CITY OF FOLEY

BEULAH HEIGHTS
STORMWATER MANAGEMENT PLAN

COMMUNITY RESILIENCE INITIATIVE

Prepared by:

thompson
ENGINEERING

SEPTEMBER 29, 2023

Funding for this project provided by the Alabama Department of Natural Resources, State Lands Division, Coastal Section, in part, by a grant from the National Oceanic and Atmospheric Administration, Office for Coastal Management, NOAA Award #20NOS4190183

Acknowledgements

This Stormwater Management Plan was developed for the community of Beulah Heights by the City of Foley. Funding for this project was provided by the Alabama Department of Conservation and Natural Resources, State Lands Division, Coastal Section, in part, by a grant from the National Oceanic and Atmospheric Administration, Office for Coastal Management, NOAA Award No. 20NOS4190183. The statements, findings, conclusions, and recommendations are those of the author(s) and do not necessarily reflect the views of NOAA or ADCNR.

Public outreach for the project included community meetings with residents and stakeholders to pinpoint flood prone areas and sanitary sewer issues. Public engagement meetings were critical to obtaining pertinent information from residents. To engage the greatest number of people possible, the City of Foley sent notices to all residential addresses within the Beulah Heights study area and hosted two (2) public meetings at City Hall to accommodate these meetings. In addition, maps and comments cards were distributed to local churches to provide residents with additional opportunities to provide comments and document flood prone areas and other issues.

Many thanks to Morning Star Baptist Church, New Hope Pentecostal Holiness Church, Foley City Hall, and the staff of the Environmental, Engineering and Public Works departments for their support and assistance in hosting public meetings and providing information needed to develop this plan.

Table of Contents

1. Introduction

1.1 Purpose and Scope of the Plan

The Beulah Heights Stormwater Management Plan has been developed to provide a roadmap for addressing stormwater flooding and non-point source pollutants in the Beulah Heights Community.

1.2 Background and Regulatory Context

The plan's study area focused on the developed areas Beulah Heights within the Wolf Creek watershed and was geographically constrained by U.S Highway 98 (Laurel Avenue) to the North, Juniper Street to the east, Michigan Avenue to the south and Wolf Creek to the east. Located approximately 1 mile southeast of downtown Foley, the community largely consists of single-family residential homes and a mixture of medium to high density commercial developments.

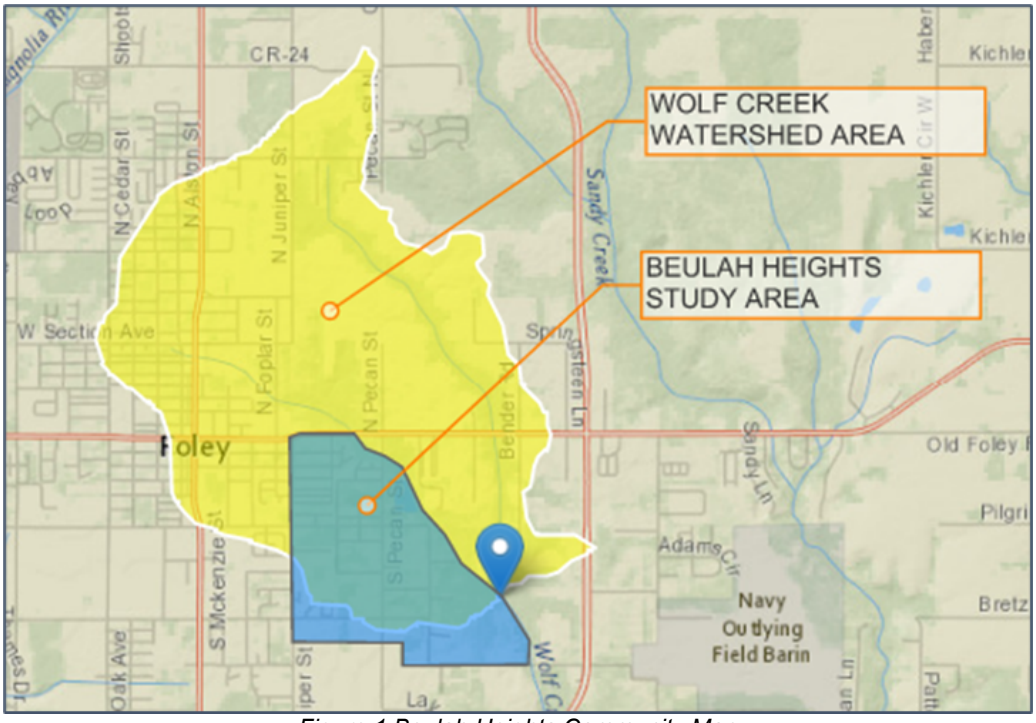


Figure 1 Beulah Heights Community Map

As with many older communities, Beulah Heights was developed prior to the institution of modern stormwater management regulations and lacks adequate infrastructure needed to improve community resilience to future flooding events. The community experiences flooding of private property and structures, overtopping of public roadways, surcharging of inlets, and overtopping of ditches due to undersized or inadequate drainage infrastructure throughout the community. Increased flooding during major storm events has contributed to property damage and diminished quality of life for residents.

In addition to the challenges posed by stormwater flooding, stormwater runoff within the community experiences pathogen contamination due to failing or overwhelmed septic systems as many structures were constructed prior to the installation of public operated sanitary sewer systems.

1.3 Stakeholders and Collaboration

In any thriving community, the residents are the most important and vital stakeholders. These are the individuals and families who have elected to make the community their home, but it is also necessary to have partners who will assist and collaborate with those community leaders in protecting their community. The partners that either funded or worked on this project are as follows:

- City of Foley
- Thompson Engineering
- Alabama Department of Conservation and Natural Resources (ADCNR)
- National Oceanic and Atmospheric Administration (NOAA)
- Mobile Bay National Estuary Program (MBNEP)
- Riviera Utilities

Working in concert with the community, these partners can bring added support in tackling the challenges faced by the community and provide opportunities that would not be available otherwise. From providing grant funding opportunities to providing technical knowledge and expertise, these community partners are a resource willing to assist and be advocates for the Beulah Heights community.

2. Community Outreach & Engagement

Community outreach and engagement is an integral part of the stormwater management planning process, focused on building a partnership between the community and local stakeholders by informing them of the project goals, working collaboratively to identify issues and develop implementation strategies that successfully achieve the goals of the community.

Public outreach for the project included community meetings with residents and stakeholders to pinpoint flood prone areas and sanitary sewer issues. To engage the greatest number of people possible, the City of Foley sent notices to all residential addresses within the Beulah Heights study area and hosted two (2) public meetings at City Hall to accommodate these meetings. In addition, maps and comments cards were distributed to local churches to provide residents with additional opportunities to provide comments and document flood prone areas and other issues.

Figure 2 Public Meeting, July 2023

An initial public meeting was held on July 20, 2023. The project team presented the project overview and goals and sought input from the community members. Community members identified areas with a history of flooding on the provided maps and comment cards. A copy of the map with comment locations is provided in Appendix B.

Community members were also informed about an upcoming Septic System Rehabilitation & Sewer Connection Program, a program which will provide financial assistance to eligible property owners within the City of Foley.

Following the first public meeting, maps and comment cards were distributed to Morning Star Baptist Church and New Hope Pentecostal Holiness Church for comment by community members who were unable to attend the meeting.

A second public meeting was held on August 31, 2023, to present the project team's findings from the stormwater study and present a list of potential projects to address flooding. The City of Foley provided an update on the previously mentioned Septic System Rehabilitation & Sewer Connection Program.

3. Stormwater Modeling

The primary goals of the stormwater management plan are to gather and document data on existing stormwater infrastructure, assess areas of flooding vulnerability, and to identify potential projects for mitigation of flooding and reduction of non-point source pollutants.

3.1 Data Collection and Analysis

Existing Stormwater Infrastructure Inventory

An inventory of existing stormwater infrastructure was performed utilizing survey equipment to gather GIS level information. All major drainage infrastructure (i.e., inlets, manholes, pipes, headwall, lined channels, ponds, etc.) was located and incorporated into the drainage analysis, and a GIS database was prepared to provide the City of Foley with a better inventory of existing infrastructure to inform decisions regarding maintenance and planning for future projects.

The existing drainage system and regional detention pond on Michigan Avenue serves as the primary means of stormwater conveyance and retention for a large portion of the study area south of E Azalea Avenue. The drainage system consists of a main trunk line beginning at South Bay Street and flowing east along Michigan Avenue to an outfall into a regional stormwater facility located at the intersection of Michigan Avenue and South Maple Street. An additional trunk line extends north from the Michigan Avenue trunk line up Pecan Street and terminates at East Jefferson Avenue. The Michigan Avenue drainage improvement project was constructed in the early 2000's and was devised to provide much needed storm drainage relief to the Michigan Avenue corridor. The stormwater pond facility was designed to contain the 50-year stormwater event and then attenuate an additional 100-year event using an outfall pipe that would discharge along Doc McDuffie Road into an improved concrete lined drainage channel prior to release into Wolf Creek.

For areas located north of East Azalea Avenue and south of East Verbena Avenue, stormwater runoff is collected using inlets and ditches and directed to a concrete lined channel, which begins east of Juniper St. and ends at Wolf Creek, adjacent to the existing sewer treatment facility. The remaining study area north of East Verbena Avenue drains northward to Wolf Creek through a combination of culverts and open roadside ditches.

A map of the study area with the individual drainage basin areas is provided in Figure 8 Below.

Hydrological Data

Making use of the current National Oceanic and Atmospheric Administration (NOAA) Atlas 14, Volume 9, Version 2 data, the anticipated precipitation depths for the 10, 25, 50 and 100-year, 24-hour event were obtained. These depths were utilized to construct a hydrological distribution of rainfall during the listed stormwater events to allow for the time-step analysis of existing and proposed infrastructure. This analysis should allow for the verification of current capacities and the modeling of future improvements to provide alleviation of ongoing flooding conditions and assurance of effective future developments. The following table provides a summary of the anticipated rainfall depths provide by NOAA:

OCCURRENCE	RAINFALL (INCHES)
10-year	9.21”
25-year	11.7”
50-year	13.9”
100-year	16.3”

Table 1 NOAA Atlas 14 Rainfall Depths

To prepare an accurate stormwater model from the NOAA Atlas 14 rainfall depths listed in Table 1, a time-distribution hyetograph over the course of a 24-Hour period must be constructed utilizing a synthetic intensity distribution curve which mimics the patten of rainfall as a storm event begins, peaks, and declines. For the study area, a Type III (Type A) distribution curve is utilized and is characterized by short intense rainfall events which is indicative of the study area and yields significant accumulation of rainfall in a short time. Figure 3 below illustrates the Type III storm event distribution and Figure 4 provides the rainfall hydrograph as computed by PCSWMM.

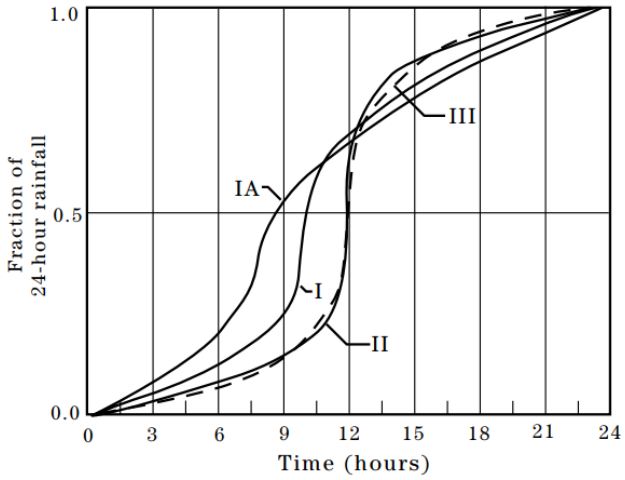


Figure 3 Type III (Type A) Rainfall Distribution Curve

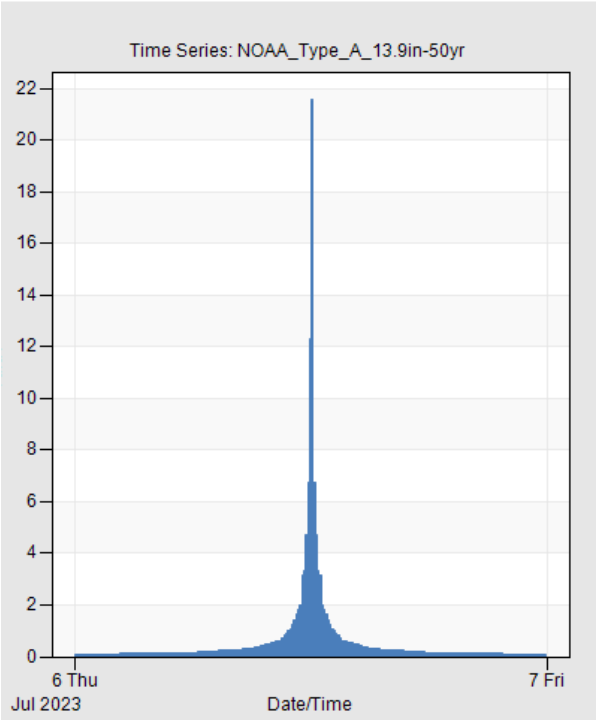


Figure 4 Type III (Type A) Hydrograph

Topographical Data

Lidar data (found https://www.sciencebase.gov/catalog/item/63490605d34e47431c0f55be and dated 2020) from the United States Geological Service (USGS) was downloaded for the Wolf Creek Watershed Area and utilized in creating the topographic model of the study area. The topographic model was utilized to identify the individual drainage basins within the watershed, as well as the average terrain slope of each drainage basin. The completed topographic model obtained from the Lidar dataset and processed through PCSWMM is illustrated in Figure 5.

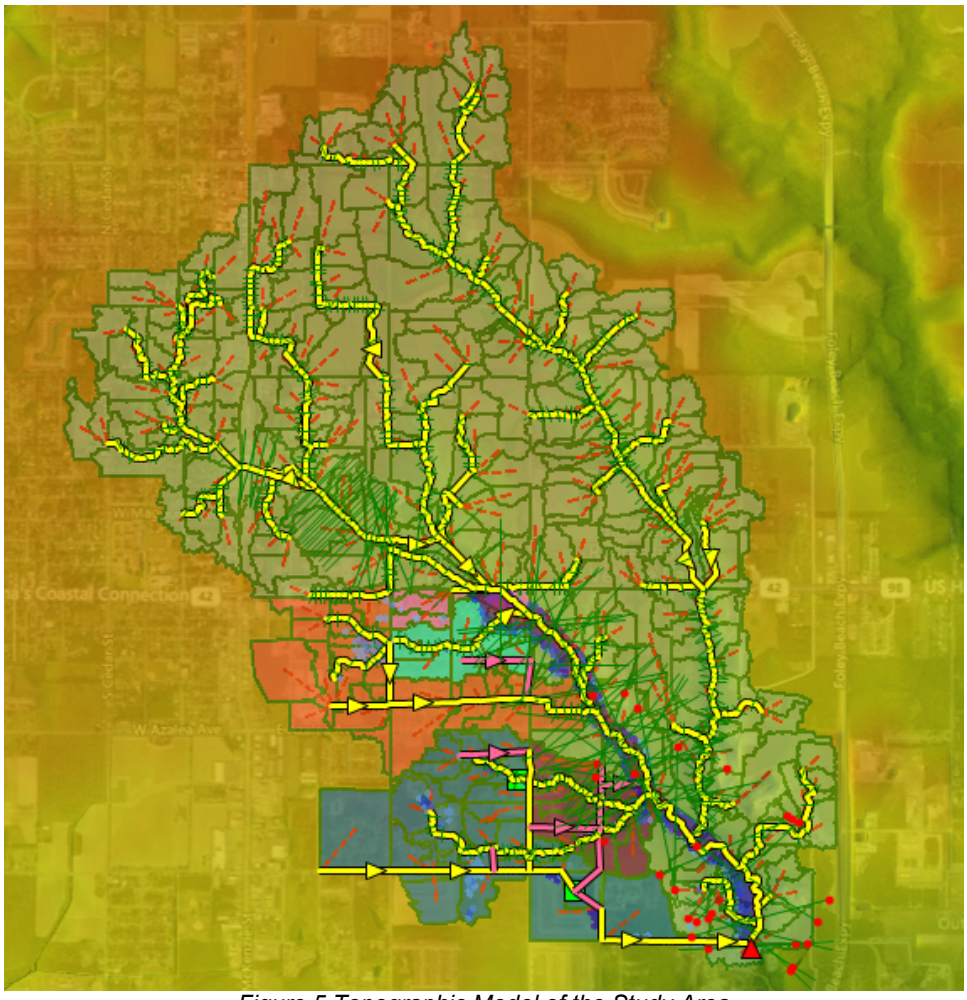
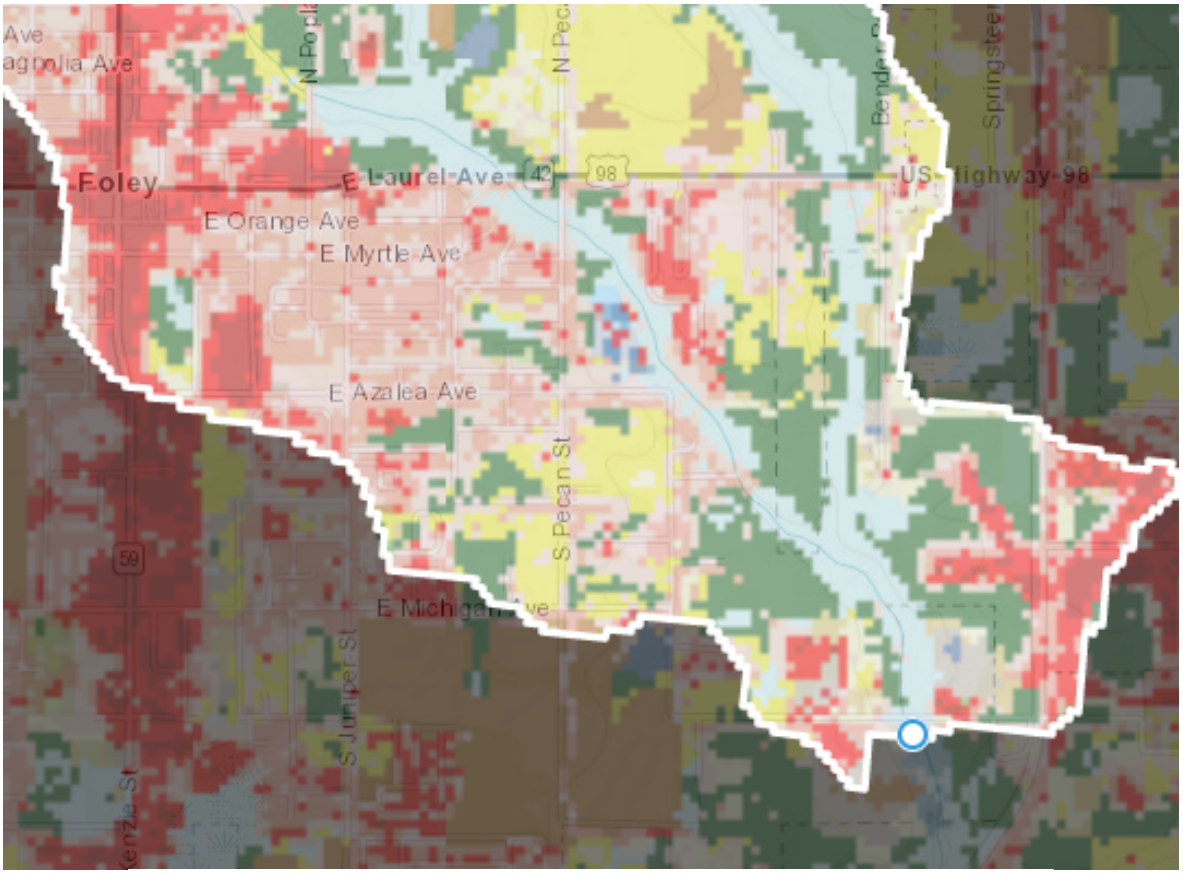


Figure 5 Topographic Model of the Study Area

Land Use, Cover and Soil Data

As the anticipated stormwater runoff within the watershed is directly connected to the surface conditions present within the basin area, the 2019 version of the National Land Cover Database (NLCD) was consulted to determine the make-up of pervious and impervious areas for each of the watershed sub-basin. As indicated in Figure 6, the study area has a diverse mixture of land uses that is dominated by low density developments and open/forested space which combine to make up nearly 47% of the basin. Table 2 provides a detailed breakdown of the identified land uses/cover within the Wolf Creek Watershed upstream of Beulah Heights. Notably, approximately one-thousand acres of open/agricultural land available for future development is possible. This ever-present possibility of future development generates the need for a forward-looking approach to stormwater management and engaging new strategies in responsible management of design, discharge, and maintenance of infrastructure.



Land Use/Cover 2019 (NLCD19)

Related Layer: Land Use/Cover 2019 (NLCD19) ✖ Turn off

Source: National Land Cover Database (NLCD 2019)

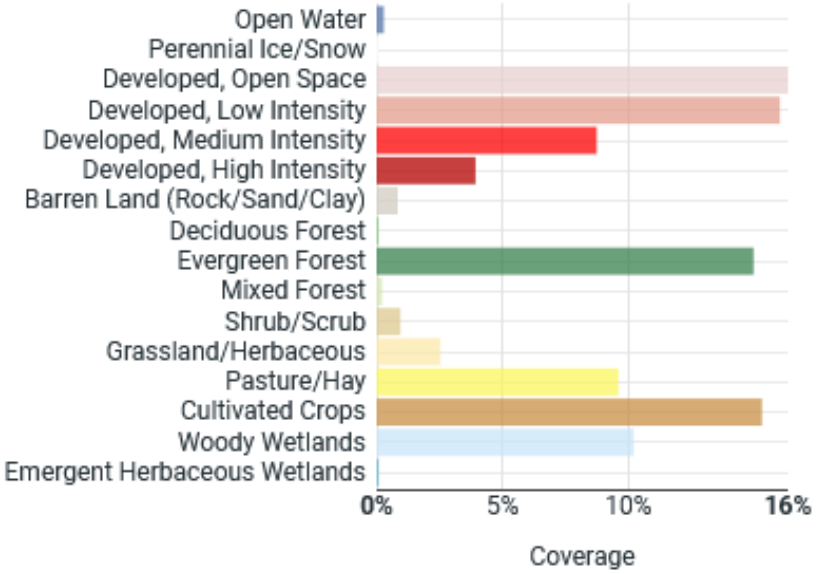
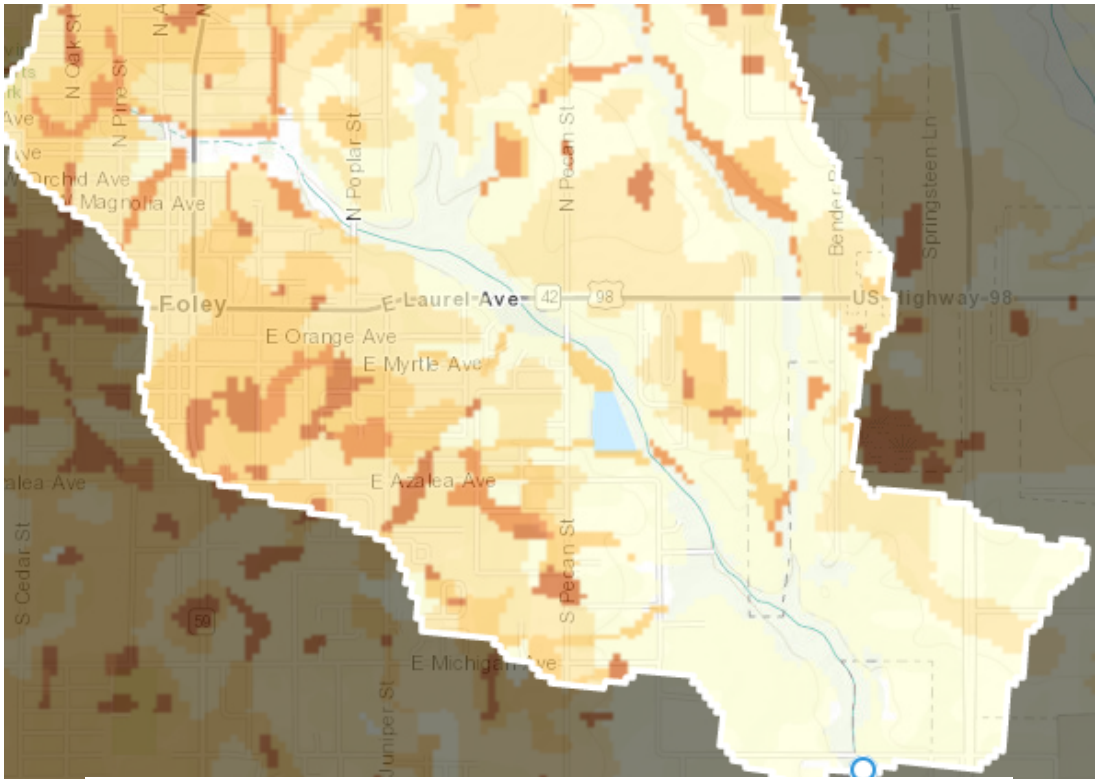


Figure 6 Land Use/Cover Map (2019)

Type	NLCD Code	Area (acres)	Coverage (%)
Developed, Open Space	21	541.16	16.33
Developed, Low Intensity	22	531.28	16.01
Cultivated Crops	82	509.04	15.3
Evergreen Forest	42	496.68	14.97
Woody Wetlands	90	338.53	10.2
Pasture/Hay	81	318.77	9.6
Developed, Medium Intensity	23	289.11	8.74
Developed, High Intensity	24	130.97	3.93
Grassland/Herbaceous	71	84.02	2.53
Shrub/Scrub	52	32.12	0.94
Barren Land (Rock/Sand/Clay)	31	27.18	0.84
Open Water	11	9.88	0.29
Mixed Forest	43	7.41	0.21
Emergent Herbaceous Wetlands	95	2.47	0.09
Deciduous Forest	41	0.00	0.01
Perennial Ice/Snow	12	0.00	0
Total		**3318.62**	**100**

Table 2 Detailed Land Use Summary

Whereas land use and cover provide an aerial view of development, the soil strata that resides below these uses and groundcover plays a pivotal role in understanding the potential for stormwater runoff. The U.S. Department of Agriculture's Natural Resources Conservation Service (NRCS) has prepared a survey database of soil types which are classified by their physical characteristics as they relate to permeability, potential for development and surface discharge. The classification ranges from Type A to Type D, with Type A yielding the largest potential for infiltration and Type D having the least potential. The NRCS's Gridded Soil Survey Geographic (gSSURGO) Database indicated that the study area is primarily composed of soils with the B and C classification which provides for moderate to low infiltration capacity leading to higher surface discharge during storm drainage events. Figure 7 illustrates the soil types and percentage present within the study area.



