

the city of RIDGELAND



NOVEMBER 2020

2020  
CITY OF RIDGELAND  
**WASTEWATER MASTER PLAN**

PREPARED BY:



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**1. SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS**

The City of Ridgeland has a long and well documented history of being committed to prudent planning for the growth of the City. This history includes overall City planning along with detailed infrastructure planning. The most recent City planning was the Ridgeland Area Master Plan (RAMP), completed in 2008, discussed priorities of the growing city and outlined a framework of projects, programs, and policies which would allow the city to continue its status as an attractive location for residential, commercial, and business growth. The 2013 Wastewater Facilities Plan responded to the needs outlined in the RAMP. These needs generally include maintaining a high quality of infrastructure in existing areas and supporting growth both within the city and in its western growth path.

Ridgeland's commitment to planning is illustrated through the numerous wastewater plans that have previously been completed. These include:

**TABLE 1 - HISTORICAL WASTEWATER PLANNING DOCUMENTS**

Historical Wastewater Planning Documents
School Creek, Purple Creek, White Oak Creek Drainage Basins (1992)
LaRue Creek (1998)
White Oak Creek Update (2007, revised 2009)
Implementation Plan for the White Oak Creek, LaRue Creek, and Hanging Moss tributary basins (2005.)
2013 Wastewater Facilities Plan

The recommendations for the School Creek, Purple Creek, and portions of the White Oak Creek basin have generally been followed. Ridgeland operates its own collection system, as well as the facilities of the East Madison County Sewage Disposal System (EMCSDS). Wastewater flows to Jackson for treatment at the Savanna Street Wastewater Treatment Facility.

Since the completion of the 2013 Wastewater Facilities Plan, the following improvements have been completed:

**TABLE 2 - RECENT WASTEWATER SYSTEM IMPROVEMENTS**

Recent Wastewater System Improvements
<b>Metering Stations</b>
White Oak Creek At Hwy 51, I-220 North, & I-220 East Metering Stations
McClellan Ridgeland & Madison Metering Stations
Rice Rd East & North Metering Stations
Country Club Metering Station
School Creek Metering Station
Purple Creek & Somerset Metering Stations
LaRue Creek Metering Station
Northpointe Metering Station

**TABLE 2 - RECENT WASTEWATER SYSTEM IMPROVEMENTS - CONTINUED**

Recent Wastewater System Improvements
<b>Collection System Improvements</b>
MEA Clinic Pump Station - Ridgeland no longer owns & operates (Developer Owned and Operated)
West Jackson Street Pump Station has been abandoned
Wastewater Mains in Bridgewater 11-A Subdivision
Wastewater Mains in Bridgewater 11-C Subdivision
<b>Gravity Sewer Rehabilitation</b>
Culley-Brashear 36” Interceptor - Lake Harbor Dr. to Country Club – Rehabbed & Repaired
Culley Creek Interceptor - Sections of the Interceptor behind the Sandalwood subdivision were rehabbed & repaired
Beaver Creek Interceptor - C.C.T.V. completed and in good shape
Purple Creek Interceptor - Co. Line Rd to Hwy 51 – C.C.T.V., Cleaned & Lined

Due to the Consent Decree between the City of Jackson and the Environmental Protection Agency, the 2013 plan included a comparison of sending flows to the Madison County Wastewater Authority (MCWA) versus continuing to send flow to the City of Jackson. After evaluating factors involved in this decision, the City of Ridgeland will continue to rely on Jackson to treat its wastewater through the East Madison County Sewage Disposal System Agreement and the Ridgeland-West Sewage Disposal System Agreement at this time. Therefore, this plan will not include the option of sending flows to MCWA.

**RECOMMENDATIONS**

Despite the City's commitment to quality infrastructure, wastewater collection system improvements are needed to continue providing high quality service to the residents of Ridgeland. These recommendations include improvements to existing infrastructure as well as infrastructure to serve developing areas. These recommendations are divided into the following areas:

- Sewer System Evaluation Surveys
- Wastewater Collection System Expansion
- Pump Station Abandonments & Improvements
- Capacity, Management, Operations, and Maintenance Program

**Sewer System Evaluation Surveys**

As a component of the City's operation of its wastewater collection system, Ridgeland performs sewer system evaluation surveys (SSES) on the collection system. These SSES are a systematic evaluation used to investigate sources of excessive inflow or infiltration sources in a sewer system. The survey also assesses the flow rate and the cost for rehabilitation if said sources are found to be excessive. The typical sewer system evaluation survey includes the elements of physical evaluation, preparatory cleaning, internal inspection, and the final survey report. The SSESs also include inspection of the manholes within the collection system. A detailed SSES is necessary for the School Creek interceptor to determine necessary repairs and rehabilitation. After sources of inflow and infiltration have been found in the SSES, necessary repairs and rehabilitation should be made. In addition, a previous SSES was completed on the Purple Creek Interceptor and the needed repairs should be implemented.

**TABLE 3 - SEWER SYSTEM EVALUATION SURVEYS RECOMMENDATIONS**

Recommended Improvements	Estimated Cost
School Creek and Purple Creek Interceptor SSES	<b>\$419,550</b>
School Creek and Purple Creek Interceptor Rehabilitation and Repair	<b>\$7,294,175</b>
Culley-Brashear Interceptor System Rehabilitation and Repair	<b>\$1,382,275</b>

**Wastewater Collection System Expansion**

The City of Ridgeland should extend sewer service in the unsewered areas within the western planning area and in areas where new commercial corridors, such as Commerce Park Connector Road, and Highland Colony Parkway, are spurring development.

**TABLE 4 - SANITARY SEWER SYSTEM EXPANSION**

Recommended Improvements	Estimated Cost
Colony Park Blvd Wastewater Improvements	<b>\$1,667,700</b>
Western Planning Area Grinder Station System	<b>\$7,213,550</b>
Commerce Park Connector Wastewater Improvements	<b>\$1,166,125</b>
Highland Colony Parkway Wastewater Improvements	<b>\$742,875</b>

**Pump Station Abandonments & Improvements**

Pump station abandonment should be considered whenever it is cost-effective. Gravity systems do not require electrical service and do not have mechanical parts which will eventually fail, requiring costly repairs. The energy savings and repair cost savings are greater than cost to abandon the stations shown in the following table.

Other needed improvements at pump stations include the addition of transfer switches and either a standby generator or a receptacle to plug a mobile generator. After a natural disaster or in case of a major electrical outage, wastewater pump stations can be kept in service if the station has a transfer switch to allow the use of a standby or portable generator. Several City pump stations do not have transfer switches allowing portable generators to be directly connected to them during these emergencies. Transfer switches should be installed on the pump stations not scheduled to be abandoned that do not have them.

TABLE 5 - RECOMMENDED PUMP STATION ABANDONMENTS AND IMPROVEMENTS

Recommended Pump Stations Abandonments	Estimated Cost
Beaver Creek Pump Station Abandonment	\$109,965
Tico's Pump Station Abandonment	\$170,829
Rice Road Pump Station Abandonment	\$174,690
M&F Bank Pump Station Abandonment	\$211,971
Salem Square Street Pump Station Abandonment	\$730,936
<b>Other Recommended Pump Station Improvements</b>	
<i>Transfer switches for pump stations:</i>	
Cole Road Pump Station	\$6,200
Dyess Road Pump Station	\$6,200
Matthews Road Pump Station	\$6,200
Stokes Road Pump Station	\$6,200
Windsong Cove Pump Station	\$6,200

#### Capacity, Management, Operations, and Maintenance Program

As Ridgeland continues to grow and its sewer system continues to age, the City will need to continue preemptive activities to ensure that the system is capable of meeting the needs of the future. Ridgeland should initiate a Capacity, Management, Operations, and Maintenance (CMOM) program as a tool to assist in monitoring the performance of the sewerage system. Capacity, Management, Operations and Maintenance programs are a best practice for collection system owners and operators. Both comprehensive and holistic, a CMOM program is an information-based program to effectively run a collection system and help lower the risk of National Pollutant Discharge Elimination System permit violations and discharge violations.

## 2. NEED FOR THE PROJECT

As a thriving City in the Jackson metropolitan area, the City of Ridgeland is aware of the need for prudent planning of growth. As such, the City completed its Ridgeland Area Master Plan (RAMP) in 2008. The RAMP discussed priorities of the growing city and outlined a framework of projects, programs, and policies which would allow the city to continue its status as an attractive location for residential, commercial, and business growth. Some of the items in the RAMP include:

- **Growth of commercial corridors.** Sewer capacity must be adequate to serve the needs of a growing community. In addition, management, operation, and maintenance of facilities must be carried out to provide reliability for the future.
- **Growth in the western portion of the planning area.** Unsewered areas will require sewer infrastructure to reduce pollution of groundwater and surface waters from improperly functioning individual disposal systems as well as promoting growth in these areas.

As Ridgeland continues to grow, it must also be aware of ongoing concerns of the wastewater system. Ongoing needs include:

- **Infiltration and inflow.** Infiltration is water other than wastewater that enters the wastewater system (including sewer service connections and foundation drains) from the ground through such means as defective pipes, pipe joints, connections, or manholes. Inflow is water other than wastewater that enters the wastewater system (including sewer service connections) from sources such as, but not limited to, roof leaders, cellar drains, yard drains, area drains, drains from springs and swampy areas, manhole covers, cross connections between storm sewers and sanitary sewers, catch basins, cooling towers, storm water, surface runoff, street wash waters, or drainage. As the system ages, infiltration and inflow will increase, reducing available capacity in the system for wastewater flows.
- **Sanitary sewer overflows (SSOs).** An SSO is any discharge of wastewater to waters of the United States or the State from the sewer system through a point source not specified in any NPDES permit, as well as any overflow, spill, or release of wastewater to public or private property from the sewer system that may not have reached waters of the United States or the State, including all building backups. These are caused by such factors as excessive wet weather flow, obstructions, or line breaks.
- **Energy and Operational costs.** Energy costs have been trending upward and are uncertain for the future. Steps should be taken to make the wastewater system's energy usage more efficient. Reduction of mechanical equipment will reduce operational costs and avoid costly repairs.

### 3. EXISTING SITUATION

#### PLANNING LOCATION AND BOUNDARIES

Generally, the planning area is the area presently serviced by wastewater systems managed by the City of Ridgeland, as well as unserved areas inside the present city limits and those areas west of the City defined as Western Planning Area.”

Exhibit 3.1 shows the planning area. The EMCSDS area includes the areas of Ridgeland, inside the drainage basins of Culley Creek, Brashear Creek, the Culley-Brashear-Diversion Ditch, Hearn Creek, School Creek, and Purple Creek. The R-WSDS area includes areas inside Ridgeland and the Western Planning Area in the White Oak, LaRue, and Hanging Moss Tributary basins. The Western Planning Area also includes portions of the Limekiln Creek Tributary B drainage basin as well as a small amount of the Upper Bogue Chitto Creek basin in western Madison County.

