



## **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,<sup>1</sup> while EPD permits disposal facilities.<sup>2</sup>

DPH regulations require certification of septic tank contractors, including those who pump and haul septage.<sup>3</sup> Certification must be renewed every two years and is conditioned on meeting continuing education requirements.<sup>4</sup> Septage pumpers must also obtain a septage removal and disposal permit from the County Boards of Health where they operate and renew it annually.<sup>5</sup> They must maintain manifests identifying where septage loads were generated and disposed.<sup>6</sup>

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),<sup>7</sup> 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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<sup>1</sup> Ga. Comp. R. & Regs. 511-3-1-.11 (2015).

<sup>2</sup> See General Permit No. GAG620000; Ga. R. & Reg. § 391-3-6-.06 (2015).

<sup>3</sup> Ga. Comp. R. & Regs. 511-3-1-.16 (2015).

<sup>4</sup> *Id.*

<sup>5</sup> Ga. Comp. R. & Regs. 511-3-1-.11 (2015).

<sup>6</sup> See Georgia Dept. of Public Health, *Manual for On-site Sewage Management Systems*, § I Septage Removal (2014).

<sup>7</sup> 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.<sup>8</sup>

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

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<sup>8</sup> See Ga. Comp. R. & Regs. 391-3-6-.23; General Permit No. GAG620000.

statewide but with limited response;<sup>9</sup> and the one coastal study available, although thorough and compelling, focused on only one community.<sup>10</sup> 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

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<sup>9</sup> 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.

<sup>10</sup> 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<sup>11</sup> 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. WeIStROM, 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

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<sup>11</sup> 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.<sup>12</sup> 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.

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<sup>12</sup> Ga. Comp. R. & Regs. 511-3-1-.11(3).

<b>Table 1. Coastal Septage Disposal Facilities</b>		
<b>Facility</b>	<b>Policies</b>	<b>Cost per load (1000gal)</b>
Pembroke WWTP	Only take from Pembroke and North Bryan Co. <sup>13</sup> 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 <sup>14</sup>	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 <sup>15</sup>	Take from one CRC county – Bulloch.	\$65 for out of county (\$50 in county)
Richmond Hill Sterling	Will take septage when	Unsure

<sup>13</sup> 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.

<sup>14</sup> 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.

<sup>15</sup> 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.

Creek WWTP	new plant is complete. Unsure of policies.	
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.<sup>16</sup> (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.

The most frequently cited reasons for accepting septage are to generate an additional source of revenue and provide a service to community residents and

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<sup>16</sup> Comingling of domestic septage and commercial waste loads is prohibited by Georgia law. Ga. Comp. R. & Regs. 391-3-6-.24(6)(b) (2015).

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<sup>17</sup> 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.<sup>18</sup> 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 additional WWTP to accept septage. As with reducing fees, educating local elected and other officials would be key here. Development of guidance for best

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<sup>17</sup> Georgia State Senate Research Office, *Final Report of the Senate Septage Disposal Study Committee* (2006).

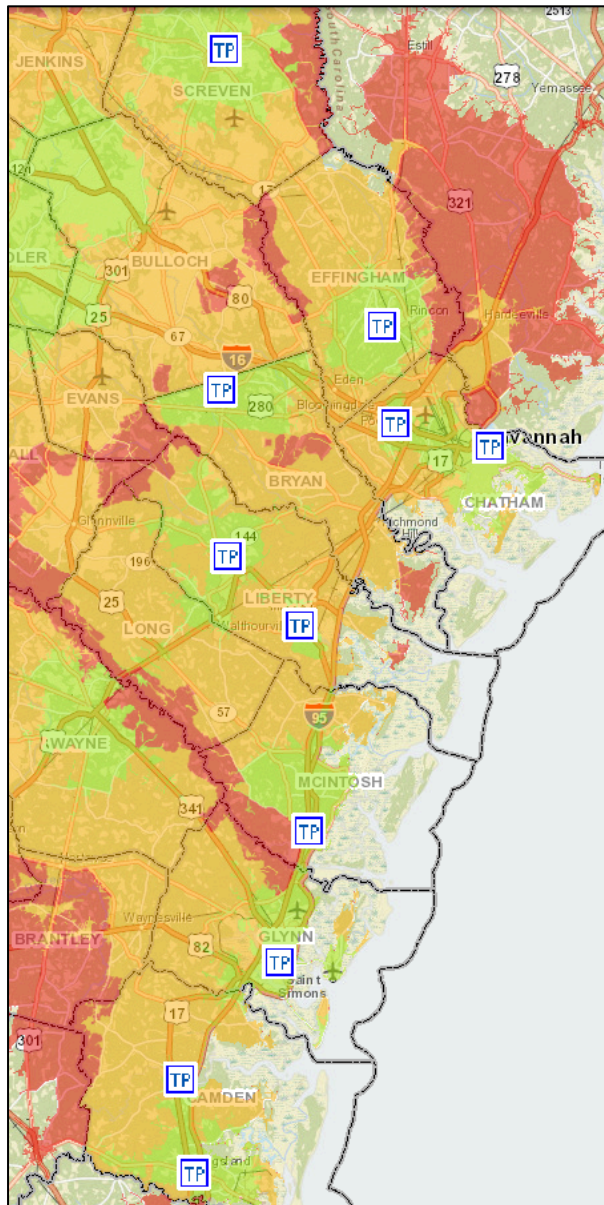
<sup>18</sup> Coastal Regional Water Plan (2011).