Hydrologic soil group distribution

Related Layer: Hydrologic Soil Groups From gSSURGO ✖ Turn off

Source: USDA (gSSURGO 2016)

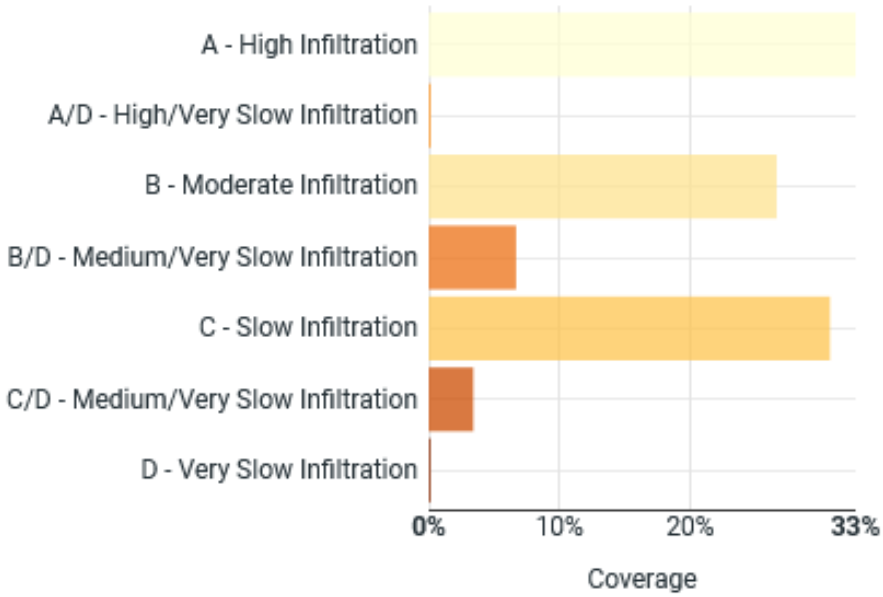


Figure 7 NRCS Soil Classification Map

3.2 Hydraulic and Hydrologic Modeling

Rainfall-Runoff Modeling

The study area data was entered into the PCSWMM software, a professional modeling tool which provides standalone GIS and time series management, to simulate the precipitation-runoff processes of watershed systems by means of precipitation, evapotranspiration, infiltration, excess precipitation transformation, base flow, and open channel routing. PCSWMM provided the precipitation runoff quantities and routing for specified rainfall events which illustrate the challenges and opportunities within the basin.

Stormwater Conveyance Modeling

PCSWMM utilized existing lidar data to delineate the watersheds and flow paths of the entire Wolf Creek Watershed Area as shown in Figure 1 above. Lidar data was also used to determine the cross-sections of Wolf Creek and any additional overland flow paths for the watershed area. Existing as-built drawings and survey information were incorporated to better define the drainage paths in the Beulah Heights study area. Major open ditches, cross-drains and culverts were added to the model to depict the accurate flow paths for the drainage areas.

To better understand the localized drainage of the Beulah Heights area, the sub-catchments were grouped into color coded sub-watersheds, see Figure 8 below.

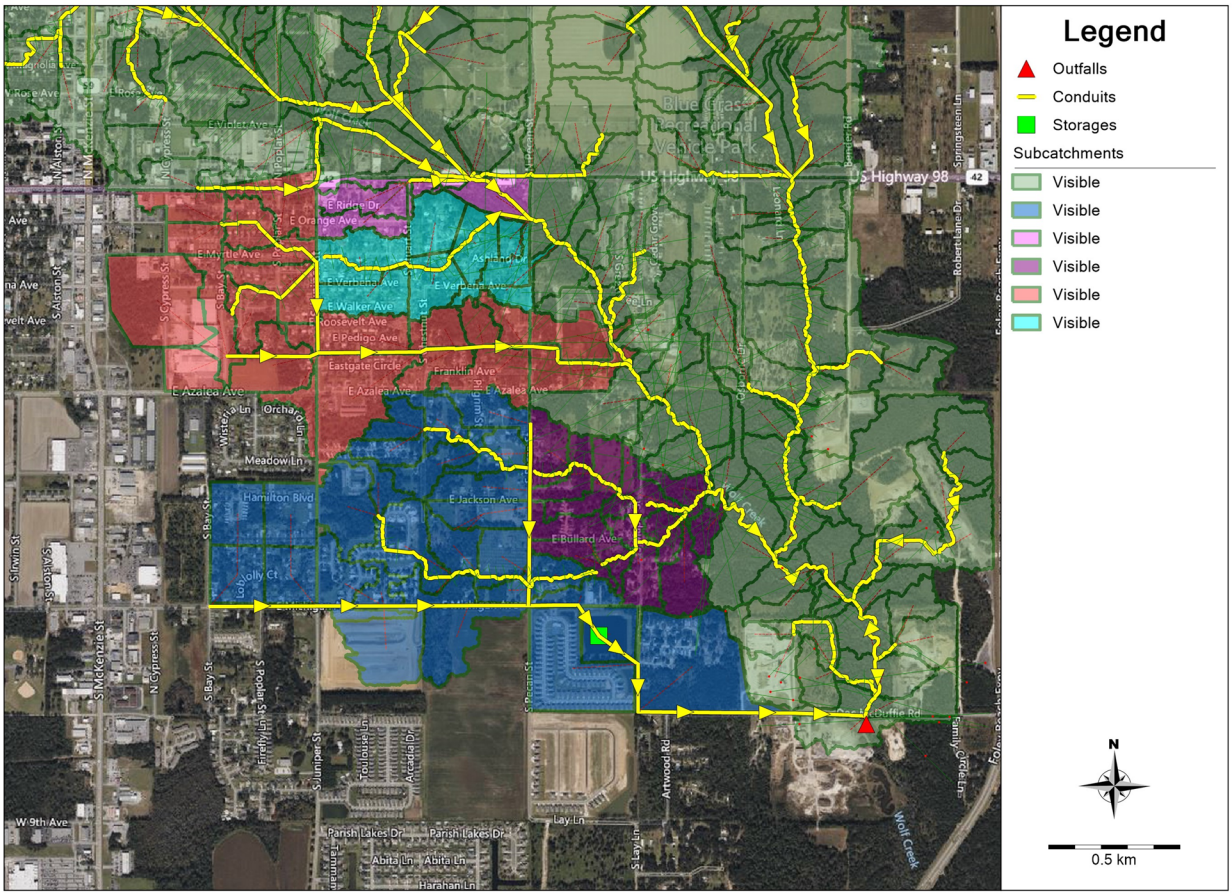


Figure 8 Study Area Drainage Basins

These sub-watersheds are described in Table 3 below:

Color	Flow Path Description	Total Area
Red	Concrete lined channel between E Pedigo Ave. and Eastgate Circle	236.34 Acres
Pink	Ridge Drive to HWY 98 Roadside Ditch	30.72 Acres
Blue	Michigan Avenue culverts/pond/Doc Mcduffie Road	318.10 Acres
Purple	Bullard Avenue/S Maple Street Outfall	91.25 Acres
Teal	South Stuart Street Cross Drains/Trade Winds Ct. Rear Yard Ditch	70.26 Acres

Table 3 Sub-watershed Descriptions

3.3 Scenario Analysis and Design Storm Selection

Each design storm scenario was run for both the existing and proposed models. The sizing of any proposed improvements was based on the 50-year design storm scenario.

3.4 Model Calibration and Validation

An existing stream gauge located at the intersection of Wolf Creek and the Foley Beach Expressway was utilized to verify the modeling results. The historical stream gauge depths from this gauge location assist in establishing the water surface elevation of Wolf Creek during past rainfall events and were beneficial in setting the model's outfall parameters.

Inundation maps of the existing and proposed design storm scenarios can be found in Appendix C.

4. Critical Issues Assessment

4.1 Identification of Problem Areas

The initial step in this stormwater management plan was to identify the challenges that exist within the study area. Beulah Heights offers many challenges as the area has been developed in smaller unregulated phases which have not been included under a comprehensive stormwater management plan. The community contains many low-lying areas which detain the flow of stormwater and contribute to flooding. As the area has developed over the years, considerations for upstream and downstream improvements needed to improve community resilience were not historically incorporated into development projects. With acknowledgement of challenges faced by the community, opportunities to improve community resilience are now being identified which can make significant impacts to the overall health and wellbeing of the community.

A review of historical data, field reconnaissance, and community outreach was used to identify flooding "hotspots" within the community. A hydraulic/hydrologic model was then created to model stormwater runoff through the community and provide a tool that could be used to verify and identify such "hotspots" and to inform the development of future improvements to alleviate flooding. This pivotal tool can be used to help guide the governmental agencies planning stormwater improvement projects and can also be used to guide future development in ways that mitigate the potential for flooding which may not be located within a federally identified floodplain.

4.2 Evaluation of Existing Infrastructure

The existing infrastructure was also analyzed to assess existing capacity and ability to accommodate additional runoff that may be routed through existing systems.

The existing major closed drainage conveyance infrastructure within the community is limited to the pipe network along Michigan Ave and Pecan Street, and the only major stormwater retention facility of public benefit is the regional detention pond located at the east end of Michigan Ave. As indicated in the analysis included in Appendix C, the existing major drainage system along Michigan Avenue adequately conveys the 10- and 25-year design storms but begins to surcharge during the 50- and 100-year storms. There is a major open drainage conveyance system in the middle of the study area that consists of a concrete lined channel. Other conveyances in the study area consist of smaller roadside ditches and culverts.

To determine the potential for flooding in the community without the presence of additional major conveyance systems, flood inundation maps were created to identify problem areas and refine the scope of potential improvements needed to alleviate flooding. These maps are included in Appendix C. Section 6 includes an overview of proposed infrastructure projects that can be implemented to alleviate flooding.

5. Stormwater Management Strategies

For the long-term viability and sustainability of a community, the necessity of developing and instituting stormwater management strategies is essential. These strategies should incorporate both traditional, environmental, and low-impact practices which lead to responsible development. The following sections expound on each practice area and provide a pathway towards establishing sound and proven methodologies which enable a lasting positive result on the community, while not inhibiting growth and prosperity.

5.1 Green Infrastructure and Low-Impact Development (LID) Practices

Green infrastructure and Low-Impact Development (LID) is an approach to water management that protects, restores, or mimics the natural water cycle. Green infrastructure is effective, economical and enhances community safety and quality of life. Green infrastructure solutions can be applied on differing scales, from individual residential sites to larger more diverse commercial developments. These solutions can employ rain gardens, permeable pavements, infiltration planters, trees, tree boxes, bioretention and rainwater harvesting. At the largest scale, this includes the preservation and restoration of natural landscapes such as forests, floodplains, and wetlands.

Rain Gardens and Bioretention

Rain Gardens and Bioretention are essentially depressed areas within a development which serve to capture stormwater runoff and through the installation of various vegetation can filter and cleanse runoff of manmade pollutants prior to discharge. These gardens and retention areas serve as a stormwater management system that provides a naturally beautiful and productive green infrastructure. Rain gardens and bioretention areas do require upkeep and regular maintenance to assure adequate functionality. The main discharge source for these improvements is provided through a combination of infiltration and spillway overflow during large rainfall events. Rain Gardens and bioretention often incorporate ground improvements (i.e., removal and replacement of native soils, installation of sand chimneys, etc.) to increase their overall effectiveness.

Permeable Pavements

With all developments, the conversion of permeable surfaces to impermeable materials is a logical result. The conversion of woods and fields to concrete, asphalt and roof tops leads to increased stormwater volumes discharging into existing infrastructure, leading to loss of capacity, longer discharge times and potentially increased flooding. The incorporation of green technologies will assist in the mitigation of those negative aspects of development and promote the seamless incorporation of development without leaving harmful impacts. Permeable technologies allow for the natural passage of stormwater into the underlying surface strata while providing developers a method for meeting the needs of the development (i.e., parking areas, pedestrian walkways, roadway infrastructure, etc.). Permeable pavements and pavers provide an all-weather surface allowing access but in return do not increase stormwater runoff as compared to traditional impervious surfaces. Whereas these permeable surfaces are more costly at the initial onset, the lasting environmental contributions will yield a lasting improvement to the community that far exceeds the initial costs.

5.2 Traditional Best Management Practices (BMPs)

Whereas the institution of green infrastructure is an innovative approach to lessening the impact of

development, the traditional Best Management Practices or BMPs should always be included in the minimal requirements for development. For stormwater management, these traditional BMPs include stormwater management ponds (detention/retention), erosion and sediment control measures, and the often-overlooked maintenance requirements.

Detention and Retention Ponds

The usage of detention and retention stormwater systems is the forged standard among all jurisdictions and is a direct method to facilitate the mitigation of impacts experienced due to the construction of new developments and impervious infrastructure. Detention ponds are a highly effective method for the control of stormwater discharge rates as this method restricts flow rates to mimic existing conditions prior to development. Although the detention method addresses flow rates, it fails to mitigate the impacts from additional stormwater volume and can result in adverse downstream effects and elongated discharge times. Retention ponds on the other hand are a methodology that retains stormwater onsite and mitigates the stormwater volumes through infiltration and evapotranspiration. The impacts from the development are minimal and can result in a reduction in downstream stormwater flows.

Infiltration Basins

Infiltration basins are similar in nature to retention ponds but incorporate a discharge feature allowing for the discharge of predeveloped stormwater volumes and infiltration of excess stormwater volumes. These types of stormwater management systems utilize the best of both the retention and detention pond systems but typically require excessive development areas to adequately function during heightened stormwater event seasons.

Maintenance and Inspection Programs

Maintenance and Inspection is the final and most prolific phase of all management systems. Regular inspections will ensure existing systems are functioning properly and routine maintenance items addressed in a timelier manner to reduce maintenance costs and/or prevent further damage. Once the inspection process has identified the need for maintenance, the quick and decisive implementation of maintenance activities should be the focus of the development or authority having jurisdiction over the infrastructure. A schedule should be developed which outlines timetables and/or frequencies for required inspections, thresholds for conducting ongoing maintenance regimes, and identify the authority who shall be responsible for such maintenance.

6. Potential Stormwater Projects

A map showing the location of the proposed projects is provided in Appendix B. Projects were prioritized by identifying improvements needed at the downstream end and progressing upstream to the top of the basin. Therefore, improvements to the Michigan Ave regional detention pond are a top priority with several additional collection and conveyance projects that will be connected to the Michigan Ave closed drainage system proposed that will increase the runoff and storage requirements of the pond.

It should be noted that projects 1.1 through 1.7 were included in the proposed model. Further analysis can be performed to see the impacts of a single project, if desired.

6.1 Priority 1 Projects

E. Michigan Ave Detention Pond Improvements (Priority 1.1)

The existing detention pond located at the end of Michigan Avenue serves as a regional stormwater attenuation facility that was initially designed to store a 50-yr storm and attenuate a 100-yr storm without overtopping. As the characteristics of the Beulah Heights area change with development and additional runoff volumes are routed to the pond, the capacity of the existing pond will need to be increased to maintain the same design requirements. Deferred maintenance will need to be performed on the pond to remove sediment accumulation and increase functionality. Modifications to the outfall will also be needed to increase the pond's ability to attenuate large storm events. These modifications can be achieved in multiple ways that need further analysis and design to determine the most effective solution.

The results from the existing model show that the pond overtops its bank during a 100-year storm event. However, with modifications to the outfall structure, the pond appears to be sized large enough contain a 100-year storm with up to 1' of free board remaining.

The proposed improvement options to the existing facility would include the following:

- Dredge existing pond to restore full capacity and increase functionality.
- Install sediment forebay at pond inlet to reduce maintenance and improve water quality.
- Modify Doc McDuffie Rd. discharge structure to improve functionality and prevent blockages.
- Modify outlet structure to increase storage capacity.
    - Option 1 – Lower existing pond outfall pipe to allow for increased storage capacity.
    - Option 2 – Maintain existing pond outfall pipe and install an additional, smaller outfall pipe at a lower elevation to allow for increased storage capacity.
    - Option 3 – Assess the feasibility of an automated outlet structure to maximize the capacity of the pond and minimize downstream impacts.

Estimated Project Cost = $500,000 – 750,000

Please note, if the outfall pipe is lowered, the final analysis and design of any pond modifications should include an evaluation of the feasibility to expand the pond to ensure detention volumes needed for a 50-yr storm can be maintained or if variations from this design requirement will be needed.

S Maple Street at E Bullard Ave Improvements (Priority 1.2)
Currently, the area south of E Bullard Ave drains through low-lying areas between S Pecan St and S Maple St to an undersized crossing on S Maple Street. Additional improvements should be made to capture and rout this runoff to the regional detention pond. The existing cross drain on Maple Street can remain in place, providing a secondary outfall for this area should the regional detention pond overtop during single extreme or repetitive major rainfall events.

The proposed project provides additional stormwater infrastructure to facilitate positive drainage from the area adjacent to S Maple St and includes the following:

- Install a new closed drainage trunk line extending from the existing trunk line on Michigan Ave up S Maple St right-of-way north to E Bullard Ave.
- Install storm drainage inlets and ditching to collect stormwater.

Estimated Project Cost: $450,000 – 650,000

E Bullard Ave Improvements (Priority 1.3)
These improvements follow priority 1.1 and 1.2 projects, and allow for a more defined flow path between S Pecan St and S Maple St, improving drainage along E Bullard Ave and providing an alternate flow path for the excess runoff from S Maple St.

The proposed project will facilitate stormwater conveyance along E Bullard Ave and includes the following:

- Install adequate roadside ditches.
- Install driveway culverts.
- Install drainage inlets as necessary.

Estimated Project Cost: $250,000 – 350,000

S Pecan St Inlet Modifications (Priority 1.4)
This project was not included in the model but is based upon local knowledge of flooding of this street during large rain events. S Pecan St improvements were previously included as a part of the Michigan Ave drainage system, but the existing storm drainage inlets routinely experience clogging.

The proposed project is to modify the existing inlets by changing their location and grate type and will include the following:

- Relocate existing grate inlets outside of existing sidewalk.
- Replace existing grates with open throat weir inlets to reduce debris clogging.
- Lower inlet elevation to increase stormwater collection.
- Re-grade roadside ditches.

Estimated Project Cost: $125,000 – 200,000

E Jefferson Ave/Pilgrim St Improvements (Priority 1.5)
E Jefferson Ave and Pilgrim St lack adequate stormwater conveyance needed to alleviate flooding of private properties. Modeling indicates local flooding exceeds 6" during a 50-year storm event and 1.2' during a 100-year storm event.

The proposed project will provide a conveyance system to greatly reduce the flooding conditions and will include the following:

- Install an extension of the existing drainage system from S Pecan Ave to E Jefferson Ave.
- Install adequate roadside ditches and pipes along E Jefferson Ave.
- Improve existing ditches along Pilgrim St and upgrade existing culverts at Azelea Ave to provide additional drainage capacity in the ditches that drain north to the concrete lined ditch north of Franklin Ave

Estimated Project Cost: $400,000 – 575,000

Beulah Heights Cemetery Drainage Improvements (Priority 1.6)
The Beulah Heights Cemetery has experienced repeated flooding which has resulted in unfavorable conditions and limited availability for burials. Modeling indicates local flooding exceeds 1' during a 50-year storm.

The proposed project will greatly reduce the flooding and includes the following:

- Install storm drainage pipe extension from the existing Michigan Ave drainage trunk along the unopened right-of-way for Pilgrim St.
- Install storm drainage ditches to intercept and redirect stormwater flow upstream of the existing cemetery.

Estimated Project Cost: $65,000 – 100,000

S Maple St/ E Jackson St Improvements (Priority 1.7)
S Maple St and E Jackson Ave lack adequate stormwater conveyance. The existing model shows E Maple St potentially overtopping during 50- and 100-year storm events. The area is too low to connect to the Michigan Ave detention pond and the development of a new outfall to Wolf Creek is needed to provide additional runoff conveyance needed to mitigate flooding.

The proposed project will provide a new conveyance system to significantly reduce flooding conditions and includes the following:

- Install and improve roadside ditches and driveway culverts along S Maple St.
- Install storm drainage culvert crossing at E Jackson St.
- Install roadside ditch along E Jackson St to Wolf Creek.
- NOTE: Construction of the project requires acquisition of right-of-way or easements to accommodate the outfall.

Estimated Project Cost: $400,000 – 575,000

S Maple St and E Azalea Ave Improvements (Priority 1.8)
S Maple St and E Azelea Ave contain inadequate stormwater conveyance. The proposed project will provide an improved conveyance system to reduce flooding conditions and includes the following:

- Improve roadside ditches and driveway culverts along S Maple St.
- Improve roadside ditches and driveway culverts along E Azalea Ave west of S Pecan St.
- Remove and replace the existing inlet and culvert crossing at the intersection of S Maple St and E Azelea Ave.
- Provide water quality treatment at new outfall.

Estimated Project Cost: $500,000 – 750,000

Concrete Ditch Maintenance Program (Priority 1.9)
This project was not included in the model but is recommended to be incorporated into the City's drainage maintenance plan. The existing concrete lined ditch which extends from S Cypress St east to Wolf Creek has adequate capacity as constructed, but experiences diminished capacity due to accumulated sediment and overgrown vegetation in the channel.

An ongoing maintenance program is recommended to assure functionality and consists of the following items:

- Monthly or quarterly inspections of the channel to assess condition and need for maintenance.
- Removal of accumulated debris and sediment.
- Removal of overgrown vegetation which threatens the functionality of the channel.
- Replacement or repair of existing fencing to provide safety.

Estimated Yearly Project Cost: $10,000 – 25,000

6.2 Priority 2 Projects

S Pecan St and E Verbena Ave Improvements
S Pecan St and E Verbena Ave lack adequate stormwater conveyance. The proposed project will provide a conveyance system to reduce flooding and includes the following:

- Improve roadside ditches and driveway culverts along S Pecan St from E Azalea Ave to Wolf Creek.
- Improve or install roadside ditches and driveway culvert along E Verbena Ave.

Estimated Project Cost: $200,000 – 300,000

6.3 Priority 3 Projects

S Stuart St Drainage Relocation

The existing storm drainage culvert crossing at S Stuart St south of E Myrtle Ave discharges onto private property and poses a flooding risk to several upstream and downstream residences. The proposed project includes the following:

- Replace the current open ditch with a closed drainage system and redirects stormwater underground north to E Myrtle Ave, then east along E Myrtle Ave and up to Orange Ct to a new outfall that discharges into Wolf Creek.
- Provide additional inlets and piping along the system to collect stormwater adjacent to the main project.
- NOTE: Construction of the project requires acquisition of right-of-way or easements to accommodate the outfall

Estimated Project Cost: 1,500,000 – 2,200,000

7. Pathogen Reduction Projects

Aging and improperly installed or maintained septic systems are prone to leaking and contribute to the presence of pathogens within the watershed. As these pathogens pose a risk to both surface and ground water, the elimination of these pathogens will promote a healthier community.

7.1 Septic System Rehabilitation & Sewer Connection Program

The City of Foley is in the process of creating and implementing a Septic System Rehabilitation and Connection Program. The goal of the program is to reduce the potential health and environmental impacts due to failing septic systems within the watersheds of Foley.

The program will provide financial assistance to eligible residential property owners for the following situations:

1. Septic system may be rehabilitated through pump outs or field line replacement if no viable public sewer connection.
2. Septic system will be converted to a public sewer service if viable gravity connection.

A copy of the proposed plan and application package is provided in Appendix D.

8. Funding Alternatives

Significant and reliable funding will be necessary to execute the management measures proposed within this Stormwater Management Plan. Implementation will require stakeholder and community support through coordination and a variety of financial resources. It is recommended that a combination of funding sources be pursued ranging from federal, state, and local funding, and creating public-private partnerships. Examples of partnerships include arrangements between landowners and governments or collaboration between civic groups and government. Both public and private entities should explore financial assistance opportunities such as grants and cooperative agreements. Potential teaming partners are listed below:

Alabama Coastal Foundation	Baldwin County-Alabama Cooperative Extension
Alabama Department of Conservation and Natural Resources	Baldwin County Commission
Alabama Department of Economic and Community Affairs	Baldwin County Health Department
Alabama Department of Environmental Management	Mississippi-Alabama SeaGrant Consortium
Alabama Department of Public Health	Mobile Bay National Estuary Program
Alabama Department of Transportation	National Fish and Wildlife Foundation
Alabama Forest Resources Center	Riviera Utilities
Alabama Forestry Commission	South Alabama Regional Planning Council
Alabama Power Company	US Army Corps of Engineers
Alabama Water Watch	US Environmental Protection Agency

Table 4 Potential Funding Partners

8.1 Financial Strategies

Numerous funding sources are available to assist in the execution of this stormwater management plan. The following sections detail the possible sources and opportunities available for each source.

Federal Funding Programs

Federal funding opportunities, such as grants, revenue sharing, and loans, can be pursued through United States Environmental Protection Agency (USEPA), National Oceanic and Atmospheric Administration (NOAA), United States Fish and Wildlife Services (USFWS), United States Geological Survey (USGS), United State Army Corps of Engineers (USACE), and the United States Department of Agriculture (USDA). These funding opportunities can be used by public and private entities to execute the measures proposed in the Stormwater Management Plan. Funding opportunities can be located and applied for through the federal portal at Grants.gov.

