WASTEWATER MANAGEMENT IN COASTAL GEORGIA

A Menu of Options

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Executive Summary

Wastewater Management in Coastal Georgia: A Menu of Options, provides Georgia's coastal communities with a suite of recommendations designed to support the following goal developed by the Coastal Wastewater Advisory Committee:

Coastal Georgia communities work together to appropriately manage wastewater to protect public and environmental health and ensure our economic future.

Its intended audience is (1) local government officials, particularly elected officials who may have an incomplete understanding of what sustainable wastewater management entails, (2) residents and organizations interested in options for meeting wastewater challenges and opportunities, and (3) state and regional agencies.

This manual is organized in five sections: Local and Regional Planning, Funding, Wastewater Treatment Plants, Onsite Systems, and Community Systems. Recommendations are centered around Action Items: specific, achievable goals for coastal wastewater management. Most Action Items include two or more management alternatives: detailed policies or programs to satisfy Action Items. When multiple management alternatives are provided, they progress from those appropriate for smaller communities to those suitable for larger urban areas. Action Items in each section are organized under broad management topics, as follows:

<u>Local and Regional Planning</u>
- Interdepartmental communication and cooperation
- Intergovernmental communication and cooperation
- Local wastewater planning

<u>Wastewater Treatment Plants</u>
- Design
- Plant operations
- Collection systems
- Education and outreach

<u>Community Systems</u>
- Inventories
- Oversight or prohibitions
- Uses, siting, and land use planning
- Management programs

<u>Funding</u>
- Permit and funding eligibility and incentive programs
- Infrastructure selection and management
- Local rates and funding programs

<u>Onsite Systems</u>
- Inventories and mapping
- Siting, design, and installation
- Operation and maintenance
- Failing and nonconforming systems
- Enforcement

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Introduction

Wastewater infrastructure development and management decisions are some of the most significant, and often contentious, choices that communities make. They can involve huge expenditures of public and private funds, influence where and how growth occurs, and impact environmental and public health. On Georgia's coast,[1] where changing population projections[2] and environmental limitations make these decisions even more complicated, careful planning and coordination are particularly important. This manual provides Georgia's coastal communities with information necessary for making smart decisions and addressing challenges and opportunities.

Wastewater Infrastructure on the Coast

This manual provides management alternatives for all three types of wastewater infrastructure used on the Georgia coast – centralized, onsite, and community systems. Centralized systems are large, highly engineered plants that provide advanced treatment and can support all development types and patterns. They provide communities with varied options for development, but are very expensive and can be a risky investment for some communities. There are currently about 40 publicly owned municipal centralized treatment plants on the Georgia coast. Most discharge treated effluent into rivers and streams, but land application sites and reuse systems are also used.

Onsite systems are small systems (less than 10,000gpd) that treat the wastewater from one home or business. Because they use simple treatment technologies and require large sites to accommodate a drainfield, onsite systems cannot support dense development. They are almost always privately owned, and so do not involve an investment of public funds to construct and operate. The vast majority of onsite systems are septic systems, but alternative technologies that provide advanced treatment and can be used on difficult sites are also available. Some coastal communities use onsite systems for most or all of their wastewater infrastructure.

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[1] In this document, "coastal Georgia" refers to communities within the purview of the Coastal Regional Commission of Georgia: Bryan, Bulloch, Camden, Chatham, Effingham, Glynn, Liberty, Long, McIntosh, and Screven Counties, and the 35 cities located within them.

[2] Coastal Georgia's population increased by 62% between 1970 and 2000. CENTER FOR QUALITY GROWTH AND REGIONAL DEVELOPMENT, GEORGIA INSTITUTE OF TECHNOLOGY, GEORGIA COAST 2030: POPULATION PROJECTIONS FOR THE 10-COUNTY COASTAL REGION 3-4 (2006). Projections developed for 2030 in 2010 estimated population growth of 47% for the region, but new projections developed in 2015 reduced the estimated population growth to only 28%. *See* U.S. CENSUS BUREAU, U.S. DEPT. OF COMMERCE, GEORGIA: 2010 – POPULATION AND HOUSING UNIT COUNTS, Table 4 (2012); GEORGIA OFFICE OF PLANNING AND BUDGET, GEORGIA RESIDENTIAL POPULATION PROJECTIONS BY COUNTY: GEORGIA COUNTIES, 2013-2015 (2015).

Community systems, also called cluster systems, are mid-sized (~10,000gpd – ~150,000gpd) and usually service multiple homes and/or businesses. Wastewater is treated off-site but nearby, usually on a large drainfield. Treatment technologies vary; some consist of conventional septic tanks on individual lots with a shared drainfield, while others incorporate more advanced treatment technologies that can support reuse.[3] Because treatment occurs offsite and more advanced processes are available, community systems can support a wide variety of development types and patterns, including dense mixed-use development. In Georgia, these systems are usually privately owned, but issues with private ownership have spurred some communities to engage in public ownership or oversight or even prohibit community systems. There are about a dozen community systems on the Georgia coast; most are in Bulloch, Chatham, and Glynn Counties.

Environmental Limitations

Coastal Georgia contains extensive undeveloped areas filled with marshes, wetlands, estuaries, rivers, streams, and groundwater recharge areas. These natural resources provide significant services and make the region an attractive place to live and visit, but they also complicate infrastructure siting and management. Many of the management alternatives in this manual address environmental limitations.

Assimilative capacity of surface waters is a significant issue for wastewater management on the coast. If surface waters degrade to a point where they can no longer assimilate additional pollutants without violating water quality standards,[4] communities where centralized plants discharge into these waters may be prohibited from increasing discharges or required to invest in expensive plant upgrades. Assimilative capacity is already compromised in some surface waters in coastal Georgia, particularly in the Ogeechee and Altamaha river basins.[5] A leading cause of surface water impairments is low dissolved oxygen, often caused by excess nutrients. When statewide nutrient water quality standards – currently under development – are implemented, it may lead to a finding that additional waters have exceeded their assimilative capacity. Estuaries are particularly sensitive to nutrients, so impacts may be noteworthy in estuaries and tidal systems.

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[3] These systems do not, however, contain the kinds of technologies found in centralized systems; "package plants" in vogue several decades ago did incorporate these processes and were problematic due to a lack of appropriate management.

[4] Assimilative Capacity is defined as the amount of contaminant load that can be discharged to a specific waterbody without exceeding water quality standards or criteria. *See* GEORGIA EPD, SYNOPSIS REPORT CURRENT ASSIMILATIVE CAPACITY ASSESSMENT 3 (2010).

[5] COASTAL GEORGIA REGIONAL WATER COUNCIL, COASTAL REGIONAL WATER PLAN 5-1 (2011).

Groundwater is abundant in coastal Georgia; the Floridan Aquifer is extremely productive and is used for most regional municipal and agricultural uses and almost half of all industrial uses.[6] Saltwater intrusion into the Floridan Aquifer became severe enough in recent years to prompt major restrictions on groundwater withdrawal permits in many coastal communities, and EPD is strongly encouraging development of costly wastewater reuse facilities to conserve groundwater resources.

High coastal water tables present issues for all types of infrastructure. Onsite and community systems and land application systems used by some centralized plants require specific site conditions, including minimum depths to water table that are uncommon on the coast. This makes siting these systems difficult in many communities. High water tables also impact sewer lines. Through infiltration and inflow, groundwater can enter collection systems, decreasing plant capacity, increasing costs and system wear and tear, and depleting groundwater resources.

Finally, climate change is expected to impact the Georgia coast. Accelerated sea level rise, increased occurrence of drought, and more frequent and severe weather events will impact wastewater infrastructure and increase the number of "enteric events" (outbreaks in intestinal disease).[7] Sea levels are predicted to rise at least six inches in coastal Georgia in the next fifty years,[8] and may damage pumps, sewer lines, and drainfields. Fortunately, coastal communities in Georgia and across the U.S. are planning for sea level rise adaptation, and funding and technical assistance programs for such measures are becoming common.

Funding

Well-planned funding policies and programs can help communities make cost-effective infrastructure decisions, ensure consistent service and sufficient revenues, avoid unexpected costs, and protect public and individual investments. This manual contains an entire section dedicated to management alternatives related to funding.

Funding capital costs for wastewater infrastructure is often a challenge for communities and individual households. Centralized treatment plants are frequently the largest single budget item for a community, and if anticipated growth is not realized they can become a crippling debt burden. Population projections for the coast have changed in recent years (see Figure 1), and many communities will have to decide whether investment in new or expanded centralized plants is worth the risk.

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[6] Coastal Water Plan, supra note 5, at ES-4.

[7] KEITH T. INGRAM, ET AL, SOUTHEAST REGION TECHNICAL REPORT TO THE NATIONAL CLIMATE ASSESSMENT 50 (2012).

[8] Georgia Sea Grant: Sea Level Rise in Georgia, http://georgiaseagrant.uga.edu/article/sea_level_rise_in_georgia/ (last visited Jan. 7, 2014).

Compared to centralized plants, onsite systems are inexpensive, but repairing or replacing them is often an unexpected and significant expense for individual households. Many onsite systems on the coast are aging and will need substantial repairs or replacement in coming years. Communities may want to consider developing funding or utility programs to help with costs. Community systems carry less financial risk than centralized plants, but local governments need to establish oversight or management programs to ensure they do not become an unexpected financial burden.

Establishing sustainable sewer rates and fees for centralized plants can be a challenging task, but is necessary for communities to provide consistent service and maintain regulatory compliance. Operation and maintenance programs for centralized systems are, however, "consistently inadequate and underfunded" in Georgia.[9] Fortunately, there are tactics and tools available to help communities set and maintain sustainable rate structures.

Figure 1. Changes in 2030 Population Projections for Georgia Coastal Communities

County	2010 Population[10]	2030 Population Projection (2010)[11]	2030 Population Projection (2015)[12]	Change in Projection (rounded)
Bryan	30,233	59,534	51,924	- 13%
Bulloch	70,217	109,034	89,828	- 18%
Camden	50,513	96,743	59,679	- 38%
Chatham	265,128	324,098	339,092	+ 0.05%
Effingham	52,250	112,062	76,320	- 32%
Glynn	79,626	109,771	96,667	- 12%
Liberty	63,453	93,821	70,890	- 24%
Long	14,464	17,171	24,618	+ 43%
McIntosh*	14,333	20,686	12,778	- 38%
Screven*	14,593	20,036	13,964	- 30%
All Counties	654,810	962,956	835,760	- 15%

**County is forecast to have decrease in residential population between 2010 and 2030.*

Infrastructure Management

Proper operation and maintenance is necessary for all wastewater infrastructure types. For centralized plants, collection (sewer) system maintenance is a challenge. It is

[9] AMERICAN SOCIETY OF CIVIL ENGINEERS, 2009 ASCE GEORGIA INFRASTRUCTURE REPORT CARD 5 (2009).
[10] U.S. Census Bureau, U.S. Dept. of Commerce, GEORGIA: 2010 – POPULATION AND HOUSING UNIT COUNTS, Table 4 (2012).
[11] Georgia Office of Planning and Budget, Georgia 2030: Population Projections 3 (2010).
[12] Georgia Office of Planning and Budget, Georgia Residential Population Projections by County: Georgia Counties, 2013-2015 (2015).

difficult and expensive to monitor and maintain miles of sewer lines, many of which are aging. Line maintenance is particularly important on the coast because of issues with infiltration and inflow. Thankfully, there are well-established methods available to prioritize sewer maintenance; these and funding practices to help pay for them are described in this manual.

Management of onsite systems is the responsibility of property owners[13] who are often unaware of best operation and maintenance practices. Improperly maintained systems are more likely to malfunction, necessitating expensive repairs and replacements that can be a significant financial burden. Non-mechanical septic systems are the most pressing concern here – state law specifically prohibits county boards of health from requiring their maintenance and most local governments have not stepped in to fill the void.[14] Fortunately, there are a wide range of options, both regulatory and non-regulatory, that can be implemented and are described in this manual. Adequate septage disposal facilities must provided to support septic maintenance programs; options here are also described.

In Georgia, community systems are usually owned by homeowners associations and managed by private companies. Some companies have discontinued management with little warning, and often after system malfunctions. Coming up with a usually expensive remedy for these situation often falls into the hands of the ill-equipped local government, making a private system a public problem. Local oversight or management programs are needed to successfully reap the many benefits these systems can provide.

Governmental Communication and Cooperation

Communication and cooperation within communities, between communities, and among agencies and communities can help provide cost-effective, sustainable wastewater management in coastal Georgia, and will become more and more important as the region grows. This manual provides management alternatives facilitating both interdepartmental and regional coordination.

Within communities, interdepartmental communication and cooperation concerning wastewater management is often lacking. A number of local departments are involved in aspects of wastewater management, and they should regularly discuss responsibilities, challenges, and goals. Local governments also need to ensure that wastewater managers are plugged into the development review process at all stages – from rezoning requests to final site inspections. This is particularly true for onsite systems and when issuing permits to tie onto a sewer line. Luckily, interdepartmental

[13] Ga. Comp. R. & Regs. § 290-5-26-.18(2) (2014).
[14] Ga. Code Ann. § 31-3-5(b)(6) (2014).

strategies are uncomplicated, and the benefits they can provide can far outweigh limited expenditures of time and money in implementation.

Communication and cooperation between local governments is also important. The impacts of wastewater management decisions traverse political boundaries, and communicating and partnering with neighboring communities can provide a wide range of benefits, including more effective, cost-efficient services and improved environmental outcomes. Partnerships may include regional wastewater facilities, septage disposal facilities, and utility programs to manage onsite or community systems.

Section 1: Local and Regional Planning

Introduction. Well-planned wastewater management is more likely to be cost-effective, environmentally protective, and responsive to local and regional needs. The most successful approaches tend to including the following:

- Communication and cooperation among local departments with some responsibilities related to wastewater management.
- Communication and cooperation with other communities, including partnerships to provide services where appropriate.
- Local wastewater plans that identify needs and goals for new and existing infrastructure, recognize the connection between wastewater infrastructure selection and growth patterns, and are coordinated with other local plans to comprehensively address water quality and other issues.

Challenges and opportunities. On the Georgia coast, local and regional wastewater planning efforts should be especially valuable because they can help communities effectively manage forecasted growth and respond to emerging challenges such as sea level rise. Fortunately, there are successful examples of local planning that communities can emulate and existing regional planning efforts that provide opportunities for collaboration.

Action Items for local and regional planning are categorized under the following topics:

Interdepartmental communication and cooperation. One of the simplest ways to facilitate effective local wastewater planning is by improving communication and coordination among local government departments. This can help educate officials on departmental activities and needs, ensure departmental plans and activities are not in conflict, and integrate permitting processes. Management alternatives described in this section are not difficult to implement, but do require dedication from local officials.

Intergovernmental communication and cooperation. Impacts from wastewater management and community growth transcend political boundaries. When communities work together, it often results in more effective and efficient services and programs that benefit local governments and the community at large. Georgia law provides for this, to a certain extent, by requiring local Service Delivery Strategies. There are, however, significant benefits that can be gained by more robust relationships with neighboring localities. Merely meeting regularly with officials from other communities can yield significant benefits. More sophisticated arrangements are also possible. Some coastal communities have, for example, partnered with each other to develop watershed assessments or provide wastewater planning and engineering services. Others have developed regional wastewater facilities or

authorities. At some point, it may be advantageous for the coast to take a region-wide approach to intergovernmental wastewater planning; one option here is a coastal regional capital improvement program.

Local wastewater planning. Wastewater planning helps communities identify and resolve financial and management decisions before they become urgent. When goals and challenges are specified in advance, communities can take advantage of a wider range of options and make cost-effective infrastructure decisions.

Interdepartmental Communication and Cooperation

Action Item 1.1. Provide for regular communication among local government departments responsible for wastewater management and community development.

Simple actions here can result in significant benefits.

Identify staff to act as department liaisons and hold regular meetings. A straightforward way to improve interdepartmental communication and cooperation is to regularly convene representatives of departments with some responsibility for wastewater management (water and sewer utilities, health department, planning and zoning, public works, stormwater) to discuss responsibilities, challenges, and opportunities. Establishing goals and benchmarks, such as improving management efficiency by annually reviewing permit procedures for streamlining opportunities, can help guide discussions and facilitate results. Regularly inviting state and regional agency representatives can help local officials anticipate policy changes and help agencies understand local needs.

Provide regularly scheduled updates of departmental activities to elected officials. Elected officials frequently interact with some officials with responsibilities related to wastewater management (planning and zoning staff, for example). It is, however, more rare for city and county commissioners and mayors to have regular communication with other departmental representatives (health department officials, for example). When elected officials hear from these representatives on a regular basis it can help them appreciate the roles these representatives play and challenges they face. Regularly scheduled updates, such as every quarter, can help keep these communications consistent and at the forefront of elected officials' minds.

Action Item 1.2. Require wastewater managers input into land use planning and development approval.

Availability of wastewater infrastructure dictates, to a large extent, when and how communities can grow, so wastewater officials should be formally involved in land use planning and development approval. If they are not, local officials may develop impractical growth scenarios or risk legal trouble by approving developments for which there is no wastewater capacity.

In this manual, several management alternatives address this subject, including:

- Identify when and where different infrastructure types should be utilized (Local and Regional Planning, Action Item 1.7).
- Require Health Department approval of site alterations and development plans (Onsite Systems, Action Item 4.3).
- Ensure capacity exists before authorizing new connections (Wastewater Treatment Plants, Action Item 3.8).

Intergovernmental Communication and Cooperation

Action Item 1.3. Provide for regular communication and cooperation with neighboring and regional communities.

The impacts of wastewater management decisions can traverse political boundaries. Water pollution from wastewater can travel into neighboring communities. Growth spurred by the extension of a sewer line or development of onsite system subdivisions can impact development patterns in adjacent areas. Communicating and cooperating will help all coastal communities as the region grows.

Identify departmental staff to act as liaisons with other communities' officials and meet regularly. Regular interactions with neighboring officials can improve relationships and inform local planning. They provides numerous opportunities for communities to learn from each other's successes and mistakes, and can help officials identify and address common issues or opportunities. Intergovernmental discussions may provide a particularly useful approach for making requests to state or regional agencies; making them as a group may be more effective than a request from a single community.

Participate in development of Coastal Regional Water Plan. Georgia's Statewide Water Plan divides the state into 11 water planning regions. Each region has a Regional Water Council (appointed by the Governor, Lieutenant Governor, and

Speaker of the House) that develops a regional water plan that is supposed to guide local management actions and state agency permitting decisions, including those related to wastewater. The Coastal Regional Water Plan covers Effingham, Bulloch, Chatham, Bryan, Liberty, Long, McIntosh, Glynn, and Camden Counties, and includes the lowest portions of five major river basins – the Savannah, Ogeechee, Altamaha, Satilla, and St. Marys. The Coastal Regional Water Plan was adopted in 2011, and will, along with the 10 other regional water plans, be revised every five years.

Georgia's regional water plans are a commendable initiative that go well beyond most states' attempts at water management. Implementation of the regional plans has been sporadic, however, as it is mostly incumbent on local governments to initiate recommended management practices and there is no supplemental funding mechanism to support these activities beyond one small annual grant per regional planning council. Indeed, many local officials are unfamiliar with the contents of the Coastal Regional Water Plan. Enhanced community involvement in developing future iterations of the Coastal Regional Water Plan will result in a plan that is more responsive to regional needs and is more likely to be implemented. Ways to promote participation include:

- Educate staff and public on the purpose and contents of the plan: Staff can attend educational forums hosted by Georgia EPD or request training, and local governments can post notices of these events and upcoming regional water planning meetings in public places and on the community web site.
- Incorporate relevant management practices into local planning: Management practices related to wastewater in the Coastal Regional Water Plan include: maximize the use of reclaimed water, upgrade wastewater treatment plants to address low dissolved oxygen conditions in receiving waters, support septic maintenance programs, and coordinated environmental planning.
- Participate in 5-year revisions of the plan: The current Coastal Regional Water Council is comprised of 28 members, including 14 local government representatives.[15] Some coastal communities do not have representation on the Council. Other methods of participation, such as staff attendance at Council meetings or service on technical subcommittees, can also be beneficial.

[15] Local government representatives on the 2016-2017 Coastal Regional Water Council are: Michael Browning (Glynn County Board of Commissioners), Jason Buelterman (City of Tybee Island), Jimmy Burnsed (Bryan County Board of Commissioners), Robbie Byrd (City of Pooler), Van Collins (City of Statesboro Water and Wastewater), Forrest Floyd (Effingham County Board of Commissioners), Hugh Hodge (City of Darien), Reggie Loper (Effingham County Board of Commissioners), Johnny Murphy (Richmond Hill City Council), Phil Odom (Liberty County Consolidated Planning Commission), John Sawyer (City of Savannah Public Works and Water Resources), Jim Thomas (City of Hinesville).

- Prepare needs summary in advance of planning: The current Coastal Water Council contains just a handful of water management professionals, including only two local government utility officials.[16] If water management professionals from coastal communities developed a summary of needs and potential management alternatives *before* five year plan revisions begin, it could help inform council members and greatly improve the planning process.

Action Item 1.4. Coordinate local services with neighboring communities.

Coordinating local services can provide many benefits. Service Delivery Strategies are an excellent starting point for local coordination. As the coast grows, it may be advisable to consider developing a regional capital improvement program.

Adopt and maintain a Service Delivery Strategy that complies with minimum standards of the Service Delivery Strategy Act. The Georgia Service Delivery Strategy Act provides a flexible framework for local governments to ensure efficient, non-duplicative delivery of services to residents. Under the Act, counties and their municipalities must specify, among other things, which local government will provide sewer service in specific geographic areas and ensure that the provision of extraterritorial sewer services are consistent with all applicable land use plans and ordinances. Because local governments must have a certified Service Delivery Strategy to remain eligible for most state administered funding and permits, these plans represent an excellent starting point for cooperation among coastal communities. The guidance document *Charting a Course for Cooperation and Collaboration: An Introduction to the Service Delivery Strategy Act for Local Governments*[17] provides a thorough background to the Act, including potential organizational structures for developing strategies for both small and large counties.

Develop a coastal regional wastewater capital improvement program prioritizing plant expansions, new construction, and decommissions. The metro Atlanta area has been coping with water supply and quality issues for decades. The region, which spans five river basins, has grown by more than 3 million people since the 1970s, and associated development has taxed the region's water supply and resulted in many water quality issues. In 2001, recognizing that the region needed a central planning entity to coordinate resolution of these issues, the Georgia General

[16] The water management professionals on the current Coastal Regional Water Council are Van Collins, Assistant Director of Water and Wastewater, City of Statesboro, and John Sawyer, Public Works and Water Resources Director, City of Savannah.

[17] ASSOCIATION COUNTY COMMISSIONERS OF GEORGIA, CHARTING A COURSE FOR COOPERATION AND COLLABORATION: AN INTRODUCTION TO THE SERVICE DELIVERY STRATEGY ACT FOR LOCAL GOVERNMENTS (2002).

Assembly created the Metro North Georgia Water Planning District (MNGWPD). The MNGWPD is tasked with creating and updating enforceable plans for management of water resources, including wastewater treatment.[18] The plans, adopted in 2009 and currently undergoing scheduled revisions, include county-by-county details on new or upgraded treatment plants they might develop in coming years. EPD permits are conditioned on compliance with this and other plan elements, so the process initiated robust local wastewater planning that might not have otherwise occurred. It also provides communities with a certain level of assurance that their permit requests will be approved by EPD because local plans were based on vetted District population forecasts (EPD's divvying up of assimilative capacity in water bodies with multiple dischargers can, however, present some issues).

It is unlikely that coastal Georgia's local governments would currently want to be bound by an enforceable regional wastewater plan. The MNGWPD plans were, however, born out of necessity after little to no regional coordination during decades of growth. Enforceable plans were needed to remedy an unsustainable situation. As coastal Georgia grows, it may be in the best interest of communities to develop a capital improvement program, considered by EPD but unbinding, to spur local planning and help communities work together towards implementing a common vision for coastal growth and water resource management.

Action Item 1.5. Partner with neighboring communities to develop assessments and provide services.

Partnerships among communities to provide wastewater management services can enhance technical capacities and cost-effectiveness and help communities address regional issues. There are a number of available options here.

Partner with neighboring jurisdictions to provide watershed and wastewater planning and engineering services. Wastewater management can be a complicated and expensive endeavor, but coordination with neighboring communities can leverage funds and expertise. One way that Georgia communities have worked together is by jointly developing Watershed Assessments and Watershed Protection Plans that are required for a NPDES wastewater treatment plant

[18] Since the MNGWPD was formed, its communities have, among other achievements, seen a 55% reduction in the number of sewer spills caused by grease, replaced over 110,000 inefficient toilets with low-flow technologies, reduced water consumption by 30%, and substantially increased intergovernmental coordination and cooperation (over 350 stakeholders participate annually in board meetings, technical committees, and basin advisory councils). *See* H.R. 1622 (resolution recognizing the 15th anniversary of the MNGWPD), March 8, 2016.

permit. The Lake Allatoona-Upper Etowah River Basin Partnership[19], for example, created a Watershed Assessment and Protection Plan, partially funded by the Army Corps of Engineers, and individual communities and authorities are responsible for implementing their portion of the Plan.[20]

Another option is to partner to provide wastewater planning and engineering services. On the Georgia coast, Liberty County does this via the Liberty Regional Water Resources Council (LRWRC), which "provide[s] the forum for the cooperative planning and provision of water, wastewater, and stormwater services for all local governments in Liberty County." Among other things, the LRWRC has coordinated updates to the water and sewer Service Delivery Strategies in the most recent round of Comprehensive Plan updates for the county and its cities. See Appendix A for more information.

Enter into sewer service agreements with neighboring communities with capacity. For some communities, building or upgrading a centralized wastewater treatment plant is impractical. Some may be unable or unwilling to incur substantial debt, or may not be able to secure necessary permits due to environmental or other constraints. In other communities, additional connections may be desired for a plant operating under capacity. A sewer service agreement to purchase or sell capacity can be a solution in these situations. These agreements can take many forms, from one-time deals for connection to a single site to purchases of a portion of a plant's capacity. In coastal Georgia, and its neighboring communities have had great success in the use of sewer service agreements. Hinesville has partnered with Fort Stewart to provide advanced wastewater treatment to 69% of the population of Liberty County.

Coordinating shared service arrangements takes substantial planning, and some communities may desire the control and independence of owning their own treatment plant. Many factors, however, can make such endeavors difficult and costly. Guyton, for example, decided against tying onto Effingham County's underused plant in favor of building its own. They city has experienced costly and time-consuming permitting delays and legal challenges, but has decided to move forward with construction of the plant.

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[19] The partnership included Bartow County, Cherokee County, Cherokee County Water and Sewerage Authority, Cobb County, Cobb County-Marietta Water Authority, Dawson County, Etowah Water and Sewer Authority, Forsyth County, Lumpkin County, and Pickens County.

[20] Other examples include partnerships which created Watershed Assessments and individual communities developed their own Watershed Protection Plans. These include the now-disbanded West Georgia Partnership, which included Carroll County, Heard County, the City of Carrollton, City of Villa Rica, and some smaller communities, and the still intact North Georgia Water Resources Partnership, which includes City of Calhoun, Pickens County, City of Rome, Chatsworth Water Works, Walker County Water and Sewer, City of Blue Ridge, City of Cave Spring, City of Fairmount, and the City of Jasper.

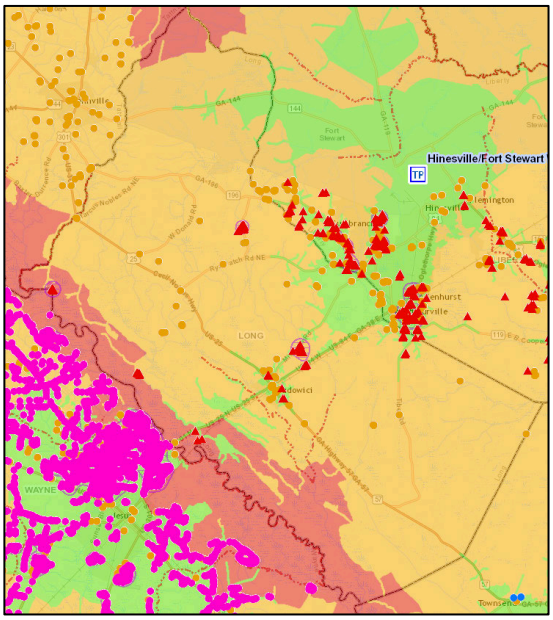
Figure 2. Water System Partnerships, Interconnections, and Interlocal Agreements in NC
The University of North Carolina Environmental Finance Center conducted a study of inter-local water system partnerships in North Carolina that provides a wealth of helpful information transferable to Georgia communities, including tips for crafting successful agreements. Information on the project, including a free webinar, is available on the Center's web site.[21]

Partner with neighboring jurisdictions to provide septage disposal facilities. Many parts of coastal Georgia have inadequate disposal facilities for septage, the concentrated sludge that must be periodically pumped from onsite systems. Currently, the only facilities permitted to accept septage on the coast are wastewater treatment plants, but many plants do not accept it, only accept it from limited areas, or charge high fees for disposal. When pumpers must drive long distances – and potentially pay high fees – to dispose of septage, it raises costs for homeowners and acts as a disincentive to regular maintenance. This can also result in more illegal dumping, which can cause serious public and environmental health impacts. For a full analysis of septage disposal capacity in coastal Georgia, see the UGA River Basin Center's *Coastal Georgia Septage Disposal Study* in Appendix D.

In places without adequate septage disposal options, communities can partner with neighboring jurisdictions to develop facilities. This type of partnership may be particularly valuable for developing standalone disposal facilities in places without wastewater treatment plants nearby. One potential method, championed by officials at the Camden County Health Department, could be to install a septage de-watering system at a landfill site. The area would already be zoned for less than desirable land uses, so siting would be easier, and dewatered solids could be disposed at the landfill. Liquids could be treated through an onsite system.

There is currently no single permit for standalone septage facilities in Georgia, and obtaining approval from EPD for earlier proposals has proven challenging. EPD officials have, however, shown interest in supporting adequate septage disposal on the coast, so it is possible that they will develop a specific permit for these facilities or materials to guide applicants through the existing permitting process. Appendix B, *Recommendations for Agencies and the Georgia General Assembly*, includes a recommendation that EPD develop a permit for these facilities.

[21] UNC Environmental Finance Center, Webinar: Water System Partnerships, Interconnections, and Interlocal Agreements, at http://www.efc.sog.unc.edu/project/water-system-partnerships-interconnections-and-interlocal-agreements.



WelSTROM includes GIS layers showing drive times to septage disposal facilities in coastal communities. This image depicts drive times in Long County; green are areas with shortest drive times, red are areas with longest drive times.
© South Georgia Regional Commission 2015

Develop regional wastewater treatment facilities and/or authorities. In many parts of the country, regional wastewater facilities or authorities provide services for multiple communities. Organizational structures and size of service areas vary widely, ranging from small, single-service governing boards that administer one or more smaller facilities serving a handful of communities,[22] to large, professionally-staffed organizations operating multiple large plants to provide service to entire river basins or metropolitan areas.[23] The Coastal Regional Water Plan includes identification of opportunities to implement regional wastewater facilities in one of its six goals.[24] For the time being, a smaller regional approach may be most practical. Several smaller communities in close proximity to one another could, for example, jointly construct

[22] The Big Bear Area Regional Wastewater Agency in the San Bernardino Mountains of Southern California has a 5-member Governing Board that administers the operation of a single wastewater treatment plant serving a handful of small communities. *See* http://bbarwa.org/. The Milton Regional Sewer Authority is administered by an 11-member Board; it operates three treatment plants that service six communities in east-central Delaware. *See* http://www.miltonregional.org/Pages/Home.aspx.

[23] The Trinity River Authority of Texas provides wastewater treatment services to over 60 cities in the Trinity River Basin through five centralized plants. It also provides drinking water treatment to the area and operates one reservoir. *See* http://www.trinityra.org/. The Northeast Ohio Regional Sewer District, governed by a 7-member Board of Trustees, operates three wastewater treatment plants serving the greater Cleveland Metropolitan Area, which includes the City of Cleveland and all or part of 61 other municipalities. *See* http://www.neorsd.org/index.php.

[24] Coastal Regional Water Plan, supra note 5, at 1-4.

and operate a treatment plant. Another option, relatively common in the state, is to develop a joint sewer authority to provide service to a county and its municipalities. In coastal Georgia, the Brunswick-Glynn County Joint Water and Sewer Commission (BGCJWSC) was created in 2006 to provide efficient, non-duplicative service and prepare for growth. The BGCJWSC represented the next step in intergovernmental sewer service for these communities, as the city had been providing sewer service to the county's north mainland through an agreement established in 1988.

Develop a regional onsite and/or community system utility. The most significant challenge with both onsite and community wastewater systems is ensuring effective management. A regional utility is one way that coastal officials could address these challenges. These programs are used in many areas of the country and operate like a centralized wastewater utility by providing a suite of management services for regular fees. On the Georgia coast, a regional approach could be particularly beneficial because it could provide a larger customer base. A regional utility would also spread the responsibility for developing the program among multiple communities. This may require more front-end planning but may end up being more cost-effective in the long run. The Otter Tail Water Management District and the Ozarks Clean Water Company are examples of regional utilities that manage onsite and community wastewater systems (see Appendix A). The UGA River Basin Center's *Decentralized Wastewater Management: A Guidebook for Georgia Communities* provides information on establishing utility programs.

Local Wastewater Planning

Action Item 1.6. Establish impetus and capacity for planning.

A formal charge to engage in local wastewater planning and establishment of a planning entity provide support for development of an effective plan.

Adopt a local resolution requiring development of a local wastewater plan. A local resolution can provide an impetus to engage local officials in wastewater planning. It can specify minimum elements the plan should include, departments that should be involved, the ways in which neighboring communities should be engaged, and a timeline for completion. The resolution can also establish a policy of treating wastewater to a level that meets or exceeds all regulatory standards. Situations can arise where a plant may temporarily, or even protractedly, violate its permit, and this DCA WaterFirst program element can initiate planning, focus staff on specific compliance activities, and highlight the need for additional resources.

Establish a local water resources council to develop plans. Local wastewater plans are most effective when they are developed by groups with extensive local

knowledge and wastewater management expertise. A way to organize such groups is through establishment of a local water resources council responsible for developing plans. On the Georgia coast, Liberty County's Liberty Regional Water Resources Council provides coordinated water-related planning for the county and its municipalities. The Council is composed of the mayors of the cities and the chair of the county commission. It is guided in its efforts by a Technical Advisory Committee composed of relevant staff from the cities and the county.

Action Item 1.7. Establish goals for new and existing infrastructure.

Effective local wastewater plans address both new and existing infrastructure, including where new infrastructure will be located and options for existing infrastructure in eventual need of upgrades or replacement.

Identify when and where different infrastructure types should be utilized. Local wastewater plans typically address where wastewater infrastructure should and should not be used. Not every type of infrastructure is appropriate in every situation, and communities that identify landscape and other limitations and plan around them will save time and money and improve the development process. Communities can include specific requirements for siting wastewater infrastructure in local development ordinances or create overlay zones that identify specific areas in the community appropriate for different infrastructure types. Any inconsistencies between the results of this assessment and existing Service Delivery Strategies will need to be addressed.

Factors that should be assessed include:

- Environmentally sensitive areas: It may be impossible or impractical to develop wastewater infrastructure in or adjacent to wetlands, groundwater recharge areas, and important habitat.
- Soils: Onsite and community treatment systems and land application disposal systems require specific soil types and depths.
- Land use and other plans: Different infrastructure types support different types of growth, so land use plans, including Comprehensive Plans, should inform this assessment.
- Sea level rise: Rising seas will cause inundation, higher water tables, and inland migration of tidal influence. This can influence the siting of all types of wastewater infrastructure, including surface water discharge points.

In some areas, multiple infrastructure types may be suitable. Communities may want to consider requiring formal alternatives analyses in these situations (see Action Item 2.3).

Identify options for aging infrastructure. Early planning for aging infrastructure can increase community options and result in more cost-effective projects. Identifying neighborhoods with aging onsite systems before they become a pressing issue, for example, can allow communities to plan funding programs for replacing or connecting them to sewer to ease the burden on residents. It can also give communities time to plan local programs for community systems if this is an option.

Action Item 1.8. Assess and address water quality issues.

Local water quality and wastewater management are intrinsically related. Poor wastewater management can impact water quality, and impacts from other sources can end up impacting wastewater management options.