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). WeIStROM 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:

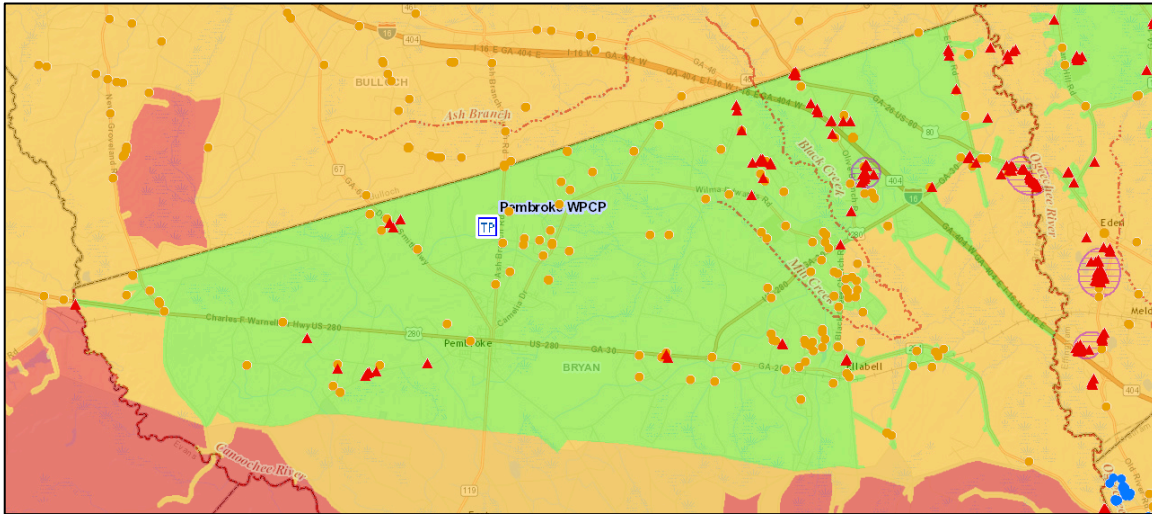
1. Description of first priority underserved area. Latitude and Longitude of the area (if a high density OSDS cluster).
  - First leading to prioritization of area.
  - Second factor...
2. Description of second priority underserved area. Etc.

All coordinates are approximate.

WeIStROM 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 WeIStROM**. 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 WeIStROM 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.