For purposes of this study, the planning area is divided into sewersheds. Each sewershed consists of the area served by a network of sewers flowing to a common terminal point. Currently, in Ridgeland, the terminal point is a flow meter. The sewersheds are generally identical to the stream basins in the area. However, the Country Club metering station sewershed consists of the portions of the Hearn Creek, Culley Creek, and Culley-Brashear Diversion Ditch basins served by the sewerage system. The School Creek basin is divided into the sewershed served by the School Creek and Northpointe stations. The Purple Creek basin consists of the Purple Creek metering station and Somerset metering station sewersheds.

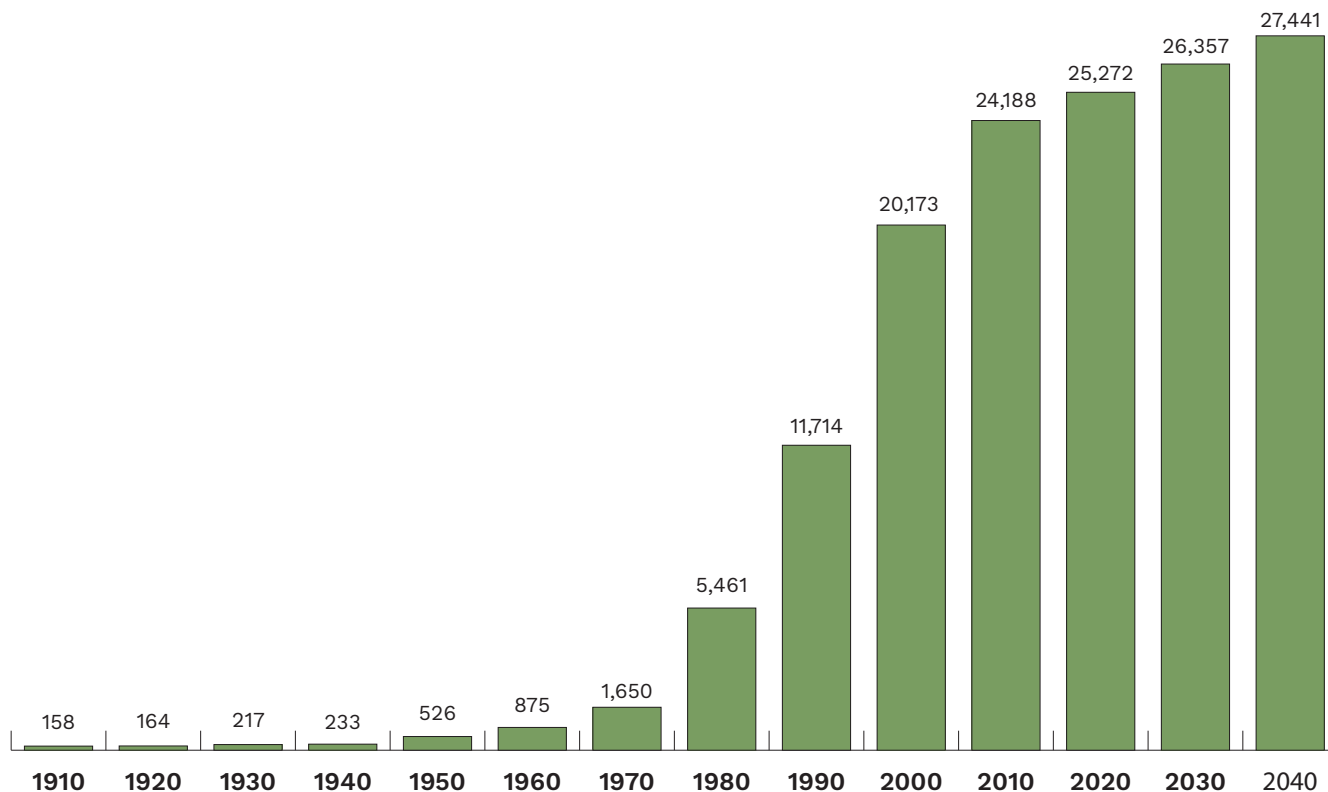
The Lake Lorman and Lake Cavalier areas are served by the Lake Lorman Utility District. Although these areas are included in the RAMP’s Additional Study Area, they are excluded from the planning area of this study.

#### POPULATION SERVED

Once a tiny community north of Jackson, Ridgeland has experienced tremendous growth through the years. However, this tremendous growth has begun to plateau. Historical and future populations are shown in the following figures. These projections were completed by the Central Mississippi Planning and Development District (CMPDD) as one of its responsibilities as the Metropolitan Planning Organization (MPO). As the area MPO, CMPDD is responsible for population projections used to support area transportation projects, which are partially federally funded. The growth predictions are divided into Traffic Analysis Zones (TAZ). For purposes of flow development and infrastructure sizing, if the population in a TAZ was projected to decrease, the future population was modified to be equivalent to the current population. **Exhibit 3.2** shows residential and total population for each TAZ for 2020 and 2040. Populations for inside each sewershed were estimated distributing population in each TAZ by sewershed. For this study, the sewer lines flowing into a metering station or other terminal point are considered a sewershed.



FIGURE 1 - CITY OF RIDGELAND HISTORICAL AND PROJECTED POPULATIONS



**SURFACE WATERS**

Portions of the EMCSDS that serve Madison and PRVWSD drain into Hearn Creek, a tributary of the Ross Barnett Reservoir. Tributaries of the Middle Pearl River draining portions of the EMCSDS in Ridgeland, Madison, and PRVWSD include Culley Creek, Brashear Creek, and the Culley-Brasher Diversion Ditch. Drainage basins of School Creek and Purple Creek, which are also tributaries of the Middle Pearl River, are in Ridgeland. The R-WSDS includes the drainage basins of White Oak, LaRue, and Hanging Moss Tributaries, which are tributaries of the Middle Pearl River. West of Ridgeland, in the Western Planning Area, Limekiln Creek Tributaries B is a tributaries of the Big Black River.

**CONTEXT**

The City of Ridgeland operates its own collection system inside its corporate limits.

The East Madison County Sewage Disposal System (EMCSDS) composed of the City of Ridgeland, the City of Madison, and the Pearl River Valley Water Supply District (PRVWSD), was established to construct interceptors for connection with the City of Jackson’s collection system. Ridgeland operates and maintains the interceptors of EMCSDS.

The Ridgeland-West Sewage Disposal System (R-WSDS) consists of the Ridgeland sewer system in the White Oak, LaRue, and Hanging Moss tributary basins. Wastewater is transported to Jackson for treatment through metering stations.

LOCATION, DESCRIPTION, AND PERFORMANCE OF EXISTING FACILITIES

Exhibit 3.3 shows the existing Ridgeland wastewater system.

The wastewater system has approximately 114 miles of gravity mains. The pipe is composed of various materials, including PVC, concrete, vitrified clay, ductile iron, and cast iron. The following table summarizes the collection system.

**TABLE 6 -GRAVITY SEWER MAIN SUMMARY**

Gravity Sewer Main Inventory		
Diameter (in)	Length (ft)	Length (mi)
4	55	0.01
6	10,654	2.02
8	495,619	93.87
10	38,736	7.34
12	17,576	3.33
15	11,567	2.19
18	6,594	1.25
21	3,467	0.66
24	10,060	1.91
27	9,492	1.80
<b>Total</b>	<b>603,820</b>	<b>114.36</b>

Ridgeland inventoried its gravity sewer system in 2010 and 2011, and compiled the results in GIS format. Each year, Ridgeland makes television inspections of portions of its collection system. The results are used to determine priorities for repairs, rehabilitation, and replacement of sewer mains for subsequent years. Gravity sewer mains identified by television inspections are usually rehabilitated in the next year.

In recent years, Ridgeland has rehabilitated sections of the gravity sewer collection system within the EMCSDS area. These areas include Culley-Brashear Interceptor from Lake Harbour Dr. to Country Club Dr. and the Culley Creek Interceptor - areas behind Sandalwood subdivision. Ridgeland also performed cleaning and tv inspection of the Beaver Creek Interceptor and the Purple Creek Interceptor from County Line Road to HWY 51. The Beaver Creek Interceptor is not in need of rehabilitation at this time and the segment of Purple Creek was lined.

Thirteen pump stations operate in the sewerage system. These pump stations are monitored and controlled by a SCADA system. They are inspected weekly by a Public Works Department crew. Ridgeland maintains several portable generators to supply power to critical facilities during power outages. However, only four pump stations have transfer switched allowing them to connect directly to a generator. Harbour Pines is the only pump station with a permanent generator on site.

TABLE 7 - EXISTING CITY OF RIDGELAND OPERATED PUMP STATIONS

Pump Station	Transfer Switch
Beaver Creek	
Brame Road	X
Cole Road	
Dyess Road	
Harbour Pines	X
M&F Bank	
Matthews Road	
Rice Road	X
Salem Court	
Stokes Road	
Ticos	
Windson Cove	



The City of Ridgeland operates 26 metering stations of which 17 monitor flow into the EMCSDS system. The City of Jackson meters flow from the EMCSDS system, through four meters, and the Ridgeland West system, through two meters. The City of Ridgeland has added 9 metering stations which monitor flow from EMCSDS and R-WSDS into the City of Jackson.

**TABLE 8 - CITY OF RIDGELAND OPERATED METERING STATIONS**

Metering Station	Flow From	Flow to
Hoy Road	Madison	EMCSDS
Sandalwood	Madison	EMCSDS
South Madison	Madison	EMCSDS
St. Augustine	Madison	EMCSDS
Stone Gate	Madison	EMCSDS
Traceland North	Madison	EMCSDS
Treasure Cove	Madison	EMCSDS
McClellan Madison	Madison	EMCSDS
Rice Rd East	Madison	EMCSDS
Reservoir	PRVWSD	EMCSDS
Beaver Creek	Ridgeland	EMCSDS
Diversion Ditch	Ridgeland	EMCSDS
North Ridgeland	Ridgeland	EMCSDS
Rice Road	Ridgeland	EMCSDS
School Creek	Ridgeland	EMCSDS
Trace Ridge IV	Ridgeland	EMCSDS
McClellan Ridgeland	Ridgeland	EMCSDS
White Oak At Hwy 51	Ridgeland	Jackson
Country Club	Ridgeland/EMCSDS	Jackson
Purple Creek	Ridgeland/EMCSDS	Jackson
Northpointe	Ridgeland/EMCSDS	Jackson
Somerset	Ridgeland/EMCSDS	Jackson
Rice Rd North	Ridgeland/EMCSDS	EMCSDS
White Oak At I-220, North	R-WSDS	Jackson
White Oak At I-220, East	R-WSDS	Jackson
LaRue Creek	R-WSDS	Jackson

**TABLE 9 - CITY OF JACKSON OPERATED METERING STATIONS**

Metering Station	Flow From	Flow to
Country Club	EMCSDS	Jackson
Northpointe	Ridgeland/EMCSDS	Jackson
Somerset	Ridgeland/EMCSDS	Jackson
Purple Creek	Ridgeland/EMCSDS	Jackson
Lake LaRue	R-WSDS	Jackson
White Oak	R-WSDS	Jackson

Locations of metering stations and pump stations are shown in **Exhibit 3.3**.