Identify current and future sources of water quality impairments. Water quality impairments cause a number of problems, including potentially impacting the operations or expansion of a centralized wastewater treatment plant. If the water body a plant discharges into is impaired, EPD may focus more attention on plant operations and may only allow an expansion of capacity if the plant is substantially upgraded. Communities that identify current and future sources of water quality impairments, especially nonpoint source pollutants such as stormwater runoff, will be better equipped to respond to them and prevent such challenges from arising. Watershed Assessments and Watershed Protection Plans, required for NPDES permits, can provide much of this information.

Coordinate local plans to address water quality issues. Water quality problems stem from many sources, and coordinated plans are more effective at addressing them. Coordinated planning is a recommended management practice in the Coastal Regional Water Plan. Land use, stormwater, water supply, and wastewater plans are primary candidates for coordination or integration.

Action Item 1.9. Coordinate comprehensive plans, wastewater plans, and zoning.

Community growth is impacted by wastewater infrastructure decisions, and local growth plans and rules should be coordinated with local wastewater plans.

Describe connection between wastewater infrastructure decisions and growth patterns in comprehensive plan. Comprehensive plans are formally adopted documents that describe the current state of a community, issues and opportunities it faces, how it wants to grow, and how it plans to get there. Describing the connection between wastewater infrastructure decisions and growth patterns in the Comprehensive Plan has at least two benefits. First, it draws attention to an issue that

is often underappreciated by local elected officials. Second, including this connection in the comprehensive plan can provide local governments with legal support for land use decisions related to wastewater infrastructure. In a lawsuit, showing that the land use decision was based on the formally adopted comprehensive plan can show that the local government's decision was reasonable.

Coweta County provides the following explanation for their decision not to extend sewer to their "Village Center" development areas in their Comprehensive Plan Community Agenda:

> *Supporting Village Centers will require innovative solutions to providing wastewater treatment service. Sewer service will be necessary. Centralized water reclamation plants are generally more economical and reliable than smaller, decentralized systems. However, one potential issue with using central water reclamation plants to serve Village Centers that are not adjacent to the wastewater treatment facilities is that interceptor lines would be on vacant land on their way from the central plants to the Village Centers. There is concern that the County would be pressured by petitions from intervening property owners to connect their property to the system via the interceptor line. This could undermine the success of the Village Centers and disrupt the Future Development Map. Therefore, the County should consider the alternative of permitting one or more decentralized systems having less than 500,000 gallons per day capacity in Village Centers. The recommended technology for these plants would be Membrane Bioreactor plants that are capable of meeting the strict effluent limits imposed on new or expanded treatment plants in the MNGWPD. These new technology plants are more economical and reliable than the older package plants because they are cleaner, operate automatically and do not require full time staff on site.*

Coordinate local growth plans with wastewater plans. Conflicting local plans can result in inefficient decision making and make it more difficult for communities to realize goals. Because wastewater infrastructure use can impact growth patterns, local wastewater plans (including Service Delivery Strategies) should be coordinated with local growth plans, and vice versa. Doing so can avoid wastewater decision making that conflicts with local growth goals, such as plans to extend a sewer line into an area where dense growth is undesirable. It can also help communities understand their practical options for the ways they want to grow. In some communities, for example, it may be impractical to service exurban "village" type pockets of dense growth with centralized sewer service; these communities may need to consider community systems for such developments.

Section 2: Funding

Introduction. Funding wastewater management can be challenging for local governments and individual households. Centralized wastewater treatment is typically one of the most expensive services a local government provides. These systems often cost tens of millions of dollars to build and are a major annual expense. Sufficient rate revenue is needed to pay for these services, but it can be difficult for local officials to overcome public sentiment for lower fees. Indeed, sudden, sharp hikes in monthly fees can be a financial burden on residents. An even greater burden for homeowners occurs when residential onsite systems need major repairs or replacement. This can easily cost in the thousands or tens of thousands of dollars, and is usually unexpected.

In Georgia, the largest provider of public loans for wastewater infrastructure is the Georgia Environmental Finance Authority (GEFA). GEFA administers most of its loans through two programs – the Clean Water State Revolving Fund (a federally subsidized loan program) and the Georgia Fund (a state loan program). Other funding sources for wastewater infrastructure projects are available through state agencies and authorities, federal agencies, and regional organizations (see Figure 3).

Figure 3. Funding sources for coastal Georgia wastewater infrastructure (excluding private capital market)

- GEFA – *Clean Water State Revolving Fund, Georgia Fund, Environmental Emergency Loans, Interim Loans*
- OneGeorgia Authority – *OneGeorgia Authority Equity Fund*
- Economic Development Administration, *Public Works and Development Facilities Grant Program*
- Georgia Department of Community Affairs – *Community Development Block Grant Program*
- USDA Rural Development – *Water and Wastewater Loans and Grants, Emergency Community Water Assistance Grants, Very Low-Income Housing Repair Loans and Grants*
- Southeast Rural Community Assistance Project, Inc. – *Loan Fund Program*

Adapted from Georgia Water and Wastewater Funding Sources, © UNC EFC 2015.

On the Georgia coast, where investments in existing and new wastewater infrastructure will be needed in coming years, it is especially important for local governments to develop sustainable strategies for wastewater management funding. Growth can help fund these activities, but capitalizing on this revenue source takes careful planning and commitment. In many instances it will not be enough. Community leaders will have to look to other sources of wastewater management funding, and understand that the importance of effective wastewater management means that some unpopular funding approaches may be necessary.

Challenges and opportunities. There are three primary ways that local officials can ensure sufficient funding: maintaining permit and funding eligibility and participating in funding incentive programs, selecting cost-effective infrastructure and managing assets, and establishing sustainable local rates and necessary funding programs. Action Items for funding are categorized under these themes.

Permit and funding eligibility and incentive programs. State permit and funding eligibility is conditioned on local governments complying with certain minimum requirements. Eligibility for state funding programs is important because they offer excellent rates. Even better rates can be obtained through participation in some agency incentive programs.

Infrastructure selection and management. Selecting cost-effective infrastructure and effectively managing infrastructure assets are key components of sustainable wastewater management programs.

Local rates and funding programs. Ensuring sufficient revenues is essential for paying off capital debt and funding the continued operation and maintenance of wastewater infrastructure. There ways for local governments to ensure rates are sufficient and fair and are established without expenditure of too much political capital. The other major source of system revenues – new user tie-on or impact fees – can be accomplished through at least two common programs.

Although local governments are usually primarily concerned with funding publicly owned, centralized treatment plants, some coastal communities may also want to consider funding programs for repairs or replacements of onsite systems. These expenses are often a major burden for homeowners, and when problematic systems are not dealt with the entire community can suffer, through public health issues, water quality impacts, contributions to economic blight, and other problems.

Permit and Funding Eligibility and Incentive Programs

Action Item 2.1. Maintain eligibility for permits, grants, and loans.

A state-issued permit, and usually a loan or grant, is required for construction or upgrade of any publicly-owned wastewater treatment system in Georgia. Local governments must develop an approved Service Delivery Strategy to remain eligible

for all state grants, loans, or permits (see Action Item 1.4 for more information). They must also maintain Qualified Local Government status in order to be eligible for a wide range of grants, loans, and other funding programs, including GEFA loans and some grants from the Department of Natural Resources. Qualified Local Governments are those with a DCA-approved comprehensive plan.

Action Item 2.2. Obtain discounts on loan rates.

Lowering interest rates can significantly lower the overall cost of wastewater projects.

Seek designation as a WaterFirst or PlanFirst community. DCA oversees two voluntary, incentive-based programs that offer participants reduced interest rates on some GEFA loans. WaterFirst awards environmental excellence in water resources management beyond what is required by law.[25] PlanFirst awards communities that clearly demonstrate a pattern of successful implementation of their comprehensive plan.[26] In coastal Georgia, the Cities of Savannah, Tybee Island, and Garden City have been designated as WaterFirst communities, and Liberty County has been designated as a PlanFirst community.

Develop GEFA Conservation Initiative qualifying projects. The GEFA Conservation Initiative program provides a 1% interest rate reduction for projects that conserve energy and water at publicly-owned wastewater treatment plants. Eligible projects include wind, solar, and biogas combined heat and power. The reduced rate for water conservation includes both projects and programs.

Infrastructure Selection and Management

Action Item 2.3. Conduct alternatives analyses for wastewater infrastructure projects.

A key step in minimizing the costs of public wastewater infrastructure is to conduct a thorough alternatives analysis when planning projects. An alternatives analysis looks

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[25] WaterFirst focuses on seven components – watershed assessment, stormwater master planning, water supply planning, water supply protection, water conservation, wastewater treatment systems and management, and water reclamation and reuse. Georgia Dept. of Community Affairs, *WaterFirst: Recognizing Communities for Excellent in Water Stewardship*, available at http://www.dca.state.ga.us/development/PlanningQualityGrowth/Water%20First/WaterFirst%20brochure%207-22-2015.pdf.

[26] *See* Georgia Dept. of Community Affairs: Program Description, at https://www.dca.ga.gov/development/PlanningQualityGrowth/programs/PlanFirst.asp.

at all potential types of infrastructure available and assesses them based on regulatory requirements, cost-effectiveness, growth implications, environmental impacts, and stakeholder priorities. They are most helpful when transparent and unbiased. One technique to help achieve this is to have the analysis developed by a consultant from outside of the community (perhaps outside of Georgia). Alternatives analyses, which are a DCA WaterFirst program element, should be informed by the community's decisions regarding where different infrastructure types should be located (see Action Item 1.7).

Action Item 2.4. Estimate and plan for funding of wastewater management.

Conduct inventories of existing assets. Understanding the condition of existing wastewater infrastructure assets is a key component of cost-effective wastewater management. Here, local officials compile information on all types of infrastructure in the community – onsite systems, centralized wastewater treatment plants, and community systems. This information helps officials decide what exactly they should plan to fund – maintenance, expansion, or upgrading of existing systems, construction of new systems, new policies or management programs, and other measures. Asset inventories inform regular infrastructure budgeting, which can be included in short term work plans in local comprehensive plans and also included in an annual plan for capital projects. They are also are a key component of asset management programs, described below.

Prepare projections of future service areas. This DCA WaterFirst program element helps communities plan for collection and treatment system expansions and upgrades by projecting populations, high growth areas, sanitary flows, and the potential impacts of infiltration and inflow. With this information in hand, local officials can better predict when and where investments will be necessary.

Implement a capital improvement program. Capital costs for new, rehabilitated, or replacement infrastructure represent a significant part of the price of treating wastewater. Capital improvement plans lay out a long-term framework for these investments; communities that have them are better prepared to provide consistent service, maintain regulatory compliance, and protect public and environmental health. They also help ensure predictable rates: long-term scheduling of major improvements avoids steep short-term rate hikes to pay for an unexpected project. Capital improvement plans usually apply to public centralized plants, but can also include publicly owned or managed onsite or community systems. The University of North

Carolina Environmental Finance Center provides helpful information on capital improvement planning for wastewater systems on their website.[27]

Implement an asset management program. The goal of asset management programs is to provide services in the most cost-effective way possible. Typically used for large public infrastructure investments like centralized wastewater treatment plants, these programs go beyond capital improvement and other funding decision programs by considering all of the factors that affect the cost of delivering services. Asset management programs include the following core components:

- Asset inventories: This is the most clear-cut and probably the most important aspect of asset management. Even communities that do not develop a comprehensive program can realize significant benefits from asset inventories. They involve asking: What do I own? Where is it? What condition is it in? What is its remaining useful life? What is its value?
- Specifying level of service: Specifying how the system and programs should operate over the long-term helps managers determine the most cost-effective way of providing desired services to customers and track accomplishments. Level of service can include actions like responding to customer complaints in a certain amount of time, repairing breaks in a certain amount of time, and levels of acceptable infiltration and inflow losses. Meeting regulatory requirements should be a component of all levels of service.
- Identifying critical assets: The two questions asked here are an asset's likelihood of failure and the consequences if it does fail. This allows managers to control risk and make informed decisions for operation and maintenance and capital expenditures.
- Life-cycle costing: Here, managers determine an optimal way to fund the different options for existing assets – operating and maintaining, repairing, rehabilitating, or replacing. This task can be quite complex, but can be scaled down for smaller communities.
- Long-term funding strategies: This final component of asset management involves determining how to fund the actions that are identified through earlier activities. Funding sources include system revenues, reserve funds, bonds and taxes, and non-system revenues such as grants and loans.

Most of the above information was taken from the New Mexico's Environmental Finance Center's *Asset Management: A Guide for Water and Wastewater Systems*.[28]

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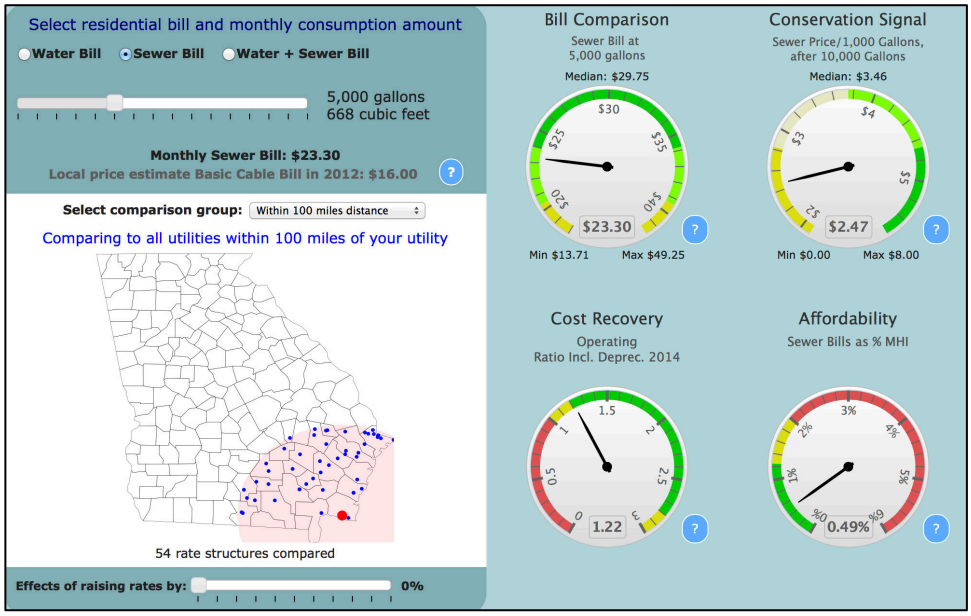
[27] UNC Environmental Finance Center, *Project: Capital Planning Resources for Water and Wastewater Utilities*, at http://www.efc.sog.unc.edu/project/capital-planning-resources-water-and-wastewater-utilities (last visited Jan. 4, 2017).

Local Rates and Funding Programs

Action Item 2.5. Establish local rates that cover the full cost of wastewater services.

Develop sewer rates using a local rates study. Local rates studies provide communities with accurate information on what rates are required to cover the *full* cost of wastewater treatment services, which includes operating expenses, capital funding, debt service, fund reserves, and sometimes source water protection. Rate studies justify rates to users and help avoid budget shortfalls that can lead to unexpected and unpopular rate hikes. Rate studies are typically conducted via contracts with outside consultants. Some communities conduct them annually, others every few years or as needed.

Figure 4. Sewer rates dashboard for Kingsland, Georgia, showing comparison to other utilities within 100 miles.



UNC EFC © 2016.

The University of North Carolina Environmental Finance Center's Georgia Water and Wastewater Rates Dashboard is a useful tool for Georgia communities interested in seeing how their rates stack up to neighboring communities (see Figure 4). (The

[28] NEW MEXICO ENVIRONMENTAL FINANCE CENTER, ASSET MANAGEMENT: A GUIDE FOR WATER AND WASTEWATER SYSTEMS (2006), available at https://www.env.nm.gov/dwb/assistance/documents/AssetManagementGuide.pdf.

Environmental Finance Center recommends that utilities set rates based on a rate study, but the Dashboard does provide useful comparisons.) The Dashboard allows sewer service providers to compare their rates to other utilities in Georgia; utilities of the same size; utilities in the same river basin; utilities with the same water source; utilities with the same rate structure; utilities serving communities with similar median household incomes; utilities in the same Water Planning Region; and utilities within 25, 50, and 100 miles. It also has a tool showing the effect of raising rates on these comparisons.[29]

Provide for annual incremental increases in sewer rates. Increasing sewer rates is likely necessary to ensure sufficient revenues are generated to pay for the full cost of treatment services. Raising rates is rarely an easy sell to residents, who are typically unaware of the true cost of wastewater treatment and loathe to pay higher fees, and to elected officials, who rely on the votes of residents to remain in office. One way to ensure rates cover treatment costs without expending political capital on the issue every year is to approve a series of incremental rate increases at one time. One approach, used by Gwinnett County, is to approve rate hikes for a set number of years; resolutions in 2009 and 2015 set small incremental rate increases through 2015 and 2021, respectively.[30] Another, used by the Henry County Water and Sewer Authority, is to provide for continual annual rate increases with no expiration date (5% per year unless the authority determines a lesser or no increase is warranted). In the case of an authority like Henry County, these rate increase decisions can be made without the approval of local elected officials (though input is recommended). In communities with city or county-owned utilities, a resolution or other policy adopted by the local governing board will be required.

The percentage of rate increase can be figured in a number of ways. The Henry County Authority utilized a flat percentage. Some communities provide for a range of rate increase, say from 3 – 5%, with the actual increase dependent on costs. Finally, in places like Griffin, Georgia, rate increases are linked to an indicator. Griffin uses the Municipal Cost Index. Other places use the rate of inflation. The use of indicators can help show residents that rate increases are not arbitrary.[31]

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[29] UNC Environmental Finance Center, *Resources: Georgia Water and Wastewater Rates Dashboard*, at http://www.efc.sog.unc.edu/reslib/item/georgia-water-and-wastewater-rates-dashboard (last visited Jan. 4, 2016).

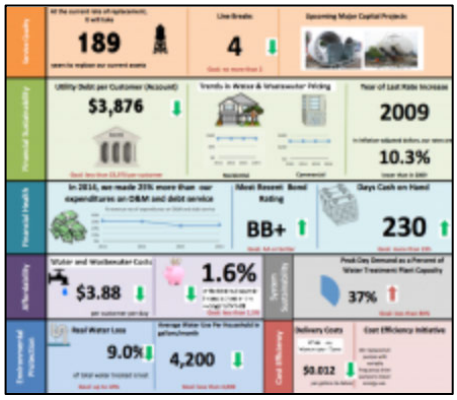
[30] Gwinnett County, Georgia, County Commission 2009 Water and Sewer Rate Resolution, at https://www.gwinnettcounty.com/static/departments/publicutilities/pdf/waterrateresolution.pdf; Gwinnett County, Georgia, County Commission 2015 Water and Sewer Rate Resolution, at https://www.gwinnettcounty.com/static/departments/Home/pdf/WaterandSewerRateResolution.pdf.

[31] Much of the information on incremental rate increases was taken from UNC Environmental Finance Center, Stacey Berahzer, *Environmental Finance Blog: Multi-Year Rate Increases: "Taking*

Some rate increases, such as the 5% annual increase in Henry County that adds up to 20% or more over four years, may seem excessive. Unfortunately, many communities in Georgia have failed to raise sewer rates to account for increasing costs for many years, and may need to "play catch up" in order to reach a rate level that is merely accounting for current services. Indeed, Henry County's rates raised 5% a year for 19 years (1994 – 2013) and are still in the middle of the pack for the Atlanta metro area. Educating residents about the issue, explaining how the gradual increase will be less burdensome than an all at once approach, and allowing for a lower increase if officials deem it warranted, may help quell pushback.

Figure 5. Rate Approval Process Communication Strategy and Toolkit

The University of North Carolina's Environmental Finance Center helps utility officials justify rate increases to elected officials or boards through its *Rate Approval Process Communication Strategy and Toolkit.* It identifies key factors influencing rate case communications, provides a messaging strategy and communications framework, and contains specific guidelines and other communication tools. It also includes an electronic clearinghouse of utility-specific communication strategies. More information available at http://www.efc.sog.unc.edu.



Rate Case Visualization Tool.
© UNC EFC 2016.

Action Item 2.6. Adopt an impact or aid-to-construction fee ordinance to recoup the cost of developing system capacity.

Impact and aid-to-construction fees allow local governments to recoup a proportion of capital costs for wastewater treatment plants from a new development or redevelopment project as a condition of obtaining or retaining connection to the facility. These fees are an approximation of the cost of developing system capacity to accommodate extra demand. They should be distinguished from "tap fees," which recover all or a portion of the cost of actually tying onto the system.

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the Politics Out?", Feb. 1, 2013, at http://efc.web.unc.edu/2013/02/01/multi-year-rate-increases-taking-the-politics-out/.

In Georgia, impact fees are regulated by the Development Impact Fee Act.[32] In order to charge any impact fee, communities must spend considerable time and effort designing an impact fee ordinance and other policies required by the Act. This may be worthwhile in coastal Georgia, specifically in growing or urbanizing communities, because these fees can help fund a wide variety of improvements required by new development without decreasing services for existing residents or overburdening existing infrastructure.[33]

Complying with the requirements of the Development Impact Fee Act can, however, be a legal and administrative burden, particularly for smaller communities. Fortunately, there is an exception in the Act that allows local governments to collect a proportionate fee for the capital cost of wastewater system capacity from new or existing users *without* adopting an impact fee ordinance.[34] The Georgia Court of Appeals has held that this provision permits "capacity recovery fees" that charge an approximate share of the capital cost of sewer facilities per residence or equivalent residential unit (ERU).[35] In many communities, including some on the coast, these fees are known as "aid-to-construction" fees.

Figure 6. St. Marys Aid-to-Construction Rates

In St. Marys, a 2011 multifamily development with 50 units of two-bedroom dwellings would be charged a $94,350 aid-to-construction fee. Per the St. Marys ordinance, two-bedroom multifamily developments are estimated to use 150 gallons per unit per day. The cost per gallon in 2011 was $12.58.

Gallons Per Day x Cost Per Gallon x Unit Total = Aid-to-Construction Fee

150 x $12.58 x 50 = $94,350

Adapted from St. Marys Code of Ordinances, §98-57.

St. Marys is one coastal community with an aid-to-construction fee ordinance for connection to its water and sewer systems. The fee, which rises 5% each year, is calculated using average daily water consumption of different kinds of structures as

[32] Ga. Code Ann. § 36-71, et seq. (2016).

[33] *See* GEORGIA MUNICIPAL ASSOCIATION, GAINING GROUND ON INFRASTRUCTURE IN GEORGIA'S CITIES 26-28 (2004), available at http://www.gmanet.com/GMASite/media/PDF/publications/infrastructure.pdf.

[34] If a community has an impact fee ordinance, it must provide credit for hook-up and connection fees. Ga. Code Ann. § 36-71-13(c) (2016).

[35] *City of Griffin v. McDaniel*, 270 Ga. App. 349 (2004).

outlined in a table in the ordinance.[36] Earthcraft or LEED certified facilities, which have a lower daily water consumption, may modify the daily rate. Existing and renovated structures pay a fee based on the number of fixtures to be added.

Action Item 2.7. Develop onsite system funding programs for repairs, replacements, or connection to another treatment system.

Private onsite systems can become an expensive public problem. Aging or malfunctioning systems can impact local water supplies and create public health threats, necessitating costly interventions by local health officials, connection to public systems, or other actions. Local governments can impose the costs of repairing or replacing systems or connecting to sewer on homeowners, but many simply cannot afford these expenses. Requiring system remediation is even more difficult in low-income areas, which are common on the Georgia coast. Not only does a lack of a funding mechanism makes it extremely difficult to deal with existing issues, it also makes implementing maintenance requirements and other programs that could prevent future problems very challenging. Residents may be quick to oppose a program that may require expensive repairs with no financial assistance provided. Fortunately, other states and communities in the U.S. have developed funding programs that may be workable on the Georgia coast.

Grant programs are offered in many communities across the U.S. Oftentimes, local governments utilize Community Development Block Grant (CDBG) funds for these programs. In Georgia, Athens has used CDBG funds to replace failing septic systems. CDBG funds are provided to larger cities and urban areas annually, but other communities can also apply for these funds from DCA regardless of their size.

Low interest loans for qualifying homeowners are used in some communities. Nags Head, North Carolina, offers three year loans of up to $5,000 at 3% below prime interest rates.[37] In Virginia, the Middle Peninsula Planning District Commission has used grant funds from a number of sources to fund over $600,000 in repairs since 1997.[38] Pierce County, Washington, offers matching funds for sewer connections, paid for through using a percentage of sewer rate increases.[39]

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[36] St. Marys, Georgia, Code of Ordinances, § 98-57(c) (2016).

[37] Town of Nags Head, Septic System Inspection and Tank Pumping Program, at http://www.nagsheadnc.gov/index.asp?Type=B_BASIC&SEC=%7BFCA3328E-2189-4ECC-AEF3-959884ACFC96%7D (last visited Jan. 5, 2017).

[38] Middle Peninsula Planning District Commission, Onsite Repair Program, at http://www.mppdc.com/index.php/service-centers/wastewater/septic-repair (last visited Jan. 5, 2017); Middle Peninsula Planning District Commission, Regional On-Site Wastewater Treatment and Disposal Funding Program, at

Other loan programs have been initiated at the state level. Some state agencies have partnered with communities to utilize Clean Water Act State Revolving Fund (SRF) monies to finance onsite system repair or replacement loans. The SRF provides federal funding to states that is loaned to communities and other public entities for water quality infrastructure projects. States like Ohio, Maryland, and Iowa have used a linked deposit lending system to provide homeowners loans through their local bank or credit union.[40] In Georgia, this type of program would be implemented by GEFA. Some GEFA policies, and perhaps its enabling legislation, would need to be amended to accomplish this program.

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http://www.mppdc.com/articles/service_centers/OSDS/Sept12_Update_PDC.pdf (last visited Jan. 5, 2017).

[39] Pierce County, Washington, Sewer Connection Assistance: Pierce County Sewer Connection Fund, at http://www.co.pierce.wa.us/index.aspx?NID=3693 (last visited Jan. 5, 2017).

[40] AMANDA WORTHINGTON, FUNDING SEPTIC SYSTEM REPAIRS IN GWINNETT COUNTY THROUGH THE CLEAN WATER STATE REVOLVING FUND 9 (2006).

Section 3: Wastewater Treatment Plants

Introduction. As of 2016, there are roughly 40 municipal wastewater treatment plants on the Georgia coast. These systems are mostly used in urbanized areas, but growth projections have led to their development in some rural communities. Treatment processes and capacities of these plants vary widely, ranging from simple designs treating hundreds of thousands of gallons per day to very advanced systems that treat wastewater to reuse quality and can handle tens of millions of gallons per day. Because of the coast's flat landscape, sewer collection systems here include a large number of lift and pump stations to move wastewater. Most plants on the coast discharge treated wastewater into streams and rivers, though some utilize land application systems and reuse systems have become more common.

The Georgia Environmental Protection Division (EPD) develops regulations governing wastewater treatment plants and writes permits for individual plants. These regulations and permits are governed by the Georgia Water Quality Control Act, written to comply with the federal Clean Water Act. Locally, municipal treatment plants are mostly owned and operated by local government sewer utilities, though some quasi-governmental sewer authorities exist and some communities have contracted with private companies for system operation.

Challenges and opportunities. In urban areas, providing effective wastewater treatment is one of the most important services a local government provides. For close to half a century, most cities and other densely developed areas have utilized centralized plants for this service. These systems can provide advanced treatment that supports all types of development in urban areas. They also provide for centralized oversight, and are a model of wastewater treatment that local and state officials, engineers, and operators are familiar with. These systems are not, however, appropriate for every situation where additional wastewater treatment is needed, and communities must engage in careful planning and provide adequate funding to ensure protection of public health and the environment.

Action Items for wastewater treatment plants are categorized under the following categories:

Design. Growth and regulatory changes means that some new plants will be constructed and existing plants will be upgraded on the coast in the not too distant future. Selecting the appropriate design for a treatment plant can be a daunting challenge for local officials who are not technical experts.

Plant operations. Treating wastewater at centralized plants is a complicated endeavor that requires careful planning and systematic implementation of tasks to

accomplish goals of meeting regulatory requirements, minimizing costs, and providing consistent service. A number of operational tasks are outlined in this section that can help communities meet these goals.

Collections systems. Collection systems are the vast networks of sewer lines, lift and pump stations, and other components that route wastewater from homes and businesses to the treatment plant. Assessing the capacity of these systems and properly maintaining them is critical. Communities with accurate information on collection system capacity can avoid overloads and expensive sewage spills and the breaks they can cause and prevent unanticipated development delays. Properly maintained collection systems can help prevent raw sewage backups into homes or spills into the environment. Maintenance can also help address infiltration and inflow, where groundwater or stormwater enters the collection system via cracked pipes or manholes. This is a significant issue on the coast, and can reduce plant capacity, increase costs, and result in sewage overflows during rain events.

Education and outreach. Residents are often completely unaware of how centralized wastewater treatment works and how much it costs. Outreach and education programs can help community members appreciate how wastewater treatment protects public health and the environment, assuage concerns about sewer rates, and garner support for programs. Outreach may be particularly helpful on the Georgia coast because growth and environmental constraints may necessitate programs and funding measures that might generate pushback from residents.

Design

Action Item 3.1. Design plants that provide, or can be easily modified to provide, advanced treatment.

Advanced treatment will likely be required at most, if not all, new and upgraded centralized wastewater treatment plants on the Georgia coast in the near future. Reasons for this include:

- Saltwater intrusion is limiting withdrawals from the Floridan Aquifer and making treatment to reuse standards essential in some communities.
- EPA is requiring numeric water quality standards for Nitrogen and Phosphorus and stricter standards for Ammonia.
- Household and business water conservation is resulting in increasingly concentrated waste streams that plants may need upgrades to handle. This has already occurred in metro Atlanta.

- Land use changes and other stressors are degrading the assimilative capacity of many waters, which will result in stricter permits for some plants.

Options for providing for advanced treatment include:

Design plants so that additional treatment components can be easily added as needed. It is difficult, if not impossible, to accurately predict the level of treatment that will be required at individual treatment plants in the future, and it is a risky endeavor to attempt to design a plant based on such predictions. Huge expenses may be incurred to meet standards that will never be implemented, or, even with the inclusion of advanced treatment processes into system design, the facility might still fail to meet requirements. In order to prepare for stricter standards without taking on undue risk, plants can be designed so that additional treatment components can be added as needed. In coastal Georgia, the recent major upgrade of the Hinesville/Ft. Stewart wastewater treatment plant includes space for additional components to be inserted so treatment can be improved without another system overhaul.

Incorporate constructed wetlands into system design. Over 1,000 constructed wetlands are used across the U.S. to improve water quality. At wastewater treatment plants, they are utilized as one step in the treatment process. One of the benefits of constructed wetlands is that they can provide advanced treatment, typically with lower capital and operational costs than traditional designs. They can provide excellent nutrient removal, and studies suggest they may also be able to remove some pharmaceuticals and other contaminants of emerging concern. Constructed wetlands can also provide valuable aesthetics and habitat, and are very adaptable – they can handle fluctuating water levels and can be used as flood control basins for sanitary sewer overflows. In Georgia, there are over a dozen municipal wastewater treatment plants that utilize constructed wetlands. They vary in size and complexity – the Clayton County Water and Sewer Authority's 17.4 MGD facility has 263 wetted acres, while the City of Lavonia's 1.3 MGD plant has about 14 acres.

Portions of four constructed municipal wastewater treatment wetlands in Georgia. Clockwise from top left: Rentz, Folkston, Clayton County, and Alamo. © Sam Woolford.

Design a reuse treatment plant. The practice of treating wastewater for reuse is becoming more and more common on the Georgia coast. Saltwater intrusion has resulted in the prohibition of additional withdrawals from the Floridan Aquifer in many communities, and any community seeking a new or modified groundwater withdrawal permit must conduct a reuse feasibility assessment. Selling reuse water can be a source of revenue for a local wastewater utility, but careful planning is needed to identify and connect to customers. Community wastewater systems are another option for localized reuse through "sewer mining" projects (see Section 5).

On the coast, the City of Savannah's President Street facility reuses treated wastewater on area parks and golf courses and Effingham County's facility sends reuse water to customers for irrigation and industrial needs.

Action Item 3.2. Design cost-effective plants that maximize revenues.

There are several design procedures and components that can help local governments increase plant cost-effectiveness and maximize revenues, including:

Analyze topography of site to enhance hydraulic flow through the facility. Gravity is the friend of the efficient wastewater treatment plant. Energy costs can be substantially reduced if system designers take advantage of the site's topography to work with gravity to move wastewater through treatment processes. This is particularly important in coastal Georgia, where the primarily flat landscape results in high costs to move wastewater with pumps and lift stations.

Incorporate energy-efficient components into plant design. Power costs are typically the most expensive operational component at a treatment plant. Focusing on energy efficiency during system design can both lower operating costs and may qualify the project for the GEFA Green Project Reserve program. Under this program, 20% of GEFA State Revolving Funds must be spent on "green projects," which include energy efficiency projects. Projects automatically included as "Green Projects" are: renewable energy projects that provide power to the plant; any project that achieves a 20% reduction in energy consumption; collection system infiltration and inflow detection equipment; and treatment plant energy planning. A "business case" must be developed to determine eligibility for other energy efficiency projects. In 2015, the City of Clayton in the northeast Georgia mountains signed a $2 million assistance agreement with GEFA that qualified under the Green Project Reserve program to rehab its collection system. Because the project will address a significant part of the

city's infiltration and inflow and reduce energy consumption it automatically qualified for a Green Project. The funding included $200,000 in principal forgiveness.[41]

Design plants to accept septage. The lack of adequate septage disposal facilities on the coast can encourage illegal dumping, which can sometimes impact wastewater treatment plants. If septage is dumped into manholes, it will enter the plant with no advance warning for operators. Septage dumped into ditches and streams can impact water quality, which may result in tighter permit standards for the treatment plant or even impede the ability to expand capacity. Accepting septage can be a source of revenue for treatment plants and can help dissuade illegal dumping. Plant operators are often concerned that this concentrated waste will upset treatment processes, but new or upgraded plants can be designed to greatly minimize these risks. Components such as holding tanks or equalization basins allow operators to add septage to the treatment process at controlled rates. Adding these components during construction of new or upgraded plants will be more cost-effective than developing them as a standalone project.

For an in-depth analysis of septage disposal capacity in coastal Georgia, see the *Coastal Georgia Septage Disposal Study*, Appendix D.

Plant Operations

Action Item 3.3. Develop operations plans to identify and meet goals.

At efficient, cost-effective wastewater treatment plants, day-to-day operations are often guided by plans with specific goals. Tracking accomplishments towards these goals helps plant operators and other officials gauge progress and identify areas for increased attention. Two common methods for operations planning are:

Use benchmarking to identify operation goals and track accomplishments. Benchmarking helps managers gauge how facilities are performing and set reasonable targets for future operations. It can be an important part of strategic planning. Benchmarks can be set for a wide variety of operations areas. Facilities interested in strengthening regional coordination and cooperation could, for example, track the number of interactions with staff in other communities. Those concerned with collection system performance could focus on the number of sanitary

[41] *See* GEORGIA ENVIRONMENTAL FINANCE AUTHORITY, STATE OF GEORGIA CLEAN WATER STATE REVOLVING FUND PROGRAM STATE FISCAL YEAR 2015 ANNUAL REPORT 3 (2015), *available at* https://gefa.georgia.gov/sites/gefa.georgia.gov/files/related_files/document/FY2015-CWSRF-AR.pdf.

sewer overflows and miles of sewer lines inspected annually. In its latest five-year plan, Columbus Water Works set 30 measurable benchmarks categorized under six strategic initiatives. Benchmarking can be simpler than Columbus's approach; communities of all sizes and sophistication can design it to suit their needs.

Implement an environmental management system. Environmental management systems were developed by the private sector to meet environmental goals in the most cost-effective manner possible. They involve setting specific environmental goals, planning for them, and setting performance benchmarks to ensure they are met.[42] Benefits include pollution prevention, environmental improvement, increased regulatory compliance, reduced hazard liability, cost savings, and promotion of technological advances. In recent years, the use of environmental management systems has extended to the public sector, including wastewater treatment utilities. One of the most common platforms used is the International Organization for Standardization (ISO) 14001 standard for environmental management.[43] Several cities in the south have achieved ISO 14001 certification for their wastewater utility, including Charleston, South Carolina, and Raleigh and Gastonia, in North Carolina.

Action Item 3.4. Reduce energy costs.

Energy efficiency planning or upgrades can greatly reduce operational costs.