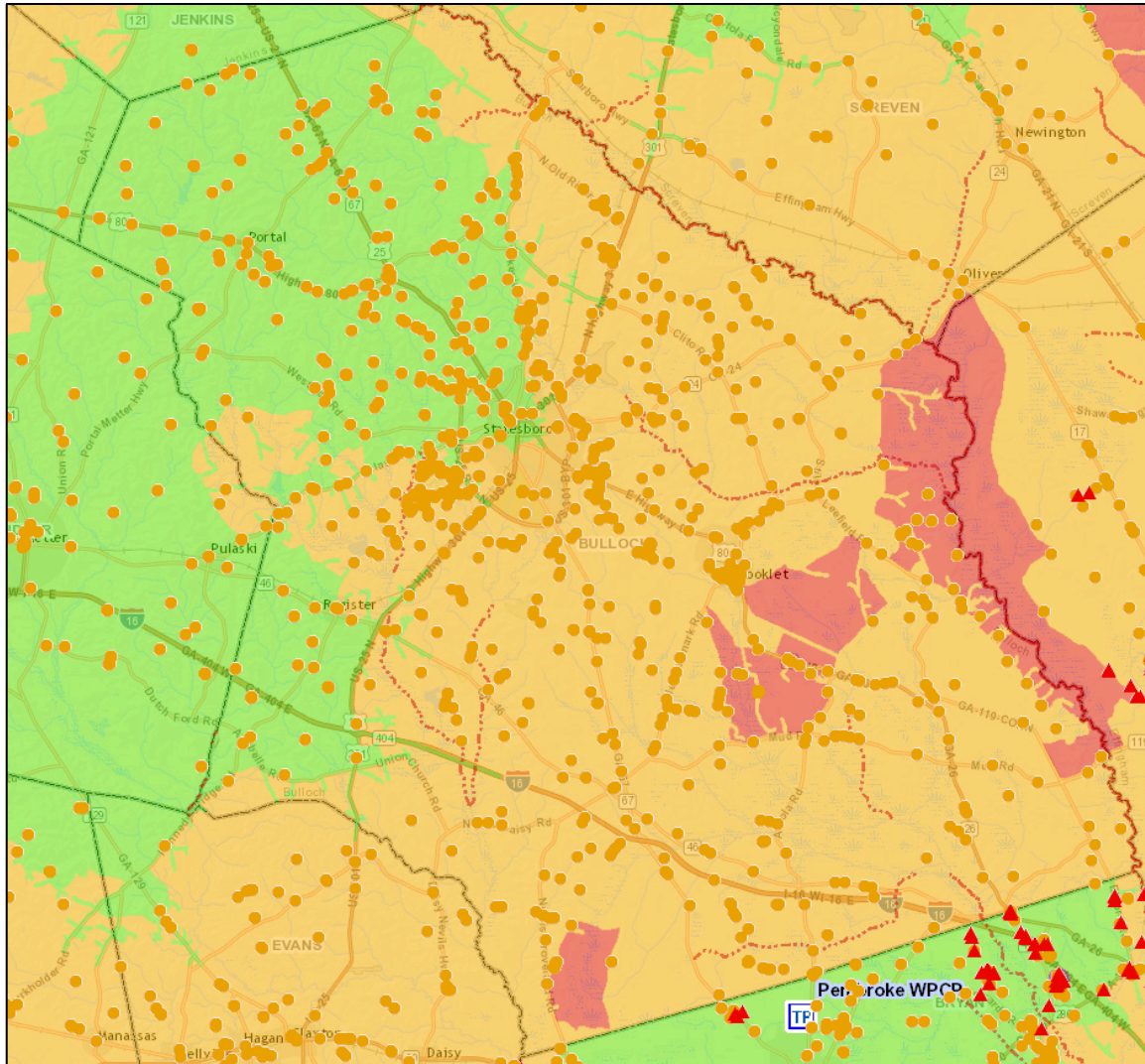
#### Underserved Areas

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.



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

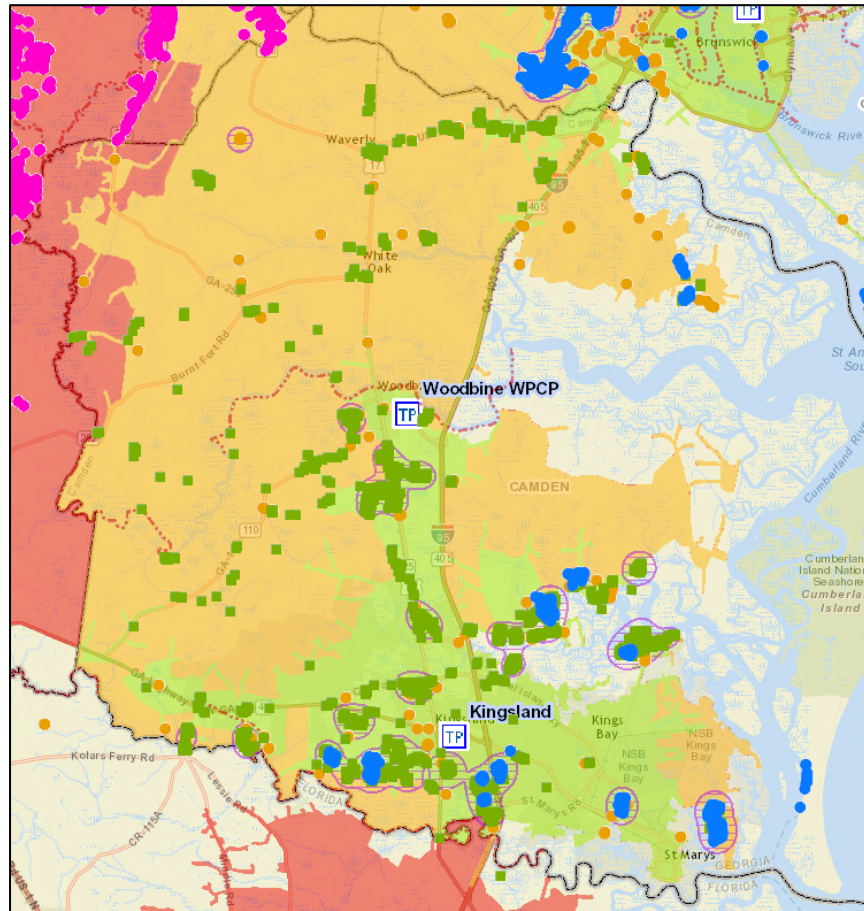


The only WWTP accepting septage within Bulloch County is in Portal, though some pumpers also take septage loads to the Metter WWTP in Candler County or the Effingham Reuse Facility. OSDs are widely scattered across Bulloch County, but there are no high density clusters according to the parameters set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

