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Section 2
Historical Water Resource Management Practices on the Mississippi Gulf Coast

2.1 Introduction

Development of water resources infrastructure in the Gulf Region has often been a reaction to forces of growth and change. In addition to normal growth of conventional housing and commercial complexes, creation or expansion of industries such as tourism, gaming, and military services have been primary drivers for planning and construction of water, wastewater and stormwater infrastructure. As is a common occurrence, not only in the Gulf Region, utility systems often were installed to provide immediate customer services without consideration for long-term growth or comprehensive future planning. As a result, much of the existing infrastructure was near capacity, or even exceeding it, at the time of Hurricane Katrina.

This section of the Plan provides an inventory and assessment of current and historical water, wastewater, and stormwater infrastructure conditions in the Gulf Region. The assessment identifies needs existing within the various service areas, as well as infrastructure issues that were found to be limiting growth prior to Katrina.

2.1.1 Historical Service Issues

Prior to Katrina, many areas within the Gulf Region were experiencing deficiencies with their utility infrastructure. Lack of capacity, aging components, old technology, and insufficient funding were a few problems faced by local and regional communities. In some areas, municipal, industrial, and commercial growth was sharply impaired either by the absence of specific utility infrastructure or by the lack of operational capacity where utilities did exist.

Many of the historical water system deficiencies that existed before Katrina related to lack of supply capacity and undersized and deteriorating components. Several systems were and still are not allowing additional connections to their water distribution systems because of the lack of available supply capacity. Deteriorating elevated storage tanks and undersized or broken waterlines were also issues that impacted the distribution of water throughout the Gulf Region prior to Katrina.

Issues with wastewater infrastructure in the Gulf Region historically have included ineffective, deteriorating, or undersized treatment systems, which have an adverse impact on water quality. Sanitary sewer collection systems typically are not maintained on a routine basis. The most prevalent problem reported with such systems in the planning area is excessive inflow and infiltration (I/I) where stormwater has entered leaking or damaged service clean outs, collection lines, and manholes during wet weather events. Aging facilities and continued use of old and

inefficient technologies have added to capacity loss and the resultant inability of utilities to meet growing customer demands.

It also has been estimated conservatively that 7.3 million gallons per day of domestic wastewater flows into the environment from failing individual onsite wastewater treatment systems in the counties of the Gulf Region. Failure is due, in part, to poor soil conditions which are not conducive to the absorption and processing of such wastewater. Additionally, such systems often are not well maintained by the homeowner, a condition that eventually leads to failure of the systems.

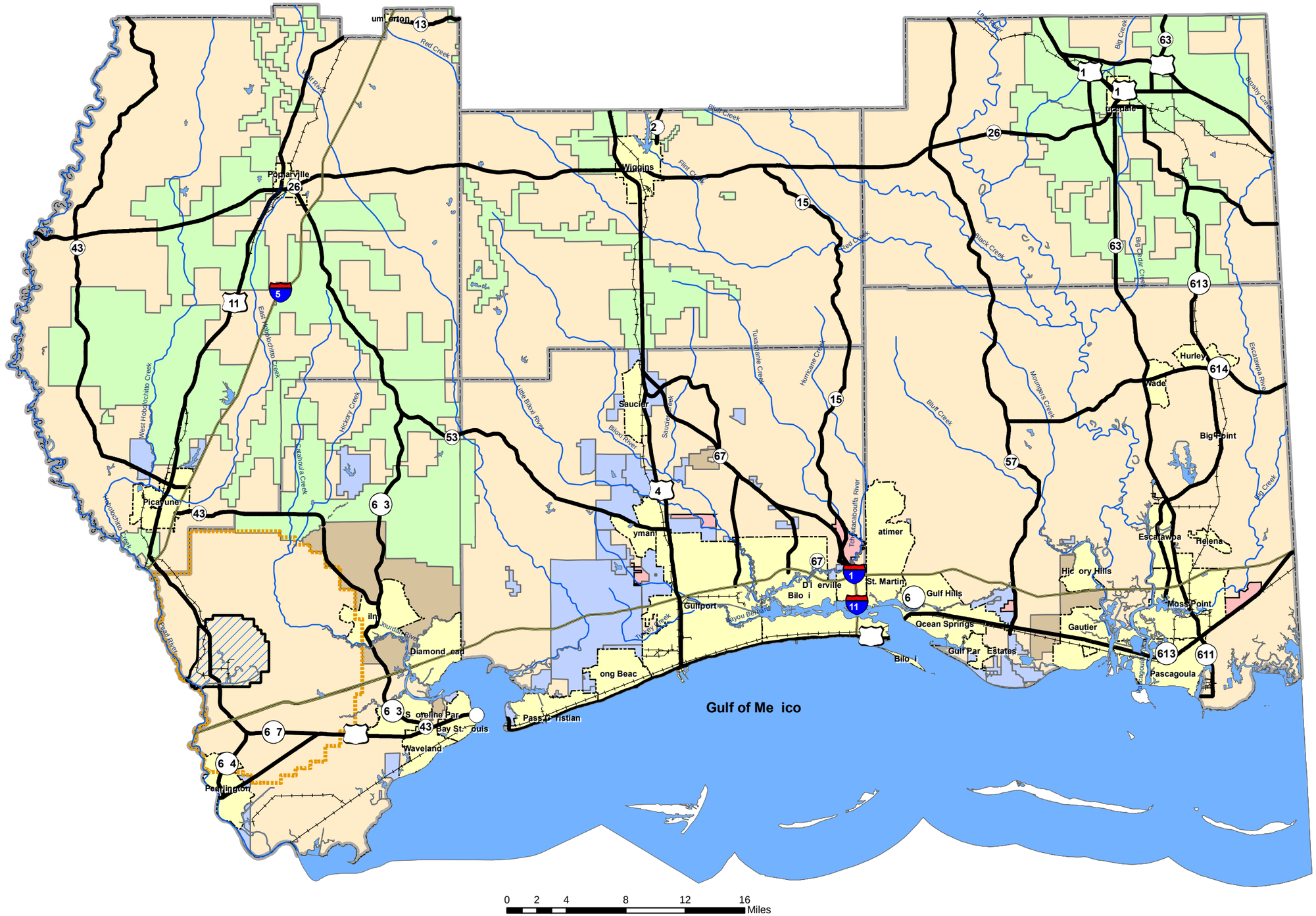
Pre-Katrina stormwater infrastructure issues were found to be typical of other areas in the state, particularly those areas experiencing steady development. Such problems focus mainly around poor stormwater management practices, drainage systems with insufficient capacity to prevent flooding of structures, roadways, and other properties, and developmental encroachment into floodplains.

2.2 Water Resource Service Providers

Water and wastewater systems in the planning area are owned, operated and managed by one of four types of entities, either 1) municipalities (city or county governmental agencies), 2) utility service districts, 3) non-profit rural water associations, or 4) private entities. Those systems that provide potable water service to a minimum of 25 persons or to 15 separate connections in an area are monitored for water quality and available system capacity by the Mississippi Department of Health.

With the exception of incorporated municipalities, which provide water service only within their boundaries or supply infrastructure serving one specific location (e.g., a rural school, welcome center, or apartment complex), a water service provider wishing to serve a particular area is required to detail its operational procedures, including a delineation of its proposed area of service. This information is forwarded to the Mississippi Public Service Commission for review and issuance of a Certificate of Public Convenience and Necessity, giving authority to the entity to provide potable water service in the identified area.

Prior to Hurricane Katrina, there were 185 collective supply, treatment, and distribution systems monitored by the Mississippi Department of Health and providing potable water to customers in the six-counties, as summarized in the following paragraphs. **Figure 2-1** illustrates the certificated areas for the water supply entities of the Gulf Region, delineated by county and service group type.



MISSISSIPPI G F REGION POTAB E WATER SER ICE PRO IDERS

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Figure 2-1
Gulf Region: Potable Water Service Providers

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- Interstate Highway
- U.S. Highway
- State Highway
- Railroad
- Stennis Space Center
- NASA
- City Limits
- Municipal Utility
- Water Supply District
- Rural Water Association
- Private Water Utility
- County Boundary

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2.2.1 Municipalities

Municipalities are authorized by State law to provide water, wastewater, and stormwater service inside their corporate limits, and each of the municipalities within the Gulf Region currently provides some degree of such service to its citizens. Municipalities may also provide water and wastewater service up to one mile from the corporate limits without obtaining certification from the Public Service Commission, as long as the area is not certificated to another utility. Municipalities may serve one to five miles from the corporate limits with a certificate and rate approval by the Public Service Commission.

2.2.2 Public Water Authorities

In 2003 the Mississippi Legislature passed legislation that enabled water associations to convert their status to "bodies politic" as a means of giving them the opportunity to access tax-exempt capital markets and thereby charge their customers the lowest water rates possible. Hillsdale Area Public Water Authority, the only water system to take advantage of the law, has constructed and operated facilities in several counties, including parts of Pearl River and Stone Counties in the Gulf Region.

2.2.3 Utility Districts

Utility districts have been established by Boards of Supervisors in several counties of the state to provide water, wastewater, or stormwater service. Utility districts are established either under provisions of existing statutes, or by local and private legislation.

The certificated areas of statutory districts are regulated by the Public Service Commission, while most of the districts established by local and private laws are not. Rates are set by the District Commissioners, who are appointed by the respective Board of Supervisors. **Table 2-1** provides a list of Utility Districts operating within the Gulf region.

Name	County	Media
Diamondhead Water and Sewer District	Hancock & Harrison	Water, Wastewater & Stormwater
East Central Harrison County Public Utility District	Harrison	Water / Wastewater
Escatawpa Utility District	Jackson	Water / Wastewater
Gautier Utility District	Jackson	Water / Wastewater
Hancock County Water and Sewer District	Hancock	Water / Wastewater
Harrison County Development Commission	Harrison	Water / Wastewater
Helena Utility District	Jackson	Water / Wastewater
Henderson Point/Pass Christian Isles Water & Sewer District No.1	Harrison	Water / Wastewater
Jackson County Port Authority	Jackson	Water / Wastewater
Kiln Water and Fire Protection District	Hancock	Water
Pearlington Water & Sewer District	Hancock	Water / Wastewater
West Harrison County Water & Sewer District	Harrison	Water / Wastewater
West Jackson County Utility District	Jackson	Water / Wastewater

Table 2-1 Utility Districts Operating in the Gulf Region

2.2.4 Non-Profit Rural Water and Sewer Associations

Water and sewer associations are non-profit, customer-owned utilities that provide service to their members. A traditional source of financing for such systems has been the U.S. Department of Agriculture – Rural Development, formerly the Farmers Home Administration. The Public Service Commission provides certification for service areas but does not regulate rates. **Table 2-2** lists the known non-profit utility associations in the Gulf Region.

Name	County	Media
Bexley Utilities, Inc.	George	Water
Bi-County Water Association, Inc.	Hancock, Pearl River	Water
Bond Community Utility Association, Inc.	Stone	Water
Carnes Utility Association, Inc.	Pearl River, Stone	Water
Center Water Association, Inc.	Hancock, Pearl River	Water
Combined Utilities, Inc.	George	Water
Flint Creek Utility Association, Inc.	Stone	Water
Janice Water Association, Inc.	Stone	Water
Leaf Water Association, Inc.	George	Water
McHenry Utility Association, Inc.	Stone	Water
Multi-Mart Waterworks Association, Inc.	Stone	Water
New Zion Utilities, Inc.	Stone	Water
Nicholson Water & Sewer Association, Inc.	Pearl River	Water/Wastewater
North Lumberton Utility Association, Inc.	Pearl River	Water
Pearl River Central Water Association, Inc.	Pearl River	Water
Rocky Creek Utilities, Inc.	George	Water
Saucier Utilities, Inc.	Harrison	Water
Southeast Greene Water Authority, Inc.	George	Water
Standard Dedeaux Water Association, Inc.	Hancock	Water
Stone Utility Association, Inc.	Stone	Water
Sunflower Utility Association, Inc.	Stone	Water
Sunny Oaks Water Association, Inc.	Stone	Water

Table 2-2 Non-Profit Rural Water and Sewer Associations in the Gulf Region

2.2.5 Private Companies

Private companies provide water and sewer service to customers for profit. The water and sewer systems are often constructed by land developers or development companies. The systems are usually transferred to utility companies on completion of construction but are sometimes retained by the developer. Rates and certificated areas are regulated by the Public Service Commission. **Table 2-3** provides the list of private water and sewer companies in the Gulf Region.