Perform a system energy baseline assessment and audit. An energy baseline assessment simply shows a facility's current energy use. It can easily be conducted for all plants, regardless of size and complexity, and often spurs efficiency planning and projects. After a baseline assessment, an energy audit helps identify the most inefficient aspects of plant operations. The way the audit is performed can vary from a general walk-through to identify high priority areas to a comprehensive audit using bills and metering data.[44] Even if there are no immediate plans to improve energy efficiency, an audit is important because it provides information that can help improve operations when funds become available.

Incorporate energy-efficient technologies at plant. Once an energy audit is completed, staff can investigate the potential for installing more energy efficient equipment. Many of these qualify for funding under the GEFA Green Project Reserve

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[42] U.S. EPA, FACT SHEET: ASSET MANAGEMENT FOR SEWER COLLECTION SYSTEMS 6, *available at* https://www3.epa.gov/npdes/pubs/assetmanagement.pdf.

[43] *See* International Organization for Standardization, ISO 14000 – Environmental Management, at http://www.iso.org/iso/home/standards/management-standards/iso14000.htm (last visited Jan. 5, 2017).

[44] U.S. EPA, ENERGY EFFICIENCY IN WATER AND WASTEWATER FACILITIES 10 (2013), *available at* http://www.pwb.wa.gov/Documents/EPA-wastewater-guide.pdf.

Program, including efficient pumps, LED lighting, and variable frequency motors. SCADA systems, which allow for remote monitoring and control of treatment processes, can also be used to reduce energy costs. Once new technologies are installed, regular energy use monitoring or audits can track savings. Columbus Water Works has incorporated energy efficient equipment at its water and wastewater treatment plants. A single energy efficient motor project saved $250,000 in energy costs, a 25% reduction, and had less than a one year payback period.[45]

Utilize renewable energy (onsite or offsite projects). Renewable energy is quickly becoming mainstream. In Georgia, solar power has gained the most traction in recent years, and some wastewater treatment plants have developed solar facilities on site to reduce energy costs and help contribute to a cleaner environment. They are also taking advantage of incentive programs like a GEFA loan interest rate reduction available for energy conservation projects. In Darien, local leaders used American Recovery and Reinvestment Act funds and a low interest GEFA loan to develop a two-pronged solar project at the city's wastewater treatment plant. A two-panel solar heating system heats water for a high pressure water system to clean outdoor equipment, and a 72-panel photovoltaic system produces electricity to help run the plant. In Chatsworth in north Georgia, a five-acre array of solar panels installed at the local wastewater treatment plant in 2015 is expected to save the utility an estimated $2.2 million in electricity costs over 25 years. The utility will sell excess electricity back to Georgia Power.

The solar installation at the Chatsworth, Georgia, wastewater treatment plant. © Dalton Daily Citizen

Another renewable power option available for some plants is biogasification. Methane is generated in plants that use anaerobic digestion, and it can be used as a power source. Onsite, plants with combined heat and power can utilize methane to power and heat the facility. Offsite, plants can sell methane to local natural gas

[45] U.S. EPA, *supra* note 41, at 9.

utilities, industrial users, or power producers, or convert it into compressed natural gas for fleet vehicle fuel. In Atlanta, the RM Clayton Wastewater Treatment Plant is using biogasification to generate nearly 13 million kWh of energy annually. The project achieved 88% of a city-wide goal to produce 5% of municipal energy from renewable sources by 2015. After loan payback, the project is estimated to generate $1million in annual savings.[46]

Action Item 3.5. Accept septage at the treatment plant.

Accepting septage can be a benefit to treatment plants. It can be a source of revenue and more options for disposal can result in less illegal dumping. Underutilized plants may use septage as a source of bacteria needed for treatment processes. Operators may, however, be disinclined to accept septage at existing facilities for fears that this will upset treatment processes. This issue can usually be ameliorated through simple tactics. Spot checking, for example, can prevent the introduction of undisclosed grease trap loads – often the culprit in incidents of "septage" impacting treatment.

For an in-depth analysis of septage disposal capacity in coastal Georgia, see the *Coastal Georgia Septage Disposal Study*, Appendix D.

Collection Systems

Action Item 3.6. Update maps.

The first step in maintaining collection systems is knowing the locations of all lines, lift and pump stations, and other components. In Georgia and the rest of the U.S., however, few communities have comprehensive, accurate information. This is understandable, as many communities have been installing sewer lines for over a hundred years, and old paper maps can be unreliable. Fortunately, modern technologies like GPS and GIS make maintaining collection system inventories much easier. The Coastal Regional Commission has developed GIS maps of at least parts of collection systems for some communities.

The first step in updating collection system maps will likely be to determine which local officials may have relevant information. Staff from the wastewater utility, water utility, public works, stormwater, and planning departments are likely sources. It may even be necessary to contact former employees; this information is sometimes only found in the head of a retired employee who spent many years dealing with sewer

[46] Power to Change, RM Clayton Combined Heat and Power, at http://p2catl.com/uncategorized/rm-clayton-combined-heat-and-power/ (last visited Jan. 5, 2017).

lines. If maps of particular developments are used, they must be "as-builts;" the actual locations of infrastructure are often different than shown on the final plat.

Action Item 3.7. Track maintenance activities and needs.

A formal system for tracking collection system maintenance helps personnel identify problem areas, ensure that maintenance actions have occurred, and plan for future improvements. Maintenance management systems can be simple, spreadsheet-based tools or utilize specialized software. Computerized maintenance management system (CMMS) software is used at many wastewater plants across the country, including those in the City of Atlanta, Cobb County, and other Georgia communities.

Action Item 3.8. Ensure capacity exists before authorizing new connections.

Ensuring that adequate collection system capacity exists before authorizing additional flows helps maintain the integrity of the system and prevent permitting snafus.

Track system capacity. Communities that track capacity in sewer lines and lift and pump stations are better prepared to accommodate growth and avoid serious malfunctions. Having an estimate of infiltration and inflow will also be necessary to get accurate figures, and in some systems this may entail a more advanced analysis (see information on more rigorous capacity certification policies, below).

Adopt simple capacity certification policies (small communities). In smaller communities without significant projected growth, simple capacity certification policies may be appropriate. Certification procedures can be required via formally adopted rules in the development code, but may merely entail utility personnel signing off on development or redevelopment proposals. It may behoove communities to include language in the procedures that allow officials to require a more sophisticated analysis (preferably performed by the local government or an independent third party) for larger developments or questionable situations.

Adopt more rigorous capacity certification policies (larger or growing communities). Capacity certification programs in larger or developing communities are more rigorous because capacity is much more likely to be a common, and expensive, issue for the local government. Components include:

- Specification of what kind of capacity review is required at what point or points of the development process (potentially as early as rezoning requests) and which departments are responsible for certifying capacity.
- Requirements for detailed plans, including estimates of wastewater flows and calculations used, in building and other permits.

- A standardized capacity certification form for signing by authorized officials.
- A flow and rainfall monitoring program to inform hydraulic modeling or manual calculations needed to determine system capacity.[47]

Action Item 3.9. Limit fats, oils, and grease inputs to the collection system.

Fats, oils, and grease (FOG) can wreak havoc on sewer systems, often by solidifying and clogging up collection lines. This can lead to sanitary sewer overflows that threaten public and environmental health and cost community tax dollars to repair.

Develop a FOG education program. Southern families tend to use a lot of grease and other fats in cooking, and may not understand the implications of putting these substances down the drain. In many Georgia communities, like Valdosta, Gwinnett County, and Griffin, officials have implemented FOG education programs to encourage residents to properly dispose of these substances. Educational pamphlets are a common and effective way to get the word out. More targeted approaches are also used. When sewer spills are caused by grease blockages in Valdosta, city staff distribute educational door hangers to residences and businesses in the area of the spill to provide information on how FOG can impact sewer systems and proper disposal methods.[48]

Adopt a FOG management ordinance. Some commercial establishments produce a lot of FOG in their day to day operations. To minimize impacts to the collection system from these businesses, communities can adopt a FOG management ordinance that requires restaurants, car washes, and other establishments to install grease traps and have them periodically cleaned. (Grease traps are required for grease-producing commercial establishments if they use an onsite system.[49]) As part of this program, officials may also want to educate businesses on the availability of recycling programs; some companies recycle used cooking oil into biodiesel.

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[47] Hydraulic models may be required for rapidly expanding systems, in communities planning facility expansions, or those experiencing redevelopment or having sanitary sewer overflow issues. Most of the information on capacity certification programs is taken from the Metro North Georgia Water Planning District 2009 WASTEWATER MANAGEMENT PLAN, at 7-12.

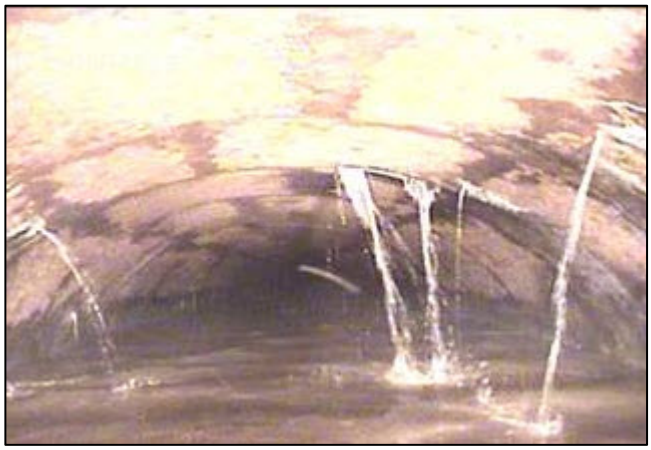
[48] *See* City of Valdosta, *City Responds to Sanitary Sewer Spill Caused by Grease Blockage*, at http://www.valdostacity.com/city-responds-to-sanitary-sewer-spill-caused-by-grease-blockage.

[49] Ga. Comp. R. & Regs. § 511-2-1-.12 (2016).

Action Item 3.10. Mitigate infiltration and inflow impacts to the collection system.

Practically every centralized wastewater treatment system has infiltration and inflow, and small amounts are expected and tolerated. High water tables can make this a major issue on the coast, however, so personnel should assess impacts and develop remediation programs if warranted.

Determine the extent of infiltration and inflow. Understanding whether your community has a major problem with infiltration and inflow can begin with a simple screening. Here, the number of people utilizing the sewer system is compared to the flows at the treatment plant to obtain a gallons per day per person (GPDPP). The GPDPP is compared to a state or local standard; a GPDPP substantially higher than the standard rate would suggest excessive infiltration. If this is the case, more robust data collection will be necessary. At least a year of data should be collected, and the accuracy of the data will determine the accuracy of the assessment and can greatly impact the effectiveness of any remediation program. Data on the flow at the treatment plant and pump stations, potable water consumption, daily rainfall, and tidal influence can be analyzed to determine average, maximum, and annual infiltration and inflow rates throughout the community and identify specific locations where they may be causing the largest impacts. Meter accuracy is essential here. For meters to be accurate, they must be sized correctly and calibrated.[50]



Infiltration into a sewer line. © RedZone Robotics.

Regular physical or visual inspections of sewer mains and other infrastructure also play a role in determining whether infiltration and inflow is causing unacceptable impacts. In many communities, a collection system operation and maintenance (O&M) plan that

[50] Much of this information taken from EPA NEW ENGLAND WATER INFRASTRUCTURE OUTREACH, GUIDE FOR ESTIMATING INFILTRATION AND INFLOW (2014).

schedules recurring inspections using CCTV, smoke tests, or dye tests, can show officials which portions of the system are suffering most from infiltration and inflow. This can help identify public or environmental health risks and help officials catch issues before they become major problems.

Develop an infiltration and inflow remediation program. Infiltration and inflow may be considered excessive and in need of remediation in a number of situations, including:

- When it causes overflows or bypasses
- The cost to move and treat it exceeds the cost to eliminate it
- When it reduces collection or treatment capacity in growing communities
- When it causes public health or environmental risks

Once the extent of infiltration and inflow has been identified, local officials can begin to craft a remediation program. Most of these programs are informed by inspections conducted pursuant to collection system O&M plans. It is important to set clear goals for these programs to keep them focused. Unless there are serious public health and environmental impacts that need to be addressed, goals may want to initially focus on securing a return on investment. This will help show the immediate value of the program to local officials and the public. The program can then turn to other repairs.[51] If repairs to the public portion of the sewer system do not effectively remediate infiltration and inflow, it might be necessary to develop policies and programs for the proper use and rehabilitation of private sewer laterals (see below).

Develop programs for the proper use and rehabilitation of private sewer laterals. Private sewer laterals, which connect homes and businesses to main collection lines, typically make up about half of the total length of the sewer system. They are often in poor condition, and can be a major contributor to infiltration and inflow. Indeed, in some communities infiltration and inflow programs have been less successful than anticipated because impacts from sewer laterals were underestimated.

Private sewer lateral programs can be tricky because work is being conducted on private property. Gaining property owner approval, deciding who pays for repairs, and coping with legal issues are three common challenges. Providing local funding for all or part of repairs can help gain residents' support. Legal authority to enter property and require repairs can be provided by an illicit discharge ordinance. Illegal gratuities (when public monies are spent for private benefit) can generally be avoided if the program will result in substantial public benefits, such as fewer sewer overflows, increased capacity, and reduced treatment costs. Liability issues from injuries or damages from faulty work should be carefully considered by the local attorney.

[51] Much of this information taken from EPA NEW ENGLAND WATER INFRASTRUCTURE OUTREACH, GUIDE FOR ESTIMATING INFILTRATION AND INFLOW (2014).

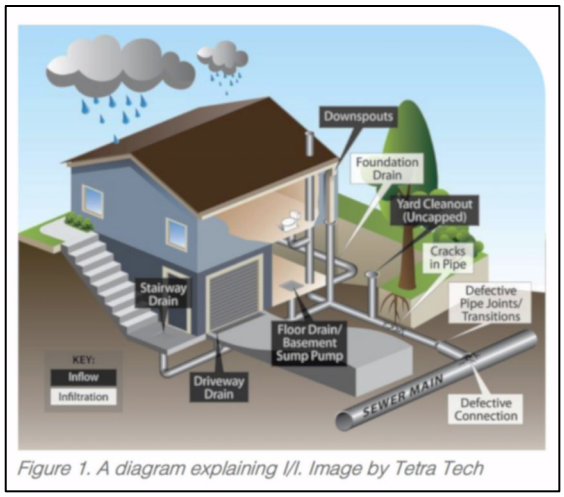


Figure 1. A diagram explaining I/I. Image by Tetra Tech

Source: Water Environment Foundation, Private Property Infiltration and Inflow (2015)

Communities often first establish a private lateral pilot program in a single basin or neighborhood to refine methods. In Brookfield, Wisconsin, officials began with a voluntary program under which the city and the Milwaukee Metropolitan Sewerage District would pay up to 75% of the costs of repairing laterals.[52]

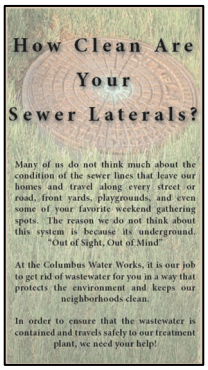
Education and Outreach

Action Item 3.11. Provide educational materials to customers.

Bill inserts are one of the most effective ways to educate customers about wastewater treatment, including the rationale behind fees, how the treatment facility is protecting public health and the environment, water quality reports, water conservation tips, FOG disposal, and other subjects. In general, residents do not understand the ins and outs of wastewater treatment, and inserts can do much to increase public support and improve their use of the system.

Columbus Water Works provides specialized inserts with water bills on different water-related topics and events every month. Insert topics include *Strong Infrastructure and Reducing I&I, Why is Your Wastewater Treated?, How Clean are Your Sewer Laterals?, Infrastructure and Why It's Important,* and *How to Prevent Fats, Oils and Grease from Damaging your Home and Environment.*

[52] Milwaukee Metropolitan Sewerage District, Private Property Inflow/Infiltration Reduction Policy, at http://www.mmsd.com/-/media/MMSD/Documents/Rules%20and%20Regs/Private%20Property%20I%20and%20I/Brookfield%20Policy.pdf.



Excerpts from bill inserts from Columbus Water Works on FOG (left, September 2011), and private sewer laterals (right, August 2014). © Columbus Water Works.

Action Item 3.12. Conduct outreach events.

Outreach events offer wastewater officials an opportunity to connect with the community and can provide additional benefits. Options include:

Offer tours of the treatment plant. Offering tours of the wastewater treatment plant is a wonderful way to engage community members, show them all of the work and expense involved in treating wastewater, educate them on – among other things – what they should and should not be flushing, and remind the public that "real people work at the other end of the pipe."[53] Tours can also help communities fulfill the public participation component of their annual NPDES permit report to EPD. Some communities offer special tours; Athens-Clarke County offers an annual "Romantic" Valentine's Day tour of one of its three treatment plants.

Participants at Athens-Clarke County's annual Romantic Valentine's Day Tour of the North Oconee Water Reclamation Facility.

[53] Laurie Loftin, *6 Reasons to Give Tours of Water Reclamation Facilities*, Treatment Plant Operator, Dec. 3, 2015, available at http://www.tpomag.com/blog/2015/12/6_reasons_to_give_tours_of_water_reclamation_facilities.

Conduct outreach during routine maintenance or repairs of sewer lines. Conducting outreach during line maintenance or repairs is an excellent way to provide targeted education to neighborhoods. Residents are likely already wondering what kind of work is being done, particularly if service is temporarily disrupted, making these opportune moments for explaining important concepts. In Valdosta, Georgia, city staff distribute educational door hangers on the proper disposal of FOG to homes and businesses in the vicinity of grease blockages of sewer lines.

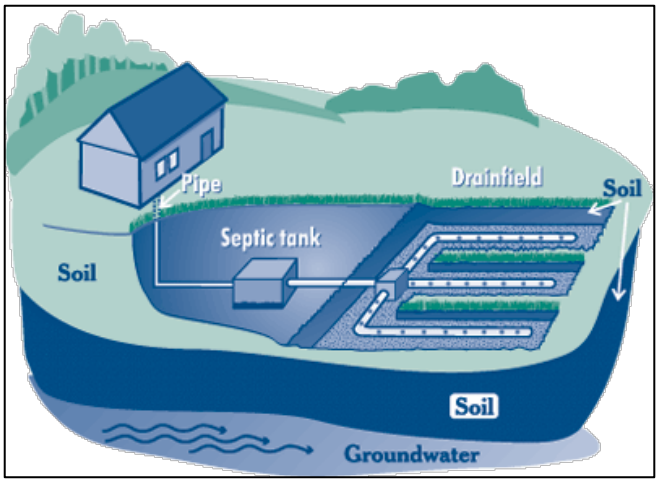
Organize or participate in community stream clean ups, monitoring events, or other outreach activities. By organizing or participating in community stream clean ups or monitoring events, local officials can help residents make the connection between wastewater treatment and the health of local waterways. They are also excellent venues for educating the public and gaining their trust. When the local wastewater treatment plant operator is standing knee-deep next to you picking garbage out of a stream, you may be more inclined to think that treatment plant staff really are invested in protecting community water resources. In Macon, the Macon Water Authority organizes an annual Ocmulgee Alive! river cleanup, which is coordinated with the annual statewide Rivers Alive cleanup event. The Authority also hosts an annual Kids Fishing Derby. Both events have garnered awards for the water and sewer service provider.

A group from the YKK USA zipper manufacturer in Macon participates in the 2011 Macon Water Authority's cleanup event, Ocmulgee Alive! © Macon Water Authority

Section 4: Onsite Systems

Introduction. Onsite systems, which include septic systems, treat and dispose of the wastewater on the property of the one home or business they service. Onsite systems service a significant portion of the homes and businesses in Georgia's coastal communities. Most of these systems are in rural or suburban areas, but some exist in cities. Some communities rely entirely on onsite systems. When properly sited, designed, installed, and maintained, onsite systems can provide effective, permanent wastewater treatment.

Onsite systems are typically simple designs that utilize natural processes to treat wastewater. In a conventional septic system, a pipe from the home routes wastewater to a watertight tank buried in the yard. In the tank, solids settle to the bottom and the remaining effluent is piped into an absorption field (also called a drainfield) where it is dispersed into the soil with small pipes and often a small pump. The soil treats the effluent physically and biologically – it filters out larger particles and nutrients and contains a complex biological community that feeds on organic matter. After the treated effluent filters through the soil, it eventually enters groundwater and then surface waters. Alternative onsite systems, which are becoming more common on the Georgia coast, are typically used in places with challenging site conditions, such as poor soils, small lots, or nearby surface waters or wetlands. These systems work like septic systems, but may include engineered absorption fields or aeration in the tank.



A conventional septic system. © U.S. EPA

Oversight of onsite systems is split between the state Department of Public Health, regional Health Districts, and County Boards of Health and Environmental Health offices. The Department of Public Health is responsible for establishing minimum statewide standards. Regional Health Districts provide administrative and technical assistance to County Boards of Health. County Boards of Health adopt local standards

for onsite systems that are at least as stringent as state minimums, and *can* be stricter. Environmental Health offices, part of County Health Departments, are home to the "boots on the ground" who actually enforce county-level standards through inspections and permits, compliance actions, and other activities.

The Department of Public Health and other entities that oversee onsite systems are charged with protecting public, not environmental health, and are limited to actions that address public (i.e., human) health threats. Local governments do, however, have authority to enact measures for onsite systems to protect environmental health, and EPD could also become more involved in this area.

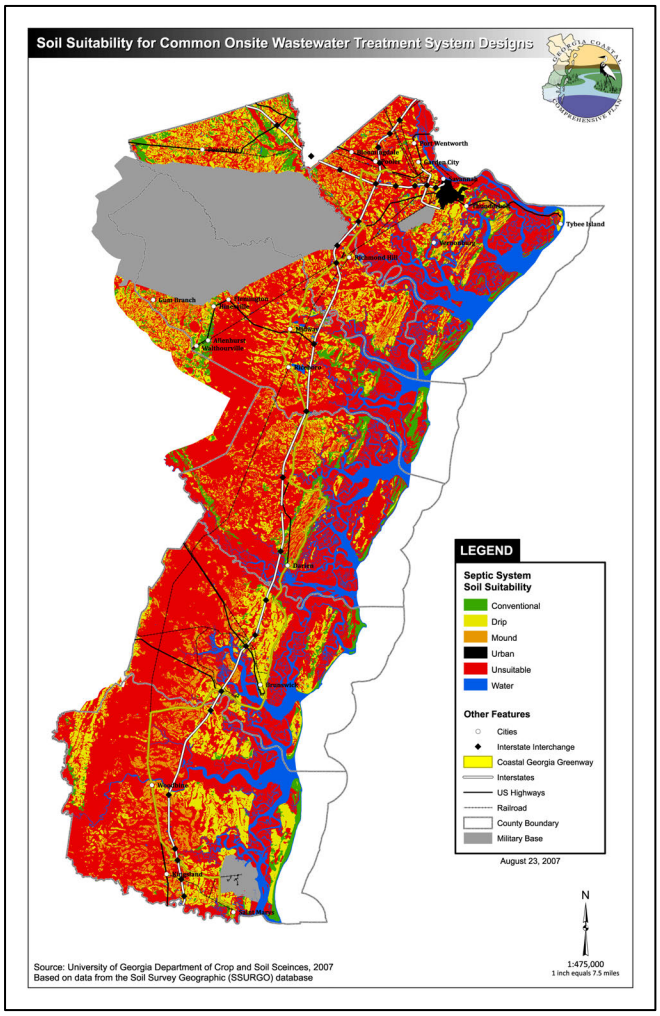
Challenges and opportunities. Across the country, efforts to improve onsite system management have increased in recent years. New treatment technologies, the prevalence of GIS, and advances in scientific understanding have led to new initiatives. Significant attention has been paid to areas with challenging site conditions, many aging systems, poor maintenance track records, significant low-income populations, or projected growth. Georgia's coast possesses all of these characteristics.

Fortunately, there are many opportunities for addressing these issues. GIS is being used to create inventories and maps that can help officials identify potential problem areas and plan for future use. Local, regional, and state officials have shown increased interest in developing programs and policies to address these challenges. Advances in treatment technologies mean more options are available for problematic sites, and a better understanding of the potential impacts of improperly sited or maintained onsite systems is helping to inform local planning and remediation programs.

Action Items for onsite systems address these challenges and opportunities and are listed under the following categories:

Inventories and mapping. Accurate onsite system inventories are necessary for many management programs. On the Georgia coast, recent projects by organizations such as UGA Marine Extension (MAREX) and the South Georgia Regional Commission have significantly improved inventories in many communities and provided innovative ways to map data.

Siting, design, and installation. The proper siting, design, and installation of onsite systems protects public and environmental health and to helps homeowners avoid the expense of unexpected repairs. In coastal Georgia, these activities can be particularly tricky due to the region's soils, high water tables, and ubiquitous water resources. Fortunately, improving these activities is not difficult, but does require some local initiative.



A septic suitability map of the Georgia coast. Red indicates the area is unsuitable for a conventional septic system.
© UGA Department of Crop and Soil Sciences 2007.

Operation and maintenance. The most common maintenance task for onsite systems is inspecting the system and pumping out septage, if necessary, every 3 to 5 years. This can prevent malfunctions, identify needed repairs or replacements, and extend the working life of systems. In Georgia, maintenance of most onsite systems is completely the responsibility of homeowners, who unfortunately do not often appreciate the need for appropriate maintenance. A provision of Georgia law prohibiting County Boards of Health from adopting maintenance requirements for conventional septic systems means that local governments must step in here, but there are many regulatory and non-regulatory options available. Local maintenance programs can also provide officials with useful planning information, such as areas where issues are common and additional intervention maybe warranted.

Failing and nonconforming systems. Although exact numbers are unknown, there are a substantial number of potentially failing and nonconforming onsite

systems on the Georgia coast. Failing systems include those that are no longer functioning (i.e., sewage is backing up into the home), those with some type of major structural issue, such as a cracked tank or defective distribution lines, and systems with compromised drainfields, such as those with compacted or clogged soils where effluent ponds on the surface. Nonconforming systems include those that were installed under older, less rigorous regulations, or that were installed without or in violation of a permit. These systems may be designed improperly, located in poor soils, or sited too close to wells, lot lines, or sensitive natural resources. Several programs are available to remediate these systems, and initiatives in other areas will lessen their number and impacts.

Enforcement. Without rigorous enforcement, even the most carefully constructed and comprehensive onsite system standards will not protect public and environmental health. In many places in Georgia, including the coast, enforcement is frequently lacking due to procedural issues and a lack of knowledge or awareness on the part of local attorneys and judges. Simple procedural changes and education can improve enforcement outcomes.

Inventories and Mapping

Action Item 4.1. Inventory all onsite systems.

Most communities in Georgia do not know the locations of all onsite systems within their borders. This is slowly changing as more local officials understand the need for comprehensive inventories to develop programs and assess impacts. The first method below gives communities information on which parcels are served by onsite systems as opposed to sewer. The second method provides additional permit information that can identify problematic systems.

Compare parcel and sewer connection data. The process for identifying locations of all onsite systems in a community is rather simple. Parcel records are compared to sewer connection records; any parcel with habitable structures that is not connected to sewer is assumed to utilize an onsite system. These inventories, like one conducted in Athens, Georgia, have been funded with Clean Water Act § 319 grants from EPD.

Compare onsite system location data to permit records. After onsite system locations are identified, local officials may want to take the next step and compare this information to Health Department permit records. This can be a tedious process, as many records are still only found on individual cards, but it provides important information on unpermitted systems. UGA Marine Extension has conducted these inventories for several coastal counties, and uncovered a surprisingly large number of

undocumented systems (i.e, those with no permit record). Local officials may want to pay particular attention to groups of undocumented systems, as they are more likely to have been installed under older, less stringent regulations or illegally installed without regard for regulatory requirements.

Figure 7. Onsite System Inventories in Bryan, Liberty, and McIntosh Counties (UGA Sea Grant/MAREX)

Category	Bryan County	Liberty County	McIntosh County
Documented onsite systems	6,245 (82%)	3,092 (52%)	2,910 (47%)
Undocumented onsite systems	1,376 (18%)	2,850 (48%)	3,250 (53%)

Action Item 4.2. Map areas unsuitable for onsite systems.

With its sandy soils, high water tables, and a prevalence of sensitive natural resources, the Georgia coast is largely unsuitable for conventional onsite systems. Rising sea levels will also cause problems for some existing systems and make future siting of new systems ill-advisable in some areas. Fortunately, there are tools and information available that make mapping these areas a much easier task.

Figure 8. WelSTROM Mapping System.

The WelSTROM GIS mapper is a user-friendly tool for onsite system inventories and mapping that is publicly available from the South Georgia Regional Commission. WelSTROM provides locations of wells and onsite systems from several mapping projects, locations of new onsite system permits, and a wealth of other data significant for onsite siting and management. Because WelSTROM is easy to navigate and understand, it is valuable regardless of the user's technical expertise, and can help local officials understand concepts and issues related to onsite systems in their community.

A WelSTROM image showing pollution susceptibility index layers for a portion of Glynn County.

Map high pollution susceptibility areas. Mapping areas vulnerable to pollution can help officials identify places where prohibiting new systems or requiring alternative systems may be beneficial and places where existing systems may be causing impacts. (These maps can also help implement management alternative *Identify where and when different infrastructure types should be utilized* in Action Item 1.7.) The WelSTROM mapping tool offers an easy way to accomplish this through its pollution susceptibility index layer (see Figure 8). It includes factors that make areas more susceptible to impacts from onsite systems, including close proximity to flood zones, recharge areas, shellfish areas, geology, and a high density of onsite systems.

Map areas vulnerable to sea level rise. Sea levels are rising along the Georgia coast, and will impact existing onsite systems and the ability of some undeveloped areas to support onsite systems. Identifying areas vulnerable to sea level rise and including them in maps can help inform land use planning and adaptation efforts. The Sea Level Rise Affecting Marshes Model (SLAMM) has been used to generate predictive maps for the Georgia coast that show potential impacts from rises of 0.4, 0.7, and 1.0 meters. The maps show predictions for the years 2025, 2050, 2075, and 2100. These maps are available at http://www.slammview.org.

Siting, Design, & Installation

Action Item 4.3. Site systems in appropriate locations and densities.

Appropriate siting is one of the most important aspects of onsite system management. Systems that are poorly sited are much more likely to fail to adequately treat wastewater, malfunction, or need premature repairs.

Develop minimum lot sizes for typical homes in community. The Georgia Department of Public Health *Manual for On-Site Sewage Management Systems* recommends minimum lot sizes of 1 acre for properties using drinking water wells and ½ acre for properties using a public water supply. These minimums are for a "typical" home of 3 to 4 bedrooms with basic appurtenances. What constitutes a "typical" home can, however, vary from community to community, and larger lot sizes may be appropriate in some places on the Georgia coast. Larger lot sizes may be required through County Board of Health regulations or a local zoning or subdivision ordinance. "Typical" homes can be specified during annual meetings between health department officials, the local building inspector, and planning staff.

Require Health Department approval of site alterations and development plans. Providing for Health Department involvement throughout the development approval

process for properties that will be served by onsite systems is essential. Health Department personnel must assess the entire site before modification to ensure appropriate siting and design and remain involved throughout the development process to ensure that initial recommendations are adhered to and systems are appropriately installed. Health Department personnel should conduct the following activities at these steps:

- During land use planning: Input on areas inappropriate for onsite systems.
- Before rezoning decisions: Weigh in on rezoning requests that could involve installing new onsite systems on a property.
- Pre-site alteration: Identify characteristics such as wetlands and other waters, elevation, and other features that could impact onsite system operation.
- Before preliminary plat is approved: Assess individual lots to ensure there are enough suitable soils to support an onsite system.
- Before final plat approval: Ensure all lots are still suitable for onsite systems.
- Pre-installation: Review intended usage and lot layout and, if approved, lay out installation requirements.
- After system installation: Certify that systems have been properly installed before they are covered with fill dirt.
- Before approval of additions or renovations: Ensure systems are properly sized.

Prohibit installation of onsite systems adjacent to aquatic resources or in areas susceptible to flooding. Improperly maintained or malfunctioning onsite systems that are adjacent to surface waters have a greater chance of negatively impacting water quality. Systems that are located in areas susceptible to flooding, like floodplains, are also more likely to be damaged by floods. Keeping systems out of these areas can help protect public and environmental health and save property owners from the expense of unanticipated repairs. The Regional Plan of Coastal Georgia includes prohibiting onsite systems within 100 feet of state waters as a performance standard worth one point. DCA includes prohibition of onsite systems in floodplains and stream buffers as a WaterFirst program element.

Establish limitations on onsite system density. In some situations, a large number of onsite systems in close proximity to one another can have cumulative water quality and public health impacts. This may be particularly true in places where systems are not regularly maintained or are adjacent to sensitive natural resources. Communities have several approaches for limiting onsite system density. These can be used across the entire community or in specific locations.

Very large lot sizes (10+ acres) can allow for some development but help retain open space. Another approach is to establish a maximum number of homes in an onsite system subdivision. In Liberty County, those with more than 50 homes must use a community system. Requiring alternative systems in some areas may be another

workable approach; this does not necessarily limit densities, but can help in areas where a high density of conventional systems might cause nutrient issues. In Glynn County, UGA MAREX is currently studying the relationship between onsite system density and surface water quality, and developing a pollutant transport model that may form the basis for limiting system densities or requiring advanced nutrient removal. Limiting onsite system densities is a WaterFirst program element.

Action Item 4.4. Require sufficient system size and treatment capabilities.

Two major components of proper system design are sufficient size and treatment capabilities. On the Georgia coast, treatment capabilities may be particularly important, as many areas may require alternative treatment systems due to site characteristics that include proximity to sensitive aquatic resources.

Ensure systems are properly sized. Undersized systems are prone to malfunctions and failure. Two common problems are hydraulic overloading of the drainfield from high water use and clogging of the drainfield with excessive solids. Both the tank and the drainfield must be properly sized.[54]

Undersized systems are often the result of poor system design, additions to a home without a corresponding increase in system capacity, and excessive water usage. Requiring health department input in all phases of the development process can help with design and addition issues (see above). Excessive water usage might be addressable through education, as homeowners may not be aware of the problem. If excessive water usage is common across the community, local standards may need to be changed; larger tank and drainfield sizes may be necessary.

Require alternative systems when conditions warrant. Alternative onsite systems may be necessary in a number of situations. They are typically used to overcome challenging sites or to provide advanced treatment in sensitive areas. Two commonly used alternative systems are Wisconsin mounds and Aerobic Treatment Units (ATUs). Wisconsin mounds are usually used on sites without sufficient appropriate soils. An engineered mound of suitable soils is installed and effluent from the treatment tank is pumped to the top of the mound for final treatment. ATUs are often used in places where nitrogen inputs to groundwater are a concern, such as neighborhoods with small lots or in places adjacent to nitrogen-sensitive waters, such as estuaries or wetlands. ATUs are also often used to replace conventional septic systems in older

[54] Georgia law requires all septic tanks for homes with up to four bedrooms to have a capacity at least 1000 gallons. Additional bedrooms require an additional capacity of 250 gallons per bedroom. If a garbage disposal is used, the tank capacity must be increased by 50% . Ga. Comp. R. &. Reg. § 511-3-1-.03(5), § 511-3-1-.05(3) (2016).

neighborhoods. When alternative technologies are utilized, appropriate maintenance requirements can increase their working lifespans (see below).

Operation and Maintenance

Action Item 4.5. Conduct education and outreach to encourage proper operation and maintenance.

Onsite systems have a tendency to be out of sight and out of mind until something goes wrong. Education and outreach programs can remind homeowners of their system's operational needs and encourage voluntary maintenance.

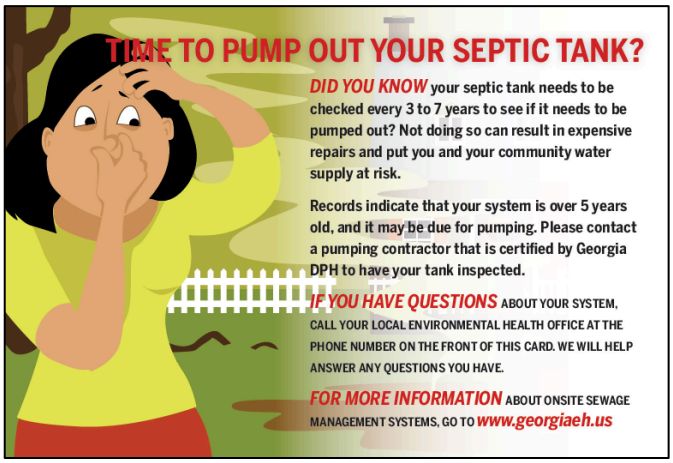
Provide general operation and maintenance education to community residents. Providing general education to the community at large is an easy way to remind residents of system needs. Many resources have already been developed by state agencies and other organizations and are available for public use, including:

- A 30-second PSA (UGA MAREX)
- An interactive game show video (UGA MAREX and Georgia DPH)
- Small pamphlets (UGA MAREX)
- Online education materials (Georgia DPH)
- Door hangers (Georgia DCA)

Implement a maintenance reminder program. Maintenance reminder programs specifically target homeowners with onsite systems. They can be general or individual reminders. General reminders are sent out on a regular basis, typically every one to three years, to all or a subset of systems in the community with onsite systems. In 2016, DPH sent out general maintenance reminders to owners of septic systems that were installed in 2009 or earlier and to owners of alternative systems that were installed in 2013 or earlier. (These reminders only went out to owners of systems in the Digital Health Department database, which currently does not include permit records for all older systems.)