### Underserved Areas

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

## Camden County



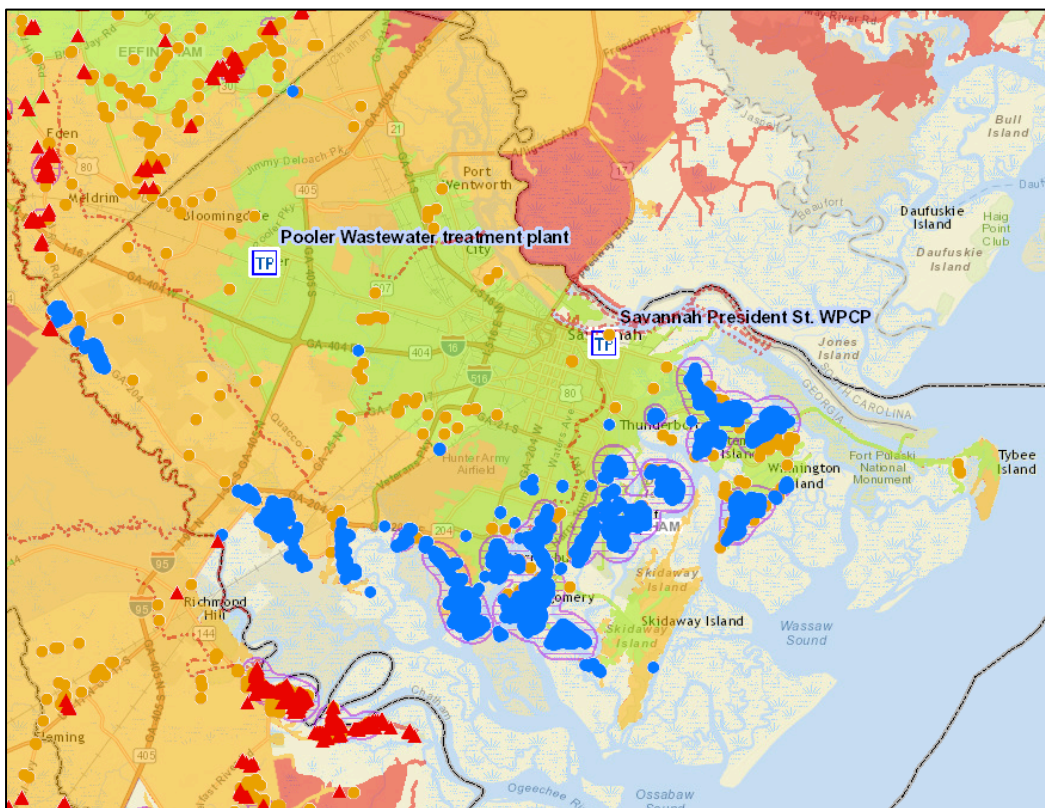
Camden County, WeISTROM 2015

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.

### Underserved Areas

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



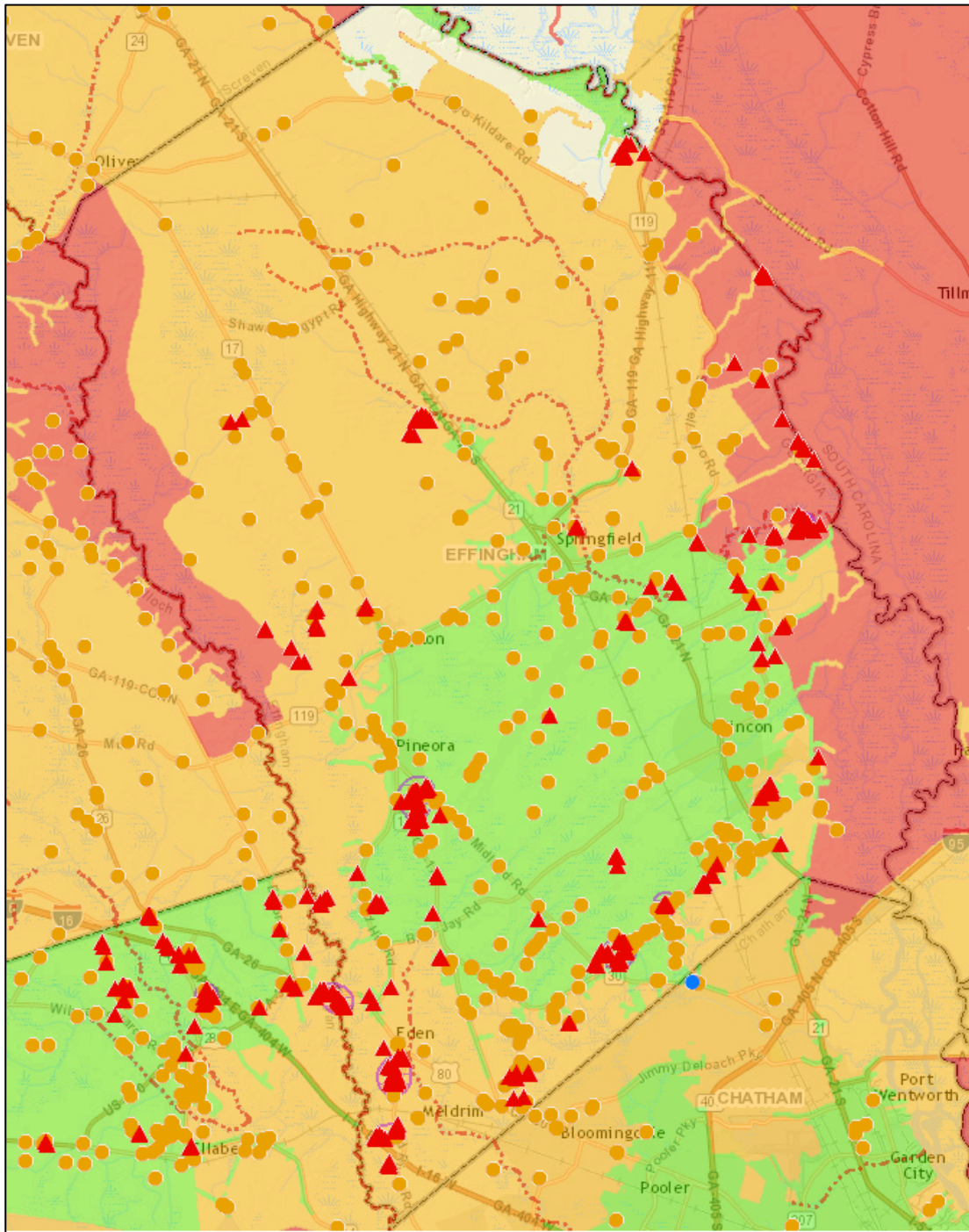
Chatham County, WeISTROM 2015

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 Late 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.

### Underserved Areas

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.