State Funding Programs

The Alabama Coastal Area Management Program (ACAMP) was approved by NOAA in 1979 as part of the National Coastal Zone Management Program. Its purpose is to balance economic growth with the need for preservation of Alabama's coastal resources for future generations. Annual program activities include coastal cleanup, implementation of public access construction projects, planning support for local

governments, and providing funds to Alabama's coastal communities and partners. ACAMP's annual grant program supports projects that protect, enhance, and improve the management of natural, cultural, and historical coastal resources and that increase the sustainability, resiliency and preparedness of coastal communities and economies. Therefore, ACAMP should be considered as a top financial resource on the state level.

State Revolving Funds

The EPA State Revolving Fund (SRF) loan program offers a reliable source of funding (Berahzer, 2010b). There are separate SRF programs for "Clean Water" and "Drinking Water". Funds are provided annually to each state by the federal government with the states providing a 20% matching amount. To receive funding, a project must be on the state's annual "Intended Use Plan" (IUP) list. The IUP contains a "comprehensive" list and a shorter "fundable" or "priority" list. A public comment process is required for the IUP. Since 2007, the SRF has moved beyond the traditional "water treatment works" projects and has begun to emphasize nonpoint sources and estuary protection as funding priorities. Projects that strengthen compliance with federal and state regulations and enhance protection of public health are eligible for consideration to receive SRF loans. In addition to funding, the costs associated with design and construction inspections are eligible for reimbursement if a project qualifies.

Local Government

The City of Foley is the coordinating municipality within the Buelah Heights Community and will likely be the primary driver in implementing the goals stated in the stormwater management plan and coordinating funding strategies.

Property, Sales, or Other Taxes (General Fund)

The use of public "general funds" to finance the projects outline in Section 6 could be considered viable, as many of the implementation measures would be considered maintenance and construction projects which would serve to benefit the community as growth within the area continues.

Impact Fees

The City of Foley recently adopted an Impact Fee Ordinance. Impact fees are paid by developers (usually at the time of development) to obtain a building permit. The fee is designed to reimburse the government for the additional impact a development may have on the community. They may be for transportation (i.e., increased impact on roads and bridges because of constructing a development), water and sewer (i.e., the impact on the system capacity because of increased volume and demand), as well as other public infrastructure impacts. Typically, a direct relationship between the development and the impact fee must exist. These fees must often be authorized by statute and are used for capital improvements, not for maintenance. New developments are being built in the City of Foley and utilizing impact fees could provide substantial revenue to update and increase infrastructure to support stormwater enhancements.

Regional Collaboration Opportunities

There are regional collaboration opportunities applicable to watershed projects. The EPA Region 4 sponsors four (4): the Green Infrastructure Partnership, Smart Growth Implementation Assistance, and Watershed Protection and Restoration Assistance collaboration opportunities. The fourth collaborative opportunity is through the Gulf of Mexico Alliance (GOMA); a partnership of the states of Alabama, Florida, Louisiana, Mississippi, and Texas.

The primary goal of the Green Infrastructure Partnership is to reduce runoff volumes and sewer overflow

events through the widespread use of green infrastructure management practices that help maintain natural hydrologic functions by absorbing and infiltrating precipitation where it falls. The EPA lists funding opportunities for this program at: https://www.epa.gov/green-infrastructure/green-infrastructure-funding-opportunities.

The Smart Growth Implementation Assistance program is an annual, competitive solicitation open to state, local, regional, and tribal governments (and non-profit organizations that have partnered with a governmental entity) to incorporate smart growth techniques into their future developments. Program opportunities are listed at: https://www.epa.gov/smartgrowth/epa-smart-growth-grants-and-other-funding.

Through the Watershed Protection and Restoration Assistance Partnership, the staff of EPA Region 4 works with state and local governments and watershed organizations to facilitate protection and restoration efforts in targeted watersheds. Funding opportunities for this program are listed at: https://www.epa.gov/nps/funding-resources-watershed-protection-and-restoration.

The goal of GOMA is to significantly increase regional collaboration to enhance the ecological and economic health of the Gulf of Mexico. Priority issues for this group include water quality, habitat conservation and restoration, ecosystem integration and assessment, nutrients and nutrient impacts, coastal community resilience, and environmental education. GOMA lists funding opportunities are listed at: https://gulfofmexicoalliance.org/announcements/funding/.

8.1 Summary

The table below provides an overview of potential financial resources that could support the implementation of the measures proposed in the Stormwater Management Plan. The table addresses the type of funding as well as the form of aid provided. Almost all sources provide financial assistance, and some provide technical assistance as well. Examples of technical assistance include sharing information, sharing data, consulting, training, assisting with management measures, and engaging in project partnerships. These funding opportunities are presented as guidance, and consideration should be given to the reality that the financial section of the economy is continuously evolving. Flexibility will be necessary if existing funds cease, or a new funding source becomes available.

Funding Source	Description	Type	Actions Funded
Alabama Coastal Area Management Program (ACAMP)	Annual Grant Program	State	Financial assistance, water, quality monitoring
Alabama Department of Conservation and Natural Resources (ADCNR)	Alabama Coastal Area Management Program	Federal	Technical assistance, financial assistance
Alabama Department of Environmental	Section 319 Grant Funds	State	Financial assistance, water, quality monitoring

Funding Source	Description	Type	Actions Funded
Management (ADEM)	Clean Water SRF		
Department of the Interior (DOI)	Land and Water Conservation Fund (LWCF)	Federal	Financial assistance
Federal Emergency Management Agency (FEMA)	Building Resilience Infrastructure and Communities (BRIC)	Federal	Financial assistance
Gulf of Mexico Alliance (GOMA)	Gulf Star Grants Program	Private-public partnership	Information and education, financial assistance, water quality monitoring
Gulf Research Program	Gulf Sea Level Variation and Rise Grants	Private	Financial assistance
	Thriving Communities Grants	Private	Financial assistance
National Environmental Education Foundation	Everyday Capacity Building Grants	Private	Financial assistance, information and education
National Fish and Wildlife Foundation (NFWF)	Conservation Partners Program	Private	Technical assistance, information, and education
	Gulf Environmental Benefit Fund (GEBF)	Private	Financial assistance
	Five Star & Urban Waters Restoration Program	Private	Financial assistance, information and education, water quality monitoring
	Gulf Coast Conservation Grant Program	Private	Financial assistance

Funding Source	Description	Type	Actions Funded
	Marine Debris Prevention, Education and Outreach Partnership Grant	Federal	Financial assistance, information, and education
National Oceanic and Atmospheric Administration (NOAA)	Gulf of Mexico Bay-Watershed Education and Training (B-WET) Program	Federal	Financial assistance, information, and education
	Community-based Restoration Program	Federal	Financial assistance, technical assistance
The Home Depot	Community Impact Grants Program	Private	Financial assistance
U.S. Department of Agriculture, Natural Resource Conservation Service (USDA, NRCS)	Environmental Quality Incentives Program	Federal	Financial assistance, technical assistance, water quality monitoring
U.S. Environmental Protection Agency (USEPA)	106 Grant Funds (Water Pollution Control)	Federal	Financial assistance, water quality monitoring
	Clean Water State Revolving Funds	Federal	Financial assistance, technical assistance
	Urban Waters Small Grants	Federal	Technical assistance, water quality monitoring
	Gulf of Mexico Division	Federal	Financial assistance, technical assistance
U.S. Geological Survey (USGS)	State Water Research Act Program	Federal	Financial assistance, technical assistance
	Cooperative Matching Funds Program	Federal	Financial Assistance

9. Conclusion

The Beulah Heights community was developed prior to modern stormwater regulations and will continue to experience flooding issues during major storm improvements until improvements are made. Public comments solicited during multiple public engagement meetings pointed to specific stormwater issues within the community, and an inventory of existing major drainage infrastructure followed by regional stormwater modeling and analysis confirm the occurrence of substantial flooding areas during large storm events. The community resilience to storm events will be greatly improved with the implementation of priority stormwater management projects that aim to address and alleviate such flooding.

Continued collaboration with community partners and further analysis and design will be needed to finalize and implement plans for each of the priority projects outlined in this plan. Much of the community lacks adequate stormwater conveyance systems, but benefits from the presence of a regional detention pond that can be expanded to accommodate additional storage from the Beulah Heights community. Improvements to the regional detention pond will be required prior to implementing new conveyance systems proposed on S Maple St, E Bullard Ave, S Pecan St, Pilgrim St, and E Jefferson St.

Additional outfalls to Wolf Creek will be needed to alleviate flooding in areas too low to connect to the regional detention pond. These outfalls can be located at the end of E Jackson St, E Azalea Ave, and possibly Orange Ct. Construction of these outfalls will require acquisition of right-of way or easements and will require additional community engagement to complete such projects. If these easements can be acquired, improvements to existing conveyance systems on S Maple St, E Azalea St, S Pecan St and E Verbana St can be made to improve runoff and alleviate flooding in residential areas.

Finally, until new projects can be implemented, there are many roadside pipes and ditches located along public rights-of-way that can be cleaned and/or re-graded to encourage positive drainage in areas where existing drainage conveyances are failing due to their age and condition.

Appendix A

Public Outreach

thompson
ENGINEERING

Meeting Minutes

July 20, 2023 -- 5:30-7:30pm

ATTENDEES

Leslie Gahagan, City of Foley
Charles Weber, Thompson Engineering
Frank Leatherwood, Thompson Engineering
Eric Jackson, Thompson Engineering
Suzanne Sweetser, Thompson Engineering
Kelly Rosson, Thompson Engineering
Aubrey Bianco, DCNR
Members of the Beulah Heights Community

LOCATION:

Foley Civic Center
Council Chambers
407 E Laurel Ave
Foley, AL

BEULAH HEIGHTS PUBLIC MEETING

PRESENTATION

Comments that came from the presentation.

1. Chestnut Ave is a flooding location.
2. Some of the low-lying properties may have trouble connecting to sewer without a pump to get sewer uphill to the main
3. Pecan ST lagoon: How does the lagoon play into this program. Has the lagoon been cleaned out? “Yes”
4. How does Riviera’s sewer cesspool fit into this plan?
    a. James Wallace (Riviera): Riviera has cleaned out this lagoon and all sludge should be removed now. This lagoon is no longer used for treatment and should only be used to catch overflows from flooding.
5. The ditch that moves east/west need maintenance
6. Cemetery had casket being unearthed in the severe flooding event. Also, burials can only take place in dryer times.

7. Calvin Hare: Ashland subdivision on Verbena need to address the drainage, check culverts. The culvert size needs to be addressed with larger. Culverts at Verbena may by undersized and causing flooding on Verbena, Ashland Subdivision, and Pena over to the sewer lagoon.
    a. (Note: Where does flooding overtop the road?)
8. The apartments behind Summerfield have a detention pond that fills up and spills into a ditch that still needs to be upgraded.
9. Why is the ditch along Pilgrim so deep? It does not drain fully and there is very little water in it.
10. Jimmy Stansel at 1020 E Bullard has flooding on his entire south yard back toward Maple. Has been complaining for years and nothing has been done.
11. Louis Dinkins at 905 Pecan (?) streets have inadequate ditches and flooding fills up the yard.
12. Louis Dinkins at 905 Pecan (?) is on septic but wants to connect to Riviera sewer. Wants to know more about the grant program and if Riviera sewer is available to him.
13. We have real concerns about the cemetery flooding and groundwater issues that keep funerals homes from being able to bury people in a timely manner.
14. Maps and comment cards were taken to be placed at the two churches.

We gave maps and comment cards to Dorothy Chapman to take to her pastor, Rev. Bennie Richardson, at Morning Star Baptist Church. His number is 251-458-1810. We need to call him to make sure he received the map and cards and ask him what he needs from us to help communicate what we are doing to his members. 801 E Jefferson Ave, Foley, AL 36535 · ~(251) 943-4919

I also learned that the pastor of New Hope Pentecostal Holiness Church is Riley Houston, but I don't have contact information. 1013 E Michigan Ave, Foley, AL 36535 ~ (251) 943-4925, newhopephc93@gmail.com. Kelly sent an email to the Pastor about the map.

COMMENT CARDS

1. **Sylvia Bullard, 251-550-7519, 921 E. Azalea Ave:**

   I am a resident my concern is regarding not having a culvert at all. When it rains water is stagnated I the yard. Rainwater has also washed away the adjacent right of way, which caused my driveway to crack and buckle. My question is can a culvert be put in or some type in drainage system be put in between my property and the right of way which belongs to the city?
2. **Louis Dinkins, 251-504-9235, 905 S Pecan St:**

   Septic tank, inadequate drainage east side of Pecan
3. **Charles McBride, 251-752-3030, 1016 E. Bullard**

   Need Sewer Connection
4. **Donsell H Harris 251-458-7011, 805 S Pecan St, carruemrs@yahoo.com**

   Street is higher than the yard rain run off to the yard looks like a river.

5. Franklin Ave water excess during stormy weather, ditch running east and west needs fencing and cleaning.
6. **Golden Means, 251-677-9643, 1115 E Bullard lot 2, goldenandsunshine@yahoo.com**

   The problem having is storm water from an adjacent roadway draining onto property. Dirt road drainage an issue.

Sign In / Iniciar sesión

Beulah Height Stormwater Study / Estudio de aguas pluviales de Beulah Height

Public Meeting / Reunión pública

Thursday, July 20, 2023 ~ 5:30-7:30 pm.

City Hall

Foley, Alabama

	Name / Nombre	Email / Correo Electrónico	Phone Number / Número
1	Vera J. Quaites	Veraquaites@gmail.com	251-979-9628
2	Bessie J. Williams		251-979-9628
3	Charles Weber	cweber@thompsonengineering.com	251-752-2073
4	Kelly Rosson	Krosson@thompsonengineering.com	720 935 5815
5	Anne Smith		251 504-4538
6	Bobbie Heard	NO --	251-312-5233
7	Charles McBride	-	251-752-3030
8	Hubert Heard		943-2927
9	Golden means	goldenandsunshine@yahoo.com	251 677-9643
10	Dorothy Chapman	Dorothy Chapman	251-978 5814
11	Jimmy Stowell	JWallace@rivierautilities.com	251-215-1733
12	[illegible]		
13	Calvin Haze	haze.calvin@yahoo.com	
14	Loretta Marshall Chaffer	LMarshJohn@gmail.com	678 6468787
15	Louis Dinkins	LouisDinkins925@gmail	251-504-9235
16	Renetta McGowin	14184 Page Ln Foley, AL	251-233-0231

Sign In / Iniciar sesión

Beulah Height Stormwater Study / Estudio de aguas pluviales de Beulah Height

Public Meeting / Reunión pública

Thursday, July 20, 2023 ~ 5:30-7:30 pm.

City Hall

Foley, Alabama

	Name / Nombre	Email / Correo Electrónico	Phone Number / Número
1	Michael McGowin	McGowinr@hotmail.com	251-233-0232
2	Aubrey Bianco	aubrey.bianco@dcnr.alabama.gov	—
3	Linda Hare		251-233-7664
4	Shemica Brown	mobile bay nep	
5	Bessie Daniel	redbeeldaniels@gmail.com	251.978.7907
6	[illegible]	Holthollidays llc@yahoo.com	251-223-9438
7	Keiko [illegible]		
8	Denise Dixon		
9	Donsell H. Harris	Carriemrs@yahoo.com	
10			
11			
12			
13			
14			
15			
16			

thompson
ENGINEERING

Meeting Minutes

August 31, 2023 -- 5:00-7:00pm

ATTENDEES

Leslie Gahagan, City of Foley
Charles Weber, Thompson Engineering
Eric Jackson, Thompson Engineering
Donovan Duffy, Meyer Engineering + Architects
Kelly Rosson, Thompson Engineering
Members of the Beulah Heights Community

LOCATION:

Foley Civic Center
Civic Center
407 E Laurel Ave
Foley, AL

BEULAH HEIGHTS PUBLIC MEETING

PRESENTATION

Comments that came from the presentation.

1. Are the new subdivision on Michigan Ave discharge to the Michigan Ave storm sewer
2. McGowin was concerned about the Maple St and Bullard St project proposal. He thought the water would not have anywhere to go.
3. Issues with Artwood Drive having tiny sheds as houses and no septic tanks.
4. Calvin Hare wanted someone to look at property east of Doc McDuffie segment for drainage directly east to Wolf Creek.
5. Ms. Annie Means wanted her driveway culvert repaired where it had collapsed due to previous storms.
6. Can something be done to help the church from flooding
7. Are the pipes large enough on Michigan Ave
8. Pipes on Pecan St aren't large enough
9. Can we run a ditch to Wolf Creek, Baldwin County parcels east of the Michigan pond

Sign In / Iniciar sesión

Beulah Height Stormwater Study / Estudio de aguas pluviales de Beulah Height

Public Meeting / Reunión pública

Thursday, August 31, 2023 ~ 5:00-7:00 pm.

Civic Center

Foley, Alabama

	Name / Nombre	Email / Correo Electrónico	Phone Number / Número
31	Annie Smith	foley.smith39@gmail.com	251 504 4938
32	Mike McGowan	mm@hotmail.com	251-253-0282
33	Jimmy STANSEL	BETTY STANSEL@MI-DC	251-215-1733
34	Vera J. Quarles	VQuarles@cityoffoley.org	251-979-9628
35	Calvin Hare		
36	Linda Hare		251-233-7664
37	Wayne Priest		
38	BOOKER HEARD	NO E-MAIL	251. 217. 5233
39			
40			
41			
42			
43			
44			

BEULAH HEIGHTS STORMWATER MANAGEMENT PLAN PUBLIC MEETING

Date: August 31, 2023
Time: 5:00 PM
Location: Foley Civic Center

Objectives:

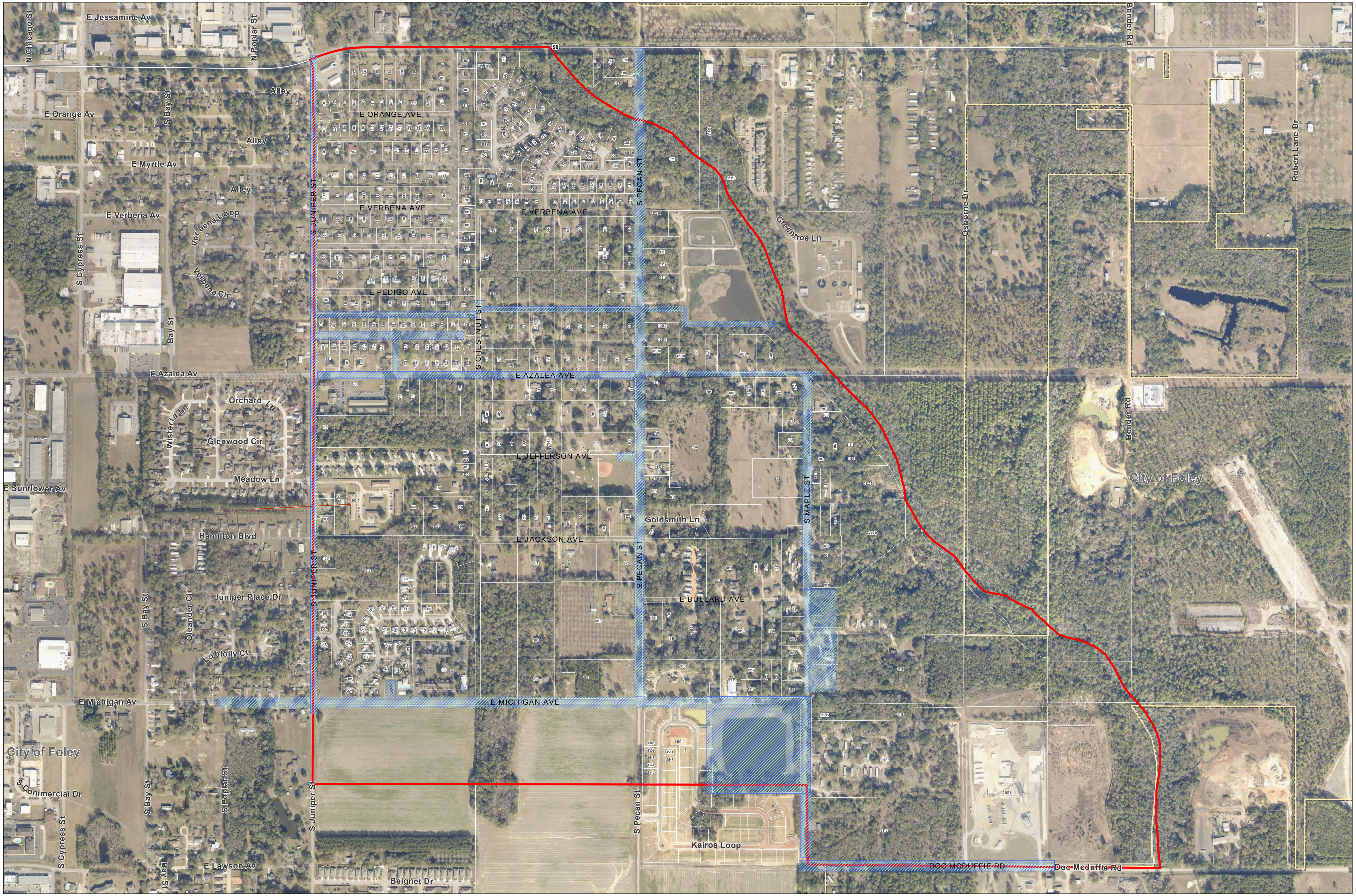
- Review study area and complaints
- Review critical issues with stormwater and sewer
- Review critical issues and inventory of existing drainage
- Review storm water analysis and recommended improvements
- Review Septic System Rehabilitation and Sewer Connection Program

Agenda

- Welcome and Introductions: Leslie Gahagan (City of Foley)
- Presentation: Thompson Engineering and City of Foley
- Group Activity/Maps: All

Appendix B

Maps



P:\2023\Projects\1120\23-1120-0009 Beulah Hts Stormwater Mgmt Plan\Working\Civil\Drawings\KR MXD\BEULAH HEIGHTS SURVEY AREA.mxd

thompson ENGINEERING

CITY OF FOLEY
BEULAH HEIGHTS STORMWATER
MANAGEMENT PLAN
CITY OF FOLEY, BALDWIN COUNTY, ALABAMA

LEGEND

- Beulah Heights Study Area (671 AC)
- Beulah Heights Area Parcels*
- City Limits (Feb. 2023)
- Survey Areas

N W E S

500 0 500 Feet

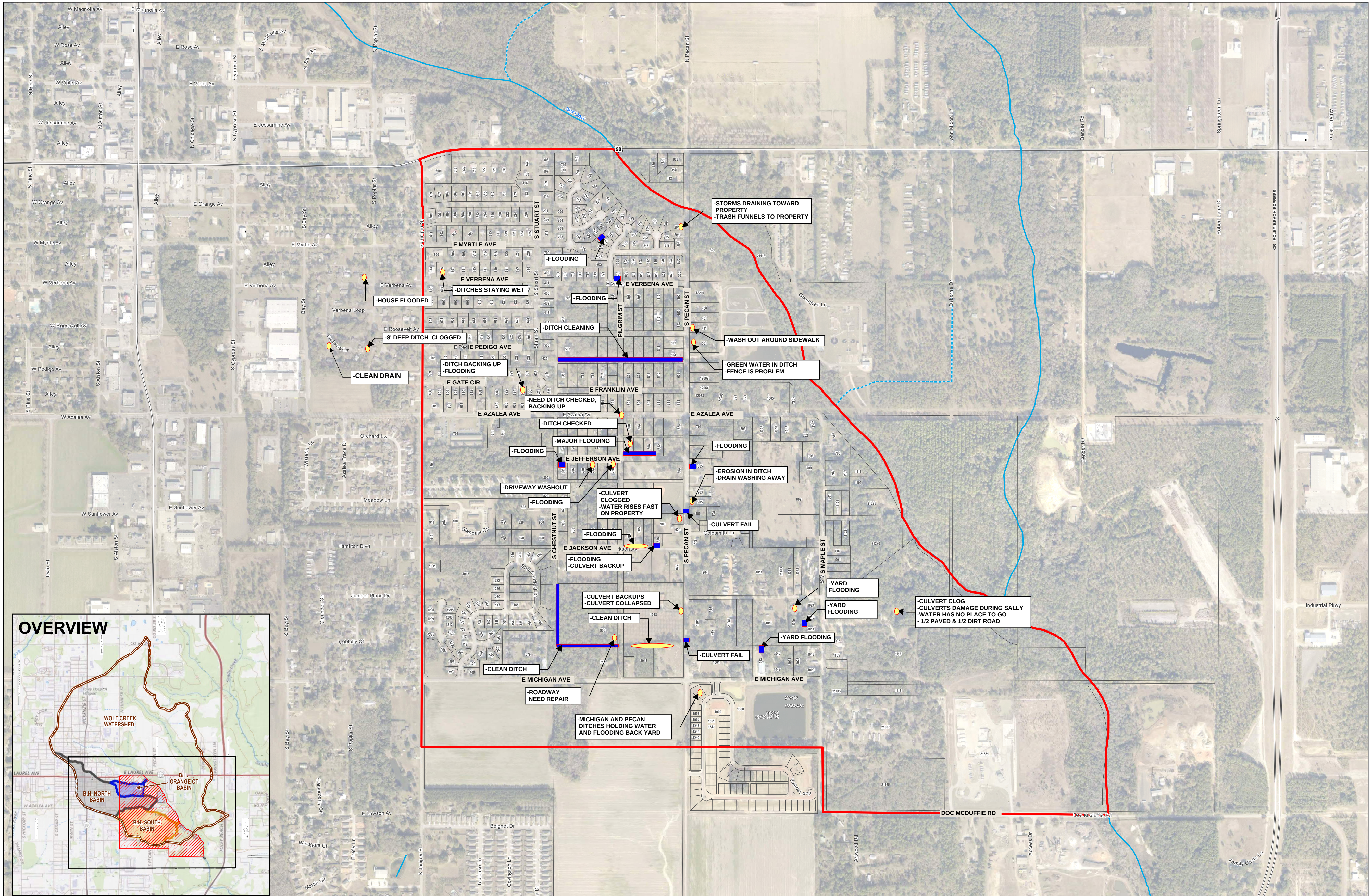
BEULAH HEIGHTS SURVEY AREAS

PROJECT NO.: 23-1120-0009

DATE: AUGUST 2023

DATA SOURCES:
USGS National Hydrography Dataset (NHD)
FEMA NFHL - Effective Product 20221111
Baldwin County 2017, 2018 Imagery, 1 Ft. Resolution
*Baldwin County 2019 Parcels
USGS StreamStats Basin Delineations
City of Foley GIS Data