The City of Ridgeland operates the Culley-Brashear interceptor system for EMCSDS. The system includes approximately 9 miles of gravity lines and 17 metering stations, and 1 pump station. In addition, the Mule Jail pumping station is owned by EMCSDS but operated by the City of Jackson. This station pumps into the interceptor system just upstream of the Country Club metering station. The EMCSDS system is included in the map of the sewerage system shown in **Exhibit 3.3**.

#### **SIGNIFICANT USERS**

No users use more than 5% of the capacity of the sewer systems.

#### **IDENTIFICATION OF UNSEWERED AREAS**

The City's transportation network has undergone major expansion in recent years through the addition of the I-55 East Frontage Roads, Lake Harbour Extension, and Colony Park Boulevard. The creation of Colony Park Boulevard has created a new commercial corridor for development which needs adequate sewer service.

The City's growth path is within the Western Planning Area, much of which is unsewered. Previous facilities plans outlined the need for collection systems in the White Oak, LaRue Creek, and Hanging Moss Tributary Basins. Segments of these collection systems have been constructed, but additional expansion of the sewer system is still needed. The Limekiln drainage basin is not sewered. As commercial and residential growth expands westward, sewerage infrastructure in this area will be required to accommodate new users.

**4. WASTE FLOW AND LOAD**

**RESIDENTIAL FLOWS**

Wastewater flows for each sewershed were determined on the CMPDD provided population projections. For residential populations, average flow estimates were based on flows of 100 gallons per capita per day (gpcd), based on MDEQ and “Ten States Standards” guidelines of 70 gpcd for domestic flow and 30 gpcd for infiltration and inflow.

**COMMERCIAL/INDUSTRIAL/SIGNIFICANT USER FLOW**

As previously stated, no users use more than 5% of the capacity of the sewer systems. However, in order to create a more accurate flow projection existing average water sales data was used to project flows for the schools and largest commercial users. For wastewater flows, 80% of average daily water use was assumed to be wastewater flow.

**INFILTRATION/INFLOW**

As recommended by MDEQ and “Ten States Standards,” 30 gpcd for equivalent population was used for infiltration and inflow.

**TOTAL FLOW/LOAD**

The total average daily wastewater flow for each basin is the sum of the residential flow projection and the commercial user projection. Peak flows for each basin were calculated based on the MDEQ and “Ten States Standards” recommended population based formula. Only flows within the City of Ridgeland and its planning area were projected. City of Madison and PRVWSD flows within the EMCSDS were not projected and are not included in the calculations.

The wastewater of the service area is primarily domestic in terms of its characteristics and strength, since the majority of it emanates from residents, employees and students. Wastewater is ultimately treated by the Savanna Street Wastewater Treatment Plant operated by Jackson, which is designed to treat influents of this quality.

A summary of the average and peak flows is shown in the following table.

**TABLE 9 - CITY OF JACKSON OPERATED METERING STATIONS**

Sewershed	2020 Average Daily Flow, gpd	2020 Peak Flow, gpd	2040 Average Daily Flow, gpd	2040 Peak Flow, gpd
Country Club MS	844,836	3,262,816	890,213	3,428,102
Purple Creek	506,915	2,041,591	524,098	2,108,808
School Creek	909,719	3,462,661	915,239	3,482,761
White Oak Creek	343,300	1,354,265	464,546	1,784,583
Hanging Moss 1	18,754	74,401	40,483	165,887
Hanging Moss 2	39,339	165,536	96,291	388,363
LaRue	40,182	170,854	76,668	317,721
Limekiln Trib B Basin	19,312	80,405	27,168	111,729
Upper Bouge Chitto	5,947	25,713	9,003	38,704

**5. ALTERNATIVE SELECTION**

**UNSEWERED AREAS**

One of the most significant challenges for a city preparing for growth in an area is to have a sewer collection system ready to serve the area when it is needed. If a sewer system is not available, development will consist of large estate lots with installation of individual wastewater treatment and disposal systems. After the developments are fully built out, it is often unfeasible to extend sewer service across existing rights of way and easements for other underground utilities. Such is the case for built-out areas in western parts of Ridgeland, such as along Richardson Road between Steed Road and Lake Castle Road. It is unfeasible to serve these areas unless residents are willing to pay for extensions to receive the benefits of sewer service.

**Wastewater Collection System Expansion**

The Western Wastewater Implementation Plan for White Oak Creek, LaRue Creek, and Hanging Moss Tributary Drainage Basins (2005) outlined steps for providing sewer inside recently annexed areas and areas to the west of the Ridgeland. Phase 1 of the White Oak Creek collection system was completed in 2012. The sewers systems for Phase 2 of White Oak Creek drainage basin, as well as for the LaRue Creek and Hanging Moss Creek basins, have not been constructed.

The original facility plans for the expansion of the LaRue Creek and Hanging Moss Creek wastewater collection systems proposed gravity main extensions. However, since 2005 there have been technological advancements which will allow the City to serve this additional area at a reduced capital cost. The City could choose to construct a grinder station system, with necessary pump stations and force mains to serve this area. This would increase the operation and maintenance costs for this system, but would allow the City to only provide the "trunk" force mains and pump stations. Developers would be required to construct grinder stations and small force mains to connect to this trunk system. A cost comparison for the gravity main system and the grinder system can be found in the Appendix .

The expansion of transportation corridors throughout the City have created new commercial corridors for development, which is vital to the long-term growth of the City. The new Colony Park Boulevard has created a commercial corridor in the last remaining growth area between the City of Madison and the City of Ridgeland east of I-55. Extending the gravity sewer system to meet this developing area will provide vitally needed infrastructure support to this corridor.

**TABLE 11- WASTEWATER COLLECTION SYSTEM SHORT TERM IMPROVEMENTS**

Recommended Improvements	Estimated Cost
<b>Short Term</b>	
Colony Park Blvd Wastewater Improvements	<b>\$1,667,700</b>
School Creek and Purple Creek Interceptor SSES	<b>\$419,550</b>
Commerce Park Connector Wastewater Improvements	<b>\$1,166,125</b>
Highland Colony Parkway Wastewater Improvements	<b>\$742,875</b>

Exhibit 5.1 shows proposed wastewater collection system improvements.



Further west, long term growth will create a need for sewer service in the drainage basin of Limekiln Creek, a tributary of the Big Black River. It is assumed that wastewater in this area will be pumped northeastward to the Madison County Wastewater Authority's (MCWA) treatment facility at Beatty's Bluff on the Big Black River. Expansion of the wastewater collection system in this area, along with the White Oak Creek Phase 2 improvements, should be considered a long term improvement for the City. While prudent planning is necessary to ensure quality growth in this area, it is cost-prohibitive to invest in the gravity collection system at this time. As growth in the City continues to move west, the City should reevaluate the infrastructure needs in this area in order to provide high quality infrastructure service in a cost-effective manner.

#### No Action Alternative

The only other alternative is to allow these unsewered areas to develop as large lots with individual on-site wastewater treatment and disposal systems, if they are ever developed.

#### COLLECTION SYSTEM

##### Sanitary Sewer System Evaluation Surveys and Rehabilitations

As collection systems age, infiltration and inflow become significant contributors to flow. Defects in sewer mains, manholes, and private service laterals, as well as connections to storm sewers or roof drains, can result in excessive flow during wet weather, causing reduction in capacity, sanitary sewer overflows, or permit violations.

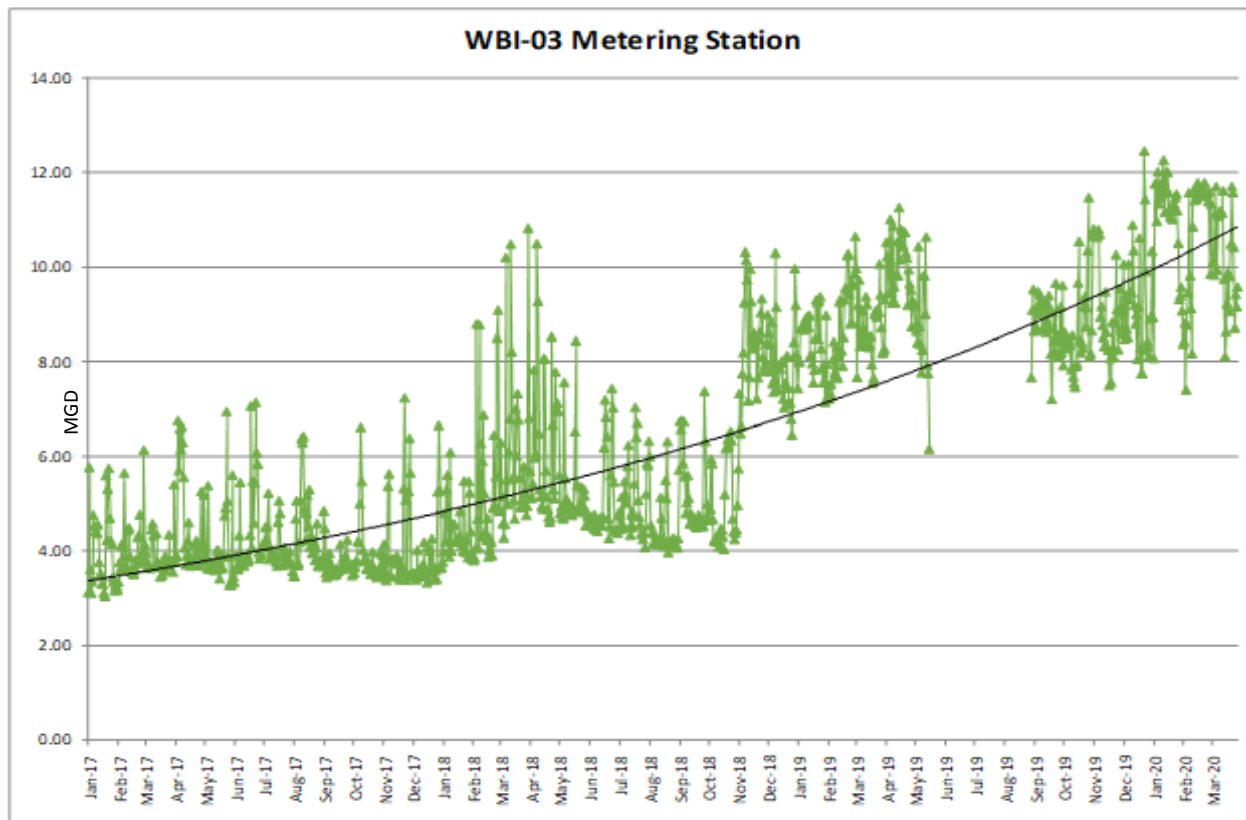
As discussed in the Existing Conditions section, Ridgeland conducts television inspections of sewer mains each year to determine priorities for repair, rehabilitation, and replacement of sewer mains for subsequent years. The City should continue these Sewer System Evaluation Surveys (SSES). Priority should be given to the larger lines which have been in place 20 years or more.



