FINAL

POND SITING REPORT

Midway Road (CR 712) PD&E STUDY

FROM GLADES CUT OFF ROAD TO SELVITZ ROAD

St. Lucie County, Florida

Financial Project ID No.: 231440-3-22-01

Prepared for:

FLORIDA DEPARTMENT OF TRANSPORTATION

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August 2016

Professional Engineer Certificate

I hereby certify that I am a registered professional engineer in the State of Florida practicing with Inwood Consulting Engineers, Inc., a corporation authorized to operate as an engineering business, FEID No. 59-3216593, by the State of Florida, Department of Professional Regulation, and Board of Professional Engineers. I have reviewed or approved the evaluation, findings, opinions and conclusions as reported in this Pond Siting Report.

The Final Pond Siting Report includes a summary of data collection efforts and design analysis for Midway Road (CR 712) PD&E Study from Glades Cut Off Road to Selvitz Road. I acknowledge that the procedures and references used to develop the results contained in this report are standard to the professional practice of civil engineering as applied through design standards and criteria set forth by the federal, state, and local regulatory agencies as well as professional judgment and experience.

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EXECUTIVE SUMMARY

The Midway Road (CR 712) project corridor is centrally located in the eastern part of St. Lucie County, Florida, and is owned and maintained by St. Lucie County. The project corridor extends approximately 1.6 miles along Midway Road (Roadway ID 94530000), from Glades Cut Off Road (Mile Post 5.813) to Selvitz Road (Mile Post 7.405). The project ties into the existing 4-lane section to the west of Glades Cut Off Road and to future 4-lane segments from Selvitz Road to just east of US Highway 1. The project corridor is located in unincorporated St. Lucie County but is the northern border to the City of Port St. Lucie.

Midway Road (CR 712) is a major east-west roadway that provides a vital connection to residents and commuters to and from Interstate 95 (I-95) to the commercial areas along US 1. Within the project limits, Midway Road (CR 712) is a two-lane undivided roadway with varying speeds, ranging from 35 to 45 miles per hour (mph). It is functionally classified as an Urban Principal Arterial and is designated as a hurricane evacuation route by the Florida Division of Emergency Management. The existing roadway typical section consists of two 12-foot lanes, one in each direction, and the existing right-of-way varies with a minimum width of 70 feet.

The purpose of this Pond Siting Report is to discuss, analyze, and identify the stormwater management plan for the proposed roadway improvements based on environmental impacts, hydrology and hydraulics, and economic factors. This report will evaluate and make recommendations for proposed pond sites as well as existing pond sites identified in South Florida Water Management District (SFWMD) Permits #56-01734-P and #56-00833-S as to their capability to provide adequate treatment and attenuation for the proposed roadway improvements.

Existing Drainage Conditions

The project is in the North Fork sub basin of the St. Lucie Estuary Watershed as defined by the SFWMD. The project traverses two (2) Water Body ID's (WBID) as identified by the Florida Department of Environmental Protection (The first, Tenmile Creek (WBID 3194A) is impaired for fecal coliform, dissolved oxygen, and nutrients with chlorophyll-a as the causative pollutant. The second is St. Lucie River (North Fork) (WBID 3194) and is impaired for mercury, copper, fecal coliform, dissolved oxygen, and nutrients with chlorophyll-a as the causative pollutant. The project area generally flows from north to south and outfalls into Canal C-103 through cross drains along the roadway. Canal C-103 outfalls into North Fork of the St. Lucie River, which ultimately outfalls into the St. Lucie Aquatic Preserve, which is designated as an Outstanding Florida Water (OFW).

There are two existing SFWMD permits along the project limits. The permit for the Midway Road and Glades Cut Off Road Intersection Improvements, ERP No. 56-01734-P, widened Midway Road from LTC Parkway to approximately 700 feet west of the Florida Turnpike Overpass from two to four lanes. The East Basin of the permitted project extends from Glades Cut Off Road to the end of the project, which is within the limits of this study. The second permit within the limits of this study is for the widening of Midway Road from Selvitz to 25th Street, ERP No. 56-00833-S, from two to four lanes and designed the surface water management systems to accommodate a future six lane facility. Basins 1 and 2 of the permitted project fall within the limits of this study. The stormwater runoff from these projects

is collected and conveyed to treatment ponds via roadside ditches and stormsewer systems before outfalling into Canal C-103. There is approximately 875' of untreated Midway Road, including the Turnpike Overpass, between the two permits.

Future Drainage Conditions

The proposed stormwater management systems consists of off-site treatment facilities (new and permitted) that will use both dry pre-treatment ponds and wet detention ponds for water quality treatment of the stormwater runoff. According to SFWMD, treatment must be provided for the greater of one inch (1") of stormwater runoff from the entire developed area, or 2.5 inches of stormwater runoff from the new impervious area. Projects that discharge to OFW shall provide an additional 50% treatment volume and will have at least 0.5" of dry detention pretreatment as part of the required detention. The SFWMD also requires that the post development peak discharge shall be at or below pre-development peak discharge for the 25-year/72-hour storm event. Both wet and dry treatment ponds shall recover one half inch of the detention volume in 24 hours.

The project will be split into four drainage basins within the study limits. The stormwater runoff will be routed to the existing and proposed stormwater management sites for water quality treatment and attenuation in each basin before ultimately out-falling into Canal C-103. Basin A begins at the beginning of the study and extends to approximately 700 feet west of the Florida Turnpike Overpass. The stormwater runoff from this basin will be routed via roadside ditches and stormsewer systems to the existing pond, Pond A, located to the south of Midway Road and east of the Glades Cut Off Road intersection. The existing control structure in this pond will be modified to provide treatment for the additional runoff being conveyed to this pond in the proposed condition. Basin B begins at the end of Basin A and extends to the Florida's Turnpike Overpass. The relatively small basin area will be collected and treated in an offsite stormwater treatment facility, Pond B-2, located south of Canal C-103. The limits of the proposed basins 1 and 2 begin and end at the same locations as the existing condition in order to maintain existing drainage patterns. Pond 1 will be located on a county acquired site on the north side of Midway Road and the existing Pond 2/3 was designed to have enough capacity for the proposed conditions of this study.

Summary

The existing and proposed stormwater management sites have been identified along the project limits. Please note that the recommendations were based on pond sizes and locations determined from preliminary data calculations, reasonable engineering judgment, and assumptions. Stormwater management sizes and configurations may change during final design as more detailed information on SHWT, wetland hydrologic information, and final roadway profile become available.

Table 1 – Pond Siting Summary

Basin Name	Pond Name	Pond Area (Acres)	Roadway Basin Area (Acres)	Required Dry Pre-Treatment (Acre-Feet)	Required Wet Detention (Acre-Feet)	Total Required PAV (Acre-Feet)	Provided Dry Pre-Treatment (Acre-Feet)	Provided Wet Detention (Acre-Feet)	Total Provided PAV (Acre-Feet)
Basin A	***Pond A**	**0.80**	**7.07**	**N/A**	**0.85**	**0.85**	**N/A**	**0.85**	**0.85**
Basin B	Pond B-1	1.85	3.21	0.19	0.39	0.58	0.19	0.39	0.58
Basin B	**Pond B-2**	**1.93**	**3.21**	**0.22**	**0.45**	**0.67**	**0.00**	**0.67**	**0.67**
Basin B	Exfiltration Trench	N/A	3.21	N/A	N/A	0.53	N/A	N/A	0.61
Basin 1	**Pond 1**	**2.92**	**8.45**	**0.46**	**1.11**	**1.57**	**0.78**	**0.79**	**1.57**
Basin 2/3	***Pond 2/3**	**5.55**	**24.66**	**1.26**	**4.29**	**5.55**	**1.17**	**5.23**	**6.40**
Total (Recommended)		**11.20**	**43.39**	**1.94**	**6.70**	**8.64**	**1.95**	**7.54**	**9.49**

Bold denotes recommended option

*Existing Ponds

SECTION 1 INTRODUCTION

The Florida Department of Transportation (FDOT), District Four, is proposing to widen Midway Road (CR 712) from Glades Cut Off Road to Selvitz Road in St. Lucie County, Florida. The project limits include one bridge over the Florida Turnpike (Bridge ID# 940050) and Canal C-103 that runs parallel to Midway Road within the limits of the project. The improvements consist of widening Midway Road from two to four 11-foot lanes and include 7-foot buffered bike lanes, curb and gutter, a raised median, a 6-foot sidewalk on the north and a 12-foot shared use path on the south. There are two alternatives being investigated to accomplish the widening. The first alternative (Alternative 1) is to shift the alignment to the north and avoid impacting the canal. The second alternative (Alternative 2) is widen to the south and enclose Canal C-103 with a box culvert that will be an extension to the box culvert under construction for the adjacent segment.

The project site is located within Section 1 of Township 36 South, Range 39 East and Section 6 of Township 36 South, Range 40 East. The project is in the North Fork sub basin of the St. Lucie Estuary Watershed as defined by the South Florida Water Management District (SFWMD). The project traverses two (2) Water Body ID's (WBID) as identified by the Florida Department of Environmental Protection (FDEP). The project area generally flows from north to south and outfalls into Canal C-103 through cross drains along the roadway. Canal C-103 outfalls into North Fork of the St. Lucie River, which ultimately outfalls into the St. Lucie Aquatic Preserve, which is designated as an Outstanding Florida Water (OFW).

Within the project limits there are two existing permits, one is for the intersection improvements at Glades Cut Off Road and LTC Parkway, which widens Midway Road from two to four lanes just west of the Turnpike and the second permit is for widening Midway Road from Selvitz Road to 25th Street from two to four lanes and accommodates a future 6 lane facility between the Turnpike and 25th Street.

The purpose of this Pond Siting Report is to discuss, analyze, and identify the stormwater management plan for the proposed roadway improvements based on environmental impacts, hydrology and hydraulics, and economic factors. This report will evaluate and make recommendations for proposed pond sites as well as existing pond sites identified in SFWMD Permits #56-01734-P and #56-00833-S as to their capability to provide adequate treatment and attenuation for the proposed roadway improvements.

SECTION 2 PROJECT DESCRIPTION

The Midway Road/County Road (CR) 712 project corridor is centrally located in the eastern part of St. Lucie County, Florida, and is owned and maintained by St. Lucie County. The project corridor extends approximately 1.6 miles along Midway Road (Roadway ID 94530000), from Glades Cut Off Road (Mile Post 5.813) to Selvitz Road (Mile Post 7.405). The project ties into the existing 4-lane section to the west of Glades Cut Off Road and to future 4-lane segments from Selvitz Road to just east of US Highway 1. The project corridor is located in unincorporated St. Lucie County but is the northern border to the City of Port St. Lucie. Please refer to the **Project Location Map**, **Exhibit 1** in **Appendix 1**.

Midway Road (CR 712) is a major east-west roadway that provides a vital connection to residents and commuters to and from Interstate 95 (I-95) to the commercial areas along US 1. Within the project limits, Midway Road (CR 712) is a two-lane undivided roadway with a varying posted speed from 35 to 45 miles per hour (mph). It is functionally classified as an Urban Principal Arterial and is designated as a hurricane evacuation route by the Florida Division of Emergency Management. The existing roadway typical section consists of two 12-foot lanes, one in each direction, and the existing right-of-way varies with a minimum width of 70 feet. The land uses consist of residential, commercial, government, and industrial facilities, such as Tropicana Products, Inc., CEMEX, Packers of Indian River Ltd., US Post Office, St. Lucie County Sheriff's Office, and New Horizons of the Treasure Coast, Inc.

The study corridor includes a bridge (ID 940050) over Florida's Turnpike (SR 91). The Florida East Coast (FEC) railroad traverses the corridor by running adjacent and parallel to the Glades Cut Off Road. Canal C-103, which was previously part of the St. Lucie Water Control District, but has since been transferred to St. Lucie County, is the principal receiving water body for the project area and conveys stormwater from the west side of Florida's Turnpike through an existing concrete box culvert. The canal runs parallel along the south side of Midway Road (CR 712) and, after Selvitz Road, it diverges and continues southeasterly to discharge into the North Fork of the St. Lucie River. The North Fork is designated as an Outstanding Florida Water and an Aquatic Preserve. It is the main collector water body in St. Lucie County and discharges into the Indian River Lagoon. The canal, along with the adjacent vegetative buffer, provides a physical separation to the residential homes on the south side.

The Midway Road/CR 712 Project Development & Environment (PD&E) Study from Glades Cut Off Road to Selvitz Road will evaluate alternatives to widen the existing road from two to four lanes within the project limits in order to satisfy future traffic demand and capacity needs. The proposed study will also consider pedestrian, bicycle, and transit facilities and improvements to freight mobility, and it will evaluate operational improvements and access management into some commercial businesses along the project corridor. Additional right-of-way requirements have been evaluated during the PD&E study for offsite ponds in order to meet stormwater management requirements.

2.1 Purpose and Need

Based on recent traffic data from St. Lucie County, the facility does not adequately handle the existing traffic demand. Without capacity improvements, the traffic operations along the corridor will continue to deteriorate. The primary purpose for this project is to provide additional capacity to meet existing and future traffic needs, improve safety by alleviating existing roadway and capacity deficiencies, and allow opportunities for pedestrian, bicycle, and transit facilities. The additional capacity will also improve freight mobility and enhance emergency evacuation along the project corridor. The purpose and need of this project are further described below and include Transportation Demand, Capacity, Plan Consistency, Social Demands and Economic Development, Modal Interrelationships, and Roadway Deficiencies.

2.1.1 Transportation Demand

The US Census-designated Port St. Lucie-Fort Pierce Metropolitan Statistical Area has been identified as one of the fastest growing metropolitan areas in Florida, which includes all of Martin and St. Lucie counties. From 2000 to 2010, this metropolitan area has experienced population growth from 319,426 persons in 2000 to 424,107 persons in 2010, representing an annual increase of 2.9%. Evaluating the population growth for the City of Port St. Lucie by itself revealed an even greater percentage increase. According to the Bureau of Economic and Business Research, the City has grown from a population of 88,769 in 2000 to 164,603 in 2010, representing an annual increase of 6.4%.

This rapid population growth has resulted in a significant increase in surface transportation demand along major arterials such as the Midway Road (CR 712) corridor. The population of the Port St. Lucie-Fort Pierce metropolitan area is projected to increase from 424,107 persons in year 2010 to 648,600 persons in year 2035, representing a growth of approximately 53% (Bureau of Economic Business Research).

As the population in the metropolitan area continues to increase, the developments in St. Lucie County will continue to push westward. In addition, the county is anticipated to experience traffic growth from the Developments of Regional Impact (DRI). A review of the recent DRI applications in the Treasure Coast Regional Planning Council shows the following statuses for the DRIs in the vicinity of the project corridor:

- Completed - Orange Blossom Mall and St. Lucie West
- Approved - The Reserve
- Pending Notice of Proposed Change - LTC Ranch
- Withdrawn - Provences and Orchard Park

The DRI located along Midway Road (CR 712), which is LTC Ranch, would have the greatest impact on the project corridor if constructed. As currently approved, the development includes 4,000 dwelling units of residential, over 1,505,000 square feet (sq. ft.) of office space, 725,000 sq. ft. of retail, and 1,960,200 sq. ft. of industrial space. However, the status of this development is pending Notice of Proposed Change that may result in a change in the size of the approved development.

The approval of the LTC Ranch DRI will further increase the transportation demand resulting in congested conditions along the project corridor. Since Midway Road (CR 712) is one of the vital east-west corridors in St. Lucie County, it is critical to increase capacity to meet the anticipated future transportation demand.

2.1.2 Capacity

Traffic data obtained from the St. Lucie County Transportation Planning Organization (TPO) Traffic Counts and Level of Service Report shows that the 2012 Annual Average Daily Traffic (AADT) along Midway Road (CR 712) west of Selvitz Road is 16,820 vehicles. Evaluating this traffic data using the 2012 FDOT Quality/Level of Service Handbook, the LOS is F which is beyond the St. Lucie County's adopted LOS criteria of E. This traffic data shows that the existing volume is already exceeding the capacity of the corridor which indicates that the roadway is operating in oversaturated and undesirable conditions. Furthermore, due to the industrial properties along the corridor, it has a high truck percentage at over 7% (Florida Traffic Online).

The traffic is anticipated to increase to 29,200 AADT by 2040 and the corridor will continue to operate at LOS F with degraded traffic operation unless the capacity is increased. The future traffic projections are based on the FDOT District Four Design Traffic Technical Memorandum for the I-95 PD&E Study from north of Becker Road to south of SR 70. This project utilized the Greater Treasure Coast Regional Planning Model as the basis for the future traffic projections. Without improvements, the congestion on the Midway Road (CR 712) project corridor will continue to operate at unacceptable driving conditions for residents and commuters due to the increased traffic volumes.

2.1.3 Plan Consistency

Martin and St. Lucie counties have independent Metropolitan Planning Organization/Transportation Planning Organization (MPO/TPO) but share a common Regional Long Range Transportation Plan (RLRTP). The RLRTP establishes a unified strategy for transportation priorities and funding and creates a joint decision-making process regarding regional transportation issues.

The Midway Road (CR 712) project corridor extends from Glades Cut Off Road to Selvitz Road and is identified in the Martin and St. Lucie 2035 RLRTP. The project is identified in the St. Lucie County TPO 2035 Cost Feasible Plan (2016-2035) with a 2021-2025 implementation horizon. In addition, the project will be included in the next update to the State Transportation Improvement Program and the St. Lucie TPO Transportation Improvement Program. It should be noted that on the south side of the project corridor a multipurpose trail has been identified in the 2035 RLRTP in Table 4-9 of the Needs Plan Development.

2.1.4 Social Demands & Economic Development

Evacuation: Serving as part of the evacuation route network established by the Florida Division of Emergency Management, Midway Road (CR 712) plays an important role in facilitating traffic during emergency evacuation periods as it connects other major highways and arterials designated on the state evacuation route network within the project limits. These facilities include Okeechobee Road (SR 70), I-95, Glades Cut Off Road (CR 709), Selvitz Road, South 25th Street (CR 615), Oleander Avenue (CR 605), and US 1. During a twelve-month period in 2004-2005, St. Lucie County was hit directly by three major hurricanes. Midway Road (CR 712) is one of the county's most critical east-west routes and serves as a vital evacuation route for hurricanes or any other disasters. Additionally, widening Midway Road (CR 712) will ease traffic flow between South 25th Street and I-95, which will minimize a bottleneck effect during an emergency. It would also improve the ability of the local emergency management organization to evacuate large portions of the Treasure Coast in an acceptable timeframe which will enhance the safety of residents.

Economic Development: The Treasure Coast Planning Council Alternative Infill Development Plan developed for Martin and St. Lucie counties has identified several regional workplace districts located along the Midway Road (CR 712) corridor. These regional workplace districts are locations where business and economic development would be focused in order to provide jobs for residents within this metropolitan area. The Midway Road (CR 712) project area is a high-growth area. Important state and federal offices and nonprofit centers are located along Midway Road (CR 712) or nearby streets. This includes the main St. Lucie County Branch of the US Post Office, St. Lucie County Sheriff's Office, St. Lucie County Health Department, St. Lucie

County Fire District Office, Hospice of the Treasure Coast, and New Horizons of the Treasure Coast, Inc. (a mental health center which is currently expanding). Significant truck traffic from the nearby St. Lucie County Landfill, CEMEX, Packers of Indian River Ltd., and Tropicana Products, Inc. place additional demands on the roadway. Meanwhile, new residential units are planned nearby. The St. Lucie County Fairgrounds, the County's Emergency Operations Center, is just six miles west of the project site.

According to the Martin and St. Lucie 2035 RLRTP, "The Regional Workplace Districts in St. Lucie County are located along the I-95 and Florida's Turnpike corridors and include the Treasure Coast Education Research Development Authority (TCERDA) area; the Crossroads Park of Commerce; the existing Rinker and Tropicana facilities along Glades Cut Off Road; the LTC Ranch Commerce Park; St. Lucie West Commerce Park; and Torrey Pines Institute south of Tradition and Gatlin Boulevard. These districts are well-situated for regional access, have ample room to grow, and can provide jobs for local residents." The Midway Road (CR 712) project corridor is anticipated to serve as the main transportation corridor linking residents of both Martin and St. Lucie counties to this business area. Increasing the capacity along the project corridor will improve mobility and support the economic development of these districts as well as stimulate major construction activities that will contribute to economic growth within this area.

2.1.5 Modal Interrelationships

The accessibility to bicyclists and pedestrians along the corridor is minimal with only two sections of sidewalk within the corridor. They are located on the north side of Midway Road (CR 712) from East Torino Boulevard to Glades Cut Off Road and along the frontage of the recently constructed New Horizons medical facility. There are no bicycle lanes. During an initial field review (February 7, 2014), pedestrians were noted walking on the grassed shoulder while pushing a child's stroller. Additionally, the existing bridge over the Florida's Turnpike does not have sufficient shoulder width to accommodate pedestrian or bicycle traffic. A review of the Martin and St. Lucie 2035 RLRTP identified a multipurpose trail in Table 4-9 of the Needs Development Plan that would run along the entirety of Midway Road (CR 712) to connect with the other proposed multipurpose trails located on Okeechobee Road, Shin Road, Glades Cut Off Road, Selvitz Road, and Midway Road to the east.

The 2035 Future Bus and Train Network identified a proposed bus route along the entirety of Midway Road (CR 712) to connect to existing bus routes. Moreover, the County's Transit Development Plan from February 2014 identified Midway Road (CR 712) as a priority corridor to implement transit. The project will create opportunities to include pedestrian, bicycle, and transit facilities along the project corridor.

2.1.6 Roadway Deficiencies

The Midway Road (CR 712) bridge structure (ID 940050) over the Florida's Turnpike is located at Mile Post 6.346 and was constructed in 1957. The last inspection of the bridge was performed on December 19, 2013. Although the report notes no structural deficiencies, the bridge is classified as Functionally Obsolete.

2.2 Alternatives Considered

Three build alternatives, including the Transportation System Management and Operations (TSMO) alternative, were developed and considered during the preliminary engineering phase of this study. The No-Build Alternative, TSMO Alternatives, and Build Alternative 1 (Canal Avoidance) and Alternative 2 (Box Culvert) are described below.

2.2.1 No-Build Alternative

No improvements are made to Midway Road (CR 712) within the limits of the study.

2.2.2 Build Alternatives

2.2.2.1 Transportation System Management and Operations (TSMO) Alternatives

TSMO alternatives involve improvements designed to maximize the utilization and efficiency of the existing facility through improved system and demand management. The various TSMO options generally include traffic signal and intersection improvements, access management, and transit improvements. The additional capacity required to meet the projected traffic volumes along Midway Road (CR 712) in the design year cannot be provided solely through the implementation of TSMO improvements.

2.2.2.2 Build Alternative 1 (Canal Avoidance)

The typical section includes two, 11-foot travel lanes in each direction separated by a 22-foot median. Seven-foot buffered bike lanes would be provided in each direction located adjacent to the outside travel lanes. Type F curb and gutter is used along the inside and outside lanes and collects stormwater runoff which is then directed to stormwater retention ponds. A six-foot wide sidewalk would be provided on the north side of the roadway, and a 12-foot-wide shared-use path would be provided along the south side of the roadway. The alignment for this alternative would shift to the north to avoid impacts to Canal C-103. This typical section requires a minimum of 153 feet of right-of-way. Since the existing County right-of-way width varies between 107 feet and 153 feet, from zero feet up to 46 feet of right-of-way would need to be acquired along the north side of the roadway. The design speed for this typical section would be 45 mph. Please refer to the **Proposed Typical Sections in Appendix 1, Exhibit 2A**.

2.2.2.3 Build Alternative 2 (Box Culvert)

The roadway and pedestrian features of the typical section for this alternative are similar to Alternative 1 except that Canal C-103 would be enclosed with a box culvert. The canal is located within right-of-way owned by both St. Lucie County and the City of Port St. Lucie. This typical section requires a minimum of 160 feet of right-of-way. Approximately 25 feet to 32.5 feet of right-of-way would need to be acquired from the City of Port St. Lucie along the south side of the roadway. Additionally, up to 28 feet of right-of-way would need to be acquired along the north side of the roadway. The design speed for this typical section would be 45 mph. Please refer to the **Proposed Typical Sections in Appendix 1, Exhibit 2B**.

SECTION 3 DESIGN CRITERIA

The design of the stormwater management facilities for the project is governed by the rules set forth by the SFWMD and FDOT. Water quality treatment and attenuation requirements will comply with the guidelines as defined in Chapter 40D-4 of the Florida Administration Code (F.A.C) and the SFWMD ERP manual. Please refer to **Appendix 2** for the **Drainage Design Criteria Matrix** compiled from SFWMD, FDOT, and St. Lucie County criterion and used for this project. For contingency purposes, the proposed ponds were upsized twenty percent (20%).

Dry pre-treatment and wet detention ponds will provide for water quality improvements as well as water quantity attenuation for the project runoff. Please refer to the summary below for the water quality, water quantity, and retention pond facilities configuration criterion used for the project:

- **Water Quality** – Treatment will be provided for one inch (1") over the entire developed area or 2.5" over the new impervious area, whichever is greater. The project limits traverse the Tenmile Creek (WBID 3194A) and the North Fork St. Lucie River (WBID 3194) limits and ultimately outfalls to the St. Lucie Aquatic Preserve, which is an Outstanding Florida Water (OFW). Projects that are over 40% impervious and discharge to an OFW are required to provide an additional fifty percent (50%) treatment volume and one half inch (1/2") of dry retention pretreatment as part of the required detention.

- **Water Quantity** – The SFWMD requires that the post development peak discharge shall be at or below pre-development peak discharge for the 25-year/72-hour storm event.

- **Wet Detention Pond Facilities Configuration** – The proposed pond shall have a minimum area of 0.5 acre and 100 feet minimum width for linear areas in excess of 200 feet length (measured at the control elevation). The pond will include a 20-foot maintenance berm width (15-foot minimum), minimum 1:4 (Vertical:Horizontal) for pond side slopes and tie up/down slopes to existing ground, and a minimum 1-foot freeboard from the inside maintenance berm to the Design High Water (DHW) stage. The pond area shall be 0.5 acres at the control elevation. The littoral area shall be shallower than 6 feet as measured from below the control elevation. The minimum shallow, littoral area shall be the lesser of 20 percent of the wet detention area or 2.5 percent of the total of the detention area (including side slopes) plus the basin contributing area.

- **Dry Pre-Treatment Pond Facilities Configuration** – The proposed pond shall of a minimum surface area equal to the greater of 6 square feet or 5% of the total retention area. The pond shall have a minimum depth of 2 feet, a maximum depth of 4 feet, and a minimum width of 1 foot.

Coordination with SFWMD to see if dry pre-treatment can be waived if economically feasible is recommended since the project is not directly discharging to the St. Lucie Aquatic Preserve. However, for this study the dry pre-treatment requirements were included for the proposed ponds.

SECTION 4 DATA COLLECTION

The design team collected and reviewed data from the following sources:

- FDOT Drainage Manual, January 2016
- FDOT Drainage Handbook – Hydrology, February 2012
- FDOT Drainage Handbook – Stormwater Management Facility, January 2004
- SFWMD Permit No. 56-01734-P, Midway and Glades Cut-Off Road Intersection Improvements
- SFWMD Permit No. 56-00833-S, Midway Road Widening (Selvitz to 25th Street)
- SFWMD Environmental Resource Permit Information Manual, 2013
- National Flood Insurance Program (NFIP) Flood Insurance Rate Map (FIRM), Panels No. Nos. 12111C0169J, 12111C0188J, 12111C0260J, and 12111C0276J, St. Lucie County, Florida dated February 16, 2012
- U.S. Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS) Soil Survey of St. Lucie County, Florida, 1980
- USDA NRCS Soil Survey Geographic (SSURGO) Database from SFWMD, 2010
- United States Geological Survey (USGS) Quadrangle Maps
- St. Lucie County Property Appraiser's Website (GIS parcel lines), 2012
- Field Reconnaissance (August 2015)

SECTION 5 EXISTING SITE CONDITIONS

5.1 TOPOGRAPHY & HYDROLOGIC FEATURES

The topography of the project area is relatively flat with elevations ranging from a high of approximately 21 feet to a low of 15 feet NAVD 88. Please refer to the **USGS Quadrangle Map**, **Exhibit 3** in **Appendix 1**. There are eight existing cross drains and 1 existing bridge within the project limits. The cross drains allow for conveyance of offsite and onsite runoff to Canal C-103, which runs along the project length. The majority of the cross drains act as outfalls for the stormwater treatment facilities of the properties on the north side of Midway Road. It will need to be determined during design if these cross drains will need to be extended or replaced. Please refer to **Table 2** for a **Summary of Existing Cross Drains and Bridges**.

Table 2 – Summary of Existing Cross Drains and Bridges

Structure Number	Station	Description
CD-1A	193+90	30" RCP
CD-2A	210+30	Double 18" RCP

Structure Number	Station	Description
Bridge ID #940050	217+57 to 220+24	52' Bridge over Florida's Turnpike
CD-100	227+30	36" CMP
CD-200	247+20	Double 24" RCP
CD-Police	251+10	24" CMP
CD-201	261+25	24" CMP
CD-202	266+00	18" Pipe
CD-203	274+50	Double 24" Pipe

5.1.1 SOILS DATA & GEOTECHNICAL INVESTIGATIONS

The Soil Survey of St. Lucie County Area, Florida, published by the USDA NRCS (dated 1980) has been reviewed for the project vicinity. According to the soil survey there are four (4) different soil types encountered along the project limits and are classified as Hydrological Soil Group (HSG) B/D and C/D soils. These types of soils are very poorly drained or poorly drained soils with high water tables. Please refer to the **NRCS Soils Map**, **Exhibit 4** in **Appendix 1**. **Table 3 – USDA NRCS Soil Survey Information** summarizes and lists the soil types and relevant information. The ground water is at a depth of 0.0' – 1.0' below the existing ground throughout the majority of the project.

Table 3 – USDA NRCS Soil Survey Information

Soil No.	St. Lucie County USDA Soil Name	Seasonal High Ground Water		HSG	Soil Classification		
		Depth (feet)	Duration (months)		Depth (inches)	Unified	AASHTO
25	NETTLES AND OLDSMAR SANDS	0.0-1.0	Jun-Oct	B/D	0-8 8-33 33-39 39-55 55-90	SP, SP-SM SP, SP-SM SP-SM, SM SP-SM, SM SM, SM-SC	A-3 A-3 A-3, A-2-4 A-3, A-2-4 A-2-4
31	PEPPER EAUGALLIE SANDS	0.0 -1.0	Jun-Oct	C/D	0-6 6-23 23-33 33-57 57-99	SP, SP-SM SP, SP-SM SP-SM, SM SP-SM, SM SM, SM-SC	A-3 A-3 A-3, A-2-4 A-3, A-2-4 A-2-4
48	WABASSO SAND	0.0 -1.0	Jun-Oct	B/D	0-25 25-34 34-60 60-80	SP, SP-SM SP-SM, SM, SP SC, SM-SC, SM SP-SM, SM	A-3 A-3, A-2-4 A-2-4, A-2-6 A-3, A-2-4
50	WAVELAND AND IMMOKALEE FINE SANDS	0.0 -1.0	Jun-Oct	B/D	0-4 4-32 32-40 40-53 53-66 66-81	SP, SP-SM SP SP-SM, SM SP-SM, SM SP-SM, SM SP-SM	A-3 A-3 A-2-4 A-2-4 A-3, A-2-4 A-3, A-2-4

5.2 ENVIRONMENTAL CHARACTERISTICS

5.2.1 Land Use Data

The project corridor is a mixture of Industrial, Commercial, and Public Facilities land uses to the north and Canal C-103 separates the project from the residential developments to the south. The proposed widening will not alter any existing or future land uses in the area. Please see **Exhibit 5** for the **Future Land Use Map** in **Appendix 1.**

5.2.2 Cultural Features

Cultural features preserve and enhance the cultural nature of a community and include parks, schools, churches and other religious institutions. Also included are historic sites, archaeologically significant sites and neighborhood gathering places. Community services include facilities that provide necessary services such as fire stations, police stations, public and private schools, hospitals, cemeteries, public buildings, and civic facilities. The Cultural Resource Assessment Report did not find any previously recorded historic resources within the area of potential effect (APE). Additional information regarding cultural features can be found in **Appendix 7 – Cultural Resource Assessment Report.**

5.2.3 Natural and Biological Features

The identification of Wetlands has been investigated and is included within the **Wetland Evaluation Report** located in **Appendix 8.** Pond alternative recommendations will be based on avoidance of wetland impacts whenever possible. Based on the protected species data collection and field reviews it was determined that the stormwater management facilities will have minimal impacts to protected species. Pond A and Pond 2/3 are constructed stormwater ponds and do not provide habitat for any protected species. The alternative pond sites for Basin B do not contain any wetlands or provide habitat for protected species. The site for pond 1 contains fresh water marsh that potentially provide foraging habitat for protected species However, the proposed stormwater pond will be shaped to avoid impacts to the existing marsh, minimizing impacts to the potential habitat. More information regarding **Protected Species** is located in **Appendix 9.**

5.2.4 Contamination Screening

A Contamination Screening Evaluation Report (CSER) was performed for the potential pond areas for the study. The CSER study area included a 500 foot envelope beyond the project corridor and pond areas and a 1000 foot envelope for solid waste facilities. The risk rankings for the recommended pond sites vary from "medium" to "low" with Pond B-2 having a risk ranking of "medium" and Ponds A, B-1, 1, 2/3, and the exfiltration trench having a risk ranking of "low." There is no additional work recommended for the sites with a risk ranking of "low." A Level 2 field screening for Pond B-2 is recommended because of its risk ranking of "medium" and required purchase of new right-of-way. More information regarding contamination screening can be found in **Appendix 10 – Contamination Screening Evaluation Report.**

5.3 EXISTING DRAINAGE CONDITIONS

5.3.1 Existing Conditions

The project is in the North Fork sub basin of the St. Lucie Estuary Watershed as defined by the SFWMD. This project also lies within the jurisdiction of the North St. Lucie River Water Control District (NSLRWCD). The project traverses two (2) Water Body ID's (WBID) as identified by the Florida Department of Environmental Protection (FDEP). The first, Tenmile Creek (WBID 3194A) is impaired for fecal coliform, dissolved oxygen, and nutrients with chlorophyll-a as the causative pollutant. The second is St. Lucie River (North Fork) (WBID 3194) and is impaired for mercury, copper, fecal coliform, dissolved oxygen, and nutrients with chlorophyll-a as the causative pollutant. The project area generally flows from north to south and outfalls into Canal C-103 through cross drains along the roadway. Canal C-103 outfalls into North Fork of the St. Lucie River, which ultimately outfalls into the St. Lucie Aquatic Preserve, which is designated as an Outstanding Florida Water (OFW).

There are two existing SFWMD permits along the project limits. The permit for the Midway Road and Glades Cut Off Road Intersection Improvements, ERP No. 56-01734-P, proposed widening Midway Road from LTC Parkway to approximately 700 feet west of the Florida Turnpike Overpass from two to four lanes. The East Basin of the permitted project extends from Glades Cut Off Road to the end of the project, which is within the limits of this study. The second permit within the limits of this study is for the widening of Midway Road from Selvitz to 25th Street, ERP No. 56-00833-S, from two to four lanes and designed the surface water management systems to accommodate a future six lane facility. Basins 1 and 2 of the permitted project fall within the limits of this study. There is approximately 875' of untreated Midway Road, including the Turnpike Overpass, between the two permits. The limits of the basins are shown in **Table 4 - Summary of Existing Drainage Basins** and are also included on the **Pre-Development Basin Maps** in **Appendix 5.**

Table 4 – Summary of Existing Drainage Basins

Basin Name	From Station	To Station	Outfall Location
East	191+40	210+25	Canal C-103
Untreated	210+25	219+00	Canal C-103
1	219+00	242+00	Canal C-103
2	242+00	275+00	Canal C-103

5.3.1.1 Basin A

The East Basin of permit number 56-01734-P, designated Basin A for this study, begins at Glades Cut Off Road (Station 191+40) and continues east towards the Florida's Turnpike Overpass (Station 210+25). Stormwater runoff from the basin is collected and conveyed via roadside ditches and a storm sewer system to an existing permitted treatment pond (Pond 2) on the south side of Canal C-103. Pond 2 outfalls directly to Canal C-103 through a control structure on the north side of the pond. The permitted pond provides 0.60 acre-feet of treatment volume for the basin, equivalent to 2.5" over the impervious area. The treatment

pond does not provide the additional 50% treatment volume for OFW criteria. The total storage available within the pond, 1-foot below the inside pond berm, is 1.83 acre-feet.

5.3.1.2 Untreated Roadway

Midway Road between the end of the East Basin of permit number 56-01734-P (Station 210+25) and the beginning of Basin 1 of permit number 56-00833-S (Station 219+00) is currently untreated. The runoff from the existing two lane roadway and the west half of the Turnpike Overpass sheet flows into existing roadside swales and discharges to Canal C-103 either directly or through cross drains under Midway Road.

5.3.1.3 Basin 1

Basin 1 begins at the Florida's Turnpike Overpass (Station 219+00) and at Post Office Road (Station 242+00). Basin 1 was originally included under the design of the adjacent segment of Midway Road (permit number 56-00833-S), beginning at Florida's Turnpike, however, the begin project and construction limit was moved to Selvitz Road and thus, Basin 1 was removed from the permitted segment. It should be noted though that a pond (Pond 1) was analyzed to provide treatment and attenuation for this basin. The FDOT District 4 pond siting process was followed to identify the pond site, which was then purchased by St. Lucie County. Documentation regarding the pond siting process is included in **Appendix 12**. In the existing condition stormwater runoff flows from west to east and outfalls into Canal C-103 through an existing cross drain located just west of Corporate Way (Station 227+30). The parcel for Pond 1 has already been acquired by the county and is located on the north side of the project. The treatment facility for this basin was sized for a future six lane roadway and the parcel will be able to fit a treatment facility designed for the proposed four lane roadway from this study.

5.3.1.4 Basin 2

Basin 2 begins at Post Office Road (Station 242+00) and extends to the end of the study limits at Selvitz Road (Station 275+00). Basin 2 shares a stormwater treatment facility (Pond 2/3) with Basin 3 (Station 275+00 to Station 310+00) of the permitted project. Pond 2/3 is located south of Midway Road, east of Christensen Road and also provides treatment for approximately 2000' of Selvitz Road. Approximately 2,170 feet of Basin 2 was removed from the design plans prior to permitting due to the change in project limits. The constructed portion of Basin 2 for the permitted project begins at Station 260+70. Pond 2/3 was constructed to provide stormwater treatment for the original design and includes all of Basin 2 (Station 239+00 to Station 275+00). The existing treatment facility was designed for a future six lane roadway and provides excess treatment for the four lane roadway that is proposed on this project. The treatment facility provides 1.17 acre-feet of dry pre-treatment volume and 5.26 acre-feet of wet detention treatment volume, totaling 6.43 acre-feet of treatment volume. The stormwater management facility will be able to handle the proposed improvements from this study.

5.3.2 FLOODPLAINS/FLOODWAYS

The Federal Emergency Management Agency (FEMA) has developed a Flood Insurance Rate Map (FIRM) for the study area. The relevant FIRM panel numbers are 12111C0169J, 12111C0188J, 12111C0260J and 12111C0276J, for St. Lucie County, Florida dated February 16,

2012. The project is designated Zone X and will not have any floodplain impacts. Please see the **FEMA Map in Appendix 1, Exhibit 6**.

SECTION 6 PROPOSED DRAINAGE CONDITIONS

The stormwater runoff from the project limits will be collected and conveyed in closed drainage systems consisting of curb and gutter, inlets, and pipes to the offsite stormwater ponds. The ponds will discharge to Canal C-103 similar to the existing condition. Water quality treatment and water quantity attenuation for the proposed roadway improvements will be provided in the stormwater ponds.

6.1 OVERVIEW

6.1.1 Stormwater Ponds

The project will be split into four drainage basins within the study limits. Stormwater runoff will be routed to the existing and proposed stormwater ponds for water quality treatment and attenuation before ultimately out-falling into Canal C-103. Pond A was previously permitted under Permit #56-01734-P and has additional storage available within the pond. It is expected that the available storage will be able to accommodate the proposed improvements of this study by modifying the control structure within the pond. Basin B and Basin 1 will be treated by proposed stormwater treatment facilities. Pond 2/3 was also previously designed and permitted (Permit #56-00833-S) to treat and attenuate the future six (6) lane condition of the roadway. Therefore, it is expected the pond will be able to accommodate the proposed conditions of this study and will not require any modifications to the design. Please refer to **Post-Development Basin Maps** in **Appendix 5** for the pond locations and the offsite drainage basin areas. **Table 5 – Summary of Proposed Drainage Basins** provides a summary of the proposed basin limits and their outfall locations.

Table 5 – Summary of Proposed Drainage Basins

Basin Name	From Station	To Station	Outfall Location
A	191+40	210+25	Canal C-103
B	210+25	219+00	Canal C-103
1	219+00	242+00	Canal C-103
2	242+00	275+00	Canal C-103

6.2 METHODOLOGY OF POND DETERMINATION

Based on the available information, only the hydraulically feasible and environmentally permissible alternative pond sites are considered. Alternative pond sites are analyzed and evaluated for the following parameters:

- Hydrologic and hydraulic factors such as existing ground elevation, soil types, estimated Seasonal High Water Table (SHWT) established by a review of the USDA NRCS soils and

geotechnical investigations, stormwater conveyance feasibility, allowable hydraulic grade line (HGL), and basin outfalls;

- Environmental resource impacts including wetlands and threatened or endangered species;
- Floodplain impacts;
- Major utility conflict potential;
- Estimated right-of-way acquisition;
- Impacts to cultural resources; and
- Hazardous materials and contamination

Because there are existing permitted ponds or previously identified pond sites that already treat and attenuate Midway Road, this study evaluates these sites to accommodate the proposed roadway improvements as part of this study. For contingency purposes, the proposed ponds were upsized twenty percent (20%). Please note that the information for environmental impacts, hazardous materials contamination impacts, estimated SHWT, and cultural resources impacts are included in **Appendices 7 through 10**. All the information were gathered and in incorporated into the **Engineering Analysis Matrix in Appendix 4**.

6.3 STORMWATER POND EVALUATION

6.3.1 Basin A

Basin A will maintain the same limits as the permitted conditions, beginning at Glades Cut Off Road at Station 191+40 and ending at Station 210+25. The basin area is flat and made up of poorly drained Wabasso, Nettles and Oldsmar sands. The ground elevations within the basin range from 15 feet to 21 feet NAVD. There is an existing pond, Pond A, that currently provides treatment for the basin and it is located south of Canal C-103 and east of Glades Cut Off Road, abutting some residential homes. Pond A is permitted as Pond 2 under SFWMD Permit 56-01734-P, but has been renamed for this study to avoid confusion with the basin and pond name designated for SFWMD Permit 56-00833-S. Pond A is a wet pond with a permitted control elevation of 16.02 feet NAVD. The pond currently provides 0.60 acre-feet of treatment volume meeting the SFWMD treatment criteria of 2.5" over the impervious area for the basin, however, it does not provide an additional 50% treatment for OFW. The improvements from this study will require an additional 50% treatment in addition to the required treatment volume. The existing pond currently has the additional volume available to provide the required 0.85 acre-feet of treatment. This will be accomplished by modifying the control structure and raising the weir from elevation 17.12 feet NAVD to elevation 17.54 feet NAVD. This basin is located within WBID 3194A which is impaired for fecal coliform, dissolved oxygen, and nutrients and WBID 3194 which is impaired for mercury, copper, fecal coliform, dissolved oxygen, and nutrients with chlorophyll-a as the causative pollutant; therefore, a pollutant loading analysis has been provided for this basin.

6.3.2 Basin B

Alternative stormwater treatment options have been investigated for the currently untreated area between Basin A and the Turnpike Overpass (Station 210+25 to Station 219+00). An interchange feasibility study is being conducted at the crossing with Florida Turnpike and there is a possibility that the stormwater management could be provided within the remaining infield areas of the interchange and should be explored as more information becomes available. However, at this time, three alternatives for stormwater treatment are being considered for Basin B. Two of the alternatives are offsite ponds and the third is to treat the stormwater runoff via an exfiltration trench within the median. The particulars of the alternatives are discussed in the following sections. All calculations and parameters for each alternative are located in **Appendix 5**. In discussions with St. Lucie County it was determined that an offsite pond is preferred over an exfiltration trench due to the required maintenance of the exfiltration trench. The preferred treatment alternative for this basin is Pond B-2. This basin is located within WBID 3194 which is impaired for mercury, copper, fecal coliform, dissolved oxygen, and nutrients with chlorophyll-a as the causative pollutant; therefore, a pollutant loading analysis has been provided for each alternative.

6.3.2.1 Pond B-1

Pond B-1 is located north of Midway Road at approximately station 215+00. The pond site sits within the southeast corner of parcel 330113100010003 and is approximately 1.85 acres. Water quality treatment and attenuation will be provided via a dry pre-treatment pond and a wet detention pond. The proposed pond site is situated on Nettles and Oldsmar Sands (HSG B/D) and has an existing ground elevation near 19.75 feet NAVD. The NRCS Web Soil Survey defines the seasonal high water depth in these soils to typically be 0.0-1.0 feet below the existing ground elevation. Due to the proximity of Canal C-103 it is anticipated that the soils in this area are well drained and will have a lower seasonal high water table. The existing permit for parcel 330113100010003 (Permit No. 56-00538-S) shows the seasonal high water elevation for the onsite pond at the north end of the property to be 16.02 feet NAVD (17.50 feet NGVD) and a control elevation for the existing onsite pond at 16.29 feet NAVD (17.77 feet NGVD). For more information regarding the existing pond information please see Permit No. 56-00538-S in **Appendix 13 – Existing Permits.** Geotechnical roadway borings were taken along the project as part of this study. The nearest roadway boring, RD-4, was taken on the south side of Midway Road near Canal C-103 with an estimated seasonal high water table at 17.0 feet NAVD. Based on these two sources, the seasonal high water table at the pond site is estimated to be 16.50 feet NAVD. This also meets the SFWMD criteria of 0.50-acre minimum area at the control elevation. Preliminary pond sizing calculations indicates that the dry pre-treatment pond requires 0.56 acres of area and the wet detention pond requires approximately 1.29 acres.

6.3.2.2 Pond B-2

Pond B-2 is located south of Midway Road at approximately station 215+00. The pond site is on parcel 330180000100002, south of Canal C-103 and is approximately 1.93 acres. In order to convey the stormwater runoff to Pond B-2 the stormsewer system will need to cross under Canal C-103 (Alternative 1) or the proposed Box Culvert (Alternative 2). This will require the proposed stormwater facility to be a wet detention pond. Pollutant loading analysis has been

performed and shows that the required nutrient removal is achieved for this basin with the proposed wet detention pond. An additional 0.22 acres of dry pre-treatment has been allocated in Pond 1 to compensate for the dry pre-treatment criteria in this basin. The proposed pond site is situated on Nettles and Oldsmar Sands (HSG B/D) and has an existing ground elevation near 20 feet NAVD. The NRCS Web Soil Survey defines the seasonal high water depth in these soils to typically be 0.0-1.0 feet below the existing ground elevation. Due to the proximity of Canal C-103, it is anticipated that the soils in this area are well drained and will have a lower seasonal high water table. The nearest roadway boring, RD-4, shows the estimated seasonal high water table to be at 17.0 feet NAVD, which is the control elevation set for the wet detention pond. Preliminary pond sizing calculations indicates that the treatment pond requires approximately 1.93 acres. Pond B-2 is the preferred pond site alternative for this basin.

6.3.2.3 Exfiltration Trench

The third alternative for water quality treatment within Basin B is to treat stormwater runoff via an exfiltration trench within the proposed median of Midway Road. The exfiltration trench will be constructed along the west approach ramp to Bridge #940050 over Florida's Turnpike, which will allow for the pipe invert to be above the seasonal high water table. The exfiltration trench will have an 8 foot width and a height of 4 feet. It will utilize a 24" perforated pipe and will be designed in multiple segments, stair stepped along the approach ramp. The length of the exfiltration trench will be controlled by the attenuation requirements for the basin and will total 490 feet. Coordination with the county indicates this alternative is not preferred due to the extensive maintenance required.

6.3.3 Basin 1

Basin 1 maintains the same limits as in the existing permitted condition, beginning at the Florida's Turnpike Overpass (Station 219+00) and ending at Post Office Road (Station 242+00). St. Lucie County has already acquired the parcel of land on the north side of Midway Road between station 228+40 and station 231+80 for Pond 1. Documentation of the procedures followed by St. Lucie County for the pond selection process has been included in **Appendix 12 – Correspondence** of this report. The parcel of land has approximately 0.63 acres of wetlands located on the east side of the property and a conservation easement that runs along the north side of the property. A permit (Permit No. 56-01995-P) was issued for the development of this site, but was never constructed. The wetland high water mark was surveyed at elevation 16.89 feet NAVD (18.37 feet NGVD). For more information regarding the existing permit information please see Permit No. 56-01995-P in **Appendix 13 – Existing Permits.** The proposed dry pre-treatment retention pond and wet detention pond will be designed to avoid the conservation easement and provide a 25 foot buffer to the onsite wetlands. The parcel of land was originally acquired for the design of a treatment facility that was sized for a future six lane roadway and will be able to fit the stormwater ponds for the four lane roadway that is proposed in this PD&E Study without affecting the wetland. Pond 1 will provide attenuation and water quality via both a dry retention pre-treatment pond and a wet detention pond that will outfall into Canal C-103. An additional 0.32 acre-feet dry pre-treatment has been provided in Pond 1 to compensate for Ponds B-2 and 2/3. The control elevation of the pond was set at 17.00 feet NAVD. Preliminary pond sizing calculations indicates that the total required pond area is 2.92 acres and will meet the SFWMD criteria of 0.50-acre minimum

area at the control elevation. This basin is located within WBID 3194 which is impaired for mercury, copper, fecal coliform, dissolved oxygen, and nutrients with chlorophyll-a as the causative pollutant; therefore, a pollutant loading analysis has been provided for this basin.

6.3.4 Basin 2/3

Basin 2 maintains the same limits as the original design of the existing permit, SFWMD permit number 56-00833-S, beginning at Post Office Road (Station 242+00) and extending to Selvitz Road (Station 275+00). Pond 2/3 is situated upon poorly drained Pepper and Eaugallie sands (HSG B/D) with a SHWT typically 0.0-1.0' below the ground surface. The ground elevations within the basin range from 15 feet to 20 feet NAVD. Per the permit, pond 2/3 was designed and constructed to provide treatment for Basins 2 and 3, as well as approximately 2000 feet of Selvitz Road. The pond is located southeast of the study limits on Christensen Road. The constructed stormwater management facility provides attenuation and water quality via both a dry retention pre-treatment pond and a wet detention treatment pond and outfalls into Canal C-103. The treatment facility provides 1.17 acre-feet of dry pre-treatment and 5.26 acre-feet of wet detention, totaling 6.43 acre-feet of treatment volume. The proposed improvements from this study require 1.26 acre-feet of dry pre-treatment due to the increased right-of-way for the proposed study and 4.29 acre-feet of wet detention. The stormwater management facility will be able to provide the required treatment volume for the proposed improvements from this study. The additional required dry pre-treatment volume will be provided in Pond 1. This basin is located within WBID 3194 which is impaired for mercury, copper, fecal coliform, dissolved oxygen, and nutrients with chlorophyll-a as the causative pollutant; therefore, a pollutant loading analysis has been provided for this basin.

6.3.5 Floodplain Compensation

There are no anticipated floodplain impacts for this study and therefore, floodplain compensation sites are not necessary. The study limits are located within FEMA Flood Zone X. Please see the **FEMA Map, Exhibit 6 in Appendix 1.**

6.4 ENVIRONMENTAL LOOK AROUNDS (ELAs)

Environmental Look Arounds (ELAs) provide a unique opportunity to team up with regional stakeholders to explore watershed wide stormwater needs and alternative permitting approaches for the project. Areas of potential cooperation are documented in this report for future follow up as the design moves forward. There is an opportunity for a joint use facility with the City of Port St. Lucie for a sports fields complex located to the south of Midway Road along Florida's Turnpike, however this is not an option that the City is interested in at this time.

SECTION 7 CONCLUSION

Potential and existing stormwater management sites have been identified along the project limits for this PD&E Study and shown that they can accomodate the improvements proposed in this study. The analysis estimates stormwater management size requirements using a volumetric analysis, which accounts for water quality treatment and water quantity for runoff attenuation. In addition, the existing permitted ponds have been further evaluated through routing the applicable storm events in ICPR. Stormwater management sizing calculations as well as graphics showing the roadway alignment and associated sites are included in **Appendix 5** of this Pond Siting Report. Please note that the recommendations were based on pond sizes and locations determined from preliminary data calculations, reasonable engineering judgment, and assumptions. Pond sizes and configurations may change during final design as more detailed information on SHWT, wetland normal pool elevation, final roadway profile design, etc. become available. The recommended treatment alternatives for each basin are shown in the following table, **Table 6 – Summary of Recommended Stormwater Management Alternatives**.

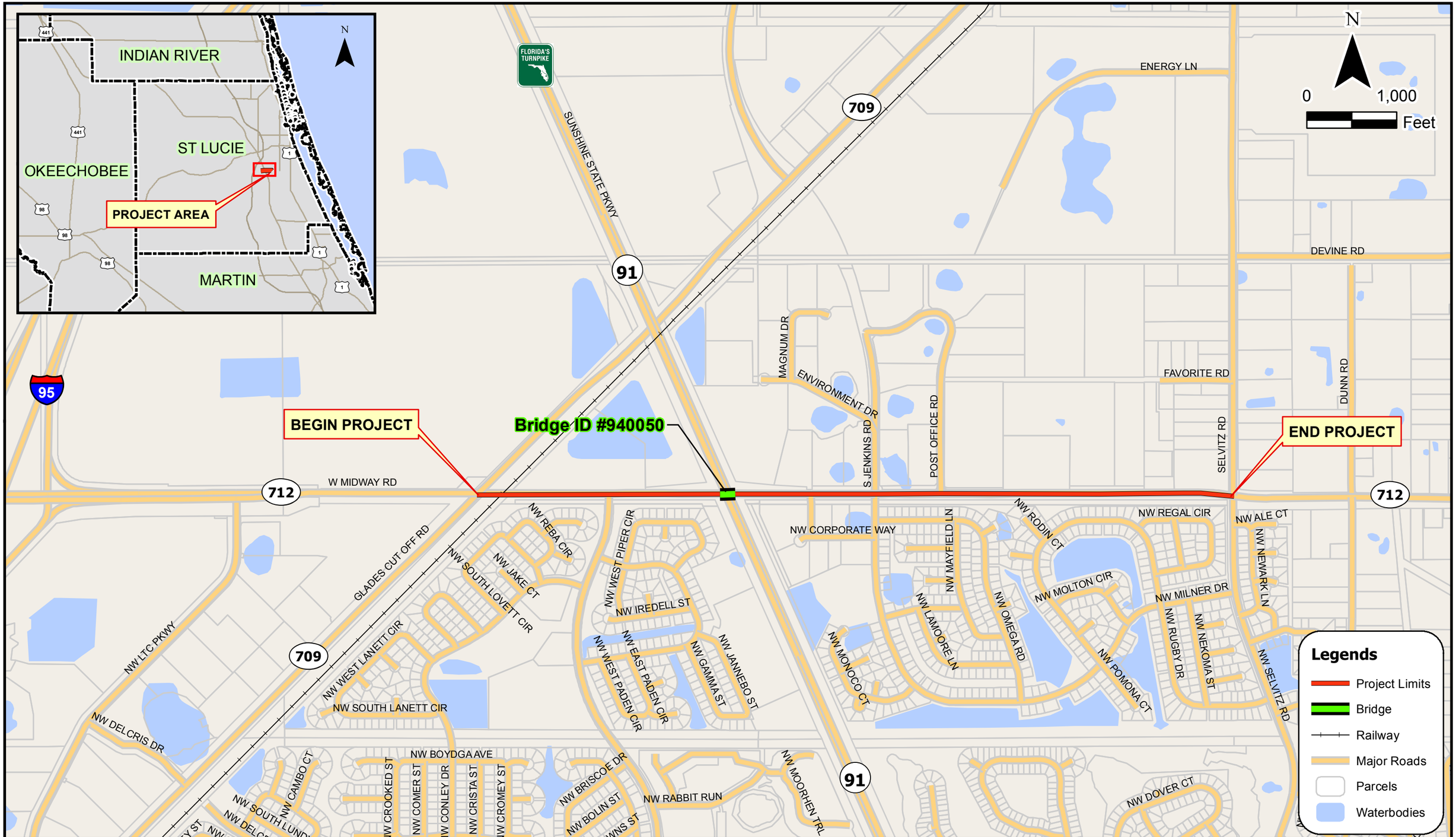
Table 6 – Summary of Recommended Stormwater Management Alternatives

Basin Name	Pond Name	Pond Area (Acres)	Basin Area (Acres)	Required Dry Pre-Treatment (Acre-Feet)	Required Wet Detention (Acre-Feet)	Total Required PAV (Acre-Feet)	Provided Dry Pre-Treatment (Acre-Feet)	Provided Wet Detention (Acre-Feet)	Total Provided PAV (Acre-Feet)
Basin A	*Pond A	0.80	7.07	N/A	0.85	0.85	N/A	0.85	0.85
Basin B	Pond B-2	1.93	3.21	0.22	0.45	0.67	0.00	0.67	0.67
Basin 1	Pond 1	2.92	8.45	0.46	1.11	1.57	0.78	0.79	1.57
Basin 2/3	*Pond 2/3	5.55	24.66	1.26	4.29	5.55	1.17	5.23	6.40
Total		11.20	43.39	1.94	6.70	8.64	1.95	7.54	9.49

*Existing Ponds

Exhibit 1 – Location Map
Exhibit 2 – Typical Section
Exhibit 3 – USGS Quadrangle Map
Exhibit 4 – NRCS Soils Map
Exhibit 5 – Future Land Use Map
Exhibit 6 – FEMA Map
Exhibit 7 – WBID Map

APPENDIX 1
Exhibits



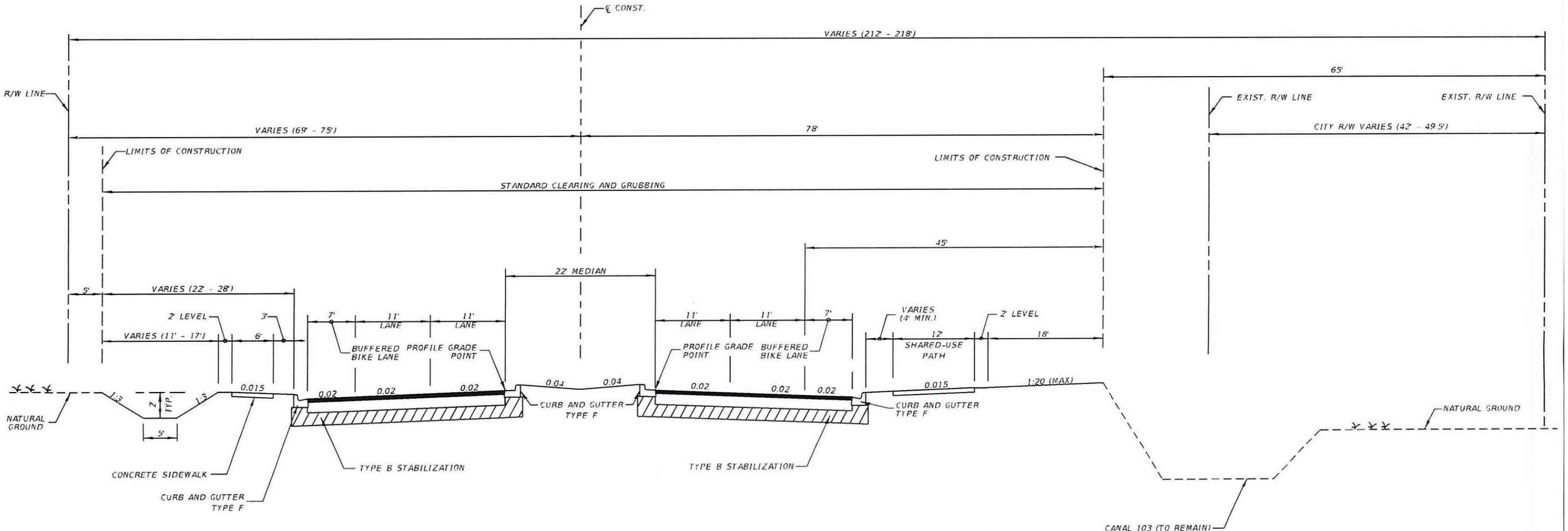
Florida Department of Transportation
District 4

Midway Rd. (CR 712)

from Glades Cut Off Road to Selvitz Road
St. Lucie County, Florida
Financial Project ID: 231440-3-22-01
ETDM No. 14177

PROJECT LOCATION MAP

EXHIBIT 1



TYPICAL SECTION
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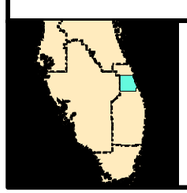
DESIGN SPEED = 45 mph.

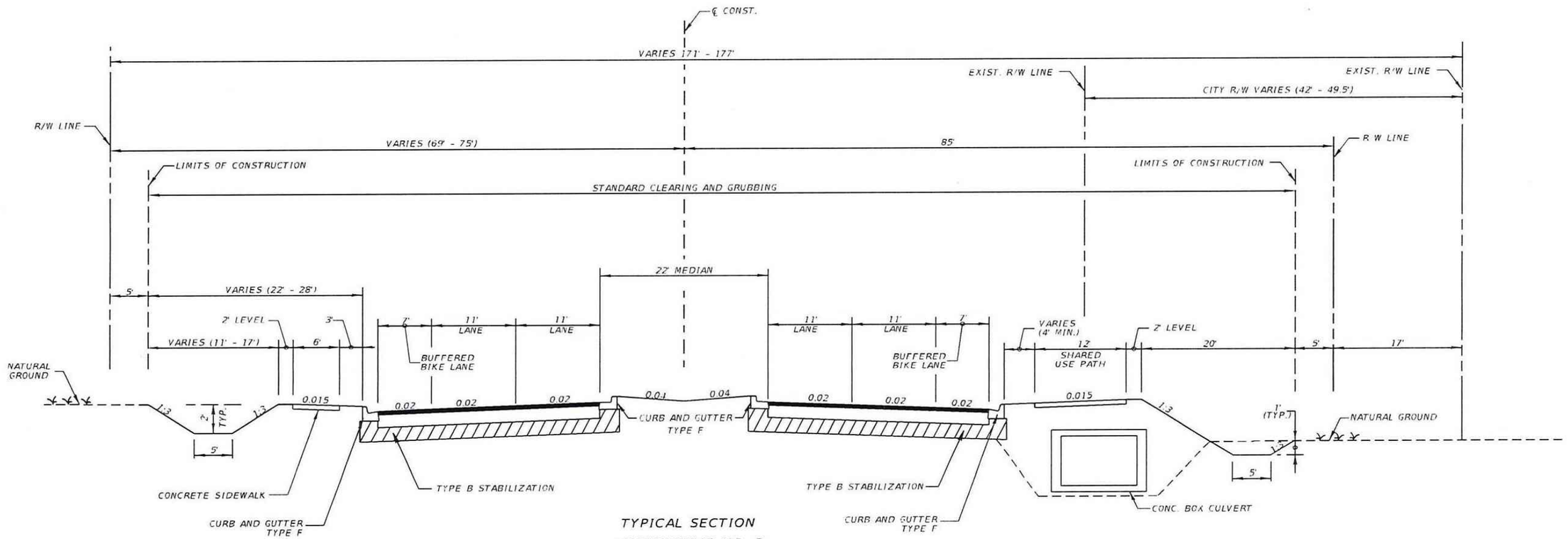


Florida Department of Transportation
District 4

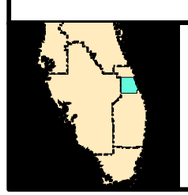
Midway Rd. (CR 712)
From Glades Cut Off Road to Selvitz Road
St. Lucie County, Florida
Financial Project ID: 231440-3-22-01
ETDM No. 14177

PROPOSED TYPICAL SECTION

EXHIBIT 2A



TYPICAL SECTION
ALTERNATIVE NO. 2
DESIGN SPEED = 45 mph.

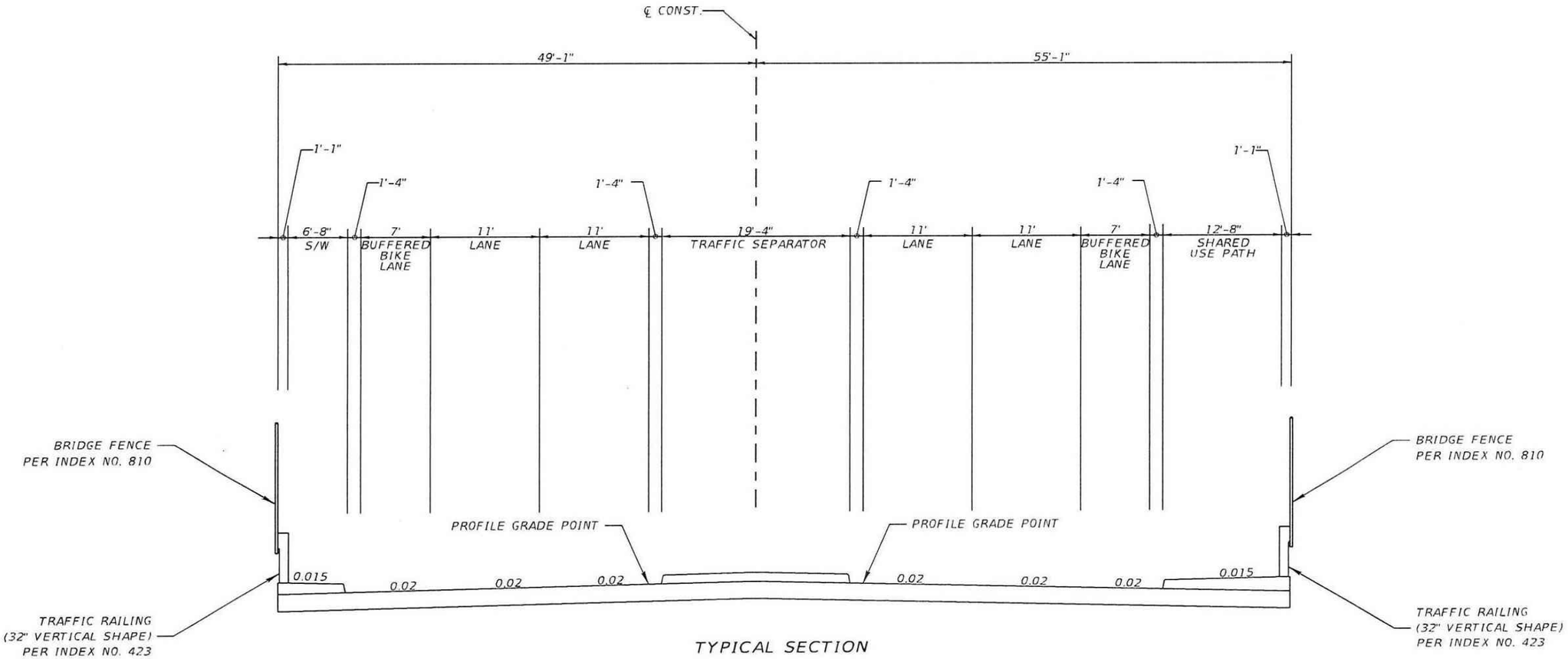


Florida Department of Transportation
District 4

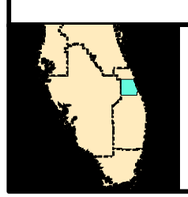
Midway Rd. (CR 712)
From Glades Cut Off Road to Selvitz Road
St. Lucie County, Florida
Financial Project ID: 231440-3-22-01
ETDM No. 14177

PROPOSED TYPICAL SECTION

EXHIBIT 2B



TYPICAL SECTION
BRIDGE
DESIGN SPEED = 45 mph.



Florida Department of Transportation
District 4

Midway Rd. (CR 712)
From Glades Cut Off Road to Selvitz Road
St. Lucie County, Florida
Financial Project ID: 231440-3-22-01
ETDM No. 14177

PROPOSED TYPICAL SECTION

EXHIBIT 2C

N

0 1,000 Feet

BEGIN PROJECT

Bridge ID #940050

END PROJECT

FLORIDA EAST COAST

FLORIDAS TURNPIKE TOLL

BM 21

SPOIL BANK

Levee

WHITE CITY

PORT ST. LUCIE

Legends

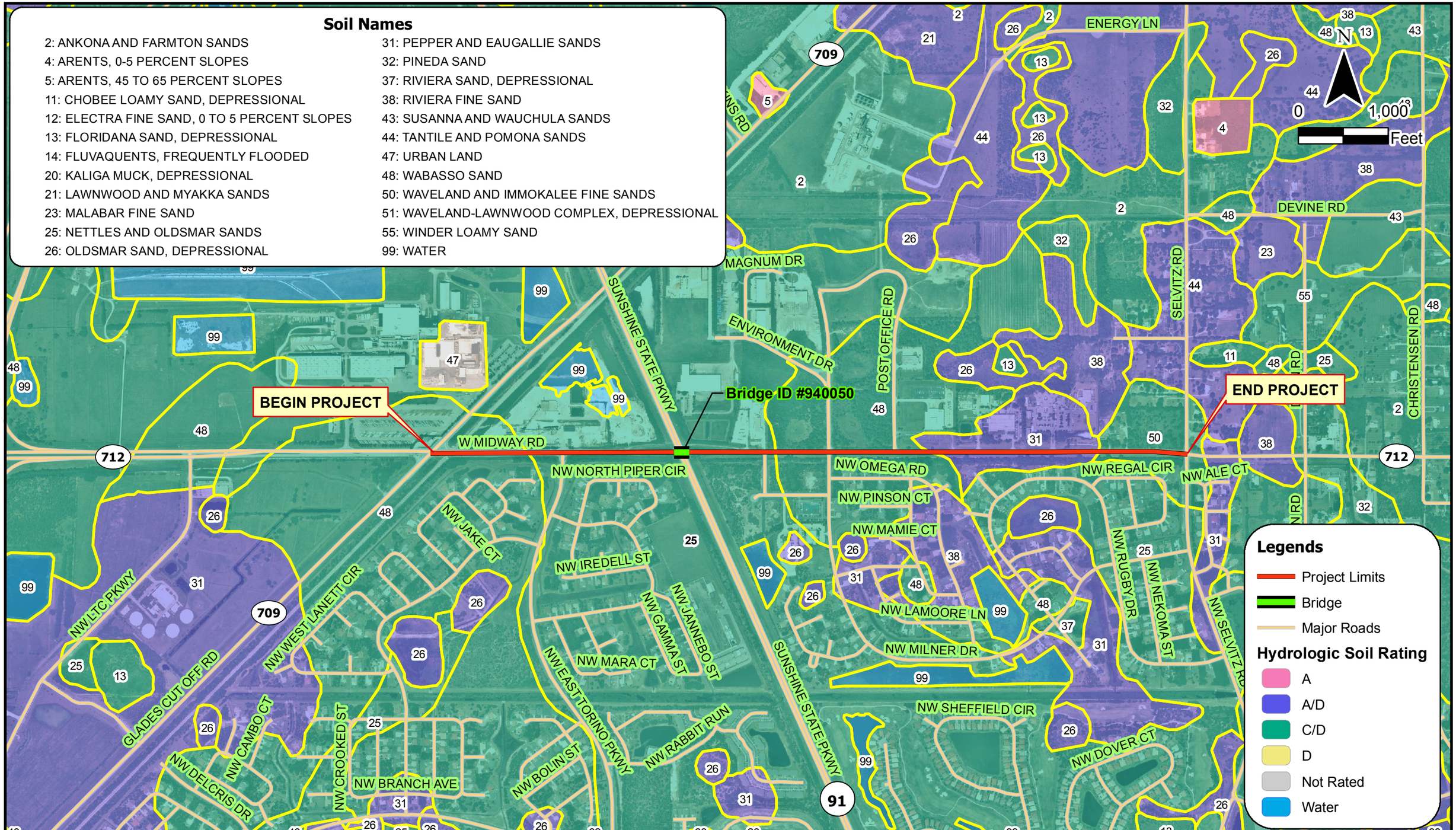
- Project Limits
- Bridge

Florida Department of Transportation
District 4

Midway Rd. (CR 712)
From Glades Cut Off Road to Selvitz Road
St. Lucie County, Florida
Financial Project ID: 213440-3-22-01
ETDM No. 14177

USGS QUADRANGLE MAP

EXHIBIT 3

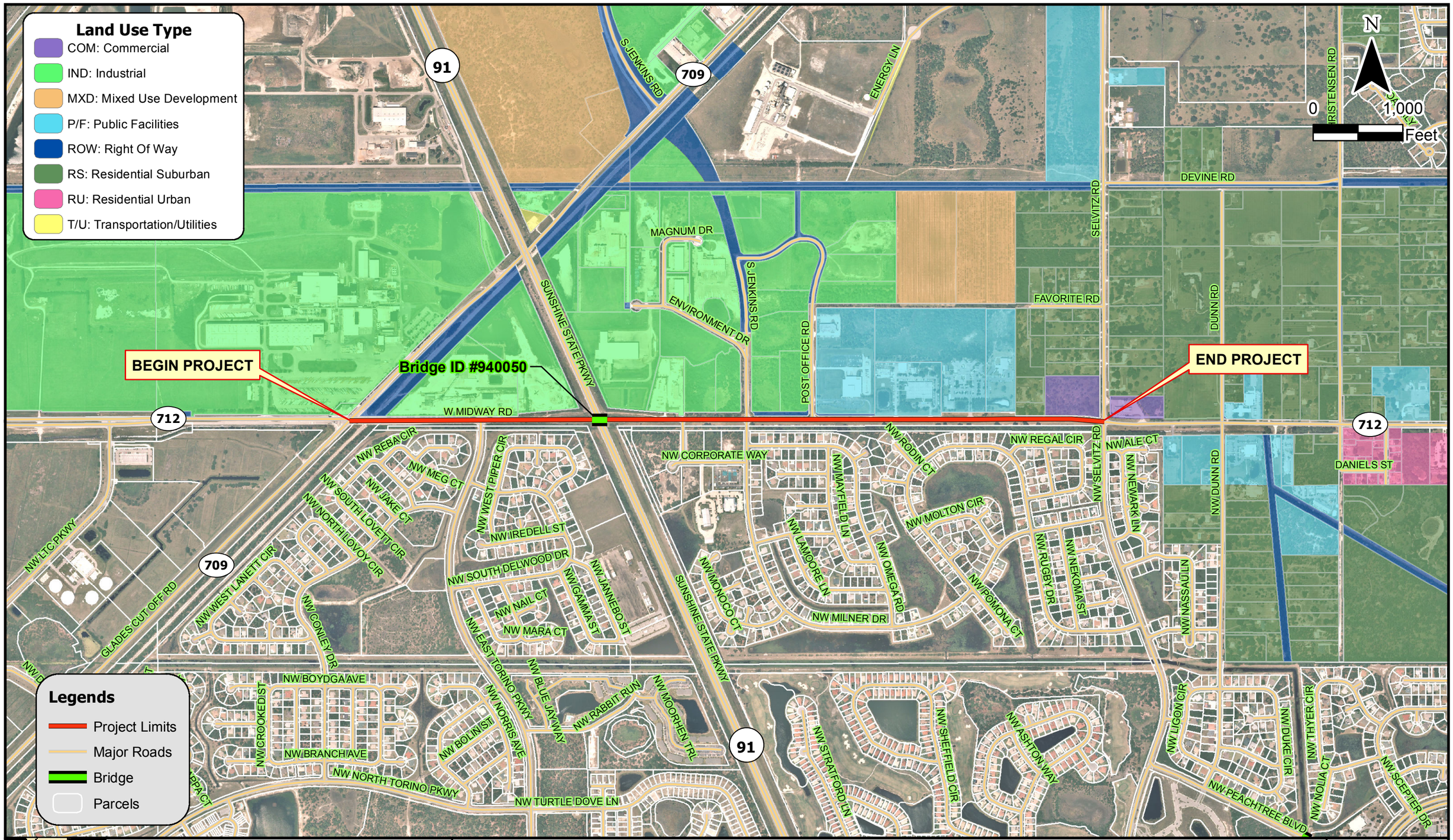


Florida Department of Transportation
District 4

Midway Rd. (CR 712)
From Glades Cut Off Road to Selvitz Road
St. Lucie County, Florida
Financial Project ID: 231440-3-22-01
ETDM No. 14177

NRCS SOILS MAP

EXHIBIT 4



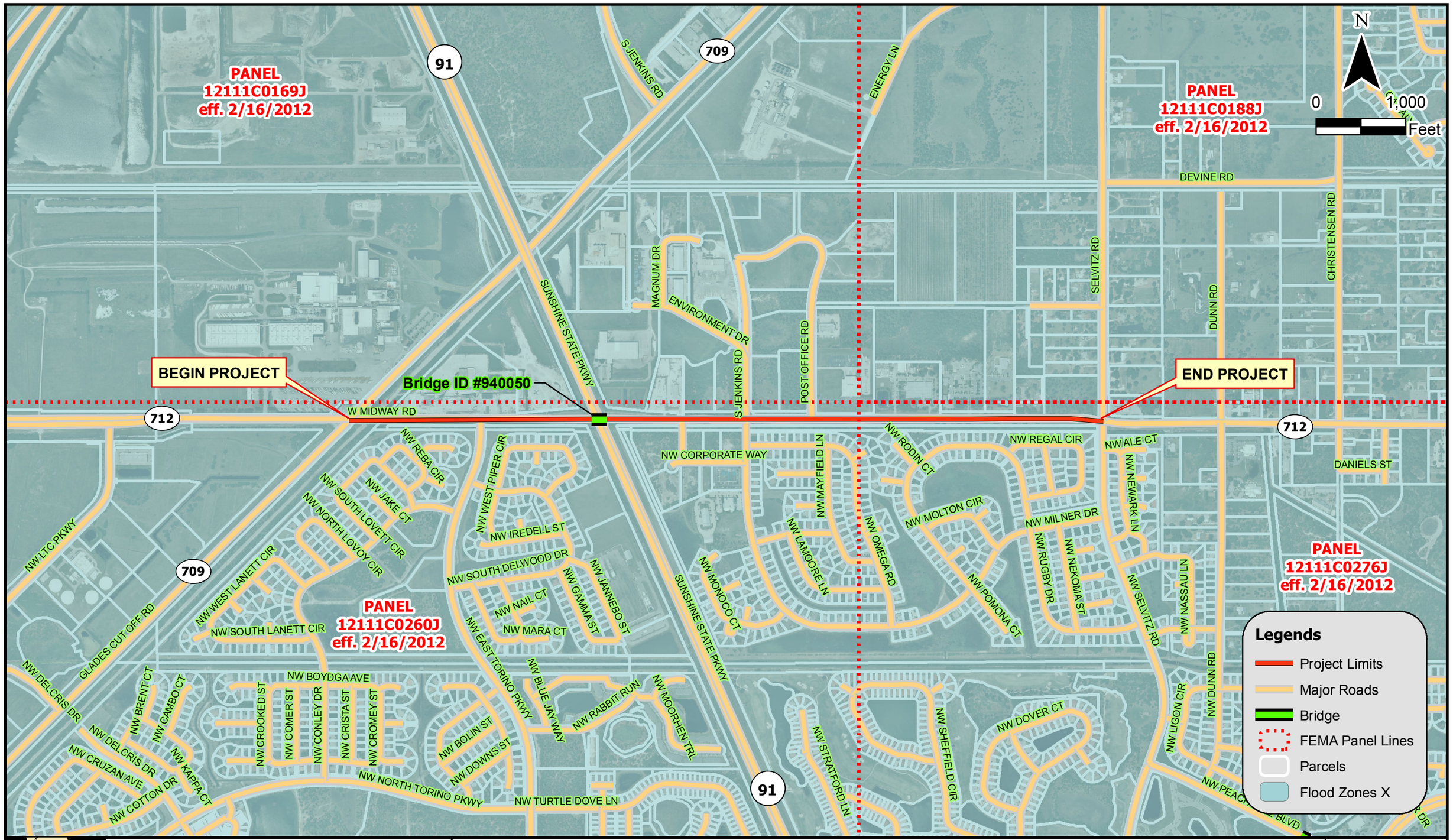
Florida Department of Transportation
District 4

Midway Rd. (CR 712)

From Glades Cut Off Road to Selvitz Road
St. Lucie County, Florida
Financial Project ID: 231440-3-22-01
ETDM No. 14177

FUTURE LAND USE MAP

EXHIBIT 5

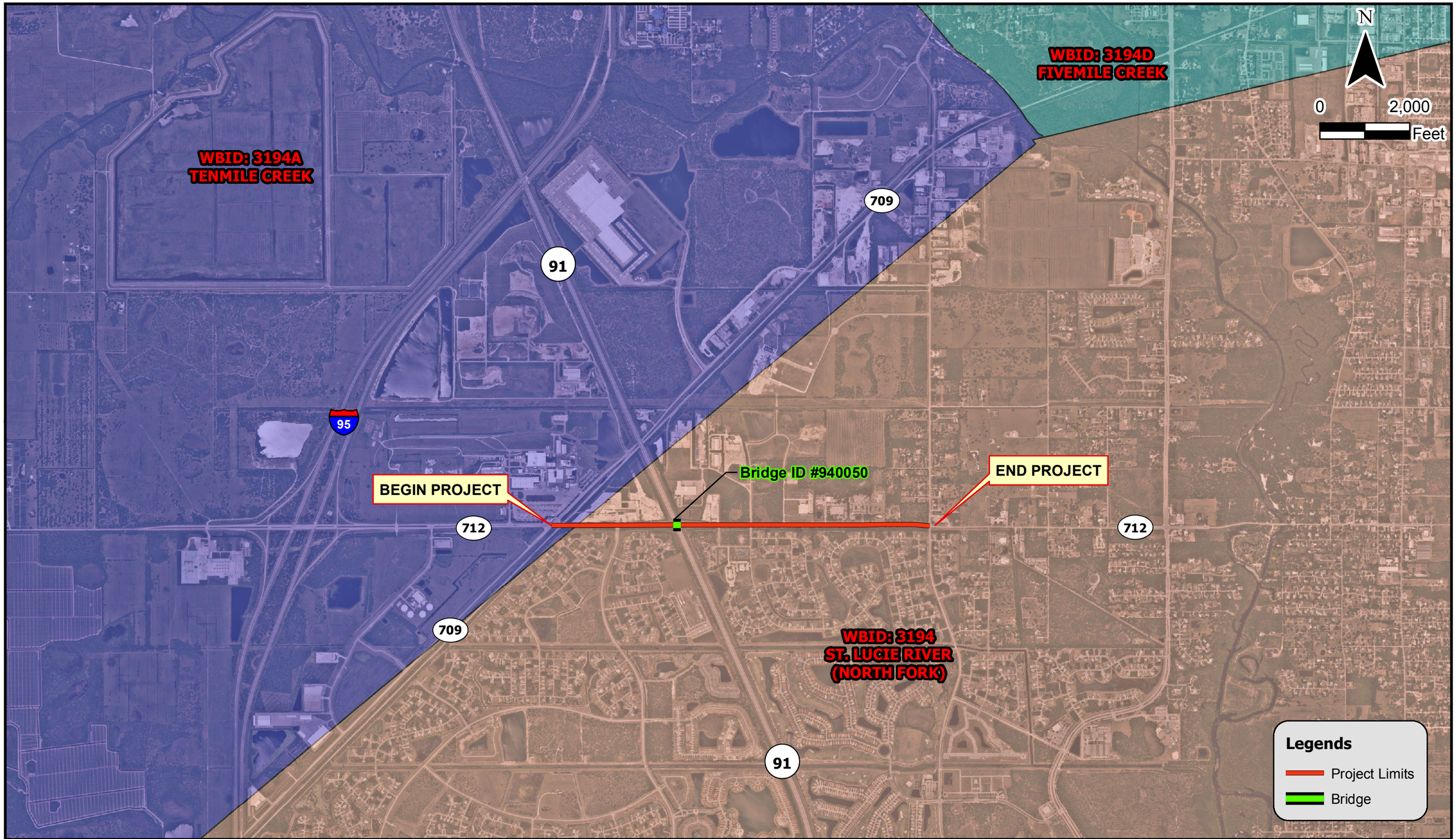


Florida Department of Transportation
District 4

Midway Rd. (CR 712)
From Glades Cut Off Road to Selvitz Road
St. Lucie County, Florida
Financial Project ID: 231440-3-22-01
ETDM No. 14177

FEMA MAP

EXHIBIT 6



Florida Department of Transportation
District 4

Midway Rd. (CR 712)
From Glades Cut Off Road to Selvitz Road
St. Lucie County, Florida
Financial Project ID: 231440-3-22-01
ETDM No. 14177

WBID MAP

EXHIBIT 7

APPENDIX 2

Drainage Criteria Matrix

Drainage Design Criteria Matrix
Midway Road (CR 712) PD
From Glades Cut Off Road to Selvitz Road
St. Lucie County

	Design Parameter	St. Lucie County Criteria	SFWMD Criteria	FDOT Criteria	Drainage Criteria to be Used
Storm Sewer	Design Frequency and Analysis for Pipe Hydraulics	N/A	N/A	Rational Method required. General design = 10-year/24-hour (P=7.5 in) Composite C-value - Impervious=0.95, Pervious=0.20	FDOT
	Spread	N/A	N/A	Analyze with 4 in./hr. rainfall intensity. Based on design speed, 1/2 of lane shall remain clear (45mph or less). Keep 8' of lane clear (between 45 mph to 55 mph). With shoulder gutter, 10-year freq. storm shall not exceed 1'-3" outside gutter toward front slope.	FDOT
	Inlet Types	N/A	N/A	FDOT Inlets (Design Standards 2015)	FDOT
	Inlet Placement	N/A	N/A	Inlets shall be placed at all low points in the gutter grade. For curb inlets on a continuous grade, a maximum spacing of 300 feet shall be used unless spread calculations indicate a greater spacing is acceptable. Curb inlets shall be placed at the critical section prior to the level section in superelevated transitions. Refer to the FDOT Drainage Manual Section 3.7.1.1	FDOT
	System Velocity	N/A	N/A	Min. velocity = 2.5 fps when flowing full	FDOT
	Pipe Lengths	Maximum 200 ft.	N/A	18" Pipe - max. 300 ft. 24" to 36" - max 400 ft. 42" and larger - max. 500 ft.	St. Lucie County
	Hydraulic Grade Line	N/A	N/A	Friction and energy losses due to pollution control and utility conflict structures shall be considered for the storm sewer design event (10-year/24-hour). If minor losses are not considered in addition to the above losses, the HGL for the design storm shall be at least 1 ft. below the theoretical gutter elevation. If all minor losses are considered, the HGL elevation can reach the gutter elevation. This criteria does not apply to DBI's or structures where temporary ponding is not objectionable.	FDOT (minor losses will be considered in the storm sewer design)

Drainage Design Criteria Matrix
Midway Road (CR 712) PD
From Glades Cut Off Road to Selvitz Road
St. Lucie County

	Design Parameter	St. Lucie County Criteria	SFWMD Criteria	FDOT Criteria	Drainage Criteria to be Used
Storm Sewer	Design Tailwater	N/A	N/A	When discharging to stormwater ponds, the tailwater shall be the peak stage in the pond for the storm sewer design event (3-year/24-hour). The tailwater shall be computed assuming the pond control orifice plugged (clogged condition). For free flowing ditches - normal depth in the ditch at the storm drain outlet for storm drain design event (may differ from ditch design event). For ditches with downstream control - the higher of either the stage due to free flow conditions or the maximum stage at the storm drain outlet due to backwater from the downstream control using flows from the storm drain design event. When discharging to existing storm drain systems - the tailwater shall be the elevation of the HGL of the existing system at the location of the connection for the storm drain design storm event.	FDOT
	Pipe Clearance	N/A	N/A	When flexible pavement is used, the minimum distance between the bottom of the roadway base material and the top of the pipe (outside edge) is 7" for concrete pipe and at least 12" for other pipe materials as specified in the FDOT Standard Index 205. Utilities - If utility has been accurately located, clearance between the outside of the storm drain pipe and the utility shall not be less than 6 in. If the location of the utility has been estimated, the clearance should not be less than 1ft.	FDOT
	Pipe Material	N/A	N/A	Optional Material Analysis to be performed for this project.	FDOT
	Pipe Size	min. = 15"	N/A	Trunk line and lateral, min. = 18". Does not apply to discharge systems from Stormwater Mgmt. Facilities	FDOT

Drainage Design Criteria Matrix
Midway Road (CR 712) PD
From Glades Cut Off Road to Selvitz Road
St. Lucie County

Design Parameter		St. Lucie County Criteria	SFWMD Criteria	FDOT Criteria	Drainage Criteria to be Used
Culvert Design	Minimum Size and Length	N/A	N/A	Crossdrain = 18"; Median Drain = 15"/18"; Side Drain = 15"/18"; Box Culvert = 3' x 3' (Precast) 4' x 4' (Cast in Place). Pipe lengths shall follow the criteria for storm sewers. Max. Length for box culverts=500 feet.	FDOT
	Design Procedure	N/A	N/A	Refer to the FDOT Drainage Manual Chapter 4 and the FDOT Drainage Handbook Culvert Design.	FDOT
gic and Hydraulic Calculations for all other Drainage Features	Peak Discharge and Runoff Volume	Discharge. Off-site discharge is limited to amounts which will not cause adverse off-site impacts. These amounts may be determined by one (1) or more of the following: Historic pre-development discharges; Amounts determined in previous SFWMD permit actions; Amounts specified in SFWMD criteria (Applicant's Handbook Volume II, Appendix A); Amounts based on capacity of the downstream conveyance system; Amounts imposed by local water control districts; Amounts imposed through the study and evaluation of sub-basins throughout the County as a part of the County Stormwater Master Plan.	Use one of the following methods: 1.) SCS Curve Number and Unit Hydrograph Method, 2.) Santa Barbara Urban Hydrograph Method, or 3.) USACOE HEC-1 Programs 4.) Other hydrographs methods approved by the District	For Open Channels and Crossdrains- Use gauge data when available. If not available, use regional or local regression equations (USGS) or use the rational equation for drainage areas up to 600 acres. For Stormwater Management Facilities, one of the following is acceptable: (1) for basins with a tc of 15 minutes or less, the modified rational method shall be used OR (2) the SCS Unit Hydrograph method shall be used.	SFWMD - NRCS/SCS Curve Number and Unit Hydrograph Method
	Design Frequency	Unless otherwise specified by previous SFWMD permits, SFWMD criteria, or the County Stormwater Master Plan, a storm event of three-day duration and twenty-five-year return frequency shall be used in computing allowable off-site discharge. Allowable discharges will be designated by the County Stormwater Master Plan or on a case by case basis by the SFWMD upon request.	25-year/72-hour storm for Stormwater Mgmt Facilities	Roadside Ditches-10-yr.; Outfall Ditches and Canals-25-yr.; Off-site crossdrains-50-yr (High use or essential).; Stormwater Management Facilities-Critical Duration Analysis (Chapter 14-86)	SFWMD and FDOT Critical Duration (if applicable)

Drainage Design Criteria Matrix
Midway Road (CR 712) PD
From Glades Cut Off Road to Selvitz Road
St. Lucie County

	Design Parameter	St. Lucie County Criteria	SFWMD Criteria	FDOT Criteria	Drainage Criteria to be Used
Hydrolo	Time of Concentration (tc)	N/A	TR-55 (Overland flow, storm sewer flow, channel flow). Minimum Tc=10 minutes.	Velocity Method (Overland flow using Kinematic Wave equation, Shallow Channel Flow using V=kS^0.5, main channel flow using Manning's equation). Minimum Tc=10 minutes. TR-55 methodology acceptable.	TR-55 methodology (SFWMD and FDOT accepted)
	Design Storm Duration	72-hour storm duration for stormwater mgmt facilities	72-hour storm duration for stormwater mgmt facilities	24-hour storm duration for closed drainage systems and roadside ditches. Chapter 14-86 - Critical Duration Analysis (1-hour through 3-day duration) not applicable (no historical flooding)	SFWMD and FDOT
	Rainfall Distributions	N/A	SFWMD Distribution table from SFWMD Technical Memorandum, Basis of Review For Environmental Resource Permit Applications Within the South Florida Water Management District, or NRCS	FDOT Rainfall Distributions	SFWMD and FDOT

Drainage Design Criteria Matrix
Midway Road (CR 712) PD
From Glades Cut Off Road to Selvitz Road
St. Lucie County

	Design Parameter	St. Lucie County Criteria	SFWMD Criteria	FDOT Criteria	Drainage Criteria to be Used
Hydrologic and Hydraulic Calculations for all Other Drainage Features	Water Quality/Treatment (Wet Detention/Dry Retention)	Commercial or industrial zoned projects shall provide at least one-half-inch of dry detention or retention pretreatment as part of the required retention/detention.	Required treatment volume = 1" over entire developed area or 2.5" over the new impervious area, whichever is greater (Wet Detention Systems). For dry detention, treatment provided equal to 75 percent of the above amounts computed for wet detention.	Specified by the Regulatory Agency (SFWMD)	SFWMD
	Water Quantity/Attenuation	Unless otherwise specified by previous SFWMD permits, SFWMD criteria, or the County Stormwater Master Plan, a storm event of three-day duration and twenty-five-year return frequency shall be used in computing allowable off-site discharge. Allowable discharges will be designated by the County Stormwater Master Plan or on a case by case basis by the SFWMD upon request.	**Open Basins:** Post-development peak discharges shall be at or below pre-development peak discharges for the 25-year/72-hour storm event.	Post-development peak discharge cannot exceed pre-development peak discharge for all frequencies and durations from the 2-year/1-hour storm event to the 100-year/3-day storm event and those in between (Critical Duration Analysis)-not applicable (no historical flooding)	SFWMD
	Off-site Flows	N/A	N/A	Bypass ditches will serve as the alternative if conveyance of offsite to the ponds is not practical.	FDOT
nd Detention Facilities	Pond Configuration - Wet Ponds (for additional info, see Open Drainage Facilities)	Minimum Surface Area (greater of): a.) Six (6) square feet. b.) Five percent (5%) of total retention area. Minimum Depth (greater of): a.) Two (2) feet. b.) One (1) foot below hardpan layer. c.) 0.5 foot below wet season water table elevation. Maximum Depth of four (4) feet. Minimum Width of one (1) foot.	Shallow, littoral areas are desirable for water quality enhancement (Please see Littoral Zone for more information). It is recommended that 25 to 50 percent of the wet retention/detention area be deeper than 12 feet. Pond Area should be greater than 0.5 acre minimum. 100 feet minimum for linear areas in excess of 200 feet length. Irregular shaped areas may have narrower reaches but shall average at least 100 feet.	Pond Depth specified by Regulatory Agency (SFWMD).	SFWMD

Drainage Design Criteria Matrix
Midway Road (CR 712) PD
From Glades Cut Off Road to Selvitz Road
St. Lucie County

	Design Parameter	St. Lucie County Criteria	SFWMD Criteria	FDOT Criteria	Drainage Criteria to be Used
Retention a	Residence Time (Wet Detention)	N/A	Shall be sloped 1:4 or flatter. The littoral area shall be shallower than 6 feet as measured from below the control elevation. The minimum shallow, littoral area shall be the lesser of 20 percent of the wet retention/detention area or 2.5 percent of the total of the retention/detention area (including side slopes) plus the basin contributing area.	Specified by the Regulatory Agency (SFWMD)	SFWMD
Retention and Detention Facilities	Littoral Zone (Wet Detention)	N/A	The outfall control structure shall be designed to drawdown one half inch of the detention volume in 24 hours.	Specified by the Regulatory Agency (SFWMD)	SFWMD
	Water Quality/Quantity Volume Recovery Rate (Wet Detention/Dry Retention)	N/A	Drawdown devices shall incorporate dimensions no smaller than 6 square inches of cross-section area that is 2 inches wide or less than 20° for "V" notches shall include a device to eliminate clogging.	Specified by the Regulatory Agency (SFWMD)	SFWMD

Drainage Design Criteria Matrix
Midway Road (CR 712) PD
From Glades Cut Off Road to Selvitz Road
St. Lucie County

	Design Parameter	St. Lucie County Criteria	SFWMD Criteria	FDOT Criteria	Drainage Criteria to be Used
Retention and Detention Facilities	Orifice/Bleeder Devices (Wet Detention)	N/A	Drawdown devices smaller than 6 square inches of cross-section area that is 2 inches wide or less than 20º for "V" notches shall include a device to eliminate clogging.	Specified by the Regulatory Agency (SFWMD)	SFWMD
	Skimmer	N/A	Systems which receive stormwater from areas with greater than 50% impervious area (excluding water bodies) or which are a potential source of oil and grease, must include a baffle, skimmer, grease trap or other mechanism suitable for preventing oil and grease from leaving the stormwater system in concentrations that would cause a violation of water quality standards.	Oil skimmer is required and should be designed to function from an elevation 6 in. below the elevation of inflow to the outfall control structure to an elevation 6 in. above the DHW of the pond. It should also cover all directions of inflow to the outfall control structure.	FDOT
	Erosion Control Measures	N/A	N/A	Sod from the Pond Berm down to 2' below the Control Elevation (NWL)	FDOT

Drainage Design Criteria Matrix
Midway Road (CR 712) PD
From Glades Cut Off Road to Selvitz Road
St. Lucie County

Design Parameter		St. Lucie County Criteria	SFWMD Criteria	FDOT Criteria	Drainage Criteria to be Used
Open Drainage Facilities (Ponds, Ditches, Canals)	Minimum Requirement for Maintenance Berms on Ditches/Canals (based on top width)	N/A	N/A	N/A	N/A
	Minimum Requirement for Maintenance Berms around Perimeter of Ponds	N/A		Ponds - 20 ft. clearance between top edge of normal pool elevation and R/W line. At least 15 ft. of berm adjacent to the pond shall be at a 1:8 slope or flatter. For wet ponds, keep the lowest point of the maintenance berm at least 1 foot above the top of the treatment volume to minimize saturation of the maintenance berm. 1 ft. of freeboard is required above the maximum DHW. Inside edge of the berm shall have a minimum 30 ft. radius to accommodate the largest maintenance equipment.	FDOT
	Maximum Side Slopes for Ditches/Canals		For permanently wet ponds or ditches, side slopes can be no steeper than 1:4 (average pond side slope) out to a depth of 2-feet below the control elevation.	Based on FDOT Clear Zone Criteria	FDOT
	Maximum Side Slopes for Ponds	N/A		Use a 1:4 side slope for ease with maintenance. Side slopes steeper than 1:3 require special equipment for mowing.	FDOT

Drainage Design Criteria Matrix
Midway Road (CR 712) PD
From Glades Cut Off Road to Selvitz Road
St. Lucie County

	Design Parameter	St. Lucie County Criteria	SFWMD Criteria	FDOT Criteria	Drainage Criteria to be Used
Open Drainage Facilities (Ponds, Ditches, Canals)	Minimum Longitudinal Slope	N/A	N/A	0.0005 ft./ft.	FDOT
	Minimum Bottom Width	N/A	N/A	V-bottom not allowed on ditches.	FDOT
	Tailwater Conditions for Ponds	N/A	For regulated systems the design and maintained stage elevations are available either from the respective local jurisdiction or the District. For non-regulated systems, water stages are computed from the best available data and must be submitted to the District for review and concurrence.	Free flowing ditches - normal depth in the ditch at the storm drain outlet for storm drain design event (may differ from ditch design event). For ditches with downstream control - the higher of the stage due to free flow conditions or the maximum stage at the storm drain outlet due to backwater from the downstream control using flows from the storm drain design event. When discharging to existing storm drain systems - the tailwater shall be the elevation of the HGL of the existing system at the location of the connection for the storm drain design storm event.	SFWMD and FDOT
	Erosion Control Measures (by max. velocity)	N/A	N/A	Grass with Mulch - Bare Soil, Sod - 4 fps max vel., Riprap (rubble) ditch lining - 6 fps max vel. (refer to FDOT Drainage Manual, Table 2.4)	FDOT

Drainage Design Criteria Matrix
Midway Road (CR 712) PD
From Glades Cut Off Road to Selvitz Road
St. Lucie County

Design Parameter		St. Lucie County Criteria	SFWMD Criteria	FDOT Criteria	Drainage Criteria to be Used
Open Drainage Facilities (Ponds, Ditches, Canals)	Minimum Freeboard	N/A	N/A	1 ft. above DHW elevation. Less freeboard is acceptable when a permanent containment, such as concrete, is provided.	FDOT
	Swales	N/A	Top width to depth ratio of the cross section equal to or greater than 6:1 or side slopes equal to or greater than 3:1 (horizontal to vertical).	Swale drainage only permitted in Type A Soils conditions	SFWMD and FDOT
	Floodplain	N/A	"Cup for cup" method; design storm is 100 yr-24hr for floodplain compensation based on FEMA BFE's.	Cup for Cup compensation for the 100 year floodplain.	FDOT defers to SFWMD

Criteria Sources:

1. SFWMD - Environmental Resource Permit Applicant's Handbook Volume II (2014)
2. FDOT - Drainage Manual (January 2016), Drainage Handbook Culvert Design (01/2004), Drainage Handbook Hydrology (February 2012),
3. Drainage Handbook Erosion and Sediment Control (July 2013), Drainage Handbook Storm Drains (February 2012), Drainage Handbook Stormwater Mgmt. Facility (01/2004),
4. Drainage Handbook Temporary Drainage Design (11/2013)
5. Land Development Code - County of St. Lucie, Florida (4/2015)

APPENDIX 3

Construction Costs

Inwood Consulting Engineers, Inc.
3000 Dovera Drive, Suite 200
Oviedo, Florida 32765
p: 407.971.8850 f: 407.971.8955

Made by: ZKE
Checked by: REC

DATE: August 25, 2016
Job Number: DT4-006-01

PROJECT : **Midway Road (CR 712) from Glades Cut Off Road to Selvitz Road**
BASIN NAME : **B**
POND NAME : **B-1**

CONSTRUCTION COSTS

Dry Pre-Treatment Pond

	ELEVATION	AREA	FILL		EXCAVATION	
			HEIGHT	VOLUME	HEIGHT	VOLUME
EXISTING GROUND (POND R/W)	19.75 ft	0.46 ac				
			1.50 ft	97 cy	1.50 ft	0 cy
BACK OF BERM	21.25 ft	0.38 ac				
			1.00 ft	145 cy	1.00 ft	0 cy
FRONT OF BERM	20.25 ft	0.20 ac				
			0.50 ft	8 cy	0.50 ft	0 cy
EXISTING GROUND (INSIDE POND)	19.75 ft	0.18 ac				
			2.25 ft	0 cy	2.25 ft	508 cy
POND BOTTOM	17.50 ft	0.10 ac				
			TOTAL:	**153 cy**	**TOTAL:**	**508 cy**

Wet Treatment Pond

	ELEVATION	AREA	FILL		EXCAVATION	
			HEIGHT	VOLUME	HEIGHT	VOLUME
EXISTING GROUND (POND R/W)	19.75 ft	1.08 ac				
			1.25 ft	101 cy	1.25 ft	0 cy
BACK OF BERM	21.00 ft	0.98 ac				
			1.00 ft	226 cy	1.00 ft	0 cy
FRONT OF BERM	20.00 ft	0.70 ac				
			0.25 ft	6 cy	0.25 ft	0 cy
EXISTING GROUND (INSIDE POND)	19.75 ft	0.67 ac				
			5.25 ft	0 cy	5.25 ft	4489 cy
SLOPE BREAK	14.50 ft	0.39 ac				
			4.00 ft	0 cy	4.00 ft	2162 cy
POND BOTTOM	10.50 ft	0.28 ac				
			TOTAL:	**232 cy**	**TOTAL:**	**6651 cy**

EARTHWORK

	VOLUME	UNIT COST
POND FILL :	385 cy	$11.06
POND EXCAVATION:	7159 cy	$4.95
TOTAL COST:		**$39,698.0**

CLEARING AND GRUBBING

POND R/W AREA :	1.54 ac
COST PER ACRE :	$8,347.36
TOTAL COST :	**$12,854.93**

POND SOD QUANTITIES

POND R/W AREA :	1.54 ac
POND WATER AREA :	0.50 ac
TOTAL POND SOD AREA :	1.04 ac
COST PER SY :	$1.85
TOTAL COST :	**$9,316.27**

MAINTENANCE

20 YEAR LIFE CYCLE	20
COST PER YEAR :	$1,500.00
TOTAL COST :	**$30,000.00**

PIPE QUANTITIES (includes both inflow and outfall pipes)

Length		
Inflow	Outfall	Total
150 ft	250 ft	400 ft
UNIT COST - PIPE (30") (RCP):		$95.65
TOTAL COST:		**$38,260.0**

TOTAL CONSTRUCTION COST: $130,129.21

Inwood Consulting Engineers, Inc.
3000 Dovera Drive, Suite 200
Oviedo, Florida 32765
p: 407.971.8850 f: 407.971.8955

Made by: ZKE
Checked by: REC

DATE: August 25, 2016
Job Number: DT4-006-01

PROJECT : **Midway Road (CR 712) from Glades Cut Off Road to Selvitz Road**
BASIN NAME : **B**
POND NAME : **B-2**

CONSTRUCTION COSTS

Wet Treatment Pond

	ELEVATION	AREA	FILL		EXCAVATION	
			HEIGHT	VOLUME	HEIGHT	VOLUME
EXISTING GROUND (POND R/W)	20.00 ft	1.60 ac	0.25 ft	4 cy	0.25 ft	0 cy
BACK OF BERM	20.25 ft	1.58 ac	0.25 ft	28 cy	0.25 ft	0 cy
EXISTING GROUND (INSIDE POND)	20.00 ft	1.44 ac	0.75 ft	0 cy	0.75 ft	1506 cy
FRONT OF BERM	19.25 ft	1.05 ac	4.25 ft	0 cy	4.25 ft	5862 cy
SLOPE BREAK	15.00 ft	0.66 ac	8.00 ft	0 cy	8.00 ft	4775 cy
POND BOTTOM	7.00 ft	0.08 ac	**TOTAL:**	**28 cy**	**TOTAL:**	**12144 cy**

EARTHWORK

	VOLUME	UNIT COST
POND FILL :	28 cy	$11.06
POND EXCAVATION:	12144 cy	$4.95
TOTAL COST:		**$60,426.9**

CLEARING AND GRUBBING

POND R/W AREA :	1.60 ac
COST PER ACRE :	$8,347.36
TOTAL COST :	**$13,355.78**

POND SOD QUANTITIES

POND R/W AREA :	1.60 ac
POND WATER AREA :	0.50 ac
TOTAL POND SOD AREA :	1.10 ac
COST PER SY :	$1.85
TOTAL COST :	**$9,865.84**

MAINTENANCE

20 YEAR LIFE CYCLE	20
COST PER YEAR :	$1,500.00
TOTAL COST :	**$30,000.00**

PIPE QUANTITIES (includes both inflow and outfall pipes)

Length		
Inflow	Outfall	Total
150 ft	500 ft	650 ft
UNIT COST - PIPE (30") (RCP):		$95.65
TOTAL COST:		**$62,172.5**

TOTAL CONSTRUCTION COST: $175,821.00

Inwood Consulting Engineers, Inc.
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Oviedo, Florida 32765
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DATE: August 25, 2016
Job Number: DT4-006-01

PROJECT : **Midway Road (CR 712) from Glades Cut Off Road to Selvitz Road**
BASIN NAME : **B**
POND NAME : **Exfiltration Trench**

CONSTRUCTION COSTS

EXFILTRATION

PIPE DIMENSIONS

DIAMETER :	24 in
LENGTH :	490 ft
COST PER FT :	$136.10
TOTAL COST :	**$66,689.00**

MAINTENANCE

ESTIMATED MAINTENANCE COSTS OVER 20 YEARS :	**$66,689.00**

(Assumed total replacement after 20 years)

TOTAL CONSTRUCTION COST: $133,378.00

APPENDIX 4

Engineering Analysis

MIDWAY ROAD PD&E - From Glades Cut Off Road to Selvitz Road

Inwood Consulting Engineers, Inc.
3000 Dovera Drive, Suite 200, Oviedo FL32765
(407)971-8850 - (407) 971-8955 (fax)

BASIN B POND SITES

ENGINEERING DATA & ANALYSIS

Alternatives	Location	Existing Ground Elevation (ft)	Soil Names & Hydrologic Groups	Estimated SHWT Elevation (ft)	Lowest Edge of Existing Roadway (ft)	Distance From Lowest Edge of Proposed Roadway (ft)	Estimated Allowable $DHW_{25yr/72hr}$ (ft)	Estimated Allowable Treatment & Attenuation Depth (ft)	Outfall Location	Roadway Drainage Area (ac)	Required Treatment & Attenuation Volume (ac-ft)	Required Pond Access Area (ac)	Dry Pre-Treatment Pond Area (ac)	Wet Detention Pond Area (ac)	Required Pond Area Including Access (ac)
Pond B-1	Station 215+00 (LT.) Parcel No. 330113100010003	19.75	Nettles Sand (B/D) and Oldsmar Sand (B/D)	16.50	23.00	500	19.00	2.50	Canal C-103	3.21	0.91	0.00	0.56	1.29	1.85
Pond B-2	Station 217+50 (RT.) Parcel No. 330180000100002	20.00	Nettles Sand (B/D) and Oldsmar Sand (B/D)	17.00	23.00	600	18.25	1.25	Canal C-103	3.21	1.06	0.00	0.00	1.92	1.92
Exfiltration Trench	Within R/W	21.00	Nettles Sand (B/D) and Oldsmar Sand (B/D)	17.00	23.00	10	21.00	3.10	Canal C-103	3.21	0.53	0.00	0.00	0.00	0.00

IMPACT & COST ANALYSIS

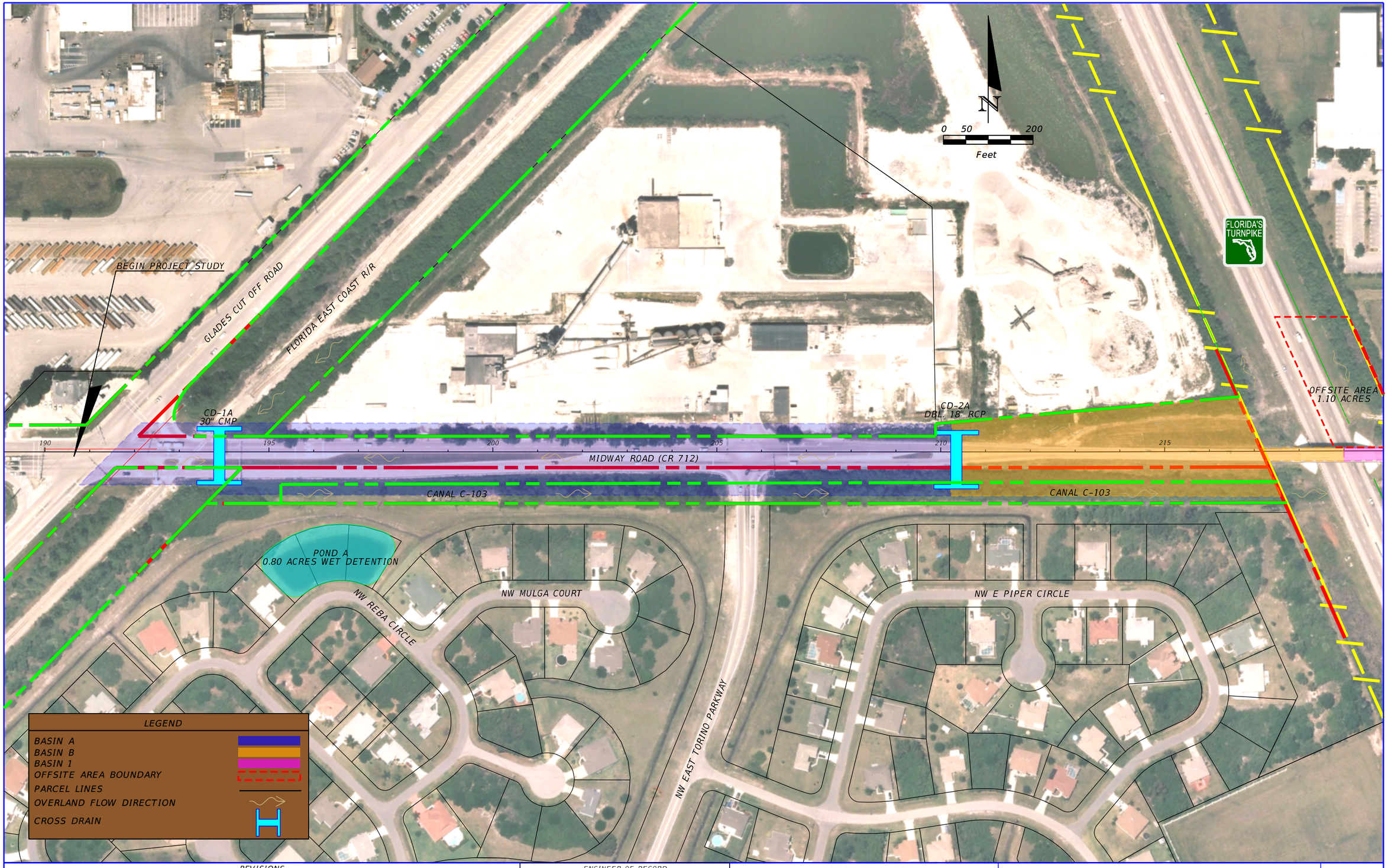
Alternatives	Roadway Floodplain Impacts (ac-ft)	Pond Floodplain Impacts (ac-ft)	Total Floodplain Impacts (ac-ft)	Arch. / Historical Impact Potential	Wetland Impacts (ac)	Wetland Impact Cost	Environmental Impact Risk	Threatened or Endangered Species Impacts	Hazardous Materials & Contamination Potential	Major Utility Conflict Potential (Y/N)	Existing Land Use	Future Land Use	Total Parcel Area (ac)	Estimated Construction Cost	Estimated Right-of-Way Acquisition Cost	Total Pond Costs	Rankings
Pond B-1	0	0	0	None	0	$0	Low	None	Low	N	Industrial	Industrial	18.56	$130,130	$2,032,210	$2,162,340	3
Pond B-2	0	0	0	None	0	$0	Low	None	Medium	N	Public	Public	2.13	$175,821	$771,613	$947,434	1
Exfiltration Trench	0	0	0	None	0	$0	Low	None	Low	N	Transportation	Transportation	0	$133,378	$0	$133,378	2

Note: -The cost evaluation for the stormwater management facility alternatives in this report includes impacts, and parcel acquisition costs. The total pond cost includes environmental impact costs, construction costs, and parcel acquisition costs. The stormwater management facility construction costs include cost of installed drainage structures, drainage pipes and outfalls, clearing and grubbing, fencing, access accommodation and sodding. The associated parcel acquisition cost for each alternative evaluated include the estimated cost of land and any impacted improvement, administrative costs and legal fees.

-Although the Exfiltration Trench option is the least costly alternative, Pond B-2 is the recommended stormwater alternative by the County due to added maintenance necessary for an exfiltration trench system.

APPENDIX 5

Pond Design Calculations and Pre and Post Development Basin Maps



REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

ENGINEER OF RECORD
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P 407.971.8850

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
CR 712	ST. LUCIE	231440-3-22-01

EXISTING BASIN MAPS

SHEET NO.

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CONSERVATION EASEMENT

OFFSITE AREA
5.26 ACRES

WETLAND

WETLAND

S JENKINS ROAD

N

0 50 200
Feet

POST OFFICE ROAD

OFFSITE AREA
10.26 ACRES

OFFSITE AREA
15.03 ACRES

220 225 230 MIDWAY ROAD (CR 712) 235 240 245 250

CANAL C-103

CD-100
36" CMP

CANAL C-103

CD-200
DBL. 24" RCP

NW CORPORATE WAY

NW CORPORATE WAY

NW MILNER DRIVE

NW OMEGA ROAD

FLORIDA'S TURNPIKE

LEGEND

BASIN 1
BASIN 2
OFFSITE AREA BOUNDARY
PARCEL LINES
OVERLAND FLOW DIRECTION
CROSS DRAIN

REVISIONS			
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STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
CR 712	ST. LUCIE	231440-3-22-01

EXISTING BASIN MAPS

SHEET NO.

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N

0 50 200

Feet

OFFSITE AREA
10.26 ACRES

OFFSITE AREA
12.01 ACRES

OFFSITE AREA
5.27 ACRES

OFFSITE AREA
5.25 ACRES

N SELVITZ ROAD

255 260 265 270

MIDWAY ROAD (CR 712)

CD-203
DBL. 24" PIPE

CD-POLICE
24" CMP

CANAL C-103

CD-201
24" PIPE

CD-202
18" PIPE

END PROJECT STUDY

NW RUGBY DRIVE

NW REGAL CIRCLE

N SELVITZ ROAD

NW NEWARD LANE

LEGEND

BASIN 2

OFFSITE AREA BOUNDARY

PARCEL LINES

OVERLAND FLOW DIRECTION

CROSS DRAIN

REVISIONS			
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STATE OF FLORIDA
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ROAD NO.	COUNTY	FINANCIAL PROJECT ID
CR 712	ST. LUCIE	231440-3-22-01

EXISTING BASIN MAPS

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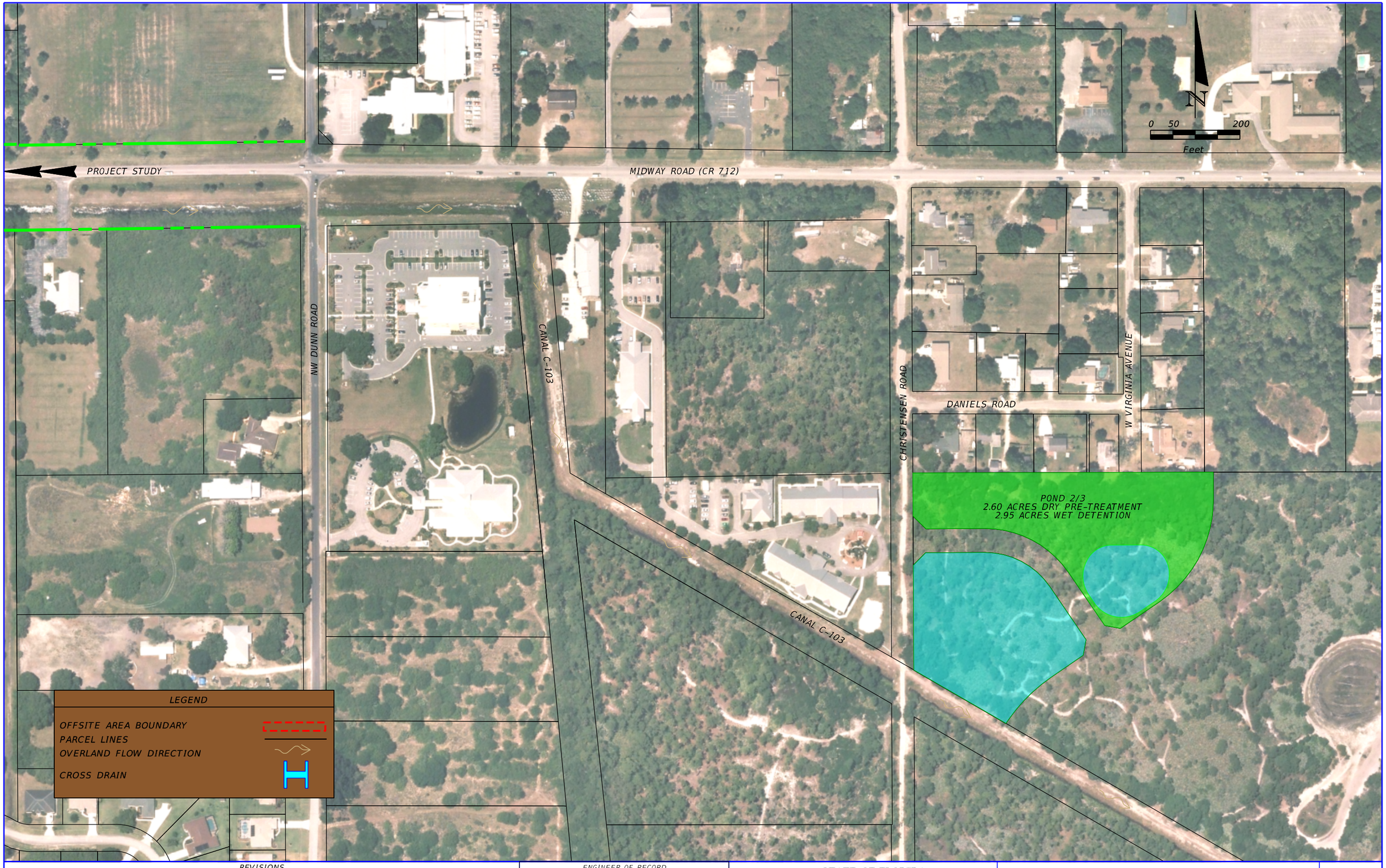

REVISIONS			
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STATE OF FLORIDA
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ROAD NO.	COUNTY	FINANCIAL PROJECT ID
CR 712	ST. LUCIE	231440-3-22-01

EXISTING BASIN MAPS

SHEET NO.

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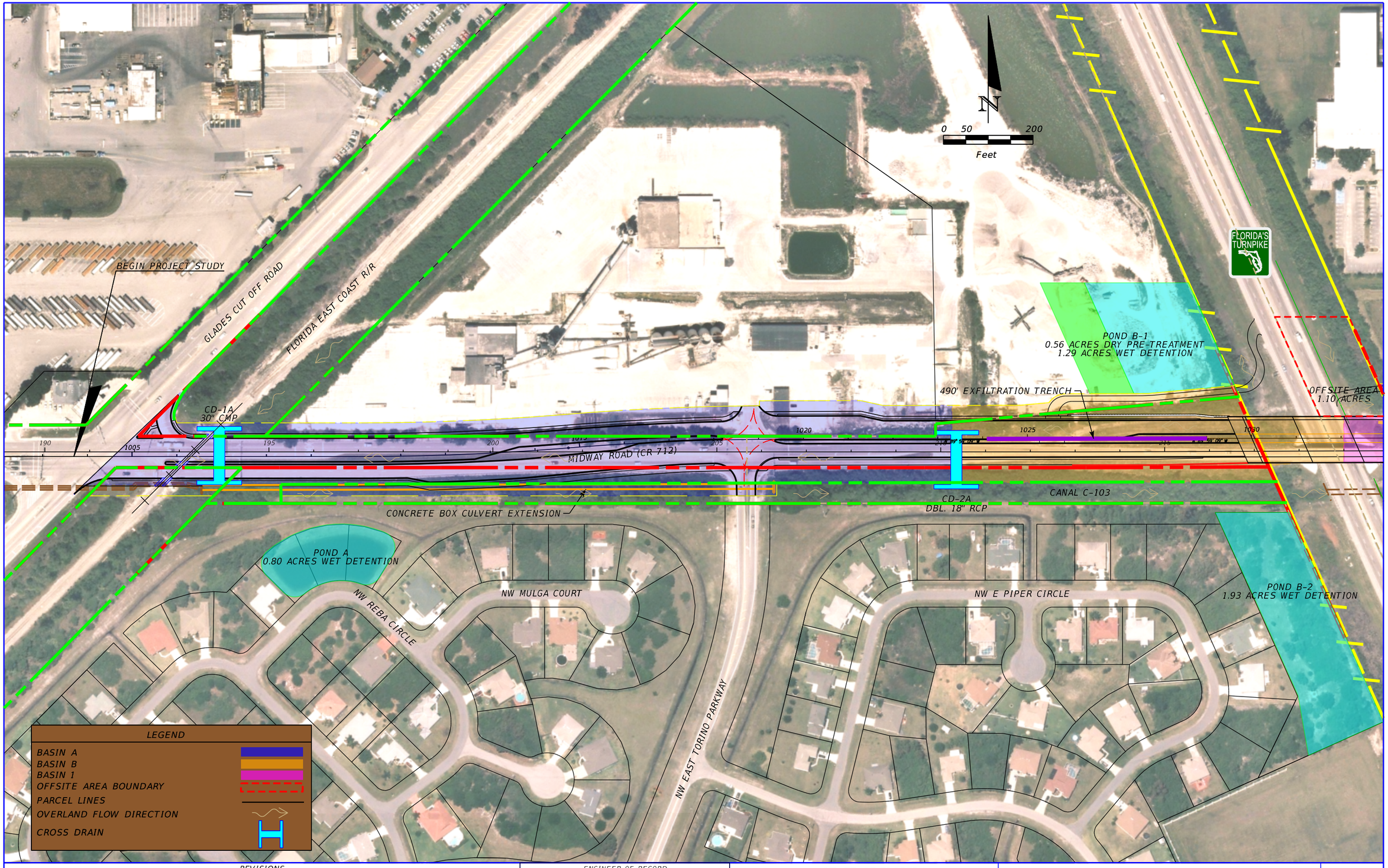

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STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
CR 712	ST. LUCIE	231440-3-22-01

ALTERNATIVE 1
BASIN MAPS

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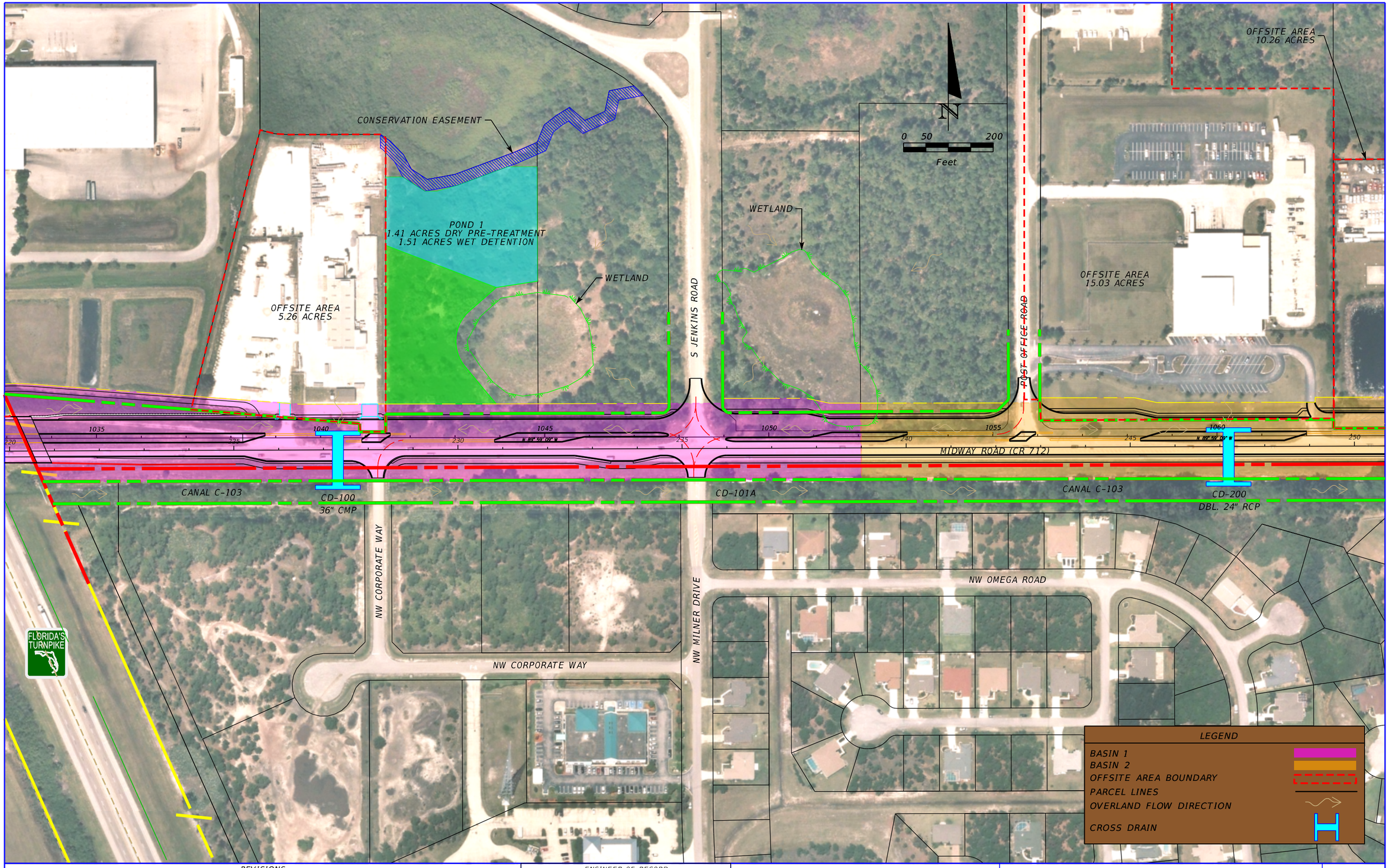

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STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
CR 712	ST. LUCIE	231440-3-22-01

ALTERNATIVE 1
BASIN MAPS

SHEET NO.

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N

0 50 200

Feet

OFFSITE AREA
12.01 ACRES

OFFSITE AREA
10.26 ACRES

OFFSITE AREA
5.27 ACRES

OFFSITE AREA
5.25 ACRES

CD-201
24" PIPE

CD-202
18" PIPE

CD-203
DBL. 24" PIPE

N SELVITZ ROAD

MIDWAY ROAD (CR 712)

1065 1070 1075 1080 1085 1090

255 260 265 270

CANAL C-103

CONCRETE BOX CULVERT EXTENSION

END PROJECT STUDY

CD-POLICE
24" CMP

NW RUGBY DRIVE

NW REGAL CIRCLE

N SELVITZ ROAD

NW NEWARK LANE

LEGEND

BASIN 2

OFFSITE AREA BOUNDARY

PARCEL LINES

OVERLAND FLOW DIRECTION

CROSS DRAIN

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

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STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
CR 712	ST. LUCIE	231440-3-22-01

ALTERNATIVE 1
BASIN MAPS

SHEET NO.

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PROJECT STUDY

MIDWAY ROAD (CR 712)

NW DUNN ROAD

CANAL C-103

CHRISTENSEN ROAD

DANIELS ROAD

W VIRGINIA AVENUE

POND 2/3
2.60 ACRES DRY PRE-TREATMENT
2.95 ACRES WET DETENTION

0 50 200
Feet

N

LEGEND

OFFSITE AREA BOUNDARY

PARCEL LINES

OVERLAND FLOW DIRECTION

CROSS DRAIN

REVISIONS			
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CR 712	ST. LUCIE	231440-3-22-01

ALTERNATIVE 1
BASIN MAPS

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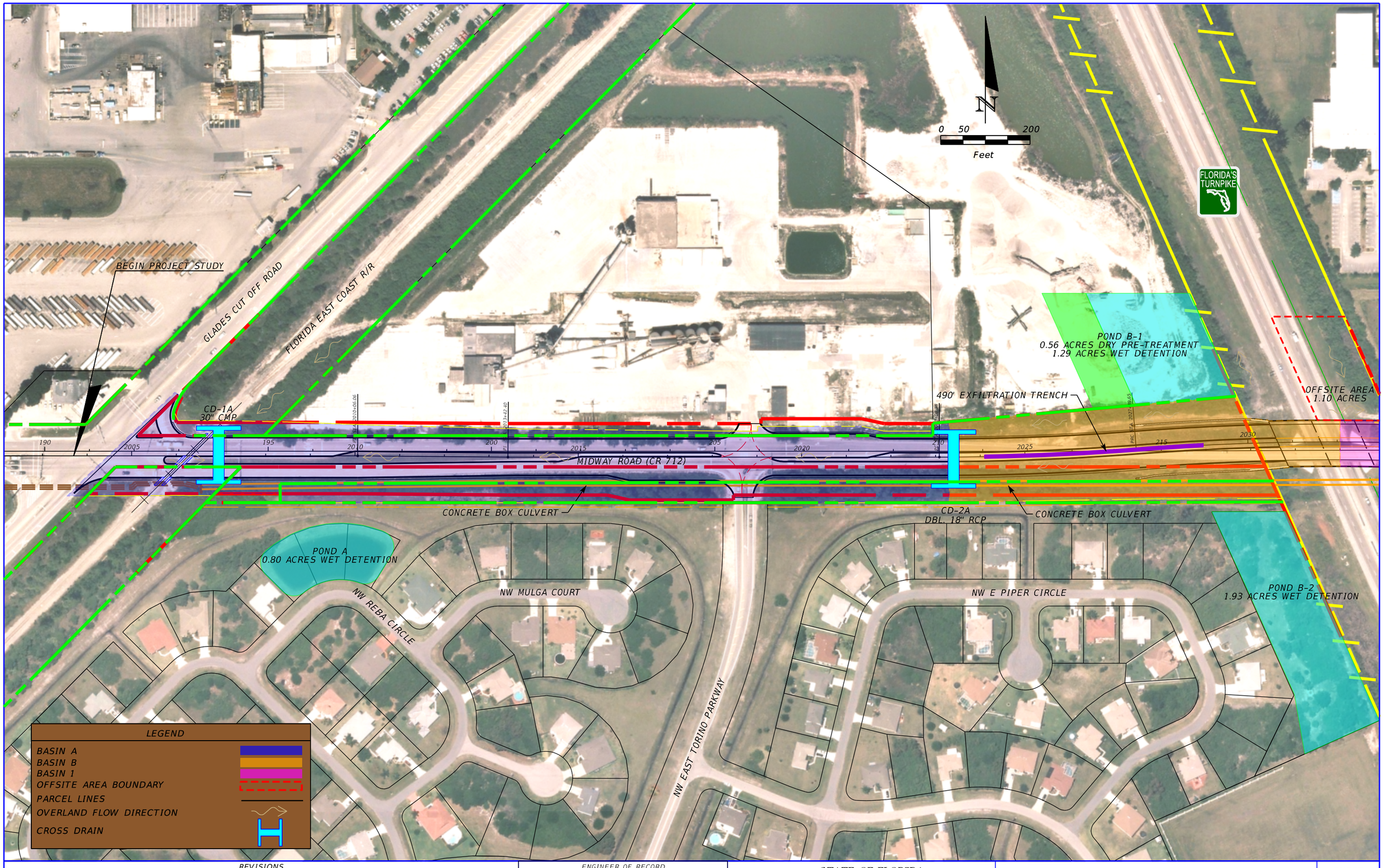

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ROAD NO.	COUNTY	FINANCIAL PROJECT ID
CR 712	ST. LUCIE	231440-3-22-01

ALTERNATIVE 2
BASIN MAPS

SHEET NO.

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CONSERVATION EASEMENT

POND 1
1.41 ACRES DRY PRE-TREATMENT
1.51 ACRES WET DETENTION

WETLAND

OFFSITE AREA
5.26 ACRES

S JENKINS ROAD

WETLAND

N

0 50 200
Feet

POST OFFICE ROAD

OFFSITE AREA
10.26 ACRES

OFFSITE AREA
15.03 ACRES

MIDWAY ROAD (CR 712)

CD-100
36" CMP

CONCRETE BOX CULVERT

CONCRETE BOX CULVERT

CD-101A

CONCRETE BOX CULVERT

CD-200
DBL. 24" RCP

NW CORPORATE WAY

NW CORPORATE WAY

NW MILNER DRIVE

NW OMEGA ROAD

FLORIDA'S TURNPIKE

LEGEND

BASIN 1
BASIN 2
OFFSITE AREA BOUNDARY
PARCEL LINES
OVERLAND FLOW DIRECTION
CROSS DRAIN

REVISIONS			
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DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
CR 712	ST. LUCIE	231440-3-22-01

ALTERNATIVE 2
BASIN MAPS

SHEET NO.

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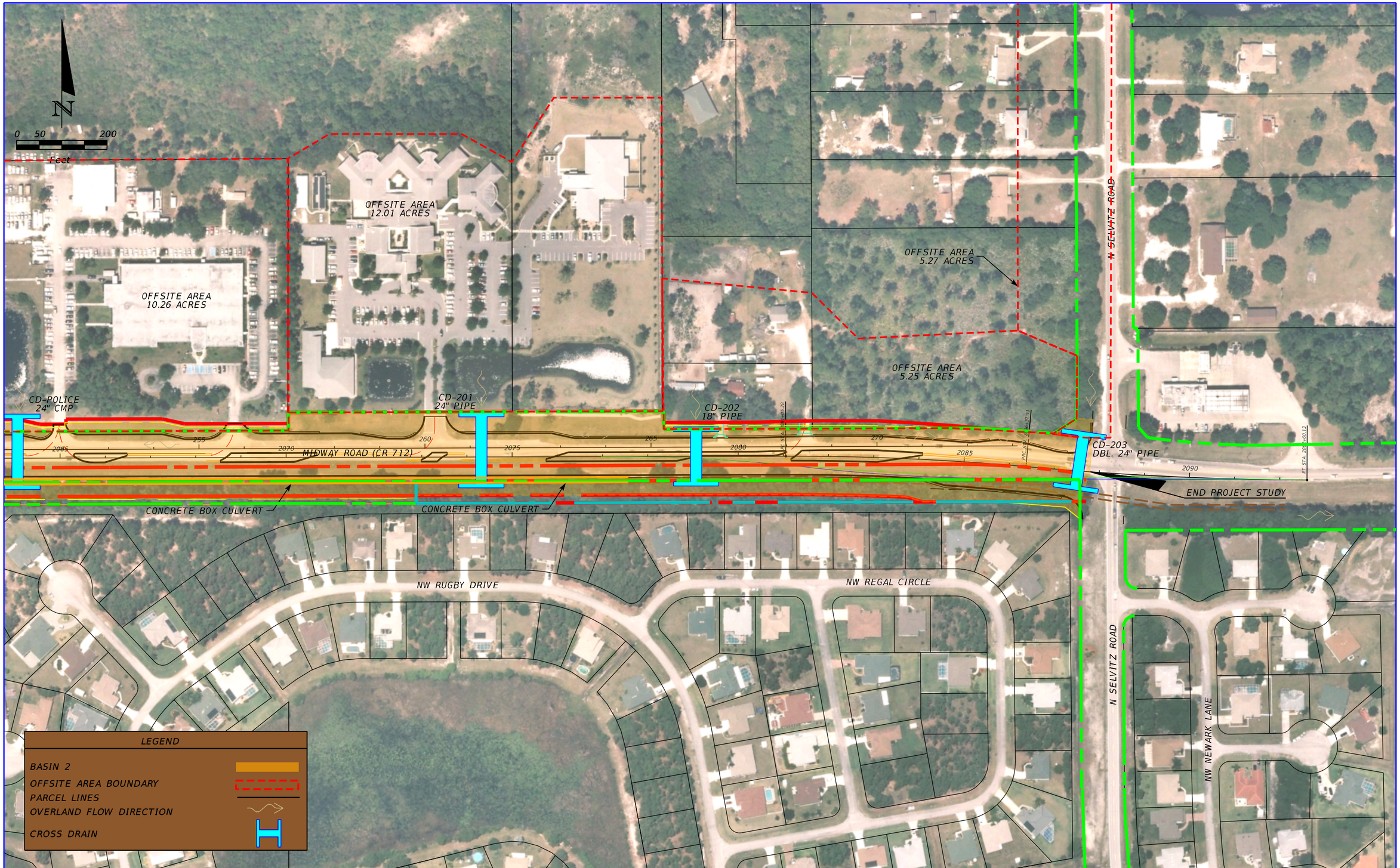

REVISIONS			
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STATE OF FLORIDA
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ROAD NO.	COUNTY	FINANCIAL PROJECT ID
CR 712	ST. LUCIE	231440-3-22-01

ALTERNATIVE 2
BASIN MAPS

SHEET NO.

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PROJECT STUDY

MIDWAY ROAD (CR 712)

NW DUNN ROAD

CANAL C-103

CHRISTENSEN ROAD

DANIELS ROAD

W VIRGINIA AVENUE

0 50 200

Feet

POND 2/3
2.60 ACRES DRY PRE-TREATMENT
2.95 ACRES WET DETENTION

LEGEND

OFFSITE AREA BOUNDARY

PARCEL LINES

OVERLAND FLOW DIRECTION

CROSS DRAIN

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

ENGINEER OF RECORD
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STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
CR 712	ST. LUCIE	231440-3-22-01

ALTERNATIVE 2
BASIN MAPS

SHEET NO.

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Inwood Consulting Engineers, Inc.

Midway Road (CR 712) from Glades Cuttoff Road to Selvitz Road PDE Study

14 December 2015

INPUT	OUTPUT
State Plane, NAD83	Geographic, NAD83
0901 - Florida East, U.S. Feet	Vertical - NAVD88, U.S. Feet
Vertical - NGVD29 (Vertcon94), U.S. Feet	

Northing/Y:	1105640.525293	**Latitude:**	27.374085104
Easting/X:	853831.206362	**Longitude:**	80.390937019
Elevation/Z:	1	**Elevation/Z:**	-0.483
Convergence:	0 16 48.19620		
Scale Factor:	0.999985967		
Combined Factor:	0.999990202		

Remark:

Basin A

Inwood Consulting Engineers, Inc.
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(407) 971-8955 (fax)

Made by: ZKE
Checked by: REC

DATE: March 22, 2016
Job Number: DT4-006-01

PROJECT : **Midway Road (CR 712) from Glades Cutoff Road to Selvitz Road PD&E Study**
BASIN NAME : **Basin A**
POND NAME : **Pond A**

Station Limits: From: 191+00 To: 210+25 Roadway Length = 1925 ft R/W Width = 160 ft

EXISTING CONDITION

Roadway Area:

Description
Existing Condition Information from SFWMD Permit No. 56-01734-P

From Permit No. 56-01734-P

Impervious Roadway Area:	2.90 ac
Pervious Roadway Area:	1.14 ac
Total Roadway Area:	4.04 ac
Additional Area from Proposed R/W:	
Impervious Roadway Area:	1.00 ac
Pervious Roadway Area:	2.03 ac
Total:	3.03 ac

Pond Area:

Pervious Pond Area :	0.29 ac	
Water Surface Area:	0.50 ac	Wet Pond
Total Pond Area:	0.79 ac	

Total Area:

Impervious Area:	**4.40 ac**
Pervious Area:	**3.46 ac**
Total Area:	**7.86 ac**

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Impervious areas; Streets & roads	D	98	1.00 ac	98.0
Open Space (lawns, parks, golf courses, cemeteries, etc.) Good condition (grass cover > 75%)	D	80	2.32 ac	185.6
Existing Lakes (Water surface)	D	100	0.50 ac	50.0
From Permit No. 56-01734-P	D	90.3	4.04 ac	364.8
		Total:	7.86 ac	698.4

CN = Total CN*Area / Total Area = **88.9**

Runoff:

		SFWMD & St. Lucie County (25yr/72hr)	Storm Sewer Design (3yr/24hr)
Soil Capacity (S) = $\frac{1000}{CN} - 10$ =	**1.25 in**	Precipitation (P) =	9.50 in	6.50 in
Runoff (Q) = $\frac{(P - 0.2S)^2}{(P + 0.8S)}$		Runoff (Q) =	**8.14 in**	**5.20 in**

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(407) 971-8955 (fax)

Made by: ZKE
Checked by: REC

DATE: March 22, 2016
Job Number: DT4-006-01

PROJECT : **Midway Road (CR 712) from Glades Cutoff Road to Selvitz Road PD&E Study**
BASIN NAME : **Basin A**
POND NAME : **Pond A**

Station Limits: From: 191+00 To: 210+25 Roadway Length = 1925 ft R/W Width = 160 ft

PROPOSED CONDITION

Roadway Area:

Description	Width	Quantity	Total Width
Travel Lane	11.0 ft	4	44 ft
Paved Shoulder	7.0 ft	2	14 ft
Imperv. Median			0 ft
Sidewalk or Trail	18.0 ft	1	18 ft
Curb&Gutter	2.0 ft	4	8 ft
Shldr Gutter			0 ft
Miscellaneous			0 ft
		Total Impervious Width:	84 ft

Impervious Roadway Area: 3.71 ac
Pervious Roadway Area: 3.36 ac
Total Roadway Area: 7.07 ac

Pond Area:

Pervious Pond Area : 0.29 ac
Water Surface Area: 0.50 ac Wet Pond
Total Pond Area: 0.79 ac

Total Area:

Impervious Area: **4.21 ac**
Pervious Area: **3.65 ac**
Total Area: **7.86 ac**

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Impervious areas; Streets & roads	D	98	3.71 ac	363.8
Proposed Ponds (Water Surface)	D	100	0.50 ac	50.0
Open Space (lawns, parks, golf courses, cemeteries, etc.) Good condition (grass cover > 75%)	D	80	3.65 ac	291.9
		Total:	7.86 ac	705.7

CN = Total CN*Area / Total Area = **89.8**

Runoff:

	SFWMD & St. Lucie County (25yr/72hr)	Storm Sewer Design (3yr/24hr)
Soil Capacity (S) = $\frac{1000}{CN} - 10$ = 1.14 in		
Precipitation (P) =	9.50 in	6.50 in
Runoff (Q) = $\frac{(P - 0.2S)^2}{(P + 0.8S)}$	**8.26 in**	**5.31 in**

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(407) 971-8955 (fax)

Made by: ZKE **DATE:** March 22, 2016
Checked by: REC **Job Number:** DT4-006-01

PROJECT : **Midway Road (CR 712) from Glades Cutoff Road to Selvitz Road PD&E Study**
BASIN NAME : **Basin A**
POND NAME : **Pond A**

POND SIZING

Required Treatment Volume (TV)

Selection criteria

Permitting Agency	**SFWMD**
StormW.Mgmt.	**Wet Detention**
Online/Offline	**Online**
OFW	**Yes**
Open/Closed Basin	**Open**

***Per Meeting with SFWMD provide Treatment for Net New Impervious for additional proposed improvements per this study.** = (Proposed Impervious - Permitted Impervious)

Wet Detention	**2.50 in**	x Net New Imperv.=	0.17 ac-ft

OFW Requirement, add 0.5 inches more TV	**0.25 ac-ft**
Required PAV from SFWMD Permit No. 56-00833-S =	**0.60 ac-ft**
Total Required PAV =	**0.85 ac-ft**

Required Attenuation Volume:

Total Runoff (ac-ft)

	SFWMD & St. Lucie County (25yr/72hr)	**Storm Sewer Design (10yr/24hr)**
Q_{pre} =	5.33 ac-ft	3.41 ac-ft
Q_{post} =	5.41 ac-ft	3.48 ac-ft
ΔQ =	**0.07 ac-ft**	**0.07 ac-ft**

Attenuation V_{req} = 0.07 ac-ft (use largest value)

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(407) 971-8955 (fax)

Made by: ZKE
Checked by: REC

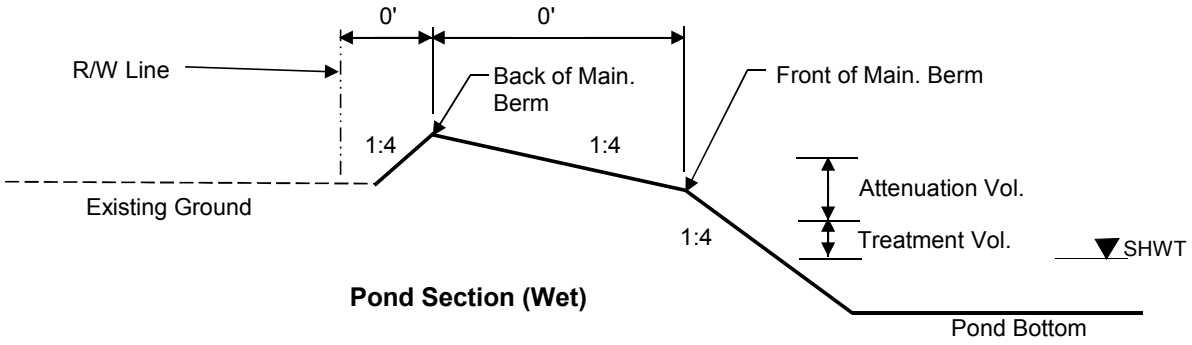
DATE: March 22, 2016
Job Number: DT4-006-01

PROJECT : **Midway Road (CR 712) from Glades Cutoff Road to Selvitz Road PD&E Study**
BASIN NAME : **Basin A**
POND NAME : **Pond A**

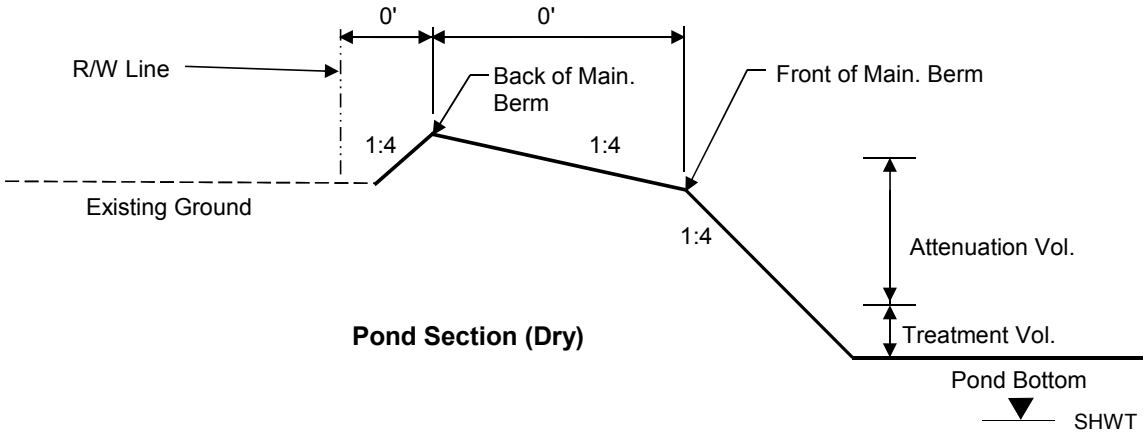
Maintenance Area Width =	0.0 ft	@ 1:4	Existing Ground Elevation =	20.00
Pond Tie-In Width =	0.1 ft	@ 1:4	Normal Water Elevation =	16.02
Maximum Storage Depth (**SD**) =	3.00 ft	with 1.0 ft freeboard	Lowest EOP Elevation =	21.00

Hydraulic Grade Line (HGL) check

HGL Slope =	0.100%	Use 0.05% for very flat terrain to 0.1% for flat terrain
Distance from Pond to Lowest EOP =	1000 ft	
Estimated Energy Losses =	1.0 ft	
HGL Clearance =	1.0 ft	Use 1.0 foot as a standard HGL clearance (no junction losses)
Estimated Storm Sewer Tailwater EL =	19.0 ft	



Pond Section (Wet)



Pond Section (Dry)

Inwood Consulting Engineers, Inc.
3000 Dovera Drive, Suite 200, Oviedo, FL 32765
(407) 971-8850 (phone)
(407) 971-8955 (fax)

Made by: ZKE
Checked by: REC
DATE: March 22, 2016
Job Number: DT4-006-01

PROJECT : **Midway Road (CR 712) from Glades Cutoff Road to Selvitz Road PD&E Study**
BASIN NAME : **Basin A**
POND NAME : **Pond A**

Pond Stage / Storage Calculations

ELEVATION	DESCRIPTION	AREA	STORAGE
20.00	Pond R/W	0.80 ac	
20.02	Back of Main. Berm	0.79 ac	2.67 ac-ft
20.02		0.79 ac	2.67 ac-ft
20.02	Front of Main. Berm	0.79 ac	2.67 ac-ft
19.02	Provided Treat.Vol.+Att.Vol	0.72 ac	1.91 ac-ft
17.66	Req'd Treat.Vol+Att. Vol	0.72 ac	0.93 ac-ft
17.65	Estimated Storm Sewer TW	0.72 ac	0.92 ac-ft
17.54	Top of Treatment Vol.	0.62 ac	0.85 ac-ft
16.02	Normal Water Level	0.50 ac	0.00 ac-ft
14.02		0.38 ac	
5.02	Pond Bottom	0.12 ac	

Required Treatment+Attenuation Vol.= 0.93 ac-ft
Required Treatment+Attenuation Stage= 17.66 ft

Provided Treatment+Attenuation Vol.= 1.91 ac-ft
Provided Treatment+Attenuation Stage= 19.02 ft

Estimated Treat. Vol.+Storm Sewer Att.= 0.92 ac-ft
Estimated Storm Sewer TW EL.= 17.65 ft HGL requirements met

Note: ICPR Routing Model indicates that the peak stage in the pond is 19.12 ft

Inwood Consulting Engineers, Inc.
3000 Dovera Drive, Suite 200, Oviedo, FL 32765
(407) 971-8850 (phone)
(407) 971-8955 (fax)

Made by: ZKE **DATE:** 2/17/2016
Checked by: REC **Job Number:** DT4-006-01

PROJECT : **Midway Road (CR 712) from Glades Cutoff Road to Selvitz Road PD&E Study**
BASIN NAME : **Basin A**
POND NAME : **Pond A**

NSLRWCD Volume Criteria

2" Over total Basin Area for 24 Hour Period

Total Basin Area = 7.86 ac

Allowable Discharge =	1.31 ac-ft /24 hrs	Design Discharge =	3.96 ac-ft /24hrs
Allowable Discharge Rate =	0.66 cfs	Design Discharge Rate =	2.00 cfs
Total Volume Discharged =	57063.6 cf	Total Volume Discharged =	172454 cf

Δ Discharge = 115390.4 cf

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Made by: ZKE
Checked by: REC

DATE: March 22, 2016
Job Number: DT4-006-01

PROJECT : **Midway Road (CR 712) from Glades Cutoff Road to Selvitz Road PD&E Study**
BASIN NAME : **Basin A**
POND NAME : **Pond A**

PERMANENT POOL VOLUME CALCULATIONS

Basin Characteristics **Meterological Zone: 2**

Land Use	Area (ac)	CN	Product
Roadway Paved Area	3.71	98.00	363.58
Roadway Pervious Area	3.35	80.00	268.00
Pond Pervious Area	0.30	80.00	24.00
Pond Area at NWL	0.50	100.00	50.00
Total	**7.86**		705.58

%DCIA = 53.56 %
Non-DCIA CN = 80.00
Composite C = **0.65**
Annual Rainfall (P) = **55.00** **in**

Min. Permanent Pool Vol. = Area x Composite C x P x 14 / (365 x 12) = **0.90** **ac-ft**

Stage Storage Calc. for Permanent Pool

ELEV. (ft)		AREA (ac)	AVG AREA (ac)	Delta D (ft)	Delta storage (ac-ft)	Sum Storage (ac-ft)
16.02	Normal Water Level	0.50				3.13
			0.44	2.00	0.88	
14.02		0.38				2.25
			0.25	9.00	2.25	
5.02	Pond Bottom	0.12				0.00

Permanent Pool Volume Provided = **3.13** **ac-ft**
Resident Time Provided = Perm. Pool Vol. Provided x 365 x 12 / (Area x C x P) **48.7** **Days**

GENERAL SITE INFORMATION: V 7.6

GO TO INTRODUCTION PAGE

Blue Numbers = Input data

Red Numbers = Calculated or Carryover

HELP

Select the appropriate Meteorological Zone, input the appropriate Mean Annual Rainfall amount and select the type of analysis

NAME OF PROJECT

Midway Road PD&E Study Basin A

VIEW ZONE MAP

Meteorological Zone (Please use zone map): CLICK ON CELL BELOW TO SELECT — Zone 2

VIEW MEAN ANNUAL RAINFALL MAP

Mean Annual Rainfall (Please use rainfall map): 55.00 Inches

Type of analysis: CLICK ON CELL BELOW TO SELECT — Net improvement

GO TO WATERSHED CHARACTERISTICS

Treatment efficiency (N, P) (leave empty if net improvement or BMP analysis is used): % %

Select the STORMWATER TREATMENT ANALYSIS Button below to begin analyzing the effectiveness of Best Management Practices.

Model documentation and example problems.

STORMWATER TREATMENT ANALYSIS

Systems available for analysis:
Retention Basin with option for calculating effluent concentration
Wet Detention
Exfiltration Trench
Pervious Pavement
Stormwater Harvesting
Biofiltration
Greenroof
Rainwater Harvesting
Managed Aquatic Plants Detention
Vegetated Natural Buffer
Vegetated Filter Strip
Swale
Rain Garden
Tree Well
Lined reuse pond
User Defined BMP

There is a user's manual for the BMPTRAINS model. It can be downloaded from www.stormwater.ucf.edu. The results from the example problems shown in the manual however may not reflect current model results due to ongoing updates of the model.

RESET INPUT FOR STORMWATER TREATMENT ANALYSIS

METHODOLOGY FOR CALCULATING REQUIRED TREATMENT EFFICIENCY

METHODOLOGY FOR RETENTION SYSTEMS

METHODOLOGY FOR WET DETENTION SYSTEMS

METHODOLOGY FOR GREENROOF SYSTEMS

METHODOLOGY FOR WATER HARVESTING SYSTEMS

WATERSHED CHARACTERISTICS V 7.6

GO TO STORMWATER TREATMENT ANALYSIS

Blue Numbers = Input data
Red Numbers = Calculated

HELP - LAND USES/EMC

SELECT CATCHMENT CONFIGURATION

CLICK ON CELL BELOW TO SELECT CONFIGURATION
A - Single Catchment

VIEW CATCHMENT CONFIGURATION

CATCHMENT NO.1 CHARACTERISTICS:

VIEW AVERAGE ANNUAL RUNOFF "C" Factor

VIEW EMC & FLUCCS

Pre-development land use: (with default EMCs)	CLICK ON CELL BELOW TO SELECT / Highway: TN=1.520 TP=0.200	
Post-development land use: (with default EMCs)	CLICK ON CELL BELOW TO SELECT / Highway: TN=1.520 TP=0.200	
Total pre-development catchment area:	7.86	AC
Total post-development catchment or BMP analysis area:	7.86	AC
Pre-development Non DCIA CN:	80.00	
Pre-development DCIA percentage:	43.30	%
Post-development Non DCIA CN:	80.00	
Post-development DCIA percentage:	53.56	%
Estimated BMPArea (No loading from this area)	0.80	AC

OVERWRITE DEFAULT CONCENTRATIONS USING:

	PRE:		POST:	
EMC(N):		mg/L		mg/L
EMC(P):		mg/L		mg/L

USE DEFAULT CONCENTRATIONS

Average annual pre runoff volume:	14.882	ac-ft/year
Average annual post runoff volume (note no BMP area):	15.691	ac-ft/year
Pre-development Annual Mass Loading - **Nitrogen:**	27.897	kg/year
Pre-development Annual Mass Loading - **Phosphorus:**	3.671	kg/year
Post-development Annual Mass Loading - **Nitrogen:**	29.414	kg/year
Post-development Annual Mass Loading - **Phosphorus:**	3.870	kg/year

CATCHMENT NO.2 CHARACTERISTICS:

Pre-development land use: (with default EMCs)	CLICK ON CELL BELOW TO SELECT / PLEASE SELECT LAND USE:	
Post-development land use: (with default EMCs)	CLICK ON CELL BELOW TO SELECT / PLEASE SELECT LAND USE:	
Total pre-development catchment area:		AC
Total post-development catchment or BMP analysis area:		AC
Pre-development Non DCIA CN:		
Pre-development DCIA percentage:		%
Post-development Non DCIA CN:		
Post-development DCIA percentage:		%
Estimated BMPArea (No loading from this area)		AC

OVERWRITE DEFAULT CONCENTRATIONS:

	PRE:		POST:	
EMC(N):		mg/L		mg/L
EMC(P):		mg/L		mg/L

USE DEFAULT CONCENTRATIONS

Average annual pre runoff volume:		ac-ft/year
Average annual post runoff volume (note no BMP area):		ac-ft/year
Pre-development Annual Mass Loading - **Nitrogen:**		kg/year
Pre-development Annual Mass Loading - **Phosphorus:**		kg/year
Post-development Annual Mass Loading - **Nitrogen:**		kg/year
Post-development Annual Mass Loading - **Phosphorus:**		kg/year

CATCHMENT NO.3 CHARACTERISTICS:

Pre-development land use: (with default EMCs)	CLICK ON CELL BELOW TO SELECT	
Post-development land use: (with default EMCs)	CLICK ON CELL BELOW TO SELECT	
Total pre-development catchment area:		AC
Total post-development catchment or BMP analysis area:		AC
Pre-development Non DCIA CN:		
Pre-development DCIA percentage:		%
Post-development Non DCIA CN:		
Post-development DCIA percentage:		%
Estimated BMPArea (no loading from this area)		AC

OVERWRITE DEFAULT CONCENTRATIONS:

	PRE:		POST:	
EMC(N):		mg/L		mg/L
EMC(P):		mg/L		mg/L

USE DEFAULT CONCENTRATIONS

Average annual pre runoff volume:		ac-ft/year
Average annual post runoff volume (note no BMP area):		ac-ft/year
Pre-development Annual Mass Loading - **Nitrogen:**		kg/year
Pre-development Annual Mass Loading - **Phosphorus:**		kg/year
Post-development Annual Mass Loading - **Nitrogen:**		kg/year
Post-development Annual Mass Loading - **Phosphorus:**		kg/year

CATCHMENT NO.4 CHARACTERISTICS:

Pre-development land use: (with default EMCs)	CLICK ON CELL BELOW TO SELECT	
Post-development land use: (with default EMCs)	CLICK ON CELL BELOW TO SELECT	
Total pre-development catchment area:		AC
Total post-development catchment or BMP analysis area:		AC
Pre-development Non DCIA CN:		
Pre-development DCIA percentage:		%
Post-development Non DCIA CN:		
Post-development DCIA percentage:		%
Estimated BMPArea (no loading from this area)		AC

OVERWRITE DEFAULT CONCENTRATIONS:

	PRE:		POST:	
EMC(N):		mg/L		mg/L
EMC(P):		mg/L		mg/L

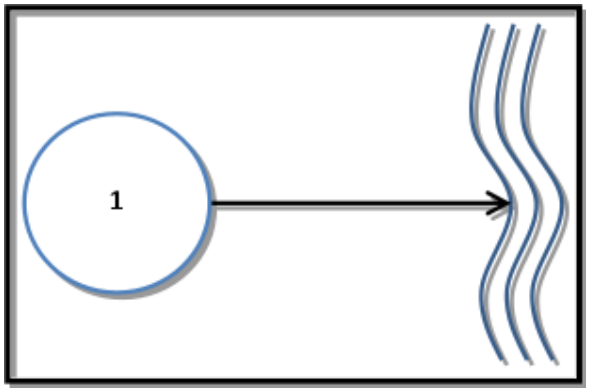
USE DEFAULT CONCENTRATIONS

Average annual pre runoff volume:		ac-ft/year
Average annual post runoff volume (note no BMP area):		ac-ft/year
Pre-development Annual Mass Loading - **Nitrogen:**		kg/year
Pre-development Annual Mass Loading - **Phosphorus:**		kg/year
Post-development Annual Mass Loading - **Nitrogen:**		kg/year
Post-development Annual Mass Loading - **Phosphorus:**		kg/year

STORMWATER TREATMENT ANALYSIS:	V 7.6	GO TO GENERAL SITE INFORMATION PAGE	Blue Numbers =	Input data
			Red Numbers =	Calculated

If not done, specify pre- and post-development watershed characteristics.

GO TO WATERSHED CHARACTERISTICS



Total Required Treatment Efficiency:

Required Treatment Eff (**Nitrogen**):	5.158	%
Required Treatment Eff (**Phosphorus**):	5.158	%

Select one of the BMPs below to analyze efficiency or review the summary data.

RETENTION BASIN	WET DETENTION	EXFILTRATION TRENCH	RAIN GARDEN	SWALE	USER DEFINED BMP
PERVIOUS PAVEMENT	STORMWATER HARVESTING	FILTRATION including Up-Flow Filters	LINED REUSE POND & UNDERDRAIN INPUT		
GREENROOF	RAINWATER HARVESTING	MANAGED AQUATIC PLANTS			
VEGETATED NATURAL BUFFER	VEGETATED FILTER STRIP	TREE WELL			

NOTE !!!: All individual system must be sized prior to being analyzed in conjunction with other systems. Please read instructions in the CATCHMENT AND TREATMENT SUMMARY RESULTS tab for more information.

CATCHMENT AND TREATMENT SUMMARY RESULTS

WET DETENTION: V 7.6

Blue Numbers =	Input data
Red Numbers =	Calculated or Carryover

WET DETENTION POND SERVING: Midway Road PD&E Study Basin A

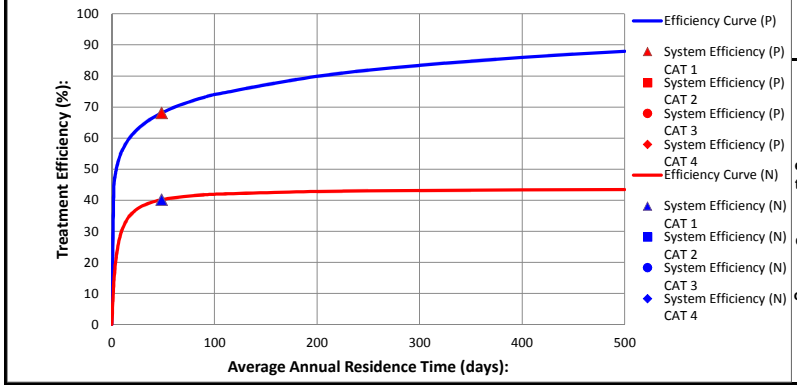
GO TO STORMWATER TREATMENT ANALYSIS

HELP - EXAMPLE PROBLEM 4

Loadings from BMP area are contained by the BMP, thus no BMP area load.	Catchment 1	Catchment 2	Catchment 3	Catchment 4	
Total pre-development catchment area:	7.860	0.000	0.000	0.000	ac
Total post-development catchment area:	7.060	0.000	0.000	0.000	ac
Average annual residence time (between 1 and 500 days):	48.60				days
Littoral Zone or other improvements used?	NO				
Littoral Zone or other improvement efficiency credit:	0.00				%
Total **Nitrogen** removal required:	5.158				%
Total **Phosphorus** removal required:	5.158				%
Total **Nitrogen** removal efficiency provided:	40.133				%
Total **Phosphorous** removal efficiency provided:	68.089				%
Is the wet detention sufficient:	YES				
Average annual runoff volume into the pond:	15.691				ac-ft/yr

To Achieve the Treatment Efficiency Shown in the Graph Below, the Following Must Hold

Minimum Pond Permanent Pool Volume:	2.089				ac-ft

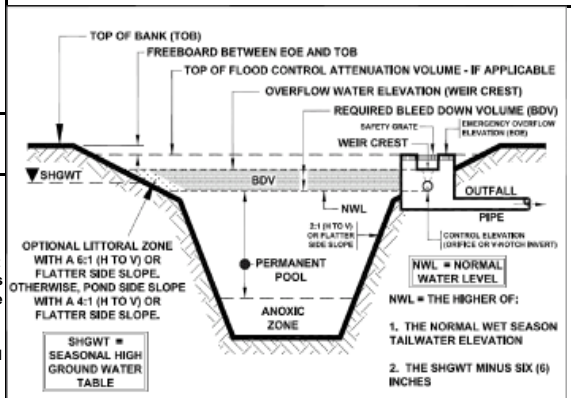


NOTE FOR TREATMENT EFFICIENCY GRAPH:

The purpose of the treatment efficiency graphs is to help illustrate the treatment efficiency of the wet detention system as the function of average annual residence time (and permanent pool volume). The graph illustrates that there is a point of diminished return as the permanent pool volume is substantially increased. The lines are produced from the conditions of catchment one, thus other catchments are shown with the data points.

REQUIRED REMAINING TREATMENT EFFICIENCIES OF TREATMENT SYSTEM IN SERIES WITH WET DETENTION. USE FOR SIZING OF TREATMENT SYSTEM IN SERIES WITH WET DETENTION.

	Catchment 1	Catchment 2	Catchment 3	Catchment 4	
Remaining treatment efficiency needed (**Nitrogen**):	0.000				%
Remaining treatment efficiency needed (**Phosphorus**):	0.000				%



TYPICAL X-SECTION OF A WET DETENTION SYSTEM

Source of Graphic: draft **STORMWATER QUALITY APPLICANT'S HANDBOOK** dated March 2010, by the Department of Environmental Protection, available at: http://www.dep.state.fl.us/water/wetlands/erp/rules/stormwater, March 2010

CATCHMENTS AND TREATMENT SUMMARY RESULTS V 7.6

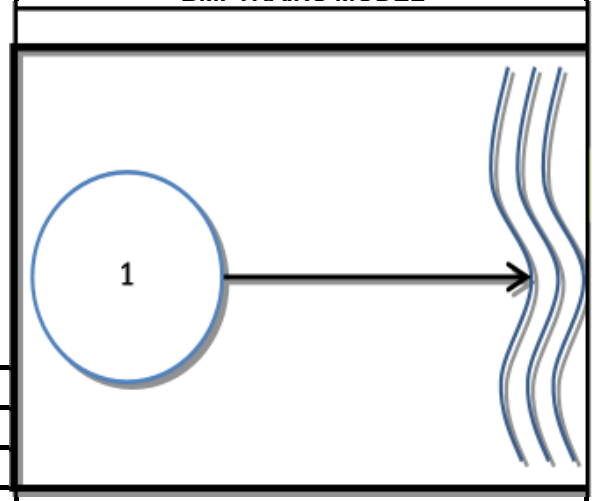
CALCULATION METHODS:

1. The effectiveness of each BMP in a single catchment is converted to an equivalent capture volume.
2. Certain BMP treatment train combinations have not been evaluated and in practice they are at this time not used, an example is a greenroof following a tree well.
3. Wet detention is last when used in a single catchment with other BMPs, except when followed by filtration

PROJECT TITLE	Midway Road PD&E Study Basin A	Optional Identification		
	Catchment 1:	Catchment 2:	Catchment 3:	Catchment 4:
BMP Name	Wet Detention			
BMP Name				
BMP Name				

Summary Performance of Entire Watershed

Catchment Configuration	A - Single Catchment		3/22/2016
Nitrogen Pre Load (kg/yr)	27.90		BMPTRAINS MODEL
Phosphorus Pre Load (kg/yr)	3.67	Treatment Objectives or Target MET	
Nitrogen Post Load (kg/yr)	29.41		
Phosphorus Post Load (kg/yr)	3.87		
Target Load Reduction (N) %	5.2		
Target Load Reduction (P) %	5.2		
Target Discharge Load, N (kg/yr)	27.90		
Target Discharge Load, P (kg/yr)	3.67		
Provided Overall Efficiency, N (%):	40.1		
Provided Overall Efficiency, P (%):	68.1		
Discharged Load, N (kg/yr & lb/yr):	17.61	38.79	
Discharged Load, P (kg/yr & lb/yr):	1.24	2.72	
Load Removed, N (kg/yr & lb/yr):	11.80	26.00	
Load Removed, P (kg/yr & lb/yr):	2.64	5.80	



Basin A ICPR

SUMMARY FOR PROPOSED PEAK STAGE FOR BASIN A AND POND A AND PEAK DISCHARGE RATE DIFFERENCE BETWEEN EXISTING AND PROPOSED CONDITIONS (25YR/72HR)

Design Storm Events	Peak Stage for Pond A (ft, NGVD)	Peak Discharge for Basin A (cfs)
ICPR Node Name	**Pond A**	**Canal C-103**
Existing Condition	18.21	20.74
Proposed Condition	19.12	20.02
Δ Discharge Rate		-0.72

SUMMARY FOR PROPOSED PEAK STAGE FOR BASIN A AND POND A AND PEAK DISCHARGE RATE DIFFERENCE BETWEEN EXISTING AND PROPOSED CONDITIONS (10YR/72HR)

Design Storm Events	Peak Stage for Pond A (ft, NGVD)	Peak Discharge for Basin A (cfs)
ICPR Node Name	**Pond A**	**Canal C-103**
Existing Condition	18.11	18.22
Proposed Condition	18.96	18.11
Δ Discharge Rate		-0.11

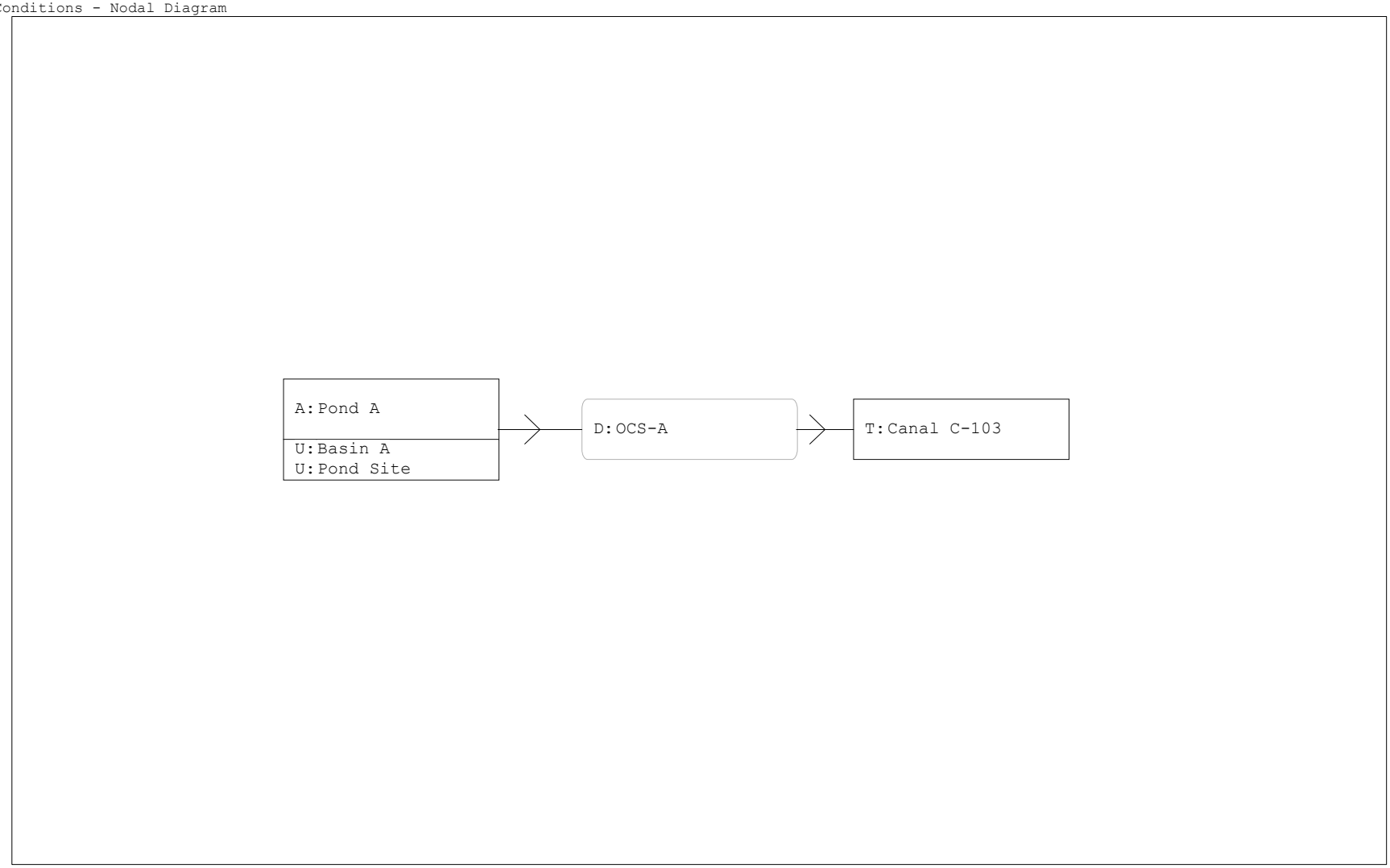
Pre

Midway Road (CR 712) from Glades Cut Off Road to Selvitz Road
PD&E Study
Basin A Existing Conditions - Nodal Diagram

Nodes
A Stage/Area
V Stage/Volume
T Time/Stage
M Manhole

Basins
O Overland Flow
U SCS Unit CN
S SBUH CN
Y SCS Unit GA
Z SBUH GA

Links
P Pipe
W Weir
C Channel
D Drop Structure
B Bridge
R Rating Curve
H Breach
E Percolation
F Filter
X Exfil Trench



==========
==== Basins ====
==========

Name: Basin A | Node: Pond A | Status: Onsite
Group: BASE | Type: SCS Unit Hydrograph CN

Unit Hydrograph:	Uh323	Peaking Factor:	323.0
Rainfall File:		Storm Duration(hrs):	0.00
Rainfall Amount(in):	0.000	Time of Conc(min):	15.00
Area(ac):	5.970	Time Shift(hrs):	0.00
Curve Number:	88.76	Max Allowable Q(cfs):	999999.000
DCIA(%):	0.00		

Name: Pond Site | Node: Pond A | Status: Onsite
Group: BASE | Type: SCS Unit Hydrograph CN

Unit Hydrograph:	Uh323	Peaking Factor:	323.0
Rainfall File:		Storm Duration(hrs):	0.00
Rainfall Amount(in):	0.000	Time of Conc(min):	15.00
Area(ac):	0.790	Time Shift(hrs):	0.00
Curve Number:	92.66	Max Allowable Q(cfs):	999999.000
DCIA(%):	0.00		

==========
==== Nodes ====
==========

Name: Canal C-103 | Base Flow(cfs): 0.000 | Init Stage(ft): 14.520
Group: BASE | Warn Stage(ft): 18.520
Type: Time/Stage

Time(hrs)	Stage(ft)
0.00	14.520
24.00	15.520
48.00	16.520
72.00	17.520
96.00	16.520
180.00	15.520
360.00	14.520

Name: Pond A | Base Flow(cfs): 0.000 | Init Stage(ft): 16.020
Group: BASE | Warn Stage(ft): 19.020
Type: Stage/Area

Stage(ft)	Area(ac)
16.020	0.5000
19.020	0.7200
20.020	0.7900

==========
==== Drop Structures ====
==========

Name: OCS-A | From Node: Pond A | Length(ft): 95.00
Group: BASE | To Node: Canal C-103 | Count: 1

	UPSTREAM	DOWNSTREAM		
Geometry:	Horz Ellipse	Horz Ellipse	Friction Equation:	Automatic
Span(in):	30.00	30.00	Solution Algorithm:	Most Restrictive
Rise(in):	19.00	19.00	Flow:	Both
Invert(ft):	14.520	14.520	Entrance Loss Coef:	0.000
Manning's N:	0.012000	0.012000	Exit Loss Coef:	1.000
Top Clip(in):	0.000	0.000	Outlet Ctrl Spec:	Use dc or tw
Bot Clip(in):	0.000	0.000	Inlet Ctrl Spec:	Use dc
			Solution Incs:	10

Upstream FHWA Inlet Edge Description:
Horizontal Ellipse Concrete: Square edge with headwall

Downstream FHWA Inlet Edge Description:
Horizontal Ellipse Concrete: Square edge with headwall

```
*** Weir 1 of 3 for Drop Structure OCS-A ***
                                                                                TABLE
                 Count: 1                      Bottom Clip(in): 0.000
                  Type: Horizontal                Top Clip(in): 0.000
                  Flow: Both                    Weir Disc Coef: 3.200
              Geometry: Rectangular           Orifice Disc Coef: 0.600

              Span(in): 36.00                       Invert(ft): 20.020
              Rise(in): 54.00                 Control Elev(ft): 20.020

*** Weir 2 of 3 for Drop Structure OCS-A ***
                                                                                TABLE
                 Count: 1                      Bottom Clip(in): 0.000
                  Type: Vertical: Mavis           Top Clip(in): 0.000
                  Flow: Both                    Weir Disc Coef: 3.200
              Geometry: Rectangular           Orifice Disc Coef: 0.600

              Span(in): 36.00                       Invert(ft): 17.120
              Rise(in): 34.80                 Control Elev(ft): 17.120

*** Weir 3 of 3 for Drop Structure OCS-A ***
                                                                                TABLE
                 Count: 1                      Bottom Clip(in): 0.000
                  Type: Vertical: Mavis           Top Clip(in): 0.000
                  Flow: Both                    Weir Disc Coef: 3.200
              Geometry: Circular              Orifice Disc Coef: 0.600

              Span(in): 3.00                        Invert(ft): 16.020
              Rise(in): 3.00                  Control Elev(ft): 15.520


=========================================================================================
==== Hydrology Simulations ==============================================================
=========================================================================================

         Name: 10YR_72HR
     Filename: F:\Projects\DT4-006-01\admin\Drainage\PSR\Appendix 4 - Pond Design Calcs\Basin A\Pond A ICPR\Basin A\Existing\10Y

      Override Defaults: Yes
    Storm Duration(hrs): 72.00
          Rainfall File: Sfwmd72
    Rainfall Amount(in): 8.50

Time(hrs)       Print Inc(min)
--------------- ---------------
72.000          5.00

-------------------------------------------------------------------------------------------------
         Name: 25YR_72HR
     Filename: F:\Projects\DT4-006-01\admin\Drainage\PSR\Appendix 4 - Pond Design Calcs\Basin A\Pond A ICPR\Basin A\Existing\25Y

      Override Defaults: Yes
    Storm Duration(hrs): 72.00
          Rainfall File: Sfwmd72
    Rainfall Amount(in): 9.50

Time(hrs)       Print Inc(min)
--------------- ---------------
72.000          5.00

=========================================================================================
==== Routing Simulations ================================================================
=========================================================================================

         Name: 10YR_72HR           Hydrology Sim: 10YR_72HR
     Filename: F:\Projects\DT4-006-01\admin\Drainage\PSR\Appendix 4 - Pond Design Calcs\Basin A\Pond A ICPR\Basin A\Existing\10Y

      Execute: Yes         Restart: No            Patch: No
  Alternative: No

        Max Delta Z(ft): 1.00                     Delta Z Factor: 0.00500
    Time Step Optimizer: 10.000
        Start Time(hrs): 0.000                     End Time(hrs): 72.00
     Min Calc Time(sec): 0.5000               Max Calc Time(sec): 60.0000
        Boundary Stages:                          Boundary Flows:



Time(hrs)       Print Inc(min)
--------------- ---------------
999.000         15.000

Group           Run
--------------- -----
BASE            Yes
```

Name: 25YR_72HR Hydrology Sim: 25YR_72HR
Filename: F:\Projects\DT4-006-01\admin\Drainage\PSR\Appendix 4 - Pond Design Calcs\Basin A\Pond A ICPR\Basin A\Existing\25Y

Execute: Yes Restart: No Patch: No
Alternative: No

Max Delta Z(ft): 1.00 Delta Z Factor: 0.00500
Time Step Optimizer: 10.000
Start Time(hrs): 0.000 End Time(hrs): 72.00
Min Calc Time(sec): 0.5000 Max Calc Time(sec): 60.0000
Boundary Stages: Boundary Flows:

Time(hrs)	Print Inc(min)
999.000	15.000

Group	Run
BASE	Yes

Name	Group	Simulation	Max Time Stage hrs	Max Stage ft	Warning Stage ft	Max Delta Stage ft	Max Surf Area ft2	Max Time Inflow hrs	Max Inflow cfs	Max Time Outflow hrs	Max Outflow cfs
Canal C-103	BASE	10YR_72HR	72.00	17.52	18.52	0.0007	0	60.00	18.22	0.00	0.00
Pond A	BASE	10YR_72HR	60.32	18.11	19.02	-0.0050	28450	60.00	17.02	60.32	9.28
Canal C-103	BASE	25YR_72HR	72.00	17.52	18.52	0.0007	0	60.00	20.74	0.00	0.00
Pond A	BASE	25YR_72HR	60.32	18.21	19.02	0.0050	28773	60.00	19.12	60.32	10.55

Simulation	Node	Group	Time	Stage	Warning Stage	Surface Area	Total Inflow	Total Outflow	Total Vol In	Total Vol Out
			hrs	ft	ft	ft2	cfs	cfs	af	af
10YR_72HR	Pond A	BASE	0.00	16.02	19.02	21780	0.00	0.00	0.0	0.0
10YR_72HR	Pond A	BASE	0.26	16.02	19.02	21780	0.00	0.00	0.0	0.0
10YR_72HR	Pond A	BASE	0.50	16.02	19.02	21780	0.00	0.00	0.0	0.0
10YR_72HR	Pond A	BASE	0.77	16.02	19.02	21780	0.00	0.00	0.0	0.0
10YR_72HR	Pond A	BASE	1.02	16.02	19.02	21780	0.00	0.00	0.0	0.0
10YR_72HR	Pond A	BASE	1.27	16.02	19.02	21780	0.00	0.00	0.0	0.0
10YR_72HR	Pond A	BASE	1.52	16.02	19.02	21780	0.00	0.00	0.0	0.0
10YR_72HR	Pond A	BASE	1.77	16.02	19.02	21780	0.00	0.00	0.0	0.0
10YR_72HR	Pond A	BASE	2.02	16.02	19.02	21780	0.00	0.00	0.0	0.0
10YR_72HR	Pond A	BASE	2.27	16.02	19.02	21780	0.00	0.00	0.0	0.0
10YR_72HR	Pond A	BASE	2.52	16.02	19.02	21780	0.00	0.00	0.0	0.0
10YR_72HR	Pond A	BASE	2.77	16.02	19.02	21780	0.00	0.00	0.0	0.0
10YR_72HR	Pond A	BASE	3.02	16.02	19.02	21780	0.00	0.00	0.0	0.0
10YR_72HR	Pond A	BASE	3.27	16.02	19.02	21780	0.00	0.00	0.0	0.0
10YR_72HR	Pond A	BASE	3.52	16.02	19.02	21780	0.00	0.00	0.0	0.0
10YR_72HR	Pond A	BASE	3.77	16.02	19.02	21780	0.00	0.00	0.0	0.0
10YR_72HR	Pond A	BASE	4.02	16.02	19.02	21780	0.00	0.00	0.0	0.0
10YR_72HR	Pond A	BASE	4.27	16.02	19.02	21780	0.00	0.00	0.0	0.0
10YR_72HR	Pond A	BASE	4.52	16.02	19.02	21780	0.00	0.00	0.0	0.0
10YR_72HR	Pond A	BASE	4.77	16.02	19.02	21780	0.00	0.00	0.0	0.0
10YR_72HR	Pond A	BASE	5.02	16.02	19.02	21780	0.00	0.00	0.0	0.0
10YR_72HR	Pond A	BASE	5.27	16.02	19.02	21780	0.00	0.00	0.0	0.0
10YR_72HR	Pond A	BASE	5.52	16.02	19.02	21781	0.00	0.00	0.0	0.0
10YR_72HR	Pond A	BASE	5.77	16.02	19.02	21781	0.00	0.00	0.0	0.0
10YR_72HR	Pond A	BASE	6.02	16.02	19.02	21782	0.01	0.00	0.0	0.0
10YR_72HR	Pond A	BASE	6.27	16.02	19.02	21783	0.01	0.00	0.0	0.0
10YR_72HR	Pond A	BASE	6.52	16.02	19.02	21784	0.01	0.00	0.0	0.0
10YR_72HR	Pond A	BASE	6.77	16.02	19.02	21786	0.01	0.00	0.0	0.0
10YR_72HR	Pond A	BASE	7.02	16.02	19.02	21788	0.02	0.00	0.0	0.0
10YR_72HR	Pond A	BASE	7.27	16.02	19.02	21790	0.02	0.00	0.0	0.0
10YR_72HR	Pond A	BASE	7.52	16.02	19.02	21793	0.02	0.00	0.0	0.0
10YR_72HR	Pond A	BASE	7.77	16.03	19.02	21796	0.03	0.00	0.0	0.0
10YR_72HR	Pond A	BASE	8.02	16.03	19.02	21800	0.03	0.00	0.0	0.0
10YR_72HR	Pond A	BASE	8.27	16.03	19.02	21804	0.03	0.00	0.0	0.0
10YR_72HR	Pond A	BASE	8.52	16.03	19.02	21808	0.03	0.00	0.0	0.0
10YR_72HR	Pond A	BASE	8.77	16.03	19.02	21813	0.04	0.00	0.0	0.0
10YR_72HR	Pond A	BASE	9.02	16.03	19.02	21818	0.04	0.00	0.0	0.0
10YR_72HR	Pond A	BASE	9.27	16.03	19.02	21823	0.04	0.00	0.0	0.0
10YR_72HR	Pond A	BASE	9.52	16.04	19.02	21828	0.04	0.00	0.0	0.0
10YR_72HR	Pond A	BASE	9.77	16.04	19.02	21834	0.05	0.00	0.0	0.0
10YR_72HR	Pond A	BASE	10.02	16.04	19.02	21840	0.05	0.00	0.0	0.0
10YR_72HR	Pond A	BASE	10.27	16.04	19.02	21847	0.05	0.00	0.0	0.0
10YR_72HR	Pond A	BASE	10.52	16.04	19.02	21853	0.05	0.00	0.0	0.0
10YR_72HR	Pond A	BASE	10.77	16.05	19.02	21860	0.05	0.00	0.0	0.0
10YR_72HR	Pond A	BASE	11.02	16.05	19.02	21867	0.06	0.00	0.0	0.0
10YR_72HR	Pond A	BASE	11.27	16.05	19.02	21875	0.06	0.00	0.0	0.0
10YR_72HR	Pond A	BASE	11.52	16.05	19.02	21882	0.06	0.00	0.0	0.0
10YR_72HR	Pond A	BASE	11.77	16.05	19.02	21890	0.06	0.00	0.0	0.0
10YR_72HR	Pond A	BASE	12.02	16.06	19.02	21898	0.06	0.00	0.0	0.0
10YR_72HR	Pond A	BASE	12.27	16.06	19.02	21906	0.07	0.00	0.0	0.0
10YR_72HR	Pond A	BASE	12.52	16.06	19.02	21915	0.07	0.00	0.0	0.0
10YR_72HR	Pond A	BASE	12.77	16.06	19.02	21923	0.07	0.00	0.0	0.0
10YR_72HR	Pond A	BASE	13.02	16.07	19.02	21932	0.07	0.00	0.0	0.0
10YR_72HR	Pond A	BASE	13.27	16.07	19.02	21941	0.07	0.00	0.0	0.0
10YR_72HR	Pond A	BASE	13.52	16.07	19.02	21950	0.07	0.00	0.0	0.0
10YR_72HR	Pond A	BASE	13.77	16.08	19.02	21959	0.08	0.01	0.0	0.0
10YR_72HR	Pond A	BASE	14.02	16.08	19.02	21968	0.08	0.01	0.0	0.0
10YR_72HR	Pond A	BASE	14.27	16.08	19.02	21978	0.08	0.01	0.0	0.0
10YR_72HR	Pond A	BASE	14.52	16.08	19.02	21987	0.08	0.01	0.0	0.0
10YR_72HR	Pond A	BASE	14.77	16.09	19.02	21997	0.08	0.01	0.0	0.0
10YR_72HR	Pond A	BASE	15.02	16.09	19.02	22006	0.08	0.01	0.0	0.0
10YR_72HR	Pond A	BASE	15.27	16.09	19.02	22016	0.08	0.01	0.0	0.0
10YR_72HR	Pond A	BASE	15.52	16.10	19.02	22026	0.09	0.01	0.0	0.0
10YR_72HR	Pond A	BASE	15.77	16.10	19.02	22036	0.09	0.01	0.0	0.0
10YR_72HR	Pond A	BASE	16.02	16.10	19.02	22046	0.09	0.01	0.0	0.0
10YR_72HR	Pond A	BASE	16.27	16.11	19.02	22056	0.09	0.01	0.0	0.0
10YR_72HR	Pond A	BASE	16.52	16.11	19.02	22066	0.09	0.01	0.0	0.0
10YR_72HR	Pond A	BASE	16.77	16.11	19.02	22076	0.09	0.01	0.0	0.0
10YR_72HR	Pond A	BASE	17.02	16.12	19.02	22087	0.09	0.02	0.1	0.0
10YR_72HR	Pond A	BASE	17.27	16.12	19.02	22097	0.09	0.02	0.1	0.0
10YR_72HR	Pond A	BASE	17.52	16.12	19.02	22107	0.10	0.02	0.1	0.0
10YR_72HR	Pond A	BASE	17.77	16.13	19.02	22117	0.10	0.02	0.1	0.0
10YR_72HR	Pond A	BASE	18.02	16.13	19.02	22128	0.10	0.02	0.1	0.0
10YR_72HR	Pond A	BASE	18.27	16.13	19.02	22138	0.10	0.02	0.1	0.0
10YR_72HR	Pond A	BASE	18.52	16.14	19.02	22148	0.10	0.02	0.1	0.0
10YR_72HR	Pond A	BASE	18.77	16.14	19.02	22158	0.10	0.02	0.1	0.0
10YR_72HR	Pond A	BASE	19.02	16.14	19.02	22168	0.10	0.02	0.1	0.0
10YR_72HR	Pond A	BASE	19.27	16.14	19.02	22179	0.10	0.02	0.1	0.0
10YR_72HR	Pond A	BASE	19.52	16.15	19.02	22189	0.10	0.03	0.1	0.0
10YR_72HR	Pond A	BASE	19.77	16.15	19.02	22199	0.11	0.03	0.1	0.0
10YR_72HR	Pond A	BASE	20.02	16.15	19.02	22209	0.11	0.03	0.1	0.0
10YR_72HR	Pond A	BASE	20.27	16.16	19.02	22219	0.11	0.03	0.1	0.0
10YR_72HR	Pond A	BASE	20.52	16.16	19.02	22229	0.11	0.03	0.1	0.0
10YR_72HR	Pond A	BASE	20.77	16.16	19.02	22239	0.11	0.03	0.1	0.0

Simulation	Node	Group	Time	Stage	Warning Stage	Surface Area	Total Inflow	Total Outflow	Total Vol In	Total Vol Out
			hrs	ft	ft	ft2	cfs	cfs	af	af
10YR_72HR	Pond A	BASE	21.02	16.17	19.02	22249	0.11	0.03	0.1	0.0
10YR_72HR	Pond A	BASE	21.27	16.17	19.02	22259	0.11	0.03	0.1	0.0
10YR_72HR	Pond A	BASE	21.52	16.17	19.02	22269	0.11	0.04	0.1	0.0
10YR_72HR	Pond A	BASE	21.77	16.18	19.02	22278	0.11	0.04	0.1	0.0
10YR_72HR	Pond A	BASE	22.02	16.18	19.02	22288	0.11	0.04	0.1	0.0
10YR_72HR	Pond A	BASE	22.27	16.18	19.02	22298	0.11	0.04	0.1	0.0
10YR_72HR	Pond A	BASE	22.52	16.19	19.02	22307	0.12	0.04	0.1	0.0
10YR_72HR	Pond A	BASE	22.77	16.19	19.02	22317	0.12	0.04	0.1	0.0
10YR_72HR	Pond A	BASE	23.02	16.19	19.02	22326	0.12	0.04	0.1	0.0
10YR_72HR	Pond A	BASE	23.27	16.19	19.02	22336	0.12	0.04	0.1	0.0
10YR_72HR	Pond A	BASE	23.52	16.20	19.02	22345	0.12	0.05	0.1	0.0
10YR_72HR	Pond A	BASE	23.77	16.20	19.02	22354	0.12	0.05	0.1	0.0
10YR_72HR	Pond A	BASE	24.02	16.20	19.02	22363	0.12	0.05	0.1	0.0
10YR_72HR	Pond A	BASE	24.27	16.21	19.02	22374	0.15	0.05	0.1	0.0
10YR_72HR	Pond A	BASE	24.52	16.21	19.02	22388	0.17	0.05	0.1	0.0
10YR_72HR	Pond A	BASE	24.77	16.22	19.02	22403	0.17	0.05	0.1	0.0
10YR_72HR	Pond A	BASE	25.02	16.22	19.02	22419	0.18	0.06	0.1	0.0
10YR_72HR	Pond A	BASE	25.27	16.22	19.02	22435	0.18	0.06	0.1	0.0
10YR_72HR	Pond A	BASE	25.52	16.23	19.02	22450	0.18	0.06	0.1	0.0
10YR_72HR	Pond A	BASE	25.77	16.23	19.02	22466	0.18	0.06	0.1	0.0
10YR_72HR	Pond A	BASE	26.02	16.24	19.02	22481	0.18	0.06	0.1	0.0
10YR_72HR	Pond A	BASE	26.27	16.24	19.02	22496	0.19	0.07	0.1	0.0
10YR_72HR	Pond A	BASE	26.52	16.25	19.02	22511	0.19	0.07	0.1	0.0
10YR_72HR	Pond A	BASE	26.77	16.25	19.02	22527	0.19	0.07	0.2	0.0
10YR_72HR	Pond A	BASE	27.02	16.26	19.02	22542	0.19	0.07	0.2	0.0
10YR_72HR	Pond A	BASE	27.27	16.26	19.02	22557	0.19	0.07	0.2	0.0
10YR_72HR	Pond A	BASE	27.52	16.27	19.02	22572	0.19	0.07	0.2	0.0
10YR_72HR	Pond A	BASE	27.77	16.27	19.02	22587	0.19	0.08	0.2	0.0
10YR_72HR	Pond A	BASE	28.02	16.28	19.02	22601	0.19	0.08	0.2	0.0
10YR_72HR	Pond A	BASE	28.27	16.28	19.02	22616	0.19	0.08	0.2	0.0
10YR_72HR	Pond A	BASE	28.52	16.29	19.02	22631	0.20	0.08	0.2	0.0
10YR_72HR	Pond A	BASE	28.77	16.29	19.02	22645	0.20	0.08	0.2	0.0
10YR_72HR	Pond A	BASE	29.02	16.30	19.02	22659	0.20	0.09	0.2	0.0
10YR_72HR	Pond A	BASE	29.27	16.30	19.02	22673	0.20	0.09	0.2	0.1
10YR_72HR	Pond A	BASE	29.52	16.30	19.02	22687	0.20	0.09	0.2	0.1
10YR_72HR	Pond A	BASE	29.77	16.31	19.02	22701	0.20	0.09	0.2	0.1
10YR_72HR	Pond A	BASE	30.02	16.31	19.02	22714	0.20	0.10	0.2	0.1
10YR_72HR	Pond A	BASE	30.27	16.32	19.02	22728	0.20	0.10	0.2	0.1
10YR_72HR	Pond A	BASE	30.52	16.32	19.02	22741	0.20	0.10	0.2	0.1
10YR_72HR	Pond A	BASE	30.77	16.32	19.02	22754	0.20	0.10	0.2	0.1
10YR_72HR	Pond A	BASE	31.02	16.33	19.02	22767	0.21	0.10	0.2	0.1
10YR_72HR	Pond A	BASE	31.27	16.33	19.02	22780	0.21	0.10	0.2	0.1
10YR_72HR	Pond A	BASE	31.52	16.34	19.02	22793	0.21	0.10	0.2	0.1
10YR_72HR	Pond A	BASE	31.77	16.34	19.02	22806	0.21	0.10	0.2	0.1
10YR_72HR	Pond A	BASE	32.02	16.35	19.02	22819	0.21	0.11	0.2	0.1
10YR_72HR	Pond A	BASE	32.27	16.35	19.02	22832	0.21	0.11	0.2	0.1
10YR_72HR	Pond A	BASE	32.52	16.35	19.02	22845	0.21	0.11	0.2	0.1
10YR_72HR	Pond A	BASE	32.77	16.36	19.02	22858	0.21	0.11	0.3	0.1
10YR_72HR	Pond A	BASE	33.02	16.36	19.02	22871	0.21	0.11	0.3	0.1
10YR_72HR	Pond A	BASE	33.27	16.37	19.02	22883	0.21	0.11	0.3	0.1
10YR_72HR	Pond A	BASE	33.52	16.37	19.02	22896	0.21	0.11	0.3	0.1
10YR_72HR	Pond A	BASE	33.77	16.37	19.02	22909	0.21	0.11	0.3	0.1
10YR_72HR	Pond A	BASE	34.02	16.38	19.02	22921	0.21	0.11	0.3	0.1
10YR_72HR	Pond A	BASE	34.27	16.38	19.02	22934	0.21	0.11	0.3	0.1
10YR_72HR	Pond A	BASE	34.52	16.39	19.02	22946	0.22	0.12	0.3	0.1
10YR_72HR	Pond A	BASE	34.77	16.39	19.02	22959	0.22	0.12	0.3	0.1
10YR_72HR	Pond A	BASE	35.02	16.39	19.02	22971	0.22	0.12	0.3	0.1
10YR_72HR	Pond A	BASE	35.27	16.40	19.02	22983	0.22	0.12	0.3	0.1
10YR_72HR	Pond A	BASE	35.52	16.40	19.02	22996	0.22	0.12	0.3	0.1
10YR_72HR	Pond A	BASE	35.77	16.40	19.02	23008	0.22	0.12	0.3	0.1
10YR_72HR	Pond A	BASE	36.02	16.41	19.02	23020	0.22	0.12	0.3	0.1
10YR_72HR	Pond A	BASE	36.27	16.41	19.02	23033	0.22	0.12	0.3	0.1
10YR_72HR	Pond A	BASE	36.52	16.42	19.02	23045	0.22	0.12	0.3	0.1
10YR_72HR	Pond A	BASE	36.77	16.42	19.02	23057	0.22	0.12	0.3	0.1
10YR_72HR	Pond A	BASE	37.02	16.42	19.02	23070	0.22	0.12	0.3	0.1
10YR_72HR	Pond A	BASE	37.27	16.43	19.02	23082	0.22	0.13	0.3	0.1
10YR_72HR	Pond A	BASE	37.52	16.43	19.02	23094	0.22	0.13	0.3	0.1
10YR_72HR	Pond A	BASE	37.77	16.44	19.02	23106	0.23	0.13	0.3	0.1
10YR_72HR	Pond A	BASE	38.02	16.44	19.02	23119	0.23	0.13	0.3	0.1
10YR_72HR	Pond A	BASE	38.27	16.44	19.02	23131	0.23	0.13	0.4	0.1
10YR_72HR	Pond A	BASE	38.52	16.45	19.02	23143	0.23	0.13	0.4	0.1
10YR_72HR	Pond A	BASE	38.77	16.45	19.02	23155	0.23	0.13	0.4	0.1
10YR_72HR	Pond A	BASE	39.02	16.45	19.02	23167	0.23	0.13	0.4	0.1
10YR_72HR	Pond A	BASE	39.27	16.46	19.02	23179	0.23	0.13	0.4	0.1
10YR_72HR	Pond A	BASE	39.52	16.46	19.02	23191	0.23	0.13	0.4	0.1
10YR_72HR	Pond A	BASE	39.77	16.47	19.02	23204	0.23	0.13	0.4	0.2
10YR_72HR	Pond A	BASE	40.02	16.47	19.02	23217	0.23	0.13	0.4	0.2
10YR_72HR	Pond A	BASE	40.27	16.47	19.02	23230	0.23	0.12	0.4	0.2
10YR_72HR	Pond A	BASE	40.52	16.48	19.02	23243	0.23	0.12	0.4	0.2
10YR_72HR	Pond A	BASE	40.77	16.48	19.02	23256	0.23	0.12	0.4	0.2
10YR_72HR	Pond A	BASE	41.02	16.49	19.02	23270	0.23	0.12	0.4	0.2
10YR_72HR	Pond A	BASE	41.27	16.49	19.02	23284	0.23	0.12	0.4	0.2
10YR_72HR	Pond A	BASE	41.52	16.50	19.02	23298	0.23	0.12	0.4	0.2
10YR_72HR	Pond A	BASE	41.77	16.50	19.02	23312	0.23	0.12	0.4	0.2

Simulation	Node	Group	Time hrs	Stage ft	Warning Stage ft	Surface Area ft2	Total Inflow cfs	Total Outflow cfs	Total Vol In af	Total Vol Out af
10YR_72HR	Pond A	BASE	42.02	16.50	19.02	23327	0.23	0.11	0.4	0.2
10YR_72HR	Pond A	BASE	42.27	16.51	19.02	23342	0.23	0.11	0.4	0.2
10YR_72HR	Pond A	BASE	42.52	16.51	19.02	23357	0.23	0.11	0.4	0.2
10YR_72HR	Pond A	BASE	42.77	16.52	19.02	23372	0.23	0.11	0.4	0.2
10YR_72HR	Pond A	BASE	43.02	16.52	19.02	23387	0.23	0.11	0.4	0.2
10YR_72HR	Pond A	BASE	43.27	16.53	19.02	23403	0.23	0.11	0.4	0.2
10YR_72HR	Pond A	BASE	43.52	16.53	19.02	23419	0.24	0.11	0.5	0.2
10YR_72HR	Pond A	BASE	43.77	16.54	19.02	23435	0.24	0.10	0.5	0.2
10YR_72HR	Pond A	BASE	44.02	16.54	19.02	23451	0.24	0.10	0.5	0.2
10YR_72HR	Pond A	BASE	44.27	16.55	19.02	23468	0.24	0.10	0.5	0.2
10YR_72HR	Pond A	BASE	44.52	16.55	19.02	23484	0.24	0.10	0.5	0.2
10YR_72HR	Pond A	BASE	44.77	16.56	19.02	23501	0.24	0.10	0.5	0.2
10YR_72HR	Pond A	BASE	45.02	16.56	19.02	23518	0.24	0.10	0.5	0.2
10YR_72HR	Pond A	BASE	45.27	16.57	19.02	23535	0.24	0.10	0.5	0.2
10YR_72HR	Pond A	BASE	45.52	16.58	19.02	23553	0.24	0.09	0.5	0.2
10YR_72HR	Pond A	BASE	45.77	16.58	19.02	23571	0.24	0.09	0.5	0.2
10YR_72HR	Pond A	BASE	46.02	16.59	19.02	23588	0.24	0.09	0.5	0.2
10YR_72HR	Pond A	BASE	46.27	16.59	19.02	23607	0.24	0.09	0.5	0.2
10YR_72HR	Pond A	BASE	46.52	16.60	19.02	23625	0.24	0.09	0.5	0.2
10YR_72HR	Pond A	BASE	46.77	16.60	19.02	23643	0.24	0.09	0.5	0.2
10YR_72HR	Pond A	BASE	47.02	16.61	19.02	23662	0.24	0.09	0.5	0.2
10YR_72HR	Pond A	BASE	47.27	16.62	19.02	23681	0.24	0.08	0.5	0.2
10YR_72HR	Pond A	BASE	47.52	16.62	19.02	23700	0.24	0.08	0.5	0.2
10YR_72HR	Pond A	BASE	47.77	16.63	19.02	23719	0.24	0.08	0.5	0.2
10YR_72HR	Pond A	BASE	48.02	16.63	19.02	23739	0.24	0.08	0.5	0.2
10YR_72HR	Pond A	BASE	48.27	16.64	19.02	23759	0.26	0.08	0.5	0.2
10YR_72HR	Pond A	BASE	48.52	16.65	19.02	23782	0.26	0.08	0.6	0.2
10YR_72HR	Pond A	BASE	48.77	16.65	19.02	23805	0.27	0.08	0.6	0.2
10YR_72HR	Pond A	BASE	49.02	16.66	19.02	23828	0.27	0.07	0.6	0.2
10YR_72HR	Pond A	BASE	49.27	16.67	19.02	23852	0.27	0.07	0.6	0.2
10YR_72HR	Pond A	BASE	49.52	16.68	19.02	23876	0.27	0.07	0.6	0.2
10YR_72HR	Pond A	BASE	49.77	16.68	19.02	23900	0.28	0.07	0.6	0.2
10YR_72HR	Pond A	BASE	50.02	16.69	19.02	23925	0.28	0.07	0.6	0.2
10YR_72HR	Pond A	BASE	50.27	16.70	19.02	23951	0.30	0.07	0.6	0.2
10YR_72HR	Pond A	BASE	50.52	16.71	19.02	23981	0.32	0.07	0.6	0.2
10YR_72HR	Pond A	BASE	50.77	16.72	19.02	24011	0.32	0.07	0.6	0.2
10YR_72HR	Pond A	BASE	51.02	16.73	19.02	24042	0.33	0.07	0.6	0.2
10YR_72HR	Pond A	BASE	51.27	16.74	19.02	24074	0.34	0.07	0.6	0.2
10YR_72HR	Pond A	BASE	51.52	16.75	19.02	24108	0.35	0.07	0.6	0.2
10YR_72HR	Pond A	BASE	51.77	16.76	19.02	24142	0.36	0.07	0.6	0.2
10YR_72HR	Pond A	BASE	52.02	16.77	19.02	24176	0.36	0.07	0.6	0.2
10YR_72HR	Pond A	BASE	52.27	16.78	19.02	24214	0.42	0.07	0.6	0.2
10YR_72HR	Pond A	BASE	52.52	16.80	19.02	24258	0.45	0.07	0.7	0.2
10YR_72HR	Pond A	BASE	52.77	16.81	19.02	24304	0.46	0.07	0.7	0.2
10YR_72HR	Pond A	BASE	53.02	16.82	19.02	24351	0.47	0.07	0.7	0.3
10YR_72HR	Pond A	BASE	53.27	16.84	19.02	24401	0.53	0.07	0.7	0.3
10YR_72HR	Pond A	BASE	53.52	16.86	19.02	24456	0.56	0.08	0.7	0.3
10YR_72HR	Pond A	BASE	53.77	16.88	19.02	24514	0.58	0.08	0.7	0.3
10YR_72HR	Pond A	BASE	54.02	16.89	19.02	24573	0.58	0.08	0.7	0.3
10YR_72HR	Pond A	BASE	54.27	16.91	19.02	24634	0.65	0.09	0.7	0.3
10YR_72HR	Pond A	BASE	54.52	16.93	19.02	24702	0.68	0.09	0.7	0.3
10YR_72HR	Pond A	BASE	54.77	16.96	19.02	24771	0.69	0.09	0.8	0.3
10YR_72HR	Pond A	BASE	55.02	16.98	19.02	24841	0.70	0.10	0.8	0.3
10YR_72HR	Pond A	BASE	55.27	17.00	19.02	24914	0.77	0.10	0.8	0.3
10YR_72HR	Pond A	BASE	55.52	17.03	19.02	24993	0.80	0.10	0.8	0.3
10YR_72HR	Pond A	BASE	55.77	17.05	19.02	25074	0.82	0.11	0.8	0.3
10YR_72HR	Pond A	BASE	56.02	17.08	19.02	25155	0.82	0.11	0.8	0.3
10YR_72HR	Pond A	BASE	56.27	17.10	19.02	25240	0.90	0.12	0.9	0.3
10YR_72HR	Pond A	BASE	56.52	17.13	19.02	25332	0.94	0.13	0.9	0.3
10YR_72HR	Pond A	BASE	56.77	17.16	19.02	25421	0.96	0.20	0.9	0.3
10YR_72HR	Pond A	BASE	57.02	17.19	19.02	25503	0.97	0.29	0.9	0.3
10YR_72HR	Pond A	BASE	57.27	17.21	19.02	25579	1.07	0.39	0.9	0.3
10YR_72HR	Pond A	BASE	57.52	17.23	19.02	25653	1.12	0.49	1.0	0.3
10YR_72HR	Pond A	BASE	57.77	17.25	19.02	25722	1.20	0.60	1.0	0.3
10YR_72HR	Pond A	BASE	58.02	17.27	19.02	25785	1.24	0.71	1.0	0.3
10YR_72HR	Pond A	BASE	58.27	17.29	19.02	25842	1.33	0.82	1.0	0.3
10YR_72HR	Pond A	BASE	58.52	17.31	19.02	25896	1.38	0.92	1.1	0.4
10YR_72HR	Pond A	BASE	58.77	17.33	19.02	25953	1.64	1.04	1.1	0.4
10YR_72HR	Pond A	BASE	59.02	17.35	19.02	26022	1.80	1.18	1.1	0.4
10YR_72HR	Pond A	BASE	59.27	17.38	19.02	26110	2.40	1.38	1.2	0.4
10YR_72HR	Pond A	BASE	59.52	17.41	19.02	26228	2.97	1.67	1.2	0.5
10YR_72HR	Pond A	BASE	59.75	17.56	19.02	26694	11.63	2.95	1.4	0.5
10YR_72HR	Pond A	BASE	60.00	17.89	19.02	27750	17.02	6.62	1.7	0.6
10YR_72HR	Pond A	BASE	60.25	18.10	19.02	28426	10.88	9.20	2.0	0.8
10YR_72HR	Pond A	BASE	60.50	18.08	19.02	28363	6.89	8.93	2.1	1.0
10YR_72HR	Pond A	BASE	60.76	17.99	19.02	28062	4.14	7.77	2.3	1.1
10YR_72HR	Pond A	BASE	61.01	17.87	19.02	27683	2.80	6.31	2.3	1.3
10YR_72HR	Pond A	BASE	61.25	17.76	19.02	27344	2.08	5.08	2.4	1.4
10YR_72HR	Pond A	BASE	61.50	17.67	19.02	27064	1.79	4.12	2.4	1.5
10YR_72HR	Pond A	BASE	61.75	17.60	19.02	26843	1.56	3.39	2.5	1.6
10YR_72HR	Pond A	BASE	62.00	17.55	19.02	26668	1.44	2.84	2.5	1.6
10YR_72HR	Pond A	BASE	62.26	17.50	19.02	26522	1.20	2.41	2.5	1.7
10YR_72HR	Pond A	BASE	62.51	17.47	19.02	26401	1.08	2.07	2.5	1.7
10YR_72HR	Pond A	BASE	62.76	17.44	19.02	26302	0.97	1.80	2.6	1.8

Simulation	Node	Group	Time	Stage	Warning Stage	Surface Area	Total Inflow	Total Outflow	Total Vol In	Total Vol Out
			hrs	ft	ft	ft2	cfs	cfs	af	af
10YR_72HR	Pond A	BASE	63.01	17.41	19.02	26221	0.92	1.58	2.6	1.8
10YR_72HR	Pond A	BASE	63.26	17.39	19.02	26157	0.91	1.41	2.6	1.8
10YR_72HR	Pond A	BASE	63.51	17.37	19.02	26108	0.90	1.28	2.6	1.9
10YR_72HR	Pond A	BASE	63.76	17.36	19.02	26072	0.90	1.18	2.6	1.9
10YR_72HR	Pond A	BASE	64.01	17.36	19.02	26046	0.90	1.10	2.7	1.9
10YR_72HR	Pond A	BASE	64.26	17.35	19.02	26018	0.71	1.02	2.7	1.9
10YR_72HR	Pond A	BASE	64.51	17.34	19.02	25983	0.60	0.92	2.7	2.0
10YR_72HR	Pond A	BASE	64.76	17.33	19.02	25950	0.56	0.82	2.7	2.0
10YR_72HR	Pond A	BASE	65.01	17.32	19.02	25925	0.54	0.74	2.7	2.0
10YR_72HR	Pond A	BASE	65.26	17.31	19.02	25907	0.54	0.67	2.7	2.0
10YR_72HR	Pond A	BASE	65.51	17.31	19.02	25896	0.54	0.61	2.7	2.0
10YR_72HR	Pond A	BASE	65.76	17.31	19.02	25891	0.54	0.55	2.7	2.0
10YR_72HR	Pond A	BASE	66.01	17.31	19.02	25893	0.54	0.50	2.7	2.0
10YR_72HR	Pond A	BASE	66.26	17.31	19.02	25901	0.54	0.45	2.8	2.1
10YR_72HR	Pond A	BASE	66.51	17.31	19.02	25914	0.54	0.40	2.8	2.1
10YR_72HR	Pond A	BASE	66.76	17.32	19.02	25932	0.54	0.35	2.8	2.1
10YR_72HR	Pond A	BASE	67.01	17.33	19.02	25955	0.54	0.32	2.8	2.1
10YR_72HR	Pond A	BASE	67.26	17.34	19.02	25982	0.54	0.29	2.8	2.1
10YR_72HR	Pond A	BASE	67.51	17.34	19.02	26010	0.54	0.27	2.8	2.1
10YR_72HR	Pond A	BASE	67.76	17.35	19.02	26041	0.54	0.26	2.8	2.1
10YR_72HR	Pond A	BASE	68.01	17.36	19.02	26072	0.54	0.26	2.8	2.1
10YR_72HR	Pond A	BASE	68.26	17.37	19.02	26100	0.44	0.22	2.8	2.1
10YR_72HR	Pond A	BASE	68.51	17.38	19.02	26124	0.39	0.16	2.9	2.1
10YR_72HR	Pond A	BASE	68.76	17.39	19.02	26151	0.37	0.11	2.9	2.1
10YR_72HR	Pond A	BASE	69.01	17.40	19.02	26181	0.36	0.08	2.9	2.1
10YR_72HR	Pond A	BASE	69.26	17.41	19.02	26213	0.36	0.06	2.9	2.1
10YR_72HR	Pond A	BASE	69.51	17.42	19.02	26246	0.36	0.06	2.9	2.1
10YR_72HR	Pond A	BASE	69.76	17.43	19.02	26279	0.36	0.06	2.9	2.1
10YR_72HR	Pond A	BASE	70.01	17.44	19.02	26312	0.36	0.06	2.9	2.1
10YR_72HR	Pond A	BASE	70.26	17.45	19.02	26345	0.36	0.06	2.9	2.1
10YR_72HR	Pond A	BASE	70.51	17.46	19.02	26378	0.36	0.06	2.9	2.1
10YR_72HR	Pond A	BASE	70.76	17.47	19.02	26412	0.36	0.06	2.9	2.1
10YR_72HR	Pond A	BASE	71.01	17.48	19.02	26445	0.36	0.06	2.9	2.1
10YR_72HR	Pond A	BASE	71.26	17.49	19.02	26478	0.36	0.06	2.9	2.1
10YR_72HR	Pond A	BASE	71.51	17.50	19.02	26511	0.36	0.06	2.9	2.1
10YR_72HR	Pond A	BASE	71.76	17.51	19.02	26544	0.36	0.06	3.0	2.1
10YR_72HR	Pond A	BASE	72.01	17.52	19.02	26575	0.36	0.05	3.0	2.1

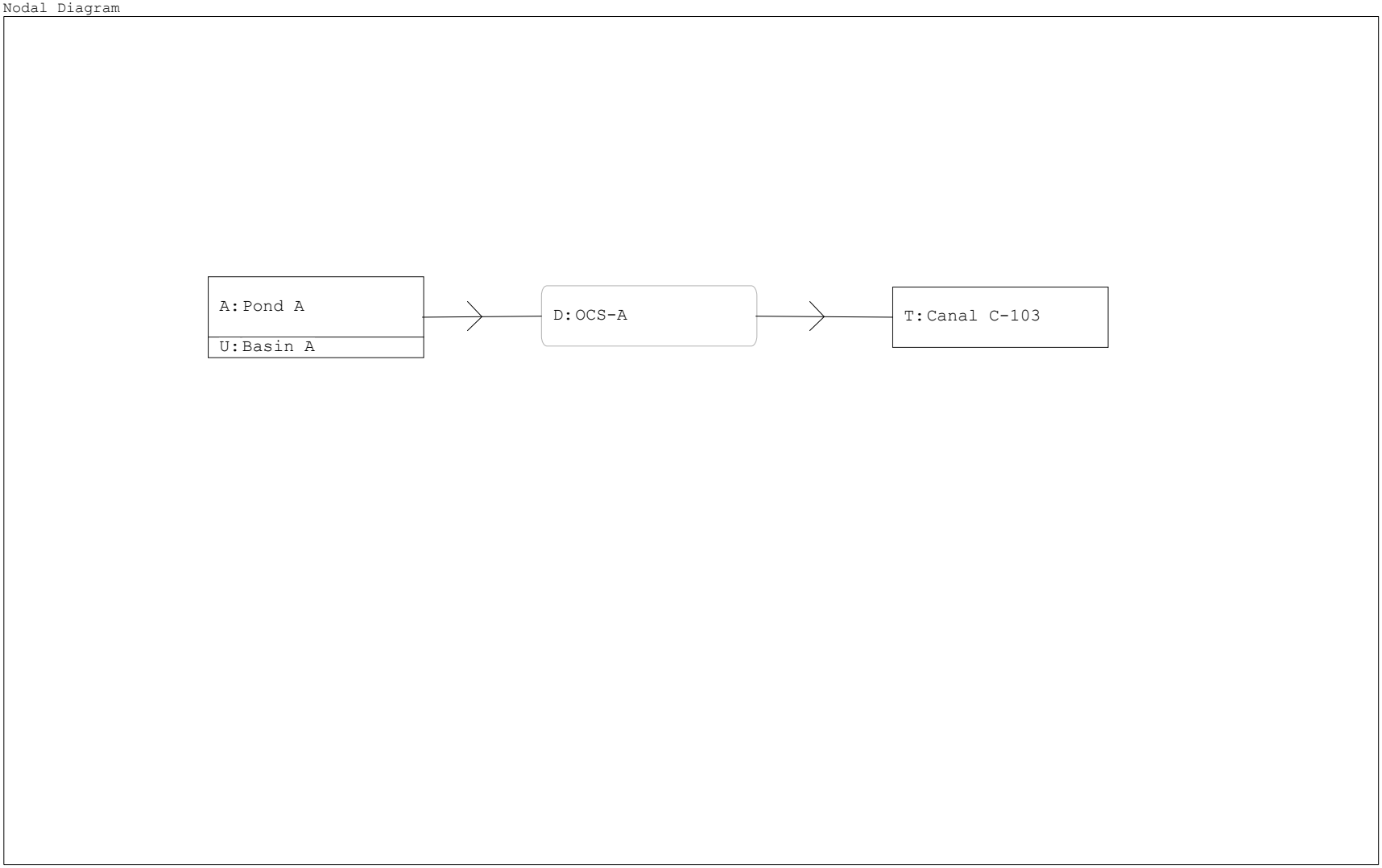
Post

Midway Road (CR 712) from Glades Cut Off Road to Selvitz Road
PD&E Study
Basin A Proposed - Nodal Diagram

Nodes
A Stage/Area
V Stage/Volume
T Time/Stage
M Manhole

Basins
O Overland Flow
U SCS Unit CN
S SBUH CN
Y SCS Unit GA
Z SBUH GA

Links
P Pipe
W Weir
C Channel
D Drop Structure
B Bridge
R Rating Curve
H Breach
E Percolation
F Filter
X Exfil Trench



==========
==== Basins ====
==========

Name: Basin A | Node: Pond A | Status: Onsite
Group: BASE | Type: SCS Unit Hydrograph CN

Unit Hydrograph:	Uh323	Peaking Factor:	323.0
Rainfall File:		Storm Duration(hrs):	0.00
Rainfall Amount(in):	0.000	Time of Conc(min):	15.00
Area(ac):	5.970	Time Shift(hrs):	0.00
Curve Number:	91.20	Max Allowable Q(cfs):	999999.000
DCIA(%):	0.00		

Name: Pond Site | Node: Pond A | Status: Onsite
Group: BASE | Type: SCS Unit Hydrograph CN

Unit Hydrograph:	Uh323	Peaking Factor:	323.0
Rainfall File:		Storm Duration(hrs):	0.00
Rainfall Amount(in):	0.000	Time of Conc(min):	15.00
Area(ac):	0.790	Time Shift(hrs):	0.00
Curve Number:	92.66	Max Allowable Q(cfs):	999999.000
DCIA(%):	0.00		

==========
==== Nodes ====
==========

Name: Canal C-103 | Base Flow(cfs): 0.000 | Init Stage(ft): 14.520
Group: BASE | Warn Stage(ft): 18.520
Type: Time/Stage

Time(hrs)	Stage(ft)
0.00	14.520
24.00	15.520
48.00	16.520
72.00	17.520
96.00	16.520
180.00	15.520
360.00	14.520

Name: Pond A | Base Flow(cfs): 0.000 | Init Stage(ft): 16.020
Group: BASE | Warn Stage(ft): 19.020
Type: Stage/Area

Stage(ft)	Area(ac)
16.020	0.5000
19.020	0.7200
20.020	0.7900

==========
==== Drop Structures ====
==========

Name: OCS-A | From Node: Pond A | Length(ft): 95.00
Group: BASE | To Node: Canal C-103 | Count: 1

	UPSTREAM	DOWNSTREAM		
Geometry:	Horz Ellipse	Horz Ellipse	Friction Equation:	Automatic
Span(in):	30.00	30.00	Solution Algorithm:	Most Restrictive
Rise(in):	19.00	19.00	Flow:	Both
Invert(ft):	14.520	14.520	Entrance Loss Coef:	0.000
Manning's N:	0.012000	0.012000	Exit Loss Coef:	1.000
Top Clip(in):	0.000	0.000	Outlet Ctrl Spec:	Use dc or tw
Bot Clip(in):	0.000	0.000	Inlet Ctrl Spec:	Use dc
			Solution Incs:	10

Upstream FHWA Inlet Edge Description:
Horizontal Ellipse Concrete: Square edge with headwall

Downstream FHWA Inlet Edge Description:
Horizontal Ellipse Concrete: Square edge with headwall

```
*** Weir 1 of 3 for Drop Structure OCS-A ***
                                                                                TABLE
                 Count: 1                      Bottom Clip(in): 0.000
                  Type: Horizontal                Top Clip(in): 0.000
                  Flow: Both                    Weir Disc Coef: 3.200
              Geometry: Rectangular           Orifice Disc Coef: 0.600

              Span(in): 36.00                       Invert(ft): 20.020
              Rise(in): 54.00                 Control Elev(ft): 20.020

*** Weir 2 of 3 for Drop Structure OCS-A ***
                                                                                TABLE
                 Count: 1                      Bottom Clip(in): 0.000
                  Type: Vertical: Mavis           Top Clip(in): 0.000
                  Flow: Both                    Weir Disc Coef: 3.200
              Geometry: Rectangular           Orifice Disc Coef: 0.600

              Span(in): 30.00                       Invert(ft): 17.540
              Rise(in): 28.80                 Control Elev(ft): 17.540

*** Weir 3 of 3 for Drop Structure OCS-A ***
                                                                                TABLE
                 Count: 1                      Bottom Clip(in): 0.000
                  Type: Vertical: Mavis           Top Clip(in): 0.000
                  Flow: Both                    Weir Disc Coef: 3.200
              Geometry: Circular              Orifice Disc Coef: 0.600

              Span(in): 3.00                        Invert(ft): 16.020
              Rise(in): 3.00                  Control Elev(ft): 15.520


==========================================================================================
==== Hydrology Simulations ===============================================================
==========================================================================================

         Name: 10YR_72HR
     Filename: F:\Projects\DT4-006-01\admin\Drainage\PSR\Appendix 4 - Pond Design Calcs\Basin A\Pond A ICPR\Basin A\Proposed - E

      Override Defaults: Yes
    Storm Duration(hrs): 72.00
          Rainfall File: Sfwmd72
    Rainfall Amount(in): 8.50

Time(hrs)       Print Inc(min)
--------------- ---------------
72.000          5.00

-------------------------------------------------------------------------------------------------
         Name: 25YR_72HR
     Filename: F:\Projects\DT4-006-01\admin\Drainage\PSR\Appendix 4 - Pond Design Calcs\Basin A\Pond A ICPR\Basin A\Proposed - E

      Override Defaults: Yes
    Storm Duration(hrs): 72.00
          Rainfall File: Sfwmd72
    Rainfall Amount(in): 9.50

Time(hrs)       Print Inc(min)
--------------- ---------------
72.000          5.00

==========================================================================================
==== Routing Simulations =================================================================
==========================================================================================

         Name: 10YR_72HR           Hydrology Sim: 10YR_72HR
     Filename: F:\Projects\DT4-006-01\admin\Drainage\PSR\Appendix 4 - Pond Design Calcs\Basin A\Pond A ICPR\Basin A\Proposed - E

      Execute: Yes         Restart: No            Patch: No
  Alternative: No

        Max Delta Z(ft): 1.00                     Delta Z Factor: 0.00500
    Time Step Optimizer: 10.000
        Start Time(hrs): 0.000                     End Time(hrs): 72.00
     Min Calc Time(sec): 0.5000               Max Calc Time(sec): 60.0000
        Boundary Stages:                          Boundary Flows:



Time(hrs)       Print Inc(min)
--------------- ---------------
999.000         15.000

Group           Run
--------------- -----
BASE            Yes
```

```
---------------------------------------------------------------------------------------------------
         Name: 25YR_72HR           Hydrology Sim: 25YR_72HR
     Filename: F:\Projects\DT4-006-01\admin\Drainage\PSR\Appendix 4 - Pond Design Calcs\Basin A\Pond A ICPR\Basin A\Proposed - E

      Execute: Yes         Restart: No            Patch: No
  Alternative: No

        Max Delta Z(ft): 1.00                    Delta Z Factor: 0.00500
    Time Step Optimizer: 10.000
        Start Time(hrs): 0.000                    End Time(hrs): 72.00
     Min Calc Time(sec): 0.5000              Max Calc Time(sec): 60.0000
        Boundary Stages:                         Boundary Flows:


Time(hrs)       Print Inc(min)
--------------- ---------------
999.000         15.000

Group           Run
--------------- -----
BASE            Yes
```

Name	Group	Simulation	Max Time Stage hrs	Max Stage ft	Warning Stage ft	Max Delta Stage ft	Max Surf Area ft2	Max Time Inflow hrs	Max Inflow cfs	Max Time Outflow hrs	Max Outflow cfs
Canal C-103	BASE	10YR_72HR	71.99	17.520	18.520	0.0007	0	60.28	18.105	0.00	0.000
Pond A	BASE	10YR_72HR	60.29	18.960	19.020	0.0050	31171	60.00	30.364	60.28	18.105
Canal C-103	BASE	25YR_72HR	72.01	17.520	18.520	0.0007	0	60.29	20.016	0.00	0.000
Pond A	BASE	25YR_72HR	60.29	19.116	19.020	-0.0050	31656	60.00	34.128	60.29	20.016

Simulation	Node	Group	Time hrs	Stage ft	Warning Stage ft	Surface Area ft2	Total Inflow cfs	Total Outflow cfs	Total Vol In af	Total Vol Out af
10YR_72HR	Canal C-103	BASE	0.00	14.520	18.520	0	0.000	0.000	0.000	0.000
10YR_72HR	Canal C-103	BASE	0.26	14.531	18.520	0	0.000	0.000	0.000	0.000
10YR_72HR	Canal C-103	BASE	0.50	14.541	18.520	0	0.000	0.000	0.000	0.000
10YR_72HR	Canal C-103	BASE	0.77	14.552	18.520	0	0.000	0.000	0.000	0.000
10YR_72HR	Canal C-103	BASE	1.02	14.562	18.520	0	0.000	0.000	0.000	0.000
10YR_72HR	Canal C-103	BASE	1.27	14.573	18.520	0	0.000	0.000	0.000	0.000
10YR_72HR	Canal C-103	BASE	1.52	14.583	18.520	0	0.000	0.000	0.000	0.000
10YR_72HR	Canal C-103	BASE	1.77	14.594	18.520	0	0.000	0.000	0.000	0.000
10YR_72HR	Canal C-103	BASE	2.02	14.604	18.520	0	0.000	0.000	0.000	0.000
10YR_72HR	Canal C-103	BASE	2.27	14.614	18.520	0	0.000	0.000	0.000	0.000
10YR_72HR	Canal C-103	BASE	2.52	14.625	18.520	0	0.000	0.000	0.000	0.000
10YR_72HR	Canal C-103	BASE	2.77	14.635	18.520	0	0.000	0.000	0.000	0.000
10YR_72HR	Canal C-103	BASE	3.02	14.646	18.520	0	0.000	0.000	0.000	0.000
10YR_72HR	Canal C-103	BASE	3.27	14.656	18.520	0	0.000	0.000	0.000	0.000
10YR_72HR	Canal C-103	BASE	3.52	14.667	18.520	0	0.000	0.000	0.000	0.000
10YR_72HR	Canal C-103	BASE	3.77	14.677	18.520	0	0.000	0.000	0.000	0.000
10YR_72HR	Canal C-103	BASE	4.02	14.687	18.520	0	0.000	0.000	0.000	0.000
10YR_72HR	Canal C-103	BASE	4.27	14.698	18.520	0	0.000	0.000	0.000	0.000
10YR_72HR	Canal C-103	BASE	4.52	14.708	18.520	0	0.000	0.000	0.000	0.000
10YR_72HR	Canal C-103	BASE	4.77	14.719	18.520	0	0.000	0.000	0.000	0.000
10YR_72HR	Canal C-103	BASE	5.02	14.729	18.520	0	0.000	0.000	0.000	0.000
10YR_72HR	Canal C-103	BASE	5.27	14.739	18.520	0	0.000	0.000	0.000	0.000
10YR_72HR	Canal C-103	BASE	5.52	14.750	18.520	0	0.000	0.000	0.000	0.000
10YR_72HR	Canal C-103	BASE	5.77	14.760	18.520	0	0.000	0.000	0.000	0.000
10YR_72HR	Canal C-103	BASE	6.02	14.771	18.520	0	0.000	0.000	0.000	0.000
10YR_72HR	Canal C-103	BASE	6.27	14.781	18.520	0	0.000	0.000	0.000	0.000
10YR_72HR	Canal C-103	BASE	6.52	14.792	18.520	0	0.000	0.000	0.000	0.000
10YR_72HR	Canal C-103	BASE	6.77	14.802	18.520	0	0.000	0.000	0.000	0.000
10YR_72HR	Canal C-103	BASE	7.02	14.812	18.520	0	0.000	0.000	0.000	0.000
10YR_72HR	Canal C-103	BASE	7.27	14.823	18.520	0	0.000	0.000	0.000	0.000
10YR_72HR	Canal C-103	BASE	7.52	14.833	18.520	0	0.000	0.000	0.000	0.000
10YR_72HR	Canal C-103	BASE	7.77	14.844	18.520	0	0.000	0.000	0.000	0.000
10YR_72HR	Canal C-103	BASE	8.02	14.854	18.520	0	0.000	0.000	0.000	0.000
10YR_72HR	Canal C-103	BASE	8.27	14.864	18.520	0	0.000	0.000	0.000	0.000
10YR_72HR	Canal C-103	BASE	8.52	14.875	18.520	0	0.000	0.000	0.000	0.000
10YR_72HR	Canal C-103	BASE	8.77	14.885	18.520	0	0.000	0.000	0.000	0.000
10YR_72HR	Canal C-103	BASE	9.02	14.896	18.520	0	0.000	0.000	0.000	0.000
10YR_72HR	Canal C-103	BASE	9.27	14.906	18.520	0	0.000	0.000	0.000	0.000
10YR_72HR	Canal C-103	BASE	9.52	14.917	18.520	0	0.001	0.000	0.000	0.000
10YR_72HR	Canal C-103	BASE	9.77	14.927	18.520	0	0.001	0.000	0.000	0.000
10YR_72HR	Canal C-103	BASE	10.02	14.937	18.520	0	0.001	0.000	0.000	0.000
10YR_72HR	Canal C-103	BASE	10.27	14.948	18.520	0	0.001	0.000	0.000	0.000
10YR_72HR	Canal C-103	BASE	10.52	14.958	18.520	0	0.002	0.000	0.000	0.000
10YR_72HR	Canal C-103	BASE	10.77	14.969	18.520	0	0.002	0.000	0.000	0.000
10YR_72HR	Canal C-103	BASE	11.02	14.979	18.520	0	0.003	0.000	0.000	0.000
10YR_72HR	Canal C-103	BASE	11.27	14.989	18.520	0	0.003	0.000	0.000	0.000
10YR_72HR	Canal C-103	BASE	11.52	15.000	18.520	0	0.004	0.000	0.000	0.000
10YR_72HR	Canal C-103	BASE	11.77	15.010	18.520	0	0.004	0.000	0.000	0.000
10YR_72HR	Canal C-103	BASE	12.02	15.021	18.520	0	0.005	0.000	0.001	0.000
10YR_72HR	Canal C-103	BASE	12.27	15.031	18.520	0	0.006	0.000	0.001	0.000
10YR_72HR	Canal C-103	BASE	12.52	15.042	18.520	0	0.007	0.000	0.001	0.000
10YR_72HR	Canal C-103	BASE	12.77	15.052	18.520	0	0.008	0.000	0.001	0.000
10YR_72HR	Canal C-103	BASE	13.02	15.062	18.520	0	0.009	0.000	0.001	0.000
10YR_72HR	Canal C-103	BASE	13.27	15.073	18.520	0	0.010	0.000	0.001	0.000
10YR_72HR	Canal C-103	BASE	13.52	15.083	18.520	0	0.011	0.000	0.001	0.000
10YR_72HR	Canal C-103	BASE	13.77	15.094	18.520	0	0.012	0.000	0.002	0.000
10YR_72HR	Canal C-103	BASE	14.02	15.104	18.520	0	0.013	0.000	0.002	0.000
10YR_72HR	Canal C-103	BASE	14.27	15.114	18.520	0	0.015	0.000	0.002	0.000
10YR_72HR	Canal C-103	BASE	14.52	15.125	18.520	0	0.016	0.000	0.003	0.000
10YR_72HR	Canal C-103	BASE	14.77	15.135	18.520	0	0.018	0.000	0.003	0.000
10YR_72HR	Canal C-103	BASE	15.02	15.146	18.520	0	0.019	0.000	0.003	0.000
10YR_72HR	Canal C-103	BASE	15.27	15.156	18.520	0	0.021	0.000	0.004	0.000
10YR_72HR	Canal C-103	BASE	15.52	15.167	18.520	0	0.023	0.000	0.004	0.000
10YR_72HR	Canal C-103	BASE	15.77	15.177	18.520	0	0.024	0.000	0.005	0.000
10YR_72HR	Canal C-103	BASE	16.02	15.187	18.520	0	0.026	0.000	0.005	0.000
10YR_72HR	Canal C-103	BASE	16.27	15.198	18.520	0	0.028	0.000	0.006	0.000
10YR_72HR	Canal C-103	BASE	16.52	15.208	18.520	0	0.030	0.000	0.006	0.000
10YR_72HR	Canal C-103	BASE	16.77	15.219	18.520	0	0.032	0.000	0.007	0.000
10YR_72HR	Canal C-103	BASE	17.02	15.229	18.520	0	0.034	0.000	0.008	0.000
10YR_72HR	Canal C-103	BASE	17.27	15.239	18.520	0	0.036	0.000	0.008	0.000
10YR_72HR	Canal C-103	BASE	17.52	15.250	18.520	0	0.038	0.000	0.009	0.000
10YR_72HR	Canal C-103	BASE	17.77	15.260	18.520	0	0.040	0.000	0.010	0.000
10YR_72HR	Canal C-103	BASE	18.02	15.271	18.520	0	0.042	0.000	0.011	0.000
10YR_72HR	Canal C-103	BASE	18.27	15.281	18.520	0	0.045	0.000	0.012	0.000
10YR_72HR	Canal C-103	BASE	18.52	15.292	18.520	0	0.047	0.000	0.013	0.000
10YR_72HR	Canal C-103	BASE	18.77	15.302	18.520	0	0.049	0.000	0.014	0.000
10YR_72HR	Canal C-103	BASE	19.02	15.312	18.520	0	0.051	0.000	0.015	0.000
10YR_72HR	Canal C-103	BASE	19.27	15.323	18.520	0	0.053	0.000	0.016	0.000
10YR_72HR	Canal C-103	BASE	19.52	15.333	18.520	0	0.055	0.000	0.017	0.000
10YR_72HR	Canal C-103	BASE	19.77	15.344	18.520	0	0.057	0.000	0.018	0.000
10YR_72HR	Canal C-103	BASE	20.02	15.354	18.520	0	0.060	0.000	0.019	0.000
10YR_72HR	Canal C-103	BASE	20.27	15.364	18.520	0	0.062	0.000	0.021	0.000
10YR_72HR	Canal C-103	BASE	20.52	15.375	18.520	0	0.064	0.000	0.022	0.000
10YR_72HR	Canal C-103	BASE	20.77	15.385	18.520	0	0.065	0.000	0.023	0.000

Simulation	Node	Group	Time hrs	Stage ft	Warning Stage ft	Surface Area ft2	Total Inflow cfs	Total Outflow cfs	Total Vol In af	Total Vol Out af
10YR_72HR	Canal C-103	BASE	21.02	15.396	18.520	0	0.067	0.000	0.025	0.000
10YR_72HR	Canal C-103	BASE	21.27	15.406	18.520	0	0.069	0.000	0.026	0.000
10YR_72HR	Canal C-103	BASE	21.52	15.417	18.520	0	0.071	0.000	0.027	0.000
10YR_72HR	Canal C-103	BASE	21.77	15.427	18.520	0	0.072	0.000	0.029	0.000
10YR_72HR	Canal C-103	BASE	22.02	15.437	18.520	0	0.074	0.000	0.030	0.000
10YR_72HR	Canal C-103	BASE	22.27	15.448	18.520	0	0.075	0.000	0.032	0.000
10YR_72HR	Canal C-103	BASE	22.52	15.458	18.520	0	0.077	0.000	0.033	0.000
10YR_72HR	Canal C-103	BASE	22.77	15.469	18.520	0	0.079	0.000	0.035	0.000
10YR_72HR	Canal C-103	BASE	23.02	15.479	18.520	0	0.082	0.000	0.037	0.000
10YR_72HR	Canal C-103	BASE	23.27	15.489	18.520	0	0.084	0.000	0.038	0.000
10YR_72HR	Canal C-103	BASE	23.52	15.500	18.520	0	0.086	0.000	0.040	0.000
10YR_72HR	Canal C-103	BASE	23.77	15.510	18.520	0	0.088	0.000	0.042	0.000
10YR_72HR	Canal C-103	BASE	24.02	15.521	18.520	0	0.091	0.000	0.044	0.000
10YR_72HR	Canal C-103	BASE	24.27	15.531	18.520	0	0.093	0.000	0.046	0.000
10YR_72HR	Canal C-103	BASE	24.52	15.542	18.520	0	0.097	0.000	0.048	0.000
10YR_72HR	Canal C-103	BASE	24.77	15.552	18.520	0	0.100	0.000	0.050	0.000
10YR_72HR	Canal C-103	BASE	25.02	15.562	18.520	0	0.102	0.000	0.052	0.000
10YR_72HR	Canal C-103	BASE	25.27	15.573	18.520	0	0.104	0.000	0.054	0.000
10YR_72HR	Canal C-103	BASE	25.52	15.583	18.520	0	0.106	0.000	0.056	0.000
10YR_72HR	Canal C-103	BASE	25.77	15.594	18.520	0	0.109	0.000	0.058	0.000
10YR_72HR	Canal C-103	BASE	26.02	15.604	18.520	0	0.111	0.000	0.061	0.000
10YR_72HR	Canal C-103	BASE	26.27	15.614	18.520	0	0.113	0.000	0.063	0.000
10YR_72HR	Canal C-103	BASE	26.52	15.625	18.520	0	0.115	0.000	0.065	0.000
10YR_72HR	Canal C-103	BASE	26.77	15.635	18.520	0	0.117	0.000	0.068	0.000
10YR_72HR	Canal C-103	BASE	27.02	15.646	18.520	0	0.119	0.000	0.070	0.000
10YR_72HR	Canal C-103	BASE	27.27	15.656	18.520	0	0.120	0.000	0.073	0.000
10YR_72HR	Canal C-103	BASE	27.52	15.667	18.520	0	0.122	0.000	0.075	0.000
10YR_72HR	Canal C-103	BASE	27.77	15.677	18.520	0	0.124	0.000	0.078	0.000
10YR_72HR	Canal C-103	BASE	28.02	15.687	18.520	0	0.126	0.000	0.080	0.000
10YR_72HR	Canal C-103	BASE	28.27	15.698	18.520	0	0.128	0.000	0.083	0.000
10YR_72HR	Canal C-103	BASE	28.52	15.708	18.520	0	0.130	0.000	0.085	0.000
10YR_72HR	Canal C-103	BASE	28.77	15.719	18.520	0	0.131	0.000	0.088	0.000
10YR_72HR	Canal C-103	BASE	29.02	15.729	18.520	0	0.133	0.000	0.091	0.000
10YR_72HR	Canal C-103	BASE	29.27	15.739	18.520	0	0.135	0.000	0.094	0.000
10YR_72HR	Canal C-103	BASE	29.52	15.750	18.520	0	0.136	0.000	0.096	0.000
10YR_72HR	Canal C-103	BASE	29.77	15.760	18.520	0	0.138	0.000	0.099	0.000
10YR_72HR	Canal C-103	BASE	30.02	15.771	18.520	0	0.140	0.000	0.102	0.000
10YR_72HR	Canal C-103	BASE	30.27	15.781	18.520	0	0.141	0.000	0.105	0.000
10YR_72HR	Canal C-103	BASE	30.52	15.792	18.520	0	0.143	0.000	0.108	0.000
10YR_72HR	Canal C-103	BASE	30.77	15.802	18.520	0	0.144	0.000	0.111	0.000
10YR_72HR	Canal C-103	BASE	31.02	15.812	18.520	0	0.146	0.000	0.114	0.000
10YR_72HR	Canal C-103	BASE	31.27	15.823	18.520	0	0.148	0.000	0.117	0.000
10YR_72HR	Canal C-103	BASE	31.52	15.833	18.520	0	0.149	0.000	0.120	0.000
10YR_72HR	Canal C-103	BASE	31.77	15.844	18.520	0	0.151	0.000	0.123	0.000
10YR_72HR	Canal C-103	BASE	32.02	15.854	18.520	0	0.152	0.000	0.126	0.000
10YR_72HR	Canal C-103	BASE	32.27	15.864	18.520	0	0.154	0.000	0.129	0.000
10YR_72HR	Canal C-103	BASE	32.52	15.875	18.520	0	0.155	0.000	0.133	0.000
10YR_72HR	Canal C-103	BASE	32.77	15.885	18.520	0	0.156	0.000	0.136	0.000
10YR_72HR	Canal C-103	BASE	33.02	15.896	18.520	0	0.158	0.000	0.139	0.000
10YR_72HR	Canal C-103	BASE	33.27	15.906	18.520	0	0.159	0.000	0.142	0.000
10YR_72HR	Canal C-103	BASE	33.52	15.917	18.520	0	0.161	0.000	0.146	0.000
10YR_72HR	Canal C-103	BASE	33.77	15.927	18.520	0	0.162	0.000	0.149	0.000
10YR_72HR	Canal C-103	BASE	34.02	15.937	18.520	0	0.163	0.000	0.152	0.000
10YR_72HR	Canal C-103	BASE	34.27	15.948	18.520	0	0.165	0.000	0.156	0.000
10YR_72HR	Canal C-103	BASE	34.52	15.958	18.520	0	0.166	0.000	0.159	0.000
10YR_72HR	Canal C-103	BASE	34.77	15.969	18.520	0	0.168	0.000	0.163	0.000
10YR_72HR	Canal C-103	BASE	35.02	15.979	18.520	0	0.169	0.000	0.166	0.000
10YR_72HR	Canal C-103	BASE	35.27	15.989	18.520	0	0.170	0.000	0.170	0.000
10YR_72HR	Canal C-103	BASE	35.52	16.000	18.520	0	0.171	0.000	0.173	0.000
10YR_72HR	Canal C-103	BASE	35.77	16.010	18.520	0	0.173	0.000	0.177	0.000
10YR_72HR	Canal C-103	BASE	36.02	16.021	18.520	0	0.174	0.000	0.180	0.000
10YR_72HR	Canal C-103	BASE	36.27	16.031	18.520	0	0.175	0.000	0.184	0.000
10YR_72HR	Canal C-103	BASE	36.52	16.042	18.520	0	0.177	0.000	0.188	0.000
10YR_72HR	Canal C-103	BASE	36.77	16.052	18.520	0	0.178	0.000	0.191	0.000
10YR_72HR	Canal C-103	BASE	37.02	16.062	18.520	0	0.179	0.000	0.195	0.000
10YR_72HR	Canal C-103	BASE	37.27	16.073	18.520	0	0.180	0.000	0.199	0.000
10YR_72HR	Canal C-103	BASE	37.52	16.083	18.520	0	0.181	0.000	0.202	0.000
10YR_72HR	Canal C-103	BASE	37.77	16.094	18.520	0	0.183	0.000	0.206	0.000
10YR_72HR	Canal C-103	BASE	38.02	16.104	18.520	0	0.184	0.000	0.210	0.000
10YR_72HR	Canal C-103	BASE	38.27	16.114	18.520	0	0.185	0.000	0.214	0.000
10YR_72HR	Canal C-103	BASE	38.52	16.125	18.520	0	0.186	0.000	0.218	0.000
10YR_72HR	Canal C-103	BASE	38.77	16.135	18.520	0	0.187	0.000	0.221	0.000
10YR_72HR	Canal C-103	BASE	39.02	16.146	18.520	0	0.188	0.000	0.225	0.000
10YR_72HR	Canal C-103	BASE	39.27	16.156	18.520	0	0.188	0.000	0.229	0.000
10YR_72HR	Canal C-103	BASE	39.52	16.167	18.520	0	0.187	0.000	0.233	0.000
10YR_72HR	Canal C-103	BASE	39.77	16.177	18.520	0	0.187	0.000	0.237	0.000
10YR_72HR	Canal C-103	BASE	40.02	16.187	18.520	0	0.187	0.000	0.241	0.000
10YR_72HR	Canal C-103	BASE	40.27	16.198	18.520	0	0.186	0.000	0.245	0.000
10YR_72HR	Canal C-103	BASE	40.52	16.208	18.520	0	0.186	0.000	0.248	0.000
10YR_72HR	Canal C-103	BASE	40.77	16.219	18.520	0	0.186	0.000	0.252	0.000
10YR_72HR	Canal C-103	BASE	41.02	16.229	18.520	0	0.185	0.000	0.256	0.000
10YR_72HR	Canal C-103	BASE	41.27	16.239	18.520	0	0.185	0.000	0.260	0.000
10YR_72HR	Canal C-103	BASE	41.52	16.250	18.520	0	0.185	0.000	0.264	0.000
10YR_72HR	Canal C-103	BASE	41.77	16.260	18.520	0	0.184	0.000	0.268	0.000

Simulation	Node	Group	Time hrs	Stage ft	Warning Stage ft	Surface Area ft2	Total Inflow cfs	Total Outflow cfs	Total Vol In af	Total Vol Out af
10YR_72HR	Canal C-103	BASE	42.02	16.271	18.520	0	0.184	0.000	0.271	0.000
10YR_72HR	Canal C-103	BASE	42.27	16.281	18.520	0	0.184	0.000	0.275	0.000
10YR_72HR	Canal C-103	BASE	42.52	16.292	18.520	0	0.183	0.000	0.279	0.000
10YR_72HR	Canal C-103	BASE	42.77	16.302	18.520	0	0.183	0.000	0.283	0.000
10YR_72HR	Canal C-103	BASE	43.02	16.312	18.520	0	0.183	0.000	0.287	0.000
10YR_72HR	Canal C-103	BASE	43.27	16.323	18.520	0	0.182	0.000	0.290	0.000
10YR_72HR	Canal C-103	BASE	43.52	16.333	18.520	0	0.182	0.000	0.294	0.000
10YR_72HR	Canal C-103	BASE	43.77	16.344	18.520	0	0.182	0.000	0.298	0.000
10YR_72HR	Canal C-103	BASE	44.02	16.354	18.520	0	0.182	0.000	0.302	0.000
10YR_72HR	Canal C-103	BASE	44.27	16.364	18.520	0	0.181	0.000	0.305	0.000
10YR_72HR	Canal C-103	BASE	44.52	16.375	18.520	0	0.181	0.000	0.309	0.000
10YR_72HR	Canal C-103	BASE	44.77	16.385	18.520	0	0.181	0.000	0.313	0.000
10YR_72HR	Canal C-103	BASE	45.02	16.396	18.520	0	0.180	0.000	0.317	0.000
10YR_72HR	Canal C-103	BASE	45.27	16.406	18.520	0	0.180	0.000	0.320	0.000
10YR_72HR	Canal C-103	BASE	45.52	16.417	18.520	0	0.180	0.000	0.324	0.000
10YR_72HR	Canal C-103	BASE	45.77	16.427	18.520	0	0.180	0.000	0.328	0.000
10YR_72HR	Canal C-103	BASE	46.02	16.437	18.520	0	0.179	0.000	0.331	0.000
10YR_72HR	Canal C-103	BASE	46.27	16.448	18.520	0	0.179	0.000	0.335	0.000
10YR_72HR	Canal C-103	BASE	46.52	16.458	18.520	0	0.179	0.000	0.339	0.000
10YR_72HR	Canal C-103	BASE	46.77	16.469	18.520	0	0.179	0.000	0.342	0.000
10YR_72HR	Canal C-103	BASE	47.02	16.479	18.520	0	0.178	0.000	0.346	0.000
10YR_72HR	Canal C-103	BASE	47.27	16.489	18.520	0	0.178	0.000	0.350	0.000
10YR_72HR	Canal C-103	BASE	47.52	16.500	18.520	0	0.178	0.000	0.354	0.000
10YR_72HR	Canal C-103	BASE	47.77	16.510	18.520	0	0.178	0.000	0.357	0.000
10YR_72HR	Canal C-103	BASE	48.02	16.521	18.520	0	0.177	0.000	0.361	0.000
10YR_72HR	Canal C-103	BASE	48.27	16.531	18.520	0	0.177	0.000	0.365	0.000
10YR_72HR	Canal C-103	BASE	48.52	16.542	18.520	0	0.177	0.000	0.368	0.000
10YR_72HR	Canal C-103	BASE	48.77	16.552	18.520	0	0.177	0.000	0.372	0.000
10YR_72HR	Canal C-103	BASE	49.02	16.562	18.520	0	0.177	0.000	0.375	0.000
10YR_72HR	Canal C-103	BASE	49.27	16.573	18.520	0	0.177	0.000	0.379	0.000
10YR_72HR	Canal C-103	BASE	49.52	16.583	18.520	0	0.177	0.000	0.383	0.000
10YR_72HR	Canal C-103	BASE	49.77	16.594	18.520	0	0.177	0.000	0.386	0.000
10YR_72HR	Canal C-103	BASE	50.02	16.604	18.520	0	0.177	0.000	0.390	0.000
10YR_72HR	Canal C-103	BASE	50.27	16.614	18.520	0	0.178	0.000	0.394	0.000
10YR_72HR	Canal C-103	BASE	50.52	16.625	18.520	0	0.178	0.000	0.397	0.000
10YR_72HR	Canal C-103	BASE	50.77	16.635	18.520	0	0.179	0.000	0.401	0.000
10YR_72HR	Canal C-103	BASE	51.02	16.646	18.520	0	0.179	0.000	0.405	0.000
10YR_72HR	Canal C-103	BASE	51.27	16.656	18.520	0	0.180	0.000	0.409	0.000
10YR_72HR	Canal C-103	BASE	51.52	16.667	18.520	0	0.180	0.000	0.412	0.000
10YR_72HR	Canal C-103	BASE	51.77	16.677	18.520	0	0.181	0.000	0.416	0.000
10YR_72HR	Canal C-103	BASE	52.02	16.687	18.520	0	0.182	0.000	0.420	0.000
10YR_72HR	Canal C-103	BASE	52.27	16.698	18.520	0	0.183	0.000	0.424	0.000
10YR_72HR	Canal C-103	BASE	52.52	16.708	18.520	0	0.185	0.000	0.427	0.000
10YR_72HR	Canal C-103	BASE	52.77	16.719	18.520	0	0.186	0.000	0.431	0.000
10YR_72HR	Canal C-103	BASE	53.02	16.729	18.520	0	0.188	0.000	0.435	0.000
10YR_72HR	Canal C-103	BASE	53.27	16.739	18.520	0	0.190	0.000	0.439	0.000
10YR_72HR	Canal C-103	BASE	53.52	16.750	18.520	0	0.192	0.000	0.443	0.000
10YR_72HR	Canal C-103	BASE	53.77	16.760	18.520	0	0.195	0.000	0.447	0.000
10YR_72HR	Canal C-103	BASE	54.02	16.771	18.520	0	0.198	0.000	0.451	0.000
10YR_72HR	Canal C-103	BASE	54.27	16.781	18.520	0	0.200	0.000	0.455	0.000
10YR_72HR	Canal C-103	BASE	54.52	16.792	18.520	0	0.203	0.000	0.459	0.000
10YR_72HR	Canal C-103	BASE	54.77	16.802	18.520	0	0.267	0.000	0.464	0.000
10YR_72HR	Canal C-103	BASE	55.02	16.812	18.520	0	0.385	0.000	0.471	0.000
10YR_72HR	Canal C-103	BASE	55.27	16.823	18.520	0	0.523	0.000	0.480	0.000
10YR_72HR	Canal C-103	BASE	55.52	16.833	18.520	0	0.675	0.000	0.493	0.000
10YR_72HR	Canal C-103	BASE	55.77	16.844	18.520	0	0.820	0.000	0.508	0.000
10YR_72HR	Canal C-103	BASE	56.02	16.854	18.520	0	0.949	0.000	0.526	0.000
10YR_72HR	Canal C-103	BASE	56.27	16.864	18.520	0	1.072	0.000	0.547	0.000
10YR_72HR	Canal C-103	BASE	56.52	16.875	18.520	0	1.198	0.000	0.571	0.000
10YR_72HR	Canal C-103	BASE	56.77	16.885	18.520	0	1.311	0.000	0.597	0.000
10YR_72HR	Canal C-103	BASE	57.02	16.896	18.520	0	1.406	0.000	0.625	0.000
10YR_72HR	Canal C-103	BASE	57.27	16.906	18.520	0	1.501	0.000	0.655	0.000
10YR_72HR	Canal C-103	BASE	57.52	16.917	18.520	0	1.612	0.000	0.687	0.000
10YR_72HR	Canal C-103	BASE	57.77	16.927	18.520	0	1.725	0.000	0.721	0.000
10YR_72HR	Canal C-103	BASE	58.02	16.937	18.520	0	1.840	0.000	0.758	0.000
10YR_72HR	Canal C-103	BASE	58.27	16.948	18.520	0	1.954	0.000	0.797	0.000
10YR_72HR	Canal C-103	BASE	58.52	16.958	18.520	0	2.075	0.000	0.839	0.000
10YR_72HR	Canal C-103	BASE	58.77	16.969	18.520	0	2.239	0.000	0.884	0.000
10YR_72HR	Canal C-103	BASE	59.02	16.979	18.520	0	2.473	0.000	0.932	0.000
10YR_72HR	Canal C-103	BASE	59.27	16.989	18.520	0	2.836	0.000	0.987	0.000
10YR_72HR	Canal C-103	BASE	59.52	17.000	18.520	0	3.382	0.000	1.051	0.000
10YR_72HR	Canal C-103	BASE	59.75	17.010	18.520	0	6.221	0.000	1.144	0.000
10YR_72HR	Canal C-103	BASE	60.00	17.020	18.520	0	14.179	0.000	1.355	0.000
10YR_72HR	Canal C-103	BASE	60.25	17.031	18.520	0	18.080	0.000	1.691	0.000
10YR_72HR	Canal C-103	BASE	60.51	17.041	18.520	0	17.090	0.000	2.058	0.000
10YR_72HR	Canal C-103	BASE	60.75	17.051	18.520	0	14.641	0.000	2.381	0.000
10YR_72HR	Canal C-103	BASE	61.00	17.062	18.520	0	11.266	0.000	2.649	0.000
10YR_72HR	Canal C-103	BASE	61.25	17.072	18.520	0	8.489	0.000	2.855	0.000
10YR_72HR	Canal C-103	BASE	61.50	17.083	18.520	0	6.582	0.000	3.011	0.000
10YR_72HR	Canal C-103	BASE	61.75	17.093	18.520	0	5.314	0.000	3.133	0.000
10YR_72HR	Canal C-103	BASE	62.01	17.104	18.520	0	4.395	0.000	3.236	0.000
10YR_72HR	Canal C-103	BASE	62.26	17.114	18.520	0	3.734	0.000	3.320	0.000
10YR_72HR	Canal C-103	BASE	62.51	17.125	18.520	0	3.190	0.000	3.392	0.000
10YR_72HR	Canal C-103	BASE	62.76	17.135	18.520	0	2.785	0.000	3.453	0.000

Simulation	Node	Group	Time hrs	Stage ft	Warning Stage ft	Surface Area ft2	Total Inflow cfs	Total Outflow cfs	Total Vol In af	Total Vol Out af
10YR_72HR	Canal C-103	BASE	63.01	17.145	18.520	0	2.465	0.000	3.507	0.000
10YR_72HR	Canal C-103	BASE	63.26	17.156	18.520	0	2.230	0.000	3.556	0.000
10YR_72HR	Canal C-103	BASE	63.51	17.166	18.520	0	2.060	0.000	3.600	0.000
10YR_72HR	Canal C-103	BASE	63.76	17.177	18.520	0	1.938	0.000	3.642	0.000
10YR_72HR	Canal C-103	BASE	64.01	17.187	18.520	0	1.850	0.000	3.681	0.000
10YR_72HR	Canal C-103	BASE	64.26	17.197	18.520	0	1.745	0.000	3.718	0.000
10YR_72HR	Canal C-103	BASE	64.51	17.208	18.520	0	1.591	0.000	3.752	0.000
10YR_72HR	Canal C-103	BASE	64.76	17.218	18.520	0	1.450	0.000	3.784	0.000
10YR_72HR	Canal C-103	BASE	65.01	17.229	18.520	0	1.334	0.000	3.812	0.000
10YR_72HR	Canal C-103	BASE	65.26	17.239	18.520	0	1.245	0.000	3.839	0.000
10YR_72HR	Canal C-103	BASE	65.51	17.250	18.520	0	1.179	0.000	3.864	0.000
10YR_72HR	Canal C-103	BASE	65.76	17.260	18.520	0	1.129	0.000	3.888	0.000
10YR_72HR	Canal C-103	BASE	66.01	17.270	18.520	0	1.091	0.000	3.911	0.000
10YR_72HR	Canal C-103	BASE	66.26	17.281	18.520	0	1.062	0.000	3.933	0.000
10YR_72HR	Canal C-103	BASE	66.51	17.291	18.520	0	1.040	0.000	3.955	0.000
10YR_72HR	Canal C-103	BASE	66.76	17.302	18.520	0	1.023	0.000	3.976	0.000
10YR_72HR	Canal C-103	BASE	67.01	17.312	18.520	0	1.009	0.000	3.997	0.000
10YR_72HR	Canal C-103	BASE	67.26	17.322	18.520	0	0.999	0.000	4.018	0.000
10YR_72HR	Canal C-103	BASE	67.51	17.333	18.520	0	0.991	0.000	4.038	0.000
10YR_72HR	Canal C-103	BASE	67.76	17.343	18.520	0	0.985	0.000	4.059	0.000
10YR_72HR	Canal C-103	BASE	68.01	17.354	18.520	0	0.980	0.000	4.079	0.000
10YR_72HR	Canal C-103	BASE	68.26	17.364	18.520	0	0.958	0.000	4.099	0.000
10YR_72HR	Canal C-103	BASE	68.51	17.375	18.520	0	0.908	0.000	4.118	0.000
10YR_72HR	Canal C-103	BASE	68.76	17.385	18.520	0	0.856	0.000	4.137	0.000
10YR_72HR	Canal C-103	BASE	69.01	17.395	18.520	0	0.811	0.000	4.154	0.000
10YR_72HR	Canal C-103	BASE	69.26	17.406	18.520	0	0.774	0.000	4.170	0.000
10YR_72HR	Canal C-103	BASE	69.51	17.416	18.520	0	0.745	0.000	4.186	0.000
10YR_72HR	Canal C-103	BASE	69.76	17.427	18.520	0	0.722	0.000	4.201	0.000
10YR_72HR	Canal C-103	BASE	70.01	17.437	18.520	0	0.704	0.000	4.216	0.000
10YR_72HR	Canal C-103	BASE	70.26	17.447	18.520	0	0.690	0.000	4.230	0.000
10YR_72HR	Canal C-103	BASE	70.51	17.458	18.520	0	0.678	0.000	4.244	0.000
10YR_72HR	Canal C-103	BASE	70.76	17.468	18.520	0	0.670	0.000	4.258	0.000
10YR_72HR	Canal C-103	BASE	71.01	17.479	18.520	0	0.663	0.000	4.272	0.000
10YR_72HR	Canal C-103	BASE	71.26	17.489	18.520	0	0.657	0.000	4.286	0.000
10YR_72HR	Canal C-103	BASE	71.51	17.500	18.520	0	0.652	0.000	4.299	0.000
10YR_72HR	Canal C-103	BASE	71.76	17.510	18.520	0	0.648	0.000	4.313	0.000
10YR_72HR	Canal C-103	BASE	72.00	17.520	18.520	0	0.645	0.000	4.326	0.000
10YR_72HR	Pond A	BASE	0.00	16.020	19.020	21780	0.000	0.000	0.000	0.000
10YR_72HR	Pond A	BASE	0.26	16.020	19.020	21780	0.000	0.000	0.000	0.000
10YR_72HR	Pond A	BASE	0.50	16.020	19.020	21780	0.000	0.000	0.000	0.000
10YR_72HR	Pond A	BASE	0.77	16.020	19.020	21780	0.000	0.000	0.000	0.000
10YR_72HR	Pond A	BASE	1.02	16.020	19.020	21780	0.000	0.000	0.000	0.000
10YR_72HR	Pond A	BASE	1.27	16.020	19.020	21780	0.000	0.000	0.000	0.000
10YR_72HR	Pond A	BASE	1.52	16.020	19.020	21780	0.000	0.000	0.000	0.000
10YR_72HR	Pond A	BASE	1.77	16.020	19.020	21780	0.000	0.000	0.000	0.000
10YR_72HR	Pond A	BASE	2.02	16.020	19.020	21780	0.000	0.000	0.000	0.000
10YR_72HR	Pond A	BASE	2.27	16.020	19.020	21780	0.000	0.000	0.000	0.000
10YR_72HR	Pond A	BASE	2.52	16.020	19.020	21780	0.000	0.000	0.000	0.000
10YR_72HR	Pond A	BASE	2.77	16.020	19.020	21780	0.000	0.000	0.000	0.000
10YR_72HR	Pond A	BASE	3.02	16.020	19.020	21780	0.000	0.000	0.000	0.000
10YR_72HR	Pond A	BASE	3.27	16.020	19.020	21780	0.000	0.000	0.000	0.000
10YR_72HR	Pond A	BASE	3.52	16.020	19.020	21780	0.000	0.000	0.000	0.000
10YR_72HR	Pond A	BASE	3.77	16.020	19.020	21780	0.000	0.000	0.000	0.000
10YR_72HR	Pond A	BASE	4.02	16.020	19.020	21780	0.000	0.000	0.000	0.000
10YR_72HR	Pond A	BASE	4.27	16.020	19.020	21780	0.000	0.000	0.000	0.000
10YR_72HR	Pond A	BASE	4.52	16.020	19.020	21780	0.000	0.000	0.000	0.000
10YR_72HR	Pond A	BASE	4.77	16.020	19.020	21780	0.001	0.000	0.000	0.000
10YR_72HR	Pond A	BASE	5.02	16.020	19.020	21780	0.002	0.000	0.000	0.000
10YR_72HR	Pond A	BASE	5.27	16.020	19.020	21780	0.002	0.000	0.000	0.000
10YR_72HR	Pond A	BASE	5.52	16.020	19.020	21781	0.003	0.000	0.000	0.000
10YR_72HR	Pond A	BASE	5.77	16.020	19.020	21781	0.003	0.000	0.000	0.000
10YR_72HR	Pond A	BASE	6.02	16.021	19.020	21782	0.004	0.000	0.000	0.000
10YR_72HR	Pond A	BASE	6.27	16.021	19.020	21782	0.006	0.000	0.000	0.000
10YR_72HR	Pond A	BASE	6.52	16.021	19.020	21783	0.010	0.000	0.001	0.000
10YR_72HR	Pond A	BASE	6.77	16.022	19.020	21785	0.015	0.000	0.001	0.000
10YR_72HR	Pond A	BASE	7.02	16.022	19.020	21788	0.021	0.000	0.001	0.000
10YR_72HR	Pond A	BASE	7.27	16.023	19.020	21791	0.026	0.000	0.002	0.000
10YR_72HR	Pond A	BASE	7.52	16.024	19.020	21794	0.031	0.000	0.002	0.000
10YR_72HR	Pond A	BASE	7.77	16.026	19.020	21799	0.036	0.000	0.003	0.000
10YR_72HR	Pond A	BASE	8.02	16.027	19.020	21804	0.040	0.000	0.004	0.000
10YR_72HR	Pond A	BASE	8.27	16.029	19.020	21809	0.045	0.000	0.005	0.000
10YR_72HR	Pond A	BASE	8.52	16.031	19.020	21815	0.050	0.000	0.006	0.000
10YR_72HR	Pond A	BASE	8.77	16.033	19.020	21822	0.054	0.000	0.007	0.000
10YR_72HR	Pond A	BASE	9.02	16.036	19.020	21830	0.058	0.000	0.008	0.000
10YR_72HR	Pond A	BASE	9.27	16.038	19.020	21838	0.063	0.000	0.009	0.000
10YR_72HR	Pond A	BASE	9.52	16.041	19.020	21846	0.067	0.001	0.010	0.000
10YR_72HR	Pond A	BASE	9.77	16.043	19.020	21855	0.071	0.001	0.012	0.000
10YR_72HR	Pond A	BASE	10.02	16.046	19.020	21864	0.075	0.001	0.013	0.000
10YR_72HR	Pond A	BASE	10.27	16.050	19.020	21874	0.079	0.001	0.015	0.000
10YR_72HR	Pond A	BASE	10.52	16.053	19.020	21885	0.082	0.002	0.017	0.000
10YR_72HR	Pond A	BASE	10.77	16.056	19.020	21895	0.086	0.002	0.018	0.000
10YR_72HR	Pond A	BASE	11.02	16.060	19.020	21907	0.090	0.003	0.020	0.000
10YR_72HR	Pond A	BASE	11.27	16.063	19.020	21918	0.093	0.003	0.022	0.000

Simulation	Node	Group	Time hrs	Stage ft	Warning Stage ft	Surface Area ft2	Total Inflow cfs	Total Outflow cfs	Total Vol In af	Total Vol Out af
10YR_72HR	Pond A	BASE	11.52	16.067	19.020	21930	0.097	0.004	0.024	0.000
10YR_72HR	Pond A	BASE	11.77	16.071	19.020	21943	0.100	0.004	0.026	0.000
10YR_72HR	Pond A	BASE	12.02	16.075	19.020	21955	0.103	0.005	0.028	0.001
10YR_72HR	Pond A	BASE	12.27	16.079	19.020	21968	0.107	0.006	0.030	0.001
10YR_72HR	Pond A	BASE	12.52	16.083	19.020	21982	0.110	0.007	0.032	0.001
10YR_72HR	Pond A	BASE	12.77	16.087	19.020	21995	0.113	0.008	0.035	0.001
10YR_72HR	Pond A	BASE	13.02	16.092	19.020	22009	0.116	0.009	0.037	0.001
10YR_72HR	Pond A	BASE	13.27	16.096	19.020	22023	0.119	0.010	0.040	0.001
10YR_72HR	Pond A	BASE	13.52	16.101	19.020	22038	0.122	0.011	0.042	0.001
10YR_72HR	Pond A	BASE	13.77	16.105	19.020	22052	0.125	0.012	0.045	0.002
10YR_72HR	Pond A	BASE	14.02	16.110	19.020	22067	0.127	0.013	0.047	0.002
10YR_72HR	Pond A	BASE	14.27	16.115	19.020	22082	0.130	0.015	0.050	0.002
10YR_72HR	Pond A	BASE	14.52	16.119	19.020	22097	0.133	0.016	0.053	0.003
10YR_72HR	Pond A	BASE	14.77	16.124	19.020	22112	0.135	0.018	0.055	0.003
10YR_72HR	Pond A	BASE	15.02	16.129	19.020	22128	0.138	0.019	0.058	0.003
10YR_72HR	Pond A	BASE	15.27	16.134	19.020	22143	0.141	0.021	0.061	0.004
10YR_72HR	Pond A	BASE	15.52	16.139	19.020	22159	0.143	0.023	0.064	0.004
10YR_72HR	Pond A	BASE	15.77	16.143	19.020	22174	0.145	0.024	0.067	0.005
10YR_72HR	Pond A	BASE	16.02	16.148	19.020	22190	0.148	0.026	0.070	0.005
10YR_72HR	Pond A	BASE	16.27	16.153	19.020	22206	0.150	0.028	0.073	0.006
10YR_72HR	Pond A	BASE	16.52	16.158	19.020	22222	0.152	0.030	0.076	0.006
10YR_72HR	Pond A	BASE	16.77	16.163	19.020	22238	0.155	0.032	0.079	0.007
10YR_72HR	Pond A	BASE	17.02	16.168	19.020	22254	0.157	0.034	0.083	0.008
10YR_72HR	Pond A	BASE	17.27	16.173	19.020	22269	0.159	0.036	0.086	0.008
10YR_72HR	Pond A	BASE	17.52	16.178	19.020	22285	0.161	0.038	0.089	0.009
10YR_72HR	Pond A	BASE	17.77	16.183	19.020	22301	0.163	0.040	0.093	0.010
10YR_72HR	Pond A	BASE	18.02	16.188	19.020	22317	0.165	0.042	0.096	0.011
10YR_72HR	Pond A	BASE	18.27	16.193	19.020	22333	0.167	0.045	0.099	0.012
10YR_72HR	Pond A	BASE	18.52	16.198	19.020	22349	0.169	0.047	0.103	0.013
10YR_72HR	Pond A	BASE	18.77	16.203	19.020	22364	0.171	0.049	0.106	0.014
10YR_72HR	Pond A	BASE	19.02	16.208	19.020	22380	0.173	0.051	0.110	0.015
10YR_72HR	Pond A	BASE	19.27	16.213	19.020	22396	0.175	0.053	0.114	0.016
10YR_72HR	Pond A	BASE	19.52	16.218	19.020	22411	0.177	0.055	0.117	0.017
10YR_72HR	Pond A	BASE	19.77	16.223	19.020	22427	0.179	0.057	0.121	0.018
10YR_72HR	Pond A	BASE	20.02	16.227	19.020	22443	0.180	0.060	0.125	0.019
10YR_72HR	Pond A	BASE	20.27	16.232	19.020	22458	0.182	0.062	0.128	0.021
10YR_72HR	Pond A	BASE	20.52	16.237	19.020	22473	0.184	0.064	0.132	0.022
10YR_72HR	Pond A	BASE	20.77	16.242	19.020	22489	0.186	0.065	0.136	0.023
10YR_72HR	Pond A	BASE	21.02	16.247	19.020	22504	0.187	0.067	0.140	0.025
10YR_72HR	Pond A	BASE	21.27	16.252	19.020	22520	0.189	0.069	0.144	0.026
10YR_72HR	Pond A	BASE	21.52	16.256	19.020	22535	0.191	0.071	0.148	0.027
10YR_72HR	Pond A	BASE	21.77	16.261	19.020	22550	0.192	0.072	0.151	0.029
10YR_72HR	Pond A	BASE	22.02	16.266	19.020	22565	0.194	0.074	0.155	0.030
10YR_72HR	Pond A	BASE	22.27	16.271	19.020	22581	0.195	0.075	0.159	0.032
10YR_72HR	Pond A	BASE	22.52	16.275	19.020	22596	0.197	0.077	0.164	0.033
10YR_72HR	Pond A	BASE	22.77	16.280	19.020	22611	0.198	0.079	0.168	0.035
10YR_72HR	Pond A	BASE	23.02	16.285	19.020	22626	0.200	0.082	0.172	0.037
10YR_72HR	Pond A	BASE	23.27	16.290	19.020	22641	0.201	0.084	0.176	0.038
10YR_72HR	Pond A	BASE	23.52	16.294	19.020	22656	0.202	0.086	0.180	0.040
10YR_72HR	Pond A	BASE	23.77	16.299	19.020	22671	0.204	0.088	0.184	0.042
10YR_72HR	Pond A	BASE	24.02	16.303	19.020	22685	0.207	0.091	0.188	0.044
10YR_72HR	Pond A	BASE	24.27	16.309	19.020	22703	0.258	0.093	0.193	0.046
10YR_72HR	Pond A	BASE	24.52	16.316	19.020	22725	0.287	0.097	0.199	0.048
10YR_72HR	Pond A	BASE	24.77	16.324	19.020	22750	0.300	0.100	0.205	0.050
10YR_72HR	Pond A	BASE	25.02	16.332	19.020	22776	0.307	0.102	0.211	0.052
10YR_72HR	Pond A	BASE	25.27	16.340	19.020	22802	0.310	0.104	0.218	0.054
10YR_72HR	Pond A	BASE	25.52	16.348	19.020	22828	0.313	0.106	0.224	0.056
10YR_72HR	Pond A	BASE	25.77	16.356	19.020	22854	0.315	0.109	0.231	0.058
10YR_72HR	Pond A	BASE	26.02	16.364	19.020	22880	0.318	0.111	0.237	0.061
10YR_72HR	Pond A	BASE	26.27	16.372	19.020	22906	0.320	0.113	0.244	0.063
10YR_72HR	Pond A	BASE	26.52	16.381	19.020	22932	0.322	0.115	0.250	0.065
10YR_72HR	Pond A	BASE	26.77	16.389	19.020	22958	0.325	0.117	0.257	0.068
10YR_72HR	Pond A	BASE	27.02	16.397	19.020	22984	0.327	0.119	0.264	0.070
10YR_72HR	Pond A	BASE	27.27	16.405	19.020	23010	0.329	0.120	0.271	0.073
10YR_72HR	Pond A	BASE	27.52	16.413	19.020	23036	0.331	0.122	0.277	0.075
10YR_72HR	Pond A	BASE	27.77	16.421	19.020	23062	0.333	0.124	0.284	0.078
10YR_72HR	Pond A	BASE	28.02	16.430	19.020	23088	0.335	0.126	0.291	0.080
10YR_72HR	Pond A	BASE	28.27	16.438	19.020	23114	0.337	0.128	0.298	0.083
10YR_72HR	Pond A	BASE	28.52	16.446	19.020	23141	0.339	0.130	0.305	0.085
10YR_72HR	Pond A	BASE	28.77	16.454	19.020	23167	0.341	0.131	0.312	0.088
10YR_72HR	Pond A	BASE	29.02	16.462	19.020	23193	0.343	0.133	0.319	0.091
10YR_72HR	Pond A	BASE	29.27	16.470	19.020	23219	0.345	0.135	0.326	0.094
10YR_72HR	Pond A	BASE	29.52	16.479	19.020	23245	0.347	0.136	0.333	0.096
10YR_72HR	Pond A	BASE	29.77	16.487	19.020	23271	0.349	0.138	0.341	0.099
10YR_72HR	Pond A	BASE	30.02	16.495	19.020	23297	0.350	0.140	0.348	0.102
10YR_72HR	Pond A	BASE	30.27	16.503	19.020	23323	0.352	0.141	0.355	0.105
10YR_72HR	Pond A	BASE	30.52	16.511	19.020	23349	0.354	0.143	0.362	0.108
10YR_72HR	Pond A	BASE	30.77	16.519	19.020	23375	0.355	0.144	0.370	0.111
10YR_72HR	Pond A	BASE	31.02	16.527	19.020	23401	0.357	0.146	0.377	0.114
10YR_72HR	Pond A	BASE	31.27	16.535	19.020	23426	0.358	0.148	0.384	0.117
10YR_72HR	Pond A	BASE	31.52	16.544	19.020	23452	0.360	0.149	0.392	0.120
10YR_72HR	Pond A	BASE	31.77	16.552	19.020	23478	0.362	0.151	0.399	0.123
10YR_72HR	Pond A	BASE	32.02	16.560	19.020	23504	0.363	0.152	0.407	0.126
10YR_72HR	Pond A	BASE	32.27	16.568	19.020	23530	0.364	0.154	0.414	0.129

Simulation	Node	Group	Time hrs	Stage ft	Warning Stage ft	Surface Area ft2	Total Inflow cfs	Total Outflow cfs	Total Vol In af	Total Vol Out af
10YR_72HR	Pond A	BASE	32.52	16.576	19.020	23555	0.366	0.155	0.422	0.133
10YR_72HR	Pond A	BASE	32.77	16.584	19.020	23581	0.367	0.156	0.429	0.136
10YR_72HR	Pond A	BASE	33.02	16.592	19.020	23607	0.369	0.158	0.437	0.139
10YR_72HR	Pond A	BASE	33.27	16.600	19.020	23633	0.370	0.159	0.445	0.142
10YR_72HR	Pond A	BASE	33.52	16.608	19.020	23658	0.371	0.161	0.452	0.146
10YR_72HR	Pond A	BASE	33.77	16.616	19.020	23684	0.373	0.162	0.460	0.149
10YR_72HR	Pond A	BASE	34.02	16.624	19.020	23709	0.374	0.163	0.468	0.152
10YR_72HR	Pond A	BASE	34.27	16.632	19.020	23735	0.375	0.165	0.475	0.156
10YR_72HR	Pond A	BASE	34.52	16.640	19.020	23760	0.376	0.166	0.483	0.159
10YR_72HR	Pond A	BASE	34.77	16.648	19.020	23786	0.378	0.168	0.491	0.163
10YR_72HR	Pond A	BASE	35.02	16.656	19.020	23811	0.379	0.169	0.499	0.166
10YR_72HR	Pond A	BASE	35.27	16.664	19.020	23836	0.380	0.170	0.507	0.170
10YR_72HR	Pond A	BASE	35.52	16.672	19.020	23862	0.381	0.171	0.515	0.173
10YR_72HR	Pond A	BASE	35.77	16.680	19.020	23887	0.382	0.173	0.522	0.177
10YR_72HR	Pond A	BASE	36.02	16.688	19.020	23912	0.384	0.174	0.530	0.180
10YR_72HR	Pond A	BASE	36.27	16.695	19.020	23938	0.387	0.175	0.538	0.184
10YR_72HR	Pond A	BASE	36.52	16.703	19.020	23963	0.389	0.177	0.546	0.188
10YR_72HR	Pond A	BASE	36.77	16.711	19.020	23989	0.391	0.178	0.554	0.191
10YR_72HR	Pond A	BASE	37.02	16.719	19.020	24014	0.392	0.179	0.562	0.195
10YR_72HR	Pond A	BASE	37.27	16.727	19.020	24039	0.393	0.180	0.571	0.199
10YR_72HR	Pond A	BASE	37.52	16.735	19.020	24065	0.394	0.181	0.579	0.202
10YR_72HR	Pond A	BASE	37.77	16.743	19.020	24090	0.395	0.183	0.587	0.206
10YR_72HR	Pond A	BASE	38.02	16.751	19.020	24116	0.396	0.184	0.595	0.210
10YR_72HR	Pond A	BASE	38.27	16.759	19.020	24141	0.397	0.185	0.603	0.214
10YR_72HR	Pond A	BASE	38.52	16.767	19.020	24166	0.398	0.186	0.611	0.218
10YR_72HR	Pond A	BASE	38.77	16.775	19.020	24191	0.399	0.187	0.620	0.221
10YR_72HR	Pond A	BASE	39.02	16.783	19.020	24216	0.400	0.188	0.628	0.225
10YR_72HR	Pond A	BASE	39.27	16.791	19.020	24242	0.401	0.188	0.636	0.229
10YR_72HR	Pond A	BASE	39.52	16.799	19.020	24267	0.402	0.187	0.644	0.233
10YR_72HR	Pond A	BASE	39.77	16.806	19.020	24292	0.402	0.187	0.653	0.237
10YR_72HR	Pond A	BASE	40.02	16.814	19.020	24318	0.403	0.187	0.661	0.241
10YR_72HR	Pond A	BASE	40.27	16.823	19.020	24344	0.404	0.186	0.669	0.245
10YR_72HR	Pond A	BASE	40.52	16.831	19.020	24369	0.405	0.186	0.678	0.248
10YR_72HR	Pond A	BASE	40.77	16.839	19.020	24395	0.406	0.186	0.686	0.252
10YR_72HR	Pond A	BASE	41.02	16.847	19.020	24421	0.407	0.185	0.695	0.256
10YR_72HR	Pond A	BASE	41.27	16.855	19.020	24447	0.408	0.185	0.703	0.260
10YR_72HR	Pond A	BASE	41.52	16.863	19.020	24474	0.408	0.185	0.711	0.264
10YR_72HR	Pond A	BASE	41.77	16.871	19.020	24500	0.409	0.184	0.720	0.268
10YR_72HR	Pond A	BASE	42.02	16.880	19.020	24526	0.410	0.184	0.728	0.271
10YR_72HR	Pond A	BASE	42.27	16.888	19.020	24553	0.411	0.184	0.737	0.275
10YR_72HR	Pond A	BASE	42.52	16.896	19.020	24580	0.411	0.183	0.745	0.279
10YR_72HR	Pond A	BASE	42.77	16.905	19.020	24606	0.412	0.183	0.754	0.283
10YR_72HR	Pond A	BASE	43.02	16.913	19.020	24633	0.413	0.183	0.762	0.287
10YR_72HR	Pond A	BASE	43.27	16.922	19.020	24660	0.414	0.182	0.771	0.290
10YR_72HR	Pond A	BASE	43.52	16.930	19.020	24687	0.414	0.182	0.779	0.294
10YR_72HR	Pond A	BASE	43.77	16.939	19.020	24714	0.415	0.182	0.788	0.298
10YR_72HR	Pond A	BASE	44.02	16.947	19.020	24741	0.416	0.182	0.797	0.302
10YR_72HR	Pond A	BASE	44.27	16.956	19.020	24769	0.416	0.181	0.805	0.305
10YR_72HR	Pond A	BASE	44.52	16.964	19.020	24796	0.417	0.181	0.814	0.309
10YR_72HR	Pond A	BASE	44.77	16.973	19.020	24823	0.418	0.181	0.822	0.313
10YR_72HR	Pond A	BASE	45.02	16.981	19.020	24851	0.418	0.180	0.831	0.317
10YR_72HR	Pond A	BASE	45.27	16.990	19.020	24878	0.419	0.180	0.840	0.320
10YR_72HR	Pond A	BASE	45.52	16.999	19.020	24906	0.420	0.180	0.848	0.324
10YR_72HR	Pond A	BASE	45.77	17.007	19.020	24934	0.420	0.180	0.857	0.328
10YR_72HR	Pond A	BASE	46.02	17.016	19.020	24962	0.421	0.179	0.866	0.331
10YR_72HR	Pond A	BASE	46.27	17.025	19.020	24989	0.422	0.179	0.874	0.335
10YR_72HR	Pond A	BASE	46.52	17.033	19.020	25017	0.422	0.179	0.883	0.339
10YR_72HR	Pond A	BASE	46.77	17.042	19.020	25045	0.423	0.179	0.892	0.342
10YR_72HR	Pond A	BASE	47.02	17.051	19.020	25073	0.423	0.178	0.901	0.346
10YR_72HR	Pond A	BASE	47.27	17.060	19.020	25102	0.424	0.178	0.909	0.350
10YR_72HR	Pond A	BASE	47.52	17.069	19.020	25130	0.424	0.178	0.918	0.354
10YR_72HR	Pond A	BASE	47.77	17.077	19.020	25158	0.425	0.178	0.927	0.357
10YR_72HR	Pond A	BASE	48.02	17.086	19.020	25186	0.426	0.177	0.936	0.361
10YR_72HR	Pond A	BASE	48.27	17.096	19.020	25216	0.452	0.177	0.945	0.365
10YR_72HR	Pond A	BASE	48.52	17.106	19.020	25248	0.466	0.177	0.954	0.368
10YR_72HR	Pond A	BASE	48.77	17.116	19.020	25282	0.472	0.177	0.964	0.372
10YR_72HR	Pond A	BASE	49.02	17.127	19.020	25315	0.475	0.177	0.974	0.375
10YR_72HR	Pond A	BASE	49.27	17.137	19.020	25349	0.481	0.177	0.984	0.379
10YR_72HR	Pond A	BASE	49.52	17.148	19.020	25384	0.485	0.177	0.994	0.383
10YR_72HR	Pond A	BASE	49.77	17.159	19.020	25419	0.487	0.177	1.004	0.386
10YR_72HR	Pond A	BASE	50.02	17.170	19.020	25454	0.489	0.177	1.014	0.390
10YR_72HR	Pond A	BASE	50.27	17.182	19.020	25492	0.537	0.178	1.024	0.394
10YR_72HR	Pond A	BASE	50.52	17.195	19.020	25534	0.563	0.178	1.036	0.397
10YR_72HR	Pond A	BASE	50.77	17.209	19.020	25578	0.574	0.179	1.047	0.401
10YR_72HR	Pond A	BASE	51.02	17.223	19.020	25623	0.579	0.179	1.059	0.405
10YR_72HR	Pond A	BASE	51.27	17.237	19.020	25669	0.609	0.180	1.072	0.409
10YR_72HR	Pond A	BASE	51.52	17.253	19.020	25718	0.625	0.180	1.084	0.412
10YR_72HR	Pond A	BASE	51.77	17.268	19.020	25768	0.632	0.181	1.097	0.416
10YR_72HR	Pond A	BASE	52.02	17.284	19.020	25818	0.638	0.182	1.110	0.420
10YR_72HR	Pond A	BASE	52.27	17.302	19.020	25874	0.742	0.183	1.125	0.424
10YR_72HR	Pond A	BASE	52.52	17.322	19.020	25940	0.799	0.185	1.141	0.427
10YR_72HR	Pond A	BASE	52.77	17.344	19.020	26009	0.822	0.186	1.157	0.431
10YR_72HR	Pond A	BASE	53.02	17.366	19.020	26080	0.834	0.188	1.174	0.435
10YR_72HR	Pond A	BASE	53.27	17.390	19.020	26156	0.940	0.190	1.193	0.439

Simulation	Node	Group	Time hrs	Stage ft	Warning Stage ft	Surface Area ft2	Total Inflow cfs	Total Outflow cfs	Total Vol In af	Total Vol Out af
10YR_72HR	Pond A	BASE	53.52	17.417	19.020	26242	0.998	0.192	1.213	0.443
10YR_72HR	Pond A	BASE	53.77	17.445	19.020	26331	1.022	0.195	1.234	0.447
10YR_72HR	Pond A	BASE	54.02	17.473	19.020	26422	1.035	0.198	1.255	0.451
10YR_72HR	Pond A	BASE	54.27	17.503	19.020	26518	1.146	0.200	1.277	0.455
10YR_72HR	Pond A	BASE	54.52	17.536	19.020	26624	1.207	0.203	1.302	0.459
10YR_72HR	Pond A	BASE	54.77	17.570	19.020	26731	1.232	0.267	1.327	0.464
10YR_72HR	Pond A	BASE	55.02	17.601	19.020	26830	1.247	0.385	1.353	0.471
10YR_72HR	Pond A	BASE	55.27	17.629	19.020	26920	1.358	0.523	1.379	0.480
10YR_72HR	Pond A	BASE	55.52	17.656	19.020	27005	1.421	0.675	1.408	0.493
10YR_72HR	Pond A	BASE	55.77	17.679	19.020	27079	1.447	0.820	1.438	0.508
10YR_72HR	Pond A	BASE	56.02	17.698	19.020	27139	1.462	0.949	1.468	0.526
10YR_72HR	Pond A	BASE	56.27	17.715	19.020	27193	1.596	1.072	1.499	0.547
10YR_72HR	Pond A	BASE	56.52	17.731	19.020	27247	1.672	1.198	1.533	0.571
10YR_72HR	Pond A	BASE	56.77	17.746	19.020	27293	1.703	1.311	1.568	0.597
10YR_72HR	Pond A	BASE	57.02	17.757	19.020	27330	1.722	1.406	1.603	0.625
10YR_72HR	Pond A	BASE	57.27	17.769	19.020	27367	1.895	1.501	1.641	0.655
10YR_72HR	Pond A	BASE	57.52	17.782	19.020	27408	1.995	1.612	1.681	0.687
10YR_72HR	Pond A	BASE	57.77	17.795	19.020	27449	2.129	1.725	1.724	0.721
10YR_72HR	Pond A	BASE	58.02	17.808	19.020	27490	2.203	1.840	1.768	0.758
10YR_72HR	Pond A	BASE	58.27	17.820	19.020	27530	2.357	1.954	1.816	0.797
10YR_72HR	Pond A	BASE	58.52	17.833	19.020	27571	2.454	2.075	1.865	0.839
10YR_72HR	Pond A	BASE	58.77	17.850	19.020	27625	2.920	2.239	1.921	0.884
10YR_72HR	Pond A	BASE	59.02	17.873	19.020	27699	3.206	2.473	1.984	0.932
10YR_72HR	Pond A	BASE	59.27	17.908	19.020	27810	4.271	2.836	2.061	0.987
10YR_72HR	Pond A	BASE	59.52	17.957	19.020	27967	5.291	3.382	2.160	1.051
10YR_72HR	Pond A	BASE	59.75	18.178	19.020	28673	20.625	6.221	2.410	1.144
10YR_72HR	Pond A	BASE	60.00	18.674	19.020	30257	30.364	14.179	2.938	1.355
10YR_72HR	Pond A	BASE	60.25	18.958	19.020	31164	19.380	18.080	3.456	1.691
10YR_72HR	Pond A	BASE	60.51	18.883	19.020	30925	12.233	17.090	3.786	2.058
10YR_72HR	Pond A	BASE	60.75	18.707	19.020	30365	7.478	14.641	3.986	2.381
10YR_72HR	Pond A	BASE	61.00	18.499	19.020	29700	5.026	11.266	4.116	2.649
10YR_72HR	Pond A	BASE	61.25	18.331	19.020	29161	3.718	8.489	4.207	2.855
10YR_72HR	Pond A	BASE	61.50	18.204	19.020	28756	3.203	6.582	4.279	3.011
10YR_72HR	Pond A	BASE	61.75	18.113	19.020	28465	2.783	5.314	4.340	3.133
10YR_72HR	Pond A	BASE	62.01	18.042	19.020	28240	2.569	4.395	4.397	3.236
10YR_72HR	Pond A	BASE	62.26	17.988	19.020	28067	2.149	3.734	4.446	3.320
10YR_72HR	Pond A	BASE	62.51	17.941	19.020	27918	1.922	3.190	4.488	3.392
10YR_72HR	Pond A	BASE	62.76	17.905	19.020	27800	1.743	2.785	4.526	3.453
10YR_72HR	Pond A	BASE	63.01	17.874	19.020	27704	1.654	2.465	4.561	3.507
10YR_72HR	Pond A	BASE	63.26	17.851	19.020	27630	1.623	2.230	4.595	3.556
10YR_72HR	Pond A	BASE	63.51	17.834	19.020	27575	1.613	2.060	4.628	3.600
10YR_72HR	Pond A	BASE	63.76	17.822	19.020	27535	1.610	1.938	4.661	3.642
10YR_72HR	Pond A	BASE	64.01	17.812	19.020	27505	1.605	1.850	4.694	3.681
10YR_72HR	Pond A	BASE	64.26	17.801	19.020	27469	1.268	1.745	4.724	3.718
10YR_72HR	Pond A	BASE	64.51	17.784	19.020	27415	1.074	1.591	4.748	3.752
10YR_72HR	Pond A	BASE	64.76	17.768	19.020	27364	0.999	1.450	4.770	3.784
10YR_72HR	Pond A	BASE	65.01	17.755	19.020	27321	0.969	1.334	4.790	3.812
10YR_72HR	Pond A	BASE	65.26	17.744	19.020	27287	0.966	1.245	4.810	3.839
10YR_72HR	Pond A	BASE	65.51	17.736	19.020	27261	0.969	1.179	4.830	3.864
10YR_72HR	Pond A	BASE	65.76	17.730	19.020	27242	0.970	1.129	4.850	3.888
10YR_72HR	Pond A	BASE	66.01	17.725	19.020	27227	0.970	1.091	4.870	3.911
10YR_72HR	Pond A	BASE	66.26	17.722	19.020	27216	0.970	1.062	4.890	3.933
10YR_72HR	Pond A	BASE	66.51	17.719	19.020	27207	0.970	1.040	4.910	3.955
10YR_72HR	Pond A	BASE	66.76	17.717	19.020	27200	0.970	1.023	4.930	3.976
10YR_72HR	Pond A	BASE	67.01	17.715	19.020	27196	0.970	1.009	4.950	3.997
10YR_72HR	Pond A	BASE	67.26	17.714	19.020	27192	0.970	0.999	4.970	4.018
10YR_72HR	Pond A	BASE	67.51	17.713	19.020	27189	0.971	0.991	4.990	4.038
10YR_72HR	Pond A	BASE	67.76	17.713	19.020	27188	0.971	0.985	5.010	4.059
10YR_72HR	Pond A	BASE	68.01	17.712	19.020	27186	0.967	0.980	5.030	4.079
10YR_72HR	Pond A	BASE	68.26	17.710	19.020	27178	0.795	0.958	5.049	4.099
10YR_72HR	Pond A	BASE	68.51	17.703	19.020	27157	0.698	0.908	5.064	4.118
10YR_72HR	Pond A	BASE	68.76	17.697	19.020	27135	0.661	0.856	5.078	4.137
10YR_72HR	Pond A	BASE	69.01	17.690	19.020	27116	0.646	0.811	5.092	4.154
10YR_72HR	Pond A	BASE	69.26	17.685	19.020	27100	0.643	0.774	5.105	4.170
10YR_72HR	Pond A	BASE	69.51	17.682	19.020	27088	0.643	0.745	5.118	4.186
10YR_72HR	Pond A	BASE	69.76	17.679	19.020	27078	0.643	0.722	5.132	4.201
10YR_72HR	Pond A	BASE	70.01	17.676	19.020	27071	0.643	0.704	5.145	4.216
10YR_72HR	Pond A	BASE	70.26	17.674	19.020	27065	0.645	0.690	5.158	4.230
10YR_72HR	Pond A	BASE	70.51	17.673	19.020	27061	0.646	0.678	5.171	4.244
10YR_72HR	Pond A	BASE	70.76	17.672	19.020	27058	0.646	0.670	5.185	4.258
10YR_72HR	Pond A	BASE	71.01	17.672	19.020	27056	0.647	0.663	5.198	4.272
10YR_72HR	Pond A	BASE	71.26	17.671	19.020	27054	0.647	0.657	5.211	4.286
10YR_72HR	Pond A	BASE	71.51	17.671	19.020	27054	0.647	0.652	5.225	4.299
10YR_72HR	Pond A	BASE	71.76	17.671	19.020	27053	0.647	0.648	5.238	4.313
10YR_72HR	Pond A	BASE	72.00	17.671	19.020	27053	0.646	0.645	5.251	4.326

Basin B

Pond B-1

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Made by: ZKE
Checked by: REC

DATE: August 25, 2016
Job Number: DT4-006-01

PROJECT : **Midway Road (CR 712) from Glades Cutoff Road to Selvitz Road PD&E Study**
BASIN NAME : **Basin B**
POND NAME : **Pond B-1**

Station Limits: From: 210+25 To: 219+00

Roadway Length = 875 ft
R/W Width = 160 ft

EXISTING CONDITION

Existing condition information from SFWMD Permit No. 56-01734-P

Roadway Area:

Description	Width	Quantity	Total Width
Travel Lane	12.0 ft	2	24 ft
Paved Shoulder	1.0 ft	2	2 ft
			0 ft
Sidewalk or Trail			0 ft
Curb&Gutter			0 ft
Shldr Gutter			0 ft
Barrier Wall			0 ft
		Total Impervious Width:	26 ft

Impervious Roadway Area:	0.52 ac
Pervious Roadway Area:	2.69 ac
Total Roadway Area:	3.21 ac

Pond Area: Pervious Pond Area = 1.37 ac

Total Area:

Impervious Area:	**0.52 ac**
Pervious Area:	**4.06 ac**
Total Area:	**4.58 ac**

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Impervious areas; Streets & roads	D	98	0.52 ac	51.2
Open Space (lawns, parks, golf courses, cemeteries, etc.) Good condition (grass cover > 75%)	D	80	4.06 ac	324.7
			Total:	4.58 ac	375.8

CN = Total CN*Area / Total Area = **82.1**

Runoff:

	SFWMD & St. Lucie County (25yr/72hr)	Storm Sewer Design (3yr/24hr)
Precipitation (P) =	9.50 in	6.50 in
Runoff (Q) =	**7.30 in**	**4.46 in**

Soil Capacity (S) = $\frac{1000}{CN} - 10$ = **2.19 in**

Runoff (Q) = $\frac{(P - 0.2S)^2}{(P + 0.8S)}$

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PROJECT : **Midway Road (CR 712) from Glades Cutoff Road to Selvitz Road PD&E Study**
BASIN NAME : **Basin B**
POND NAME : **Pond B-1**

Station Limits: From: 210+25 To: 219+00 Roadway Length = 875 ft R/W Width = 160 ft

PROPOSED CONDITION

Roadway Area:

Description	Width	Quantity	Total Width
Travel Lane	11.0 ft	4	44 ft
Paved Shoulder	7.0 ft	2	14 ft
Imperv. Median			0 ft
Sidewalk or Trail	18.0 ft	1	18 ft
Curb&Gutter	2.0 ft	4	8 ft
Shldr Gutter			0 ft
Miscellaneous			0 ft
		Total Impervious Width:	84 ft

Impervious Roadway Area: 1.69 ac
Pervious Roadway Area: 1.53 ac
Total Roadway Area: 3.21 ac

Pond Area:

Pervious Pond Area : 0.87 ac
Water Surface Area: 0.50 ac Pond
Total Pond Area: 1.37 ac

Total Area:

Impervious Area: **1.69 ac**
Pervious Area: **2.40 ac**
Water Surface Area: **0.50 ac**
Total Area: **4.58 ac**

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Impervious areas; Streets & roads	D	98	1.69 ac	165.4
Proposed Ponds (Water Surface)	D	100	0.50 ac	49.6
Open Space (lawns, parks, golf courses, cemeteries, etc.) Good condition (grass cover > 75%)	D	80	2.40 ac	191.8
				0.0
		Total:	4.58 ac	406.7

CN = Total CN*Area / Total Area = **88.8**

Runoff:

		SFWMD & St. Lucie County (25yr/72hr)	Storm Sewer Design (3yr/24hr)
Soil Capacity (S) = $\frac{1000}{CN} - 10$ =	1.26 in	Precipitation (P) =	9.50 in	6.50 in
Runoff (Q) = $\frac{(P - 0.2S)^2}{(P + 0.8S)}$		Runoff (Q) =	**8.14 in**	**5.20 in**

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PROJECT : **Midway Road (CR 712) from Glades Cutoff Road to Selvitz Road PD&E Study**
BASIN NAME : **Basin B**
POND NAME : **Pond B-1**

POND SIZING

Required Treatment Volume (TV)

Selection criteria

Permitting Agency	**SFWMD**
StormW.Mgmt.	**Wet Detention**
Online/Offline	**Online**
OFW	**Yes**
Open/Closed Basin	**Open**

Wet Detention	**2.50 in**	x Impervious Areas =	0.35 ac-ft
	1.00 in	x Total Basin Area =	0.38 ac-ft

Required Dry Pre-Treatment	
0.5 in x Total Basin Area =	**0.19 ac-ft**

Treatment V_{req} = Largest of Trt. Vol. =	**0.38 ac-ft**
OFW Requirement, provide 50% more TV =	**0.57 ac-ft**
Required Wet Detention TV =	**0.38 ac-ft**

Required Attenuation Volume:

Total Runoff (ac-ft)

	SFWMD	**Storm Sewer Design**
Q_{pre} =	2.79 ac-ft	1.70 ac-ft
Q_{post} =	3.11 ac-ft	1.98 ac-ft
ΔQ =	**0.32 ac-ft**	**0.28 ac-ft**

Attenuation V_{req} = 0.32 ac-ft (use largest value)

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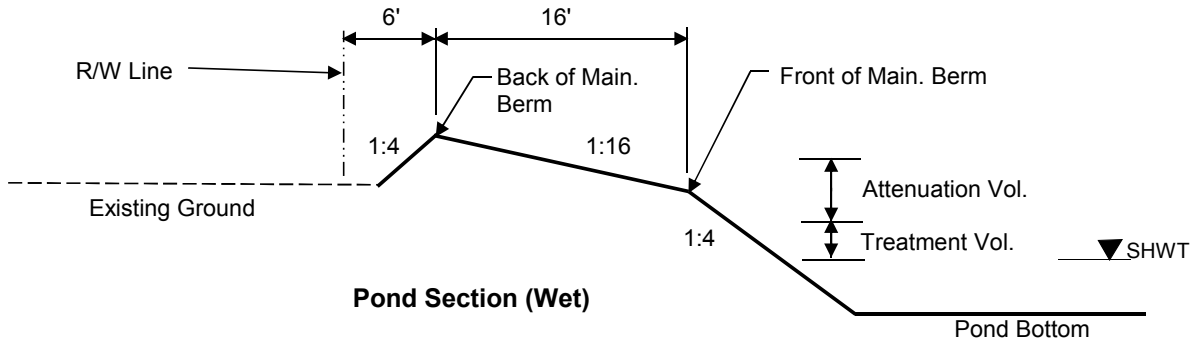
PROJECT : **Midway Road (CR 712) from Glades Cutoff Road to Selvitz Road PD&E Study**
BASIN NAME : **Basin B**
POND NAME : **Pond B-1**

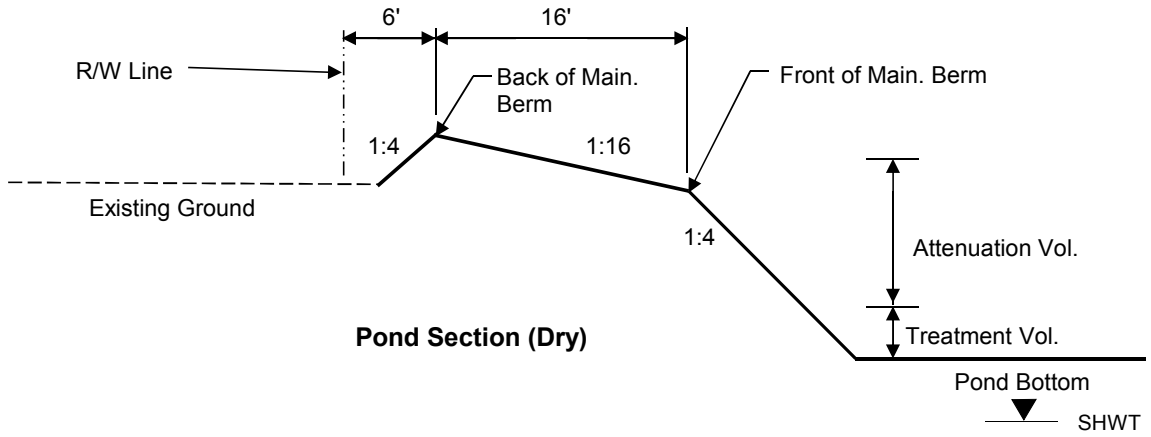
Maintenance Area Width =	16.0 ft	@ 1:16	Existing Ground Elevation =	19.75
Pre-Treatment Pond Tie-In Width =	6.0 ft	@ 1:4	Normal Water Elevation =	16.50
Wet Detention Pond Tie-In Width =	5.0 ft	@ 1:4	Lowest EOP Elevation =	23.00
Maximum Storage Depth (**SD**) =	3.50 ft	with 1.0 ft freeboard		

Hydraulic Grade Line (HGL) check

HGL Slope =	0.100%	Use 0.05% for very flat terrain to 0.1% for flat terrain
Distance from Pond to Lowest EOP =	500 ft	
Estimated Energy Losses =	0.5 ft	
HGL Clearance =	1.0 ft	Use 1.0 foot as a standard HGL clearance (no junction losses)
Estimated Storm Sewer Tailwater EL =	21.5 ft	



Pond Section (Wet)



Pond Section (Dry)

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DATE: August 25, 2016
Job Number: DT4-006-01

PROJECT : **Midway Road (CR 712) from Glades Cutoff Road to Selvitz Road PD&E Study**
BASIN NAME : **Basin B**
POND NAME : **Pond B-1**

Pond Stage / Storage Calculations

ELEVATION	DESCRIPTION	AREA	DIMENSIONS		STORAGE
			LENGTH	WIDTH	
19.75	Pond R/W	0.46 ac	213.0 ft	95.0 ft	
21.25	Back of Main. Berm	0.38 ac	201.0 ft	83.0 ft	0.69 ac-ft
20.75		0.28 ac	185.0 ft	67.0 ft	0.52 ac-ft
20.25	Front of Main. Berm	0.20 ac	169.0 ft	51.0 ft	0.40 ac-ft
19.00	Provided Treat.Vol.	0.15 ac	159.0 ft	41.0 ft	0.19 ac-ft
19.00	Top of Treatment Vol.	0.15 ac	159.0 ft	41.0 ft	0.19 ac-ft
17.50	Pond Bottom	0.10 ac	147.0 ft	29.0 ft	0.00 ac-ft

Required Dry Pre-Treatment = 0.19 ac-ft
Required Dry Pre-Treatment Stage = 20.00 ft

Provided Treatment= 0.19 ac-ft
Provided Treatment Stage= 19.00 ft

Pond Stage / Storage Calculations

ELEVATION	DESCRIPTION	AREA	DIMENSIONS		STORAGE
			LENGTH	WIDTH	
19.75	Pond R/W	1.08 ac	215.0 ft	219.0 ft	
21.00	Back of Main. Berm	0.98 ac	205.0 ft	209.0 ft	2.90 ac-ft
20.50		0.84 ac	189.0 ft	193.0 ft	2.44 ac-ft
20.00	Front of Main. Berm	0.70 ac	173.0 ft	177.0 ft	2.06 ac-ft
19.00	Provided Treat.Vol.+Att.Vol	0.62 ac	163.0 ft	167.0 ft	1.39 ac-ft
17.84	Req'd Treat.Vol+Att. Vol	0.56 ac	153.7 ft	157.7 ft	0.71 ac-ft
17.76	Estimated Storm Sewer TW	0.55 ac	153.1 ft	157.1 ft	0.67 ac-ft
17.25	Top of Treatment Vol.	0.54 ac	151.0 ft	155.0 ft	0.39 ac-ft
16.50	Normal Water Level	0.50 ac	145.0 ft	149.0 ft	0.00 ac-ft
14.50		0.39 ac	129.0 ft	133.0 ft	
10.50	Pond Bottom	0.28 ac	121.0 ft	101.0 ft	

Required Treatment+Attenuation Vol.= 0.71 ac-ft
Required Treatment+Attenuation Stage= 17.84 ft

Provided Treatment+Attenuation Vol.= 1.39 ac-ft
Provided Treatment+Attenuation Stage= 19.00 ft

Estimated Treat. Vol.+Storm Sewer Att.= 0.67 ac-ft
Estimated Storm Sewer TW EL.= 17.76 ft

HGL requirements met

Additional 20% = 1.85 ac

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PROJECT : **Midway Road (CR 712) from Glades Cutoff Road to Selvitz Road PD&E Study**
BASIN NAME : **Basin B**
POND NAME : **Pond B-1**

PERMANENT POOL VOLUME CALCULATIONS

Basin Characteristics **Meterological Zone: 2**

Land Use	Area (ac)	CN	Product
Roadway Paved Area	1.69	98.00	165.62
Roadway Pervious Area	1.53	80.00	122.40
Pond Pervious Area	0.87	80.00	69.20
Pond Area at NWL	0.50	100.00	49.50
Total	**4.58**		406.72

%DCIA = 47.71 %
Non-DCIA CN = 80.00
Composite C = **0.65**
Annual Rainfall (P) = **55.00** **in**

Min. Permanent Pool Vol. = Area x Composite C x P x 14 / (365 x 12) = **0.52** **ac-ft**

Stage Storage Calc. for Permanent Pool

ELEV. (ft)		AREA (ac)	AVG AREA (ac)	Delta D (ft)	Delta storage (ac-ft)	Sum Storage (ac-ft)
16.50	Normal Water Level	0.50				2.23
			0.45	2.00	0.89	
14.50		0.39				1.34
			0.34	4.00	1.34	
10.50	Pond Bottom	0.28				0.00

Permanent Pool Volume Provided = **2.23** **ac-ft**
Resident Time Provided = Perm. Pool Vol. Provided x 365 x 12 / (Area x C x P) **59.6** **Days**

GENERAL SITE INFORMATION: V 7.6

GO TO INTRODUCTION PAGE

Blue Numbers = Input data
Red Numbers = Calculated or Carryover

HELP

Select the appropriate Meteorological Zone, input the appropriate Mean Annual Rainfall amount and select the type of analysis

NAME OF PROJECT

Midway Road PD&E Study Basin B1

VIEW ZONE MAP

Meteorological Zone (Please use zone map): CLICK ON CELL BELOW TO SELECT — Zone 2

Mean Annual Rainfall (Please use rainfall map): 55.00 Inches

VIEW MEAN ANNUAL RAINFALL MAP

Type of analysis: CLICK ON CELL BELOW TO SELECT — Net improvement

Treatment efficiency (N, P) (leave empty if net improvement or BMP analysis is used): % %

GO TO WATERSHED CHARACTERISTICS

Select the STORMWATER TREATMENT ANALYSIS Button below to begin analyzing the effectiveness of Best Management Practices.