Name	County	Media
Bayou Caddy Utilities South, L.L.C.	Hancock	Water
Coast Waterworks, Inc.	Harrison, Jackson	Water/Wastewater
Dedeaux Utility Company, Inc.	Harrison	Water/Wastewater
Deerwood Utility Association, Inc.	Harrison	Water
Dixie Utilities, Inc.	Pearl River	Water/Wastewater
Dogwood Hills Golf Course, Inc.	Harrison	Water
Galion Utilities Corp.	Harrison	Water
Hide-A-Way Lake Club, Inc.	Pearl River	Water
Honey Dipper of Biloxi Corporation	Harrison	Wastewater
Houston Estates Utility Company	Jackson	Water/Wastewater
Island Utilities, Inc.	Hancock	Water
J & J Water Company	Jackson	Water
Lakeland Sales, Inc.	Stone	Wastewater
Lyman Utilities, Inc.	Harrison	Water
Magnolia Utilities, Inc.	Harrison, Jackson	Water
MCC Enterprises, LLC	Harrison	Wastewater
McHenry Hill Utility, LLC	Stone	Wastewater
P.A.C. Utility Company	Jackson	Water/Wastewater
Palmer Creek Utility Company, Inc.	Harrison	Water
Pine Grove Water System, Inc.	Jackson	Water
Riverbend Utilities, Inc.	Harrison	Water/Wastewater
Robinwood Forest Utility Association, Inc.	Harrison	Water/Wastewater
Round Rock Utilities, L.L.C.	Pearl River	Wastewater
Southeast Mississippi Utility, Inc.	Harrison	Water/Wastewater
Superior Utilities, Inc.	Harrison	Water/Wastewater
St. Andrews Water & Sewer, Inc.	Jackson	Water/Wastewater
Sutter Water Service, Inc.	Harrison	Water
Total Environmental Solutions, Inc.	Hancock, Harrison, Jackson	Water/Wastewater
Westwick Utilities, Inc.	Jackson	Water
WildWood Utilities, L.L.C.	Pearl River	Wastewater
Woodland Park Utilities	Jackson	Water/Wastewater

Table 2-3 Privately Owned Utilities in the Gulf Region

2.2.6 Wastewater Treatment Authorities Prior to Hurricane Katrina

Regional wastewater treatment authorities existed in the Gulf Region prior to Katrina. Authorities in existence included Southern Regional Wastewater Management District in Hancock County, Harrison County Wastewater and Solid Waste Management District, and Mississippi Gulf Coast Regional Wastewater Authority in Jackson County. These regional authorities did not have countywide responsibilities but were limited geographically in their service areas. No wastewater treatment authorities existed prior to Hurricane Katrina in the three inland counties.

These authorities historically have provided treatment service for public and private utilities in their respective jurisdictions and either owned treatment facilities outright or operated facilities for others. They also owned and operated large regional pumping facilities and transmission systems utilized for transmission of wastewater from utility collection systems to treatment facilities. Wholesale rates were established by the authorities and charged to utilities for which they provided service.

2.2.7 Non-Utility Water and Wastewater Providers

Some entities provide water or wastewater service but do not charge fees. Non-utility providers are regulated by the Mississippi Department of Health or the Mississippi Department of Environmental Quality. Examples of non-utility providers include schools, industries, trailer parks, and similar operations.

2.2.8 Stormwater Service Providers

Incorporated municipalities generally are responsible for oversight, maintenance, and regulation of localized stormwater management within their jurisdictions. These areas might include annexed areas and, in some cases, peripheral developments that have entered into interim joint agreements for performing periodic maintenance. Counties typically maintain and operate drainage and stormwater facilities located in unincorporated areas. Much of the drainage infrastructure in either case is associated with roadways and is operated and maintained as part of the roadway system. Similarly, the Mississippi Department of Transportation (MDOT) provides oversight for drainage facilities along state highways, routes, and certain parks and rural roads that fall outside the jurisdiction of local governments or other management authorities.

The Mississippi Emergency Management Agency (MEMA) has authority for emergency response and disaster relief necessitated by flooding of streams and limited waterways and is responsible for coordinating with FEMA and other federal agencies, MDOT, appropriate flood control districts and municipalities. The Federal Highway Administration (FHwA) provides oversight for federal roads; and the U.S. Army Corps of Engineers regulates navigable waterways, coastal areas, flood protection levees and federally funded programs related to flood control and drainage.

2.3 Existing Water Resource Infrastructure

2.3.1 Water Supply, Treatment, and Distribution

Surface and Groundwater Supply Sources

Groundwater provides the major source of potable water for domestic demands throughout the Gulf Region. Groundwater aquifers currently in use include, but are not limited to, the Citronelle Formation and the Miocene aquifer system, consisting of the Graham Ferry, Pascagoula, and Hattiesburg formations.

At present, surface water sources are being used to provide certain process water supplies for industrial activities. These sources include the Pascagoula and Escatawpa Rivers in Jackson County, the Biloxi River in Harrison County, and the transport canal system located at Stennis Space Center in Hancock County.

Water Treatment Facilities

Large-scale water treatment is being performed in only a few instances in the Gulf Region, and all of these cases are in Jackson County, as summarized in **Table 2-4.**

Water Treatment Facilities in Jackson County			
Location	**Type**	**Capacity (MGD)**	**Use**
Bayou Casotte (Pascagoula)	Surface Water Treatment	100 MGD (permit); 55 MGD (design)	Industrial Process Water
City of Pascagoula	Reverse Osmosis Treatment of Groundwater	3 plants, each with a capacity of 1 MGD	Domestic supply for Pascagoula
City of Moss Point	Reverse Osmosis Treatment of Groundwater	5 MGD	Domestic supply for City of Moss Point and Escatawpa Utility District

Table 2-4 Existing Water Treatment Facilities in the Gulf Region

In addition to the above facilities, a 3.2 million gallon per day conventional surface water treatment facility for potable supply is planned for implementation in Jackson County and is anticipated to be under construction before the end of calendar year 2007.

The limited amount of water treatment occurring in the Gulf Region is due in part to the relatively good quality and quantity of groundwater. However, the groundwater sources in certain areas of the Gulf Region do have tendencies to contain elevated levels of dissolved solids and other constituents that are proven to produce potentially unhealthy byproducts, when combined with conventional disinfection chemicals. As Federal drinking water regulations become continually more stringent, additional constraints likely will be placed on water treatment processes.

In accordance with the requirements of the Mississippi Department of Health, Water Supply Division, the public water supplies in the Gulf Region undergo disinfection, primarily through chlorination. However, of the monitored public water supplies in the Gulf Region, only the Cities of Lucedale, Poplarville, and Wiggins, as well as Keesler Air Force Base, provide fluoridation.

Major Transmission Facilities

The Jackson County Industrial Water Supply System is the only major water transmission system in the planning area. The system pumps water from the Pascagoula River at Cumbest Bluff to a treatment plant located in Pascagoula, which then treats the water for use in the Bayou Casotte industrial area.

No regional, potable water transmission facilities currently operate in the planning area; although, a system currently is planned for phased construction in eastern Jackson County. When completed, this transmission system will extend from the previously mentioned proposed water treatment plant north of the Escatawpa community, along Mississippi Highway 63 and through the City of Pascagoula to Singing River Island.

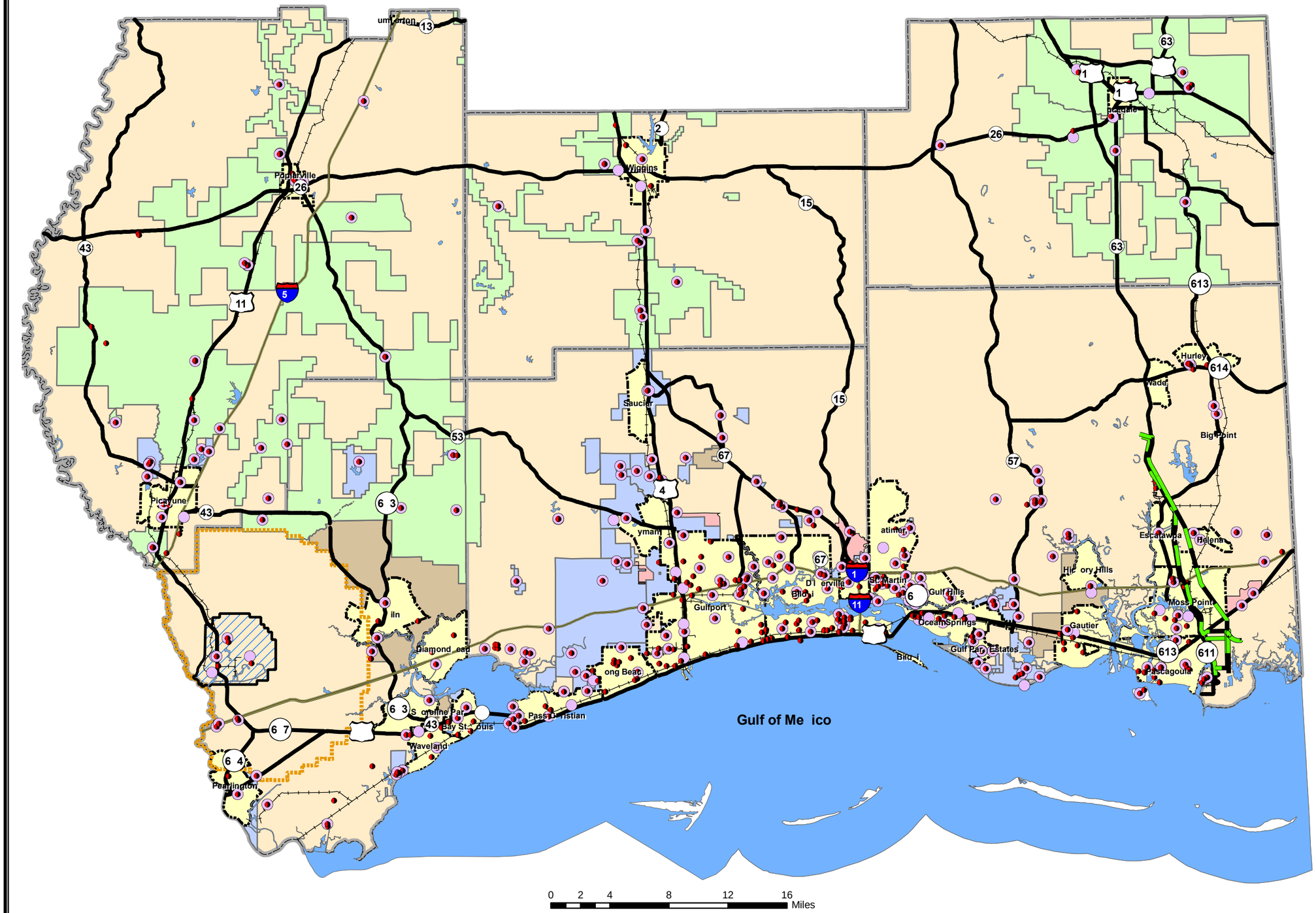
Local Distribution Systems

Water supply entities within the planning area typically operate and maintain their own independent distribution systems for their customers. With minimal exceptions, most potable water distribution systems outside incorporated areas provide water for domestic consumption only and are inadequate to meet fire-fighting demands. **Figure 2-2** illustrates the known public supply and distribution systems and their corresponding service areas.

Areas served by Private Wells

Shallow, private water wells provide potable water to individual users throughout the Gulf Region. These wells have remained popular through the years because of the availability of good quality groundwater at low cost and the lack of public supplies in many rural areas.

Site information exists for 17,221 private domestic water wells in the planning area, with wells in Harrison and Jackson Counties accounting for approximately 61 percent of the total. **Table 2-5** summarizes pertinent information on the private domestic wells within the planning area. Data reported in **Table 2-5** were obtained from databases maintained by USGS and MDEQ. The MDEQ database contains more recent information and served as the primary source of statistical data used in the subsequent evaluation.



MISSISSIPPI GULF REGION EXISTING POTABLE WATER INFRASTRUCTURE

Figure 2-2
Gulf Region: Existing Potable Water Infrastructure

Legend

- Permitted Wells
- Water Storage Tanks
- Interstate Highway
- U.S. Highway
- State Highway
- Railroad
- Existing Water Line
- Stennis Space Center
- NASA
- Municipal Utility
- Water Supply District
- Rural Water Association
- Private Water Utility

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County	No. of Wells	% of Regional Total	Number of Wells at Listed Depth			
			less than 50 ft.	50 - 100 ft.	100 - 1,000 ft.	Greater than 1,000 ft.
George	1,659	9.6%	145	662	852	0
Hancock	1,885	11.0%	10	66	1,797	12
Harrison	3,786	22.0%	165	98	3,519	4
Jackson	6,714	39.0%	421	1,021	5,265	7
Pearl River	2,238	13.0%	75	466	1,681	16
Stone	939	5.4%	71	402	466	0
Total	**17,221**		**887**	**2,715**	**13,580**	**39**

Table 2-5 Private Domestic Water Wells in the Gulf Region

Figure 2-3 identifies the locations of the known private wells within the Gulf Region. The amount of water supplied by these private wells is not known to any degree of accuracy; but it is estimated that approximately 38 percent of the Gulf Region population is served by such private supplies. This percentage of population served equates to approximately 17 million gallons per day of water supplied by private wells in the Gulf Region.

