PRELIMINARY ENGINEERING REPORT FINAL

WITHLACOOCHEE BASIN SEWER SYSTEM IMPROVEMENTS

VALDOSTA GEORGIA UTILITIES DEPARTMENT

PARSONS

LOVELL ENGINEERING ASSOCIATES, PC
CIVIL • ENVIRONMENTAL • LAND PLANNING

AUGUST 2011

PRELIMINARY ENGINEERING REPORT

Table of Contents

LIST OF FIGURES

LIST OF TABLES

LIST OF APPENDICES

EXECUTIVE SUMMARY

ES.1 PROJECT SUMMARY

This Preliminary Engineering Report (PER) describes sewer system improvements in the Withlacoochee service area. Improvements will be packaged into multiple construction packages to meet the needs of the City of Valdosta system while providing opportunities for local contractors to bid on the improvements.

The outfall sewer to the Withlacoochee Water Pollution Control Plant (WPCP) is located in the broad floodplain of the Withlacoochee River. Due to its location, the outfall is periodically underwater, allowing river water to directly inflow into manholes and other structures. This coupled with infiltration and inflow into the collection system overwhelms the existing collection and treatment systems. This project provides sewer system improvements which eliminate the use of the 54-inch Withlacoochee Outfall by intercepting all flows to the outfall and pumping directly to the Withlacoochee WPCP. This project is being done in conjunction with improvements to the Withlacoochee WPCP presented in a separate Design Development Report.

ES.2 RECOMMENDED FACILITIES

The Withlacoochee service area sewer system will be rerouted to eliminate the 54-inch Withlacoochee Outfall. These improvements include:

- New Gornto Road Pump Station (PS) along Gornto Road
- New Remer Lane PS on the site of the decommissioned Remerton WPCP
- New force mains from Gornto PS and Remer PS that combine into a single force main to the new Withlacoochee WPCP headworks and equalization.
- New Valdosta Correctional Institution (VCI) PS pumping flow to the Gornto Road sub-basin sewer system.

ES.3 COST AND SCHEDULE

The City of Valdosta anticipates funding the capital cost of this project either through FEMA or other funding resources. Operating costs and any debt service will be paid by revenue from the water and sewer service. The total capital cost of these sewer system improvements is estimated at $27.1 million. The components of this capital cost are shown in Table ES-1. Operation and maintenance (O&M) costs for the improvements will increase the City of Valdosta's annual operating budget requirements. O&M costs for these facilities, including planned capital renewal and replacement costs, are projected to be $470,000 per year. The components of this annual O&M cost are shown in Table ES-2.

Table ES-1. Capital Cost Estimate	
Item	**Cost, million dollars**
Sewer System Improvements	
Design	1.1
Construction	26.0
Total Projected Capital Cost	27.1

Table ES-2. Operations & Maintenance Cost Estimate	
Item	**Average Operation and Maintenance Cost, dollars**
Sewer System Improvements	
Labor	64,000
Electric Power	168,000
Maintenance	46,000
Renewal/Capital Replacement	167,000
Other	25,000
Estimated Annual Average O&M	470,000

The milestones for implementation of these improvements are shown in Table ES-3. Under this schedule, the improvements will be completed in 2013.

Table ES-3 Schedule	
Milestone	**Date**
Detailed Design Complete	April 2012
Bid Opening	June 2012
Construction Contract Issued	July 2012
Construction Completion	October 2013
Testing, Startup and Training Completion	November 2013

SECTION 1
INTRODUCTION

This Preliminary Engineering Report (PER) describes sewer system improvements in the Withlacoochee service area. This project is being done in conjunction with improvements to the Withlacoochee Water Pollution Control Plant (WPCP) presented in a separate Design Development Report (DDR). Section 1 provides an overview of the project purpose and objectives and related projects. The detailed design of these improvements will be packaged in multiple construction packages to meet the needs of the City of Valdosta system while providing opportunities for local medium sized contractors to bid on the improvements.

1.1 PROJECT PURPOSE AND OBJECTIVES

The outfall sewer to the Withlacoochee WPCP is located in the broad floodplain of the Withlacoochee River. Due to its location, the outfall is periodically underwater, allowing river water to directly inflow into manholes and other structures. Inflow to the outfall sewer combines with infiltration and inflow into the collection system to overwhelm the collection and treatment systems. The outfall pipe is difficult to access making maintenance and operation of the collection system difficult. The City of Valdosta recognizes the need to address these sewer system issues, to protect receiving water quality, eliminate sanitary sewer overflows (SSOs) and provide for growth and economic development. This project is being done in conjunction with Withlacoochee WPCP improvements presented in a separate Design Development Report (DDR).

Extreme rain events in April 2009 resulted in severe flooding of the Withlacoochee River and severely impacted operation of the Withlacoochee WPCP and sewer system. Interceptors backed up and overflowed because of the inability of the 54-inch pipe to convey the flows. Approximately forty percent of the plant was flooded. Emergency construction of a 20-foot-high berm around the influent pump station controlled flooding, thus avoiding major influent lift station damage that would have resulted in an extended raw wastewater spill and extensive environmental impact.

The City of Valdosta has evaluated sewer flows and collection system conditions. The system experiences higher than normal peaks during wet weather events. Flow monitoring and the sanitary sewer rehabilitation priorities are documented in 2010 engineering reports titled Sewer System Modeling and Capacity Evaluation Report, and Sanitary Sewer Condition Assessment and Rehabilitation Program Plan.

This project provides for the elimination of the 54-inch outfall sewer. Wastewater flows in the Withlacoochee sewer system will be intercepted upstream of the 54-inch sewer and pumped to the new Withlacoochee WPCP headworks and flow equalization facilities which are documented

in a separate DDR. The facilities are sized based on longer-term flows including peak flow reductions and are capable of handling current wet weather peak flow conditions.

This PER describes the Withlacoochee sewer system improvements, including the following:

- New Gornto Road Pump Station (PS) along Gornto Road
- New Remer Lane PS on the site of the decommissioned Remerton WPCP
- New force mains from Gornto PS and Remer PS that combine into a single force main to the new Withlacoochee WPCP headworks and equalization.
- New Valdosta Correctional Institution (VCI) PS pumping flow to the Gornto Road sub-basin sewer system.

This PER provides a general description of the proposed scope of work and the criteria used in the selection of major equipment. This report forms the basis for the detailed design effort.

1.2 RELATED PROJECTS

The City of Valdosta has recently completed a system capacity and condition assessment of it sewer system. Based on this assessment, areas of the system were prioritized for the City's infiltration and inflow control efforts. Due to aging infrastructure, rehabilitation is expected to include lining existing older pipelines, replacing pipelines and structures, construction of relief sewers, and both trenched and trenchless pipe rehabilitation. The City of Valdosta has initiated a sewer system rehabilitation and replacement program. They have CCTV recorded 2 interceptors in the areas of the system identified as high priority. The City of Valdosta is rehabilitating 20 manholes and developing an ongoing listing of other manholes requiring rehabilitation. They anticipate work beginning on at least 20 additional manuals within the next year. Lift stations in the system are being replaced. Planning is also underway for elimination of three dated aerial sewer lines near the new Remer PS. Contracts have been issued for the replacement of four lift stations, including 2 damaged in the 2009 flood event. The remaining ten lift stations will be replaced as funding is identified.

The City of Valdosta is developing a Withlacoochee WPCP Improvement project which will provide new headworks and equalization storage. The Withlacoochee WPCP improvements are being planned in conjunction with these Sewer System Improvements and are presented in a separate DDR. The estimated capital cost and the annual average operations and maintenance cost for the Withlacoochee WPCP improvements are 5.2 million dollars and 79,000 dollars, respectively.

SECTION 2
BACKGROUND

The City of Valdosta provides wastewater collection and treatment services throughout the City limits. The Withlacoochee WPCP discharges into the Withlacoochee River, and the Mud Creek WPCP discharges into Mud Creek, which is a tributary of the Alapaha River. Both rivers are in the Suwannee River Basin. This section provides an overview of the Withlacoochee service area, the sewer system and the WPCP.

2.1 SERVICE AREA DESCRIPTION

The City of Valdosta is located in the coastal plain of Georgia along the Interstate 75 corridor. Its location approximately fifteen miles north of the Georgia's boundary with Florida allows it to serve as a commercial center of South Georgia. The coastal plain is generally characterized as flat, but the Withlacoochee service area has elevations ranging from 120 feet to 240 feet MSL. Soils in the coastal plain tend to be sandy. The climate can be described as humid subtropical with mild, wet winters and hot, humid summers.

Figure 2-1 shows the collection systems boundaries and locations of the City of Valdosta WPCPs.

2.2 WITHLACOOCHEE SERVICE AREA SEWER SYSTEM

The Withlacoochee WPCP, located at 3352 Wetherington Lane in Valdosta, Georgia receives and treats wastewater from a network of sewer systems in the north and west sections of the City of Valdosta as shown on Figure 2-1. The service area is generally bounded by Highway 84 on the south, Forrest Street and Bemiss Road on the east, and the northern corporate limits of the City of Valdosta. This service area consists of approximately 20 miles of 15 to 54-inch sewers with major interceptor sewers along One Mile Branch, and Three Mile Branch. The 54-inch outfall sewer which delivers all influent flow to the Withlacoochee WPCP lies in the floodplain of the Withlacoochee River and is subject to flooding and direct inflow.

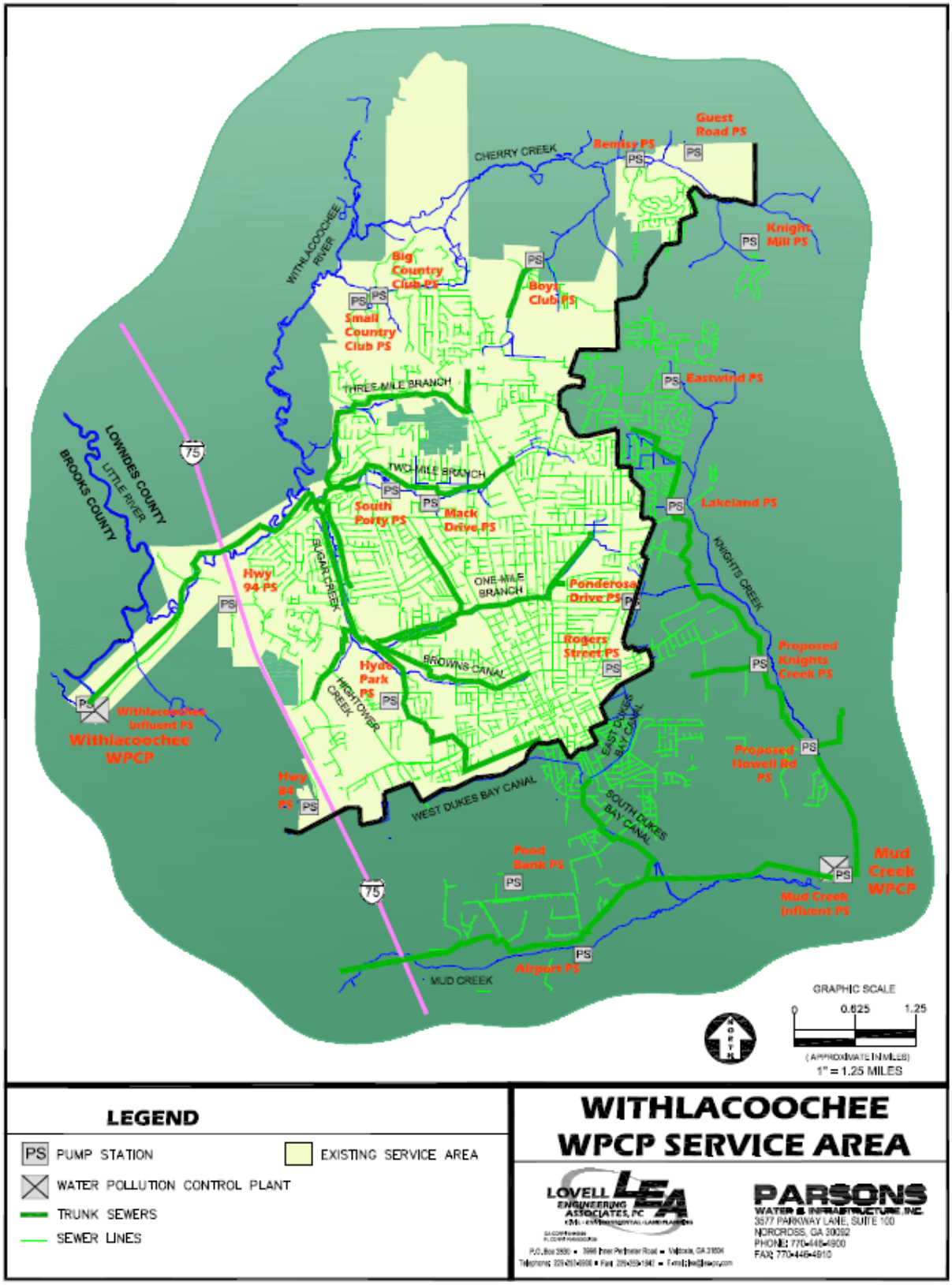


Figure 2-1. City of Valdosta Wastewater Service Areas

2.3 WITHLACOOCHEE WPCP

The Withlacoochee WPCP (NPDES permit No. GA0033235) is currently permitted to discharge to the Withlacoochee River with seasonal effluent limitations. Seasonal flow limitations for the existing Withlacoochee WPCP are listed in Table 2-1. Biochemical oxygen demand, ammonia and total residual chlorine concentrations also vary seasonally.

Table 2-1. Withlacoochee WPCP NPDES Permit Effluent Flow Limitations

Months	Seasonal monthly discharge flow limitations, mgd
January – April	12
May	10
June – December	8

The Withlacoochee WPCP plant property is at a low elevation adjacent to the Withlacoochee River. The plant receives high peak flow following rain storms as a result of infiltration and inflow into the system, including significant inflow into to the 54-inch outfall sewer. Due to heavy rains in April 2009, much of the plant was underwater and during that time plant flows were estimated at 25 million gallons per day (mgd).

SECTION 3
WASTEWATER FLOW CHARACTERISTICS AND IMPROVEMENT OBJECTIVES

This section discusses wastewater projections for the Withlacoochee WPCP service area. The section further identifies wastewater design flows for each facility

3.1 POPULATION AND FLOWS

Population and wastewater flow projections for the Withlacoochee service area in the years 2018, 2038 and build-out (2050) are developed and documented in the City of Valdosta Sewer System Modeling and Capacity Evaluation Report, January 2010 (Sewer System Modeling Report). These projections serve as the basis for developing design flows. An analysis to develop design flows for this project is documented in a report titled Technical Memorandum (TM) No 1 Wastewater Flows dated January 28, 2011. A copy of this Technical Memorandum is included as Appendix A.

Average dry weather wastewater flows for the Withlacoochee service area are projected to increase from 5.16 mgd in year 2008 to 12.94 mgd at build out. These Camp Dresser & McKee (CDM) developed projections represent a 150 percent increase in average dry weather flow over a 42 year period. Build out was set at year 2050. Five-minute peak flow factors ranging from 1.7 to 12.4 times average dry weather flow are reported in the Sewer System Modeling Report. Average dry weather diurnal flow variation for each monitor location is included in the City's SewerCad model of the collection system.

The Withlacoochee service area sewer system is generally divided into two sub-basins for the purpose of developing and analyzing collection system improvements. These sub-basins are shown on Exhibit 2 to TM-1 in Appendix A. Generally, flows converge at two locations in the collection system, in the area of the abandoned treatment facility off Remer Lane, and Gornto Road, near the Withlacoochee River. Average dry weather flow projections for these service areas are shown in Table 3-1.

Table 3-1. Withlacoochee Basin Average Dry Weather Flow

Service Area	Average Dry Weather Flow, mgd			
	2008	**2018**	**2038**	**2050**
Remer Lane	3.31	4.76	6.41	7.33
Gornto Road	1.85	2.78	4.55	5.26
Direct to WPCP	0.00	0.10	0.30	0.35
Total, Withlacoochee WPCP	**5.16**	**7.64**	**11.26**	**12.94**

The City is undertaking a prioritized program to reduce the infiltration and inflow into its collection system. This program is expected to reduce the peak flows that will be conveyed to the Withlacoochee WPCP. Therefore, it is appropriate to select a future peaking factor that reflects this reduction. Based on a review of peaking factors for similar sized facilities, a peaking factor of 3.0 times average dry weather flows is used to calculate peak hour flows for the development of long-term improvements to the system. This peaking factor is generally conservative to account for the uncertainty of future reductions of infiltration and inflow into the collection system. Peak hour projections are presented in Table 3-2.

Table 3-2. Withlacoochee Basin Peak Hour Flow

Service Area	Peak Hour Flow, mgd			
	2008	**2018**	**2038**	**2050**
Remer Lane	9.94	14.27	19.23	21.98
Gornto Road	5.54	8.35	13.66	15.79
Direct to WPCP	0.00	0.30	0.90	1.05
Withlacoochee WPCP	**15.48**	**22.92**	**33.79**	**38.82**

Facilities sized based on these projections will provide for the future growth needs of the system, and provide additional peak capacity during the interim period, as the Sewer System Rehabilitation Program reduces infiltration and inflow into the system. For example, firm capacity to meet the Remer Lane 2038 peak hour flows of 19.23 mgd, provides infrastructure that is capable of conveying peak flows that are approximatly 9 mgd higher than year 2008 peak hour wastewater flows using a peaking factor of 3.0.

In developing recommended improvements, consideration must also be given to the minimum flows from each service area. Minimum flows from each service area are based on diurnal variations monitored in 2008 as included in Valdosta's SewerCAD model. Minimum hourly flows from the Remer Lane service area are approximately 65 percent of average dry weather flow. Minimum hourly flows from the Gornto Road service area are approximately 45 percent of average dry weather flow.

3.2 DESIGN FLOWS

Sewer system improvement design flows are summarized in Table 3-3. The structural elements of the pumping system will be designed for 2050 flows. The mechanical design of the station is based on 2038 flows, and will be designed to accommodate future expansion to 2050 flows rates.

Table 3-3. Wastewater Flows for Developing Collection System Improvements				
Service Area	**Wastewater Flows, mgd**			
	2008	**2018**	**2038**	**2050**
Remer Lane, Peak Hour	9.94	14.27	19.23	21.98
Remer Lane, Minimum Hour	2.15	3.09	4.16	4.76
Gornto Road, Peak Hour	5.54	8.35	13.66	15.79
Gornto Road, Minimum Hour	0.83	1.25	2.05	2.37

This page intentionally left blank.

SECTION 4
PROPOSED FACILITIES

This section presents the proposed facilities for the sewer system improvements for the Withlacoochee service area. These improvements are being done in conjunction with improvements to the Withlacoochee WPCP presented in a separate Design Development Report. Projected capital costs, operation and maintenance cost and the schedule for completion of the proposed facilities are presented.

4.1 SUMMARY OF THE EXPANSION CONCEPT

The design for the expansion of the Withlacoochee sewer system improvements involves the following elements, more fully discussed in subsequent sections:

- New Gornto Road Pump Station (PS) along Gornto Road
- New Remer Lane PS on the site of the decommissioned Remerton WPCP
- New force mains from Gornto PS and Remer PS that combine into a single force main to the new Withlacoochee WPCP headworks and equalization.
- New Valdosta Correctional Institution (VCI) PS pumping flow to the Gornto Road sub-basin sewer system.

Upon completion of these improvements flow will be routed away from the existing 54-inch outfall and directly to the Withlacoochee WPCP.

4.2 BASIS OF DESIGN

This section presents the basis of design for the proposed Collection System Improvements..

4.2.1 Gornto Road PS

Flow will be routed from the existing sewer system to the new Gornto Road PS. The location of the pump station and general alignment of the force main are shown in Figure 4-1. A site plan and profile of the force main routing are included in Appendix C. The centrifugal submersible pumping station will be constructed with 4 - 250 horsepower pumps, with room for a 5^{th} pump to be added to accommodate projected flow beyond 2038. Table 4-1 presents the basis of design in tabular format. Preliminary plan and section are included in Appendix C to this report.