Model documentation and example problems.

STORMWATER TREATMENT ANALYSIS

Systems available for analysis:
Retention Basin with option for calculating effluent concentration
Wet Detention
Exfiltration Trench
Pervious Pavement
Stormwater Harvesting
Biofiltration
Greenroof
Rainwater Harvesting
Managed Aquatic Plants Detention
Vegetated Natural Buffer
Vegetated Filter Strip
Swale
Rain Garden
Tree Well
Lined reuse pond
User Defined BMP

There is a user's manual for the BMPTRAINS model. It can be downloaded from www.stormwater.ucf.edu. The results from the example problems shown in the manual however may not reflect current model results due to ongoing updates of the model.

RESET INPUT FOR STORMWATER TREATMENT ANALYSIS

METHODOLOGY FOR CALCULATING REQUIRED TREATMENT EFFICIENCY

METHODOLOGY FOR RETENTION SYSTEMS

METHODOLOGY FOR WET DETENTION SYSTEMS

METHODOLOGY FOR GREENROOF SYSTEMS

METHODOLOGY FOR WATER HARVESTING SYSTEMS

WATERSHED CHARACTERISTICS V 7.6

GO TO STORMWATER TREATMENT ANALYSIS

Blue Numbers = Input data
Red Numbers = Calculated

HELP - LAND USES/EMC

SELECT CATCHMENT CONFIGURATION

CLICK ON CELL BELOW TO SELECT CONFIGURATION
A - Single Catchment

VIEW CATCHMENT CONFIGURATION

CATCHMENT NO.1 CHARACTERISTICS:

VIEW AVERAGE ANNUAL RUNOFF "C" Factor

VIEW EMC & FLUCCS

	CLICK ON CELL BELOW TO SELECT	
Pre-development land use:	Highway: TN=1.520 TP=0.200	
with default EMCs	CLICK ON CELL BELOW TO SELECT	
Post-development land use:	Highway: TN=1.520 TP=0.200	
with default EMCs		
Total pre-development catchment area:	4.58	AC
Total post-development catchment or BMP analysis area:	4.58	AC
Pre-development Non DCIA CN:	80.00	
Pre-development DCIA percentage:	11.40	%
Post-development Non DCIA CN:	80.00	
Post-development DCIA percentage:	47.71	%
Estimated BMPArea (No loading from this area)	1.37	AC

OVERWRITE DEFAULT CONCENTRATIONS USING:

	PRE:	POST:
EMC(N):	mg/L	mg/L
EMC(P):	mg/L	mg/L

USE DEFAULT CONCENTRATIONS

Average annual pre runoff volume:	4.005	ac-ft/year
Average annual post runoff volume (note no BMP area):	6.532	ac-ft/year
Pre-development Annual Mass Loading - **Nitrogen:**	7.508	kg/year
Pre-development Annual Mass Loading - **Phosphorus:**	0.988	kg/year
Post-development Annual Mass Loading - **Nitrogen:**	12.244	kg/year
Post-development Annual Mass Loading - **Phosphorus:**	1.611	kg/year

CATCHMENT NO.2 CHARACTERISTICS:

	CLICK ON CELL BELOW TO SELECT	
Pre-development land use:		
with default EMCs	CLICK ON CELL BELOW TO SELECT	
Post-development land use:		
with default EMCs		
Total pre-development catchment area:		AC
Total post-development catchment or BMP analysis area:		AC
Pre-development Non DCIA CN:		
Pre-development DCIA percentage:		%
Post-development Non DCIA CN:		
Post-development DCIA percentage:		%
Estimated BMPArea (No loading from this area)		AC

OVERWRITE DEFAULT CONCENTRATIONS:

	PRE:	POST:
EMC(N):	mg/L	mg/L
EMC(P):	mg/L	mg/L

USE DEFAULT CONCENTRATIONS

Average annual pre runoff volume:		ac-ft/year
Average annual post runoff volume (note no BMP area):		ac-ft/year
Pre-development Annual Mass Loading - **Nitrogen:**		kg/year
Pre-development Annual Mass Loading - **Phosphorus:**		kg/year
Post-development Annual Mass Loading - **Nitrogen:**		kg/year
Post-development Annual Mass Loading - **Phosphorus:**		kg/year

CATCHMENT NO.3 CHARACTERISTICS:

	CLICK ON CELL BELOW TO SELECT	
Pre-development land use:		
with default EMCs	CLICK ON CELL BELOW TO SELECT	
Post-development land use:		
with default EMCs		
Total pre-development catchment area:		AC
Total post-development catchment or BMP analysis area:		AC
Pre-development Non DCIA CN:		
Pre-development DCIA percentage:		%
Post-development Non DCIA CN:		
Post-development DCIA percentage:		%
Estimated BMPArea (no loading from this area)		AC

OVERWRITE DEFAULT CONCENTRATIONS:

	PRE:	POST:
EMC(N):	mg/L	mg/L
EMC(P):	mg/L	mg/L

USE DEFAULT CONCENTRATIONS

Average annual pre runoff volume:		ac-ft/year
Average annual post runoff volume (note no BMP area):		ac-ft/year
Pre-development Annual Mass Loading - **Nitrogen:**		kg/year
Pre-development Annual Mass Loading - **Phosphorus:**		kg/year
Post-development Annual Mass Loading - **Nitrogen:**		kg/year
Post-development Annual Mass Loading - **Phosphorus:**		kg/year

CATCHMENT NO.4 CHARACTERISTICS:

	CLICK ON CELL BELOW TO SELECT	
Pre-development land use:		
with default EMCs	CLICK ON CELL BELOW TO SELECT	
Post-development land use:		
with default EMCs		
Total pre-development catchment area:		AC
Total post-development catchment or BMP analysis area:		AC
Pre-development Non DCIA CN:		
Pre-development DCIA percentage:		%
Post-development Non DCIA CN:		
Post-development DCIA percentage:		%
Estimated BMPArea (no loading from this area)		AC

OVERWRITE DEFAULT CONCENTRATIONS:

	PRE:	POST:
EMC(N):	mg/L	mg/L
EMC(P):	mg/L	mg/L

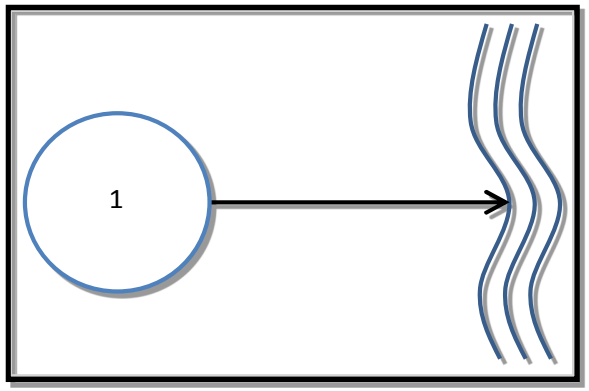
USE DEFAULT CONCENTRATIONS

Average annual pre runoff volume:		ac-ft/year
Average annual post runoff volume (note no BMP area):		ac-ft/year
Pre-development Annual Mass Loading - **Nitrogen:**		kg/year
Pre-development Annual Mass Loading - **Phosphorus:**		kg/year
Post-development Annual Mass Loading - **Nitrogen:**		kg/year
Post-development Annual Mass Loading - **Phosphorus:**		kg/year

STORMWATER TREATMENT ANALYSIS:	V 7.6	GO TO GENERAL SITE INFORMATION PAGE	Blue Numbers =	Input data
			Red Numbers =	Calculated

If not done, specify pre- and post-development watershed characteristics.

GO TO WATERSHED CHARACTERISTICS



Total Required Treatment Efficiency:

Required Treatment Eff (**Nitrogen**):	38.682	%
Required Treatment Eff (**Phosphorus**):	38.682	%

Select one of the BMPs below to analyze efficiency or review the summary data.

RETENTION BASIN	WET DETENTION	EXFILTRATION TRENCH	RAIN GARDEN	SWALE	USER DEFINED BMP
PERVIOUS PAVEMENT	STORMWATER HARVESTING	FILTRATION including Up-Flow Filters	LINED REUSE POND & UNDERDRAIN INPUT		
GREENROOF	RAINWATER HARVESTING	MANAGED AQUATIC PLANTS			
VEGETATED NATURAL BUFFER	VEGETATED FILTER STRIP	TREE WELL			

NOTE !!!: All individual system must be sized prior to being analyzed in conjunction with other systems. Please read instructions in the CATCHMENT AND TREATMENT SUMMARY RESULTS tab for more information.

CATCHMENT AND TREATMENT SUMMARY RESULTS

RETENTION BASIN: V 7.6

Blue Numbers =	Input data
Red Numbers =	Calculated or Carryover

RETENTION BASIN SERVING: Midway Road PD&E Study Basin B1

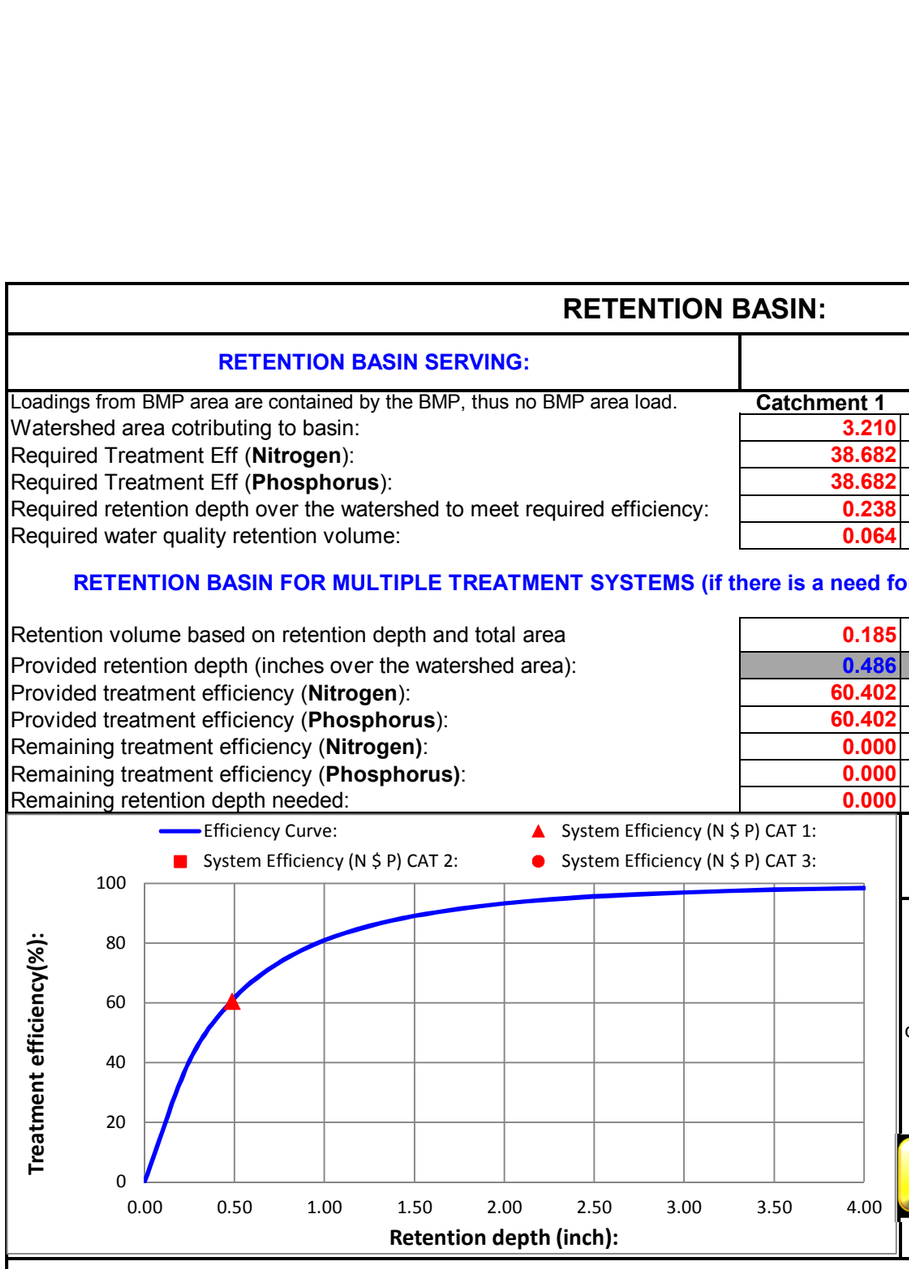
GO TO STORMWATER TREATMENT ANALYSIS

Loadings from BMP area are contained by the BMP, thus no BMP area load.

	Catchment 1	Catchment 2	Catchment 3	Catchment 4	
Watershed area cotributing to basin:	3.210	0.000	0.000	0.000	ac
Required Treatment Eff (**Nitrogen**):	38.682				%
Required Treatment Eff (**Phosphorus**):	38.682				%
Required retention depth over the watershed to meet required efficiency:	0.238	0.000	0.000	0.000	in
Required water quality retention volume:	0.064	0.000	0.000	0.000	ac-ft

RETENTION BASIN FOR MULTIPLE TREATMENT SYSTEMS (if there is a need for additional removal efficiencies in a series of BMPs):

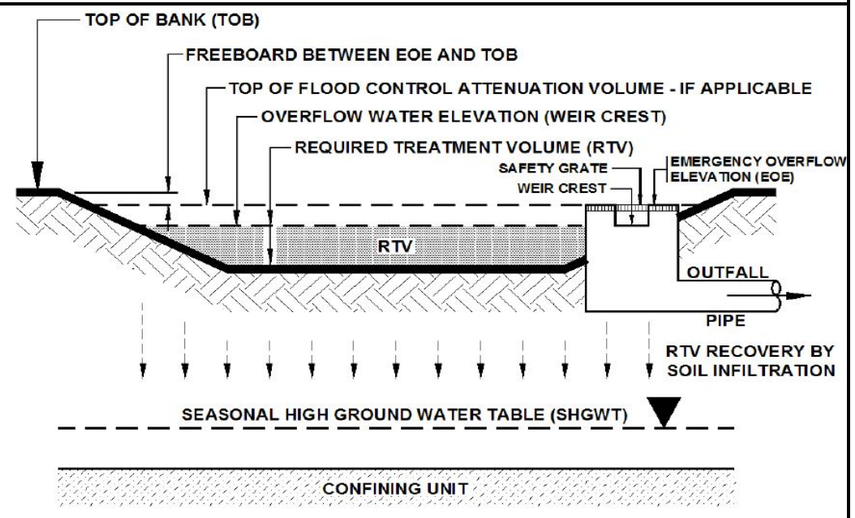
Retention volume based on retention depth and total area	0.185	0.000	0.000	0.000	ac-ft
Provided retention depth (inches over the watershed area):	0.486				in
Provided treatment efficiency (**Nitrogen**):	60.402	0.000	0.000	0.000	%
Provided treatment efficiency (**Phosphorus**):	60.402	0.000	0.000	0.000	%
Remaining treatment efficiency (**Nitrogen**):	0.000				%
Remaining treatment efficiency (**Phosphorus**):	0.000				%
Remaining retention depth needed:	0.000	0.000	0.000	0.000	in



NOTE FOR TREATMENT EFFICIENCY GRAPH:

The purpose of this graph is to help illustrate the treatment efficiency of the retention system as the function of retention depth **for a single BMP and in a single catchment**. The graph illustrates that there is a diminished return as the retention depth is increased. Thus evaluations of other alternatives in "treatment trains" and compensatory treatment should be considered.

HELP - EXAMPLE PROBLEM 3



TYPICAL CROSS SECTION OF A "DRY" RETENTION SYSTEM

View Media Mixes

	Catchment 1	Catchment 2	Catchment 3	Catchment 4
Use only donw flow media mix before water enters the ground, specify type				
Nitrogen mass reduction in groundwater discharge (%)				
Phosphorus mass reduction in groundwater discharge (%)				

Source of Graphic: draft **STORMWATER QUALITY APPLICANT'S HANDBOOK** dated March 2010, by the Department of Environmental Protection, available at: http://www.dep.state.fl.us/water/wetlands/erp/rules/stormwater, March 2010.

WET DETENTION: V 7.6

Blue Numbers =	Input data
Red Numbers =	Calculated or Carryover

WET DETENTION POND SERVING: Midway Road PD&E Study Basin B1

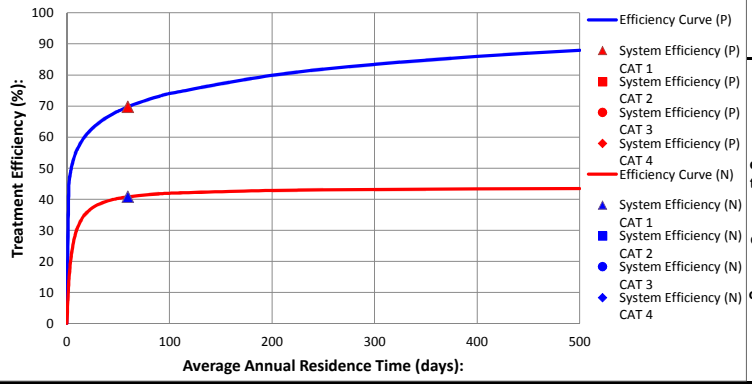
GO TO STORMWATER TREATMENT ANALYSIS

HELP - EXAMPLE PROBLEM 4

Loadings from BMP area are contained by the BMP, thus no BMP area load.	Catchment 1	Catchment 2	Catchment 3	Catchment 4	
Total pre-development catchment area:	4.580	0.000	0.000	0.000	ac
Total post-development catchment area:	3.210	0.000	0.000	0.000	ac
Average annual residence time (between 1 and 500 days):	59.60				days
Littoral Zone or other improvements used?	NO				
Littoral Zone or other improvement efficiency credit:	0.00				%
Total **Nitrogen** removal required:	38.682				%
Total **Phosphorus** removal required:	38.682				%
Total **Nitrogen** removal efficiency provided:	40.755				%
Total **Phosphorous** removal efficiency provided:	69.736				%
Is the wet detention sufficient:	YES				
Average annual runoff volume into the pond:	6.532				ac-ft/yr

To Achieve the Treatment Efficiency Shown in the Graph Below, the Following Must Hold

Minimum Pond Permanent Pool Volume:	1.067				ac-ft

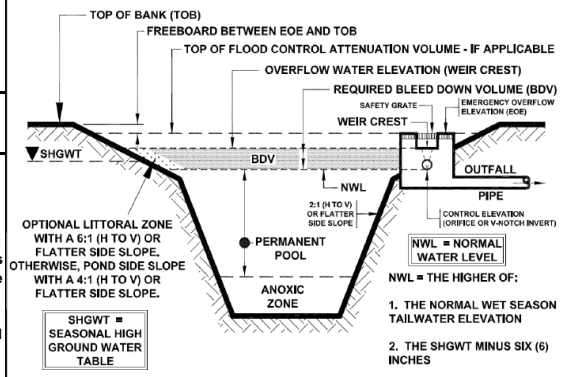


NOTE FOR TREATMENT EFFICIENCY GRAPH:

The purpose of the treatment efficiency graphs is to help illustrate the treatment efficiency of the wet detention system as the function of average annual residence time (and permanent pool volume). The graph illustrates that there is a point of diminished return as the permanent pool volume is substantially increased. The lines are produced from the conditions of catchment one, thus other catchments are shown with the data points.

REQUIRED REMAINING TREATMENT EFFICIENCIES OF TREATMENT SYSTEM IN SERIES WITH WET DETENTION. USE FOR SIZING OF TREATMENT SYSTEM IN SERIES WITH WET DETENTION.

	Catchment 1	Catchment 2	Catchment 3	Catchment 4	
Remaining treatment efficiency needed (**Nitrogen**):	0.000				%
Remaining treatment efficiency needed (**Phosphorus**):	0.000				%



TYPICAL X-SECTION OF A WET DETENTION SYSTEM

Source of Graphic: draft **STORMWATER QUALITY APPLICANT'S HANDBOOK** dated March 2010, by the Department of Environmental Protection, available at: http://www.dep.state.fl.us/water/wetlands/erp/rules/stormwater, March 2010

CATCHMENTS AND TREATMENT SUMMARY RESULTS V 7.6

CALCULATION METHODS:

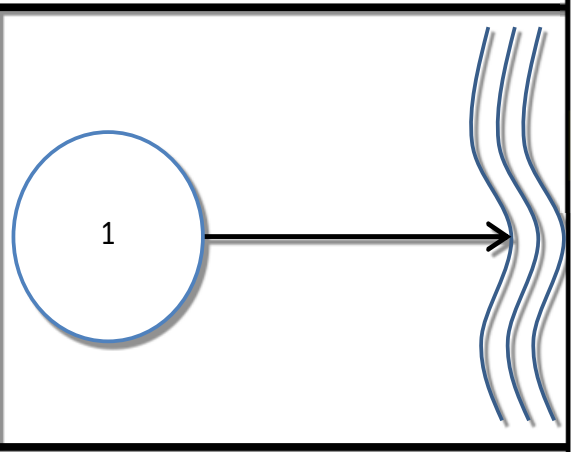
1. The effectiveness of each BMP in a single catchment is converted to an equivalent capture volume.
2. Certain BMP treatment train combinations have not been evaluated and in practice they are at this time not used, an example is a greenroof following a tree well.
3. Wet detention is last when used in a single catchment with other BMPs, except when followed by filtration

PROJECT TITLE	Midway Road PD&E Study Basin B1	Optional Identification		
	Catchment 1:	Catchment 2:	Catchment 3:	Catchment 4:
BMP Name	Retention Basin			
BMP Name	Wet Detention			
BMP Name				

Summary Performance of Entire Watershed

Catchment Configuration	A - Single Catchment		8/25/2016
Nitrogen Pre Load (kg/yr)	7.51		BMPTRAINS MODEL
Phosphorus Pre Load (kg/yr)	0.99		
Nitrogen Post Load (kg/yr)	12.24		
Phosphorus Post Load (kg/yr)	1.61		
Target Load Reduction (N) %	38.7		
Target Load Reduction (P) %	38.7		
Target Discharge Load, N (kg/yr)	7.51		
Target Discharge Load, P (kg/yr)	0.99		
Provided Overall Efficiency, N (%):	67.8		
Provided Overall Efficiency, P (%):	84.6		
Discharged Load, N (kg/yr & lb/yr):	3.94	8.68	
Discharged Load, P (kg/yr & lb/yr):	0.25	0.55	
Load Removed, N (kg/yr & lb/yr):	8.31	18.29	
Load Removed, P (kg/yr & lb/yr):	1.36	3.00	

Treatment Objectives or Target MET



Pond B-2

Inwood Consulting Engineers, Inc.
3000 Dovera Drive, Suite 200, Oviedo, FL 32765
(407) 971-8850 (phone)
(407) 971-8955 (fax)

Made by: ZKE
Checked by: REC

DATE: August 25, 2016
Job Number: DT4-006-01

PROJECT : **Midway Road (CR 712) from Glades Cutoff Road to Selvitz Road PD&E Study**
BASIN NAME : **Basin B**
POND NAME : **Pond B-2**

Station Limits: From: 210+25 To: 219+00 Roadway Length = 875 ft R/W Width = 160 ft

EXISTING CONDITION

Existing condition information from SFWMD Permit No. 56-01734-P

Roadway Area:

Description	Width	Quantity	Total Width
Travel Lane	12.0 ft	2	24 ft
Paved Shoulder	1.0 ft	2	2 ft
			0 ft
Sidewalk or Trail			0 ft
Curb&Gutter			0 ft
Shldr Gutter			0 ft
Barrier Wall			0 ft
		Total Impervious Width:	26 ft

Impervious Roadway Area: 0.52 ac
Pervious Roadway Area: 2.69 ac
Total Roadway Area: 3.21 ac

Pond Area: Pervious Pond Area = 2.15 ac

Total Area:
Impervious Area: **0.52 ac**
Pervious Area: **4.85 ac**
Total Area: **5.37 ac**

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Impervious areas; Streets & roads	D	98	0.52 ac	51.2
Open Space (lawns, parks, golf courses, cemeteries,	D	80	4.85 ac	387.7
		Total:	5.37 ac	438.8

CN = Total CN*Area / Total Area = **81.8**

Runoff:

			SFWMD & St. Lucie County (25yr/72hr)	Storm Sewer Design (3yr/24hr)
Soil Capacity (S) =	$\frac{1000}{CN} - 10$ =	**2.23 in**	Precipitation (P) =	9.50 in	6.50 in
Runoff (Q) =	$\frac{(P - 0.2S)^2}{(P + 0.8S)}$		Runoff (Q) =	**7.26 in**	**4.42 in**

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POND NAME : **Pond B-2**

Station Limits: From: 210+25 To: 219+00 Roadway Length = 875 ft R/W Width = 160 ft

PROPOSED CONDITION

Roadway Area:

Description	Width	Quantity	Total Width
Travel Lane	11.0 ft	4	44 ft
Paved Shoulder	7.0 ft	2	14 ft
Imperv. Median			0 ft
Sidewalk or Trail	18.0 ft	1	18 ft
Curb&Gutter	2.0 ft	4	8 ft
Shldr Gutter			0 ft
Miscellaneous			0 ft
		Total Impervious Width:	84 ft

Impervious Roadway Area: 1.69 ac
Pervious Roadway Area: 1.53 ac
Total Roadway Area: 3.21 ac

Pond Area:

Pervious Pond Area : 1.32 ac
Water Surface Area: 0.84 ac Wet Pond
Total Pond Area: 2.15 ac

Total Area:

Impervious Area: **1.69 ac**
Pervious Area: **2.84 ac**
Water Surface Area: **0.84 ac**
Total Area: **5.37 ac**

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Impervious areas; Streets & roads	D	98	1.69 ac	165.4
Proposed Ponds (Water Surface)	D	100	0.84 ac	83.9
Open Space (lawns, parks, golf courses, cemeteries, etc.) Good condition (grass cover > 75%)	D	80	2.84 ac	227.3
				0.0
			Total:	5.37 ac	476.6

CN = Total CN*Area / Total Area = **88.8**

Runoff:

		SFWMD & St. Lucie County (25yr/72hr)	Storm Sewer Design (3yr/24hr)
Soil Capacity (S) = $\frac{1000}{CN} - 10$ =	1.26 in	Precipitation (P) =	9.50 in	6.50 in
Runoff (Q) = $\frac{(P - 0.2S)^2}{(P + 0.8S)}$		Runoff (Q) =	**8.14 in**	**5.20 in**

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PROJECT : **Midway Road (CR 712) from Glades Cutoff Road to Selvitz Road PD&E Study**
BASIN NAME : **Basin B**
POND NAME : **Pond B-2**

POND SIZING

Required Treatment Volume (TV)

Selection criteria

Permitting Agency	**SFWMD**
StormW.Mgmt.	**Wet Detention**
Online/Offline	**Online**
OFW	**Yes**
Open/Closed Basin	**Open**

Wet Detention	**2.50 in**	x Impervious Areas =	0.35 ac-ft
	1.00 in	x Total Basin Area =	0.45 ac-ft

Treatment V_{req} = Largest of Trt. Vol. =	**0.45 ac-ft**
OFW Requirement, provide 50% more TV =	**0.67 ac-ft**
Required Wet Detention TV =	**0.67 ac-ft**

Required Dry Pre-Treatment	
0.5 in x Total Basin Area =	**0.22 ac-ft**
Dry Pre-Treatment is allocated in Pond 1 for this basin.	

Required Attenuation Volume:

Total Runoff (ac-ft)

	SFWMD	**Storm Sewer Design**
Q_{pre} =	3.25 ac-ft	1.98 ac-ft
Q_{post} =	3.64 ac-ft	2.32 ac-ft
ΔQ =	**0.39 ac-ft**	**0.35 ac-ft**

Attenuation V_{req} = 0.39 ac-ft (use largest value)

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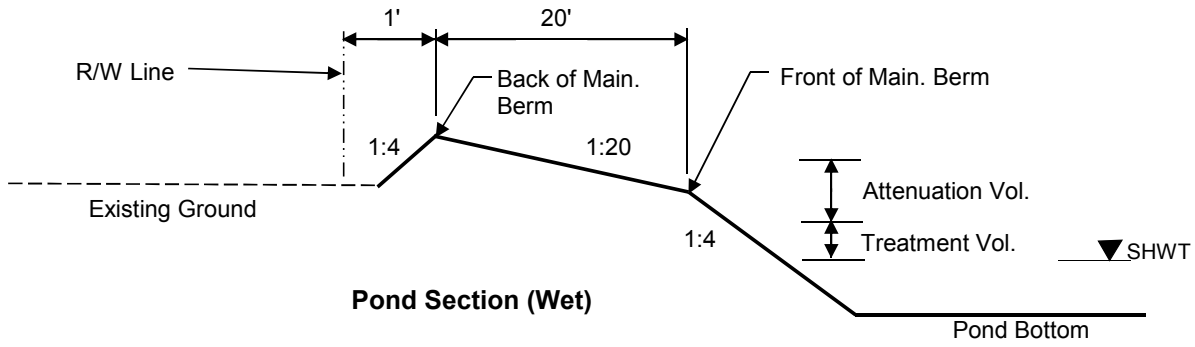
PROJECT : **Midway Road (CR 712) from Glades Cutoff Road to Selvitz Road PD&E Study**
BASIN NAME : **Basin B**
POND NAME : **Pond B-2**

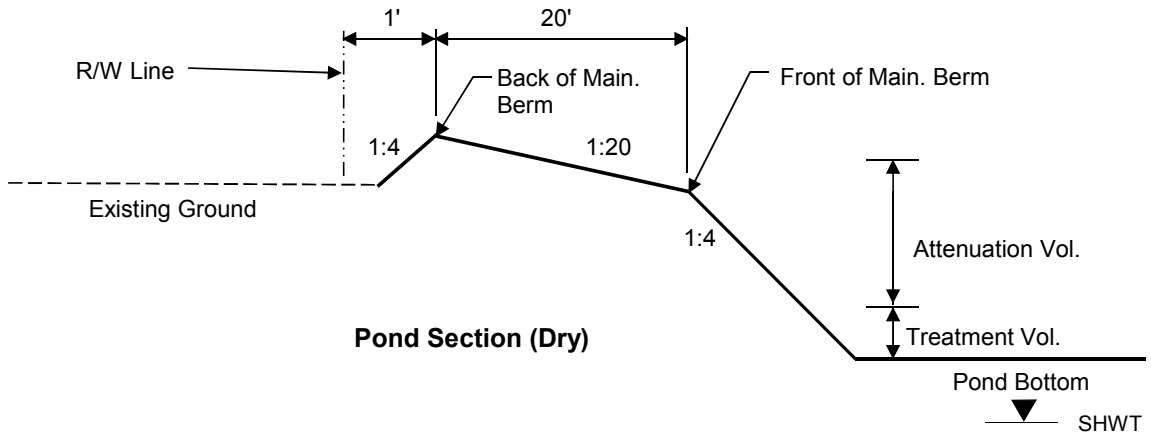
Maintenance Area Width =	20.0 ft	@ 1:20	Existing Ground Elevation =	20.00
Pond Tie-In Width =	1.0 ft	@ 1:4	Normal Water Elevation =	17.00
Maximum Storage Depth (**SD**) =	2.25 ft	with 1.0 ft freeboard	Lowest EOP Elevation =	23.00

Hydraulic Grade Line (HGL) check

HGL Slope =	0.100%	Use 0.05% for very flat terrain to 0.1% for flat terrain
Distance from Pond to Lowest EOP =	750 ft	
Estimated Energy Losses =	0.8 ft	
HGL Clearance =	1.0 ft	Use 1.0 foot as a standard HGL clearance (no junction losses)
Estimated Storm Sewer Tailwater EL =	21.3 ft	



Pond Section (Wet)



Pond Section (Dry)

Inwood Consulting Engineers, Inc.
3000 Dovera Drive, Suite 200, Oviedo, FL 32765
(407) 971-8850 (phone)
(407) 971-8955 (fax)

Made by: ZKE
Checked by: REC

DATE: August 25, 2016
Job Number: DT4-006-01

PROJECT : **Midway Road (CR 712) from Glades Cutoff Road to Selvitz Road PD&E Study**
BASIN NAME : **Basin B**
POND NAME : **Pond B-2**

Pond Stage / Storage Calculations

ELEVATION	DESCRIPTION	AREA	DIMENSIONS		STORAGE
			LENGTH	WIDTH	
20.00	Pond R/W	1.60 ac	466.0 ft	150.0 ft	
20.25	Back of Main. Berm	1.58 ac	464.0 ft	148.0 ft	3.43 ac-ft
19.75		1.30 ac	444.0 ft	128.0 ft	2.71 ac-ft
19.25	Front of Main. Berm	1.05 ac	424.0 ft	108.0 ft	2.12 ac-ft
18.25	Provided Treat.Vol.+Att.Vol	0.96 ac	416.0 ft	100.0 ft	1.12 ac-ft
18.19	Req'd Treat.Vol+Att. Vol	0.95 ac	415.5 ft	99.5 ft	1.06 ac-ft
18.14	Estimated Storm Sewer TW	0.94 ac	415.1 ft	99.1 ft	1.02 ac-ft
17.77	Top of Treatment Vol.	0.91 ac	412.2 ft	96.2 ft	0.67 ac-ft
17.00	Normal Water Level	0.84 ac	406.0 ft	90.0 ft	0.00 ac-ft
15.00		0.66 ac	390.0 ft	74.0 ft	
7.00	Pond Bottom	0.08 ac	366.0 ft	10.0 ft	

Required Treatment+Attenuation Vol.= 1.06 ac-ft
Required Treatment+Attenuation Stage= 18.19 ft

Provided Treatment+Attenuation Vol.= 1.12 ac-ft
Provided Treatment+Attenuation Stage= 18.25 ft

Estimated Treat. Vol.+Storm Sewer Att.= 1.02 ac-ft
Estimated Storm Sewer TW EL.= 18.14 ft

HGL requirements met

Additional 20% = 1.93 ac

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Made by: ZKE
Checked by: REC

DATE: August 23, 2016
Job Number: DT4-006-01

PROJECT : **Midway Road (CR 712) from Glades Cutoff Road to Selvitz Road PD&E Study**
BASIN NAME : **Basin B**
POND NAME : **Pond B-2**

PERMANENT POOL VOLUME CALCULATIONS

Basin Characteristics **Meterological Zone: 2**

Land Use	Area (ac)	CN	Product
Roadway Paved Area	1.69	98.00	165.62
Roadway Pervious Area	1.53	80.00	122.40
Pond Pervious Area	1.31	80.00	104.80
Pond Area at NWL	0.84	100.00	84.00
Total	**5.37**		476.82

%DCIA = 47.11 %
Non-DCIA CN = 80.00
Composite C = **0.65**
Annual Rainfall (P) = **55.00** **in**

Min. Permanent Pool Vol. = Area x Composite C x P x 14 / (365 x 12) = **0.61** **ac-ft**

Stage Storage Calc. for Permanent Pool

ELEV. (ft)		AREA (ac)	AVG AREA (ac)	Delta D (ft)	Delta storage (ac-ft)	Sum Storage (ac-ft)
17.00	Normal Water Level	0.84				4.46
			0.75	2.00	1.50	
15.00		0.66				2.96
			0.37	8.00	2.96	
7.00	Pond Bottom	0.08				0.00

Permanent Pool Volume Provided = **4.46** **ac-ft**
Resident Time Provided = Perm. Pool Vol. Provided x 365 x 12 / (Area x C x P) **101.7** **Days**

GENERAL SITE INFORMATION: V 7.6

GO TO INTRODUCTION PAGE

Blue Numbers =	Input data
Red Numbers =	Calculated or Carryover

HELP

Select the appropriate Meteorological Zone, input the appropriate Mean Annual Rainfall amount and select the type of analysis

NAME OF PROJECT

Midway Road PD&E Study Basin B2

VIEW ZONE MAP

Meteorological Zone (Please use zone map): CLICK ON CELL BELOW TO SELECT — Zone 2

Mean Annual Rainfall (Please use rainfall map): 55.00 Inches

VIEW MEAN ANNUAL RAINFALL MAP

Type of analysis: CLICK ON CELL BELOW TO SELECT — Net improvement

Treatment efficiency (N, P) (leave empty if net improvement or BMP analysis is used): % %

GO TO WATERSHED CHARACTERISTICS

Select the STORMWATER TREATMENT ANALYSIS Button below to begin analyzing the effectiveness of Best Management Practices.

Model documentation and example problems.

STORMWATER TREATMENT ANALYSIS

Systems available for analysis:
Retention Basin with option for calculating effluent concentration
Wet Detention
Exfiltration Trench
Pervious Pavement
Stormwater Harvesting
Biofiltration
Greenroof
Rainwater Harvesting
Managed Aquatic Plants Detention
Vegetated Natural Buffer
Vegetated Filter Strip
Swale
Rain Garden
Tree Well
Lined reuse pond
User Defined BMP

There is a user's manual for the BMPTRAINS model. It can be downloaded from www.stormwater.ucf.edu. The results from the example problems shown in the manual however may not reflect current model results due to ongoing updates of the model.

RESET INPUT FOR STORMWATER TREATMENT ANALYSIS

METHODOLOGY FOR CALCULATING REQUIRED TREATMENT EFFICIENCY

METHODOLOGY FOR RETENTION SYSTEMS

METHODOLOGY FOR WET DETENTION SYSTEMS

METHODOLOGY FOR GREENROOF SYSTEMS

METHODOLOGY FOR WATER HARVESTING SYSTEMS

WATERSHED CHARACTERISTICS V 7.6

GO TO STORMWATER TREATMENT ANALYSIS

Blue Numbers = Input data
Red Numbers = Calculated

HELP - LAND USES/EMC

SELECT CATCHMENT CONFIGURATION

CLICK ON CELL BELOW TO SELECT CONFIGURATION
A - Single Catchment

VIEW CATCHMENT CONFIGURATION

CATCHMENT NO.1 CHARACTERISTICS:

VIEW AVERAGE ANNUAL RUNOFF "C" Factor

VIEW EMC & FLUCCS

	CLICK ON CELL BELOW TO SELECT			
Pre-development land use: with default EMCs	Highway: TN=1.520 TP=0.200	Total pre-development catchment area:	5.36	AC
Post-development land use: with default EMCs	Highway: TN=1.520 TP=0.200	Total post-development catchment or BMP analysis area:	5.36	AC
		Pre-development Non DCIA CN:	80.00	
		Pre-development DCIA percentage:	9.74	%
		Post-development Non DCIA CN:	80.00	
		Post-development DCIA percentage:	47.11	%
		Estimated BMPArea (No loading from this area)	2.15	AC

OVERWRITE DEFAULT CONCENTRATIONS USING:

	PRE:	POST:
EMC(N):	mg/L	mg/L
EMC(P):	mg/L	mg/L

USE DEFAULT CONCENTRATIONS

Average annual pre runoff volume:	4.402	ac-ft/year
Average annual post runoff volume (note no BMP area):	6.470	ac-ft/year
Pre-development Annual Mass Loading - **Nitrogen:**	8.252	kg/year
Pre-development Annual Mass Loading - **Phosphorus:**	1.086	kg/year
Post-development Annual Mass Loading - **Nitrogen:**	12.129	kg/year
Post-development Annual Mass Loading - **Phosphorus:**	1.596	kg/year

CATCHMENT NO.2 CHARACTERISTICS:

	CLICK ON CELL BELOW TO SELECT			
Pre-development land use: with default EMCs		Total pre-development catchment area:		AC
Post-development land use: with default EMCs		Total post-development catchment or BMP analysis area:		AC
		Pre-development Non DCIA CN:		
		Pre-development DCIA percentage:		%
		Post-development Non DCIA CN:		
		Post-development DCIA percentage:		%
		Estimated BMPArea (No loading from this area)		AC

OVERWRITE DEFAULT CONCENTRATIONS:

	PRE:	POST:
EMC(N):	mg/L	mg/L
EMC(P):	mg/L	mg/L

USE DEFAULT CONCENTRATIONS

Average annual pre runoff volume:		ac-ft/year
Average annual post runoff volume (note no BMP area):		ac-ft/year
Pre-development Annual Mass Loading - **Nitrogen:**		kg/year
Pre-development Annual Mass Loading - **Phosphorus:**		kg/year
Post-development Annual Mass Loading - **Nitrogen:**		kg/year
Post-development Annual Mass Loading - **Phosphorus:**		kg/year

CATCHMENT NO.3 CHARACTERISTICS:

	CLICK ON CELL BELOW TO SELECT			
Pre-development land use: with default EMCs		Total pre-development catchment area:		AC
Post-development land use: with default EMCs		Total post-development catchment or BMP analysis area:		AC
		Pre-development Non DCIA CN:		
		Pre-development DCIA percentage:		%
		Post-development Non DCIA CN:		
		Post-development DCIA percentage:		%
		Estimated BMPArea (no loading from this area)		AC

OVERWRITE DEFAULT CONCENTRATIONS:

	PRE:	POST:
EMC(N):	mg/L	mg/L
EMC(P):	mg/L	mg/L

USE DEFAULT CONCENTRATIONS

Average annual pre runoff volume:		ac-ft/year
Average annual post runoff volume (note no BMP area):		ac-ft/year
Pre-development Annual Mass Loading - **Nitrogen:**		kg/year
Pre-development Annual Mass Loading - **Phosphorus:**		kg/year
Post-development Annual Mass Loading - **Nitrogen:**		kg/year
Post-development Annual Mass Loading - **Phosphorus:**		kg/year

CATCHMENT NO.4 CHARACTERISTICS:

	CLICK ON CELL BELOW TO SELECT			
Pre-development land use: with default EMCs		Total pre-development catchment area:		AC
Post-development land use: with default EMCs		Total post-development catchment or BMP analysis area:		AC
		Pre-development Non DCIA CN:		
		Pre-development DCIA percentage:		%
		Post-development Non DCIA CN:		
		Post-development DCIA percentage:		%
		Estimated BMPArea (no loading from this area)		AC

OVERWRITE DEFAULT CONCENTRATIONS:

	PRE:	POST:
EMC(N):	mg/L	mg/L
EMC(P):	mg/L	mg/L

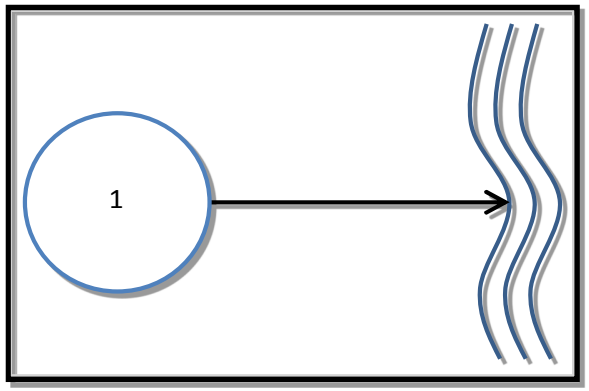
USE DEFAULT CONCENTRATIONS

Average annual pre runoff volume:		ac-ft/year
Average annual post runoff volume (note no BMP area):		ac-ft/year
Pre-development Annual Mass Loading - **Nitrogen:**		kg/year
Pre-development Annual Mass Loading - **Phosphorus:**		kg/year
Post-development Annual Mass Loading - **Nitrogen:**		kg/year
Post-development Annual Mass Loading - **Phosphorus:**		kg/year

STORMWATER TREATMENT ANALYSIS:	V 7.6	GO TO GENERAL SITE INFORMATION PAGE	Blue Numbers =	Input data
			Red Numbers =	Calculated

If not done, specify pre- and post-development watershed characteristics.

GO TO WATERSHED CHARACTERISTICS



Total Required Treatment Efficiency:

Required Treatment Eff (**Nitrogen**):	31.966	%
Required Treatment Eff (**Phosphorus**):	31.966	%

Select one of the BMPs below to analyze efficiency or review the summary data.

RETENTION BASIN	WET DETENTION	EXFILTRATION TRENCH	RAIN GARDEN	SWALE	USER DEFINED BMP
PERVIOUS PAVEMENT	STORMWATER HARVESTING	FILTRATION including Up-Flow Filters	LINED REUSE POND & UNDERDRAIN INPUT		
GREENROOF	RAINWATER HARVESTING	MANAGED AQUATIC PLANTS			
VEGETATED NATURAL BUFFER	VEGETATED FILTER STRIP	TREE WELL			

NOTE !!!: All individual system must be sized prior to being analyzed in conjunction with other systems. Please read instructions in the CATCHMENT AND TREATMENT SUMMARY RESULTS tab for more information.

CATCHMENT AND TREATMENT SUMMARY RESULTS

WET DETENTION: V 7.6

Blue Numbers =	Input data
Red Numbers =	Calculated or Carryover

WET DETENTION POND SERVING: Midway Road PD&E Study Basin B2

GO TO STORMWATER TREATMENT ANALYSIS

HELP - EXAMPLE PROBLEM 4

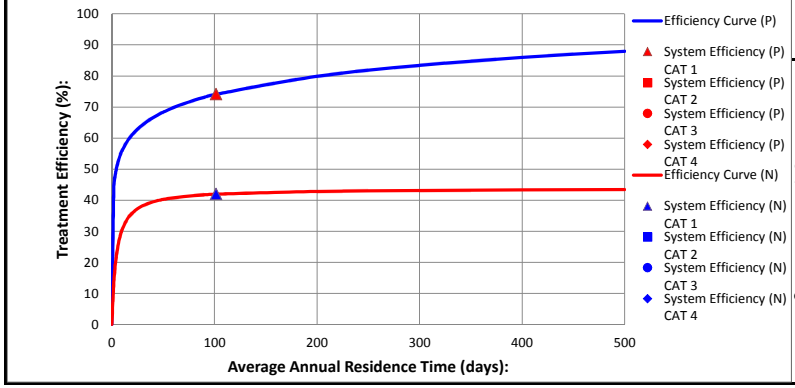
Loadings from BMP area are contained by the BMP, thus no BMP area load.	Catchment 1	Catchment 2	Catchment 3	Catchment 4	
Total pre-development catchment area:	5.360	0.000	0.000	0.000	ac
Total post-development catchment area:	3.210	0.000	0.000	0.000	ac
Average annual residence time (between 1 and 500 days):	101.70				days
Littoral Zone or other improvements used?	NO				
Littoral Zone or other improvement efficiency credit:	0.00				%
Total **Nitrogen** removal required:	31.966				%
Total **Phosphorus** removal required:	31.966				%
Total **Nitrogen** removal efficiency provided:	41.944				%
Total **Phosphorous** removal efficiency provided:	74.132				%
Is the wet detention sufficient:	YES				
Average annual runoff volume into the pond:	6.470				ac-ft/yr

To Achieve the Treatment Efficiency Shown in the Graph Below, the Following Must Hold

Minimum Pond Permanent Pool Volume:	1.803				ac-ft

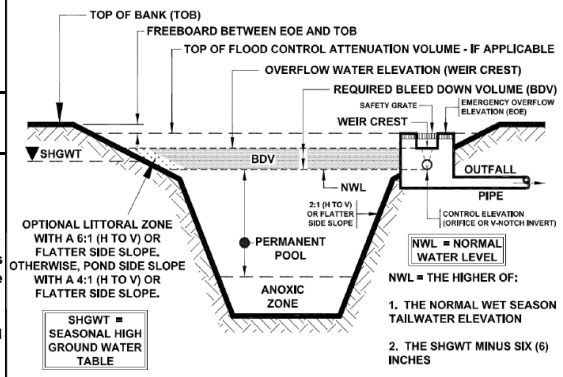
REQUIRED REMAINING TREATMENT EFFICIENCIES OF TREATMENT SYSTEM IN SERIES WITH WET DETENTION. USE FOR SIZING OF TREATMENT SYSTEM IN SERIES WITH WET DETENTION.

	Catchment 1	Catchment 2	Catchment 3	Catchment 4	
Remaining treatment efficiency needed (**Nitrogen**):	0.000				%
Remaining treatment efficiency needed (**Phosphorus**):	0.000				%



NOTE FOR TREATMENT EFFICIENCY GRAPH:

The purpose of the treatment efficiency graphs is to help illustrate the treatment efficiency of the wet detention system as the function of average annual residence time (and permanent pool volume). The graph illustrates that there is a point of diminished return as the permanent pool volume is substantially increased. The lines are produced from the conditions of catchment one, thus other catchments are shown with the data points.



TYPICAL X-SECTION OF A WET DETENTION SYSTEM

Source of Graphic: draft **STORMWATER QUALITY APPLICANT'S HANDBOOK** dated March 2010, by the Department of Environmental Protection, available at: http://www.dep.state.fl.us/water/wetlands/erp/rules/stormwater, March 2010

CATCHMENTS AND TREATMENT SUMMARY RESULTS V 7.6

CALCULATION METHODS:

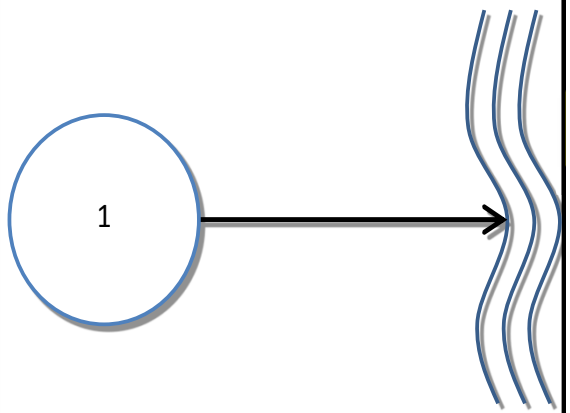
1. The effectiveness of each BMP in a single catchment is converted to an equivalent capture volume.
2. Certain BMP treatment train combinations have not been evaluated and in practice they are at this time not used, an example is a greenroof following a tree well.
3. Wet detention is last when used in a single catchment with other BMPs, except when followed by filtration

PROJECT TITLE	Midway Road PD&E Study Basin B2	Optional Identification		
	Catchment 1:	Catchment 2:	Catchment 3:	Catchment 4:
BMP Name	Wet Detention			
BMP Name				
BMP Name				

Summary Performance of Entire Watershed

Catchment Configuration	A - Single Catchment		8/23/2016
Nitrogen Pre Load (kg/yr)	8.25		BMPTRAINS MODEL
Phosphorus Pre Load (kg/yr)	1.09		
Nitrogen Post Load (kg/yr)	12.13		
Phosphorus Post Load (kg/yr)	1.60		
Target Load Reduction (N) %	32.0		
Target Load Reduction (P) %	32.0		
Target Discharge Load, N (kg/yr)	8.25		
Target Discharge Load, P (kg/yr)	1.09		
Provided Overall Efficiency, N (%):	41.9		
Provided Overall Efficiency, P (%):	74.1		
Discharged Load, N (kg/yr & lb/yr):	7.04	15.51	
Discharged Load, P (kg/yr & lb/yr):	0.41	0.91	
Load Removed, N (kg/yr & lb/yr):	5.09	11.21	
Load Removed, P (kg/yr & lb/yr):	1.18	2.61	

Treatment Objectives or Target MET



Exfiltration Trench

PROJECT TITLE:	Midway Road PD&E			
PROJECT NUMBER:	DT4-006-01			**DATE**
BASIN DESIGNATION:	Basin B	**MADE BY:**	ZKE	23-Mar-16
BASIN ANALYSIS (PRE/POST):	PRE	**CHECKED BY:**	REC	23-Mar-16

BASIN RUNOFF CURVE NUMBER WORKSHEET

LAND-USE DESCRIPTION	SOIL NAME	SOIL GROUP	CN	AREA (ac)	PRODUCT
Impervious areas; Streets & Roads	Nettles and Oldsmar Sands	D	98	0.52	50.96
Open Space (lawns, parks, golf courses)	Nettles and Oldsmar Sands	D	80	2.69	215.20
			TOTALS	**3.21**	**266.16**

COMPOSITE CN	**82.92**

ESTIMATE OF RUNOFF VOLUME

PROCEDURE TO DETERMINE RUNOFF VOLUME IS BASED ON THE SCS EQUATION AND IS AS FOLLOWS:

1) DETERMINE SOIL STORAGE - S ----------> S = (1000 / CN) - 10 (inches)

2) DETERMINE RUNOFF - R ----------> R = (P - 0.2*S)^2 / (P + 0.8*S) (inches)

P = rainfall in inches

3) DETERMINE RUNOFF VOLUME - V(R) ----------> V(R) = (R / 12)*BASIN AREA (acres-feet)

CALCULATION TABLE

Agency	Design Storm Frequency	P (in)	S (in)	R (in)	V(R) (ac-ft)
SFWMD	25 yr / 72 hr	9.50	2.06	7.41	**1.98**
NSLRWCD	10 yr / 72 hr	8.25	2.06	6.21	**1.66**
St. Lucie County	25 yr / 72 hr	9.50	2.06	7.41	**1.98**

PROJECT TITLE:	Midway Road PD&E			
PROJECT NUMBER:	DT4-006-01			**DATE**
BASIN DESIGNATION:	Basin B	**MADE BY:**	ZKE	23-Mar-16
BASIN ANALYSIS (PRE/POST):	POST	**CHECKED BY:**	REC	23-Mar-16

BASIN RUNOFF CURVE NUMBER WORKSHEET

LAND-USE DESCRIPTION	SOIL NAME	SOIL GROUP	CN	AREA (ac)	PRODUCT
Impervious areas; Streets & Roads	Nettles and Oldsmar Sands	D	98	1.69	165.13
Open Space (lawns, parks, golf courses)	Nettles and Oldsmar Sands	D	84	1.52	127.68
			TOTALS	**3.21**	**292.81**

COMPOSITE CN	**91.36**

ESTIMATE OF RUNOFF VOLUME

PROCEDURE TO DETERMINE RUNOFF VOLUME IS BASED ON THE SCS EQUATION AND IS AS FOLLOWS:

1) DETERMINE SOIL STORAGE - S ----------> S = (1000 / CN) - 10 (inches)

2) DETERMINE RUNOFF - R ----------> R = (P - 0.2*S)^2 / (P + 0.8*S) (inches)

P = rainfall in inches

3) DETERMINE RUNOFF VOLUME - V(R) ----------> V(R) = (R / 12)*BASIN AREA (acres-feet)

CALCULATION TABLE

Agency	Design Storm Frequency	P (in)	S (in)	R (in)	V(R) (ac-ft)
SFWMD	25 yr / 72 hr	9.50	0.95	8.45	**2.26**
NSLRWCD	10 yr / 72 hr	8.25	0.95	7.21	**1.93**
St. Lucie County	25 yr / 72 hr	9.50	0.95	8.45	**2.26**

MADE BY:	ZKE	DATE:	03/23/16	JOB NO.	DT4-006-01
CHECKED BY:	REC	DATE:		SHEET NO.	
CALCULATIONS FOR:	Midway Road PD&E			BASIN:	Basin B

Water Quality

Total Basin Area =	3.21	ac
Paved Area =	1.69	ac
Pervious Area =	1.52	ac

Treatment Criteria

A.	0.5	" Over Total Basin Area =	0.13	Ac-Ft
B.	1.25	" Over Paved Area =	0.18	Ac-Ft
		PAV =	**0.18**	Ac-Ft

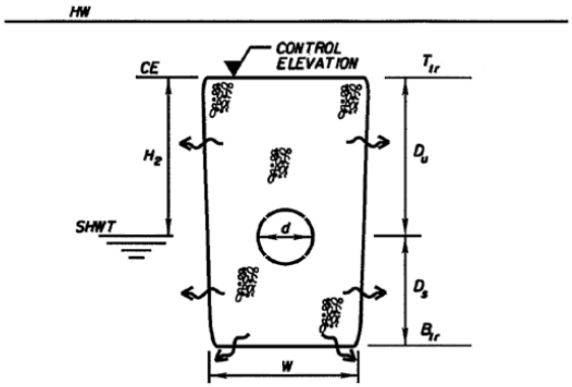
Note: For O.F.W., at least an additional 50% of the PAV for off-line storage must be provided

		PAV for OFW =	**0.26** Ac-Ft
Factor of Safety =	2	**Req'd PAV =**	**0.53** Ac-Ft
		Required Attenuation Volume =	**0.28** Ac-Ft

Seasonal High Water Table (SHWT) =	17.89	ft
Tail Water Elevation (TW) =	17.89	ft
Head Water (HW) =	22	ft
Saturated Hydraulic Conductivity (K) =	0.00025	ft^3/sec / ft^2-ft of head

Exfiltration Trench Characteristics

Outfall Control Elevation (CE) =	21	ft
Trench Bottom Width (W) =	8	ft
Trench Bottom Elevation (B_{el}) =	16	ft
Trench Top Elevation (T_{el}) =	21	ft
Perforated Pipe Diameter (D) =	24	in
Perforated Pipe Invert (P_{inv}) =	18	ft
Length of Trench (L) =	490	ft



Calculations

Effective Head (H_2) =	CE - SHWT =	3.11	ft
Trench Height (H) =	T_{el} - B_{el} =	5	ft
Unsaturated Depth of Trench (D_u) =	T_{el} - SHWT =	3.11	ft
Saturated Depth of Trench (D_s) =	SHWT - B_{el} =	1.89	ft

If $D_u > D_s$ or $W < 2H$

Treatment Volume Provided (V) = $L(K(H_2W+2H_2D_u-D_u^2+2H_2D_s)+0.000139WD_{u)}$ = 0.61 Ac-Ft

If $D_u < D_s$ or $W > 2H$

Treatment Volume Provided (V) = $L(K(2H_2D_u-D_u^2+2H_2D_s)+0.000139WD_{u)}$ = Criteria Not Met

Note: If both criteria are met then use most conservative:

Treatment Volume (TV) = 0.61 Ac-Ft

Attenuation Volume (AV) = 0.28 Ac-Ft = (CE-SHWT) * W * L

GENERAL SITE INFORMATION: V 7.6

GO TO INTRODUCTION PAGE

Blue Numbers = Input data
Red Numbers = Calculated or Carryover

HELP

Select the appropriate Meteorological Zone, input the appropriate Mean Annual Rainfall amount and select the type of analysis

NAME OF PROJECT

Midway Road PD&E Study Basin B

VIEW ZONE MAP

Meteorological Zone (Please use zone map): CLICK ON CELL BELOW TO SELECT — Zone 2

Mean Annual Rainfall (Please use rainfall map): 55.00 Inches

VIEW MEAN ANNUAL RAINFALL MAP

Type of analysis: CLICK ON CELL BELOW TO SELECT — Net improvement

Treatment efficiency (N, P) (leave empty if net improvement or BMP analysis is used): % %

GO TO WATERSHED CHARACTERISTICS

Select the STORMWATER TREATMENT ANALYSIS Button below to begin analyzing the effectiveness of Best Management Practices.

Model documentation and example problems.

STORMWATER TREATMENT ANALYSIS

Systems available for analysis:
Retention Basin with option for calculating effluent concentration
Wet Detention
Exfiltration Trench
Pervious Pavement
Stormwater Harvesting
Biofiltration
Greenroof
Rainwater Harvesting
Managed Aquatic Plants Detention
Vegetated Natural Buffer
Vegetated Filter Strip
Swale
Rain Garden
Tree Well
Lined reuse pond
User Defined BMP

There is a user's manual for the BMPTRAINS model. It can be downloaded from www.stormwater.ucf.edu. The results from the example problems shown in the manual however may not reflect current model results due to ongoing updates of the model.

RESET INPUT FOR STORMWATER TREATMENT ANALYSIS

METHODOLOGY FOR CALCULATING REQUIRED TREATMENT EFFICIENCY

METHODOLOGY FOR RETENTION SYSTEMS

METHODOLOGY FOR WET DETENTION SYSTEMS

METHODOLOGY FOR GREENROOF SYSTEMS

METHODOLOGY FOR WATER HARVESTING SYSTEMS

WATERSHED CHARACTERISTICS V 7.6

GO TO STORMWATER TREATMENT ANALYSIS

Blue Numbers = Input data
Red Numbers = Calculated

HELP - LAND USES/EMC

SELECT CATCHMENT CONFIGURATION

CLICK ON CELL BELOW TO SELECT CONFIGURATION
A - Single Catchment

VIEW CATCHMENT CONFIGURATION

CATCHMENT NO.1 CHARACTERISTICS:

VIEW AVERAGE ANNUAL RUNOFF "C" Factor

VIEW EMC & FLUCCS

Pre-development land use: (with default EMCs)	CLICK ON CELL BELOW TO SELECT: Highway: TN=1.520 TP=0.200	
Post-development land use: (with default EMCs)	CLICK ON CELL BELOW TO SELECT: Highway: TN=1.520 TP=0.200	
Total pre-development catchment area:	3.21	AC
Total post-development catchment or BMP analysis area:	3.21	AC
Pre-development Non DCIA CN:	80.00	
Pre-development DCIA percentage:	16.20	%
Post-development Non DCIA CN:	80.00	
Post-development DCIA percentage:	52.57	%
Estimated BMPArea (No loading from this area)	0.00	AC

OVERWRITE DEFAULT CONCENTRATIONS USING:

	PRE:		POST:	
EMC(N):		mg/L		mg/L
EMC(P):		mg/L		mg/L

USE DEFAULT CONCENTRATIONS

Average annual pre runoff volume:	3.301	ac-ft/year
Average annual post runoff volume (note no BMP area):	7.032	ac-ft/year
Pre-development Annual Mass Loading - **Nitrogen:**	6.189	kg/year
Pre-development Annual Mass Loading - **Phosphorus:**	0.814	kg/year
Post-development Annual Mass Loading - **Nitrogen:**	13.183	kg/year
Post-development Annual Mass Loading - **Phosphorus:**	1.735	kg/year

CATCHMENT NO.2 CHARACTERISTICS:

Pre-development land use: (with default EMCs)	CLICK ON CELL BELOW TO SELECT	
Post-development land use: (with default EMCs)	CLICK ON CELL BELOW TO SELECT	
Total pre-development catchment area:		AC
Total post-development catchment or BMP analysis area:		AC
Pre-development Non DCIA CN:		
Pre-development DCIA percentage:		%
Post-development Non DCIA CN:		
Post-development DCIA percentage:		%
Estimated BMPArea (No loading from this area)		AC

OVERWRITE DEFAULT CONCENTRATIONS:

	PRE:		POST:	
EMC(N):		mg/L		mg/L
EMC(P):		mg/L		mg/L

USE DEFAULT CONCENTRATIONS

Average annual pre runoff volume:		ac-ft/year
Average annual post runoff volume (note no BMP area):		ac-ft/year
Pre-development Annual Mass Loading - **Nitrogen:**		kg/year
Pre-development Annual Mass Loading - **Phosphorus:**		kg/year
Post-development Annual Mass Loading - **Nitrogen:**		kg/year
Post-development Annual Mass Loading - **Phosphorus:**		kg/year

CATCHMENT NO.3 CHARACTERISTICS:

Pre-development land use: (with default EMCs)	CLICK ON CELL BELOW TO SELECT	
Post-development land use: (with default EMCs)	CLICK ON CELL BELOW TO SELECT	
Total pre-development catchment area:		AC
Total post-development catchment or BMP analysis area:		AC
Pre-development Non DCIA CN:		
Pre-development DCIA percentage:		%
Post-development Non DCIA CN:		
Post-development DCIA percentage:		%
Estimated BMPArea (no loading from this area)		AC

OVERWRITE DEFAULT CONCENTRATIONS:

	PRE:		POST:	
EMC(N):		mg/L		mg/L
EMC(P):		mg/L		mg/L

USE DEFAULT CONCENTRATIONS

Average annual pre runoff volume:		ac-ft/year
Average annual post runoff volume (note no BMP area):		ac-ft/year
Pre-development Annual Mass Loading - **Nitrogen:**		kg/year
Pre-development Annual Mass Loading - **Phosphorus:**		kg/year
Post-development Annual Mass Loading - **Nitrogen:**		kg/year
Post-development Annual Mass Loading - **Phosphorus:**		kg/year

CATCHMENT NO.4 CHARACTERISTICS:

Pre-development land use: (with default EMCs)	CLICK ON CELL BELOW TO SELECT	
Post-development land use: (with default EMCs)	CLICK ON CELL BELOW TO SELECT	
Total pre-development catchment area:		AC
Total post-development catchment or BMP analysis area:		AC
Pre-development Non DCIA CN:		
Pre-development DCIA percentage:		%
Post-development Non DCIA CN:		
Post-development DCIA percentage:		%
Estimated BMPArea (no loading from this area)		AC

OVERWRITE DEFAULT CONCENTRATIONS:

	PRE:		POST:	
EMC(N):		mg/L		mg/L
EMC(P):		mg/L		mg/L

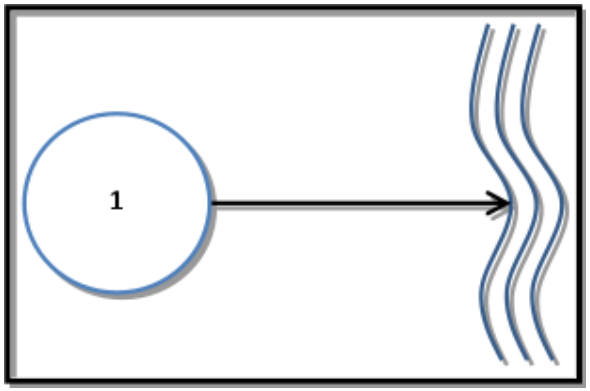
USE DEFAULT CONCENTRATIONS

Average annual pre runoff volume:		ac-ft/year
Average annual post runoff volume (note no BMP area):		ac-ft/year
Pre-development Annual Mass Loading - **Nitrogen:**		kg/year
Pre-development Annual Mass Loading - **Phosphorus:**		kg/year
Post-development Annual Mass Loading - **Nitrogen:**		kg/year
Post-development Annual Mass Loading - **Phosphorus:**		kg/year

STORMWATER TREATMENT ANALYSIS:	V 7.6	GO TO GENERAL SITE INFORMATION PAGE	Blue Numbers =	Input data
			Red Numbers =	Calculated

If not done, specify pre- and post-development watershed characteristics.

GO TO WATERSHED CHARACTERISTICS



Total Required Treatment Efficiency:

Required Treatment Eff (**Nitrogen**):	53.053	%
Required Treatment Eff (**Phosphorus**):	53.053	%

Select one of the BMPs below to analyze efficiency or review the summary data.

RETENTION BASIN	WET DETENTION	EXFILTRATION TRENCH	RAIN GARDEN	SWALE	USER DEFINED BMP
PERVIOUS PAVEMENT	STORMWATER HARVESTING	FILTRATION including Up-Flow Filters	LINED REUSE POND & UNDERDRAIN INPUT		
GREENROOF	RAINWATER HARVESTING	MANAGED AQUATIC PLANTS			
VEGETATED NATURAL BUFFER	VEGETATED FILTER STRIP	TREE WELL			

NOTE !!!: All individual system must be sized prior to being analyzed in conjunction with other systems. Please read instructions in the CATCHMENT AND TREATMENT SUMMARY RESULTS tab for more information.

CATCHMENT AND TREATMENT SUMMARY RESULTS

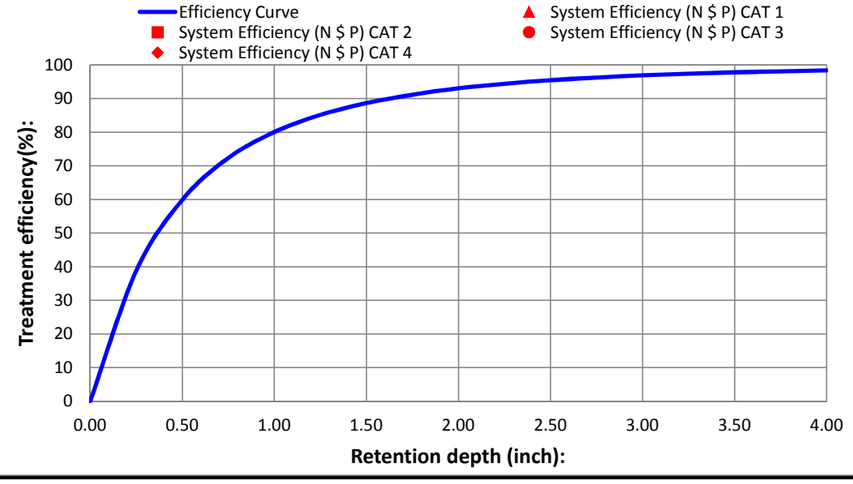
EXFILTRATION TRENCH: V 7.6

EXFILTRATION TRENCH SERVING: **Midway Road PD&E Study Basin B**

Note: There are loadings from this BMP area above the trench.	Catchment 1	Catchment 2	Catchment 3	Catchment 4	
Contributing catchment area:	3.210	0.000	0.000	0.000	ac
Required treatment efficiency (**Nitrogen**):	53.053				%
Required treatment efficiency (**Phosphorus**):	53.053				%
Required retention for the entire catchment to meet required efficiency:	0.419	0.000	0.000	0.000	in
Required water quality retention volume:	0.112	0.000	0.000	0.000	ac-ft

This is an underground system, thus there is no surface area loading reduction for the area of exfiltration

Provided retention depth:	60.000				in
Provided treatment efficiency (**Nitrogen**):	98.400	0.000	0.000	0.000	%
Provided treatment efficiency (**Phosphorus**):	98.400	0.000	0.000	0.000	%
Remaining treatment efficiency needed (**Nitrogen**):	0.000				%
Remaining treatment efficiency needed (**Phosphorus**):	0.000				%
Remaining retention depth needed if retention:	0.000	0.000	0.000	0.000	in



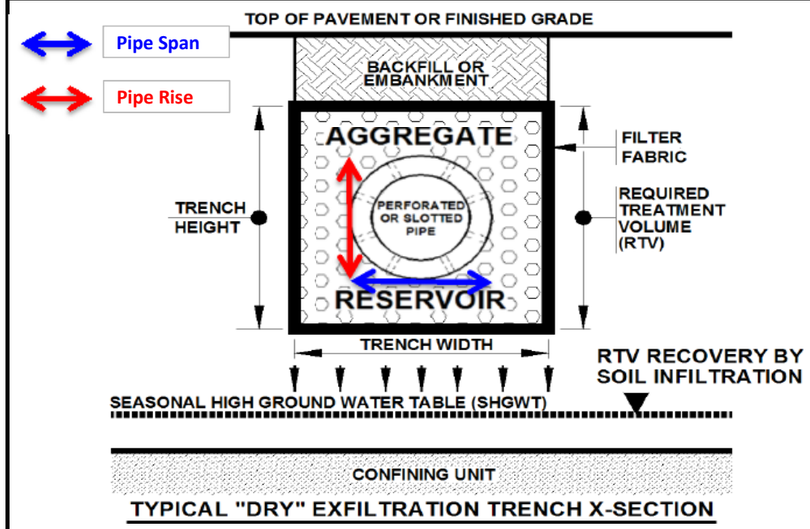
NOTE FOR TREATMENT EFFICIENCY GRAPH:

The purpose of this graph is to help illustrate the treatment efficiency of the retention system as the function of retention depth. The graph illustrates that there is a point of diminished return as the retention depth is substantially increased. Therefore, to provide the most economical BMP treatment system, other alternatives such as "treatment trains" and compensatory treatment should be considered.

Blue Numbers =	Input data
Red Numbers =	Calculated or Carryover

GO TO STORMWATER TREATMENT ANALYSIS

GO TO EXFILTRATION TRENCH STORAGE CALCULATOR



TYPICAL "DRY" EXFILTRATION TRENCH X-SECTION

Source of Graphic: draft **STORMWATER QUALITY APPLICANT'S HANDBOOK** dated March 2010, by the Department of Environmental Protection, available at: http://www.dep.state.fl.us/water/wetlands/erp/rules/stormwater, March 2010

CATCHMENTS AND TREATMENT SUMMARY RESULTS V 7.6

CALCULATION METHODS:

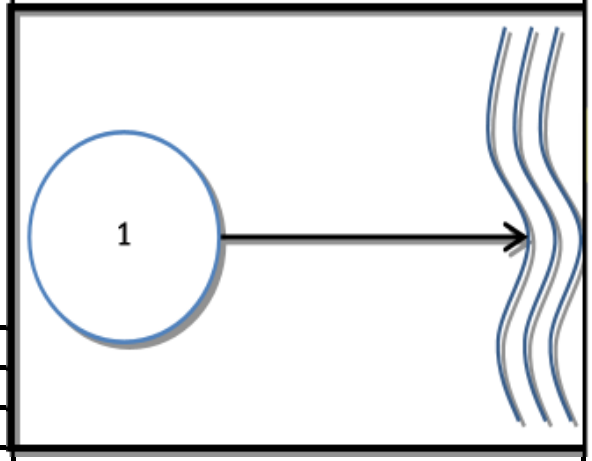
1. The effectiveness of each BMP in a single catchment is converted to an equivalent capture volume.
2. Certain BMP treatment train combinations have not been evaluated and in practice they are at this time not used, an example is a greenroof following a tree well.
3. Wet detention is last when used in a single catchment with other BMPs, except when followed by filtration

PROJECT TITLE	Midway Road PD&E Study Basin B	Optional Identification		
	Catchment 1:	Catchment 2:	Catchment 3:	Catchment 4:
BMP Name	Exfiltration Trench			
BMP Name				
BMP Name				

Summary Performance of Entire Watershed

Catchment Configuration	A - Single Catchment		3/21/2016
Nitrogen Pre Load (kg/yr)	6.19		BMPTRAINS MODEL
Phosphorus Pre Load (kg/yr)	0.81		
Nitrogen Post Load (kg/yr)	13.18		
Phosphorus Post Load (kg/yr)	1.73		
Target Load Reduction (N) %	53.1		
Target Load Reduction (P) %	53.1		
Target Discharge Load, N (kg/yr)	6.19		
Target Discharge Load, P (kg/yr)	0.81		
Provided Overall Efficiency, N (%):	98.4		
Provided Overall Efficiency, P (%):	98.4		
Discharged Load, N (kg/yr & lb/yr):	0.21	0.46	
Discharged Load, P (kg/yr & lb/yr):	0.03	0.06	
Load Removed, N (kg/yr & lb/yr):	12.97	28.57	
Load Removed, P (kg/yr & lb/yr):	1.71	3.76	

Treatment Objectives or Target MET



Basin 1

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Made by: ZKE
Checked by: REC

DATE: August 25, 2016
Job Number: DT4-006-01

PROJECT : **Midway Road (CR 712) from Glades Cutoff Road to Selvitz Road PD&E Study**
BASIN NAME : **Basin 1**
POND NAME : **Pond 1**

Station Limits: From: 219+00 To: 242+00 Roadway Length = 2300 ft R/W Width = 160 ft

EXISTING CONDITION

Roadway Area:

Description
Existing Condition Information from SFWMD Permit No. 56-00833-S

Impervious Roadway Area:	3.17 ac
Pervious Roadway Area:	4.07 ac
Pervious Area from Additional R/W	1.20 ac
Total Roadway Area:	8.45 ac

Pond Area: Pervious Pond Area = 2.43 ac

Total Area:

Impervious Area:	**3.17 ac**
Pervious Area:	**7.71 ac**
Total Area:	**10.88 ac**

Curve Number:

Existing Basin Delineations (Permit No. 56-00833-S)	Soil Group	CN	Area	CN*Area
CCORPA	D	85.46	3.17 ac	271.3
CMILNA	D	84.31	2.66 ac	224.0
CSELVC0	D	85.8	1.41 ac	121.4
Additional Pervious Area	D	80	1.20 ac	96.2
Pervious Area (Pond Site)	D	80	2.43 ac	194.5
		Total:	10.88 ac	907.4

CN = Total CN*Area / Total Area = **83.4**

Runoff:

		SFWMD & St. Lucie County (25yr/72hr)	Storm Sewer Design (3yr/24hr)
Soil Capacity (S) = $\frac{1000}{CN} - 10$ =	**1.99 in**	Precipitation (P) =	9.50 in	6.50 in
Runoff (Q) = $\frac{(P - 0.2S)^2}{(P + 0.8S)}$		Runoff (Q) =	**7.47 in**	**4.60 in**

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BASIN NAME : **Basin 1**
POND NAME : **Pond 1**

Station Limits: From: 219+00 To: 242+00 Roadway Length = 2300 ft R/W Width = 160 ft

PROPOSED CONDITION

Roadway Area:

Description	Width	Quantity	Total Width
Travel Lane	11.0 ft	4	44 ft
Paved Shoulder	7.0 ft	2	14 ft
Imperv. Median			0 ft
Sidewalk or Trail	18.0 ft	1	18 ft
Curb&Gutter	2.0 ft	4	8 ft
Shldr Gutter			0 ft
Cross Over/TurnLanes	11.0 ft	1	11 ft
		Total Impervious Width:	95 ft

Impervious Roadway Area: 5.02 ac
Pervious Roadway Area: 3.43 ac
Total Roadway Area: 8.45 ac

Pond Area:

Pervious Pond Area : 1.93 ac
Water Surface Area: 0.50 ac Wet Pond
Total Pond Area: 2.43 ac

Total Area:

Impervious Area: **5.02 ac**
Pervious Area: **5.37 ac**
Water Surface Area: **0.50 ac**
Total Area: **10.88 ac**

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Impervious areas; Streets & roads	D	98	5.02 ac	491.6
Proposed Ponds (Water Surface)	D	100	0.50 ac	49.7
Open Space (lawns, parks, golf courses, cemeteries,	D	80	5.37 ac	429.3
				0.0
			Total:	10.88 ac	970.6

CN = Total CN*Area / Total Area = **89.2**

Runoff:

		SFWMD & St. Lucie County (25yr/72hr)	Storm Sewer Design (3yr/24hr)
Soil Capacity (S) = $\frac{1000}{CN} - 10$ =	1.21 in	Precipitation (P) =	9.50 in	6.50 in
Runoff (Q) = $\frac{(P - 0.2S)^2}{(P + 0.8S)}$		Runoff (Q) =	**8.19 in**	**5.24 in**

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Made by: ZKE **DATE:** August 25, 2016
Checked by: REC **Job Number:** DT4-006-01

PROJECT : **Midway Road (CR 712) from Glades Cutoff Road to Selvitz Road PD&E Study**
BASIN NAME : **Basin 1**
POND NAME : **Pond 1**

POND SIZING

Required Treatment Volume (TV)

Selection criteria

Permitting Agency	**SFWMD**
StormW.Mgmt.	**Wet Detention**
Online/Offline	**Online**
OFW	**Yes**
Open/Closed Basin	**Open**

Wet Detention	**2.50 in**	x Impervious Areas =	1.05 ac-ft
	1.00 in	x Total Basin Area =	0.91 ac-ft

Required Dry Pre-Treatment	
0.5 in x Total Basin Area =	**0.45 ac-ft**

An additional 0.32 ac-ft of Dry Pre-Treatment is provided in Pond 1 for Ponds B-2 and 2/3

Treatment V_{req} = Largest of Trt. Vol. =	**1.05 ac-ft**
OFW Requirement, provide 50% more TV =	**1.57 ac-ft**
Required Wet Detention TV =	**1.11 ac-ft**

Required Attenuation Volume:

Total Runoff (ac-ft)

	SFWMD & St. Lucie County (25yr/72hr)	**Storm Sewer Design (10yr/24hr)**
Q_{pre} =	6.77 ac-ft	4.17 ac-ft
Q_{post} =	7.42 ac-ft	4.76 ac-ft
ΔQ =	**0.65 ac-ft**	**0.58 ac-ft**

Attenuation V_{req} = 0.65 ac-ft (use largest value)

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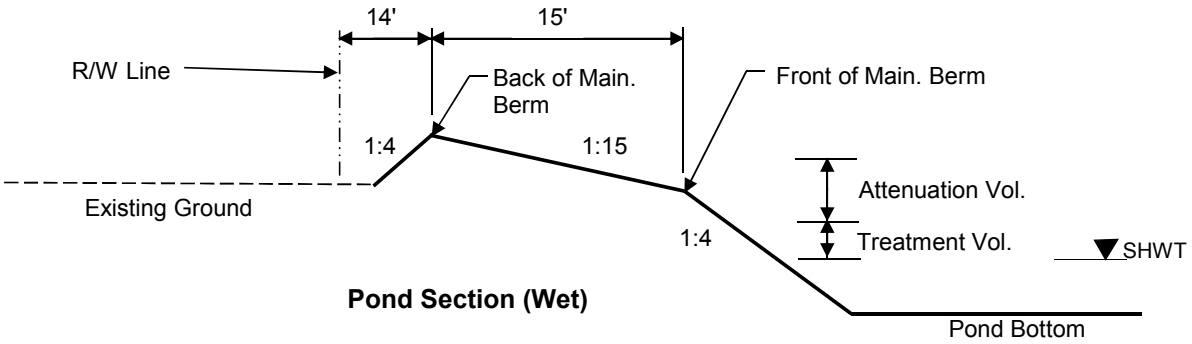
DATE: August 25, 2016
Job Number: DT4-006-01

PROJECT : **Midway Road (CR 712) from Glades Cutoff Road to Selvitz Road PD&E Study**
BASIN NAME : **Basin 1**
POND NAME : **Pond 1**

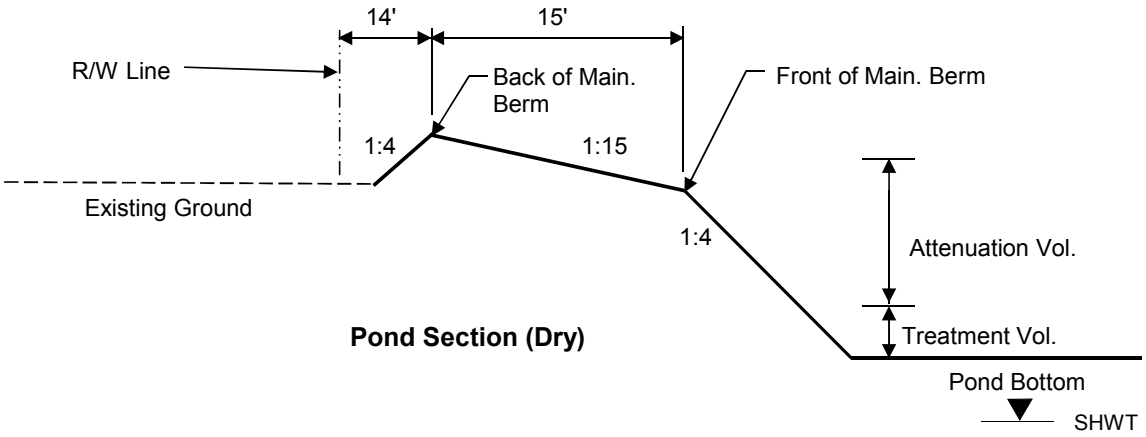
Maintenance Area Width =	15.0 ft	@ 1:15	Existing Ground Elevation =	18.50
Pond Tie-In Width (Dry) =	14.0 ft	@ 1:4	Normal Water Elevation =	17.00
Pond Tie-In Width (Wet) =	12.0 ft	@ 1:4	Lowest EOP Elevation =	21.00
Maximum Storage Depth (**SD**) =	4.00 ft	with 1.0 ft freeboard		

Hydraulic Grade Line (HGL) check

HGL Slope =	0.050%	Use 0.05% for very flat terrain to 0.1% for flat terrain
Distance from Pond to Lowest EOP =	1000 ft	
Estimated Energy Losses =	0.5 ft	
HGL Clearance =	1.0 ft	Use 1.0 foot as a standard HGL clearance (no junction losses)
Estimated Storm Sewer Tailwater EL =	19.5 ft	



Pond Section (Wet)



Pond Section (Dry)

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Made by: ZKE
Checked by: REC

DATE: August 25, 2016
Job Number: DT4-006-01

PROJECT : **Midway Road (CR 712) from Glades Cutoff Road to Selvitz Road PD&E Study**
BASIN NAME : **Basin 1**
POND NAME : **Pond 1**

Dry Pond Stage / Storage Calculations

ELEVATION	DESCRIPTION	AREA	DIMENSIONS		STORAGE
			LENGTH	WIDTH	
18.50	Pond R/W	1.17 ac	230.0 ft	222.0 ft	
22.00	Back of Main. Berm	0.90 ac	202.0 ft	194.0 ft	2.45 ac-ft
21.50		0.77 ac	187.0 ft	179.0 ft	2.03 ac-ft
21.00	Front of Main. Berm	0.65 ac	172.0 ft	164.0 ft	1.68 ac-ft
19.50	Provided Treat.Vol.	0.56 ac	160.0 ft	152.0 ft	0.78 ac-ft
19.50	Top of Treatment Vol.	0.56 ac	160.0 ft	152.0 ft	0.78 ac-ft
18.00	Pond Bottom	0.48 ac	148.0 ft	140.0 ft	0.00 ac-ft

Required Dry Pre-Treatment = 0.45 ac-ft
Required Dry Pre-Treatment Stage = 19.50 ft

*Provided Treatment+Attenuation Vol.= 0.78 ac-ft
Provided Treatment+Attenuation Stage= 19.50 ft

*Note: 0.32 ac-ft of additional dry pre-treatment provided to compensate the dry pre-treatment for Basins B & 2-3

Pond Stage / Storage Calculations

ELEVATION	DESCRIPTION	AREA	DIMENSIONS		STORAGE
			LENGTH	WIDTH	
18.50	Pond R/W	1.26 ac	177.0 ft	310.0 ft	
21.50	Back of Main. Berm	1.00 ac	153.0 ft	286.0 ft	2.99 ac-ft
21.00		0.86 ac	138.0 ft	271.0 ft	2.52 ac-ft
20.50	Front of Main. Berm	0.72 ac	123.0 ft	256.0 ft	2.13 ac-ft
19.50	Provided Treat.Vol.+Att.Vol	0.65 ac	115.0 ft	248.0 ft	1.44 ac-ft
19.50	Req'd Treat.Vol+Att. Vol	0.65 ac	115.0 ft	248.0 ft	1.44 ac-ft
19.41	Estimated Storm Sewer TW	0.65 ac	114.3 ft	247.3 ft	1.38 ac-ft
18.45	Top of Treatment Vol.	0.59 ac	106.6 ft	239.6 ft	0.79 ac-ft
17.00	Normal Water Level	0.50 ac	95.0 ft	228.0 ft	0.00 ac-ft
15.00		0.38 ac	79.0 ft	212.0 ft	
6.50	Pond Bottom	0.04 ac	11.0 ft	144.0 ft	

Required Treatment+Attenuation Vol.= 1.44 ac-ft
Required Treatment+Attenuation Stage= 19.50 ft

Provided Treatment+Attenuation Vol.= 1.44 ac-ft
Provided Treatment+Attenuation Stage= 19.50 ft

Estimated Treat. Vol.+Storm Sewer Att.= 1.38 ac-ft
Estimated Storm Sewer TW EL.= 19.41 ft

HGL requirements met

Additional 20% = 2.92 ac

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Made by: ZKE
Checked by: REC

DATE: August 24, 2016
Job Number: DT4-006-01

PROJECT : **Midway Road (CR 712) from Glades Cutoff Road to Selvitz Road PD&E Study**
BASIN NAME : **Basin 1**
POND NAME : **Pond 1**

PERMANENT POOL VOLUME CALCULATIONS

Basin Characteristics **Meterological Zone: 2**

Land Use	Area (ac)	CN	Product
Roadway Paved Area	5.02	98.00	491.96
Roadway Pervious Area	3.43	80.00	274.40
Pond Pervious Area	1.93	80.00	154.40
Pond Area at NWL	0.50	100.00	50.00
Total	**10.88**		970.76

%DCIA = 50.74 %
Non-DCIA CN = 80.00
Composite C = **0.65**
Annual Rainfall (P) = **55.00** **in**

Min. Permanent Pool Vol. = Area x Composite C x P x 14 / (365 x 12) = **1.25 ac-ft**

Stage Storage Calc. for Permanent Pool

ELEV. (ft)		AREA (ac)	AVG AREA (ac)	Delta D (ft)	Delta storage (ac-ft)	Sum Storage (ac-ft)
17.00	Normal Water Level	0.50				2.67
			0.44	2.00	0.88	
15.00		0.38				1.79
			0.21	8.50	1.79	
6.50	Pond Bottom	0.04				0.00

Permanent Pool Volume Provided = **2.67 ac-ft**
Resident Time Provided = Perm. Pool Vol. Provided x 365 x 12 / (Area x C x P) **30.0 Days**

GENERAL SITE INFORMATION: V 7.6

GO TO INTRODUCTION PAGE

Blue Numbers = Input data
Red Numbers = Calculated or Carryover

HELP

Select the appropriate Meteorological Zone, input the appropriate Mean Annual Rainfall amount and select the type of analysis

NAME OF PROJECT

Midway Road PD&E Study Basin 1

VIEW ZONE MAP

Meteorological Zone (Please use zone map): CLICK ON CELL BELOW TO SELECT — Zone 2

Mean Annual Rainfall (Please use rainfall map): 55.00 Inches

VIEW MEAN ANNUAL RAINFALL MAP

Type of analysis: CLICK ON CELL BELOW TO SELECT — Net improvement

GO TO WATERSHED CHARACTERISTICS

Treatment efficiency (N, P) (leave empty if net improvement or BMP analysis is used): % %

Select the STORMWATER TREATMENT ANALYSIS Button below to begin analyzing the effectiveness of Best Management Practices.

Model documentation and example problems.

STORMWATER TREATMENT ANALYSIS

Systems available for analysis:
Retention Basin with option for calculating effluent concentration
Wet Detention
Exfiltration Trench
Pervious Pavement
Stormwater Harvesting
Biofiltration
Greenroof
Rainwater Harvesting
Managed Aquatic Plants Detention
Vegetated Natural Buffer
Vegetated Filter Strip
Swale
Rain Garden
Tree Well
Lined reuse pond
User Defined BMP

There is a user's manual for the BMPTRAINS model. It can be downloaded from www.stormwater.ucf.edu. The results from the example problems shown in the manual however may not reflect current model results due to ongoing updates of the model.

RESET INPUT FOR STORMWATER TREATMENT ANALYSIS

METHODOLOGY FOR CALCULATING REQUIRED TREATMENT EFFICIENCY

METHODOLOGY FOR RETENTION SYSTEMS

METHODOLOGY FOR WET DETENTION SYSTEMS

METHODOLOGY FOR GREENROOF SYSTEMS

METHODOLOGY FOR WATER HARVESTING SYSTEMS

WATERSHED CHARACTERISTICS V 7.6

GO TO STORMWATER TREATMENT ANALYSIS

Blue Numbers = Input data
Red Numbers = Calculated

HELP - LAND USES/EMC

SELECT CATCHMENT CONFIGURATION

CLICK ON CELL BELOW TO SELECT CONFIGURATION
A - Single Catchment

VIEW CATCHMENT CONFIGURATION

CATCHMENT NO.1 CHARACTERISTICS:

VIEW AVERAGE ANNUAL RUNOFF "C" Factor

VIEW EMC & FLUCCS

	CLICK ON CELL BELOW TO SELECT			
Pre-development land use:	Highway: TN=1.520 TP=0.200	Total pre-development catchment area:	10.88	AC
with default EMCs	CLICK ON CELL BELOW TO SELECT	Total post-development catchment or BMP analysis area:	10.88	AC
Post-development land use:	Highway: TN=1.520 TP=0.200	Pre-development Non DCIA CN:	80.00	
with default EMCs		Pre-development DCIA percentage:	29.17	%
		Post-development Non DCIA CN:	80.00	
		Post-development DCIA percentage:	50.74	%
		Estimated BMPArea (No loading from this area)	2.43	AC

OVERWRITE DEFAULT CONCENTRATIONS USING:

	PRE:	POST:
EMC(N):	mg/L	mg/L
EMC(P):	mg/L	mg/L

USE DEFAULT CONCENTRATIONS

Average annual pre runoff volume:	15.668	ac-ft/year
Average annual post runoff volume (note no BMP area):	18.016	ac-ft/year
Pre-development Annual Mass Loading - **Nitrogen:**	29.370	kg/year
Pre-development Annual Mass Loading - **Phosphorus:**	3.864	kg/year
Post-development Annual Mass Loading - **Nitrogen:**	33.772	kg/year
Post-development Annual Mass Loading - **Phosphorus:**	4.444	kg/year

CATCHMENT NO.2 CHARACTERISTICS:

	CLICK ON CELL BELOW TO SELECT			
Pre-development land use:		Total pre-development catchment area:		AC
with default EMCs	CLICK ON CELL BELOW TO SELECT	Total post-development catchment or BMP analysis area:		AC
Post-development land use:		Pre-development Non DCIA CN:		
with default EMCs		Pre-development DCIA percentage:		%
		Post-development Non DCIA CN:		
		Post-development DCIA percentage:		%
		Estimated BMPArea (No loading from this area)		AC

OVERWRITE DEFAULT CONCENTRATIONS:

	PRE:	POST:
EMC(N):	mg/L	mg/L
EMC(P):	mg/L	mg/L

USE DEFAULT CONCENTRATIONS

Average annual pre runoff volume:		ac-ft/year
Average annual post runoff volume (note no BMP area):		ac-ft/year
Pre-development Annual Mass Loading - **Nitrogen:**		kg/year
Pre-development Annual Mass Loading - **Phosphorus:**		kg/year
Post-development Annual Mass Loading - **Nitrogen:**		kg/year
Post-development Annual Mass Loading - **Phosphorus:**		kg/year

CATCHMENT NO.3 CHARACTERISTICS:

	CLICK ON CELL BELOW TO SELECT			
Pre-development land use:		Total pre-development catchment area:		AC
with default EMCs	CLICK ON CELL BELOW TO SELECT	Total post-development catchment or BMP analysis area:		AC
Post-development land use:		Pre-development Non DCIA CN:		
with default EMCs		Pre-development DCIA percentage:		%
		Post-development Non DCIA CN:		
		Post-development DCIA percentage:		%
		Estimated BMPArea (no loading from this area)		AC

OVERWRITE DEFAULT CONCENTRATIONS:

	PRE:	POST:
EMC(N):	mg/L	mg/L
EMC(P):	mg/L	mg/L

USE DEFAULT CONCENTRATIONS

Average annual pre runoff volume:		ac-ft/year
Average annual post runoff volume (note no BMP area):		ac-ft/year
Pre-development Annual Mass Loading - **Nitrogen:**		kg/year
Pre-development Annual Mass Loading - **Phosphorus:**		kg/year
Post-development Annual Mass Loading - **Nitrogen:**		kg/year
Post-development Annual Mass Loading - **Phosphorus:**		kg/year

CATCHMENT NO.4 CHARACTERISTICS:

	CLICK ON CELL BELOW TO SELECT			
Pre-development land use:		Total pre-development catchment area:		AC
with default EMCs	CLICK ON CELL BELOW TO SELECT	Total post-development catchment or BMP analysis area:		AC
Post-development land use:		Pre-development Non DCIA CN:		
with default EMCs		Pre-development DCIA percentage:		%
		Post-development Non DCIA CN:		
		Post-development DCIA percentage:		%
		Estimated BMPArea (no loading from this area)		AC

OVERWRITE DEFAULT CONCENTRATIONS:

	PRE:	POST:
EMC(N):	mg/L	mg/L
EMC(P):	mg/L	mg/L

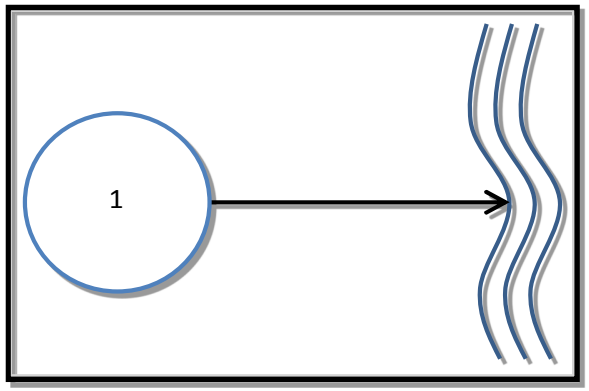
USE DEFAULT CONCENTRATIONS

Average annual pre runoff volume:		ac-ft/year
Average annual post runoff volume (note no BMP area):		ac-ft/year
Pre-development Annual Mass Loading - **Nitrogen:**		kg/year
Pre-development Annual Mass Loading - **Phosphorus:**		kg/year
Post-development Annual Mass Loading - **Nitrogen:**		kg/year
Post-development Annual Mass Loading - **Phosphorus:**		kg/year

STORMWATER TREATMENT ANALYSIS:	V 7.6	GO TO GENERAL SITE INFORMATION PAGE	Blue Numbers =	Input data
			Red Numbers =	Calculated

If not done, specify pre- and post-development watershed characteristics.

GO TO WATERSHED CHARACTERISTICS



Total Required Treatment Efficiency:

Required Treatment Eff (**Nitrogen**):	13.035	%
Required Treatment Eff (**Phosphorus**):	13.035	%

Select one of the BMPs below to analyze efficiency or review the summary data.

RETENTION BASIN	WET DETENTION	EXFILTRATION TRENCH	RAIN GARDEN	SWALE	USER DEFINED BMP
PERVIOUS PAVEMENT	STORMWATER HARVESTING	FILTRATION including Up-Flow Filters	LINED REUSE POND & UNDERDRAIN INPUT		
GREENROOF	RAINWATER HARVESTING	MANAGED AQUATIC PLANTS			
VEGETATED NATURAL BUFFER	VEGETATED FILTER STRIP	TREE WELL			

NOTE !!!: All individual system must be sized prior to being analyzed in conjunction with other systems. Please read instructions in the CATCHMENT AND TREATMENT SUMMARY RESULTS tab for more information.

CATCHMENT AND TREATMENT SUMMARY RESULTS

RETENTION BASIN: V 7.6

Blue Numbers =	Input data
Red Numbers =	Calculated or Carryover

RETENTION BASIN SERVING: Midway Road PD&E Study Basin 1

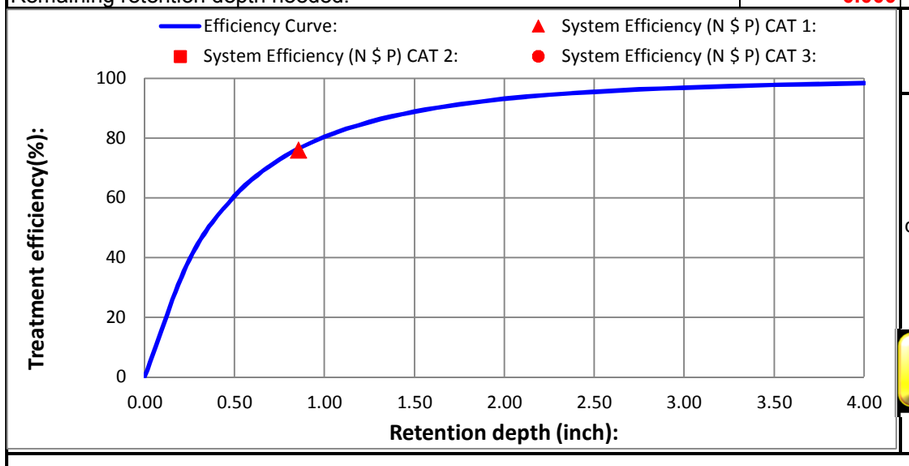
GO TO STORMWATER TREATMENT ANALYSIS

Loadings from BMP area are contained by the BMP, thus no BMP area load.

	Catchment 1	Catchment 2	Catchment 3	Catchment 4	
Watershed area cotributing to basin:	8.450	0.000	0.000	0.000	ac
Required Treatment Eff (**Nitrogen**):	13.035				%
Required Treatment Eff (**Phosphorus**):	13.035				%
Required retention depth over the watershed to meet required efficiency:	0.083	0.000	0.000	0.000	in
Required water quality retention volume:	0.058	0.000	0.000	0.000	ac-ft

RETENTION BASIN FOR MULTIPLE TREATMENT SYSTEMS (if there is a need for additional removal efficiencies in a series of BMPs):

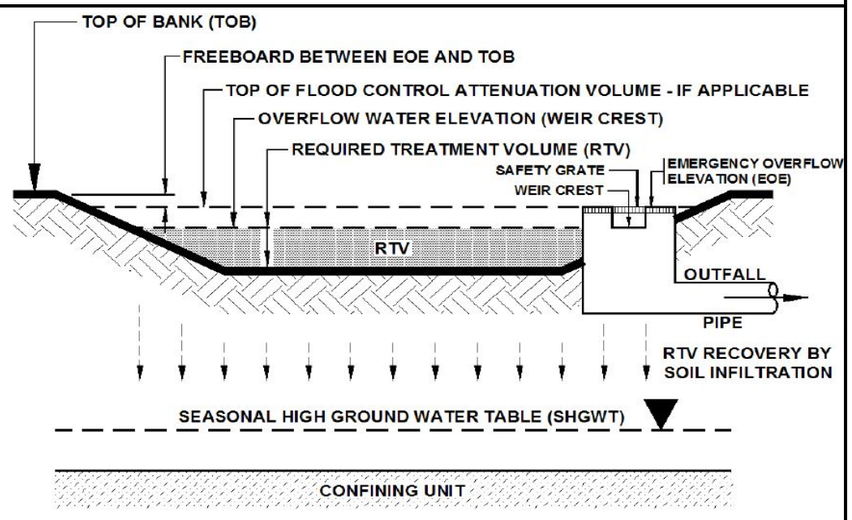
Retention volume based on retention depth and total area	0.775	0.000	0.000	0.000	ac-ft
Provided retention depth (inches over the watershed area):	0.855				in
Provided treatment efficiency (**Nitrogen**):	75.982	0.000	0.000	0.000	%
Provided treatment efficiency (**Phosphorus**):	75.982	0.000	0.000	0.000	%
Remaining treatment efficiency (**Nitrogen**):	0.000				%
Remaining treatment efficiency (**Phosphorus**):	0.000				%
Remaining retention depth needed:	0.000	0.000	0.000	0.000	in



NOTE FOR TREATMENT EFFICIENCY GRAPH:

The purpose of this graph is to help illustrate the treatment efficiency of the retention system as the function of retention depth **for a single BMP and in a single catchment**. The graph illustrates that there is a diminished return as the retention depth is increased. Thus evaluations of other alternatives in "treatment trains" and compensatory treatment should be considered.

HELP - EXAMPLE PROBLEM 3



TYPICAL CROSS SECTION OF A "DRY" RETENTION SYSTEM

View Media Mixes

	Catchment 1	Catchment 2	Catchment 3	Catchment 4
Use only donw flow media mix before water enters the ground, specify type				
Nitrogen mass reduction in groundwater discharge (%)				
Phosphorus mass reduction in groundwater discharge (%)				

Source of Graphic: draft **STORMWATER QUALITY APPLICANT'S HANDBOOK** dated March 2010, by the Department of Environmental Protection, available at: http://www.dep.state.fl.us/water/wetlands/erp/rules/stormwater, March 2010.

WET DETENTION: V 7.6

Blue Numbers =	Input data
Red Numbers =	Calculated or Carryover

WET DETENTION POND SERVING: Midway Road PD&E Study Basin 1

GO TO STORMWATER TREATMENT ANALYSIS

HELP - EXAMPLE PROBLEM 4

Loadings from BMP area are contained by the BMP, thus no BMP area load.

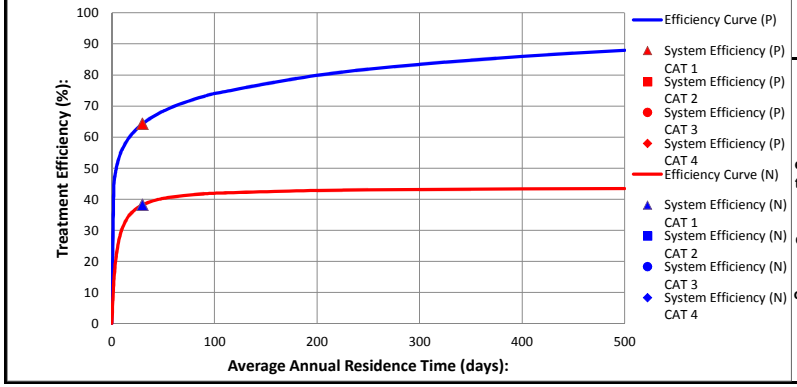
	Catchment 1	Catchment 2	Catchment 3	Catchment 4	
Total pre-development catchment area:	10.880	0.000	0.000	0.000	ac
Total post-development catchment area:	8.450	0.000	0.000	0.000	ac
Average annual residence time (between 1 and 500 days):	30.00				days
Littoral Zone or other improvements used?	NO				
Littoral Zone or other improvement efficiency credit:	0.00				%
Total **Nitrogen** removal required:	13.035				%
Total **Phosphorus** removal required:	13.035				%
Total **Nitrogen** removal efficiency provided:	38.176				%
Total **Phosphorous** removal efficiency provided:	64.266				%
Is the wet detention sufficient:	YES				
Average annual runoff volume into the pond:	18.016				ac-ft/yr

To Achieve the Treatment Efficiency Shown in the Graph Below, the Following Must Hold

Minimum Pond Permanent Pool Volume:	1.481				ac-ft

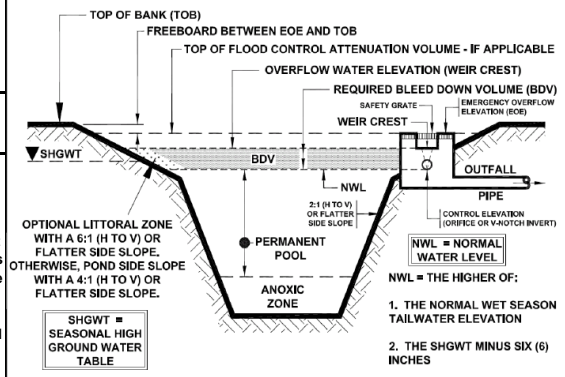
REQUIRED REMAINING TREATMENT EFFICIENCIES OF TREATMENT SYSTEM IN SERIES WITH WET DETENTION. USE FOR SIZING OF TREATMENT SYSTEM IN SERIES WITH WET DETENTION.

	Catchment 1	Catchment 2	Catchment 3	Catchment 4	
Remaining treatment efficiency needed (**Nitrogen**):	0.000				%
Remaining treatment efficiency needed (**Phosphorus**):	0.000				%



NOTE FOR TREATMENT EFFICIENCY GRAPH:

The purpose of the treatment efficiency graphs is to help illustrate the treatment efficiency of the wet detention system as the function of average annual residence time (and permanent pool volume). The graph illustrates that there is a point of diminished return as the permanent pool volume is substantially increased. The lines are produced from the conditions of catchment one, thus other catchments are shown with the data points.



TYPICAL X-SECTION OF A WET DETENTION SYSTEM

Source of Graphic: draft **STORMWATER QUALITY APPLICANT'S HANDBOOK** dated March 2010, by the Department of Environmental Protection, available at: http://www.dep.state.fl.us/water/wetlands/erp/rules/stormwater, March 2010

CATCHMENTS AND TREATMENT SUMMARY RESULTS V 7.6

CALCULATION METHODS:

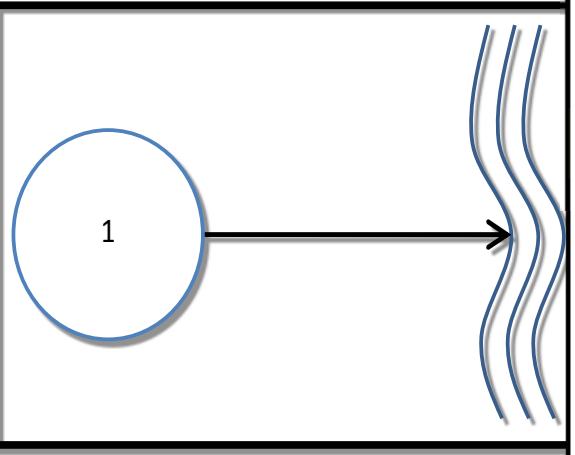
1. The effectiveness of each BMP in a single catchment is converted to an equivalent capture volume.
2. Certain BMP treatment train combinations have not been evaluated and in practice they are at this time not used, an example is a greenroof following a tree well.
3. Wet detention is last when used in a single catchment with other BMPs, except when followed by filtration

PROJECT TITLE	Midway Road PD&E Study Basin 1	Optional Identification		
	Catchment 1:	Catchment 2:	Catchment 3:	Catchment 4:
BMP Name	Retention Basin			
BMP Name	Wet Detention			
BMP Name				

Summary Performance of Entire Watershed

Catchment Configuration	A - Single Catchment		8/24/2016
Nitrogen Pre Load (kg/yr)	29.37		BMPTRAINS MODEL
Phosphorus Pre Load (kg/yr)	3.86		
Nitrogen Post Load (kg/yr)	33.77		
Phosphorus Post Load (kg/yr)	4.44		
Target Load Reduction (N) %	13.0		
Target Load Reduction (P) %	13.0		
Target Discharge Load, N (kg/yr)	29.37		
Target Discharge Load, P (kg/yr)	3.86		
Provided Overall Efficiency, N (%):	79.9		
Provided Overall Efficiency, P (%):	88.5		
Discharged Load, N (kg/yr & lb/yr):	6.80	14.98	
Discharged Load, P (kg/yr & lb/yr):	0.51	1.12	
Load Removed, N (kg/yr & lb/yr):	26.97	59.41	
Load Removed, P (kg/yr & lb/yr):	3.93	8.67	

Treatment Objectives or Target MET



Basin 2/3

Inwood Consulting Engineers, Inc.
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(407) 971-8955 (fax)

Made by: ZKE **DATE:** March 21, 2016
Checked by: REC **Job Number:** DT4-006-01

PROJECT : **Midway Road (CR 712) from Glades Cutoff Road to Selvitz Road PD&E Study**
BASIN NAME : **Basin 2/3**
POND NAME : **Pond 2/3**

	Basin 2		Basin 3	
Station Limits:	From: 242+00	Length = 3300 ft	From: 275+00	Length = 2591 ft
	To: 275+00	R/W Width = 160 ft	To: 300+91	R/W Width = 148 ft

EXISTING CONDITION

Roadway Area:

Description
Existing Condition Information from SFWMD Permit No. 56-00833-S

From Permit No. 56-00833-S
Basin 2 and Basin 3

Total Existing Area from Permit 17.91 ac
Area from Additionall R/W in Basin 2 0.83 ac
Total Roadway Area: 18.74 ac

Basin Limits Extend to STA 300+91
Include Portions of
N Selvitz Road 4.78 ac
Christensen Road 1.14 ac

Pond Area: Pervious Pond Area = 5.55 ac

Total Area:
Roadway Area: **30.21 ac**
Total Area: **30.21 ac**

Curve Number:

Existing Basin Delineations (Permit No. 56-00833-S)	Soil Group	CN	Area	CN*Area
CSELCV	D	84.48	2.57 ac	217.1
CSELVE	D	84.48	4.64 ac	392.0
CSELCF	D	83.16	2.51 ac	208.7
CSELVG	D	84.48	1.50 ac	126.7
CHURA	D	84.61	1.94 ac	164.1
CDUNNA	D	83.96	1.40 ac	117.5
CBENDA	D	83.96	3.19 ac	267.8
N SELVITZ	D	84.56	2.96 ac	250.3
N SELVITZ	D	84.26	1.82 ac	153.4
open space, good condition	D	80	0.16 ac	12.8
CCHRIA (Christensen SB)	D	88.64	0.57 ac	50.5
OUT123 (Christensen NB)	D	88.64	0.57 ac	50.5
open space, area from additional R/W	D	80	0.83 ac	66.4
open space, good condition (Pond Site)	D	80	5.55 ac	444.0
		Total:	30.21 ac	2522.0

CN = Total CN*Area / Total Area = **83.5**

Runoff:

		SFWMD & St. Lucie County (25yr/72hr)	Storm Sewer Design (3yr/24hr)
Soil Capacity (S) = $\frac{1000}{CN} - 10$ =	**1.98 in**		
Precipitation (P) =		9.50 in	6.50 in
Runoff (Q) = $\frac{(P - 0.2S)^2}{(P + 0.8S)}$		**7.48 in**	**4.61 in**

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BASIN NAME : **Basin 2/3**
POND NAME : **Pond 2/3**

Station Limits:

	Basin 2			Basin 3		
From:	242+00	Length =	3300 ft	From: 275+00	Length =	2591 ft
To:	275+00	R/W Width =	160 ft	To: 300+91	R/W Width =	148 ft

PROPOSED CONDITION

Roadway Area:

Description	Width	Quantity	Total Width
Travel Lane	11.0 ft	5	55 ft
Paved Shoulder	7.0 ft	2	14 ft
Imperv. Median			0 ft
Sidewalk or Trail	18.0 ft	1	18 ft
Curb&Gutter	2.0 ft	4	8 ft
Shldr Gutter			0 ft
Cross Over/TurnLanes	11.0 ft	1	11 ft
		Total Impervious Width:	106 ft

Includes areas from Permit No. 56-00833-S

Impervious Roadway Area:	17.74 ac
Pervious Roadway Area:	6.92 ac
Total Roadway Area:	24.66 ac

From Permit No. 56-00833-S

N Selvitz Impervious	3.97 ac
N Selvitz pervious	0.81 ac
Christensen Impervious	0.56 ac
Christensen pervious	0.60 ac
Basin 3 Impervious	5.18 ac
Basin 3 Pervious	1.42 ac

Pond Area:

Pervious Pond Area :	4.04 ac	
Water Surface Area:	1.51 ac	Wet Pond
Total Pond Area:	5.55 ac	

Total Area:

Impervious Area:	**17.74 ac**
Pervious Area:	**10.96 ac**
Water Surface Area:	**1.51 ac**
Total Area:	**30.21 ac**

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Impervious areas; Streets & roads	D	98	17.74 ac	1738.5
Proposed Ponds (Water Surface)	D	100	1.51 ac	151.0
Open Space (lawns, parks, golf courses, cemeteries,	D	80	10.96 ac	876.9
	D			0.0
		Total:	30.21 ac	2766.4

CN = Total CN*Area / Total Area = **91.6**

Runoff:

			SFWMD & St. Lucie County (25yr/72hr)	Storm Sewer Design (3yr/24hr)
Soil Capacity (S) =	$\frac{1000}{CN} - 10 =$	0.92 in	Precipitation (P) =	9.50 in	6.50 in
Runoff (Q) =	$\frac{(P - 0.2S)^2}{(P + 0.8S)}$		Runoff (Q) =	**8.48 in**	**5.51 in**

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PROJECT : **Midway Road (CR 712) from Glades Cutoff Road to Selvitz Road PD&E Study**
BASIN NAME : **Basin 2/3**
POND NAME : **Pond 2/3**

POND SIZING

Required Treatment Volume (TV)

Selection criteria

Permitting Agency	**SFWMD**
StormW.Mgmt.	**Wet Detention**
Online/Offline	**Online**
OFW	**Yes**
Open/Closed Basin	**Open**

Wet Detention	**2.50 in**	x Impervious Areas =	3.70 ac-ft
	1.00 in	x Total Basin Area =	2.52 ac-ft

Required Dry Pre-Treatment	
0.5 in x Total Basin Area =	**1.26 ac-ft**

Treatment V_{req} = Largest of Trt. Vol. =	**3.70 ac-ft**
OFW Requirement, provide 50% more TV =	**5.54 ac-ft**
Required Wet Detention TV =	**4.29 ac-ft**

Required Attenuation Volume:

Total Runoff (ac-ft)

	SFWMD & St. Lucie County (25yr/72hr)	**Storm Sewer Design (10yr/24hr)**
Q_{pre} =	18.83 ac-ft	11.61 ac-ft
Q_{post} =	21.34 ac-ft	13.88 ac-ft
ΔQ =	**2.52 ac-ft**	**2.27 ac-ft**

Attenuation V_{req} = 2.52 ac-ft (use largest value)

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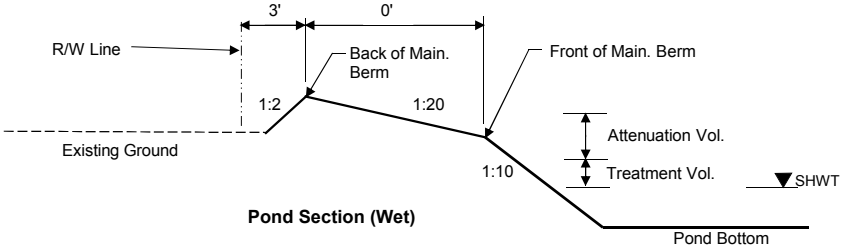
PROJECT : **Midway Road (CR 712) from Glades Cutoff Road to Selvitz Road PD&E Study**
BASIN NAME : **Basin 2/3**
POND NAME : **Pond 2/3**

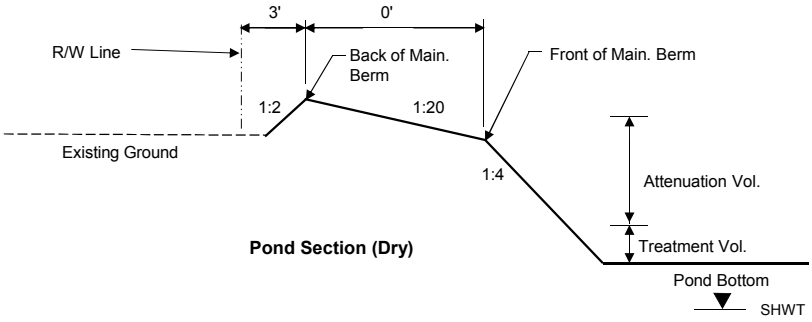
Maintenance Area Width =	0.0 ft	@ 1:20	Existing Ground Elevation =	15.00
Pond Tie-In Width =	3.0 ft	@ 1:2	Normal Water Elevation =	9.50
Maximum Storage Depth (**SD**) =	4.50 ft	with 1.0 ft freeboard	Lowest EOP Elevation =	16.00

Hydraulic Grade Line (HGL) check

HGL Slope =	0.050%	Use 0.05% for very flat terrain to 0.1% for flat terrain
Distance from Pond to Lowest EOP =	1000 ft	
Estimated Energy Losses =	0.5 ft	
HGL Clearance =	1.0 ft	Use 1.0 foot as a standard HGL clearance (no junction losses)
Estimated Storm Sewer Tailwater EL =	14.5 ft	



Pond Section (Wet)



Pond Section (Dry)

Inwood Consulting Engineers, Inc.
3000 Dovera Drive, Suite 200, Oviedo, FL 32765
(407) 971-8850 (phone)
(407) 971-8955 (fax)

Made by: ZKE **Checked by:** REC **DATE:** March 21, 2016 **Job Number:** DT4-006-01

PROJECT : **Midway Road (CR 712) from Glades Cutoff Road to Selvitz Road PD&E Study**
BASIN NAME : **Basin 2/3**
POND NAME : **Pond 2/3**

Dry Pond Stage / Storage Calculations **Pond Areas and Weir Elevations from Permit No. 56-00833-S**

ELEVATION	DESCRIPTION	AREA	STORAGE
15.00	Pond R/W	2.60 ac	
15.00	Back of Main. Berm	2.13 ac	4.02 ac-ft
15.00		2.13 ac	4.02 ac-ft
15.00	Front of Main. Berm	2.13 ac	4.02 ac-ft
13.61	Provided Treat.Vol.	1.99 ac	1.17 ac-ft
13.61	Top of Treatment Vol.	1.93 ac	1.17 ac-ft
13.00	Pond Bottom	1.84 ac	0.00 ac-ft

Required Dry Pre-Treatment = 1.17 ac-ft
Required Dry Pre-Treatment = 13.61 ft

Provided Treatment= 1.17 ac-ft
Provided Treatment Stage= 13.61 ft
*Note: Remaining required Dry Pre-Treatment provided in Pond 1

Wet Pond Stage / Storage Calculations **Pond Areas and Weir Elevations from Permit No. 56-00833-S**

ELEVATION	DESCRIPTION	AREA	STORAGE
15.00	Pond R/W	2.95 ac	
15.00	Back of Main. Berm	2.76 ac	11.94 ac-ft
15.00		2.76 ac	11.94 ac-ft
15.00	Front of Main. Berm	2.76 ac	11.94 ac-ft
14.00	Provided Treat.Vol.+Att.Vol	2.53 ac	9.29 ac-ft
13.05	Req'd Treat.Vol+Att. Vol	2.53 ac	6.89 ac-ft
12.96	Estimated Storm Sewer TW	2.53 ac	6.65 ac-ft
12.35	Top of Treatment Vol.	2.16 ac	5.23 ac-ft
9.50	Normal Water Level	1.51 ac	0.00 ac-ft
7.00		1.12 ac	
-3.00	Pond Bottom	0.75 ac	

Required Treatment+Attenuation Vol.= 6.89 ac-ft
Required Treatment+Attenuation Stage= 13.05 ft

Provided Treatment+Attenuation Vol.= 9.29 ac-ft
Provided Treatment+Attenuation Stage= 14.00 ft

Estimated Treat. Vol.+Storm Sewer Att.= 6.65 ac-ft
Estimated Storm Sewer TW EL.= 12.96 ft

HGL requirements met

Inwood Consulting Engineers, Inc.
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(407) 971-8955 (fax)

Made by: ZKE
Checked by: REC

DATE: March 22, 2016
Job Number: DT4-006-01

PROJECT : **Midway Road (CR 712) from Glades Cutoff Road to Selvitz Road PD&E Study**
BASIN NAME : **Basin 2/3**
POND NAME : **Pond 2/3**

PERMANENT POOL VOLUME CALCULATIONS

Basin Characteristics **Meterological Zone: 2**

Land Use	Area (ac)	CN	Product
Roadway Paved Area	17.74	98.00	1738.52
Roadway Pervious Area	6.92	80.00	553.60
Pond Pervious Area	4.04	80.00	323.20
Pond Area at NWL	1.51	100.00	151.00
Total	**30.21**		2766.32

%DCIA = 63.72 %
Non-DCIA CN = 80.00
Composite C = **0.66**
Annual Rainfall (P) = **55.00** **in**

Min. Permanent Pool Vol. = Area x Composite C x P x 14 / (365 x 12) = **3.48** **ac-ft**

Stage Storage Calc. for Permanent Pool

ELEV. (ft)		AREA (ac)	AVG AREA (ac)	Delta D (ft)	Delta storage (ac-ft)	Sum Storage (ac-ft)
9.50	Normal Water Level	1.51				12.64
			1.32	2.50	3.29	
7.00		1.12				9.35
			0.94	10.00	9.35	
-3.00	Pond Bottom	0.75				0.00

Permanent Pool Volume Provided = **12.64** **ac-ft**
Resident Time Provided = Perm. Pool Vol. Provided x 365 x 12 / (Area x C x P) **50.8** **Days**

GENERAL SITE INFORMATION: V 7.6

GO TO INTRODUCTION PAGE

Blue Numbers = Input data
Red Numbers = Calculated or Carryover

HELP

Select the appropriate Meteorological Zone, input the appropriate Mean Annual Rainfall amount and select the type of analysis

NAME OF PROJECT

Midway Road PD&E Study Basin 2-3

VIEW ZONE MAP

Meteorological Zone (Please use zone map): CLICK ON CELL BELOW TO SELECT — Zone 2

Mean Annual Rainfall (Please use rainfall map): 55.00 Inches

VIEW MEAN ANNUAL RAINFALL MAP

Type of analysis: CLICK ON CELL BELOW TO SELECT — Net improvement

Treatment efficiency (N, P) (leave empty if net improvement or BMP analysis is used): % %

GO TO WATERSHED CHARACTERISTICS

Select the STORMWATER TREATMENT ANALYSIS Button below to begin analyzing the effectiveness of Best Management Practices.

Model documentation and example problems.

STORMWATER TREATMENT ANALYSIS

Systems available for analysis:
Retention Basin with option for calculating effluent concentration
Wet Detention
Exfiltration Trench
Pervious Pavement
Stormwater Harvesting
Biofiltration
Greenroof
Rainwater Harvesting
Managed Aquatic Plants Detention
Vegetated Natural Buffer
Vegetated Filter Strip
Swale
Rain Garden
Tree Well
Lined reuse pond
User Defined BMP

There is a user's manual for the BMPTRAINS model. It can be downloaded from www.stormwater.ucf.edu. The results from the example problems shown in the manual however may not reflect current model results due to ongoing updates of the model.

RESET INPUT FOR STORMWATER TREATMENT ANALYSIS

METHODOLOGY FOR CALCULATING REQUIRED TREATMENT EFFICIENCY

METHODOLOGY FOR RETENTION SYSTEMS

METHODOLOGY FOR WET DETENTION SYSTEMS

METHODOLOGY FOR GREENROOF SYSTEMS

METHODOLOGY FOR WATER HARVESTING SYSTEMS

WATERSHED CHARACTERISTICS V 7.6

GO TO STORMWATER TREATMENT ANALYSIS

Blue Numbers = Input data
Red Numbers = Calculated

HELP - LAND USES/EMC

SELECT CATCHMENT CONFIGURATION

CLICK ON CELL BELOW TO SELECT CONFIGURATION
A - Single Catchment

VIEW CATCHMENT CONFIGURATION

CATCHMENT NO.1 CHARACTERISTICS:

VIEW AVERAGE ANNUAL RUNOFF "C" Factor

VIEW EMC & FLUCCS

CLICK ON CELL BELOW TO SELECT		
Pre-development land use:	Highway: TN=1.520 TP=0.200	
with default EMCs	CLICK ON CELL BELOW TO SELECT	
Post-development land use:	Highway: TN=1.520 TP=0.200	
with default EMCs		
Total pre-development catchment area:	30.21	AC
Total post-development catchment or BMP analysis area:	30.21	AC
Pre-development Non DCIA CN:	80.00	
Pre-development DCIA percentage:	30.06	%
Post-development Non DCIA CN:	80.00	
Post-development DCIA percentage:	70.33	%
Estimated BMPArea (No loading from this area)	5.55	AC

OVERWRITE DEFAULT CONCENTRATIONS USING:

	PRE:		POST:	
EMC(N):		mg/L		mg/L
EMC(P):		mg/L		mg/L

USE DEFAULT CONCENTRATIONS

Average annual pre runoff volume:	44.366	ac-ft/year
Average annual post runoff volume (note no BMP area):	68.076	ac-ft/year
Pre-development Annual Mass Loading - **Nitrogen:**	83.167	kg/year
Pre-development Annual Mass Loading - **Phosphorus:**	10.943	kg/year
Post-development Annual Mass Loading - **Nitrogen:**	127.613	kg/year
Post-development Annual Mass Loading - **Phosphorus:**	16.791	kg/year

CATCHMENT NO.2 CHARACTERISTICS:

CLICK ON CELL BELOW TO SELECT		
Pre-development land use:		
with default EMCs	CLICK ON CELL BELOW TO SELECT	
Post-development land use:		
with default EMCs		
Total pre-development catchment area:		AC
Total post-development catchment or BMP analysis area:		AC
Pre-development Non DCIA CN:		
Pre-development DCIA percentage:		%
Post-development Non DCIA CN:		
Post-development DCIA percentage:		%
Estimated BMPArea (No loading from this area)		AC

OVERWRITE DEFAULT CONCENTRATIONS:

	PRE:		POST:	
EMC(N):		mg/L		mg/L
EMC(P):		mg/L		mg/L

USE DEFAULT CONCENTRATIONS

Average annual pre runoff volume:		ac-ft/year
Average annual post runoff volume (note no BMP area):		ac-ft/year
Pre-development Annual Mass Loading - **Nitrogen:**		kg/year
Pre-development Annual Mass Loading - **Phosphorus:**		kg/year
Post-development Annual Mass Loading - **Nitrogen:**		kg/year
Post-development Annual Mass Loading - **Phosphorus:**		kg/year

CATCHMENT NO.3 CHARACTERISTICS:

CLICK ON CELL BELOW TO SELECT		
Pre-development land use:		
with default EMCs	CLICK ON CELL BELOW TO SELECT	
Post-development land use:		
with default EMCs		
Total pre-development catchment area:		AC
Total post-development catchment or BMP analysis area:		AC
Pre-development Non DCIA CN:		
Pre-development DCIA percentage:		%
Post-development Non DCIA CN:		
Post-development DCIA percentage:		%
Estimated BMPArea (no loading from this area)		AC

OVERWRITE DEFAULT CONCENTRATIONS:

	PRE:		POST:	
EMC(N):		mg/L		mg/L
EMC(P):		mg/L		mg/L

USE DEFAULT CONCENTRATIONS

Average annual pre runoff volume:		ac-ft/year
Average annual post runoff volume (note no BMP area):		ac-ft/year
Pre-development Annual Mass Loading - **Nitrogen:**		kg/year
Pre-development Annual Mass Loading - **Phosphorus:**		kg/year
Post-development Annual Mass Loading - **Nitrogen:**		kg/year
Post-development Annual Mass Loading - **Phosphorus:**		kg/year

CATCHMENT NO.4 CHARACTERISTICS:

CLICK ON CELL BELOW TO SELECT		
Pre-development land use:		
with default EMCs	CLICK ON CELL BELOW TO SELECT	
Post-development land use:		
with default EMCs		
Total pre-development catchment area:		AC
Total post-development catchment or BMP analysis area:		AC
Pre-development Non DCIA CN:		
Pre-development DCIA percentage:		%
Post-development Non DCIA CN:		
Post-development DCIA percentage:		%
Estimated BMPArea (no loading from this area)		AC

OVERWRITE DEFAULT CONCENTRATIONS:

	PRE:		POST:	
EMC(N):		mg/L		mg/L
EMC(P):		mg/L		mg/L

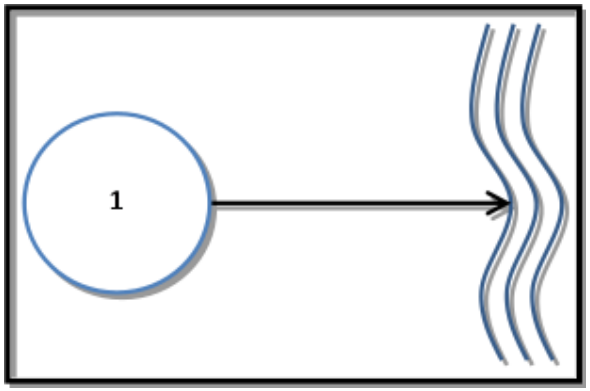
USE DEFAULT CONCENTRATIONS

Average annual pre runoff volume:		ac-ft/year
Average annual post runoff volume (note no BMP area):		ac-ft/year
Pre-development Annual Mass Loading - **Nitrogen:**		kg/year
Pre-development Annual Mass Loading - **Phosphorus:**		kg/year
Post-development Annual Mass Loading - **Nitrogen:**		kg/year
Post-development Annual Mass Loading - **Phosphorus:**		kg/year

STORMWATER TREATMENT ANALYSIS:	V 7.6	GO TO GENERAL SITE INFORMATION PAGE	Blue Numbers =	Input data
			Red Numbers =	Calculated

If not done, specify pre- and post-development watershed characteristics.

GO TO WATERSHED CHARACTERISTICS



Total Required Treatment Efficiency:

Required Treatment Eff (**Nitrogen**):	34.829	%
Required Treatment Eff (**Phosphorus**):	34.829	%

Select one of the BMPs below to analyze efficiency or review the summary data.

RETENTION BASIN	WET DETENTION	EXFILTRATION TRENCH	RAIN GARDEN	SWALE	USER DEFINED BMP
PERVIOUS PAVEMENT	STORMWATER HARVESTING	FILTRATION including Up-Flow Filters	LINED REUSE POND & UNDERDRAIN INPUT		
GREENROOF	RAINWATER HARVESTING	MANAGED AQUATIC PLANTS			
VEGETATED NATURAL BUFFER	VEGETATED FILTER STRIP	TREE WELL			

NOTE !!!: All individual system must be sized prior to being analyzed in conjunction with other systems. Please read instructions in the CATCHMENT AND TREATMENT SUMMARY RESULTS tab for more information.

CATCHMENT AND TREATMENT SUMMARY RESULTS

RETENTION BASIN: V 7.6

Blue Numbers =	Input data
Red Numbers =	Calculated or Carryover

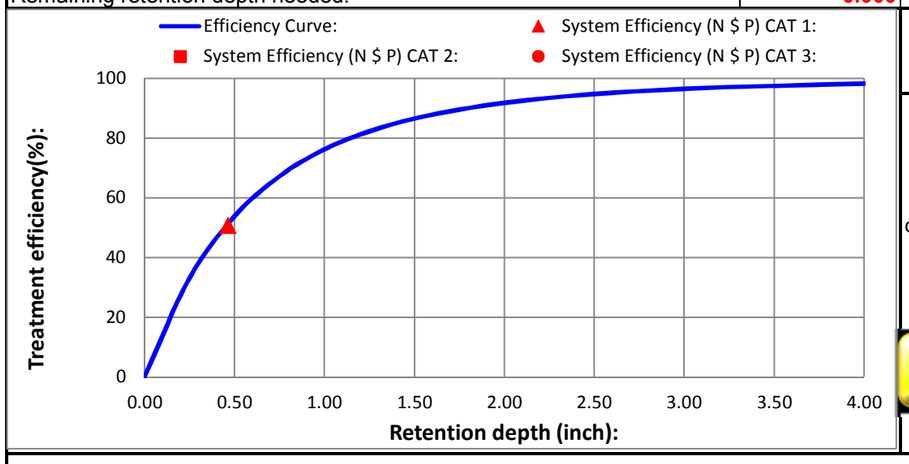
RETENTION BASIN SERVING: Midway Road PD&E Study Basin 2-3

GO TO STORMWATER TREATMENT ANALYSIS

Loadings from BMP area are contained by the BMP, thus no BMP area load.	Catchment 1	Catchment 2	Catchment 3	Catchment 4	
Watershed area cotributing to basin:	24.660	0.000	0.000	0.000	ac
Required Treatment Eff (**Nitrogen**):	34.829				%
Required Treatment Eff (**Phosphorus**):	34.829				%
Required retention depth over the watershed to meet required efficiency:	0.271	0.000	0.000	0.000	in
Required water quality retention volume:	0.556	0.000	0.000	0.000	ac-ft

RETENTION BASIN FOR MULTIPLE TREATMENT SYSTEMS (if there is a need for additional removal efficiencies in a series of BMPs):

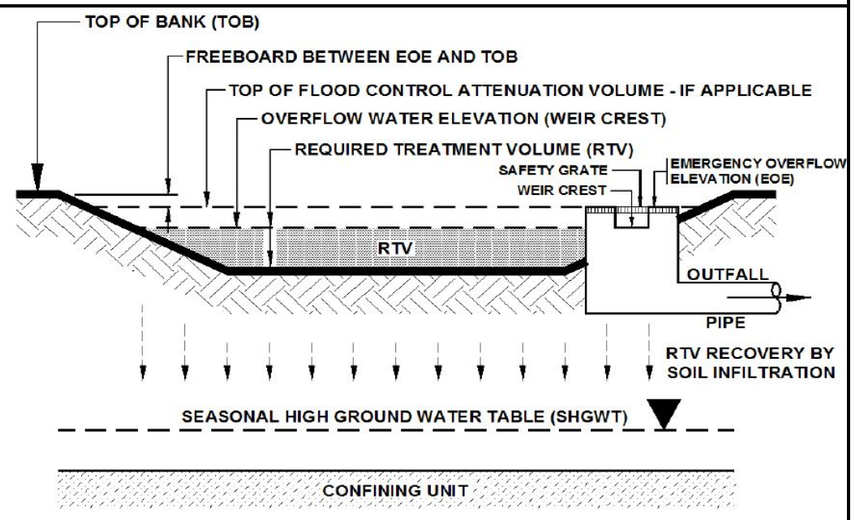
Retention volume based on retention depth and total area	1.166	0.000	0.000	0.000	ac-ft
Provided retention depth (inches over the watershed area):	0.463				in
Provided treatment efficiency (**Nitrogen**):	50.728	0.000	0.000	0.000	%
Provided treatment efficiency (**Phosphorus**):	50.728	0.000	0.000	0.000	%
Remaining treatment efficiency (**Nitrogen**):	0.000				%
Remaining treatment efficiency (**Phosphorus**):	0.000				%
Remaining retention depth needed:	0.000	0.000	0.000	0.000	in



NOTE FOR TREATMENT EFFICIENCY GRAPH:

The purpose of this graph is to help illustrate the treatment efficiency of the retention system as the function of retention depth **for a single BMP and in a single catchment**. The graph illustrates that there is a diminished return as the retention depth is increased. Thus evaluations of other alternatives in "treatment trains" and compensatory treatment should be considered.

HELP - EXAMPLE PROBLEM 3



TYPICAL CROSS SECTION OF A "DRY" RETENTION SYSTEM

View Media Mixes

Use only donw flow media mix before water enters the ground, specify type	Catchment 1	Catchment 2	Catchment 3	Catchment 4
Nitrogen mass reduction in groundwater discharge (%)				
Phosphorus mass reduction in groundwater discharge (%)				

Source of Graphic: draft **STORMWATER QUALITY APPLICANT'S HANDBOOK** dated March 2010, by the Department of Environmental Protection, available at: http://www.dep.state.fl.us/water/wetlands/erp/rules/stormwater, March 2010.

WET DETENTION: V 7.6

Blue Numbers =	Input data
Red Numbers =	Calculated or Carryover

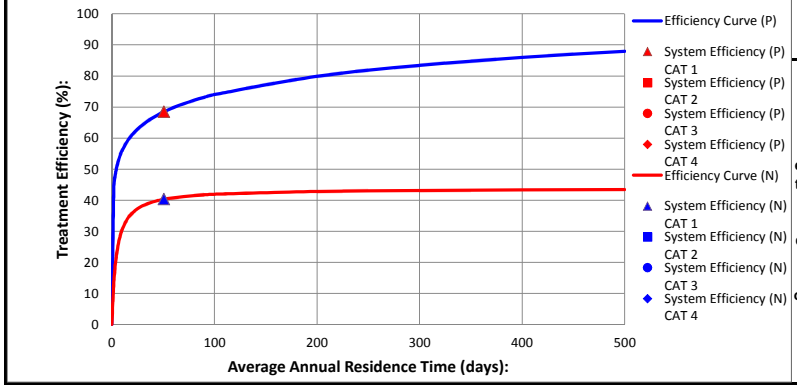
WET DETENTION POND SERVING: Midway Road PD&E Study Basin 2-3

Loadings from BMP area are contained by the BMP, thus no BMP area load.

	Catchment 1	Catchment 2	Catchment 3	Catchment 4	
Total pre-development catchment area:	30.210	0.000	0.000	0.000	ac
Total post-development catchment area:	24.660	0.000	0.000	0.000	ac
Average annual residence time (between 1 and 500 days):	50.80				days
Littoral Zone or other improvements used?	NO				
Littoral Zone or other improvement efficiency credit:	0.00				%
Total **Nitrogen** removal required:	34.829				%
Total **Phosphorus** removal required:	34.829				%
Total **Nitrogen** removal efficiency provided:	40.277				%
Total **Phosphorous** removal efficiency provided:	68.445				%
Is the wet detention sufficient:	YES				
Average annual runoff volume into the pond:	68.076				ac-ft/yr

To Achieve the Treatment Efficiency Shown in the Graph Below, the Following Must Hold

Minimum Pond Permanent Pool Volume:	9.475				ac-ft



NOTE FOR TREATMENT EFFICIENCY GRAPH:

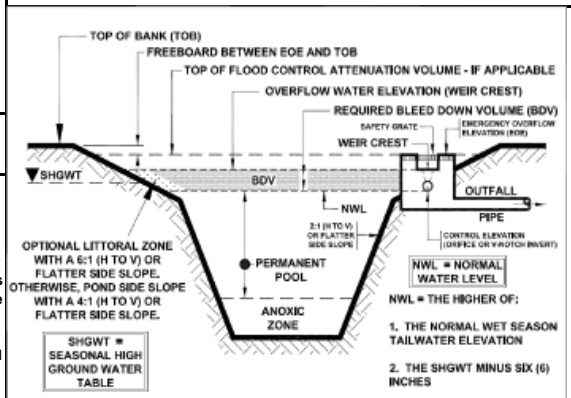
The purpose of the treatment efficiency graphs is to help illustrate the treatment efficiency of the wet detention system as the function of average annual residence time (and permanent pool volume). The graph illustrates that there is a point of diminished return as the permanent pool volume is substantially increased. The lines are produced from the conditions of catchment one, thus other catchments are shown with the data points.

GO TO STORMWATER TREATMENT ANALYSIS

HELP - EXAMPLE PROBLEM 4

REQUIRED REMAINING TREATMENT EFFICIENCIES OF TREATMENT SYSTEM IN SERIES WITH WET DETENTION. USE FOR SIZING OF TREATMENT SYSTEM IN SERIES WITH WET DETENTION.

	Catchment 1	Catchment 2	Catchment 3	Catchment 4	
Remaining treatment efficiency needed (**Nitrogen**):	0.000				%
Remaining treatment efficiency needed (**Phosphorus**):	0.000				%



TYPICAL X-SECTION OF A WET DETENTION SYSTEM

Source of Graphic: draft **STORMWATER QUALITY APPLICANT'S HANDBOOK** dated March 2010, by the Department of Environmental Protection, available at: http://www.dep.state.fl.us/water/wetlands/erp/rules/stormwater, March 2010

CATCHMENTS AND TREATMENT SUMMARY RESULTS V 7.6

CALCULATION METHODS:

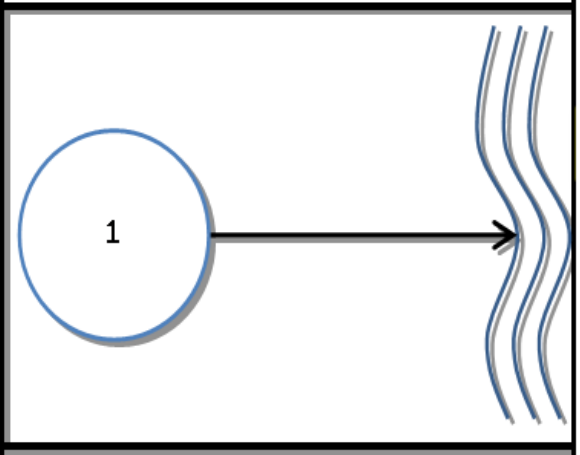
1. The effectiveness of each BMP in a single catchment is converted to an equivalent capture volume.
2. Certain BMP treatment train combinations have not been evaluated and in practice they are at this time not used, an example is a greenroof following a tree well.
3. Wet detention is last when used in a single catchment with other BMPs, except when followed by filtration

PROJECT TITLE	Midway Road PD&E Study Basin 2-3	Optional Identification		
	Catchment 1:	Catchment 2:	Catchment 3:	Catchment 4:
BMP Name	Retention Basin			
BMP Name	Wet Detention			
BMP Name				

Summary Performance of Entire Watershed

Catchment Configuration	A - Single Catchment		3/22/2016
Nitrogen Pre Load (kg/yr)	83.17		BMPTRAINS MODEL
Phosphorus Pre Load (kg/yr)	10.94		
Nitrogen Post Load (kg/yr)	127.61		
Phosphorus Post Load (kg/yr)	16.79		
Target Load Reduction (N) %	34.8		
Target Load Reduction (P) %	34.8		
Target Discharge Load, N (kg/yr)	83.17		
Target Discharge Load, P (kg/yr)	10.94		
Provided Overall Efficiency, N (%):	59.7		
Provided Overall Efficiency, P (%):	80.9		
Discharged Load, N (kg/yr & lb/yr):	51.38	113.18	
Discharged Load, P (kg/yr & lb/yr):	3.21	7.07	
Load Removed, N (kg/yr & lb/yr):	76.23	167.90	
Load Removed, P (kg/yr & lb/yr):	13.58	29.91	

Treatment Objectives or Target MET



APPENDIX 6

Site Visit Pictures

POND A

PERIMETER DITCH AROUND POND A

CONSTRUCTION OF BOX CULVERT FOR
CANAL C-103 FOR ADJACENT PROJECT

PERIMETER DITCH AROUND POND A

POND A CONTROL STRUCTURE

MIDWAY ROAD FROM S JENKINS ROAD

POND A

PERIMETER DITCH AROUND POND A

COUNTY ACQUIRED SITE FOR POND 1

CANAL C-103

CANAL C-103

CANAL C-103

MIDWAY ROAD FROM S JENKINS ROAD

CANAL C-103

CULVERT BENEATH S JENKINS ROAD

CULVERT BENEATH S JENKINS ROAD

CANAL C-103

CANAL C-103

CANAL C-103

CANAL C-103

CONSTRUCTION OF PERMITTED PROJECT No. 56-00833-S

CONSTRUCTION OF PERMITTED PROJECT No. 56-00833-S

CONSTRUCTION OF PERMITTED PROJECT No. 56-00833-S

CONSTRUCTION OF PERMITTED PROJECT No. 56-00833-S

CONSTRUCTION OF POND 2/3 FOR
PERMITTED PROJECT No. 56-00833-S

CONSTRUCTION OF PERMITTED PROJECT No. 56-00833-S

CANAL C-103

CONSTRUCTION OF POND 2/3 FOR
PERMITTED PROJECT No. 56-00833-S

APPENDIX 7

Cultural Resource Assessment Survey

Memo

To: Lynn Kelley, FDOT District 4
From: Diane K. Kloetzer, Janus Research
Date: 02/17/2016
Re: Desktop Analysis of Three Potential Pond sites for Midway Road from Glades Cut Off Road to Selvitz Road, St. Lucie County, Florida (Financial Project ID: 231440-3-22-01; ETDM No. 14177)

At the request of the Florida Department of Transportation (FDOT), District 4 Janus Research conducted a desktop analysis of potential pond site locations for Midway Road/CR 712 from Glades Cut Off Road to Selvitz Road, St. Lucie County, Florida (Figure 1). The study area consists of three potential pond sites. The project corridor was surveyed during the *Cultural Resource Assessment Survey of Midway Road/County Road 712 Project Development and Environment (PD&E) Study from Glades Cut Off Road to Selvitz Road, St. Lucie County, Florida* (Janus Research 2016).

The proposed pond sites are located in Section 1 of Township 36 South, Range 39 East and Section 6 of Township 36 South, Range 40 East on the Fort Pierce NW (1949 Photorevised [PR] 1983) and Fort Pierce SW (1953 PR 1983) United States Geological Survey (USGS) quadrangle maps.

The purpose of this pond siting analysis was to determine the location of any previously recorded cultural resources within or adjacent to the proposed pond sites and to determine archaeological site probability for each of the pond locations.

Methods

An archaeological and historical literature and background information search pertinent to the proposed pond site locations was conducted in order to determine the types, chronological placement, and location patterning of cultural resources within the pond site locations. This included a search of the Florida Master Site File (FMSF)[1], historic maps, county and local site inventories, books and journal articles, and unpublished CRM reports. In addition, land use history and environmental variables known to be associated with prehistoric and historic sites were reviewed.

The study area for archaeological resources was the proposed pond footprints and an area measuring 150 feet adjacent to the pond footprints in order to identify any previously recorded sites directly adjacent to the pond site locations.

[1] The FMSF serves as an archive and repository of information about Florida's recorded cultural resources. It represents an inventory of resources for which available information exists and describes their condition at a particular point of time. Because the inventory of resources is not all-inclusive on a statewide basis, gaps in data may exist. The FMSF is an important planning tool that assists in identifying potential cultural resources issues and resources that may warrant further investigation and protection. It can be used as a guide but should not be used to determine the Division of Historical Resources'/State Historic Preservation Office's (FDHR/SHPO) official position about the significance of a resource.

Figure 1: General Location of the Project Area

The study area for historic resources was the footprint of the pond sites and adjacent parcels up to 200 feet.

Background research methods included a search of the FMSF to identify cultural resources that are listed, eligible, or potentially eligible for listing in the *National Register of Historic Places* (National Register) and resources with potential or confirmed human remains.

A review of the General Land Office (GLO) historic plat maps and historic aerial photographs was also conducted in order to establish the pre-development environment and land use history of the proposed pond sites, as well as to identify any potential historic resources within the pond sites.

Background Research

Florida Master Site File

The work of previous investigators was reviewed in order to gather information about the types of precolumbian and early historic period sites that could be expected to occur within the pond siting alternatives. A search of pertinent literature and records was conducted to determine the locations of previously recorded National Register–listed, eligible, and potentially eligible resources within proposed pond sites, as well as any archaeological and historical assessments of other tracts of land within 200 feet.

The FMSF search identified one previously conducted cultural resource survey within or adjacent to the proposed ponds. FMSF Survey No. 9684, *St. Lucie County Historic Resources Survey* (Janus Research 2003) is a county-wide historic resources survey of the unincorporated areas of St. Lucie County. The study area has not been subject to a comprehensive cultural resource survey.

Archaeological Sites

No previously recorded archaeological sites were identified within the study area.

Historic Structures

No previously recorded historic structures were identified within the study area.

Historic Cemeteries

No previously recorded historic cemeteries were identified within the study area.

Historic Resource Groups

No previously recorded historic resource groups were identified within the study area.

Historic Linear Resources

The FMSF search identified three previously recorded linear resources within the study area (Table 1; Figure 2). The portions of Midway Road (8SL1657) and Canal 103 (8SL1809) to the east of the Florida's Turnpike have been determined ineligible for listing in the National Register by the SHPO. The portions of Midway Road (8SL1657) and Canal 103 (8SL1809) to the west of the Florida's Turnpike and the Florida's Turnpike (8SL1789) were considered National Register-ineligible in the CRAS survey (Janus Research 2016). As of January 2016, the three resources have not been further evaluated by the SHPO.

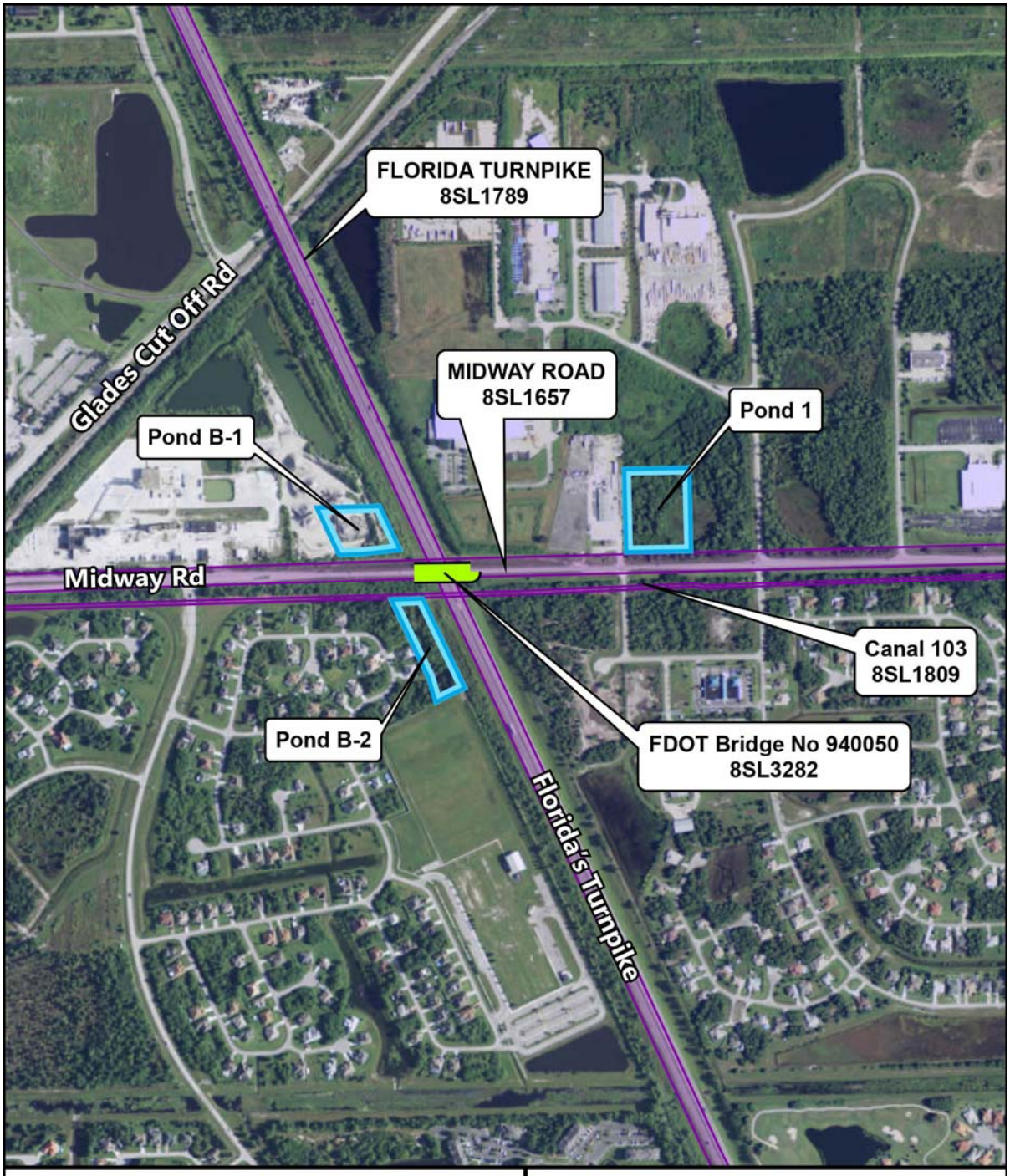


Figure 2: Previously Recorded Historic Resources

Midway Road Ponds from Glades Cut Off Road to Selviz Road
(FP ID. 231440-3-22-01)

Proposed Pond

Previously Recorded Linear Resource

Previously Identified Historic Bridge

0 500 1,000 Feet

TABLE 1: PREVIOUSLY RECORDED HISTORIC RESOURCES WITHIN THE STUDY AREA				
Site #	**Site Name**	**Date**	**Style**	**National Register Status**
8SL1657	Midway Road	c. 1890	Historic road segment	Portions considered and determined National Register–ineligible within APE
8SL1789	Florida's Turnpike	c. 1957	Historic road Segment	Portion considered National Register–ineligible within APE
8SL1809	Canal 103	c. 1920	Historic canal segment	Portion considered National Register–ineligible within APE

Historic Districts
No previously recorded historic districts were identified within the study area.

Historic Bridges
One historic bridge, FDOT Bridge No. 940050 (8SL3282), was identified within the study area (Figure 2). FDOT Bridge No. 940050 (8SL3282) was identified during the CRAS of the project corridor (Janus Research 2016) and is considered ineligible for listing in the National Register. As of January 2016, the resource has not been evaluated by SHPO.

Historic Parcels
A search of the St. Lucie County Property Appraiser data identified no parcels within or adjacent to the proposed pond sites that have a historic build date during or before 1968.

Environmental Setting
A review of the General Land Office (GLO) historic plat maps (Florida Department of Environmental Protection [FDEP] 1853a, 1853b) and surveyor's field notes (FDEP 1845, 1853c, 1853d) was conducted to examine past environmental conditions within the vicinity of the archeological APE. The historic surveyor's notes describe the project area as 2rd rate pineland. No hammocks are illustrated or described in the vicinity of the project area.

The historic plat maps and surveyor's notes were also reviewed for evidence of other early settlement. There are no military forts, roads, encampments, battlefields, homesteads, or historic Native American villages or trails depicted on the plat maps in the vicinity of the proposed pond sites alternatives.

A review of aerial photograph from 1944 (University of Florida, George A. Smathers Libraries 2014) was conducted to examine land use during the mid-1900s. In 1944, Midway Road and Canal 103 were present. The study area was undeveloped with only a few scattered trees. Ponds were located just to the east of proposed Pond B-2 and in the southeastern portion of Pond 1. No hammocks are visible within the study area.

The *Soil Survey of St. Lucie County Area, Florida* (USDA 1980) was reviewed to help determine the predevelopment environment, assess the level of modification, and identify natural features within the project corridor indicative of increased archaeological site potential. The project area is located within the Nettles-Ankona-Pepper soil association (USDA 1980:7–8). These soils are poorly drained and found on broad flatwoods interspersed with depressional areas and sloughs. The characteristics of the soils present in the study area are described in Table 2.

TABLE 2: SOIL CHARACTERISTICS WITHIN THE PROJECT APE

Drainage Characteristics	Soil Type	Environmental Association
Poorly Drained	Nettles sand	This soil is found on broad flatwoods. Natural vegetation includes south Florida slash pine, cabbage palm, saw palmetto, wax myrtle, inkberry, fetterbush, bluestems, and threeawns.
	Wabasso sand	This soil is found on flatwoods. Natural vegetation consists of longleaf or slash pine, cabbage palm, saw palmetto, running oak, inkberry, fetterbush, bluestems, and threeawns.

USDA 1980: 29–30, 43–44

Archaeological Probability

The site file search and literature review contributed to the determination of the archaeological site potential for the study area. Typically, four environmental factors are employed in predicting site locations: soil type (soil drainage), distance to fresh (potable) water, distance to hardwood hammocks, and topography.

Numerous researchers have successfully used drainage characteristics of soil in the formulation of site location predictive models. In general, archaeological sites are associated with better drained soils. Although wet areas can contain abundant wildlife and plant resources, they make poorer habitation areas when better-drained locations are available. Modern drainage and development have changed the historical drainage patterns and overall environment of the project corridor and surrounding area during the past century. As previously mentioned, the soils in the project APE are poorly drained (Table 2).

Fresh water is obviously an important resource, as the need for water is universal. This variable would have been of greater importance during the Paleoindian and Early Archaic periods (12,000–5000 BC) when the perched water system was more restricted. Access to water during these early periods would have been from sinkholes and aquifer-fed rivers. In precolumbian times, wetland ponds were located within Pond 1 and adjacent to Pond B-2.

The study area is located in the Eastern Valley. The terrain is relatively flat with an elevation between 15 and 20 feet above sea level.

With the easy availability of water, a greater importance would have been placed on the resources, increased elevation, and other benefits provided by hardwood hammocks. The presence of hammock vegetation serves as a reliable indicator of site location in Florida, and the use of hammocks during the precontact and historic periods is well documented. No hammocks were identified on the 19th century plat maps and surveyor's notes or the 1944 aerial photograph.

Based on these factors, the proposed Pond 1, Pond B-1, and Pond B-2 have low archaeological site potential.

Summary

This research of the three proposed pond sites did not identify any previously recorded archaeological sites within or adjacent to the proposed pond sites. The proposed ponds are located in areas with poorly drained soils indicative of the past pine flatwoods environment. The three proposed pond locations have low archaeological site potential.

Three previously recorded linear resources and a previously identified historic bridge were identified within the historic resources study area. The historic bridge (FDOT Bridge No. 940050 (8SL3282) was identified during the CRAS of the Midway Road corridor (Janus Research 2016) and is considered ineligible for listing in the National Register. The three linear resources, Midway Road (8SL1657), Florida's Turnpike (8SL1789), and Canal 103 (8SL1809), are previously recorded and portions within the study area were previously determined ineligible for listing in the National Register by the SHPO. The portions of the three resources which have not been previously determined ineligible were considered ineligible for listing in the National Register during the CRAS survey (Janus Research 2016). As of January 2016, the four historic resources have not been evaluated by the SHPO. No historic parcels or unrecorded historic resources were identified within the study area.

References

Florida Department of Environmental Protection (FDEP)

1845b Surveyor's Notes for Township 36 South, Range 40 East. Electronic document, http://labins.org/survey_data/landrecords/landrecords.cfm, accessed September 29, 2014.

1853a Plat Map for Township 36 South, Range 39 East. Division of State Lands, Board of Trustees Land Document System. Electronic document, http://tlhdslweb.dep.state.fl.us/, accessed September 29, 2014.

1853b Plat Map for Township 36 South, Range 40 East. Division of State Lands, Board of Trustees Land Document System. Electronic document, http://tlhdslweb.dep.state.fl.us/, accessed September 29, 2014.

1853c Surveyor's Notes for Township 36 South, Range 39 East. Electronic document, http://labins.org/survey_data/landrecords/landrecords.cfm, accessed September 29, 2014.

1853d Surveyor's Notes for Township 36 South, Range 40 East. Electronic document, http://labins.org/survey_data/landrecords/landrecords.cfm, accessed September 29, 2014.

Janus Research

2016 Cultural Resource Assessment Survey Midway Road/County Road 712 Project Development and Environment (PD&E) Study from Glades Cut Off Road to Selvitz Road, St. Lucie County, Florida. Manuscript on file, Florida Department of Transportation, District 4, Fort Lauderdale.

United States Department of Agriculture (USDA)

1980 *Soil Survey of the St. Lucie County Area, Florida.* United States Department of Agriculture/Natural Resources Conservation Service.

University of Florida, George A. Smathers Libraries

2014 Aerial Photography: Florida Collection. University of Florida Digital Collections. Electronic documents, http://ufdc.ufl.edu/aerials, accessed September 29, 2014.

APPENDIX 8

Wetland Evaluation Report

WETLAND EVALUATION REPORT

for

Midway Road (County Road 712)
Project Development and Environment (PD&E) Study
From Glades Cut Off Road to Selvitz Road
St. Lucie County, Florida

Financial Project ID: 231440-3-22-01
ETDM Number: 14177

Prepared for:

Florida Department of Transportation
District IV
3400 West Commercial Boulevard
Fort Lauderdale, Florida 33309

June 2016

WETLAND EVALUATION REPORT

for

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Prepared for:

Florida Department of Transportation
District IV
3400 West Commercial Boulevard
Fort Lauderdale, Florida 33309

June 2016

Prepared by:
Kimley-Horn and Associates, Inc.

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EXECUTIVE SUMMARY

In accordance with Presidential Executive Order 11990, Federal Highway Administration (FHWA) Technical Advisory T6640.8A and the Florida Department of Transportation (FDOT) *Project Development and Environment (PD&E) Manual*, Part 2, Chapter 18 (revised April 24, 2013), a wetland evaluation was conducted for the proposed widening of Midway Road (CR 712) between Glades Cut Off Road and Selvitz Road in St. Lucie County, Florida. The project was screened through the Efficient Transportation Decision Making (ETDM) Environmental Screening Tool (EST) and the programming screen was published on May 27, 2015 (ETDM #14177 -https://etdmpub.fla-etat.org/est/).

The purpose of this report is to identify wetlands and other surface waters within the project area, evaluate potential wetland and surface water impacts, identify measures to avoid and minimize impacts, and identify conceptual mitigation options.

The proposed "action" under consideration is the widening of Midway Road (CR 712) from two to four lanes and the construction of stormwater management ponds. Two build alternatives were considered and compared to the No Build Alternative. Alternative 1 (Canal Avoidance) generally widens the road north of the existing while Alternative 2 (Box Culvert) generally widens the road to the south of the existing. Alternative 2 would result in culverting Canal 103 similar to the design currently under construction to the east between Selvitz Road and 25th Street.

Direct and secondary impacts to wetlands range from 0.36 (Alternative 1) to 0.07 (Alternative 2) and impacts to surface waters range from 1.54 acres (Alternative 1) to 3.95 acres (Alternative 2). Mitigation for surface waters will not be required, though South Florida Water Management District (SFWMD) will require a mechanism for air exchange for Alternative 2 which culverts Canal 103. Mitigation would be provided for direct and secondary wetland impacts through purchase of mitigation credits in Bluefield Mitigation Bank.

FDOT commits to the following measures to minimize and mitigate potential impacts to wetlands and water quality:

- If Alternative 2 is preferred, mechanisms will be included in the culvert design to allow for air exchange.
- Best Management Practices (BMP's) will also be implemented in order to reduce sediment transport and minimize erosion.

1.0 INTRODUCTION

In accordance with Presidential Executive Order 11990, Federal Highway Administration (FHWA) Technical Advisory T6640.8A and the Florida Department of Transportation (FDOT) *Project Development and Environment (PD&E) Manual*, Part 2, Chapter 18 (revised April 24, 2013), a wetland evaluation was conducted for the proposed widening of Midway Road (CR 712) between Glades Cut Off Road and Selvitz Road in St. Lucie County, Florida. See ***Location Map - Figure 1***. The project was screened through the Efficient Transportation Decision Making (ETDM) Environmental Screening Tool (EST) and the programming screen was published on May 27, 2015 (ETDM #14177 -https://etdmpub.fla-etat.org/est/).

The purpose of this report is to identify wetlands and other surface waters within the project area, evaluate potential wetland and surface water impacts, identify measures to avoid and minimize impacts, and identify conceptual mitigation options.

The proposed "action" under consideration is the widening of Midway Road (CR 712) from two to four lanes and the construction of stormwater management ponds.

2.0 PROJECT DESCRIPTION

The Midway Road (CR 712) project corridor is centrally located in the eastern part of St. Lucie County, Florida, and is owned and maintained by St. Lucie County. The project corridor extends approximately 1.6 miles along Midway Road (CR 712) (Roadway ID 94530000), from Glades Cut Off Road (Mile Post 5.813) (CR 709) to Selvitz Road (Mile Post 7.405) (CR 615). The project ties into the existing 4-lane section to the west of Glades Cut Off Road and to future 4-lane segments from Selvitz Road to just east of US Highway 1. The project corridor is located in unincorporated St. Lucie County but is the northern border to the City of Port St. Lucie (See ***Figure 1***).

Midway Road (CR 712) is a major east-west roadway that provides a vital connection to residents and commuters to and from Interstate 95 (I-95) to the commercial areas along US 1. Within the project limits, Midway Road (CR 712) is a two-lane undivided roadway with a varying posted speed from 35 to 45 miles per hour (mph). It is functionally classified as an Urban Principal Arterial and is designated as a hurricane evacuation route by the Florida Division of Emergency Management. The existing roadway typical section consists of two 12-foot lanes, one in each direction, and the existing right-of-way (R/W) varies with a minimum width of 70 feet. The land uses consist of residential, commercial, government, and industrial facilities, such as Tropicana Products, Inc., CEMEX, Packers of Indian River Ltd., US Post Office, St. Lucie County Sheriff's Office, and New Horizons of the Treasure Coast, Inc.

The study corridor includes a bridge (ID 940050) over Florida's Turnpike (SR 91). The Florida East Coast (FEC) railroad traverses the corridor by running adjacent and parallel to the Glades Cut Off Road. Canal 103, which was previously owned and maintained by the North St. Lucie Water Control District (NSLWCD) but is now owned and maintained by St. Lucie County, is the principal receiving water body for the project area and conveys stormwater from the west side of Florida's Turnpike through an existing concrete box culvert. The canal runs parallel along the south side of Midway Road (CR 712) and, after Selvitz Road, it diverges and continues southeasterly to discharge into the North Fork of the St. Lucie River (NFSLR or North Fork). Canal 103 is currently being culverted from Selvitz to 25th Street as part of St. Lucie County's widening of Midway Road in this segment. The North Fork is designated as an Outstanding Florida Water (OFW) and an Aquatic Preserve. It is the main collector water body in St. Lucie County and

discharges into the Indian River Lagoon. The canal, along with the adjacent vegetative buffer, provides a physical separation to the residential homes on the south side.

The Midway Road/CR 712 PD&E Study from Glades Cut Off Road to Selvitz Road will evaluate alternatives to widen the existing road from two to four lanes within the project limits in order to satisfy future traffic demand and capacity needs. The proposed study will also consider pedestrian, bicycle, and transit facilities and improvements to freight mobility, and it will evaluate operational improvements and access management into some commercial businesses along the project corridor. Additional right-of- way requirements will be evaluated during the PD&E study for offsite ponds in order to meet stormwater management requirements.

2.1 PURPOSE AND NEED

Based on recent traffic data from St. Lucie County, the facility does not adequately handle the existing traffic demand. Without capacity improvements, the traffic operations along the corridor will continue to deteriorate. The primary purpose for this project is to provide additional capacity to meet existing and future traffic needs, improve safety by alleviating existing roadway and capacity deficiencies, and allow opportunities for pedestrian, bicycle, and transit facilities. The additional capacity will also improve freight mobility and enhance emergency evacuation along the project corridor. The purpose and need of this project are further described below and include Transportation Demand, Capacity, Plan Consistency, Social Demands and Economic Development, Modal Interrelationships, and Roadway Deficiencies.

Transportation Demand

The US Census-designated Port St. Lucie-Fort Pierce Metropolitan Statistical Area has been identified as one of the fastest growing metropolitan areas in Florida, which includes all of Martin and St. Lucie counties. From 2000 to 2010, this metropolitan area has experienced population growth from 319,426 persons in 2000 to 424,107 persons in 2010, representing an annual increase of 2.9%. Evaluating the population growth for the City of Port St. Lucie by itself revealed an even greater percentage increase. According to the Bureau of Economic and Business Research, the City has grown from a population of 88,769 in 2000 to 164,603 in 2010, representing an annual increase of 6.4%.

This rapid population growth has resulted in a significant increase in surface transportation demand along major arterials such as the Midway Road (CR 712) corridor. The population of the Port St. Lucie-Fort Pierce metropolitan area is projected to increase from 424,107 persons in year 2010 to 648,600 persons in year 2035, representing a growth of approximately 53% (Bureau of Economic Business Research).

As the population in the metropolitan area continues to increase, the developments in St. Lucie County will continue to push westward. In addition, the county is anticipated to experience traffic growth from the Developments of Regional Impact (DRI). A review of the recent DRI applications in the Treasure Coast Regional Planning Council shows the following statuses for the DRIs in the vicinity of the project corridor:

Completed - Orange Blossom Mall and St. Lucie West

Approved - The Reserve

Pending Notice of Proposed Change - LTC Ranch

Withdrawn - Provences and Orchard Park

The DRI located along Midway Road (CR 712), which is LTC Ranch, would have the greatest impact on the project corridor if constructed. As currently approved, the development includes 4,000 dwelling units of residential, over 1,505,000 square feet (sq. ft.) of office space, 725,000 sq. ft. of retail, and 1,960,200 sq. ft. of industrial space. However, the status of this development is pending Notice of Proposed Change that may result in a change in the size of the approved development.

The approval of the LTC Ranch DRI will further increase the transportation demand resulting in congested conditions along the project corridor. Since Midway Road (CR 712) is one of the vital east-west corridors in St. Lucie County, it is critical to increase capacity to meet the anticipated future transportation demand.

Capacity

Traffic data obtained from the St. Lucie County Transportation Planning Organization (TPO) Traffic Counts and Level of Service Report shows that the 2012 Annual Average Daily Traffic (AADT) along Midway Road (CR 712) west of Selvitz Road is 16,820 vehicles. Evaluating this traffic data using the 2012 FDOT Quality/Level of Service Handbook, the LOS is F which is beyond the St. Lucie County's adopted LOS criteria of E. This traffic data shows that the existing volume is already exceeding the capacity of the corridor which indicates that the roadway is operating in oversaturated and undesirable conditions. Furthermore, due to the industrial properties along the corridor, it has a high truck percentage at over 7% (Florida Traffic Online).

The traffic is anticipated to increase to 29,200 AADT by 2040 and the corridor will continue to operate at LOS F with degraded traffic operation unless the capacity is increased. The future traffic projections are based on the FDOT District Four Design Traffic Technical Memorandum for the I-95 PD&E Study from north of Becker Road to south of SR 70. This project utilized the Greater Treasure Coast Regional Planning Model as the basis for the future traffic projections. Without improvements, the congestion on the Midway Road (CR 712) project corridor will continue to operate at unacceptable driving conditions for residents and commuters due to the increased traffic volumes.

Plan Consistency

Martin and St. Lucie counties have independent Metropolitan Planning Organization/Transportation Planning Organization (MPO/TPO) but share a common Regional Long Range Transportation Plan (RLRTP). The RLRTP establishes a unified strategy for transportation priorities and funding and creates a joint decision-making process regarding regional transportation issues.

The Midway Road (CR 712) project corridor extends from Glades Cut Off Road to Selvitz Road and is identified in the Martin and St. Lucie 2035 RLRTP. The project is identified in the St. Lucie County TPO 2035 Cost Feasible Plan (2016-2035) with a 2021-2025 implementation horizon. In addition, the project will be included in the next update to the State Transportation Improvement Program and the St. Lucie TPO Transportation Improvement Program. It should be noted that on the south side of the project corridor a multipurpose trail has been identified in the 2035 RLRTP in Table 4-9 of the Needs Plan Development.

Social Demands & Economic Development

Evacuation: Serving as part of the evacuation route network established by the Florida Division of Emergency Management, Midway Road (CR 712) plays an important role in facilitating traffic during emergency evacuation periods as it connects other major highways and arterials designated on the state evacuation route network within the project limits. These facilities include Okeechobee Road (SR 70), I-95, Glades Cut Off Road (CR 709), Selvitz Road, South 25th Street (CR 615), Oleander Avenue (CR 605),

and US 1. During a twelve-month period in 2004-2005, St. Lucie County was hit directly by three major hurricanes. Midway Road (CR 712) is one of the county's most critical east-west routes and serves as a vital evacuation route for hurricanes or any other disasters. Additionally, widening Midway Road (CR 712) will ease traffic flow between South 25th Street and I-95, which will minimize a bottleneck effect during an emergency. It would also improve the ability of the local emergency management organization to evacuate large portions of the Treasure Coast in an acceptable timeframe which will enhance the safety of residents.

Economic Development: The Treasure Coast Planning Council Alternative Infill Development Plan developed for Martin and St. Lucie counties has identified several regional workplace districts located along the Midway Road (CR 712) corridor. These regional workplace districts are locations where business and economic development would be focused in order to provide jobs for residents within this metropolitan area. The Midway Road (CR 712) project area is a high-growth area. Important state and federal offices and nonprofit centers are located along Midway Road (CR 712) or nearby streets. This includes the main St. Lucie County Branch of the US Post Office, St. Lucie County Sheriff's Office, St. Lucie County Health Department, St. Lucie County Fire District Office, Hospice of the Treasure Coast, and New Horizons of the Treasure Coast, Inc. (a mental health center which is currently expanding). Significant truck traffic from the nearby St. Lucie County Landfill, CEMEX, Packers of Indian River Ltd., and Tropicana Products, Inc. place additional demands on the roadway. Meanwhile, new residential units are planned nearby. The St. Lucie County Fairgrounds, the County's Emergency Operations Center, is just six miles west of the project site.

According to the Martin and St. Lucie 2035 RLRTP, "The Regional Workplace Districts in St. Lucie County are located along the I-95 and Florida’s Turnpike corridors and include the Treasure Coast Education Research Development Authority (TCERDA) area; the Crossroads Park of Commerce; the existing Rinker and Tropicana facilities along Glades Cut Off Road; the LTC Ranch Commerce Park; St. Lucie West Commerce Park; and Torrey Pines Institute south of Tradition and Gatlin Boulevard. These districts are well-situated for regional access, have ample room to grow, and can provide jobs for local residents." The Midway Road (CR 712) project corridor is anticipated to serve as the main transportation corridor linking residents of both Martin and St. Lucie counties to this business area. Increasing the capacity along the project corridor will improve mobility and support the economic development of these districts as well as stimulate major construction activities that will contribute to economic growth within this area.

Modal Interrelationships

The accessibility to bicyclists and pedestrians along the corridor is minimal with only two sections of sidewalk within the corridor. They are located on the north side of Midway Road (CR 712) from East Torino Boulevard to Glades Cut Off Road and along the frontage of the recently constructed New Horizons medical facility. There are no bicycle lanes. During a recent field review (February 7, 2014), pedestrians were noted walking on the grassed shoulder while pushing a child's stroller. Additionally, the existing bridge over the Florida's Turnpike does not have sufficient shoulder width to accommodate pedestrian or bicycle traffic. A review of the Martin and St. Lucie 2035 RLRTP identified a multipurpose trail in Table 4-9 of the Needs Development Plan that would run along the entirety of Midway Road (CR 712) to connect with the other proposed multipurpose trails located on Okeechobee Road, Shin Road, Glades Cut Off Road, Selvitz Road, and Midway Road to the east.

The 2035 Future Bus and Train Network identified a proposed bus route along the entirety of Midway Road (CR 712) to connect to existing bus routes. Moreover, the County's Transit Development Plan from

February 2014 identified Midway Road (CR 712) as a priority corridor to implement transit. The project will create opportunities to include pedestrian, bicycle, and transit facilities along the project corridor.

Roadway Deficiencies

The Midway Road (CR 712) bridge structure (ID 940050) over the Florida's Turnpike is located at Mile Post 6.346 and was constructed in 1957. The last inspection of the bridge was performed on December 19, 2013. Although the report notes no structural deficiencies, the bridge is classified as functionally obsolete.

3.0 ALTERNATIVES CONSIDERED

Three build alternatives, including the Transportation System Management and Operations (TSMO) alternative, were developed and considered during the preliminary engineering phase of this study. The No-Build Alternative, TSMO Alternatives, and Build Alternative 1 (Canal Avoidance) and Build Alternative 2 (Box Culvert) are described below. See ***Appendix A – Typical Sections and Plans***.

No-Build Alternative

No improvements are made to Midway Road (CR 712) within the limits of the study.

Build Alternatives

Transportation System Management and Operations (TSMO) Alternatives

TSMO alternatives involve improvements designed to maximize the utilization and efficiency of the existing facility through improved system and demand management. The various TSMO options generally include traffic signal and intersection improvements, access management, and transit improvements. The additional capacity required to meet the projected traffic volumes along Midway Road (CR 712) in the design year cannot be provided solely through the implementation of TSMO improvements.

Build Alternative 1 (Canal Avoidance)

The typical section includes two, 11-foot travel lanes in each direction separated by a 22-foot median. Seven-foot buffered bike lanes would be provided in each direction located adjacent to the outside travel lanes. Type F curb and gutter is used along the inside and outside lanes and collects stormwater runoff which is then directed to stormwater retention ponds. A six-foot wide sidewalk would be provided on the north side of the roadway, and a 12-foot-wide shared-use path would be provided along the south side of the roadway. The alignment for this alternative would shift to the north to avoid impacts to Canal 103. This typical section requires a minimum of 153 feet of R/W. Since the existing County R/W width varies between 107 feet and 153 feet, from zero feet up to 46 feet of R/W would need to be acquired along the north side of the roadway. The design speed for this typical section would be 45 mph (See ***Appendix A***).

Build Alternative 2 (Box Culvert)

The roadway and pedestrian features of the typical section for this alternative are similar to Alternative 1 except that Canal 103 would be enclosed with a box culvert. The canal is located within R/W owned by both St. Lucie County and the City of Port St. Lucie. This typical section requires a minimum of 160 feet of R/W. Approximately 25 feet to 32.5 feet of R/W would need to be acquired from the City of Port St. Lucie along the south side of the roadway. Additionally, up to 28 feet of R/W would need to be acquired along the north side of the roadway. The design speed for this typical section would be 45 mph (See ***Appendix A***).

4.0 EXISTING ENVIRONMENTAL CHARACTERISTICS

4.1 EXISTING AND FUTURE LAND USE

4.1.1 Existing Land Use

The project study area includes the existing R/W of Midway Road between Glades Cut Off Road and Selvitz Road (project corridor), as well as an approximately 500-foot buffer area surrounding the project corridor (***Figure 1***). Existing land use within the project study area was determined through the interpretation of 1" = 100' scale aerial photography, review of land cover Geographic Information System (GIS) data obtained from the South Florida Water Management District (SFWMD), and field reconnaissance of the project corridor on July 2 and 15, 2015. Existing land use was mapped based on the *Florida Land Use, Cover and Forms Classification System* (FLUCFCS) (FDOT, 1999) for the project area and is depicted in ***Figure 2***.

The project study area that extends south from Midway Road is located within the city limits of the City of Port St. Lucie and the area that extends north of Midway Road is located within unincorporated St. Lucie County. The project study area can be generally characterized by existing roadways, medium and low density residential developments, food processing and industrial facilities (e.g. Tropicana Packers of Indian River, Cemex, etc.), governmental facilities (e.g. U.S. Post Office, St. Lucie County Sherriff's Office, Health Department, and Fire District), medical and health care (e.g. New Horizons of the Treasure Coast and Okeechobee), and wholesale and retail sales and services. Undeveloped land uses include freshwater marshes, improved pastures, and pine flatwoods. Existing roads and highways; however, make up the largest single land use within the project study area. The majority of the natural land uses observed within the project study area are located south of Midway Road within the residential developments or surrounding Jenkins Road, north of Midway Road.

4.1.2 Future Land Use

Future land use was determined based on a review of the St. Lucie County and City of Port St. Lucie Future Land Use (FLU) Maps (***Figure 3***). According to the St. Lucie County FLU map the project study area to the north of Midway Road is primarily Industrial (IND), Residential Suburban (RS), Public Facilities (P/F), Mixed Use (MXD), and Commercial (COM). According to the City of Port St. Lucie FLU map the project study area south of Midway Road is primarily Residential (RL), Open Space Conservation (OSC), Institutional (I), Service Commercial (CS), General Commercial (CG), Open Space-Recreational (OSR).

Within the study area, the Industrial FLU is located along the northwestern portion of the project adjacent to Florida's Turnpike and Glades Cut Off Road, Residential and Open Space Conservation FLU runs along the entire southern portion of the project as well as the northeastern project terminus. Public Facilities and Mixed Use FLU are centrally located approximately 1200 feet northwest of the Selvitz Road/Midway Road intersection. Commercial FLU is primarily found southwest of the Glades Cut Off Road/Midway Road intersection and north of the Selvitz Road/Midway Road intersection.

4.2 NATURAL AND BIOLOGICAL FEATURES

The assessment of natural and biological features, wetlands, and threatened and endangered species within the corridor included the review of the following data and documents:

- US Department of Agriculture Soil Conservation Service (USDA/SCS) *Soil Survey of St. Lucie County Area, Florida* (1980)

- Aerial photography (2012) obtained from FDOT
- Historical aerial photography from the FDOT Aerial Photo Look-up System (APLUS) and Publication of Archival Library and Museum Materials (PALMM)
- Habitat and species-specific information obtained from the US Fish and Wildlife Service (USFWS), the Florida Fish and Wildlife Conservation Commission (FWC), Florida Fish and Wildlife Research Institute (FWRI), Florida Geographic Data Library (FGDL), the Florida Natural Areas Inventory (FNAI), and St Lucie County.
- The Hydric Soils of Florida Handbook (2007)
- The US Geological Survey (USGS) 7.5-Minute Quadrangle Maps (2703 – Ankona; 2704 – Fort Pierce SW; 2803 – Fort Pierce; 2804 – Fort Pierce NW)
- The USFWS National Wetland Inventory (NWI) maps
- The USGS Groundwater Atlas of the United States
- The Federal Emergency Management Agency's (FEMA) Flood Insurance Rate Maps (FIRM)
- Review of the ETDM Programming Summary Report (Published May 27, 2015) – included in ***Appendix B.***

In addition to the review of databases, reports and other resources, field reconnaissance of the project study area was performed on July 2 and 15, 2015.

4.2.1 Land Cover

Upland (undeveloped) and wetland communities were observed within the project study area and habitat classifications have been assigned according to the FLUCFCS. The upland and wetland communities observed are depicted in ***Figure 2.*** A description of the observed communities, by FLUCFCS type, and calculated total acreages are provided in ***Table 1***.

The upland land cover was approximately 21.9% of the land cover in the study area and includes five (5) undeveloped, natural upland communities: undeveloped land within urban areas (FLUCFCS 191), improved pastures (FLUCFCS 211), pine flatwoods (FLUCFCS 411), Brazilian pepper (FLUCFCS 422), and hardwood-conifer mixed (FLUCFCS 434). The wetland land cover classes included exotic wetland hardwoods (FLUCFCS 619) and freshwater marshes (FLUCFCS 641).

Pine flatwoods occupied the largest area, approximately 28.8 acres of the vegetated uplands within the study area and the dominant vegetation observed within these areas included slash pine (*Pinus elliottii*), cabbage palm (*Sabal palmetto*), saw palmetto (*Serenoa repens*), wax myrtle (*Myrica cerifera*) and numerous vines (e.g. *Smilax* spp. and *Vitis rotundifolia*). Exotic and nuisance vegetation including Australian pine (*Casuarina equisetifolia*), Brazilian pepper (*Schinus terebinthifolius*), and earleaf acacia (*Acacia auriculiformis*) were also observed within these areas.

The hardwood-conifer mixed land cover occupied approximately 9.9 acres of the study area along the southern banks of Canal 103 between Jenkins Road and Selvitz Road, and southwest of the Florida's Turnpike. Vegetation in these areas was dominated by laurel oak (*Quercus laurifolia*) and slash pine, with water oak (*Q. nigra*), live oak (*Q. virginiana*), cabbage palm, saw palmetto, red maple (*Acer rubrum*), Australian pine, Brazilian pepper, and earleaf acacia as associate species.

The undeveloped land within urban areas land cover occupied approximately 6.0 acres of the project study area and consisted of mowed and maintained bahia grass areas that were primarily located south of Midway Road within the residential developments.

The Brazilian pepper communities consisted of dense monocultures of the invasive tree species with sparse live oak and cabbage palm in the understory. These upland communities were generally located along the Florida East Coast (FEC) railroad corridor within the northwestern portion of the project study area.

The improved pastures land cover occupied approximately 0.25 acres of the project study area and consisted of actively grazed cattle pastures located at the southwest corner of the Midway Road and Glades Cut Off Road intersection (western terminus). Vegetation consisted primarily of bahia grass with isolated patches of slash pine, cabbage palm and Brazilian pepper.

There were two wetland community types within the study area: exotic wetland hardwoods (FLUCFCS 619), and freshwater marshes (FLUCFCS 641). The most abundant wetland communities within the study area were freshwater marshes. Vegetation found within the freshwater marshes included corkwood (*Stillingia aquatica*), rosy camphorweed (*Pluchea rosea*), spadeleaf *(Centella asiatica*), duck potato (*Sagittaria lancifolia*), beakrush (*Rhynchospora spp*.), white top sedge (*Rhynchospora colorata*), St. John's wort (*Hypericum fasciculatum*), common reed (*Phragmites australis*), spike rush (*Eleocharis spp.*) broomsedge (*Andropogon spp*.), groundseltree (*Baccharis halimifolia*), and wax myrtle. These communities were located along the east shoulder of Florida's Turnpike, north of Midway Road to the east and west of Jenkins Road, and south of Midway Road approximately 0.25 mile west of Selvitz Road.

The exotic wetland hardwoods (FLUCFCS 619) wetland community type within the project study area occupied approximately 2.0 acres of the study area. Vegetation primarily consisted of Brazilian pepper, Carolina willow (*Salix caroliniana*), primrose willow (*Ludwigia peruviana*), earleaf acacia, pickerel weed (*Pontederia cordata*), duck potato, groundseltree, shield fern (*Dryopteris ludoviciana*), and white top sedge. The exotic wetland hardwoods were located in three areas within the project study area, including a depressional area between the FEC railroad and Glades Cut Off Road, within the drainage swale that runs along the west side of Florida's Turnpike, and south of Midway Road to the east of Omega Road.

Table 1 - Summary of Upland Land Cover Within the Project Study Area			
FLUCFCS Code	**FLUCFCS Type**	**Description**	**Acres**
111	Residential, Low Density - Fixed Single Family Units	This category includes residential fixed single family unit housing, with less than two dwelling units per acre. Includes residences to the north of Midway Road, approximately 800 feet west and immediately east of Selvitz Road.	4.70
121	Residential, Medium Density - Fixed Single Family Units	This category includes residential fixed single family unit housing. Two to five dwelling units per acre. These residences are primarily located south of Midway Road between the FEC railroad and Florida's Turnpike and between Milner Drive and Selvitz Road within the project study area.	36.6
141	Retail Sales and Services	This category is primarily devoted to the sale of products and services. This land cover includes the Mobil gas station at the northeast corner of Midway Road and Selvitz Road.	2.13
142	Wholesale Sales and Services	This category is associated with the storage and wholesale distribution of products and materials. This land cover includes All Scape Supply, LLC located approximately 800 feet west of Jenkins Road, north of Midway Road.	3.55
151	Food Processing	This land cover category includes citrus processing plants such as Tropicana and Packers of Indian River located north of Midway Road.	8.72
156	Other Heavy Industrial	This category is associated with ship building and repair, pre-stressed concrete plants, metal fabrication plants, and cement plants such as the CEMEX facility located between Glades Cut Off Road and Florida's Turnpike, north of Midway Road.	18.3
174	Medical and Health Care	This category includes all buildings and grounds that compose medical facilities such as the New Horizons of Treasure Coast and Okeechobee facility.	6.61
175	Governmental	This category includes all buildings and facilities which are identifiable as non-military governmental, such as the St. Lucie County Sheriff's Office and the U.S. Post Office.	13.2
191	Undeveloped Land within urban areas	This category includes undeveloped land within urban areas. Normally does not exhibit any structures or indication of intended use. Includes vacant grass areas immediately surrounding the residential developments south of Midway Road.	6.05
211	Improved Pastures	This category is composed of land which has been cleared, tilled, and reseeded with specific grass types. Land is periodically improved with brush control and fertilizer application. Within project study area, this land	0.25

Table 1 - Summary of Upland Land Cover Within the Project Study Area			
FLUCFCS Code	**FLUCFCS Type**	**Description**	**Acres**
		cover is located southwest of the intersection of Glades Cut Off Road and Midway Road.	
411	Pine Flatwoods	This category is dominated by either slash pine, longleaf pine, or both. The common understory species include saw palmetto, wax myrtle, gallberry and a wide variety of herbs and brush. This land cover primarily includes areas north and south of Midway Road adjacent to Jenkins Road, and the northwest corner of the Midway Road and Selvitz Road intersection.	28.8
422	Brazilian Pepper	This category includes Brazilian pepper dominated areas located adjacent to the FEC Railroad.	1.45
434	Hardwood - Conifer Mixed	This category is composed of forested areas in which neither upland conifers nor hardwoods have achieved a 66 percent crown canopy dominance. This land cover includes areas located south of Midway Road along Canal 103.	9.93
812	Railroads	This category includes the FEC Railroad.	1.84
814	Roads and Highways	This category includes portions of roads and highways such as Midway Road (CR 712), Glades Cut Off Road (CR 709), Florida's Turnpike (SR 91), Selvitz Road, Milner Drive, and Jenkins Road.	54.6
		Grand Total	**196.73**

Compiled by Kimley-Horn and Associates, Inc. 2015

4.2.2 Soils

Based on a review of the United States Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS) *Soil Survey for St. Lucie County*, there are seven (7) major soil types within the project study area (See soils map ***Figure 4***). In general, the soils found within the project study area are derived from sandy marine sediments, are gently sloping, and are poorly drained. According to the *Hydric Soils of Florida Handbook, Fourth Edition* (Florida Association of Environmental Soil Scientists, 2007), Riviera fine sand, 0 to 2 percent slopes is considered a hydric soil and Wabasso sand, 0 to 2 percent slopes has hydric soil inclusions greater than ten (10) percent. Hydric soils and hydric soil inclusions are one indicator of the presence of wetlands, and the areas where these soils (i.e. Wabasso sand) are mapped correspond to the locations of freshwater marsh wetlands that were observed within the project study area during field reconnaissance. ***Table 2*** includes a summary of the soil types found in the project study area.

Table 2 - Soil Types Mapped Within the Project Study Area								
Soil ID Number	**Soil Name**	**Parent Material**	**Drainage Class**	**Water Storage Capacity**	**Hydraulic Conductivity**	**Depth to Restrictive Feature**	**Water Table Depth**	**Acres**
25	Nettles and Oldsmar sands	Sandy and loamy marine deposits	Poorly drained	Very low	Moderately low to moderately high	31 to 50 inches	6 to 18 inches	80.5
26	**Oldsmar sand, depressional**	**Sandy and loamy marine deposits**	**Very poorly drained**	**Low**	**Moderately low to moderately high**	**> 80 inches**	**0 inches**	**0.10**
31	Pepper and EauGallie sands	Sandy and loamy marine deposits	Poorly drained	Moderate	Moderately low to high	> 80 inches	6 to 18 inches	28.3
38	**Riviera fine sand, 0 to 2 percent slopes**	**Sandy and loamy marine deposits**	**Poorly drained**	**Low**	**Moderately high to high**	**> 80 inches**	**0 to 12 inches**	**2.96**
44	Tantile and Pomona sands	Sandy and loamy marine deposits	Poorly drained	Very low	Moderately low to moderately high	18 to 31 inches	6 to 18 inches	1.39
48	**Wabasso sand, 0 to 2 percent slopes**	**Sandy and loamy marine deposits**	**Poorly drained**	**Very low**	**Moderately low to moderately high**	**9 to 50 inches**	**6 to 18 inches**	**77.1**
50	Waveland and Immokalee fine sands	Sandy marine deposits	Poorly drained	Very low	Moderately low to moderately high	31 to 50 inches	6 to 18 inches	20.8
Bold text denotes hydric soils or soils with hydric inclusions greater than 10% of the soil mapping unit.								

Compiled by Kimley-Horn and Associates, Inc. 2015

4.2.3 Floodplains/Drainage/Groundwater

The project study area is located entirely within FEMA flood zone X, areas determined to be outside the 0.2% annual chance floodplain (i.e. 500-year floodplain). See attached FEMA Flood Zone Map (***Figure 5***). A review of available hydrogeological maps and the USGS Ground Water Atlas of the United States indicated that the underlying hydrogeological units in this geomorphic zone of St. Lucie County include the surficial aquifer system and the Floridan aquifer system.

The Surficial Aquifer System (SAS) is typically less than 50 feet in thickness and is comprised of beds of unconsolidated sand, shelly sand, and shell material. In St. Lucie County, the SAS has limestone, sandstone, shell and clay lenses within the unconsolidated quartz sand layers (Lukasiewicz, 1995). Ground water in the Surficial Aquifer system is unconfined and is generally used for domestic, commercial, or small municipal water supplies rather than public consumption. Groundwater within the Surficial Aquifer System in St. Lucie County generally moves in a lateral direction eastward towards areas of lower elevation and the Atlantic Ocean. Additionally, because the surficial aquifer system extends under the Atlantic Ocean, saltwater intrusion can occur in these coastal areas.

The Floridan Aquifer system is a large, productive, artesian aquifer covering approximately 100,000 square miles in southeastern Georgia, southern South Carolina, and all of Florida. It is contained within the underlying limestone formation and is characterized by very high permeability limestone and dolomite formations. The Floridan Aquifer system is divided into upper and lower units. The Upper Floridan is the target aquifer for domestic water wells and is considered the most important aquifer in this region, while much of the Lower Floridan contains saline water and is not a suitable water supply. Regionally, the Upper Floridan Aquifer is approximately 500 feet thick and is separated from the SAS by a thick confining layer called the Hawthorn Group that is comprised of fine sands, silts and clays (Lukasiewicz, 1995). Generally, groundwater flows east-southeast in this portion of St. Lucie. Groundwater is expected to move east towards the NFSLR, which flows from the convergence of Five Mile Creek and Ten Mile Creek, approximately two miles northeast of the project study area, to the south where it drains into the St. Lucie Estuary and eventually into the Atlantic Ocean via the St. Lucie Inlet. Groundwater and surface water movement may also be influenced by localized depressional features such as freshwater marshes and canals such as Canal 103.

5.0 WETLANDS EVALUATION

5.1 DATA COLLECTION

In accordance with Executive Order 11990, Protection of Wetlands, and FHWA Technical Advisory T6640 8A, the extent and types of wetlands in the study area were documented through the following methods:

- Review of the USDA *Soil Survey of St. Lucie County Area, Florida* (1980) and the *Hydric Soils of Florida Handbook, Fourth Edition* (Florida Association of Environmental Soil Scientists, 2007) to identify hydric soils, USGS 7.5-Minute Quadrangle Maps and USFWS National Wetland Inventory maps to identify potential wetlands and surface waters within the project corridor.
- Interpretation of 1"=100' scale aerial photography to identify other wetland and surface water resources within the project study area.
- Field reconnaissance of the project corridor was conducted on July 2, 2015 and July 15, 2015 to field verify and/or confirm the presence of wetlands and surface waters within and immediately adjacent to the R/W of the project corridor.

Wetlands and other surface waters occurring within and immediately adjacent the Midway Road R/W were identified and incorporated into the study. Surface waters include both natural and manmade bodies of water, such as streams, lakes, ponds, canals, and ditches.

Each wetland site was identified in the field using the delineation methods described in the U. S. Army Corps of Engineers (USACE) *Federal Manual for Identification and Delineation of Wetlands* (USACE 1987) and *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Atlantic and Gulf*

Coastal Plain Region (Version 2.0) in accordance with Chapter 62-340, of Florida Administrative Code (FAC), *Delineation of the Landward Extent of Wetlands and Surface Waters*. Wetland classifications occurring within the project area were determined based on FLUCFCS as well as the USFWS publication *Classification of Wetlands and Deepwater Habitats of the United States* (Cowardin et al. 1979). These methods take into account prevalence of wetland vegetation, hydric soil indicators, and wetland hydrology.

All wetlands and surface waters identified in the field were compiled onto digital aerial imagery of the project study area. Acreage calculations of the existing area and area of impact were then calculated using GIS Software. It was not practical to obtain total acreage calculations for some of the wetlands and surface waters that extended outside the project area**.** Formal wetland delineations including field flagging and approval by SFWMD or USACE have not been conducted, but will occur during the design and permitting phase of the project.

ETDM Comment Summary

ETDM comments received from SFWMD, US Environmental Protection Agency (USEPA), USACE, USFWS, Florida Department of Environmental Protection (FDEP) and National Marine Fisheries Service (NMFS) focused on avoidance and minimization of impacts to wetland resources located within the proposed project study area. NMFS indicated that potential direct impacts and impacts associated with construction activities could affect low to moderate quality emergent wetlands and ditches within the project corridor as well as recreationally, commercially, and ecologically important species that are located within downstream estuaries. The USACE added that "filling wetlands reduces the ability of the natural environment to provide: sustainable habitat for wildlife, aquifer recharge, natural filters for pollutants, essential carbon export/import functions, flood water attenuation and storage, and contributions to the ecosystem through food-web productivity, among many other functions." SFWMD added that the wetlands may provide habitat for a variety of wetland dependent wildlife including listed species such as the wood stork.

The USEPA indicated that the proposed project alignment and footprint should be designed and developed in a manner that will avoid impact on the wetland resources to the greatest extent practicable and that unavoidable impacts should be fully mitigated. The USFWS and FDEP reiterated these comments, and FDEP added that avoidance -oriented corridor alignments, pile bridging and steep/vertically retained side slopes, and reduction of median widths should be minimization measures that are emphasized. FDEP also stated that wetlands should not be displaced by the installation of stormwater conveyance and treatment swales.

SFWMD, USEPA and FDEP further noted that the increased stormwater runoff generated as a result of increased quantity of impervious surfaces are of concern. They indicated that the project must be designed to meet SFWMD water quality and quantity criteria and should maximize stormwater treatment prior to discharge in order to prevent groundwater and surface water contamination. FDEP added that retro-fitting of the existing stormwater conveyance systems would help reduce water quality impacts.

5.2 WETLAND CHARACTERIZATION

Baseline information characterizing the wetlands involved within the study area including contiguity, vegetative structural diversity, edge relationships, wildlife habitat value, hydrologic functions, public use, and integrity is found in ***Table 3***. The wetland polygons were individually characterized based on their FLUCFCS type and are depicted in ***Figure 6***. Representative photographs of wetlands and surface waters are included in ***Appendix C***.

Table 3 - Wetland and Surface Water Characteristics within the Project Study Area

Wetland ID	FLUCFCS Code	USFWS Code	Contiguity	Vegetative Structural Diversity	Edge Relationships	Wildlife Habitat Value	Hydrologic Function	Public Use	Integrity	Size (Acres)
SW1 (aka Canal 103)	510	Palustrine Unconsolidated Bottom, Sand (PUB2)	Contiguous within study area and connected via a control structure to NFSLR. Extends the length of the project along the south side of Midway Road. Surface water appears to be connected to adjacent roadway stormwater drainage system.	Low structural diversity, canal slopes periodically mowed. Species include ragweed, dollarweed, beggar ticks, Brazilian pepper, earleaf acacia, Australian pine and patches of smartweed and cattail along banks. Invasive or non-native species presence due to disturbance and location.	Surrounding land uses include roads and highways, railroads, and residential.	Provides minimal foraging/refuge habitat for wading birds, fish, raptors, and herpetofauna. Public input noted river otters have been observed. However, the canal is being filled and culverted to the east (County design project) so wildlife access will be affected.	Primarily a stormwater conveyance system that provides storage and sedimentation abatement functions.	Not Applicable	Excavated surface water was designed as water conveyance for stormwater runoff. Impacted by surrounding development and regular mowing affects the habitat composition and structure.	3.86
SW2	534	Palustrine Emergent Nonpersistent (PEM2)	Limited contiguity within study area. Surface water appears to be contiguous to adjacent roadway stormwater drainage system.	Low structural diversity, periodically mowed. Species include bahia grass, wax myrtle, dog fennel, dollarweed, pickerelweed, and primrose willow. Potential for invasive or non-native species presence due to disturbance and location.	Extends along western side of and within Glades Cut Off Road R/W. Extends off-site and is surrounded by natural and developed land uses including the improved pastures and roads and highways.	Limited foraging habitat support for wading birds and herpetofauna when inundated.	Provides stormwater storage, treatment, and sedimentation abatement functions.	Not Applicable	Graded roadside surface water that undergoes periodic mowing and maintenance. Composition and structure of vegetation affected by surrounding land uses.	0.23
SW3	510	Palustrine Emergent Nonpersistent (PEM2)	Limited contiguity within study area. Surface water appears to be contiguous to adjacent roadway stormwater drainage system.	Low structural diversity, periodically mowed. Species include bahia grass, dollarweed, pickerelweed, and primrose willow. Potential for invasive or non-native species presence due to disturbance and location.	Extends along the east side of and within Glades Cut Off Road R/W. Extends off-site and is surrounded by pine flatwoods, FEC railroad and Glades Cutoff Road	Provides minimal habitat value due to isolation, intermittent hydrology, and adjacent land uses.	Primarily provides stormwater detention, treatment, and sedimentation abatement functions	Not Applicable	Graded roadside surface water that undergoes periodic mowing and maintenance. Composition and structure of vegetation affected by surrounding land uses.	0.12
SW4	510	Palustrine Emergent Intermittently Flooded Excavated (PEMJx)	Surface water conveyance system for adjacent residential neighborhood and roadways.	Low structural diversity, periodically mowed and maintained. Species include bahia grass, dollarweed, and sparse patches of pickerelweed. Potential for invasive or non-native species presence due to disturbance and location.	Within residential development surrounded by undeveloped land, Canal 103, single family homes and roads. Part of the interconnected drainage system for Winterlakes Subdivision	May provide limited wildlife habitat support for small mammals, wading birds, small fish and herpetofauna due to intermittent hydrology and periodic disturbance.	Primarily a stormwater conveyance system that provides storage and sedimentation abatement functions.	Not Applicable.	Surface water was designed as water conveyance for stormwater runoff. Impacted by surrounding development and regular mowing affects the habitat composition and structure.	0.87
SW5	534	Palustrine Unconsolidated Bottom Permanently Flooded Excavated (PUBHx)	Contiguous with adjacent surface water conveyance system for residential neighborhood and roadways.	Low structural diversity, open water retention pond. Species include torpedo grass and sparse patches of pickerelweed along perimeter. Potential for invasive or non-native species presence due to disturbance and location.	Within residential development surrounded by undeveloped land, SW 4, single family homes and roads.	May provide limited habitat and life cycle support for small mammals, wading birds, small fish and herpetofauna.	Water storage, stormwater pretreatment, flood abatement and groundwater recharge functions.	Not Applicable.	Stormwater pond excavated for water storage/treatment. Lacks diversity in habitat composition and structure.	0.53
SW6	534	Palustrine Unconsolidated Bottom Permanently Flooded Excavated (PUBHx)	Limited contiguity with retention pond to the north. Surrounded by impervious surfaces.	Not applicable – open water pond within Cemex facility.	Located completely within industrial development for drainage purposes.	Minimal value due to isolation, size, lack of vegetation and surrounding land uses.	Water storage, stormwater pretreatment, flood abatement and groundwater recharge functions.	Not Applicable.	Stormwater pond excavated for water storage Isolated due to surrounding development. Lacks diversity in habitat composition and structure.	0.30
SW7	534	Palustrine Emergent Intermittently Flooded Excavated (PEMJx)	Series of interconnected stormwater management ponds. Isolated from nearby wetlands and surface waters.	Low structural diversity, isolated patches of Carolina willow and Brazilian pepper within retention pond. Periodically mowed.	Surrounded by urban development, Florida's Turnpike and Midway Road. Vegetated buffers surrounding surface water.	May provide limited habitat and life cycle support for small mammals, wading birds, small fish and herpetofauna.	Water storage, stormwater pretreatment, flood abatement and groundwater recharge functions.	Not Applicable.	Excavated surface water for storage of stormwater runoff. Isolated due to surrounding development. Some diversity in habitat composition and structure.	1.89

Table 3 - Wetland and Surface Water Characteristics within the Project Study Area

Wetland ID	FLUCFCS Code	USFWS Code	Contiguity	Vegetative Structural Diversity	Edge Relationships	Wildlife Habitat Value	Hydrologic Function	Public Use	Integrity	Size (Acres)
SW8	510	Palustrine Unconsolidated Bottom Semipermanently Flooded Excavated (PUBFx)	Surface water conveyance system for adjacent residential neighborhood and roadways. Limited contiguity with freshwater marsh to south.	Low structural diversity, periodically mowed and maintained. Species include bahia grass, dollarweed, and sparse patches of pickerelweed. Potential for invasive or non-native species presence due to disturbance and location.	Within residential development surrounded by undeveloped land, single family homes and roads.	Minimal value due to intermittent hydrology, lack of vegetation, and periodic disturbance.	Primarily a stormwater conveyance system that provides storage and sedimentation abatement functions.	Not Applicable.	Excavated surface water was designed as water conveyance for stormwater runoff. Impacted by surrounding development and regular mowing affects the habitat composition and structure.	0.06
SW9	534	Palustrine Emergent Seasonally Flooded Excavated (PEMCx)	Interconnected stormwater management ponds (dry detention). Surface water appears contiguous with adjacent roadway stormwater drainage system.	Low structural diversity, periodically mowed and maintained dry detention areas. Species include bahia grass sod.	Surrounded by developed land, Post Office Road and Midway Road. Grassed buffer surrounding surface water.	Minimal value due to intermittent hydrology, lack of vegetation, and frequent disturbance (i.e. mowing).	Water storage, stormwater pretreatment, flood abatement and groundwater recharge functions.	Not Applicable.	Designed as grassed stormwater detention area with intermittent hydroperiod.	1.35
SW10	534	Palustrine Unconsolidated Bottom Permanently Flooded Excavated (PUBHx)	Limited contiguity within study area. Isolated from adjacent roadway stormwater drainage system.	Low to moderate diversity – open water pond with perimeter of wax myrtle, cattail, spikerush, water-lily and pickerelweed.	Surrounded by urban development and Midway Road. Narrow vegetated buffer surrounding surface water.	Provides habitat and life cycle support for small mammals, wading birds, small fish and herpetofauna. Access somewhat limited due to fence surrounding surface water.	Water storage, stormwater pretreatment, flood abatement and groundwater recharge functions	Not Applicable.	Stormwater pond excavated for water storage/treatment. Isolated due to surrounding development. Some diversity in habitat composition and structure.	0.73
SW11	510	Palustrine Unconsolidated Bottom Semipermanently Flooded Excavated (PUBFx)	Surface water conveyance system for adjacent residential neighborhood and roadways. Contiguous with freshwater marsh to south.	Low structural diversity, periodically mowed and maintained ditch. Species include dollarweed, primrose willow and smartweed. Potential for invasive or non-native species presence due to disturbance and location.	Within residential development surrounded by undeveloped land, single family homes, freshwater marshes, and roads.	Minimal value due to intermittent hydrology, lack of vegetation, and periodic disturbance.	Primarily a stormwater conveyance system that provides storage and sedimentation abatement functions.	Not Applicable.	Impacted by surrounding development and regular disturbance. Minimal habitat composition and structure.	0.09
SW12	534	Palustrine Unconsolidated Bottom Permanently Flooded Excavated (PUBHx)	Limited contiguity within study area. Appears isolated from adjacent roadway stormwater drainage system.	Low to moderate diversity – open water ponds with perimeter of wax myrtle, cattail, spikerush, water-lily and pickerelweed.	Within medical complex surrounded by undeveloped land, parking lots, and roads and highways.	Provides habitat and life cycle support for small mammals, wading birds, small fish and herpetofauna. Access somewhat limited due to fence surrounding surface water.	Water storage, stormwater pretreatment, flood abatement and groundwater recharge functions.	Not Applicable.	Stormwater pond excavated for water storage/treatment. Isolated due to surrounding development. Some diversity in habitat composition and structure.	1.04
SW13	510	Palustrine Unconsolidated Bottom Semipermanently Flooded Excavated (PUBFx)	Surface water conveyance system for adjacent residential neighborhood and roadways. Limited contiguity with wetland to southwest.	Low structural diversity, periodically mowed and maintained ditch. Species include water hyssop, dollarweed, primrose willow and smartweed. Potential for invasive or non-native species presence due to disturbance and location.	Surrounded by residential development, Canal 103, and Selvitz Road.	Minimal value due to intermittent hydrology, lack of vegetation, periodic disturbance, and proximity to Selvitz Road.	Primarily a stormwater conveyance system that provides storage and sedimentation abatement functions.	Not Applicable.	Impacted by surrounding development and regular disturbance from maintenance activities. Minimal habitat composition and structure.	0.09
WL1	619	Palustrine Scrub-Shrub Broad-Leaved Evergreen Semi-permanently flooded Partly Drained/Ditched	Connected to adjacent roadway stormwater management system	Low structural diversity – species include Brazilian pepper, Carolina willow, smartweed, duck potato, beakrush, wax myrtle and cabbage palm.	Linear feature between Glades Cut Off Road and the FEC Railroad.	Provides limited foraging habitat and refuge opportunities for small mammals, birds, raptors, and herpetofauna due to size and disturbed vegetative community	Provides water detention, groundwater recharge, and water quality enhancement functions.	Not applicable.	The structure and function of the wetland has been disturbed by adjacent roadway and railroad development and by infiltration of exotic species.	0.88

Table 3 - Wetland and Surface Water Characteristics within the Project Study Area

Wetland ID	FLUCFCS Code	USFWS Code	Contiguity	Vegetative Structural Diversity	Edge Relationships	Wildlife Habitat Value	Hydrologic Function	Public Use	Integrity	Size (Acres)
WL2	619	Palustrine Scrub-Shrub Broad-Leaved Evergreen Semi-permanently flooded Partly Drained/Ditched (PSS3Fd)	Linear feature adjacent to Florida's Turnpike (SR 91). Connected to adjacent roadway stormwater management system	Low structural diversity – species include Brazilian pepper, Carolina willow, primrose willow, smartweed, duck potato, beakrush, wax myrtle and cabbage palm.	Located within Florida's Turnpike R/W (west side) with surrounding land uses including industrial development, Midway Road, and Florida's Turnpike.	Limited foraging and habitat support function for invertebrates, birds, and herpetofauna due to location and disturbed vegetative community.	Provides water detention, groundwater recharge, and water quality enhancement functions. May provide food and refuge for wildlife.	Not applicable.	The integrity of this wetland has been affected by invasive and exotic species, adjacent roadway (i.e. Florida's Turnpike) and industrial (i.e. Cemex) developments, and isolation.	0.41
WL3	619	Palustrine Scrub-Shrub Broad-Leaved Evergreen Semi-permanently flooded Partly Drained/Ditched (PSS3Fd)	Connected to adjacent roadway stormwater management system and Canal 103,	Low structural diversity – species include Brazilian pepper, Carolina willow, primrose willow, smartweed, duck potato, beakrush, wax myrtle and cabbage palm.	Located within Florida's Turnpike R/W (west side) with surrounding land uses including a narrow buffer of mixed coniferous hardwoods habitat, Midway Road, and Florida's Turnpike.	Limited foraging and habitat support function for invertebrates, birds, and herpetofauna due to location and disturbed vegetative community.	Provides water detention, groundwater recharge, and water quality enhancement functions. May provide food and refuge for wildlife.	Not applicable.	The integrity of this wetland has been affected by invasive and exotic species, adjacent roadway (i.e. Florida's Turnpike) and residential development.	0.40
WL4	641	Palustrine Emergent Non-persistent Semi-permanently flooded Partly Drained/Ditched (PEM2Fd)	Connected to adjacent roadway stormwater management system, Canal 103, and downstream to NFSLR	Moderate structural diversity – species include pickerelweed, duck potato, soft rush, dollarweed, white top sedge, and spike rush.	Located within Florida's Turnpike R/W (east side) with surrounding land uses including pine flatwoods habitat, Canal 103, Midway Road, and Florida's Turnpike.	Provides limited foraging habitat and refuge opportunities for invertebrates, small mammals, wading birds, raptors, and herpetofauna due to proximity to roads, size and intermittent hydrology.	Provides limited stormwater water retention, groundwater recharge, and water quality enhancement functions. May provide food and refuge for wildlife.	Not applicable.	The integrity of this wetland has been affected by adjacent roadway (i.e. Florida's Turnpike) development and routine mowing and maintenance of Florida's Turnpike shoulders.	0.20
WL5	641	Palustrine Emergent Persistent Semi-permanently flooded Partly Drained/Ditched (PEM1Fd)	Isolated wetland surrounded by pine flatwoods	Moderate to High structural diversity – species include corkwood, rosy camphorweed, spadeleaf, beakrush, St. John's wort, common reed, groundsel tree and wax myrtle.	Immediately surrounded by pine flatwoods habitat. In proximity to roads and highways (e.g. Jenkins Road and Midway Road), and commercial development.	Provides valuable foraging habitat, life cycle support, and refuge for fish, invertebrates, herpetofauna, wading birds, and mammals.	Provides water quality enhancement, water storage and groundwater recharge in addition to providing food and cover for wildlife species.	Not applicable.	Habitat composition and structure have been minimally affected by surrounding land use activities and roads.	1.25
WL6	641	Palustrine Emergent Persistent Semi-permanently flooded Partly Drained/Ditched (PEM1Fd)	Wetland extends to Midway Road R/W and may receive runoff from the road	Moderate to High structural diversity – species include corkwood, rosy camphorweed, spadeleaf, beakrush, St. John's wort, common reed, groundseltree and wax myrtle. This wetland is in a conservation easement per SFWMD Permit #56-01444-P.	Immediately surrounded by pine flatwoods habitat. In proximity to roads and highways (e.g. Jenkins Road and Midway Road), and commercial development.	Provides valuable foraging habitat, life cycle support, and refuge for fish, invertebrates, herpetofauna, wading birds, and mammals.	Provides water quality enhancement, water storage and groundwater recharge in addition to providing food and cover for wildlife species.	Not applicable.	Wetland receives some runoff from adjacent Midway Road. Habitat composition and structure have been minimally affected by surrounding land use activities and roads.	1.47
WL7	619	Palustrine Scrub-Shrub Broad-Leaved Evergreen Semi-permanently flooded (PSS3F)	Isolated wetland with surrounding upland buffer (hardwood-conifer mixed)	Low structural diversity – Species include Brazilian pepper, Carolina willow and primrose willow.	Surrounding land uses include roads, residential development, and narrow vegetated buffer.	Provides limited foraging habitat, nursery and refuge opportunities for fish, invertebrates, small mammals, wading birds, raptors, and herpetofauna due to size and disturbed vegetative community	Provides limited water quality enhancement, water storage and groundwater recharge function due to its size and disturbed condition.	Not applicable.	The structure and function of the wetland has been affected by invasive species infiltration, isolation from nearby wetlands and surrounding residential development.	0.30

Table 3 - Wetland and Surface Water Characteristics within the Project Study Area										
Wetland ID	**FLUCFCS Code**	**USFWS Code**	**Contiguity**	**Vegetative Structural Diversity**	**Edge Relationships**	**Wildlife Habitat Value**	**Hydrologic Function**	**Public Use**	**Integrity**	**Size (Acres)**
WL8	641	Palustrine Emergent Persistent Semi-permanently flooded Partly Drained/Ditched (PEM1Fd)	Connected to adjacent roadway stormwater management system via drainage ditches (SW11)	Moderate structural diversity - dominated by spikerush, pickerelweed, duck potato, bulrush, and soft rush.	Surrounding land uses include residential development and roads and highways.	Provides valuable foraging habitat and life cycle support for fish, invertebrates, small mammals, wading birds, raptors, and herpetofauna.	Provides water quality enhancement, water storage and groundwater recharge in addition to providing food and cover for wildlife species.	Not applicable.	The wetland habitat composition and structure has been affected by the adjacent residential and roadway developments.	0.19

Data Compiled by Kimley-Horn and Associates, Inc. October 2015

5.3 Wetland and Surface Water Effects Analysis

Within the project study area, impacts to wetlands and surface waters are anticipated to occur based on the proposed build alternatives and are discussed in the following sections.

Direct Effects

Wetland and surface water direct effects were calculated based on the proposed footprint of the build alternatives and are summarized in ***Table 4***.

Table 4 — Summary of Direct Wetland and Surface Water Impacts

WL/SW Number	FLUCFCS Code	FLUCFCS Description	Alternative 1		Alternative 2	
SW01	510	Streams and Waterways	1.14		3.53	
SW12	534	Reservoirs less than 10 acres	0.01		-	
WL01	619	Exotic Wetland Hardwoods	0.01		0.01	
WL06	641	Freshwater Marshes	0.12		-	
Direct Impact Totals:			***SW***	***1.15***	***SW***	***3.53***
			WL	***0.13***	***WL***	***0.01***

Note: Wetlands and surface waters listed for only those areas where impacts would occur. All impacts are fill impacts.

Compiled by Kimley-Horn and Associates, Inc., 2016

Secondary Effects

Secondary effects to wetlands and surface waters were also calculated for the proposed build alternatives based on a 25-foot buffer that was established around each alignment footprint. ***Table 5*** provides a summary of potential secondary impacts to wetlands and surface waters within the project study area.

Table 5 — Summary of Secondary Wetland and Surface Water Impacts

WL/SW Number	FLUCFCS Code	FLUCFCS Description	Alternative 1		Alternative 2	
SW01	510	Streams and Waterways	0.22		0.19	
SW04	510	Streams and Waterways	-		0.22	
SW10	534	Reservoirs less than 10 acres	0.07		-	
SW12	534	Reservoirs less than 10 acres	0.09		-	
SW13	510	Streams and Waterways	0.01		0.01	
WL01	619	Exotic Wetland Hardwoods	0.06		0.05	
WL05	641	Freshwater Marshes	0.07		-	
WL06	641	Freshwater Marshes	0.10		0.01	
Secondary Impact Totals:			***SW***	***0.39***	***SW***	***0.42***
			WL	***0.23***	***WL***	***0.06***

Compiled by Kimley-Horn and Associates, Inc. 2016

6.0 INDIRECT AND CUMULATIVE EFFECTS

Indirect Effects

Indirect effects "are caused by the action and are later in time or farther removed in distance, but are still reasonably foreseeable." (Council on Environmental Quality (CEQ) 1986, 40 Code of Federal Regulations (CFR) 1508.8). There are two types of indirect effects evaluated under National Environmental Protection Act (NEPA): induced growth effects and encroachment/alteration effects. Induced growth effects are related to changes in patterns of land use, population density or growth rate and their effects on natural systems. Encroachment/alteration effects can be characterized as either ecological or socioeconomic effects. Types of ecological encroachment/alteration effects include habitat fragmentation, degradation of habitat from pollution, water quality degradation from stormwater runoff or roadway spills, changes in hydrology, exotic/invasive species range expansion and disruption of natural processes. Types of socioeconomic encroachment/alteration effects include alteration of: neighborhood cohesion and stability, travel patterns of commuters and shoppers, personal safety, and aesthetic impacts.

The proposed project includes widening of an existing roadway within a primarily developed corridor. So many of the edge effects and fragmentation of habitat have already occurred as a result of the existing development. However, widening the road will further impact wildlife movement that would potentially attempt to cross the road(s). For the wetlands, where a partial impact occurs, there can be a secondary impact to the remaining wetlands as described above. Alternative 2 minimizes this secondary effect as the wetland impacts to the freshwater marshes north of Midway Road are impacted less. There is a greater impact to the surface waters though with Alternative 2 because the canal would be filled. But the Canal is currently being filled and replaced with a culvert further east as part of the County's widening of Midway Road from 25th Street to Selvitz. Thus, it is anticipated that there would already be some indirect effect associated with these impacts to the east.

From a water quality perspective, there is limited stormwater facilities for Midway Road. The project includes a curb and gutter section where stormwater will be conveyed, piped and discharged to stormwater management ponds. Several ponds have been evaluated in each basin and the ponds have been located and designed to avoid direct and secondary impacts to wetlands. As part of previous improvements by St. Lucie County east of the project, ponds have been constructed and sized to accommodate portions of this project. These ponds have been designed to meet Outstanding Florida Water (OFW) criteria (50% additional water quality treatment) because the project ultimately discharges to the NFSLR (OFW and aquatic preserve south of Midway Road). For this project, new impervious areas must also meet OFW criteria. The County ponds for the project to the east also provided dry detention to address nutrient impairment. Based on a meeting with SFWMD on August 20, 2015 nutrient analysis may be needed on this project. This will be evaluated more during design and permitting. Thus, an indirect benefit for the project is enhanced water quality treatment for the existing and future impervious road areas. Finally, mitigation will be provided for the secondary effects pursuant to SFWMD and USACE requirements.

Cumulative Effects

Cumulative effects on the environment result from the incremental impact of the action (direct and indirect effects) when added to other past, present, and reasonably foreseeable future actions by others. In general, road construction has the potential to impact wetlands during construction and by changing future land use patterns. Direct impacts remove wetlands from the landscape, thus removing all wetland function associated with it. Indirect wetland impacts vary greatly and depend generally on adjacent land condition. Cumulative

effects are the degree of potential impact that are largely dependent upon the size of the road corridor (wide roads having more influence than relatively narrow roads), the relative position of the road corridor within the landscape, and the relative condition of the wetlands being traversed (new roads in an undeveloped landscape vs. widening an existing road in a developed landscape).

Given the built out nature of the project corridor, minimal native habitats, including wetlands, the proposed improvements will not result in adverse cumulative effects.

7.0 WETLAND MITIGATION ASSESSMENT

Methodology

For this project it is anticipated that mitigation will be provided through purchase of credits at Bluefield Mitigation Bank. Bluefield Mitigation Bank is located within the Service area of this project. As such, the wetland assessments for determining required mitigation are done using the Wetland Rapid Assessment Procedure (WRAP) (SFWMD, April 1999). WRAP is a rating index that assists in evaluating the functions and values of a wetland system and is an accepted assessment methodology of the SFWMD and USACE. It establishes a numerical ranking for a wetland based on various ecological or anthropogenic variables known to influence the functional value of a wetland. WRAP scores are based on a total of six variables, scored from zero (0) (severely impacted with negligible attributes) to three (3) (best a system can function), divided by the sum of the maximum possible score for the rated variables. Scores can also be expressed in half increments. The WRAP value is expressed as a percentage. The variables assessed include:

- Wildlife Utilization
- Wetland Overstory/Shrub Canopy
- Wetland Vegetative Ground Cover
- Adjacent Upland/Wetland Buffer
- Field Indicators of Wetland Hydrology
- Water Quality Input and Treatment System

Data was collected during field reconnaissance and WRAP data sheets were prepared for the wetlands impacted. WRAP data sheets are found in ***Appendix D***.

WRAP Results

As described in Section 5.3, impacts to wetlands are minimal and consist of impacts to exotic hardwood wetlands and freshwater marsh. Because the wetlands are similar in vegetation and landscape location along the corridor, WRAP scores were determined based on FLUCFCS. The WRAP score for FLUCFCS 619 – Exotic Wetland Hardwoods is 20.42% and the WRAP score for FLUCFCS 641 – Freshwater Marsh is 74.03%. It is anticipated that mitigation will not be required for surface water impacts.[1]

8.0 AVOIDANCE AND MINIMIZATION

Avoidance and minimization of impacts have been considered for the project. However, complete avoidance of surface waters and wetlands is not possible with a build alternative because there are a number of linear drainage features that parallel or cross the project area and wetlands that extend into the R/W.

[1] Based on a review of Permit No. 56-00833-S for the widening of Midway Road from Selvitz to 25th Street, mitigation was not required for impacts to surface waters including the C-103 canal.

Alternative 2 minimizes impacts to wetlands, but has a greater impact on surface waters as the alignment is shifted south and includes culverting the Canal 103. As discussed below in Section 10.0 Permitting Requirements and Coordination, SFWMD commented during a pre-application meeting that for the canal alternative the design will need to allow of air exchange (e.g. saddle risers). Alternative 1 impacts the most wetland and includes impacts to WL 06 which has an existing conservation easement. If impacted, the easement would have to be released and additional compensation may be required. Stormwater management ponds have been cited to avoid impacts to wetlands and where applicable provide buffers between the pond limits and adjacent wetlands.

9.0 CONCEPTUAL MITIGATION

Wetland delineations will occur during the design and permitting phase to determine exact impacts to wetlands and surface waters. Potential wetland mitigation required was calculated for each proposed build alternative and is presented in ***Table 7***.

Table 6 – Potential Mitigation Credits

FLUCFCS	Alternative Impacts (acres)		WRAP Score	Mitigation Credit	
	Alternative 1	Alternative 2		Alternative 1	Alternative 2
619	0.07	0.06	20.42%	0.01	0.01
641	0.29	0.01	74.03%	0.21	0.01

Compiled by Kimley-Horn and Associates, Inc., 2016

Mitigation will include purchase of mitigation bank credits at Bluefield Mitigation Bank.

10.0 PERMITTING REQUIREMENTS AND COORDINATION

It is anticipated that the following permits will be required:

- Environmental Resource Permit Modification from the SFWMD for dredge and fill activities within wetlands/surface waters of State and stormwater management districts. Historic permits issued for this corridor include SFWMD Permit Nos.:
    - 56-01316-P Midway Road Widening from U.S. Highway 1 to 25th Street – issued to FDOT with St. Lucie County as co-applicant
    - 56-00833-S Midway Road Widening from 25th Street to Selvitz – issued to St. Lucie County
    - 56-01734-P Midway and Glades Cut Off Road Intersection Improvements – issued to St. Lucie County
- Section 404 Dredge and Fill Permit from USACE for dredge and fill activities within wetlands/waters of the United States. Based on the impacts, it is anticipated that the project would qualify for a Nationwide Permit. However, the Nationwide permits are due to expire in March 2017; thus, if not reauthorized the permit type may change.
- National Pollutant Discharge Elimination System Permit from the FDEP, which is required for all projects which have potential discharge to Waters of the United States, from construction sites that are one acre or greater in size.

ETAT Reviews

Coordination with environmental review agencies has occurred through the Efficient Transportation Decision Making (ETDM) Programming Screening Tool (ETDM #14177) and the Advance Notification process. Agency coordination will continue throughout the PD&E Study, final design and permitting phase. The comments are summarized in Section 5.1.

Agency Meetings

A meeting was held with SFWMD on August 20, 2015 to discuss the proposed project and the pond siting criteria. A copy of the meeting minutes are included in ***Appendix E***. Below is a summary of the comments from SFWMD at this meeting:

- The portion of runoff from the proposed project that will not be treated by the existing ponds should be subject to new "Pre-Post" analysis per SFWMD criteria (i.e. 25-year/72- day storm event). Need to treat for new net impervious area only.
- New treatment will need to meet 150% treatment criteria to address OFW (for new impervious areas only).
- Due to impaired water body analysis, nutrient loading analysis may be needed.
- NSLRWCD – If no control structure downstream from project, then NSLRWCD criteria does not apply (use SFWMD criteria).
- Existing permit called for a box culvert – need to make sure this culvert can handle additional capacity associated with proposed project.
- Potential wetland impacts (associated with pond expansion) will need to be addressed during permit process.
- With box culverts proposed, design will need to allow for air exchange mechanism (e.g. saddle risers).
- Contact Jose Vega for any pre-application field meetings.

11.0 CONCLUSIONS AND RECOMMENDATIONS

Direct and secondary impacts to wetlands range from 0.36 (Alternative 1) to 0.07 (Alternative 2) and impacts to surface waters range from 1.54 acres (Alternative 1) to 3.95 acres (Alternative 2). Mitigation for surface waters will not be required, though SFWMD will require a mechanism for air exchange for Alternative 2 which culverts Canal 103. Mitigation would be provided for wetland impacts through purchase of mitigation credits in Bluefield Mitigation Bank.

FDOT commits to the following measures to minimize and mitigate potential impacts to wetlands and water quality:

- If Alternative 2 is preferred, mechanisms will be included in the culvert design to allow for air exchange.
- Best Management Practices (BMP's) will also be implemented in order to reduce sediment transport and minimize erosion.

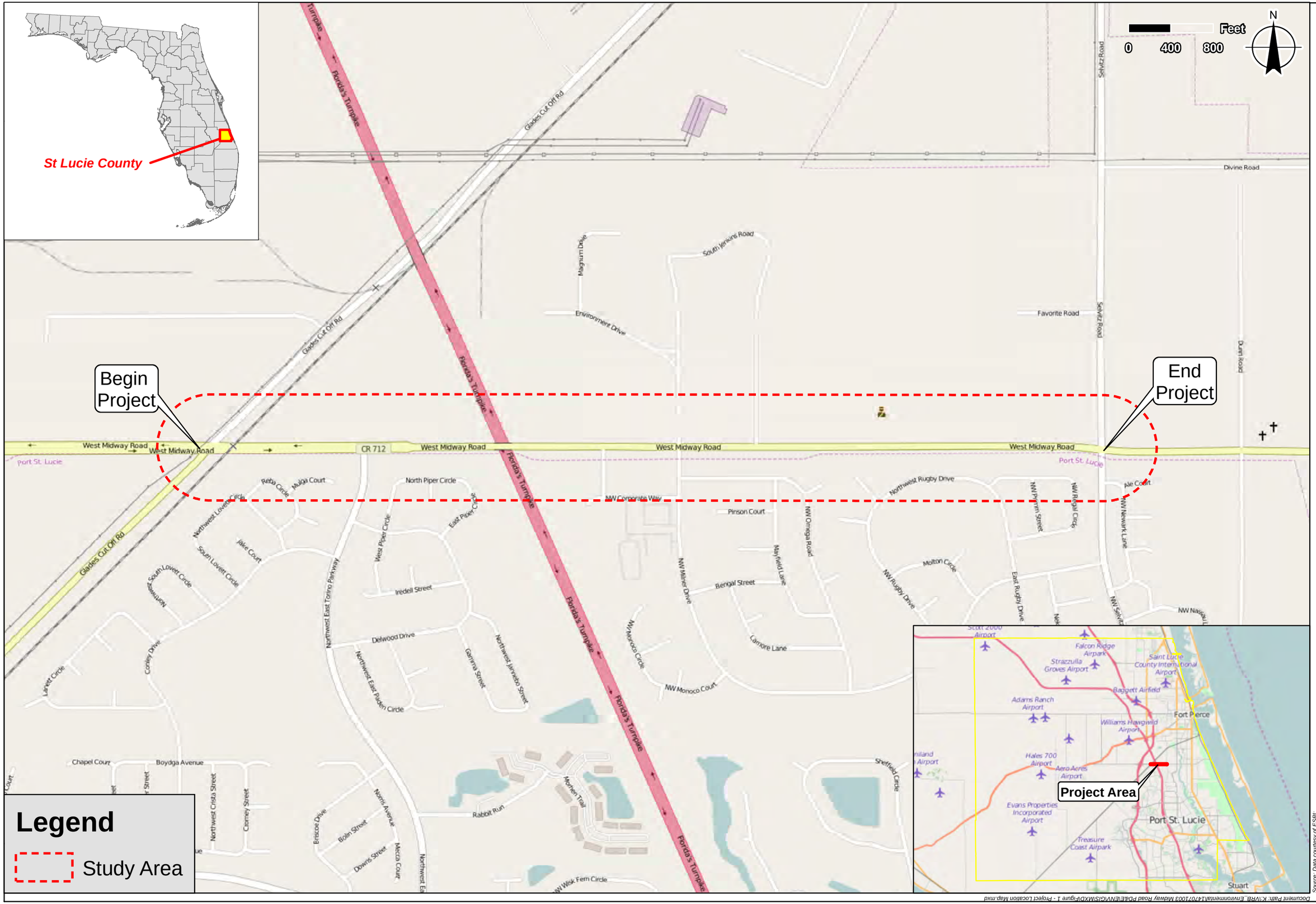
12.0 REFERENCES

Cowardin *et. al*. U.S. Department of Interior - Fish and Wildlife Service. Classification of Wetlands and Deepwater Habitats of the United States. USFWS/OBS-79/31, December 1979.

Lukasiewicz, John, Switanek, Milton Paul. 1995 Ground water quality in the surficial and Floridan aquifer systems underlying the Upper East Coast Planning Area. South Florida Water Management District, Department of Water Resources Evaluation, Hydrogeology Division. WRE – 329 Technical Publication 95-04. September, 1995.

Miller, Raymond E., Jr. and Boyd Gunsalus, South Florida Water Management District, Technical Publication REG-001, Wetland Rapid Assessment Procedure, Second Edition, August 1999.

FIGURE 1
PROJECT LOCATION MAP



Source: Data courtesy of ESRI.

Document Path: K:\VRB_Environmental\14707\003 Midway Road PD&E\ENV\GIS\MXD\Figure 1 - Project Location Map.mxd

FDOT

Project Location Map

Project Development and Environment (PD&E) Study - Midway Road (CR712)
From Glades Cut Off Road (CR 709) to Selvitz Road (CR 615)
St. Lucie County, Florida
Financial Project ID: 231440-3-22-01; ETDM Number: 14177

1 inch = 800 feet

MAY 2016

FIGURE 1

FIGURE 2

FLORIDA LAND USE, COVER AND FORMS CLASSIFICATION SYSTEM (FLUCFCS) MAP

Legend

- Study Area
- 111: Low Density Residential - Fixed Single Family Units
- 121: Medium Density Residential - Fixed Single Family Units
- 141: Retail Sales and Services
- 142: Wholesale Sales and Services
- 151: Food Processing
- 156: Other Heavy Industrial
- 174: Medical and Health Care
- 175: Governmental
- 191: Undeveloped Land within urban areas
- 211: Improved Pastures
- 411: Pine Flatwoods
- 422: Brazilian Pepper
- 434: Hardwood - Conifer Mixed
- 510: Streams and Waterways
- 534: Reservoirs less than 10 acres
- 619: Exotic Wetland Hardwoods
- 619: Exotic wetland hardwoods
- 641: Freshwater Marshes
- 812: Railroads
- 814: Roads and Highways

Source Aerials courtesy of FDOT (2012). FLUCFCS data courtesy of Kimley-Horn (2015).

Document Path: K:\IVR_Environmental\14707103 Midway Road PD&E\ENV\GIS\MXD\Figure 2 - FLUCFCS Map_v2.mxd

FDOT

Florida Land Use, Cover and Forms Classification System (FLUCFCS) Map

Project Development and Environment (PD&E) Study - Midway Road (CR712)
From Glades Cut Off Road (CR 709) to Selvitz Road (CR 615)
St. Lucie County, Florida
Financial Project ID: 231440-3-22-01; ETDM Number: 14177

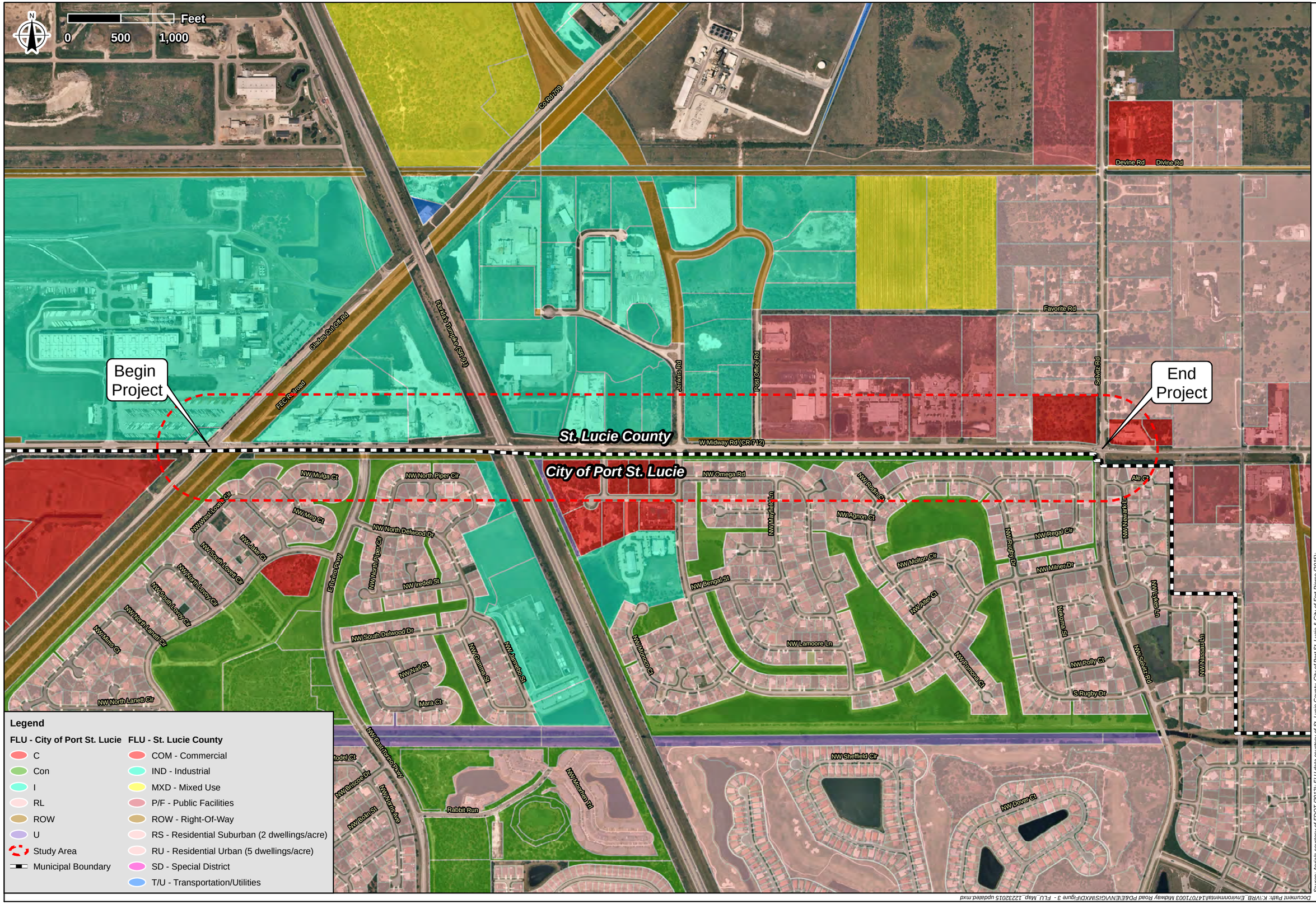
1 inch = 700 feet

FIGURE 2

MAY 2016

FIGURE 3

FUTURE LAND USE MAP (FLUM)



Source: Aerials courtesy of FDOT (2012); FLU data courtesy of St. Lucie County, City of Port St. Lucie & City of Fort Pierce (2015).

Document Path: K:\IVRE_Environmental\470710003 Midway Road PD&E\ENVGIS\MXD\Figure 3 - FLU_Map_12232015 updated.mxd

FDOT

Future Land Use Map - St. Lucie County & City of Port St. Lucie

Project Development and Environment (PD&E) Study - Midway Road (CR712)
From Glades Cut Off Road (CR 709) to Selvitz Road (CR 615)
St. Lucie County, Florida
Financial Project ID: 231440-3-22-01; ETDM Number: 14177

1 inch = 1,000 feet

Figure 3

MAY 2016

FIGURE 4

NATURAL RESOURCES CONSERVATION SERVICE (NRCS) SOILS MAP

Feet
0 350 700
N

Begin Project
End Project
Co Rd 709
Florida's Turnpike (SR91)
Glades Cut Off Rd
FEC Railroad
Jenkins Rd
Post Office Rd
Devine Rd Divine Rd
Favorite Rd
Selvitz Rd
W Midway Rd (CR 712)
NW Mulga Ct
NW North Piper Cir
NW Omega Rd
NW West Lovett Cir
NW Meg Ct
NW South Lovett Cir
NW Jake Ct
NW North Lovoy Cir
NW South Lovoy Cir
NW North Lanett Ct
NW Minns Ct
NW North Lanett Cir
NW North Piper Cir
NW North Delwood Dr
NW Iredell St
E Torino Pkwy
NW South Delwood Dr
NW Nail Ct
Mara Ct
NW Gamma St
NW Jamebo St
NW Mayfield Ln
NW Rodin Ct
NW Agnon Ct
NW Bengal St
NW Monoco Ct
NW Lamoore Ln
NW Molton Cir
NW Alter Ct
NW Pomona Ct
NW Rugby Dr
NW Regal Cir
NW Milner Dr
Nekoma St
NW Polly Ct
S Rugby Dr
NW Newark Ln
Ale Ct
NW Lykes Ln
NW Nassau Ln
NW Selvitz Rd
NW Sheffield Cir
NW Dover Ct

Legend

- Study Area
- 2: Ankona and Farmton sands
- 4: Arents, 0 to 5 percent slopes
- 11: Chobee loamy sand, depressional
- 13: Floridana sand, depressional
- 23: Malabar fine sand, 0 to 2 percent slopes
- 25: Nettles and Oldsmar sands
- 26: Oldsmar sand, depressional
- 31: Pepper and EauGallie sands
- 32: Pineda sand
- 37: Riviera sand, depressional
- 38: Riviera fine sand, 0 to 2 percent slopes
- 44: Tantile and Pomona sands
- 47: Urban land
- 48: Wabasso sand, 0 to 2 percent slopes
- 50: Waveland and Immokalee fine sands
- 55: Winder loamy sand
- Hydric Soils
- Soils with Hydric Inclusions (>10%)

Sources: 2012 Aerial Photography - Florida Department of Transportation (FDOT); Soil Data - Natural Resources Conservation Service (NRCS) Geospatial Data Gateway

Document Path: K:\IVR&_Environmental\147071003 Midway Road PD&E\ENVGIS\MXD\Figure 4 - NRCS Soils Map.mxd

FDOT

Natural Resources Conservation Service (NRCS) Soils Map

Project Development and Environment (PD&E) Study - Midway Road (CR712)
From Glades Cut Off Road (CR 709) to Selvitz Road (CR 615)
St. Lucie County, Florida
Financial Project ID: 231440-3-22-01; ETDM Number: 14177

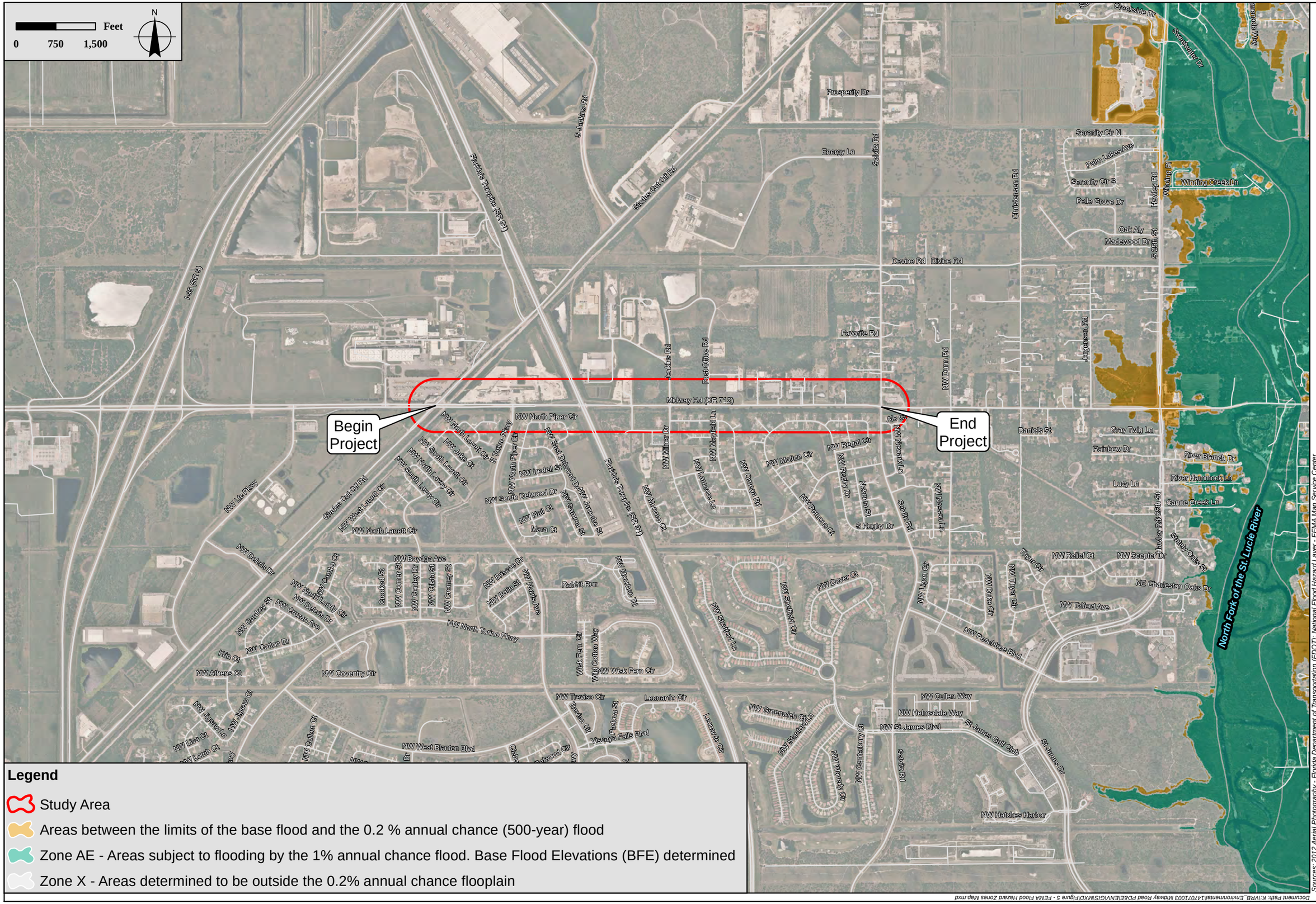
1 inch = 700 feet

FIGURE 4

MAY 2016

FIGURE 5

FEDERAL EMERGENCY MANAGEMENT AGENCY (FEMA) FLOOD HAZARD ZONES MAP



FDOT

Federal Emergency Management Agency (FEMA) Flood Hazard Zones Map

Project Development and Environment (PD&E) Study - Midway Road (CR712)
From Glades Cut Off Road (CR 709) to Selvitz Road (CR 615)
St. Lucie County, Florida
Financial Project ID: 231440-3-22-01; ETDM Number: 14177

1 inch = 1600 feet

FIGURE 5

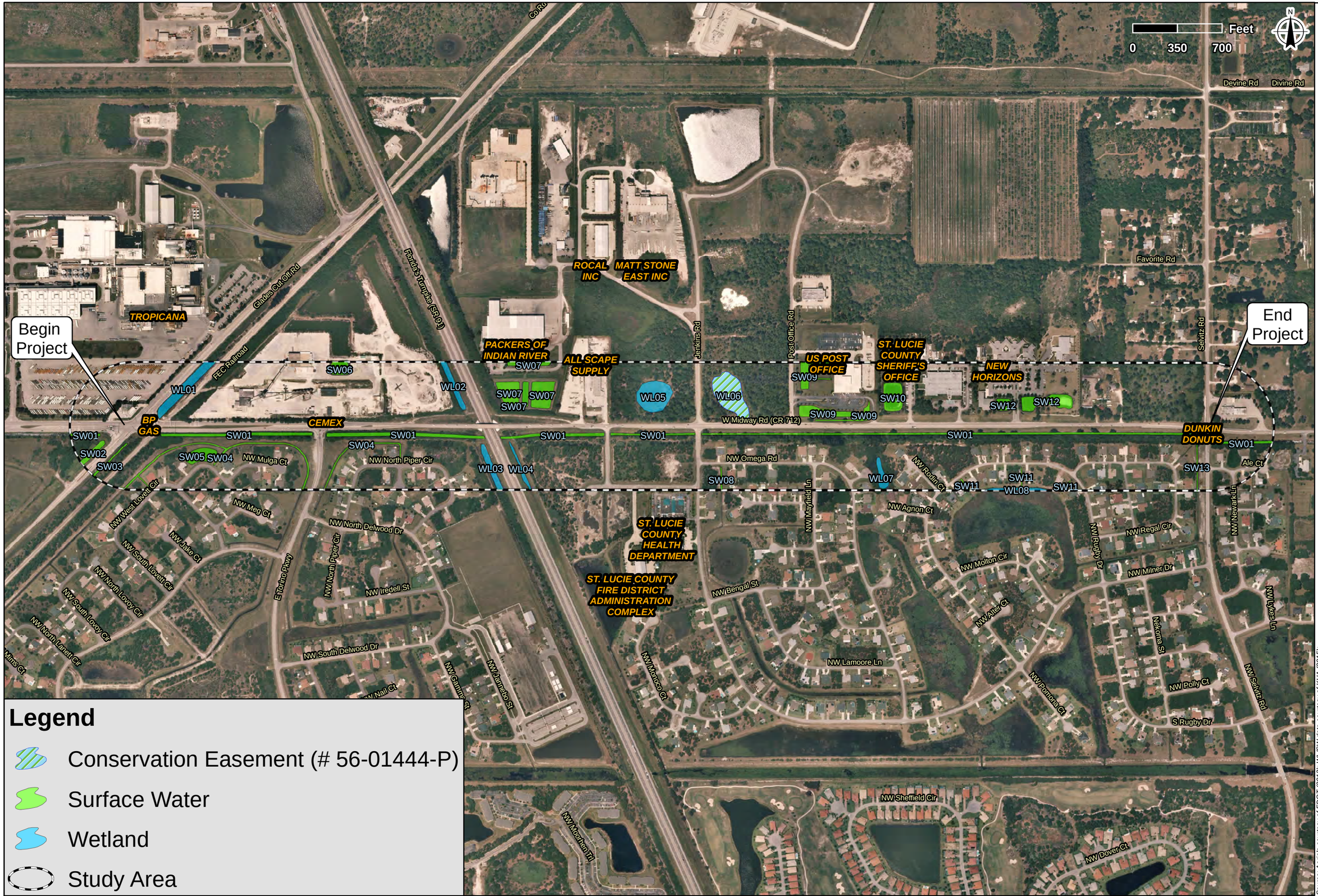
MAY 2016

Sources: 2012 Aerial Photography - Florida Department of Transportation (FDOT); National Flood Hazard Layer - FEMA Map Service Center

Document Path: K:\IVR_Environmental\147\2003 Midway Road PD&E\ENVGIS\MXD\Figure 5 - FEMA Flood Hazard Zones Map.mxd

FIGURE 6

WETLANDS AND SURFACE WATERS MAP



Legend

- Conservation Easement (# 56-01444-P)
- Surface Water
- Wetland
- Study Area

Source: Aerials courtesy of FDOT (2012); WLSW data courtesy of KHA (2015).