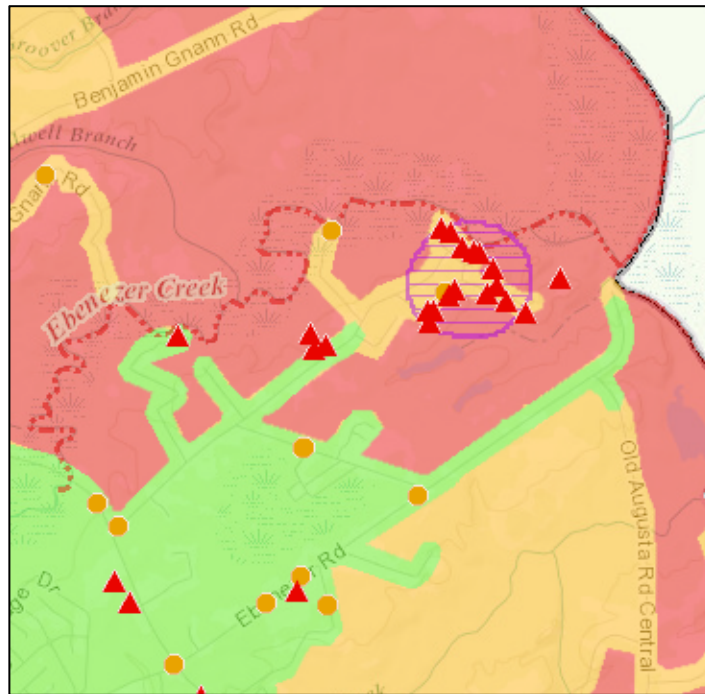
## Effingham County



Effingham County, WeIStROM 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.