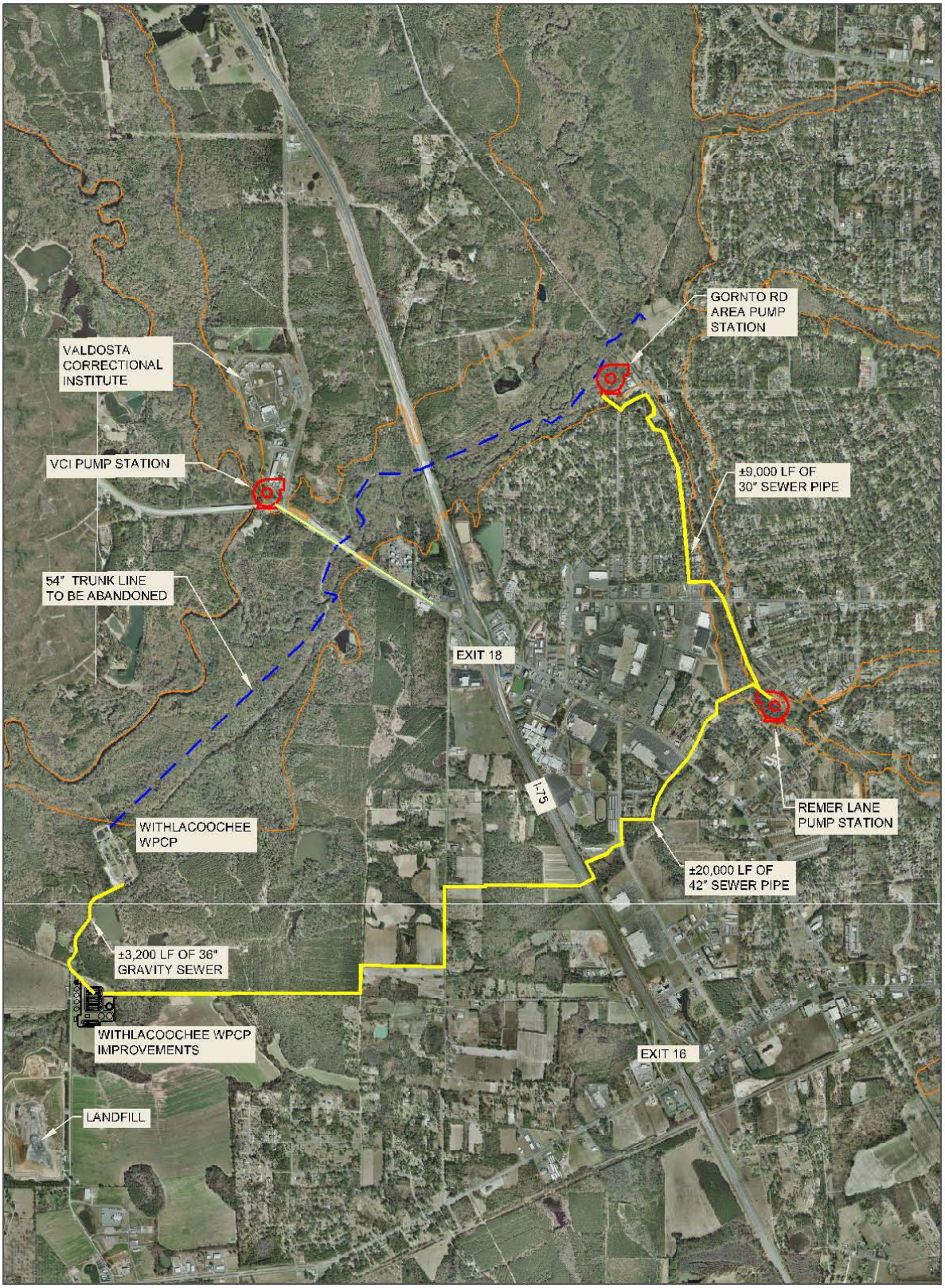


Figure 4-1. Withlacoochee Service Area Sewer System Improvements

Table 4-1. Basis of Design		
Withlacoochee Basin Sewer System Improvements		
Item	**Design Year 2038**	**Design Year 2050**
Gornto Road PS		
Peak hour pumping capacity, mgd	14	
Type	Submersible centrifugal with variable frequency drives	Submersible centrifugal with variable frequency drives
Number, total/redundant	4/1	5/1
Horsepower	250	250
Capacity, each, gpm	3150	3150
Speed, rpm	1785	1785
Head, feet	175	175
Efficiency, percent	78	78
Remer Road PS		
Peak hour pumping capacity, mgd	22	22
	Submersible centrifugal with variable frequency drives	Submersible centrifugal with variable frequency drives
Number, total/redundant	4/1	4/1
Horsepower	385	385
Capacity, each, gpm	5100	5100
Speed, rpm	1190	1190
Head, feet	132	132
Efficiency, percent	79	79
Valdosta Correctional Institute PS		
Peak hour pumping capacity, mgd		
Type	Submersible centrifugal	Submersible centrifugal
Number, total/redundant	2/1	2/1
Horsepower	5	5
Capacity, each, gpm	350	350

Table 4-1. Basis of Design				
Withlacoochee Basin Sewer System Improvements				
Item			Design Year 2038	Design Year 2050
		Speed, rpm	1850	1850
		Head, feet	25	25
		Efficiency, percent	70	70

A 30-inch diameter HDPE force main will be constructed from the Gornto Road PS to a combined flow intersection outside of the Remer Lane PS. The approximately 10,000 linear feet (lf) force main will generally be located in existing City of Valdosta rights-of-way and existing easements between the two pump stations. Jack-and-bores and/or directional bores (as appropriate) will occur at two major roadway crossings, one railroad crossing, and the crossing of Sugar Creek.

4.2.2 Remer Lane PS

Flow will be routed from the existing sewer system to the new Remer Lane PS. The location of the pump station and general alignment of the force main are shown in Figure 4.1. A site plan and profile of the force main routing are included in Appendix D. The centrifugal submersible pumping station will be constructed with 4 – 385 horsepower pumps. Table 4.1 presents the basis of design in tabular format. Preliminary plan and section are included in Appendix C to this report.

A short run of 36-inch HDPE force main will be constructed from the Remer Lane PS to the combined flow intersection with the force main from the Gornto Road PS. From the combined flow intersection, approximately 21,000 lf of 42-inch HDPE force main will be constructed in existing and acquired easements to the new headworks. The design of the headworks is presented in a separate design report. Jack-and-bores and/or directional bores as appropriate will occur at five major roadway crossings, one railroad crossing, and the Sugar Creek and Hightower Creek stream crossings.

4.2.3 Valdosta Correctional Institute PS

Flow will be routed from the existing collection system to the gravity system tributary to the Gornto Road PS. The location of the pump station and general alignment of the force main are shown in Figure 4.1. A profile of the force main routing is included in Appendix D. The centrifugal submersible pumping station will be constructed with 2 – 5 horsepower constant speed pumps. Table 4.1 presents the basis of design in tabular format. Preliminary plan and section drawings are included in Appendix D to this report.

The force main from VCI PS will be approximately 4,000 lf of 12-inch HDPE. The line will discharge into an existing gravity sewer near I-75 Exit 18. The force main will involve several jack-and-bore crossings: under the Withlacoochee River, along GA Highway 133, and in crossing several driveways. All of these crossings will be coordinated with GA DOT.

4.2.4 Sewer System Improvement Permitting Considerations

Sewer system improvements will meet the following criteria:

- All construction materials and activities will be in accordance with GA EPD and City of Valdosta Standards and Specifications.
- Full pipe conditions will be maintained by creating a barometric loop at the Withlacoochee WPCP headworks.
- The depth to the top of line will average 4 feet with varying depths no less than 4 feet at existing utility conflict points.
- Air relief valves with provision for future odor control (if necessary) will be installed at high points along the run of the force main.
- Wetland impacts, if necessary, will be permitted through the Army Corps of Engineers Albany Field Office.
- Stream buffer encroachments and NPDES Construction Permitting will be coordinated through GA EPD and the City of Valdosta.
- Erosion control and land disturbance permitting will be permitted through the City of Valdosta.

4.2.5 Ancillary Facilities

This section presents a discussion of ancillary facilities utilized in the Sewer System Improvements. These facilities include odor control, electrical, heating, ventilation and air conditioning, noise, fire protection, and plant utilities.

4.2.5.1 Odor Control

Odor control will be provided for the Gornto Road PS and Remer Lane PS. The odor control systems will be covered biofilters using beds of organic material (medium). This medium will be a mixture of compost and wood chips. As air passes through the biofilter the microbes on the organic material convert odorous gases to carbon dioxide and water. Fans will pull air from the wet well and force the air through the biofilter media. After treatment, clean air will be released into the atmosphere. The odor control systems will be designed to maintain a negative pressure within the wet well. The negative air pressure will minimize the release of odorous air to the atmosphere by creating an inflow of air through any cracks, vents, or designed openings. The

ductwork which will transport odorous air to the biofilter systems will be thermoset fiberglass reinforced plastic (FRP). All duct exposed to sunlight will be manufactured with UV inhibitors.

4.2.5.2 Electrical

Primary electrical supply will be from the Georgia Power Company electrical distribution system. Emergency diesel generators will be installed at the Gornto Road Ps and Remer Lane PS. At the VCI PS quick connects will be provided for use of a portable emergency generator. Each generator set will be connected to the low voltage switchgear/MCCs through an interlocked low voltage changeover circuit breaker pair. Wet wells will be sized in order to accommodate the time needed to respond to power outages. Uninterruptible power systems will be provided for required equipment that is sensitive to power supply interruption and disturbances, such as PLCs, LCPs, and switchgear.

4.2.5.3 Heating, Ventilation, and Air Conditioning

Design ventilation rates will be applied as follows:

- Nonworker-accessible spaces – 4 to 6 air changes per hour (AC/h).
- Worker-accessible spaces(when accessed) – 12 AC/h.

4.2.5.4 Noise Reduction

Sound mitigation measures will be incorporated to attenuate excessive noise. Emergency diesel engine generators will be provided with sound attenuating enclosures and exhaust silencers.

4.2.5.5 Fire Protection

Fire protection for the facilities will be provided through the proper selection of ventilation, electrical equipment, materials of construction and will include access to fire hydrants, wall mounted portable fire extinguishers, and automatic sprinkler systems, where appropriate.

4. 3 CONSTRUCTION SEQUENCING

The following construction sequence summarizes the general order of planned construction activities for the Withlacoochee Sewer System Improvements. A more detailed construction sequence will be developed during detailed design phase.

The pump stations and force mains are located to allow construction to start immediately. Construction will be scheduled for commissioning of these improvements to coincide with completion of construction of the Withlacoochee WPCP Improvements.

4. 4 PROJECTED COST AND SCHEDULE

Estimated capital costs for the facilities are summarized in Table 4.2. The City of Valdosta anticipates funding the project through the FEMA or other funding sources.

Table 4-2. Projected Capital Cost

Item	Cost, million dollars
Sewer System Improvements	
Design	1.1
Construction	26.0
Total Projected Capital Cost	27.1

Projected annual operation and maintenance costs for the facilities are summarized in Table 4-3.

Table 4-3. Projected Annual Operation and Maintenance Cost

Item	Average Operation and Maintenance Cost, dollars
Sewer System Improvements	
Labor	64,000
Electric Power	168,000
Maintenance	46,000
Renewal/Capital Replacement	167,000
Other	25,000
Estimated Annual Average O&M	470,000

The City of Valdosta anticipates using a design-bid-build approach for this project, with a plan to have facilities in operation by the end of Year 2013. The projected construction schedule for these facilities is outlined in Table 4-4.

Table 4-4. Anticipated Construction Schedule

Item	Anticipated Date
Detailed Design Complete	April 2012
Bid Opening	June 2012
Construction Contract Issued	July 2012
Construction Completion	October 2013
Testing, Startup and Training Completion	November 2013

Appendix A

Flow Projections

Technical Memorandum No. 1

Wastewater Flows

Withlacoochee Water Pollution Control Plant & Sewer System Improvements

Date: January 28, 2011

PURPOSE

This technical memorandum (TM) defines wastewater flow characteristics to be used in the evaluation of alternatives for the Withlacoochee Water Pollution Control Plant (WPCP) & Sewer System Improvements. Pertinent tables and figures from the report titled City of Valdosta Sewer System Modeling and Capacity Evaluation Report, January 2010 (Sewer System Modeling Report) are included as exhibits in this TM.

FINDINGS

Wastewater flows for use in developing the Withlacoochee WPCP & Sewer System Improvements are based on the projections presented in the Sewer System Modeling Report prepared by CDM. The Withlacoochee WPCP collection system is generally divided into two subbasins for the purpose of developing and analyzing collection system improvements. Generally, flows converge at two locations in the collection system, in the area of the abandoned treatment facility off Remer Lane, and Gornto Road, near the Withlacoochee River. Flow projections for these two locations serve as the basis for developing improvement alternatives. Peak and minimum flows for use in developing alternatives are presented in Table 1.

Table 1. Wastewater Flows for Developing Improvement Alternatives, mgd.

Subbasin / Sewershed	2008	2018	2038	2050
Remer Lane, Peak Hour	9.94	14.27	19.23	21.98
Remer Lane, Minimum Hour	2.15	3.09	4.16	4.76
Gornto Road, Peak Hour	5.54	8.35	13.66	15.79
Gornto Road, Minimum Hour	0.83	1.25	2.05	2.37

BACKGROUND

Wastewater flow projections for the Withlacoochee Basin of the City of Valdosta wastewater service area in the years 2018, 2038 and build-out (2050) are developed and documented in the Sewer System Modeling Report.

In the previous work, the existing Withlacoochee WPCP service was divided into 14 sewersheds. These sewersheds are shown on Exhibit 1 from the Sewer System Modeling Report. The future service area is divided into an additional 10 sewersheds, and the point of each of these sewershed's loading into the present sewer collection system was identified. These future sewersheds are shown on the Exhibit 2 from the Sewer System Modeling Report**.**

Average Dry Weather Flow Projections

Exhibit 3 shows Table 3-2 from the Sewer System Modeling Report. It presents average dry weather wastewater flow projections by sewershed for the Withlacoochee WPCP service area. Average dry weather wastewater flows are projected to increase from 5.16 mgd in year 2008 to 12.94 mgd at build out. These CDM developed projections represent a 150 percent increase in average dry weather flow over a 42 year period. Build out was set at year 2050.

Monitored Flow Variations

Five-minute peak flow factors ranging from 1.7 to 12.4 times average dry weather flow are reported in the Sewer System Modeling Report.

Average dry weather diurnal flow variation for each monitor location is included in the City's SewerCad model of the collection system.

Exhibit 1. Existing Sewer System Sewersheds

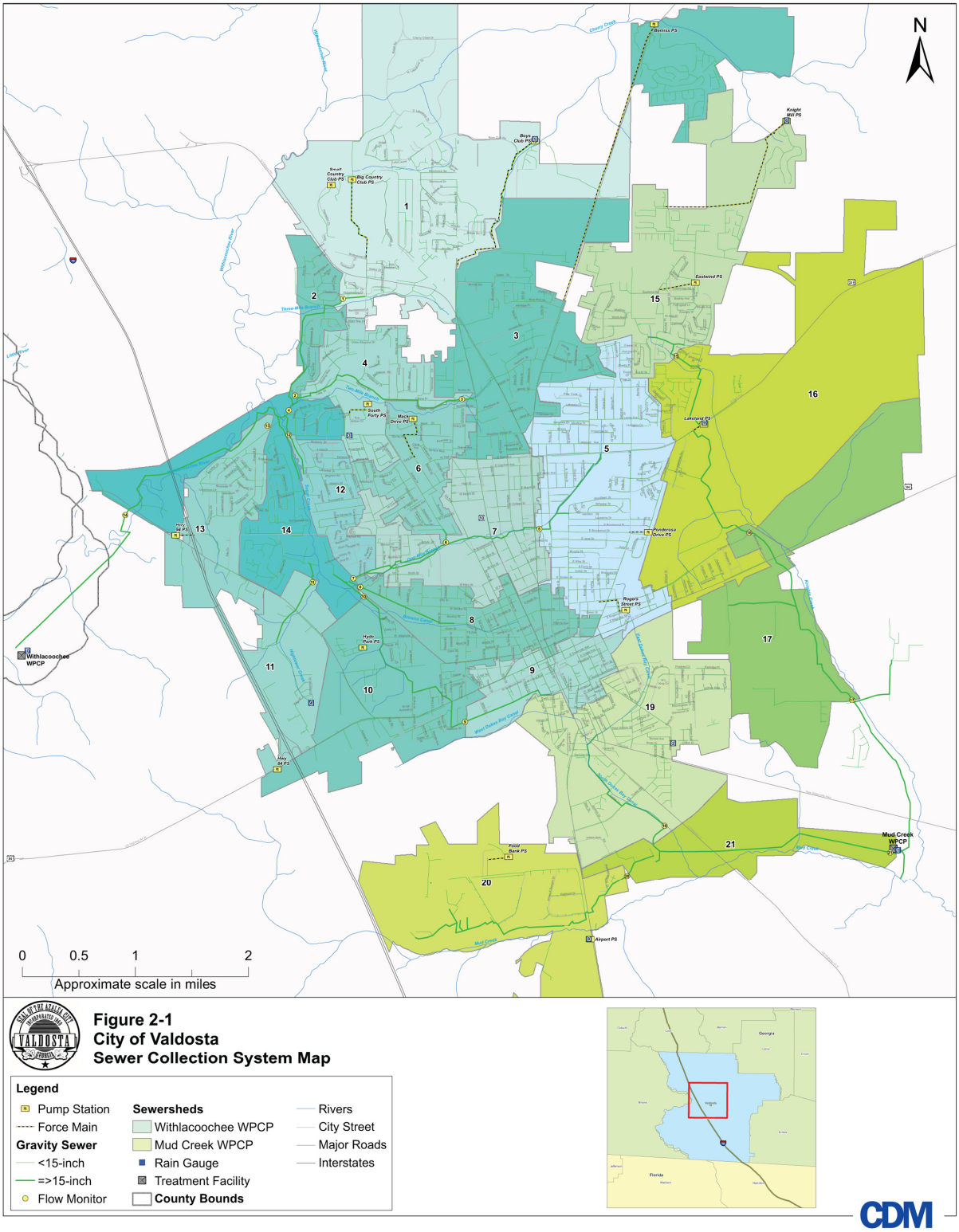


Exhibit 2. Future Sewer System Sewersheds

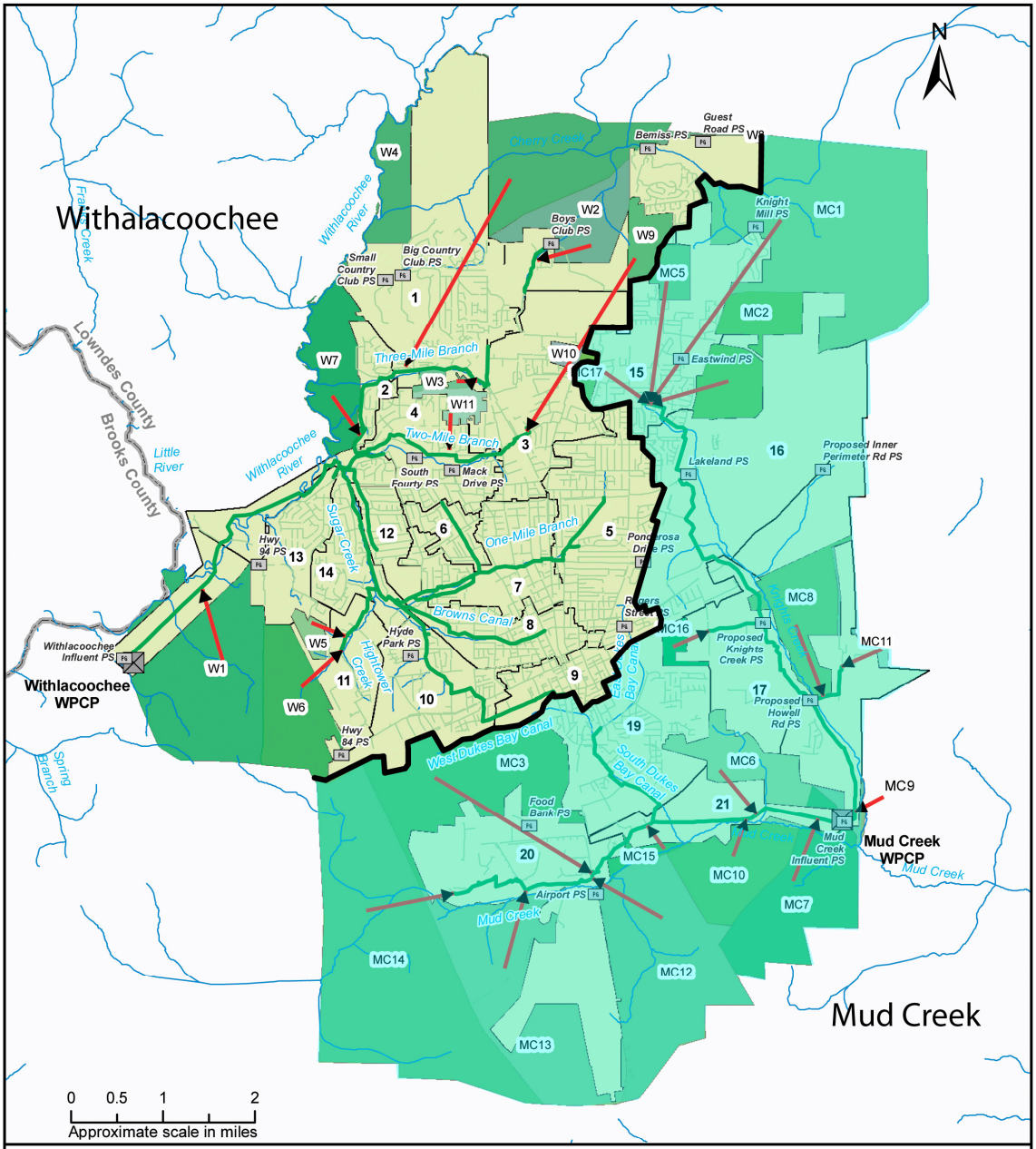


Figure 3-2
City of Valdosta
Future Service Areas Loading Points

Legend

- Water Pollution Control Plant
- Modeled Trunk Sewers
- Loading Points
- Pump Station
- Sewer < 15" Diameter
- Existing Service Area
- County Bounds