Document Path: K:\IVRE_Environmental\4707103 Midway Road PD&E\ENVGIS\MXD\Figure 6 - Wetlands and Surface Waters Map.mxd

FDOT

Wetlands and Surface Waters Map

Project Development and Environment (PD&E) Study - Midway Road (CR712)
From Glades Cut Off Road (CR 709) to Selvitz Road (CR 615)
St. Lucie County, Florida
Financial Project ID: 231440-3-22-01; ETDM Number: 14177

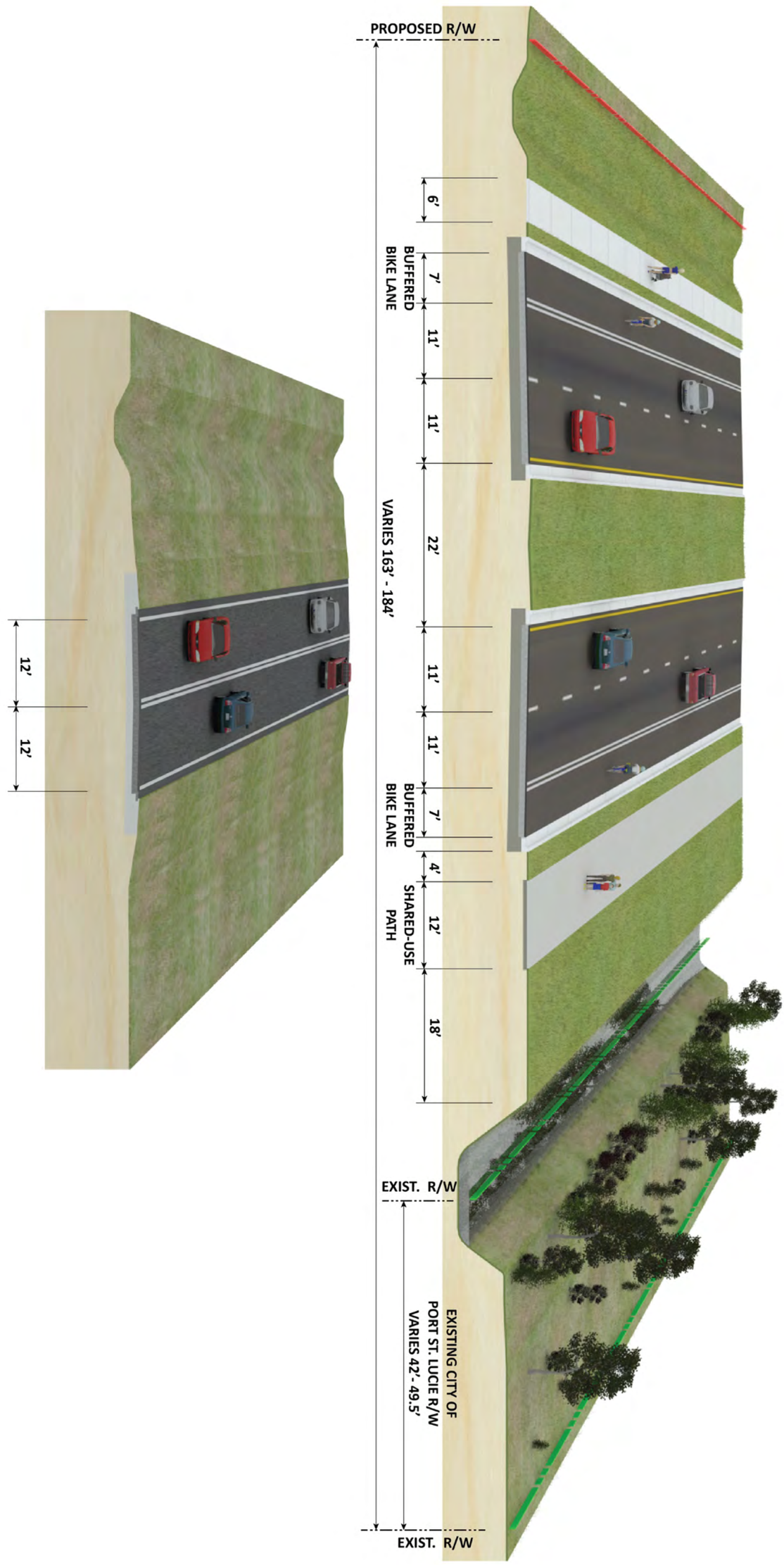
1 inch = 700 feet

FIGURE 6

MAY 2016

APPENDIX A

TYPICAL SECTIONS AND ALTERNATIVES

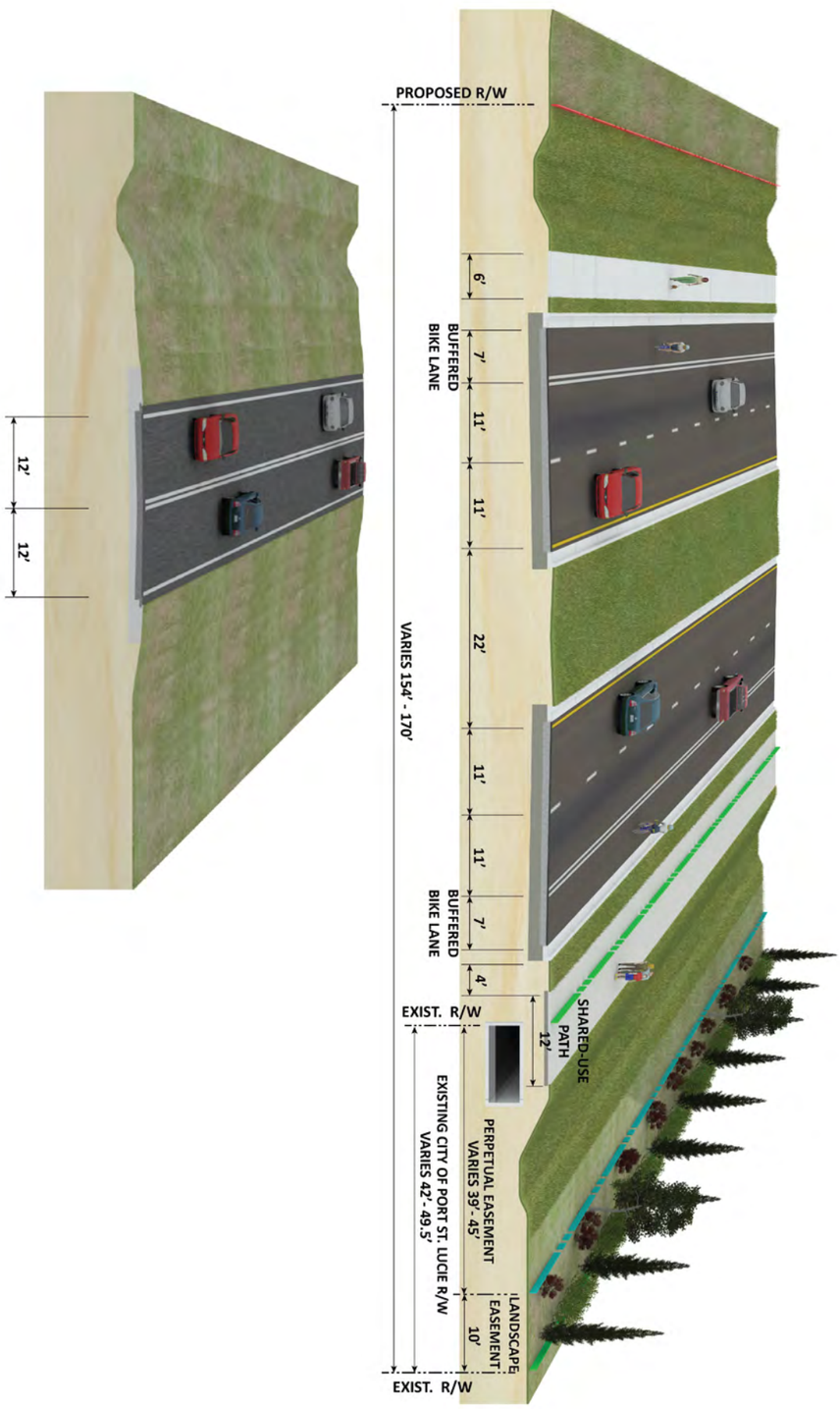


Alternative 1 - Canal Avoidance

Project Development and Environment (PD&E) Study - Midway Road (CR712)
From Glades Cut Off Road (CR 709) to Selvitz Road (CR 615)
St. Lucie County, Florida
Financial Project ID: 231440-3-22-01; ETDM Number: 14177

Appendix A1	*MAY 2016*	*Not drawn to scale*

Document Path: K:\RB_Environmental\147071003 Midway Road PD&E\ENV\GIS\MXD\Appendix A1 Alt 1 Canal Avoidance.mxd



Document Path: K:\VRB_Environmental\147071003 Midway Road PD&E\ENV\GIS\MXD\Appendix A2 Alt 2 Box Culvert.mxd

Alternative 2 - Box Culvert

Project Development and Environment (PD&E) Study - Midway Road (CR712)
From Glades Cut Off Road (CR 709) to Selvitz Road (CR 615)
St. Lucie County, Florida
Financial Project ID: 231440-3-22-01; ETDM Number: 14177

Appendix A2	*MAY 2016*	*Not drawn to scale*

APPENDIX B

ETDM PROGRAMMING SUMMARY REPORT

Florida Department of Transportation

RICK SCOTT
GOVERNOR

605 Suwannee Street
Tallahassee, FL 32399-0450

JIM BOXOLD
SECRETARY

ETDM Summary Report

Project #14177 - Midway Road Widening

Programming Screen - Published on 05/27/2015

Printed on: 9/23/2015

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Introduction to Programming Screen Summary Report

The Programming Screen Summary Report shown below is a read-only version of information contained in the Programming Screen Summary Report generated by the ETDM Coordinator for the selected project after completion of the ETAT Programming Screen review. The purpose of the Programming Screen Summary Report is to summarize the results of the ETAT Programming Screen review of the project; provide details concerning agency comments about potential effects to natural, cultural, and community resources; and provide additional documentation of activities related to the Programming Phase for the project. Available information for a Programming Screen Summary Report includes:

- Screening Summary Report chart
- Project Description information (including a summary description of the project, a summary of public comments on the project, and community-desired features identified during public involvement activities)
- Purpose and Need information (including the Purpose and Need Statement and the results of agency reviews of the project Purpose and Need)
- Alternative-specific information, consisting of descriptions of each alternative and associated road segments; an overview of ETAT Programming Screen reviews for each alternative; and agency comments concerning potential effects and degree of effect, by issue, to natural, cultural, and community resources.
- Project Scope information, consisting of general project commitments resulting from the ETAT Programming Screen review, permits, and technical studies required (if any)
- Class of Action determined for the project
- Dispute Resolution Activity Log (if any)

The legend for the Degree of Effect chart is provided in an appendix to the report.

For complete documentation of the project record, also see the GIS Analysis Results Report published on the same date as the Programming Screen Summary Report.

#14177 Midway Road Widening

District: District 4
County: St. Lucie
Planning Organization: FDOT District 4
Plan ID: Not Available
Federal Involvement: Federal Funding

Phase: Programming Screen
From: Glades Cut-Off Rd
To: Selvitz Road
Financial Management No.: 23144032201

Contact Information: Vanita Saini (954) 777-4468 vanita.saini@dot.state.fl.us
Snapshot Data From: Summary Report Re-Published 5/27/2015
Issues and Categories are reflective of what was in place at the time of the screening event.

	Social and Economic							Cultural			Natural					Physical					
	Land Use Changes	Social	Relocation Potential	Farmlands	Aesthetic Effects	Economic	Mobility	Section 4(f) Potential	Historic and Archaeological Sites	Recreation Areas	Wetlands	Water Quality and Quantity	Floodplains	Wildlife and Habitat	Coastal and Marine	Noise	Air Quality	Contamination	Infrastructure	Navigation	Special Designations
Alternative #1 - Alternative 1 From: Glades Cut-Off Rd To: Selvitz Road *Re-Published: 05/27/2015 Reviewed from 05/23/2014 to 07/07/2014)*	2	2	2	0	2	1	1	3	3	0	3	2	0	2	0	0	2	3	N/A	N/A	0

Purpose and Need

Purpose and Need

Based on recent traffic data from St. Lucie County, the facility does not adequately handle the existing traffic demand. Without capacity improvements, the traffic operations along the corridor will continue to deteriorate. The primary purpose for this project is to provide additional capacity to meet existing and future traffic needs, improve safety by alleviating existing roadway and capacity deficiencies, and allow opportunities for pedestrian, bicycle, and transit facilities. The additional capacity will also improve freight mobility and enhance emergency evacuation along the project corridor. The purpose and need of this project are further described in the following sections that include Transportation Demand, Capacity, Plan Consistency, Social Demands and Economic Development, and Modal Interrelationships.

Transportation Demand

The US Census designated Port St. Lucie-Fort Pierce Metropolitan Statistical Area (MSA) has been identified as one of the fastest growing metropolitan areas in Florida, which includes all of Martin and St. Lucie Counties. From 2000 to 2010, this metropolitan area has experienced population growth from 319,426 persons in 2000 to 424,107 persons in 2010, representing an annual increase of 2.9%. Evaluating the population growth for the City of Port St. Lucie by itself revealed an even greater percentage increase. According to the Bureau of Economic and Business Research, the City has grown from a population of 88,769 in 2000 to 164,603 in 2010 representing an annual increase of 6.4%.

This rapid population growth has resulted in a significant increase in surface transportation demand along major arterials such as the Midway Road (CR 712) corridor. The population of the Port St. Lucie-Fort Pierce metropolitan area is projected to increase from 424,107 in year 2010 to 648,600 in year 2035 representing a growth of approximately 53% (Source: Bureau of Economic Business Research).

As the population in the metropolitan area continues to increase, the developments in St. Lucie County will continue to push westward. In addition, the County is anticipated to experience traffic growth from the Developments of Regional Impact (DRI). A review of the recent DRI's applications in the Treasure Coast Regional Planning Council (TCRPC) shows the following statuses for the DRI's in the vicinity of the project corridor:

Completed - Orange Blossom Mall and St. Lucie West
Approved - The Reserved
Pending Notice of Proposed Change (NOPC) - LTC Ranch
Withdrawn - Provences and Orchard Park

These DRI's are geographically shown in Figure 2. The DRI located along Midway Road (CR 712), which is LTC Ranch, would have the greatest impact on the project corridor if constructed. As currently approved, the development includes 4,000 dwelling units of residential, over 1,505,000 square feet (SQFT) of office space, 725,000 SQFT of retail, and 1,960,200 SQFT of industrial space. However, the status of this development is pending Notice of Proposed Change (NOPC) that may result in a change in the size of the approved development.

The approval of the LTC Ranch DRI will further increase the transportation demand resulting in congested conditions along the project corridor. Since Midway Road (CR 712) is one of the vital east-west corridors in St. Lucie County, it is critical to increase capacity to meet the anticipated future transportation demand.

Capacity

Traffic data obtained from the St. Lucie County TPO Traffic Counts and Level of Service Report shows that the 2012 Annual Average Daily Traffic (AADT) along Midway Road (CR 712) west of Selvitz Road is 16,820 vehicles. Evaluating

this traffic data using the 2012 FDOT Quality/Level of Service Handbook, the Level of Service (LOS) is LOS F which is beyond the St. Lucie County's adopted LOS criteria of LOS E. This traffic data shows that the existing volume is already exceeding the capacity of the corridor which indicates that the roadway is operating in oversaturated and undesirable conditions. Furthermore, due to the industrial properties along the corridor, it has a high truck percentage at over 7% (Florida Traffic Online.)

The traffic is anticipated to increase to 29,200 AADT by 2040 and the corridor will continue to operate at LOS F with degraded traffic operation unless if the capacity is increased. The future traffic projections are based on the FDOT District Four Design Traffic Technical Memorandum for the I-95 PD&E Study from north of Becker Road to south of SR 70. This project utilized the Greater Treasure Coast Regional Planning Model (GTCRPM) as the basis for the future traffic projections. Without improvements, the congestion on the Midway Road (CR 712) project corridor will continue to operate at unacceptable driving conditions for residents and commuters due to the increased traffic volumes.

Plan Consistency

Martin and St. Lucie Counties have independent Metropolitan Planning Organizations (MPO) but share a common Regional Long Range Transportation Plan (RLRTP). The RLRTP establishes a unified strategy for transportation priorities and funding and creates a joint decision-making process regarding regional transportation issues.

The Midway Road (CR 712) project corridor extends from Glades Cut-Off Road to Selvitz Road and is identified in the Martin and St. Lucie 2035 Regional Long Range Transportation Plan (RLRTP). The project is identified in the St. Lucie County TPO 2035 Cost Feasible Plan (2016-2035) with a 2021-2025 implementation horizon. In addition, the project will be included in the next update to the State Transportation Improvement Program (STIP) and the St. Lucie TPO TIP. It should be noted that on the south side of the project corridor a multipurpose trail has been identified in the 2035 RLRTP in Table 4-9 of the Needs Plan Development.

Social Demands & Economic Development

Evacuation: Serving as part of the evacuation route network established by the Florida Division of Emergency Management, Midway Road (CR 712) plays an important role in facilitating traffic during emergency evacuation periods as it connects other major highways and arterials designated on the state evacuation route network within the project limits. These facilities include the Okeechobee Road (SR 70), I-95, Glades Cut-off Road (CR 709), Selvitz Road, S 25th Street (CR 615), Oleander Avenue (CR 605), and US 1. During a twelve month period in 2004-2005, St. Lucie County was hit directly by three major hurricanes. Midway Road (CR 712) is one of the county's most critical east-west routes and serves as a vital evacuation route for hurricanes or any other disasters. Additionally, widening Midway Road (CR 712) will ease traffic flow between S 25th Street and I-95, which will minimize a bottleneck effect during an emergency. It would also improve the ability of the local emergency management organization to evacuate large portions of the Treasure Coast in an acceptable time frame which will enhance the safety of residents.

Economic Development: The Treasure Coast Planning Council Alternative Infill Development Plan developed for Martin and St. Lucie Counties has identified several regional workplace districts located along the Midway Road (CR 712) corridor (see Figure 3). These regional workplace districts are locations where business and economic development would be focused to provide jobs for residents within this metropolitan area. The Midway Road (CR 712) project area is a high-growth area. Important state and federal offices and nonprofit centers are located along Midway Road (CR 712) or nearby streets. This includes the main St. Lucie County Branch of the U.S. Post Office, the St. Lucie County Sheriff's Office, St. Lucie County Health Department, St. Lucie County Fire District Office, Hospice of the Treasure Coast, and the New Horizons of the Treasure Coast, Inc. (Mental Health Center which is currently expanding). Significant truck traffic from the nearby St. Lucie County Landfill, CEMEX, Packers of Indian River Ltd., and Tropicana place additional demands on the roadway. Meanwhile, new residential units are planned nearby. The St. Lucie County Fairgrounds, the County's

Emergency Operations Center, is just six miles west of the project site.

According to the Martin and St. Lucie County 2035 Regional Long Range Transportation Plan, "The Regional Workplace Districts in St. Lucie County are located along the I-95 and Turnpike corridors and include the Treasure Coast Education Research Development Authority (TCERDA) area; the Crossroads Park of Commerce; the existing Rinker and Tropicana facilities along Glades Cut-off Road; the LTC Ranch Commerce Park; St. Lucie West Commerce Park; and Torrey Pines Institute south of Tradition and Gatlin Boulevard. These districts are well-situated for regional access, have ample room to grow, and can provide jobs for local residents." The Midway Road (CR 712) project corridor is anticipated to serve as the main transportation corridor linking residents of both Martin and St. Lucie Counties to this business area. Increasing the capacity along the project corridor will improve mobility and support the economic development of these districts as well as stimulate major construction activities that will contribute to economic growth within this area.

Modal Interrelationships

The accessibility to bicyclists and pedestrians along the corridor is minimal with only two sections of sidewalk within the corridor. They are located on the north side of Midway Road (CR 712) from East Torino Boulevard to Glades Cut-Off Road and along the frontage of the recently construction New Horizons medical facility. There are no bicycle lanes. During a recent field review (February 7, 2014), pedestrians were noted walking on the grassed shoulder pushing a child's stroller. Additionally, the existing bridge over the Florida's Turnpike does not have sufficient shoulder width to accommodate pedestrian or bicycle traffic. A review on the Martin and St. Lucie County 2035 RLRTP identified a multipurpose trail in Table 4-9 of the Needs Development Plan that would run along the entirety of Midway Road (CR 712) to connect with the other proposed multipurpose trails located on Okeechobee Rd, Shin Road, Glades Cut-Off Road, Selvitz Road, and roads further east.

The 2035 Future Bus and Train Network identified a proposed bus route along the entirety of Midway Road (CR 712) to connect to existing bus routes. Moreover, the County's Transit Development Plan (TDP) from February 2014 identified Midway Road (CR 712) as a priority corridor to implement transit. The project will create opportunities to include pedestrian, bicycle and transit facilities along the project corridor.

Roadway Deficiencies

The Midway Road bridge structure (ID 940050) over the Florida's Turnpike is located at M.P. 6.346 and was constructed in 1957. The last inspection of the bridge was performed on December 19, 2013. Although the report notes no structural deficiencies the bridge is classified as Functionally Obsolete.

Purpose and Need Reviews

FDOT District 4

Acknowledgement	Date Reviewed	Reviewer	Comments
Understood	10/09/2014	Zhuan Loo (zhuan.loo@stantec.com)	Safety issues will be further evaluated during PD&E Phase. The St. Lucie County MPO TIP lists the project for $3.8M for the Preliminary Engineering phase, while the FDOT STIP lists the project total for $71.2M for the Preliminary Engineering and PD&E phases.

FL Department of Agriculture and Consumer Services

Acknowledgement	Date Reviewed	Reviewer	Comments
Understood	06/27/2014	Steve Bohl (Steve.Bohl@freshfromflorida.com)	No Purpose and Need comments found.

FL Department of Economic Opportunity

Acknowledgement	Date Reviewed	Reviewer	Comments

Understood	07/03/2014	Matt Preston (matt.preston@deo.myflorida.com)	No Purpose and Need comments found.

FL Department of Environmental Protection

Acknowledgement	Date Reviewed	Reviewer	Comments
Understood	07/01/2014	Lauren Milligan (lauren.milligan@dep.state.fl.us)	No Purpose and Need comments found.

FL Department of State

Acknowledgement	Date Reviewed	Reviewer	Comments
Understood	06/12/2014	Ginny Jones (ginny.jones@dos.myflorida.com)	none

FL Fish and Wildlife Conservation Commission

Acknowledgement	Date Reviewed	Reviewer	Comments
Understood	07/01/2014	Scott Sanders (scott.sanders@myfwc.com)	No Purpose and Need comments found.

Federal Highway Administration

Acknowledgement	Date Reviewed	Reviewer	Comments
Accepted	08/08/2014	Luis Lopez, P.E. (luis.d.lopez@dot.gov)	Purpose and Need: Safety was mentioned during the overall introduction of the Purpose and Need but there is no data or discussion available to support it. Discussion is recommended. Planning Consistency: Is the project included in the current STIP? Planning Consistency: This project is in the ETDM Programming Screen and therefore the project phase costs and related funding for those phases that are identified should be consistent with the TIP and LRTP. The project description identifies the project cost, excluding ROW, to be approximately $19m, but the upcoming TIP (to be effective October 1m, 2014) identifies the project costs programmed over the next 5 years as $36m ($45 if ROW is included) and total project costs estimated to be $57m. Please update this information in the screening tool to more accurately reflect what is being presented to the public. Public comments on this project were not included in the screening tool. Is FDOT aware of any controversy or support for the proposed project? The status of the planning Consistency for this projects was identified as - "no information available" yet, within the project purpose and need there was narrative that described the programming of this project with the MPO documents. This should be updated to reflect this information.

National Marine Fisheries Service

Acknowledgement	Date Reviewed	Reviewer	Comments
Understood	05/28/2014	Brandon Howard (Brandon.Howard@noaa.gov)	None

National Park Service

Acknowledgement	Date Reviewed	Reviewer	Comments
Understood	06/17/2014	Anita Barnett (anita_barnett@nps.gov)	No Purpose and Need comments found.

Natural Resources Conservation Service

Acknowledgement	Date Reviewed	Reviewer	Comments
Understood	05/29/2014	Rick Robbins (rick.a.robbins@fl.usda.gov)	No Purpose and Need comments found.

South Florida Water Management District

Acknowledgement	Date Reviewed	Reviewer	Comments
Understood	06/27/2014	Mindy Parrott (mparrott@sfwmd.gov)	No Purpose and Need comments found.

US Army Corps of Engineers

Acknowledgement	Date Reviewed	Reviewer	Comments
Understood	06/24/2014	Garett Lips (Garett.G.Lips@usace.army.mil)	No Purpose and Need comments found.

US Coast Guard

Acknowledgement	Date Reviewed	Reviewer	Comments
Understood	05/27/2014	Evelyn Smart (evelyn.smart@uscg.mil)	No Coast Guard involvement.

US Environmental Protection Agency

Acknowledgement	Date Reviewed	Reviewer	Comments
Understood	07/02/2014	Maher Budeir (budeir.maher@epa.gov)	No Purpose and Need comments found.

US Fish and Wildlife Service

Acknowledgement	Date Reviewed	Reviewer	Comments
Understood	05/28/2014	John Wrublik (john_wrublik@fws.gov)	No Purpose and Need comments found.

Project Description Data

Project Description

Project Description

The Midway Road (CR 712) project corridor is centrally located in the eastern part of St. Lucie County, Florida and is owned and maintained by St. Lucie County. The project corridor extends approximately 1.6 miles along Midway Road (Roadway ID: 94530000), also known as County Road (CR) 712, from Glades Cut-Off Road (Mile Post: 5.813) to Selvitz Road (Mile Post: 7.405). The project corridor is located in Unincorporated St. Lucie County but is the northern border to the City of Port St. Lucie (See Figure 1).

Midway Road (CR 712) is a major east-west roadway that provides a vital connection to residents and commuters to and from the Interstate 95 (I-95) to the commercial areas along US 1. Within the project limits, Midway Road (CR 712) is a two lane undivided roadway with a varying posted speed from 35 to 45 miles per hour. Midway Road (CR 712) is functionally classified as an Urban Principal Arterial and is designated as a hurricane evacuation route by the Florida Division of Emergency Management. The existing roadway typical section consists of two 12-ft lanes, one in each direction and the existing right of way also varies with a minimum width of 70-ft. The land uses consist of residential, commercial, government, and industrial facilities such as Tropicana Products Inc., CEMEX, Packers of Indian River Ltd., US Post Office, St. Lucie County Sheriff, and New Horizons.

The study corridor includes a bridge (#940050) that goes over the Florida's Turnpike. The Florida East Coast (FEC) railroad traverses the corridor by running adjacent and parallel to the Glades Cut-Off Road. Canal 103, part of the St. Lucie Water Control District, is the principal receiving water body for the project area and conveys stormwater from the west side of the Florida's Turnpike through an existing concrete box culvert. The canal runs parallel along the south side

of Midway Road (CR 712) and after Selvitz Road, the canal diverges and continues southeasterly to discharge into the North Fork of the St. Lucie River. The North Fork is designated as an Outstanding Florida Water (OFW) and an Aquatic Preserve. It is the main collector water body in the St. Lucie County and discharges into the Indian River Lagoon. The canal along with the adjacent vegetative buffer, provide a physical separation to the residential homes on the south side.

The Midway Road (CR 712) Project Development & Environment (PD&E) study from Glades Cut-Off Road to Selvitz Road will evaluate alternatives to widen the existing road from two to four lanes within the project limits to satisfy future traffic demand and capacity needs. The proposed study will also consider pedestrian, bicycle, and transit facilities, improvements to freight mobility, and evaluate operational improvements and access management into some commercial businesses along the project corridor. Additional right of way requirements will be evaluated during the PD&E Study for offsite ponds in order to meet stormwater management requirements. At this time, it is not anticipated that any right of way requirements will impact the adjacent environmentally sensitive areas.

The current project construction cost is estimated at $19 million based on the St. Lucie County and Martin County 2035 Regional Long Range Transportation Plan (RLRTP). The project construction cost is anticipated to be funded with federal funds. It should be noted that this estimated cost does not include right of way acquisitions.

Logical Termini

The Midway Road (CR 712) project limits are from Glades Cut-off Road as the western terminus to Selvitz Road as the eastern terminus in St. Lucie County. The proposed eastern and western limits for this project represent logical end points that tie into other future projects along Midway Road (CR 712) with the ultimate vision of having a continuous four-lane roadway from I-95 to US-1. The only existing four-lane section of Midway Road (CR 712) is from the interchange with I-95 to Glades Cut-off Road. East of Glades Cut-off Road up to the commercial area of US-1, Midway Road (CR 712) is generally a two-lane, undivided roadway.

Midway Road (CR 712) from Glades Cut-off Road to Selvitz Road has been identified for widening from two to four lanes in the 2035 Cost Feasible Plan of the St. Lucie County Transportation Planning Organization (TPO) (see Plan Consistency section for more information). The western limits of the project corridor will logically connect with the existing four-lane section of Midway Road (CR 712). The eastern limits of the project corridor at Selvitz Road will connect with a future four-lane section of Midway Road (CR 712) from Selvitz to S 25th Street that has also been identified in the 2035 St. Lucie TPO Cost Feasible Plan and will be completed with the County's Transportation Management Area (TMA) funding. From S 25th Street to US-1, this segment is slated for construction to widen from two to four lanes in 2013 to 2016 based on the St. Lucie TPO Transportation Improvement Program (TIP) of Fiscal Year (FY) 2013/14 - 2017/18.

Summary of Public Comments

Summary of Public Comments is not available at this time.

Justification

An extensive Public Involvement Plan (PIP) will be prepared and conducted during the PD&E phase of this project. The PIP will (1) outline how project team members will engage the community and other stakeholders in consensus-building/context sensitive solutions for any alternative under consideration, including the No-Build Alternative, and (2) incorporate environmental and community values into the development of the preferred alternative.

Planning Consistency Status

No information available.

Federal Consistency Determination

Date: 07/01/2014

Determination: CONSISTENT with Coastal Zone Management Program.

Lead Agency

Federal Highway Administration

Participating and Cooperating Agencies

No Cooperating Agencies have been identified.

No Participating Agencies have been identified.

Exempted Agencies

Agency Name	Justification	Date
Federal Transit Administration	FTA has requested to be exempt from reviewing any non-transit projects.	05/21/2014

Community Desired Features

No desired features have been entered into the database. This does not necessarily imply that none have been identified.

User Defined Communities Within 500 Feet

No user defined communities were found within a 500 ft. buffer distance for this project.

Census Places Within 500 Feet

- Port St. Lucie
- White City

Alternative #1 - Alternative 1

Alternative Description

Name	From	To	Type	Status	Total Length	Cost	Modes	SIS
Alternative 1	Glades Cut-Off Rd	Selvitz Road	Widening	ETAT Review Complete	1.6 mi.	$19,000,000.00	Roadway Bicycle Pedestrian	N

Segment Description(s)

Location and Length

Segment No.	Name	Beginning Location	Ending Location	Length (mi.)	Roadway Id	BMP	EMP
Segment 1	Segment 1	Glades Cut-Off Road	Selvitz Road	1.6	94530000		

Jurisdiction and Class

Segment No.	Jurisdiction	Urban Service Area	Functional Class
Segment 1	County	In/Out	URBAN: Principal Arterial - Other

Base Conditions

Segment No.	Year	AADT	Lanes	Config
Segment 1	2012	16820	2	Lanes Undivided

Interim Plan

Segment No.	Year	AADT	Lanes	Config
Segment 1				

Needs Plan

Segment No.	Year	AADT	Lanes	Config
Segment 1	2040	29200	4	

Cost Feasible Plan

Segment No.	Year	AADT	Lanes	Config
Segment 1	2040			

Funding Sources

Segment No.	FEDERAL	Unknown
$19,000,000.00		

Project Effects Overview for Alternative #1 - Alternative 1

Issue	Degree of Effect	Organization	Date Reviewed
Social and Economic			
Land Use Changes	2 Minimal	FDOT District 4	07/03/2014
Land Use Changes	1 Enhanced	FL Department of Economic Opportunity	07/03/2014
Social	0 None	US Environmental Protection Agency	07/07/2014
Social	2 Minimal	FDOT District 4	07/03/2014
Relocation Potential	2 Minimal	FDOT District 4	07/03/2014
Farmlands	0 None	Natural Resources Conservation Service	05/29/2014
Aesthetic Effects	2 Minimal	FDOT District 4	07/03/2014
Economic	1 Enhanced	FDOT District 4	07/03/2014
Economic	1 Enhanced	FL Department of Economic Opportunity	07/03/2014
Mobility	1 Enhanced	FDOT District 4	07/03/2014

Cultural			
Historic and Archaeological Sites	3 Moderate	FL Department of State	06/12/2014
Recreation Areas	0 None	US Environmental Protection Agency	07/07/2014
Recreation Areas	N/A N/A / No Involvement	National Park Service	06/17/2014
Recreation Areas	0 None	FL Department of Environmental Protection	07/01/2014
Recreation Areas	0 None	South Florida Water Management District	07/01/2014
Natural			
Wetlands	3 Moderate	National Marine Fisheries Service	05/28/2014
Wetlands	2 Minimal	US Environmental Protection Agency	07/07/2014
Wetlands	3 Moderate	US Army Corps of Engineers	06/24/2014
Wetlands	2 Minimal	FL Department of Environmental Protection	07/01/2014
Wetlands	2 Minimal	US Fish and Wildlife Service	05/29/2014
Wetlands	3 Moderate	South Florida Water Management District	07/01/2014
Water Quality and Quantity	2 Minimal	South Florida Water Management District	07/01/2014
Water Quality and Quantity	2 Minimal	US Environmental Protection Agency	07/07/2014
Water Quality and Quantity	2 Minimal	FL Department of Environmental Protection	07/01/2014
Floodplains	0 None	US Environmental Protection Agency	07/07/2014
Floodplains	0 None	South Florida Water Management District	07/01/2014
Wildlife and Habitat	2 Minimal	FL Fish and Wildlife Conservation Commission	07/01/2014
Wildlife and Habitat	2 Minimal	US Fish and Wildlife Service	05/29/2014
Coastal and Marine	0 None	National Marine Fisheries Service	05/28/2014
Coastal and Marine	0 None	South Florida Water Management District	07/01/2014
Physical			
Air Quality	2 Minimal	US Environmental Protection Agency	07/07/2014
Contamination	3 Moderate	US Environmental Protection Agency	07/07/2014
Contamination	2 Minimal	South Florida Water Management District	07/01/2014
Contamination	3 Moderate	FL Department of Environmental Protection	07/01/2014
Infrastructure	N/A N/A / No Involvement	FL Department of Agriculture and Consumer Services	06/27/2014
Navigation	N/A N/A / No Involvement	US Army Corps of Engineers	06/24/2014
Navigation	N/A N/A / No Involvement	US Coast Guard	05/27/2014
Special Designations			
Special Designations	0 None	US Environmental Protection Agency	07/07/2014

Special Designations	0 None	South Florida Water Management District	07/01/2014

ETAT Reviews and Coordinator Summary: Social and Economic

Land Use Changes

Project Effects

Coordinator Summary Degree of Effect: 2 *Minimal* assigned 09/03/2014 by FDOT District 4

Comments:

This project is identified in the Martin and St. Lucie 2035 Regional Long Range Transportation Plan (RLRTP) and is identified in the St. Lucie County TPO 2035 Cost Feasible Plan (2016-2035) with a 2021-2025 implementation horizon. In addition, the project will be included in the next update to the State Transportation Improvement Program (STIP) and the St. Lucie TPO TIP. It should be noted that on the south side of the project corridor a multipurpose trail has been identified in the 2035 RLRTP in Table 4-9 of the Needs Plan Development. The project is not located within a quarter mile of any existing local parks. The project is also not located in an Area of Critical State Concern, does not encroach on a military base, and is not located within the Coastal High Hazard Area.

The Future Land Use Map (FLUM) of the Comprehensive Plan shows several FLUM categories surrounding the project: a mix of land uses that consist of residential land uses to the south and industrial, public facilities, and commercial land uses to the north. The City of Port St. Lucie future land use map shows that the currently vacant land in the southeast quadrant of Midway Road (CR 712) and the Florida's Turnpike has a commercial land use. The widening of the project corridor will primarily utilize the existing right of way; however, additional right of way may be identified for acquisition during the PD&E Study to provide offsite ponds for stormwater management requirements. Based on ETAT review comments, FDOT assigns a summary degree of effects of Minimal to Land Use Changes.

Degree of Effect: 2 *Minimal* assigned 07/03/2014 by Gaspar Jorge Padron, FDOT District 4

Coordination Document: PD&E Support Document As Per PD&E Manual

Direct Effects

Identified Resources and Level of Importance:

Residential communities located to the south and east of the project corridor. Industrial and government facilities located to the north of the project corridor.

Comments on Effects to Resources:

The future land use maps of St. Lucie County (2013) and the City of Port St. Lucie (2014) revealed that the project corridor is composed of a mix of land uses that consist of residential land uses to the south and industrial, public facilities, and commercial land uses to the north. The City of Port St. Lucie future land use map shows that the currently vacant land in the southeast quadrant of Midway Road (CR 712) and the Florida's Turnpike has a commercial land use. During a field visit conducted on February 7, 2014, it was verified that the land uses along the project corridor consists of residential, commercial, government, and industrial facilities. Canal 103, which is part of the St. Lucie Water Control District, is located along the south side of the Midway Road (CR 712) project corridor and provides a physical divide between the southern residential area and the northern industrial and commercial area.
The widening of the project corridor will primarily utilize the existing right of way; however, additional right of way may be identified for acquisition during the PD&E Study to provide offsite ponds for stormwater management requirements.
It is anticipated that the effect to Land Use will be Minimal.

Additional Comments (optional):

CLC Commitments and Recommendations:

Degree of Effect: 1 *Enhanced* assigned 07/03/2014 by Matt Preston, FL Department of Economic Opportunity

Coordination Document: No Involvement

Direct Effects

Identified Resources and Level of Importance:

St. Lucie County Comprehensive Plan 2010.

Comments on Effects to Resources:

The proposed improvements are consistent and compatible with the *St. Lucie County Comprehensive Plan 2010* and the development goals of the City and County. Midway road is a critical east-west evacuation route. The Comprehensive Plan projects a 2030 LOS of F if no improvements are made. It is currently operating at a LOS E. Policy 5.2.3.1 calls for the improvement of Midway Road so as to operate at a minimum LOS D during an emergency evacuation.

This section of Midway Road is identified on the Right of Way Protection Map as a proposed 4 lane roadway.

The Future Land Use Map (FLUM) of the Comprehensive Plan shows several FLUM categories surrounding the project, including: **City of Port St. Lucie** - Commercial Limited, Institutional, Open Space - Conservation, Commercial General, and Commercial Service.**St. Lucie County** - Industrial, Public Facilities, and Residential.

The project is not located within a quarter mile of any existing local parks.

The project is not located in an Area of Critical State Concern, does not encroach on a military base, and is not located within the Coastal High Hazard Area.

Additional Comments (optional):

CLC Commitments and Recommendations:

Social

Project Effects

Coordinator Summary Degree of Effect: 2 *Minimal* assigned 09/03/2014 by FDOT District 4

Comments:
The project serves to enhance mobility and accessibility and public safety along the project corridor. While the widening of the project corridor will primarily utilize the existing right of way; additional right of way may be identified for acquisition during the PD&E Study to provide offsite ponds for stormwater management requirements. Potential noise and vibration effects may be of concern to the residential areas located to the south as a result of increased traffic on an expanded facility, the overall impacts on the social environment and cohesion are anticipated to be minor. Potential social impacts will be assessed further during Project Development as more detailed information becomes available.

Public outreach to solicit input from the transportation disadvantaged, elderly, low income, and minority populations will be conducted to ensure that a thorough Environmental Justice/Title VI analysis that considers potentially disproportionate impacts to protected groups is conducted and that identified transportation needs are addressed through the project. Limited English Proficiency (LEP) accommodations will be necessary during public outreach as the demographic data indicates that 16% of the Spanish-speakers speak English "Less than very well". Public commentary collected as a result of such efforts will be documented in the EST. Additionally, a Socio-cultural Effects Evaluation and Noise Study Report will be conducted as part of the PD&E Study. Based on ETAT review comments, FDOT assigns a summary degree of effect of Minimal to Social.

Degree of Effect: 0 *None* assigned 07/07/2014 by Maher Budeir, US Environmental Protection Agency

Coordination Document: PD&E Support Document As Per PD&E Manual

Direct Effects

Identified Resources and Level of Importance:

Comments on Effects to Resources:

Additional Comments (optional):

CLC Commitments and Recommendations:

Degree of Effect: 2 *Minimal* assigned 07/03/2014 by Gaspar Jorge Padron, FDOT District 4

Coordination Document: PD&E Support Document As Per PD&E Manual

Direct Effects

Identified Resources and Level of Importance:
Within the 500-ft buffer, the following resources were identified:
LTC Ranch
Cemex
Packers of Indian River
Contech Engineered Solutions
St. Lucie County Department of Health
US Post Office
St. Lucie County Sheriff's Office
New Horizons (Emotional and Mental Health Facility)

Mobil Gas Station
Dunkin' Donuts
Subway Sandwich
FEC Railroad
Canal 103
Bridge #940050
Residential communities located to the south and east of the project corridor. Industrial and government facilities located to the north of the project corridor.
City of Port St. Lucie to the south and the White City community to the east of the project

Comments on Effects to Resources:
The project corridor is located along the northern border of the City of Port St. Lucie. The roadway is owned and maintained by St. Lucie County. The corridor is within the US Census designated Port St. Lucie-Fort Pierce Metropolitan Statistical Area (MSA) and has been identified as one of the fastest growing metropolitan areas in Florida, which includes all of Martin and St. Lucie Counties. From 2000 to 2010, this metropolitan area has experienced population growth from 319,426 persons in 2000 to 424,107 persons in 2010, representing an annual increase of 2.9%. Evaluating the population growth for the City of Port St. Lucie by itself revealed an even greater percentage increase. According to the Bureau of Economic and Business Research, the City has grown from a population of 88,769 in 2000 to 164,603 in 2010 representing an annual increase of 6.4%.
The population of the Port St. Lucie-Fort Pierce metropolitan area is projected to increase from 424,107 in year 2010 to 648,600 in year 2035 representing a growth of approximately 53% (Source: Bureau of Economic Business Research). As the population in the metropolitan area continues to increase, developments in St. Lucie County will continue to grow thereby increasing the amount of traffic on the roads. According to the 2010 US Census, the population of St. Lucie County is 277,789 and includes the following breakdown:
African-Americans: 53,036 (19%)
American Indian, Eskimo or Aleut: 1,123 (0.4%)
Asian Americans: 4,334 (1.6%)
Caucasian American: 199,336 (72%)
Native Hawaiian and Other Pacific Islander: 161 (0.06%)
Other: 19,799 (7%)
Hispanics: 45,995 (17%)*
*(the Hispanic Ethnicity includes Blacks and Whites)
Serving as part of the evacuation route network established by the Florida Division of Emergency Management, Midway Road (CR 712) plays an important role in facilitating traffic movement during emergency evacuation periods. The project corridor provides connections to other major highways and arterials designated on the state evacuation route network such as Okeechobee Road (SR 70), I-95, Glades Cut-off Road (CR 709), Selvitz Road, S 25th Street (CR 615), Oleander Avenue (CR 605), and US-1. In addition, there is one overpass bridge (#940060) over the Florida's Turnpike that may need to be modified or replaced depending on the alternative.
It should be noted that any transportation project that requires federal funding must satisfy the Executive Order 13166, "Improving Access to Services for Persons with Limited English Proficiency (LEP)." Demographic information of four Census Tracts that surround the project area was analyzed. Of the Spanish-speaking residents, over 16% speak "English less than very well". Based on LEP specifications as defined by Chapter 11 of the Project Development and Environment (PD&E) Manual, future public involvement efforts in Spanish should be considered.
It is anticipated that the effect to Social will be Minimal.

Additional Comments (optional):

CLC Commitments and Recommendations:

Relocation Potential

Project Effects

Coordinator Summary Degree of Effect: 2 *Minimal* assigned 09/30/2014 by FDOT District 4

Comments:
While the widening of the project corridor will primarily utilize the existing right of way; additional right of way may be identified for acquisition during the PD&E Study to provide offsite ponds for stormwater management requirements. Should right of way acquisitionbe identified during Project Development, FDOT shall carry out a Right of Way and Relocation Program in accordance with the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970 and Florida Statute 339.09.

FDOT assigns a degree of effect of Minimal to Relocation Potential.

Degree of Effect: 2 *Minimal* assigned 07/03/2014 by Gaspar Jorge Padron, FDOT District 4

Coordination Document: PD&E Support Document As Per PD&E Manual

Direct Effects

Identified Resources and Level of Importance:

Residential communities located to the south and east of the project corridor. Industrial and government facilities located to the north of the project corridor.

Comments on Effects to Resources:

The widening of the project corridor will primarily utilize the existing right of way. It is not anticipated to displace any residences or businesses within the community. However, additional right of way may be identified for acquisition during the PD&E Study to provide offsite ponds for stormwater management requirements. It is not anticipated that any right of way requirements will impact the adjacent environmentally sensitive areas.

A Conceptual Stage Relocation Plan will be prepared if relocations are determined to be necessary. If right of way or relocations are required then FDOT will carry out a right of way and relocation program in accordance with Florida Statute 339.09 and the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970 (as amended by the Public Law 100-17.
It is anticipated that the effect to Relocation Potential will be Minimal.

Additional Comments (optional):

CLC Commitments and Recommendations:

Farmlands

Project Effects

Coordinator Summary Degree of Effect: 0 *None* assigned 09/03/2014 by FDOT District 4

Comments:

A review of the GIS Analysis and ETAT agency comment identified Farmland Soils of Unique Importanceat all buffer widths for this project; however, the USDA-NRCS considers land to be used in production of commodity crops, such as, cotton, citrus, row crops, specialty crops, nuts, etc. as Farmlands of Unique Importance or Farmlands of Local Importance. The project corridor traverses through a mix of residential land uses to the south and industrial, public facilities, and commercial land uses to the north. FDOT assigns a degree of effect of None to Farmlands.

Degree of Effect: 0 *None* assigned 05/29/2014 by Rick Allen Robbins, Natural Resources Conservation Service

Coordination Document: No Involvement

Direct Effects

Identified Resources and Level of Importance:

The USDA-NRCS considers soil map units with important soil properties for agricultural uses to be Prime Farmland. In addition, the USDA-NRCS considers any soils with important soil properties and have significant acreages that are used in the production of commodity crops (such as, cotton, citrus, row crops, specialty crops, nuts, etc.) to be considered as Farmlands of Unique Importance or Farmlands of Local Importance. Nationally, there has been a reduction in the overall amount of Prime and Unique Farmlands through conversion to non-farm uses. This trend has the possibility of impacting the nation's food supply and exporting capabilities.

Comments on Effects to Resources:

Conducting GIS analysis of Prime Farmland (using USDA-NRCS data) and Important Farmland Analysis (using Assoicated Level !!! Water Management District data and 2010 SSURGO data) has resulted in the determination that there areFarmland Soils of Unique Importance at all buffer widths for this project. The amounts range from 34.36acres at the 100' buffer width and188.21 acres at the 500' buffer width. However, most of the project area is mixed urban and residential land use. With existing Land use andproject design (widening), we are assigning aNo Degree of Effect to Important Farmlands.

Additional Comments (optional):

CLC Commitments and Recommendations:

Aesthetic Effects

Project Effects

Coordinator Summary Degree of Effect: 2 *Minimal* assigned 09/03/2014 by FDOT District 4

Comments:

A review of the GIS Analysis and ETAT agency comments identified a park Milner Drive Tot, in the vicinity of the project corridor and an existing bridge

(Bridge #940050) along Midway Road over the Florida's Turnpike. The park is located approximately 500-ft to the east of the Florida's Turnpike and it is not anticipated that the project will directly affect the park. However, changes to the Florida Turnpike crossing, such as raising the profile grade for a new bridge, may affect aesthetics for adjacent facilities. Additionally, there is a native plant buffer between Canal 103 and the residential community to the south. The City of Port St. Lucie and County have entered into an agreement to ensure that the existing native plant buffer is preserved to the greatest extent possible. FDOT shall coordinate with the City of Port St. Lucie and the County.

FDOT assigns a degree of effect of Minimal to Aesthetics Effects.

Degree of Effect: 2 *Minimal* assigned 07/03/2014 by Gaspar Jorge Padron, FDOT District 4

Coordination Document: PD&E Support Document As Per PD&E Manual

Direct Effects

Identified Resources and Level of Importance:

Residential communities located to the south and east of the project corridor. Industrial and government facilities located to the north of the project corridor.
City of Port St. Lucie to the south and the White City community to the east of the project.

Comments on Effects to Resources:

Approximately 500-ft from the project corridor on the east side of the Florida's Turnpike is Milner Drive Tot lot which is a park that is maintained by the City of Port St. Lucie. At this time it is not anticipated that this park will be directly affected by the project. If the existing two-lane bridge along Midway Road (CR 712) over the Florida's Turnpike is elevated as a result of replacement to accommodate four lanes, then some visual impacts may be a concern to the surrounding communities due to the higher bridge profile. In addition, on the south side of the corridor there exists a native plant community that acts as a buffer between Canal 103 and the residential communities. The City and County have entered into an agreement to ensure that the existing native plant communities are preserved to the greatest extent possible.
It is anticipated that the effect to Aesthetics Effects will be Minimal.

Additional Comments (optional):

CLC Commitments and Recommendations:

Economic

Project Effects

Coordinator Summary Degree of Effect: 1 *Enhanced* assigned 09/03/2014 by FDOT District 4

Comments:

A review of the GIS Analysis and ETAT agency comments identified several commercial, industrial, county and federal facilities along the project corridor. The project is not located in a Rural Area of Critical Economic Concern (RACEC). The project traverses one of the St. Lucie's Regional Workplace Districts to which the project may serve as one of the main transportation corridor to link residents of Martin and St. Lucie Counties to the districts. The project would also be beneficial for future industrial development within St. Lucie County. However, an unconstrained roadway would be beneficial for future industrial development within St. Lucie County. The area is built-out within the city of Port St. Lucie, but an unconstrained roadway would be beneficial for any future redevelopment and industrial related employment.

Based on ETAT review comments, FDOT assigns a summary degree of effect of Enhanced to Economic.

Degree of Effect: 1 *Enhanced* assigned 07/03/2014 by Gaspar Jorge Padron, FDOT District 4

Coordination Document: PD&E Support Document As Per PD&E Manual

Direct Effects

Identified Resources and Level of Importance:

Within the 500-ft buffer, the following resources were identified:
LTC Ranch
Cemex
Packers of Indian River
Contech Engineered Solutions
St. Lucie County Department of Health
US Post Office
St. Lucie County Sheriff's Office
New Horizons (Emotional and Mental Health Facility)

Mobil Gas Station
Dunkin' Donuts
Subway Sandwich

Comments on Effects to Resources:
The project corridor includes commercial and industrial land uses such as the Tropicana Products Inc., CEMEX, Packers of Indian River Ltd., Hospice of the Treasure Coast, and the New Horizons of the Treasure Coast, Inc. (Mental Health Center which is currently expanding). The truck percentage is high at over 7%; which indicates that the project corridor has significant freight activity. Meanwhile, new residential units are planned nearby. The St. Lucie County Fairgrounds and the County's Emergency Operations Center are just six miles west of the project site. The corridor also includes Federal and County offices such as the U.S. Post Office, St. Lucie County's Sheriff's Office, Fire District, and Health Department.
According to the Martin and St. Lucie County 2035 Regional Long Range Transportation Plan (RLRTP), "The Regional Workplace Districts in St. Lucie County are located along the I-95 and Turnpike corridors and include the Treasure Coast Education Research Development Authority (TCERDA) area; the Crossroads Park of Commerce; the existing Rinker and Tropicana facilities by the intersection of Glades Cut-off Road and Midway Road (CR 712); the LTC Ranch Commerce Park; St. Lucie West Commerce Park; and Torrey Pines Institute south of Tradition and Gatlin Boulevard." The project corridor traverses one of the Regional Workplace Districts and as state in the RLRTP, these districts are well-situated for regional access, have ample room to grow, and can provide jobs for local residents. The Midway Road (CR 712) project corridor is anticipated to serve as one of the main transportation corridor linking residents of both Martin and St. Lucie Counties to these business areas.
The Treasure Coast Planning Council Alternative Infill Development Plan developed for Martin and St. Lucie Counties has also identified several regional workplace districts located along the Midway Road (CR 712) project corridor. These regional workplace districts are focused to provide jobs for residents within this metropolitan area.
It is anticipated that the effect to Economic will be Enhanced.

Additional Comments (optional):

CLC Commitments and Recommendations:

Degree of Effect: 1 *Enhanced* assigned 07/03/2014 by Matt Preston, FL Department of Economic Opportunity

Coordination Document: No Involvement

Direct Effects
Identified Resources and Level of Importance:
St. Lucie County Comprehensive Plan 2010.

Comments on Effects to Resources:
The project is not located in a Rural Area of Critical Economic Concern (RACEC).However, an unconstrained roadway would be beneficial for future industrial development within St. Lucie County. The area is built-out within the city of Port St. Lucie, but an unconstrained roadway would be beneficial for any future redevelopment and industrial related employment.

Additional Comments (optional):

CLC Commitments and Recommendations:

Mobility

Project Effects

Coordinator Summary Degree of Effect: 1 *Enhanced* assigned 09/03/2014 by FDOT District 4

Comments:
A review of the GIS Analysis and ETAT agency comments identified several commercial, industrial, county and federal facilities along the project corridor. The project will tie into the existing four lane section along Midway Road (CR 712) on the west side from Glades Cut-off Road to I-95 and to the widening project east of Selvitz Road that is being developed by the St. Lucie County. This project in anticipated to improve vehicular connectivity, mobility, emergency response, and evacuation access to I-95. FDOT shall coordinate with St. Lucie County to create opportunities to include pedestrian, bicycle, and transit facilities.

Based on ETAT review comments, FDOT assigns a degree of effect of Enhanced to Mobility.

Degree of Effect: 1 *Enhanced* assigned 07/03/2014 by Gaspar Jorge Padron, FDOT District 4

Coordination Document: PD&E Support Document As Per PD&E Manual

Direct Effects

Identified Resources and Level of Importance:

Within the 500-ft buffer, the following resources were identified:
New Horizons (Emotional and Mental Health Facility)
Midway Road Connector Corridor Multi-Use Trail Opportunities
FEC Railroad
Canal 103
Bridge #940050

Comments on Effects to Resources:

The widening of the project corridor will tie into the existing four lane section along Midway Road (CR 712) on the west side from Glades Cut-off Road to I-95. The project will also provide a connection to the Midway Road (CR 712) widening project east of Selvitz Road that is being developed by the St. Lucie County. This will improve vehicular connectivity, mobility, emergency response, and evacuation access to I-95. In addition the proposed project will create opportunities to include pedestrian, bicycle, and transit facilities. Currently, the existing corridor does not have sidewalks and that forces pedestrians to utilize the existing swale area.
It is anticipated that the effect to Mobility will be Enhanced.

Additional Comments (optional):

CLC Commitments and Recommendations:

ETAT Reviews and Coordinator Summary: Cultural

Section 4(f) Potential

Project Effects

Coordinator Summary Degree of Effect: 3 *Moderate* assigned 09/03/2014 by FDOT District 4

Comments:

A review of the EST GIS Analysis did not identify any public parks, recreation lands, or wildlife and waterfowl refuges along the project corridor. Howerver, a review of the GIS Analysis and ETAT agency comments for historic and archaeological resources identified a historic-aged bridge (#940050), constructed in 1957, and 5 linear sources such the FEC Railroad, Midway Road, Florida's Turnpike, Canal 103 and CR 706. There are no recorded archaeological sites in the project corridor but there is a potential for unrecorded sites. At this time, it is unknown if specific sections of these resources near the project have been examined. Additionally, it is unknown whether bridge # 940050 will need to be replaced as part of the project, which may have an adverse effect if the bridge is determined to be significant.
A Cultural Resource Assessment Survey (CRAS) will be performed for the entire corridor during the PD&E phase. FDOT will coordinate with ETAT agencies throughout Project Development, including for review and comment of the CRAS. FDOT will avoid and minimize impacts to any resources which may be identified by the CRAS to the greatest extent practicable. However, if the project results in any adverse effects to significant or historic or archaeological resources, Section 4(f) coordination will be required. A Section 4(f) Programmatic or Individual Statement will be completed during PD&E, if warranted.
Based on ETAT comments and a review of the EST, FDOT assigns a degree of effect of Moderate to Section 4(f) Potential.

None found

Historic and Archaeological Sites

Project Effects

Coordinator Summary Degree of Effect: 3 *Moderate* assigned 09/03/2014 by FDOT District 4

Comments:

A review of the GIS Analysis and ETAT agency comments identified a historic-aged bridge (#940050), constructed in 1957, and 5 linear sources such the FEC Railroad, Midway Road, Florida's Turnpike, Canal 103 and CR 706. There are no recorded archaeological sites in the project corridor but there is a potential for unrecorded sites. At this time, it is unknown if specific sections of these resources near the project have been examined. Additionally, it is also unknown whether bridge # 940050 will need to be replaced as part of the project, which may have an adverse effect.

A Cultural Resource Assessment Survey (CRAS) will be performed for the entire corridor during the PD&E phase. FDOT will coordinate with ETAT agencies throughout Project Development, including for review and comment of the CRAS. FDOT will avoid and minimize impacts to any resources which may be identified by the CRAS to the greatest extent practicable.

FDOT agrees with the Florida Department of State and assigns a degree of effect of Moderate to Historic and Archaeological Sites.

Degree of Effect: 3 *Moderate* assigned 06/12/2014 by Ginny Leigh Jones, FL Department of State

Coordination Document: PD&E Support Document As Per PD&E Manual
Coordination Document Comments:
A survey conducted in 2006 covered the project corridor from the Turnpike to beyondSelvitz Road. However, the survey was not reviewed by FDOT or any federal agency. Finally, due to the passage of time since the survey more resources may have reached 50 years old. As discussed in the PED, a Cultural Resources Assessment Survey (CRAS) should be conducted. All historic-age resources, including potential historic districts, within the area of potential effect should be documented and assessed for NRHP eligibility. The resultant survey report shall conform to the specifications set forth in Chapter 1A-46 Florida Administrative Code, FDOT PD&E Manual Part 2, Chapter 12and will need to be forwarded to this agency (or the appropriate Federal Agency) for review and comment.

Direct Effects
Identified Resources and Level of Importance:
GIS analysis of the project corridor reveals that the proposed project intersects with one historic-aged bridge, and 5 linear resources. The bridge - FDOT bridge no. 940050 - was constructed in 1957. However, it is unknown if this bridge is significant. One of the linear resources - FEC Railroad (8SL3014) has been determined by this office to be significant. The other four linear resources (Midway Road - SL1657; Florida Turnpike - SL1789, Canal 103 - SL1809, CR 706 - SL3149) have had sections determined not significant. It is unknown if the specific sections of these resources close the proposed project have been examined. This will need to be determined in the Cultural Resources Assessment Survey (CRAS) that will be completed for this project.

There are no recorded archaeological sites in the project corridor but there is a potential for unrecorded sites.

The 1944 aerial shows very little development in project area. There is some agricultural fields and there may be some associated home sites with these farms. By the 1958 aerial the Turnpike, Glades Cut-Off Road, and Midway Road are extant. There is some additional - though minor - agricultural use around the project corridor. Most of the additional development is on the eastern end of the project corridor. The 1970 aerial shows still minor development around the intersection of the Turnpike, Glades Cut-off Road and Midway Road but there is more development west of that intersection, reflecting more development in the interior of the state. Also predictably, there is increased development in the eastern portion of the project corridor by the 1970 aerial. These aerials show that there may be unrecorded cultural resources in the project corridor.

Comments on Effects to Resources:
It is unclear if the project will include the replacement of FDOT bridge no. 940050 but if the bridge is found to be significant, its replacement would be an adverse effect. Regarding the linear resources, typically adverse effects to these resources would be the severing or re-routing of the resource. It is difficult at this time to determine if the proposed project would result in this occurring. The widening of the roadway has the potential to impact significant archaeological resources.

Additional Comments (optional):
A survey conducted in 2006 covered the project corridor from the Turnpike to beyondSelvitz Road. However, the survey was not reviewed by FDOT or any federal agency. Finally, due to the passage of time since the survey more resources may have reached 50 years old. As discussed in the PED, a Cultural Resources Assessment Survey (CRAS) should be conducted. All historic-age resources, including potential historic districts, within the area of potential effect should be documented and assessed for NRHP eligibility. The resultant survey report shall conform to the specifications set forth in Chapter 1A-46 Florida Administrative Code, FDOT PD&E Manual Part 2, Chapter 12and will need to be forwarded to this agency (or the appropriate Federal Agency) for review and comment.

CLC Commitments and Recommendations:

Recreation Areas
Project Effects
Coordinator Summary Degree of Effect: 0 *None* assigned 09/03/2014 by FDOT District 4

Comments:
A review of the GIS Analysis and ETAT agency comments identified a South Florida Water Management District owned easement within 100-ft of the project corridor. An ERP will be required for this project.

Based on ETAT comments and a review of the EST, FDOT agrees with the US Environmental Protection Agency, Florida Department of Environmental Protection, and South Florida Water Management District and assigns a summary degree of effect of None to Recreation Areas.

Degree of Effect: 0 *None* assigned 07/07/2014 by Maher Budeir, US Environmental Protection Agency

Coordination Document: PD&E Support Document As Per PD&E Manual

Direct Effects
Identified Resources and Level of Importance:

Comments on Effects to Resources:

Additional Comments (optional):

CLC Commitments and Recommendations:

Degree of Effect: N/A *N/A / No Involvement* assigned 06/17/2014 by Anita Barnett, National Park Service

Coordination Document: No Involvement

Direct Effects
Identified Resources and Level of Importance:

Comments on Effects to Resources:

Additional Comments (optional):

CLC Commitments and Recommendations:

Degree of Effect: 0 *None* assigned 07/01/2014 by Lauren P. Milligan, FL Department of Environmental Protection

Coordination Document: No Involvement

Direct Effects
Identified Resources and Level of Importance:

Comments on Effects to Resources:

Additional Comments (optional):

CLC Commitments and Recommendations:

Degree of Effect: 0 *None* assigned 07/01/2014 by Mindy Parrott, South Florida Water Management District

Coordination Document: Permit Required
Coordination Document Comments:
An ERP is required.

Direct Effects
Identified Resources and Level of Importance:

Comments on Effects to Resources:
Effects to Recreation, Coastal Resources and Floodplains are not anticipated based on SFWMD's review.

Additional Comments (optional):
An ERP is required.

CLC Commitments and Recommendations:

ETAT Reviews and Coordinator Summary: Natural

Wetlands

Project Effects

Coordinator Summary Degree of Effect: 3 *Moderate* assigned 09/03/2014 by FDOT District 4

Comments:
Based on the agency comments and the GIS analysis results, there are a total of 6.7 acres of palustrine wetlands with both forested and scrub-shrub wetlands, and Canal 103 within the 500-ft buffer of the project corridor. The wetlands, surface waters, and natural areas along the corridor provide suitable habitat for wildlife, aquifer recharge, natural filters for pollutants, essential carbon export/import functions, flood water attenuation and storage, and contributions to the ecosystem through food-web productivity, among many other functions.

The project will primarily utilize the existing right of way. However, additional right of way may be identified for acquisition during the PD&E Study to provide offsite ponds for stormwater management. Where practicable, any necessary stormwater management facilities will be located within previously disturbed, upland sites and outside of environmentally sensitive areas. A Wetlands Evaluation and Report (WER) will be completed during the PD&E phase. The WER will provide habitat characterizations of the existing wetlands within the corridor and the vicinity; document the existing conditions of the resources; evaluate direct, indirect, cumulative, and secondary impacts; and, make recommendations for sequentially avoiding, minimizing and/or mitigating resource impacts.
FDOT will continue coordination with regulatory agencies throughout the development of the project to address potential environmental issues and to ensure wetland impacts are sequentially avoided and minimized to the greatest extent practicable. Agency coordination discussions will also include the design of the proposed stormwater system and the requirements for stormwater treatment. FDOT will obtain an environmental resource permit (ERP) during final design and provide compensatory mitigation for any unavoidable impacts.

Stormwater Pollution Prevention Plans (SWPPP) will be prepared during the design phase and incorporated into the construction contract to ensure that Contractor implements BMPs to control stormwater runoff and other potential water quality impacts. The SWPPP will be prepared in compliance with state and federal standards. Furthermore, the Contractor will be required to obtain an FDEP NPDES permit. A preconstruction meeting will be held with the project Contractor to review construction requirements in environmentally sensitive areas; to delineate the wetlands limits; and, to reiterate the requirement for the use of Best Management Practices to minimize temporary construction impacts.
Based on ETAT comments and a review of the EST, FDOT agrees with South Florida Water Management District, US Army Corps of Engineers and the National Marine Fisheries Service, and assigns a summary degree of effect of Moderate to Wetlands.

Degree of Effect: 3 *Moderate* assigned 05/28/2014 by Brandon Howard, National Marine Fisheries Service

Coordination Document: No Involvement

Direct Effects

Identified Resources and Level of Importance:

Based on our review of the information provided on the EST website, GIS-based effects analysis on wetlands and interpretation of aerial photographs, NOAA's National Marine Fisheries Service (NMFS) has determined that emergent wetlands and ditches are located within the project corridor. These wetlands range from low to moderate in quality.

Comments on Effects to Resources:

The wetlands along the proposed roadway expansion provide water quality functions, such as removal of sediments, excess nutrients, and contaminants, which benefit and support these aquatic ecosystems. Through hydrological connections, these wetlands also contribute plant material and other useable nutrients (both dissolved and particulate organic matter) into aquatic food webs that include recreationally, commercially, and ecologically important species within downstream estuaries. If wetland impacts are unavoidable, sequential minimization and mitigation should take place.

In addition to the direct impacts from filling wetlands, construction activities may impact adjacent wetlands through sedimentation and runoff.

Additional Comments (optional):

CLC Commitments and Recommendations:

Degree of Effect: 2 *Minimal* assigned 07/07/2014 by Maher Budeir, US Environmental Protection Agency

Coordination Document: PD&E Support Document As Per PD&E Manual

Direct Effects

Identified Resources and Level of Importance:

1.7 Acres of wetland within 200 foot buffer

Comments on Effects to Resources:

The design of the project including the alignemnt and the foot print of the proposed project should be developed in a manner that will avoid impact on the wetland resource. Unavoidable impact should be fully mitigated.

Additional Comments (optional):

CLC Commitments and Recommendations:

Degree of Effect: 3 *Moderate* assigned 06/24/2014 by Garett Lips, US Army Corps of Engineers

Coordination Document: Permit Required

Direct Effects

Identified Resources and Level of Importance:

The areas adjacent to the corridor have residential, commercial, and undeveloped lands with both uplands and wetlands. There areapproximately 1.7 acres of freshwaterpalustrine wetlands with bothforestedand scrub-shrub wetlands. The project area includes Canal 103 which is located along the south side of Midway Road throughout the project limits. The wetlands and natural environment provide sustainable habitat for wildlife,aquifer recharge, natural filters for pollutants, essentialcarbon export/import functions, flood water attenuation and storage, and contributions to the ecosystem through food-web productivity, among many other functions.

Comments on Effects to Resources:

Filling wetlands reduces the ability of the natural environment to provide: sustainable habitat for wildlife,aquifer recharge, natural filters for pollutants, essentialcarbon export/import functions, flood water attenuation and storage, and contributions to the ecosystem through food-web productivity, among many other functions.

Additional Comments (optional):

CLC Commitments and Recommendations:

Degree of Effect: 2 *Minimal* assigned 07/01/2014 by Lauren P. Milligan, FL Department of Environmental Protection

Coordination Document: Permit Required

Direct Effects

Identified Resources and Level of Importance:

The National Wetlands Inventory GIS report indicates that there are a total of 6.7 acres of palustrine wetlands within the 500-ft. project buffer zone.

Comments on Effects to Resources:

The proposed project will require an environmental resource permit (ERP) from the South Florida Water Management District for stormwater management and any wetland impacts. The ERP applicant will be required to eliminate or reduce the proposed wetland resource impacts of roadway construction to the greatest extent practicable.

- Minimization should emphasize avoidance-oriented corridor alignments, wetland fill reductions via pile bridging and steep/vertically retained side slopes, and median width reductions within safety limits.
- Wetlands should not be displaced by the installation of stormwater conveyance and treatment swales; compensatory treatment in adjacent uplands is the preferred alternative.
- After avoidance and minimization have been exhausted, mitigation must be proposed to offset the adverse impacts of the project to existing wetland functions and values. Significant attention is given to any forested wetland systems, which are difficult to mitigate.
- The cumulative impacts of concurrent and future transportation improvement projects in the vicinity of the subject project should also be addressed.

Additional Comments (optional):

CLC Commitments and Recommendations:

Degree of Effect: 2 *Minimal* assigned 05/29/2014 by John Wrublik, US Fish and Wildlife Service

Coordination Document: To Be Determined: Further Coordination Required

Direct Effects

Identified Resources and Level of Importance:

Wetlands

Comments on Effects to Resources:

Wetlands provide important habitat for fish and wildlife. According to data in the Environmental Screening tool, wetlands occur within the project area. We recommend that the project be designed to avoid these valuable resources to the greatest extent practicable. If impacts to wetlands are unavoidable, we recommend that the FDOT provides mitigation that fully compensates for the loss of wetland resources.

Additional Comments (optional):

CLC Commitments and Recommendations:

Degree of Effect: 3 *Moderate* assigned 07/01/2014 by Mindy Parrott, South Florida Water Management District

Coordination Document: Permit Required

Direct Effects

Identified Resources and Level of Importance:

Wetlands and surface water exist within and adjacent to the project. These features may provide habitat for a variety of wetland dependent wildlife, including listed species such as the woodstork.

Comments on Effects to Resources:

The project may require dreding, filling, or crossing of wetlands and surface waters to accomodate road widening and the required stormwater management facilities.

Additional Comments (optional):

CLC Commitments and Recommendations:

Water Quality and Quantity

Project Effects

Coordinator Summary Degree of Effect: 2 *Minimal* assigned 09/03/2014 by FDOT District 4

Comments:

A review of the GIS Analysis and ETAT agency comments identified Canal 103, 2 limited drinking water wells, 6 active onsite sewage facilities, 2 verified impaired Florida Waters, and 4 US EPA National Pollutant Discharge Elimination System permits. The project is also within the Surficial Aquifer System. The project currently discharges to C-103, which connects to the North Fork of the St. Lucie River. The North Fork of the St. Lucie River is an Outstanding Florida Water and portions of it are an Aquatic Preserve.

FDOT acknowledges the ETAT agency's comments regarding the project's potential permit requirements and will obtain all required permits during final design. FDOT also acknowledges the ETAT's agency's concerns regarding the project's potential impacts to wetlands/surface waters and water quality. These concerns are addressed in more detail within each of the corresponding sections within this document. A Wetlands Evaluation and a Water Quality Impact Evaluation (WQIE) will be conducted during Project Development. FDOT will continue coordination with regulatory agencies, such as the North St. Lucie River Water Control District, throughout the development of the project to ensure all potential environmental issues are fully resolved. Additionally, water qualityimpact evaluationshould be conducted to ensure no impact on water quality in Canal 103.

Storm water runoff will increase in quantity as a result of the additional impervious area associated with the proposed widening. FDOT will evaluate the existing stormwater system and the stormwater compensation needed for the project during the PD&E phase. Coordination will be maintained with each agency for the design of any needed stormwater system improvements and the requirements for stormwater treatment. To minimize potential construction-related impacts, Stormwater Pollution Prevention Plans (SWPPP) will be prepared in compliance with state and federal standards and incorporated into the construction contract. The Contractor will be required adhere to the SWPPP and implement Best Management Practices (BMPs) to control stormwater runoff and other potential water quality impacts during construction. The SWPPP will be prepared in compliance with state and federal standards. Furthermore, the Florida Department of Transportation will be required to obtain an Environmental Resource Permit (ERP) or permit modification. During Construction, a water use permit from the SFWMD may be required. The project shall be designed to meet the SFWMD water quantity and quality criteria in ERP Applicant's Handbook Volume I and II.

Based on ETAT comments, FDOT agrees with the US Environmental Protection Agency, FL Department of Environmental Protection and South Florida Water Management District and assigns a summary degree of effect of Minimal to Water Quality and Quantity.

Degree of Effect: 2 *Minimal* assigned 07/01/2014 by Mindy Parrott, South Florida Water Management District

Coordination Document: Permit Required

Coordination Document Comments:

An Environmental Resource Permit (56-00833-S) exists for Midway Road from Selvitz to 25th Street. This permit could be modified to include the project.

Direct Effects

Identified Resources and Level of Importance:

The project currently discharges to C-103, which connects to the North Fork of the St. Lucie River. The North Fork of the St. Lucie River is an Outstanding Florida Water and portions of it are an Aquatic Preserve.

Comments on Effects to Resources:
The project must be designed to meet the SFWMD water quantity and quality criteria inERP Applicant's Handbook Volume I and II.

Additional Comments (optional):
An Environmental Resource Permit (56-00833-S) exists for Midway Road from Selvitz to 25th Street. This permit could be modified to include the project.

CLC Commitments and Recommendations:

Degree of Effect: 2 *Minimal* assigned 07/07/2014 by Maher Budeir, US Environmental Protection Agency

Coordination Document: PD&E Support Document As Per PD&E Manual

Direct Effects
Identified Resources and Level of Importance:
Canal 103

Comments on Effects to Resources:
Storm water runoff will increase in quantity due the increased impervious surface. Impact on water quantity and pond siting should be fully assessed. Additionally water qualityimpact evaluationshould be conducted to ensure no impact on water quality in Canal 103

Additional Comments (optional):

CLC Commitments and Recommendations:

Degree of Effect: 2 *Minimal* assigned 07/01/2014 by Lauren P. Milligan, FL Department of Environmental Protection

Coordination Document: Permit Required

Direct Effects
Identified Resources and Level of Importance:
Increased stormwater runoff carrying oils, greases, metals, sediment, and other pollutants from the increased impervious surface would be of concern. Natural resource impacts within and adjacent to the proposed road right-of-way will likely include alteration of the existing surface water hydrology and natural drainage patterns, and reduction in flood attenuation capacity of area creeks, ditches, and sloughs as a result of increased impervious surface within the watershed.

Comments on Effects to Resources:
Every effort should be made to maximize the treatment of stormwater runoff from the proposed road project to prevent ground and surface water contamination. Stormwater treatment should be designed to maintain the natural predevelopment hydroperiod and water quality, as well as to protect the natural functions of adjacent wetlands. We recommend that the PD&E study include an evaluation of existing stormwater treatment adequacy and details on the future stormwater treatment facilities. Retro-fitting of stormwater conveyance systems would help reduce impacts to water quality.

Additional Comments (optional):

CLC Commitments and Recommendations:

Floodplains

Project Effects

Coordinator Summary Degree of Effect: 0 *None* assigned 09/03/2014 by FDOT District 4

Comments:
A GIS review of the FEMA Floodplain identified that the project is within Zone X. FDOT acknowledges South Florida Water Management's concern on acquiring appropriate permits and will coordinate with the appropriate agencies during project development and design. FDOT will continue coordination with regulatory agencies throughout the development of the project to ensure all potential environmental issues, if any, are fully resolved. Stormwater Pollution Prevention Plans (SWPPP) will be prepared during the design phase and incorporated into the construction contract to ensure that Contractor implements Best Management Practices (BMPs) to control stormwater runoff and other potential water quality impacts. The SWPPP will be prepared in compliance with state and federal standards. Furthermore, the Contractor will be required to obtain an FDEP NPDES permit.
Based on a review of the EST and the ETAT agency's comments, FDOT agrees with the US Environmental Protection Agency and the South Florida Water Management District and assigns a summary degree of effect of None to Floodplain.

Degree of Effect: 0 *None* assigned 07/07/2014 by Maher Budeir, US Environmental Protection Agency

Coordination Document: PD&E Support Document As Per PD&E Manual

Direct Effects
Identified Resources and Level of Importance:

Comments on Effects to Resources:

Additional Comments (optional):

CLC Commitments and Recommendations:

Degree of Effect: 0 *None* assigned 07/01/2014 by Mindy Parrott, South Florida Water Management District

Coordination Document: Permit Required
Coordination Document Comments:
An ERP is required.

Direct Effects
Identified Resources and Level of Importance:

Comments on Effects to Resources:
Effects to Recreation, Coastal Resources and Floodplains are not anticipated based on SFWMD's review.

Additional Comments (optional):
An ERP is required.

CLC Commitments and Recommendations:

Wildlife and Habitat

Project Effects

Coordinator Summary Degree of Effect: 2 *Minimal* assigned 09/03/2014 by FDOT District 4

Comments:
According to the GIS Analysis results and ETAT agency comments,, the project area is dominated by a mix of commercial, industrial, and residential development, with 68.77% classified as High or Low Intensity Urban, and another 6.86% as Transportation (roads and rail). Other land cover types in the assessment area include Mesic Flatwoods (15.90%, 33.5 acres), Improved Pasture (4.32%, 9.1 acres), Freshwater Marshes (3.03%, 6.4 acres), Rural Lands (0.95%, 2.0 acres), and Exotic Plants (0.16%, 0.3 acres).
The project area is within U.S. Fish and Wildlife Service Consultation Areas for caracara, Florida grasshopper sparrow, red-cockaded woodpecker, scrub jay, and snail kite. The corridor is also within four wood stork Core Foraging Areas (CFAs). There is no Critical Habitat for listed species or bald eagle nest within the one-mile buffer. Based on range and preferred habitat type, the following species listed by the Federal Endangered Species Act and the State of Florida as Federally Endangered (FE), Federally Threatened (FT), State-Threatened (ST), or State Species of Special Concern (SSC) may occur along the project area: gopher frog (SSC), gopher tortoise (ST), American alligator (FT based on similarity of appearance to American crocodile), Eastern indigo snake (FT), Florida pine snake (SSC), Audubon's crested caracara (FT), Florida burrowing owl (SSC), Southeastern American kestrel (ST), Florida sandhill crane (ST), least tern (ST), wood stork (FE), limpkin (SSC), little blue heron (SSC), tricolored heron (SSC), roseate spoonbill (SSC), snowy egret (SSC), white ibis (SSC), and Sherman's fox squirrel (SSC). FWC's Potential Habitat Richness classifications within the 500 ft buffer include 2.32% moderately high and 27.67% medium. In the Florida Natural Areas Inventory Critical Lands and Waters Identification Project (CLIP), 14.15% of the assessment area is Priority 2 (high) for Biodiversity Resources. Also in CLIP, 0.63% ranks Moderately High for Rare Species Habitat Conservation Priorities.
FDOT acknowledges the agencies' concerns regarding the project's potential impacts to wildlife and habitat. An Endangered Species Biological Assessment (ESBA) and wetland evaluation (as described in the previous Wetlands issue) will be conducted during the PD&E Study. The ESBA will include wildlife surveys, plant community mapping, habitat characterizations, existing resources condition descriptions, and recommendations for sequentially avoiding, minimizing and mitigating direct, secondary, and cumulative effects on wildlife and habitat resources. The ESBA report will be prepared in compliance with Section 7 of the Endangered Species Act (ESA) of 1973, as amended (16 USC 1531 *et seq.*) and in accordance with Part 2, Chapter 27 of the FDOT PD&E Manual.
Primary wildlife issues associated with this project include: potential adverse effects to a moderate number of species listed by the Federal Endangered Species Act as Endangered or Threatened, or by the State of Florida as Threatened or Species of Special Concern; potential water quality degradation as a result of additional stormwater runoff from the expanded roadway surface draining into adjacent waterways and wetlands; and potential for increased wildlife roadkill. FDOT will coordinate with the ETAT agencies throughout project development so that the final design of the project, including any offsite drainage ponds, will avoid and minimize wildlife and habitat impacts to the greatest extent practicable. Drainage retention areas and

equipment staging areas will be evaluated and sited to avoid habitat destruction or degradation to the greatest extent practicable. If impacts are determined to be unavoidable, a detailed compensatory mitigation plan will be prepared. In addition, if required, an appropriate wetland mitigation plan will be prepared (as described in the previous Wetlands issue), including type for type restoration, enhancement or creation within the same wood stork CFA as any wetland impacts, where practicable, to minimize wood stork foraging habitat loss.
Based on the ETAT comments, FDOT agrees with Florida Fish and Wildlife Conservation Commission and US Fish and Wildlife Services and assigns a summary degree of effect of Minimal to Wildlife and Habitat.

Degree of Effect: 2 *Minimal* assigned 07/01/2014 by Scott Sanders, FL Fish and Wildlife Conservation Commission

Coordination Document: To Be Determined: Further Coordination Required

Direct Effects

Identified Resources and Level of Importance:

The Office of Conservation Planning Services of the Florida Fish and Wildlife Conservation Commission (FWC) has coordinated an agency review of ETDM #14177, St. Lucie County, and provides the following comments related to potential effects to fish and wildlife resources on this Programming Phase project.

The Project Description Summary states that this project involves the evaluation of alternatives to widen Midway Road (CR 712) from two to four lanes between Glades Cut-Off Road and Selvitz Road, a distance of approximately 1.6 miles. The Project Description did not address the potential need for new Drainage Retention Areas (DRAs) to handle the additional stormwater runoff from the expanded roadway.

The project area was evaluated for potential fish, wildlife, and habitat resources within 500 feet of the proposed alignment. Our assessment reveals that the project area is dominated by a mix of commercial, industrial, and residential development, with 68.77% classified as High or Low Intensity Urban, and another 6.86% as Transportation (roads and rail). Other land cover types in the assessment area include Mesic Flatwoods (15.90%, 33.5 acres), Improved Pasture (4.32%, 9.1 acres), Freshwater Marshes (3.03%, 6.4 acres), Rural Lands (0.95%, 2.0 acres), and Exotic Plants (0.16%, 0.3 acres).

Based on range and preferred habitat type, the following species listed by the Federal Endangered Species Act and the State of Florida as Federally Endangered (FE), Federally Threatened (FT), State-Threatened (ST), or State Species of Special Concern (SSC) may occur along the project area: gopher frog (SSC), gopher tortoise (ST), American alligator (FT based on similarity of appearance to American crocodile), Eastern indigo snake (FT), Florida pine snake (SSC), Audubon's crested caracara (FT), Florida burrowing owl (SSC), Southeastern American kestrel (ST), Florida sandhill crane (ST), least tern (ST), wood stork (FE), limpkin (SSC), little blue heron (SSC), tricolored heron (SSC), roseate spoonbill (SSC), snowy egret (SSC), white ibis (SSC), and Sherman's fox squirrel (SSC).

The GIS analysis revealed several specific characteristics associated with lands along the project alignment that provide an indication of potential habitat quality or sensitivity that will require field studies to verify the presence or absence of listed wildlife species and the quality of wildlife habitat resources. In the FWC's Potential Habitat Richness classification, 2.32% of the assessment area is ranked moderately high, while 27.67% is ranked medium. In the Florida Natural Areas Inventory Critical Lands and Waters Identification Project (CLIP), 14.15% of the assessment area is Priority 2 (high) for Biodiversity Resources. Also in CLIP, 0.63% ranks Moderately High for Rare Species Habitat Conservation Priorities. The project area is within U.S. Fish and Wildlife Service Consultation Areas for Caracara, Florida Grasshopper Sparrow, Red-cockaded Woodpecker, Scrub Jay, and Snail Kite, and is within the core foraging area of four wood stork colonies.

Primary wildlife issues associated with this project include: potential adverse effects to a moderate number of species listed by the Federal Endangered Species Act as Endangered or Threatened, or by the State of Florida as Threatened or Species of Special Concern; potential water quality degradation as a result of additional stormwater runoff from the expanded roadway surface draining into adjacent waterways and wetlands; and potential for increased wildlife roadkill. New DRAs outside the ROW should be sited to avoid undisturbed natural habitats.

Comments on Effects to Resources:

Based on the project information provided, we believe that direct and indirect effects of this project could be minimal, provided that all roadway construction is confined to the existing ROW, any new DRAs are not constructed within areas of natural habitat, and degradation of adjacent or downstream water quality is avoided via inclusion of Best Management Practices in the project design.

Additional Comments (optional):

CLC Commitments and Recommendations:

Degree of Effect: 2 *Minimal* assigned 05/29/2014 by John Wrublik, US Fish and Wildlife Service

Coordination Document: To Be Determined: Further Coordination Required

Direct Effects

Identified Resources and Level of Importance:

Federally listed species and fish and wildlife resources

Comments on Effects to Resources:

Federally-listed species -

The Service has reviewed our Geographic Information Systems (GIS) database for recorded locations of Federally listed threatened and endangered species on or adjacent to the project study area. The GIS database is a compilation of data received from several sources. Based on review of our GIS database, the Service notes that the following Federally listed species may occur in or near the project area.

Wood Stork

The project corridor is located in the Core Foraging Areas (CFA)(within 18.6 miles) of three active nesting colonies of the endangered wood stork (*Mycteria americana*). The Service believes that the loss of wetlands within a CFA due to an action could result in the loss of foraging habitat for the wood stork. To minimize adverse effects to the wood stork, we recommend that any lost foraging habitat resulting from the project be replaced within the CFA of the affected nesting colony. Moreover, wetlands provided as mitigation should adequately replace the wetland functions lost as a result of the action. The Service does not consider the preservation of wetlands, by itself, as adequate compensation for impacts to wood stork foraging habitat, because the habitat lost is not replaced. Accordingly, any wetland mitigation plan proposed should include a restoration, enhancement, or creation component. In some cases, the Service accepts wetlands compensation located outside the CFA of the affected wood stork nesting colony. Specifically, wetland credits purchased from a "Service Approved" mitigation bank located outside of the CFA would be acceptable to the Service, provided that the impacted wetlands occur within the permitted service area of the bank.

For projects that impact 5 or more acres of wood stork foraging habitat, the Service requires a functional assessment be conducted using our "Wood Stork Foraging Analysis Methodology" (Methodology) on the foraging habitat to be impacted and the foraging habitat provided as mitigation. The Methodology can be found at: http://www.fws.gov/verobeach/ListedSpeciesBirds.html .

Florida Scrub-Jay

The project occurs within the geographic range of the threatened Florida Scrub-Jay (*Aphelocoma coerulescens*). If suitable habitat occurs in the project corridor, we recommend that surveys based on Service protocol be conducted to determine the status of the Florida scrub-jay in the project area. The Service's Florida scrub-jay survey protocol can be found at: http://www.fws.gov/verobeach/ListedSpeciesBirds.html .

Audubon's crested caracara

The project occurs within the geographic range of the threatened Audubon's crested caracara (*Polyborus cheriway = Polyborus plancus audubonii*). If suitable habitat occurs in or near the project corridor, we recommend that nest surveys based on Service protocol be conducted to determine the status of caracara nesting in the project area. The Service's caracara nest survey guidance can be found at: http://www.fws.gov/verobeach /ListedSpeciesBirds.html

The Service believes that the following federally listed species have the potential to occur in or near the project site: wood stork, Audubon's crested caracara, Florida scrub-jay, Eastern indigo snake (*Drymarchon couperi = Drymarchon corais couperi*), and Federally listed plants in St. Lucie County at http://ecos.fws.gov/ ipac/. Accordingly, the Service recommends that the Florida Department of Transportation (FDOT) prepare a Biological Assessment for the project (as required by 50 CFR 402.12) during the FDOT's Project Development and Environment process.

Fish and Wildlife Resources

Wetlands provide important habitat for fish and wildlife. According to data in the Environmental Screening tool, wetlands occur within the project area. We recommend that the project be designed to avoid these valuable resources to the greatest extent practicable. If impacts to wetlands are unavoidable, we recommend that the FDOT provides mitigation that fully compensates for the loss of wetland resources.

Additional Comments (optional):

CLC Commitments and Recommendations:

Coastal and Marine

Project Effects

Coordinator Summary Degree of Effect: 0 *None* assigned 09/03/2014 by FDOT District 4

Comments:
Based on a review of relevant GIS layers, there are no coastal and marine facilities within the project vicinity. FDOT acknowledges the ETAT agency's comments on wetlands. These concerns are addressed in detail within the corresponding sections below. A Wetlands Evaluation Report (WER) will be prepared during the PD&E phase. The report will provide habitat characterization of the existing wetlands within the corridor and the vicinity, document the existing conditions of the resources, and make recommendations for sequentially avoiding, minimizing and mitigating resource impacts.

Stormwater Pollution Prevention Plans (SWPPP) will be prepared during the design phase and incorporated into the construction contract to ensure that Contractor implements Best Management Practices (BMPs) to control stormwater runoff and other potential water quality impacts. The SWPPP will be prepared in compliance with state and federal standards. Furthermore, the Contractor will be required to obtain an FDEP NPDES permit.

If during the PD&E and/or Design Phase, wetland impacts are determined to be unavoidable, a detailed mitigation plan will be prepared. FDOT will continue coordination with regulatory agencies throughout the development of the project to ensure all potential environmental issues are fully addressed and resolved.

Based on the ETAT comments and a review of the EST GIS, FDOT assigns a summary degree of effect of None to Coastal and Marine.

Degree of Effect: 0 *None* assigned 05/28/2014 by Brandon Howard, National Marine Fisheries Service

Coordination Document: No Involvement

Direct Effects
Identified Resources and Level of Importance:
Based on our review of the information provided on the EST website, GIS-based effects analysis on wetlands and interpretation of aerial photographs, NOAA's National Marine Fisheries Service (NMFS) has determined that emergent wetlands and ditches are located within the project corridor. These wetlands range from low to moderate in quality.

Comments on Effects to Resources:
The wetlands along the proposed roadway expansion provide water quality functions, such as removal of sediments, excess nutrients, and contaminants, which benefit and support these aquatic ecosystems. Through hydrological connections, these wetlands also contribute plant material and other useable nutrients (both dissolved and particulate organic matter) into aquatic food webs that include recreationally, commercially, and ecologically important species within downstream estuaries. If wetland impacts are unavoidable, sequential minimization and mitigation should take place.

In addition to the direct impacts from filling wetlands, construction activities may impact adjacent wetlands through sedimentation and runoff.

Additional Comments (optional):

CLC Commitments and Recommendations:

Degree of Effect: 0 *None* assigned 07/01/2014 by Mindy Parrott, South Florida Water Management District

Coordination Document: Permit Required
Coordination Document Comments:
An ERP is required.

Direct Effects
Identified Resources and Level of Importance:

Comments on Effects to Resources:
Effects to Recreation, Coastal Resources and Floodplains are not anticipated based on SFWMD's review.

Additional Comments (optional):
An ERP is required.

CLC Commitments and Recommendations:

ETAT Reviews and Coordinator Summary: Physical

Noise

Project Effects

Coordinator Summary Degree of Effect: 0 *None* assigned 09/03/2014 by FDOT District 4

Comments:

A review of the EST GIS Analysis indicates that there is a Healthcare facility (New Horizons) and two residential areas within the 100-ft buffer. During PD&E phase, a Noise Study Analysis shall be conducted to identify impacts to these resources, if any.
Based on a review of the EST GIS layers and ETAT comment, FDOT assigns a degree of effect of None to Noise.

None found

Air Quality

Project Effects

Coordinator Summary Degree of Effect: 2 *Minimal* assigned 09/03/2014 by FDOT District 4

Comments:

This project is located within a USEPA designated Air Quality Maintenance Attainment Area for all of the four pollutants (nitrogen oxides, ozone, carbon monoxide, and small particulate matter) specified in theNational Ambient Air Quality Standards (NAAQS). Activities during construction will use BMPs to minimize the impact of fugitive emission and dustresulting from construction activities.

The project area is in attainment for all air quality standards related to transportation.The proposed scope of work, widening from two to four lanes will improve the corridor's level of service, and, therefore, is not anticipated to adversely affect air quality. An Air Quality screening evaluation will be performed during the PD&E Study to confirm and quantify impacts, if any.

Based on the ETAT agency comments and review of the EST GIS, FDOT assigns a summary degree of effect of Minimal to Air Quality.

Degree of Effect: 2 *Minimal* assigned 07/07/2014 by Maher Budeir, US Environmental Protection Agency

Coordination Document: PD&E Support Document As Per PD&E Manual

Direct Effects

Identified Resources and Level of Importance:

Air

Comments on Effects to Resources:

This project is located within a USEPA designated Air Quality Maintenance Attainment Area for all of the four pollutants (nitrogen oxides, ozone, carbon monoxide, and small particulate matter) specified in theNational Ambient Air Quality Standards (NAAQS). Activities during constructions should use BMPs to minimize the impact of fugitive emission and dustresulting from construction activities.

Additional Comments (optional):

CLC Commitments and Recommendations:

Contamination

Project Effects

Coordinator Summary Degree of Effect: 3 *Moderate* assigned 09/03/2014 by FDOT District 4

Comments:

A review of the GIS Analysis indicated that there are two hazardous waste facilities, three petroleum contamination monitoring sites, one solid waste facility and five storage tank contamination monitoring sites within the 500-ft. buffer of this project. These sites represent potential subsurface contamination. Construction activities have the potential to mobilize subsurface contamination.

A Contamination Screening Evaluation Report (CSER) will be prepared during the PD&E phase to further document these sites and any other potentially contaminated sites, and assess their involvement with the project. During final design, the CSER will be reevaluated, additional assessment (Level I) and remediation (Level II) activities will occur as needed, and various recommendations for construction will be implemented. Dewatering, if allowed, may need to be limited (i.e., low flow, short term) in order to avoid exacerbation of contamination. Special Provisions addressing Areas of Known Contamination, and/or "Section 120 Excavation and Embankment - Unidentified Areas of Contamination" (FDOT Standard Specifications for

Road and Bridge Construction), will be included in the project's construction contract documents.
FDOT will notify FDEP and St. Lucie County in the event contamination is detected during construction. Also, as advised by FDEP, the Contamination Screening Evaluation shall outline specific procedures that should be followed by the applicant in the event drums, wastes, tanks or potentially contaminated soils are encountered during construction. Special attention should be made in the screening evaluation to historical land uses (such as solid waste disposal) that may have an effect on the proposed project, including stormwater retention and treatment areas.

Based on the ETAT comments and a review of GIS layers, FDOT agrees with the US Environmental Protection Agency and the Florida Department of Environmental Protection and assigns a summary degree of effect of Moderate to Contaminated Sites.

Degree of Effect: 3 *Moderate* assigned 07/07/2014 by Maher Budeir, US Environmental Protection Agency

Coordination Document: PD&E Support Document As Per PD&E Manual

Direct Effects
Identified Resources and Level of Importance:
Groundwater Aquifer

Comments on Effects to Resources:
Based in EST data, a solid waste facility, a biomedical waste facility, a hazardous waste facility and several petroleum contamination monitoring sites and storage tank contamination monitoring sites are within the 200 foot buffer of the proposed project.
All these sites represent potential subsurface contamination. A site specific survey for known subsurface contamination will help design construction activities in a manner that avoids or properly manages encountered contamination. Construction activities has the potential to mobilize subsurface contamination. Contingencies should be in place to manage encountered contamination in a manner consistent with local, sate and federal regulations.

Additional Comments (optional):

CLC Commitments and Recommendations:

Degree of Effect: 2 *Minimal* assigned 07/01/2014 by Mindy Parrott, South Florida Water Management District

Coordination Document: To Be Determined: Further Coordination Required
Coordination Document Comments:
A water use permit for dewatering may be required. Coordination prior to submittal of the ERP is recommended to determine permit reqiurements.

Direct Effects
Identified Resources and Level of Importance:
Groundwater from the surficial aquifer in south Florida is used for drinking water supplies and irrigation.

Comments on Effects to Resources:
Project construction activities, such as dewatering, must be designed and performed in a manner that will not result in the movement of contaminant plumes.

Additional Comments (optional):
A water use permit for dewatering may be required. Coordination prior to submittal of the ERP is recommended to determine permit reqiurements.

CLC Commitments and Recommendations:

Degree of Effect: 3 *Moderate* assigned 07/01/2014 by Lauren P. Milligan, FL Department of Environmental Protection

Coordination Document: To Be Determined: Further Coordination Required

Direct Effects
Identified Resources and Level of Importance:
GIS data indicates that there are two hazardous waste facilities, three petroleum contamination monitoring sites, one solid waste facility and five storage tank contamination monitoring sites within the 500-ft. buffer of this project.

Comments on Effects to Resources:
A Contamination Screening Evaluation (similar to Phase I and Phase II Audits) may need to be conducted along the project right-of-way in considering the proximity to potential hazardous waste and petroleum contamination sites. The Contamination Screening Evaluation should outline specific procedures that would be followed by the applicant in the event drums, wastes, tanks or potentially contaminated soils are encountered during

construction. Special attention should be made in the screening evaluation to historical land uses (such as solid waste disposal) that may have an affect on the proposed project, including stormwater retention and treatment areas.

Additional Comments (optional):

CLC Commitments and Recommendations:

Infrastructure

Project Effects

Coordinator Summary Degree of Effect: N/A *N/A / No Involvement* assigned 09/03/2014 by FDOT District 4

Comments:
A review of the GIS Analysis identified the FEC Railroad; however, impacts to the facility are not anticipated. Based on the ETAT agency comments and review of the EST GIS, FDOT assigns a summary degree of effect of NA/No Involvement to Infrastructure.

Degree of Effect: N/A *N/A / No Involvement* assigned 06/27/2014 by Steve Bohl, FL Department of Agriculture and Consumer Services

Coordination Document: No Involvement

Direct Effects

Identified Resources and Level of Importance:

Comments on Effects to Resources:

Additional Comments (optional):

CLC Commitments and Recommendations:

Navigation

Project Effects

Coordinator Summary Degree of Effect: N/A *N/A / No Involvement* assigned 10/07/2014 by FDOT District 4

Comments:

Degree of Effect: N/A *N/A / No Involvement* assigned 06/24/2014 by Garett Lips, US Army Corps of Engineers

Coordination Document: No Involvement

Direct Effects

Identified Resources and Level of Importance:

There are no navigable waterways in the project area.

Comments on Effects to Resources:

There are noanticipatedeffects on Navigation

Additional Comments (optional):

CLC Commitments and Recommendations:

Degree of Effect: N/A *N/A / No Involvement* assigned 05/27/2014 by Evelyn Smart, US Coast Guard

Coordination Document: No Involvement

Direct Effects

Identified Resources and Level of Importance:
There are no navigable waters in the project vicinity. No Coast Guard involvement.

Comments on Effects to Resources:

Additional Comments (optional):

CLC Commitments and Recommendations:

ETAT Reviews and Coordinator Summary: Special Designations

Special Designations

Project Effects

Coordinator Summary Degree of Effect: 0 *None* assigned 09/03/2014 by FDOT District 4

Comments:
A review of the GIS Analysis identified that the project corridor is not adjacent to any area designated as Coastal Barrier Resource System (CBRS), Wild and Scenic River, Aquatic Preserve, Outstanding Florida Waters (OFW), or Sole Source Aquifer. The project area is underlain by the Floridan Aquifer, which is not designated as a Sole Source Aquifer (vs. the sole source Biscayne Aquifer, which underlies south Florida, well south of St. Lucie County).
Based on a review of the EST GIS layers and ETAT comments, FDOT agrees with the US Environmental Agency and the South Florida Water Management District and assigns a summary degree of effect of None to Special Designations.

Degree of Effect: 0 *None* assigned 07/07/2014 by Maher Budeir, US Environmental Protection Agency

Coordination Document: PD&E Support Document As Per PD&E Manual

Direct Effects
Identified Resources and Level of Importance:

Comments on Effects to Resources:

Additional Comments (optional):

CLC Commitments and Recommendations:

Degree of Effect: 0 *None* assigned 07/01/2014 by Mindy Parrott, South Florida Water Management District

Coordination Document: Permit Required
Coordination Document Comments:
An ERP is required.

Direct Effects
Identified Resources and Level of Importance:

Comments on Effects to Resources:
Effects to Recreation, Coastal Resources and Floodplains are not anticipated based on SFWMD's review.

Additional Comments (optional):
An ERP is required.

CLC Commitments and Recommendations:

Eliminated Alternatives

There are no eliminated alternatives for this project.

Project Scope

General Project Recommendations

There are no general project recommendations identified for this project in the EST.

Anticipated Permits

Permit	Type	Conditions	Review Org	Review Date
USACOE General Use Permit	USACE		FDOT District 4	09/30/14
SFWMD Environmental Resource Permit	Water		FDOT District 4	09/30/14

Anticipated Technical Studies

Technical Study Name	Type	Conditions	Review Org	Review Date
Noise Study Report	ENVIRONMENTAL		FDOT District 4	09/30/2014
Air Quality Report	ENVIRONMENTAL		FDOT District 4	09/30/2014
Contamination Screening Evaluation Report	ENVIRONMENTAL		FDOT District 4	09/30/2014
Endangered Species Biological Assessment	ENVIRONMENTAL		FDOT District 4	09/30/2014
Wetlands Evaluation Report	ENVIRONMENTAL		FDOT District 4	09/30/2014
Section 4f Evaluation	ENVIRONMENTAL		FDOT District 4	09/30/2014
Section 106 Case Study	ENVIRONMENTAL		FDOT District 4	09/30/2014
Cultural Resource Assessment Survey	ENVIRONMENTAL		FDOT District 4	09/30/2014

Class of Action

Class of Action Determination

Class of Action	Other Actions	Lead Agency	Cooperating Agencies	Participating Agencies
Type 2 Categorical Exclusion	Section 4(f) Evaluation Endangered Species Assessment	Federal Highway Administration	No Cooperating Agencies have been identified.	No Participating Agencies have been identified.

Class of Action Signatures

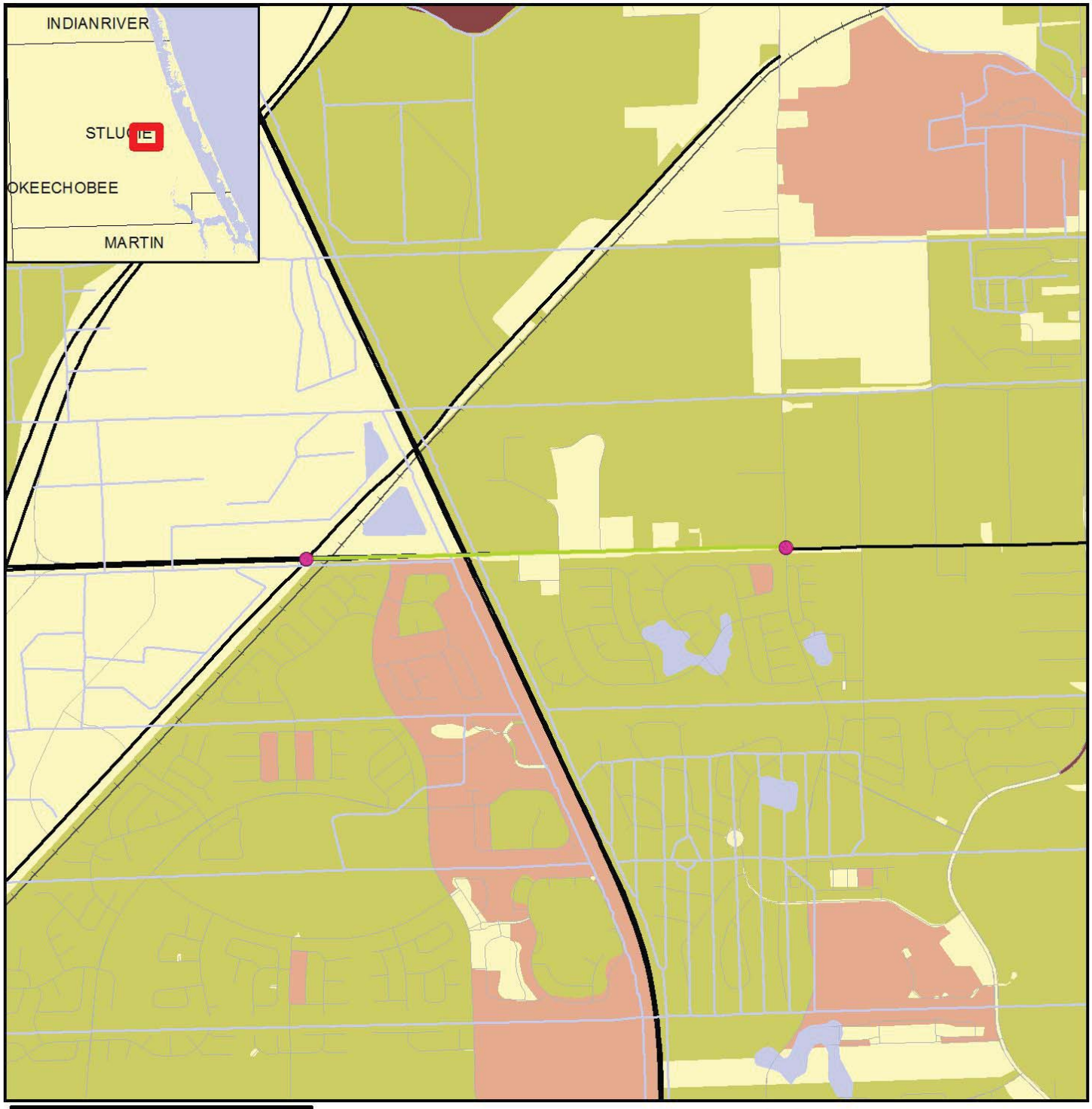
Name	Agency	Review Status	Date	ETDM Role
Richard Young	FDOT District 4	ACCEPTED	04/02/2015	FDOT ETDM Coordinator
Luis D Lopez, P.E.	Federal Highway Administration	ACCEPTED	05/20/2015	Lead Agency ETAT Member

Dispute Resolution Activity Log

There are no dispute actions identified for this project in the EST.

Hardcopy Maps: Alternative #1

14177 Midway Road Widening, Alternative 1
Glades Cut-Off Rd to Selvitz Road



0 1 Miles

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Population Age Distribution Map

- ETDM Alternative Point
- ETDM Alternative Terminus
- ETDM Alternative Segment
- ETDM Alternative Polygon
- Major Road
- Local Road or Trail
- Railroad
- River, Stream or Canal
- Water Body

Median Age

0 - 18 | 18 - 30 | 30 - 65 | > 65

Data Sources:
US Geological Survey
FL Department of Transportation
NAVTEQ
US Census Bureau (2010)

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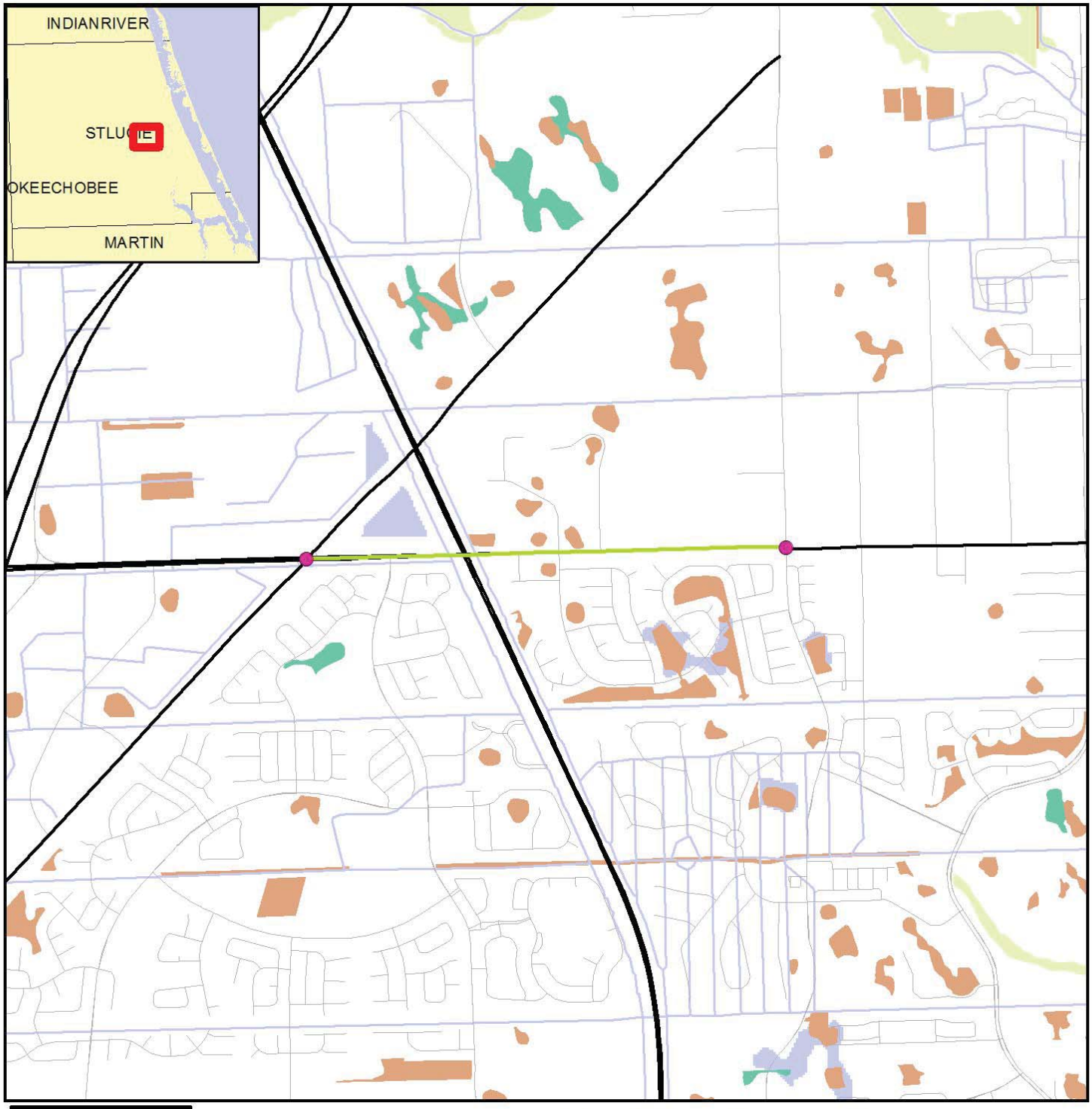
Map Generated on: 5/23/2014

FDOT

14177 Midway Road Widening, Alternative 1
Glades Cut-Off Rd to Selvitz Road



0 0.6 Miles

N W E S

Coastal and Marine Resource Map

- ETDM Alternative Point
- ETDM Alternative Terminus
- ETDM Alternative Segment
- ETDM Alternative Polygon
- Major Road
- Local Road or Trail
- River, Stream or Canal
- Water Body
- Aquatic Preserve
- Navigable Water Way
- Continuous Seagrass
- Discontinuous Seagrass
- Coastal Barrier Resource Area
- Swamp or Marsh
- Exposed Rocky Platform
- Sand Beach
- Gravel Beach/Riprap
- Exposed Tidal Flat
- Sheltered Tidal Flat
- Mixed Sand And Gravel Beach
- Sheltered Rock/Seawall/Vegetated
- Exposed Vertical Rocky Shore/Seawall

Data Sources: NAVTEQ; US Geological Survey; Florida Marine Research Institute; Florida Department of Transportation; Florida Department of Environmental Protection; National Oceanic and Atmospheric Association; Florida Water Management Districts

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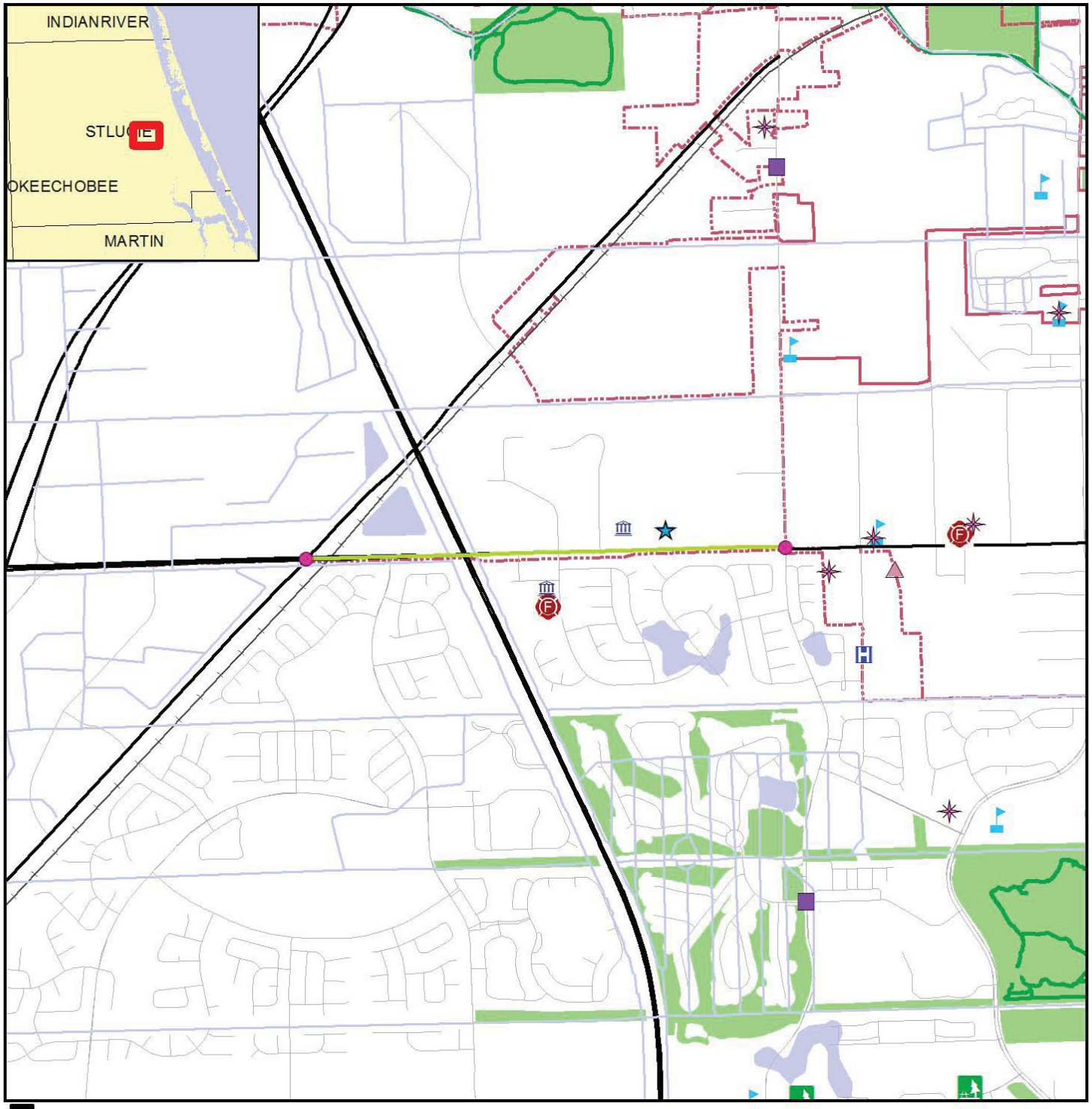
14177 Midway Road Widening, Alternative 1
Glades Cut-Off Rd to Selvitz Road



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- ETDM Alternative Point
- ETDM Alternative Terminus
- ETDM Alternative Segment
- ETDM Alternative Polygon
- Major Road
- Local Road or Trail
- Government
- Civic Center
- Cemetery
- Social Service
- Community Center
- Law Enforcement
- Place of Worship

Community Facilities and Services Map

- Cultural Center
- Fire Station
- Health Care
- School
- Park
- River, Stream or Canal
- Recreational Trail
- Railroad
- Community Boundary
- Water Body
- Conservation or Recreation Area

Data Sources:
US Geological Survey; FL Department of Transportation; NAVTEQ; FL Property Appraisers; FL Natural Areas Inventory

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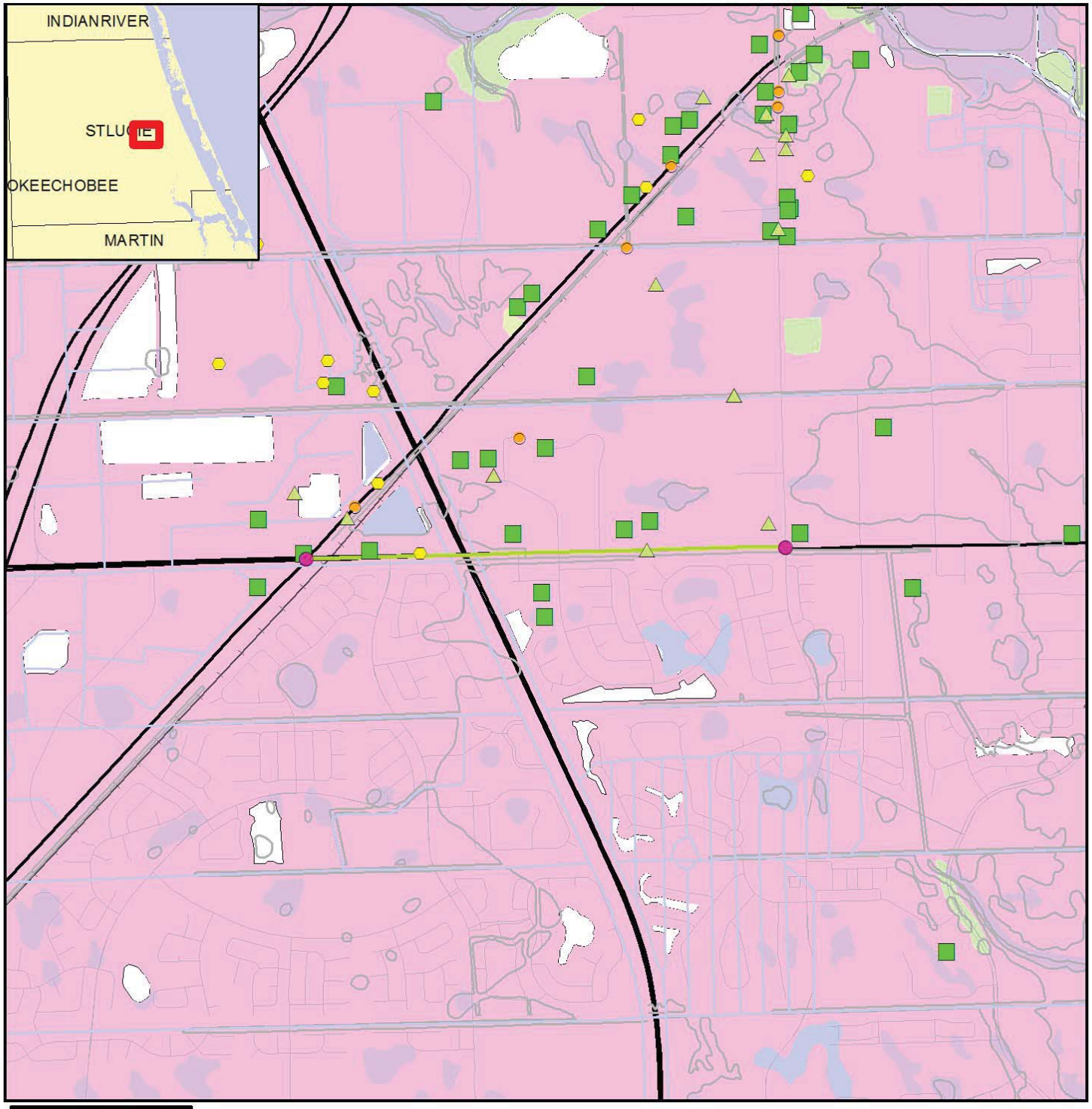
14177 Midway Road Widening, Alternative 1
Glades Cut-Off Rd to Selvitz Road



0 0.6 Miles

N W E S

ETDM Alternative Point
ETDM Alternative Terminus
ETDM Alternative Segment
ETDM Alternative Polygon
Major Road
Local Road or Trail
Railroad
River, Stream or Canal
Toxic Release Inventory
Dry Cleaning Facility
Solid Waste Facility
NPL Remediation Site
Hazardous Material Site
Power Plant
Superfund Site
Nuclear Site
FDEP Tanks
Brownfield Area
5 FT Contour
Water Body
Swamp/Marsh

Potential Contamination Assessment Map

Soil Drainage
- Excessively Drained
- Somewhat Excessively Drained
- Moderately Well Drained
- Well Drained
- Somewhat Poorly Drained
- Poorly Drained
- Very Poorly Drained
- Unclassified

Data Sources:
NAVTEQ; US Geological Survey; FL Department of Transportation; FL Department of Environmental Protection; FL Water Management Districts; US Environmental Protection Agency; Natural Resource Conservation Service

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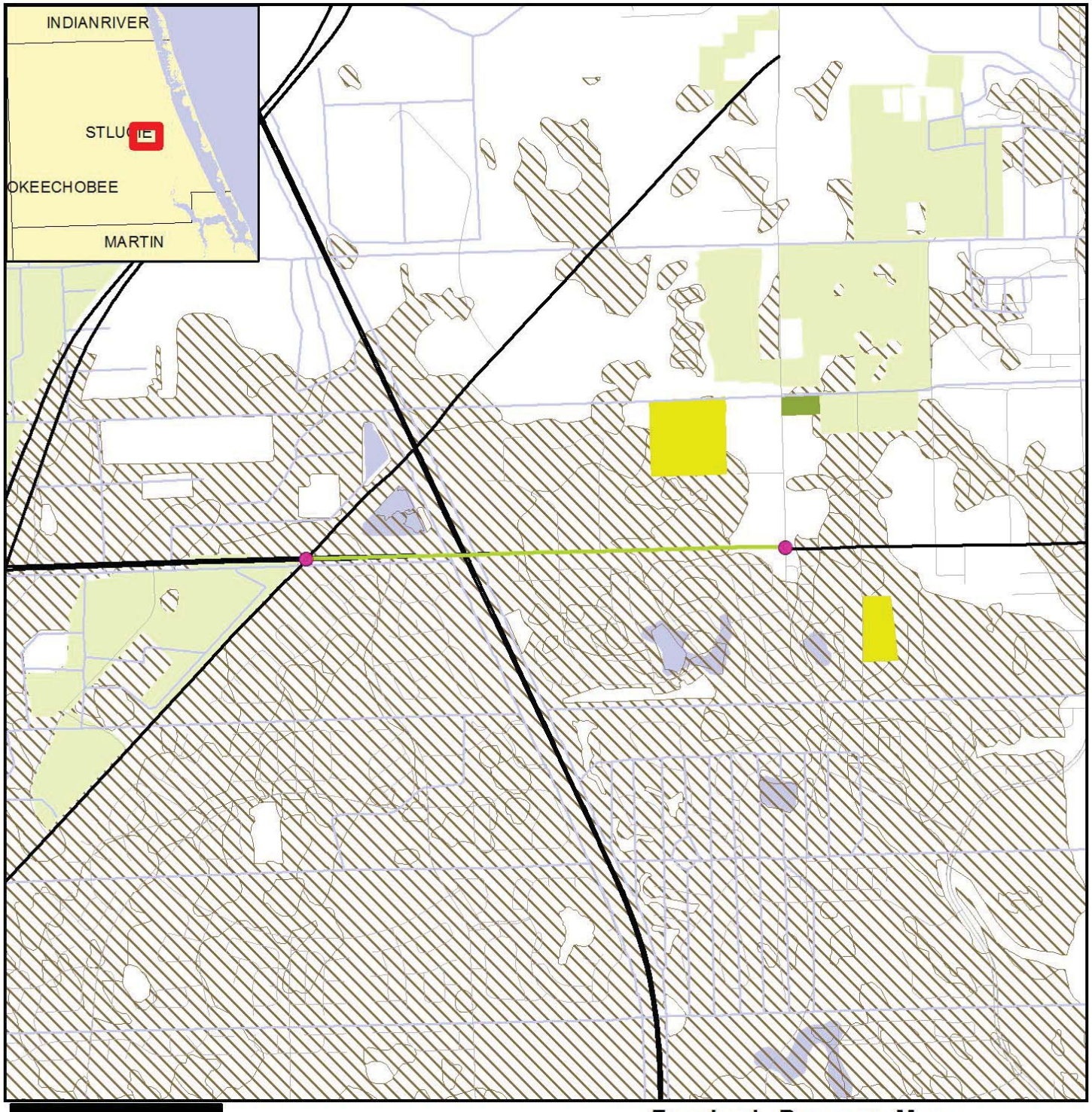
FDOT

14177 Midway Road Widening, Alternative 1
Glades Cut-Off Rd to Selvitz Road



Farmlands Resource Map

- ETDM Alternative Point
- ETDM Alternative Terminus
- ETDM Alternative Segment
- ETDM Alternative Polygon
- Major Road
- Local Road or Trail
- River, Stream or Canal
- Water Body
- Prime Farmland Soils
- Cropland/Pastureland
- Nurseries/Vineyards
- Specialty Farms
- Tree Crops
- Rural Open Lands

Data Sources: NAVTEQ, Florida Water Management Districts, US Geological Survey, Natural Resources Conseration Services

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etdm Efficient Transportation Decision Making

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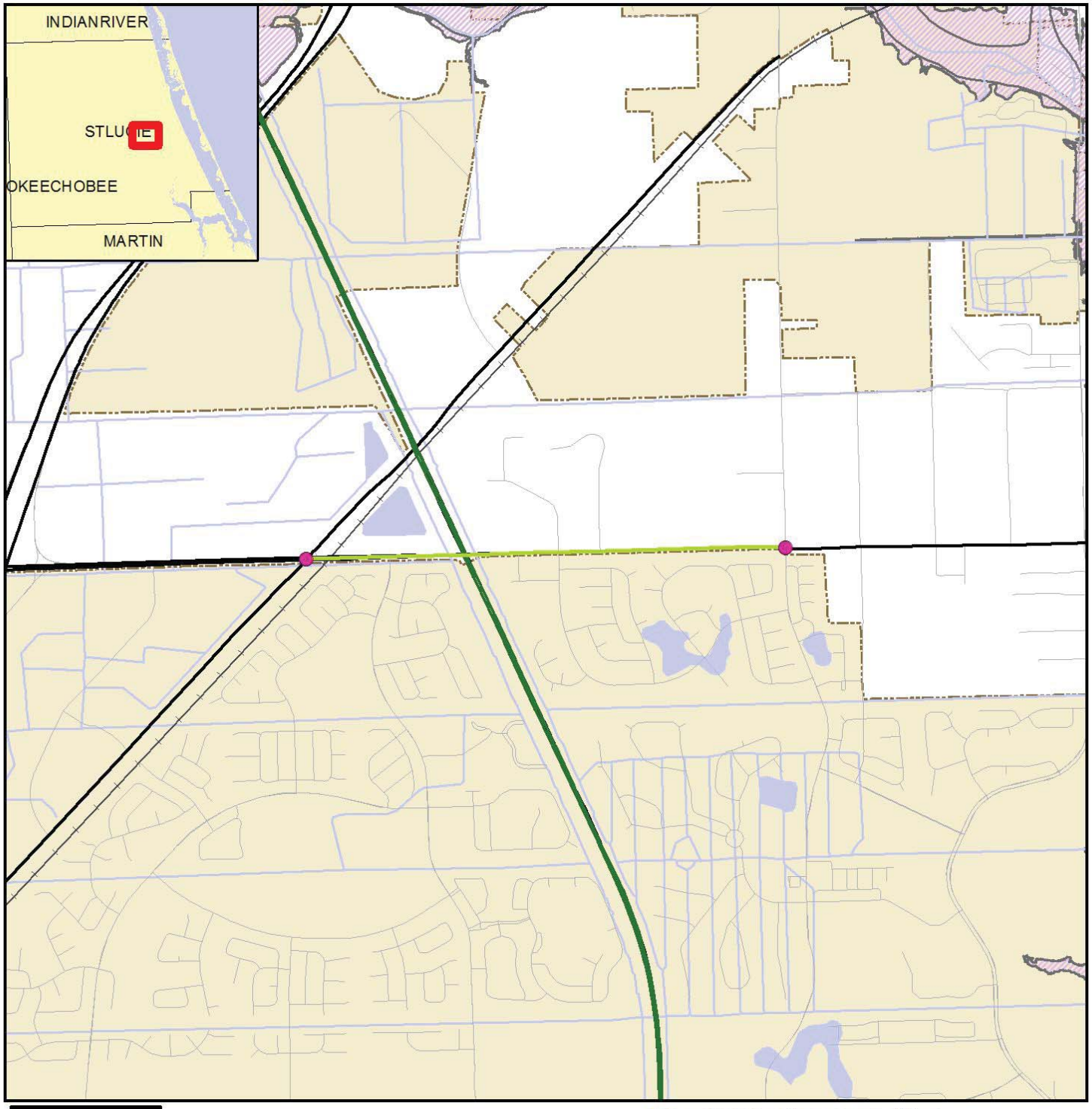
FDOT

14177 Midway Road Widening, Alternative 1
Glades Cut-Off Rd to Selvitz Road



0 0.5 Miles

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Floodplain Resource Map

- ETDM Alternative Point
- ETDM Alternative Terminus
- ETDM Alternative Segment
- ETDM Alternative Polygon
- Major Road
- Local Road or Trail
- Railroad
- River, Stream or Canal
- Water Body
- City Limits
- County Boundaries
- Special Flood Hazard Area

Data Sources:
NAVTEQ
US Geological Survey
Federal Emergency Management Agency

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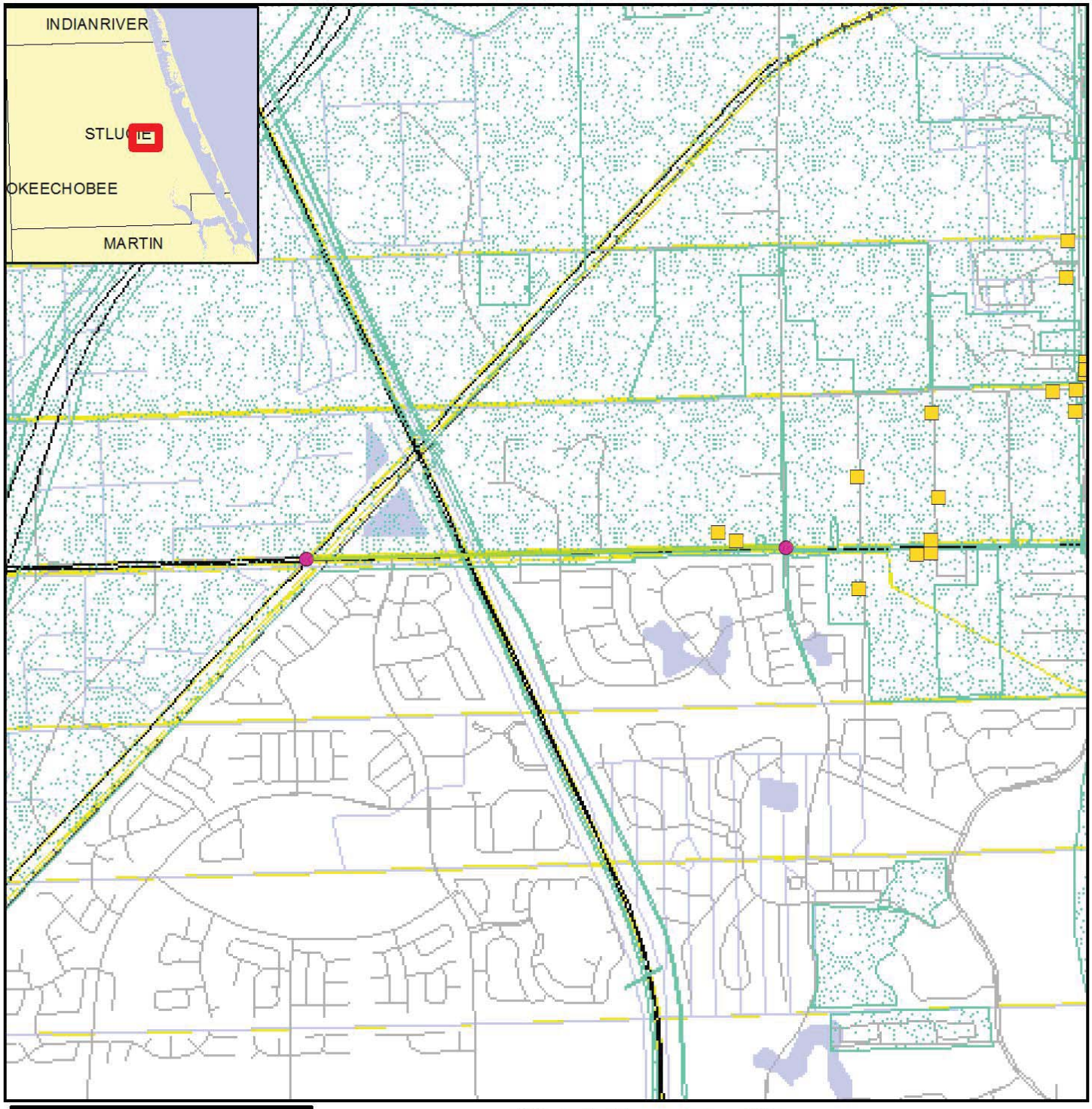
etdm Efficient Transportation Decision Making
est Environmental Screening Tool

Map Generated on: 5/23/2014

FDOT

14177 Midway Road Widening, Alternative 1
Glades Cut-Off Rd to Selvitz Road



0 1 Miles

N W E S

Data Sources:
NAVTEQ
US Geological Survey
Florida Department of Transportation
Florida Department of State,
Bureau of Archaeological Research

Historic Resources Map

- ETDM Alternative Point
- ETDM Alternative Terminus
- ETDM Alternative Segment
- ETDM Alternative Polygon
- Major Road
- Local Road or Trail
- River, Stream or Canal
- Water Body
- Swamp/Marsh
- Railroad
- Historic Structure
- Historic Cemetery
- Historic Bridge
- Historic Resource Group
- Cultural Resource Field Survey Area
- State Historic Highway

Note: Historic properties depicted on this map represent resources listed in the Florida Master Site File excluding archeological site locations, which, pursuant to Chapter 267.135, Florida Statutes, may be exempt from public record (Chapter 119.07, Florida Statutes). Absence of features on the map does not necessarily indicate an absence of resources in the project vicinity.

etdm Efficient Transportation Decision Making

est Environmental Screening Tool

Map Generated on: 5/23/2014

FDOT

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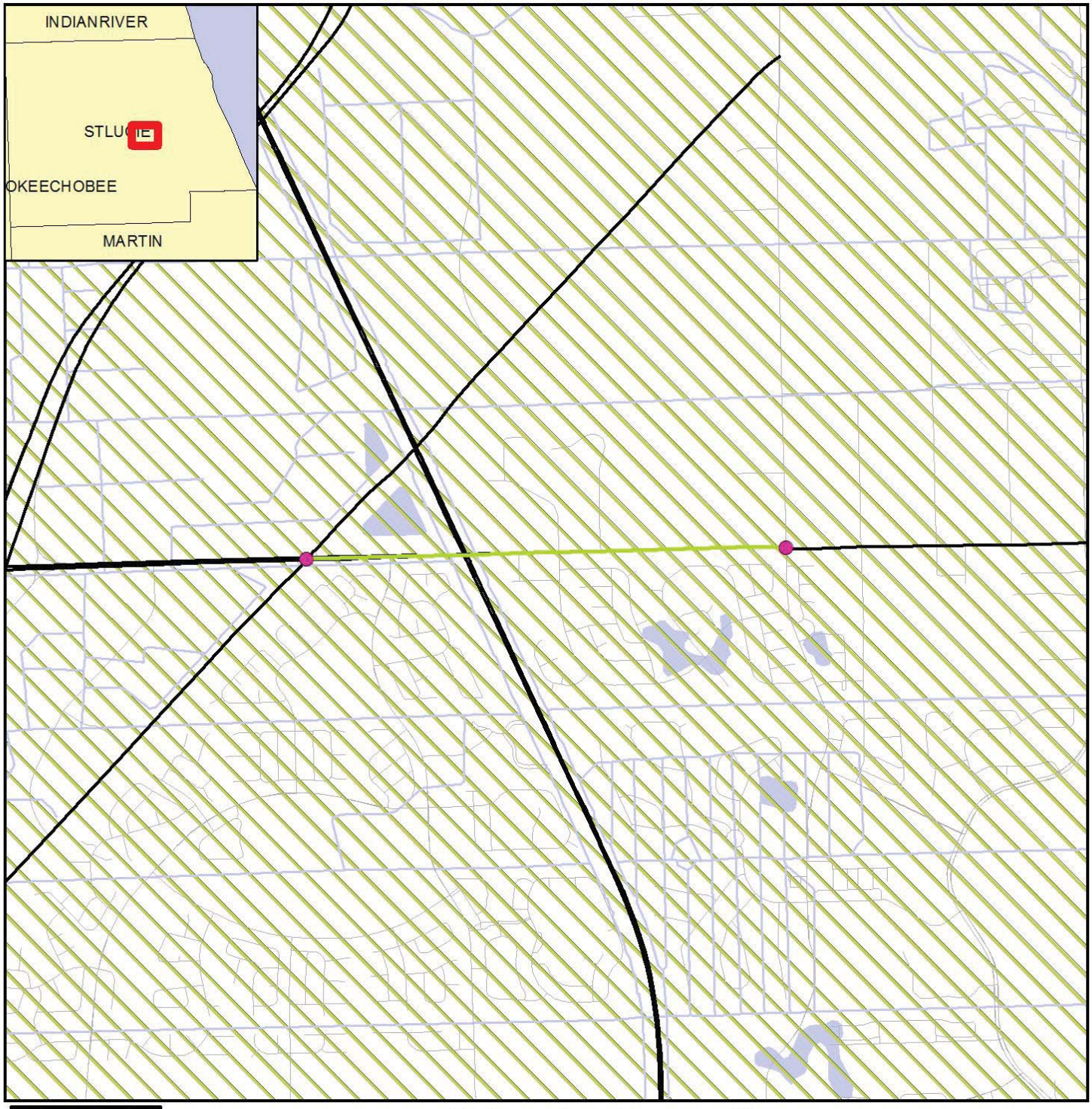
14177 Midway Road Widening, Alternative 1
Glades Cut-Off Rd to Selvitz Road



0 0.5 Miles

N W E S

Hydrogeology Resource Map

- ETDM Alternative Point
- ETDM Alternative Terminus
- ETDM Alternative Segment
- ETDM Alternative Polygon
- Major Road
- Local Road or Trail
- River, Stream or Canal
- Water Body
- Swamp/Marsh

Recharge Areas of the Floridan Aquifer
- Discharge 1 TO 5
- Discharge > 5
- Disharge < 1
- Recharge 1 TO 10
- Recharge > 10
- Recharge < 1

Geological Epoch
- Eocene
- Holocene
- Miocene
- Miocene/Pliocene
- Oligocene
- Oligocene/Miocene
- Pleistocene
- Pleistocene & Holocene
- Pliocene
- Pliocene/Pleistocene

Data Sources: NAVTEQ; US Geological Survey; Florida Department of Transportation; South West Florida Water Management District; Florida Geological Survey

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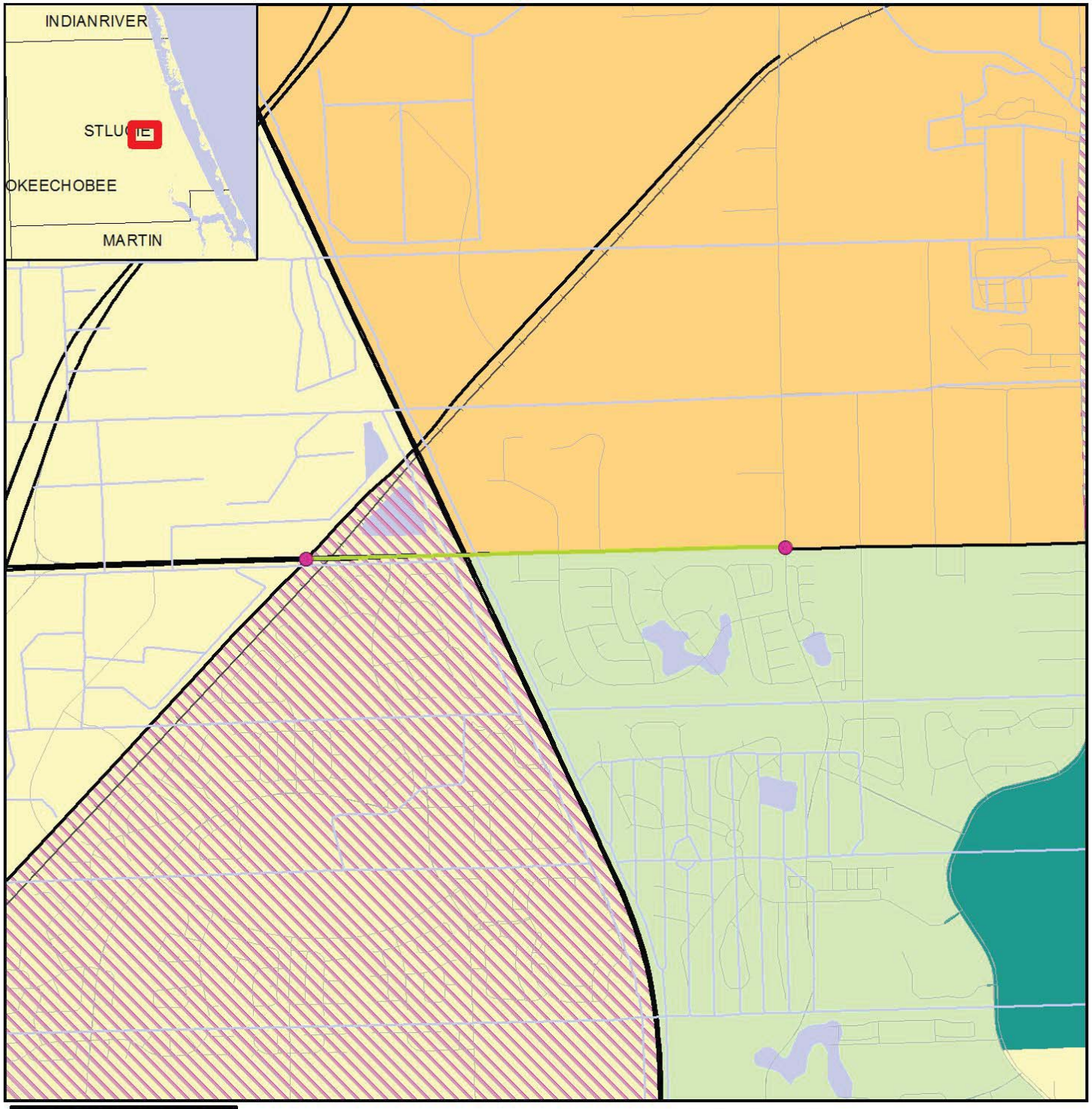

0 0.75 Miles

N
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Income Distribution Map

- ETDM Alternative Point
- ETDM Alternative Terminus
- ETDM Alternative Segment
- ETDM Alternative Polygon
- Major Road
- Local Road or Trail
- Railroad
- River, Stream or Canal
- > 20% Below Poverty
- Water Body

Median Household Income

0 - 10000
10001 - 29999
30000 - 49999
50000 - 79999
80000 - 125000
> 125000

Data Sources:
US Geological Survey
FL Department of Transportation
NAVTEQ
US Census Bureau (2010)

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Map Generated on: 5/23/2014

FDOT

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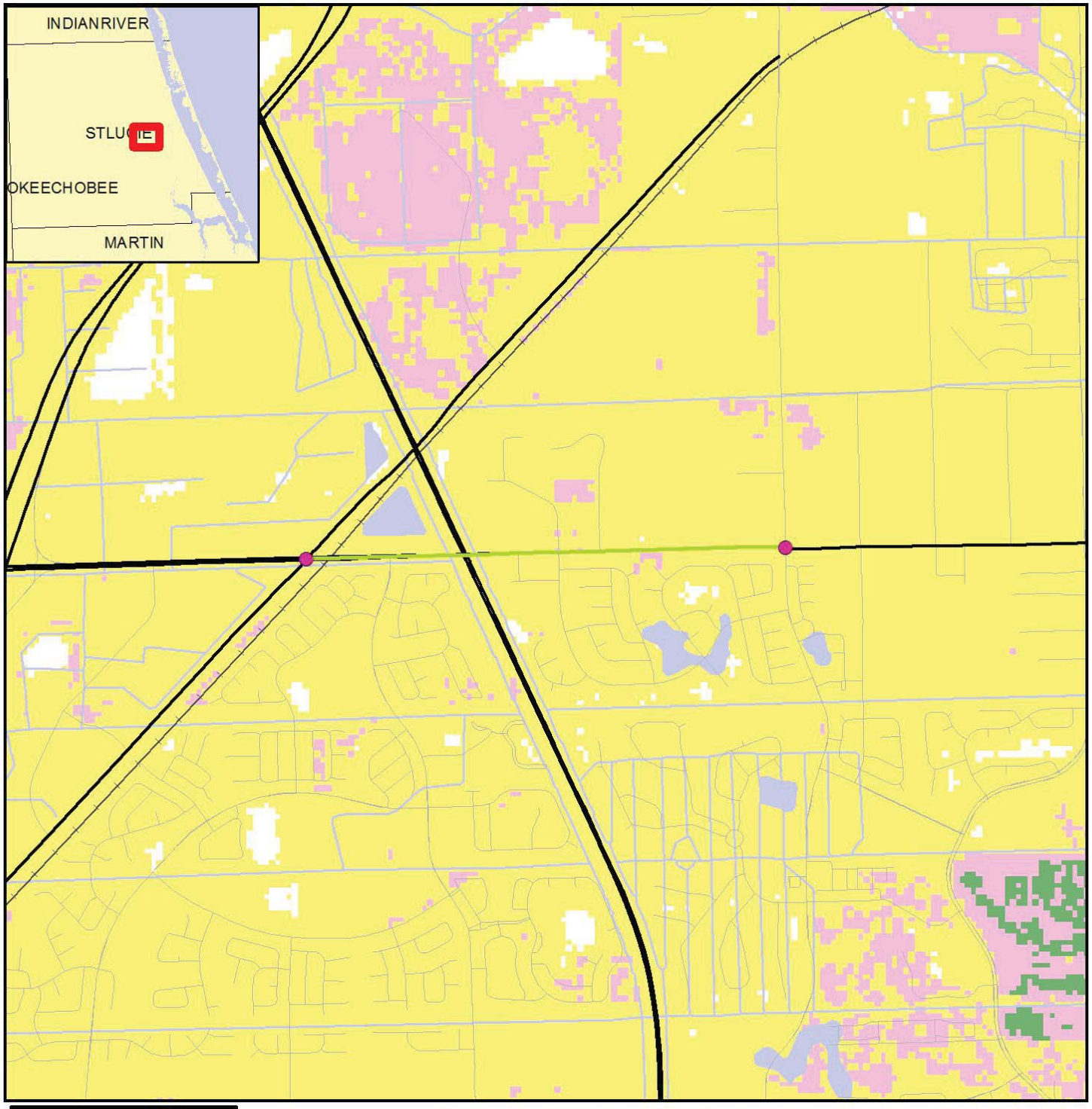

0 0.75 Miles

N
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Data Sources:
NAVTEQ
US Geological Survey
Florida Department of Transportation
Florida Fish & Wildlife Conservation Commission

Integrated Wildlife Habitat Ranking System Map

- ETDM Alternative Point
- ETDM Alternative Terminus
- ETDM Alternative Segment
- ETDM Alternative Polygon
- Major Road
- Local Road or Trail
- Railroad
- River, Stream or Canal
- Water Body
- Low Habitat Quality
- Medium Habitat Quality
- High Habitat Quality

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Map Generated on: 5/23/2014

FDOT

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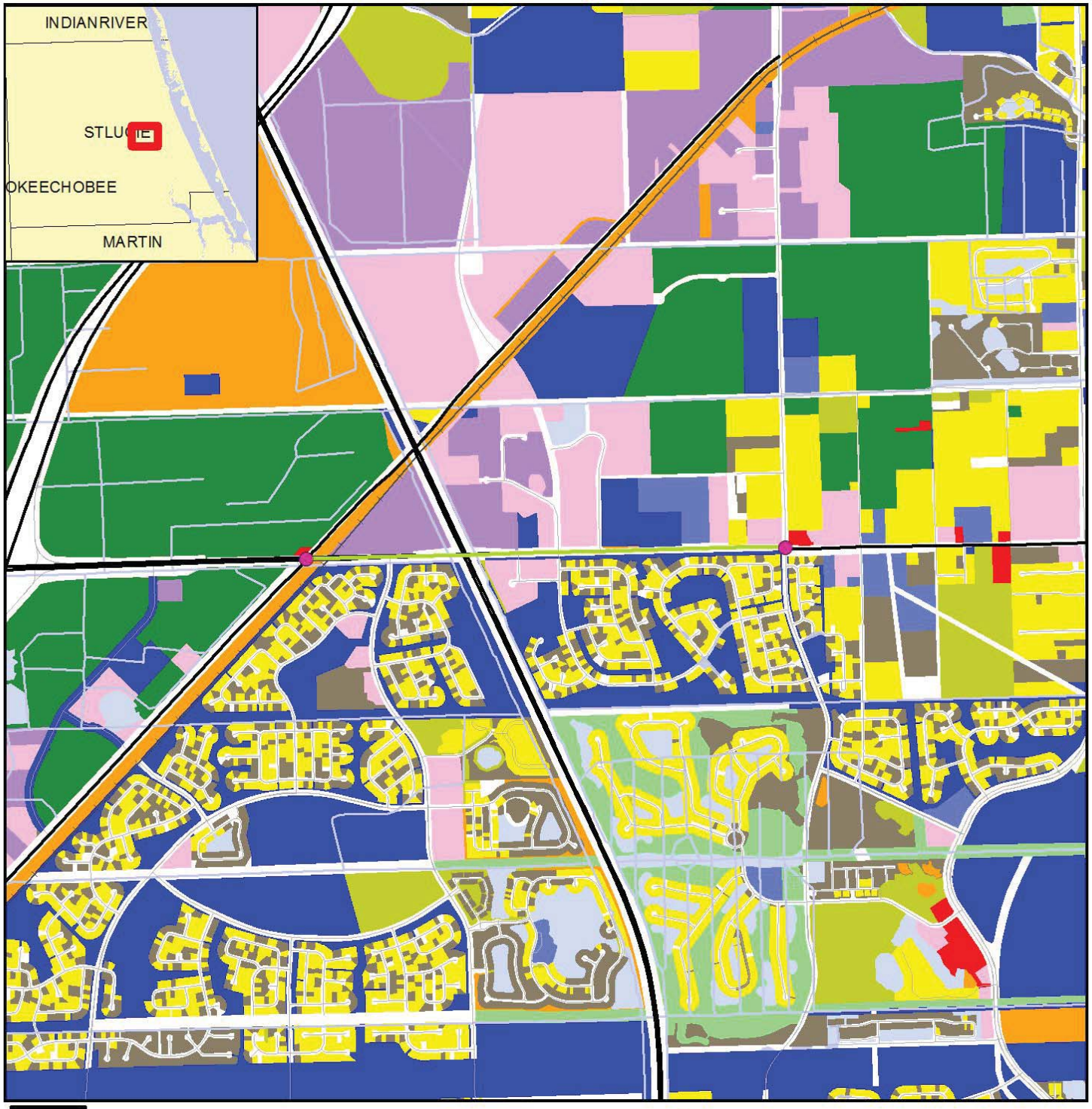

0 0.25 Miles

N
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Land Use Map

- ETDM Alternative Point
- ETDM Alternative Terminus
- ETDM Alternative Segment
- ETDM Alternative Polygon
- Major Road
- Local Road or Trail
- Railroad
- River, Stream or Canal
- Agricultural
- Industrial
- Institutional
- Mining
- Open (Not Agricultural)
- Other
- Public
- Right-of-Way
- Recreational
- Residential
- Retail/Office
- Vacant (Residential)
- Vacant (Nonresidential)
- Water
- No Data

Data Sources:
NAVTEQ
US Geological Survey
Florida Department of Revenue
Florida Department of Transportation
Florida County Property Appraiser Offices

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Map Generated on: 5/23/2014

FDOT

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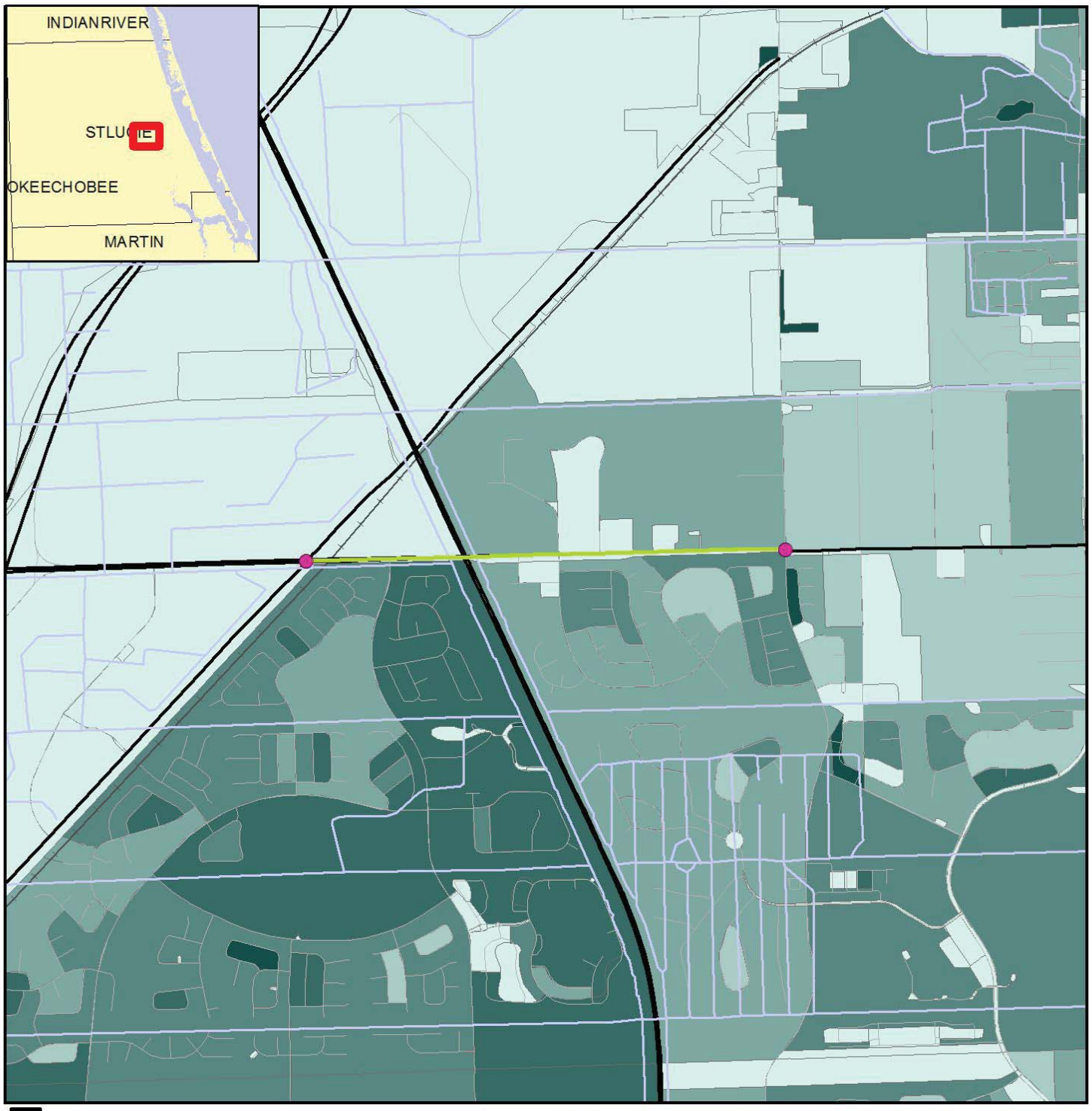

0 0.1 Miles

N
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S

Data Sources:
US Geological Survey
FL Department of Transportation
NAVTEQ
US Census Bureau (2010)

Minority Population Distribution Map

- ETDM Alternative Point
- ETDM Alternative Terminus
- ETDM Alternative Segment
- ETDM Alternative Polygon
- Major Road
- Local Road or Trail
- Railroad
- River, Stream or Canal
- Water Body

Percent Minority Population (2010)

0 - 6 | 7 - 20 | 21 - 40 | 41 - 60 | 61 - 85 | 86 - 100

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est Environmental Screening Tool

Map Generated on: 5/23/2014

FDOT

14177 Midway Road Widening, Alternative 1
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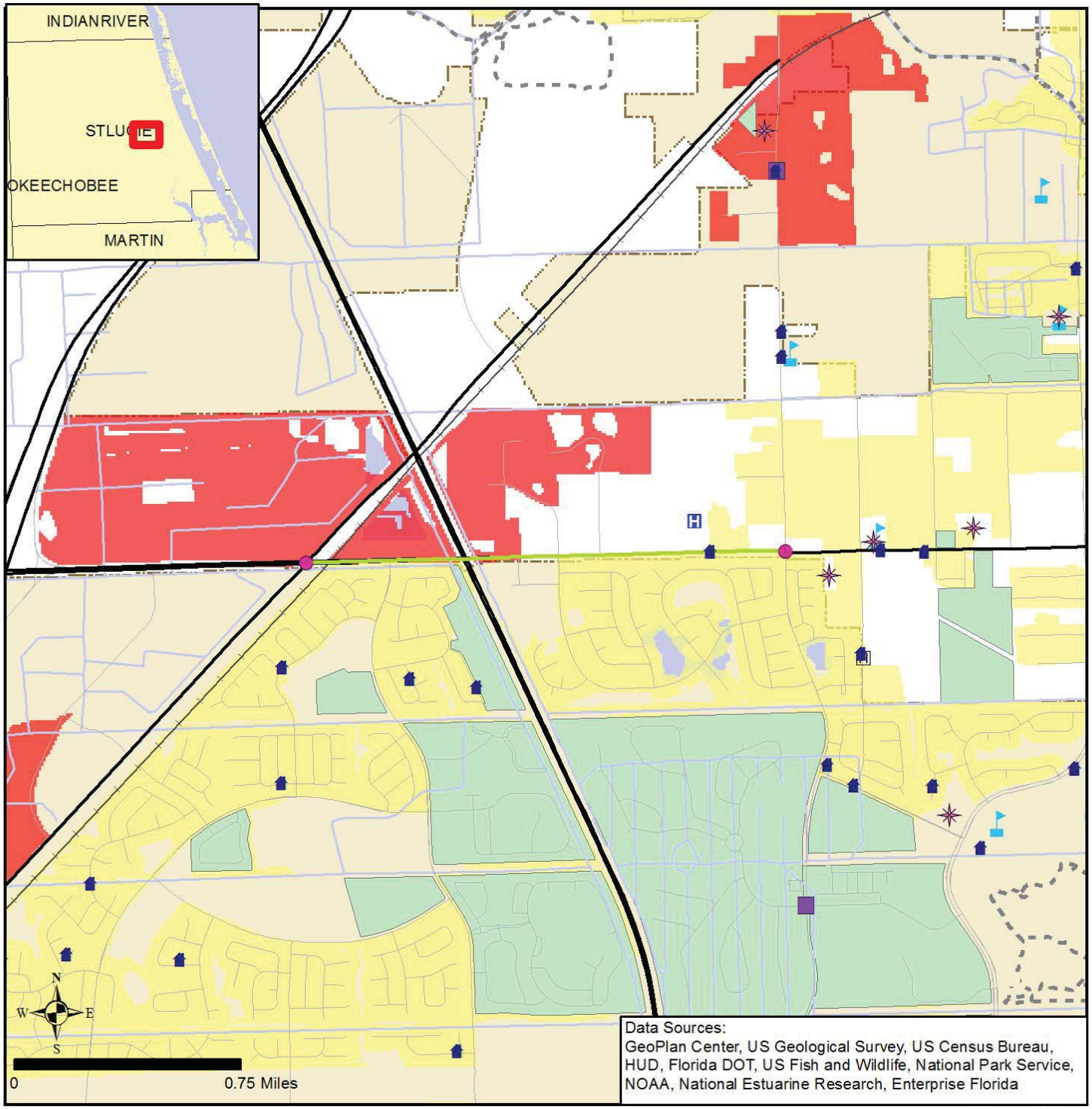

Noise Map

- ETDM Alternative Point
- ETDM Alternative Segment
- ETDM Alternative Polygon
- ETDM Alternative Terminus
- County Boundaries
- City Limits
- Major Road
- Local Road or Trail
- Noise Barriers
- Existing Trails
- Railroad
- River, Stream or Canal
- Water Body
- Swamp/Marsh
- Airport
- Condo Owners Associations
- Hospitals
- Laser On-site
- Group Care Facilities
- Cemetery
- Community Center
- Cultural Center
- Health Care
- Park
- Place of Worship
- School
- Historic Cemetery
- Planned Unit Developments
- Wildlife Refuges
- National Parks
- National Park Projects
- Marine Sanctuaries
- Military Installations
- Industrial
- Residential
- HUD Renewal
- Nat'l Estuarine Reserves
- Enterprise Zones
- DRI

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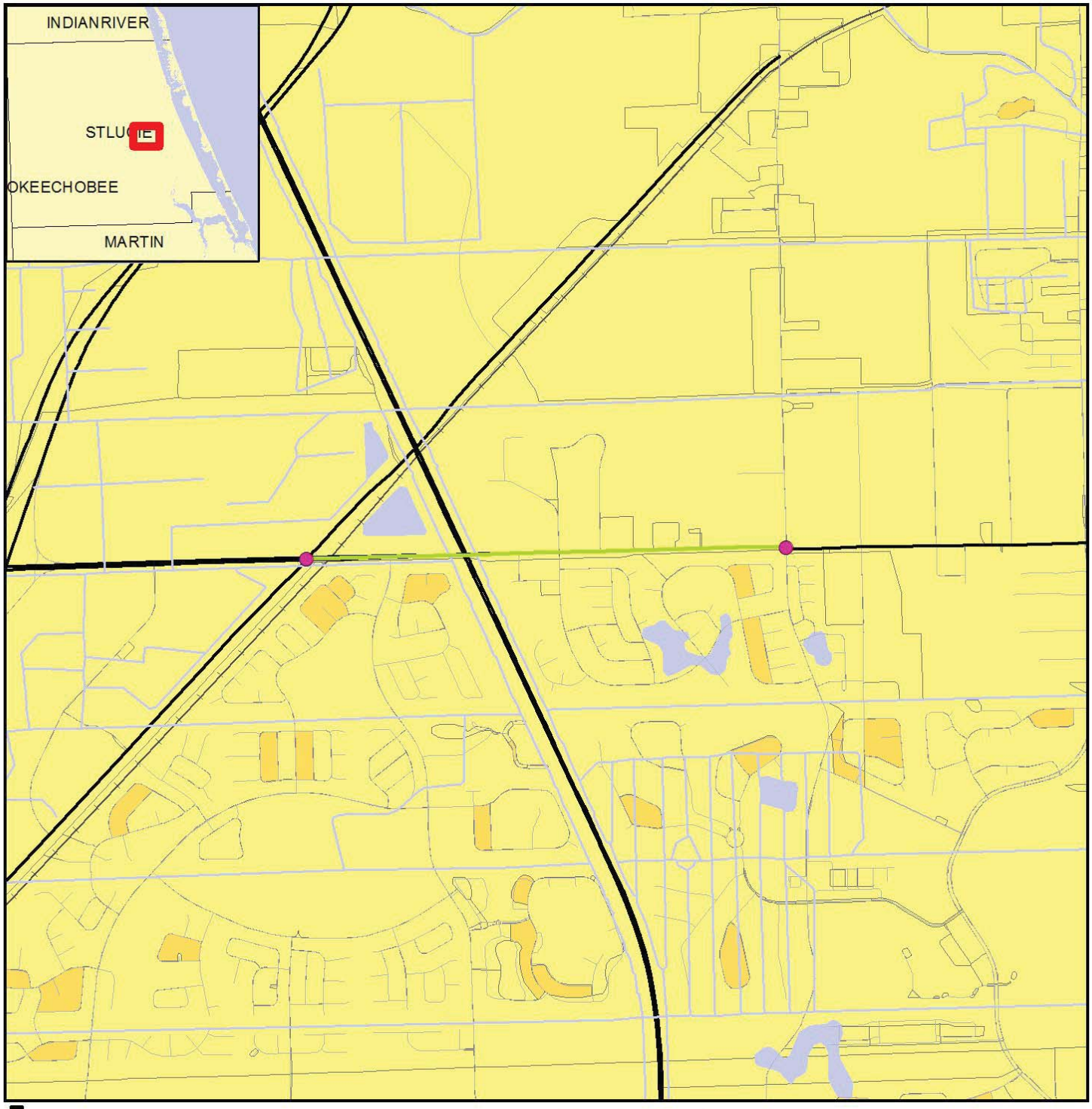
Map Generated on: 5/23/2014

FDOT

14177 Midway Road Widening, Alternative 1
Glades Cut-Off Rd to Selvitz Road



0.04 Miles

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S

Data Sources:
US Geological Survey
FL Department of Transportation
NAVTEQ
US Census Bureau (2010)

Population Density Map

- ETDM Alternative Point
- ETDM Alternative Terminus
- ETDM Alternative Segment
- ETDM Alternative Polygon
- Major Road
- Local Road or Trail
- Railroad
- River, Stream or Canal
- Water Body

Population per Acre (2010)

0 - 4.9 | 5 - 29.9 | 30 - 99.9 | 100 - 349.9 | 350 - 800 | > 800

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Map Generated on: 5/23/2014

FDOT

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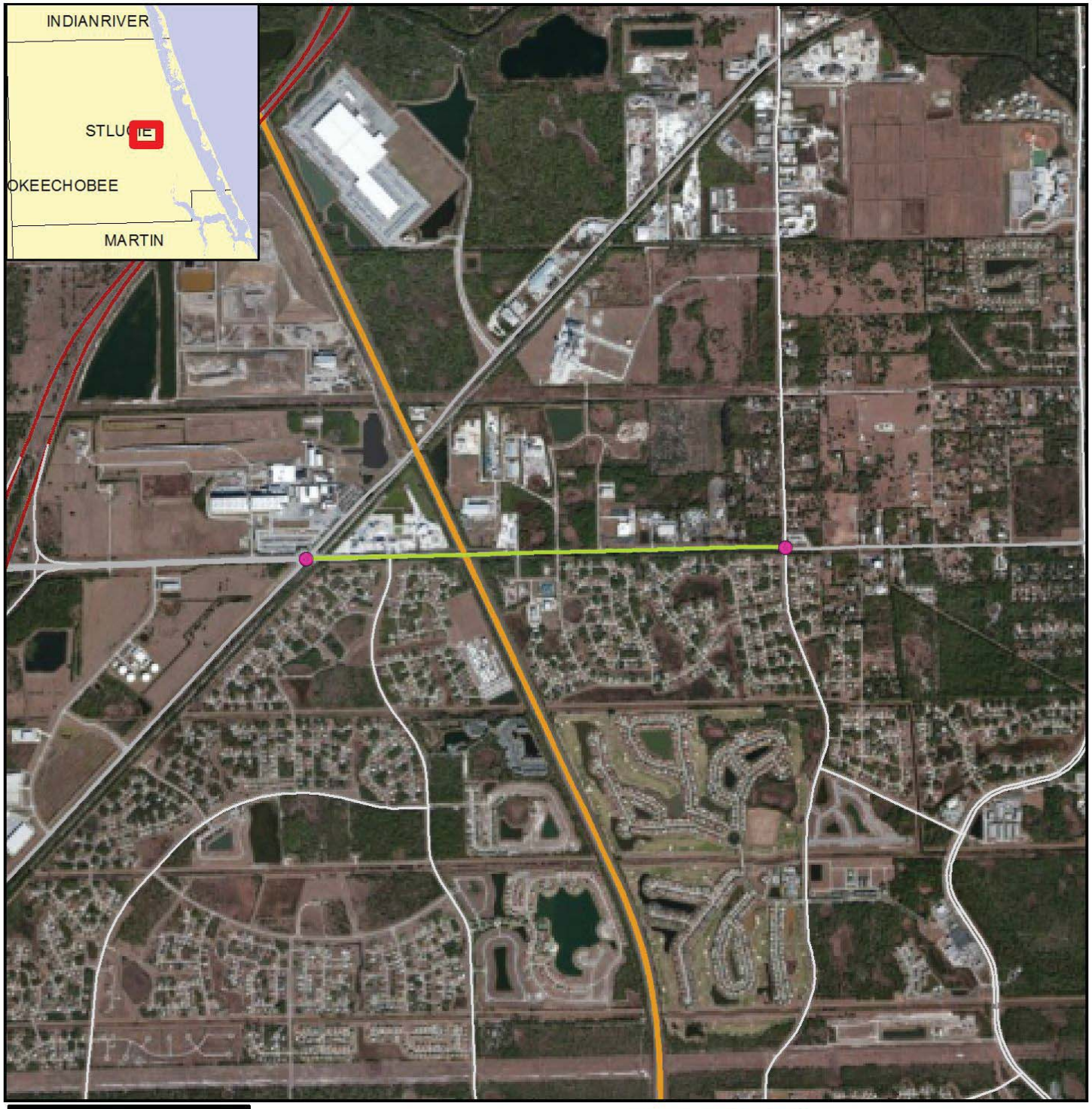

0 0.8 Miles

Project Aerial Map

N
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S

- ETDM Alternative Point
- ETDM Alternative Terminus
- ETDM Alternative Segment
- ETDM Alternative Polygon
- Primary and Limited Access Highway
- Secondary, Unlimited Access Highway
- Other Highway Feature
- Local Road

Data Sources:
Highways - NAVTEQ
Digital Orthophotograph - US Geological Survey

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Map Generated on: 5/23/2014

FDOT

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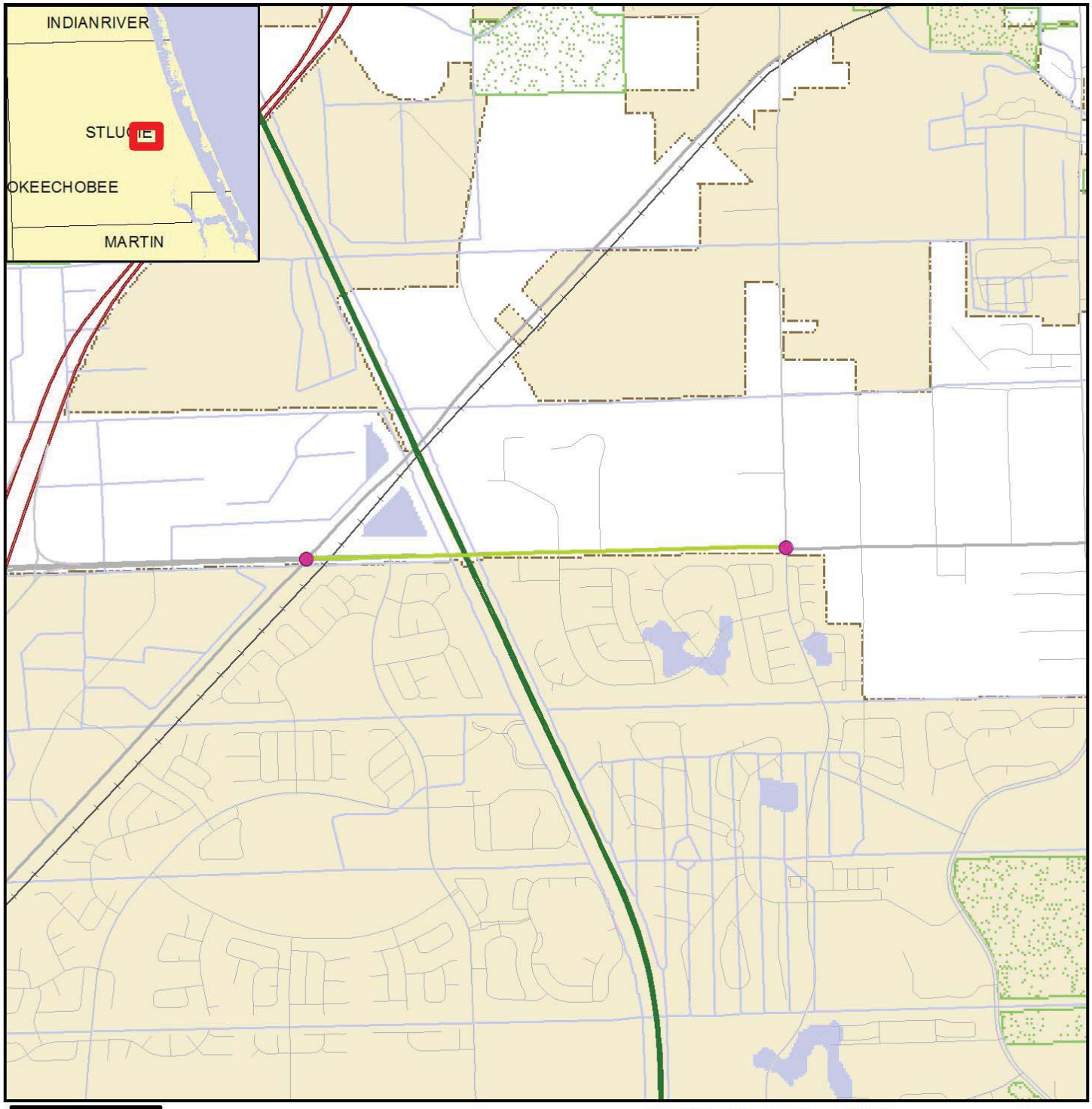

0 0.5 Miles

N
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Project Location Map

- ETDM Alternative Point
- ETDM Alternative Terminus
- ETDM Alternative Segment
- ETDM Alternative Polygon
- River, Stream or Canal
- Water Body
- Swamp/Marsh
- Managed Conservation Lands
- Toll Road
- Railroad
- Airport
- City Limits
- County Boundaries

Data Sources:
NAVTEQ
US Geological Survey
US Census Bureau
County Property Appraisers
Florida Natural Areas Inventory

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Map Generated on: 5/23/2014

FDOT

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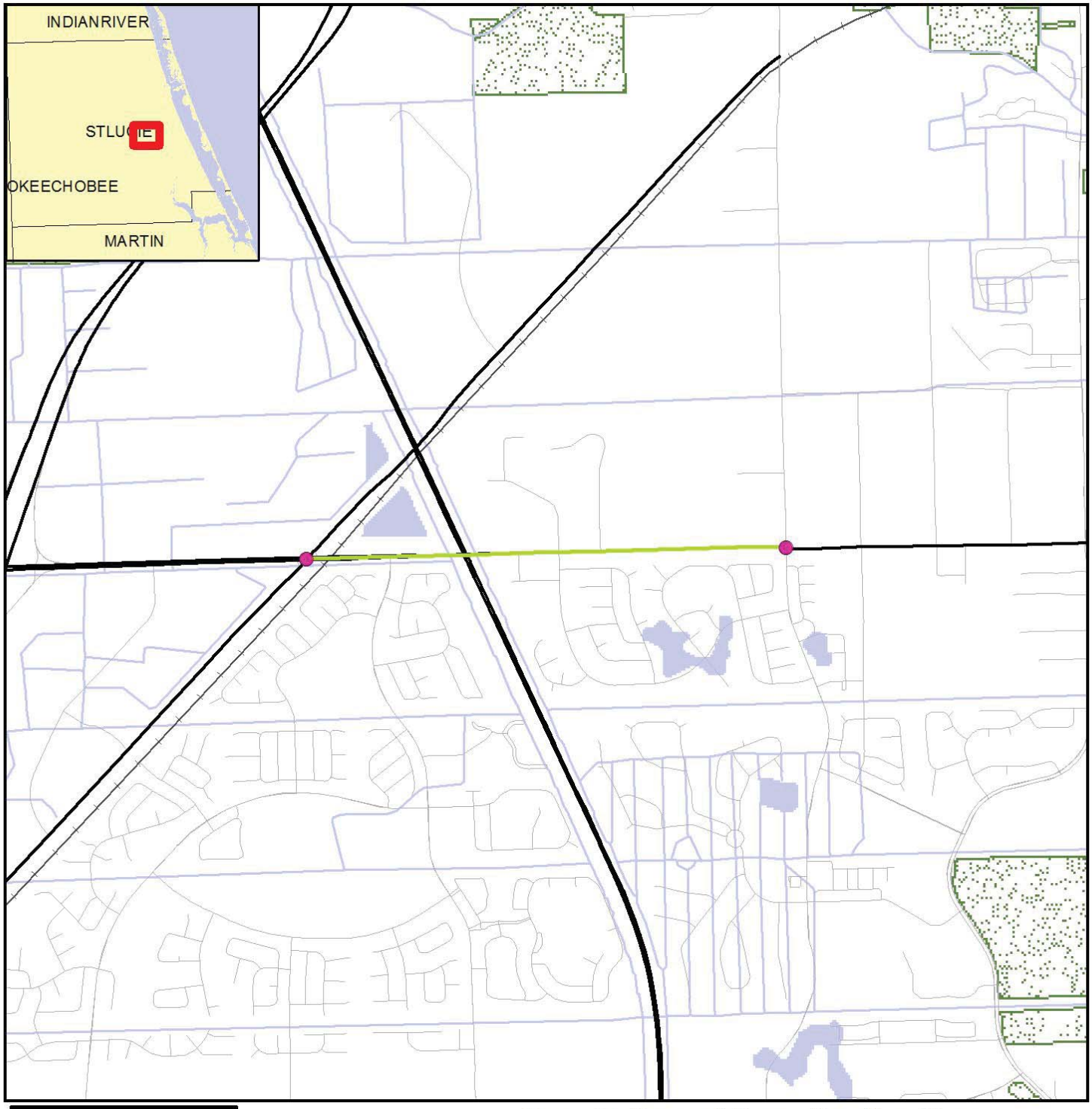

0 0.75 Miles

N
W E
S

Data Sources:
NAVTEQ
US Geological Survey
Florida Natural Areas Inventory

Conservation and Recreation Area Map

- ETDM Alternative Point
- ETDM Alternative Segment
- ETDM Alternative Polygon
- ETDM Alternative Terminus
- Major Road
- Local Road or Trail
- River, Stream or Canal
- Water Body
- Swamp/Marsh
- Conservation or Recreation Area
- Railroad
- County Boundary

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Map Generated on: 5/23/2014

FDOT

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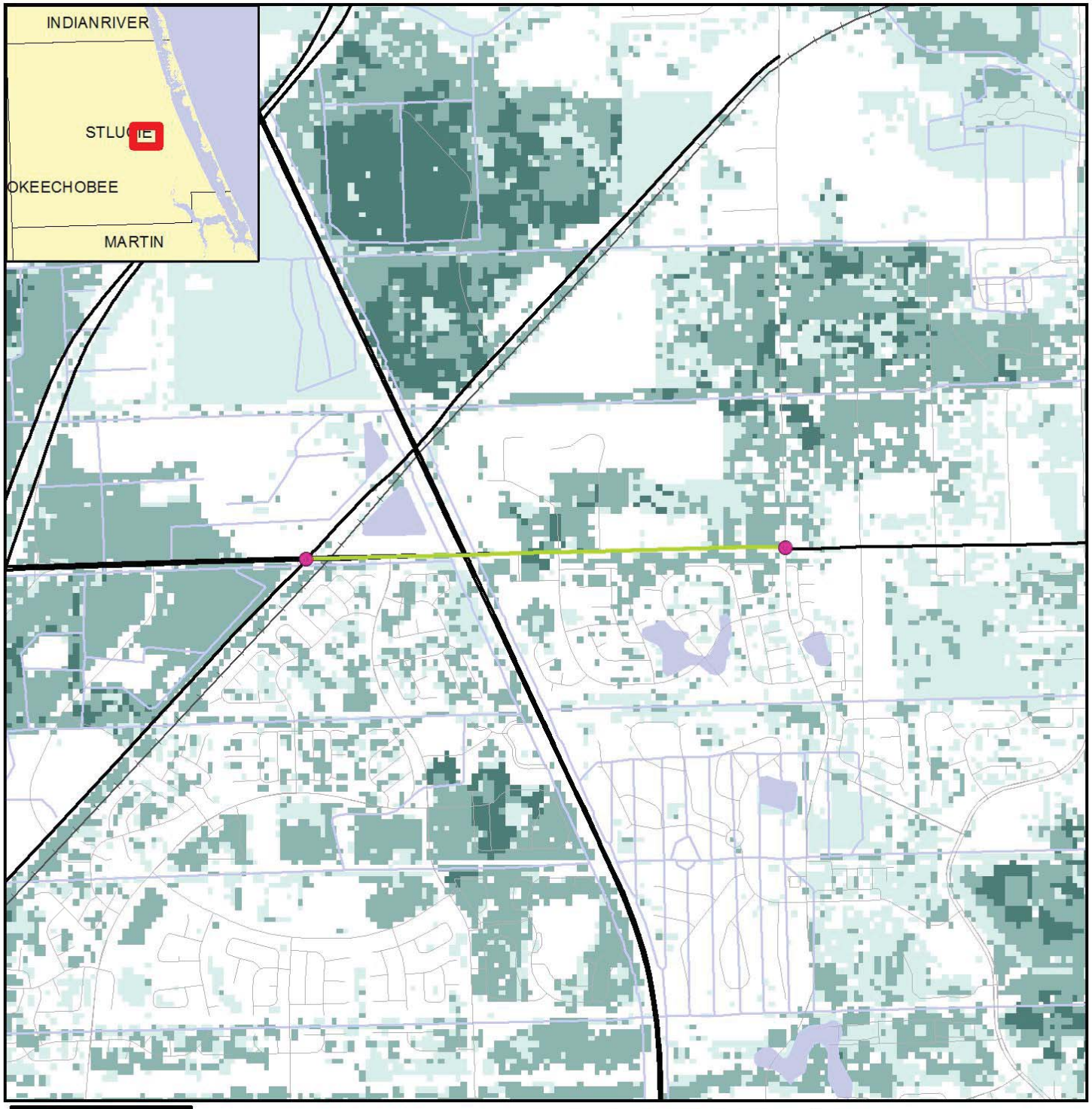

0 0.6 Miles

N W E S

Data Sources:
NAVTEQ
US Geological Survey
Florida Department of Transportation
Florida Fish & Wildlife Conservation Commission

Species Potential Habitat Model Map

- ETDM Alternative Point
- ETDM Alternative Terminus
- ETDM Alternative Segment
- ETDM Alternative Polygon
- Major Road
- Local Road or Trail
- Railroad
- River, Stream or Canal
- Water Body

Potential Habitat Richness

- 1 - 2 Species
- 3 - 5 Species
- 6 - 8 Species
- 9 - 10 Species
- 11 - 13 Species

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Map Generated on: 5/23/2014

FDOT

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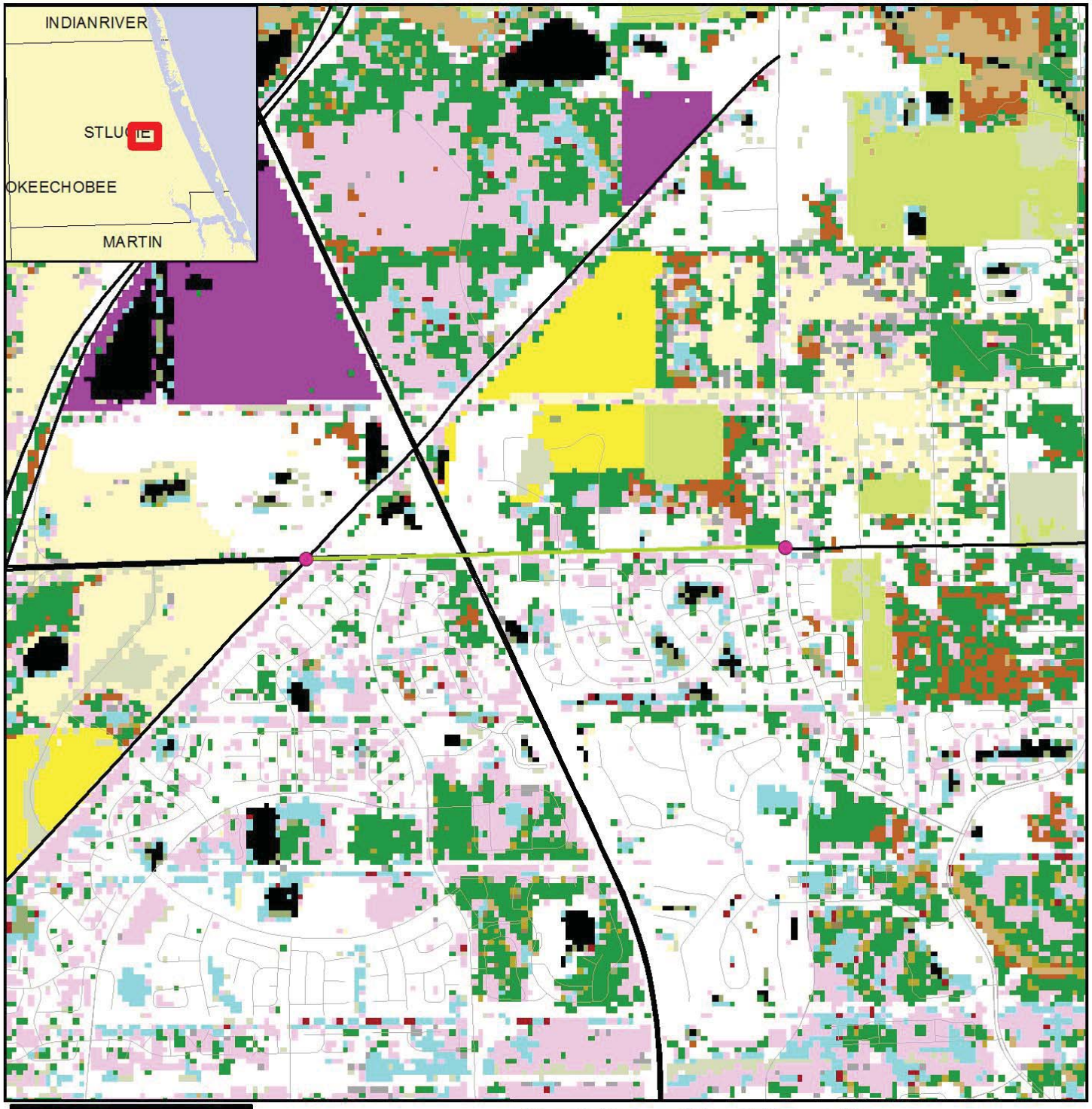

Vegetation and Land Cover Map

- ETDM Alternative Polygon
- ETDM Alternative Segment
- ETDM Alternative Terminus
- ETDM Alternative Point
- Major Road
- Local Road or Trail

- Not Classified
- Coastal Strand
- Sand/Beach
- Xeric Oak Scrub
- Sand Pine Scrub
- Sandhill
- Dry Prairie
- Mixed Hardwood-pine Forest
- Hardwood Hammocks and Forests
- Pinelands
- Cabbage Palm-live Oak Hammock
- Tropical Hardwood Hammock
- Freshwater Marsh and Wet Prairie
- Sawgrass Marsh
- Cattail Marsh
- Shrub Swamp
- Bay Swamp
- Cypress Swamp
- Cypress/Pine/Cabbage Palm
- Mixed Wetland Forest
- Hardwood Swamp
- Hydric Hammock
- Bottomland Hardwood Forest
- Salt Marsh
- Mangrove Swamp
- Scrub Mangrove
- Tidal Flats
- Open Water
- Shrub and Brushland
- Grassland
- Bare Soil/Clearcut
- Improved Pasture
- Unimproved Pasture
- Sugarcane
- Citrus
- Row and Field Crops
- Other Agriculture
- Exotic Plants
- Australian Pine
- Melaleuca
- Brazilian Pepper
- High Impact Urban
- Low Impact Urban
- Extractive

Data Sources:
NAVTEQ; Florida Department of Transportation; Florida Fish and Wildlife Conservation Commission

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Map Generated on: 5/23/2014

FDOT

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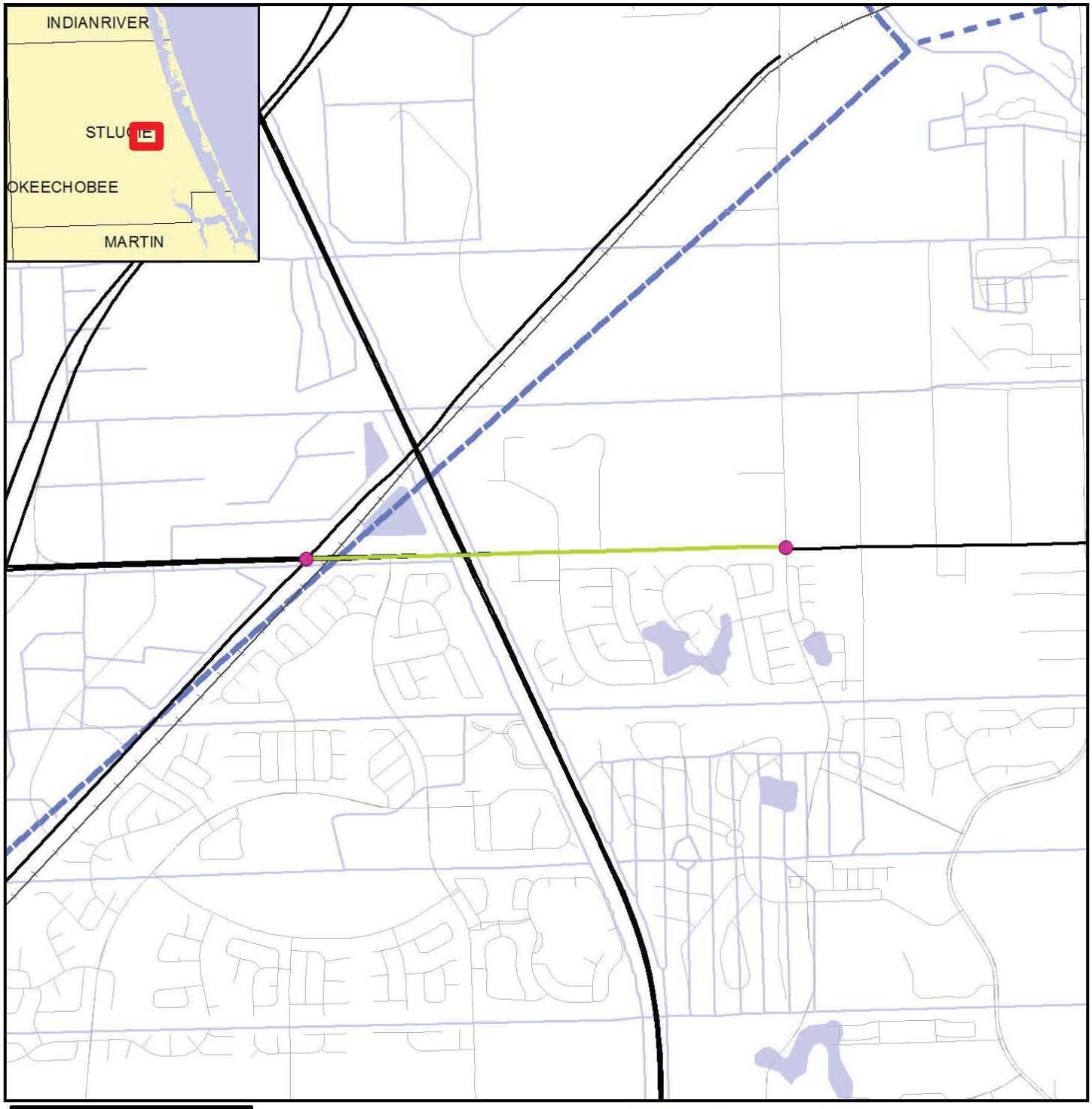

0 0.8 Miles

N W E S

Water Resources Map

- ETDM Alternative Point
- ETDM Alternative Terminus
- ETDM Alternative Segment
- ETDM Alternative Polygon
- Railroad
- 1st Magnitude Spring
- River, Stream or Canal
- Navigable Water Way
- SFWMD Canals
- Drainage Basin
- Outstanding Florida Water
- Surface Water Class I
- Surface Water Class II
- Water Body
- Swamp/Marsh
- Major Road
- Local Road or Trail

Data Sources:
NAVTEQ
US Geological Survey
Florida Department of Transportation
Florida Department of Environmental Protection
Florida Geological Survey
US Bureau of Transportation Statistics

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Map Generated on: 5/23/2014

FDOT

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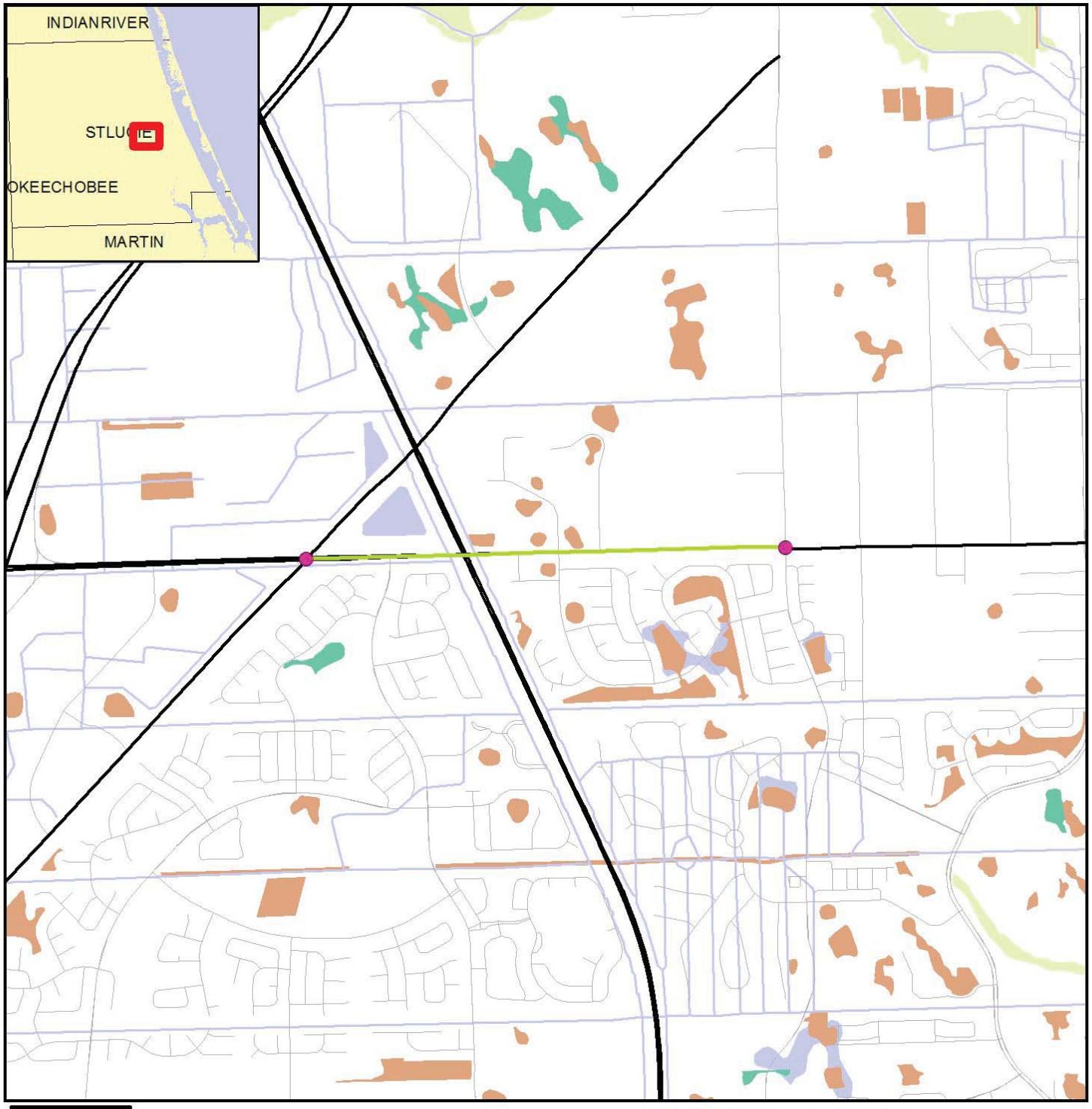

Wetland Resource Map

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- ETDM Alternative Polygon
- ETDM Alternative Segment
- ETDM Alternative Terminus
- ETDM Alternative Point
- Major Road
- Local Road or Trail
- River, Stream or Canal
- Water Body
- Non-vegetated Wetland
- Vegetated Non-forested Wetland
- Wetland Forested Mixed
- Wetland Coniferous Forest
- Wetland Hardwood Forest

Data Sources: NAVTEQ; Florida Water Management Districts; US Geological Survey

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etdm Efficient Transportation Decision Making

est Environmental Screening Tool

Map Generated on: 5/23/2014

FDOT

Appendices

PED Comments

Advance Notification Comments

Federal Highway Administration Comment --

Purpose and Need:

- Safety was mentioned during the overall introduction of the Purpose and Need but there is no data or discussion available to support it. Discussion is recommended.
- Planning Consistency: Is the project included in the current STIP?
- Planning Consistency: This project is in the ETDM Programming Screen and therefore the project phase costs and related funding for those phases that are identified should be consistent with the TIP and LRTP. The project description identifies the project cost, excluding ROW, to be approximately $19m, but the upcoming TIP (to be effective October 1m, 2014) identifies the project costs programmed over the next 5 years as $36m ($45 if ROW is included) and total project costs estimated to be $57m. Please update this information in the screening tool to more accurately reflect what is being presented to the public.
- Public comments on this project were not included in the screening tool. Is FDOT aware of any controversy or support for the proposed project?
- The status of the planning Consistency for this projects was identified as - "no information available" yet, within the project purpose and need there was narrative that described the programming of this project with the MPO documents. This should be updated to reflect this information.

Socio Cultural Impacts:

- There are medium density (fixed single family) dwelling units within 1320 feet of the project. How will access to these home sites be maintained?
- What outreach efforts are planned or have been made to the minority and low income populations along this project? There appears to be at least one residential area that has been identified in the ETDM tool as having a 100% minority population. Additionally, the ETDM tool identifies a small percentage of the population that does not speak English well and will require special outreach efforts.

Mobility/Freight

- Business and commercial - what mitigation coordination has taken place with the commercial businesses within the project area of impact for either continued access to their businesses or any taking/relocation of property for the project? There are a number of businesses within the project impact area that are major traffic generators (US Postal Service, Health Department, and Mental Health Center among others).
- What operational improvements are being considered as part of or independent of this project to assist with access to/from the existing businesses?
- Bicycle/Pedestrian facilities - it is stated that currently accessibility for both modes is minimal along the facility. It is not clear if bicycle and pedestrian facilities will be included in the project. A mention is made of a proposed multiuse trail in the Long Range Plan Needs Plan, but not if there are any actions to move the trail forward as a funded project.
- Truck traffic - This appears to be a well-used freight corridor with currently a 7% truck volume. What is the anticipated growth of the freight volume over the next 20 years especially considering the developments and economic centers planned along this corridor? Have any outreach efforts been made to the freight providers for their input for operational improvements?

Transit -

It did not appear from the project description that transit services are currently available. Are these services part of the planned improvement to this facility in this location?

--Luis D Lopez, P.E., 8/8/2014

Response --

--, $tools.date.format("M/d/yyyy",$comment.responseTimestamp)

South Florida Water Management District Comment --

No additional comments.

--Mindy Parrott, 7/1/2014

Response --

--, $tools.date.format("M/d/yyyy",$comment.responseTimestamp)

GIS Analyses

Since there are so many GIS Analyses available for Project #14177 - Midway Road Widening, they have not been included in this ETDM Summary Report. GIS Analyses, however, are always available for this project on the Public ETDM Website. Please click on the link below (or copy this link into your Web Browser) in order to view detailed GIS tabular information for this project:

http://etdmpub.fla-etat.org/est/index.jsp?tpID=14177&startPageName=GIS%20Analysis%20Results

Special Note: Please be sure that when the GIS Analysis Results page loads, the **Summary Report Re-Published 5/27/2015Milestone** is selected. GIS Analyses snapshots have been taken for Project #14177 at various points throughout the project's life-cycle, so it is important that you view the correct snapshot.

Project Attachments

Note: Attachments are not included in this Summary Report, but can be accessed by clicking on the links below:

Date	Type	Size	Link / Description
05/22/2014	Hardcopy Map (from Attach Document Tool)	2.35 MB	http://etdmpub.fla-etat.org/est/servlet/blobViewer?blobID=17215 Figure 1- Project Location Map.jpg
05/22/2014	Form SF-424: Application for Federal Assistance	989 KB	http://etdmpub.fla-etat.org/est/servlet/blobViewer?blobID=17214 Federal Aid Application
05/21/2014	Ancillary Project Documentation	142 KB	http://etdmpub.fla-etat.org/est/servlet/blobViewer?blobID=17210 Regional Workplace District
05/21/2014	Ancillary Project Documentation	2.23 MB	http://etdmpub.fla-etat.org/est/servlet/blobViewer?blobID=17209 DRI Locations
05/21/2014	Ancillary Project Documentation	2.35 MB	http://etdmpub.fla-etat.org/est/servlet/blobViewer?blobID=17208 Project Location Map

Degree of Effect Legend

Color Code	Meaning	ETAT	Public Involvement
N/A	Not Applicable / No Involvement	There is no presence of the issue in relationship to the project, or the issue is irrelevant in relationship to the proposed transportation action.	
0	None (after 12/5/2005)	The issue is present, but the project will have no impact on the issue; project has no adverse effect on ETAT resources; permit issuance or consultation involves routine interaction with the agency. The *None* degree of effect is new as of 12/5/2005.	No community opposition to the planned project. No adverse effect on the community.
1	Enhanced	Project has positive effect on the ETAT resource or can reverse a previous adverse effect leading to environmental improvement.	Affected community supports the proposed project. Project has positive effect.
2	Minimal	Project has little adverse effect on ETAT resources. Permit issuance or consultation involves routine interaction with the agency. Low cost options are available to address concerns.	Minimum community opposition to the planned project. Minimum adverse effect on the community.
2	Minimal to None (assigned prior to 12/5/2005)	Project has little adverse effect on ETAT resources. Permit issuance or consultation involves routine interaction with the agency. Low cost options are available to address concerns.	Minimum community opposition to the planned project. Minimum adverse effect on the community.
3	Moderate	Agency resources are affected by the proposed project, but avoidance and minimization options are available and can be addressed during development with a moderated amount of agency involvement and moderate cost impact.	Project has adverse effect on elements of the affected community. Public Involvement is needed to seek alternatives more acceptable to the community. Moderate community interaction will be required during project development.
4	Substantial	The project has substantial adverse effects but ETAT understands the project need and will be able to seek avoidance and minimization or mitigation options during project development. Substantial interaction will be required during project development and permitting.	Project has substantial adverse effects on the community and faces substantial community opposition. Intensive community interaction with focused Public Involvement will be required during project development to address community concerns.
5	Potential Dispute (Planning Screen)	Project may not conform to agency statutory requirements and may not be permitted. Project modification or evaluation of alternatives is required before advancing to the LRTP Programming Screen.	Community strongly opposes the project. Project is not in conformity with local comprehensive plan and has severe negative impact on the affected community.
5	Dispute Resolution (Programming Screen)	Project does not conform to agency statutory requirements and will not be permitted. Dispute resolution is required before the project proceeds to programming.	Community strongly opposes the project. Project is not in conformity with local comprehensive plan and has severe negative impact on the affected community.

	No ETAT Consensus	ETAT members from different agencies assigned a different degree of effect to this project, and the ETDM coordinator has not assigned a summary degree of effect.
	No ETAT Reviews	No ETAT members have reviewed the corresponding issue for this project, and the ETDM coordinator has not assigned a summary degree of effect.

APPENDIX C

WETLAND AND SURFACE WATER PHOTOGRAPHS

FLUCFCS 510

FLUCFCS 510

Centennial FDOT 1915 ★ 2015

Representative Wetland and Surface Water Photos

Project Development and Environment (PD&E) Study

Midway Road (CR712) From Glades Cut Off Road (CR 709) to Selvitz Road (CR 615) St. Lucie County, Florida

Financial Project ID: 231440-3-22-01; ETDM Number: 14177

FLUCFCS 534

FLUCFCS 534

Centennial FDOT 1915 ★ 2015

Representative Wetland and Surface Water Photos

Project Development and Environment (PD&E) Study

Midway Road (CR712) From Glades Cut Off Road (CR 709) to Selvitz Road (CR 615) St. Lucie County, Florida

Financial Project ID: 231440-3-22-01; ETDM Number: 14177

FLUCFCS 619

FLUCFCS 619

Centennial FDOT 1915 ★ 2015

Representative Wetland and Surface Water Photos

Project Development and Environment (PD&E) Study

Midway Road (CR712) From Glades Cut Off Road (CR 709) to Selvitz Road (CR 615) St. Lucie County, Florida

Financial Project ID: 231440-3-22-01; ETDM Number: 14177

FLUCFCS 641

FLUCFCS 641

Centennial FDOT 1915 ★ 2015

Representative Wetland and Surface Water Photos

Project Development and Environment (PD&E) Study

Midway Road (CR712) From Glades Cut Off Road (CR 709) to Selvitz Road (CR 615) St. Lucie County, Florida

Financial Project ID: 231440-3-22-01; ETDM Number: 14177

APPENDIX D
WRAP DATA SHEETS

☐ PROPOSED
☑ EXISTING CONDITIONS

WETLAND RAPID ASSESSMENT PROCEDURE

COUNTY:	PROJECT	DATE	REVIEWER	FLUCCS CODE
St. Lucie	Midway PDE	7/2/2015	Steven Hitt & Oliver Basse	619

APP. #: WETLAND TYPE: ☑ FORESTED ☐ Non-Forested

LAND USE CATEGORY	WETLAND AREA	SECONDARY IMPACTS	MELALEUCA INVASION >50%
619	0.88 ACRES	☑ NO ☐ YES %=	☑ NO ☐ YES
	ACRES OF IMPACT	ACRES	

WILD LIFE UTILIZATION 0.5

WETLAND CANOPY 0.5

WETLAND GROUND COVER 0.5

HABITAT SUPPORT / BUFFER 0.275

BUFFER TYPE	SCORE	% AREA	SUB TOTAL
HV HWY	0.5	5	0.025
HV HWY	0.5	45	0.225
INDUSTRIAL	0	45	0
NUA (exotics)	0.5	5	0.025
			0

FIELD HYDROLOGY 1.5

WATER QUALITY INPUT & TREATMENT 0.4

LAND USE CATEGORY

LAND USE CATEGORY	SCORE	% AREA	SUB TOTAL
HV HWY	0.5	5	0.025
HV HWY	0.5	45	0.225
INDUSTRIAL	0	45	0
NUA (exotics)	0.5	5	0.025
			0
		LU TOTAL	0.275

PRETREATMENT CATEGORY

PRETREATMENT CATEGORY	SCORE	% AREA	SUB TOTAL
Grass Swale	1	5	0.05
Grass Swale	1	45	0.45
No Treatment	0	45	0
NUA (exotics)	0.5	5	0.025
			0
		PT TOTAL	0.525

WRAP SCORE

20.42%

WILDLIFE UTILIZATION

There was no observed wildlife within the wetland. Wildlife utilization is anticipated to be low due to distrurbance and density of exotic vegetation.

WETLAND CANOPY

Vegetation within the wetland is comprised of Brazilian pepper, wax myrtle, cabbage palms, and Carolina willow.

WETLAND GROUND COVER

Vegetation within the wetland is comprised of Brazilian prepper, wax myrtle, cabbage palms, primrose willow, duck potatoe, smartweed and Carolina willow. However, dominated by exotic and nuisance vegetation

HABITAT SUPPORT/BUFFER

The wetland is surrounded by high volume highway (31%), moderately intensive commercial (27%), and natural undeveloped areas (42%).

FIELD HYDROLOGY

Hydrology is intermittent and influence by discharge of stormwater from Midway Road, Glades Cut Off Road, and the FEC Railroad.

WQ INPUT & TREATMENT

Minimal treatment occurs on approximately 50% of the wetland.

☐ PROPOSED
☑ EXISTING CONDITIONS

WETLAND RAPID ASSESSMENT PROCEDURE

COUNTY:	PROJECT	DATE	REVIEWER	FLUCCS CODE
St. Lucie	Midway PDE	7/2/2015	Steven Hitt & Oliver Basse	641

APP. #:

WETLAND TYPE: ☑ FORESTED ☐ Non-Forested

LAND USE CATEGORY	WETLAND AREA		SECONDARY IMPACTS	MELALEUCA INVASION >50%
Freshwater Marsh	1.47	ACRES	☑ NO ☐ YES %=	☑ NO ☐ YES
	0.12	ACRES OF IMPACT	ACRES	

WILD LIFE UTILIZATION 2

WETLAND CANOPY 2

WETLAND GROUND COVER 2

HABITAT SUPPORT / BUFFER 2.9

BUFFER TYPE	SCORE	% AREA	SUB TOTAL
HV HWY	1	5	0.05
NUA	3	95	2.85
			0
			0
			0

FIELD HYDROLOGY 1.5

WATER QUALITY INPUT & TREATMENT 2.925

LAND USE CATEGORY

LAND USE CATEGORY	SCORE	% AREA	SUB TOTAL
HV HWY	1	5	0.05
NUA	3	95	2.85
			0
			0
			0
		LU TOTAL	2.9

PRETREATMENT CATEGORY

PRETREATMENT CATEGORY	SCORE	% AREA	SUB TOTAL
Swale w/dry detention	2	5	0.1
NUA	3	95	2.85
			0
			0
			0
		PT TOTAL	2.95

WRAP SCORE

74.03%

WILDLIFE UTILIZATION

There was no observed wildlife within the wetland; however, the wetland does provide habitat for a variety of species including potential for wading bird foraging.

WETLAND CANOPY

Vegetative community structure appears robust, with minimal influence from adjacent land uses. Vegetation within the wetland comprised of corkwood, rosy camphorweed, spadeleaf, beakrush, St. John's wort, common reed, groundseltree, and wax myrtle.

WETLAND GROUND COVER

Vegetative community structure appears robust, with minimal influence from adjacent land uses. Vegetation within the wetland comprised of corkwood, rosy camphorweed, spadeleaf, beakrush, St. John's wort, common reed, groundseltree, and waxy myrtle.

HABITAT SUPPORT/BUFFER

The wetland is located north of Midway Road and is located within a pine flatwoods upland habitat. Also, within proximity to other freshwater marsh systems to the north and hydrologic connectivity to stormwater drainage system of Midway Road. Some limitatios to widlife utilization due to adjacent land uses such as Jenkins Road to the east, commercial development to the west, and Midway Road to the south.

FIELD HYDROLOGY

Hydrology of the wetland appears consistent with freshwater marsh systems and wetland function appeared normal.

WQ INPUT & TREATMENT

Runoff from Midway Road occurs after treatment; however, the majority of the wetland is surrounded by undeveloped natural areas (natural treatment).

APPENDIX E

SFWMD MEETING MINUTES

FLORIDA DEPARTMENT OF TRANSPORTATION
DISTRICT IV INTERAGENCY MEETING MINUTES

TO: Binod Basnet, Florida Department of Transportation
FROM: Justin Freedman, E Sciences, Incorporated
MEETING DATE: August 20, 2015
LOCATION: South Florida Water Management District (SFWMD)
3301 Gun Club Road, West Palm Beach, Florida
SUBJECT: Florida Department of Transportation (FDOT) Interagency Meeting Minutes

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First meeting started at 9:07 am.

Attendees:

Name	Organization	Email Address
Barbara Conmy	SFWMD	bconmy@sfwmd.gov
Hugo Carter	SFWMD	hcarter@sfwmd.gov
Wilord Metellus	FDOT	wilord.metellus@dot.state.fl.us
Binod Basnet	FDOT	binod.basnet@dot.state.fl.us
James Ford	FDOT	james.ford@dot.state.fl.us
Justin Freedman	E Sciences	jfreedman@esciencesinc.com

District: Four
FPID/FM Number: 434360-1
FDOT Project Manager: James Ford, P.E.
Consultant/Company Name: FDOT/In House
SR/local Name: County Road CR-712A/McCarty Road
Project limits: 250-foot approaches on either end of bridge (Project length approximately 0.12 miles)
General Scope: McCarty Road bridge replacement over Ten Mile Creek Bridge # 940031 located in North St. Lucie River Water Control, District (NSLRWCD). At the project limit, the road will be reconstructed from a single lane county road to two (2) lanes for about 250 feet at each approach of the bridge. The proposed drainage is designed to use 100 feet of French Drain to provide water treatment and attenuation while maintaining the proper discharge into the Creek.
Specific Agenda Items Discussed: See below.
Requested Attendees: Hugo Carter, SFWMD, Barb Conmy, SFWMD

Binod Basnet, Wilord Metellus and James Ford discussed project:

- FDOT recently met with Patrick Holmes of NSLRWCD to confirm FDOT will need permit from the NSLRWCD.
- Total project length is 630 feet (127 feet actual bridge; 250 feet each approach).
- Existing drainage – scuppers on bridge deck, sheet flow into canal.
- Project has two outfalls (one in southwest quadrant, one ±300 feet northeast of project).

- Proposed system will provide better treatment than existing system (in terms of water quality and water discharge quantity).
- Road will shift to east - to compensate for swale capacity reduction, proposing exfiltration trench to the southeast and northeast of the project.
- FDOT conducted “Pre-Post” drainage analysis to confirm stormwater discharges before and after project. Stormwater discharges will be decreased in the “Post” condition.
- Anticipated wetland impacts of 0.038 acres due to rip rap installation along bridge slope.

Hugo Carter and Barb Conmy commented on project:

- Project should be covered under SFWMD General Permit (GP) for FDOT and Municipalities (i.e. for minor bridge alterations, replacement, etc.):
    - Less than 0.5 acres of wetland or surface water impacts
    - Channel clearing and shaping allowed
    - 30 day turn around, $250 fee
- Based on project acreage, project should qualify for the GP.
- Will not need to mitigate for wetland impacts.

Additional comments from Binod Basnet and James Ford:

- When team applies for GP, they will be sure to meet special conditions of GP.
- Team spoke to Randy Turner at USACE, should not need to mitigate for USACE due to less than 0.5 acres of impact.
- Schedule – letting in January 2017; applications submitted within one month of current date.

Meeting ended at 9:18 am.

Second meeting started at 9:20 am

Attendees:

Name	Organization	Email Address
Barbara Conmy	SFWMD	bconmy@sfwmd.gov
Hugo Carter	SFWMD	hcarter@sfwmd.gov
Binod Basnet	FDOT	binod.basnet@dot.state.fl.us
Brady Walker	Kimely Horn	brady.walker@kimley-horn.com
Zack Evans	Inwood Consulting Engineers	zevans@inwoodinc.com
Renato Chuw	Inwood Consulting Engineers	rchuw@inwoodinc.com
Justin Freedman	E Sciences	jfreedman@esciencesinc.com

District: Four
FPID/FM Number: 231440-3-22-01
FDOT Project Manager: Vanita Saini, PE
Consultant/Company Name: Inwood Consulting Engineers, Inc.
SR/local Name: Midway Road/ CR 712
Project limits: Glades Cut Off Road to Selvitz Road
General Scope: Project Development and Environment (PD&E) Study to evaluate the widening of Midway Road/CR 712 from a two-lane rural roadway to a four-lane divided urban roadway between the limits of Glades Cutoff Road to Selvitz Road.
Specific Agenda Items Discussed: See below.
Requested Attendees: Hugo Carter, SFWMD, Barb Conmy, SFWMD

Renato Chuw and Zack Evans discussed project:

- Project is PD&E Study.
- Discussed scope of project noted above.
- Different options:
  - Widen road to south - Canal C-103 would be impacted.
  - Widen road to north - Development to north and wetlands could be impacted.
- Two existing SFWMD permits:
  - First permit (issued 2003) for intersection of Midway Road and Glades Cutoff Road. The County built Pond #2 to handle water from intersection as well as improvements along Midway Road up to 700 feet west of Turnpike.
  - Second permit (issued 2012) for Midway Road widening from Selvitz Road to 25th Street. Original design included additional pond (Pond #1) – handling basin from Turnpike to west of Post Office Road but not included in the issued permit or part of the final construction plans.
- Majority of treatment needed for proposed project will be handled by existing, previously permitted ponds (some portion of proposed project needs additional treatment).
- Existing Ponds #1 and #2/3 are designed to accommodate the widening of Midway Road to six lanes.
  - This study only proposing widening from two to four lanes.
- All discharge collected by C-103 Canal leading to St. Lucie Aquatic Preserve, which is an Outstanding Florida Water (OFW)
  - Existing Pond #1 and #2/3 designed to provide additional 50% water quality.

  - Pond #2 from first permit does not provide additional 50% water quality.
- Attenuation
  - Existing Pond #1 and #2/3 designed to handle 25 year/72-hour year storm event per SFWMD.
  - Pond #2 from first permit designed based on NSLRWCD criteria (10-year/3-day storm, 2 inches per day).
- Question to SFWMD – if design proposed to use extra capacity within Pond #2 to provide the additional necessary treatment for the project, which criteria should be used?
  - Use criteria from 2012 permit?
  - Use new criteria for pre/post analysis?
  - Does project need to meet OFW criteria?
- Second question to SFWMD: Receiving water bodies (Ten Mile Creek and North Fork of St. Lucie River) are impaired for nutrients; should dry pre-treatment areas be provided to address issue of impaired water bodies?
- C-103 Canal used to be maintained by NSLRWCD – now it is managed by St. Lucie County.
- May be some potential impacts to wetlands to north (pond expansion).
- The south widening alternative will look into enclosing portions of the C-103 Canal with a box culvert, similar to the adjacent segment under construction.

Hugo Carter and Barb Conmy commented on project:

- The portion of runoff from the proposed project that will not be treated by the existing ponds should be subject to new “Pre-Post” analysis per SFWMD criteria (i.e. 25-year/72-day storm event). Need to treat for new net impervious area only.
- New treatment will need to meet 150% treatment criteria to address OFW (for new impervious areas only).
- Due to impaired water body analysis, nutrient loading analysis may be needed.
- NSLRWCD – If no control structure downstream from project, then NSLRWCD criteria does not apply (use SFWMD criteria).
- Existing permit called for a box culvert – need to make sure this culvert can handle additional capacity associated with proposed project.
- Potential wetland impacts (associated with pond expansion) will need to be addressed during permit process.
- With box culverts proposed, design will need to allow for air exchange mechanism (i.e. saddle risers).
- Contact Jose Vega for any pre-application field meetings.

Meeting ended at 9:50 am.

APPENDIX 9

Protected Species Report

ENDANGERED SPECIES BIOLOGICAL ASSESSMENT (ESBA)

for

Midway Road (County Road 712)
Project Development and Environment (PD&E) Study
From Glades Cut Off Road to Selvitz Road
St. Lucie County, Florida

Financial Management Number: 231440-3-22-01
ETDM Number: 14177

Prepared for:

Florida Department of Transportation
District IV
3400 West Commercial Boulevard
Fort Lauderdale, Florida 33309

June 2016

ENDANGERED SPECIES BIOLOGICAL ASSESSMENT (ESBA)

for

Midway Road (County Road 712)
Project Development and Environment (PD&E) Study
From Glades Cut Off Road to Selvitz Road
St. Lucie County, Florida

Financial Management Number: 231440-3-22-01
ETDM Number: 14177

Prepared for:

Florida Department of Transportation
District IV
3400 West Commercial Boulevard
Fort Lauderdale, Florida 33309

June 2016

Prepared by:
Kimley-Horn and Associates, Inc.

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EXECUTIVE SUMMARY

This Biological Assessment was prepared in accordance with Section 7(c) of the Endangered Species Act (ESA) of 1973 (ESA, P.L. 93-205) and the Florida Department of Transportation (FDOT) *Project Development and Environment* (PD&E) *Manual*, Part 2, Chapter 27 (revised October 1, 1991). An Endangered Species Biological Assessment (ESBA) was conducted for the proposed widening of Midway Road (CR 712) between Glades Cut Off Road and Selvitz Road in St. Lucie County, Florida. The project was screened through the Efficient Transportation Decision Making (ETDM) Environmental Screening Tool (EST) and the programming screen was published on May 27, 2015 (ETDM #14177 - https://etdmpub.fla-etat.org/est/).

Section 7 of the ESA requires that all federal agencies ensure that any action they authorize, fund or execute will not jeopardize the continued existence of any endangered or threatened species (listed species) or result in the destruction or adverse modification of any critical habitat of such species. The proposed "action" under consideration is the widening of Midway Road (CR 712) from two to four lanes and the construction of stormwater management ponds. Two build alternatives were considered and compared to the No Build Alternative. Alternative 1 (Canal Avoidance) generally widens the road north of the existing while Alternative 2 (Box Culvert) generally widens the road to the south of the existing. Alternative 2 would result in culverting Canal 103 similar to the design currently under construction to the east between Selvitz Road and 25th Street.

Seven federally listed species were evaluated to determine if the proposed project will adversely affect these species. Based on review of available data, in conjunction with field reconnaissance and surveys, the following effects determinations have been made:

Common Name	Effect Determination
Audubon's crested caracara	May affect, not likely to adversely affect
Wood stork	May affect, not likely to adversely affect
Red-cockaded woodpecker	No effect
Everglade snail kite	No effect
Florida scrub jay	No effect
American alligator	No effect
Eastern indigo snake	May affect, not likely to adversely affect
Tiny polygala	No effect

Twenty-two additional state listed species were evaluated and adverse impacts are not anticipated, either because there is no habitat for the species along the corridor or habitat impacts are minimal and mitigation will be provided.

FDOT commits to the following measures to minimize and mitigate potential impacts to listed species:

- Prior to construction an updated caracara nest survey will be performed. Additional coordination will be conducted, if necessary with USFWS. Construction staging will be prohibited within the primary buffer of the caracara nest.
- An updated gopher tortoise survey will be conducted prior to construction. Gopher tortoises will be avoided or if they cannot be avoided, a permit will be obtained for relocation.
- The *Standard Protection Measures for the Eastern Indigo Snake* will be implemented during construction.

1.0 INTRODUCTION

This Biological Assessment was prepared in accordance with Section 7(c) of the Endangered Species Act (ESA) of 1973 (ESA, P.L. 93-205) and the Florida Department of Transportation (FDOT) *Project Development and Environment* (PD&E) *Manual*, Part 2, Chapter 27 (revised October 1, 1991). An Endangered Species Biological Assessment (ESBA) was conducted for the proposed widening of Midway Road (CR 712) between Glades Cut Off Road and Selvitz Road in St. Lucie County, Florida. See ***Location Map - Figure 1***. The project was screened through the Efficient Transportation Decision Making (ETDM) Environmental Screening Tool (EST) and the programming screen was published on May 27, 2015 (ETDM #14177 -https://etdmpub.fla-etat.org/est/).

Section 7 of the ESA requires that all federal agencies ensure that any action they authorize, fund or execute will not jeopardize the continued existence of any endangered or threatened species (listed species) or result in the destruction or adverse modification of any critical habitat of such species. . The proposed "action" under consideration is the widening of Midway Road (CR 712) from two to four lanes and the construction of stormwater management ponds.

2.0 PROJECT DESCRIPTION

The Midway Road (CR 712) project corridor is centrally located in the eastern part of St. Lucie County, Florida, and is owned and maintained by St. Lucie County. The project corridor extends approximately 1.6 miles along Midway Road (CR 712) (Roadway ID 94530000), from Glades Cut Off Road (Mile Post 5.813) (CR 709) to Selvitz Road (Mile Post 7.405) (CR 615). The project ties into the existing 4-lane section to the west of Glades Cut Off Road and to future 4-lane segments from Selvitz Road to just east of US Highway 1. The project corridor is located in unincorporated St. Lucie County but is the northern border to the City of Port St. Lucie (See ***Figure 1***).

Midway Road (CR 712) is a major east-west roadway that provides a vital connection to residents and commuters to and from Interstate 95 (I-95) to the commercial areas along US 1. Within the project limits, Midway Road (CR 712) is a two-lane undivided roadway with a varying posted speed from 35 to 45 miles per hour (mph). It is functionally classified as an Urban Principal Arterial and is designated as a hurricane evacuation route by the Florida Division of Emergency Management. The existing roadway typical section consists of two 12-foot lanes, one in each direction, and the existing right-of-way (R/W) varies with a minimum width of 70 feet. The land uses consist of residential, commercial, government, and industrial facilities, such as Tropicana Products, Inc., CEMEX, Packers of Indian River Ltd., US Post Office, St. Lucie County Sheriff's Office, and New Horizons of the Treasure Coast, Inc.

The study corridor includes a bridge (ID 940050) over Florida's Turnpike (SR 91). The Florida East Coast (FEC) railroad traverses the corridor by running adjacent and parallel to the Glades Cut Off Road. Canal 103, which was previously owned and maintained by the North St. Lucie Water Control District (NSLWCD) but is now owned and maintained by St. Lucie County, is the principal receiving water body for the project area and conveys stormwater from the west side of Florida's Turnpike through an existing concrete box culvert. The canal runs parallel along the south side of Midway Road (CR 712) and, after Selvitz Road, it diverges and continues southeasterly to discharge into the North Fork of the St. Lucie River (NFSLR or North Fork). Canal 103 is currently being culverted from Selvitz to 25th Street as part of St. Lucie County's widening of Midway Road in this segment. The North Fork is designated as an Outstanding Florida Water (OFW) and an Aquatic Preserve. It is the main collector water body in St.

Lucie County and discharges into the Indian River Lagoon. The canal, along with the adjacent vegetative buffer, provides a physical separation to the residential homes on the south side.

The Midway Road/CR 712 PD&E Study from Glades Cut Off Road to Selvitz Road will evaluate alternatives to widen the existing road from two to four lanes within the project limits in order to satisfy future traffic demand and capacity needs. The proposed study will also consider pedestrian, bicycle, and transit facilities and improvements to freight mobility, and it will evaluate operational improvements and access management into some commercial businesses along the project corridor. Additional right-of- way requirements will be evaluated during the PD&E study for offsite ponds in order to meet stormwater management requirements.

2.1 PURPOSE AND NEED

Based on recent traffic data from St. Lucie County, the facility does not adequately handle the existing traffic demand. Without capacity improvements, the traffic operations along the corridor will continue to deteriorate. The primary purpose for this project is to provide additional capacity to meet existing and future traffic needs, improve safety by alleviating existing roadway and capacity deficiencies, and allow opportunities for pedestrian, bicycle, and transit facilities. The additional capacity will also improve freight mobility and enhance emergency evacuation along the project corridor. The purpose and need of this project are further described below and include Transportation Demand, Capacity, Plan Consistency, Social Demands and Economic Development, Modal Interrelationships, and Roadway Deficiencies.

Transportation Demand

The US Census-designated Port St. Lucie-Fort Pierce Metropolitan Statistical Area has been identified as one of the fastest growing metropolitan areas in Florida, which includes all of Martin and St. Lucie counties. From 2000 to 2010, this metropolitan area has experienced population growth from 319,426 persons in 2000 to 424,107 persons in 2010, representing an annual increase of 2.9%. Evaluating the population growth for the City of Port St. Lucie by itself revealed an even greater percentage increase. According to the Bureau of Economic and Business Research, the City has grown from a population of 88,769 in 2000 to 164,603 in 2010, representing an annual increase of 6.4%.

This rapid population growth has resulted in a significant increase in surface transportation demand along major arterials such as the Midway Road (CR 712) corridor. The population of the Port St. Lucie-Fort Pierce metropolitan area is projected to increase from 424,107 persons in year 2010 to 648,600 persons in year 2035, representing a growth of approximately 53% (Bureau of Economic Business Research).

As the population in the metropolitan area continues to increase, the developments in St. Lucie County will continue to push westward. In addition, the county is anticipated to experience traffic growth from the Developments of Regional Impact (DRI). A review of the recent DRI applications in the Treasure Coast Regional Planning Council shows the following statuses for the DRIs in the vicinity of the project corridor:

Completed - Orange Blossom Mall and St. Lucie West

Approved - The Reserve

Pending Notice of Proposed Change - LTC Ranch

Withdrawn - Provences and Orchard Park

The DRI located along Midway Road (CR 712), which is LTC Ranch, would have the greatest impact on the project corridor if constructed. As currently approved, the development includes 4,000 dwelling units of residential, over 1,505,000 square feet (sq. ft.) of office space, 725,000 sq. ft. of retail, and 1,960,200 sq. ft. of industrial space. However, the status of this development is pending Notice of Proposed Change that may result in a change in the size of the approved development.

The approval of the LTC Ranch DRI will further increase the transportation demand resulting in congested conditions along the project corridor. Since Midway Road (CR 712) is one of the vital east-west corridors in St. Lucie County, it is critical to increase capacity to meet the anticipated future transportation demand.

Capacity

Traffic data obtained from the St. Lucie County Transportation Planning Organization (TPO) Traffic Counts and Level of Service Report shows that the 2012 Annual Average Daily Traffic (AADT) along Midway Road (CR 712) west of Selvitz Road is 16,820 vehicles. Evaluating this traffic data using the 2012 FDOT Quality/Level of Service Handbook, the LOS is F which is beyond the St. Lucie County's adopted LOS criteria of E. This traffic data shows that the existing volume is already exceeding the capacity of the corridor which indicates that the roadway is operating in oversaturated and undesirable conditions. Furthermore, due to the industrial properties along the corridor, it has a high truck percentage at over 7% (Florida Traffic Online).

The traffic is anticipated to increase to 29,200 AADT by 2040 and the corridor will continue to operate at LOS F with degraded traffic operation unless the capacity is increased. The future traffic projections are based on the FDOT District Four Design Traffic Technical Memorandum for the I-95 PD&E Study from north of Becker Road to south of SR 70. This project utilized the Greater Treasure Coast Regional Planning Model as the basis for the future traffic projections. Without improvements, the congestion on the Midway Road (CR 712) project corridor will continue to operate at unacceptable driving conditions for residents and commuters due to the increased traffic volumes.

Plan Consistency

Martin and St. Lucie counties have independent Metropolitan Planning Organization/Transportation Planning Organization (MPO/TPO) but share a common Regional Long Range Transportation Plan (RLRTP). The RLRTP establishes a unified strategy for transportation priorities and funding and creates a joint decision-making process regarding regional transportation issues.

The Midway Road (CR 712) project corridor extends from Glades Cut Off Road to Selvitz Road and is identified in the Martin and St. Lucie 2035 RLRTP. The project is identified in the St. Lucie County TPO 2035 Cost Feasible Plan (2016-2035) with a 2021-2025 implementation horizon. In addition, the project will be included in the next update to the State Transportation Improvement Program and the St. Lucie TPO Transportation Improvement Program. It should be noted that on the south side of the project corridor a multipurpose trail has been identified in the 2035 RLRTP in Table 4-9 of the Needs Plan Development.

Social Demands & Economic Development

Evacuation: Serving as part of the evacuation route network established by the Florida Division of Emergency Management, Midway Road (CR 712) plays an important role in facilitating traffic during emergency evacuation periods as it connects other major highways and arterials designated on the state

evacuation route network within the project limits. These facilities include Okeechobee Road (SR 70), I-95, Glades Cut Off Road (CR 709), Selvitz Road, South 25th Street (CR 615), Oleander Avenue (CR 605), and US 1. During a twelve-month period in 2004-2005, St. Lucie County was hit directly by three major hurricanes. Midway Road (CR 712) is one of the county's most critical east-west routes and serves as a vital evacuation route for hurricanes or any other disasters. Additionally, widening Midway Road (CR 712) will ease traffic flow between South 25th Street and I-95, which will minimize a bottleneck effect during an emergency. It would also improve the ability of the local emergency management organization to evacuate large portions of the Treasure Coast in an acceptable timeframe which will enhance the safety of residents.

Economic Development: The Treasure Coast Planning Council Alternative Infill Development Plan developed for Martin and St. Lucie counties has identified several regional workplace districts located along the Midway Road (CR 712) corridor. These regional workplace districts are locations where business and economic development would be focused in order to provide jobs for residents within this metropolitan area. The Midway Road (CR 712) project area is a high-growth area. Important state and federal offices and nonprofit centers are located along Midway Road (CR 712) or nearby streets. This includes the main St. Lucie County Branch of the US Post Office, St. Lucie County Sheriff's Office, St. Lucie County Health Department, St. Lucie County Fire District Office, Hospice of the Treasure Coast, and New Horizons of the Treasure Coast, Inc. (a mental health center which is currently expanding). Significant truck traffic from the nearby St. Lucie County Landfill, CEMEX, Packers of Indian River Ltd., and Tropicana Products, Inc. place additional demands on the roadway. Meanwhile, new residential units are planned nearby. The St. Lucie County Fairgrounds, the County's Emergency Operations Center, is just six miles west of the project site.

According to the Martin and St. Lucie 2035 RLRTP, "The Regional Workplace Districts in St. Lucie County are located along the I-95 and Florida’s Turnpike corridors and include the Treasure Coast Education Research Development Authority (TCERDA) area; the Crossroads Park of Commerce; the existing Rinker and Tropicana facilities along Glades Cut Off Road; the LTC Ranch Commerce Park; St. Lucie West Commerce Park; and Torrey Pines Institute south of Tradition and Gatlin Boulevard. These districts are well-situated for regional access, have ample room to grow, and can provide jobs for local residents." The Midway Road (CR 712) project corridor is anticipated to serve as the main transportation corridor linking residents of both Martin and St. Lucie counties to this business area. Increasing the capacity along the project corridor will improve mobility and support the economic development of these districts as well as stimulate major construction activities that will contribute to economic growth within this area.

Modal Interrelationships

The accessibility to bicyclists and pedestrians along the corridor is minimal with only two sections of sidewalk within the corridor. They are located on the north side of Midway Road (CR 712) from East Torino Boulevard to Glades Cut Off Road and along the frontage of the recently constructed New Horizons medical facility. There are no bicycle lanes. During a recent field review (February 7, 2014), pedestrians were noted walking on the grassed shoulder while pushing a child's stroller. Additionally, the existing bridge over the Florida's Turnpike does not have sufficient shoulder width to accommodate pedestrian or bicycle traffic. A review of the Martin and St. Lucie 2035 RLRTP identified a multipurpose trail in Table 4-9 of the Needs Development Plan that would run along the entirety of Midway Road (CR 712) to connect with the other proposed multipurpose trails located on Okeechobee Road, Shin Road, Glades Cut Off Road, Selvitz Road, and Midway Road to the east.

The 2035 Future Bus and Train Network identified a proposed bus route along the entirety of Midway Road (CR 712) to connect to existing bus routes. Moreover, the County's Transit Development Plan from February 2014 identified Midway Road (CR 712) as a priority corridor to implement transit. The project will create opportunities to include pedestrian, bicycle, and transit facilities along the project corridor.

Roadway Deficiencies

The Midway Road (CR 712) bridge structure (ID 940050) over the Florida's Turnpike is located at Mile Post 6.346 and was constructed in 1957. The last inspection of the bridge was performed on December 19, 2013. Although the report notes no structural deficiencies, the bridge is classified as functionally obsolete.

3.0 ALTERNATIVES CONSIDERED

Three build alternatives, including the Transportation System Management and Operations (TSMO) alternative, were developed and considered during the preliminary engineering phase of this study. The No-Build Alternative, TSMO Alternatives, and Build Alternative 1 (Canal Avoidance) and Build Alternative 2 (Box Culvert) are described below. See ***Appendix A – Typical Sections and Plans***.

No-Build Alternative

No improvements are made to Midway Road (CR 712) within the limits of the study.

Build Alternatives

Transportation System Management and Operations (TSMO) Alternatives

TSMO alternatives involve improvements designed to maximize the utilization and efficiency of the existing facility through improved system and demand management. The various TSMO options generally include traffic signal and intersection improvements, access management, and transit improvements. The additional capacity required to meet the projected traffic volumes along Midway Road (CR 712) in the design year cannot be provided solely through the implementation of TSMO improvements.

Build Alternative 1 (Canal Avoidance)

The typical section includes two, 11-foot travel lanes in each direction separated by a 22-foot median. Seven-foot buffered bike lanes would be provided in each direction located adjacent to the outside travel lanes. Type F curb and gutter is used along the inside and outside lanes and collects stormwater runoff which is then directed to stormwater retention ponds. A six-foot wide sidewalk would be provided on the north side of the roadway, and a 12-foot-wide shared-use path would be provided along the south side of the roadway. The alignment for this alternative would shift to the north to avoid impacts to Canal 103. This typical section requires a minimum of 153 feet of R/W. Since the existing County R/W width varies between 107 feet and 153 feet, from zero feet up to 46 feet of R/W would need to be acquired along the north side of the roadway. The design speed for this typical section would be 45 mph (See ***Appendix A***).

Build Alternative 2 (Box Culvert)

The roadway and pedestrian features of the typical section for this alternative are similar to Alternative 1 except that Canal 103 would be enclosed with a box culvert. The canal is located within R/W owned by both St. Lucie County and the City of Port St. Lucie. This typical section requires a minimum of 160 feet

of R/W. Approximately 25 feet to 32.5 feet of R/W would need to be acquired from the City of Port St. Lucie along the south side of the roadway. Additionally, up to 28 feet of R/W would need to be acquired along the north side of the roadway. The design speed for this typical section would be 45 mph (See ***Appendix A***).

4.0 EXISTING ENVIRONMENTAL CHARACTERISTICS

4.1 EXISTING AND FUTURE LAND USE

4.1.1 Existing Land Use

The project study area includes the existing R/W of Midway Road between Glades Cut Off Road and Selvitz Road (project corridor), as well as an approximately 500-foot buffer area surrounding the project corridor (***Figure 1***). For the purposes of Audubon's crested caracara surveys, this buffer was expanded to 1500 meters from the project study area to identify potential areas of caracara habitat. This is discussed further in *Section 6.0*. Existing land use within the project study area was determined through the interpretation of 1" = 100' scale aerial photography, review of land cover Geographic Information System (GIS) data obtained from the South Florida Water Management District (SFWMD), and field reconnaissance of the project corridor on July 2 and 15, 2015. Existing land use was mapped based on the *Florida Land Use, Cover and Forms Classification System* (FLUCFCS) (FDOT, 1999) for the project area and is depicted in ***Figure 2***.

The project study area that extends south from Midway Road is located within the city limits of the City of Port St. Lucie and the area that extends north of Midway Road is located within unincorporated St. Lucie County. The project study area can be generally characterized by existing roadways, medium and low density residential developments, food processing and industrial facilities (e.g. Tropicana Packers of Indian River, Cemex, etc.), governmental facilities (e.g. U.S. Post Office, St. Lucie County Sherriff's Office, Health Department, and Fire District), medical and health care (e.g. New Horizons of the Treasure Coast and Okeechobee), and wholesale and retail sales and services. Undeveloped land uses include freshwater marshes, improved pastures, and pine flatwoods. Existing roads and highways; however, make up the largest single land use within the project study area. The majority of the natural land uses observed within the project study area are located south of Midway Road within the residential developments or surrounding Jenkins Road, north of Midway Road.

4.1.2 Future Land Use

Future land use was determined based on a review of the St. Lucie County and City of Port St. Lucie Future Land Use (FLU) Maps (***Figure 3***). According to the St. Lucie County FLU map the project study area to the north of Midway Road is primarily Industrial (IND), Residential Suburban (RS), Public Facilities (P/F), Mixed Use (MXD), and Commercial (COM). According to the City of Port St. Lucie FLU map the project study area south of Midway Road is primarily Residential (RL), Open Space Conservation (OSC), Institutional (I), Service Commercial (CS), General Commercial (CG), Open Space-Recreational (OSR).

Within the study area, the Industrial FLU is located along the northwestern portion of the project adjacent to Florida's Turnpike and Glades Cut Off Road, Residential and Open Space Conservation FLU runs along the entire southern portion of the project as well as the northeastern project terminus. Public

Facilities and Mixed Use FLU are centrally located approximately 1200 feet northwest of the Selvitz Road/Midway Road intersection. Commercial FLU is primarily found southwest of the Glades Cut Off Road/Midway Road intersection and north of the Selvitz Road/Midway Road intersection.

4.2 Natural and Biological Features

The assessment of natural and biological features within the corridor included the review of the following data and documents:

- US Department of Agriculture Soil Conservation Service (USDA/SCS) *Soil Survey of St. Lucie County Area, Florida* (1980)
- Aerial photography (2012) obtained from FDOT
- Historical aerial photography from the FDOT Aerial Photo Look-up System (APLUS) and Publication of Archival Library and Museum Materials (PALMM)
- Habitat and species-specific information obtained from the US Fish and Wildlife Service (USFWS), the Florida Fish and Wildlife Conservation Commission (FWC), Florida Fish and Wildlife Research Institute (FWRI), Florida Geographic Data Library (FGDL), the Florida Natural Areas Inventory (FNAI), and St Lucie County.
- The Hydric Soils of Florida Handbook (2007)
- The US Geological Survey (USGS) 7.5-Minute Quadrangle Maps (2703 – Ankona; 2704 – Fort Pierce SW; 2803 – Fort Pierce; 2804 – Fort Pierce NW)
- The USFWS National Wetland Inventory (NWI) maps
- The USGS Groundwater Atlas of the United States
- The Federal Emergency Management Agency's (FEMA) Flood Insurance Rate Maps (FIRM)
- FNAI Biodiversity Matrix for the Midway Road study area included in ***Appendix B***
- Review of books and other technical reports for each of the listed species evaluated in this biological assessment.
- Caracara Survey Results 2015 for FM #436646-1-52-01 SR 9/I95 over Midway Road and SR 9/Interstate 95 over Gatlin Boulevard interchanges, FDOT 2015.
- Review of the ETDM Programming Summary Report (Published May 27, 2015) –ETDM Summary Report comments for Wildlife and Habitat is included in ***Appendix C.***

In addition to the review of databases, reports and other resources, general field reconnaissance of the project study area was performed on July 2, 2015 and July 15, 2015. Based on a review of the caracara report referenced above, updated caracara surveys were conducted for this PD&E from January – April 2016. Details regarding the specific surveys are provided in *Section 5.3*.

4.2.1 Upland Land Cover

Upland communities were observed within the project study area and habitat classifications have been assigned according to the FLUCFCS. The upland communities observed are depicted in ***Figure 2.*** A description of the observed communities, by FLUCFCS type, and calculated total acreages are provided in ***Table 1***.

The upland land cover was approximately 21.9% of the land cover in the study area and includes five (5) undeveloped, natural upland communities: undeveloped land within urban areas (FLUCFCS 191),

improved pastures (FLUCFCS 211), pine flatwoods (FLUCFCS 411), Brazilian pepper (FLUCFCS 422), and hardwood-conifer mixed (FLUCFCS 434).

Pine flatwoods occupied the largest area, approximately 28.8 acres of the vegetated uplands within the study area and the dominant vegetation observed within these areas included slash pine (*Pinus elliottii*), cabbage palm (*Sabal palmetto*), saw palmetto (*Serenoa repens*), wax myrtle (*Myrica cerifera*) and numerous vines (e.g. *Smilax* spp. and *Vitis rotundifolia*). Exotic and nuisance vegetation including Australian pine (*Casuarina equisetifolia*), Brazilian pepper (*Schinus terebinthifolius*), and earleaf acacia (*Acacia auriculiformis*) were also observed within these areas.

The hardwood-conifer mixed land cover occupied approximately 9.9 acres of the study area along the southern banks of Canal 103 between Jenkins Road and Selvitz Road, and southwest of the Florida's Turnpike. Vegetation in these areas was dominated by laurel oak (*Quercus laurifolia*) and slash pine, with water oak (*Q. nigra*), live oak (*Q. virginiana*), cabbage palm, saw palmetto, red maple (*Acer rubrum*), Australian pine, Brazilian pepper, and earleaf acacia as associate species.

The undeveloped land within urban areas land cover occupied approximately 6.0 acres of the project study area and consisted of mowed and maintained bahia grass areas that were primarily located south of Midway Road within the residential developments.

The Brazilian pepper communities consisted of dense monocultures of the invasive tree species with sparse live oak and cabbage palm in the understory. These upland communities were generally located along the Florida East Coast (FEC) railroad corridor within the northwestern portion of the project study area.

The improved pastures land cover occupied approximately 0.25 acres of the project study area and consisted of actively grazed cattle pastures located at the southwest corner of the Midway Road and Glades Cut Off Road intersection (western terminus). Vegetation consisted primarily of bahia grass with isolated patches of slash pine, cabbage palm and Brazilian pepper.

Table 1 - Summary of Upland Land Cover Within the Project Study Area

FLUCFCS Code	FLUCFCS Type	Description	Acres
111	Residential, Low Density - Fixed Single Family Units	This category includes residential fixed single family unit housing, with less than two dwelling units per acre. Includes residences to the north of Midway Road, approximately 800 feet west and immediately east of Selvitz Road.	4.70
121	Residential, Medium Density - Fixed Single Family Units	This category includes residential fixed single family unit housing. Two to five dwelling units per acre. These residences are primarily located south of Midway Road between the FEC railroad and Florida's Turnpike and between Milner Drive and Selvitz Road within the project study area.	36.6
141	Retail Sales and Services	This category is primarily devoted to the sale of products and services. This land cover includes the Mobil gas station at the northeast corner of Midway Road and Selvitz Road.	2.13

Table 1 - Summary of Upland Land Cover Within the Project Study Area			
FLUCFCS Code	**FLUCFCS Type**	**Description**	**Acres**
142	Wholesale Sales and Services	This category is associated with the storage and wholesale distribution of products and materials. This land cover includes All Scape Supply, LLC located approximately 800 feet west of Jenkins Road, north of Midway Road.	3.55
151	Food Processing	This land cover category includes citrus processing plants such as Tropicana and Packers of Indian River located north of Midway Road.	8.72
156	Other Heavy Industrial	This category is associated with ship building and repair, pre-stressed concrete plants, metal fabrication plants, and cement plants such as the CEMEX facility located between Glades Cut Off Road and Florida's Turnpike, north of Midway Road.	18.3
174	Medical and Health Care	This category includes all buildings and grounds that compose medical facilities such as the New Horizons of Treasure Coast and Okeechobee facility.	6.61
175	Governmental	This category includes all buildings and facilities which are identifiable as non-military governmental, such as the St. Lucie County Sheriff's Office and the U.S. Post Office.	13.2
191	Undeveloped Land within urban areas	This category includes undeveloped land within urban areas. Normally does not exhibit any structures or indication of intended use. Includes vacant grass areas immediately surrounding the residential developments south of Midway Road.	6.05
211	Improved Pastures	This category is composed of land which has been cleared, tilled, and reseeded with specific grass types. Land is periodically improved with brush control and fertilizer application. Within project study area, this land cover is located southwest of the intersection of Glades Cut Off Road and Midway Road.	0.25
411	Pine Flatwoods	This category is dominated by either slash pine, longleaf pine, or both. The common understory species include saw palmetto, wax myrtle, gallberry and a wide variety of herbs and brush. This land cover primarily includes areas north and south of Midway Road adjacent to Jenkins Road, and the northwest corner of the Midway Road and Selvitz Road intersection.	28.8
422	Brazilian Pepper	This category includes Brazilian pepper dominated areas located adjacent to the FEC Railroad.	1.45
434	Hardwood - Conifer Mixed	This category is composed of forested areas in which neither upland conifers nor hardwoods have achieved a 66 percent crown canopy dominance. This land cover includes areas located south of Midway Road along Canal 103.	9.93
812	Railroads	This category includes the FEC Railroad.	1.84

Table 1 - Summary of Upland Land Cover Within the Project Study Area			
FLUCFCS Code	**FLUCFCS Type**	**Description**	**Acres**
814	Roads and Highways	This category includes portions of roads and highways such as Midway Road (CR 712), Glades Cut Off Road (CR 709), Florida's Turnpike (SR 91), Selvitz Road, Milner Drive, and Jenkins Road.	54.6
		Grand Total	196.73

Compiled by Kimley-Horn and Associates, Inc. 2015

4.2.2 Soils

Based on a review of the United States Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS) *Soil Survey for St. Lucie County*, there are seven (7) major soil types within the project study area (See soils map ***Figure 4***). In general, the soils found within the project study area are derived from sandy marine sediments, are gently sloping, and are poorly drained. According to the *Hydric Soils of Florida Handbook, Fourth Edition* (Florida Association of Environmental Soil Scientists, 2007), Riviera fine sand, 0 to 2 percent slopes is considered a hydric soil and Wabasso sand, 0 to 2 percent slopes has hydric soil inclusions greater than ten (10) percent. Hydric soils and hydric soil inclusions are one indicator of the presence of wetlands, and the areas where these soils (i.e. Wabasso sand) are mapped correspond to the locations of freshwater marsh wetlands that were observed within the project study area during field reconnaissance. ***Table 2*** includes a summary of the soil types found in the project study area.

Table 2 - Soil Types Mapped Within the Project Study Area								
Soil ID Number	**Soil Name**	**Parent Material**	**Drainage Class**	**Water Storage Capacity**	**Hydraulic Conductivity**	**Depth to Restrictive Feature**	**Water Table Depth**	**Acres**
25	Nettles and Oldsmar sands	Sandy and loamy marine deposits	Poorly drained	Very low	Moderately low to moderately high	31 to 50 inches	6 to 18 inches	80.5
26	**Oldsmar sand, depressional**	**Sandy and loamy marine deposits**	**Very poorly drained**	**Low**	**Moderately low to moderately high**	**> 80 inches**	**0 inches**	**0.10**
31	Pepper and EauGallie sands	Sandy and loamy marine deposits	Poorly drained	Moderate	Moderately low to high	> 80 inches	6 to 18 inches	28.3
38	**Riviera fine sand, 0 to 2 percent slopes**	**Sandy and loamy marine deposits**	**Poorly drained**	**Low**	**Moderately high to high**	**> 80 inches**	**0 to 12 inches**	**2.96**
44	Tantile and Pomona sands	Sandy and loamy marine deposits	Poorly drained	Very low	Moderately low to moderately high	18 to 31 inches	6 to 18 inches	1.39
48	**Wabasso sand, 0 to 2 percent slopes**	**Sandy and loamy marine deposits**	**Poorly drained**	**Very low**	**Moderately low to moderately high**	**9 to 50 inches**	**6 to 18 inches**	**77.1**
50	Waveland and Immokalee fine sands	Sandy marine deposits	Poorly drained	Very low	Moderately low to moderately high	31 to 50 inches	6 to 18 inches	20.8
Bold text denotes hydric soils or soils with hydric inclusions greater than 10% of the soil mapping unit.								

Compiled by Kimley-Horn and Associates, Inc. 2015

4.2.3 Floodplains/Drainage Patterns/ Groundwater

The project study area is located entirely within FEMA flood zone X, areas determined to be outside the 0.2% annual chance floodplain (i.e. 500-year floodplain). See attached FEMA Flood Zone Map (***Figure 5***). A review of available hydrogeological maps and the USGS Ground Water Atlas of the United States indicated that the underlying hydrogeological units in this geomorphic zone of St. Lucie County include the surficial aquifer system and the Floridan aquifer system.

The Surficial Aquifer System (SAS) is typically less than 50 feet in thickness and is comprised of beds of unconsolidated sand, shelly sand, and shell material. In St. Lucie County, the SAS has limestone, sandstone, shell and clay lenses within the unconsolidated quartz sand layers (Lukasiewicz, 1995). Ground water in the Surficial Aquifer system is unconfined and is generally used for domestic, commercial, or small municipal water supplies rather than public consumption. Groundwater within the Surficial Aquifer System in St. Lucie County generally moves in a lateral direction eastward towards areas of lower elevation and the Atlantic Ocean. Additionally, because the surficial aquifer system extends under the Atlantic Ocean, saltwater intrusion can occur in these coastal areas.

The Floridan Aquifer system is a large, productive, artesian aquifer covering approximately 100,000 square miles in southeastern Georgia, southern South Carolina, and all of Florida. It is contained within the underlying limestone formation and is characterized by very high permeability limestone and dolomite formations. The Floridan Aquifer system is divided into upper and lower units. The Upper Floridan is the target aquifer for domestic water wells and is considered the most important aquifer in this region, while much of the Lower Floridan contains saline water and is not a suitable water supply. Regionally, the Upper Floridan Aquifer is approximately 500 feet thick and is separated from the SAS by a thick confining layer called the Hawthorn Group that is comprised of fine sands, silts and clays (Lukasiewicz, 1995). Generally, groundwater flows east-southeast in this portion of St. Lucie. Groundwater is expected to move east towards the NFSLR, which flows from the convergence of Five Mile Creek and Ten Mile Creek, approximately two miles northeast of the project study area, to the south where it drains into the St. Lucie Estuary and eventually into the Atlantic Ocean via the St. Lucie Inlet. Groundwater and surface water movement may also be influenced by localized depressional features such as freshwater marshes and canals such as Canal 103.

4.3 Essential Fish Habitat

Essential fish habitat (EFH) is defined in the Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act) as “those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity.” Federal agencies that permit, fund, or undertake activities that may adversely impact EFH must undertake an EFH consultation with the National Marine Fisheries Service (NMFS). No areas within the project study area were designated as EFH. NMFS indicated during the EDTM that *through hydrological connections, wetlands within the project study area contribute plant material and other useable nutrients (both dissolved and particulate organic matter) into aquatic food webs that include recreationally, commercially, and ecologically important species within downstream estuaries. Based on these considerations it is recommended that best management practices be employed during construction to prevent siltation of downstream estuarine habitats, and that stormwater treatment systems be designed to meet approved criteria to prevent degraded water from entering downstream estuarine habitats, if appropriate. No further EFH consultation is required*.

4.4 Wetlands and Surface Waters

A wetland evaluation was also conducted for the project. A detailed description of the wetlands and surface waters observed within the project corridor and the results of the evaluation are provided in the *Wetland Evaluation Report* prepared for this project. The surface waters within the project area included Canal 103 which extends along the south side of Midway Road, existing ponds, and swales.

There were two wetland community types within the study area: exotic wetland hardwoods (FLUCFCS 619), and freshwater marshes (FLUCFCS 641). The most abundant wetland communities within the study area were freshwater marshes. Vegetation found within the freshwater marshes included corkwood (*Stillingia aquatica*), rosy camphorweed (*Pluchea rosea*), spadeleaf (*Centella asiatica*), duck potato (*Sagittaria lancifolia*), beakrush (*Rhynchospora* spp.), white top sedge (*Rhynchospora colorata*), St. John's wort (*Hypericum fasciculatum*), common reed (*Phragmites australis*), spike rush (*Eleocharis* spp.) broomsedge (*Andropogon* spp.), groundseltree (*Baccharis halimifolia*), and wax myrtle. These communities were located along the east shoulder of Florida's Turnpike, north of Midway Road to the east and west of Jenkins Road, and south of Midway Road approximately 0.25 mile west of Selvitz Road.

The exotic wetland hardwoods (FLUCFCS 619) wetland community type within the project study area occupied approximately 2.0 acres of the study area. Vegetation primarily consisted of Brazilian pepper, Carolina willow (*Salix caroliniana*), primrose willow (*Ludwigia peruviana*), earleaf acacia, pickerel weed (*Pontederia cordata*), duck potato, groundseltree, shield fern (*Dryopteris ludoviciana*), and white top sedge. The exotic wetland hardwoods were located in three areas within the project study area, including a depressional area between the FEC railroad and Glades Cut Off Road and within the drainage swales that run along the west side of Florida's Turnpike, and south of Midway Road and a small depressional area south of Midway Road.

A summary of the wetlands and surface waters within the project area is provided in ***Table 3***. ***Figure 6*** shows the wetlands ands and surface waters.

Table 3 – Summary of Wetlands and Surface Waters within Project Study Area

Wetland Number	FLUCFCS Description	FLUCFCS Code	Size (acres)
SW1 (Canal 103)	Streams and Waterways	510	3.86
SW2	Reservoirs less than 10 acres	534	0.23
SW3	Streams and Waterways	510	0.12
SW4	Streams and Waterways	510	0.87
SW5	Reservoirs less than 10 acres	534	0.53
SW6	Reservoirs less than 10 acres	534	0.30
SW7	Reservoirs less than 10 acres	534	1.89
SW8	Streams and Waterways	510	0.06
SW9	Reservoirs less than 10 acres	534	1.35
SW10	Reservoirs less than 10 acres	534	0.73
SW11	Streams and Waterways	510	0.09
SW12	Reservoirs less than 10 acres	534	1.04
SW13	Streams and Waterways	510	0.09

Table 3 – Summary of Wetlands and Surface Waters within Project Study Area			
Wetland Number	**FLUCFCS Description**	**FLUCFCS Code**	**Size (acres)**
WL1	Exotic Wetland Hardwoods	619	0.88
WL2	Exotic Wetland Hardwoods	619	0.41
WL3	Exotic Wetland Hardwoods	619	0.40
WL4	Freshwater Marshes	641	0.20
WL5	Freshwater Marshes	641	1.25
WL6	Freshwater Marshes	641	1.47
WL7	Exotic Wetland Hardwoods	619	0.30
WL8	Freshwater Marshes	641	0.19
		Total Acres	**16.26**

5.0 Methodology

5.1 Data Collection

Information on the potential occurrence of federal and state listed species within the project corridor was qualitatively assessed based on a review of available literature, database review, and on site reconnaissance that was conducted along the corridor on July 2, 2015 and July 15, 2015 and January – April 2016 (caracara surveys). Survey methods are described in Section 5.3. Literature reviews were conducted and data was collected from numerous regulatory agencies including the USFWS, NRCS, Florida Department of Agriculture and Consumer Services (FDA), Florida Fish and Wildlife Conservation Commission (FWC), Florida Fish and Wildlife Research Institute (FWRI), FWC's Eagle Nest Locator Database (https://public.myfwc.com/FWRI/EagleNests/nestlocator.aspx, accessed 06/18/2015), FWC's Waterbird Colony Locator (http://atoll.floridamarine.org/WaterBirds/, accessed 06/18/2015), and the South Florida Water Management District (SFWMD). The biodiversity matrix was also obtained from the Florida Natural Areas Inventory (FNAI) and GIS data were obtained from the aforementioned agencies, FNAI, and the Florida Geographic Data Library (FGDL).

Based on a review of this data, the project corridor is located within the Core Foraging Areas of three active wood stork nesting colonies (*Sewall's Point MC2-Bird Island, Cypress Creek Bluefield Road, North Fork St. Lucie River*) and the USFWS designated Consultation Areas for the Audubon's crested caracara (caracara) (*Polyborus plancus audubonii*), red-cockaded woodpecker (RCW) (*Picoides borealis*), Florida scrub-jay (scrub-jay) (*Aphelocoma coerulescens*), Everglade snail kite (*Rostrhamus sociabilis plumbeus*), and Florida grasshopper sparrow (*Ammodramus savannarum floridanus*) The project study area is not located within the USFWS Critical Habitat for any species.

FNAI reports no documented or historic occurrences of state or federal listed species in the project area. FWC reports one bald eagle nest, SL 006, approximately 1.73 miles from the beginning of the project (Glades Cut Off Road and Midway Road). This nest is located in a preserve area north of the Walmart Distribution Center. According to FWC, it was last surveyed in 2012 and was active at that time.

ETDM comments from USFWS and FWC are summarized below:

> FWC stated that several species occur or may occur within the project area including, gopher frog, gopher tortoise, American alligator, Eastern indigo snake, Florida pine snake, Audubon's crested caracara, Florida burrowing owl, Southeastern American kestrel, Florida sandhill crane, least tern, wood stork, limpkin, little blue heron, tricolored heron, roseate spoonbill, snowy egret, white ibis, and Sherman's fox squirrel. Additionally, the project area is within U.S. Fish and Wildlife Service Consultation Areas for Audubon's crested caracara, Florida grasshopper sparrow, red-cockaded Woodpecker, Florida scrub-jay, and snail kite, and is within the core foraging area of four wood stork colonies [Note: Based on the GIS review of wood stork CFAs and the USFWS comments (see below) the project is within only three CFAs]. Primary wildlife issues associated with this project include: potential adverse effects to a moderate number of species listed by the Federal Endangered Species Act as Endangered or Threatened, or by the State of Florida as Threatened or Species of Special Concern; potential water quality degradation as a result of additional stormwater runoff from the expanded roadway surface draining into adjacent waterways and wetlands; and potential for increased wildlife roadkill. Based on the project information provided, FWC believes that direct and indirect effects of this project could be minimal, provided that all roadway construction is confined to the existing ROW, any new DRAs are not constructed within areas of natural habitat, and degradation of adjacent or downstream water quality is avoided via inclusion of Best Management Practices in the project design.
>
> USFWS stated that federally listed species that occur on or adjacent to study area are: wood stork, Florida scrub-jay, Audubon's crested caracara, and eastern indigo snake. Surveys should be conducted for Florida scrub-jay and Audubon's crested caracara to determine extent of wildlife use, especially nesting habitat. The project corridor is located within the Core Foraging Areas (CFA) (within 18.6 miles) of three active nesting colonies of the endangered wood stork. Wetlands are also located within the project area and appropriate mitigation should be provided. This mitigation could suffice for impacts to the CFA of the wood stork. For projects that impact 5 or more acres[1] of wood stork foraging habitat, USFWS requires a functional assessment be conducted using the "Wood Stork Foraging Analysis Methodology" on the foraging habitat to be impacted and the foraging habitat provided as mitigation.

5.2 Listed Species

Pursuant to Section 7(c) of the Endangered Species Act of 1973, the project corridor was evaluated for the potential occurrence of federal listed threatened and endangered species and species classified by federal agencies as candidates for listing. In addition, state species were evaluated and are discussed as part of this assessment. The likelihood of species occurrences considered for the study area were determined based on several factors including whether the species were positively identified by project biologists during field surveys, suitable habitat was observed or is known to occur, species life history, and local knowledge. Based on the data and literature review and subsequent field reconnaissance, state and federally listed species that may occur in the project area are identified in ***Table 4***.

[1] The project does not have more than 5 acres of impact to wood stork foraging habitat. Foraging analysis not required.

Table 4 – Potential Federal and State Listed Species				
Scientific Name	**Common Name**	**Federal Status**	**State Status**	**Likelihood of Occurrence**
Mammals				
Sciurus niger shermani	Sherman's Fox Squirrel	N	SSC	High
Birds				
*Polyborus plancus audubonii**	Audubon's Crested Caracara	T	T	High
*Mycteria americana**	Wood Stork	E	E	High
Picoides borealis	Red-cockaded Woodpecker	E	E	Low
Rostrhamus sociabilis plumbeus	Everglade Snail Kite	E	E	Low
Aphelocoma coerulescens	Florida Scrub Jay	T	T	Low
Haliaeetus leucocephalus[1]	Bald Eagle	N	N	High
Athene cunicularia floridana	Florida Burrowing Owl	N	SSC	Low
Sternula antillarum	Least Tern	N	T	None
Aramus guarauna	Limpkin	N	SSC	None
Egretta caerulea	Little Blue Heron	N	SSC	Moderate
Egretta tricolor	Tricolored Heron	N	SSC	Moderate
*Grus canadensis pratensis**	Florida Sandhill Crane	N	T	High
Platalea ajaja	Roseate spoonbill	N	SSC	Low
Egretta thula	Snowy Egret	N	SSC	Low
*Eudocimus albus**	White Ibis	N	SSC	Moderate
*Falco sparverius paulus**	Southeastern American Kestrel	N	T	Moderate
Reptiles				
*Alligator mississippiensis**	American Alligator	T(S/A)	T(S/A)	High
Drymarchon corais couperi	Eastern Indigo Snake	T	T	Moderate
*Gopherus polyphemus**	Gopher Tortoise	C	T	High
Pituophis melanoleucus mugitus	Florida Pine Snake	N	SSC	Low
Amphibians				
Rana capito	Gopher frog	N	SSC	Moderate
Plants				
Coelorachis tuberculosa	Piedmont Jointgrass	N	T	Low
Conradina grandiflora	Large-flowered Rosemary	N	T	Low
Glandularia maritima	Coastal Vervain	N	E	Low

Table 4 – Potential Federal and State Listed Species				
Scientific Name	**Common Name**	**Federal Status**	**State Status**	**Likelihood of Occurrence**
Lechea cernua	Nodding Pinweed	N	T	Low
Linum carteri var. smallii	Small's Flax	N	E	Low
Nemastylis floridana	Celestial Lily	N	E	Low
Polygala smallii	Tiny Polygala	E	E	Low
Pteroglossaspis ecristata	Giant Orchid	N	T	Low

E = Endangered T = Threatened T(S/A) = Listed Threatened due to similarity of appearance SSC = Species of Special Concern
N = Not Listed *Observed or reported within the project corridor.
[1] The Bald Eagle is no longer listed, but is protected under the Bald and Golden Eagle Protection Act, Migratory Bird Treaty Act, and FWC's bald eagle rule (F.A.C. 68A-16.002).

5.3 Field Survey Methods

General corridor surveys were conducted in July 2015. These surveys were conducted to identify potential habitat for listed species and to determine listed species habitat utilization within the existing and proposed R/W, where accessible. The field surveys for wildlife and listed species consisted of observations from a slow-moving vehicle along the road shoulder in areas where the R/W was entirely cleared. In areas where the R/W was forested or contained shrubby vegetation, random, meandering pedestrian transects were conducted. Evidence of federal or state listed species habitat utilization included tracks, scats, calls, distinctive soil or vegetation disturbances, burrows, nests, and direct observations.

Based on initial database review, species specific surveys were conducted for gopher tortoises. Gopher tortoise burrows were field located with a hand-held global positioning system (GPS). Per the Florida Fish and Wildlife Conservation Commission gopher tortoise permitting regulations, approximately 15% of the suitable gopher tortoise habitat within the project corridor was surveyed, and included the open, mowed road shoulders and accessible areas within the Midway Road (CR 712) R/W. See ***Figure 7*** for the location of listed species noted during the field surveys.

An updated caracara survey was also conducted but was expanded from the previous survey to include suitable habitat north of Midway Road east and west of Selvitz. A copy of the survey locations is included in ***Appendix D*** along with a detailed summary report of the caracara surveys.

Non-listed species observed within the project corridor included mockingbird (*Mimus polyglottos*), great egret (*Ardea alba*), warblers, squirrels (*Sciurus carolinensis*), glossy ibis (*Plegadis falcinellus*), laughing gull (*Leucophaeus atricilla*), black (*Coragyps atratus*) and turkey vultures (*Cathartes aura)*, red-shouldered hawk (*Buteo lineatus*), red-tailed hawk (*Buteo jamaicensis*), great blue heron (*Ardea Herodias*), wild turkey (*Meleagris gallopavo*), American kestrel (*Falco sparverius*), eastern meadowlark (*Sturnella magna*), American robin (*Turdus migratorius*), osprey (*Pandion haliaetus*), belted kingfisher (*Megaceryle alcyon*), red-bellied woodpeckers (*Melanerpes carolinus*), and various duck species. The results of all plant and animal surveys are summarized in *Section 6.2*.

6.0 Habitat Impacts

6.1 Roadway and Pond Impacts

Impacts to the natural communities present along the project corridor are anticipated to be minimal because the majority of the improvements will occur within the existing R/W. Additionally, much of the uplands along the corridor have been impacted by past and present agricultural activities as well as residential, commercial and industrial development. A summary of the proposed impacts within the project study area are presented in ***Table 5***.

Table 5 – Habitat Impacts (acres)

FLUCFCS Code	FLUCFCS Type	Alternative 1	Alternative 2	Ponds
411	Pine Flatwoods	1.40	1.52	2.96
422	Brazilian Pepper	0.10	0.18	-
434	Hardwood – Conifer Mixed	0.74	4.56	1.92
510	Streams and Waterways	1.14	3.53	-
534	Reservoirs less than 10 acres	0.01	-	-
619	Exotic Wetland Hardwoods	0.07	0.06	-
641	Freshwater Marshes	0.29	0.01	-
Total		**3.75**	**9.86**	**4.88**

Note: Wetland impacts (FLUCFCS 619 and 641) include both direct and secondary impacts. Several pond alternatives are being considered for each drainage basin and there are existing ponds which can accommodate some of the storm water runoff. Thus, the impacts from ponds could be less during final design.

6.2 Listed Species Survey Results and Effects

Provided below is a discussion of the listed species that may occur within the project area and the potential impacts to these species resulting from project implementation. The descriptions of the species and their habitat requirements were excerpted from multiple resources. Listings of the resources used in these descriptions are provided in *Section 9.0* of this report.

6.2.1 Federally Listed Fauna Species

Audubon's crested caracara

Caracara is listed as threatened by both the USFWS and the FWC. Caracaras are long legged birds with a black crown or crest, red facial skin, white and black banded tail with a wide, dark terminal band and have black and white barring at the base of the primaries. Immature caracaras are similar in appearance but duller in color. Caracaras prefer open land including pastures and dry prairie with cabbage palm and/or live oak hammocks and shallow ponds or sloughs. Nesting occurs within cabbage palm trees or live oaks, if cabbage palms are not present. Two to three eggs are laid in late winter and typically a pair will maintain the same territory for several years. They feed on reptiles, birds, mammals and carrion. Loss of habitat from improved pastures and citrus has contributed to the species decline. A detailed summary of the caracara surveys conducted for this project is included in ***Appendix D***. FDOT conducted

a survey in 2015 as part of potential interchange improvements at the Midway Road and Gatlin Boulevard interchanges with I-95. This survey documented a nest north of Midway Road adjacent to I-95. This nest location was used as a starting point for the 2016 survey, but an additional observation point was added north of Midway Road along Selvitz Road as habitat was observed and the area was within the secondary buffer (1500 meters).

The 2016 survey results showed that the previously identified nest (2015) has moved approximately 190 meters northeast. No other nests were identified. The primary buffer (300 meters) lies outside the project area. The secondary (1500 meters) buffer overlaps the western end of the project area at Glades Cut Off Road. However, there is no new construction at the intersection with Glades Cut Off Road. The proposed widening ends east of Glades Cut Off, so construction would consist of "tie in" to the existing four lanes. The FDOT commits to the following during construction to minimize impacts to the caracara:

- Construction staging will be prohibited within the primary buffer.
- Prior to construction an updated caracara nest survey will be performed. Additional coordination will be conducted, if necessary with USFWS.

Based on the lack of construction in the primary or secondary buffers and the implementation of the commitments listed above, FDOT has determined that the project m*ay affect, but is not likely to adversely affect* the Audubon's crested caracara.

Wood Stork

The wood stork is listed as threatened by both the USFWS and the FWC. Wood storks are typically found in marshes, cypress swamps, and mangrove swamps, but their presence in artificial ponds, seasonally flooded roadside or agricultural ditches, and managed impoundments has become common. Wood stork breeding areas extend from South Florida through Georgia and along the coastal areas of South Carolina. Large, colonial nesting areas are typically established in swamps or islands surrounded by broad, open water areas. The same colony site may be used over many years, provided the site remains undisturbed and sufficient foraging habitat is available, and wood storks are known to nest with other wading bird species, including white ibis, tricolored herons, snowy egrets, and great blue herons. Foraging habitat consists of nearly any calm, shallow water area (between 10 and 25 centimeters) or wetland depression that concentrates fish and is not overgrown with dense, aquatic vegetation. Some examples of foraging sites include freshwater marshes, stocked ponds, shallow ditches, narrow tidal creeks, shallow tidal pools, and depressional areas of cypress heads and swamp sloughs provide foraging habitat. The project area is located within the 18.6 mile core foraging area of three active wood stork nesting colonies. A copy of the USFWS's *Florida Wood Stork Colonies Core Foraging Areas Map* is included in ***Appendix E***.

Potential wood stork foraging habitat (e.g. mixed wetland hardwoods, gum swamps, saltmarshes, stream and lake swamps, and streams and waterways) occurs within the project corridor. Direct and secondary impacts to wetlands that could be used for foraging range from 0.36 acres (Alternative 1) to 0.07 acres (Alternative 2). Direct impacts to surface waters that could be utilized for foraging range from 0.01 acres (Alternative 1) to 0 acres (Alternative 2). Although Alternative 2 would result in filling of Canal 103, this canal consists of steep banks and exotic and nuisance vegetation (Brazilian pepper, earleaf acacia, and Australian pine) overgrowing the banks. Water levels in this canal are generally high, thus, precluding foraging by wood storks. Wood storks were observed west of the project in wet swales and drainage areas. Wetland impacts will be avoided and minimized to the extent practical and compensatory mitigation will be provided at Bluefield Ranch mitigation bank, a USFWS approved mitigation bank.

Based on these considerations, and in accordance with *The Corps Of Engineers, Jacksonville District, U. S. Fish And Wildlife Service, Jacksonville Ecological Services Field Office And State Of Florida Effect Determination Key For The Wood Stork In Central And North Peninsular Florida*, the project *may affect, but is not likely to adversely affect* wood storks.

Red-cockaded Woodpecker

RCW is listed as endangered by USFWS and FWC due to habitat fragmentation and poor management of appropriate habitat, which includes, longleaf pine flatwoods, and mixed longleaf and slash pine. These woodpeckers are highly specialized in their habitat requirements and typically prefer mature, old-growth long leaf pine ecosystems with relatively open understories over dense pine/hardwood forest communities (Red-cockaded woodpecker recovery, http://www.fws.gov/rcwrecovery/rcw.html). These habitats are preferred because the pines often suffer from a fungus called red heart disease that softens the heartwood and allows for cavity excavation. The RCW is the only North American woodpecker to excavate roost and nest cavities in living pine trees.

RCW were not observed during field reconnaissance. Potential RCW habitat observed within the Midway Road (CR 712) R/W including upland coniferous forests, pine flatwoods, upland hardwood forests, and mixed hardwood-coniferous forest do not meet the USFWS habitat suitability definition "…a pine or pine/hardwood stand of forest, woodland, or savannah in which 50 percent or more of the dominant trees are pines and the dominant pine trees are generally 60 years in age or older" (Red-cockaded Woodpecker South Florida Survey Protocol [adapted from Service 2003]). Although the project area is located within the USFWS Consultation Area for RCW, because no suitable habitat or RCW individuals were observed within the project area, and the proposed roadway improvements are located primarily within existing cleared R/W, the project will have *no effect* the red-cockaded woodpecker.

Everglades Snail Kite

The Everglades snail kite is listed as endangered by both the USFWS and the FWC. This medium-sized raptor is dark slate gray to black with a white tail and a long, hooked bill. Snail kites inhabit large, open, freshwater marshes and lakes from the St. Johns River headwaters south. They prefer relatively shallow water (less than 4 feet) and a low density of emergent vegetation. Their primary food source is the apple snail which they catch at the water's surface. Snail kites usually nest over the water in a low tree or shrub. Although the project is located within the USFWS Consultation Area for the Everglades snail kite, the project area is not located within critical habitat and no snail kites or their habitat were observed in the project area. Thus, the project will have *no effect* on the Everglades snail kite.

Florida Scrub Jay

The Florida scrub-jay (scrub-jay) is a federal and state listed threatened species. The scrub-jay prefers low growing oak scrub habitats, including sand pine and scrubby flatwoods. Optimal habitat includes scrub oak with most of the oaks and other shrubs limited to 1-4 meters in height, interspersed with numerous small patches of bare sand. Fire is a frequent natural event in scrub habitats and serves to maintain the habitat. Fire suppression and development of the habitat has made this species vulnerable to extinction.

Scrub-jays are similar in size and shape to its relative, the blue jay, but they differ strikingly in color pattern. The scrub-jays are subtly marked as opposed to the blue jay. They have a pale blue head, nape, wings and tail and are pale gray on the back and belly. A white eyebrow blends with a frosted white forehead. The throat and upper breast are faintly striped and bordered by pale blue, forming a distinct

bib. The scrub-jay is relatively sedentary and rarely sustains a flight of more than a kilometer. The Florida scrub jay is a non-migratory species and is endemic to Florida.

The project area is within the USFWS Consultation Area for the scrub-jay, but there is no scrub-jay habitat in the project area or immediate vicinity. As such, there project will have *no effect* on the Florida scrub-jay.

American Alligator

The American alligator is listed as endangered by the USFWS and FWC due to its similarity of appearance to more endangered crocodilians. The range of the American alligator extends from east Texas and southeast Oklahoma, throughout Florida and east to North Carolina. Alligators typically inhabit freshwater lakes, wetlands and slow moving rivers, but are sometimes found in brackish water habitats. Juvenile alligators primarily consume insects, amphibians, small fish, and other invertebrates. Adult alligators eat rough fish, snakes, turtles, small mammals, and birds.

There is habitat for the American alligator within open water areas including existing ponds and Canal 103. However, the project area is outside the known range of the American crocodile. As such, it is anticipated that this project will have *no effect* on this species.

Eastern Indigo Snake

The eastern indigo snake is listed as threatened by both the USFWS and the FWC due to a decline in population caused by habitat loss or degradation. The eastern indigo snake occurs in a range of habitats, including pine flatwoods, scrubby flatwoods, high pine, dry prairie, tropical hardwood hammocks, edges of freshwater marshes, agricultural fields, coastal dunes, and human-altered habitats. Eastern indigo snakes in the northern Florida region are typically found in in strong association with gopher tortoises, but are also known to use the burrows of armadillos, cotton rats, and land crabs (in coastal areas). These snakes require large tracts of land for survival and are typically restricted to xeric habitats on pine-oak sandhills. Indigo snakes forage in hydric habitats, often along wetland ecotones. Gopher tortoise burrows provide EIS with shelter from cold winter temperatures and relief from desiccation (Multi-Species Recovery Plan for South Florida, FWS).