Date 8/30/2023 /


-STORMS DRAINING TOWARD PROPERTY
-TRASH FUNNELS TO PROPERTY
-FLOODING
-FLOODING
-HOUSE FLOODED
-DITCHES STAYING WET
-DITCH CLEANING
-WASH OUT AROUND SIDEWALK
-8' DEEP DITCH CLOGGED
-CLEAN DRAIN
-DITCH BACKING UP
-FLOODING
-GREEN WATER IN DITCH
-FENCE IS PROBLEM
-NEED DITCH CHECKED, BACKING UP
-DITCH CHECKED
-MAJOR FLOODING
-FLOODING
-FLOODING
-EROSION IN DITCH
-DRAIN WASHING AWAY
-DRIVEWAY WASHOUT
-FLOODING
-CULVERT CLOGGED
-WATER RISES FAST ON PROPERTY
-CULVERT FAIL
-FLOODING
-FLOODING
-CULVERT BACKUP
-YARD FLOODING
-CULVERT BACKUPS
-CULVERT COLLAPSED
-YARD FLOODING
-CULVERT CLOG
-CULVERTS DAMAGE DURING SALLY
-WATER HAS NO PLACE TO GO
- 1/2 PAVED & 1/2 DIRT ROAD
-CLEAN DITCH
-YARD FLOODING
-CULVERT FAIL
-CLEAN DITCH
-ROADWAY NEED REPAIR
-MICHIGAN AND PECAN DITCHES HOLDING WATER AND FLOODING BACK YARD
E MYRTLE AVE
E VERBENA AVE
E PEDIGO AVE
E GATE CIR
E FRANKLIN AVE
E AZALEA AVE
E JEFFERSON AVE
E JACKSON AVE
E MICHIGAN AVE
DOC MCDUFFIE RD
S STUART ST
PILGRIM ST
S PECAN ST
S CHESTNUT ST
S MAPLE ST
CR. FOLEY-BEACH EXPRESS
OVERVIEW
WOLF CREEK WATERSHED
B.H. NORTH BASIN
B.H. ORANGE CT BASIN
B.H. SOUTH BASIN

P:\2023\Projects\1120\23-1120-0009 Beulah Hts Stormwater Mgmt Plan\Working\Civil\Drawings\KR MXD\MAP1-1.mxd

thompson ENGINEERING

CITY OF FOLEY
BEULAH HEIGHTS STORMWATER MANAGEMENT PLAN
CITY OF FOLEY, BALDWIN COUNTY, ALABAMA

LEGEND

- Beulah Heights Study Area (671 AC)
- Beulah Heights Area Parcels*
- City Calls
- Public Comments

NHDFlowline

- Stream/River - Intermittent
- Stream/River - Perennial

500 0 500 Feet

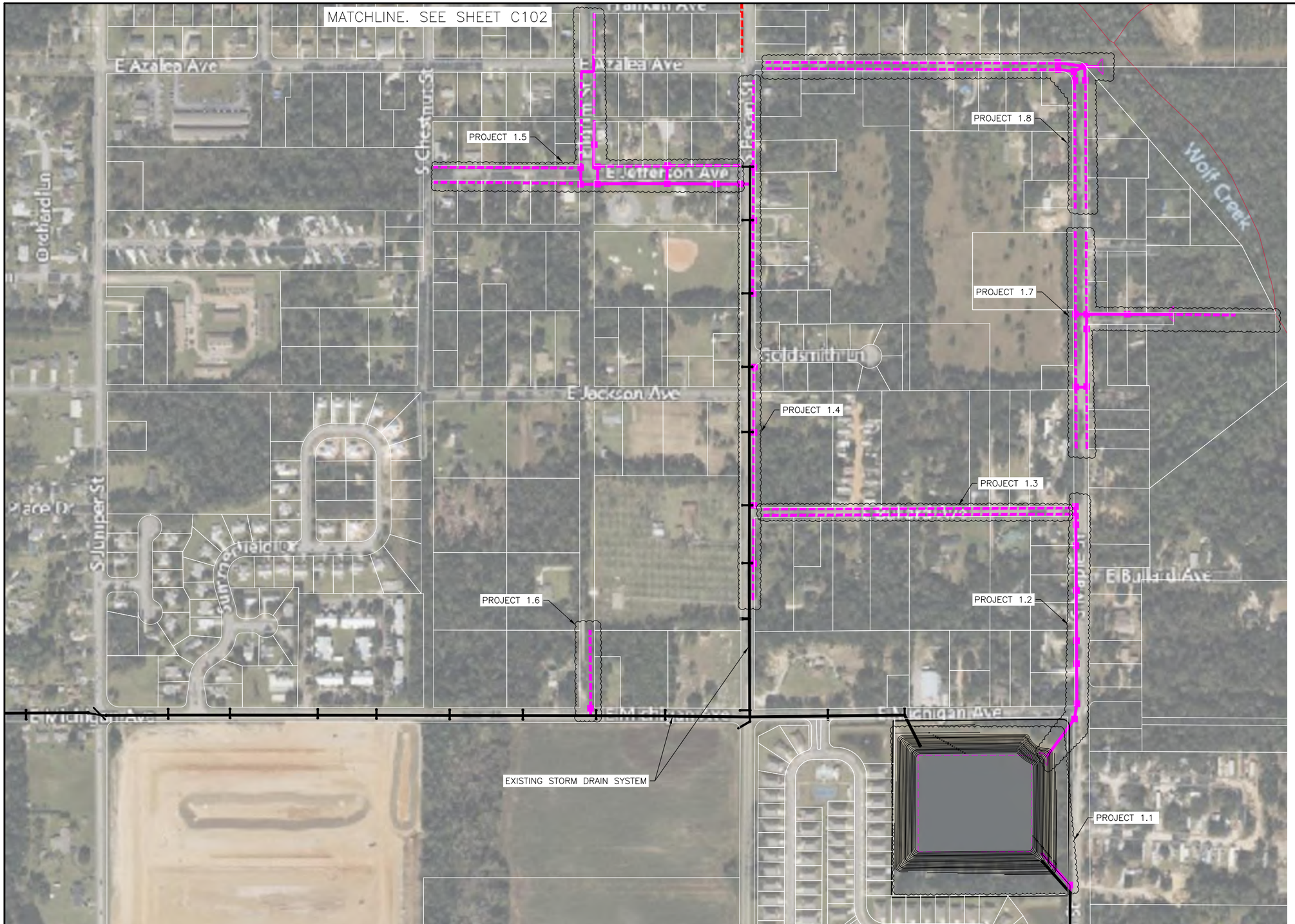
USGS The National Map: National Boundaries Dataset, 3DEP Elevation Program, Geographic Names Information System, National Hydrography Dataset, National Land Cover Database, National Structures Dataset, and National Transportation Dataset; USGS Global Ecosystems; U.S. Census Bureau TIGER/Line data; USFS Road Data; Natural Earth Data; U.S. Department of State Humanitarian Information Unit; and NOAA National Centers for Environmental Information, U.S. Coastal Relief Model. Data refreshed April, 2023.

BEULAH HEIGHTS FLOOD CALLS AND PUBLIC COMMENTS

PROJECT NO.: 23-1120-0009

DATE: AUGUST 2023

Date 8/22/2023 /



LEGEND

PRIORITY 1
- DITCH IMPROVEMENT
- PROPOSED CULVERT
- PROPOSED INLET/JUNCTION BOX

PRIORITY 2
- DITCH IMPROVEMENT
- PROPOSED CULVERT
- PROPOSED INLET/JUNCTION BOX

PRIORITY 3
- PROPOSED CULVERT
- PROPOSED INLET/JUNCTION BOX

1. PRIORITY 1 PROJECTS

1.1. E. MICHIGAN DETENTION POND IMPROVEMENTS
Dredge existing regional detention pond to restore full capacity and functionality. Install sediment forebay and pond inlet for improved maintenance/water quality. Lower pond outfall pipe to allow for increased storage capacity. Modify Doc McDuffie Rd. discharge structure.

1.2. S. MAPLE AT E. BULLARD IMPROVEMENTS
Extend drainage system from existing E. Michigan Detention north along S. Maple St. Right-of-way to E. Bullard Avenue.

1.3. E. BULLARD AVE. IMPROVEMENTS
Improve roadside ditches and driveway culverts.

1.4. S. PECAN INLET MODIFICATIONS
East side of S. Pecan from E. Michigan to E. Azalea. Relocate existing grate inlets outside of existing sidewalk. Replace existing grate inlets with open throat weir inlets to reduce debris clogging, lower inlet elevation and re-grade roadside ditches.

1.5. E JEFFERSON AVE./PILGRIM IMPROVEMENTS
Extend drainage system from S. Pecan Ave along E. Jefferson Ave. Improve roadside ditches and Azalea Ave. culverts north along Pilgrim St. to existing concrete ditch.

1.6. CEMETERY DRAINAGE IMPROVEMENTS
Extend piping and drainage ditch from E. Michigan approximately 300 feet north along Pilgrim St. Right-of-way to intercept stormwater west of the cemetery.

1.7. S. MAPLE / E. JACKSON IMPROVEMENTS
Improve roadside ditches and driveway culverts along S. Maple St. Install crossing at E. Jackson and route roadside ditch to Wolf Creek. Project would require Right-of-way/easement acquisition.

1.8. S. MAPLE / E. AZALEA IMPROVEMENTS
Improve roadside ditches and driveway culverts along S. Maple St. and E. Azalea to S. Pecan St. Replace outfall at S Maple/E. Azalea Avenue. Provide water quality treatment at outfall.

1.9. CONCRETE DITCH MAINTENANCE
Existing east/west concrete ditch to Riviera lagoon: Clean ditch, clear overgrown vegetation and repair fencing.

2. PRIORITY 2 PROJECTS

2.1 PECAN ST./E. VERBENA IMPROVEMENTS
Reconstruct roadside ditches and driveway culverts.

3. PRIORITY 3 PROJECTS

3.1. S. STUART DRAINAGE RELOCATION
Relocate stormwater from S. Stuart crossing to E. Myrle Ave. and Orange Ct.

0 200 400 Feet

REVISION NO.	DESCRIPTION	DATE	BY:

CITY OF FOLEY
FOLEY, ALABAMA

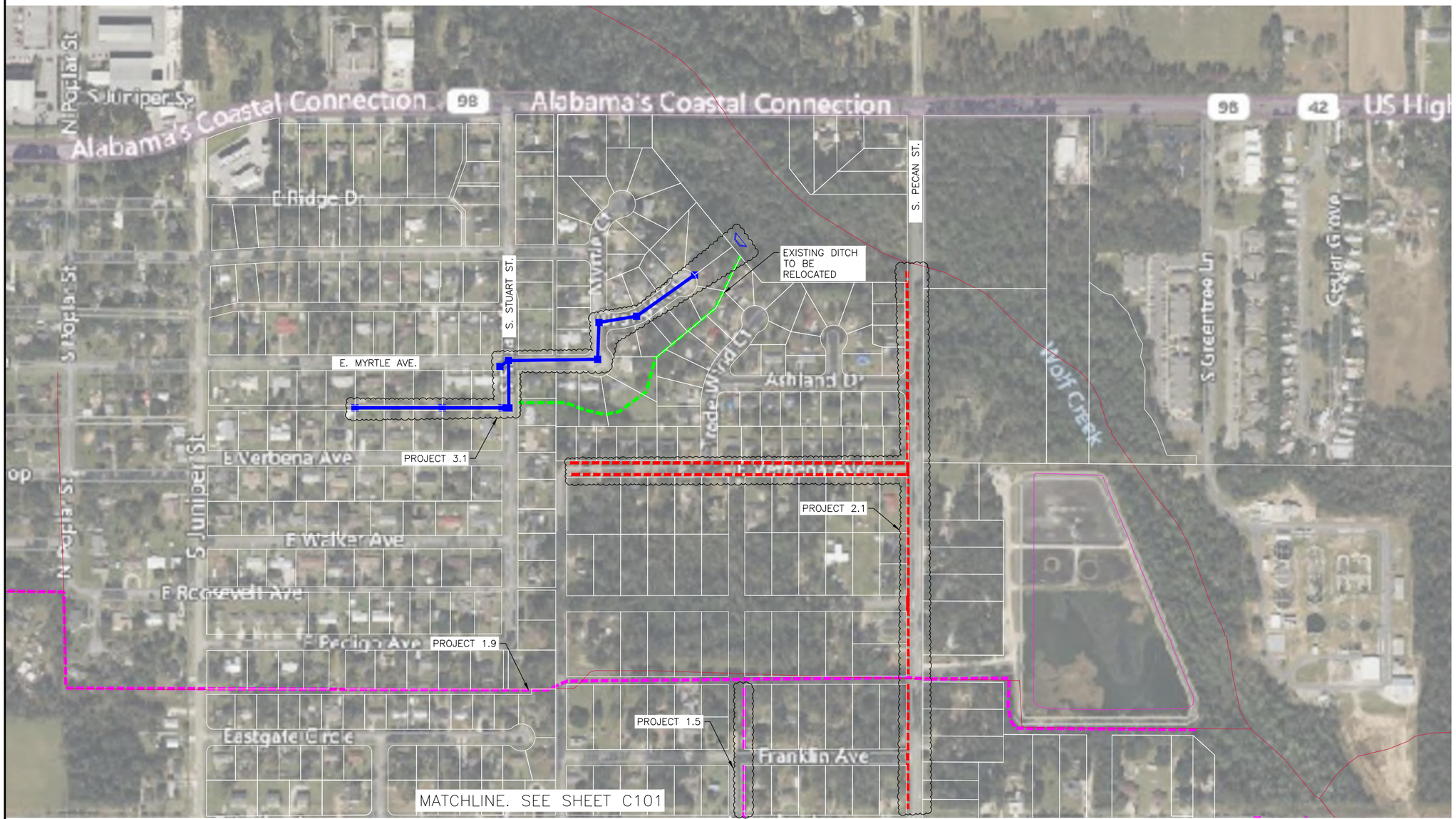
thompson ENGINEERING
4830 MAIN ST., STE. G-212
ORANGE BEACH, ALABAMA 36561
TEL: (251) 666-2443
FAX: (251) 666-6422

SCALE:	PLOT SCALE:	DRAWN BY:	CHECKED BY:	APPROVED BY:
1"=200	1:1	EDJ	EDJ	CDW

BEULAH HEIGHTS STORMWATER MANAGEMENT PLAN

CONCEPTUAL DRAINAGE IMPROVEMENT PLAN

DATE :	JOB NO. :	DRAWING NO.	REVISION NO. :
SEPTEMBER 20, 2023	23-1120-0009	C101	



LEGEND

PRIORITY 1
- DITCH IMPROVEMENT
- PROPOSED CULVERT
- PROPOSED INLET/JUNCTION BOX

PRIORITY 2
- DITCH IMPROVEMENT
- PROPOSED CULVERT
- PROPOSED INLET/JUNCTION BOX

PRIORITY 3
- PROPOSED CULVERT
- PROPOSED INLET/JUNCTION BOX

1. PRIORITY 1 PROJECTS

1.1. E. MICHIGAN DETENTION POND IMPROVEMENTS
Dredge existing regional detention pond to restore full capacity and functionality. Install sediment forebay and pond inlet for improved maintenance/water quality. Lower pond outfall pipe to allow for increased storage capacity. Modify Doc McDuffie Rd. discharge structure.

1.2. S. MAPLE AT E. BULLARD IMPROVEMENTS
Extend drainage system from existing E. Michigan Detention north along S. Maple St. Right-of-way to E. Bullard Avenue.

1.3. E. BULLARD AVE. IMPROVEMENTS
Improve roadside ditches and driveway culverts.

1.4. S. PECAN INLET MODIFICATIONS
East side of S. Pecan from E. Michigan to E. Azalea. Relocate existing grate inlets outside of existing sidewalk. Replace existing grate inlets with open throat weir inlets to reduce debris clogging, lower inlet elevation and re-grade roadside ditches.

1.5. E JEFFERSON AVE./PILGRIM IMPROVEMENTS
Extend drainage system from S. Pecan Ave along E. Jefferson Ave. Improve roadside ditches and Azalea Ave. culverts north along Pilgrim St. to existing concrete ditch.

1.6. CEMETERY DRAINAGE IMPROVEMENTS
Extend piping and drainage ditch from E. Michigan approximately 300 feet north along Pilgrim St. Right-of-way to intercept stormwater west of the cemetery.

1.7. S. MAPLE / E. JACKSON IMPROVEMENTS
Improve roadside ditches and driveway culverts along S. Maple St. Install crossing at E. Jackson and route roadside ditch to Wolf Creek. Project would require Right-of-way/easement acquisition.

1.8. S. MAPLE / E. AZALEA IMPROVEMENTS
Improve roadside ditches and driveway culverts along S. Maple St. and E. Azalea to S. Pecan St. Replace outfall at S Maple/E. Azalea Avenue. Provide water quality treatment at outfall.

1.9. CONCRETE DITCH MAINTENANCE
Existing east/west concrete ditch to Riviera lagoon: Clean ditch, clear overgrown vegetation and repair fencing.

2. PRIORITY 2 PROJECTS

2.1 PECAN ST./E. VERBENA IMPROVEMENTS
Reconstruct roadside ditches and driveway culverts.

3. PRIORITY 3 PROJECTS

3.1. S. STUART DRAINAGE RELOCATION
Relocate stormwater from S. Stuart crossing to E. Myrle Ave. and Orange Ct.

0 200 400 Feet

REVISION NO.	DESCRIPTION	DATE	BY:

CITY OF FOLEY
FOLEY, ALABAMA

thompson ENGINEERING
4830 MAIN ST., STE. G-212
ORANGE BEACH, ALABAMA 36561
TEL: (251) 666-2443
FAX: (251) 666-6422

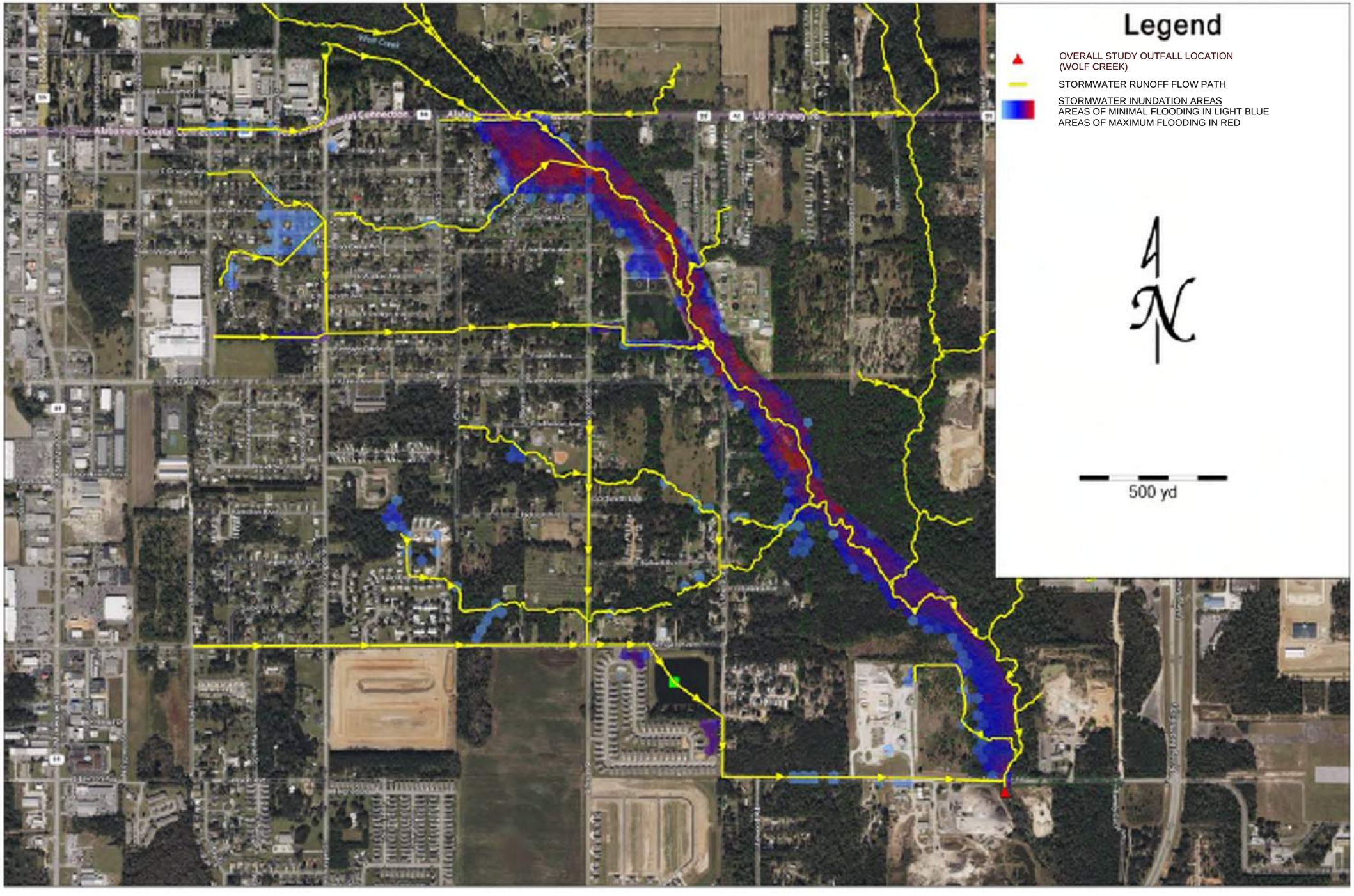
BEULAH HEIGHTS
STORMWATER MANAGEMENT PLAN

CONCEPTUAL DRAINAGE
IMPROVEMENT PLAN

SCALE:	PLOT SCALE:	DRAWN BY:	CHECKED BY:	APPROVED BY:	DATE :	JOB NO. :	DRAWING NO.	REVISION NO. :
1"=200	1:1	EDJ	EDJ	CDW	SEPTEMBER 20, 2023	23-1120-0009	C102	

Appendix C

Stormwater Modeling



REVISION NO.	DESCRIPTION	DATE	BY:
REVISION NO.	DESCRIPTION	DATE	BY:
REVISION NO.	DESCRIPTION	DATE	BY:
REVISION NO.	DESCRIPTION	DATE	BY:
REVISION NO.	DESCRIPTION	DATE	BY:
REVISION NO.	DESCRIPTION	DATE	BY:

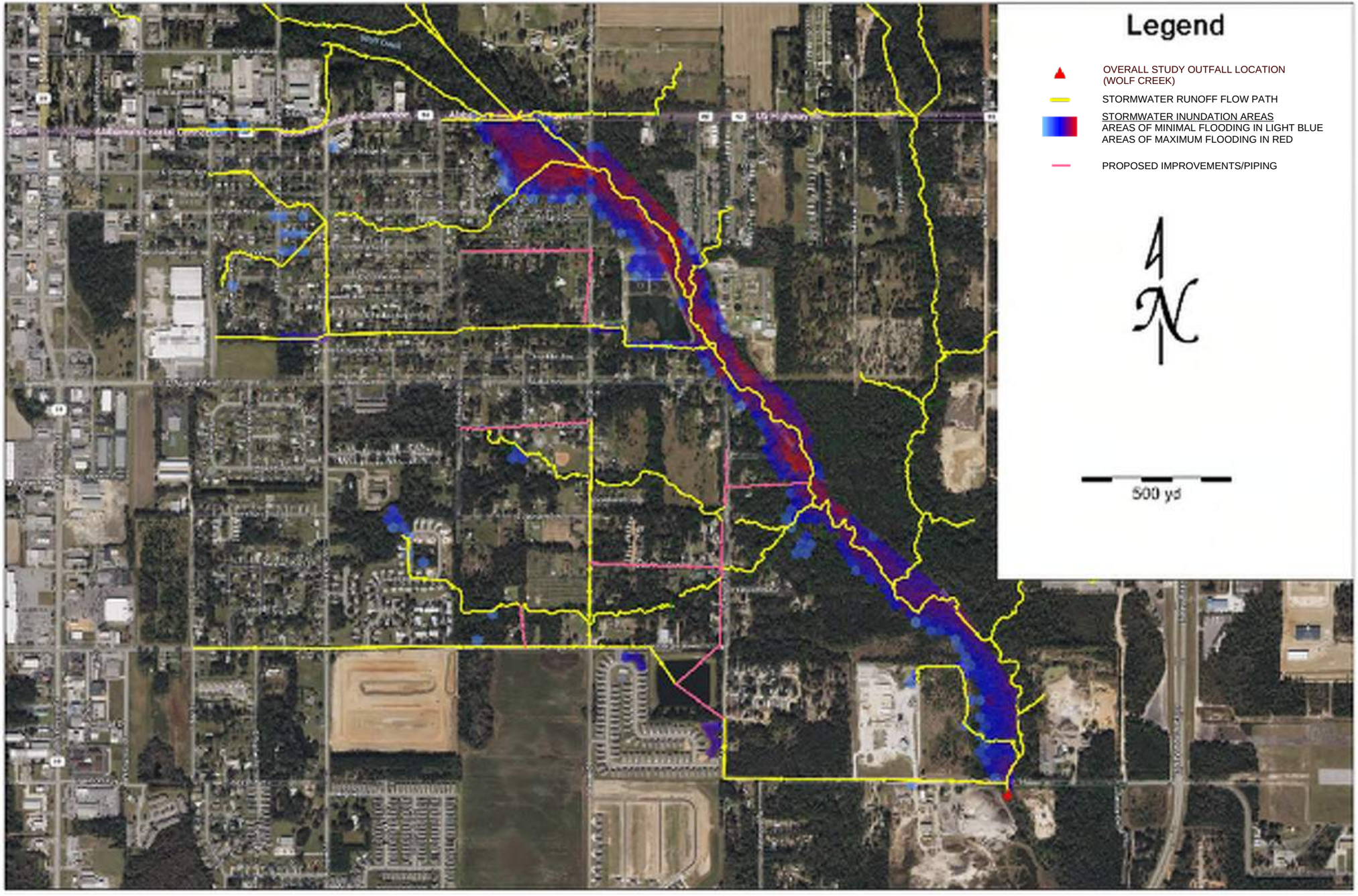
CITY OF FOLEY
FOLEY, ALABAMA

thompson ENGINEERING
4830 MAIN ST., STE. G-212
ORANGE BEACH, ALABAMA 36561
TEL: (251) 666-2443
FAX: (251) 666-6422

BEULAH HEIGHTS STORMWATER MANAGEMENT PLAN

EXISTING 10 YEAR STORMWATER RAINFALL EVENT STORMWATER INUNDATION MAP

SCALE:	PLOT SCALE:	DRAWN BY:	CHECKED BY:	APPROVED BY:	DATE :	JOB NO. :	DRAWING NO.	REVISION NO. :
	1:1	EDJ	EDJ	CDW	SEPTEMBER 20, 2023	23-1120-0009		