CDM

Exhibit 3. Average Dry-Weather Flow for Withlacoochee Sewersheds

Table 3-2: Summary of Future Average Dry-Weather Flow

Sewershed	2008 Measured ADWF (mgd)	2018 ADWF (mgd)	2038 ADWF (mgd)	Buildout (2050) ADWF (mgd)
Withlacoochee WWTP				
1	0.52	0.54	0.71	0.82
2	0.08	0.08	0.08	0.09
3	0.54	1.19	1.60	1.85
4	0.06	0.17	0.22	0.26
5	0.91	1.28	1.69	1.93
6	0.15	0.18	0.24	0.27
7	0.63	0.94	1.26	1.46
8	0.33	0.66	0.89	1.02
9	0.19	0.49	0.63	0.71
10	0.86	0.86	0.99	1.12
11	0.10	0.16	0.22	0.25
12	0.16	0.22	0.29	0.33
13	0.22	0.24	0.32	0.37
14	0.41	0.53	0.71	0.82
5000	0.00	0.10	0.13	0.15
W1	N/A	N/A	0.17	0.20
W2	N/A	N/A	0.05	0.06
W3	N/A	N/A	0.25	0.28
W4	N/A	N/A	0.03	0.04
W5	N/A	N/A	0.11	0.12
W6	N/A	N/A	0.24	0.28
W7	N/A	N/A	0.12	0.14
W8	N/A	N/A	0.11	0.13
W9	N/A	N/A	0.17	0.20
W10	N/A	N/A	0.034	0.04

Shading indicates that flow projections were lower than monitored flow. The higher flows were substituted.

WASTEWATER FLOWS FOR ALTERNATIVES DEVELOPMENT

The Withlacoochee WPCP collection system is divided into two subbasins for the purpose of developing and analyzing collection system improvements. Generally, flows converge at two locations in the collection system, in the area of the abandoned treatment facility off Remer Lane, and Gornto Road, near the Withlacoochee River. Table 2 presents the sewersheds in the previous work that are mapped to each of these subbasins. Exhibit 4 shows the boundaries of these subbasins. Gravity flows from Sewershed 11, and approximately 35% of Sewershed 14 discharge

to the line downstream from Remer Lane. In the alternatives, these Sewershed 11 and Sewershed 14 flows will be intercepted and rerouted from the Gornto Road Subbasin into the Remer Lane Subbasin.

Table 2. Sewersheds in Each Subbasin

Subbasin	Existing Sewersheds	Future Sewersheds
Remer Lane	5, 6, 7, 8, 9, 10, 11, 14 (35%)	W6
Gornto Road	1, 2, 3, 4, 12, 13, 14 (65%)	W2, W3, W4, W5, W7, W8, W9, W10

Average Dry Weather Flow Projections summarized by subbasin are presented in Table 3.

Table 3. Withlacoochee Basin Average Dry Weather Flow, mgd

Subbasin	2008	2018	2038	2050
Remer Lane	3.31	4.76	6.41	7.33
Gornto Road	1.85	2.78	4.55	5.26
Direct to WPCP	0.00	0.10	0.30	0.35
Total, Withlacoochee WPCP	**5.16**	**7.64**	**11.26**	**12.94**

The City is undertaking a prioritized program to reduce the infiltration and inflow into its collection system. This program is expected to reduce the peak flows that will be conveyed to the Withlacoochee WPCP. Therefore, it is appropriate to select a future peaking factor that reflects this reduction. Exhibit 5 shows peaking factor for various size facilities from Wastewater Engineering: Treatment and Reuse. Based on a review of peaking factors for similar sized facilities, a peaking factor of 3.0 times average dry weather flows is used to calculate peak hour flows for the development of long-term improvements to the system. The basis of the selection of this peaking factor can be seen in Exhibit 5. This peaking factor is generally conservative to account for the uncertainty of future reductions of infiltration and inflow into the collection system. Peak hour projections are presented in Table 4. These projections are illustrated graphically in Exhibit 6.

Facilities sized based on these projections will provide for the future growth needs of the system, and provide additional peak capacity during the interim period, as the Sewer System Rehabilitation Program reduces infiltration and inflow into the system. For example, firm capacity to meet the Remer Lane 2038 peak hour flows of 19.23 mgd, provides infrastructure that is initially capable of conveying peak flows that are approximatly 9 mgd higher than projected peak hour wastewater flows using a factor of 3.0. This interim capacity is shown graphically on Exhibits 6 and 7 for the Remer Lane and Gornto Road subbasins.

Exhibit 4. Withlacoochee WPCP Subbasins

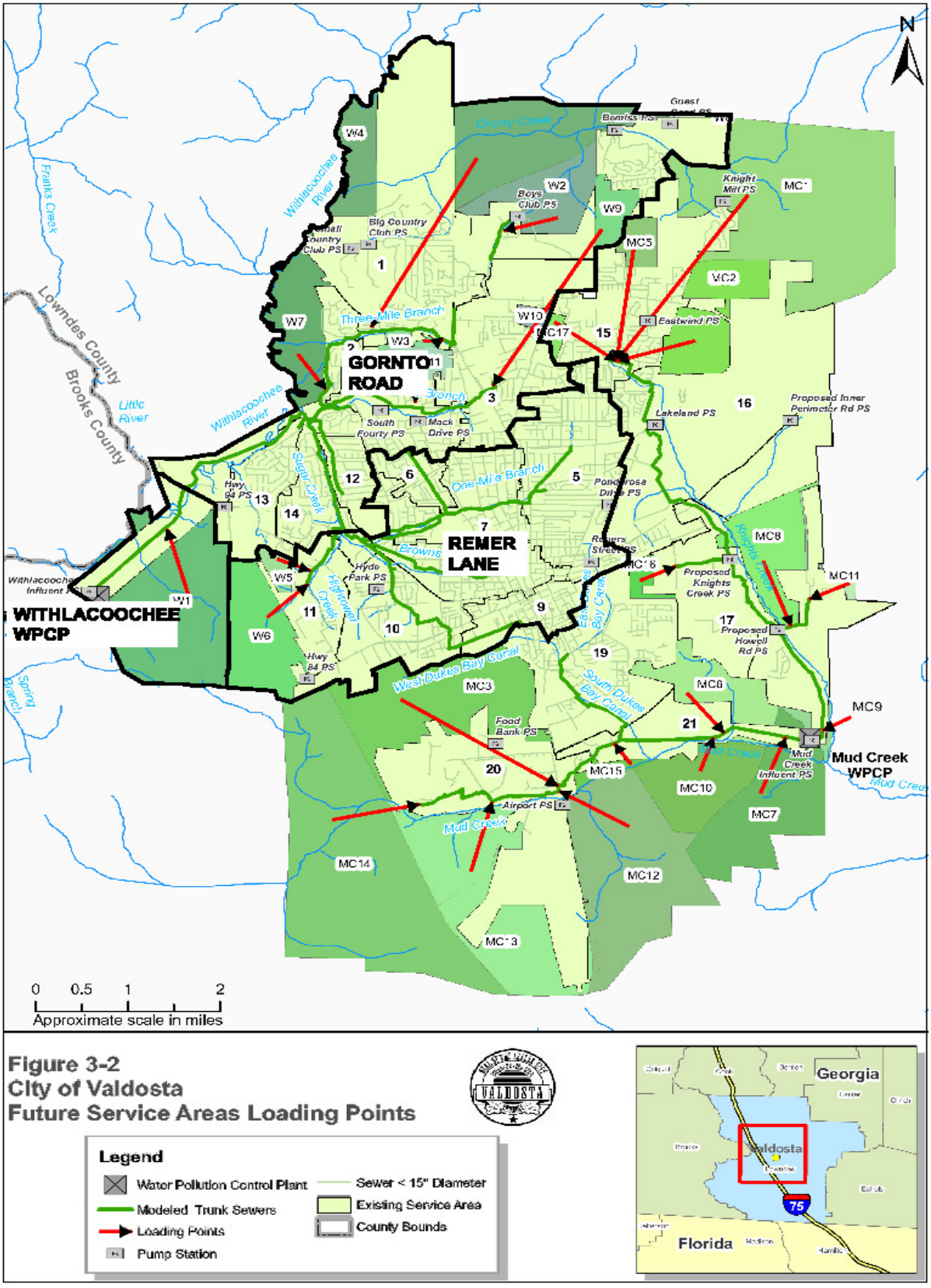


Exhibit 5. Peaking Factors for Various Sized Facilities

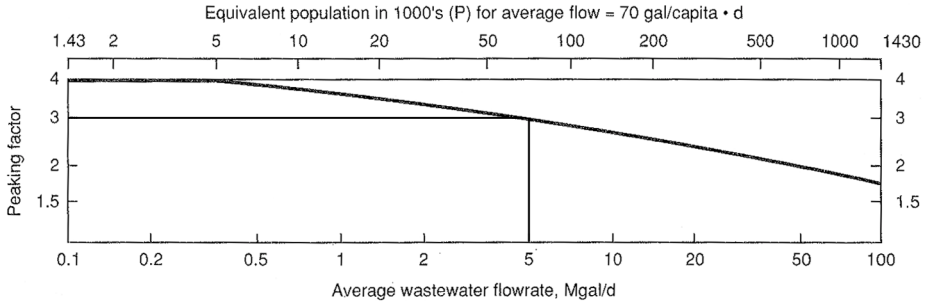


FIGURE 5-1
Hourly peaking factor for domestic wastewater flowrates. Peaking factor is the ratio of maximum hourly flowrate to average flowrate. *Note:* Mgal/d × 0.043813 = m^3/s.

Source: Wastewater Engineering Treatment, Disposal, Reuse

Table 4. Withlacoochee Basin Peak Hour Flow, mgd

Subbasin / Sewershed	2008	2018	2038	2050
Remer Lane	9.94	14.27	19.23	21.98
Gornto Road	5.54	8.35	13.66	15.79
Direct to WPCP	0.00	0.30	0.90	1.05
Withlacoochee WPCP	**15.48**	**22.92**	**33.79**	**38.82**

Exhibit 6. Peak Hour Flows based on a 3.0 peaking factor

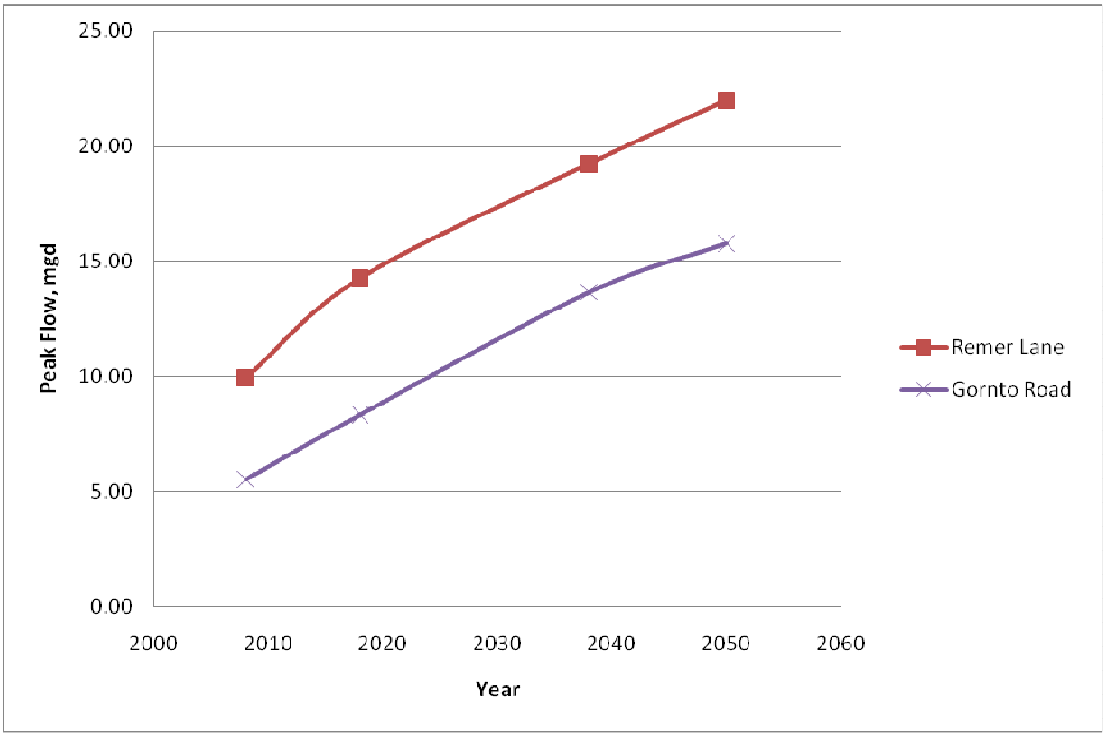


Exhibit 7. Peak Hour Capacity Remer Lane Subbbasin During Implementation of Sanitary Sewer Rehabilitation Program

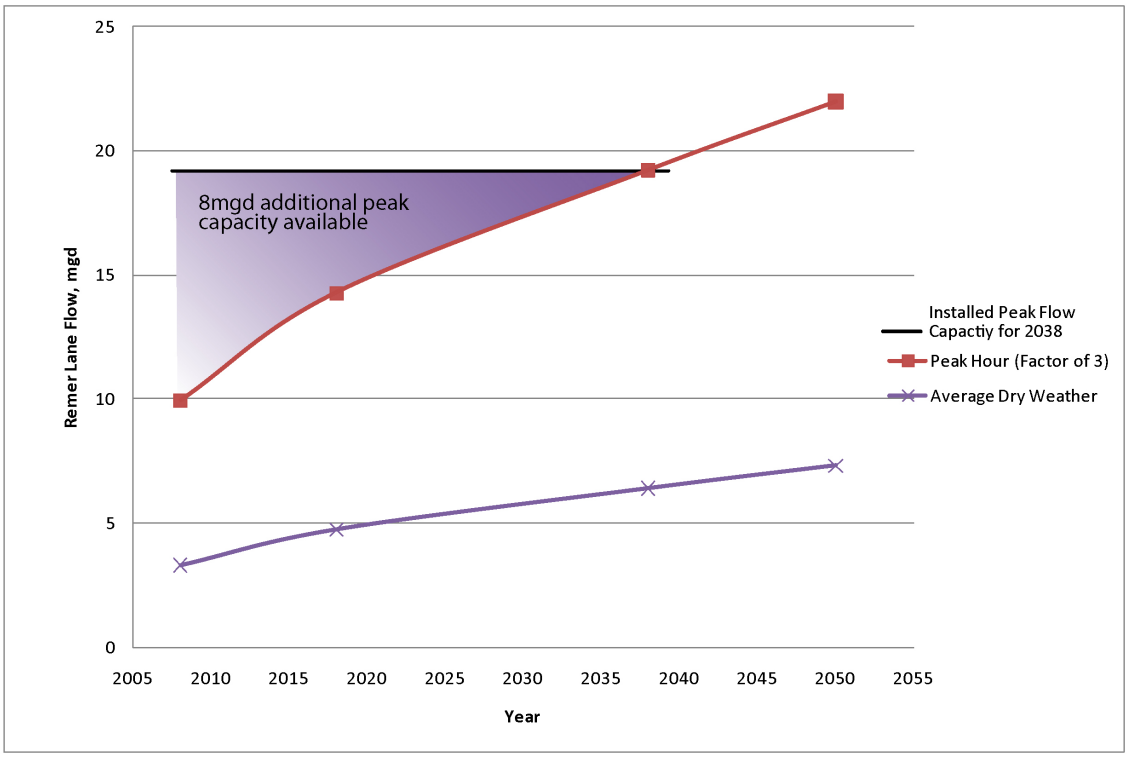
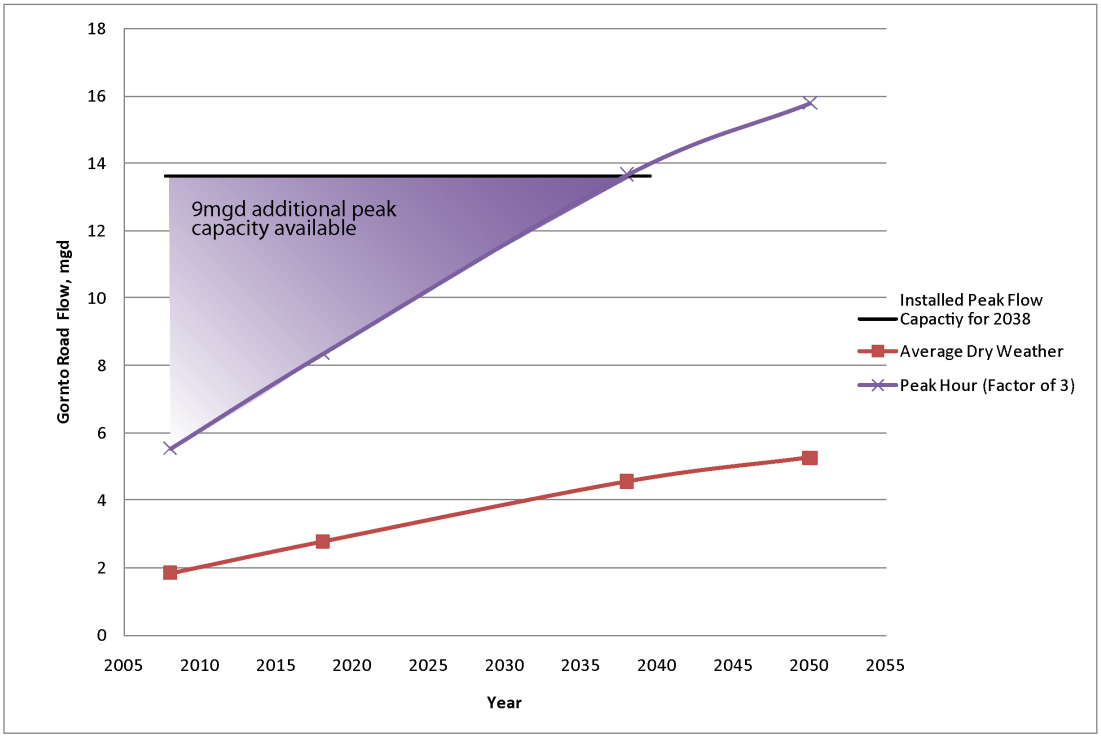


Exhibit 8. Peak Hour Capacity Gornto Road Subbbasin During Implementation of Sanitary Sewer Rehabilitation Program



In developing and evaluating alternatives, consideration must also be given to the minimum flows from each subbasin. Minimum flows from each subbasin are based on diurnal variations monitored in 2008. Exhibit 9 is a graph of diurnal flow in the Remer Lane subbasin. Minimum hourly flows from the Remer Lane subbasin are approximately 65 percent of average dry weather flow. Exhibit 10 is a graph of diurnal flow in the Gornto Road subbasin. Minimum hourly flows from the Gornto Road subbasin are approximately 45 percent of average dry weather flow. Projected minimum hourly flows are summarized in Table 5.