According to USFWS and FNAI data, potential habitat for the eastern indigo snake may be present within the project corridor. No specific surveys were conducted for indigo snakes during this PD&E study and no individuals were observed during surveys for other species and/or during wetlands evaluations. However one potentially active gopher tortoise burrows, was documented during field reconnaissance. The burrow is located on the south side of Midway Road and immediately west of Milner Drive adjacent to upland hardwood forest and hardwood-coniferous mixed forest habitats that may provide habitat for this species. Due to the presence of potential habitat within the study area, there is a moderate likelihood for the species to occur within the project corridor. The *Standard Protection Measures for the Eastern Indigo Snake* will be implemented during construction. Based on the *North and South Florida Ecological Services Field offices Programmatic Concurrence for the Eastern Indigo Snake Key*, the project *may affect, but is not likely to adversely affect* the eastern indigo snake. A copy of these standard measures are included in ***Appendix E***.

Other Federally Protected Species

Bald Eagle

As of 2008, the bald eagle is no longer listed by the USFWS or FWC as endangered or threatened. Bald eagles are still protected under the Bald and Golden Eagle Protection Act, Migratory Bird Treaty Act, and FWC's bald eagle rule (F.A.C. 68A-16.002). Potential habitat for bald eagles (e.g. tall pine trees,) occurs throughout the project study area, and commonly includes areas in proximity to bays, rivers, lakes, or other bodies of water that provide concentrated prey availability. Eagles usually nest in tall trees (mostly live pines) that provide clear views of the surrounding area.

As mentioned in Section 5.1, eagle nest SL006 is located approximately 1.73 miles northwest of the intersection of Florida's Turnpike (US 91) and Midway Road (CR 712). The data also report that the nest was last surveyed in 2012 and was documented as being active. Bald eagles are frequently observed feeding over the St. Lucie landfill and were observed in the pasture west of the project corridor during the surveys conducted for the caracara. No additional nests were observed during field surveys conducted for this PD&E study. Based on the USFWS *National Bald Eagle Management Guidelines* and the FWC *Bald Eagle Management Plan*, construction activities proposed at least 660 feet from an eagle nest do not require an Eagle Permit from the FWC/USFWS. Based on these guidelines, and the nest location as reported by FWC, potential impacts to bald eagles and/or their nests will not occur. Thus, *adverse effects* on bald eagles are not anticipated.

State Listed Fauna Species

Sherman's Fox Squirrel

The Sherman's fox squirrel is one of ten subspecies of the eastern fox squirrel, is 1 of 4 subspecies occurring in Florida and is the largest in size. This large tree squirrel (measuring 600 to 700 mm/ 23 to 28 inches in length) has a highly variable dorsal fur color ranging from all black to silver with variations of black over silver and silver over black. The underside is tan and the head is generally black with varying amounts of white on the rostrum and ears. Preferred habitat is mature, open, fire-maintained longleaf pine and turkey oak sandhills and pine flatwoods. To accommodate the large home range and seasonally fluctuating food sources, they also inhabit lower slopes of sandhills. They can be found in mixed hardwood pine, mature pine forests, cypress domes, pastures, the ecotone between bayheads and pine flatwood and other open lands with pines and oaks. Fox squirrels usually nest in turkey oak trees but also use longleaf pine, live oak, post oak, laurel oak and slash pine, though slash pine are used less frequently. They rely on a variety of oak trees for seasonal food as well as longleaf pine cones and seeds. There is no habitat within the existing R/W for this species. There is marginal habitat (pine flatwoods) adjacent to the corridor and west of the corridor (pastures), but these areas are small and fragmented by development. Furthermore, there is no management of these areas. Sherman's fox squirrels or nests were not observed in the project corridor area. Thus, the project is not expected to have adverse effects on this species.

Gopher Frog

The gopher frog is a member of the true frog family (Ranidae) and is listed by FWC as a species of special concern, primarily due to habitat destruction. It is a medium-sized, boldly spotted frog with a chunky appearance. The body is short and plump and the head is large with somewhat rounded snout. The legs are relatively short. The back has a somewhat warty appearance and a prominent, often bronze-

colored longitudinal ridge on each side behind the eye. A pattern of irregularly shaped dark spots on a background that may be cream, gray, or brown is visible on the back. The chin and throat are spotted and the belly is usually unmarked posteriorly. Adults are approximately 2.5 to 4 inches excluding the legs. The call resembles a deep snore. In Florida, gopher frogs occur in a variety of habitats including sandhills, upland pine forests, scrub, xeric hammock, mesic and scrubby flatwoods, dry prairie, mixed hardwood-pine communities, pastures and other disturbed habitats that have gopher tortoise burrows. This species appears to be closely associated with gopher tortoise burrows, but will use other burrows including pocket gophers, small mammal burrows, crayfish burrows, stump holes, hollow logs etc. Breeding sites include wetlands that are shallow, fishless and temporary or semi-permanent in nature. Breeding has been documented in depression marshes, basin marshes, wet prairies, dome swamps, upland sandhill lakes, sinkhole ponds, ditches and borrow pits. No suitable habitat or individuals were observed within the project area. Thus, the project is not expected to have adverse effects on this species.

Gopher Tortoise

The gopher tortoise is listed as threatened by FWC and is a candidate species for listing with the USFWS. The gopher tortoise ranges throughout the southeastern U.S. and occurs in suitable habitat in all Florida counties. The gopher tortoise excavates extensive underground burrows and spends the majority of its life in these burrows. Gopher tortoise habitat generally has the following characteristics: well drained, sandy soils; abundant groundcover; relatively open canopy and sparse shrub cover.

These habitat characteristics occur in a variety of Florida's native upland communities, including scrub communities, coastal strand and pine flatwoods. Development pressures on many of the upland communities in Florida have been increasing. As a result, more disturbed habitats, such as fence rows, old fields, range lands, and canal banks have become important to gopher tortoises. Gopher tortoise burrows are important shelter for a variety of other species including the Eastern indigo snake, gopher frog and Florida mouse.

Potential gopher tortoise habitat (e.g. upland hardwood and mixed hardwood-coniferous forest communities) exists along portions of the project area and one potentially active burrow was observed within the project R/W west of Milner Road and south of Midway Road (CR 712) (***Figure 7***). Because there is potential gopher tortoise habitat and burrows were documented, FWC gopher tortoise permitting guidelines will be implemented and pre-construction surveys within suitable habitat will be conducted. Following surveys, a relocation permit will be required by the FWC for any burrows being impacted by the proposed alignment. Because gopher tortoise burrows will be avoided or gopher tortoises will be relocated, it is anticipated that this project will have no adverse effects on this species.

Florida Pine Snake

The Florida pine snake is listed by FWC as a species of special concern and is found throughout the state, excluding the Florida Keys, the Everglades, extreme southwest Florida, and immediately north of Lake Okeechobee. This snake requires dry sandy soils for burrowing. It is found most often in open, pine-turkey oak woodlands and abandoned fields, and also in scrub, sandhills, and longleaf pine forest. Florida pine snakes spend most of their time underground in pocket gopher or gopher tortoise burrows. Threats include collection for pets (now restricted); highway mortality, habitat loss and fragmentation from development, intensive agriculture and mining.

The Florida pine snake is a large, stocky, tan or rusty colored snake with an indistinct pattern of large blotches on a lighter background. The body is muscular, with keeled scales. The head is relatively small

and the snout is somewhat pointed with four prefrontal scales; the rostral scale extends upward between the internasal scales. Adults grow to 4 - 7 feet or longer.

No Florida pine snakes were observed during surveys of the corridor and there are no historic occurrences noted in FNAI. The proposed impacts to upland mixed coniferous hardwoods and pine flatwoods habitats ranges from approximately 2.14 acres (Alternative 1) to 6 acres (Alternative 2) and potentially 4.9 acres for ponds. Direct impacts to the habitat of the Florida pine snake will be minimized to the greatest practicable extent. Based on these considerations, it is anticipated that the project will have no adverse impacts to this species.

Burrowing Owl

The Florida burrowing owl is listed as a species of special concern by the FWC. This small, ground-dwelling owl is boldly spotted and barred with brown and white. This is one of Florida's smallest owls, averaging nine inches in height. The burrowing owl lacks ear tufts, has bright yellow eyes and white chin. Long legs provide additional height for better view from the typical ground-level perch. This species occurs throughout the state though its distribution is local and spotty. Habitat includes open, native prairies and cleared areas that provide short ground cover such as pastures, agricultural fields, golf courses, airports and vacant lots in residential areas. They often dig their own burrow and line the entrance with decorative materials prior to laying eggs at the bottom of the burrow. The nest in single breeding pairs or in loose colonies with two or more families. They are active both day and night and are often seen in the day standing erect at the burrow mouth or on a nearby post. When agitated, they bob their heads and make a chattering or clucking call. They use their burrows year around – roosting during winter and raising young during breeding season (February – July). There is no habitat in the study area, though there is marginal habitat west of the study area (pastures). However, neither burrowing owls nor their burrows, were observed within the study area. Thus, the project will have no effect on this species.

Least tern

The least tern is listed as threatened by the FWC and is listed as endangered by the USFWS in Midwest and Great Plains states. Least tern is the smallest North American tern. Breeding adults are light gray above with white or grayish breast and underparts. They also have a black cap and nape, a white forehead, and a black line that runs from their crown through the eye to base of bill. Their bill is yellow-orange in color and is often tipped in black (non-breeding adults). The tail is short and deeply forked, the legs and feet are yellowish-orange, and the outer primaries have dark edges that are easily observed in flight. Juveniles have a dark bill and black eye-line and are mottled above with more dark on upper wing. Least tern habitat consists of coastal areas throughout Florida, including beaches, lagoons, bays, and estuaries. This species often nests on gravel rooftops and other artificial nest sites such as spoil islands, dredged material deposits, construction sites, causeways, and mining lands. Nesting areas have a substrate of well-drained sand or gravel and usually have little vegetation. Suitable nesting habitat does not occur within the project area and any potential nesting habitat is located more than 8 miles from the project area. Thus, the project will have no effect on this species.

Limpkin

The limpkin is listed by FWC as a species of special concern. This species is a marsh bird known for its characteristic limping gate. They are a medium sized bird (56 to 74 cm; 22 to 29 in) in length. Plumage is dark brown with white spotting and streaking. Males and females are indistinguishable. They have long legs and neck and a heavy, yellowish bill slightly curved downward. Suitable habitat for foraging,

resting, and breeding include freshwater sloughs and marshes, wooded swamps, springs and spring runs, edges of rivers and ponds, low-salinity estuarine wetlands and human-created impoundments and canals. Their primary food source is the apple snail and suitable foraging habitat will contain a healthy population of this food source. Other food sources include insects, frogs, lizards, crustaceans and mussels. No limpkins or apple snails were observed in the project area and habitat is minimal (freshwater marshes). Also, due to the suburban nature of the project area, there is a low likelihood of this species being present in the corridor. Thus, the project will have no effect on this species.

Little Blue Heron, Snowy Egret, Tricolored Heron and White Ibis

Little blue heron, snowy egret, tricolored heron, and white ibis are listed by the FWC as species of special concern. These birds are opportunistic feeders and travel to find areas where conditions are suitable and food is abundant. They feed in shallow freshwater, brackish, and saltwater habitats. The largest nesting colonies occur in coastal areas, but these species prefer foraging in freshwater lakes, marshes, swamps, and streams. These birds nest in a variety of woody vegetation types, including cypress, willow, maple, black mangrove, and cabbage palm. They usually breed in mixed-species colonies in flooded vegetation or on islands. For snowy egrets, a wide variety of wetland types must be available within 5 - 7 miles to support breeding colonies. The breeding success of snowy egrets and tricolored herons is tied to water-level fluctuations. White ibis adults prefer foraging in freshwater areas when feeding young. Based on a review of the FWC water bird locator and field reconnaissance there is no nesting habitat or known nesting colonies in the project area or in the immediate vicinity. White ibis were observed foraging in the pastures west of the project area and it is anticipated that all of these species could forage from time to time within the wet swales and freshwater marshes along the corridor. Direct and secondary impacts to wetlands range from 0.36 (Alternative 1) to 0.07 (Alternative 2). The direct impacts to surface waters that could be utilized for foraging range from 0.01 acres (Alternative 1) to 0 acres (Alternative 2). Though Alternative 2 would result in filling of Canal 103, this canal consists of steep banks and exotic and nuisance vegetation (Brazilian pepper, earleaf acacia, and Australian pine) overgrowing the banks. Water levels in this canal are generally high, thus, precluding foraging most of the time for these species. As such, adverse impacts to these species are not anticipated.

Florida Sandhill Crane

The Florida sandhill crane is listed as threatened by the FWC. This is a tall grey bird with a red forehead, and long neck and legs. The Florida sandhill crane is non-migratory and inhabits open grasslands, freshwater marshes, swampy edges of lakes and ponds, river banks, prairies, pasture lands and occasionally pine savanna throughout the state. Florida sandhill cranes typically start nesting on the margins of marshes and wet grasslands in late December and continue into June. The nests, which are built by both adults, generally consist of sticks, reeds, grasses and mosses. Sandhill cranes are omnivorous and have been known to feed on seeds, grains, berries, insects, earthworms, mice, small birds, snakes, lizards, frogs, and crayfish.

Sandhill crane nests were not observed in the freshwater marshes located in the project area. There is foraging habitat (pastures) west of the project area and sandhill cranes were observed foraging on multiple occasions during the caracara surveys (See ***Figure 7*** – Listed Species Observations Map). The project will not impact wetlands with nesting cranes or the pastures west of the project. Thus, the project will have no adverse effect on the sandhill crane.

Roseate Spoonbill

The roseate spoonbill is a state listed species of special concern by FWC. Adult roseate spoonbills have bright pink bodies, contrasting white necks, and flat, spoon-like bills. Immature birds are whitish, acquiring the pink coloration as they mature. Roseate spoonbills are the only spoonbill native to the Western Hemisphere and the only pink bird that breeds in Florida. Their primary nesting sites include coastal mangrove islands or in Brazilian pepper on man-made dredge spoil islands near suitable foraging habitat. Roseate spoonbills typically forage in shallow water of variable salinity, including marine tidal flats and ponds, coastal marshes, mangrove-dominated inlets and pools, and freshwater sloughs and marshes. They have also been observed foraging in stormwater ponds and canals when water levels are low.

Most of the known breeding sites occur within federally owned national parks and wildlife refuges and National Audubon Society sanctuaries. Nests are found in Florida from Tampa Bay on the Gulf coast and Brevard County on the Atlantic coast, south to northern Florida Bay. There are no known nesting colonies for this species in St. Lucie County and no spoonbills were observed during field reconnaissance. It is possible that spoonbills could occasionally forage within the wetlands and surface waters within the project corridor, but the habitat is marginal. The impacts to wetlands and surface waters are minimal. Thus, adverse impacts to this species are not anticipated.

Southeastern American Kestrel

The southeastern American kestrel is listed as threatened by the FWC as a result of natural nesting and foraging habitat declines. The SE American kestrel is 1 of 17 subspecies of the American kestrel and is the only non-migratory, permanent resident in Florida; however, the northern subspecies (*F.s. sparverius*) occurs in Florida as a migrant and winter visitor. The male kestrel has blue-gray wings, while the female is larger and has a more uniformly rufous back and wings. Both sexes have a mustached black-and white facial pattern with strong perpendicular lines extending below the eye and ear, and a black band at the base of the rufous tail. The alarm call is highly distinguishable and given frequently in flight.

The kestrel's range is limited by nest and perch site availability, foraging habitat and food supply all in close proximity to one another. Kestrels utilize a wide variety of habitats. Type I Habitat is defined as upland plant communities (e.g. grassland and pasture) with less than 10% canopy cover and with at least 60% herbaceous ground cover less than 25 cm in height (Stys, 1993). Type II habitat is described as open woodland communities with greater than 10% but less than 25% woody canopy cover and with at least 60% herbaceous ground cover less than 25 cm in height (Stys, 1993). Kestrels are secondary cavity nesters using abandoned woodpecker cavities. Kestrels nest in open pine habitats, woodland edges, prairies, and pastures throughout much of Florida. Nest sites are located in tall dead trees or utility poles generally with an unobstructed view of surroundings. Sandhill habitats seem to be preferred, but kestrels have been observed in flatwoods. Open patches of grass or bare ground are necessary for kestrels to effectively utilize flatwoods, since thick palmettos may prevent detection of prey.

An American kestrel was observed on multiple occasions at observation station 4 during the caracara surveys (approximately 1 mile north of Midway Road, west of Selvitz Road) (See ***Figure 7*** – Listed Species Observations Map). Because the caracara surveys were conducted during the period when the northern migrants are present, it is not possible to positively determine if this observation was the SE American kestrel. However, surveys conducted along the corridor in June 2015, revealed no SE American kestrels or potential nest cavities. Thus, adverse impacts to this species are not anticipated.

Listed Plant Species

A review of the online FNAI database, indicates that one federally listed plant species and seven state-listed plant species have the potential to occur within the project area.

Tiny Polygala

The Tiny polygala is listed as endangered by the FWC and USFWS. This species is relatively short-lived (germinating and dying within one year) species grows to a height of approximately 4 inches tall, has one to four unbranched stems, and a fragrant tap root. The plant is also characterized by 2 inch long, lance-shaped leaves that extend radially from the base. Flowers are greenish-yellow in color, small and numerous, forming a crowded head at the top of the stem, with two (2) wing-like sepals, three (3) small sepals, and petals fused into a keel with a projecting fringe.

The St. Lucie County population occurs on a scrubby flatwoods knoll in Hobe Sand soils. Site elevation is 2.0 to 3.0 m and gently slopes to a mesic flatwoods and marsh area. Canopy trees include sand pine, slash pine, and scrub live oak. Habitat is not present along the corridor for this species. Thus, the project will have *no effect* on this species.

Small's Flax

Small's flax is listed as endangered by FWC. This annual herb reaches a height of 4-24 inches, with smooth, narrowly wing-angled stems. Leaves are up to 1.2 inches long, very narrow, alternate, and do not have red glands at the base of the leaf, like Carter's flax. Small's flax has a 5 petal, yellow-orange flower, typically 0.5 inches wide. Habitat includes pine rocklands, pine flatwoods, and adjacent disturbed areas. Habitat for small's flax does not occur within the study area and no individuals were observed during field reconnaissance. Therefore, the proposed project will have no effect on this species.

Coastal Vervain

Coastal vervain is listed as endangered by FWC. This short-lived, purple, perennial flower reaches 1.5-2 feet in height and 1-1.5 feet in width. Flowers are lavender with and orange throat, and leaves are irregularly lobed and toothed. Coastal vervain inhabits back dunes, dune swales, and coastal hammocks; it is also known to occur in disturbed, sandy areas. Habitat is not present for this species in the project area. Therefore, the proposed project will have no effect on this species.

Nodding Pinweed

Nodding pinweed is listed as threatened by FWC. This perennial herb has slender, erect, flowering stems, rising from a dense mat of spreading. Leaves are short (>0.4 inches), narrowly oval and alternating, with pointed tips, disappearing by flowering time. Nodding pinweed flowers in tight clusters at the ends of short branches, with 3 tiny, purple or green petals. The entire plan is covered with spreading, gray hairs and has a tiny, hard capsule fruit. Habitat includes scrub and scrubby flatwoods. Habitat is not present for this species in the project area. Therefore, the proposed project will have no effect on this species.

Piedmont Jointgrass

Piedmont jointgrass is listed as threatened by FWC. Piedmont jointgrass is a tall, tufted, perennial grass. This particular jointgrass has 3 spikelets (1.3-2 mm wide); first glume with scattered small or no transverse ridges. Habitat includes flatwoods, swamps, savannas, ponds, right-of-ways, and ditches.

Preliminary field reconnaissance did not yield positive identification of piedmont jointgrass and habitat is minimal in the study area. Therefore, the proposed project will have no effect on this species.

Large-flowered Rosemary

The large-flowered rosemary is listed as threatened by FWC. This long-lived perennial shrub reaches a height of 3-4 feet and a width of 1-2 feet, with purple to lavender flowers. Native habitat for large-flowered rosemary includes scrub and coastal strand; it has also been known to inhibit disturbed areas. Large-flowered rosemary flowers year-round (blue) and can therefore be surveyed at any time. Habitat is not present for this species in the project area. Therefore, the proposed project will have no effect on this species.

Celestial Lily

The Celestial Lily is listed as endangered by FWC. This perennial herb has a single bulb emanating from a single, tall stem that can reach two feet in height. The flowers are 1.5 inches across and have six dark blue spreading petals. Additionally, celestial lily flowers open at 4 pm and close by dusk. This species is found in wet flatwoods, prairies, marshes, and cabbage palm hammock edges primarily in the St. John's River drainage. The best survey season is from August to October from 4 pm to dusk. Habitat is not present for this species in the project area. Therefore, the proposed project will have no effect on this species.

Indirect and Cumulative Impacts

Indirect Effects

Indirect effects "are caused by the action and are later in time or farther removed in distance, but are still reasonably foreseeable." (Council on Environmental Quality (CEQ) 1986, 40 Code of Federal Regulations (CFR) 1508.8). There are two types of indirect effects evaluated under National Environmental Protection Act (NEPA): induced growth effects and encroachment/alteration effects. Induced growth effects are related to changes in patterns of land use, population density or growth rate and their effects on natural systems. Encroachment/alteration effects can be characterized as either ecological or socioeconomic effects. Types of ecological encroachment/alteration effects include habitat fragmentation, degradation of habitat from pollution, water quality degradation from stormwater runoff or roadway spills, changes in hydrology, exotic/invasive species range expansion and disruption of natural processes. Types of socioeconomic encroachment/alteration effects include alteration of: neighborhood cohesion and stability, travel patterns of commuters and shoppers, personal safety, and aesthetic impacts.

The proposed project includes widening of an existing roadway within a primarily developed corridor. So many of the edge effects and fragmentation of habitat have already occurred as a result of the existing development. However, widening the road will further impact wildlife movement that would potentially attempt to cross the road(s). For the wetlands, where a partial impact occurs, there can be a secondary impact to the remaining wetlands as described above. Alternative 2 minimizes this secondary effect as the wetland impacts to the freshwater marshes north of Midway Road are impacted less. There is a greater impact to the surface waters though with Alternative 2 because the canal would be filled. But the Canal is currently being filled and replaced with a culvert further east as part of the County's widening of Midway Road from 25th Street to Selvitz. Thus, it is anticipated that there would already be some indirect effect associated with these impacts to the east.

From a water quality perspective, there is limited stormwater facilities for Midway Road. The project includes a curb and gutter section where stormwater will be conveyed, piped and discharged to stormwater management ponds. Several ponds have been evaluated in each basin and the ponds have been located and designed to avoid direct and secondary impacts to wetlands. As part of previous improvements by St. Lucie County east of the project, ponds have been constructed and sized to accommodate portions of this project. These ponds have been designed to meet Outstanding Florida Water (OFW) criteria (50% additional water quality treatment) because the project ultimately discharges to the NFSLR (OFW and aquatic preserve south of Midway Road). For this project, new impervious areas must also meet OFW criteria. The County ponds for the project to the east also provided dry detention to address nutrient impairment. Based on a meeting with SFWMD on August 20, 2015 nutrient analysis may be needed on this project. This will be evaluated more during design and permitting. Thus, an indirect benefit for the project is enhanced water quality treatment for the existing and future impervious road areas. Finally, mitigation will be provided for the secondary effects pursuant to SFWMD and USACE requirements.

The western end of the lies within the secondary buffer of one caracara nest (See Appendix D – *Audubon's Crested Caracara Survey Report – Figure 2*). Secondary impacts associated with roadway projects could include increased threat of motor vehicle collisions and disturbance during construction that could affect result in abandonment of the nest or affect nesting behavior. As discussed in *Section 6.2.1,* this portion of the project study area is already 4-laned. The extent of construction would be "tie in" to the existing construction. Minimization measures discussed in *Section 6.2.1* and in *7.0* will be implemented to minimize the potential indirect effects.

Cumulative Effects

Cumulative effects on the environment result from the incremental impact of the action (direct and indirect effects) when added to other past, present, and reasonably foreseeable future actions by others. In general, road construction has the potential to impact wetlands during construction and by changing future land use patterns. Direct impacts remove wetlands from the landscape, thus removing all wetland function associated with it. Indirect wetland impacts vary greatly and depend generally on adjacent land condition. Cumulative effects are the degree of potential impact that are largely dependent upon the size of the road corridor (wide roads having more influence than relatively narrow roads), the relative position of the road corridor within the landscape, and the relative condition of the wetlands being traversed (new roads in an undeveloped landscape vs. widening an existing road in a developed landscape).

Given the built out nature of the project corridor, minimal native habitats, including wetlands, the proposed improvements will not result in adverse cumulative effects.

7.0 Avoidance, Minimization and Mitigation

Avoidance and minimization of impacts have been considered for the project. However, complete avoidance of surface waters, wetlands and native uplands is not possible with a build alternative because there are a number of linear drainage features that parallel or cross the project area and wetlands that extend into the R/W and existing cleared R/W is not sufficient to accommodate the 4-lane road. Alternative 2 minimizes impacts to wetlands, but has a greater impact on surface waters as the alignment is shifted south and includes culverting the Canal 103. As discussed below in *Section 10.0*, SFWMD commented during a pre-application meeting that for the canal alternative the design will need to allow for air exchange (e.g. saddle risers). Alternative 1 impacts the most wetland and includes impacts to WL

06 which has an existing conservation easement. If impacted, the easement would have to be released and additional compensation may be required. Stormwater management ponds have been cited to avoid impacts to wetlands and where applicable provide buffers between the pond limits and adjacent wetlands. Furthermore, there are existing ponds that have additional capacity for Midway Road drainage and will be utilized where possible to avoid additional clearing and grading of native habitats.

From a species perspective, there is a potential effect though not adverse for the wood stork, Audubon's crested caracara and the Eastern indigo snake. Wetland impacts have been minimized and mitigation will be provided in Bluefield Mitigation Bank, a USFWS approved mitigation bank. For the caracara, construction will be timed outside nesting season for the western end of the project (e.g. the tie in to the existing 4-lane at Glades Cut Off Road) and a staging areas will be prohibited in the primary and secondary buffer areas. The *Standard Protection Measures for the Eastern Indigo Snake* will be implemented during construction

8.0 Conclusions and Commitments

Seven federally listed species were evaluated to determine if the proposed project will adversely affect these species. Based on review of available data, in conjunction with field reconnaissance and surveys, the following effects determinations have been made:

Common Name	Effect Determination
Audubon's crested caracara	May affect, not likely to adversely affect
Wood stork	May affect, not likely to adversely affect
Red-cockaded woodpecker	No effect
Everglade snail kite	No effect
Florida scrub jay	No effect
American alligator	No effect
Eastern indigo snake	May affect, not likely to adversely affect
Tiny polygala	No effect

Twenty-two additional state listed species were evaluated and adverse impacts are not anticipated either because there is no habitat for the species along the corridor or habitat impacts are minimal and mitigation will be provided.

FDOT commits to the following measures to minimize and mitigate potential impacts to listed species:

- Prior to construction an updated caracara nest survey will be performed. Additional coordination will be conducted, if necessary with USFWS. Construction staging will be prohibited within the primary buffer of the caracara nest.

- An updated gopher tortoise survey will be conducted prior to construction. Gopher tortoises will be avoided or if they cannot be avoided, a permit will be obtained for relocation.
- The *Standard Protection Measures for the Eastern Indigo Snake* will be implemented during construction.

9.0 References

Chafin, L. *Field Guide to the Rare Plants of Florida*. 2000. Florida Natural Areas Inventory, Tallahassee.

Florida Association of Environmental Soil Scientists. *Hydric Soils of Florida Handbook*. 2007.

Florida Fish and Wildlife Conservation Commission. Florida black bear management plan: *Ursus americanus floridanus*. June, 2012.

Florida Fish and Wildlife Conservation Commission. Selected GIS Layers. Office of Environmental Services Habitat Protection Planning Section. 2002.

Florida Fish and Wildlife Conservation Commission Water Bird Locator @ http://atoll.floridamarine.org/waterbirds/, accessed 10-02-15.

Florida Fish and Wildlife Conservation Commission. Eagle Nest Locator Database @ https://public.myfwc.com/FWRI/EagleNests/nestlocator.aspx, accessed 10-02-15.

Florida Fish and Wildlife Conservation Commission. Bald Eagle Management Plan: *Haliaeetus leucocephalus.* April 2008.

Florida Fish and Wildlife Conservation Commission. *Florida's Endangered Species, Threatened Species, and Species of Special Concern*. November 2007.

Florida Fish and Wildlife Conservation Commission. *A Species Action Plan for the Sherman's Fox Squirrel (Scuirus niger shermani)*. Final Draft, November 1, 2013.

Florida Fish and Wildlife Conservation Commission. *A Species Action Plan for the Southeastern American Kestrel (Falco sparverius paulus)*. Final Draft, November 1, 2013.

Florida Fish and Wildlife Conservation Commission. *A Species Action Plan for the Limpkin (Aramus guarauna)*. Final Draft, November 1, 2013.

Florida Fish and Wildlife Conservation Commission. *A Species Action Plan for the Gopher Frog (Lithobates capito)*. Final Draft, November 1, 2013.

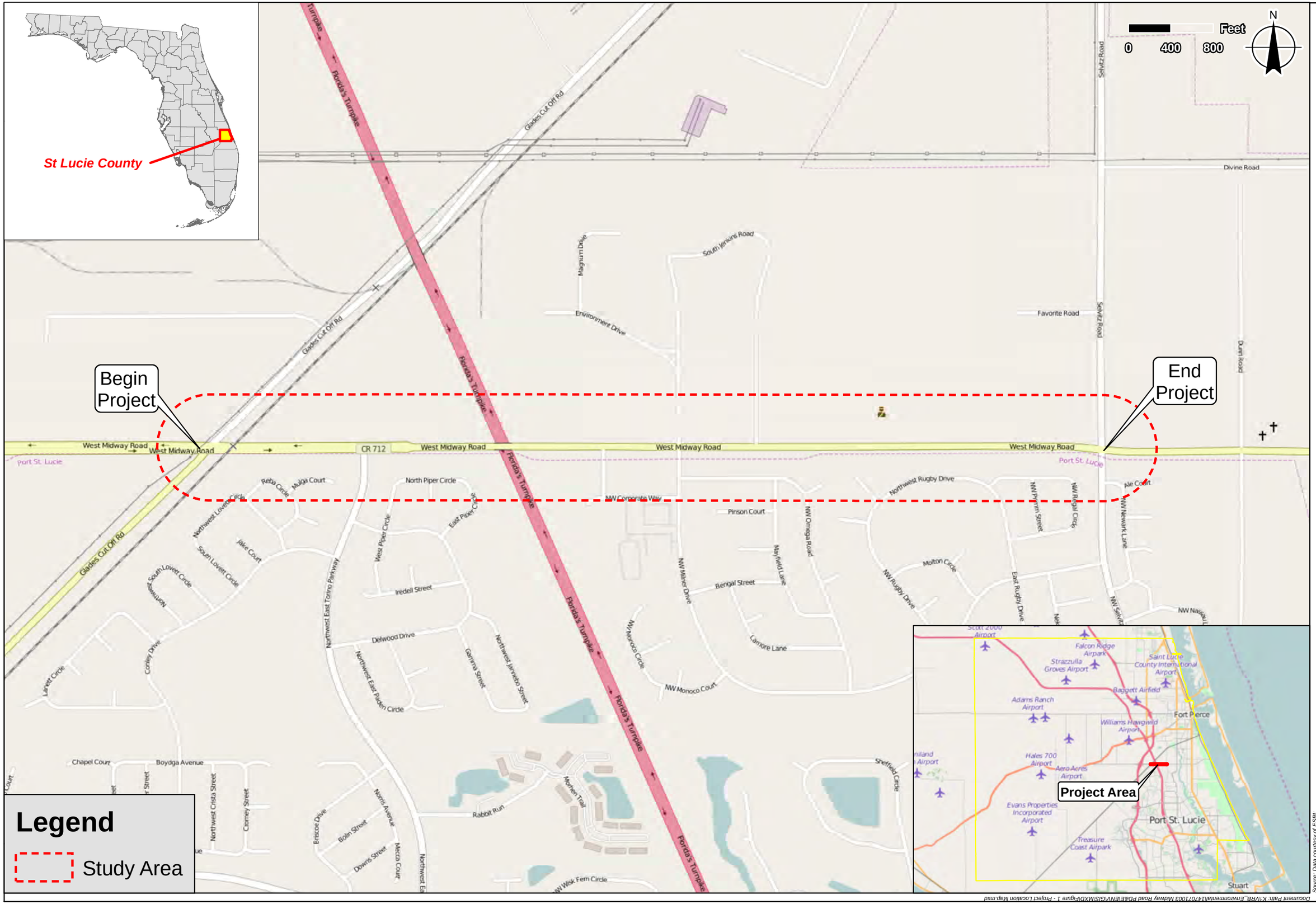
U.S. Department of Agriculture, Soil Conservation Service. *Soil Survey of St. Lucie County*, Florida. 2007.

U.S. Fish and Wildlife Service. 2002. Standard Local Operating Procedures for Endangered Species: Wood Storks.

U.S. Fish and Wildlife Service. 1987. *Habitat Management Guidelines for the Bald Eagle in the Southeast Region.* U.S. Fish and Wildlife Service. Atlanta, GA. 41pp+79pp.

U.S. Fish and Wildlife Service and National Marine Fisheries Service, Endangered Species Consultation Handbook, March 1998.

FIGURE 1
PROJECT LOCATION MAP



Source: Data courtesy of ESRI.

Document Path: K:\VRB_Environmental\14707\003 Midway Road PD&E\ENV\GIS\MXD\Figure 1 - Project Location Map.mxd

FDOT

Project Location Map

Project Development and Environment (PD&E) Study - Midway Road (CR712)
From Glades Cut Off Road (CR 709) to Selvitz Road (CR 615)
St. Lucie County, Florida
Financial Project ID: 231440-3-22-01; ETDM Number: 14177

1 inch = 800 feet

MAY 2016

FIGURE 1

FIGURE 2
FLORIDA LAND USE, COVER AND FORMS CLASSIFICATION SYSTEM MAP

Legend

- Study Area
- 111: Low Density Residential - Fixed Single Family Units
- 121: Medium Density Residential - Fixed Single Family Units
- 141: Retail Sales and Services
- 142: Wholesale Sales and Services
- 151: Food Processing
- 156: Other Heavy Industrial
- 174: Medical and Health Care
- 175: Governmental
- 191: Undeveloped Land within urban areas
- 211: Improved Pastures
- 411: Pine Flatwoods
- 422: Brazilian Pepper
- 434: Hardwood - Conifer Mixed
- 510: Streams and Waterways
- 534: Reservoirs less than 10 acres
- 619: Exotic Wetland Hardwoods
- 619: Exotic wetland hardwoods
- 641: Freshwater Marshes
- 812: Railroads
- 814: Roads and Highways

Source Aerials courtesy of FDOT (2012). FLUCFCS data courtesy of Kimley-Horn (2015).

Document Path: K:\IVR_Environmental\14707103 Midway Road PD&E\ENV\GIS\MXD\Figure 2 - FLUCFCS Map_v2.mxd

FDOT

Florida Land Use, Cover and Forms Classification System (FLUCFCS) Map

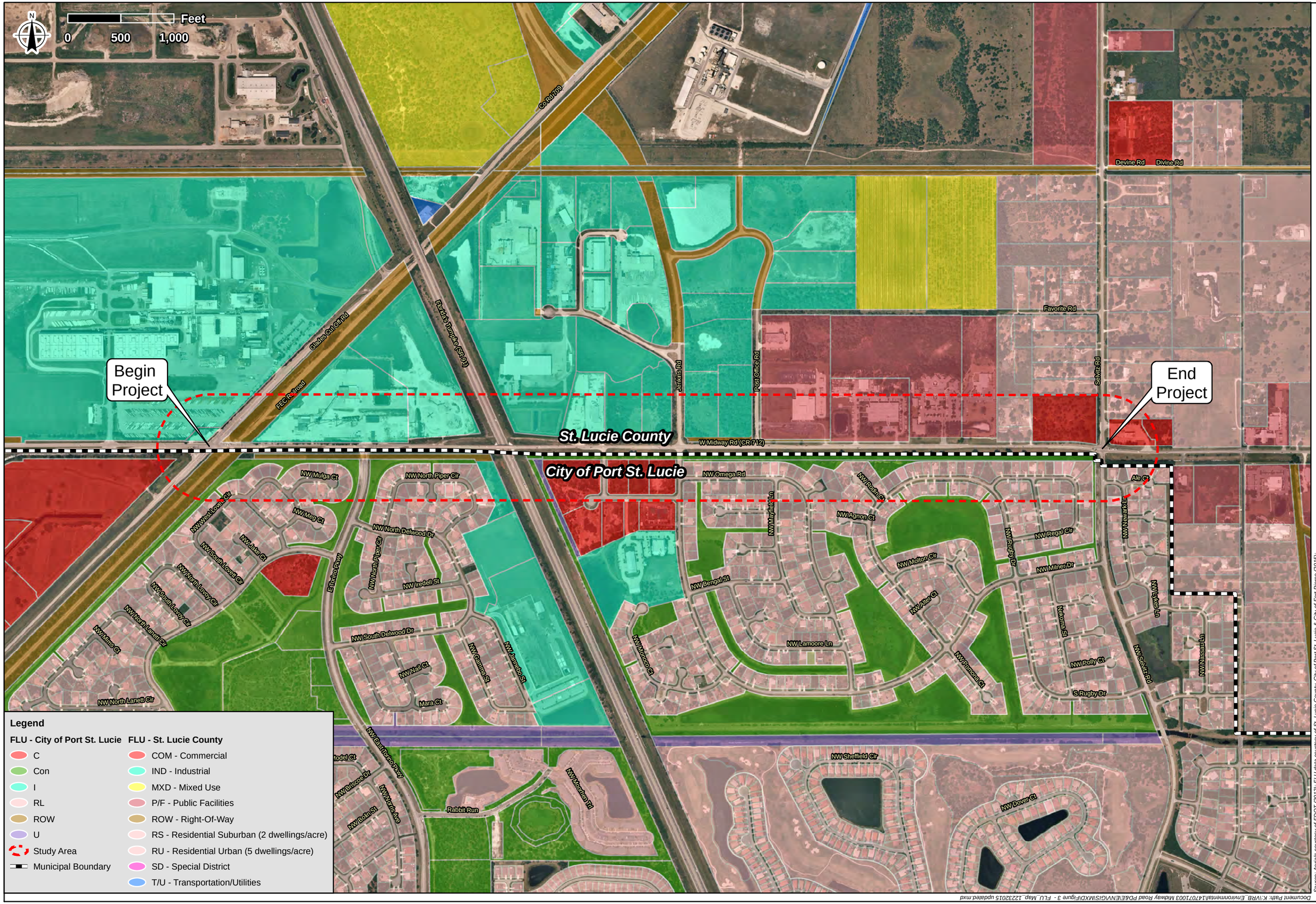
Project Development and Environment (PD&E) Study - Midway Road (CR712)
From Glades Cut Off Road (CR 709) to Selvitz Road (CR 615)
St. Lucie County, Florida
Financial Project ID: 231440-3-22-01; ETDM Number: 14177

1 inch = 700 feet

FIGURE 2

MAY 2016

FIGURE 3
FUTURE LAND USE MAP



Source: Aerials courtesy of FDOT (2012); FLU data courtesy of St. Lucie County, City of Port St. Lucie & City of Fort Pierce (2015).

Document Path: K:\IVRE_Environmental\470710003 Midway Road PD&E\ENVGIS\MXD\Figure 3 - FLU_Map_12232015 updated.mxd

FDOT

Future Land Use Map - St. Lucie County & City of Port St. Lucie

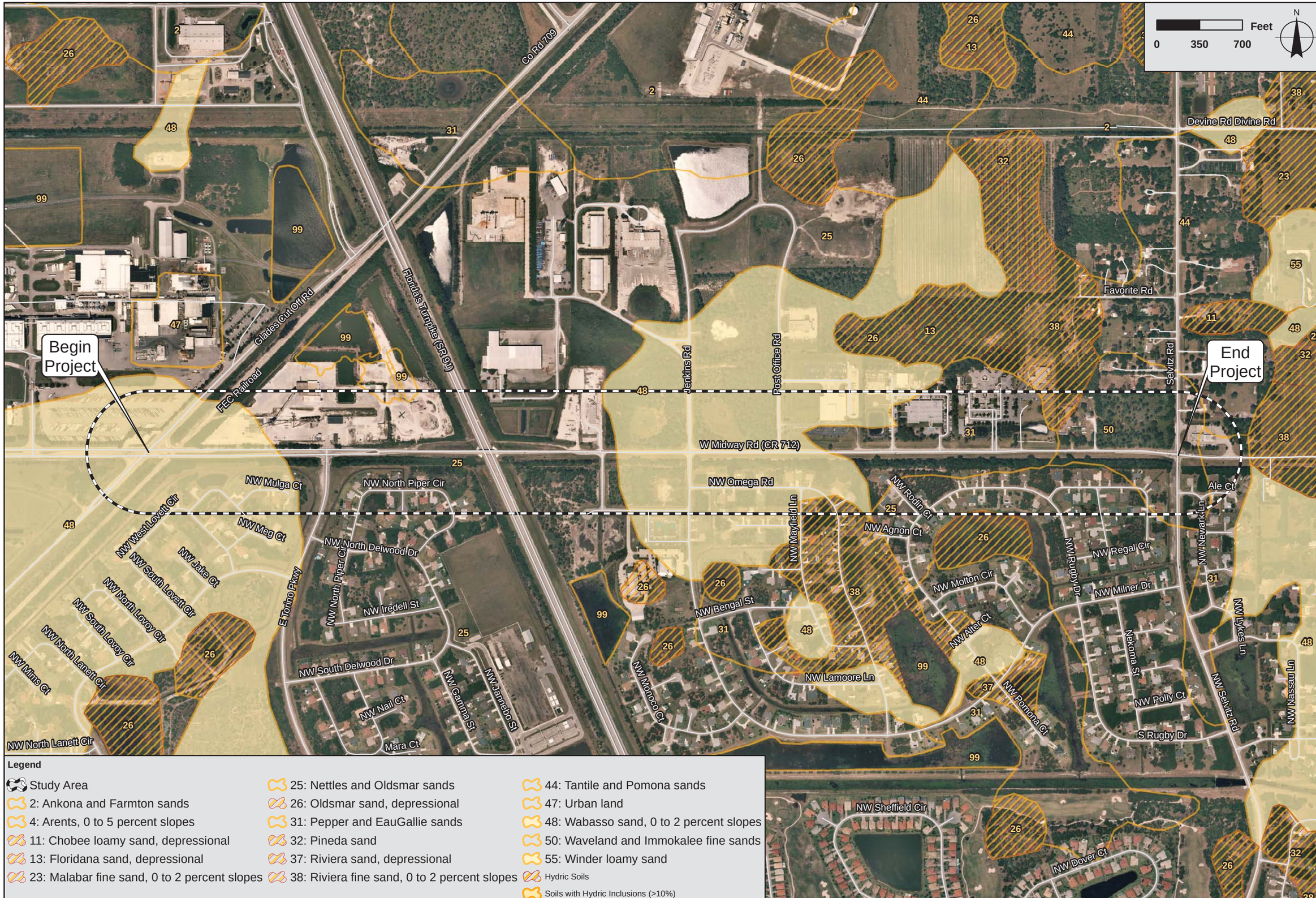
Project Development and Environment (PD&E) Study - Midway Road (CR712)
From Glades Cut Off Road (CR 709) to Selvitz Road (CR 615)
St. Lucie County, Florida
Financial Project ID: 231440-3-22-01; ETDM Number: 14177

1 inch = 1,000 feet

Figure 3

MAY 2016

FIGURE 4
NRCS SOILS MAP



Sources: 2012 Aerial Photography - Florida Department of Transportation (FDOT); Soil Data - Natural Resources Conservation Service (NRCS) Geospatial Data Gateway

Document Path: K:\VRB_Environmental\147071003 Midway Road PD&E\ENV\GIS\MXD\Figure 4 - NRCS Soils Map.mxd

FDOT

Natural Resources Conservation Service (NRCS) Soils Map

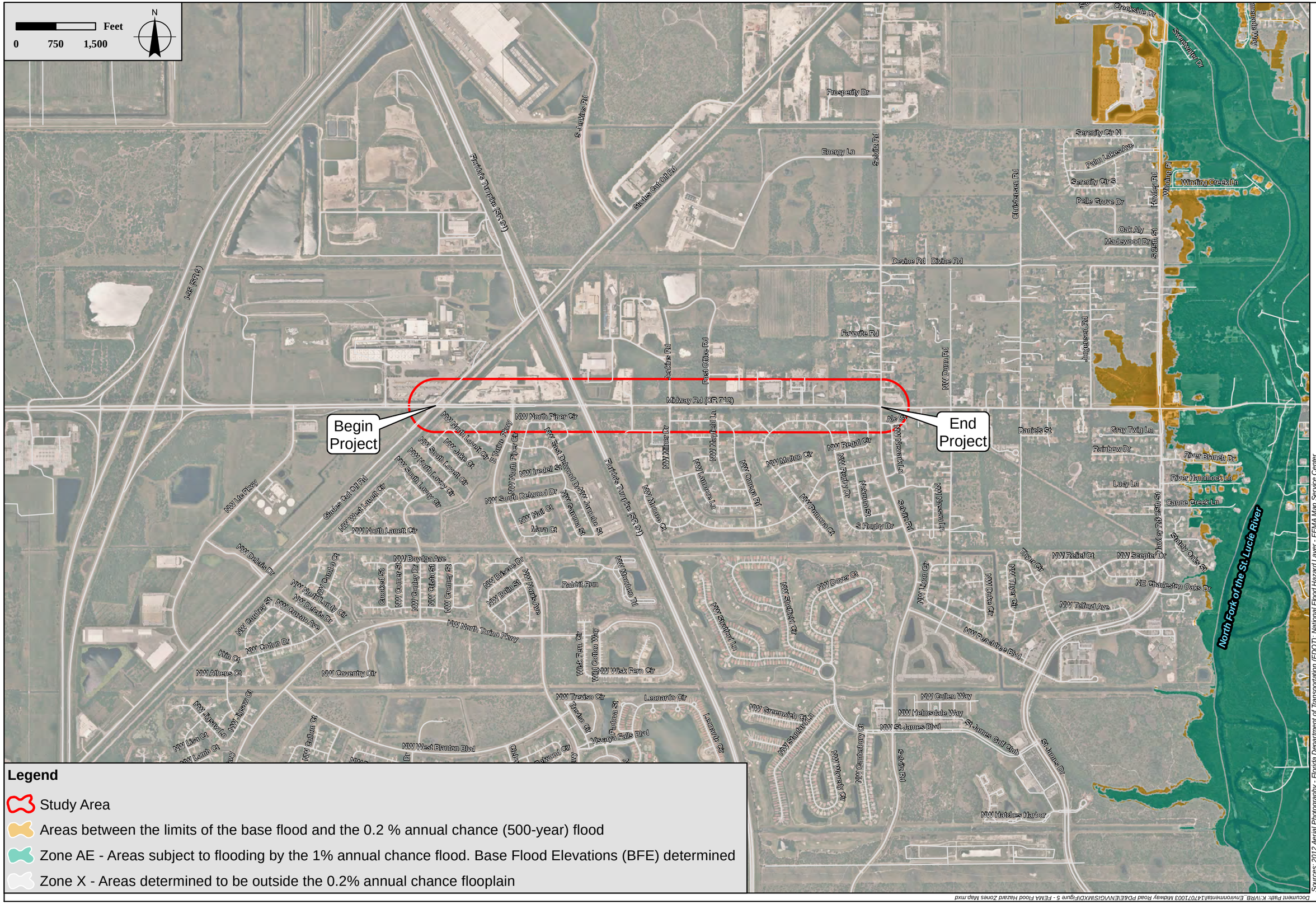
Project Development and Environment (PD&E) Study - Midway Road (CR712)
From Glades Cut Off Road (CR 709) to Selvitz Road (CR 615)
St. Lucie County, Florida
Financial Project ID: 231440-3-22-01; ETDM Number: 14177

1 inch = 700 feet

MAY 2016

FIGURE 4

FIGURE 5
FEMA FLOODZONE MAP



FDOT

Federal Emergency Management Agency (FEMA) Flood Hazard Zones Map

Project Development and Environment (PD&E) Study - Midway Road (CR712)
From Glades Cut Off Road (CR 709) to Selvitz Road (CR 615)
St. Lucie County, Florida
Financial Project ID: 231440-3-22-01; ETDM Number: 14177

1 inch = 1600 feet

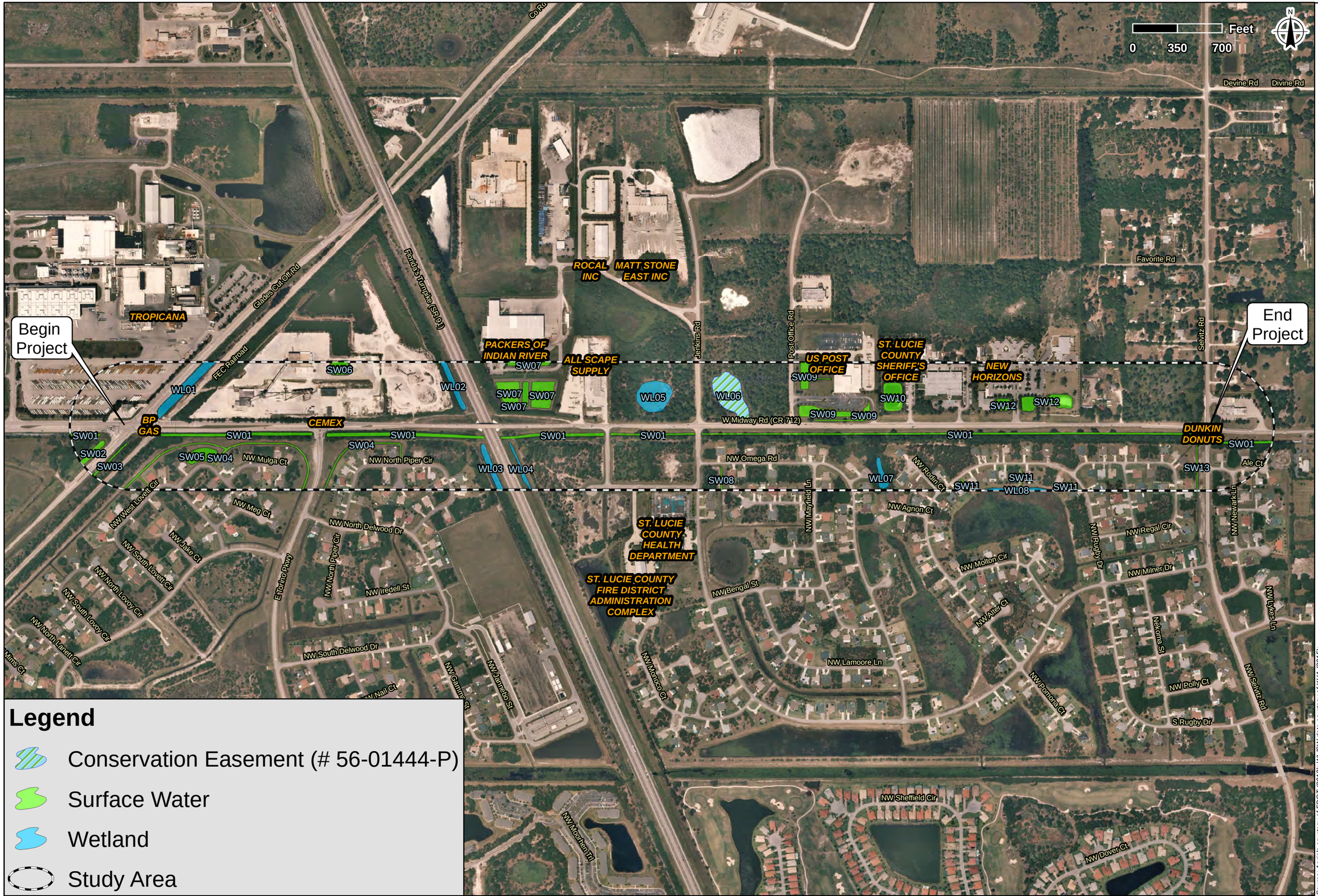
FIGURE 5

MAY 2016

Sources: 2012 Aerial Photography - Florida Department of Transportation (FDOT); National Flood Hazard Layer - FEMA Map Service Center

Document Path: K:\IVR_Environmental\147\2003 Midway Road PD&E\ENVGIS\MXD\Figure 5 - FEMA Flood Hazard Zones Map.mxd

FIGURE 6
WETLAND AND SURFACE WATERS MAP



Legend

- Conservation Easement (# 56-01444-P)
- Surface Water
- Wetland
- Study Area

Source: Aerials courtesy of FDOT (2012); WLSW data courtesy of KHA (2015).

Document Path: K:\IVRE_Environmental\4707103 Midway Road PD&E\ENVGIS\MXD\Figure 6 - Wetlands and Surface Waters Map.mxd

FDOT

Wetlands and Surface Waters Map

Project Development and Environment (PD&E) Study - Midway Road (CR712)
From Glades Cut Off Road (CR 709) to Selvitz Road (CR 615)
St. Lucie County, Florida
Financial Project ID: 231440-3-22-01; ETDM Number: 14177

1 inch = 700 feet

FIGURE 6

MAY 2016

FIGURE 7
LISTED SPECIES MAP

Label	Observation Description
1	Bald eagle landed from west of I-95
2	Sandhill crane foraging (multiple observations over duration of surveys)
3	Bald eagle passing over Station 2 (flight path west to east)
4	Sandhill crane foraging (multiple observations over duration of surveys)
5	American Kestrel perching (multiple observations over duration of surveys)
6	Potentially active gopher tortoise burrow
7	Active caracara nest
8	Observed bald eagle nest (FWC ID No. SL006)

Species observed consistently during surveys:

White ibis
Glossy ibis
Cattle egret
Great egret
Wood stork

Legend

- Study Area
- Listed Species Observed

FDOT

Listed Species Observation Map

Project Development and Environment (PD&E) Study - Midway Road (CR712)
From Glades Cut Off Road (CR 709) to Selvitz Road (CR 615)
St. Lucie County, Florida
Financial Project ID: 231440-3-22-01; ETDM Number: 14177

1 inch = 1600 feet

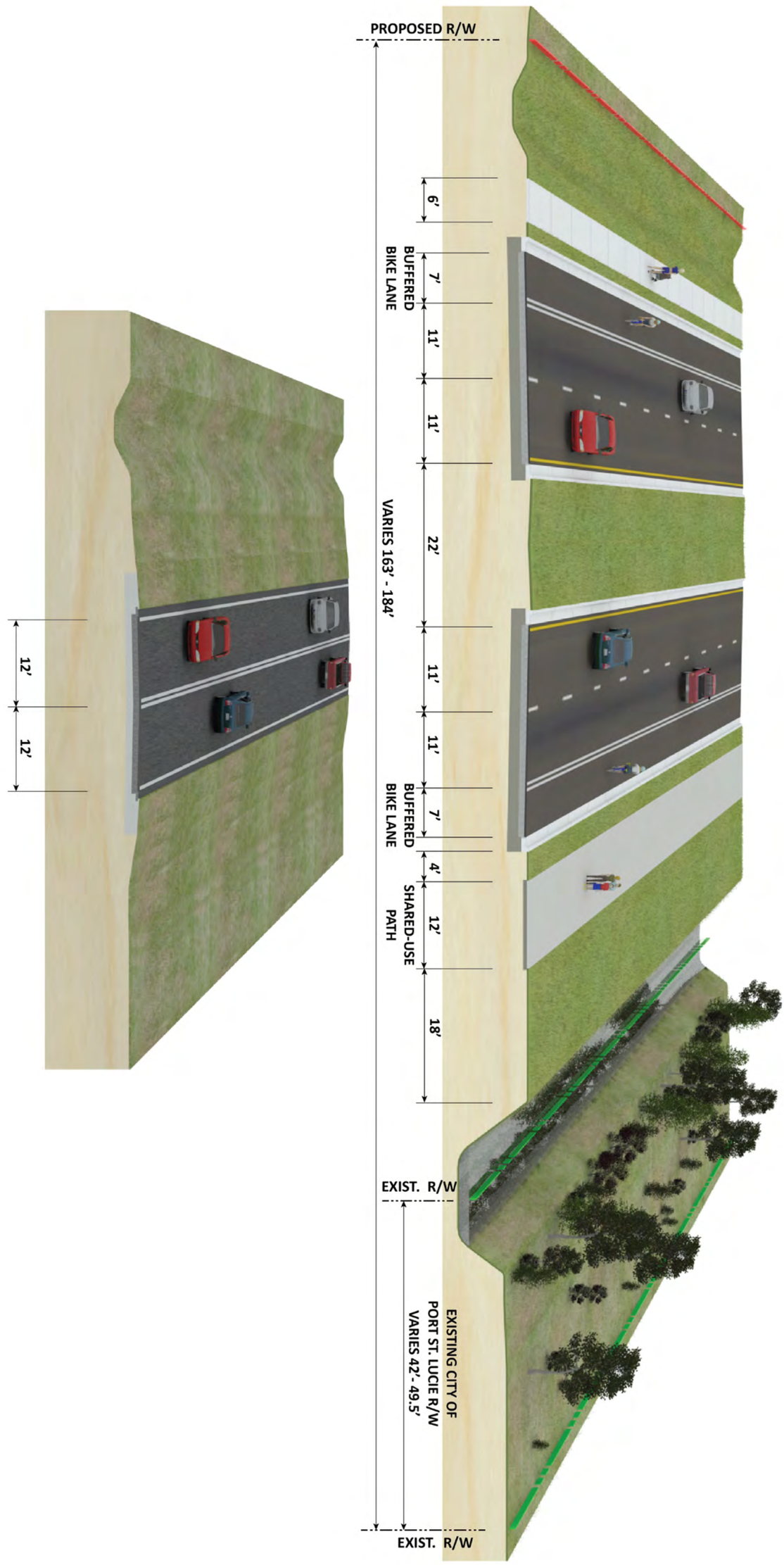
JUNE 2016

FIGURE 7

Sources: 2012 Aerial Photography - Florida Department of Transportation (FDOT)

Document Path: K:\IVRE_Environmental\47071003 Midway Road PD&E\ENVGIS\MXD\Figure 7 - Listed Species Map.mxd

APPENDIX A
TYPICAL SECTIONS AND ALTERNATIVES

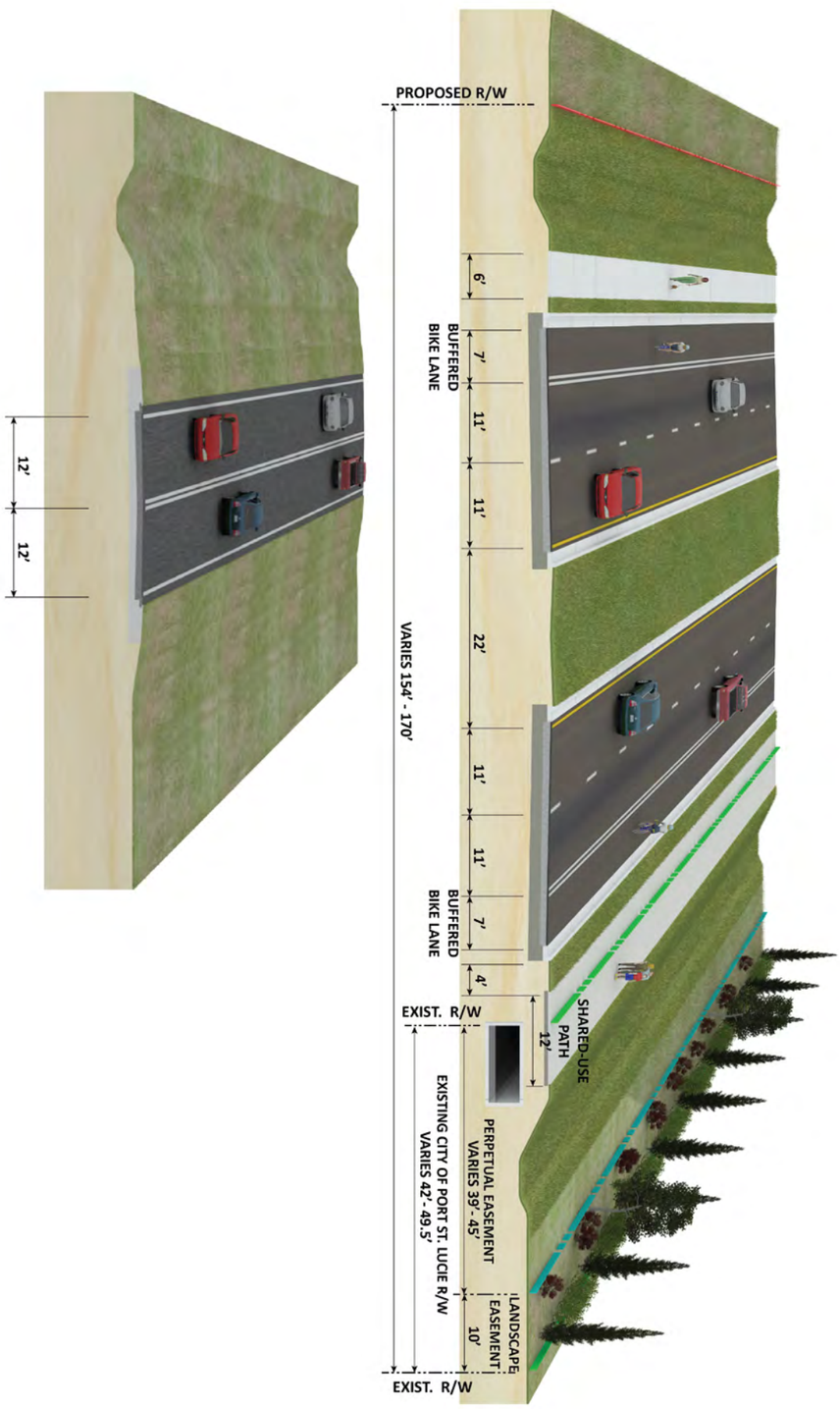


Alternative 1 - Canal Avoidance

Project Development and Environment (PD&E) Study - Midway Road (CR712)
From Glades Cut Off Road (CR 709) to Selvitz Road (CR 615)
St. Lucie County, Florida
Financial Project ID: 231440-3-22-01; ETDM Number: 14177

Appendix A1	*MAY 2016*	*Not drawn to scale*

Document Path: K:\RB_Environmental\147071003 Midway Road PD&E\ENV\GIS\MXD\Appendix A1 Alt 1 Canal Avoidance.mxd



Document Path: K:\VRB_Environmental\147071003 Midway Road PD&E\ENV\GIS\MXD\Appendix A2 Alt 2 Box Culvert.mxd

Alternative 2 - Box Culvert

Project Development and Environment (PD&E) Study - Midway Road (CR712)
From Glades Cut Off Road (CR 709) to Selvitz Road (CR 615)
St. Lucie County, Florida
Financial Project ID: 231440-3-22-01; ETDM Number: 14177

Appendix A2	*MAY 2016*	*Not drawn to scale*

APPENDIX B
FLORIDA'S NATURAL AREAS INVENTORY BIODIVERSITY MATRIX

1018 Thomasville Road
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Florida Natural Areas Inventory

Biodiversity Matrix Query Results

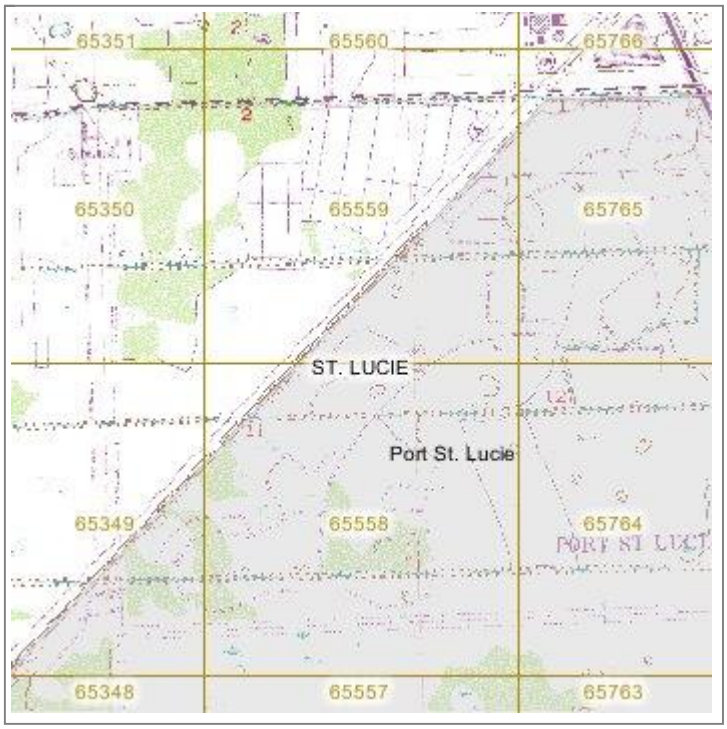
UNOFFICIAL REPORT

Created 9/30/2015

(Contact the FNAI Data Services Coordinator at 850.224.8207 for information on an official Standard Data Report)

NOTE: The Biodiversity Matrix includes only rare species and natural communities tracked by FNAI.

Report for 8 Matrix Units: 65559 , 65560 , 65765 , 65766 , 65970 , 65971 , 66171 , 66172



Descriptions

DOCUMENTED - There is a documented occurrence in the FNAI database of the species or community within this Matrix Unit.

DOCUMENTED-HISTORIC - There is a documented occurrence in the FNAI database of the species or community within this Matrix Unit; however the occurrence has not been observed/reported within the last twenty years.

LIKELY - The species or community is *known* to occur in this vicinity, and is considered likely within this Matrix Unit because:

1. documented occurrence overlaps this and adjacent Matrix Units, but the documentation isn't precise enough to indicate which of those Units the species or community is actually located in; *or*
2. there is a documented occurrence in the vicinity and there is suitable habitat for that species or community within this Matrix Unit.

POTENTIAL - This Matrix Unit lies within the known or predicted range of the species or community based on expert knowledge and environmental variables such as climate, soils, topography, and landcover.

Matrix Unit ID: 65559

0 Documented Elements Found

0 Documented-Historic Elements Found

2 Likely Elements Found

Scientific and Common Names	Global Rank	State Rank	Federal Status	State Listing
Mesic flatwoods	G4	S4	N	N
	G4	S2	LE	FE

Mycteria americana Wood Stork				

Matrix Unit ID: 65560
0 Documented Elements Found

0 Documented-Historic Elements Found

1 Likely Element Found

Scientific and Common Names	Global Rank	State Rank	Federal Status	State Listing
Mycteria americana Wood Stork	G4	S2	LE	FE

Matrix Unit ID: 65765
0 Documented Elements Found

0 Documented-Historic Elements Found

2 Likely Elements Found

Scientific and Common Names	Global Rank	State Rank	Federal Status	State Listing
Mesic flatwoods	G4	S4	N	N
Mycteria americana Wood Stork	G4	S2	LE	FE

Matrix Unit ID: 65766
0 Documented Elements Found

0 Documented-Historic Elements Found

2 Likely Elements Found

Scientific and Common Names	Global Rank	State Rank	Federal Status	State Listing
Mesic flatwoods	G4	S4	N	N
Mycteria americana Wood Stork	G4	S2	LE	FE

Matrix Unit ID: 65970
0 Documented Elements Found

0 Documented-Historic Elements Found

2 Likely Elements Found

Scientific and Common Names	Global Rank	State Rank	Federal Status	State Listing
Mesic flatwoods	G4	S4	N	N
Mycteria americana Wood Stork	G4	S2	LE	FE

Matrix Unit ID: 65971

0 Documented Elements Found

0 Documented-Historic Elements Found

2 Likely Elements Found

Scientific and Common Names	Global Rank	State Rank	Federal Status	State Listing
Mesic flatwoods	G4	S4	N	N
Mycteria americana Wood Stork	G4	S2	LE	FE

Matrix Unit ID: 66171

0 Documented Elements Found

0 Documented-Historic Elements Found

4 Likely Elements Found

Scientific and Common Names	Global Rank	State Rank	Federal Status	State Listing
Blackwater stream	G4	S3	N	N
Mesic flatwoods	G4	S4	N	N
Mycteria americana Wood Stork	G4	S2	LE	FE
Trichechus manatus Manatee	G2	S2	LE	FE

Matrix Unit ID: 66172

0 Documented Elements Found

0 Documented-Historic Elements Found

2 Likely Elements Found

Scientific and Common Names	Global Rank	State Rank	Federal Status	State Listing
Blackwater stream	G4	S3	N	N
Mycteria americana Wood Stork	G4	S2	LE	FE

Matrix Unit IDs: 65559 , 65560 , 65765 , 65766 , 65970 , 65971 , 66171 , 66172

17 Potential Elements Common to Any of the 8 Matrix Units

Scientific and Common Names	Global Rank	State Rank	Federal Status	State Listing
Athene cunicularia floridana Florida Burrowing Owl	G4T3	S3	N	SSC
Coelorachis tuberculosa Piedmont Jointgrass	G3	S3	N	LT
Conradina grandiflora Large-flowered Rosemary	G3	S3	N	LT
Corynorhinus rafinesquii Rafinesque's Big-eared Bat	G3G4	S2	N	N
Drymarchon couperi Eastern Indigo Snake	G3	S3	LT	FT
Glandularia maritima Coastal Vervain	G3	S3	N	LE

Gopherus polyphemus Gopher Tortoise	G3	S3	C	ST
Lechea cernua Nodding Pinweed	G3	S3	N	LT
Linum carteri var. smallii Small's Flax	G2T2	S2	N	LE
Nemastylis floridana Celestial Lily	G2	S2	N	LE
Pituophis melanoleucus mugitus Florida Pine Snake	G4T3	S3	N	SSC
Polygala smallii Tiny Polygala	G1	S1	LE	LE
Pteroglossaspis ecristata Giant Orchid	G2G3	S2	N	LT
Rostrhamus sociabilis plumbeus Snail Kite	G4G5T2	S2	LE	FE
Sceloporus woodi Florida Scrub Lizard	G2G3	S2S3	N	N
Sciurus niger shermani Sherman's Fox Squirrel	G5T3	S3	N	SSC
Trichechus manatus Manatee	G2	S2	LE	FE

Disclaimer

The data maintained by the Florida Natural Areas Inventory represent the single most comprehensive source of information available on the locations of rare species and other significant ecological resources statewide. However, the data are not always based on comprehensive or site-specific field surveys. Therefore, this information should not be regarded as a final statement on the biological resources of the site being considered, nor should it be substituted for on-site surveys. FNAI shall not be held liable for the accuracy and completeness of these data, or opinions or conclusions drawn from these data. FNAI is not inviting reliance on these data. Inventory data are designed for the purposes of conservation planning and scientific research and are not intended for use as the primary criteria for regulatory decisions.

Unofficial Report

These results are considered unofficial. FNAI offers a Standard Data Request option for those needing certifiable data.

APPENDIX C
EFFICIENT TRANSPORATION DECISION MAKING (ETDM) PROGRAMMING SUMMARY REPORT

Florida Department of Transportation

RICK SCOTT
GOVERNOR

605 Suwannee Street
Tallahassee, FL 32399-0450

JIM BOXOLD
SECRETARY

ETDM Summary Report

Project #14177 - Midway Road Widening

Programming Screen - Published on 05/27/2015

Printed on: 9/23/2015

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Introduction to Programming Screen Summary Report

The Programming Screen Summary Report shown below is a read-only version of information contained in the Programming Screen Summary Report generated by the ETDM Coordinator for the selected project after completion of the ETAT Programming Screen review. The purpose of the Programming Screen Summary Report is to summarize the results of the ETAT Programming Screen review of the project; provide details concerning agency comments about potential effects to natural, cultural, and community resources; and provide additional documentation of activities related to the Programming Phase for the project. Available information for a Programming Screen Summary Report includes:

- Screening Summary Report chart
- Project Description information (including a summary description of the project, a summary of public comments on the project, and community-desired features identified during public involvement activities)
- Purpose and Need information (including the Purpose and Need Statement and the results of agency reviews of the project Purpose and Need)
- Alternative-specific information, consisting of descriptions of each alternative and associated road segments; an overview of ETAT Programming Screen reviews for each alternative; and agency comments concerning potential effects and degree of effect, by issue, to natural, cultural, and community resources.
- Project Scope information, consisting of general project commitments resulting from the ETAT Programming Screen review, permits, and technical studies required (if any)
- Class of Action determined for the project
- Dispute Resolution Activity Log (if any)

The legend for the Degree of Effect chart is provided in an appendix to the report.

For complete documentation of the project record, also see the GIS Analysis Results Report published on the same date as the Programming Screen Summary Report.

#14177 Midway Road Widening

District: District 4
County: St. Lucie
Planning Organization: FDOT District 4
Plan ID: Not Available
Federal Involvement: Federal Funding

Phase: Programming Screen
From: Glades Cut-Off Rd
To: Selvitz Road
Financial Management No.: 23144032201

Contact Information: Vanita Saini (954) 777-4468 vanita.saini@dot.state.fl.us
Snapshot Data From: Summary Report Re-Published 5/27/2015
Issues and Categories are reflective of what was in place at the time of the screening event.

	Social and Economic							Cultural			Natural					Physical					
	Land Use Changes	Social	Relocation Potential	Farmlands	Aesthetic Effects	Economic	Mobility	Section 4(f) Potential	Historic and Archaeological Sites	Recreation Areas	Wetlands	Water Quality and Quantity	Floodplains	Wildlife and Habitat	Coastal and Marine	Noise	Air Quality	Contamination	Infrastructure	Navigation	Special Designations
Alternative #1 - Alternative 1 From: Glades Cut-Off Rd To: Selvitz Road *Re-Published: 05/27/2015 Reviewed from 05/23/2014 to 07/07/2014)*	2	2	2	0	2	1	1	3	3	0	3	2	0	2	0	0	2	3	N/A	N/A	0

Coordination Document: PD&E Support Document As Per PD&E Manual

Direct Effects
Identified Resources and Level of Importance:

Comments on Effects to Resources:

Additional Comments (optional):

CLC Commitments and Recommendations:

Degree of Effect: N/A *N/A / No Involvement* assigned 06/17/2014 by Anita Barnett, National Park Service

Coordination Document: No Involvement

Direct Effects
Identified Resources and Level of Importance:

Comments on Effects to Resources:

Additional Comments (optional):

CLC Commitments and Recommendations:

Degree of Effect: 0 *None* assigned 07/01/2014 by Lauren P. Milligan, FL Department of Environmental Protection

Coordination Document: No Involvement

Direct Effects
Identified Resources and Level of Importance:

Comments on Effects to Resources:

Additional Comments (optional):

CLC Commitments and Recommendations:

Degree of Effect: 0 *None* assigned 07/01/2014 by Mindy Parrott, South Florida Water Management District

Coordination Document: Permit Required
Coordination Document Comments:
An ERP is required.

Direct Effects
Identified Resources and Level of Importance:

Comments on Effects to Resources:
Effects to Recreation, Coastal Resources and Floodplains are not anticipated based on SFWMD's review.

Additional Comments (optional):
An ERP is required.

CLC Commitments and Recommendations:

ETAT Reviews and Coordinator Summary: Natural

Wetlands

Project Effects

Coordinator Summary Degree of Effect: 3 *Moderate* assigned 09/03/2014 by FDOT District 4

Comments:
Based on the agency comments and the GIS analysis results, there are a total of 6.7 acres of palustrine wetlands with both forested and scrub-shrub wetlands, and Canal 103 within the 500-ft buffer of the project corridor. The wetlands, surface waters, and natural areas along the corridor provide suitable habitat for wildlife, aquifer recharge, natural filters for pollutants, essential carbon export/import functions, flood water attenuation and storage, and contributions to the ecosystem through food-web productivity, among many other functions.

The project will primarily utilize the existing right of way. However, additional right of way may be identified for acquisition during the PD&E Study to provide offsite ponds for stormwater management. Where practicable, any necessary stormwater management facilities will be located within previously disturbed, upland sites and outside of environmentally sensitive areas. A Wetlands Evaluation and Report (WER) will be completed during the PD&E phase. The WER will provide habitat characterizations of the existing wetlands within the corridor and the vicinity; document the existing conditions of the resources; evaluate direct, indirect, cumulative, and secondary impacts; and, make recommendations for sequentially avoiding, minimizing and/or mitigating resource impacts.
FDOT will continue coordination with regulatory agencies throughout the development of the project to address potential environmental issues and to ensure wetland impacts are sequentially avoided and minimized to the greatest extent practicable. Agency coordination discussions will also include the design of the proposed stormwater system and the requirements for stormwater treatment. FDOT will obtain an environmental resource permit (ERP) during final design and provide compensatory mitigation for any unavoidable impacts.

Stormwater Pollution Prevention Plans (SWPPP) will be prepared during the design phase and incorporated into the construction contract to ensure that Contractor implements BMPs to control stormwater runoff and other potential water quality impacts. The SWPPP will be prepared in compliance with state and federal standards. Furthermore, the Contractor will be required to obtain an FDEP NPDES permit. A preconstruction meeting will be held with the project Contractor to review construction requirements in environmentally sensitive areas; to delineate the wetlands limits; and, to reiterate the requirement for the use of Best Management Practices to minimize temporary construction impacts.
Based on ETAT comments and a review of the EST, FDOT agrees with South Florida Water Management District, US Army Corps of Engineers and the National Marine Fisheries Service, and assigns a summary degree of effect of Moderate to Wetlands.

Degree of Effect: 3 *Moderate* assigned 05/28/2014 by Brandon Howard, National Marine Fisheries Service

Coordination Document: No Involvement

Direct Effects

Identified Resources and Level of Importance:

Based on our review of the information provided on the EST website, GIS-based effects analysis on wetlands and interpretation of aerial photographs, NOAA's National Marine Fisheries Service (NMFS) has determined that emergent wetlands and ditches are located within the project corridor. These wetlands range from low to moderate in quality.

Comments on Effects to Resources:

The wetlands along the proposed roadway expansion provide water quality functions, such as removal of sediments, excess nutrients, and contaminants, which benefit and support these aquatic ecosystems. Through hydrological connections, these wetlands also contribute plant material and other useable nutrients (both dissolved and particulate organic matter) into aquatic food webs that include recreationally, commercially, and ecologically important species within downstream estuaries. If wetland impacts are unavoidable, sequential minimization and mitigation should take place.

In addition to the direct impacts from filling wetlands, construction activities may impact adjacent wetlands through sedimentation and runoff.

Additional Comments (optional):

CLC Commitments and Recommendations:

Degree of Effect: 2 *Minimal* assigned 07/07/2014 by Maher Budeir, US Environmental Protection Agency

Coordination Document: PD&E Support Document As Per PD&E Manual

Direct Effects

Identified Resources and Level of Importance:

1.7 Acres of wetland within 200 foot buffer

Comments on Effects to Resources:

The design of the project including the alignemnt and the foot print of the proposed project should be developed in a manner that will avoid impact on the wetland resource. Unavoidable impact should be fully mitigated.

Additional Comments (optional):

CLC Commitments and Recommendations:

Degree of Effect: 3 *Moderate* assigned 06/24/2014 by Garett Lips, US Army Corps of Engineers

Coordination Document: Permit Required

Direct Effects

Identified Resources and Level of Importance:

The areas adjacent to the corridor have residential, commercial, and undeveloped lands with both uplands and wetlands. There areapproximately 1.7 acres of freshwaterpalustrine wetlands with bothforestedand scrub-shrub wetlands. The project area includes Canal 103 which is located along the south side of Midway Road throughout the project limits. The wetlands and natural environment provide sustainable habitat for wildlife,aquifer recharge, natural filters for pollutants, essentialcarbon export/import functions, flood water attenuation and storage, and contributions to the ecosystem through food-web productivity, among many other functions.

Comments on Effects to Resources:

Filling wetlands reduces the ability of the natural environment to provide: sustainable habitat for wildlife,aquifer recharge, natural filters for pollutants, essentialcarbon export/import functions, flood water attenuation and storage, and contributions to the ecosystem through food-web productivity, among many other functions.

Additional Comments (optional):

CLC Commitments and Recommendations:

Degree of Effect: 2 *Minimal* assigned 07/01/2014 by Lauren P. Milligan, FL Department of Environmental Protection

Coordination Document: Permit Required

Direct Effects

Identified Resources and Level of Importance:

The National Wetlands Inventory GIS report indicates that there are a total of 6.7 acres of palustrine wetlands within the 500-ft. project buffer zone.

Comments on Effects to Resources:

The proposed project will require an environmental resource permit (ERP) from the South Florida Water Management District for stormwater management and any wetland impacts. The ERP applicant will be required to eliminate or reduce the proposed wetland resource impacts of roadway construction to the greatest extent practicable.
- Minimization should emphasize avoidance-oriented corridor alignments, wetland fill reductions via pile bridging and steep/vertically retained side slopes, and median width reductions within safety limits.
- Wetlands should not be displaced by the installation of stormwater conveyance and treatment swales; compensatory treatment in adjacent uplands is the preferred alternative.
- After avoidance and minimization have been exhausted, mitigation must be proposed to offset the adverse impacts of the project to existing wetland functions and values. Significant attention is given to any forested wetland systems, which are difficult to mitigate.
- The cumulative impacts of concurrent and future transportation improvement projects in the vicinity of the subject project should also be addressed.

Additional Comments (optional):

CLC Commitments and Recommendations:

Degree of Effect: 2 *Minimal* assigned 05/29/2014 by John Wrublik, US Fish and Wildlife Service

Coordination Document: To Be Determined: Further Coordination Required

Direct Effects

Identified Resources and Level of Importance:

Wetlands

Comments on Effects to Resources:

Wetlands provide important habitat for fish and wildlife. According to data in the Environmental Screening tool, wetlands occur within the project area. We recommend that the project be designed to avoid these valuable resources to the greatest extent practicable. If impacts to wetlands are unavoidable, we recommend that the FDOT provides mitigation that fully compensates for the loss of wetland resources.

Additional Comments (optional):

CLC Commitments and Recommendations:

Degree of Effect: 3 *Moderate* assigned 07/01/2014 by Mindy Parrott, South Florida Water Management District

Coordination Document: Permit Required

Direct Effects

Identified Resources and Level of Importance:

Wetlands and surface water exist within and adjacent to the project. These features may provide habitat for a variety of wetland dependent wildlife, including listed species such as the woodstork.

Comments on Effects to Resources:

The project may require dreding, filling, or crossing of wetlands and surface waters to accomodate road widening and the required stormwater management facilities.

Additional Comments (optional):

CLC Commitments and Recommendations:

Water Quality and Quantity

Project Effects

Coordinator Summary Degree of Effect: 2 *Minimal* assigned 09/03/2014 by FDOT District 4

Comments:

A review of the GIS Analysis and ETAT agency comments identified Canal 103, 2 limited drinking water wells, 6 active onsite sewage facilities, 2 verified impaired Florida Waters, and 4 US EPA National Pollutant Discharge Elimination System permits. The project is also within the Surficial Aquifer System. The project currently discharges to C-103, which connects to the North Fork of the St. Lucie River. The North Fork of the St. Lucie River is an Outstanding Florida Water and portions of it are an Aquatic Preserve.

FDOT acknowledges the ETAT agency's comments regarding the project's potential permit requirements and will obtain all required permits during final design. FDOT also acknowledges the ETAT's agency's concerns regarding the project's potential impacts to wetlands/surface waters and water quality. These concerns are addressed in more detail within each of the corresponding sections within this document. A Wetlands Evaluation and a Water Quality Impact Evaluation (WQIE) will be conducted during Project Development. FDOT will continue coordination with regulatory agencies, such as the North St. Lucie River Water Control District, throughout the development of the project to ensure all potential environmental issues are fully resolved. Additionally, water qualityimpact evaluationshould be conducted to ensure no impact on water quality in Canal 103.

Storm water runoff will increase in quantity as a result of the additional impervious area associated with the proposed widening. FDOT will evaluate the existing stormwater system and the stormwater compensation needed for the project during the PD&E phase. Coordination will be maintained with each agency for the design of any needed stormwater system improvements and the requirements for stormwater treatment. To minimize potential construction-related impacts, Stormwater Pollution Prevention Plans (SWPPP) will be prepared in compliance with state and federal standards and incorporated into the construction contract. The Contractor will be required adhere to the SWPPP and implement Best Management Practices (BMPs) to control stormwater runoff and other potential water quality impacts during construction. The SWPPP will be prepared in compliance with state and federal standards. Furthermore, the Florida Department of Transportation will be required to obtain an Environmental Resource Permit (ERP) or permit modification. During Construction, a water use permit from the SFWMD may be required. The project shall be designed to meet the SFWMD water quantity and quality criteria in ERP Applicant's Handbook Volume I and II.

Based on ETAT comments, FDOT agrees with the US Environmental Protection Agency, FL Department of Environmental Protection and South Florida Water Management District and assigns a summary degree of effect of Minimal to Water Quality and Quantity.

Degree of Effect: 2 *Minimal* assigned 07/01/2014 by Mindy Parrott, South Florida Water Management District

Coordination Document: Permit Required

Coordination Document Comments:

An Environmental Resource Permit (56-00833-S) exists for Midway Road from Selvitz to 25th Street. This permit could be modified to include the project.

Direct Effects

Identified Resources and Level of Importance:

The project currently discharges to C-103, which connects to the North Fork of the St. Lucie River. The North Fork of the St. Lucie River is an Outstanding Florida Water and portions of it are an Aquatic Preserve.

Comments on Effects to Resources:
The project must be designed to meet the SFWMD water quantity and quality criteria inERP Applicant's Handbook Volume I and II.

Additional Comments (optional):
An Environmental Resource Permit (56-00833-S) exists for Midway Road from Selvitz to 25th Street. This permit could be modified to include the project.

CLC Commitments and Recommendations:

Degree of Effect: 2 *Minimal* assigned 07/07/2014 by Maher Budeir, US Environmental Protection Agency

Coordination Document: PD&E Support Document As Per PD&E Manual

Direct Effects
Identified Resources and Level of Importance:
Canal 103

Comments on Effects to Resources:
Storm water runoff will increase in quantity due the increased impervious surface. Impact on water quantity and pond siting should be fully assessed. Additionally water qualityimpact evaluationshould be conducted to ensure no impact on water quality in Canal 103

Additional Comments (optional):

CLC Commitments and Recommendations:

Degree of Effect: 2 *Minimal* assigned 07/01/2014 by Lauren P. Milligan, FL Department of Environmental Protection

Coordination Document: Permit Required

Direct Effects
Identified Resources and Level of Importance:
Increased stormwater runoff carrying oils, greases, metals, sediment, and other pollutants from the increased impervious surface would be of concern. Natural resource impacts within and adjacent to the proposed road right-of-way will likely include alteration of the existing surface water hydrology and natural drainage patterns, and reduction in flood attenuation capacity of area creeks, ditches, and sloughs as a result of increased impervious surface within the watershed.

Comments on Effects to Resources:
Every effort should be made to maximize the treatment of stormwater runoff from the proposed road project to prevent ground and surface water contamination. Stormwater treatment should be designed to maintain the natural predevelopment hydroperiod and water quality, as well as to protect the natural functions of adjacent wetlands. We recommend that the PD&E study include an evaluation of existing stormwater treatment adequacy and details on the future stormwater treatment facilities. Retro-fitting of stormwater conveyance systems would help reduce impacts to water quality.

Additional Comments (optional):

CLC Commitments and Recommendations:

Floodplains

Project Effects

Coordinator Summary Degree of Effect: 0 *None* assigned 09/03/2014 by FDOT District 4

Comments:
A GIS review of the FEMA Floodplain identified that the project is within Zone X. FDOT acknowledges South Florida Water Management's concern on acquiring appropriate permits and will coordinate with the appropriate agencies during project development and design. FDOT will continue coordination with regulatory agencies throughout the development of the project to ensure all potential environmental issues, if any, are fully resolved. Stormwater Pollution Prevention Plans (SWPPP) will be prepared during the design phase and incorporated into the construction contract to ensure that Contractor implements Best Management Practices (BMPs) to control stormwater runoff and other potential water quality impacts. The SWPPP will be prepared in compliance with state and federal standards. Furthermore, the Contractor will be required to obtain an FDEP NPDES permit.
Based on a review of the EST and the ETAT agency's comments, FDOT agrees with the US Environmental Protection Agency and the South Florida Water Management District and assigns a summary degree of effect of None to Floodplain.

Degree of Effect: 0 *None* assigned 07/07/2014 by Maher Budeir, US Environmental Protection Agency

Coordination Document: PD&E Support Document As Per PD&E Manual

Direct Effects
Identified Resources and Level of Importance:

Comments on Effects to Resources:

Additional Comments (optional):

CLC Commitments and Recommendations:

Degree of Effect: 0 *None* assigned 07/01/2014 by Mindy Parrott, South Florida Water Management District

Coordination Document: Permit Required
Coordination Document Comments:
An ERP is required.

Direct Effects
Identified Resources and Level of Importance:

Comments on Effects to Resources:
Effects to Recreation, Coastal Resources and Floodplains are not anticipated based on SFWMD's review.

Additional Comments (optional):
An ERP is required.

CLC Commitments and Recommendations:

Wildlife and Habitat

Project Effects

Coordinator Summary Degree of Effect: 2 *Minimal* assigned 09/03/2014 by FDOT District 4

Comments:
According to the GIS Analysis results and ETAT agency comments,, the project area is dominated by a mix of commercial, industrial, and residential development, with 68.77% classified as High or Low Intensity Urban, and another 6.86% as Transportation (roads and rail). Other land cover types in the assessment area include Mesic Flatwoods (15.90%, 33.5 acres), Improved Pasture (4.32%, 9.1 acres), Freshwater Marshes (3.03%, 6.4 acres), Rural Lands (0.95%, 2.0 acres), and Exotic Plants (0.16%, 0.3 acres).
The project area is within U.S. Fish and Wildlife Service Consultation Areas for caracara, Florida grasshopper sparrow, red-cockaded woodpecker, scrub jay, and snail kite. The corridor is also within four wood stork Core Foraging Areas (CFAs). There is no Critical Habitat for listed species or bald eagle nest within the one-mile buffer. Based on range and preferred habitat type, the following species listed by the Federal Endangered Species Act and the State of Florida as Federally Endangered (FE), Federally Threatened (FT), State-Threatened (ST), or State Species of Special Concern (SSC) may occur along the project area: gopher frog (SSC), gopher tortoise (ST), American alligator (FT based on similarity of appearance to American crocodile), Eastern indigo snake (FT), Florida pine snake (SSC), Audubon's crested caracara (FT), Florida burrowing owl (SSC), Southeastern American kestrel (ST), Florida sandhill crane (ST), least tern (ST), wood stork (FE), limpkin (SSC), little blue heron (SSC), tricolored heron (SSC), roseate spoonbill (SSC), snowy egret (SSC), white ibis (SSC), and Sherman's fox squirrel (SSC). FWC's Potential Habitat Richness classifications within the 500 ft buffer include 2.32% moderately high and 27.67% medium. In the Florida Natural Areas Inventory Critical Lands and Waters Identification Project (CLIP), 14.15% of the assessment area is Priority 2 (high) for Biodiversity Resources. Also in CLIP, 0.63% ranks Moderately High for Rare Species Habitat Conservation Priorities.
FDOT acknowledges the agencies' concerns regarding the project's potential impacts to wildlife and habitat. An Endangered Species Biological Assessment (ESBA) and wetland evaluation (as described in the previous Wetlands issue) will be conducted during the PD&E Study. The ESBA will include wildlife surveys, plant community mapping, habitat characterizations, existing resources condition descriptions, and recommendations for sequentially avoiding, minimizing and mitigating direct, secondary, and cumulative effects on wildlife and habitat resources. The ESBA report will be prepared in compliance with Section 7 of the Endangered Species Act (ESA) of 1973, as amended (16 USC 1531 *et seq.*) and in accordance with Part 2, Chapter 27 of the FDOT PD&E Manual.
Primary wildlife issues associated with this project include: potential adverse effects to a moderate number of species listed by the Federal Endangered Species Act as Endangered or Threatened, or by the State of Florida as Threatened or Species of Special Concern; potential water quality degradation as a result of additional stormwater runoff from the expanded roadway surface draining into adjacent waterways and wetlands; and potential for increased wildlife roadkill. FDOT will coordinate with the ETAT agencies throughout project development so that the final design of the project, including any offsite drainage ponds, will avoid and minimize wildlife and habitat impacts to the greatest extent practicable. Drainage retention areas and

equipment staging areas will be evaluated and sited to avoid habitat destruction or degradation to the greatest extent practicable. If impacts are determined to be unavoidable, a detailed compensatory mitigation plan will be prepared. In addition, if required, an appropriate wetland mitigation plan will be prepared (as described in the previous Wetlands issue), including type for type restoration, enhancement or creation within the same wood stork CFA as any wetland impacts, where practicable, to minimize wood stork foraging habitat loss.
Based on the ETAT comments, FDOT agrees with Florida Fish and Wildlife Conservation Commission and US Fish and Wildlife Services and assigns a summary degree of effect of Minimal to Wildlife and Habitat.

Degree of Effect: 2 *Minimal* assigned 07/01/2014 by Scott Sanders, FL Fish and Wildlife Conservation Commission

Coordination Document: To Be Determined: Further Coordination Required

Direct Effects

Identified Resources and Level of Importance:

The Office of Conservation Planning Services of the Florida Fish and Wildlife Conservation Commission (FWC) has coordinated an agency review of ETDM #14177, St. Lucie County, and provides the following comments related to potential effects to fish and wildlife resources on this Programming Phase project.

The Project Description Summary states that this project involves the evaluation of alternatives to widen Midway Road (CR 712) from two to four lanes between Glades Cut-Off Road and Selvitz Road, a distance of approximately 1.6 miles. The Project Description did not address the potential need for new Drainage Retention Areas (DRAs) to handle the additional stormwater runoff from the expanded roadway.

The project area was evaluated for potential fish, wildlife, and habitat resources within 500 feet of the proposed alignment. Our assessment reveals that the project area is dominated by a mix of commercial, industrial, and residential development, with 68.77% classified as High or Low Intensity Urban, and another 6.86% as Transportation (roads and rail). Other land cover types in the assessment area include Mesic Flatwoods (15.90%, 33.5 acres), Improved Pasture (4.32%, 9.1 acres), Freshwater Marshes (3.03%, 6.4 acres), Rural Lands (0.95%, 2.0 acres), and Exotic Plants (0.16%, 0.3 acres).

Based on range and preferred habitat type, the following species listed by the Federal Endangered Species Act and the State of Florida as Federally Endangered (FE), Federally Threatened (FT), State-Threatened (ST), or State Species of Special Concern (SSC) may occur along the project area: gopher frog (SSC), gopher tortoise (ST), American alligator (FT based on similarity of appearance to American crocodile), Eastern indigo snake (FT), Florida pine snake (SSC), Audubon's crested caracara (FT), Florida burrowing owl (SSC), Southeastern American kestrel (ST), Florida sandhill crane (ST), least tern (ST), wood stork (FE), limpkin (SSC), little blue heron (SSC), tricolored heron (SSC), roseate spoonbill (SSC), snowy egret (SSC), white ibis (SSC), and Sherman's fox squirrel (SSC).

The GIS analysis revealed several specific characteristics associated with lands along the project alignment that provide an indication of potential habitat quality or sensitivity that will require field studies to verify the presence or absence of listed wildlife species and the quality of wildlife habitat resources. In the FWC's Potential Habitat Richness classification, 2.32% of the assessment area is ranked moderately high, while 27.67% is ranked medium. In the Florida Natural Areas Inventory Critical Lands and Waters Identification Project (CLIP), 14.15% of the assessment area is Priority 2 (high) for Biodiversity Resources. Also in CLIP, 0.63% ranks Moderately High for Rare Species Habitat Conservation Priorities. The project area is within U.S. Fish and Wildlife Service Consultation Areas for Caracara, Florida Grasshopper Sparrow, Red-cockaded Woodpecker, Scrub Jay, and Snail Kite, and is within the core foraging area of four wood stork colonies.

Primary wildlife issues associated with this project include: potential adverse effects to a moderate number of species listed by the Federal Endangered Species Act as Endangered or Threatened, or by the State of Florida as Threatened or Species of Special Concern; potential water quality degradation as a result of additional stormwater runoff from the expanded roadway surface draining into adjacent waterways and wetlands; and potential for increased wildlife roadkill. New DRAs outside the ROW should be sited to avoid undisturbed natural habitats.

Comments on Effects to Resources:

Based on the project information provided, we believe that direct and indirect effects of this project could be minimal, provided that all roadway construction is confined to the existing ROW, any new DRAs are not constructed within areas of natural habitat, and degradation of adjacent or downstream water quality is avoided via inclusion of Best Management Practices in the project design.

Additional Comments (optional):

CLC Commitments and Recommendations:

Degree of Effect: 2 *Minimal* assigned 05/29/2014 by John Wrublik, US Fish and Wildlife Service

Coordination Document: To Be Determined: Further Coordination Required

Direct Effects

Identified Resources and Level of Importance:

Federally listed species and fish and wildlife resources

Comments on Effects to Resources:

Federally-listed species -

The Service has reviewed our Geographic Information Systems (GIS) database for recorded locations of Federally listed threatened and endangered species on or adjacent to the project study area. The GIS database is a compilation of data received from several sources. Based on review of our GIS database, the Service notes that the following Federally listed species may occur in or near the project area.

Wood Stork

The project corridor is located in the Core Foraging Areas (CFA)(within 18.6 miles) of three active nesting colonies of the endangered wood stork (*Mycteria americana*). The Service believes that the loss of wetlands within a CFA due to an action could result in the loss of foraging habitat for the wood stork. To minimize adverse effects to the wood stork, we recommend that any lost foraging habitat resulting from the project be replaced within the CFA of the affected nesting colony. Moreover, wetlands provided as mitigation should adequately replace the wetland functions lost as a result of the action. The Service does not consider the preservation of wetlands, by itself, as adequate compensation for impacts to wood stork foraging habitat, because the habitat lost is not replaced. Accordingly, any wetland mitigation plan proposed should include a restoration, enhancement, or creation component. In some cases, the Service accepts wetlands compensation located outside the CFA of the affected wood stork nesting colony. Specifically, wetland credits purchased from a "Service Approved" mitigation bank located outside of the CFA would be acceptable to the Service, provided that the impacted wetlands occur within the permitted service area of the bank.

For projects that impact 5 or more acres of wood stork foraging habitat, the Service requires a functional assessment be conducted using our "Wood Stork Foraging Analysis Methodology" (Methodology) on the foraging habitat to be impacted and the foraging habitat provided as mitigation. The Methodology can be found at: http://www.fws.gov/verobeach/ListedSpeciesBirds.html .

Florida Scrub-Jay

The project occurs within the geographic range of the threatened Florida Scrub-Jay (*Aphelocoma coerulescens*). If suitable habitat occurs in the project corridor, we recommend that surveys based on Service protocol be conducted to determine the status of the Florida scrub-jay in the project area. The Service's Florida scrub-jay survey protocol can be found at: http://www.fws.gov/verobeach/ListedSpeciesBirds.html .

Audubon's crested caracara

The project occurs within the geographic range of the threatened Audubon's crested caracara (*Polyborus cheriway = Polyborus plancus audubonii*). If suitable habitat occurs in or near the project corridor, we recommend that nest surveys based on Service protocol be conducted to determine the status of caracara nesting in the project area. The Service's caracara nest survey guidance can be found at: http://www.fws.gov/verobeach /ListedSpeciesBirds.html

The Service believes that the following federally listed species have the potential to occur in or near the project site: wood stork, Audubon's crested caracara, Florida scrub-jay, Eastern indigo snake (*Drymarchon couperi = Drymarchon corais couperi*), and Federally listed plants in St. Lucie County at http://ecos.fws.gov/ ipac/. Accordingly, the Service recommends that the Florida Department of Transportation (FDOT) prepare a Biological Assessment for the project (as required by 50 CFR 402.12) during the FDOT's Project Development and Environment process.

Fish and Wildlife Resources

Wetlands provide important habitat for fish and wildlife. According to data in the Environmental Screening tool, wetlands occur within the project area. We recommend that the project be designed to avoid these valuable resources to the greatest extent practicable. If impacts to wetlands are unavoidable, we recommend that the FDOT provides mitigation that fully compensates for the loss of wetland resources.

Additional Comments (optional):

CLC Commitments and Recommendations:

Coastal and Marine

Project Effects

Coordinator Summary Degree of Effect: 0 *None* assigned 09/03/2014 by FDOT District 4

Comments:
Based on a review of relevant GIS layers, there are no coastal and marine facilities within the project vicinity. FDOT acknowledges the ETAT agency's comments on wetlands. These concerns are addressed in detail within the corresponding sections below. A Wetlands Evaluation Report (WER) will be prepared during the PD&E phase. The report will provide habitat characterization of the existing wetlands within the corridor and the vicinity, document the existing conditions of the resources, and make recommendations for sequentially avoiding, minimizing and mitigating resource impacts.

Stormwater Pollution Prevention Plans (SWPPP) will be prepared during the design phase and incorporated into the construction contract to ensure that Contractor implements Best Management Practices (BMPs) to control stormwater runoff and other potential water quality impacts. The SWPPP will be prepared in compliance with state and federal standards. Furthermore, the Contractor will be required to obtain an FDEP NPDES permit.

If during the PD&E and/or Design Phase, wetland impacts are determined to be unavoidable, a detailed mitigation plan will be prepared. FDOT will continue coordination with regulatory agencies throughout the development of the project to ensure all potential environmental issues are fully addressed and resolved.

Based on the ETAT comments and a review of the EST GIS, FDOT assigns a summary degree of effect of None to Coastal and Marine.

Degree of Effect: 0 *None* assigned 05/28/2014 by Brandon Howard, National Marine Fisheries Service

Coordination Document: No Involvement

Direct Effects
Identified Resources and Level of Importance:
Based on our review of the information provided on the EST website, GIS-based effects analysis on wetlands and interpretation of aerial photographs, NOAA's National Marine Fisheries Service (NMFS) has determined that emergent wetlands and ditches are located within the project corridor. These wetlands range from low to moderate in quality.

Comments on Effects to Resources:
The wetlands along the proposed roadway expansion provide water quality functions, such as removal of sediments, excess nutrients, and contaminants, which benefit and support these aquatic ecosystems. Through hydrological connections, these wetlands also contribute plant material and other useable nutrients (both dissolved and particulate organic matter) into aquatic food webs that include recreationally, commercially, and ecologically important species within downstream estuaries. If wetland impacts are unavoidable, sequential minimization and mitigation should take place.

In addition to the direct impacts from filling wetlands, construction activities may impact adjacent wetlands through sedimentation and runoff.

Additional Comments (optional):

CLC Commitments and Recommendations:

Degree of Effect: 0 *None* assigned 07/01/2014 by Mindy Parrott, South Florida Water Management District

Coordination Document: Permit Required
Coordination Document Comments:
An ERP is required.

Direct Effects
Identified Resources and Level of Importance:

Comments on Effects to Resources:
Effects to Recreation, Coastal Resources and Floodplains are not anticipated based on SFWMD's review.

Additional Comments (optional):
An ERP is required.

CLC Commitments and Recommendations:

APPENDIX D
AUDUBON'S CRESTED CARACARA SURVEY REPORT

AUDUBON'S CRESTED CARACARA
(*Polyborus plancus audubonii)*

SURVEY REPORT

for

Project Development and Environment (PD&E) Study
Midway Road (CR 712) from Glades Cut Off Road to Selvitz Road
St. Lucie County, Florida

Financial Management Number: 231440-3-22-01
Federal Aid Number:
ETDM Number: 14177

Prepared for:

Florida Department of Transportation
District IV
3400 West Commercial Boulevard
Fort Lauderdale, Florida 33309

May 2016

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1.0 Introduction

As part of the Endangered Species Biological Assessment prepared for the Florida Department of Transportation (FDOT) *Project Development and Environment* (PD&E) Study for the widening of Midway Road (CR 712) between Glades Cut Off Road and Selvitz Road in St. Lucie County, Florida (***Location Map - Figure 1***), an updated survey for the Audubon's crested caracara (caracara) was conducted. A previous survey was conducted by FDOT in January 2015 for proposed improvements the Midway Road and Gaitlin Boulevard interchanges with I-95. From that survey one caracara nest was documented adjacent to I-95, west of the proposed Midway Road widening project. An updated survey was conducted from January – April 2016 and the purpose of this report is to summarize the results of this 2016 survey.

The proposed "action" under consideration is the widening of Midway Road (CR 712) from two to four lanes and the construction of stormwater management ponds. Two build alternatives were considered and compared to the No Build Alternative. Alternative 1 (Canal Avoidance) generally widens the road north of the existing while Alternative 2 (Box Culvert) generally widens the road to the south of the existing. Alternative 2 would result in culverting Canal 103 similar to the design currently under construction to the east between Selvitz Road and 25th Street.

2. 0 Existing Environmental Characteristics

2.1 Preliminary Data Collection

Prior to field reconnaissance, a desktop review was performed to identify previously documented caracara nests or suitable habitat within the project corridor. Resources that were utilized include aerial photography of the corridor (FDOT APLUS), Florida Land Use Cover, Forms, and Cover Classification System GIS layer (SFWMD), USFWS Caracara Consultation Area GIS Layer, USFWS Conservation Guidelines, USDA NRCS Soil Survey of St. Lucie County, and the Florida Natural Areas Inventory Online Biodiversity Matrix. The previous survey was also reviewed.

2.2 Preliminary Caracara Habitat Analysis

Following the desktop review, field reconnaissance was conducted to verify existing conditions and identify areas of potential habitat. General wildlife surveys were conducted in July 2015 in conjunction with the Endangered Species Biological Assessment prepared for the PD&E Study. One potentially active caracara nest and suitable habitat were documented west of Glades Cut Off Road and approximately 1500 meters north of Midway Road, east and west of Selvitz Road. Additionally, several caracara were observed flying west of the proposed project near where the previous nest was identified.

2.3 Existing Vegetative Communities and Land Uses and Vegetative Descriptions

Land cover within the areas surveyed for caracara consisted of improved pasture (FLUCFCS 211). The improved pastures consists of actively grazed cattle pastures with bahia grass and isolated patches of slash pine, cabbage palm and Brazilian pepper. Surrounding land uses in the vicinity of the areas surveyed for

caracara include the St. Lucie County Landfill, Tropicana, CEMEX, Power sub-station, water treatment facility and other miscellaneous industrial, commercial and residential development. See ***Figure 2***.

3.0 Audubon's Crested Caracara Survey

3.1 Survey Design and Planning

Pursuant to the USFWS's Crested Caracara Survey Protocol – Additional Guidance (November 2015) the following survey design was developed. During the PD&E Study field reconnaissance conducted July 2, and 15, 2015 the previous observation blocks and locations were evaluated to determine if these were still suitable for the 2016 survey. It was determined due to the presence of buildings or dense vegetation along Midway Road changes to the observation blocks was recommended. In addition, the 2015 survey did not include areas north of Midway Road between the project limits where suitable habitat is located. Attached is a map (***Figure 2***) showing the location of the observation stations. The stations were selected such that suitable caracara nesting and foraging habitat as well as the suspected nest tree could be observed. Three observation points were established along Midway Road in order to clearly see the pastures both north and south of Midway. An additional, observation point was added for this survey approximately 1500 meters north of Midway Road, west of Selvitz Road. Each of these station locations provided for unobstructed views of the project area and could be accessed via existing public roads. Thus, no private property access requests were needed.

The following provides the site location information for each Station:

Station No.	Latitude	Longitude	Section/Township/Range	County
Station 1	27.374744	-80.403206	Sec. 2, Township 36, Range 39	St. Lucie
Station 2	27.374013	-80.401119	Sec. 2, Township 36, Range 39	
Station 3	27.373885	-80.399309	Sec. 2, Township 36, Range 39	
Station 4	27.387206	-80.3665	Sec. 31, Township 35, Range 40	

Surveys were conducted from January 6, 2016 through April 26, 2016 in general accordance with the USFWS 2015 survey protocol. Each station was monitored two weeks apart beginning 15 minutes before sunrise and concluding late morning (approximately 3 hours after sunrise). No evening surveys were conducted. From a stationary position, the surveyors would search for caracara activity and presence of other birds that might elicit a response from caracara or indicate the presence of carrion that may attract caracaras. All surveys were conducted from inside the field vehicle, and, if applicable, surveyors would move to the truck bed to obtain a clearer view of the area. Surveys were conducted using high-power binoculars. Standard data forms were used to record weather conditions, general bird activity, caracara observations, and flight patterns. If a caracara was observed, the time, number of individuals, approximate age, and behavior was recorded on the data sheets (***Appendix A***). Other wildlife observations were also recorded.

4.0 Survey Results

Adult and juvenile caracara were observed during field surveys, and all observed caracara activity is presented in ***Figures 3A*** and ***3B***. A summary of all caracara activity is provided in ***Table 1***. The corresponding field data sheets are provided in ***Appendix A***.

One active caracara nest was observed within the project area. However, the nest observed during 2016 survey was approximately 190 meters northeast of the location documented by others in the 2015 survey. During the first month of the survey, both adult and juvenile caracara were observed utilizing the nest. However, as the survey season continued, activity at the nest declined.

Caracara individuals were observed at Stations 1-3 but not at Station 4. Station 4 is north of the proposed project, and was the furthest distance from the nest tree. Suitable habitat was present throughout the area surrounding Station 4.

Caracara activity around the nest tree was generally grouped into three categories: perching on a telephone pole, perching on the adjacent fence, or flying to and from the area of the nest to the surrounding pastures both north and south of Midway Road. Hunting, perching, and preening behaviors were observed during many of the surveys. At the end of the survey period, only one adult was documented.

Other bird species documented either foraging in the pastures or roadside swales or flying over the site included sandhill cranes (*Grus canadensis*), white ibis (*Eudocimus albus*), glossy ibis (*Plegadis falcinellus*), laughing gull (*Leucophaeus atricilla*), black (*Coragyps atratus*) and turkey vultures (*Cathartes aura),* red-shouldered hawk (*Buteo lineatus*), great blue heron (*Ardea herodias*), brown pelicans (*Pelecanus occidentalis*), wild turkey (*Meleagris gallopavo*), American kestrel (*Falco sparverius*), wood stork (*Mycteria americana*), eastern meadowlark (*Sturnella magna*), American robin (*Turdus migratorius*), red-tailed hawk (*Buteo jamaicensis*), osprey (*Pandion haliaetus*), belted kingfisher (*Megaceryle alcyon*), red-bellied woodpeckers (*Melanerpes carolinus*), duck species, and passerine songbirds. Additionally, a bald eagle (*Haliaeetus leucocephalus*) was seen on several surveys either flying above a station or within a field at a station.

Table 1 - Summary of Caracara Activity Observed

Date	Number of Individuals	Time	Station ID	Activity Observed
1/5/16	2	7:05 AM	1	Adults flew S to N into pine tree
1/5/16	2	7:15 AM	1	Immature flew into nest tree
1/5/16	2	7:30 AM	1	Adults feeding and perching near power pole
1/5/16	2	8:30 AM	1	Same adults as 7:05 sighting flew W over I-95
1/12/16	1	7:43 AM	3	Adult flew into pine tree at NE corner of property
1/12/16	2	8:15 AM	3	Adults flew S to N, perched in pine tree, then landed in field
1/12/16	2	8:20 AM	3	Adults from station 1 returned to nest
1/19/16	2	9:13 AM	1	One adult flew into palm and one adult perched on fence post

Table 1 - Summary of Caracara Activity Observed				
Date	**Number of Individuals**	**Time**	**Station ID**	**Activity Observed**
1/26/16	2	8:19 AM	2	Adults flew from S to pine tree then flew towards Station 1
2/2/16	1	8:00 AM	1	Adult perched on power pole
2/2/16	1	8:05 AM	1	Adult perched on power pole, then flew to opposite side of field
2/4/16	2	7:30 AM	2	One adult flew S over station, then E towards station 1 and joined with 2nd adult near road
2/9/16	1	7:30 AM	3	Adult flew S across station
2/17/16	1	6:55 AM	1	Adult flew from nest tree to power pole
2/17/16	1	7:15 AM	1	Adult flew from S across field to power pole, then to ground to eat
2/18/16	1	7:05 AM	2	Adult flew N to S over station, then back to nest
3/1/16	1	7:17 AM	1	Adult flew from S, landed in road, captured prey, then flew N
3/2/16	1	7:01 AM	2	Adult flew over station to the N, then over tree line to station 1
3/14/16	1	8:32 AM	1	Adult perched on power pole
3/14/16	1	9:26 AM	1	Adult flew from the E, perched on power pole, then flew N
3/14/16	1	9:57 AM	1	Adult flew from the N and perched on power pole, then flew to ground and captured prey
3/18/16	1	8:30 AM	2	Adult perched on power pole
3/18/16	1	9:47 AM	2	Adult flew SW over I-95
3/28/16	1	9:29 AM	1	Adult seen walking on roadway, then perched on fence post
3/31/16	1	8:19 AM	2	Adult perched on power pole at station 1, then flew E to ground, then back to pole at 9:01 AM
4/9/16	1	8:15 AM	1	Adult flew N to power pole, perched, preened, then flew N out of sight
4/11/16	1	7:57 AM	2	Adult perched on power pole at station 1
4/11/16	1	9:09 AM	2	Adult perched on power pole at station 1, then flew E along tree line
4/25/16	1	6:51 AM	1	Adult perched on power pole, flew E, then landed on ground, flew back to pole and continued this activity until 7:46 AM when caracara flew NE out of sight

5.0 Conclusions

Suitable habitat is present west and north of the Midway Road PD&E study area, and adult and juvenile caracaras were observed. Based on behavioral patterns observed throughout the season, it is likely that the nest tree was active with older juvenile caracara during the first half of the survey and less utilized during the latter half of the season. Kimley-Horn biologists observed a nesting pair of caracara and two juveniles during January surveys, and activity to and from the nest tree was frequent. By the end of February, it was rarer to see two adult caracaras, and activity centered around the nest was minimal. The nest is located within an agricultural area with frequent truck traffic on site. In addition, the parcel is located immediately east of the I-95 northbound on-ramp and Midway Road Interchange. Consequently, it is

reasonable to infer that the caracara in this area are not unduly disturbed by vehicle traffic. The nest is located approximately 1,177 meters from the western end of the project limits.

The 2016 survey results showed that the previously identified nest (2015) has moved approximately 190 meters northeast. No other nests were identified. The primary buffer (300 meters) lies outside the project area. The secondary buffer (1500 meters) overlaps the western end of the project area at Glades Cut Off Road. However, there is no new construction at the intersection with Glades Cut Off Road. The proposed widening ends east of Glades Cut Off, so construction would consist of "tie in" to the existing four lanes. The FDOT commits to the following during construction to minimize impacts to the caracara:

- Construction will be timed outside of nesting season for the "tie in" to Glades Cut Off Road
- Construction staging will be prohibited within the primary or secondary buffers.
- Prior to construction an updated caracara nest survey will be performed. Additional coordination will be conducted, if necessary with USFWS.

Based on the lack of construction in the primary or secondary buffers and the implementation of the commitments listed above, FDOT has determined that the project m*ay affect, but is not likely to adversely affect* the Audubon's crested caracara.

6.0 References

Florida Fish and Wildlife Conservation Commission. Selected GIS Layers. Office of Environmental Services Habitat Protection Planning Section. 2002.

Morrison, J.L. 1996. Crested caracara (*Caracara plancus*) in A. Poole and F. Gill, editors. The birds of North America, No. 249. The Academy of Natural Sciences, Philadelphia, Pennsylvania, and the American Ornithologists Union, Washington, DC.

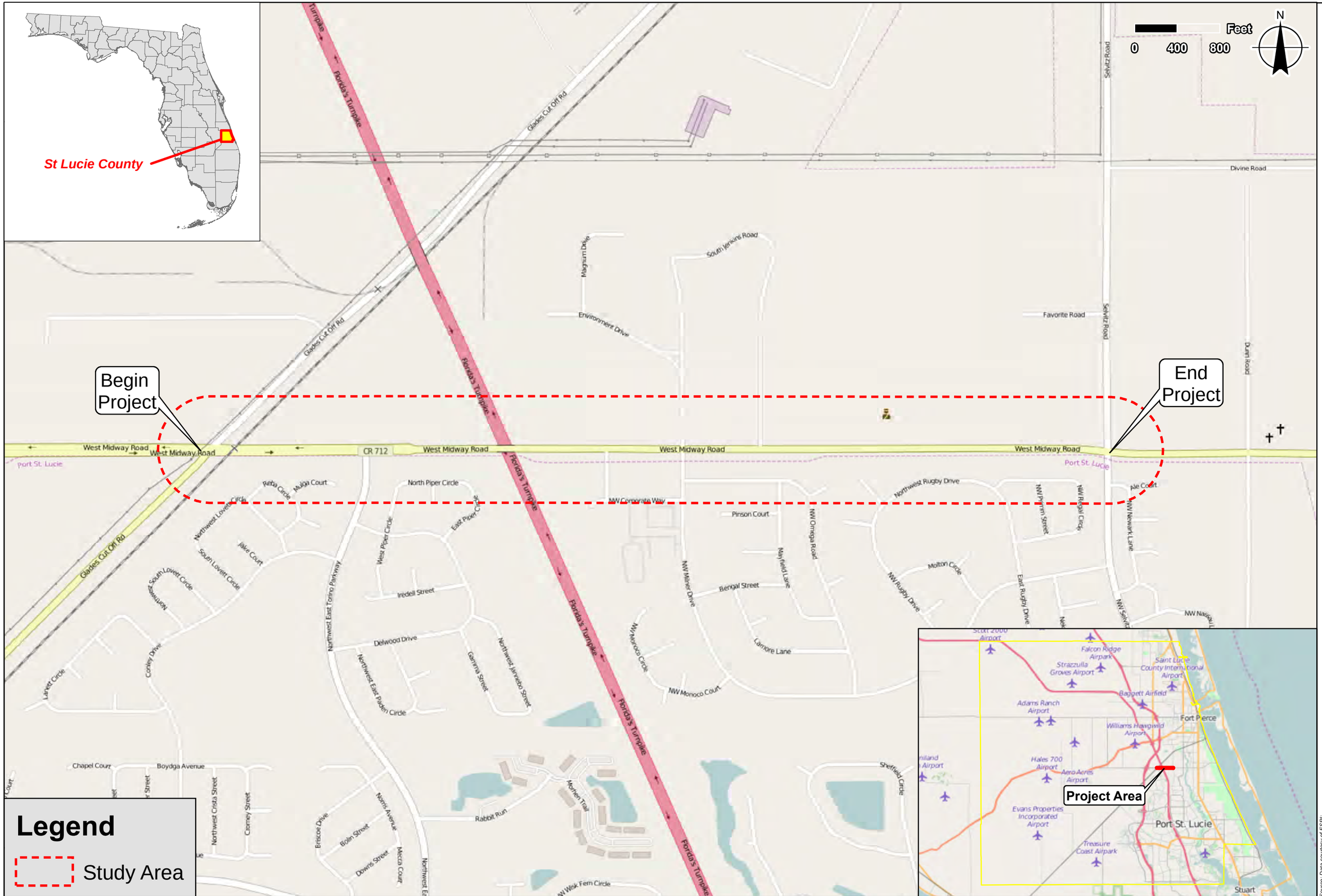
Morrison, J.L. 1997a. Reproductive ecology and habitat associations of Florida's crested caracaras (*Caracara plancus audubonii*). Dissertation, University of Florida, Gainesville, Florida, USA.

Morrison, J.L. 1999. Breeding Biology and Productivity of Florida's Crested Caracaras. *The Condor*, 101:505-517.

Morrison, J.L. 2001. Recommended management practices and survey protocols for Audubon's crested caracaras (*Caracara cheriway audubonii*) in Florida. Technical Report No. 18. Florida Fish and Wildlife Conservation Commission, Tallahassee, Florida (Appendix A).

U.S. Department of Agriculture, Soil Conservation Service. *Soil Survey of St. Lucie County*, Florida. 2007.

FIGURE 1
PROJECT LOCATION MAP



Source: Data courtesy of ESRI;

Document Path: K:\TRE_Environmental\147073003 Midway Road PD&E\ENV\GIS\MXD\Figure 1 - Project Location Map.mxd

FDOT

Project Location Map

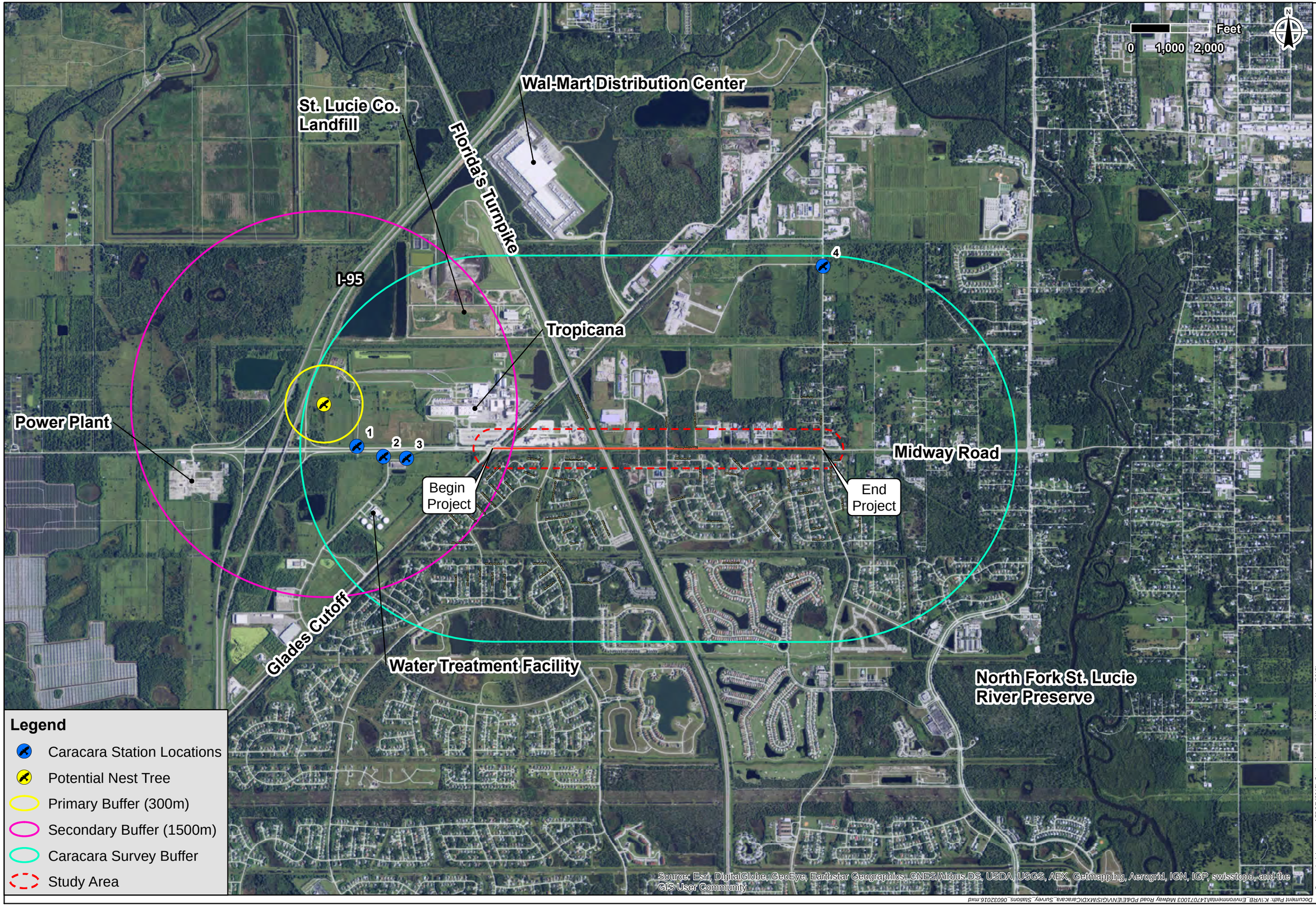
Project Development and Environment (PD&E) Study - Midway Road (CR712)
From Glades Cut Off Road (CR 709) to Selvitz Road (CR 615)
St. Lucie County, Florida
Financial Project ID: 231440-3-22-01; ETDM Number: 14177

1 inch = 800 feet

FIGURE 1

MAY 2016

FIGURE 2
SURVEY LOCATIONS



FDOT

Caracara Survey Stations Location Map

Midway Road (CR712) From Glades Cut Off Road to Selvitz Road
St. Lucie County, Florida
FPID: 231440-3-22-01

1 inch = 2000 feet

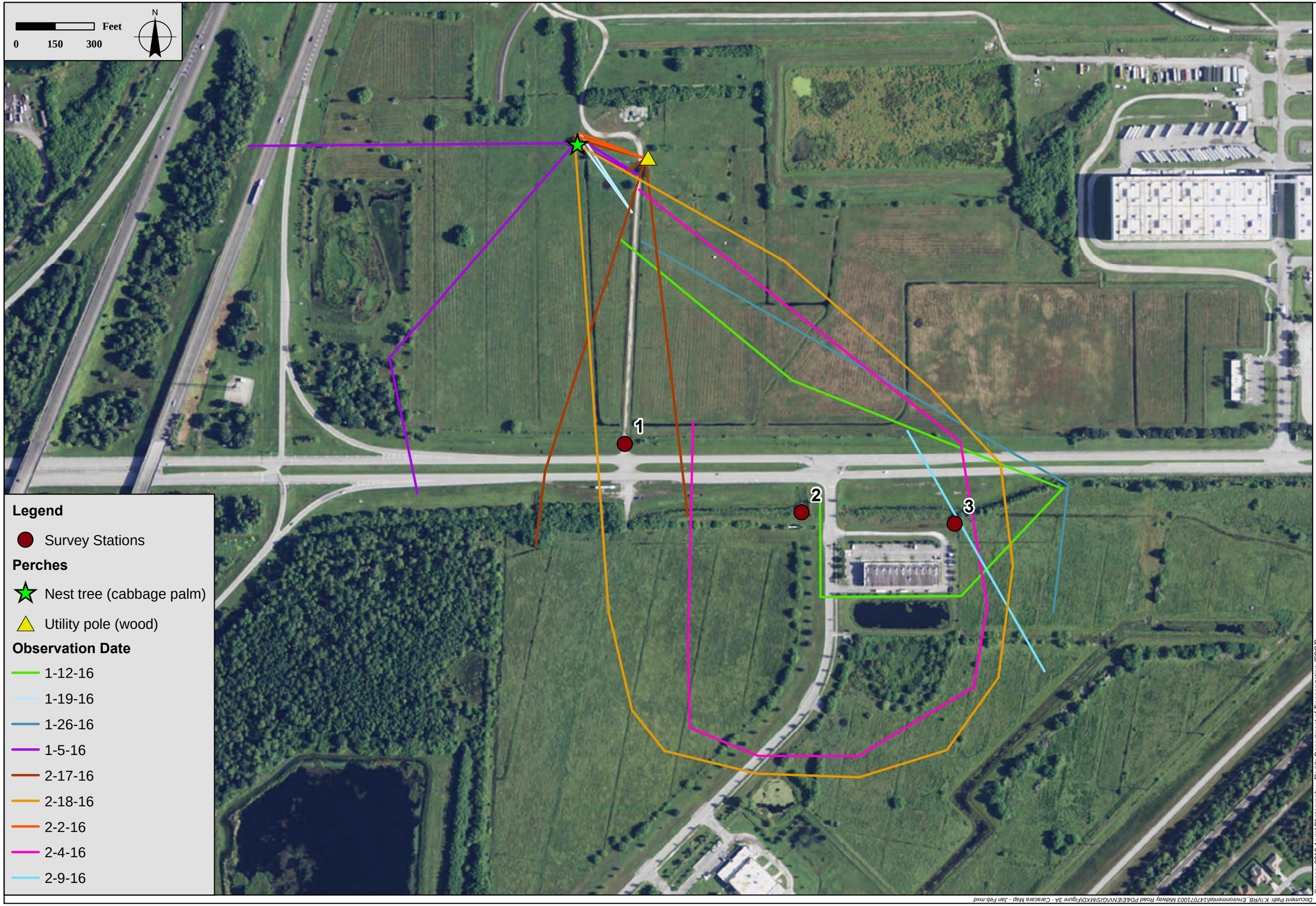
JUNE 2016

FIGURE 2

Source: Aerials courtesy of FDOT (2012); Station data courtesy of Kimley-Horn (2015).

Document Path: K:\VRB_Environmental\147071003 Midway Road PD&E\ENV\GIS\MXD\Caracara_Survey_Stations_06032016.mxd

FIGURES 3A AND 3 B
CARACARA SURVEY RESULTS



FDOT

Caracara Observation Map - January and February 2016

Project Development and Environment (PD&E) Study - Midway Road (CR712)
From Glades Cut Off Road (CR 709) to Selvitz Road (CR 615)
St. Lucie County, Florida
Financial Project ID: 231440-3-22-01; ETDM Number: 14177

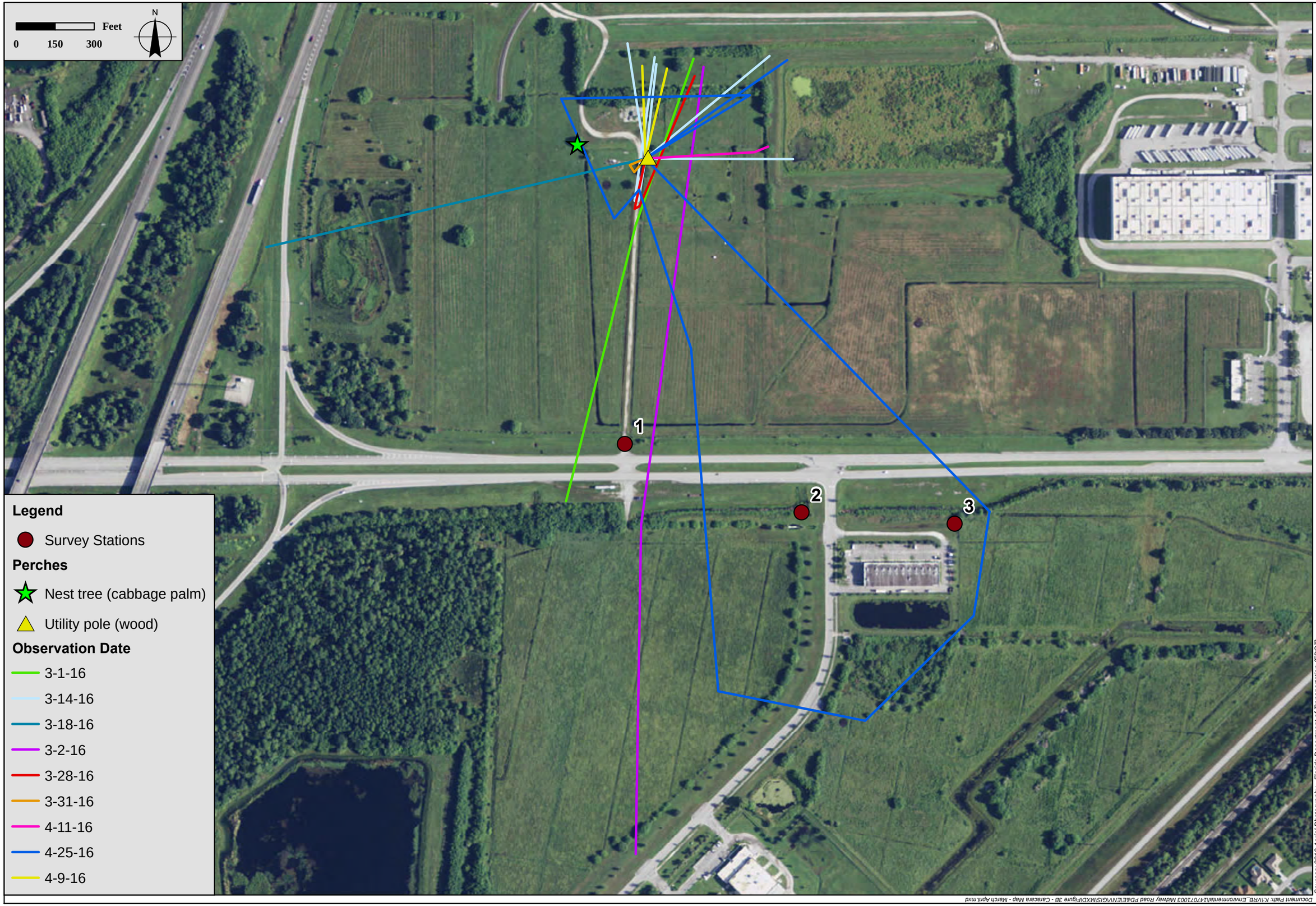
1 inch = 1600 feet

FIGURE 3A

JUNE 2016

Sources: 2012 Aerial Photography - Florida Department of Transportation (FDOT)

Document Path: K:\IVRE_Environmental\14707\003 Midway Road PD&E\ENVGIS\MXD\Figure 3A - Caracara Map - Jan Feb.mxd



FDOT

Caracara Observation Map - March and April 2016

Project Development and Environment (PD&E) Study - Midway Road (CR712)
From Glades Cut Off Road (CR 709) to Selvitz Road (CR 615)
St. Lucie County, Florida
Financial Project ID: 231440-3-22-01; ETDM Number: 14177

1 inch = 1600 feet

FIGURE 3B

JUNE 2016

Sources: 2012 Aerial Photography - Florida Department of Transportation (FDOT)

Document Path: K:\IVRE_Environmental\14707\003 Midway Road PD&E\ENVGIS\MXD\Figure 38 - Caracara Map - March April.mxd

APPENDIX A
CARACARA SURVEY DATA SHEETS

Crested Caracara Monitoring
Field Data Form

Date: 1-5-16 Start Time 7:00 Stop Time 10:00 Monitor BW, MC

Site Name and Location: **Include latitude and longitude**, section, township, and range, and county.

Midway Rd - Station 1, St. Lucie County, 27.374744, -80.403206 S2, T36S, R39E

Weather Data

Time	Temp	Wind Speed/Direction	% Cloud Cover	Cloud Type	Rain
Start	66° F	3 mph SSW	50%	low	none
Finish					

Flight Data

#	Age A/Im	Time	Description
2	A	7:05	flew S to N to pine trees, possible courtship
2	I	7:15	flew into nest tree, perched on fence posts
2	A	8:30	flew W over I-95 past pine trees

Nesting Data: Observed Activity
(perching, preening, courtship, feeding, nest building, incubation, head color change, head throwback, diving)

#	Age A/Im	Time	Description
2	Im	7:15	nest tree observed, feathers light brown
2	A	7:30	feeding (small lizard?), perching, near cattle & tall pole

General Observations
(crested caracara reaction to passing planes, trains, trucks, pedestrians, other birds, etc.)

#	Age A/Im	Time	Description
1	(eagle) Im	9:15	bald eagle lands in pasture

Crested Caracara Monitoring
Field Data Form

Date: 1-6-15 Start Time 6:50 Stop Time 9:50 Monitor BW, MC

Site Name and Location: **Include latitude and longitude**, section, township, and range, and county.

Midway Road, Station ~~X~~ renamed station 2, St. Lucie Co., 27.374013, -80.401119, S 2 T36 R37E

Weather Data

Time	Temp	Wind Speed/Direction	% Cloud Cover	Cloud Type	Rain
Start	67°	0 mph (SW)	90%		none
Finish					

Flight Data

#	Age A/Im	Time	Description

Nesting Data: Observed Activity
(perching, preening, courtship, feeding, nest building, incubation, head color change, head throwback, diving)

#	Age A/Im	Time	Description

General Observations
(crested caracara reaction to passing planes, trains, trucks, pedestrians, other birds, etc.)

#	Age A/Im	Time	Description
N/A	Both	continuously	Seagulls, ibis, passerine songbirds, sandhill cranes present

Crested Caracara Monitoring
Field Data Form

Date: 1-12-15 Start Time 6:45 Stop Time 9:45 Monitor BW, MC

Site Name and Location: **Include latitude and longitude**, section, township, and range, and county.

Midway Station 3

Weather Data

Time	Temp	Wind Speed/Direction	% Cloud Cover	Cloud Type	Rain
Start	51°	0-2, S	75%		none
Finish	55°	0-2, ESE	75%		none

Flight Data

#	Age A/Im	Time	Description
1	A	7:43	flew to perch in pine tree at NE corner of prop. / flew E to W behind building S of station
2	A	8:15	flew S to N, perched shortly in pine row located in field, eating → see notes 8:22 on back

Nesting Data: Observed Activity
(perching, preening, courtship, feeding, nest building, incubation, head color change, head throwback, diving)

#	Age A/Im	Time	Description
2	A	8:20	pair from station 1 returned to nest (likely)

General Observations
(crested caracara reaction to passing planes, trains, trucks, pedestrians, other birds, etc.)

#	Age A/Im	Time	Description
			passerine song birds, ducks, vultures, N to S over station 2 bald eagles (soaring flight) 8:00
			8:40 juvenile bald eagle S to N across station

Crested Caracara Monitoring
Field Data Form

Date: 1-13-15 Start Time 6:45 Stop Time 9:45 Monitor BO, MC

Site Name and Location: **Include latitude and longitude**, section, township, and range, and county.

Midway Station #4

Weather Data

Time	Temp	Wind Speed/Direction	% Cloud Cover	Cloud Type	Rain
Start	50°	0-2 SSW	50-75%		none
Finish	54°	0-2 S	50%		none

Flight Data

#	Age A/Im	Time	Description

Nesting Data: Observed Activity
(perching, preening, courtship, feeding, nest building, incubation, head color change, head throwback, diving)

#	Age A/Im	Time	Description

General Observations
(crested caracara reaction to passing planes, trains, trucks, pedestrians, other birds, etc.)

#	Age A/Im	Time	Description

Crested Caracara Monitoring
Field Data Form

Date: 1-19-16 Start Time 6:45 Stop Time 9:45 Monitor BW, MC

Site Name and Location: **Include latitude and longitude**, section, township, and range, and county.

Station 1 - Midway Rd,

Weather Data

Time	Temp	Wind Speed/Direction	% Cloud Cover	Cloud Type	Rain
Start	44°	0-2 mph N	75%		none
Finish	52°	0-2 mph N	25%		none

Flight Data

#	Age A/Im	Time	Description
X		~~9:35~~	~~flew from W behind B. pop~~
2	A	9:13	one flew into palm, one perched on low fence post

Nesting Data: Observed Activity
(perching, preening, courtship, feeding, nest building, incubation, head color change, head throwback, diving)

#	Age A/Im	Time	Description

General Observations
(crested caracara reaction to passing planes, trains, trucks, pedestrians, other birds, etc.)

#	Age A/Im	Time	Description
			sandhill cranes, eagle from N to S to W, 2 red-shouldered hawks

Crested Caracara Monitoring
Field Data Form

Date: 1-20-16 Start Time 6:45 Stop Time 9:45 Monitor BW, MC

Site Name and Location: **Include latitude and longitude**, section, township, and range, and county.

Midway Station 2

Weather Data

Time	Temp	Wind Speed/Direction	% Cloud Cover	Cloud Type	Rain
Start	47°	2-4 mph NW	75%		none
Finish	58°	2-4 mph NW			none

Flight Data

#	Age A/Im	Time	Description

Nesting Data: Observed Activity
(perching, preening, courtship, feeding, nest building, incubation, head color change, head throwback, diving)

#	Age A/Im	Time	Description

General Observations
(crested caracara reaction to passing planes, trains, trucks, pedestrians, other birds, etc.)

#	Age A/Im	Time	Description
			great blue heron perched in pine, 7-10 vultures

Crested Caracara Monitoring
Field Data Form

Date: 1-26-15 Start Time 6:45 Stop Time 9:45 Monitor BW, MC

Site Name and Location: **Include latitude and longitude**, section, township, and range, and county.

Station #3 (Midway)

Weather Data

Time	Temp	Wind Speed/Direction	% Cloud Cover	Cloud Type	Rain
Start	56°	10 mph ENE	50%		none
Finish	65°				

-rain sprinkle <5mins at 9:20

Flight Data

#	Age A/Im	Time	Description
2	A	8:19	flew from S to pine (stopped) then flew in direction of Station 1

Nesting Data: Observed Activity
(perching, preening, courtship, feeding, nest building, incubation, head color change, head throwback, diving)

#	Age A/Im	Time	Description

General Observations
(crested caracara reaction to passing planes, trains, trucks, pedestrians, other birds, etc.)

#	Age A/Im	Time	Description
			several passing sandhill cranes, passerine songbirds, herons, plovers (mostly N to S or S to N)

✓

↗ Friday survey used because Wed was rained out

Crested Caracara Monitoring
Field Data Form

Date: 1-29-16 Start Time 6:45 Stop Time 9:45 Monitor BW, MC

Site Name and Location: **Include latitude and longitude**, section, township, and range, and county.

Midway Station #4 (NE quad station)

Weather Data

Time	Temp	Wind Speed/Direction	% Cloud Cover	Cloud Type	Rain
Start	56°	7-10 mph NW	30-40%		none
Finish	57°	10 mph NW	25%		none

Flight Data

#	Age A/Im	Time	Description

Nesting Data: Observed Activity
(perching, preening, courtship, feeding, nest building, incubation, head color change, head throwback, diving)

#	Age A/Im	Time	Description

General Observations
(crested caracara reaction to passing planes, trains, trucks, pedestrians, other birds, etc.)

#	Age A/Im	Time	Description
			7:10 – lots of general activity → egrets, vultures, anhinga, wood stork, Kestrel, kingfisher

Crested Caracara Monitoring
Field Data Form

Date: 2-2-16 Start Time 6:45 Stop Time 9:45 Monitor BW, MC

Site Name and Location: **Include latitude and longitude**, section, township, and range, and county.

Station 1

Weather Data

Time	Temp	Wind Speed/Direction	% Cloud Cover	Cloud Type	Rain
Start	60°	0-4mph	0-20%		some fog early
Finish	74°	0-4mph	0-20%		none

Flight Data

#	Age A/Im	Time	Description
1	A	8:00	perched on power pole (same as prior surveys)
1	A	8:05	" " w/ material (food or nest) in mouth → flew to opposite side of field into palm

Nesting Data: Observed Activity
(perching, preening, courtship, feeding, nest building, incubation, head color change, head throwback, diving)

#	Age A/Im	Time	Description

General Observations
(crested caracara reaction to passing planes, trains, trucks, pedestrians, other birds, etc.)

#	Age A/Im	Time	Description

✓

Crested Caracara Monitoring
Field Data Form

Date: 2-4-16 Start Time 6:45 Stop Time 9:45 Monitor BW, MC

Site Name and Location: **Include latitude and longitude**, section, township, and range, and county.

Midway Station ~~2~~ X (S of station 1 to W)

Weather Data → changed name to Station 2

Time	Temp	Wind Speed/Direction	% Cloud Cover	Cloud Type	Rain
Start	67°	3-5 mph	20-30%		none
Finish	75°	S-15	10%	Cirrus	none

Flight Data

#	Age A/Im	Time	Description
1/2	A	7:30	flew S over station then turned E + flew toward station 1/landfill, met #2 near road

Nesting Data: Observed Activity
(perching, preening, courtship, feeding, nest building, incubation, head color change, head throwback, diving)

#	Age A/Im	Time	Description

General Observations
(crested caracara reaction to passing planes, trains, trucks, pedestrians, other birds, etc.)

#	Age A/Im	Time	Description
1	A	7:45	bald eagle skirted E side of station + flew south / carrying food in mouth
		—	sandhill cranes passing, vultures, ducks, glossy ibis, robins, E. meadowlark

✓

Crested Caracara Monitoring
Field Data Form

Date: 2-9-16 Start Time 6:45 Stop Time 9:45 Monitor BW, MC

Site Name and Location: **Include latitude and longitude**, section, township, and range, and county.

Station X (SE field area)
→ changed name to station 3

Weather Data

Time	Temp	Wind Speed/Direction	% Cloud Cover	Cloud Type	Rain
Start	52°	10-20 mph W	30-40 %	clr	none
Finish	56°	0-10 mph W	20-30 %		none

Flight Data

#	Age A/Im	Time	Description
1	A	7:30	flew 3 across station

Nesting Data: Observed Activity
(perching, preening, courtship, feeding, nest building, incubation, head color change, head throwback, diving)

#	Age A/Im	Time	Description

General Observations
(crested caracara reaction to passing planes, trains, trucks, pedestrians, other birds, etc.)

#	Age A/Im	Time	Description

Crested Caracara Monitoring
Field Data Form

Date: 2-10-15 Start Time 6:45 Stop Time 9:45 Monitor BW, MC

Site Name and Location: **Include latitude and longitude**, section, township, and range, and county.

Station 4

Weather Data

Time	Temp	Wind Speed/Direction	% Cloud Cover	Cloud Type	Rain
Start	45°	5-10 NW	20%		none
Finish	50°	5-10 NW	90%		none

Flight Data

#	Age A/Im	Time	Description

Nesting Data: Observed Activity
(perching, preening, courtship, feeding, nest building, incubation, head color change, head throwback, diving)

#	Age A/Im	Time	Description

General Observations
(crested caracara reaction to passing planes, trains, trucks, pedestrians, other birds, etc.)

#	Age A/Im	Time	Description
			Kingfisher, woodpeckers,

Crested Caracara Monitoring
Field Data Form

Date: 2-17-16 Start Time 6:45 Stop Time 9:45 Monitor BW, MC

Site Name and Location: **Include latitude and longitude**, section, township, and range, and county.

Midway RD, Station 2 (field w/ trucks + nest)

Weather Data

Time	Temp	Wind Speed/Direction	% Cloud Cover	Cloud Type	Rain
Start	48°	0-5 mph	50%		none
Finish	56°	0-5 mph	10-20%		none

Flight Data

#	Age A/Im	Time	Description
1	A	6:55	flew from nest tree to pole
1	A	7:15	flew from S across field to pole (something in beak) perched then flew to ground to eat

Nesting Data: Observed Activity
(perching, preening, courtship, feeding, nest building, incubation, head color change, head throwback, diving)

#	Age A/Im	Time	Description

General Observations
(crested caracara reaction to passing planes, trains, trucks, pedestrians, other birds, etc.)

#	Age A/Im	Time	Description

Crested Caracara Monitoring
Field Data Form

Date: 2-18-16 Start Time 6:45 Stop Time 9:45 Monitor BW, MC

Site Name and Location: **Include latitude and longitude**, section, township, and range, and county.

Midway Rd, Station 2 (S of road adjacent to Station 1)

Weather Data

Time	Temp	Wind Speed/Direction	% Cloud Cover	Cloud Type	Rain
Start	52°	0-5 mph	0-10%		none
Finish	69°	5-10 mph	0-10%		none

Flight Data

#	Age A/Im	Time	Description
1	A	7:05	flew N to S over station, looped around + flew back to nest

Nesting Data: Observed Activity
(perching, preening, courtship, feeding, nest building, incubation, head color change, head throwback, diving)

#	Age A/Im	Time	Description

General Observations
(crested caracara reaction to passing planes, trains, trucks, pedestrians, other birds, etc.)

#	Age A/Im	Time	Description

J

Crested Caracara Monitoring
Field Data Form

Date: 9-23-16 Start Time 6:30 Stop Time 9:30 Monitor BW, MC

Site Name and Location: **Include latitude and longitude**, section, township, and range, and county.

Midway Station 3

Weather Data

Time	Temp	Wind Speed/Direction	% Cloud Cover	Cloud Type	Rain
Start	61°	0-2 mph SSE	20%		none
Finish	69°	0-5 mph SE	20-30%		none

Flight Data

#	Age A/Im	Time	Description

Nesting Data: Observed Activity
(perching, preening, courtship, feeding, nest building, incubation, head color change, head throwback, diving)

#	Age A/Im	Time	Description

General Observations
(crested caracara reaction to passing planes, trains, trucks, pedestrians, other birds, etc.)

#	Age A/Im	Time	Description

✓

Crested Caracara Monitoring
Field Data Form

Date: 2-25-16 Start Time 6:30 Stop Time 4:30 Monitor BW, MC

Site Name and Location: **Include latitude and longitude**, section, township, and range, and county.

Midway Station 4 (far E station)

Weather Data

Time	Temp	Wind Speed/Direction	% Cloud Cover	Cloud Type	Rain
Start	52°	0-5 mph S	20-30%		none
Finish	67°	5-10 mph SE	0-10%		none

Flight Data

#	Age A/Im	Time	Description

Nesting Data: Observed Activity
(perching, preening, courtship, feeding, nest building, incubation, head color change, head throwback, diving)

#	Age A/Im	Time	Description

General Observations
(crested caracara reaction to passing planes, trains, trucks, pedestrians, other birds, etc.)

#	Age A/Im	Time	Description
			Kestrel, kingbird, passing mockingbirds, woodpeckers

✓

Crested Caracara Monitoring
Field Data Form

Date: 3-1-16 Start Time 6:30 Stop Time 9:30 Monitor BW, MC

Site Name and Location: **Include latitude and longitude**, section, township, and range, and county.

Station 1

Weather Data

Time	Temp	Wind Speed/Direction	% Cloud Cover	Cloud Type	Rain
Start	53°	0-5 mph E	30-40%		none
Finish	67°	0-5 mph E	0-10%		none

Flight Data

#	Age A/Im	Time	Description
1	A	7:17	flew from S, landed in road (new behavior), captured lizard, flew N over treeline

Nesting Data: Observed Activity
(perching, preening, courtship, feeding, nest building, incubation, head color change, head throwback, diving)

#	Age A/Im	Time	Description

General Observations
(crested caracara reaction to passing planes, trains, trucks, pedestrians, other birds, etc.)

#	Age A/Im	Time	Description

Crested Caracara Monitoring
Field Data Form

Date: 3-2-16 Start Time 6:30 Stop Time 9:30 Monitor BW, MC

Site Name and Location: **Include latitude and longitude**, section, township, and range, and county.

Midway Station 2

Weather Data

Time	Temp	Wind Speed/Direction	% Cloud Cover	Cloud Type	Rain
Start	59°	0-5 WNW	10-20		none
Finish	67°	0-5 WSW	0-10		none

Flight Data

#	Age A/Im	Time	Description
1	A	7:01	flew over station N tower treeline at station 1

Nesting Data: Observed Activity
(perching, preening, courtship, feeding, nest building, incubation, head color change, head throwback, diving)

#	Age A/Im	Time	Description

General Observations
(crested caracara reaction to passing planes, trains, trucks, pedestrians, other birds, etc.)

#	Age A/Im	Time	Description
			less general bird activity than normal

Crested Caracara Monitoring
Field Data Form

Date: 3-7-16 Start Time 6:25 Stop Time 9:25 Monitor BW, MC

Site Name and Location: **Include latitude and longitude**, section, township, and range, and county.

Midway Station 3

Weather Data

Time	Temp	Wind Speed/Direction	% Cloud Cover	Cloud Type	Rain
Start	50°	0-5 mph NW	0-10%		none
Finish	75°	10-20 mph N	10-20%		none

Flight Data

#	Age A/Im	Time	Description

Nesting Data: Observed Activity
(perching, preening, courtship, feeding, nest building, incubation, head color change, head throwback, diving)

#	Age A/Im	Time	Description

General Observations
(crested caracara reaction to passing planes, trains, trucks, pedestrians, other birds, etc.)

#	Age A/Im	Time	Description
			great blue heron, wood storks foraging in field

Crested Caracara Monitoring
Field Data Form

Date: 3-10-16 Start Time 6:25 Stop Time 9:45 Monitor MC, TO

Site Name and Location: **Include latitude and longitude**, section, township, and range, and county.

Midway Station 4

Weather Data

Time	Temp	Wind Speed/Direction	% Cloud Cover	Cloud Type	Rain
Start	71°	0-5	20-30		none
Finish	75°	5-10	10-20		none

Flight Data

#	Age A/Im	Time	Description

Nesting Data: Observed Activity
(perching, preening, courtship, feeding, nest building, incubation, head color change, head throwback, diving)

#	Age A/Im	Time	Description

General Observations
(crested caracara reaction to passing planes, trains, trucks, pedestrians, other birds, etc.)

#	Age A/Im	Time	Description
			Woodstork passing over NW, Sandhill crane flying,

✓

Crested Caracara Monitoring
Field Data Form

Date: 3-14-16 Start Time 7:15 Stop Time 10:15 Monitor BM MC, MA

Site Name and Location: **Include latitude and longitude**, section, township, and range, and county.

Midway Station 1

Weather Data

Time	Temp	Wind Speed/Direction	% Cloud Cover	Cloud Type	Rain
Start	68°	0-5 SSW	50%		none
Finish	74°	6 SSW	90-100		NONE

Flight Data

#	Age A/Im	Time	Description
1	A	8:32	Perched on pole
1	A	9:26	Came from the E, perched on pole then flew N over trees
1	A	9:57	came from the N, perched on pole, flew to ground, stalked prey, perched on fence, flew back

Nesting Data: Observed Activity
(perching, preening, courtship, feeding, nest building, incubation, head color change, head throwback, diving)

#	Age A/Im	Time	Description
			lots of crows in nest tree, caracara didn't seem interested. Couldn't see other Adult in nest

General Observations
(crested caracara reaction to passing planes, trains, trucks, pedestrians, other birds, etc.)

#	Age A/Im	Time	Description

Crested Caracara Monitoring
Field Data Form

Date: 3-18-16 Start Time 7:10 Stop Time 10:10 Monitor BM MC, MA

Site Name and Location: **Include latitude and longitude**, section, township, and range, and county.

Midway Station 2

Weather Data

Time	Temp	Wind Speed/Direction	% Cloud Cover	Cloud Type	Rain
Start	62°F	0-5mph	40		N
Finish	71	5-10mph	25		N

Flight Data

#	Age A/Im	Time	Description

Nesting Data: Observed Activity
(perching, preening, courtship, feeding, nest building, incubation, head color change, head throwback, diving)

#	Age A/Im	Time	Description

General Observations
(crested caracara reaction to passing planes, trains, trucks, pedestrians, other birds, etc.)

#	Age A/Im	Time	Description
1	A	8:30	(carrion) perched in pole
1	A	9:47	Flew over I-95 NW SW

✓

Crested Caracara Monitoring
Field Data Form

Date: 3/21/2016 Start Time 7:00 Stop Time 10:00 Monitor MC + TD

Site Name and Location: **Include latitude and longitude**, section, township, and range, and county.

Midway Station 3

Weather Data

Time	Temp	Wind Speed/Direction	% Cloud Cover	Cloud Type	Rain
Start	57°F	10-20	10-20		None
Finish	55°F	15-20	10-20		None

Flight Data

#	Age A/Im	Time	Description

Nesting Data: Observed Activity
(perching, preening, courtship, feeding, nest building, incubation, head color change, head throwback, diving)

#	Age A/Im	Time	Description

General Observations
(crested caracara reaction to passing planes, trains, trucks, pedestrians, other birds, etc.)

#	Age A/Im	Time	Description
			red tailed hawk, wood stork, sandhill crane

Crested Caracara Monitoring
Field Data Form

Date: 3/23 Start Time 7:10 Stop Time 10:10 Monitor MA/MC

Site Name and Location: **Include latitude and longitude**, section, township, and range, and county.

Midway Station 4

Weather Data

Time	Temp	Wind Speed/Direction	% Cloud Cover	Cloud Type	Rain
Start	58°	0-5	40		No
Finish	71°	5-10	50-60		No

Flight Data

#	Age A/Im	Time	Description

Nesting Data: Observed Activity
(perching, preening, courtship, feeding, nest building, incubation, head color change, head throwback, diving)

#	Age A/Im	Time	Description

General Observations
(crested caracara reaction to passing planes, trains, trucks, pedestrians, other birds, etc.)

#	Age A/Im	Time	Description
			Woodstork, Turkey - M

Crested Caracara Monitoring
Field Data Form

Date: ~~2020~~ 03/28 Start Time 7:00 Stop Time 10:00 Monitor MA/MC

Site Name and Location: **Include latitude and longitude**, section, township, and range, and county.

Midway Station 1

Weather Data

Time	Temp	Wind Speed/Direction	% Cloud Cover	Cloud Type	Rain
Start	72	0-5	90%		N
Finish					

Flight Data

#	Age A/Im	Time	Description
1	A	9:29	walking on roadway - perched on fencepost preening 8 min looking around 7 min

Nesting Data: Observed Activity
(perching, preening, courtship, feeding, nest building, incubation, head color change, head throwback, diving)

#	Age A/Im	Time	Description

General Observations
(crested caracara reaction to passing planes, trains, trucks, pedestrians, other birds, etc.)

#	Age A/Im	Time	Description

✓

Crested Caracara Monitoring
Field Data Form

Date: 3/31/16 Start Time 7:00 Stop Time 10:00 Monitor MA/MC

Site Name and Location: **Include latitude and longitude**, section, township, and range, and county.

Midway Station 2

Weather Data

Time	Temp	Wind Speed/Direction	% Cloud Cover	Cloud Type	Rain
Start	69	0	80		N
Finish					

Flight Data

#	Age A/Im	Time	Description
1	A	8:19	Perched on telephone pole at station 1
			8:51 Flew East to ground → 9:01 to pole

Nesting Data: Observed Activity
(perching, preening, courtship, feeding, nest building, incubation, head color change, head throwback, diving)

#	Age A/Im	Time	Description
~~1~~	~~A~~	~~8:19~~	~~Perched on telephone pole @ station 1~~

General Observations
(crested caracara reaction to passing planes, trains, trucks, pedestrians, other birds, etc.)

#	Age A/Im	Time	Description
1		8:29	Osprey
1	A	8:51	Red tailed Hawk

Crested Caracara Monitoring
Field Data Form

Date: 4-5-16 Start Time 6:50 Stop Time 9:50 Monitor MC, MA

Site Name and Location: **Include latitude and longitude**, section, township, and range, and county.

Station 3 (S of road)

Weather Data

Time	Temp	Wind Speed/Direction	% Cloud Cover	Cloud Type	Rain
Start	58°	5-10 WNW	0-10		none
Finish	65°	5-10 WNW	0-10		none

Flight Data

#	Age A/Im	Time	Description

Nesting Data: Observed Activity
(perching, preening, courtship, feeding, nest building, incubation, head color change, head throwback, diving)

#	Age A/Im	Time	Description

General Observations
(crested caracara reaction to passing planes, trains, trucks, pedestrians, other birds, etc.)

#	Age A/Im	Time	Description
			less bird activity than past weeks

✓

Crested Caracara Monitoring
Field Data Form

Date: 4-8-16 Start Time 6:45 Stop Time 9:45 Monitor MC, MA

Site Name and Location: **Include latitude and longitude**, section, township, and range, and county.

Midway Station 4

Weather Data

Time	Temp	Wind Speed/Direction	% Cloud Cover	Cloud Type	Rain
Start	61°	0-5 NW	0-10%		none
Finish	66°	0-5 NW	0-10		none

Flight Data

#	Age A/Im	Time	Description

Nesting Data: Observed Activity
(perching, preening, courtship, feeding, nest building, incubation, head color change, head throwback, diving)

#	Age A/Im	Time	Description

General Observations
(crested caracara reaction to passing planes, trains, trucks, pedestrians, other birds, etc.)

#	Age A/Im	Time	Description
			Swainson's hawk, red tailed hawk, wood stork, ducks

✓

Crested Caracara Monitoring
Field Data Form

Date: 4-9-16 Start Time 6:40 Stop Time 9:40 Monitor MC, MA

Site Name and Location: **Include latitude and longitude**, section, township, and range, and county.

Midway Station 1

Weather Data

Time	Temp	Wind Speed/Direction	% Cloud Cover	Cloud Type	Rain
Start	47°	0-5 NW	20-30		none
Finish	65°	5-10 N	0		none

Flight Data

#	Age A/Im	Time	Description
1	A	8:15	flew from N to pole, perched, preened, flew away at 8:37 to N

Nesting Data: Observed Activity
(perching, preening, courtship, feeding, nest building, incubation, head color change, head throwback, diving)

#	Age A/Im	Time	Description

General Observations
(crested caracara reaction to passing planes, trains, trucks, pedestrians, other birds, etc.)

#	Age A/Im	Time	Description

✓

Crested Caracara Monitoring
Field Data Form

Date: 4/11 Start Time 6:45 Stop Time 9:45 Monitor MA

Site Name and Location: **Include latitude and longitude**, section, township, and range, and county.

#2

Weather Data

Time	Temp	Wind Speed/Direction	% Cloud Cover	Cloud Type	Rain
Start	70°	ESE 5-10mph	75		N
Finish	75°	E 10-15MPH	40		N

Flight Data

#	Age A/Im	Time	Description
1	A	7:57	Perched on telephone pole site #1
1	A	9:09	Perched on telephone pole site #1 - Flew E along treeline @9:13 & landed in tree.

Nesting Data: Observed Activity
(perching, preening, courtship, feeding, nest building, incubation, head color change, head throwback, diving)

#	Age A/Im	Time	Description

General Observations
(crested caracara reaction to passing planes, trains, trucks, pedestrians, other birds, etc.)

#	Age A/Im	Time	Description
1	A	7:23	Red tailed Hawk
2	A	9:31	Red tailed Hawk - W of I-95

Crested Caracara Monitoring
Field Data Form

Date: 4-19-16 Start Time 6:35 Stop Time 9:35 Monitor MC, MA

Site Name and Location: **Include latitude and longitude**, section, township, and range, and county.

Midway Station 3

Weather Data

Time	Temp	Wind Speed/Direction	% Cloud Cover	Cloud Type	Rain
Start	66°	0-5 NE	30-40%		none
Finish	73°	0-5 NE	0-10%		none

Flight Data

#	Age A/Im	Time	Description

Nesting Data: Observed Activity
(perching, preening, courtship, feeding, nest building, incubation, head color change, head throwback, diving)

#	Age A/Im	Time	Description

General Observations
(crested caracara reaction to passing planes, trains, trucks, pedestrians, other birds, etc.)

#	Age A/Im	Time	Description
			lower bird activity than normal, sandhill crane flyover,
			some wood stork flyover

Crested Caracara Monitoring
Field Data Form

Date: 4/20/16 Start Time 6:36 Stop Time 9:36 Monitor MA/MC

Site Name and Location: **Include latitude and longitude**, section, township, and range, and county.

Weather Data

Time	Temp	Wind Speed/Direction	% Cloud Cover	Cloud Type	Rain
Start	62°	0-5	90		N
Finish	70	0-5	85		N

Flight Data

#	Age A/Im	Time	Description

Nesting Data: Observed Activity
(perching, preening, courtship, feeding, nest building, incubation, head color change, head throwback, diving)

#	Age A/Im	Time	Description

General Observations
(crested caracara reaction to passing planes, trains, trucks, pedestrians, other birds, etc.)

#	Age A/Im	Time	Description
1	A	6:56	white Ibis
1	A	7:28	osprey flew E → W over tree line

Crested Caracara Monitoring
Field Data Form

Date: 4/25/16 Start Time 6:25 Stop Time 9:25 Monitor MA/MC

Site Name and Location: **Include latitude and longitude**, section, township, and range, and county.

Station 1

Weather Data

Time	Temp	Wind Speed/Direction	% Cloud Cover	Cloud Type	Rain
Start	~~60~~ 69	~~5-10~~ 0-5	35		none
Finish	78	0-5	10-20		none

Flight Data

#	Age A/Im	Time	Description
1	A	6:51	Perched on pole, flew E behind OJ building, then looped W over station 1 + landed E of pole on ground
		7:21	back to pole, 7:29 flew to ground + back to pole (being pestered by mockingbird)
		7:35	flew W (chased by crow) then back to pole then along powerline to more NE of train cars, then perched on poles
		7:46	flew NE toward landfill (out of sight)

Nesting Data: Observed Activity
(perching, preening, courtship, feeding, nest building, incubation, head color change, head throwback, diving)

#	Age A/Im	Time	Description

General Observations
(crested caracara reaction to passing planes, trains, trucks, pedestrians, other birds, etc.)

#	Age A/Im	Time	Description
			*not disturbed by moving train

Crested Caracara Monitoring
Field Data Form

Date: 4/26/16 Start Time 6:25 Stop Time 9:25 Monitor MA/MC

Site Name and Location: **Include latitude and longitude**, section, township, and range, and county.

Station 2

Weather Data

Time	Temp	Wind Speed/Direction	% Cloud Cover	Cloud Type	Rain
Start	69	0-5	35		
Finish					

Flight Data

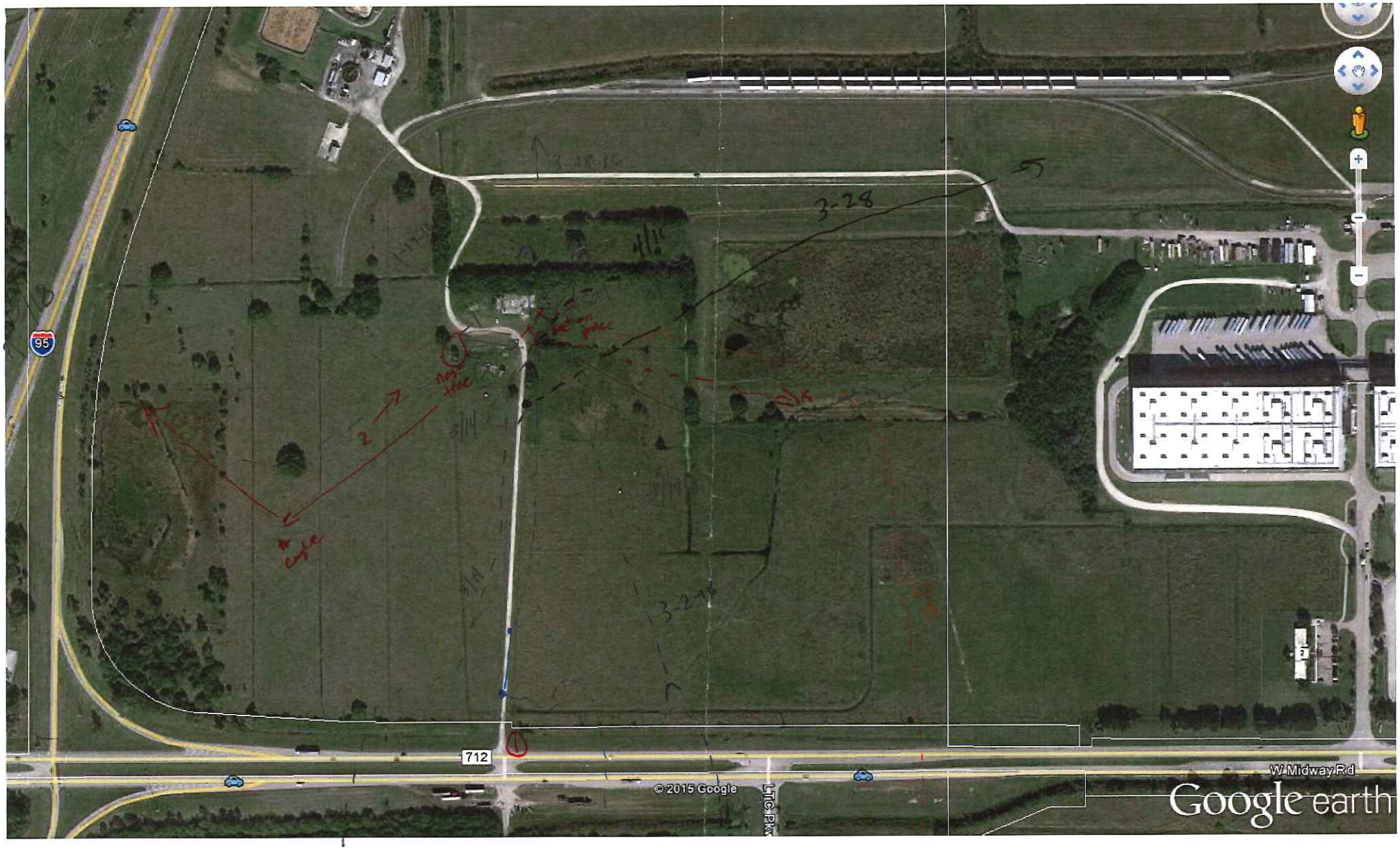
#	Age A/Im	Time	Description

Nesting Data: Observed Activity
(perching, preening, courtship, feeding, nest building, incubation, head color change, head throwback, diving)

#	Age A/Im	Time	Description

General Observations
(crested caracara reaction to passing planes, trains, trucks, pedestrians, other birds, etc.)

#	Age A/Im	Time	Description



*survey 1

*survey 2

*survey 3 ----

* 2-17-16

* 3-1-16 → landed on road then went to edge to cut / went

* station 2 3-2-16 ---

* 3/14 ---

* 3-18

3-28 fence to landfill

3/31 sat on pole

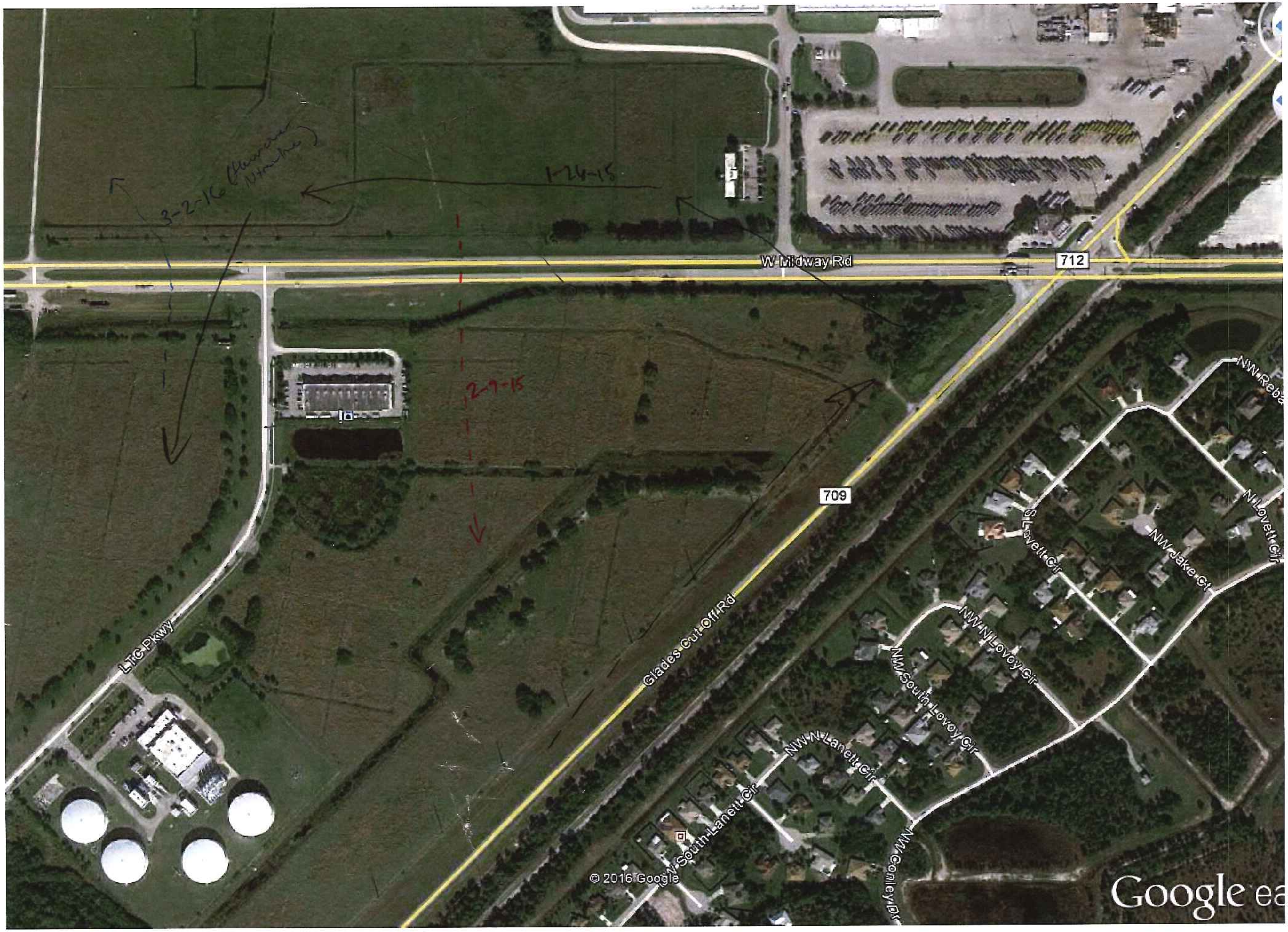
4/11 Saturn pole - Flew E to perch in tree

* Feb 4 ...

* Feb 18 ...

709
Prosperity Dr
Energy Ln
Divine Rd
© 2015 Google
Google earth

W Midway Rd
712
709
Glades Cut Off Rd
LTC Pkwy
NW Lovett Cir
NW Jake Ct
NW N Lovoy Cir
NW South Lovoy Cir
NW N Lanett Cir
NW South Lanett Cir
© 2016 Google



W Midway Rd
712
709
Glades Cut Off Rd
LTC Pkwy
NW Rebe
N Lovett Cir
NW Jake Ct
S Lovett Cir
NW N Lovoy Cir
NW South Lovoy Cir
NW N Lanett Cir
NW South Lanett Cir
NW Conley Dr
© 2016 Google
Google ea
1-24-15
2-9-15
3-2-16

APPENDIX B
PHOTOGRAPHS

Typical view of pasture at the stations

Typical view of pasture at the stations

Kimley»Horn
© 2016 Kimley-Horn and Associates, Inc.
445 24th Street, Suite 200, Vero Beach, FL 32960
Phone (772) 794-4100
www.kimley-horn.com

Site Photographs

Project Development and Environment Study (PD&E)
Midway Road (CR 712)
Audubon's Crested Caracara Survey
St. Lucie County, FL

SCALE: NTS	**Financial Project ID: 231440-3-22-01**	DATE: June 2016	Appendix B

Typical view of pasture at the stations

Typical view of pasture at the stations

Kimley»Horn
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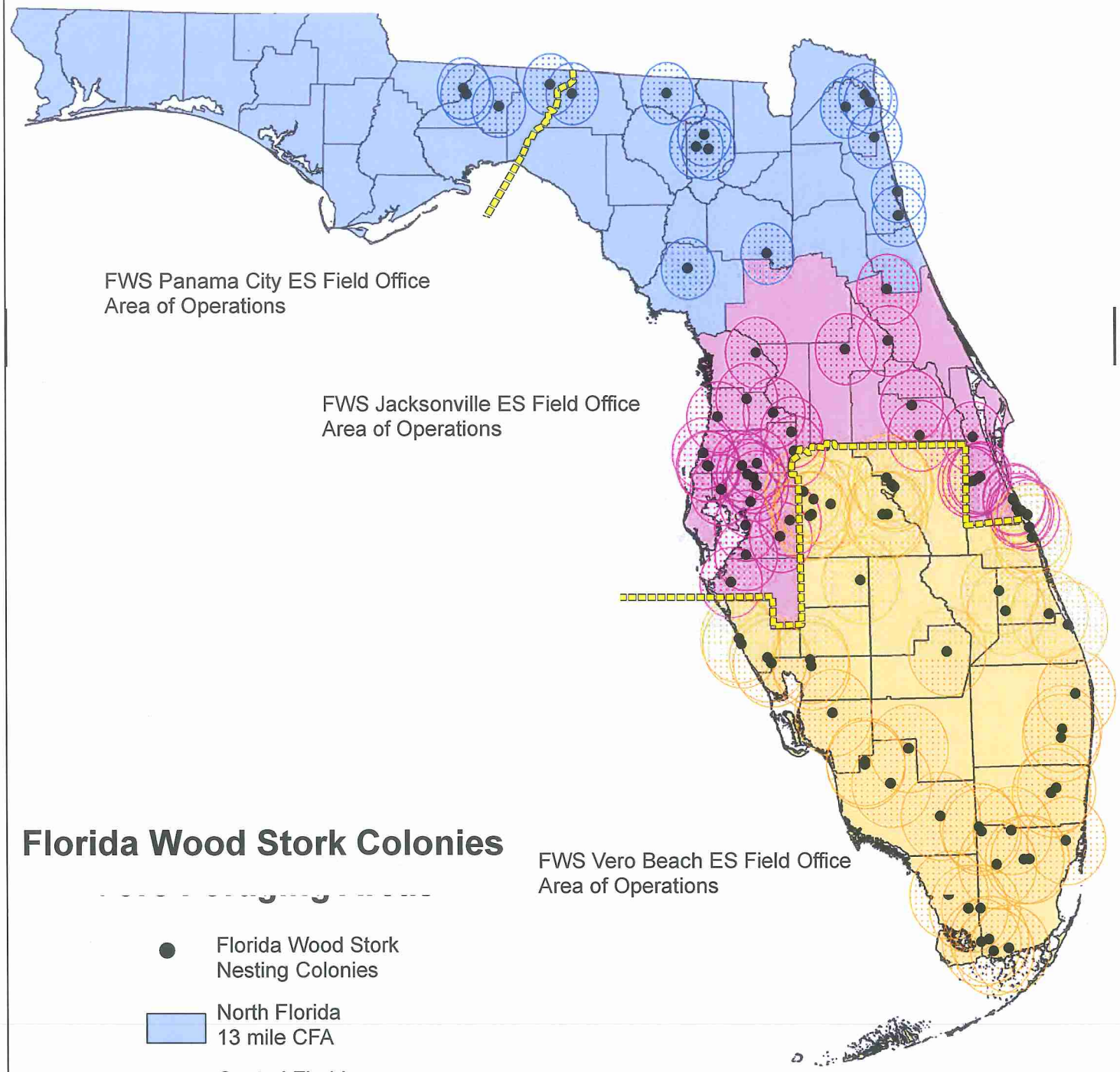
St. Lucie County, FL

SCALE: NTS	**Financial Project ID: 231440-3-22-01**	DATE: June 2016	Appendix B

APPENDIX E
FLORIDA WOOD STORK COLONIES CORE FORAGING AREAS MAP



Florida Wood Stork Colonies

Florida Wood Stork Nesting Colonies

North Florida 13 mile CFA

Central Florida 15 mile CFA

South Florida 18.6 mile CFA

N

0 25 50 100 Miles

The U.S. Fish and Wildlife Service gives no warranty, either expressed or implied, as to the accuracy, reliability, or completeness of this map.

November 1, 2007

APPENDIX F
STANDARD PROTECTION MEASURES FOR THE EASTERN INDIGO SNAKE

STANDARD PROTECTION MEASURES FOR THE EASTERN INDIGO SNAKE
U.S. Fish and Wildlife Service
August 12, 2013

The eastern indigo snake protection/education plan (Plan) below has been developed by the U.S. Fish and Wildlife Service (USFWS) in Florida for use by applicants and their construction personnel. At least **30 days prior** to any clearing/land alteration activities, the applicant shall notify the appropriate USFWS Field Office via e-mail that the Plan will be implemented as described below (North Florida Field Office: jaxregs@fws.gov; South Florida Field Office: verobeach@fws.gov; Panama City Field Office: panamacity@fws.gov). As long as the signatory of the e-mail certifies compliance with the below Plan (including use of the attached poster and brochure), no further written confirmation or "approval" from the USFWS is needed and the applicant may move forward with the project.

If the applicant decides to use an eastern indigo snake protection/education plan other than the approved Plan below, written confirmation or "approval" from the USFWS that the plan is adequate must be obtained. At least 30 days prior to any clearing/land alteration activities, the applicant shall submit their unique plan for review and approval. The USFWS will respond via e-mail, typically within 30 days of receiving the plan, either concurring that the plan is adequate or requesting additional information. A concurrence e-mail from the appropriate USFWS Field Office will fulfill approval requirements.

The Plan materials should consist of: 1) a combination of posters and pamphlets (see **Poster Information** section below); and 2) verbal educational instructions to construction personnel by supervisory or management personnel before any clearing/land alteration activities are initiated (see **Pre-Construction Activities** and **During Construction Activities** sections below).

POSTER INFORMATION

Posters with the following information shall be placed at strategic locations on the construction site and along any proposed access roads (a final poster for Plan compliance, to be printed on 11" x 17" or larger paper and laminated, is attached):

DESCRIPTION: The eastern indigo snake is one of the largest non-venomous snakes in North America, with individuals often reaching up to 8 feet in length. They derive their name from the glossy, blue-black color of their scales above and uniformly slate blue below. Frequently, they have orange to coral reddish coloration in the throat area, yet some specimens have been reported to only have cream coloration on the throat. These snakes are not typically aggressive and will attempt to crawl away when disturbed. Though indigo snakes rarely bite, they should NOT be handled.

SIMILAR SNAKES: The black racer is the only other solid black snake resembling the eastern indigo snake. However, black racers have a white or cream chin, thinner bodies, and WILL BITE if handled.

LIFE HISTORY: The eastern indigo snake occurs in a wide variety of terrestrial habitat types throughout Florida. Although they have a preference for uplands, they also utilize some wetlands

and agricultural areas. Eastern indigo snakes will often seek shelter inside gopher tortoise burrows and other below- and above-ground refugia, such as other animal burrows, stumps, roots, and debris piles. Females may lay from 4 - 12 white eggs as early as April through June, with young hatching in late July through October.

PROTECTION UNDER FEDERAL AND STATE LAW: The eastern indigo snake is classified as a Threatened species by both the USFWS and the Florida Fish and Wildlife Conservation Commission. "Taking" of eastern indigo snakes is prohibited by the Endangered Species Act without a permit. "Take" is defined by the USFWS as an attempt to kill, harm, harass, pursue, hunt, shoot, wound, trap, capture, collect, or engage in any such conduct. Penalties include a maximum fine of $25,000 for civil violations and up to $50,000 and/or imprisonment for criminal offenses, if convicted.

Only individuals currently authorized through an issued Incidental Take Statement in association with a USFWS Biological Opinion, or by a Section 10(a)(1)(A) permit issued by the USFWS, to handle an eastern indigo snake are allowed to do so.

IF YOU SEE A <u>LIVE</u> EASTERN INDIGO SNAKE ON THE SITE:

- Cease clearing activities and allow the live eastern indigo snake sufficient time to move away from the site without interference;
- Personnel must NOT attempt to touch or handle snake due to protected status.
- Take photographs of the snake, if possible, for identification and documentation purposes.
- Immediately notify supervisor or the applicant's designated agent, **and** the appropriate USFWS office, with the location information and condition of the snake.
- If the snake is located in a vicinity where continuation of the clearing or construction activities will cause harm to the snake, the activities must halt until such time that a representative of the USFWS returns the call (within one day) with further guidance as to when activities may resume.

IF YOU SEE A <u>DEAD</u> EASTERN INDIGO SNAKE ON THE SITE:

- Cease clearing activities and immediately notify supervisor or the applicant's designated agent, **and** the appropriate USFWS office, with the location information and condition of the snake.
- Take photographs of the snake, if possible, for identification and documentation purposes.
- Thoroughly soak the dead snake in water and then freeze the specimen. The appropriate wildlife agency will retrieve the dead snake.

Telephone numbers of USFWS Florida Field Offices to be contacted if a live or dead eastern indigo snake is encountered:

North Florida Field Office – (904) 731-3336
Panama City Field Office – (850) 769-0552
South Florida Field Office – (772) 562-3909

PRE-CONSTRUCTION ACTIVITIES

1. The applicant or designated agent will post educational posters in the construction office and throughout the construction site, including any access roads. The posters must be clearly visible to all construction staff. A sample poster is attached.

2. Prior to the onset of construction activities, the applicant/designated agent will conduct a meeting with all construction staff (annually for multi-year projects) to discuss identification of the snake, its protected status, what to do if a snake is observed within the project area, and applicable penalties that may be imposed if state and/or federal regulations are violated. An educational brochure including color photographs of the snake will be given to each staff member in attendance and additional copies will be provided to the construction superintendent to make available in the onsite construction office (a final brochure for Plan compliance, to be printed double-sided on 8.5" x 11" paper and then properly folded, is attached). Photos of eastern indigo snakes may be accessed on USFWS and/or FWC websites.

3. Construction staff will be informed that in the event that an eastern indigo snake (live or dead) is observed on the project site during construction activities, all such activities are to cease until the established procedures are implemented according to the Plan, which includes notification of the appropriate USFWS Field Office. The contact information for the USFWS is provided on the referenced posters and brochures.

DURING CONSTRUCTION ACTIVITIES

1. During initial site clearing activities, an onsite observer may be utilized to determine whether habitat conditions suggest a reasonable probability of an eastern indigo snake sighting (example: discovery of snake sheds, tracks, lots of refugia and cavities present in the area of clearing activities, and presence of gopher tortoises and burrows).

2. If an eastern indigo snake is discovered during gopher tortoise relocation activities (i.e. burrow excavation), the USFWS shall be contacted within one business day to obtain further guidance which may result in further project consultation.

3. Periodically during construction activities, the applicant's designated agent should visit the project area to observe the condition of the posters and Plan materials, and replace them as needed. Construction personnel should be reminded of the instructions (above) as to what is expected if any eastern indigo snakes are seen.

POST CONSTRUCTION ACTIVITIES

Whether or not eastern indigo snakes are observed during construction activities, a monitoring report should be submitted to the appropriate USFWS Field Office within 60 days of project completion. The report can be sent electronically to the appropriate USFWS e-mail address listed on page one of this Plan.

ATTENTION:

THREATENED EASTERN INDIGO SNAKES MAY BE PRESENT ON THIS SITE!!!

IF YOU SEE A LIVE EASTERN INDIGO SNAKE ON THE SITE:

- Cease clearing activities and allow the eastern indigo snake sufficient time to move away from the site without interference.
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Panama City Field Office – (850) 769-0552
South Florida Field Office – (772) 562-3909

Killing, harming, or harassing indigo snakes is strictly prohibited and punishable under State and Federal Law.

DESCRIPTION: The eastern indigo snake is one of the largest non-venomous snakes in North America, with individuals often reaching up to 8 feet in length. They derive their name from the glossy, blue-black color of their scales above and uniformly slate blue below. Frequently, they have orange to coral reddish coloration in the throat area, yet some specimens have been reported to only have cream coloration on the throat. These snakes are not typically aggressive and will attempt to crawl away when disturbed. Though indigo snakes rarely bite, they should NOT be handled.

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August 12, 2013

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August 12, 2013

ATTENTION:

THREATENED EASTERN INDIGO SNAKES MAY BE PRESENT ON THIS SITE!!!

Please read the following information provided by the U.S. Fish and Wildlife Service to become familiar with standard protection measures for the eastern indigo snake.

APPENDIX 10

Contamination Screening Evaluation Report

LEVEL 1
CONTAMINATION SCREENING EVALUATION REPORT (CSER)

Project Development and Environment (PD&E) Study
Midway Road (CR 712) from
Glades Cut Off Road (CR 709) to Selvitz Road (CR 615)
St. Lucie County, Florida

Financial Project ID: 231440-3-22-01
Federal Aid Number:
ETDM Number: 14177

Florida Department of Transportation District 4
3400 West Commercial Boulevard
Fort Lauderdale, Florida 33309

August 2016

LEVEL 1
CONTAMINATION SCREENING EVALUATION REPORT (CSER)

Project Development and Environment (PD&E) Study
Midway Road (CR 712) from
Glades Cut Off Road (CR 709) to Selvitz Road (CR 615)
St. Lucie County, Florida

Financial Project ID: 231440-3-22-01
Federal Aid Number:
ETDM Number: 14177

Prepared for:
Inwood Consulting Engineers
3000 Dovera Drive, Suite 200
Oviedo, Florida 32765

Prepared by:

TIERRA SOUTH FLORIDA, INC.
2765 Vista Parkway, Suite 10
West Palm Beach, Florida 33411

TSF Project No.: 7111-15-154

August 2016

Executive Summary

This CSER was prepared in accordance with the FDOT PD&E Manual, Part 2, Chapter 22 (latest revision). The purpose of this report is to present the findings of a Level 1 contamination screening evaluation for the proposed improvements; to identify, review, and evaluate known or potential contamination problems; provide risk rankings for properties, facilities or sites that have the potential for contamination to affect the proposed improvements; and to present recommendations concerning these problems. This CSER includes file and regulatory document research, local and state historical land use reviews, field reconnaissance, and interviews with site/facility owners (when necessary) and nearby businesses and residents where possible. The details for each site investigated are discussed in the table provided in **Appendix A**.

For purposes of this report, the project study area includes an approximate 500 foot area extending beyond the project corridor or potential pond areas and 1000 feet for solid waste facilities which meets the search requirements for the SFWMD. Suspect facilities or sites within this search distance are investigated for their potential for petroleum contamination or hazardous materials to impact the proposed project improvements. Details for specific sites are outlined in **Appendix A**. Site locations are presented in **Appendix B**.

When facilities/sites are identified in proximity to the right-of-way, they are assigned a risk ranking using the FDOT's standard methodology (High, Medium, Low or No). In a similar manner, pond sites are assigned a risk ranking so they can be evaluated as part of the overall engineering design process. This Level 1 CSER has resulted in the following High/Medium risk rankings; all sites are discussed further in **Appendix A**:

Table 1
Risk Ranking Summary

Mainline Sites		
Site Name	**Initial Risk Ranking**	**Comments**
Townstar # 38	**High**	Based on the close proximity of the underground storage tank (UST) area to the right-of-way (ROW) and the currently contaminated site status, this facility is given a contamination risk ranking of "**High**."
CSX Railroad	**High**	Based on its close proximity to the project corridor, the CSX Railroad is given a contamination risk ranking of "**High**."
Former Agricultural Field	**Medium**	Based on historic uses of pesticides and herbicides, the Former Agricultural Fields are given a risk ranking of "**Medium**."
Potential Pond Areas		
Potential Pond Area	**Initial Risk Ranking**	**Comments**
Pond A * Existing pond site	**Low**	Pond A is agricultural land dating back to 1970, woodlands dating back to 1992 and existing storm water pond since 2004. Pond A is an existing Pond
Exfiltration Trench	**Low**	Exfiltration trench to be within existing right of way.
Pond B-1	**Low**	Pond B-1 is a cement stockyard for the adjoining CEMEX plant.
Pond B-2	**Medium**	Pond B-2 is agricultural land dating back to 1970, woodlands dating back to 1992 and residences since 2004.
Pond 1	**Low**	Pond 1 is wetland and rangeland dating back to 1944.
Pond 2-3 * Existing pond site	**Low**	Pond 2-3 is agricultural land dating back to 1944, and woodlands dating back to 1969. Pond 2-3 is an existing pond

For sites or potential pond areas ranked “No” or “Low,” no additional work is recommended at this time. These facilities are located at a distance that would not be expected to present contamination involvement to the project. Although the distances vary to make this determination, “No” and “Low” sites are generally greater than 100 feet from the project corridor or pond site. Should a facility’s permitting or regulatory status change between now and the time acquisitions are initiated, additional screening should be conducted.

For those locations with a risk ranking of “Medium” or “High,” Level 2 field screening should be conducted unless proposed improvements do not include new right of way purchase or modifications to existing conditions. These sites have been determined to have potential contaminants, which may impact the project and are generally located within 100 feet of the project corridor or pond site. A soil and groundwater sampling plan should be developed for each site. The sampling plan would provide sufficient detail as to the number of soil and groundwater samples to be obtained and the specific analytical test to be performed. A site location sketch for each facility showing all proposed boring locations and groundwater monitoring wells would be prepared. Additional requirements for dewatering may be required by the SFWMD for impacted sites within 500 feet and solid waste facilities within 1000 feet of proposed dewatering areas.

This *Executive Summary* provides a brief overview of the environmental contamination concerns associated with the proposed roadway improvement project. The reader should utilize the detailed information presented within this report for specific information regarding any area of particular interest.

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Appendix E.... Supplemental Information
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1.0 Introduction

This CSER was prepared in accordance with the FDOT PD&E Manual, Part 2, Chapter 22 (latest revision). The purpose of this report is to present the findings of a Level 1 contamination screening evaluation for the proposed improvements; to identify, review, and evaluate known or potential contamination problems; provide risk rankings for properties, facilities or sites that have the potential for contamination to affect the proposed improvements; and to present recommendations concerning these problems. This CSER includes file and regulatory document research, local and state historical land use reviews, field reconnaissance, and interviews with site/facility owners (when necessary) and nearby businesses and residents where possible. The details for each site investigated are discussed in the table provided in **Appendix A**.

2.0 Project Description

The Midway Rd. (CR 712) project corridor is centrally located in the eastern part of St. Lucie County, Florida, and is owned and maintained by St. Lucie County. The project corridor extends approximately 1.6 miles along Midway Rd. (Roadway ID 94530000), from Glades Cut Off Rd. (Mile Post 5.813) to Selvitz Rd. (Mile Post 7.405). The project ties into the existing 4-lane section to the west of Glades Cut Off Rd. and to future 4-lane segments from Selvitz Rd. to just east of US Highway 1. The project corridor is located in unincorporated St. Lucie County but is the northern border to the City of Port St. Lucie.

Midway Rd. (CR 712) is a major east-west roadway that provides a vital connection to residents and commuters to and from Interstate 95 (I-95) to the commercial areas along US 1. Within the project limits, Midway Rd. (CR 712) is a two-lane undivided roadway with a varying posted speed from 35 to 45 miles per hour (mph). It is functionally classified as an Urban Principal Arterial and is designated as a hurricane evacuation route by the Florida Division of Emergency Management. The existing roadway typical section consists of two 12-foot lanes, one in each direction, and the existing right-of-way (ROW) varies with a minimum width of 70 feet. The land uses consist of residential, commercial, government, and industrial facilities, such as Tropicana Products, Inc., CEMEX, Packers of Indian River Ltd., US Post Office, St. Lucie County Sheriff's Office, and New Horizons of the Treasure Coast, Inc.

The study corridor includes a bridge (ID 940050) over Florida's Turnpike (SR 91). The Florida East Coast (FEC) railroad traverses the corridor by running adjacent and parallel to the Glades Cut Off Rd. Canal 103, which is part of the St. Lucie Water Control District, is the principal receiving water body for the project area and conveys stormwater from the west side of Florida's Turnpike through an existing concrete box culvert. The canal runs parallel along the south side of Midway Rd. (CR 712) and, after Selvitz Rd., it diverges and continues southeasterly to discharge into the North Fork of the St. Lucie River. The North Fork is designated as an Outstanding Florida Water and an Aquatic Preserve. It is the main collector water body in St. Lucie County and discharges into the Indian River Lagoon. The canal, along with the adjacent vegetative buffer, provides a physical separation to the residential homes on the south side.

The Midway Rd. (CR 712) PD&E Study from Glades Cut Off Rd. to Selvitz Rd. will evaluate alternatives to widen the existing road from two to four lanes within the project limits in order to satisfy future traffic demand and capacity needs. The proposed study will also consider pedestrian, bicycle, and transit facilities and improvements to freight mobility, and it will evaluate operational improvements and access management into some commercial businesses along the project corridor. Additional right-of- way requirements will be evaluated during the PD&E study for offsite ponds in order to meet stormwater management requirements.

2.1 Purpose and Need

Based on recent traffic data from St. Lucie County, the facility does not adequately handle the existing traffic demand. Without capacity improvements, the traffic operations along the corridor will continue to deteriorate. The primary purpose for this project is to provide additional capacity to meet existing and future traffic needs, improve safety by alleviating existing roadway and capacity deficiencies, and allow opportunities for pedestrian, bicycle, and transit facilities. The additional capacity will also improve freight mobility and enhance emergency evacuation along the project corridor. The purpose and need of this project are further described below and include Transportation Demand, Capacity, Plan Consistency, Social Demands and Economic Development, Modal Interrelationships, and Roadway Deficiencies.

2.1.2 Transportation Demand

The US Census-designated Port St. Lucie-Fort Pierce Metropolitan Statistical Area has been identified as one of the fastest growing metropolitan areas in Florida, which includes all of Martin and St. Lucie counties. From 2000 to 2010, this metropolitan area has experienced population growth from 319,426 persons in 2000 to 424,107 persons in 2010, representing an annual increase of 2.9%. Evaluating the population growth for the City of Port St. Lucie by itself revealed an even greater percentage increase. According to the Bureau of Economic and Business Research, the City has grown from a population of 88,769 in 2000 to 164,603 in 2010, representing an annual increase of 6.4%. This rapid population growth has resulted in a significant increase in surface transportation demand along major arterials such as the Midway Rd. (CR 712) corridor. The population of the Port St. Lucie-Fort Pierce metropolitan area is projected to increase from 424,107 persons in year 2010 to 648,600 persons in year 2035, representing a growth of approximately 53% (Bureau of Economic Business Research). As the population in the metropolitan area continues to increase, the developments in St. Lucie County will continue to push westward. In addition, the county is anticipated to experience traffic growth from the Developments of Regional Impact (DRI). A review of the recent DRI applications in the Treasure Coast Regional Planning Council shows the following statuses for the DRIs in the vicinity of the project corridor:

- Completed - Orange Blossom Mall and St. Lucie West
- Approved - The Reserve
- Pending Notice of Proposed Change - LTC Ranch
- Withdrawn - Provences and Orchard Park

The DRI located along Midway Rd. (CR 712), which is LTC Ranch, would have the greatest impact on the project corridor if constructed. As currently approved, the development includes 4,000 dwelling units of residential, over 1,505,000 square feet (sq. ft.) of office space, 725,000 sq. ft. of retail, and 1,960,200 sq. ft. of industrial space. However, the status of this development is pending Notice of Proposed Change that may result in a change in the size of the approved development.

The approval of the LTC Ranch DRI will further increase the transportation demand resulting in congested conditions along the project corridor. Since Midway Rd. (CR 712) is one of the vital east-west corridors in St. Lucie County, it is critical to increase capacity to meet the anticipated future transportation demand.

2.1.3 Capacity

Traffic data obtained from the St. Lucie County Transportation Planning Organization (TPO) Traffic Counts and Level of Service Report shows that the 2012 Annual Average Daily Traffic (AADT) along Midway Rd. (CR 712) west of Selvitz Rd. is 16,820 vehicles. Evaluating this traffic data using the 2012 FDOT Quality/Level of Service Handbook, the LOS is F which is beyond the St. Lucie County's adopted LOS criteria of E. This traffic data shows that the existing volume is already exceeding the capacity of the corridor which indicates that the roadway is operating in oversaturated and undesirable conditions. Furthermore, due to the industrial properties along the corridor, it has a high truck percentage at over 7% (Florida Traffic Online). The traffic is anticipated to increase to 29,200 AADT by 2040 and the corridor will continue to operate at LOS F with degraded traffic operation unless the capacity is increased. The future traffic projections are based on the FDOT District Four Design Traffic Technical Memorandum for the I-95 PD&E Study from north of Becker Rd. to south of SR 70. This project utilized the Greater Treasure Coast Regional Planning Model as the basis for the future traffic projections. Without improvements, the congestion on the Midway Rd. (CR 712) project corridor will continue to operate at unacceptable driving conditions for residents and commuters due to the increased traffic volumes.

2.1.4 Plan Consistency

Martin and St. Lucie counties have independent Metropolitan Planning Organization/Transportation Planning Organization (MPO/TPO) but share a common Regional Long Range Transportation Plan (RLRTP). The RLRTP establishes a unified strategy for transportation priorities and funding and creates a joint decision-making process regarding regional transportation issues. The Midway Rd. (CR 712) project corridor extends from Glades Cut Off Rd. to Selvitz Rd. and is identified in the Martin and St. Lucie 2035 RLRTP. The project is identified in the St. Lucie County TPO 2035 Cost Feasible Plan (2016-2035) with a 2021-2025 implementation horizon. In addition, the project will be included in the next update to the State Transportation Improvement Program and the St. Lucie TPO Transportation Improvement Program. It should be noted that on the south side of the project corridor a multipurpose trail has been identified in the 2035 RLRTP in Table 4-9 of the Needs Plan Development.

2.1.5 Social Demands & Economic Development

Evacuation: Serving as part of the evacuation route network established by the Florida Division of Emergency Management, Midway Rd. (CR 712) plays an important role in facilitating traffic during emergency evacuation periods as it connects other major highways and arterials designated on the state evacuation route network within the project limits. These facilities include Okeechobee Rd. (SR 70), I-95, Glades Cut Off Rd. (CR 709), Selvitz Rd., South 25th Street (CR 615), Oleander Avenue (CR 605), and US 1. During a twelve-month period in 2004-2005, St. Lucie County was hit directly by three major hurricanes. Midway Rd. (CR 712) is one of the county's most critical east-west routes and serves as a vital evacuation route for hurricanes or any other disasters. Additionally, widening Midway Rd. (CR 712) will ease traffic flow between South 25th Street and I-95, which will minimize a bottleneck effect during an emergency. It would also improve the ability of the local emergency management organization to evacuate large portions of the Treasure Coast in an acceptable timeframe which will enhance the safety of residents.

Economic Development: The Treasure Coast Planning Council Alternative Infill Development Plan developed for Martin and St. Lucie counties has identified several regional workplace districts located along the Midway Rd. (CR 712) corridor. These regional workplace districts are

locations where business and economic development would be focused in order to provide jobs for residents within this metropolitan area. The Midway Rd. (CR 712) project area is a high-growth area. Important state and federal offices and nonprofit centers are located along Midway Rd. (CR 712) or nearby streets. This includes the main St. Lucie County Branch of the US Post Office, St. Lucie County Sheriff's Office, St. Lucie County Health Department, St. Lucie County Fire District Office, Hospice of the Treasure Coast, and New Horizons of the Treasure Coast, Inc. (a mental health center which is currently expanding). Significant truck traffic from the nearby St. Lucie County Landfill, CEMEX, Packers of Indian River Ltd., and Tropicana Products, Inc. place additional demands on the roadway. Meanwhile, new residential units are planned nearby. The St. Lucie County Fairgrounds, the County's Emergency Operations Center, is just six miles west of the project site.

According to the Martin and St. Lucie 2035 RLRTP, "The Regional Workplace Districts in St. Lucie County are located along the I-95 and Florida's Turnpike corridors and include the Treasure Coast Education Research Development Authority (TCERDA) area; the Crossroads Park of Commerce; the existing Rinker and Tropicana facilities along Glades Cut Off Rd.; the LTC Ranch Commerce Park; St. Lucie West Commerce Park; and Torrey Pines Institute south of Tradition and Gatlin Boulevard. These districts are well-situated for regional access, have ample room to grow, and can provide jobs for local residents." The Midway Rd. (CR 712) project corridor is anticipated to serve as the main transportation corridor linking residents of both Martin and St. Lucie counties to this business area. Increasing the capacity along the project corridor will improve mobility and support the economic development of these districts as well as stimulate major construction activities that will contribute to economic growth within this area.

2.1.6 Modal Interrelationships

The accessibility to bicyclists and pedestrians along the corridor is minimal with only two sections of sidewalk within the corridor. They are located on the north side of Midway Rd. (CR 712) from East Torino Boulevard to Glades Cut Off Rd. and along the frontage of the recently constructed New Horizons medical facility. There are no bicycle lanes. During an initial field review (February 7, 2014), pedestrians were noted walking on the grassed shoulder while pushing a child's stroller. Additionally, the existing bridge over the Florida's Turnpike does not have sufficient shoulder width to accommodate pedestrian or bicycle traffic. A review of the Martin and St. Lucie 2035 RLRTP identified a multipurpose trail in Table 4-9 of the Needs Development Plan that would run along the entirety of Midway Rd. (CR 712) to connect with the other proposed multipurpose trails located on Okeechobee Rd., Shin Rd., Glades Cut Off Rd., Selvitz Rd., and Midway Rd. (CR 712) to the east. The 2035 Future Bus and Train Network identified a proposed bus route along the entirety of Midway Rd. (CR 712) to connect to existing bus routes. Moreover, the County's Transit Development Plan from February 2014 identified Midway Rd. (CR 712) as a priority corridor to implement transit. The project will create opportunities to include pedestrian, bicycle, and transit facilities along the project corridor.

2.1.7 Roadway Deficiencies

The Midway Rd. (CR 712) bridge structure (ID 940050) over the Florida's Turnpike is located at Mile Post 6.346 and was constructed in 1957. The last inspection of the bridge was performed on December 19, 2013. Although the report notes no structural deficiencies, the bridge is classified as Functionally Obsolete.

2.2 Alternatives Considered

Three build alternatives, including the Transportation System Management and Operations (TSMO) alternative, were developed and considered during the preliminary engineering phase of this study. The No-Build Alternative, TSMO Alternatives, and Build Alternative 1 (Canal Avoidance) and Alternative 2 (Box Culvert) are described below.

2.2.1 No-Build Alternative

No improvements are made to Midway Rd. (CR 712) within the limits of the study.

2.2.3 Build Alternatives

Transportation System Management and Operations (TSMO) Alternatives

TSMO alternatives involve improvements designed to maximize the utilization and efficiency of the existing facility through improved system and demand management. The various TSMO options generally include traffic signal and intersection improvements, access management, and transit improvements. The additional capacity required to meet the projected traffic volumes along Midway Rd. (CR 712) in the design year cannot be provided solely through the implementation of TSMO improvements.

Build Alternative 1 (Canal Avoidance)

The typical section includes two, 11-foot travel lanes in each direction separated by a 22-foot median. Seven-foot buffered bike lanes would be provided in each direction located adjacent to the outside travel lanes. Type F curb and gutter is used along the inside and outside lanes and collects stormwater runoff which is then directed to stormwater retention ponds. A six-foot wide sidewalk would be provided on the north side of the roadway, and a 12-foot-wide shared-use path would be provided along the south side of the roadway. The alignment for this alternative would shift to the north to avoid impacts to Canal 103. This typical section requires a minimum of 153 feet of ROW. Since the existing County ROW width varies between 107 feet and 153 feet, from zero feet up to 46 feet of ROW would need to be acquired along the north side of the roadway. The design speed for this typical section would be 45 mph.

Build Alternative 2 (Box Culvert)

The roadway and pedestrian features of the typical section for this alternative are similar to Alternative 1 except that Canal 103 would be enclosed with a box culvert. The canal is located within ROW owned by both St. Lucie County and the City of Port St. Lucie. This typical section requires a minimum of 160 feet of ROW. Approximately 25 feet to 32.5 feet of ROW would need to be acquired from the City of Port St. Lucie along the south side of the roadway. Additionally, up to 28 feet of ROW would need to be acquired along the north side of the roadway. The design speed for this typical section would be 45 mph.

3.0 Hydrogeologic Features

The St. Lucie County Area is underlain by two (2) major aquifers; the deep artesian Florida aquifer and the shallow, nonartesian aquifer which are separated by a layer of slowly permeable clay and sand. Generally, the soils in the county consist of a sandy surface layer followed by a loamy or cemented subsoil with varying amounts of organic matter. The primary source of groundwater in the

county is derived from local precipitation stored in the nonartesian aquifer. Most of the St. Lucie County Area is drained through intermittent streams, creeks, rivers, closed depressions and grassy sloughs. Elevation in the area varies from sea level to about 60 feet above sea level. Groundwater flow direction can vary significantly in the county depending on localized surface or subsurface conditions such as elevation or manmade water control systems.

4.0 Methodology

A CSER was conducted within the existing and proposed ROW limits and extending outward approximately 500 feet. The purpose of the CSER is to evaluate the potential for environmental impacts associated with proposed construction within the project limits. The evaluation included the following tasks:

- Document review using St. Lucie County Property Appraiser's website;
- A regulatory review of governmental databases for permits and or violations associated with environmental issues;
- Obtaining and evaluating historical aerial photographs, topographic maps and soil surveys in an effort to determine potential contamination problem areas;
- Conducting site visits to verify information provided and to identify other potential concerns within the vicinity of the project;
- Determining the contamination potential and assigning a risk rank for each property within the proposed project limits.

4.1 Regulatory Review

An environmental database search using Environmental Data Management Inc. (EDM) was conducted on October 15, 2015 to identify sites, facilities or listings within close proximity of the project containing documented or suspected petroleum contamination or other hazardous materials. The regulatory review of federal and state environmental records utilizes an integrated geographic information system database. The search was conducted as a preliminary screening tool to identify facilities that are registered with various county, state, and federal agencies.

The database search report provides geocoded and non-geocoded regulatory listings of interest that are identified within close proximity to the project. All are reviewed for the potential of contamination to impact the project. Each listing is located by address, facility ID number or field verified where possible. Generally, those identified to be more than 300 feet from the project are considered to be outside of the project limits and excluded from further investigation.

Some sites may have more than one regulatory listing. The remaining listings are grouped by facility/site location (listings from multiple databases can be consolidated to individual property parcels) and are discussed in applicable sections of the Potential Contamination Sites Summary Table provided in **Appendix A**. The reviewed records include information compiled by the United States Environmental Protection Agency (EPA), the Florida Department of Environmental Protection (FDEP), and other various reporting programs identified below. A complete list of all environmental record databases searched is included in the database search report. A copy of the Environmental Database Report is provided in **Appendix D**.

- Federal NPL site list
- Federal Delisted NPL site list

- Federal CERCLIS list
- Federal CERCLIS NFRAP site List
- Federal RCRA CORRACTS facilities list
- Federal RCRA non-CORRACTS TSD facilities list
- Federal RCRA generators list
- Federal institutional controls / engineering controls registries
- Federal ERNS list
- State- and tribal - equivalent CERCLIS
- State and tribal landfill and/or solid waste disposal site lists
- State and tribal leaking storage tank lists
- State and tribal registered storage tank lists
- State and tribal institutional control / engineering control registries
- State and tribal voluntary cleanup sites
- State and tribal Brownfields sites
- Local Brownfield lists
- Local Lists of Landfill / Solid Waste Disposal Sites
- Local Lists of Hazardous waste / Contaminated Sites
- Local Land Records
- Records of Emergency Release Reports
- Other Ascertainable Records, including but not limited to:
    - DOT OPS ..... Incident and Accident Data
    - DOD ..... Department of Defense Sites
    - FUDS ..... Formerly Used Defense Sites
    - CONSENT ..... Superfund (CERCLA) Consent Decrees
    - ROD ..... Records Of Decision
    - US MINES ..... Mines Master Index File
    - TRIS ..... Toxic Chemical Release Inventory System
    - TSCA ..... Toxic Substances Control Act
    - PADS ..... PCB Activity Database System
    - FINDS ..... Facility Index System/Facility Registry System
    - DRYCLEANERS ..... Drycleaning Facilities
    - DEDB ..... Ethylene Dibromide Database Results
    - FL Cattle Dip Vats ..... Cattle Dipping Vats
    - TIER 2 ..... Tier 2 Facility Listing
    - PRP ..... Potentially Responsible Parties
    - PCB TRANSFORMER ..... PCB Transformer Registration Database
    - COAL ASH DOE ..... Steam-Electric Plant Operation Data
    - COAL ASH EPA ..... Coal Combustion Residues Surface Impoundments
    - Financial Assurance ..... Financial Assurance Information Listing

4.2 Supplemental Regulatory Information

In addition to the EDM Report, Tierra South Florida (TSF) supplemented the regulatory records review with readily available information from various online sources as listed below. A copy of useful documentation is included in **Appendix E**.

- FDEP Map Direct
- FDEP OCULUS Document Management System
- FDEP Storage Tank/Contaminated Facility (STCF) search
- FDEP Hazardous Waste Facilities Search
- FDEP Solid Waste Facility Inventory
- EPA EnviroMapper for Envirofacts Multi-system Search

4.3 Aerial Photographs

Historical aerial photographs were reviewed as part of the Level 1 CSER to develop a history of the previous land uses along the project corridor and to identify any areas, which may have historical uses which pose potential environmental concerns.

Historical aerial photographs dated 1944, 1958, 1969, 1970, 1980, 1992, 1994, 1999, 2004, 2005, 2006, 2007, 2009, 2010, 2012, 2014 were reviewed from the University of Florida (UF), FDOT Survey & Mapping, and Google Earth. A summary of our review is presented in the table below. Copies of the 1944, 1958, 1969, 1970, 1980, 1992, and 2005 aerial photographs are presented in **Appendix C**. A copy of the 2012 aerial photograph is presented in **Appendix B.**

TABLE 2
SUMMARY OF AERIAL PHOTOGRAPH REVIEW

Year	Comment	Source
1944	Midway Rd. (CR 712) is apparent. Land use in the vicinity of the study area can generally be described as primarily wetland, agricultural and rural residential.	UF
1958	Glades Cut Off Rd., CSX Railroad and Florida Turnpike (SR 91) apparent. Man-made pond visible northeast of project west limit. No significant visible changes apparent in surrounding areas.	UF
1969-1970	No significant visible changes noted.	UF & FDOT Survey & Mapping
1980	Industrial-type facility apparent near project west limit to the north. Additional residential housing apparent near project east limit.	FDOT Survey & Mapping
1992	Townstar #38 and CEMEX Plant apparent at project west limit. Residential neighborhood roads apparent south of Midway Rd. (CR 712) Commercial structures apparent east of Florida Turnpike, north of Midway Rd. (CR 712)	FDOT Survey & Mapping
1999-2003	Additional commercial structures apparent east of Florida Turnpike, north of Midway Rd. (CR 712) Sunshine Foodmart #343 apparent at project east limit.	Google Earth
2004	Residential housing apparent south of Midway Rd. (CR 712)	Google Earth
2005-2014	No significant visible changes noted	FDOT Survey & Mapping & Google Earth

4.4 Site Reconnaissance

A site visit was conducted on October 29, 2015 to evaluate each property along the project corridor for potential contamination. The reconnaissance included a systematic inspection of each parcel adjoining the Midway Rd. (CR 712) corridor looking for signs of potential contamination. This was achieved by first driving the mainline roadway several times in both directions to get generalized information on the study area, then walking specific parcels of interest fronting the ROW to gain specific information regarding the usage and condition of the parcel. Photographs of parcels were obtained during the site inspection and select images are included in **Appendix F**.

Some of the typical physical indicators for contamination include: UST/AST fill ports and vent pipes; oil/petroleum staining; drums; chemical containers; refuse; illicit dumping; solid waste; stressed vegetation; dry cleaning facilities; materials handling from adjacent businesses; petroleum dispensers; excavated areas; agricultural use areas; chemical mix/load areas; stormwater outfall areas; surface water indicators; and other property uses that may present environmental concerns.

The site reconnaissance in conjunction with the review of historical aerial photography allows the site to be ranked as to the degree of environmental concerns as discussed in **Section 6.0** and **Section 7.0**.

4.5 Interviews/Correspondence

Communication with land owners, facility operators, residents and governmental agencies can aid in the understanding of past and current land uses within the study area. Where possible or when necessary, interviews or requests for information are collected in an effort to identify potential concerns associated with petroleum storage tanks, automotive or marine, maintenance, service or repair, dry-cleaning processes, and other industrial or agricultural operations that could affect the project. Applicable records of communication, if any, documenting interviews or email correspondence are included in **Appendix E.**

5.0 Determination of Potential Risk

After gathering and reviewing all readily available public information and conducting site reconnaissance, contamination risk rankings were assigned to sites of potential concern. The rating system is divided into four categories of risk as defined by the FDOT in Chapter 22 of the PD&E Guidelines Manual. These four degrees of risk are “No”, “Low”, “Medium” and “High”. This system expresses the degree of concern for potential contamination problems. Known problems may not necessarily present a high cause for concern if the regulatory agencies are aware of the situation and actions, where necessary, are either complete or are underway, and these actions will not have an adverse impact on the proposed project.

No Risk Site
A review of all available information finds there is nothing to indicate contamination would be a problem. It is possible that contaminants were handled on the property; however, all information (DEP reports, monitoring wells, water and soil samples, etc.) indicate that contamination problems should not be expected. An example of an operation that may receive this rating is a wholesale or retail outlet that handles hazardous materials in sealed containers that are never opened while at the facility, such as cans of spray paint at a "drug store."

Low Risk Site
The former or current operation has a hazardous waste generator identification (ID) number, or deals with hazardous materials; however, based on all available information, there is no reason to believe there would be any involvement with contamination in relation to this project. This is the lowest possible rating a gasoline station operating within current regulations can receive. This rating could also apply to a retail store that blends paint. Some Low sites, such as gas stations in compliance, should be reevaluated during the design phase.

Medium Risk Site
After a review of all available information, indications are found (reports, Notice of Violations, consent orders, etc.) that identify known soil and/or water contamination and that the problem does not need remediation, is being remediated (i.e., air stripping of the groundwater, etc.), or that continued monitoring is required. The complete details of remediation requirements are important to determine what the Department must do if the property were to be acquired. A recommendation should be made on each property falling into this category to its acceptability for use within the proposed project, what actions might be required if the property is acquired, and the possible alternatives if there is a need to avoid the property. This rating expresses the degree of concern for potential contamination problems. Known problems may not necessarily present a high cause for concern if the regulatory agencies are aware of the situation and corrective actions are either underway or complete. The actions may not have an adverse impact on the proposed project.

High Risk Site
After a review of all available information, there is a potential for contamination problems. Further assessment will be required after alignment selection to determine the actual presence and/or levels of contamination and the need for remedial action. A recommendation must be included for what further assessment is required. Conducting the actual Contamination Assessment is not expected to begin until the alignment is defined; however, circumstances may require additional screening assessments (i.e., collecting soil or water samples for laboratory analysis necessary to determine the presence and/or levels of contaminants) to begin earlier. Properties previously used as gasoline stations and which have not been evaluated or assessed would probably receive this rating.

6.0 Mainline Risk Rankings

Based on the historical research, review of environmental record databases, site reconnaissance, and detailed file reviews completed by TSF, a total of eight (8) facilities and/or properties were located in close proximity to the study area, which may present the potential for finding petroleum contamination or hazardous materials and therefore may impact the proposed improvements for this project. Specific details for these sites are outlined in **Appendix A** and their locations are presented in **Appendix B**.

Of the eight (8) mainline sites investigated, the following risk rankings have been applied: **two (2) "High" ranking sites, one (1) "Medium" ranking sites, five (5) "Low" ranking sites, and zero (0) sites ranked "No"** for potential contamination concerns. The "**High"** and **"Medium"** ranked sites are discussed below:

Townstar #38
Contamination concerns: Petroleum Products
Address: 6600 Midway Rd.
Facility ID No.: 8942900
Distance of UST storage area from project ROW: 40 feet northwest of project west limit

Located at the west end of the project limit at northwest quadrant of Midway Rd. (CR 712) and Glades Cut Off Rd. During site reconnaissance, this site was observed as Marathon fuel station and Townstar convenience store. According to the (EDM) this facility currently maintains one (1) 22,000-gallon underground storage tank (UST) (unleaded gasoline) installed on May 1, 2009. Previous site layout included three (3) 10,000-gallon unleaded gasoline and one (1) 6,000-gallon diesel USTs. According to the Contamination Assessment Report (CAR) dated June 20, 3013, one discharge was reported on July 19, 1989 consisting of 11,000-gallons of automotive gasoline released from the UST system. In June 1992, a CAR detailed the installation and subsequent sampling of 76 soil borings and 23 monitor wells. Based on the results of this sampling event, a Remedial Action Plan (RAP) was developed and implemented to remediate the sites' impacted media. The RAP was approved by the FDEP on January 11, 1994, however the OCULUS database has no documents pertaining to the system startup or length of time the treatment system was in operation. When personnel visited the site in December 2008, the system had been installed but was not in operation and appeared deteriorated and non-functional after years of exposure to the elements. Additional site assessment work was performed on April 1, 2013 which included the collection of soil and groundwater samples. An Organic Vapor Analyzer (OVA) was used to screen the soil samples with the highest reading being 1003 parts per million (ppm) at 4 feet below land surface (BLS). Laboratory analytical results for the soil and groundwater samples were found to be above the State's guidelines for the Cleanup Target Levels (CTL's). Soil and groundwater analytical maps showing a contamination plume encroaching the ROW are provided in **Appendix E**. Based on the proximity of the former and current UST area to the right-of-way (40 feet northwest of project west limit) and the associated soil and groundwater contamination, this facility is given a contamination risk ranking of "**High**" for potential contamination to impact the project corridor.

CSX Railroad
Contamination concerns: Arsenic & Pesticides/ Herbicides
Distance to ROW: Site within project corridor

An operational CSX railroad corridor intersects the mainline project corridor, adjacent west of the project west limit. According to historical aerial photographs, this railroad corridor first appeared in the 1958 aerial photograph. Historical aerial photographs are presented in **Appendix C**. Historically, railroads used arsenic based pesticides/herbicides for vegetation and weed control along its corridors as well as petroleum based and creosote compounds to preserve railroad ties. These compounds

have typically been identified in the surficial soils within railroad beds tested. Based on its proximity to the project corridor, the CSX Railroad is given a contamination risk ranking of "**High**."

Former Agricultural Field
Contamination concerns: Herbicides, Pesticides & Heavy Metals
Distance to ROW: Between Glades Cut Off Rd. and Florida's Turnpike (1970 & 1980 historical aerials); Onsite for Pond A, Pond B-2, and Pond 2-3

Agricultural lands used for row crops and citrus groves are typically associated with contamination from residual pesticides, herbicides, and heavy metals contaminants in the soil and/or groundwater. The potential for contamination is primarily in the vicinity of receiving, storage, mixing, washing and distribution areas. Agricultural uses of organic and inorganic pesticides are exempt from most RCRA provisions, provided that the farmers apply the chemicals on their own farms and in accordance with labeled instructions. Spills, improper application, too much application and application of disallowed pesticides are not exempted from these requirements. Additionally, citrus groves typically include diesel powered irrigation pumps and/or "Smudge Pots." There exists the possibility of residual petroleum hydrocarbons and heavy metals in the soil and/or groundwater at these locations. Based on this information, areas used as agricultural are risk ranked "**Medium**" for potential contamination to impact the project corridor and ponds.

7.0 Pond Area Risk Rankings

Of the five (5) pond sites investigated plus an exfiltration trench, the following risk rankings have been applied: **zero (0) "High" ranking sites, one (1) "Medium" ranking sites, five (5) "Low" ranking sites, and zero (0) sites ranked "No"** for potential contamination concerns.

7.1 Pond A

The potential pond alternative is located south of Midway Rd. (CR 712) and east of CSX Railroad in St. Lucie County, Florida. Pond A encompasses approximately 0.60 acres of land. The location is shown on recent aerial photography presented in **Appendix B.**

During site reconnaissance, Pond A was observed to be an existing stormwater pond adjacent to residential housing. Surrounding properties in the vicinity of the pond site include Midway Rd. (CR 712) followed by the CEMEX plant to the north/northeast, Florida Turnpike to the east, and residences to the south. No unusual odors, staining, or indication of large amounts of solid waste or buried debris was observed.

Historical Land Use Summary

Historical aerial photographs dated 1944, 1958, 1969, 1970, 1980, 1992, 1994, 1999, 2004, 2005, 2006, 2007, 2009, 2010, 2012, 2014 were reviewed from the University of Florida (UF), FDOT Survey & Mapping, and Google Earth. A summary of our review is presented in the table below. Copies of the 1944, 1958, 1969, 1970, 1980, 1992, and 2005 aerial photographs are presented in **Appendix C**. A copy of the 2012 aerial photograph is presented in **Appendix B.**

Table 3
Aerial Photograph Review of Pond A

Year	Comment	Source
1944-1958	The potential pond area and surrounding areas are primarily rangeland and wetland. *Offsite:* Midway Rd. (CR 712) appears to the north, Florida turnpike apparent to the east, CSX Railroad and Glades Cut Off Rd. apparent west.	UF
1969-1980	Area appears as agricultural property. *Offsite:* Industrial building apparent to the north.	UF & FDOT Survey & Mapping
1992-1998	Area appears as a drainage canal. *Offsite:* CEMEX plant apparent north, commercial structures apparent northeast, residential roads apparent south.	FDOT Survey & Mapping
1999-2014	Area appears as existing stormwater pond *Offsite:* Residential housing apparent south.	FDOT Survey & Mapping & Google Earth

Regulatory Review

Former Agricultural Field
Contamination concerns: Herbicides, Pesticides & Heavy Metals
Distance of facility to Pond: Onsite

Agricultural lands used for row crops and citrus groves are typically associated with contamination from residual pesticides, herbicides, and heavy metals contaminants in the soil and/or groundwater. The potential for contamination is primarily in the vicinity of receiving, storage, mixing, washing and distribution areas. Agricultural uses of organic and inorganic pesticides are exempt from most RCRA provisions, provided that the farmers apply the chemicals on their own farms and in accordance with labeled instructions. Spills, improper application, too much application and application of disallowed pesticides are not exempted from these requirements. Additionally, citrus groves typically include diesel powered irrigation pumps and/or “Smudge Pots”. There exists the possibility of residual petroleum hydrocarbons and heavy metals in the soil and/or groundwater at these locations. Based on this information, areas used for agricultural purposes are considered contamination concerns to impact the project improvements.

CEMEX-West Ft. Pierce Ready-Mix & Block
Address: 6100 Midway Rd. (CR 712)
Facility ID No.: 8520370
Distance of facility to Pond: 230 feet north

Located approximately 230 feet north of Pond 1. During site reconnaissance, this site was observed as CEMEX plant. According to the EDM report, this facility currently maintains one (1) 200-gallon waste-oil aboveground storage tank (AST) installed on July 1, 1984 and one (1) 20,000-gallon diesel AST installed April 1, 2005. A Tank Closure Assessment Report dated April 10, 2002 indicated that petroleum contaminated soil was removed from the former dispenser island area in conjunction with the system removal in April 2001. Two (2) shallow-monitor wells were installed with no dissolved petroleum constituents detected. A No Further Action (NFA) status has been granted for this facility.

Risk Ranking

Based on the current regulatory listings and the property currently developed as a pond site, Pond A is given a risk ranking of "Low" for risk of potential contamination. For those locations with a risk ranking of “Low,” no additional assessment is recommended.

7.2 Pond B-1

The potential pond alternative is located northwest of Midway Rd. (CR 712) and Florida Turnpike overpass, in St. Lucie County, Florida. Pond B-1 encompasses approximately 1.86 acres of land. The location is shown on recent aerial photography presented in **Appendix B.**

During site reconnaissance, Pond B-1 was observed to be a cement stockpile yard for the adjoining CEMEX plant in operation since 1985, and the proposed area for Pond B-1 has been used as a cement stockpile yard since 2004. Surrounding properties in the vicinity of the pond site include man made ponds to the north, Florida Turnpike to the east, residences to the south, and CEMEX plant to the west.

Historical Land Use Summary

Historical aerial photographs dated 1944, 1958, 1969, 1970, 1980, 1992, 1994, 1999, 2004, 2005, 2006, 2007, 2009, 2010, 2012, 2014 were reviewed from the University of Florida (UF), FDOT Survey & Mapping, and Google Earth. A summary of our review is presented in the table below. Copies of the 1944, 1958, 1969, 1970, 1980, 1992, and 2005 aerial photographs are presented in **Appendix C**. A copy of the 2012 aerial photograph is presented in **Appendix B.**

Table 4
Aerial Photograph Review of Pond B- 1

Year	Comment	Source
1944	The potential pond area and surrounding areas are primarily rangeland and wetland. Midway Rd. (CR 712) appears to the south.	UF
1958	Northwest section of pond appears as part of man-made pond. *Offsite:* Florida turnpike apparent to the east, Glades Cut Off Rd. apparent west.	UF
1969-1980	No significant changes apparent. *Offsite:* Agricultural field apparent south.	UF & FDOT Survey & Mapping
1992-1998	No significant changes apparent. *Offsite:* CEMEX plant apparent west, residential roads apparent south, commercial structures apparent east.	FDOT Survey & Mapping
1999-2003	Land appears cleared. *Offsite:* No significant visible changes apparent.	FDOT Survey & Mapping
2004-2014	Land appears to be used as cement stockpile yard for adjoining CEMEX plant to the west. *Offsite:* Residential housing apparent to the south.	FDOT Survey & Mapping & Google Earth

Regulatory Review

An environmental database search using EDM was conducted on October 15, 2015 to identify sites, facilities or listings within close proximity of the project corridor containing documented or suspected petroleum contamination or other hazardous materials. The regulatory review of federal and state environmental records utilizes an integrated geographic information system database. The search was conducted as a preliminary screening tool to identify facilities that are registered with various county, state, and federal agencies.

CEMEX-West Ft. Pierce Ready-Mix & Block
Address: 6100 Midway Rd. (CR 712)
Facility ID No.: 8520370
Distance of facility to Pond: Onsite
During site reconnaissance, this site was observed as CEMEX plant cement waste stockpile yard. According to the EDM report, this facility currently maintains one (1) 200-gallon waste-oil aboveground

storage tank (AST) installed on July 1, 1984 and one (1) 20,000-gallon diesel AST installed April 1, 2005. A Tank Closure Assessment Report dated April 10, 2002 indicated that petroleum contaminated soil was removed from the former dispenser island area in conjunction with the system removal in April 2001. Two (2) shallow-monitor wells were installed with no dissolved petroleum constituents detected. A No Further Action (NFA) status has been granted for this facility.

Risk Ranking

Based on the lack of contamination concerns at Pond B-1, this pond is given a risk ranking of "Low" for risk of potential contamination. For sites with risk ranking of "Low" no additional assessment is recommended.

7.3 Pond B-2

The potential pond alternative is located southwest of Midway Rd. (CR 712) and Florida Turnpike overpass, in St. Lucie County, Florida. Pond B-2 encompasses approximately 1.91 acres of land. The location is shown on recent aerial photography presented in **Appendix B.**

During site reconnaissance, Pond B-2 was observed to be wooded land adjacent to residential housing. Surrounding properties in the vicinity of the pond site include Midway Rd. (CR 712) followed by the CEMEX plant to the north, Florida Turnpike to the east, recreational field to the south, and residences to the west. No unusual odors, staining, or indication of large amounts of solid waste or buried debris was observed. Photos are included in **Appendix F.**

Historical Land Use Summary

Historical aerial photographs dated 1944, 1958, 1969, 1970, 1980, 1992, 1994, 1999, 2004, 2005, 2006, 2007, 2009, 2010, 2012, 2014 were reviewed from the University of Florida (UF), FDOT Survey & Mapping, and Google Earth. A summary of our review is presented in the table below. Copies of the 1944, 1958, 1969, 1970, 1980, 1992, and 2005 aerial photographs are presented in **Appendix C**. A copy of the 2012 aerial photograph is presented in **Appendix B.**

Table 5
Aerial Photograph Review of Pond B- 2

Year	Comment	Source
1944-1958	The potential pond area and surrounding areas are primarily rangeland and wetland. *Offsite:* Midway Rd. (CR 712) appears to the north, Florida Turnpike apparent to the east, Glades Cut Off Rd. apparent west.	UF
1969-1980	Area appears as agricultural property. *Offsite:* Industrial building apparent to the west.	UF & FDOT Survey & Mapping
1992-1998	Area appears wooded. *Offsite:* CEMEX plant apparent northwest, commercial structures apparent northeast, residential roads apparent west.	FDOT Survey & Mapping
1999-2003	No significant changes apparent. *Offsite:* Residential housing apparent west.	FDOT Survey & Mapping
2004-2014	Land appears to be used as cement waste stockpile yard for adjoining CEMEX plant to the west. *Offsite:* Residential housing apparent to the south.	FDOT Survey & Mapping & Google Earth

Regulatory Review

Former Agricultural Field
Contamination concerns: Herbicides, Pesticides & Heavy Metals
Distance of facility to Pond: Onsite

Agricultural lands used for row crops and citrus groves are typically associated with contamination from residual pesticides, herbicides, and heavy metals contaminants in the soil and/or groundwater. The potential for contamination is primarily in the vicinity of receiving, storage, mixing, washing and distribution areas. Agricultural uses of organic and inorganic pesticides are exempt from most RCRA provisions, provided that the farmers apply the chemicals on their own farms and in accordance with labeled instructions. Spills, improper application, too much application and application of disallowed pesticides are not exempted from these requirements. Additionally, citrus groves typically include diesel powered irrigation pumps and/or “Smudge Pots”. There exists the possibility of residual petroleum hydrocarbons and heavy metals in the soil and/or groundwater at these locations. Based on this information, areas used for agricultural purposes are considered contamination concerns to impact the project improvements.

CEMEX-West Ft. Pierce Ready-Mix & Block
Address: 6100 Midway Road
Facility ID No.: 8520370
Distance of facility to Pond: 350 feet northwest

Located approximately 350 feet northwest of Pond B-2. During site reconnaissance, this site was observed as CEMEX plant. According to the EDM report, this facility currently maintains one (1) 200-gallon waste-oil aboveground storage tank (AST) installed on July 1, 1984 and one (1) 20,000-gallon diesel AST installed April 1, 2005. A Tank Closure Assessment Report dated April 10, 2002 indicated that petroleum contaminated soil was removed from the former dispenser island area in conjunction with the system removal in April 2001. Two (2) shallow-monitor wells were installed with no dissolved petroleum constituents detected. A No Further Action (NFA) status has been granted for this facility.

Risk Ranking

Based on the historical presence of agricultural fields onsite, Pond B-2 is given a risk ranking of "Medium" for risk of potential contamination. For those locations with a risk ranking of “Medium” or “High,” Level 2 field screening should be conducted, unless proposed improvements do not include new right of way purchase or modifications to existing conditions.

7.4 Pond 1

The potential pond alternative is located north of Midway Rd. (CR 712) and east of Florida Turnpike in St. Lucie County, Florida. Pond 1 encompasses approximately 4.53 acres of land. The location is shown on recent aerial photography presented in **Appendix B.**

During site reconnaissance, Pond 1 was observed to be wooded land adjacent to Site No. 4 FECP Cast Crete/ Prestige Gunite. Surrounding properties in the vicinity of the pond site include Midway Rd. (CR 712) to the south and woods to the east and north, followed by Florida Turnpike to the west. No unusual odors, staining, or indication of large amounts of solid waste or buried debris was observed.

Historical Land Use Summary

Historical aerial photographs dated 1944, 1958, 1969, 1970, 1980, 1992, 1994, 1999, 2004, 2005, 2006, 2007, 2009, 2010, 2012, 2014 were reviewed from the University of Florida (UF), FDOT Survey & Mapping, and Google Earth. A summary of our review is presented in the table below. Copies of the 1944, 1958, 1969, 1970, 1980, 1992, and 2005 aerial photographs are presented in **Appendix C**. A copy of the 2012 aerial photograph is presented in **Appendix B.**

Table 6
Aerial Photograph Review of Pond 1

Year	Comment	Source
1944-1958	The potential pond area and surrounding areas are primarily rangeland and wetland. *Offsite:* Midway Rd. (CR 712) appears to the south, Florida turnpike apparent to the west followed by Glades Cut Off Road.	UF
1969-1980	No significant changes apparent. *Offsite:* No significant changes apparent.	UF & FDOT Survey & Mapping
1992-1998	Area appears wooded. *Offsite:* Commercial structure apparent adjoining west.	FDOT Survey & Mapping
1999-2014	No significant changes apparent *Offsite:* No significant changes apparent.	FDOT Survey & Mapping & Google Earth

Regulatory Review

FECP Cast Crete/ Prestige Gunite Address: 6100 Midway Road
Facility ID No.: 8837720, 9701113
Distance of facility to Pond: Adjacent to the west

During site reconnaissance, this site was observed as All Scape Supply, a landscaping material supply company. The EDM Regulatory Report lists this site as formerly having multiple AST's containing gasoline and diesel fuel varying in sizes which have all been removed. Based on the distance to Pond 1 and lack of a documented discharge, this facility is not considered a contamination concern to Pond 1.

Risk Ranking

Based on the lack of contamination concerns, Pond 1 is given a risk ranking of "Low" for risk of potential contamination. For sites with risk ranking of "Low" no additional assessment is recommended.

7.5 Pond 2-3

The potential pond alternative is located south of Midway Rd. (CR 712) and east of Selvitz Rd. in St. Lucie County, Florida. Pond 2-3 encompasses approximately 7.21 acres of land. The location is shown on recent aerial photography presented in **Appendix B.**

During site reconnaissance, Pond 2-3 was observed to be wooded land adjacent east to a drug and treatment center (Florida Center for Recovery). Surrounding properties in the vicinity of the pond site include residential housing followed by Midway Rd. (CR 712) to the north, and woods to the south and east. No unusual odors, staining, or indication of large amounts of solid waste or buried debris was observed.

Historical Land Use Summary

Historical aerial photographs dated 1944, 1958, 1969, 1970, 1980, 1992, 1994, 1999, 2004, 2005, 2006, 2007, 2009, 2010, 2012, 2014 were reviewed from the University of Florida (UF), FDOT Survey & Mapping, and Google Earth. A summary of our review is presented in the table below. Copies of the 1944, 1958, 1969, 1970, 1980, 1992, and 2005 aerial photographs are presented in **Appendix C**. A copy of the 2012 aerial photograph is presented in **Appendix B.**

Table 7
Aerial Photograph Review of Pond 2-3

Year	Comment	Source
1944-1969	The potential pond area and surrounding areas are primarily agricultural fields. *Offsite:* Man-made canal to the south, residences followed by Midway Rd. (CR 712) to the north, Florida turnpike followed by Glades Cut Off Rd. apparent west.	UF & FDOT Survey & Mapping
1970-1992	Area appears wooded with access trails *Offsite:* No significant changes apparent	UF & FDOT Survey & Mapping
1994-1999	No significant changes apparent *Offsite:* commercial building apparent adjoining west	FDOT Survey & Mapping
2004-2014	No significant changes apparent *Offsite:* No significant changes apparent	FDOT Survey & Mapping

Regulatory Review

Former Agricultural Field
Contamination concerns: Herbicides, Pesticides & Heavy Metals
Distance of facility to Pond: Onsite

Agricultural lands used for row crops and citrus groves are typically associated with contamination from residual pesticides, herbicides, and heavy metals contaminants in the soil and/or groundwater. The potential for contamination is primarily in the vicinity of receiving, storage, mixing, washing and distribution areas. Agricultural uses of organic and inorganic pesticides are exempt from most RCRA provisions, provided that the farmers apply the chemicals on their own farms and in accordance with labeled instructions. Spills, improper application, too much application and application of disallowed pesticides are not exempted from these requirements. Additionally, citrus groves typically include diesel powered irrigation pumps and/or “Smudge Pots”. There exists the possibility of residual petroleum hydrocarbons and heavy metals in the soil and/or groundwater at these locations. Based on this information, areas used for agricultural purposes are considered contamination concerns to impact the project improvements.

Risk Ranking

Based on the current regulatory listings and the site currently developed as a pond site, Pond 2-3 is given a risk ranking of "Low" for risk of potential contamination. For those locations with a risk ranking of "Low" no additional assessment is recommended.

7.6 Exfiltration Trench

This pond alternative is located north of Midway Road and runs parallel to the existing roadway. No new right of way is required for this alternative. Based on current regulatory listings evaluated for the mainline this pond site alternative is given a risk ranking of "Low" for potential contamination. For those sites with risk ranking of "Low" no additional assessment is required.

8.0 Risk Ranking Summary

This Level 1 contamination screening evaluation has resulted in the following risk rankings:

Table 8 Risk Ranking Summary		
Mainline Site		
Site Name	**Initial Risk Ranking**	**Comments**
Townstar # 38	**High**	Based on the proximity of the underground storage tank (UST) area to the right-of-way (ROW) and the currently contaminated site status, this facility is given a contamination risk ranking of "**High**."
CSX Railroad	**High**	Based on its intersecting Midway Rd. (CR 712) Near the western limit, the CSX Railroad is given a contamination risk ranking of "**High**."
Former Agricultural Field	**Medium**	Based on historic uses of pesticides and herbicides, the Former Agricultural Fields are given a risk ranking of "**Medium**."
Potential Pond Areas		
Potential Pond Area	**Initial Risk Ranking**	**Comments**
Pond A * Existing Pond Site	**Low**	Pond A is agricultural land dating back to 1970, woodlands dating back to 1992 and existing stormwater pond since 2004.
Exfiltration Trench	**Low**	Exfiltration trench to be within existing right of way.
Pond B-1	**Low**	Pond B-1 is a cement stockyard for the adjoining CEMEX plant.
Pond B-2	**Medium**	Pond B-2 is agricultural land dating back to 1970, woodlands dating back to 1992 and residences since 2004.
Pond 1	**Low**	Pond 1 is wetland and rangeland dating back to 1944.
Pond 2-3 * Existing Pond Site	**Low**	Pond 2-3 is an existing pond site and historically depicted as agricultural land dating back to 1944, and woodlands dating back to 1969.

9.0 Recommendations

Based on the conclusions of the study and the risk ratings noted above, the following recommendations are made for this project:

For sites or potential pond areas ranked “No” or “Low,” no additional work is recommended at this time. These facilities are located at a distance that would not be expected to present contamination involvement to the project. Although the distances vary to make this determination, “No” and “Low” sites are generally greater than 100 feet from the project corridor or pond site. Should a facility’s permitting or regulatory status change between now and the time acquisitions are initiated, additional screening should be conducted.

For those locations with a risk ranking of “Medium” or “High,” Level 2 field screening should be conducted unless proposed improvements do not include new right of way purchase or modifications to existing conditions. These sites have been determined to have potential contaminants, which may impact the project and are generally located within 100 feet of the project corridor or pond site. A soil and groundwater sampling plan should be developed for each site. The sampling plan would provide sufficient detail as to the number of soil and groundwater samples to be obtained and the specific analytical test to be performed. A site location sketch for each facility showing all proposed boring locations and groundwater monitoring wells would be prepared.

10.0 References

- Aerial photographs of St. Lucie County
    - St. Lucie County Property Appraiser's website
    - FDOT Survey & Mapping APLUS www.dot.state.fl.us/surveyingandmapping/
    - University of Florida, Map & Imagery Library http://web.uflib.ufl.edu/maps/
    - Google Earth www.google.com/earth/
- EDM Environmental Data Report for the project corridor
- EPA, Envirofacts, Multi-system Database Search www.epa.gov/enviro/
- EPA, Final National Priorities List (NPL) www.epa.gov/region4/superfund/
- FDEP, Files for Hazardous Waste Facilities for St. Lucie County, Florida
- FDEP, Files for Solid Waste Disposal Facilities for St. Lucie County, Florida
- FDEP, Files for Storage Tank/Contaminated Facilities (STCF) for St. Lucie County, Florida
- FDEP, Map Direct http://ca.dep.state.fl.us/mapdirect/
- FDEP, OCULUS Document Management System http://depedms.dep.state.fl.us/Oculus/
- FDOT Chapter 22, PD&E Manual
- St. Lucie County Government websites
- USDA, NRCS Soil Survey of St. Lucie County, Florida, Issued March 1980

11.0 Limitations

Site access was often limited to off-site boundary review due to site accessibility (fences, gates, private property, etc.). This report reflects information obtained in the field and from noted resources at the time this report was completed. Additional information may become available or site-specific conditions may have changed since the time this report was prepared and should be considered prior to acquiring right-of-way and/or proceeding with roadway construction. There exists a possibility that conditions may exist within the project study area that could not be identified or were not reasonably identifiable from the information available at the time the study was conducted. Information from other sources was obtained for the evaluation of the project and is believed to be accurate; however, TSF does not warrant or guarantee the accuracy of any third party information. The methodologies of this assessment generally follow accepted practices outlined in the FDOT PD&E Manual, Chapter 22 and are not intended to be used as contamination assessments, but rather to provide planners and design professionals with information regarding existing and potential environmental conditions that could affect the project.

Appendix A

Potential Contamination Sites Summary Table

POTENTIAL CONTAMINATION SITES SUMMARY TABLE

Mainline Site No. & Name *Locations are illustrated in Appendix B*		Address	St Lucie County Parcel No.	Type of Concern	Facility ID No.	Distance/Direction to ROW	Risk Ranking	Site History, Regulatory Status and Comments
1	Townstar # 38	6600 Midway Rd. Fort Pierce, FL 34986	3301-243-0001-000-7	Petroleum Products	FACID: 8942900	Northwest section of project west limit	High	Located at the west end of the project limit at northwest quadrant of Midway Rd. and Glades Cut Off Rd. During site reconnaissance, this site was observed as Marathon fuel station and Townstar convenience store. According to the Environmental Data Management report (EDM) this facility currently maintains one (1) 22,000-gallon underground storage tank (UST) (unleaded gasoline) installed on May 1, 2009. Previous site layout included three (3) 10,000-gallon unleaded gasoline and one (1) 6,000-gallon diesel USTs. According to the Contamination Assessment Report (CAR) dated June 20, 3013, one discharge was reported on July 19, 1989 consisting of 11,000-gallons of automotive gasoline released from the UST system. In June 1992, a CAR detailed the installation and subsequent sampling of 76 soil borings and 23 monitor wells. Based on the results of this sampling event, a Remedial Action Plan (RAP) was developed and implemented to remediate the sites' impacted media. The RAP was approved by the FDEP on January 11, 1994, however the OCULUS database has no documents pertaining to the system startup or length of time the treatment system was in operation. When personnel visited the site in December 2008, the system had been installed but was not in operation and appeared deteriorated and non-functional after years of exposure to the elements. Additional site assessment work was performed on April 1, 2013 which included the collection of soil and groundwater samples. An Organic Vapor Analyzer (OVA) was used to screen the soil samples with the highest reading being 1003 parts per million (ppm) at 4 feet below land surface (BLS). Laboratory analytical results for the soil and groundwater samples were found to be above the State's guidelines for the Cleanup Target Levels (CTL's). Soil and groundwater analytical maps showing a contamination plume encroaching the ROW are provided in Appendix E. Based on the proximity of the former and current UST area to the right-of-way (40 feet northwest of project west limit) and the associated soil and groundwater contamination, this facility is given a contamination risk ranking of "High" for potential contamination to impact the project corridor.
2	CSX Railroad	West end of project corridor	NA	Petroleum Products Herbicides & Pesticides	NA	Site within project corridor	High	An operational CSX railroad corridor intersects the mainline project corridor at the project west limit. According to historical aerial photographs, this railroad corridor first appeared in the 1958 aerial photograph. Historical aerial photographs are presented in Appendix C. Historically, railroads used arsenic based pesticides/herbicides for vegetation and weed control along its corridors as well as petroleum based and creosote compounds to preserve railroad ties. These compounds have typically been identified in the surficial soils within railroad beds tested. Based on its proximity to the project corridor, the CSX Railroad is given a contamination risk ranking of "High" for potential contamination to impact the project corridor.
3	CEMEX-West Ft. Pierce Ready-Mix & Block	6100 Midway Rd. Fort Pierce, FL 34986	3301-131-0000-010-9	Petroleum Products	FACID: 8520370	Adjacent north of the project corridor	Low	Located near the west end of the project limit. During site reconnaissance, this site was observed as CEMEX plant. According to the EDM report, this facility currently maintains one (1) 200-gallon waste-oil aboveground storage tank (AST) installed on July 1, 1984 and one (1) 20,000-gallon diesel AST installed April 1, 2005. A Tank Closure Assessment Report dated April 10, 2002 indicated that petroleum contaminated soil was removed from the former dispenser island area in conjunction with the system removal in April 2001. Two (2) shallow-monitor wells were installed with no dissolved petroleum constituents detected. A No Further Action (NFA) status has been granted for this facility. Based on this information, this facility is given a risk ranking of "Low" for potential contamination to impact the project corridor.
4	FECP Cast Crete/ Prestige Gunite	5600 Midway Rd. Fort Pierce, FL 34986	3406-501-0042-000-9	Petroleum Products	FACID: 8837720, 9701113	Adjacent north of the project corridor	Low	During site reconnaissance, this site was observed as All Scape Supply, a landscaping material supply company. The EDM Regulatory Report lists this site as formerly having multiple AST's containing gasoline and diesel fuel varying in sizes which have all been removed. Based on the distance from the project corridor and lack of a documented discharge, this facility is given a risk ranking of "Low" for potential contamination to impact the project corridor.
5	US Postal Service	5000 Midway Rd. Fort Pierce, FL 34986	3406-501-0014-010-7	Petroleum Products	FACID: 9046228	Former tank area 600 feet north of project corridor	Low	During site reconnaissance, this site was observed as United States Post Office. The northeast corner of the property once contained a 12,000-gallon gasoline UST installed March 1, 1990 and removed August 1, 1996. Soil and groundwater samples were collected in accordance with the Tank Closure Assessment Report (TCAR). No indications of contaminated soil were found, and the minor levels of petroleum constituents detected in the groundwater fell within the state target levels for a NFA status. An SRCO was awarded on September 28, 1998. Based on distance to the project corridor, this facility is given a risk ranking of "Low" for potential contamination to impact the project corridor.
6	St Lucie County Sheriff's Department	4700 Midway Rd. Fort Pierce, FL 34986	3406-501-0015-000-1	Petroleum Products	FACID:9600068	ASTs 475 feet north of project corridor	Low	During site reconnaissance, this site was observed as St Lucie County Sheriff's Department. According to the EDM Report, this site maintains one (1) 9,000-gallon unleaded gas and 4,000-gallon diesel AST installed on June 1, 1995; one (1) 10,000-gallon unleaded gas and one (1) 3,000-gallon diesel AST installed on September 1, 1997. According to a source removal report dated July 6, 2000, one of the tanks was overfilled during a refueling event resulting in a small area of soil contamination. Contaminated soil (approx. 52 tons) was removed until all field screening indicated all contaminated soil had been removed. No groundwater was affected. A Site Rehabilitation Completion Order (SRCO) was awarded on June 5, 2001. Based on the information reviewed, this facility is given a risk ranking of "Low" for potential contamination to impact the project corridor.
7	Sunshine Food Mart # 343	4090 Midway Rd. Fort Pierce, FL 34986	3405-601-0002-000-1	Petroleum Products	FACID:9801525	Tank farm and pump island 250 feet northeast of project east limit	Low	During site reconnaissance, this site was observed as Mobil fuel station and Sunshine Food Mart convenience store. According to the EDM report, this facility currently maintains two (2) 12,000-gallon unleaded gasoline USTs and one (1) 12,000 –gallon diesel UST installed on March 1, 1999. Based on the distance from the project corridor and lack of a documented discharge, this facility is given a risk ranking of "Low" for potential contamination to impact the project corridor.

POTENTIAL CONTAMINATION SITES SUMMARY TABLE								
Mainline Site No. & Name *Locations are illustrated in Appendix B*		Address	St Lucie County Parcel No.	Type of Concern	Facility ID No.	Distance/Direction to ROW	Risk Ranking	Site History, Regulatory Status and Comments
8	Former Agricultural Field	NA	NA	Herbicides, Pesticides & Heavy Metals	NA	Between Glades Cut Off Rd. and Florida's Turnpike (1970 & 1980 historical aerials) ; East of Selvitz Rd. (1944, 1958, 1969 & 1970 historical aerials) Onsite for Pond A, Pond B-2, and Pond 2-3	Medium	Agricultural lands used for row crops and citrus groves are typically associated with contamination from residual pesticides, herbicides, and heavy metals contaminants in the soil and/or groundwater. The potential for contamination is primarily in the vicinity of receiving, storage, mixing, washing and distribution areas. Agricultural uses of organic and inorganic pesticides are exempt from most RCRA provisions, provided that the farmers apply the chemicals on their own farms and in accordance with labeled instructions. Spills, improper application, too much application and application of disallowed pesticides are not exempted from these requirements. Additionally, citrus groves typically include diesel powered irrigation pumps and/or "Smudge Pots". There exists the possibility of residual petroleum hydrocarbons and heavy metals in the soil and/or groundwater at these locations. Based on this information, areas used as agricultural are risk ranked "Medium" for potential contamination to impact the project corridor and ponds.

GENERAL NOTES:

Midway Road = CR 712
N/A = Not Applicable

ARN = Abandoned Rail Network
AST = Above Ground Storage Tank
ATRP = Abandoned Tank Restoration Program
BF = Brownfields Management System
CESQG = Conditionally Exempt SQG, generating less than 100 kg per month
CSQGs = County regulated SQG ID number
CTLs = Cleanup Target Levels
DRF = Discharge Report Form
DSCP = Dry-cleaning Solvent Cleanup Program
EPAID = EPA Facility ID number
ETDM = Efficient Transportation Decision Making (screening tool)
FACID = FDEP Facility ID number
FDEP = Florida Department of Environmental Protection
FDOT = Florida Department of Transportation
FRSFL= Facility Registry System

GCTLs = Groundwater Cleanup Target Levels
kg = kilograms (1 kg = 2.2 lb)
lb = pounds (1 lb = 0.45 kg)
HISTCLEANERS = Historical Dry Cleaners
LUST = Leaking Underground Storage Tank
LUAST= Registered Leaking Underground Storage Tanks
LPG = Liquefied/Liquid Petroleum Gas (propane or butane)
LQG = Large Quantity Generator, generating more than 1,000 kg per month
MOP = Monitoring Only Plan
NAM = Natural Attenuation Monitoring
NFA = No Further Action
NREQ = Cleanup Not Required
NPDES = National Pollutant Discharge Elimination System Facilities
PAHs = Polycyclic Aromatic Hydrocarbons
PARM = Post Active Remediation Monitoring
PCE = Perchloroethylene (PCE)

PD&E = Project, Development & Environment
PVC = Polyvinyl chloride
RAP = Remedial Action Plan
RCRA = Resource Conservation Recovery Act
RCRAGR04 = RCRA Generator Facilities
ROW = Right of Way
SAR = Site Assessment Report
SCTLs = Soil Cleanup Target Levels
SQG = Small Quantity Generator of hazardous waste, generating 100 kg to 1,000 kg per month
SRCO = Site Rehabilitation Completion Order
SWF= Solid Waste Facilities
TCE = tetrachloroethylene (TCE)
TSD = Treatment, Storage & Disposal of hazardous waste
UST = Underground Storage Tank
UAST= Registered Storage Tanks

Appendix B

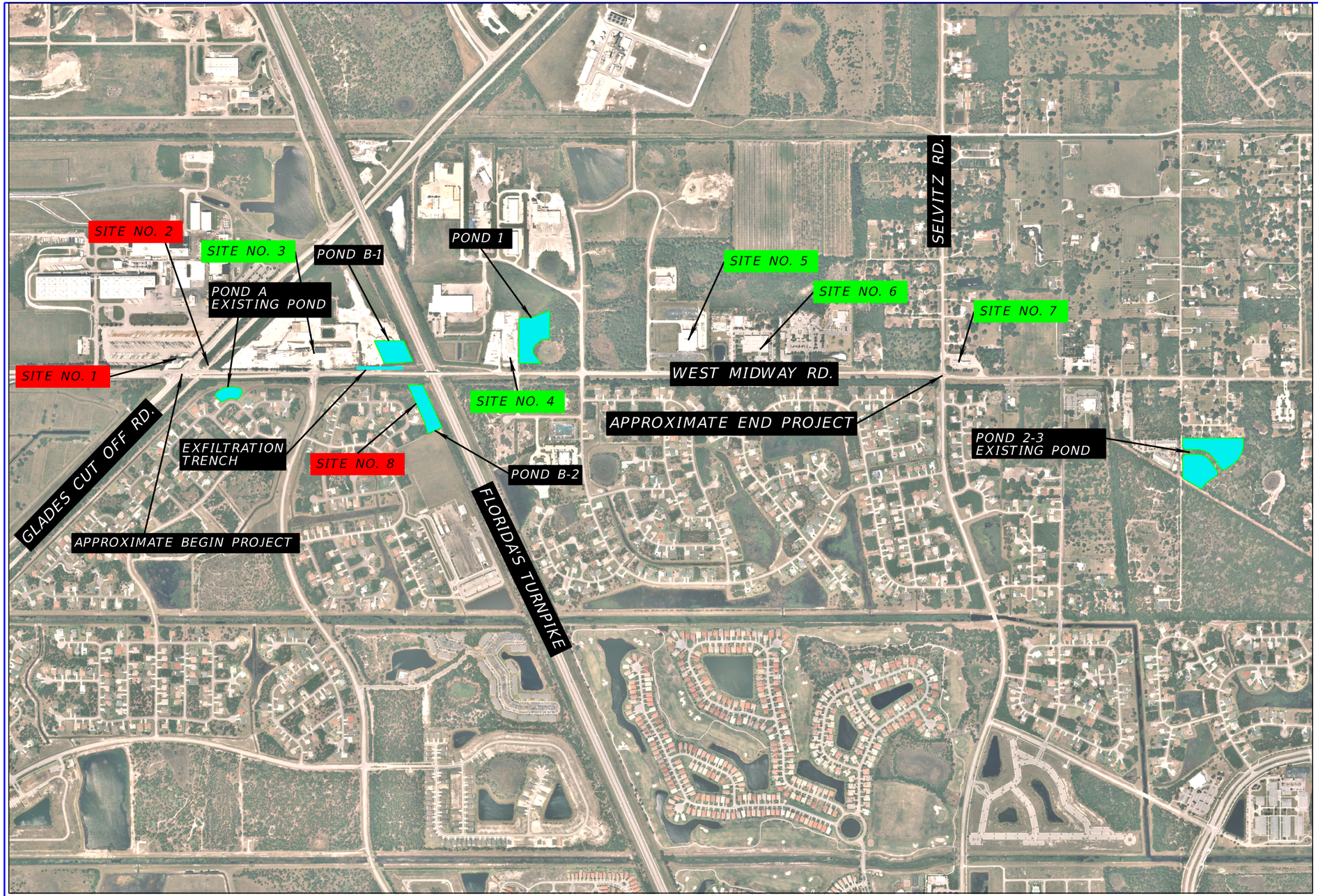
Project Location and Potential Contamination Sites Map

SOURCE: FDOT SURVEY AND MAPPING DATED 2012

PROJECT LOCATION MAP

REVISIONS				TIERRA SOUTH FLORIDA, INC. 2765 VISTA PARKWAY H-10 WEST PALM BEACH, FLORIDA 33411 CERTIFICATE OF AUTHORIZATION 28073	STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION			MIDWAY ROAD (CR 712) FROM GLADES CUT OFF ROAD TO SELVITZ ROAD	SHEET NO.
DATE	DESCRIPTION	DATE	DESCRIPTION		ROAD NO.	COUNTY	FINANCIAL PROJECT ID		
			TSF PROJECT NO7111-15-154		CR 712	ST. LUCIE	N/A		B-1

joliva 8/19/2016 9:46:18 AM J:\Tierra Documents\Projects\TSF 2015\7111-15-154.Midway Road from Glades Cuttoff to



N

0 240 1200

Feet

SITE NO.	MAINLINE SITE NAME(S)	RISK RANKING
1	Townstar #38	High
2	CSX Railroad	High
3	CEMEX-West Ft. Pierce Ready-Mix & Block	Low
4	FECP Cast Crete/ Prestige Gunite	Low
5	US Postal Service	Low
6	St. Lucie County Sheriff's Department	Low
7	Sunshine Food Mart #343	Low
8	Former Agricultural Field	Medium

SITE NO. GREEN = NO/LOW RISK SITE

SITE NO. RED = MEDIUM/LOW RISK SITE

SOURCE: FDOT SURVEY AND MAPPING DATED 2012

POTENTIAL CONTAMINATION SITES

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION
			TSF PROJECT NO7111-15-154

TIERRA SOUTH FLORIDA, INC.
2765 VISTA PARKWAY H-10
WEST PALM BEACH, FLORIDA 33411
CERTIFICATE OF AUTHORIZATION 28073

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
CR 712	ST. LUCIE	N/A

MIDWAY ROAD (CR 712) FROM GLADES CUT OFF ROAD TO SELVITZ ROAD

SHEET NO. B-2

joliva 8/19/2016 11:17:24 AM J:\Tierra Documents\Projects\TSF 2015\7111-15-154.Midway Road from Glades Cutoff to

Appendix C
Historical Aerial Photographs

SOURCE: UNIVERSITY OF FLORIDA

1944 HISTORICAL AERIAL PHOTOGRAPH

REVISIONS				TIERRA SOUTH FLORIDA, INC. 2765 VISTA PARKWAY H-10 WEST PALM BEACH, FLORIDA 33411 CERTIFICATE OF AUTHORIZATION 28073	*STATE OF FLORIDA* *DEPARTMENT OF TRANSPORTATION*			MIDWAY ROAD (CR 712) FROM GLADES CUT OFF ROAD TO SELVITZ ROAD	SHEET NO.
DATE	DESCRIPTION	DATE	DESCRIPTION		ROAD NO.	COUNTY	FINANCIAL PROJECT ID		
			TSF PROJECT NO.:		CR 712	ST. LUCIE	N/A		C-1

joliva 3/16/2016 4:06:03 PM J:\Tierra Documents\Projects\TSF 2015\7111-15-154.Midway Road from Glades Cuttoff to Selvitz Rd (Inwood)\f

1958 HISTORICAL AERIAL PHOTOGRAPH

SOURCE: UNIVERSITY OF FLORIDA

REVISIONS				TIERRA SOUTH FLORIDA, INC. 2765 VISTA PARKWAY H-10 WEST PALM BEACH, FLORIDA 33411 CERTIFICATE OF AUTHORIZATION 28073	*STATE OF FLORIDA* *DEPARTMENT OF TRANSPORTATION*			MIDWAY ROAD (CR 712) FROM GLADES CUT OFF ROAD TO SELVITZ ROAD	SHEET NO.
DATE	DESCRIPTION	DATE	DESCRIPTION		ROAD NO.	COUNTY	FINANCIAL PROJECT ID		
			TSF PROJECT NO.:		CR 712	ST. LUCIE	N/A		C-2

joliva 3/16/2016 4:08:10 PM J:\Tierra Documents\Projects\TSF 2015\7111-15-154.Midway Road from Glades Cuttoff to Selvitz Rd (Inwood)\F

1969 HISTORICAL AERIAL PHOTOGRAPH

SOURCE: FDOT SURVEY AND MAPPING

REVISIONS				TIERRA SOUTH FLORIDA, INC. 2765 VISTA PARKWAY H-10 WEST PALM BEACH, FLORIDA 33411 CERTIFICATE OF AUTHORIZATION 28073	*STATE OF FLORIDA* *DEPARTMENT OF TRANSPORTATION*			MIDWAY ROAD (CR 712) FROM GLADES CUT OFF ROAD TO SELVITZ ROAD	SHEET NO.
DATE	DESCRIPTION	DATE	DESCRIPTION		ROAD NO.	COUNTY	FINANCIAL PROJECT ID		
			TSF PROJECT NO.:		CR 712	ST. LUCIE	N/A		C-3

joliva 3/16/2016 4:09:55 PM J:\Tierra Documents\Projects\TSF 2015\7111-15-154.Midway Road from Glades Cuttoff to Selvitz Rd (Inwood)\F

1970 HISTORICAL AERIAL PHOTOGRAPH

SOURCE: UNIVERSITY OF FLORIDA

REVISIONS						
DATE	DESCRIPTION	DATE	DESCRIPTION	TIERRA SOUTH FLORIDA, INC. 2765 VISTA PARKWAY H-10 WEST PALM BEACH, FLORIDA 33411 CERTIFICATE OF AUTHORIZATION 28073	*STATE OF FLORIDA* *DEPARTMENT OF TRANSPORTATION*	MIDWAY ROAD (CR 712) FROM GLADES CUT OFF ROAD TO SELVITZ ROAD	SHEET NO.
			TSF PROJECT NO.:		ROAD NO. / COUNTY / FINANCIAL PROJECT ID CR 712 / ST. LUCIE / N/A		C-4

joliva 3/16/2016 4:11:58 PM J:\Tierra Documents\Projects\TSF 2015\7111-15-154.Midway Road from Glades Cuttoff to Selvitz Rd (Inwood)\F

1980 HISTORICAL AERIAL PHOTOGRAPH

SOURCE: FDOT SURVEY AND MAPPING

REVISIONS				TIERRA SOUTH FLORIDA, INC. 2765 VISTA PARKWAY H-10 WEST PALM BEACH, FLORIDA 33411 CERTIFICATE OF AUTHORIZATION 28073	*STATE OF FLORIDA* *DEPARTMENT OF TRANSPORTATION*			MIDWAY ROAD (CR 712) FROM GLADES CUT OFF ROAD TO SELVITZ ROAD	SHEET NO.
DATE	DESCRIPTION	DATE	DESCRIPTION		ROAD NO.	COUNTY	FINANCIAL PROJECT ID		
			TSF PROJECT NO.:		CR 712	ST. LUCIE	N/A		C-5

joliva 3/16/2016 4:13:42 PM J:\Tierra Documents\Projects\TSF 2015\7111-15-154.Midway Road from Glades Cuttoff to Selvitz Rd (Inwood)\F

1992 HISTORICAL AERIAL PHOTOGRAPH

SOURCE: FDOT SURVEY AND MAPPING

REVISIONS				TIERRA SOUTH FLORIDA, INC. 2765 VISTA PARKWAY H-10 WEST PALM BEACH, FLORIDA 33411 CERTIFICATE OF AUTHORIZATION 28073	*STATE OF FLORIDA* *DEPARTMENT OF TRANSPORTATION*			MIDWAY ROAD (CR 712) FROM GLADES CUT OFF ROAD TO SELVITZ ROAD	SHEET NO.
DATE	DESCRIPTION	DATE	DESCRIPTION		ROAD NO.	COUNTY	FINANCIAL PROJECT ID		
			TSF PROJECT NO.:		CR 712	ST. LUCIE	N/A		C-6

joliva 3/16/2016 4:16:55 PM J:\Tierra Documents\Projects\TSF 2015\7111-15-154.Midway Road from Glades Cutoff to Selvitz Rd (Inwood)\Pl

2005 HISTORICAL AERIAL PHOTOGRAPH

SOURCE: FDOT SURVEY AND MAPPING

REVISIONS						
DATE	DESCRIPTION	DATE	DESCRIPTION			
			TSF PROJECT NO.:			

TIERRA SOUTH FLORIDA, INC.
2765 VISTA PARKWAY H-10
WEST PALM BEACH, FLORIDA 33411
CERTIFICATE OF AUTHORIZATION 28073

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
CR 712	ST. LUCIE	N/A

MIDWAY ROAD (CR 712) FROM GLADES CUT OFF ROAD TO SELVITZ ROAD

SHEET NO.
C-7

joliva 3/16/2016 4:19:26 PM J:\Tierra Documents\Projects\TSF 2015\7111-15-154,Midway Road from Glades Cuttoff to Selvitz Rd (Inwood)\F

Appendix D

Environmental Database Report

Environmental Data Report

Basic 1/8 Mile Research

Midway Road Corridor
Glades Cut-off Road to Selvitz Road
Fort Pierce, Florida

Prepared For:

Tierra South Florida
2765 Vista Parkway Suite 10
West Palm Beach, FL 33411

Prepared By:

Environmental Data Management, Inc.
2840 West Bay Drive, Suite 208
Largo, Florida 33770

October 15, 2015

Environmental Data Management, Inc.
2840 West Bay Drive, Suite 208
Largo, Florida 33770
Tel. (727) 586-1700
http://www.edm-net.com

October 15, 2015

Don Polanis
Tierra South Florida
2765 Vista Parkway
West Palm Beach, FL 33411

Subject: **Basic 1/8 Mile Research - EDM Project #23048**

Dear Mr. Polanis

Thank you for choosing Environmental Data Management, Inc. The following report provides the results of our environmental data research that you requested for the following location:

Midway Road Corridor
Glades Cut-off Road to Selvitz Road
Fort Pierce, Florida

The following is a summary of the components contained within this report:

- **Executive Summary** –lists the databases that were searched for this report, the search distance criteria and the number of sites identified for each database.
- **Map of Study Area**– street map showing the location of the Subject Property and any regulatory listed sites identified within the search criteria.
- **Site Summary Table** –displays the Map ID number, Permit or Registration number, Name/Address and the Government Database(s) for the identified regulatory listed sites.
- **Detail Reports** – data detail for each database record identified.
- **Proximal Records Table** – a listing of potentially relevant sites identified just beyond the search criteria.
- **Non-Mapped Records Table** - lists those government records that do not contain sufficient address information to plot within our GIS system, but may still exist within your study area.
- **Addl Maps (where applicable)** – includes Recent Aerial Photo, USGS Topographic maps, FEMA Floodplain & NWI Wetland Map, map of statewide American Indian Lands and our Environmental Impact Areas map, showing the location of suspect sites such as NPL/STNPL, Brownfields, FUDS, etc.... Our Florida well data report is also include with the Standard and Comprehensive formats.
- **Agency List Descriptions –** defines the regulatory databases included in this report along with the dates that each database was last updated by the respective agency and EDM.

At EDM we take great pride in our work, and continually strive to provide you with the most accurate and thorough research service available. This report is only intended as a means to assist in identifying locations that may pose an environmental concern relative to the property under evaluation. Its use is not intended to replace the need for a complete environmental assessment or regulatory file review, but rather as a supplement to the overall evaluation.

Thank you again for selecting EDM as your data research provider. Should you have any questions regarding this report or our service, please feel free to contact us. We appreciate the opportunity to be of service to you and look forward to working with you in the future.

ENVIRONMENTAL DATA MANAGEMENT, INC.

Report Date: 10/15/2015

Executive Summary

Client Information	Project Information
Tierra South Florida 2765 Vista Parkway Suite 10 West Palm Beach FL 33411 Client Job No: Midway Road PD&E Client P.O. No:	Basic 1/8 Mile Research Midway Road Corridor Glades Cut-off Road to Selvitz Road Fort Pierce, Florida EDM Job No# 23048

The following table displays the databases that were included in the research provided, the respective search distance for each database and the number of records identified for each database. The distance values indicated are measured from the centroid of the Subject Property. The absence of records in this table and the Site Summary Tables indicates that our research found no data for other sites located within the specified search distances.

	# Found
EPA DATABASES	
National Priorities List(NPL)	0
Comprehensive Env Response, Compensation & Liability Information System List(CERCLIS)	0
Archived Cerclis Sites(NFRAP)	0
Emergency Response Notification System List(ERNS)	0
RCRIS Handlers with Corrective Action(CORRACTS)	0
RCRA-Treatment, Storage and/or Disposal Sites(TSD)	0
RCRA-LQG,SQG,CESQG and Transporters(NONTSD)	0
Tribal Tanks List(TRIBLTANKS)	0
Tribal Lust List(TRIBLLUST)	0
Brownfields Management System(USBRWNFLDS)	0
Institutional and/or Engineering Controls(USINSTENG)	0
FDEP DATABASES	
State NPL Equivalent(STNPL)	0
State CERCLIS Equivalent(STCERC)	1
Solid Waste Facilities List(SLDWST)	0
Leaking Underground Storage Tanks List(LUST)	4
Underground/Aboveground Storage Tanks(TANKS)	8
State Designated Brownfields(BRWNFLDS)	0
Voluntary Cleanup List(VOLCLNUP)	0
Institutional and/or Engineering Controls(INSTENG)	0
Dry Cleaners List(DRY)	0

***** Disclaimer *****

Please understand that the regulatory databases we utilize were not originally intended for our use, but rather for the source agency's internal tracking of sites for which they have jurisdiction or other interest. As a result of this difference in intended use, their data is frequently found to be incomplete or inaccurate, and is less than ideal for our use. Additionally, limitations exist in mapping data detail and accuracy. Our report is not to be relied upon for any purpose other than to "point" at approximate locations where further evaluation may be warranted. No conclusion can be based solely upon our report. Rather, our report should be used in conjunction with other relevant information to direct your attention at potential problem areas; which should be followed up by site inspections, interviews with relevant personnel and regulatory file review. Readers proceed at their own risk in relying upon this data, in whole or in part, for use within any evaluation. The EDM Service Request Form contains more detailed language with regard to such limitations, the terms of which the reader must accept in their entirety before utilizing this report. If the signed contract is not available to the reader, EDM will gladly furnish a copy upon request. Requests via email authorization are construed to be in accordance with these terms.