Similar to the studies conducted on the Culley-Brashear Interceptor and Purple Creek Interceptors, a detailed SSES should be performed on the School Creek Interceptor. The SSES will include smoke testing, cleaning where necessary, television inspections where warranted, and visual inspection of manholes. After the SSES is completed, a determination should be made of the required rehabilitation and repair work to reduce infiltration and inflow. A detailed opinion of probable cost for School Creek Interceptor rehabilitation can be developed at that time once quantities are more certain. Additional SSES work may be required in the collection systems that feed to the Culley-Brashear, School Creek, and Purple Creek Interceptors after the completion of the proposed rehabilitation to continue to eliminate I/I from the system. Eliminating I/I from the system has a direct cost savings to the City in the form of decreased wastewater transportation and treatment costs.

Recent flow meter data from the WBI-3 Metering Station, which is downstream of the School Creek Interceptor, supports the need for SSES work in this interceptor. As shown in the following Figure 3, the daily flow has increased. However there have not been an influent of new flows into this system. Therefore, the only likely reason for the continued flow increase is increased I/I into the system.

FIGURE 3 - WBI-03 METERING STATION



SSES and rehabilitation projects are summarized in following Table. Locations are shown in **Exhibit 5.1**. The preliminary Opinions of Probable Cost can be found in the Appendix.

**TABLE 13- SANITARY SEWER SYSTEM EVALUATION SURVEY RECOMMENDATIONS**

Recommended Improvements	Estimated Cost
School Creek and Purple Creek Interceptor SSES	<b>\$389,550</b>
School Creek and Purple Creek Interceptor Rehabilitation and Repair	<b>\$7,294,175</b>
Culley-Brashear Interceptor System Rehabilitation and Repair	<b>\$1,382,275</b>

**No Action Alternative**

The only other alternative is to allow these aging interceptor lines to continue to degrade. As with all gravity systems, I/I increases with system age and will not self-correct.

**Pump Station Abandonments & Improvements**

The Ridgeland wastewater system currently has 13 pump stations. Several of these pump stations are within short distances of gravity sewers with capacity to accept flow, thereby allowing the Public Works Department to abandon the pump stations. Eliminating pump stations will reduce energy consumption and operation/maintenance costs. As these stations age, the City should consider abandonment instead of costly pump station rehabilitation.

Locations are shown in **Exhibit 5.2**.

The Beaver Creek pump station at the intersection of Beaver Creek Drive and Patrick Cove pumps wastewater away from a small number of homes in a low part of Beaver Creek Subdivision. Approximately 390 linear feet of gravity main would be constructed to the Beaver Creek Interceptor of the EMCSDS system.

The Tico’s pump station serves several businesses north of East County Line Road, east of Pear Orchard Road. Approximately 840 linear feet of gravity main would be constructed to a manhole on the right of way of North County Line Road.

The Salem Square pump station on School Street is approximately 900 feet west of its proposed discharge point. Pipes flowing to and from the pump station are located under the pavement of School Street and other streets. Ridgeland’s Transportation Plan has recommended that this part of School Street be widened. Abandonment of the pump station and collection lines to the east, as well as construction of a discharge line should be performed in conjunction with street widening. The cost listed above is the estimated cost of the sewerage improvements for the project.

As noted in the “Existing Situation” section above, many pump stations do not have transfer switches allowing them to connect directly to portable generators. Transfer switches should be considered to be added to those stations that are not recommended for abandonment.

The pump stations which are feasible to abandon are included in the following table. A preliminary Opinion of Probable Cost is located in the Appendix.

**TABLE 5 - RECOMMENDED PUMP STATION ABANDONMENTS AND IMPROVEMENTS**

Recommended Pump Stations Abandonments	Estimated Cost
Beaver Creek Pump Station Abandonment	\$109,965
Tico’s Pump Station Abandonment	\$170,829
Rice Road Pump Station Abandonment	\$174,690
M&F Bank Pump Station Abandonment	\$211,971
Salem Square Street Pump Station Abandonment	\$730,936
<b>Other Recommended Pump Station Improvements</b>	
<i>Transfer switches for pump stations:</i>	
Cole Road Pump Station	\$6,200
Dyess Road Pump Station	\$6,200
Matthews Road Pump Station	\$6,200
Stokes Road Pump Station	\$6,200
Windsong Cove Pump Station	\$6,200

### No Action Alternative

The existing pump stations are performing adequately at this time. However, all mechanical components have a service life and the City will be forced to perform costly repairs/upgrades at each station when these stations begin to fail.

Without transfer switches, these pump stations will not be operational following a natural disaster or other power outage.

### Capacity, Management, Operations, and Maintenance Program

The SSES and rehabilitation/repairs listed above should be part of a comprehensive Capacity, Management, Operations, and Maintenance (CMOM) program as outlined below.

As Ridgeland continues to grow and its sewer system continues to age, the City will need to continue preemptive activities to ensure that the system is capable of meeting the needs of the future. Integral to planning is a CMOM program. Originally proposed as a requirement by EPA, CMOM is used as a proactive tool by many cities to remain in compliance with EPA regulations. The CMOM is essentially a self-audit by the utility to outline its strengths and weaknesses and make recommendations for improvements to its programs. CMOM activities are intended to:

1. Properly manage, operate and maintain, at all times, all parts of collection system that the City owns or over which it has operational control;
2. Provide adequate capacity to convey base flows and peak flows for all parts of the collection system that the City owns or operationally controls;
3. Take all feasible steps to stop, and mitigate the impact of, sanitary sewer overflows in portions of the collection system owned or operationally controlled by the City;
4. Provide notification to parties with a reasonable potential for exposure to pollutants associated with the overflow event; and
5. Develop a written summary of the City's CMOM program and make it available to any member of the public upon request.

Examples of CMOM programs that the City typically is required to develop and implement include the following:

1. Training Program;
2. Capacity Assurance Program;
3. Sewer Overflow Response Plan (SORP);
4. Inter-Jurisdictional Agreement Program;
5. Private Lateral Program;
6. Water Quality Monitoring Program;
7. Pump Station Operations Program;
8. Pump Station Preventive Maintenance Program;
9. Fats, Oils and Grease Control Program (FOG); and
10. Gravity Line Preventive Maintenance Program

The City of Ridgeland is already performing many of the activities included in a CMOM. For example, Ridgeland continuously performs routine operation and maintenance activities on its pump stations. These activities can be formally organized as part of a CMOM.

### **No Action Alternative**

While the City already performs many activities included in a CMOM, the self-audit practice will only lead to improved procedures and performances. Without this, the City will continue to function as it currently does and is more vulnerable to human error and potential litigation.

## **6. SELECTED PLAN**

### **Western Sewer System**

Unsewered portions of the Hanging Moss and LaRue basins are within areas to be developed in the next decade. Without adequate sewers, the quality of surface water and groundwater will potentially deteriorate. The selected plan includes construction of trunk system to support a grinder station system within the Hanging Moss Creek and LaRue Creek basins. MDEQ has also contacted residents in the area about connecting to the City's sewer system in efforts to alleviate private septic systems.

### **Colony Park Boulevard Wastewater Improvements**

The City of Ridgeland should extend sewer service to the proposed Colony Park Boulevard corridor. The extension of sewer service will facilitate development of the area. Additionally, the extension will allow the abandonment of two small pump stations currently serving a residential area.

### **Highland Colony Parkway Wastewater Improvements**

Approximately 3,000 LF of sewer gravity main is being proposed along Highland Colony Pkwy from New Pointe Dr to Old Agency. The new line would help to collect the wastewater in the newly developing area.

### **Commerce Park Connector Wastewater Improvements**

A proposed frontage Rd along I-220 connecting New Pointe Dr and Highland Colony Pkwy. The project would include approximately 6,750 LF of sewer gravity main. The new development along and around the proposed Frontage Rd would require improvements to the wastewater collection system.

### **Sewer System Evaluation Survey and Rehabilitation**

The gravity main system is a vital component of wastewater collection system. The City has completed several rehabilitations in recent years of this backbone infrastructure. Further work is needed in the form of SSES for School Creek Interceptor and rehabilitation of the School and Purple Creek Interceptors. Rehabilitation of these vital components will reduce I/I into the system and extend the service life of these aging interceptors.

### **Pump Station Abandonment**

Abandonment of pump stations will reduce energy and operational costs for the City of Ridgeland. New gravity sewer lines should be constructed which will allow abandonment of the Beaver Creek, Tico's, and Rice Road pump stations. Abandonment of the Salem Square pump station can be accomplished as part of a proposed School Street widening project.

## Transfer Switches for Pump Stations

Unsewered portions of the Hanging Moss and LaRue basins are within areas to be developed in the next decade. Without adequate sewers, the quality of surface water and groundwater will potentially deteriorate. The selected plan includes construction of trunk system to support a grinder station system within the Hanging Moss Creek and LaRue Creek basins.

## CMOM Program

A CMOM program will allow Ridgeland to maintain its compliance with EPA regulations and to continue operating its wastewater system efficiently. Ridgeland should choose which CMOM activities to begin and proceed to implement them.

## ENVIRONMENTAL IMPACT

Each of the proposed improvements will address one or more needs of the City of Ridgeland and will aid in maintaining the quality of the area's waters:

- The Western sewer system expansion will allow the subject area to continue to grow in an orderly fashion without the addition of less efficient individual onsite wastewater disposal systems. Development will be denser, providing for more sewer customers and a larger tax base. Wastewater from the projects in the LaRue and Hanging Moss basins will be treated by the City of Jackson under the existing Ridgeland-West Sewage Disposal System agreement.
- Abandoning pump stations will reduce energy and operational costs of the sewer system.
- The addition of transfer switches to pump stations will allow the use of portable generators, minimizing the likelihood of SSOs during power outages.
- SSES and rehabilitation interceptors will increase flow volume and reduce SSOs in the system and reduce treatment costs.