Exhibit 9. Diurnal Variation Remer Lane Subbasin

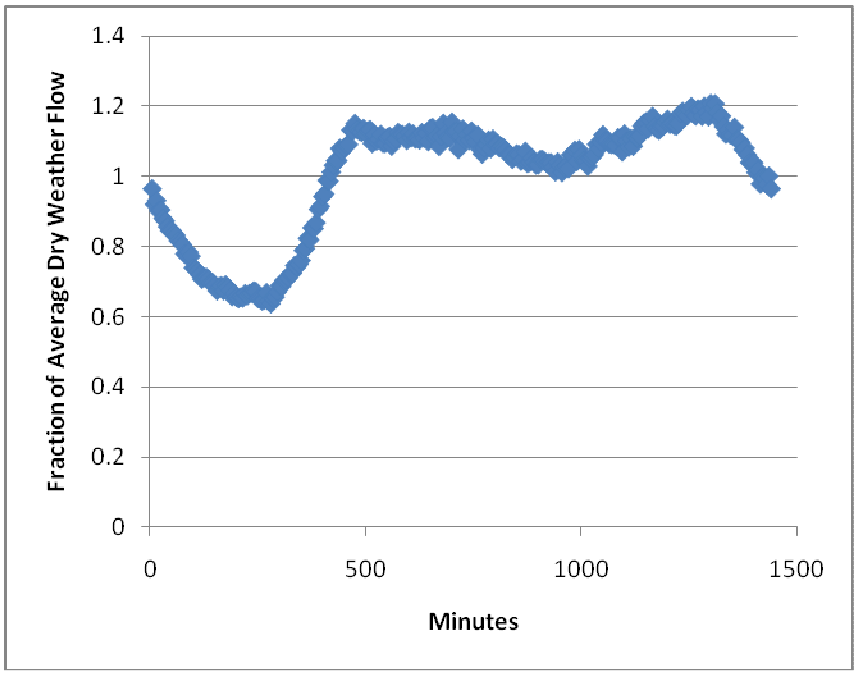


Exhibit 10. Diurnal Variation Gornto Road Subbasin

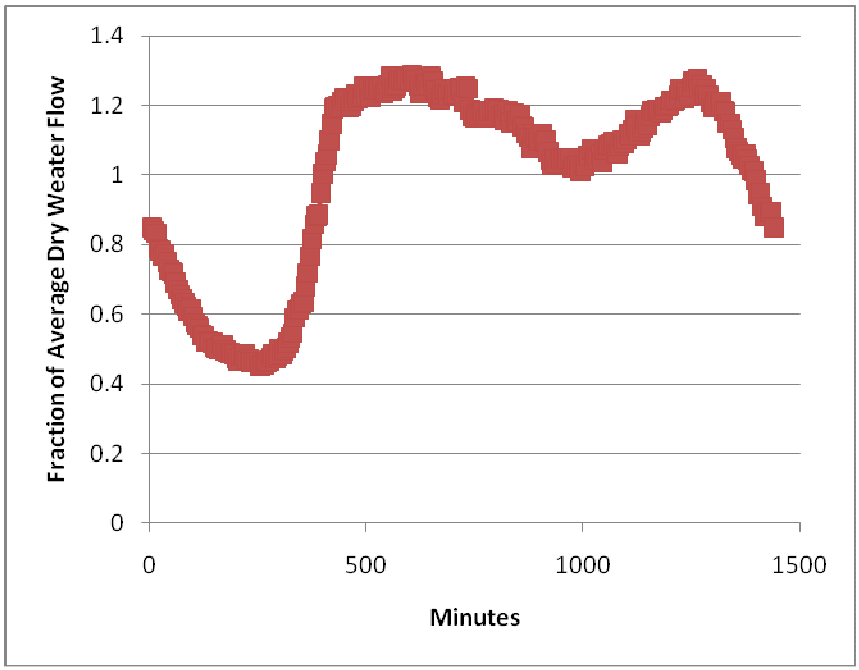


Table 5. Minimum Hourly Wastewater Flows for Developing Improvement Alternatives, mgd.

Subbasin / Sewershed	2008	2018	2038	2050
Remer Lane, Minimum Hour	2.15	3.09	4.16	4.76
Gornto Road, Minimum Hour	0.83	1.25	2.05	2.37

ACCEPTANCE

Signature acknowledges review and acceptance of TM-1 Wastewater Flows by the City of Valdosta:

_____

signature

_____

date

Appendix B

Collection System
Improvement Evaluation

Withlacoochee WPCP Sewer System Improvements

Workshop No. 2

Pump Station & Route Analysis Selection

Technical Memorandum No. 1 (TM1)

Withlacoochee Wastewater Flows (MGD) for Developing Sewer Improvement Alternatives

Sub Basin/Sewershed	2008	2018	2038	2050
Mall Area P.S., Peak Hour	9.94	14.27	19.23	21.98
Mall Area P.S., Minimum Hour	2.15	3.09	4.16	4.76
Gornto Rd Area P.S., Peak Hour	5.54	8.35	13.66	15.79
Gornto Rd Area P.S., Minimum Hour	0.83	1.25	2.05	2.37

Planned Installed Pumping Capacity

Planned Installed Infrastructure Capacity

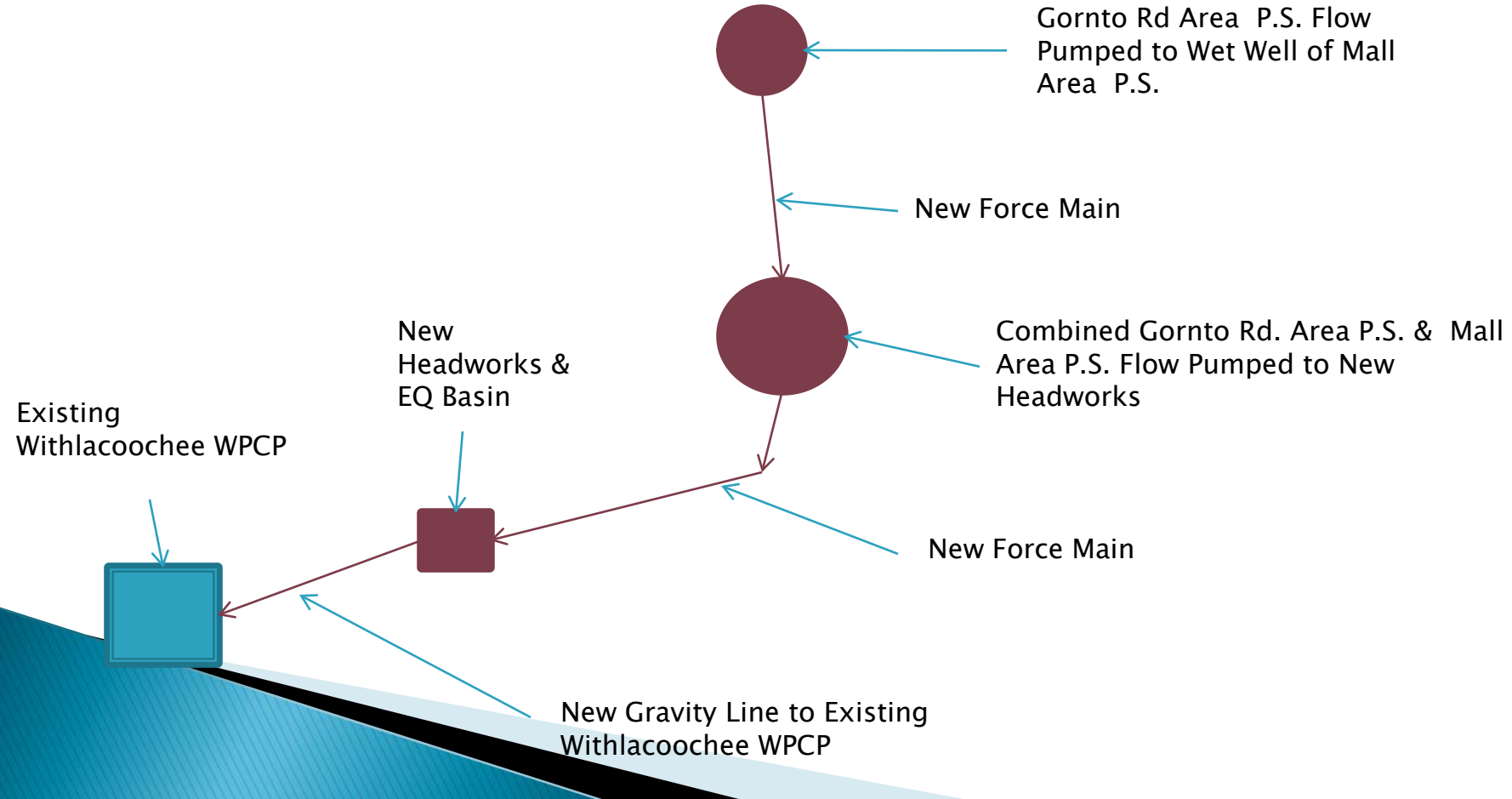
Technical Memorandum No. 1 (TM1)

Withlacoochee WPCP Sub -Basin Average Dry Weather Flow - MGD

Sub Basin/Sewershed	2008	2018	2038	2050
Mall Area P.S.	3.31	4.76	6.41	7.33
Gornto Rd. Area P.S.	1.85	2.78	4.55	5.26
Direct to Withlacoochee WPCP	0.00	0.10	0.30	0.35
Total Withlacoochee WPCP	**5.16**	**7.64**	**11.26**	**12.94**