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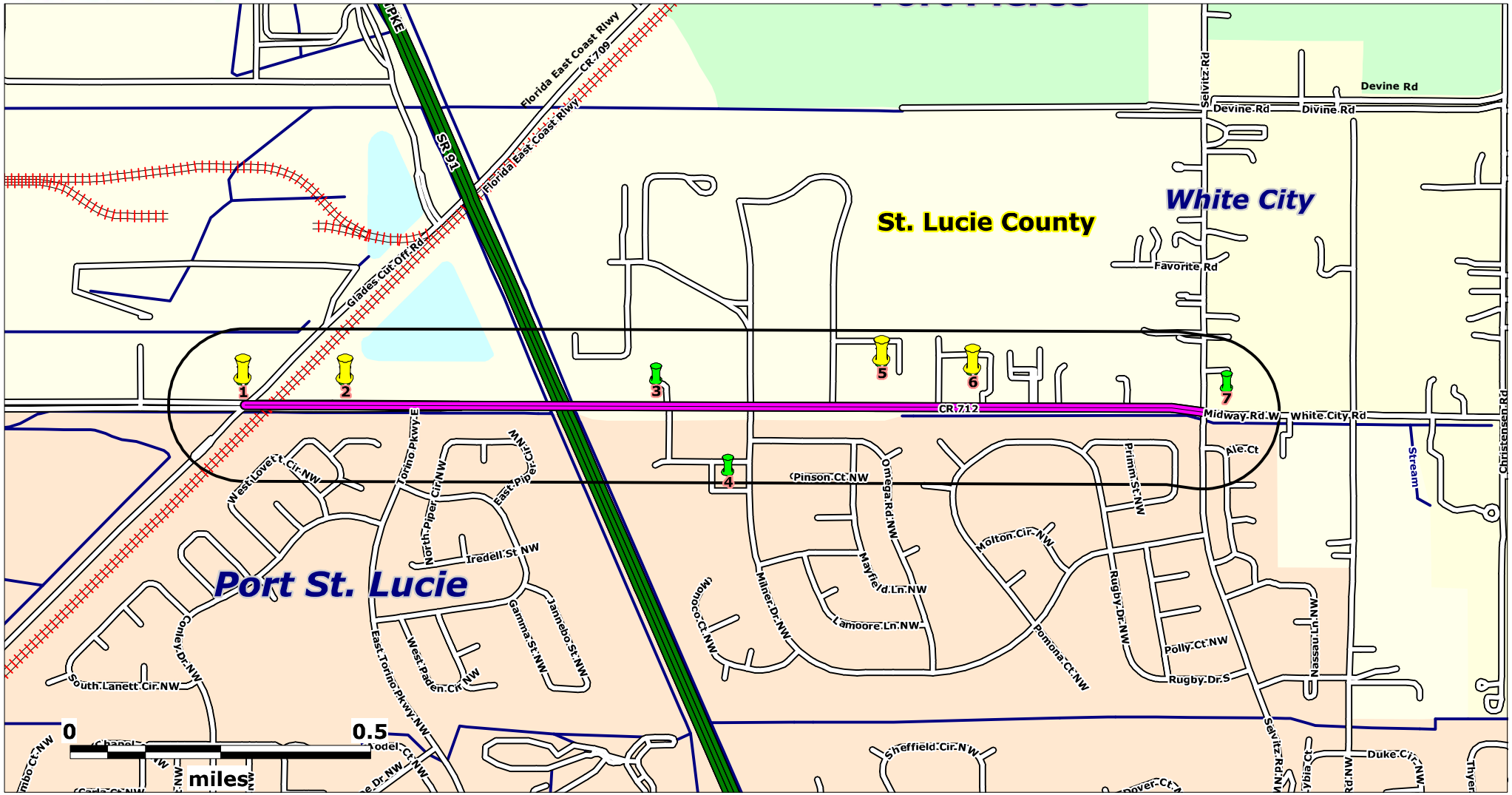
Basic 1/8 Mile Research Report
Street Map



Source: US Census Bureau TIGER Files

Map Scale and Site Locations are Approximate

Subject Property

Midway Road Corridor
Glades Cut-off Road to Selvitz Road
Fort Pierce, Florida

EDM Job No: 23048
October 15, 2015

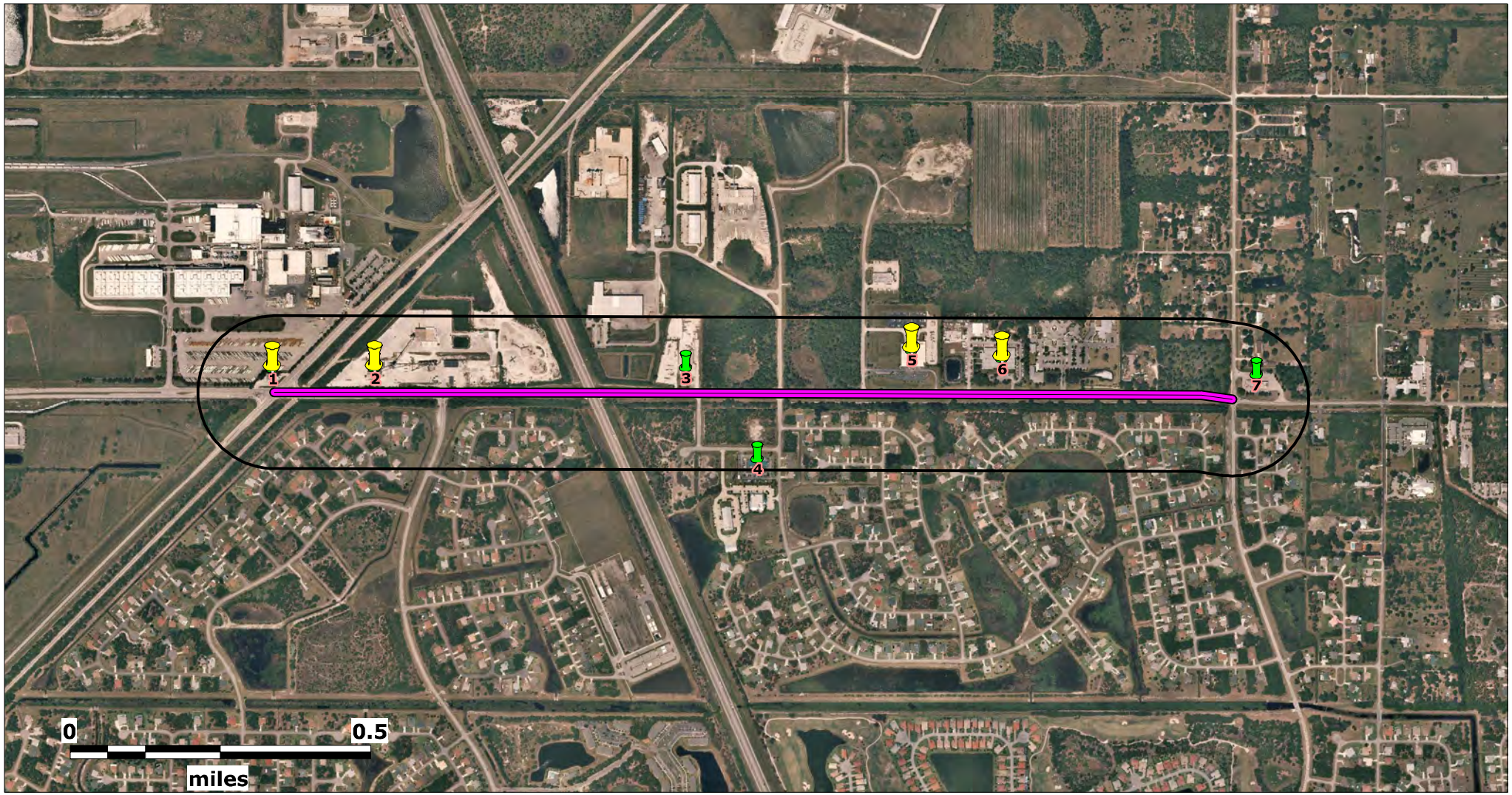
Subject Corridor

NPL, STNPL, CORRACTS & TSD sites

CERCLIS, NFRAP, STCERC, SLDWST, LUST, BRWNFLDS, VOLCLNUP & DRY sites

ERNS, NONTSD, TANKS & INSTENG sites

Basic 1/8 Mile Research Report
2013 Aerial Photo



Source: Florida Department of Transportation

Map Scale and Site Locations are Approximate

Subject Property

Midway Road Corridor
Glades Cut-off Road to Selvitz Road
Fort Pierce, Florida

EDM Job No: 23048
October 15, 2015

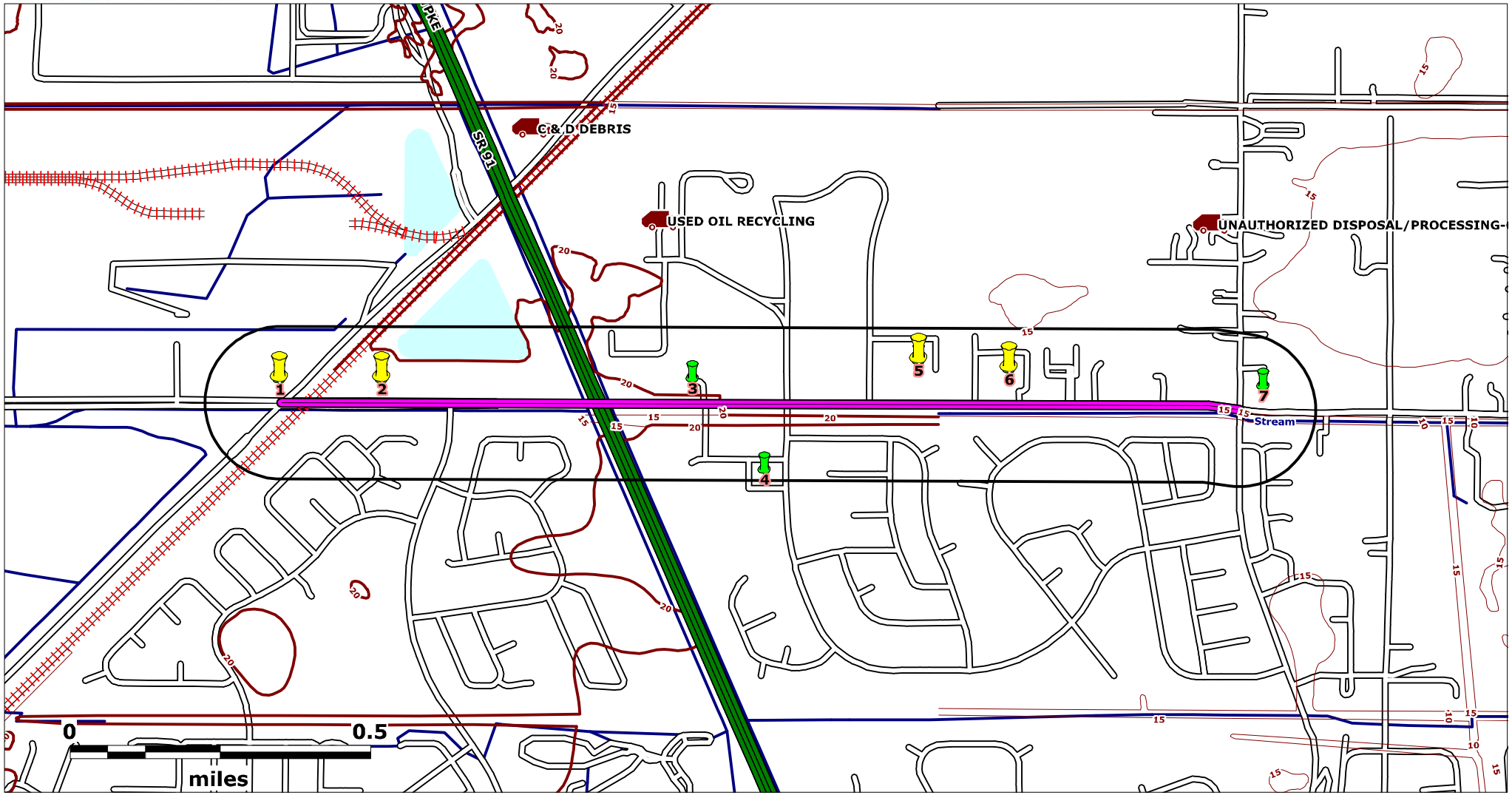
Subject Corridor

NPL, STNPL, CORRACTS & TSD sites

CERCLIS, NFRAP, STCERC, SLDWST, LUST, BRWNFLDS, VOLCLNUP & DRY sites

ERNS, NONTSD, TANKS & INSTENG sites

Basic 1/8 Mile Research Report
Environmental Impact Areas Map



Source: FDEP and USEPA Geodata

Map Scale and Site Locations are Approximate

Subject Property

Midway Road Corridor
Glades Cut-off Road to Selvitz Road
Fort Pierce, Florida

EDM Job No: 23048
October 15, 2015

- FDEP Brownfield Areas
- FDEP Brownfield Sites
- USEPA NPL & FDEP STNPL Sites
- FDEP Delineated GW Contamination
- Formerly Used Defense Sites FUDS
- FUDS Munitions Response Areas
- FDEP Cattle Dipping Vat
- FDEP Solid Waste Sites
- Subject Corridor
- NPL, STNPL, CORRACTS & TSD sites
- CERCLIS, NFRAP, STCERC, SLDWST, LUST, BRWNFLDS, VOLCLNUP & DRY sites
- ERNS, NONTSD, TANKS & INSTENG sites

ENVIRONMENTAL DATA MANAGEMENT
Basic 1/8 Mile Research

Report Date: 10/15/2015

SUMMARY TABLE

MAPID#	FAC ID, NAME AND LOCATION	REGULATORY LISTS																			
		NPL	CERCLIS	NFRAP	ERNS	CORRACTS	TSD	NONTSD	TRIBLTANKS	TRIBLLUST	USBRWNFLDS	USINSTENG	STNPL	STCERC	SLDWST	LUST	TANKS	BRWNFLDS	VOLCLNUP	INSTENG	DRY
1)	39872907 TOWNSTAR #38 6600 W MIDWAY RD FORT PIERCE, FL. 34986													X							
1)	8942900 TOWNSTAR #38 6600 W MIDWAY RD FORT PIERCE, FL. 34986															X	X				
2)	8520370 CEMEX-WEST FORT PIERCE READY-MIX & BLOCK 6100 W MIDWAY RD FORT PIERCE, FL. 34981															X	X				
3)	8837720 FECP CAST CRETE 5600 W MIDWAY RD FORT PIERCE, FL. 34981																X				
3)	9701113 PRESTIGE GUNITE 5600 MIDWAY RD FORT PIERCE, FL. 34981																X				
4)	9808972 ST LUCIE CNTY HEALTH DEPT 5150 NW MILNER DR PORT SAINT LUCIE, FL. 34983																X				
5)	9046228 US POSTAL SERVICE 5000 W MIDWAY RD FORT PIERCE, FL. 34981															X	X				
6)	9600068 ST LUCIE CNTY SHERIFFS DEPT 4700 W MIDWAY RD FORT PIERCE, FL. 34981															X	X				
7)	9801525 SUNSHINE FOOD MART #343 4090 W MIDWAY RD FORT PIERCE, FL. 34981																X				

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FDEP SITE INVESTIGATION LIST

Report Date: 10/15/2015

(STCERC)

FACILITY ID NUMBER, NAME AND LOCATION:

39872907
TOWNSTAR #38
6600 W MIDWAY RD
FORT PIERCE, FL 34986 0

MAP ID NUMBER: 1
Dist (Miles):
Direction:

STCERC

SOURCE: FDEP Cleanup Sites

SITE NUMBER:
DISTRICT: SED
LEAD UNIT:

PROJECT MGR:
ATTORNEY:
SUPPORT UNIT:

STATUS:
STATUS DATE:

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FDEP LEAKING UNDERGROUND STORAGE TANKS REPORT

(LUST)

FACILITY ID NUMBER, NAME AND LOCATION

8942900
TOWNSTAR #38
6600 W MIDWAY RD
FORT PIERCE, FL 34986-

COUNTY CODE: 56
FACILITY STATUS: OPEN
FACILITY TYPE: A - Retail Station

OWNERSHIP INFORMATION

ACCOUNT OWNER
TOWN STAR HOLDINGS LLC
2178 NW RESERVE PARK TRACE
PORT ST LUCIE, FL 34986-
(817)899-7890
AVRY DAVIDOVICH

FAC OPERATOR: MICHAEL GAZZALLA
FAC TEL #: (772)429-3330

MAP ID NUMBER: 1
Dist (Miles):
Direction:

LUST

SCORE 26 **SCORE EFF DT:** 7/6/2010 **RANK:** 12937 **SCORE WHEN RANKED:** 6 **FAC CLNUP STATUS:**

DISCHARGE INFORMATION

Mapid: 1

DISCHARGE DATE: 7/17/1989

INSPECTION DATE: 07/21/1989
CLEANUP WORK STATUS: INACTIVE
CLEANUP REQUIRED R - CLEANUP REQUIRED
CLEANUP COMBINED:
INFO SOURCE: I - PLIRP (INSURANCE)
DISCH CLNUP STATUS: 06/01/2009 RA - RA ONGOING
CONTAMINATED MEDIA?: **SOIL:** Y **SUR WATER:** N **GR WATER:** Y **MON WELL:** Y **# DW WELLS CONTAMINATED:** 0
POLLUTANT : B - UNLEADED GAS **GALLONS** **OTHER**

CLEANUP INFORMATION

Mapid: 1

CLNUP PROG: P - PETROLEUM LIABILITY AN **CLNUP OFF:** PCTM5 - PETROLEUM CLEANUP TEAM 5
ELIG STAT: E **ELLIG STAT DT:** 14-SEP-8 **APPL RCVD:** 07-AUG-89 **LOI:** 01/30/1991 **ELIG LTR SNT:** 09/14/1989 **REDETERM:** N
DEDUCT AMT: 500 **DEDUCT PD TO DT:** 500 **COPAY AMT:** 0 **COPAY TO DT:** 0 **CAP AMT:** 1200000

SITE ASSESSMENT

CLNP RESP: RP - RESPONSIBLE PARTY
FUND ELLIG: -
ACTUAL COMPLETION DATE: 08-31-1992
PAYMENT DATE: 03-02-1993
ACTUAL COST:

REMEDIAL ACTION PLAN

CLEANUP RESP: RP - RESPONSIBLE PARTY
FUND ELLIG: -
ORDER APPRV DATE: 1/14/1994
ACTUAL COMPL DATE: 01-14-1994
PAYMENT DATE:
ACTUAL COST:

REMEDIAL ACTION

CLEANUP RESP: RP - RESPONSIBLE PARTY
FUND ELLIG: -
ACTUAL COST:
YEARS TO COMPL:

SITE REHABILITATION COMPLETION REPORT

ACTION TYPE: -
SUBMIT DATE:
REVIEW DATE:
ISSUE DATE:
COMPL STATUS: -
COMPL STATUS DT:
COMMENTS:

SOURCE REMOVAL

CLEANUP RESP: RP - RESPONSIBLE PARTY
FUND ELLIG: -
ACTUAL COMPLETION DATE: 09-20-1989
FREE PRODUCT REMOVAL?(Y/N): Y
SOIL REMOVAL? (Y/N): Y
SOIL TONNAGE REMOVED: 67
SOIL TREATMENT?(Y/N):
OTHER TREATMENT?: 10,000 GALS FP
ALT PROC STATUS:
ALT PROC STATUS DT:
ALT PROC COMMENT:

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FDEP STORAGE TANKS REPORT

Report Date: 10/15/2015

(TANKS)

FACILITY ID NUMBER, NAME AND LOCATION:

8942900
TOWNSTAR #38
6600 W MIDWAY RD
FORT PIERCE, FL 34986

OWNERSHIP INFORMATION:

TOWN STAR HOLDINGS LLC
2178 NW RESERVE PARK TRACE
PORT ST LUCIE, FL 34986
CONTACT TEL #: (817) 899-7890
CONTACT: AVRY DAVIDOVICH
FACILTY TEL #: (772) 429-3330

MAP ID NUMBER: 1
Dist (Miles):
Direction:

TANKS

COUNTY ID: 56 **FAC TYPE:** Retail Station **FAC STATUS:** OPEN

TANK #:	TANK VOL(GALS):	INST.DATE:	TANK CONTENTS:	TANK POSITION:	TANK STATUS (as of...):
1	10000	01-Jan-1989	Unleaded Gas	UNDERGROUND	REMOVED 01-Apr-2009

** **CONSTR TYPE:** EMNO **PIPING TYPE:** CJK **LEAK MONIT TYPE:** 24HLS

TANK #:	TANK VOL(GALS):	INST.DATE:	TANK CONTENTS:	TANK POSITION:	TANK STATUS (as of...):
2	10000	01-Jan-1989	Unleaded Gas	UNDERGROUND	REMOVED 01-Apr-2009

** **CONSTR TYPE:** EMNO **PIPING TYPE:** CJK **LEAK MONIT TYPE:** 24HS

TANK #:	TANK VOL(GALS):	INST.DATE:	TANK CONTENTS:	TANK POSITION:	TANK STATUS (as of...):
3	10000	01-Jan-1989	Unleaded Gas	UNDERGROUND	REMOVED 01-Apr-2009

** **CONSTR TYPE:** EMNO **PIPING TYPE:** CJK **LEAK MONIT TYPE:** 24HS

TANK #:	TANK VOL(GALS):	INST.DATE:	TANK CONTENTS:	TANK POSITION:	TANK STATUS (as of...):
4	6000	01-Jan-1989	Vehicular Diesel	UNDERGROUND	REMOVED 01-Apr-2009

** **CONSTR TYPE:** AEMNO **PIPING TYPE:** CJK **LEAK MONIT TYPE:** 24HS

TANK #:	TANK VOL(GALS):	INST.DATE:	TANK CONTENTS:	TANK POSITION:	TANK STATUS (as of...):
5	22000	01-May-2009	Unleaded Gas	UNDERGROUND	IN SERVICE 01-May-2009

** **CONSTR TYPE:** AEILMNOP **PIPING TYPE:** CFJK **LEAK MONIT TYPE:** 134FHKL

See "Agency List Descriptions" Ssection for Code Definitions

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FDEP LEAKING UNDERGROUND STORAGE TANKS REPORT

(LUST)

FACILITY ID NUMBER, NAME AND LOCATION

8520370
CEMEX-WEST FORT PIERCE READY-MIX & BLOCK
6100 W MIDWAY RD
FORT PIERCE, FL 34981-4305

OWNERSHIP INFORMATION

ACCOUNT OWNER
CEMEX CONSTRUCTION MATERIALS FL LLC
3820 NORTHDALE BLVD #100B ATTN: DENISE CORRALES
TAMPA, FL 33624-
(813)968-3274
DENISE CORRALES

MAP ID NUMBER: 2
Dist (Miles):
Direction:

LUST

COUNTY CODE: 56
FACILITY STATUS: OPEN
FACILITY TYPE: C - Fuel user/Non-retail

FAC OPERATOR: SCOTT MORGAN-OPER FOREMAN
FAC TEL #: (772)461-6700

SCORE 5 **SCORE EFF DT:** 4/16/2002 **RANK:** **SCORE WHEN RANKED:** **FAC CLNUP STATUS:**

DISCHARGE INFORMATION

Mapid: 2

DISCHARGE DATE: 4/9/2001

INSPECTION DATE:
CLEANUP WORK STATUS: COMPLETED
CLEANUP REQUIRED N - NO CLEANUP REQUIRED **CLEANUP COMBINED:**
INFO SOURCE: D - DISCHARGE NOTIFICATION
DISCH CLNUP STATUS: 12/27/2002 NREQ - CLEANUP NOT REQUIRED
CONTAMINATED MEDIA?: **SOIL:** Y **SUR WATER:** N **GR WATER:** N **MON WELL:** N **# DW WELLS CONTAMINATED:** 0
POLLUTANT : Y - UNKNOWN/NOT REPORTED **GALLONS** **OTHER**

CLEANUP INFORMATION

Mapid: 2

CLNUP PROG: **CLNUP OFF:** PCSED - SED CLEANUP & COMPLIANCE ASSURANCE PROGRAM
ELIG STAT: **ELLIG STAT DT:** **APPL RCVD:** **LOI:** **ELIG LTR SNT:** **REDETERM:**
DEDUCT AMT: **DEDUCT PD TO DT:** **COPAY AMT:** **COPAY TO DT:** **CAP AMT:**

SITE ASSESSMENT

CLNP RESP: -
FUND ELLIG: -
ACTUAL COMPLETION DATE:
PAYMENT DATE:
ACTUAL COST:

REMEDIAL ACTION PLAN

CLEANUP RESP: -
FUND ELLIG: -
ORDER APPRV DATE:
ACTUAL COMPL DATE:
PAYMENT DATE:
ACTUAL COST:

REMEDIAL ACTION

CLEANUP RESP: -
FUND ELLIG: -
ACTUAL COST:
YEARS TO COMPL:

SITE REHABILITATION COMPLETION REPORT

ACTION TYPE: -
SUBMIT DATE:
REVIEW DATE:
ISSUE DATE:
COMPL STATUS: -
COMPL STATUS DT:
COMMENTS:

SOURCE REMOVAL

CLEANUP RESP: -
FUND ELLIG: -
ACTUAL COMPLETION DATE:
FREE PRODUCT REMOVAL?(Y/N):
SOIL REMOVAL? (Y/N):
SOIL TONNAGE REMOVED:
SOIL TREATMENT?(Y/N):
OTHER TREATMENT?:
ALT PROC STATUS:
ALT PROC STATUS DT:
ALT PROC COMMENT:

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FDEP STORAGE TANKS REPORT

Report Date: 10/15/2015

(TANKS)

FACILITY ID NUMBER, NAME AND LOCATION:

8520370
CEMEX-WEST FORT PIERCE READY-MIX & BLOCK
6100 W MIDWAY RD
FORT PIERCE, FL 34981

OWNERSHIP INFORMATION:

CEMEX CONSTRUCTION MATERIA
3820 NORTHDALE BLVD #100B ATTN:
TAMPA, FL 33624
CONTACT TEL #: (813) 968-3274
CONTACT: DENISE CORRALES
FACILTY TEL #: (772) 461-6700

MAP ID NUMBER: 2
Dist (Miles):
Direction:

TANKS

COUNTY ID: 56 **FAC TYPE:** Fuel user/Non-retail **FAC STATUS:** OPEN

TANK #:	TANK VOL(GALS):	INST.DATE:	TANK CONTENTS:	TANK POSITION:	TANK STATUS (as of...):
1	10000	01-Jul-1984	Vehicular Diesel	UNDERGROUND	REMOVED 24-Apr-2001
** CONSTR TYPE: EMO	PIPING TYPE:	LEAK MONIT TYPE: N			
TANK #:	TANK VOL(GALS):	INST.DATE:	TANK CONTENTS:	TANK POSITION:	TANK STATUS (as of...):
2	2000	01-Jul-1984	Unleaded Gas	UNDERGROUND	REMOVED 24-Apr-2001
** CONSTR TYPE: EMO	PIPING TYPE:	LEAK MONIT TYPE: N			
TANK #:	TANK VOL(GALS):	INST.DATE:	TANK CONTENTS:	TANK POSITION:	TANK STATUS (as of...):
3	275	01-Jul-1984	New/Lube Oil	UNDERGROUND	REMOVED 24-Apr-2001
** CONSTR TYPE: C	PIPING TYPE:	LEAK MONIT TYPE: N			
TANK #:	TANK VOL(GALS):	INST.DATE:	TANK CONTENTS:	TANK POSITION:	TANK STATUS (as of...):
4	275	01-Jul-1984	New/Lube Oil	UNDERGROUND	REMOVED 24-Apr-2001
** CONSTR TYPE: C	PIPING TYPE:	LEAK MONIT TYPE: B			
TANK #:	TANK VOL(GALS):	INST.DATE:	TANK CONTENTS:	TANK POSITION:	TANK STATUS (as of...):
5	200	01-Jul-1984	Waste Oil	ABOVEGROUND	IN SERVICE
** CONSTR TYPE: D	PIPING TYPE:	LEAK MONIT TYPE: Y			
TANK #:	TANK VOL(GALS):	INST.DATE:	TANK CONTENTS:	TANK POSITION:	TANK STATUS (as of...):
6	10000	01-Nov-2000	Vehicular Diesel	ABOVEGROUND	REMOVED 01-Mar-2013
** CONSTR TYPE: CIP	PIPING TYPE: AI	LEAK MONIT TYPE: Q			
TANK #:	TANK VOL(GALS):	INST.DATE:	TANK CONTENTS:	TANK POSITION:	TANK STATUS (as of...):
7	4000	01-Apr-2004	Vehicular Diesel	ABOVEGROUND	REMOVED 01-Apr-2005
** CONSTR TYPE: CIMP	PIPING TYPE:	LEAK MONIT TYPE: 4Q			
TANK #:	TANK VOL(GALS):	INST.DATE:	TANK CONTENTS:	TANK POSITION:	TANK STATUS (as of...):
8	20000	01-Apr-2005	Vehicular Diesel	ABOVEGROUND	IN SERVICE 01-Apr-2005
** CONSTR TYPE: CIMP	PIPING TYPE: ABI	LEAK MONIT TYPE: 4Q			

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FDEP STORAGE TANKS REPORT

Report Date: 10/15/2015

(TANKS)

FACILITY ID NUMBER, NAME AND LOCATION:

8837720
FECP CAST CRETE
5600 W MIDWAY RD
FORT PIERCE, FL 34981

OWNERSHIP INFORMATION:

LAND & SEA PETROLEUM INC
6710 NW 15TH WAY
FORT LAUDERDALE, FL 33309
CONTACT TEL #: (954) 978-3835
CONTACT: JAMES ANGELONE
FACILTY TEL #: (772) 467-1914

MAP ID NUMBER: 3
Dist (Miles):
Direction:

TANKS

COUNTY ID: 56 **FAC TYPE:** Fuel user/Non-retail **FAC STATUS:** CLOSED

TANK #:	TANK VOL(GALS):	INST.DATE:	TANK CONTENTS:	TANK POSITION:	TANK STATUS (as of...):
1	2000	01-Nov-1987	Vehicular Diesel	ABOVEGROUND	REMOVED 30-Apr-1988

** **CONSTR TYPE:** E **PIPING TYPE:** **LEAK MONIT TYPE:** I

TANK #:	TANK VOL(GALS):	INST.DATE:	TANK CONTENTS:	TANK POSITION:	TANK STATUS (as of...):
2	550		Leaded Gas	ABOVEGROUND	REMOVED 30-Jun-1990

** **CONSTR TYPE:** D **PIPING TYPE:** **LEAK MONIT TYPE:** I

TANK #:	TANK VOL(GALS):	INST.DATE:	TANK CONTENTS:	TANK POSITION:	TANK STATUS (as of...):
3	2000	01-Jan-1993	Vehicular Diesel	ABOVEGROUND	REMOVED 01-Jun-2000

** **CONSTR TYPE:** C **PIPING TYPE:** **LEAK MONIT TYPE:** I

TANK #:	TANK VOL(GALS):	INST.DATE:	TANK CONTENTS:	TANK POSITION:	TANK STATUS (as of...):
4	550	01-Apr-1988	Vehicular Diesel	ABOVEGROUND	REMOVED 30-Jun-1990

** **CONSTR TYPE:** D **PIPING TYPE:** **LEAK MONIT TYPE:** I

TANK #:	TANK VOL(GALS):	INST.DATE:	TANK CONTENTS:	TANK POSITION:	TANK STATUS (as of...):
5	10000		Vehicular Diesel	ABOVEGROUND	DELETED 01-Jan-1993

** **CONSTR TYPE:** C **PIPING TYPE:** **LEAK MONIT TYPE:** I

TANK #:	TANK VOL(GALS):	INST.DATE:	TANK CONTENTS:	TANK POSITION:	TANK STATUS (as of...):
6	1000	01-Mar-2004	Vehicular Diesel	ABOVEGROUND	REMOVED 01-May-2012

** **CONSTR TYPE:** CK **PIPING TYPE:** AZ **LEAK MONIT TYPE:** Q

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FDEP STORAGE TANKS REPORT

Report Date: 10/15/2015

(TANKS)

FACILITY ID NUMBER, NAME AND LOCATION:

9701113 **--HISTORICAL ENTRY--**
PRESTIGE GUNITE
5600 MIDWAY RD
FORT PIERCE, FL 34981-

OWNERSHIP INFORMATION:

PRESTIGE GUNITE
7228-C WESTPORT PL
WEST PALM BEACH, FL 33413-
CONTACT TEL #: 5614789980
CONTACT: YVONNE TUCKER
FACILTY TEL #: 5614615586

MAP ID NUMBER: 3
Dist (Miles):
Direction:

TANKS

COUNTY ID: 56 **FAC TYPE:** CONTAM SITE/PRIOR TK LOCATION **FAC STATUS:** DELETED

TANK #:	TANK VOL(GALS):	INST.DATE:	TANK CONTENTS:	TANK POSITION:	TANK STATUS (as of...):
1	55		MISC PETROL-BASED PRODUCT	ABOVEGROUND	DELETED 25-Sep-2000

** CONSTR TYPE: PIPING TYPE: LEAK MONIT TYPE:

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FDEP STORAGE TANKS REPORT

Report Date: 10/15/2015

(TANKS)

FACILITY ID NUMBER, NAME AND LOCATION:

9808972
ST LUCIE CNTY HEALTH DEPT
5150 NW MILNER DR
PORT SAINT LUCIE, FL 34983

OWNERSHIP INFORMATION:

ST LUCIE CNTY BOCC
2300 VIRGINIA AVE ATTN: CENTRA
FORT PIERCE, FL 34982
CONTACT TEL #: (772) 462-1546
CONTACT: RON SIGMON/ DOUGLAS ANDER
FACILTY TEL #: (772) 462-1432

MAP ID NUMBER: 4
Dist (Miles):
Direction:

TANKS

COUNTY ID: 56 **FAC TYPE:** County Government **FAC STATUS:** OPEN

TANK #:	TANK VOL(GALS):	INST.DATE:	TANK CONTENTS:	TANK POSITION:	TANK STATUS (as of...):
1	950	01-May-2007	Emerg Generator Diesel	ABOVEGROUND	IN SERVICE 01-May-2007

** **CONSTR TYPE:** CIP **PIPING TYPE:** P **LEAK MONIT TYPE:** F

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FDEP LEAKING UNDERGROUND STORAGE TANKS REPORT

(LUST)

FACILITY ID NUMBER, NAME AND LOCATION

9046228 **--HISTORICAL ENTRY--**
US POSTAL SERVICE
5000 W MIDWAY RD
FORT PIERCE, FL 34981-4827

COUNTY CODE: 56
FACILITY STATUS: CLOSED
FACILITY TYPE: F - Federal Government -

OWNERSHIP INFORMATION

TANK OWNER
US POSTAL SERVICE
PO BOX 22725
TAMPA, FL 33622-2725
(813) 877-0380
MARILY WONG

FAC OPERATOR: US POSTAL SERVICE
FAC TEL #:

MAP ID NUMBER: 5
Dist (Miles):
Direction:

LUST

SCORE **SCORE EFF DT:** **RANK:** **SCORE WHEN RANKED:** **FAC CLNUP STATUS:**

DISCHARGE INFORMATION

Mapid: 5

DISCHARGE DATE: 8/21/1996

INSPECTION DATE:
CLEANUP WORK STATUS: COMPLETED
CLEANUP REQUIRED R - CLEANUP REQUIRED
CLEANUP COMBINED:
INFO SOURCE: D - DISCHARGE NOTIFICATION
DISCH CLNUP STATUS: 10/2/1998 SRCR - SRCR COMPLETE
CONTAMINATED MEDIA?: **SOIL:** N **SUR WATER:** N **GR WATER:** Y **MON WELL:** Y **# DW WELLS CONTAMINATED:** 0
POLLUTANT : B - UNLEADED GAS **GALLONS** **OTHER**

CLEANUP INFORMATION

Mapid: 5

CLNUP PROG: **CLNUP OFF:**
ELIG STAT: **ELLIG STAT DT:** **APPL RCVD:** **LOI:** **ELIG LTR SNT:** **REDETERM:**
DEDUCT AMT: **DEDUCT PD TO DT:** **COPAY AMT:** **COPAY TO DT:** **CAP AMT:**

SITE ASSESSMENT

CLNP RESP:
FUND ELLIG:
ACTUAL COMPLETION DATE:
PAYMENT DATE:
ACTUAL COST:

REMEDIAL ACTION PLAN

CLEANUP RESP:
FUND ELLIG:
ORDER APPRV DATE:
ACTUAL COMPL DATE:
PAYMENT DATE:
ACTUAL COST:

REMEDIAL ACTION

CLEANUP RESP:
FUND ELLIG:
ACTUAL COST:
YEARS TO COMPL:

SITE REHABILITATION COMPLETION REPORT

ACTION TYPE: SRCR
SUBMIT DATE: 7/16/1998
REVIEW DATE: 9/10/1998
ISSUE DATE: 10/2/1998
COMPL STATUS:
COMPL STATUS DT: 10/2/1998
COMMENTS:

SOURCE REMOVAL

CLEANUP RESP:
FUND ELLIG:
ACTUAL COMPLETION DATE:
FREE PRODUCT REMOVAL?(Y/N):
SOIL REMOVAL? (Y/N):
SOIL TONNAGE REMOVED:
SOIL TREATMENT?(Y/N):
OTHER TREATMENT?:
ALT PROC STATUS:
ALT PROC STATUS DT:
ALT PROC COMMENT:

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FDEP STORAGE TANKS REPORT

Report Date: 10/15/2015

(TANKS)

FACILITY ID NUMBER, NAME AND LOCATION:

9046228 **--HISTORICAL ENTRY--**
US POSTAL SERVICE
5000 W MIDWAY RD
FORT PIERCE, FL 34981

OWNERSHIP INFORMATION:

,
CONTACT TEL #:
CONTACT:
FACILTY TEL #:

MAP ID NUMBER: 5
Dist (Miles):
Direction:

TANKS

COUNTY ID: 56 **FAC TYPE:** Federal Government **FAC STATUS:** CLOSED

TANK #:	TANK VOL(GALS):	INST.DATE:	TANK CONTENTS:	TANK POSITION:	TANK STATUS (as of...):
1	12000	01-Mar-1990	Unleaded Gas	UNDERGROUND	REMOVED 01-Aug-1996

** **CONSTR TYPE:** AEI **PIPING TYPE:** AF **LEAK MONIT TYPE:** EGH

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FDEP LEAKING UNDERGROUND STORAGE TANKS REPORT

(LUST)

FACILITY ID NUMBER, NAME AND LOCATION

9600068
ST LUCIE CNTY SHERIFFS DEPT
4700 W MIDWAY RD
FORT PIERCE, FL 34981-

COUNTY CODE: 56
FACILITY STATUS: OPEN
FACILITY TYPE: I - County Government

OWNERSHIP INFORMATION

ACCOUNT OWNER
ST LUCIE CNTY SHERIFFS OFFICE
4700 W MIDWAY RD ATTN: A ANTINO-FINANCE DEPT
FORT PIERCE, FL 34981-
(772)462-3319
CLAY RIGDON

FAC OPERATOR: VINCE DRISCOLL
FAC TEL #: (772)462-3632

MAP ID NUMBER: 6
Dist (Miles):
Direction:

LUST

SCORE **SCORE EFF DT:** **RANK:** **SCORE WHEN RANKED:** **FAC CLNUP STATUS:**

DISCHARGE INFORMATION

Mapid: 6

DISCHARGE DATE: 4/7/2000

INSPECTION DATE:
CLEANUP WORK STATUS: COMPLETED
CLEANUP REQUIRED R - CLEANUP REQUIRED
CLEANUP COMBINED:
INFO SOURCE: D - DISCHARGE NOTIFICATION
DISCH CLNUP STATUS: 06/05/2001 NFA - NFA COMPLETE
CONTAMINATED MEDIA?: **SOIL:** **SUR WATER:** **GR WATER:** **MON WELL:** **# DW WELLS CONTAMINATED:**
POLLUTANT : UNLEADED GAS **GALLONS** **OTHER**

CLEANUP INFORMATION

Mapid: 6

CLNUP PROG: **CLNUP OFF:** -
ELIG STAT: **ELLIG STAT DT:** **APPL RCVD:** **LOI:** **ELIG LTR SNT:** **REDETERM:**
DEDUCT AMT: **DEDUCT PD TO DT:** **COPAY AMT:** **COPAY TO DT:** **CAP AMT:**

SITE ASSESSMENT

CLNP RESP: -
FUND ELLIG: -
ACTUAL COMPLETION DATE:
PAYMENT DATE:
ACTUAL COST:

REMEDIAL ACTION PLAN

CLEANUP RESP: -
FUND ELLIG: -
ORDER APPRV DATE:
ACTUAL COMPL DATE:
PAYMENT DATE:
ACTUAL COST:

REMEDIAL ACTION

CLEANUP RESP: -
FUND ELLIG: -
ACTUAL COST:
YEARS TO COMPL: 0

SITE REHABILITATION COMPLETION REPORT

ACTION TYPE: NFA - NO FURTHER ACTION
SUBMIT DATE: 06-25-2000
REVIEW DATE: 06-05-2001
ISSUE DATE: 06-05-2001
COMPL STATUS: A - APPROVED
COMPL STATUS DT: 06-05-2001
COMMENTS:

SOURCE REMOVAL

CLEANUP RESP: -
FUND ELLIG: -
ACTUAL COMPLETION DATE:
FREE PRODUCT REMOVAL?(Y/N):
SOIL REMOVAL? (Y/N):
SOIL TONNAGE REMOVED:
SOIL TREATMENT?(Y/N):
OTHER TREATMENT?:
ALT PROC STATUS:
ALT PROC STATUS DT:
ALT PROC COMMENT:

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FDEP STORAGE TANKS REPORT

Report Date: 10/15/2015

(TANKS)

FACILITY ID NUMBER, NAME AND LOCATION:

9600068
ST LUCIE CNTY SHERIFFS DEPT
4700 W MIDWAY RD
FORT PIERCE, FL 34981

OWNERSHIP INFORMATION:

ST LUCIE CNTY SHERIFFS OFF
4700 W MIDWAY RD ATTN: A ANTINO
FORT PIERCE, FL 34981
CONTACT TEL #: (772) 462-3319
CONTACT: CLAY RIGDON
FACILTY TEL #: (772) 462-3632

MAP ID NUMBER: 6
Dist (Miles):
Direction:

TANKS

COUNTY ID: 56 **FAC TYPE:** County Government **FAC STATUS:** OPEN

TANK #:	TANK VOL(GALS):	INST.DATE:	TANK CONTENTS:	TANK POSITION:	TANK STATUS (as of...):
1	9000	01-Jun-1995	Unleaded Gas	ABOVEGROUND	IN SERVICE 01-Jun-1995

** **CONSTR TYPE:** CIL **PIPING TYPE:** CFJK **LEAK MONIT TYPE:** KLQ

TANK #:	TANK VOL(GALS):	INST.DATE:	TANK CONTENTS:	TANK POSITION:	TANK STATUS (as of...):
2	4000	01-Jun-1995	Emerg Generator Diesel	ABOVEGROUND	IN SERVICE 01-Jun-1995

** **CONSTR TYPE:** CI **PIPING TYPE:** A **LEAK MONIT TYPE:** KLQ

TANK #:	TANK VOL(GALS):	INST.DATE:	TANK CONTENTS:	TANK POSITION:	TANK STATUS (as of...):
3	10000	01-Sep-1997	Unleaded Gas	ABOVEGROUND	IN SERVICE 01-Sep-1997

** **CONSTR TYPE:** CI **PIPING TYPE:** CFJK **LEAK MONIT TYPE:** FQ

TANK #:	TANK VOL(GALS):	INST.DATE:	TANK CONTENTS:	TANK POSITION:	TANK STATUS (as of...):
4	3000	01-Sep-1997	Vehicular Diesel	ABOVEGROUND	IN SERVICE 01-Sep-1997

** **CONSTR TYPE:** CIL **PIPING TYPE:** CFJK **LEAK MONIT TYPE:** KLQ

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FDEP STORAGE TANKS REPORT

Report Date: 10/15/2015

(TANKS)

FACILITY ID NUMBER, NAME AND LOCATION:

9801525
SUNSHINE FOOD MART #343
4090 W MIDWAY RD
FORT PIERCE, FL 34981

OWNERSHIP INFORMATION:

M & R UNITED INC
402 HIGH POINT DR #101 ATTN: JO
COCOA, FL 32926
CONTACT TEL #: (321) 631-0245
CONTACT: JOE FIELDS
FACILTY TEL #: (321) 631-0245

MAP ID NUMBER: 7
Dist (Miles):
Direction:

TANKS

COUNTY ID: 56 **FAC TYPE:** Retail Station **FAC STATUS:** OPEN

TANK #:	TANK VOL(GALS):	INST.DATE:	TANK CONTENTS:	TANK POSITION:	TANK STATUS (as of...):
1	12000	01-Mar-1999	Vehicular Diesel	UNDERGROUND	IN SERVICE 01-Mar-1999

** **CONSTR TYPE:** AEIMNOP **PIPING TYPE:** CFJK **LEAK MONIT TYPE:** 34FHK

TANK #:	TANK VOL(GALS):	INST.DATE:	TANK CONTENTS:	TANK POSITION:	TANK STATUS (as of...):
2	12000	01-Mar-1999	Unleaded Gas	UNDERGROUND	IN SERVICE 01-Mar-1999

** **CONSTR TYPE:** AEIMNOP **PIPING TYPE:** CFJK **LEAK MONIT TYPE:** 34FHK

TANK #:	TANK VOL(GALS):	INST.DATE:	TANK CONTENTS:	TANK POSITION:	TANK STATUS (as of...):
3	12000	01-Mar-1999	Unleaded Gas	UNDERGROUND	IN SERVICE 01-Mar-1999

** **CONSTR TYPE:** AEIMNOP **PIPING TYPE:** CFJK **LEAK MONIT TYPE:** 34FHK

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PROXIMAL RECORDS TABLE

Report Date: 10/15/2015

The Proximal Records Table includes mapped facilities that appear outside of the study area, but in the proximity of the research boundary. They are provided in a summary fashion to allow one to determine potential interest.

Generally, these sites may be of potential interest for three reasons:

1.) The location occurs so close to the research boundary that it merits inclusion in the evaluation.

2.) The site may be expansive with regard to the property boundary. The physical address of a landfill for example may occur outside of the research boundary, but the landfill boundary may extend into the research area. Large industrial complexes may also fall into this category.

3.) The U.S. Census Bureau data, from which our maps are created, is not always precise with regard to address information. A facility may therefore appear on the map outside of the research area, but actually fall within the research area. These inaccuracies are typically less than 500 feet. If you observe any such inaccuracies, we ask that you please notify us of the more precise location and we will use this information to improve our product.

If more specific information relative to one or more locations included in the Proximal Records Table is desired, please feel free to contact us and we will send you this information as an addendum to this report.

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ENVIRONMENTAL DATA MANAGEMENT
Basic 1/8 Mile Research

Report Date: 10/15/2015

PROXIMAL RECORDS TABLE

MAPID#	FAC ID, NAME AND LOCATION	REGULATORY LISTS																			
		NPL	CERCLIS	NFRAP	ERNS	CORRACTS	TSD	NONTSD	TRIBLTANKS	TRIBLLUST	USBRWNFLDS	USINSTENG	STNPL	STCERC	SLDWST	LUST	TANKS	BRWNFLDS	VOLCLNUP	INSTENG	DRY
1A)	9808368 ST LUCIE CNTY FIRE DIST ADMIN-MAINT 5160 NW MILNER DR PORT SAINT LUCIE, FL.																X				

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NONMAPPED RECORDS TABLE

Report Date: 10/15/2015

The Non-Mapped Records Table is a listing of database records that lack sufficient address information to be placed within our mapping system, but may exist within your study area. These records have been manually screened to determine whether they could likely fall within the study area or can be conclusively identified as existing outside of the study area. Those records that could be located within the study area, but cannot be plotted within our GIS, are displayed in the Non-Mapped Records Table within this report.

If more specific information relative to one or more locations included in the Non-Mapped Records Table is desired, please feel free to contact us and we will send you this information as an addendum to this report.

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ENVIRONMENTAL DATA MANAGEMENT
Basic 1/8 Mile Research
NON-MAPPED RECORDS TABLE

MAPID#	FAC ID, NAME AND LOCATION	REGULATORY LISTS																			
		NPL	CERCLIS	NFRAP	ERNS	CORRACTS	TSD	NONTSD	TRIBLTANKS	TRIBLLUST	USBRWNFLDS	USINSTENG	STNPL	STCERC	SLDWST	LUST	TANKS	BRWNFLDS	VOLCLNUP	INSTENG	DRY
114899	GLASGOW GLADES RD AND MIDWAY CITGO STATION FORT PIERCE, FL.				X																
8626175.	FL MAID DRAINAGE & IRRIGATION DIST NEAR FLORIDA TNPK (GROVE B-11) FT PIERCE, FL. 33448																X				
9701088	JOE MIGLINO POOL SERVICE PO BOX 9128 FORT PIERCE, FL. 34954																X				

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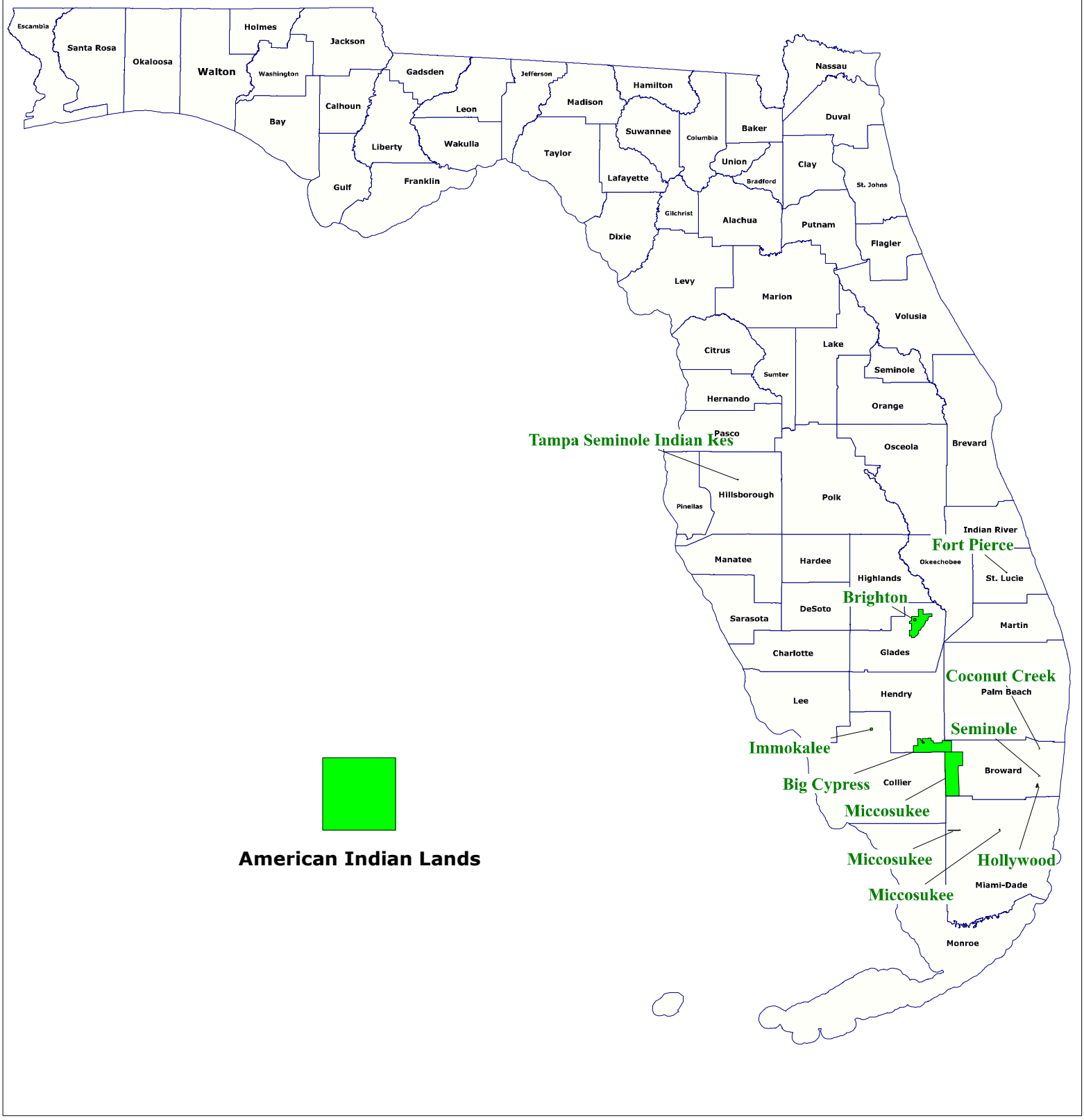
American Indian Lands
State of Florida



Source: US Census Bureau TIGER Files

Map Scale and Property Boundaries are Approximate

American Indian Lands in Florida

Name	Entity	County	General Location Information	Approx. Area (Acres)
Tampa Reservation	Seminole Tribe of Florida	Hillsborough	I-4 & Hillsborough Avenue	42
Fort Pierce Reservation	Seminole Tribe of Florida	Saint Lucie	Okeechobee Rd & Eleven Mile Rd	54
Brighton Reservation	Seminole Tribe of Florida	Glades	N of CR 721 & SR 78	36,630
Immokalee Reservation	Seminole Tribe of Florida	Collier	N of CR 846 & Stockade Rd	660
Big Cypress Reservation	Seminole Tribe of Florida	Hendry/Broward	CR 833 & BIA Hwy 182	52,750
Miccosukee Reservation	Miccosukee Tribe of Florida	Broward	I-75 & Government Rd	81,440
Miccosukee Reservation	Miccosukee Tribe of Florida	Dade	SW 8th St & Loop Rd	750
Miccosukee Reservation	Miccosukee Tribe of Florida	Dade	SW 177th Ave & SW 8th St	56
Holly (Dania) Reservation	Seminole Tribe of Florida	Broward	Stirling Rd & Florida's turnpike	560
Coconut Creek Reservation	Seminole Tribe of Florida	Broward	US 441 & NW 40th St	6
Seminole Trust Land	Seminole Tribe of Florida	Broward	US 441 & Davie Blvd	1

Florida Tribal Contacts

Entity	Contact	Tel/Fac	Source
Miccosukee Tribe of Florida	**Billy Cypress** Tribal Chairman Miccosukee Tribe of Indians of Florida iPost Office Box 440021 Miami, Florida 33144 County: Dade	Phone: (305) 223-8380 Facsimile: (305) 223-1011	EPA Reg IV Tribal Contacts
Miccosukee Tribe of Florida	**Steve Terry** Land Resources Manager Miccosukee Tribe of Indians of Florida Post Office Box 440021 Miami, Florida 33144 E-Mail:esoterry@shadow.net	Phone:(305) 223-8380 Facsimile: (305) 223-1011	EPA Reg IV Tribal Contacts
Miccosukee Tribe of Florida	**Billy Cypress** Chairman Miccosukee Indian Tribe Tamiami Station PO Box 440021 Miami, Florida 33144	Phone: (305) 223-8380 Facsimile: (305) 223-1011	US DOI - BIA Tribal Leaders Directory
Seminole Tribe of Florida	**Mitchell Cypress** Tribal Chairman Seminole Tribe of Florida 6300 Stirling Road Hollywood, Florida 33024 County: Broward	Phone: (954) 967-3900 Facsimile: (954) 967-3486	EPA Reg IV Tribal Contacts
Seminole Tribe of Florida	**Craig T. Tepper**, Director Water Resource Management Department Seminole Tribe of Florida 6300 Stirling Road Hollywood, Florida 33024 County: Broward E-Mail:water@gate.net	Phone: (954) 966-6300, extension 1120 Facsimile: (954) 967-3489	EPA Reg IV Tribal Contacts
Seminole Tribe of Florida	**Susie Kippenberger**, Director Utilities Department Seminole Tribe of Florida 6300 Stirling Road Hollywood, Florida 33024 County: Broward E-Mail:susiek@semtribe.com	Phone: (954) 966-3475 Facsimile: (954) 967-3475	EPA Reg IV Tribal Contacts
Seminole Tribe of Florida	**Mitchell Cypress** Chairman Seminole Indian Tribe 6300 Stirling Road Hollywood, Florida 33024 http://www.seminoletribe.com/	Phone: (954) 966-6300 Facsimile: (954) 967-3463	US DOI - BIA Tribal Leaders Directory
Seminole Tribe of Florida	**Joe Frank, Acting Superintendent** Seminole Agency Bureau of Indian Affairs 6100 Hollywood Blvd, Suite 206 Hollywood, FL 33024	Phone: (954) 983-1537 Facsimile: (954) 983-5018	US DOI - BIA Tribal Leaders Directory

Agency List Descriptions

USEPA and State Databases are updated on a quarterly basis. Supplemental Databases are updated on an annual basis.

United States Environmental Protection Agency (EPA)

Comprehensive Env Response, Compensation & Liability Information System List(CERCLIS)

The US EPA Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLIS) database tracks potential and confirmed hazardous waste sites at which the EPA Superfund program has some involvement. It contains sites that are either proposed to be or are on the National Priorities List (NPL) as well as sites that are in the screening and assessment phase for possible inclusion on the NPL.

Agency File Date: 11/12/2013 **Received by EDM:** 9/25/2015 **EDM Database Updated:** 9/25/2015

RCRIS Handlers with Corrective Action(CORRACTS)

The US EPA Corrective Action Sites (CORRACTS) database is a listing of hazardous waste handlers that have undergone RCRA corrective action activity.

Agency File Date: 6/9/2015 **Received by EDM:** 7/1/2015 **EDM Database Updated:** 7/2/2015

Emergency Response Notification System List(ERNS)

The Emergency Response Notification System (ERNS) database stores information on oil discharges and hazardous substance releases. The ERNS program is a cooperative data sharing effort among the EPA, DOT and the National Response Center (NRC), which currently provides access to this data.

Agency File Date: 5/17/2015 **Received by EDM:** 9/25/2015 **EDM Database Updated:** 9/28/2015

Archived Cerclis Sites(NFRAP)

The US EPA NFRAP list contains archived data of CERCLIS records where the EPA has completed assessment activities and determined that no further steps to list the site on the NPL will be taken. NFRAP sites may be reviewed in the future to determine if they should be returned to CERCLIS based upon newly identified contamination problems at the site.

Agency File Date: 10/25/2013 **Received by EDM:** 6/4/2015 **EDM Database Updated:** 6/4/2015

RCRA-LQG,SQG,CESQG and Transporters(NONTSD)

The EDM NONTSD list is a subset of the US EPA RCRAInfo System and identifies facilities that generate and transport hazardous wastes. These facilities may be Large Quantity Generators (LQG), Small Quantity Generators (SQG), Conditionally Exempt SQG's (CESQG) as well as" Non-Notifiers" and "Non-Handlers".

Agency File Date: 5/12/2015 **Received by EDM:** 5/22/2015 **EDM Database Updated:** 5/22/2015

National Priorities List(NPL)

The US EPA National Priorities List (NPL) contains facilities and/or locations where environmental contamination has been confirmed and prioritized for cleanup activities. In addition to sites that are currently on the EPA NPL, the EDM database contatains sites that have been Proposed, Withdrawn and Deleted from the list.

Agency File Date: 6/25/2015 **Received by EDM:** 7/1/2015 **EDM Database Updated:** 7/2/2015

Tribal Lust List(TRIBLLUST)

EDM's Tribal LUST list is derived from the USEPA Region IV Tribal Tanks database by extracting those sites with indicators of past and/or current releases.

Agency File Date: 2/24/2010 **Received by EDM:** 3/9/2010 **EDM Database Updated:** 3/9/2010

Tribal Tanks List(TRIBLTANKS)

The USEPA Region IV Tribal Tanks database lists Active and Closed storage tank facilities on Native American lands.

Agency File Date: 2/24/2010 **Received by EDM:** 3/9/2010 **EDM Database Updated:** 3/9/2010

RCRA-Treatment, Storage and/or Disposal Sites(TSD)

The EDM TSD list is a subset of the US EPA RCRAInfo system and identifies facilities that Treat, Store and/or Dispose of hazardous waste.

Agency File Date: 5/12/2015 **Received by EDM:** 5/22/2015 **EDM Database Updated:** 5/22/2015

Brownfields Management System(USBRWNFLDS)

The US EPA Brownfields program provides information on environmentally distressed properties that have received Grants or Targeted funding for cleanup and redevelopment . Tribal Brownfield sites are included in the USBRWNFLDS database.

Agency File Date: 8/19/2015 **Received by EDM:** 8/19/2015 **EDM Database Updated:** 9/8/2015

Institutional and/or Engineering Controls(USINSTENG)

The USINSTENG list is compiled from data elements contained in the NPL, CORRACTS and USBRWNFLDS lists.

Agency File Date: 6/9/2015 **Received by EDM:** 7/1/2015 **EDM Database Updated:** 7/2/2015

Florida Department of Environmental Protection (FDEP)

State Designated Brownfields(BRWNFLDS)

The FDEP Brownfields database contains a listing of State Designated Brownfield Areas and Brownfield Sites with signed rehabilitation agreements. Brownfields are typically defined as abandoned, idled or underused industrial and commercial sites where expansion or redevelopment is complicated by real or perceived environmental contamination.

Agency File Date: 6/22/2015 **Received by EDM:** 7/2/2015 **EDM Database Updated:** 7/2/2015

Dry Cleaners List(DRY)

The FDEP Dry Cleaning Facilities List is comprised of data from the FDEP Storage Tank and Contamination Monitoring (STCM) database and the Drycleaning Solvent Cleanup Program- Priority Ranking List. It contains a listing of those Dry Cleaning sites (and suspected historical Dry Cleaning sites) who have registered with the FDEP and/or have applied for the Dry Cleaning Solvent Cleanup Program.

Agency File Date: 9/10/2015 **Received by EDM:** 9/28/2015 **EDM Database Updated:** 9/28/2015

Institutional and/or Engineering Controls(INSTENG)

The FDEP Institutional Controls Registry Database (INSTENG) contains sites that have had Institutional and/or Engineering Controls implemented to regulate exposure to environmental hazards

Agency File Date: 8/1/2015 **Received by EDM:** 9/8/2015 **EDM Database Updated:** 9/8/2015

Leaking Underground Storage Tanks List(LUST)

The FDEP LUST list identifies facilities and/or locations that have notified the FDEP of a possible release of contaminants from petroleum storage systems. This Report is generated from the FDEP Storage Tank and Contamination Monitoring Database (STCM).

Agency File Date: 5/8/2015 **Received by EDM:** 5/19/2015 **EDM Database Updated:** 5/19/2015

Solid Waste Facilities List(SLDWST)

The FDEP SLDWST list identifies locations that have been permitted to conduct solid waste handling activities including Landfills, Transfer Stations and sites handling Bio-Hazardous wastes. Sites listed with "##" after the Facility ID Number are historical locations, obtained from documents on record at local agencies.

Agency File Date: 5/21/2015 **Received by EDM:** 5/21/2015 **EDM Database Updated:** 5/22/2015

State CERCLIS Equivalent(STCERC)

The STCERC list is compiled from the FDEP Site Investigation Section list, the Florida SITES list(historical) and the FDEP Cleanup Sites list. These sites are being assessed or cleaned up as a result of suspected contamination from accidental or uncontrolled releases of hazardous substances.

Agency File Date: 7/20/2015 **Received by EDM:** 7/22/2015 **EDM Database Updated:** 7/23/2015

State NPL Equivalent(STNPL)

The FDEP SFAS list contains facilities and/or locations that have been identified by the FDEP as having known environmental contamination and are currently being addressed through State funded cleanup action.

Agency File Date: 1/23/2015 **Received by EDM:** 6/22/2015 **EDM Database Updated:** 7/2/2015

Underground/Aboveground Storage Tanks(TANKS)

The FDEP TANKS list contains sites with registered aboveground and/or underground storage tanks containing regulated petroleum products. Please refer to the "Explanation of Florida Tank Codes" insert to interpret tank construction, monitoring and piping codes.

Agency File Date: 5/8/2015 **Received by EDM:** 6/4/2015 **EDM Database Updated:** 6/5/2015

Voluntary Cleanup List(VOLCLNUP)

The VOLCLNUP List is derived from the FDEP Brownfields Site Rehabilitation Agreement (BSRA) database and the FDEP Office of Waste Cleanup Responsible Party Sites database. This list identifies those sites that have signed an agreement to Voluntarily cleanup a site and/or sites where legal responsibility for site rehabilitation exists pursuant to Florida Statutes and is being conducted either voluntarily or pursuant to enforcement activity.

Agency File Date: 6/22/2015 **Received by EDM:** 7/2/2015 **EDM Database Updated:** 7/2/2015

EXPLANATION OF FLORIDA TANK CODES

CONSTRUCTION TYPE CODES

A = BALL CHECK VALVE
B = INTERNAL LINING
C = STEEL
D = UNKNOWN
E = FIBERGLASS
F = FIBERGLASS-CLAD STEEL
G = CATHODIC PROTECTION-SACRIFICIAL ANODE
H = CATHODIC PROTECTION -IMPRESSED CURRENT
I = DBL WALL/SINGLE MATERIAL
J = SYNTHETIC LINER IN TANK EXCAVATION
K = AST CONTAINMENT: CONCRETE /SYNTHETIC MATERIAL AREA
L = COMPARTMENTED
M = SPILL CONTAINMENT BUCKET
N = FLOW SHUT OFF
O = TIGHT FILL
P = LEVEL GAUGES, HI LEVEL ALARMS
Q = OTHER DER APPROVED PROTECTION METHOD
R = DBL WALL/DUAL MATERIAL/ (TANK "JACKET")
S = OTHER DEP APPROVED SECONDARY CONTAINTMENT SYSTEM
T = SMALL USE TANK
U = FIELD ERECTED TANK
V = PIPELESS UST W/SECONDARY CONTAINMENT
W = BUILT ON SUPPORTS
X = CONCRETE
Y = POLYETHYLENE
Z = OTHER DEP APPROVED TANK MATERIAL

PIPING TYPE CODES

A = ABOVE GROUND-NO CONTACT W/SOIL
B = STEEL OR GALVANIZED METAL
C = FIBERGLASS
D = EXTERNAL PROTECTIVE COATING
E = CATHODIC PROTECTION (SACRIFICIAL ANODE/IMPRESSED CURRENT)
F = DBLWALL/SINGLE MATERIAL
G = SYNTHETIC OR BOX/TRENCH LINER
H = AIRPORT/SEAPORT HYDRANT SYSTEM
I = SUCTION PIPING SYSTEM
J = PRESSURIZED PIPING SYSTEM
K = DISPENSER LINERS
L = BULK PRODUCT SYSTEM
M = DOUBLE WALL / DUAL MATERIAL (PIPE "JACKET")
N = APPROVED SYNTHETIC MATERIAL
O = SEVERE VIOLATION
P = INTERNAL PIPING WITHIN INTERNAL SUMP RISER
V = VIOLATION
X = NO PIPING ASOCIATED WITH TANK
Y = UNKNOWN
Z = OTHER DEP APPROVED PIPING MATERIAL

LEAK MONITORING CODES

1 = CONTINUOUS ELECTRONIC SENSING EQUIPMENT
2 = VISUAL INSPECTIONS OF PIPING SUMPS
3 = ELECTRONIC MONITORING OF PIPING SUMPS
4 = VISUAL INSPECTIONS OF DISPENSING LINERS
5 = ELECTRONIC MONITORING OF DISPENSER LINERS
6 = EXTERNAL PIPING MONITORING
7 = AUTOMATICALLY SAMPLED WELLS
8 = MANUALLY SAMPLED WELLS
A = SITE SUITABILITY PLAN
B = SITE SUITABILITY PLAN EXEMPTION
C = GROUNDWATER MONITOR PLAN
D = SPCC PLAN
E = INTERSTITIAL MONITORING UST LINERS
F = INTERSTITIAL SPACE-DOUBLE WALL TANK
G = ELECTRONIC LINE LEAK DETECTOR W/FLOW SHUTOFF
H = MECHANICAL LINE LEAK DETECTOR
I = NOT REQUIRED-SEE RULE FOR EXEMPTIONS
J = INTERSTITIAL MONITORING-PIPING LINER
K = INTERSTITIAL MONITORING- DOUBLE WALL PIPING
L = AUTOMATIC TANK GAUGING SYSTEM (USTS)
M = MANUAL TANK GAUGING SYSTEM (USTS)
N = GROUNDWATER MONITORING SYSTEM
O = VAPOR MONITORING SYSTEM
P = VAPOR MONITORING W/DILUTION PROCEDURES
Q = VISUAL INSPECTION OF AST SYSTEMS
R = INTERSTITIAL MONITORING OF TANK BOTTOM
S = STATISTICAL INVENTORY RECONCILIATION (SIR/USTS)
T = ANNUAL TIGHTNESS TEST WITH INVENTORY (UST)
U = BULK PIPING PRESSURE TEST
V = SUCTION PUMP CHECK VALVE
W = FIBER-OPTIC TECHNOLOGIES
X = NONE
Y = UNKNOWN
Z = OTHER DEP APPROVED MONITORING METHOD

Appendix E

Supplemental Information

G.E.A.R.
Gator Engineering & Aquifer Restoration, Inc.
1173 SPRING CENTRE SOUTH BLVD., SUITE C
ALTAMONTE SPRINGS, FL 32714-1976
ph: 407.682.2009 • fx: 407.682.3400

ENTERED
RECEIVED
DEPARTMENT OF
ENVIRONMENTAL PROTECTION
2013 JUN 28 A 10:42
BUREAU OF PETROLEUM
STORAGE SYSTEMS
BUREAU CHIEF'S
OFFICE

June 20, 2013

Mr. James M. Fillmore, III, P.E.
WRScompass Senior Engineer
Florida Department of Environmental Protection
Bureau of Petroleum Storage Systems – Team 5
Mail Station 4585
2600 Blair Stone Road
Tallahassee, FL 32399-2400

LSSI

RECEIVED
FLORIDA DEPARTMENT OF
ENVIRONMENTAL PROTECTION
13 JUN 28 PM 12:54
BUREAU OF PETROLEUM
STORAGE SYSTEMS

REFERENCE: **LOW SCORE SITE INITIATIVE**
SITE ASSESSMENT REPORT
Town Star #38
6600 West Midway Road,
Fort Pierce, St. Lucie County, Florida
FDEP Facility ID No. 56-8942900
Priority Score = 26
Discharge Date: ~~06/19/1989~~ 7/17/1989
Program Eligibility: PLRIP

Dear Mr. Fillmore:

The property owner TimeSaver Food Stores, LLC (TimeSaver) has designated Gator Engineering & Aquifer Restoration, Inc. (GEAR) to complete the Site Assessment Report under the Preapproval Low Score Site Initiative (LSSI) Program procedures for the Town Star #38. This facility is located at 600 West Midway Road, Fort Pierce, St. Lucie County, Florida.

Enclosed please find one (1) copy of the sealed Site Assessment Report and one (1) CD with a PDF copy of the report for your review, as required for the final deliverable of the FDEP work order 2013-95-W4586A.

Should you have any questions, please feel free to contact us at (407) 682-2009.

Sincerely,
GATOR ENGINEERING & AQUIFER RESTORATION, INC.

A. James Kelly, P.E.
Professional Engineer

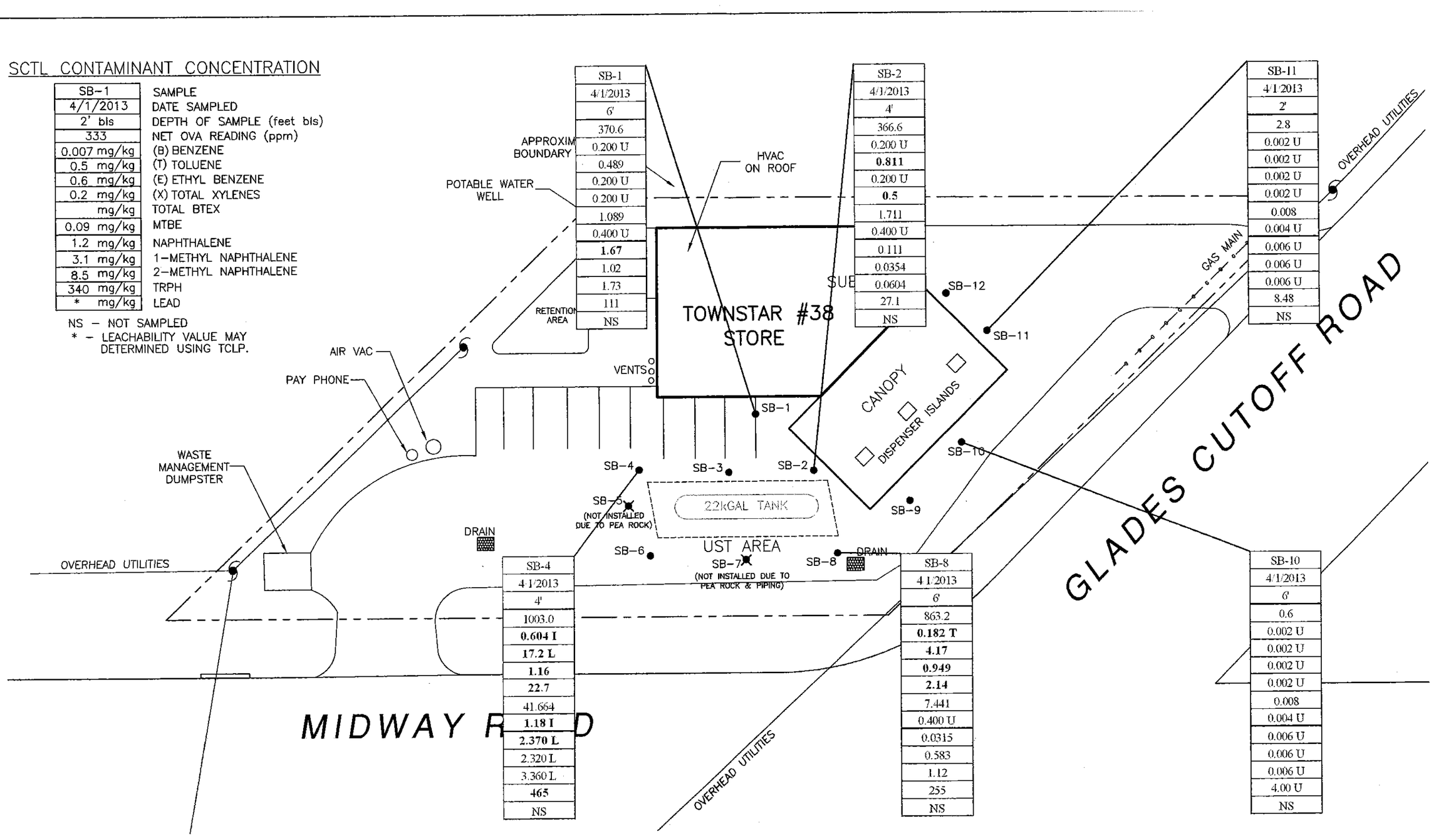
Nelson Wilson, P.G.
President

Cc: Mr. John Tiffany, TimeSaver Food Store Co., 2178 Reserve Park Trace, Fort Pierce, FL 34986.
File Copy Project: 12-0141-1

SCTL CONTAMINANT CONCENTRATION

SB-1	SAMPLE
4/1/2013	DATE SAMPLED
2' bls	DEPTH OF SAMPLE (feet bls)
333	NET OVA READING (ppm)
0.007 mg/kg	(B) BENZENE
0.5 mg/kg	(T) TOLUENE
0.6 mg/kg	(E) ETHYL BENZENE
0.2 mg/kg	(X) TOTAL XYLENES
mg/kg	TOTAL BTEX
0.09 mg/kg	MTBE
1.2 mg/kg	NAPHTHALENE
3.1 mg/kg	1-METHYL NAPHTHALENE
8.5 mg/kg	2-METHYL NAPHTHALENE
340 mg/kg	TRPH
* mg/kg	LEAD

NS - NOT SAMPLED
* - LEACHABILITY VALUE MAY DETERMINED USING TCLP.



LEGEND

● SOIL BORING LOCATION

0' 15' 30'
SCALE: 1" = 30'

SOIL ANALYTICAL RESULTS

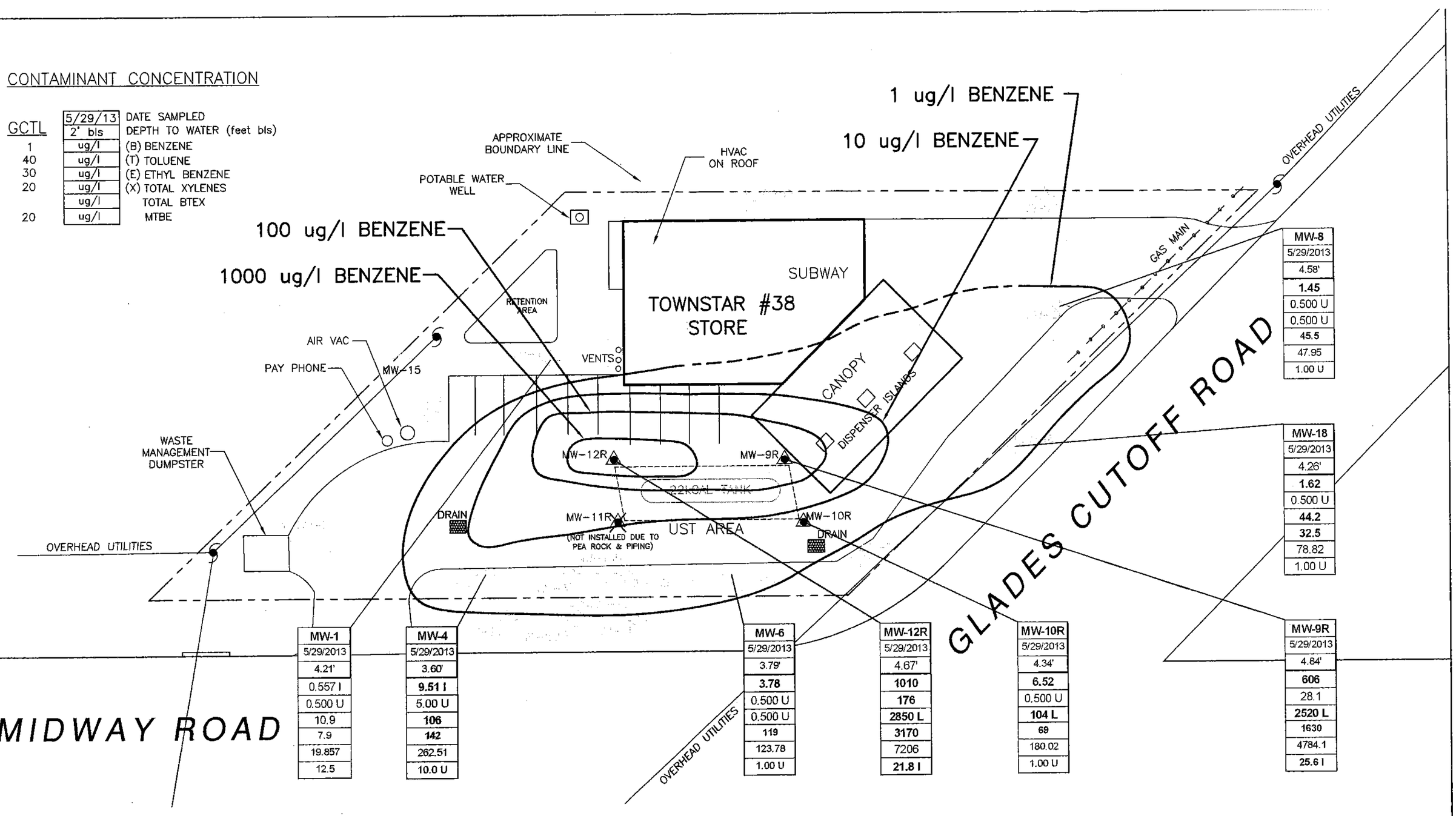
G.E.A.R.

TOWNSTAR #38
6600 WEST MIDWAY ROAD
FORT PIERCE, FLORIDA
ST.LUCIE COUNTY
FDEP FACILITY ID NO. 568942900

Created By:	GG
Checked By:	
Date	6/17/2013
FIGURE	4

CONTAMINANT CONCENTRATION

GCTL		
	5/29/13	DATE SAMPLED
	2' bls	DEPTH TO WATER (feet bls)
1	ug/l	(B) BENZENE
40	ug/l	(T) TOLUENE
30	ug/l	(E) ETHYL BENZENE
20	ug/l	(X) TOTAL XYLENES
	ug/l	TOTAL BTEX
20	ug/l	MTBE



MW-8
5/29/2013
4.58'
1.45
0.500 U
0.500 U
45.5
47.95
1.00 U

MW-18
5/29/2013
4.26'
1.62
0.500 U
44.2
32.5
78.82
1.00 U

MW-1
5/29/2013
4.21'
0.557 I
0.500 U
10.9
7.9
19.857
12.5

MW-4
5/29/2013
3.60'
9.51 I
5.00 U
106
142
262.51
10.0 U

MW-6
5/29/2013
3.79'
3.78
0.500 U
0.500 U
119
123.78
1.00 U

MW-12R
5/29/2013
4.67'
1010
176
2850 L
3170
7206
21.8 I

MW-10R
5/29/2013
4.34'
6.52
0.500 U
104 L
69
180.02
1.00 U

MW-9R
5/29/2013
4.84'
606
28.1
2520 L
1630
4784.1
25.6 I

LEGEND

EXISTING MONITOR WELL LOCATION

NEW MONITOR WELL LOCATION

0' 15' 30'

SCALE: 1" = 30'

N

GROUNDWATER ANALYTICAL - BTEX MAP

G.E.A.R.

Geo-Engineering & Pipeline Restoration, Inc.

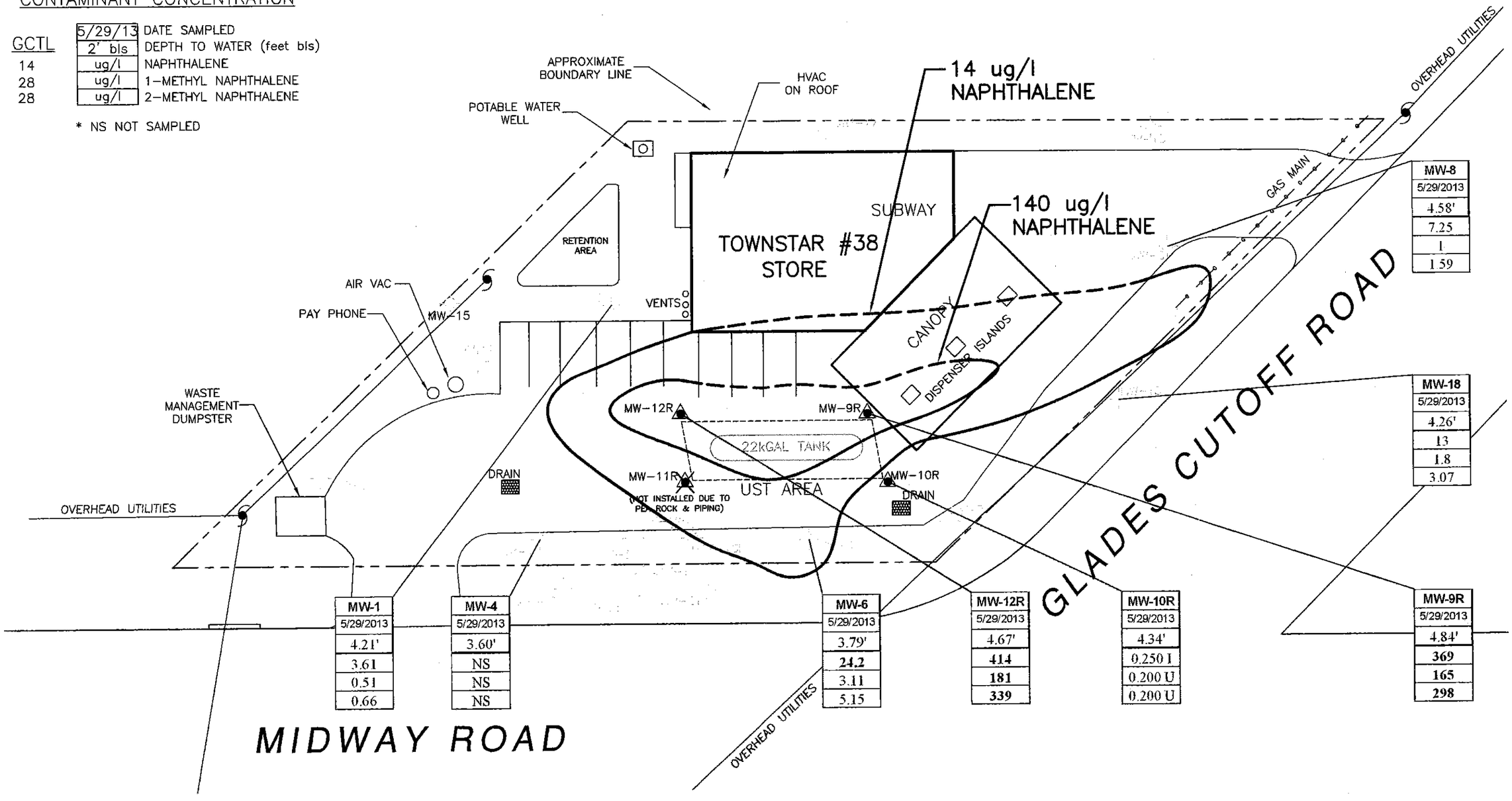
TOWNSTAR #38
6600 WEST MIDWAY ROAD
FORT PIERCE, FLORIDA
ST.LUCIE COUNTY
FDEP FACILITY ID NO. 568942900

Created By:	GG
Checked By:	
Date	6/12/2013
FIGURE	6

CONTAMINANT CONCENTRATION

GCTL		
	5/29/13	DATE SAMPLED
	2' bls	DEPTH TO WATER (feet bls)
14	ug/l	NAPHTHALENE
28	ug/l	1-METHYL NAPHTHALENE
28	ug/l	2-METHYL NAPHTHALENE

* NS NOT SAMPLED



LEGEND

EXISTING MONITOR WELL LOCATION

NEW MONITOR WELL LOCATION

0' 15' 30'

SCALE: 1" = 30'

N

GROUNDWATER ANALYTICAL - NAPHTHALENE MAP

G.E.A.R.

Geological Engineering & Aquifer Restoration, Inc.

TOWNSTAR #38
6600 WEST MIDWAY ROAD
FORT PIERCE, FLORIDA
ST.LUCIE COUNTY
FDEP FACILITY ID NO. 568942900

Created By:	GG
Checked By:	
Date	6/12/2013
FIGURE	7

Department of Environmental Protection

Lawton Chiles
Governor

Southeast District
P.O. Box 15425
West Palm Beach, Florida 33416

Virginia B. Wetherell
Secretary

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

Mr. Robert Rose
USPS-Facilities Service Office
4000 Dekalb Technology Parkway
Building 300, Suite 300
Atlanta, GA 30340-2799

TK\USPS-Midway Road
St. Lucie County

Subject: Site Rehabilitation Completion Order
US Postal Service
5000 Midway Road
Fort Pierce, St. Lucie County
FDEP Facility ID# 569046228

Dear Mr. Rose:

CHECKLIST FOR FINAL ORDER

CASE NAME & NO. USPS #569046228

_____ MEMO APPROVING NFA/MO ATTACHED
__✓__ MEMO APPROVING SRCO ATTACHED
_____ REVIEWED BY PG/PE AS APPLICABLE
__✓__ OTHER: Discharge Serv. Contact

ENFORCEMENT TRACKING	
DRAFT_____	
Initial	Date
WE	9/22/98

Department of Environmental Protection

Southeast District
P.O. Box 15425
West Palm Beach, Florida 33416

Lawton Chiles
Governor

Virginia B. Wetherell
Secretary

OCT 2 1998

CERTIFIED MAIL P 109458088
RETURN RECEIPT REQUESTED

Mr. Robert Rose
USPS-Facilities Service Office
4000 Dekalb Technology Parkway
Building 300, Suite 300
Atlanta, GA 30340-2799

TK\USPS-Midway Road
St. Lucie County

Subject: Site Rehabilitation Completion Order
US Postal Service
5000 Midway Road
Fort Pierce, St. Lucie County
FDEP Facility ID# 569046228

Dear Mr. Rose:

The Bureau of Petroleum Storage Systems has reviewed the First Quarter Monitoring Only Report (MOR) dated October 21, 1997 (received October 27, 1997), the Second Quarter MOR dated December 18, 1997 (received December 19, 1997), the Third Quarter MOR dated March 25, 1998 (received March 30, 1998), and the Fourth Quarter MOR and Site Rehabilitation Completion Report (SRCR) dated July 10, 1998 (received July 16, 1998), prepared and submitted by Ardaman & Associates, Inc. for the discharge discovered on August 21, 1996, at this site. Documentation submitted with the SRCR confirms that criteria set forth in Rule 62-770.680(1), Florida Administrative Code (F.A.C.), have been met. The SRCR is hereby incorporated by reference in this Site Rehabilitation Completion Order (Order). Therefore, you are released from any further obligation to conduct site rehabilitation at the site, except as set forth below.

1. In the event concentrations of petroleum products' chemicals of concern increase above the levels approved in this Order, or if a subsequent discharge of petroleum or petroleum product occurs at the site, the Department may require site rehabilitation to reduce concentrations of petroleum products' chemicals of concern to the levels approved in the SRCR or otherwise allowed by Chapter 62-770, F.A.C.

2. Additionally, you are required to properly abandon all monitoring wells, except compliance wells required by Chapter 62-761, F.A.C., for release detection, within 60 days after receipt of this Order. The monitoring wells must be abandoned in accordance with the requirements of Rule 62-532.500(4), F.A.C.

56-8946228

Persons affected by this Order have the following options:

If you choose to accept the above decision by the Department about this Order you do not have to do anything. This Order is final as of the date on the top of the first page of this Order.

If you disagree with the decision, you may do one of the following within 21 days after receipt of this Order:

1. File a petition for administrative hearing with the Office of the General Counsel of the Department within 21 days after receipt of this Order;

OR

2. File a request for an extension of time to file a petition for hearing with the Office of the General Counsel of the Department within 21 days after receipt of this Order. Such a request should be made if you wish to meet with the Department in an attempt to informally resolve any disputes without first filing a petition for hearing.

Please be advised that mediation of this decision, pursuant to Section 120.573, Florida Statutes (F.S.), is not available.

How to Request an Extension of Time to File a Petition for Hearing

A request for an extension of time to file a petition for hearing must be filed (received) in the Office of the General Counsel of the Department at 3900 Commonwealth Boulevard, MS 35, Tallahassee, Florida 32399-3000, within 21 days after receipt of this Order. Pursuant to Rule 28-106.111(3), F.A.C., a request for extension of time shall contain a certificate that the moving party has consulted with all other parties, if any, concerning the extension and that the Department and any other parties agree to said extension. Petitioner, if different from the U.S. Postal Service, shall mail a copy of the petition to the U.S. Postal Service at the time of filing. Timely filing a request for an extension of time tolls the time period within which a petition for administrative hearing must be filed until the request is acted upon.

How to File a Petition for Administrative Hearing

A person whose substantial interests are affected by this Order may petition for administrative hearing in accordance with Sections 120.569 and 120.57, F.S. The petition must contain the information set forth below and must be filed (received) in the Office of the General Counsel of the Department at 3900 Commonwealth Boulevard, MS 35, Tallahassee, Florida 32399-3000, within 21 days after receipt of this Order. Petitioner, if different from the U.S. Postal Service, shall mail a copy of the petition to the U.S. Postal Service at the time of filing. Failure to file a petition within this time period shall waive the right of anyone who may request an administrative hearing under Sections 120.569 and 120.57, F.S.

Pursuant to Rules 62-103.155 and 28-106.201, F.A.C., a petition for administrative hearing shall contain the following information:

a) The name, address, and telephone number of each petitioner, the name, address, and telephone number of the petitioner's representative, if any, the site owner's name and address, if different from the petitioner, the FDEP facility number, and the name and address of the facility;
b) A statement of how and when each petitioner received notice of the Department's action or proposed action;
c) A statement of how each petitioner's substantial interests are affected by the Department's action or proposed action;
d) A statement of the material facts disputed by the petitioner, if any;
e) A statement of facts which petitioner contends warrant reversal or modification of the Department's action or proposed action;
f) A statement of which rules or statutes petitioner contends requires reversal or modification of the Department's action or proposed action; and
g) A statement of the relief petitioner seeks, stating precisely what petitioner wants the Department to do regarding the Department's action or proposed action.

This Order is final and effective as of the date on the top of the first page of this Order. Timely filing a petition for administrative hearing postpones the date this Order takes effect until the Department issues either a Final Order pursuant to an administrative hearing or an Order Responding to Supplemental Information provided pursuant to meetings with the Department.

Judicial Review

Any party to this Order has the right to seek judicial review of this Order pursuant to Section 120.68, F.S., by filing a Notice of Appeal pursuant to Rule 9.110, Florida Rules of Appellate Procedure, with the Department clerk in the Office of the General Counsel, 3900 Commonwealth Boulevard, MS 35, Tallahassee, Florida 32399-3000. Simultaneously with filing a Notice of Appeal with the Department, petitioner must file a copy of the Notice of Appeal with the applicable filing fees, with the appropriate District Court of Appeal. The Notice of Appeal must be received by the Department clerk within 30 days from the date this Order was signed by an agency clerk (see below).

The FDEP Facility Number for this site is 569046228. Please use this identification on all future correspondence with the Department.

Questions

Should you have any questions regarding the legal processes, please contact the Office of the General Counsel at (850) 488-9730. Any questions regarding the Department's review of your Site Rehabilitation Completion Report should be directed to William Barrett at (561) 681-6734. Technical questions should be

directed to Joan Ragland at (850) 922-9349. Contact with any of the above does not constitute a petition for administrative hearing.

Sincerely,

Carlos Rivero-deAguilar Date 9/28/98
Director of District Management
Southeast District

VK
CRA\VK\62\wab\USPS-Mid.doc

FILING AND ACKNOWLEDGMENT
FILED, on this date, pursuant to §120.52 Florida Statutes, with the designated Department Clerk, receipt of which is hereby acknowledged.

Clerk (or Deputy Clerk) 10-2-98 Date

c: West Palm Beach DEP File
Storage Tank Archboard
St. Lucie County Public Health Unit
Joan Ragland, DEP-Tallahassee, BPSS, PCS-4
Marily Wong, USPS-Tampa
Paul C. Stemle, Ardaman & Associates, Inc.

CHECKLIST FOR FINAL ORDER

ENFORCEMENT TRACKING	
DRAFT_____	
Initial	Date
WAR	9/22/98
	9/[illegible]/98
	9/23

CASE NAME & NO. USPS #569046228

_____ MEMO APPROVING NFA/MO ATTACHED
__✓__ MEMO APPROVING SRCO ATTACHED
_____ REVIEWED BY PG/PE AS APPLICABLE
__✓__ OTHER: Discharge Scree Printout

Department of Environmental Protection

Jeb Bush
Governor

Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

David B. Struhs
Secretary

June 5, 2001

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

Mr. Douglas Anderson
St. Lucie County Board of Commissioners
2300 Virginia Avenue
Fort Pierce, Florida 34981

Subject: Site Rehabilitation Completion Order
St. Lucie County Sheriff's Department
4300 West Midway Road
Fort Pierce, St. Lucie County
FDEP Facility ID# 569600068

Dear Mr. Anderson:

The Bureau of Petroleum Storage Systems has reviewed the Source Removal Report and No Further Action Proposal (NFAP) dated May 5, 2000 (received June 25, 2000), for the petroleum product discharge discovered on April 7, 2000 at this site. Documentation submitted with the NFAP confirms that criteria set forth in Rule 62-770.680(1), Florida Administrative Code (F.A.C.), have been met. The NFAP is hereby incorporated by reference in this Site Rehabilitation Completion Order (Order). Therefore, you are released from any further obligation to conduct site rehabilitation at the site for petroleum product contamination associated with the discharge listed above, except as set forth below.

In the event concentrations of petroleum products' contaminants of concern increase above the levels approved in this Order, or if a subsequent discharge of petroleum or petroleum product occurs at the site, the Department of Environmental Protection (Department) may require site rehabilitation to reduce concentrations of petroleum products' contaminants of concern to the levels approved in the NFAP or otherwise allowed by Chapter 62-770, F.A.C.

Legal Issues

The Department's Order shall become final unless a timely petition for an administrative proceeding (hearing) is filed under Sections 120.569 and 120.57, Florida Statutes (F.S.), within 21 days of receipt of this Order. The procedures for petitioning for a hearing are set forth below.

Persons affected by this Order have the following options:

If you choose to accept the above decision by the Department about the No Further Action Proposal you do not have to do anything. This Order is final and effective as of the date on the top of the first page of this Order.

If you disagree with the decision, you may do one of the following:

(1) File a petition for administrative hearing with the Department's Office of General Counsel within 21 days of receipt of this Order; or

(2) File a request for an extension of time to file a petition for hearing with the Department's Office of General Counsel within 21 days of receipt of this Order. Such a request should be made if you wish to meet with the Department in an attempt to informally resolve any disputes without first filing a petition for hearing.

Please be advised that mediation of this decision pursuant to Section 120.573, F.S., is not available.

How to Request an Extension of Time to File a Petition for Hearing

For good cause shown, pursuant to Rule 62-110.106(4), F.A.C., the Department may grant a request for an extension of time to file a petition for hearing. Such a request must be filed (received) in the Department's Office of General Counsel at 3900 Commonwealth Boulevard, Mail Station 35, Tallahassee, Florida 32399-3000, within 21 days of receipt of this Order. Petitioner, if different from St. Lucie County Board of Commissioners, shall mail a copy of the request to St. Lucie County Board of Commissioners at the time of filing. Timely filing a request for an extension of time tolls the time period within which a petition for administrative hearing must be made.

How to File a Petition for Administrative Hearing

A person whose substantial interests are affected by this Order may petition for an administrative hearing under Sections 120.569 and 120.57, F.S. The petition must contain the information set forth below and must be filed (received) in the Department's Office of General Counsel at 3900 Commonwealth Boulevard, Mail Station 35, Tallahassee, Florida 32399-3000, within 21 days of receipt of this Order. Petitioner, if different from St. Lucie County Board of Commissioners, shall mail a copy of the request to St. Lucie County Board of Commissioners at the time of filing. Failure to file a petition within this time period shall waive the right of anyone who may request an administrative hearing under Sections 120.569 and 120.57, F.S.

Pursuant to Section 120.54(5)(b)4.a., F.S. (1998, Supp.), and Rule 28-106.201, F.A.C., a petition for administrative hearing shall contain the following information:

(a) The name, address, and telephone number of each petitioner, the name, address, and telephone number of the petitioner's representative, if any, the site owner's name and address, if different from the petitioner, the FDEP facility number, and the name and address of the facility;
(b) A statement of how and when each petitioner received notice of the Department's action or proposed action;
(c) An explanation of how each petitioner's substantial interests are or will be affected by the Department's action or proposed action;
(d) A statement of the material facts disputed by the petitioner, or a statement that there are no disputed facts;
(e) A statement of the ultimate facts alleged, including a statement of the specific facts the petitioner contends warrant reversal or modification of the Department's action or proposed action;
(f) A statement of the specific rules or statutes the petitioner contends require reversal or modification of the Department's action or proposed action; and
(g) A statement of the relief sought by the petitioner, stating precisely the action petitioner wishes the Department to take with respect to the Department's action or proposed action.

This Order is final and effective as of the date on the top of the first page of this Order. Timely filing a petition for administrative hearing postpones the date this Order takes effect until the Department issues either a final order pursuant to an administrative hearing or an order responding to supplemental information provided pursuant to meetings with the Department.

Judicial Review

Any party to this Order has the right to seek judicial review of it under Section 120.68, F.S., by filing a notice of appeal under Rule 9.110 of the Florida Rules of Appellate Procedure with the clerk of the Department in the Office of General Counsel, 3900 Commonwealth Boulevard, Mail Station 35, Tallahassee, Florida 32399-3000, and by filing a copy of the notice of appeal accompanied by the applicable filing fees with the appropriate district court of appeal. The notice of appeal must be filed within 30 days after this Order is filed with the clerk of the Department (see below).

The FDEP Facility Number for this site is 569600068. Please use this identification on all future correspondence with the Department.

Questions

Any questions regarding the Department's review of your No Further Action Proposal should be directed to Susan Fields at (850) 921-0804. Questions regarding legal issues should be referred to the Department's Office of General Counsel at (850) 488-9314. Contact with any of

the above does not constitute a petition for administrative hearing or request for an extension of time to file a petition for administrative hearing.

Sincerely,

Michael E. Ashey, Chief
Bureau of Petroleum Storage Systems

MEA/sf

cc: Stephen E. Brown, FDEP Southeast District Office
Wayne Teegardin, St. Lucie County Risk Management Safety Office, 2300 Virginia Avenue, Fort Pierce, Florida 34981
Paul R. Loudenslager, REP Associates, Inc. 3932 RCA Boulevard, Suite 3204, Palm Beach Gardens, Florida 33410
Sam DiMaria, Magnum Environmental Services, Inc., 5690 West Midway Road, Fort Pierce, Florida 34981
File

FILING AND ACKNOWLEDGMENT
FILED, on this date, pursuant to
§120.52 Florida Statutes, with the
designated Department Clerk, receipt
of which is hereby acknowledged.

Joanie Diestelhorst — Clerk (or Deputy Clerk)
6-5-01 — Date

P.E. CERTIFICATION

No Further Action Proposal for St. Lucie County Sheriff's Department, located at 4300 West Midway Road, Fort Pierce, FDEP Facility ID# 569600068.

I hereby certify that in my professional judgment, the components of this No Further Action Proposal satisfy the requirements set forth in Chapter 62-770, Florida Administrative Code (F.A.C.).

___ I personally completed this review.

X This review was conducted by Susan Fields working under my direct supervision.

Thomas W. Conrardy

Tom Conrardy, P.E.
PE Administrator
Petroleum Cleanup Section 3

6/5/01

Date

Department of
Environmental Protection

Jeb Bush
Governor

Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

David B. Struhs
Secretary

Memorandum

TO: Teresa Rahrig
Florida Department of Environmental Protection – Southeast District
P.O. Box 15425, West Palm Beach, Florida 33416-5425

THROUGH: MB Michael Bland, P.G.
Bureau of Petroleum Storage Systems
Petroleum Cleanup Section 4
Mail Station 4580

FROM: JSV John S. Vargo, C.P.G., P.G.
Bureau of Petroleum Storage Systems
WRS Petroleum Cleanup Section 5
Mail Station 4585

DATE: October 21, 2002

SUBJECT: Request to Rescind: Preliminary Review Comments dated May 17, 2002
Tank Closure Assessment Report (DRF April 9, 2001)
Rinker Materials Facility
6100 West Midway Road
Port St. Lucie, St. Lucie County, Florida
DEP Facility ID #56-8520370

The Southeast District and St. Lucie County Health Department (SLCHD) have requested that the above referenced Preliminary Review Comments dated May 17, 2002, be rescinded. The subject review comments were prepared based on review of the Tank Closure Assessment Report (TCAR) dated May 24, 2001, (prepared by Seyfried & Associates, Inc. as authorized by Rinker Materials Corporation) according to Rule 62-770, F.A.C. However, since the St. Lucie County Health Department (SLCHD) intends to issue a No Further Assessment letter pursuant to Rule 62-761, F.A.C., the Preliminary Review Comments dated May 17, 2002, are hereby rescinded.

If you have any questions please contact me by telephone at (850) 222-6446, ext. 248.

John Vargo

From: "Kuehle, Nicole" <Nicole.Kuehle@dep.state.fl.us>
To: "Rahrig, Teresa" <Teresa.Rahrig@dep.state.fl.us>
Sent: Thursday, October 17, 2002 9:04 AM
Subject: FW: TCAR review

Teresa, Please review and send to John Vargo at jvargo@wrsie.com

John,

You issued comments on a review of this TCAR for Rinker Materials (FDEP ID #568520370) on 5/17/02. I believe there was a misunderstanding and it was reviewed as a SAR. I have been in conversation with Rinker after these 5/17/02 comments were issued to them and they did not understand why a SAR was even required from the county because nothing was found above cleanup target levels in the TCAR. I informed them I would do more research into why a SAR was required by the county. I reviewed the report myself, contacted St. Lucie County for reasons a cleanup notification letter was issued, and then sent it to Guillermo Wibmer requesting his clarification (see below). It is now the SED/DEP belief that a SAR should never have been required for this site and therefore a no further assessment letter should be issued by the county.

However we need to discuss your comments that were issued and if you could rescind them. Once rescinded St. Lucie County could then issue a no further assessment letter for this site. Please contact me in regards to this facility if you have any questions. Thanks for your help.

Nicole Kuehle
Environmental Specialist II
SED/DEP - Tanks Program
Phone: (561) 681-6734, SC 226-6734

-----Original Message-----
From: Wibmer, Guillermo
Sent: Tuesday, September 10, 2002 2:49 PM
To: Kuehle, Nicole
Subject: RE: TCAR review

Although confirmatory soil samples were not collected, since there was only a minor hit on the OVA and CTLs were not exceeded it is my opinion that the County should have issued a No Further Assessment letter instead of requesting a SAR. Somebody needs to explain the reviewer that contamination is present only if CTLs are exceeded. GJW

-----Original Message-----
From: Kuehle, Nicole
Sent: Tuesday, September 10, 2002 11:27 AM
To: Wibmer, Guillermo
Subject: TCAR review

Guillermo,
Enclosed I have scanned a TCAR from Rinker Materials (FDEP ID #568520370). St. Lucie County reviewed this TCAR and stated cleanup was necessary (ie: they had to do a SAR). I sent a letter stating a SAR was overdue to the facility. They submitted two more groundwater samples. I sent the TCAR and the samples for technical review. Outcome was that a complete SAR had never been done so it could not be reviewed. I again told the facility that a SAR was due. They disagree and believe a SAR should never have been necessary because their levels were not above Table IV in the Closure Guidelines. I told them I would review the TCAR and check with St. Lucie County as to why they stated cleanup was necessary. St.

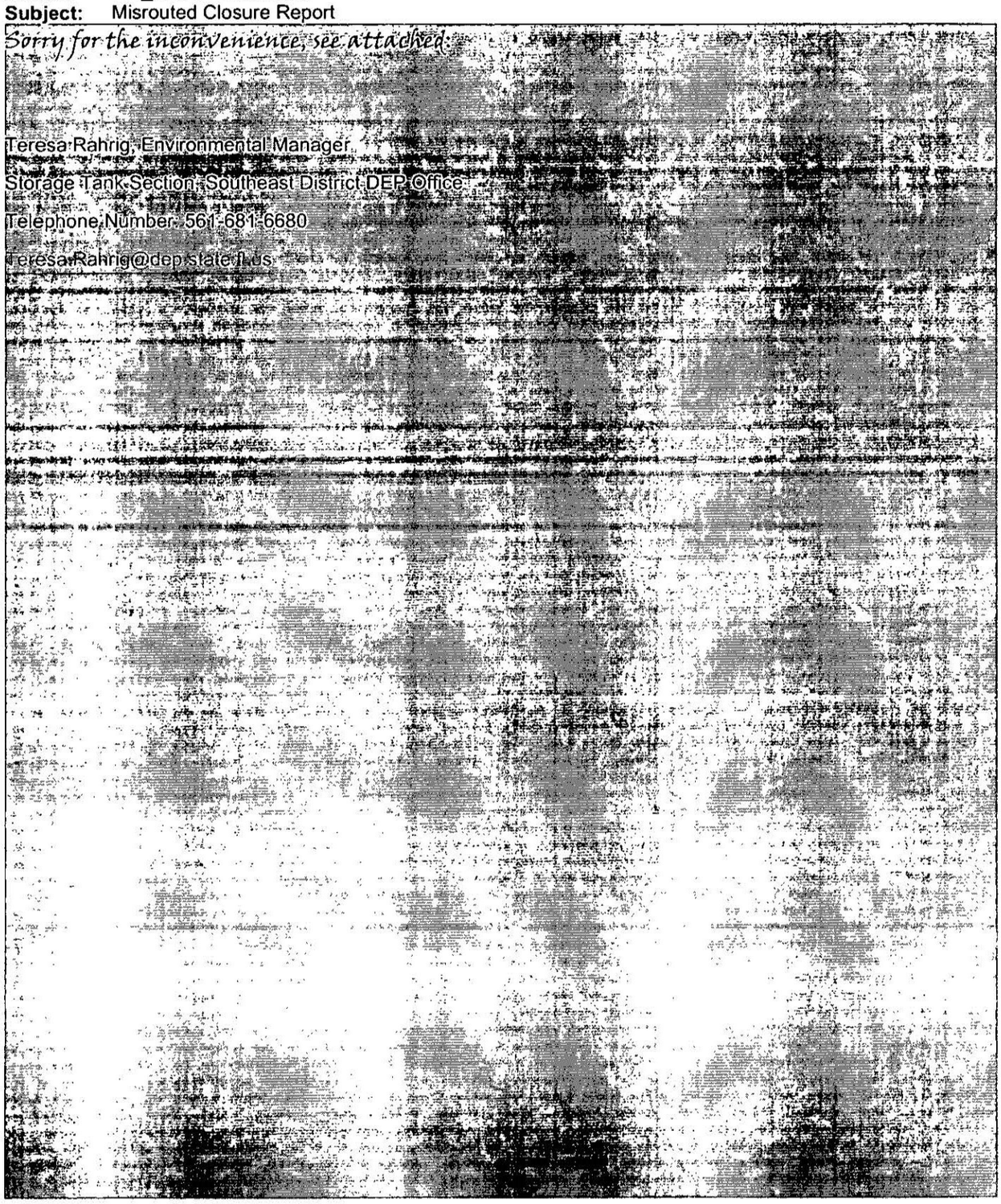
Lucie's response was that whenever a hit is discovered they automatically issue a letter, they then referenced the April 9th sample hit for FL PRO. The Total PRO in the TCAR is under 350 mg/kg. It has always been my understanding that if the hit is under the detection limits of the Table (IV) that a no further assessment letter should have been issued. Could you please clarify.

Nicole Kuehle
Environmental Specialist II
SED/DEP - Storage Tank Section
561-681-6734
<< File: FDEP 568520370-Rinker Materials.tif >>

John Vargo

From: "Rahrig, Teresa" <Teresa.Rahrig@dep.state.fl.us>
To: <jvargo@wrsie.com>
Sent: Thursday, October 17, 2002 9:46 AM
Attach: FW_ TCAR review.eml
Subject: Misrouted Closure Report

Sorry for the inconvenience, see attached.



Florida Department of Environmental Protection

Twin Towers Office Bldg. 2600 Blair Stone Road. Tallahassee, Florida 32399-

Division of Waste Management
Bureau of Petroleum Storage Systems

Storage Tank Facility Annual Compliance Site Inspection Report

Facility Information:

Facility ID:	8520370	County: ST. LUCIE	Inspection Date: 03/26/2015
Facility Type:	C -Fuel user/Non-retail		
Facility Name:	CEMEX-WEST FORT PIERCE READY-MIX & BLOCK		# Of Inspected ASTs: 1
	6100 W MIDWAY RD		USTs: 0
	FORT PIERCE, FL 34981		Mineral Acid Tanks: 0
Latitude:	27° 22' 29.376"		
Longitude:	80° 23' 20.7084"		
LL Method:	DPHO		

Inspection Result:

Result : In Compliance

Description: Facility is In Compliance.

Financial Responsibility

Financial Responsibility: SELF-INSURANCE - LETTER FROM CHIEF FINANCIAL OFFICER

Effective Date: 04/14/2014 Expiration Date: 04/14/2015

Signatures:

TKPBEM - PALM BEACH CNTY ENVIRONMENTAL RESOURCES MGMT

Storage Tank Program Office

(561) 233-2400

Storage Tank Program Office Phone Number

Martha E Rutherfoord	Bradford Austin
INSPECTOR NAME	**REPRESENTATIVE NAME**
INSPECTOR SIGNATURE	**REPRESENTATIVE SIGNATURE**

Facility ID: 8520370

Owners of UST facilities are reminded that the Federal Energy Policy Act of 2005 requires Operator Training at all facilities by August 8, 2012. For further information please visit: http://www.dep.state.fl.us/waste/categories/tanks/pages/op_train.htm

System Tests

Type	Date Completed	Results	Reviewed	Next Due Date	Comment
Completed Tests					
Annual Operability Test	03/27/2015	Passed	03/30/2015	03/27/2016	Krueger leak gauge by Cemex Operator Bradford Austin.

Reviewed Records

Record Category	Record Type	From Date	To Date	Reviewed Record Comment
Two Years	Monthly Maint. Visual Examinations and Results	03/26/2013	03/26/2015	
Life Time	Written Release Detection Response Level Info	03/26/2013	03/26/2015	
Two Years	Certificate of Financial Responsiblity	04/14/2014	04/14/2015	

Inspection Comments

03/26/2015

Physical inspection performed on 3/26/15.
Site photo and map verified and attached to the Facility Information page in FIRST.
DEP registration placard observed and the registration, facility and owner info verified.
Inspection emailed.

RELEASE DETECTION, every 30 to 35 days, not to exceed 35 days, monitor and maintain reports:
Tank, piping and components: visual inspection including Krueger tank interstitial gauge.

PHYSICAL INSPECTION OBSERVATIONS:
TANK: (1) AST doublewall 10K gallon Tank #8 vehicular diesel, (1) tank vent, (1) emergency tank vent, (1) outerwall vent, color-coding/labeling per API requirements, ok, remove rust and repaint as needed.
PIPING: Aboveground singlewall no contact with soil, anti-siphon valve present, ok.
DISPENSING EQUIPMENT: No obvious integrity issues, spill containment ok, ensure all is clean and dry for accurate inspection.
TANK OUTERWALL: Krueger level gauge, Operator provided test 3/27/15, ok, documentation attached in FIRST.
OVERFILL PREVENTION: Morrison clock level gauge and high level alarm, appear operational, ok.
SURROUNDING AREA: No staining noted on pavement or dirt that would indicate release to environment.
EMERGENCY SHUT-OFF: Appears functional.

Inspection Photos

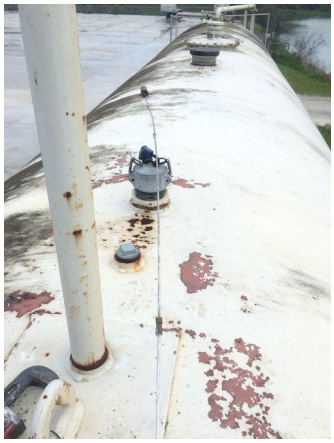
Facility ID: 8520370

Added Date 03/30/2015

2015_03_26 Tank #8 Fill and dispensing -looking south

Added Date 03/30/2015

2015_03_27 Krueger leak gauge test



Appendix F
Site Photographs

View to the east of Midway Road from project west limit

View to the northeast of Site No. 1 – Townstar # 38, located northwest section of project west limit

View to the southwest of Site No. 2 – CSX Railroad located on Midway Road

View to the northeast of entrance to Site No. 3 –CEMEX-West Ft. Pierce Ready-Mix & Block

View to the south of Site No. 4 – FECP Cast Crete/ Prestige Gunite

View to the northwest of Site No. 5 – US Postal Service

View to the northwest of Site No. 6 – St Lucie County Sheriff's Department

View to the west of Site No. 7 – Sunshine Food Mart #343

APPENDIX 11

Geotech

TIERRA SOUTH FLORIDA, INC.

May 26, 2016

Inwood Consulting Engineers
3000 Dovera Dr., Suite 200
Oviedo, FL 32765

Attn: Alex B. Hull, PE
Principal

RE: **Preliminary Roadway Soil Survey Report**
PD&E Study for Midway Road (CR 712)
From Glades Cut Off Road (CR 709) to Selvitz Road (CR 615)
St. Lucie County, Florida
FPID No. 231440-3-22-01
TSF Project No.: 7111-15-154

Dear Alex:

Tierra South Florida, Inc. (TSF) has completed a preliminary roadway soil survey for the subject roadway improvement PD&E Study project. The preliminary soil survey was performed in general accordance with FDOT procedures. The results of our preliminary geotechnical study and subsequent preliminary geotechnical recommendations are presented in this report.

If you have any questions or comments regarding this report, please contact our office at your earliest convenience.

Sincerely,

TIERRA SOUTH FLORIDA, INC.

Raj Krishnasamy, P.E.
Principal Engineer/President
FL Registration No. 53567

N. Manoharan, Ph.D.
Senior Specialist

2765 VISTA PARKWAY, SUITE 10; WEST PALM BEACH, FLORIDA 33411
(561) 687-8539; FAX (561) 687-8570
State of Florida Professional Engineers License #28073

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APPENDIX: Vicinity Map
USDA Soil Survey Map
Boring Location Plan
Roadway Soil Survey
Soil Profiles
Groundwater Level Data
Laboratory Test Results

1.0 PROJECT DESCRIPTION

The Florida Department of Transportation District Four is conducting a Project Development and Environment (PD&E) study in an effort to provide improvements (widening) of Midway Road (CR 712) from Glades cut off Road (CR 709) to Selvitz Road (CR 615) in St. Lucie County.

The purpose of this preliminary geotechnical study was to provide preliminary geotechnical information to assist in the PD&E Study.

2.0 SCOPE OF SERVICES

The study was performed to obtain information on the existing subsurface conditions along the project alignment to assist in the design and preparation of construction plans for the proposed construction. The following services were provided:

1. Reviewed readily available published topographic and soils information. This information was obtained from the "Soil Survey of St. Lucie County, Florida" published by the United States Department of Agriculture (USDA) Natural Resources Conservation Services (NRCS), and USGS Maps.

2. Performed a preliminary geotechnical exploration along the project corridor which included a total of sixteen (16) roadway soil borings (14 Standard Penetration Test (SPT) borings to 10 feet deep below existing grades + 2 hand auger borings 6 to 10ft deep). Hand auger borings were performed at difficult site access conditions locations.

3. Classified soil samples using the AASHTO Soil Classification System and performed a limited laboratory testing to establish the soil properties. The laboratory testing included grain size analysis, moisture content and organic determination and Atterberg Limit tests.

4. Prepared this Preliminary Roadway Soil Survey Report for the project.

These Geotechnical Services were performed in general accordance with FDOT's Soils and Foundations Handbook (2016)

3.0 RESULTS OF SUBSURFACE EXPLORATION

3.1 Review of USDA Soil Survey, St. Lucie County, Florida

Based on a review of the St. Lucie County Soil Survey, the project corridor is mapped as:

25—Nettles and Oldsmar sands
31—Pepper and EauGallie sands
38—Riviera fine sand, 0 to 2 percent slopes
44—Tantile and Pomona sands
48—Wabasso sand, 0 to 2 percent slopes
50—Waveland and Immokalee fine sands

A Site Vicinity Map and USDA soil survey map are presented in the Appendix.

3.2 Field Explorations

The subsurface conditions along the project corridor were explored by a total of 16 soil borings as follows:

- A total of 14 SPT borings to 10 feet deep below existing grades (borings RD-1 thru RD-5, RD-7 thru RD-10, RD-12 thru RD-15, and RD-18).
- A total of 2 hand auger borings (RD-6 and RD-7) at difficult site access conditions.

During our field work the east end of the project was a construction zone and borings RD-16 and RD-17 planned in this area could not be performed.

The borings were located in the field by TSF personnel using a hand-held GPS system. The SPT borings were drilled using a truck-mounted CME-55 drill rig and mud rotary procedures. In the borings samples of the in-place materials were obtained continuously in the upper 10 feet. At a few locations, due to difficult site access conditions, borings were performed using hand augers (about 6 to 10 feet below existing grades). Approximate locations of the borings are presented in the boring location plan included in the Appendix. The soil samples were returned to our laboratory for classification by a geotechnical engineer. The samples were visually classified in general accordance with the AASHTO Soil Classification System.

3.3 General Soil Condition

The soil types encountered in the borings have been assigned a stratum number. The stratum numbers and soil types encountered are listed below.

Stratum Number	Typical Soil Description	AASHTO Classification	FDOT Soil Designation
1	Topsoil	A-8	Unsuitable
2	Brown to light brown sand, occasionally few to trace silt and trace limerock	A-3	Select
3	Brown silty sand occasionally trace shell	A-2-4	Select
4	Dark brown organic stained silty sand	A-2-4	Select

Soil profiles encountered in the borings are presented in the Appendix.

A Geotechnical engineer bases soil stratification on a visual review of the recovered samples, laboratory testing, and interpretation of the field boring logs. The boring stratification lines represent the approximate boundaries between soil types of significantly different engineering properties; however, the actual transition may be gradual. In some cases, small variations in properties not considered pertinent to our engineering evaluation may have been abbreviated or omitted for clarity. The boring profiles represent the conditions at the particular boring location and variations do occur and should be expected among the borings.

4.0 LABORATORY TESTING

Representative soil samples collected from the borings were classified and stratified in general accordance with the AASHTO Soil Classification System. Our classification was based on visual inspection, using the results from the laboratory testing as confirmation. The laboratory tests performed include natural moisture content and organic content tests, grain size analysis and Atterberg Limit tests. Laboratory test results are presented in the Appendix.

5.0 GROUNDWATER CONDITIONS

5.1 Groundwater

Encountered groundwater depth was measured at the boring locations following termination of drilling. The groundwater table measured in the borings generally ranged from about 3.3 to 5.5 feet below existing grades (elevations approximately from +12.7 to +17.8 feet, NAVD 1988). Encountered groundwater depths measured in the boring are presented in the roadway soils survey in the Appendix. Some of the borings did not encounter groundwater within the boring termination depths.

Groundwater conditions will vary with environmental variations and seasonal conditions, such as the frequency and magnitude of rainfall patterns, as well as man-made influences (i.e. existing canals, swells, drainage ponds, under drains, and areas of covered soils, like paved parking lots and sidewalks). Fluctuation should be anticipated. We recommend that the contractor determine the actual groundwater levels at the time of construction to determine groundwater impact on his construction procedure.

5.2 Seasonal High Groundwater Estimates

Seasonal high groundwater levels are expected to be controlled by existing drainage features present in the project vicinity. A summary of encountered groundwater elevations and estimated seasonal high groundwater levels are included in the Appendix. Based on the preliminary soil borings, estimated seasonal high groundwater table levels within the project limits are expected to range approximately from elevation +13 to +18 feet, NAVD 1988.

6.0 ENGINEERING EVALUATIONS AND PRELIMINARY RECOMMENDATIONS

6.1 General

In general, the existing shallow subsurface soils encountered in the borings are suitable for supporting the proposed improvements after proper subgrade preparation. Site preparation should consist of normal clearing and grubbing followed by compaction of subgrade soils.

The removal of topsoil where required should be accomplished in accordance with the Florida Department of Transportation (FDOT) Standard Specifications Section 110 – Clearing and Grubbing. Buried organic soils, plastic soils, debris, or unsuitable fills encountered during construction, which are not shown on the boring profiles should be removed and replaced with properly compacted suitable fill. The removal organic soils and plastic soils where required should be accomplished in accordance with FDOT Standard Index 500. Backfill should consist of materials conforming to FDOT Standard Index 505 and compacted in accordance with Section 120-9 of the Standard Specification for Road and Bridge Construction, latest edition.

6.2 Permanent Cut and Fill Slopes

We anticipate that fills will be required for the proposed roadway widening. Assuming proper subgrade preparation and adequate fill materials are utilized, we recommend that all proposed permanent side slopes be constructed on 2.0 horizontal to 1.0 vertical (2H:1V) or flatter. To prevent minor sloughing at the surface, we recommend that the slopes be seeded, mulched and maintained to enhance slope stability soon after being completed.

6.3 Excavations

All excavations should be performed in accordance with FDOT Standard Index 500, the latest Standard Specifications for Road and Bridge Construction, and in accordance with OSHA Standards. We recommend that sides of temporary excavations be sloped to 2H:1V or flatter or supported by temporary shoring.

6.4 Groundwater Control

Groundwater may not have impact on the proposed roadway widening if the proposed roadway elevations are kept at or above the existing road level. However, depending upon groundwater levels at the time of construction, some form of dewatering may be required for utility excavations.

6.5 On-Site Soil Suitability

Stratum 1 consists of topsoil. Topsoil should be stripped from the proposed widening areas in accordance with Standard Specifications Section 110 - Clearing and Grubbing.

Stratum 2 consists of select material (A-3). This material appears to be suitable to use in embankment and should be utilized according to Standard Index 505.

Strata 3 and 4 consist of select material (A-2-4). This material is likely to retain excess moisture and may be difficult to dry and compact. It may be used in the embankment above water level at the time of construction and should be utilized according to Standard Index 505. It may be used in the subgrade portion of the roadbed when approved by the District Materials Engineer. Material placed below the existing water level must be non-plastic and contain less than 15% passing the 15% the No. 200 U.S. Standard Sieve.

7.0 REPORT LIMITATIONS

Our Geotechnical engineering evaluation of the site and subsurface conditions with respect to the planned roadway improvements and our recommendations for site preparation and foundation construction are based upon the followings: (1) site observations, (2) the field exploratory test data obtained during the geotechnical study, and (3) our understanding of the project information and anticipated final grades as presented in this report.

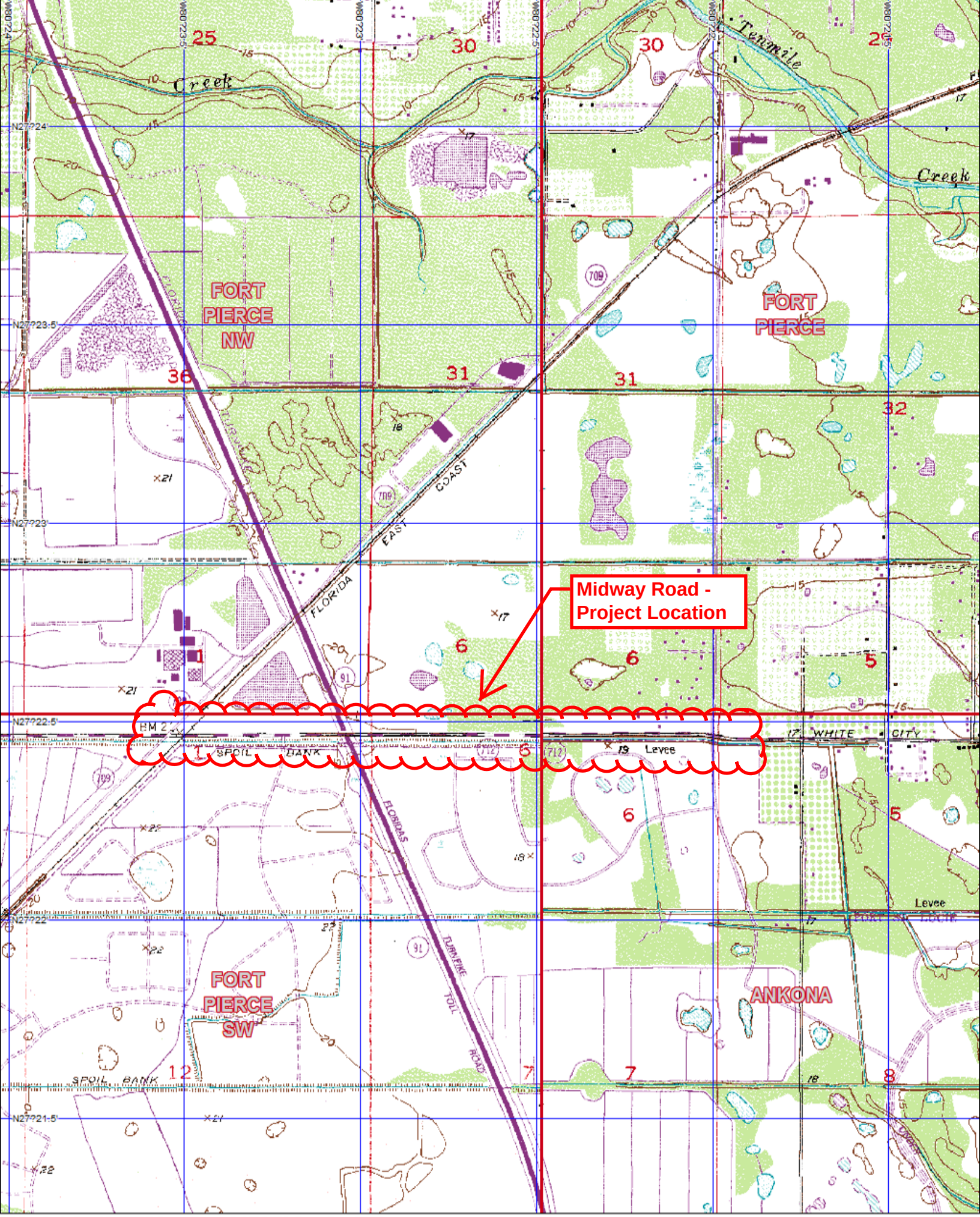
If the final grades vary considerably from those stated, or when final cross-sectional data becomes available, please contact our offices so that we can review our recommendations. Furthermore, upon the discovery of any site or subsurface conditions during construction, which appears to deviate from the data obtained during this geotechnical exploration, please contact us immediately so that we may visit the site, observe the differing conditions, and evaluate the new information with regards to our evaluation and recommendations contained herein.

The recommendations presented previously represent design and construction techniques that we feel are both applicable and feasible for the planned construction. We recommend, however, that we be provided the opportunity to review the final construction plans and the earthwork/roadway embankment construction specifications to evaluate whether our recommendations have been properly interpreted and implemented.

A detail roadway soil survey is required during design phase of the project to meet project requirements and the guidelines presented in the FDOT Soils and Foundation Handbook.

APPENDIX

Vicinity Map
USDA Soil Survey Map
Boring Location Plan
Roadway Soil Survey
Soil Profiles
Groundwater Level Data
Laboratory Test Results



3-D TopoQuads Copyright ?1999 DeLorme Yarmouth, ME 04096 Source Data: USGS

850 ft Scale: 1 : 24,000 Detail: 13-1 Datum: WGS84

Soil Map—St. Lucie County, Florida
(Midway Road)

80° 23' 49" W
80° 21' 45" W
27° 22' 58" N
27° 21' 57" N
559700
560000
560300
560600
560900
561200
561500
561800
562100
562400
562700
563000
3029000
3028700
3028400
3028100
3027800
3027500
3027200

Glades Cut Off Rd
Floridas Tpke
709
W Milner Dr
Devine Rd
Selvitz
Favorite Rd
48
25
W Midway Rd
712
48
31
38
50
44
31
25
Pinson Ct
W Rugby Dr
Selvitz Rd
Nw Conley Dr
Torino
Nw Jannebo St
N Monoco Cir
E Rugby Dr
S Monoco Cir
S Milner Dr
S Rugby Dr
Nassau Ln

Map Scale: 1:9,200 if printed on B landscape (17" x 11") sheet.

N

Meters
0 100 200 400 600

Feet
0 400 800 1600 2400

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 17N WGS84

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils
- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL: http://websoilsurvey.nrcs.usda.gov
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: St. Lucie County, Florida
Survey Area Data: Version 8, Nov 19, 2015

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Dec 15, 2010—Mar 13, 2011

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

St. Lucie County, Florida (FL111)			
Map Unit Symbol	**Map Unit Name**	**Acres in AOI**	**Percent of AOI**
25	Nettles and Oldsmar sands	25.2	29.9%
31	Pepper and EauGallie sands	18.1	21.5%
38	Riviera fine sand, 0 to 2 percent slopes	0.2	0.2%
44	Tantile and Pomona sands	0.3	0.3%
48	Wabasso sand, 0 to 2 percent slopes	29.6	35.1%
50	Waveland and Immokalee fine sands	10.9	13.0%
Totals for Area of Interest		**84.3**	**100.0%**

St. Lucie County, Florida

25—Nettles and Oldsmar sands

Map Unit Setting

National map unit symbol: 1jpvl
Mean annual precipitation: 49 to 58 inches
Mean annual air temperature: 70 to 77 degrees F
Frost-free period: 350 to 365 days
Farmland classification: Farmland of unique importance

Map Unit Composition

Oldsmar and similar soils: 40 percent
Nettles and similar soils: 40 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Nettles

Setting

Landform: Flatwoods on marine terraces
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Sandy and loamy marine deposits

Typical profile

A - 0 to 8 inches: sand
E - 8 to 33 inches: sand
Bh1 - 33 to 39 inches: sand
Bh2 - 39 to 55 inches: sand
Btg - 55 to 80 inches: fine sandy loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: 31 to 50 inches to ortstein
Natural drainage class: Poorly drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 6 to 18 inches
Frequency of flooding: None
Frequency of ponding: None
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 4.0
Available water storage in profile: Very low (about 1.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4w
Hydrologic Soil Group: C/D
Other vegetative classification: Sandy soils on flats of mesic or hydric lowlands (G156BC141FL)

Description of Oldsmar

Setting

Landform: Flatwoods on marine terraces
Landform position (three-dimensional): Talf
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Sandy and loamy marine deposits

Typical profile

A - 0 to 5 inches: sand
E - 5 to 32 inches: sand
Bh - 32 to 42 inches: sand
Btg - 42 to 80 inches: fine sandy loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Poorly drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 6 to 18 inches
Frequency of flooding: None
Frequency of ponding: None
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 4.0
Available water storage in profile: Low (about 4.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4w
Hydrologic Soil Group: A/D
Other vegetative classification: Sandy soils on flats of mesic or hydric lowlands (G156BC141FL)

Minor Components

Pineda

Percent of map unit: 4 percent
Landform: Drainageways on marine terraces, flats on marine terraces
Landform position (three-dimensional): Dip
Down-slope shape: Linear
Across-slope shape: Concave
Other vegetative classification: Sandy over loamy soils on flats of hydric or mesic lowlands (G156BC241FL)

Pepper

Percent of map unit: 4 percent
Landform: Flatwoods on marine terraces
Landform position (three-dimensional): Talf
Down-slope shape: Convex
Across-slope shape: Linear
Other vegetative classification: Sandy soils on flats of mesic or hydric lowlands (G156BC141FL)

Oldsmar

Percent of map unit: 4 percent
Landform: Depressions on marine terraces
Landform position (three-dimensional): Dip
Down-slope shape: Concave
Across-slope shape: Concave
Other vegetative classification: Sandy soils on stream terraces, flood plains, or in depressions (G156BC145FL)

Wabasso

Percent of map unit: 4 percent
Landform: Flatwoods on marine terraces
Landform position (three-dimensional): Talf
Down-slope shape: Convex
Across-slope shape: Linear
Other vegetative classification: Sandy soils on flats of mesic or hydric lowlands (G156BC141FL)

Ankona

Percent of map unit: 4 percent
Landform: Flatwoods on marine terraces
Landform position (three-dimensional): Talf
Down-slope shape: Convex
Across-slope shape: Linear
Other vegetative classification: Sandy soils on flats of mesic or hydric lowlands (G156BC141FL)

31—Pepper and EauGallie sands

Map Unit Setting

National map unit symbol: 1jpvs
Mean annual precipitation: 49 to 58 inches
Mean annual air temperature: 70 to 77 degrees F
Frost-free period: 350 to 365 days
Farmland classification: Farmland of unique importance

Map Unit Composition

Pepper and similar soils: 45 percent
Eaugallie and similar soils: 45 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Eaugallie

Setting

Landform: Flatwoods on marine terraces
Landform position (three-dimensional): Talf
Down-slope shape: Convex
Across-slope shape: Linear

Parent material: Sandy and loamy marine deposits

Typical profile

A - 0 to 5 inches: sand
E - 5 to 26 inches: sand
Bh - 26 to 47 inches: sand
Btg - 47 to 62 inches: sandy loam
Cg - 62 to 80 inches: sand

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Poorly drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to high (0.06 to 1.98 in/hr)
Depth to water table: About 6 to 18 inches
Frequency of flooding: None
Frequency of ponding: None
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 4.0
Available water storage in profile: Moderate (about 7.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4w
Hydrologic Soil Group: A/D
Other vegetative classification: Sandy soils on flats of mesic or hydric lowlands (G156BC141FL)

Description of Pepper

Setting

Landform: Flatwoods on marine terraces
Landform position (three-dimensional): Talf
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Sandy and loamy marine deposits

Typical profile

A - 0 to 6 inches: sand
E - 6 to 23 inches: sand
Bh1 - 23 to 33 inches: sand
Bh2 - 33 to 57 inches: sand
Btg - 57 to 80 inches: sandy loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: 16 to 31 inches to ortstein
Natural drainage class: Poorly drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 6 to 18 inches
Frequency of flooding: None
Frequency of ponding: None
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)

Sodium adsorption ratio, maximum in profile: 4.0
Available water storage in profile: Very low (about 1.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4w
Hydrologic Soil Group: D
Other vegetative classification: Sandy soils on flats of mesic or hydric lowlands (G156BC141FL)

Minor Components

Wabasso

Percent of map unit: 2 percent
Landform: Flatwoods on marine terraces
Landform position (three-dimensional): Talf
Down-slope shape: Convex
Across-slope shape: Linear
Other vegetative classification: Sandy soils on flats of mesic or hydric lowlands (G156BC141FL)

Pineda

Percent of map unit: 2 percent
Landform: Drainageways on marine terraces, flats on marine terraces
Landform position (three-dimensional): Dip
Down-slope shape: Linear
Across-slope shape: Concave
Other vegetative classification: Sandy over loamy soils on flats of hydric or mesic lowlands (G156BC241FL)

Tantile

Percent of map unit: 2 percent
Landform: Flatwoods on marine terraces
Landform position (three-dimensional): Talf
Down-slope shape: Convex
Across-slope shape: Linear
Other vegetative classification: Sandy soils on flats of mesic or hydric lowlands (G156BC141FL)

Lawnwood

Percent of map unit: 2 percent
Landform: Marine terraces on flatwoods
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Other vegetative classification: Sandy soils on flats of mesic or hydric lowlands (G156BC141FL)

Nettles

Percent of map unit: 2 percent
Landform: Flatwoods on marine terraces
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Other vegetative classification: Sandy soils on flats of mesic or hydric lowlands (G156BC141FL)

38—Riviera fine sand, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: 2tzw2
Elevation: 0 to 80 feet
Mean annual precipitation: 44 to 59 inches
Mean annual air temperature: 68 to 77 degrees F
Frost-free period: 300 to 365 days
Farmland classification: Farmland of unique importance

Map Unit Composition

Riviera and similar soils: 80 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Riviera

Setting

Landform: Drainageways on marine terraces, flatwoods on marine terraces
Landform position (three-dimensional): Tread, dip, talf
Down-slope shape: Linear
Across-slope shape: Linear, concave
Parent material: Sandy and loamy marine deposits

Typical profile

A - 0 to 6 inches: fine sand
E - 6 to 28 inches: fine sand
Bt/E - 28 to 36 inches: sandy loam
Btg - 36 to 42 inches: sandy clay loam
2C - 42 to 80 inches: fine sand

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Poorly drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 6.00 in/hr)
Depth to water table: About 0 to 12 inches
Frequency of flooding: None
Frequency of ponding: None
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 4.0
Available water storage in profile: Moderate (about 6.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3w
Hydrologic Soil Group: A/D

Ecological site: Slough (R155XY011FL)
Other vegetative classification: Slough (R155XY011FL), Sandy over loamy soils on flats of hydric or mesic lowlands (G155XB241FL)

Minor Components

Wabasso
Percent of map unit: 8 percent
Landform: Drainageways on marine terraces, flatwoods on marine terraces
Landform position (three-dimensional): Tread, dip, talf
Down-slope shape: Linear, convex
Across-slope shape: Linear, concave
Ecological site: South Florida Flatwoods (R155XY003FL)
Other vegetative classification: Sandy soils on flats of mesic or hydric lowlands (G156AC141FL)

Pinellas
Percent of map unit: 4 percent
Landform: Drainageways on marine terraces, flatwoods on marine terraces
Landform position (three-dimensional): Tread, dip, talf
Down-slope shape: Linear, convex
Across-slope shape: Linear, concave
Ecological site: Cabbage Palm Flatwoods (R155XY005FL)
Other vegetative classification: Sandy over loamy soils on flats of hydric or mesic lowlands (G156AC241FL)

Hallandale
Percent of map unit: 4 percent
Landform: Drainageways on marine terraces, flatwoods on marine terraces
Landform position (three-dimensional): Tread, dip, talf
Down-slope shape: Linear, convex
Across-slope shape: Linear, concave
Ecological site: Slough (R155XY011FL)
Other vegetative classification: Sandy soils on flats of mesic or hydric lowlands (G156AC141FL)

Oldsmar
Percent of map unit: 2 percent
Landform: Drainageways on marine terraces, flatwoods on marine terraces
Landform position (three-dimensional): Tread, dip, talf
Down-slope shape: Linear, convex
Across-slope shape: Linear, concave
Ecological site: South Florida Flatwoods (R155XY003FL)
Other vegetative classification: Sandy soils on flats of mesic or hydric lowlands (G156AC141FL)

Floridana
Percent of map unit: 2 percent
Landform: Depressions on marine terraces
Landform position (three-dimensional): Tread, dip
Down-slope shape: Concave
Across-slope shape: Concave, linear
Ecological site: Freshwater Marshes and Ponds (R155XY010FL)
Other vegetative classification: Sandy over loamy soils on stream terraces, flood plains, or in depressions (G156BC245FL)

44—Tantile and Pomona sands

Map Unit Setting

National map unit symbol: 1jpw6
Elevation: 20 to 120 feet
Mean annual precipitation: 49 to 58 inches
Mean annual air temperature: 70 to 77 degrees F
Frost-free period: 350 to 365 days
Farmland classification: Not prime farmland

Map Unit Composition

Pomona and similar soils: 44 percent
Tantile and similar soils: 44 percent
Minor components: 12 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Tantile

Setting

Landform: Flatwoods on marine terraces
Landform position (three-dimensional): Talf
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Sandy and loamy marine deposits

Typical profile

A - 0 to 5 inches: sand
Eg - 5 to 26 inches: sand
Bh - 26 to 34 inches: sand
Bt - 34 to 49 inches: loamy sand
E'g - 49 to 69 inches: sand
Btg - 69 to 80 inches: fine sandy loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: 18 to 31 inches to ortstein
Natural drainage class: Poorly drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 6 to 18 inches
Frequency of flooding: None
Frequency of ponding: None
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 4.0
Available water storage in profile: Very low (about 1.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4w

Hydrologic Soil Group: A/D
Other vegetative classification: Sandy soils on flats of mesic or hydric lowlands (G156BC141FL)

Description of Pomona

Setting

Landform: Flatwoods on marine terraces
Landform position (three-dimensional): Talf
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Sandy and loamy marine deposits

Typical profile

A - 0 to 5 inches: sand
E - 5 to 26 inches: sand
Bh - 26 to 39 inches: sand
E' - 39 to 51 inches: sand
Btg - 51 to 72 inches: sandy loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Poorly drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.57 in/hr)
Depth to water table: About 6 to 18 inches
Frequency of flooding: None
Frequency of ponding: None
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 4.0
Available water storage in profile: Moderate (about 6.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4w
Hydrologic Soil Group: A/D
Other vegetative classification: Sandy soils on flats of mesic or hydric lowlands (G156BC141FL)

Minor Components

Lawnwood

Percent of map unit: 3 percent
Landform: Marine terraces on flatwoods
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Other vegetative classification: Sandy soils on flats of mesic or hydric lowlands (G156BC141FL)

Nettles

Percent of map unit: 3 percent
Landform: Flatwoods on marine terraces
Landform position (three-dimensional): Talf
Down-slope shape: Linear

Across-slope shape: Linear
Other vegetative classification: Sandy soils on flats of mesic or hydric lowlands (G156BC141FL)

Ankona

Percent of map unit: 3 percent
Landform: Flatwoods on marine terraces
Landform position (three-dimensional): Talf
Down-slope shape: Convex
Across-slope shape: Linear
Other vegetative classification: Sandy soils on flats of mesic or hydric lowlands (G156BC141FL)

Pepper

Percent of map unit: 3 percent
Landform: Flatwoods on marine terraces
Landform position (three-dimensional): Talf
Down-slope shape: Convex
Across-slope shape: Linear
Other vegetative classification: Sandy soils on flats of mesic or hydric lowlands (G156BC141FL)

48—Wabasso sand, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: 2svyr
Elevation: 10 to 50 feet
Mean annual precipitation: 38 to 62 inches
Mean annual air temperature: 68 to 77 degrees F
Frost-free period: 300 to 365 days
Farmland classification: Farmland of unique importance

Map Unit Composition

Wabasso and similar soils: 89 percent
Minor components: 11 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Wabasso

Setting

Landform: — error in exists on —
Landform position (three-dimensional): Tread, talf
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Sandy over loamy marine deposits

Typical profile

A - 0 to 6 inches: sand
E - 6 to 25 inches: sand
Bh - 25 to 30 inches: sand

Btg - 30 to 58 inches: sandy clay loam
Cg - 58 to 80 inches: loamy sand

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: 9 to 50 inches to strongly contrasting textural stratification
Natural drainage class: Poorly drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 6 to 18 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 5 percent
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 4.0
Available water storage in profile: Very low (about 1.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3w
Hydrologic Soil Group: C/D
Other vegetative classification: South Florida Flatwoods (R155XY003FL), Sandy soils on flats of mesic or hydric lowlands (G155XB141FL)

Minor Components

Hallandale

Percent of map unit: 6 percent
Landform: Drainageways on marine terraces
Landform position (three-dimensional): Tread, dip
Down-slope shape: Convex, linear
Across-slope shape: Linear, concave
Other vegetative classification: Slough (R155XY011FL), Sandy soils on flats of mesic or hydric lowlands (G155XB141FL)

Boca

Percent of map unit: 5 percent
Landform: — error in exists on —
Landform position (three-dimensional): Tread, talf
Down-slope shape: Convex
Across-slope shape: Linear
Ecological site: South Florida Flatwoods (R155XY003FL)
Other vegetative classification: South Florida Flatwoods (R155XY003FL), Sandy over loamy soils on flats of hydric or mesic lowlands (G155XB241FL)

50—Waveland and Immokalee fine sands

Map Unit Setting

National map unit symbol: 1jpwd

Elevation: 20 to 200 feet
Mean annual precipitation: 49 to 58 inches
Mean annual air temperature: 70 to 77 degrees F
Frost-free period: 350 to 365 days
Farmland classification: Not prime farmland

Map Unit Composition

Waveland and similar soils: 44 percent
Immokalee and similar soils: 44 percent
Minor components: 12 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Immokalee

Setting

Landform: Flatwoods on marine terraces
Landform position (three-dimensional): Talf
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Sandy marine deposits

Typical profile

A - 0 to 6 inches: fine sand
E - 6 to 35 inches: fine sand
Bh - 35 to 54 inches: fine sand
Cg - 54 to 72 inches: fine sand

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Poorly drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: About 6 to 18 inches
Frequency of flooding: None
Frequency of ponding: None
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 4.0
Available water storage in profile: Low (about 5.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4w
Hydrologic Soil Group: B/D
Other vegetative classification: Sandy soils on flats of mesic or hydric lowlands (G156BC141FL)

Description of Waveland

Setting

Landform: Flatwoods on marine terraces
Landform position (three-dimensional): Talf
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Sandy marine deposits

Typical profile

A - 0 to 4 inches: fine sand
Eg - 4 to 32 inches: sand
Bh1 - 32 to 40 inches: loamy sand
Bh2 - 40 to 53 inches: sand
Cg1 - 53 to 66 inches: sand
Cg2 - 66 to 80 inches: sand

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: 31 to 50 inches to ortstein
Natural drainage class: Poorly drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 6 to 18 inches
Frequency of flooding: None
Frequency of ponding: None
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 4.0
Available water storage in profile: Very low (about 0.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4w
Hydrologic Soil Group: C/D
Other vegetative classification: Sandy soils on flats of mesic or hydric lowlands (G156BC141FL)

Minor Components

Lawnwood

Percent of map unit: 3 percent
Landform: Marine terraces on flatwoods
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Other vegetative classification: Sandy soils on flats of mesic or hydric lowlands (G156BC141FL)

Electra

Percent of map unit: 3 percent
Landform: Knolls on marine terraces, rises on marine terraces
Landform position (three-dimensional): Interfluve
Down-slope shape: Convex
Across-slope shape: Linear
Other vegetative classification: Sandy soils on rises and knolls of mesic uplands (G156BC131FL)

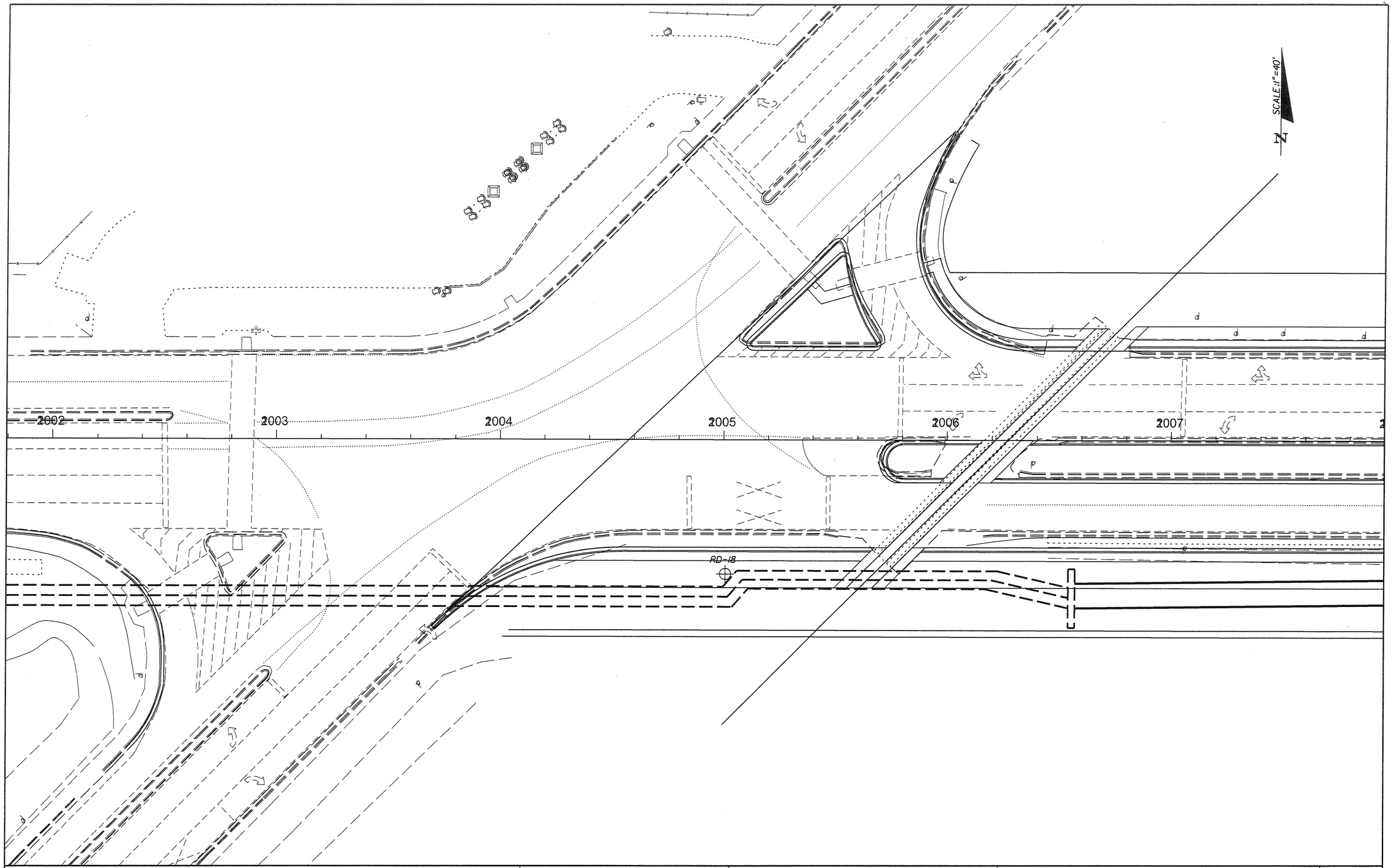
Jonathan

Percent of map unit: 3 percent
Landform: Knolls on marine terraces, ridges on marine terraces
Landform position (three-dimensional): Interfluve
Down-slope shape: Convex
Across-slope shape: Linear

Other vegetative classification: Sandy soils on rises, knolls, and ridges of mesic uplands (G156BC121FL)

Salerno

Percent of map unit: 3 percent
Landform: Flatwoods on marine terraces
Landform position (three-dimensional): Talf
Down-slope shape: Convex
Across-slope shape: Linear
Other vegetative classification: Sandy soils on flats of mesic or hydric lowlands (G156BC141FL)



REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

RAJ KRISHNASAMY, P.E.
P.E. LICENSE NUMBER 53567
TIERRA SOUTH FLORIDA
2765 VISTA PARKWAY, S-10
WEST PALM BEACH, FL 33411
CERTIFICATE OF AUTHORIZATION 28073

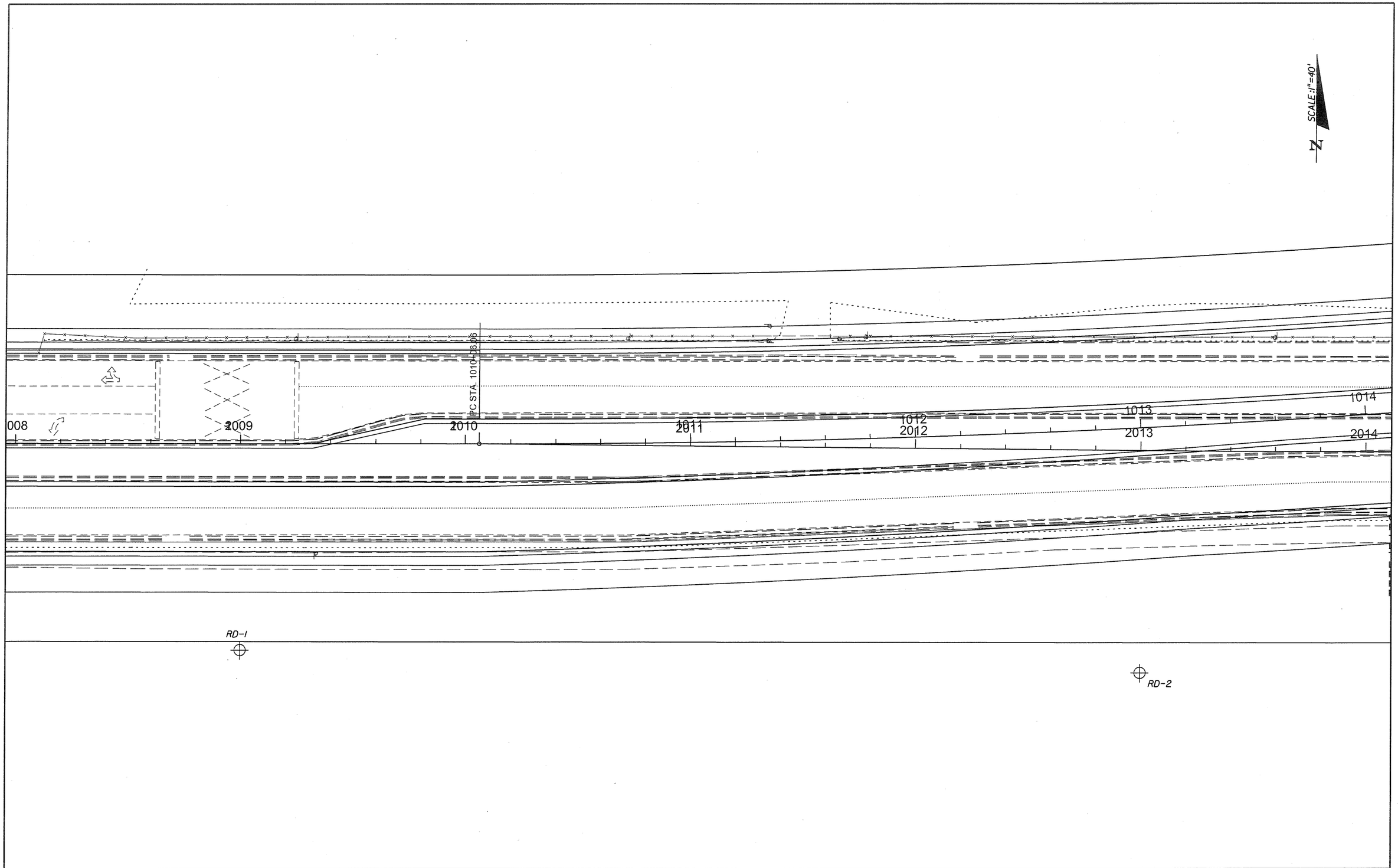
STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
CR712	ST. LUCIE	231440-3-22-01

BORINGS LOCATION PLAN

SHEET NO.

ngonzalez 5/24/2016 1:45:42 PM J:\Tierra Documents\Projects\TSF 2015\7111-15-154.Midway Road from Glades Cutoff to Selvitz Rd (Inwood)\geotech\RDGE002.DGN



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TIERRA SOUTH FLORIDA
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STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
CR712	ST. LUCIE	231440-3-22-01

BORINGS LOCATION PLAN

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SCALE: 1"=40'

N

RD-3

1015 1016 1017 1018 1019 1020

2015 2016 2017 2018 2019 2020

REVISIONS			
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TIERRA SOUTH FLORIDA
2765 VISTA PARKWAY, S-10
WEST PALM BEACH, FL 33411
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STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
CR712	ST. LUCIE	231440-3-22-01

BORINGS LOCATION PLAN

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SCALE: 1"=40'

N

1021 1022 1023 1024 1025 1026

2021 2022 2023 2024 2025 2026

RD-4

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

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TIERRA SOUTH FLORIDA
2765 VISTA PARKWAY, S-10
WEST PALM BEACH, FL 33411
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STATE OF FLORIDA
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ROAD NO.	COUNTY	FINANCIAL PROJECT ID
CR712	ST. LUCIE	231440-3-22-01

BORINGS LOCATION PLAN

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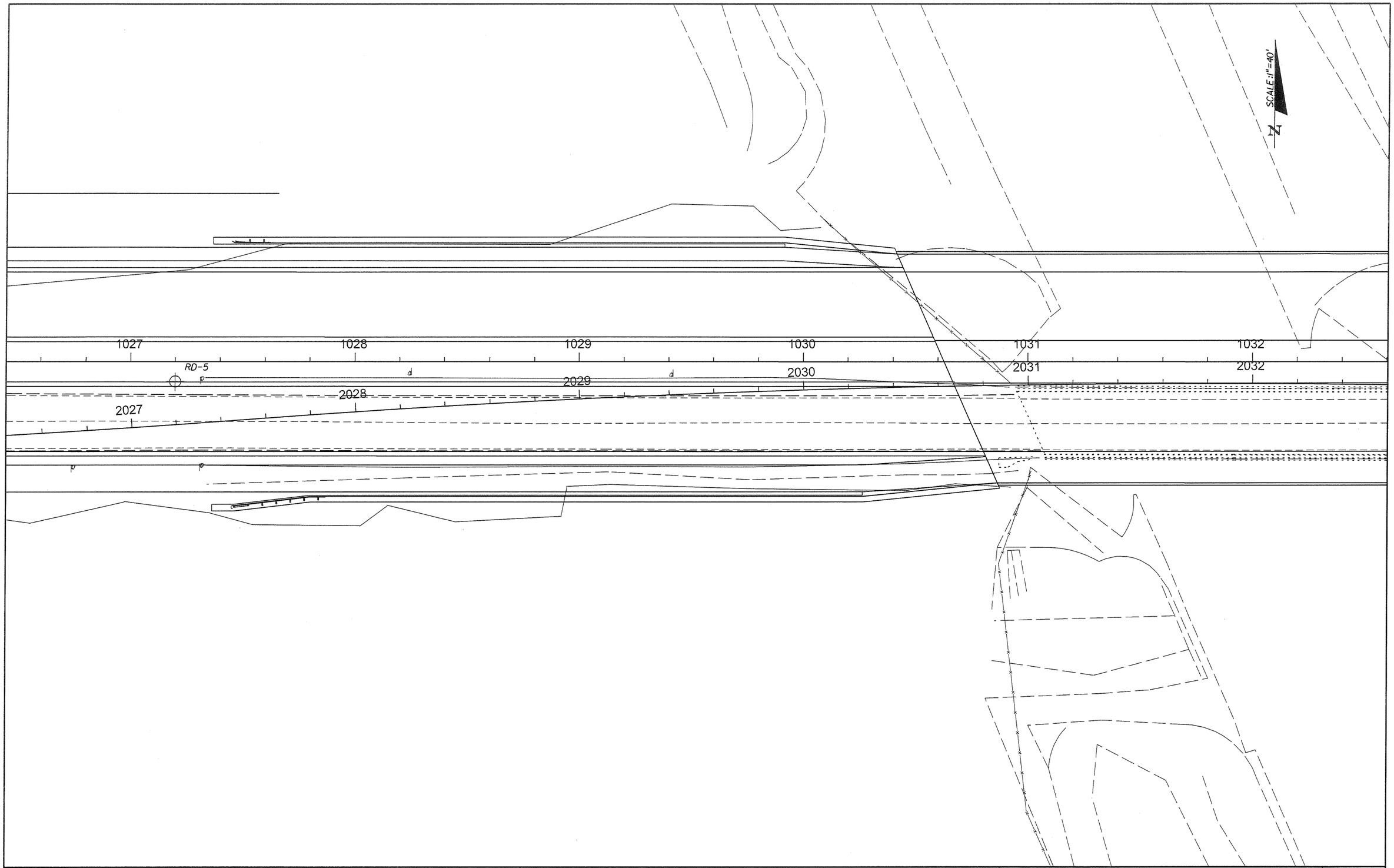

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DATE	DESCRIPTION	DATE	DESCRIPTION

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TIERRA SOUTH FLORIDA
2765 VISTA PARKWAY, S-10
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STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
CR712	ST. LUCIE	231440-3-22-01

BORINGS LOCATION PLAN

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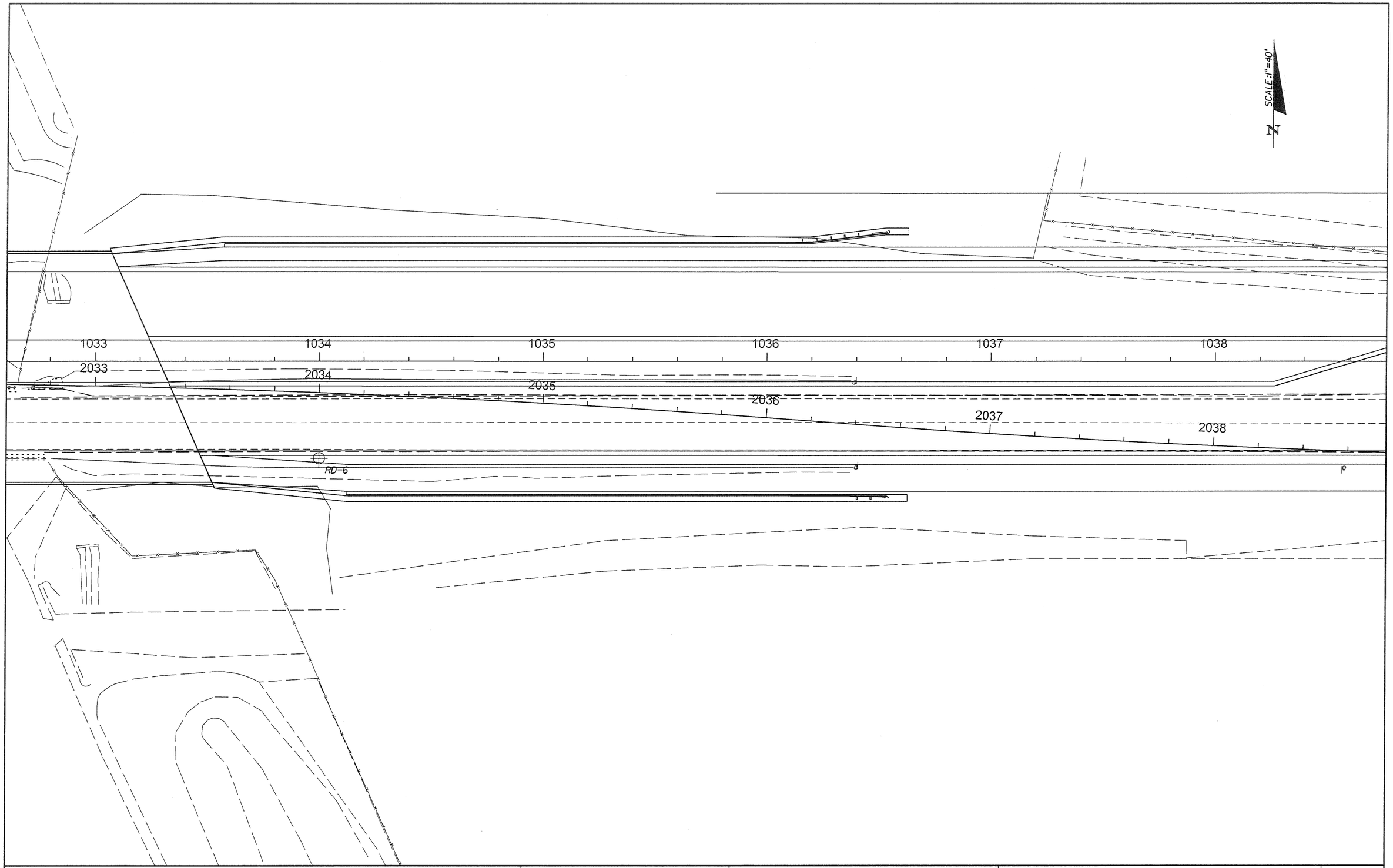

REVISIONS			
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STATE OF FLORIDA
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ROAD NO.	COUNTY	FINANCIAL PROJECT ID
CR712	ST. LUCIE	231440-3-22-01

BORINGS LOCATION PLAN

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SCALE: 1"=40'

RD-7

1039 1040 1041 1042 1043 1044

2039 2040 2041 2042 2043 2044

RD-8

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

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TIERRA SOUTH FLORIDA
2765 VISTA PARKWAY, S-10
WEST PALM BEACH, FL 33411
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STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
CR712	ST. LUCIE	231440-3-22-01

BORINGS LOCATION PLAN

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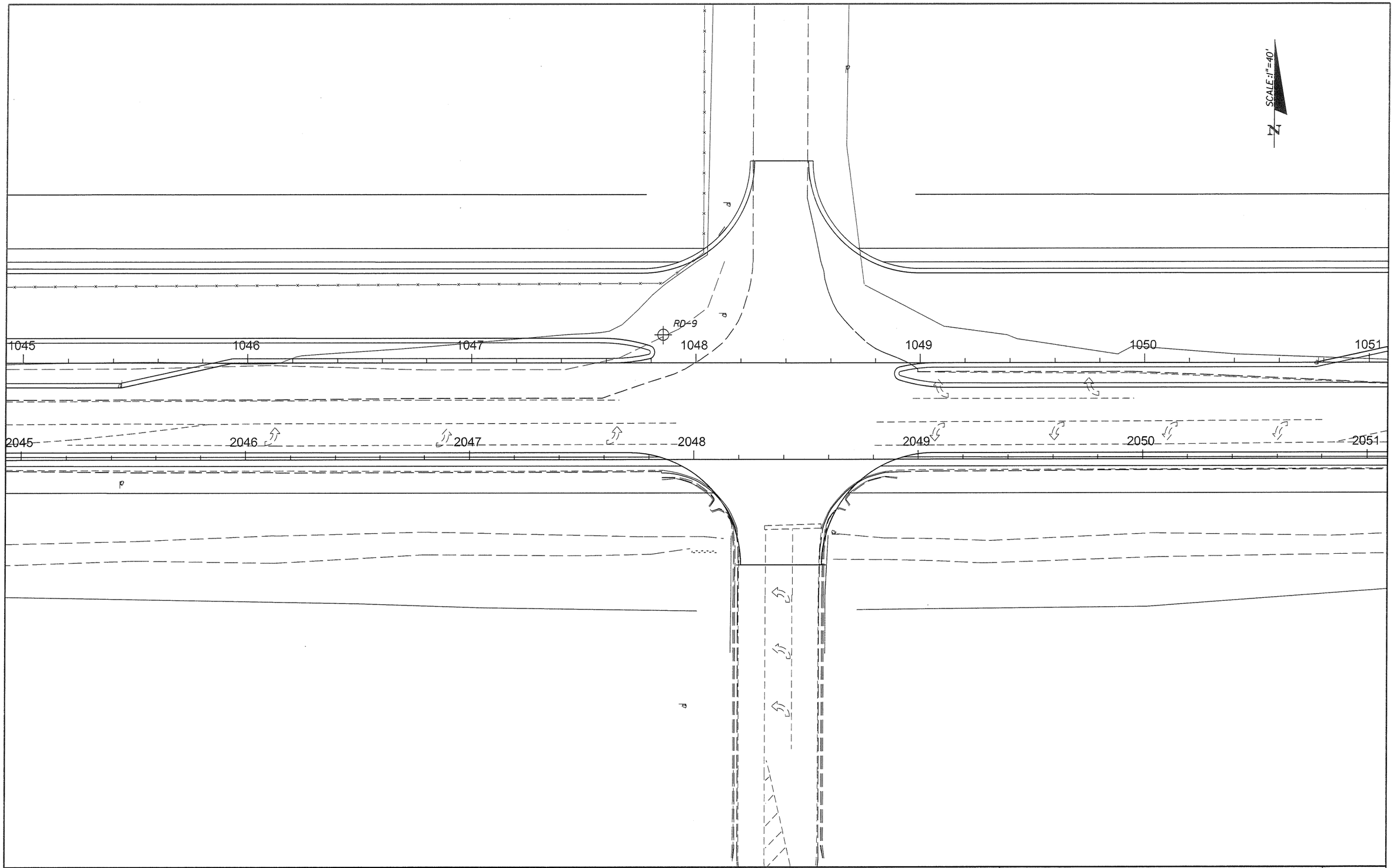

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RAJ KRISHNASAMY, P.E.
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TIERRA SOUTH FLORIDA
2765 VISTA PARKWAY, S-10
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CR712	ST. LUCIE	231440-3-22-01

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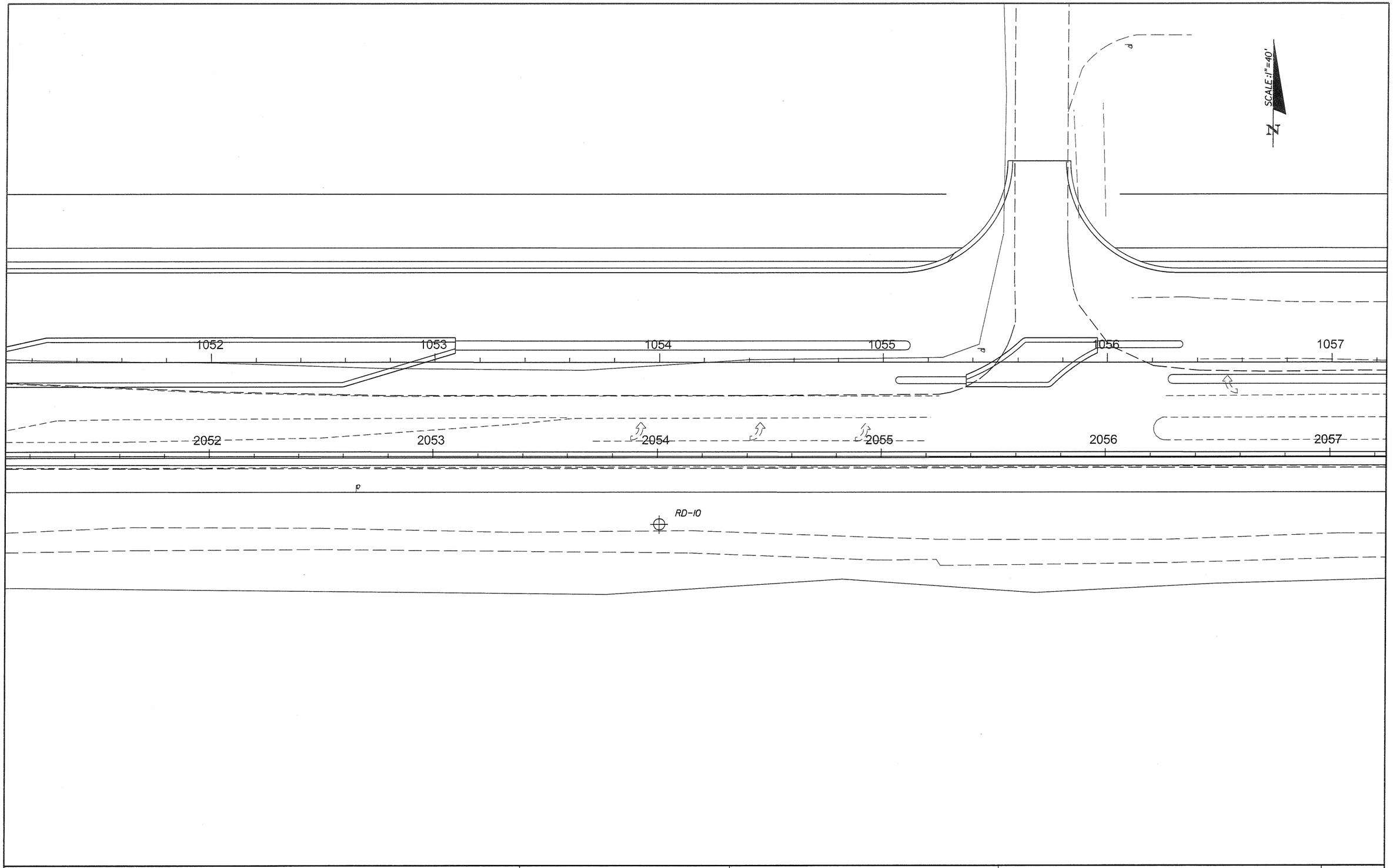

REVISIONS			
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TIERRA SOUTH FLORIDA
2765 VISTA PARKWAY, S-10
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STATE OF FLORIDA
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ROAD NO.	COUNTY	FINANCIAL PROJECT ID
CR712	ST. LUCIE	231440-3-22-01

BORINGS LOCATION PLAN

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SCALE: 1"=40'

N

1058 1059 1060 1061 1062 1063

RD-II

2058 2059 2060 2061 2062 2063

P

P

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

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TIERRA SOUTH FLORIDA
2765 VISTA PARKWAY, S-10
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STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
CR712	ST. LUCIE	231440-3-22-01

BORINGS LOCATION PLAN

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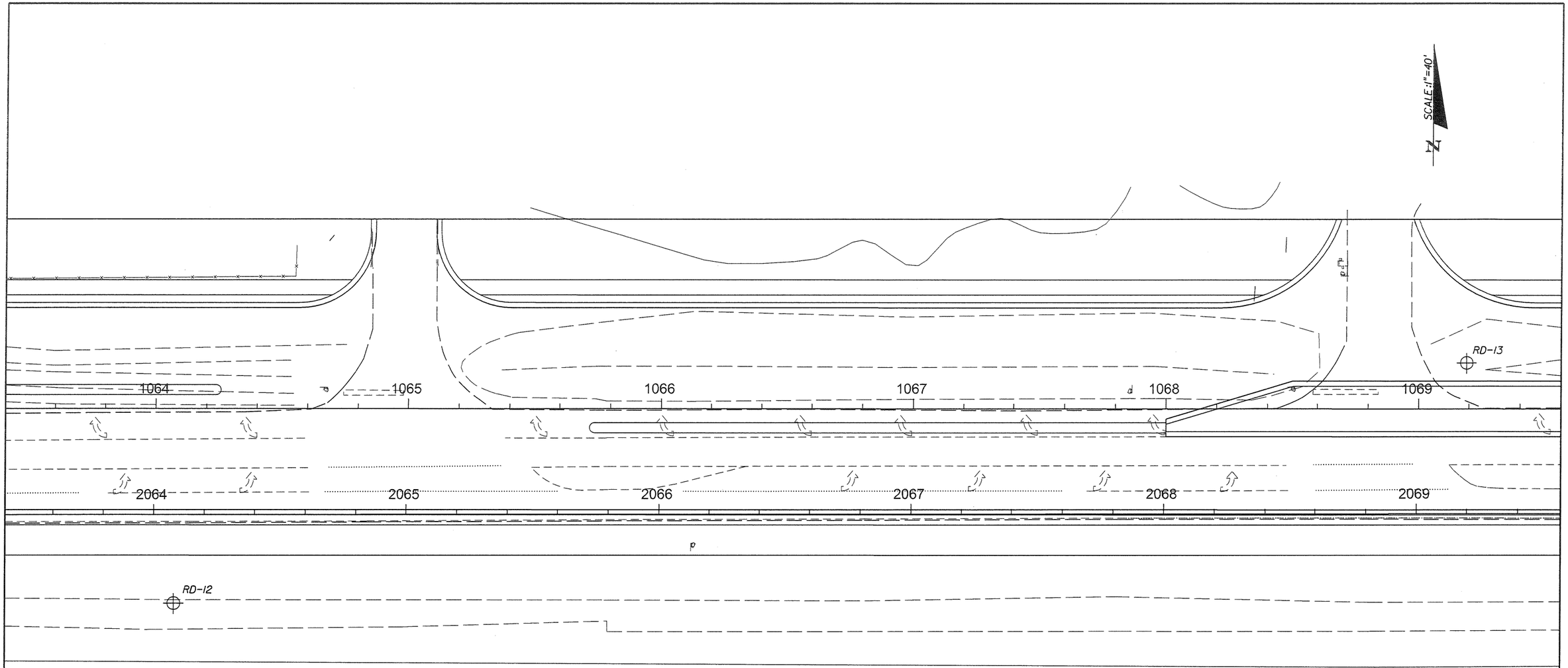

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

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TIERRA SOUTH FLORIDA
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STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
CR712	ST. LUCIE	231440-3-22-01

BORINGS LOCATION PLAN

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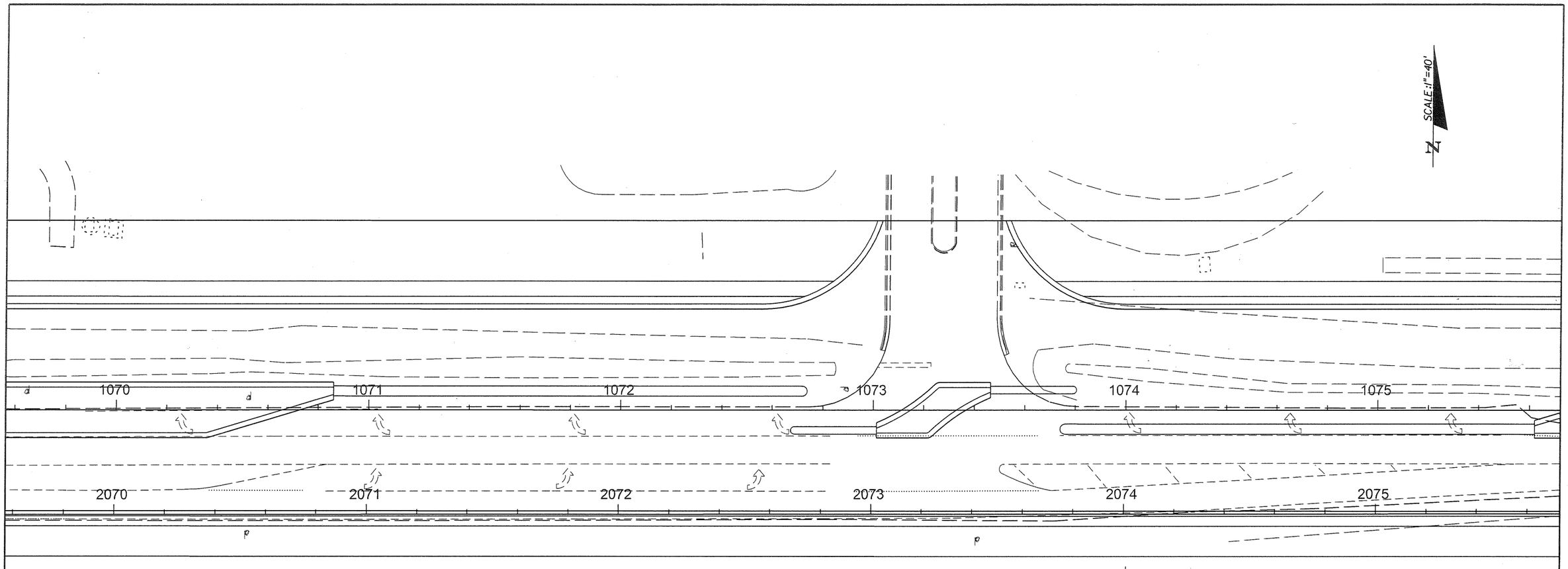

REVISIONS			
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ROAD NO.	COUNTY	FINANCIAL PROJECT ID
CR712	ST. LUCIE	231440-3-22-01

BORINGS LOCATION PLAN

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SCALE: 1"=40'

N

RD-15

1076 1077 1078 1079 1080 1083

2076 2077 2078 2079 2080 2081

PC STA. 1076+17.51

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

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P.E. LICENSE NUMBER 53567
TIERRA SOUTH FLORIDA
2765 VISTA PARKWAY, S-10
WEST PALM BEACH, FL 33411
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STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
CR712	ST. LUCIE	231440-3-22-01

BORINGS LOCATION PLAN

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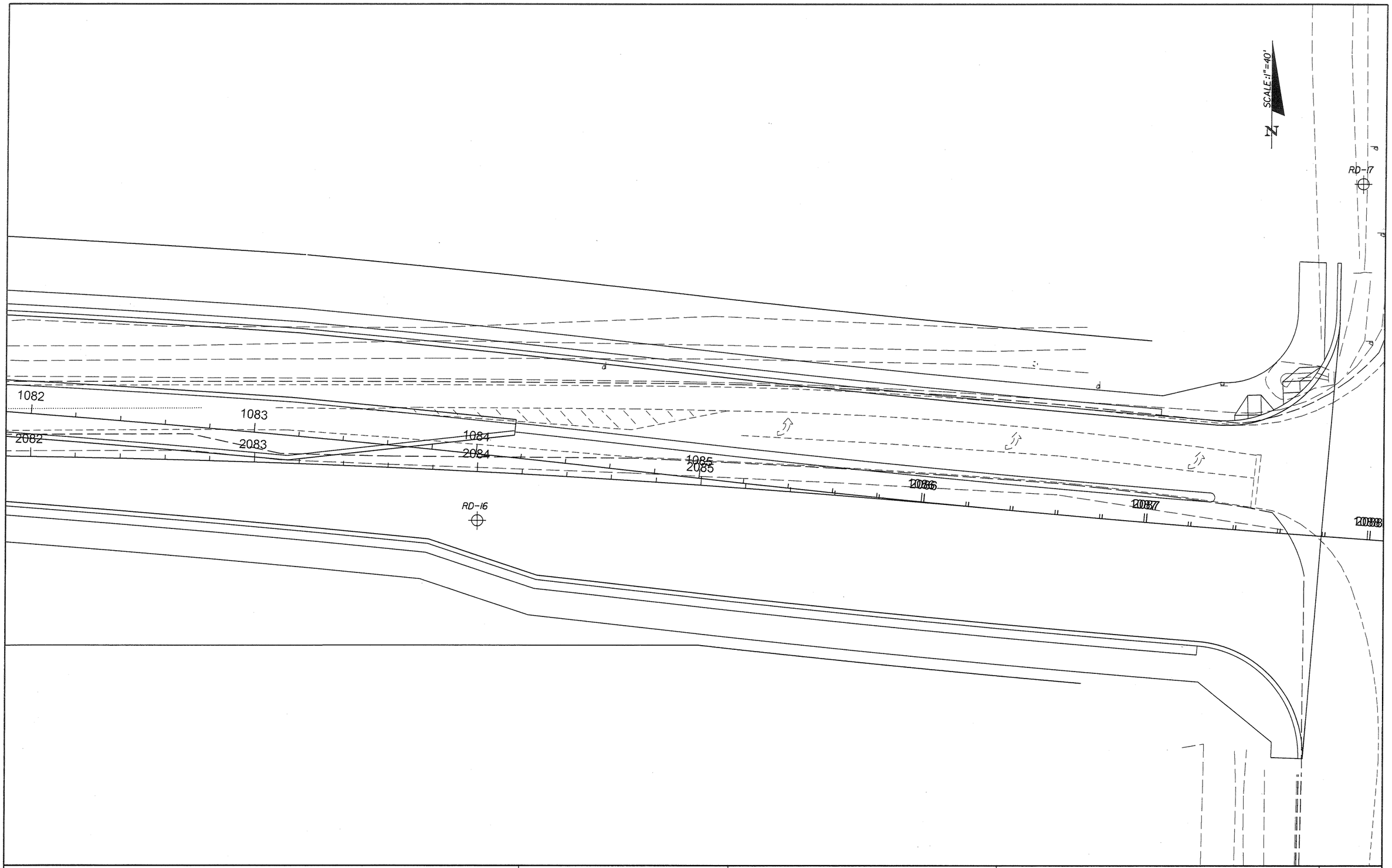

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

RAJ KRISHNASAMY, P.E.
P.E. LICENSE NUMBER 53567
TIERRA SOUTH FLORIDA
2765 VISTA PARKWAY, S-10
WEST PALM BEACH, FL 33411
CERTIFICATE OF AUTHORIZATION 28073

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
CR712	ST. LUCIE	231440-3-22-01

BORINGS LOCATION PLAN

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ngonzalez 5/24/2016 1:40:20 PM J:\Tierra Documents\Projects\TSF 2015\7111-15-154.Midway Road from Glades Cuttoff to Selvitz Rd (Inwood)\geotech\RDGE0115.DGN

DATE OF SURVEY: APRIL 2016
SURVEY MADE BY: TIERRA SOUTH FLORIDA
SUBMITTED BY: RAJ KRISHNASAMY, P.E.

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION
MATERIALS AND RESEARCH

DISTRICT: IV
COUNTY: ST LUCIE

FINANCIAL PROJECT ID : 231440-3-22-01

PROJECT NAME: MIDWAY ROAD (CR 712) FROM GLADES CUT OFF ROAD (CR 709) TO SELVITZ ROAD (CR 615)-PD&E STUDY

CROSS SECTION SOIL SURVEY FOR THE DESIGN OF ROADS

SURVEY BEGINS STA. : 1005+00.00 SURVEY ENDS STA. : 1088+00.00 CL ALT1

	ORGANIC CONTENT		MOISTURE CONTENT		SIEVE ANALYSIS RESULTS PERCENT PASS						ATTERBERG LIMITS (%)					CORROSION TEST RESULTS				
STRATUM NO.	NO. OF TESTS	% ORGANIC	NO. OF TESTS	MOISTURE CONTENT	NO. OF TESTS	10 MESH	40 MESH	60 MESH	100 MESH	200 MESH	NO. OF TESTS	LIQUID LIMIT	PLASTIC INDEX	AASHTO GROUP	DESCRIPTION	NO. OF TESTS	RESISTIVITY ohm-cm	CHLORIDE ppm	SULFATES ppm	pH
1	-	-	-	-	-	-	-	-	-	-	-	-	-	A-8	TOPSOIL	-	-	-	-	-
2	1	4.0	3	15-30	3	100	87-92	45-61	18-35	2-9	-	-	-	A-3	BROWN TO LIGHT BROWN SAND OCCASIONALLY FEW TO TRACE SILT AND TRACE LIMEROCK	-	-	-	-	-
3	1	0.9	3	9-17	3	93-100	81-94	41-72	27-46	11-21	2	NP	NP	A-2-4	BROWN SILTY SAND OCCASIONALLY TRACE SHELL	-	-	-	-	-
4	2	2.7-3.9	2	20-23	2	100	82-88	39-53	20-30	12-17	1	NP	NP	A-2-4	DARK BROWN ORGANIC STAINED SILTY SAND	-	-	-	-	-

EMBANKMENT AND SUBGRADE MATERIAL

STRATA BOUNDARIES ARE APPROXIMATE. MAKE FINAL CHECK AFTER GRADING.

∇ - ENCOUNTERED GROUNDWATER LEVEL

GNE - GROUNDWATER NOT ENCOUNTERED

NP - NON-PLASTIC

NOTES

1- STRATUM 1 CONSISTS OF TOPSOIL AND SHOULD BE STRIPPED FROM PROPOSED CONSTRUCTION AREAS IN ACCORDANCE WITH THE FDOT STANDARD SPECIFICATIONS SECTION 110 CLEARING AND GRUBBING.

2- STRATUM 2 CONSISTS OF SELECT MATERIAL (A-3). THIS MATERIAL APPEARS TO BE SUITABLE TO USE IN EMBANKMENT AND SHOULD BE UTILIZED ACCORDING TO STANDARD INDEX 505.

3- STRATA 3 AND 4 CONSIST OF SELECT MATERIAL (A-2-4). THIS MATERIAL IS LIKELY TO RETAIN EXCESS MOISTURE AND MAY BE DIFFICULT TO DRY AND COMPACT. IT SHOULD BE USED IN THE EMBANKMENT ABOVE THE WATER LEVEL AT THE TIME OF CONSTRUCTION. IT MAY BE USED IN THE SUBGRADE PORTION OF THE ROADBED WHEN APPROVED BY THE DISTRICT MATERIALS ENGINEER. MATERIAL PLACED BELOW THE EXISTING WATER LEVEL MUST BE NON-PLASTIC AND CONTAIN LESS THAN 15% PASSING THE No. 200 U.S. STANDARD SIEVE.

4- A FINAL ROADWAY SOIL SURVEY IS REQUIRED DURING DESIGN PHASE OF THE PROJECT TO MEET PROJECT REQUIREMENTS AND GUIDELINES PRESENTED IN THE FDOT SOILS AND FOUNDATIONS HANDBOOK.

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

RAJ KRISHNASAMY, P.E.
P.E. LICENSE NUMBER 53567
TIERRA SOUTH FLORIDA
2765 VISTA PARKWAY, S-10
WEST PALM BEACH, FL 33411
CERTIFICATE OF AUTHORIZATION 28073

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

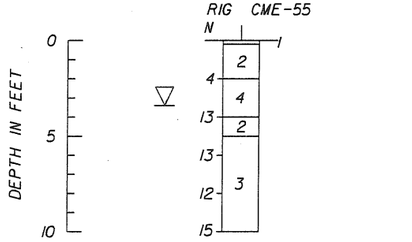
ROAD NO.	COUNTY	FINANCIAL PROJECT ID
CR 712	ST. LUCIE	231440-3-22-01

ROADWAY SOIL SURVEY

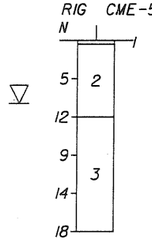
SHEET NO.

ngonzalez 5/25/2016 11:12:24 AM J:\Tierra Documents\Projects\TSF 2015\7111-15-154.Midway Road from Glades Cuttoff to Selvitz Rd (Inwood)\geotech\rdssgeo00.dgn

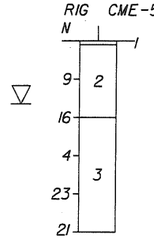
BOR # RD-1
STA. 1009+00.00 CL-ALT1
OFF. 91.7' RT
DATE 4/21/2016
HAMMER Auto
RIG CME-55



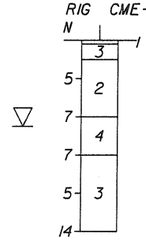
BOR # RD-2
STA. 1012+94.63 CL-ALT1
OFF. 108.8' RT
DATE 4/21/2016
HAMMER Auto
RIG CME-55



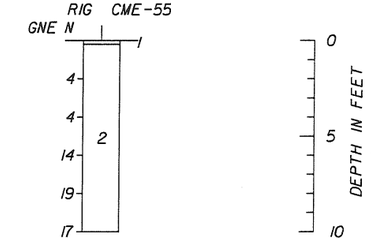
BOR # RD-3
STA. 1018+01.13 CL-ALT1
OFF. 26.6' LT
DATE 4/30/2016
HAMMER Auto
RIG CME-55



BOR # RD-4
STA. 1023+00.00 CL-ALT1
OFF. 127.3' RT
DATE 4/21/2016
HAMMER Auto
RIG CME-55



BOR # RD-5
STA. 1027+20.00 CL-ALT1
OFF. 8.8' RT
DATE 4/30/2016
HAMMER Auto
RIG CME-55



BOR # RD-6
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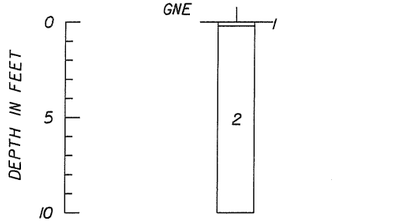
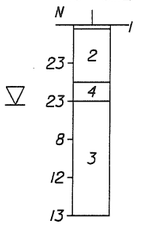
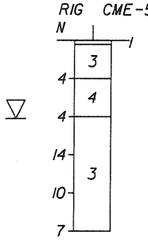
OFF. 43.3' RT
DATE 4/30/2016



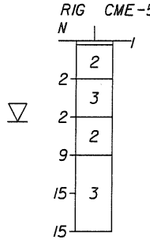
BOR # RD-7
STA. 1039+00.00 CL-ALT1
OFF. 8.7' LT
DATE 4/30/2016
HAMMER Auto
RIG CME-55



BOR # RD-8
STA. 1044+00.00 CL-ALT1
OFF. 69.4' RT
DATE 4/21/2016
HAMMER Auto
RIG CME-55



BOR # RD-9
STA. 1047+85.38 CL-ALT1
OFF. 12.5' LT
DATE 4/30/2016
HAMMER Auto
RIG CME-55



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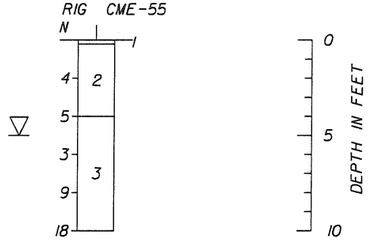
OFF. 72.3' RT
DATE 4/21/2016
HAMMER Auto
RIG CME-55



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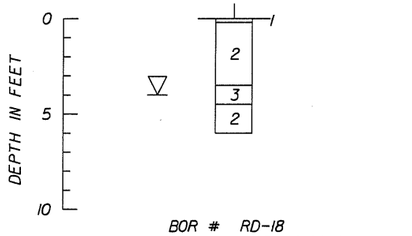
OFF. 2.5' RT
DATE 4/30/2016



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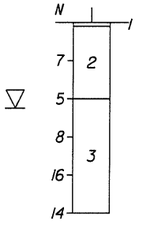
DATE 4/21/2016
HAMMER Auto
RIG CME-55



BOR # RD-13
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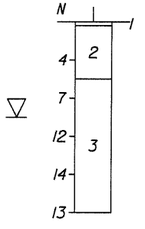
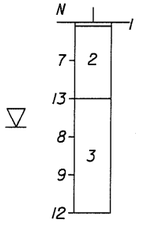
DATE 4/30/2016
HAMMER Auto
RIG CME-55



BOR # RD-14
STA. 1074+00.00 CL-ALT1
OFF. 65.8' RT
DATE 4/21/2016
HAMMER Auto
RIG CME-55



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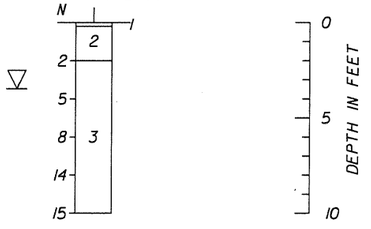
OFF. 27.1' LT
DATE 4/21/2016
HAMMER Auto
RIG CME-55



BOR # RD-18
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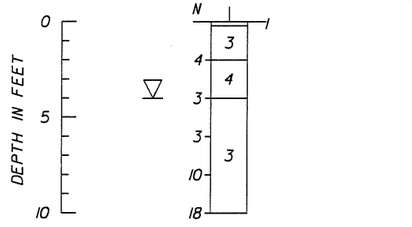
DATE 4/21/2016
HAMMER Auto
RIG CME-55



LEGEND
1. TOPSOIL (A-8)
2. BROWN TO LIGHT BROWN SAND OCCASIONALLY FEW TO TRACE SILT AND TRACE LIMEROCK (A-3)
3. BROWN SILTY SAND OCCASIONALLY TRACE SHELL (A-2-4)
4. DARK BROWN ORGANIC STAINED SILTY SAND (A-2-4)

NOTES
▽ ENCOUNTERED GROUNDWATER TABLE
N NUMBERS TO THE LEFT OF BORINGS INDICATE SPT VALUE FOR 12" PENETRATION AND THEY WERE OBTAINED USING AN AUTOMATIC HAMMER.
GNE GROUNDWATER NOT ENCOUNTERED

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

RAJ KRISHNASAMY, P.E.
P.E. LICENSE NUMBER 53567
TIERRA SOUTH FLORIDA
2765 VISTA PARKWAY, S-10
WEST PALM BEACH, FL 33411
CERTIFICATE OF AUTHORIZATION 28073

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
CR 712	ST. LUCIE	231440-3-22-01

SOIL PROFILES

SHEET NO.

Midway Road (CR 712)
St. Lucier County, Florida
FPID NO. 231440-3-22-01
TSF Project No. 7111-15-154

Summary of Groundwater Level and Estimate of SHGWT

Broing Number	Station No. (BL Survey)	Ground Elevation (feet, NAVD 1988)	Groundwater Depth (feet)	Groundwater Elevation (feet, NAVD 1988)	Estimated SHGWT (feet, NAVD 1988)
RD-18	1005+00	21.8	4	17.8	18
RD-1	1009+00	20.6	3.4	17.2	
RD-2	1012+95	20.4	3.3	17.1	
RD-3	1018+01	20.9	3.3	17.6	
RD-4	1023+00	21	4.5	16.5	17
RD-5	1027+20	27.7	GNE	#VALUE!	
RD-6	1034+00	37.2	GNE	#VALUE!	
RD-7	1039+00	19.8	4.2	15.6	16
RD-8	1044+00	18.6	4.1	14.5	15
RD-9	1047+85	18	4.3	13.7	14
RD-10	1054+00	18.2	5	13.2	
RD-11	1059+00	17.4	4	13.4	
RD-12	1064+07	17.2	4.5	12.7	13
RD-13	1069+19	17.7	5	12.7	
RD-14	1074+00	18.3	5.5	12.8	
RD-15	1079+00	16.3	3.5	12.8	

Summary of Laboratory Test Results
Midway Roadd from Glades Cut Off Road to Selvitz Road
St. Lucie County
TSF Project No: 7111-15-154

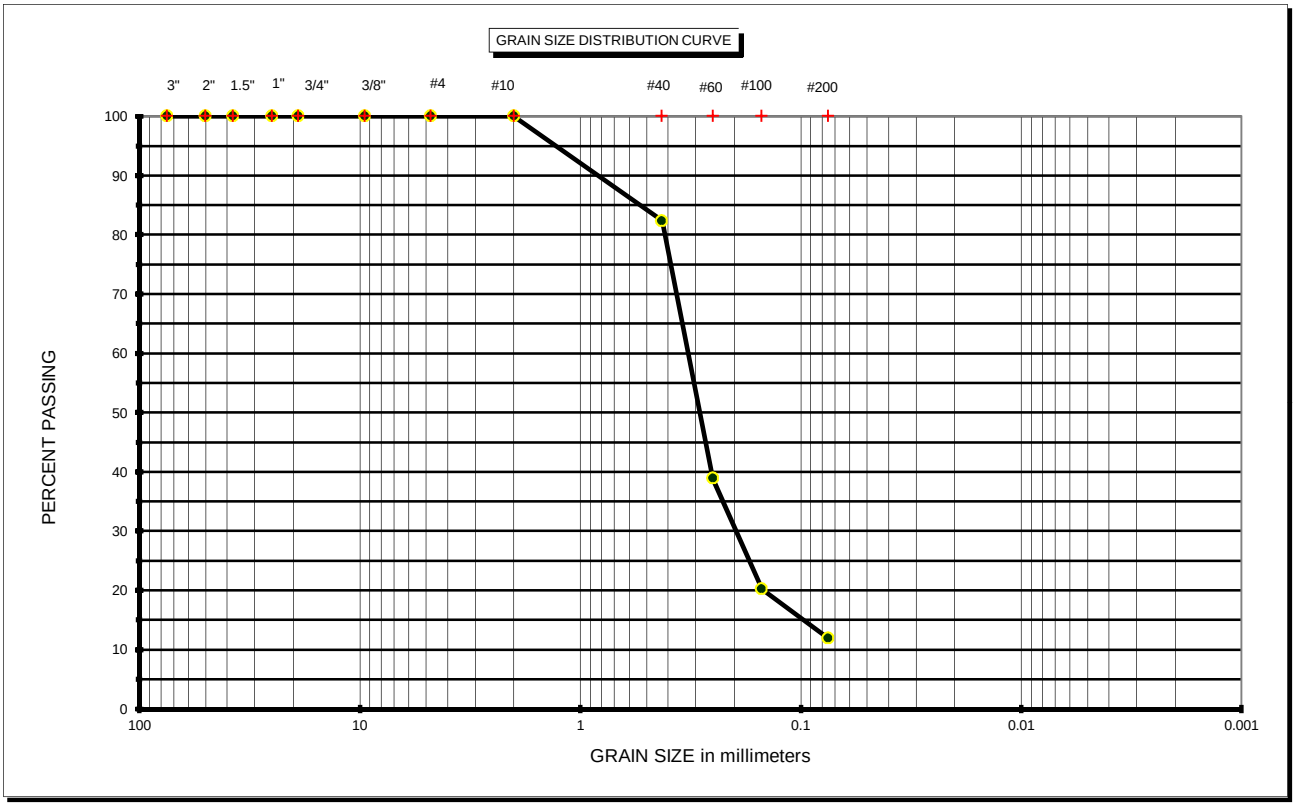
Boring Number	Sample Depth (ft)	Stratum Number	AASHTO Symbol	Sieve Analysis, Percentage Passing								Atterberg Limits			Organic Content (%)	Natural Moisture Content (%)
				3/4"	3/8"	#4	#10	#40	#60	#100	#200	Liquid Limit	Plastic Limit	Plasticity Index		
RD-1	2.0-4.0	4	A-2-4				100	82	39	20	12				3.9	20
RD-4	2.0-4.0	2	A-3				100	87	45	18	2					15
RD-4	4.0-6.0	4	A-2-4				100	88	53	30	17	NP	NP	NP	2.7	23
RD-8	0.3-2.0	3	A-2-4	95	94	93	93	82	50	29	11				0.9	9
RD-12	8.0-10.0	3	A-2-4				100	94	72	46	21	NP	NP	NP		17
RD-14	2.0-4.0	2	A-3				100	91	60	33	7					18
RD-15	0.3-1.0	2	A-3				100	92	61	35	9				4.0	30
RD-18	6.0-8.0	3	A-2-4				100	81	41	27	18	NP	NP	NP		16

NP = Non Plastic

GRAIN SIZE DATA SHEET

PROJECT NAME: Midway Road **DATE:** 5/2/2016

PROJECT #: 7111-15-154



ASTM D 2487 Classification of Soil for Engineering Purposes			**Coarse Sand**	**< #4 and > #10**	**Cu = D_{60} / D_{10}**
Coarse Gravel	**< 3" and > 3/4"**		**Medium Sand**	**< #10 and > #40**	**Cc = $(D_{30})^2$ / (D_{10} x D_{60})**
Fine Gravel	**< 3/4" and > #4**		**Fine Sand**	**< #40 and > #200**	

BORING # RD-1 **OFFSET (ft)** **DEPTH (ft):** 2.0-4.0

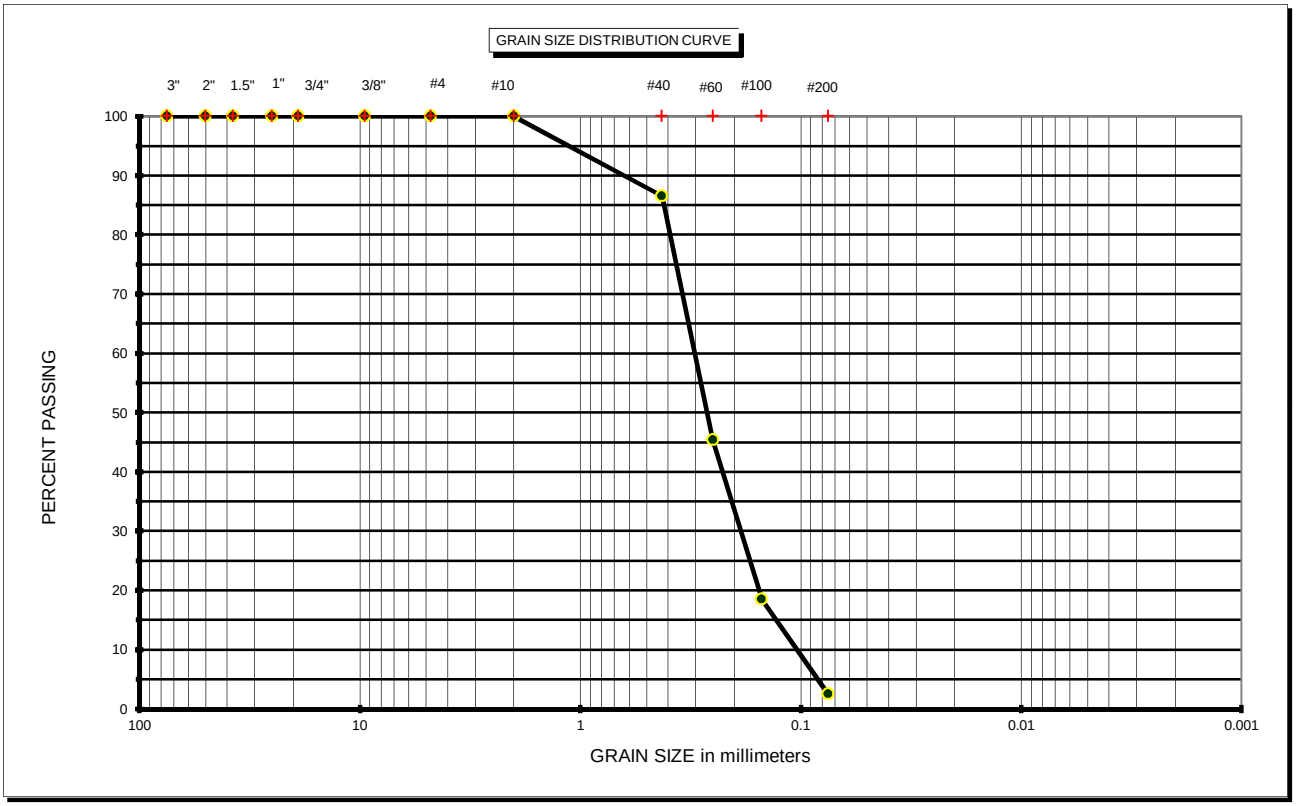
SOIL CLASSIFICATION: A-2-4

ATTERBERG LIMIT (- #40 Material)
LIQUID LIMIT
PLASTIC LIMIT
PLASTIC INDEX

GRAIN SIZE DATA SHEET

PROJECT NAME: Midway Road **DATE:** 5/2/2016

PROJECT #: 7111-15-154



ASTM D 2487 Classification of Soil for Engineering Purposes			Coarse Sand	< #4 and > #10	$Cu = D_{60} / D_{10}$
Coarse Gravel	< 3" and > 3/4"		Medium Sand	< #10 and > #40	$Cc = (D_{30})^2 / (D_{10} \times D_{60})$
Fine Gravel	< 3/4" and > #4		Fine Sand	< #40 and > #200	

BORING # RD-4 **OFFSET (ft)** **DEPTH (ft):** 2.0-4.0

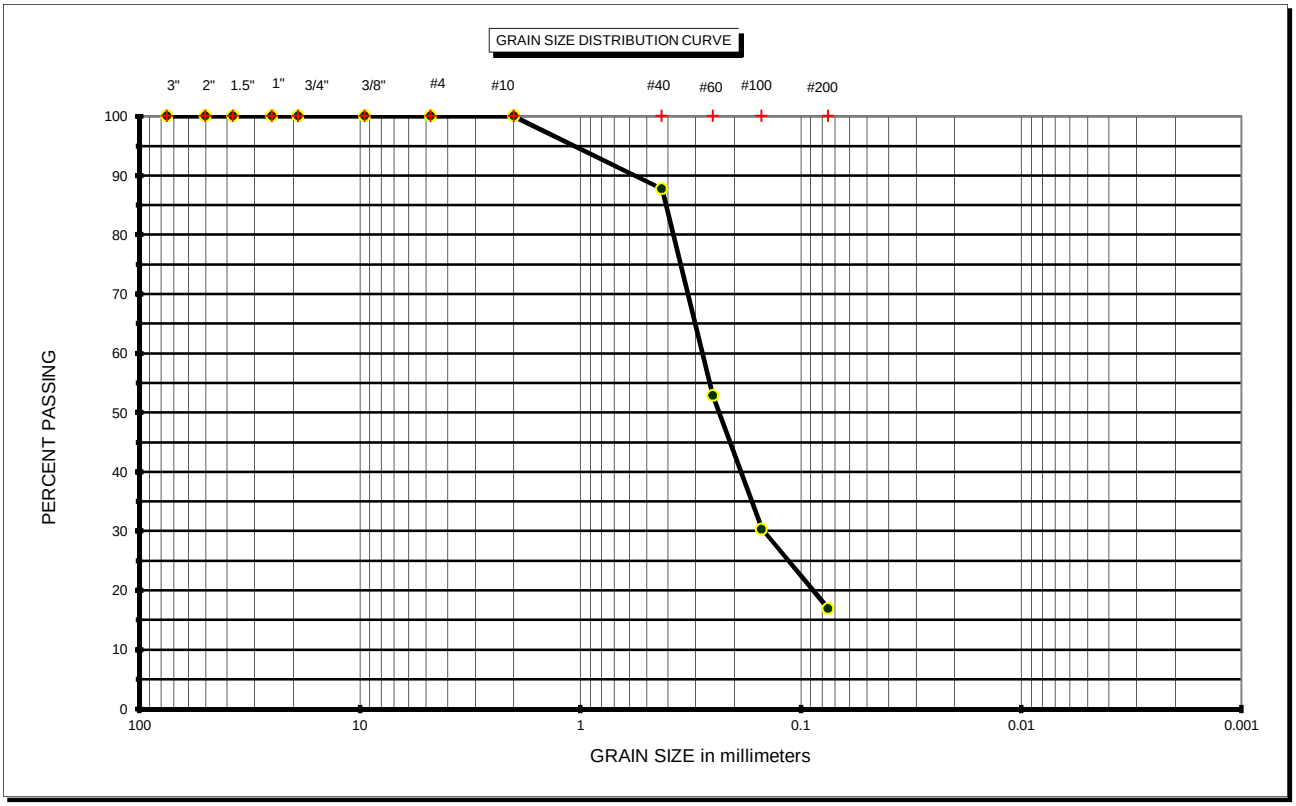
SOIL CLASSIFICATION: A-3

ATTERBERG LIMIT (- #40 Material)	
LIQUID LIMIT	
PLASTIC LIMIT	
PLASTIC INDEX	

GRAIN SIZE DATA SHEET

PROJECT NAME: Midway Road **DATE:** 5/2/2016

PROJECT #: 7111-15-154



ASTM D 2487 Classification of Soil for Engineering Purposes			Coarse Sand	< #4 and > #10	$Cu = D_{60} / D_{10}$
Coarse Gravel	< 3" and > 3/4"		Medium Sand	< #10 and > #40	$Cc = (D_{30})^2 / (D_{10} \times D_{60})$
Fine Gravel	< 3/4" and > #4		Fine Sand	< #40 and > #200	

BORING # RD-4 **OFFSET (ft)** **DEPTH (ft):** 4.0-6.0

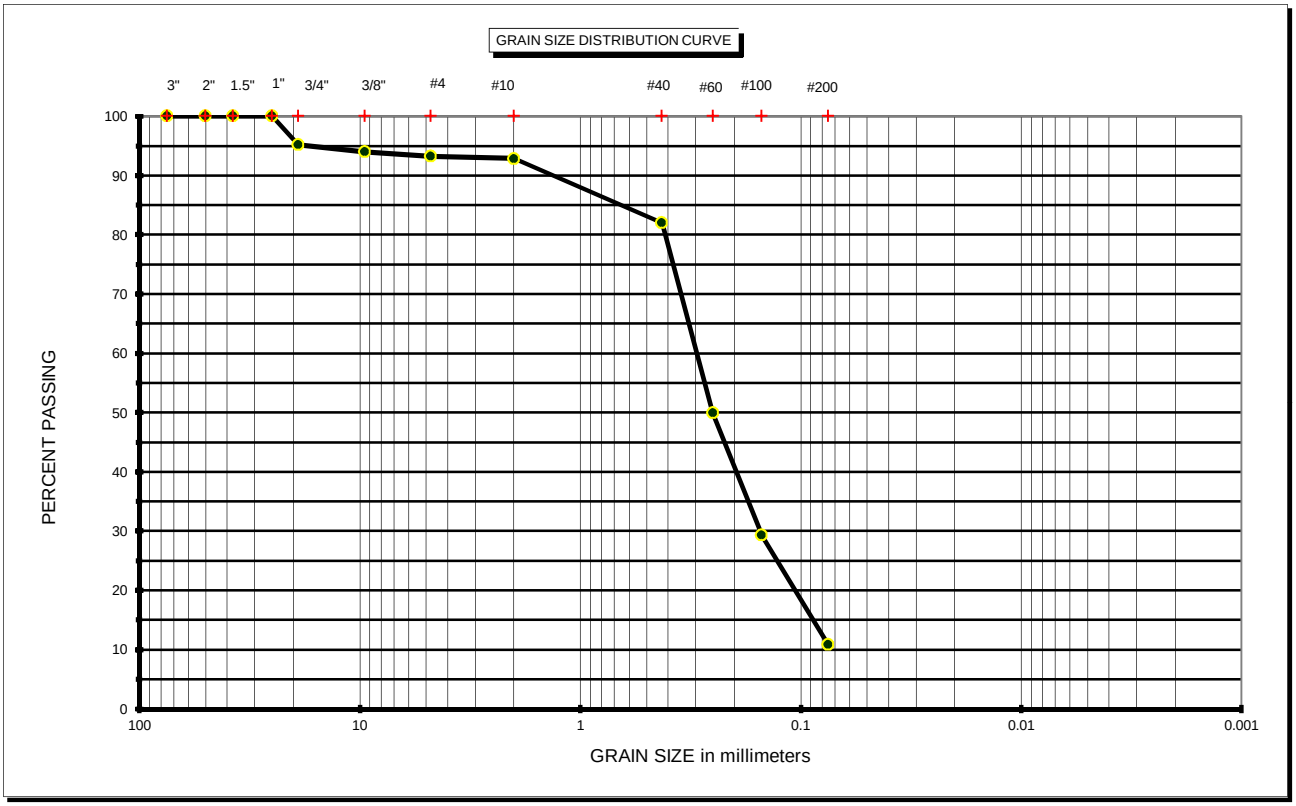
SOIL CLASSIFICATION: A-2-4

ATTERBERG LIMIT (- #40 Material)	
LIQUID LIMIT	NP
PLASTIC LIMIT	NP
PLASTIC INDEX	NP

GRAIN SIZE DATA SHEET

PROJECT NAME: Midway Road **DATE:** 5/2/2016

PROJECT #: 7111-15-154



ASTM D 2487 Classification of Soil for Engineering Purposes			Coarse Sand	< #4 and > #10	$Cu = D_{60} / D_{10}$
Coarse Gravel	< 3" and > 3/4"		Medium Sand	< #10 and > #40	$Cc = (D_{30})^2 / (D_{10} \times D_{60})$
Fine Gravel	< 3/4" and > #4		Fine Sand	< #40 and > #200	

BORING # RD-8 **OFFSET (ft)** **DEPTH (ft):** 0.3-2.0

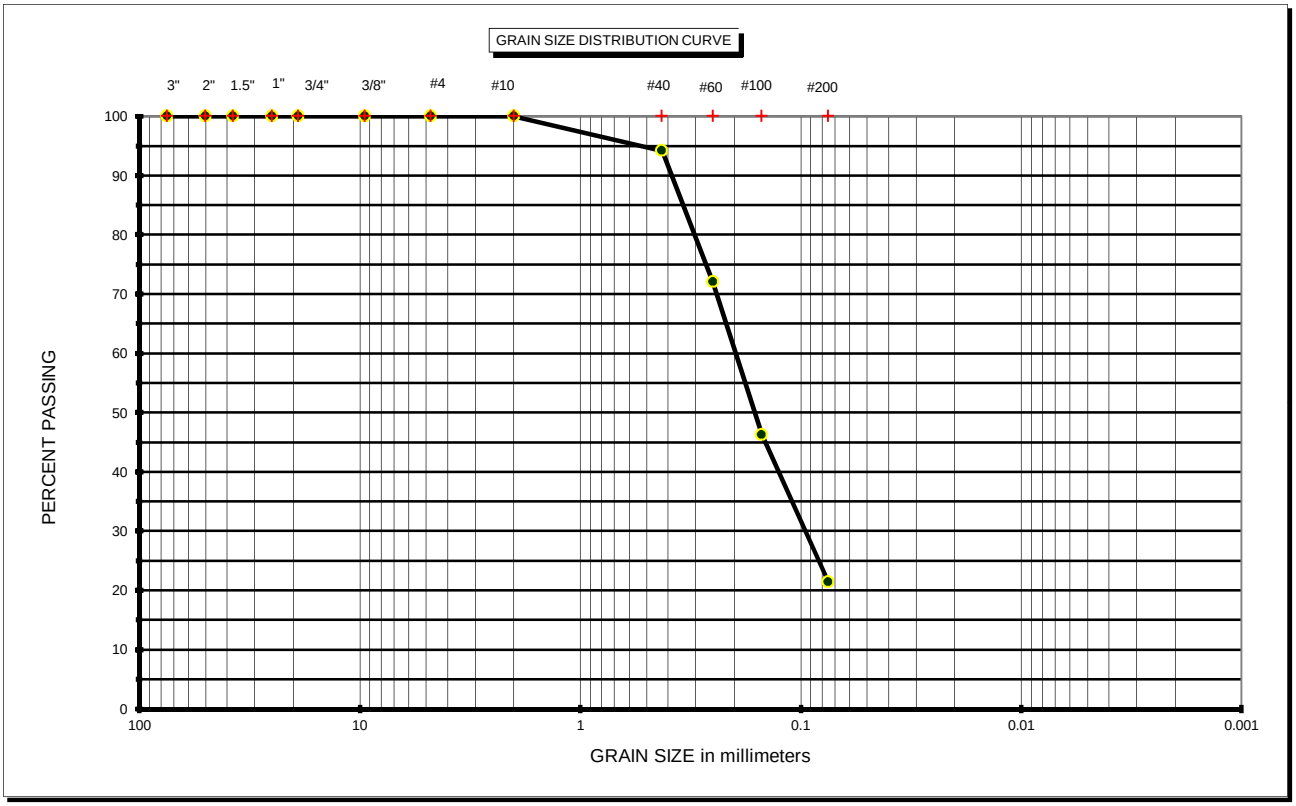
SOIL CLASSIFICATION: A-2-4

ATTERBERG LIMIT (- #40 Material)
LIQUID LIMIT
PLASTIC LIMIT
PLASTIC INDEX

GRAIN SIZE DATA SHEET

PROJECT NAME: Midway Road **DATE:** 5/2/2016

PROJECT #: 7111-15-154



ASTM D 2487 Classification of Soil for Engineering Purposes			Coarse Sand	< #4 and > #10	$Cu = D_{60} / D_{10}$
Coarse Gravel	< 3" and > 3/4"		Medium Sand	< #10 and > #40	$Cc = (D_{30})^2 / (D_{10} \times D_{60})$
Fine Gravel	< 3/4" and > #4		Fine Sand	< #40 and > #200	

BORING # RD-12 **OFFSET (ft)** **DEPTH (ft):** 8.0-10.0

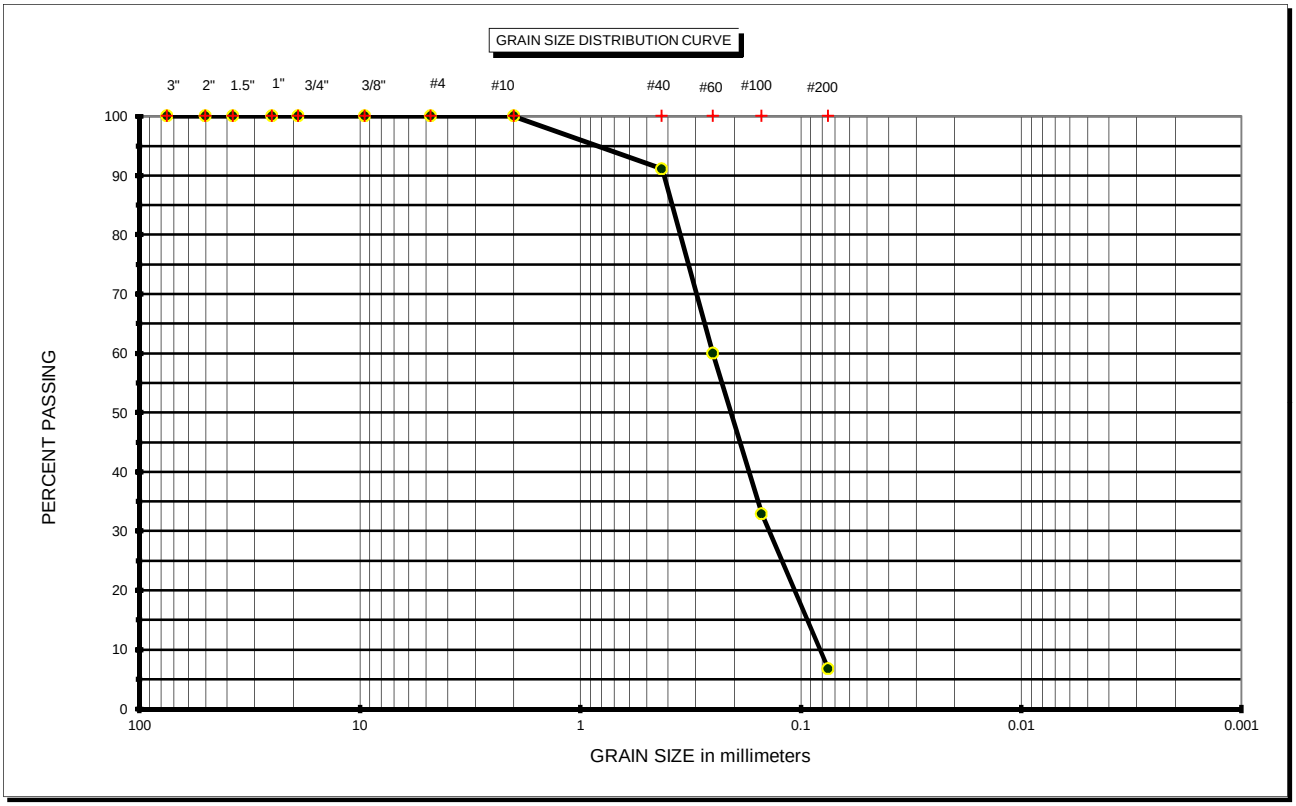
SOIL CLASSIFICATION: A-2-4

ATTERBERG LIMIT (- #40 Material)	
LIQUID LIMIT	NP
PLASTIC LIMIT	NP
PLASTIC INDEX	NP

GRAIN SIZE DATA SHEET

PROJECT NAME: Midway Road **DATE:** 5/2/2016

PROJECT #: 7111-15-154



ASTM D 2487 Classification of Soil for Engineering Purposes			Coarse Sand	< #4 and > #10	$Cu = D_{60} / D_{10}$
Coarse Gravel	< 3" and > 3/4"		Medium Sand	< #10 and > #40	$Cc = (D_{30})^2 / (D_{10} \times D_{60})$
Fine Gravel	< 3/4" and > #4		Fine Sand	< #40 and > #200	

BORING # RD-14 **OFFSET (ft)** **DEPTH (ft):** 2.0-4.0

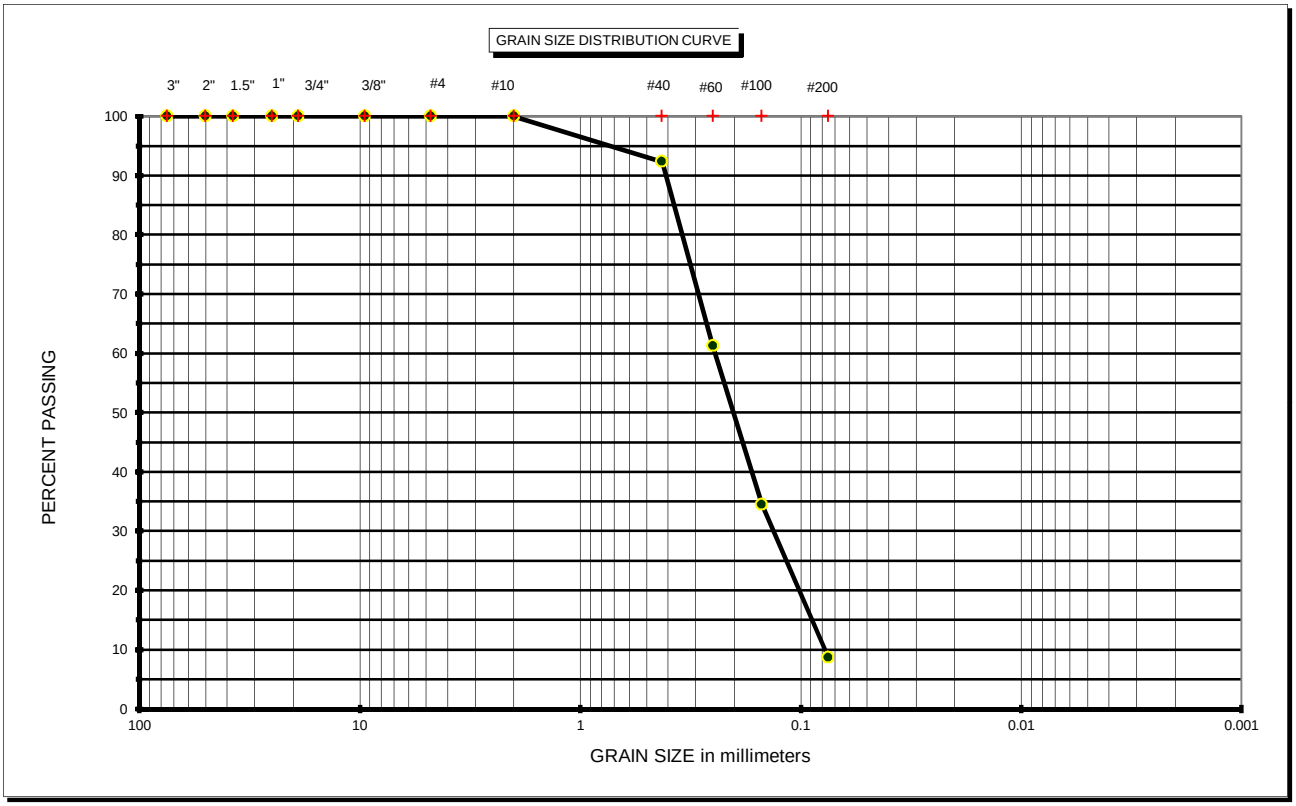
SOIL CLASSIFICATION: A-3

ATTERBERG LIMIT (- #40 Material)	
LIQUID LIMIT	
PLASTIC LIMIT	
PLASTIC INDEX	

GRAIN SIZE DATA SHEET

PROJECT NAME: Midway Road **DATE:** 5/2/2016

PROJECT #: 7111-15-154



ASTM D 2487 Classification of Soil for Engineering Purposes			Coarse Sand	< #4 and > #10	$Cu = D_{60} / D_{10}$
Coarse Gravel	< 3" and > 3/4"		Medium Sand	< #10 and > #40	$Cc = (D_{30})^2 / (D_{10} \times D_{60})$
Fine Gravel	< 3/4" and > #4		Fine Sand	< #40 and > #200	

BORING # RD-15 **OFFSET (ft)** **DEPTH (ft):** 0.3-1

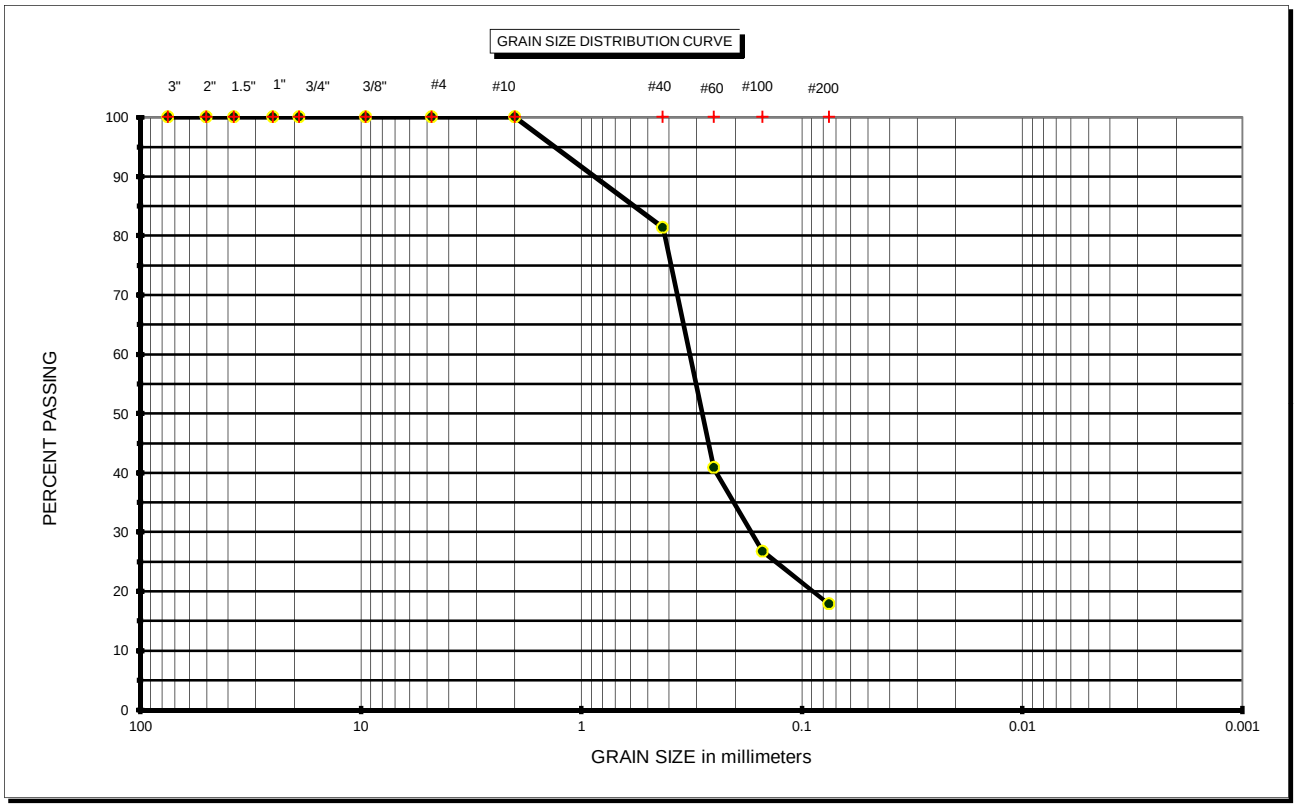
SOIL CLASSIFICATION: A-3

ATTERBERG LIMIT (- #40 Material)	
LIQUID LIMIT	
PLASTIC LIMIT	
PLASTIC INDEX	

GRAIN SIZE DATA SHEET

PROJECT NAME: Midway Road **DATE:** 5/2/2016

PROJECT #: 7111-15-154



ASTM D 2487 Classification of Soil for Engineering Purposes			Coarse Sand	< #4 and > #10	$Cu = D_{60} / D_{10}$
Coarse Gravel	< 3" and > 3/4"		Medium Sand	< #10 and > #40	$Cc = (D_{30})^2 / (D_{10} \times D_{60})$
Fine Gravel	< 3/4" and > #4		Fine Sand	< #40 and > #200	

BORING # RD-18 **OFFSET (ft)** **DEPTH (ft):** 6.0-8.0

SOIL CLASSIFICATION: A-2-4

ATTERBERG LIMIT (- #40 Material)

LIQUID LIMIT	NP
PLASTIC LIMIT	NP
PLASTIC INDEX	NP

APPENDIX 12

Correspondence

Meeting Minutes

3000 Dovera Drive, Suite 200, Oviedo, FL 32765 I P: 407-971-8850 I F: 407-971-8955 I www.inwoodinc.com

DATE: June 5, 2015

TO: **Vanita Saini – FDOT**

FROM: Alex Hull - Inwood

RE: Midway Road CR 712 PD&E Study – Project Kickoff Meeting

ATTENDANCE: Kadian McLeean – FDOT, Andrew Gonzalez – FDOT, Shandra Davis – FDOT, Ruben Rodriquez – FDOT, John Frank – St. Lucie County, Craig Hauschild – St. Lucie County, Beth Zsoka – QCA, Lee Powers – Keith and Associates, Kelly Schwarz – Kimley-Horn, Ian Rairden – Kimley-Horn, Geoff VanBueren – Inwood, Lynn Kiefer – Kimley-Horn (Phone), Bernard Kinney – Bernard Kinney Associates, Inc. (Phone), Steven Kuda – ACA (Phone), Matt LaLuzurene – ACA (Phone), Renato Chuw – Inwood (Phone), David Ledgerwood – Inwood (Phone), Don Polanis - Tierra South Florida (Phone)

The meeting began at 10:30 am with introductions of the attendees. Several attendees participated through the conference call phone line (indicated by (Phone) above) and have been included in the Attendance list. The meeting included the following topics of discussion: Survey/Mapping, Planning and Environmental, Turnpike Coordination, Traffic Operations, Drainage/Permitting, Geotechnical, Right of Way, Modal Development, Value Engineering, and Project Management.

1. Survey and Mapping
    - The current St. Lucie County construction project from Selvitz Road to 25th Street is scheduled to be completed by May 2017.
    - The schedule for the survey of the Midway Road PD&E (near Selvitz Road) will need to be adjusted as necessary to coordinate with the ongoing construction activities. The goal is to wait as long as possible to ensure that the Midway Road PD&E survey picks up the construction efforts at the intersection. If needed, Inwood will utilize the design files from the County's construction project to supplement any survey that is acquired in association with this study.
    - St. Lucie County staff will try to coordinate with the contractor of the ongoing construction project to see if construction at Selivtz Road can be moved earlier in the schedule.
    - Lee Powers will schedule a separate meeting with District 4 Survey staff to coordinate and discuss the survey efforts for this PD&E Study.
    - The goal is to get the aerial targets set quickly due to the fact that we are moving into the rainy season in Florida.
    - There are 200 field days associated with the survey efforts, so it is anticipated that survey efforts will be completed in approximately 5 months.
    - There is enough existing information regarding the baseline and right of way that early progress can be made regarding alternatives analysis and right of way estimates. Inwood will begin these efforts prior to completion of final survey.
    - The county requested that any tree larger than 4 inches in diameter be surveyed. The scope will be reviewed to determine what was negotiated.
2. Planning and Environmental
    - Environmental
        i. District 4 has developed a QA/QC checklist to aid consultants in developing high quality documents. The areas of concern for the FDOT staff include:
            1. Graphics and figures being produced on 11"x17" paper
            2. Numerous grammatical errors
            3. Inconsistent formatting of the document
            4. Unclear results or stated conclusions (Consultant needs to be decisive)

5. Utilizing the QA/QC checklist (a copy of the checklist was passed out to all attendees during the meeting)

ii. All documents need to be finalized and concurrency with agencies needs to be accomplished 21 days prior to the public hearing.
iii. PDF submittals of all environmental documents is preferred until the final submittal (at that point, the printed documents will be submitted).
iv. No company logos on any environmental documents, except on title page.
v. The Purpose and Need for this project needs to reflect exactly what is stated in ETDM.
vi. Andrew requested good effort by the consultant to produce high quality figures.
vii. FDOT will coordinate meetings with any agencies.
viii. The final report will be a three ring binder.
ix. Vanita requested that she be copied on all email correspondence with District 4 environmental staff. Craig and John also requested to be copied on all project email correspondence.

- Noise
  i. A noise methodology meeting will be setup to occur within the next 3 to 4 months.
- Public Involvement
  i. PIP plan will be submitted by Beth to Alex during the first week in June.
- Turnpike Coordination
  i. The traffic data collection is complete. There will be a two month time frame to complete the traffic modeling.
  ii. A traffic methodology meeting will be scheduled with Florida's Turnpike within the next two weeks. This meeting will also be utilized to discuss FGT concerns and future Turnpike widening options that may impact this study. The meeting can be held at the Treasure Coast FDOT office if necessary.
  iii. Kadian McLean requested he be invited to the meeting with the Turnpike.
  iv. Ian will coordinate with Alex regarding setting an agenda for a meeting.
  v. Even if the interchange is not feasible, the widening of Midway Road will still proceed.
- Traffic
  i. Ian is still in the process of obtaining all the crash data.
  ii. Signal interconnects and ITS were discussed and John Frank stated that he wanted to be sure that the signals would be interconnected.
  iii. Inwood will coordinate with St. Lucie County regarding the spacing associated with access management. The County stated that they prefer to follow FDOT access management criteria.
- CRAS
  i. Inwood will send Janus pdf's and CADD files when available

3. Drainage/Permitting
   - Renato will coordinate permitting issues.
   - The study will utilize the existing pond and County parcel for stormwater management pond.
   - It is important to get early buy-in from the permitting agency, therefore, a pre-application meeting will be scheduled prior to developing the 30% plans.
   - Canal 103 permitting concerns need to be coordinated with AECOM, according to John and Craig.
     i. John will email Inwood the contact with AECOM
   - According to John, it may be necessary to analyze "polishing" ponds to deal with nutrient loading. This concern will be coordinated with the permitting agency.
   - The pond west of the Turnpike will be a permit modification to accommodate additional runoff.
   - The pond that will be constructed on the Counties property will be designed and permitted according the necessary requirements of the roadway.
4. Geotechnical
   - Any geotechnical activities need to be coordinated with John for a St. Lucie Co. RW Permit.
   - High water table at Glades Cut Off Road. There is currently over a foot of asphalt at the intersection to handle the high water table.

5. Right of Way
    - Tom Stepp will help with developing any right of way estimate for this project.
    - Jeff Smith will be available to help with any title search or easement locations necessary for the study.
6. Modal Development
    - Coordination will be necessary if there are any flight path issues.
    - Corine Williams with St. Lucie County will help with transit coordination.
    - Bus and transit coordination will be necessary as there is a planned bus route along the project corridor. At this point, New Horizons is the planned location for the bus stop.
    - It is very important to have TIP/STIP/LRTP consistency as this is a federally funded project. This project is currently funded for all phases.
7. Value Engineering
    - It is available (optional services) if necessary or requested during the course of the project. If so, Tim Brock is the contact person.
8. Project Management
    - It is the goal for each consultant to act in a way that represents the Department well. The consultant is an extension of the department.
    - Inwood will develop a contact matrix to be used for project communications.
    - It was noted that no work done out of scope will be compensated. If there is work out of scope, contact Vanita so that the work item can be reviewed and determined if it is necessary.
    - Inwood will send Vanita the two users that will maintain VPN and LRE access.
    - Inwood will be responsible for all future meeting agendas and meeting minutes. Any phone calls or emails need to be documented to the project file.
    - FDOT is trying to make everything more web based, so the consultant team is encouraged to utilize the website.
    - At the request of St. Lucie County, we will need County signatures if there are any deviations from PPM.
    - The county would like the sidewalk as far as possible from the curb. A meandering sidewalk would be preferred.
    - We need to keep all water runoff within the right of way. No runoff can go onto private property.
    - A two foot strip is required at the RW line for utility access.
    - Inwood will set up a standardized email subject line that will be used for email communications.
    - Vanita will provide performance evaluations at different points throughout the project. Inwood will need to set up the evaluation meetings with Vanita when they come up on the schedule. Grades can also be given at milestones if requested by the consultant.
    - It is the consultant's responsibility to track the budget throughout the duration of the project.
    - Vanita asked Alex to review the project schedule to ensure that everything is accurate.
    - Vanita handed out sample monthly progress reports to be used as a go-by for this project.
    - As the project moves forward, the option is available for the current consultant team to stay on board for the design option. If the consultant team is not chosen to continue, the design will be advertised around may 2016 for FDOT FY17.

Action Items:

1. John Frank will coordinate with the Contractor on the ongoing Midway Construction project to determine if construction activities near Selvitz Road can be moved up in the schedule.
2. Lee Powers will schedule a meeting with District 4 survey staff to discuss survey related issues for the project.
3. Beth Zsoka will submit the PIP to Alex Hull during the first week of June for review.
4. Alex and Ian Raiden will coordinate to schedule a meeting with the Turnpike to occur within the next two weeks.
5. John will email Alex the contact information for the point of contact with AECOM regarding Canal 103.

6. Inwood will develop a contact matrix.
7. Inwood will contact Vanita with the two users for VPN and LRE access.
8. Inwood will establish a common subject line to use for email correspondence.
9. Alex will review the schedule and email Vanita any necessary changes prior to June 7.

The meeting ended at 12:50 pm.

Midway Road PD&E Study

From Glades Cut Off Road to Selvitz Road

FPID: 231440-3-22-01

Kickoff Meeting
May 28, 2015

Sign-In Sheet

Name	Representing	E-Mail
Geoff VanBueren	Inwood	gvanbueren@inwoodinc.com
Beth Zsoka	QCA	Beth.Zsoka@QCAusa.com
Alex Hull	Inwood	ahull@inwoodinc.com
LEE POWERS	KEITH & ASSOC	lpowers@keith-associates.com
Kelly Schwarz	Kimley-Horn	Kelly.schwarz@kimley-horn.com
Ian Rairden	Kimley-Horn	Ian.Rairden@kimley-horn.com
John Frank	St. Lucie County	FrankJ@stlucieco.org
Kadian McLean	FDOT	KADIAN.MCLEAN@DOT.STATE.FL.US
Andrew Gonzalez	FDOT / PLEN	Andrew.gonzalez@dot.state.FL.US
SHANDRA DAVIS	"	shandra.davis@dot.state.fl.us
~~Ruben Rodriguez~~	~~FDOT~~	ruben.rodriguez@dot.....
CRAIG HAUSCHILD	ST. LUCIE COUNTY	HAUSCHILDC@STLUCIECO.ORG
Vanita Saini	FDOT	Vanita.Saini@dot.State.fl.us.

Meeting Minutes

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DATE: December 18, 2015

TO: **Vanita Saini, PE**

FROM: Renato Chuw, PE

RE: Midway Road PD&E Study (FPID: 231440-3) – Drainage Coordination Meeting

CC: All Attendees (via email), File

A drainage coordination meeting was held on December 15th, 2015, via teleconference in regard to the Midway Road (CR 712) PD&E Study. The purpose of the meeting was to review Inwood's drainage approach for the project. The meeting began with introductions and was followed by a drainage overview of the project by Renato Chuw. The overview and resulting discussions are outlined below. Meeting materials were provided separately via email prior to the teleconference and are attached to this document for reference.

Alignment Alternatives and Overview

- An overview of the project limits from Glades Cut Off Road to Selvitz Road was provided as well as the scope of the PD&E Study.
- The purpose of the project is to evaluate widening Midway Road to a four-lane facility.
- Two alignment alternatives are currently being evaluated:
  - Alt. 1 – Avoids impacting Canal C-103 by widening/shifting alignment to the north
  - Alt. 2 – Encloses Canal C-103 in a box culvert. This typical section is consistent with Midway Road typical section east of Selvitz Road (under construction)
- Kimley-Horn and Associates is part of the study team and they are evaluating the potential for an interchange at the Turnpike and Midway Road.

Existing and Proposed Drainage

- Canal C-103 is located parallel to and along the south side of Midway Road. The canal flows west to east until it is enclosed with a box culvert (11'x5') beginning 1000 feet west of Selvitz Road and continuing to 450 feet east of Dunn Road. The box culvert is currently under construction as part of the widening project of Midway Road from Selvitz Road to 25th Street.
- Canal C-103 serves as the direct outfall for the project area runoff. The canal ultimately discharges to the St. Lucie Aquatic Preserve, which is a designated Outstanding Florida Water (OFW).
- The canal was previously owned and maintained by the North St. Lucie River Water Control District (NSLRWCD). Recently, ownership and maintenance has been relegated to St. Lucie County.
- The project is within two nutrient-impaired waterbodies: Ten Mile Creek (WBID 3194A) and North Fork St. Lucie River (WBID 3194).
- The project area has been divided into four drainage basins (Basins A, B, 1, and 2).
- There is an existing County-owned pond in Basin A that provides treatment for the existing Midway Road. It contains enough storage to treat the proposed improvements from this project. Per the inter-agency meeting with South Florida Water Management District (SFWMD), OFW criteria will be required for the net new impervious area while maintaining the existing permitted criteria for the existing impervious area. The existing pond was designed to meet the NSLRWCD discharge criteria of 2 inches of depth over the area served for any 24-hour period for the 10yr/72hr storm event. At the time this pond was designed and permitted, nutrient loading analysis was not required, but it will need to be included as part of the Pond Siting Report.

- The portion of Midway Road from the Turnpike west for 800 feet is currently untreated (Basin B). It is anticipated that runoff from this area will be taken to and treated in infield areas of the construction schedule for the interchange. However, due to the unknown construction schedule for the interchange it was decided that pond site alternatives will be evaluated for Basin B. An alternative matrix will be developed to determine the preferred pond site for this basin.
- The County acquired a parcel on the north side of the project between Corporate Way and Milner Drive within Basin 1 for a proposed pond to treat improvements for Midway Road between the Turnpike and Post Office Road. This pond was originally designed as part of the adjacent segment of Midway Road under construction (Selvitz Road to 25th Street) but it was removed from the scope of that project and the SFWMD 1permit. Since this site is already owned by the County for the purpose of the stormwater pond, it will be utilized as the proposed pond site for this PD&E Study. The pond was designed to meet OFW requirements and pre- vs. post-discharge requirements by SFWMD as well as accommodations for a future six-lane roadway.
- The permitted project to the east is currently constructing a pond (Pond 2/3) that is designed for a future six-lane roadway and has the capacity to provide treatment for the proposed improvements from this project. Basin 2 (from Post Office Road to Selvitz Road) is accounted for in Pond 2/3. The existing pond meets SFWMD pre vs. post discharge criteria for the 25yr/72hr storm event as well as OFW criteria.
- There are no floodplains within the limits of this project. A Location Hydraulics Memo will be provided.

Discharge Criteria

- Per the previous meeting with SFWMD, the proposed ponds will be required to meet pre vs. post 25yr/72hr storm event assuming no restrictions (control structure) downstream of Canal C-103. Additionally, the ponds would not have to meet the discharge criteria from NSLRWCD.
- St. Lucie County mentioned that there may be a proposed structure downstream on Canal C-103 and that they still consult with AECOM and NSLRWCD for any proposed work with regard to allowable discharge.
- Coordination with AECOM/NSLRWCD will be required to determine if the allowable discharge criteria for Canal C-103 will be applicable for this project.

Comments from FDOT

- FDOT asked if there was a possibility that Canal C-103 could be used for storage and provide additional nutrient reductions. Inwood stated that currently the canal is used for conveyance only and receives runoff from areas west of Glades Cut Off Road and adding weirs or check dams would cause an adverse effect upstream of the canal. The County also agreed and stated that the canal has staged up very high in the past.
- FDOT asked if there was a watershed model for Canal C-103. Inwood stated that an ICPR model was developed for the adjacent east segment of Midway Road that is already permitted. This model encompassed a large area even beyond their project limits and included the canal. This model covers our study project limits and will be used for this project.
- FDOT asked if there was an option for the canal to be shifted further south to avoid impacting right-of-way limits to the north. Inwood stated that shifting the canal to the south is feasible. A meeting with the City of Port St. Lucie has been scheduled (1/22/16) to discuss landscape buffer requirements. We will investigate the potential to relocate the canal based on the results of this meeting.
- FDOT mentioned that a matrix for the pond site alternatives is typically required for the Pond Siting Report evaluating different factors in recommending a preferred site. However, since most of the pond sites on this project are already constructed or acquired by the County and, therefore, already cleared, a matrix is not applicable. The only exception is for Basin B.

Comments from St. Lucie County

- St. Lucie County expressed concern that Canal C-103 currently stages up very high during storm events.
- The contractor (Midway Road – Selvitz Road to 25th Street) has been fined multiple times by SFWMD during the construction of the box culvert for turning off the dewatering pumps and causing the canal to overtop.

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- City of Port St. Lucie has requested a buffer between the right-of-way line and the canal; therefore, shifting or widening the canal to the south will impact this buffer.
- St. Lucie County conducted an in-house analysis to determine the location of the pond site for Basin 1 prior to purchasing the parcel of land.
- St. Lucie County mentioned that they want to be included in further coordination meetings with SFWMD and NSLRWCD.

Action Items

- A meeting with the City of Port St. Lucie has been scheduled for 1/22/16 to discuss the landscape buffer requirements and the feasibility of relocating Canal C-103.
- Inwood will determine the most restrictive discharge criteria and set up a meeting with St Lucie County, SFWMD, and AECOM/NSLRWCD to discuss it.

Note: The above reflects the writer's understanding of the contents of the meeting. If any misinterpretations or inaccuracies are included, please contact Renato Chuw (407-971-8850) as soon as possible for resolution and revisions if necessary.

FLORIDA DEPARTMENT OF TRANSPORTATION
DISTRICT IV INTERAGENCY MEETING MINUTES

TO: Binod Basnet, Florida Department of Transportation
FROM: Justin Freedman, E Sciences, Incorporated
MEETING DATE: August 20, 2015
LOCATION: South Florida Water Management District (SFWMD)
3301 Gun Club Road, West Palm Beach, Florida
SUBJECT: Florida Department of Transportation (FDOT) Interagency Meeting Minutes

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First meeting started at 9:07 am.

Attendees:

Name	Organization	Email Address
Barbara Conmy	SFWMD	bconmy@sfwmd.gov
Hugo Carter	SFWMD	hcarter@sfwmd.gov
Wilord Metellus	FDOT	wilord.metellus@dot.state.fl.us
Binod Basnet	FDOT	binod.basnet@dot.state.fl.us
James Ford	FDOT	james.ford@dot.state.fl.us
Justin Freedman	E Sciences	jfreedman@esciencesinc.com

District: Four
FPID/FM Number: 434360-1
FDOT Project Manager: James Ford, P.E.
Consultant/Company Name: FDOT/In House
SR/local Name: County Road CR-712A/McCarty Road
Project limits: 250-foot approaches on either end of bridge (Project length approximately 0.12 miles)
General Scope: McCarty Road bridge replacement over Ten Mile Creek Bridge # 940031 located in North St. Lucie River Water Control, District (NSLRWCD). At the project limit, the road will be reconstructed from a single lane county road to two (2) lanes for about 250 feet at each approach of the bridge. The proposed drainage is designed to use 100 feet of French Drain to provide water treatment and attenuation while maintaining the proper discharge into the Creek.
Specific Agenda Items Discussed: See below.
Requested Attendees: Hugo Carter, SFWMD, Barb Conmy, SFWMD

Binod Basnet, Wilord Metellus and James Ford discussed project:

- FDOT recently met with Patrick Holmes of NSLRWCD to confirm FDOT will need permit from the NSLRWCD.
- Total project length is 630 feet (127 feet actual bridge; 250 feet each approach).
- Existing drainage – scuppers on bridge deck, sheet flow into canal.
- Project has two outfalls (one in southwest quadrant, one ±300 feet northeast of project).

- Proposed system will provide better treatment than existing system (in terms of water quality and water discharge quantity).
- Road will shift to east - to compensate for swale capacity reduction, proposing exfiltration trench to the southeast and northeast of the project.
- FDOT conducted “Pre-Post” drainage analysis to confirm stormwater discharges before and after project. Stormwater discharges will be decreased in the “Post” condition.
- Anticipated wetland impacts of 0.038 acres due to rip rap installation along bridge slope.

Hugo Carter and Barb Conmy commented on project:

- Project should be covered under SFWMD General Permit (GP) for FDOT and Municipalities (i.e. for minor bridge alterations, replacement, etc.):
    - Less than 0.5 acres of wetland or surface water impacts
    - Channel clearing and shaping allowed
    - 30 day turn around, $250 fee
- Based on project acreage, project should qualify for the GP.
- Will not need to mitigate for wetland impacts.

Additional comments from Binod Basnet and James Ford:

- When team applies for GP, they will be sure to meet special conditions of GP.
- Team spoke to Randy Turner at USACE, should not need to mitigate for USACE due to less than 0.5 acres of impact.
- Schedule – letting in January 2017; applications submitted within one month of current date.

Meeting ended at 9:18 am.

Second meeting started at 9:20 am

Attendees:

Name	Organization	Email Address
Barbara Conmy	SFWMD	bconmy@sfwmd.gov
Hugo Carter	SFWMD	hcarter@sfwmd.gov
Binod Basnet	FDOT	binod.basnet@dot.state.fl.us
Brady Walker	Kimely Horn	brady.walker@kimley-horn.com
Zack Evans	Inwood Consulting Engineers	zevans@inwoodinc.com
Renato Chuw	Inwood Consulting Engineers	rchuw@inwoodinc.com
Justin Freedman	E Sciences	jfreedman@esciencesinc.com

District: Four
FPID/FM Number: 231440-3-22-01
FDOT Project Manager: Vanita Saini, PE
Consultant/Company Name: Inwood Consulting Engineers, Inc.
SR/local Name: Midway Road/ CR 712
Project limits: Glades Cut Off Road to Selvitz Road
General Scope: Project Development and Environment (PD&E) Study to evaluate the widening of Midway Road/CR 712 from a two-lane rural roadway to a four-lane divided urban roadway between the limits of Glades Cutoff Road to Selvitz Road.
Specific Agenda Items Discussed: See below.
Requested Attendees: Hugo Carter, SFWMD, Barb Conmy, SFWMD

Renato Chuw and Zack Evans discussed project:

- Project is PD&E Study.
- Discussed scope of project noted above.
- Different options:
  - Widen road to south - Canal C-103 would be impacted.
  - Widen road to north - Development to north and wetlands could be impacted.
- Two existing SFWMD permits:
  - First permit (issued 2003) for intersection of Midway Road and Glades Cutoff Road. The County built Pond #2 to handle water from intersection as well as improvements along Midway Road up to 700 feet west of Turnpike.
  - Second permit (issued 2012) for Midway Road widening from Selvitz Road to 25th Street. Original design included additional pond (Pond #1) – handling basin from Turnpike to west of Post Office Road but not included in the issued permit or part of the final construction plans.
- Majority of treatment needed for proposed project will be handled by existing, previously permitted ponds (some portion of proposed project needs additional treatment).
- Existing Ponds #1 and #2/3 are designed to accommodate the widening of Midway Road to six lanes.
  - This study only proposing widening from two to four lanes.
- All discharge collected by C-103 Canal leading to St. Lucie Aquatic Preserve, which is an Outstanding Florida Water (OFW)
  - Existing Pond #1 and #2/3 designed to provide additional 50% water quality.

  - Pond #2 from first permit does not provide additional 50% water quality.
- Attenuation
  - Existing Pond #1 and #2/3 designed to handle 25 year/72-hour year storm event per SFWMD.
  - Pond #2 from first permit designed based on NSLRWCD criteria (10-year/3-day storm, 2 inches per day).
- Question to SFWMD – if design proposed to use extra capacity within Pond #2 to provide the additional necessary treatment for the project, which criteria should be used?
  - Use criteria from 2012 permit?
  - Use new criteria for pre/post analysis?
  - Does project need to meet OFW criteria?
- Second question to SFWMD: Receiving water bodies (Ten Mile Creek and North Fork of St. Lucie River) are impaired for nutrients; should dry pre-treatment areas be provided to address issue of impaired water bodies?
- C-103 Canal used to be maintained by NSLRWCD – now it is managed by St. Lucie County.
- May be some potential impacts to wetlands to north (pond expansion).
- The south widening alternative will look into enclosing portions of the C-103 Canal with a box culvert, similar to the adjacent segment under construction.

Hugo Carter and Barb Conmy commented on project:

- The portion of runoff from the proposed project that will not be treated by the existing ponds should be subject to new “Pre-Post” analysis per SFWMD criteria (i.e. 25-year/72-day storm event). Need to treat for new net impervious area only.
- New treatment will need to meet 150% treatment criteria to address OFW (for new impervious areas only).
- Due to impaired water body analysis, nutrient loading analysis may be needed.
- NSLRWCD – If no control structure downstream from project, then NSLRWCD criteria does not apply (use SFWMD criteria).
- Existing permit called for a box culvert – need to make sure this culvert can handle additional capacity associated with proposed project.
- Potential wetland impacts (associated with pond expansion) will need to be addressed during permit process.
- With box culverts proposed, design will need to allow for air exchange mechanism (i.e. saddle risers).
- Contact Jose Vega for any pre-application field meetings.

Meeting ended at 9:50 am.

Meeting Minutes

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DATE: December 17, 2015

TO: **Vinita Saini, PE**

FROM: Renato Chuw, PE

RE: Midway Road PD&E (FPID: 231440-3) – Drainage Coordination Meeting

CC: All Attendees (via email), File

A drainage coordination meeting was held on December 15th, 2015 via teleconference in regards to the Midway Road (CR712) PD&E Study. The purpose of the meeting was to review Inwood's drainage approach to the study.

The meeting began with introductions, an overview of the project by Renato.

The alignment alternatives were discussed

- Widen to the North avoid impacting Canal C-103
- Widen to the South and enclose Canal C-103 in a Box Culvert

The drainage approach was discussed

- There is an existing pond in Basin A that provides treatment for the existing roadway. It contains enough storage to treat the proposed improvements from this study. Per meeting with SFWMD, OFW will be required for net new impervious area. Existing pond was designed to follow NSLRWCD discharge criteria of 2 inches of depth over the area served for any 24 hours period for the 10yr/72hr storm event.
- A pond site will be located for Basin B, either within the infield area of the future proposed interchange or at an offsite location. A pond alternative matrix will be created for this basin.
- The county owns a parcel on the north side of the project, within Basin 1, that was purchased for a proposed pond to treat improvements from a previously proposed project that was not permitted. The parcel will be utilized as the proposed pond site for this study
- The permitted project to the east is currently constructing a pond that is designed for a future 6-lane facility and has the capacity to provide treatment for the proposed improvements from this study. Existing pond meets SFWMD Pre vs Post discharge criteria for the 25yr/72hr storm event.
- There are no Floodplains within the limits of this study. A memo will be provided for the LHR.

Discharge criteria was discussed for the proposed study

- Inwood discussed from previous meeting with SFWMD the proposed ponds will be required to meet the 25yr/72hr storm event if there is no downstream control structure from NSLRWCD.
- St Lucie County mentioned there may be a proposed structure downstream on Canal C-103 and that they still consult with AECOM and NSLRWCD for any proposed work with regards to allowable discharge.
- Coordination will be required to determine the allowable discharge into Canal C-103.

Comments from FDOT

- Canal C-103 is used for conveyance only.
- Could it be used as treatment by widening and placing weirs?
- Could the canal be shifted to avoid impacting R/W limits to the north?
- Why was the pond site for Pond 1 chosen?

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Comments from St. Lucie County

- St Lucie expressed concern that the Canal currently stages up very high during storm events.
- The contractor has been fined multiple times during the construction of the box culvert for turning off the dewatering pumps causing the canal to overtop.
- St Lucie County has requested the buffer between the R/W line and the canal, shifting or widening the canal will impact the buffer.
- An in-house design matrix was performed to determine the pond site for Basin 1

Action Items

- A meeting will be coordinated to discuss the feasibility of relocating Canal C-103.
- Inwood will determine the most restrictive discharge criteria and set up a meeting with St Lucie County, SFWMD, and NSLRWCD to discuss.
- St Lucie County will provide FDOT with documentation as to why the pond site was chosen for Basin 1.
- Inwood will discuss with FDOT whether more traffic counts will be required to determine the need for designated right turn lanes.

Meeting Minutes

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DATE: July 13, 2016

TO: **July Jimenez, PE**

FROM: Renato Chuw, PE

RE: Midway Road PD&E (FPID: 231440-3) – Contamination Discussion Meeting

CC: All Attendees (via email), File

A coordination meeting was held on July 13th, 2016 via teleconference to discuss the comments on the Pond Siting Report regarding contamination.

The meeting began with introductions.

Overview of the project by Renato

- The limits of the project begin at Glades Cut Off Road and end at Selvitz Road.
- The project is split into four basins each with their own treatment facility:
    - Basin A: Treatment is provided by the existing pond located on the south side of Midway Road. Modifications to the control structure are proposed.
    - Basin B: Three stormwater treatment alternatives were investigated for Basin B. Two offsite ponds and an exfiltration trench inside the right of way. Pond B-1 and Pond B-2 are located on the north and south side of the road respectively.
    - Basin 1: Pond 1 is located on a parcel on the north side of Midway Road previously acquired by St. Lucie County.
    - Basin 2/3: Pond 2/3 is being constructed as part of the adjacent segment and is sized so that it will be able to treat the runoff from the proposed improvements of this study. No modifications will be made to this pond.

The comments on the Pond Siting Report (PSR) regarding contamination were discussed

- FDOT would like for the Contamination Screening Evaluation Report (CSER) to be updated to have verbiage and general language discussing that the 500' and 1000' buffer were investigated as part of the project study.
- The general language discussing the 500' and 1000' buffer will address the comment regarding SFWMD rules and regulations for ponds.
- FDOT stated that concerns regarding contamination for the existing ponds are not necessary and do not need to be included within the report. The Medium Risk ranking will be removed from the existing ponds.
- The 500' and 1000' buffer will be included in the report for any proposed pond alternatives that are part of the study.

Action Items

- The CSER will be updated based on the comments on the PSR and this meeting
- The PSR will be updated to incorporate the updated CSER.

*****END OF MEETING*****

Note: The above reflects the writer's understanding of the contents of the meeting. If any misinterpretations or inaccuracies are included, please contact Renato Chuw at (407) 971-8850 as soon as possible for resolution and revisions if necessary.

Janet Licausi - Midway Road Pond Siting Evaluation Preliminary Findings

From: "Kuntz, Mark" <mkuntz@hwlochner.com>
To: <harveym@co.st-lucie.fl.us>, <powelym@co.st-lucie.fl.us.>, <harrisr@co.st-lucie.fl.us>, <licausij@co.st-lucie.fl.us>
Date: 6/4/2007 3:59 PM
Subject: Midway Road Pond Siting Evaluation Preliminary Findings
CC: "Navaille, Pierre" <pnavaille@hwlochner.com>, "Jaworski, Susan" <sjaworski@hwlochner.com>
Attachments: Midway Road Pond Siting Alternative Matrix.pdf; Midway Road Parcel Information.pdf

Hello Everyone:

Using the input provided to me by the team (in the form of the worksheets that were circulated earlier this month), I have prepared the attached table which summarizes what I believe to be the most viable pond site alternatives available within the project.

Five alternative pond sites were identified by the County as possible pond site locations during the meeting held between Pierre Navaille and County Staff during pre-proposal research. Ron Harris provided a map dated April 28, 2005 on which those parcels were labeled "Pond Site." Those sites are analyzed herein as Basin II Alternative I, Basin III Alternative I, and Basin IV Alternatives I, IA and II. Subsequent to project initiation, a sixth parcel, identified as Basin I Alternative I, was identified as a possible shared pond by the County during the development review process.

In keeping with good engineering practices, a minimum of two alternatives have been identified within each basin for evaluation. A summary of the parcels (on a basin by basin basis) considered is as follows:

Basin I (from the Turnpike Overpass to the east driveway of the Police Station)

Alternative I is for the construction of a joint use pond located within parcels 153 and 154. The county has already initiated discussions with the property owner of this property for the construction of a shared use pond. Because of the need to provide additional treatment for the future widening of the segment of Midway Road between the Turnpike and Selvitz Road, the volumetric needs within this basin have increased beyond what was originally expected. H.W.Lochner has discussed this matter with Stef Mathes from Culpepper and Terpening, the consulting engineer for this property, and while it does not appear that the current site plan (which has already been permitted by SFWMD) does not have sufficient storage to meet our treatment requirements, Stef has agreed to reevaluate their property to see if they can accommodate the most recently determined needs. It is more than likely that this site will not be able to be modified significantly enough to provide the volume that the county needs without significant impact to the site. For this reason, we are suggesting that several pond site alternatives be explored for this basin. Alternative IA relates to utilizing the parcels identified as Alternative I to whatever degree possible and shifting the eastern basin limits for basin I further to the west to minimize the area contributing to the basin I pond. This will be possible since the basin limits for this basin (as well as for basin II) are artificially determined and can be manipulated in this way. Moving this basin boundary would, of course, result in a need for greater volume needed for the proposed pond located in basin II along with higher costs needed to route this additional flow to the pond in basin II.

Alternatives II and III are for the construction of a pond on either parcel 146 and 145 which are located to the east of the parcels identified in alternative I. These parcels contain wetlands and upland habitat, so the cost of these impacts is expected to be significant.

Alternative IV is the Pete Tree property. This alternative was included for consideration because of the possibility of this property becoming available for acquisition due to issues arising from its modified access for semi trailers. The greatest concerns with this parcel involve the potential for contamination because of its current use.

Basin II (from the east driveway of the Police Station to Selvitz Road)

Alternative I for this basin is parcel 142. It appears to be viable alternative for the construction of a pond within this basin.

Parcel 133 will also be evaluated as Alternative II. While the southern half of this parcel is already developed, the northern half is still undeveloped. Constructing a pond on this site will involve issues related to both access and piping. These issues may limit this alternative's viability.

Basin III (from Selvitz Road to Jorgenson Road)

Alternative I for this basin is parcel 130. This property is owned by Liberty Baptist Church. A pond on this property will be a shared use facility with the church. The county has already initiated discussions with the Church regarding the construction of a shared use pond on their property.

Alternative II for this basin is parcel 110. Piping issues and an existing wetland may limit this parcel's viability.

Alternative III for this basin is parcel 114. Piping issues, access issues and size limitations might limit the viability of this parcel.

Basin IV (From Jorgenson Road to Project End)

Alternative I for this basin is parcel 89. Because of the elevation of this property (which is high compared to the rest of the basin), its proximity to the outfall (which is located further to the east) and the piping issues related to having to cross existing ditches on the property, it appears that this property has limited potential. It may, however, be useful to provide a part of the necessary treatment for this basin, but probably cannot be used to provide all the treatment needed for this basin.

Alternative II for this basin is parcel 34. The issues related to this parcel include potential wetland impacts, high elevation, a potential unwilling seller. This parcel may be useful to provide a part of the necessary treatment for this basin.

Alternative III for this basin is a combination of parcels 11 and 13. While these parcels are too small to be used for wet detention and their elevation is too high. They could be used to provide a part of the necessary treatment (in the form of dry treatment) for this basin.

Alternatives IV and V are for two parcels both of which are owned by a potential unwilling seller, but the location for both of these parcels seems favorable for ponds. If neither one of these parcels is available, I suggest we expand the analysis to include the properties to the south of Midway Road and east of 25th street. We will need to determine whether or not our evaluations needs to be expanded in this regard as soon as possible so as to avoid any delay to the schedule.

Conclusion

I am requesting that all team members comment on the contents of this email as soon as reasonably possible. If any of the reviewers feel that any of the parcels identified within should be eliminated from consideration for any reason, they are encouraged to comment. Likewise, if any potential parcel was overlooked and should be included, it should be brought to the teams attention as well.

After the team has concurred with the parcels to be evaluated, a cost comparison will need to follow. Determining relevant costs (which will include right-of-way, mitigation, and any special construction or maintenance considerations will require the involvement of certain team members. These costs will be compiled and presented in a table which will appear in the pond siting report.

In addition, updated calculations will need to be provided to the owners of both of the properties being considered for the construction of shared use facilities. So that they can confirm the viability of these alternatives. I will be happy to provide this information directly to the engineers representing these owners (while copying the County). Or, if the county prefers, this information can be provided to the county for you to present to the property owners. I will be happy to proceed either way.

Finally, it is important to note that, with the exception of Parcels 153 and 154 (identified as alternative I for basin I), there is no water table data available for any of the parcels considered. Since there are limited resources available for geotechnical investigation, it may be prudent to request data immediately after preferred alternatives are identified. Conversely, this investigation can be conducted concurrently with this evaluation if sufficient funds are available to assure that the evaluation includes this consideration and so that delay to the project schedule can be minimized.

MIDWAY ROAD POND SITING ALTERNATIVES MATRIX

		Alternative I		Altenative IA		Alterrnative II		Alternative III		Alternative IV	
BASIN	Required Acreage	Parcel	Acres	Parcel	Acres	Parcel	Acres	Parcel	Acres	Parcel	Acres
I	2.82	153, 154 (1) (2) (5) (7)	8.85	(11)		146 (5)	5.01	145 (5)	4.54	152 (9) (10)	5.06
II	3.00	142	6.31			133	9.06				
III	3.47	130 (1) (2)	13.88			110 (5) (8)	9.86	114 (2) (8)	2.94		
IV	2.13	89 (3) (8)	34.75	34 (3) (5) (6)	4.76	11,13 (2) (4)	2.21	87 (6)	6.72	88 (6)	6.63

NOTES:

1. Shared Use Facility
2. Site may not have sufficient storage for entire basin
3. Site is not hydraulically favorable
4. Dry Detention only
5. Wetland Impacts
6. Potential unwilling Seller
7. Parcels under development
8. Parcel has access issues for piping
9. Potential contamination
10. Already developed
11. Convey all or part of run off to Basin II

From: "Kuntz, Mark" <mkuntz@hwlochner.com>
To: <harrisr@co.st-lucie.fl.us>, "Navaille, Pierre" <pnavaille@hwlochner.com...
Date: 4/4/2007 5:54 PM
Subject: FW: Pond Siting Team for Midway Road Widening
Attachments: D-4 Pond Siting Procedures 03-19-07.pdf; D-4 POND SITING PROCESS CHART 03-1
9-07.pdf; Midway Road Pond Siting Team.xls

CC: <powelym@co.st-lucie.fl.us.>, "Vijjapu, Satish" <svijjapu@hwlochner.com>...

Yesterday a meeting was held at the Saint Lucie County Engineering Department to discuss the pond siting evaluation for the widening of Midway Road. During this meeting, it was decided to utilize the guidelines established by the Florida Department of Transportation for pond siting as the basis for the analysis of candidate parcels for ponds on this particular project. Although certain parcels within the corridor have already been identified as favorable, this process is necessary so that the County will have the tools it needs to pursue acquisition of the proposed parcels should any of the prospective owners be unwilling or unable to sell. This process will likewise help the county determine alternative pond sites for the project in case the preferred sites are not available.

We had suggested this approach to the County since it is has proven to be a very effective tool for the Department in screening potential sites to determine the viability of each parcel and provides the entity acquiring the property with the documentation it needs to justify each acquisition.

The pond siting process used by the Department utilizes the team approach. Individuals selected from a variety or backgrounds are brought together to analyze the all viable alternatives. These disciplines include:

Right-of-way
Design
Drainage
Environmental Management
Maintenance
Construction
Eminent Domain

Having input from all team members continually throughout the process will greatly expedite the determination of the best possible solutions to the County and will provide the County with all needed documentation.

I am forwarding you a copy of these guidelines to you for your use.

I have also attached a spreadsheet which contains a listing of the individuals who seem best suited to represent the various disciplines. I ask that each of you review the spreadsheet and confirm that those listed are the most appropriate individuals to participate in this effort.

Shortly after this list is finalized, I would like to set up a meeting with the team to begin discussing alternatives.

Your assistance in this venture is greatly appreciated.

Respectfully,

Mark J Kuntz, P. E.
Project Manager
Senior Drainage Engineer
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Sunrise, Florida 33325
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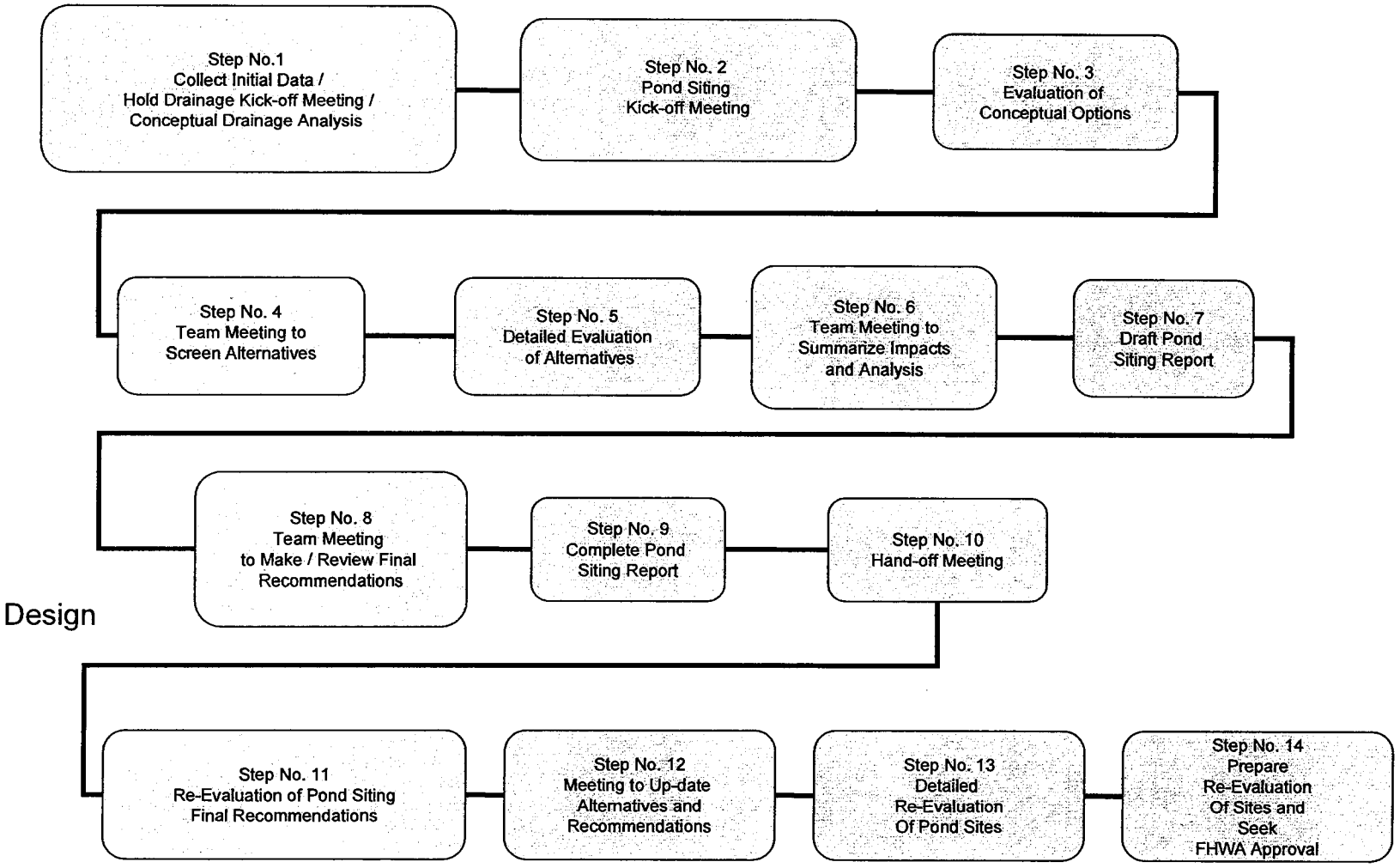
mkuntz@hwlochner.com
www.hwlochner.com <blocked::http://www.hwlochner.com/>

Midway Road Pond Siting Team Contact Information				
Discipline	**Individual**	**Entity**	**Phone Number**	**Email Address**
Right-of-Way	Ron Harris	Saint Lucie County	772-462-1721	harrisr@co.st-lucie.fl.us
Design	Pierre Navaille	HW Lochner	407-482-6600	pnavaille@hwlochner.com
Design	Mike Harvey	Saint Lucie County	772-462-1717	harveym@co.st-lucie.fl.us
Drainage	Mark Kuntz	HW Lochner	954-846-0009	mkuntz@hwlochner.com
Environmental Management	Vanessa Bessey	Saint Lucie County	772-462-2528	besseyv@co.st-lucie.fl.us
Maintenance	Don Pauley	Saint Lucie County	772-462-2511	pauleyd@co.st-lucie.fl.us
Construction	Mike Harvey	Saint Lucie County	772-462-1717	harveym@co.st-lucie.fl.us
Eminent Domain	JoAnn Riley	Saint Lucie County	772-412-2825	jriley@co.st-lucie.fl.us

D-4 POND SITING PROCESS

Environmental Management



INTRODUCTION

The Florida Department of Transportation District 4 Office is continually seeking improvements in their policies and procedures utilized to deliver quality transportation projects to its stakeholders. The following document addresses procedures to be utilized within the District for the purpose of providing the necessary guidance, consistency and quality in the establishment of stormwater management facilities for transportation ponds. The Florida Department of Transportation currently provides guidance for the selection of locations for stormwater management facilities. This guidance is outlined in the Department's "Stormwater Management Facility Handbook, dated January 1999 as published by the Department's Office of Design, Drainage Section in Tallahassee. Although the current published guidelines represent a fairly comprehensive overview of the process, District 4 wanted to develop a more refined and detailed process that deals with the logistical and coordination challenges associated with what is known as "The Pond Siting Process".

"Pond Siting" consists of the methods and procedures utilized by the Florida Department of Transportation to document and justify the selection of a specific site for the construction of stormwater management facilities. The documentation produced by the pond siting procedures is utilized for the justification of any necessary right-of-way acquisition associated with meeting the stormwater management requirements of a proposed roadway project. This justification is often referred to as meeting "Public Purpose" or "Public Need".

The Pond Siting process in District 4 has traditionally been left to the responsibility of the District Drainage Office for coordination and oversight. This has lead to coordination issues and logistical problems in the past. From August 18th to 22nd, 2003 District 4 initiated a Value Engineering Study of the existing pond siting process to identify potential improvements. These procedures and the process outlined in this document incorporate several of the concepts outlined during the Value Engineering Study. In addition several enhancements have been included to provide in-depth guidance in addressing stormwater management facilities.

GENERAL DRAINAGE DESIGN PROCESS OVERVIEW

The development of stormwater management facilities for a transportation project involves a significant amount of information, as well as extensive coordination among various individuals and agencies. Most major transportation projects are developed through the Project Development & Environment (PD&E) Study process. This process is utilized by the Florida Department of Transportation to document that proposed improvements to an existing corridor or the establishment of a new corridor is in compliance with the National Environmental Policy Act of 1969. The PD&E Study process incorporates the development of various alternatives for the proposed roadway improvements. As part of the development of these roadway alternatives various stormwater management schemes are considered. Some of these schemes include the following:

- ***Exfiltration Trenches:*** This type of system consists of a piped drainage system with sections of perforated pipe surrounded by a rock filled trench wrapped in filter fabric. Stormwater is typically exfiltrated into the ground through the porous stones utilizing the head differential between the water level in the trench and the ground water table. Stormwater storage capacity is attained within the trench voids and typically contained through the use of weirs in the trench system prior to the discharge point. Use of this type of system is typically seen in an urban environment, with soils containing a high hydraulic conductivity. This system does not typically require right-of-way acquisition for the construction of the stormwater management facilities. ***Note: This type of system requires high maintenance and posses long-term functionality concerns.***

- ***Swale systems:*** This type of system consists of a series of swales sometimes referred to as linear ponds for the storage of stormwater. Two types of swale systems are typically utilized, dry retention and dry detention. These systems typically do not require additional right-of-way acquisition with their associated stormwater facilities being contained within the road right-of-way template. ***Note: This type of system poses moderate maintenance concerns with mowing and standing water.***

- ***Adjacent Property Stormwater Management Systems:*** On several occasions proposed or existing residential subdivisions or commercial properties have been designed to accommodate adjacent roadway drainage into their respective stormwater management systems. This typically occurs as part of the municipal or county development process. These types of requirements are sometimes imposed and documented in the adjacent property's "Development Order" as mandated by the respective municipality or county issuing the permits for construction of the respective development. When this situation occurs the need for additional right-of-way for the roadway stormwater management system is typically reduced. However, storage and flowage easements may be required. If this has not been required by the County or Municipality in some instances the Department has been able to negotiate this with the developer of the adjacent property. ***Note: This type of system poses low maintenance concerns, since maintenance is typically handled through maintenance agreements with the property owner assuming the maintenance responsibilities. The agreements however, must include language that if the property owner is not maintaining the facilities the Department has the legal right to enter onto their property, correct the situation and back charge the property owner.***

- ***Isolated Stormwater Pond Systems (Positive Systems):*** When additional right-of-way is necessary to accommodate the stormwater management requirements of a project; isolated ponds are required. These ponds can be constructed as either wet retention systems or wet detention ponds. Each system type has its advantages and disadvantages which can result in large right-of-way needs depending on the project parameters. These types of systems typically possess an outfall which allows for the control of the size of the right-of-way required for the pond. In addition to wet ponds this system can also be utilized as a dry pond similar to the swale system mentioned above. The key issue with the use of a dry system is to have adequate hydraulic conductivity of the soil and proper separation between the pond bottom and the seasonal high ground water table. **Note: This type of system poses a lower maintenance concern with the use of the wet ponds.**

- ***Isolated Stormwater Pond Systems (Closed Basin Systems):*** This type of system is similar to the positive system in the fact that right-of-way is required outside the roadway typical section. Thus additional right-of-way is required for the construction of isolated ponds. The only exception with this system is that the respective pond is located within a drainage basin that does not have a positive outfall (Landlocked areas). These types of systems typically are required to contain larger storm events and thus require more right-of-way to meet the needs of the project. **Note: This type of system poses a lower maintenance concern with the use of the wet ponds.**

Once it has been determined that the acquisition of right-of-way may be required to accommodate the proposed stormwater management facilities the process known as "Pond Siting" will commence. This process consists of a multi-discipline effort which supports the justification of the need to acquire right-of-way to meet the stormwater management needs of the project. The overall responsibility of the activities associated with the pond siting process lies with the PD&E Project Manager. It is his or her responsibility to coordinate the efforts of each of the disciplines associated with the pond siting process. Once the PD&E Study is completed and Initial Engineering commences the responsibility for Pond Siting shifts to the Roadway Project Manager.

This procedure will outline the activities associated with the pond siting process during the PD&E study and the creation of the initial pond siting report. Given the fact that sometimes there is a delay between the completion of the PD&E study and final design plans development, it may be necessary to re-evaluate the findings of the initial pond siting report. The oversight responsibilities of this re-evaluation will be that of the Roadway Project

Manager. It will also be his or her responsibility to oversee the ultimate coordination with the various individuals in delivering the final right-of-way requirements to the FDOT R/W office.

POND SITING TEAM

In order to develop a more efficient and effective pond siting report a multi-disciplinary team is established during the PD&E process. This team is initially led by the PD&E Project Manager, who will be responsible to secure adequate participation and information from the members of the report team. The team's composition identified below provides broad based input to develop the most appropriate use of the right-of-way to be acquired for the pond site with the least environmental impact while being cost-effective. ***Note: Once the PD&E Study is completed the leadership (Project Management) responsibilities will change to the Design Project Manager. At this point the PD&E Project Manager's role will be minimized.***

It is the responsibility of the PD&E Project Manager to develop the Pond Siting team using the PD&E Consultant. The team will consist of individuals from various FDOT departments and Consultant Classifications, which are assigned. The following team members must be included in the decisions during the pond siting process:

- ***PD&E / Design Project Manager:*** Overall Project Management and coordination of the development of the pond siting report. He or she is responsible for considering all pertinent information provided by the various team members necessary for the final production and coordination of the pond siting report while maintaining consistency within the team. During the PD&E phase the PD&E Project Manager insures proper coordination for potential pond sites and documentation of the process. During the design Phase the Design Project Manager takes charge of the overall pond siting process and insures the coordination between all disciplines/area including right-of-way.

- ***Roadway Engineer (Roadway Design) / PD&E Design Liaison:*** This individual will be responsible for providing information pertaining to the various roadway alignments, typical sections and associated roadway design elements.

- ***Drainage Engineer (Drainage Office) / PD&E Drainage Liaison:*** This individual will be responsible for quantifying the drainage needs (Conceptual and Final) for the project, developing the initial pond sites to be considered by the team, identifying permitting requirements and implications and producing the actual pond siting report.

- ***Environmental Scientist (PL/EM Office):*** This individual will be responsible for identifying and evaluating impacts as identified in the National Environmental Policy Act of 1969 (NEPA) and associated amendments for compliance with NEPA guidelines. This individual will assist the Drainage Engineer in the identification of permitting requirements for the study alternatives. This individual will ensure that all Pond Siting activities are properly addressed in the required NEPA documents.

- ***Right-of-Way Appraiser / Land Planner (R/W Office):*** This individual will provide input on alternate pond sites based on land impact estimates as they relate to the acquisition. This individual will also be responsible for the production and review of the Right-of-way cost estimate report.

- ***Legal Council (District Legal Office):*** An attorney from the District's legal office will be assigned as an advisor to the pond siting team to respond to legal issues affecting the decisions made during the development of the pond siting report. This individual will also provide a review and corresponding comments in reference to the pond siting report. This individual will have the added responsibility of reviewing any correspondence between property owners and FDOT or Consultant during the pond siting process.

- ***Construction Engineer (District Construction Office):*** This individual will provide constructibility and cost input for the development of the various pond sites.

- ***Maintenance Engineer (Area Maintenance Office):*** This individual will be responsible for the identification of potential maintenance concerns. In addition he or she will review and define the associated maintenance costs as well as identify maintenance features desired for the specific sites.

POND SITING PROCESS

The Pond Siting process outlined in these guidelines consists of a fourteen step process. The initial eleven steps are performed during the PD&E Study phase, while the remaining steps occur during initial engineering in the Design phase. The following section outlines these steps and includes guidance as to typical tasks and requirements associated with each of these steps.

ACTIVITIES DURING DEVELOPMENT OF THE PD&E STUDY

Step 1 Collect Initial Data / Drainage Kick-off Meeting / Conceptual Analysis
Step 2 Pond Siting Kick-off Meeting
Step 3 Evaluation of Conceptual Options
Step 4 Team Meeting to Screen Alternatives
Step 5 Detailed Evaluation of Alternatives
Step 6 Team Meeting to Summarize Impacts and Analysis
Step 7 Draft Pond Siting Report
Step 8 Team Meeting to Make Final Recommendations
Step 9 Complete Pond Siting Report
Step 10 Hand-off Meeting between PD&E and Design

INITIAL ENGINEERING PHASE

Step 11 Re-Evaluation of Final Pond Siting Recommendations
Step 12 Meeting to Update Alternatives and Recommendations
Step 13 Detailed Re-Evaluation of Pond Sites
Step 14 Prepare Re-Evaluation of Sites and Seek FHWA Approval

Step 1 Collect Initial Data / Drainage Kick-off Meeting / Conceptual Analysis

The initial step associated with the process consists of preliminary data acquisition, establishment of design parameters and the development of some conceptual drainage solutions. This is done to provide the pond siting team with a basis to begin from.

- Assembly of Preliminary Roadway Data

  The development of the roadway alternatives associated with a PD&E study coupled with the initial data acquisition provides the basis for identification of the project drainage needs. The PD&E Roadway Design Engineer assigned to the PD&E Study will provide the following information to the Drainage Engineer:

  - Existing Roadway Plans
  - Existing & Proposed Typical Sections
  - Proposed Alternative Alignments
  - Proposed Project Profiles and Proposed Low Point Elevation (Line & Grade – 15%)

- Available Topographic Data and Aerial Photography (Include Local Data Sources)
- Land Use Data for Corridor / GIS Data Base (Includes Existing and Proposed Developments)
- Tax Maps and Land Owner Information (Can be provided as part of Public Involvement Research)
- Existing and Proposed R/W Maps
- Copies of any previous studies
- Existing Agreements (JPA's, Easements and or Maintenance Agreements, etc.)

❑ Hold Drainage / Permitting Kick-off Meeting with the District Drainage Office.

The PD&E Project Manager and Drainage Engineer shall meet with the District Drainage office to review the project scope, schedule, design criteria, special issues, identification of potential permit involvement, transfer of information in Drainage / Permit Offices possession (i.e. Prior Studies, Plans, Drainage Connection Permits, Drainage Inquiry Data Records, Permit Information, etc.). In addition the Pond Siting Process is to be reviewed and a Reviewer assigned from the Drainage Office.