Individual maintenance reminders are timed based on system-specific information, such as the size of the system and home and the last time the system was pumped. These programs may be more effective because they are targeted to individual homeowners, but do require development of a maintenance database that includes individual system maintenance needs and histories to establish a timeline for when reminders should be sent. Because it involves much of the same recordkeeping as an inspection and maintenance requirement program, communities considering those requirements may wish to begin with a targeted maintenance reminder program.

Mahoning County, Ohio's targeted maintenance reminder program increased annual pumpouts by about 300% (see Appendix A).



This general maintenance reminder post card was sent out by Georgia DPH in 2016. © Georgia DPH

Action Item 4.6. Provide incentives for onsite system maintenance.

Incentive programs encourage maintenance and may be easier to adopt than mandatory maintenance requirements. There are a variety of incentives offered by communities across the U.S., including:

- Free inspections or pumpouts: Some communities, such as Nags Head, North Carolina, provide free inspections to educate homeowners and identify necessary maintenance and repairs. Others, like Taney County, Missouri, provide free pumpouts.
- Rebates or discounts for pumpouts: Rebates are often factored into a property owner's water bill. Ozarks Water Watch provides a $50 rebate for homes in the White River Watershed of Missouri. In some communities, discounts are available when officials schedule group pumpouts for a neighborhood.
- Stormwater utility credits: Poorly maintained systems can contribute to stormwater pollution, so some communities offer a utility fee credit for maintenance. On the Georgia coast, Garden City provides a five year, 10% credit for a pumpout.

Action Item 4.7. Adopt ordinances requiring maintenance of onsite systems.

In some places, education and incentive programs may not be sufficient, and communities may need to require maintenance. Because of some unique aspects of Georgia law, the avenue for requiring maintenance depends on whether the system is

a conventional septic system or an alternative system with mechanical components. Regardless of how the requirements are implemented, they should be established as a partnership between the local government and the County Board of Health.

Require maintenance contracts for the life of alternative systems. Frequent inspections and maintenance of alternative systems are essential. These systems are installed in areas unsuitable for conventional septic systems. On the coast, this likely means that the site has a high water table, unsuitable soils, or is adjacent to sensitive water sources, and a system malfunction or failure that releases sewage into the environment is more likely to impact public or environmental health. In addition, these systems contain electrical and mechanical components, and as such are more prone to occasional malfunction than a typical gravity-fed septic system, particularly as the system ages.

DPH regulations require homeowners to have maintenance contracts with the system manufacturer for the first three years after alternative systems are installed.[55] These contracts must be included in the purchase price of the system, and must include inspections at six month intervals. Inspection reports must be submitted to the Health Department annually. Often overlooked is another requirement that "[m]aintenance and the periodic reporting requirements … *must continue for the life of the system*."[56]

Maintenance contracts are the simplest way to require permanent maintenance of alternative onsite systems. Homeowners will already be familiar with such an arrangement, and they will not have to remember to schedule inspections. It also lessens the administrative burden for local officials, since reports will be coming from a small group of manufacturers instead of a large number of homeowners.

Figure 9. Guidance for Georgia Communities

The UGA River Basin Center's *Decentralized Wastewater Management: A Guidebook for Georgia Communities* provides guidance on a wide range of regulatory and non-regulatory programs local governments can adopt for post-installation management of onsite systems. It is available at www.rivercenter.uga.edu.

Develop maintenance requirements for nonresidential onsite systems. The somewhat misleading term "nonresidential onsite system" includes those serving commercial establishments and multi-family dwellings like townhomes and

[55] The DPH rules state that maintenance of onsite systems "shall" be in accordance with the DPH manual; Section D of the DPH manual includes the maintenance contract (called an "initial service policy") requirements. Ga. Comp. R. & Regs. § 511-3-1-.17(2) (2016); GEORGIA DEPT. OF PUBLIC HEALTH, ENVIRONMENTAL HEALTH SECTION, MANUAL FOR ON-SITE SEWAGE MANAGEMENT SYSTEMS D-17,18 (2014).

[56] MANUAL FOR ON-SITE SEWAGE MANAGEMENT SYSTEMS, *supra* note 52, at D-18 (emphasis added).

apartments. In areas without widespread sewer these systems are common. Like residential systems (i.e., those serving single-family homes), they require regular maintenance. For some nonresidential onsite systems with high water usage, such as those at restaurants and hotels, frequent maintenance may be necessary to keep the system functioning. Some of these large systems are regulated under the EPD permit for large community systems, but the permit does not establish a maintenance schedule. Others do not fall under the permit and therefore do not have state oversight. Coastal communities can develop their own maintenance requirements for these systems, either through operating permits that establish specific requirements for individual systems or through standardized requirements for different classes of systems. A standardized ordinance could, for example, require inspections of commercial onsite systems servicing restaurants every six months, and less frequent intervals for offices buildings.

Figure 10. Georgia's septic maintenance prohibition for County Boards of Health.

Unlike any other state, Georgia's County Boards of Health are specifically prohibited by state law from establishing regulations requiring maintenance of the most common onsite systems in the state: conventional (i.e., nonmechanical) septic systems. This is true even if there are documented public health impacts from poorly maintained septic systems in the county. Any local program requiring maintenance of conventional septic systems must be adopted via local ordinance, not through County Board of Health rules.

Require regular inspections and maintenance of all septic systems. Many communities across the U.S. require regular maintenance of septic systems at the same standard interval. Regular inspection and maintenance programs typically fall within two general categories. Some programs require inspections and pumpouts every five years or so, with variances available if the inspection shows a pumpout is unnecessary. Others require inspections at more frequent intervals (every year or two years), with a pumpout required only when the inspection shows it is needed. In Georgia, the city of Berkeley Lake requires inspections and pumpouts every five years (see Appendix A). Although these programs must be developed by local government ordinance, County Boards of Health and Health Departments should participate by verifying inspection results, enforcing system repair requirements, and other activities.

Because it applies the same standards to all septic systems in a community, this system is easier to develop and implement than the risk-based ordinance discussed below. It may, however, be politically harder to accomplish because all septic systems are treated equally regardless of individual characteristics.

Adopt a risk-based maintenance ordinance. EPA recommends selecting management programs based on the risks onsite systems pose. Doing so ensures that systems that are most likely to impact environmental and public health receive

more intensive oversight, and may make requirements more palpable to community residents. It is logical to impose somewhat frequent inspection and maintenance requirements on a group of aging systems on small lots adjacent to a water resource, but imposing the same requirements on a recently installed septic system on a very large property far from surface waters may result in pushback.

DCA has developed a model risk-based ordinance specifically geared towards coastal communities (see Appendix E).

Establish an onsite system utility. When properly planned, an onsite system utility is the best way to ensure long-term management of onsite systems and can provide for system repairs and replacements without major, unexpected costs for property owners. An onsite utility works like centralized sewer service: property owners pay a regular fee for program services. Depending on the scope of the program, the utility may provide:

- Inspections and maintenance
- Inspections, maintenance, and repairs
- Inspections, maintenance, repairs, and eventual system replacement

Onsite utility programs are usually implemented in areas where there is a clear link between systems and public or environmental health issues (often water quality), but they could be valuable in many other situations. In coastal Georgia, it might make sense to pilot an onsite utility program for nonresidential systems. The systems that service restaurants, hotels, apartments, and other establishments often need frequent maintenance, and a utility program can give property owners reliable, consistent service. The program could also include grease trap cleanouts, often an issue on the coast. Utility programs may also be valuable in lower income areas where homeowners may be amenable to programs that allow them to pay for eventual system repairs or replacements over time.

Utility programs do require intensive planning and community outreach, but have been successfully implemented in many parts of the country. The Otter Tail Water Management District in Minnesota is a successful public utility that manages conventional septic systems, while the Ozarks Clean Water Company in Missouri and the Southern Iowa Rural Water Association are utility programs that manage alternative systems (see Appendix A). Part Three of the UGA River Basin Center's *Decentralized Wastewater Management: A Guidebook for Georgia Communities*, provides detailed information on planning and implementing an onsite system utility program. It is available on the River Basin Center website at www.rivercenter.uga.edu.

Failing and Nonconforming Systems

Action Item 4.8. Require repairs, replacements, or connection to other treatment systems for failing systems or those that do not conform to regulatory standards.

Dealing with onsite systems with significant malfunctions or that were sited, designed, or installed in violation of regulatory standards can be a difficult task for Health Department and local government officials. Requiring repair, replacements, or connection to another type of system can be unpopular, particularly when homeowners are ill-equipped to pay for what is usually a rather expensive undertaking. Local officials should try to strike a balance between enforcing standards and accommodating homeowners, while keeping the primary goals of protecting public and environmental health at the forefront. Onsite system repair and replacement funding programs, described in Section 2, can help.

When addressing this issue, officials can either deal with problematic systems individually as they are identified or in prioritized groups.

Require repairs, replacements, or connections to sewer as individual failing and nonconforming systems are identified. During a system inspection at the homeowner's request or as the result of a complaint, Health Department officials may find a system needs repairs or total replacement, or that it is otherwise violating standards. In the vast majority of instances, officials should require system repairs, replacements, or connection to sewer, if available. Boards of Health have authority to issue variances for malfunctioning systems in "cases of hardship,"[57] but these variances should be issued sparingly to protect public and environmental health.

Identify and prioritize groups of potentially failing or nonconforming systems. Identification of groups of potentially problematic systems may occur through inventories and mapping (see Action Item 1.1), or communities may already be aware of problematic areas. Officials should pay particular attention to systems that were installed between the mid-1980s and late 1990s, when some state standards reverted to local control; some communities may have relaxed standards during this period of population growth. Prioritization can occur according to a number of factors, and may depend on the particular response the community will implement. A simple targeted education plan can encourage residents to deal with their systems on their own. In places where community systems are being contemplated as a remedy, local officials may want to prioritize one area with amenable residents as a pilot project.

[57] Ga. Comp. R. & Reg. § 511-3-1-.17(6) (2016).

Communities considering loan or grant programs may want to prioritize in other ways, such as by the potential impacts from the systems or benefits to homeowners.

Figure 11. Options for failing or nonconforming systems.

There are a number of options for remediating failing or nonconforming systems, including:

- Connection to sewer: A flat fee for all connections can help make this option more palatable to residents. A lower cost option is to continue to use the septic tank and connect it to the main sewer line with small diameter pipe.
- System repair or upgrade: Some issues can be mitigated with repairs or upgrades; this may be more attractive and less expensive for homeowners.
- System replacement: In many cases the entire system must be replaced. In some situations alternative technologies may be advisable, such as when homes are on small lots or if nearby waters are impaired.
- Community systems: If suitable land is available nearby, community systems can offer a workable solution for groups of problematic systems. They may be lower cost than lot-by-lot approaches, and provide centralized oversight.
- Frequent maintenance: In some situations, requiring frequent maintenance (pumping every 3-6 months) may protect public health and keep the system functioning. This option should be used as an interim measure while the homeowner obtains funding or financing for repairs.

Enforcement

Action Item 4.9. Provide for timely and effective enforcement of onsite system standards.

Laws and regulations are virtually worthless if they are not enforced. Enforcement of onsite system standards can be challenging because these systems are spread out across communities and a number of individuals are involved in enforcement actions. There are a number of methods for strengthening enforcement mechanisms.

Move enforcement of onsite system standards to magistrate court. The default venue for onsite system standards enforcement cases is superior court. These courts often have such full dockets that onsite cases can be delayed for months, during which time a public health threat remains unchecked. Local governments can move these cases to the local magistrate court via local ordinance, where they will be heard in a much more timely fashion.

Provide for straightforward citation issuance. In many communities, Health Department officials can only issue citations through the county code enforcement officer or county attorney. This can be inefficient, but other, simpler options do exist.

In the first option, the local government passes an ordinance adopting DPH and County Board of Health rules into the local code and providing for issuance of a citation when the Health Department Environmental Health officer becomes aware of violations. In Camden County, Georgia, where this approach is used, the Environmental Health officer sends citation warning letters to homeowners, which has been sufficient to ensure compliance in most situations.

Another, more formal method used in Lincoln County, Georgia, is to officially deputize Environmental Health officers as inspection and enforcement officers so they can serve actual citations on offending property owners. Communities should be careful when considering this approach, however, as Health Department officials are not county employees.

Educate local government attorneys and local judges on the importance of, and options for, onsite systems standard enforcement. A lack of enforcement is often due to a lack of understanding. In Georgia, the local government attorneys and judges charged with the ultimate enforcement of onsite standards citations do not receive any training on the impacts of violations and their options for enforcement. Training programs for local attorneys and judges can help to fill these enforcement gaps. They could be developed by state agencies, universities, or other groups.

Section 5: Community Systems

Introduction. Community systems (also called cluster systems) are mid-sized wastewater treatment systems used in many communities in Georgia. These systems usually treat wastewater from two or more homes or businesses and are often used in subdivisions. Community system designs vary; some use processes similar to conventional septic systems while others incorporate advanced technologies, such as membrane bioreactors, that can treat wastewater to reuse quality standards. For all systems, final treatment and dispersal of effluent almost always occurs in an absorption field (drainfield). The capacity of community systems can be as little as 2,000gpd for facilities serving one or two structures, and as much as hundreds of thousands of gallons per day for those used in larger developments.

Community systems are commonly used to service dense or commercial development in areas where centralized sewer service is impractical or undesirable. In Georgia, they have been used to support subdivisions in rural areas, commercial developments in areas without ready sewer access, and smart growth developments. These systems are also used for localized reuse projects (also known as sewer mining), where wastewater is piped from a sewer line, given advanced treatment by a community system, and reused nearby. The Emory WaterHub in Atlanta is a localized reuse system that has received widespread acclaim.

Regulation of community systems is split between EPD, which has a general permit for systems that treat between 10,000 and 150,000gpd (see Appendix F), and DPH, which is responsible for systems between 2,000 and 9,999gpd.

Matt Vinson of Natural Utilities, Inc., gives River Basin Center interns a tour of the constructed wetlands at the community system servicing the Serenbe community south of Atlanta.

Challenges and opportunities. Community systems could be quite useful for Georgia's coastal communities. Much of the coast is rural, and these systems can support a wide range of development patterns in places without access to sewer. They can also help communities manage growth and debt because systems are built as-needed, and do not involve financing in the tens of millions of dollars as with centralized treatment plants. Reuse potential is another benefit. Saltwater intrusion has resulted in strict water conservation measures, and community systems can make reuse more efficient because reuse customers are usually located in the development the system services. Community systems can also free up treatment plant capacity and promote water conservation through sewer mining projects. Finally, community systems can be an option for replacing groups of problematic onsite systems.

Despite their advantages, community systems do present challenges. Most importantly, they should have some form of local oversight or management so communities can avoid unexpected issues and ensure effective wastewater treatment.

Action Items for community systems are organized under the following topics:

Inventories. This simple task gives local governments clear information on community systems that already exist within their borders.

Oversight or prohibitions. Community systems can offer significant benefits, but local governments that allow their use with no local oversight may risk expensive problems down the road. This typically happens when problems occur with a system owned by a homeowners association. These organizations rarely have the technical expertise to effectively cope with such situations, and local governments in Georgia have had to spend time and money coming up with solutions. Pressure for local government intervention may be particularly strong if multiple homes or businesses are impacted, there is a public or environmental health risk, or if the system operator has discontinued management. Local oversight can prevent these unexpected burdens and establish procedures and standards that can forestall many issues.

Local governments should adopt a blanket prohibition for one type of community system: those for which DPH is responsible (2,000 – 9,999gpd). DPH has no standard permit and no rules for these systems, and the vast majority of Health Department personnel do not have the expertise to regulate these larger facilities that often involve multiple property owners.

Uses, siting, and land use planning. Community systems have a wide range of potential uses, but they also require specific site characteristics. Advance planning that identifies desired uses and suitable locations and aligns community systems with local land use plans can help maximize the benefits of these systems.

Management programs. A range of local management programs are available for community systems. Options include acting as the system trustee, developing local standards through an ordinance, entering into a public-private partnership, and establishing a public management utility.

Inventories

Action Item 5.1. Collect information on system location, design, owner, operator, and history.

Gathering information on existing community systems shows local governments how they are already being used and may also alert them to potential issues. According to EPD records, there are currently less than 20 community wastewater systems on the Georgia coast. Local officials can contact the EPD Watershed Protection Branch Municipal Permitting Unit and request the full notices of intent for all systems within their borders permitted under the General Land Application System Permit for Large Community Systems, General Permit Number GAG278000. These documents should provide location, design, and management entity information. Meeting with system owners and operators to discuss system histories can provide valuable information concerning design and operation successes and failures and may inform local management actions. Officials can also search for enforcement orders for specific facilities on the EPD web site. If officials are aware of community systems that are not shown in EPD permit records, they should inform the Municipal Permitting Unit.

Oversight or Prohibitions

Action Item 5.2. Decide whether to prohibit community systems or provide for local oversight or management.

All Georgia communities should decide whether they want to prohibit community systems or provide for some sort of local oversight or management. Taking no action on these systems leaves local governments vulnerable to having to unexpectedly deal with these systems if problems arise.

Educate local officials and residents about the uses, benefits, and challenges of community systems. Providing education before decision making can result in more productive discussions and better overall outcomes. Communities may want to enlist unbiased experts from universities or agencies; US EPA has professionals who are experts on community system uses, design, and management needs.

Provide local oversight of community system development and management. Local governments that want to allow the use of community systems should become actively involved in system oversight or management. The general permit from EPD provides a solid framework for community system regulation in Georgia, but there are several areas where local governments could require additional requirements and protections. Local oversight can help enforce system requirements and avoid costly problems.

There are a number of options for local oversight or management of community systems, described in Action Items 5.5 and 5.6, below. At the very least, communities should specify when and where these systems can be used and act as system trustee, with conditions. A more robust management method is to develop local standards through a local ordinance or management program. Management programs are the most comprehensive and reliable approach; they can be public-private partnerships or public utility programs.

Prohibit development of new community systems. If local officials are not prepared to provide some sort of local oversight, they should prohibit community systems. Unexpected problems can take time and money to resolve and are not worth the risk.

Local officials must, however, carefully consider which types of community systems they want to prohibit. These systems can service multi-structure developments such as subdivisions and office parks and single structures such as schools or standalone commercial buildings. It is usually the systems that are servicing subdivisions or other multi-structure developments that cause the most issues, because a larger number of property owners are affected and it may be more difficult to craft a solution that is acceptable to all parties. Single structure systems can also cause problems, but it is only a single property owner who is impacted and negotiations for a remedy should be easier. In addition, in some communities single structure community systems are the only wastewater treatment option available for commercial establishments or institutional facilities such as schools. These communities should probably not prohibit the systems that would be necessary to support these types of development.

All local governments should prohibit the development of small community systems that are the responsibility of DPH. There is no standard permit and no statewide rules applicable to these systems, and Health Department personnel typically do not have the expertise to successfully oversee the use of these larger systems that often involve multiple property owners. Local ordinance language can prohibit these systems or require that all community systems are sized to treat at least 10,000gpd; both options have the same effect.

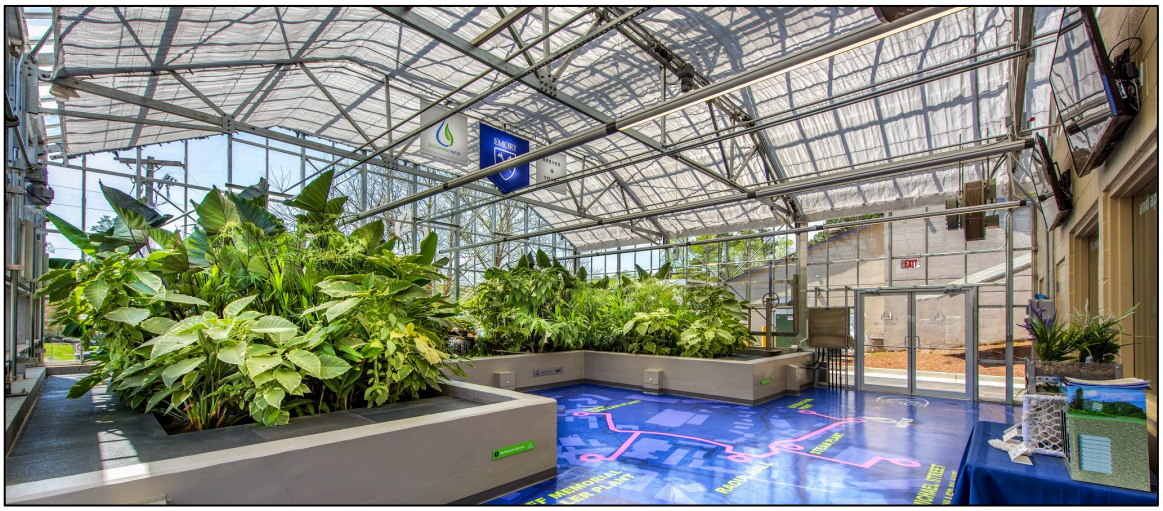
Uses, Siting, and Land Use Planning

Action Item 5.3. Decide how community systems will be used.

Community systems can be used for a number of different purposes. Specifying and including preferred uses in local land use, wastewater, and other plans can focus local efforts, streamline decision making, and ensure these systems are used in a way to responds to individual community needs. Potential uses include:

- Growth management: Community systems can be used to support clustered, mixed-use developments, including townhomes and apartments. Because they are sized for individual developments and cost less to construct and operate, they are often used by communities that desire growth but do not want to take on the larger risks of centralized wastewater treatment plants.
- Commercial and institutional facilities: In communities without centralized sewer, community systems are often used to service commercial establishments and institutional facilities such as schools.
- Onsite system remediation: If replacing a group of problematic onsite systems with new onsite systems or connecting to sewer is not possible or practical, constructing a community system may be a potential third option. Community systems can be particularly appealing because they provide for centralized oversight and avoid unpopular or impractical sewer extensions. The town of Pegram, 10 miles west of Nashville, Tennessee, decided to utilize a community system in lieu of expensive or otherwise impractical centralized options when it had to cope with a number of failing systems serving homes and businesses.[58]
- Maximize reuse potential: One significant benefit of community systems is that they are frequently designed for and can maximize wastewater reuse. When they service subdivisions or other developments with irrigation needs, reuse water does not have to be piped for miles and miles to the plant and back for it to be utilized.
- Sewer mining: In communities with centralized wastewater treatment plants, community systems can be used in "sewer mining" localized reuse projects. At the Emory WaterHub, close to half a million gallons of raw sewage are piped from a City of Atlanta sewer line and treated by the university's WaterHub treatment system. The system treats the wastewater to reuse standards, providing about 40% of Emory's daily water needs for operation of steam and chiller plants and toilet flushing (see Appendix A for more details).

[58] Pipeline Vol. 11, Decentralized Wastewater Treatment Systems 1 (Fall 2000), *available at* http://www.nesc.wvu.edu/pdf/WW/publications/pipline/PL_FA00.pdf.



The interior of the greenhouse portion of the WaterHub at Emory University in Atlanta.
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Action Item 5.4. Identify where community systems can be used.

Although community systems provide many benefits, they are not suitable for all situations. They require specific site characteristics, and because they can be located in places where denser development may not have otherwise been possible, communities should be careful to align their use with land use plans.

Identify suitable sites for community system use. Most community systems discharge treated effluent into a large drainfield. As with onsite systems, these drainfields must meet standards related to soils, depth to water table, slope, and other factors.[59] Tools such as WelSTROM and soil surveys can provide helpful information here, but it may be necessary to contract with an outside consultant to provide more specific guidance. Communities interested in using these systems as a remedy for problematic onsite systems should first assess whether sufficient land exists nearby that would support a community system drainfield.

Limit use of community systems to align with land use plans. Community systems are often utilized to implement local growth plans, particularly when these plans involve clustered development in exurban areas. Specifying exactly where in the community they will be allowed in support of these plans helps avoid growth that does not align with community goals. Communities can use zoning districts or other development regulations to specify areas appropriate for community systems.

[59] *See* Georgia EPD, General Land Application System Permit for Large Community Systems – General Permit No. GAG278000.

In communities with a centralized treatment plant, it will also be necessary to decide how close to the plant community systems will be permitted. If this is not determined, officials may experience conflicts if treatment plant managers feel they are losing out on customers. The local service delivery strategy, land use plans, and, if it exists, a local wastewater plan should be able to provide officials with this information.

Management Programs

Action Item 5.5. Provide for local oversight of community systems.

Communities that decide to allow community systems within their borders need to provide some local oversight. A range of options are available.

Act as system trustee, with conditions. The EPD General Permit for large community systems requires owners of privately owned systems to execute a trust indenture that sets up a successor to own and operate the system if the original operator can no longer perform their duties. Local governments and property owners associations are preferred, but other nongovernmental organizations are also considered. EPD requires use of a standard trust indenture for all privately owned water and community wastewater systems (see Appendix F), but additional trust indentures are authorized. Under the EPD standard indenture, the trustee holds title to the property and all system equipment, while the original owner (the grantor) has possession and must ensure that management of the system complies with all standards in the EPD General Permit. EPD, not the trustee, is responsible for enforcing compliance with all standards and requiring the grantor to turn the system over to the trustee if there has been an issue that the grantor is unable or unwilling to remedy. If the system is turned over, all of the grantor's rights in the property are extinguished, including the right to any proceeds from a sale of the property and/or equipment.

Homeowners associations have had a historically poor track record in taking over community system management. Local governments that allow the use of these systems should at the very least act as trustee to ensure a responsible successor, but should condition this role on one or more critical stipulations which can be included in a separate indenture or included as addendums to the standard trust indenture required for the EPD General Permit.

One of the biggest problems local governments face when addressing a malfunctioning community system is paying for repairs. Any local government that signs on as trustee to a community system should, therefore, require the grantor to

post a bond at least equivalent to the cost to replace the entire system. Taking over the system will still be a nuisance for the local government, but funding will be available to make repairs and contract for another operator, if necessary.

Local governments should also consider stipulating conditions that allow them to keep tabs on the system and how it is being managed, such as requiring monitoring and other reports to be provided to local officials and granting right of entry. Officials can thus remain apprised of how the system is functioning, which will allow them to voice any concerns to EPD and the system operator. It can also give them advanced warning when the system is having issues that might necessitate the local government stepping in to take possession.

Adopt a local community systems ordinance. A local ordinance specifies siting, design, oversight, operation, maintenance, and other standards desired by the community. The EPD General Permit will still apply, so officials must ensure that the ordinance does not conflict with any of its requirements (more stringent and additional standards are acceptable). A trust indenture will still be required, so requirements pertaining to that instrument should also be included in the ordinance.

Local governments should consider incorporating the following elements into a community systems ordinance. A technical expert should always be conducted when developing these requirements.

- Planning and coordination: The local ordinance should require a pre-design meeting with local officials, and concurrent review of the EPD General Permit and the local permit.
- Trust indenture and bond: As described above, the local government should require a performance bond at least equivalent to the cost to replace the entire system.
- Siting: The ordinance should refer to local land use plans or zoning rules that lay out where community systems can be used (see Action Item 5.4, above). It should also contain specific requirements regarding the site's ability to treat all constituents of the wastewater stream of the particular development and protect public and environmental health. Factors here include hydraulic conductivity of the soil (how fast liquids move through soils), slope, and proximity to wells and sensitive resources such as surface waters.
- Design: The design of the system should be based on the most restrictive (i.e., the least suitable) soils on the site. Hydraulic conductivity tests can provide this information. Communities should consider requiring advanced treatment systems that provide at least 50% total nitrogen removal and dosing

equipment that keeps discharges to the drainfield consistent and helps extend their working life.[60]

- Installation: The EPD General Permit requires a certified engineer to install community systems. A community ordinance could also require inspection by the local engineer or a consultant hired by the community during installation and prior to system operation.
- Operation and maintenance: The EPD General Permit requires that operation proceed according to an operations manual that becomes part of the system's permit. An ordinance should mirror this requirement so local officials can enforce system-specific operational and maintenance standards. The local ordinance could also require that the operator complete an operations and maintenance checklist (which should be included in the operations manual) a minimum number of times each month and include this information in regular reports. (The EPD General Permit only requires that the operator be on site two hours each month.)
- Monitoring and recordkeeping: The ordinance should require all records required by the EPD General Permit and the local ordinance to be sent to the local government. Officials may want to require groundwater monitoring wells for all systems (they are not necessarily required by the EPD General Permit), and more frequent monitoring or reporting than is required by that permit. Officials should consider including a requirement for a telemetry system that gives the operator daily operational statistics and alerts them when a malfunction has occurred.
- Miscellaneous: The ordinance should grant community officials right of entry to inspect the system. Officials may also consider including fee change provisions that provide for arbitration or some other means of resolving disputes.

Action Item 5.6. Develop a local community system management program.

If local resources and technical expertise are sufficient, the best way to utilize community systems is through a local management program. This goes beyond acting as a trustee or a local standards ordinance by involving the local government in actual management of the systems in some way. These programs can be public/private partnerships or public management programs.

[60] Communication with A. Robert Rubin, Ph.D., Professor Emeritus and former Extension Specialist of Biological and Agricultural Engineering at North Carolina State University, July 11, 2016.

Enter into a public-private partnership. In some parts of the United States, communities utilize public-private agreements to manage community systems. This model usually occurs when there is no public wastewater utility, or when the existing utility is too unfamiliar with community systems to agree to manage them. One of the most important facets of these programs is finding the right private partner. The ideal candidate would have plenty of experience with community system technologies, a track record of responsible management, and, preferably, an established presence in the community. Local oversight of system management is still essential, and many of the elements of the local ordinance detailed in 4.5.a above should be incorporated into a public-private program. The partnership between the Water and Wastewater Authority of Wilson County, Tennessee, and Tennessee Wastewater/Adenus Utilities is an example of a successful public-private partnership to manage community systems (see Appendix A).

A portion of one of Adenus Utilities' community treatment systems.

Develop a public utility to manage community systems. In some communities, a local government department owns and manages community systems. In many cases, this is the best way to ensure proper management. Here, the local water or sewer utility is typically the management entity (such as the Coweta County Water and Sewerage Authority in Coweta County, Georgia, see Appendix A), though in some communities (such as Bethel Heights, Arkansas) it is the public works department. In this management model, the local government adopts an ordinance specifying where community systems may be utilized and requiring them to abide by standards developed by the local management entity. Typically, the developer pays to construct the system according to these standards, and deeds the system to the management entity when construction is complete. In the case of residential subdivisions, a common provision requires the developer to pay for operation and maintenance of the system until a certain percentage of homes in the development have been sold. This protects the management entity from paying for a system with only a small number of rate payers.

Appendix A. Case Studies

Otter Tail Water Management District onsite and community systems utility

Otter Tail County, located in west central Minnesota, contains over a thousand lakes that are the backbone of the community's tourism-based economy. In the 1970s, the county's lakes began to experience algal blooms that were attributed to onsite systems. A citizens task force analyzed the issue and decided overwhelmingly to form a sanitary sewer district to manage onsite systems (a centralized treatment plant was dismissed as a solution because of cost and fears that it would erode the community's rural character).

The Otter Tail Water Management District manages over 1,700 onsite systems and over a dozen community systems. It covers six lakes, four townships, and portions of the City of Otter Tail. Most of the systems service seasonal residences. Participation in the program is mandatory, but property owners are given two participation options. In the "active" program, the District owns and maintains the system. Fees pay for inspections, monitoring, maintenance, and repairs of the systems. In the "passive" program, the owner owns the system, maintains it according to District requirements, and pays a small annual administration fee. Community systems must be on the active program. Active/passive decisions for other systems are made at the time of construction. Systems that are on the active plan may not switch to the passive plan. Those on the passive plan, however, may switch to active in some situations. If a passive to active switch is requested, the District first conducts a baseline assessment of the system to ensure that it is not assuming ownership and responsibility for a system that is in poor condition. Rollie Mann, chief administrator and maintenance supervisor, says that the District rarely accepts systems that are over 3 or 4 years old into the active program. For systems formerly on the passive plan, full coverage for repairs is phased in over a ten-year period. The District takes over 10% of the costs of repairs in the first year, and an additional 10% each year until repairs are fully covered. If owner abuse damages the system before it is fully covered, they may be kicked out of the active program or only partially covered.

Initial construction expenses for upgrading and replacing existing systems in the District were paid for by grants from EPA and the state. These grants totaled $5,621,700: $4,347,400 of this money was used for construction, $1,106,000 for engineering, $130,423 for administration, and $37,800 for land. Non-reimbursable expenses paid by Otter Tail property owners and the county were $244,660, which included financing and bonding charges. Today, the District's annual operating budget is only $140,000. The property owner pays for new systems. Those on the active plan then deed the system over to the district. User fees vary depending on the type of system and whether the active or passive program covers the system.

Because installation and repair costs for new systems have increased significantly in recent years, the District board has had to approve corresponding rate increases. Annual passive program fees start at $49 but may be higher, depending on system type and whether the property is a home or business. A breakdown of user fees for the active program is found in the table below.

Otter Tail Water Mgmt. District Fees for Active Program*	
Type of Facility	Annual Fee
Permanent residence with septic tank, pump, and absorption field	$234
Permanent residence with septic tank and absorption field	$175
Seasonal residence with septic tank, pump, and absorption field	$207
Seasonal residence with septic tank and absorption field	$158
Permanent residence on cluster system	$224 - 262
Seasonal residence on cluster system	$197 - 232
Resorts and businesses	$224 – 262
	**Fees as of 2013*

In its 30 plus years, the Otter Tail Water Management District has succeeded in improving water quality and providing reliable and cost-effective wastewater services to the community. Both surface and groundwater quality has improved in those years, and between 1984 and 2010, only 17 systems (1.1%) have needed replacement.

For a more in-depth case study on the Otter Tail Water Management District, see the UGA River Basin Center's Decentralized Wastewater Management: A Guidebook for Georgia Communities.

Ozarks Clean Water Company onsite and community systems utility

The Ozarks Clean Water Company was established pursuant to a demonstration project designed to install and test alternative onsite and community systems. It is a not-for-profit company created under Missouri statute that can service onsite and community systems anywhere in the state. Participation in the Company's management program is voluntary, and it accepts both new and existing systems (existing systems must comply with current regulatory standards). The company's board of directors sets rates according to a two-tiered system – one set of rates are for conventional onsite systems and the other set is for alternative onsite systems and community systems.

The Ozarks Clean Water Company is part of a larger effort, Table Rock Lake Water Quality, Inc. For a more in-depth case study on Table Rock Lake Water Quality, Inc., see

the UGA River Basin Center's Decentralized Wastewater Management: A Guidebook for Georgia Communities.

Mahoning County, OH maintenance reminder program

Mahoning County's maintenance reminder program was established in response to citizen concerns about the impacts of high-density onsite systems on water quality. The community grew rapidly during the 1980s and 1990s, and many neighborhoods serviced by septic systems were developed during this time. After soliciting public input, the Mahoning County District Board of Health decided to implement an individualized maintenance reminder program.

The reminder program was informed by a maintenance database that included information from the county's records and pumper's certified maintenance reports. It included system size, number of bedrooms in the home, and date of last pumping for the nearly 17,000 systems in the community. Individualized maintenance reminders were sent out according to a pumping schedule based on these factors. The maintenance reminder contained a letter explaining that it is time to have the system pumped, a list of registered pumpers in the county, and educational information on proper maintenance of a septic system. The start up costs to implement the program were about $20,000, and it cost about $7,000 to administer every year. Once the program was established, system pumpouts rose from about 440 per year to over 2,000. Although the program was disbanded in 2009 due to budget cuts, pumpout rates remained high.

For a more in-depth case study on Mahoning County's maintenance reminder program, see the UGA River Basin Center's Decentralized Wastewater Management: A Guidebook for Georgia Communities.