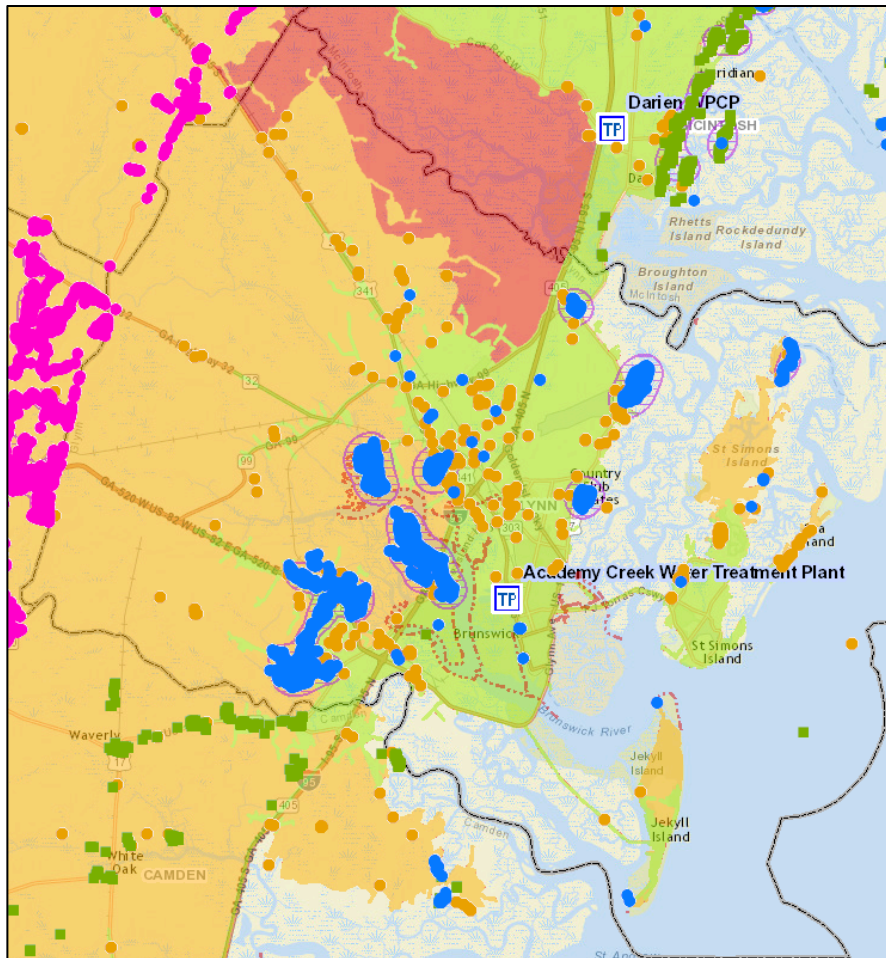


High density OSDS area along Ebenezer Creek, Effingham County, WeISTROM 2015

#### Underserved Areas

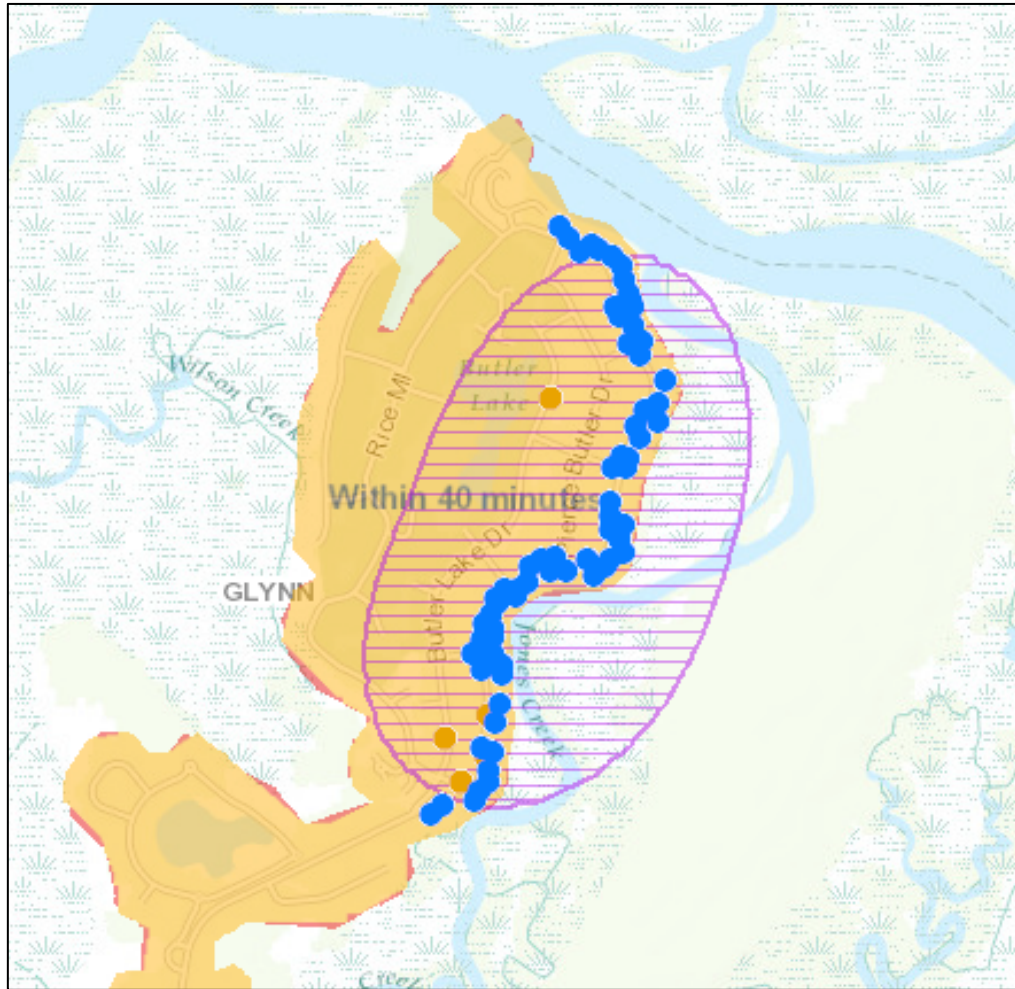
1. High density OSDS cluster on Ebenezer Creek. Lat.: 32.379686, Long: -81.195111.
  - Adjacent to impaired waters (Ebenezer Creek).
2. High density OSDS area off of Old Rail Road. Lat.: 32.157767, Long: -81.389019.
  - 40 minute drive time.
3. High density OSDS cluster off of Sandy Hill Road and Schuman 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, WeISTROM 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.