Existing Consumption

Data on historical water consumption in the Gulf Region were gathered from available sources and are summarized in **Table 2-6**. Consumption is reported for both groundwater and surface water sources. The totals reported for year 2005 are approximations, given that reporting was incomplete at the time of data collection.

County	Historical Water Consumption (million gallons per day, MGD)														
	1975			1980			1990			2000			2005		
	GW	SW	*Total*	GW	SW	*Total*	GW	SW	*Total*	GW	SW	*Total*	GW	SW	*Total*
George	0.866	0.194	*1.06*	1.112	0.068	*1.18*	1.92	0.52	*2.44*	1.36	0.65	*2.01*	1.5	0.6	*2.1*
Hancock	4.615	0.338	*4.953*	4.779	0.043	*4.822*	6.1	0.18	*6.28*	7.85	0.18	*8.03*	8.64	0.2	*8.84*
Harrison	25.723	537.444	*563.167*	24.24	502.2	*526.4*	26.35	315.54	*341.93*	35.73	320	*355.73*	41.09	330	*371.09*
Jackson	18.966	46.152	*65.118*	21.91	50.32	*72.23*	30.93	57.86	*88.8*	31.8	58.8	*90.6*	34.98	59.8	*94.78*
Pearl River	4.46	0.878	*5.338*	4.182	0.22	*4.402*	5.42	0.28	*5.7*	7.85	0.3	*8.15*	9.03	0.4	*9.43*
Stone	1.745	0.209	*1.954*	2.305	0.058	*2.363*	2.3	0.21	*2.51*	2.42	0.16	*2.58*	2.66	0.2	*2.86*

Table 2-6 Historical Water Consumption in the Gulf Region

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Figure 2-3
Gulf Region: Private Water
Supply Infrastructure

egend

- Private Water Well
- Interstate Highway
- U.S. Highway
- State Highway
- Railroad
- Stennis Space Center
- NASA
- City Limits
- County Boundary

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Major Consumers

Table 2-7 lists the ten largest users of groundwater in each county of the Gulf Region and includes the permitted capacity for each user.

County	Owner	No. of Wells	Permitted Capacity, (MGD)	Use
George	Combined Utility	3	0.7	Commercial
George	Lucedale	3	0.5	Commercial
George	Ronald Smith	2	0.28	Irrigation
George	Rocky Creek Utility	3	0.21	Commercial
George	Bexley Utility	2	0.18	Commercial
George	Thomas Dickerson	1	0.058	Irrigation
George	Clyde Dugan	1	0.0214	Irrigation
George	George County	1	0.02	Commercial
George	Rocky Creek Utility	1	0.0116	Industrial
George	Deans Nursery	1	0.0027	Industrial
Stone	International Paper	10	1.07	Industrial
Stone	Coastal Paper	2	0.75	Industrial
Stone	Wiggins	3	0.588	Commercial
Stone	Carnes Utility (Big Level)	1	0.32	Commercial
Stone	New Zion Utility	2	0.24	Commercial
Stone	Stone Utility	2	0.24	Commercial
Stone	McHenry Utility	2	0.15	Commercial
Stone	Sunflower Utility	2	0.11	Commercial
Stone	MS Gulf Coast CC	2	0.02	Commercial
Stone	Pine Burr Area Council	1	0.005	Commercial
Pearl River	Picayune	5	1.8	Commercial
Pearl River	Pearl R Central W.A.	13	1.69	Commercial
Pearl River	Poplarville	2	1.35	Commercial
Pearl River	Arizona Chemical	5	1	Commercial
Pearl River	Hillsdale Water Authority	2	0.72	Commercial
Pearl River	Center Water Assoc	5	0.65	Commercial
Pearl River	Hide-A-Way Club	2	0.35	Commercial
Pearl River	Nicholson	1	0.15	Commercial

Table 2-7 Major Groundwater Users in the Gulf Region

County	Owner	No. of Wells	Permitted Capacity (MGD)	Use
Pearl River	Sunny Oaks W.A.	2	0.1	Commercial
Pearl River	Dixie Utility	2	0.1	Commercial
Jackson	Pascagoula	10	4.75	Commercial
Jackson	Ocean Springs	4	4.61	Commercial
Jackson	Seachick	4	4.32	Industrial
Jackson	Moss Point	4	3.45	Commercial
Jackson	Miss Phosphates	6	3	Industrial
Jackson	Gautier	8	1.93	Commercial
Jackson	Chevron	2	1.08	Industrial
Jackson	Gulf Coast Water	12	1.25	Commercial
Jackson	Tesi, Inc.	7	0.92	Commercial
Jackson	Gulf South, LLC	2	0.72	Irrigation
Harrison	Gulfport	27	12.855	Commercial
Harrison	Biloxi	27	10.84	Commercial
Harrison	E.I. Dupont	5	8.27	Industrial
Harrison	Keesler AFB	11	5.393	Commercial
Harrison	Long Beach	9	4.472	Commercial
Harrison	Pass Christian	4	1.2	Commercial
Harrison	Grand Casinos	1	0.979	Commercial
Harrison	D'Iberville	5	0.76	Commercial
Harrison	Tesi, Inc.	5	0.42	Commercial
Harrison	ASH Corporation	1	0.333	Industrial
Hancock	NASA	6	3.89	Commercial
Hancock	Hancock County Port	1	1.73	Commercial
Hancock	Diamondhead Water/Sewer	3	1.4	Commercial
Hancock	Bay St Louis	4	1.22	Commercial
Hancock	Waveland	4	1.22	Commercial
Hancock	Calgon Carbon Corp	1	0.98	Industrial
Hancock	Gerald Boelte	1	0.8033	Industrial
Hancock	Kiln Water District	3	0.56	Commercial
Hancock	Polychemie, Inc.	1	0.54	Industrial
Hancock	TESI, Inc.	4	0.29	Commercial

Table 2-7 Major Groundwater Users in the Gulf Region (Continued)

Table 2-8 summarizes the largest users of surface water in the Gulf Region and indicates the permitted capacity for each user.

County	Owner	Permitted Capacity (MGD)	Use
Hancock	NASA	3.0	Industrial
Harrison	MS Power Company, Plant Watson	670	Industrial
Jackson	Jackson Co. Port Authority	200	Industrial
Jackson	Jackson Co. Port Authority	70	Commercial
Jackson	Jackson Co. Port Authority	4.0	Industrial
Jackson	MS Phosphates	14	Industrial
Jackson	Omega Protein	20.7	Industrial

Table 2-8 Major Surface Water Users in the Gulf Region

2.3.2 Wastewater Collection, Treatment and Disposal

2.3.2.1 Wastewater Treatment Facilities

Treated wastewater effluent that is discharged from a point source (a specific discharge location and receiving stream) must have a National Pollutant Discharge Elimination System (NPDES) permit issued by MDEQ and comply with applicable state and federal regulations. There are 481 NPDES permitted facilities in the Gulf Region, ranging from large industrial and municipal users to small, localized utility customers, such as schools, businesses and subdivisions.

The publicly-owned NPDES discharges in the Gulf Region are those classified as "Municipal" type permits. As connoted by the label Municipal, these facilities are typically owned and operated by cities. However, in the three coastal counties, the regional wastewater authorities own many of the treatment and discharge facilities. These authorities receive wastewater from the coastal cities and provide treatment and disposal service to the municipalities at a wholesale cost.

NPDES permits held by industries constitute the majority of the 481 total NPDES permits in the Gulf Region. These are permits for discharge of industrial process wastewater. Industrial facilities also may have pretreatment permits for discharge of industrial effluent into publicly owned treatment works (POTW). Federal NPDES permits are those that are issued by the Federal government and are serving facilities such as post offices and military installations. Permits classified as "Other" typically are for domestic or commercial uses and ownership. Some facilities operate disposal systems with no discharge to waters of the State. Such facilities are issued "State Operating No Discharge" permits.

Figure 2-4 maps the location of existing treatment facilities in the Gulf Region. Brief descriptions of the major facilities also follow in subsequent paragraphs.

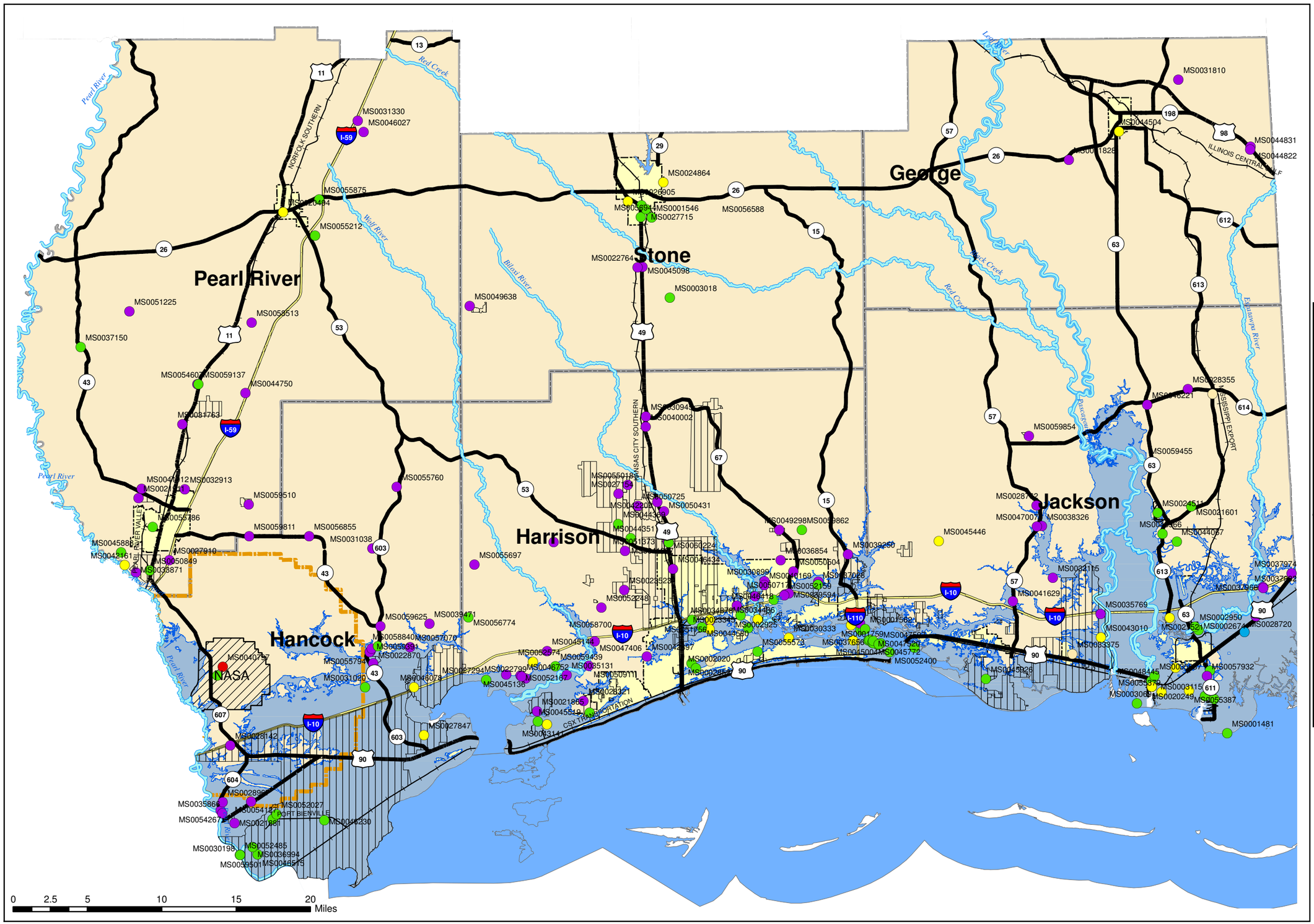

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Figure 2-4
Location of Treatment Facilities

Legend

- Domestic/Commercial
- Federal
- Industrial
- Municipal
- No Discharge
- Pretreatment
- Certificated Areas
- Surge Inundation
- Rivers
- Railroads
- State Highway
- U.S. Highway
- Interstate Highway
- Stennis Space Center
- NASA
- County Boundary
- City Limits

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MISSISSIPPI GULF REGION - WASTEWATER INFORMATION

Hancock County

At present there are 32 permitted wastewater treatment facilities (WWTFs) in Hancock County, including 2 Federal facilities, 4 municipal facilities, and 26 industrial facilities. Following is a brief description of some of the larger facilities in the county.