❑ Develop Preliminary Drainage Report (Conceptual Only)

The Drainage Engineer begins his or her preliminary examination of the data and develops potential drainage concepts. This work can occur concurrent with the assembly of Preliminary roadway data task. However, the Drainage Engineer will ultimately need all the requested data before he/she can finish this preliminary report. Tasks associated with this effort include:

- Establish Drainage Design Criteria (May include a Pre-Permit Application Meeting with Agencies). Criteria should include:
  - Permitting Criteria (Water Quality and Quantity as well as Discharge Limitations)
  - Rainfall Intensity for Critical Duration Events (Identify Design Storm Events)
  - Curve Numbers or Run-off Coefficients
  - Times of Concentration
  - Tailwater (Discharge Condition and stages) Criteria
- Conduct a Review of Drainage Permit Files for Corridor and adjacent developments
- **Determination of Drainage Basin Boundaries** - Use aerial contour maps, old construction plans, available surveys to identify the primary basins and general outfall locations. In addition identify high points on the profile to separate the primary basins. Field visits are needed for this determination.
- Determination of Major Offsite Contributing Areas
- Establishment of Floodplain Elevations and Potential for Encroachment
- Identification of Outfall Locations (Verify if Closed Basin Criteria Applies)
- Development of Generic Soils Information (Obtain from County Soil Conservation Survey or prior area geotechnical studies)
- Establishment of Seasonal High Ground Water Elevations (SHGWT)
- Water Quality / Water Quantity Design Estimates

❑ Identify Alternative Stormwater Management Options - (Consider Funding Available)

- Existing Stormwater Management Facilities – Are these adequate to handle the proposed improvements (With or without modifications)?
- Potential Exfiltration Trench Options
- Dry Detention / Retention Systems
- Wet Detention / Retention Systems

- ❑ Coordinate with R/W Office on Initial Pond Sites – The Drainage Engineer will coordinate with the R/W Office on some initial sites to take to the Kick-off meeting.

- ❑ Coordinate with local agencies for potential pond sites to be considered. In addition the Drainage Engineer shall discuss the area's stormwater management plan with the local agencies and how the potential ponds sites will impact or can be incorporated into the area plan.

Step 2 Pond Siting Kick-off Meeting

The pond siting team is assembled by the PD&E Project Manager and a kick-off meeting is held. The team will consist of members from: Planning and Environmental Management, Roadway Design, Drainage, Survey, Right-of-Way, Maintenance, Construction, and other offices as deemed necessary. A representative from Legal will be on the team as an advisor only. By creating the team early on in the PD&E process, issues from every discipline will be identified at the start of the pond siting process. The intent of the pond siting team is to have alternatives evaluated with consideration to all potential aspects. This will allow for undesirable alternatives to be identified early on in the decision process so that they can be eliminated from further consideration, saving time and effort. (i.e. Fatal flaw analysis, etc.). During the Kick-off meeting the following issues need to be addressed:

- ❑ Verification of Pond Design Guidelines and Criteria (Includes District Preferences)

- ❑ Identify Potential Detention / Retention Pond Sites

    - o Assign Property ID No. to each Property to be considered. The R/W Office will provide these numbers.

- ❑ Identify Potential Joint Use Pond Sites (Public / Private)
- ❑ Assign Impact Analysis to Team Members

Step 3 Evaluation of Conceptual Options by the Individual Team Members

This evaluation consists of a general review by the team to narrow down potential alternatives. This review will consist of the following:

- ❑ Identify Potential NEPA Impacts and Issues (By PL/EM Office or PD&E Consultant)

    - o Natural Resources - Threatened & Endangered Species and Wetlands
    - o Socio-cultural Resources (Historical and Archeological sites and 4f properties)
    - o Physical Impacts (Including Noise, Contamination, Air Quality, etc.)

- ❑ Identify Potential Relocations (By R/W Office).
- ❑ Identify Potential Development Issues (By R/W Office- Land Planner).
- ❑ Identify Potential Construction Issues (By Construction Office).
- ❑ Identify Potential Maintenance Issues (By Maintenance Office).
- ❑ Identify Potential R/W Requirements
    - o Computation of Area required. (By Drainage Office).
    - o Determination of Impacts to adjacent properties. (By R/W Office)
    - o Determination of Easement Needs (By R/W Office).
- ❑ Identify Potential R/W Costs and Damages (By R/W Office).
- ❑ Identify Potential Business Damages Issues (By R/W Office).
- ❑ Consider Other Social Impacts (Public Opinion) (By PL/EM and Drainage Office).

Note: Issues to consider (By each member of the pond siting team) when evaluating right-of-way include:

- Utilize existing R/W whenever possible.
- Avoid residential and commercial relocations, if possible.
- Weigh the impacts of a partial R/W acquisition versus a whole acquisition of the property.
- Minimize the number of parcels required for pond construction along the corridor.
- Look at each pond location and how it sits on the site. Also consider the impacts to the remainder parcel and its viability for development. How will it function for its current or future use?
- Utilize vacant land whenever possible. Properties which are fully or partially developed significantly increase the cost of the acquisition particularly when business damages are considered. Land may be vacant because owner is having a hard time permitting proposed improvements. Need to establish why a property is vacant, or if the property owner has plans for its development.
- Always consider the development potential of a property.
- Look at access management issues and how the remainder site will operate. Also consider how maintenance will access the pond site.
- Avoid land locking the property.
- Avoid pond sites being directly located on State Road frontage, if possible.
- Avoid public and historic facilities,
- Adherence to avoidance and minimization of existing wetland systems and wildlife habitat. When placing ponds near wetlands check the potential draw down effects on the wetlands. The South Florida Water Management District (SFWMD) Basis of Review has guidance on how to estimate and address this issue.
- Avoid placing ponds on or adjacent to contaminated sites. For example, there are various regulatory requirements to ensure proper separation between contaminated or hazardous waste sites to ensure the potentially polluted water does not leach into a projects drainage swales or ponds. If by some chance ponds must be located near a contaminated site, there are physical measures that can be considered to restrict such flow (Clay core, ditch liner, etc.).
- Avoid Floodplain Impacts.
- Minimize Utility Relocations and review requirements for utility access for maintenance purposes.
- Identify if proposed pond sites are candidates for advanced acquisition. If so, the R/W Office must have an increased role and the advanced R/W process identified in the project schedule.

Note: Maintenance Issues for Pond Sites include:

- Ponds shall provide a minimum 20-foot wide maintenance berm.
- To compensate for grading irregularities, 1 foot of freeboard is required above the maximum design stage.
- Ponds having slopes steeper than 1:4 shall have a fence to prevent unauthorized entry.

Note: Fatal Flaw Screening Review – The following provides a quick checklist to narrow down alternatives:

- Exfiltration systems can be considered when hydraulic conductivity is greater than 1.0×10^{-5}.
- For Dry Retention Systems ground water tables need to be low. The minimum distance from bottom of swale to the SHGWT is 2.0 for adequate cover (Verify this assumption with Geotechnical Engineer Recommendations).
- Check Wellfield Protection Zone Cone of Influence and allowable treatment facilities within wellfield contours.
- Review aerials for potentially available vacant land.
- Review USGS Quadrangle Maps and Survey data for adequate slope to pond locations. Required piping system depths of 12 foot or deeper cuts are not recommended.

- Conduct a Desktop Environmental Review of GIS Data sets to identify potential NEPA issues. In the event that the GIS data reveals the potential for impacts; Ground Truthing (Field Review to verify conditions) is required.
- Review Land Use Data and Land Use plans for potential developments that may eliminate potential sites.
- Avoid placement of either exfiltration trench or dry retention / detention swales adjacent to a contaminated plume. The idea is not to shift the plume through exfiltration or infiltration from the drainage system.

Step 4 Team Meeting to Screen Alternatives

In order to create more consistency in the development of a pond siting report, an evaluation matrix will be utilized for comparison of alternative pond sites. The use of evaluation matrices are widely accepted in the realm of PD&E studies to aid in documenting and evaluating alternatives. For the evaluation of stormwater management ponds several standardized factors (and the corresponding matrix format) need to be considered, such as reflected in the tables on pages 9 through 11of this procedure:

Each pond siting team has the option of customizing the matrix reflected above to satisfy the particularities of their associated project site. If any of the standard factors above are eliminated, the team is to document the report to reflect why the factor is not relevant to the evaluation. This can be done within the matrix description area. If the team decides that one specific factor has a significant bearing on the project, they can decide to weight the factors accordingly with the appropriate documentation in the report. For consistency, the team should use a ranking for each factor with the weighting decided upon by the entire group.

- ❑ Conduct Qualitative Evaluation of All Alternatives.
- ❑ Prepare Qualitative Matrix Evaluation.
- ❑ Select a minimum of Three Alternatives per Basin for Further Evaluation.
- ❑ Assign refinement of Selected Alternatives to Drainage / Design Team Members.
- ❑ Provide Selected Alternatives to Team Members for Detailed Evaluation.
- ❑ Proceed to evaluate ponds for NEPA compliance and inclusion into the PD&E Study.

FACTOR	DESCRIPTION / ISSUES TO CONISDER	COST $	WEIGHTED VALUE
Brief Description of Alternative	Provide a detailed description of the pond site.		N/A
Parcel Number	Identify the Parcel Number in conjunction with the Right of Way office.		N/A
Parcel Size (Acres)	Provide the total area for the required R/W acquisition. The total area is to include the area to meet the water quality / quantity storage requirements as well as maintenance berm width, slopes, perimeter drainage / conveyance ditch area and maintenance access drive for access to pond sites.		N/A
Right-of-Way (Zoning)	Describe the Right-of-Way implications of the parcel in question. For example the parcel could be currently under a proposed plan for improvement (Rezoning Request); the site may currently be located on a commercial site with an active business. Consideration should also be given to existing and proposed zoning.		No Zoning Problems with Site add 5 points per acre. If there are potential zoning issues add zero points.
Land Use	Identify the current and/or proposed land use, which could affect the acquisition costs of the parcel. For example a partial R/W take of a property could have a significant impact on the remainders use.		N/A, but costs requirements will need to be added to the overall site costs and weighted value applied accordingly.
Right-of-Way Costs	Identify Right-of-Way Costs associated with the acquisition of the parcel.		N/A, but costs requirements will need to be added to the overall site costs and weighted value applied accordingly.
Drainage Considerations	Include a description of the system and corresponding outfall location and parameters. Considerations should be given to such items as whether or not the pond is located in the center of the basin; in the low area within the basin; adjacent to the outfall location, and piping needs / costs, etc. Also consider site elevations and the corresponding need to elevate (build-up) the perimeter berm.		Meets FDOT's needs – points TBD by Team Meets most needs –points TBD by Team Other issues between sites will be dependent on costs associated with the construction of a facility at each particular site.
Flood Zone FEMA	Identify the Flood Zone and associated impacts / benefits of constructing the pond within the respective flood zone. The perimeter berm will affect flood zone storage, while the pond will enhance said storage. When Right-of-way is acquired within a low lying area the construction of the roadway template may affect adjacent properties ability to utilize that area for storage. An evaluation of the floodplain impacts is in order.		Meets FDOT's needs – points TBD by Team Meets most needs –points TBD by Team Other issues between sites will be dependent on the benefit to the floodplain associated with the construction of a facility at each particular site.
Contamination - Hazardous Materials	Identify if the parcel is contaminated. This will limit the ability to utilize the site. Consideration of this parcel must include the costs associated with the clean-up of the site.		N/A, but additional costs requirements will need to be added to the overall site costs and weighted value applied accordingly.
Utilities	Identification of existing and proposed facilities which are located within or adjacent to the parcel. The cost of relocating these facilities must be included in the consideration of the parcel in question.		N/A, but additional costs requirements will need to be added to the overall site costs and weighted value applied accordingly.

Threatened & Endangered Species (TES) and associated Mitigation Costs	Identify TES as Threatened, Endangered, or Significant. Identify the anticipated mitigation costs.		N/A, but additional costs requirements will need to be added to the overall site costs and weighted value applied accordingly.
Noise	Identify noise impacts and corresponding noise abatement which may impact the location and placement of pond sites.		N/A, but additional costs requirements will need to be added to the overall site costs and weighted value applied accordingly.
Wetlands / Protected Uplands and associated Mitigation Costs	High values indicate known habitat or historic presence such as Rookery Area. Medium values may be indicative of relatively undisturbed, natural, or stable habitat types. Low values may indicate disturbed low habitats. Identify the cost of mitigating for these impacts.		N/A, but additional costs requirements will need to be added to the overall site costs and weighted value applied accordingly.
Cultural Resources Involvement and associated Costs	Identify the presence of cultural resources including archeological and historical resources which could affect the suitability of the site in question and associated costs.		N/A, but additional costs requirements will need to be added to the overall site costs and weighted value applied accordingly.
Section 4(f)	Identify the presence of 4F properties which could affect the suitability of the site in question and associated costs.		N/A, but additional costs requirements will need to be added to the overall site costs and weighted value applied accordingly.
Public Wellfield	The proximity to a wellfield site will have a direct impact on the type of drainage facility which can be placed on the corresponding parcel.		N/A
Construction	Identify access for construction and associated impacts which may affect construction costs, such as amount of drainage piping required to reach pond.		No set weighted value is applicable for this item; however requirements for items identified may have a direct impact on the construction cost need. This needs to be considered and added to the overall costs associated with utilizing this site.
Maintenance	Identify the costs of maintaining a facility at this parcel location. Potential for Maintenance Agreements with others. Consider access costs to the pond site.		In conjunction with District Maintenance staff needs to establish yearly maintenance costs per acre of pond area. This cost would be looked at as a yearly cost say over a twenty year period and brought to present value for inclusion in the overall cost item below. Establish a cost for: Wet Detention Maint. Cost per Acre $_____ Dry Pond Maint. Cost per Acre $_____ Dry Linear Swale Cost per Acre $_____ Offsite Pond Maintenance by others $ 0.00 At the commencement of establishing each pond siting study the PD&E Project Manager shall check with the Maintenance Office for the most current maintenance costs.

Aesthetics	Identify the need for landscape buffers, fencing, variable pond shapes, etc.		No set weighted value is applicable for this item, however requirements for fencing, landscaping, littoral shelves, etc. which have a direct impact on the area required to physically set the pond needs to be considered. This in combination with the actual costs associated with the placement of plants, fencing etc. will need to be added to the overall costs of utilizing the specific site.
Public Opinion / Adjacent Residency Concerns	Identify possible impacts to current or proposed land use (i.e. Schools may dedicate a dry pond versus a wet pond).		N/A, but can affect the type of system selected for a specific site.
Other	Joint Use potential.		If the ability to utilize joint use ponds is available assume a weighted value of 10 per acre-ft of available storage. Otherwise utilize 0 for this value.
Total Applicable Costs	Identify the total cost of the parcel including cost identified from all issues above.		Overall costs vary significantly between rural and urban locations. This value should be utilized when comparing final costs between alternative pond locations. Engineering Judgement will need to be considered and an acceptable cost modifier applied as agreed to be the team members. Utilize 1 point per 5% differential in cost between alternative sites.
Comments, Advantages, Disadvantages, etc.	Include a detailed description of the Advantages and Disadvantages associated with the parcel in question.		N/A

Step 5 Detailed Evaluation of Alternatives

Repeat Step 3 on the selected alternatives. Each Office should provide a detailed evaluation of these alternatives with regards to their issues.

- ❑ Team Members Conduct Field Reviews as Deemed Necessary. The extent of the field review should include the verification of all NEPA Impacts to assess the viability of a potential pond site. At a minimum a Level I Assessment would be appropriate. A Level I assessment includes the following:
    - o Desktop Review Environmental Evaluation of Corridor utilizing D-4 PD&E Study database, available GIS layers from the Florida Geographic Data Library and other sources.
    - o Review should include:
        - ▪ Natural Resources - Threatened & Endangered Species and Wetlands
        - ▪ Socio-cultural Resources (Historical and Archeological sites and 4f properties)
        - ▪ Physical Impacts (Including Noise, Contamination, Air Quality, etc.)

- ❑ Submit Alternatives for Inclusion in Public Workshop – All alternatives identified in Step 4 will be shown with the exceptions of any alternative eliminated by this detailed evaluation step.

Step 6 Team Meeting to Summarize Impacts and Analysis

During the PD&E Public Involvement process, reasonable efforts must be made to inform the public/affected property owners of the potential impacts to the community/properties of the proposed improvements. As such, properties identified for potential acquisition for retention/detention ponds should be presented to the public in the same manner as acquisition for geometric requirements. This information would assist in informing the public of the entire magnitude of the right-of-way needs. Although the proposed right-of-way acquisition is displayed, the public would be clearly informed that all proposals are preliminary, and subject to change, as the project develops.

- ❑ Review Comments Generated from Public Workshop
- ❑ Update Weighted Matrix of Alternatives Evaluated (See Step 4)
- ❑ Assign Refinement of Selected Alternatives to Drainage / Design Team Members
- ❑ Refine Alternatives for Final Evaluation
- ❑ Provide Updated Alternatives to Team Members for Re-Evaluation
- ❑ Finalize Weighted Matrix of Alternative Pond Site (See Step 4)

Note: A significant consideration comes with when to stop the evaluation, and what type of report (i.e. depth) should be written. For example: 1) Projects with a significant time lag from PD&E to Design may go on the shelf with as many alternatives as possible and a very preliminary matrix; versus 2) Projects going straight from PD&E to Design will have a great deal of detail and a limited number of pond sites established.

This will need to be identified at the time the scope of services is established. In some cases although a project has a potential for a significant time laps between the PD&E Study and Construction stage; it may prove beneficial to conduct a more targeted pond siting approach and proceed with advanced right-of-way acquisition of those parcels. This approach is prudent particularly with a rapidly developing corridor. Another consideration for rapidly developing corridors is to acquire joint use ponds where the Department can utilize a developments internal stormwater management system to address the portion of the roadway fronting the development. This works best when the adjacent property owner is developing a new site and the requirement can become part of the properties development order.

Step 7 Draft Pond Siting Report

- ❑ Prepare Document Containing Analyses and Evaluation Matrix
- ❑ Submit Draft Report (See Sample Table of Contents) for Review and Comment by Team Members
- ❑ Should it be in the Department's interest to pursue "Advanced R/W Acquisition"; the R/W Office should be notified prior to completion of the Draft Pond Siting Report for coordination with the property owners and proper public notification.

Step 8 Team Meeting to Make / Review Final Recommendations Prior to Public Hearing

- ❑ Update Report to Address Team Members Comments
- ❑ Team Members to make Final Matrix Recommendations
- ❑ Submit Draft Pond Siting Report for Inclusion into Public Hearing

Step 9 Complete Pond Siting Report

- ❑ Review Comments Generated from Public Hearing
- ❑ Convene Team to Evaluate Public Comments if Deemed Necessary
- ❑ Rank Recommended and Alternative Pond Sites
- ❑ Finalize Pond Siting Report and Recommendations Based on Team Evaluation
- ❑ Incorporate findings into NEPA documents (Project Design Summary Report (PDSR), Environmental Assessment (EA) / Finding of No Significant Impact (FONSI) and/or Environmental Impact Statement (EIS)).

Step 10 Hand-off Meeting between PD&E and Design

Prior to completion of the Design Scope of Services a coordination meeting is to be held between the PD&E Project Manager and the District Consultant Management Office or In-house PM to review the Pond Siting Report and the corresponding Final Design Scope of Services. Activities during this meeting will include:

- ❑ Review Project's Scope of Services as it Relates to Drainage and Pond Sites
- ❑ Estimate Required Scope of Services for the Pond Site Re-Evaluation and Additional Data Required
    - o Survey
    - o Geotechnical
- ❑ Identify need to process a Re-Evaluation with FHWA for NEPA compliance of the project. This generally occurs if pond sites will require changes or if a project has been on the shelf for some time.

At the commencement of the final design phase a hand-off meeting will be held between the PD&E Project Manager and the Final Design Project Manager to review the Pond Siting Report and Transfer all information pertaining to the project to the design team.

INITIAL ENGINEERING PHASE

Step 11 Re-Evaluation of Final Pond Siting Recommendations

When the project reaches the initial engineering stage, the roadway design project manager (either in-house or consultant) will initiate a re-evaluation of the existing pond siting report. The roadway design project manager will assemble the original pond siting team (The PD&E Engineer will play a very limited role at this stage) with as many original members as possible. A comparable replacement should be made for any original team member who is unavailable. The team will be responsible for providing engineering data and input about all issues that have changed since the original pond siting report was produced. If necessary, the team will then modify the pond siting report to create the "official" pond siting report. The roadway design project manager will then send to right-of-way mapping the preferred pond sites as specified in the pond siting report. Specific activities which are to be incorporated into this step include:

- ❑ Conducting a Field Review of Recommended Pond Sites to insure compliance with the intent of the design. In addition each pond site should be reviewed for changes which have occurred since the original pond siting report.
- ❑ Re-Evaluation documentation of the PD&E Study is to be developed and submitted to FHWA for approval. Please not that re-evaluation of the pond siting report, is not the same as re-evaluation of the PD&E Study. In final design the pond sites are re-evaluated to ensure project requirements and compliance with NEPA requirements. Should pond locations shift or significant changes be required the updated Pond Siting Report would be included as part of the re-evaluation documents submitted to FHWA for compliance with NEPA.
- ❑ Assign Update of Preliminary Drainage Report to Drainage / Design Team Members
- ❑ Provide Summary of Relevant Changes to Team Members
- ❑ The Team members are to receive plans during all formal phase reviews.

Note: If ponds or any other drainage system which required the acquisition of right-of-way was included in the PD&E Study the project can go into preliminary engineering immediately upon completion of the PD&E Study. If pond sites change or are added after Location Design Concept Acceptance (LDCA), the Right-of-way phase of the project cannot commence until the Re-Evaluation for FHWA approval is complete for new pond sites.

Step 12 Meeting to Update Alternatives and Recommendations

- ❑ Re-convene Team to Review Recommendations and Changes
- ❑ Identify Sites, which have Significant Changes Requiring Re-Ranking of Recommendations
- ❑ Identify Pond Sites Alternatives for Re-Evaluation by Team Members
- ❑ Identify Additional Design Information, Survey and Geotechnical Data Required for Final Re-Evaluation of Pond Sites
- ❑ Refine Pond Site Layouts with Real Site Geometrics for the Viable Recommended Sites and Identified Alternatives

Step 13 Detailed Re-Evaluation of Pond Sites

- ❑ Re-Evaluate Remaining Viable Recommended Sites and Identified Alternate Sites
    - o Potential Environmental Impacts and Permit Issues (By EMO with Drainage support on issues).
    - o Potential Relocations (By R/W Office).
    - o Potential Development Issues (By R/W Office – Land Planner and Drainage Office).
    - o Potential Construction Issues (By Construction Office).
    - o Potential Maintenance Issues (By Maintenance Office).
    - o Potential R/W Costs and Impacts (By R/W Office).
    - o Potential Relocation Costs (By R/W Office).
    - o Property Acquisition Costs (By R/W Office).
    - o Potential Business Damage Costs (By R/W Office).
    - o Potential Demolition and Remediation Costs (By R/W Office).
    - o Potential Social Impacts (By PL/EM and Drainage Office).
- ❑ Team Members Conduct Field Reviews as Deemed Necessary
- ❑ Finalize Pond Site Layout with Real Site Geometrics for the Viable Recommended Sites and Identified Alternatives

Step 14 Prepare Re-Evaluation of Sites and Seek FHWA Approval

- ❑ Convene Team to Review Findings, Update the Matrix as Necessary and Recommend Final Pond Sites for Project.
- ❑ Finalize Re-Evaluation Report and Recommendations Based on Team Evaluation.
- ❑ Send R/W requirements to R/W Mapping.
- ❑ Seek FHWA approval for LDCA or Re-Evaluation. FHWA needs to approve the Re-Evaluation prior to the Department opening the any funding phase (Design, R/W, etc.)

FLOW CHART OF PROCESS

SEE ATTACHED FILE FOR REFERENCE

CONCERNS / GUIDANCE FOR RURAL VERSUS URBAN POND SITING

General rule of thumb, one pond per mile of corridor.

ISSUE	RURUAL PONDS	URBAN PONDS
Conveyance system	In the design of rural pond sites and associated roadway the use of swales for conveyance and storage should be maximized to control costs	Minimize the length and size of the stormwater conveyance system (Trunk line) required to convey the runoff to the pond.
Use of Fencing	If wet ponds have 1:4 slopes or flatter a perimeter fence is not mandatory.	In an urban environment wet ponds will require fencing.
Access to pond site for maintenance	Place as close to the outfall as possible.	Ponds are to be set behind commercial properties to avoid impacting high property value frontage along the highway. This will require obtaining the necessary access easements.
Joint Use Ponds	Wet ponds cannot be utilized for recreational purposes such as swimming, fishing, etc. However the can be utilized in Golf Courses and other recreational facilities which prohibit swimming, fishing, etc.	When ponds sites are utilized in conjunction with developments, the require pond areas may need to be larger. For example when utilizing a pond which is being established for residential zoning a littoral shelf at a fairly flat slope is required. This will increase the required pond area.
Off-site Flow contirbution	Rural ponds can more easily allow for the bypass of offsite runoff through the use of conveyance ditches and regional cross-drains.	Construction within an urban section may not allow for bypass of offsite water. This requires larger ponds. A cost benefit ratio of larger ponds versus the use of a separate by-pass system may be needed.
Outfall	Rural locations have a greater possibility of having ponds placed near wetlands. The tail water condition for the pond can be affected by the staging in these wetlands and must be considered...	Potential for landlock or the need to bleeddown through another drainage collection system to reach ultimate outfall.
Utilities		Conflicts more prevalent.
R/W Availability	Land more available, less restrictions on location of potential pond sites. However, wetland areas must be avoided. In some cases ponds can be located adjacent to wetland areas on uplands. When a pond is located adjacent to a wetland the potential for draw down of the wetland exists. This needs to be verified (See SFWMD Manual)	Restricted to available vacant locations size impacts to existing businesses or residential properties are very costly. This requires more in-depth cost analysis.
Overtopping	If a rural pond overtops the impacts are not as critical. However freeboard requirements must still be met.	Berm must be set high enough to contain runoff to avoid overtopping.

Optional Stormwater Management Techniques for Urban Areas: In highly urbanized areas traditional treatment may not meet the needs of a community. Other methods often times need to be considered such as Compensatory Treatment.

Compensatory treatment is a method acceptable to many agencies in cases where it is impractical to construct a stormwater management system to capture runoff from a portion of the project due to extreme physical site condition and constraints or nominal right-of-way availability. The criterion for this treatment is that the alternate treatment site be located within the principal drainage basin of the project. This alternative will require close coordination with the respective stormwater management agency and a collaborative pre-application meeting with the agency is strongly recommended. There are two methods that have been successfully utilized to compensate for lack of treatment. The first method is providing **over-treatment** and the second is **off-site compensation.**

The **over-treatment method** consists of treating the runoff from the project area that can be captured and conveyed to a proposed pond to a higher level than the rule requires to compensate for the portions of the project corridor that are not receiving treatment due to physical constraints. There are specific pollutant removal efficiency goals that must be met if this method is utilized. These are outlined in the stormwater management agencies criteria. This method may be utilized by taking several basins which are hydraulically connected within the project corridor that fall within the same watershed and suing a regional approach to improving the water quality for that watershed.

For the **off-site compensation method,** an existing development or local road that is currently not treated will be treated to compensate for untreated portions of the proposed project corridor. For this method the area that is going to be treated has to have a similar or higher pollutant loading than the portion of the project corridor that is going to remain untreated due to physical constraints. The off-site areas must also fall within the same watershed as the proposed project corridor.

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EXHIBITS

Exhibit A- Location Map
Exhibit B- Existing Roadway Section
Exhibit C- Proposed Roadway Typical Section
Exhibit D- Rainfall Data
Exhibit E- Typical Sections for Stormwater Treatment Ponds
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APPENDICES

Appendix A- Pond Siting Plan
Appendix B- Geotechnical Data
a. Excerpts from Draft Preliminary Report of Geotechnical Exploration; S. R. 50 from Hancock Road to Orange County Line, Lake County, Florida by Law Engineering and Environmental Services, Inc. October 2003.
b. Excerpts from Draft Preliminary Report of Geotechnical Exploration; S. R. 50 from Lake County Line to East Turnpike Ramps, Orange County, Florida by Law Engineering and Environmental Services, Inc. October 2003.
c. Excerpts from the PD&E Geotechnical Investigation
d. Excerpts from Soil Survey of Lake County, Florida
e. Excerpts from Soil Survey of Orange County, Florida
Appendix C- Rainfall
Appendix D- Floodplain Data
Appendix E- Pond Siting Calculations
a. Water Quality and Attenuation
b. Pond Area Requirements (Proposed Locations)
c. Pond Area Requirements (Alternative Locations)
d. Recovery Time (Preliminary Evaluation)
Appendix F- Property Maps and Data
Appendix G- Excerpts from Development Permits
Appendix H- Project Correspondence

PROPOSED CHANGES TO PD&E SCOPE OF SERVICES

2.22 Drainage Analysis and Pond Siting Report

The CONSULTANT shall perform preliminary drainage design in order to determine potential outfall locations and preliminary sizes (volume and area) of required detention and/or retention facilities for storm water treatment or attenuation. The location and size of potential detention/retention areas will be determined for all viable alternate alignments.

The CONSULTANT shall prepare a "Pond Siting Report" for the project in accordance to the Department's Stormwater Facilities Handbook **and the FDOT District 4 Pond Siting Procedures.**

PROPOSED CHANGES TO ROADWAY FINAL DESIGN SCOPE OF SERVICES

6.0 DRAINAGE ANALYSIS: The CONSULTANT shall analyze and document Drainage Tasks in accordance with all applicable manuals, guidelines, standards, handbooks, procedures, and current design memorandums.

The CONSULTANT shall be responsible for designing a drainage and stormwater management system. All design work shall comply with the requirements of the appropriate regulatory agencies and the DEPARTMENT's Drainage Manual. The CONSULTANT shall coordinate fully with the appropriate permitting agencies and the DEPARTMENT's staff. All activities and submittals should be coordinated through the DEPARTMENT's Project Manager. The work will include the engineering analyses for any or all of the following:

6.1 Determine Base Clearance Water Elevation

Analyze, determine, and document high water elevations which will be used to set roadway profile grade. Determine surface water elevations at cross drains, floodplains, outfalls and adjacent stormwater ponds. Determine groundwater elevations at intervals between the above-mentioned surface waters.

6.2 Pond Siting Analysis and Report

Evaluate pond sites using a preliminary hydrologic analysis. Document the results and coordination for all of the project's pond site analyses. The Drainage Manual and District 4 Pond Siting Procedures provide specific documentation requirements.

6.3 Design of Cross Drains

Analyze the hydraulic design of cross drains. Check existing cross drains to determine if they are structurally sound and can be extended. Document the design as required. Determine and provide flood data as required.

6.4 Design of Roadway Ditches

Design roadway conveyance ditches. This includes determining ditch cross sections, grades, selecting suitable channel lining, designing the side drain pipes, and documentation.

6.5 Design of Outfalls

Analyze and document the design of ditch or piped outfalls. (Pond outlet structure included in task 6.6)

6.6 Design of Stormwater Management Facility (Offsite Pond)

Design stormwater management facilities to meet requirements for stormwater quality treatment and attenuation. Develop proposed pond layout (shape, contours, slopes, etc.), perform routing calculations, and design the outlet control structure.

6.7 Design of Stormwater Management Facility (Roadside Ditch as Linear Pond)

Design stormwater management facilities to meet requirements for stormwater quality treatment and attenuation. Develop proposed pond layout (shape, contours, slopes, etc.), perform routing calculations, and design the outlet control structure.

6.8 Design of Flood Plain Compensation Area

Determine flood plain encroachments, coordinate with regulatory agencies, and develop proposed compensation area layout (shape, contours, slopes, etc.). Document the design following the requirements of the regulatory agency.

6.9 Design of Storm Drains

Develop a "working drainage map"; determine runoff, inlet locations, and spread. Calculate hydraulic losses (friction, utility conflict and, if necessary, minor losses). Determine Design Tailwater and, if necessary, outlet scour protection.

6.10 Optional Culvert Material

Determine acceptable options for pipe materials.

6.11 French Drain Design

Design French Drain Systems to provide stormwater treatment and attenuation. Identify location for percolation tests and review these, determine the size and length of French Drains, design the control structure/weir, and model the system of inlets, conveyances, French Drains, and other outfalls using a routing program such as ICPR.

6.12 Drainage Wells

Design the discharge into deep wells to comply with regulatory requirements. Identify the location of the well, design the control structure/weir, and model the system using a routing program such as ICPR.

6.13 Drainage Design Documentation Report

Compile drainage design documentation into report format. Include documentation for all the drainage design tasks and associated meetings and decisions, except the Pond Siting Analysis Report and Bridge Hydraulics Report.

6.14 Bridge Hydraulic Report

Calculate hydrology, hydraulics, scour, and deck drainage. Prepare report and the information for the Bridge Hydraulics Recommendation Sheet.

6.15 Temporary Drainage Analysis

Evaluate and address drainage to adequately drain the road and maintain existing offsite drainage during all construction phases. Provide documentation.

6.16 Cost Estimate

6.17 Technical Special Provisions

6.18 Field Reviews

6.19 Technical Meetings

6.20 Quality Assurance/Quality Control

6.21 Independent Peer Review

6.22 Supervision

STAFF HOUR RANGES FOR POND SITING

The Department has procedures in place which establish guidance for the estimation of staff hours associated with Design and PD&E projects. The ranges reflected in those guidelines a general in nature and should consider the complexities of the specific project being scoped. The following is offered as points of consideration in establishing staff hours for any given project. Predominately what is identified below is the effort required for the Drainage Engineers Technical Work. Additional Guidance is provided for coordination aspects between disciplines.

- ❑ Step 1 Collect Initial Data / Drainage Kick-off Meeting / Conceptual Analysis
    - o Data Collection – 6 to 12 hrs per drainage basin. For rural projects assume at least one drainage basin per mile of roadway. Urban drainage systems will have more basins. This time is utilized to gather existing plans and review of prior studies which could affect the proposed design. In addition to this time, hours should be provided for field reviews by the drainage engineer to assess the existing conditions. These hours are based on the complexity of project, but will range between 8 to 12 hours per mile.
    - o Drainage Office Coordination Kick-off Meeting – 4 hrs for preparation and 4 to 8 hrs per person attending meeting based on distance traveled to District. The meeting time includes preparation of meeting notes documenting the decisions made during the meeting.
    - o Conceptual Drainage Analysis – With any drainage design the establishment of a good pre-development drainage model allows for ease of design and decision making. Preliminary computations addressing these requirements would consist of 8 to 12 hrs per drainage basin.
    - o Seasonal High Ground Water Determination – 8 to 16 hrs for documentation and coordination with Geotechnical Engineer.
    - o Coordination for Drainage Issues and set-up of Pond Siting Team - 8 to 16 hrs.
- ❑ Step 2 Pond Siting Kick-off Meeting
    - o Pond Siting Kick-off Meeting – 6 hrs for preparation and 4 to 8 hrs per person attending meeting based on distance traveled to District. The meeting time includes preparation of meeting notes documenting the decisions made during the meeting.
- ❑ Step 3 Evaluation of Conceptual Options
    - o During this phase each team member evaluates the various issues associated with their respective area of practice and submits information to the Drainage Engineer for review. It is assumed that the Drainage Engineer will require 6 to 8 hrs per pond site to evaluate information received from the other team members. Additional hydraulic analysis may be required should pond sites change and some additional hours should be allocated for this as a contingency item. Hours associated with the other disciplines work should be added to the respective items based on the complexity of the work.
- ❑ Step 4 Team Meeting to Screen Alternatives
    - o Screening Meeting – 6 hrs for preparation and 4 to 8 hrs per person attending meeting based on distance traveled to District. The meeting time includes preparation of meeting notes documenting the decisions made during the meeting.

- ❑ Step 5 Detailed Evaluation of Alternatives

  - During this phase each team member evaluates the various issues associated with their respective area of practice and submits information to the Drainage Engineer for review. It is assumed that the Drainage Engineer will require 12 to 24 hrs per pond site to evaluate information received from the other team members and Post Development ICPR hydraulic Analysis. Additional hydraulic analysis may be required should pond sites change and some additional hours should be allocated for this as a contingency item. Hours associated with the other disciplines work should be added to the respective items based on the complexity of the work. Additional hours for field reviews may need to be considered.

- ❑ Step 6 Team Meeting to Summarize Impacts and Analysis

  - Screening Meeting – 16 hrs for preparation and 4 to 8 hrs per person attending meeting based on distance traveled to District. The meeting time includes preparation of meeting notes documenting the decisions made during the meeting.

- ❑ Step 7 Draft Pond Siting Report

  - Preparation of Draft Pond Siting Report – 48 hrs for compilation and preparation of Report.

- ❑ Step 8 Team Meeting to Make Final Recommendations

  - Screening Meeting – 12 hrs for preparation and 4 to 8 hrs per person attending meeting based on distance traveled to District. The meeting time includes preparation of meeting notes documenting the decisions made during the meeting, plus coordination time with team members for comments on matrix. This could be handled through a meeting or e-mail correspondence.

- ❑ Step 9 Complete Pond Siting Report

  - Coordination Meeting – 12 hrs for preparation and 4 to 8 hrs per person attending meeting based on distance traveled to District. The meeting time includes preparation of meeting notes documenting the decisions made during the meeting.
  - Preparation of Final Pond Siting Report – 40 hrs for compilation and preparation of Report.

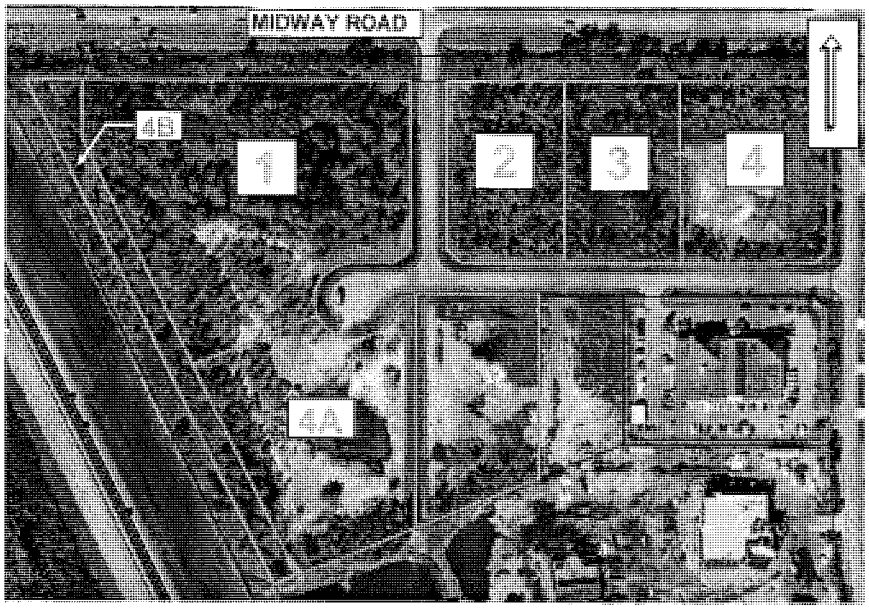
- ❑ Step 10 Hand-off Meeting between PD&E and Design

  - Hand-off Meeting – 8 hrs for preparation and 4 to 8 hrs per person attending meeting based on distance traveled to District. The meeting time includes preparation of meeting notes documenting the decisions made during the meeting.

- ❑ Steps 11 through 14 Initial Engineering Phase

  - Staff hours for these phases will be dependent on the complexity of issues required to be addressed and the extent of what was done in the PD&E phase. Utilize above guidance in establishing hours.

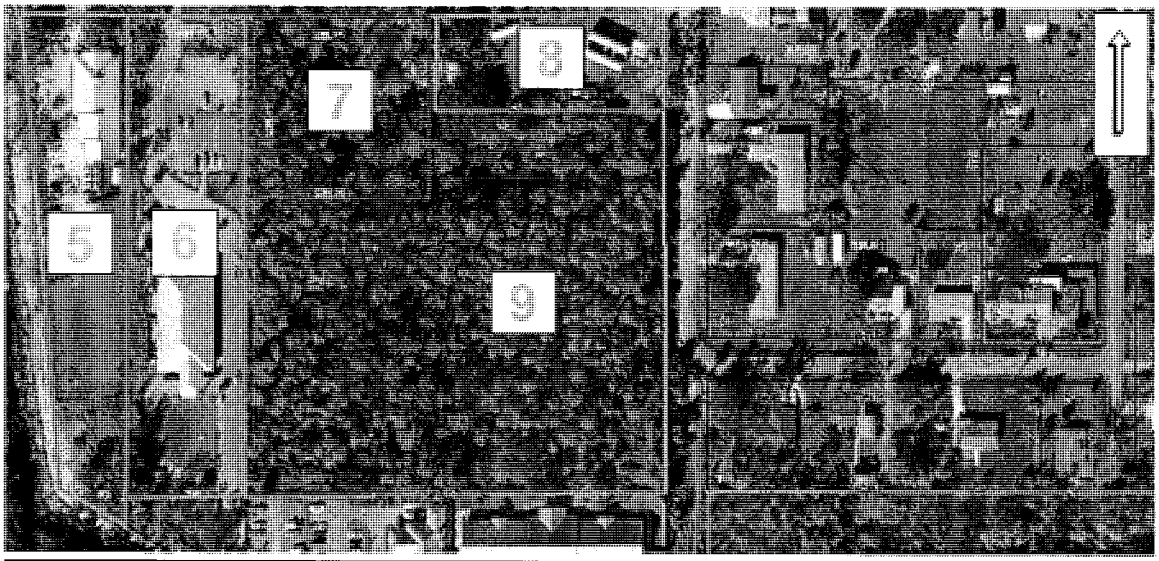
As can be seen above the Pond Siting process encompasses a significant amount of coordination between disciplines. The amount of work effort can vary significantly based on issues and project location. The above is provided as a guideline only with engineering judgment required to estimate the proper amount of time to do a good job. Remember that the construction of ponds can be costly; therefore the pond siting process should not be taken lightly!



#	Parcel ID#	Owner	Area (acres)	Comments
1	3301-701-0010-000-8	Flex Site LLC	4.82	
2	3301-701-0009-000-8	Financial Site LLC	1.53	
3	3301-701-0008-000-1	Retail Shop Site LLC	1.5	
4	3301-701-0007-000-4	Corner Store Site LLC	1.91	
4A	3301-701-0003-000-6	Showroom Site LLC	2.84	
4B	3301-701-0001-000-2	Midway Commerce Center POA Inc	0.99	

Parcel Boundary

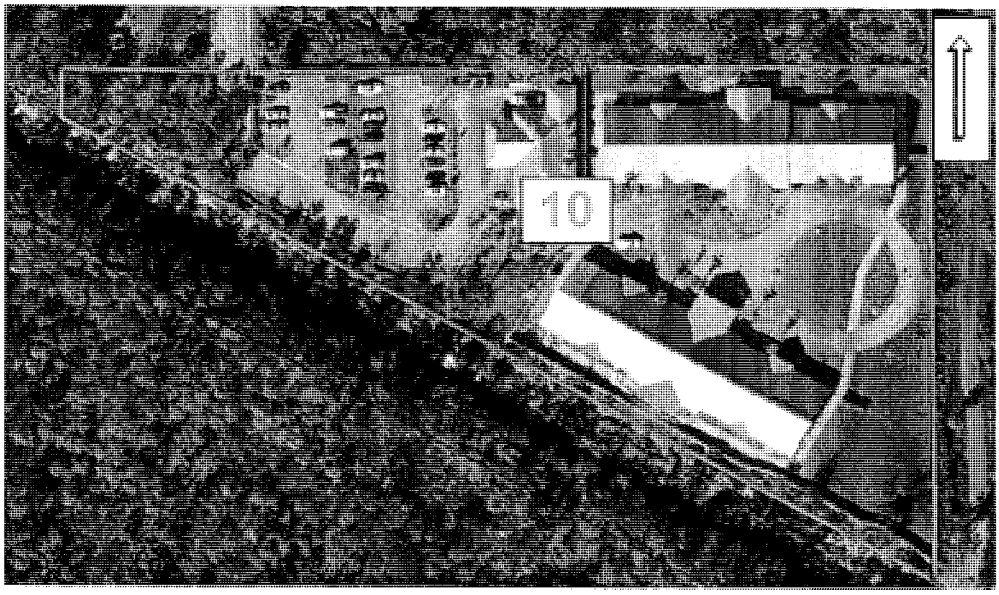
Reviewer: _____ **Discipline:** _____



#	Parcel ID#	Owner	Area (acres)	Comments
5	3403-502-0193-000-6	Exchange Cl Cen Prev Chd Abuse	1.37	
6	3403-502-0192-000-9	Florida Center for Recovery In	1.72	
7	3403-502-0191-000-2	Ronald J Buchmeyer Denise K Buchmeyer	1	
8	3403-502-0189-000-5	Caroline J Hunt	0.66	
9	3403-502-0190-000-5	DJS Enterprises LLC	5.15	

Parcel Boundary
Parcel Boundary

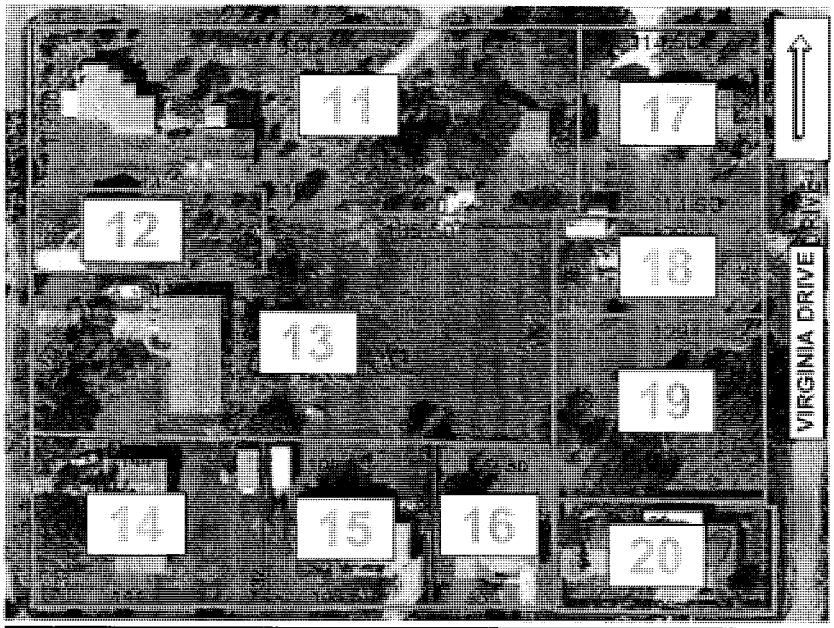
Reviewer: _____ **Discipline:** _____



#	Parcel ID#	Owner	Area (acres)	Comments
10	3403-502-0199-000-8	Florida Center for Recovery In	10.45	

Parcel Boundary

Reviewer: _____ **Discipline:** _____

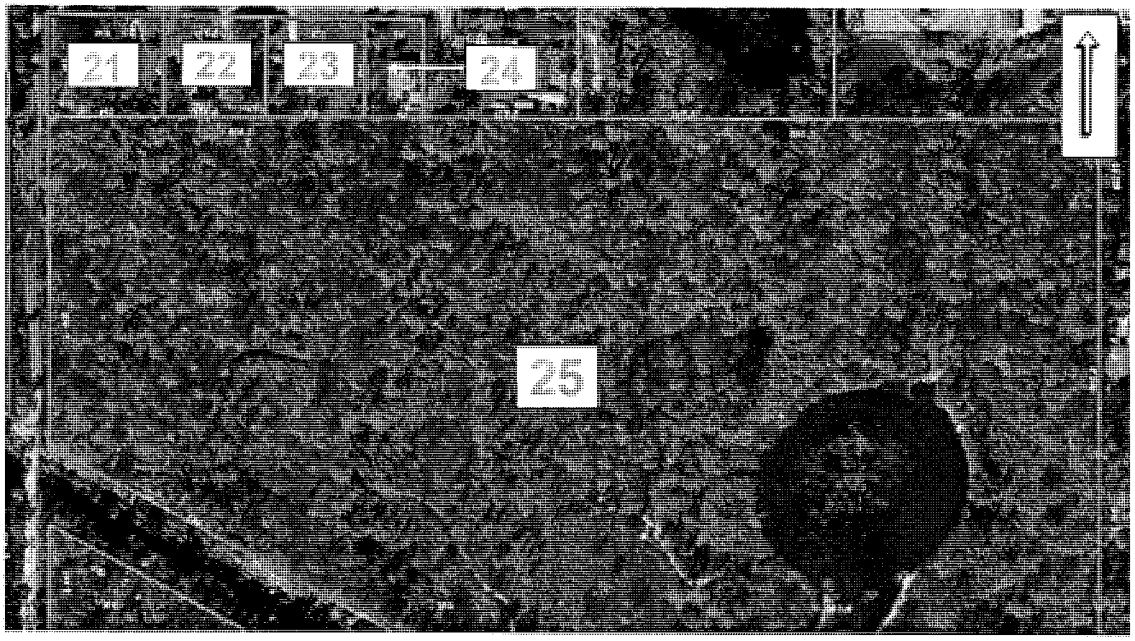


#	Parcel ID#	Owner	Area (acres)	Comments
11	3403-502-0175-000-4	Billie R Nease Ellen M Nease	0.39	
12	3403-502-0178-000-5	Sidney P Harless Mary F Harless	0.22	
13	3403-502-0178-010-8	Larry G Hopkins	1.2	
14	3403-502-0180-000-2	Robert P Harless Cary L Harless	0.44	
15	3403-502-0181-000-9	Tyler A Stone	0.32	
16	3403-502-0181-010-2	Mary L King	0.24	
17	3403-502-0174-000-7	Raymond L Harless Pamela G Harless	0.35	
18	3403-502-0179-000-2	Raymond L Harless Pamela G Harless	0.22	
19	3403-502-0182-000-6	Raymond L Harless Pamela G Harless	0.44	
20	3403-502-0183-000-3	Douglas M Parrett Ursula A Parrett	0.3	

Parcel Boundary

Parcel Boundary

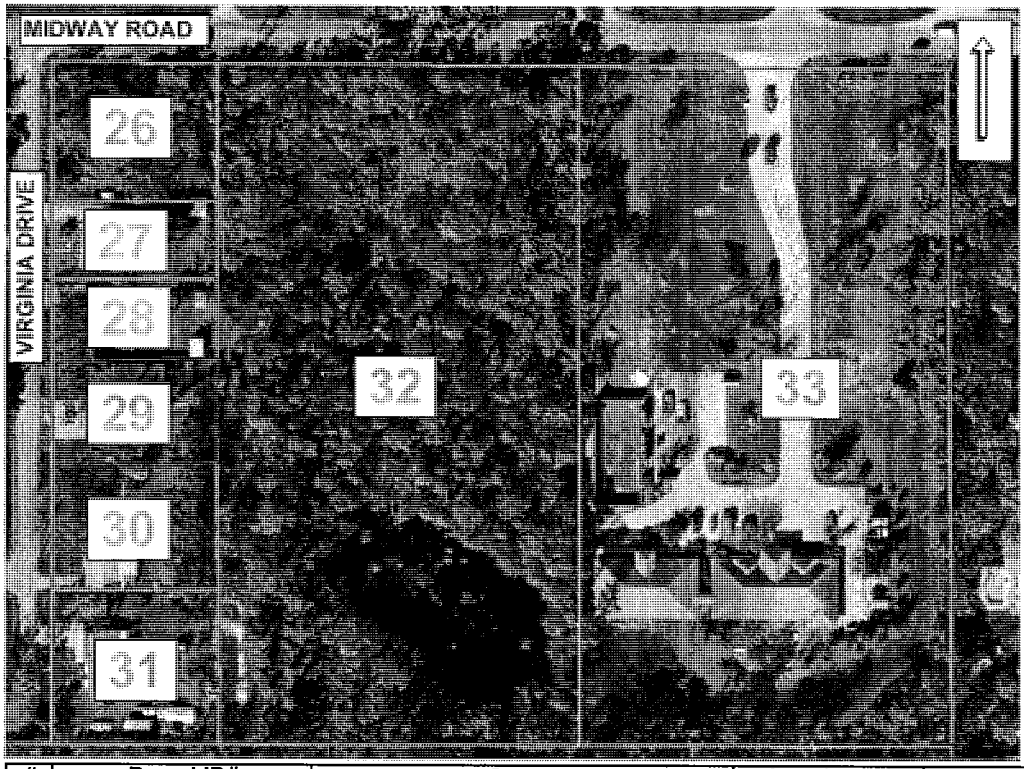
Reviewer: _____ **Discipline:** _____



#	Parcel ID#	Owner	Area (acres)	Comments
21	3403-502-0184-000-0	Kevin Lindstadt Shirley Lindstadt	0.42	
22	3403-502-0185-000-7	Mary H Rogers (LF EST) TR/Mary H Rogers Trust	0.38	
23	3403-502-0187-000-1	Roberto Rivas Rebecca J Rivas	0.36	
24	3403-502-0188-000-8	Elsie H Schepf Franklin C Roche	0.22	
25	3403-502-0200-000-9	Centerline Homes at Ravinia LL	55.82	

Parcel Boundary

Reviewer: _____ **Discipline:** _____

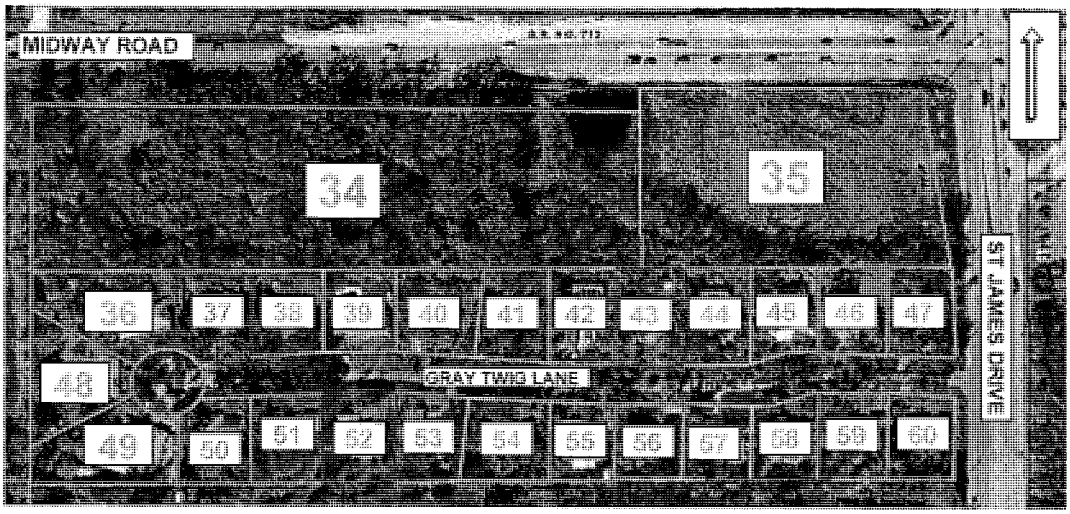


#	Parcel ID#	Owner	Area (acres)	Comments
26	3403-502-0168-000-2	St Lucie County	0.38	
27	3403-502-0169-000-9	Randy S Combs Beverly J Combs	0.25	
28	3403-502-0170-000-9	Timothy R Harless	0.25	
29	3403-502-0171-000-6	Richard Willis Renee Willis	0.33	

#	Parcel ID#	Owner	Area (acres)	Comments
30	3403-502-0172-000-3	Robert W Lachar	0.4	
31	3403-502-0173-000-0	Jackie K Perry Ronna D Perry	0.46	
32	3403-502-0166-000-8	Centerline Homes at Ravinia LL	4.36	
33	3405-421-0001-000-2	Phillip M Drawdy Troy W Drawdy	4.69	

Parcel Boundary

Reviewer: _____ **Discipline:** _____

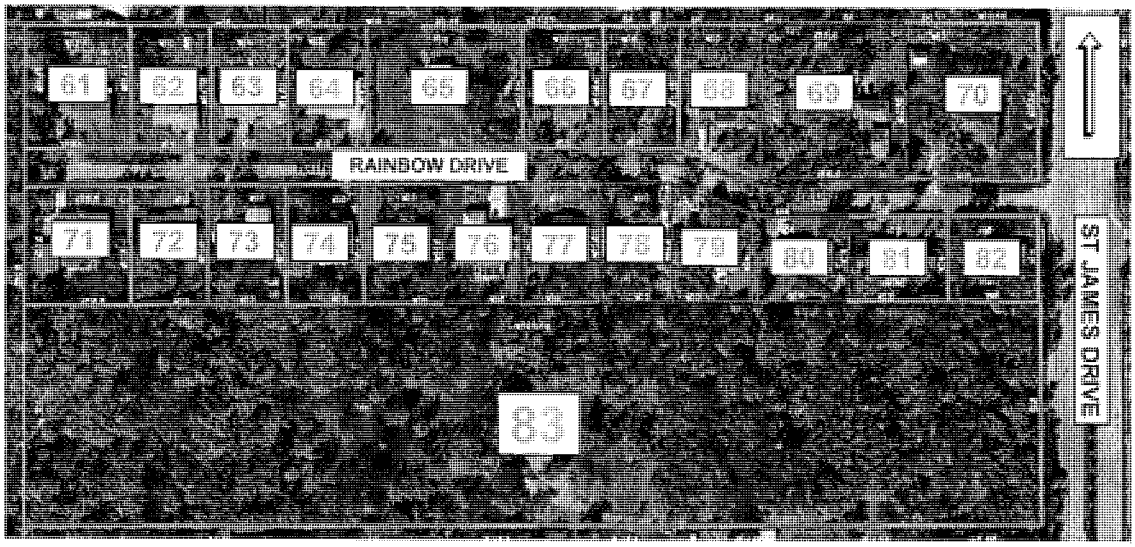


#	Parcel ID#	Owner	Area (acres)	Comments
34	3405-411-0001-000-1	Ben D Emerson Kenneth A Jackson	4.76	
35	3405-411-0003-000-5	WMW LLC	2.69	
36	3405-801-0012-000-8	Leonard T Walinski (TR) Marilyn J Walinski (TR)	0.49	
37	3405-801-0011-000-1	Charles E Hill Jr Patricia Hill	0.29	
38	3405-801-0010-000-4	Earliene R Smith	0.3	
39	3405-801-0009-000-4	Michael N Bostwick Toni M Bostwick	0.29	
40	3405-801-0008-000-7	Joan Panetta Mary A Vaughn	0.36	
41	3405-801-0007-000-0	Leslie A Griffith Shirlee L Griffith	0.31	
42	3405-801-0006-000-3	David Sharpe Diane M Sharpe	0.31	
43	3405-801-0005-000-6	Donald Vozella Betty S Vozella	0.31	
44	3405-801-0004-000-9	Earl J Rouse Verna Rouse I	0.31	
45	3405-801-0003-000-2	Joseph H Noelke Jr Gina M Noelke	0.29	

#	Parcel ID#	Owner	Area (acres)	Comments
46	3405-801-0002-000-5	Resident	0.28	
47	3405-801-0001-000-8	Thomas Kane Catherine Kane	0.29	
48	3405-801-0013-000-5	Stephanie A Reid	0.41	
49	3405-801-0014-000-2	Cheryl A Austin	0.46	
50	3405-801-0015-000-9	Peter Webb Sherry Webb	0.31	
51	3405-801-0016-000-6	Denis D Fowler Judy L Fowler	0.33	
52	3405-801-0017-000-3	Thomas Reschak Rose Reschak	0.33	
53	3405-801-0018-000-0	Sally Miller	0.32	
54	3405-801-0019-000-7	David A Smith Kimberly H Smith	0.34	
55	3405-801-0020-000-7	Stanley J Wrobleski Mary T Wrobleski	0.27	
56	3405-801-0021-000-4	Sharon Elmore-Sapp William Sapp	0.27	
57	3405-801-0022-000-1	Fred C Lienhard Rita A Lienhard	0.27	
58	3405-801-0023-000-8	William E Tulley Ellen D Tulley	0.29	
59	3405-801-0024-000-5	John Eames Barbara Eames	0.31	
60	3405-801-0025-000-2	Dalene R Price	0.31	

Parcel Boundary
Parcel Boundary

Reviewer: _____ **Discipline:** _____

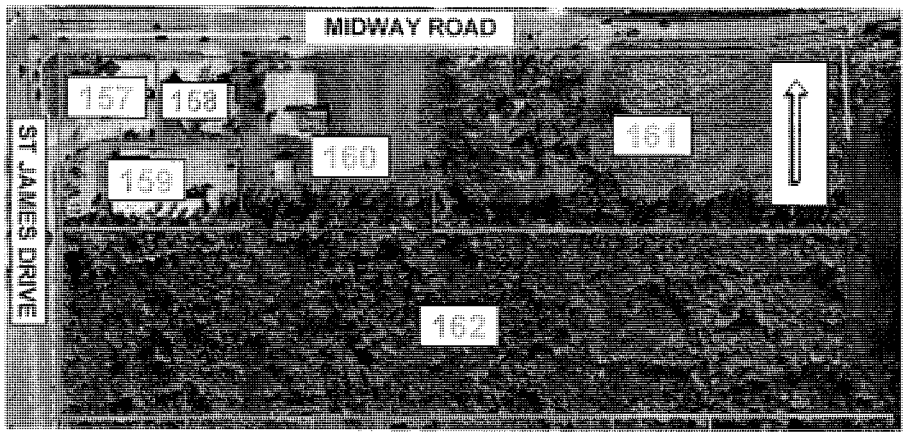


#	Parcel ID#	Owner	Area (acres)	Comments
61	3405-413-0006-000-2	Larry C Johnson	0.46	
62	3405-413-0005-000-5	Maxine Roach	0.35	
63	3405-413-0004-000-8	Rebecca Padrick	0.35	
64	3405-413-0003-000-1	Sara K Denning	0.35	
65	3405-413-0002-000-4	Kazue M More	0.7	
66	3405-413-0001-000-7	Lewis P Roach Maxine P Roach	0.35	
67	3405-414-0003-000-4	Donola Sprinkle Randleman	0.35	
68	3405-414-0002-000-7	Clara A Jackson John F Jackson	0.4	
69	3405-414-0001-010-3	John Cirjaru Gabriela Cirjaru	0.8	
70	3405-414-0001-000-0	William J Wilcox Jeanne R Wilcox	0.81	
71	3405-413-0008-000-6	Robert L Swain Linda D Swain	0.47	

#	Parcel ID#	Owner	Area (acres)	Comments
72	3405-413-0009-000-3	Ingrid Sherwood	0.37	
73	3405-413-0010-000-3	Jay F Wise Olga M (tr) Wise	0.37	
74	3405-413-0011-000-0	Dolly R Bridges Kim Stroman	0.37	
75	3405-413-0012-000-7	Irma Andresen Carole Mitacchione	0.37	
76	3405-413-0013-000-4	Sidney T Milton III Janice A Milton	0.37	
77	3405-413-0014-000-1	Peggy C Gollnick Glenn C Gollnick	0.37	
78	3405-414-0004-000-1	Marc Severe	0.37	
79	3405-414-0005-000-8	Thomas B Tillman	0.33	
80	3405-414-0006-000-5	Cynthia N Paschal Courtney Paschal	0.35	
81	3405-414-0007-000-2	Meera Chagani	0.35	
82	3405-414-0008-000-9	Robert Conklin Jr (TR) Nancy L Conklin (TR)	0.32	
83	3405-413-0015-000-8	Richard J Waldron Mary Waldron	8.82	

Parcel Boundary
Parcel Boundary

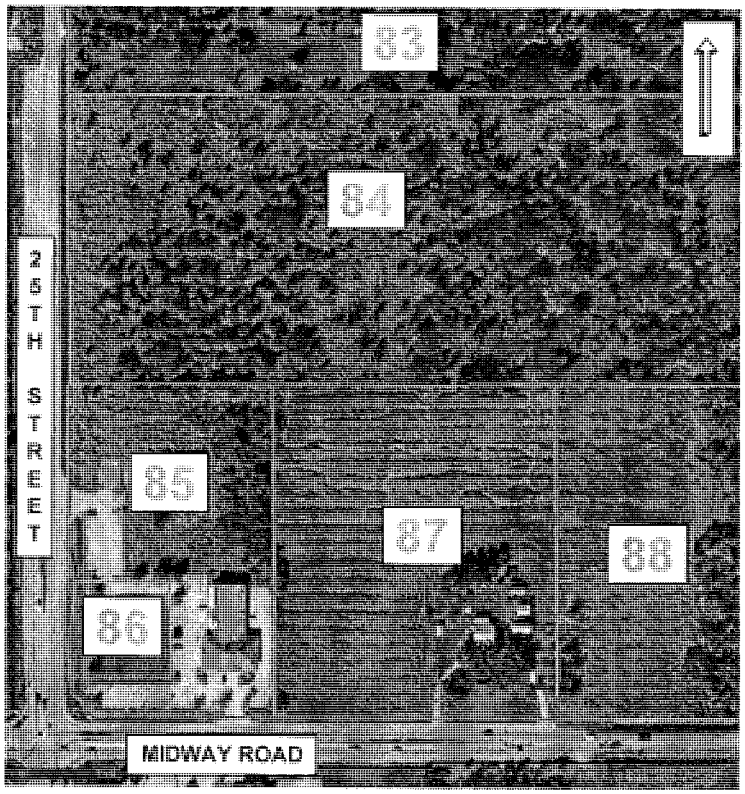
Reviewer: _____ **Discipline:** _____



#	Parcel ID#	Owner	Area (acres)	Comments
157	3403-502-0096-030-5	Reb Oil Leasing Inc	0.55	
158	3403-502-0096-020-2	Guy Cormier Sarah Cormier	0.48	
159	3403-502-0096-010-9	Cheyne Professional Complex LL	1.00	
160	3403-502-0096-000-6	Raymond Greggs	2.10	
161	3403-502-0095-000-9	LA Investment Fund Ltd	4.58	
162	3404-312-0001-000-4	Aurelio Pereira Maria Pereira	9.43	

Parcel Boundary
Parcel Boundary

Reviewer: _____ **Discipline:** _____

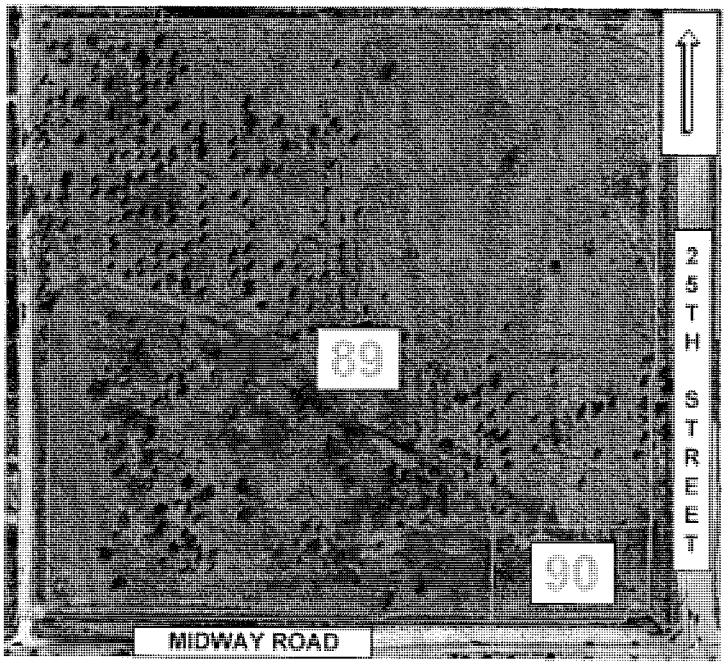


#	Parcel ID#	Owner	Area (acres)	Comments
83	3403-502-0085-000-6	John W Ferrick Patricia A Ferrick	14.14	
84	3403-502-0086-000-3	AW River Landing LLC	24.31	
85	3403-502-0094-100-3	Creekside Plaza LLC	4.27	
86	3403-502-0094-110-6	Creekside Plaza LLC	0.68	

#	Parcel ID#	Owner	Area (acres)	Comments
87	3403-502-0094-000-2	Forest J Capobianco Caroline G Capobianco	6.72	
88	3403-502-0094-010-5	Kelly L Smith Corine J Van Grootheest	6.63	

Parcel Boundary

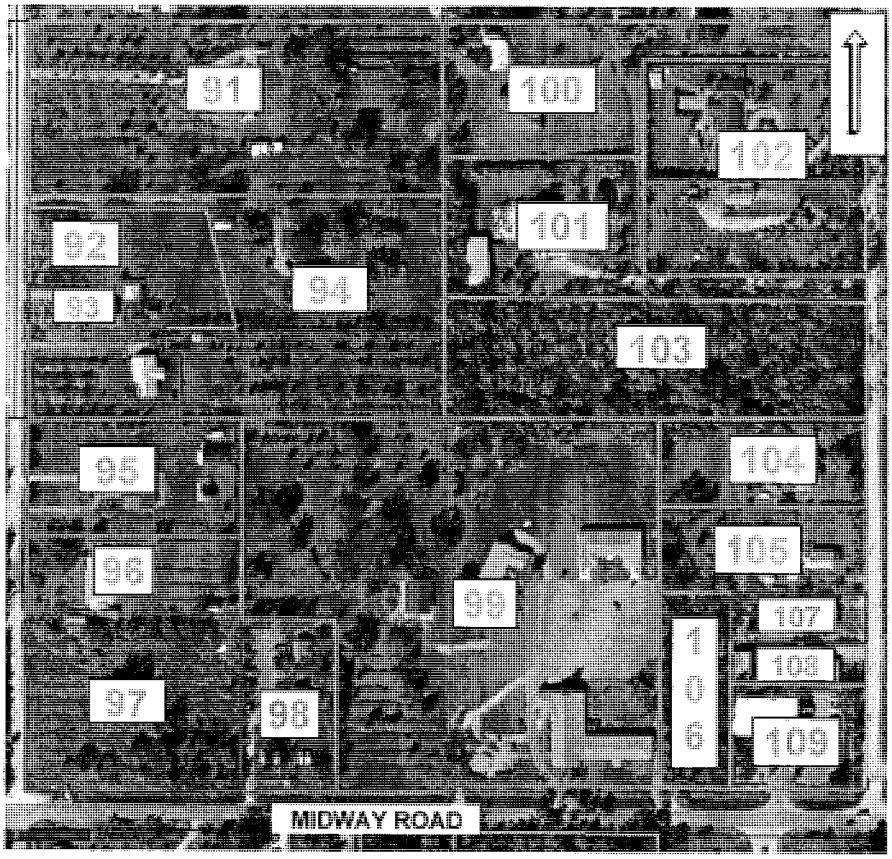
Reviewer: _____ **Discipline:** _____



#	Parcel ID#	Owner	Area (acres)	Comments
89	3403-502-0145-000-5	Midway Groves Investors LLC	34.75	
90	3403-502-0145-020-1	Long-Term Finance and Dev LLC	1.43	

Parcel Boundary

Reviewer: _____ **Discipli** _____



#	Parcel ID#	Owner	Area (acres)	Comments
91	3403-502-0148-000-6	Adolfo Covelli Nely I Covelli	4.42	
92	3403-502-0148-500-1	Walter Wood Jr Denise M Wood	1.00	

#	Parcel ID#	Owner	Area (acres)	Comments
93	3403-502-0148-200-8	Heather J Bush	0.36	
94	3403-502-0148-300-9	Raymond T Black Gloria J Black	2.03	
95	3403-502-0157-050-7	Patrick B Engle Martha C Engle	1.47	
96	3403-502-0157-000-2	John R Fossati Wanna A Fossati	0.95	
97	3405-133-0002-000-5	GIK Development LLC	2.16	
98	3405-133-0003-000-2	Raymond Van Meerten John A Lester	1.02	
99	3405-133-0001-000-8	Midway Road Church Of Christ	8.25	
100	3403-502-0147-020-5	John E Stalhut Chaundra S Stalhut	2.09	
101	3403-502-0147-040-1	Thomas K Mulvey	3.24	
102	3403-502-0147-000-9	Francis Guettler	2.74	
103	3403-502-0147-010-2	Raymond J Nadeau	3.07	
104	3403-502-0159-000-6	Mack J Hubbard Jr	1.06	
105	3403-502-0160-000-6	Cynthia B McCabe	0.96	
106	3403-502-0163-000-7	William Cunningham Nancy A	0.82	
107	3403-502-0161-000-3	Cynthia McNair	0.52	
108	3403-502-0162-000-0	Thomas A Cobb Jr Ruth S Cobb	0.36	
109	3403-502-0164-000-4	David Walters Iris Walters	0.99	

Parcel Boundary
Parcel Boundary

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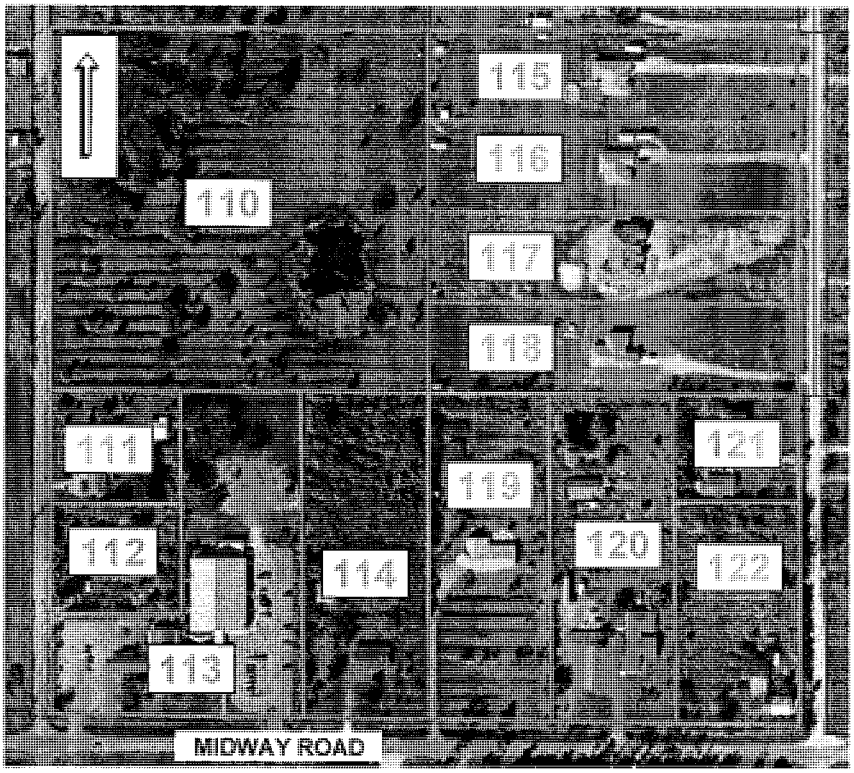
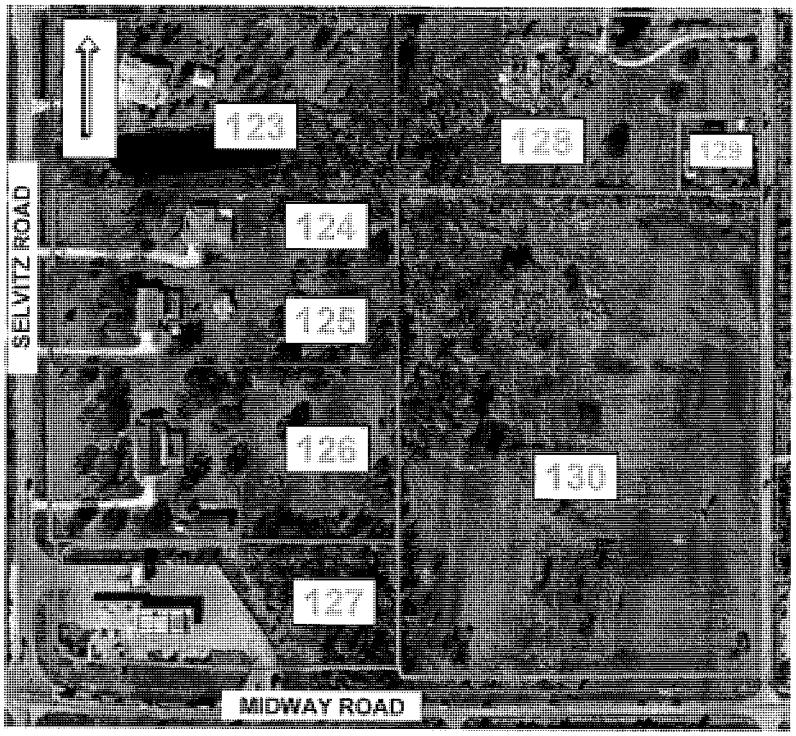


#	Parcel ID#	Owner	Area (acres)	Comments
110	3403-502-0150-000-3	Larry E Gruwell Brenda M Gruwell	9.86	
111	3403-502-0156-200-7	Alan R Schaefer Regina M Schaefer	1.06	
112	3403-502-0156-300-8	John F Kinley Jeannine M Kinley	1.01	
113	3403-502-0156-100-6	Liberty Baptist Church Inc	3.92	
114	3403-502-0156-000-5	Mary A Brundage	2.94	
115	3405-600-0002-000-8	Ross M Brinker Melissa A Brinker	2.41	

#	Parcel ID#	Owner	Area (acres)	Comments
116	3405-600-0003-000-5	William J Franklin Amber R Franklin	2.41	
117	3405-600-0004-000-2	Wilbert E Lindo Lillian Lindo	2.41	
118	3405-600-0005-000-9	Michael R LaBouef II Deborah	2.41	
119	3403-502-0156-700-2	Bradenton Teamsters Bldg Corp	2.95	
120	3403-502-0156-600-1	Midway Veterinary Hospital Pa	2.96	
121	3403-502-0156-500-0	Gregory H Mallon	1.04	
122	3403-502-0156-800-3	Ralph O Walther	2.09	

Parcel Boundary

Reviewer: _____ **Discipline:** _____

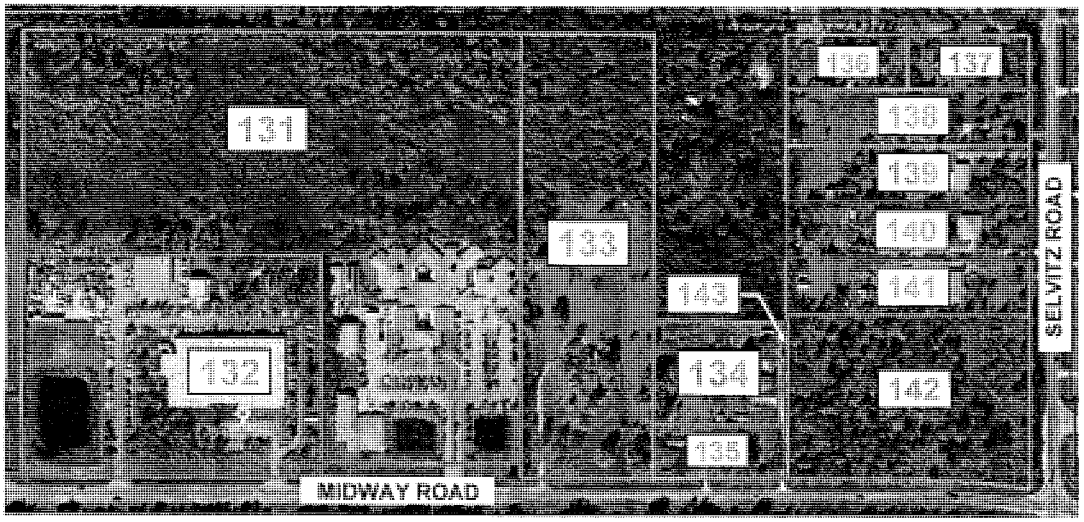


#	Parcel ID#	Owner	Area (acres)	Comments
123	3403-502-0152-000-7	Renee Cavero Mario Sordo	4.66	
124	3403-502-0153-200-6	Chrysanthos Panayiotou Joan Panayiotou	2.10	
125	3403-502-0153-000-4	Vicente A Ventulan Winnie L Ventulan	2.56	
126	3403-502-0153-100-5	Rachel L Futch	4.66	
127	3403-502-0154-000-1	Ekonomy Enterprises Inc	3.51	

#	Parcel ID#	Owner	Area (acres)	Comments
128	3403-502-0138-000-3	Larry E Gruwell Brenda M Gruwell	14.36	
129	3403-502-0138-010-6	Billie B Gruwell Brenda A Gruwell	0.42	
130	3403-502-0151-000-0	Liberty Baptist Church Inc	13.88	

Parcel Boundary

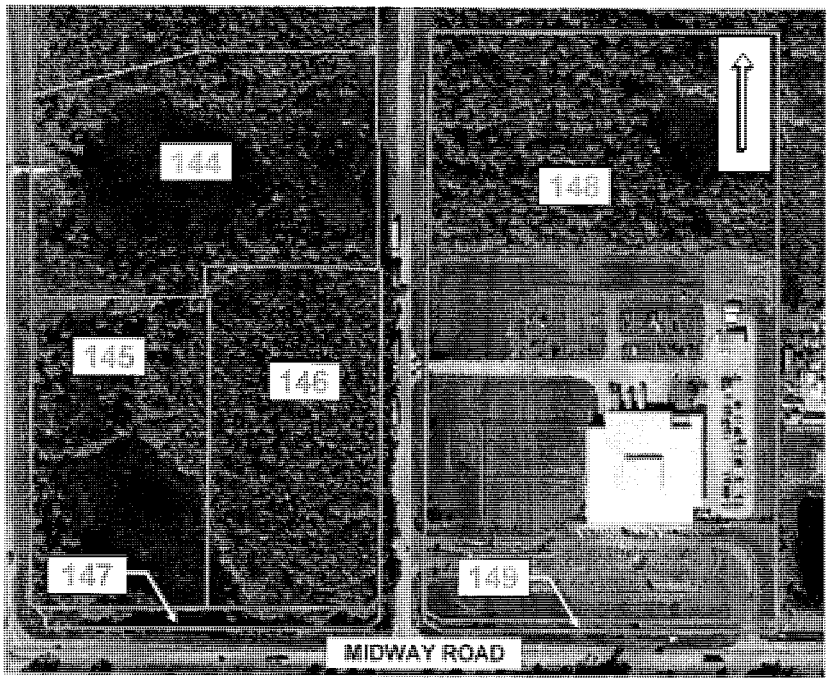
Reviewer: _____ **Discipline:** _____



#	Parcel ID#	Owner	Area (acres)	Comments
131	3406-501-0014-500-9	New Horizons of The Treas Cst	23.56	
132	3406-501-0015-000-1	St Lucie County	10.00	
133	3406-501-0020-000-9	New Horizons of The Treas Cst	9.06	
134	3406-501-0023-000-0	Charles W Cooper Rheba Cooper	1.88	
135	3406-501-0024-000-7	Rheba M Cooper	1.02	
136	3406-501-0025-000-4	Dan L Zollinger Melanie F Zollinger	1.02	
137	3406-501-0026-000-1	Keith Robinson Jeannie O'Brion	1.02	
138	3406-501-0027-000-8	Ada F Johnson	2.10	
139	3406-501-0028-000-5	Elio J Hernandez Ruth V Hernandez	2.10	
140	3406-501-0029-000-2	Manuel R Rodriguez Ana L	2.10	
141	3406-501-0030-100-3	Ronald S Sides Diane C Sides	2.10	
142	3406-501-0030-000-2	Kremser Family LP North	6.31	
143	3406-501-0022-000-3	Lewis S Fitzherbert Nellie	0.12	

Parcel Boundary

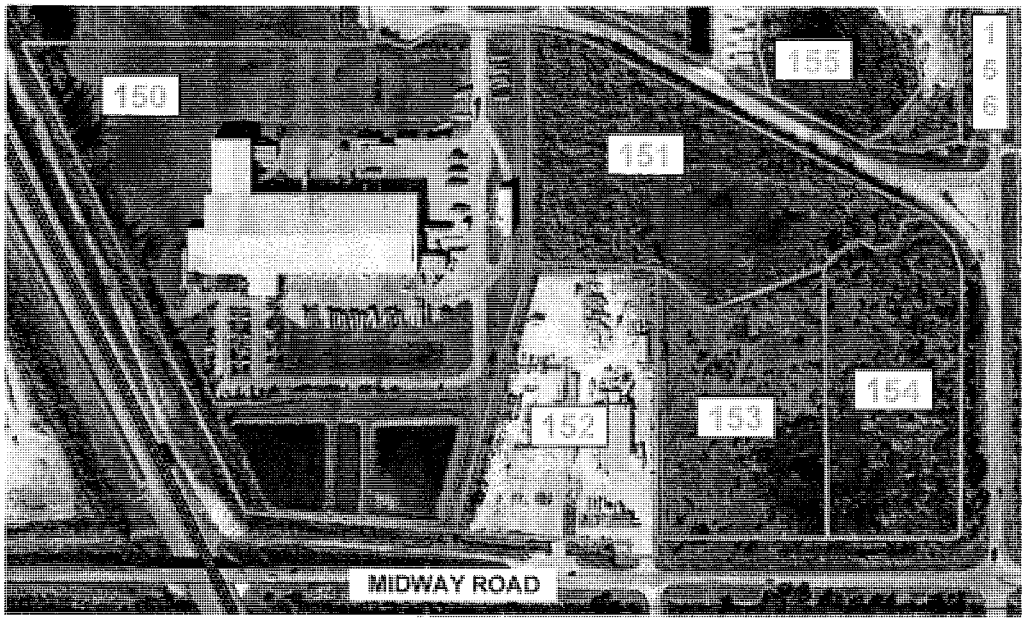
Reviewer: _____ **Discipline:** _____



#	Parcel ID#	Owner	Area (acres)	Comments
144	3406-502-0010-000-9	Midway Industrial Park III POA	6.47	
145	3406-502-0011-000-6	R and M LLC	4.54	
146	3406-502-0012-000-3	R and M LLC	5.01	
147	3406-502-0003-000-7	St Lucie County	0.61	
148	3406-501-0014-010-7	United States Postal Service	17.69	
149	3406-501-0014-020-0	St Lucie County	0.30	

Parcel Boundary

Reviewer: _____ **Discipline:** _____



#	Parcel ID#	Owner	Area (acres)	Comments
150	3301-500-0002-000-2	Packers Of Indian River Ltd	19.47	
151	3406-601-0003-000-1	Ocean House Group Inc	6.79	
152	3406-501-0042-000-9	Pete-Tree Properties Llc	5.06	
153	3406-601-0002-000-4	Mayo Development Grp LLC	4.50	
154	3406-601-0001-000-7	Mayo Development Grp LLC	4.35	
155	3406-600-0004-000-5	Midway Industrial Park POA Inc	1.85	
156	3406-502-0001-000-3	St Lucie County	8.01	

Parcel Boundary

Reviewer: _____ **Discipline:** _____

APPENDIX 13

Existing Permits

SFWMD Permit No. 56-01734-P

SOUTH FLORIDA WATER MANAGEMENT DISTRICT
ENVIRONMENTAL RESOURCE PERMIT NO. 56-01995-P
DATE ISSUED: AUGUST 11, 2004

FORM #0145
Rev. 08/95

PERMITTEE: JOHN A. MAYO
(MAYO WAREHOUSE)
PO BOX 292256,
DAVIE , FL 33329-2256

PROJECT DESCRIPTION: CONCEPTUAL APPROVAL OF A SURFACE WATER MANAGEMENT SYSTEM TO SERVE AN 8.84 ACRE PROJECT KNOWN AS MAYO WAREHOUSE. (NO CONSTRUCTION IS AUTHORIZED BY THIS PERMIT.)

PROJECT LOCATION: ST LUCIE COUNTY , SECTION 6 TWP 36S RGE 40E

PERMIT DURATION: See Special Condition No:1. See attached Rule 40E-4.321, Florida Administrative Code.

This Permit is issued pursuant to Application No. 031216-16 , date(November 5, 2003. Permittee agrees to hold and save the South Florida Water Management District and its successors harmless from any and all damages, claims or liabilities which may arise by reason of the construction, operation, maintenance or use of activities authorized by this Permit. This Permit is issued under the provisions of Chapter 373 , Part IV Florida Statutes (F.S.), and the Operating Agreement Concerning Regulation Under Part IV, Chapter 373 F.S., between South Florida Water Management District and the Department of Environmental Protection. Issuance of this Permit constitutes certification of compliance with state water quality standards where neccessary pursuant to Section 401, Public Law 92-500, 33 USC Section 1341 , unless this Permit is issued pursuant to the net improvement provisions of Subsections 373.414(1)(b), F.S., or as otherwise stated herein.

This Permit may be transferred pursuant to the appropriate provisions of Chapter 373, F.S, and Sections 40E-1.6107(1) and (2), and 40E-4.351(1), (2), and (4), Florida Administrative Code (F.A.C.). This Permit may be revoked, suspended, or modified at any time pursuant to the appropriate provisions of Chapter 373, F.S. and Sections 40E-4.351(1), (2), and (4), F.A.C.

This Permit shall be subject to the General Conditions set forth in Rule 40E-4.381, F.A.C., unless waived or modified by the Governing Board. The Application, and the Environmental Resource Permit Staff Review Summary of the Application, including conditions, and all plans and specifications incorporated by reference, are a part of this Permit. All activities authorized by this Permit shall be implemented as set forth in the plans, specifications, and performance criteria as set forth and incorporated in the Environmental Resource Permit Staff Review Summary. Within 30 days after completion of construction of the permitted activity, the Permittee shall submit a written statement of completion and certification by a registered professional engineer or other appropriate individual, pursuant to the appropriate provisions of Chapter 373, F.S. and Sections 40E-4.361 and 40E-4.381, F.A.C.

In the event the property is sold or otherwise conveyed, the Permittee will remain liable for compliance with this Permit until transfer is approved by the District pursuant to Rule 40E-1.6107, F.A.C.

SPECIAL AND GENERAL CONDITIONS ARE AS FOLLOWS:

SEE PAGES 2 - 3 OF 6 (18 SPECIAL CONDITIONS).
SEE PAGES 4 - 6 OF 6 (19 GENERAL CONDITIONS).

FILED WITH THE CLERK OF THE SOUTH FLORIDA WATER MANAGEMENT DISTRICT

On ORIGINAL SIGNED BY:
By ELIZABETH VEGUILLA
DEPUTY CLERK

SOUTH FLORIDA WATER MANAGEMENT DISTRICT, BY ITS GOVERNING BOARD

ORIGINAL SIGNED BY:
By LORI OJALA
SECRETARY

SPECIAL CONDITIONS

. The conceptual phase of this permit shall expire on August 12, 2006.

2. Operation of the surface water management system shall be the responsibility of the permittee.

3. Discharge Facilities:

Structure: CS-1
1-3" WIDE RECTANGULAR NOTCH weir with crest at elev. 20.3' NGVD.
1-3" dia. CIRCULAR ORIFICE with invert at elev. 18.65' NGVD.
1-drop inlet with crest at elev. 22.5' NGVD.
Receiving body : NSLRWCD C-103 Canal
Control elev : 18.65 feet NGVD.

Structure: CS-2
1-6" WIDE RECTANGULAR NOTCH weir with crest at elev. 20.05' NGVD.
1-drop inlet with crest at elev. 22' NGVD.
Receiving body : Wetland
Control elev : 18.65 feet NGVD.

4. The permittee shall be responsible for the correction of any erosion, shoaling or water quality problems that result from the construction or operation of the surface water management system.

5. Measures shall be taken during construction to insure that sedimentation and/or turbidity violations do not occur in the receiving water.

6. The District reserves the right to require that additional water quality treatment methods be incorporated into the drainage system if such measures are shown to be necessary.

7. Facilities other than those stated herein shall not be constructed without an approved modification of this permit.

8. A stable, permanent and accessible elevation reference shall be established on or within one hundred (100) feet of all permitted discharge structures no later than the submission of the certification report. The location of the elevation reference must be noted on or with the certification report.

9. The permittee shall provide routine maintenance of all of the components of the surface water management system in order to remove all trapped sediments/debris. All materials shall be properly disposed of as required by law. Failure to properly maintain the system may result in adverse flooding conditions.

10. This permit is issued based on the applicant's submitted information which reasonably demonstrates that adverse water resource related impacts will not be caused by the completed permit activity. Should any adverse impacts caused by the completed surface water management system occur, the District will require the permittee to provide appropriate mitigation to the District or other impacted party. The District will require the permittee to modify the surface water management system, if necessary, to eliminate the cause of the adverse impacts.

11. Minimum building floor elevation: BASIN: Site - 23.30 feet NGVD.

12. Minimum parking lot elevation: Basin: Site - 22.00 feet NGVD.

13. All commercial/industrial parcels shall provide a minimum dry pre-treatment volume of 1/2 inch of runoff prior to discharge into the master surface water management system.

14. Prior to any future construction, the permittee shall apply for and receive a permit modification. As part of the permit application, the applicant for that phase shall

provide documentation verifying that the proposed construction is consistent with the design of the master surface water management system, including the land use and site grading assumptions.

15. The District reserves the right to require remedial measures to be taken by the permittee if monitoring or other information demonstrates that adverse impacts to onsite or offsite wetlands, upland conservation areas or buffers, or other surface waters have occurred due to project related activities.

16. At the time of construction approval, the permittee shall submit two certified copies of the recorded conservation easement for the upland buffer. The data should also be supplied in a digital CAD (.dxf) or GIS (ESRI Coverage) format. The files should be in the Florida State Plane coordinate system, East Zone (3601) with a data datum of NAD83, HARN with the map units in feet. This data should reside on a CD or floppy disk and be submitted to the District's Environmental Resource Compliance Division in the service area office where the application was submitted.

    The recorded easement shall be in substantial conformance with Exhibit 8. Any proposed modifications to the approved form must receive prior written consent from the District. The easement must be free of encumbrances or interests in the easement which the District determines are contrary to the intent of the easement. In the event it is later determined that there are encumbrances or interests in the easement which the District determines are contrary to the intent of the easement, the permittee shall be required to provide release or subordination of such encumbrances or interests.

17. Upon submittal of an application for construction approval, the permittee shall submit a maintenance plan for the upland buffer along the north property line for review by District staff. The plan shall be subject to the approval of District staff and the environmental criteria in effect at the time of the construction permit application. A maintenance program shall be implemented on a regular basis to ensure the integrity and viability of the upland buffer area as permitted. Maintenance shall be conducted in perpetuity to ensure that the conservation area is maintained free from Category 1 exotic vegetation (as defined by the Florida Exotic Pest Plant Council at the time of permit issuance) immediately following a maintenance activity. Coverage of exotic and nuisance plant species shall not exceed 5% of total cover between maintenance activities. In addition, the permittee shall manage the conservation areas such that exotic/nuisance plant species do not dominate any one section of those areas.

18. Issuance of this permit deletes 8.84 from District permit number 56-01444-P (Midway Industrial Park).

GENERAL CONDITIONS

1. All activities authorized by this permit shall be implemented as set forth in the plans, specifications and performance criteria as approved by this permit. Any deviation from the permitted activity and the conditions for undertaking that activity shall constitute a violation of this permit and Part IV, Chapter 373. F.S.

2. This permit or a copy thereof, complete with all conditions, attachments, exhibits, and modifications shall be kept at the work site of the permitted activity. The complete permit shall be available for review at the work site upon request by District staff. The permittee shall require the contractor to review the complete permit prior to commencement of the activity authorized by this permit.

3. Activities approved by this permit shall be conducted in a manner which does not cause violations of State water quality standards. The permittee shall implement best management practices for erosion and pollution control to prevent violation of State water quality standards. Temporary erosion control shall be implemented prior to and during construction, and permanent control measures shall be completed within 7 days of any construction activity. Turbidity barriers shall be installed and maintained at all locations where the possibility of transferring suspended solids into the receiving waterbody exists due to the permitted work. Turbidity barriers shall remain in place at all locations until construction is completed and soils are stabilized and vegetation has been established. All practices shall be in accordance with the guidelines and specifications described in Chapter 6 of the Florida Land Development Manual; A Guide to Sound Land and Water Management (Department of Environmental Regulation, 1988), incorporated by reference in Rule 40E-4.091, F.A.C. unless a project-specific erosion and sediment control plan is approved as part of the permit. Thereafter the permittee shall be responsible for the removal of the barriers. The permittee shall correct any erosion or shoaling that causes adverse impacts to the water resources.

4. The permittee shall notify the District of the anticipated construction start date within 30 days of the date that this permit is issued. At least 48 hours prior to commencement of activity authorized by this permit, the permittee shall submit to the District an Environmental Resource Permit Construction Commencement Notice Form Number 0960 indicating the actual start date and the expected construction completion date.

5. When the duration of construction will exceed one year, the permittee shall submit construction status reports to the District on an annual basis utilizing an annual status report form. Status report forms shall be submitted the following June of each year.

6. Within 30 days after completion of construction of the permitted activity, the permitee shall submit a written statement of completion and certification by a professional engineer or other individual authorized by law, utilizing the supplied Environmental Resource/Surface Water Management Permit Construction Completion/Certification Form Number 0881A, or Environmental Resource/Surface Water Management Permit Construction Completion Certification - For Projects Permitted prior to October 3, 1995 Form No. 0881B, incorporated by reference in Rule 40E-1.659, F.A.C. The statement of completion and certification shall be based on onsite observation of construction or review of as-built drawings for the purpose of determining if the work was completed in compliance with permitted plans and specifications. This submittal shall serve to notify the District that the system is ready for inspection. Additionally, if deviation from the approved drawings are discovered during the certification process, the certification must be accompanied by a copy of the approved permit drawings with deviations noted. Both the original and revised specifications must be clearly shown. The plans must be clearly labeled as "as-built" or "record" drawings. All surveyed dimensions and elevations shall be certified by a registered surveyor.

7. The operation phase of this permit shall not become effective: until the permittee has complied with the requirements of condition (6) above, and submitted a request

for conversion of Environmental Resource Permit from Construction Phase to Operation Phase, Form No. 0920; the District determines the system to be in compliance with the permitted plans and specifications; and the entity approved by the District in accordance with Sections 9.0 and 10.0 of the Basis of Review for Environmental Resource Permit Applications within the South Florida Water Management District, accepts responsibility for operation and maintenance of the system. The permit shall not be transferred to such approved operation and maintenance entity until the operation phase of the permit becomes effective. Following inspection and approval of the permitted system by the District, the permittee shall initiate transfer of the permit to the approved responsible operating entity if different from the permittee. Until the permit is transferred pursuant to Section 40E-1.6107, F.A.C., the permittee shall be liable for compliance with the terms of the permit.

8. Each phase or independent portion of the permitted system must be completed in accordance with the permitted plans and permit conditions prior to the initiation of the permitted use of site infrastructure located within the area served by that portion or phase of the system. Each phase or independent portion of the system must be completed in accordance with the permitted plans and permit conditions prior to transfer of responsibility for operation and maintenance of the phase or portion of the system to a local government or other responsible entity.

9. For those systems that will be operated or maintained by an entity that will require an easement or deed restriction in order to enable that entity to operate or maintain the system in conformance with this permit, such easement or deed restriction must be recorded in the public records and submitted to the District along with any other final operation and maintenance documents required by Sections 9.0 and 10.0 of the Basis of Review for Environmental Resource Permit applications within the South Florida Water Management District, prior to lot or units sales or prior to the completion of the system, whichever comes first. Other documents concerning the establishment and authority of the operating entity must be filed with the Secretary of State, county or municipal entities. Final operation and maintenance documents must be received by the District when maintenance and operation of the system is accepted by the local government entity. Failure to submit the appropriate final documents will result in the permittee remaining liable for carrying out maintenance and operation of the permitted system and any other permit conditions.

10. Should any other regulatory agency require changes to the permitted system, the permittee shall notify the District in writing of the changes prior to implementation so that a determination can be made whether a permit modification is required.

11. This permit does not eliminate the necessity to obtain any required federal, state, local and special district authorizations prior to the start of any activity approved by this permit. This permit does not convey to the permittee or create in the permittee any property right, or any interest in real property, nor does it authorize any entrance upon or activities on property which is not owned or controlled by the permittee, or convey any rights or privileges other than those specified in the permit and Chapter 40E-4 or Chapter 40E-40, F.A.C..

12. The permittee is hereby advised that Section 253.77, F.S. states that a person may not commence any excavation, construction, or other activity involving the use of sovereign or other lands of the State, the title to which is vested in the Board of Trustees of the Internal Improvement Trust Fund without obtaining the required lease, license, easement, or other form of consent authorizing the proposed use. Therefore, the permittee is responsible for obtaining any necessary authorizations from the Board of Trustees prior to commencing activity on sovereignty lands or other state-owned lands.

13. The permittee must obtain a Water Use permit prior to construction dewatering, unless the work qualifies for a general permit pursuant to Subsection 40E-20.302(3), F.A.C., also known as the "No Notice" Rule.

14. The permittee shall hold and save the District harmless from any and all damages, claims, or liabilities which may arise by reason of the construction, alteration, operation, maintenance, removal, abandonment or use of any system authorized by the

permit.

15. Any delineation of the extent of a wetland or other surface water submitted as part of the permit application, including plans or other supporting documentation, shall not be considered binding, unless a specific condition of this permit or a formal determination under Section 373.421(2), F.S., provides otherwise.

16. The permittee shall notify the District in writing within 30 days of any sale, conveyance, or other transfer of ownership or control of a permitted system or the real property on which the permitted system is located. All transfers of ownership or transfers of a permit are subject to the requirements of Rules 40E-1.6105 and 40E-1.6107, F.A.C.. The permittee transferring the permit shall remain liable for corrective actions that may be required as a result of any violations prior to the sale, conveyance or other transfer of the system.

17. Upon reasonable notice to the permittee, District authorized staff with proper identification shall have permission to enter, inspect, sample and test the system to insure conformity with the plans and specifications approved by the permit.

18. If historical or archaeological artifacts are discovered at any time on the project site, the permittee shall immediately notify the appropriate District service center.

19. The permittee shall immediately notify the District in writing of any previously submitted information that is later discovered to be inaccurate.

40E-4.321 Duration of Permits

(1) Unless revoked or otherwise modified the duration of an environmental resource permit issued under this chapter or Chapter 40E-40, F.A.C. is as follows:

(a) For a conceptual approval, two years from the date of issuance or the date specified as a condition of the permit, unless within that period an application for an individual or standard general permit is filed for any portion of the project. If an application for an environmental resource permit is filed, then the conceptual approval remains valid until final action is taken on the environmental resource permit application. If the application is granted, then the conceptual approval is valid for an additional two years from the date of issuance of the permit. Conceptual approvals which have no individual or standard general environmental resource permit applications filed for a period of two years shall expire automatically at the end of the two year period.

(b) For a conceptual approval filed concurrently with a development of regional impact (DRI) application for development approval (ADA) and a local government comprehensive plan amendment, the duration of the conceptual approval shall be two years from whichever one of the following occurs at the latest date:

1. the effective date of the local government's comprehensive plan amendment.
2. the effective date of the local government development order.
3. the date on which the District issues the conceptual approval, or
4. the latest date of the resolution of any Chapter 120.57, F.A.C., administrative proceeding or other legal appeals.

(c) For an individual or standard general environmental resource permit, five years from the date of issuance or such amount of time as made a condition of the permit.

(d) For a noticed general permit issued pursuant to chapter 40-E-400, F.A.C., five years from the date the notice of intent to use the permit is provided to the District.

(2)(a) Unless prescribed by special permit condition, permits expire automatically according to the timeframes indicated in this rule. If application for extension is made in writing pursuant to subsection (3), the permit shall remain in full force and effect until:

1. the Governing Board takes action on an application for extension of an individual permit, or
2. staff takes action on an application for extension of a standard general permit.

(b) Installation of the project outfall structure shall not constitute a vesting of the permit.

(3) The permit extension shall be issued provided that a permittee files a written request with the District showing good cause prior to the expiration of the permit. For the purpose of this rule, good cause shall mean a set of extenuating circumstances outside of the control of the permittee. Requests for extensions, which shall include documentation of the extenuating circumstances and how they have delayed this project, will not be accepted more than 180 days prior to the expiration date.

(4) Substantial modifications to Conceptual Approvals will extend the duration of the Conceptual Approval for two years from the date of issuance of the modification. For the purposes of this section, the term "substantial modification" shall mean a modification which is reasonably expected to lead to substantially different water resource or environmental impacts which require a detailed review.

(5) Substantial modifications to individual or standard general environmental resource permits issued pursuant to a permit application extend the duration of the permit for three years from the date of issuance of the modification. Individual or standard general environmental resource permit modifications do not extend the duration of a conceptual approval.

(6) Permit modifications issued pursuant to subsection 40E-4.331(2)(b), F.A.C. (letter modifications) do not extend the duration of a permit.

(7) Failure to complete construction or alteration of the surface water management system and obtain operation phase approval from the District within the permit duration shall require a new permit authorization in order to continue construction unless a permit extension is granted.

Specific authority 373.044, 373.113 F.S. Law implemented 373.413, 373.416, 373.419, 373.426 F.S. History—New 9-3-81, Amended 1-31-82, 12-1-82, Formerly 16K-4.07(4), Amended 7-1-86, 4/20/94, Amended 7-1-96, 4/20/94, 10-3-95

Last Date For Agency Action: 28-JUN-2003

GENERAL ENVIRONMENTAL RESOURCE PERMIT STAFF REPORT

Project Name: Midway And Glades Cut Off Road Intersection Improvements
Permit No.: 56-01734-P
Application No.: 000822-11 **Associated File:** 030310-21 WU
Application Type: Environmental Resource (New General Permit)
Location: St Lucie County, S1/T36S/R39E
Permittee : St Lucie County Board Of County Commissioners
Operating Entity : St Lucie County Board Of County Commissioners
Project Area: 19.53 acres
Project Land Use: Highway
Drainage Basin: NORTH ST LUCIE
Receiving Body: NSLRWCD CANAL C-103 / C-102
Special Drainage District: North St Lucie River Water Control District
Conservation Easement To District : No
Sovereign Submerged Lands: No

PROJECT PURPOSE:

This application is a request for an Environmental Resource Permit to authorize construction and operation of a surface water management system to serve 19.53 acres of roadway. Staff recommends approval with conditions.

PROJECT EVALUATION:

PROJECT SITE DESCRIPTION:

The site is located in St. Lucie County at the intersection of Midway Road and Glades Cut-Off Road Please see Exhibit 1 for the site location map.

There are no permitted surface water management facilities within the project area. The site contains existing roadways, F.E.C. Railway spurs, and North St. Lucie River Water Control District C-103 canal.

There are no wetlands or other surface waters located within or affected by the proposed project.

PROPOSED PROJECT:

The proposed project is the widening of approximately one mile of Midway Road from LTC Parkway to approximately 700 ft west of the Florida Turnpike overpass; the widening of approximately 0.7 miles of Glades Cut-Off Road from 1000 ft south of the intersection with Midway Road to the Florida Turnpike; the widening of approximately 400 ft of East Torino Parkway; and relocating approximately 950 ft of St. Lucie County landfill entrance road. Due to the Midway Road widening, a portion of the C-103 canal will be relocated to the south, but will remain within the existing right-of-way. Water quality treatment and storm attenuation for the project will be provided in two new wet detention ponds, one new dry detention pond, and in the LTC Ranch master drainage system (Permit 56-01480-S).

The project is divided into four drainage basins: the East Basin (Midway Road from Station 191+40 to 210+25), the West Basin (Midway Road from Station 165+40 to 191+40 and Glades Cut-off Road from Station 409+30 to 429+75), the North Basin (Glades Cut-Off Road from Station 429+75 to 446+40 and the Landfill Entrance Road), and the East Torino Basin (East Torino Parkway south of Midway Road).

Documentation has been submitted from the City of Port St. Lucie authorizing the construction within the East Torino Parkway right-of-way and the C-103 canal right-of-way along with the relocation of a portion of the C-103 canal within the existing 100-ft right-of-way. North St. Lucie River Water Control District has also provided documentation authorizing the relocation of the C-103 canal.

LAND USE:

The water mangement acreage in the North Basin represents 1.15 acres of dry detention (measured at the bottom) and 0.20 acres of side slopes of the dry detention area.

Construction:

Basin : East Basin

	This Phase	
Lake	.50	acres
Lake Bank	.29	acres
Pavement	2.90	acres
Pervious	.35	acres
Total:	**4.04**	

Basin : East Torino

Basin . East Torino

	This Phase	
Pavement	.09	acres
Total:	**.09**	

Basin : North Basin

	This Phase	
Pavement	2.75	acres
Pervious	2.33	acres
Water Mgnt Acreage	1.35	acres
Total:	**6.43**	

Basin : West Basin

	This Phase	
Pavement	7.13	acres
Pervious	1.84	acres
Total:	**8.97**	

WATER QUANTITY :

Discharge Rate :

As shown in the table below, the proposed project discharge is within the allowable limit for the East Basin. The discharge from the North Basin is through the minimum size bleeder. The West Basin discharges into the LTC Ranch Master Drainage System which provides storm attenuation. The Torino Basin discharges into the City of Port St. Lucie system which provides storm attenuation.

Discharge Storm Frequency : 10 YEAR-3 DAY Design Rainfall : 7.5 inches

Basin	Allow Disch (cfs)	Method Of Determination	Peak Disch (cfs)	Peak Stage (ft, NGVD)
East Basin	.34	Discharge Formula	.26	19.89
North Basin	.58	Minimum Size Bleeder	.58	19.61

Road Design :

Road Storm Frequency : 10 YEAR-1 DAY Design Rainfall: 5.5 inches

Basin	Peak Stage (ft, NGVD)	Proposed Min. Road Crown (ft, NGVD)
East Basin	18.01	22.27
North Basin	19.26	20.56

acres of impervious area into the LTC Ranch, which requires 1.49 acre-ft of water quality treatment volume. In order to avoid encumbering the existing water quality treatment volume within the LTC Ranch system which may be needed for future roadway projects, the remaining 0.73 acre-ft of required water quality treatment volume will be mitigated in the dry detention area in the North Basin.

North Basin: Water quality treatment volume equivalent to 2.5-inches over the total 2.75 acres of impervious area within this basin (0.43 acre-ft) along with mitigation for 0.73 acre-ft (2.5 inches over 3.49 acres of impervious area) from the West Basin is provided in the dry detention area "Pond 3".

East Basin: Water quality treatment volume equivalent to 2.5-inches over the total 2.90 acres of impervious area with in this basin (0.60 acre-ft) along with mitigation for 2.5 inches over 0.75 acres of untreated impervious area (0.16 acre-ft) is provided in the wet detention area "Pond 2".

Torino Basin: The City of Port St. Lucie system provides water quality treatment for this basin.

The untreated impervious areas to be mitigated have been included as Exhibit 4 along with a summary of the provided water quality mitigation. No adverse water quality impacts are anticipated as a result of the proposed project.

Basin	Treatment Method		Vol Req.d (ac-ft)	Vol Prov'd (ac-ft)
East Basin	Treatment	Wet Detention	.6	1.48
West Basin	Treatment	Wet Detention	1.49	.76
North Basin	Treatment	Dry Detention	1.15 acres 1 ft deep	1.16 1.17

CERTIFICATION AND MAINTENANCE OF THE WATER MANAGEMENT SYSTEM:

It is suggested that the permittee retain the services of a Professional Engineer registered in the State of Florida for periodic observation of construction of the surface water management (SWM) system. This will facilitate the completion of construction completion certification Form #0881 which is required pursuant to Section 10 of the Basis of Review for Environmental Resource Permit Applications within the South Florida Water Management District, and Rule 40E-4361(2), Florida Administrative Code (F.A.C.).

Pursuant to Chapter 40E-4 F.A.C., this permit may not be converted from the construction phase to the operation phase until certification of the SWM system is submitted to and accepted by this District. Rule 40E-4.321(7) F.A.C. states that failure to complete construction of the SWM system and obtain operation phase approval from the District within the permit duration shall require a new permit authorization unless a permit extension is granted.

For SWM systems permitted with an operating entity who is different from the permittee, it should be noted that until the permit is transferred to the operating entity pursuant to Rule 40E-1.6107, F.A.C., the permittee is liable for compliance with the terms of this permit.

The permittee is advised that the efficiency of a SWM system will normally decrease over time unless the system is periodically maintained. A significant reduction in flow capacity can usually be attributed to partial blockages of the conveyance system. Once flow capacity is compromised, flooding of the project may result. Maintenance of the SWM system is required to protect the public health, safety and the natural resources of the state. Therefore, the permittee must have periodic inspections of the SWM system performed to ensure performance for flood protection and water quality purposes. If deficiencies are found, it is the responsibility of the permittee to correct these deficiencies in a timely manner.

Offsite Flows:

The existing gas station near Station 188+00 currently discharges into a grassed swale and then through a 15-inch CMP to the C-103 canal. Structure S-63B, with an internal baffle, will be installed prior to the new C-103 outfall.

Control Elevation :

Basin	Area (Acres)	Ctrl Elev (ft, NGVD)	WSWT Ctrl Elev (ft, NGVD)	Method Of Determination
East Basin	4.04	17.5	17.50	Surrounding Projects
West Basin	8.97	20	20.00	Surrounding Projects
North Basin	6.43	17.2	17.20	Surrounding Projects

Receiving Body :

Basin	Str.#	Receiving Body
East Basin	S-100	C-103 Canal
West Basin	S-1	NE Basin - LTC Ranch Master Drainage System
West Basin	S-53	NE Basin - LTC Ranch Master Drainage System
North Basin	S-101	un-named ditch

Discharge Structures:

Bleeders:

Basin	Str#	Count	Type	Width	Height	Length	Dia.	Invert Angle	Invert Elev. (ft, NGVD)
East Basin	S-100	1	Circular Orifice				3"		17.5
North Basin	S-101	1	Circular Orifice				3"		17.2

Culverts:

Basin	Str#	Count	Type	Width	Height	Length	Dia.
East Basin	S-100	1	Elliptical Reinforced Concrete	30"	19"	95'	
North Basin	S-101	1	Reinforced Concrete Pipe			74'	24"
West Basin	S-1	1	Corrugated Aluminum Pipe			356'	30"
West Basin	S-53	2	Reinforced Concrete Pipe			541'	30"

Inlets:

Basin	Str#	Count	Type	Width	Length	Dia.	Crest Elev. (ft, NGVD)
East Basin	S-100	1	Fdot Mod E Drop Inlet	3'	4.5'		21.4
North Basin	S-101	1	Fdot Mod E Drop Inlet	3'	4.5'		19.5

Weirs:

Basin	Str#	Count	Type	Width	Height	Length	Dia.	Elev. (ft, NGVD)
East Basin	S-100	1	Sharp Crested	3'	1.4'			20 (crest)
North Basin	S-101	1	Sharp Crested	3'	1.5'			17.7 (crest)

WATER QUALITY :

West Basin: The supporting calculations for the LTC Ranch (Permit 56-01480-S) reflect that the master system design included water quality treatment for 0.33 acres of pavement from Midway Road and 0.40 acres of pavement on Glades Cut-Off Road north of Delcris Drive. The proposed project will direct 7.13

RELATED CONCERNS:

Water Use Permit Status:

The applicant has indicated that no irrigation is proposed for this project.

The applicant has indicated that dewatering is required for construction of this project. Water Use application number 030310-21 is being processed concurrently for this project.

This permit does not release the permittee from obtaining all necessary Water Use authorization(s) prior to the commencement of activities which will require such authorization, including construction dewatering and irrigation, unless the work qualifies for a general permit issued pursuant to Section 40E-20 FAC.

Historical/Archeological Resources:

The District has received correspondence from the Florida Department of State, Division of Historical Resources indicating that the agency has no objections to the issuance of this permit.

DCA/CZM Consistency Review:

The District has not received a finding of inconsistency from the Florida Department of Community Affairs or other commenting agencies regarding the provisions of the federal Coastal Zone Management Plan.

Enforcement:

There has been no enforcement activity associated with this application.

STAFF REVIEW:

DIVISION APPROVAL:

NATURAL RESOURCE MANAGEMENT:

Donald L. Medellin

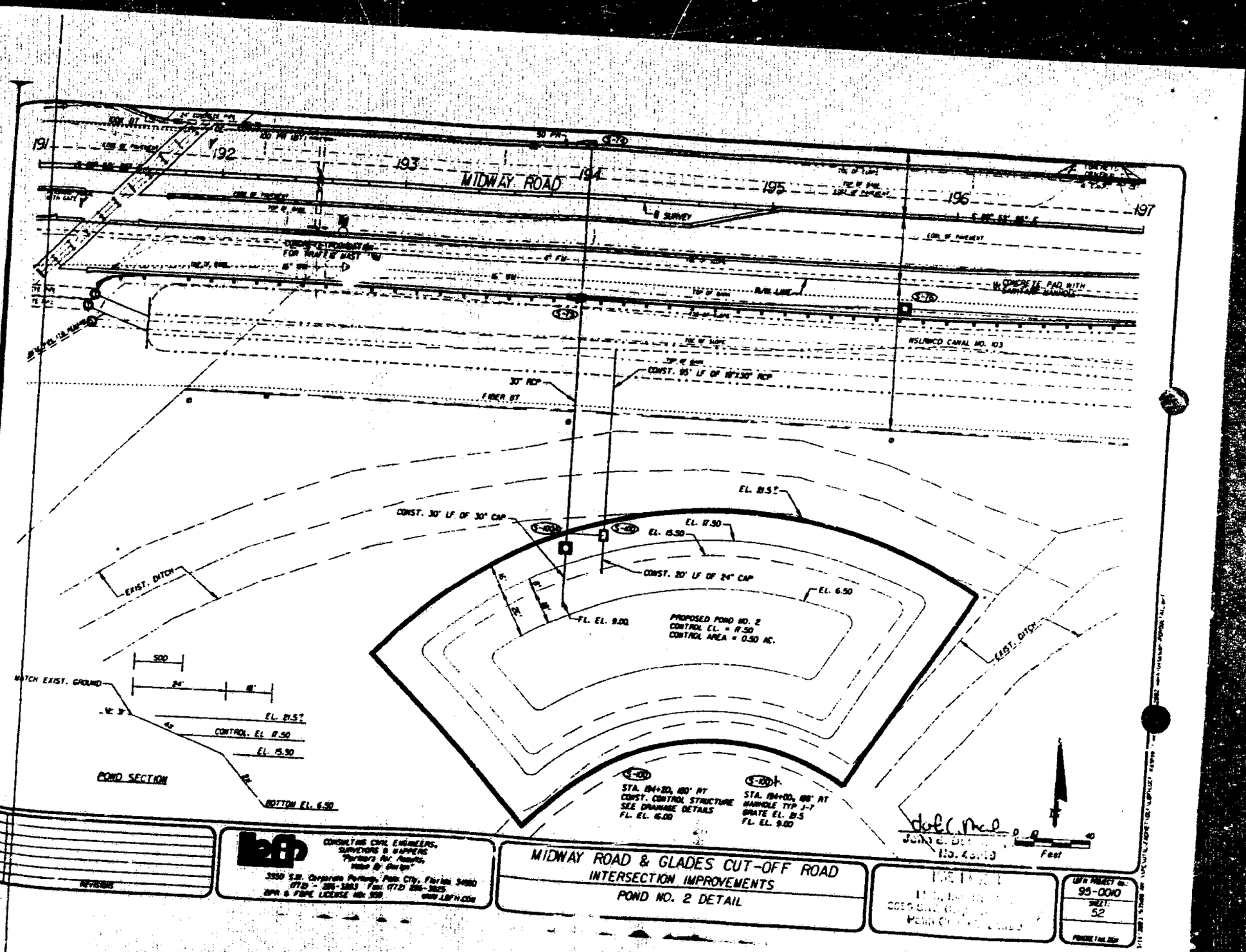
Donald L. Medellin

DATE: 03 June 03

SURFACE WATER MANAGEMENT:

Hugo A. Carter, P.E.

DATE: 6 June 03



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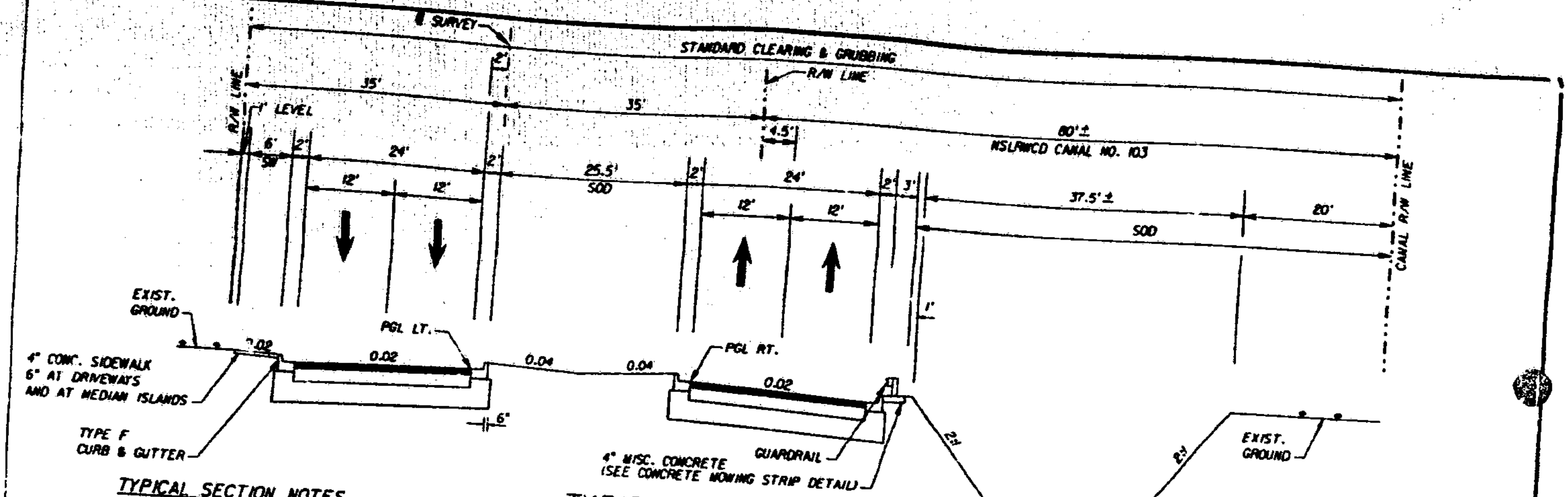
REVISIONS

MIDWAY ROAD & GLADES CUT-OFF ROAD
INTERSECTION IMPROVEMENTS
POND NO. 2 DETAIL

LBFH PROJECT No. 95-0010
SHEET: 52

APPLICATION 000622-11
EXHIBIT 14



TYPICAL SECTION NOTES

1. ALL PERMANENT GRASS AREAS ARE TO RECEIVE A 6" TOPSOIL TREATMENT. THE COST SHALL BE INCLUDED IN THE SOD PAY ITEM.
2. AT THE BEGINNING AND END OF THE PROJECT, THE EXISTING PAVEMENT SHALL BE SAWCUT TO AN APPROXIMATE DEPTH OF 1" TO MAKE A CLEAN BUTT JOINT AND REMOVE APPROXIMATELY 35' FOR A SMOOTH TIE-IN. THE COST SHALL BE INCLUDED IN THE 3" TYPE S STRUCTURAL COURSE.
3. THE CONTRACTOR SHALL REMOVE THE ASPHALT AND BASE OF THE EXISTING ROAD UNLESS OTHERWISE NOTED.
4. TURN LANES SHALL HAVE THE SAME CROSS SLOPE AS ADJACENT PAVEMENT UNLESS OTHERWISE INDICATED BY SUPPLEMENTAL PROFILES OR SPOT ELEVATIONS.
5. CANAL TO BE RELOCATED FROM STA. 191+65 TO STA. 198+50.
6. ACTUAL WIDTH OF BASE WIDENING MAY VARY DUE TO ACTUAL EXISTING PAVEMENT WIDTH. CONTRACTOR MAY ELECT TO PLACE UNIFORM WIDTH BASE WIDENING STRIP AT NO ADDITIONAL COST.

TYPICAL SECTION

MIDWAY ROAD
EAST OF GLADES CUT-OFF ROAD
STA. 190+19.26 TO STA. 208+00.00

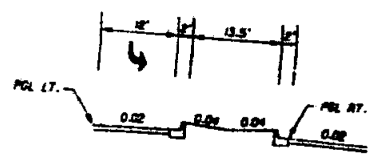
DESIGN SPEED = 40 MPH

RESURFACING: TYPE S OVERBUILD (SEE SUMMARY TABLE) WITH 1½" TYPE S STRUCTURAL COURSE

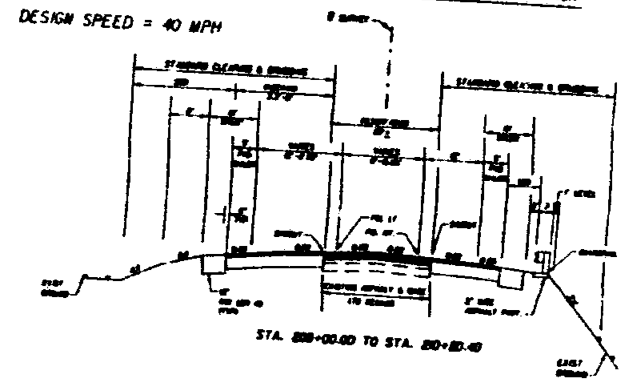
WIDENING: 3" TYPE S STRUCTURAL COURSE WITH OPTIONAL BASE GROUP 15 (ABC-3/TYPE B-12.5 ONLY) (FOR THICKNESS SEE INDEX NO. 514)

NEW CONSTRUCTION: 3" TYPE S STRUCTURAL COURSE OPTIONAL BASE GROUP 13 (ABC-3/TYPE B-12.5 ONLY) 12" STABILIZED SUBGRADE MIN. LBR 40

PAVED SHOULDER: SAME AS NEW CONSTRUCTION



LEFT TURN LANE DETAIL



STA. 208+00.00 TO STA. 210+20.40

SUMMARY OF OVERBUILD	
STATION RANGE	AVG. SPREAD RATE (LBS/SY)
[illegible]	[illegible]
[illegible]	[illegible]

John E. Don..., P.E.
No. 43919

DATE	BY	REVISIONS

LBFH
CONSULTING CIVIL ENGINEERS, SURVEYORS & MAPPERS
"Partners for Results, Value By Design"
3550 S.W. Corporate Parkway, Palm City, Florida 34990
(772) 286-3883 Fax: (772) 286-3925
BPR & FBPE LICENSE NO: 959 WWW.LBFH.COM

MIDWAY ROAD & GLADES CUT-OFF ROAD
INTERSECTION IMPROVEMENTS
TYPICAL SECTION

MAR 14 2003
Lb..., Inc. No. 959
3550 S.W. Corporate Parkway

LBFH PROJECT No.: 95-0010
SHEET: 12

APPLICATION 000622-11
EXHIBIT 8

Exhibit B
DRAINAGE CALCULATIONS

DRAINAGE CALCULATION SUMMARY

PRE-DEVELOPMENT:

The existing right of way area's drainage infrastructure is a patchwork of driveway culverts, equalizer culverts, remnant swales & conveyances, all of which have been interconnected with one common goal – to drain into the North St. Lucie River Water Control District's (NSLRWCD) backbone drainage system.

Currently, the roadway improvements within the project area's right of ways are crowned roadway sections with limited swale drainage serving its storm water needs. The NSLRWCD Canal No. 103 is adjacent to and south of the Midway Road portion of the project. It is into this canal that much of the storm water runoff ultimately goes from the area. The remaining portions of the project area's storm water runoff flows to the north and enters the NSLRWCD at Canal No. 102.

The existing roadway improvements include 5.1-acres of impervious surface – mainly asphalt pavement with a limited number of concrete driveways. The remaining pervious surface is largely adjacent open space that conveys overland sheet flow to the canals.

In developing the storm water design for the project, the existing gallimaufry of small drainage areas and pipes was consolidated into three basins – East Basin, West Basin, and North Basin. Included in these basins are some additional areas that have been or being acquired by St. Lucie County in order to complete the proposed roadway improvements. These areas include:

- A portion of the north right of way of the NSLRWCD's Canal No. 103 along Midway Road and within the east & west project boundaries;
- A portion of the Tropicana Products property to the north of its wet detention area. In fact, this is a mere formality as there has been an easement granted to the County from Tropicana over this piece for the last several years;
- A corner clip from the Florida East Coast (FEC) railroad right of way on the northeast corner of the intersection;
- and, three lots within the Harrett – Plat Unit 47 subdivision in the City of Port St. Lucie.

As applicable, these additional areas are included in the overall roadway improvement project. They are also included in the appropriate drainage basin or, as is the case with the shoulder improvements to the east of East Torino Parkway, the runoff is already included in a SFWMD permit by others for the City of Port St. Lucie. Based upon the North St. Lucie River Water Control District's (NSLRWCD) criterion of 2" per acre per day of average allowable discharge, the allowable discharge for each of these basins was determined. We have designed to these permitted average allowable discharges.

Please note that in addition to the existing areas that have been/are being acquired by the St. Lucie County, there are a few easements and agreements that have been/will be given for the construction:

- an interlocal agreement between the City of Port St. Lucie and St. Lucie County for the improvements beyond the Midway Road right of way on East Torino Parkway;
- a drainage easement across the public area of the City of Port St. Lucie to the north of the St. Lucie County owned lots located in the Sharrett – Plat Unit 47 subdivision;
- a temporary construction easement from Rinker Materials for the improvements beyond the Midway Road right of way at the East Torino Parkway intersection;
- a temporary construction easement from the NSLRWCD and the City of Port St. Lucie for the relocation of NSLRWCD Canal No. 103 southward;
- an agreement between LTC Ranch and St. Lucie County to tie the West Basin of the roadway improvements into the permitted LTC Ranch system. To reiterate, the LTC Ranch system is already permitted to take the runoff – it is simply a legal matter between the two entities for the actual connection;
- and, a temporary construction easement from Tropicana Products for curb and shoulder improvements beyond the Midway Road and the Glades Cutoff Road right of way at their existing driveways.

These agreements and easements will be in place before construction commencement in the applicable areas.

POST-DEVELOPMENT:

A post-development analysis of the project area was computed to explore the hydrology and hydraulics of the proposed site. As discussed above, the site was broken into three (3) physical drainage basins. To fulfill the model's requirements for boundary conditions, three (3) additional basins were developed. The following basins were modeled:

- **EAST** : The proposed East Basin from the FEC RR to the end of construction to the east – this basin includes only a portion of Midway Road and the three lot pond site;
- **NORTH** : The proposed North Basin from the end of the proposed curbed section through the Florida Turnpike – this basin includes only a portion of Glades Cutoff Road and the improved SLC Landfill Road & pond site;
- **OUT102** : The boundary condition at the NSLRWCD Canal No. 102;
- **OUT103** : The boundary condition at the NSLRWCD Canal No. 103;

The project will use a proposed wet detention area for the East Basin, an existing wet detention system for the West Basin, and a dry detention area for the North Basin to meet the water quality and attenuation requirements for each basin. These basins are independent and will have separate outfalls into the NSLRWCD system.

The discharge structures were designed as follows:

EAST BASIN:

- **a 3" circular bleeder with an invert elevation = 17.5 NGVD;**
- **a 3-ft wide weir with crest elevation = 18.6 NGVD;**

As shown in the stage-storage computations that follow, the required treatment volume of 0.6 acre-feet occurs, in the pond, at elevation 18.6 ft-NGVD – therefore open discharge of excess storm water above this elevation is allowable, so long as the maximum allowable discharge is not exceeded. The maximum allowable discharge is actually much less due to the minimum weir elevation. Since, the minimum sized bleeder has been specified and the minimum weir elevation was used – the system will not reach the maximum allowable discharge based upon the configuration of the pond. No adverse impacts are expected based upon the maximum stages achieved.

Routings of the design storm (the 10 year 3 day event), the 10 year 24 hour event, and the 100 year 3 day event were conducted for the proposed site using the Santa Barbara Urban Hydrograph (SBUH) method and the AdICPR program. The results of these routings are summarized following this discussion.

Ultimately, the post-development design storm was found to have a maximum stage of 19.0 NGVD with an associated maximum discharge of 0.3 cfs. This was accomplished while meeting the required water quality volume of 0.6 acre-feet within the pond.

WEST BASIN:

The West Basin has been designed to convey storm water runoff into the Northeast Basin of the LTC Ranch drainage system. The SFWMD permit for LTC Ranch includes capacity for the runoff for a pre-defined amount of the future improvements to the Midway Road and Glades Cutoff Road roadway system.

Specifically, from the permitted support calculations for the Northeast Basin of the LTC Ranch system, the additional capacity in the system was sized for the runoff attenuation and water quality associated with 9.6 acres of total contributory offsite area with a 0.63" soil storage characteristic. The attached single basin inflow hydrograph from the permitted calculations support this.

Exceeds assumed impervious assumptions

Using the proposed improvements, the contributory area has a total associated area of 9.0 acres and corresponds to a 1.11" soil storage characteristic. The attached West Basin Land Use summary table supports this.

Please note the actual physical connections to the LTC Ranch system are still to be agreed upon by St. Lucie County and LTC Ranch. A formal agreement will be worked out before construction of the storm water infrastructure.

before permit is issued

NORTH BASIN:

- **a 3" circular bleeder with an invert elevation = 17.2 NGVD;**
- **a 3-ft wide weir with crest elevation = 19.5 NGVD;**

As shown in the stage-storage computations that follow, the required treatment volume of 0.4 acre-feet occurs, in the pond, at elevation 18.6 NGVD – therefore open discharge of excess storm water above this elevation is allowable, so long as the maximum allowable discharge is not exceeded. The maximum allowable discharge was actually exceeded by 0.04 cfs (0.54 allowable – 0.58 actual).

Routings of the design storm (the 10 year 3 day event), the 10 year 24 hour event, and the 100 year 3 day event were conducted for the proposed site using the Santa Barbara Urban Hydrograph (SBUH) method and the AdICPR program. The results of these routings are summarized following this discussion.

Ultimately, the post-development design storm was found to have a maximum stage of 19.6 NGVD with an associated maximum discharge of 0.6 cfs. This was accomplished while meeting the required water quality volume of 0.4 acre-feet within the pond. The

actual amount of water quality treatment that is provided at the weir crest of 19.5 ft-NGVD is 1.5 acre-feet within the pond.

The calculations that follow support the information outlined above.

DRAINAGE CALCULATION OBSERVATIONS

1. GROUND WATER / WET SEASON WATER TABLE

The estimated ground water/wet season water elevations for the three basins are:

- East Basin = 17.5 ft-NGVD;
- West Basin = 20.0 ft-NGVD;
- North Basin = 17.2 ft-NGVD

The wet season water table for the project basins vary based on their location. In general however, the permitted control elevations for the existing surrounding properties were used to determine the control elevation for the basins within the project.

- **EAST BASIN:** The East Basin is the portion of the project's right of way that falls east of the Florida East Coast (FEC) railroad along Midway Road. The proposed control elevation for this basin is elevation 17.5 ft-NGVD. There are four adjacent properties that form a range of control elevations for the area.

  - ✓ Rinker Material Corporation (SFWMD Permit # 56-00538-S), adjacent and to the north, has a permitted control elevation of 17.5 ft-NGVD;
  - ✓ The Midway Industrial Park (SFWMD Permit # 56-01444-P), adjacent to the north, has a permitted control elevation of 16.5 ft-NGVD; ← on other side of turnpike
  - ✓ Chiquita Citrus Packers (SFWMD Permit # 56-00619-S), to the north, has a permitted control elevation of 16.0 ft-NGVD;
  - ✓ and, Sharrett - Plat Unit 47 of the City of Port St. Lucie (SFWMD Permit # 56-00466-S), adjacent to the south and on which the proposed wet detention pond is to be excavated, has a permitted control which ranges from 14.3 to 16.2 ft-NGVD. ← Not adjacent

- **WEST BASIN:** The West Basin is the portion of the project's right of way that extends for the remainder of the Midway Road improvements to the west of the FEC railroad; the Glades Cutoff Road improvements south of the intersections; and a portion of Glades Cutoff Road to the north of the intersection. This basin is conveyed into the Northeast Basin of the LTC Ranch system (SFWMD Permit # 56-01480-S), adjacent to the south, were it has already been included under permit. The control for this basin is based on the LTC Ranch permit which defines a control of elevation 20.0 ft-NGVD.

- **NORTH BASIN:** The North Basin is the remainder of the Glades Cutoff Road right of way from the West Basin, defined above, and extending to the Florida Turnpike right of way to the north. The proposed control elevation for this basin is elevation 17.25 ft-NGVD. There are three adjacent properties that form a range of control elevations for the area.

  - ✓ Tropicana Products (SFWMD Permit # 56-00565-S), adjacent and to the west, has a permitted control elevation of 17.2 ft-NGVD;

  - ✓ Rinker Material Corporation (SFWMD Permit # 56-00538-S), adjacent and to the east, has a permitted control elevation of 17.5 ft-NGVD;

  - ✓ Chiquita Citrus Packers (SFWMD Permit # 56-00619-S), to the east, has a permitted control elevation of 16.0 ft-NGVD. ← Not Adjacent

2. TAILWATER AT RECEIVING SYSTEM

The North St. Lucie River Water Control District's (NSLRWCD) Canals Nos. 102 and 103 are both 'uncontrolled' canals that are ultimately controlled by tidal influences in the North Fork of the St. Lucie River. As such, per the NSLRWCD, during most times of the year the canals are dry but can fluctuate as much as three feet during the peak of large storm events. Within the limits of the project work, the inverts of the canals vary roughly from elevation 13 ft-NGVD (to the west) to 16 ft-NGVD (to the east).

Based on this and the existing canal inverts at the approximate connection points, a conservative maximum tail water condition of roughly 19.0 ft-NGVD was used in a time vs. stage hydrograph to simulate the tail water effects in the model.

DESIGNER'S NOTES

1. **WATER QUALITY/WATER QUANTITY COMPENSATION:** As discussed throughout the write-up, the typical water quality and water quantity requirement for any existing, unpermitted roadway project is for the system to treat only the addition impervious. As shown in the following calculations, this system have been designed to do this PLUS treat as much of the existing impervious surface as possible.

By doing this we propose to mitigate for the additional impervious transition areas that we are unable to readily collect and convey into the proposed storm water infrastructure:

On Midway Road:

- From **STA 165+54** to **STA 169+50±:** Specifically the south 5-ft shoulder with its associated transition to the existing edge of pavement. This area is proposed to sheet flow into the existing roadside swale ultimately draining into the NSLRWCD Canal No. 103. The area for this is 0.14 Ac. – located in the West Basin;
- From **STA 206+30±** to **STA 210+20:** Specifically the north 5-ft paved shoulder with its associated transition to the existing edge of pavement. This area is proposed to sheet flow into the existing roadside swale ultimately draining into the NSLRWCD Canal No. 103. The area for this is 0.04 Ac – located in the East Basin;
- From **STA 207+80±** to **STA 210+20:** Specifically the south 5-ft paved shoulder with its associated transition to the existing edge of pavement. This area is proposed to sheet flow into the existing roadside swale ultimately draining into the NSLRWCD Canal No. 103. The area for this is 0.14 Ac – located in the East Basin.

On Glades Cutoff Road:

- From **STA 409+30** to **STA 413+60:** Specifically the east 5-ft shoulder with its associated transition to the existing edge of pavement. This area is proposed to sheet flow into the existing roadside swale ultimately draining into the NSLRWCD Canal No. 103. The area for this is 0.08 Ac. – located in the West Basin;
- From **STA 409+30** to **STA 413+60:** Specifically the west 5-ft shoulder with its associated transition to the existing edge of pavement. This area is proposed to sheet flow into the existing roadside swale ultimately draining into the NSLRWCD Canal No. 103. The area for this is 0.12 Ac. – located in the West Basin;
- From **STA 441+00** to **STA 446+39:** Specifically the east 5-ft shoulder at the railroad spur with its associated transition to the existing edge of pavement past the spur. This area is proposed to sheet flow into the existing roadside swale

ultimately draining into the NSLRWCD Canal No. 102. The area for this is 0.14 Ac. – located in the North Basin;

WATER QUALITY/QUANTITY COMPENSATION TABLE

BASIN	AREA TO BE MITIGATED	EXISTING IMPERVIOUS AREA TREATED	SURPLUS or DEFICIT
WEST	0.34 Ac	2.24 Ac	*SURPLUS* OF 1.90 Ac
EAST	0.18 Ac	0.85 Ac	*SURPLUS* OF 0.67 Ac
NORTH	0.14 Ac	0.78 Ac	*SURPLUS* OF 0.64 Ac
TOTAL	0.66 Ac	3.87 Ac	*SURPLUS* OF 3.21 Ac

As shown, the three basins treat far more water quality/quantity surface area than the additional impervious area that is allowed to runoff untreated.

2. **USE OF SLOTTED DRAIN:** An innovative use of slot drain will be installed in the proposed 5-ft paved shoulder along Glades Cutoff Road in the North Basin. This slot drain will collect and transmit runoff from the roadway generated by rainfall events. The use of this storm water collection solution is being used due to the tight confines between the proposed edge of pavement and the County right of way along the FEC railroad right of way and Tropicana Products property.

Relevant specifics are:

- From the USDOT, Hydraulic Engineering Circular No. 12 dated March 1984: "The grate on a standard 20-ft length of Slotted Drain will intercept up to 50% more runoff than most standard 2' x 2' grate inlets.";
- FHWA testing on straight-sided grate has shown its efficiency to resist clogging range from 73% and 86%;
- Per CONTECH Construction Product, Inc.: "Slotted Drain is used to intercept runoff from wide, flat areas such as parking lots and highways. In these installations, the drain is placed traverse to the direction of flow, so that the open slot acts as a weir intercepting all of the flow uniformly along the entire length of the drain."
- FHWA Report No. FHWA-RD-79-106 has tested overland flow (sheet flow) with the Slotted Drain. The test system was designed to supply at least 0.025 cfs per foot, which corresponds to a rainstorm of 15 inches per hour over a 72-foot-wide roadway (i.e. six lanes).

In addition, attached are cut sheets from CONTECH Products, Inc. about the Slotted Drain.

3. **EAST TORINO PARKWAY IMPROVEMENTS:** Improvements to East Torino Parkway - south of the Midway Road right of way - in the City of Port St. Lucie were provided to us by Culpepper & Terpening, Inc. who designed and permitting the improvements for the City of Port St. Lucie/Brisbane Properties.

No changes are proposed to the East Torino Parkway work, which is assumed permitted, so no permit is being applied for this part of the work.

4. **EAST POND MAINTENANCE:** The East Basin pond has been designed to meet the SFWMD Basis of Review criteria for a 20-ft maintenance easement at no more than 4:1 slopes – on the east and west sides. Sixteen feet has been provided on the north and south sides in order to get from natural ground to the control water elevation within the limits of the County's property. It is suggested that since the north and south property lines abut public right of way at more than a 4:1 slope AND that the intent of the maintenance strip criteria in the Basis of Review is for access & maintenance around the detention area – that the spirit and intent is met.

EAST BASIN

Storm Event Summary Table
EAST BASIN

	Pre-Development		Post-Development	
	Maximum Discharge (cfs)	Maximum Stage (NGVD)	Maximum Discharge (cfs)	Maximum Stage (NGVD)
10 Year - 1 Day			0.1	18.0
10 Year - 3 Day	0.3	N / A	0.3	19.0
100 Year - 3 Day			0.5	19.0
100 Year - Zero Discharge*			0.0	18.8

** Predicted 100 Year 3 Day 0-Discharge maximum stage is less than the 100 Year 3 Day storm because of predicted tail water effect.*

EAST BASIN

AdICPR Input Information

PRE-Development Stormwater Calculations
EAST BASIN

Project: Midway/Glades
Project #: 95-0010C

Revised:
Engineer: ZZ
Date: 1/20/2003

North St. Lucie River Water Control District
Discharge Criteria

* The allowable discharge within the North St. Lucie River Water Control District is limited to an average of 2 Ac-In per day. Therefore, a pre-development calculation is not necessary given the maximum discharge criteria for the NSLRWCD.

	Project Acreage	=	4.04	Acres
	(2 Inches per Day) x (Project Acreage)	=	8.08	Ac-Inches
8.08	Ac-Inches x (1 ft / 12 inches)	=	0.67	Ac-Feet
0.67	Ac-Feet x (43,560 SF / 1 Acre)	=	29,330	CF per day
29,330	CF per day x (1 day / 86,400 seconds)	=	*0.34*	cfs

POST - Development Basin
EAST BASIN

Project: Midway/Glades
Project #: 95-0010C

Revised:
Engineer: ZZ
Date: 1/20/2003

Land Use Table

Use	Imp. (ac)	Pervious (ac)	Total (ac)
Pavement & Curb =	2.90	0.0[illegible]	[illegible].90
Wet Detention (C.W.E.) =	0.50	0.00	0.50
Wet Detention (Slopes) =	0.00	0.29	0.29
Remaining Open Space =	0.00	0.35	0.35
TOTAL =	3.40	0.64	4.04

Find Curve Number:

Exist. 20-21

Avg. Pervious Ground El. =	22.00	
Control Elevation =	17.50	ESTIMATED FROM ADJACENT WATER BODIES
Distance to Water Table =	4.50	

Soil Storage Table

Depth to W.T. (ft)	Coastal Storage (in)	Flatwoods Storage (in)	Depression Storage (in)
1.0	0.6	0.6	0.6
1.5	1.6	1.6	1.4
2.0	2.5	2.5	2.1
2.5	4.6	4.0	3.3
3.0	6.6	5.4	4.4
3.5	8.8	7.2	5.6
4.0	10.9	9.0	6.8

Find the basin's soil classification and input below as "Soil Storage" using the above "Depth to W.T.".

Developed Pervious Area =	0.64	
Undeveloped Pervious Area =	0.00	
Soil Storage =	9.00	inches
Soil Moisture Storage (S) =	1.07	inches
Curve Number =	90.3	

MIDWAY ROAD GLADES CUTOFF ROAD

POST-DEVELOPMENT
STAGE - STORAGE CALCULATION

Execution Date: 1/20/2003
Engineer's Name: ZZ
Job No: 95-0010C

Computation Type: Stage-Storage

Starting Stage: 17.5
Ending Stage: 26.5
Stage Increment: 0.50

Total Acreage: 4.04
Impervious: 3.40
Pervious: 0.64

EAST BASIN

Name	Pavement & Curb	WDA (CWE)	WDA (Slopes)	Remaining Open Space
Area	2.90	0.50	0.29	0.35
Start Elev	22.25	17.50	17.50	22.75
End Elev	25.20	0.00	21.50	25.70

Stage Feet NGVD	Linear Storage Ac-ft	Vert Storage Ac-ft	Linear Storage Ac-ft	Linear Storage Ac-ft	Total Storage Ac-ft
17.50	0.00	0.00	0.00	0.00	0.00
18.00	0.00	0.25	0.01	0.00	0.26
18.50	0.00	0.50	0.04	0.00	0.54
19.00	0.00	0.75	0.08	0.00	0.83
19.50	0.00	1.00	0.15	0.00	1.15
20.00	0.00	1.25	0.23	0.00	1.48
20.50	0.00	1.50	0.33	0.00	1.83
21.00	0.00	1.75	0.44	0.00	2.19
21.50	0.00	2.00	0.58	0.00	2.58
22.00	0.00	2.25	0.73	0.00	2.98
22.50	0.03	2.50	0.87	0.00	3.40
23.00	0.28	2.75	1.02	0.00	4.05
23.50	0.77	3.00	1.16	0.03	4.96
24.00	1.51	3.25	1.31	0.09	6.15
24.50	2.49	3.50	1.45	0.18	7.82
25.00	3.72	3.75	1.60	0.30	9.36
25.50	5.17	4.00	1.74	0.45	11.36
26.00	6.62	4.25	1.89	0.62	13.38
26.50	8.07	4.50	2.03	0.80	15.40

POST - Development Water Quality Calculations
EAST BASIN

Project: Midway/Glades
Project #: 95-0010C

Revised:
Engineer: ZZ
Date: 1/20/2003

1 - Inch Over the Project Area

(Treated Volume) 1-inch x 1-ft / 12-in x 4.04 (PROJECT AREA) = 0.34 (TREATED VOLUME) ac-ft

2.5 - Inches Times the Percent Impervious

(Site Area) 4.04 (PROJECT AREA (AC)) - (0.50 ("Wet" Water Management (AC)) + 0.00 (ROOFS (AC))) = 3.54 (SITE AREA) ac

(Impervious Area) 3.54 (SITE AREA (AC)) - 0.64 (PERVIOUS AREA (AC)) = 2.90 (IMPERVIOUS AREA) ac

(% Impervious) IMPERVIOUS AREA * 100% / SITE AREA (AC) = 81.92%

(2.5 - in x % Imp.) 2.5 - inches x 81.92% (PERCENT IMPERVIOUS) = 2.05 (INCHES TO BE TREATED) in

(Treated Volume) 2.05 (TREATED (IN)) x 1-ft / 12-in x 3.54 (PROJECT AREA - LAKES (AC)) = 0.60 (TREATED VOLUME) ac-ft

Required Wet Detention =	0.60 ac-ft	USED
Required Dry Detention (75% of wet) =	0.45 ac-ft	
Required Retention (50% of wet) =	0.30 ac-ft	
Dry Pre-Treatment (Commercial / Industrial Only)* =	0.17 ac-ft	

* An additional 0.5-inch of pretreatment for industrial or commercial projects - if needed.

POST - Development Bleeder Size Calculations
EAST BASIN

Project: Midway/Glades
Project #: 95-0010C

Revised:
Engineer: ZZ
Date: 1/20/2003

Allowed discharge in the first 24-hours is 0.5-inches of the required detention.

(Discharge Volume) 0.5-inch x 1-ft/12-in x $\frac{3.54}{\text{PROJECT AREA - WTA (AC)}}$ = $\frac{0.15}{\text{TREATED VOLUME}}$ ac-ft

(Conversion) $\frac{1\text{-day}}{86{,}400\text{-sec.}}$ x $\frac{43{,}560\text{-sf}}{1\text{-acre}}$ x $\frac{0.15}{\text{VOLUME (AC-FT)}}$ = $\frac{0.074}{\text{DISCHARGE}}$ cfs

Basin Area = 4.04 ac

Lake Area = 0.50 ac

Control Elevation = 17.50 ft

Bleeder Size (dia) = [3.00] in * First iteration use 3-inch diameter bleeder.

Weir Elevation = [18.60] ft * Enter the water quality elevation from the stage-storage table.

Bleeder Sizing:

Size bleeder to discharge at a rate of 0.5 in/day for the contributing area.

For circular orifice use the following equation.

$$A = \frac{Q}{4.8 * (H)^{.5}}$$

Q = Maximum Flow (cfs)
A = Cross Sectional Area (sq.ft.)
H = Head above bleeder centroid (ft)

Results,

Q = 0.074 cfs
H = 0.975 feet

A = [0.0157] sq.ft.

For diameter of the circular orifice use the following equation.

$$d = \left(\frac{4 * A}{Pi}\right)^{.5}$$

d = diameter (ft)
A = Cross Sectional Area (sq.ft.)

Results, A = 0.0157 sq.ft.

d = 0.1413 feet

Finally, the diameter in inches

d = 1.70 inches

* Bleeder to be 3-inch minimum.
* If diameter is larger than 3-inches then "Bleeder Size" input information needs to be revised until bleeder input size and output diameter equal each other.

Advanced Interconnected Channel & Pond Routing (adICPR Ver 1.40)
Copyright 1989, Streamline Technologies, Inc.

GLADES-MIDWAY: EAST BASIN 10 YEAR 3 DAY DESIGN STORM
01-22-03: P:\95-0010\ADICPR\EAST\EP1-103.*

CONTROL PARAMETERS

START TIME: .00
END TIME: 300.00

TO TIME (hours)	SIMULATION INC (secs)	PRINT INC (mins)
24.00	5.00	30.00
48.00	5.00	15.00
72.00	5.00	5.00
96.00	5.00	15.00
180.00	5.00	30.00
300.00	5.00	60.00

RUNOFF HYDROGRAPH FILE: DEFAULT
OFFSITE HYDROGRAPH FILE: DEFAULT
BOUNDARY DATABASE FILE: NONE

NOTE:

Advanced Interconnected Channel & Pond Routing (adICPR Ver 1.40)
Copyright 1989, Streamline Technologies, Inc.

GLADES-MIDWAY: EAST BASIN 10 YEAR 3 DAY DESIGN STORM
01-22-03: P:\95-0010\ADICPR\EAST\EP1-103.*

NODE NAME	NODE TYPE	INI STAGE (ft)	X-COOR (ft)	Y-COOR (ft)	LENGTH (ft)	STAGE (ft)	AR/TM/STR (ac/hr/af)
N-EAST	STRG	17.500	.000	.000	.000	17.500	.000
						18.500	.540
						19.500	1.150
						21.500	2.580
						22.250	3.170
						22.750	3.690
						23.000	4.050
						25.000	9.360
						26.500	15.400
OUT103	TIME	16.000	.000	.000	.000	16.000	.000
						17.000	24.000
						18.000	48.000
						19.000	72.000
						18.000	96.000
						17.000	180.000
						16.000	360.000

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        GLADES-MIDWAY: EAST BASIN 10 YEAR 3 DAY DESIGN STORM
        01-22-03: P:\95-0010\ADICPR\EAST\EP1-103.*

>>REACH NAME      : WCS-TOP
  FROM NODE       : N-EAST
  TO NODE         : OUT103
  REACH TYPE      : RECTANGULAR WEIR/GATE/ORIFICE, VILLEMONTE EQ.
  FLOW DIRECTION  : POSITIVE AND NEGATIVE FLOWS ALLOWED
    CREST EL. (ft):  21.000  CREST LN. (ft):  10.500    OPENING (ft): 999.000
       WEIR COEF.:   3.000       GATE COEF.:    .600 NUMBER OF ELEM.:   1.000
             NOTE:
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        GLADES-MIDWAY: EAST BASIN 10 YEAR 3 DAY DESIGN STORM
        01-22-03: P:\95-0010\ADICPR\EAST\EP1-103.*

>>REACH NAME       : WCS-WB
  FROM NODE        : N-EAST
  TO NODE          : OUT103
  REACH TYPE       : DROP STRUCTURE W/ ELLP. CULVERT
  FLOW DIRECTION   : POSITIVE AND NEGATIVE FLOWS ALLOWED
  TURBO SWITCH     : OFF

  CULVERT DATA     :
        SPAN (in):  30.000       RISE (in):  19.000     LENGTH (ft):  75.000
  U/S INVERT (ft):  16.000 D/S INVERT (ft):  16.000      MANNING N:    .012
      ENTRNC LOSS:    .500   # OF CULVERTS:   1.000

  POSITION A       : RECTANGULAR RISER SLOT
    CREST EL. (ft):  18.600  CREST LN. (ft):   3.000    OPENING (ft):  2.400
        WEIR COEF.:   3.200       GATE COEF.:    .600 NUMBER OF ELEM.:  1.000

  POSITION B       : CIRCULAR RISER SLOT
    INVERT EL. (ft):  17.500       SPAN (in):  3.000       RISE (in):  3.000
        WEIR COEF.:   3.200       GATE COEF.:    .600 NUMBER OF ELEM.:  1.000