Berkeley Lake, Georgia onsite system maintenance requirements

The small city of Berkeley Lake is named after an 88 acre lake that was created in 1948 by one of Georgia's largest earthen dams. Most of the 1,700 residents are on sewer, but homes surrounding the lake utilize onsite systems. The lake had been experiencing issues with algal blooms, and in 2005 the city adopted a septic system inspection and maintenance ordinance to mitigate any impacts that might have stemmed from these systems.

Berkeley Lake's program requires that all onsite systems within the city (which are only those surrounding the lake) be inspected and pumped every five years. Ninety days before the five-year servicing is due, the city clerk sends a "Notice for Service Due" letter to the property owner. The letter contains a segment to be filled out by the service provider and submitted to the city clerk as proof of service. Homeowners who have service completed prior to the five year time period can obtain a substitute

form from the city clerk. If the service meets the city's standards, the date of that service is established as the start of a new five-year service interval.

If a system is malfunctioning, the property owner must have it repaired or replaced within 30 days of receiving a notice regarding the malfunction. For purposes of the ordinance, a malfunctioning system is one that permits sewage to discharge into a storm drain, stream, water body, gutter, street, roadway or public place, or permits sewage discharges to the surface or subsurface of any property so as to create a nuisance or condition detrimental to health. Substantial backflow from absorption lines into the tank during a pumpout and damaged, misaligned, or missing system parts are also specifically considered malfunctions.

Property owners may receive an extension for the five year required service if they can show, for example, that the system's capacity is significantly greater than its usage, the home is not occupied full-time, or the system is advanced. Extensions are valid for one year. Failure to have a system serviced, failure to submit the servicing form, and failure to make required repairs are all considered separate violations of the ordinance. Violations are punishable by a fine not to exceed $1,000 or imprisonment for 60 days, or both. Separate violations accrue every 90 days. The city clerk administers the ordinance and maintains all records. The city has assessed fines for violations of the ordinance, but the ordinance itself has not been challenged.

Homeowners living around Berkeley Lake were supportive of the ordinance because they were concerned about impacts to the lake. Those living in other parts of the city were less supportive, but in general public opinion of the ordinance was favorable. The fact that the ordinance applies only to those properties surrounding the lake may have contributed to this.

For a more in-depth case study on Berkeley Lake's onsite system maintenance requirements, see the UGA River Basin Center's Decentralized Wastewater Management: A Guidebook for Georgia Communities.

Water and Wastewater Authority of Wilson County, Tennessee & Tennessee Wastewater/Adenus Utilities public-private partnership community system management program

Wilson County, Tennessee, is one of the "donut" communities surrounding Nashville. In the 1990s and early 2000s, it experienced a significant housing boom. Most developments occurred in areas where sewer service was unavailable and soils and other conditions appropriate for onsite systems were rare (the county is underlain with bedrock and thin soils are common). The Water and Wastewater Authority of Wilson County (WWAWC) realized that community systems might be a way to maximize the potential of the few areas with appropriate site factors to support growth in these areas. Because the community had a good experience working with Adenus Wastewater Solutions providing a community system to service a local school, leaders decided to work with the company to develop a public-private community system management partnership. Beginning in the late 1990s, WWAWC began a public-private partnership with Adenus to provide community system wastewater treatment to new subdivisions and commercial developments in Wilson County. WWAWC is extremely pleased with this partnership.

WWAWC chose Adenus as its private partner because the company was the most well established decentralized wastewater service provider in the state of Tennessee. Adenus is a subsidiary of Tennessee Wastewater Systems, Inc. (formerly Onsite Systems, Inc.), which was Tennessee's first publicly regulated and privately owned decentralized wastewater utility. In addition to being a subsidiary of Tennessee's leading decentralized wastewater service provider, Adenus was also attractive to WWAWC because the company agreed to operate and maintain WWAWC's systems in perpetuity. Reliable management was very important to the authority, so this agreement was a major selling point. Today, WWAWC owns approximately twenty residential and commercial community systems that are managed by Adenus.

WWAWC has the authority to provide all public wastewater services in the unincorporated areas of Wilson County, and has a non-exclusive contract with Adenus under which the utility oversees the design, installation, operation and maintenance of community systems and the authority owns the systems and takes care of billing. If any of these systems fails to meet environmental or public health standards, Adenus is liable. If a homeowner does something to the system that damages it, that homeowner is liable. The county is not liable for any of the debts or actions of WWAWC, and would not be liable in the event that one of the systems fails.

Adenus receives about 70% of the monthly fees paid by WWAWC's community system customers. The average monthly rate paid by a residential customer is about $38. This rate is regulated by the Tennessee Regulatory Authority, and is comparable to the cost of centralized sewer service in nearby communities. WWAWC sets aside a small portion of the monthly rate to finance a reserve fund to handle problems that may arise if the authority assumes management of the systems. A provision in WWAWC and Adenus' contract gives the authority the power to assume control of any of the systems if Adenus fails to fulfill its obligations.

Developers pay the full cost of designing and installing community systems for new developments in Wilson County. Adenus provides the developer with design and installation specifications and oversees these activities. Once the development is complete, the developer deeds the system to WWAWC, and Adenus takes over operation and maintenance activities.

For a more in-depth case study on the WWAWC/Adenus Utilities public-private partnership, see the UGA River Basin Center's Decentralized Wastewater Management: A Guidebook for Georgia Communities.

Coweta County community system public utility program

Coweta County, Georgia, is a growing community about 45 minutes southwest of Atlanta. As part of it's 2006 Comprehensive Plan update, the county developed a plan to both accommodate much of the rapid growth it had experienced and maintain its rural character. The plan focuses new development in "village centers" and restricts it in traditionally rural areas. The Comprehensive Plan also recognizes that wastewater treatment options impact growth, stating that "[w]astewater management has been identified as the most important issue facing the creation of Village Centers because it can greatly impact the development pattern of an area through cost and zoning limitations." Officials decided to use community wastewater systems to implement the village center approach to growth. These relatively inexpensive systems can service commercial and dense residential development envisioned for the village centers. Because they are designed to treat a fixed amount of wastewater, they facilitate specific growth plans.

Interestingly, Coweta County had at one point banned the development of community systems within its borders because of management issues with of a couple of these systems. Therefore, when the county decided to rely on them for its village center growth plan, it also knew it had to provide for reliable management. The county entered into an intergovernmental agreement with Newnan Utilities, the county seat's sewer provider, where the utility agreed to own

and operate the systems. Recently, the county has switched management providers; the Coweta Water and Sewer Department (Coweta Sewer) now manages these systems.

Coweta County requires that all community systems within its borders are designed, constructed, operated and owned by Coweta Sewer. The county commission must approve construction of these systems via issuance of a special use permit. These systems should service compact, nodal developments instead of linear ones; the commission must consider development layout when deciding whether to issue the special use permit. Once a special use permit is issued, Coweta Sewer oversees the design and construction of the system. Design and siting must adhere to county requirements for community systems. Among other things, the county requires a replacement absorption field and minimization of adverse effects resulting from noise, odor, lighting and aerosol drift.

The developer or business owner pays all costs of design and construction. Coweta Sewer owns the system and all permits for the system are in its name so the developer undertakes no legal responsibility. For systems that are used in subdivisions, Coweta Sewer requires the developer to subsidize operation of the system until a certain number of homes are sold. Residential user fees for the system are about $40.

All Coweta Sewer's systems are Septic Tank Effluent Pumping (STEP) systems, which utilize individual septic tanks and pumps that route effluent to a common final treatment system and absorption field. The utility prefers STEP technology because it is easy to design and requires minimal maintenance. As of 2012, the utility owned five STEP systems that service two residential developments, a church, a shopping center, and a tractor supply store. The hydraulic capacities of these systems range from 7,500gpd to 30,000gpd.

For a more in-depth case study on the Coweta County community system public utility, see the UGA River Basin Center's Decentralized Wastewater Management: A Guidebook for Georgia Communities.

Appendix B. Recommendations for Agencies and Georgia Assembly

Remove the prohibition on County Boards of Health requiring maintenance of non-mechanical onsite systems (i.e., gravity-fed septic systems) from O.C.G.A. § 31-3-5(b)(6). (Georgia General Assembly)

This prohibition hamstrings the ability of County Boards of Health to protect public health from improperly maintained conventional septic systems. Conventional septic systems, which represent the vast majority of onsite systems used in Georgia, must be regularly maintained. Poorly maintained systems are more likely to discharge raw sewage into the environment, which can cause outbreaks of gastrointestinal disease and other serious health threats.

This code section could be amended to give County Boards of Health flexibility so that maintenance requirements would not necessarily apply to all conventional septic systems within the community. A County Board of Health could decide, for example, to only require maintenance for systems that are more likely to impact public health, such as aging systems on small lots or systems adjacent to surface waters. Systems that posed less of a risk, such as those on large lots, could be excluded from requirements.

Develop regulations or other policies to ensure oversight and management of community wastewater systems with a capacity between 2,000 GPD and 9,999 GPD. (Department of Public Health and Environmental Protection Division)

Community systems that treat between 2,000 GPD and 9,999 GPD are regulated by the Georgia DPH and its local agencies, County Boards of Health and local Health Departments. DPH has not, however, developed comprehensive regulations for these systems, and Health Department personnel are typically ill-equipped to oversee the use of these larger, more complicated systems that often involve multiple owners. Georgia EPD regulates community systems larger than 9,999 GPD through a General Permit and staff with technical and legal expertise. DPH and EPD should work together to develop regulations or other policies (such as a Memorandum of Agreement) to provide for appropriate oversight of these small community systems.

Develop a permit for separate septage handling facilities. (Environmental Protection Division)

Separate septage handling facilities – one of the three approved methods for disposing of septage in Georgia – could be used to fill septage disposal gaps on the coast. These systems often involve additional dewatering of septage and disposal of

the resulting solids in a landfill or through incineration (much like biosolids generated at wastewater treatment plants). A single, specific permit for these systems (currently nonexistent) would simplify the process of establishing them (currently onerous).

Establish Clean Water Act State Revolving Fund loan and grant programs for onsite system repairs. (Georgia Environmental Finance Authority and Georgia General Assembly)

Funding onsite system repairs is a difficult task faced by many communities across the U.S. Many homeowners cannot afford repairs, which can make local programs designed to remediate issues with these systems unpopular. In some states, Clean Water Act State Revolving Fund monies are used for low interest loan and grant programs for onsite system repairs. Establishing such a program would require internal policy changes by GEFA, and possibly legislative changes by the General Assembly, but could help address public and environmental health threats that can stem from malfunctioning or failing onsite systems.

For an in-depth analysis of developing one of these programs in Georgia, see AMANDA WORTHINGTON, FUNDING SEPTIC SYSTEM REPAIRS IN GWINNETT COUNTY THROUGH THE CLEAN WATER STATE REVOLVING FUND (2006).

Clarify lifetime maintenance requirements for alternative onsite systems. (Department of Public Health)

DPH regulations require homeowners to have maintenance contracts with the system manufacturer for the first three years after alternative systems are installed.[61] These contracts must be included in the purchase price of the system, and must include inspections at six month intervals. Inspection reports must be submitted to the Health Department annually. Often overlooked is another requirement that "[m]aintenance and the periodic reporting requirements … *must continue for the life of the system*."[62]

Many, if not most, County Boards of Health and local governments are unaware of the perpetual maintenance requirement for alternative systems. DPH should clarify this requirement so these entities can ensure alternative systems receive the maintenance they require.

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[61] The DPH rules state that maintenance of onsite systems "shall" be in accordance with the DPH manual; Section D of the DPH manual includes the maintenance contract (called an "initial service policy") requirements. Ga. Comp. R. & Regs. § 511-3-1-.17(2) (2016); GEORGIA DEPT. OF PUBLIC HEALTH, ENVIRONMENTAL HEALTH SECTION, MANUAL FOR ON-SITE SEWAGE MANAGEMENT SYSTEMS D-17,18 (2014).

[62] MANUAL FOR ON-SITE SEWAGE MANAGEMENT SYSTEMS, supra note 58, at D-18 (emphasis added).

Appendix C. Needed Research, Tools, etc.

Community capacity survey.

Many coastal communities lack some sort of capacity to accomplish the complicated task of wastewater management, whether it be technical expertise, tools such as GIS, staff, or funding. A community capacity survey could identify specific capacity deficits in coastal communities to inform state or regional efforts to fill these gaps.

Wastewater management training for local officials.

Georgia's local government officials receive annual training on a number of topics, including environmental policies and infrastructure development. Wastewater management is covered to some extent in some of these courses, but local officials could benefit from more comprehensive training on all types of wastewater infrastructure and all aspects of management. Such programs may be particularly beneficial in growing communities or those experiencing wastewater management issues.

Technical assistance.

Many coastal local governments could benefit from technical assistance in some aspect of wastewater management, such as conducting alternatives analyses, reviewing plans, and other matters. A number of models for technical assistance exist across the U.S., including programs sponsored by state or regional agencies and cooperative extension programs provided by state universities. A community capacity survey, described above, could help inform which type of assistance program would be most effective.

Onsite systems standards enforcement training for local attorneys and judges.

In Georgia, the local government attorneys and judges charged with the ultimate enforcement of onsite standards citations do not receive any training on the impacts of violations and their options for enforcement. Training programs for local attorneys and judges can help to fill enforcement gaps. They could be developed by state agencies, universities, or other groups.

Coastal Georgia Septage Disposal Study

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Executive Summary

Sufficient septage disposal sites are necessary to deter illegal dumping and prevent regular maintenance of onsite sewage disposal systems from becoming cost prohibitive. On Georgia's coast, adequate septage disposal is particularly important. The region has ubiquitous water resources, sensitive natural areas, and many recent initiatives to increase onsite system maintenance. Anecdotal evidence of the coast's insufficient septage disposal sites abounds, but quantitative data is needed to accurately convey the situation and encourage action. This study provides much of this information. It catalogs coastal disposal sites and their fees and policies, identifies and prioritizes underserved areas, and lays out potential policy and other methods for increasing septage disposal options.

There are currently eleven WWTP accepting septage from coastal communities and two that will begin accepting soon. Four of the facilities currently accepting will only take septage loads generated within city or county limits. One facility outside of the coastal region accepts septage from one coastal county. Procedures and fees vary by facility. Every coastal county contains underserved areas, identified by driving times to a disposal facility or high disposal fees. The number of underserved high density OSDS clusters, prioritized in this study, vary from county to county.

A number of policy and other methods for increasing coastal septage disposal options exist, and include planning initiatives, funding and other incentives, regulatory options, expansion of service areas of existing disposal facilities, creation of new facilities, and other options.

Study Background

Septage definition. Domestic septage is highly concentrated waste that must be periodically pumped from septic systems, cesspools, and other onsite sewage disposal systems (OSDS). In a septic system tank, solids settle to the bottom and form a layer of sludge; this sludge is septage. Pumping septage is critical to maintaining the proper functioning of these systems. If septage is not periodically removed, it can clog outlets and drainfield lines and, if it reaches the drainfield, damage lines and soils to the extent that a new drainfield may be necessary. Failure to regularly pump septage is one of the most common causes of OSDS failures, which can result in public health and environmental impacts and can cost a property owner thousands of dollars to remedy.

Septage disposal regulation. The U.S. Environmental Protection Agency describes the need septage disposal regulation as follows:

> *"Septage is highly variable and organic, with significant levels of grease, grit, hair, and debris. The liquids and solids pumped from a septic tank or cesspool have an offensive odor and appearance, a tendency to foam upon agitation, and a resistance to settling and dewatering. Septage is also a host for many disease-causing viruses, bacteria, and parasites. As a result, septage requires special handling and treatment."*

In Georgia, regulatory authority over septage disposal is split between the Georgia Department of Public Health (DPH) and the Georgia Environmental Protection Division (EPD). DPH develops rules concerning certification of septage pumpers and the appropriate methods of disposal,[63] while EPD permits disposal facilities.[64]

DPH regulations require certification of septic tank contractors, including those who pump and haul septage.[65] Certification must be renewed every two years and is conditioned on meeting continuing education requirements.[66] Septage pumpers must also obtain a septage removal and disposal permit from the County Boards of Health where they operate and renew it annually.[67] They must maintain manifests identifying where septage loads were generated and disposed.[68]

There are three types of facilities where domestic septage can be legally disposed of in Georgia: wastewater treatment plants (WWTP), land disposal sites, and separate septage handling facilities. EPD issues National Pollutant Discharge Elimination System (NPDES) and Land Application System (LAS) permits for WWTP and a General Permit for septage land disposal sites. Standalone septage handling facilities may be permitted to operate as pretreatment facilities, non-domestic septage systems (NDSS),[69] or through NPDES or LAS permits.

Coastal septage disposal. Adequate septage disposal facilities are needed to deter illegal dumping and promote OSDS maintenance. When septage pumpers must travel long distances or pay high fees for disposal, they may be inclined to dump septage into a ditch or stream or even into a sewer manhole on a quiet street. On the coast, illegally dumped septage can quickly move through and

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[63] Ga. Comp. R. & Regs. 511-3-1-.11 (2015).

[64] *See* General Permit No. GAG620000; Ga. R. & Reg. § 391-3-6-.06 (2015).

[65] Ga. Comp. R. & Regs. 511-3-1-.16 (2015).

[66] *Id.*

[67] Ga. Comp. R. & Regs. 511-3-1-.11 (2015).

[68] *See* Georgia Dept. of Public Health, *Manual for On-site Sewage Management Systems*, § I Septage Removal (2014).

[69] *See* Ga. Comp. R. & Regs. 391-3-6-.13 (Underground Injection Control).

contaminate the region's abundant surface and groundwater resources and damage its copious sensitive ecosystems. Depending on where it is dumped, it can contaminate well water and other drinking water sources, recreational areas, and result in public health impacts. If dumped into a manhole, the unanticipated input of highly concentrated waste can upset treatment processes and may result in permit violations. If the septage contains substances such as commercial grease or toxic chemicals, treatment processes at the plant can be significantly impacted. Enforcement of anti-dumping regulations is, unfortunately, difficult, as offenders are rarely caught in the act. This also makes it difficult to quantify how often illegal dumping occurs, though it is likely that it is underreported.

In recent years, a number of state and federal agencies, local governments, and other organizations have been developing programs and guidance to increase maintenance of coastal OSDS. These efforts are certainly laudable, as the high water tables and sandy soils common on the coast make use of OSDS difficult and the consequences of system malfunctions more pronounced. In addition, the coast has many aging systems that may require more frequent pumping. Increasing OSDS maintenance in areas without adequate septage disposal facilities could, however, result in unintended consequences. When pumpers have to travel long distances to properly dispose of septage loads, it may increase costs and the chances of illegal dumping. Higher costs for pumping can be a burden on homeowners and erode public support of maintenance programs, and illegal dumping could cancel out water quality benefits gained by system maintenance. Establishing OSDS maintenance programs without first ensuring adequate disposal sites could undermine maintenance program efforts.

Currently in coastal Georgia, the only legal disposal facilities are WWTP. EPD permits do not require WWTP to accept septage and, aside from requiring certification of pumpers, do not regulate septage acceptance policies. It may be difficult to permit septage land disposal sites on the coast due to the region's high water table and generally unsuitable soils. Septage land disposal sites that may be permitted further inland and utilized by coastal haulers may have application rates less than the maximum of 40,000 gallons per acre per year under the agronomic rate requirements of the general permit.[70]

Over the years, septage pumpers, homeowners, and various agency officials have noted the inadequacy of septage disposal facilities on the coast. They maintain that too few sites exist, and that fees, facilities, and policies at those that are available make disposal unpredictable and costly. Some studies exist, but they provide limited data. A 2006 State Senate report provided important statewide policy recommendations but did not quantify the disposal issue; surveys of WWTP operators and septage pumpers have been conducted

[70] *See* Ga. Comp. R. & Regs. 391-3-6-.23; General Permit No. GAG620000.

statewide but with limited response;[71] and the one coastal study available, although thorough and compelling, focused on only one community.[72] Apart from these resources, most of the information we have about coastal septage disposal is anecdotal. Without data that quantifies disposal site availability, it has been difficult for agency officials and others to explain the issue and prioritize action. This study seeks to provide this needed data.

Study Method

Area covered. This study is part of a larger coastal regional wastewater planning project conducted by the UGA River Basin Center (RBC) and funded by Georgia Sea Grant. The project area is the communities within the service area of the Coastal Regional Commission (CRC) (a major project partner): Bulloch, Bryan, Camden, Chatham, Glynn, Effingham, Liberty, Long, McIntosh, and Screven counties and their associated municipalities. Analysis of underserved areas was limited to CRC communities, but adjacent counties and cities were included in the identification of disposal sites.

Research method. Research for this study was divided into several distinct tasks. Methods for each are as follows:

Determine scope and approach of project. A septage working group was formed as part of the coastal regional wastewater planning project comprised of project Advisory Committee members with expertise or interest in septage disposal. Along with Katie Hill, working group members include:

- Chris Kumnick: Deputy Environmental Health Director, Georgia Department of Public Health
- Ted Hendrickx: Wastewater Regulatory Information Unit Manager, Georgia EPD
- Todd Driver: District Environmental Health Director, Coastal Health District
- Terry Ferrell: Environmental Health Manager, Camden County
- Jackie Jackson Teel: Comprehensive and Natural Resources Planning Director, Chatham County-Savannah Metropolitan Planning Commission
- Ebony Simpson: Grant Project Coordinator, Georgia Department of Community Affairs
- Nils Gustavson: Transportation and Planning Engineer, Liberty Consolidated Planning Commission
- David Radcliffe: Professor, UGA Crop and Soil Sciences

[71] A 2013 pumper survey by the Georgia Onsite Wastewater Association included only two coastal pumpers; a 2012 survey of disposal rates included only two coastal WWTP; and a 2015 survey conducted by the Georgia Association of Water Professionals for EPD provided good general information but no useful coastal data.

[72] Ferrell, Terry, *Septage Disposal: Getting Rid of What No One Wants*, Environmental Public Health Leadership Institute (2011).

- Brant Phelps: Environmental Health Manager, Liberty and Long Counties
- Charles Draeger: Director of Water Operations, Garden City, Georgia
- Rick Frey: St. Marys River Management Committee
- Ashby Nix: Satilla Riverkeeper
- Ron Carroll: Professor Emeritus, UGA School of Ecology
- Merrill Varn: St. Marys River Management Committee
- Ray Bodrey: Marine Resource Specialist III, UGA Marine Extension Service
- Jen Hilburn: Altamaha Riverkeeper

The working group was formed shortly before the RBC entered into its agreement with DCA for this project, and had its first meeting shortly thereafter. At the meeting, the working group clearly singled out the need for more than merely anecdotal evidence of coastal septage disposal issues and previously conducted septage disposal surveys. The group decided that a coastal septage disposal study should include a GIS analysis showing underserved areas, identified by distance to a disposal facility, fees and facility policies, and other factors, and prioritized by the potential of contamination of aquatic resources. The group also agreed that personal communication with WWTP operators and septage haulers would be necessary.

Identify coastal WWTP and their septage acceptance policies. Hill updated a 2009 inventory of coastal WWTP[73] through conversations with plant operators, engineering firms, local officials, regulators, and others. She conducted research online to find contact information for WWTP operators, and conducted phone interviews with operators and other local officials to determine individual plant septage acceptance policies.

Identify high density OSDS areas. The septage working group identified areas with a high density of OSDS, and particularly those that have a higher chance of impacting waters, as those that should receive special attention when identifying underserved septage disposal areas. WelSTROM, a GIS mapping database developed by the South Georgia Regional Commission (SGRC) and populated with onsite system data by UGA Marine Extension (MAREX) and others, contains polygons of high density OSDS that are in high-risk pollution susceptibility index (PSI) areas. This database was used to identify high density OSDS areas for this study.

Identify drive times from high density OSDS to WWTP accepting septage. The RBC contracted with GIS analysts at the CRC and SGRC to quantify drive times from WWTP to areas from which they accept septage. WWTP that only accept

[73] Thomas and Hutton, *Coastal Georgia Water, Sewer, and Stormwater Inventory Summary Report* (2009) (prepared for the CRC).

from their particular city or county, for example, had their drive times clipped to reflect these limitations.

Identify underserved areas. The septage working group agreed that underserved areas are those that are 40 minutes or farther from an approved disposal site. If an area is closer than 40 minutes to a disposal facility, but the facility charges high fees, the area is also considered underserved. Hill identified these areas using WelSTROM.

Prioritize underserved areas. The septage working group decided that high density OSDS clusters should be prioritized, and that these areas should be further prioritized based on their proximity to impaired surface waters and surface waters in general, in that order.

Describe policy and other options for increasing septage disposal options on coast. Options were developed through meetings and other communications of the septage working group, review of surveys, reports, and studies, review of other states' septage regulations and policies, discussions with WWTP operators and septage pumpers, agency officials, and other experts.

Results.

Current septage disposal facilities. There are currently eleven WWTP accepting septage from CRC counties and two that will accept septage within a year (See Table 1). Of the facilities currently accepting septage, five will take septage generated anywhere while four will only take it from within city or county limits. One facility, in Metter, takes septage generated in Candler County (where Metter is located) and in Bulloch County. Fees charged to dump 1000 gallons of septage range from $30 to $165. Interestingly, the highest and lowest fee are at the same facility – the Pembroke WWTP charges $30 for a load of septage originating within the city limits and $165 for a load originating from North Bryan County. On average, fees are around $75.

There is some anecdotal evidence that some septage pumpers have crossed state lines to dispose of loads at facilities in South Carolina. Under DPH regulations, septage generated in Georgia must be disposed at an EPD permitted system.[74] It is possible that DPH and EPD could provide for disposal across state lines through a variance procedure if facility and procedure equivalency could be verified. This has not yet and may never occur, however, and a general consensus exists that pumpers should not have to drive to another state to find a suitable disposal facility. For these reasons, we have not included out of state facilities in this study.

[74] Ga. Comp. R. & Regs. 511-3-1-.11(3).

Table 1. Coastal Septage Disposal Facilities		
Facility	**Policies**	**Cost per load (1000gal)**
Pembroke WWTP	Only take from Pembroke and North Bryan Co.[75] Currently only one hauler regularly dumps there.	Pembroke - $30 N. Bryan - $165
Portal WWTP	Take it from anyone but it mostly comes from in county. Typically take ~6 loads/day.	First 1000gal - $65 Each additional 1000gal - $10
Woodbine WWTP	Only take from Woodbine.	~$120
Savannah – President St. WWTP	Only take from Chatham Co.	$35
Effingham Co. WWTP	Take from anyone. No port-a-potty waste. Very rough estimate of 32 loads per month.	$125
Brunswick Academy Creek WWTP	Take from anyone. Key and password system; no appointment needed.	$10 flat fee plus 3¢/gal
Hinesville/Ft. Stewart Taylor's Creek WWTP	Take from anyone; they must call in.	$75
Darien WWTP	Take from anyone. Small plant so they cannot take a lot.	$40
Sylvania WWTP	Only take from Screven County. Two haulers currently dump there.	$75
Jesup WWTP[76]	Take from anyone. Sell dump tickets; each ticket is for 500gal. Must purchase at least 5 dump tickets at a time.	$100 (tickets are $50/500gal)
Metter WWTP[77]	Take from one CRC county – Bulloch.	$65 for out of county ($50 in county)

[75] Because Ft. Stewart traverses Bryan County from its eastern to its western border, the county is effectively split in two: North Bryan County and South Bryan County.

[76] Jesup is not in the CRC service area, but we included it as a coastal septage disposal facility because it accepts septage from anywhere and some CRC community septage may be disposed there.

[77] Metter is not in the CRC service area, but we included it as a coastal septage disposal facility because Bulloch County septage is accepted there.

Richmond Hill Sterling Creek WWTP	Will take septage when new plant is complete. Unsure of policies.	Unsure
Pooler WWTP	Will take septage late 2015/early 2016.	Unsure

Considerations for WWTP. Some coastal WWTP have never accepted septage, while some used to take it and discontinued the practice. One plant, in Kingsland, discontinued accepting for some years but began again in the spring of 2015. Plant officials that discontinued taking septage were typically prompted by two concerns. The first is that WWTP were having problems abiding by their permit discharge limits and septage was seen as the cause. In some cases, WWTP operators suspected that some septage haulers were unlawfully sneaking commercial grease into their loads.[78] (Domestic septage includes some grease, but it is relatively innocuous compared to that generated in commercial establishments such as restaurants.) These operators noted that, while it is easy to quickly test septage pH on site, they are unaware of similar tests that indicate whether or not the load contains significant grease. It should be noted that none of these WWTP had definitively proved that septage was the culprit behind their permit violations, though the nature of WWTP processes can make identifying the cause of such issues difficult.

The second issue WWTPs referred to was the equipment and supervision needed to properly accept septage. At least one operator noted that his plant's experience accepting septage was challenging because they did not have a dumping station or the manpower to oversee or test every load. Others have asserted that constructing holding tanks or equalization basins at WWTP for septage storage and handling is cost-prohibitive.

WWTP that accept septage generally share several characteristics. They typically have some sort of dumping station, which can be as simple as a manhole at the plant's headworks outfitted with a basic screen. They also tend to check loads, which can be as little as a visual assessment, though some plants test every load's pH. One WWTP operator noted that merely chatting with the septage pumper can be very helpful; indeed, many operators indicated that having relationships with pumpers can assist with quality control. At least one plant, Academy Creek in Brunswick, uses a key card and password system to monitor loads and improve compliance. This system has been in operation for years and has worked well for the plant and pumpers.

[78] Comingling of domestic septage and commercial waste loads is prohibited by Georgia law. Ga. Comp. R. & Regs. 391-3-6-.24(6)(b) (2015).

The most frequently cited reasons for accepting septage are to generate an additional source of revenue and provide a service to community residents and businesses. Fees and the number of loads accepted per day vary from plant to plant, but a plant charging $75 per load that receives two loads per day would generate $27,300 in a year. Service to the community appears to be an important incentive for accepting septage; WWTP operators understand the issues associated with inadequate septage disposal facilities and generally seem to want to help if they can be assured it won't harm their plant.

It is important to note that WWTP of a wide range of sizes and treatment technologies accept septage. These include a 0.35mgd aerated lagoon to LAS plant (Pembroke), a 7.15mgd secondary trickling filter plant (Hinesville), and a 40mgd activated sludge secondary treatment plant (Savannah President St.).

Underserved septage disposal areas. Areas considered underserved for septage disposal are those that are 40 minutes or more from a disposal facility and all areas, regardless of drive time, if the closest facility charges high fees ($100 or more for a 1000 gallon load). High drive times and high fees can increase the chances of illegal dumping and higher pumping fees. In underserved areas, high density OSDS clusters are prioritized because of their potential for impacting public and environmental health if improperly maintained. These systems – particularly those that are on very small lots – are also more likely to be aging and installed under older, less rigorous regulations; as such, they deserve additional attention and care. High density OSDS clusters are further prioritized, first by adjacency to impaired waters and then to surface waters in general. All of the factors considered in designating and prioritizing underserved areas are available layers on WelSTROM.

Appendix A contains short reports on underserved septage disposal areas in individual counties.

Table 2. Underserved Septage Disposal Areas

Underserved septage disposal areas in this study (see Appendix A) include:

- All areas 40 minutes or more from a septage disposal facility
- All areas where closest septage disposal facility charges high fees ($100+)
- High density OSDS clusters are prioritized, and are further prioritized by:
  - Adjacency to impaired waters; then,
  - Adjacency to surface waters

Potential Methods for Increasing Coastal Septage Disposal Options.

There are a number of potential methods for increasing coastal septage disposal options. A few involving planning and funding were recommended in a 2006 State Senate septage disposal report[79] but have not yet been acted on. That report recommended that septage disposal be considered in regional water plans; some have explicitly included septage disposal considerations but the Coastal Regional Water Plan does not.[80] The five year planning cycle is set to begin again quite soon, and when the Coastal Water Council meets they should include septage disposal management practices in the latest iteration of the plan. The plan could follow another recommendation of the 2006 Senate report and encourage regional partnerships to increase disposal options. It could also, like the 2006 report, call for GEFA grants and/or loans to help communities pay for what can be an expensive endeavor.

Some changes at WWTP that currently accept septage could be beneficial. Many WWTP only accept septage from inside city or county limits. Allowing disposal of septage generated anywhere could improve disposal options in many areas. Of course, accepting septage only from within community limits is better than not accepting it at all, so operators must ensure they have the appropriate procedures in place before making this kind of change. Strict manifest and load checking procedures would be very beneficial if not necessary; the Brunswick Academy Creek key card system is an effective system to emulate.

Another potential change for WWTP involves fees. Some of these plants charge high fees that, if lowered, could make for more cost-effective disposal. Educating local elected officials and other leaders and recruiting them to help initiate discussions with plant operators would likely prove quite helpful here.

Constructing holding tanks or equalization basins at WWTP is another option. These facilities help provide reliable disposal for pumpers because they have a place to dump even if the plant cannot currently take septage. They also make accepting this high strength waste less worrisome for WWTP operators because it can be gradually fed into the system as conditions warrant. These facilities can, however, be expensive, so loans or grants would be advantageous, if not necessary.

Establishing new septage disposal facilities would likely be the best way to provide for adequate disposal options on the coast. The first option would be for

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[79] Georgia State Senate Research Office, *Final Report of the Senate Septage Disposal Study Committee* (2006).

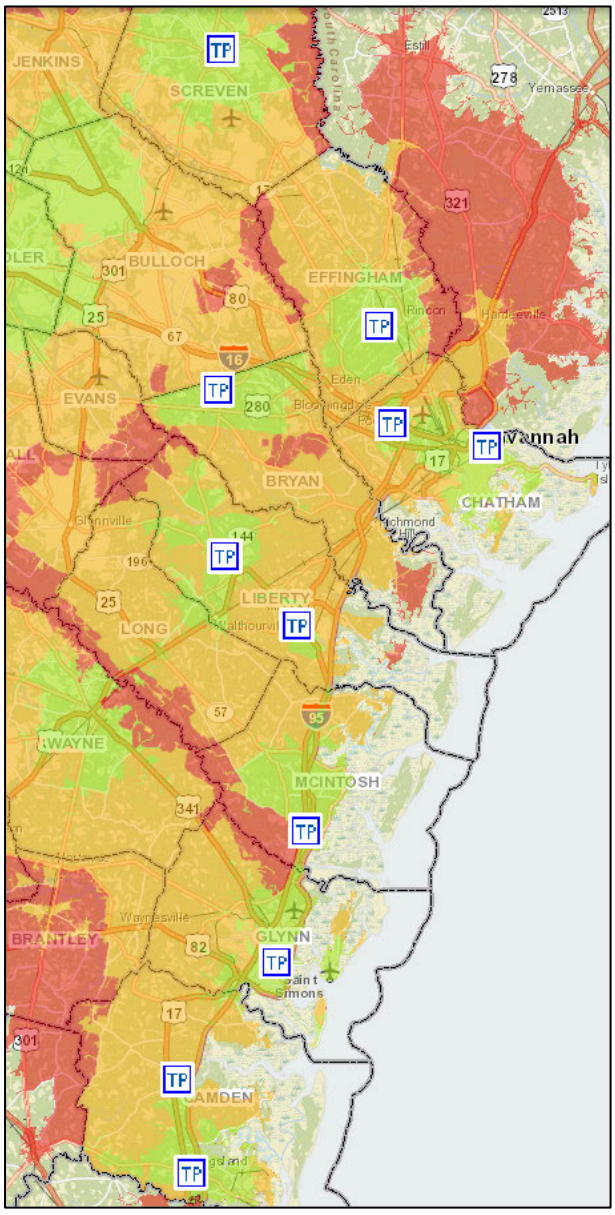
[80] Coastal Regional Water Plan (2011).

additional WWTP to accept septage. As with reducing fees, educating local elected and other officials would be key here. Development of guidance for best practices for accepting septage would also be very helpful, as would engineering guidance for including septage acceptance stations at new or upgraded plants. Another option would be to develop separate septage receiving facilities. One simple setup is a dewatering station where water is treated with an OSDS on site and solids are taken to a nearby landfill. Indeed, siting these facilities adjacent to a landfill would be one way to deal with zoning and other land use restrictions. EPD development of general permits for septage handling facilities that do not easily fit under another permit would be significant in promoting their development, as would providing for GEFA funding or other state incentives.

One way to help with the septage disposal issue may be to provide for more grease handling facilities. More research is needed, but problems with commercial grease in septage loads were cited by several WWTP operators and septage pumpers. There are currently limited grease handling facilities on the coast; providing more options here may make it less tempting for some unscrupulous pumpers to sneak the occasional load of commercial grease into their residential septage loads. An analysis of grease disposal options and cost in coastal Georgia would be advantageous here.