Waveland Plant

The Waveland WWTF is operated by the Hancock County Utility Authority and serves the Cities of Waveland and Bay St. Louis, and the Hancock County Water and Sewer District for areas north of Waveland to I-10, Shoreline Park, and some areas west of Waveland. The plant discharges into Edwards Bayou, which terminates into St. Louis Bay. Edwards Bayou is designated by MDEQ as an "impaired" stream, along with the Jourdan River, Bayou LaCroix and St. Louis Bay. Treatment is provided by a complete mix activated sludge unit and two oxidation ditches, all operating in parallel. The facility has a capacity of 4 million gallons per day but is permitted for a monthly average discharge of 4.9 million gallons per day. Prior to Katrina, influent flows were above capacity 34 percent of the time.

Pearlington Water and Sewer District

Although not yet constructed, a permit for a discharge from a WWTF currently exists with a capacity of 0.2 million gallons per day for discharge in the NASA Buffer Zone, a 175-square-mile uninhabited area in central and western Hancock County. However, there is no sewer service currently offered in this area. Prior to Katrina, the Pearlington area had planned a phased collector system and had requested that the Southern Regional Wastewater Management District (SRWMD), predecessor to the Hancock County Utility Authority, provide treatment services utilizing the NPDES permit.

Stennis Space Center

The Stennis Space Center has two operating lagoon systems with discharge points on Mikes River (0.160 MGD), a tributary of the Pearl River, and on the Pearl River itself (0.100 MGD). Each lagoon uses water hyacinths in its cells, and polishing is provided by constructed artificial wetlands

Diamondhead Water and Sewer District

The Diamondhead Water and Sewer District has its own collection and treatment facilities to serve the Diamondhead community. The two conventional oxidation ditches in parallel have a combined capacity of 1.25 million gallons per day daily average flow. The plant discharges effluent to Rotten Bayou, a tributary of the Jourdan River. Maximum monthly average flow was about 1.25 million gallons per day prior to Katrina.

Port Bienville Industrial Park

This Industrial Park is located in the southwestern part of Hancock County at the mouth of the Pearl River. There is a small package plant (0.075 million gallons per day) for domestic wastewater and a larger facility (0.183 million gallons per day) for industrial wastewater. The plants discharge into the Pearl River.

Stennis International Airport
The airport and associated industrial area are served by an extended aeration plant with a design capacity of 0.080 million gallons per day, which discharges into the Jourdan River.

Kiln Water and Fire Protection District
There are no central sewer systems available in Hancock County north of Interstate 10; consequently, there is no sewer service offered in this area. Prior to Katrina, the Kiln District had planned a phased collector system and had requested that SRWMD provide treatment services.

Northern Hancock County
The northern area of Hancock County is predominantly rural and has no central treatment facilities. Residences and businesses are served by individual on-site wastewater disposal systems (IOWDS).

Harrison County

The Harrison County Utility Authority operates seven wastewater treatment plants, with discharge permits ranging from 0.200 to 11.7 million gallons per day. Following are descriptions of the pre-storm conditions at these facilities.

D'Iberville WWTF
This oxidation-ditch plant is located near the north bank of the Back Bay of Biloxi, into which it discharges. Permitted monthly average flow is 1.156 million gallons per day. The facility was constructed in 1987, and a sludge holding lagoon was added in 1993. Pre-Katrina flows were approximately 90 percent of capacity.

West Biloxi WWTF
This activated sludge plant is located north of Pass Road and east of Popps Ferry Road, south of the Back Bay. It was originally constructed in 1973 and modified several times before a major expansion in 1989. It has a permitted capacity of 11.7 million gallons per day, and pre-Katrina flow averaged 8.3 million gallons per day. The facility receives flow from Gulfport and west Biloxi, but construction of new force mains will divert flow to the Gulfport North WWTF and allow the West Biloxi plant to serve future growth from west Biloxi and Keesler Air Force Base.

Keegan Bayou WWTF
The Keegan Bayou WWTF was originally constructed as a trickling filter plant in the 1950s and converted to a sequencing batch reactor plant in 1996. Construction of sludge processing improvements was begun in 2004. The facility is located west of Interstate 110 and several blocks south of the Back Bay, into which it discharges. The permitted monthly average flow is 10 million gallons per day, and before Katrina average monthly flow was 4.8 million gallons per day.

Gulfport South WWTF
This facility is north of the Gulfport-Biloxi Regional Airport and south of Bernard Bayou. It was originally constructed by the Corps of Engineers as a primary treatment facility in 1940 and converted to a trickling filter plant in 1961.

Improvements were made in the 1980s and 1990s. The plant has a seasonal permit for 10.5 million gallons per day monthly average flow from May through October and 16 million gallons per day from November through April. Average flow in the maximum month was 11 million gallons per day prior to Katrina.

Gulfport North WWTF

The Gulfport North WWTF is an oxidation ditch plant located in the Bayou Bernard Industrial Park south of Interstate 10 and discharges through an effluent ditch indirectly into Bayou Bernard. The plant has a permit for a monthly average flow of 7.75 million gallons per day, and the maximum monthly flow prior to Katrina was 4.725 million gallons per day. At the time of the storm, plans were being made to divert flow from west Biloxi to this facility.

Long Beach/Pass Christian WWTF

This plant, located south of Johnson Bayou in Pass Christian, receives flow from Long Beach, Pass Christian, and the unincorporated area of Henderson Point. It was constructed as an oxidation ditch in 1988 at the site of an existing wastewater treatment facility. The current design capacity of this facility is 7 million gallons per day, with a maximum monthly flow prior to Katrina of 4.875 million gallons per day.

West Harrison (DeLisle) WWTF

The Harrison County Utility Authority operates a 0.20 million gallons per day facility south of Interstate 10 in DeLisle. The facility currently is sized to service DuPont, the DeLisle Elementary School and approximately 330 residences, with a reserve capacity of approximately 0.075 million gallons per day.

Eagle Point Lagoon

The Harrison County Utility Authority operates this lagoon in the northern part of Biloxi. The facility currently is approaching its permitted capacity of 0.18 million gallons per day.

East Central Harrison County WWTF

A 0.10 million-gallon-per-day package plant is scheduled for completion in January 2007, in order to serve the Tradition development north of Biloxi and Gulfport. The Harrison County Utility Authority has an NPDES permit to discharge a total of 4.0 million gallons per day from the facility as new phases are constructed.

Stone County

There are six NPDES permit holders in Stone County that lie outside the Wiggins corporate limits. The largest facility treating domestic wastewater is a lagoon at Perkinston operated by Mississippi Gulf Coast Community College, with a permitted flow of 0.1 million gallons per day.

City of Wiggins WWTFs

The City of Wiggins is served by a wastewater collection system that is divided into two drainage areas, East and West. The West System's aerated lagoon and wetland cell are receiving wastewater flows in excess of its design capacity. The East Lagoon is the larger and currently has an unused cell which could be put into service to

increase its capacity. The existing permitted flows are 0.015 million gallons per day for the West and 0.48 million gallons per day for the East. Projected flows for Wiggins total 0.58 million gallons per day, including 0.38 million gallons per day from the West System and 0.20 million gallons per day from the East System. Improvements proposed before Katrina would reroute these flows, resulting in a flow of 0.07 million gallons per day for the West System and 0.52 million gallons per day for the East System.

Pearl River County

City of Picayune WWTF

The City of Picayune treats wastewater with an aerated lagoon followed by a marsh treatment system. Design capacity is 2.0 million gallons per day, but the City holds an NPDES permit for 3.075 million gallons per day. Prior to Katrina, maximum monthly flow was 3.9 million gallons per day.

Dixie Utilities WWTF

The City of Picayune acquired Dixie Utilities, which serves Westchester Heights outside the City, from a private owner. Funding is needed to bring this plant to proper standards, since the entire water and wastewater utility system is in dire need of rehabilitation. Estimated average flow is 0.036 million gallons per day.

City of Poplarville WWTF

The City of Poplarville operates a wastewater collection system and treatment plant with a design capacity of 0.6 million gallons per day. The City holds an NPDES permit for 3.08 million gallons per day, and prior to Katrina average flows were 1.73 million gallons per day.

Jackson County

The Jackson County Utility Authority operates four wastewater treatment plants with discharge permits ranging from 3 to 10 million gallons per day. Following are pre-storm descriptions of conditions at these facilities.

Gautier WWTF

The Gautier facility is located in the City of Gautier and handles the wastewater from the city and immediate area. The treatment facility consists of two oxidation ditches and two clarifiers operating in parallel. The facility was originally constructed and permitted to handle 4 million gallons per day, but the highest monthly flow before Katrina was 2.15 million gallons per day. The plant discharges into the West Pascagoula River.

Escatawpa WWTF
The existing facility is a 3 million gallon per day complete mix conventional aeration plant. The existing sludge processing equipment consists of digestion tanks and two small filter belt presses. The plant is producing more sludge than a typical oxidation facility and consequently is experiencing difficulty with sludge removal.

Pascagoula/Moss Point WWTF
This treatment facility is located in the City of Pascagoula and serves the southern portion of Moss Point as well as the City of Pascagoula. The facility consists of an extended aeration activated sludge process. The discharge is into the Pascagoula River and is permitted and designed for 10 million gallons per day. The existing flow to the plant is averaging approximately 5 million gallons per day.

West Jackson Facility
The West Jackson Facility is located in west Jackson County on Seaman Road, contiguous to the National Sand Hill Crane Refuge. The facility serves the City of Ocean Springs, the West Jackson County Utility District and surrounding area. The facility consists of a lagoon, wetlands area and land application system and is permitted for discharge of 5 million gallons per day into Bayou Costapia. Current flow to the facility is approximately 4 million gallons per day.

George County

The City of Lucedale provides water and sewer services to its citizens and to customers in areas in close proximity to the corporate limits. The City also provides water and sewer services for George County High School and George County Industrial Park. Flow capacity for this treatment facility is 0.52 million gallons per day, with an average pre-Katrina flow of approximately 0.39 million gallons per day.

2.3.2.2 Collection Systems

Wastewater collection systems have been established over the past several decades in the more densely populated portions of the Gulf Region, especially within municipal corporate limits and within planned developments. As stated earlier, it is not uncommon that the collection systems are owned and operated independently from the wastewater treatment and discharge facilities.

Hancock County

The Diamondhead Water and Sewer District operates the Diamondhead Wastewater Treatment Plant and collection system in Hancock County. Before Katrina, problems included excessive inflow and infiltration, as well as capacity related issues for pump stations and force mains. Prior to the storm the District served 3,900 residential and commercial customers.

Hancock County Port & Harbor Commission operates and provides sewer service to the Stennis International Airport (SIA) and Port Bienville (PB). The facilities serve 24 commercial customers and had pre-storm flow capacities of 0.080 million gallons per

day for SIA and 0.105 million gallons per day for PB. Prior to Hurricane Katrina, the major problem was that the Port & Harbor Commission had no ability to deal with increased future capacity.

Hancock County Water and Sewer District provides sewer infrastructure for the collection and transportation of wastewater. Service is provided to 1,600 residential and 3 commercial customers, who fall within the unincorporated areas of Hancock County south of Interstate-10. Approximately 1,500 homes do not receive public sewer service and rely on onsite systems. Flow capacity of the District's collection and transportation system is 0.70 million gallons per day. Pre-Katrina problems included the need for additional lift stations and force mains for collection and transmission systems and the need for increased treatment capacity.

The Cities of Waveland and Bay Saint Louis are responsible for sewer collection and transmission within their respective cities. Waveland's pre-Katrina capacity was 4 million gallons per day serving 1,424 residential customers and 127 commercial users. Both cities' local collection systems generally consist of gravity sewers with pump stations. Due to lack of operation and maintenance, the collection systems suffered historically from excessive infiltration of groundwater and rainwater. Flows from Bay St. Louis comprise approximately 45 percent of the regional flow to the Waveland plant, while flows from Waveland comprise approximately 37 percent of the flow.

Several populated areas of the county are currently unsewered, with residents utilizing onsite systems, many of which were failing prior to Katrina. Some of these areas include Pearlington, the Lakeshore and Clermont Harbor areas west of Waveland, and the Kiln area.