REVISION NO.	DESCRIPTION	DATE	BY:
REVISION NO.	DESCRIPTION	DATE	BY:
REVISION NO.	DESCRIPTION	DATE	BY:
REVISION NO.	DESCRIPTION	DATE	BY:
REVISION NO.	DESCRIPTION	DATE	BY:
REVISION NO.	DESCRIPTION	DATE	BY:

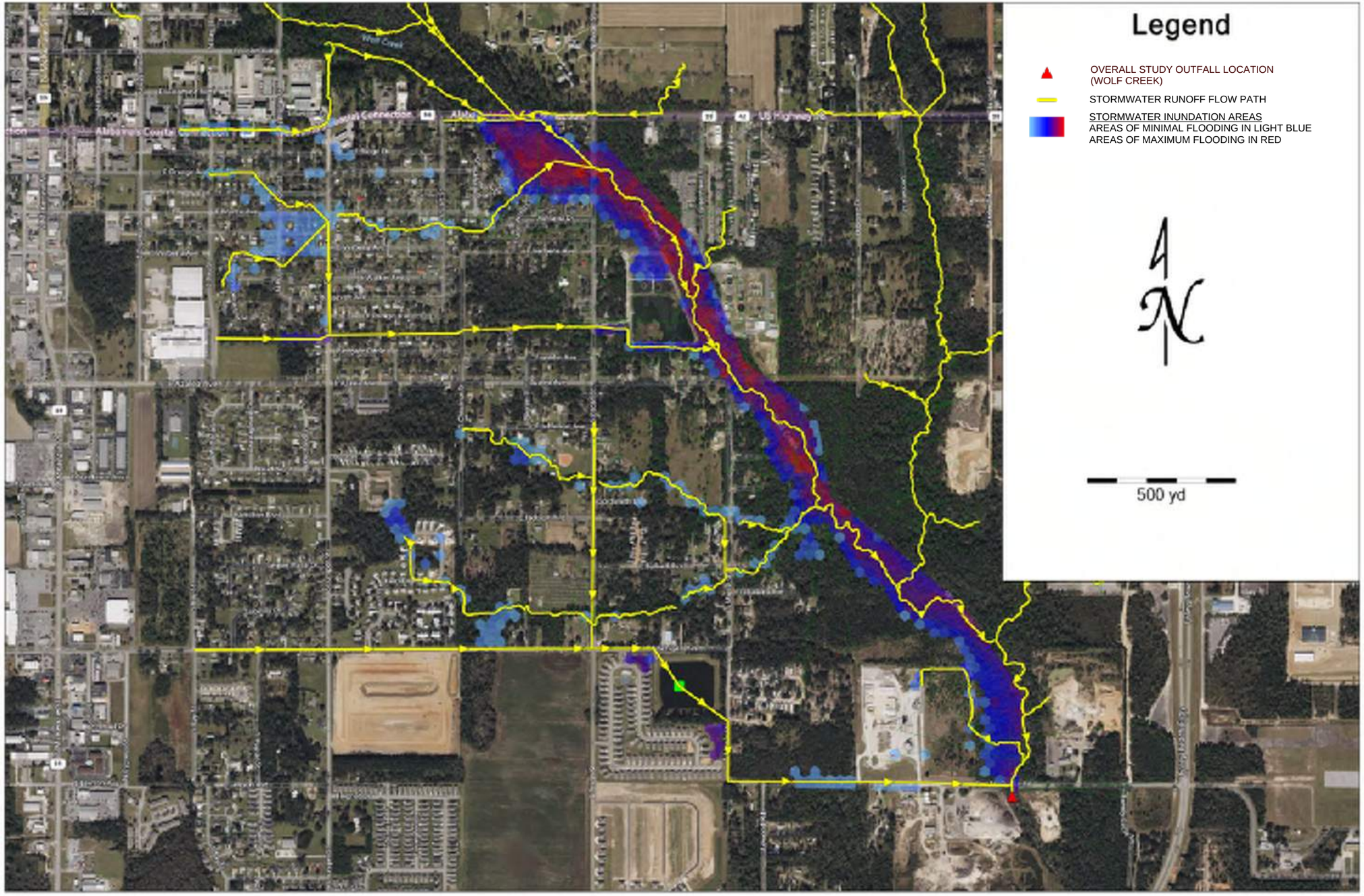
CITY OF FOLEY
FOLEY, ALABAMA

thompson ENGINEERING
4830 MAIN ST., STE. G-212
ORANGE BEACH, ALABAMA 36561
TEL: (251) 666-2443
FAX: (251) 666-6422

BEULAH HEIGHTS STORMWATER MANAGEMENT PLAN

PROPOSED 10 YEAR STORMWATER RAINFALL EVENT STORMWATER INUNDATION MAP

SCALE:	PLOT SCALE:	DRAWN BY:	CHECKED BY:	APPROVED BY:	DATE :	JOB NO. :	DRAWING NO.	REVISION NO. :
	1:1	EDJ	EDJ	CDW	SEPTEMBER 20, 2023	23-1120-0009		



REVISION NO.	DESCRIPTION	DATE	BY:
REVISION NO.	DESCRIPTION	DATE	BY:
REVISION NO.	DESCRIPTION	DATE	BY:
REVISION NO.	DESCRIPTION	DATE	BY:
REVISION NO.	DESCRIPTION	DATE	BY:
REVISION NO.	DESCRIPTION	DATE	BY:

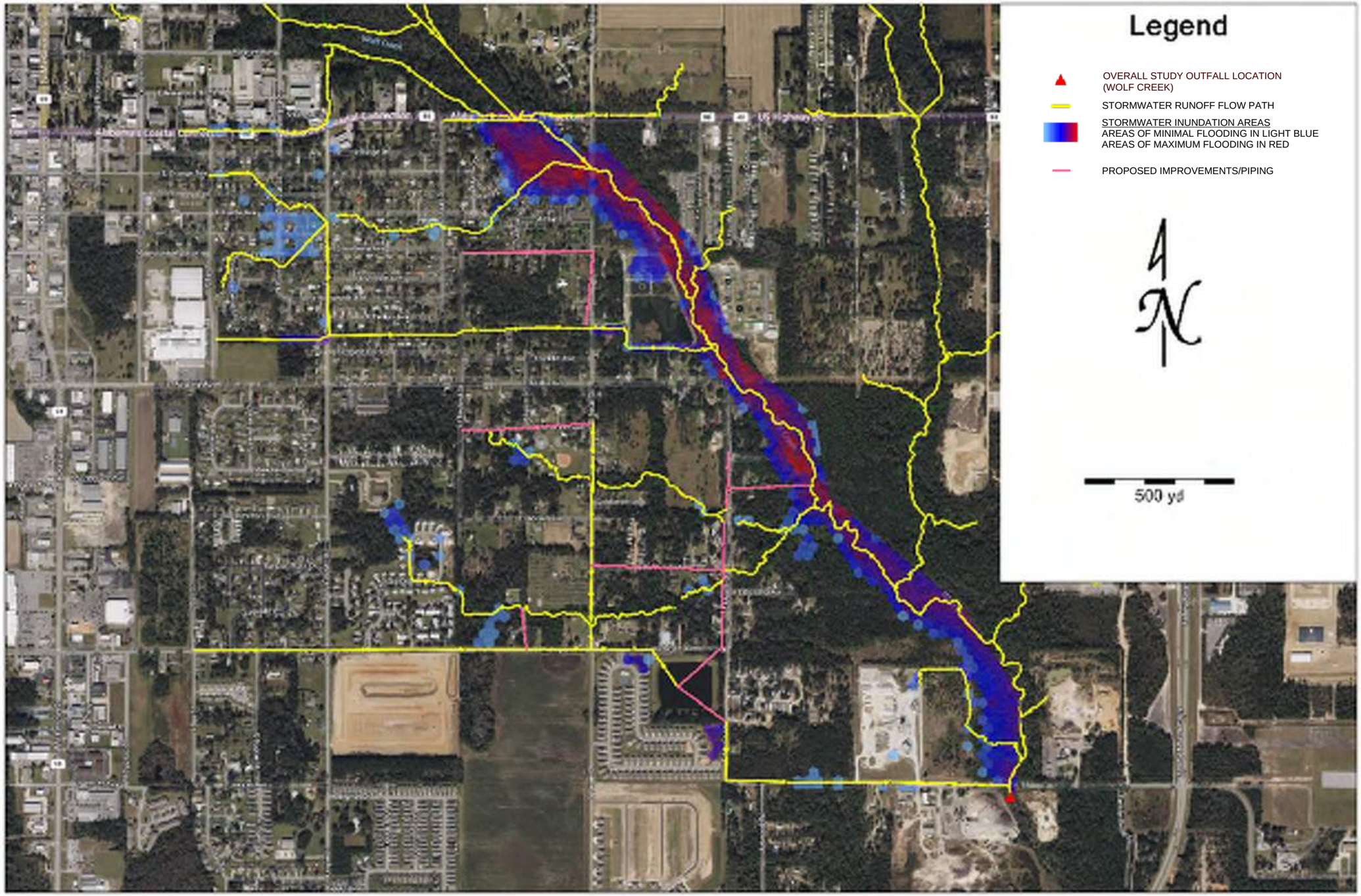
CITY OF FOLEY
FOLEY, ALABAMA

thompson ENGINEERING
4830 MAIN ST., STE. G-212
ORANGE BEACH, ALABAMA 36561
TEL: (251) 666-2443
FAX: (251) 666-6422

BEULAH HEIGHTS STORMWATER MANAGEMENT PLAN

EXISTING 25 YEAR STORMWATER RAINFALL EVENT STORMWATER INUNDATION MAP

SCALE:	PLOT SCALE:	DRAWN BY:	CHECKED BY:	APPROVED BY:	DATE :	JOB NO. :	DRAWING NO.	REVISION NO. :
	1:1	EDJ	EDJ	CDW	SEPTEMBER 20, 2023	23-1120-0009		



REVISION NO.	DESCRIPTION	DATE	BY:
REVISION NO.	DESCRIPTION	DATE	BY:
REVISION NO.	DESCRIPTION	DATE	BY:
REVISION NO.	DESCRIPTION	DATE	BY:
REVISION NO.	DESCRIPTION	DATE	BY:
REVISION NO.	DESCRIPTION	DATE	BY:

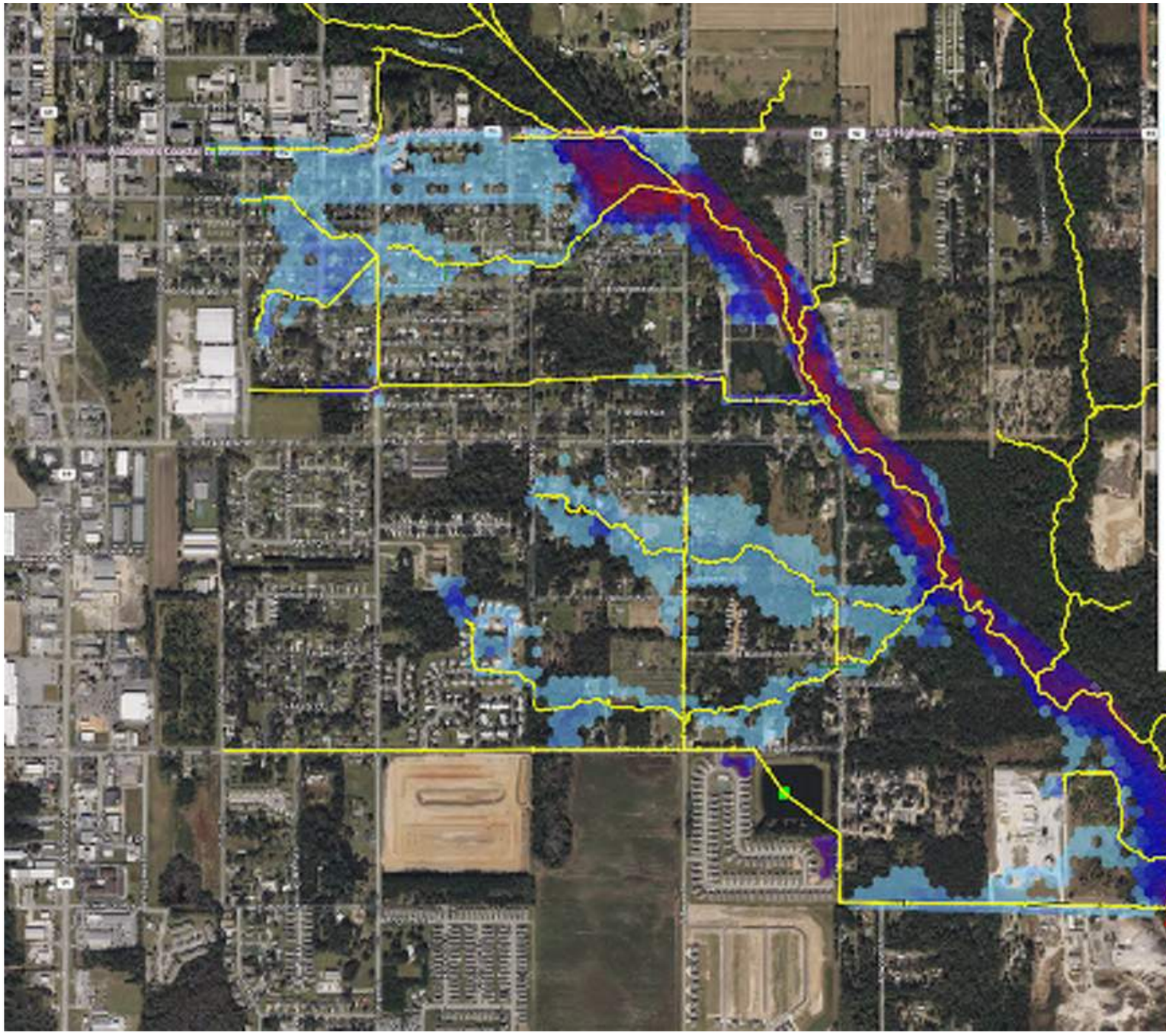
CITY OF FOLEY
FOLEY, ALABAMA

thompson ENGINEERING
4830 MAIN ST., STE. C-212
ORANGE BEACH, ALABAMA 36561
TEL: (251) 666-2443
FAX: (251) 666-6422

BEULAH HEIGHTS
STORMWATER MANAGEMENT PLAN

PROPOSED 25 YEAR STORMWATER RAINFALL EVENT
STORMWATER INUNDATION MAP

SCALE:	PLOT SCALE:	DRAWN BY:	CHECKED BY:	APPROVED BY:	DATE :	JOB NO. :	DRAWING NO.	REVISION NO. :
	1:1	EDJ	EDJ	CDW	SEPTEMBER 20, 2023	23-1120-0009		



Legend

- OVERALL STUDY OUTFALL LOCATION (WOLF CREEK)
- STORMWATER RUNOFF FLOW PATH
- STORMWATER INUNDATION AREAS
  AREAS OF MINIMAL FLOODING IN LIGHT BLUE
  AREAS OF MAXIMUM FLOODING IN RED

N

REVISION NO.	DESCRIPTION	DATE	BY:
REVISION NO.	DESCRIPTION	DATE	BY:
REVISION NO.	DESCRIPTION	DATE	BY:
REVISION NO.	DESCRIPTION	DATE	BY:
REVISION NO.	DESCRIPTION	DATE	BY:
REVISION NO.	DESCRIPTION	DATE	BY:

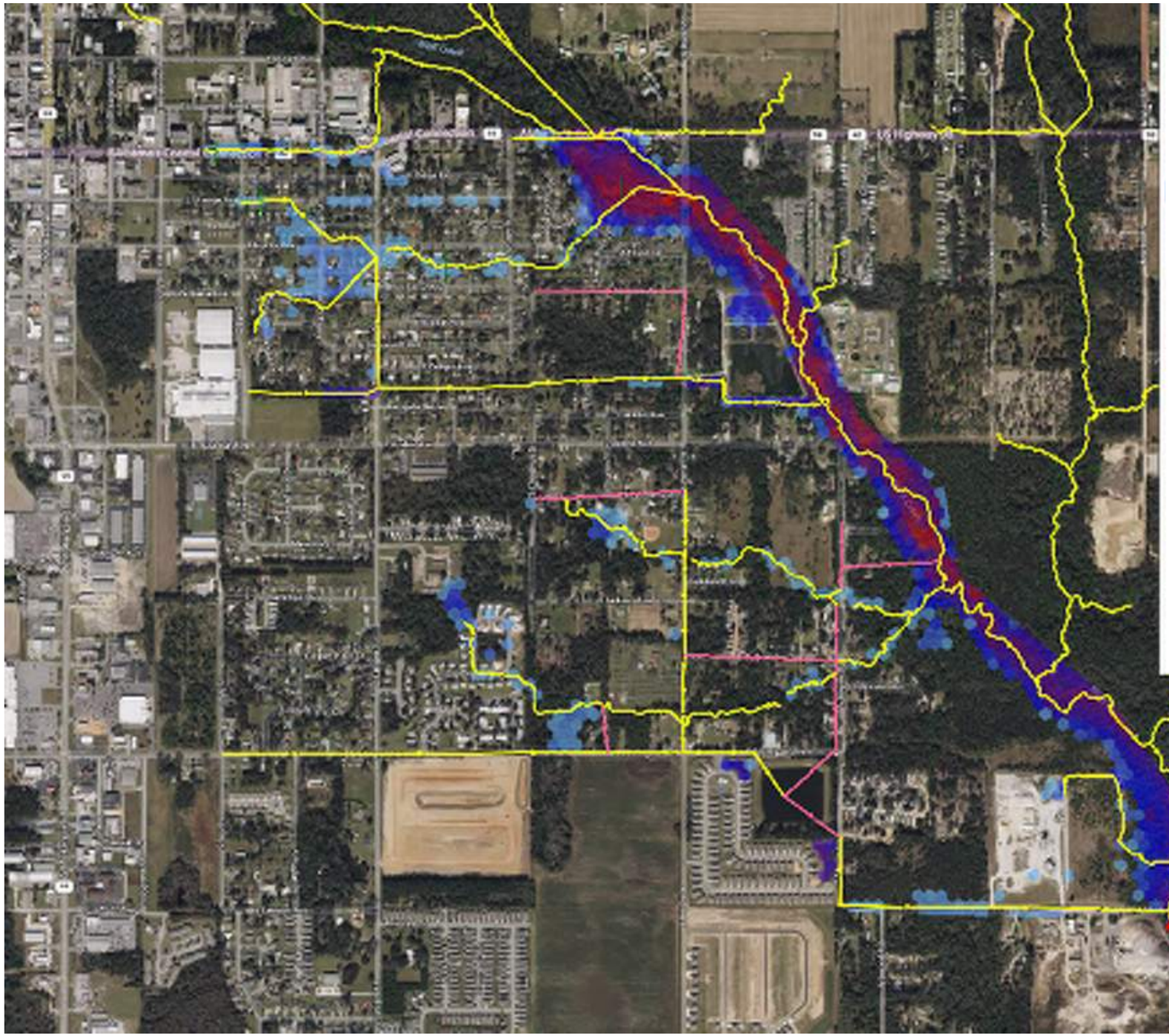
CITY OF FOLEY
FOLEY, ALABAMA

thompson ENGINEERING
4830 MAIN ST., STE. G-212
ORANGE BEACH, ALABAMA 36561
TEL: (251) 666-2443
FAX: (251) 666-6422

BEULAH HEIGHTS
STORMWATER MANAGEMENT PLAN

EXISTING 50 YEAR STORMWATER RAINFALL EVENT
STORMWATER INUNDATION MAP

SCALE:	PLOT SCALE:	DRAWN BY:	CHECKED BY:	APPROVED BY:	DATE :	JOB NO. :	DRAWING NO.	REVISION NO. :
	1:1	EDJ	EDJ	CDW	SEPTEMBER 20, 2023	23-1120-0009		



Legend

- OVERALL STUDY OUTFALL LOCATION (WOLF CREEK)
- STORMWATER RUNOFF FLOW PATH
- STORMWATER INUNDATION AREAS
  AREAS OF MINIMAL FLOODING IN LIGHT BLUE
  AREAS OF MAXIMUM FLOODING IN RED
- PROPOSED IMPROVEMENTS/PIPING

N

500 yd

REVISION NO.	DESCRIPTION	DATE	BY:
REVISION NO.	DESCRIPTION	DATE	BY:
REVISION NO.	DESCRIPTION	DATE	BY:
REVISION NO.	DESCRIPTION	DATE	BY:
REVISION NO.	DESCRIPTION	DATE	BY:
REVISION NO.	DESCRIPTION	DATE	BY:

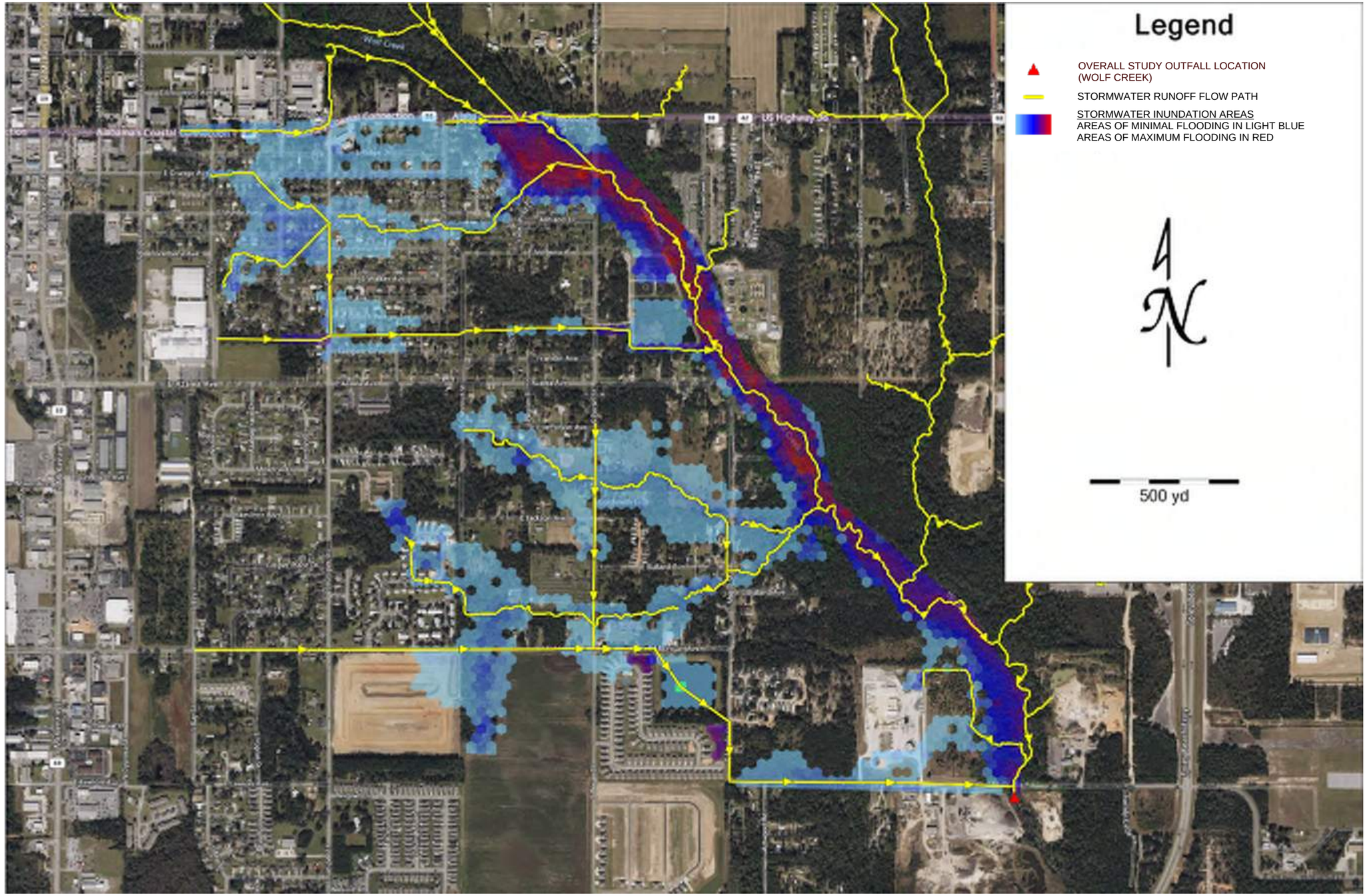
CITY OF FOLEY
FOLEY, ALABAMA

thompson ENGINEERING
4830 MAIN ST., STE. G-212
ORANGE BEACH, ALABAMA 36561
TEL: (251) 666-2443
FAX: (251) 666-6422

BEULAH HEIGHTS STORMWATER MANAGEMENT PLAN

PROPOSED 50 YEAR STORMWATER RAINFALL EVENT
STORMWATER INUNDATION MAP

SCALE:	PLOT SCALE:	DRAWN BY:	CHECKED BY:	APPROVED BY:	DATE :	JOB NO. :	DRAWING NO.	REVISION NO. :
	1:1	EDJ	EDJ	CDW	SEPTEMBER 20, 2023	23-1120-0009		