Finally, there are some regulatory options available for increasing septage acceptance. EPD likely has the authority to require WWTP to accept septage. That is very unlikely to happen, but a less burdensome tactic could be to require those WWTP that state they will accept septage in their engineering plans to actually take it. Currently, plants sometimes state that they will accept septage on their plans but never actually take it at the plant.

Appendix A:
Underserved Areas for Septage Disposal, by County



WWTP accepting septage and drive times for CRC coastal counties (portion of northern Screven omitted and Jesup WWTP not shown). WelSTROM 2015.

Introduction

This Appendix contains underserved areas for septage disposal, by county, for CRC communities (Bryan, Bulloch, Camden, Chatham, Effingham, Glynn, Liberty, Long, McIntosh, and Screven Counties).

Underserved areas are based on proximity to a WWTP, indicated by drive times. High density OSDS clusters are prioritized in underserved areas, and these are further prioritized by adjacency to impaired waters and to surface waters, in that order.

In images, WWTP that accept septage are represented by a text box containing "TP."

Drive times are color coded:

- Red = 60 minutes
- Yellow = 40 minutes
- Green = 20 minutes

Underserved area descriptions are ranked according to priority, as follows:

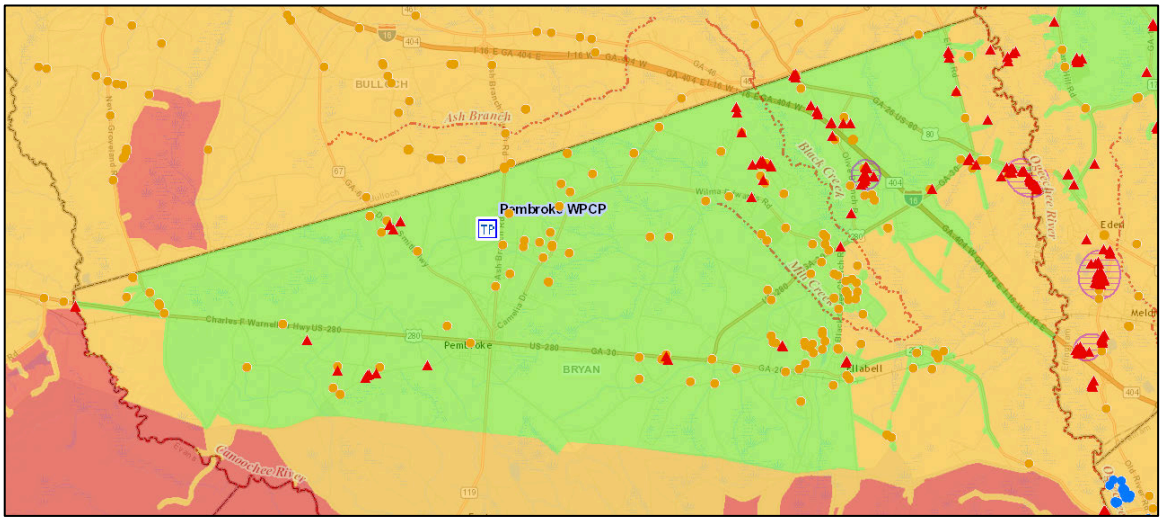
1. Description of first priority underserved area. Latitude and Longitude of the area (if a high density OSDS cluster).
    - First leading to prioritization of area.
    - Second factor…
2. Description of second priority underserved area. Etc.

All coordinates are approximate.

WelSTROM contains locations of OSDS from a number of different sources; the source dictates the icon used for individual OSDS. Many permit records have not yet been digitally recorded, however, so **not all OSDS are included in WelSTROM.** The incidence of underreporting varies by county. Many counties that have made progress digitizing data focused first on high density OSDS clusters, so in some places underserved areas lists should be quite accurate. For others, drive time data will be the first marker of service needs; as WelSTROM is populated with additional data more specific underserved areas can be identified.

Bryan County

Fort Stewart effectively splits Bryan County in two, so here underserved areas are grouped into two lists: North and South Bryan County.



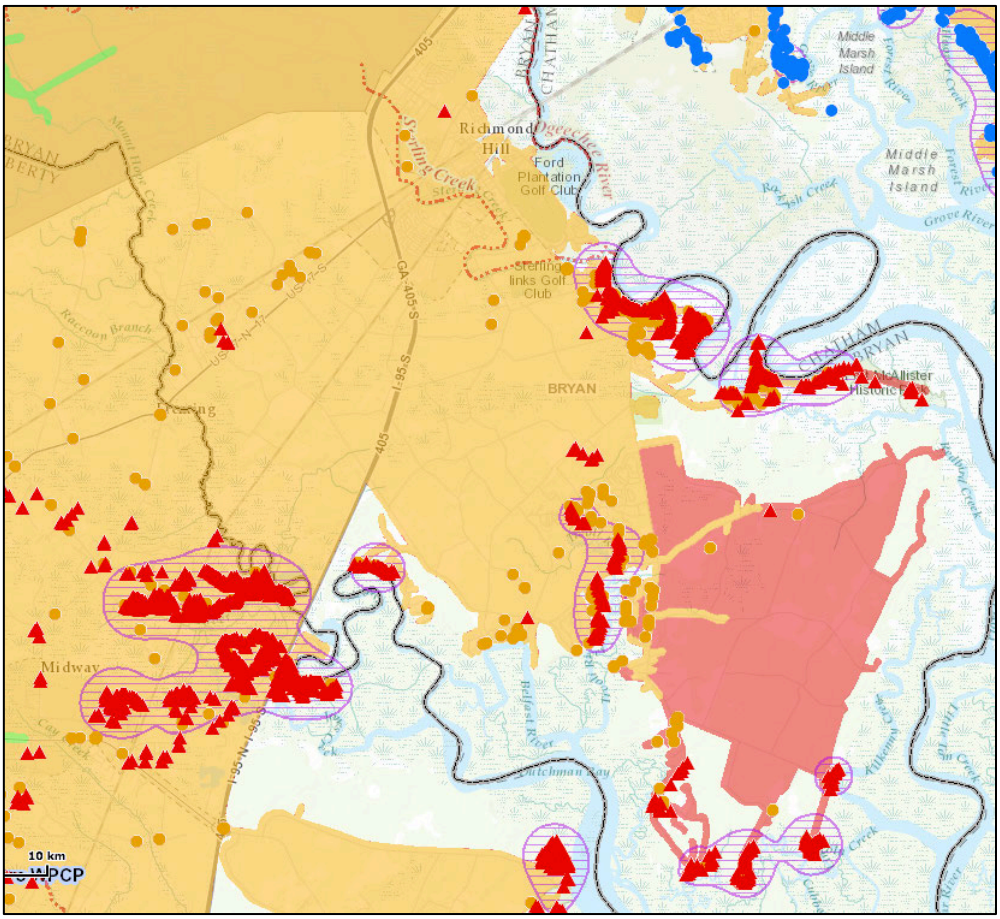
North Bryan County, WelSTROM 2015

North Bryan County

The closest available septage disposal facility to most of North Bryan County is the Pembroke WWTP. Most of this part of the county is within twenty minutes of the facility, but the high fees charged by the WWTP ($165) make this area more akin to places with higher drive times. For this reason, all of North Bryan is designated as underserved and all High density OSDS clusters are prioritized.

<u>Underserved Areas</u>

1. High density OSDS cluster on Ogeechee River/border of Bryan and Effingham Counties. Lat.: 32.188819, Long: -81.419581.
    - Adjacent to impaired waters (Ogeechee River).
2. High density OSDS cluster between Black Creek and GA-404 W. Lat.: 32.189690, Long: -81.479663
3. High density OSDS cluster on Bill Fultch Road. Lat.: 32.193950, Long: -81.518209.
4. All 40 minute drive time areas in North Bryan County.
5. All 20 minute drive time areas in North Bryan County.



South Bryan County, WelSTROM 2015

South Bryan County

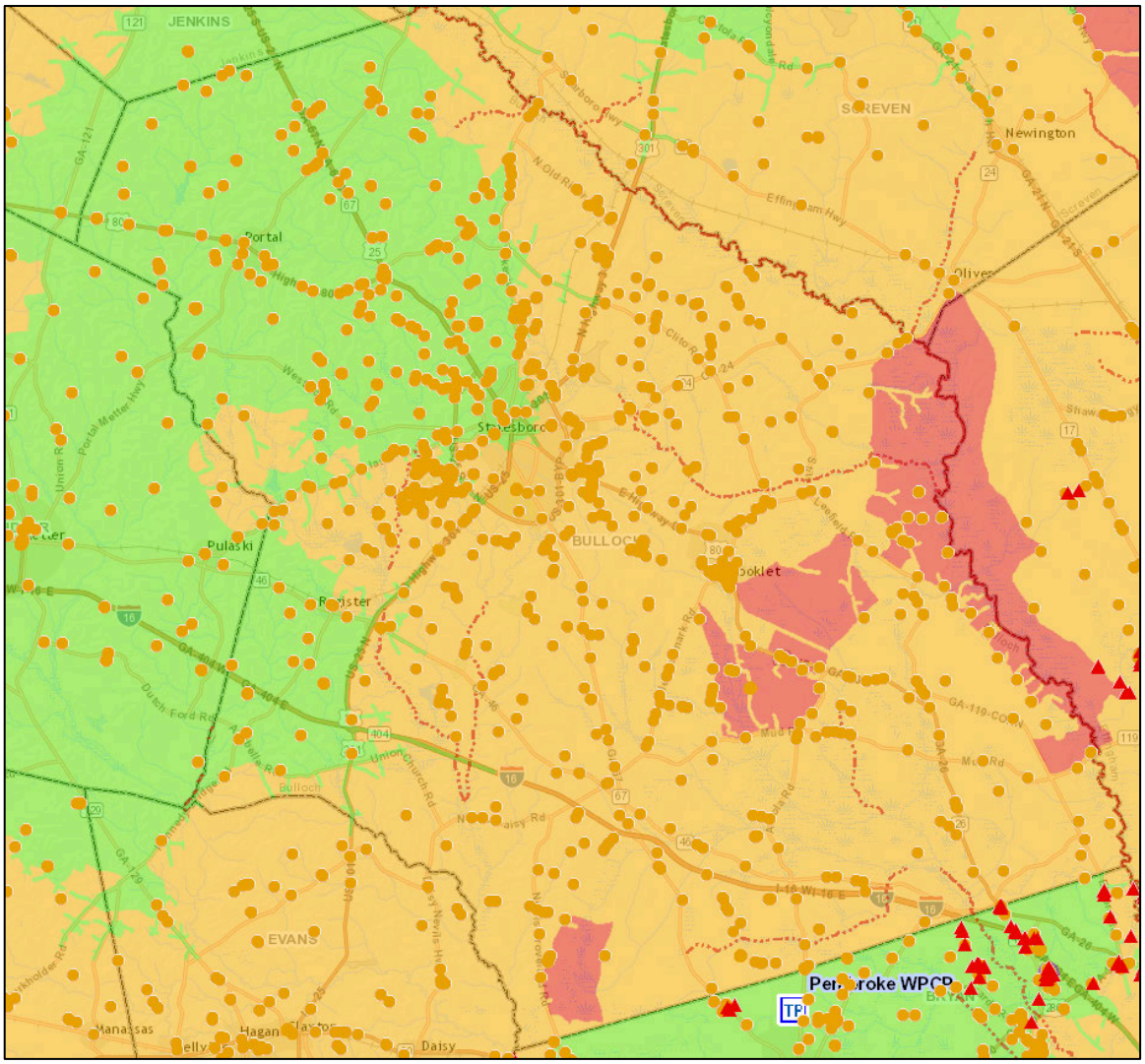
South Bryan County's closest available septage disposal facility is the Hinesville/Ft. Stewart WWTP (Riceboro and, for some areas, Savannah's President St. facility may be closer but neither accept septage from out of county). Currently, all of South Bryan County is in the 40 or 60 minute drive time range. The new Richmond Hill WWTP, currently under construction, will accept septage, so when that facility comes on line the drive times for South Bryan will reduce.

<u>Underserved Areas</u>

1. Two easternmost high density OSDS clusters near Kilkenny Creek, Lincoln Creek, and Cabbage Creek. Lat.: 31.770031, Long: -81.226025.
    - 60 minute drive times, adjacent to surface waters.
2. Two high density OSDS clusters along the Ogeechee River/Chatham County border. Eastern area – Lat.: 31.902837, Long: -81.256812; Western area – Lat.: 31.887691, Long: -81.217758.
    - Some 60 minute drive times, some adjacent to impaired waters, adjacent to surface waters.

3. High density OSDS area off of Dashers Landing Road. Lat.: 32.188991, Long: -81.417788.
    - Adjacent to impaired waters (Ogeechee River).
4. High density OSDS cluster adjacent to Tivoli River. Lat.: 31.840892, Long: -81.267025.
    - Adjacent to surface waters.
5. High density OSDS area on Jerico River/Liberty County border. Lat.: 31.841165, Long: -81.333133.
    - Adjacent to surface waters.
6. All 60 minute drive time areas in South Bryan.
7. All 40 minute drive time areas in South Bryan.

Bulloch County

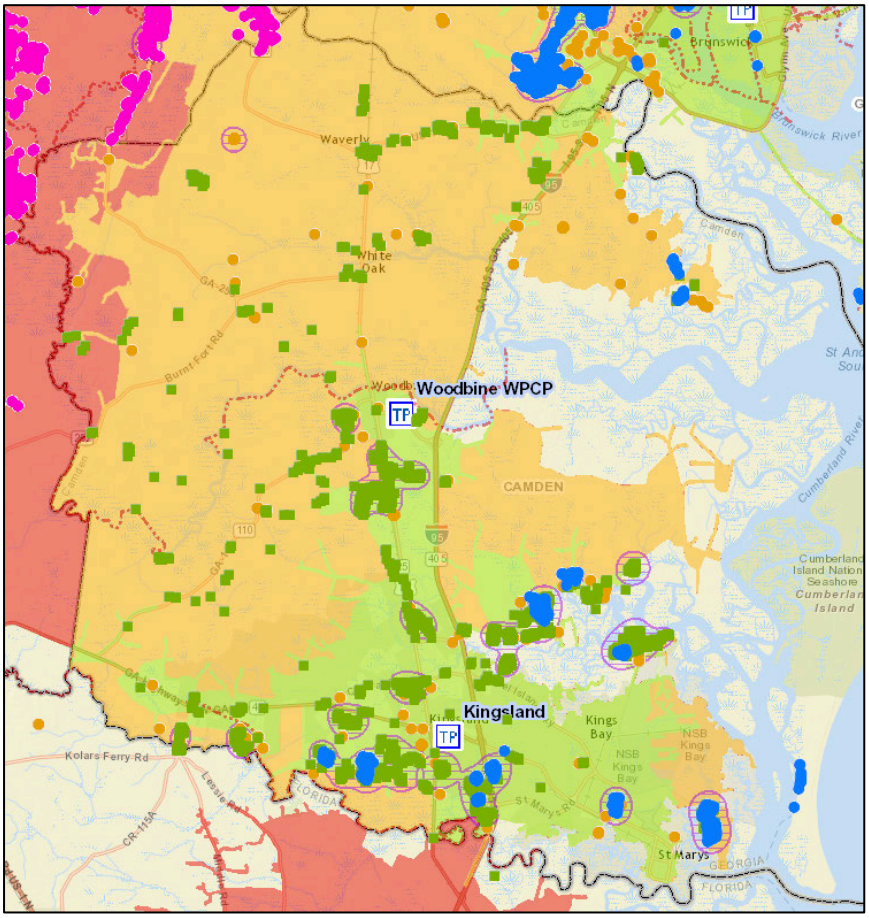


The only WWTP accepting septage within Bulloch County is in Portal, though some pumpers also take septage loads to the Metter WWTP in Candler County or the Effingham Reuse Facility. OSDS are widely scattered across Bulloch County, but there are no high density clusters according to the parameters set in WelSTROM.

<u>Underserved Areas</u>

1. All 60 minute drive time areas in Bulloch County.
2. All 40 minute drive time areas in Bulloch County.

Camden County



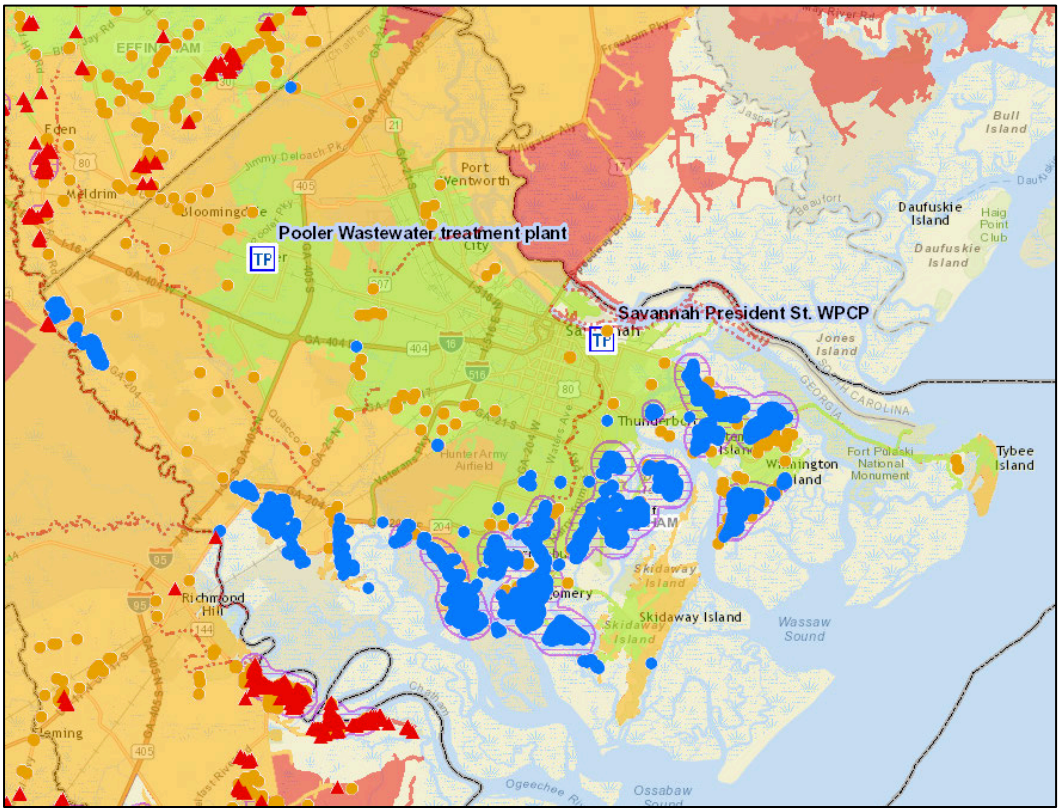
Camden County, WelSTROM 2015

Until the spring of 2015, the only septage disposal facility in Camden County was the Woodbine WWTP, which only takes septage from within city limits. Septage haulers would drive to the Academy Creek plant in Brunswick to dispose of their septage loads. Recently, however, the Kingsland WWTP began accepting septage, greatly improving disposal service in Camden County. There are, however, still many areas of Camden that are 40 minutes from a WWTP accepting septage, and an area on the western edge of the county that is 60 minutes away. There is one high density OSDS cluster in a 40 minute drive time range that is prioritized.

<u>Underserved Areas</u>

1. High density OSDS cluster on peninsula between North River and Point Peter Creek (south of Kings Bay Naval Base). Lat.: 30.748459, Long: -81.522235.
2. All 60 minute drive time areas in Camden County.
3. All 40 minute drive time areas in Camden County.

Chatham County



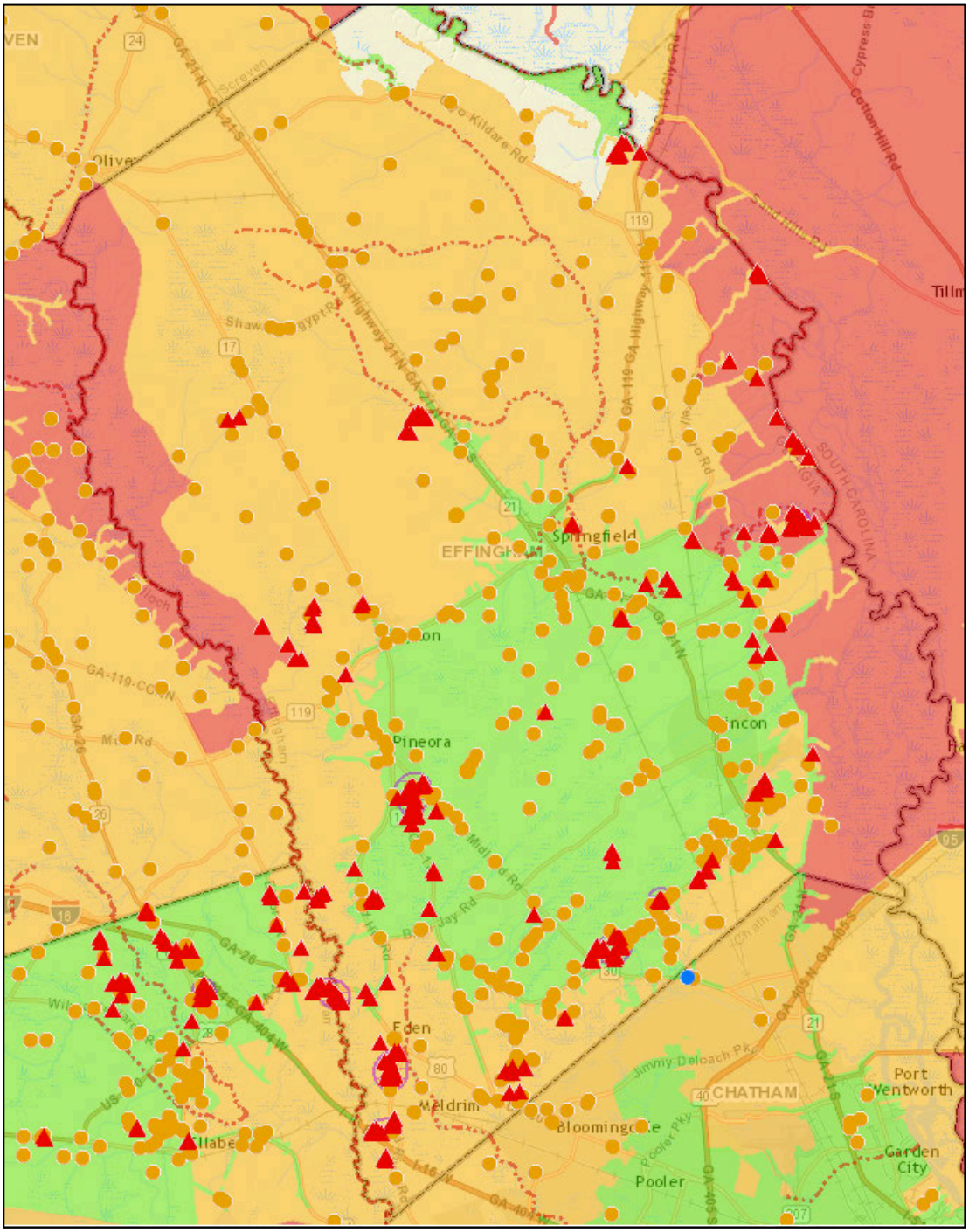
Chatham County, WelSTROM 2015

The President St. WWTP in Savannah accepts septage and puts most of the county in the 20 minute drive time range. In addition, the Pooler WWTP will begin accepting septage in Lat.e 2015 or early 2016. As such, Chatham County is generally well served for septage disposal. There are currently some underserved areas, listed below, but service will improve for these areas when the Pooler WWTP begins accepting septage.

<u>Underserved Areas</u>

1. Three clusters of high density OSDS near Middle Marsh Island (west of Vernonburg). Westernmost cluster – Lat.: 31.963848, Long: -81.215004; middle cluster – Lat.: 31.978119, Long: -81.183590; easternmost cluster – Lat.: 31.950157, Long: -81.152176.
2. Chevis Road/Ogeechee Farms (not marked as high density but a significant number of OSDS in this area) Lat.: 31.987303, Long: -81.258282.
3. Small 60 minute drive time area in northernmost portion of county.
4. All 40 minute drive time areas.

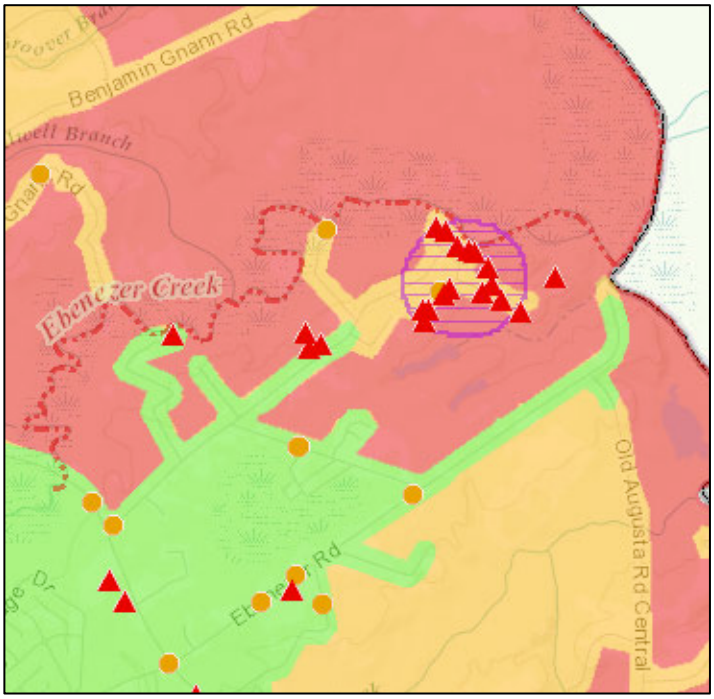
Effingham County



Effingham County, WelSTROM 2015

Effingham County's WWTP charges the second-highest disposal fees on the coast ($125), which makes the county more akin to places with higher drive

times. For this reason, all of Effingham is designated as underserved and all High density OSDS clusters are prioritized.

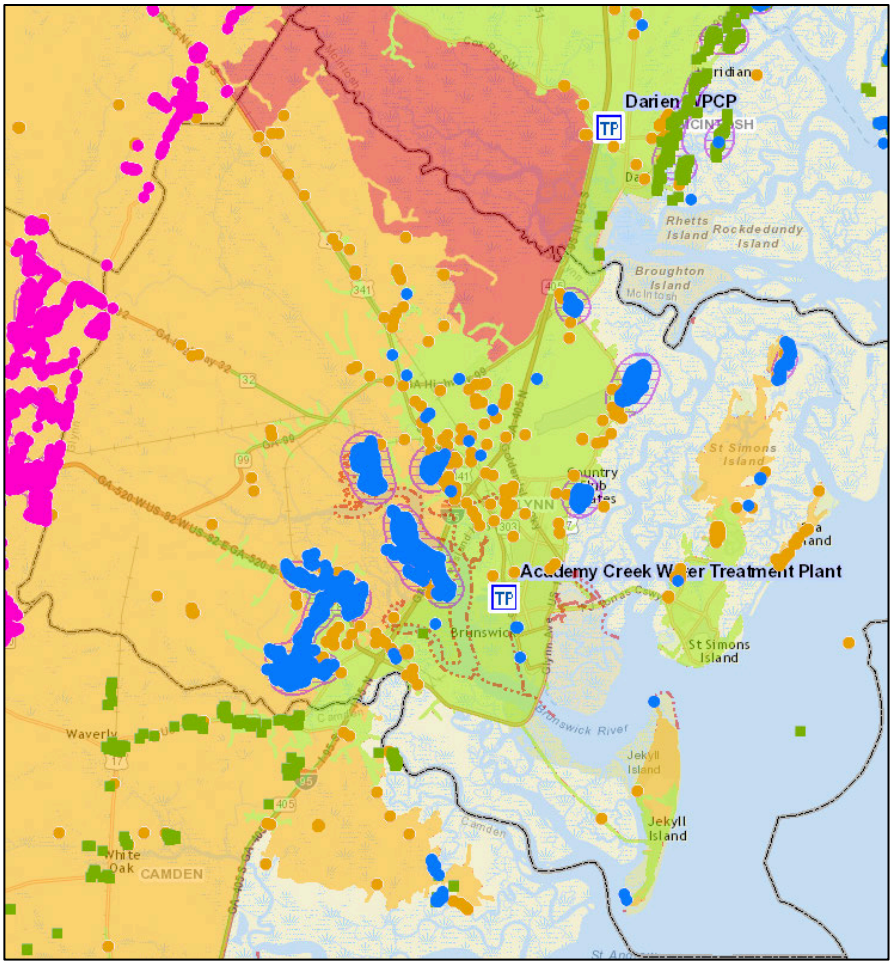


High density OSDS area along Ebenezer Creek, Effingham County, WelSTROM 2015

Underserved Areas

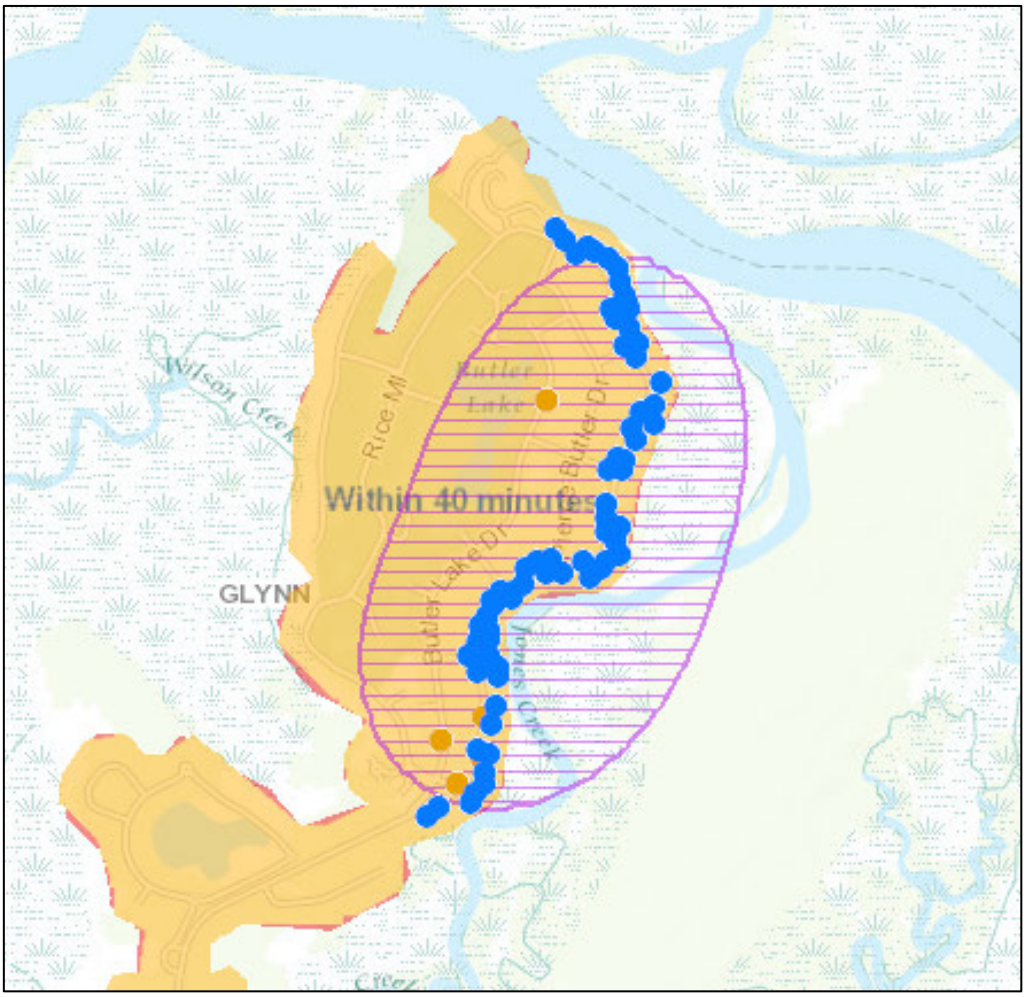
1. High density OSDS cluster on Ebenezer Creek. Lat..: 32.379686, Long: -81.195111.
    - Adjacent to impaired waters (Ebenezer Creek).
2. High density OSDS area off of Old Rail Road. Lat.: 32.157767, Long: -81.389019.
    - 40 minute drive time.
3. High density OSDS cluster off of Sandy Hill Road and Schuman Drive. Lat.: 32.134468, Long: -81.394956.
    - 40 minute drive time.
4. High density OSDS cluster between Midland Road and US-17. Lat.: 32.269031, Long: -81.378869.
5. High density OSDS area off of Goshen Road. Lat.: 32.226440, Long: - 81.260862.
6. High density OSDS area off of Kolic Helmey Road. Lat.: 32.207702, Long: -81.283210.
7. All 60 minute drive time areas.
8. All 40 minute drive time areas.

Glynn County



Glynn County, WelSTROM 2015

The Academy Creek WWTP puts most of Glynn County in the 20 or 40 minute drive time range, and 60 minute areas are in wetland or marsh areas without much development. The only high density OSDS cluster with a drive time over 20 minutes is on St. Simons Island.

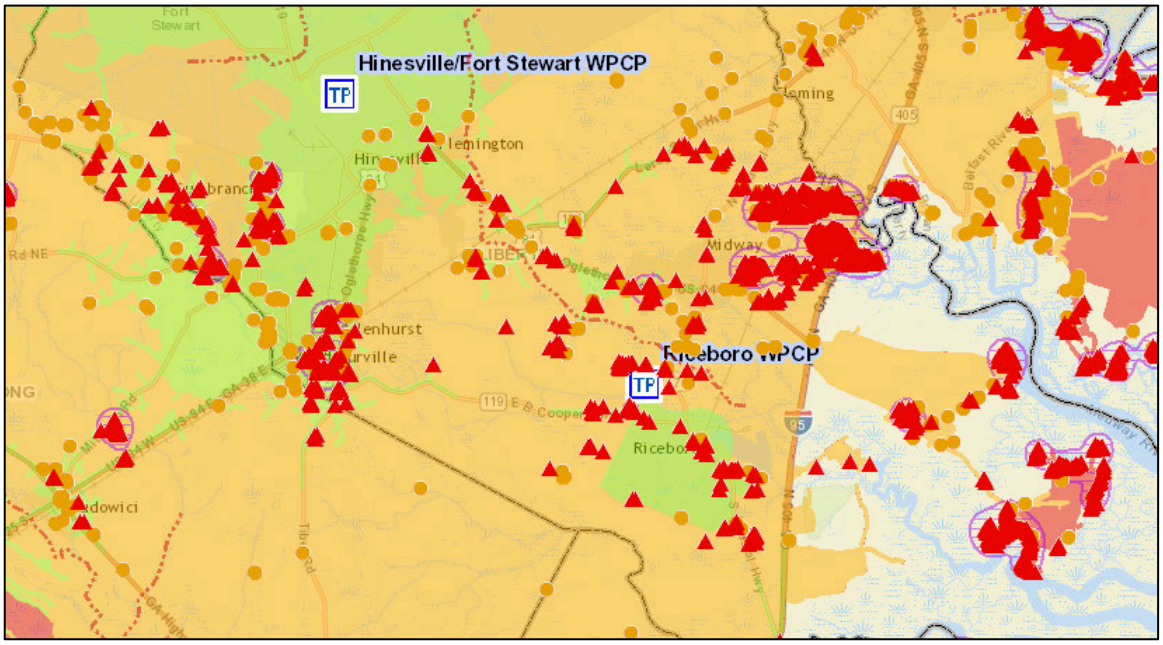


Northern end of St. Simons Island, Glynn County, WelSTROM 2015

Underserved Areas

1. High density OSDS cluster on the northern end of St. Simons Island. Lat.: 31.283052, Long: -81.341826.
    - 40 minute drive time.
2. All 60 minute drive time areas.
3. All 40 minute drive time areas.