Harrison County

The City of Biloxi has a collection system that was carrying 80-90 percent of its capacity prior to Hurricane Katrina. Biloxi also lacks a collection system in some northern parts of the City. The collection system delivers the sewage flows to the transmission system of the Harrison County Utility Authority, which then transports the flows to the treatment plant. That transmission system was operating at 95 percent capacity prior to Hurricane Katrina, and a portion of its pump stations and force mains were damaged by the storm. Additionally, inflow and infiltration have increased from damaged collection lines and appurtenances and sewers that are filled with sediment and storm debris.

The D'Iberville area is 90 percent sewered, with an estimated 100 unsewered homes located along Lamey Bridge Road in the newly annexed area. Inflow and infiltration were prevalent in the collection system prior to Katrina. Residential growth likely will occur in the northern part of the City, while growth along the coast likely will be from casinos, apartments, and condos.

East Central Harrison County Public Utility District currently serves no customers. A collection system to serve the first phase of The Village at Tradition is under construction and is expected to be complete by January 2007.

The City of Gulfport serves residential, industrial, and commercial customers. The collection and transmission systems in older parts of the City are in severe need of rehabilitation and upgrades. The collection system in the Orange Grove area of the northern part of the City is inadequate and in need of upgrade as well.

The facilities of Henderson Point/Pass Christian Isles Water & Sewer District No. 1 were completely destroyed during hurricane Katrina.

The City of Long Beach serves residential and commercial customers with a collection/transmission system handling a flow capacity of 6,500 gallons per minute. All of the Long Beach area is sewered; and prior to Katrina, the City was preparing to provide new interceptor sewers to serve the beachfront area along U.S. Highway 90, where future growth was expected to occur.

As with Long Beach, all of Pass Christian is sewered, and collection lines have a capacity of 4,900 gallons per minute and 2,500 gallons per minute for transmission. Pass Christian continues to experience pre-Katrina capacity problems in the transmission system located in the southeast corner of the city; and the City's system experienced some pump station damage as a result of Hurricane Katrina.

West Harrison Water and Sewer District operates a collection system serving commercial and industrial customers in the DeLisle area.

Jackson County

In general, pre-Katrina problems in Jackson County included transmission systems with insufficient capacity to meet continuing population growth and collection systems with excessive inflow and infiltration.

The Escatawpa Utility District (EUD) provides wastewater collection for 2,500 customers within its boundaries. With the exception of hurricane damage and general deterioration of the infrastructure, there are no known problems with the system that were reported during this evaluation.

The City of Gautier provides sanitary sewer collection service to 6,460 residential and 340 commercial customers. Treatment is provided by the Jackson County Utility Authority (JCUA). System problems include failing onsite systems in unsewered areas and operational and maintenance problems with limited and isolated collection systems. The majority of unsewered areas are located in the northeast, northwest, and southwest quadrants of the City.

The Helena Utility District was created in January 2006 and provides water and sewer service to the Helena Community. The District currently serves 286 residential customers with collection and transmission systems having capacity for 0.22 million gallons per day. The Helena area is largely unsewered with varying individual on-site disposal systems being utilized, as well as privately owned utilities.

The West Jackson County Utility District is responsible for wastewater collection for 2,598 residential and 162 commercial customers. System capacity is approximately 2.5 million gallons per day. Pre-Katrina problems included system infiltration in a

privately owned system located within the West Jackson County Utility District area. Currently 85 percent of the district is sewered with 2,346 customers being served by privately owned utilities. Approximately 95 percent of the private utility customers are served by Coast Water Works, Inc., and the remaining 5 percent are served by Westwick Utilities and Total Environmental Systems, Inc. The district also has three small areas that currently use onsite systems.

There are no wastewater collection or treatment systems in the Vancleave, Hurley and Wade areas. Unsewered areas, located north of the coastal cities, are being served by onsite systems maintained by the homeowners. Future development is expected to occur along the County's entire coastline and in the areas of Vancleave, St. Martin, Escatawpa, Wade, Hurley, and Helena.

Jackson County Port Authority provides 10 to 15 industrial customers with sanitary sewer services. The Port Authority has plans to connect their Bayou Casotte Harbor wastewater system directly to the Jackson County Utility Authority (JCUA) system when possible.

Pearl River County

The City of Picayune provides sewer service for the City and some adjacent areas, serving a total of 5,974 residential, commercial, and industrial customers. There are continuing problems with treatment, transmission and collection facilities; however, infiltration appears to be the main contributor to recurring system overflows.

The City of Poplarville provides sewer service for 720 residential and 186 commercial customers in the City and continues to experience capacity problems and difficulties in maintaining its aging facilities. There also are unsewered areas located outside the corporate limits. Pearl River Community College was constructing additions before Katrina and still has plans to add an additional 500 dormitory rooms within the next two years.

Pearl River County provides no treatment or collection of wastewater. However there are about 1,500 customers being served by private and member-owned utilities. The unincorporated areas outside of the following areas are unsewered and rely on onsite systems. These areas include Nicholson, Westchester (Dixie Utilities), Round Rock Subdivision on Moeller Road, Wildwood Subdivision on Highway 11, and New Arbor Lake on South Valley Road. Residential development is likely to occur around Interstate 59 and the Highway 11 corridor. Residential developments are continuing on Highway 43 and Highway 26, and other planned projects will bring development to the central portion of the county.

Stone County

The City of Wiggins provides sewer service to 1,500 residential customers, as well as a number of commercial and industrial customers. The City's present system flows are generally within the system's capacity. There is no sewer service provided in the unincorporated areas of the county.

George County

The City of Lucedale provides sewer service to its residents and to George County High School, George County Industrial Park, and some adjacent areas. Lucedale currently serves 759 residential customers and 321 commercial customers. Age, lack of redundant systems, and insufficient capacity continue to pose problems for the City's system. Corley, a large subdivision, is the only unsewered portion of the City; and it is currently served by individual onsite systems.

2.3.2.3 Areas Served by Individual On-Site Wastewater Disposal Systems

Sanitary sewer service is unavailable in large parts of the Gulf Region, particularly in unincorporated areas. In areas where sewer service is not available, residents and businesses must install and operate individual onsite wastewater treatment and disposal systems. Also referred to simply as onsite systems, these units typically consist of septic tanks and absorption fields located on the property where the wastewater is generated. These systems have a tendency to fail when not maintained properly, when misapplied in areas with unsuitable soils or high water tables, or when absorption fields become clogged. Estimates are that in the Gulf Region, a total of 7.3 million gallons per day of improperly treated sewage flows into the environment from failing individual on-site systems.

Soils in the Gulf Region generally are not conducive to installation of absorption fields for septic tanks. Relative suitability ranges from about 8 percent in Hancock County to about 75 percent in George County. When soil conditions will not support effective operation of septic tanks and absorption fields, residents must use aerobic treatment systems. These mechanical systems are more complicated to operate than septic tanks and often fail due to lack of maintenance by homeowners.

The Mississippi Department of Health (MDH) regulates the use of onsite systems in the State. Prior to installation of onsite systems in subdivisions of 30 lots or greater in areas with no certificated sewer system (or 10 lots or greater inside a certificated area, district or authority), the subdivision developers are required to demonstrate that sanitary sewers are not economically feasible. If MDH concurs with the developer, they typically will approve individual lots for either septic tanks or alternate systems, depending on soil suitability.

Regulation of onsite systems historically has been a difficult task. The standard of proof for infeasibility of sewer systems has been fairly low, and the feasibility of sewering a particular subdivision generally has been considered independently of neighboring, or even adjacent, subdivisions. This process has resulted in a proliferation of onsite systems concentrated in particular areas. Conditions are commonly found where an area in the county might contain multiple subdivisions with hundreds of lots, each using an individual onsite system. Had such areas been considered holistically, sewers likely would have been deemed feasible for all the lots.

Data derived from MDH databases are summarized in **Table 2-9** and include the number of on-site systems approved by MDH within each county. The number of

systems was equated to a volumetric flow rate by applying factors of 3 persons per household at a rate of 66 gallons per day per person.

County	No. of Housing Units	No. of On-Site Treatment Units	Estimated Failing Units	Estimated Flow from Failing Units (MGD)
George	7,649	6,597	990	0.196
Hancock	22,363	12,020	7,212	1.428
Harrison	83,631	24,019	9,608	1.902
Jackson	54,035	22,664	11,332	2.244
Pearl River	21,457	15,953	6,381	1.263
Stone	5,445	3,899	1,560	0.309
Totals	194,580	85,152	37,083	7.342

Table 2-9 On-Site Treatment Units within the Gulf Region

2.3.2.4 Major Discharge Sources

Table 2-10 provides a list of the ten largest Industrial/Commercial wastewater dischargers in each county of the Gulf Region. It is significant to note that, out of sixty listed dischargers, only ten have permitted flows of more than 1 million gallons per day.

Table 2-11 lists the permitted municipal wastewater treatment facilities in the Gulf Region.

2.3.3 Flood Control, Drainage and Stormwater Management

Flood control, drainage, and stormwater management within the Gulf Region is accomplished by means of various man-made and natural channels, basins, reservoirs, and dams. There is no centralized or connected "system" in the planning area, other than the naturally connected hydrologic basins that drain the region. These basins include 3 major watersheds and 27 sub-watersheds, many of which cross jurisdictional boundaries. **Figure 2-5** depicts the drainage courses of the Gulf Region. Detailed flood control and stormwater data are discussed hereafter by county.