REVISION NO.	DESCRIPTION	DATE	BY:
REVISION NO.	DESCRIPTION	DATE	BY:
REVISION NO.	DESCRIPTION	DATE	BY:
REVISION NO.	DESCRIPTION	DATE	BY:
REVISION NO.	DESCRIPTION	DATE	BY:
REVISION NO.	DESCRIPTION	DATE	BY:

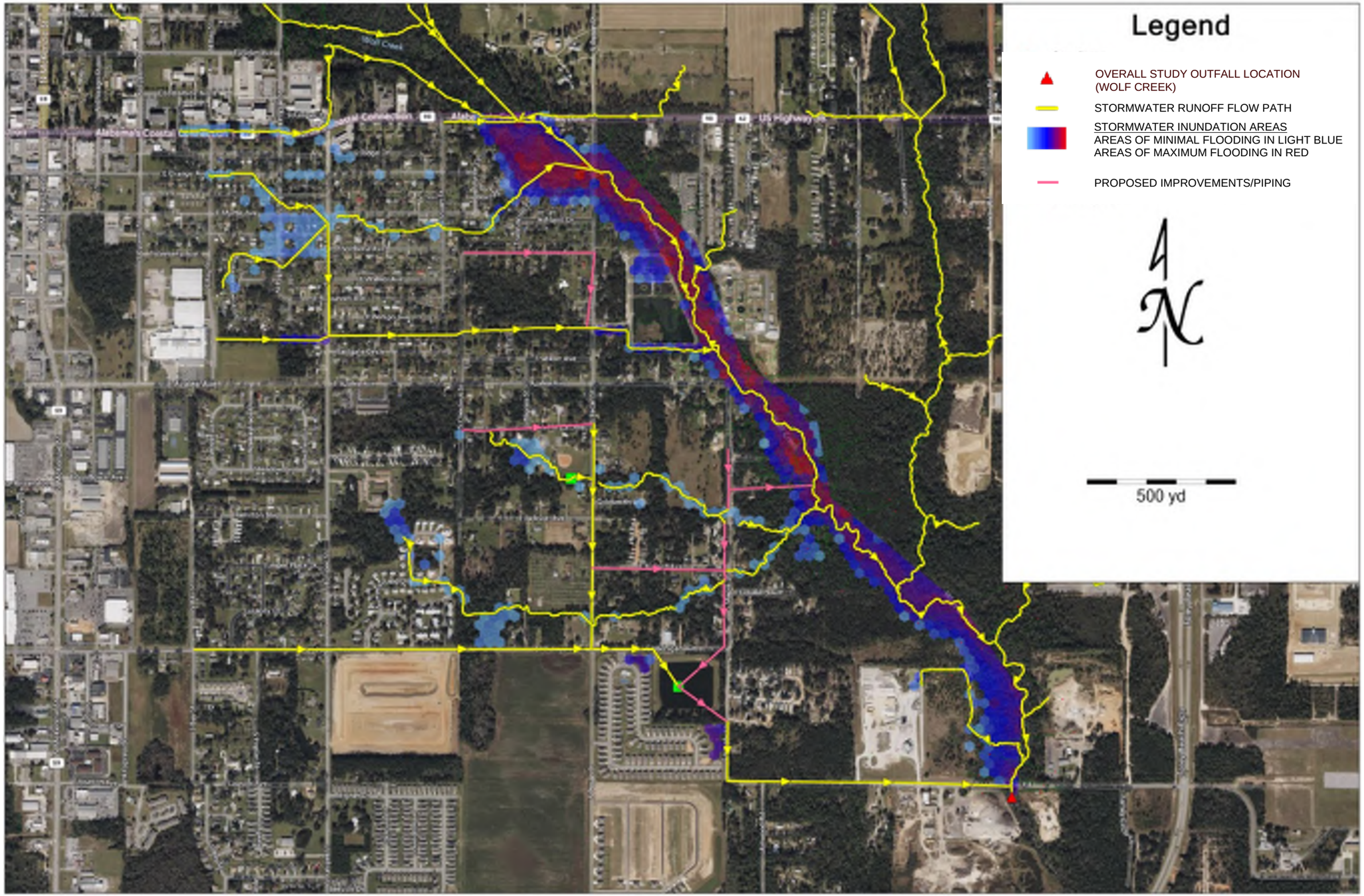
CITY OF FOLEY
FOLEY, ALABAMA

thompson ENGINEERING
4830 MAIN ST., STE. G-212
ORANGE BEACH, ALABAMA 36561
TEL: (251) 666-2443
FAX: (251) 666-6422

BEULAH HEIGHTS
STORMWATER MANAGEMENT PLAN

EXISTING 100 YEAR STORMWATER RAINFALL EVENT
STORMWATER INUNDATION MAP

SCALE:	PLOT SCALE:	DRAWN BY:	CHECKED BY:	APPROVED BY:	DATE :	JOB NO. :	DRAWING NO.	REVISION NO. :
	1:1	EDJ	EDJ	CDW	SEPTEMBER 20, 2023	23-1120-0009		



REVISION NO.	DESCRIPTION	DATE	BY:
REVISION NO.	DESCRIPTION	DATE	BY:
REVISION NO.	DESCRIPTION	DATE	BY:
REVISION NO.	DESCRIPTION	DATE	BY:
REVISION NO.	DESCRIPTION	DATE	BY:
REVISION NO.	DESCRIPTION	DATE	BY:

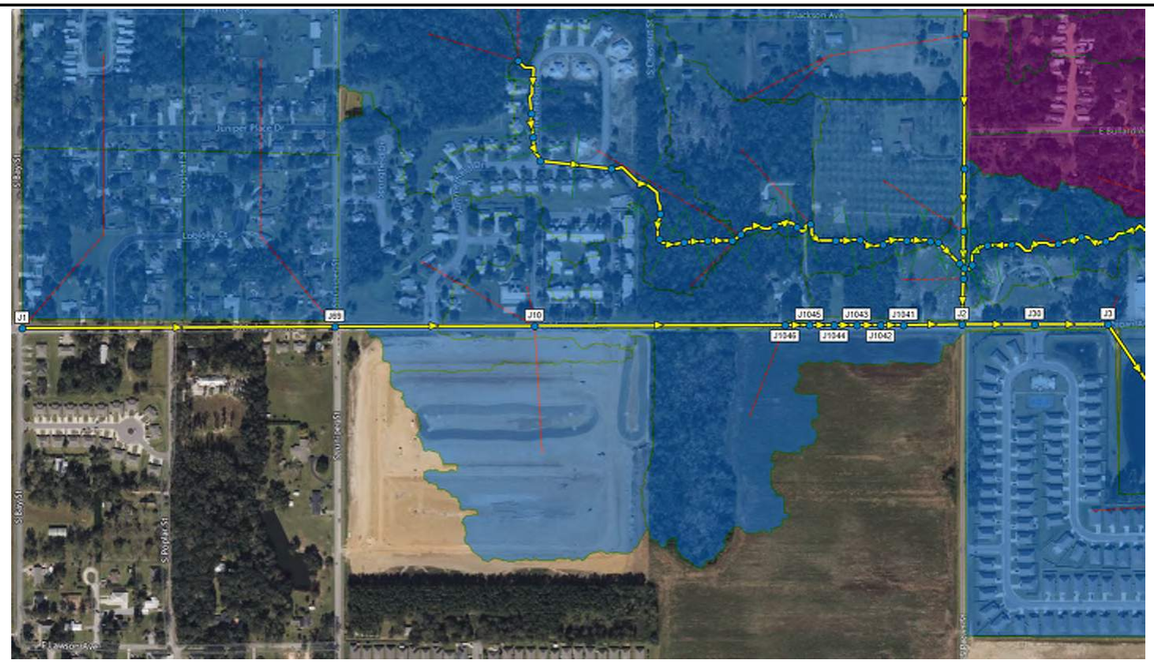
CITY OF FOLEY
FOLEY, ALABAMA

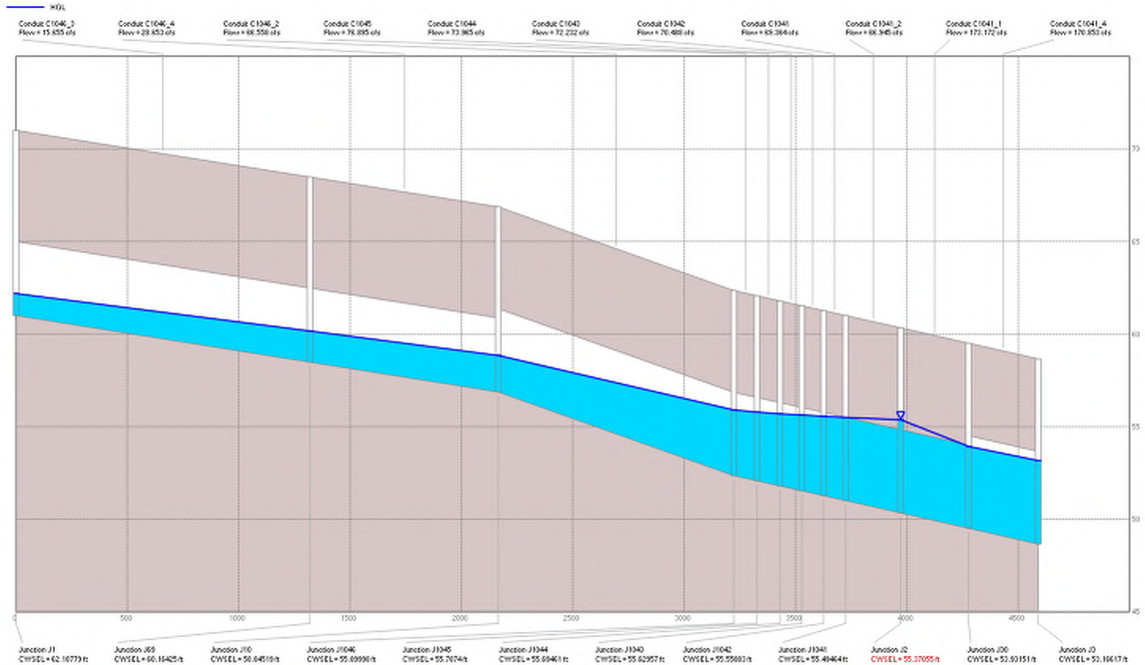
thompson ENGINEERING
4830 MAIN ST., STE. G-212
ORANGE BEACH, ALABAMA 36561
TEL: (251) 666-2443
FAX: (251) 666-6422

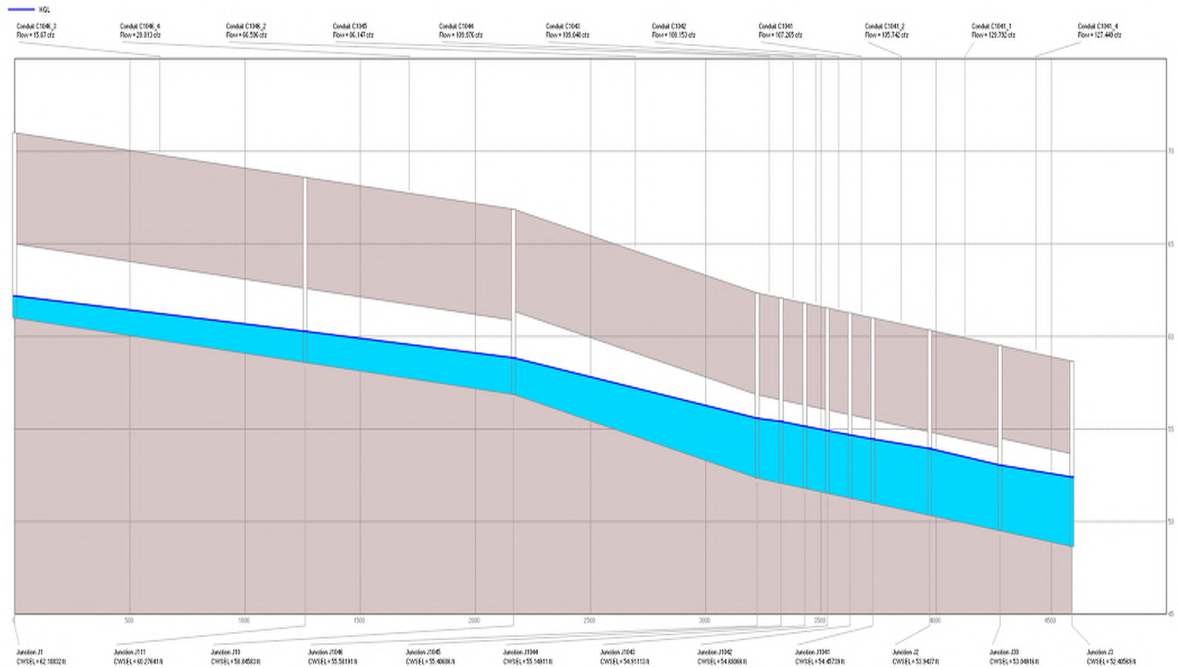
BEULAH HEIGHTS
STORMWATER MANAGEMENT PLAN

PROPOSED 100 YEAR STORMWATER RAINFALL EVENT
STORMWATER INUNDATION MAP

SCALE:	PLOT SCALE:	DRAWN BY:	CHECKED BY:	APPROVED BY:	DATE :	JOB NO. :	DRAWING NO.	REVISION NO. :
	1:1	EDJ	EDJ	CDW	SEPTEMBER 20, 2023	23-1120-0009		







EXISTING PROFILE

PROPOSED PROFILE

REVISION NO.	DESCRIPTION	DATE	BY:
REVISION NO.	DESCRIPTION	DATE	BY:
REVISION NO.	DESCRIPTION	DATE	BY:
REVISION NO.	DESCRIPTION	DATE	BY:
REVISION NO.	DESCRIPTION	DATE	BY:
REVISION NO.	DESCRIPTION	DATE	BY:

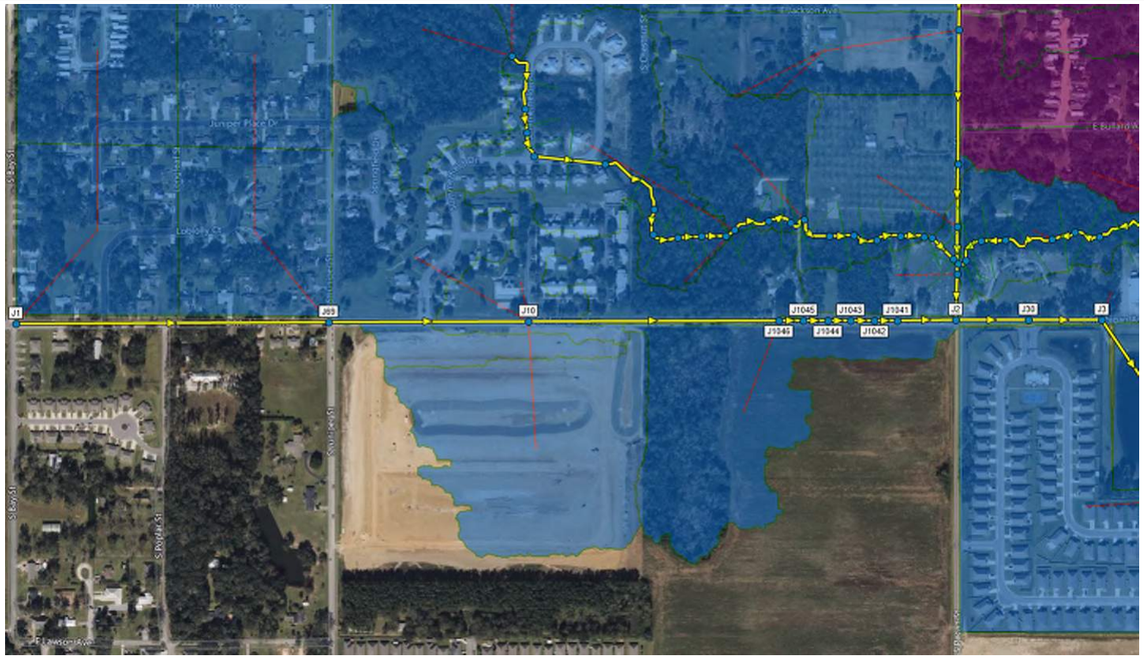
CITY OF FOLEY
FOLEY, ALABAMA

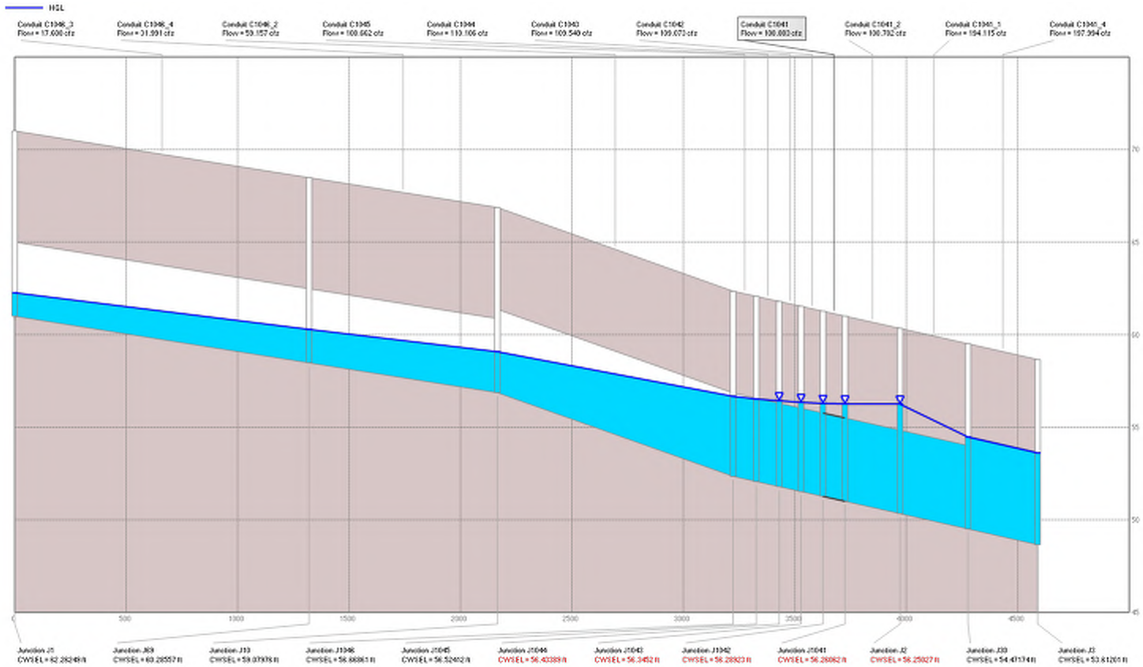
BEULAH HEIGHTS
STORMWATER MANAGEMENT PLAN

thompson ENGINEERING
4830 MAIN ST., STE. G-212
ORANGE BEACH, ALABAMA 36561
TEL: (251) 666-2443
FAX: (251) 666-6422

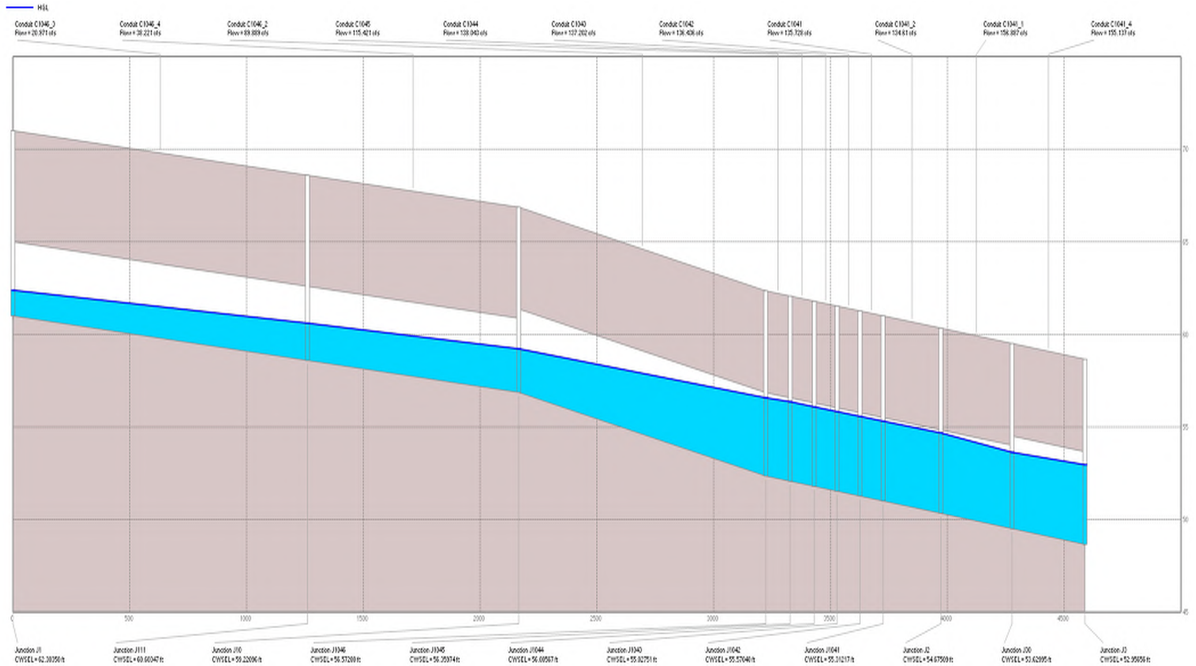
MICHIGAN AVENUE TRUNK LINE
EXISTING AND PROPOSED 10-YR HGL PROFILE

SCALE:	PLOT SCALE:	DRAWN BY:	CHECKED BY:	APPROVED BY:	DATE :	JOB NO. :	DRAWING NO.	REVISION NO. :
	1:1	EDJ	EDJ	CDW	SEPTEMBER 20, 2023	23-1120-0009		





EXISTING PROFILE



PROPOSED PROFILE

REVISION NO.	DESCRIPTION	DATE	BY:
REVISION NO.	DESCRIPTION	DATE	BY:
REVISION NO.	DESCRIPTION	DATE	BY:
REVISION NO.	DESCRIPTION	DATE	BY:
REVISION NO.	DESCRIPTION	DATE	BY:
REVISION NO.	DESCRIPTION	DATE	BY:

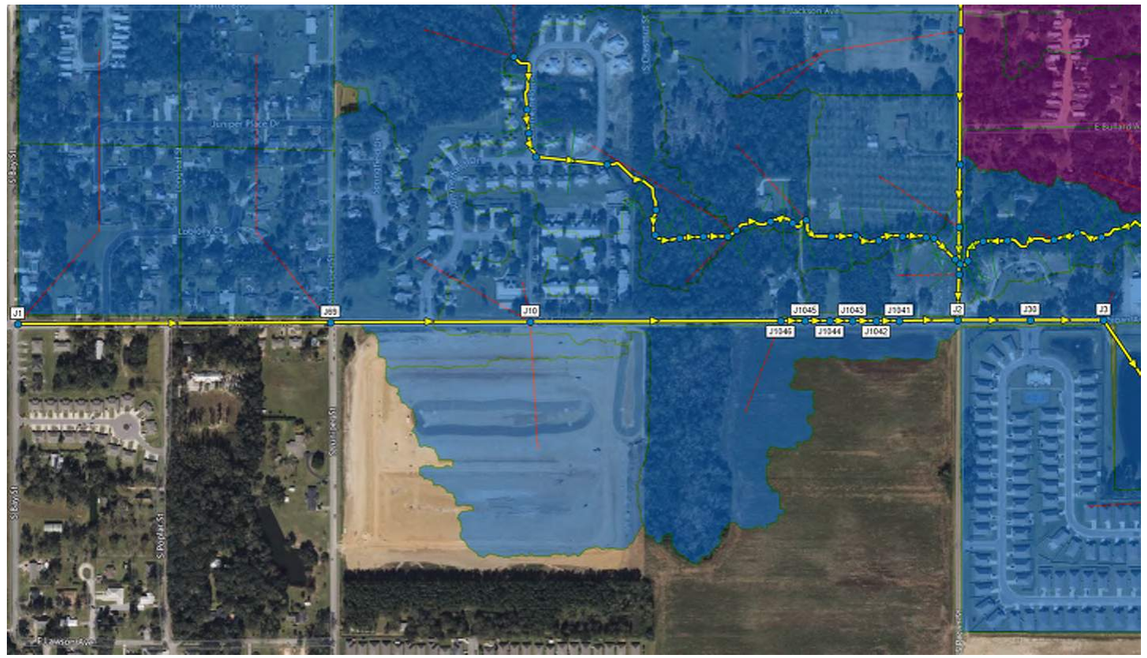
CITY OF FOLEY
FOLEY, ALABAMA

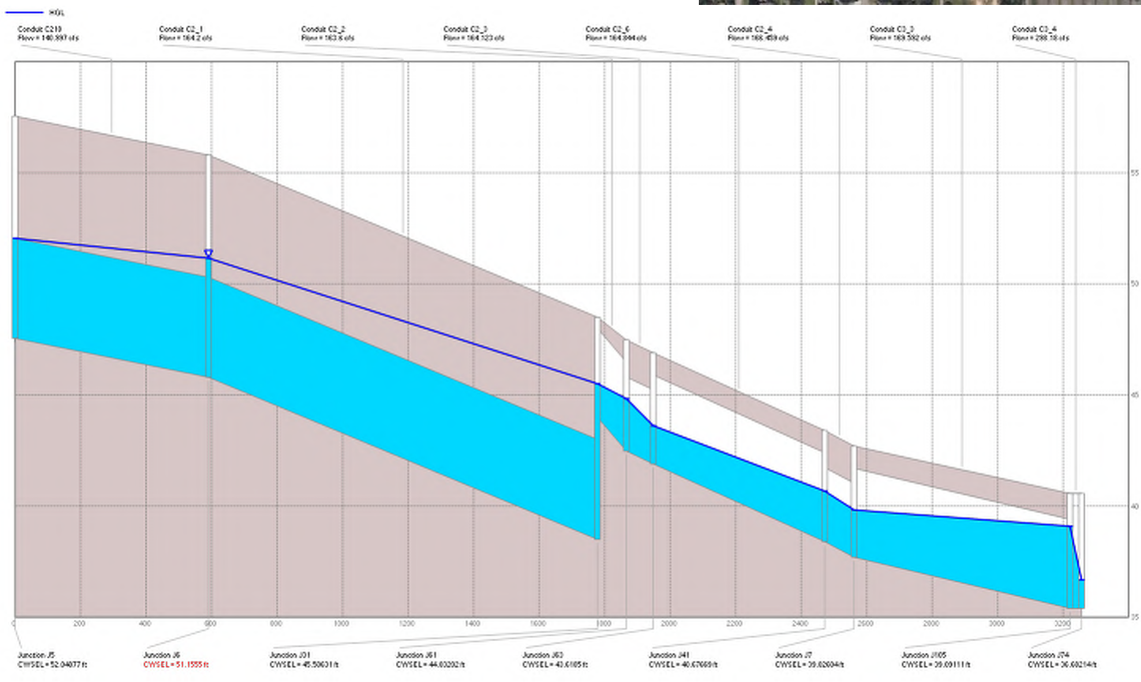
thompson ENGINEERING
4830 MAIN ST., STE. G-212
ORANGE BEACH, ALABAMA 36561
TEL: (251) 666-2443
FAX: (251) 666-6422