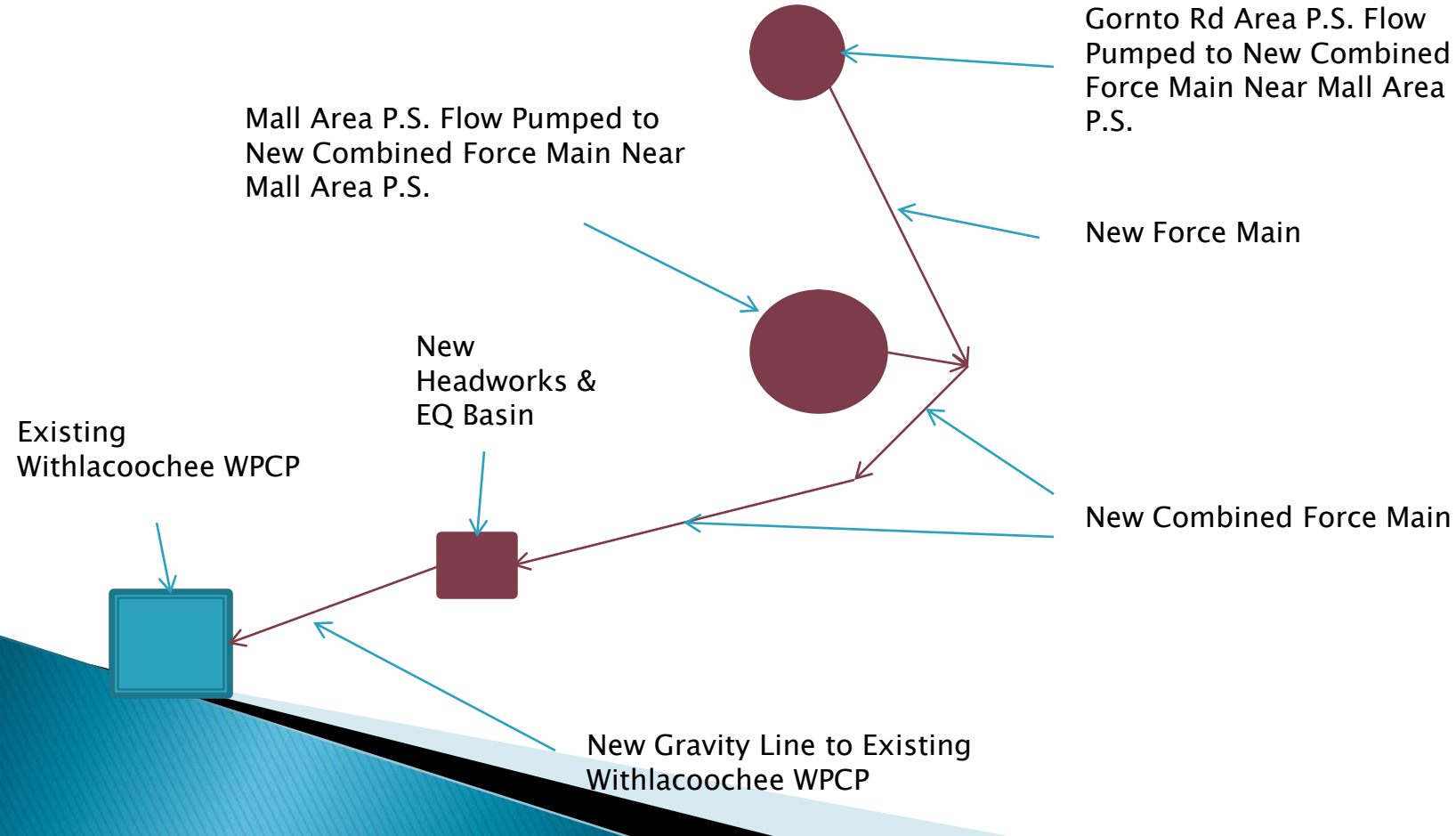
Workshop No. 2
Alternative Selection

- Alternatives Description
- Option 1



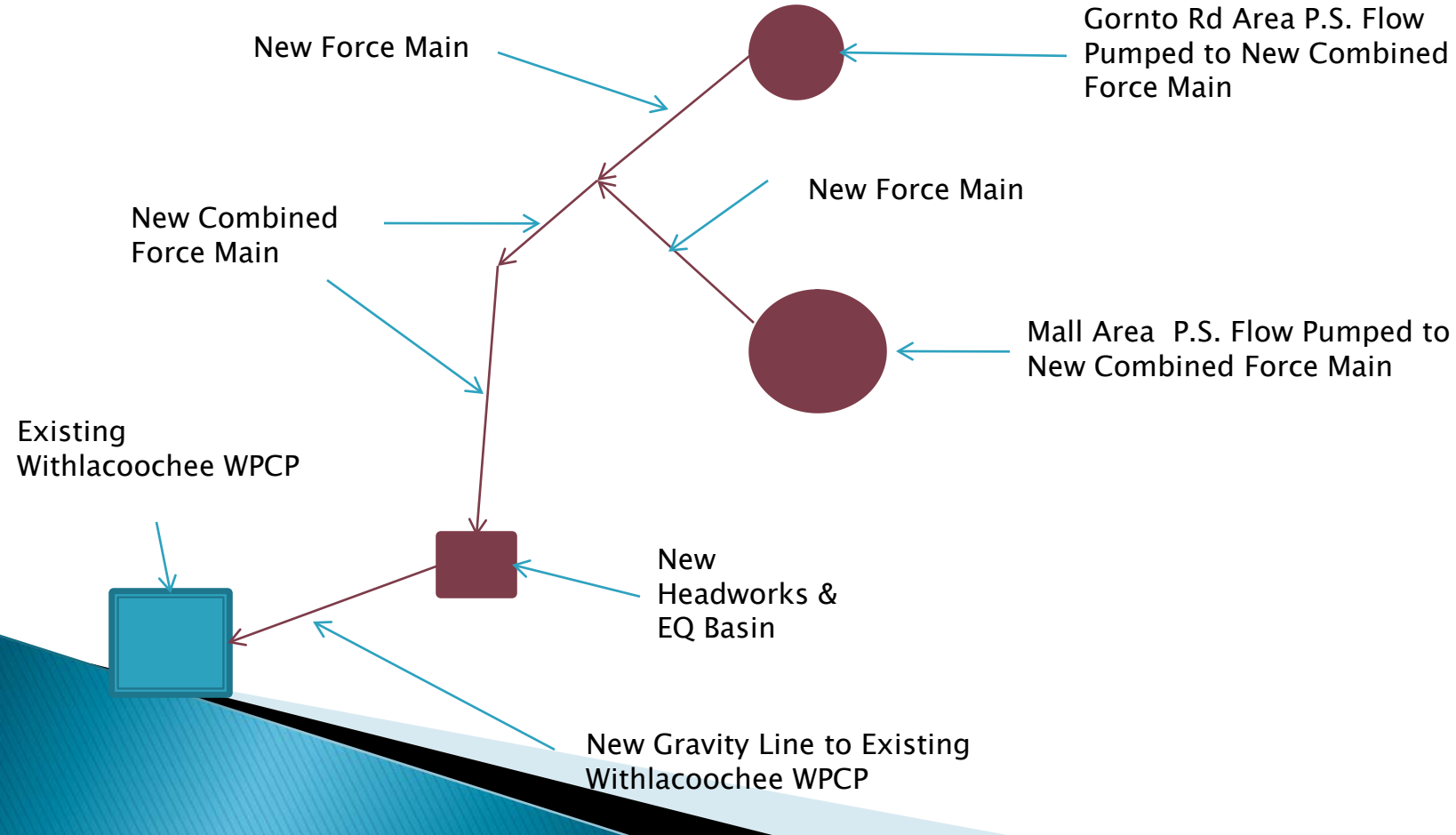
Workshop No. 2
Alternative Selection

- Alternatives Description
- Option 2



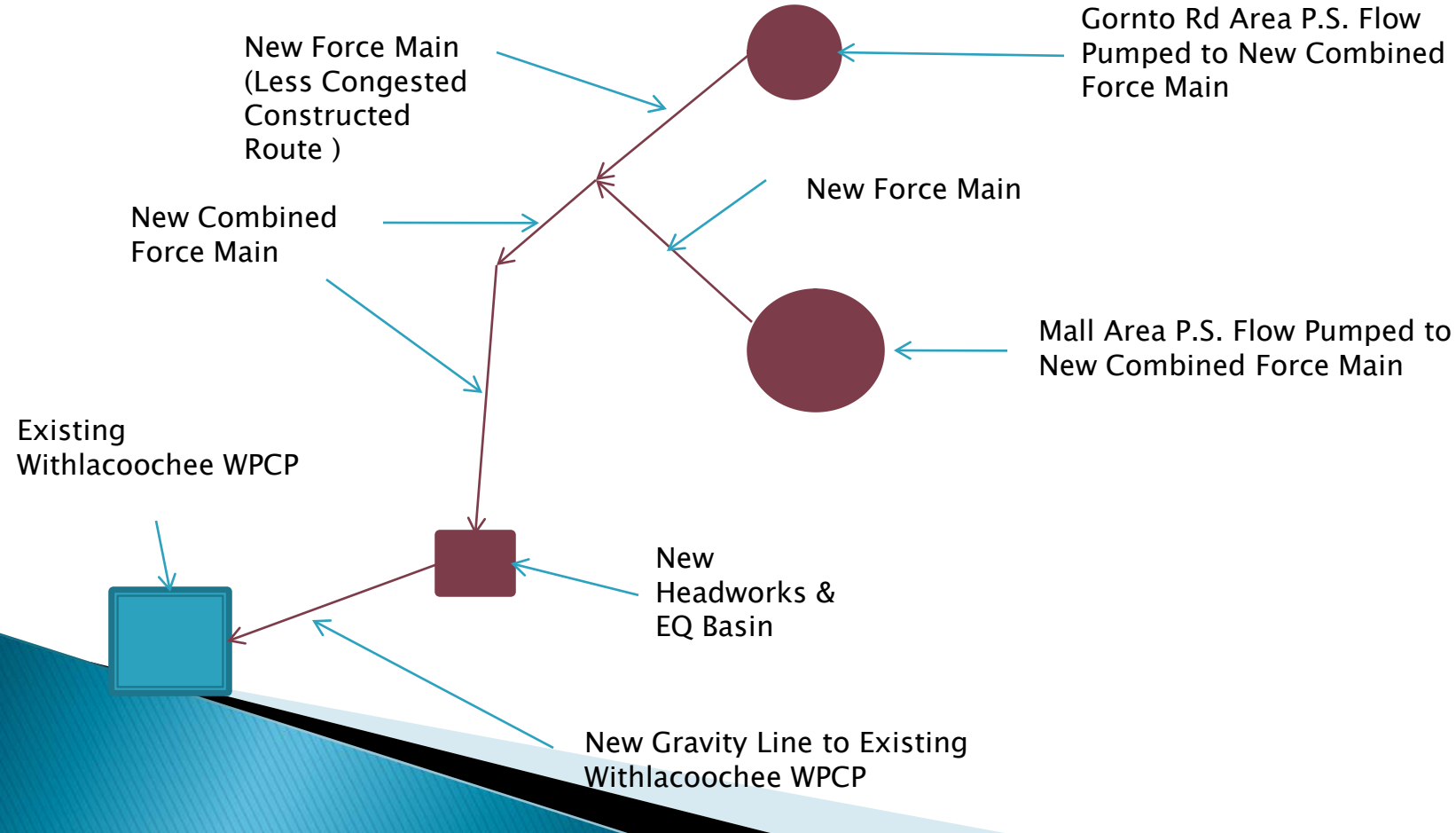
Workshop No. 2
Alternative Selection

- Alternatives Description
- Option 3

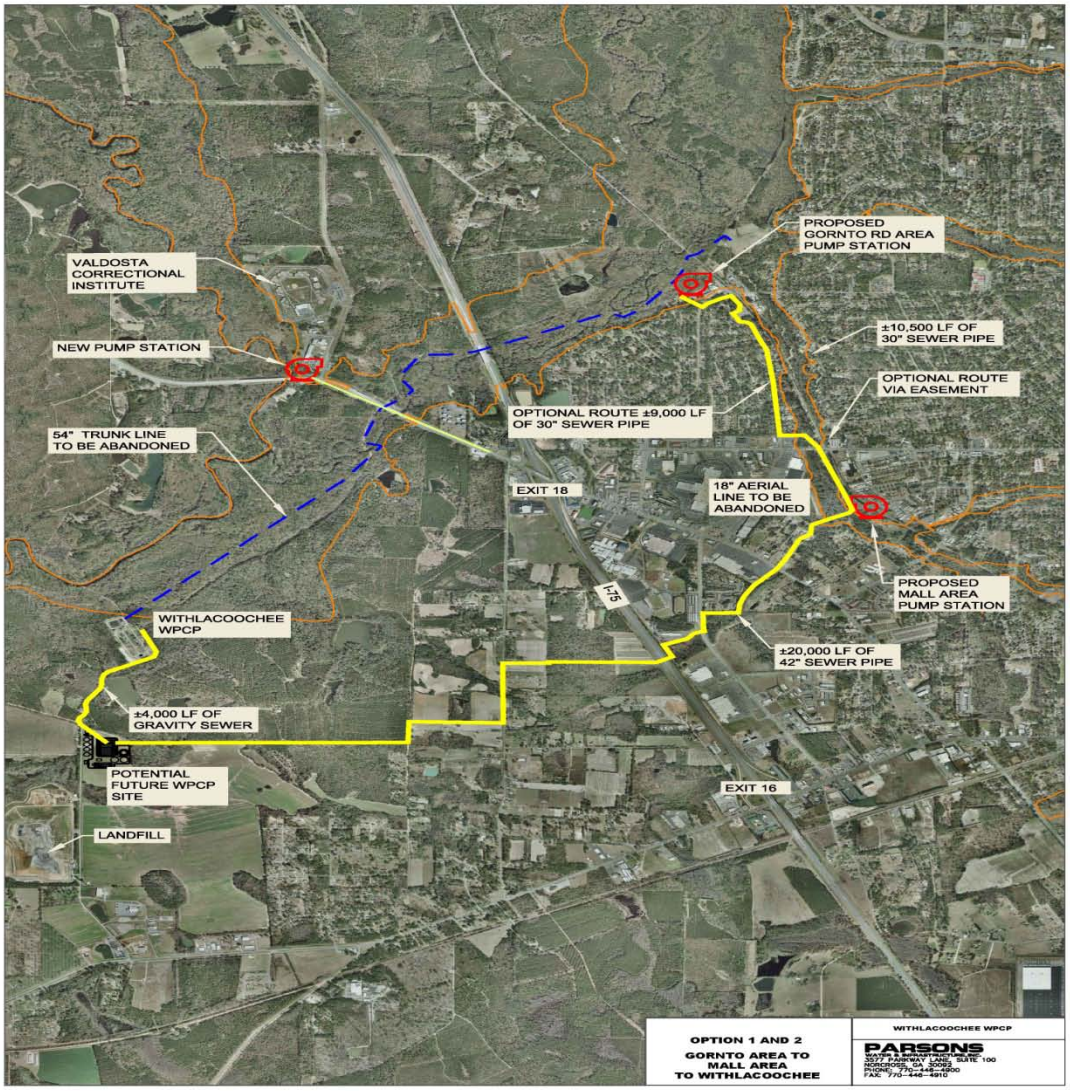


Workshop No. 2
Alternative Selection

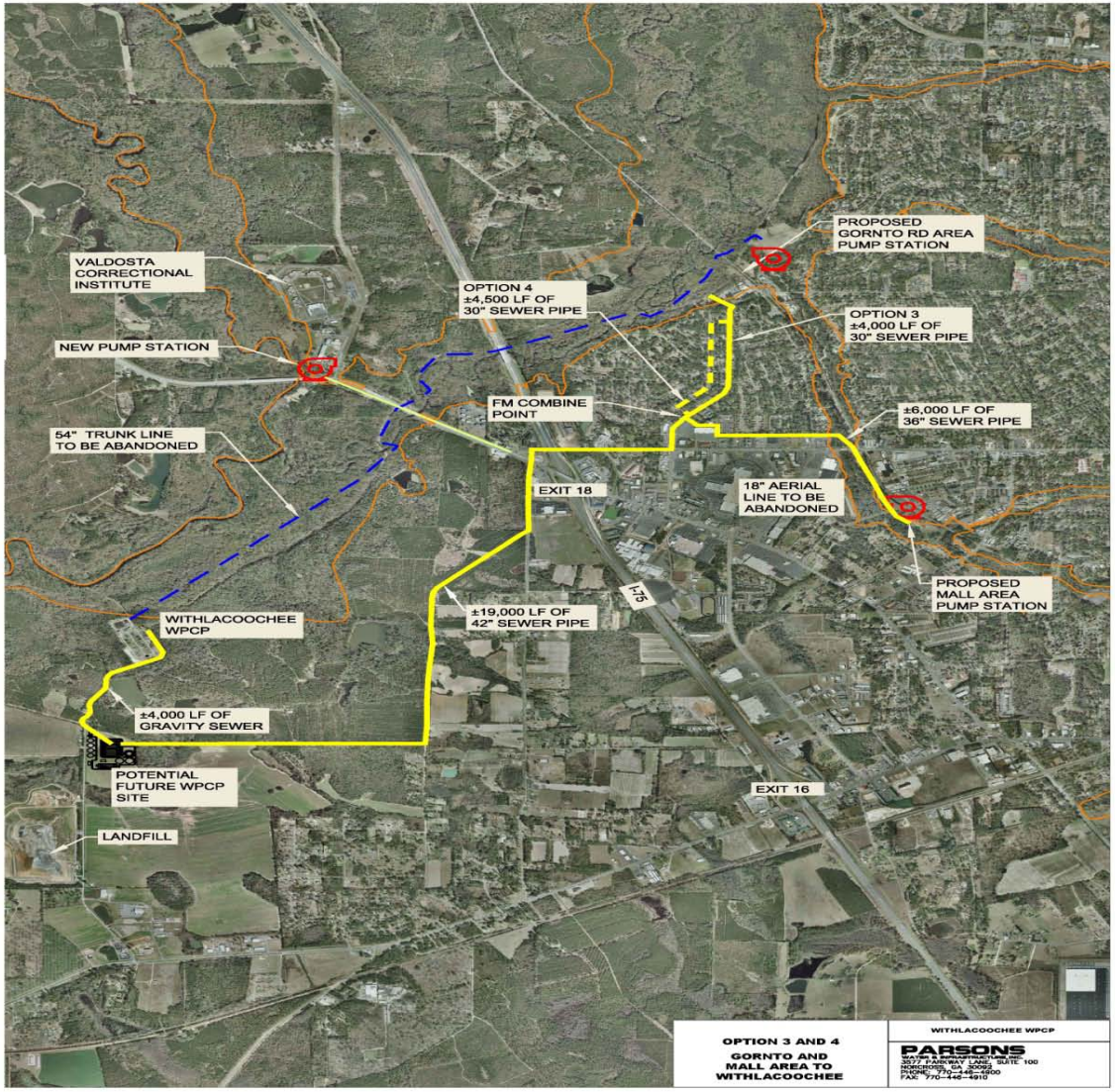
- Alternatives Description
- Option 4



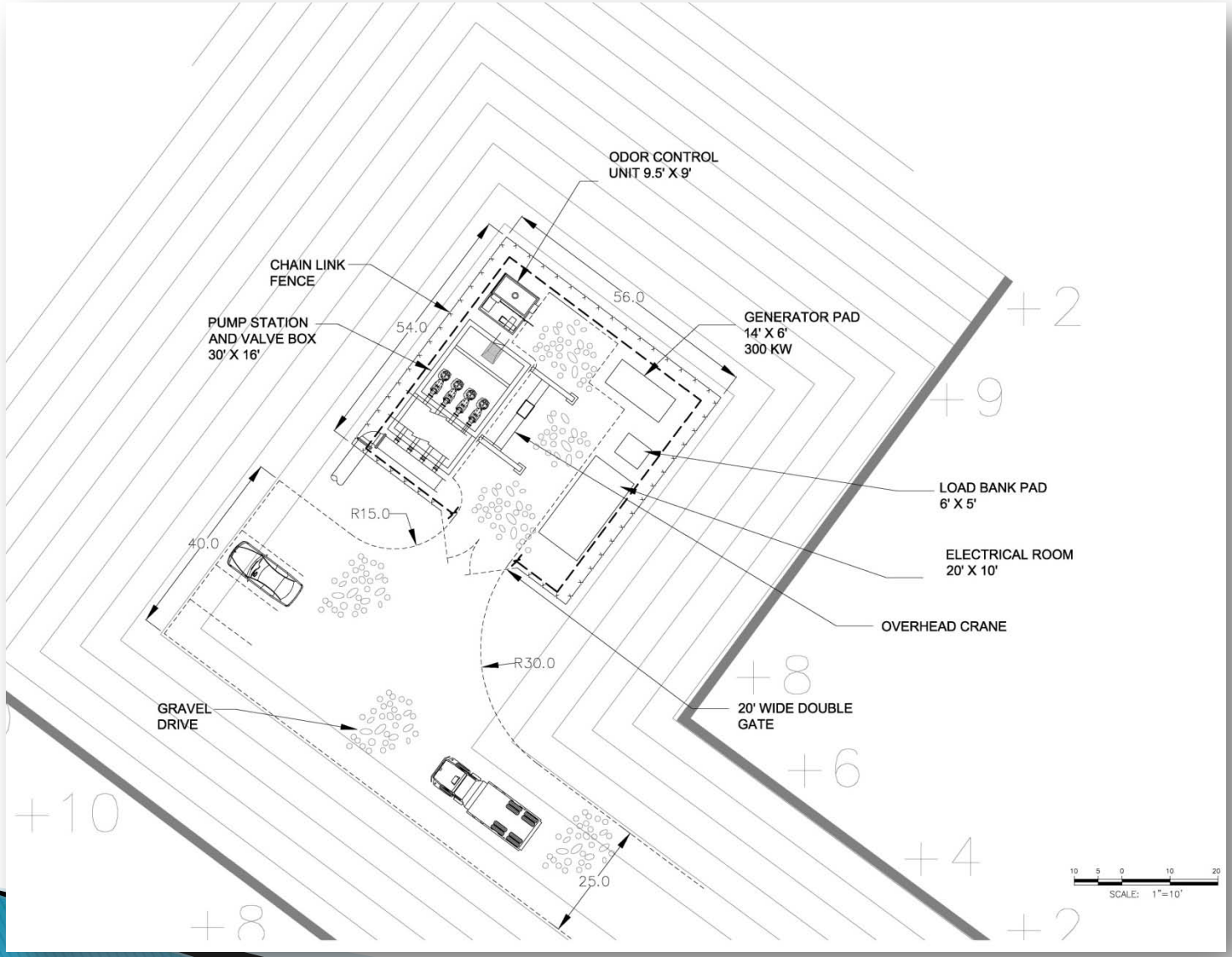
Force Main Alternatives 1 & 2



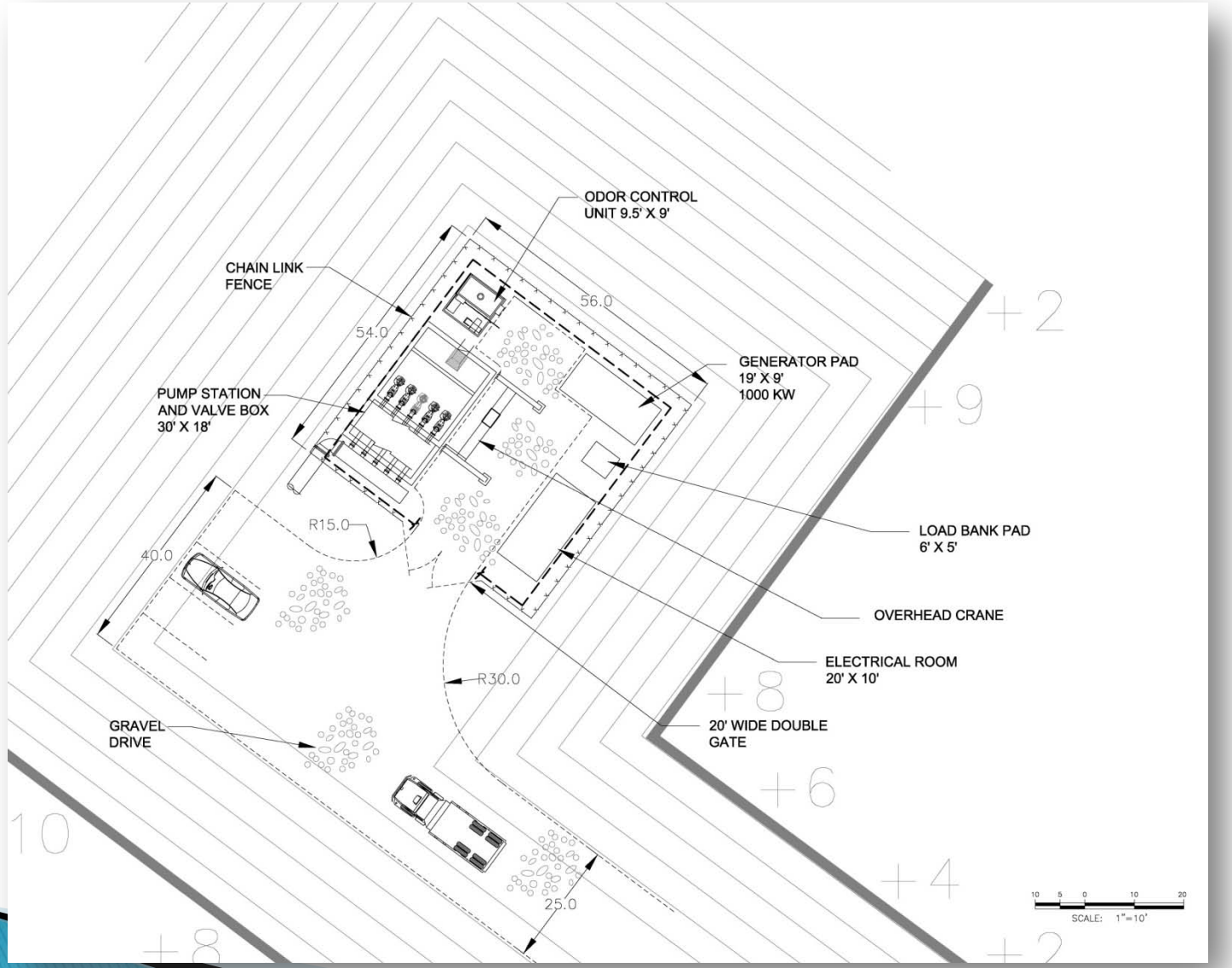
Force Main Alternatives 3 & 4



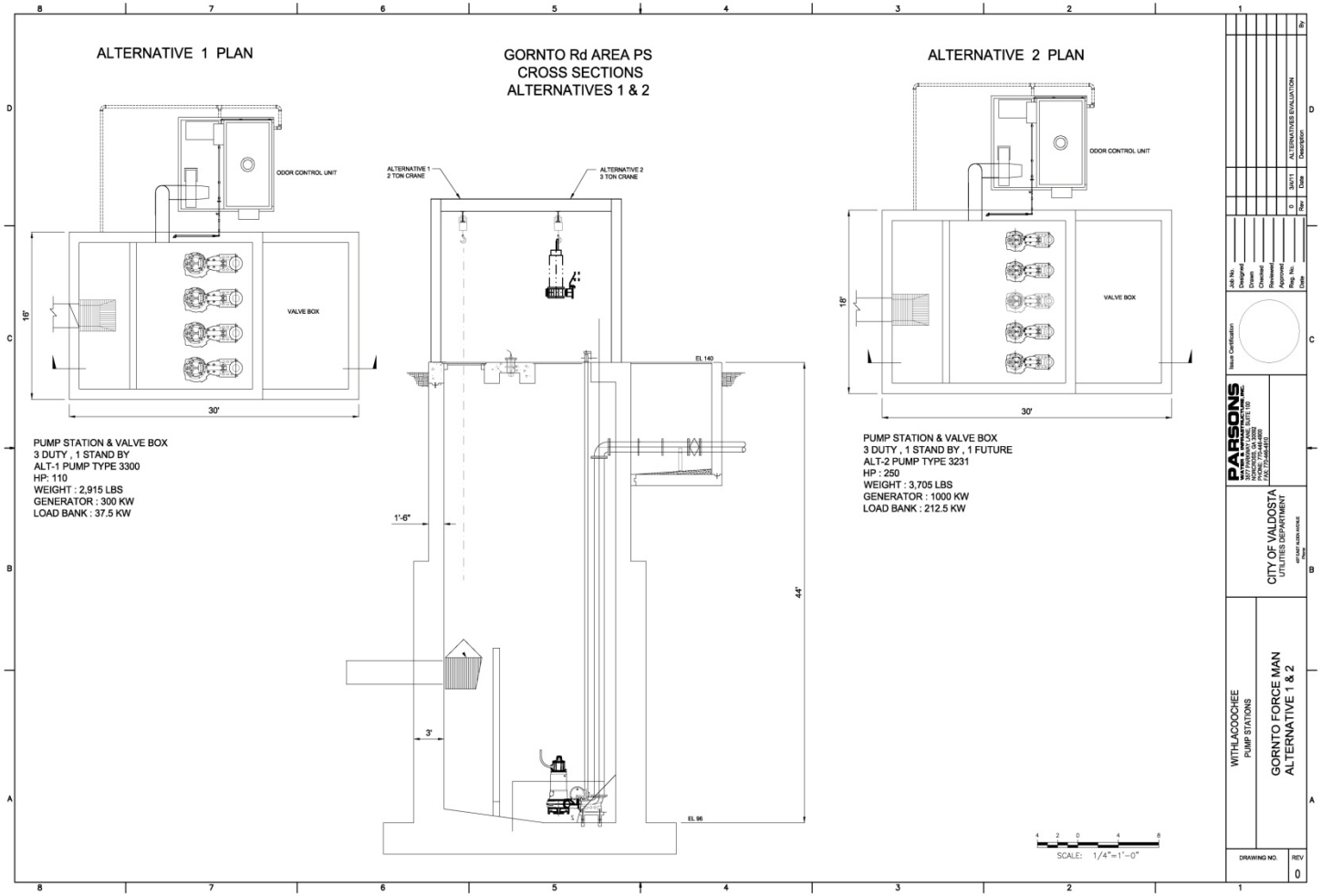
Gornto Rd. Area P.S. Alternative 1 plan view