NPDES Permit No.	Name	Type	Major	SIC Description	County	Receiving Stream	Basin	Permit Flow (MGD)	Future Flow (MGD)
MSU096084	FOUR MILE TRUCK STOP	Industrial		GASOLINE SERVICE STATIONS	GEORGE	NO DISCHARGE		0.02500	0.0320
MS0031810	ROCKY CREEK ELEMENTARY SCHOOL	Industrial		ELEMENTARY & SECONDARY SCHOOLS	GEORGE	ROCKY CREEK	ESCATAWPA	0.01800	0.0220
MS0031828	CENTRAL ELEMENTARY SCHOOL	Industrial		ELEMENTARY & SECONDARY SCHOOLS	GEORGE	BIG CREEK	PASCAGOULA	0.01600	0.0200
MSU098113	GEORGE COUNTY SCHOOLS	Industrial		ELEMENTARY & SECONDARY SCHOOLS	GEORGE	NO DISCHARGE		0.00960	0.0120
MSU096052	ROCKY CREEK CATFISH COTTAGE	Industrial		EATING PLACES	GEORGE	NO DISCHARGE		0.00250	0.0030
MS0044831	MDOT HWY 98 TRUCK SCALES-EAST	Industrial		INSPECTION & FIXED FACILITIE	GEORGE	TRIBUTARY OF ROCKY CREEK	ESCATAWPA	0.00150	0.0020
MS0044822	MDOT HWY 98 TRUCK SCALES-WEST	Industrial		REG & ADMIN OF TRANS PROGRAMS	GEORGE	TRIBUTARY OF ROCKY CREEK	ESCATAWPA	0.00150	0.0020
MSR220012	TRI-STATE POLE AND PILING	Industrial		WOOD PRESERVING	GEORGE	ROCKY CREEK	PASCAGOULA	0.00100	0.0013
MSU097105	COUNTRY FARMS QUAIL	Industrial		SAUSAGES & PREPARED MEAT PROD	GEORGE	NO DISCHARGE		0.00000	0.0000
MSU096134	FAMILY LIFE FELLOWSHIP	Industrial		RELIGIOUS ORGANIZATIONS	GEORGE	NO DISCHARGE		0.00000	0.0000
MS0046515	CALGON CARBON CORPORATION	Industrial		INDUSTRIAL INORGANIC CHEMICALS	HANCOCK	MULATTO BAYOU	LOWER PEARL	0.25000	0.3200
MS0022870	TESI/JOURDAN RIVER SHORES	Industrial		LAND SUBDIVIDERS & DEV, EX CEM	HANCOCK	JOURDAN RIVER	MISSISSIPPI COASTAL	0.21400	0.2600
MS0052485	WELLMAN OF MISSISSIPPI INC	Industrial		PLSTC MAT./SYN RESINS/NV ELAST	HANCOCK	WOODY BAYOU & PEARL RIVER	LOWER PEARL	0.21000	0.3000
MSP091316	WELLMAN OF MISSISSIPPI INC.	Industrial		PLSTC MAT./SYN RESINS/NV ELAST	HANCOCK	MS0030198 - PORT BIENVILLE IND. PK.	LOWER PEARL	0.21000	0.3000
MS0021610	NASA JOHN C STENNIS SPACE CENT	Industrial		SPACE RESEARCH AND TECHNOLOGY	HANCOCK	EAST PEARL RIVER	ESCATAWPA	0.20000	0.2500
MS0030198	HANCOCK CNTY PORT & HARBOR	Industrial		OPER OF NONRESIDENTIAL BLDGS	HANCOCK	PEARL RIVER	MISSISSIPPI COASTAL	0.18000	0.2000
MS0052027	EAGLEBROOK INCORPORATED	Industrial		INDUSTRIAL INORGANIC CHEMICALS	HANCOCK	PORT BIENVILLE BARGE CANAL	MISSISSIPPI COASTAL	0.12000	0.1600
MS0046230	TENNESSEE GAS PIPELINE COMPANY	Industrial		NATURAL GAS TRANSMISSION	HANCOCK	BRYAN BAYOU	MISSISSIPPI COASTAL	0.08600	0.1000
MS0031020	STENNIS AIR INDUSTRIAL PARK	Industrial		WATER SUPPLY	HANCOCK	JOURDAN RIVER	MISSISSIPPI COASTAL	0.08000	0.1000
MS0054127	POLYCHEMIE INC	Industrial		CHEMICALS & CHEM PREP, NEC	HANCOCK	PEARL RIVER	LOWER PEARL	0.06300	0.0900
MS0002925	MISSISSIPPI POWER COMPANY	Industrial	M	ELECTRICAL SERVICES	HARRISON	BILOXI BACK BAY/BIG LAKE	MISSISSIPPI COASTAL	265.20000	300.0000
MS0027294	E I DU PONT DE NEMOURS-DELISLE	Industrial	M	INORGANIC PIGMENTS	HARRISON	SAINT LOUIS BAY	MISSISSIPPI COASTAL	5.96600	7.0000
MS0022373	LONG BEACH INDUSTRIAL PARK	Industrial		SEWERAGE SYSTEMS	HARRISON	DITCH TO CANAL #1	MISSISSIPPI COASTAL	0.60000	0.8000
MS0047520	OLE BILOXI SEAFOOD CO	Industrial		FRE OR FROZ PCK FISH, SEAFOOD	HARRISON	BACK BAY OF BILOXI	MISSISSIPPI COASTAL	0.22600	0.3000
MS0034436	HC/EAGLE POINT POTW	Industrial		SEWERAGE SYSTEMS	HARRISON	BILOXI RIVER	MISSISSIPPI COASTAL	0.18200	0.2500
MSP091520	GULF COAST LAUNDRY SERVICES	Industrial		DRYCLEAN PLANTS, EXC RUG CLEAN	HARRISON	MS0027537 - BERNARD BAYOU IND DIST	MISSISSIPPI COASTAL	0.17500	0.2100
MSP091667	SOUTHERN LINEN SERVICE INC	Industrial		LINEN SUPPLY	HARRISON	MS0022373 - LONG BEACH INDUST PARK	MISSISSIPPI COASTAL	0.15000	0.1750
MS0040142	GOLDEN GULF COAST PACKING CO	Industrial		FRE OR FROZ PCK FISH, SEAFOOD	HARRISON	BACK BAY OF BILOXI	MISSISSIPPI COASTAL	0.13400	0.1700
MSP091211	AMERIPRIDE LINEN & APPAREL SER	Industrial		LINEN SUPPLY	HARRISON	MS0051756 - GULFPORT POTW	MISSISSIPPI COASTAL	0.10000	0.1200
MS0027154	RIVERBEND UTILITIES INC	Industrial		LAND SUBDIVIDERS & DEV, EX CEM	HARRISON	LITTLE BILOXI RIVER	MISSISSIPPI COASTAL	0.10000	0.1300
MS0002020	ANIP ACQUISITION COMPANY	Industrial	M	PHARMACEUTICAL PREPARATIONS	HARRISON	BRICKYARD BAYOU	MISSISSIPPI COASTAL	0.0500	0.0650
MS0021601	JACKSON CO PORT AUTHORITY	Industrial		WATER SUPPLY	JACKSON	BLACK CREEK	MISSISSIPPI COASTAL	72.00000	100.0000
MS0001481	CHEVRON TEXACO PRODUCTS CO	Industrial	M	PETROLEUM REFINING	JACKSON	MISSISSIPPI SOUND OF BAYOU CASOTTE	MISSISSIPPI COASTAL	9.33300	12.0000
MS0043966	SEACHICK (MS) INCORPORATED	Industrial		FRE OR FROZ PCK FISH, SEAFOOD	JACKSON	CLARKE BAYOU	MISSISSIPPI COASTAL	6.20000	7.5000
MS0002950	OMEGA PROTEIN INC	Industrial		ANIMAL AND MARINE FATS & OILS	JACKSON	ESCATAWPA RIVER	ESCATAWPA	6.00000	7.5000
MS0003115	MISSISSIPPI PHOSPHATES CORP	Industrial	M	PHOSPHATIC FERTILIZERS	JACKSON	BAYOU CASOTTE	PASCAGOULA	4.20000	5.2000
MS0057151	PASCAGOULA WATER TREATMENT	Industrial		WATER SUPPLY	JACKSON	KREBS LAKE	MISSISSIPPI COASTAL	2.50000	3.5000
MSG130083	CHEVRON PIPELINE CO	Industrial		NATURAL GAS TRANSMISSION	JACKSON	MISSISSIPPI SOUND	MISSISSIPPI COASTAL	1.50000	2.0000
MSP090360	FIRST CHEMICAL CORPORATION	Industrial		INDUST. ORGANIC CHEMICALS NEC	JACKSON	MS0020249 - PASCAGOULA POTW	MISSISSIPPI COASTAL	0.60000	0.8000
MS0002674	INTERNATIONAL PAPER CO	Industrial		PAPER MILLS	JACKSON	ESCATAWPA RIVER	ESCATAWPA	0.57000	0.7500
MS0045926	AQUACULTURE CORP OF AMERICA	Industrial		ANIMAL AQUACULTURE	JACKSON	SIMMONS BAYOU	MISSISSIPPI COASTAL	0.50000	0.7500
MS0060135	WARM HUNTING CLUB	Other			JACKSON				
MSG130073	FLORIDA GAS TRANSMISSION CO	Industrial		NATURAL GAS TRANSMISSION	PEARL RIVER	HOBOLOCHITTO CREEK		0.75000	1.0000
MS0055875	PEARL RIVER CHIP MILL	Industrial		SAWMILLS & PLANING MILLS, GEN	PEARL RIVER	UNNAMED TRIBUTARY/POPLAR SPRINGS	LOWER PEARL	0.36000	0.5000
MS0033871	NICHOLSON WATER & SEWER DIS	Industrial		SEWERAGE SYSTEMS	PEARL RIVER	MCCALL RIVER	LOWER PEARL	0.18000	0.2500
MS0059510	ROUND ROCK UTILITIES LLC	Industrial		LAND SUBDIVIDERS & DEV, EX CEM	PEARL RIVER	UNNAMED THENCE BLACKSNAKE BRANCH	LOWER PEARL	0.10000	0.1200
MS0046027	WOLF RIVER RANCH RESORT	Industrial		HOTELS AND MOTELS	PEARL RIVER	WOLF RIVER	MISSISSIPPI COASTAL	0.06400	0.0750
MS0031763	PEARL RIVER COUNTY SCH DIST	Industrial		ELEMENTARY & SECONDARY SCHOOLS	PEARL RIVER	GEORGE BRANCH	LOWER PEARL	0.05000	0.0600
MS0058513	PEARL RIVER BOARD SUPERVISORS	Industrial		CORRECTIONAL INSTITUTIONS	PEARL RIVER	UNNAMED INTO HOBOLOCHITTO CREEK	LOWER PEARL	0.04000	0.0600
MS0021911	WESTCHESTER HEIGHTS S/D	Industrial		LAND SUBDIVIDERS & DEV, EX CEM	PEARL RIVER	LONG BRANCH	LOWER PEARL	0.04000	0.0500
MSG120065	SOUTHERN EARTH SCIENCES INC	Industrial		GASOLINE SERVICE STATIONS	PEARL RIVER	TRIBUTARY OF CATAHOULA CREEK		0.03600	0.0420
MS0003018	PERKINSTON SAND AND GRAVEL	Industrial		CONSTRUCTION SAND AND GRAVEL	STONE	RED CREEK	BLACK	2.20000	3.0000
MS0033057	COASTAL PAPER COMPANY	Industrial		PAPER MILLS	STONE	TRIBUTARY THENCE RED CREEK	BLACK	0.80000	1.1000
MS0022764	MS GULF COAST JR COLLEGE	Industrial		JUNIOR COLLEGES & TECH INSTITU	STONE	TEN MILE CREEK	BLACK	0.11000	0.1300
MSP090033	INTERNATIONAL PAPER COMPANY	Industrial		WOOD PRESERVING	STONE	MS0024864 - WIGGINS POTW #1	BLACK	0.10000	0.1300
MS0056588	BIG LEVEL UTILITY ASSOC INC	Industrial		LAND SUBDIVIDERS & DEV, EX CEM	STONE	TRIB. OF OLD CREEK	BLACK	0.07000	0.1000
MS0059684	MCHENRY UTILITIES ASSOC INC	Industrial		LAND SUBDIVIDERS & DEV, EX CEM	STONE	MCHENRY BRANCH		0.07000	0.1000
MSP090030	TIMCO INC	Industrial		WOOD PRESERVING	STONE	MS0024864 - WIGGINS POTW #1	BLACK	0.05800	0.0700
MS0049638	LAKELAND SALES INC	Industrial		LAND SUBDIVIDERS & DEV, EX CEM	STONE	SILVER RUN CREEK	BLACK	0.01000	0.0120
MS0058084	LAZY JS RV PARK	Industrial		REC VEHICLE PARKS & CAMPSITES	STONE	PASCAGOULA RIVER		0.00600	0.0070
MS0057452	O'RAGS INC.	Industrial		SEWERAGE SYSTEMS	STONE	SAUCIER_CREEK/MCHENRY BRANCH	MISSISSIPPI COASTAL	0.00330	0.0040

Notes: This file created from data received from Mike Donahoo, EPA Region 4, Permits Compliance Section
Future flows based on responses to questionaires, analysis of permitted flow vs actual flow, type of discharge (ie cooling water, etc.) and other factors.