Several State and Federal agencies may have interests in the selected projects. Each agency must be contacted to determine whether Ridgeland must conduct further investigations or applications as follows:

- Mississippi Department of Archives and History: archaeological/cultural resources survey
- Mississippi Natural Heritage Program: vegetative/wildlife survey
- U.S. Army Corps of Engineers: Section 10 or 404 permit application

Any comments received from these agencies must be addressed prior to submitting an application to MDEQ for funding. The environmental impact of the selected plan is minimal, as shown in the following table:

Environmental Impact	No Action Alternative	Selected Plan
Surface/Groundwaters	Construction in Unsewered areas will require individual, onsite disposal systems, which would pose an environmental threat to area waterways.	Construction of western sewer improvements will enable flow to a regional wastewater treatment facility. Pump station abandonment and installation of transfer switches for portable generators will minimize possibility of wet weather SSOs. Ridgeland will monitor construction to ensure compliance with Stormwater Pollution Prevention Plan.
Archaeological/Historical/Cultural Resources	No Impact	Improvements required to cross the Natchez Trace Parkway will be bored under the Natchez Trace Parkway, eliminating any impact.
Vegetative/Wildlife	No Impact	No post-construction impact, and all reasonable efforts will be made during construction to prevent disturbance.
Wetlands/Navigable Waterways	Extensive use of individual onsite disposal systems, which would pose an environmental threat to area waterways.	No post-construction impact and all reasonable efforts will be made during construction to prevent disturbance.
Floodplains	Peak hour overflows and extensive use of individual onsite disposal systems could contribute to negative effects upon the floodplains	No post-construction impact and all reasonable efforts will be made during construction to prevent disturbance.
Coastal Zones	Not Applicable	Not Applicable
Wild/Scenic Rivers	Not Applicable	Not Applicable
Air Quality	Not Applicable	Not Applicable

Additionally, abandonment of pump stations will reduce pumping requirements, thereby reducing energy usage and lowering power costs along with other operational costs. Rehabilitation of the Purple and School Creek Interceptors will reduce I/I into Jackson therefore reducing wastewater treatment costs.

## 7. FINANCIAL CAPACITY ANALYSIS

The previous section of this Plan lists the recommended improvements to the Ridgeland sewer system. One source of low interest funding is the Water Pollution Control Revolving Loan Fund (WPCRLF), which is administered by the Mississippi Department of Environmental Quality (MDEQ). MDEQ requires a financial capacity analysis to determine whether the City can afford to pay its existing and proposed financial obligations for its sewer system, as well as determining whether the proposed rates are affordable to low and moderate income residents. MDEQ provides an outline for this analysis that should be completed based on requested loan amount and current sewer rates at the time of the application.

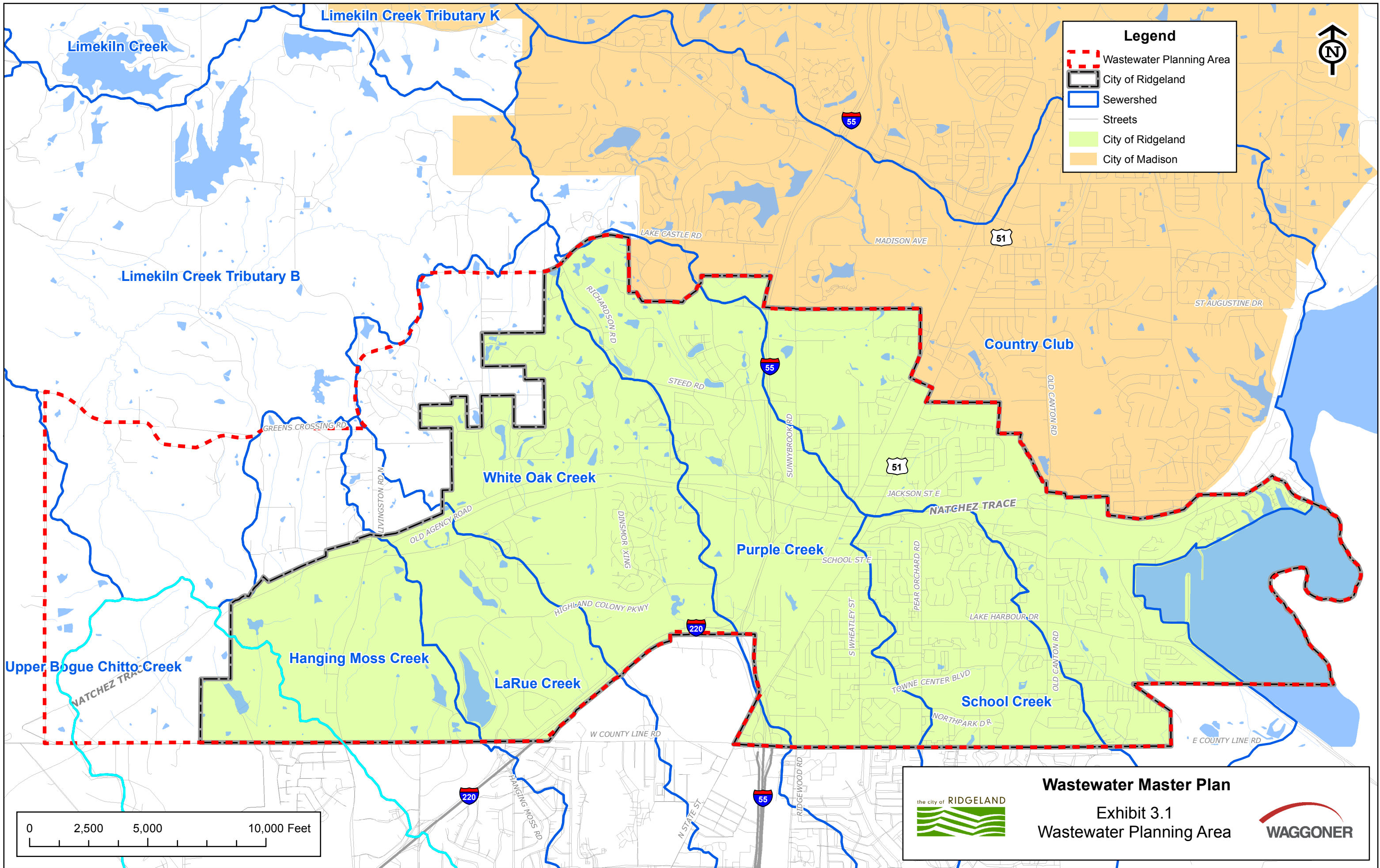
### INTER-LOCAL AGREEMENTS

As described earlier, under the East Madison County Sewage Disposal System agreement (EMCSDS), Ridgeland operates and maintains the facilities of the EMCSDS. Jackson bills EMCSDS two years in arrears, based on proportionate flow in the West Bank Interceptor (WBI) and to the Savanna Street Wastewater Treatment Facility (SSWWTF). Ridgeland bills each member based on proportionate flow for each member's share of operation and maintenance and debt service. AWP CRLF project for any of the facilities within the EMCSDS system would require the agreement of all parties that would be responsible for loan repayment.

Under the Ridgeland-West Sewage Disposal System agreement with Jackson, Ridgeland owns, operates, and maintains its system in the western part of the City. Jackson bills Ridgeland two years in arrears, based on proportionate flow in the West Bank Interceptor (WBI) and to the Savanna Street Wastewater Treatment Facility (SSWWTF). The City of Ridgeland alone is responsible for the costs of improvements to this system.

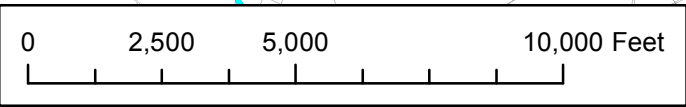








**Legend**

- Wastewater Planning Area
- City of Ridgeland
- Sewershed
- Streets
- City of Ridgeland
- City of Madison

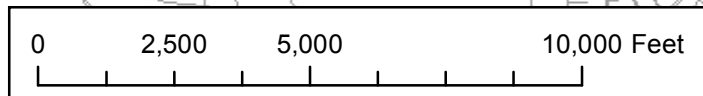
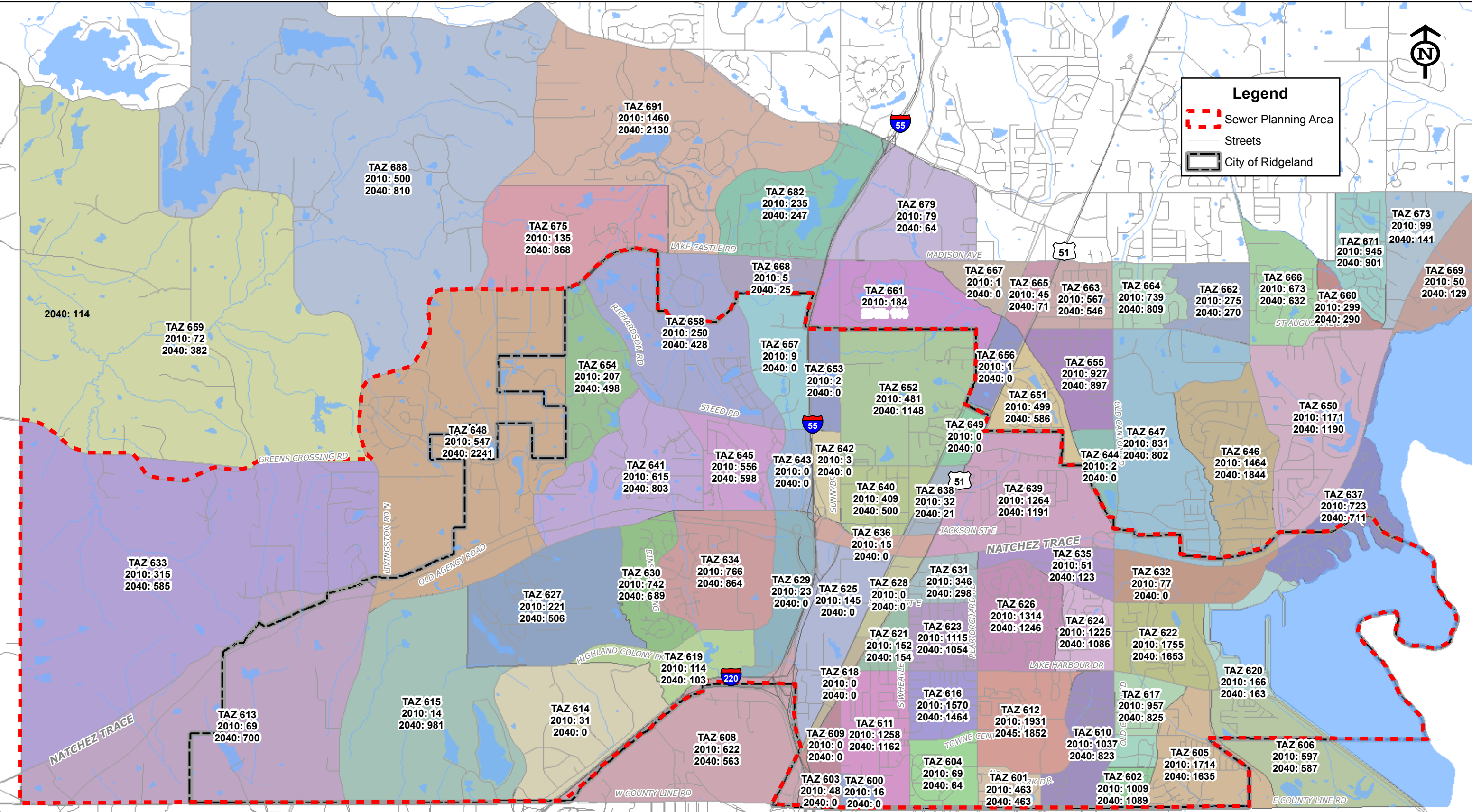