            NOTE: EAST BASIN - WCS WEIR & BLEEDER
```

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GLADES-MIDWAY: EAST BASIN 10 YEAR 3 DAY DESIGN STORM
01-22-03: P:\95-0010\ADICPR\EAST\EP1-103.*

REACH SUMMARY

INDEX	RCHNAME	FRMNODE	TONODE	REACH TYPE
1	WCS-TOP	N-EAST	OUT103	RECTANGULAR WEIR/GATE/ORIFICE, VILLEMONTE EQ
2	WCS-MB	N-EAST	OUT103	DROP STRUCTURE W/ ELLP. CULVERT

EAST BASIN

AdICPR Output Information

EAST BASIN

10 Year 24 Hour Storm Event

Advanced Interconnected Channel & Pond Routing (adICPR Ver 1.40)
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GLADES-MIDWAY: EAST BASIN 10 YEAR 24 HOUR STORM EVENT
01-22-03: P:\95-0010\ADICPR\EAST\EP1-101.*

BASIN NAME	EAST
NODE NAME	N-EAST
TIME INCREMENT (min)	5.00
RAINFALL FILE	SFWMD24
RAIN AMOUNT (in)	5.50
STORM DURATION (hrs)	72.00
AREA (ac)	.79
CURVE NUMBER	90.00
DCIA (%)	.00
TC (mins)	15.00
LAG TIME (hrs)	.00
BASIN STATUS	ONSITE

BASIN	QMX (cfs)	TMX (hrs)	VOL (in)	NOTES
EAST	.91	35.92	4.36	ROADWAY AND POND SITE

Exhibit B

Advanced Interconnected Channel & Pond Routing (adICPR Ver 1.40)
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GLADES-MIDWAY: EAST BASIN 10 YEAR 24 HOUR STORM EVENT
01-22-03: P:\95-0010\ADICPR\EAST\EP10-01.*

REACH MAXIMUM FLOW REPORT

REACH ID	TIME (hrs)	FLOW (cfs)	FR NODE NAME	STAGE (ft)	TO NODE NAME	STAGE (ft)
WCS-TOP	.00	.00	N-EAST	17.50	OUT103	16.00
WCS-WB	42.00	.14	N-EAST	17.98	OUT103	17.63

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GLADES-MIDWAY: EAST BASIN 10 YEAR 24 HOUR STORM EVENT
01-22-03: P:\95-0010\ADICPR\EAST\EP1-101.*

NODAL MIN/MAX/TIME CONDITIONS REPORT

NODE ID	PARAMETER	<-- MINIMUMS --> VALUE	TIME (hr)	<-- MAXIMUMS --> VALUE	TIME (hr)
N-EAST	STAGE (ft):	17.50	11.00	18.01	37.75
	VOLUME (af):	.00	10.50	.28	37.75
	RUNOFF (cfs):	.00	300.00	.90	35.75
	OFFSITE (cfs):	.00	300.00	.00	300.00
	OTHER (cfs):	.00	300.00	.00	300.00
	OUTFLOW (cfs):	-.14	24.00	.14	42.00
OUT103	STAGE (ft):	7.50	300.00	18.00	24.00
	VOLUME (af):	-.11	33.50	.28	300.00
	RUNOFF (cfs):	.00	300.00	.00	300.00
	OFFSITE (cfs):	.00	300.00	.00	300.00
	OTHER (cfs):	-.14	24.00	.14	42.00
	OUTFLOW (cfs):	.00	300.00	.00	300.00

EAST BASIN

10 Year 3 Day Design Storm Event

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GLADES-MIDWAY: EAST BASIN 10 YEAR 3 DAY DESIGN STORM
01-22-03: P:\95-0010\ADICPR\EAST\EP1-103.*

BASIN NAME	EAST
NODE NAME	N-EAST
TIME INCREMENT (min)	5.00
RAINFALL FILE	SFWMD72
RAIN AMOUNT (in)	8.50
STORM DURATION (hrs)	72.00
AREA (ac)	.79
CURVE NUMBER	90.00
DCIA (%)	.00
TC (mins)	15.00
LAG TIME (hrs)	.00
BASIN STATUS	ONSITE

BASIN	QMX (cfs)	TMX (hrs)	VOL (in)	NOTES
EAST	2.51	59.92	7.30	ROADWAY AND POND SITE

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GLADES-MIDWAY: EAST BASIN 10 YEAR 3 DAY DESIGN STORM
01-22-03: P:\95-0010\ADICPR\EAST\EP1-103.*

REACH MAXIMUM FLOW REPORT

REACH ID	TIME (hrs)	FLOW (cfs)	FR NODE NAME	STAGE (ft)	TO NODE NAME	STAGE (ft)
WCL-TOP	.00	.00	N-EAST	17.50	OUT103	16.00
WCS-WB	73.50	.30	N-EAST	18.95	OUT103	18.94

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GLADES-MIDWAY: EAST BASIN 10 AY DESIGN STORM
01-22-03: P:\95-0010\ADICPR\EA3 103.*

NODAL MIN/MAX/TIME CONDITIONS REPORT

NODE ID	PARAMETER	<-- MINIMUMS --> VALUE	TIME (hr)	<-- MAXIMUMS --> VALUE	TIME (hr)
N-EAST	STAGE (ft):	17.50	5.50	18.90	[illegible]
	VOLUME (af):	.00	5.50	.84	[illegible]
	RUNOFF (cfs):	.00	300.00	2.57	[illegible]
	OFFSITE (cfs):	.00	300.00	.00	300.00
	OTHER (cfs):	.00	300.00	.00	300.00
	OUTFLOW (cfs):	-.28	65.83	.30	73.50
OUT103	STAGE (ft):	16.00	.00	19.00	72.00
	VOLUME (af):	-.36	72.00	.47	300.00
	RUNOFF (cfs):	.00	300.00	.00	300.00
	OFFSITE (cfs):	.00	300.00	.00	300.00
	OTHER (cfs):	-.28	65.83	.30	73.50
	OUTFLOW (cfs):	.00	300.00	.00	300.00

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GLADES-MIDWAY: EAST BASIN 10 YEAR 3 DAY DESIGN STORM
01-22-03: P:\95-0010\ADICPR\EAST\EP1-103.*

NODAL STAGE/VOLUME/FLOW REPORT

NODE ID: M-EAST

TIME (hrs)	STAGE (ft)	VOLUME (af)	INFLOW RUNOFF (cfs)	INFLOW OFFSITE (cfs)	OTHER (cfs)	OUTFLOW (cfs)
.00	17.50	.00	.00	.00	.00	.00
.50	17.50	.00	.00	.00	.00	.00
1.00	17.50	.00	.00	.00	.00	.00
1.50	17.50	.00	.00	.00	.00	.00
2.00	17.50	.00	.00	.00	.00	.00
2.50	17.50	.00	.00	.00	.00	.00
3.00	17.50	.00	.00	.00	.00	.00
3.50	17.50	.00	.00	.00	.00	.00
4.00	17.50	.00	.00	.00	.00	.00
4.50	17.50	.00	.00	.00	.00	.00
5.00	17.50	.00	.00	.00	.00	.00
5.50	17.50	.00	.00	.00	.00	.00
6.00	17.50	.00	.00	.00	.00	.00
6.50	17.50	.00	.00	.00	.00	.00
7.00	17.50	.00	.00	.00	.00	.00
7.50	17.50	.00	.00	.00	.00	.00
8.00	17.50	.00	.00	.00	.00	.00
8.50	17.50	.00	.00	.00	.00	.00
9.00	17.50	.00	.01	.00	.00	.00
9.50	17.50	.00	.01	.00	.00	.00
10.00	17.50	.00	.01	.00	.00	.00
10.50	17.50	.00	.01	.00	.00	.00
11.00	17.50	.00	.01	.00	.00	.00
11.50	17.50	.00	.01	.00	.00	.00
12.00	17.50	.00	.01	.00	.00	.00
12.50	17.51	.00	.01	.00	.00	.00
13.00	17.51	.00	.01	.00	.00	.00
13.50	17.51	.00	.01	.00	.00	.00
14.00	17.51	.00	.01	.00	.00	.00
14.50	17.51	.00	.01	.00	.00	.00
15.00	17.51	.01	.01	.00	.00	.00
15.50	17.51	.01	.01	.00	.00	.00
16.00	17.51	.01	.01	.00	.00	.00
16.50	17.51	.01	.01	.00	.00	.00
17.00	17.51	.01	.01	.00	.00	.00
17.50	17.51	.01	.01	.00	.00	.00
18.00	17.52	.01	.02	.00	.00	.00
18.50	17.52	.01	.02	.00	.00	.00
19.00	17.52	.01	.02	.00	.00	.00
19.50	17.52	.01	.02	.00	.00	.00
20.00	17.52	.01	.02	.00	.00	.00
20.50	17.52	.01	.02	.00	.00	.00
21.00	17.52	.01	.02	.00	.00	.00
21.50	17.52	.01	.02	.00	.00	.00

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GLADES-MIDWAY: EAST BASIN 10 YEAR 3 DAY DESIGN STORM
01-22-03: P:\95-0010\ADICPR\EAST\EP1-103.*

NODAL STAGE/VOLUME/FLOW REPORT

NODE ID: N-EAST

TIME (hrs)	STAGE (ft)	VOLUME (af)	INFLOW RUNOFF (cfs)	INFLOW OFFSITE (cfs)	INFLOW OTHER (cfs)	OUTFLOW (cfs)
22.00	17.53	.01	.02	.00	.00	.00
22.50	17.53	.01	.02	.00	.00	.00
23.00	17.53	.02	.02	.00	.00	.00
23.50	17.53	.02	.02	.00	.00	.00
24.00	17.53	.02	.02	.00	.00	.00
24.25	17.53	.02	.02	.00	.00	.00
24.50	17.53	.02	.03	.00	.00	.00
24.75	17.53	.02	.03	.00	.00	.00
25.00	17.53	.02	.03	.00	.00	.00
25.25	17.54	.02	.03	.00	.00	.00
25.50	17.54	.02	.03	.00	.00	.00
25.75	17.54	.02	.03	.00	.00	.00
26.00	17.54	.02	.03	.00	.00	.00
26.25	17.54	.02	.03	.00	.00	.00
26.50	17.54	.02	.03	.00	.00	.00
26.75	17.54	.02	.03	.00	.00	.00
27.00	17.54	.02	.03	.00	.00	.00
27.25	17.54	.02	.03	.00	.00	.00
27.50	17.54	.02	.03	.00	.00	.00
27.75	17.55	.02	.03	.00	.00	.00
28.00	17.55	.02	.03	.00	.00	.00
28.25	17.55	.03	.03	.00	.00	.00
28.50	17.55	.03	.03	.00	.00	.00
28.75	17.55	.03	.03	.00	.00	.00
29.00	17.55	.03	.03	.00	.00	.00
29.25	17.55	.03	.03	.00	.00	.01
29.50	17.55	.03	.03	.00	.00	.01
29.75	17.55	.03	.03	.00	.00	.01
30.00	17.55	.03	.03	.00	.00	.01
30.25	17.56	.03	.03	.00	.00	.01
30.50	17.56	.03	.03	.00	.00	.01
30.75	17.56	.03	.03	.00	.00	.01
31.00	17.56	.03	.03	.00	.00	.01
31.25	17.56	.03	.03	.00	.00	.01
31.50	17.56	.03	.03	.00	.00	.01
31.75	17.56	.03	.03	.00	.00	.01
32.00	17.56	.03	.03	.00	.00	.01
32.25	17.56	.03	.03	.00	.00	.01
32.50	17.56	.03	.03	.00	.00	.01
32.75	17.56	.04	.03	.00	.00	.01
33.00	17.57	.04	.03	.00	.00	.01
33.25	17.57	.04	.03	.00	.00	.01
33.50	17.57	.04	.03	.00	.00	.01
33.75	17.57	.04	.03	.00	.00	.01

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GLADES-MIDWAY: EAST BASIN 10 YEAR 3 DAY DESIGN STORM
01-22-03: P:\95-0010\ADICPR\EAST\EP1-103.*

NODAL STAGE/VOLUME/FLOW REPORT

NODE ID: N-EAST

TIME (hrs)	STAGE (ft)	VOLUME (af)	|<-- INFLOW --> RUNOFF (cfs)	INFLOW OFFSITE (cfs)	INFLOW OTHER (cfs)|	OUTFLOW (cfs)
34.00	17.57	.04	.03	.00	.00	.01
34.25	17.57	.04	.03	.00	.00	.01
34.50	17.57	.04	.03	.00	.00	.01
34.75	17.57	.04	.03	.00	.00	.01
35.00	17.57	.04	.03	.00	.00	.01
35.25	17.58	.04	.03	.00	.00	.01
35.50	17.58	.04	.03	.00	.00	.01
35.75	17.58	.04	.03	.00	.00	.01
36.00	17.58	.04	.04	.00	.00	.01
36.25	17.58	.04	.04	.00	.00	.01
36.50	17.58	.04	.04	.00	.00	.01
36.75	17.58	.04	.04	.00	.00	.01
37.00	17.58	.04	.04	.00	.00	.01
37.25	17.58	.04	.04	.00	.00	.01
37.50	17.58	.04	.04	.00	.00	.01
37.75	17.58	.05	.04	.00	.00	.01
38.00	17.58	.05	.04	.00	.00	.01
38.25	17.59	.05	.04	.00	.00	.00
38.50	17.59	.05	.04	.00	.00	-.01
38.75	17.59	.05	.04	.00	.00	-.01
39.00	17.59	.05	.04	.00	.00	-.02
39.25	17.59	.05	.04	.00	.00	-.02
39.50	17.60	.05	.04	.00	.00	-.02
39.75	17.60	.05	.04	.00	.00	-.03
40.00	17.60	.06	.04	.00	.00	-.03
40.25	17.60	.06	.04	.00	.00	-.04
40.50	17.61	.06	.04	.00	.00	-.04
40.75	17.61	.06	.04	.00	.00	-.04
41.00	17.61	.06	.04	.00	.00	-.05
41.25	17.62	.06	.04	.00	.00	-.05
41.50	17.62	.07	.04	.00	.00	-.06
41.75	17.63	.07	.04	.00	.00	-.06
42.00	17.63	.07	.04	.00	.00	-.06
42.25	17.63	.07	.04	.00	.00	-.06
42.50	17.64	.07	.04	.00	.00	-.07
42.75	17.64	.08	.04	.00	.00	-.07
43.00	17.65	.08	.04	.00	.00	-.07
43.25	17.65	.08	.04	.00	.00	-.07
43.50	17.65	.08	.04	.00	.00	-.09
43.75	17.66	.09	.04	.00	.00	-.09
44.00	17.66	.09	.04	.00	.00	-.10
44.25	17.67	.09	.04	.00	.00	-.10
44.50	17.68	.09	.04	.00	.00	-.10
44.75	17.68	.10	.04	.00	.00	-.10

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GLADES-MIDWAY: EAST BASIN 10 YEAR 3 DAY DESIGN STORM
01-22-03: P:\95-0010\ADICPR\EAST\EP1-103.*

NODAL STAGE/VOLUME/FLOW REPORT

NODE ID: N-EAST

TIME (hrs)	STAGE (ft)	VOLUME (af)	INFLOW |<-------- RUNOFF (cfs)	INFLOW OFFSITE (cfs)	INFLOW --------> OTHER (cfs)	OUTFLOW (cfs)
45.00	17.69	.10	.04	.00	.00	-.10
45.25	17.69	.10	.04	.00	.00	-.10
45.50	17.70	.11	.04	.00	.00	-.11
45.75	17.70	.11	.04	.00	.00	-.11
46.00	17.71	.11	.04	.00	.00	-.11
46.25	17.71	.12	.04	.00	.00	-.11
46.50	17.72	.12	.04	.00	.00	-.11
46.75	17.72	.12	.04	.00	.00	-.11
47.00	17.73	.12	.04	.00	.00	-.11
47.25	17.74	.13	.04	.00	.00	-.11
47.50	17.74	.13	.04	.00	.00	-.11
47.75	17.75	.13	.04	.00	.00	-.11
48.00	17.75	.14	.04	.00	.00	-.12
48.08	17.76	.14	.04	.00	.00	-.12
48.17	17.76	.14	.04	.00	.00	-.12
48.25	17.76	.14	.04	.00	.00	-.12
48.33	17.76	.14	.04	.00	.00	-.12
48.42	17.76	.14	.04	.00	.00	-.12
48.50	17.77	.14	.04	.00	.00	-.12
48.58	17.77	.14	.04	.00	.00	-.12
48.67	17.77	.15	.04	.00	.00	-.12
48.75	17.77	.15	.04	.00	.00	-.12
48.83	17.77	.15	.04	.00	.00	-.12
48.92	17.78	.15	.04	.00	.00	-.12
49.00	17.78	.15	.04	.00	.00	-.12
49.08	17.78	.15	.04	.00	.00	-.12
49.17	17.78	.15	.04	.00	.00	-.12
49.25	17.79	.15	.04	.00	.00	-.12
49.33	17.79	.16	.04	.00	.00	-.12
49.42	17.79	.16	.04	.00	.00	-.12
49.50	17.79	.16	.04	.00	.00	-.12
49.58	17.79	.16	.04	.00	.00	-.12
49.67	17.80	.16	.04	.00	.00	-.12
49.75	17.80	.16	.04	.00	.00	-.12
49.83	17.80	.16	.04	.00	.00	-.12
49.92	17.80	.16	.05	.00	.00	-.12
50.00	17.80	.16	.05	.00	.00	-.12
50.08	17.81	.17	.05	.00	.00	-.13
50.17	17.81	.17	.05	.00	.00	-.13
50.25	17.81	.17	.05	.00	.00	-.13
50.33	17.81	.17	.05	.00	.00	-.13
50.42	17.82	.17	.05	.00	.00	-.13
50.50	17.82	.17	.05	.00	.00	-.13
50.58	17.82	.17	.05	.00	.00	-.13

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GLADES-MIDWAY: EAST BASIN 10 YEAR 3 DAY DESIGN STORM
01-22-03: P:\95-0010\ADICPR\EAST\EP1-103.*

NODAL STAGE/VOLUME/FLOW REPORT

NODE ID: N-EAST

TIME (hrs)	STAGE (ft)	VOLUME (af)	INFLOW |<-------- RUNOFF (cfs)	INFLOW OFFSITE (cfs)	INFLOW OTHER (cfs) -------->|	OUTFLOW (cfs)
50.67	17.82	.17	.05	.00	.00	-.13
50.75	17.82	.18	.05	.00	.00	-.13
50.83	17.83	.18	.05	.00	.00	-.13
50.92	17.83	.18	.05	.00	.00	-.13
51.00	17.83	.18	.05	.00	.00	-.13
51.08	17.83	.18	.05	.00	.00	-.13
51.17	17.84	.18	.06	.00	.00	-.13
51.25	17.84	.19	.06	.00	.00	-.13
51.33	17.84	.19	.06	.00	.00	-.13
51.42	17.84	.19	.06	.00	.00	-.13
51.50	17.85	.19	.06	.00	.00	-.13
51.58	17.85	.19	.06	.00	.00	-.13
51.67	17.85	.19	.06	.00	.00	-.13
51.75	17.85	.19	.06	.00	.00	-.13
51.83	17.86	.19	.06	.00	.00	-.13
51.92	17.86	.19	.06	.00	.00	-.13
52.00	17.86	.20	.06	.00	.00	-.13
52.08	17.87	.20	.07	.00	.00	-.13
52.17	17.87	.20	.07	.00	.00	-.13
52.25	17.87	.20	.07	.00	.00	-.13
52.33	17.87	.20	.07	.00	.00	-.13
52.42	17.88	.20	.07	.00	.00	-.13
52.50	17.88	.20	.07	.00	.00	-.13
52.58	17.88	.21	.07	.00	.00	-.13
52.67	17.88	.21	.08	.00	.00	-.13
52.75	17.89	.21	.08	.00	.00	-.13
52.83	17.89	.21	.08	.00	.00	-.13
52.92	17.89	.21	.08	.00	.00	-.13
53.00	17.89	.21	.08	.00	.00	-.13
53.08	17.90	.22	.09	.00	.00	-.13
53.17	17.90	.22	.09	.00	.00	-.13
53.25	17.90	.22	.09	.00	.00	-.13
53.33	17.91	.22	.09	.00	.00	-.13
53.42	17.91	.22	.09	.00	.00	-.13
53.50	17.91	.22	.09	.00	.00	-.13
53.58	17.92	.23	.09	.00	.00	-.13
53.67	17.92	.23	.09	.00	.00	-.13
53.75	17.92	.23	.10	.00	.00	-.13
53.83	17.93	.23	.10	.00	.00	-.13
53.92	17.93	.23	.10	.00	.00	-.13
54.00	17.93	.23	.10	.00	.00	-.13
54.08	17.93	.23	.11	.00	.00	-.13
54.17						
54.25						

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GLADES-MIDWAY: EAST BASIN 10 YEAR 3 DAY DESIGN STORM
01-22-03: P:\95-0010\ADICPR\EAST\EP1-103.*

NODAL STAGE/VOLUME/FLOW REPORT

NODE ID: N-EAST

TIME (hrs)	STAGE (ft)	VOLUME (af)	INFLOW |<-------- RUNOFF (cfs)	INFLOW OFFSITE (cfs)	INFLOW --------> OTHER (cfs)	OUTFLOW (cfs)
54.33	17.94	.24	.11	.00	.00	-.13
54.42	17.94	.24	.11	.00	.00	-.13
54.50	17.94	.24	.11	.00	.00	-.14
54.58	17.95	.24	.11	.00	.00	-.14
54.67	17.95	.24	.11	.00	.00	-.14
54.75	17.95	.24	.11	.00	.00	-.14
54.83	17.96	.25	.11	.00	.00	-.14
54.92	17.96	.25	.11	.00	.00	-.14
55.00	17.96	.25	.12	.00	.00	-.14
55.08	17.97	.25	.12	.00	.00	-.14
55.17	17.97	.25	.12	.00	.00	-.14
55.25	17.97	.26	.13	.00	.00	-.14
55.33	17.98	.26	.13	.00	.00	-.14
55.42	17.98	.26	.13	.00	.00	-.14
55.50	17.98	.26	.13	.00	.00	-.14
55.58	17.99	.26	.13	.00	.00	-.14
55.67	17.99	.27	.13	.00	.00	-.14
55.75	17.99	.27	.13	.00	.00	-.14
55.83	18.00	.27	.13	.00	.00	-.14
55.92	18.00	.27	.14	.00	.00	-.14
56.00	18.00	.27	.14	.00	.00	-.14
56.08	18.01	.28	.14	.00	.00	-.14
56.17	18.01	.28	.15	.00	.00	-.14
56.25	18.01	.28	.15	.00	.00	-.14
56.33	18.02	.28	.15	.00	.00	-.14
56.42	18.02	.28	.15	.00	.00	-.14
56.50	18.03	.29	.15	.00	.00	-.14
56.58	18.03	.29	.16	.00	.00	-.14
56.67	18.03	.29	.16	.00	.00	-.14
56.75	18.04	.29	.16	.00	.00	-.14
56.83	18.04	.29	.16	.00	.00	-.14
56.92	18.04	.30	.16	.00	.00	-.14
57.00	18.05	.30	.17	.00	.00	-.14
57.08	18.05	.30	.17	.00	.00	-.14
57.17	18.06	.30	.18	.00	.00	-.13
57.25	18.06	.31	.18	.00	.00	-.13
57.33	18.06	.31	.18	.00	.00	-.13
57.42	18.07	.31	.19	.00	.00	-.13
57.50	18.07	.31	.19	.00	.00	-.13
57.58	18.08	.32	.19	.00	.00	-.13
57.67	18.08	.32	.20	.00	.00	-.13
57.75	18.08	.32	.20	.00	.00	-.13
57.83	18.09	.32	.20	.00	.00	-.13
57.92	18.09	.32	.20	.00	.00	-.13

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GLADES-MIDWAY: EAST BASIN 10 YEAR 3 DAY DESIGN STORM
01-22-93: P:\95-0010\ADICPR\EAST\EP1-103.*

NODAL STAGE/VOLUME/FLOW REPORT

NODE ID: M-EAST

TIME (hrs)	STAGE (ft)	VOLUME (af)	INFLOW |<-- RUNOFF (cfs)	INFLOW OFFSITE (cfs)	INFLOW OTHER (cfs)-->	OUTFLOW (cfs)
58.00	18.10	.32	.20	.00	.00	-.13
58.08	18.10	.32	.21	.00	.00	-.13
58.17	18.11	.33	.21	.00	.00	-.13
58.25	18.11	.33	.22	.00	.00	-.13
58.33	18.11	.33	.22	.00	.00	-.13
58.42	18.12	.33	.23	.00	.00	-.13
58.50	18.12	.34	.23	.00	.00	-.13
58.58	18.13	.34	.25	.00	.00	-.13
58.67	18.13	.34	.26	.00	.00	-.13
58.75	18.14	.34	.28	.00	.00	-.13
58.83	18.14	.35	.29	.00	.00	-.13
58.92	18.15	.35	.31	.00	.00	-.13
59.00	18.15	.35	.32	.00	.00	-.13
59.08	18.16	.36	.35	.00	.00	-.13
59.17	18.17	.36	.38	.00	.00	-.13
59.25	18.17	.36	.41	.00	.00	-.13
59.33	18.18	.37	.56	.00	.00	-.13
59.42	18.19	.37	.70	.00	.00	-.13
59.50	18.20	.38	.84	.00	.00	-.12
59.58	18.22	.39	1.35	.00	.00	-.12
59.67	18.24	.40	1.86	.00	.00	-.12
59.75	18.27	.41	2.37	.00	.00	-.11
59.83	18.30	.43	2.44	.00	.00	-.10
59.92	18.33	.45	2.51	.00	.00	-.10
60.00	18.37	.47	2.57	.00	.00	-.09
60.08	18.40	.49	2.18	.00	.00	-.08
60.17	18.42	.50	1.78	.00	.00	-.07
60.25	18.45	.51	1.39	.00	.00	-.06
60.33	18.46	.52	1.23	.00	.00	-.05
60.42	18.48	.53	1.07	.00	.00	-.05
60.50	18.4	.54	.91	.00	.00	-.04
60.58	18.50	.54	.79	.00	.00	-.04
60.67	18.51	.55	.68	.00	.00	-.03
60.75	18.52	.55	.57	.00	.00	-.03
60.83	18.52	.56	.52	.00	.00	.02
60.92	18.53	.56	.48	.00	.00	.02
61.00	18.54	.56	.43	.00	.00	-.02
61.08	18.54	.56	.40	.00	.00	-.02
61.17	18.55	.57	.36	.00	.00	-.01
61.25	18.55	.57	.33	.00	.00	-.01
61.33	18.55	.57	.31	.00	.00	-.01
61.42	18.56	.57	.30	.00	.00	-.01
61.50	18.56	.58	.29	.00	.00	-.01
61.58	18.56	.58	.27	.00	.00	-.01

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GLADES-MIDWAY: EAST BASIN 10 YEAR 3 DAY DESIGN STORM
01-22-03: P:\95-0010\ADICPR\EAST\EP1-103.*

NODAL STAGE/VOLUME/FLOW REPORT

NODE ID: N-EAST

TIME (hrs)	STAGE (ft)	VOLUME (af)	|<-------- INFLOW --------> RUNOFF (cfs)	OFFSITE (cfs)	OTHER (cfs)	OUTFLOW (cfs)
61.67	18.57	.58	.26	.00	.00	-.01
61.75	18.57	.58	.25	.00	.00	-.01
61.83	18.57	.58	.24	.00	.00	-.01
61.92	18.58	.59	.23	.00	.00	-.02
62.00	18.58	.59	.23	.00	.00	-.02
62.08	18.58	.59	.21	.00	.00	-.02
62.17	18.58	.59	.20	.00	.00	-.02
62.25	18.59	.59	.19	.00	.00	-.02
62.33	18.59	.59	.18	.00	.00	-.02
62.42	18.59	.60	.18	.00	.00	-.02
62.50	18.59	.60	.17	.00	.00	-.03
62.58	18.59	.60	.17	.00	.00	-.03
62.67	18.60	.60	.16	.00	.00	-.04
62.75	18.60	.60	.16	.00	.00	-.05
62.83	18.60	.60	.15	.00	.00	-.05
62.92	18.60	.60	.15	.00	.00	-.06
63.00	18.61	.60	.15	.00	.00	-.07
63.08	18.61	.61	.15	.00	.00	-.08
63.17	18.61	.61	.15	.00	.00	-.08
63.25	18.61	.61	.15	.00	.00	-.09
63.33	18.62	.61	.15	.00	.00	-.10
63.42	18.62	.61	.15	.00	.00	-.11
63.50	18.62	.61	.15	.00	.00	-.11
63.58	18.63	.62	.15	.00	.00	-.12
63.67	18.63	.62	.15	.00	.00	-.13
63.75	18.63	.62	.15	.00	.00	-.14
63.83	18.64	.62	.14	.00	.00	-.15
63.92	18.64	.62	.14	.00	.00	-.15
64.00	18.64	.63	.14	.00	.00	-.16
64.08	18.65	.63	.13	.00	.00	-.17
64.17	18.65	.63	.12	.00	.00	-.18
64.25	18.65	.63	.11	.00	.00	-.19
64.33	18.66	.63	.10	.00	.00	-.19
64.42	18.66	.64	.10	.00	.00	-.20
64.50	18.66	.64	.09	.00	.00	-.21
64.56	18.67	.64	.09	.00	.00	-.22
64.67	18.67	.64	.09	.00	.00	-.23
64.75	18.67	.65	.09	.00	.00	-.23
64.83	18.68	.65	.09	.00	.00	-.24
64.92	18.68	.65	.09	.00	.00	-.25
65.00	18.68	.65	.09	.00	.00	-.25
65.08	18.69	.65	.09	.00	.00	-.26
65.17	18.69	.66	.09	.00	.00	-.26
65.25	18.70	.66	.09	.00	.00	-.27

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GLADES-MIDWAY: EAST BASIN 10 YEAR 3 DAY DESIGN STORM
01-22-03: P:\95-0010\ADICPR\EAST\EP1-103.*

NODAL STAGE/VOLUME/FLOW REPORT

NODE ID: N-EAST

TIME (hrs)	STAGE (ft)	VOLUME (af)	INFLOW RUNOFF (cfs)	INFLOW OFFSITE (cfs)	INFLOW OTHER (cfs)	OUTFLOW (cfs)
65.33	18.70	.66	.09	.00	.00	-.27
65.42	18.70	.66	.09	.00	.00	-.27
65.50	18.71	.67	.09	.00	.00	-.28
65.58	18.71	.67	.09	.00	.00	-.28
65.67	18.72	.67	.09	.00	.00	-.28
65.75	18.72	.68	.09	.00	.00	-.28
65.83	18.72	.68	.09	.00	.00	-.28
65.92	18.73	.68	.09	.00	.00	-.28
66.00	18.73	.68	.09	.00	.00	-.28
66.08	18.74	.69	.09	.00	.00	-.28
66.17	18.74	.69	.09	.00	.00	-.28
66.25	18.75	.69	.09	.00	.00	-.27
66.33	18.75	.69	.09	.00	.00	-.27
66.42	18.75	.70	.09	.00	.00	-.27
66.50	18.76	.70	.09	.00	.00	-.26
66.58	18.76	.70	.09	.00	.00	-.26
66.67	18.77	.70	.09	.00	.00	-.26
66.75	18.77	.71	.09	.00	.00	-.26
66.83	18.77	.71	.09	.00	.00	-.25
66.92	18.78	.71	.09	.00	.00	-.25
67.00	18.78	.71	.09	.00	.00	-.25
67.08	18.78	.72	.09	.00	.00	-.25
67.17	18.79	.72	.09	.00	.00	-.24
67.25	18.79	.72	.09	.00	.00	-.24
67.33	18.80	.72	.09	.00	.00	-.24
67.42	18.80	.72	.09	.00	.00	-.24
67.50	18.80	.73	.09	.00	.00	-.23
67.58	18.81	.73	.09	.00	.00	-.23
67.67	18.81	.73	.09	.00	.00	-.23
67.75	18.81	.74	.09	.00	.00	-.23
67.83	18.82	.74	.08	.00	.00	-.23
67.92	18.82	.74	.08	.00	.00	-.23
68.00	18.82	.74	.07	.00	.00	-.23
68.08	18.83	.75	.07	.00	.00	-.24
68.17	18.83	.75	.06	.00	.00	-.24
68.25	18.84	.75	.06	.00	.00	-.24
68.33	18.84	.75	.06	.00	.00	-.25
68.42	18.84	.76	.06	.00	.00	-.25
68.50	18.85	.76	.06	.00	.00	-.25
68.58	18.85	.76	.06	.00	.00	-.25
68.67	18.85	.76	.06	.00	.00	-.25
68.75	18.86	.76	.06	.00	.00	-.25
68.83	18.86	.76	.06	.00	.00	-.25
68.92	18.86	.76	.06	.00	.00	-.25

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GLADES-MIDWAY: EAST BASIN 10 YEAR 3 DAY DESIGN STORM
01-22-03: P:\95-0010\ADICPR\EAST\EP1-103.*

NODAL STAGE/VOLUME/FLOW REPORT

NODE ID: N-EAST

TIME (hrs)	STAGE (ft)	VOLUME (af)	INFLOW RUNOFF (cfs)	INFLOW OFFSITE (cfs)	INFLOW OTHER (cfs)	OUTFLOW (cfs)
69.00	18.87	.76	.06	.00	.00	-.25
69.08	18.87	.77	.06	.00	.00	-.25
69.17	18.87	.77	.06	.00	.00	-.25
69.25	18.88	.77	.06	.00	.00	-.25
69.33	18.88	.77	.06	.00	.00	-.25
69.42	18.88	.77	.06	.00	.00	-.25
69.50	18.89	.78	.06	.00	.00	-.25
69.58	18.89	.78	.06	.00	.00	-.25
69.67	18.89	.78	.06	.00	.00	-.25
69.75	18.90	.78	.06	.00	.00	-.25
69.83	18.90	.79	.06	.00	.00	-.25
69.92	18.91	.79	.06	.00	.00	-.25
70.00	18.91	.79	.06	.00	.00	-.25
70.08	18.91	.79	.06	.00	.00	-.25
70.17	18.92	.79	.06	.00	.00	-.25
70.25	18.92	.80	.06	.00	.00	-.25
70.33	18.92	.80	.06	.00	.00	-.25
70.42	18.93	.80	.06	.00	.00	-.25
70.50	18.93	.80	.06	.00	.00	-.25
70.58	18.93	.80	.05	.00	.00	-.25
70.67	18.94	.81	.06	.00	.00	-.25
70.75	18.94	.81	.06	.00	.00	-.25
70.83	18.94	.81	.06	.00	.00	-.25
70.92	18.95	.81	.06	.00	.00	-.25
71.00	18.95	.82	.06	.00	.00	-.25
71.08	18.95	.82	.06	.00	.00	-.25
71.17	18.96	.82	.06	.00	.00	-.25
71.25	18.96	.82	.06	.00	.00	-.25
71.33	18.97	.82	.06	.00	.00	-.25
71.42	18.97	.83	.06	.00	.00	-.25
71.50	18.97	.83	.06	.00	.00	-.25
71.58	18.98	.83	.06	.00	.00	-.25
71.67	18.98	.83	.06	.00	.00	-.25
71.75	18.98	.83	.06	.00	.00	-.25
71.83	18.99	.84	.06	.00	.00	-.25
71.92	18.99	.84	.05	.00	.00	-.25
72.00	18.99	.84	.05	.00	.00	-.26
72.25	18.99	.84	.02	.00	.00	.18
72.50	18.99	.84	.01	.00	.00	.27
72.75	18.98	.83	.00	.00	.00	.30
73.00	18.97	.82	.00	.00	.00	.30
73.25	18.96	.82	.00	.00	.00	.30
73.50	18.95	.81	.00	.00	.00	.30
73.75	18.94	.81	.00	.00	.00	.30

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GLADES-MIDWAY: EAST BASIN 10 YEAR 3 DAY DESIGN STORM
01-22-03: P:\95-0010\ADICPR\EAST\EP1-103.*

NODAL STAGE/VOLUME/FLOW REPORT

NODE ID: N-EAST

TIME (hrs)	STAGE (ft)	VOLUME (af)	INFLOW |<------- RUNOFF (cfs)	INFLOW OFFSITE (cfs)	INFLOW -------> OTHER (cfs)	OUTFLOW (cfs)
74.00	18.93	.80	.00	.00	.00	.30
74.25	18.92	.79	.00	.00	.00	.30
74.50	18.91	.79	.00	.00	.00	.30
74.75	18.90	.78	.00	.00	.00	.30
75.00	18.89	.78	.00	.00	.00	.30
75.25	18.88	.77	.00	.00	.00	.30
75.50	18.86	.76	.00	.00	.00	.30
75.75	18.85	.76	.00	.00	.00	.30
76.00	18.84	.75	.00	.00	.00	.30
76.25	18.83	.74	.00	.00	.00	.30
76.50	18.82	.74	.00	.00	.00	.30
76.75	18.81	.73	.00	.00	.00	.30
77.00	18.80	.73	.00	.00	.00	.29
77.25	18.79	.72	.00	.00	.00	.29
77.50	18.78	.71	.00	.00	.00	.29
77.75	18.78	.71	.00	.00	.00	.29
78.00	18.77	.70	.00	.00	.00	.29
78.25	18.76	.70	.00	.00	.00	.28
78.50	18.75	.69	.00	.00	.00	.28
78.75	18.74	.68	.00	.00	.00	.28
79.00	18.73	.68	.00	.00	.00	.27
79.25	18.72	.67	.00	.00	.00	.27
79.50	18.71	.67	.00	.00	.00	.26
79.75	18.70	.66	.00	.00	.00	.25
80.00	18.69	.66	.00	.00	.00	.24
80.25	18.69	.65	.00	.00	.00	.23
80.50	18.68	.65	.00	.00	.00	.22
80.75	18.67	.65	.00	.00	.00	.21
81.00	18.67	.64	.00	.00	.00	.20
81.25	18.66	.64	.00	.00	.00	.19
81.50	18.65	.63	.00	.00	.00	.18
81.75	18.65	.63	.00	.00	.00	.17
82.00	18.64	.63	.00	.00	.00	.16
82.25	18.64	.62	.00	.00	.00	.14
82.50	18.63	.62	.00	.00	.00	.13
82.75	18.63	.62	.00	.00	.00	.12
83.00	18.63	.62	.00	.00	.00	.12
83.25	18.62	.61	.00	.00	.00	.11
83.50	18.62	.61	.00	.00	.00	.10
83.75	18.62	.61	.00	.00	.00	.10
84.00	18.61	.61	.00	.00	.00	.10
84.25	18.61	.61	.00	.00	.00	.09
84.50	18.61	.60	.00	.00	.00	.09
84.75	18.60	.60	.00	.00	.00	.09

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GLADES-MIDWAY: EAST BASIN 10 YEAR 3 DAY DESIGN STORM
01-22-03: P:\95-0010\ADICPR\EAST\EP1-103.*

NODAL STAGE/VOLUME/FLOW REPORT

NODE ID: N-EAST

TIME (hrs)	STAGE (ft)	VOLUME (af)	INFLOW |<-------- RUNOFF (cfs)	INFLOW OFFSITE (cfs)	INFLOW --------> OTHER (cfs)	OUTFLOW (cfs)
85.00	18.60	.60	.00	.00	.00	.09
85.25	18.60	.60	.00	.00	.00	.09
85.50	18.59	.60	.00	.00	.00	.09
85.75	18.59	.60	.00	.00	.00	.10
86.00	18.59	.59	.00	.00	.00	.10
86.25	18.58	.59	.00	.00	.00	.10
86.50	18.58	.59	.00	.00	.00	.10
86.75	18.58	.59	.00	.00	.00	.10
87.00	18.57	.59	.00	.00	.00	.11
87.25	18.57	.58	.00	.00	.00	.11
87.50	18.57	.58	.00	.00	.00	.11
87.75	18.56	.58	.00	.00	.00	.11
88.00	18.56	.58	.00	.00	.00	.11
88.25	18.56	.57	.00	.00	.00	.11
88.50	18.55	.57	.00	.00	.00	.12
88.75	18.55	.57	.00	.00	.00	.12
89.00	18.54	.57	.00	.00	.00	.12
89.25	18.54	.56	.00	.00	.00	.12
89.50	18.54	.56	.00	.00	.00	.12
89.75	18.53	.56	.00	.00	.00	.12
90.00	18.53	.56	.00	.00	.00	.12
90.25	18.52	.55	.00	.00	.00	.13
90.50	18.52	.55	.00	.00	.00	.13
90.75	18.51	.55	.00	.00	.00	.13
91.00	18.51	.55	.00	.00	.00	.13
91.25	18.51	.54	.00	.00	.00	.13
91.50	18.50	.54	.00	.00	.00	.13
91.75	18.50	.54	.00	.00	.00	.13
92.00	18.49	.54	.00	.00	.00	.13
92.25	18.49	.53	.00	.00	.00	.14
92.50	18.48	.53	.00	.00	.00	.14
92.75	18.48	.53	.00	.00	.00	.14
93.00	18.47	.52	.00	.00	.00	.14
93.25	18.46	.52	.00	.00	.00	.14
93.50	18.46	.52	.00	.00	.00	.14
93.75	18.45	.52	.00	.00	.00	.14
94.00	18.45	.51	.00	.00	.00	.14
94.25	18.44	.51	.00	.00	.00	.14
94.50	18.44	.51	.00	.00	.00	.14
94.75	18.43	.50	.00	.00	.00	.15
95.00	18.43	.50	.00	.00	.00	.15
95.25	18.42	.50	.00	.00	.00	.15
95.50	18.42	.49	.00	.00	.00	.15
95.75	18.41	.49	.00	.00	.00	.15

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GLADES-NIDWAY: EAST BASIN 10 YEAR 3 DAY DESIGN STORM
01-22-03: P:\95-0010\ADICPR\EAST\EP1-103.*

NODAL STAGE/VOLUME/FLOW REPORT

NODE ID: N-EAST

TIME (hrs)	STAGE (ft)	VOLUME (af)	INFLOW RUNOFF (cfs)	INFLOW OFFSITE (cfs)	INFLOW OTHER (cfs)	OUTFLOW (cfs)
96.00	18.40	.49	.00	.00	.00	.15
96.50	18.39	.48	.00	.00	.00	.15
97.00	18.38	.48	.00	.00	.00	.15
97.50	18.37	.47	.00	.00	.00	.15
98.00	18.36	.46	.00	.00	.00	.15
98.50	18.35	.46	.00	.00	.00	.15
99.00	18.34	.45	.00	.00	.00	.14
99.50	18.33	.45	.00	.00	.00	.14
100.00	18.31	.44	.00	.00	.00	.14
100.50	18.30	.43	.00	.00	.00	.14
101.00	18.29	.43	.00	.00	.00	.14
101.50	18.28	.42	.00	.00	.00	.14
102.00	18.27	.42	.00	.00	.00	.14
102.50	18.26	.41	.00	.00	.00	.14
103.00	18.25	.41	.00	.00	.00	.14
103.50	18.24	.40	.00	.00	.00	.14
104.00	18.23	.39	.00	.00	.00	.13
104.50	18.22	.39	.00	.00	.00	.13
105.00	18.21	.38	.00	.00	.00	.13
105.50	18.20	.38	.00	.00	.00	.13
106.00	18.19	.37	.00	.00	.00	.13
106.50	18.18	.37	.00	.00	.00	.13
107.00	18.17	.36	.00	.00	.00	.13
107.50	18.16	.36	.00	.00	.00	.13
108.00	18.15	.35	.00	.00	.00	.13
108.50	18.14	.35	.00	.00	.00	.13
109.00	18.13	.34	.00	.00	.00	.13
109.50	18.12	.33	.00	.00	.00	.13
110.00	18.11	.33	.00	.00	.00	.12
110.50	18.10	.32	.00	.00	.00	.12
111.00	18.09	.32	.00	.00	.00	.12
111.50	18.08	.31	.00	.00	.00	.12
112.00	18.07	.31	.00	.00	.00	.12
112.50	18.06	.30	.00	.00	.00	.12
113.00	18.05	.30	.00	.00	.00	.12
113.50	18.05	.29	.00	.00	.00	.12
114.00	18.04	.29	.00	.00	.00	.12
114.50	18.03	.28	.00	.00	.00	.12
115.00	18.02	.28	.00	.00	.00	.12
115.50	18.01	.28	.00	.00	.00	.12
116.00	18.00	.27	.00	.00	.00	.12
116.50	17.99	.27	.00	.00	.00	.12
117.00	17.98	.26	.00	.00	.00	.11
117.50	17.97	.26	.00	.00	.00	.11

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GLADES-MIDWAY: EAST BASIN 10 YEAR 3 DAY DESIGN STORM
01-22-03: P:\95-0010\ADICPR\EAST\EP1-103.*

NODAL STAGE/VOLUME/FLOW REPORT

NODE ID: M-EAST

TIME (hrs)	STAGE (ft)	VOLUME (af)	INFLOW RUNOFF (cfs)	INFLOW OFFSITE (cfs)	INFLOW OTHER (cfs)	OUTFLOW (cfs)
118.00	17.97	.25	.00	.00	.00	.11
118.50	17.96	.25	.00	.00	.00	.11
119.00	17.95	.24	.00	.00	.00	.11
119.50	17.94	.24	.00	.00	.00	.11
120.00	17.93	.23	.00	.00	.00	.11
120.50	17.92	.23	.00	.00	.00	.11
121.00	17.91	.22	.00	.00	.00	.11
121.50	17.91	.22	.00	.00	.00	.11
122.00	17.90	.22	.00	.00	.00	.11
122.50	17.89	.21	.00	.00	.00	.11
123.00	17.88	.21	.00	.00	.00	.11
123.50	17.87	.20	.00	.00	.00	.11
124.00	17.87	.20	.00	.00	.00	.11
124.50	17.86	.19	.00	.00	.00	.10
125.00	17.85	.19	.00	.00	.00	.10
125.50	17.84	.18	.00	.00	.00	.10
126.00	17.83	.18	.00	.00	.00	.10
126.50	17.83	.18	.00	.00	.00	.10
127.00	17.82	.17	.00	.00	.00	.10
127.50	17.81	.17	.00	.00	.00	.10
128.00	17.80	.16	.00	.00	.00	.10
128.50	17.80	.16	.00	.00	.00	.10
129.00	17.79	.16	.00	.00	.00	.07
129.50	17.78	.15	.00	.00	.00	.07
130.00	17.78	.15	.00	.00	.00	.08
130.50	17.77	.15	.00	.00	.00	.08
131.00	17.77	.14	.00	.00	.00	.08
131.50	17.76	.14	.00	.00	.00	.08
132.00	17.76	.14	.00	.00	.00	.08
132.50	17.75	.14	.00	.00	.00	.07
133.00	17.74	.13	.00	.00	.00	.07
133.50	17.74	.13	.00	.00	.00	.07
134.00	17.73	.13	.00	.00	.00	.07
134.50	17.73	.12	.00	.00	.00	.07
135.00	17.72	.12	.00	.00	.00	.07
135.50	17.72	.12	.00	.00	.00	.07
136.00	17.71	.11	.00	.00	.00	.07
136.50	17.71	.11	.00	.00	.00	.07
137.00	17.70	.11	.00	.00	.00	.06
137.50	17.70	.11	.00	.00	.00	.06
138.00	17.69	.10	.00	.00	.00	.06
138.50	17.69	.10	.00	.00	.00	.06
139.00	17.69	.10	.00	.00	.00	.06
139.50	17.68	.10	.00	.00	.00	.05
						.05

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GLADES-MIDWAY: EAST BASIN 10 YEAR 3 DAY DESIGN STORM
01-22-03: P:\95-0010\ADICPR\EAST\EP1-103.*

NODAL STAGE/VOLUME/FLOW REPORT

NODE ID: N-EAST

TIME (hrs)	STAGE (ft)	VOLUME (af)	INFLOW RUNOFF (cfs)	INFLOW OFFSITE (cfs)	INFLOW OTHER (cfs)	OUTFLOW (cfs)
140.00	17.68	.10	.00	.00	.00	.05
140.50	17.67	.09	.00	.00	.00	.05
141.00	17.67	.09	.00	.00	.00	.05
141.50	17.67	.09	.00	.00	.00	.05
142.00	17.66	.09	.00	.00	.00	.04
142.50	17.66	.09	.00	.00	.00	.04
143.00	17.66	.08	.00	.00	.00	.04
143.50	17.65	.08	.00	.00	.00	.04
144.00	17.65	.08	.00	.00	.00	.04
144.50	17.65	.08	.00	.00	.00	.04
145.00	17.64	.08	.00	.00	.00	.04
145.50	17.64	.08	.00	.00	.00	.03
146.00	17.64	.08	.00	.00	.00	.03
146.50	17.64	.07	.00	.00	.00	.03
147.00	17.63	.07	.00	.00	.00	.03
147.50	17.63	.07	.00	.00	.00	.03
148.00	17.63	.07	.00	.00	.00	.03
148.50	17.63	.07	.00	.00	.00	.03
149.00	17.63	.07	.00	.00	.00	.03
149.50	17.62	.07	.00	.00	.00	.03
150.00	17.62	.07	.00	.00	.00	.03
150.50	17.62	.06	.00	.00	.00	.03
151.00	17.62	.06	.00	.00	.00	.02
151.50	17.62	.06	.00	.00	.00	.02
152.00	17.61	.06	.00	.00	.00	.02
152.50	17.61	.06	.00	.00	.00	.02
153.00	17.61	.06	.00	.00	.00	.02
153.50	17.61	.06	.00	.00	.00	.02
154.00	17.61	.06	.00	.00	.00	.02
154.50	17.61	.06	.00	.00	.00	.02
155.00	17.60	.06	.00	.00	.00	.02
155.50	17.60	.06	.00	.00	.00	.02
156.00	17.60	.05	.00	.00	.00	.02
156.50	17.60	.05	.00	.00	.00	.02
157.00	17.60	.05	.00	.00	.00	.02
157.50	17.60	.05	.00	.00	.00	.02
158.00	17.60	.05	.00	.00	.00	.02
158.50	17.59	.05	.00	.00	.00	.02
159.00	17.59	.05	.00	.00	.00	.02
159.50	17.59	.05	.00	.00	.00	.02
160.00	17.59	.05	.00	.00	.00	.02
160.50	17.59	.05	.00	.00	.00	.02
161.00	17.59	.05	.00	.00	.00	.01
161.50	17.59	.05	.00	.00	.00	.01

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GLADES-MIDWAY: EAST BASIN 10 YEAR 3 DAY DESIGN STORM
01-22-03: P:\95-0010\ADICPR\EAST\EP1-103.*

NODAL STAGE/VOLUME/FLOW REPORT

NODE ID: N-EAST

TIME (hrs)	STAGE (ft)	VOLUME (af)	INFLOW RUNOFF (cfs)	INFLOW OFFSITE (cfs)	INFLOW OTHER (cfs)	OUTFLOW (cfs)
162.00	17.59	.05	.00	.00	.00	.01
162.50	17.58	.05	.00	.00	.00	.01
163.00	17.58	.05	.00	.00	.00	.01
163.50	17.58	.04	.00	.00	.00	.01
164.00	17.58	.04	.00	.00	.00	.01
164.50	17.58	.04	.00	.00	.00	.01
165.00	17.58	.04	.00	.00	.00	.01
165.50	17.58	.04	.00	.00	.00	.01
166.00	17.58	.04	.00	.00	.00	.01
166.50	17.58	.04	.00	.00	.00	.01
167.00	17.58	.04	.00	.00	.00	.01
167.50	17.58	.04	.00	.00	.00	.01
168.00	17.57	.04	.00	.00	.00	.01
168.50	17.57	.04	.00	.00	.00	.01
169.00	17.57	.04	.00	.00	.00	.01
169.50	17.57	.04	.00	.00	.00	.01
170.00	17.57	.04	.00	.00	.00	.01
170.50	17.57	.04	.00	.00	.00	.01
171.00	17.57	.04	.00	.00	.00	.01
171.50	17.57	.04	.00	.00	.00	.01
172.00	17.57	.04	.00	.00	.00	.01
172.50	17.57	.04	.00	.00	.00	.01
173.00	17.57	.04	.00	.00	.00	.01
173.50	17.57	.04	.00	.00	.00	.01
174.00	17.57	.04	.00	.00	.00	.01
174.50	17.57	.04	.00	.00	.00	.01
175.00	17.56	.03	.00	.00	.00	.01
175.50	17.56	.03	.00	.00	.00	.01
176.00	17.56	.03	.00	.00	.00	.01
176.50	17.56	.03	.00	.00	.00	.01
177.00	17.56	.03	.00	.00	.00	.01
177.50	17.56	.03	.00	.00	.00	.01
178.00	17.56	.03	.00	.00	.00	.01
178.50	17.56	.03	.00	.00	.00	.01
179.00	17.56	.03	.00	.00	.00	.01
179.50	17.56	.03	.00	.00	.00	.01
180.00	17.56	.03	.00	.00	.00	.01
181.00	17.56	.03	.00	.00	.00	.01
182.00	17.56	.03	.00	.00	.00	.01
183.00	17.56	.03	.00	.00	.00	.01
184.00	17.55	.03	.00	.00	.00	.01
185.00	17.55	.03	.00	.00	.00	.01
186.00	17.55	.03	.00	.00	.00	.01
187.00	17.55	.03	.00	.00	.00	.01

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GLADES-MIDWAY: EAST BASIN 10 YEAR 3 DAY DESIGN STORM
01-22-03: P:\95-0010\ADICPR\EAST\EP1-103.*

NODAL STAGE/VOLUME/FLOW REPORT

NODE ID: N-EAST

TIME (hrs)	STAGE (ft)	VOLUME (af)	INFLOW RUNOFF (cfs)	INFLOW OFFSITE (cfs)	INFLOW OTHER (cfs)	OUTFLOW (cfs)
188.00	17.55	.03	.00	.00	.00	.01
189.00	17.55	.03	.00	.00	.00	.01
190.00	17.55	.03	.00	.00	.00	.00
191.00	17.55	.03	.00	.00	.00	.00
192.00	17.55	.03	.00	.00	.00	.00
193.00	17.55	.03	.00	.00	.00	.00
194.00	17.55	.03	.00	.00	.00	.00
195.00	17.55	.03	.00	.00	.00	.00
196.00	17.55	.02	.00	.00	.00	.00
197.00	17.55	.02	.00	.00	.00	.00
198.00	17.54	.02	.00	.00	.00	.00
199.00	17.54	.02	.00	.00	.00	.00
200.00	17.54	.02	.00	.00	.00	.00
201.00	17.54	.02	.00	.00	.00	.00
202.00	17.54	.02	.00	.00	.00	.00
203.00	17.54	.02	.00	.00	.00	.00
204.00	17.54	.02	.00	.00	.00	.00
205.00	17.54	.02	.00	.00	.00	.00
206.00	17.54	.02	.00	.00	.00	.00
207.00	17.54	.02	.00	.00	.00	.00
208.00	17.54	.02	.00	.00	.00	.00
209.00	17.54	.02	.00	.00	.00	.00
210.00	17.54	.02	.00	.00	.00	.00
211.00	17.54	.02	.00	.00	.00	.00
212.00	17.54	.02	.00	.00	.00	.00
213.00	17.54	.02	.00	.00	.00	.00
214.00	17.54	.02	.00	.00	.00	.00
215.00	17.54	.02	.00	.00	.00	.00
216.00	17.54	.02	.00	.00	.00	.00
217.00	17.54	.02	.00	.00	.00	.00
218.00	17.53	.02	.00	.00	.00	.00
219.00	17.53	.02	.00	.00	.00	.00
220.00	17.53	.02	.00	.00	.00	.00
221.00	17.53	.02	.00	.00	.00	.00
222.00	17.53	.02	.00	.00	.00	.00
223.00	17.53	.02	.00	.00	.00	.00
224.00	17.53	.02	.00	.00	.00	.00
225.00	17.53	.02	.00	.00	.00	.00
226.00	17.53	.02	.00	.00	.00	.00
227.00	17.53	.02	.00	.00	.00	.00
228.00	17.53	.02	.00	.00	.00	.00
229.00	17.53	.02	.00	.00	.00	.00
230.00	17.53	.02	.00	.00	.00	.00
231.00	17.53	.02	.00	.00	.00	.00

EAST BASIN

100 Year 3 Day Storm Event

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GLADES-MIDWAY: EAST BASIN 100 YEAR 3 DAY STORM EVENT
01-22-03: P:\95-0010\ADICPR\EAST\EP1-1003.*

BASIN NAME	EAST
NODE NAME	N-EAST
TIME INCREMENT (min)	5.00
RAINFALL FILE	SFWMD72
RAIN AMOUNT (in)	12.00
STORM DURATION (hrs)	72.00
AREA (ac)	.79
CURVE NUMBER	90.00
DCIA (%)	.00
TC (mins)	15.00
LAG TIME (hrs)	.00
BASIN STATUS	ONSITE

BASIN	QMX (cfs)	TMX (hrs)	VOL (in)	NOTES
EAST	4.03	59.92	10.76	ROADWAY AND POND SITE

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GLADES-MIDWAY: EAST BASIN 100 YEAR 3 DAY STORM EVENT
01-22-03: P:\95-0010\ADICPR\EAST\EP1-1003.*

REACH MAXIMUM FLOW REPORT

REACH ID	TIME (hrs)	FLOW (cfs)	FR NODE NAME	STAGE (ft)	TO NODE NAME	STAGE (ft)
WCS-TOP	.00	.00	N-EAST	17.50	OUT103	16.00
WCS-WB	61.17	.49	N-EAST	18.72	OUT103	18.55

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GLADES-MIDWAY: EAST BASIN 100 YEAR 3 DAY STORM EVENT
01-22-03: P:\95-0010\ADICPR\EAST\EP1-1003.*

NODAL MIN/MAX/TIME CONDITIONS REPORT

NODE ID	PARAMETER	MINIMUMS VALUE	MINIMUMS TIME (hr)	MAXIMUMS VALUE	MAXIMUMS TIME (hr)
N-EAST	STAGE (ft):	17.50	4.00	18.99	72.25
	VOLUME (af):	.00	4.00	.84	72.25
	RUNOFF (cfs):	.00	300.00	3.68	60.00
	OFFSITE (cfs):	.00	300.00	.00	300.00
	OTHER (cfs):	.00	300.00	.00	300.00
	OUTFLOW (cfs):	-.23	72.00	.49	61.17
OUT103	STAGE (ft):	16.00	.00	19.00	72.00
	VOLUME (af):	-.14	59.92	.70	300.00
	RUNOFF (cfs):	.00	300.00	.00	300.00
	OFFSITE (cfs):	.00	300.00	.00	300.00
	OTHER (cfs):	-.23	72.00	.49	61.17
	OUTFLOW (cfs):	.00	300.00	.00	300.00

SFWMD Permit No. 56-00833-S

SOUTH FLORIDA WATER MANAGEMENT DISTRICT
ENVIRONMENTAL RESOURCE
STANDARD PERMIT NO. 56-00833-S
DATE ISSUED:November 14, 2012

Form #0941
08/95

PERMITTEE: ST LUCIE COUNTY BOARD OF COUNTY COMMISSIONERS
2300 VIRGINIA AVE
FORT PIERCE, FL 34982

PROJECT DESCRIPTION: Construction and operation of a surface water management system to serve a 37.9 acre roadway widening project known as Midway Road Widening (Selvitz to 25th ST).

PROJECT LOCATION: ST LUCIE COUNTY, SEC 5,6 TWP 36S RGE 40E

PERMIT DURATION: See Special Condition No:1. Pursuant to Rule 40E-4.321, Florida Administrative Code.

This is to notify you of the District's agency action concerning Notice of Intent for Permit Application No. 120405-1, dated April 5, 2012. This action is taken pursuant to Rule 40E-1.603 and Chapter 40E-40 , Florida Administrative Code (F.A.C.).

Based on the information provided, District rules have been adhered to and an Environmental Resource Permit is in effect for this project subject to:

1. Not receiving a filed request for a Chapter 120, Florida Statutes, administrative hearing.
2. the attached 19 General Conditions (See Pages : 2 - 4 of 7),
3. the attached 19 Special Conditions (See Pages : 5 - 7 of 7) and
4. the attached 2.1 Exhibit(s)

Should you object to these conditions, please refer to the attached "Notice of Rights" which addresses the procedures to be followed if you desire a public hearing or other review of the proposed agency action. Please contact this office if you have any questions concerning this matter. If we do not hear from you in accordance with the "Notice of Rights," we will assume that you concur with the District's action.

CERTIFICATE OF SERVICE

I HEREBY CERTIFY that a "Notice of Rights" has been mailed to the Permittee (and the persons listed in the attached distribution list) no later than 5:00 p.m. on this 14th day of November, 2012, in accordance with Section 120.60(3), Florida Statutes.

BY: Anita R Bain

Anita Bain
Bureau Chief - Environmental Resource Permitting
Martin / St Lucie Regulatory Office

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GENERAL CONDITIONS

1. All activities authorized by this permit shall be implemented as set forth in the plans, specifications and performance criteria as approved by this permit. Any deviation from the permitted activity and the conditions for undertaking that activity shall constitute a violation of this permit and Part IV, Chapter 373. F.S.

2. This permit or a copy thereof, complete with all conditions, attachments, exhibits, and modifications shall be kept at the work site of the permitted activity. The complete permit shall be available for review at the work site upon request by District staff. The permittee shall require the contractor to review the complete permit prior to commencement of the activity authorized by this permit.

3. Activities approved by this permit shall be conducted in a manner which does not cause violations of State water quality standards. The permittee shall implement best management practices for erosion and pollution control to prevent violation of State water quality standards. Temporary erosion control shall be implemented prior to and during construction, and permanent control measures shall be completed within 7 days of any construction activity. Turbidity barriers shall be installed and maintained at all locations where the possibility of transferring suspended solids into the receiving waterbody exists due to the permitted work. Turbidity barriers shall remain in place at all locations until construction is completed and soils are stabilized and vegetation has been established. All practices shall be in accordance with the guidelines and specifications described in Chapter 6 of the Florida Land Development Manual; A Guide to Sound Land and Water Management (Department of Environmental Regulation, 1988), incorporated by reference in Rule 40E-4.091, F.A.C. unless a project-specific erosion and sediment control plan is approved as part of the permit. Thereafter the permittee shall be responsible for the removal of the barriers. The permittee shall correct any erosion or shoaling that causes adverse impacts to the water resources.

4. The permittee shall notify the District of the anticipated construction start date within 30 days of the date that this permit is issued. At least 48 hours prior to commencement of activity authorized by this permit, the permittee shall submit to the District an Environmental Resource Permit Construction Commencement Notice Form Number 0960 indicating the actual start date and the expected construction completion date.

5. When the duration of construction will exceed one year, the permittee shall submit construction status reports to the District on an annual basis utilizing an annual status report form. Status report forms shall be submitted the following June of each year.

6. Within 30 days after completion of construction of the permitted activity, the permitee shall submit a written statement of completion and certification by a professional engineer or other individual authorized by law, utilizing the supplied Environmental Resource/Surface Water Management Permit Construction Completion/Certification Form Number 0881A, or Environmental Resource/Surface Water Management Permit Construction Completion Certification - For Projects Permitted prior to October 3, 1995 Form No. 0881B, incorporated by reference in Rule 40E-1.659, F.A.C. The statement of completion and certification shall be based on onsite observation of construction or review of as-built drawings for the purpose of determining if the work was completed in compliance with permitted plans and specifications. This submittal shall serve to notify the District that the system is ready for inspection. Additionally, if deviation from the approved drawings are discovered during the certification process, the certification must be accompanied by a copy of the approved permit drawings with deviations noted. Both the original and revised specifications must be clearly shown. The plans must be clearly labeled as "as-built" or "record" drawings. All surveyed dimensions and elevations shall be certified by a registered surveyor.

7. The operation phase of this permit shall not become effective: until the permittee has complied with the requirements of condition (6) above, and submitted a request for conversion of Environmental Resource Permit from Construction Phase to Operation Phase, Form No. 0920; the District determines the system to

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GENERAL CONDITIONS

be in compliance with the permitted plans and specifications; and the entity approved by the District in accordance with Sections 9.0 and 10.0 of the Basis of Review for Environmental Resource Permit Applications within the South Florida Water Management District, accepts responsibility for operation and maintenance of the system. The permit shall not be transferred to such approved operation and maintenance entity until the operation phase of the permit becomes effective. Following inspection and approval of the permitted system by the District, the permittee shall initiate transfer of the permit to the approved responsible operating entity if different from the permittee. Until the permit is transferred pursuant to Section 40E-1.6107, F.A.C., the permittee shall be liable for compliance with the terms of the permit.

8. Each phase or independent portion of the permitted system must be completed in accordance with the permitted plans and permit conditions prior to the initiation of the permitted use of site infrastructure located within the area served by that portion or phase of the system. Each phase or independent portion of the system must be completed in accordance with the permitted plans and permit conditions prior to transfer of responsibility for operation and maintenance of the phase or portion of the system to a local government or other responsible entity.

9. For those systems that will be operated or maintained by an entity that will require an easement or deed restriction in order to enable that entity to operate or maintain the system in conformance with this permit, such easement or deed restriction must be recorded in the public records and submitted to the District along with any other final operation and maintenance documents required by Sections 9.0 and 10.0 of the Basis of Review for Environmental Resource Permit applications within the South Florida Water Management District, prior to lot or units sales or prior to the completion of the system, whichever comes first. Other documents concerning the establishment and authority of the operating entity must be filed with the Secretary of State, county or municipal entities. Final operation and maintenance documents must be received by the District when maintenance and operation of the system is accepted by the local government entity. Failure to submit the appropriate final documents will result in the permittee remaining liable for carrying out maintenance and operation of the permitted system and any other permit conditions.

10. Should any other regulatory agency require changes to the permitted system, the permittee shall notify the District in writing of the changes prior to implementation so that a determination can be made whether a permit modification is required.

11. This permit does not eliminate the necessity to obtain any required federal, state, local and special district authorizations prior to the start of any activity approved by this permit. This permit does not convey to the permittee or create in the permittee any property right, or any interest in real property, nor does it authorize any entrance upon or activities on property which is not owned or controlled by the permittee, or convey any rights or privileges other than those specified in the permit and Chapter 40E-4 or Chapter 40E-40, F.A.C..

12. The permittee is hereby advised that Section 253.77, F.S. states that a person may not commence any excavation, construction, or other activity involving the use of sovereign or other lands of the State, the title to which is vested in the Board of Trustees of the Internal Improvement Trust Fund without obtaining the required lease, license, easement, or other form of consent authorizing the proposed use. Therefore, the permittee is responsible for obtaining any necessary authorizations from the Board of Trustees prior to commencing activity on sovereignty lands or other state-owned lands.

13. The permittee must obtain a Water Use permit prior to construction dewatering, unless the work qualifies for a general permit pursuant to Subsection 40E-20.302(3), F.A.C., also known as the "No Notice" Rule.

14. The permittee shall hold and save the District harmless from any and all damages, claims, or liabilities

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GENERAL CONDITIONS

which may arise by reason of the construction, alteration, operation, maintenance, removal, abandonment or use of any system authorized by the permit.

15. Any delineation of the extent of a wetland or other surface water submitted as part of the permit application, including plans or other supporting documentation, shall not be considered binding, unless a specific condition of this permit or a formal determination under Section 373.421(2), F.S., provides otherwise.

16. The permittee shall notify the District in writing within 30 days of any sale, conveyance, or other transfer of ownership or control of a permitted system or the real property on which the permitted system is located. All transfers of ownership or transfers of a permit are subject to the requirements of Rules 40E-1.6105 and 40E-1.6107, F.A.C.. The permittee transferring the permit shall remain liable for corrective actions that may be required as a result of any violations prior to the sale, conveyance or other transfer of the system.

17. Upon reasonable notice to the permittee, District authorized staff with proper identification shall have permission to enter, inspect, sample and test the system to insure conformity with the plans and specifications approved by the permit.

18. If historical or archaeological artifacts are discovered at any time on the project site, the permittee shall immediately notify the appropriate District service center.

19. The permittee shall immediately notify the District in writing of any previously submitted information that is later discovered to be inaccurate.

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SPECIAL CONDITIONS

1. The construction phase of this permit shall expire on November 14, 2017.

2. Operation of the surface water management system shall be the responsibility of the permittee.

3. Discharge Facilities:

   Basin: BASIN 2/3, Structure: Pond 2/3 Weir

   1-70' W X 1.39' H SHARP CRESTED weir with crest at elev. 13.61' NAVD 88.

   Receiving body : Pond 2/3
   Control elev : 9.5 feet NAVD 88.

   Basin: BASIN 2/3, Structure: S-323

   1-9.5" W X 2.65' H SHARP CRESTED weir with crest at elev. 12.35' NAVD 88.
   1-6" dia. CIRCULAR ORIFICE with invert at elev. 9.5' NAVD 88.

   Receiving body : C-103 Canal
   Control elev : 9.5 feet NAVD 88.

   Basin: BASIN 4, Structure: BASIN 4 WEIR

   1-50' W X 2.4' H SHARP CRESTED weir with crest at elev. 8.4' NAVD 88.

   Receiving body : POND 4
   Control elev : 5 feet NAVD 88.

   Basin: BASIN 4, Structure: S-419

   1-24" W X 1.9' H SHARP CRESTED weir with crest at elev. 7.9' NAVD 88.
   1-6" dia. CIRCULAR ORIFICE with invert at elev. 5' NAVD 88.

   Receiving body : MIDWAY ROAD
   Control elev : 5 feet NAVD 88.

4. The permittee shall be responsible for the correction of any erosion, shoaling or water quality problems that result from the construction or operation of the surface water management system.

5. Measures shall be taken during construction to insure that sedimentation and/or turbidity violations do not occur in the receiving water.

6. The District reserves the right to require that additional water quality treatment methods be incorporated into the drainage system if such measures are shown to be necessary.

7. Lake side slopes shall be no steeper than 4:1 (horizontal:vertical) to a depth of two feet below the control elevation. Side slopes shall be nurtured or planted from 2 feet below to 1 foot above control elevation to insure vegetative growth, unless shown on the plans.

8. Facilities other than those stated herein shall not be constructed without an approved modification of this permit.

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SPECIAL CONDITIONS

9. A stable, permanent and accessible elevation reference shall be established on or within one hundred (100) feet of all permitted discharge structures no later than the submission of the certification report. The location of the elevation reference must be noted on or with the certification report.

10. The permittee shall provide routine maintenance of all of the components of the surface water management system in order to remove all trapped sediments/debris. All materials shall be properly disposed of as required by law. Failure to properly maintain the system may result in adverse flooding conditions.

11. This permit is issued based on the applicant's submitted information which reasonably demonstrates that adverse water resource related impacts will not be caused by the completed permit activity. Should any adverse impacts caused by the completed surface water management system occur, the District will require the permittee to provide appropriate mitigation to the District or other impacted party. The District will require the permittee to modify the surface water management system, if necessary, to eliminate the cause of the adverse impacts.

12. The permittee acknowledges that, pursuant to Rule 40E-4.101(2), F.A.C., a notice of Environmental Resource or Surface Water Management Permit may be recorded in the county public records. Pursuant to the specific language of the rule, this notice shall not be considered an encumbrance upon the property.

13. If prehistoric or historic artifacts, such as pottery or ceramics, stone tools or metal implements, dugout canoes, or any other physical remains that could be associated with Native American cultures, or early colonial or American settlement are encountered at any time within the project site area, the permitted project should cease all activities involving subsurface disturbance in the immediate vicinity of such discoveries. The permittee, or other designee, should contact the Florida Department of State, Division of Historical Resources, Review and Compliance Section at (850) 245-6333 or (800) 847-7278, as well as the appropriate permitting agency office. Project activities should not resume without verbal and/or written authorization from the Division of Historical Resources. In the event that unmarked human remains are encountered during permitted activities, all work shall stop immediately and the proper authorities notified in accordance with Section 872.05, Florida Statutes.

14. Minimum road crown elevation: BASIN 2/3 - 17.80 feet NAVD 88. BASIN 4 - 9.80 feet NAVD 88.

15. Silt screens, synthetic bales, turbidity screens/barriers or other such sediment control measures shall be utilized during construction. The selected sediment control measures shall be installed prior to the commencement of construction in or adjacent to other surface waters in accordance with Exhibit No. 2.0 and shall remain in place until all adjacent construction is completed. All areas shall be stabilized and vegetated immediately after construction to prevent erosion into the surface waters.

16. Prior to the commencement of construction, the permittee shall conduct a pre-construction meeting with field representatives, contractors and District staff. The purpose of the meeting will be to discuss construction methods and sequencing, including type and location of turbidity and erosion controls to be implemented during construction, mobilization and staging of contractor equipment, phasing of construction, methods of vegetation clearing, construction dewatering if required, ownership documentation for eminent domain authority, coordination with other entities on adjacent construction projects, wetland/buffer protection methods, endangered species protection with the permittee and contractors. The permittee shall contact District Environmental Resource Compliance staff from the Martin/St.Lucie Regulatory Office at (863)462-5260 ext 3613 to schedule the pre-construction meeting.

17. The exhibits and special conditions in this permit apply only to this application. They do not supersede or delete any requirements for other applications covered in Permit No. 56-00833-S unless otherwise

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SPECIAL CONDITIONS

specified herein.

18. The Construction Plans Exhibit 2.0. are incorporated by reference herein and are located in the permit file. The drawings were signed and sealed by Theresa D. Ellison P.E. on September 28, 2012. In addition, it can be viewed on the District's ePermitting website under application number 120405-1.

19. This permit is not conceptual approval of any future development (construction) of the project. Any future development must be in compliance with District rules in effect at the time of future application approval.

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NOTICE OF RIGHTS

As required by Sections 120.569(1), and 120.60(3), Fla. Stat., following is notice of the opportunities which may be available for administrative hearing or judicial review when the substantial interests of a party are determined by an agency. Please note that this Notice of Rights is not intended to provide legal advice. Not all the legal proceedings detailed below may be an applicable or appropriate remedy. You may wish to consult an attorney regarding your legal rights.

RIGHT TO REQUEST ADMINISTRATIVE HEARING

A person whose substantial interests are or may be affected by the South Florida Water Management District's (SFWMD or District) action has the right to request an administrative hearing on that action pursuant to Sections 120.569 and 120.57, Fla. Stat. Persons seeking a hearing on a District decision which does or may determine their substantial interests shall file a petition for hearing with the District Clerk within 21 days of receipt of written notice of the decision, unless one of the following shorter time periods apply: 1) within 14 days of the notice of consolidated intent to grant or deny concurrently reviewed applications for environmental resource permits and use of sovereign submerged lands pursuant to Section 373.427, Fla. Stat.; or 2) within 14 days of service of an Administrative Order pursuant to Subsection 373.119(1), Fla. Stat. "Receipt of written notice of agency decision" means receipt of either written notice through mail, or electronic mail, or posting that the District has or intends to take final agency action, or publication of notice that the District has or intends to take final agency action. Any person who receives written notice of a SFWMD decision and fails to file a written request for hearing within the timeframe described above waives the right to request a hearing on that decision.

Filing Instructions

The Petition must be filed with the Office of the District Clerk of the SFWMD. Filings with the District Clerk may be made by mail, hand-delivery or facsimile. **Filings by e-mail will not be accepted.** Any person wishing to receive a clerked copy with the date and time stamped must provide an additional copy. A petition for administrative hearing is deemed filed upon receipt during normal business hours by the District Clerk at SFWMD headquarters in West Palm Beach, Florida. Any document received by the office of the SFWMD Clerk after 5:00 p.m. shall be filed as of 8:00 a.m. on the next regular business day. Additional filing instructions are as follows:

- Filings by mail must be addressed to the Office of the SFWMD Clerk, P.O. Box 24680, West Palm Beach, Florida 33416.
- Filings by hand-delivery must be delivered to the Office of the SFWMD Clerk. **Delivery of a petition to the SFWMD's security desk does not constitute filing. To ensure proper filing, it will be necessary to request the SFWMD's security officer to contact the Clerk's office**. An employee of the SFWMD's Clerk's office will receive and file the petition.
- Filings by facsimile must be transmitted to the SFWMD Clerk's Office at (561) 682-6010. Pursuant to Subsections 28-106.104(7), (8) and (9), Fla. Admin. Code, a party who files a document by facsimile represents that the original physically signed document will be retained by that party for the duration of that proceeding and of any subsequent appeal or subsequent proceeding in that cause. Any party who elects to file any document by facsimile shall be responsible for any delay, disruption, or interruption of the electronic signals and accepts the full risk that the document may not be properly filed with the clerk as a result. The filing date for a document filed by facsimile shall be the date the SFWMD Clerk receives the complete document.

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Initiation of an Administrative Hearing
Pursuant to Rules 28-106.201 and 28-106.301, Fla. Admin. Code, initiation of an administrative hearing shall be made by written petition to the SFWMD in legible form and on 8 and 1/2 by 11 inch white paper. All petitions shall contain:

1. Identification of the action being contested, including the permit number, application number, District file number or any other SFWMD identification number, if known.
2. The name, address and telephone number of the petitioner and petitioner's representative, if any.
3. An explanation of how the petitioner's substantial interests will be affected by the agency determination.
4. A statement of when and how the petitioner received notice of the SFWMD's decision.
5. A statement of all disputed issues of material fact. If there are none, the petition must so indicate.
6. A concise statement of the ultimate facts alleged, including the specific facts the petitioner contends warrant reversal or modification of the SFWMD's proposed action.
7. A statement of the specific rules or statutes the petitioner contends require reversal or modification of the SFWMD's proposed action.
8. If disputed issues of material fact exist, the statement must also include an explanation of how the alleged facts relate to the specific rules or statutes.
9. A statement of the relief sought by the petitioner, stating precisely the action the petitioner wishes the SFWMD to take with respect to the SFWMD's proposed action.

A person may file a request for an extension of time for filing a petition. The SFWMD may, for good cause, grant the request. Requests for extension of time must be filed with the SFWMD prior to the deadline for filing a petition for hearing. Such requests for extension shall contain a certificate that the moving party has consulted with all other parties concerning the extension and that the SFWMD and any other parties agree to or oppose the extension. A timely request for extension of time shall toll the running of the time period for filing a petition until the request is acted upon.

If the District takes action with substantially different impacts on water resources from the notice of intended agency decision, the persons who may be substantially affected shall have an additional point of entry pursuant to Rule 28-106.111, Fla. Admin. Code, unless otherwise provided by law.

Mediation
The procedures for pursuing mediation are set forth in Section 120.573, Fla. Stat., and Rules 28-106.111 and 28-106.401-.405, Fla. Admin. Code. The SFWMD is not proposing mediation for this agency action under Section 120.573, Fla. Stat., at this time.

RIGHT TO SEEK JUDICIAL REVIEW
Pursuant to Sections 120.60(3) and 120.68, Fla. Stat., a party who is adversely affected by final SFWMD action may seek judicial review of the SFWMD's final decision by filing a notice of appeal pursuant to Florida Rule of Appellate Procedure 9.110 in the Fourth District Court of Appeal or in the appellate district where a party resides and filing a second copy of the notice with the SFWMD Clerk within 30 days of rendering of the final SFWMD action.

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Last Date For Agency Action: November 27, 2012

STANDARD ENVIRONMENTAL RESOURCE PERMIT STAFF REPORT

Project Name: Midway Road Widening (Selvitz To 25th St)

Permit No.: 56-00833-S

Application No.: 120405-1

Application Type: Environmental Resource (General Permit Modification)

Location: St Lucie County, S5,6/T36S/R40E

Permittee : St Lucie County Board Of County Commissioners

Operating Entity : Permittee

Project Area: 37.90 acres

Project Land Use: Roadway

Drainage Basin: NORTH ST LUCIE

Receiving Body: C-103 Canal / North Fork St Lucie River **Class:** CLASS III

Special Drainage District: NA

Conservation Easement To District : No

Sovereign Submerged Lands: No

PROJECT PURPOSE:

This application is a request for an Environmental Resource Permit modification of a Surface Water Management Permt to authorize construction and operation of a surface water management system to serve 37.90 acres of roadway widening know as Midway Road Widening (Selvitz to 25th Street).

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PROJECT EVALUATION:

PROJECT SITE DESCRIPTION:

Midway Road is located in central St. Lucie County and extends from US-1 to SR -70. The proposed widening segment is approximately 1 mile in length and starts just west of Selvitz Road and extends east to 25th Street. Please see the Location Map Exhibit 1.0.

The existing surface water management facilities within this segment of Midway Road pre-date District rule development and did not receive a District permit. Runoff from the roadway and adjacent properties is directed by road side swales, inlets, and culverts into the C-103 canal, which ultimately discharges to the North Fork of the St. Lucie River. The adjacent properties include: undeveloped, commercial, residential, agricultural, and institutional land uses.

There are no wetlands within the proposed project area, but there are Other Surface Waters in the form of drainage ditches and a borrow pit area within the proposed project area.

PROPOSED PROJECT:

St. Lucie County proposes to widen 1.047 miles of Midway Road from just west of Selvitz Road east to 25th Street. The proposed construction will increase the roadway from two lanes to four. The applicant's engineer has designed the surface water management system to accommodate two more lanes for a total of six lanes in the future. Improvements are also proposed to Selvitz Road and 25th Street at their intersections with Midway Road. This project will include the installation of curb and gutter, storm sewer, and stormwater runoff treatment facilities to service the future six-lane configuration. A significant amount of offsite area outside the right-of-way contributes runoff to Midway Road. The proposed design will route runoff from the offsite areas around the proposed surface water management system and direct it to the C-103 Canal as is historical.

The proposed widening project will replace approximately 2,200 linear feet of the C-103 canal that parallels Midway Road (Sta. 1271 to Sta. 1293) with an 11 ft by 6 ft box culvert. The box culvert will include Type C inlets every 300 feet to provide ventilation and maintenance access. Please see the construction plans Exhibit 2.0 (incorporated by reference) for addition project details.

Please see the Drainage Basin Map Exhibit 2.1. The project study area of 699 acres included six drainage basins contributing runoff to the C-103 canal. The proposed construction will be limited to Basins 2/3 and Basin 4.

Basin 2/3 begins just east of Selvitz Road and ends at Christensen Road. It also includes 2,000 feet of North Selvitz Road. The Basin 2/3 system directs runoff through a storm sewer system to a pond site located east of Christensen Road south of Midway Road. Stormwater runoff is pre-treated in a dry pond and then discharged to a wet detention pond. The wet pond outfalls through a control structure to the existing C-103 Canal.

Basin 4 begins at Christensen Road and ends at 25th Street. Stormwater runoff is pre-treated in a dry pond and then discharged to a wet detention pond. The wet pond outfalls through a control structure to the existing storm sewer system in the intersection to a pair of existing roadside ditches along Midway Road. The existing ditches drain to the North Fork of the St. Lucie River.

This permit is not conceptual approval of the future 6 lane construction. Any future development must be in compliance with District rules in effect at the time of future application submittal.

LAND USE:

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The land use shown in the table below is for the 6 lane design.

Construction Project:

	Total Project	
Pavement	27.57	acres
Pervious	5.75	acres
Water Mgnt Acreage	4.58	acres
Total:	**37.90**	

Discharge Rate :

As shown in the table below, the proposed project discharge is within the allowable limit for the area. The project study area includes six basins totaling 699 acres that contribute runoff to the C-103 canal with an existing peak flow rate of 282.55 cfs. The proposed project will result in a peak discharge rate of 282.52 cfs to the C-103.

Discharge Storm Frequency : 25 YEAR-3 DAY Design Rainfall : 9.5 inches

Basin	Allow Disch (cfs)	Method Of Determination	Peak Disch (cfs)	Peak Stage (ft, NAVD 88)
BASIN 2/3	9.53	Pre Vs Post	9.53	14.46
BASIN 4	11.11	Pre Vs Post	11.11	9.31

Road Design :

Road Storm Frequency : 25 YEAR-3 DAY Design Rainfall: 9.5 inches

Basin	Peak Stage (ft, NAVD 88)	Proposed Min. Road Crown (ft, NAVD 88)
BASIN 2/3	14.46	17.8
BASIN 4	9.31	9.8

Control Elevation :

Basin	Area (Acres)	Ctrl Elev (ft, NAVD 88)	WSWT Ctrl Elev (ft, NAVD 88)	Method Of Determination
BASIN 2/3	28.10	9.5	9.50	Wet Season Soil Borings
BASIN 4	9.80	5	5.00	Wet Season Soil Borings

Receiving Body :

Basin	Str.#	Receiving Body

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Receiving Body :

Basin	Str.#	Receiving Body
Basin 2/3	Pond 2/3 We	Pond 2/3
Basin 2/3	S-323	C-103 Canal
Basin 4	BASIN 4 WE	POND 4
Basin 4	S-419	MIDWAY ROAD

Water Quality Structures: Note: The units for all the elevation values of structures are (ft, NAVD 88)

Bleeders:

Basin	Str#	Count	Type	Width	Height	Length	Dia.	Invert Angle	Invert Elev.
BASIN 2/3	S-323	1	Circular Orifice				6"		9.5
BASIN 4	S-419	1	Circular Orifice				3"		5

Weirs:

Basin	Str#	Count	Type	Width	Height	Length	Dia.	Elev.
BASIN 2/3	Pond 2/3 Weir	1	Trapezoidal	70'	1.39'			13.61 (crest)
BASIN 2/3	S-323	1	Sharp Crested	9.5"	2.65'			12.35 (crest)
BASIN 4	BASIN 4 WEIR	1	Trapezoidal	50'	2.4'			8.4 (crest)
BASIN 4	S-419	1	Sharp Crested	24"	1.9'			7.9 (crest)

No adverse water quality impacts are anticipated as a result of the proposed project. The proposed project ultimately contributes stormwater to the North Fork St. Lucie River which is an impaired water body and an Aquatic Preserve south of Midway Road. In order to provide reasonable assurance that the proposed project will not contribute to the existing impairment, an additional 50% of water quality treatment volume is provided. Since one of the impairments is nutrients, a site specific pre and post development nutrient analysis has been prepared indicating that the proposed system will not increase the annual nutrient loading over existing conditions.

The standard treatment volume of 2.5 inches over the percent imperviousness plus the additional 50% for impaired waters equals the required treatment. One half inch over the basin as retention pre-treatment to meet post development nutrient reduction is included in the table below. Water quality treatment is provided in the form of a treatment train of dry retention followed by wet detention resulting in the provided treatment volumes in the table below. The treatment areas represent the bottom area of the retention ponds and the area at the control elevation in the wet detention ponds.

The proposed system provides treatment for the proposed 6 lane construction. Any future expansion or construction will require a permit modification and may require additional stormwater management facilities. The excess water quality treatment provided may not be used for any development outside of the roadway project boundary.

The applicant has provided reasonable assurance that water quality standards will not be violated during construction of the proposed work. Best Management Practices (BMPs) will be implemented and silt screens will be placed so as to contain turbidity during construction of the proposed project. All erosion and turbidity control measures shall remain in place until the completion of onsite construction. Please refer to Exhibit No. 2 and Special Conditions.

Basin	Treatment Method

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Basin	Treatment Method			Vol Req.d (ac-ft)	Vol Prov'd
BASIN 2/3	Treatment	Dry Retention	1.84 acres	1.17	1.17
BASIN 2/3	Treatment	Wet Detention	1.51 acres	4.09	5.26
BASIN 4	Treatment	Dry Retention	.73 acres	.41	.41
BASIN 4	Treatment	Wet Detention	.5 acres	1.36	1.77

WETLANDS:

There are no wetlands located within or affected by the proposed project. The applicant has identified 5.79 acres of Other Surface Water impacts. However, approximately 3.48 acres of the impacts are swale areas and only 2.31 acres are ditch/canal area. There is an approximate 0.16 borrow area adjacent to the construction area and no work is proposed within the borrow area.

Wetland Inventory :

CONSTRUCTION MOD -Midway Road Widening (Selvitz to 25th St)

Site Id	Site Type	Pre-Development				Post-Development						
		Pre Fluccs	AA Type	Acreage (Acres)	Current Wo Pres	With Project	Time Lag (Yrs)	Risk Factor	Pres. Adj. Factor	Post Fluccs	Adj Delta	Functional Gain / Loss
OSW	ON	510	Direct	2.31							.000	.000
			Total:	2.31								.00

Fluccs Code	Description
510	Streams And Waterways

Wildlife Issues:

The project site does not contain preferred habitat for wetland-dependent endangered or threatened wildlife species or species of special concern. No wetland-dependent endangered/threatened species or species of special concern were observed onsite, and submitted information indicates that potential use of the site by such species is minimal. This permit does not relieve the applicant from complying with all applicable rules and any other agencies' requirements if, in the future, endangered/threatened species or species of special concern are discovered on the site.

CERTIFICATION AND MAINTENANCE OF THE WATER MANAGEMENT SYSTEM:

It is suggested that the permittee retain the services of a Professional Engineer registered in the State of Florida for periodic observation of construction of the surface water management (SWM) system. This will facilitate the completion of construction completion certification Form #0881 which is required pursuant to Section 10 of the Basis of Review for Environmental Resource Permit Applications within the South Florida Water Management District, and Rule 40E-4.361(2), Florida Administrative Code (F.A.C.).

Pursuant to Chapter 40E-4 F.A.C., this permit may not be converted from the construction phase to the operation phase until certification of the SWM system is submitted to and accepted by this District. Rule

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40E-4.321(7) F.A.C. states that failure to complete construction of the SWM system and obtain operation phase approval from the District within the permit duration shall require a new permit authorization unless a permit extension is granted.

For SWM systems permitted with an operating entity who is different from the permittee, it should be noted that until the permit is transferred to the operating entity pursuant to Rule 40E-1.6107, F.A.C., the permittee is liable for compliance with the terms of this permit.

The permittee is advised that the efficiency of a SWM system will normally decrease over time unless the system is periodically maintained. A significant reduction in flow capacity can usually be attributed to partial blockages of the conveyance system. Once flow capacity is compromised, flooding of the project may result. Maintenance of the SWM system is required to protect the public health, safety and the natural resources of the state. Therefore, the permittee must have periodic inspections of the SWM system performed to ensure performance for flood protection and water quality purposes. If deficiencies are found, it is the responsibility of the permittee to correct these deficiencies in a timely manner.

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RELATED CONCERNS:

Water Use Permit Status:

The applicant has indicated that irrigation is not necessary for the proposed project.

The applicant's engineer has indicated that dewatering will be required to construct the project and the contract documents indicate the selected contractor will be required to obtain a dewatering permit from the District.

This permit does not release the permittee from obtaining all necessary Water Use authorization(s) prior to the commencement of activities which will require such authorization, including construction dewatering and irrigation.

CERP:

The proposed project is not located within or adjacent to a Comprehensive Everglades Restoration Project component.

Potable Water Supplier:

No potable water service required.

Waste Water System/Supplier:

Wastewater service is not required

Right-Of-Way Permit Status:

A District Right-of-Way Permit is not required for this project.

DRI Status:

This project is not a DRI.

Historical/Archeological Resources:

The District has received correspondence from the Florida Department of State, Division of Historical Resources indicating that no significant archaeological or historical resources are recorded in the project area and therefore is unlikely to have an effect upon any such properties.

DEO/CZM Consistency Review:

The issuance of this permit constitutes a finding of consistency with the Florida Coastal Management Program.

Third Party Interest:

No third party has contacted the District with concerns about this application.

Enforcement:

There has been no enforcement activity associated with this application.

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STAFF REVIEW:

DIVISION APPROVAL:

NATURAL RESOURCE MANAGEMENT:

Barbara J. Conmy

DATE: 11/9/12

Barbara J. Conmy

SURFACE WATER MANAGEMENT:

DATE: 8 Nov 2012

Hugo A. Carter, P.E.

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Table of Contents for Staff Report Exhibits

App. No. 120405-1

Midway Road Widening (Selvitz to 25th St)

1.0 Location Map

2.0 Construction Plans (incorporated by reference)

2.1 Basin Map

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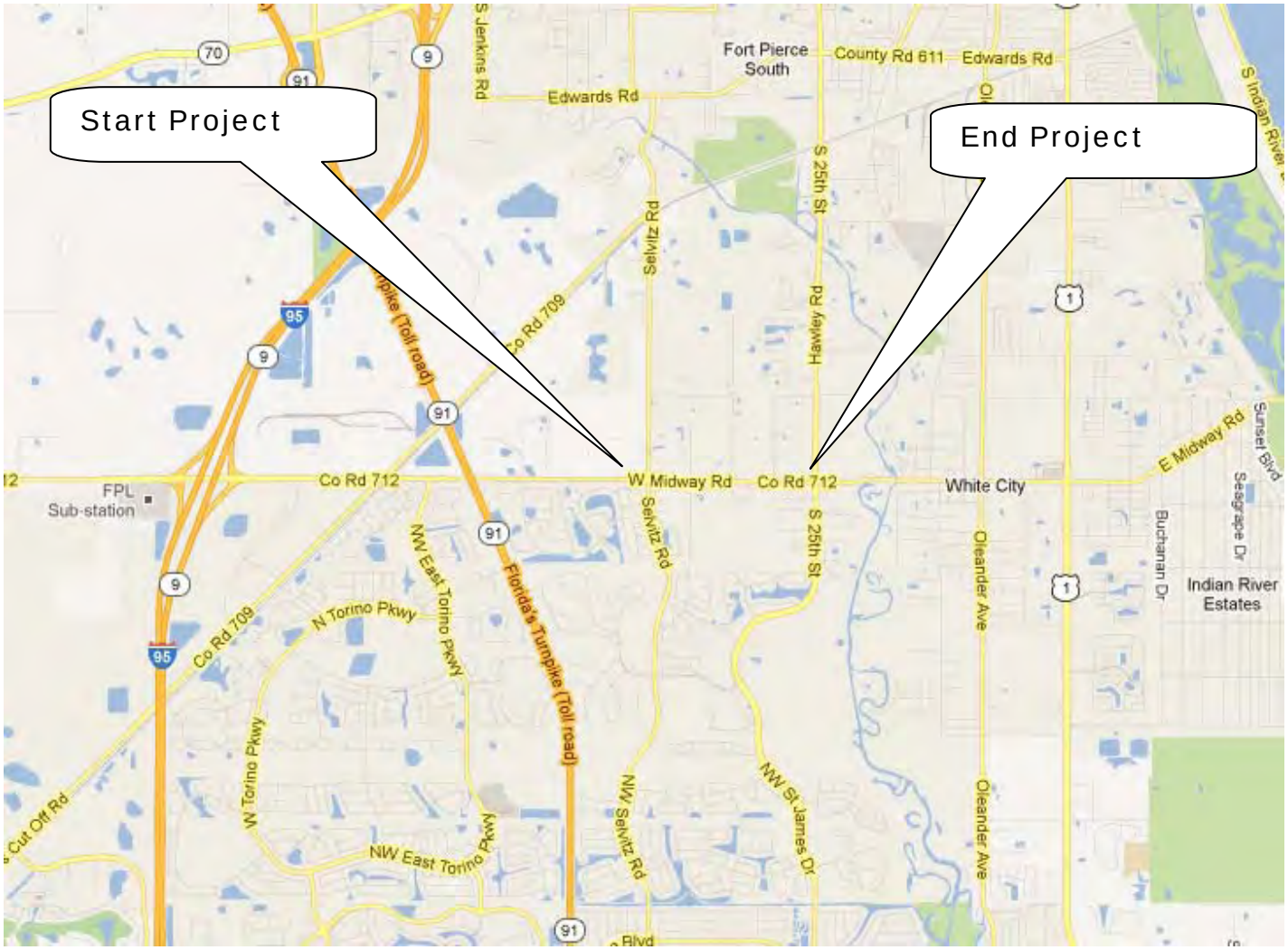

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(n.t.s.)

MIDWAY ROAD WIDENING (SELVITZ TO 25TH ST)

LOCATION MAP

EXHIBIT 2.0

Application No. 120405-1

Midway Road Widening (Selvitz to 25th St)

The referenced drawings consisting of 294 sheets have been signed and sealed by Theresa Ellison, P.E., of LOCHNER, and have been included in this permit by reference.

Please see the online e-permitting file www.sfwmd.gov.

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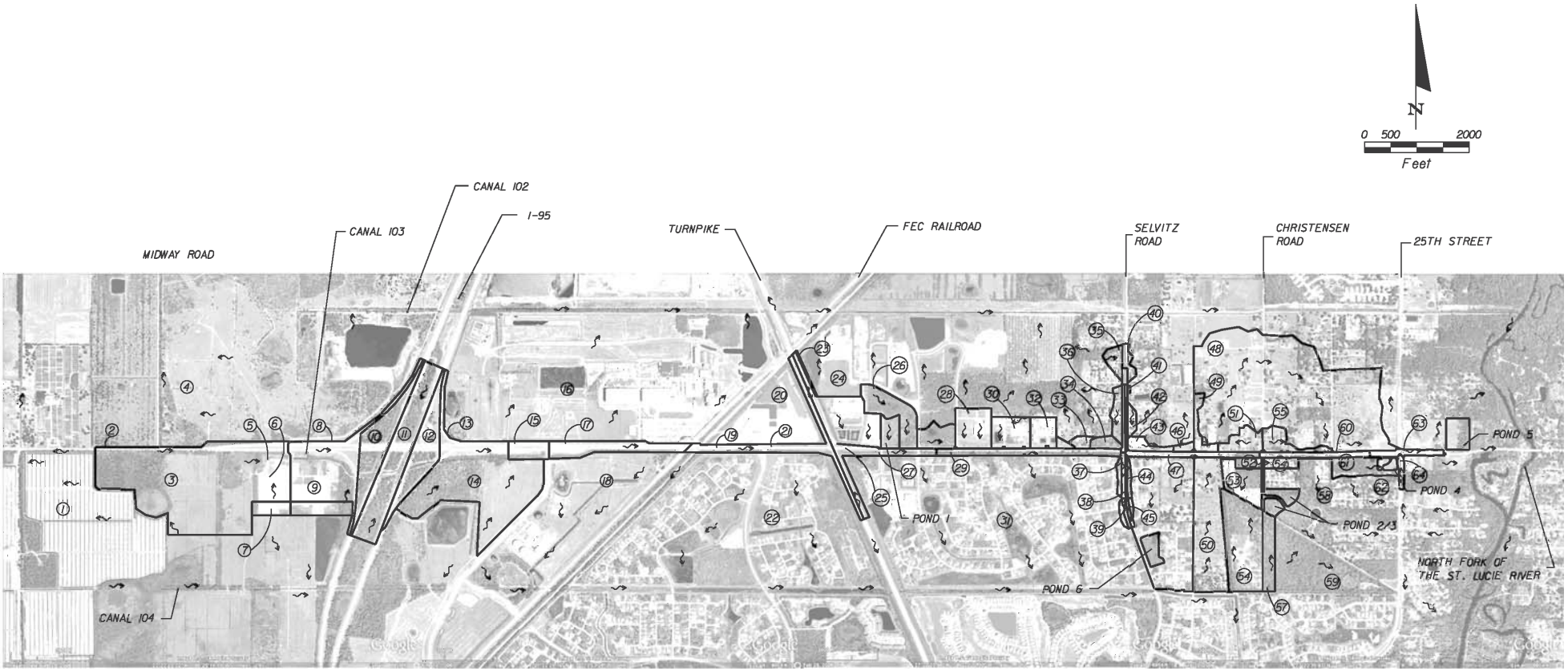
APPLICATION 120405-1 EXHIBIT 2.1 Page 1 of 1



1. LTC RANCH (N/A)
2. CSUBSA (21.34 AC)
3. WESTLTC (85.22 AC)
4. WILLOW LAKES (N/A)
5. SUBSBIA (0.67 AC)
6. SUBSIB (1.18 AC)
7. SUBSB2 (8.28 AC)
8. C195A (42.01 AC)
9. SUBSI95 (16.72 AC)
10. C195 (21.39 AC)
11. C195E (35.20 AC)
12. C195G (19.79 AC)
13. CLTCA (15.96 AC)
14. OFFLTC (56.72 AC)
15. CLTCC (6.15 AC)
16. TROPICANA (N/A)
17. CFECRA (14.04 AC)
18. LTC RANCH JOINT VENTURE (N/A)
19. CTORIA (6.67 AC)
20. RINKER (N/A)
21. CTURNA (49.82 AC)
22. SHARETT RANGE (N/A)
23. CD-100A (12.03 AC)
24. PACKERS OF INDIAN RIVER (N/A)
25. CCORPA (8.19 AC)
26. CD-101A (23.57 AC)
27. BASIN 1 (6.30 AC)
28. POST OFFICE (13.15 AC)
29. BASIN 2/3 (23.83 AC)
30. POLICE (10.00 AC)
31. SHARETT RANGE (N/A)
32. NEW HORIZONS (13.18 AC) AND CD-201A (1.10 AC)
33. CD-202A (1.86 AC)
34. CD-203A (2.78 AC)
35. N. SELVITZ OFFSITE (3.74 AC)
36. CD-203C (5.95 AC)
37. S. SELVITZ OFFSITE (2.57 AC)
38. S. SELVITZ (5.52 AC)
39. S. SELVITZ OFFSITE (1.42 AC)
40. N. SELVITZ OFFSITE (1.33 AC)
41. BASIN 2/3 (23.83 AC)
42. CD-203D (2.12 AC)
43. CD-300A (4.91 AC)
44. S. SELVITZ OFFSITE (1.73 AC)
45. S. SELVITZ OFFSITE (0.81 AC)
46. CD-300A (4.91 AC)
47. BASIN 2/3 (23.83 AC)
48. OFFSITE RESIDENTIAL (149.00 AC)
49. CD-301A (11.12 AC)
50. CSPUR (34.47 AC)
51. CD-301A (11.12 AC)
52. OFFSITE RESIDENTIAL (5.93 AC)
53. CCHRI (40.50 AC)
54. CCHRI (40.50 AC)
55. OFFSITE RESIDENTIAL (6.69 AC)
56. OFFSITE RESIDENTIAL (5.93 AC)
57. COUTI23A (8.10 AC)
58. COUTI23B (70.79 AC)
59. COUTI23B (70.79 AC)
60. BASIN 4 (7.13 AC)
61. OFFSITE UNDEVELOPED (6.89 AC)
62. OFFSITE RESIDENTIAL (N/A)
63. BASIN 5 (5.48 AC)
64. BASIN 5 (5.48 AC)

EXHIBIT B

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

LOCHNER
13577 FEATHER SOUND DR. SUITE 600
CLEARWATER, FLORIDA 33762
FBPR CERTIFICATE OF AUTH. # 894
MICHAEL D. FINCH, P.E. NO 40118

ST. LUCIE COUNTY ENGINEERING DIVISION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
CR 712	ST. LUCIE	06-18

REGIONAL DRAINAGE MAP

SHEET NO. D-13

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MIDWAY ROAD WIDENING (SELVITZ TO 25TH ST)

Application No: 120405-1

Permit No: 56-00833-S

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X Agent - H W Lochner Inc
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X City of Port St Lucie - Planning Div
X St. Lucie County Engineer
X St. Lucie County Planning and Development Services Mark Satterlee, AICP, Director

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Fort Pierce FL 34982
powleym@stlucieco.org

St. Lucie County Planning and Development Services
Mark Satterlee, AICP, Director
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Fort Pierce FL 34482
satterleem@stlucieco.org

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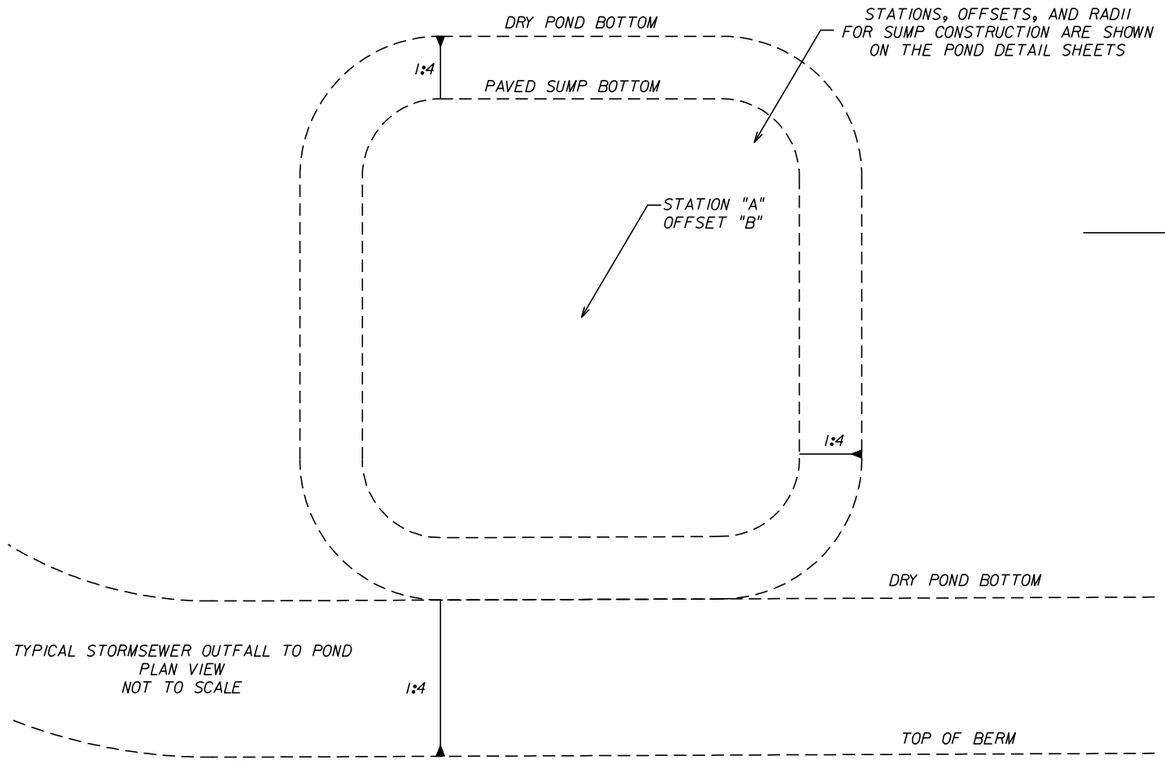
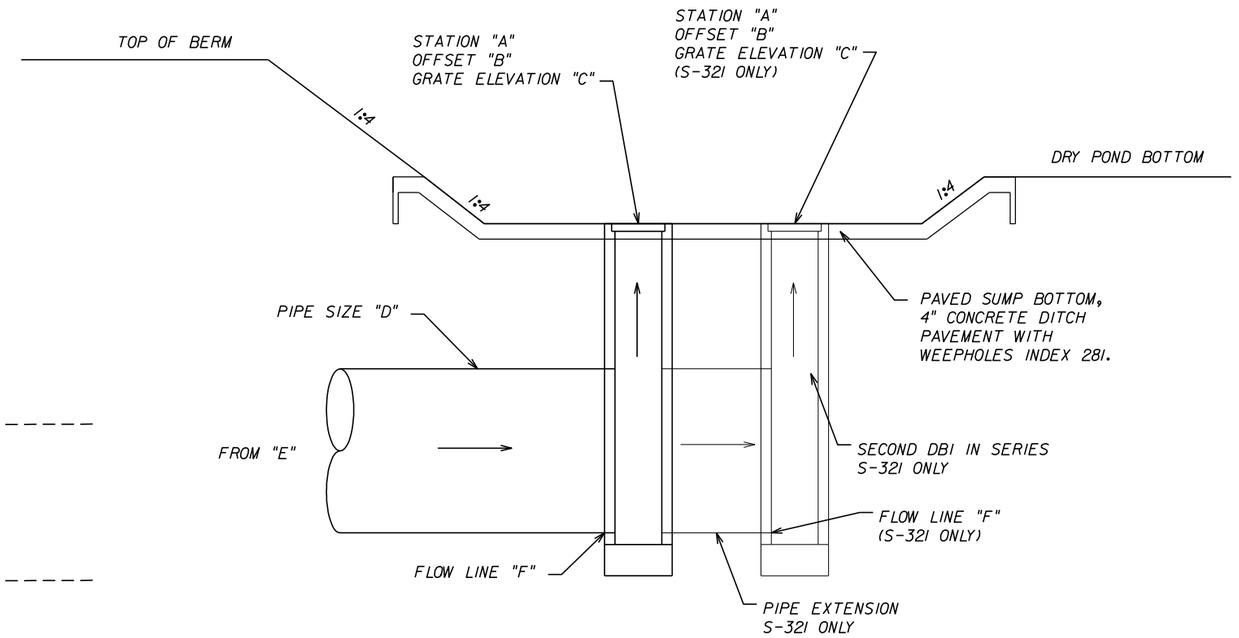
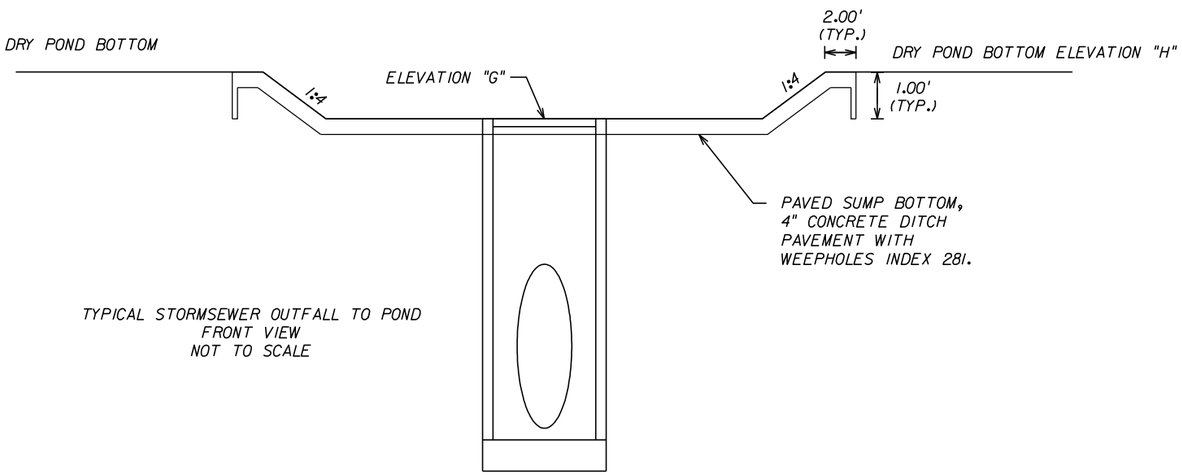




TYPICAL STORMSEWER OUTFALL TO POND
SIDE VIEW
NOT TO SCALE



TYPICAL STORMSEWER OUTFALL TO POND
FRONT VIEW
NOT TO SCALE

POND NUMBER	STRUCT. NUMBER	STRUCT. TYPE	FDOT INDEX	STATION	OFFSET	GRATE EL.	PIPE SIZE	FROM	FLOW LINE	ELEVATIONS	
				A	B	C	D	E	F	G	H
2/3	S-320	DBI H	232	44+96.45	65.68 RT	12.00	66"	S-319	4.20	12.00	13.00
2/3	S-321	DBI H	232	44+96.45	76.68 RT	12.00	66"	S-320	4.10	12.00	13.00
4	S-418	DBI H	232	1323+79.63	124.37 RT	7.00	48"	S-415	2.60	7.00	8.00

NOTE:
ALL ELEVATIONS ARE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88).

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

ST. LUCIE COUNTY ENGINEERING DIVISION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
C.R. 712	ST. LUCIE	06-18

STORM SEWER OUTFALL DETAIL SHEET

SHEET NO. 88

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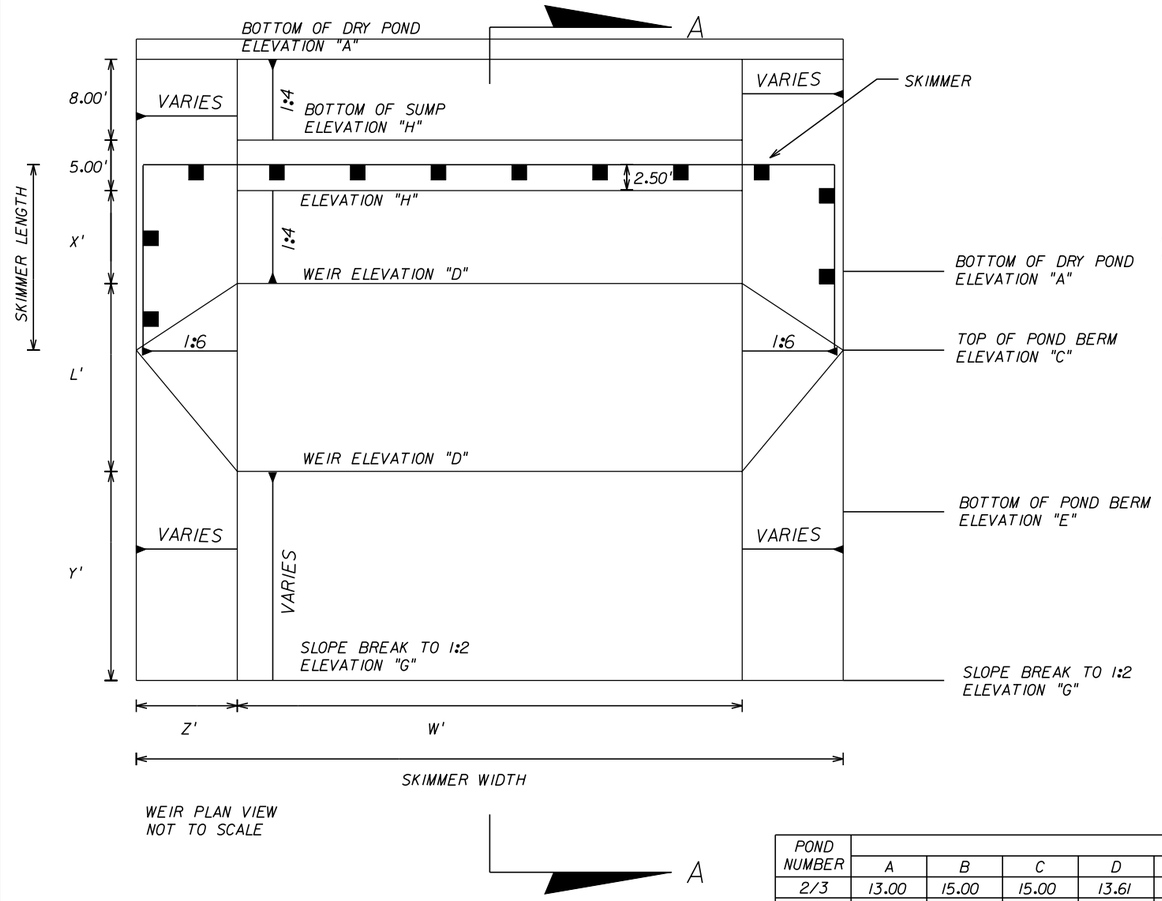

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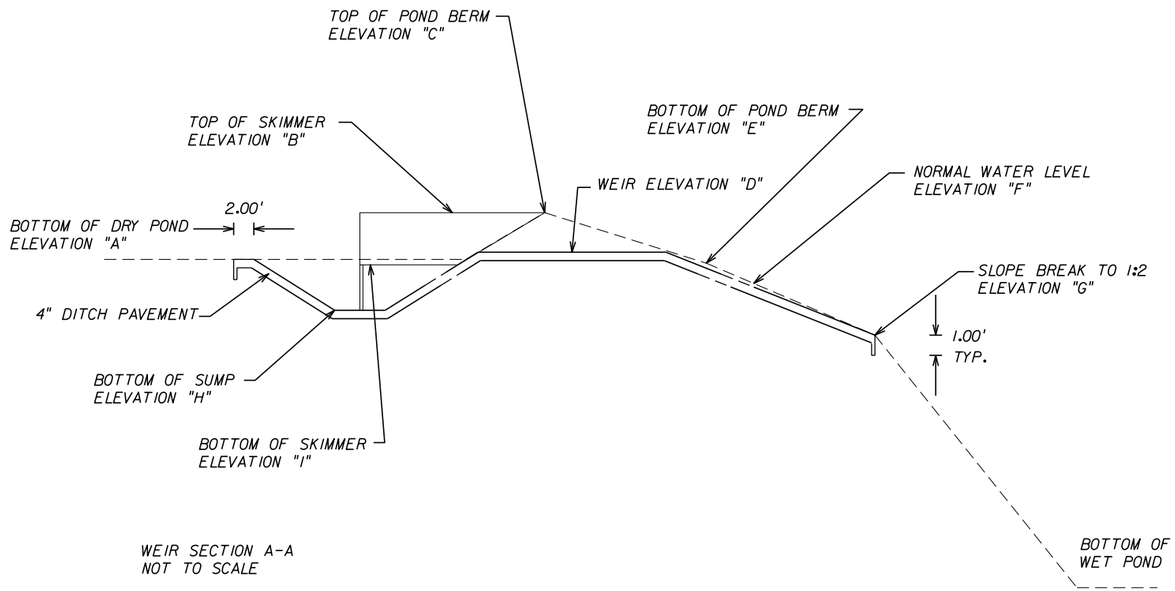

WEIR SECTION A-A
NOT TO SCALE

POND NUMBER	ELEVATIONS											DIMENSIONS					SKIMMER LENGTH	SKIMMER WIDTH	PIPE LENGTH
	A	B	C	D	E	F	G	H	I			W	L	X	Y	Z			
2/3	13.00	15.00	15.00	13.61	13.00	9.50	7.50	11.00	13.00			70.00	16.68	10.44	40.24	8.34	17.77	74.76	55.34
4	8.00	10.80	10.80	8.40	8.80	5.00	3.00	6.00	8.00			50.00	26.94	9.60	21.60	14.40	21.40	78.80	44.54

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THERESA D. ELLISON, P.E. # 53918

ST. LUCIE COUNTY ENGINEERING DIVISION

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WEIR DETAIL SHEET

SHEET NO. 89

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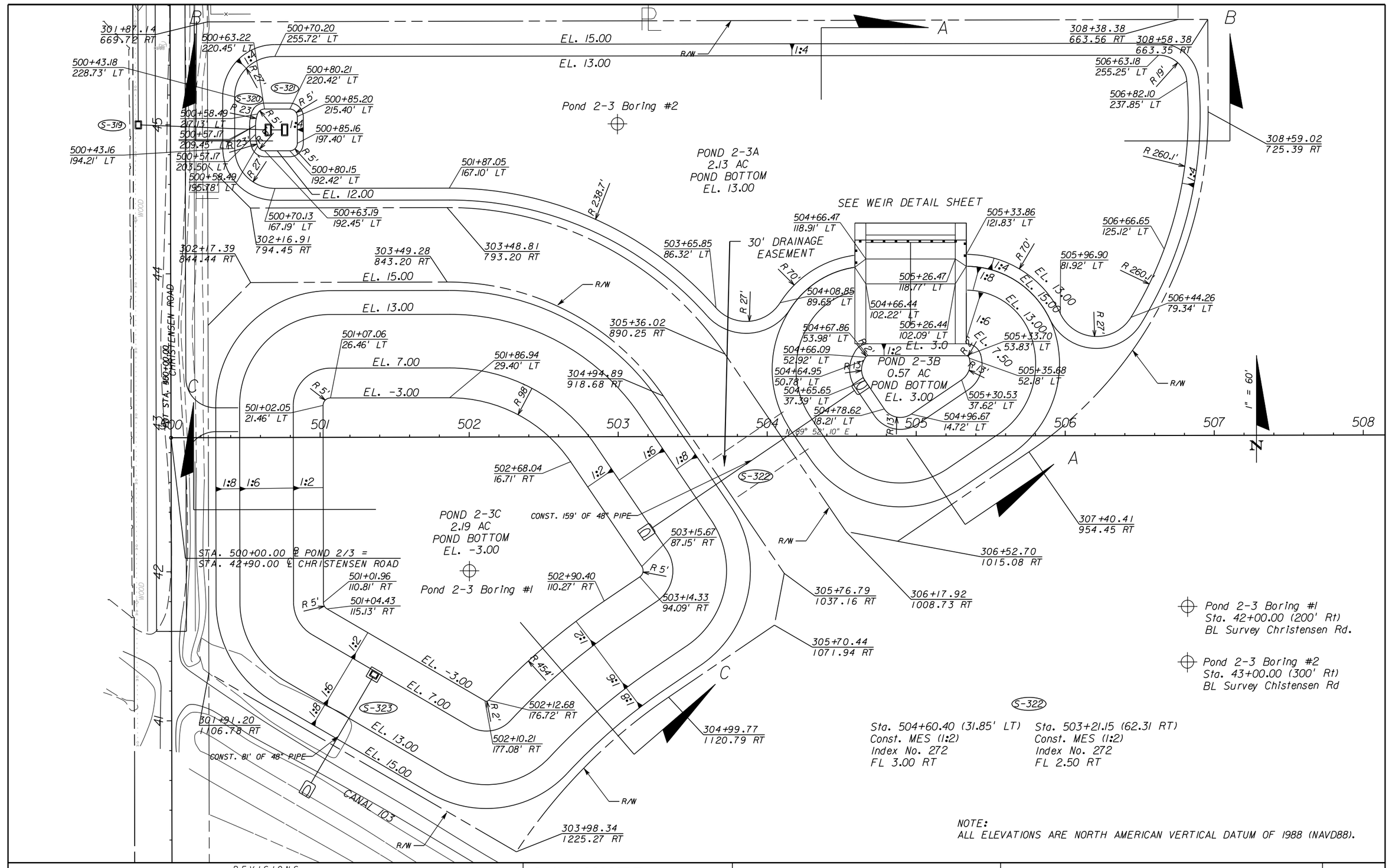
APPLICATION 120405-1

EXHIBIT 2.0 PAGE 80 OF 181



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ST. LUCIE COUNTY ENGINEERING DIVISION

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C.R. 712	ST. LUCIE	06-18

POND 2-3 DETAIL SHEET

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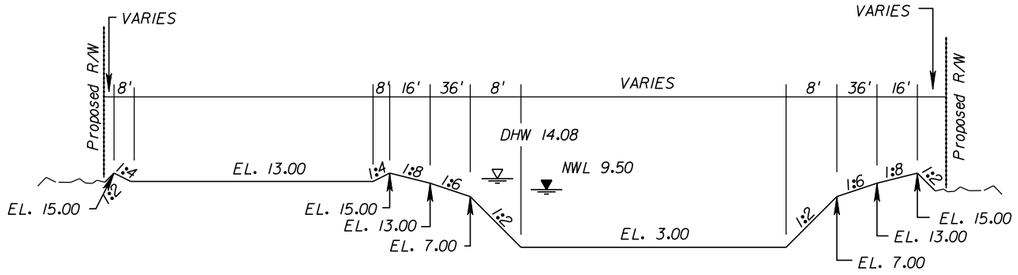
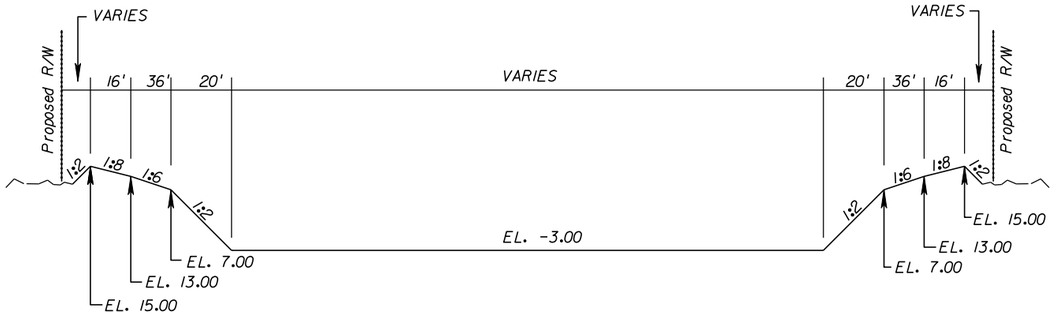


POND SECTION A-A
N.T.S.

POND SECTION B-B
N.T.S.



POND SECTION C-C
N.T.S.

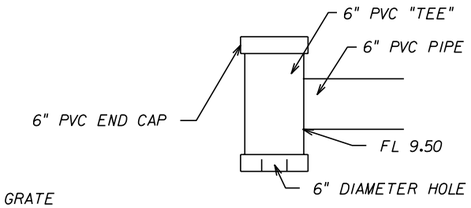
NOTE:
ALL ELEVATIONS ARE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88).

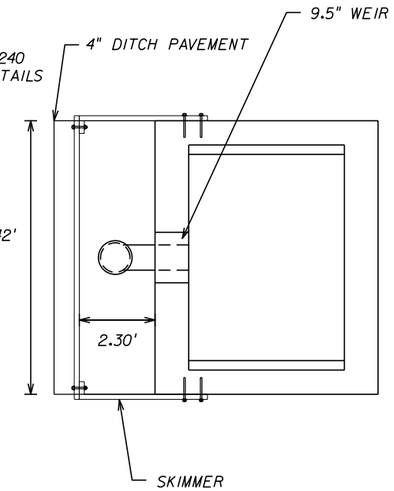
S-323

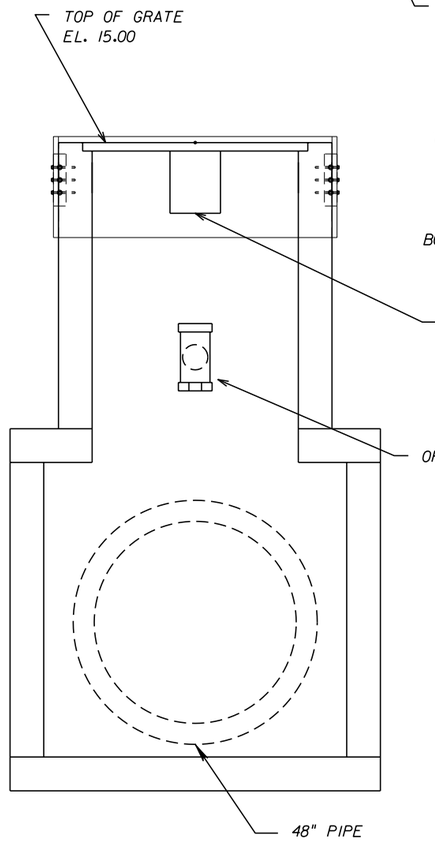
STA. 501+35.77 (159.34 RT)
CONST. MOD. DBI TYPE D (J BOTTOM 6'X3.5')
INDEX NO. 200, 232
GRATE EL. 15.00
FL 6.50 (RT)

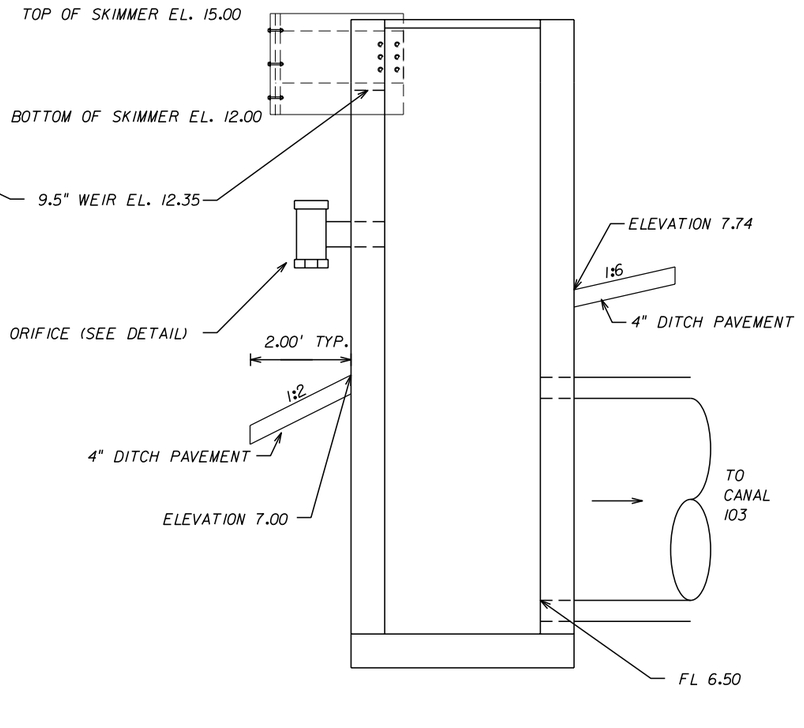
SEE FDOT STANDARD INDEX 240 FOR SKIMMER CONNECTION DETAILS

ORIFICE DETAIL:
CONSTRUCT 6" PVC "TEE".
ATTACH CAP TO TOP END.









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POND 2-3 DETAIL SHEET

SHEET NO. 93

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DRAINAGE DOCUMENTATION REPORT

FOR

MIDWAY ROAD (CR No. 712)
FROM STA 1260+50.00 TO STA 1326+50.00
ST. LUCIE COUNTY
PROJECT NO. 06-18

PREPARED FOR:

ST. LUCIE COUNTY

PREPARED BY:

LOCHNER

H. W. LOCHNER, INC.
13577 FEATHER SOUND DR., SUITE 600
CLEARWATER, FLORIDA 33762
FBPR CERTIFICATE OF AUTHORIZATION #894

June 2013

_____

Theresa D. Ellison
P.E. No. 53918

_____

Date

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Sub-Basin Calculations
Pre-Development Offsite Time of Concentrations
Canal 103 Tailwater Elevations

Appendix E - ICPR Modeling

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Existing Basin 1, 2, and 3 Input Report
Existing Basin 1, 2, And 3 Node Min/Max Report
Proposed Basin 1, 2, and 3 Nodal Diagram
Proposed Basin 1, 2, and 3 Input Report
Proposed Basin 1, 2, and 3 Node Min/Max Report
Proposed Basin 1, 2, and 3 Node Time Series Report

Existing and Proposed Basin 4 Nodal Diagram
Existing and Proposed Basin 4 Input Report
Existing and Proposed Basin 4 Node Min/Max Report
Proposed Basin 4 Node Time Series Report

Appendix F – Final Geotechnical Report

Appendix G - Meeting Minutes and Correspondence

Executive Summary

The design considerations for this project are based on the ultimate design conditions; this drainage design document includes the ultimate drainage design of 1.047 miles of Midway Road from just west of Selvitz Road to just west of and not including 25th Street to address current and future traffic capacity deficiencies (See Project Location Map, Appendix A). The widening will increase the roadway from two lanes to four, with an option to increase to six in the future. Improvements are also proposed to Selvitz Road at its intersection with Midway Road. This project will include the installation of curb and gutter, storm sewer, and stormwater runoff treatment facilities to service the future six-lane configuration. The total project area (including pond sites) is 48 acres.

Canal 103 runs south of and parallel to Midway road. In order to minimize the acquisition of right-of-way needed for the widening of Midway Road, St Lucie County proposes to convert Canal 103 from an open channel ditch to a concrete box culvert from west of Selvitz Road to where the canal turns south, away from Midway Road. The proposed box culvert was sized to match existing open channel flows and water surface elevations and as a result the proposed flow rates and water surface elevations generated by converting an open ditch to a concrete box culvert, do not exceed those of the existing open channel.

In order to properly size the replacement for the canal, different sizes of box culverts were modeled. With two existing 6'x10' box culverts already in use in conjunction with the canal, the height of the proposed box culvert was held to 5 and 6 feet. The width of the proposed box culvert began with 10', then 11' and 12' in order to get the most efficient and practical size for the proposed box culvert. After comparing the different sized culverts in ICPR, the 11' x 5' box was selected because it reduced the maximum stage height and maximum outflow for the 25, 50 and 100 year, 72 hour storm frequency and duration events.

The ultimate condition proposes replacing more of the existing Canal 103 with a box culvert, the modeling for the box culvert and parts of the drainage documentation will include the ultimate project design as a modeling condition.

Project Description

Project Introduction: St. Lucie County proposes to widen 1.047 miles of Midway Road from just west of Selvitz Road to just west of 25th Street to address current and future traffic capacity deficiencies (See Project Location Map, Appendix A). The widening will increase the roadway from two lanes to four, with an option to increase to six in the future. Improvements are also proposed to Selvitz Road and 25th Street at their intersections with Midway. This project will include the installation of curb and gutter, storm sewer, and stormwater runoff treatment facilities to service the future six-lane configuration. The total project area (including pond sites) will be 48 acres.

Basin Summary: For the ultimate condition, this project is split into six drainage basins. See Project Drainage Maps, Appendix A – Exhibit B and Regional Drainage Maps/Structures, Appendix A – Exhibits C and D. **Basin 1** begins at the Turnpike and ends just east of Jenkins Road. Stormwater runoff would be pre-treated in a dry pond and then discharged to a wet detention pond. The wet pond would outfall through a cross drain into the proposed Culvert 103. This pond will not be constructed with this design. **Basin 2** begins just east of Jenkins Road and ends east of Selvitz Road. It also includes 2000 feet of North Selvitz Road. **Basin 3** begins east of Selvitz Road and ends at Christensen Road. **Basin 2 and 3** both drain through a storm sewer system to a pond site located east of Christensen Road south of Midway Road. Stormwater runoff is pre-treated in a dry pond and then discharged to a wet detention pond. The wet pond outfalls through a storm pipe to the existing Canal 103. **Basin 4** begins at Christensen Road and ends at 25th Street. Stormwater runoff is pre-treated in a dry pond and then discharged to a wet detention pond. The wet pond outfalls through the existing storm sewer system to a pair of existing roadside ditches along Midway Road. The existing ditches drain to the North Fork of the St. Lucie River. **Basin 5** begins at 25th Street and ends 1,700 feet east. Stormwater runoff would be pre-treated in a dry pond and then discharged to a wet detention pond. The wet pond would outfall through a storm pipe to an existing roadside ditch along Midway Road. The existing ditch drains to the North Fork of the St. Lucie River. This pond will not be constructed with this design. **Basin 6** begins at Selvitz Road station 111+71 (at the limit of the project) and ends at station 126+09. Stormwater runoff is collected by curb and gutter and roadside liner ditches and a roadway storm sewer system discharging to the nearby existing Pond 404 (renamed to South Selvitz/Pond 6 for this project) for wet detention treatment.

Canal 103 and Culvert 103: Canal 103 runs south of and parallel to Midway road. It is part of a regional system draining stormwater runoff from west of I-95 to the North Fork of the St. Lucie River five miles east. The canal drains an estimated 400 acres west of the Turnpike and another 299 acres east of the Turnpike to the North Fork of the St Lucie River. The Midway Road improvements account for 48 of those acres. The total area drained by Canal 103 is 699 acres.

In order to minimize the acquisition of right-of-way needed for the widening of Midway Road, St Lucie County proposes to convert Canal 103 from an open channel ditch to a concrete box culvert from west of

Selvitz Road to where the canal turns south, away from Midway Road. The proposed box culvert was sized to match existing open channel flows and water surface elevations and as a result the proposed flow rates and water surface elevations generated by converting an open ditch to a concrete box culvert do not exceed those of the existing open channel.

Location, Land Use, Regional Drainage Patterns and Datum: This project is located in St. Lucie County, Sections 4, 5, and 6 in Township 35S, Range 40E. Nearby land use includes residential, commercial, industrial, and agricultural. The regional drainage pattern is from west to east. The datum used is NAVD 88 (the conversion formula used is 1.499' NGVD 29 = 0.0' NAVD 88).

Design Considerations

Project Areas: This project consists of 37.90 total acres; 27.57 acres of impervious area, 8.3 acres of impervious areas and wetlands and 2.03 acres of wet pond permanent pools. Onsite stormwater runoff will be treated and attenuated in onsite dry and wet ponds.

Canal 103/Culvert 103: 2441 feet of open ditch will be converted to an 11'x5' concrete box culvert. Type C ditch bottom inlets will be placed along the top of the box culvert at an average spacing of 300 feet to provide venting and maintenance access.

Permit Criteria: A permit has been obtained from the South Florida Water Management District (SFWMD). The South Florida Water Management District has determined that project discharges to the North Fork of the St. Lucie River will require dry retention pre-treatment for nutrient removal. As a result, each pond has two components; a dry retention cell for pre-treatment and a wet detention cell for additional treatment. All ponds except Pond 6 will be new construction. Pond 6 is an existing pond which will be modified to accept runoff from the Selvitz Road improvements.

Channel, Pond and Tailwater Modeling: Project pre vs. post development flows for the 3 year-72 hour, 25 year-72 hour, 50 year-72 hour, and 100 year-72 hour storms are modeled with Streamline Technologies' Interconnected Channel and Pond Routing (ICPR) software.

Where possible, offsite areas draining to the project have been quantified through the use of existing permit information. Where existing permit information is not available, aerial photographs and United States Geological Survey (USGS) quad maps are used to estimate areas, curve numbers, time of concentrations and offsite storage. Onsite calculations are based on project survey and geotechnical data, and are located in the proposed condition basin calculations.

The project tailwater is equal to the average of the daily maximum gage heights recorded by the USGS for the North Fork of the St Lucie River at White City Park from 2002 to present (USGS Gauge 272229080203400 St Lucie River at Midway Road, See Appendix A - Exhibit I). The stage for the tailwater is set at 1.52 feet NAVD 88.

Storm Sewer Modeling: The storm sewer system is modeled using Hiteshew Engineering Systems, Inc.'s Automated Storm Sewer Analysis and Design (ASAD) software. Considering Midway Road's importance as an evacuation route, the design storm for the onsite storm sewer is the FDOT 10 year-24 hour event. The spread criteria used to determine inlet placement is equal to no further than half of the outside travel lane after 4" of rainfall.

Adjacent Existing Permits and Plans (SFWMD and others) Referenced during Design:

- Adonel Concrete (SFWMD Permit 56-00619-S-02)
- I-95
- International Alzheimer's Foundation Trust, Inc. (SFWMD Permit 56-01403-P)
- LTC Ranch (SFWMD Permit 56-01480-P)
- Mayo Warehouse (SFWMD Permit 56-01995-P)
- Midway Commons (SFWMD Permit 56-00873-S)
- Midway Industrial Park (SFWMD Permit 56-01444-P)
- New Horizons (SFWMD Permit56-01258-P)
- Packers of Indian River (SFWMD Application 01297-B)
- Police (SFWMD Permit 56-01184-S)
- Post Office (SFWMD Permit 56-00681-S)
- Ravinia (SFWMD Permit 56-02350-P)
- Substation (SFWMD Permit 56-00838-S)
- Tropicana (SFWMD Permit 56-00565-5)
- Turnpike

See Construction Plans for Roadway and Pond Drainage Details.

Basin 1

Description and Pond Design: Basin 1 is included here as part of the Ultimate Condition for Midway Road and the modeling of the Box Culvert. The basin area and impervious area, ponds and drainage structures have been removed from the design of this Midway Road project. Basin 1 begins at Midway Road station 1219+00 (at the start of the original project) and ends at station 1239+00. Because of the changes to the project limits, Basin 1 plans have been removed from the project and only the calculations in this report remain for future reference.

Soils, Seasonal High Groundwater Elevation, and Existing Ground Elevation: Basin 1 has nearly level, poorly drained sandy soils in the B/D hydrological group. The seasonal high ground water table (SHGWT) depth is typically around 1.0' below the surface. The natural ground elevation in the pond area ranges from18.5 to 15.3 NAVD.

Regional Drainage and Cross Drains: Basin 1 flows from west to east and from North to South. There is an existing cross drain (CD-100) at station 1227+30 consisting of two lengths of 36" corrugated metal pipe (68' CMP and 21' CMP) connected by a catch basin structure.

Basin 2/3

Description and Pond Design: Basin 2 begins at Midway Road station 1239+00, ends at station 1275+00, and includes approximately 2000 feet of Selvitz road north of Midway. Basin 3 runs from station 1275+00 to 1300+91. Basins 2 and 3 both drain to Canal 103 and will be treated in the same pond. Onsite runoff is collected by curb and gutter and routed to the pond by a storm sewer system. The pond consists of two cells; a dry pre-treatment area with 1 foot vertical to 4 feet horizontal side slopes and a wet detention area with a 16' wide berm sloped at 1:8 followed by a 1:6 slope down to 2' below the water line. From 2' below the water line to the pond bottom, the side slopes are 1 to 2. The pond is designed to treat 150% x 2.5 inches over the project impervious area. Of that volume, one half inch over the project area will be pre-treated in the dry cell.

Soils, Seasonal High Groundwater Elevation, and Existing Ground Elevation: Basins 2 and 3 have nearly level, poorly drained sandy soils in the B/D hydrological group. The seasonal high ground water table (SHGWT) depth is typically around 6.0' below the surface due to the proximity of Canal 103. The natural ground elevation in the pond area is around 16.5.

Pond Elevations and Outfall Information: The control elevation for the wet detention cell will be set at 9.50 NAVD 88. The top of the treatment volume will be at elevation 12.35. The dry cell pond bottom will be set at elevation 13.00. The top of the pre-treatment volume will be at elevation 13.61. The design high water (DHW) for both cells will remain a minimum of 1' below the top of the berm, set at elevation 15.00. Pond 2/3

will discharge to offsite Canal 103. At this location, the canal has a flow line of 6.62 and a top of bank at 13.60. Canal 103 discharges to the North Fork of the St. Lucie River.

Regional Drainage and Cross Drains: Basin 2/3 flows from west to east and from North to South. There are seven cross drains in Basin 2/3.

CD-200 is located at station 1247+20 and consists of two 24" RCP's connected to a catch basin that discharges to Canal 103 through one 15" CMP.

CD-Police is a 24" RCP that carries stormwater 140' from the police station wet pond to Canal 103 near station 1251+00.

CD-201 is located at station 1261+25 and consists of two lengths of 24" corrugated metal pipe (105' CMP and 34' CMP) connected by a catch basin structure.

CD-202 is located at station 1266+25 and consists of two lengths of corrugated metal pipe (45' of 15" CMP and 21' of 12" CMP) connected by a ditch.

CD-203B is located at station 1274+50 and consists of three 24" RCP's tying into a manhole that discharges to Canal 103 through 105' of 24" RCP. The proposed condition replaces the three pipes tying into a manhole with 2- 18" RCP's and a 14"x23" ERCP. The manhole will discharge to Culvert 103 through dual 24" RCP's.

CD-300 is located at station 1284+40 and consists of two lengths of 24" corrugated metal pipe (71' CMP and 41' CMP) connected by a ditch. The proposed condition replaces the corrugated metal pipes and ditch with one 19"x30" ERCP.

CD-301 is located at station 1293+00 and consists of 56' of 24" corrugated metal pipe discharging to a ditch that connects to Canal 103. The proposed condition replaces the corrugated metal pipe and ditch with one 19"x30" ERCP.

Basin 4

Description and Pond Design: Basin 4 begins at Midway Road station 1300+91 and ends at station 1324+50. Onsite runoff is collected by curb and gutter and routed to the pond by a storm sewer system. The pond consists of two cells; a dry pre-treatment area with 1 foot vertical to 4 feet horizontal side slopes and a wet detention area with a 16' wide berm sloped at 1:8 followed by a 1:4 slope down to 2' below the water line. From 2' below the water line to the pond bottom, the side slopes are 1 to 2. The pond is designed to treat 150% x 2.5 inches over the project impervious area. Of that volume, one half inch over the project area will be pre-treated in the dry cell.

Soils, Seasonal High Groundwater Elevation, and Existing Ground Elevation: Basin 4 has nearly level, poorly drained sandy soils in the B/D hydrological group. The seasonal high ground water table (SHGWT) depth is typically around 1.0' below the surface. The natural ground elevation in the pond area ranges from11.0 to 8.0 NAVD.

Pond Elevations and Outfall Information: The control elevation for the wet detention cell will be set at 5.00 NAVD 88. The top of the treatment volume will be at elevation 7.90. The dry cell pond bottom will be set at elevation 8.00. The top of the pre-treatment volume will be at elevation 9.10. The design high water (DHW) for both cells will remain a minimum of 1' below the top of the berm, set at elevation 10.80. Pond 4 will discharge to an onsite existing storm sewer system. The existing system contains two 38"x60" trunk lines that discharge to the roadside ditches at the eastern end of the project. The ditch flowline elevation at the points of discharge is 2.10 and the top of bank elevation is 4.30'. The ditches continue on to the North Fork of the St. Lucie River. The tail water will be set to elevation 5.00 for pond modeling purposes.

Regional Drainage and Cross Drains: Basin 4 flows from west to east and from North to South. There are no cross drains in Basin 4.

Basin 5

Description and Pond Design: Basin 5 is included here as part of the Ultimate Condition for the Midway Road project. The basin area and impervious area, ponds and drainage structures have been removed from the design of this Midway Road project. Basin 5 begins at Midway Road station 1324+50, ends at station 1339+21 (original project terminus), and includes approximately 620 feet of 25th street south of Midway. Because of the changes to the project limits, Basin 5 plans have been removed from the project and only the calculations in this report remain for future reference.

Soils, Seasonal High Groundwater Elevation, and Existing Ground Elevation: Basin 5 has nearly level, poorly drained sandy soils in the B/D hydrological group. The seasonal high ground water table (SHGWT) depth is typically around 1.0' below the surface. The natural ground elevation in the pond area ranges from 5.0 to 2.0 NAVD. Based on geotechnical borings, the SHGWT is assumed to be at elevation 3.0 NAVD 88.

South Selvitz (Basin 6)

Description and Pond Design: The South Selvitz Basin begins at Selvitz Road station 111+71 (at the limit of the project) and ends at station 126+09. Onsite runoff is collected by curb and gutter, roadside linear ditches and a roadway storm sewer system discharging to the nearby existing Pond 404 (renamed to South Selvitz/Pond 6 for this project) for wet detention treatment.

Pond 6/Pond 404 is part of the treatment system designed and built to service the Sharrett Range development. The modification proposed to Pond 6/Pond 404 is addressed in SFWMD Permit Application # 120214-1, Permit # 56-00466-S. See Appendix G for a copy of the Permit.

The existing lagoon (Pond 404) discharges through a channel to Canal 102. Canal 102 flows to the North Fork of the St. Lucie River.

Offsite Areas

Offsite areas, including those draining to Canal 103, are shown on the Regional Drainage Map in Appendix A. Time of Concentration paths and estimated structure sizes and inverts are shown on the Regional Drainage Structure Map in Appendix A.

Floodplain

No portion of Midway Road that is part of the project is located within the 100 year floodplain according to the FEMA FIRM. The 500 year floodplain is located at the intersection of Midway Road and 25th Street. No floodplain compensation is required as part of this project. Please see Appendix A, FEMA FIRM Map(s) Number 12111C0276J dated February 16, 2012.

Appendix A
Exhibits

A. Project Location Map
B. Project Drainage Maps and Time of Concentration Paths
C. Regional Drainage Map with Areas
D. Regional Drainage Structures Map with Time of Concentration Paths
E. USGS Quad Map
F. FEMA Floodplain Map
G. SFWMD Rainfall Maps for 3, 10, 25, and 100 Year Return Periods
H. FDOT Precipitation Data Maps
I. USGS Tailwater Gauge Height vs. Time Graph

Appendix A
Exhibits

A. Project Location Map
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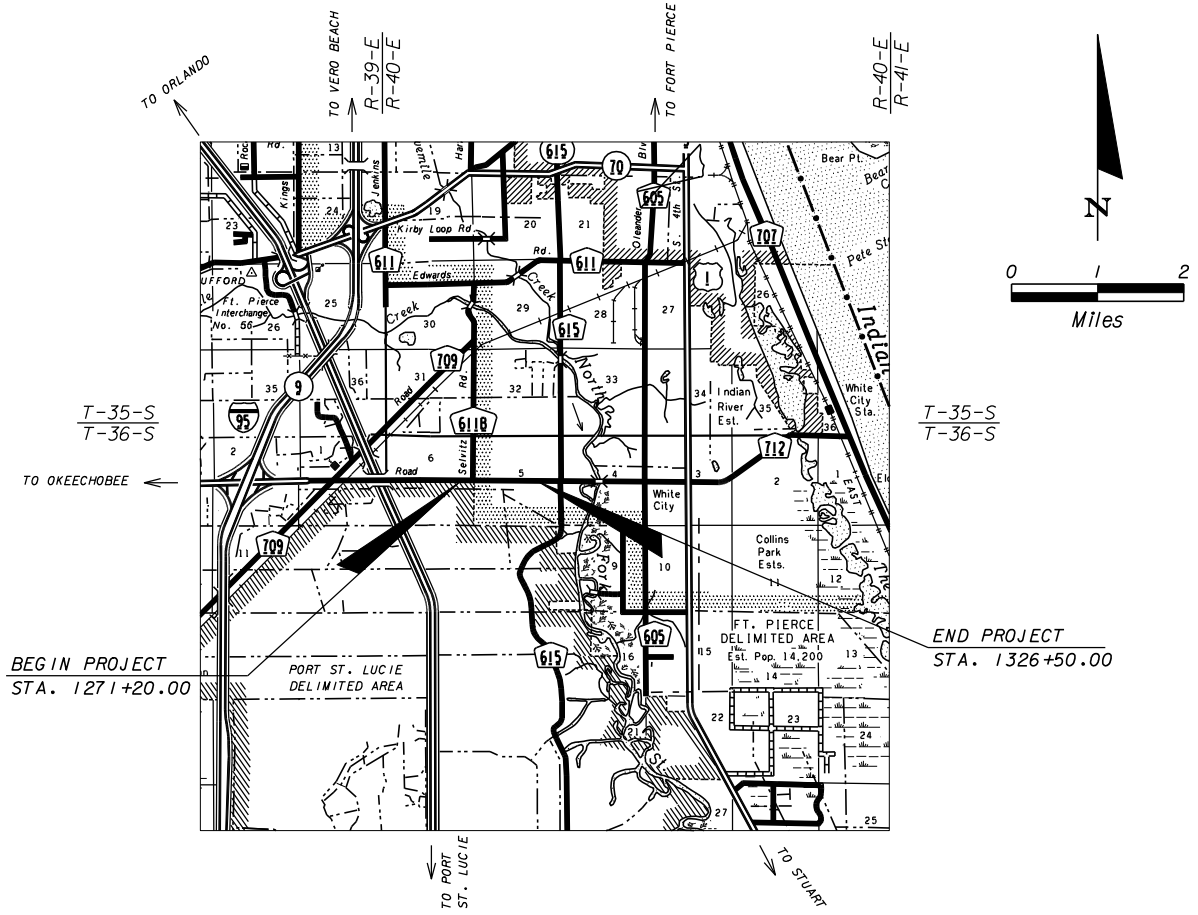
E. USGS Quad Map
F. FEMA Floodplain Map
G. SFWMD Rainfall Maps for 3, 10, 25, and 100 Year Return Periods
H. FDOT Precipitation Data Maps
I. USGS Tailwater Gauge Height vs. Time Graph

PROJECT LOCATION MAP
EXHIBIT A



NOTE:
ALL ELEVATIONS ARE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88).

SCALE:
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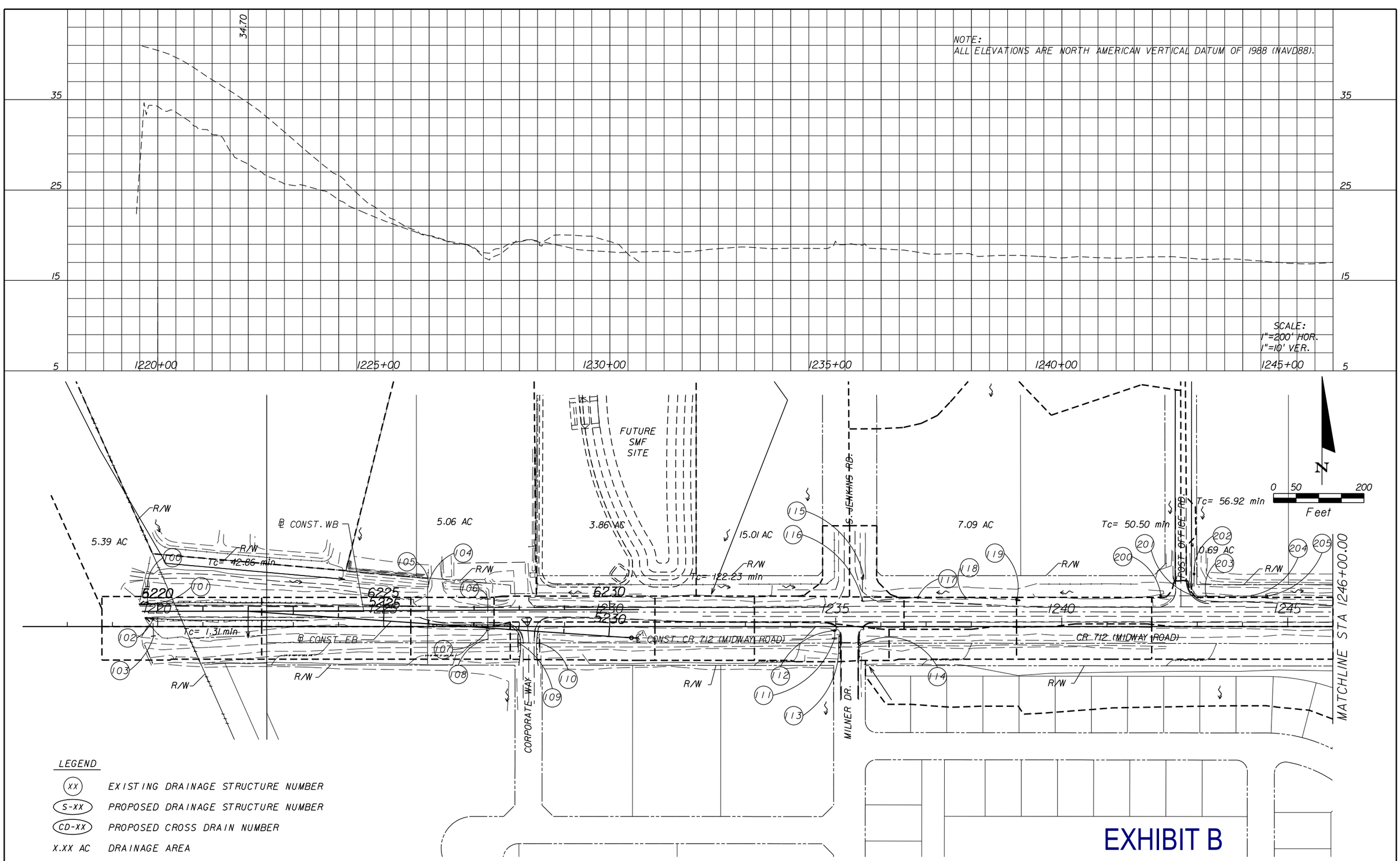
1"=10' VER.



LEGEND

(XX)	EXISTING DRAINAGE STRUCTURE NUMBER
(S-XX)	PROPOSED DRAINAGE STRUCTURE NUMBER
(CD-XX)	PROPOSED CROSS DRAIN NUMBER
X.XX AC	DRAINAGE AREA

EXHIBIT B

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

LOCHNER
4350 W. CYPRESS STREET, SUITE 800
TAMPA, FLORIDA 33607
FBPR CERTIFICATE OF AUTH. # 894
THERESA D. ELLISON, P.E. # 53918

ST. LUCIE COUNTY ENGINEERING DIVISION

ROAD NO.	COUNTY	PROJECT ID
CR 712	ST. LUCIE	0618

DRAINAGE MAP

SHEET NO.

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NOTE:
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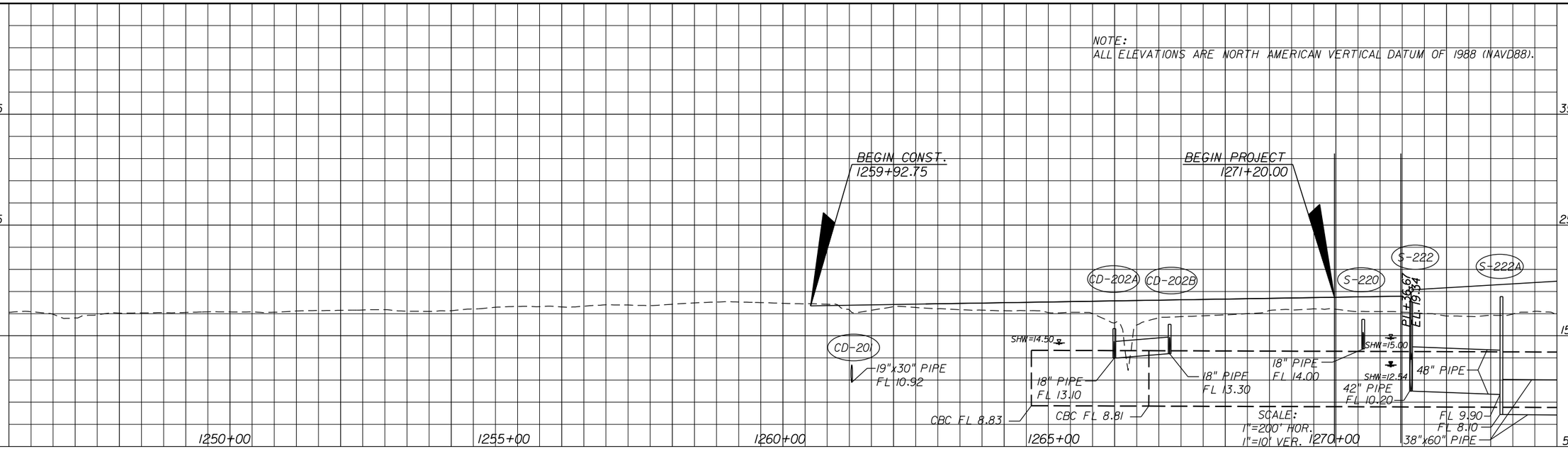
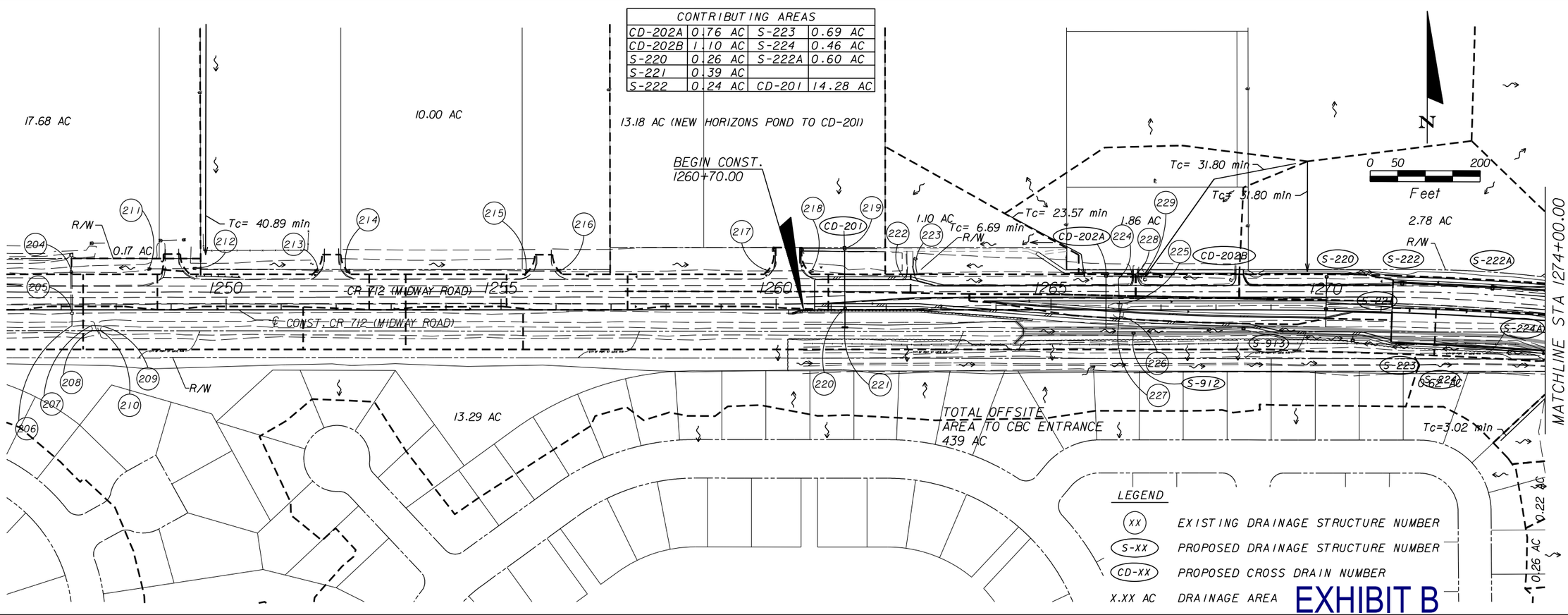


CONTRIBUTING AREAS			
CD-202A	0.76 AC	S-223	0.69 AC
CD-202B	1.10 AC	S-224	0.46 AC
S-220	0.26 AC	S-222A	0.60 AC
S-221	0.39 AC		
S-222	0.24 AC	CD-201	14.28 AC



LEGEND

XX	EXISTING DRAINAGE STRUCTURE NUMBER
S-XX	PROPOSED DRAINAGE STRUCTURE NUMBER
CD-XX	PROPOSED CROSS DRAIN NUMBER
X.XX AC	DRAINAGE AREA

EXHIBIT B

REVISIONS			
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TAMPA, FLORIDA 33607
FBPR CERTIFICATE OF AUTH. # 894
THERESA D. ELLISON, P.E. # 53918

ST. LUCIE COUNTY ENGINEERING DIVISION

ROAD NO.	COUNTY	PROJECT NUMBER
CR 712	ST. LUCIE	06-18

DRAINAGE MAP

SHEET NO. 5

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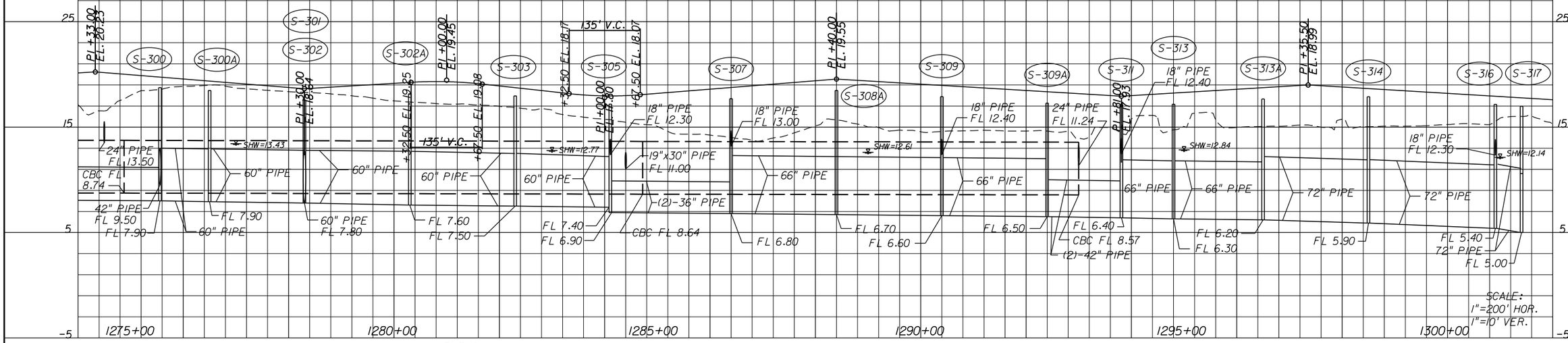
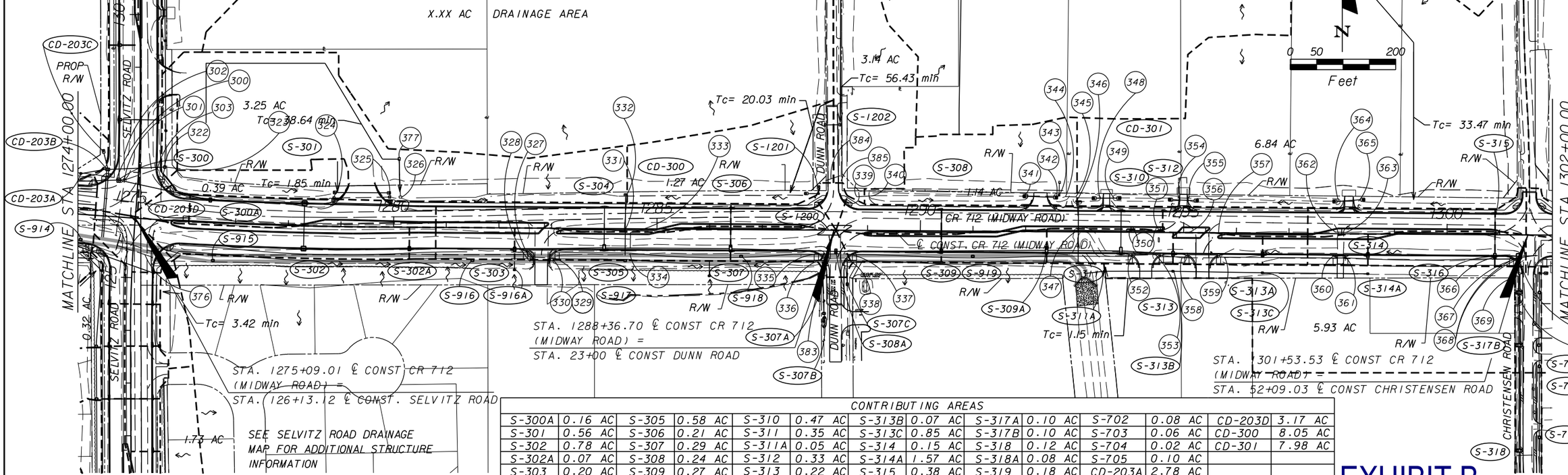


SCALE:
1"=200' HOR.
1"=10' VER.

LEGEND

(XX)	EXISTING DRAINAGE STRUCTURE NUMBER
S-XX	PROPOSED DRAINAGE STRUCTURE NUMBER
CD-XX	PROPOSED CROSS DRAIN NUMBER
X.XX AC	DRAINAGE AREA



CONTRIBUTING AREAS

S-300A	0.16 AC	S-305	0.58 AC	S-310	0.47 AC	S-313B	0.07 AC	S-317A	0.10 AC	S-702	0.08 AC	CD-203D	3.17 AC		
S-301	0.56 AC	S-306	0.21 AC	S-311	0.35 AC	S-313C	0.85 AC	S-317B	0.10 AC	S-703	0.06 AC	CD-300	8.05 AC		
S-302	0.78 AC	S-307	0.29 AC	S-311A	0.05 AC	S-314	0.15 AC	S-318	0.12 AC	S-704	0.02 AC	CD-301	7.98 AC		
S-302A	0.07 AC	S-308	0.24 AC	S-312	0.33 AC	S-314A	1.57 AC	S-318A	0.08 AC	S-705	0.10 AC				
S-303	0.20 AC	S-309	0.27 AC	S-313	0.22 AC	S-315	0.38 AC	S-319	0.18 AC	CD-203A	2.78 AC				
S-304	0.83 AC	S-309A	0.27 AC	S-313A	0.12 AC	S-316	0.36 AC	S-701	0.10 AC	CD-203C	5.95 AC				

EXHIBIT B

REVISIONS

DATE	DESCRIPTION	DATE	DESCRIPTION

LOCHNER
4350 W. CYPRESS STREET, SUITE 800
TAMPA, FLORIDA 33607
FBPR CERTIFICATE OF AUTH. # 894
THERESA D. ELLISON, P.E. # 53918

ST. LUCIE COUNTY ENGINEERING DIVISION

ROAD NO.	COUNTY	PROJECT NUMBER
CR 712	ST. LUCIE	06-18

DRAINAGE MAP

SHEET NO. 6

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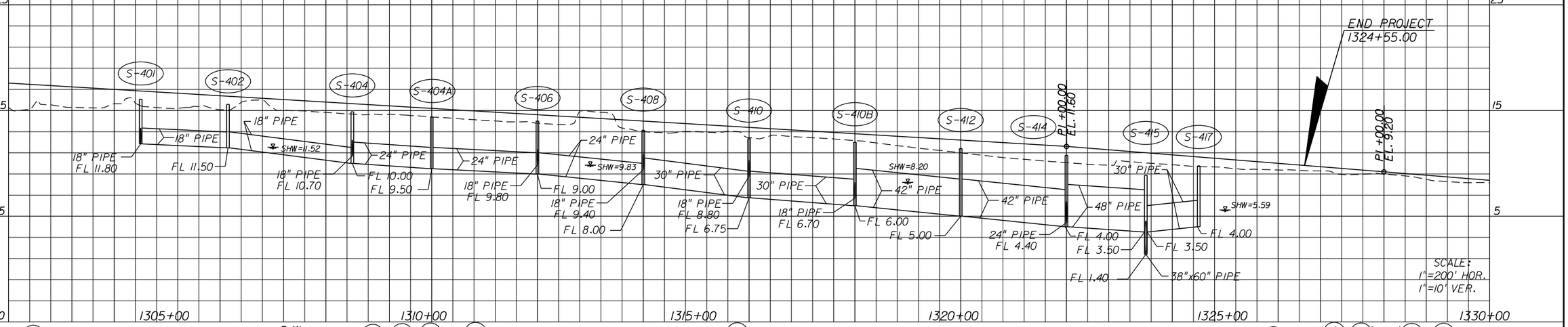
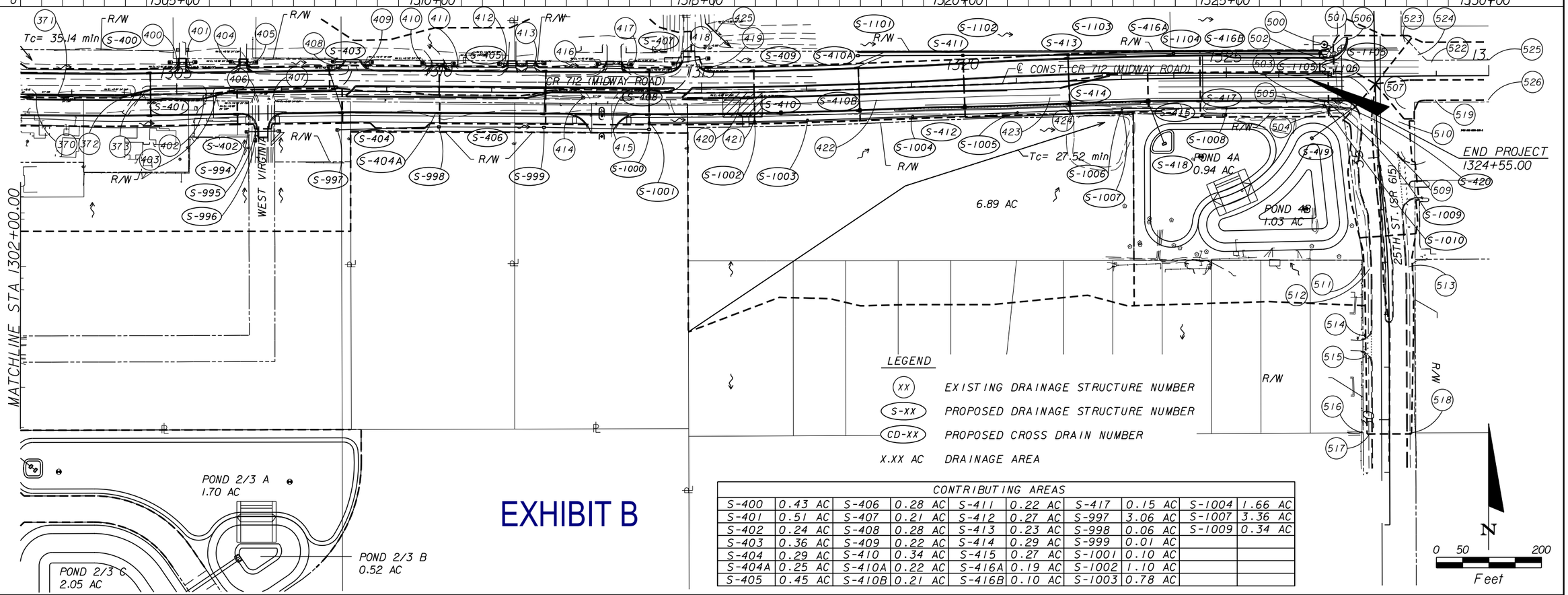
NOTE:
ALL ELEVATIONS ARE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88).





LEGEND

(XX)	EXISTING DRAINAGE STRUCTURE NUMBER
(S-XX)	PROPOSED DRAINAGE STRUCTURE NUMBER
(CD-XX)	PROPOSED CROSS DRAIN NUMBER
X.XX AC	DRAINAGE AREA

CONTRIBUTING AREAS

S-400	0.43 AC	S-406	0.28 AC	S-411	0.22 AC	S-417	0.15 AC	S-1004	1.66 AC
S-401	0.51 AC	S-407	0.21 AC	S-412	0.27 AC	S-997	3.06 AC	S-1007	3.36 AC
S-402	0.24 AC	S-408	0.28 AC	S-413	0.23 AC	S-998	0.06 AC	S-1009	0.34 AC
S-403	0.36 AC	S-409	0.22 AC	S-414	0.29 AC	S-999	0.01 AC		
S-404	0.29 AC	S-410	0.34 AC	S-415	0.27 AC	S-1001	0.10 AC		
S-404A	0.25 AC	S-410A	0.22 AC	S-416A	0.19 AC	S-1002	1.10 AC		
S-405	0.45 AC	S-410B	0.21 AC	S-416B	0.10 AC	S-1003	0.78 AC		

EXHIBIT B

0 50 200
Feet

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

LOCHNER
4350 W. CYPRESS STREET, SUITE 800
TAMPA, FLORIDA 33607
FBPR CERTIFICATE OF AUTH. # 894
THERESA D. ELLISON, P.E. # 53918

ST. LUCIE COUNTY ENGINEERING DIVISION

ROAD NO.	COUNTY	PROJECT NUMBER
CR 712	ST. LUCIE	06-18

DRAINAGE MAP

SHEET NO. 7

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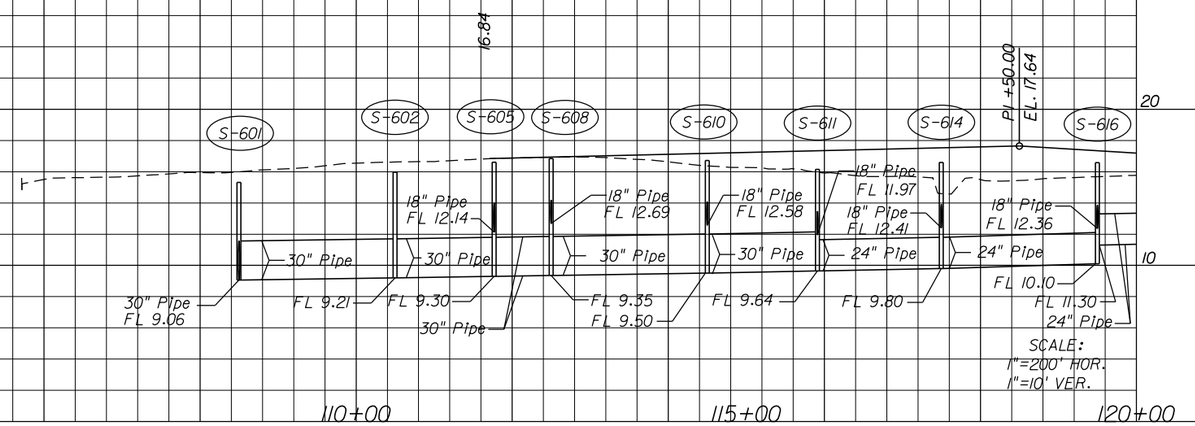

SCALE:
1"=200' HOR.
1"=10' VER.

CONTRIBUTING AREAS							
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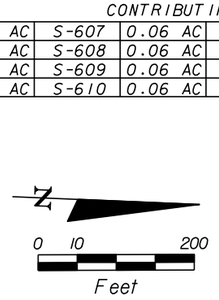
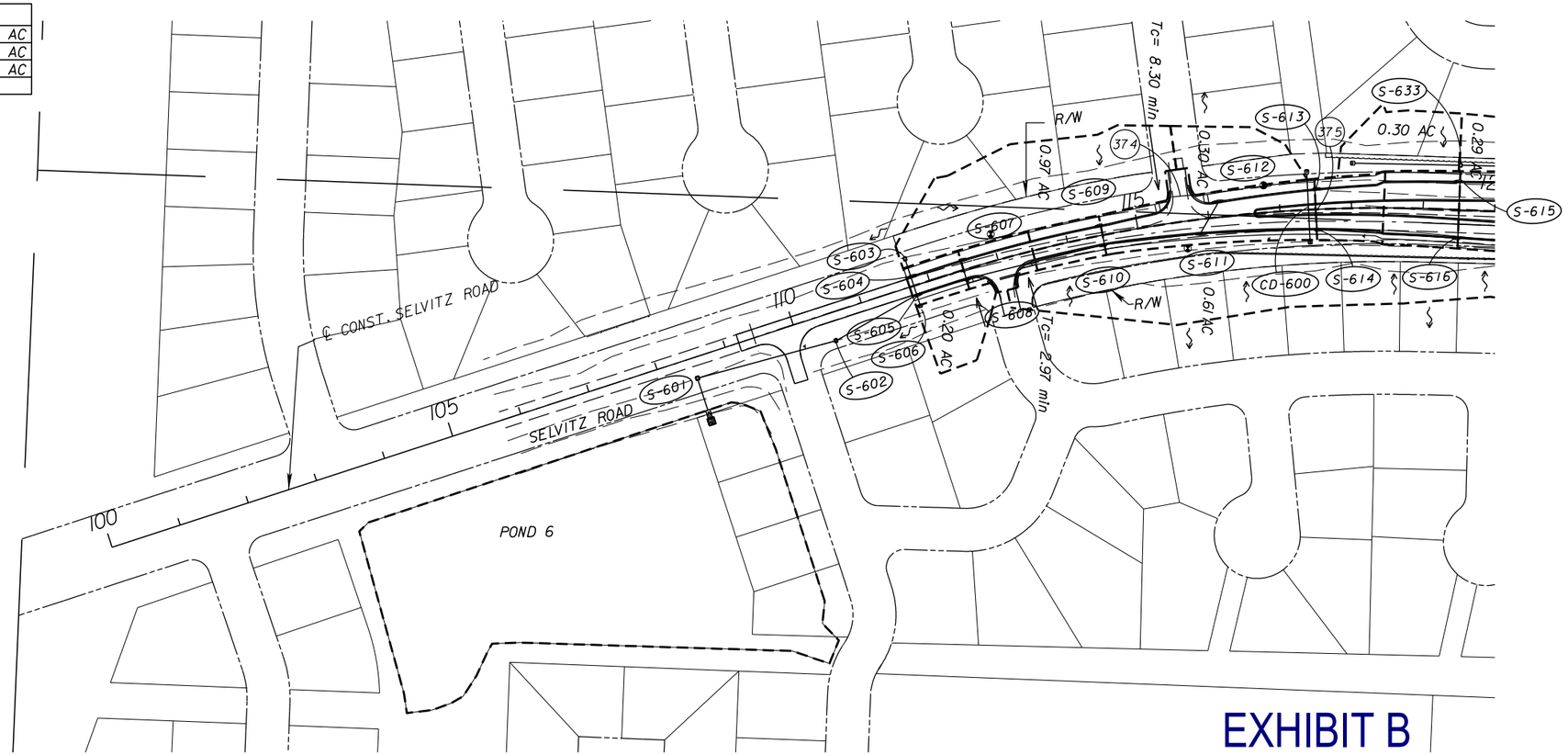
S-604	0.05 AC	S-608	0.06 AC	S-612	0.25 AC	S-616	0.13 AC
S-605	0.08 AC	S-609	0.06 AC	S-613	0.09 AC	S-633	0.30 AC
S-606	0.20 AC	S-610	0.06 AC	S-614	0.09 AC		



SEE POND 6 PLAN SHEET
FOR ADDITIONAL DETAILS



LEGEND

(XX)	EXISTING DRAINAGE STRUCTURE NUMBER
(S-XX)	PROPOSED DRAINAGE STRUCTURE NUMBER
(CD-XX)	PROPOSED CROSS DRAIN NUMBER
X.XX AC	DRAINAGE AREA

EXHIBIT B

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

LOCHNER
4350 W. CYPRESS STREET, SUITE 800
TAMPA, FLORIDA 33607
FBPR CERTIFICATE OF AUTH. # 894
THERESA D. ELLISON, P.E. # 53918

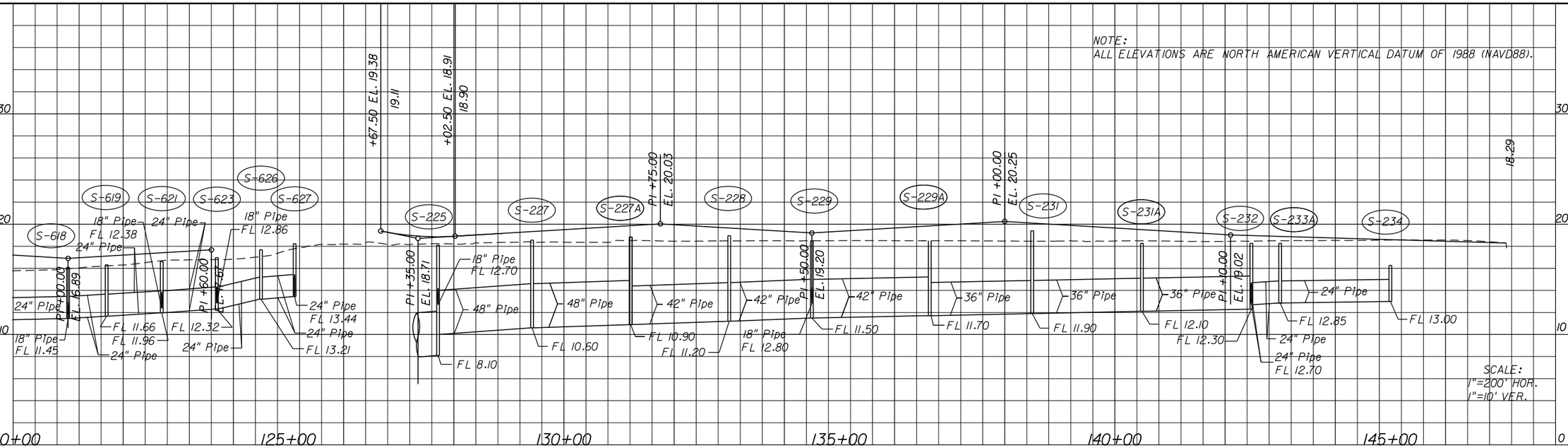
ST. LUCIE COUNTY ENGINEERING DIVISION

ROAD NO.	COUNTY	PROJECT NUMBER
CR 712	ST. LUCIE	06-18

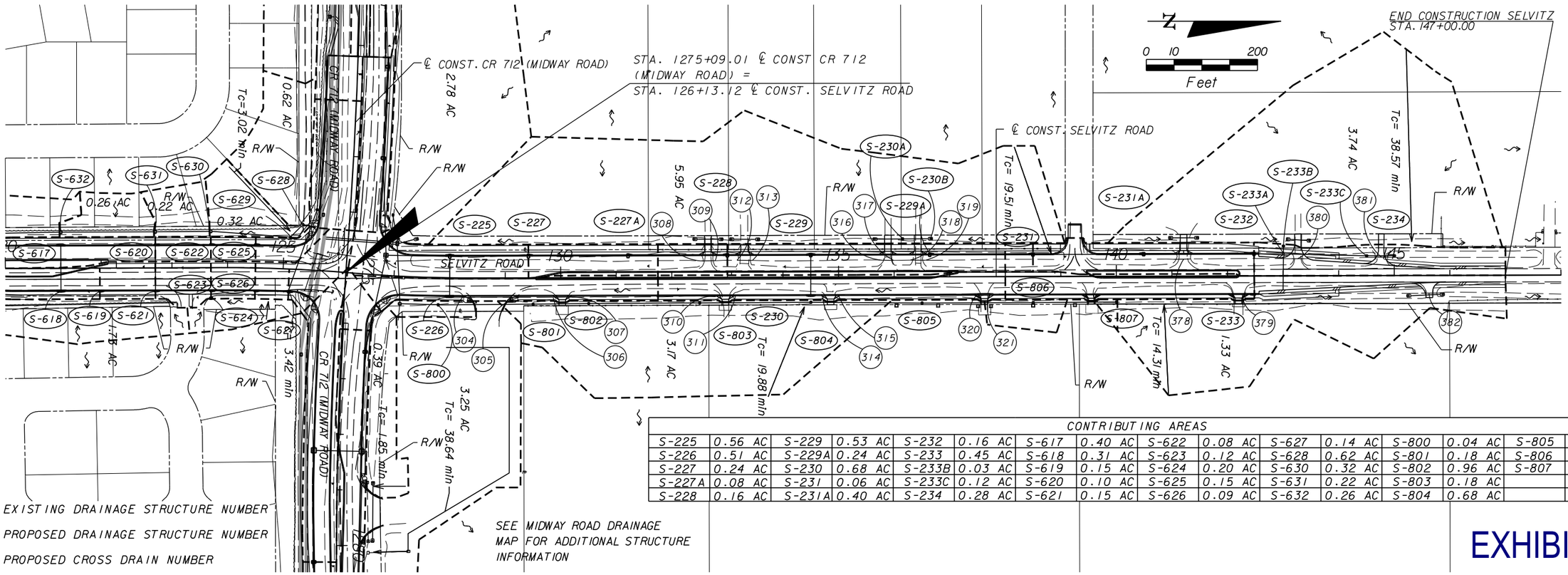
DRAINAGE MAP

SHEET NO. 8

NOTE:
ALL ELEVATIONS ARE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88).



SCALE:
1"=200' HOR.
1"=10' VER.



SEE MIDWAY ROAD DRAINAGE MAP FOR ADDITIONAL STRUCTURE INFORMATION

CONTRIBUTING AREAS

S-225	0.56 AC	S-229	0.53 AC	S-232	0.16 AC	S-617	0.40 AC	S-622	0.08 AC	S-627	0.14 AC	S-800	0.04 AC	S-805	0.20 AC
S-226	0.51 AC	S-229A	0.24 AC	S-233	0.45 AC	S-618	0.31 AC	S-623	0.12 AC	S-628	0.62 AC	S-801	0.18 AC	S-806	0.18 AC
S-227	0.24 AC	S-230	0.68 AC	S-233B	0.03 AC	S-619	0.15 AC	S-624	0.20 AC	S-630	0.32 AC	S-802	0.96 AC	S-807	0.75 AC
S-227A	0.08 AC	S-231	0.06 AC	S-233C	0.12 AC	S-620	0.10 AC	S-625	0.15 AC	S-631	0.22 AC	S-803	0.18 AC		
S-228	0.16 AC	S-231A	0.40 AC	S-234	0.28 AC	S-621	0.15 AC	S-626	0.09 AC	S-632	0.26 AC	S-804	0.68 AC		

LEGEND

(XX)	EXISTING DRAINAGE STRUCTURE NUMBER
(S-XX)	PROPOSED DRAINAGE STRUCTURE NUMBER
(CD-XX)	PROPOSED CROSS DRAIN NUMBER
X.XX AC	DRAINAGE AREA

EXHIBIT B

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

LOCHNER
4350 W. CYPRESS STREET, SUITE 800
TAMPA, FLORIDA 33607
FBPR CERTIFICATE OF AUTH. # 894
THERESA D. ELLISON, P.E. # 53918

ST. LUCIE COUNTY ENGINEERING DIVISION

ROAD NO.	COUNTY	PROJECT NUMBER
CR 712	ST. LUCIE	06-18

DRAINAGE MAP

SHEET NO. 9

jmiller 10/8/2013 4:59:57 PM h:\design\d4\2134_midway\2134000000\drainage\DRMPRD07.dgn

(204) CATCH BASIN
GRATE EL 15.95
12" RCP 12.51 N
24" RCP 11.95 S
24" RCP 12.05 S

(205) CATCH BASIN
GRATE EL 15.95
15" RCP 12.02 S
24" RCP 11.97 N
24" RCP 12.03 N

(206) PIPE END
15" RCP 11.53 N

(207) PIPE END
48" CMP 11.45 W

(208) PIPE END
48" CMP 9.50 W

(209) PIPE END
48" CMP 10.88 E

(210) PIPE END
48" CMP 9.71 E

(211) MES
24" RCP 15.34 W

(212) MES
24" RCP 15.06 E

(213) MES
24" RCP 15.57 W

(214) MES
24" RCP 15.72 E

(215) MES
24" RCP 16.10 W

(216) MES
24" RCP 16.23 E

(217) MES
18" RCP 16.50 W

(218) MES
18" RCP 16.60 E

(219) CATCH BASIN
GRATE EL 18.80
24" CMP 13.56 S
24" CMP 13.66 N

(220) CATCH BASIN
GRATE EL 17.24
24" CMP 13.41 N
24" CMP 11.26 S

(221) PIPE END
24" CMP 11.20 N

(222) MES
12" CMP 17.18 W

(223) MES
12" CMP 17.18 E

(224) PIPE END
15" CMP 14.49 N

(225) PIPE END
15" CMP 13.90 S

(226) PIPE END
12" CMP 11.09 N

(227) PIPE END
12" CMP 10.86 S

(228) PIPE END
15" CMP 14.88 W

(229) PIPE END
15" CMP 14.78 E

(300) MES
24" CMP 14.31 W

(301) MANHOLE
RIM EL 18.12
24" CMP 13.87 NE
24" CMP 13.62 W
24" CMP 13.82 N&S

(302) PIPE END
24" CMP 15.24 S

(303) PIPE END
24" CMP 13.45 SW

(304) PIPE END
15" RCP 14.47 S

(305) PIPE END
15" RCP 14.66 N

(306) PIPE END
12" CMP 14.78 S

(307) PIPE END
12" CMP 14.94 N

(308) PIPE END
12" CMP 15.95 S

(309) PIPE END
12" CMP 15.84 N

(310) PIPE END
12" CMP 15.13 S

(311) PIPE END
12" CMP 15.27 N

(312) PIPE END
12" CMP 15.78 S

(313) PIPE END
12" CMP 15.88 N

(314) PIPE END
12" CMP 15.06 S

(315) PIPE END
12" CMP 15.18 N

(316) PIPE END
15" CMP 15.80 S

(317) PIPE END
15" CMP 15.95 N

(318) PIPE END
12" RCP 16.19 S

(319) PIPE END
12" RCP 16.17 N

(320) PIPE END
12" RCP 15.55 S

(321) PIPE END
12" RCP 15.71 N

(322) PIPE END
24" RCP 13.63 E

(323) CATCH BASIN
GRATE EL 18.59
24" RCP 13.91 W

(324) MES
15" RCP 15.93 W

(325) MES
15" RCP 15.54 E

(326) CATCH BASIN
GRATE EL 15.22
24" RCP 12.42 N

(327) PIPE END
60" CMP 7.04 W

(328) PIPE END
60" CMP 7.58 W

(329) PIPE END
60" CMP 7.41 E

(330) PIPE END
60" CMP 7.66 E

(331) PIPE END
24" CMP 9.92 N

(332) PIPE END
24" CMP 10.95 S

(333) PIPE END
24" CMP 9.13 S

(334) PIPE END
24" CMP 7.55 N

(335) PIPE END
72" CMP 5.55 W

(336) PIPE END
72" CMP 6.70 W

(337) PIPE END
72" CMP 6.39 E

(338) PIPE END
72" CMP 6.52 E

(339) MES
12" CMP 12.19 W

(340) MES
12" CMP 11.83 E

(341) MES
18" CMP 11.21 W

(342) MES
18" CMP 11.29 E

(343) SIDE DRAIN
12" CMP 11.66 S
12" CMP 11.76 N

(344) MES
24" CMP 10.31 W

(345) MES
24" CMP 11.36 E

(346) PIPE END
24" CMP 10.83 S

(347) PIPE END
24" CMP 9.74 N

(348) PIPE END
12" CMP 13.07 W

(349) PIPE END
12" CMP 13.07 E

(350) MES
18" CMP 12.39 W

(351) PIPE END
18" CMP 12.39 E

(352) PIPE END
36" RCP 10.68 W

(353) PIPE END
36" RCP 11.17 E

(354) PIPE END
12" CMP 12.98 W

(355) PIPE END
12" CMP 13.14 E

(356) PIPE END
24" RCP 13.00 W

(357) PIPE END
24" RCP 13.22 E

(358) PIPE END
36" RCP 11.20 W

(359) PIPE END
36" RCP 11.10 E

(360) PIPE END
24" RCP 11.38 W

(361) PIPE END
24" RCP 10.92 E

(362) PIPE END
12" CMP 13.38 W

(363) PIPE END
12" CMP 13.58 E

(364) PIPE END
12" CMP 13.46 W

(365) PIPE END
12" CMP 13.22 E

(366) PIPE END
18" CMP 12.57 W

(367) PIPE END
18" CMP 12.95 E

EXHIBIT B

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

LOCHNER
4350 W. CYPRESS STREET, SUITE 800
TAMPA, FLORIDA 33607
FBPR CERTIFICATE OF AUTH. # 894
THERESA D. ELLISON, P.E. # 53918

ST. LUCIE COUNTY ENGINEERING DIVISION

ROAD NO.	COUNTY	PROJECT NUMBER
CR 712	ST. LUCIE	06-18

EXISTING DRAINAGE STRUCTURE DATA

SHEET NO. 10

(346) PIPE END 24 CMP 10.95 N
(347) PIPE END 24 CMP 10.95 N
(348) PIPE END 24 CMP 10.95 N
(349) PIPE END 24 CMP 10.95 N
(350) PIPE END 24 CMP 10.95 N
(351) PIPE END 24 CMP 10.95 N
(352) PIPE END 24 CMP 10.95 N
(353) PIPE END 24 CMP 10.95 N
(354) PIPE END 24 CMP 10.95 N
(355) PIPE END 24 CMP 10.95 N
(356) PIPE END 24 CMP 10.95 N
(357) PIPE END 24 CMP 10.95 N
(358) PIPE END 24 CMP 10.95 N
(359) PIPE END 24 CMP 10.95 N
(360) PIPE END 24 CMP 10.95 N
(361) PIPE END 24 CMP 10.95 N

(362) PIPE END 24 CMP 10.95 N
(363) PIPE END 24 CMP 10.95 N
(364) PIPE END 24 CMP 10.95 N
(365) PIPE END 24 CMP 10.95 N
(366) PIPE END 24 CMP 10.95 N
(367) PIPE END 24 CMP 10.95 N
(368) PIPE END 24 CMP 10.95 N
(369) PIPE END 24 CMP 10.95 N
(370) PIPE END 24 CMP 10.95 N
(371) PIPE END 24 CMP 10.95 N
(372) PIPE END 24 CMP 10.95 N
(373) PIPE END 24 CMP 10.95 N
(400) PIPE END 24 CMP 10.95 N
(401) PIPE END 24 CMP 10.95 N
(402) PIPE END 24 CMP 10.95 N
(403) PIPE END 24 CMP 10.95 N

(404) PIPE END 24 CMP 10.95 N
(405) PIPE END 24 CMP 10.95 N
(406) PIPE END 24 CMP 10.95 N
(407) PIPE END 24 CMP 10.95 N
(408) PIPE END 24 CMP 10.95 N
(409) PIPE END 24 CMP 10.95 N
(410) PIPE END 24 CMP 10.95 N
(411) PIPE END 24 CMP 10.95 N
(412) PIPE END 24 CMP 10.95 N
(413) PIPE END 24 CMP 10.95 N
(414) PIPE END 24 CMP 10.95 N
(415) PIPE END 24 CMP 10.95 N
(416) PIPE END 24 CMP 10.95 N
(417) PIPE END 24 CMP 10.95 N
(418) PIPE END 24 CMP 10.95 N
(419) PIPE END 24 CMP 10.95 N

STRUCTURE NO.	STATION	DESIGN FLOOD		BASE FLOOD		OVERTOPPING FLOOD				GREATEST FLOOD			
		2% PROB.	50 YR.FREQ.	1% PROB.	100 YR.FREQ.								
		DISCHARGE	STAGE	DISCHARGE	STAGE	DISCHARGE	STAGE	PROB. %	FREQ. YR.	DISCHARGE	STAGE	PROB. %	FREQ. YR.
CD-201	1261+25	2.50	14.31	3.22	15.31	-	-	-	-	5.90	19.00	0.2	500
CD-202A	1266+00	1.60	14.17	1.86	15.11	-	-	-	-	2.50	18.80	0.2	500
CD-203A	1274+00	2.26	16.80	2.66	16.86	-	-	-	-	3.95	17.23	0.2	500
CD-203C	1274+50	4.66	17.07	5.42	17.23	-	-	-	-	6.80	17.60	0.2	500
CD-203D	1275+58	2.60	14.72	3.03	14.94	-	-	-	-	4.25	16.20	0.2	500
CD-300	1284+40	6.38	13.82	7.39	14.52	-	-	-	-	10.50	16.80	0.2	500
CD-301	1293+00	7.12	13.57	8.19	14.03	-	-	-	-	10.30	15.10	0.2	500

NOTE: THE HYDRAULIC DATA IS SHOWN FOR INFORMATIONAL PURPOSES ONLY, TO INDICATE THE FLOOD DISCHARGES AND WATER SURFACE ELEVATIONS WHICH MAY BE ANTICIPATED IN ANY GIVEN YEAR. THIS DATA WAS GENERATED USING HIGHLY VARIABLE FACTORS DETERMINED BY A STUDY OF THE WATERSHED. MANY JUDGEMENTS AND ASSUMPTIONS ARE REQUIRED TO ESTABLISH THESE FACTORS. THE RESULTANT HYDRAULIC DATA IS SENSITIVE TO CHANGES, PARTICULARLY OF ANTECEDENT CONDITIONS, URBANIZATION, CHANNELIZATION, AND LAND USE. USERS OF THIS DATA ARE CAUTIONED AGAINST THE ASSUMPTION OF PRECISION WHICH CAN NOT BE ATTAINED. DISCHARGES ARE IN CUBIC FEET PER SECOND AND STAGES ARE IN FEET NAVD 1988.

DEFINITIONS:

DESIGN FLOOD: THE FLOOD SELECTED TO BE UTILIZED TO ASSURE A STANDARD LEVEL OF HYDRAULIC PERFORMANCE.

BASE FLOOD: THE FLOOD HAVING A 1% CHANCE OF BEING EXCEEDED IN ANY YEAR. (100 YR. FREQUENCY)

OVERTOPPING FLOOD: THE FLOOD WHERE FLOW OCCURS (A) OVER THE HIGHWAY (B) OVER A WATERSHED DIVIDE OR (C) THRU EMERGENCY RELIEF STRUCTURES.

GREATEST FLOOD: THE MOST SEVERE FLOOD WHICH CAN BE PREDICTED WHERE OVERTOPPING IS NOT PRACTICABLE, NORMALLY ONE WITH A 0.2% CHANCE OF BEING EXCEEDED IN ANY YEAR. (500 YR. FREQUENCY)

FLOOD DATA SUMMARY BOX

(517a) END OF SURVEY 18 STEEL 6.66 TOP
(518a) END OF SURVEY 18 STEEL 5.21 TOP

(420) PIPE END 24 CMP 10.95 N
(421) PIPE END 24 CMP 10.95 N
(422) PIPE END 24 CMP 10.95 N
(423) PIPE END 24 CMP 10.95 N
(424) PIPE END 24 CMP 10.95 N
(500) PIPE END 24 CMP 10.95 N
(501) PIPE END 24 CMP 10.95 N
(502) PIPE END 24 CMP 10.95 N

(503) PIPE END 24 CMP 10.95 N
(504) PIPE END
RIM EL 9.09
24" RCP 1.54 W
60"X34" RCP 1.71 NE
24" RCP 2.19 SE
38"X24" RCP 1.58 SW
(505) PIPE END 24 CMP 10.95 N
(506) PIPE END 24 CMP 10.95 N
(507) PIPE END 24 CMP 10.95 N
(508) PIPE END 24 CMP 10.95 N
(509) PIPE END 24 CMP 10.95 N
(510) PIPE END 24 CMP 10.95 N

(511) PIPE END 24 CMP 10.95 N
(512) PIPE END 24 CMP 10.95 N
(513) PIPE END 24 CMP 10.95 N
(514) PIPE END 24 CMP 10.95 N
(515) PIPE END 24 CMP 10.95 N
(516) PIPE END 24 CMP 10.95 N
(517) PIPE END 24 CMP 10.95 N
(518) PIPE END 24 CMP 10.95 N

(519) PIPE END 24 CMP 10.95 N
(520) PIPE END 24 CMP 10.95 N
(521) PIPE END 24 CMP 10.95 N
(522) PIPE END 24 CMP 10.95 N
(523) PIPE END 24 CMP 10.95 N
(524) PIPE END 24 CMP 10.95 N
(525) PIPE END 24 CMP 10.95 N
(526) PIPE END 24 CMP 10.95 N

EXHIBIT B

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

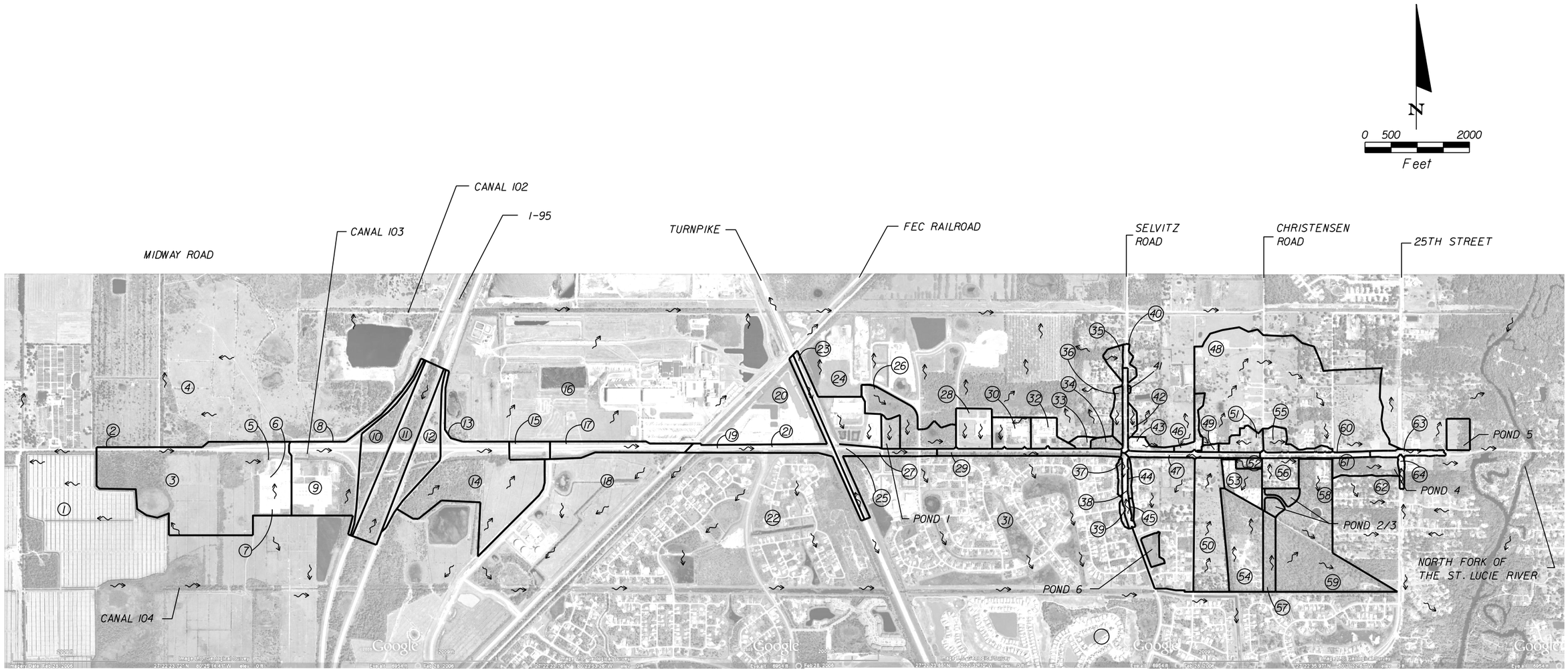
LOCHNER
4350 W. CYPRESS STREET, SUITE 800
TAMPA, FLORIDA 33607
FBPR CERTIFICATE OF AUTH. # 894
THERESA D. ELLISON, P.E. # 53918

ST. LUCIE COUNTY ENGINEERING DIVISION

ROAD NO.	COUNTY	PROJECT NUMBER
CR 712	ST. LUCIE	06-18

EXISTING DRAINAGE STRUCTURE DATA

SHEET NO. 11



1. LTC RANCH (N/A)
2. CSUBSA (21.34 AC)
3. WESTLTC (85.22 AC)
4. WILLOW LAKES (N/A)
5. SUBSBIA (0.67 AC)
6. SUBSIB (1.18 AC)
7. SUBSB2 (8.28 AC)
8. C195A (42.01 AC)
9. SUBS195 (16.72 AC)
10. C195C (21.39 AC)
11. C195E (35.20 AC)
12. C195G (19.79 AC)
13. CLTCA (15.96 AC)
14. OFFLTC (56.72 AC)
15. CLTCC (6.15 AC)
16. TROPICANA (N/A)
17. CFECRA (14.04 AC)
18. LTC RANCH JOINT VENTURE (N/A)
19. CTORIA (6.67 AC)
20. RINKER (N/A)
21. CTURNA (49.82 AC)
22. SHARETT RANGE (N/A)
23. CD-100A (12.03 AC)
24. PACKERS OF INDIAN RIVER (N/A)
25. CCORPA (8.19 AC)
26. CD-101A (23.57 AC)
27. BASIN 1 (6.30 AC)
28. POST OFFICE (13.15 AC)
29. BASIN 2/3 (23.83 AC)
30. POLICE (10.00 AC)
31. SHARETT RANGE (N/A)
32. NEW HORIZONS (13.18 AC) AND CD-201A (1.10 AC)
33. CD-202A (1.86 AC)
34. CD-203A (2.78 AC)
35. N. SELVITZ OFFSITE (3.74 AC)
36. CD-203C (5.95 AC)
37. S. SELVITZ OFFSITE (2.57 AC)
38. S. SELVITZ (5.52 AC)
39. S. SELVITZ OFFSITE (1.42 AC)
40. N. SELVITZ OFFSITE (1.33 AC)
41 & 42. CD-203D (3.17 AC)
43 & 46. CD-300A (8.05 AC)
44. S. SELVITZ OFFSITE (1.73 AC)
45. S. SELVITZ OFFSITE (0.81 AC)
47. BASIN 2/3 (23.83 AC)
48. OFFSITE RESIDENTIAL (149.00 AC)
49 & 51. CD-301A (7.98 AC)
50. CSPUR (34.47 AC)
52. OFFSITE RESIDENTIAL (5.93 AC)
53. FCFR (10.81 AC)
54. CCHRI (29.70 AC)
55. OFFSITE RESIDENTIAL (6.69 AC)
56. OFFSITE RESIDENTIAL (5.93 AC)
57. COUTI23A (8.10 AC)
58. COUTI23B (70.79 AC)
59. COUTI23B (SEE ABOVE)
60. BASIN 4 (7.13 AC)
61. OFFSITE UNDEVELOPED (6.89 AC)
62. OFFSITE RESIDENTIAL (N/A)
63 & 64. BASIN 5 (5.48 AC)

NOTE:

THE AREAS FROM #53 FLORIDA CENTER FOR RECOVERY AND #54 CCHRI ARE COMBINED IN THE ICPR HYDROLOGY BASIN LABELED "CCHRI" (TOTAL 40.59 AC).

EXHIBIT C

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

LOCHNER
4350 W. CYPRESS ST. SUITE 800
TAMPA, FLORIDA 33607
FBPR CERTIFICATE OF AUTH. # 894
THERESA D. ELLISON, P.E. # 53918

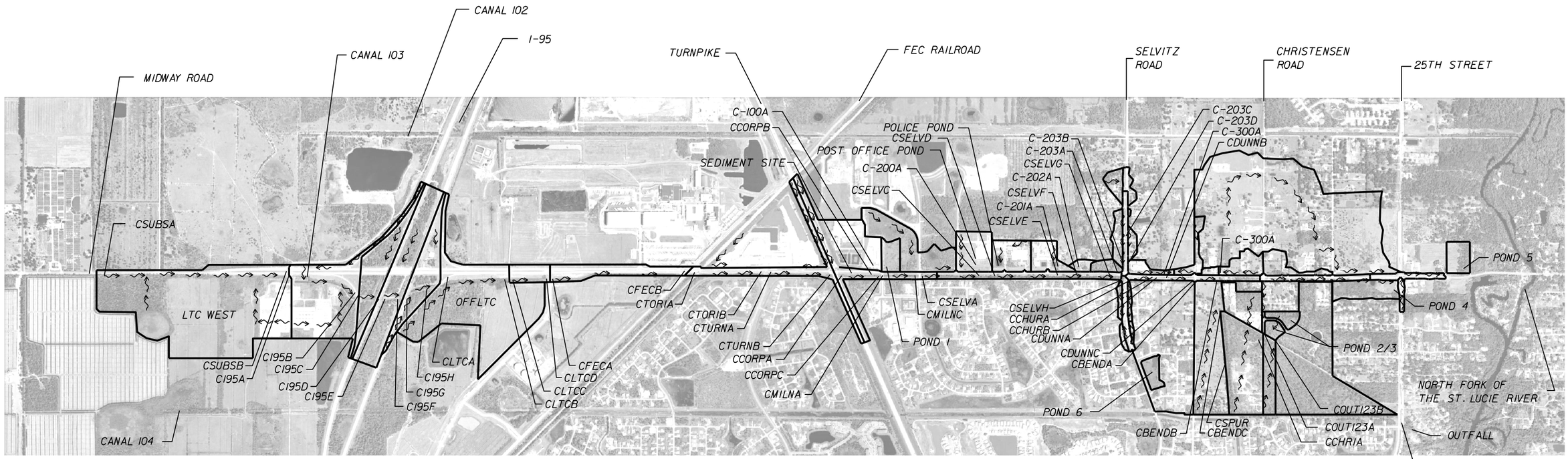
ST. LUCIE COUNTY ENGINEERING DIVISION

ROAD NO.	COUNTY	PROJECT NUMBER
CR 712	ST. LUCIE	06-18

REGIONAL DRAINAGE MAP

SHEET NO. D-13

NOTICE: THE OFFICIAL RECORD OF THIS SHEET IS THE ELECTRONIC FILE SIGNED AND SEALED UNDER RULE 61G15, F.A.C.



PIPE SIZES AND INVERTS ARE ESTIMATED FROM FIELD REVIEW AND/OR PERMIT APPLICATIONS ON FILE WITH THE SFWMD. THIS INFORMATION IS FOR MODELING PURPOSES ONLY.
FLOW ARROWS INDICATE TIME OF CONCENTRAITION PATHS.

CSUBSA N/A N/A	C195B 48" RCP X 2 13.50	C195F 60" RCP X 2 13.50	OFFLTC N/A N/A	CLTCD 76" X 48" ERCP 13.40	CTORIB 72" RCP 13.25	SEDIMENT SITE N/A	CCORPC 96" RCP 9.24	POST OFFICE POND	POLICE 24" RCP 13.79	C-202A 15" RCP 14.49	C-203C 24" RCP 15.24	CSELVH 10' X 6' CBC 7.72	C-300A 24" RCP 10.95	C-301 24" RCP 10.83	CCHRIA 72" RCP 7.23	COUTI23C 60" RCP X 3 2.00
LTC WEST N/A N/A	C195C 48" RCP X 2 13.50	C195G 60" RCP X 2 13.50	CLTCB 60" RCP X 2 13.45	CFECA 76" X 48" ERCP 13.40	CTURNA 72" RCP 13.25	C-100A 36" RCP 13.38	CMILNA 96" RCP 8.97	C-200A 24" RCP X 2 12.05	CSGLUD 24" RCP 13.66	CSELVF 12" RCP 10.86	C-203D 24" RCP 13.45	CCHURA 10' X 6' CBC 7.36	CDUNNB 24" RCP 7.55	CBENDB 24" RCP 9.74	COUTI23A 72" RCP 7.23	OUTFALL 60" RCP X 3 2.00
CSUBSB 36" RCP 15.50	C195D 54" RCP X 2 13.50	C195H 7' X 6' CBC 13.50	CLTCC 60" RCP X 2 13.45	CFECB 48" RCP X 2 13.31	CTURNB 10' X 5' CBC 13.20	CCORPB 36" RCP 12.71	CMILNC 10' X 6' CBC 10.33	CSELVC 15" RCP 11.53	C-201A 24" RCP 13.56	C-203A 24" RCP 14.31	CSELVG 24" RCP 10.52	CCHURB 60" RCP X 2 7.04	CDUNNC 72" RCP X 2 6.70	CBENDC N/A N/A	COUTI23B N/A N/A	
C195A 30" RCP 15.48	C195E 54" RCP X 2 13.50	CLTCA 7' X 6' CBC 13.50	INTENTIONALLY BLANK	CTORIA 48" RCP 13.31	CCORPA 10' X 5' CBC 12.95	BLANK	CSELVA 10' X 6' CBC 10.38	BLANK	CSELVE 24" RCP 11.02	C-203B 24" RCP 13.82	BLANK	CDUNNA 60" RCP X 2 7.41	CBENDA 72" RCP X 2 6.52	CSPUR N/A N/A	BLANK	

EXHIBIT D

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

LOCHNER
4350 W. CYPRESS ST. SUITE 800
TAMPA, FLORIDA 33607
FBPR CERTIFICATE OF AUTH. # 894
THERESA D. ELLISON, P.E. # 53918

ST. LUCIE COUNTY ENGINEERING DIVISION

ROAD NO.	COUNTY	PROJECT NUMBER
CR 712	ST. LUCIE	06-18

REGIONAL DRAINAGE STRUCTURES MAP

SHEET NO.

$USER$ $DATE$ $TIME$ $FILE$

BEGIN PROJECT

END PROJECT

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

UNITED STATES
DEPARTMENT OF COMMERCE
COAST AND GEODETIC SURVEY

ANKONA QUADRANGLE
FLORIDA
7.5 MINUTE SERIES (TOPOGRAPHIC)

SCALE 1:24 000

CONTOUR INTERVAL 5 FEET
NATIONAL GEODETIC VERTICAL DATUM OF 1929
SHORELINE SHOWN REPRESENTS THE APPROXIMATE LINE OF MEAN HIGH WATER
THE AVERAGE RANGE OF TIDE IS APPROXIMATELY 1 FOOT

THIS MAP COMPLIES WITH NATIONAL MAP ACCURACY STANDARDS
FOR SALE BY U. S. GEOLOGICAL SURVEY
DENVER, COLORADO 80225, OR RESTON, VIRGINIA 22092
A FOLDER DESCRIBING TOPOGRAPHIC MAPS AND SYMBOLS IS AVAILABLE ON REQUEST

Mapped by U. S. Coast and Geodetic Survey
Edited and published by the Geological Survey

Control by NOS/NOAA (C) and USCE (E)

Planimetry in part by photogrammetric methods
from aerial photographs taken 1946
Topography by planetable surveys 1948

Polyconic projection. 10,000-foot grid ticks based on Florida coordinate system, east zone. 1000-meter Universal Transverse Mercator grid ticks, zone 17, shown in blue. 1927 North American Datum. To place on the predicted North American Datum 1983 move the projection lines 32 meters south and 22 meters west as shown by dashed corner ticks

No distinction is made between dwellings, barns, commercial, and industrial buildings

There may be private inholdings within the boundaries of the National or State reservations shown on this map

UTM GRID AND 1983 MAGNETIC NORTH
DECLINATION AT CENTER OF SHEET

Revisions shown in purple and woodland compiled by the Geological Survey in cooperation with State of Florida agencies from aerial photographs taken 1980 and other sources
This information not field checked. Map edited 1983

Purple tint indicates extension of urban areas

ROAD CLASSIFICATION
Primary highway, hard surface
Secondary highway, hard surface
Light-duty road, hard or improved surface
Unimproved road
Interstate Route
U. S. Route
State Route
County Route

FLORIDA
QUADRANGLE LOCATION

ANKONA, FLA.
27080-C3-TF-024

1948
PHOTOREVISED 1983
DMA 4938 IV SE—SERIES V847

EXHIBIT E

ance Program at 1-800-638-6620.

MAP SCALE 1" = 500'

0 250 500 750 1,000 FEET

BEGIN PROJECT

80°22'30" 562000mE 563000mE

27°22'30"

3028000mN

3027000mN

JOINS PANEL 0188

AF7708

W MIDWAY RD

SELVITZ RD

DUNN RD

CHRISTENSEN RD

DANIELS ST

NW RUGBY DR

NW RODIN CT

NW REGAL CIR

NW PRIMM ST

NW AGNON CT

NW ALE CT

NW DORA CT

NW NEWARK LN

NW HALA CT

NW DOWNY CT

NW MOLTON CIR

NW CRAFT CT

NW LYKES LN

NW NASSAU LN

NW ALTER CT

NW COSMO CT

NW MILNER DR

NW NEKOMA ST

NW TAPER CT

NW OMEGA RD

NW MAYFIELD LN

NW POMONA CT

NW POLLY CT

NW KOA CT

NW SELVITZ RD

NW TAMBAY AVE

NW LAMOORE LN

NW CHESHIRE LN

NW ODATE CT

NW HUEY CT

NW SNOOK CT

NW LYBIA LN

NW KUKUI CT

NW THYER CIR

NW LYNDHURST CT

NW DOVER CT

NW ASHTON WAY

NW SHEFFIELD CIR

NW DORSET CT

NW LIGON CIR

NW SAYERS AVE

NW DUKE CIR

DL1924

NW HYCHE CT

St. Lucie Coun
Unincorporated A
120285

NFIP NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0276J

FIRM

FLOOD INSURANCE RATE MAP

ST. LUCIE COUNTY, FLORIDA

AND INCORPORATED AREAS

PANEL 276 OF 420

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
PORT ST. LUCIE, CITY OF	120287	0276	J
ST. LUCIE COUNTY	120285	0276	J

Notice to User: The **Map Number** shown below should be used when placing map orders; the **Community Number** shown above should be used on insurance applications for the subject community.

MAP NUMBER
12111C0276J

MAP REVISED
FEBRUARY 16, 2012

Federal Emergency Management Agency

EXHIBIT F

This is an official copy of a portion of the above referenced flood map. It was extracted using F-MIT On-Line. This map does not reflect changes or amendments which may have been made subsequent to the date on the title block. For the latest product information about National Flood Insurance Program flood maps check the FEMA Flood Map Store at www.msc.fema.gov

END PROJECT

JOINS PANEL 0188

$^{5}64^{000m}$E

80°20'37.5"

27°22'30"

JORGENSEN RD

W MIDWAY RD

CHRISTENSEN RD

WEST VIRGINIA DR

DANIELS ST

GRAY TWIG LN

DL1921

RIVER BRANCH DR

RAINBOW DR

RIVER HAMMOCK LN

LUCY LN

GREGORY LN

S 25TH ST

CANOE CREEK LN

GRAND OAK AVE

STATELY OAKS ST

ZONE AE

1105000 FT

PROFILE BASE LINE

North Fork St. Lucie River

St. Lucie County
Unincorporated Areas
120285

NW HUEY CT

NW SNOOK CT

NW RELIEF CT

NW THYER CIR

NW SCEPTER DR

NW TYROL CT

NW HIXON CT

NW THEDA LN

NE CHARLESTON OAKS DR

CHARLESTON OAKS DR

NW DUKE CIR

NW TELFORD AVE

NW HOKE CT

NE ST JAMES DR

ance Program at 1-800-638-6620.

MAP SCALE 1" = 500'

0 250 500 750 1,000 FEET

NFIP

NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0276J

FIRM

FLOOD INSURANCE RATE MAP

ST. LUCIE COUNTY, FLORIDA

AND INCORPORATED AREAS

PANEL 276 OF 420

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

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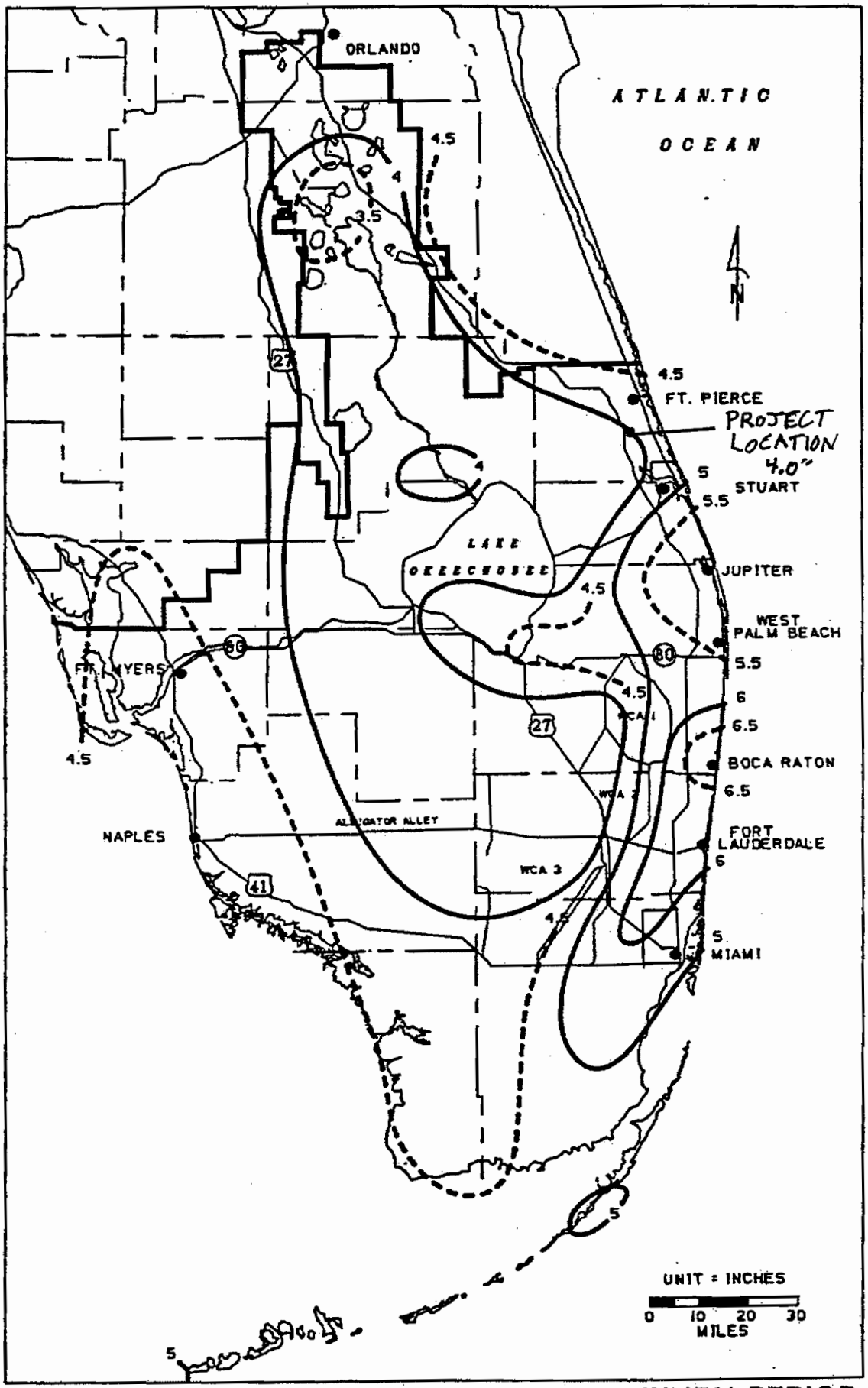


FIGURE C-2. 1-DAY RAINFALL: 3-YEAR RETURN PERIOD

SFWMD PERMIT INFORMATION
MANUAL VOL. IV 2004 C-4

EXHIBIT G

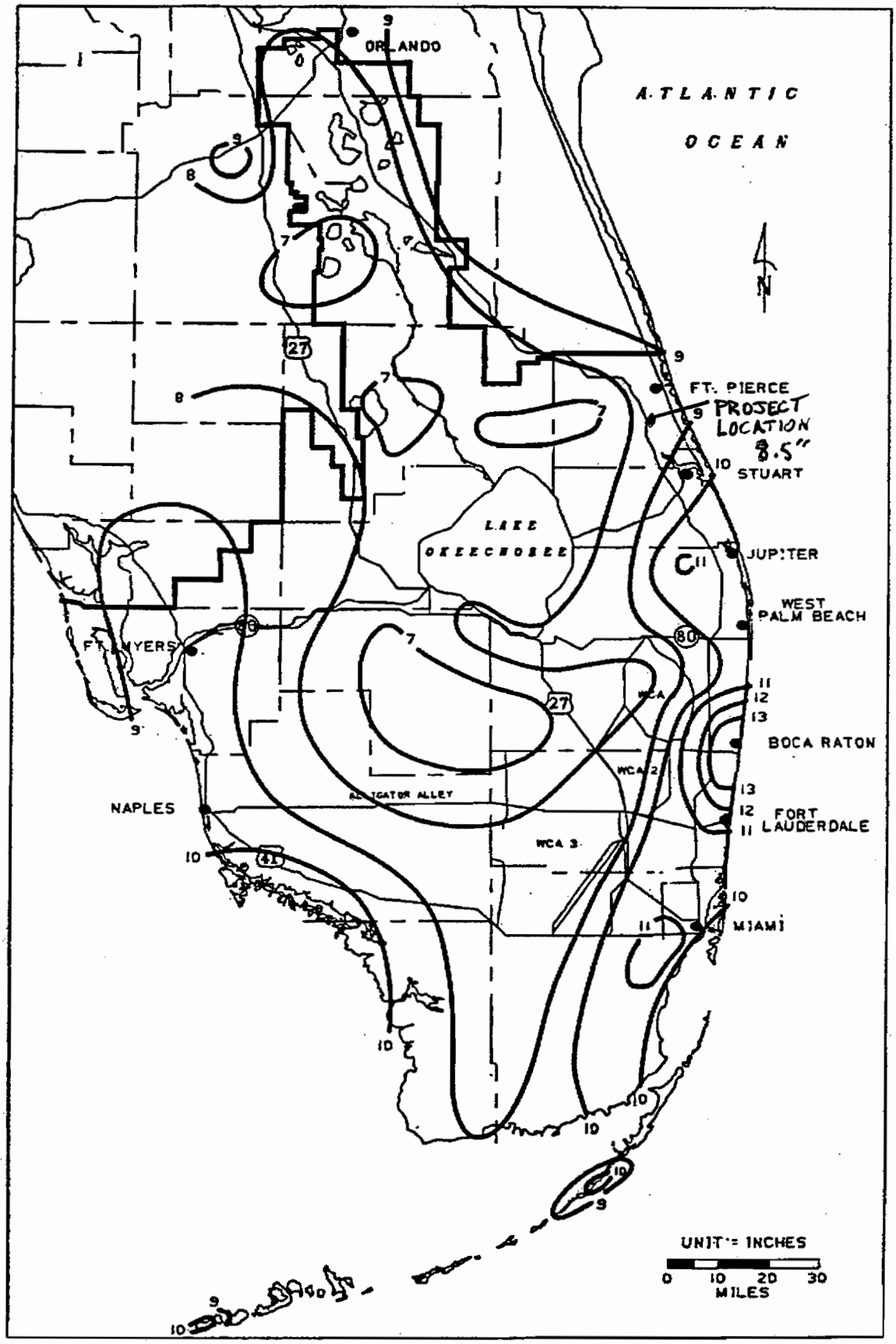


FIGURE C-7. 3-DAY RAINFALL: 10-YEAR RETURN PERIOD

SFWMD PERMIT INFORMATION C-9
MANUAL VOL. IV 2008

EXHIBIT G

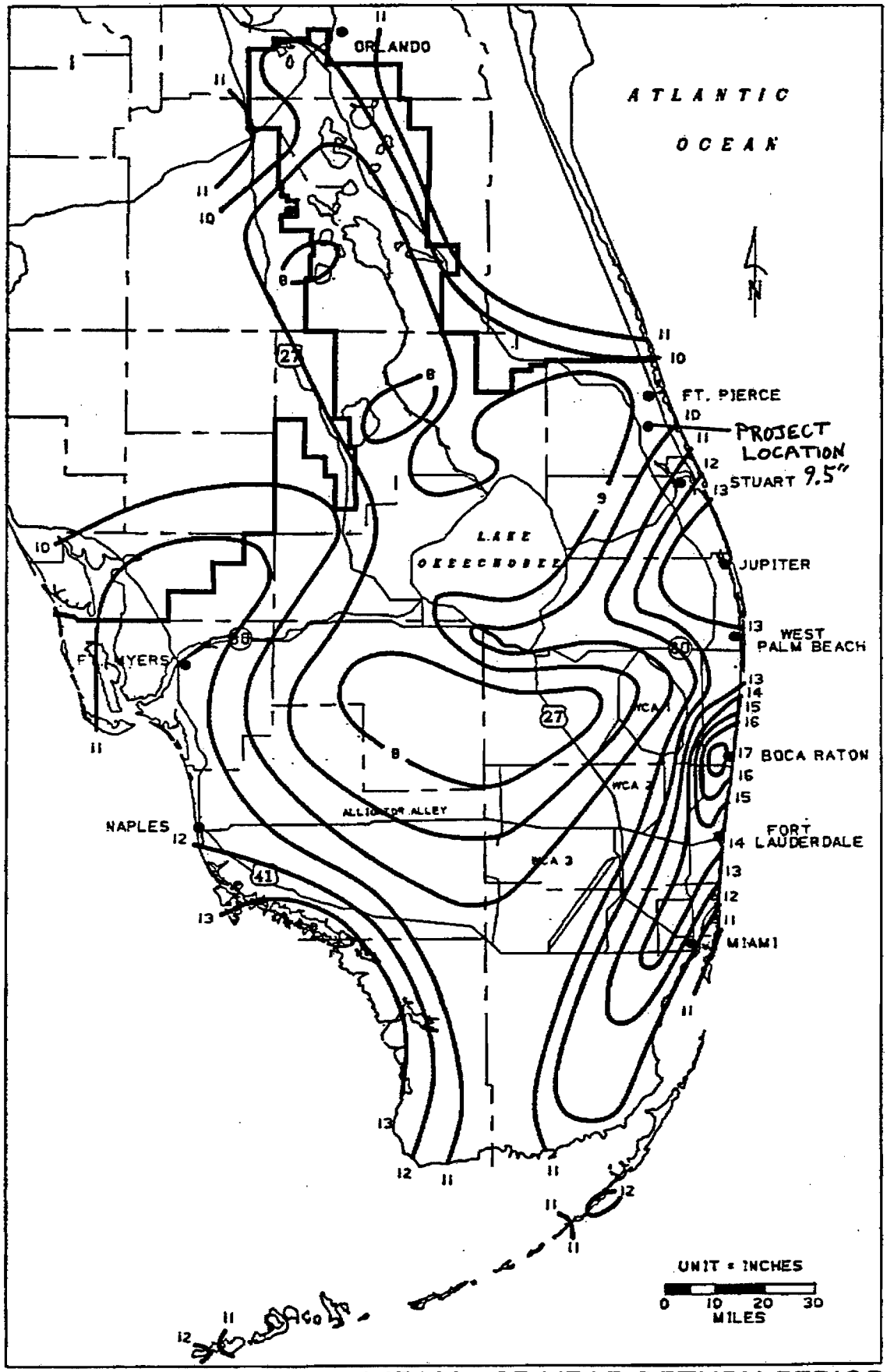


FIGURE C-8. 3-DAY RAINFALL: 25-YEAR RETURN PERIOD

SFWMD PERMIT INFORMATION C-10
MANUAL VOL. IV 2008

EXHIBIT G

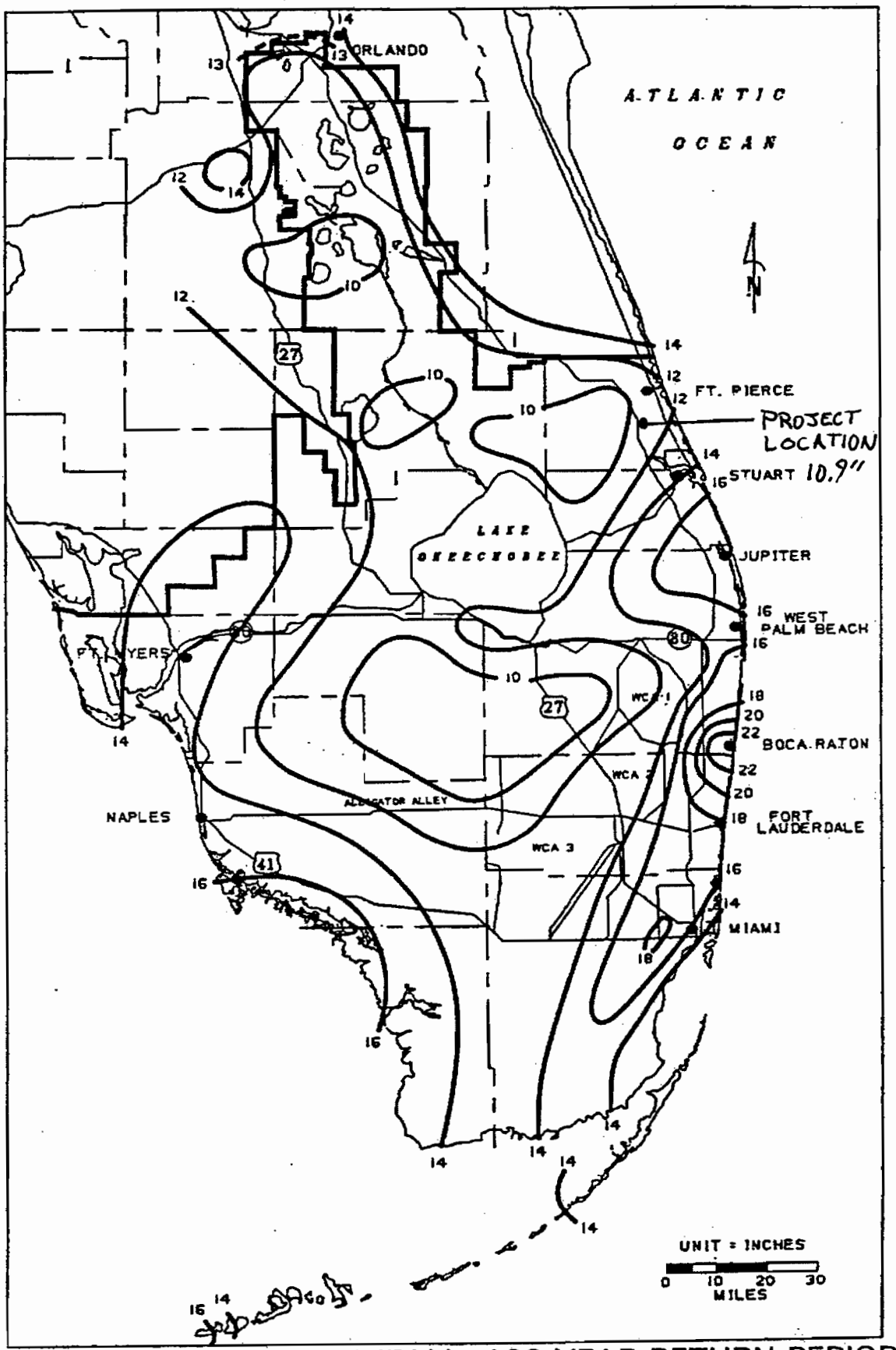


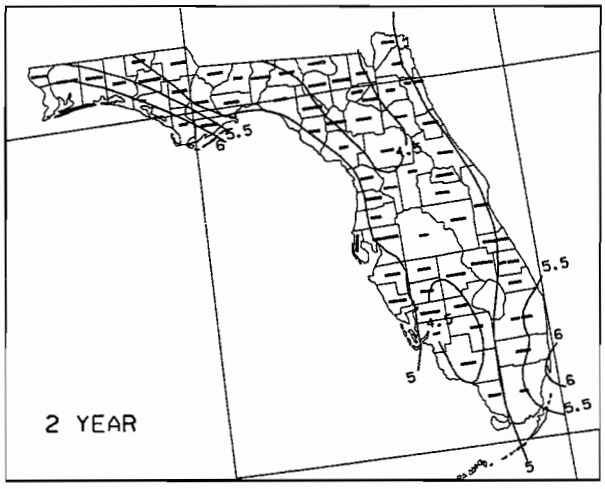
FIGURE C-9. 3-DAY RAINFALL: 100-YEAR RETURN PERIOD

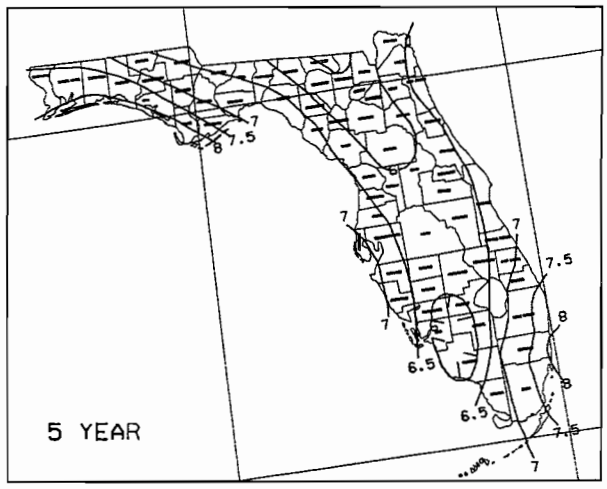
SFWMD PERMIT INFORMATION C-11
MANUAL VOL. IV 2008

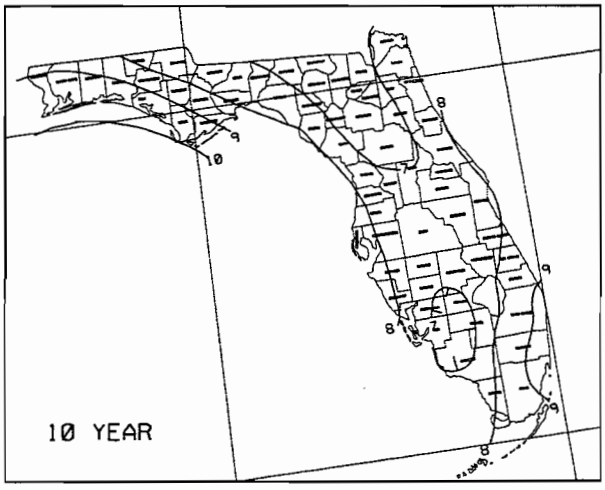
EXHIBIT G

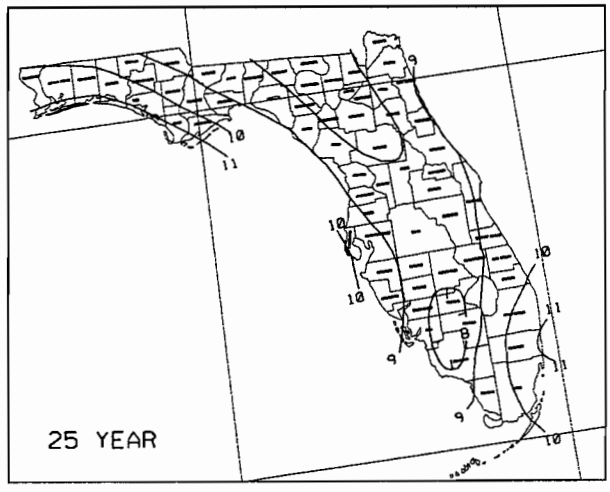
PRECIPITATION DEPTH DATA FOR 2-,5-,10-,25-, 50-, AND 100-YEAR FREQUENCIES

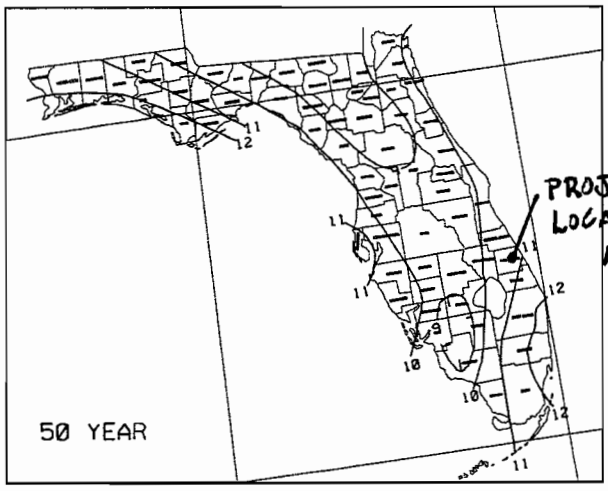
1 DAY

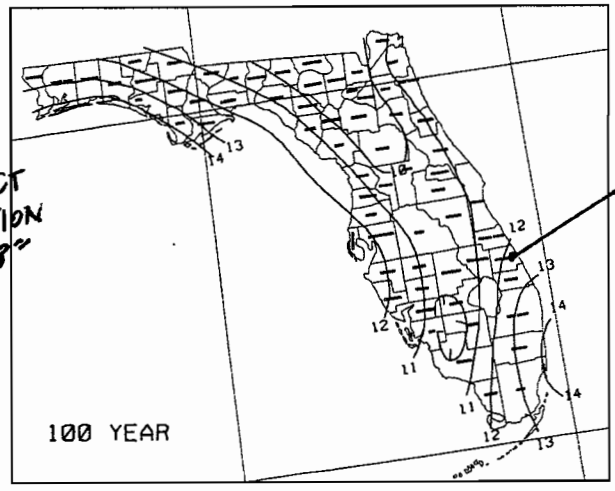












ALL DEPTH CONTOURS IN INCHES

EXHIBIT H

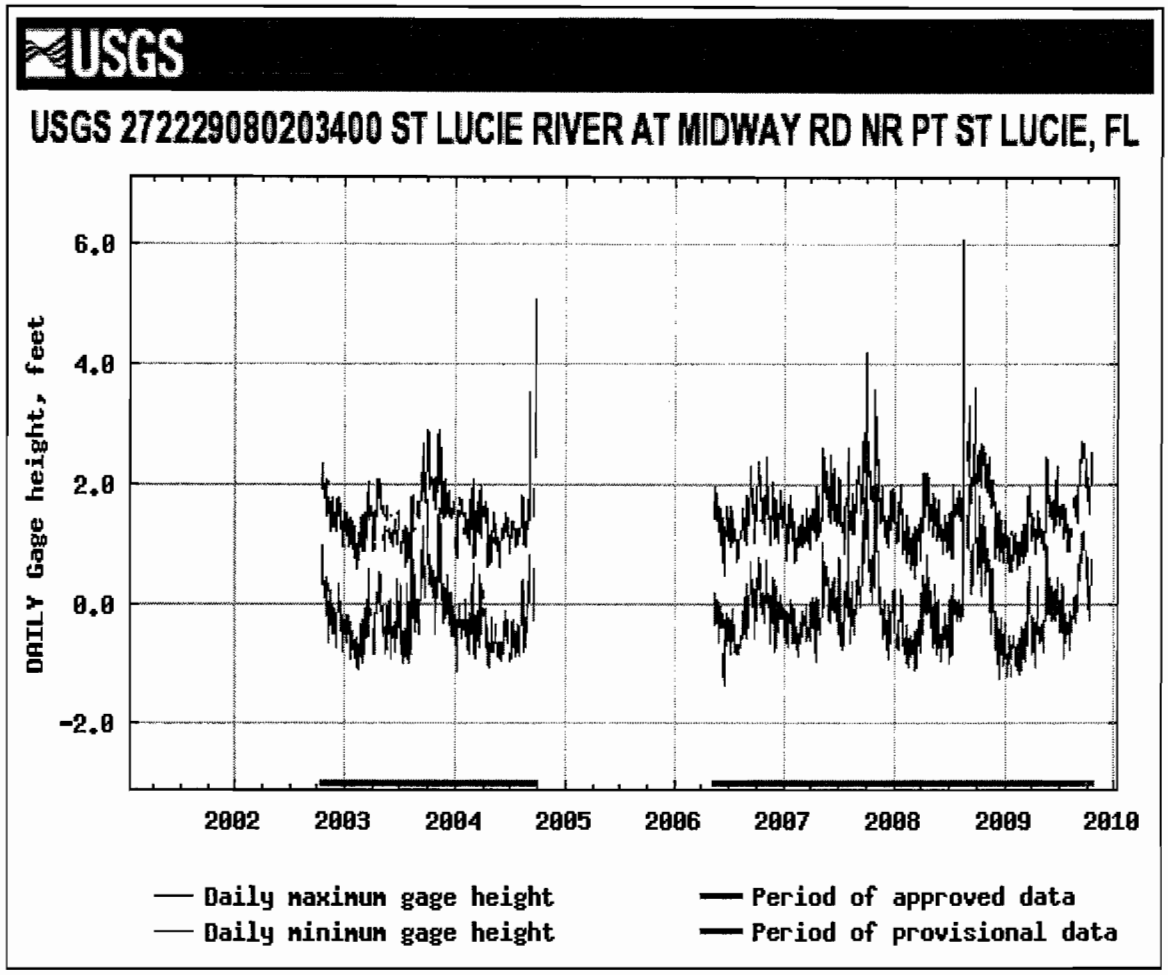

USGS
USGS 272229080203400 ST LUCIE RIVER AT MIDWAY RD NR PT ST LUCIE, FL
DAILY Gage height, feet
6.0
4.0
2.0
0.0
-2.0
2002
2003
2004
2005
2006
2007
2008
2009
2010
Daily maximum gage height
Daily minimum gage height
Period of approved data
Period of provisional data

EXHIBIT I

Appendix B
Basin 1

Description
Volume Criteria
Pre-Development Runoff Curve Numbers
Pre-Development Runoff Volumes
Post-Development Runoff Curve Numbers
Post-Development Runoff Volume

Basin 1

Basin 1 is included here as part of the Ultimate Condition for Midway Road and the modeling of the Box Culvert. The basin area and impervious area, ponds and drainage structures have been removed from the design of this Midway Road project. Basin 1 begins at Midway Road station 1219+00 (at the start of the original project limits) and ended at station 1239+00. Because of the changes to the project limits, Basin 1 plans have been removed from the project and only the calculations in this report remain for future reference.

Basin 1 has nearly level, poorly drained sandy soils in the B/D hydrological group. The seasonal high ground water table (SHGWT) depth is typically around 1.0' below the surface. The natural ground elevation in the pond area ranges from18.5 to 15.3 NAVD.

Future Pond 1 will discharge to Culvert 103 near station 1231+17. Culvert 103 is the 11' x 5' concrete box culvert proposed to replace the existing channel for Canal 103. Canal 103 discharges to the North Fork of the St. Lucie River.

LOCHNER

Project: Midway Road Widening
Calculations by: JBM **Job #:** 2134
Checked by: MDF **Date:** 3/27/2012

Basin 1 — Volume Criteria and Stage/Storage

Attenuation Volume

a	Post-development runof (ac-ft) =	7.76	(SFWMD 25yr/72hr)
b	Pre-development runoff (ac-ft) =	6.71	(SFWMD 25yr/72hr)
c	Increase in runoff (ac-ft) =	1.05	

Water Quality Volume

The WQV is equal to the greater of 150% x 1" over the total area or 150% x 2.5" over the imp. area.

d	Total area (ac) =	10.16	
	x 150% x 1.0" x (1'/12")		
e		1.27	ac-ft
f	Impervious area (ac) =	7.21	
	x 150% x 2.5" x (1'/12")		
g		2.25	ac-ft

Use **2.25** ac-ft for required water quality volume.

Because this project discharges to an OFW, 1/2" dry detention pre-treatment is required.

	Total area (ac) =	10.16		
	x 0.5" x (1'/12")			
h		0.42	ac-ft	(Required dry pre-treatment volume)

The required treatment volume less the pre-treatment volume is:

		2.25		
	-	0.42		
i		1.83	ac-ft	(Required wet pond treatment volume)

LOCHNER

Project: Midway Road Widening
Calculations by: JBM **Job #:** 2134
Checked by: **Date:** 1/28/2010

Basin 1 — Pre-Development Runoff

From Station = 1219+00
To Station = 1239+00
Length (ft) = 2000

1a. Runoff Curve Number — **Onsite**

Soil Name	Hydro. Group	Cover Description	CN	Area* (ac)	(CN) x (Area)
Please see Soils Maps	B/D	CCORPA (less turnpike/overpass area)	85.46	2.76	236
Please see Soils Maps	B/D	CMILNA	84.31	2.31	195
Please see Soils Maps	B/D	CSELVC1	85.8	1.23	106
			Totals =	6.30	536

CN (weighted) = total product / total area = 536.16 / 6.3 = CN = **85.10**

*Areas based on edge of asphault in topord01.dgn.

1b. Runoff Curve Number — **Pond Location**

Soil Name	Hydro. Group	Cover Description	CN	Area (ac)	(CN) x (Area)
Please see Soils Maps	B/D	open space, good condition	80	3.86	309
			Totals =	3.86	309

CN (weighted) = total product / total area = 308.8 / 3.86 = CN = **80.00**

LOCHNER

Project: Midway Road Widening
Calculations by: JBM **Job #:** 2134
Checked by: **Date:** 1/28/2010

Basin 1 — Pre-Development Runoff

2a. Runoff — **Onsite**

	Storm 1 SFWMD				
Frequency (yr)	25				
Duration (hr)	72				
Rainfall Amount (in)	10				
CN (see above)	85.10				
S = 1000/(CN) - 10 =	1.75				
Runoff Depth Q(in) = $\frac{(P - 0.2 * S)^2}{(P + 0.8 * S)}$ =	8.17				
Runoff volume (ac-ft) = Q(in)/12*total area =	**4.29**				

2b. Runoff — **Pond Location**

	Storm 1 SFWMD				
Frequency (yr)	25				
Duration (hr)	72				
Rainfall Amount (in)	10				
CN (see above)	80.00				
S = 1000/(CN) - 10 =	2.50				
Runoff Depth Q(in) = $\frac{(P - 0.2 * S)^2}{(P + 0.8 * S)}$ =	7.52				
Runoff volume (ac-ft) = Q(in)/12*total area =	**2.42**				

Pre-Development Runoff — **Summary**

Total area = 10.16 ac
Impervious area = 2.76 ac
Average CN = 83.16
25 yr 72 hr Runoff = 6.71 ac-ft.

LOCHNER

Project: Midway Road Widening
Calculations by: JBM **Job #:** 2134
Checked by: **Date:** 1/28/2010

Basin 1 — Post-Development Runoff

From Station = 1219+00
To Station = 1239+00
Length (ft) = 2000

1a. Runoff Curve Number — **Onsite**

Soil Name	Hydro. Group	Cover Description	CN	Area* (ac)	(CN) x (Area)
Urban	B/D	roadway & sidewalks (impervious)	98	5.56	545
Please see Soils Maps	B/D	open space, good condition	80	0.74	59
			Totals =	6.30	604

CN (weighted) = total product / total area = 604.494 / 6.3047 = CN = **95.88**

1b. Runoff Curve Number — **Pond Location**

Soil Name	Hydro. Group	Cover Description	CN	Area (ac)	(CN) x (Area)
Please see Soils Maps	B/D	Pond Permanent Pool Area	100	1.65	165
Please see Soils Maps	B/D	Wet Pond Berm & Side Slopes	80	0.60	48
Please see Soils Maps	B/D	Dry Pond	80	1.61	129
			Totals =	3.86	342

CN (weighted) = total product / total area = 341.8 / 3.86 = CN = **88.55**

LOCHNER

Project: Midway Road Widening
Calculations by: JBM **Job #:** 2134
Checked by: **Date:** 1/28/2010

Basin 1 — Post-Development Runoff

2a. Runoff — **Onsite**

	Storm 1 SFWMD				
Frequency (yr)	25				
Duration (hr)	72				
Rainfall Amount (in)	10				
CN (see above)	95.88				
S = 1000/(CN) - 10 =	0.43				
Runoff Depth Q(in) = $\frac{(P - 0.2 * S)^2}{(P + 0.8 * S)}$ =	9.50				
Runoff volume (ac-ft) = Q(in)/12*total area =	**4.99**				

2b. Runoff — **Pond Location**

	Storm 1 SFWMD				
Frequency (yr)	25				
Duration (hr)	72				
Rainfall Amount (in)	10				
CN (see above)	88.55				
S = 1000/(CN) - 10 =	1.29				
Runoff Depth Q(in) = $\frac{(P - 0.2 * S)^2}{(P + 0.8 * S)}$ =	8.60				
Runoff volume (ac-ft) = Q(in)/12*total area =	**2.77**				

Post-Development Runoff — **Summary**

Total area = 10.16 ac
Impervious area = 7.21 ac
Average CN = 93.10
25 yr 72 hr Runoff = 7.76 ac-ft.

Appendix B
Basin 2/3

Description
Volume Criteria and Stage/Storage
Wet Pond Permanent Pool Volume and Pond Depth
Pond Recovery
Pre- vs Post Runoff Flow Rates
Pre-Development Runoff Curve Numbers
Pre-Development Runoff Volumes
Post-Development Runoff Curve Numbers
Post-Development Runoff Volume
Time of Concentration Calculations
Onsite ASAD Storm Sewer Hydraulics Report
ASAD Spread Tabulation Report
Offsite ASAD Storm Sewer Hydraulics Reports
Culvert Overtopping Flood Graphs

Basins 2 and 3

Basin 2 begins at Midway Road station 1239+00, ends at station 1275+00, and includes approximately 2000 feet of Selvitz road north of Midway. The calculations presented in this report represent the ultimate condition from station 1239+00 to station 1271+20. Basin 3 runs from station 1275+00 to 1300+91. Basins 2 and 3 both drain to Canal 103 and will be treated in the same pond. Onsite runoff is collected by curb and gutter and routed to the pond by a storm sewer system. The pond consists of two cells; a dry pre-treatment area with 1 foot vertical to 4 feet horizontal side slopes and a wet detention area with a 16' wide berm sloped at 1:8 followed by a 1:6 slope down to 2' below the water line. From 2' below the water line to the pond bottom, the side slopes are 1 to 2. The pond is designed to treat 150% x 2.5 inches over the project impervious area. Of that volume, one half inch over the project area will be pre-treated in the dry cell.

Basins 2 and 3 have nearly level, poorly drained sandy soils in the B/D hydrological group. The seasonal high ground water table (SHGWT) depth is typically around 6.0' below the surface due to the proximity of Canal 103. The natural ground elevation in the pond area is around 16.5.

The control elevation for the wet detention cell will be set at 9.50 NAVD 88. The top of the treatment volume will be at elevation 12.35. The dry cell pond bottom will be set at elevation 13.00. The top of the pre-treatment volume will be at elevation 13.61. The design high water (DHW) for both cells will remain below the top of the berm, set at elevation 15.00.

Pond 2/3 will discharge to offsite Canal 103. At this location, the canal has a flow line of 6.00 and a top of bank at 15.00.

LOCHNER

Project: Midway Road Widening
Calculations by: JM **Job #:** 2134
Checked by: TE **Date:** 6/20/2013

Basins 2 & 3 — Volume Criteria and Stage/Storage

Attenuation Volume

a	Post-development runof (ac-ft) =	21.51	(SFWMD 25yr/72hr)
b	Pre-development runoff (ac-ft) =	18.73	(SFWMD 25yr/72hr)
c	Increase in runoff (ac-ft) =	2.78	

Water Quality Volume

The WQV is equal to the greater of 150% x 1" over the total area or 150% x 2.5" over the imp. area.

d	Total area (ac) =	28.10	
	x 150% x 1.0" x (1'/12")		
e		3.51	ac-ft
f	Impervious area (ac) =	20.59	
	x 150% x 2.5" x (1'/12")		
g		6.43	ac-ft

Use **6.43** ac-ft for required water quality volume.

In order to meet Nutrient Removal criteria, 0.5" of Dry Retention is required.

	Total area (ac) =	28.10	
	x 0.5" x (1'/12")		
h		1.17	ac-ft (Required dry retention volume)

The required treatment volume less the retention volume is:

		6.43	
	-	1.17	
i		5.26	ac-ft (Required wet pond treatment volume)

(Dry Pre-Treatment) Stage/Storage

Stage	Area (sf)	Area (ac)	Volume (ac-ft)	Cum. Vol. (ac-ft)	Notes
13.00	80337	1.84	0.00	0.00	Pond Bottom
13.61	~	~	~	1.17	Top of Pre-Treatment Volume
14.00	86580	1.99	1.92	1.92	1' Below Berm (Top of Attenuation Vol.)
15.00	92923	2.13	2.06	3.98	Top of Berm

(Wet Pond) Stage/Storage

Stage	Area 1 (sf)	Area 2 (sf)	Total Area (ac)	Volume (ac-ft)	Cum. Vol. (ac-ft)	Notes
9.50	8087	57875	1.51	0.00	0.00	Normal Water Elevation
12.35	~	~	~	~	5.26	Top of Treatment Volume
13.00	16588	78127	2.17	6.46	6.46	Slope Break
14.00	20525	86529	2.46	2.32	8.77	1' Below Berm (Top of Attenuation Vol.)
15.00	24865	95333	2.76	2.61	11.38	Top of Berm

LOCHNER

Project: Midway Road Widening
Calculations by: JM **Job #:** 2134
Checked by: TE **Date:** 6/20/2013

Basins 2 & 3 — Wet Detention Pond Calculations

Permanent Pool Volume

Stage	Area (sf)	Area (ac)	Volume (ac-ft)	Cum. Vol. (ac-ft)	Notes
-3.00	30565	0.70	0.00	0.00	Pond Bottom
3.50	42096	0.97	5.42	9.05	6' below control elevation (Littoral Zone)
7.00	48343	1.11	3.63	3.63	Slope Break
9.50	65962	1.51	3.28	12.33	Control elevation

Littoral Zone and Pond Depth

Depth - Shallow, littoral areas are desirable for water quality enhancement purposes. Such areas are defined for purposes of this criteria as the portion of wet retention/detention bodies shallower than 6 feet as measured from below the control elevation. The minimum shallow, littoral area shall be the lesser of 20 percent of the wet retention/detention area or 2.5 percent of the total of the retention/detention area (including side slopes) plus the basin contributing area. It is recommended that 25 to 50 percent of the wet retention/detention area be deeper than 12 feet.

Pond area at control elevation =	1.51	ac
	x 20%	
	0.30	ac
Total basin contributing area =	28.10	ac
	x 2.5%	
	0.70	ac
Use	0.30	ac as the minimum required littoral area

Pond area at control elevation =	1.51	ac
- Pond area at 6' depth =	0.97	ac
	0.55	ac (Littoral Area)

Pond area at control elevation =	1.51	ac
Pond area at > 12' depth =	0.70	ac
% of pond deeper than 12' =	46%	

LOCHNER

Project: Midway Road Widening
Calculations by: JM **Job #:** 2134
Checked by: TE **Date:** 6/20/2013

Basins 2 & 3 — Wet Detention Pond Calculations

Treatment Volume Discharge

SFWMD criteria require that gravity control devices shall be sized based upon a maximum design discharge of one half inch of the detention volume in 24 hours. The devices shall incorporate dimensions no smaller than 6 square inches of cross sectional area, two inches minimum dimension, and 20 degrees for "V" notches. Systems which are limited by a discharge structure with an orifice no larger than the minimum dimensions described herein shall be presumed to meet the discharge quantity criteria except for projects which are required to have zero discharge.

Orifice Diameter: 6.00 inches

0.5" over the impervious area is: 0.50 x 20.59 ac = 0.86 ac-ft

Discharge Volume = 0.86 ac-ft

Corresponding Pond Stage = 9.97 ft NAVD

Per the attached ICPR Node Time Series Report:

The pond stage 9.97 ft occurs at time: 133.00 hours.

The pond stage 9.50 ft occurs at time: 162.00 hours.

One half inch of the detention volume is discharged in: **29.00 hours.**

Pond Recovery

SFWMD criteria require that the pond fully recover from the 25 year, 72 hour storm event within 12 days.

Per the attached ICPR Node Time Series Report:

The storm begins at time: 0.00 hours.

The storm ends at time: 72.00 hours.

The pond returns to the control elevation of 9.50 at time: 164.50 hours.

164.5	-	72.00	=	92.50 hours.
(End Recover Time)		(End Storm Time)		(Hours to Recover)

92.5 hours/(24 hours/day) = **3.85 days to recover.**

LOCHNER

Project: Midway Road Widening
Calculations by: JM **Job #:** 2134
Checked by: TE **Date:** 6/20/2013

Basins 2 & 3 Pre v Post Development Runoff Flow Rates

SFWMD criteria require that the Pre Development Runoff be greater than or equal to the Post Development Runoff

Per the attached ICPR Node Min/Max Reports:

286.27	CFS in the Existing Condition
284.03	CFS in the Proposed Condition

LOCHNER

Project: Midway Road Widening
Calculations by: JBM **Job #:** 2134
Checked by: MDF **Date:** 3/27/2012

Basins 2 & 3 — Pre-Development Runoff

From Station = 1239+00
To Station = 1300+91
Length (ft) = 6191

1a. Runoff Curve Number — **Onsite**

Soil Name	Hydro. Group	Cover Description	CN	Area* (ac)	(CN) x (Area)
Please see Soils Maps	B/D	CSELVC	84.48	2.57	217
Please see Soils Maps	B/D	CSELVE	84.48	4.64	392
Please see Soils Maps	B/D	CSELVF	83.16	2.51	208
Please see Soils Maps	B/D	CSELVG	84.48	1.50	127
Please see Soils Maps	B/D	CHURA	84.61	1.94	164
Please see Soils Maps	B/D	CDUNNA	83.96	1.40	118
Please see Soils Maps	B/D	CBENDA	83.96	3.19	268
Please see Soils Maps	B/D	N SELVITZ	84.56	2.96	250
Please see Soils Maps	B/D	N SELVITZ	84.26	1.82	153
Please see Soils Maps	B/D	open space, good condition	80.00	0.16	13
Please see Soils Maps	B/D	CCHRIA (Christensen SB)	88.64	0.57	51
Please see Soils Maps	B/D	OUT123 (Christensen NB)	88.64	0.57	51
			Totals =	23.83	2011

CN (weighted) = $\frac{\text{total product}}{\text{total area}} = \frac{2011.44}{23.8279}$ = CN = **84.42**

1b. Runoff Curve Number — **Pond Location**

Soil Name	Hydro. Group	Cover Description	CN	Area (ac)	(CN) x (Area)
Please see Soils Maps	B/D	open space, good condition	80	4.28	342
			Totals =	4.28	342

CN (weighted) = $\frac{\text{total product}}{\text{total area}} = \frac{342.4}{4.28}$ = CN = **80.00**

LOCHNER

Project: Midway Road Widening
Calculations by: JBM **Job #:** 2134
Checked by: MDF **Date:** 3/27/2012

Basins 2 & 3 — Pre-Development Runoff

2a. Runoff	Storm 1 SFWMD					Onsite
Frequency (yr)	25					
Duration (hr)	72					
Rainfall Amount (in)	10					
CN (see above)	84.42					
S = 1000/(CN) - 10 =	1.85					
Runoff Depth Q(in) = (P - 0.2 * S)^2 / (P + 0.8 * S) =	8.08					
Runoff volume (ac-ft) = Q(in)/12*total area =	**16.05**					

2b. Runoff	Storm 1 SFWMD					Pond Location
Frequency (yr)	25					
Duration (hr)	72					
Rainfall Amount (in)	10					
CN (see above)	80.00					
S = 1000/(CN) - 10 =	2.50					
Runoff Depth Q(in) = (P - 0.2 * S)^2 / (P + 0.8 * S) =	7.52					
Runoff volume (ac-ft) = Q(in)/12*total area =	**2.68**					

Pre-Development Runoff — Summary

Total area = 28.11 ac
Impervious area = 9.08 ac
Average CN = 83.75
25 yr 72 hr Runoff = 18.73 ac-ft.

LOCHNER

Project: Midway Road Widening
Calculations by: JBM **Job #:** 2134
Checked by: MDF **Date:** 3/27/2012

Basins 2 & 3 — Post-Development Runoff

From Station = 1239+00
To Station = 1300+91
Length (ft) = 6191

1a. Runoff Curve Number — **Onsite**

Soil Name	Hydro. Group	Cover Description	CN	Area* (ac)	(CN) x (Area)
Urban	B/D	Basin 2 proposed roadway (impervious)	98	9.49	930
Please see Soils Maps	B/D	Basin 2 open space, good condition	80	1.80	144
Urban	B/D	N Selvitz proposed roadway (imp)	98	3.97	389
Please see Soils Maps	B/D	N Selvitz open space, good condition	80	0.81	64
Urban	B/D	Basin 3 proposed roadway (impervious)	98	5.18	508
Please see Soils Maps	B/D	Basin 3 open space, good condition	80	1.42	114
Urban	B/D	Christensen proposed roadway (imp.)	98	0.56	55
Please see Soils Maps	B/D	Christensen open space, good condition	80	0.60	48
			Totals =	23.82	2251

CN (weighted) = total product / total area = 2251.28 / 23.8214 = CN = **94.51**

1b. Runoff Curve Number — **Pond Location**

Soil Name	Hydro. Group	Cover Description	CN	Area (ac)	(CN) x (Area)
Please see Soils Maps	B/D	Pond Permanent Pool Area	100	1.39	139
Please see Soils Maps	B/D	Wet Pond Berm & Side Slopes	80	1.19	95
Please see Soils Maps	B/D	Dry Pond	80	1.70	136
			Totals =	4.28	370

CN (weighted) = total product / total area = 370.2 / 4.28 = CN = **86.50**

LOCHNER

Project: Midway Road Widening
Calculations by: JBM **Job #:** 2134
Checked by: MDF **Date:** 3/27/2012

Basins 2 & 3 — Post-Development Runoff

2a. Runoff					Onsite
	Storm 1 SFWMD				
Frequency (yr)	25				
Duration (hr)	72				
Rainfall Amount (in)	10				
CN (see above)	94.51				
S = 1000/(CN) - 10 =	0.58				
Runoff Depth Q(in) = (P - 0.2 * S)^2 / (P + 0.8 * S) =	9.34				
Runoff volume (ac-ft) = Q(in)/12*total area =	**18.53**				

2b. Runoff					Pond Location
	Storm 1 SFWMD				
Frequency (yr)	25				
Duration (hr)	72				
Rainfall Amount (in)	10				
CN (see above)	86.50				
S = 1000/(CN) - 10 =	1.56				
Runoff Depth Q(in) = (P - 0.2 * S)^2 / (P + 0.8 * S) =	8.34				
Runoff volume (ac-ft) = Q(in)/12*total area =	**2.98**				

Post-Development Runoff — Summary

Total area = 28.10 ac
Impervious area = 20.59 ac
Average CN = 93.29
25 yr 72 hr Runoff = 21.51 ac-ft.

LOCHNER

Project: Midway Road Widening
Calculations by: JBM **Job #:** 2134
Checked by: MDF **Date:** 06/20/13

Pond 2-3 Time of Concentration Calculations

Time of Concentration Worksheet (all references to tables and figures refer to USDA TR-55)

Sheet Flow	Existing Condition	Existing Condition		Proposed Condition
1. Surface description (table 3-1):	Smooth	Grass		
2. Manning's roughness coefficient, (table 3-1):	0.011	0.13		
3. Flow length, L (Total L < 300ft) (ft):	12	288		
4. Two-year 24-hour rainfall, P_2 (in):	5	5		
5. Land slope, s (ft/ft):	0.02	0.0066		
6. T6 = $\frac{0.007(nL)^{0.8}}{(P_2)^{0.5} * s^{0.4}}$ *60(min):	0.18	25.39		
Shallow Concentrated Flow	Existing Condition			Proposed Condition
7. Surface description (paved or unpaved):	Unpaved			
8. Flow length, L (ft):	32			
9. Water course slope, s (ft/ft):	0.01			
10. Average velocity, V (figure 3-1) (ft/s):	1.6			
11. T11 = $\frac{L}{3600\ V}$ *60(min):	0.33			
Channel/Pipe Flow	Existing Condition	Existing Condition		Proposed Condition
12. Cross sectional flow area, a (ft^2):	53	104		
13. Wetted perimeter Pw (ft):	38	39		
14. Hydraulic radius, r = a/Pw (ft):	1.39	2.67		
15. Channel slope, s (ft/ft):	0.00246	0.0008		
16. Manning roughness coefficient, n:	0.042	0.042		
17. V = $\frac{1.49 * r^{(2/3)} * s^{(1/2)}}{n}$ (ft/s):	2.20	1.93		
18. Flow length, L (ft):	260	6225		
19. T19 = $\frac{L}{3600\ V}$ *60(min):	1.97	53.77		
Total Tc		Existing Condition		Proposed Condition
20. Tc (min) = T6 + T11 + T19:		81.64		54.01*

*See ASAD storm tabs

Existing Condition Time of Concentration Path: Stormwater runoff sheet flows to the grassed R/W north of the road at station 1239+00, sheet flows 288' east, and then undergoes a shallow concentrated flow 32' to the side drain drain at station 1242+20. The side drain discharges to a ditch which flows 260' into a cross drain at station 1247+20. The cross drain discharges into Canal 103 about 6225 feet upstream of the proposed pond discharge point.

Proposed Condition: Stormwater runoff is collected by curb and gutter and routed through storm sewer to the treatment pond. The pond discharges south through a drop structure and a pipe to Canal 103.

FLORIDA DEPARTMENT OF TRANSPORTATION
STORM DRAIN TABULATION FORM

Financial Prj Id: **21340000000** County: **St. Lucie** Network: **Basin2/3** Designed by **JS** Date: 10/15/2013
Description: **Midway Road** Organization **H.W. LOCHNER, INC.** State Road: **-** Checked by: Date: 10/15/2013

LOCATION OF UPPER END / ALIGNMENT NAME / STATION	DIST	SD	STR. NO. / UPPER / LOWER	TYPE OF STR.	LEN. (ft.)	AREAS (Ac) C= 0.95 / C= 0.20 / C= 0.00 INC	TOTAL	SUB-TOTAL (C*A)	TIME OF CONC (min)	TIME OF FLOW SECT. (min)	INTEN (in/hr)	TOTAL (C*A)	BASE FLOW SUMM BASE (cfs)	TOTAL FLOW (cfs)	MINOR LOSS (ft.)	INLET ELEV. (ft.)	HGL CLEAR (ft.)	HYDRAULIC GRADE CROWN / FLOWLINE UPPER (ft.)	LOWER (ft.)	FALL (ft.)	# BR / L / S	PIPE SIZE (in.) / RISE / SPAN	SLOPE % / HGL / PHYS. MIN.	ACTUAL VEL. / PHYS. / VEL. (fps)	FULL FLOW CAP. (cfs)	NOTES & REMARKS ZONE: 10 / FREQ. (Yrs): 10 / MANNINGS n: 0.0120 / TAILW EL (ft): 14.17
CL-BA			**Future**			7.74	7.74	7.35										18.16	17.84	0.31		48.00	0.093	3.24		S-200 through S-221 from
				DBI-H	335.66	1.56	1.56	0.31	27.33	1.73	5.31	7.66	0.00	**40.74**	0.08	19.33	**1.17**	14.75	14.20		1		0.164		62.99	the previous design
1268+00	52.35	Lt.	S-222			0.00	0.00	0.00					0.00					10.75	10.20	0.55		48.00	0.041	5.01		
CL-BA			**S-222**			0.21	7.95	0.20										17.84	17.65	0.19		48.00	0.119	3.24		
				J-6	160.46	0.03	1.59	0.01	29.06	0.83	5.17	7.87	0.00	**40.71**	0.08	18.26	**0.42**	14.20	13.90		1		0.187		67.29	
1271+36.67	55.00	Lt.	S-222A			0.00	0.00	0.00					0.00					10.20	9.90	0.30		48.00	0.041	5.35		
CL-BA			**S-222A**			0.52	8.47	0.49										17.65	17.42	0.23		38.00	0.134	3.44		
				J-5	170.97	0.08	1.67	0.02	29.88	0.83	5.11	8.38	0.00	**42.80**	0.09	18.76	**1.11**	11.27	11.17		1		0.058		36.48	
1273+00	55.00	Lt.	S-300			0.00	0.00	0.00					0.00					8.10	8.00	0.10		60.00	0.043	2.93		
CLSEL2			**S-225**			0.51	3.63	0.48										17.47	17.42	0.04		48.00	0.039	1.61		
				J-6	110.06	0.05	0.72	0.01	23.75	0.92	5.64	3.59	0.00	**20.27**	0.02	18.19	**0.72**	12.10	12.00		1		0.091		46.91	
128+00	36.50	Lt.	S-300			0.00	0.00	0.00					0.00					8.10	8.00	0.10		48.00	0.041	3.73		
CLSEL2			**S-226**			0.48	0.48	0.46										17.56	17.47	0.10		18.00	0.141	2.00		
				P-6	69.00	0.03	0.03	0.01	10.00	0.57	7.63	0.46	0.00	**3.53**	0.03	18.19	**0.63**	14.50	14.20		1		0.435		7.50	
128+00	36.50	Rt.	S-225			0.00	0.00	0.00					0.00					13.00	12.70	0.30		18.00	0.150	4.25		
CLSEL2			**S-227**			0.19	2.64	0.18										17.49	17.47	0.02		48.00	0.018	1.21		
				J-5	136.49	0.05	0.64	0.01	22.61	1.14	5.76	2.64	0.00	**15.18**	0.01	18.62	**1.13**	14.60	14.00		1		0.440		103.17	
129+41.83	36.50	Lt.	S-225			0.00	0.00	0.00					0.00					10.60	10.00	0.60		48.00	0.041	8.21		
CLSEL2			**S-227A**			0.06	2.45	0.06										17.52	17.49	0.03		48.00	0.015	1.15		
				J-5	174.17	0.02	0.59	0.00	21.16	1.45	5.91	2.45	0.00	**14.46**	0.01	19.15	**1.63**	14.90	14.60		1		0.172		64.58	
131+21.00	36.50	Lt.	S-227			0.00	0.00	0.00					0.00					10.90	10.60	0.30		48.00	0.041	5.14		
CLSEL2			**S-228**			0.13	2.39	0.12										17.56	17.52	0.05		42.00	0.028	1.51		
				J-5	174.00	0.03	0.57	0.01	19.71	1.45	6.08	2.38	0.00	**14.50**	0.02	18.95	**1.38**	14.70	14.40		1		0.172		45.26	
133+00	36.50	Lt.	S-227A			0.00	0.00	0.00					0.00					11.20	10.90	0.30		42.00	0.048	4.70		
CLSEL2			**S-229**			0.43	2.26	0.41										17.61	17.56	0.04		42.00	0.030	1.46		
				J-6	145.00	0.10	0.54	0.02	18.50	1.21	6.23	2.26	0.00	**14.04**	0.02	18.50	**0.89**	15.00	14.70		1		0.207		49.58	
134+50	36.50	Lt.	S-228			0.00	0.00	0.00					0.00					11.50	11.20	0.30		42.00	0.048	5.15		
CLSEL2			**S-229A**			0.20	1.25	0.19										17.63	17.61	0.02		42.00	0.008	0.84		
				J-5	209.00	0.04	0.34	0.01	16.76	1.74	6.46	1.26	0.00	**8.11**	0.01	19.14	**1.51**	15.20	15.00		1		0.096		33.72	
136+64	36.50	Lt.	S-229			0.00	0.00	0.00					0.00					11.70	11.50	0.20		42.00	0.048	3.50		
CLSEL2			**S-230**			0.58	0.58	0.55										17.76	17.61	0.15		18.00	0.215	2.47		
				P-6	69.00	0.10	0.10	0.02	10.00	0.47	7.63	0.57	0.00	**4.36**	0.05	18.50	**0.74**	14.50	14.30		1		0.290		6.13	
134+50	36.50	Rt.	S-229			0.00	0.00	0.00					0.00					13.00	12.80	0.20		18.00	0.150	3.47		
CLSEL2			**S-231**			0.05	1.05	0.05										17.65	17.63	0.03		36.00	0.014	1.00		
				J-5	181.00	0.01	0.30	0.00	15.25	1.51	6.68	1.06	0.00	**7.06**	0.01	19.40	**1.74**	14.90	14.70		1		0.110		24.02	
138+50	36.50	Lt.	S-229A			0.00	0.00	0.00					0.00					11.90	11.70	0.20		36.00	0.059	3.40		
CLSEL2			**S-231A**			0.35	1.00	0.33										17.68	17.65	0.03		36.00	0.013	0.99		
				J-5	194.00	0.05	0.29	0.01	13.64	1.62	6.93	1.01	0.00	**6.99**	0.01	18.79	**1.11**	15.10	14.90		1		0.103		23.20	
140+49.00	36.50	Lt.	S-231			0.00	0.00	0.00					0.00					12.10	11.90	0.20		36.00	0.059	3.28		
CLSEL2			**S-232**			0.10	0.65	0.10										17.69	17.68	0.01		36.00	0.007	0.68		
				J-5	193.50	0.06	0.24	0.01	12.02	1.61	7.22	0.67	0.00	**4.81**	0.00	18.26	**0.57**	15.30	15.10		1		0.103		23.23	
142+47.10	36.55	Lt.	S-231A			0.00	0.00	0.00					0.00					12.30	12.10	0.20		36.00	0.059	3.29		

Units: ENGLISH

HGL method: Standard FDOT (Jump HGL to pipe crown).

Automated Storm sewer Analysis & Design (ASAD), copyright 1992-2007, Hiteshew Engineering Systems, Inc. Ph: (352) 383-4191
Portions of ASAD were developed by Kenneth J. Leeming, P.E. at International Engineering Consultants, Inc.

FLORIDA DEPARTMENT OF TRANSPORTATION
STORM DRAIN TABULATION FORM

Financial Prj Id: **21340000000** County: **St. Lucie** Network: **Basin2/3** Designed by **JS** Date: 10/15/2013
Description: **Midway Road** Organization **H.W. LOCHNER, INC.** State Road: **-** Checked by: Date: 10/15/2013

LOCATION OF UPPER END / ALIGNMENT NAME / STATION	DIST	SD	STR. NO. / UPPER / LOWER	TYPE OF STR.	LEN. (ft.)	AREAS (Ac) C= 0.95 / C= 0.20 / C= 0.00 INC	TOTAL	SUB-TOTAL (C*A)	TIME OF CONC (min)	TIME OF FLOW SECT. (min)	INTEN (in/hr)	TOTAL (C*A)	BASE FLOW SUMM BASE (cfs)	TOTAL FLOW (cfs)	MINOR LOSS (ft.)	INLET ELEV. (ft.)	HGL CLEAR (ft.)	HYDRAULIC GRADE CROWN / FLOWLINE UPPER (ft.)	LOWER (ft.)	FALL (ft.)	# B R L S	PIPE SIZE (in.) RISE SPAN	SLOPE % HGL PHYS MIN.	ACTUAL VEL. PHYS. VEL. (fps)	FULL FLOW CAP. (cfs)	NOTES & REMARKS ZONE: 10 / FREQ. (Yrs): 10 / MANNINGS n: 0.0120 / TAILW EL (ft): 14.17
CLSEL2			**S-233**			0.42	0.42	0.40										17.71	17.69	0.02		24.00	0.027	0.98		
				P-5	69.00	0.03	0.03	0.01	10.00	0.58	7.63	0.41	0.00	**3.09**	0.01	18.26	**0.55**	15.00	14.70		1		0.435		16.16	
142+48.43	36.44	Rt.	S-232			0.00	0.00	0.00					0.00					13.00	12.70	0.30		24.00	0.102	5.14		
CLSEL2			**S-233A**			0.00	0.13	0.00										17.69	17.69	0.00		24.00	0.004	0.36		
				MH-8	48.90	0.00	0.15	0.00	11.62	0.41	7.30	0.15	0.00	**1.12**	0.00	17.90	**0.21**	14.85	14.70		1		0.307		13.57	
143+00	36.28	Lt.	S-232			0.00	0.00	0.00					0.00					12.85	12.70	0.15		24.00	0.102	4.32		
CLSEL2			**S-233B**			0.00	0.00	0.00										17.69	17.69	0.00		18.00	0.000	0.03		Overtopping EL 17.66
				DBI-C	12.00	0.03	0.03	0.01	10.00	0.10	7.63	0.01	0.00	**0.05**	0.00	16.90	**-0.79**	15.08	14.46		1		5.167		25.87	
143+00	50.47	Lt.	S-233A			0.00	0.00	0.00					0.00					13.58	12.96	0.62		18.00	0.150	14.64		
CLSEL2			**S-233C**			0.06	0.13	0.06										17.70	17.69	0.00		24.00	0.003	0.35		Overtopping EL 17.66
				DBI-C	147.00	0.06	0.12	0.01	10.39	1.23	7.55	0.15	0.00	**1.11**	0.00	16.75	**-0.95**	14.96	14.85		1		0.075		6.70	
144+50	34.12	Lt.	S-233A			0.00	0.00	0.00					0.00					12.96	12.85	0.11		24.00	0.102	2.13		
CLSEL2			**S-234**			0.07	0.07	0.07										17.70	17.70	0.00		24.00	0.001	0.19		Overtopping EL 17.66
				DBI-C	47.00	0.06	0.06	0.01	10.00	0.39	7.63	0.08	0.00	**0.60**	0.00	16.70	**-1.00**	15.00	14.96		1		0.085		7.15	
145+00	31.28	Lt.	S-233C			0.00	0.00	0.00					0.00					13.00	12.96	0.04		24.00	0.102	2.28		
CL-BA			**S-300**			0.00	12.10	0.00										17.42	17.21	0.21		60.00	0.122	3.08		
				MH-8J	173.00	0.00	2.39	0.00	30.71	0.94	5.04	11.97	0.00	**60.39**	0.13	19.37	**1.95**	13.00	12.90		1		0.058		67.83	
1274+72.72	69.72	Lt.	S-300A			0.00	0.00	0.00					0.00					8.00	7.90	0.10		60.00	0.030	3.45		
CL-BA			**S-300A**			0.13	12.23	0.12										17.21	17.05	0.17		60.00	0.096	3.07		
				J-5	173.00	0.03	2.42	0.01	31.65	0.94	4.97	12.10	0.00	**60.20**	0.09	18.57	**1.36**	12.90	12.80		1		0.058		67.83	
1276+50	43.00	Lt.	S-301			0.00	0.00	0.00					0.00					7.90	7.80	0.10		60.00	0.030	3.45		
CL-BA			**S-301**			0.42	12.65	0.40										17.05	16.89	0.16		60.00	0.198	3.13		
				J-6	81.00	0.14	2.56	0.03	32.59	0.43	4.91	12.53	0.00	**61.47**	0.12	17.81	**0.76**	12.80	12.70		1		0.123		99.14	
1278+30	43.00	Lt.	S-302			0.00	0.00	0.00					0.00					7.80	7.70	0.10		60.00	0.030	5.05		
CL-BA			**S-302**			0.50	13.15	0.47										16.89	16.66	0.23		60.00	0.118	3.24		
				J-6	195.72	0.28	2.84	0.06	33.02	1.01	4.88	13.06	0.00	**63.68**	0.13	17.81	**0.92**	12.70	12.60		1		0.051		63.78	
1278+30	43.00	Rt.	S-302A			0.00	0.00	0.00					0.00					7.70	7.60	0.10		60.00	0.030	3.25		
CL-BA			**S-302A**			0.05	13.20	0.05										16.66	16.48	0.18		60.00	0.091	3.21		
				J-5	195.00	0.02	2.86	0.00	34.02	1.01	4.81	13.11	0.00	**63.03**	0.08	18.45	**1.79**	12.60	12.50		1		0.051		63.89	
1280+30.00	40.66	Rt.	S-303			0.00	0.00	0.00					0.00					7.60	7.50	0.10		60.00	0.030	3.25		
CL-BA			**S-303**			0.15	13.35	0.14										16.48	16.32	0.16		60.00	0.098	3.20		
				J-5	165.00	0.05	2.91	0.01	35.04	0.86	4.74	13.26	0.00	**62.86**	0.08	17.95	**1.48**	12.50	12.40		1		0.061		69.46	
1282+30	40.25	Rt.	S-305			0.00	0.00	0.00					0.00					7.50	7.40	0.10		60.00	0.030	3.54		
CL-BA			**S-304**			0.55	0.55	0.52										16.48	16.32	0.16		18.00	0.214	2.50		
				P-6	76.50	0.28	0.28	0.06	10.00	0.51	7.63	0.58	0.00	**4.42**	0.05	17.17	**0.69**	14.50	13.80		1		0.915		10.89	
1284+00.00	40.25	Lt.	S-305			0.00	0.00	0.00					0.00					13.00	12.30	0.70		18.00	0.150	6.16		
CL-BA			**S-305**			0.43	14.33	0.41										16.32	15.99	0.32		34.00	0.138	3.40		
				J-6	235.00	0.15	3.34	0.03	35.90	1.15	4.68	14.28	0.00	**66.89**	0.11	17.17	**0.85**	9.73	9.63		2		0.043		45.52	
1284+00.00	40.25	Rt.	S-307			0.00	0.00	0.00					0.00					6.90	6.80	0.10		53.00	0.050	2.32		
CL-BA			**S-306**			0.17	0.17	0.16										16.01	15.99	0.01		18.00	0.018	0.73		
				P-5	76.50	0.04	0.04	0.01	10.00	0.64	7.63	0.17	0.00	**1.29**	0.00	17.98	**1.97**	14.90	14.50		1		0.523		8.23	
1286+40	40.25	Lt.	S-307			0.00	0.00	0.00					0.00					13.40	13.00	0.40		18.00	0.150	4.66		

Units: ENGLISH

HGL method: Standard FDOT (Jump HGL to pipe crown).

Automated Storm sewer Analysis & Design (ASAD), copyright 1992-2007, Hiteshew Engineering Systems, Inc. Ph: (352) 383-4191
Portions of ASAD were developed by Kenneth J. Leeming, P.E. at International Engineering Consultants, Inc.

FLORIDA DEPARTMENT OF TRANSPORTATION
STORM DRAIN TABULATION FORM

Financial Prj Id: **21340000000** County: **St. Lucie** Network: **Basin2/3** Designed by **JS** Date: 10/15/2013
Description: **Midway Road** Organization **H.W. LOCHNER, INC.** State Road: **-** Checked by: Date: 10/15/2013

LOCATION OF UPPER END / ALIGNMENT NAME / STATION	DIST	SD	STR. NO. / UPPER / LOWER	TYPE OF STR.	LEN. (ft.)	AREAS (Ac) C= 0.95 / C= 0.20 / C= 0.00 INC	TOTAL	SUB-TOTAL (C*A)	TIME OF CONC (min)	TIME OF FLOW SECT. (min)	INTEN (in/hr)	TOTAL (C*A)	BASE FLOW SUMM BASE (cfs)	TOTAL FLOW (cfs)	MINOR LOSS (ft.)	INLET ELEV. (ft.)	HGL CLEAR (ft.)	HYDRAULIC GRADE CROWN / FLOWLINE UPPER (ft.)	LOWER (ft.)	FALL (ft.)	# BR L S	PIPE SIZE (in.) / RISE / SPAN	SLOPE % / HGL / PHYS	ACTUAL VEL. / PHYS. VEL. (fps)	FULL FLOW CAP. (cfs)	NOTES & REMARKS
CL-BA			**S-307**			0.26	14.76	0.25										15.99	15.85	0.14		66.00	0.074	2.85		ZONE: 10
				J-5	195.00	0.03	3.41	0.01	37.05	1.14	4.61	14.70	0.00	**67.81**	0.08	17.98	**1.98**	12.30	12.20		1		0.051		82.38	FREQ. (Yrs): 10
1286+40	40.25	Rt.	S-308A			0.00	0.00	0.00					0.00					6.80	6.70	0.10		66.00	0.027	3.47		MANNINGS n: 0.0120
CL-BA			**S-308**			0.23	0.23	0.22										15.74	15.72	0.02		18.00	0.031	0.95		
				P-5	76.50	0.01	0.01	0.00	10.00	0.64	7.63	0.22	0.00	**1.68**	0.01	18.17	**2.43**	14.50	13.90		1		0.784		10.08	
1290+40	40.25	Lt.	S-309			0.00	0.00	0.00					0.00					13.00	12.40	0.60		18.00	0.150	5.70		TAILW EL (ft): 14.17
CL-BA			**S-308A**			0.00	14.76	0.00										15.85	15.72	0.13		66.00	0.065	2.81		
				MH-8J	195.00	0.00	3.41	0.00	38.19	1.16	4.54	14.70	0.00	**66.80**	0.06	18.72	**2.87**	12.20	12.10		1		0.051		82.38	
1288+40.00	40.25	Rt.	S-309			0.00	0.00	0.00					0.00					6.70	6.60	0.10		66.00	0.027	3.47		
CL-BA			**S-309**			0.20	15.19	0.19										15.72	15.58	0.14		66.00	0.073	2.85		
				J-5	195.00	0.07	3.49	0.01	39.34	1.14	4.47	15.13	0.00	**67.70**	0.08	18.17	**2.45**	12.10	12.00		1		0.051		82.38	
1290+40	40.25	Rt.	S-309A			0.00	0.00	0.00					0.00					6.60	6.50	0.10		66.00	0.027	3.47		
CL-BA			**S-309A**			0.20	15.39	0.19										15.58	15.35	0.23		42.00	0.167	3.51		
				J-5	136.00	0.07	3.56	0.01	40.48	0.65	4.41	15.33	0.00	**67.62**	0.10	17.54	**1.96**	10.00	9.90		2		0.074		59.11	
1292+40.00	40.25	Rt.	S-311			0.00	0.00	0.00					0.00					6.50	6.40	0.10		42.00	0.048	3.07		
CL-BA			**S-310**			0.39	0.71	0.37										15.62	15.35	0.27		18.00	0.348	2.94		
				P-6	76.50	0.08	0.09	0.02	10.63	0.43	7.50	0.69	0.00	**5.19**	0.11	17.15	**1.53**	14.50	13.90		1		0.784		10.08	
1293+81	40.25	Lt.	S-311			0.00	0.00	0.00					0.00					13.00	12.40	0.60		18.00	0.150	5.70		
CL-BA			**S-311**			0.31	16.41	0.29										15.35	15.23	0.12		66.00	0.128	3.01		
				J-6	94.00	0.04	3.69	0.01	41.13	0.52	4.37	16.33	0.00	**71.43**	0.08	17.15	**1.80**	11.90	11.80		1		0.106		118.66	
1293+81	40.25	Rt.	S-313			0.00	0.00	0.00					0.00					6.40	6.30	0.10		66.00	0.027	4.99		
CL-BA			**S-312**			0.32	0.32	0.30										15.66	15.62	0.05		18.00	0.060	1.32		
				P-5	76.00	0.01	0.01	0.00	10.00	0.63	7.63	0.31	0.00	**2.34**	0.01	17.39	**1.72**	14.70	14.50		1		0.263		5.84	
1294+60	40.25	Lt.	S-310			0.00	0.00	0.00					0.00					13.20	13.00	0.20		18.00	0.150	3.30		
CL-BA			**S-313**			0.17	16.58	0.16										15.23	15.10	0.13		66.00	0.082	3.02		
				J-5	165.00	0.05	3.74	0.01	41.65	0.91	4.35	16.50	0.00	**71.71**	0.07	17.45	**2.22**	11.80	11.70		1		0.061		89.56	
1294+80	40.25	Rt.	S-313A			0.00	0.00	0.00					0.00					6.30	6.20	0.10		66.00	0.027	3.77		
CL-BA			**S-313A**			0.09	16.67	0.09										15.10	15.00	0.10		72.00	0.049	2.52		
				J-5	195.00	0.03	3.77	0.01	42.56	1.29	4.30	16.59	0.00	**71.30**	0.05	17.96	**2.86**	12.20	11.90		1		0.154		179.96	
1296+50.00	40.25	Rt.	S-314			0.00	0.00	0.00					0.00					6.20	5.90	0.30		72.00	0.024	6.36		
CL-BA			**S-314**			0.12	16.79	0.11										15.00	14.89	0.10		72.00	0.044	2.50		
				J-5	236.00	0.03	3.80	0.01	43.85	1.57	4.23	16.71	0.00	**70.70**	0.05	17.87	**2.87**	11.90	11.40		1		0.212		211.18	
1298+50	40.25	Rt.	S-316			0.00	0.00	0.00					0.00					5.90	5.40	0.50		72.00	0.024	7.47		
CL-BA			**S-315**			0.31	0.31	0.29										14.94	14.89	0.05		18.00	0.061	1.33		
				P-5	76.50	0.07	0.07	0.01	10.00	0.64	7.63	0.31	0.00	**2.35**	0.01	17.15	**2.21**	14.50	13.80		1		0.915		10.89	
1300+91	40.25	Lt.	S-316			0.00	0.00	0.00					0.00					13.00	12.30	0.70		18.00	0.150	6.16		
CL-BA			**S-316**			0.31	17.41	0.29										14.89	14.82	0.07		72.00	0.172	2.54		
				J-5	40.91	0.05	3.92	0.01	45.42	0.27	4.15	17.32	0.00	**71.93**	0.06	17.15	**2.25**	11.40	11.00		1		0.978		453.67	
1300+91.00	40.25	Rt.	S-317			0.00	0.00	0.00					0.00					5.40	5.00	0.40		72.00	0.024	16.05		
CL-BA			**S-317**			0.00	17.41	0.00										14.82	14.73	0.10		72.00	0.153	2.54		
				MH-8J	62.00	0.00	3.92	0.00	45.69	0.41	4.14	17.32	0.00	**71.70**	0.08	16.98	**2.16**	11.00	10.83		1		0.274		240.24	
1301+36.91	40.25	Rt.	S-317A			0.00	0.00	0.00					0.00					5.00	4.83	0.17		72.00	0.024	8.50		

Units: ENGLISH

HGL method: Standard FDOT (Jump HGL to pipe crown).

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Portions of ASAD were developed by Kenneth J. Leeming, P.E. at International Engineering Consultants, Inc.

FLORIDA DEPARTMENT OF TRANSPORTATION
STORM DRAIN TABULATION FORM

Financial Prj Id: **21340000000** County: **St. Lucie** Network: **Basin2/3** Designed by **JS** Date: 10/15/2013
Description: **Midway Road** Organization **H.W. LOCHNER, INC.** State Road: **-** Checked by: Date: 10/15/2013

LOCATION OF UPPER END / ALIGNMENT NAME / STATION	DIST	SD	STR. NO. / UPPER / LOWER	TYPE OF STR.	LEN. (ft.)	AREAS (Ac) C= 0.95 / C= 0.20 / C= 0.00 INC	TOTAL	SUB-TOTAL (C*A)	TIME OF CONC (min)	TIME OF FLOW SECT. (min)	INTEN (in/hr)	TOTAL (C*A)	BASE FLOW SUMM BASE (cfs)	TOTAL FLOW (cfs)	MINOR LOSS (ft.)	INLET ELEV. (ft.)	HGL CLEAR (ft.)	HYDRAULIC GRADE CROWN / FLOWLINE UPPER (ft.)	LOWER (ft.)	FALL (ft.)	# B R L S	PIPE SIZE (in.) / RISE / SPAN	SLOPE % / HGL / PHYS. / MIN.	ACTUAL VEL. / PHYS. VEL. (fps)	FULL FLOW CAP. (cfs)	NOTES & REMARKS / ZONE: 10 / FREQ. (Yrs): 10 / MANNINGS n: 0.0120 / TAILW EL (ft): 14.17
CLCHR			**S-317A**			0.04	17.45	0.04										14.73	14.66	0.07		72.00	0.077	2.53		Overtopping EL 14.95
				DBI-DJ	95.00	0.06	3.98	0.01	46.10	0.63	4.12	17.37	0.00	**71.56**	0.05	14.08	**-0.65**	10.83	10.59		1		0.253		230.60	
51+00	20.63	Lt.	S-317B			0.00	0.00	0.00					0.00					4.83	4.59	0.24		72.00	0.024	8.16		
CLCHR			**S-317B**			0.04	17.49	0.04										14.66	14.56	0.10		72.00	0.049	2.52		Overtopping EL 14.95
				DBI-DJ	196.00	0.06	4.04	0.01	46.72	1.30	4.09	17.42	0.00	**71.25**	0.05	13.84	**-0.82**	10.59	10.47		1		0.061		113.52	
50+00	21.09	Lt.	S-318			0.00	0.00	0.00					0.00					4.59	4.47	0.12		72.00	0.024	4.02		
CLCHR			**S-318**			0.05	17.54	0.05										14.56	14.48	0.08		72.00	0.057	2.49		Overtopping EL 15.16
				DBI-DJ	146.00	0.07	4.11	0.01	48.02	0.98	4.03	17.49	0.00	**70.44**	0.05	13.96	**-0.60**	10.47	10.38		1		0.062		113.91	
48+00	21.16	Lt.	S-318A			0.00	0.00	0.00					0.00					4.47	4.38	0.09		72.00	0.024	4.03		
CLCHR			**S-318A**			0.03	17.57	0.03										14.48	14.41	0.07		72.00	0.083	2.47		Overtopping EL 15.37
				DBI-DJ	79.00	0.05	4.16	0.01	49.00	0.53	3.98	17.52	0.00	**69.82**	0.05	14.05	**-0.43**	10.38	10.30		1		0.101		146.00	
46+50.00	20.32	Lt.	S-319			0.00	0.00	0.00					0.00					4.38	4.30	0.08		72.00	0.024	5.16		
CLCHR			**S-319**			0.07	17.64	0.07										14.41	14.31	0.10		72.00	0.099	2.47		Overtopping EL 15.83
				DBI-DJ	100.00	0.11	4.27	0.02	49.53	0.68	3.96	17.61	0.00	**69.75**	0.08	14.11	**-0.30**	10.30	10.20		1		0.100		145.09	
45+60	19.70	Lt.	S-320			0.00	0.00	0.00					0.00					4.30	4.20	0.10		72.00	0.024	5.13		
CLCHR			**S-320**			0.00	17.64	0.00										14.31	14.26	0.05		72.00	0.489	2.45		Bubble-up structure
				DBI-H	10.00	0.00	4.27	0.00	50.20	0.00	3.93	17.61	0.00	**69.23**	0.05	12.00	**-2.31**	10.20	10.10		1		1.000		458.80	
45+00	66.93	Rt.	S-321			0.00	0.00	0.00					0.00					4.20	4.10	0.10		72.00	0.024	16.23		

Units: ENGLISH

HGL method: Standard FDOT (Jump HGL to pipe crown).

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FLORIDA DEPARTMENT OF TRANSPORTATION
SPREAD TABULATION REPORT

Financial Prj Id **Basin2/3** County: **Midway Road** Rainfall Zone: **10** Designed: **H.W. LOCHNER, IN** Date: 10/15/2013
Description: **21340000000** Organization **-** State Road: **St. Lucie** Checked: **JS** Date: 10/15/2013

Structure No.	Station	Side	Type of Structure	Drainage Area (acres)	Composite Runoff Coefficient	Rainfall Intensity (in/hr)	Overland Runoff (cfs)	Previous nlet Bypass (cfs)	Total Runoff (cfs)	Cross Slope (ft/ft)	Longitudinal Slope (ft/ft)	Manning's n	Calculated Spread (ft)	Allowable Spread (ft)	Sumped Spread (ft)	Intercepted Flow (cfs)	Bypass Flow to Nxt Inlet (cfs)	Bypass to Structure No.
S-222	1271+36.67	L	J-6	0.24	0.86	4.00	0.41	0.00	0.41	0.020	0.0030	0.016	5.41	11.50	0.00	0.41	0.00	Future
S-222A	1273+00	L	J-5	0.60	0.85	4.00	2.04	0.00	2.04	0.020	0.0030	0.016	11.27	11.50	0.00	2.04	0.00	Future
S-226	128+00	R	P-6	0.51	0.91	4.00	1.85	0.00	1.85	0.020	0.0030	0.016	10.82	11.50	6.49	1.85	0.00	SAG
S-227	129+41.83	L	J-5	0.24	0.79	4.00	0.76	0.00	0.76	0.020	0.0030	0.016	7.35	11.50	0.00	0.76	0.00	S-225
S-227A	131+21.00	L	J-5	0.08	0.76	4.00	0.24	0.00	0.24	0.020	0.0030	0.016	3.98	11.50	0.00	0.24	0.00	Future
S-228	133+00	L	J-5	0.16	0.81	4.00	0.52	0.00	0.52	0.020	0.0030	0.016	6.11	11.50	0.00	0.52	0.00	S-229
S-229A	136+64	L	J-5	0.24	0.82	4.00	0.79	0.00	0.79	0.020	0.0030	0.016	7.48	11.50	0.00	0.79	0.00	Future
S-230	134+50	R	P-6	0.68	0.84	4.00	1.14	0.00	1.14	0.020	0.0030	0.016	8.82	11.50	4.71	1.14	0.00	SAG
S-231	138+50	L	J-5	0.06	0.82	4.00	0.20	0.00	0.20	0.020	0.0030	0.016	3.45	11.50	0.00	0.20	0.00	S-232
S-231A	140+49.00	L	J-5	0.40	0.86	4.00	1.37	0.00	1.37	0.020	0.0030	0.016	9.54	11.50	0.00	1.37	0.00	Future
S-233	142+48.43	R	P-5	0.45	0.90	4.00	1.62	0.00	1.62	0.020	0.0030	0.016	10.24	11.50	0.00	1.62	0.00	S-234
S-300A	1276+50	L	J-5	0.16	0.81	4.00	0.52	0.00	0.52	0.020	0.0040	0.016	5.67	11.50	0.00	0.52	0.00	Future
S-301	1278+30	L	J-6	0.56	0.76	4.00	0.85	0.00	0.85	0.020	0.0040	0.016	7.25	11.50	3.88	0.85	0.00	SAG
S-302	1278+30	R	J-6	0.78	0.68	4.00	1.06	0.00	1.06	0.020	0.0040	0.016	8.01	11.50	4.48	1.06	0.00	SAG
S-302A	1280+30.00	R	J-5	0.07	0.74	4.00	0.21	0.00	0.21	0.020	0.0030	0.016	3.55	11.50	0.00	0.21	0.00	Future
S-303	1282+30	R	J-5	0.20	0.76	4.00	0.61	0.00	0.61	0.020	0.0055	0.016	5.68	11.50	0.00	0.61	0.00	S-305
S-306	1286+40	L	P-5	0.21	0.81	4.00	0.68	0.00	0.68	0.020	0.0040	0.016	6.50	11.50	0.00	0.68	0.00	S-304
S-307	1286+40	R	J-5	0.29	0.87	4.00	1.01	0.00	1.01	0.020	0.0040	0.016	7.85	11.50	0.00	1.01	0.00	S-305
S-308	1290+40	L	P-5	0.24	0.92	4.00	0.88	0.00	0.88	0.020	0.0030	0.016	7.86	11.50	0.00	0.88	0.00	S-310
S-309	1290+40	R	J-5	0.27	0.76	4.00	0.82	0.00	0.82	0.020	0.0030	0.016	7.59	11.50	0.00	0.82	0.00	S-311
S-309A	1292+40.00	R	J-5	0.27	0.76	4.00	0.82	0.00	0.82	0.020	0.0030	0.016	7.59	11.50	0.00	0.82	0.00	Future
S-312	1294+60	L	P-5	0.33	0.93	4.00	1.22	0.00	1.22	0.020	0.0030	0.016	9.08	11.50	0.00	1.22	0.00	S-310
S-313	1294+80	R	J-5	0.22	0.78	4.00	0.69	0.00	0.69	0.020	0.0030	0.016	7.00	11.50	0.00	0.69	0.00	S-311
S-313A	1296+50.00	R	J-5	0.12	0.76	4.00	0.37	0.00	0.37	0.020	0.0030	0.016	5.08	11.50	0.00	0.37	0.00	Future
S-316	1300+91.00	R	J-5	0.36	0.85	4.00	1.22	0.00	1.22	0.020	0.0030	0.016	9.07	11.50	0.00	1.22	0.00	S-315
S-225	128+00	L	J-6	0.56	0.88	4.00	1.98	0.00	1.98	0.020	0.0030	0.016	11.12	11.50	6.79	1.98	0.00	SAG
S-229	134+50	L	J-6	0.53	0.81	4.00	0.86	0.00	0.86	0.020	0.0030	0.016	7.76	11.50	3.89	0.86	0.00	SAG
S-232	142+47.10	L	J-5	0.16	0.67	4.00	0.43	0.00	0.43	0.020	0.0030	0.016	5.53	11.50	0.00	0.43	0.00	S-234

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FLORIDA DEPARTMENT OF TRANSPORTATION
SPREAD TABULATION REPORT

Financial Prj Id **Basin2/3** County: **Midway Road** Rainfall Zone: **10** Designed: **H.W. LOCHNER, IN** Date: 10/15/2013
Description: **21340000000** Organization **-** State Road: **St. Lucie** Checked: **JS** Date: 10/15/2013

Structure No.	Station	Side	Type of Structure	Drainage Area (acres)	Composite Runoff Coefficient	Rainfall Intensity (in/hr)	Overland Runoff (cfs)	Previous nlet Bypass (cfs)	Total Runoff (cfs)	Cross Slope (ft/ft)	Longitudinal Slope (ft/ft)	Manning's n	Calculated Spread (ft)	Allowable Spread (ft)	Sumped Spread (ft)	Intercepted Flow (cfs)	Bypass Flow to Nxt Inlet (cfs)	Bypass to Structure No.
S-304	1284+00.00	L	P-6	0.83	0.70	4.00	2.31	0.00	2.31	0.020	0.0030	0.016	11.86	11.50	7.53	2.31	0.00	SAG
S-315	1300+91	L	P-5	0.38	0.81	4.00	1.23	0.00	1.23	0.020	0.0030	0.016	9.12	11.50	0.00	1.23	0.00	S-314
S-305	1284+00.00	R	J-6	0.58	0.76	4.00	1.75	0.00	1.75	0.020	0.0030	0.016	10.58	11.50	6.26	1.75	0.00	SAG
S-310	1293+81	L	P-6	0.47	0.82	4.00	0.77	0.00	0.77	0.020	0.0030	0.016	7.40	11.50	3.63	0.77	0.00	SAG
S-311	1293+81	R	J-6	0.35	0.86	4.00	0.60	0.00	0.60	0.020	0.0030	0.016	6.59	11.50	3.08	0.60	0.00	SAG
S-314	1298+50	R	J-5	0.15	0.80	4.00	0.48	0.00	0.48	0.020	0.0030	0.016	5.88	11.50	0.00	0.48	0.00	Future

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FLORIDA DEPARTMENT OF TRANSPORTATION
STORM DRAIN TABULATION FORM

Financial Prj Id: **21340000000** County: **St. Lucie** Network: **S-800** Designed by Date: 10/15/2013
Description: **Midway Road** Organization **H.W. LOCHNER, INC.** State Road: **-** Checked by: Date: 10/15/2013

LOCATION OF UPPER END / ALIGNMENT NAME / STATION	DIST	SD	STR. NO. / UPPER / LOWER	TYPE OF STR.	LEN. (ft.)	AREAS (Ac) C= 0.95 / C= 0.20 / C= 0.00 INC	TOTAL	SUB-TOTAL (C*A)	TIME OF CONC (min)	TIME OF FLOW SECT. (min)	INTEN (in/hr)	TOTAL (C*A)	BASE FLOW SUMM BASE (cfs)	TOTAL FLOW (cfs)	MINOR LOSS (ft.)	INLET ELEV. (ft.)	HGL CLEAR (ft.)	HYDRAULIC GRADE CROWN / FLOWLINE UPPER (ft.)	LOWER (ft.)	FALL (ft.)	# BR / L / S	PIPE SIZE (in.) / RISE / SPAN	SLOPE % / HGL / MIN.	ACTUAL VEL. / PHYS. / VEL. (fps)	FULL FLOW CAP. (cfs)	NOTES & REMARKS ZONE: 10 / FREQ. (Yrs): 10 / MANNINGS n: 0.0120 / TAILW EL (ft): 15.70
CLSEL2			**S-800**			0.00	0.00	0.00										15.89	15.77	0.11		18.00	0.168	2.17		
				DBI-C	68.07	0.04	3.17	0.01	19.89	0.00	6.06	0.63	0.00	**3.84**	0.04	17.45	**1.56**	15.20	15.10		1		0.147		4.36	
127+80	52.29	Rt.	CD203D			0.00	0.00	0.00					0.00					13.70	13.60	0.10		18.00	0.150	2.47		
CLSEL2			**S-801**			0.00	0.00	0.00										16.12	15.89	0.23		18.00	0.139	2.20		Slot @ 16.70
				DBI-C	168.86	0.18	3.13	0.04	18.61	1.28	6.21	0.63	0.00	**3.89**	0.04	17.70	**1.58**	15.50	15.20		1		0.178		4.80	
129+50	50.24	Rt.	S-800			0.00	0.00	0.00					0.00					14.00	13.70	0.30		18.00	0.150	2.71		
CLSEL2			**S-802**			0.00	0.00	0.00										16.26	16.12	0.14		18.00	0.142	2.11		Slot @ 16.96
				DBI-C	98.00	0.96	2.95	0.19	17.83	0.77	6.31	0.59	0.00	**3.72**	0.03	17.96	**1.70**	15.70	15.50		1		0.204		5.14	
130+50	50.38	Rt.	S-801			0.00	0.00	0.00					0.00					14.20	14.00	0.20		18.00	0.150	2.91		
CLSEL2			**S-803**			0.00	0.00	0.00										16.38	16.26	0.12		18.00	0.061	1.47		Slot @ 17.45
				DBI-C	198.00	0.18	1.99	0.04	16.18	1.65	6.54	0.40	0.00	**2.60**	0.02	18.45	**2.07**	16.00	15.70		1		0.152		4.43	
132+50	49.76	Rt.	S-802			0.00	0.00	0.00					0.00					14.50	14.20	0.30		18.00	0.150	2.51		
CLSEL2			**S-804**			0.00	0.00	0.00										16.49	16.38	0.11		18.00	0.054	1.39		Slot @ 17.14
				DBI-C	198.00	0.68	1.81	0.14	14.53	1.65	6.79	0.36	0.00	**2.46**	0.02	18.14	**1.65**	16.30	16.00		1		0.152		4.43	
134+50	49.09	Rt.	S-803			0.00	0.00	0.00					0.00					14.80	14.50	0.30		18.00	0.150	2.51		
CLSEL2			**S-805**			0.00	0.00	0.00										16.54	16.49	0.05		14.00	0.024	0.91		Slot @ 16.48
				DBI-C	198.01	0.20	1.13	0.04	12.88	1.65	7.06	0.23	0.00	**1.60**	0.01	17.48	**0.94**	16.27	15.97		1		0.152		4.30	
136+50	51.00	Rt.	S-804			0.00	0.00	0.00					0.00					15.10	14.80	0.30		23.00	0.160	2.45		
CLSEL2			**S-806**			0.00	0.00	0.00										16.57	16.54	0.04		14.00	0.018	0.78		Slot @ 17.27
				DBI-C	198.00	0.18	0.93	0.04	11.23	1.65	7.37	0.19	0.00	**1.37**	0.00	18.27	**1.70**	16.57	16.27		1		0.152		4.30	
138+50	50.62	Rt.	S-805			0.00	0.00	0.00					0.00					15.40	15.10	0.30		23.00	0.160	2.45		
CLSEL2			**S-807**			0.00	0.00	0.00										16.59	16.57	0.02		14.00	0.013	0.65		Slot @ 17.11
				DBI-C	148.00	0.75	0.75	0.15	10.00	1.23	7.63	0.15	0.00	**1.14**	0.00	18.11	**1.52**	16.87	16.57		1		0.203		4.98	
140+00	50.07	Rt.	S-806			0.00	0.00	0.00					0.00					15.70	15.40	0.30		23.00	0.160	2.83		

Units: ENGLISH

HGL method: Standard FDOT (Jump HGL to pipe crown).

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Portions of ASAD were developed by Kenneth J. Leeming, P.E. at International Engineering Consultants, Inc.

FLORIDA DEPARTMENT OF TRANSPORTATION
STORM DRAIN TABULATION FORM

Financial Prj Id: **21340000000** County: **St. Lucie** Network: **Christen** Designed by **JBM** Date: 10/15/2013
Description: **Midway Road** Organization **H.W. LOCHNER, INC.** State Road: **-** Checked by: Date: 10/15/2013

LOCATION OF UPPER END / ALIGNMENT NAME / STATION DIST SD	STR. NO. / UPPER / LOWER	TYPE OF STR.	LEN. (ft.)	AREAS (Ac) C= 0.95 / C= 0.20 / C= 0.00 INC	AREAS (Ac) TOTAL	SUB-TOTAL (C*A)	TIME OF CONC (min)	TIME OF FLOW SECT. (min)	INTEN (in/hr)	TOTAL (C*A)	BASE FLOW SUMM BASE (cfs)	TOTAL FLOW (cfs)	MINOR LOSS (ft.)	INLET ELEV. (ft.)	HGL CLEAR (ft.)	HYDRAULIC GRADE CROWN / FLOWLINE UPPER (ft.)	HYDRAULIC GRADE FLOWLINE LOWER (ft.)	HYDRAULIC GRADE FLOWLINE FALL (ft.)	# BR L S	PIPE SIZE (in.) RISE SPAN	SLOPE % HGL PHYS MIN.	ACTUAL VEL. PHYS. VEL. (fps)	FULL FLOW CAP. (cfs)	NOTES & REMARKS ZONE: 10 / FREQ. (Yrs): 10 / MANNINGS n: 0.0120 / TAILW EL (ft): 12.85
CLCHR	**S-701**			0.04	0.04	0.04										13.47	13.47	0.00		14.00	0.003	0.22		
		DBI-D	23.00	0.06	0.06	0.01	10.00	0.19	7.63	0.05	0.00	**0.38**	0.00	14.75	**1.28**	13.52	13.47		1		0.217		5.16	
46+80 20.97 Rt.	S-701A			0.00	0.00	0.00					0.00					12.35	12.30	0.05		23.00	0.160	2.94		
CLCHR	**S-701A**			0.00	0.29	0.00										13.34	13.25	0.09		14.00	0.074	1.46		
		MH-8	116.00	0.00	0.31	0.00	10.19	0.97	7.59	0.34	0.00	**2.56**	0.02	15.91	**2.57**	13.47	13.23		1		0.207		5.03	
47+06 44.00 Rt.	S-702			0.00	0.00	0.00					0.00					12.30	12.06	0.24		23.00	0.160	2.86		
CLCHR	**S-701B**			0.25	0.25	0.24										13.82	13.80	0.02		18.00	0.097	1.24		
		DBI-C	20.00	0.25	0.25	0.05	10.00	0.17	7.63	0.29	0.00	**2.19**	0.01	14.90	**1.08**	13.90	13.80		1		0.500		8.05	
47+06 44.00 Rt.	S-701A			0.00	0.00	0.00					0.00					12.40	12.30	0.10		18.00	0.150	4.55		
CLCHR	**S-702**			0.03	0.32	0.03										13.25	13.15	0.10		14.00	0.078	1.58		
		DBI-D	132.00	0.05	0.36	0.01	11.16	1.10	7.39	0.38	0.00	**2.78**	0.02	14.66	**1.41**	13.23	12.97		1		0.197		4.91	
48+25 20.81 Rt.	S-703			0.00	0.00	0.00					0.00					12.06	11.80	0.26		23.00	0.160	2.79		
CLCHR	**S-703**			0.03	0.35	0.03										13.15	13.10	0.05		14.00	0.130	1.68		
		DBI-D	37.01	0.03	0.39	0.01	12.26	0.31	7.18	0.41	0.00	**2.95**	0.02	14.58	**1.43**	12.97	12.89		1		0.216		5.14	
49+60 21.05 Rt.	S-704			0.00	0.00	0.00					0.00					11.80	11.72	0.08		23.00	0.160	2.93		
CLCHR	**S-704**			0.01	0.36	0.01										13.10	13.01	0.09		14.00	0.097	1.71		
		DBI-D	97.01	0.01	0.40	0.00	12.57	0.81	7.12	0.42	0.00	**3.00**	0.02	14.56	**1.46**	12.89	12.69		1		0.206		5.02	
50+00 20.28 Rt.	S-705			0.00	0.00	0.00					0.00					11.72	11.52	0.20		23.00	0.160	2.86		
CLCHR	**S-705**			0.04	0.40	0.04										13.01	12.95	0.06		14.00	0.170	1.88		
		DBI-D	33.75	0.06	0.46	0.01	13.38	0.28	6.98	0.47	0.00	**3.29**	0.03	14.50	**1.49**	12.69	12.62		1		0.207		5.04	
51+00 21.46 Rt.	S-707			0.00	0.00	0.00					0.00					11.52	11.45	0.07		23.00	0.160	2.87		
CLCHR	**S-707**			0.00	0.40	0.00										12.95	12.90	0.05		14.00	0.487	1.86		
		MH-8	9.46	0.00	0.46	0.00	13.66	0.00	6.93	0.47	0.00	**3.27**	0.04	15.65	**2.70**	12.62	12.52		1		1.057		11.37	
51+36.75 21.65 Rt.	S-707Z			0.00	0.00	0.00					0.00					11.45	11.35	0.10		23.00	0.160	6.47		

Units: ENGLISH

HGL method: Standard FDOT (Jump HGL to pipe crown).

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CD-201

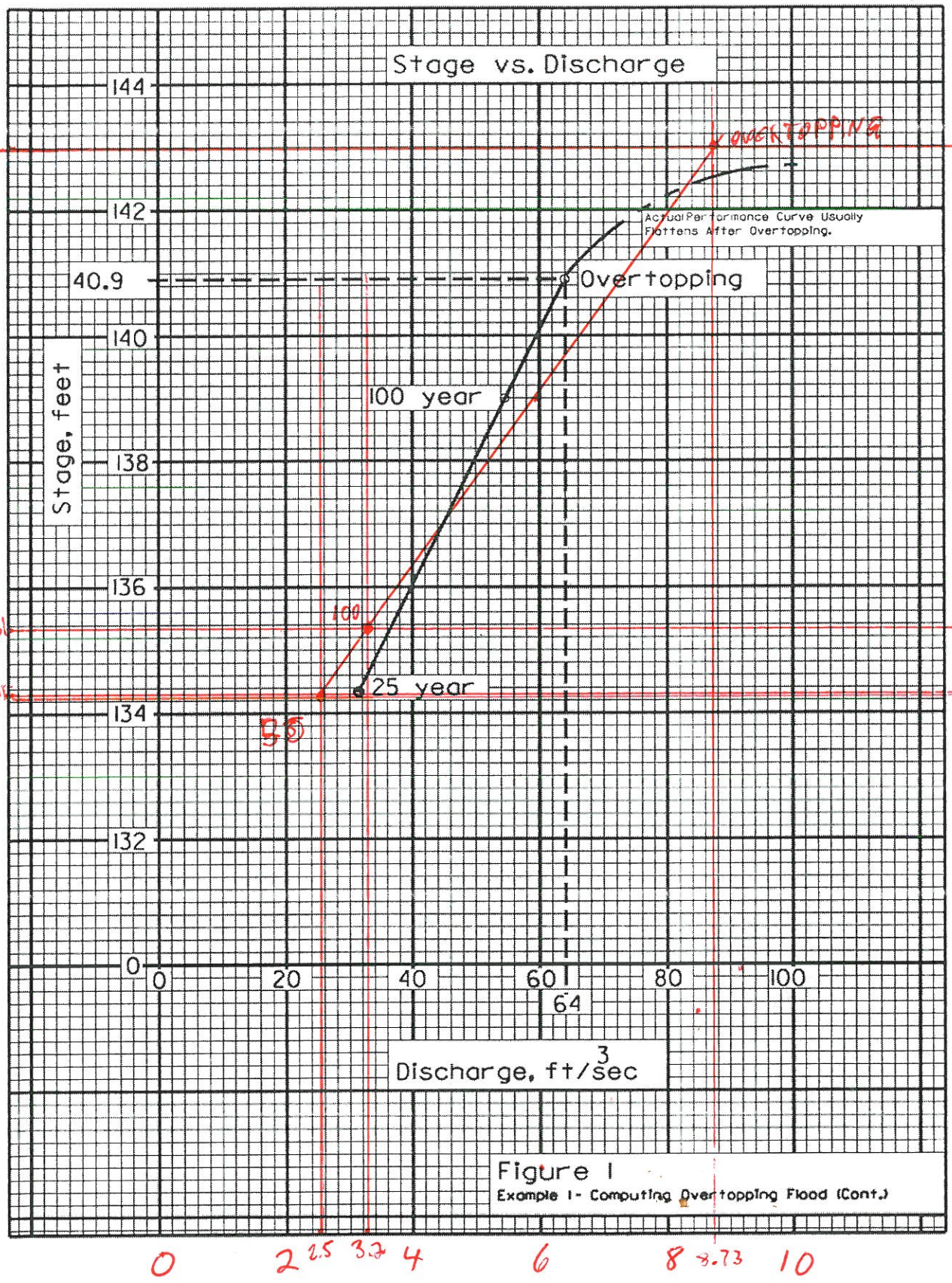


Figure 1
Example 1- Computing Overtopping Flood (Cont.)

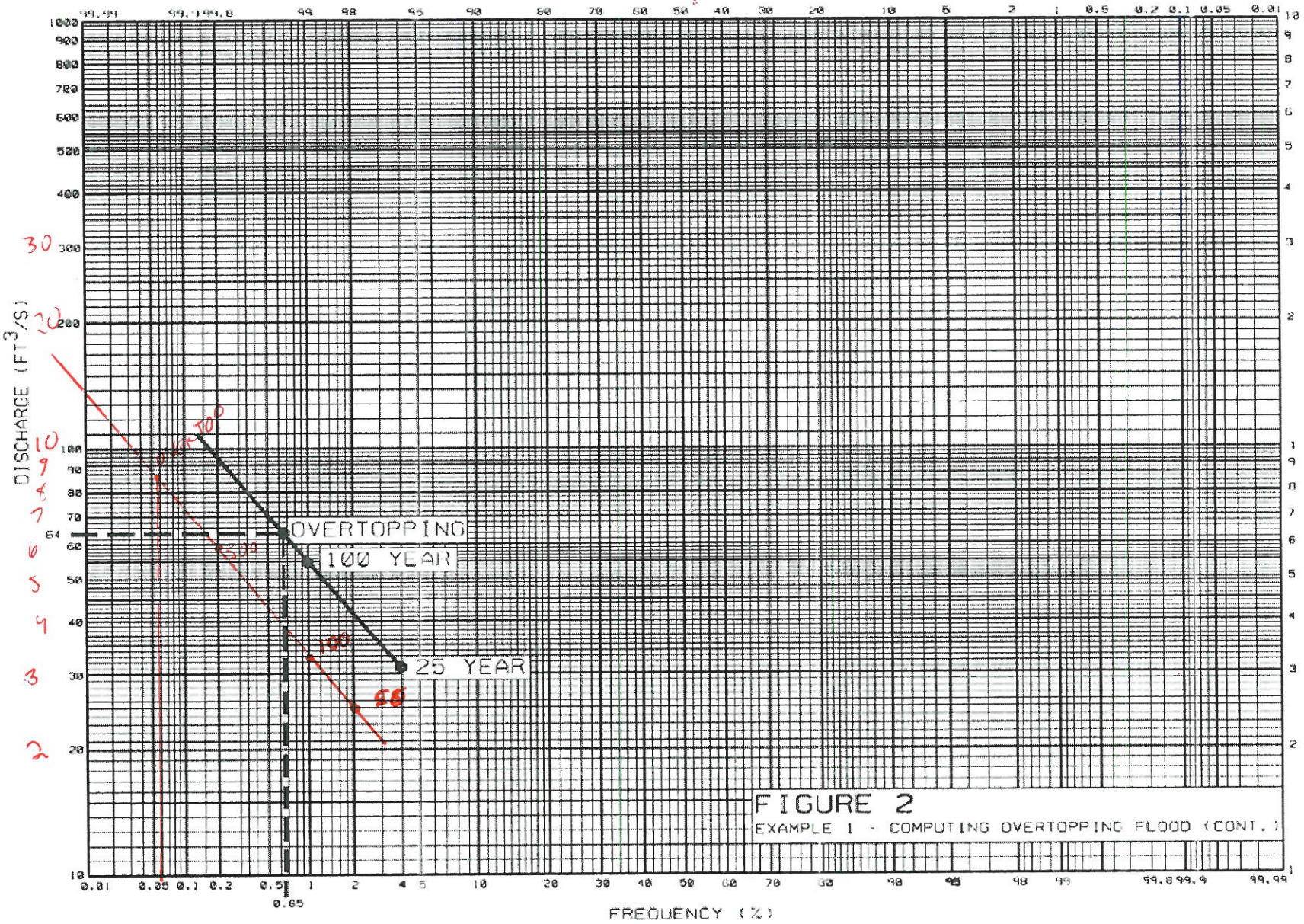


FIGURE 2
EXAMPLE 1 - COMPUTING OVERTOPPING FLOOD (CONT.)

CD-201

CO-202A

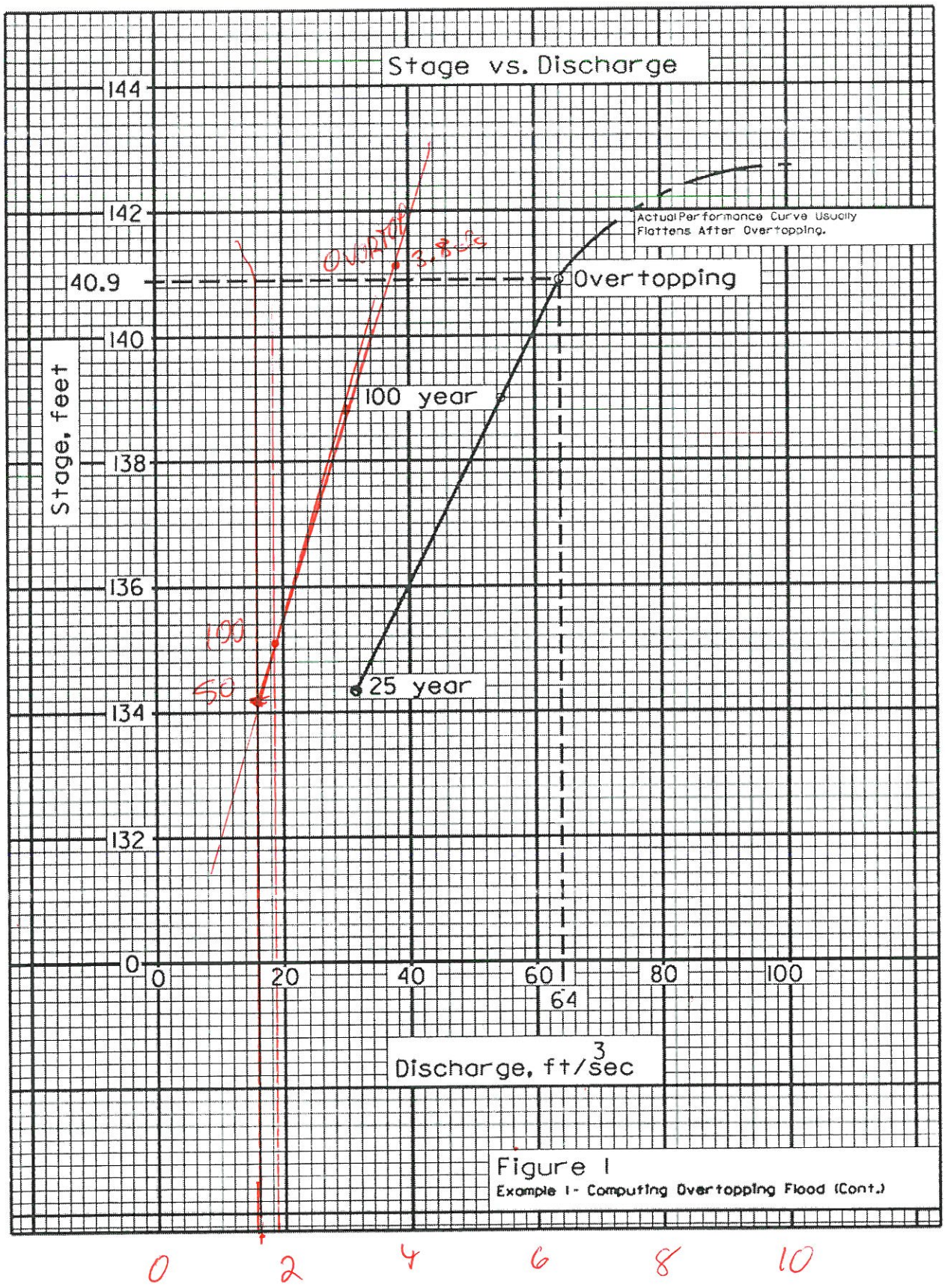


Figure 1
Example 1 - Computing Overtopping Flood (Cont.)

CD - 202A

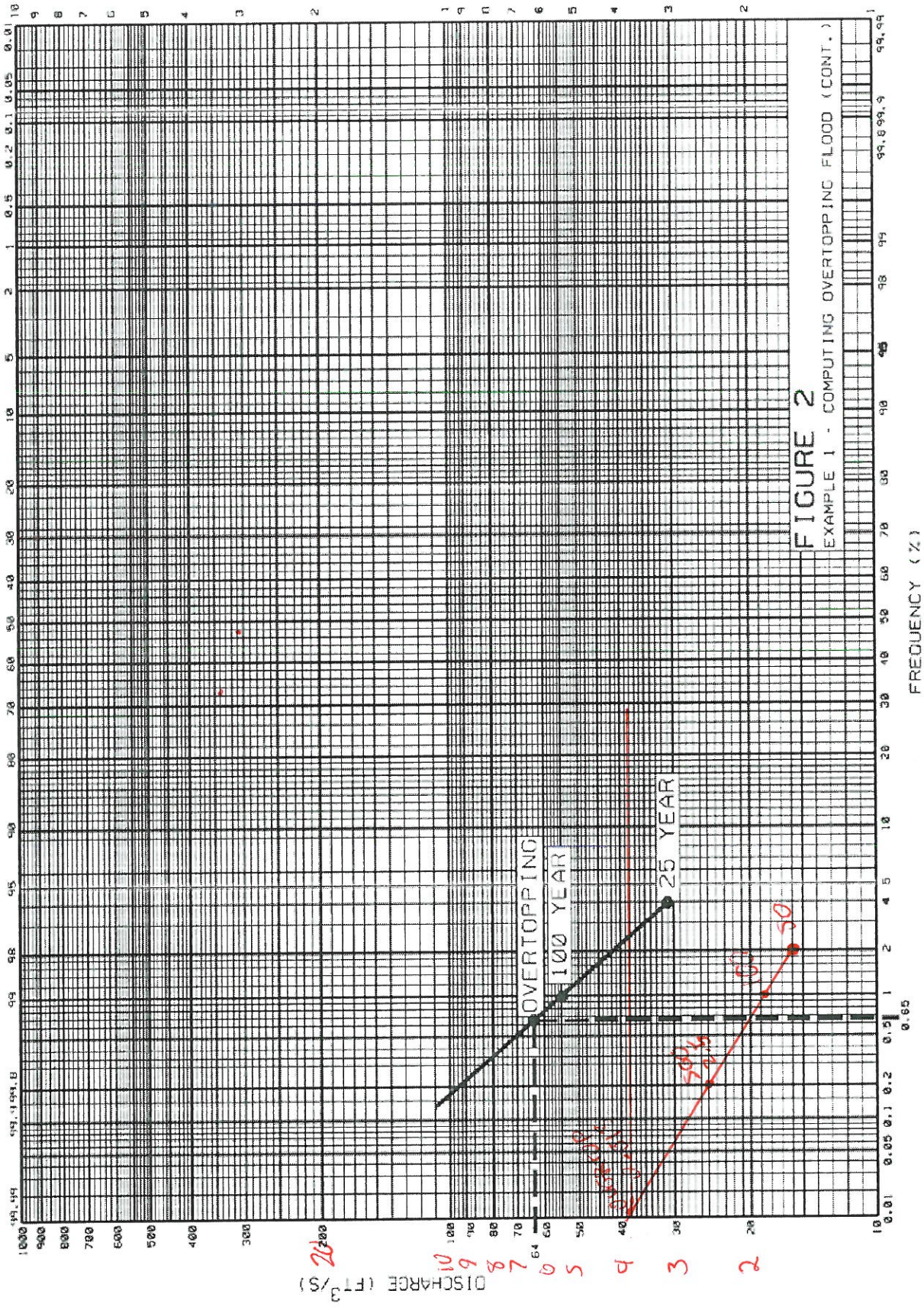


FIGURE 2
EXAMPLE 1 - COMPUTING OVERTOPPING FLOOD (CONT.)
OVERTOPPING
100 YEAR
25 YEAR
DISCHARGE (FT³/S)
FREQUENCY (%)

CD-203A

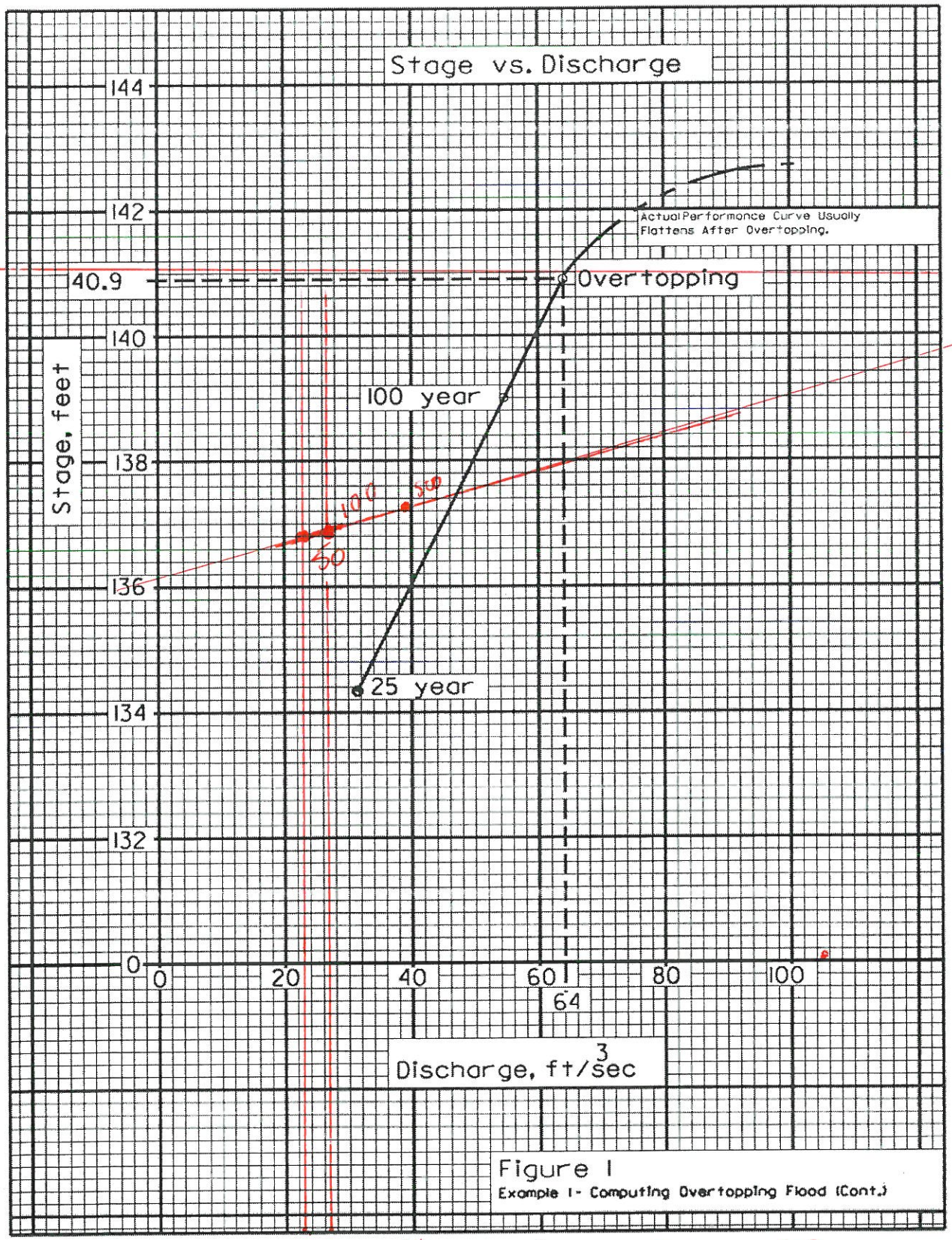


Figure 1
Example 1- Computing Overtopping Flood (Cont.)

CD-203A

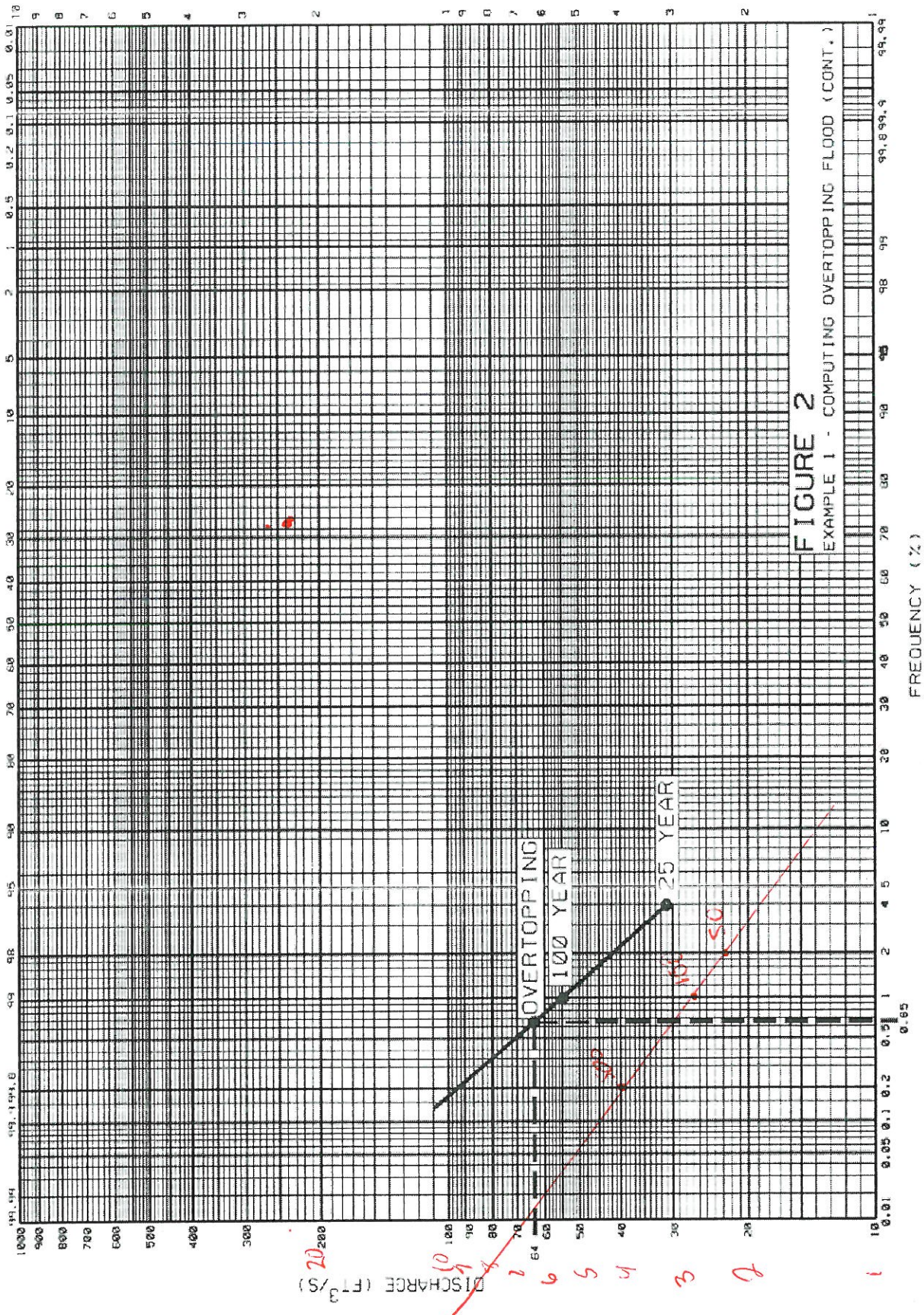


FIGURE 2
EXAMPLE 1 - COMPUTING OVERTOPPING FLOOD (CONT.)
OVERTOPPING
100 YEAR
25 YEAR
DISCHARGE (FT³/S)
FREQUENCY (%)

CD-203C

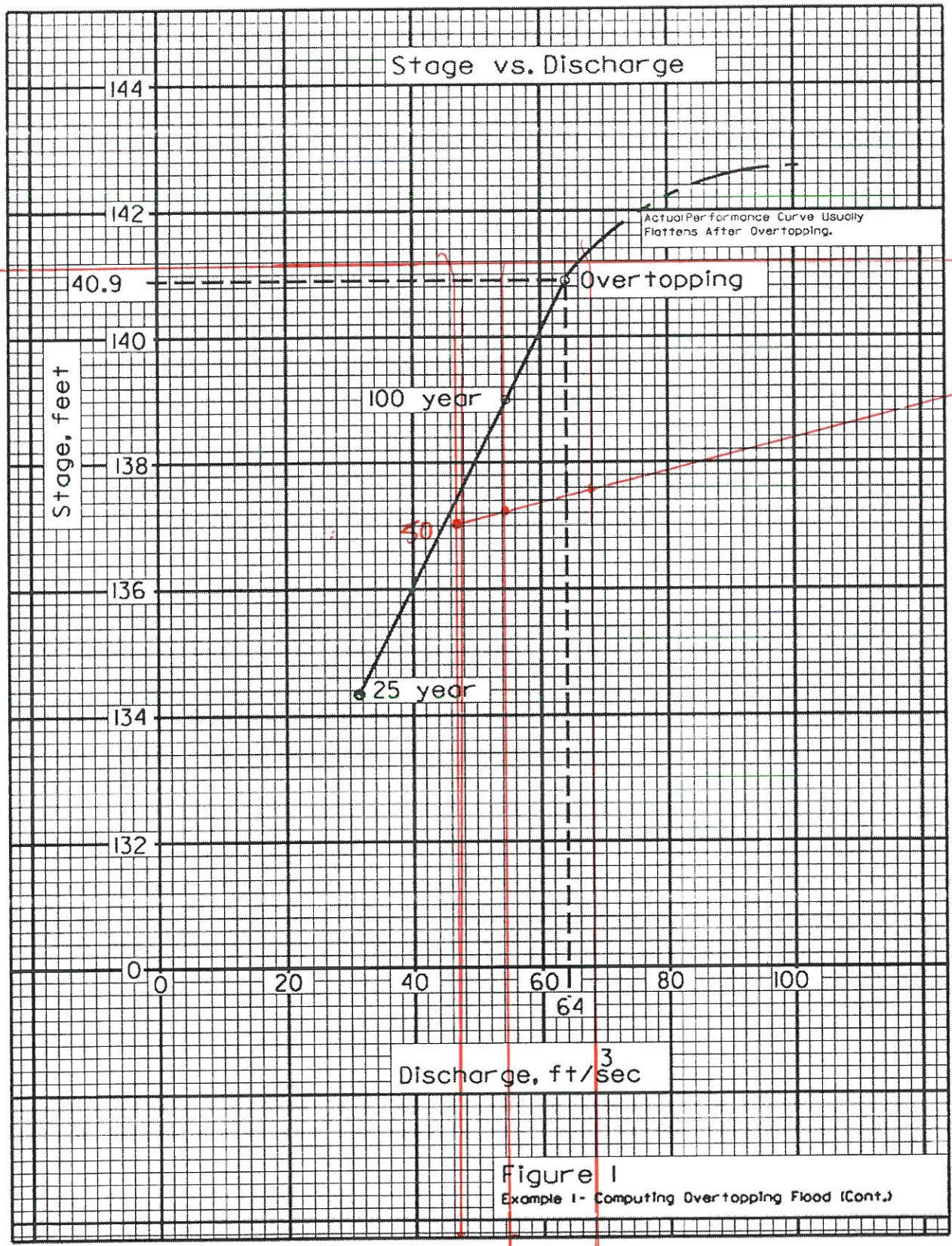


Figure 1
Example 1- Computing Overtopping Flood (Cont.)

CD-203C

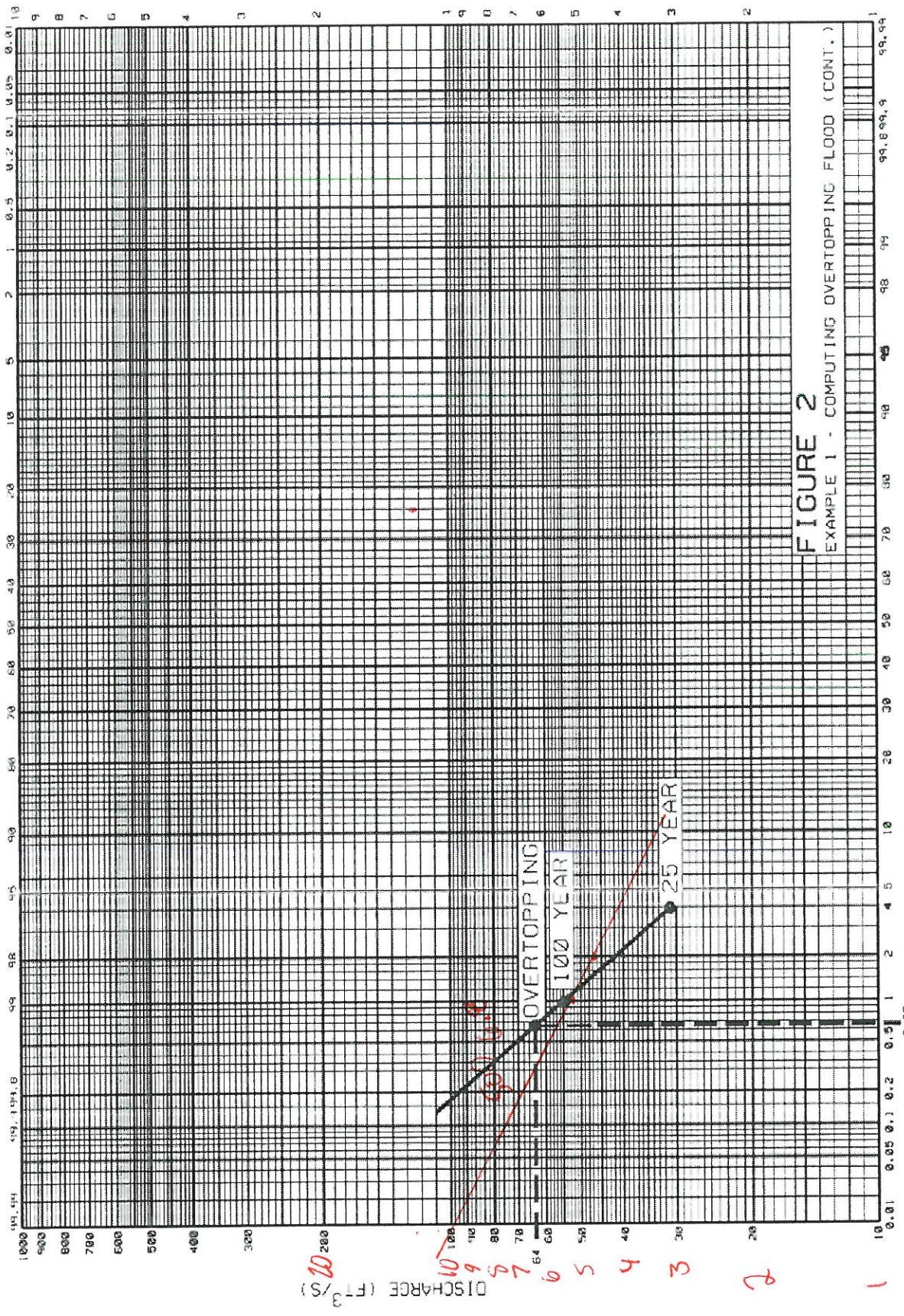


FIGURE 2
EXAMPLE 1 - COMPUTING OVERTOPPING FLOOD (CONT.)
DISCHARGE (FT³/S)
FREQUENCY (%)
OVERTOPPING
100 YEAR
25 YEAR

CD-203D

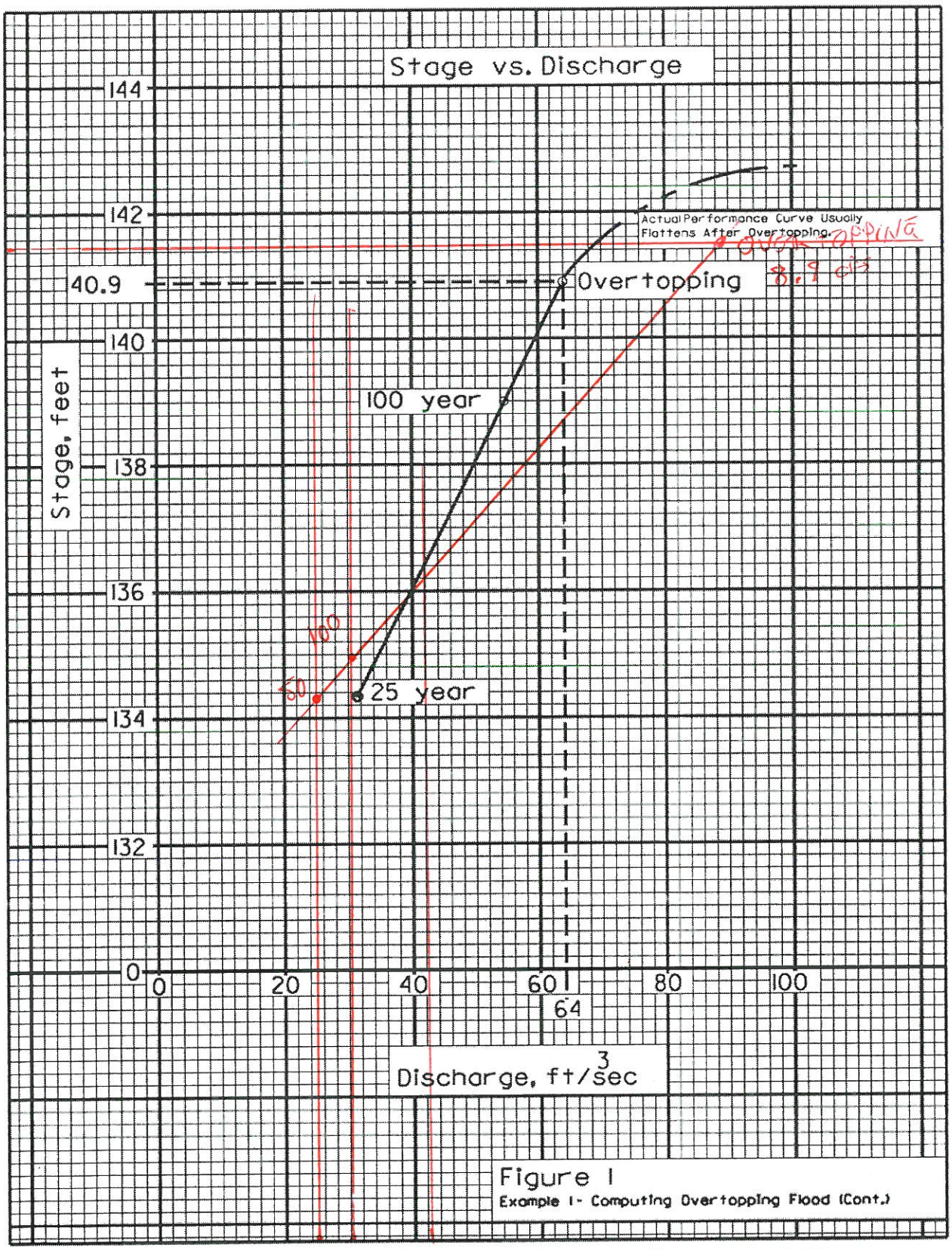


Figure 1
Example 1- Computing Overtopping Flood (Cont.)

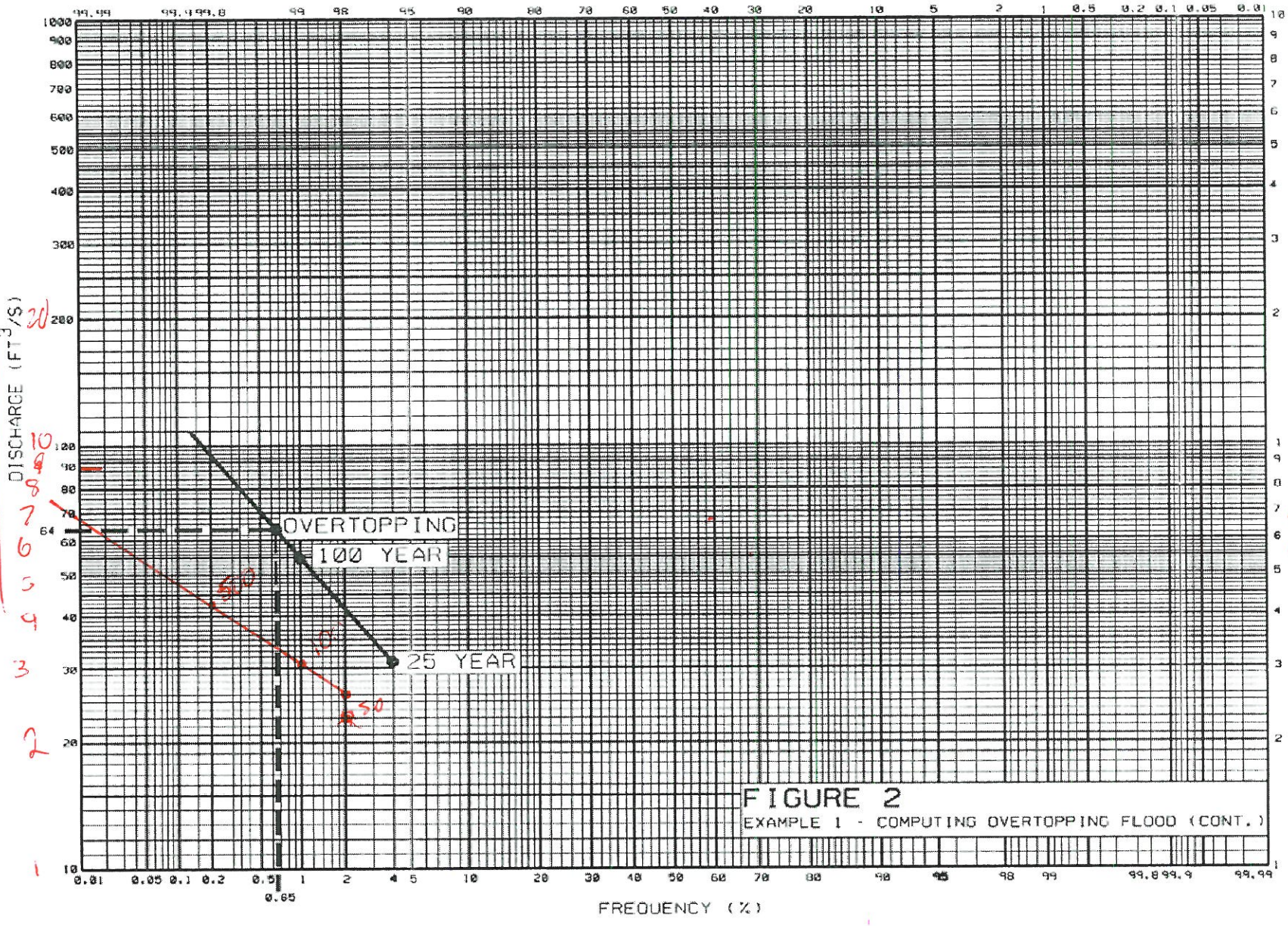
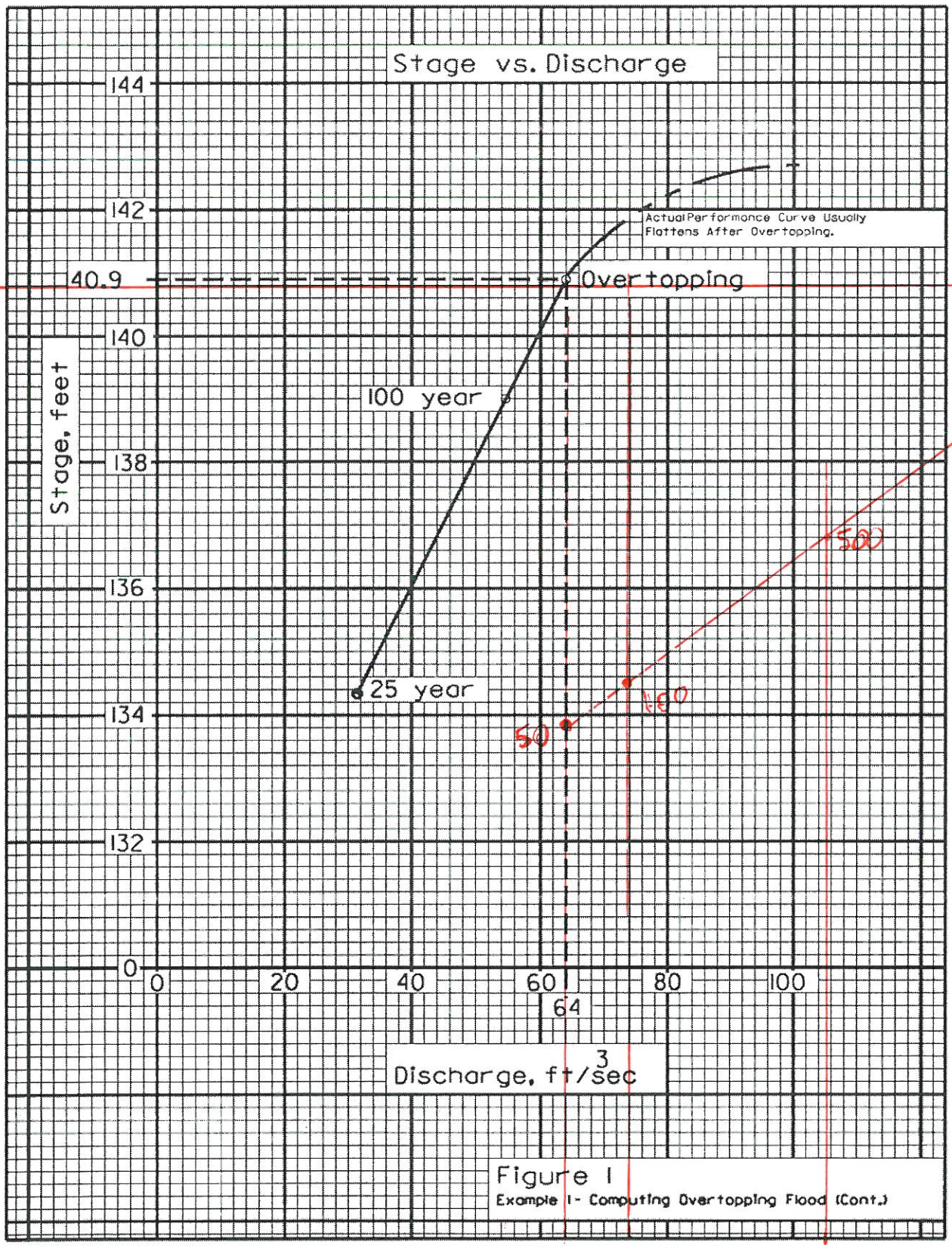


FIGURE 2
EXAMPLE 1 - COMPUTING OVERTOPPING FLOOD (CONT.)

CD-300


Stage vs. Discharge
144
142
140
138
136
134
132
0
40.9
Overtopping
Actual Performance Curve Usually Flattens After Overtopping.
100 year
25 year
Stage, feet
0
20
40
60
80
100
64
Discharge, ft³/sec
Figure 1
Example 1- Computing Overtopping Flood (Cont.)

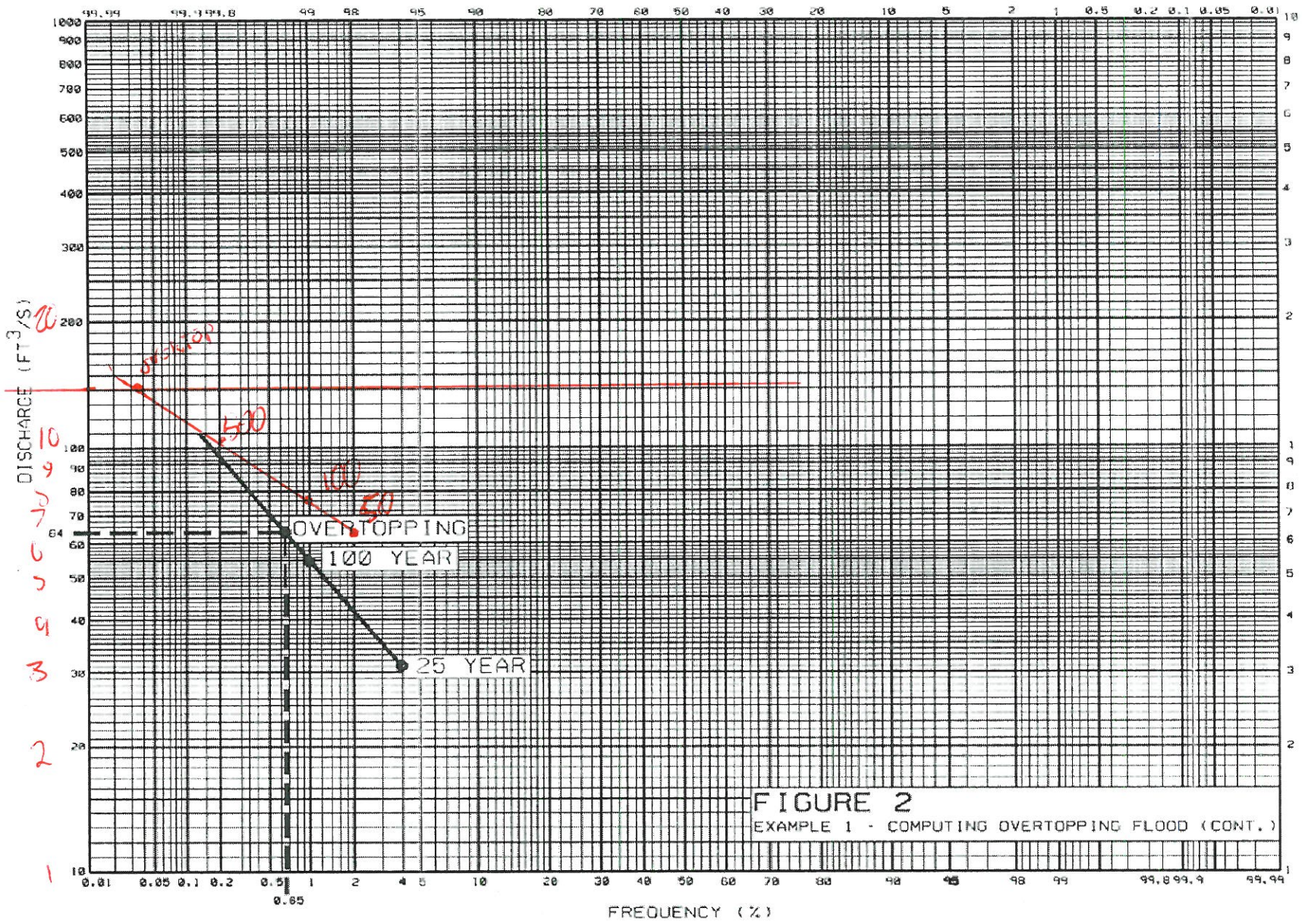


FIGURE 2
EXAMPLE 1 - COMPUTING OVERTOPPING FLOOD (CONT.)

CD-301

Figure 1
Example 1- Computing Overtopping Flood (Cont.)

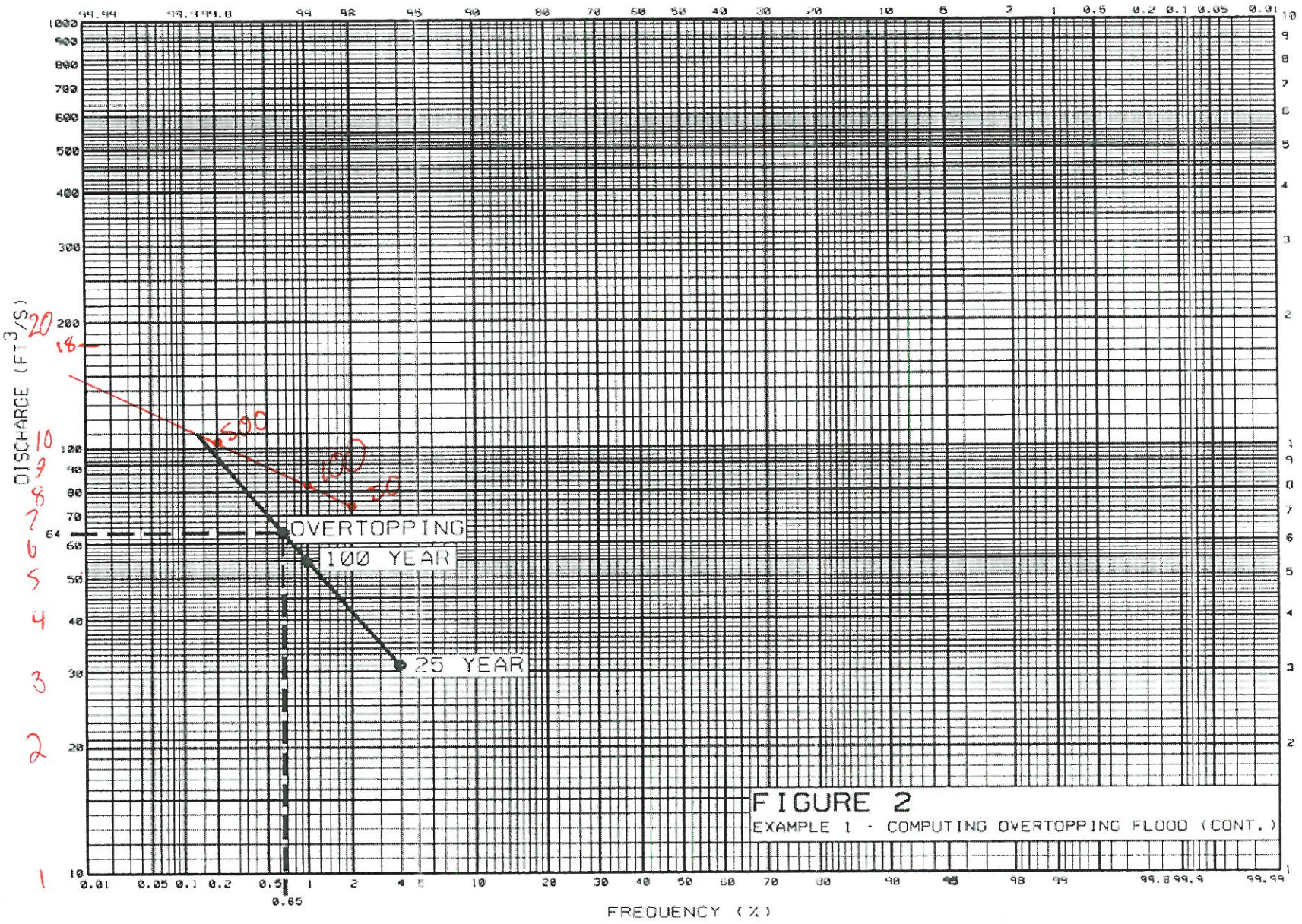


FIGURE 2
EXAMPLE 1 - COMPUTING OVERTOPPING FLOOD (CONT.)

CD-301

Appendix C
Proposed Ditch Calculations at Key Locations

LOCHNER

Project: Midway Road Widening
Calculations by: JBM
Checked by: TDE
Job #: 2134
Date: 10/22/13

Midway Road Mainline (Left Side) — Ditch Calculations

Notes: 1) Do not alter the shaded cells.
2) Modify the "Est. Flow Depth" until "Velocity based on Est. Flow Depth" matches "Velocity based on Manning's Equation".

From Station	From Elevation	To Station	To Elevation	Front Slope (1:X)	Back Slope (1:X)	Bottom Width (ft)	Drain Area 1 (ac)	Runoff Coefficient 1	Drain Area 2 (ac)	Runoff Coefficient 2	Pre-ditch Tc (min)	Manning's "n" Value	Height to Front TOB (ft)	**Est. Flow Depth (ft)**	10yr Rainfall (in/hr)	Slope (ft/ft)	Required Min. Flow Rate per CIA (cfs)	Calc. Flow Rate per Manning's (cfs)	**Velocity based on Est. Flow Depth (ft/s)**	**Velocity based on Manning's Eqn (ft/s)**	Spec. Ditch Lining Req?	Calc. Total Tc (min)
1263+00	15.98	1266+00	15.80	4	4	1.3	0.15	0.95	0.94	0.34	23.57	0.04	1.80	**0.89**	5.00	0.00060	2.31	2.34	**0.54**	**0.54**		32.76
1267+00	15.93	1268+00	16.27	4	4	4.1	0.05	0.95	1.12	0.34	31.80	0.06	0.50	**0.49**	4.90	0.00340	2.10	2.12	**0.72**	**0.72**		34.11
1269+00	16.75	1270+00	16.69	6	4	3.5	0.06	0.95	0.12	0.34	10.00	0.06	1.00	**0.41**	6.20	0.00060	0.61	0.60	**0.27**	**0.27**		16.26
1270+00	16.69	1271+20	17.52	4	4	5	0.08	0.95	0.05	0.34	10.00	0.06	0.66	**0.18**	6.30	0.00692	0.59	0.59	**0.59**	**0.59**		13.37
1271+20	17.52	1273+50	17.40	3	3	4		0.95	2.78	0.34	31.80	0.04	1.67	**1.00**	4.60	0.00052	4.35	4.35	**0.62**	**0.62**		37.97
1273+50	17.40	1274+00	17.35	3	3	4		0.95	2.78	0.34	37.83	0.04	2.10	**0.84**	4.60	0.00100	4.35	4.34	**0.79**	**0.79**		38.88
1276+04	15.99	1278+80	15.71	4	3	5	1.42	0.95	2.22	0.30	38.64	0.04	2.59	**1.09**	4.40	0.00101	8.87	8.85	**0.92**	**0.92**		43.64
1279+90	15.69	1281+50	15.18	4	3	5	1.42	0.95	2.22	0.30	43.05	0.04	3.14	**0.80**	4.30	0.00319	8.66	8.67	**1.40**	**1.40**		44.95
1284+57	11.94	1287+50	12.12	3	3	0	0.44	0.95	3.97	0.34	56.43	0.04	5.90	**1.74**	3.60	0.00061	6.36	6.34	**0.70**	**0.70**		63.42
1289+50	12.32	1293+00	11.80	2	2	0	0.4	0.95	0.74	0.34	10.00	0.04	6.58	**1.46**	6.20	0.00149	3.92	3.91	**0.92**	**0.92**		16.36
1294+00	13.00	1301+00	13.70	3	3	4	0.58	0.95	6.26	0.34	33.47	0.04	4.66	**1.40**	4.30	0.00100	11.52	11.50	**1.00**	**1.00**		45.12
1301+00	13.70	1311+00	12.90	3	3	0	0.59	0.95	5.25	0.34	35.14	0.04	1.97	**1.90**	3.85	0.00080	9.03	9.03	**0.83**	**0.83**		55.13
1311+00	12.90	1312+00	12.00	3	3	0	0.59	0.95	5.25	0.34	55.13	0.04	1.67	**1.16**	3.70	0.00900	8.68	8.66	**2.15**	**2.15**		55.91
1312+00	12.00	1314+60	11.70	3	3	0	0.82	0.95	5.87	0.34	55.91	0.04	2.16	**1.84**	3.60	0.00115	9.99	10.01	**0.98**	**0.99**		60.31
1315+20	9.56	1318+00	9.00	3	3	5	0.82	0.95	5.87	0.34	60.31	0.04	3.47	**0.99**	3.50	0.00200	9.71	9.78	**1.24**	**1.25**		64.05

LOCHNER

Project: Midway Road Widening
Calculations by: JBM
Checked by: TDE
Job #: 2134
Date: 10/22/13

Midway Road Mainline (Right Side) — Ditch Calculations

Notes: 1) Do not alter the shaded cells.
2) Modify the "Est. Flow Depth" until "Velocity based on Est. Flow Depth" matches "Velocity based on Manning's Equation".

From Station	From Elevation	To Station	To Elevation	Front Slope (1:X)	Back Slope (1:X)	Bottom Width (ft)	Drain Area 1 (ac)	Runoff Coefficient 1	Drain Area 2 (ac)	Runoff Coefficient 2	Pre-ditch Tc (min)	Manning's "n" Value	Height to Front TOB (ft)	**Est. Flow Depth (ft)**	10yr Rainfall (in/hr)	Slope (ft/ft)	Required Min. Flow Rate per CIA (cfs)	Calc. Flow Rate per Manning's (cfs)	**Velocity based on Est. Flow Depth (ft/s)**	**Velocity based on Manning's Eqn (ft/s)**	Spec. Ditch Lining Req?	Calc. Total Tc (min)
1264+50	16.67	1266+50	16.55	4	4	20	0.03	0.95	0.26	0.34	0.00	0.06	0.60	**0.21**	7.40	0.00060	0.87	0.91	**0.20**	**0.21**		16.00
1266+50	16.55	1268+50	16.67	4	4	20	0.16	0.95	0.44	0.34	0.00	0.06	1.13	**0.36**	7.25	0.00060	2.19	2.15	**0.29**	**0.29**		11.51
1293+50	14.50	1294+00	14.90	3	3	5		0.95	0.04	0.34	0.00	0.06	2.98	**0.06**	7.40	0.00800	0.10	0.10	**0.32**	**0.33**		2.52
1294+50	14.60	1294+80	14.50	3	3	5		0.95	0.02	0.34	0.00	0.06	3.44	**0.06**	7.40	0.00333	0.06	0.07	**0.19**	**0.21**		2.34
1294+80	14.50	1295+10	14.60	3	3	5		0.95	0.03	0.34	0.00	0.06	3.61	**0.07**	7.40	0.00333	0.08	0.09	**0.21**	**0.24**		2.12
1295+70	14.50	1296+50	14.40	3	3	5		0.95	0.06	0.34	0.00	0.06	4.23	**0.13**	7.40	0.00125	0.15	0.16	**0.21**	**0.22**		6.13
1296+50	14.40	1297+75	14.70	3	3	5		0.95	0.76	0.34	10.00	0.06	4.23	**0.48**	7.40	0.00240	1.91	1.96	**0.62**	**0.63**		13.29
1298+20	14.70	1298+50	14.60	3	3	5		0.95	0.27	0.34	10.00	0.06	3.97	**0.24**	7.40	0.00333	0.68	0.69	**0.49**	**0.51**		10.99
1298+50	14.60	1301+00	14.85	3	3	5		0.95	1.32	0.34	10.00	0.06	2.94	**0.70**	6.20	0.00100	2.78	2.47	**0.56**	**0.50**		18.37
1302+00	12.75	1308+00	12.15	3	3	5		0.95	3.07	0.34	10.00	0.04	3.54	**0.93**	5.90	0.00100	6.16	6.22	**0.85**	**0.86**		21.65
1308+50	14.00	1312+00	13.30	3	3	5		0.95	0.14	0.34	0.00	0.06	1.19	**0.17**	6.20	0.00200	0.30	0.30	**0.32**	**0.32**		18.32
1312+00	13.30	1312+70	13.44	3	3	5		0.95	0.04	0.34	0.00	0.06	0.94	**0.09**	7.40	0.00200	0.10	0.10	**0.21**	**0.21**		5.44
1313+50	12.45	1314+00	11.45	3	3	3		0.95	0.04	0.34	0.00	0.06	2.44	**0.06**	7.40	0.02000	0.10	0.10	**0.53**	**0.52**		1.61
1314+00	11.45	1314+50	11.50	3	3	5		0.95	0.03	0.34	0.00	0.06	2.44	**0.10**	7.40	0.00100	0.08	0.08	**0.15**	**0.16**		5.31
1326+10	7.20	1326+87	7.10	4	4	8.3		0.95	0.13	0.34	0.00	0.06	1.76	**0.15**	7.40	0.00130	0.33	0.32	**0.25**	**0.24**		5.33

LOCHNER

Project: Midway Road Widening
Calculations by: JBM
Checked by: TDE
Job #: 2134
Date: 10/22/13

Selvitz Road (Left Side) — Ditch Calculations

Notes: 1) Do not alter the shaded cells.
2) Modify the "Est. Flow Depth" until "Velocity based on Est. Flow Depth" matches "Velocity based on Manning's Equation".

From Station	From Elevation	To Station	To Elevation	Front Slope (1:X)	Back Slope (1:X)	Bottom Width (ft)	Drain Area 1 (ac)	Runoff Coefficient 1	Drain Area 2 (ac)	Runoff Coefficient 2	Pre-ditch Tc (min)	Manning's "n" Value	Height to Front TOB (ft)	**Est. Flow Depth (ft)**	10yr Rainfall (in/hr)	Slope (ft/ft)	Required Min. Flow Rate per CIA (cfs)	Calc. Flow Rate per Manning's (cfs)	**Velocity based on Est. Flow Depth (ft/s)**	**Velocity based on Manning's Eqn (ft/s)**	Spec. Ditch Lining Req?	Calc. Total Tc (min)
111+77	15.00	115+40	15.20	4	4	6		0.95	0.97	0.34	8.30	0.06	2.15	**0.62**	5.60	0.00055	1.85	1.82	**0.35**	**0.35**		25.76
116+00	14.50	117+40	13.00	4	4	5		0.95	0.3	0.34	8.30	0.06	3.55	**0.18**	7.25	0.01071	0.74	0.74	**0.74**	**0.74**		11.46
118+00	13.60	118+08	15.60	4	4	5		0.95	0.3	0.34	18.74	0.06	3.78	**0.06**	6.20	0.25000	0.63	0.63	**1.91**	**1.90**		18.81
118+08	15.60	119+50	15.40	4	4	13		0.95	0.3	0.34	10.00	0.06	1.74	**0.17**	6.20	0.00141	0.63	0.63	**0.27**	**0.27**		18.74
119+50	15.40	121+00	15.85	4	4	10		0.95	0.29	0.34	17.36	0.06	0.82	**0.15**	5.70	0.00300	0.56	0.55	**0.37**	**0.36**		24.30
121+00	15.85	122+70	16.01	4	4	8		0.95	0.26	0.34	10.00	0.06	1.03	**0.25**	6.00	0.00094	0.53	0.61	**0.24**	**0.28**		20.27
122+70	16.01	123+70	16.10	4	4	8.7		0.95	0.22	0.34	10.00	0.06	1.17	**0.21**	6.40	0.00090	0.48	0.49	**0.24**	**0.25**		16.77
123+70	16.10	125+00	16.20	4	4	3		0.95	0.32	0.34	3.00	0.06	2.57	**0.49**	7.40	0.00077	0.81	0.81	**0.33**	**0.33**		9.52
127+50	16.43	139+00	17.00	3	3	0		0.95	5.95	0.34	19.51	0.04	2.82	**2.04**	4.20	0.00050	8.50	8.49	**0.68**	**0.68**		47.68
127+50	16.43	139+00	17.00	3	3	3		0.95	5.95	0.34	19.51	0.04	3.14	**2.04**	4.20	0.00050	8.50	14.80	**0.46**	**0.80**		43.61
140+00	16.50	141+50	16.05	3	3	0		0.95	3.74	0.34	38.57	0.04	3.12	**1.23**	4.50	0.00300	5.72	5.75	**1.27**	**1.28**		40.53
142+00	16.20	147+00	15.70	3	3	1.5		0.95	3.74	0.34	40.53	0.04	2.82	**1.20**	4.00	0.00100	5.09	5.07	**0.83**	**0.83**		50.59
143+00	16.24	145+00	16.04	3	3	3	0.13	0.95	0.15	0.34	0.00	0.06	0.95	**0.62**	7.40	0.00100	1.29	1.32	**0.43**	**0.44**		7.61

LOCHNER

Project: Midway Road Widening
Calculations by: JBM
Checked by: TDE
Job #: 2134
Date: 10/22/13

Selvitz Road (Right Side) — Ditch Calculations

Notes: 1) Do not alter the shaded cells.
2) Modify the "Est. Flow Depth" until "Velocity based on Est. Flow Depth" matches "Velocity based on Manning's Equation".

From Station	From Elevation	To Station	To Elevation	Front Slope (1:X)	Back Slope (1:X)	Bottom Width (ft)	Drain Area 1 (ac)	Runoff Coefficient 1	Drain Area 2 (ac)	Runoff Coefficient 2	Pre-ditch Tc (min)	Manning's "n" Value	Height to Front TOB (ft)	**Est. Flow Depth (ft)**	10yr Rainfall (in/hr)	Slope (ft/ft)	Required Min. Flow Rate per CIA (cfs)	Calc. Flow Rate per Manning's (cfs)	**Velocity based on Est. Flow Depth (ft/s)**	**Velocity based on Manning's Eqn (ft/s)**	Spec. Ditch Lining Req?	Calc. Total Tc (min)
111+77	15.70	112+50	15.80	4	4	3		0.95	0.2	0.34	2.97	0.06	2.16	**0.33**	7.40	0.00137	0.50	0.51	**0.35**	**0.36**		6.35
113+50	16.00	117+00	13.60	4	4	3		0.95	0.61	0.34	2.97	0.06	2.16	**0.39**	7.40	0.00686	1.53	1.57	**0.86**	**0.88**		9.59
117+00	13.60	119+50	15.40	4	4	3		0.95	1.53	0.34	11.29	0.06	2.23	**0.58**	6.60	0.00720	3.43	3.42	**1.11**	**1.11**		15.05
119+50	15.40	122+50	15.60	4	4	3		0.95	1.53	0.34	3.42	0.04	1.05	**0.91**	7.30	0.00067	3.80	3.84	**0.63**	**0.63**		11.29
123+70	16.50	125+00	17.00	4	4	3		0.95	0.2	0.34	3.42	0.06	0.90	**0.25**	7.40	0.00385	0.50	0.52	**0.51**	**0.52**		7.61
127+00	17.41	128+00	17.47	4	20	1		0.95	0.07	0.34	0.00	0.06	1.99	**0.26**	7.40	0.00060	0.18	0.18	**0.16**	**0.17**		9.89
143+00	16.24	145+00	16.04	3	3	0		0.95	1.33	0.34	14.31	0.04	1.34	**1.15**	6.20	0.00100	2.80	2.82	**0.71**	**0.71**		18.99

LOCHNER

Project: Midway Road Widening
Calculations by: JBM
Checked by: TDE

Job #: 2134
Date: 10/22/13

Dunn Road (Left Side)

Ditch Calculations

Notes: 1) Do not alter the shaded cells.
2) Modify the "Est. Flow Depth" until "Velocity based on Est. Flow Depth" matches "Velocity based on Manning's Equation".

From Station	From Elevation	To Station	To Elevation	Front Slope (1:X)	Back Slope (1:X)	Bottom Width (ft)	Drain Area 1 (ac)	Runoff Coefficient 1	Drain Area 2 (ac)	Runoff Coefficient 2	Pre-ditch Tc (min)	Manning's "n" Value	Height to Front TOB (ft)	**Est. Flow Depth (ft)**	10yr Rainfall (in/hr)	Slope (ft/ft)	Required Min. Flow Rate per CIA (cfs)	Calc. Flow Rate per Manning's (cfs)	**Velocity based on Est. Flow Depth (ft/s)**	**Velocity based on Manning's Eqn (ft/s)**	Spec. Ditch Lining Req?	Calc. Total Tc (min)
23+80	11.80	25+00	11.89	3	3	3		0.95	3.14	0.34	56.43	0.04	2.44	**0.94**	3.60	0.00075	3.84	3.81	**0.70**	**0.70**		59.31

LOCHNER

Project: Midway Road Widening
Calculations by: JBM
Checked by: TDE
Job #: 2134
Date: 10/22/13

Christensen Road (Left Side) — Ditch Calculations

Notes: 1) Do not alter the shaded cells.
2) Modify the "Est. Flow Depth" until "Velocity based on Est. Flow Depth" matches "Velocity based on Manning's Equation".

From Station	From Elevation	To Station	To Elevation	Front Slope (1:X)	Back Slope (1:X)	Bottom Width (ft)	Drain Area 1 (ac)	Runoff Coefficient 1	Drain Area 2 (ac)	Runoff Coefficient 2	Pre-ditch Tc (min)	Manning's "n" Value	Height to Front TOB (ft)	**Est. Flow Depth (ft)**	10yr Rainfall (in/hr)	Slope (ft/ft)	Required Min. Flow Rate per CIA (cfs)	Calc. Flow Rate per Manning's (cfs)	**Velocity based on Est. Flow Depth (ft/s)**	**Velocity based on Manning's Eqn (ft/s)**	Spec. Ditch Lining Req?	Calc. Total Tc (min)
41+60	14.34	45+60	14.11	3	3	0.5	0.07	0.95	0.11	0.34	0.00	0.04	0.96	**0.70**	6.60	0.00058	0.69	0.80	**0.38**	**0.44**		15.26
45+60	14.11	46+50	14.05	3	3	1.6	0.03	0.95	0.05	0.34	0.00	0.06	1.17	**0.43**	7.40	0.00067	0.34	0.34	**0.27**	**0.27**		5.48
46+50	14.05	48+00	13.96	3	3	1.6	0.05	0.95	0.07	0.34	0.00	0.06	1.17	**0.56**	7.40	0.00060	0.53	0.55	**0.29**	**0.30**		8.42
48+00	13.96	50+00	13.84	3	3	3.7	0.04	0.95	0.06	0.34	0.00	0.06	1.40	**0.35**	7.00	0.00060	0.41	0.43	**0.25**	**0.26**		12.91

LOCHNER

Project: Midway Road Widening
Calculations by: JBM
Checked by: TDE
Job #: 2134
Date: 10/22/13

Christensen Road (Right Side) — Ditch Calculations

Notes: 1) Do not alter the shaded cells.
2) Modify the "Est. Flow Depth" until "Velocity based on Est. Flow Depth" matches "Velocity based on Manning's Equation".

From Station	From Elevation	To Station	To Elevation	Front Slope (1:X)	Back Slope (1:X)	Bottom Width (ft)	Drain Area 1 (ac)	Runoff Coefficient 1	Drain Area 2 (ac)	Runoff Coefficient 2	Pre-ditch Tc (min)	Manning's "n" Value	Height to Front TOB (ft)	**Est. Flow Depth (ft)**	10yr Rainfall (in/hr)	Slope (ft/ft)	Required Min. Flow Rate per CIA (cfs)	Calc. Flow Rate per Manning's (cfs)	**Velocity based on Est. Flow Depth (ft/s)**	**Velocity based on Manning's Eqn (ft/s)**	Spec. Ditch Lining Req?	Calc. Total Tc (min)
43+50	14.95	46+80	14.75	3	3	5.8	0.04	0.95	0.06	0.34	0.00	0.06	0.82	**0.28**	5.80	0.00061	0.34	0.44	**0.18**	**0.24**		23.08
46+80	14.75	48+25	14.66	3	3	4	0.03	0.95	0.05	0.34	0.00	0.06	1.03	**0.29**	7.40	0.00062	0.34	0.34	**0.24**	**0.24**		10.13
48+25	14.66	49+60	14.58	3	3	2.6	0.03	0.95	0.03	0.34	0.00	0.06	1.27	**0.33**	7.40	0.00059	0.29	0.29	**0.24**	**0.24**		9.40
49+60	14.58	50+00	14.56	3	3	0.4	0.01	0.95	0.01	0.34	0.00	0.06	1.33	**0.36**	7.40	0.00050	0.10	0.10	**0.18**	**0.19**		3.58
50+00	14.56	51+00	14.50	3	3	0.4	0.04	0.95	0.06	0.34	0.00	0.06	1.33	**0.65**	7.40	0.00060	0.43	0.44	**0.28**	**0.28**		5.90

Appendix D
Canal 103 and Culvert 103 Calculations

Offsite Composite Basin Curve Numbers
Sub-Basin Calculations
Pre-Development Offsite Time of Concentrations
Canal 103 Tailwater Elevations

LOCHNER

Project: Midway Road Widening
Calculations by: JBM **Job #:** 2134
Checked by: **Date:** 10/23/2008

Composite Basin Curve Numbers — Offsite

WestLTC Runoff Curve Number — **Offsite**

Soil Name	Hydro. Group	Cover Description	CN	Area* (ac)	(CN) x (Area)
Please see Soils Maps	B/D	WestLTC Range	80.00	57.30	4584
Please see Soils Maps	B/D	West LTC Woods	77.00	27.92	2150
			Totals =	85.22	6734

CN (weighted) = total product / total area = 6733.84 / 85.22 = CN = **79.02**

CI95A Runoff Curve Number — **Offsite**

Soil Name	Hydro. Group	Cover Description	CN	Area (ac)	(CN) x (Area)
Please see Soils Maps	B/D	Midway Road, Canal 103, and adjacent	84.22	10.13	853
Please see Soils Maps	B/D	SUBSI95	92.37	16.72	1544
Please see Soils Maps	B/D	Substation and offsite west woods	77.00	4.85	373
Please see Soils Maps	B/D	I-95 W Range	80.00	5.54	443
Please see Soils Maps	B/D	I-95 NW Ramp	85.46	2.69	230
Please see Soils Maps	B/D	I-95 SW Ramp	85.46	2.08	178
			Totals =	42.01	3622

CN (weighted) = total product / total area = 3621.98 / 42.0115 = CN = **86.21**

CI95C Runoff Curve Number — **Offsite**

Soil Name	Hydro. Group	Cover Description	CN	Area (ac)	(CN) x (Area)
Please see Soils Maps	B/D	Midway Road, Canal 103, and adjacent	85.80	1.54	132
Please see Soils Maps	B/D	I-95 NW Ramp	82.05	2.11	173
Please see Soils Maps	B/D	I-95 NW Woods	77.00	5.54	427
Please see Soils Maps	B/D	I-95 SW Ramp	82.05	1.64	134
Please see Soils Maps	B/D	I-95 SW Woods	77.00	3.80	293
Please see Soils Maps	B/D	I-95 SB Main	87.56	6.76	592
			Totals =	21.39	1751

CN (weighted) = total product / total area = 1750.7 / 21.3881 = CN = **81.85**

LOCHNER

Project: Midway Road Widening
Calculations by: JBM **Job #:** 2134
Checked by: **Date:** 10/23/2008

Composite Basin Curve Numbers — Offsite

CI95E Runoff Curve Number — **Offsite**

Soil Name	Hydro. Group	Cover Description	CN	Area (ac)	(CN) x (Area)
Please see Soils Maps	B/D	Midway Road, Canal 103, and adjacent	85.80	2.04	175
Please see Soils Maps	B/D	I-95 SB Main	85.74	5.76	494
Please see Soils Maps	B/D	I-95 S Woods	77.00	14.18	1092
Please see Soils Maps	B/D	I-95 NB Main	85.74	5.76	494
Please see Soils Maps	B/D	I-95 N Woods	77.00	7.46	574
			Totals =	35.20	2829

CN (weighted) = total product / total area = 2828.78 / 35.1972 = CN = **80.37**

CI95G Runoff Curve Number — **Offsite**

Soil Name	Hydro. Group	Cover Description	CN	Area (ac)	(CN) x (Area)
Please see Soils Maps	B/D	Midway Road, Canal 103, and adjacent	88.20	2.85	251
Please see Soils Maps	B/D	I-95 NB Main	87.56	6.21	543
Please see Soils Maps	B/D	I-95 NE Ramp	82.05	1.46	120
Please see Soils Maps	B/D	I-95 NE Range	80.00	1.78	142
Please see Soils Maps	B/D	I-95 SE Ramp	82.05	1.82	150
Please see Soils Maps	B/D	I-95 SE Woods	77.00	5.67	437
			Totals =	19.79	1643

CN (weighted) = total product / total area = 1643.32 / 19.792 = CN = **83.03**

CLTCA Runoff Curve Number — **Offsite**

Soil Name	Hydro. Group	Cover Description	CN	Area (ac)	(CN) x (Area)
Please see Soils Maps	B/D	Midway Road, Canal 103, and adjacent	84.22	11.02	928
Please see Soils Maps	B/D	I-95 NE Ramp	85.46	1.86	159
Please see Soils Maps	B/D	I-95 E Range	80.00	0.71	57
Please see Soils Maps	B/D	I-95 SE Ramp	85.46	2.36	202
			Totals =	15.96	1346

CN (weighted) = total product / total area = 1346.13 / 15.957 = CN = **84.36**

LOCHNER

Project: Midway Road Widening
Calculations by: JBM **Job #:** 2134
Checked by: **Date:** 10/23/2008

Composite Basin Curve Numbers — Offsite

OFFLTC Runoff Curve Number — **Offsite**

Soil Name	Hydro. Group	Cover Description	CN	Area (ac)	(CN) x (Area)
Please see Soils Maps	B/D	LTC Range	80.00	33.28	2662
Please see Soils Maps	B/D	LTC Woods	77.00	23.44	1805
			Totals =	56.72	4467

CN (weighted) = total product / total area = 4467.28 / 56.72 = CN = **78.76**

CLTCC Runoff Curve Number — **Offsite**

Soil Name	Hydro. Group	Cover Description	CN	Area (ac)	(CN) x (Area)
Please see Soils Maps	B/D	Midway Road, Canal 103, and adjacent	84.04	6.15	517
			Totals =	6.15	517

CN (weighted) = total product / total area = 517.034 / 6.15189 = CN = **84.04**

CFECRA Runoff Curve Number — **Offsite**

Soil Name	Hydro. Group	Cover Description	CN	Area (ac)	(CN) x (Area)
Please see Soils Maps	B/D	Midway Road, Canal 103, and adjacent	86.30	11.59	1000
Please see Soils Maps	B/D	Adjacent range	80.00	2.45	196
			Totals =	14.04	1196

CN (weighted) = total product / total area = 1196.1 / 14.0386 = CN = **85.20**

CTORIA Runoff Curve Number — **Offsite**

Soil Name	Hydro. Group	Cover Description	CN	Area (ac)	(CN) x (Area)
Please see Soils Maps	B/D	Midway Road, Canal 103, and adjacent	87.20	6.67	582
			Totals =	6.67	582

CN (weighted) = total product / total area = 581.534 / 6.66896 = CN = **87.20**

LOCHNER

Project: Midway Road Widening
Calculations by: JBM **Job #:** 2134
Checked by: **Date:** 10/23/2008

Composite Basin Curve Numbers — Offsite

CTURNA Runoff Curve Number — **Offsite**

Soil Name	Hydro. Group	Cover Description	CN	Area (ac)	(CN) x (Area)
Please see Soils Maps	B/D	Midway Road, Canal 103, and adjacent	87.20	5.43	474
Please see Soils Maps	B/D	FEC Railroad	84.91	3.48	296
Please see Soils Maps	B/D	Rinker	94.92	28.67	2721
Please see Soils Maps	B/D	Turnpike SB Main	85.11	12.23	1041
			Totals =	49.82	4532

CN (weighted) = total product / total area = 4531.96 / 49.8174 = CN = **90.97**

CCORPA Runoff Curve Number — **Offsite**

Soil Name	Hydro. Group	Cover Description	CN	Area (ac)	(CN) x (Area)
Please see Soils Maps	B/D	Midway Road, Canal 103, and adjacent	85.46	2.91	249
Please see Soils Maps	B/D	NB Turnpike south of canal 103	85.11	5.28	449
Please see Soils Maps	B/D				0
Please see Soils Maps	B/D				0
			Totals =	8.19	698

CN (weighted) = total product / total area = 698.174 / 8.19123 = CN = **85.23**

CSELVC Runoff Curve Number — **Offsite**

Soil Name	Hydro. Group	Cover Description	CN	Area (ac)	(CN) x (Area)
Please see Soils Maps	B/D	CSELVC1	85.80	1.23	106
Please see Soils Maps	B/D	CSELVC2	84.48	2.57	217
			Totals =	3.80	323

CN (weighted) = total product / total area = 323.02 / 3.8042 = CN = **84.91**

CCHRI Runoff Curve Number — **Offsite-Ex**

Soil Name	Hydro. Group	Cover Description	CN	Area (ac)	(CN) x (Area)
Please see Soils Maps	B/D	Florida Recovery and adjacent areas	84.09	10.90	917
Please see Soils Maps	B/D	Undeveloped	77.00	29.60	2279
Please see Soils Maps	B/D	Christensen Road	88.64	0.57	51
			Totals =	41.07	3247

CN (weighted) = total product / total area = 3246.65 / 41.0739 = CN = **79.04**

LOCHNER

Project: Midway Road Widening
Calculations by: JBM **Job #:** 2134
Checked by: **Date:** 10/23/2008

Composite Basin Curve Numbers — Offsite

COUT123A Runoff Curve Number — **Offsite-Ex**

Soil Name	Hydro. Group	Cover Description	CN	Area (ac)	(CN) x (Area)
Please see Soils Maps	B/D	Christensen Road	88.64	0.57	51
Please see Soils Maps	B/D	Pond 2/3 location	77.00	4.28	330
Please see Soils Maps	B/D	Undeveloped	77.00	8.10	624
			Totals =	12.95	1004

CN (weighted) = total product / total area = 1004.13 / 12.9539 = CN = **77.52**

LOCHNER

Project: Midway Road Widening
Calculations by: JBM
Checked by:
Job #: 2134
Date: 3/29/2012

Sub-Basin Calculations — Offsite

Drainage Structure		Drainage Area				Impervious Width								Misc.	Drainage Areas			
Number		From Station	To Station	Length (ft)	Width (ft)	Travel Lanes (ft)	Turn Lanes (ft)	Bike Ln/ Shldr (ft)	Type F C&G (ft)	Type E C&G (ft)	Traffic Sep./ Walls (ft)	Side-Walk (ft)	Total Imp. Width (ft)	Misc. Imp. (ac)	Total (ac)	Imp. (ac)	Perv. (ac)	CN
Midway Road, Canal 130, and adjacent areas																		
Basin 1																		
C SUBSA		1076+81	1114+00	3719	250.00	48.00		10.00					58.00		21.34	4.95	16.39	84.18
C I95A		1114+00	1126+61	1261	350.00	48.00	24.00	10.00					82.00		10.13	2.37	7.76	84.22
C I95C		1126+61	1130+34	373	180.00	48.00		10.00					58.00		1.54	0.50	1.04	85.80
C I95E		1130+34	1135+28	494	180.00	48.00		10.00					58.00		2.04	0.66	1.38	85.80
C I95G		1135+28	1142+17	689	180.00	48.00	24.00	10.00					82.00		2.85	1.30	1.55	88.20
C LTCA		1142+17	1155+89	1372	350.00	48.00	24.00	10.00					82.00		11.02	2.58	8.44	84.22
C LTCC		1155+89	1163+31	742	350.00	48.00	12.00	10.00					70.00	0.19	6.15	1.38	4.77	84.04
C FECR		1163+31	1188+55	2524	200.00	48.00	12.00	10.00					70.00		11.59	4.06	7.53	86.30
C TORIA		1188+55	1205+15	1660	175.00	48.00	12.00	10.00					70.00		6.67	2.67	4.00	87.20
C TURNA		1205+15	1218+67	1352	175.00	48.00	12.00	10.00					70.00		5.43	2.17	3.26	87.20
C CORPA		1218+67	1227+97	930	136.50	24.00		16.00					40.00	0.03	2.91	0.88	2.03	85.46
C MILNA		1227+97	1235+06	709	142.00	24.00	10.00						34.00		2.31	0.55	1.76	84.31
C SELVC1		1235+06	1239+00	394	136.50	24.00	20.00						44.00		1.23	0.40	0.84	85.80
Basin 2																		
C SELVC2		1239+00	1247+20	820	136.50	24.00	10.00						34.00		2.57	0.64	1.93	84.48
C SELVE		1247+20	1262+00	1480	136.50	24.00	10.00						34.00		4.64	1.16	3.48	84.48
C SELVF		1262+00	1270+00	800	136.50	24.00							24.00		2.51	0.44	2.07	83.16
C SELVG		1270+00	1274+79	479	136.50	24.00	10.00						34.00		1.50	0.37	1.13	84.48
Basin 3																		
C CHURA		1274+79	1282+56	777	109.00	24.00							24.00	0.07	1.94	0.50	1.45	84.61
C DUNNA		1282+56	1288+16	560	109.00	24.00							24.00		1.40	0.31	1.09	83.96
C BENDA		1288+16	1300+91	1275	109.00	24.00							24.00		3.19	0.70	2.49	83.96
Basin 5		1322+00	1328+60	660	125.00	48.00	10.00						58.00		1.89	0.88	1.02	88.35
Basin 5		1328+60	1336+40	780	108.00	48.00	12.00		4.00		6.00		70.00		1.93	1.25	0.68	91.67
WestLTC																		
C SUBSA		Range													57.30	0.00	57.30	80.00
C SUBSA		Woods													27.92	0.00	27.92	77.00
Florida Power & Light substation and offsite																		
SUBSPOND1		SUBSB1A													0.67			83.00
SUBSPOND2		SUBSB1B													1.18			84.00
C SUBSB2		SUBSB2													8.28	6.94	1.34	94.60
C I95A		SUBSI95													16.72	11.49	5.23	92.37
C I95A		Woods													4.85	0.00	4.85	77.00

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Project: Midway Road Widening
Calculations by: JBM
Checked by:
Job #: 2134
Date: 3/29/2012

Sub-Basin Calculations — Offsite

Drainage Structure		Drainage Area				Impervious Width								Misc.	Drainage Areas			
Number		From Station	To Station	Length (ft)	Width (ft)	Travel Lanes (ft)	Turn Lanes (ft)	Bike Ln/ Shldr (ft)	Type F C&G (ft)	Type E C&G (ft)	Traffic Sep./ Walls (ft)	Side-Walk (ft)	Total Imp. Width (ft)	Misc. Imp. (ac)	Total (ac)	Imp. (ac)	Perv. (ac)	CN
Offsite I-95 interchange																		
C I95A		NW Ramp		2090	56.00	12.00		5.00					17.00		2.69	0.82	1.87	85.46
C I95A		SW Ramp		1620	56.00	12.00		5.00					17.00		2.08	0.63	1.45	85.46
C I95A		W Range													5.54	0.00	5.54	80.00
C I95C		NW Ramp		2090	44.00	0.00		5.00					5.00		2.11	0.24	1.87	82.05
C I95C		NW Woods													5.54	0.00	5.54	77.00
C I95C		SW Ramp		1620	44.00	0.00		5.00					5.00		1.64	0.19	1.45	82.05
C I95C		SW Woods													3.80	0.00	3.80	77.00
C I95C		SB Main		3635	81.00	24.00		10.00					34.00		6.76	2.84	3.92	87.56
C I95E		SB Main		3635	69.00	12.00		10.00					22.00		5.76	1.84	3.92	85.74
C I95E		S Woods													14.18	0.00	14.18	77.00
C I95E		NB Main		3635	69.00	12.00		10.00					22.00		5.76	1.84	3.92	85.74
C I95E		N Woods													7.46	0.00	7.46	77.00
C I95G		NB Main		3338	81.00	24.00		10.00					34.00		6.21	2.61	3.60	87.56
C I95G		NE Ramp		1450	44.00	0.00		5.00					5.00		1.46	0.17	1.30	82.05
C I95G		NE Range													1.78	0.00	1.78	80.00
C I95G		SE Ramp		1805	44.00	0.00		5.00					5.00		1.82	0.21	1.62	82.05
C I95G		SE Woods													5.67	0.00	5.67	77.00
C LTCA		NE Ramp		1450	56.00	12.00		5.00					17.00		1.86	0.57	1.30	85.46
C LTCA		SE Ramp		1835	56.00	12.00		5.00					17.00		2.36	0.72	1.64	85.46
C LTCA		E Range													0.71	0.00	0.71	80.00

LOCHNER

Project: Midway Road Widening
Calculations by: JBM
Checked by:
Job #: 2134
Date: 3/29/2012

Sub-Basin Calculations — Offsite

Drainage Structure		Drainage Area				Impervious Width								Misc.	Drainage Areas			
Number		From Station	To Station	Length (ft)	Width (ft)	Travel Lanes (ft)	Turn Lanes (ft)	Bike Ln/ Shldr (ft)	Type F C&G (ft)	Type E C&G (ft)	Traffic Sep./ Walls (ft)	Side-Walk (ft)	Total Imp. Width (ft)	Misc. Imp. (ac)	Total (ac)	Imp. (ac)	Perv. (ac)	CN
Offsite undeveloped LTC property																		
C LTCA		Range													33.28	0.00	33.28	80.00
C LTCA		Woods													23.44	0.00	23.44	77.00
Offsite Turnpike																		
C TURNA		SB Main		3438	155.00	24.00		10.00			10.00		44.00		12.23	3.47	8.76	85.11
C -100		NB Main		1955	155.00	24.00		10.00			10.00		44.00		6.96	1.97	4.98	85.11
C CORPA		NB Main		1483	155.00	24.00		10.00			10.00		44.00		5.28	1.50	3.78	85.11
Undeveloped (CSPUR)																		
C SPUR	1293+00.00														34.47	0.00	34.47	80.00
Florida Recovery and adjacent areas (CCHRIA)																		
C CHRI															10.90	3.68	7.22	84.09
Undeveloped (CCHRI)																		
C CHRIA															29.60	0.00	29.60	77.00
Christensen Road																		
C CHRI		41+50	51+50	1000	25.00	12.00							12.00		0.57	0.28	0.30	88.64
C OUT123		41+50	51+50	1000	25.00	12.00							12.00		0.57	0.28	0.30	88.64
Undeveloped (Out123A)																		
C OUT123															8.10	0.00	8.10	77.00
Undeveloped (Out123B)																		
C OUT123B		Residential (North)													9.32	0.00	9.32	87.00
C OUT123B		Woods (North)													23.68	0.00	23.68	77.00
C OUT123B		Woods (South)													37.79	0.00	37.79	77.00

LOCHNER

Project: Midway Road Widening
Calculations by: JBM **Job #:** 2134
Checked by: **Date:** 01/28/10

WestLTC **Time of Concentration** **Pre-Development Offsite**

Time of Concentration Worksheet (all references to tables and figures refer to USDA TR-55)

Sheet Flow	Existing Condition
1. Surface description (table 3-1):	Woods
2. Manning's roughness coefficient, (table 3-1):	0.8
3. Flow length, L (Total L < 300ft) (ft):	300
4. Two-year 24-hour rainfall, P_2 (in):	5
5. Land slope, s (ft/ft):	0.005
6. T6 = $\frac{0.007(nL)^{0.8}}{(P_2)^{0.5} * s^{0.4}}$ *60(min):	125.41
Shallow Concentrated Flow	Existing Condition
7. Surface description (paved or unpaved):	Unpaved
8. Flow length, L (ft):	600
9. Water course slope, s (ft/ft):	0.005
10. Average velocity, V (figure 3-1) (ft/s):	1.19
11. T11 = $\frac{L}{3600\ V}$ *60(min):	8.40
Channel Flow	Existing Condition
12. Cross sectional flow area, a (ft^2):	
13. Wetted perimeter Pw (ft):	
14. Hydraulic radius, r = a/Pw (ft):	
15. Channel slope, s (ft/ft):	
16. Manning roughness coefficient, n:	
17. V = $\frac{1.49 * r^{(2/3)} * s^{(1/2)}}{n}$ (ft/s):	
18. Flow length, L (ft):	
19. T19 = $\frac{L}{3600\ V}$ *60(min):	
Total Tc	Existing Condition
20. Tc = T6 + T11 + T19 (min):	133.82

Existing Condition Time of Concentration Path: Stormwater runoff sheetflows east through the woods to the depressional area.

Proposed Condition:

LOCHNER

Project: Midway Road Widening
Calculations by: JBM **Job #:** 2134
Checked by: **Date:** 01/28/10

SUBSB2 Time of Concentration Pre-Development Offsite

Time of Concentration Worksheet (all references to tables and figures refer to USDA TR-55)

Sheet Flow	Existing Condition
1. Surface description (table 3-1):	Smooth
2. Manning's roughness coefficient, (table 3-1):	0.011
3. Flow length, L (Total L < 300ft) (ft):	300
4. Two-year 24-hour rainfall, P_2 (in):	5
5. Land slope, s (ft/ft):	0.005
6. T6 = $\frac{0.007(nL)^{0.8}}{(P_2)^{0.5} * s^{0.4}}$ *60(min):	4.06
Shallow Concentrated Flow	Existing Condition
7. Surface description (paved or unpaved):	Paved
8. Flow length, L (ft):	311
9. Water course slope, s (ft/ft):	0.005
10. Average velocity, V (figure 3-1) (ft/s):	1.4
11. T11 = $\frac{L}{3600\ V}$ *60(min):	3.70
Channel Flow	Existing Condition
12. Cross sectional flow area, a (ft^2):	52
13. Wetted perimeter Pw (ft):	21
14. Hydraulic radius, r = a/Pw (ft):	2.48
15. Channel slope, s (ft/ft):	0.0021
16. Manning roughness coefficient, n:	0.06
17. V = $\frac{1.49 * r^{(2/3)} * s^{(1/2)}}{n}$ (ft/s):	2.08
18. Flow length, L (ft):	936
19. T19 = $\frac{L}{3600\ V}$ *60(min):	7.49
Total Tc	Existing Condition
20. Tc = T6 + T11 + T19 (min):	15.26

Existing Condition Time of Concentration Path: Stormwater runoff undergoes sheetflow and shallow concentrated flow west through the substation and then flows north to the ditch along Midway Road.

Proposed Condition:

LOCHNER

Project: Midway Road Widening
Calculations by: JBM **Job #:** 2134
Checked by: **Date:** 01/28/10

SUBSI95 **Time of Concentration** **Pre-Development Offsite**

Time of Concentration Worksheet (all references to tables and figures refer to USDA TR-55)

Sheet Flow	Existing Condition
1. Surface description (table 3-1):	Smooth
2. Manning's roughness coefficient, (table 3-1):	0.011
3. Flow length, L (Total L < 300ft) (ft):	300
4. Two-year 24-hour rainfall, P_2 (in):	5
5. Land slope, s (ft/ft):	0.005
6. $T6 = \frac{0.007(nL)^{0.8}}{(P_2)^{0.5} * s^{0.4}}$ *60(min):	4.06

Shallow Concentrated Flow	Existing Condition	Existing Condition
7. Surface description (paved or unpaved):	Paved	Unpaved
8. Flow length, L (ft):	468	133
9. Water course slope, s (ft/ft):	0.005	0.005
10. Average velocity, V (figure 3-1) (ft/s):	1.4	1.19
11. $T11 = \frac{L}{3600\ V}$ *60(min):	5.57	1.86

Channel Flow	Existing Condition
12. Cross sectional flow area, a (ft^2):	52
13. Wetted perimeter Pw (ft):	21
14. Hydraulic radius, r = a/Pw (ft):	2.48
15. Channel slope, s (ft/ft):	0.0026
16. Manning roughness coefficient, n:	0.06
17. $V = \frac{1.49 * r^{(2/3)} * s^{(1/2)}}{n}$ (ft/s):	2.32
18. Flow length, L (ft):	750
19. $T19 = \frac{L}{3600\ V}$ *60(min):	5.39
Total Tc	Existing Condition
20. Tc = T6 + T11 + T19 (min):	16.89

Existing Condition Time of Concentration Path: Stormwater runoff undergoes sheetflow and shallow concentrated flow east through the substation and then flows north to the ditch along Midway Road.

Proposed Condition:

LOCHNER

Project: Midway Road Widening
Calculations by: JBM **Job #:** 2134
Checked by: **Date:** 01/28/10

CI95A **Time of Concentration** **Pre-Development Offsite**

Time of Concentration Worksheet (all references to tables and figures refer to USDA TR-55)

Sheet Flow	Existing Condition	Existing Condition
1. Surface description (table 3-1):	Smooth	Grass
2. Manning's roughness coefficient, (table 3-1):	0.011	0.15
3. Flow length, L (Total L < 300ft) (ft):	17	283
4. Two-year 24-hour rainfall, P_2 (in):	5	5
5. Land slope, s (ft/ft):	0.02	0.005
6. T6 = $\frac{0.007(nL)^{0.8}}{(P_2)^{0.5} * s^{0.4}}$ *60(min):	0.23	31.37

Shallow Concentrated Flow	Existing Condition
7. Surface description (paved or unpaved):	Unpaved
8. Flow length, L (ft):	2090
9. Water course slope, s (ft/ft):	0.005
10. Average velocity, V (figure 3-1) (ft/s):	1.19
11. T11 = $\frac{L}{3600\ V}$ *60(min):	29.27

Channel Flow	Existing Condition
12. Cross sectional flow area, a (ft^2):	51
13. Wetted perimeter Pw (ft):	17
14. Hydraulic radius, r = a/Pw (ft):	3.00
15. Channel slope, s (ft/ft):	0.0005
16. Manning roughness coefficient, n:	0.042
17. V = $\frac{1.49 * r^{(2/3)} * s^{(1/2)}}{n}$ (ft/s):	1.65
18. Flow length, L (ft):	800
19. T19 = $\frac{L}{3600\ V}$ *60(min):	8.08

Total Tc	Existing Condition
20. Tc = T6 + T11 + T19 (min):	68.95

Existing Condition Time of Concentration Path: Stormwater runoff sheetflows west off of the I-95 NW Ramp to the grassy roadside. It then undergoes sheetflow and shallow concentrated south flow until it reaches the ditch north of Midway Road. Stormwater is conveyed west by the ditch until the cross drain east of the substation driveway where it is discharged to Canal 103.

Proposed Condition:

LOCHNER

Project: Midway Road Widening
Calculations by: JBM **Job #:** 2134
Checked by: **Date:** 01/28/10

CI95C **Time of Concentration** **Pre-Development Offsite**

Time of Concentration Worksheet (all references to tables and figures refer to USDA TR-55)

Sheet Flow	Existing Condition	Existing Condition
1. Surface description (table 3-1):	Smooth	Grass
2. Manning's roughness coefficient, (table 3-1):	0.011	0.15
3. Flow length, L (Total L < 300ft) (ft):	34	266
4. Two-year 24-hour rainfall, P_2 (in):	5	5
5. Land slope, s (ft/ft):	0.02	0.005
6. T6 = $\frac{0.007(nL)^{0.8}}{(P_2)^{0.5} * s^{0.4}}$ *60(min):	0.41	29.85
Shallow Concentrated Flow	Existing Condition	Existing Condition
7. Surface description (paved or unpaved):	Unpaved	Unpaved
8. Flow length, L (ft):	1450	440
9. Water course slope, s (ft/ft):	0.005	0.005
10. Average velocity, V (figure 3-1) (ft/s):	1.19	1.19
11. T11 = $\frac{L}{3600\ V}$ *60(min):	20.31	6.16
Channel Flow	Existing Condition	
12. Cross sectional flow area, a (ft^2):		
13. Wetted perimeter Pw (ft):		
14. Hydraulic radius, r = a/Pw (ft):		
15. Channel slope, s (ft/ft):		
16. Manning roughness coefficient, n:		
17. V = $\frac{1.49 * r^{(2/3)} * s^{(1/2)}}{n}$ (ft/s):		
18. Flow length, L (ft):		
19. T19 = $\frac{L}{3600\ V}$ *60(min):		
Total Tc	Existing Condition	
20. Tc = T6 + T11 + T19 (min):	56.73	

Existing Condition Time of Concentration Path: Stormwater runoff sheetflows off of I-95 to the grassy roadside. It then undergoes sheetflow and shallow concentrated flow south to a culvert pipe under Midway Road. The pipe discharges the stormwater south through woods to Canal 103.

Proposed Condition:

LOCHNER

Project: Midway Road Widening
Calculations by: JBM **Job #:** 2134
Checked by: **Date:** 01/28/10

CI95E **Time of Concentration** **Pre-Development Offsite**

Time of Concentration Worksheet (all references to tables and figures refer to USDA TR-55)

Sheet Flow	Existing Condition
1. Surface description (table 3-1):	Woods
2. Manning's roughness coefficient, (table 3-1):	0.8
3. Flow length, L (Total L < 300ft) (ft):	300
4. Two-year 24-hour rainfall, P_2 (in):	5
5. Land slope, s (ft/ft):	0.005
6. T6 = $\frac{0.007(nL)^{0.8}}{(P_2)^{0.5} * s^{0.4}}$ *60(min):	125.41

Shallow Concentrated Flow	Existing Condition	Existing Condition
7. Surface description (paved or unpaved):	Unpaved	Unpaved
8. Flow length, L (ft):	1332	430
9. Water course slope, s (ft/ft):	0.005	0.005
10. Average velocity, V (figure 3-1) (ft/s):	1.19	1.19
11. T11 = $\frac{L}{3600\ V}$ *60(min):	18.66	6.02

Channel Flow	Existing Condition
12. Cross sectional flow area, a (ft^2):	
13. Wetted perimeter Pw (ft):	
14. Hydraulic radius, r = a/Pw (ft):	
15. Channel slope, s (ft/ft):	
16. Manning roughness coefficient, n:	
17. V = $\frac{1.49 * r^{(2/3)} * s^{(1/2)}}{n}$ (ft/s):	
18. Flow length, L (ft):	
19. T19 = $\frac{L}{3600\ V}$ *60(min):	

Total Tc	Existing Condition
20. Tc = T6 + T11 + T19 (min):	150.09

Existing Condition Time of Concentration Path: Stormwater runoff undergoes sheetflow and shallow concentrated flow south west through the woods in the I-95 median south to a culvert pipe under Midway Road. The pipe discharges the stormwater south through woods to Canal 103.

Proposed Condition:

LOCHNER

Project: Midway Road Widening
Calculations by: JBM **Job #:** 2134
Checked by: **Date:** 01/28/10

CI95G **Time of Concentration** **Pre-Development Offsite**

Time of Concentration Worksheet (all references to tables and figures refer to USDA TR-55)

Sheet Flow	Existing Condition	Existing Condition
1. Surface description (table 3-1):	Smooth	Grass
2. Manning's roughness coefficient, (table 3-1):	0.011	0.15
3. Flow length, L (Total L < 300ft) (ft):	34	266
4. Two-year 24-hour rainfall, P_2 (in):	5	5
5. Land slope, s (ft/ft):	0.02	0.005
6. T6 = $\frac{0.007(nL)^{0.8}}{(P_2)^{0.5} * s^{0.4}}$ *60(min):	0.41	29.85

Shallow Concentrated Flow	Existing Condition
7. Surface description (paved or unpaved):	Unpaved
8. Flow length, L (ft):	800
9. Water course slope, s (ft/ft):	0.005
10. Average velocity, V (figure 3-1) (ft/s):	1.19
11. T11 = $\frac{L}{3600\ V}$ *60(min):	11.20

Channel Flow	Existing Condition
12. Cross sectional flow area, a (ft^2):	
13. Wetted perimeter Pw (ft):	
14. Hydraulic radius, r = a/Pw (ft):	
15. Channel slope, s (ft/ft):	
16. Manning roughness coefficient, n:	
17. V = $\frac{1.49 * r^{(2/3)} * s^{(1/2)}}{n}$ (ft/s):	
18. Flow length, L (ft):	
19. T19 = $\frac{L}{3600\ V}$ *60(min):	

Total Tc	Existing Condition
20. Tc = T6 + T11 + T19 (min):	41.46

Existing Condition Time of Concentration Path: Stormwater runoff sheetflows off of I-95 to the grassy roadside. It then undergoes sheetflow and shallow concentrated flow to Canal 103.

Proposed Condition:

LOCHNER

Project: Midway Road Widening
Calculations by: JBM **Job #:** 2134
Checked by: **Date:** 01/28/10

CLTCA **Time of Concentration** **Pre-Development Offsite**

Time of Concentration Worksheet (all references to tables and figures refer to USDA TR-55)

Sheet Flow	Existing Condition	Existing Condition
1. Surface description (table 3-1):	Smooth	Grass
2. Manning's roughness coefficient, (table 3-1):	0.011	0.15
3. Flow length, L (Total L < 300ft) (ft):	5	295
4. Two-year 24-hour rainfall, P_2 (in):	5	5
5. Land slope, s (ft/ft):	0.02	0.005
6. T6 = $\frac{0.007(nL)^{0.8}}{(P_2)^{0.5} * s^{0.4}}$ *60(min):	0.09	32.43

Shallow Concentrated Flow	Existing Condition
7. Surface description (paved or unpaved):	Unpaved
8. Flow length, L (ft):	900
9. Water course slope, s (ft/ft):	0.005
10. Average velocity, V (figure 3-1) (ft/s):	1.19
11. T11 = $\frac{L}{3600\ V}$ *60(min):	12.61

Channel Flow	Existing Condition
12. Cross sectional flow area, a (ft^2):	
13. Wetted perimeter Pw (ft):	
14. Hydraulic radius, r = a/Pw (ft):	
15. Channel slope, s (ft/ft):	
16. Manning roughness coefficient, n:	
17. V = $\frac{1.49 * r^{(2/3)} * s^{(1/2)}}{n}$ (ft/s):	
18. Flow length, L (ft):	
19. T19 = $\frac{L}{3600\ V}$ *60(min):	

Total Tc	Existing Condition
20. Tc = T6 + T11 + T19 (min):	45.12

Existing Condition Time of Concentration Path: Stormwater runoff sheetflows off of the I-95 SW Ramp shoulder to the grassy roadside. It then undergoes sheetflow and shallow concentrated flow to Canal 103.

Proposed Condition:

LOCHNER

Project: Midway Road Widening
Calculations by: JBM **Job #:** 2134
Checked by: **Date:** 01/28/10

OFFLTC **Time of Concentration** **Pre-Development Offsite**

Time of Concentration Worksheet (all references to tables and figures refer to USDA TR-55)

Sheet Flow	Existing Condition
1. Surface description (table 3-1):	Woods
2. Manning's roughness coefficient, (table 3-1):	0.8
3. Flow length, L (Total L < 300ft) (ft):	300
4. Two-year 24-hour rainfall, P_2 (in):	5
5. Land slope, s (ft/ft):	0.005
6. T6 = $\frac{0.007(nL)^{0.8}}{(P_2)^{0.5} * s^{0.4}}$ *60(min):	125.41
Shallow Concentrated Flow	Existing Condition
7. Surface description (paved or unpaved):	Unpaved
8. Flow length, L (ft):	1300
9. Water course slope, s (ft/ft):	0.005
10. Average velocity, V (figure 3-1) (ft/s):	1.19
11. T11 = $\frac{L}{3600\ V}$ *60(min):	18.21
Channel Flow	Existing Condition
12. Cross sectional flow area, a (ft^2):	
13. Wetted perimeter Pw (ft):	
14. Hydraulic radius, r = a/Pw (ft):	
15. Channel slope, s (ft/ft):	
16. Manning roughness coefficient, n:	
17. V = $\frac{1.49 * r^{(2/3)} * s^{(1/2)}}{n}$ (ft/s):	
18. Flow length, L (ft):	
19. T19 = $\frac{L}{3600\ V}$ *60(min):	
Total Tc	Existing Condition
20. Tc = T6 + T11 + T19 (min):	143.62

Existing Condition Time of Concentration Path: Stormwater runoff sheetflows off of the I-95 SW Ramp shoulder to the grassy roadside. It then undergoes sheetflow and shallow concentrated flow to Canal 103.

Proposed Condition:

LOCHNER

Project: Midway Road Widening
Calculations by: JBM **Job #:** 2134
Checked by: **Date:** 01/28/10

CTORIA **Time of Concentration** **Pre-Development Offsite**

Time of Concentration Worksheet (all references to tables and figures refer to USDA TR-55)

Sheet Flow	Existing Condition	Existing Condition
1. Surface description (table 3-1):	Smooth	Woods
2. Manning's roughness coefficient, (table 3-1):	0.011	0.4
3. Flow length, L (Total L < 300ft) (ft):	30	270
4. Two-year 24-hour rainfall, P_2 (in):	5	5
5. Land slope, s (ft/ft):	0.02	0.005
6. T6 = $\frac{0.007(nL)^{0.8}}{(P_2)^{0.5} * s^{0.4}}$ *60(min):	0.37	66.21

Shallow Concentrated Flow	Existing Condition
7. Surface description (paved or unpaved):	Unpaved
8. Flow length, L (ft):	650
9. Water course slope, s (ft/ft):	0.005
10. Average velocity, V (figure 3-1) (ft/s):	1.19
11. T11 = $\frac{L}{3600\ V}$ *60(min):	9.10

Channel Flow	Existing Condition
12. Cross sectional flow area, a (ft^2):	
13. Wetted perimeter Pw (ft):	
14. Hydraulic radius, r = a/Pw (ft):	
15. Channel slope, s (ft/ft):	
16. Manning roughness coefficient, n:	
17. V = $\frac{1.49 * r^{(2/3)} * s^{(1/2)}}{n}$ (ft/s):	
18. Flow length, L (ft):	
19. T19 = $\frac{L}{3600\ V}$ *60(min):	

Total Tc	Existing Condition
20. Tc = T6 + T11 + T19 (min):	75.68

Existing Condition Time of Concentration Path: Stormwater runoff sheetflows off of the FEC railroad bed to the wooded railroadside. It then undergoes sheetflow and shallow concentrated flow to Midway Road and is conveyed by cross drain to Canal 103.

Proposed Condition:

LOCHNER

Project: Midway Road Widening
Calculations by: JBM **Job #:** 2134
Checked by: **Date:** 01/28/10

CTURNA **Time of Concentration** **Pre-Development Offsite**

Time of Concentration Worksheet (all references to tables and figures refer to USDA TR-55)

Sheet Flow	Existing Condition	Existing Condition
1. Surface description (table 3-1):	Smooth	Grass
2. Manning's roughness coefficient, (table 3-1):	0.011	0.15
3. Flow length, L (Total L < 300ft) (ft):	34	266
4. Two-year 24-hour rainfall, P_2 (in):	5	5
5. Land slope, s (ft/ft):	0.02	0.005
6. T6 = $\frac{0.007(nL)^{0.8}}{(P_2)^{0.5} * s^{0.4}}$ *60(min):	0.41	29.85

Shallow Concentrated Flow	Existing Condition
7. Surface description (paved or unpaved):	Unpaved
8. Flow length, L (ft):	1430
9. Water course slope, s (ft/ft):	0.005
10. Average velocity, V (figure 3-1) (ft/s):	1.19
11. T11 = $\frac{L}{3600\ V}$ *60(min):	20.03

Channel Flow	Existing Condition
12. Cross sectional flow area, a (ft^2):	
13. Wetted perimeter Pw (ft):	
14. Hydraulic radius, r = a/Pw (ft):	
15. Channel slope, s (ft/ft):	
16. Manning roughness coefficient, n:	
17. V = $\frac{1.49 * r^{(2/3)} * s^{(1/2)}}{n}$ (ft/s):	
18. Flow length, L (ft):	
19. T19 = $\frac{L}{3600\ V}$ *60(min):	

Total Tc	Existing Condition
20. Tc = T6 + T11 + T19 (min):	50.29

Existing Condition Time of Concentration Path: Stormwater runoff sheetflows off of the Turnpike to the grassy roadside. It then undergoes sheetflow and shallow concentrated flow to Midway Road and is conveyed by cross drain to Canal 103.

Proposed Condition:

LOCHNER

Project: Midway Road Widening
Calculations by: JBM **Job #:** 2134
Checked by: **Date:** 01/28/10

CBENDC **Time of Concentration** **Pre-Development Offsite**

Time of Concentration Worksheet (all references to tables and figures refer to USDA TR-55)

Sheet Flow	Existing Condition	Existing Condition
1. Surface description (table 3-1):	Smooth	Grass
2. Manning's roughness coefficient, (table 3-1):	0.011	0.15
3. Flow length, L (Total L < 300ft) (ft):	12	288
4. Two-year 24-hour rainfall, P_2 (in):	5	5
5. Land slope, s (ft/ft):	0.02	0.005
6. T6 = $\frac{0.007(nL)^{0.8}}{(P_2)^{0.5} * s^{0.4}}$ *60(min):	0.18	31.81

Shallow Concentrated Flow	Existing Condition
7. Surface description (paved or unpaved):	Unpaved
8. Flow length, L (ft):	2050
9. Water course slope, s (ft/ft):	0.005
10. Average velocity, V (figure 3-1) (ft/s):	1.19
11. T11 = $\frac{L}{3600\ V}$ *60(min):	28.71

Channel Flow	Existing Condition
12. Cross sectional flow area, a (ft^2):	
13. Wetted perimeter Pw (ft):	
14. Hydraulic radius, r = a/Pw (ft):	
15. Channel slope, s (ft/ft):	
16. Manning roughness coefficient, n:	
17. V = $\frac{1.49 * r^{(2/3)} * s^{(1/2)}}{n}$ (ft/s):	
18. Flow length, L (ft):	
19. T19 = $\frac{L}{3600\ V}$ *60(min):	

Total Tc	Existing Condition
20. Tc = T6 + T11 + T19 (min):	60.70

Existing Condition Time of Concentration Path: Stormwater runoff sheetflows off of Dunn Road and continues to sheetflow northeast across grassy residential lots. The stormwater then continues northeast in a shallow concentrated flow until it reachs Canal 103.

Proposed Condition:

LOCHNER

Project: Midway Road Widening
Calculations by: JBM **Job #:** 2134
Checked by: **Date:** 01/28/10

CCHRI **Time of Concentration** **Pre-Development Offsite**

Time of Concentration Worksheet (all references to tables and figures refer to USDA TR-55)

Sheet Flow	Existing Condition
1. Surface description (table 3-1):	Woods
2. Manning's roughness coefficient, (table 3-1):	0.4
3. Flow length, L (Total L < 300ft) (ft):	300
4. Two-year 24-hour rainfall, P_2 (in):	5
5. Land slope, s (ft/ft):	0.02
6. T6 = $\frac{0.007(nL)^{0.8}}{(P_2)^{0.5} * s^{0.4}}$ *60(min):	41.37
Shallow Concentrated Flow	Existing Condition
7. Surface description (paved or unpaved):	Unpaved
8. Flow length, L (ft):	1400
9. Water course slope, s (ft/ft):	0.005
10. Average velocity, V (figure 3-1) (ft/s):	1.19
11. T11 = $\frac{L}{3600\ V}$ *60(min):	19.61
Channel Flow	Existing Condition
12. Cross sectional flow area, a (ft^2):	
13. Wetted perimeter Pw (ft):	
14. Hydraulic radius, r = a/Pw (ft):	
15. Channel slope, s (ft/ft):	
16. Manning roughness coefficient, n:	
17. V = $\frac{1.49 * r^{(2/3)} * s^{(1/2)}}{n}$ (ft/s):	
18. Flow length, L (ft):	
19. T19 = $\frac{L}{3600\ V}$ *60(min):	
Total Tc	Existing Condition
20. **Tc** = T6 + T11 + T19 (min):	60.98

Existing Condition Time of Concentration Path: Stormwater runoff undergoes sheetflow and shallow concentrated flow northeast through the wooded lot until it reachs Canal 103.

Proposed Condition:

LOCHNER

Project: Midway Road Widening
Calculations by: JBM **Job #:** 2134
Checked by: **Date:** 01/28/10

COUT123A **Time of Concentration** **Pre-Development Offsite**

Time of Concentration Worksheet (all references to tables and figures refer to USDA TR-55)

Sheet Flow	Existing Condition
1. Surface description (table 3-1):	Woods
2. Manning's roughness coefficient, (table 3-1):	0.4
3. Flow length, L (Total L < 300ft) (ft):	300
4. Two-year 24-hour rainfall, P_2 (in):	5
5. Land slope, s (ft/ft):	0.02
6. T6 = $\frac{0.007(nL)^{0.8}}{(P_2)^{0.5} * s^{0.4}}$ *60(min):	41.37
Shallow Concentrated Flow	Existing Condition
7. Surface description (paved or unpaved):	Unpaved
8. Flow length, L (ft):	1000
9. Water course slope, s (ft/ft):	0.005
10. Average velocity, V (figure 3-1) (ft/s):	1.19
11. T11 = $\frac{L}{3600\ V}$ *60(min):	14.01
Channel Flow	Existing Condition
12. Cross sectional flow area, a (ft^2):	
13. Wetted perimeter Pw (ft):	
14. Hydraulic radius, r = a/Pw (ft):	
15. Channel slope, s (ft/ft):	
16. Manning roughness coefficient, n:	
17. V = $\frac{1.49 * r^{(2/3)} * s^{(1/2)}}{n}$ (ft/s):	
18. Flow length, L (ft):	
19. T19 = $\frac{L}{3600\ V}$ *60(min):	
Total Tc	Existing Condition
20. Tc = T6 + T11 + T19 (min):	55.38

Existing Condition Time of Concentration Path: Stormwater runoff undergoes sheetflow and shallow concentrated flow northeast through the wooded lot until it reachs Canal 103.

Proposed Condition:

LOCHNER

Project: Midway Road Widening
Calculations by: JBM **Job #:** 2134
Checked by: **Date:** 01/28/10

COUT123B **Time of Concentration** **Pre-Development Offsite**

Time of Concentration Worksheet (all references to tables and figures refer to USDA TR-55)

Sheet Flow	Existing Condition
1. Surface description (table 3-1):	Woods
2. Manning's roughness coefficient, (table 3-1):	0.4
3. Flow length, L (Total L < 300ft) (ft):	300
4. Two-year 24-hour rainfall, P_2 (in):	5
5. Land slope, s (ft/ft):	0.02
6. T6 = $\frac{0.007(nL)^{0.8}}{(P_2)^{0.5} * s^{0.4}}$ *60(min):	41.37
Shallow Concentrated Flow	Existing Condition
7. Surface description (paved or unpaved):	Unpaved
8. Flow length, L (ft):	991
9. Water course slope, s (ft/ft):	0.005
10. Average velocity, V (figure 3-1) (ft/s):	1.19
11. T11 = $\frac{L}{3600\ V}$ *60(min):	13.88
Channel Flow	Existing Condition
12. Cross sectional flow area, a (ft^2):	
13. Wetted perimeter Pw (ft):	
14. Hydraulic radius, r = a/Pw (ft):	
15. Channel slope, s (ft/ft):	
16. Manning roughness coefficient, n:	
17. V = $\frac{1.49 * r^{(2/3)} * s^{(1/2)}}{n}$ (ft/s):	
18. Flow length, L (ft):	
19. T19 = $\frac{L}{3600\ V}$ *60(min):	
Total Tc	Existing Condition
20. Tc = T6 + T11 + T19 (min):	55.25

Existing Condition Time of Concentration Path: Stormwater runoff undergoes sheetflow and shallow concentrated flow northeast through the wooded lot until it reachs Canal 103.

Proposed Condition:

LOCHNER

Project: Midway Road Widening
Calculations by: JBM **Job #:** 2134
Checked by: **Date:** 10/23/2008

Canal 103 Tailwater Elevations — North Fork of the St Lucie River

Average Daily High Water Elevation =	1.52	NGVD 29		=	0.02 NAVD 88
Average Daily Low Water Elevation =	-0.15	NGVD 29		=	-1.65 NAVD 88
Highest High Water Elevation =	6.05	NGVD 29	(8/19/2008)	=	4.55 NAVD 88
Lowest Low Water Elevation =	-1.34	NGVD 29	(6/14/2006)	=	-2.84 NAVD 88

LOCATION.--Lat 27°22'29", long 80°20'34" referenced to North American Datum of 1927, in NE 1/4 NE 1/4 NW 1/4 sec.4, T.36 S., R.40 E., St. Lucie County, FL, Hydrologic Unit 03090202, on the St. Lucie River, Port St. Lucie, off of Midway road 1.0 mi west, .5 mi east of 25th Street.

DRAINAGE AREA.--Indeterminate.

GAGE (MANU).--Satellite data collection platform with water-stage shaft encoder and water-quality monitor. Datum of gage is National Geodetic Vertical Datum of 1929.

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# ---------------------------------- WARNING ----------------------------------------
# The data you have obtained from this automated U.S. Geological Survey database
# have not received Director's approval and as such are provisional and subject to
# revision.  The data are released on the condition that neither the USGS nor the
# United States Government may be held liable for any damages resulting from its use.
# Additional info: http://waterdata.usgs.gov/nwis/help/?provisional
#
# File-format description:  http://waterdata.usgs.gov/nwis/?tab_delimited_format_info
# Automated-retrieval info: http://waterdata.usgs.gov/nwis/?automated_retrieval_info
#
# Contact:   gs-w_support_nwisweb@usgs.gov
# retrieved: 2010-01-13 07:23:08 EST
#
# Data for the following site(s) are contained in this file
#    USGS 272229080203400 ST LUCIE RIVER AT MIDWAY RD NR PT ST LUCIE, FL
# -----------------------------------------------------------------------------
#
# Data provided for site 272229080203400
#    DD parameter statistic   Description
#    01  00065     00001     Gage height, feet (Maximum)
#    01  00065     00002     Gage height, feet (Minimum)
#
# Data-value qualification codes included in this output:
#     A  Approved for publication -- Processing and review completed.
#     P  Provisional data subject to revision.
#
agency_cd site_no              datetime    01_00065_ 01_00065_ 01_00065_ 01_00065_00002_cd
5s        15s                  16d         14n       10s       14n       10s
USGS      272229080203400      10/19/2002      2.32 A              0.97 A
USGS      272229080203400      10/20/2002       2.1 A              0.68 A
```

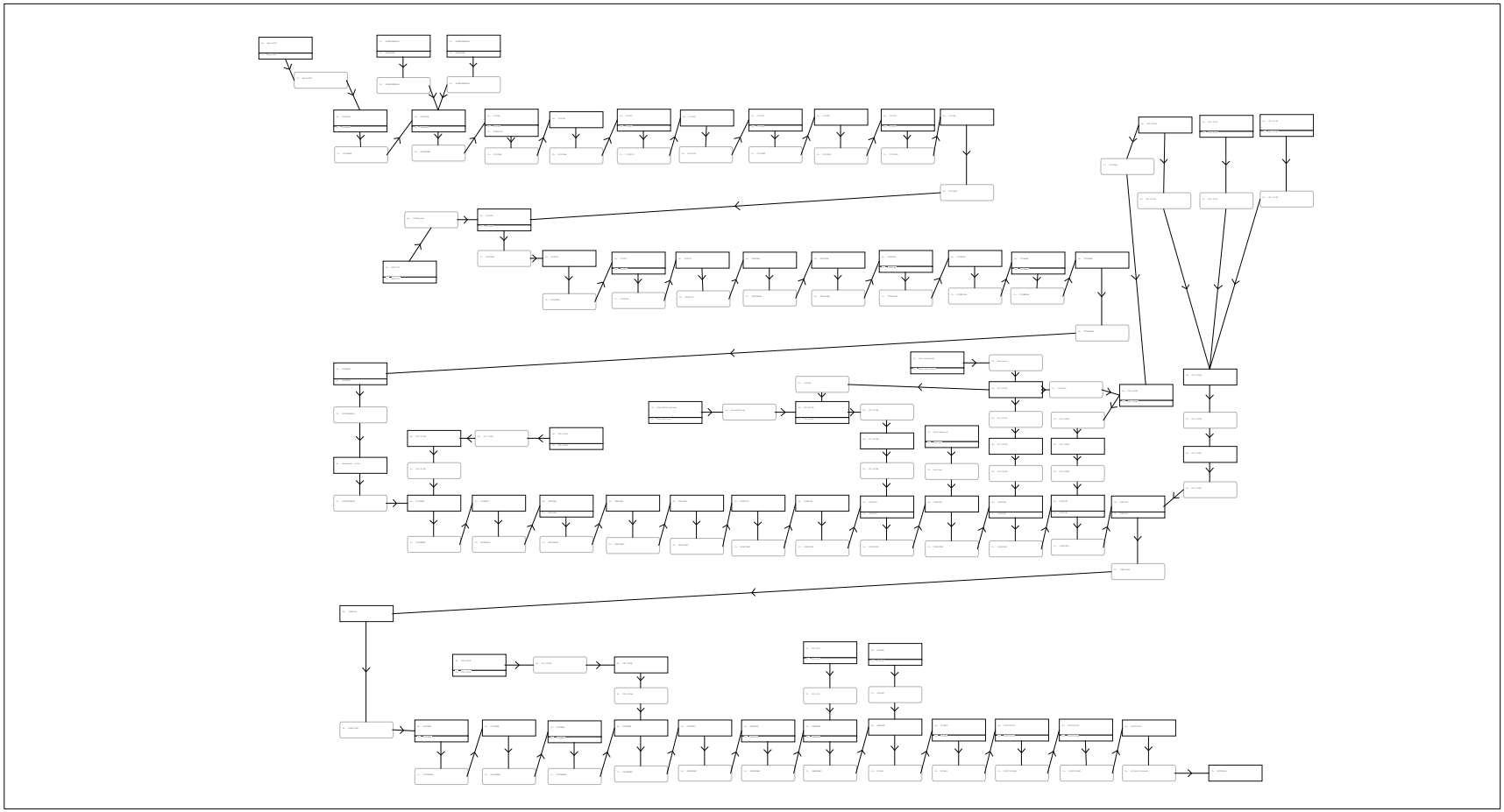
Appendix E
ICPR Modeling

Existing Basin 1, 2, and 3 Nodal Diagram
Existing Basin 1, 2, and 3 Input Report
Existing Basin 1, 2, And 3 Node Max/Min Report

Nodes
A Stage/Area
V Stage/Volume
T Time/Stage
M Manhole

Basins
O Overland Flow
U SCS Unit CN
S SBUH CN
Y SCS Unit GA
Z SBUH GA

Links
P Pipe
W Weir
C Channel
D Drop Structure
B Bridge
R Rating Curve
H Breach
E Percolation
F Filter
X Exfil Trench



Interconnected Channel and Pond Routing Model (ICPR) ©2002 Streamline Technologies, Inc.