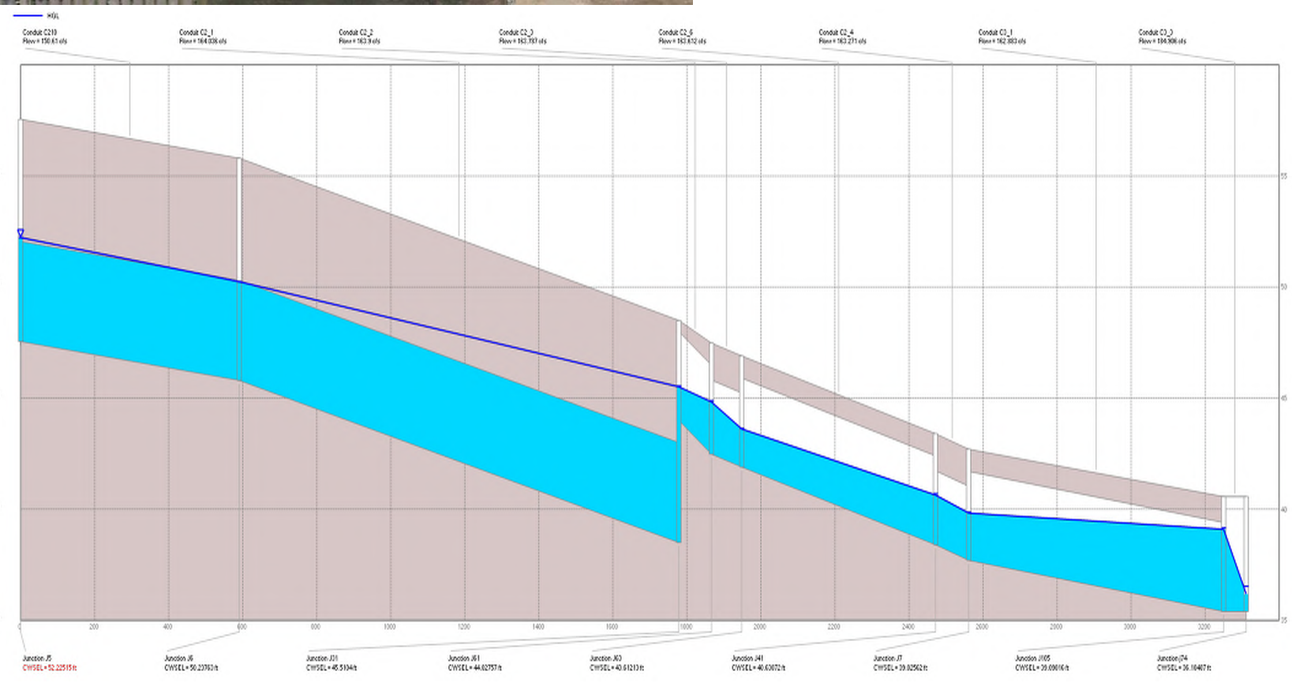
BEULAH HEIGHTS
STORMWATER MANAGEMENT PLAN

MICHIGAN AVENUE TRUNK LINE
EXISTING AND PROPOSED 25-YR HGL PROFILE

SCALE:	PLOT SCALE:	DRAWN BY:	CHECKED BY:	APPROVED BY:	DATE :	JOB NO. :	DRAWING NO.	REVISION NO. :
	1:1	EDJ	EDJ	CDW	SEPTEMBER 20, 2023	23-1120-0009		







EXISTING PROFILE

PROPOSED PROFILE

REVISION NO.	DESCRIPTION	DATE	BY:
REVISION NO.	DESCRIPTION	DATE	BY:
REVISION NO.	DESCRIPTION	DATE	BY:
REVISION NO.	DESCRIPTION	DATE	BY:
REVISION NO.	DESCRIPTION	DATE	BY:
REVISION NO.	DESCRIPTION	DATE	BY:

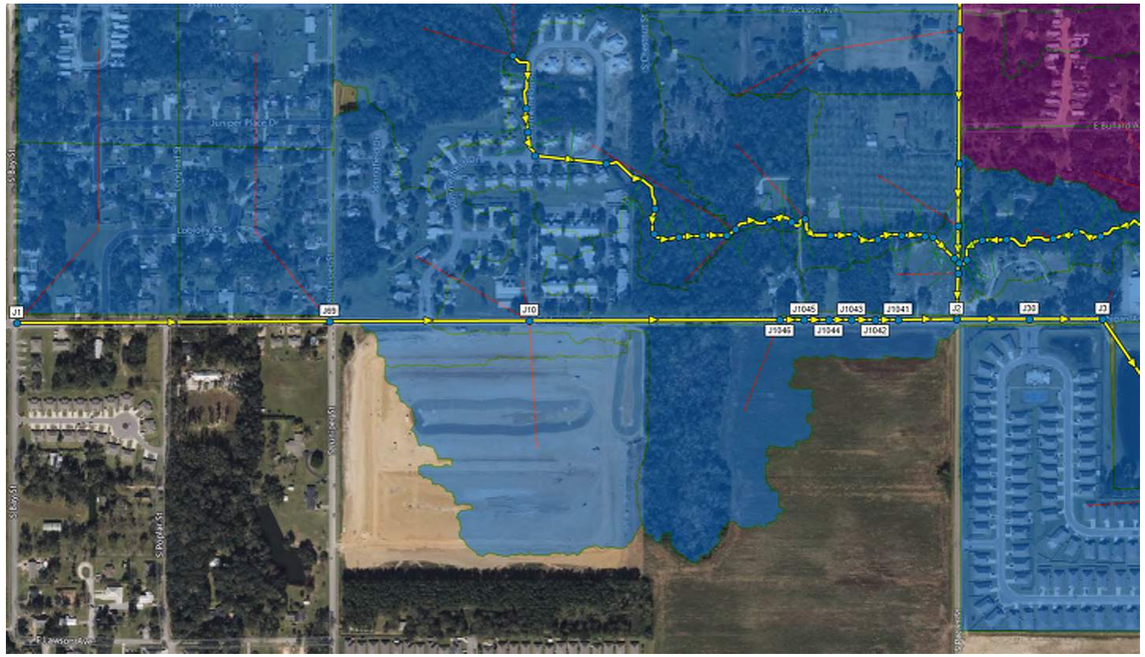
CITY OF FOLEY
FOLEY, ALABAMA

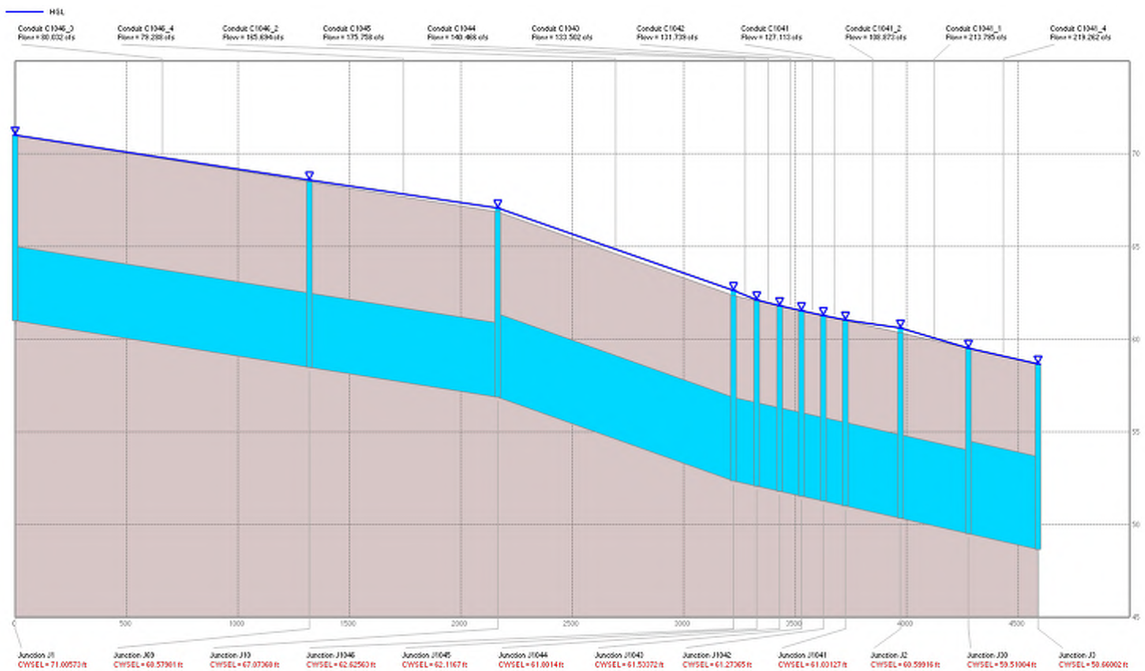
thompson ENGINEERING
4830 MAIN ST., STE. G-212
ORANGE BEACH, ALABAMA 36561
TEL: (251) 666-2443
FAX: (251) 666-6422

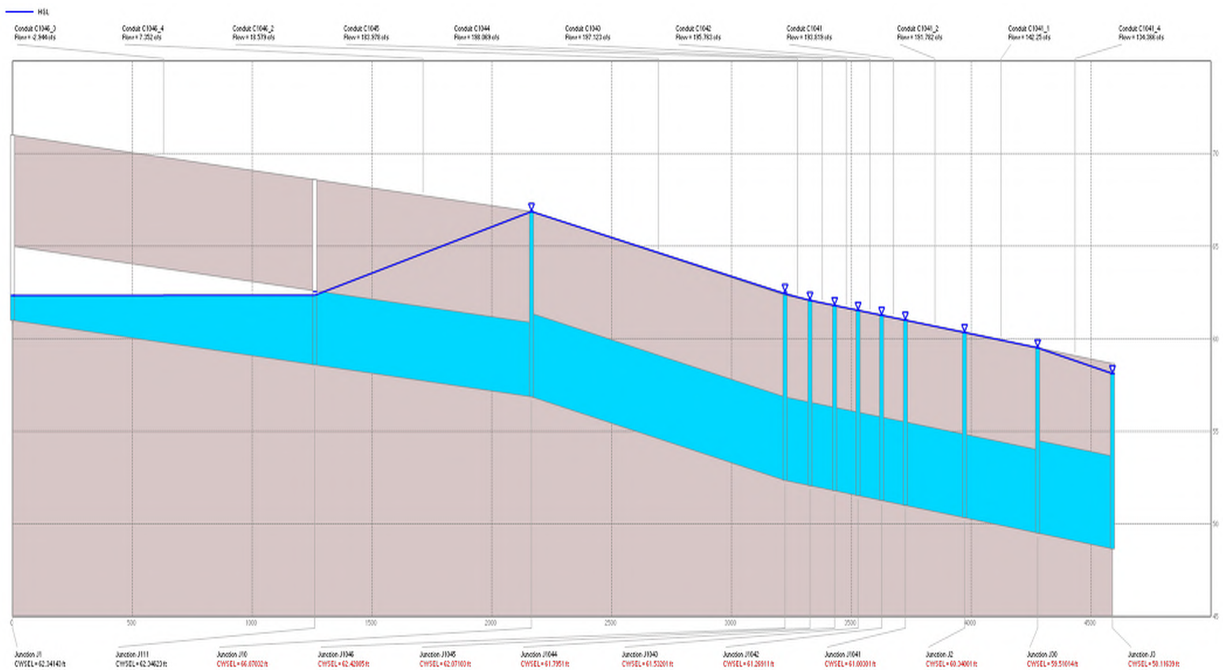
BEULAH HEIGHTS
STORMWATER MANAGEMENT PLAN

MICHIGAN AVENUE TRUNK LINE
EXISTING AND PROPOSED 50-YR HGL PROFILE

SCALE:	PLOT SCALE:	DRAWN BY:	CHECKED BY:	APPROVED BY:	DATE :	JOB NO. :	DRAWING NO.	REVISION NO. :
	1:1	EDJ	EDJ	CDW	SEPTEMBER 20, 2023	23-1120-0009		







EXISTING PROFILE

PROPOSED PROFILE

REVISION NO.	DESCRIPTION	DATE	BY:
REVISION NO.	DESCRIPTION	DATE	BY:
REVISION NO.	DESCRIPTION	DATE	BY:
REVISION NO.	DESCRIPTION	DATE	BY:
REVISION NO.	DESCRIPTION	DATE	BY:
REVISION NO.	DESCRIPTION	DATE	BY:

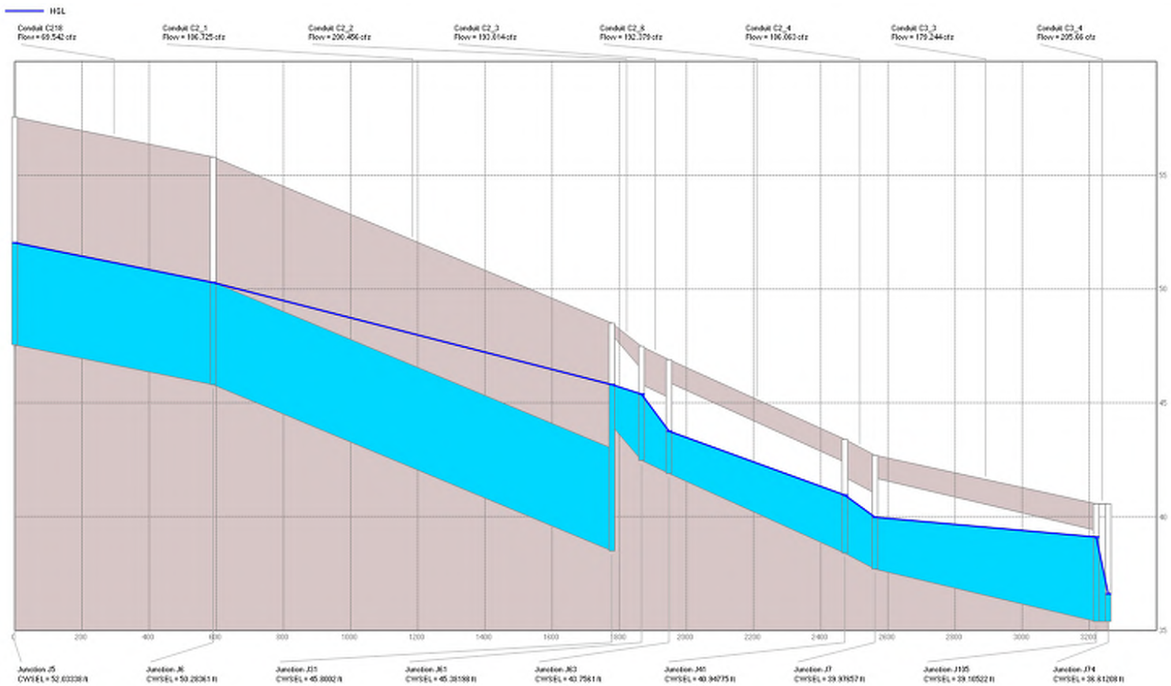
CITY OF FOLEY
FOLEY, ALABAMA

thompson ENGINEERING
4830 MAIN ST., STE. G-212
ORANGE BEACH, ALABAMA 36561
TEL: (251) 666-2443
FAX: (251) 666-6422

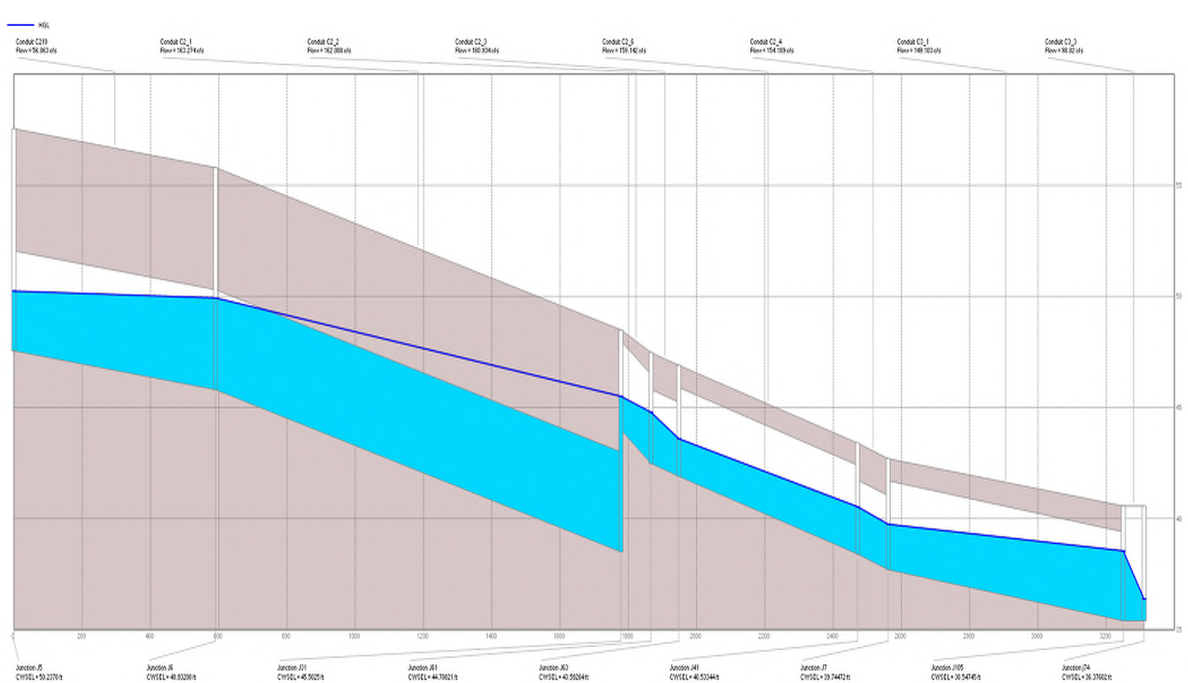
BEULAH HEIGHTS
STORMWATER MANAGEMENT PLAN

MICHIGAN AVENUE TRUNK LINE
EXISTING AND PROPOSED 100-YR HGL PROFILE

SCALE:	PLOT SCALE:	DRAWN BY:	CHECKED BY:	APPROVED BY:	DATE :	JOB NO. :	DRAWING NO.	REVISION NO. :
	1:1	EDJ	EDJ	CDW	SEPTEMBER 20, 2023	23-1120-0009		



EXISTING PROFILE



PROPOSED PROFILE

REVISION NO.	DESCRIPTION	DATE	BY:
REVISION NO.	DESCRIPTION	DATE	BY:
REVISION NO.	DESCRIPTION	DATE	BY:
REVISION NO.	DESCRIPTION	DATE	BY:
REVISION NO.	DESCRIPTION	DATE	BY:
REVISION NO.	DESCRIPTION	DATE	BY:

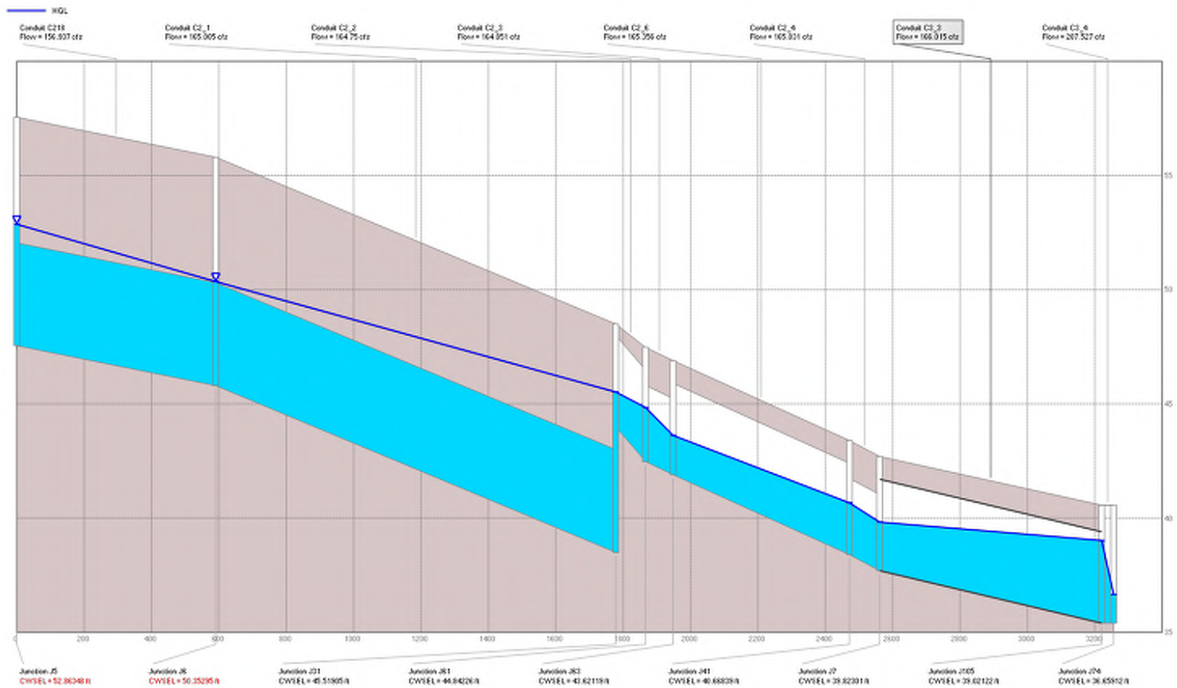
CITY OF FOLEY
FOLEY, ALABAMA

thompson ENGINEERING
4830 MAIN ST., STE. G-212
ORANGE BEACH, ALABAMA 36561
TEL: (251) 666-2443
FAX: (251) 666-6422

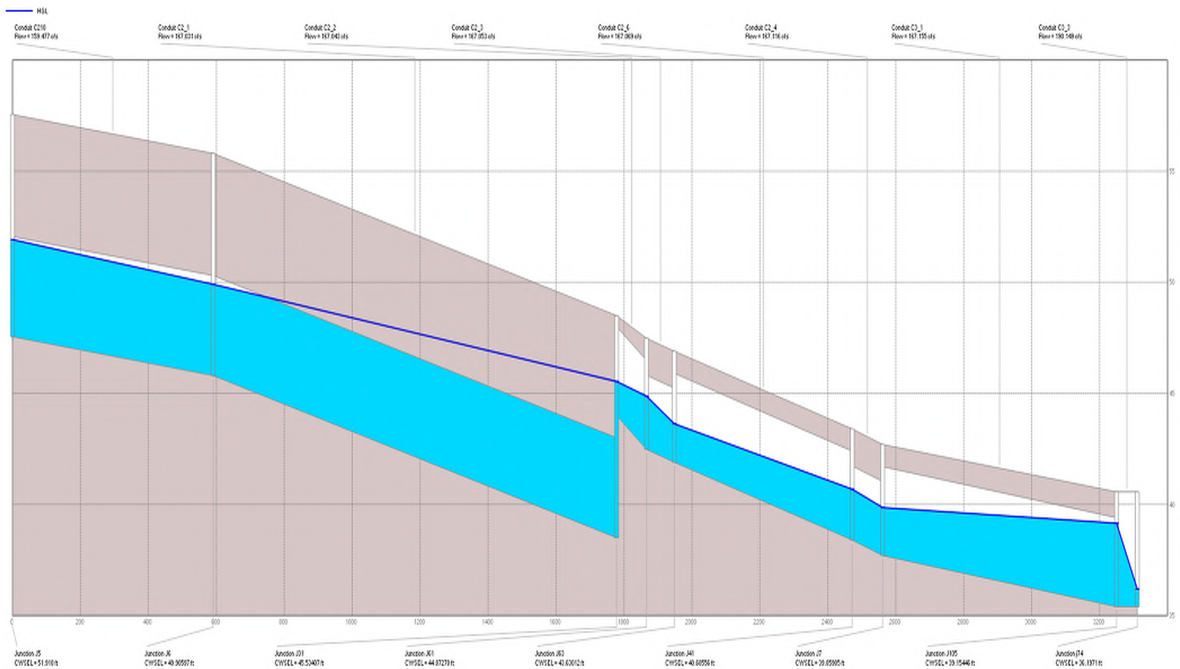
BEULAH HEIGHTS
STORMWATER MANAGEMENT PLAN

MICHIGAN AVENUE POND OUTFALL LINE
EXISTING AND PROPOSED 10-YR HGL PROFILE

SCALE:	PLOT SCALE:	DRAWN BY:	CHECKED BY:	APPROVED BY:	DATE :	JOB NO. :	DRAWING NO.	REVISION NO. :
	1:1	EDJ	EDJ	CDW	SEPTEMBER 20, 2023	23-1120-0009		