**Wastewater Master Plan**  
 Exhibit 3.1  
 Wastewater Planning Area
 



**Legend**

- Sewer Planning Area
- Streets
- City of Ridgeland



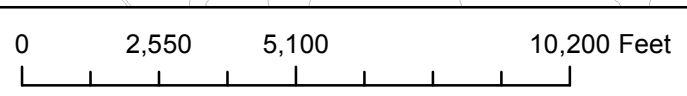
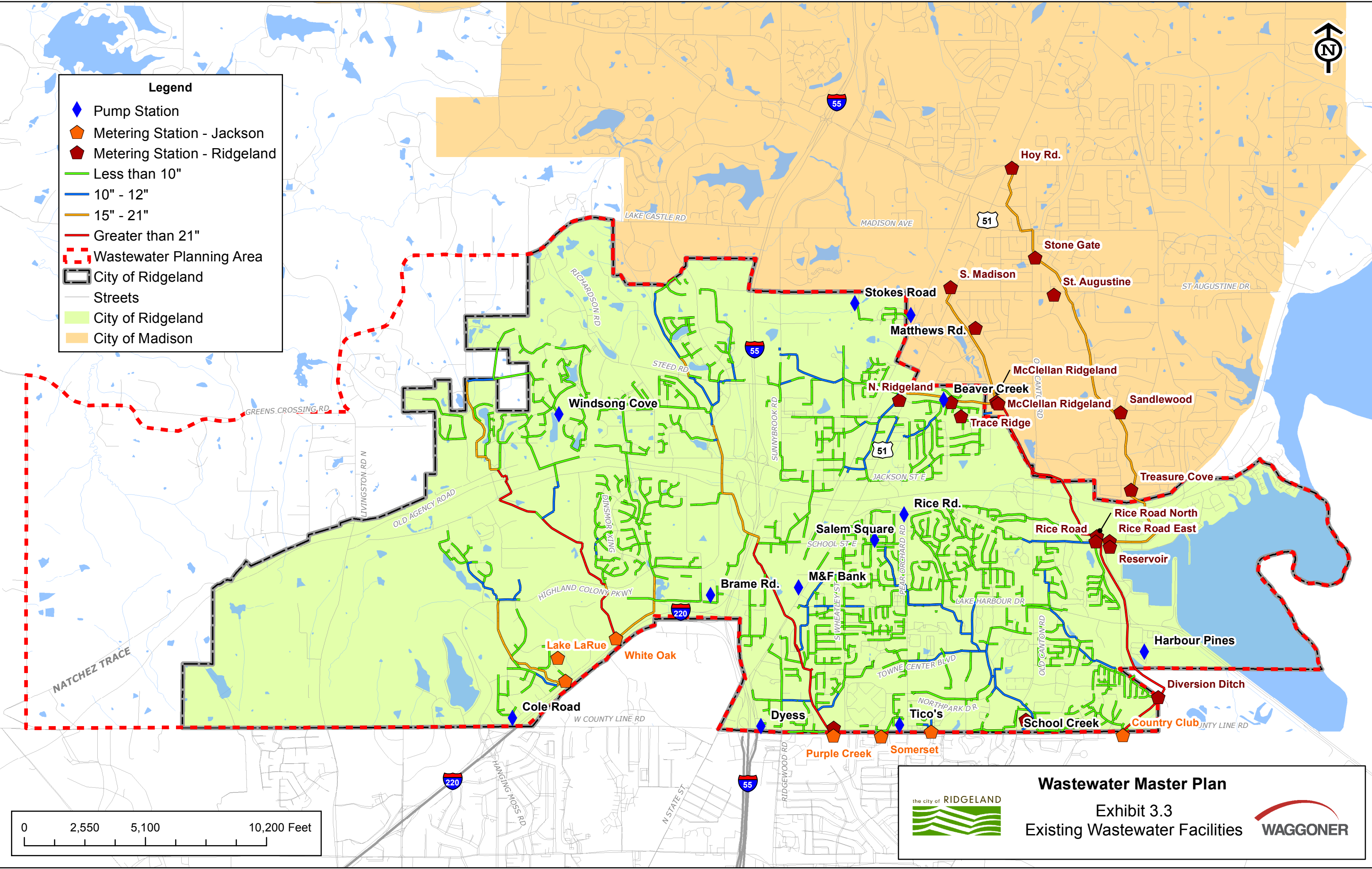
**Wastewater Master Plan**  
 Exhibit 3.2  
 2010 & 2040 TAZ  
 POPULATION PROJECTIONS

the city of RIDGELAND



**Legend**

- ◆ Pump Station
- ◈ Metering Station - Jackson
- ◈ Metering Station - Ridgeland
- Less than 10"
- 10" - 12"
- 15" - 21"
- Greater than 21"
- - - Wastewater Planning Area
- ▭ City of Ridgeland
- ▭ Streets
- ▭ City of Ridgeland
- ▭ City of Madison



**the city of RIDGELAND**

**Wastewater Master Plan**

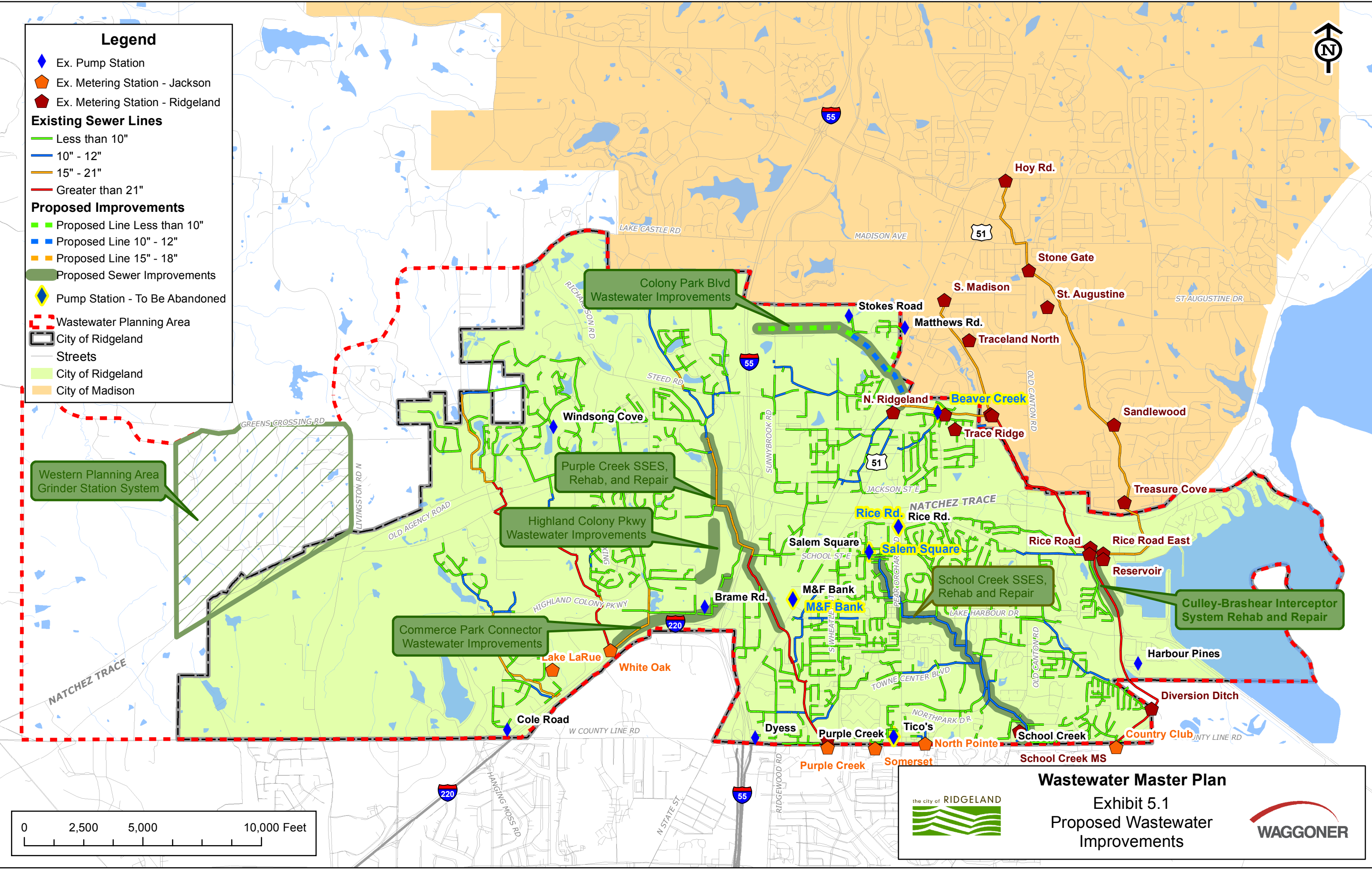
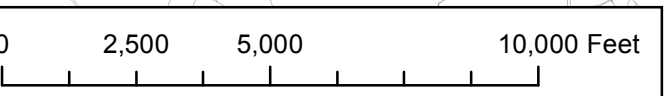
Exhibit 3.3  
Existing Wastewater Facilities



**Legend**

- Ex. Pump Station
- Ex. Metering Station - Jackson
- Ex. Metering Station - Ridgeland
- Existing Sewer Lines**
- Less than 10"
- 10" - 12"
- 15" - 21"
- Greater than 21"
- Proposed Improvements**
- Proposed Line Less than 10"
- Proposed Line 10" - 12"
- Proposed Line 15" - 18"
- Proposed Sewer Improvements
- Pump Station - To Be Abandoned
- Wastewater Planning Area
- City of Ridgeland
- Streets
- City of Ridgeland
- City of Madison