Liberty County



Portion of Liberty County (much of northern end of county containing Ft. Stewart not pictured), WelSTROM 2015

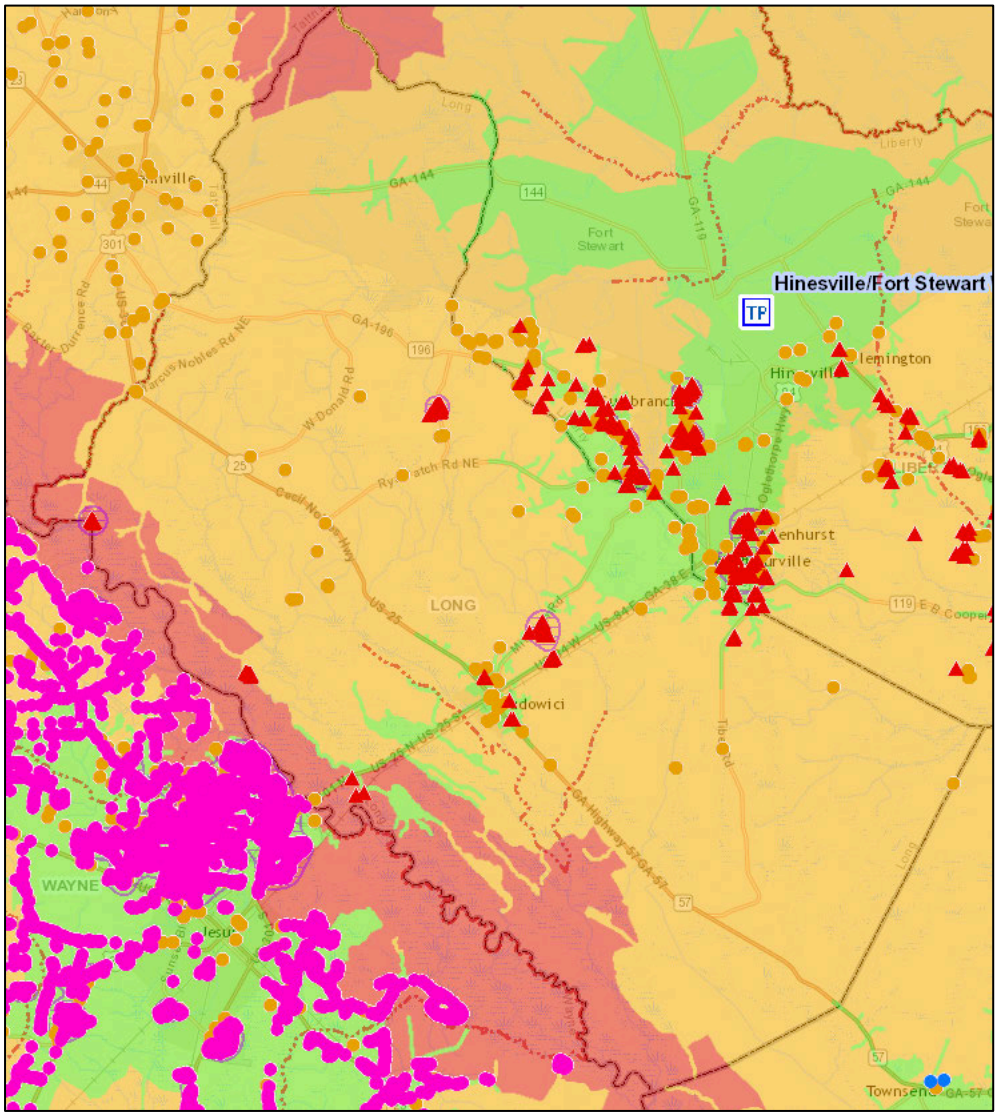
Septage generated in Liberty County is typically taken to the Hinesville/Ft. Stewart WWTP or the Darien WWTP. Riceboro is shown to take septage from within city limits on the image above, but some have indicated that the plant does not in fact accept septage (if it does it takes it from city limits, and there are few OSDS in Riceboro).

<u>Underserved Areas</u>

1. Colonel's Island high density OSDS cluster – northern end of island. Lat.: 31.727059, Long: -81.245006.
    - 60 minute drive time.
    - Adjacent to surface waters.
2. Colonel's Island high density OSDS cluster – southern end of island. Lat.: 31.697852, Long: -81.281913.
    - 40 and 60 minute drive times.
    - Adjacent to surface waters.
3. Large high density OSDS cluster between Jerico River and US 84. Lat.: 31.825246, Long: -81.376004.
    - 40 minute drive time.
    - Adjacent to surface waters.
4. High density OSDS cluster adjacent to Dutchman Bay. Lat.: 31.769847, Long: -81.284206.
    - 40 minute drive time.

    - Adjacent to surface waters.
5. High density OSDS cluster off of Islands Highway. Lat.: 31.746785, Long: -81.331842.
    - 40 minute drive time.
6. High density OSDS cluster north of Riceboro. Lat.: 31.768314, Long: -81.469815.
    - 40 minute drive time.
7. High density OSDS cluster south of Riceboro.
    - 40 minute drive time.
8. All 60 minute drive time areas.
9. All 40 minute drive time areas.

Long County



Long County, WelSTROM 2015.

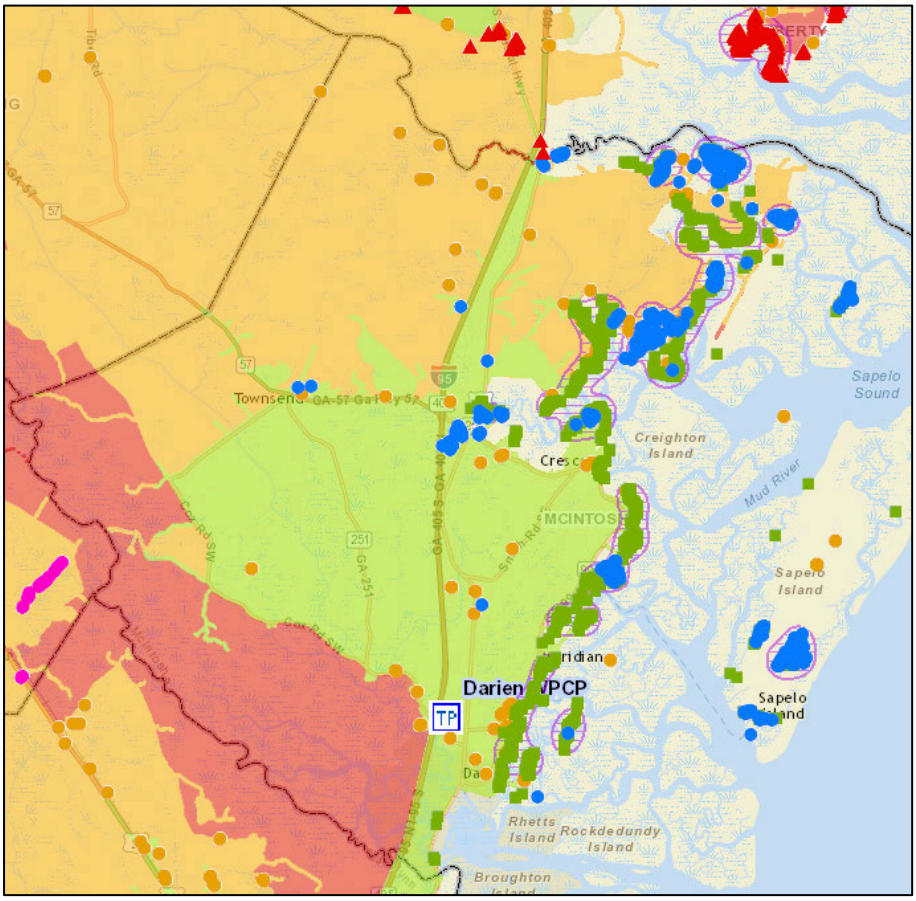
Most of Long County is 40 minutes from the nearest WWTP accepting septage; available WWTP are Hinesville/Ft. Stewart and Jesup. Long County's OSDS data appears to be the most underreported in WelSTROM, so it is likely that there are more high density OSDS clusters than are currently in the database.

<u>Underserved Areas</u>

1. Beard's Bluff high density OSDS cluster. Lat.: 31.789349, Long: -81.951241.
    - 60 minute drive time.
    - Adjacent to impaired waters (Altamaha River).

2. High density OSDS cluster on Carson St. Lat.: 31.742048, Long: -81.718933.
    - 40 minute drive time.
    - Adjacent to surface waters (Doctors Creek).
3. High density OSDS cluster off of Smiley Rd. NE. Lat.: 31.838795, Long: -81.773270.
    - 40 minute drive time.
4. All 60 minute drive time areas.
5. All 40 minute drive time areas.

McIntosh County



McIntosh County, WelSTROM 2015.

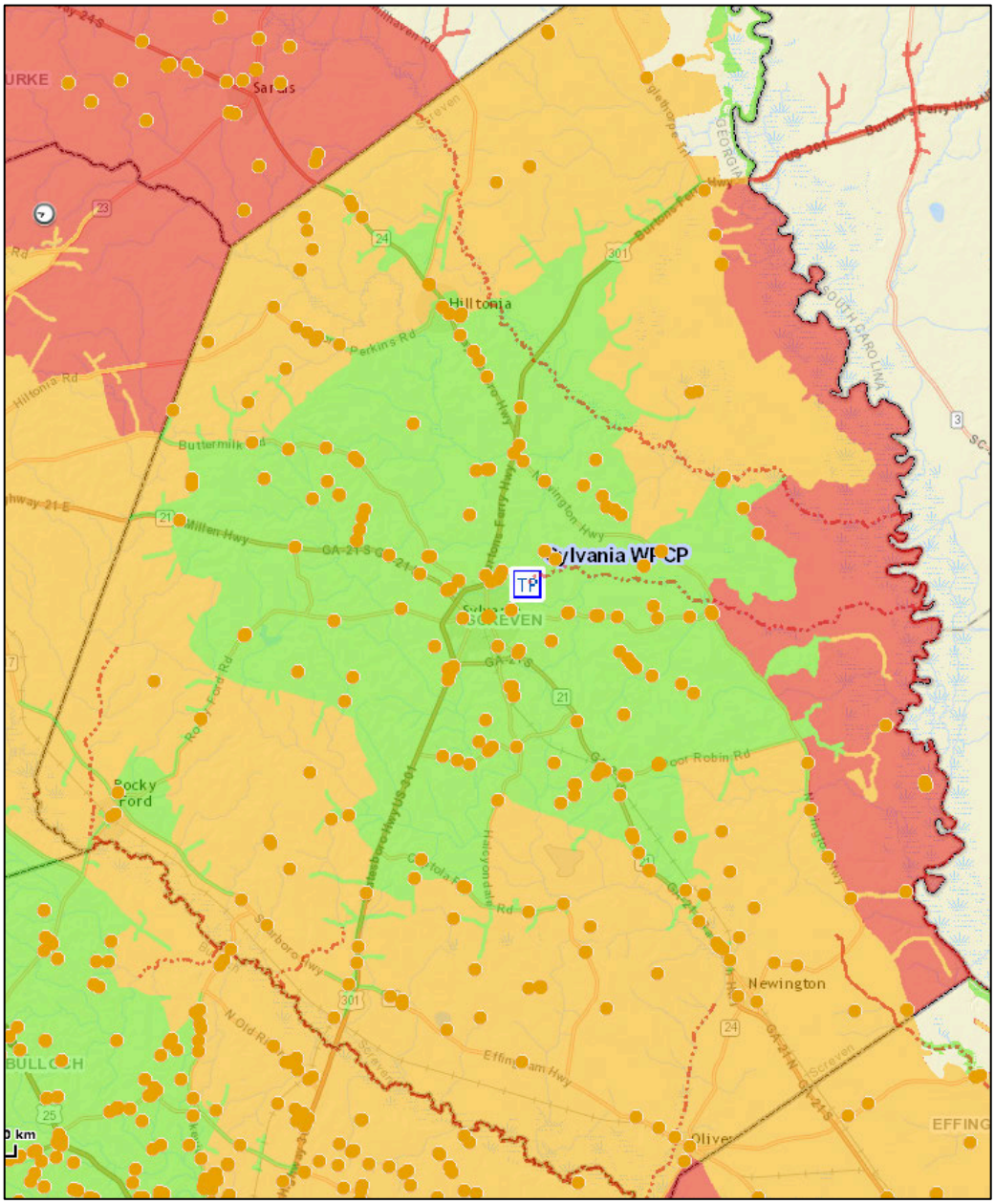
McIntosh County is generally well-served by the Darien WWTP, which accepts septage from anywhere and charges reasonable fees. The Darien WWTP is, however, somewhat small and cannot take a lot of loads in one day. High density OSDS clusters in the northern end of the county are all similar (40 minute drive times and adjacent to surface waters), so they have been prioritized from north to south to reflect the likely longer drive times for the more northern clusters.

<u>Underserved Areas</u>

1. High density OSDS cluster off of Belvedere Dr. NE. Lat.: 31.643947, Long: -81.300786.
2. High density OSDS cluster off of Eagle Neck Dr. Lat.: 31.641075, Long: -81.330281.
3. High density OSDS cluster off of Goulds Landing Rd. NE. Lat.: 31.617894, Long: -81.268256.

4. Large high density OSDS cluster that includes Sapelo Hammock Golf Club, Shellman Bluff, OSDS on Julienton Dr. NE, and other locations. Lat.: 31.581849, Long: -81.311345.
5. High density OSDS cluster off of Belle Hammock Rd. NE and River Dr. NE (on either side of White Chimney River; 20 minute drive time areas of this cluster excluded). Lat.: 31.570486, Long: -81.364259.
6. All 60 minute drive time areas.
7. All 40 minute drive time areas.

Screven County



Screven County, WelSTROM 2015.

Screven County is reasonably well served by the Sylvania WWTP, which charges $75 per 1000 gallon load. There are currently no high density OSDS clusters in WelSTROM for the county, though that may be a product of underreporting.

<u>Underserved Areas</u>

1. All 60 minute drive time areas.
2. All 40 minute drive time areas.

Appendix E. DCA Risk-Based Ordinance

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On-Site Sewage Management Systems (OSSMS)
Risk-Based Operations & Maintenance Model Ordinance

I. Purpose and Intent

A. To protect the public health, safety, and natural environment by preventing and correcting on-site sewage disposal system malfunctions and failures.
B. To identify the risk of on-site sewage disposal system malfunction and failure under varying site and environmental conditions, and to establish standards for on-site sewage disposal system operations and maintenance based on the assigned risk factor.
C. To manage OSSMS according to the risks they pose. Lower-risk systems may be managed through non-regulatory programs; higher-risk systems require regulatory standards to ensure appropriate management.

II. Applicability

This policy will apply to permits for new construction and repair of on-site sewage management systems (OSSMS), permitted by the County Health Department.

III. Findings

OSSMS management must be in direct proportion to the risks posed by the systems. In areas without a high density of systems and with no limiting site conditions or sensitive areas nearby, non-regulatory programs are appropriate. In higher risk areas, such as those where many systems are close to sensitive areas, more comprehensive regulatory options may be necessary. Additionally, the Department of Public Health and the County Health Department cannot require inspections or maintenance of non-mechanical OSSMS, however this prohibition does not include education, nor does it relieve homeowners of the responsibility to repair and/or replace malfunctioning OSSMS.

IV. Definitions

Unless otherwise outlined within this ordinance, definitions shall be consistent with those in **the Rules of the Department of Public Health; Chapter 511-3-1.**

County Board of Health shall refer to _____ County Board of Health.

County Health Department shall refer to _____ County Health Department.

Mechanical OSSMS shall refer to any OSSMS that are not gravity fed and/or have any moving parts.

On-Site Sewage Management System (OSSMS) shall mean an on-site sewage management system per the Manual.

The Manual shall be defined as the most **current version of the technical handbook adopted and periodically updated by the Department in the implementation of Chapter 511-3-1**.

V. Procedure for Risk Assignment

Through this ordinance, risk posed by OSSMS is established through a points-based system. Points are assigned to specific risk factors; the higher the number of points assigned to an OSSMS, the higher risk the system poses and the greater the need for a more comprehensive management program. Management programs will include a range of options specific to non-mechanical and mechanical OSSMS, including, but not limited to: education, documentation of maintenance activities, required inspections, and an operations permit.

VI. Risk Factor Schedule

Points are added or subtracted to the score of a particular site/parcel where an OSSMS is proposed to be constructed or repaired, based on the conditions that exist on that site prior to land disturbing activities. If the site is already developed, points should be assigned and calculated prior to the start of any redevelopment activities. The data utilized to assess individual parcels and award points is included in the WellSTROM database and/or the DRASTIC model, and is available to County Health Department for their use in implementation of this policy. The risk assignment schedule below assigns points to various risk factors.

CONDITION	POINTS	EXPLANATION
Lot size	> 1.0 Acre or > 0.5 acres with public water = +1 points 1.0 Acre or 0.5 acres with public water = 0 points < 1.0 Acre or < 0.5 acres with public water = -1 points	The Manual recommends a minimum lot size of 0.5 acres with public water; 1 acre with a private well. Older systems permitted under previous regulations exist on smaller lots.
Slope	Convex = +1 Flat = 0 Concave = -1	Slope makes decentralized systems harder to site, design, and operate. Slope affects transport of wastewater to and through absorption field. Soils are often thinner in sloping topography and very wet in concave reliefs.
Soil permeability	Meets standards for permeability from the Manual = 0 Does not meet standards for permeability from the Manual = -1	Wastewater may not spend enough time in soil to be treated properly if soil permeability is rapid. Slow permeability may result in wastewater ponding on surface or soil becoming clogged with solids. Both situations pose

CONDITION	POINTS	EXPLANATION
		risks to groundwater and surface water. Soil permeability over 90 min/inch on lots less than 3 acres are unsuitable. For lots greater than 3 acres, the maximum percolation rate allowed for use is 120 min/inch..
Depth to Restrictive Soil Horizon	Meets Standards from the Manual = 0 Does not meet Standards from the Manual = -1	Absorption field soils treat wastewater. The shallower the soil, the greater the chance is that wastewater will not be properly treated.
Regulatory Setbacks	Meets DPH Standards for Regulatory Setbacks = 0 Does not meet DPH Standards for Regulatory Setbacks = -1	Wetlands can be damaged by contaminants in wastewater. Significant groundwater recharge areas require strict protection. Wild and scenic rivers are special pristine areas that must be afforded highest levels of protection
Title 31 Sensitive Areas	Located within a Title 31 Sensitive Area as established by the County Board of Health = -1 Located outside of a Title 31 Sensitive Area = 0	Boards of Health may opt through Title 31 to identify sensitive areas and restrict OSSMS in those areas. Some potential sensitive areas include, but are not limited to: • 303(d)/305(b) stream watersheds • Regulatory flood plains • Shellfish harvesting areas
System Capacity	Undersized system = -1 Properly sized system = 0 Oversized system = +1	Systems must be sized properly in accordance with the standards put forth in the Manual. Undersized systems discharge higher levels of solids into absorption field, causing quicker soil clogging impacting treatment.
Effluent Filter	+1 if Effluent Filter is present -1 if there is no Effluent	Effluent Filters extend the useful life of the drain field and ensure proper treatment of septage can occur. Filters must be routinely

CONDITION	POINTS	EXPLANATION
		serviced and will necessitate inspections/pump-outs on a routine basis.
Type of Facility served	Multi-Family Residential = -1 High Strength Waste Stream with no pre-treatment = -1 Over 2000 gal/day = -1 All other land uses/system types = 0 The maximum loss of points for this category is -1.	Multi-family residences have greater water use and incidence of improper disposals. Commercial wastewater can be high strength with greater impacts.

VII. Proposed Management Systems

The total number of points awarded to a parcel and the type of proposed OSSMS will dictate the management program needed for that system to protect public health and environmental quality. The risk point ranges are identified below with the management measure.

Points Total	OSSMS Type & Management Program		
	Non-Mechanical	Mechanical	Advanced Treatment
< -5	Targeted Education	Inspection Contract	Operating Permit with a Perpetual Maintenance Agreement
-1 to -5	General System Owner education and awareness	Targeted Education	
≥ 0	General System Owner education and awareness	General System Owner education and awareness	

VIII. Management Program Standards

A. <u>General System Owner Education</u>

Operation and maintenance of OSSMS is the responsibility of the property owner, per **<u>Chapter 511-3-1-.17.</u>** A general education program involves informing the property owner of this responsibility and providing educational materials on proper OSSMS maintenance to OSSMS owners/operators. Educational materials include guidelines for system inspection and maintenance. This program includes delivery by the County Health Department of the general homeowner's education packet to all property upon construction of a new OSSMS. Additional educational information is made available at public buildings, and may also be provided directly to homeowners by the County Health Department.

B. Targeted Education with Maintenance Reminders

A targeted education program involves targeting a database of OSSMS that were deemed to have a certain level of risk, as identified in the table above. The County Health Department will maintain a database of applicable OSSMS (OSSMS identified to have the associated level of risk for failure). These OSSMS owners will be mailed, or otherwise provided, specific education information detailing potential system risk factors as well as recommendations for system inspection and maintenance.

The targeted education will include a message from the County Health Department requesting that the homeowner provide any records of OSSMS inspection or maintenance activities to the Health Department. Information will be sent to homes or facilities with OSSMS to inform owners that proper system maintenance includes inspections and pumping. Maintenance information sent to OSSMS that are part of a targeted education program will include one or both of the following types of information.

1. *General.* General maintenance reminder programs note that systems must be inspected and pumped on a routine basis, and often include a pumping frequency chart, such as the one found in the Manual.

2. *Individualized.* The County Health Department may, from time to time, provide individualized maintenance reminders that are system-specific and are sent out when a system would be expected to need an inspection or maintenance.

C. Inspection Agreement

Inspection agreements for applicable OSSMS will be executed between the homeowner and the County Health Department and will stipulate the required inspection frequency for a specific OSSMS. This agreement will be established and made part of the Construction or Repair permit for applicable OSSMS.

Inspections will be conducted by a certified professional, credentialed in the type of system to be inspected. Certified professionals shall be certified in accordance with the minimum inspection standards and procedures outlined within the Manual or will maintain NSF International Onsite Wastewater Inspector Accreditation. The County Health Department may also provide inspection services, based on staff availability, for a fee, in accordance with the currently adopted fee schedule. The agreement will also require the OSSMS owner to provide records of inspections to the County Health Department to document that inspection have occurred according to the required schedule, and in accordance with the criteria established by the County Health Department

If an inspection indicates that a septic pump-out is required, the OSSMS owner is required to have said service provided, and provide records of the pump-out to the County Health

Department. Alternatively, a record of a septic pump-out can be substituted for an inspection, if performed in accordance with the frequency required by the Agreement.

1. *Inspection Agreement Requirements*:

    a) After meeting all requirements of the construction or repair permit, per **Chapter 511-3-1-.03 "General Requirements for on-site Sewage Management Systems",** and prior to final inspection and approval, an inspection agreement may be issued by the _____ County Board of Health, as a permit condition.
    b) The inspection agreement will contain a schedule for conducting inspection of the OSSMS, and requirements for submittal of documentation related to said inspections to the County Board of Health.
    c) The OSSMS owner shall be responsible for compliance with all the maintenance requirements set forth in the Manual, which is incorporated herewith in pertinent part. Proof of compliance shall be provided to the County Health Department in accordance with the schedule outlined in the inspection agreement.
    d) Private OSSMS inspectors shall be certified professionals according to the standards set forth within the Manual or will maintain NSF International Onsite Wastewater Inspector Accreditation.

D. Operating Permit

An annual operating permit shall be required for Advanced Treatment Systems and all components thereof. The operating permit shall require that owners of an Advanced Treatment System obtain and keep active a service agreement with an approved maintenance contractor and provide the County Health Department with an annual service inspection report. Failure to maintain an active service agreement and to submit annual service reports shall result in an inspection by the County Health Department and imposition of an inspection fee. If an inspection finds the system to be improperly maintained, the operating permit may be revoked.

1. Operating Permit Requirements:

    a) After meeting all requirements of the construction permit and after final inspection and approval, an operating permit may be issued by the County Board of Health. Within 30 days of final approval the following information shall be submitted to the County Board of Health.
        1) A copy of the applicable manufacturer's warranty and service agreement.
        2) Proof of a recorded notification filed with the deed of the property of the existence and maintenance requirements of an advanced treatment system with county deeds records.

3) Other documentation as reasonably required by the County Board of Health to ensure the health, safety and welfare of the public.

b) Renewal of the operating permit shall be required annually on the anniversary of the issuance of said permit.

c) The County Board of Health shall annually renew the operating permit after the County Health Department establishes full compliance.

d) The system owner shall be responsible for compliance with all the maintenance requirements set forth in the Manual, which is incorporated herewith in pertinent part. Proof of compliance shall be provided to the county health department prior to the renewal date.

e) As a regulatory matter and in order to protect the public health, safety and welfare, current owners of pre-existing advanced treatment systems, shall be required to obtain an operating permit within 12 months after the effective date of these rules.

2. Operating Permit Review and Fees

a) The County Health Department shall review the Advanced Treatment System operating permit at the time of renewal for compliance. If the review finds the system to be improperly maintained, the operating permit may be revoked. A fee for this review may be charged to the owner of the Advanced Treatment System. This fee shall be established by the County Board of Health as provided in the **Official Code of Georgia Annotated (O.C.G.A.) Title 31-3-4(6).**

b) Owners of an Advanced Treatment System who obtain and keep active a service agreement with an approved maintenance contractor and provide the county health department with an annual service inspection report.

1) Shall not be subject to an annual inspection fee by the county health department.

2) May be charged an annual fee at the time of renewal of the annual operating permit for review of the maintenance agreement and service reports. This fee shall be established by the County Board of Health as provided by the **O.C.G.A. Title 31-3-4(6).**

3) Failure to maintain an active service agreement and to submit annual service reports shall result in an inspection by the County Health Department and imposition of an inspection fee. If an inspection finds the system to be improperly maintained, the operating permit may be revoked.

E. OSSMS Maintenance Requirements:

1. OSSMS shall be maintained, inspected and pumped in accordance with the standards and requirements established by the Manual.

2. The Advanced Treatment System shall be pumped in accordance with manufacturer recommendations and/or after a visual inspection shows the mixed-liquor (aerator) solids are above 6,000 mg/L or the final settler is more than one-third (1/3) full of settled solids per the USEPA's Onsite Wastewater Treatment Systems Manual.
3. The Advanced Treatment System shall be operated in accordance with the manufacturer requirements and all applicable state rules and regulations.
4. The absorption field shall be maintained in a manner to prevent any prohibited discharge of effluent.

F. Maintenance Contractor Requirements:

1. Maintenance contractors shall register with the County Health Department. The following criteria shall be required for registration:
    a) Pay a registration fee established by the county board of health as provided by **O.C.G.A. Title 31-3-4(6).**
    b) Maintenance contractors shall maintain NSF International Onsite Wastewater Inspector Accreditation or equivalent as established by the Department, OR
    c) Be certified by the manufacturer to perform service with written documentation provided to County Health Department.

IX. Enforcement

The administration and enforcement of these rules shall be in accordance with the **O.C.G.A. Title 31-3-4** and with the County Board of Health Administrative Practice and Procedures.

Appendix F. EPD General Permit for Large Community Systems and Standard Trust Indenture

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STATE OF GEORGIA
DEPARTMENT OF NATURAL RESOURCES
ENVIRONMENTAL PROTECTION DIVISION

GENERAL LAND APPLICATION SYSTEM PERMIT FOR LARGE COMMUNITY SYSTEMS

GENERAL PERMIT NO. GAG278000

In accordance with the provisions of the Georgia Water Quality Control Act (Georgia Laws 1964, p. 416, as amended), and the Rules and Regulations promulgated pursuant thereto, this permit is issued for the discharge of sanitary wastes from any large community system with a monthly average design flow of 10,000 to 150,000 gallons per day, located within the State of Georgia to a preapplication treatment system and then to a subsurface fluid distribution system.

Owners of existing and proposed large community systems may, on submittal of a notice of intent to discharge sanitary wastes to a preapplication treatment system and subsurface fluid distribution system, and after acknowledgement by the Environmental Protection Division of coverage under this permit, discharge sanitary wastes to such systems in accordance with the preapplication treatment system effluent limitations, monitoring requirements, and other conditions set forth in this permit.

This permit is conditioned upon the permittee complying with the preapplication treatment system effluent limitations, monitoring requirements and other conditions set forth in the permit, with the statements and supporting data submitted with the Notice of Intent and filed with the Environmental Protection Division of the Department of Natural Resources and with any requirements specified in the Notice of Intent acceptance letter.

This permit shall expire at midnight, February 4, 2015.

Signed this 5th day of February 2010.

J. Allen Barnes

Director,
Environmental Protection Division

PART I.

A. CONDITIONS

1. DEFINITIONS: All terms used in this permit shall be interpreted in accordance with the definitions contained in the Rules and Regulations for Water Quality Control, unless otherwise defined in this permit.

Class V septic system: A septic system that handles sanitary and/or other wastes and has the capacity to serve 20 or more persons a day. For the purposes of this permit, a person means a full-time resident.

Class V well: For the purposes of this permit, a Class V well means a well used to distribute fluids below the surface of the ground from a community system and/or Class V septic system.

Community System: Any system that treats sanitary wastes (other than those serving single family residences (SRF) or non-domestic sewage systems) and has a design flow greater than 2,000 gallons per day. Examples include subdivisions, mobile home parks, shopping centers, schools, towns, etc., and Class V septic systems, but exclude industrial facilities unless the only wastes discharged are sanitary wastes.

Design Flow: For new facilities, means the design flow accepted by EPD in the NOI. For existing facilities, means the flow for which the system was designed at the time of construction or if unavailable, is based on Division guidelines for the type of facilities presently served by the existing system.

Director: The Director of the EPD.

Division: The Environmental Protection Division of the Department of Natural Resources.

Domestic Wastes: For the purpose of this permit, means the same as sanitary wastes.

EPD: The Environmental Protection Division of the Department of Natural Resources.

Existing Facility: Any community system that was in operation or under construction or design at the time of issuance of this permit.

Injection Well: A well into which fluids are being, or intended to be, injected.

Land Application System: Any method of disposing of pollutants in which the pollutants are applied to the surface or beneath the surface of a parcel of land and which results in the pollutants percolating, infiltrating, or being absorbed into the soil and then into the waters of the state.

Large Community System: Any system that treats sanitary wastes (other than those serving single family residences (SFR) or non-domestic sewage systems) and has a design flow greater than 10,000 gallons per day and no greater than 150,000 gallons per day. Examples include subdivisions, mobile home parks, shopping centers, schools, towns, etc., and Class V septic systems, but exclude industrial facilities unless the only wastes discharged are sanitary wastes.

Monthly Average: the arithmetic or geometric mean of values for samples collected during a calendar month.

New System: Any system for which design and/or construction had not begun prior to the date of issuance of this permit.

Non-Domestic Septic Systems: An on-site sewage management system consisting of a preapplication treatment system and a subsurface fluid distribution system which accepts wastes other than sanitary wastes. Examples include, but are not limited to, industrial process wastewater discharges, discharges from photo laboratories, discharges from carwashes, etc.

Notice Of Intent (NOI): A form used by a potential permittee to notify the EPD that they intend to seek coverage under a general permit.

Notice Of Termination (NOT): A form used by a permittee to notify the EPD that they wish to cease coverage under a general permit.

Permittee: The owner of a large community system that has submitted a Notice of Intent (NOI) for coverage under this general permit and for which the EPD has authorized coverage under this permit.

Person: For the purpose of this permit, a person means a full-time resident.

Point of Injection: The last accessible sampling point prior to waste fluids being released into the subsurface environment through an injection well. For example, the point of injection for a Class V septic system might be the distribution box.

Preapplication Treatment System: The wastewater treatment system which reduces the high strength wastewater prior to the subsurface fluid distribution system. Examples include septic tanks, aerobic treatment systems, or any other system which has been approved by the Division.

Replacement Area: An area that is set aside for installation of another subsurface fluid disposal system should the initial system fail to perform as designed.

Sanitary wastes: The liquid or solid wastes originating solely from humans and human activities, such as wastes collected from toilets, showers, wash basins, sinks used for cleaning domestic areas, sinks used for food preparation, clothes washing operations, and sinks or washing machines where food and beverage serving dishes, glasses, and utensils are cleaned. Sources of sanitary wastes may include single or multiple family residences, hotels and motels, restaurants, schools, campgrounds, and commercial and industrial facilities provided the waste is not mixed with industrial waste. Sanitary wastes and domestic waste mean the same for the purpose of this permit.

Septic System: A well or subsurface fluid distribution system that is used to emplace sanitary wastes below the surface and is typically comprised of a preapplication treatment system and subsurface fluid distribution system or disposal system.

Septic Tank: A watertight tank designed or used to receive sewage and to affect separation and organic decomposition of sewage solids and which discharges effluent to a subsurface disposal system.

Sewage Sludge: The liquid or solid residue generated during the treatment of domestic sewage in a preapplication treatment system.

Small Community System: Any system that treats sanitary wastes (other than those serving single family residences (SFR) or non-domestic sewage systems) and has a design flow greater than or equal to 2000 gallons per day and less than or equal to 10,000 gallons per day. Examples include subdivisions, mobile home parks, shopping centers, schools, etc., and Class V septic systems, but exclude industrial facilities unless the only wastes discharged are sanitary wastes.

State Act: The Georgia Water Quality Control Act (Official Code of Georgia Annotated; Title 12, Chapter 5, Article 2).

State Rules: The State Rules refers to the Rules and Regulations for Water Quality Control.

Subsurface Disposal System: Any system where the pretreated wastewater is injected into a system beneath the soil surface at a rate where it will be absorbed by the soil and will prevent saturation of the soil.

Subsurface Fluid Distribution System: An assemblage of perforated pipes, drain tiles, emitter systems, chamber systems, or similar mechanisms intended to distribute fluids below the surface of the ground.

Subsurface Land Application System: Any system where the pretreated wastewater is injected beneath the surface of a parcel of land and which results in the pollutants percolating, infiltrating, or being absorbed into the soil and then into the waters of the state.

Well: A well for the purposes of this permit means a subsurface fluid distribution system.

2. MONITORING

a. A primary flow measuring device(s) shall be installed in accordance with generally accepted engineering design. Secondary flow measurement devices are required which will measure and record the volume of flow distributed to the subsurface fluid distribution system(s) on a daily basis. Calibration of the secondary flow measuring devices must be maintained to $\pm$ 10% of actual flows. Qualified personnel must calibrate the flow measurement device annually and records of the calibrations must be maintained. If secondary flow instruments malfunction or fail to maintain calibration as required, the flow shall be computed from either manual measurements or by other method(s) approved by EPD until such time as the secondary flow instrument is repaired.

b. For facilities which utilize alternate technologies for measuring flow, the flow measurement device must be calibrated semi-annually by qualified personnel and records of the calibration checks shall be maintained.

c. Quarterly analyses required by this permit shall be performed in March, June, September, and December. Analyses required twice per year will be performed in June and December. Analyses required annually will be performed in June.

d. Some parameters must be analyzed to the detection limits specified by the EPD. These parameters will be reported as "not detected" when they are below the detection limit and will then be considered in compliance with the effluent limit. The detection limit will also be reported.

e. Analytical procedures, sample containers, sample preservation techniques, and sample holding times must be consistent with the techniques and procedures listed in 40 CFR Part 136 for monitoring the waste stream.

f. Samples and measurements of the monitored waste shall represent the volume and nature of the waste stream. The permittee shall maintain a written sampling and monitoring schedule.

g. For each required parameter analyzed, the permittee shall record:

i. The exact place, date, and time of sampling, and the person(s) collecting the samples;
ii. The dates and times the analyses were performed;
iii. The person(s) who performed the analyses;
iv. The analytical procedures or methods used; and
v. The results of all required analyses.

h. If the permittee monitors required parameters at the locations designated in this permit more frequently than required, the permittee shall analyze all samples using approved analytical methods. The results of this additional monitoring shall be included in calculating and reporting the values on the Discharge Monitoring Report forms. The permittee shall indicate the monitoring frequency on the report.

3. SEWAGE SLUDGE DISPOSAL AND MONITORING REQUIREMENTS

Sewage sludge shall be disposed of according to the regulations and guidelines established by the EPD and the Federal Act section 405(d) and (e), and the Resource Conservation and Recovery Act (RCRA). In land applying nonhazardous municipal sewage sludge, the permittee shall comply with the general criteria outlined in the most current version of the EPD "Guidelines for Land Application of Sewage Sludge (Biosolids) at Agronomic Rates" and with the State Rules, Chapter 391-3-6-.17. Before disposing of municipal sewage sludge by land application or any method other than co-disposal in a permitted sanitary landfill, the permittee shall submit a sewage sludge management plan to EPD for written approval. This plan will become a part of the Permit after approval and modification of the permit. The permittee shall notify the EPD of any changes planned in an approved sewage sludge management plan.

If an applicable management practice or numerical limitation for pollutants in sewage sludge is promulgated under Section 405(d) of the Federal Act after approval of the plan, then the plan shall be modified to conform with the new regulations.