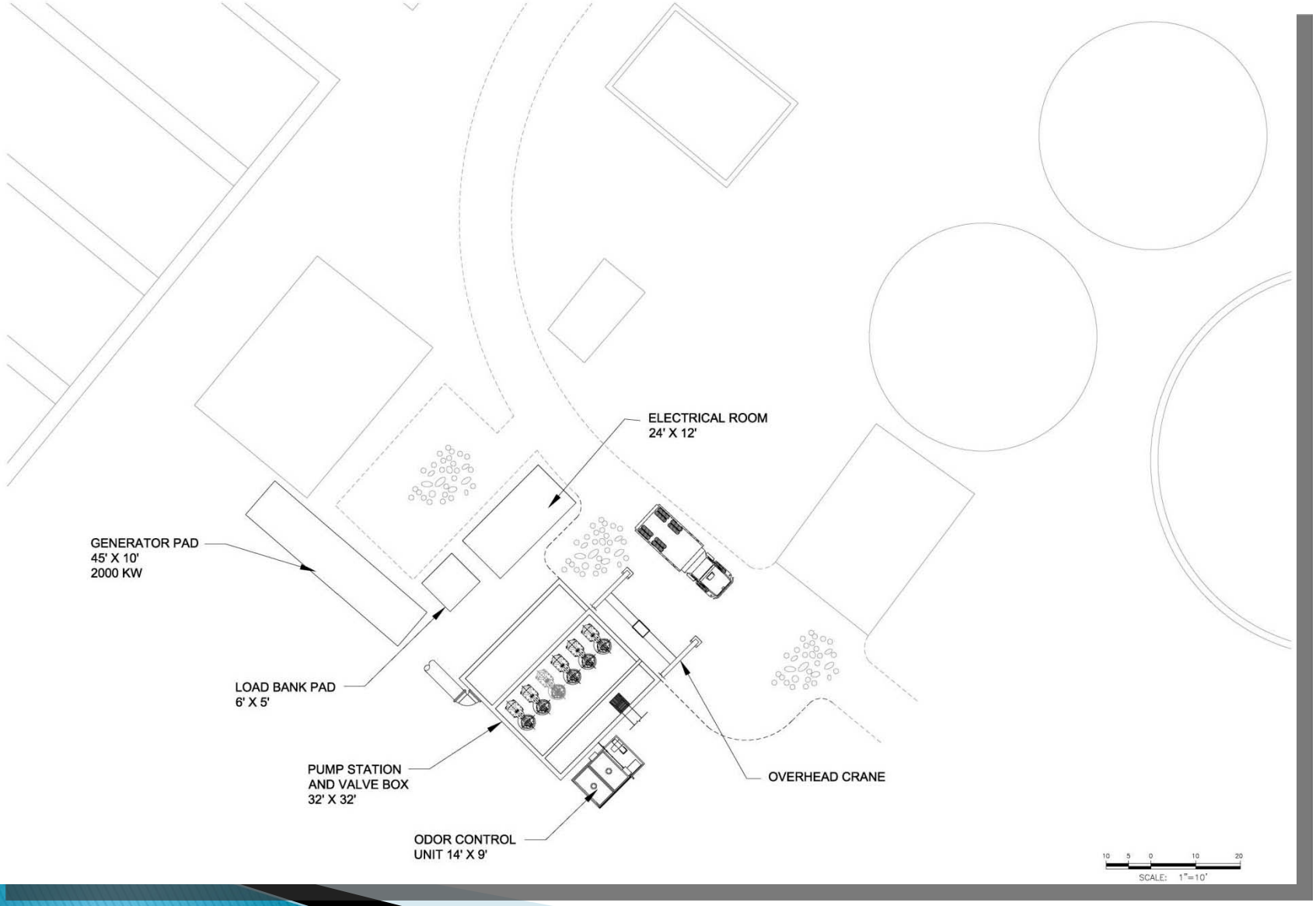
Gornto Rd. Area P.S. Alternative 2 plan view



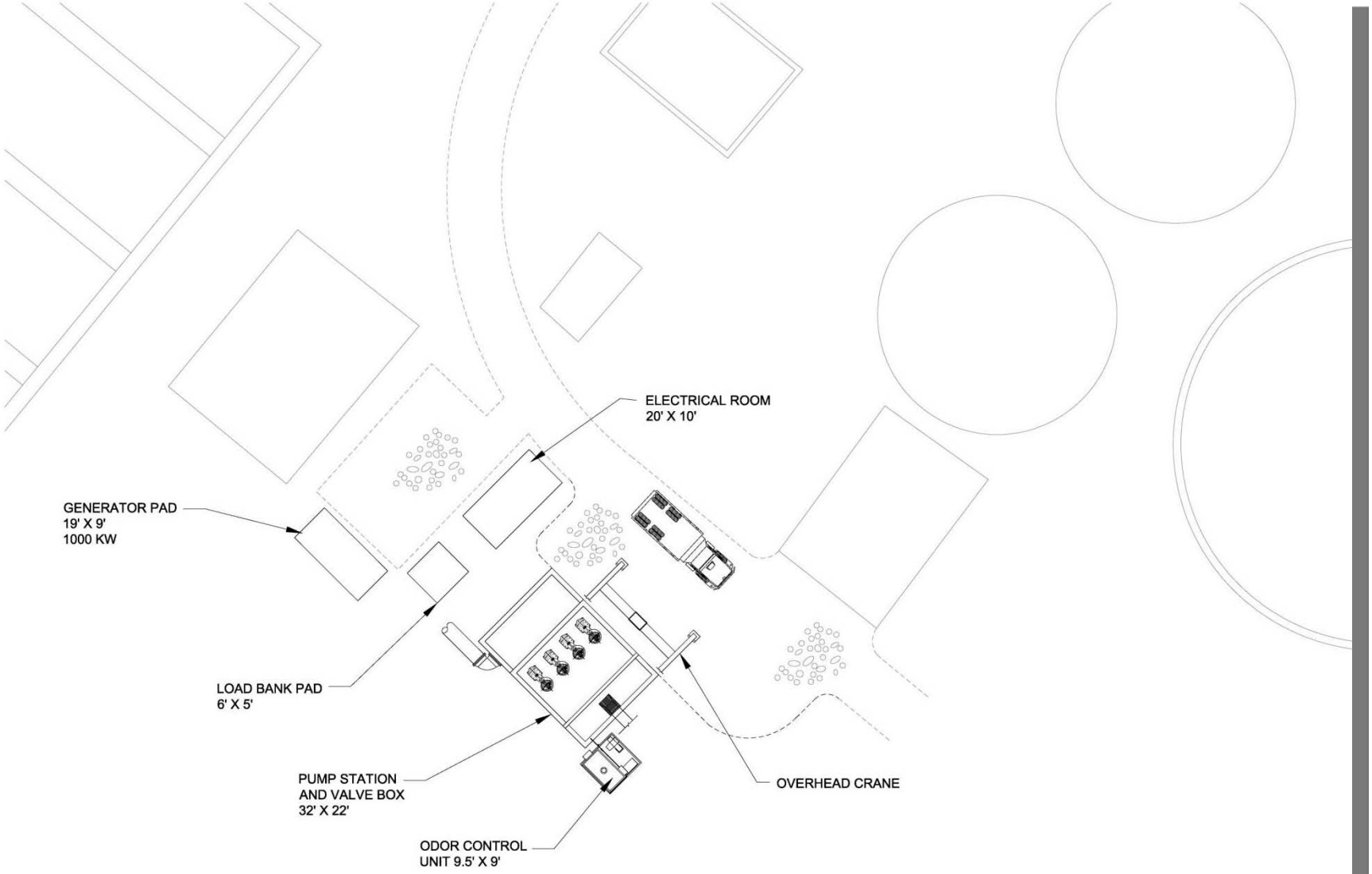
Gornto Rd. Area P.S. Alternatives 1& 2 Cross Sections



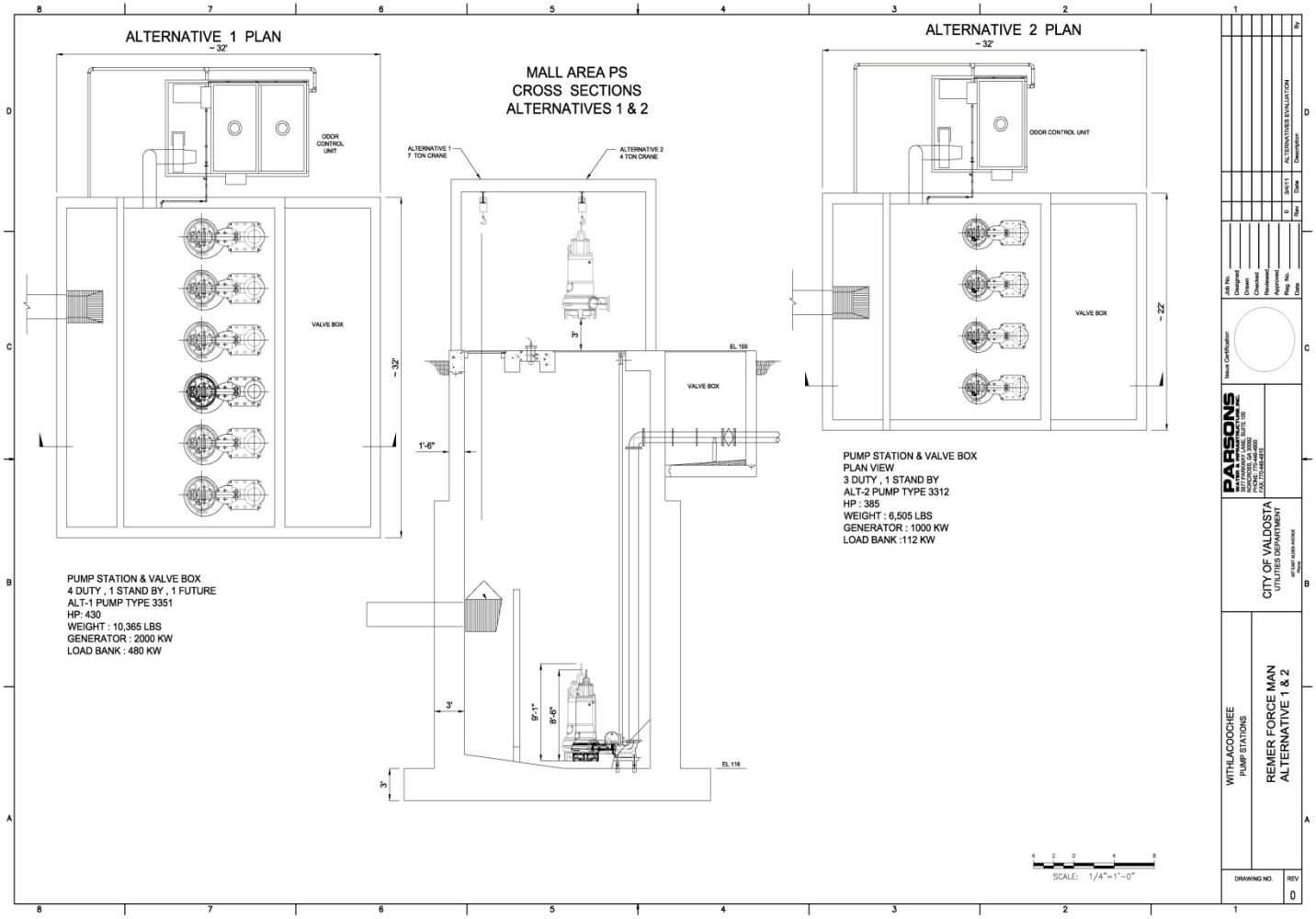
Mall Area P.S. Alternative 1 plan view



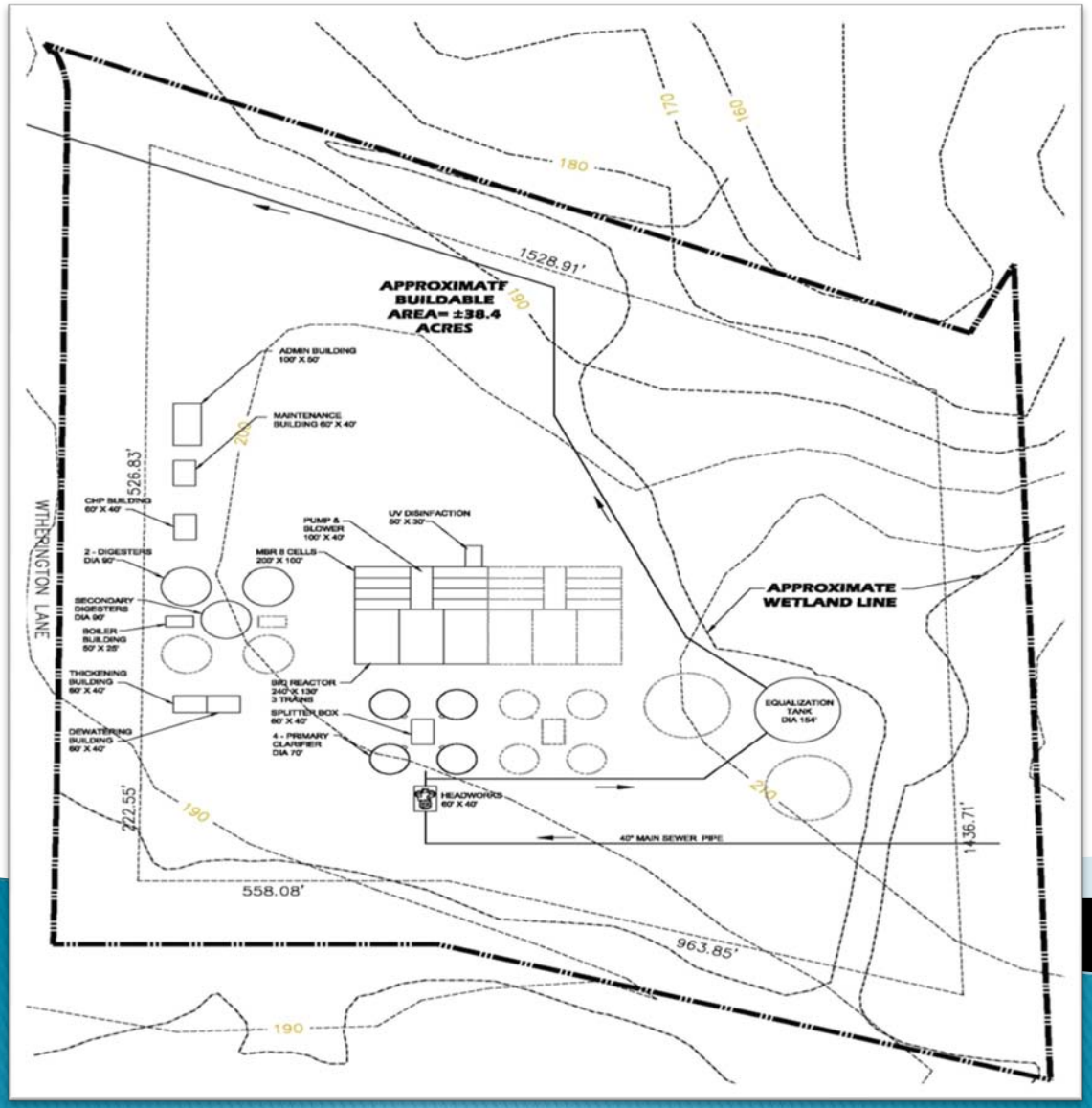
Mall Area P.S. Alternative 2 plan view



Mall Area P.S. Alternatives 1& 2 Cross Sections



Conceptual 12 MGD (Expandable to 24 MGD)
New Plant Layout



Workshop No. 2
Alternative Selection

Force Main Analysis

Option	From	To	Pipe Diameter inches	Pipe Length Feet	Pipe Material Type	Maximum Elev. Ft above sea level	Minimum Elev. Ft above sea level	Cost
1 & 2	Gornto Rd. Area P.S. to	Mall Area P.S. to	30	10,596	HDPE	185/174	115	
	Mall Area P.S.	New Headworks	42	20,629	HDPE	234	131	
Total				31,225				
	VCI Pump Station	Gravity Line Near Exit 18	12	4,000	HDPE			$8,856,750
	New Headworks	Existing Plant Headworks	36	4,390	PVCSDR35			$791,300
	Total			39,615				$9,648,050
3 & 4	Gornto Rd. P.S. to	Combined Flow Intersection	30	5,186	HDPE	215	115	
	Mall Area P.S.	Combined Flow Intersection	36	6,413	HDPE	211	131	
	Combined Flow Intersection	New Headworks	42	17,832	HDPE	234	160	
Total				29,431				
	VCI Pump Station	Gravity Line Near Exit 18	12	4,000	HDPE			$9,040,500
	New Headworks	Existing Plant Headworks	36	4,390	PVCSDR35			$791,300
	Total			37,821				$9,831,800

Workshop No. 2
Alternative Selection

Pump Station Analysis

Option	Pump Station	Installed Pumps - Year 2038 Duty - HP	Stand-By - HP	Future Pumps - 2050 Build-Out Additonal - HP	2038 Peak Flow Installed MGD	2050 Build Out Peak Flow MGD	Construction Costs	Present Value (PV) Life Cycle Costs (LCC) (2011 to 2038)	Total Construction + LCC
1	Gornto Rd. Area	110	110	0	16	16			
		110							
		110							
	Total	330	110	0			$3,352,611	$1,192,538	$4,545,149
	Mall Area	430	430	430	33	38			
		430							
		430							
		430							
	Total	1,720	430	430			$7,306,677	$3,901,187	$11,207,863
	Combined Totals	**2,050**	**540**	**430**			**$10,659,288**	**$5,093,725**	**$15,753,013**
2, 3, 4	Gornto Rd. Area	250	250	250	14	16			
		250							
		250							
	Total	750	250	250			$4,365,446	$2,117,737	$6,483,184
	Mall Area	385	385	0	22	22			
		385							
		385							
	Total	1155	385	0			$5,477,414	$2,978,003	$8,455,418
	Combined Totals	**1,905**	**635**	**250**			**$9,842,861**	**$5,095,741**	**$14,938,601**

Workshop No. 2
Alternative Selection

Withlacoochee WPCP Sewer Systems Improvements
Cost Analysis

Option	Force Main	Easements (Est.)	Total Force Main	Pump Station	Total Construction	Life Cycle Cost (LCC)	Total Construction + LCC
1	$9,648,050	$190,249	$9,838,299	$10,659,288	$20,497,586	$5,093,725	$25,591,311
2	$9,648,050	$190,249	$9,838,299	$9,842,861	$19,681,159	$5,095,741	$24,776,900
3	$9,831,800	$484,829	$10,316,629	$9,842,861	$20,159,490	$5,095,741	$25,255,230
4	$9,831,800	$484,829	$10,316,629	$9,842,861	$20,159,490	$5,095,741	$25,255,230

Note: Easement Estimated Cost = 1.5 x Tax Map Land Value

Workshop No. 2
Alternative Selection

Criterion	Rank	Weight	Description
Capital Cost			The alternative pump station configurations being considered will differ in the size of the pumps, the amount of reinforced concrete required for new structures, the length and diameter of the force mains. The process with the lowest capital cost will receive the most favorable score.
Life Cycle Costs			The alternative pump station configurations being considered will differ in the amount of electrical power consumed (kwh/yr) and maintenance costs. Life Cycle Costs (LCCs) which include both capital and 50 year O&M costs will be developed for comparative purposes. The process with the lowest annual O&M cost would receive the most favorable score.
Environmental Impacts			The alternatives differ in their impacts on the environment. These impacts include impacts upon wetlands, air quality, noise, and other unavoidable impacts of this construction.
Community Impacts			The alternatives being considered will differ in their impacts on the surrounding community. Community impacts include permanent and temporary impacts of construction on the surrounding neighborhoods and businesses. These impacts include road closures during construction.
Reliability/Maintainability			This criteria includes the ease of monitoring, control, operation, and maintenance considerations. The alternatives also differ in accessibility for maintenance, and equipment modularity between pump stations.

Workshop No. 2
Alternative Selection

Name _____

Criterion	Option			
	1	2	3	4
Capital Cost				
Life Cycle Costs				
Environmental Impacts				
Community Impacts				
Reliability/Maintainability				

Rate each option against the listed criteria. Use a 1 to 5 scale, with 5 being most desirable.

Economic Criteria

Capital Cost. Capital costs were developed for comparative purposes. These costs include estimated construction costs, allowances for lega and administrative costs, general conditions and contingencies.