EPA-DEQ-DMR-NPDES-Sorted by Permit Number

NPDES Permit No.	Data Sources	Name of Permit Holder	Facility Name	Permit Type	SIC Description	Major	City	County	Receiving Stream	Receiving Basin	Type of WWTF	Flow in MGD				$BOD_{5\ in}$ mg/l			SS in mg/l			$NH_{3\ in\ mg/l}$		
												Permit-EPA	Permit-DMR	Recorded-DMR	%	Permit	DMR	%	Permit	DMR	%	Permit	DMR	%
(*7)	(*1)	(*3)	(*2)	(*3)	(*3)	(*3)	(*2)	(*2)	(*3)	(*3)		(*4)	(*5)	(*5)	(*6)									
MS0020249	DEQ/EPA	GC/PASCAGOULA/MOSS POINT POTW	Mississippi Gulf Coast Regional Wastewater Authority, Pascagoula POTW	Municipal	SEWERAGE SYSTEMS	M	Pascagoula	JACKSON	PASCAGOULA RIVER	PASCAGOULA		10.00	10.00	5.41	54%	30	7.55	25%	30	4.99	17%	-	10.07	-
MS0020494	DEQ/EPA	POPLARVILLE POTW	Poplarville POTW	Municipal	SEWERAGE SYSTEMS		Poplarville	PEARL RIVER	JUMP OFF CREEK	MISSISSIPPI COASTAL		0.64	0.64	0.55	86%	15	3.72	25%	30	4.79	16%	2	1.72	86%
MS0021521*	DEQ/EPA	GC/ESCATAWPA - ACT SLUDGE	Mississippi Gulf Coast Regional Wastewater Authority, Escatawpa	Municipal	SEWERAGE SYSTEMS	M	Escatawpa	JACKSON	ESCATAWPA RIVER	PASCAGOULA		3.00	N/R	1.40		425	5.69	1%	425	5.2	1%	142	3.96	3%
MS0023159	DEQ/EPA	HC/EAST BILOXI POTW	Harrison County Wastewater and Solid Waste Management Authority, East Biloxi POTW	Municipal	SEWERAGE SYSTEMS	M	Biloxi	HARRISON	KEEGAN BAYOU AND BACK BAY OF BILOXI	MISSISSIPPI COASTAL		10.00	18.50	7.65	41%	30	16.00	53%	30	26	87%	15	5	33%
MS0023345	DEQ/EPA	HC/GULFPORT POTW_SOUTH	Harrison County Wastewater and Solid Waste Management Authority, Gulfport POTW	Municipal	SEWERAGE SYSTEMS	M	Gulfport	HARRISON	BERNARD BAYOU (SEG 168)	MISSISSIPPI COASTAL		16.00	26.50	15.85	60%	22	7.00	32%	30	9	30%	15	1.3	9%
MS0024864	DEQ/EPA	WIGGINS POTW - # 1	Wiggins POTW, Number 1	Municipal	SEWERAGE SYSTEMS		Wiggins	STONE	FLINT CREEK	PASCAGOULA		0.48	0.48	0.44	91%	45	35.00	78%	90	24	27%	-	11.85	
MS0026905	DEQ/EPA	WIGGINS POTW - # 2	Wiggins POTW, Number 2	Municipal	SEWERAGE SYSTEMS		Wiggins	STONE	FOUR MILE CREEK	PASCAGOULA		0.16	0.16	0.19	121%	30	25.00	83%	90	10	11%	14	10	71%
MS0027537	DEQ/EPA	BERNARD BAYOU INDUSTRIAL DIST	Bernard Bayou Industrial District	Municipal	SEWERAGE SYSTEMS		Gulfport	HARRISON	DITCH TO BERNARD BAYOU	MISSISSIPPI COASTAL		0.60	0.6000	0.23		16	2.59	16%	30	2.32	8%	6	0.20	3%
MS0027847	DEQ/EPA	SRWMD/WAVELAND POTW	Southern Regional Wastewater Management District, Waveland POTW	Municipal	SEWERAGE SYSTEMS	M	Waveland	HANCOCK	EDWARDS BAYOU	MISSISSIPPI COASTAL		4.90	4.90	3.58	73%	10	4.31	43%	30	5.58	19%	2	0.74	37%
MS0030333	DEQ/EPA	HC/WEST BILOXI POTW	Harrison County Wastewater and Solid Waste Management Authority, West Biloxi POTW	Municipal	SEWERAGE SYSTEMS	M	Biloxi	HARRISON	BACK BAY OF BILOXI	MISSISSIPPI COASTAL		11.70	11.70	7.86	67%	30	-	-	30	8.87	30%	15	4.74	32%
MS0034436	DMR	HC/EAGLEPOINTPOTW		Municipal	SEWERAGE SYSTEMS			HARRISON		MISSISSIPPI COASTAL		0.30	0.30	0.19	63%	-	-	-	-	16.36		-	1.58	-
MS0042161	DEQ/EPA	PICAYUNE POTW	Picayune POTW	Municipal	SEWERAGE SYSTEMS	-	M	Picayune	PEARL RIVER	PEARL RIVER	LOWER PEARL	3.08	3.08	1.73	56%	30	23.41	78%	30	20.88	70%	-	-	
MS0042340	DEQ/EPA	HC/D'IBERVILLE POTW	Harrison County Wastewater and Solid Waste Management District, Diberville POTW	Municipal	SEWERAGE SYSTEMS	M	D'Iberville	HARRISON	BACK BAY OF BILOXI	MISSISSIPPI COASTAL		1.16	1.16	0.95	82%	30	12.96	43%	30	16.43	55%	20	3.40	17%
MS0043010	DEQ/EPA	GC/GAUTIER POTW	Mississippi Gulf Coast Regional Wastewater Authority, Gautier POTW	Municipal	SEWERAGE SYSTEMS	M	Gautier	JACKSON	WEST PASCAGOULA RIVER	PASCAGOULA		4.00	4.00	1.70	43%	30	4.71	16%	30	4.41	15%	-	-	
MS0043141	DEQ/EPA	HC/LONG BEACH-PASS CHRISTIAN	Harrison County Wastewater and Solid Waste Management Authority, Long Beach and Pass Christian	Municipal	SEWERAGE SYSTEMS	M	Pass Christian	HARRISON	BAYOU PORTAGE	MISSISSIPPI COASTAL		7.00	7.00	3.78	54%	20	4.06	20%	30	5.87	20%	5.5	1.06	19%
MS0044504	DEQ/EPA	LUCEDALE POTW	Lucedale POTW	Municipal	SEWERAGE SYSTEMS		Lucedale	GEORGE	BIG CEDAR CREEK	PASCAGOULA		0.50	0.50	0.39	77%	30	9	30%	30	6.5	22%	-	-	
MS0045446	DEQ/EPA	GC/WEST JACKSON COUNTY POTW	Mississippi Gulf Coast Regional Wastewater Authority, West Jackson County POTW	Municipal	SEWERAGE SYSTEMS	M	Ocean Springs	JACKSON	COSTAPIA BAYOU	MISSISSIPPI COASTAL		5.00	5.00	3.17	63%	10	7.29	73%	30	5.71	19%	-	4.67	-
MS0046078	DEQ/EPA	DIAMONDHEAD WATER/SEWER DIST	Diamondhead Water Sewer District	Municipal	SEWERAGE SYSTEMS	M	Diamondhead	HANCOCK	JOURDAN RIVER	MISSISSIPPI COASTAL		2.50	2.50	0.80	32%	30	4.47	15%	30	11.27	38%	20	0.44	2%
MS0051756	DEQ/EPA	HC/GULFPORT POTW - NORTH #2	Harrison County Wastewater and Solid Waste Management Authority, Gulfport POTW, North	Municipal	SEWERAGE SYSTEMS	M	Gulfport	HARRISON	BERNARD BAYOU (GULFPORT LAKE)	MISSISSIPPI COASTAL		5.50	13.25	7.29	55%	4	2.48	62%	30	1.37	5%	1	0.20	20%
MS0052574	DEQ/EPA	HC/DELISLE WASTEWATER TREATMENT	HC/DeLisle Wastewater Treatment	Municipal	SEWERAGE SYSTEMS			HARRISON	DELISLE BAYOU	MISSISSIPPI COASTAL		0.20	0.20	0.02	11%	10	7.33	73%	30	8	27%	2	1.63	82%
MS0055379	DMR	GULF COAST REGIONAL WASTEWATER AUTHORITY	Pascagoula Wastewater Treatment	Municipal	SEWERAGE SYSTEMS			JACKSON	PASCAGOULA RIVER	PASCAGOULA		N/R	N/R	0.28	-	30	-	-	-	1	-	-	-	-
MS0057011	EPA	HC/WW & SOLID WASTE MGT DIST	Tradition	Municipal	SEWERAGE SYSTEMS			HARRISON	TIGER CREEK THENCE BILOXI RIVER	MISSISSIPPI COASTAL		0.35	0.35	N/R		10	-	-	30	-	-	2	-	-
MS0058718	EPA	SOUTHERN REGIONAL WASTEWATER	Pearlington	Municipal	SEWERAGE SYSTEMS			HANCOCK	PATE BAYOU/WHITE BAYOU	LOWER PEARL		0.20	0.20	N/R		10	-	0%	30	-	0%	2	-	0%
MS0059307	EPA	Harrison County Wastewater and Solid Waste Management District	Northpark Sewage Treatment	Municipal	SEWERAGE SYSTEMS			HARRISON	UNNAMED TRIBUTARY THENCE HONEY	MISSISSIPPI COASTAL		0.06	0.06	N/R		10	-	-	30	-	-	2	-	-
MS0059501	DEQ/EPA	HANCOCK CNTY PORT & HARBOR	Port Bienville Industrial Park	Municipal	SEWERAGE SYSTEMS		Bay St. Louis	HANCOCK	PEARL RIVER	MISSISSIPPI COASTAL		0.15	0.1500	0.11		27	2.8	10%	30	5.4	18%	-	0.22	

= Effluent levels are above 65% of permitted flows.

N/R - Not Reported

Notes:
(1) Data Sources indicate origin of NPDES number. Only DEQ Permits shown on County Maps.
(2) Information from DEQ - received from Daryl Cook at DEQ on 5-1-06 as "COASTNPDES".
(3) Information from Mike Donahoo, EPA Region IV, Permits Compliance Section
(4) Data from EPA WEB-SITE:
(5) Data from DEQ furnished DMR information
(6) % based on DMR Permit Limits
(7) Permits do not include permits with a prefix of MSL or MSU or permits for Water Treatment Plants
(8) EPA/DMR information from website - http://oaspub.epa.gov/enviro/ad_hoc_where.retrieval_list

T:\MEG, Inc\Gulf Coast Regional Utility Authority\2 - Planning Phase\B - Planning\Work Order 7 Draft Report\2nd October Draft\2nd Section 2\Tables\[Table 2-11 h 3-MS Gulf Region Municipal WWTF.xls]Sheet1

Table 2-11 Gulf Region Municipal Wastewater Treatment Facilities

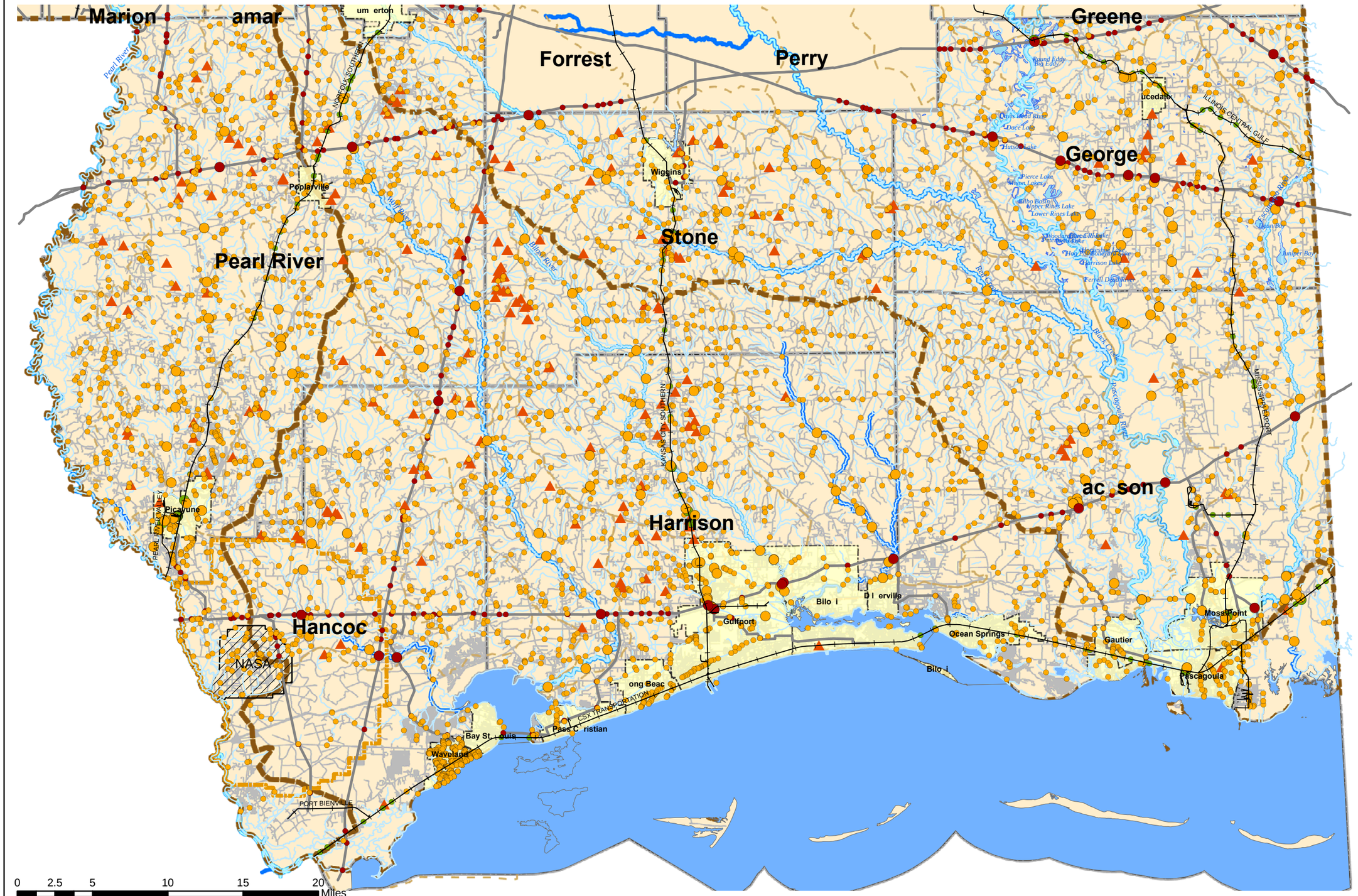

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Figure 2-5
Gulf Region: Drainage, Flood Control, & Stormwater Management Infrastructure

egend

- Major Stream Crossings: Roads
- Stream Crossings: Roads
- Major Stream Crossings: Natural Gas
- Stream Crossings: Natural Gas
- Major Stream Crossings: Railroads
- Stream Crossings: Railroads
- Reservoirs & Dams
- Gulf of Mexico
- Lakes, Ponds, etc..
- Rivers
- Intermittent / Annual Streams
- Natural Gas Pipelines
- Local Roads
- Railroads
- Stennis Space Center
- NASA
- City Limits
- County Boundary
- Watersheds
- Drainage Basins

NOTE: Assumes Drainage Infrastructure follows most Highways, Roadways, & Railroads.