The permittee shall develop and implement procedures to ensure adequate year-round sewage sludge disposal. The permittee shall monitor and maintain records documenting the quantity of sewage sludge removed from the facility. Records shall be maintained documenting that the quantity of solids removed from the facility equals the solids generated on an average day. The total quantity of sewage sludge removed from the facility during the reporting period shall be reported each month with the Discharge Monitoring Reports as required under Part I.A.7.of this permit. The quantity shall be reported on a dry weight basis.

Preapplication treatment systems that remove sewage sludge on a less than monthly frequency are required to report the total quantity of sewage sludge removed from the facility only during the months that sludge is removed.

The permittee must develop and maintain a written program for regular pumping of grease traps serving all food preparation establishments connected to the system. Records of the pumping, including the person performing the pumping and the location of final disposal of the removed material, must be maintained on file with the Monitoring Report Forms for a minimum of five years.

4. ELIGIBILITY AND PERMIT COVERAGE AREA

a. This permit may regulate all new and existing discharges of sanitary wastes from large community systems to subsurface fluid distribution systems within the State of Georgia.

b. Limitations on coverage: This permit does not authorize the following discharges:

i. Discharges associated with non-domestic septic systems (NDSS);

ii. Discharges that are covered by an individual LAS permit;

iii. Single-family residences that are served by their individual subsurface disposal system;

iv. Discharges from small community systems to a subsurface disposal system;

v. Discharges of sanitary wastes from community systems to subsurface disposal systems that are designed for flows greater than 150,000 gpd (0.15 MGD).

5. AUTHORIZATION

a. Large community systems discharging or proposing to discharge sanitary wastes to subsurface land application systems must submit a Notice of Intent (NOI) in accordance with this permit to be authorized under this general permit. Such Notice of Intent shall be on forms as may be prescribed and furnished by the Division.

b. EPD shall review the NOI and supporting information upon submittal. Coverage under this permit shall be effective only after this review and written confirmation from EPD.

c. The Division may deny coverage under this permit and require submittal of an application for an individual land application system permit after review of the NOI. EPD may deny coverage based as a result of an incomplete or incorrect NOI submittal, past noncompliance by the applicant at similar facilities, or other factors.

d. Notice Of Intent Forms shall be submitted to the Permitting, Compliance, and Enforcement Program. The address for submittal of the form (and for obtaining the form) is:

Permitting, Compliance, and Enforcement Program
Watershed Protection Branch
Environmental Protection Division
4220 International Parkway, Suite 101
Atlanta, Georgia 30354

6. APPLICATION AREA AND LOADING RATES

a. The hydraulic wastewater loading to the infiltrative area shall not exceed 2.8 inches per week (inches/week) unless:

i. adequate documentation is provided in the written hydrogeologic determination that the soils are capable of absorbing the planned higher loading rate; and

ii. an undisturbed replacement area has been set aside which is sufficient to install a replacement area for the planned loading rate.

b. The area of the subsurface land application system (and replacement area if applicable) shall consist of the number of acres identified in the Notice of Intent.

c. Use of an underdrain system within the subsurface application system to lower the groundwater table will require coverage under a National Pollutant Discharge Elimination System (NPDES) permit issued by the Division.

7. REPORTING AND RECORDS

a. Required analytical results obtained by the permittee shall be summarized on a Discharge Monitoring Report form. The Monitoring Report Forms shall be completed each month with the summarized monitoring results, signed in accordance with the State Rules 391-3-6-.11 (5) e., and shall be maintained on file at the preapplication treatment system, unless otherwise notified in writing by the Division. The Division may require the reporting of additional monitoring results by written notification.

b. The monthly report shall also include a record of the time spent on site by the operator and a summary of solids removed from the preapplication treatment system.

c. All reports or information generated in compliance with this permit must be signed in accordance with the State Rules 391-3-6-.11 (5) e.

d. The permittee shall retain records of:

i. All laboratory analyses performed including sample data, quality control data, and standard curves;
ii. Calibration and maintenance records of laboratory instruments;
iii. Calibration and maintenance records and recordings from continuous recording instruments;
iv. Process control monitoring records;
v. Facility operation and maintenance records;
vi. Copies of all reports required by this permit;
vii. All data and information used to complete the NOI;
viii. Pumping of any grease traps serving food preparation establishments (or other connections with high concentrations of oil and grease) that are connected to this system; and
ix. All monitoring data related to sludge use and disposal.

e. The permittee shall submit a copy of the previous three (3) monthly reports quarterly in April, July, October and January, to the EPD.

f. All records shall be kept for at least five years unless extended by EPD written notification.

8. ELIMINATION OF DISCHARGE

Operation of this facility will cease and the discharge will be eliminated by connection to an appropriate municipal water pollution control plant sewer system within three months of reasonable availability of the connection.

9. EXPANSION OF SYSTEM

The permittee shall not allow any new connections to the facility beyond that capacity identified in the Notice of Intent without written approval from EPD.

B.1. PREAPPLICATION TREATMENT SYSTEM MONITORING

The preapplication treatment system shall be monitored by the permittee for the parameters and at the frequency listed below, unless waived by the Division [a]:

Parameter *	Daily Maximum in mg/l, Unless Otherwise Specified	Monitoring Requirements		
		Frequency	Sample Type	Sample Location [b]
Flow, gallons per day	Report [c]	Daily	Continuous	Effluent
Biochemical Oxygen Demand (5 Day)	[d]	One/month	Grab	Effluent
Total Suspended Solids	[d]	One/month	Grab	Effluent
pH, standard units	Report	One/month	Grab	Effluent
Oil and Grease	25	One/month	Grab	Effluent

* These parameters shall be monitored and reported on the discharge monitoring reports.

[a] For existing large community systems that do not have a point of injection, the Division may waive the requirement for effluent flow measurement and sampling. Any such waiver will occur at the time of acceptance of the NOI, and will be limited only to the existing large community system. Any expansion or upgrade will require the permittee to install a point of injection for flow measurement and sample collection.

[b] For the purposes of sample collection, the effluent sample point is defined as the point of injection.

[c] This is a monthly average for reporting and not a daily maximum. The maximum design value for the permittee shall be stipulated in the NOI, and the monthly average shall not exceed the maximum design value stipulated in the NOI. The maximum value that can be covered under this permit is 150,000 gpd or 0.15 MGD.

[d] Effluent limits for BOD and Suspended Solids for mechanical preapplication treatment systems shall be 30 mg/l for a monthly average and 45 mg/l for a daily maximum. Effluent concentrations for BOD and Suspended Solids for preapplication treatment systems that consist of passive septic tank(s) systems shall be sampled, analyzed, and reported.

B.2. SOIL MONITORING REQUIREMENTS

Representative samples shall be collected from each major soil series present within the land application system. The samples shall be analyzed in accordance with the latest edition of Methods of Soil Analysis (published by the American Society of Agronomy, Madison, Wisconsin) or other methods approved by the Division. The soil samples shall be analyzed for the parameters and at the frequency listed below:

Parameter	Measurement Frequency
pH, standard units	One/Year
Cation Exchange Capacity	If pH changes by one unit
Percent Base Saturation	If pH changes by one unit

The permittee may be required, upon written notification by the Division, to sample for additional parameters. These parameters may include heavy metals and organic compounds.

B.3. GROUNDWATER MONITORING REQUIREMENTS

Groundwater leaving the land application system boundaries must not exceed maximum contaminant levels for drinking water. The groundwater from each groundwater monitoring well (identified in the operations manual) must be monitored by the permittee for the parameters and at the frequency below:

Parameter	Measurement Frequency
Depth to Groundwater	One/Six Months
pH, standard units	One/Six Months
Electrical Conductivity	One/Six Months
Nitrate-Nitrogen	One/Six Months
Fecal Coliform Bacteria	One/Six Months

The permittee may be required, upon written notification by the Division, to sample for additional parameters. These parameters may include heavy metals and organic compounds.

PART II.

A. MANAGEMENT REQUIREMENTS

1. FACILITY OPERATION

a. The permittee shall at all times maintain in good working order and operate as efficiently as possible all treatment or control facilities (and related appurtenances) which are installed or used by the permittee to achieve compliance with the terms and conditions of this permit.

b. Proper operation and maintenance includes effective performance, adequate funding, adequate operator staffing and training, and adequate laboratory and process controls, including appropriate quality assurance procedures.

c. Proper operation of the land application system also includes the best management practice of establishing and maintaining a vegetative cover on the land application site.

2. NONCOMPLIANCE NOTIFICATION

a. If, for any reason the permittee does not comply with, or will be unable to comply with any effluent limitations specified in the permit, the permittee shall provide EPD with an oral report within 24 hours from the time the permittee becomes aware of the circumstances followed by a written report within five (5) days of becoming aware of such condition. The written submission shall contain the following information:

i. A description of the noncompliance and its cause;
ii. The period of noncompliance, including the exact date and times; or, if not corrected, the anticipated time the noncompliance is expected to continue; and
iii. The steps taken to reduce, eliminate, and prevent recurrence of the non-complying discharge.

b. If, for any reason the permittee anticipates a noncompliance event, the permittee shall give written notice to the EPD at least 10 days before:

i. Any planned changes in the permitted facility; or
ii. Any activity that may result in noncompliance with the permit.

c. The permittee must report all instances of noncompliance not reported under other specific reporting requirements, at the time monitoring reports are submitted. The reports shall contain the information required under conditions of twenty-four hour reporting.

3. OPERATOR CERTIFICATION REQUIREMENTS

The permittee shall ensure that:

a. The operator in responsible charge of the daily operation of this land application system is, at a minimum, a Class III Certified Operator in accordance with the Georgia Certification of Water and Wastewater Plant Operators and Laboratory Analysts Act, as amended, and specified by Subparagraph 391-3-6-.12 of the Rules and Regulations for Water Quality Control.

b. The operator in responsible charge is physically on site for a minimum of 2 hours per month and that records are maintained at the preapplication treatment system to document the time spent on site by the operator and of all operation and maintenance activities.

4. LABORATORY ANALYST CERTIFICATION REQUIREMENTS

The permittee shall ensure that all persons performing the laboratory analyses for this wastewater treatment plant are Certified Wastewater Laboratory Analysts unless such analyses is performed in a commercial environmental laboratory that is approved by the Division under the Rules for Commercial Environmental Laboratories, Chapter 391-3-26.

5. POWER FAILURES

If the primary source of power to this facility is reduced or lost, the permittee shall use an alternative source of power to reduce or control all discharges to maintain permit compliance.

6. ADVERSE IMPACT

The permittee shall take all reasonable steps to minimize or prevent any discharge or sludge disposal that might adversely affect human health or the environment.

7. GROUNDWATER AND MONITORING WELL REQUIREMENTS

a. Groundwater leaving the land application system boundaries must not exceed maximum contaminant levels for drinking water.

b. If groundwater samples indicate contamination, the permittee will be required to develop a plan that will ensure that the primary maximum contaminant levels for drinking water are not exceeded.

c. The plan will be implemented by the permittee immediately upon Division approval.

d. The permittee, upon written notification by the Division, may be required to install groundwater-monitoring wells at an existing land application system. This requirement may apply if monitoring wells were not included in the original design of the facility and also, if the Division determines the existing groundwater monitoring wells are not adequate.

B. RESPONSIBILITIES

1. COMPLIANCE

a. The permittee must comply with this permit. Any permit noncompliance is a violation of the State Act, and the State Rules, and is grounds for:

i. Enforcement action;
ii. Permit termination, revocation and reissuance, or modification; or
iii. Denial of coverage under this permit.

b. It shall not be a defense of the permittee in an enforcement action that it would have been necessary to halt or reduce the permitted activity to maintain compliance with the conditions of this permit.

2. RIGHT OF ENTRY

The permittee shall allow the Director of the EPD, the Regional Administrator of EPA, and their authorized representatives, agents, or employees after they present credentials to:

a. Enter the permittee's premises where a regulated activity or facility is located, or where any records required by this permit are kept;

b. Review and copy any records required by this permit;

c. Inspect any facilities, equipment, practices, or operations regulated or required by this permit; and

d. Sample any substance or parameter at any location.

3. SUBMITTAL OF INFORMATION

The permittee shall furnish to the Division, within a reasonable time, any information which the Division may request to determine whether cause exists for modifying, revoking and reissuing, or terminating this permit or to determine compliance with this permit. The permittee shall also furnish to the Division upon request, copies of records required to be kept by this permit. Where the permittee becomes aware that it failed to submit any relevant facts in a permit application, or submitted incorrect information in a permit application or in any report to the Division, the permittee shall promptly submit such facts or information.

4. TRANSFER OF OWNERSHIP OR CONTROL

A permit may be transferred to another person by a permittee if:

a. The permittee notifies the Director in writing of the proposed transfer;

b. A written agreement containing a specific date for transfer of permit responsibility and coverage between the current and new permittee (including acknowledgment that the existing permittee is liable for violations up to that date, and that the new permittee is liable for violations from that date on) is submitted to the Director, via a documented tracking system such as certified mail, at least 30 days in advance of the proposed transfer; and

c. The Director, within thirty (30) days, does not notify the current permittee and the new permittee of the Division's intent to modify, revoke and reissue, or terminate the permit and to require that a new application be filed rather than agreeing to the transfer of the permit.

5. PERMIT MODIFICATION

This permit may be modified, terminated, or revoked and reissued in whole or in part during its term for causes including, but not limited to:

d. Permit violations;

e. Obtaining this permit by misrepresentation or by failure to disclose all relevant facts;

f. Changing any condition that requires either a temporary or permanent reduction or elimination of the permitted discharge; and

d. Changes in effluent characteristics.

The filing of a request by the permittee for permit modification, termination, revocation and reissuance, or notification of planned changes or anticipated noncompliance does not negate any permit condition.

6. PENALTIES

a. The State Act provides that any person who falsifies, tampers with, or knowingly renders inaccurate any monitoring device or method required to be maintained under this permit, makes any false statement, representation, or certification in any record or other document submitted or required to be maintained under this permit, including monitoring reports or reports of compliance or noncompliance shall, upon conviction, be punished by a fine or by imprisonment, or by both. The State Act also provides procedures for imposing civil penalties which may be levied for violations of the Act, any permit condition or limitation established pursuant to the Act, or negligently or intentionally failing or refusing to comply with any final or emergency order of the Director of the Division.

b. Nothing in this permit shall be construed to relieve the permittee from civil or criminal penalties for noncompliance.

7. CIVIL AND CRIMINAL LIABILITIES

The permittee is liable for civil or criminal penalties for noncompliance with this permit and must comply with applicable State laws including promulgated water quality standards. The permit cannot be interpreted to relieve the permittee of this liability even if it has not been modified to incorporate new requirements.

8. EXPIRATION OF PERMIT

The permittee shall not operate the system after the expiration date. In order to receive authorization to operate beyond the expiration date, the permittee shall submit such information, NOI forms, and fees as are required by the Division no later than 180 days prior to the expiration date.

9. CONTESTED HEARINGS

Any person aggrieved or adversely affected by any action of the Director of the EPD shall petition the Director for a hearing within 30 days of notice of the action.

10. SEVERABILITY

The provisions of this permit are severable. If any permit provision or the application of any permit provision to any circumstance is held invalid, the provision does not affect other circumstances or the remainder of this permit.

11. NEW SYSTEMS

Prior to start-up of a new system:

a. The professional engineer responsible for the design must certify that the system has been constructed according to the design plans and specifications.

b. The professional engineer responsible for the design must certify that an operations manual has been developed in accordance with the most recent EPD guidelines. This operations manual will be considered a part of the permit requirements and will be enforceable under this general permit for the owner/operator covered by the NOI.

c. Final authorization to begin operation must be received in writing from the Division.

PART III. NOTICE OF INTENT REQUIREMENTS

A. DEADLINES FOR NOTIFICATION

1. Owners of an existing large community system must obtain coverage for an existing discharge of sanitary wastes to a subsurface disposal system under this general permit by submitting a Notice of Intent (NOI) upon notification by EPD.

2. Owners of a new large community system who intend to obtain coverage for a proposed discharge of sanitary wastes to a subsurface disposal system under this general permit shall submit a Notice of Intent (NOI) and receive coverage under this permit prior to construction of the new system.

3. Construction of a new large community system after the date of issuance of this permit will be considered a violation of this permit, the Rules and Regulations for Water Quality Control, and the Water Quality Control Act; unless an NOI has been submitted to the Division and the Division has included coverage of the system under this general permit; or unless the system is covered under an individual permit.

4. When ownership of a large community system which is covered by this general permit changes, the new owner must submit a new NOI to the EPD in accordance with the requirements of this permit at least thirty (30) days prior to the change of ownership. Failure to submit the new NOI may be considered an intentional violation of this permit. The EPD may decline to allow continued coverage under this general permit and may require coverage by another permit.

5. Prior to any proposed change in use of a large community system that is covered by this general permit, such as from a warehouse to a wet industrial process, which would result in a change in volume or character of pollutants, the permittee must comply with Part IV A. of this permit.

6. An owner of a large community system that is operating at the time of issuance of this permit is not precluded from submitting an NOI in accordance with the requirements of this permit after the deadlines provided in this section. In any such instance, the EPD may bring an enforcement action for failure to submit the NOI in a timely manner or for any unauthorized discharges of sanitary wastes to a subsurface disposal system associated with the large community system that have occurred after the deadlines provided in this section.

B. THE CONTENTS OF NOTICE OF INTENTS (NOIs) FOR NEW LARGE COMMUNITY SYSTEMS SHALL INCLUDE:

1. The name, mailing address, contact person, phone numbers, county, and location of the facility for which the notification is submitted. The location address shall also include the latitude and longitude and/or GIS coordinates of the facility.

2. The estimated volume of treated sanitary wastes that will be injected in the subsurface fluid distribution system on an average daily and peak daily basis, and the method of sewage sludge handling and disposal.

3. Information shall be provided on the estimated strength of influent and effluent pH, BOD, TSS, oil and grease, and ammonia nitrogen. Upon request from the EPD, information shall be provided on the estimated strength of other relevant wastewater constituents or pollutants that may be of concern to the EPD.

4. A certification that an operations manual will be developed for the large community system that meets the requirements of the EPD guidelines and will be available at the facility.

5. Non-governmental entities shall submit a copy of a continuous maintenance and operation agreement, a copy of a trust indenture with a local government or some other form of perpetual ownership acceptable to the EPD, and a copy of a sewer use agreement that will regulate the introduction of wastes other than sanitary wastes. On a case-by-case basis, the EPD may waive submittal of the sewer use agreement.

6. A copy of the Large Community Subsurface System Engineering Submittal for the new system.

7. Any additional information that may be required by the EPD NOI form.

C. THE CONTENTS OF NOTICE OF INTENTS (NOIs) FOR EXISTING LARGE COMMUNITY SYSTEMS SHALL INCLUDE:

1. Name, mailing address, contact person, phone numbers, county, and location of the facility for which the notification is submitted. The location address shall also include the latitude and longitude and/or GIS coordinates of the facility.

2. The design and present estimated volume of treated sanitary wastes that will be injected in the subsurface fluid distribution system on an average daily and peak daily basis, and the method of sewage sludge handling and disposal.

3. If available, information shall be provided on the present strength of influent BOD, TSS, oil and grease, and ammonia nitrogen.

4. Non-governmental entities shall submit a copy of a continuous maintenance and operation agreement and a copy of a sewer use agreement that will regulate the introduction of wastes other than sanitary wastes. On a case-by-case basis, the EPD may waive submittal of the sewer use agreement. Owners of a system that currently has an executed trust indenture are required to submit a copy of the trust indenture with the NOI. Owners of a system that do not have a trust indenture are to submit with the NOI, either a schedule for obtaining a trust indenture with a local government or a status report regarding the owner's ability to enter into a trust indenture. Any schedule submitted will become part of the permit and will be enforceable as such.

5. A copy of the construction permit (or other vehicle) for the existing large community system, showing the location of the existing large community system and the set-aside area for replacement. If such construction permit is not available, then the owner may submit a site plan showing the location of the preapplication treatment system, the subsurface fluid distribution system, the point of application, and the replacement area.

6. A certification that an operations manual is available for the large community system that meets the requirements of the EPD guidelines. For those systems that do not have an approved operations manual, the owner shall submit a schedule for the development of an operations manual and submit that schedule to EPD.

7. Any additional information that may be required by the EPD NOI form.

D. PUBLIC NOTIFICATION REQUIREMENTS

1. Existing Facilities: A public notice will not be required to be performed by the owner or operator of an existing Large Community System as a prerequisite to receiving coverage under this general permit.

2. New or Expanding Facilities: After receipt of a completed NOI a public notice will be required to be performed for the owner or operator of a new or expanding system, prior to receiving coverage under this general permit.

PART IV.

INTRODUCTION OF POLLUTANTS INTO THE TREATMENT WORKS

1. The permittee must notify EPD and obtain approval from EPD of:

   a. Any introduction of pollutants into the treatment works or sewerage system from an indirect discharger that does not result from normal domestic activities;

   b. Any substantial change in the volume or character of pollutants from a source that existed when the permittee obtained coverage under this permit; and

   c. Any industrial users connected to the system or proposing to connect to the system from the date of coverage of this permit.

2. This notice shall include information on the quality and quantity of the indirect discharge introduced and any anticipated impact on the quantity or quality of effluent to be discharged from the treatment works.

3. Upon a determination by the EPD that the permittee meets the definition of a non-domestic septic system, EPD may notify the permittee of the intent to withdraw coverage under this general permit and require coverage under another general permit or an individual permit.

Georgia Department of Natural Resources
2 MLK, Jr. Drive, S.E., East Floyd Tower, Atlanta, Georgia 30334
Mark Williams, Commissioner
Judson H Turner, Director
Environmental Protection Division

Trust Indenture

Please find enclosed a trust indenture that has been developed by the Attorney General's staff as an acceptable legal basis for assuring uninterrupted service and to provide relief for the property owners in the event of suspension of service or improper operation by the owner.

The Environmental Protection Division (EPD) is very concerned about the disruption in the continuity of service that has been occurring with many privately owned water supply systems because of decisions by the owner to shut down the water system or not to make repairs that are required to correct leaks, pump failures and other operational problems. These occurrences have caused many problems for the property owners as well as EPD.

The attached trust indenture is the prescribed form approved by the Director of EPD as required by Rule 391-3-5-(3). You must also **provide Exhibit A describing the real property and the trust indenture must be recorded with the Clerk of Superior Court in the county where the property is located**. This is the **ONLY trust indenture acceptable to the Division.** If another agency such as FHA/VA requires a different form, compliance with their requirements is your responsibility and between you and that agency.

The Trustee should preferably be a governmental entity or an incorporated property owners association. An established community utility, approved mortgage or a title company would also be acceptable. If a Trustee other than one of the above is proposed, it will be necessary that the Grantor and Trustee supply, to the Division, written statements indicating the proposed Trustee's relationship to the Grantor, does not create a conflict of interest for the Trustee. **The mailing address and telephone number for each principal signing the trust deed must be provided as an attachment to the trust indenture.**

Please submit an executed and recorded copy of the trust deed and the required supporting material to EPD promptly.

Enclosure

TRUST INDENTURE

THIS TRUST INDENTURE, Made this____day of _____, 20___by and between _____, a corporation organized and existing under and by virtue of the laws of the State of Georgia, (hereinafter called "GRANTOR" or "PARTY OF THE FIRST PART"), AND _____, TRUSTEE, a corporation duly chartered, organized and existing under and by the virtue of the laws of the State of Georgia or a government entity, (hereinafter called "TRUSTEE" or "PARTY OF THE SECOND PART").

WITNESSETH

THAT WHEREAS, _____, is now the owner of property known as _____, County of _____, State of Georgia, which property is being improved and developed by the construction of dwellings thereon; and

WHEREAS, Grantor is the owner of certain property, upon which there is located (1) a well or wells and/or a water treatment plant, together with distribution facilities, and/or (2) a sewage treatment plant, individually or collectively hereinafter referred to as "the utility system" for the purpose of supplying adequate water and/or sewer service to all properties connected to or to be connected to the utility system; and

WHEREAS, the Georgia Department of Natural Resources (DNR) Environmental Protection Division (EPD) (hereinafter the "Division"), will not permit the operation of said utility system without assurance of continuity of maintenance and operation, as provided by DNR Rules 391-3-5-.04(3) and 391-3-6-.06(13), among other written requirements; and

WHEREAS, it is the intention and purpose of the Grantor that such utility system shall be used and operated to provide adequate disposal of sewage and an adequate supply of water for each of the properties connected thereto, regardless of the ownership of the individual properties, and properly to maintain the utility system to assure the continuance of the operation and maintenance of said system for the benefit of the present and future owners of the properties connected thereto.

NOW THEREFORE, for and in consideration of the undertakings of the Grantor to provide and assure the maintenance and operation of the utility system as aforesaid and the further sum of One Dollar ($1.00) lawful money of the United States cash in hand to Grantor does hereby grant and convey to the party of the second part, as Trustee, the following property, to wit:

(A) All the rights, title and interest in and to the following described real property as set forth in Exhibit A which is attached hereto and made a part hereof.

(B) The sewage collection system including all appurtenances such as manholes, pumping stations, etc. and the sewage treatment plant including effluent line to point of final disposal, heretofore constructed or to be constructed, including all easements incident to the ownership and operation of said sewage system.

(C) The well or wells, plant, chemical treatment facilities, storage and distribution facilities, including the water mains and lateral lines, heretofore constructed or to be constructed, including all easements incident to the ownership and operation of said water system.

Further, the Grantor hereby warrants that there are no existing encumbrances, liens, or other indebtedness to the title of the utility system conveyed hereunder, other than those set out in Exhibit B which is attached hereto and made a part hereof.

Grantor further warrants that the said encumbrances, liens, or indebtedness (if any) have been subordinated to this conveyance and are subject to this Trust Indenture.

This conveyance is upon the trusts and for the purposes following, to wit:

1. This grant is for the benefit of the present and future owners of all and each of the properties now or hereafter connected to the said utility system, as well as the holders of the mortgages covering each of the said properties, and Trustee shall hold the title to the property granted by this indenture until either (a) the utility system is taken over by either a governmental authority or public utility for maintenance and operation, or (b) other adequate utility service is provided either by a governmental authority or public utility through means other than the operation of the utility and facilities now transferred to the Trustee herein. Upon the happening of either of such events at a time when the Grantor is still operating and managing the utility system in accordance with the terms and provisions hereof, the Trustee shall immediately reconvey the property to the Grantor, its successors or assigns, and this indenture shall be of no further effect.

2. The Grantor shall supply at all times and under adequate pressure for the use of each of the properties duly connected to the said utility system, a sufficient quantity of potable water to meet the reasonable needs of each of the properties duly connected to said utility system. Such water shall be of the quality and purity as shall meet the Georgia Safe Drinking Water Act of 1977, as amended, and t he Rules, Chapter 391-3-5 adopted under the Act, so as to produce water without excessive hardness, corrosive properties, or other objectionable characteristics making it unsafe or unsuitable for domestic use or harmful to any or all pipes within and/or without the dwellings. In addition, the Grantor agrees to provide at all times, for each of the properties connected to the said utility system, service adequate for the safe and sanitary collection, treatment, and disposal of all domestic sewage from said dwellings, in accordance with the 1972 Federal Water Pollution Act, as amended, of the U.S. Environmental Protection Agency (EPA), and the Georgia Water Quality Control Act, as amended, and the Rules, Chapter 391-3-6 adopted under the Act. The Grantor further shall operate and maintain the utility system so as not to pollute the ground, air or water in, under or around said properties with improperly or inadequately treated sewage, or with noxious or offensive gases or odors. The Grantor further agrees to operate the utility system in accordance with the requirements of the Division, to produce a treated wastewater effluent of a quality satisfactory to the Division. Records of any and all tests conducted in connection with said utility system shall be kept by the Grantor, as required by the Division, and said records shall be open to inspection by the Division and the owners of the properties connected to the said utility system. The Division shall at all times have access to the utility plants of the Grantor to conduct any and all tests as the Division shall consider necessary to determine compliance with the said requirements. In any event, the Grantor shall conduct all tests required by operating permits issued by the Division and shall pay all costs in connection therewith. In the event the Division shall determine that the operation of the utility system does not meet all applicable requirements, the Grantor shall, with reasonable dispatch at its sole cost make any adjustment, repair, installation, or improvement that shall be necessary or recommended by the Division to bring the operation of the utility system up to the said requirements.

3. The Grantor shall maintain said utility system at all times in good order and repair so

that satisfactory service as aforesaid may be supplied to each of said properties as provided in paragraph 2 above.

4. Until the happening of one of the events set forth under paragraph numbered 1 above: Should Grantor fail to operate and manage the utility system in the manner and under the conditions specified in paragraphs numbered 2 and 3 above and should Grantor fail, after notice in writing from the Trustee to correct such failure with reasonable dispatch, then Trustee shall take immediate possession or the utility system for the purpose of operating and maintaining the same, and shall hold, use, operate, manage, and control the same either itself or by or through any of the agencies or parties for whose benefit this trust is created and it shall take possession thereof for the purpose of operating the same, and in that event, the Trustee or the entity operating the utility system in its behalf or in the behalf of any of the beneficiaries of this trust, shall be subrogated to all rights of the Grantor to levy and collect a charge against each customer.

5. In the event the Trustee takes possession of the utility system pursuant to the provisions of paragraph numbered 4 the Grantor shall have no further right, title or interest in the utility system or other property granted by this indenture and shall not be entitled to any portion of the proceeds resulting from any sale of such utility system or property; but the Trustee shall have the right to transfer such utility system to a governmental authority upon such terms or conditions as may be approved by the Trustee and the owner or owners of a majority of the properties connected to the utility system.

6. The Grantor reserves the right to levy and collect a charge for utility services provided to the occupants of each of the properties connected to the utility system. Services shall be charged on a prorate basis from the date the services are established at the request of a customer, to the date of its discontinuance. In connection with the foregoing, the Grantor shall have be maintained by the Grantor, through which all water supplied to the consumer or consumers shall pass and to which the Grantor shall have access at reasonable times for the purpose of taking meter readings and keeping said meter in repair.

7. If it should become necessary at any future time for the Trustee or any entity acting in its behalf or any beneficiary under this trust indenture, to take over, operate, and manage the utility system under the provisions of this trust, then and in that event, the operator of such systems shall be entitled to a Trustee's fee payable from the income of the utility system at a rate not in excess of fifteen 15% of the gross charges collected by such Trustee, provided that such Trustee's fee may be increased with the approval of the owner or owners of seventy-five (75) percent of the properties connected to the said utility system.

8. Should the Trustee or any entity acting in its behalf or any beneficiary under this trust indenture, take over, operate and manage the utility system under the provisions of this trust, the Trustee shall notify the Division within thirty (30) days of such take over and shall meet all the requirements of the Grantors permits issued by the Division.

9. If the Trustee named herein shall cease to serve as Trustee before the termination of this Trust Indenture, then a successor Trustee may be selected by the Grantor with the approval of a majority of the beneficiaries. To ensure the continuity of the maintenance and operation of the water system, approval of the successor Trustee shall also be obtained from the Director of the Division, but this must occur prior to the release of the first Trustee. If a majority of the beneficiaries or the

Director is unable to agree on the appointment of a successor Trustee within a reasonable time, either the Grantor or beneficiaries may petition any Court to select and appoint such successor Trustee.

10. Whenever the word "Grantor" occurs herein, it shall also include its successors and assigns; and whenever the word "Trustee" occurs herein, it shall include the successor Trustee and successors and assigns.

The Grantor warrants that all property described in "A" (above) as well as all equipment, materials, tools, appurtenances, etc. associated with the normal daily operation and maintenance of the utility system hereinafter acquired by the Grantor shall be made subject to the Deed by recording of appropriate covenants, required by Georgia law to put all persons on notice that such properties have been subjected to the terms of this Deed.

In Testimony Whereof _____, the Grantor, has caused these presents to be executed by herself and the Trustee herein named, has caused these presents to be executed by himself the day and year first hereinabove written. In entering into the agreement contained herein and executing the Trust Indenture, _____, acts for himself as Trustee and as representative of any by authority of all persons, firms, corporations, or entities which are or may be beneficiaries under the trust hereby created.

(Grantor's Name)

(As to Grantor)
Signed, sealed and delivered in the presence of:

_____ (Grantor's Signature) _____ (Witness Signature)

_____ (Type or Print Name Above) _____(Type or Print Name Above)

_____ (Notary Public) _____(Notary Public)

_____ (Seal) _____(Seal)

(Trustee's Name)

_____ (Trustee's Signature) _____ (Witness Signature)

_____ (Type or Print Name Above) _____(Type or Print Name Above)

_____ (Notary Public) _____(Notary Public)

_____ (Seal) _____(Seal)

NO-IDENTITY-OF-INTEREST

The Trust Indenture for the _____ water system located in _____County Georgia does not create a conflict of interest for either _____ the owner, or _____ the trustee as they are not related by blood or marriage and they have not entered into any business relationship which would compromise this agreement.

OWNER: **TRUSTEE:**

_____ _____
(Signature) (Signature)

_____ _____
(Owner's Name) (Trustee's Name)

Address:_____ Address:_____

_____ _____

_____ _____

Telephone:_____ Telephone: _____

ADDENDUM TO TRUST DEED

1. The Grantor reserves and has the right to establish and collect as a charge of charges for water furnished and consumed by the owners or occupants of each of the buildings, residences and other improvements at the initial rates described in the rate schedule set out below. The Grantor shall have the right to install on the premises of each of the individual buildings, residences and other improvements a water meter to be maintained by the Grantor through which all water supplied to the consumer shall pass and to which the Grantor shall have access at reasonable times for the purpose of taking meter readings and keeping said meters in repair. In the event said meter shall be installed the Grantor may charge for water and service at the rate or rates set forth in the rate schedule set out below.

2. The Grantor may establish, amend or revise from time to time and enforce Rules and Regulations for Water Service covering the furnishing of water supply service within said, areas or subdivisions, provided, however, all such rules and regulations established by the Grantor from time to time shall at all times be reasonable and subject to such regulations as may now or hereafter be provided by law' and provided further that no such rule or regulation so established, amended or revised can be inconsistent with the requirements of this Deed nor shall t he same abrogate any provision hereof. Any such rules and regulations established, amended, revised and enforced by the Grantor from time to time shall be binding upon any owners or occupant of any of the property located within the boundaries of such areas or subdivisions the owner or occupants of any building, residence or other improvements constructed or located upon such property and the user or consumer of any water supply service.

3. Changes in the initial rate described in Paragraph One above may be proposed by the Grantor and by third party beneficiaries in this Deed in the following manner:

If within ninety (90) days after notice to the Trustee and to all parties connected to the water supply system of a rate change proposed by the Grantor, not more than one-third (1/3) of such parties have signified in writing their opposition to such proposed rate change, the Grantor may forthwith establish such new rates. If more than one-third of such parties signify, in writing, their opposition to a rate change proposed by the Grantor, or if more than one-third of such parties proposed in writing a rate change which the Grantor opposes, and the parties cannot negotiate an agreement within ninety (90) days to the reasonableness of such new rate, then the matter of the reasonableness of such new rate shall be referred to a Board of Arbiters selected as follows: The Grantor shall designate one arbiter, the objecting party shall designator one arbiter, and the two arbiters thus selected shall choose a third arbiter. The three arbiters shall make their written recommendations to the parties to the dispute as to the reasonableness of the new rates within ninety (90) days after the reference of the dispute to them. Written notice of the hearing of the dispute by the arbiters shall be given to the Grantor and to all objecting parties. All proceedings before the arbiters shall be recorded in writing.

Either side to the arbitration may present written objections to the recommendations within thirty (30) days after the decision. If no written objections are made, it shall be considered that all parties have agreed that the new rates recommended by the arbiters are reasonable. If written objections are filed by either side, the question of reasonableness of the new rates shall be subject to the review by court of competent jurisdiction in appropriate legal proceedings initiated for such purposes. In the event of arbitration or court proceedings, the proposed change of rates shall be held in abeyance and shall not become effective until the conclusion of such proceedings.

RATE SCHEDULE

(A) The Grantor may levy and collect a charge for water availability of $____ per month, and a charge for water used of $_____ per one thousand (1,000) gallons used.

(B) The Grantor may charge the sum of $_____ for the installation of a water meter for any consumer.

(C) All charges for water shall be paid by the day of each month. If said bill is not paid within the Grantor shall have the right to discontinue service to the delinquent user. The Grantor shall also have the right to charge a delinquent charge of $___for any bill not paid by the _____ (___) of the month.

(D) It is agreed between the parties hereto that for the first year of operation of the water system, the above rates shall be deemed reasonable.

This _____ day of _____, 20_____