Life-Cycle Cost. Life Cycle Costs (LCCs) which include both capital and 27 year (to 2038) O&M costs were developed for comparative purposes. Operation and maintenance costs were estimated based on pumping costs and equipment maintenance. Most of the projected O&M expenses are in the electrical costs of operating the pumps. The present worth for 27 years of annual O&M costs at an annual interest rate of 6.0% was added to the estimated capital cost to determine the present worth of life cycle costs for each option.

Non-economic Criteria

Impacts on the Environment. Environmental impacts include impacts upon wetlands, air quality, noise, and other unavoidable impacts of such construction.

Impacts on the Community. Community impacts include permanent and temporary impacts of construction on the surrounding neighborhoods. An example of this impact is road closures during construction.

Reliability /Maintainability. This criteria includes the ease of monitoring, control, operation, acce[illegible]ility and maintenance considerations.

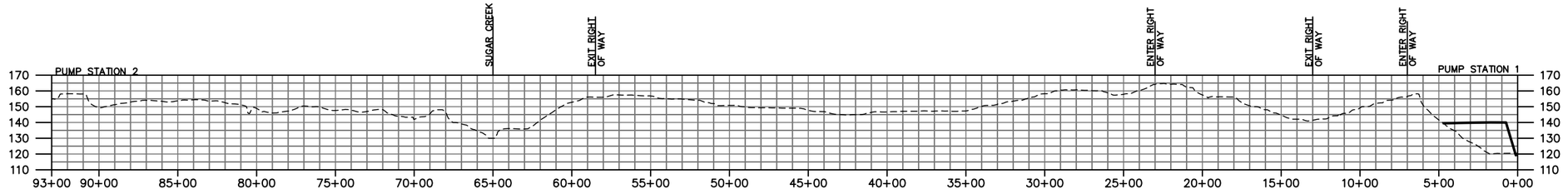
Workshop No. 2
Alternative Selection

Alternative Selection Analysis
Summary Table

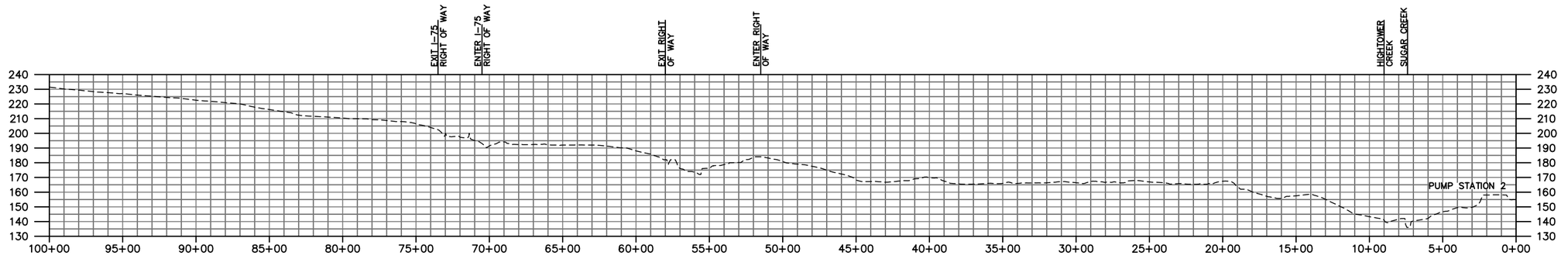
	Weighted Scores			
Criterion	Alt. 1	Alt. 2	Alt. 3	Alt. 4
Reliability/Maintainability	6.4	6.8	6.0	5.2
Capital Cost	6.3	6.7	5.6	5.3
Life Cycle Cost	6.5	5.2	5.2	5.2
Environmental Impacts	4.5	4.8	5.1	4.5
Community Impacts	3.0	4.3	3.8	3.3
Total Scores	26.7	27.7	25.7	23.4

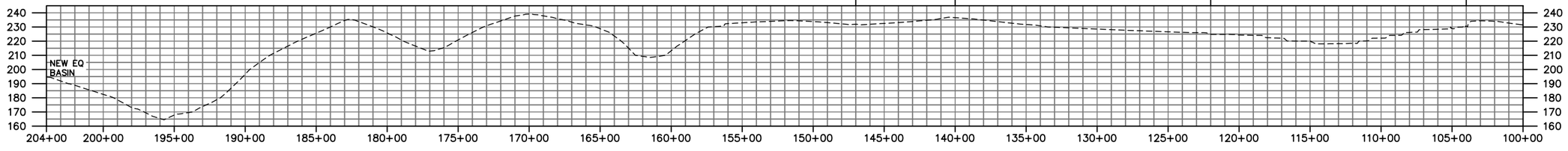
Appendix C

Collection System
Improvement Drawings

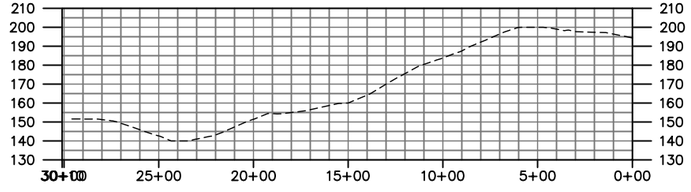


FORCE MAIN ROUTE PROFILE - GORNTO ROAD PS TO REMER LANE PS





FORCE MAIN ROUTE PROFILE - REMER LANE PS TO NEW EQ BASIN



GRAVITY SEWER MAIN ROUTE PROFILE - NEW EQ BASIN TO EXISTING WPCP

GRAPHIC SCALE
0 400 800 1600
1 inch = 800 ft.

By	Description	Date	Rev

Job No.
Designed
Drawn
Checked
Reviewed
Approved
Reg. No.
Date

PARSONS
WATER & INFRASTRUCTURE INC.
3577 PARKWAY LANE, SUITE 100
NORCROSS, GA 30092
PHONE: 770-446-4900
FAX: 770-446-4910

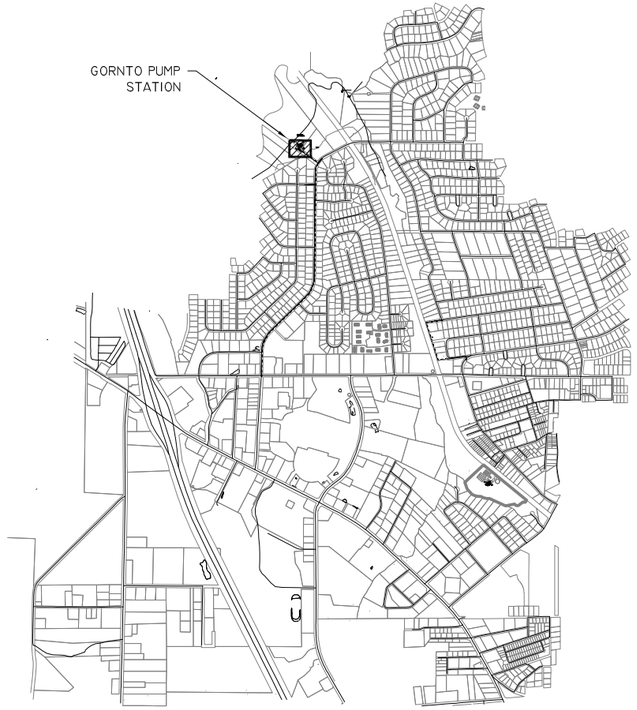
LOVELL LEA
ENGINEERING & LAND SURVEYING
CIVIL ENGINEERING & LAND PLANNING

City of Valdosta
UTILITIES DEPARTMENT
1016 Myrtle Street Valdosta, GA 31603
Phone: 229-259-3592

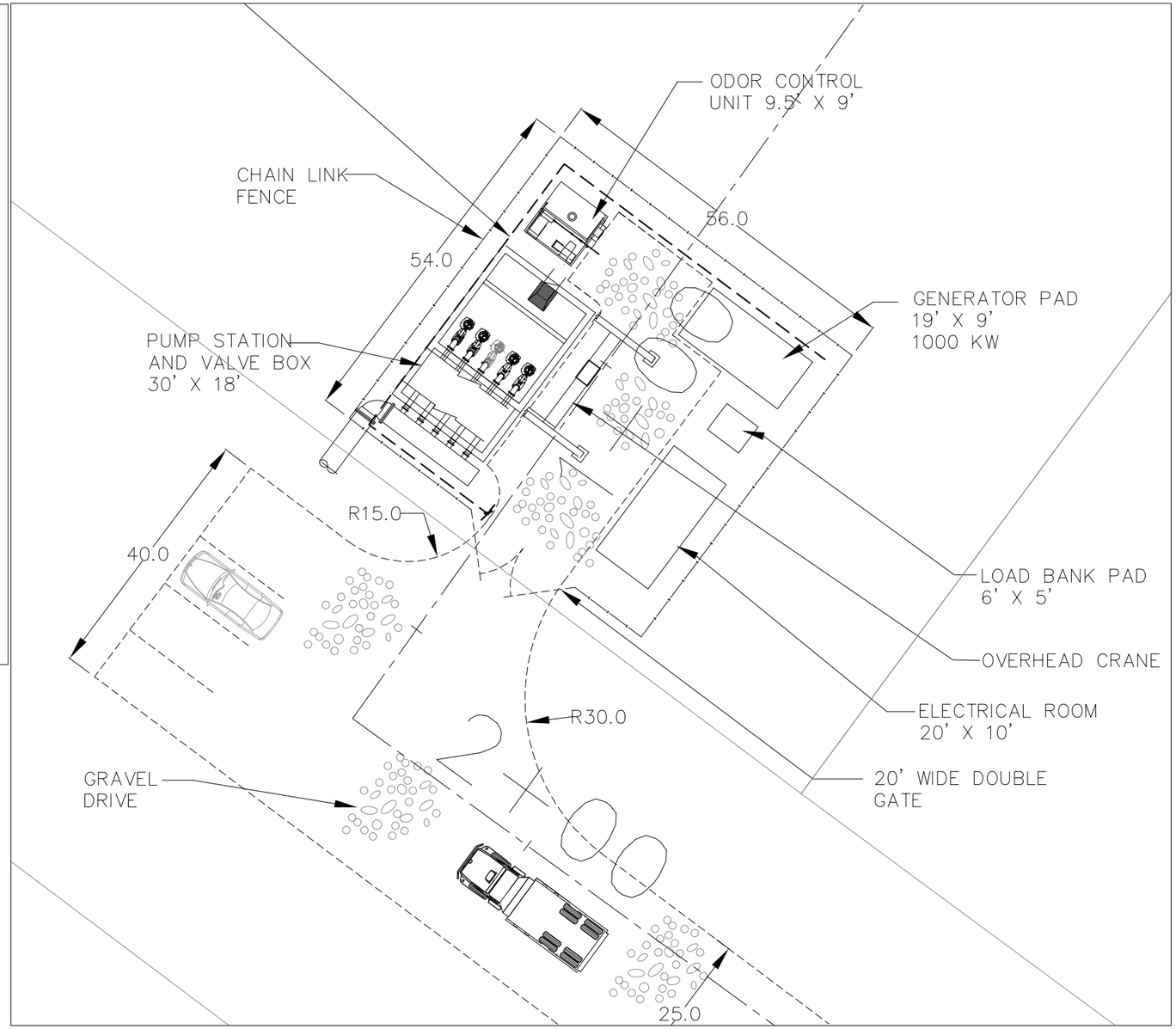
WITHLACOOCHEE WATER POLLUTION CONTROL PLANT
AND SEWER SYSTEM IMPROVEMENTS

FORCE MAIN AND GRAVITY SEWER ROUTE PROFILES

DRAWING NO. 0489-01
REV 0



VALDOSTA KEY PLAN
NTS



GORNTO PS SITE PLAN
1" = 10'

SCALE: 1"=10'

By	Description	Date	Rev
	DESIGN DEVELOPMENT REPORT		A

Job No.	260501
Designed	
Drawn	PG
Checked	XX
Reviewed	XX
Approved	XX
Reg. No.	
Date	6/7/11

Issue Certification

PARSONS
WATER & INFRASTRUCTURE INC.
5577 SUGARLOAF PKWY, SUITE 100
NORCROSS, GA 30092
PHONE: 770-446-4900
FAX: 770-446-4910

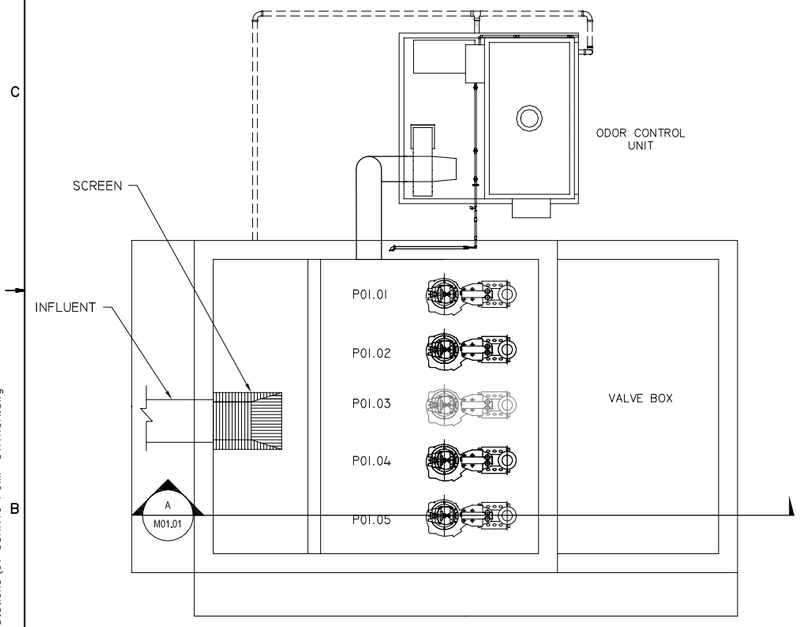
City of Valdosta
UTILITIES DEPARTMENT
1016 Myrtle Street, Valdosta, GA 31603
Phone: 229-259-3592

WITHLACOOCHEE WATER POLLUTION CONTROL PLANT
AND SEWER SYSTEM IMPROVEMENTS

GORNTO PUMP STATION SITE PLAN

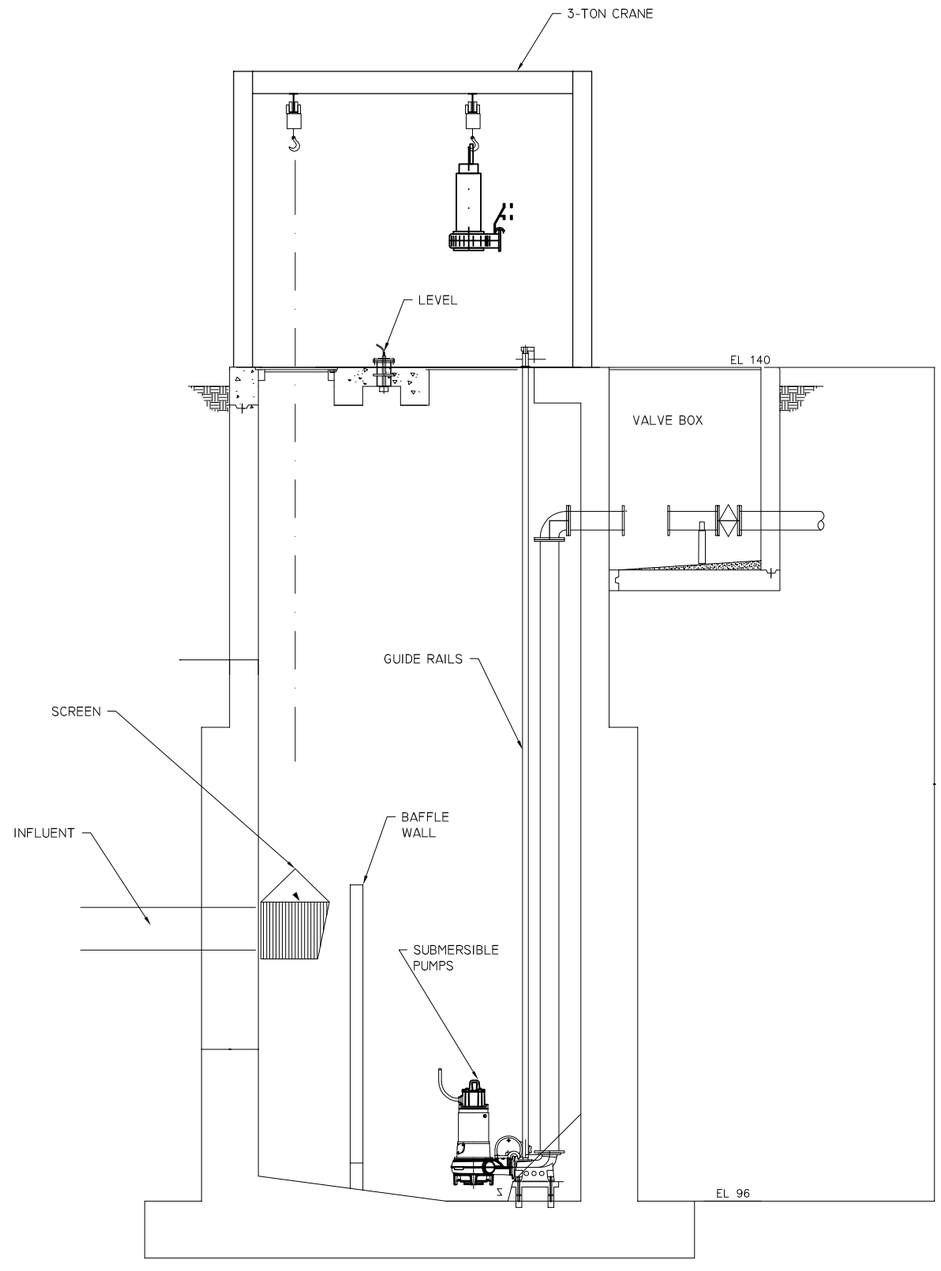
DRAWING NO.	REV
C01.01	0

J:\Withlacoochee WWTP\Construction Drawings\Phase 1\02_Civil\01_Pump Stations\C01.01 Pump Stations Site Plan.dwg



PUMP STATION & VALVE BOX
3 DUTY , 1 STAND BY , 1 FUTURE
ALT-2 PUMP TYPE 3231
HP : 250
WEIGHT : 3,705 LBS
GENERATOR : 1000 KW
LOAD BANK : 212.5 KW

GORNTO PS PLAN
1/4"=1'-0"



SECTION A
1/4"=1'-0"

4 2 0 4 8
SCALE: 1/4"=1'-0"

By	Description	Date	Rev
	DESIGN DEVELOPMENT REPORT		A

Job No. 260501
Designed
Drawn PG
Checked XX
Reviewed XX
Approved XX
Reg. No.
Date 6/7/11

Issue Certification

PARSONS
WATER & INFRASTRUCTURE INC.
3595 PARKWAY LANE, SUITE 100
NORCROSS, GA 30092
PHONE: 770-446-4900
FAX: 770-446-4910

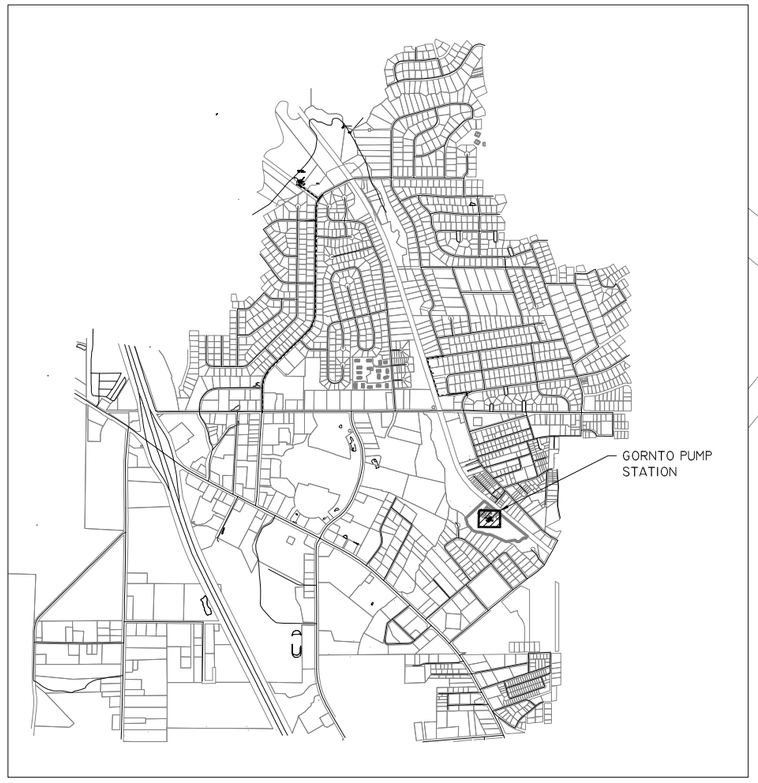
City of Valdosta
UTILITIES DEPARTMENT
1016 Myrtle Street, Valdosta, GA 31603
Phone: 229-259-3592