Western Planning Area  
Grinder Station System



the city of RIDGELAND

**Wastewater Master Plan**

Exhibit 5.1

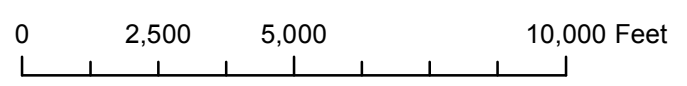
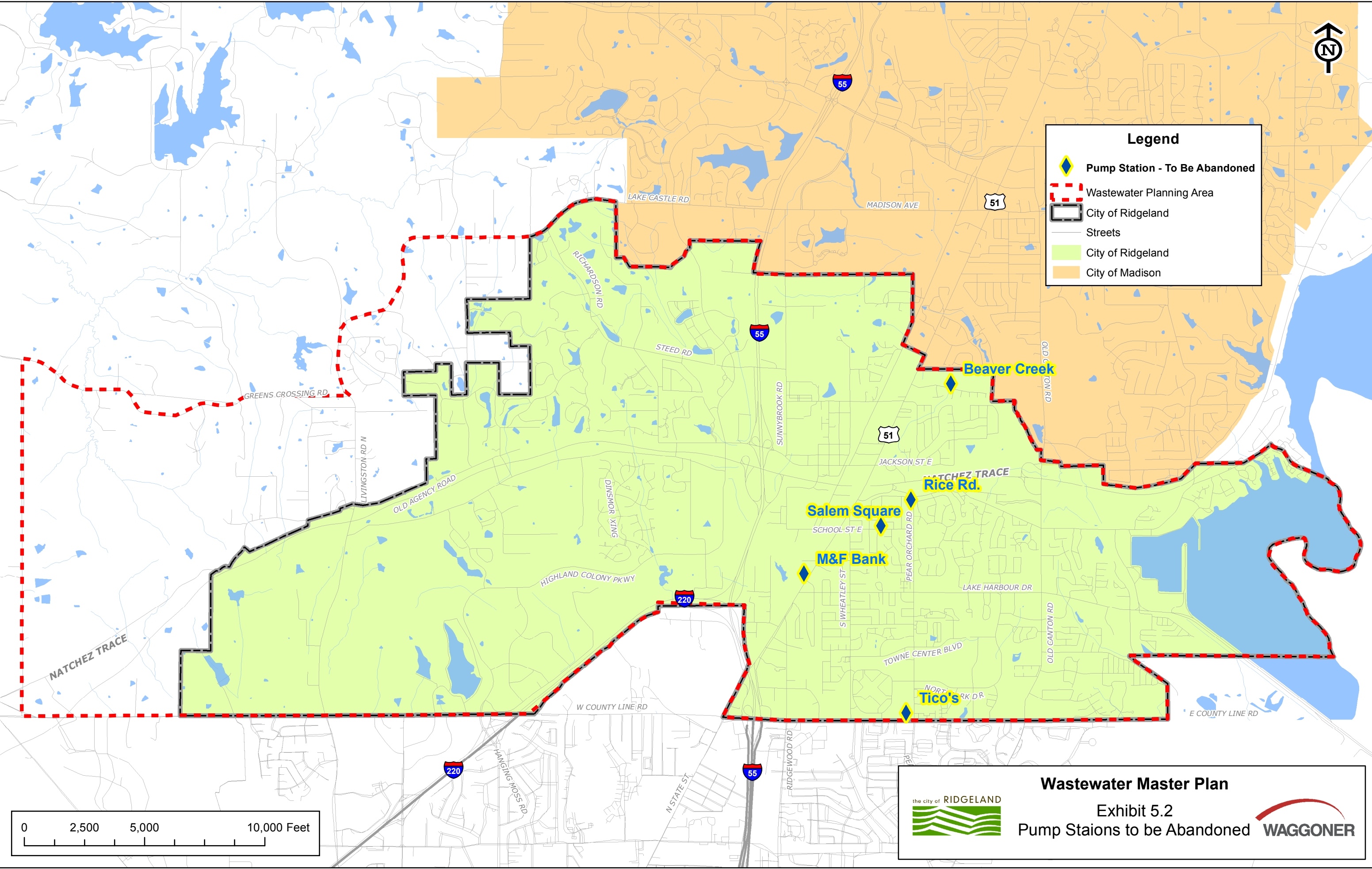
Proposed Wastewater Improvements

**WAGGONER**



**Legend**

- Pump Station - To Be Abandoned
- Wastewater Planning Area
- City of Ridgeland
- Streets
- City of Ridgeland
- City of Madison



**the city of RIDGELAND**

**Wastewater Master Plan**

Exhibit 5.2  
Pump Stations to be Abandoned

## School Creek & Purple Creek Sanitary Sewer Evaluation Survey (SSES)

November 2020

Item No.	Description	Unit	Quantity	Unit Cost	Total Cost
1	Mobilization/Demobilization	LS	1	\$30,000	\$30,000
2	Manhole Inspections	EA	110	\$155	\$17,050
3	C.C.T.V. Inspection, All Sizes	LF	35,000	\$6.50	\$227,500
4	Bypass Pumping Operations	EA	15	\$325	\$4,875
5	Locate & Uncover Manholes	EA	25	\$85	\$2,125
<i>Contingencies (15%)</i>					\$43,000
<b>Subtotal Wastewater</b>					<b>\$324,550</b>

**Construction Costs** **\$324,550**

**Non-Construction Costs** **\$95,000**

*Design Engineering Services* \$40,000

*Construction Phase Services* \$55,000

**Total Opinion of Probable Project Cost** **\$419,550**

## School Creek & Purple Creek Rehabilitation and Repair

November 2020

Item No.	Description	Unit	Quantity	Unit Cost	Total Cost
1	Mobilization/Demobilization	LS	1	\$500,000	\$500,000
2	Raise Manholes	EA	33	\$1,700	\$56,100
3	Replace or Reseal Manhole Ring & Cover	EA	75	\$675	\$50,625
4	Heavy Cleaning Sewer Lines, All Sizes	LF	35,000	\$6.75	\$236,250
5	Cured In Place Pipe (C.I.P.P.), All Sizes	LF	35,000	\$120.00	\$4,200,000
6	Bypass Pump Setups	EA	28	\$3,650	\$102,200
7	Bypass Pumping Operations	HR	4,750	\$68	\$323,000

*Contingencies (15%)* \$821,000

**Subtotal Wastewater** \$6,289,175

**Construction Costs** \$6,289,175

**Non-Construction Costs** \$1,005,000

*Design Engineering Services* \$500,000

*Construction Phase Services* \$505,000

**Total Opinion of Probable Project Cost** \$7,294,175

Item No.	Description	Unit	Quantity	Unit Cost	Total Cost
1	Mobilization/Demobilization	LS	1	\$50,000	\$50,000
2	Raise Manholes	EA	33	\$1,700	\$56,100
3	Replace or Reseal Manhole Ring & Cover	EA	75	\$675	\$50,625
4	Heavy Cleaning Sewer Lines, All Sizes	LF	6,000	\$6.75	\$40,500
5	Cured In Place Pipe (C.I.P.P.), All Sizes	LF	6,000	\$120.00	\$720,000
6	Bypass Pump Setups	EA	5	\$3,650	\$18,250
7	Bypass Pumping Operations	HR	850	\$68	\$57,800

*Contingencies (15%)* \$149,000

**Subtotal Wastewater** \$1,142,275

**Construction Costs** \$1,142,275

**Non-Construction Costs** \$240,000

*Design Engineering Services* \$115,000

*Construction Phase Services* \$125,000

**Total Opinion of Probable Project Cost** \$1,382,275



Commerce Park Connector Wastewater Improvements

November 2020

Item No.	Description	Unit	Quantity	Unit Cost	Total Cost	
<b>Wastewater Collection Improvements</b>						
1	Mobilization/Demobilization	LS	1	\$55,000	\$55,000	
2	Clearing and Grubbing	AC	1.5	\$5,000	\$7,500	
3	Erosion Control	LS	1	\$25,000	\$25,000	
4	Seeding, Sodding, Fertilizing, and Mulching	AC	1.5	\$1,750	\$2,625	
5	12" C900 PVC Sewer Gravity Main	LF	6,750	\$40	\$270,000	
6	18" Steel Casing, Bore and Jack	LF	200	\$200	\$40,000	
7	12" Sewer Line Unencased Bore	LF	100	\$75	\$7,500	
8	12" Sewer Line Creek Crossing	LF	350	\$250	\$87,500	
9	48" Sewer Manhole	EA	20	\$10,000	\$200,000	
10	Connection/Disconnection to Existing Sewer	EA	4	\$2,500	\$10,000	
11	Select Bedding	CY	1,000	\$22	\$22,000	
12	Select Backfill	CY	1,000	\$13	\$13,000	
					<i>Contingencies (15%)</i>	\$112,000
					<b>Subtotal Wastewater</b>	<b>\$852,125</b>
					<b>Construction Cost</b>	<b>\$852,125</b>
					<b>Non-Construction Cost</b>	<b>\$314,000</b>
					<i>Property Acquisition</i>	\$70,000
					<i>Design Survey</i>	\$48,000
					<i>Design Engineering Services</i>	\$90,500
					<i>Construction Phase Services</i>	\$105,500
					<b>Total Opinion of Probable Cost</b>	<b>\$1,166,125</b>

## Highland Colony Wastewater Improvements

November 2020

Item No.	Description	Unit	Quantity	Unit Cost	Total Cost
<b>Wastewater Collection Improvements</b>					
1	Mobilization/Demobilization	LS	1	\$35,000	\$35,000
2	Maintenance of Traffic	LS	1	\$13,000	\$13,000
3	Clearing and Grubbing	AC	0.70	\$5,000	\$3,500
4	Erosion Control	LS	1	\$25,000	\$25,000
5	Seeding, Sodding, Fertilizing, and Mulching	AC	0.70	\$1,750	\$1,225
6	12" C900 PVC Sewer Gravity Main	LF	3,020	\$40	\$120,800
7	18" Steel Casing, Bore and Jack	LF	190	\$200	\$38,000
8	24" Steel Casing, Jack and Bore	LF	100	\$215	\$21,500
9	48" Sewer Manhole	EA	16	\$10,000	\$160,000
10	Connection/Disconnection to Existing Sewer	EA	2	\$2,500	\$5,000
11	Select Bedding	CY	1,510	\$22	\$33,220
12	Select Backfill	CY	1,510	\$13	\$19,630