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MDE

MISSISSIPPI G F REGION

DRAINAGE, FLOOD CONTROL, & STORMWATER MANAGEMENT INFRASTRUCTURE

Drainage system maps and infrastructure inventory tables in the cities of Lucedale and Waveland were based on GIS maps provided by those entities. For the remaining counties and cities, drainage system data and infrastructure quantities were estimated based on assumptions from available road, railroad and waterway data. For planning purposes, the assumption was that there are 1.2 miles of stormwater ditches or swales per mile of road and railroad. Unless more accurate information was provided by the local entities, it was assumed that storm sewer systems had manholes every 300 feet and catch basins on both sides of the road at each manhole. The mileage of roadways, railroads and open channels, along with drainage assumptions based on these values, are presented in **Table 2-12**. The total replacement value of the drainage facilities shown is estimated at approximately $4.0 billion.

George County

George County covers 478 square miles, drained by the Pascagoula drainage basin, which includes portions of eight different watersheds. The large water bodies draining George County and ultimately discharging to the Mississippi Sound include the Pascagoula River, Black Creek (a Pascagoula tributary), Red Creek (a Pascagoula tributary), and the Escatawpa River.

There are nearly 2,200 miles of local conveyance systems, largely associated with roadways; and less than 1 percent is piped. There are also 32 major stream crossings and 422 minor stream crossings. The total estimated replacement value of these drainage components is approximately $300 million.

Hancock County

Hancock County covers 477 square miles and is drained by the Pearl River and Coastal Streams drainage basins, which include portions of six different watersheds. The Pearl River drainage basin drains the western portion of the County, and the Coastal Rivers drainage basin drains the eastern portion, which encompasses the majority of the county. This basin includes the watersheds for Hancock County's Catahoula Creek, Jourdan River and Bayou La Croix, which drain into the Bay of St. Louis.

There are over 2,600 miles of local conveyance systems, largely associated with roadways, with piped systems comprising less than 1 percent. There are also 16 major stream crossings and 440 minor stream crossings. The total estimated replacement value of these drainage facilities within Hancock County is approximately $400 million. More detailed drainage system information is available within the incorporated jurisdictions of Harrison County, which include the Cities of Bay St. Louis and Waveland.

Summary of Stormwater Statistics y County and City

urisdiction	2 5 Population	Total Area (mi^2)	Major Receiving Waters	Major Waters ed(s)	Streams and Open C annels[1] (Miles)	Roadways and Railroads (Miles)	Storm Sewers[2] (Miles)	Roadside Ditc es and Swales[3] (Miles)	Major Stream Crossings[4]	Minor Stream Crossings[4]	Man oles	Catc Basins	Reservoirs (Each)	Dams (Each)	Beac Outfalls (Each)	Replacement alue[5]
George County	**21**	**47 .**	**Pascagoula River Escatawpa River**	**Pascagoula**	**7**	**1132**	**2**	**14**	**32**	**422**	**37**	**74**		**13**		**315 5 35**
George Unincorporated	18,500	474.2	Pascagoula River Escatawpa River	Pascagoula	777	1091	1	1377	32	413	16	33			0	$290,152,071
City of Lucedale	2,500	3.8	Pascagoula River Escatawpa River	Pascagoula	3	41	1	31	0	9	21	41	0	1	0	$6,597,964
Hancoc County	**46**	**477.**	**Mississippi Sound Bay of St. ouis**	**Coastal Streams Pearl River**	**7**	**1572**	**25**	**1 1**	**16**	**44**	**431**	**63**	**3**	**2**	**31**	**371 643 734**
Hancock Unincorporated	31,100	464.1	Mississippi Sound Bay of St. Louis	Coastal Streams Pearl River	698	1399	12	1720	16	429	211	423	3	20	0	$339,474,797
Bay St. Louis	8,200	6.1	Mississippi Sound Bay of St. Louis	Coastal Streams	4	85	9	92	0	6	163	325	0	0	10	$20,533,517
City of Waveland	6,700	6.8	Mississippi Sound	Coastal Streams	5	88	3	78	0	5	57	115	0	0	21	$11,635,420
Harrison County	**1 5**	**5 1.**	**Bac Bay of Bilo i Mississippi Sound Bay of St. ouis**	**Coastal Streams**	**3**	**2353**	**5**	**2224**	**57**	**636**	**1 374**	**2 74**	**1**	**3**	**135**	**1 245 25 726**
Harrison Unincorporated	37,000	462.9	Back Bay of Biloxi Mississippi Sound Bay of St. Louis	Coastal Streams	797	1217	11	1586	34	426	201	402	1	28	1	$370,685,162
City of Biloxi	50,000	38.0	Back Bay of Biloxi Mississippi Sound	Coastal Streams	37	323	194	143	0	24	3417	6834	0	1	42	$276,444,594
City of D'Iberville	7,800	4.7	Back Bay of Biloxi Tchoutacaoubouffa River	Coastal Streams	2	59	30	38	0	4	527	1054			0	$43,086,641
City of Gulfport	71,000	57.0	Mississippi Sound	Coastal Streams	74	559	289	314	23	122	5089	10179	0	1	45	$450,161,201
City of Long Beach	17,000	10.0	Mississippi Sound	Coastal Streams	14	104	28	77	0	41	488	977	0	0	20	$47,474,906
Pass Christian	6,700	8.4	Mississippi Sound Bay of St. Louis	Coastal Streams	13	92	37	67	0	19	651	1302	0	0	27	$57,406,223
ac son County	**135**	**727.**	**Pascagoula Bay Bilo i Bay Mississippi Sound**	**Coastal Streams Pascagoula**	**1123**	**2423**	**373**	**2457**	**44**	**6**	**6571**	**13142**	**6**	**6**	**4**	**6 41 3**
Jackson Unincorporated	64,600	663.0	Pascagoula Bay Biloxi Bay Mississippi Sound	Coastal Streams Pascagoula	1015	1741	63	2092	36	521	1106	2211	5	6	0	$493,432,993
City of Gautier	11,600	12.2	Pascagoula Bay Mississippi Sound	Coastal Streams Pascagoula	26	109	42	60	0	34	748	1496	0	0	0	$66,944,937
City of Moss Point	15,800	25.0	Pascagoula Bay Mississippi Sound	Pascagoula	34	201	77	149	5	60	1355	2711	0	0	0	$127,474,010
City of Ocean Springs	17,000	11.6	Biloxi Bay Mississippi Sound	Coastal Streams	18	153	80	64	0	29	1416	2831	0	0	4	$115,824,021
City of Pascagoula	26,000	15.2	Pascagoula Bay Mississippi Sound	Pascagoula	30	219	111	91	3	54	1947	3893	1	0	0	$165,734,943
Pearl River County	**52**	**11.**	**Pearl River Wolf River**	**Coastal Streams Pearl River**	**1411**	**24**	**34**	**2 4**	**47**	**1 35**	**6 5**	**12**	**12**	**41**		**6 3 61 26**
Pearl River Unincorporated	38,500	795.4	Pearl River Wolf River	Coastal Streams Pearl River	1389	2223	15	2717	31	1003	267	533	12	40	0	$625,682,157
City of Picayune	10,800	11.8	Pearl River	Pearl River	19	130	12	101	16	24	218	435	0	1	0	$46,306,450
City of Poplarville	2,700	3.8	Pearl River Wolf River	Coastal Streams Pearl River	3	47	7	21	0	8	121	241	0	0	0	$11,630,653
Stone County	**14 4**	**445.**	**Bilo i River Wolf River Red Cree Blac Cree**	**Coastal Streams Pascagoula**	**7 6**	**1 4**	**3**	**1347**	**21**	**3 3**	**54**	**1**	**12**	**47**		**36 765 3 6**
Stone Unincorporated	10,100	434.2	Biloxi River Wolf River Red Creek Black Creek	Coastal Streams Pascagoula	772	958	0	1263	21	372	5	10	11	46	0	$352,939,350
City of Wiggins	4,300	10.8	Red Creek	Pascagoula	14	82	3	84	0	21	49	98	1	1	0	$16,825,956
Total	**457**	**3 51**			**5 745**	**1 2**	**1 27**	**12 167**	**217**	**3 624**	**1 72**	**36 144**	**34**	**157**	**17**	**3 54 747 65**

[1] Based on streams depicted National Hydrography dataset provided by the United States Geological Survey
[2] Based on measured length of roadways times estimated percentage of roadways with curb and gutter systems by census tract
[3] Based on measured length of roadways less length with curb and gutter systems, assuming length of ditch is 1.2 times length of road
[4] Estimated based on the Intersection of roads and major or minor streams
[5] System Replacement costs based on the following assumptions:

- o Average pipe diameter of 18 inches with replacement cost of $250 per lf — $250 per lf
- o Average cost to grade roadside ditch of $15 per lf — $15 per lf
- o Based on stream bed and bank stabilization cost of — $300 per lf within 10% of streams
- o Average stream crossing replacement cost of $60,000 per minor crossing, $1,000,000 per major crossing
- o Average small dam / lake cost size of 25 acre-ft at a cost of $61,000 per acre-ft = $1,525,000 per facility

Table 2-12 Stormwater Infrastructure Problem Areas in the Gulf Region

Harrison County

Harrison County covers 581 square miles and is drained by the Coastal Rivers drainage area, which includes portions of seven different watersheds. Most of the Coastal Streams drainage basin drains into the Wolf River and the Biloxi River, which discharge into the Bay of St. Louis and the Biloxi Bay, respectively. In addition, several smaller streams discharge directly to the Mississippi Sound.

The larger drainage courses in Harrison County discharging to the Bay of St. Louis and the Mississippi Sound include Bernard Bayou, Turkey Creek, Wolf River, Little Biloxi River, Biloxi River, DeLisle Bayou, Tuxachanie Creek, and Riverline Lake Reservoir.

There are over 3,700 miles of local conveyance systems, largely associated with roadways, and approximately 16 percent are piped. There are 57 major stream crossings and 636 minor stream crossings. The total estimated replacement value of this drainage system is approximately $1.2 billion.

Jackson County

Jackson County covers 727 square miles, is drained by the Pascagoula River and Coastal Streams drainage basins and includes portions of nine different sub-watersheds. The Pascagoula drainage basin drains the eastern, central, and northwestern portions of the County; and the Coastal Rivers drainage basin drains the southwestern portion of the County. The large water courses draining the Jackson County area and discharging to the Pascagoula Bay, Biloxi Bay and the Mississippi Sound include the Escatawpa River, Pascagoula River, Black Creek and Moungers Creek.

Nearly 4,000 miles of local conveyance systems drain the county, largely associated with roadways. Approximately 9 percent of these systems are piped. There are 44 major stream crossings and 698 minor stream crossings. The total estimated replacement value of these drainage components is approximately $1.0 billion. More detailed drainage system information is available within each incorporated jurisdiction.

Pearl River County

Pearl River County covers 811 square miles and is drained by the Pearl River and Coastal Streams drainage basins, including portions of nine different watersheds. The Pearl River drainage basin encompasses the western portion of the County and discharges to the Mississippi Sound through Lake Borgne. The Coastal Streams drainage basin serves the eastern portion of the County and drains into the Bay of St. Louis. The major water courses draining Pearl River County and discharging to the Mississippi Sound include the Pearl River, East Hobolochitto Creek (Pearl River Tributary), West Hobolochitto Creek (Pearl River Tributary), Wolf River (Coastal

River), Murder Creek (Wolf River Tributary), and Crane Creek (Wolf River Tributary).

There are nearly 4,300 miles of local conveyance systems, largely associated with roadways, and piped systems comprise less than 1 percent. There are also 47 major stream crossings and 1,035 minor stream crossings. The total estimated replacement value of these drainage system components is approximately $700 million.

Stone County

Stone County covers 445 square miles and is drained by the Coastal Rivers and Pascagoula River drainage basins and includes portions of six different watersheds. The northern part of the county drains into the Escatawpa and Pascagoula Rivers within the Pascagoula River drainage basin. The southern part of the county drains into the Wolf and Biloxi Rivers within the Coastal Rivers drainage basin. The larger water courses draining Stone County include Black Creek (tributary of Pascagoula River), Red Creek (tributary of Pascagoula River), and the Biloxi River.

There are over 2,100 miles of local conveyance systems in the county, largely associated with roadways, with piped systems comprising less than 1 percent. There are 21 major stream crossings and 393 minor stream crossings. The total estimated replacement value of the drainage components is approximately $400 million.