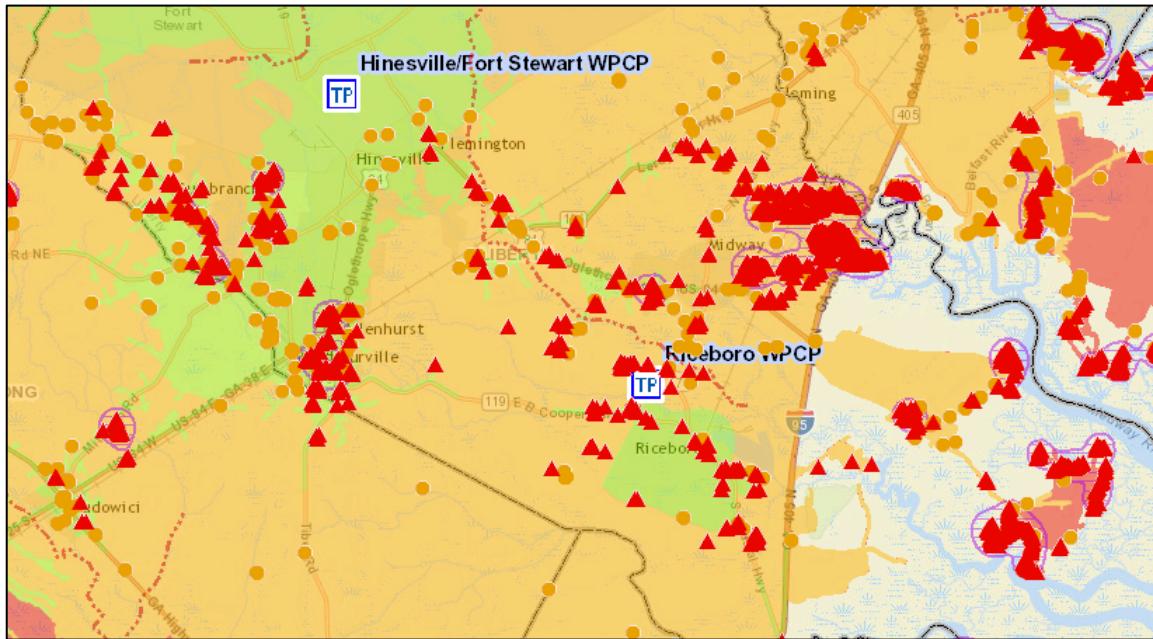


Northern end of St. Simons Island, Glynn County, WeISTROM 2015

#### 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), WeIStROM 2015

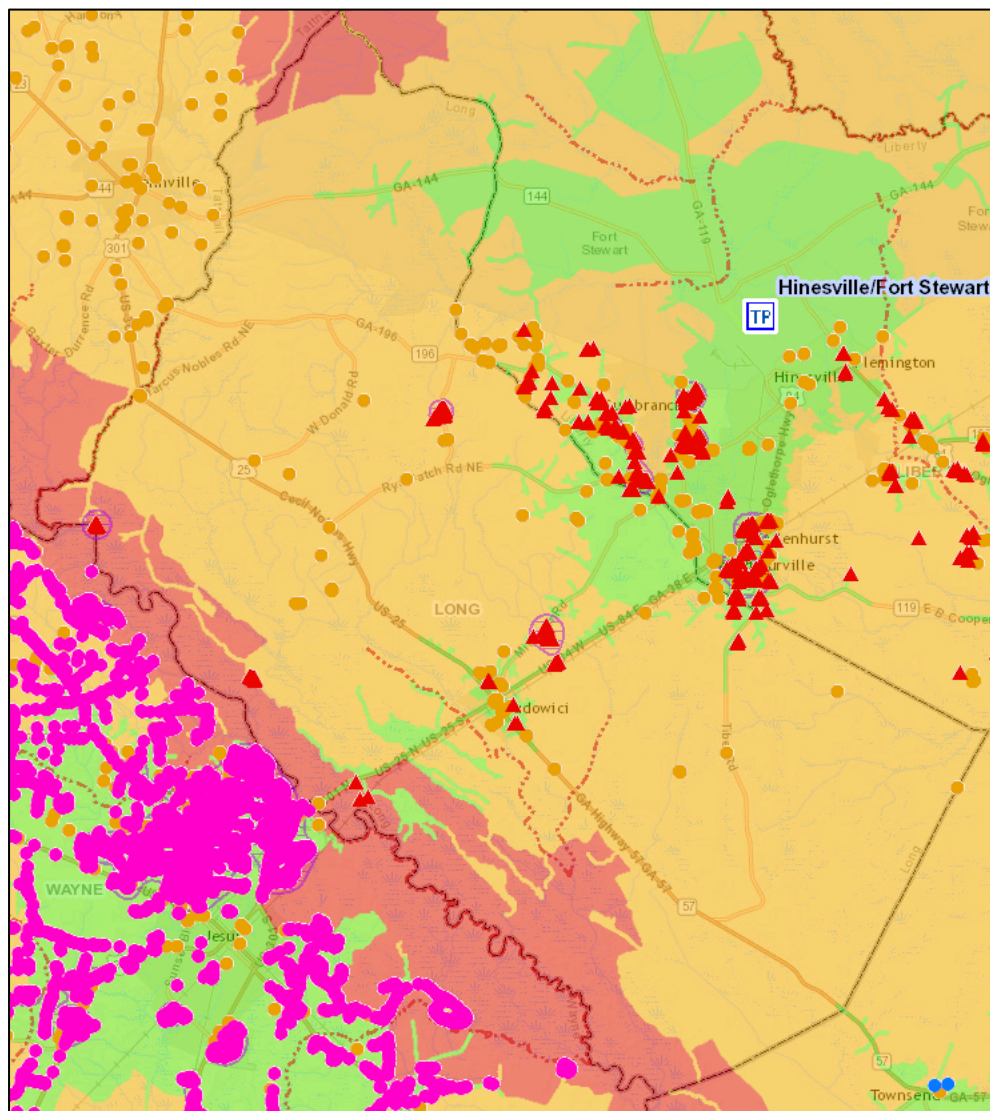
Septage generated in Liberty County is typically taken to the Hinesville/Ft. Stewart WWTP or the Darien WWTP. Riceboro is shown to take septage from within city limits on the image above, but some have indicated that the plant does not in fact accept septage (if it does it takes it from city limits,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

### Underserved Areas

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.

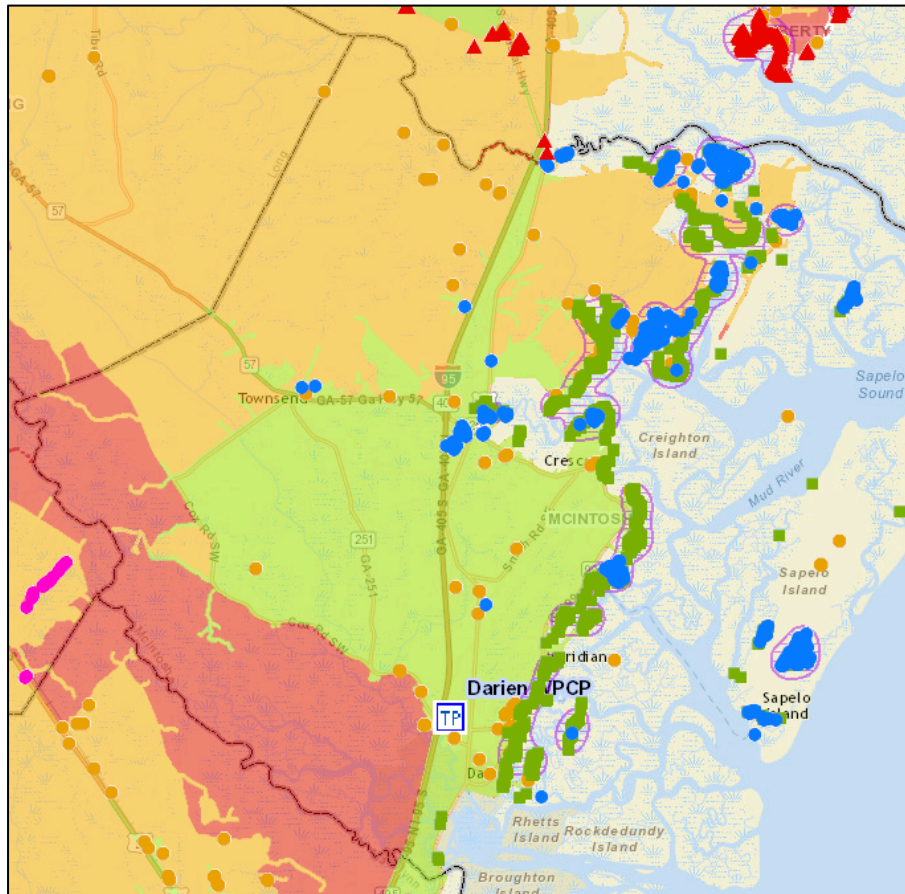
Most of Long County is 40 minutes from the nearest WWTP accepting septage; available WWTP are Hinesville/Ft. Stewart and Jesup. Long County's OSDS data appears to be the most underreported in WelSTROM, so it is likely that there are more high density OSDS clusters than are currently in the database.