*Contingencies (15%)* \$72,000

**Subtotal Wastewater** **\$547,875**

**Construction Cost** **\$547,875**

**Non-Construction Cost** **\$195,000**

*Property Acquisition* \$46,000

*Design Survey* \$12,000

*Design Engineering Services* \$60,000

*Construction Phase Services* \$77,000

**Total Opinion of Probable Cost** **\$742,875**

## Colony Park Blvd Wastewater Improvements

November 2020

Item No.	Description	Unit	Quantity	Unit Cost	Total Cost
1	Mobilization/Demobilization	LS	1	\$65,000	\$65,000
2	E. Frontage Rd Reach, 8" Sanitary Sewer	LF	820	\$85	\$69,700
3	Colony Park Blvd Reach, 8" Sanitary Sewer	LF	5,340	\$85	\$453,900
4	Colony Park Blvd Reach, 12" Sanitary Sewer	LF	3,450	\$110.00	\$379,500
5	Stokes Rd Pump Station Abandonment	LS	1	\$8,500.00	\$8,500
6	Stokes Rd PS Interceptor, 8" Sanitary Sewer	LF	950	\$110	\$104,500
7	Matthews Rd Pump Station Abandonment	LS	1	\$8,500	\$8,500
8	Matthews Rd PS Interceptor, 8" Sanitary Sewer	LF	1,210	\$110	\$133,100

*Contingencies (15%)* \$164,000

**Subtotal Wastewater** **\$1,386,700**

**Construction Costs** **\$1,386,700**

**Non-Construction Costs** **\$281,000**

*Design Engineering Services* \$137,000

*Construction Phase Services* \$144,000

**Total Opinion of Probable Project Cost** **\$1,667,700**

Item No.	Description	Unit	Quantity	Unit Cost	Total Cost
<b>Grinder Stations &amp; Force Mains</b>					
1	Mobilization	LS	1	\$70,000	\$70,000
2	Clearing & Grubbing	LS	1	\$40,000	\$40,000
3	Grinder Pump Stations	EA	123	\$12,000	\$1,476,000
4	2" PVC FM	LF	46,600	\$9	\$419,400
5	2" HDPE Bore	LF	11,650	\$19	\$221,350
6	1.5" Service Line	LF	27,675	\$10	\$276,750
7	Valves (at each house)	EA	123	\$6,000	\$738,000
8	Air Release Valves	EA	24	\$5,000	\$120,000
9	Connection to Ex. Manhole	EA	1	\$2,000	\$2,000
10	Erosion Control	AC	11	\$5,100	\$56,100

Contingencies (15%) \$513,000

**Subtotal Wastewater** \$3,932,600

**Construction Costs** \$3,932,600

**Non-Construction Costs** \$1,532,750

Facilities Plannign & Design \$334,000

Construction Phase Servies \$339,500

Plat & Description / Property Acquisition \$859,250

**Total Opinion of Probable Project Cost (Grinder) \$5,465,350**

<b>Pump Station and Force Main</b>					
1	Mobilization	LS	1	\$100,000	\$100,000
2	Clearing & Grubbing	LS	1	\$30,000	\$30,000
3	Force Main	LF	6,600	\$100	\$660,000
4	Pump Station	EA	1	\$150,000	\$150,000
5	16" Steel Casing (Bored)	LF	350	\$500	\$175,000
10	Erosion Control	AC	7	\$5,100	\$35,700

Contingencies (15%) \$173,000

**Subtotal Wastewater** \$1,323,700

**Construction Costs** \$1,323,700

**Non-Construction Costs** \$424,500

Facilities Plannign & Design \$132,000

Construction Phase Servies \$140,500

Plat & Description / Property Acquisition \$152,000

**Total Opinion of Probable Project Cost (PS / FM) \$1,748,200**

**Total Opinion of Probable Project Cost \$7,213,550**

Item No.	Description	Unit	Quantity	Unit Cost	Total Cost	
1	Mobilization/Demobilization	LS	1	\$5,000	\$5,000	
2	Clearing & Grubbing	LS	1	\$2,300	\$2,300	
3	8" Sanitary Sewer (0/8)	LF	262	\$35	\$9,170	
4	Design	LF	128	\$45	\$5,760	
5	Stream Crossing	LF	50	\$60	\$3,000	
6	Manholes (0/8)	EA	1	\$2,870	\$2,870	
7	Flow Meter Installation	EA	1	\$26,500	\$26,500	
8	Connect to Ex. Manhole/PS	EA	2	\$2,275	\$4,550	
9	PS Abandonment	EA	1	\$7,500	\$7,500	
10	Erosion Control	LS	1	\$4,500	\$4,500	
11	Seeding & Fertilization	AC	0.1	\$1,750	\$175	
12	Solid Sod	SY	440	\$6	\$2,640	
					<i>Contingencies (15%)</i>	\$11,000
					<b>Subtotal Wastewater</b>	<b>\$84,965</b>

**Construction Costs** **\$84,965**

**Non-Construction Costs** **\$25,000**

*Design Engineering Services* \$10,000

*Construction Phase Services* \$15,000

**Total Opinion of Probable Project Cost** **\$109,965**

Item No.	Description	Unit	Quantity	Unit Cost	Total Cost
1	Mobilization/Demobilization	LS	1	\$5,000	\$5,000
2	Clearing & Grubbing	LS	1	\$11,500	\$11,500
3	8" Sanitary Sewer (0/8)	LF	488	\$35	\$17,080
4	8" Sanitary Sewer (8/12)	LF	147	\$45	\$6,615
5	8" Sanitary Sewer (12/16)	LF	202	\$57	\$11,514
6	Manholes (0/8)	EA	1	\$2,870	\$2,870
7	Manholes (8/12)	EA	1	\$3,500	\$3,500
8	Connect to Ex. Manhole/PS	EA	2	\$2,275	\$4,550
9	PS Abandonment	EA	1	\$7,500	\$7,500
10	Erosion Control	LS	1	\$9,000	\$9,000
11	Seeding & Fertilization	AC	0.4	\$1,750	\$700

*Contingencies (15%)* \$12,000

**Subtotal Wastewater** \$91,829

**Construction Costs** \$91,829

**Non-Construction Costs** \$79,000

*Property Acquisition* \$45,000

*Design Engineering Services* \$13,000

*Construction Phase Services* \$21,000

**Total Opinion of Probable Project Cost** \$170,829

Item No.	Description	Unit	Quantity	Unit Cost	Total Cost
1	Mobilization/Demobilization	LS	1	\$4,000	\$4,000
2	Clearing & Grubbing	LS	1	\$3,500	\$3,500
3	8" Sanitary Sewer (0/8)	LF	1,300	\$35	\$45,500
4	16" Casing, Bore & Jack	LF	120	\$230	\$27,600
5	Manholes (0/8)	EA	2	\$2,870	\$5,740
6	Connect to Ex. Manhole/PS	EA	2	\$2,275	\$4,550
7	PS Abandonment	EA	1	\$7,500	\$7,500
8	Erosion Control	LS	1	\$2,000	\$2,000
9	Solid Sod	SY	1,300.0	\$6	\$7,800

*Contingencies (15%)* \$17,000

**Subtotal Wastewater** \$125,190

**Construction Costs** \$125,190

**Non-Construction Costs** \$49,500

*Property Acquisition* \$4,500

*Design Engineering Services* \$17,500

*Construction Phase Services* \$27,500

**Total Opinion of Probable Project Cost** **\$174,690**

## M&F Bank Pump Station Abandonment

November 2020

Item No.	Description	Unit	Quantity	Unit Cost	Total Cost
1	Mobilization/Demobilization	LS	1	\$2,500	\$2,500
2	Clearing & Grubbing	LS	1	\$18,000	\$18,000
3	8" Sanitary Sewer (0/8)	LF	487	\$35	\$17,045
4	8" Sanitary Sewer (8/12)	LF	419	\$45	\$18,855
5	8" Sanitary Sewer (12/16)	LF	223	\$57	\$12,711
6	8" Sanitary Sewer (16/20)	LF	206	\$65	\$13,390
7	Manholes (0/8)	EA	1	\$2,870	\$2,870
8	Manholes (8/12)	EA	1	\$3,500	\$3,500
9	Manholes (>20)	EA	2	\$5,000	\$10,000
10	Connect to Ex. Manhole/PS	EA	2	\$2,275	\$4,550
11	PS Abandonment	EA	1	\$7,500	\$7,500
12	Erosion Control	LS	1	\$15,000	\$15,000
13	Seeding & Fertilization	AC	0.6	\$1,750	\$1,050

*Contingencies (15%)* \$20,000

**Subtotal Wastewater** \$146,971

**Construction Costs** \$146,971

**Non-Construction Costs** \$65,000

*Property Acquisition* \$15,000

*Design Engineering Services* \$20,000

*Construction Phase Services* \$30,000

**Total Opinion of Probable Project Cost** \$211,971



Item No.	Description	Unit	Quantity	Unit Cost	Total Cost
1	Mobilization/Demobilization	LS	1	\$20,000	\$20,000
2	10" Sanitary Sewer (10/12)	LF	761	\$57	\$43,377
3	8" Sanitary Sewer (6/8)	LF	701	\$34	\$23,834
4	8" Sanitary Sewer (8/10)	LF	429	\$40	\$17,160
5	8" Sanitary Sewer (10/12)	LF	92	\$50	\$4,600
6	8" Ductile Iron Sewer (6/8)	LF	193	\$75	\$14,475
7	6" Service Lines	LF	500	\$40	\$20,000
8	Reconnect Ex. Service Lines to New Main	EA	30	\$850	\$25,500
9	Manholes (6/8)	EA	2	\$2,870	\$5,740
10	Manholes (8/10)	EA	2	\$3,200	\$6,400
11	Drop Manholes (8/10)	EA	3	\$3,675	\$11,025
12	Drop Manholes (10/12)	EA	1	\$3,900	\$3,900
13	Manhole Installed on Ex. Line (6/8)	EA	1	\$3,675	\$3,675
14	Connect to Ex. Manhole/PS	EA	1	\$2,250	\$2,250
15	PS Abandonment	EA	1	\$7,500	\$7,500
16	Asphalt Road Repair	TN	1,700	\$175	\$297,500

*Contingencies (15%)* \$77,000

**Subtotal Wastewater** \$583,936

**Construction Costs** \$583,936

**Non-Construction Costs** \$147,000

*Property Acquisition* -

*Design Engineering Services* \$65,000

*Construction Phase Services* \$82,000

**Total Opinion of Probable Project Cost** \$730,936

## Transfer Switches (Cole Rd, Dyess Rd, Matthews Rd, Stokes Rd, & Windsong Cove)

November 2020

Item No.	Description	Unit	Quantity	Unit Cost	Total Cost
1	Transfer Switches (Cole Rd, Dyess Rd, Matthews Rd, Stokes Rd, & Windsong Cove)	LS	5	\$4,000	\$20,000
				<i>Contingencies (15%)</i>	\$3,000
				<b>Subtotal Wastewater</b>	<b>\$23,000</b>
				<b>Construction Costs</b>	<b>\$23,000</b>
				<b>Non-Construction Costs</b>	<b>\$8,000</b>
				<i>Design Engineering Services</i>	\$3,000
				<i>Construction Phase Services</i>	\$5,000
<b>Total Opinion of Probable Project Cost</b>					<b>\$31,000</b>