WITHLACOOCHEE WATER POLLUTION CONTROL PLANT
AND SEWER SYSTEM IMPROVEMENTS

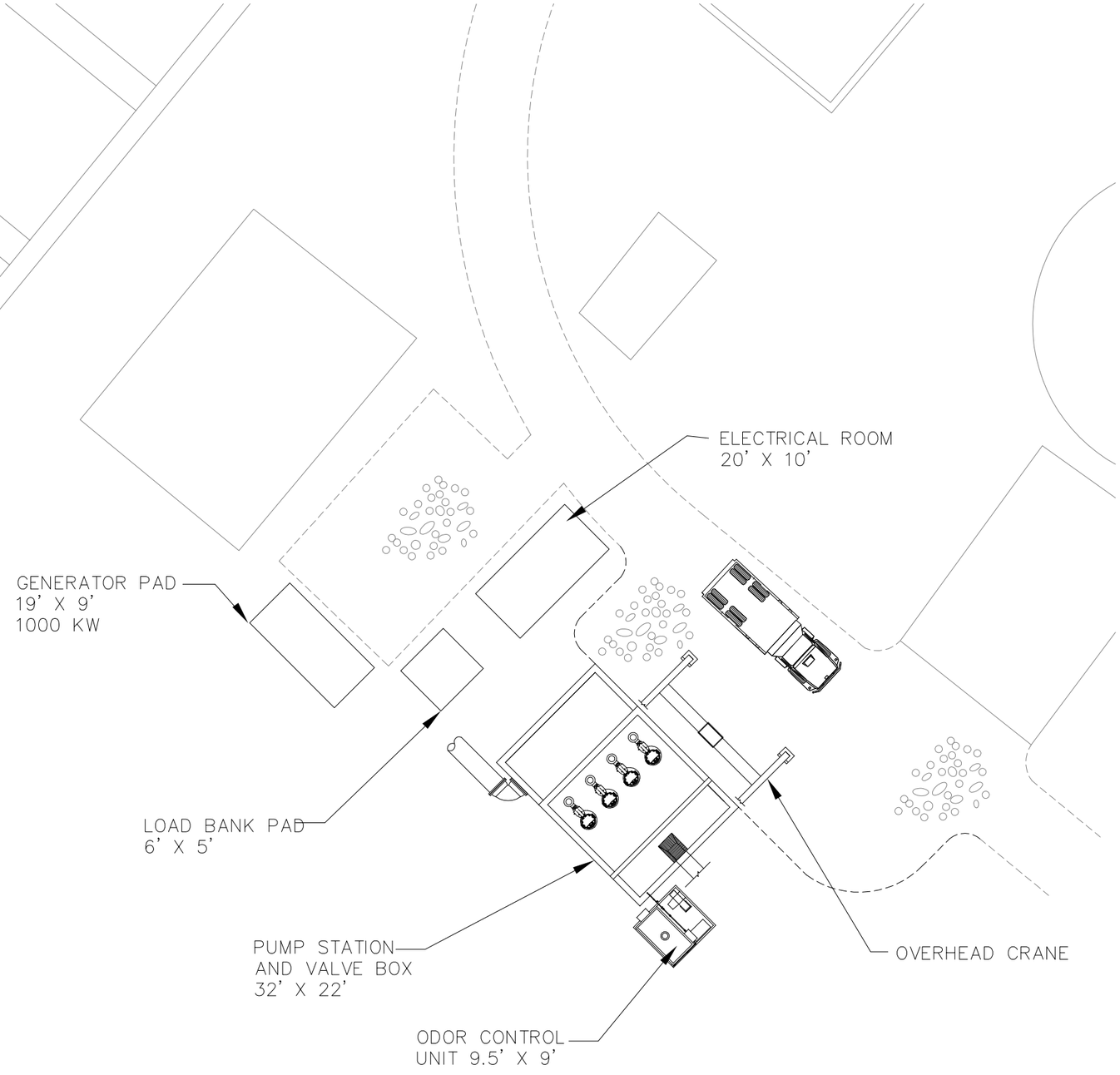
GORNTO PUMP STATION
PLAN AND SECTION

DRAWING NO.	REV
M01.01	0

J:\Withlacoochee WWTP\Construction Drawings\Phase 1\06_Mech\01_Pump Stations\01 GORNTO PUMP STATION.dwg



VALDOSTA KEY PLAN
NTS



REMER SITE PLAN
1" = 10'

10 5 0 10 20
SCALE: 1"=10'

By	Description	Date	Rev
	DESIGN DEVELOPMENT REPORT		A

Job No. 260501
Designed
Drawn PG
Checked XX
Reviewed XX
Approved XX
Reg. No.
Date 6/7/11

Issue Certification

PARSONS
WATER & INFRASTRUCTURE INC.
5577 KIMZEY LANE, SUITE 100
NORCROSS, GA 30092
PHONE: 770-446-4900
FAX: 770-446-4910

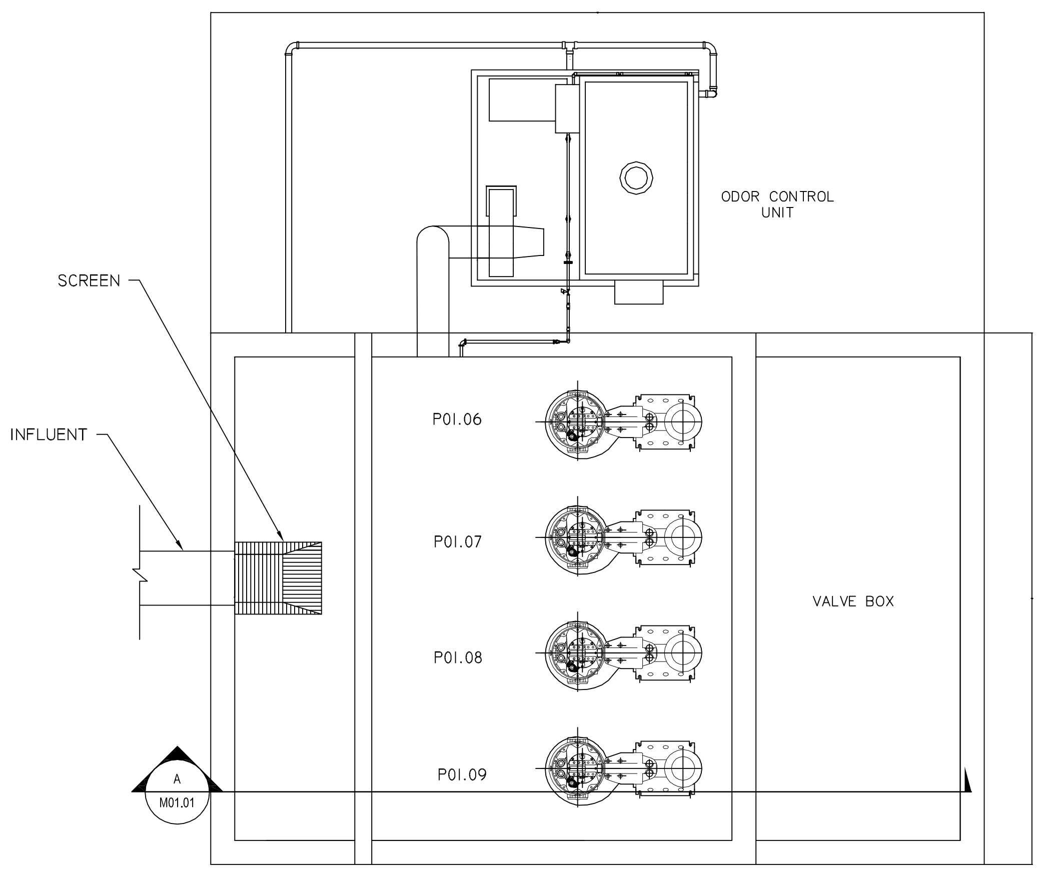
City of Valdosta
UTILITIES DEPARTMENT
1016 Myrtle Street, Valdosta, GA 31603
Phone: 229-259-3592

WITHLACOOCHEE WATER POLLUTION CONTROL PLANT
AND SEWER SYSTEM IMPROVEMENTS

REMER PUMP STATION
SITE PLAN

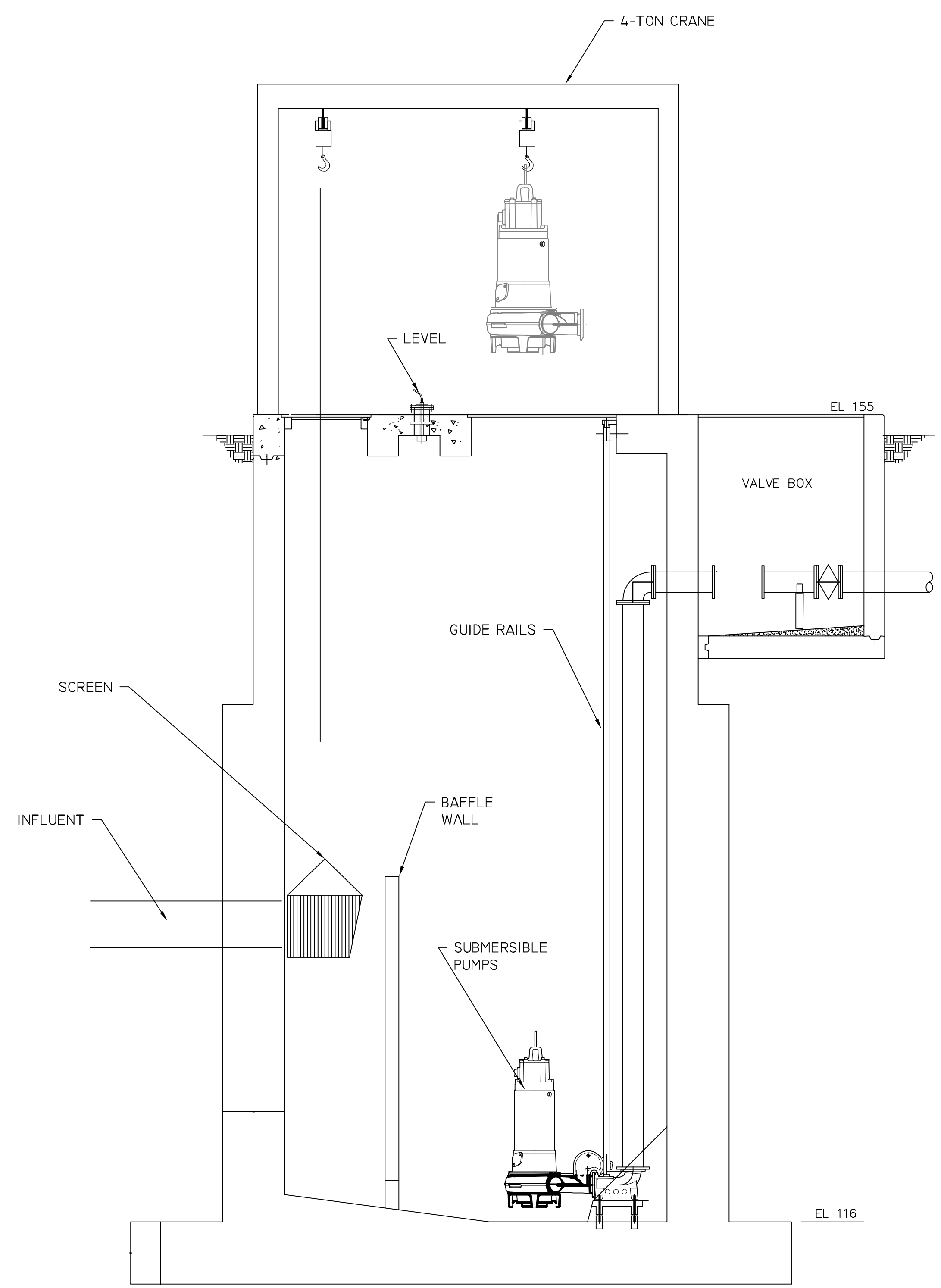
DRAWING NO. C01.02
REV 0

J:\Withlacoochee WWTP\Construction Drawings\Phase 1\02_Civil\01_Pump Stations\C01.01 Pump Stations Site Plan.dwg



PUMP STATION & VALVE BOX
PLAN VIEW
3 DUTY , 1 STAND BY
ALT-2 PUMP TYPE 3312
HP : 385
WEIGHT : 6,505 LBS
GENERATOR : 1000 KW
LOAD BANK :112 KW

REMER PS PLAN
1/4"=1'-0"



SECTION A
1/4"=1'-0"

SCALE: 1/4"=1'-0"

Rev	Date	Description	By
A		DESIGN DEVELOPMENT REPORT	

Job No.	260501
Designed	
Drawn	PG
Checked	XX
Reviewed	XX
Approved	XX
Reg. No.	
Date	6/7/11

Issue Certification

PARSONS
WATER & INFRASTRUCTURE, INC.
3577 PARKWAY LANE, SUITE 100
NORCROSS, GA 30092
PHONE: 770-446-4900
FAX: 770-446-4910

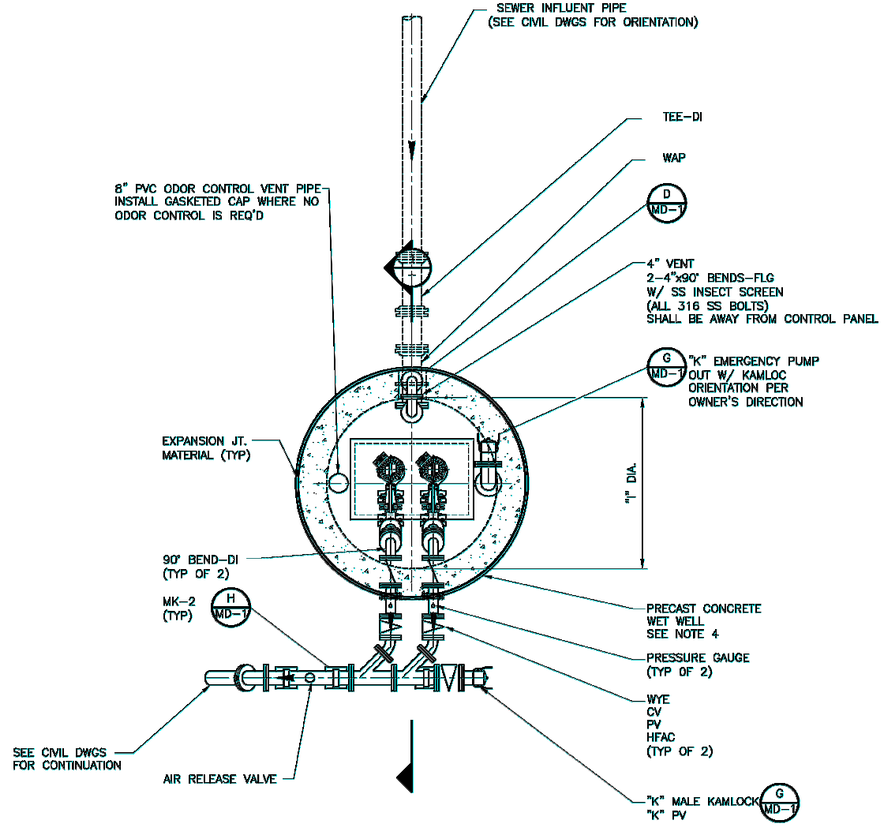
City of Valdosta
UTILITIES DEPARTMENT
1016 Myrtle Street; Valdosta, GA 31603
Phone: 229-259-3592

WITHLACOOCHEE WATER POLLUTION CONTROL PLANT
AND SEWER SYSTEM IMPROVEMENTS

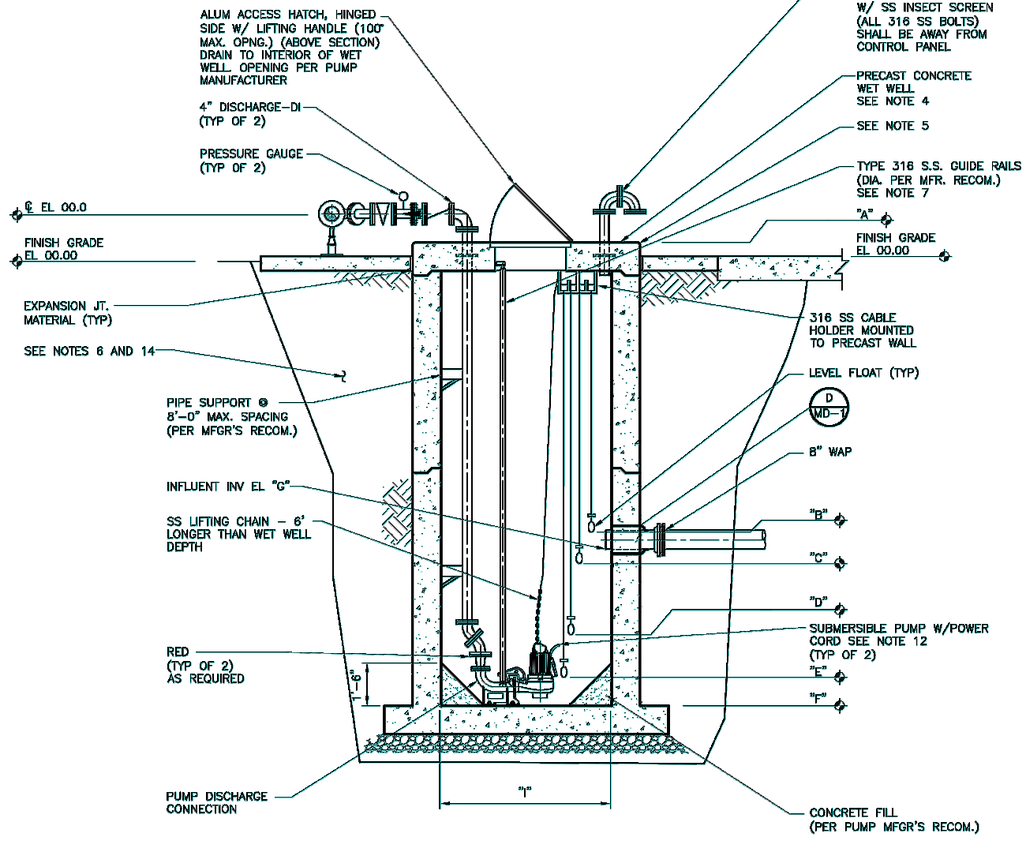
REMER PUMP STATION
PLAN AND SECTION

DRAWING NO. M01.02 REV 0

J:\Withlacoochee WWTP\Construction Drawings\Phase 1\06_Mech\01_Pump Stations\01 REMER PUMP STATION.dwg



VCI PS PLAN
NTS



SECTION A
NTS

By	Description	Date	Rev
	DESIGN DEVELOPMENT REPORT		A

Job No. 260501
Designed
Drawn PG
Checked XX
Reviewed XX
Approved XX
Reg. No.
Date 6/7/11

Issue Certification

PARSONS
WATER & INFRASTRUCTURE INC.
5395 TRINITY PARKWAY, SUITE 100
NORCROSS, GA 30092
PHONE: 770-446-4900
FAX: 770-446-4910

City of Valdosta
UTILITIES DEPARTMENT
1016 Myrtle Street Valdosta, GA 31603
Phone: 229-259-3592

WITHLACOOCHEE WATER POLLUTION CONTROL PLANT
AND SEWER SYSTEM IMPROVEMENTS

VCI PUMP STATION
PLAN AND SECTION

DRAWING NO. M01.03
REV 0

J:\Withlacoochee WWTP\Construction Drawings\Phase 1\06_Mech\01_Pump Stations\01 VCI PUMP STATION.dwg