### Underserved Areas

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, WeIStROM 2015.

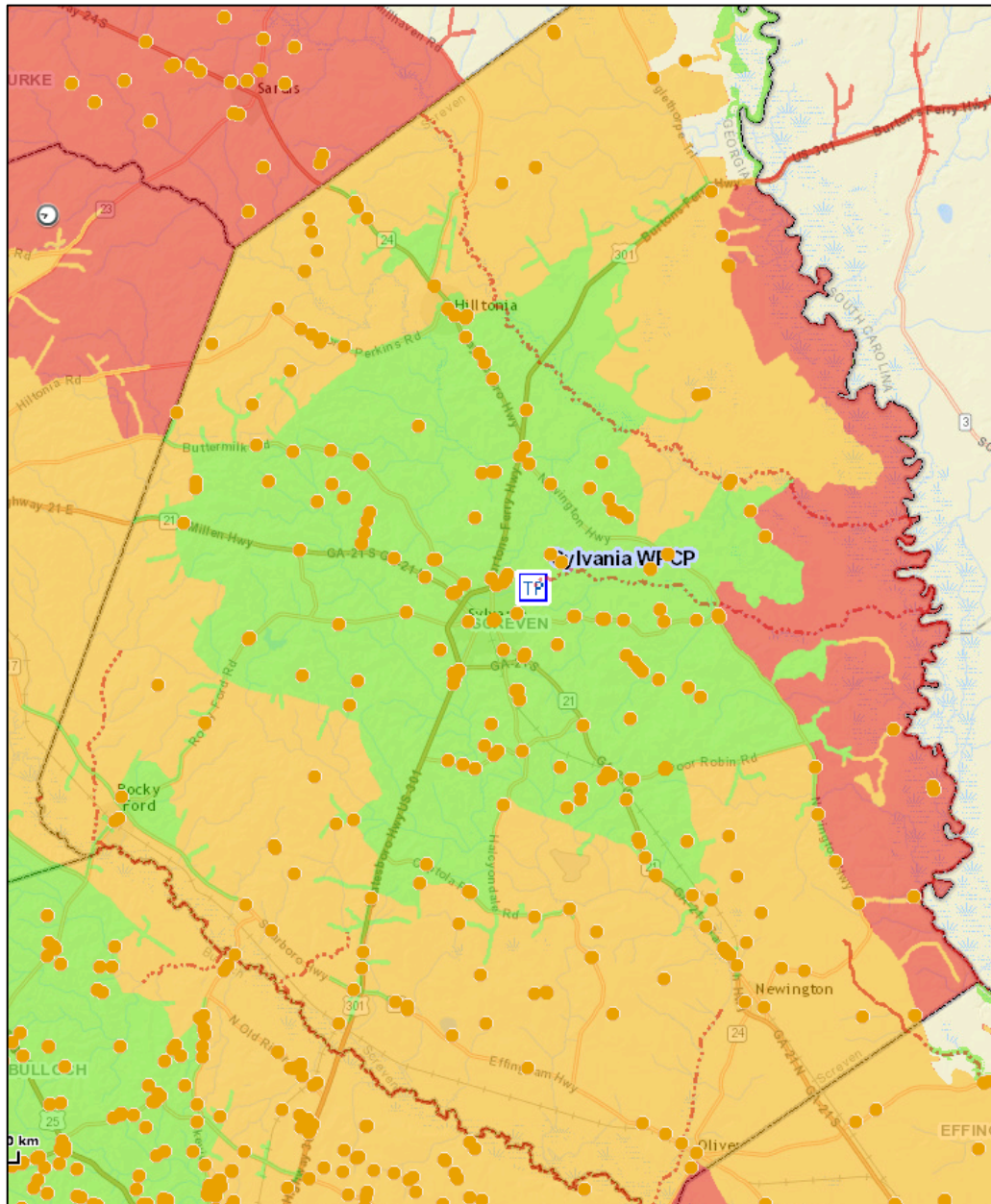
McIntosh County is generally well-served by the Darien WWTP, which accepts septage from anywhere and charges reasonable fees. The Darien WWTP is, however, somewhat small and cannot take a lot of loads in one day. High density OSDS clusters in the northern end of the county are all similar (40 minute 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.

### Underserved Areas

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.

### Underserved Areas

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