EXISTING PROFILE



PROPOSED PROFILE

REVISION NO.	DESCRIPTION	DATE	BY:
REVISION NO.	DESCRIPTION	DATE	BY:
REVISION NO.	DESCRIPTION	DATE	BY:
REVISION NO.	DESCRIPTION	DATE	BY:
REVISION NO.	DESCRIPTION	DATE	BY:
REVISION NO.	DESCRIPTION	DATE	BY:

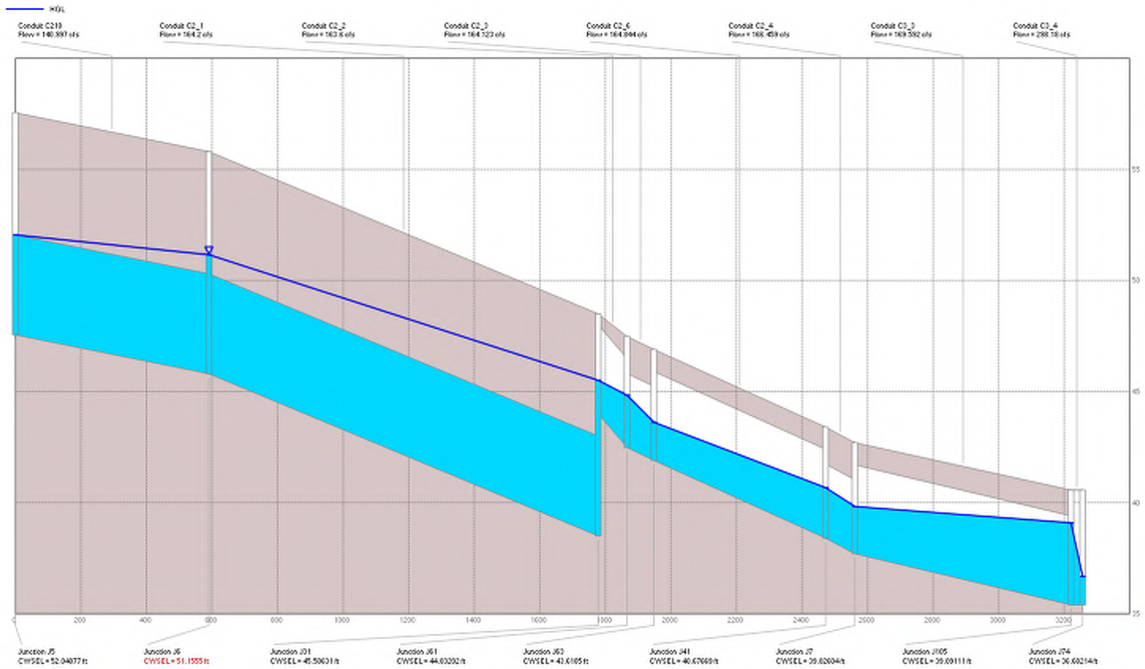
CITY OF FOLEY
FOLEY, ALABAMA

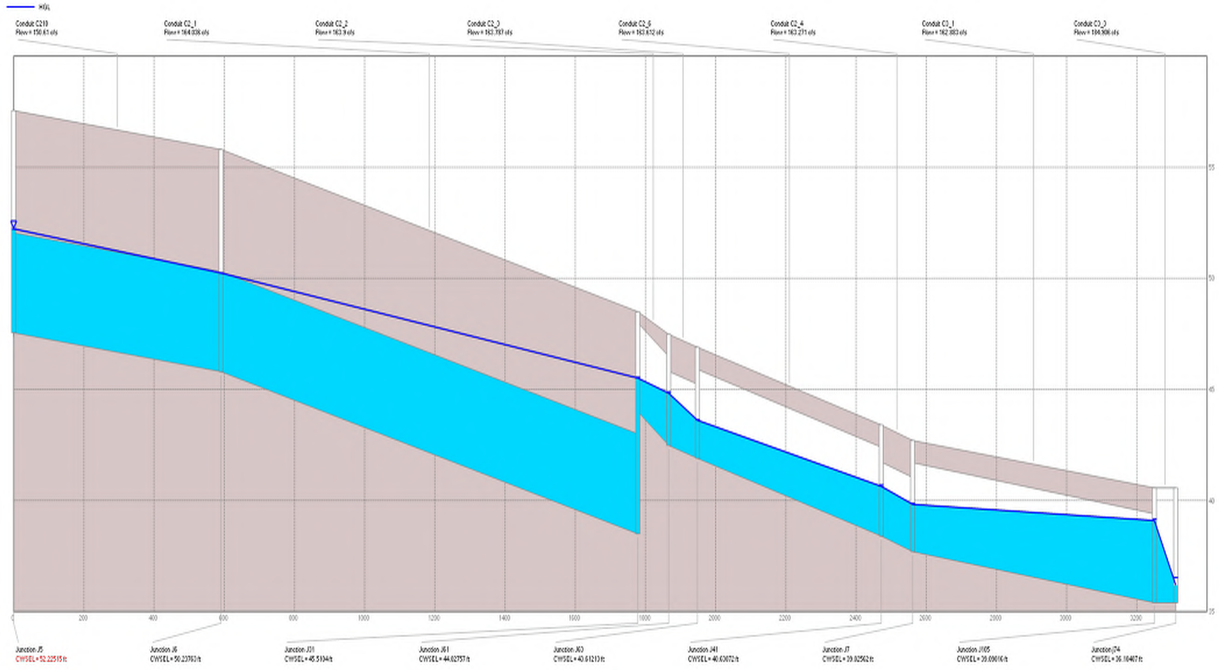
thompson ENGINEERING
4830 MAIN ST., STE. G-212
ORANGE BEACH, ALABAMA 36561
TEL: (251) 666-2443
FAX: (251) 666-6422

BEULAH HEIGHTS
STORMWATER MANAGEMENT PLAN

MICHIGAN AVENUE POND OUTFALL LINE
EXISTING AND PROPOSED 25-YR HGL PROFILE

SCALE:	PLOT SCALE:	DRAWN BY:	CHECKED BY:	APPROVED BY:	DATE :	JOB NO. :	DRAWING NO.	REVISION NO. :
	1:1	EDJ	EDJ	CDW	SEPTEMBER 20, 2023	23-1120-0009		





EXISTING PROFILE

PROPOSED PROFILE

REVISION NO.	DESCRIPTION	DATE	BY:
REVISION NO.	DESCRIPTION	DATE	BY:
REVISION NO.	DESCRIPTION	DATE	BY:
REVISION NO.	DESCRIPTION	DATE	BY:
REVISION NO.	DESCRIPTION	DATE	BY:
REVISION NO.	DESCRIPTION	DATE	BY:

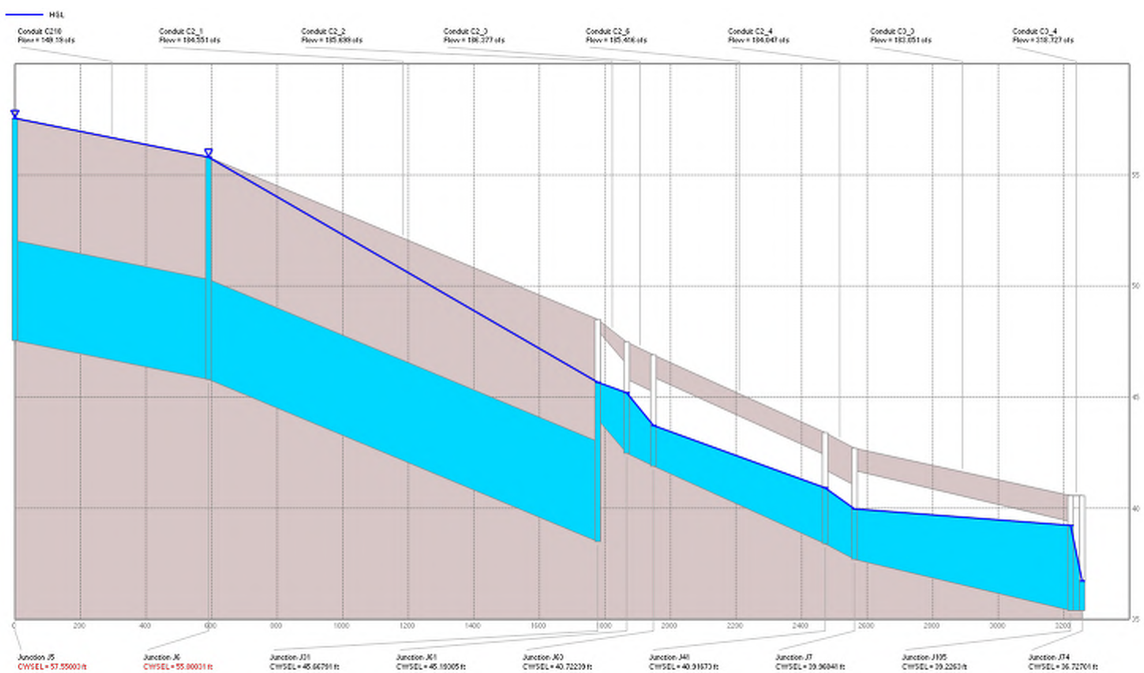
CITY OF FOLEY
FOLEY, ALABAMA

BEULAH HEIGHTS
STORMWATER MANAGEMENT PLAN

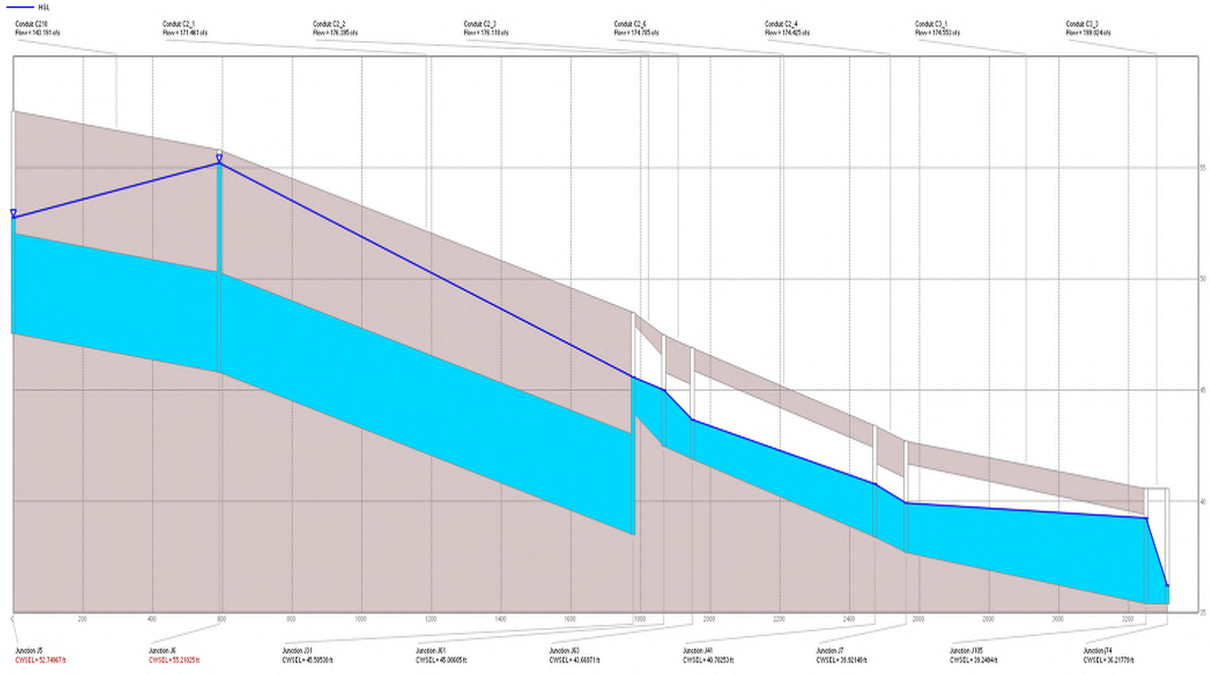
thompson ENGINEERING
4830 MAIN ST., STE. G-212
ORANGE BEACH, ALABAMA 36561
TEL: (251) 666-2443
FAX: (251) 666-6422

MICHIGAN AVENUE POND OUTFALL LINE
EXISTING AND PROPOSED 50-YR HGL PROFILE

SCALE:	PLOT SCALE:	DRAWN BY:	CHECKED BY:	APPROVED BY:	DATE :	JOB NO. :	DRAWING NO.	REVISION NO. :
	1:1	EDJ	EDJ	CDW	SEPTEMBER 20, 2023	23-1120-0009		



EXISTING PROFILE



PROPOSED PROFILE

REVISION NO.	DESCRIPTION	DATE	BY:
REVISION NO.	DESCRIPTION	DATE	BY:
REVISION NO.	DESCRIPTION	DATE	BY:
REVISION NO.	DESCRIPTION	DATE	BY:
REVISION NO.	DESCRIPTION	DATE	BY:
REVISION NO.	DESCRIPTION	DATE	BY:

CITY OF FOLEY
FOLEY, ALABAMA

thompson ENGINEERING
4830 MAIN ST., STE. G-212
ORANGE BEACH, ALABAMA 36561
TEL: (251) 666-2443
FAX: (251) 666-6422

BEULAH HEIGHTS
STORMWATER MANAGEMENT PLAN

MICHIGAN AVENUE POND OUTFALL LINE
EXISTING AND PROPOSED 100-YR HGL PROFILE

SCALE:	PLOT SCALE:	DRAWN BY:	CHECKED BY:	APPROVED BY:	DATE :	JOB NO. :	DRAWING NO.	REVISION NO. :
	1:1	EDJ	EDJ	CDW	SEPTEMBER 20, 2023	23-1120-0009		

Appendix D

Septic Program Package

SEPTIC SYSTEM REHABILITATION & SEWER CONNECTION PROGRAM

GOALS

The goal of the Septic System Rehabilitation and Sewer Connection Program is to reduce the potential health and environmental impacts that occur due to failing septic systems and the associated discharges of the sewage effluent into the coastal watersheds in Foley, Alabama including Wolf Creek, Bon Secour River and Magnolia River.

This shall be accomplished by providing financial assistance to eligible residential property owners for the following situations:

1. *Septic system may be rehabilitated through pump outs or field line replacement if no viable public sewer connection.*
2. *Septic system will be converted to a public sewer service if viable gravity connection.*

ELIGIBILITY

The property must meet ALL of the following credentials to qualify for the program:

- ✓ Located in the City of Foley Corporate Limits
- ✓ Existing residential single family dwelling
- ✓ Owner occupied property
- ✓ No current connection to Riviera Wastewater System
- ✓ Have an existing septic system
- ✓ Owner must meet income eligibility requirements for the program
- ✓ Homeowner's Insurance Policy

Income Eligibility & Program Funding

$ *The City of Foley's Annual Media Income (AMI) is $53,817 based on the 2020 Census. Therefore, the funding criteria for the program is defined in the table below:*

Connection to Sewer Line: ($10,000 MAXIMUM)

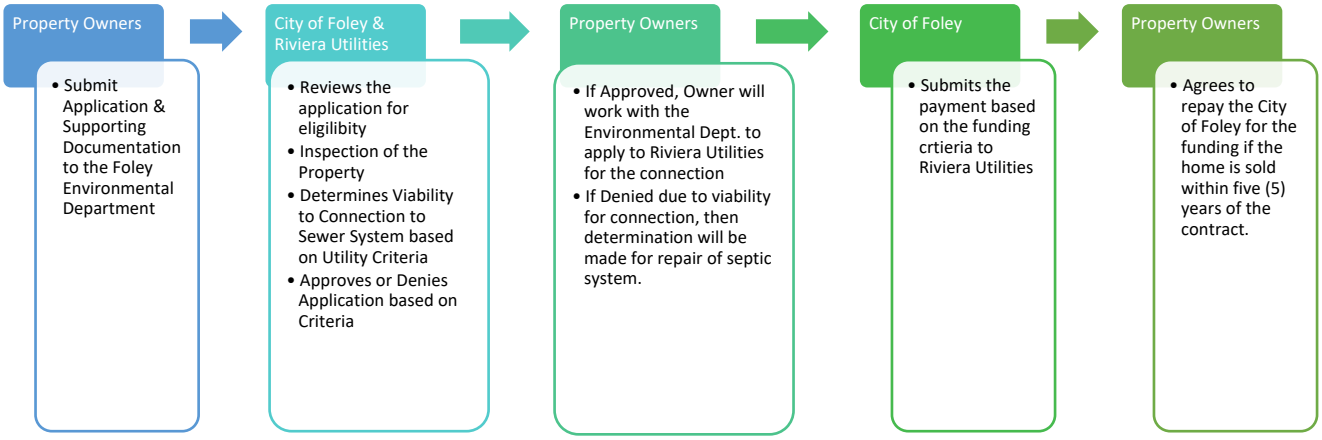
Criteria	AMI through 2025	Percent of Total Cost Funded by the Program
100-120% AMI	$53,818 - $64,580	25%
80-100% AMI	$43,054 - $53,817	50%
0-80% AMI	At or Below $43,053	100%

Repair a Failing Septic System ($5,000 MAXIMUM):

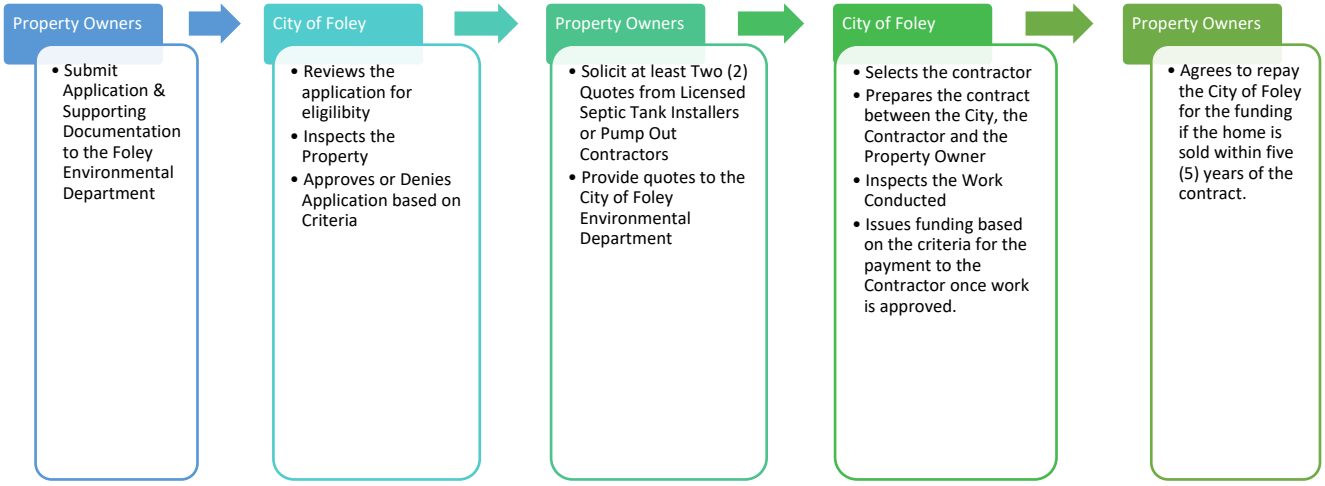
Criteria	AMI through 2025	Percent of Total Cost Funded by the Program
100-120% AMI	$53,818 - $64,580	25%
80-100% AMI	$43,054 - $53,817	75%
0-80% AMI	At or Below $43,053	100%

PROCESS

Connection to Sewer Line: ($10,000 MAXIMUM)



Repair a Failing Septic System ($5,000 MAXIMUM):



Applications will be accepted continuously, but will be processed as funds are available on first come basis.

Submit Your Application Package to the following:

Email: lgahagan@cityoffoley.org

City of Foley Environmental Department
Attn: Leslie Gahagan
23030 Wolf Bay Drive
Foley, AL 36535

Questions: 251-923-4267

SEPTIC SYSTEM REHABILITATION & SEWER CONNECTION PROGRAM

APPLICATION PACKAGE

Foley

CREATE A Clean Water FUTURE

SUBMIT BY EMAIL OR MAIL TO THE FOLLOWING:

lgahagan@cityoffoley.org

City of Foley Environmental Department
Attn: Leslie Gahagan
23030 Wolf Bay Drive
Foley, AL 36535

NOAA

RIVIERA UTILITIES
Serving South Baldwin County

Septic Rehabilitation Program

Checklist

Property Address: _____ **PIN #** _____

Application Document Checklist:

- [ ] Property Owner Application
- [ ] Program Certification Form
- [ ] Household Member Information Form
- [ ] Self-Certification of Annual Income Form

Required Supporting Documentation (Copies are acceptable)

- [ ] Deed to Property
- [ ] Photo ID - Current and Valid
- [ ] Homeowner's Insurance Policy with Declarations Page

Documentation for all Household Members

- [ ] Pay Stubs for last 2 months or 6 most recent & consecutive pay stubs
- [ ] W-2's for the past 2 years or Federal Income Tax Return for past 2 years
- [ ] Photo ID, Legible Copy for each person over 18 years old
- [ ] Documentation of any other source of income

Staff Only

Scheduled Inspection

- [ ] Inspection Date _____
- [ ] Inspection Performed By: _____

Septic Rehabilitation Program **Application**

Property Address: _____ **PIN #** _____

Property Owner's Information:

Name: _____

Mailing Address: _____

Email Address: _____

Phone Number: _____ Cell Number: _____

Property Information:

Square Feet of Property: _____ Square Feet of Residence: _____

# of People in Residence: _____ Age of Septic Tank: _____

Date of Last Pump Out of Septic Tank (if applicable): _____

Mortgage Company Name and Contact Information (if applicable): _____

_____

Insurance Company Name and Contact Information: _____

_____

Insurance Policy #: _____

☐ **I certify that all answers given herin are true and complete to the best of my knowledge. I certify that I am the owner or authorized owner's representative. I authorize investigation and inspections by the City of Foley and Riviera Utilities, as needed.**

Applicant Name Printed: _____

Applicant Signature: _____ Date: _____

Septic Rehabilitation Program

Program Certification Form

Property Address: _____ **PIN #** _____

The undersigned hereby submit this application to the City of Foley (the "City") for the SEPTIC SYSTEM REHABILITATION & SEWER CONNECTION PROGRAM to repair failing septic systems, or to connect to an existing sewer line abutting the property line. The undersigned acknowledges that this application is made pursuant to a program offered by the City and that the eligibility for rehabilitating a septic system or to connect to a sewer line will be determined by the City. The undersigned further agrees to allow and facilitate the work on the property by a licensed contractor or if applicable a licensed designer, approved by the City.

The undersigned agrees that for a minimum of five (5) years following the completion of the improvements, a lien will be placed on the property and recorded in the County Clerk's office. In the event that this property is sold, the City will be repaid the expenses incurred.

The undersigned further agrees that he/she will not discriminate against any person on the basis of race, color, religion, national origin, sex, marital status, physical or mental handicap or age in any aspect of the program and will comply with all applicable Federal, State and Local laws regarding discrimination and equal opportunity in employment, housing, and credit practices, including Title VI of the Civil Rights Act of 1964 and regulations pursuant thereto, Title VIII of the Civil Rights Act of 1968, as amended.

The undersigned understands that failure to comply with SEPTIC SYSTEM REHABILITATION & SEWER CONNECTION PROGRAM requirements may result in recapture by the City for the value of the improvements to the Property. The undersigned certifies under penalty of law that to the best of their knowledge, all statements made in this application and supporting documentation are true and accurate, correct and complete.

Applicant Name (Print): _____

Applicant Signature: _____ Date: _____

All submissions are confidential.

Septic Rehabilitation Program

Household Member Information

Property Address: ______________________________ **PIN #** ____________

Head of Household:

Name: ______________________ Date of Birth: __________ Age: __________

Monthly Income: ________________ Employer: ________________

Employer Contact: ______________________________________

Other Household Members:

Name: ______________________ Date of Birth: __________ Age: __________

Monthly Income: ________________ Employer: ________________

Employer Contact: ______________________________________

Relationship to Head of Household: ____________________________

Name: ______________________ Date of Birth: __________ Age: __________

Monthly Income: ________________ Employer: ________________

Employer Contact: ______________________________________

Relationship to Head of Household: ____________________________

Name: ______________________ Date of Birth: __________ Age: __________

Monthly Income: ________________ Employer: ________________

Employer Contact: ______________________________________

Relationship to Head of Household: ____________________________

Name: ______________________ Date of Birth: __________ Age: __________

Monthly Income: ________________ Employer: ________________

Employer Contact: ______________________________________

Relationship to Head of Household: ____________________________

Name: ______________________ Date of Birth: __________ Age: __________

Monthly Income: ________________ Employer: ________________

Employer Contact: ______________________________________

Relationship to Head of Household: ____________________________

Attach additional page(s), if necessary. All submissions are confidential.

Septic Rehabilitation Program

Self-Certification of Annual Income Form

Property Address: _____ **PIN #** _____

INSTRUCTIONS: This is a written statement from the beneficiary documenting the definition used to determine "Annual (Gross) Income", the number of members in the family or household and the relevant characteristics of each member for the purposes of income determination. To complete this statement, fill in the blank fields below, and check only the boxes that apply to each member and add the Income and Source for each person. In addition to employment, income may also include disability, pension and Social Security. Adult beneficiary members must then sign this statement to certify that the information is complete and accurate and that source documentation will be provided upon request.

Last Name:	First Name:	Income & Source	HH	CH	DIS	19+	62+	<19

HH = Head of Household; CH = Co-Head of Household; DIS = Person with disabilities; 19+ = Person 19 or over; 62+ = Person 62 years of age or older; <19 = Child under the age of 19 years.

Income Information: Annual gross income (total of all members) = $_____

Certification: I/we certify that this information is complete and accurate. I/we agree to provide, upon request, documentation on all income sources to the Program Administrator.

Attach additional page(s), if necessary. All submissions are confidential.

Head of Household

Signature: _____ Date: _____

Other Adults

Signature: _____ Date: _____

Signature: _____ Date: _____

Signature: _____ Date: _____

Signature: _____ Date: _____