==========
==== Basins ==========
==========

Name: CBENDA Node: CBENDA Status: Onsite
Group: BASE Type: SCS Unit Hydrograph CN

Unit Hydrograph: Uh256 Peaking Factor: 256.0
Rainfall File: Sfwmd72 Storm Duration(hrs): 72.00
Rainfall Amount(in): 9.500 Time of Conc(min): 10.00
Area(ac): 3.190 Time Shift(hrs): 0.00
Curve Number: 83.96 Max Allowable Q(cfs): 999999.000
DCIA(%): 0.00

Name: CBENDB Node: CBENDB Status: Onsite
Group: BASE Type: SCS Unit Hydrograph CN

Unit Hydrograph: Uh256 Peaking Factor: 256.0
Rainfall File: Sfwmd72 Storm Duration(hrs): 72.00
Rainfall Amount(in): 9.500 Time of Conc(min): 30.00
Area(ac): 11.860 Time Shift(hrs): 0.00
Curve Number: 86.00 Max Allowable Q(cfs): 999999.000
DCIA(%): 0.00

Name: CCHRI Node: CCHRI Status: Onsite
Group: BASE Type: SCS Unit Hydrograph CN

Unit Hydrograph: Uh256 Peaking Factor: 256.0
Rainfall File: Sfwmd72 Storm Duration(hrs): 72.00
Rainfall Amount(in): 9.500 Time of Conc(min): 60.98
Area(ac): 40.590 Time Shift(hrs): 0.00
Curve Number: 79.04 Max Allowable Q(cfs): 999999.000
DCIA(%): 0.00

Name: CCHURA Node: CCHURA Status: Onsite
Group: BASE Type: SCS Unit Hydrograph CN

Unit Hydrograph: Uh256 Peaking Factor: 256.0
Rainfall File: Sfwmd72 Storm Duration(hrs): 72.00
Rainfall Amount(in): 9.500 Time of Conc(min): 10.00
Area(ac): 1.940 Time Shift(hrs): 0.00
Curve Number: 84.61 Max Allowable Q(cfs): 999999.000
DCIA(%): 0.00

Name: CCORPA Node: CCORPA Status: Onsite
Group: BASE Type: SCS Unit Hydrograph CN

Unit Hydrograph: Uh256 Peaking Factor: 256.0
Rainfall File: Sfwmd72 Storm Duration(hrs): 72.00
Rainfall Amount(in): 9.500 Time of Conc(min): 10.00
Area(ac): 8.190 Time Shift(hrs): 0.00
Curve Number: 85.23 Max Allowable Q(cfs): 999999.000
DCIA(%): 0.00

5.28 ac NB Turnpike south of Canal 103 and 2.91 ac Midway Road.

Name: CD-100A Node: CD-100A Status: Onsite
Group: BASE Type: SCS Unit Hydrograph CN

Unit Hydrograph: Uh256 Peaking Factor: 256.0
Rainfall File: Sfwmd72 Storm Duration(hrs): 72.00
Rainfall Amount(in): 9.500 Time of Conc(min): 122.23
Area(ac): 31.680 Time Shift(hrs): 0.00
Curve Number: 83.99 Max Allowable Q(cfs): 999999.000
DCIA(%): 0.00

6.97 ac Turnpike, 5.06 ac Pete-Tree, 3.86 ac future Pond 1 site and 15.79 ac undeveloped area west of Jenkins Road.

Name: CD-200A Node: CD-200A Status: Onsite

Group: BASE Type: SCS Unit Hydrograph CN

Unit Hydrograph: Uh256 Peaking Factor: 256.0
Rainfall File: Sfwmd72 Storm Duration(hrs): 72.00
Rainfall Amount(in): 9.500 Time of Conc(min): 106.23
Area(ac): 7.780 Time Shift(hrs): 0.00
Curve Number: 77.81 Max Allowable Q(cfs): 999999.000
DCIA(%): 0.00

7.78 ac between Jenkins Road and the Post Office.

Name: CD-202A Node: CD-202A Status: Onsite
Group: BASE Type: SCS Unit Hydrograph CN

Unit Hydrograph: Uh256 Peaking Factor: 256.0
Rainfall File: Sfwmd72 Storm Duration(hrs): 72.00
Rainfall Amount(in): 9.500 Time of Conc(min): 39.98
Area(ac): 5.740 Time Shift(hrs): 0.00
Curve Number: 80.00 Max Allowable Q(cfs): 999999.000
DCIA(%): 0.00

1.10 ac area, 1.86 ac area, and 2.78 ac area west of Selvitz Road.

Name: CD-203C Node: CD-203C Status: Onsite
Group: BASE Type: SCS Unit Hydrograph CN

Unit Hydrograph: Uh256 Peaking Factor: 256.0
Rainfall File: Sfwmd72 Storm Duration(hrs): 72.00
Rainfall Amount(in): 9.500 Time of Conc(min): 48.70
Area(ac): 7.480 Time Shift(hrs): 0.00
Curve Number: 80.90 Max Allowable Q(cfs): 999999.000
DCIA(%): 0.00

West side of North Selvitz Road.
Includes 5.95 ac offsite and 1.53 ac onsite.

Name: CD-203D Node: CD-203D Status: Onsite
Group: BASE Type: SCS Unit Hydrograph CN

Unit Hydrograph: Uh256 Peaking Factor: 256.0
Rainfall File: Sfwmd72 Storm Duration(hrs): 72.00
Rainfall Amount(in): 9.500 Time of Conc(min): 45.13
Area(ac): 4.700 Time Shift(hrs): 0.00
Curve Number: 81.04 Max Allowable Q(cfs): 999999.000
DCIA(%): 0.00

East side of North Selvitz Road.
Includes 3.17 ac offsite and 1.53 ac onsite.

Name: CD-300A Node: CD-300A Status: Onsite
Group: BASE Type: SCS Unit Hydrograph CN

Unit Hydrograph: Uh256 Peaking Factor: 256.0
Rainfall File: Sfwmd72 Storm Duration(hrs): 72.00
Rainfall Amount(in): 9.500 Time of Conc(min): 40.28
Area(ac): 6.390 Time Shift(hrs): 0.00
Curve Number: 85.83 Max Allowable Q(cfs): 999999.000
DCIA(%): 0.00

6.39 ac on and offsite north of Midway Road from Selvitz to Dunn.

Name: CD-301 Node: CD-301 Status: Onsite
Group: BASE Type: SCS Unit Hydrograph CN

Unit Hydrograph: Uh256 Peaking Factor: 256.0
Rainfall File: Sfwmd72 Storm Duration(hrs): 72.00
Rainfall Amount(in): 9.500 Time of Conc(min): 63.20
Area(ac): 12.620 Time Shift(hrs): 0.00
Curve Number: 82.56 Max Allowable Q(cfs): 999999.000
DCIA(%): 0.00

On and offsite north of Midway Road east of Dunn.

Name: CDUNNA Node: CDUNNA Status: Onsite
Group: BASE Type: SCS Unit Hydrograph CN

Unit Hydrograph: Uh256 Peaking Factor: 256.0

Rainfall File: Sfwmd72 Storm Duration(hrs): 72.00
Rainfall Amount(in): 9.500 Time of Conc(min): 10.00
Area(ac): 1.400 Time Shift(hrs): 0.00
Curve Number: 83.96 Max Allowable Q(cfs): 999999.000
DCIA(%): 0.00

Name: CI95A Node: CI95A Status: Onsite
Group: BASE Type: SCS Unit Hydrograph CN

Unit Hydrograph: Uh256 Peaking Factor: 256.0
Rainfall File: Sfwmd72 Storm Duration(hrs): 72.00
Rainfall Amount(in): 9.500 Time of Conc(min): 68.95
Area(ac): 42.010 Time Shift(hrs): 0.00
Curve Number: 86.21 Max Allowable Q(cfs): 999999.000
DCIA(%): 0.00

Name: CI95C Node: CI95C Status: Onsite
Group: BASE Type: SCS Unit Hydrograph CN

Unit Hydrograph: Uh256 Peaking Factor: 256.0
Rainfall File: Sfwmd72 Storm Duration(hrs): 72.00
Rainfall Amount(in): 9.500 Time of Conc(min): 56.73
Area(ac): 21.390 Time Shift(hrs): 0.00
Curve Number: 81.85 Max Allowable Q(cfs): 999999.000
DCIA(%): 0.00

Name: CI95E Node: CI95E Status: Onsite
Group: BASE Type: SCS Unit Hydrograph CN

Unit Hydrograph: Uh256 Peaking Factor: 256.0
Rainfall File: Sfwmd72 Storm Duration(hrs): 72.00
Rainfall Amount(in): 9.500 Time of Conc(min): 150.09
Area(ac): 35.200 Time Shift(hrs): 0.00
Curve Number: 80.37 Max Allowable Q(cfs): 999999.000
DCIA(%): 0.00

Name: CI95G Node: CI95G Status: Onsite
Group: BASE Type: SCS Unit Hydrograph CN

Unit Hydrograph: Uh256 Peaking Factor: 256.0
Rainfall File: Sfwmd72 Storm Duration(hrs): 72.00
Rainfall Amount(in): 9.500 Time of Conc(min): 41.46
Area(ac): 19.790 Time Shift(hrs): 0.00
Curve Number: 83.03 Max Allowable Q(cfs): 999999.000
DCIA(%): 0.00

Name: CLTCA Node: CLTCA Status: Onsite
Group: BASE Type: SCS Unit Hydrograph CN

Unit Hydrograph: Uh256 Peaking Factor: 256.0
Rainfall File: Sfwmd72 Storm Duration(hrs): 72.00
Rainfall Amount(in): 9.500 Time of Conc(min): 45.12
Area(ac): 15.960 Time Shift(hrs): 0.00
Curve Number: 84.36 Max Allowable Q(cfs): 999999.000
DCIA(%): 0.00

Name: CLTCC Node: CLTCC Status: Onsite
Group: BASE Type: SCS Unit Hydrograph CN

Unit Hydrograph: Uh256 Peaking Factor: 256.0
Rainfall File: Sfwmd72 Storm Duration(hrs): 72.00
Rainfall Amount(in): 9.500 Time of Conc(min): 10.00
Area(ac): 6.150 Time Shift(hrs): 0.00
Curve Number: 84.04 Max Allowable Q(cfs): 999999.000
DCIA(%): 0.00

```
-----------------------------------------------------------------------------------------------
         Name: CMILNA                  Node: CMILNA                Status: Onsite
        Group: BASE                    Type: SCS Unit Hydrograph CN

        Unit Hydrograph: Uh256                   Peaking Factor: 256.0
          Rainfall File: Sfwmd72            Storm Duration(hrs): 72.00
    Rainfall Amount(in): 9.500                Time of Conc(min): 10.00
               Area(ac): 2.310                  Time Shift(hrs): 0.00
           Curve Number: 84.31             Max Allowable Q(cfs): 999999.000
                DCIA(%): 0.00


-----------------------------------------------------------------------------------------------
         Name: COUT123A                Node: COUT123A              Status: Onsite
        Group: BASE                    Type: SCS Unit Hydrograph CN

        Unit Hydrograph: Uh256                   Peaking Factor: 256.0
          Rainfall File: Sfwmd72            Storm Duration(hrs): 72.00
    Rainfall Amount(in): 9.500                Time of Conc(min): 55.38
               Area(ac): 12.950                 Time Shift(hrs): 0.00
           Curve Number: 77.52             Max Allowable Q(cfs): 999999.000
                DCIA(%): 0.00


-----------------------------------------------------------------------------------------------
         Name: COUT123B                Node: COUT123B              Status: Onsite
        Group: BASE                    Type: SCS Unit Hydrograph CN

        Unit Hydrograph: Uh256                   Peaking Factor: 256.0
          Rainfall File: Sfwmd72            Storm Duration(hrs): 72.00
    Rainfall Amount(in): 9.500                Time of Conc(min): 55.25
               Area(ac): 70.790                 Time Shift(hrs): 0.00
           Curve Number: 78.32             Max Allowable Q(cfs): 999999.000
                DCIA(%): 0.00


-----------------------------------------------------------------------------------------------
         Name: CSELVC                  Node: CSELVC                Status: Onsite
        Group: BASE                    Type: SCS Unit Hydrograph CN

        Unit Hydrograph: Uh256                   Peaking Factor: 256.0
          Rainfall File: Sfwmd72            Storm Duration(hrs): 72.00
    Rainfall Amount(in): 9.500                Time of Conc(min): 10.00
               Area(ac): 3.800                  Time Shift(hrs): 0.00
           Curve Number: 84.91             Max Allowable Q(cfs): 999999.000
                DCIA(%): 0.00


-----------------------------------------------------------------------------------------------
         Name: CSELVE                  Node: CSELVE                Status: Onsite
        Group: BASE                    Type: SCS Unit Hydrograph CN

        Unit Hydrograph: Uh256                   Peaking Factor: 256.0
          Rainfall File: Sfwmd72            Storm Duration(hrs): 72.00
    Rainfall Amount(in): 9.500                Time of Conc(min): 10.00
               Area(ac): 4.640                  Time Shift(hrs): 0.00
           Curve Number: 84.48             Max Allowable Q(cfs): 999999.000
                DCIA(%): 0.00


-----------------------------------------------------------------------------------------------
         Name: CSELVF                  Node: CSELVF                Status: Onsite
        Group: BASE                    Type: SCS Unit Hydrograph CN

        Unit Hydrograph: Uh256                   Peaking Factor: 256.0
          Rainfall File: Sfwmd72            Storm Duration(hrs): 72.00
    Rainfall Amount(in): 9.500                Time of Conc(min): 10.00
               Area(ac): 2.510                  Time Shift(hrs): 0.00
           Curve Number: 83.16             Max Allowable Q(cfs): 999999.000
                DCIA(%): 0.00


-----------------------------------------------------------------------------------------------
         Name: CSELVG                  Node: CSELVG                Status: Onsite
        Group: BASE                    Type: SCS Unit Hydrograph CN

        Unit Hydrograph: Uh256                   Peaking Factor: 256.0
          Rainfall File: Sfwmd72            Storm Duration(hrs): 72.00
```

Rainfall Amount(in): 9.500 Time of Conc(min): 10.00
Area(ac): 1.500 Time Shift(hrs): 0.00
Curve Number: 84.48 Max Allowable Q(cfs): 999999.000
DCIA(%): 0.00

Name: CSPUR Node: CSPUR Status: Onsite
Group: BASE Type: SCS Unit Hydrograph CN

Unit Hydrograph: Uh256 Peaking Factor: 256.0
Rainfall File: Sfwmd72 Storm Duration(hrs): 72.00
Rainfall Amount(in): 9.500 Time of Conc(min): 60.70
Area(ac): 34.470 Time Shift(hrs): 0.00
Curve Number: 80.00 Max Allowable Q(cfs): 999999.000
DCIA(%): 0.00

Name: CSUBSA Node: CSUBSA Status: Onsite
Group: BASE Type: SCS Unit Hydrograph CN

Unit Hydrograph: Uh256 Peaking Factor: 256.0
Rainfall File: Sfwmd72 Storm Duration(hrs): 72.00
Rainfall Amount(in): 9.500 Time of Conc(min): 10.00
Area(ac): 21.340 Time Shift(hrs): 0.00
Curve Number: 84.18 Max Allowable Q(cfs): 999999.000
DCIA(%): 0.00

Name: CTORIA Node: CTORIA Status: Onsite
Group: BASE Type: SCS Unit Hydrograph CN

Unit Hydrograph: Uh256 Peaking Factor: 256.0
Rainfall File: Sfwmd72 Storm Duration(hrs): 72.00
Rainfall Amount(in): 9.500 Time of Conc(min): 75.68
Area(ac): 6.670 Time Shift(hrs): 0.00
Curve Number: 87.20 Max Allowable Q(cfs): 999999.000
DCIA(%): 0.00

Name: CTURNA Node: CTURNA Status: Onsite
Group: BASE Type: SCS Unit Hydrograph CN

Unit Hydrograph: Uh256 Peaking Factor: 256.0
Rainfall File: Sfwmd72 Storm Duration(hrs): 72.00
Rainfall Amount(in): 9.500 Time of Conc(min): 50.29
Area(ac): 49.820 Time Shift(hrs): 0.00
Curve Number: 90.97 Max Allowable Q(cfs): 999999.000
DCIA(%): 0.00

Name: New Horizons Node: HorizonPond Status: Onsite
Group: BASE Type: SCS Unit Hydrograph CN

Unit Hydrograph: Uh256 Peaking Factor: 256.0
Rainfall File: Sfwmd72 Storm Duration(hrs): 72.00
Rainfall Amount(in): 9.500 Time of Conc(min): 20.00
Area(ac): 13.180 Time Shift(hrs): 0.00
Curve Number: 85.00 Max Allowable Q(cfs): 999999.000
DCIA(%): 0.00

Name: OFFLTC Node: OFFLTC Status: Onsite
Group: BASE Type: SCS Unit Hydrograph CN

Unit Hydrograph: Uh256 Peaking Factor: 256.0
Rainfall File: Storm Duration(hrs): 0.00
Rainfall Amount(in): 0.000 Time of Conc(min): 143.62
Area(ac): 56.720 Time Shift(hrs): 0.00
Curve Number: 78.76 Max Allowable Q(cfs): 999999.000
DCIA(%): 0.00

```
-----------------------------------------------------------------------------------------------
         Name: Police                   Node: PolicePond             Status: Onsite
        Group: BASE                     Type: SCS Unit Hydrograph CN

        Unit Hydrograph: Uh256                   Peaking Factor: 256.0
          Rainfall File: Sfwmd72            Storm Duration(hrs): 72.00
    Rainfall Amount(in): 9.500                Time of Conc(min): 20.00
               Area(ac): 10.000                 Time Shift(hrs): 0.00
           Curve Number: 88.78             Max Allowable Q(cfs): 999999.000
                DCIA(%): 0.00


-----------------------------------------------------------------------------------------------
         Name: PostOffice               Node: PostOfficePond         Status: Onsite
        Group: BASE                     Type: SCS Unit Hydrograph CN

        Unit Hydrograph: Uh256                   Peaking Factor: 256.0
          Rainfall File: Sfwmd72            Storm Duration(hrs): 72.00
    Rainfall Amount(in): 9.500                Time of Conc(min): 30.00
               Area(ac): 13.150                 Time Shift(hrs): 0.00
           Curve Number: 89.43             Max Allowable Q(cfs): 999999.000
                DCIA(%): 0.00


-----------------------------------------------------------------------------------------------
         Name: SUBSB1A                  Node: SUBPONDB1A             Status: Onsite
        Group: BASE                     Type: SCS Unit Hydrograph CN

        Unit Hydrograph: Uh256                   Peaking Factor: 256.0
          Rainfall File: Sfwmd72            Storm Duration(hrs): 72.00
    Rainfall Amount(in): 9.500                Time of Conc(min): 10.00
               Area(ac): 0.670                  Time Shift(hrs): 0.00
           Curve Number: 83.00             Max Allowable Q(cfs): 999999.000
                DCIA(%): 0.00


-----------------------------------------------------------------------------------------------
         Name: SUBSB1B                  Node: SUBPONDB1B             Status: Onsite
        Group: BASE                     Type: SCS Unit Hydrograph CN

        Unit Hydrograph: Uh256                   Peaking Factor: 256.0
          Rainfall File: Sfwmd72            Storm Duration(hrs): 72.00
    Rainfall Amount(in): 9.500                Time of Conc(min): 10.00
               Area(ac): 1.180                  Time Shift(hrs): 0.00
           Curve Number: 84.00             Max Allowable Q(cfs): 999999.000
                DCIA(%): 0.00


-----------------------------------------------------------------------------------------------
         Name: SUBSB2                   Node: CSUBSB                 Status: Onsite
        Group: BASE                     Type: SCS Unit Hydrograph CN

        Unit Hydrograph: Uh256                   Peaking Factor: 256.0
          Rainfall File: Sfwmd72            Storm Duration(hrs): 72.00
    Rainfall Amount(in): 9.500                Time of Conc(min): 15.26
               Area(ac): 8.280                  Time Shift(hrs): 0.00
           Curve Number: 94.60             Max Allowable Q(cfs): 999999.000
                DCIA(%): 0.00


-----------------------------------------------------------------------------------------------
         Name: SUBSI95                  Node: CI95A                  Status: Onsite
        Group: BASE                     Type: SCS Unit Hydrograph CN

        Unit Hydrograph: Uh256                   Peaking Factor: 256.0
          Rainfall File: Sfwmd72            Storm Duration(hrs): 72.00
    Rainfall Amount(in): 9.500                Time of Conc(min): 16.89
               Area(ac): 16.720                 Time Shift(hrs): 0.00
           Curve Number: 92.37             Max Allowable Q(cfs): 999999.000
                DCIA(%): 0.00


-----------------------------------------------------------------------------------------------
         Name: WestLTC                  Node: WestLTC                Status: Onsite
        Group: BASE                     Type: SCS Unit Hydrograph CN

        Unit Hydrograph: Uh256                   Peaking Factor: 256.0
          Rainfall File: Sfwmd72            Storm Duration(hrs): 72.00
    Rainfall Amount(in): 9.500                Time of Conc(min): 133.82
```

Area(ac): 85.220 Time Shift(hrs): 0.00
Curve Number: 79.02 Max Allowable Q(cfs): 999999.000
DCIA(%): 0.00

==========
==== Nodes ==========
==========

Name: CBENDA Base Flow(cfs): 0.000 Init Stage(ft): 6.520
Group: BASE Warn Stage(ft): 14.900
Type: Stage/Area

This node represents the beginning of the last portion of the channel along Midway Road.

Stage(ft)	Area(ac)

Name: CBENDB Base Flow(cfs): 0.000 Init Stage(ft): 7.510
Group: BASE Warn Stage(ft): 14.900
Type: Stage/Area

This node represents the end of the channel along Midway Road. After this node, the channel turns south.

Stage(ft)	Area(ac)
7.510	0.1400
14.900	0.3000

Name: CBENDC Base Flow(cfs): 0.000 Init Stage(ft): 7.390
Group: BASE Warn Stage(ft): 14.400
Type: Stage/Area

This node represents the point in the channel where it turns from a due south direction to a south east direction. It is also t

Stage(ft)	Area(ac)
7.390	0.2000
14.400	0.4000

Name: CCHRI Base Flow(cfs): 0.000 Init Stage(ft): 7.230
Group: BASE Warn Stage(ft): 14.200
Type: Stage/Area

This node represents the end of the channel discharging to PCHRI under Christensen Road.

Stage(ft)	Area(ac)
7.230	0.2700
14.200	0.5400

Name: CCHURA Base Flow(cfs): 0.000 Init Stage(ft): 7.360
Group: BASE Warn Stage(ft): 16.000
Type: Stage/Area

This node represents the beginning of the channel discharging to PCHURAB under the church driveway.

Stage(ft)	Area(ac)

Name: CCHURB Base Flow(cfs): 0.000 Init Stage(ft): 7.040
Group: BASE Warn Stage(ft): 16.000
Type: Stage/Area

This node represents the end of the channel discharging to PCHURAB under the church driveway.

Stage(ft)	Area(ac)
7.040	0.2600
16.000	0.5400

Name: CCORPA Base Flow(cfs): 0.000 Init Stage(ft): 12.950
Group: BASE Warn Stage(ft): 18.000
Type: Stage/Area

This node represents the beginning of the channel discharging to PCORPAC under Corporate Way.

Stage(ft)	Area(ac)

Name: CCORPB Base Flow(cfs): 0.000 Init Stage(ft): 13.000
Group: BASE Warn Stage(ft): 18.000
Type: Stage/Area

This node represents a portion of the channel discharging to PCORPAC under Corporate Way.

Stage(ft)	Area(ac)
12.950	0.2600
18.000	0.4300

Name: CCORPC Base Flow(cfs): 0.000 Init Stage(ft): 9.240
Group: BASE Warn Stage(ft): 18.000
Type: Stage/Area

This node represents the end of the channel discharging to PCORPAC under Corporate Way.

Stage(ft)	Area(ac)
9.240	0.0300
18.000	0.0500

Name: CD-100A Base Flow(cfs): 0.000 Init Stage(ft): 13.380
Group: BASE Warn Stage(ft): 19.570
Type: Stage/Area

Stage(ft)	Area(ac)

Name: CD-100B Base Flow(cfs): 0.000 Init Stage(ft): 13.030
Group: BASE Plunge Factor: 1.00 Warn Stage(ft): 19.570
Type: Manhole, Flat Floor

Stage(ft)	Area(ac)

Name: CD-200A Base Flow(cfs): 0.000 Init Stage(ft): 12.050
Group: BASE Warn Stage(ft): 18.510
Type: Stage/Area

Stage(ft)	Area(ac)

Name: CD-200B Base Flow(cfs): 0.000 Init Stage(ft): 11.970
Group: BASE Plunge Factor: 1.00 Warn Stage(ft): 18.510
Type: Manhole, Flat Floor

Stage(ft)	Area(ac)

Name: CD-201A Base Flow(cfs): 0.000 Init Stage(ft): 13.560
Group: BASE Warn Stage(ft): 18.240
Type: Stage/Area

Stage(ft)	Area(ac)

Name: CD-201B Base Flow(cfs): 0.000 Init Stage(ft): 11.260
Group: BASE Plunge Factor: 1.00 Warn Stage(ft): 18.540
Type: Manhole, Flat Floor

Stage(ft)	Area(ac)

Name: CD-202A Base Flow(cfs): 0.000 Init Stage(ft): 14.490
Group: BASE Warn Stage(ft): 18.180
Type: Stage/Area

Stage(ft)	Area(ac)

Name: CD-202B Base Flow(cfs): 0.000 Init Stage(ft): 11.090
Group: BASE Warn Stage(ft): 18.180
Type: Stage/Area

Roadside depressional area.

Stage(ft)	Area(ac)
11.090	0.0020
15.900	0.0140

Name: CD-203A Base Flow(cfs): 0.000 Init Stage(ft): 18.000
Group: BASE Warn Stage(ft): 18.460
Type: Stage/Area

Stage(ft)	Area(ac)

Name: CD-203B Base Flow(cfs): 0.000 Init Stage(ft): 13.820
Group: BASE Plunge Factor: 1.00 Warn Stage(ft): 18.460
Type: Manhole, Flat Floor

Stage(ft)	Area(ac)

Name: CD-203C Base Flow(cfs): 0.000 Init Stage(ft): 17.250
Group: BASE Warn Stage(ft): 18.500
Type: Stage/Area

This node represents the roadside swale west of Selvitz Road.

Stage(ft)	Area(ac)
17.250	0.0000
19.000	1.2100

Name: CD-203D Base Flow(cfs): 0.000 Init Stage(ft): 13.450
Group: BASE Warn Stage(ft): 18.460
Type: Stage/Area

This node represents the roadside swale east of Selvitz Road.

Stage(ft)	Area(ac)
13.450	0.0000
17.940	1.5600

Name: CD-203E Base Flow(cfs): 0.000 Init Stage(ft): 10.720
Group: BASE Plunge Factor: 1.00 Warn Stage(ft): 18.460
Type: Manhole, Flat Floor

Stage(ft)	Area(ac)

Name: CD-300A Base Flow(cfs): 0.000 Init Stage(ft): 10.950
Group: BASE Warn Stage(ft): 16.320
Type: Stage/Area

Stage(ft)	Area(ac)

Name: CD-300B Base Flow(cfs): 0.000 Init Stage(ft): 9.130
Group: BASE Plunge Factor: 1.00 Warn Stage(ft): 16.320
Type: Manhole, Flat Floor

Stage(ft)	Area(ac)

Name: CD-301 Base Flow(cfs): 0.000 Init Stage(ft): 10.830
Group: BASE Warn Stage(ft): 16.190
Type: Stage/Area

Stage(ft)	Area(ac)

Name: CDUNNA Base Flow(cfs): 0.000 Init Stage(ft): 7.410
Group: BASE Warn Stage(ft): 15.600
Type: Stage/Area

This node represents the beginning of the channel discharging to PDUNNAC under Dunn Road.

Stage(ft)	Area(ac)

Name: CDUNNB Base Flow(cfs): 0.000 Init Stage(ft): 7.550
Group: BASE Warn Stage(ft): 15.600
Type: Stage/Area

This node represents a portion of the channel discharging to PDUNNAC under Dunn Road.

Stage(ft)	Area(ac)
7.550	0.0600
15.600	0.1000

Name: CDUNNC Base Flow(cfs): 0.000 Init Stage(ft): 6.700
Group: BASE Warn Stage(ft): 14.400
Type: Stage/Area

This node represents the end of the channel discharging to PDUNNAC under Dunn Road.

Stage(ft)	Area(ac)
6.700	0.2200
14.400	0.3200

Name: CFECRA Base Flow(cfs): 0.000 Init Stage(ft): 13.400
Group: BASE Warn Stage(ft): 19.630
Type: Stage/Area

This node represents the beginning of the channel discharging to PFECRAB under Glades Cut-off Road and the FEC Railraod R/W.

Stage(ft)	Area(ac)

Name: CFECRB Base Flow(cfs): 0.000 Init Stage(ft): 13.310
Group: BASE Warn Stage(ft): 19.630
Type: Stage/Area

This node represents the end of the channel discharging to PFECRAB under Glades Cut-off Road and the FEC Railraod R/W.

Stage(ft)	Area(ac)
13.310	0.5400
19.000	1.7700

Name: CI95A Base Flow(cfs): 0.000 Init Stage(ft): 13.500
Group: BASE Warn Stage(ft): 21.310
Type: Stage/Area

This node represents the beginning of the channel discharging to PI95AB under the I-95 SW Ramp.

Stage(ft)	Area(ac)
13.500	0.1300
19.000	0.6000

Name: CI95B Base Flow(cfs): 0.000 Init Stage(ft): 13.500
Group: BASE Warn Stage(ft): 21.310
Type: Stage/Area

This node represents the end of the channel discharging to PI95AB under The I-95 SW Ramp.

Stage(ft)	Area(ac)
13.500	0.1300
19.000	0.6000

Name: CI95C Base Flow(cfs): 0.000 Init Stage(ft): 13.500
Group: BASE Warn Stage(ft): 21.210
Type: Stage/Area

This node represents the beginning of the channel discharging to PI95CD under SB I-95.

Stage(ft)	Area(ac)

Name: CI95D Base Flow(cfs): 0.000 Init Stage(ft): 13.500
Group: BASE Warn Stage(ft): 21.210
Type: Stage/Area

This node represents the end of the channel discharging to PI95CD under The I-95 SW Ramp.

Stage(ft)	Area(ac)
13.500	0.1000
19.000	0.2100

Name: CI95E Base Flow(cfs): 0.000 Init Stage(ft): 13.500
Group: BASE Warn Stage(ft): 21.070
Type: Stage/Area

This node represents the beginning of the channel discharging to PI95EF under NB I-95.

Stage(ft)	Area(ac)

Name: CI95F Base Flow(cfs): 0.000 Init Stage(ft): 13.500
Group: BASE Warn Stage(ft): 21.070
Type: Stage/Area

This node represents the end of the channel discharging to PI95EF under NB I-95.

Stage(ft)	Area(ac)
13.500	0.1400
19.000	0.3000

Name: CI95G Base Flow(cfs): 0.000 Init Stage(ft): 13.500
Group: BASE Warn Stage(ft): 20.890
Type: Stage/Area

This node represents the beginning of the channel discharging to PI95GH under the I-95 SE Ramp.

Stage(ft)	Area(ac)

Name: CI95H Base Flow(cfs): 0.000 Init Stage(ft): 13.500
Group: BASE Warn Stage(ft): 20.890
Type: Stage/Area

This node represents the end of the channel discharging to PI95GH under the I-95 SE Ramp.

Stage(ft)	Area(ac)

13.500	0.2600
19.000	0.5000

Name: CLTCA Base Flow(cfs): 0.000 Init Stage(ft): 13.500
Group: BASE Warn Stage(ft): 20.510
Type: Stage/Area

This node represents the beginning of the channel discharging to PLTCAB under the first LTC driveway.

Stage(ft)	Area(ac)

Name: CLTCB Base Flow(cfs): 0.000 Init Stage(ft): 13.450
Group: BASE Warn Stage(ft): 20.510
Type: Stage/Area

This node represents the end of the channel discharging to PLTCAB under the first LTC driveway.

Stage(ft)	Area(ac)
13.450	0.2800
19.000	0.8900

Name: CLTCC Base Flow(cfs): 0.000 Init Stage(ft): 13.450
Group: BASE Warn Stage(ft): 20.310
Type: Stage/Area

This node represents the beginning of the channel discharging to PLTCCD under the second LTC driveway.

Stage(ft)	Area(ac)

Name: CLTCD Base Flow(cfs): 0.000 Init Stage(ft): 13.400
Group: BASE Warn Stage(ft): 20.310
Type: Stage/Area

This node represents the end of the channel discharging to PLTCCD under the second LTC driveway.

Stage(ft)	Area(ac)
14.560	0.1500
19.000	0.4700

Name: CMILNA Base Flow(cfs): 0.000 Init Stage(ft): 8.970
Group: BASE Warn Stage(ft): 18.000
Type: Stage/Area

This node represents the beginning of the channel discharging to PMILNAC under Milner Drive.

Stage(ft)	Area(ac)

Name: CMILNB Base Flow(cfs): 0.000 Init Stage(ft): 12.230
Group: BASE Warn Stage(ft): 18.000
Type: Stage/Area

This node represents a portion of the channel discharging to PMILNAC under Milner Drive.

Stage(ft)	Area(ac)
12.230	0.0700
18.000	0.1600

Name: CMILNC Base Flow(cfs): 0.000 Init Stage(ft): 10.330
Group: BASE Warn Stage(ft): 17.500
Type: Stage/Area

This node represents the end of the channel discharging to PMILNAC under Milner Drive.

Stage(ft)	Area(ac)
10.330	0.1100
17.500	0.2200

Name: COUT123A Base Flow(cfs): 0.000 Init Stage(ft): 7.230
Group: BASE Warn Stage(ft): 13.600

Type: Stage/Area

This node represents the beginning of the channel discharging to the outfall for Basins 1, 2, and 3.

Stage(ft)	Area(ac)

Name: COUT123B Base Flow(cfs): 0.000 Init Stage(ft): 6.620
Group: BASE Warn Stage(ft): 13.600
Type: Stage/Area

This node represents a portion of the channel discharging to the outfall for Basins 1, 2, and 3.

Stage(ft)	Area(ac)
6.620	0.0300
13.300	0.0500

Name: COUT123C Base Flow(cfs): 0.000 Init Stage(ft): 2.000
Group: BASE Warn Stage(ft): 9.000
Type: Stage/Area

This node represents the end of the channel discharging to the outfall for Basins 1, 2, and 3.

Stage(ft)	Area(ac)
2.000	0.9200
9.000	1.5300

Name: CSELVA Base Flow(cfs): 0.000 Init Stage(ft): 10.380
Group: BASE Warn Stage(ft): 17.500
Type: Stage/Area

This node represents the beginning of the channel discharging to PSELVAH under Selvitz Road.

Stage(ft)	Area(ac)

Name: CSELVB Base Flow(cfs): 0.000 Init Stage(ft): 11.860
Group: BASE Warn Stage(ft): 17.500
Type: Stage/Area

This node represents a portion of the channel discharging to PSELVAH under Selvitz Road.

Stage(ft)	Area(ac)
11.860	0.0200
17.500	0.0500

Name: CSELVC Base Flow(cfs): 0.000 Init Stage(ft): 11.100
Group: BASE Warn Stage(ft): 16.200
Type: Stage/Area

This node represents a portion of the channel discharging to PSELVAH under Selvitz Road.

Stage(ft)	Area(ac)
11.100	0.2900
16.200	0.5300

Name: CSELVD Base Flow(cfs): 0.000 Init Stage(ft): 10.520
Group: BASE Warn Stage(ft): 14.600
Type: Stage/Area

This node represents a portion of the channel discharging to PSELVAH under Selvitz Road.

Stage(ft)	Area(ac)
10.520	0.1100
14.600	0.1800

Name: CSELVE Base Flow(cfs): 0.000 Init Stage(ft): 11.130
Group: BASE Warn Stage(ft): 14.600
Type: Stage/Area

This node represents a portion of the channel discharging to PSELVAH under Selvitz Road.

Stage(ft)	Area(ac)
11.130	0.3300
14.600	0.5100

Name: CSELVF Base Flow(cfs): 0.000 Init Stage(ft): 10.870
Group: BASE Warn Stage(ft): 16.700
Type: Stage/Area

This node represents a portion of the channel discharging to PSELVAH under Selvitz Road.

Stage(ft)	Area(ac)
10.870	0.1600
16.700	0.2900

Name: CSELVG Base Flow(cfs): 0.000 Init Stage(ft): 8.530
Group: BASE Warn Stage(ft): 17.000
Type: Stage/Area

This node represents a portion of the channel discharging to PSELVAH under Selvitz Road.

Stage(ft)	Area(ac)
8.530	0.2800
17.000	0.5600

Name: CSELVH Base Flow(cfs): 0.000 Init Stage(ft): 7.720
Group: BASE Warn Stage(ft): 18.700
Type: Stage/Area

This node represents the end of the channel discharging to PSELVAH under Selvitz Road.

Stage(ft)	Area(ac)
7.700	0.0100
18.700	0.0200

Name: CSPUR Base Flow(cfs): 0.000 Init Stage(ft): 7.390
Group: BASE Warn Stage(ft): 14.400
Type: Stage/Area

This node represents the storage area available in the abandoned southern spur of Canal 103.

Estimated storage volumes were reduced by 20% to account for siltation and excessive vegetation.

Stage(ft)	Area(ac)
7.390	0.5000
14.400	0.9900

Name: CSUBSA Base Flow(cfs): 0.000 Init Stage(ft): 17.500
Group: BASE Warn Stage(ft): 21.300
Type: Stage/Area

This node represents the beginning of the channel discharging to PSUBSAB under the substation driveway.

Stage(ft)	Area(ac)

Name: CSUBSB Base Flow(cfs): 0.000 Init Stage(ft): 15.500
Group: BASE Warn Stage(ft): 21.300
Type: Stage/Area

This node represents the end of the channel discharging to PSUBSAB under the substation driveway.

Stage(ft)	Area(ac)
15.500	0.4100
19.000	1.2400

Name: CTORIA Base Flow(cfs): 0.000 Init Stage(ft): 13.310
Group: BASE Warn Stage(ft): 19.180
Type: Stage/Area

This node represents the beginning of the channel discharging to PTORIAB under East Torino Parkway.

Stage(ft)	Area(ac)

Name: CTORIB Base Flow(cfs): 0.000 Init Stage(ft): 13.250
Group: BASE Warn Stage(ft): 19.180
Type: Stage/Area

This node represents the end of the channel discharging to PTORIAB under East Torino Parkway

Stage(ft)	Area(ac)
13.760	0.1300
19.000	0.7500

Name: CTURNA Base Flow(cfs): 0.000 Init Stage(ft): 13.250
Group: BASE Warn Stage(ft): 18.810
Type: Stage/Area

This node represents the beginning of the channel discharging to PTURNAB under the Florida Turnpike.

Stage(ft)	Area(ac)

Name: CTURNB Base Flow(cfs): 0.000 Init Stage(ft): 13.200
Group: BASE Warn Stage(ft): 19.000
Type: Stage/Area

This node represents the end of the channel discharging to PTURNAB under the Florida Turnpike.

Stage(ft)	Area(ac)
13.200	0.1400
19.000	0.8000

Name: HorizonPond Base Flow(cfs): 0.000 Init Stage(ft): 15.000
Group: BASE Warn Stage(ft): 18.240
Type: Stage/Volume

Converted from NGVD to NAVD

Stage(ft)	Volume(af)
15.000	0.0000
15.500	0.4000
16.000	0.9000
16.300	3.8000
16.500	5.8000
17.500	16.9000
18.500	30.7000

Name: OffLTC Base Flow(cfs): 0.000 Init Stage(ft): 18.000
Group: BASE Warn Stage(ft): 20.510
Type: Stage/Area

This node represents the storage volume available in the depressional areas to the south and west of the ditch draining east to

Stage(ft)	Area(ac)
18.000	5.6700
19.000	56.7200

Name: OUTFALL Base Flow(cfs): 0.000 Init Stage(ft): 1.520
Group: BASE Warn Stage(ft): 9.000
Type: Time/Stage

FEMA Flood Maps show the 100 year flood stage at 9' NGVD 29 (7.5' NAVD 88).
Per Glen Gareau of the SFWMD, the tailwater has been lowered to 1.52' NAVD 88 to match the mean high water elevation.

Time(hrs)	Stage(ft)
0.00	1.520
72.00	1.520
96.00	1.520

```
--------------------------------------------------------------------------------------------
      Name: PolicePond          Base Flow(cfs): 0.000          Init Stage(ft): 14.000
     Group: BASE                                              Warn Stage(ft): 18.390
      Type: Stage/Volume

Converted from NGVD to NAVD

      Stage(ft)      Volume(af)
--------------- ---------------
         14.000          0.0000
         18.500          5.7000
         21.500         17.9000

--------------------------------------------------------------------------------------------
      Name: PostOfficePond      Base Flow(cfs): 0.000          Init Stage(ft): 14.800
     Group: BASE                                              Warn Stage(ft): 18.510
      Type: Stage/Volume



      Stage(ft)      Volume(af)
--------------- ---------------
         14.800          0.0000
         16.500          0.6300
         17.650          2.6200
         18.000          3.3800

--------------------------------------------------------------------------------------------
      Name: Sediment Site       Base Flow(cfs): 0.000          Init Stage(ft): 14.050
     Group: BASE                                              Warn Stage(ft): 18.000
      Type: Stage/Area

This node represents the site of the future sedimentation basin and is located just east of the Turnpike R/W line.

      Stage(ft)        Area(ac)
--------------- ---------------

--------------------------------------------------------------------------------------------
      Name: SUBPONDB1A          Base Flow(cfs): 0.000          Init Stage(ft): 19.000
     Group: BASE                                              Warn Stage(ft): 22.000
      Type: Stage/Volume

Converted from NGVD to NAVD

      Stage(ft)      Volume(af)
--------------- ---------------
         19.000          0.0000
         20.500          0.0640
         21.500          0.1300

--------------------------------------------------------------------------------------------
      Name: SUBPONDB1B          Base Flow(cfs): 0.000          Init Stage(ft): 19.000
     Group: BASE                                              Warn Stage(ft): 22.000
      Type: Stage/Volume

Converted from NGVD to NAVD

      Stage(ft)      Volume(af)
--------------- ---------------
         19.000          0.0000
         20.500          0.1520
         21.500          0.2900

--------------------------------------------------------------------------------------------
      Name: WestLTC             Base Flow(cfs): 0.000          Init Stage(ft): 17.500
     Group: BASE                                              Warn Stage(ft): 21.300
      Type: Stage/Area

This node represents the storage volume available in the depressional areas to the south and west of the ditch draining east to

      Stage(ft)        Area(ac)
--------------- ---------------
         17.500          1.0000
         18.500          5.1800
         19.000         26.0000

============================================================================================
==== Pipes =================================================================================
============================================================================================

         Name: 25thStCulvert       From Node: COUT123C           Length(ft): 140.00
        Group: BASE                  To Node: OUTFALL                Count: 3
                                                          Friction Equation: Automatic
               UPSTREAM       DOWNSTREAM                Solution Algorithm: Most Restrictive
```

Geometry:	Circular	Circular	Flow:	Both
Span(in):	60.00	60.00	Entrance Loss Coef:	0.20
Rise(in):	60.00	60.00	Exit Loss Coef:	1.00
Invert(ft):	2.000	2.000	Bend Loss Coef:	0.00
Manning's N:	0.012000	0.012000	Outlet Ctrl Spec:	Use dc or tw
Top Clip(in):	0.000	0.000	Inlet Ctrl Spec:	Use dc
Bot Clip(in):	0.000	0.000	Stabilizer Option:	None

Upstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

Downstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

Name:	CD-100A	From Node: CD-100A	Length(ft):	68.00
Group:	BASE	To Node: CD-100B	Count:	1
			Friction Equation:	Automatic
	UPSTREAM	DOWNSTREAM	Solution Algorithm:	Most Restrictive
Geometry:	Circular	Circular	Flow:	Both
Span(in):	36.00	36.00	Entrance Loss Coef:	0.20
Rise(in):	36.00	36.00	Exit Loss Coef:	0.00
Invert(ft):	13.380	13.030	Bend Loss Coef:	0.00
Manning's N:	0.022000	0.022000	Outlet Ctrl Spec:	Use dc or tw
Top Clip(in):	0.000	0.000	Inlet Ctrl Spec:	Use dc
Bot Clip(in):	0.000	0.000	Stabilizer Option:	None

Upstream FHWA Inlet Edge Description:
Circular CMP: Headwall

Downstream FHWA Inlet Edge Description:
Circular CMP: Headwall

Name:	CD-100B	From Node: CD-100B	Length(ft):	21.00
Group:	BASE	To Node: CCORPB	Count:	1
			Friction Equation:	Automatic
	UPSTREAM	DOWNSTREAM	Solution Algorithm:	Most Restrictive
Geometry:	Circular	Circular	Flow:	Both
Span(in):	36.00	36.00	Entrance Loss Coef:	0.20
Rise(in):	36.00	36.00	Exit Loss Coef:	1.00
Invert(ft):	13.030	12.710	Bend Loss Coef:	0.00
Manning's N:	0.022000	0.022000	Outlet Ctrl Spec:	Use dc or tw
Top Clip(in):	0.000	0.000	Inlet Ctrl Spec:	Use dc
Bot Clip(in):	0.000	0.000	Stabilizer Option:	None

Upstream FHWA Inlet Edge Description:
Circular CMP: Headwall

Downstream FHWA Inlet Edge Description:
Circular CMP: Projecting

Name:	CD-200A	From Node: CD-200A	Length(ft):	73.00
Group:	BASE	To Node: CD-200B	Count:	2
			Friction Equation:	Automatic
	UPSTREAM	DOWNSTREAM	Solution Algorithm:	Most Restrictive
Geometry:	Circular	Circular	Flow:	Both
Span(in):	24.00	24.00	Entrance Loss Coef:	0.02
Rise(in):	24.00	24.00	Exit Loss Coef:	0.00
Invert(ft):	12.050	11.970	Bend Loss Coef:	0.00
Manning's N:	0.012000	0.012000	Outlet Ctrl Spec:	Use dc or tw
Top Clip(in):	0.000	0.000	Inlet Ctrl Spec:	Use dc
Bot Clip(in):	0.000	0.000	Stabilizer Option:	None

Upstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

Downstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

Name:	CD-200B	From Node: CD-200B	Length(ft): 21.00
Group:	BASE	To Node: CSELVC	Count: 1
			Friction Equation: Automatic
	UPSTREAM	DOWNSTREAM	Solution Algorithm: Most Restrictive
Geometry:	Circular	Circular	Flow: Both
Span(in):	15.00	15.00	Entrance Loss Coef: 0.20
Rise(in):	15.00	15.00	Exit Loss Coef: 1.00
Invert(ft):	12.020	11.530	Bend Loss Coef: 0.00
Manning's N:	0.022000	0.022000	Outlet Ctrl Spec: Use dc or tw
Top Clip(in):	0.000	0.000	Inlet Ctrl Spec: Use dc
Bot Clip(in):	0.000	0.000	Stabilizer Option: None

Upstream FHWA Inlet Edge Description:
Circular CMP: Headwall

Downstream FHWA Inlet Edge Description:
Circular CMP: Projecting

Name:	CD-201A	From Node: CD-201A	Length(ft): 105.00
Group:	BASE	To Node: CD-201B	Count: 1
			Friction Equation: Automatic
	UPSTREAM	DOWNSTREAM	Solution Algorithm: Most Restrictive
Geometry:	Circular	Circular	Flow: Both
Span(in):	24.00	24.00	Entrance Loss Coef: 0.20
Rise(in):	24.00	24.00	Exit Loss Coef: 0.00
Invert(ft):	13.560	13.410	Bend Loss Coef: 0.00
Manning's N:	0.022000	0.022000	Outlet Ctrl Spec: Use dc or tw
Top Clip(in):	0.000	0.000	Inlet Ctrl Spec: Use dc
Bot Clip(in):	0.000	0.000	Stabilizer Option: None

Upstream FHWA Inlet Edge Description:
Circular CMP: Headwall

Downstream FHWA Inlet Edge Description:
Circular CMP: Headwall

Name:	CD-201B	From Node: CD-201B	Length(ft): 34.00
Group:	BASE	To Node: CSELVE	Count: 1
			Friction Equation: Automatic
	UPSTREAM	DOWNSTREAM	Solution Algorithm: Most Restrictive
Geometry:	Circular	Circular	Flow: Both
Span(in):	24.00	24.00	Entrance Loss Coef: 0.20
Rise(in):	24.00	24.00	Exit Loss Coef: 1.00
Invert(ft):	11.260	11.200	Bend Loss Coef: 0.00
Manning's N:	0.022000	0.022000	Outlet Ctrl Spec: Use dc or tw
Top Clip(in):	0.000	0.000	Inlet Ctrl Spec: Use dc
Bot Clip(in):	0.000	0.000	Stabilizer Option: None

Upstream FHWA Inlet Edge Description:
Circular CMP: Headwall

Downstream FHWA Inlet Edge Description:
Circular CMP: Projecting

Name:	CD-202A	From Node: CD-202A	Length(ft): 45.00
Group:	BASE	To Node: CD-202B	Count: 1
			Friction Equation: Automatic
	UPSTREAM	DOWNSTREAM	Solution Algorithm: Most Restrictive
Geometry:	Circular	Circular	Flow: Both
Span(in):	15.00	15.00	Entrance Loss Coef: 0.90
Rise(in):	15.00	15.00	Exit Loss Coef: 1.00
Invert(ft):	14.490	13.900	Bend Loss Coef: 0.00
Manning's N:	0.022000	0.022000	Outlet Ctrl Spec: Use dc or tw
Top Clip(in):	0.000	0.000	Inlet Ctrl Spec: Use dc
Bot Clip(in):	0.000	0.000	Stabilizer Option: None

Upstream FHWA Inlet Edge Description:
Circular CMP: Projecting

Downstream FHWA Inlet Edge Description:
Circular CMP: Projecting

Name:	CD-202B	From Node:	CD-202B	Length(ft):	21.00
Group:	BASE	To Node:	CSELVF	Count:	1
				Friction Equation:	Automatic
	UPSTREAM	DOWNSTREAM		Solution Algorithm:	Most Restrictive
Geometry:	Circular	Circular		Flow:	Both
Span(in):	12.00	12.00		Entrance Loss Coef:	0.90
Rise(in):	12.00	12.00		Exit Loss Coef:	1.00
Invert(ft):	11.090	10.860		Bend Loss Coef:	0.00
Manning's N:	0.022000	0.022000		Outlet Ctrl Spec:	Use dc or tw
Top Clip(in):	0.000	0.000		Inlet Ctrl Spec:	Use dc
Bot Clip(in):	0.000	0.000		Stabilizer Option:	None

Upstream FHWA Inlet Edge Description:
Circular CMP: Projecting

Downstream FHWA Inlet Edge Description:
Circular CMP: Projecting

Name:	CD-203A	From Node:	CD-203A	Length(ft):	15.00
Group:	BASE	To Node:	CD-203B	Count:	1
				Friction Equation:	Automatic
	UPSTREAM	DOWNSTREAM		Solution Algorithm:	Most Restrictive
Geometry:	Circular	Circular		Flow:	Both
Span(in):	24.00	24.00		Entrance Loss Coef:	0.09
Rise(in):	24.00	24.00		Exit Loss Coef:	1.00
Invert(ft):	14.310	13.620		Bend Loss Coef:	0.00
Manning's N:	0.022000	0.022000		Outlet Ctrl Spec:	Use dc or tw
Top Clip(in):	0.000	0.000		Inlet Ctrl Spec:	Use dc
Bot Clip(in):	0.000	0.000		Stabilizer Option:	None

Upstream FHWA Inlet Edge Description:
Circular CMP: Projecting

Downstream FHWA Inlet Edge Description:
Circular CMP: Headwall

Name:	CD-203B	From Node:	CD-203B	Length(ft):	85.00
Group:	BASE	To Node:	CD-203E	Count:	1
				Friction Equation:	Automatic
	UPSTREAM	DOWNSTREAM		Solution Algorithm:	Most Restrictive
Geometry:	Circular	Circular		Flow:	Both
Span(in):	24.00	24.00		Entrance Loss Coef:	0.20
Rise(in):	24.00	24.00		Exit Loss Coef:	0.00
Invert(ft):	13.820	10.720		Bend Loss Coef:	0.00
Manning's N:	0.022000	0.022000		Outlet Ctrl Spec:	Use dc or tw
Top Clip(in):	0.000	0.000		Inlet Ctrl Spec:	Use dc
Bot Clip(in):	0.000	0.000		Stabilizer Option:	None

Upstream FHWA Inlet Edge Description:
Circular CMP: Headwall

Downstream FHWA Inlet Edge Description:
Circular CMP: Headwall

Name:	CD-203C	From Node:	CD-203C	Length(ft):	45.00
Group:	BASE	To Node:	CD-203B	Count:	1
				Friction Equation:	Automatic
	UPSTREAM	DOWNSTREAM		Solution Algorithm:	Most Restrictive
Geometry:	Circular	Circular		Flow:	Both
Span(in):	24.00	24.00		Entrance Loss Coef:	0.90

Rise(in):	24.00	24.00	Exit Loss Coef: 1.00
Invert(ft):	15.240	13.820	Bend Loss Coef: 0.00
Manning's N:	0.022000	0.022000	Outlet Ctrl Spec: Use dc or tw
Top Clip(in):	0.000	0.000	Inlet Ctrl Spec: Use dc
Bot Clip(in):	0.000	0.000	Stabilizer Option: None

Upstream FHWA Inlet Edge Description:
Circular CMP: Projecting

Downstream FHWA Inlet Edge Description:
Circular CMP: Headwall

Name:	CD-203D	From Node: CD-203D	Length(ft): 65.00
Group:	BASE	To Node: CD-203B	Count: 1
			Friction Equation: Automatic
	UPSTREAM	DOWNSTREAM	Solution Algorithm: Most Restrictive
Geometry:	Circular	Circular	Flow: Both
Span(in):	24.00	24.00	Entrance Loss Coef: 0.90
Rise(in):	24.00	24.00	Exit Loss Coef: 1.00
Invert(ft):	13.450	13.870	Bend Loss Coef: 0.00
Manning's N:	0.022000	0.022000	Outlet Ctrl Spec: Use dc or tw
Top Clip(in):	0.000	0.000	Inlet Ctrl Spec: Use dc
Bot Clip(in):	0.000	0.000	Stabilizer Option: None

Upstream FHWA Inlet Edge Description:
Circular CMP: Projecting

Downstream FHWA Inlet Edge Description:
Circular CMP: Headwall

Name:	CD-203E	From Node: CD-203E	Length(ft): 19.00
Group:	BASE	To Node: CSELVG	Count: 1
			Friction Equation: Automatic
	UPSTREAM	DOWNSTREAM	Solution Algorithm: Most Restrictive
Geometry:	Circular	Circular	Flow: Both
Span(in):	24.00	24.00	Entrance Loss Coef: 0.20
Rise(in):	24.00	24.00	Exit Loss Coef: 1.00
Invert(ft):	10.720	10.520	Bend Loss Coef: 0.00
Manning's N:	0.022000	0.022000	Outlet Ctrl Spec: Use dc or tw
Top Clip(in):	0.000	0.000	Inlet Ctrl Spec: Use dc
Bot Clip(in):	0.000	0.000	Stabilizer Option: None

Upstream FHWA Inlet Edge Description:
Circular CMP: Headwall

Downstream FHWA Inlet Edge Description:
Circular CMP: Projecting

Name:	CD-300A	From Node: CD-300A	Length(ft): 71.00
Group:	BASE	To Node: CD-300B	Count: 1
			Friction Equation: Automatic
	UPSTREAM	DOWNSTREAM	Solution Algorithm: Most Restrictive
Geometry:	Circular	Circular	Flow: Both
Span(in):	24.00	24.00	Entrance Loss Coef: 0.90
Rise(in):	24.00	24.00	Exit Loss Coef: 1.00
Invert(ft):	10.950	9.920	Bend Loss Coef: 0.00
Manning's N:	0.022000	0.022000	Outlet Ctrl Spec: Use dc or tw
Top Clip(in):	0.000	0.000	Inlet Ctrl Spec: Use dc
Bot Clip(in):	0.000	0.000	Stabilizer Option: None

Upstream FHWA Inlet Edge Description:
Circular CMP: Projecting

Downstream FHWA Inlet Edge Description:
Circular CMP: Projecting

Name: CD-300B	From Node: CD-300B	Length(ft): 41.00	
Group: BASE	To Node: CDUNNB	Count: 1	
		Friction Equation: Automatic	
	UPSTREAM	DOWNSTREAM	Solution Algorithm: Most Restrictive
Geometry:	Circular	Circular	Flow: Both
Span(in):	24.00	24.00	Entrance Loss Coef: 0.90
Rise(in):	24.00	24.00	Exit Loss Coef: 1.00
Invert(ft):	9.130	7.550	Bend Loss Coef: 0.00
Manning's N:	0.022000	0.022000	Outlet Ctrl Spec: Use dc or tw
Top Clip(in):	0.000	0.000	Inlet Ctrl Spec: Use dc
Bot Clip(in):	0.000	0.000	Stabilizer Option: None

Upstream FHWA Inlet Edge Description:
Circular CMP: Projecting

Downstream FHWA Inlet Edge Description:
Circular CMP: Projecting

Name: CD-301	From Node: CD-301	Length(ft): 56.00	
Group: BASE	To Node: CBENDB	Count: 1	
		Friction Equation: Automatic	
	UPSTREAM	DOWNSTREAM	Solution Algorithm: Most Restrictive
Geometry:	Circular	Circular	Flow: Both
Span(in):	24.00	24.00	Entrance Loss Coef: 0.90
Rise(in):	24.00	24.00	Exit Loss Coef: 1.00
Invert(ft):	10.830	9.740	Bend Loss Coef: 0.00
Manning's N:	0.022000	0.022000	Outlet Ctrl Spec: Use dc or tw
Top Clip(in):	0.000	0.000	Inlet Ctrl Spec: Use dc
Bot Clip(in):	0.000	0.000	Stabilizer Option: None

Upstream FHWA Inlet Edge Description:
Circular CMP: Projecting

Downstream FHWA Inlet Edge Description:
Circular CMP: Projecting

Name: PCHRI	From Node: CCHRI	Length(ft): 42.00	
Group: BASE	To Node: COUT123A	Count: 1	
		Friction Equation: Automatic	
	UPSTREAM	DOWNSTREAM	Solution Algorithm: Most Restrictive
Geometry:	Circular	Circular	Flow: Both
Span(in):	72.00	72.00	Entrance Loss Coef: 0.90
Rise(in):	72.00	72.00	Exit Loss Coef: 0.00
Invert(ft):	7.230	7.230	Bend Loss Coef: 0.00
Manning's N:	0.022000	0.022000	Outlet Ctrl Spec: Use dc or tw
Top Clip(in):	0.000	0.000	Inlet Ctrl Spec: Use dc
Bot Clip(in):	0.000	0.000	Stabilizer Option: None

Upstream FHWA Inlet Edge Description:
Circular CMP: Projecting

Downstream FHWA Inlet Edge Description:
Circular CMP: Projecting

Name: PCHURAB	From Node: CCHURB	Length(ft): 48.00	
Group: BASE	To Node: CDUNNA	Count: 2	
		Friction Equation: Automatic	
	UPSTREAM	DOWNSTREAM	Solution Algorithm: Most Restrictive
Geometry:	Circular	Circular	Flow: Both
Span(in):	60.00	60.00	Entrance Loss Coef: 0.90
Rise(in):	60.00	60.00	Exit Loss Coef: 0.00
Invert(ft):	7.040	7.410	Bend Loss Coef: 0.00
Manning's N:	0.022000	0.022000	Outlet Ctrl Spec: Use dc or tw
Top Clip(in):	0.000	0.000	Inlet Ctrl Spec: Use dc
Bot Clip(in):	0.000	0.000	Stabilizer Option: None

Upstream FHWA Inlet Edge Description:

Circular CMP: Projecting

Downstream FHWA Inlet Edge Description:
Circular CMP: Projecting

Name: PCORPAC	From Node: CCORPC	Length(ft): 49.00	
Group: BASE	To Node: CMILNA	Count: 1	
		Friction Equation: Automatic	
	UPSTREAM	DOWNSTREAM	Solution Algorithm: Most Restrictive
Geometry:	Circular	Circular	Flow: Both
Span(in):	96.00	96.00	Entrance Loss Coef: 0.20
Rise(in):	96.00	96.00	Exit Loss Coef: 0.00
Invert(ft):	9.240	8.970	Bend Loss Coef: 0.00
Manning's N:	0.012000	0.012000	Outlet Ctrl Spec: Use dc or tw
Top Clip(in):	0.000	0.000	Inlet Ctrl Spec: Use dc
Bot Clip(in):	0.000	0.000	Stabilizer Option: None

Upstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

Downstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

Name: PDUNNAC	From Node: CDUNNC	Length(ft): 41.00	
Group: BASE	To Node: CBENDA	Count: 2	
		Friction Equation: Automatic	
	UPSTREAM	DOWNSTREAM	Solution Algorithm: Most Restrictive
Geometry:	Circular	Circular	Flow: Both
Span(in):	72.00	72.00	Entrance Loss Coef: 0.90
Rise(in):	72.00	72.00	Exit Loss Coef: 0.00
Invert(ft):	6.700	6.520	Bend Loss Coef: 0.00
Manning's N:	0.022000	0.022000	Outlet Ctrl Spec: Use dc or tw
Top Clip(in):	0.000	0.000	Inlet Ctrl Spec: Use dc
Bot Clip(in):	0.000	0.000	Stabilizer Option: None

Upstream FHWA Inlet Edge Description:
Circular CMP: Projecting

Downstream FHWA Inlet Edge Description:
Circular CMP: Projecting

Name: PFECRAB	From Node: CFECRB	Length(ft): 493.00	
Group: BASE	To Node: CTORIA	Count: 2	
		Friction Equation: Automatic	
	UPSTREAM	DOWNSTREAM	Solution Algorithm: Most Restrictive
Geometry:	Circular	Circular	Flow: Both
Span(in):	48.00	48.00	Entrance Loss Coef: 0.20
Rise(in):	48.00	48.00	Exit Loss Coef: 0.00
Invert(ft):	13.310	13.310	Bend Loss Coef: 0.00
Manning's N:	0.012000	0.012000	Outlet Ctrl Spec: Use dc or tw
Top Clip(in):	0.000	0.000	Inlet Ctrl Spec: Use dc
Bot Clip(in):	0.000	0.000	Stabilizer Option: None

Upstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

Downstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

Name: PI95AB	From Node: CI95B	Length(ft): 146.00	
Group: BASE	To Node: CI95C	Count: 2	
		Friction Equation: Automatic	
	UPSTREAM	DOWNSTREAM	Solution Algorithm: Most Restrictive
Geometry:	Circular	Circular	Flow: Both
Span(in):	48.00	48.00	Entrance Loss Coef: 0.20
Rise(in):	48.00	48.00	Exit Loss Coef: 0.00
Invert(ft):	13.500	13.500	Bend Loss Coef: 0.00

Manning's N:	0.012000	0.012000	Outlet Ctrl Spec: Use dc or tw
Top Clip(in):	0.000	0.000	Inlet Ctrl Spec: Use dc
Bot Clip(in):	0.000	0.000	Stabilizer Option: None

Upstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

Downstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

Name:	PI95CD	From Node: CI95D	Length(ft): 181.00
Group:	BASE	To Node: CI95E	Count: 2
			Friction Equation: Automatic
	UPSTREAM	DOWNSTREAM	Solution Algorithm: Most Restrictive
Geometry:	Circular	Circular	Flow: Both
Span(in):	54.00	54.00	Entrance Loss Coef: 0.20
Rise(in):	54.00	54.00	Exit Loss Coef: 0.00
Invert(ft):	13.500	13.500	Bend Loss Coef: 0.00
Manning's N:	0.012000	0.012000	Outlet Ctrl Spec: Use dc or tw
Top Clip(in):	0.000	0.000	Inlet Ctrl Spec: Use dc
Bot Clip(in):	0.000	0.000	Stabilizer Option: None

Upstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

Downstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

Name:	PI95EF	From Node: CI95F	Length(ft): 189.00
Group:	BASE	To Node: CI95G	Count: 2
			Friction Equation: Automatic
	UPSTREAM	DOWNSTREAM	Solution Algorithm: Most Restrictive
Geometry:	Circular	Circular	Flow: Both
Span(in):	60.00	60.00	Entrance Loss Coef: 0.20
Rise(in):	60.00	60.00	Exit Loss Coef: 0.00
Invert(ft):	13.500	13.500	Bend Loss Coef: 0.00
Manning's N:	0.012000	0.012000	Outlet Ctrl Spec: Use dc or tw
Top Clip(in):	0.000	0.000	Inlet Ctrl Spec: Use dc
Bot Clip(in):	0.000	0.000	Stabilizer Option: None

Upstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

Downstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

Name:	PI95GH	From Node: CI95H	Length(ft): 144.00
Group:	BASE	To Node: CLTCA	Count: 1
			Friction Equation: Automatic
	UPSTREAM	DOWNSTREAM	Solution Algorithm: Most Restrictive
Geometry:	Rectangular	Rectangular	Flow: Both
Span(in):	84.00	84.00	Entrance Loss Coef: 0.20
Rise(in):	72.00	72.00	Exit Loss Coef: 0.00
Invert(ft):	13.500	13.500	Bend Loss Coef: 0.00
Manning's N:	0.012000	0.012000	Outlet Ctrl Spec: Use dc or tw
Top Clip(in):	0.000	0.000	Inlet Ctrl Spec: Use dc
Bot Clip(in):	0.000	0.000	Stabilizer Option: None

Upstream FHWA Inlet Edge Description:
Rectangular Box: 30° to 75° wingwall flares

Downstream FHWA Inlet Edge Description:
Rectangular Box: 30° to 75° wingwall flares

Name:	PLTCAB	From Node: CLTCB	Length(ft): 110.00

Group: BASE To Node: CLTCC Count: 2
Friction Equation: Automatic

	UPSTREAM	DOWNSTREAM		
Geometry:	Circular	Circular	Solution Algorithm:	Most Restrictive
Span(in):	60.00	60.00	Flow:	Both
Rise(in):	60.00	60.00	Entrance Loss Coef:	0.90
Invert(ft):	13.450	13.450	Exit Loss Coef:	0.00
Manning's N:	0.022000	0.022000	Bend Loss Coef:	0.00
Top Clip(in):	0.000	0.000	Outlet Ctrl Spec:	Use dc or tw
Bot Clip(in):	0.000	0.000	Inlet Ctrl Spec:	Use dc
			Stabilizer Option:	None

Upstream FHWA Inlet Edge Description:
Circular CMP: Projecting

Downstream FHWA Inlet Edge Description:
Circular CMP: Projecting

Name: PLTCCD From Node: CLTCD Length(ft): 156.00
Group: BASE To Node: CFECRA Count: 1
Friction Equation: Automatic

	UPSTREAM	DOWNSTREAM		
Geometry:	Horz Ellipse	Horz Ellipse	Solution Algorithm:	Most Restrictive
Span(in):	76.00	76.00	Flow:	Both
Rise(in):	48.00	48.00	Entrance Loss Coef:	0.70
Invert(ft):	13.400	13.400	Exit Loss Coef:	0.00
Manning's N:	0.012000	0.012000	Bend Loss Coef:	0.00
Top Clip(in):	0.000	0.000	Outlet Ctrl Spec:	Use dc or tw
Bot Clip(in):	0.000	0.000	Inlet Ctrl Spec:	Use dc
			Stabilizer Option:	None

Upstream FHWA Inlet Edge Description:
Horizontal Ellipse Concrete: Square edge with headwall

Downstream FHWA Inlet Edge Description:
Horizontal Ellipse Concrete: Square edge with headwall

Name: PMILNAC From Node: CMILNC Length(ft): 48.00
Group: BASE To Node: CSELVA Count: 1
Friction Equation: Automatic

	UPSTREAM	DOWNSTREAM		
Geometry:	Rectangular	Rectangular	Solution Algorithm:	Most Restrictive
Span(in):	120.00	120.00	Flow:	Both
Rise(in):	72.00	72.00	Entrance Loss Coef:	0.20
Invert(ft):	10.330	10.380	Exit Loss Coef:	0.00
Manning's N:	0.012000	0.012000	Bend Loss Coef:	0.00
Top Clip(in):	0.000	0.000	Outlet Ctrl Spec:	Use dc or tw
Bot Clip(in):	0.000	0.000	Inlet Ctrl Spec:	Use dc
			Stabilizer Option:	None

Upstream FHWA Inlet Edge Description:
Rectangular Box: 30° to 75° wingwall flares

Downstream FHWA Inlet Edge Description:
Rectangular Box: 30° to 75° wingwall flares

Name: PSELVAH From Node: CSELVH Length(ft): 79.00
Group: BASE To Node: CCHURA Count: 1
Friction Equation: Automatic

	UPSTREAM	DOWNSTREAM		
Geometry:	Rectangular	Rectangular	Solution Algorithm:	Most Restrictive
Span(in):	120.00	120.00	Flow:	Both
Rise(in):	72.00	72.00	Entrance Loss Coef:	0.20
Invert(ft):	7.720	7.360	Exit Loss Coef:	0.00
Manning's N:	0.012000	0.012000	Bend Loss Coef:	0.00
Top Clip(in):	0.000	0.000	Outlet Ctrl Spec:	Use dc or tw
Bot Clip(in):	0.000	0.000	Inlet Ctrl Spec:	Use dc
			Stabilizer Option:	None

Upstream FHWA Inlet Edge Description:
Rectangular Box: 30° to 75° wingwall flares

Downstream FHWA Inlet Edge Description:
Rectangular Box: 30° to 75° wingwall flares

Name: PSUBSAB		From Node: CSUBSB	Length(ft): 121.00
Group: BASE		To Node: CI95A	Count: 1
			Friction Equation: Automatic
	UPSTREAM	DOWNSTREAM	Solution Algorithm: Most Restrictive
Geometry:	Circular	Circular	Flow: Both
Span(in):	36.00	36.00	Entrance Loss Coef: 0.90
Rise(in):	36.00	36.00	Exit Loss Coef: 0.00
Invert(ft):	15.500	15.480	Bend Loss Coef: 0.00
Manning's N:	0.022000	0.022000	Outlet Ctrl Spec: Use dc or tw
Top Clip(in):	0.000	0.000	Inlet Ctrl Spec: Use dc
Bot Clip(in):	0.000	0.000	Stabilizer Option: None

Upstream FHWA Inlet Edge Description:
Circular CMP: Projecting

Downstream FHWA Inlet Edge Description:
Circular CMP: Projecting

Name: PTORIAB		From Node: CTORIB	Length(ft): 119.00
Group: BASE		To Node: CTURNA	Count: 1
			Friction Equation: Automatic
	UPSTREAM	DOWNSTREAM	Solution Algorithm: Most Restrictive
Geometry:	Circular	Circular	Flow: Both
Span(in):	72.00	72.00	Entrance Loss Coef: 0.20
Rise(in):	72.00	72.00	Exit Loss Coef: 0.00
Invert(ft):	13.250	13.250	Bend Loss Coef: 0.00
Manning's N:	0.012000	0.012000	Outlet Ctrl Spec: Use dc or tw
Top Clip(in):	0.000	0.000	Inlet Ctrl Spec: Use dc
Bot Clip(in):	0.000	0.000	Stabilizer Option: None

Upstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

Downstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

Name: PTURNAB		From Node: CTURNB	Length(ft): 118.00
Group: BASE		To Node: CCORPA	Count: 1
			Friction Equation: Automatic
	UPSTREAM	DOWNSTREAM	Solution Algorithm: Most Restrictive
Geometry:	Rectangular	Rectangular	Flow: Both
Span(in):	120.00	120.00	Entrance Loss Coef: 0.20
Rise(in):	60.00	60.00	Exit Loss Coef: 0.00
Invert(ft):	13.200	12.950	Bend Loss Coef: 0.00
Manning's N:	0.012000	0.012000	Outlet Ctrl Spec: Use dc or tw
Top Clip(in):	0.000	0.000	Inlet Ctrl Spec: Use dc
Bot Clip(in):	0.000	0.000	Stabilizer Option: None

Upstream FHWA Inlet Edge Description:
Rectangular Box: 30° to 75° wingwall flares

Downstream FHWA Inlet Edge Description:
Rectangular Box: 30° to 75° wingwall flares

Name: SUBPONDB1A		From Node: SUBPONDB1A	Length(ft): 90.00
Group: BASE		To Node: CSUBSB	Count: 1
			Friction Equation: Automatic
	UPSTREAM	DOWNSTREAM	Solution Algorithm: Most Restrictive
Geometry:	Circular	Circular	Flow: Both
Span(in):	3.00	3.00	Entrance Loss Coef: 0.20
Rise(in):	3.00	3.00	Exit Loss Coef: 1.00
Invert(ft):	19.000	19.000	Bend Loss Coef: 0.00
Manning's N:	0.011000	0.011000	Outlet Ctrl Spec: Use dc or tw
Top Clip(in):	0.000	0.000	Inlet Ctrl Spec: Use dc

Bot Clip(in): 0.000 0.000 Stabilizer Option: None

Upstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

Downstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

Converted from NGVD to NAVD

Name: SUBPONDB1B From Node: SUBPONDB1B Length(ft): 50.00
Group: BASE To Node: CSUBSB Count: 1
Friction Equation: Automatic

	UPSTREAM	DOWNSTREAM		
Geometry:	Circular	Circular	Solution Algorithm:	Most Restrictive
Span(in):	3.00	3.00	Flow:	Both
Rise(in):	3.00	3.00	Entrance Loss Coef:	0.20
Invert(ft):	19.000	19.000	Exit Loss Coef:	1.00
Manning's N:	0.011000	0.011000	Bend Loss Coef:	0.00
Top Clip(in):	0.000	0.000	Outlet Ctrl Spec:	Use dc or tw
Bot Clip(in):	0.000	0.000	Inlet Ctrl Spec:	Use dc
			Stabilizer Option:	None

Upstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

Downstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

Converted from NGVD to NAVD

==========
==== Channels ==========
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Name: C200A From Node: CD-201A Length(ft): 1480.00
Group: BASE To Node: CD-200A Count: 1

	UPSTREAM	DOWNSTREAM		
Geometry:	Trapezoidal	Trapezoidal	Friction Equation:	Automatic
Invert(ft):	17.400	15.560	Solution Algorithm:	Automatic
TClpInitZ(ft):	9999.000	9999.000	Flow:	Both
Manning's N:	0.042000	0.042000	Contraction Coef:	0.100
Top Clip(ft):	0.000	0.000	Expansion Coef:	0.300
Bot Clip(ft):	0.000	0.000	Entrance Loss Coef:	0.000
Main XSec:			Exit Loss Coef:	0.000
AuxElev1(ft):			Outlet Ctrl Spec:	Use dc or tw
Aux XSec1:			Inlet Ctrl Spec:	Use dc
AuxElev2(ft):			Stabilizer Option:	None
Aux XSec2:				
Top Width(ft):				
Depth(ft):				
Bot Width(ft):	0.000	0.000		
LtSdSlp(h/v):	8.00	8.00		
RtSdSlp(h/v):	8.00	8.00		

Name: C202A1 From Node: CD-201A Length(ft): 400.00
Group: BASE To Node: CD-202A Count: 1

	UPSTREAM	DOWNSTREAM		
Geometry:	Trapezoidal	Trapezoidal	Friction Equation:	Automatic
Invert(ft):	17.400	15.140	Solution Algorithm:	Automatic
TClpInitZ(ft):	9999.000	9999.000	Flow:	Both
Manning's N:	0.042000	0.042000	Contraction Coef:	0.100
Top Clip(ft):	0.000	0.000	Expansion Coef:	0.300
Bot Clip(ft):	0.000	0.000	Entrance Loss Coef:	0.000
Main XSec:			Exit Loss Coef:	0.000
AuxElev1(ft):			Outlet Ctrl Spec:	Use dc or tw
Aux XSec1:			Inlet Ctrl Spec:	Use dc
AuxElev2(ft):			Stabilizer Option:	None
Aux XSec2:				
Top Width(ft):				
Depth(ft):				
Bot Width(ft):	0.000	0.000		
LtSdSlp(h/v):	6.00	6.00		
RtSdSlp(h/v):	6.00	6.00		

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---------------------------------------------------------------------------------------------
         Name: C202A2              From Node: CD-203A           Length(ft): 700.00
        Group: BASE                  To Node: CD-202A                Count: 1

               UPSTREAM       DOWNSTREAM                Friction Equation: Automatic
     Geometry: Trapezoidal    Trapezoidal              Solution Algorithm: Automatic
   Invert(ft): 18.000         15.140                              Flow: Both
TClpInitZ(ft): 9999.000       9999.000                  Contraction Coef: 0.100
  Manning's N: 0.042000       0.042000                    Expansion Coef: 0.300
 Top Clip(ft): 0.000          0.000                   Entrance Loss Coef: 0.000
 Bot Clip(ft): 0.000          0.000                       Exit Loss Coef: 0.000
    Main XSec:                                        Outlet Ctrl Spec: Use dc or tw
 AuxElev1(ft):                                          Inlet Ctrl Spec: Use dc
    Aux XSec1:                                       Stabilizer Option: None
 AuxElev2(ft):
    Aux XSec2:
Top Width(ft):
    Depth(ft):
Bot Width(ft): 0.000          0.000
 LtSdSlp(h/v): 3.00           3.00
 RtSdSlp(h/v): 3.00           3.00


---------------------------------------------------------------------------------------------
         Name: CBENDAB             From Node: CBENDA            Length(ft): 443.00
        Group: BASE                  To Node: CBENDB                 Count: 1

               UPSTREAM       DOWNSTREAM                Friction Equation: Automatic
     Geometry: Trapezoidal    Trapezoidal              Solution Algorithm: Automatic
   Invert(ft): 7.510          7.510                               Flow: Both
TClpInitZ(ft): 9999.000       9999.000                  Contraction Coef: 0.100
  Manning's N: 0.030000       0.030000                    Expansion Coef: 0.300
 Top Clip(ft): 0.000          0.000                   Entrance Loss Coef: 0.000
 Bot Clip(ft): 0.000          0.000                       Exit Loss Coef: 0.000
    Main XSec:                                        Outlet Ctrl Spec: Use dc or tw
 AuxElev1(ft):                                          Inlet Ctrl Spec: Use dc
    Aux XSec1:                                       Stabilizer Option: None
 AuxElev2(ft):
    Aux XSec2:
Top Width(ft):
    Depth(ft):
Bot Width(ft): 14.000         14.000
 LtSdSlp(h/v): 1.00           1.00
 RtSdSlp(h/v): 1.00           1.00


---------------------------------------------------------------------------------------------
         Name: CBENDBC             From Node: CBENDB            Length(ft): 626.00
        Group: BASE                  To Node: CBENDC                 Count: 1

               UPSTREAM       DOWNSTREAM                Friction Equation: Automatic
     Geometry: Trapezoidal    Trapezoidal              Solution Algorithm: Automatic
   Invert(ft): 7.510          7.390                               Flow: Both
TClpInitZ(ft): 9999.000       9999.000                  Contraction Coef: 0.100
  Manning's N: 0.030000       0.030000                    Expansion Coef: 0.300
 Top Clip(ft): 0.000          0.000                   Entrance Loss Coef: 0.000
 Bot Clip(ft): 0.000          0.000                       Exit Loss Coef: 0.000
    Main XSec:                                        Outlet Ctrl Spec: Use dc or tw
 AuxElev1(ft):                                          Inlet Ctrl Spec: Use dc
    Aux XSec1:                                       Stabilizer Option: None
 AuxElev2(ft):
    Aux XSec2:
Top Width(ft):
    Depth(ft):
Bot Width(ft): 14.000         14.000
 LtSdSlp(h/v): 1.00           1.00
 RtSdSlp(h/v): 1.00           1.00


---------------------------------------------------------------------------------------------
         Name: CCHRI               From Node: CBENDC            Length(ft): 850.00
        Group: BASE                  To Node: CCHRI                  Count: 1

               UPSTREAM       DOWNSTREAM                Friction Equation: Automatic
     Geometry: Trapezoidal    Trapezoidal              Solution Algorithm: Automatic
   Invert(ft): 7.390          7.230                               Flow: Both
TClpInitZ(ft): 9999.000       9999.000                  Contraction Coef: 0.100
  Manning's N: 0.030000       0.030000                    Expansion Coef: 0.300
 Top Clip(ft): 0.000          0.000                   Entrance Loss Coef: 0.000
 Bot Clip(ft): 0.000          0.000                       Exit Loss Coef: 0.000
    Main XSec:                                        Outlet Ctrl Spec: Use dc or tw
```

AuxElev1(ft):			Inlet Ctrl Spec:	Use dc
Aux XSec1:			Stabilizer Option:	None
AuxElev2(ft):				
Aux XSec2:				
Top Width(ft):				
Depth(ft):				
Bot Width(ft):	14.000	14.000		
LtSdSlp(h/v):	1.00	1.00		
RtSdSlp(h/v):	1.00	1.00		

Name:	CCHURAB	From Node: CCHURA	Length(ft):	703.00
Group:	BASE	To Node: CCHURB	Count:	1
	UPSTREAM	DOWNSTREAM	Friction Equation:	Automatic
Geometry:	Trapezoidal	Trapezoidal	Solution Algorithm:	Automatic
Invert(ft):	7.360	7.040	Flow:	Both
TClpInitZ(ft):	9999.000	9999.000	Contraction Coef:	0.100
Manning's N:	0.030000	0.030000	Expansion Coef:	0.300
Top Clip(ft):	0.000	0.000	Entrance Loss Coef:	0.000
Bot Clip(ft):	0.000	0.000	Exit Loss Coef:	0.000
Main XSec:			Outlet Ctrl Spec:	Use dc or tw
AuxElev1(ft):			Inlet Ctrl Spec:	Use dc
Aux XSec1:			Stabilizer Option:	None
AuxElev2(ft):				
Aux XSec2:				
Top Width(ft):				
Depth(ft):				
Bot Width(ft):	16.000	16.000		
LtSdSlp(h/v):	1.00	1.00		
RtSdSlp(h/v):	1.00	1.00		

Name:	CCORPASED	From Node: CCORPA	Length(ft):	115.00
Group:	BASE	To Node: Sediment Site	Count:	1
	UPSTREAM	DOWNSTREAM	Friction Equation:	Automatic
Geometry:	Trapezoidal	Trapezoidal	Solution Algorithm:	Automatic
Invert(ft):	12.950	14.050	Flow:	Both
TClpInitZ(ft):	9999.000	9999.000	Contraction Coef:	0.100
Manning's N:	0.030000	0.030000	Expansion Coef:	0.300
Top Clip(ft):	0.000	0.000	Entrance Loss Coef:	0.000
Bot Clip(ft):	0.000	0.000	Exit Loss Coef:	0.000
Main XSec:			Outlet Ctrl Spec:	Use dc or tw
AuxElev1(ft):			Inlet Ctrl Spec:	Use dc
Aux XSec1:			Stabilizer Option:	None
AuxElev2(ft):				
Aux XSec2:				
Top Width(ft):				
Depth(ft):				
Bot Width(ft):	15.000	15.000		
LtSdSlp(h/v):	1.00	1.00		
RtSdSlp(h/v):	1.00	1.00		

Name:	CCORPBC	From Node: CCORPB	Length(ft):	67.00
Group:	BASE	To Node: CCORPC	Count:	1
	UPSTREAM	DOWNSTREAM	Friction Equation:	Automatic
Geometry:	Trapezoidal	Trapezoidal	Solution Algorithm:	Automatic
Invert(ft):	13.000	9.240	Flow:	Both
TClpInitZ(ft):	9999.000	9999.000	Contraction Coef:	0.100
Manning's N:	0.030000	0.030000	Expansion Coef:	0.300
Top Clip(ft):	0.000	0.000	Entrance Loss Coef:	0.000
Bot Clip(ft):	0.000	0.000	Exit Loss Coef:	0.000
Main XSec:			Outlet Ctrl Spec:	Use dc or tw
AuxElev1(ft):			Inlet Ctrl Spec:	Use dc
Aux XSec1:			Stabilizer Option:	None
AuxElev2(ft):				
Aux XSec2:				
Top Width(ft):				
Depth(ft):				
Bot Width(ft):	17.000	17.000		
LtSdSlp(h/v):	1.00	1.00		
RtSdSlp(h/v):	1.00	1.00		

Name:	CDUNNAB	From Node:	CDUNNA	Length(ft):	134.00
Group:	BASE	To Node:	CDUNNB	Count:	1

	UPSTREAM	DOWNSTREAM		
Geometry:	Trapezoidal	Trapezoidal	Friction Equation:	Automatic
Invert(ft):	7.410	7.550	Solution Algorithm:	Automatic
TClpInitZ(ft):	9999.000	9999.000	Flow:	Both
Manning's N:	0.030000	0.030000	Contraction Coef:	0.100
Top Clip(ft):	0.000	0.000	Expansion Coef:	0.300
Bot Clip(ft):	0.000	0.000	Entrance Loss Coef:	0.000
Main XSec:			Exit Loss Coef:	0.000
AuxElev1(ft):			Outlet Ctrl Spec:	Use dc or tw
Aux XSec1:			Inlet Ctrl Spec:	Use dc
AuxElev2(ft):			Stabilizer Option:	None
Aux XSec2:				
Top Width(ft):				
Depth(ft):				
Bot Width(ft):	21.000	21.000		
LtSdSlp(h/v):	1.00	1.00		
RtSdSlp(h/v):	1.00	1.00		

Name:	CDUNNBC	From Node:	CDUNNB	Length(ft):	376.00
Group:	BASE	To Node:	CDUNNC	Count:	1

	UPSTREAM	DOWNSTREAM		
Geometry:	Trapezoidal	Trapezoidal	Friction Equation:	Automatic
Invert(ft):	7.550	6.700	Solution Algorithm:	Automatic
TClpInitZ(ft):	9999.000	9999.000	Flow:	Both
Manning's N:	0.030000	0.030000	Contraction Coef:	0.100
Top Clip(ft):	0.000	0.000	Expansion Coef:	0.300
Bot Clip(ft):	0.000	0.000	Entrance Loss Coef:	0.000
Main XSec:			Exit Loss Coef:	0.000
AuxElev1(ft):			Outlet Ctrl Spec:	Use dc or tw
Aux XSec1:			Inlet Ctrl Spec:	Use dc
AuxElev2(ft):			Stabilizer Option:	None
Aux XSec2:				
Top Width(ft):				
Depth(ft):				
Bot Width(ft):	26.000	26.000		
LtSdSlp(h/v):	1.00	1.00		
RtSdSlp(h/v):	1.00	1.00		

Name:	CFECRAB	From Node:	CFECRA	Length(ft):	2368.00
Group:	BASE	To Node:	CFECRB	Count:	1

	UPSTREAM	DOWNSTREAM		
Geometry:	Trapezoidal	Trapezoidal	Friction Equation:	Automatic
Invert(ft):	13.400	13.310	Solution Algorithm:	Automatic
TClpInitZ(ft):	9999.000	9999.000	Flow:	Both
Manning's N:	0.030000	0.030000	Contraction Coef:	0.100
Top Clip(ft):	0.000	0.000	Expansion Coef:	0.300
Bot Clip(ft):	0.000	0.000	Entrance Loss Coef:	0.000
Main XSec:			Exit Loss Coef:	0.000
AuxElev1(ft):			Outlet Ctrl Spec:	Use dc or tw
Aux XSec1:			Inlet Ctrl Spec:	Use dc
AuxElev2(ft):			Stabilizer Option:	None
Aux XSec2:				
Top Width(ft):				
Depth(ft):				
Bot Width(ft):	10.000	10.000		
LtSdSlp(h/v):	2.00	2.00		
RtSdSlp(h/v):	2.00	2.00		

Name:	CI95AB	From Node:	CI95A	Length(ft):	1140.00
Group:	BASE	To Node:	CI95B	Count:	1

	UPSTREAM	DOWNSTREAM		
Geometry:	Trapezoidal	Trapezoidal	Friction Equation:	Automatic
Invert(ft):	15.480	13.500	Solution Algorithm:	Automatic
TClpInitZ(ft):	9999.000	9999.000	Flow:	Both
Manning's N:	0.030000	0.030000	Contraction Coef:	0.100
Top Clip(ft):	0.000	0.000	Expansion Coef:	0.300
Bot Clip(ft):	0.000	0.000	Entrance Loss Coef:	0.000
Main XSec:			Exit Loss Coef:	0.000
AuxElev1(ft):			Outlet Ctrl Spec:	Use dc or tw
Aux XSec1:			Inlet Ctrl Spec:	Use dc
			Stabilizer Option:	None

AuxElev2(ft):		
Aux XSec2:		
Top Width(ft):		
Depth(ft):		
Bot Width(ft):	5.000	5.000
LtSdSlp(h/v):	2.00	2.00
RtSdSlp(h/v):	2.00	2.00

Name:	CI95CD	From Node:	CI95C	Length(ft): 216.00
Group:	BASE	To Node:	CI95D	Count: 1

	UPSTREAM	DOWNSTREAM		
Geometry:	Trapezoidal	Trapezoidal	Friction Equation:	Automatic
Invert(ft):	13.500	13.500	Solution Algorithm:	Automatic
TClpInitZ(ft):	9999.000	9999.000	Flow:	Both
Manning's N:	0.030000	0.030000	Contraction Coef:	0.100
Top Clip(ft):	0.000	0.000	Expansion Coef:	0.300
Bot Clip(ft):	0.000	0.000	Entrance Loss Coef:	0.000
Main XSec:			Exit Loss Coef:	0.000
AuxElev1(ft):			Outlet Ctrl Spec:	Use dc or tw
Aux XSec1:			Inlet Ctrl Spec:	Use dc
AuxElev2(ft):			Stabilizer Option:	None
Aux XSec2:				
Top Width(ft):				
Depth(ft):				
Bot Width(ft):	20.000	20.000		
LtSdSlp(h/v):	2.00	2.00		
RtSdSlp(h/v):	2.00	2.00		

Name:	CI95EF	From Node:	CI95E	Length(ft): 314.00
Group:	BASE	To Node:	CI95F	Count: 1

	UPSTREAM	DOWNSTREAM		
Geometry:	Trapezoidal	Trapezoidal	Friction Equation:	Automatic
Invert(ft):	13.500	13.500	Solution Algorithm:	Automatic
TClpInitZ(ft):	9999.000	9999.000	Flow:	Both
Manning's N:	0.030000	0.030000	Contraction Coef:	0.100
Top Clip(ft):	0.000	0.000	Expansion Coef:	0.300
Bot Clip(ft):	0.000	0.000	Entrance Loss Coef:	0.000
Main XSec:			Exit Loss Coef:	0.000
AuxElev1(ft):			Outlet Ctrl Spec:	Use dc or tw
Aux XSec1:			Inlet Ctrl Spec:	Use dc
AuxElev2(ft):			Stabilizer Option:	None
Aux XSec2:				
Top Width(ft):				
Depth(ft):				
Bot Width(ft):	20.000	20.000		
LtSdSlp(h/v):	2.00	2.00		
RtSdSlp(h/v):	2.00	2.00		

Name:	CI95GH	From Node:	CI95G	Length(ft): 461.00
Group:	BASE	To Node:	CI95H	Count: 1

	UPSTREAM	DOWNSTREAM		
Geometry:	Trapezoidal	Trapezoidal	Friction Equation:	Automatic
Invert(ft):	13.500	13.500	Solution Algorithm:	Automatic
TClpInitZ(ft):	9999.000	9999.000	Flow:	Both
Manning's N:	0.030000	0.030000	Contraction Coef:	0.100
Top Clip(ft):	0.000	0.000	Expansion Coef:	0.300
Bot Clip(ft):	0.000	0.000	Entrance Loss Coef:	0.000
Main XSec:			Exit Loss Coef:	0.000
AuxElev1(ft):			Outlet Ctrl Spec:	Use dc or tw
Aux XSec1:			Inlet Ctrl Spec:	Use dc
AuxElev2(ft):			Stabilizer Option:	None
Aux XSec2:				
Top Width(ft):				
Depth(ft):				
Bot Width(ft):	25.000	25.000		
LtSdSlp(h/v):	2.00	2.00		
RtSdSlp(h/v):	2.00	2.00		

Name:	CLTCAB	From Node:	CLTCA	Length(ft): 1207.00
Group:	BASE	To Node:	CLTCB	Count: 1

	UPSTREAM	DOWNSTREAM		
Geometry:	Trapezoidal	Trapezoidal	Friction Equation:	Automatic
Invert(ft):	13.500	13.450	Solution Algorithm:	Automatic
TClpInitZ(ft):	9999.000	9999.000	Flow:	Both
Manning's N:	0.030000	0.030000	Contraction Coef:	0.100
Top Clip(ft):	0.000	0.000	Expansion Coef:	0.300
Bot Clip(ft):	0.000	0.000	Entrance Loss Coef:	0.000
Main XSec:			Exit Loss Coef:	0.000
AuxElev1(ft):			Outlet Ctrl Spec:	Use dc or tw
Aux XSec1:			Inlet Ctrl Spec:	Use dc
AuxElev2(ft):			Stabilizer Option:	None
Aux XSec2:				
Top Width(ft):				
Depth(ft):				
Bot Width(ft):	10.000	10.000		
LtSdSlp(h/v):	2.00	2.00		
RtSdSlp(h/v):	2.00	2.00		

Name: CLTCCD From Node: CLTCC Length(ft): 632.00
Group: BASE To Node: CLTCD Count: 1

	UPSTREAM	DOWNSTREAM		
Geometry:	Trapezoidal	Trapezoidal	Friction Equation:	Automatic
Invert(ft):	13.450	13.400	Solution Algorithm:	Automatic
TClpInitZ(ft):	9999.000	9999.000	Flow:	Both
Manning's N:	0.030000	0.030000	Contraction Coef:	0.100
Top Clip(ft):	0.000	0.000	Expansion Coef:	0.300
Bot Clip(ft):	0.000	0.000	Entrance Loss Coef:	0.000
Main XSec:			Exit Loss Coef:	0.000
AuxElev1(ft):			Outlet Ctrl Spec:	Use dc or tw
Aux XSec1:			Inlet Ctrl Spec:	Use dc
AuxElev2(ft):			Stabilizer Option:	None
Aux XSec2:				
Top Width(ft):				
Depth(ft):				
Bot Width(ft):	10.000	10.000		
LtSdSlp(h/v):	2.00	2.00		
RtSdSlp(h/v):	2.00	2.00		

Name: CMILNAB From Node: CMILNA Length(ft): 275.00
Group: BASE To Node: CMILNB Count: 1

	UPSTREAM	DOWNSTREAM		
Geometry:	Trapezoidal	Trapezoidal	Friction Equation:	Automatic
Invert(ft):	8.970	12.230	Solution Algorithm:	Automatic
TClpInitZ(ft):	9999.000	9999.000	Flow:	Both
Manning's N:	0.030000	0.030000	Contraction Coef:	0.100
Top Clip(ft):	0.000	0.000	Expansion Coef:	0.300
Bot Clip(ft):	0.000	0.000	Entrance Loss Coef:	0.000
Main XSec:			Exit Loss Coef:	0.000
AuxElev1(ft):			Outlet Ctrl Spec:	Use dc or tw
Aux XSec1:			Inlet Ctrl Spec:	Use dc
AuxElev2(ft):			Stabilizer Option:	None
Aux XSec2:				
Top Width(ft):				
Depth(ft):				
Bot Width(ft):	11.000	11.000		
LtSdSlp(h/v):	1.00	1.00		
RtSdSlp(h/v):	1.00	1.00		

Name: CMILNBC From Node: CMILNB Length(ft): 387.00
Group: BASE To Node: CMILNC Count: 1

	UPSTREAM	DOWNSTREAM		
Geometry:	Trapezoidal	Trapezoidal	Friction Equation:	Automatic
Invert(ft):	12.230	10.330	Solution Algorithm:	Automatic
TClpInitZ(ft):	9999.000	9999.000	Flow:	Both
Manning's N:	0.030000	0.030000	Contraction Coef:	0.100
Top Clip(ft):	0.000	0.000	Expansion Coef:	0.300
Bot Clip(ft):	0.000	0.000	Entrance Loss Coef:	0.000
Main XSec:			Exit Loss Coef:	0.000
AuxElev1(ft):			Outlet Ctrl Spec:	Use dc or tw
Aux XSec1:			Inlet Ctrl Spec:	Use dc
AuxElev2(ft):			Stabilizer Option:	None
Aux XSec2:				

Top Width(ft):		
Depth(ft):		
Bot Width(ft):	12.000	12.000
LtSdSlp(h/v):	1.00	1.00
RtSdSlp(h/v):	1.00	1.00

Name:	COUT123AB	From Node:	COUT123A	Length(ft): 83.00
Group:	BASE	To Node:	COUT123B	Count: 1

	UPSTREAM	DOWNSTREAM		
			Friction Equation:	Automatic
Geometry:	Trapezoidal	Trapezoidal	Solution Algorithm:	Automatic
Invert(ft):	7.230	6.620	Flow:	Both
TClpInitZ(ft):	9999.000	9999.000	Contraction Coef:	0.100
Manning's N:	0.030000	0.030000	Expansion Coef:	0.300
Top Clip(ft):	0.000	0.000	Entrance Loss Coef:	0.000
Bot Clip(ft):	0.000	0.000	Exit Loss Coef:	0.000
Main XSec:			Outlet Ctrl Spec:	Use dc or tw
AuxElev1(ft):			Inlet Ctrl Spec:	Use dc
Aux XSec1:			Stabilizer Option:	None
AuxElev2(ft):				
Aux XSec2:				
Top Width(ft):				
Depth(ft):				
Bot Width(ft):	14.000	14.000		
LtSdSlp(h/v):	1.00	1.00		
RtSdSlp(h/v):	1.00	1.00		

Name:	COUT123BC	From Node:	COUT123B	Length(ft): 2856.00
Group:	BASE	To Node:	COUT123C	Count: 1

	UPSTREAM	DOWNSTREAM		
			Friction Equation:	Automatic
Geometry:	Trapezoidal	Trapezoidal	Solution Algorithm:	Automatic
Invert(ft):	6.620	2.000	Flow:	Both
TClpInitZ(ft):	9999.000	9999.000	Contraction Coef:	0.100
Manning's N:	0.030000	0.030000	Expansion Coef:	0.300
Top Clip(ft):	0.000	0.000	Entrance Loss Coef:	0.000
Bot Clip(ft):	0.000	0.000	Exit Loss Coef:	0.000
Main XSec:			Outlet Ctrl Spec:	Use dc or tw
AuxElev1(ft):			Inlet Ctrl Spec:	Use dc
Aux XSec1:			Stabilizer Option:	None
AuxElev2(ft):				
Aux XSec2:				
Top Width(ft):				
Depth(ft):				
Bot Width(ft):	14.000	14.000		
LtSdSlp(h/v):	1.00	1.00		
RtSdSlp(h/v):	1.00	1.00		

Name:	CSEDCORPB	From Node:	Sediment Site	Length(ft): 630.00
Group:	BASE	To Node:	CCORPB	Count: 1

	UPSTREAM	DOWNSTREAM		
			Friction Equation:	Automatic
Geometry:	Trapezoidal	Trapezoidal	Solution Algorithm:	Automatic
Invert(ft):	14.050	13.000	Flow:	Both
TClpInitZ(ft):	9999.000	9999.000	Contraction Coef:	0.100
Manning's N:	0.030000	0.030000	Expansion Coef:	0.300
Top Clip(ft):	0.000	0.000	Entrance Loss Coef:	0.000
Bot Clip(ft):	0.000	0.000	Exit Loss Coef:	0.000
Main XSec:			Outlet Ctrl Spec:	Use dc or tw
AuxElev1(ft):			Inlet Ctrl Spec:	Use dc
Aux XSec1:			Stabilizer Option:	None
AuxElev2(ft):				
Aux XSec2:				
Top Width(ft):				
Depth(ft):				
Bot Width(ft):	15.000	15.000		
LtSdSlp(h/v):	1.00	1.00		
RtSdSlp(h/v):	1.00	1.00		

Name:	CSELVAB	From Node:	CSELVA	Length(ft): 95.00
Group:	BASE	To Node:	CSELVB	Count: 1

	UPSTREAM	DOWNSTREAM		
			Friction Equation:	Automatic

Geometry:	Trapezoidal	Trapezoidal	Solution Algorithm:	Automatic
Invert(ft):	10.380	11.860	Flow:	Both
TClpInitZ(ft):	9999.000	9999.000	Contraction Coef:	0.100
Manning's N:	0.030000	0.030000	Expansion Coef:	0.300
Top Clip(ft):	0.000	0.000	Entrance Loss Coef:	0.000
Bot Clip(ft):	0.000	0.000	Exit Loss Coef:	0.000
Main XSec:			Outlet Ctrl Spec:	Use dc or tw
AuxElev1(ft):			Inlet Ctrl Spec:	Use dc
Aux XSec1:			Stabilizer Option:	None
AuxElev2(ft):				
Aux XSec2:				
Top Width(ft):				
Depth(ft):				
Bot Width(ft):	11.000	11.000		
LtSdSlp(h/v):	1.00	1.00		
RtSdSlp(h/v):	1.00	1.00		

Name:	CSELVBC	From Node:	CSELVB	Length(ft): 1070.00
Group:	BASE	To Node:	CSELVC	Count: 1

	UPSTREAM	DOWNSTREAM		
			Friction Equation:	Automatic
Geometry:	Trapezoidal	Trapezoidal	Solution Algorithm:	Automatic
Invert(ft):	11.860	11.100	Flow:	Both
TClpInitZ(ft):	9999.000	9999.000	Contraction Coef:	0.100
Manning's N:	0.030000	0.030000	Expansion Coef:	0.300
Top Clip(ft):	0.000	0.000	Entrance Loss Coef:	0.000
Bot Clip(ft):	0.000	0.000	Exit Loss Coef:	0.000
Main XSec:			Outlet Ctrl Spec:	Use dc or tw
AuxElev1(ft):			Inlet Ctrl Spec:	Use dc
Aux XSec1:			Stabilizer Option:	None
AuxElev2(ft):				
Aux XSec2:				
Top Width(ft):				
Depth(ft):				
Bot Width(ft):	12.000	12.000		
LtSdSlp(h/v):	1.00	1.00		
RtSdSlp(h/v):	1.00	1.00		

Name:	CSELVCD	From Node:	CSELVC	Length(ft): 380.00
Group:	BASE	To Node:	CSELVD	Count: 1

	UPSTREAM	DOWNSTREAM		
			Friction Equation:	Automatic
Geometry:	Trapezoidal	Trapezoidal	Solution Algorithm:	Automatic
Invert(ft):	11.100	10.520	Flow:	Both
TClpInitZ(ft):	9999.000	9999.000	Contraction Coef:	0.100
Manning's N:	0.030000	0.030000	Expansion Coef:	0.300
Top Clip(ft):	0.000	0.000	Entrance Loss Coef:	0.000
Bot Clip(ft):	0.000	0.000	Exit Loss Coef:	0.000
Main XSec:			Outlet Ctrl Spec:	Use dc or tw
AuxElev1(ft):			Inlet Ctrl Spec:	Use dc
Aux XSec1:			Stabilizer Option:	None
AuxElev2(ft):				
Aux XSec2:				
Top Width(ft):				
Depth(ft):				
Bot Width(ft):	13.000	13.000		
LtSdSlp(h/v):	1.00	1.00		
RtSdSlp(h/v):	1.00	1.00		

Name:	CSELVDE	From Node:	CSELVD	Length(ft): 1025.00
Group:	BASE	To Node:	CSELVE	Count: 1

	UPSTREAM	DOWNSTREAM		
			Friction Equation:	Automatic
Geometry:	Trapezoidal	Trapezoidal	Solution Algorithm:	Automatic
Invert(ft):	10.520	11.130	Flow:	Both
TClpInitZ(ft):	9999.000	9999.000	Contraction Coef:	0.100
Manning's N:	0.030000	0.030000	Expansion Coef:	0.300
Top Clip(ft):	0.000	0.000	Entrance Loss Coef:	0.000
Bot Clip(ft):	0.000	0.000	Exit Loss Coef:	0.000
Main XSec:			Outlet Ctrl Spec:	Use dc or tw
AuxElev1(ft):			Inlet Ctrl Spec:	Use dc
Aux XSec1:			Stabilizer Option:	None
AuxElev2(ft):				
Aux XSec2:				
Top Width(ft):				
Depth(ft):				

Bot Width(ft):	14.000	14.000
LtSdSlp(h/v):	1.00	1.00
RtSdSlp(h/v):	1.00	1.00

Name:	CSELVEF	From Node:	CSELVE	Length(ft): 500.00
Group:	BASE	To Node:	CSELVF	Count: 1

	UPSTREAM	DOWNSTREAM		
			Friction Equation:	Automatic
Geometry:	Trapezoidal	Trapezoidal	Solution Algorithm:	Automatic
Invert(ft):	11.130	10.870	Flow:	Both
TClpInitZ(ft):	9999.000	9999.000	Contraction Coef:	0.100
Manning's N:	0.030000	0.030000	Expansion Coef:	0.300
Top Clip(ft):	0.000	0.000	Entrance Loss Coef:	0.000
Bot Clip(ft):	0.000	0.000	Exit Loss Coef:	0.000
Main XSec:			Outlet Ctrl Spec:	Use dc or tw
AuxElev1(ft):			Inlet Ctrl Spec:	Use dc
Aux XSec1:			Stabilizer Option:	None
AuxElev2(ft):				
Aux XSec2:				
Top Width(ft):				
Depth(ft):				
Bot Width(ft):	14.000	14.000		
LtSdSlp(h/v):	1.00	1.00		
RtSdSlp(h/v):	1.00	1.00		

Name:	CSELVFG	From Node:	CSELVF	Length(ft): 825.00
Group:	BASE	To Node:	CSELVG	Count: 1

	UPSTREAM	DOWNSTREAM		
			Friction Equation:	Automatic
Geometry:	Trapezoidal	Trapezoidal	Solution Algorithm:	Automatic
Invert(ft):	10.870	8.530	Flow:	Both
TClpInitZ(ft):	9999.000	9999.000	Contraction Coef:	0.100
Manning's N:	0.030000	0.030000	Expansion Coef:	0.300
Top Clip(ft):	0.000	0.000	Entrance Loss Coef:	0.000
Bot Clip(ft):	0.000	0.000	Exit Loss Coef:	0.000
Main XSec:			Outlet Ctrl Spec:	Use dc or tw
AuxElev1(ft):			Inlet Ctrl Spec:	Use dc
Aux XSec1:			Stabilizer Option:	None
AuxElev2(ft):				
Aux XSec2:				
Top Width(ft):				
Depth(ft):				
Bot Width(ft):	15.000	15.000		
LtSdSlp(h/v):	1.00	1.00		
RtSdSlp(h/v):	1.00	1.00		

Name:	CSELVGH	From Node:	CSELVG	Length(ft): 31.00
Group:	BASE	To Node:	CSELVH	Count: 1

	UPSTREAM	DOWNSTREAM		
			Friction Equation:	Automatic
Geometry:	Trapezoidal	Trapezoidal	Solution Algorithm:	Automatic
Invert(ft):	8.530	7.720	Flow:	Both
TClpInitZ(ft):	9999.000	9999.000	Contraction Coef:	0.100
Manning's N:	0.030000	0.030000	Expansion Coef:	0.300
Top Clip(ft):	0.000	0.000	Entrance Loss Coef:	0.000
Bot Clip(ft):	0.000	0.000	Exit Loss Coef:	0.000
Main XSec:			Outlet Ctrl Spec:	Use dc or tw
AuxElev1(ft):			Inlet Ctrl Spec:	Use dc
Aux XSec1:			Stabilizer Option:	None
AuxElev2(ft):				
Aux XSec2:				
Top Width(ft):				
Depth(ft):				
Bot Width(ft):	9.000	9.000		
LtSdSlp(h/v):	1.00	1.00		
RtSdSlp(h/v):	1.00	1.00		

Name:	CSPUR	From Node:	CSPUR	Length(ft): 1927.00
Group:	BASE	To Node:	CBENDC	Count: 1

	UPSTREAM	DOWNSTREAM		
			Friction Equation:	Automatic
Geometry:	Trapezoidal	Trapezoidal	Solution Algorithm:	Automatic
Invert(ft):	7.390	7.390	Flow:	Both

TClpInitZ(ft):	9999.000	9999.000	Contraction Coef:	0.100
Manning's N:	0.030000	0.030000	Expansion Coef:	0.300
Top Clip(ft):	0.000	0.000	Entrance Loss Coef:	0.000
Bot Clip(ft):	0.000	0.000	Exit Loss Coef:	0.000
Main XSec:			Outlet Ctrl Spec:	Use dc or tw
AuxElev1(ft):			Inlet Ctrl Spec:	Use dc
Aux XSec1:			Stabilizer Option:	None
AuxElev2(ft):				
Aux XSec2:				
Top Width(ft):				
Depth(ft):				
Bot Width(ft):	14.000	14.000		
LtSdSlp(h/v):	1.00	1.00		
RtSdSlp(h/v):	1.00	1.00		

Name:	CSUBAB	From Node: CSUBSA	Length(ft):	3600.00
Group:	BASE	To Node: CSUBSB	Count:	1
	UPSTREAM	DOWNSTREAM	Friction Equation:	Automatic
Geometry:	Trapezoidal	Trapezoidal	Solution Algorithm:	Automatic
Invert(ft):	17.500	15.500	Flow:	Both
TClpInitZ(ft):	9999.000	9999.000	Contraction Coef:	0.100
Manning's N:	0.030000	0.030000	Expansion Coef:	0.300
Top Clip(ft):	0.000	0.000	Entrance Loss Coef:	0.000
Bot Clip(ft):	0.000	0.000	Exit Loss Coef:	0.000
Main XSec:			Outlet Ctrl Spec:	Use dc or tw
AuxElev1(ft):			Inlet Ctrl Spec:	Use dc
Aux XSec1:			Stabilizer Option:	None
AuxElev2(ft):				
Aux XSec2:				
Top Width(ft):				
Depth(ft):				
Bot Width(ft):	5.000	5.000		
LtSdSlp(h/v):	2.00	2.00		
RtSdSlp(h/v):	2.00	2.00		

Name:	CTORIAB	From Node: CTORIA	Length(ft):	1167.00
Group:	BASE	To Node: CTORIB	Count:	1
	UPSTREAM	DOWNSTREAM	Friction Equation:	Automatic
Geometry:	Trapezoidal	Trapezoidal	Solution Algorithm:	Automatic
Invert(ft):	13.310	13.250	Flow:	Both
TClpInitZ(ft):	9999.000	9999.000	Contraction Coef:	0.100
Manning's N:	0.030000	0.030000	Expansion Coef:	0.300
Top Clip(ft):	0.000	0.000	Entrance Loss Coef:	0.000
Bot Clip(ft):	0.000	0.000	Exit Loss Coef:	0.000
Main XSec:			Outlet Ctrl Spec:	Use dc or tw
AuxElev1(ft):			Inlet Ctrl Spec:	Use dc
Aux XSec1:			Stabilizer Option:	None
AuxElev2(ft):				
Aux XSec2:				
Top Width(ft):				
Depth(ft):				
Bot Width(ft):	5.000	5.000		
LtSdSlp(h/v):	2.00	2.00		
RtSdSlp(h/v):	2.00	2.00		

Name:	CTURNAB	From Node: CTURNA	Length(ft):	1233.00
Group:	BASE	To Node: CTURNB	Count:	1
	UPSTREAM	DOWNSTREAM	Friction Equation:	Automatic
Geometry:	Trapezoidal	Trapezoidal	Solution Algorithm:	Automatic
Invert(ft):	13.250	13.200	Flow:	Both
TClpInitZ(ft):	9999.000	9999.000	Contraction Coef:	0.100
Manning's N:	0.030000	0.030000	Expansion Coef:	0.300
Top Clip(ft):	0.000	0.000	Entrance Loss Coef:	0.000
Bot Clip(ft):	0.000	0.000	Exit Loss Coef:	0.000
Main XSec:			Outlet Ctrl Spec:	Use dc or tw
AuxElev1(ft):			Inlet Ctrl Spec:	Use dc
Aux XSec1:			Stabilizer Option:	None
AuxElev2(ft):				
Aux XSec2:				
Top Width(ft):				
Depth(ft):				
Bot Width(ft):	5.000	5.000		
LtSdSlp(h/v):	2.00	2.00		

```
  RtSdSlp(h/v): 2.00           2.00


-------------------------------------------------------------------------------------------------
          Name: WestLTC             From Node: WestLTC           Length(ft): 705.00
         Group: BASE                  To Node: CSUBSA                Count: 1

                UPSTREAM       DOWNSTREAM                 Friction Equation: Automatic
      Geometry: Trapezoidal    Trapezoidal               Solution Algorithm: Automatic
    Invert(ft): 17.500         17.500                               Flow: Both
 TClpInitZ(ft): 9999.000       9999.000                  Contraction Coef: 0.100
   Manning's N: 0.030000       0.030000                    Expansion Coef: 0.300
  Top Clip(ft): 0.000          0.000                    Entrance Loss Coef: 0.000
  Bot Clip(ft): 0.000          0.000                        Exit Loss Coef: 0.000
     Main XSec:                                          Outlet Ctrl Spec: Use dc or tw
  AuxElev1(ft):                                           Inlet Ctrl Spec: Use dc
     Aux XSec1:                                         Stabilizer Option: None
  AuxElev2(ft):
     Aux XSec2:
 Top Width(ft):
     Depth(ft):
 Bot Width(ft): 5.000          5.000
  LtSdSlp(h/v): 2.00           2.00
  RtSdSlp(h/v): 2.00           2.00


=================================================================================================
==== Drop Structures ============================================================================
=================================================================================================

          Name: Horizon             From Node: HorizonPond       Length(ft): 35.00
         Group: BASE                  To Node: CD-201A               Count: 1

                UPSTREAM       DOWNSTREAM                 Friction Equation: Automatic
      Geometry: Circular       Circular                  Solution Algorithm: Most Restrictive
      Span(in): 24.00          24.00                                Flow: Both
      Rise(in): 24.00          24.00                    Entrance Loss Coef: 0.200
    Invert(ft): 13.790         13.660                       Exit Loss Coef: 1.000
   Manning's N: 0.022000       0.022000                  Outlet Ctrl Spec: Use dc or tw
 Top Clip(in): 0.000          0.000                       Inlet Ctrl Spec: Use dc
 Bot Clip(in): 0.000          0.000                         Solution Incs: 10

Upstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

Downstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

Converted from NGVD to NAVD

*** Weir 1 of 2 for Drop Structure Horizon ***
                                                                                    TABLE
                 Count: 1                        Bottom Clip(ft): 0.000
                  Type: Vertical: Mavis             Top Clip(ft): 0.000
                  Flow: Both                     Weir Disc Coef: 3.200
              Geometry: Trapezoidal           Orifice Disc Coef: 0.600

       Bottom Width(ft): 0.00                          Invert(ft): 15.000
       Left Sd Slp(h/v): 0.17                   Control Elev(ft): 15.000
      Right Sd Slp(h/v): 0.17              Struct Opening Dim(ft): 9999.00

*** Weir 2 of 2 for Drop Structure Horizon ***
                                                                                    TABLE
                 Count: 1                        Bottom Clip(in): 0.000
                  Type: Vertical: Mavis             Top Clip(in): 0.000
                  Flow: Both                     Weir Disc Coef: 3.200
              Geometry: Rectangular           Orifice Disc Coef: 0.600

              Span(in): 12.00                          Invert(ft): 16.300
              Rise(in): 999.00                 Control Elev(ft): 16.300


-------------------------------------------------------------------------------------------------
          Name: Police              From Node: PolicePond        Length(ft): 140.00
         Group: BASE                  To Node: CSELVD                Count: 1

                UPSTREAM       DOWNSTREAM                 Friction Equation: Automatic
      Geometry: Circular       Circular                  Solution Algorithm: Most Restrictive
      Span(in): 24.00          24.00                                Flow: Both
      Rise(in): 24.00          24.00                    Entrance Loss Coef: 0.200
    Invert(ft): 12.000         10.520                       Exit Loss Coef: 1.000
   Manning's N: 0.012000       0.012000                  Outlet Ctrl Spec: Use dc or tw
 Top Clip(in): 0.000          0.000                       Inlet Ctrl Spec: Use dc
```

Bot Clip(in): 0.000 0.000 Solution Incs: 10

Upstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

Downstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

Converted from NGVD to NAVD

*** Weir 1 of 2 for Drop Structure Police ***

TABLE

Count:	1	Bottom Clip(in):	0.000
Type:	Horizontal	Top Clip(in):	0.000
Flow:	Both	Weir Disc Coef:	3.200
Geometry:	Circular	Orifice Disc Coef:	0.600
Span(in):	3.50	Invert(ft):	14.000
Rise(in):	3.50	Control Elev(ft):	14.000

*** Weir 2 of 2 for Drop Structure Police ***

TABLE

Count:	1	Bottom Clip(in):	0.000
Type:	Vertical: Mavis	Top Clip(in):	0.000
Flow:	Both	Weir Disc Coef:	3.200
Geometry:	Rectangular	Orifice Disc Coef:	0.600
Span(in):	10.00	Invert(ft):	17.250
Rise(in):	999.00	Control Elev(ft):	17.250

Name:	PostOffice	From Node:	PostOfficePond	Length(ft):	27.00
Group:	BASE	To Node:	CD-200A	Count:	1

	UPSTREAM	DOWNSTREAM		
Geometry:	Circular	Circular	Friction Equation:	Automatic
Span(in):	12.00	12.00	Solution Algorithm:	Most Restrictive
Rise(in):	12.00	12.00	Flow:	Both
Invert(ft):	14.380	12.510	Entrance Loss Coef:	0.200
Manning's N:	0.012000	0.012000	Exit Loss Coef:	1.000
Top Clip(in):	0.000	0.000	Outlet Ctrl Spec:	Use dc or tw
Bot Clip(in):	0.000	0.000	Inlet Ctrl Spec:	Use dc
			Solution Incs:	10

Upstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

Downstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

*** Weir 1 of 2 for Drop Structure PostOffice ***

TABLE

Count:	1	Bottom Clip(in):	0.000
Type:	Horizontal	Top Clip(in):	0.000
Flow:	Both	Weir Disc Coef:	3.200
Geometry:	Circular	Orifice Disc Coef:	0.600
Span(in):	3.00	Invert(ft):	14.800
Rise(in):	3.00	Control Elev(ft):	14.800

*** Weir 2 of 2 for Drop Structure PostOffice ***

TABLE

Count:	1	Bottom Clip(in):	0.000
Type:	Vertical: Mavis	Top Clip(in):	0.000
Flow:	Both	Weir Disc Coef:	3.200
Geometry:	Rectangular	Orifice Disc Coef:	0.600
Span(in):	8.00	Invert(ft):	17.650
Rise(in):	999.00	Control Elev(ft):	17.650

==========
==== Weirs ==========
==========

Name:	LTCRanch	From Node:	OffLTC
Group:	BASE	To Node:	CLTCA
Flow:	Both	Count:	1
Type:	Vertical: Mavis	Geometry:	Trapezoidal
Bottom Width(ft):	0.00		
Left Side Slope(h/v):	300.00		
Right Side Slope(h/v):	300.00		

```
                 Invert(ft): 18.700
       Control Elevation(ft): 18.700
      Struct Opening Dim(ft): 9999.00
                                        TABLE
             Bottom Clip(ft): 0.000
                Top Clip(ft): 0.000
          Weir Discharge Coef: 3.200
      Orifice Discharge Coef: 0.600



================================================================================
==== Hydrology Simulations =====================================================
================================================================================

         Name: 025y-072h
     Filename: C:\21340000000\DRAINAGE\ICPR-EX\025y-072h.R32

      Override Defaults: Yes
    Storm Duration(hrs): 72.00
          Rainfall File: Sfwmd72
    Rainfall Amount(in): 9.50

Time(hrs)       Print Inc(min)
--------------- ---------------
74.000          5.00

--------------------------------------------------------------------------------------------------------
         Name: fdot 050y-024h
     Filename: C:\21340000000\DRAINAGE\ICPR-EX\fdot 050y-024h.R32

      Override Defaults: Yes
    Storm Duration(hrs): 24.00
          Rainfall File: Fdot-24
    Rainfall Amount(in): 10.80

Time(hrs)       Print Inc(min)
--------------- ---------------
30.000          5.00

--------------------------------------------------------------------------------------------------------
         Name: fdot 100y-024h
     Filename: C:\21340000000\DRAINAGE\ICPR-EX\fdot 100y-024h.R32

      Override Defaults: Yes
    Storm Duration(hrs): 24.00
          Rainfall File: Fdot-24
    Rainfall Amount(in): 12.30

Time(hrs)       Print Inc(min)
--------------- ---------------
30.000          5.00

================================================================================
==== Routing Simulations =======================================================
================================================================================

         Name: 025y-072h           Hydrology Sim: 025y-072h
     Filename: C:\21340000000\DRAINAGE\ICPR-EX\025y-072h.I32

      Execute: Yes         Restart: No            Patch: No
  Alternative: No

        Max Delta Z(ft): 1.00                    Delta Z Factor: 0.00500
    Time Step Optimizer: 10.000
       Start Time(hrs): 0.000                     End Time(hrs): 80.00
     Min Calc Time(sec): 0.5000               Max Calc Time(sec): 60.0000
        Boundary Stages:                         Boundary Flows:



Time(hrs)       Print Inc(min)
--------------- ---------------
24.000          30.000
50.000          5.000
70.000          15.000
150.000         30.000

Group           Run
--------------- -----
BASE            Yes


--------------------------------------------------------------------------------------------------------
         Name: fdot 050y-024h      Hydrology Sim: fdot 050y-024h
```

Filename: C:\21340000000\DRAINAGE\ICPR-EX\fdot 050y-024h.I32

Execute: Yes Restart: No Patch: No
Alternative: No

Max Delta Z(ft): 1.00 Delta Z Factor: 0.00500
Time Step Optimizer: 10.000
Start Time(hrs): 0.000 End Time(hrs): 30.00
Min Calc Time(sec): 0.5000 Max Calc Time(sec): 60.0000
Boundary Stages: Boundary Flows:

Time(hrs)	Print Inc(min)
11.000	30.000
16.000	5.000
24.000	15.000
150.000	30.000

Group	Run
BASE	Yes

Name: fdot 100y-024h Hydrology Sim: fdot 100y-024h
Filename: C:\21340000000\DRAINAGE\ICPR-EX\fdot 100y-024h.I32

Execute: Yes Restart: No Patch: No
Alternative: No

Max Delta Z(ft): 1.00 Delta Z Factor: 0.00500
Time Step Optimizer: 10.000
Start Time(hrs): 0.000 End Time(hrs): 30.00
Min Calc Time(sec): 0.5000 Max Calc Time(sec): 60.0000
Boundary Stages: Boundary Flows:

Time(hrs)	Print Inc(min)
11.000	30.000
16.000	5.000
24.000	15.000
150.000	30.000

Group	Run
BASE	Yes

Name	Group	Simulation	Max Time Stage hrs	Max Stage ft	Warning Stage ft	Max Delta Stage ft	Max Surf Area ft2	Max Time Inflow hrs	Max Inflow cfs	Max Time Outflow hrs	Max Outflow cfs
CBENDA	BASE	025y-072h	62.83	13.65	14.90	0.0009	5942	63.35	165.89	63.37	166.06
CBENDB	BASE	025y-072h	62.81	13.60	14.90	0.0009	25851	63.05	175.54	63.21	176.00
CBENDC	BASE	025y-072h	62.80	13.52	14.40	0.0010	60998	62.89	195.23	63.21	196.24
CCHRI	BASE	025y-072h	62.77	13.38	14.20	0.0010	33342	62.57	218.68	62.77	218.47
CCHURA	BASE	025y-072h	63.00	14.62	16.00	0.0020	10913	66.16	186.39	62.98	161.54
CCHURB	BASE	025y-072h	63.00	14.59	16.00	0.0009	32500	62.98	161.54	63.26	161.89
CCORPA	BASE	025y-072h	61.85	17.04	18.00	-0.0046	2001	61.32	124.58	61.34	124.44
CCORPB	BASE	025y-072h	62.09	16.62	18.00	0.0016	24475	61.34	154.97	61.44	152.58
CCORPC	BASE	025y-072h	62.21	16.38	18.00	-0.0092	3123	61.44	152.58	61.45	152.28
CD-100A	BASE	025y-072h	61.50	17.92	19.57	-0.0103	118	61.25	31.18	61.26	31.16
CD-100B	BASE	025y-072h	61.61	17.16	19.57	0.0113	120	61.26	31.16	61.26	31.15
CD-200A	BASE	025y-072h	63.00	17.44	18.51	-0.0086	16907	61.25	10.48	74.00	8.36
CD-200B	BASE	025y-072h	63.00	17.40	18.51	0.0078	121	74.00	8.36	63.67	8.00
CD-201A	BASE	025y-072h	63.01	15.33	18.24	0.0004	7229	68.18	1.53	64.72	1.93
CD-201B	BASE	025y-072h	62.98	15.32	18.54	0.0005	165	61.00	3.00	61.00	2.94
CD-202A	BASE	025y-072h	60.85	17.92	18.18	0.0014	9753	60.25	11.37	60.16	6.01
CD-202B	BASE	025y-072h	62.06	16.69	18.18	0.0029	698	60.16	6.01	60.58	5.47
CD-203A	BASE	025y-072h	0.00	18.00	18.46	-0.0925	117	0.00	0.00	0.00	21.77
CD-203B	BASE	025y-072h	60.97	15.92	18.46	0.0947	185	0.00	33.49	61.04	13.20
CD-203C	BASE	025y-072h	60.48	17.40	18.50	-0.0457	4654	60.33	13.20	60.47	12.94
CD-203D	BASE	025y-072h	61.35	16.03	18.46	0.0025	39096	60.33	8.77	62.37	5.15
CD-203E	BASE	025y-072h	62.63	15.28	18.46	0.0131	127	61.04	13.20	61.07	13.12
CD-300A	BASE	025y-072h	62.32	14.08	16.32	0.0028	117	60.25	13.30	60.27	13.21
CD-300B	BASE	025y-072h	62.71	13.99	16.32	0.0017	119	60.27	13.21	60.27	13.14
CD-301	BASE	025y-072h	60.75	14.71	16.19	0.0024	116	60.50	19.14	60.53	19.07
CDUNNA	BASE	025y-072h	62.92	13.96	15.60	0.0077	2405	63.26	162.18	62.22	225.56
CDUNNB	BASE	025y-072h	62.91	13.95	15.60	0.0017	13647	62.22	229.79	63.23	164.73
CDUNNC	BASE	025y-072h	62.91	13.95	14.40	0.0009	21228	63.23	164.73	63.35	165.24
CFECRA	BASE	025y-072h	61.99	18.49	19.63	0.0007	36091	60.82	82.09	66.52	77.37
CFECRB	BASE	025y-072h	62.00	18.40	19.63	0.0007	107475	66.52	77.37	66.44	78.96
CI95A	BASE	025y-072h	61.19	19.74	21.31	0.0027	42558	60.17	104.70	60.23	86.47
CI95B	BASE	025y-072h	61.23	19.67	21.31	0.0013	44501	60.23	86.47	60.48	58.29
CI95C	BASE	025y-072h	61.24	19.54	21.21	-0.0071	4913	60.48	92.84	62.30	161.24
CI95D	BASE	025y-072h	61.24	19.54	21.21	0.0024	14432	62.30	161.24	60.51	82.39
CI95E	BASE	025y-072h	61.30	19.37	21.07	0.0010	6980	61.20	105.81	61.23	105.66
CI95F	BASE	025y-072h	61.30	19.36	21.07	0.0010	20401	61.23	105.66	61.28	105.44
CI95G	BASE	025y-072h	61.31	19.16	20.89	0.0010	11142	61.14	127.78	61.16	127.47
CI95H	BASE	025y-072h	61.31	19.15	20.89	0.0010	33552	61.16	127.47	61.21	126.79
CLTCA	BASE	025y-072h	61.36	19.08	20.51	0.0010	20137	60.49	128.25	60.51	118.81
CLTCB	BASE	025y-072h	61.45	19.05	20.51	0.0009	58559	60.51	118.81	60.70	90.24
CLTCC	BASE	025y-072h	61.67	18.90	20.31	0.0009	10202	60.49	96.82	60.63	92.42
CLTCD	BASE	025y-072h	61.70	18.88	20.31	0.0009	30210	60.63	92.42	60.82	82.09
CMILNA	BASE	025y-072h	62.23	16.35	18.00	-0.0050	3532	61.45	153.21	61.46	152.87
CMILNB	BASE	025y-072h	62.34	16.24	18.00	-0.0009	12667	61.46	152.87	61.51	151.62
CMILNC	BASE	025y-072h	62.43	16.14	17.50	0.0007	13315	61.51	151.62	61.56	150.26
COUT123A	BASE	025y-072h	60.99	10.59	13.60	0.0013	1093	62.55	225.94	62.56	225.98
COUT123B	BASE	025y-072h	60.94	10.53	13.60	0.0013	34525	60.85	291.90	60.93	291.61
COUT123C	BASE	025y-072h	61.51	6.96	9.00	0.0012	92687	60.93	291.61	61.51	286.27
CSELVA	BASE	025y-072h	62.45	16.12	17.50	0.0050	1384	61.56	150.26	61.57	150.13
CSELVB	BASE	025y-072h	62.52	16.05	17.50	0.0007	13798	61.57	150.13	61.63	148.76
CSELVC	BASE	025y-072h	62.80	15.67	16.20	0.0006	37449	61.60	157.87	61.79	152.87
CSELVD	BASE	025y-072h	62.85	15.58	14.60	0.0006	25054	61.80	154.61	61.95	151.73
CSELVE	BASE	025y-072h	62.95	15.31	14.60	0.0005	41100	61.94	154.08	62.29	149.73
CSELVF	BASE	025y-072h	62.98	15.13	16.70	0.0006	26890	62.23	154.55	62.67	152.62
CSELVG	BASE	025y-072h	62.99	15.00	17.00	0.0009	32920	62.29	162.80	62.87	161.23
CSELVH	BASE	025y-072h	63.00	14.77	18.70	0.0207	1089	62.87	161.23	66.16	186.15
CSPUR	BASE	025y-072h	62.80	13.52	14.40	0.0010	65746	60.50	52.35	60.90	27.82
CSUBSA	BASE	025y-072h	60.10	19.91	21.30	0.0007	32663	59.92	47.44	60.06	35.50

Name	Group	Simulation	Max Time Stage hrs	Max Stage ft	Warning Stage ft	Max Delta Stage ft	Max Surf Area ft2	Max Time Inflow hrs	Max Inflow cfs	Max Time Outflow hrs	Max Outflow cfs
CSUBSB	BASE	025y-072h	61.39	19.62	21.30	0.0011	95444	60.06	65.40	75.07	23.81
CTORIA	BASE	025y-072h	61.68	18.03	19.18	0.0016	14089	65.85	80.45	65.74	80.63
CTORIB	BASE	025y-072h	61.55	17.87	19.18	0.0019	40936	65.74	80.63	65.34	81.42
CTURNA	BASE	025y-072h	61.47	17.81	18.81	0.0016	14305	61.14	124.60	61.21	123.97
CTURNB	BASE	025y-072h	61.83	17.07	19.00	0.0014	38942	61.21	123.97	61.38	121.14
HorizonPond	BASE	025y-072h	68.18	16.52	18.24	0.0002	461152	60.08	40.25	68.18	1.53
OffLTC	BASE	025y-072h	65.38	19.02	20.51	0.0001	2510455	61.50	47.15	67.20	29.57
OUTFALL	BASE	025y-072h	0.00	1.52	9.00	0.0000	53	61.51	286.27	0.00	0.00
PolicePond	BASE	025y-072h	64.18	17.91	18.39	0.0007	100247	60.08	31.35	64.34	1.94
PostOfficePond	BASE	025y-072h	63.36	18.92	18.51	0.0018	154592	60.17	33.40	64.56	3.27
Sediment Site	BASE	025y-072h	61.91	16.94	18.00	0.0006	8004	61.34	124.44	61.38	123.88
SUBPONDB1A	BASE	025y-072h	62.23	22.40	22.00	0.0011	4294	60.00	2.62	60.43	0.18
SUBPONDB1B	BASE	025y-072h	64.05	22.30	22.00	0.0011	8087	60.00	4.65	69.68	0.23
WestLTC	BASE	025y-072h	70.17	19.69	21.30	0.0001	2392768	61.42	74.71	75.46	19.32
CBENDA	BASE fdot	050y-024h	16.42	13.66	14.90	0.0014	5947	17.25	164.62	17.27	164.73
CBENDB	BASE fdot	050y-024h	16.41	13.61	14.90	0.0006	25874	16.20	177.00	16.89	177.08
CBENDC	BASE fdot	050y-024h	16.41	13.53	14.40	0.0005	61048	16.37	196.31	16.81	196.77
CCHRI	BASE fdot	050y-024h	16.39	13.39	14.20	0.0005	33367	16.22	219.11	16.39	219.01
CCHURA	BASE fdot	050y-024h	16.59	14.60	16.00	0.0022	10900	23.04	189.05	16.83	158.58
CCHURB	BASE fdot	050y-024h	16.58	14.57	16.00	0.0005	32461	16.83	158.58	17.17	159.02
CCORPA	BASE fdot	050y-024h	15.47	16.91	18.00	-0.0050	1987	14.00	114.81	14.02	114.77
CCORPB	BASE fdot	050y-024h	15.92	16.50	18.00	0.0017	24219	13.92	136.01	14.10	135.07
CCORPC	BASE fdot	050y-024h	16.06	16.28	18.00	-0.0089	3113	14.10	135.07	14.13	134.95
CD-100A	BASE fdot	050y-024h	15.40	17.11	19.57	0.0098	118	13.50	21.59	13.51	21.58
CD-100B	BASE fdot	050y-024h	15.62	16.77	19.57	-0.0107	120	13.51	21.58	13.51	21.57
CD-200A	BASE fdot	050y-024h	17.56	17.32	18.51	-0.0089	15705	15.75	8.24	19.69	7.96
CD-200B	BASE fdot	050y-024h	17.54	17.27	18.51	0.0092	121	19.69	7.96	19.72	7.97
CD-201A	BASE fdot	050y-024h	16.65	15.30	18.24	0.0002	6092	22.39	2.19	22.41	2.36
CD-201B	BASE fdot	050y-024h	16.60	15.29	18.54	0.0003	170	22.41	2.36	22.42	2.38
CD-202A	BASE fdot	050y-024h	15.43	16.70	18.18	0.0009	5364	12.17	4.88	11.93	4.69
CD-202B	BASE fdot	050y-024h	15.77	16.12	18.18	0.0015	636	11.93	4.69	12.00	4.37
CD-203A	BASE fdot	050y-024h	0.00	18.00	18.46	-0.0925	117	0.00	0.00	0.00	21.77
CD-203B	BASE fdot	050y-024h	13.21	15.40	18.46	0.0947	281	0.00	33.49	13.25	8.95
CD-203C	BASE fdot	050y-024h	0.00	17.25	18.50	-0.0457	126	12.25	6.21	0.00	11.72
CD-203D	BASE fdot	050y-024h	13.47	15.50	18.46	0.0025	30990	12.25	3.97	14.05	3.57
CD-203E	BASE fdot	050y-024h	16.39	15.12	18.46	0.0131	135	13.25	8.95	13.26	8.91
CD-300A	BASE fdot	050y-024h	16.17	14.10	16.32	-0.0012	117	12.17	5.80	12.17	5.77
CD-300B	BASE fdot	050y-024h	16.31	14.01	16.32	-0.0023	119	12.17	5.77	12.17	5.75
CD-301	BASE fdot	050y-024h	15.64	13.97	16.19	0.0009	116	12.42	10.12	12.49	10.10
CDUNNA	BASE fdot	050y-024h	16.42	13.97	15.60	-0.0053	2406	17.17	159.61	15.84	230.77
CDUNNB	BASE fdot	050y-024h	16.49	13.96	15.60	0.0011	13650	15.84	234.51	14.73	164.88
CDUNNC	BASE fdot	050y-024h	16.49	13.95	14.40	0.0005	21232	14.73	164.88	17.25	163.28
CFECRA	BASE fdot	050y-024h	21.13	18.43	19.63	0.0003	35735	25.21	80.98	25.31	81.51
CFECRB	BASE fdot	050y-024h	15.35	18.31	19.63	0.0003	106275	25.31	81.51	25.44	83.32
CI95A	BASE fdot	050y-024h	15.13	19.45	21.31	0.0049	40793	12.08	55.04	12.09	48.17
CI95B	BASE fdot	050y-024h	15.16	19.38	21.31	0.0009	42733	12.09	48.17	15.16	46.52
CI95C	BASE fdot	050y-024h	21.20	19.31	21.21	-0.0072	4812	14.98	60.61	17.55	154.96
CI95D	BASE fdot	050y-024h	21.21	19.31	21.21	0.0025	14128	17.55	154.96	14.98	60.55
CI95E	BASE fdot	050y-024h	21.34	19.26	21.07	0.0006	6910	14.98	81.80	15.00	81.83
CI95F	BASE fdot	050y-024h	21.35	19.26	21.07	0.0006	20197	15.00	81.83	15.12	81.76
CI95G	BASE fdot	050y-024h	22.08	19.20	20.89	0.0007	11179	14.09	94.84	14.12	94.81
CI95H	BASE fdot	050y-024h	22.10	19.20	20.89	0.0004	33681	14.12	94.81	14.19	94.75
CLTCA	BASE fdot	050y-024h	22.24	19.19	20.51	0.0006	20384	12.43	89.41	12.45	86.15
CLTCB	BASE fdot	050y-024h	22.17	19.15	20.51	0.0004	59277	12.45	86.15	24.88	80.41
CLTCC	BASE fdot	050y-024h	22.00	18.96	20.31	0.0007	10271	12.57	81.29	24.00	80.63
CLTCD	BASE fdot	050y-024h	22.00	18.93	20.31	0.0008	30438	24.00	80.63	25.21	80.98
CMILNA	BASE fdot	050y-024h	16.07	16.26	18.00	0.0071	3514	14.13	136.39	14.16	136.26
CMILNB	BASE fdot	050y-024h	16.13	16.16	18.00	-0.0011	12561	14.16	136.26	14.27	135.76

Name	Group	Simulation	Max Time Stage hrs	Max Stage ft	Warning Stage ft	Max Delta Stage ft	Max Surf Area ft2	Max Time Inflow hrs	Max Inflow cfs	Max Time Outflow hrs	Max Outflow cfs
CMILNC	BASE	fdot 050y-024h	16.17	16.07	17.50	0.0009	13239	14.27	135.76	14.38	135.22
COUT123A	BASE	fdot 050y-024h	15.61	10.42	13.60	0.0003	1060	16.25	226.10	16.25	226.11
COUT123B	BASE	fdot 050y-024h	15.58	10.33	13.60	0.0003	34006	15.47	267.55	15.56	267.47
COUT123C	BASE	fdot 050y-024h	15.92	6.75	9.00	0.0004	91529	15.56	267.47	15.92	266.90
CSELVA	BASE	fdot 050y-024h	16.18	16.05	17.50	0.0060	1377	14.38	135.22	14.40	135.17
CSELVB	BASE	fdot 050y-024h	16.21	15.99	17.50	0.0006	13719	14.40	135.17	14.52	134.62
CSELVC	BASE	fdot 050y-024h	16.43	15.63	16.20	0.0003	37305	14.69	143.94	15.09	142.26
CSELVD	BASE	fdot 050y-024h	16.47	15.54	14.60	0.0005	24977	15.19	144.60	15.46	143.73
CSELVE	BASE	fdot 050y-024h	16.56	15.28	14.60	0.0003	40984	15.47	147.42	16.11	146.45
CSELVF	BASE	fdot 050y-024h	16.58	15.10	16.70	0.0004	26820	16.00	151.02	16.21	150.50
CSELVG	BASE	fdot 050y-024h	16.59	14.97	17.00	0.0005	32850	16.03	158.20	16.60	157.70
CSELVH	BASE	fdot 050y-024h	16.59	14.75	18.70	0.0213	1087	16.60	157.70	23.04	188.84
CSPUR	BASE	fdot 050y-024h	16.41	13.53	14.40	0.0005	65798	12.42	26.97	15.67	19.60
CSUBSA	BASE	fdot 050y-024h	24.02	19.89	21.30	0.0010	34713	30.00	20.75	30.00	21.28
CSUBSB	BASE	fdot 050y-024h	22.09	19.72	21.30	0.0012	97547	30.00	21.70	30.00	26.69
CTORIA	BASE	fdot 050y-024h	15.15	17.91	19.18	0.0025	13795	25.12	83.97	25.10	84.13
CTORIB	BASE	fdot 050y-024h	15.10	17.72	19.18	0.0031	39813	25.10	84.13	25.00	84.84
CTURNA	BASE	fdot 050y-024h	15.05	17.64	18.81	0.0023	13937	13.69	110.85	13.76	110.66
CTURNB	BASE	fdot 050y-024h	15.44	16.95	19.00	0.0023	37987	13.76	110.66	14.00	109.68
HorizonPond	BASE	fdot 050y-024h	22.39	16.66	18.24	0.0004	472649	12.00	12.97	22.39	2.19
OffLTC	BASE	fdot 050y-024h	22.50	19.19	20.51	0.0000	2901981	14.17	33.99	26.14	46.10
OUTFALL	BASE	fdot 050y-024h	0.00	1.52	9.00	0.0000	53	15.92	266.90	0.00	0.00
PolicePond	BASE	fdot 050y-024h	20.08	18.28	18.39	0.0038	110312	12.00	10.15	20.38	3.35
PostOfficePond	BASE	fdot 050y-024h	21.17	19.18	18.51	0.0050	168745	12.08	12.88	22.01	4.24
Sediment Site	BASE	fdot 050y-024h	15.56	16.82	18.00	0.0007	7916	14.02	114.77	14.08	114.57
SUBPONDB1A	BASE	fdot 050y-024h	21.15	22.89	22.00	0.0004	4793	12.00	0.67	19.37	0.19
SUBPONDB1B	BASE	fdot 050y-024h	22.01	23.02	22.00	0.0003	9233	12.00	1.19	21.80	0.25
WestLTC	BASE	fdot 050y-024h	25.23	19.95	21.30	0.0001	2860779	13.92	52.49	30.00	20.75
CBENDA	BASE	fdot 100y-024h	16.20	14.08	14.90	0.0013	6133	17.43	179.00	17.47	179.13
CBENDB	BASE	fdot 100y-024h	16.19	14.04	14.90	0.0006	26725	16.16	192.87	16.99	193.15
CBENDC	BASE	fdot 100y-024h	16.18	13.96	14.40	0.0005	63041	16.19	215.96	16.67	216.52
CCHRI	BASE	fdot 100y-024h	16.16	13.82	14.20	0.0005	34472	16.01	243.13	16.16	243.05
CCHURA	BASE	fdot 100y-024h	16.47	15.16	16.00	0.0033	11295	24.56	226.73	17.31	171.76
CCHURB	BASE	fdot 100y-024h	16.46	15.14	16.00	0.0005	33626	17.31	171.76	17.46	172.52
CCORPA	BASE	fdot 100y-024h	15.64	17.16	18.00	-0.0049	2016	13.13	123.17	13.14	123.08
CCORPB	BASE	fdot 100y-024h	16.06	16.84	18.00	0.0018	24936	13.28	147.75	13.42	146.33
CCORPC	BASE	fdot 100y-024h	16.12	16.63	18.00	-0.0101	3145	13.42	146.33	13.43	146.14
CD-100A	BASE	fdot 100y-024h	15.25	17.65	19.57	0.0076	118	13.50	25.11	13.50	25.11
CD-100B	BASE	fdot 100y-024h	15.63	17.19	19.57	0.0070	120	13.50	25.11	13.50	25.10
CD-200A	BASE	fdot 100y-024h	16.69	17.76	18.51	-0.0074	20509	13.96	9.28	22.64	8.33
CD-200B	BASE	fdot 100y-024h	16.68	17.72	18.51	0.0077	121	22.64	8.33	22.66	8.34
CD-201A	BASE	fdot 100y-024h	16.79	15.91	18.24	0.0002	10661	22.39	2.78	20.53	3.17
CD-201B	BASE	fdot 100y-024h	16.61	15.83	18.54	0.0007	120	20.53	3.57	17.95	3.53
CD-202A	BASE	fdot 100y-024h	15.27	17.61	18.18	0.0010	8564	12.17	5.70	11.32	4.63
CD-202B	BASE	fdot 100y-024h	15.68	16.91	18.18	0.0016	721	11.32	4.63	11.39	4.32
CD-203A	BASE	fdot 100y-024h	0.00	18.00	18.46	-0.0925	117	0.00	0.00	0.00	21.77
CD-203B	BASE	fdot 100y-024h	16.53	16.04	18.46	0.0947	166	0.00	33.49	13.18	10.36
CD-203C	BASE	fdot 100y-024h	0.00	17.25	18.50	-0.0457	126	12.25	7.25	0.00	11.72
CD-203D	BASE	fdot 100y-024h	16.77	16.09	18.46	0.0025	39899	12.25	4.63	19.89	4.05
CD-203E	BASE	fdot 100y-024h	16.52	15.71	18.46	0.0131	118	13.18	10.36	13.18	10.32
CD-300A	BASE	fdot 100y-024h	16.00	14.62	16.32	-0.0013	117	12.17	6.70	12.17	6.67
CD-300B	BASE	fdot 100y-024h	16.14	14.50	16.32	-0.0030	119	12.17	6.67	12.17	6.64
CD-301	BASE	fdot 100y-024h	15.35	14.56	16.19	0.0010	116	12.42	11.78	12.42	11.76
CDUNNA	BASE	fdot 100y-024h	16.31	14.44	15.60	-0.0061	2468	17.46	173.19	16.62	263.59
CDUNNB	BASE	fdot 100y-024h	16.30	14.42	15.60	0.0014	13989	16.62	267.37	17.41	176.93
CDUNNC	BASE	fdot 100y-024h	16.29	14.42	14.40	0.0005	21671	17.41	176.93	17.43	177.46
CFECRA	BASE	fdot 100y-024h	21.17	18.60	19.63	0.0003	36582	25.65	85.23	25.98	85.72
CFECRB	BASE	fdot 100y-024h	20.00	18.48	19.63	0.0003	108691	25.98	85.72	26.04	87.37

Name	Group	Simulation	Max Time Stage hrs	Max Stage ft	Warning Stage ft	Max Delta Stage ft	Max Surf Area ft2	Max Time Inflow hrs	Max Inflow cfs	Max Time Outflow hrs	Max Outflow cfs
CI95A	BASE	fdot 100y-024h	19.43	19.66	21.31	0.0050	42090	11.83	57.92	13.10	52.84
CI95B	BASE	fdot 100y-024h	21.16	19.62	21.31	0.0010	44186	13.10	52.84	13.64	52.37
CI95C	BASE	fdot 100y-024h	21.24	19.56	21.21	-0.0060	4920	13.22	70.98	17.78	154.23
CI95D	BASE	fdot 100y-024h	21.24	19.56	21.21	0.0020	14453	17.78	154.23	13.32	70.82
CI95E	BASE	fdot 100y-024h	21.48	19.50	21.07	0.0006	7062	13.50	95.29	13.50	95.29
CI95F	BASE	fdot 100y-024h	21.50	19.50	21.07	0.0006	20654	13.50	95.29	13.54	95.30
CI95G	BASE	fdot 100y-024h	22.33	19.44	20.89	0.0007	11395	13.32	112.32	13.33	112.29
CI95H	BASE	fdot 100y-024h	22.36	19.43	20.89	0.0004	34343	13.33	112.29	13.37	112.22
CLTCA	BASE	fdot 100y-024h	22.62	19.42	20.51	0.0006	20952	11.82	91.91	11.84	88.05
CLTCB	BASE	fdot 100y-024h	22.57	19.38	20.51	0.0003	60984	11.84	88.05	25.48	84.71
CLTCC	BASE	fdot 100y-024h	22.08	19.18	20.31	0.0009	10548	25.48	84.71	25.53	84.83
CLTCD	BASE	fdot 100y-024h	22.08	19.15	20.31	0.0008	31409	25.53	84.83	25.65	85.23
CMILNA	BASE	fdot 100y-024h	16.13	16.60	18.00	0.0071	3582	13.40	147.84	13.43	147.63
CMILNB	BASE	fdot 100y-024h	16.17	16.51	18.00	-0.0011	13037	13.43	147.63	13.49	146.82
CMILNC	BASE	fdot 100y-024h	16.20	16.44	17.50	0.0010	13399	13.49	146.82	13.56	145.95
COUT123A	BASE	fdot 100y-024h	15.42	10.70	13.60	0.0003	1081	15.97	251.55	15.97	251.56
COUT123B	BASE	fdot 100y-024h	15.39	10.62	13.60	0.0003	34952	15.30	301.68	15.38	301.59
COUT123C	BASE	fdot 100y-024h	15.62	7.12	9.00	0.0003	93630	15.38	301.59	15.62	301.03
CSELVA	BASE	fdot 100y-024h	16.21	16.41	17.50	0.0052	1184	13.56	145.95	13.57	145.86
CSELVB	BASE	fdot 100y-024h	16.24	16.36	17.50	0.0006	14257	13.57	145.86	13.64	144.93
CSELVC	BASE	fdot 100y-024h	16.40	16.07	16.20	0.0003	38823	13.70	154.88	14.15	151.92
CSELVD	BASE	fdot 100y-024h	16.43	16.00	14.60	0.0004	25966	14.92	154.86	15.16	153.79
CSELVE	BASE	fdot 100y-024h	16.49	15.78	14.60	0.0003	42890	15.08	158.82	16.11	157.74
CSELVF	BASE	fdot 100y-024h	16.50	15.65	16.70	0.0004	28078	16.00	162.86	16.29	162.43
CSELVG	BASE	fdot 100y-024h	16.50	15.54	17.00	0.0006	34172	16.10	170.23	17.29	170.56
CSELVH	BASE	fdot 100y-024h	16.49	15.33	18.70	-0.0260	1128	17.29	170.56	24.56	226.70
CSPUR	BASE	fdot 100y-024h	16.18	13.96	14.40	0.0005	67932	12.42	31.56	15.46	23.70
CSUBSA	BASE	fdot 100y-024h	24.03	20.09	21.30	0.0012	36552	30.00	18.99	30.00	19.23
CSUBSB	BASE	fdot 100y-024h	22.15	19.96	21.30	0.0012	101679	11.42	20.10	30.00	20.95
CTORIA	BASE	fdot 100y-024h	15.23	18.04	19.18	0.0026	14101	25.12	87.97	25.07	88.19
CTORIB	BASE	fdot 100y-024h	15.14	17.87	19.18	0.0034	40920	25.07	88.19	24.92	89.11
CTURNA	BASE	fdot 100y-024h	15.10	17.80	18.81	0.0022	14373	13.10	118.68	13.20	118.38
CTURNB	BASE	fdot 100y-024h	15.60	17.20	19.00	0.0021	39766	13.20	118.38	13.33	116.91
HorizonPond	BASE	fdot 100y-024h	22.28	16.77	18.24	0.0004	481731	12.00	14.98	22.39	2.78
OffLTC	BASE	fdot 100y-024h	22.79	19.43	20.51	0.0001	3416170	14.08	39.97	27.89	54.71
OUTFALL	BASE	fdot 100y-024h	0.00	1.52	9.00	0.0000	53	15.62	301.03	0.00	0.00
PolicePond	BASE	fdot 100y-024h	19.49	18.49	18.39	0.0039	115832	12.00	11.66	19.56	4.19
PostOfficePond	BASE	fdot 100y-024h	21.31	19.46	18.51	0.0050	184076	12.08	14.78	24.57	4.80
Sediment Site	BASE	fdot 100y-024h	15.77	17.09	18.00	0.0008	8124	13.14	123.08	13.21	122.71
SUBPONDB1A	BASE	fdot 100y-024h	21.24	23.44	22.00	0.0004	5351	12.00	0.77	19.67	0.20
SUBPONDB1B	BASE	fdot 100y-024h	22.10	23.57	22.00	0.0003	10110	12.00	1.38	21.90	0.26
WestLTC	BASE	fdot 100y-024h	25.53	20.14	21.30	0.0001	3207428	13.92	61.69	30.00	18.99

Appendix E
ICPR Modeling

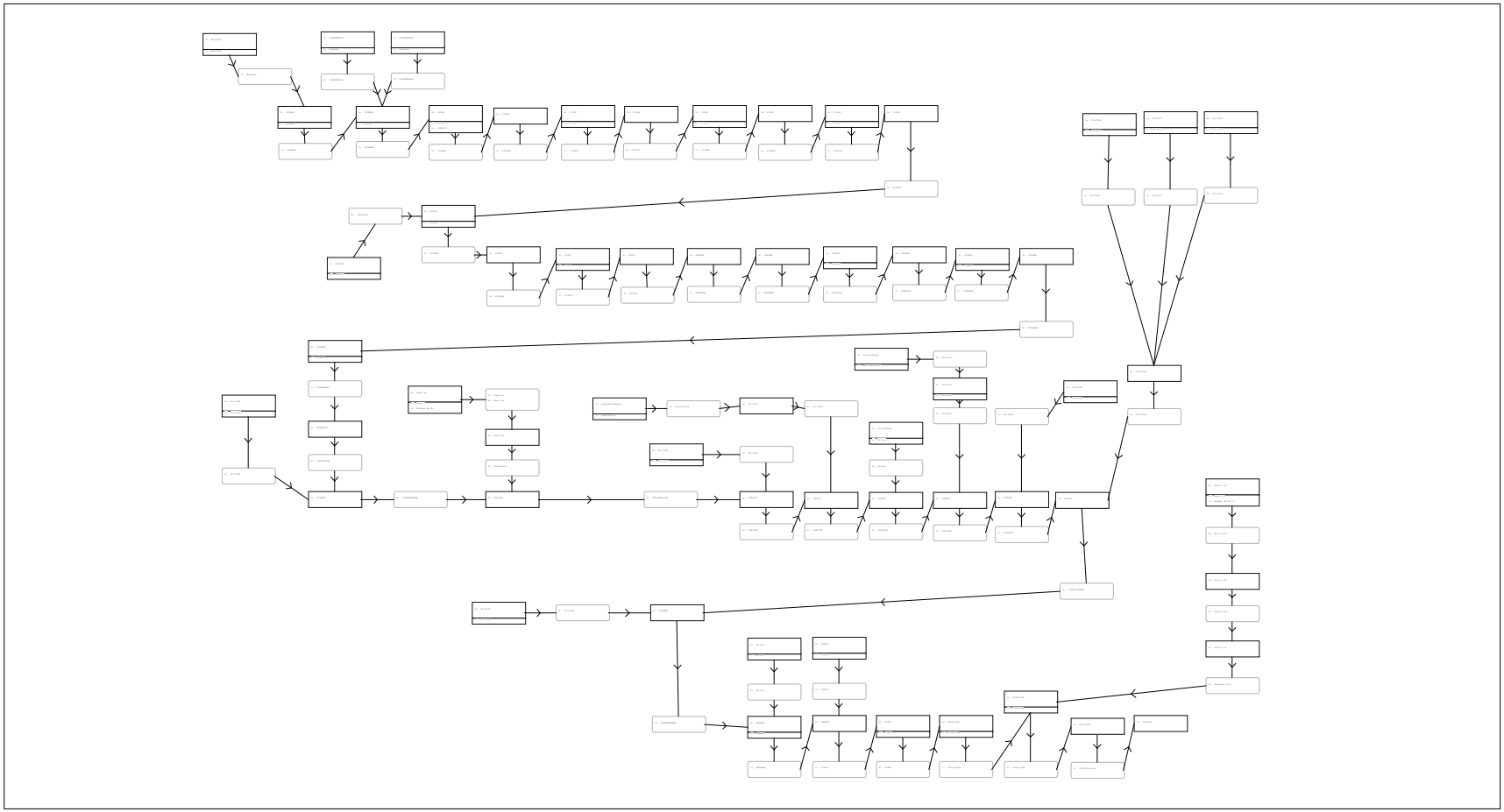
Proposed Basin 1, 2, and 3 Nodal Diagram
Proposed Basin 1, 2, and 3 Input Report
Proposed Basin 1, 2, and 3 Node Max/Min Report
Proposed Basin 1, 2, and 3 Node Time Series Report

Proposed Nodal Diagram
Midway Road Basin 2/3
06/18/2013

Nodes
A Stage/Area
V Stage/Volume
T Time/Stage
M Manhole

Basins
O Overland Flow
U SCS Unit CN
S SBUH CN
Y SCS Unit GA
Z SBUH GA

Links
P Pipe
W Weir
C Channel
D Drop Structure
B Bridge
R Rating Curve
H Breach
E Percolation
F Filter
X Exfil Trench



Proposed Culvert 103
and Proposed Basin 2/3

==========
==== Basins ====
==========

Name: CBENDB Node: CBENDB Status: Onsite
Group: BASE Type: SCS Unit Hydrograph CN

Unit Hydrograph: Uh256 Peaking Factor: 256.0
Rainfall File: Sfwmd72 Storm Duration(hrs): 72.00
Rainfall Amount(in): 9.500 Time of Conc(min): 30.00
Area(ac): 11.860 Time Shift(hrs): 0.00
Curve Number: 86.00 Max Allowable Q(cfs): 999999.000
DCIA(%): 0.00

Includes areas from the Regional Drainage Map labeled #53 (Florida Center for Recovery 10.89 AC), and #54 (CCHRI 29.70 AC)

Name: CCHRI Node: CCHRI Status: Onsite
Group: BASE Type: SCS Unit Hydrograph CN

Unit Hydrograph: Uh256 Peaking Factor: 256.0
Rainfall File: Sfwmd72 Storm Duration(hrs): 72.00
Rainfall Amount(in): 9.500 Time of Conc(min): 60.98
Area(ac): 40.590 Time Shift(hrs): 0.00
Curve Number: 79.04 Max Allowable Q(cfs): 999999.000
DCIA(%): 0.00

Includes areas from the Regional Drainage Map labeled #53 (Florida Center for Recovery 10.89 AC), and #54 (CCHRI 29.70 AC)

Name: CCORPA Node: CCORPA Status: Onsite
Group: BASE Type: SCS Unit Hydrograph CN

Unit Hydrograph: Uh256 Peaking Factor: 256.0
Rainfall File: Sfwmd72 Storm Duration(hrs): 72.00
Rainfall Amount(in): 9.500 Time of Conc(min): 10.00
Area(ac): 8.190 Time Shift(hrs): 0.00
Curve Number: 90.97 Max Allowable Q(cfs): 999999.000
DCIA(%): 0.00

5.28 ac NB Turnpike south of Canal 103.

Name: CD-100A Node: CD-100A Status: Onsite
Group: BASE Type: SCS Unit Hydrograph CN

Unit Hydrograph: Uh256 Peaking Factor: 256.0
Rainfall File: Sfwmd72 Storm Duration(hrs): 72.00
Rainfall Amount(in): 9.500 Time of Conc(min): 42.86
Area(ac): 12.030 Time Shift(hrs): 0.00
Curve Number: 89.35 Max Allowable Q(cfs): 999999.000
DCIA(%): 0.00

6.97 ac Turnpike, 5.06 Pete-Tree, and undeveloped area west of Jenkins Road.
(This excludes onsite runoff captured by the storm sewer.)

Name: CD-101A Node: CD-101A Status: Onsite
Group: BASE Type: SCS Unit Hydrograph CN

Unit Hydrograph: Uh256 Peaking Factor: 256.0
Rainfall File: Sfwmd72 Storm Duration(hrs): 72.00
Rainfall Amount(in): 9.500 Time of Conc(min): 122.23
Area(ac): 23.570 Time Shift(hrs): 0.00
Curve Number: 79.87 Max Allowable Q(cfs): 999999.000
DCIA(%): 0.00

Includes 15.79 ac west of Jenkins previously routed to CD-100A and 7.78 ac previously routed to CD-200A.
(This excludes onsite runoff captured by the storm sewer.)

Name: CD-201A Node: CD-201A Status: Onsite
Group: BASE Type: SCS Unit Hydrograph CN

Unit Hydrograph: Uh256 Peaking Factor: 256.0
Rainfall File: Storm Duration(hrs): 0.00
Rainfall Amount(in): 0.000 Time of Conc(min): 48.62
Area(ac): 1.100 Time Shift(hrs): 0.00
Curve Number: 77.00 Max Allowable Q(cfs): 999999.000
DCIA(%): 0.00

Includes 1.10 ac that were previously draining to CD-202 and routed against the grade to CD-201A through roadside ditches.
(This excludes onsite runoff captured by the storm sewer.)

```
-------------------------------------------------------------------------------------------------
         Name: CD-202A                 Node: CD-202A               Status: Onsite
        Group: BASE                    Type: SCS Unit Hydrograph CN

        Unit Hydrograph: Uh256                    Peaking Factor: 256.0
          Rainfall File: Sfwmd72             Storm Duration(hrs): 72.00
    Rainfall Amount(in): 9.500                 Time of Conc(min): 39.98
              Area(ac): 1.860                    Time Shift(hrs): 0.00
          Curve Number: 82.00               Max Allowable Q(cfs): 999999.000
               DCIA(%): 0.00

1.86 ac undeveloped area west of Selvitz Road continues to drain to CD-202A.
(This excludes onsite runoff captured by the storm sewer.)

1.10 ac have been redirected to CD-201A in the proposed condition.
2.78 ac have been redirected to CD-203A in the proposed condition.

-------------------------------------------------------------------------------------------------
         Name: CD-203A                 Node: CD-203A               Status: Onsite
        Group: BASE                    Type: SCS Unit Hydrograph CN

        Unit Hydrograph: Uh256                    Peaking Factor: 256.0
          Rainfall File: Sfwmd72             Storm Duration(hrs): 72.00
    Rainfall Amount(in): 9.500                 Time of Conc(min): 40.42
              Area(ac): 2.780                    Time Shift(hrs): 0.00
          Curve Number: 77.00               Max Allowable Q(cfs): 999999.000
               DCIA(%): 0.00

West side of North Selvitz Road.
Includes 2.78 ac that were previously draining to CD-202 and routed against the grade to CD-203A through roadside ditches.
(This excludes onsite runoff captured by the storm sewer.)

-------------------------------------------------------------------------------------------------
         Name: CD-203C                 Node: CD-203C               Status: Onsite
        Group: BASE                    Type: SCS Unit Hydrograph CN

        Unit Hydrograph: Uh256                    Peaking Factor: 256.0
          Rainfall File: Sfwmd72             Storm Duration(hrs): 72.00
    Rainfall Amount(in): 9.500                 Time of Conc(min): 51.78
              Area(ac): 5.950                    Time Shift(hrs): 0.00
          Curve Number: 82.00               Max Allowable Q(cfs): 999999.000
               DCIA(%): 0.00

West side of North Selvitz Road.
Includes 5.95 ac offsite Selvitz and excludes onsite runoff captured by the storm sewer.

-------------------------------------------------------------------------------------------------
         Name: CD-203D                 Node: CD-203D               Status: Onsite
        Group: BASE                    Type: SCS Unit Hydrograph CN

        Unit Hydrograph: Uh256                    Peaking Factor: 256.0
          Rainfall File: Sfwmd72             Storm Duration(hrs): 72.00
    Rainfall Amount(in): 9.500                 Time of Conc(min): 55.19
              Area(ac): 3.170                    Time Shift(hrs): 0.00
          Curve Number: 82.00               Max Allowable Q(cfs): 999999.000
               DCIA(%): 0.00

East side of North Selvitz Road.
Includes 3.17 ac offsite Selvitz and excludes onsite runoff captured by the storm sewer.

-------------------------------------------------------------------------------------------------
         Name: CD-300A                 Node: CD-300A               Status: Onsite
        Group: BASE                    Type: SCS Unit Hydrograph CN

        Unit Hydrograph: Uh256                    Peaking Factor: 256.0
          Rainfall File: Sfwmd72             Storm Duration(hrs): 72.00
    Rainfall Amount(in): 9.500                 Time of Conc(min): 76.46
              Area(ac): 8.050                    Time Shift(hrs): 0.00
          Curve Number: 85.83               Max Allowable Q(cfs): 999999.000
               DCIA(%): 0.00

8.05 Offsite north of Midway Road from Selvitz to just east of Dunn (This includes 3.14 ac previously draining to CD-301 and exc

-------------------------------------------------------------------------------------------------
         Name: CD-301                  Node: CD-301                Status: Onsite
        Group: BASE                    Type: SCS Unit Hydrograph CN

        Unit Hydrograph: Uh256                    Peaking Factor: 256.0
          Rainfall File: Sfwmd72             Storm Duration(hrs): 72.00
    Rainfall Amount(in): 9.500                 Time of Conc(min): 37.02
              Area(ac): 7.980                    Time Shift(hrs): 0.00
          Curve Number: 82.56               Max Allowable Q(cfs): 999999.000
               DCIA(%): 0.00

Offsite north of Midway Road east of Dunn.  (This excludes onsite runoff captured by the storm sewer and 3.14 ac redirected to C
```

```
-----------------------------------------------------------------------------------------------
         Name: CI95A                    Node: CI95A                  Status: Onsite
        Group: BASE                     Type: SCS Unit Hydrograph CN

        Unit Hydrograph: Uh256                    Peaking Factor: 256.0
          Rainfall File: Sfwmd72             Storm Duration(hrs): 72.00
    Rainfall Amount(in): 9.500                 Time of Conc(min): 68.95
               Area(ac): 42.010                  Time Shift(hrs): 0.00
           Curve Number: 86.21              Max Allowable Q(cfs): 999999.000
                DCIA(%): 0.00


-----------------------------------------------------------------------------------------------
         Name: CI95C                    Node: CI95C                  Status: Onsite
        Group: BASE                     Type: SCS Unit Hydrograph CN

        Unit Hydrograph: Uh256                    Peaking Factor: 256.0
          Rainfall File: Sfwmd72             Storm Duration(hrs): 72.00
    Rainfall Amount(in): 9.500                 Time of Conc(min): 56.73
               Area(ac): 21.390                  Time Shift(hrs): 0.00
           Curve Number: 81.85              Max Allowable Q(cfs): 999999.000
                DCIA(%): 0.00


-----------------------------------------------------------------------------------------------
         Name: CI95E                    Node: CI95E                  Status: Onsite
        Group: BASE                     Type: SCS Unit Hydrograph CN

        Unit Hydrograph: Uh256                    Peaking Factor: 256.0
          Rainfall File: Sfwmd72             Storm Duration(hrs): 72.00
    Rainfall Amount(in): 9.500                 Time of Conc(min): 150.09
               Area(ac): 35.200                  Time Shift(hrs): 0.00
           Curve Number: 80.37              Max Allowable Q(cfs): 999999.000
                DCIA(%): 0.00


-----------------------------------------------------------------------------------------------
         Name: CI95G                    Node: CI95G                  Status: Onsite
        Group: BASE                     Type: SCS Unit Hydrograph CN

        Unit Hydrograph: Uh256                    Peaking Factor: 256.0
          Rainfall File: Sfwmd72             Storm Duration(hrs): 72.00
    Rainfall Amount(in): 9.500                 Time of Conc(min): 41.46
               Area(ac): 19.790                  Time Shift(hrs): 0.00
           Curve Number: 83.03              Max Allowable Q(cfs): 999999.000
                DCIA(%): 0.00


-----------------------------------------------------------------------------------------------
         Name: CLTCA                    Node: CLTCA                  Status: Onsite
        Group: BASE                     Type: SCS Unit Hydrograph CN

        Unit Hydrograph: Uh256                    Peaking Factor: 256.0
          Rainfall File: Sfwmd72             Storm Duration(hrs): 72.00
    Rainfall Amount(in): 9.500                 Time of Conc(min): 45.12
               Area(ac): 15.960                  Time Shift(hrs): 0.00
           Curve Number: 84.36              Max Allowable Q(cfs): 999999.000
                DCIA(%): 0.00


-----------------------------------------------------------------------------------------------
         Name: CLTCC                    Node: CLTCC                  Status: Onsite
        Group: BASE                     Type: SCS Unit Hydrograph CN

        Unit Hydrograph: Uh256                    Peaking Factor: 256.0
          Rainfall File: Sfwmd72             Storm Duration(hrs): 72.00
    Rainfall Amount(in): 9.500                 Time of Conc(min): 10.00
               Area(ac): 6.150                   Time Shift(hrs): 0.00
           Curve Number: 84.04              Max Allowable Q(cfs): 999999.000
                DCIA(%): 0.00


-----------------------------------------------------------------------------------------------
         Name: COUT123A                 Node: COUT123A               Status: Onsite
        Group: BASE                     Type: SCS Unit Hydrograph CN

        Unit Hydrograph: Uh256                    Peaking Factor: 256.0
          Rainfall File: Sfwmd72             Storm Duration(hrs): 72.00
```

Rainfall Amount(in): 9.500 Time of Conc(min): 55.38
Area(ac): 8.100 Time Shift(hrs): 0.00
Curve Number: 77.00 Max Allowable Q(cfs): 999999.000
DCIA(%): 0.00

Name: COUT123B Node: COUT123B Status: Onsite
Group: BASE Type: SCS Unit Hydrograph CN

Unit Hydrograph: Uh256 Peaking Factor: 256.0
Rainfall File: Sfwmd72 Storm Duration(hrs): 72.00
Rainfall Amount(in): 9.500 Time of Conc(min): 55.24
Area(ac): 70.790 Time Shift(hrs): 0.00
Curve Number: 78.32 Max Allowable Q(cfs): 999999.000
DCIA(%): 0.00

Name: CSPUR Node: CSPUR Status: Onsite
Group: BASE Type: SCS Unit Hydrograph CN

Unit Hydrograph: Uh256 Peaking Factor: 256.0
Rainfall File: Sfwmd72 Storm Duration(hrs): 72.00
Rainfall Amount(in): 9.500 Time of Conc(min): 60.70
Area(ac): 34.470 Time Shift(hrs): 0.00
Curve Number: 80.00 Max Allowable Q(cfs): 999999.000
DCIA(%): 0.00

Name: CSUBSA Node: CSUBSA Status: Onsite
Group: BASE Type: SCS Unit Hydrograph CN

Unit Hydrograph: Uh256 Peaking Factor: 256.0
Rainfall File: Sfwmd72 Storm Duration(hrs): 72.00
Rainfall Amount(in): 9.500 Time of Conc(min): 10.00
Area(ac): 21.340 Time Shift(hrs): 0.00
Curve Number: 84.18 Max Allowable Q(cfs): 999999.000
DCIA(%): 0.00

Name: CTORIA Node: CTORIA Status: Onsite
Group: BASE Type: SCS Unit Hydrograph CN

Unit Hydrograph: Uh256 Peaking Factor: 256.0
Rainfall File: Sfwmd72 Storm Duration(hrs): 72.00
Rainfall Amount(in): 9.500 Time of Conc(min): 75.68
Area(ac): 6.670 Time Shift(hrs): 0.00
Curve Number: 87.20 Max Allowable Q(cfs): 999999.000
DCIA(%): 0.00

Name: CTURNA Node: CTURNA Status: Onsite
Group: BASE Type: SCS Unit Hydrograph CN

Unit Hydrograph: Uh256 Peaking Factor: 256.0
Rainfall File: Sfwmd72 Storm Duration(hrs): 72.00
Rainfall Amount(in): 9.500 Time of Conc(min): 50.29
Area(ac): 49.820 Time Shift(hrs): 0.00
Curve Number: 90.97 Max Allowable Q(cfs): 999999.000
DCIA(%): 0.00

Name: Midway Rd B1 Node: Pond 1a Status: Onsite
Group: BASE Type: SCS Unit Hydrograph CN

Unit Hydrograph: Uh256 Peaking Factor: 256.0
Rainfall File: Sfwmd72 Storm Duration(hrs): 72.00
Rainfall Amount(in): 9.500 Time of Conc(min): 14.75
Area(ac): 6.300 Time Shift(hrs): 0.00
Curve Number: 95.88 Max Allowable Q(cfs): 999999.000
DCIA(%): 0.00

```
-------------------------------------------------------------------------------------------------
        Name: Midway Rd B2/3          Node: Pond 2/3a             Status: Onsite
       Group: BASE                    Type: SCS Unit Hydrograph CN

       Unit Hydrograph: Uh256                  Peaking Factor: 256.0
         Rainfall File: Sfwmd72          Storm Duration(hrs): 72.00
   Rainfall Amount(in): 9.500              Time of Conc(min): 50.25
             Area(ac): 23.830                Time Shift(hrs): 0.00
         Curve Number: 94.72           Max Allowable Q(cfs): 999999.000
              DCIA(%): 0.00


-------------------------------------------------------------------------------------------------
        Name: New Horizons            Node: HorizonPond           Status: Onsite
       Group: BASE                    Type: SCS Unit Hydrograph CN

       Unit Hydrograph: Uh256                  Peaking Factor: 256.0
         Rainfall File: Sfwmd72          Storm Duration(hrs): 72.00
   Rainfall Amount(in): 9.500              Time of Conc(min): 20.00
             Area(ac): 13.180                Time Shift(hrs): 0.00
         Curve Number: 85.00           Max Allowable Q(cfs): 999999.000
              DCIA(%): 0.00


-------------------------------------------------------------------------------------------------
        Name: OFFLTC                  Node: OFFLTC                Status: Onsite
       Group: BASE                    Type: SCS Unit Hydrograph CN

       Unit Hydrograph: Uh256                  Peaking Factor: 256.0
         Rainfall File:                  Storm Duration(hrs): 0.00
   Rainfall Amount(in): 0.000              Time of Conc(min): 143.62
             Area(ac): 56.720                Time Shift(hrs): 0.00
         Curve Number: 78.76           Max Allowable Q(cfs): 999999.000
              DCIA(%): 0.00


-------------------------------------------------------------------------------------------------
        Name: Police                  Node: PolicePond            Status: Onsite
       Group: BASE                    Type: SCS Unit Hydrograph CN

       Unit Hydrograph: Uh256                  Peaking Factor: 256.0
         Rainfall File: Sfwmd72          Storm Duration(hrs): 72.00
   Rainfall Amount(in): 9.500              Time of Conc(min): 20.00
             Area(ac): 10.000                Time Shift(hrs): 0.00
         Curve Number: 88.78           Max Allowable Q(cfs): 999999.000
              DCIA(%): 0.00


-------------------------------------------------------------------------------------------------
        Name: Pond 1                  Node: Pond 1a               Status: Onsite
       Group: BASE                    Type: SCS Unit Hydrograph CN

       Unit Hydrograph: Uh256                  Peaking Factor: 256.0
         Rainfall File: Sfwmd72          Storm Duration(hrs): 72.00
   Rainfall Amount(in): 9.500              Time of Conc(min): 10.00
             Area(ac): 3.860                 Time Shift(hrs): 0.00
         Curve Number: 88.55           Max Allowable Q(cfs): 999999.000
              DCIA(%): 0.00


-------------------------------------------------------------------------------------------------
        Name: Pond 2/3                Node: Pond 2/3a             Status: Onsite
       Group: BASE                    Type: SCS Unit Hydrograph CN

       Unit Hydrograph: Uh256                  Peaking Factor: 256.0
         Rainfall File: Sfwmd72          Storm Duration(hrs): 72.00
   Rainfall Amount(in): 9.500              Time of Conc(min): 10.00
             Area(ac): 4.280                 Time Shift(hrs): 0.00
         Curve Number: 86.50           Max Allowable Q(cfs): 999999.000
              DCIA(%): 0.00


-------------------------------------------------------------------------------------------------
        Name: PostOffice              Node: PostOfficePond        Status: Onsite
       Group: BASE                    Type: SCS Unit Hydrograph CN

       Unit Hydrograph: Uh256                  Peaking Factor: 256.0
         Rainfall File: Sfwmd72          Storm Duration(hrs): 72.00
   Rainfall Amount(in): 9.500              Time of Conc(min): 30.00
```

Area(ac): 13.150 Time Shift(hrs): 0.00
Curve Number: 89.43 Max Allowable Q(cfs): 999999.000
DCIA(%): 0.00

Name: SUBSB1A Node: SUBPONDB1A Status: Onsite
Group: BASE Type: SCS Unit Hydrograph CN

Unit Hydrograph: Uh256 Peaking Factor: 256.0
Rainfall File: Sfwmd72 Storm Duration(hrs): 72.00
Rainfall Amount(in): 9.500 Time of Conc(min): 10.00
Area(ac): 0.670 Time Shift(hrs): 0.00
Curve Number: 83.00 Max Allowable Q(cfs): 999999.000
DCIA(%): 0.00

Name: SUBSB1B Node: SUBPONDB1B Status: Onsite
Group: BASE Type: SCS Unit Hydrograph CN

Unit Hydrograph: Uh256 Peaking Factor: 256.0
Rainfall File: Sfwmd72 Storm Duration(hrs): 72.00
Rainfall Amount(in): 9.500 Time of Conc(min): 10.00
Area(ac): 1.180 Time Shift(hrs): 0.00
Curve Number: 84.00 Max Allowable Q(cfs): 999999.000
DCIA(%): 0.00

Name: SUBSB2 Node: CSUBSB Status: Onsite
Group: BASE Type: SCS Unit Hydrograph CN

Unit Hydrograph: Uh256 Peaking Factor: 256.0
Rainfall File: Sfwmd72 Storm Duration(hrs): 72.00
Rainfall Amount(in): 9.500 Time of Conc(min): 15.26
Area(ac): 8.280 Time Shift(hrs): 0.00
Curve Number: 94.60 Max Allowable Q(cfs): 999999.000
DCIA(%): 0.00

Name: SUBSI95 Node: CI95A Status: Onsite
Group: BASE Type: SCS Unit Hydrograph CN

Unit Hydrograph: Uh256 Peaking Factor: 256.0
Rainfall File: Sfwmd72 Storm Duration(hrs): 72.00
Rainfall Amount(in): 9.500 Time of Conc(min): 16.89
Area(ac): 16.720 Time Shift(hrs): 0.00
Curve Number: 92.37 Max Allowable Q(cfs): 999999.000
DCIA(%): 0.00

Name: WestLTC Node: WestLTC Status: Onsite
Group: BASE Type: SCS Unit Hydrograph CN

Unit Hydrograph: Uh256 Peaking Factor: 256.0
Rainfall File: Sfwmd72 Storm Duration(hrs): 72.00
Rainfall Amount(in): 9.500 Time of Conc(min): 133.82
Area(ac): 85.220 Time Shift(hrs): 0.00
Curve Number: 79.02 Max Allowable Q(cfs): 999999.000
DCIA(%): 0.00

==========
==== Nodes ==========
==========

Name: CBENDB Base Flow(cfs): 0.000 Init Stage(ft): 8.560
Group: BASE Warn Stage(ft): 14.900
Type: Stage/Area

This node represents the length of C-103 immediately west of CD-301.

After this node, C-103 turns south and ends.

Stage(ft)	Area(ac)

8.560	0.2400
14.570	0.2400

Name: CBENDC Base Flow(cfs): 0.000 Init Stage(ft): 7.390
Group: BASE Warn Stage(ft): 14.400
Type: Stage/Area

This node represents the point in the channel where it turns from a due south direction to a south east direction. It is also t

Stage(ft)	Area(ac)
7.390	0.3200
14.400	0.9200

Name: CCHRI Base Flow(cfs): 0.000 Init Stage(ft): 7.230
Group: BASE Warn Stage(ft): 14.200
Type: Stage/Area

This node represents the end of the channel discharging to PCHRI under Christensen Road.

Stage(ft)	Area(ac)
7.230	0.4300
14.200	1.2400

Name: CCORPA Base Flow(cfs): 0.000 Init Stage(ft): 12.950
Group: BASE Warn Stage(ft): 18.000
Type: Stage/Area

This node represents the beginning of the channel discharging to the Sedimentation Basin.

Stage(ft)	Area(ac)

Name: CCORPB Base Flow(cfs): 0.000 Init Stage(ft): 9.180
Group: BASE Warn Stage(ft): 17.570
Type: Stage/Area

This node represents the length of C-103 immediately west of CD-100.

Stage(ft)	Area(ac)
9.180	0.1500
15.220	0.1500

Name: CD-100A Base Flow(cfs): 0.000 Init Stage(ft): 13.380
Group: BASE Warn Stage(ft): 19.360
Type: Stage/Area

Stage(ft)	Area(ac)

Name: CD-101A Base Flow(cfs): 0.000 Init Stage(ft): 14.000
Group: BASE Warn Stage(ft): 20.080
Type: Stage/Area

Stage(ft)	Area(ac)

Name: CD-200A Base Flow(cfs): 0.000 Init Stage(ft): 11.800
Group: BASE Warn Stage(ft): 20.820
Type: Stage/Area

Stage(ft)	Area(ac)

Name: CD-201A Base Flow(cfs): 0.000 Init Stage(ft): 10.920
Group: BASE Warn Stage(ft): 19.840

Type: Stage/Area

Stage(ft)	Area(ac)

Name: CD-202A Base Flow(cfs): 0.000 Init Stage(ft): 10.560
Group: BASE Warn Stage(ft): 18.780
Type: Stage/Area

Stage(ft)	Area(ac)

Name: CD-203A Base Flow(cfs): 0.000 Init Stage(ft): 16.230
Group: BASE Warn Stage(ft): 18.080
Type: Stage/Area

Stage(ft)	Area(ac)

Name: CD-203B Base Flow(cfs): 0.000 Init Stage(ft): 15.540
Group: BASE Plunge Factor: 1.00 Warn Stage(ft): 18.080
Type: Manhole, Flat Floor

Stage(ft)	Area(ac)

Name: CD-203C Base Flow(cfs): 0.000 Init Stage(ft): 15.240
Group: BASE Warn Stage(ft): 18.080
Type: Stage/Area

This node represents the roadside swale west of Selvitz Road.

Stage(ft)	Area(ac)
15.240	0.1400
17.490	0.2700

Name: CD-203D Base Flow(cfs): 0.000 Init Stage(ft): 13.600
Group: BASE Plunge Factor: 1.00 Warn Stage(ft): 18.080
Type: Manhole, Flat Floor

Stage(ft)	Area(ac)

Name: CD-300A Base Flow(cfs): 0.000 Init Stage(ft): 11.200
Group: BASE Warn Stage(ft): 17.400
Type: Stage/Area

Stage(ft)	Area(ac)

Name: CD-301 Base Flow(cfs): 0.000 Init Stage(ft): 11.800
Group: BASE Warn Stage(ft): 17.370
Type: Stage/Area

Stage(ft)	Area(ac)

Name: CDUNNB Base Flow(cfs): 0.000 Init Stage(ft): 8.640
Group: BASE Warn Stage(ft): 15.600
Type: Stage/Area

This node represents the length of C-103 immediately west of CD-300.

Stage(ft)	Area(ac)
8.640	0.2700
14.650	0.2700

Name: CFECRA Base Flow(cfs): 0.000 Init Stage(ft): 13.400
Group: BASE Warn Stage(ft): 19.630
Type: Stage/Area

This node represents the beginning of the channel discharging to PFECRAB under Glades Cut-off Road and the FEC Railraod R/W.

Stage(ft)	Area(ac)

Name: CFECRB Base Flow(cfs): 0.000 Init Stage(ft): 13.310
Group: BASE Warn Stage(ft): 19.630
Type: Stage/Area

This node represents the end of the channel discharging to PFECRAB under Glades Cut-off Road and the FEC Railraod R/W.

Stage(ft)	Area(ac)
13.310	0.5400
19.000	1.7700

Name: CI95A Base Flow(cfs): 0.000 Init Stage(ft): 13.500
Group: BASE Warn Stage(ft): 21.310
Type: Stage/Area

This node represents the beginning of the channel discharging to PI95AB under the I-95 SW Ramp.

Stage(ft)	Area(ac)
13.500	0.1300
19.000	0.6000

Name: CI95B Base Flow(cfs): 0.000 Init Stage(ft): 13.500
Group: BASE Warn Stage(ft): 21.310
Type: Stage/Area

This node represents the end of the channel discharging to PI95AB under The I-95 SW Ramp.

Stage(ft)	Area(ac)
13.500	0.1300
19.000	0.6000

Name: CI95C Base Flow(cfs): 0.000 Init Stage(ft): 13.500
Group: BASE Warn Stage(ft): 21.210
Type: Stage/Area

This node represents the beginning of the channel discharging to PI95CD under SB I-95.

Stage(ft)	Area(ac)

Name: CI95D Base Flow(cfs): 0.000 Init Stage(ft): 13.500
Group: BASE Warn Stage(ft): 21.210
Type: Stage/Area

This node represents the end of the channel discharging to PI95CD under The I-95 SW Ramp.

Stage(ft)	Area(ac)
13.500	0.1000
19.000	0.2100

Name: CI95E Base Flow(cfs): 0.000 Init Stage(ft): 13.500
Group: BASE Warn Stage(ft): 21.070
Type: Stage/Area

This node represents the beginning of the channel discharging to PI95EF under NB I-95.

Stage(ft)	Area(ac)

Name: CI95F Base Flow(cfs): 0.000 Init Stage(ft): 13.500
Group: BASE Warn Stage(ft): 21.070
Type: Stage/Area

This node represents the end of the channel discharging to PI95EF under NB I-95.

Stage(ft)	Area(ac)
13.500	0.1400
19.000	0.3000

Name: CI95G Base Flow(cfs): 0.000 Init Stage(ft): 13.500
Group: BASE Warn Stage(ft): 20.890
Type: Stage/Area

This node represents the beginning of the channel discharging to PI95GH under the I-95 SE Ramp.

Stage(ft)	Area(ac)

Name: CI95H Base Flow(cfs): 0.000 Init Stage(ft): 13.500
Group: BASE Warn Stage(ft): 20.890
Type: Stage/Area

This node represents the end of the channel discharging to PI95GH under the I-95 SE Ramp.

Stage(ft)	Area(ac)
13.500	0.2600
19.000	0.5000

Name: CLTCA Base Flow(cfs): 0.000 Init Stage(ft): 13.500
Group: BASE Warn Stage(ft): 20.510
Type: Stage/Area

This node represents the beginning of the channel discharging to PLTCAB under the first LTC driveway.

Stage(ft)	Area(ac)

Name: CLTCB Base Flow(cfs): 0.000 Init Stage(ft): 13.450
Group: BASE Warn Stage(ft): 20.510
Type: Stage/Area

This node represents the end of the channel discharging to PLTCAB under the first LTC driveway.

Stage(ft)	Area(ac)
13.450	0.2800
19.000	0.8900

Name: CLTCC Base Flow(cfs): 0.000 Init Stage(ft): 13.450
Group: BASE Warn Stage(ft): 20.310
Type: Stage/Area

This node represents the beginning of the channel discharging to PLTCCD under the second LTC driveway.

Stage(ft)	Area(ac)

Name: CLTCD Base Flow(cfs): 0.000 Init Stage(ft): 13.400
Group: BASE Warn Stage(ft): 20.310
Type: Stage/Area

This node represents the end of the channel discharging to PLTCCD under the second LTC driveway.

Stage(ft)	Area(ac)
14.560	0.1500
19.000	0.4700

Name: CMILNB Base Flow(cfs): 0.000 Init Stage(ft): 9.140
Group: BASE Warn Stage(ft): 17.390
Type: Stage/Area

This node represents the length of C-103 immediately west of the Pond 1 outfall.

Stage(ft)	Area(ac)

9.140	0.1100
15.180	0.1100

Name: COUT123A Base Flow(cfs): 0.000 Init Stage(ft): 7.230
Group: BASE Warn Stage(ft): 13.600
Type: Stage/Area

This node represents the beginning of the channel discharging to the outfall for Basins 1, 2, and 3.

Stage(ft)	Area(ac)

Name: COUT123B Base Flow(cfs): 0.000 Init Stage(ft): 6.620
Group: BASE Warn Stage(ft): 13.600
Type: Stage/Area

This node represents a portion of the channel discharging to the outfall for Basins 1, 2, and 3.

Stage(ft)	Area(ac)
6.620	0.0300
13.600	0.0500

Name: COUT123C Base Flow(cfs): 0.000 Init Stage(ft): 2.000
Group: BASE Warn Stage(ft): 9.000
Type: Stage/Area

This node represents the end of the channel discharging to the outfall for Basins 1, 2, and 3.

Stage(ft)	Area(ac)
2.000	0.9200
9.000	1.5300

Name: CSELVB Base Flow(cfs): 0.000 Init Stage(ft): 9.090
Group: BASE Warn Stage(ft): 17.150
Type: Stage/Area

This node represents the length of C-103 immediately west of CD-101.

Stage(ft)	Area(ac)
9.090	0.1500
15.120	0.1500

Name: CSELVC Base Flow(cfs): 0.000 Init Stage(ft): 8.990
Group: BASE Warn Stage(ft): 16.660
Type: Stage/Area

This node represents the length of C-103 immediately west of CD-200.

Stage(ft)	Area(ac)
8.990	0.2900
15.020	0.2900

Name: CSELVD Base Flow(cfs): 0.000 Init Stage(ft): 8.960
Group: BASE Warn Stage(ft): 16.480
Type: Stage/Area

This node represents the length of C-103 immediately west of the Police Pond outfall.

Stage(ft)	Area(ac)
8.960	0.1000
14.980	0.1000

Name: CSELVE Base Flow(cfs): 0.000 Init Stage(ft): 8.860
Group: BASE Warn Stage(ft): 16.020
Type: Stage/Area

This node represents the length of C-103 immediately west of CD-201.

Stage(ft)	Area(ac)
8.860	0.2800
14.880	0.2800

Name: CSELVF Base Flow(cfs): 0.000 Init Stage(ft): 8.810
Group: BASE Warn Stage(ft): 15.790
Type: Stage/Area

This node represents the length of C-103 immediately west of CD-202.

Stage(ft)	Area(ac)
8.810	0.1400
14.830	0.1400

Name: CSELVG Base Flow(cfs): 0.000 Init Stage(ft): 8.740
Group: BASE Warn Stage(ft): 15.410
Type: Stage/Area

This node represents the length of C-103 immediately west of CD-203.

Stage(ft)	Area(ac)
8.740	0.2300
14.750	0.2300

Name: CSPUR Base Flow(cfs): 0.000 Init Stage(ft): 7.390
Group: BASE Warn Stage(ft): 14.400
Type: Stage/Area

This node represents the storage area available in the abandoned southern spur of Canal 103.

Estimated storage volumes were reduced by 20% to account for siltation and excessive vegetation.

Stage(ft)	Area(ac)
7.390	0.5000
14.400	0.9900

Name: CSUBSA Base Flow(cfs): 0.000 Init Stage(ft): 17.500
Group: BASE Warn Stage(ft): 21.300
Type: Stage/Area

This node represents the beginning of the channel discharging to PSUBSAB under the substation driveway.

Stage(ft)	Area(ac)

Name: CSUBSB Base Flow(cfs): 0.000 Init Stage(ft): 15.500
Group: BASE Warn Stage(ft): 21.300
Type: Stage/Area

This node represents the end of the channel discharging to PSUBSAB under the substation driveway.

Stage(ft)	Area(ac)
15.500	0.4100
19.000	1.2400

Name: CTORIA Base Flow(cfs): 0.000 Init Stage(ft): 13.310
Group: BASE Warn Stage(ft): 19.180
Type: Stage/Area

This node represents the beginning of the channel discharging to PTORIAB under East Torino Parkway.

Stage(ft)	Area(ac)

Name: CTORIB Base Flow(cfs): 0.000 Init Stage(ft): 13.250
Group: BASE Warn Stage(ft): 19.180
Type: Stage/Area

This node represents the end of the channel discharging to PTORIAB under East Torino Parkway

Stage(ft)	Area(ac)
13.760	0.1300
19.000	0.7500

Name: CTURNA Base Flow(cfs): 0.000 Init Stage(ft): 13.250
Group: BASE Warn Stage(ft): 18.810
Type: Stage/Area

This node represents the beginning of the channel discharging to PTURNAB under the Florida Turnpike.

Stage(ft)	Area(ac)

Name: CTURNB Base Flow(cfs): 0.000 Init Stage(ft): 13.200
Group: BASE Warn Stage(ft): 19.000
Type: Stage/Area

This node represents the end of the channel discharging to PTURNAB under the Florida Turnpike.

Stage(ft)	Area(ac)
13.200	0.1400
19.000	0.8000

Name: HorizonPond Base Flow(cfs): 0.000 Init Stage(ft): 15.000
Group: BASE Warn Stage(ft): 18.240
Type: Stage/Volume

Converted from NGVD to NAVD

Stage(ft)	Volume(af)
15.000	0.0000
15.500	0.4000
16.000	0.9000
16.300	3.8000
16.500	5.8000
17.500	16.9000
18.500	30.7000

Name: OffLTC Base Flow(cfs): 0.000 Init Stage(ft): 18.000
Group: BASE Warn Stage(ft): 20.510
Type: Stage/Area

This node represents the storage volume available in the depressional areas to the south and west of the ditch draining east to

Stage(ft)	Area(ac)
18.000	5.6700
19.000	56.7200

Name: OUTFALL Base Flow(cfs): 0.000 Init Stage(ft): 1.520
Group: BASE Warn Stage(ft): 9.000
Type: Time/Stage

FEMA Flood Maps show the 100 year flood stage at 9' NGVD 29 (7.5' NAVD 88).
Per Glen Gareau of the SFWMD, the tailwater has been lowered to 1.52' NAVD 88 to match the mean high water elevation.

Time(hrs)	Stage(ft)
0.00	1.520
72.00	1.520
96.00	1.520

Name: PolicePond Base Flow(cfs): 0.000 Init Stage(ft): 14.000
Group: BASE Warn Stage(ft): 18.390
Type: Stage/Volume

Converted from NGVD to NAVD

Stage(ft)	Volume(af)
14.000	0.0000
18.500	5.7000
21.500	17.9000

Name: Pond 1a Base Flow(cfs): 0.000 Init Stage(ft): 17.150
Group: BASE Warn Stage(ft): 19.000
Type: Stage/Area

Dry pre-treatment pond

Stage(ft)	Area(ac)
17.140	1.3800
19.000	1.4600
20.000	1.6100

Name: Pond 1b Base Flow(cfs): 0.000 Init Stage(ft): 17.150
Group: BASE Warn Stage(ft): 19.000
Type: Stage/Area

Wet pond

Stage(ft)	Area(ac)
17.140	1.6500
18.000	1.7900
19.000	2.0200
20.000	2.2500

Name: Pond 2/3a Base Flow(cfs): 0.000 Init Stage(ft): 13.000
Group: BASE Warn Stage(ft): 15.000
Type: Stage/Area

Dry pre-treatment pond

Stage(ft)	Area(ac)
13.000	1.8400
14.000	1.9900
15.000	2.1300

Name: Pond 2/3b Base Flow(cfs): 0.000 Init Stage(ft): 9.500
Group: BASE Warn Stage(ft): 15.000
Type: Stage/Area

Wet pond

Stage(ft)	Area(ac)
9.500	0.1850
13.000	0.3800
14.000	0.4700
15.000	0.5700

Name: Pond 2/3c Base Flow(cfs): 0.000 Init Stage(ft): 9.500
Group: BASE Warn Stage(ft): 15.000
Type: Stage/Area

Wet pond

Stage(ft)	Area(ac)
9.500	1.3300
13.000	1.7900
14.000	1.9900
15.000	2.1900

Name: PostOfficePond Base Flow(cfs): 0.000 Init Stage(ft): 14.800
Group: BASE Warn Stage(ft): 18.510
Type: Stage/Volume

Stage(ft)	Volume(af)
14.800	0.0000
16.500	0.6300
17.650	2.6200
18.000	3.3800

Name: SEDBASIN Base Flow(cfs): 0.000 Init Stage(ft): 9.230
Group: BASE Warn Stage(ft): 19.290
Type: Stage/Area

Stage(ft)	Area(ac)
9.230	0.0200
19.290	0.1200

Name: SUBPONDB1A Base Flow(cfs): 0.000 Init Stage(ft): 19.000
Group: BASE Warn Stage(ft): 22.000
Type: Stage/Volume

Converted from NGVD to NAVD

Stage(ft)	Volume(af)
19.000	0.0000
20.500	0.0640
21.500	0.1300

Name: SUBPONDB1B Base Flow(cfs): 0.000 Init Stage(ft): 19.000
Group: BASE Warn Stage(ft): 22.000
Type: Stage/Volume

Converted from NGVD to NAVD

Stage(ft)	Volume(af)
19.000	0.0000
20.500	0.1520
21.500	0.2900

Name: WestLTC Base Flow(cfs): 0.000 Init Stage(ft): 17.500
Group: BASE Warn Stage(ft): 21.300
Type: Stage/Area

This node represents the storage volume available in the depressional areas to the south and west of the ditch draining east to

Stage(ft)	Area(ac)
17.500	1.0000
18.500	5.1800
19.000	26.0000

==== Pipes ====

Name: 25thStCulver From Node: COUT123C Length(ft): 140.00
Group: BASE To Node: OUTFALL Count: 3
Friction Equation: Automatic

	UPSTREAM	DOWNSTREAM		
Geometry:	Circular	Circular	Solution Algorithm:	Most Restrictive
Span(in):	60.00	60.00	Flow:	Both
Rise(in):	60.00	60.00	Entrance Loss Coef:	0.20
Invert(ft):	2.000	2.000	Exit Loss Coef:	1.00
Manning's N:	0.012000	0.012000	Bend Loss Coef:	0.00
Top Clip(in):	0.000	0.000	Outlet Ctrl Spec:	Use dc or tw
Bot Clip(in):	0.000	0.000	Inlet Ctrl Spec:	Use dc
			Stabilizer Option:	None

Upstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

Downstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

Name: CCORPBMILNB From Node: CCORPB Length(ft): 545.00
Group: BASE To Node: CMILNB Count: 1
Friction Equation: Automatic

	UPSTREAM	DOWNSTREAM		
Geometry:	Rectangular	Rectangular	Solution Algorithm:	Most Restrictive
Span(in):	132.00	132.00	Flow:	Both
Rise(in):	60.00	60.00	Entrance Loss Coef:	0.00
Invert(ft):	9.180	9.140	Exit Loss Coef:	0.00
Manning's N:	0.012000	0.012000	Bend Loss Coef:	0.00
Top Clip(in):	0.000	0.000	Outlet Ctrl Spec:	Use dc or tw
Bot Clip(in):	0.000	0.000	Inlet Ctrl Spec:	Use dc
			Stabilizer Option:	None

Upstream FHWA Inlet Edge Description:
Rectangular Box: 30° to 75° wingwall flares

Downstream FHWA Inlet Edge Description:
Rectangular Box: 30° to 75° wingwall flares

Name: CD-100A		From Node: CD-100A	Length(ft): 120.00
Group: BASE		To Node: CCORPB	Count: 1
			Friction Equation: Automatic
	UPSTREAM	DOWNSTREAM	Solution Algorithm: Most Restrictive
Geometry:	Circular	Circular	Flow: Both
Span(in):	36.00	36.00	Entrance Loss Coef: 0.20
Rise(in):	36.00	36.00	Exit Loss Coef: 1.00
Invert(ft):	13.380	13.000	Bend Loss Coef: 0.00
Manning's N:	0.012000	0.012000	Outlet Ctrl Spec: Use dc or tw
Top Clip(in):	0.000	0.000	Inlet Ctrl Spec: Use dc
Bot Clip(in):	0.000	0.000	Stabilizer Option: None

Upstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

Downstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

Name: CD-101A		From Node: CD-101A	Length(ft): 144.00
Group: BASE		To Node: CSELVB	Count: 1
			Friction Equation: Automatic
	UPSTREAM	DOWNSTREAM	Solution Algorithm: Most Restrictive
Geometry:	Horz Ellipse	Horz Ellipse	Flow: Both
Span(in):	30.00	30.00	Entrance Loss Coef: 0.70
Rise(in):	19.00	19.00	Exit Loss Coef: 1.00
Invert(ft):	14.000	12.460	Bend Loss Coef: 0.00
Manning's N:	0.012000	0.012000	Outlet Ctrl Spec: Use dc or tw
Top Clip(in):	0.000	0.000	Inlet Ctrl Spec: Use dc
Bot Clip(in):	0.000	0.000	Stabilizer Option: None

Upstream FHWA Inlet Edge Description:
Horizontal Ellipse Concrete: Square edge with headwall

Downstream FHWA Inlet Edge Description:
Horizontal Ellipse Concrete: Square edge with headwall

Name: CD-200A		From Node: CD-200A	Length(ft): 144.00
Group: BASE		To Node: CSELVC	Count: 1
			Friction Equation: Automatic
	UPSTREAM	DOWNSTREAM	Solution Algorithm: Most Restrictive
Geometry:	Circular	Circular	Flow: Both
Span(in):	24.00	24.00	Entrance Loss Coef: 0.20
Rise(in):	24.00	24.00	Exit Loss Coef: 1.00
Invert(ft):	11.800	11.500	Bend Loss Coef: 0.00
Manning's N:	0.012000	0.012000	Outlet Ctrl Spec: Use dc or tw
Top Clip(in):	0.000	0.000	Inlet Ctrl Spec: Use dc
Bot Clip(in):	0.000	0.000	Stabilizer Option: None

Upstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

Downstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

Name: CD-201A		From Node: CD-201A	Length(ft): 146.00
Group: BASE		To Node: CSELVE	Count: 1
			Friction Equation: Automatic
	UPSTREAM	DOWNSTREAM	Solution Algorithm: Most Restrictive

Geometry:	Horz Ellipse	Horz Ellipse	Flow:	Both
Span(in):	30.00	30.00	Entrance Loss Coef:	0.20
Rise(in):	19.00	19.00	Exit Loss Coef:	1.00
Invert(ft):	10.920	10.620	Bend Loss Coef:	0.00
Manning's N:	0.012000	0.012000	Outlet Ctrl Spec:	Use dc or tw
Top Clip(in):	0.000	0.000	Inlet Ctrl Spec:	Use dc
Bot Clip(in):	0.000	0.000	Stabilizer Option:	None

Upstream FHWA Inlet Edge Description:
Horizontal Ellipse Concrete: Square edge with headwall

Downstream FHWA Inlet Edge Description:
Horizontal Ellipse Concrete: Square edge with headwall

Name:	CD-202A	From Node: CD-202A	Length(ft):	123.00
Group:	BASE	To Node: CSELVF	Count:	1
			Friction Equation:	Automatic
	UPSTREAM	DOWNSTREAM	Solution Algorithm:	Most Restrictive
Geometry:	Horz Ellipse	Horz Ellipse	Flow:	Both
Span(in):	23.00	23.00	Entrance Loss Coef:	0.20
Rise(in):	14.00	14.00	Exit Loss Coef:	1.00
Invert(ft):	10.560	10.310	Bend Loss Coef:	0.00
Manning's N:	0.022000	0.022000	Outlet Ctrl Spec:	Use dc or tw
Top Clip(in):	0.000	0.000	Inlet Ctrl Spec:	Use dc
Bot Clip(in):	0.000	0.000	Stabilizer Option:	None

Upstream FHWA Inlet Edge Description:
Horizontal Ellipse Concrete: Square edge with headwall

Downstream FHWA Inlet Edge Description:
Horizontal Ellipse Concrete: Square edge with headwall

Name:	CD-203A	From Node: CD-203A	Length(ft):	44.00
Group:	BASE	To Node: CD-203B	Count:	1
			Friction Equation:	Automatic
	UPSTREAM	DOWNSTREAM	Solution Algorithm:	Most Restrictive
Geometry:	Horz Ellipse	Horz Ellipse	Flow:	Both
Span(in):	30.00	30.00	Entrance Loss Coef:	0.70
Rise(in):	19.00	19.00	Exit Loss Coef:	1.00
Invert(ft):	16.230	15.540	Bend Loss Coef:	0.00
Manning's N:	0.012000	0.012000	Outlet Ctrl Spec:	Use dc or tw
Top Clip(in):	0.000	0.000	Inlet Ctrl Spec:	Use dc
Bot Clip(in):	0.000	0.000	Stabilizer Option:	None

Upstream FHWA Inlet Edge Description:
Horizontal Ellipse Concrete: Square edge with headwall

Downstream FHWA Inlet Edge Description:
Horizontal Ellipse Concrete: Square edge with headwall

Name:	CD-203B	From Node: CD-203B	Length(ft):	155.00
Group:	BASE	To Node: CSELVG	Count:	2
			Friction Equation:	Automatic
	UPSTREAM	DOWNSTREAM	Solution Algorithm:	Most Restrictive
Geometry:	Circular	Circular	Flow:	Both
Span(in):	24.00	24.00	Entrance Loss Coef:	0.20
Rise(in):	24.00	24.00	Exit Loss Coef:	1.00
Invert(ft):	13.500	11.250	Bend Loss Coef:	0.00
Manning's N:	0.012000	0.012000	Outlet Ctrl Spec:	Use dc or tw
Top Clip(in):	0.000	0.000	Inlet Ctrl Spec:	Use dc
Bot Clip(in):	0.000	0.000	Stabilizer Option:	None

Upstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

Downstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

Name:	CD-203C	From Node: CD-203C	Length(ft): 26.00
Group:	BASE	To Node: CD-203B	Count: 1
			Friction Equation: Automatic
	UPSTREAM	DOWNSTREAM	Solution Algorithm: Most Restrictive
Geometry:	Circular	Circular	Flow: Both
Span(in):	18.00	18.00	Entrance Loss Coef: 0.70
Rise(in):	18.00	18.00	Exit Loss Coef: 1.00
Invert(ft):	15.600	15.540	Bend Loss Coef: 0.00
Manning's N:	0.012000	0.012000	Outlet Ctrl Spec: Use dc or tw
Top Clip(in):	0.000	0.000	Inlet Ctrl Spec: Use dc
Bot Clip(in):	0.000	0.000	Stabilizer Option: None

Upstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

Downstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

Name:	CD-203D	From Node: CD-203D	Length(ft): 113.00
Group:	BASE	To Node: CD-203B	Count: 1
			Friction Equation: Automatic
	UPSTREAM	DOWNSTREAM	Solution Algorithm: Most Restrictive
Geometry:	Horz Ellipse	Horz Ellipse	Flow: Both
Span(in):	30.00	30.00	Entrance Loss Coef: 0.20
Rise(in):	19.00	19.00	Exit Loss Coef: 1.00
Invert(ft):	13.600	13.500	Bend Loss Coef: 0.00
Manning's N:	0.012000	0.012000	Outlet Ctrl Spec: Use dc or tw
Top Clip(in):	0.000	0.000	Inlet Ctrl Spec: Use dc
Bot Clip(in):	0.000	0.000	Stabilizer Option: None

Upstream FHWA Inlet Edge Description:
Horizontal Ellipse Concrete: Square edge with headwall

Downstream FHWA Inlet Edge Description:
Horizontal Ellipse Concrete: Square edge with headwall

Name:	CD-300A	From Node: CD-300A	Length(ft): 110.00
Group:	BASE	To Node: CDUNNB	Count: 1
			Friction Equation: Automatic
	UPSTREAM	DOWNSTREAM	Solution Algorithm: Most Restrictive
Geometry:	Horz Ellipse	Horz Ellipse	Flow: Both
Span(in):	30.00	30.00	Entrance Loss Coef: 0.70
Rise(in):	19.00	19.00	Exit Loss Coef: 1.00
Invert(ft):	11.200	11.000	Bend Loss Coef: 0.00
Manning's N:	0.012000	0.012000	Outlet Ctrl Spec: Use dc or tw
Top Clip(in):	0.000	0.000	Inlet Ctrl Spec: Use dc
Bot Clip(in):	0.000	0.000	Stabilizer Option: None

Upstream FHWA Inlet Edge Description:
Horizontal Ellipse Concrete: Square edge with headwall

Downstream FHWA Inlet Edge Description:
Horizontal Ellipse Concrete: Square edge with headwall

Name:	CD-301	From Node: CD-301	Length(ft): 102.00
Group:	BASE	To Node: CBENDB	Count: 2
			Friction Equation: Automatic
	UPSTREAM	DOWNSTREAM	Solution Algorithm: Most Restrictive
Geometry:	Horz Ellipse	Horz Ellipse	Flow: Both
Span(in):	30.00	30.00	Entrance Loss Coef: 0.70
Rise(in):	19.00	19.00	Exit Loss Coef: 1.00
Invert(ft):	11.800	11.700	Bend Loss Coef: 0.00
Manning's N:	0.012000	0.012000	Outlet Ctrl Spec: Use dc or tw
Top Clip(in):	0.000	0.000	Inlet Ctrl Spec: Use dc
Bot Clip(in):	0.000	0.000	Stabilizer Option: None

Upstream FHWA Inlet Edge Description:
Horizontal Ellipse Concrete: Square edge with headwall

Downstream FHWA Inlet Edge Description:
Horizontal Ellipse Concrete: Square edge with headwall

Name: CDUNNBBENDB		From Node: CDUNNB	Length(ft): 860.00
Group: BASE		To Node: CBENDB	Count: 1
			Friction Equation: Automatic
	UPSTREAM	DOWNSTREAM	Solution Algorithm: Most Restrictive
Geometry:	Rectangular	Rectangular	Flow: Both
Span(in):	132.00	132.00	Entrance Loss Coef: 0.00
Rise(in):	60.00	60.00	Exit Loss Coef: 0.00
Invert(ft):	8.640	8.570	Bend Loss Coef: 0.70
Manning's N:	0.012000	0.012000	Outlet Ctrl Spec: Use dc or tw
Top Clip(in):	0.000	0.000	Inlet Ctrl Spec: Use dc
Bot Clip(in):	0.000	0.000	Stabilizer Option: None

Upstream FHWA Inlet Edge Description:
Rectangular Box: 30° to 75° wingwall flares

Downstream FHWA Inlet Edge Description:
Rectangular Box: 30° to 75° wingwall flares

Name: CMILNBSELVB		From Node: CMILNB	Length(ft): 530.00
Group: BASE		To Node: CSELVB	Count: 1
			Friction Equation: Automatic
	UPSTREAM	DOWNSTREAM	Solution Algorithm: Most Restrictive
Geometry:	Rectangular	Rectangular	Flow: Both
Span(in):	132.00	132.00	Entrance Loss Coef: 0.00
Rise(in):	60.00	60.00	Exit Loss Coef: 0.00
Invert(ft):	9.140	9.090	Bend Loss Coef: 0.00
Manning's N:	0.012000	0.012000	Outlet Ctrl Spec: Use dc or tw
Top Clip(in):	0.000	0.000	Inlet Ctrl Spec: Use dc
Bot Clip(in):	0.000	0.000	Stabilizer Option: None

Upstream FHWA Inlet Edge Description:
Rectangular Box: 30° to 75° wingwall flares

Downstream FHWA Inlet Edge Description:
Rectangular Box: 30° to 75° wingwall flares

Name: CSEDCORPB		From Node: SEDBASIN	Length(ft): 545.00
Group: BASE		To Node: CCORPB	Count: 1
			Friction Equation: Automatic
	UPSTREAM	DOWNSTREAM	Solution Algorithm: Most Restrictive
Geometry:	Rectangular	Rectangular	Flow: Both
Span(in):	132.00	132.00	Entrance Loss Coef: 0.20
Rise(in):	60.00	60.00	Exit Loss Coef: 0.00
Invert(ft):	9.230	9.180	Bend Loss Coef: 0.00
Manning's N:	0.012000	0.012000	Outlet Ctrl Spec: Use dc or tw
Top Clip(in):	0.000	0.000	Inlet Ctrl Spec: Use dc
Bot Clip(in):	0.000	0.000	Stabilizer Option: None

Upstream FHWA Inlet Edge Description:
Rectangular Box: 30° to 75° wingwall flares

Downstream FHWA Inlet Edge Description:
Rectangular Box: 30° to 75° wingwall flares

Name: CSELVBC		From Node: CSELVB	Length(ft): 1070.00
Group: BASE		To Node: CSELVC	Count: 1
			Friction Equation: Automatic
	UPSTREAM	DOWNSTREAM	Solution Algorithm: Most Restrictive
Geometry:	Rectangular	Rectangular	Flow: Both
Span(in):	132.00	132.00	Entrance Loss Coef: 0.00

Rise(in):	60.00	60.00	Exit Loss Coef: 0.00
Invert(ft):	9.090	8.990	Bend Loss Coef: 0.00
Manning's N:	0.012000	0.012000	Outlet Ctrl Spec: Use dc or tw
Top Clip(in):	0.000	0.000	Inlet Ctrl Spec: Use dc
Bot Clip(in):	0.000	0.000	Stabilizer Option: None

Upstream FHWA Inlet Edge Description:
Rectangular Box: 30° to 75° wingwall flares

Downstream FHWA Inlet Edge Description:
Rectangular Box: 30° to 75° wingwall flares

Name:	CSELVCD	From Node: CSELVC	Length(ft): 380.00
Group:	BASE	To Node: CSELVD	Count: 1
			Friction Equation: Automatic
	UPSTREAM	DOWNSTREAM	Solution Algorithm: Most Restrictive
Geometry:	Rectangular	Rectangular	Flow: Both
Span(in):	132.00	132.00	Entrance Loss Coef: 0.00
Rise(in):	60.00	60.00	Exit Loss Coef: 0.00
Invert(ft):	8.990	8.960	Bend Loss Coef: 0.00
Manning's N:	0.012000	0.012000	Outlet Ctrl Spec: Use dc or tw
Top Clip(in):	0.000	0.000	Inlet Ctrl Spec: Use dc
Bot Clip(in):	0.000	0.000	Stabilizer Option: None

Upstream FHWA Inlet Edge Description:
Rectangular Box: 30° to 75° wingwall flares

Downstream FHWA Inlet Edge Description:
Rectangular Box: 30° to 75° wingwall flares

Name:	CSELVDE	From Node: CSELVD	Length(ft): 1025.00
Group:	BASE	To Node: CSELVE	Count: 1
			Friction Equation: Automatic
	UPSTREAM	DOWNSTREAM	Solution Algorithm: Most Restrictive
Geometry:	Rectangular	Rectangular	Flow: Both
Span(in):	132.00	132.00	Entrance Loss Coef: 0.00
Rise(in):	60.00	60.00	Exit Loss Coef: 0.00
Invert(ft):	8.960	8.860	Bend Loss Coef: 0.00
Manning's N:	0.012000	0.012000	Outlet Ctrl Spec: Use dc or tw
Top Clip(in):	0.000	0.000	Inlet Ctrl Spec: Use dc
Bot Clip(in):	0.000	0.000	Stabilizer Option: None

Upstream FHWA Inlet Edge Description:
Rectangular Box: 30° to 75° wingwall flares

Downstream FHWA Inlet Edge Description:
Rectangular Box: 30° to 75° wingwall flares

Name:	CSELVEF	From Node: CSELVE	Length(ft): 500.00
Group:	BASE	To Node: CSELVF	Count: 1
			Friction Equation: Automatic
	UPSTREAM	DOWNSTREAM	Solution Algorithm: Most Restrictive
Geometry:	Rectangular	Rectangular	Flow: Both
Span(in):	132.00	132.00	Entrance Loss Coef: 0.00
Rise(in):	60.00	60.00	Exit Loss Coef: 0.00
Invert(ft):	8.860	8.810	Bend Loss Coef: 0.00
Manning's N:	0.012000	0.012000	Outlet Ctrl Spec: Use dc or tw
Top Clip(in):	0.000	0.000	Inlet Ctrl Spec: Use dc
Bot Clip(in):	0.000	0.000	Stabilizer Option: None

Upstream FHWA Inlet Edge Description:
Rectangular Box: 30° to 75° wingwall flares

Downstream FHWA Inlet Edge Description:
Rectangular Box: 30° to 75° wingwall flares

```
---------------------------------------------------------------------------------------------------
         Name: CSELVFG             From Node: CSELVF             Length(ft): 825.00
        Group: BASE                  To Node: CSELVG                  Count: 1
                                                          Friction Equation: Automatic
               UPSTREAM       DOWNSTREAM                Solution Algorithm: Most Restrictive
     Geometry: Rectangular    Rectangular                         Flow: Both
     Span(in): 132.00         132.00                    Entrance Loss Coef: 0.00
     Rise(in): 60.00          60.00                         Exit Loss Coef: 0.00
   Invert(ft): 8.810          8.740                         Bend Loss Coef: 0.00
  Manning's N: 0.012000       0.012000                    Outlet Ctrl Spec: Use dc or tw
 Top Clip(in): 0.000          0.000                       Inlet Ctrl Spec: Use dc
 Bot Clip(in): 0.000          0.000                     Stabilizer Option: None


Upstream FHWA Inlet Edge Description:
Rectangular Box: 30° to 75° wingwall flares

Downstream FHWA Inlet Edge Description:
Rectangular Box: 30° to 75° wingwall flares


---------------------------------------------------------------------------------------------------
         Name: CSELVGDUNNB         From Node: CSELVG             Length(ft): 990.00
        Group: BASE                  To Node: CDUNNB                  Count: 1
                                                          Friction Equation: Automatic
               UPSTREAM       DOWNSTREAM                Solution Algorithm: Most Restrictive
     Geometry: Rectangular    Rectangular                         Flow: Both
     Span(in): 132.00         132.00                    Entrance Loss Coef: 0.00
     Rise(in): 60.00          60.00                         Exit Loss Coef: 0.00
   Invert(ft): 8.740          8.640                         Bend Loss Coef: 0.00
  Manning's N: 0.012000       0.012000                    Outlet Ctrl Spec: Use dc or tw
 Top Clip(in): 0.000          0.000                       Inlet Ctrl Spec: Use dc
 Bot Clip(in): 0.000          0.000                     Stabilizer Option: None


Upstream FHWA Inlet Edge Description:
Rectangular Box: 30° to 75° wingwall flares

Downstream FHWA Inlet Edge Description:
Rectangular Box: 30° to 75° wingwall flares


---------------------------------------------------------------------------------------------------
         Name: PCHRI               From Node: CCHRI              Length(ft): 42.00
        Group: BASE                  To Node: COUT123A                Count: 1
                                                          Friction Equation: Automatic
               UPSTREAM       DOWNSTREAM                Solution Algorithm: Most Restrictive
     Geometry: Circular       Circular                            Flow: Both
     Span(in): 72.00          72.00                     Entrance Loss Coef: 0.90
     Rise(in): 72.00          72.00                         Exit Loss Coef: 0.00
   Invert(ft): 7.230          7.230                         Bend Loss Coef: 0.00
  Manning's N: 0.022000       0.022000                    Outlet Ctrl Spec: Use dc or tw
 Top Clip(in): 0.000          0.000                       Inlet Ctrl Spec: Use dc
 Bot Clip(in): 0.000          0.000                     Stabilizer Option: None


Upstream FHWA Inlet Edge Description:
Circular CMP: Projecting

Downstream FHWA Inlet Edge Description:
Circular CMP: Projecting


---------------------------------------------------------------------------------------------------
         Name: PFECRAB             From Node: CFECRB             Length(ft): 493.00
        Group: BASE                  To Node: CTORIA                  Count: 2
                                                          Friction Equation: Automatic
               UPSTREAM       DOWNSTREAM                Solution Algorithm: Most Restrictive
     Geometry: Circular       Circular                            Flow: Both
     Span(in): 48.00          48.00                     Entrance Loss Coef: 0.20
     Rise(in): 48.00          48.00                         Exit Loss Coef: 0.00
   Invert(ft): 13.310         13.310                        Bend Loss Coef: 0.00
  Manning's N: 0.012000       0.012000                    Outlet Ctrl Spec: Use dc or tw
 Top Clip(in): 0.000          0.000                       Inlet Ctrl Spec: Use dc
 Bot Clip(in): 0.000          0.000                     Stabilizer Option: None


Upstream FHWA Inlet Edge Description:
```

Circular Concrete: Square edge w/ headwall

Downstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

Name: PI95AB		From Node: CI95B	Length(ft):	146.00
Group: BASE		To Node: CI95C	Count:	2
			Friction Equation:	Automatic
	UPSTREAM	DOWNSTREAM	Solution Algorithm:	Most Restrictive
Geometry:	Circular	Circular	Flow:	Both
Span(in):	48.00	48.00	Entrance Loss Coef:	0.20
Rise(in):	48.00	48.00	Exit Loss Coef:	0.00
Invert(ft):	13.500	13.500	Bend Loss Coef:	0.00
Manning's N:	0.012000	0.012000	Outlet Ctrl Spec:	Use dc or tw
Top Clip(in):	0.000	0.000	Inlet Ctrl Spec:	Use dc
Bot Clip(in):	0.000	0.000	Stabilizer Option:	None

Upstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

Downstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

Name: PI95CD		From Node: CI95D	Length(ft):	181.00
Group: BASE		To Node: CI95E	Count:	2
			Friction Equation:	Automatic
	UPSTREAM	DOWNSTREAM	Solution Algorithm:	Most Restrictive
Geometry:	Circular	Circular	Flow:	Both
Span(in):	54.00	54.00	Entrance Loss Coef:	0.20
Rise(in):	54.00	54.00	Exit Loss Coef:	0.00
Invert(ft):	13.500	13.500	Bend Loss Coef:	0.00
Manning's N:	0.012000	0.012000	Outlet Ctrl Spec:	Use dc or tw
Top Clip(in):	0.000	0.000	Inlet Ctrl Spec:	Use dc
Bot Clip(in):	0.000	0.000	Stabilizer Option:	None

Upstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

Downstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

Name: PI95EF		From Node: CI95F	Length(ft):	189.00
Group: BASE		To Node: CI95G	Count:	2
			Friction Equation:	Automatic
	UPSTREAM	DOWNSTREAM	Solution Algorithm:	Most Restrictive
Geometry:	Circular	Circular	Flow:	Both
Span(in):	60.00	60.00	Entrance Loss Coef:	0.20
Rise(in):	60.00	60.00	Exit Loss Coef:	0.00
Invert(ft):	13.500	13.500	Bend Loss Coef:	0.00
Manning's N:	0.012000	0.012000	Outlet Ctrl Spec:	Use dc or tw
Top Clip(in):	0.000	0.000	Inlet Ctrl Spec:	Use dc
Bot Clip(in):	0.000	0.000	Stabilizer Option:	None

Upstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

Downstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

Name: PI95GH		From Node: CI95H	Length(ft):	144.00
Group: BASE		To Node: CLTCA	Count:	1
			Friction Equation:	Automatic
	UPSTREAM	DOWNSTREAM	Solution Algorithm:	Most Restrictive
Geometry:	Rectangular	Rectangular	Flow:	Both
Span(in):	84.00	84.00	Entrance Loss Coef:	0.20
Rise(in):	72.00	72.00	Exit Loss Coef:	0.00
Invert(ft):	13.500	13.500	Bend Loss Coef:	0.00

Manning's N:	0.012000	0.012000	Outlet Ctrl Spec: Use dc or tw
Top Clip(in):	0.000	0.000	Inlet Ctrl Spec: Use dc
Bot Clip(in):	0.000	0.000	Stabilizer Option: None

Upstream FHWA Inlet Edge Description:
Rectangular Box: 30° to 75° wingwall flares

Downstream FHWA Inlet Edge Description:
Rectangular Box: 30° to 75° wingwall flares

Name:	Pipe-1a	From Node: Pond 1a	Length(ft): 36.50
Group:	BASE	To Node: Pond 1b	Count: 1
			Friction Equation: Automatic
	UPSTREAM	DOWNSTREAM	Solution Algorithm: Most Restrictive
Geometry:	Circular	Circular	Flow: Both
Span(in):	3.00	3.00	Entrance Loss Coef: 0.20
Rise(in):	3.00	3.00	Exit Loss Coef: 1.00
Invert(ft):	17.150	17.050	Bend Loss Coef: 0.00
Manning's N:	0.011000	0.011000	Outlet Ctrl Spec: Use dc or tw
Top Clip(in):	0.000	0.000	Inlet Ctrl Spec: Use dc
Bot Clip(in):	0.000	0.000	Stabilizer Option: None

Upstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

Downstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

Name:	Pipe-2/3b	From Node: Pond 2/3b	Length(ft): 160.00
Group:	BASE	To Node: Pond 2/3c	Count: 2
			Friction Equation: Automatic
	UPSTREAM	DOWNSTREAM	Solution Algorithm: Most Restrictive
Geometry:	Circular	Circular	Flow: Both
Span(in):	48.00	48.00	Entrance Loss Coef: 0.70
Rise(in):	48.00	48.00	Exit Loss Coef: 1.00
Invert(ft):	3.000	2.500	Bend Loss Coef: 0.00
Manning's N:	0.012000	0.012000	Outlet Ctrl Spec: Use dc or tw
Top Clip(in):	0.000	0.000	Inlet Ctrl Spec: Use dc
Bot Clip(in):	0.000	0.000	Stabilizer Option: None

Upstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

Downstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

Name:	PLTCAB	From Node: CLTCB	Length(ft): 110.00
Group:	BASE	To Node: CLTCC	Count: 2
			Friction Equation: Automatic
	UPSTREAM	DOWNSTREAM	Solution Algorithm: Most Restrictive
Geometry:	Circular	Circular	Flow: Both
Span(in):	60.00	60.00	Entrance Loss Coef: 0.90
Rise(in):	60.00	60.00	Exit Loss Coef: 0.00
Invert(ft):	13.450	13.450	Bend Loss Coef: 0.00
Manning's N:	0.022000	0.022000	Outlet Ctrl Spec: Use dc or tw
Top Clip(in):	0.000	0.000	Inlet Ctrl Spec: Use dc
Bot Clip(in):	0.000	0.000	Stabilizer Option: None

Upstream FHWA Inlet Edge Description:
Circular CMP: Projecting

Downstream FHWA Inlet Edge Description:
Circular CMP: Projecting

Name:	PLTCCD	From Node: CLTCD	Length(ft): 156.00

Group: BASE | To Node: CFECRA | Count: 1
Friction Equation: Automatic
Solution Algorithm: Most Restrictive
Flow: Both
Entrance Loss Coef: 0.70
Exit Loss Coef: 0.00
Bend Loss Coef: 0.00
Outlet Ctrl Spec: Use dc or tw
Inlet Ctrl Spec: Use dc
Stabilizer Option: None

	UPSTREAM	DOWNSTREAM
Geometry:	Horz Ellipse	Horz Ellipse
Span(in):	76.00	76.00
Rise(in):	48.00	48.00
Invert(ft):	13.400	13.400
Manning's N:	0.012000	0.012000
Top Clip(in):	0.000	0.000
Bot Clip(in):	0.000	0.000

Upstream FHWA Inlet Edge Description:
Horizontal Ellipse Concrete: Square edge with headwall

Downstream FHWA Inlet Edge Description:
Horizontal Ellipse Concrete: Square edge with headwall

Name: PSUBSAB | From Node: CSUBSB | Length(ft): 121.00
Group: BASE | To Node: CI95A | Count: 1
Friction Equation: Automatic
Solution Algorithm: Most Restrictive
Flow: Both
Entrance Loss Coef: 0.90
Exit Loss Coef: 0.00
Bend Loss Coef: 0.00
Outlet Ctrl Spec: Use dc or tw
Inlet Ctrl Spec: Use dc
Stabilizer Option: None

	UPSTREAM	DOWNSTREAM
Geometry:	Circular	Circular
Span(in):	36.00	36.00
Rise(in):	36.00	36.00
Invert(ft):	15.500	15.480
Manning's N:	0.022000	0.022000
Top Clip(in):	0.000	0.000
Bot Clip(in):	0.000	0.000

Upstream FHWA Inlet Edge Description:
Circular CMP: Projecting

Downstream FHWA Inlet Edge Description:
Circular CMP: Projecting

Name: PTORIAB | From Node: CTORIB | Length(ft): 119.00
Group: BASE | To Node: CTURNA | Count: 1
Friction Equation: Automatic
Solution Algorithm: Most Restrictive
Flow: Both
Entrance Loss Coef: 0.20
Exit Loss Coef: 0.00
Bend Loss Coef: 0.00
Outlet Ctrl Spec: Use dc or tw
Inlet Ctrl Spec: Use dc
Stabilizer Option: None

	UPSTREAM	DOWNSTREAM
Geometry:	Circular	Circular
Span(in):	72.00	72.00
Rise(in):	72.00	72.00
Invert(ft):	13.250	13.250
Manning's N:	0.012000	0.012000
Top Clip(in):	0.000	0.000
Bot Clip(in):	0.000	0.000

Upstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

Downstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

Name: PTURNAB | From Node: CTURNB | Length(ft): 118.00
Group: BASE | To Node: CCORPA | Count: 1
Friction Equation: Automatic
Solution Algorithm: Most Restrictive
Flow: Both
Entrance Loss Coef: 0.20
Exit Loss Coef: 0.00
Bend Loss Coef: 0.00
Outlet Ctrl Spec: Use dc or tw
Inlet Ctrl Spec: Use dc
Stabilizer Option: None

	UPSTREAM	DOWNSTREAM
Geometry:	Rectangular	Rectangular
Span(in):	120.00	120.00
Rise(in):	60.00	60.00
Invert(ft):	13.200	12.950
Manning's N:	0.012000	0.012000
Top Clip(in):	0.000	0.000
Bot Clip(in):	0.000	0.000

Upstream FHWA Inlet Edge Description:
Rectangular Box: 30° to 75° wingwall flares

Downstream FHWA Inlet Edge Description:
Rectangular Box: 30° to 75° wingwall flares

```
         Name: SUBPONDB1A          From Node: SUBPONDB1A         Length(ft): 90.00
        Group: BASE                  To Node: CSUBSB                Count: 1
                                                          Friction Equation: Automatic
               UPSTREAM       DOWNSTREAM                Solution Algorithm: Most Restrictive
     Geometry: Circular       Circular                        Flow: Both
     Span(in): 3.00           3.00                      Entrance Loss Coef: 0.20
     Rise(in): 3.00           3.00                          Exit Loss Coef: 1.00
   Invert(ft): 19.000         19.000                        Bend Loss Coef: 0.00
  Manning's N: 0.011000       0.011000                    Outlet Ctrl Spec: Use dc or tw
 Top Clip(in): 0.000          0.000                        Inlet Ctrl Spec: Use dc
 Bot Clip(in): 0.000          0.000                     Stabilizer Option: None
```

Upstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

Downstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

Converted from NGVD to NAVD

```
         Name: SUBPONDB1B          From Node: SUBPONDB1B         Length(ft): 50.00
        Group: BASE                  To Node: CSUBSB                Count: 1
                                                          Friction Equation: Automatic
               UPSTREAM       DOWNSTREAM                Solution Algorithm: Most Restrictive
     Geometry: Circular       Circular                        Flow: Both
     Span(in): 3.00           3.00                      Entrance Loss Coef: 0.20
     Rise(in): 3.00           3.00                          Exit Loss Coef: 1.00
   Invert(ft): 19.000         19.000                        Bend Loss Coef: 0.00
  Manning's N: 0.011000       0.011000                    Outlet Ctrl Spec: Use dc or tw
 Top Clip(in): 0.000          0.000                        Inlet Ctrl Spec: Use dc
 Bot Clip(in): 0.000          0.000                     Stabilizer Option: None
```

Upstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

Downstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

Converted from NGVD to NAVD

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==== Channels ==========
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```
          Name: CBENDBC             From Node: CBENDB             Length(ft): 626.00
         Group: BASE                  To Node: CBENDC                  Count: 1

                UPSTREAM       DOWNSTREAM                Friction Equation: Automatic
      Geometry: Trapezoidal    Trapezoidal               Solution Algorithm: Automatic
    Invert(ft): 8.560          7.390                           Flow: Both
 TClpInitZ(ft): 9999.000       9999.000                  Contraction Coef: 0.100
   Manning's N: 0.042000       0.042000                    Expansion Coef: 0.300
  Top Clip(ft): 0.000          0.000                     Entrance Loss Coef: 0.000
  Bot Clip(ft): 0.000          0.000                         Exit Loss Coef: 0.000
     Main XSec:                                          Outlet Ctrl Spec: Use dc or tw
  AuxElev1(ft):                                            Inlet Ctrl Spec: Use dc
     Aux XSec1:                                         Stabilizer Option: None
  AuxElev2(ft):
     Aux XSec2:
 Top Width(ft):
     Depth(ft):
 Bot Width(ft): 14.000         14.000
  LtSdSlp(h/v): 1.00           1.00
  RtSdSlp(h/v): 1.00           1.00
```

```
          Name: CCHRI               From Node: CBENDC             Length(ft): 850.00
         Group: BASE                  To Node: CCHRI                   Count: 1

                UPSTREAM       DOWNSTREAM                Friction Equation: Automatic
      Geometry: Trapezoidal    Trapezoidal               Solution Algorithm: Automatic
    Invert(ft): 7.390          7.230                           Flow: Both
```

TClpInitZ(ft):	9999.000	9999.000	Contraction Coef:	0.100
Manning's N:	0.042000	0.042000	Expansion Coef:	0.300
Top Clip(ft):	0.000	0.000	Entrance Loss Coef:	0.000
Bot Clip(ft):	0.000	0.000	Exit Loss Coef:	0.000
Main XSec:			Outlet Ctrl Spec:	Use dc or tw
AuxElev1(ft):			Inlet Ctrl Spec:	Use dc
Aux XSec1:			Stabilizer Option:	None
AuxElev2(ft):				
Aux XSec2:				
Top Width(ft):				
Depth(ft):				
Bot Width(ft):	14.000	14.000		
LtSdSlp(h/v):	1.00	1.00		
RtSdSlp(h/v):	1.00	1.00		

Name:	CCORPASED	From Node: CCORPA	Length(ft):	115.00
Group:	BASE	To Node: SEDBASIN	Count:	1
	UPSTREAM	DOWNSTREAM	Friction Equation:	Automatic
Geometry:	Trapezoidal	Trapezoidal	Solution Algorithm:	Automatic
Invert(ft):	12.950	14.050	Flow:	Both
TClpInitZ(ft):	9999.000	9999.000	Contraction Coef:	0.100
Manning's N:	0.042000	0.042000	Expansion Coef:	0.300
Top Clip(ft):	0.000	0.000	Entrance Loss Coef:	0.000
Bot Clip(ft):	0.000	0.000	Exit Loss Coef:	0.000
Main XSec:			Outlet Ctrl Spec:	Use dc or tw
AuxElev1(ft):			Inlet Ctrl Spec:	Use dc
Aux XSec1:			Stabilizer Option:	None
AuxElev2(ft):				
Aux XSec2:				
Top Width(ft):				
Depth(ft):				
Bot Width(ft):	15.000	15.000		
LtSdSlp(h/v):	1.00	1.00		
RtSdSlp(h/v):	1.00	1.00		

Name:	CFECRAB	From Node: CFECRA	Length(ft):	2368.00
Group:	BASE	To Node: CFECRB	Count:	1
	UPSTREAM	DOWNSTREAM	Friction Equation:	Automatic
Geometry:	Trapezoidal	Trapezoidal	Solution Algorithm:	Automatic
Invert(ft):	13.400	13.310	Flow:	Both
TClpInitZ(ft):	9999.000	9999.000	Contraction Coef:	0.100
Manning's N:	0.042000	0.042000	Expansion Coef:	0.300
Top Clip(ft):	0.000	0.000	Entrance Loss Coef:	0.000
Bot Clip(ft):	0.000	0.000	Exit Loss Coef:	0.000
Main XSec:			Outlet Ctrl Spec:	Use dc or tw
AuxElev1(ft):			Inlet Ctrl Spec:	Use dc
Aux XSec1:			Stabilizer Option:	None
AuxElev2(ft):				
Aux XSec2:				
Top Width(ft):				
Depth(ft):				
Bot Width(ft):	10.000	10.000		
LtSdSlp(h/v):	2.00	2.00		
RtSdSlp(h/v):	2.00	2.00		

Name:	CI95AB	From Node: CI95A	Length(ft):	1140.00
Group:	BASE	To Node: CI95B	Count:	1
	UPSTREAM	DOWNSTREAM	Friction Equation:	Automatic
Geometry:	Trapezoidal	Trapezoidal	Solution Algorithm:	Automatic
Invert(ft):	15.480	13.500	Flow:	Both
TClpInitZ(ft):	9999.000	9999.000	Contraction Coef:	0.100
Manning's N:	0.042000	0.042000	Expansion Coef:	0.300
Top Clip(ft):	0.000	0.000	Entrance Loss Coef:	0.000
Bot Clip(ft):	0.000	0.000	Exit Loss Coef:	0.000
Main XSec:			Outlet Ctrl Spec:	Use dc or tw
AuxElev1(ft):			Inlet Ctrl Spec:	Use dc
Aux XSec1:			Stabilizer Option:	None
AuxElev2(ft):				
Aux XSec2:				
Top Width(ft):				
Depth(ft):				
Bot Width(ft):	5.000	5.000		
LtSdSlp(h/v):	2.00	2.00		

RtSdSlp(h/v): 2.00 2.00

Name: CI95CD From Node: CI95C Length(ft): 216.00
Group: BASE To Node: CI95D Count: 1

	UPSTREAM	DOWNSTREAM		
Geometry:	Trapezoidal	Trapezoidal	Friction Equation:	Automatic
Invert(ft):	13.500	13.500	Solution Algorithm:	Automatic
TClpInitZ(ft):	9999.000	9999.000	Flow:	Both
Manning's N:	0.042000	0.042000	Contraction Coef:	0.100
Top Clip(ft):	0.000	0.000	Expansion Coef:	0.300
Bot Clip(ft):	0.000	0.000	Entrance Loss Coef:	0.000
Main XSec:			Exit Loss Coef:	0.000
AuxElev1(ft):			Outlet Ctrl Spec:	Use dc or tw
Aux XSec1:			Inlet Ctrl Spec:	Use dc
AuxElev2(ft):			Stabilizer Option:	None
Aux XSec2:				
Top Width(ft):				
Depth(ft):				
Bot Width(ft):	20.000	20.000		
LtSdSlp(h/v):	2.00	2.00		
RtSdSlp(h/v):	2.00	2.00		

Name: CI95EF From Node: CI95E Length(ft): 314.00
Group: BASE To Node: CI95F Count: 1

	UPSTREAM	DOWNSTREAM		
Geometry:	Trapezoidal	Trapezoidal	Friction Equation:	Automatic
Invert(ft):	13.500	13.500	Solution Algorithm:	Automatic
TClpInitZ(ft):	9999.000	9999.000	Flow:	Both
Manning's N:	0.042000	0.042000	Contraction Coef:	0.100
Top Clip(ft):	0.000	0.000	Expansion Coef:	0.300
Bot Clip(ft):	0.000	0.000	Entrance Loss Coef:	0.000
Main XSec:			Exit Loss Coef:	0.000
AuxElev1(ft):			Outlet Ctrl Spec:	Use dc or tw
Aux XSec1:			Inlet Ctrl Spec:	Use dc
AuxElev2(ft):			Stabilizer Option:	None
Aux XSec2:				
Top Width(ft):				
Depth(ft):				
Bot Width(ft):	20.000	20.000		
LtSdSlp(h/v):	2.00	2.00		
RtSdSlp(h/v):	2.00	2.00		

Name: CI95GH From Node: CI95G Length(ft): 461.00
Group: BASE To Node: CI95H Count: 1

	UPSTREAM	DOWNSTREAM		
Geometry:	Trapezoidal	Trapezoidal	Friction Equation:	Automatic
Invert(ft):	13.500	13.500	Solution Algorithm:	Automatic
TClpInitZ(ft):	9999.000	9999.000	Flow:	Both
Manning's N:	0.042000	0.042000	Contraction Coef:	0.100
Top Clip(ft):	0.000	0.000	Expansion Coef:	0.300
Bot Clip(ft):	0.000	0.000	Entrance Loss Coef:	0.000
Main XSec:			Exit Loss Coef:	0.000
AuxElev1(ft):			Outlet Ctrl Spec:	Use dc or tw
Aux XSec1:			Inlet Ctrl Spec:	Use dc
AuxElev2(ft):			Stabilizer Option:	None
Aux XSec2:				
Top Width(ft):				
Depth(ft):				
Bot Width(ft):	25.000	25.000		
LtSdSlp(h/v):	2.00	2.00		
RtSdSlp(h/v):	2.00	2.00		

Name: CLTCAB From Node: CLTCA Length(ft): 1207.00
Group: BASE To Node: CLTCB Count: 1

	UPSTREAM	DOWNSTREAM		
Geometry:	Trapezoidal	Trapezoidal	Friction Equation:	Automatic
Invert(ft):	13.500	13.450	Solution Algorithm:	Automatic
TClpInitZ(ft):	9999.000	9999.000	Flow:	Both
Manning's N:	0.042000	0.042000	Contraction Coef:	0.100
			Expansion Coef:	0.300

Top Clip(ft):	0.000	0.000	Entrance Loss Coef:	0.000
Bot Clip(ft):	0.000	0.000	Exit Loss Coef:	0.000
Main XSec:			Outlet Ctrl Spec:	Use dc or tw
AuxElev1(ft):			Inlet Ctrl Spec:	Use dc
Aux XSec1:			Stabilizer Option:	None
AuxElev2(ft):				
Aux XSec2:				
Top Width(ft):				
Depth(ft):				
Bot Width(ft):	10.000	10.000		
LtSdSlp(h/v):	2.00	2.00		
RtSdSlp(h/v):	2.00	2.00		

Name:	CLTCCD	From Node: CLTCC	Length(ft):	632.00
Group:	BASE	To Node: CLTCD	Count:	1

	UPSTREAM	DOWNSTREAM		
Geometry:	Trapezoidal	Trapezoidal	Friction Equation:	Automatic
Invert(ft):	13.450	13.400	Solution Algorithm:	Automatic
TClpInitZ(ft):	9999.000	9999.000	Flow:	Both
Manning's N:	0.042000	0.042000	Contraction Coef:	0.100
Top Clip(ft):	0.000	0.000	Expansion Coef:	0.300
Bot Clip(ft):	0.000	0.000	Entrance Loss Coef:	0.000
Main XSec:			Exit Loss Coef:	0.000
AuxElev1(ft):			Outlet Ctrl Spec:	Use dc or tw
Aux XSec1:			Inlet Ctrl Spec:	Use dc
AuxElev2(ft):			Stabilizer Option:	None
Aux XSec2:				
Top Width(ft):				
Depth(ft):				
Bot Width(ft):	10.000	10.000		
LtSdSlp(h/v):	2.00	2.00		
RtSdSlp(h/v):	2.00	2.00		

Name:	COUT123AB	From Node: COUT123A	Length(ft):	83.00
Group:	BASE	To Node: COUT123B	Count:	1

	UPSTREAM	DOWNSTREAM		
Geometry:	Trapezoidal	Trapezoidal	Friction Equation:	Automatic
Invert(ft):	7.230	6.620	Solution Algorithm:	Automatic
TClpInitZ(ft):	9999.000	9999.000	Flow:	Both
Manning's N:	0.042000	0.042000	Contraction Coef:	0.100
Top Clip(ft):	0.000	0.000	Expansion Coef:	0.300
Bot Clip(ft):	0.000	0.000	Entrance Loss Coef:	0.000
Main XSec:			Exit Loss Coef:	0.000
AuxElev1(ft):			Outlet Ctrl Spec:	Use dc or tw
Aux XSec1:			Inlet Ctrl Spec:	Use dc
AuxElev2(ft):			Stabilizer Option:	None
Aux XSec2:				
Top Width(ft):				
Depth(ft):				
Bot Width(ft):	14.000	14.000		
LtSdSlp(h/v):	1.00	1.00		
RtSdSlp(h/v):	1.00	1.00		

Name:	COUT123BC	From Node: COUT123B	Length(ft):	2856.00
Group:	BASE	To Node: COUT123C	Count:	1

	UPSTREAM	DOWNSTREAM		
Geometry:	Trapezoidal	Trapezoidal	Friction Equation:	Automatic
Invert(ft):	6.620	2.000	Solution Algorithm:	Automatic
TClpInitZ(ft):	9999.000	9999.000	Flow:	Both
Manning's N:	0.042000	0.042000	Contraction Coef:	0.100
Top Clip(ft):	0.000	0.000	Expansion Coef:	0.300
Bot Clip(ft):	0.000	0.000	Entrance Loss Coef:	0.000
Main XSec:			Exit Loss Coef:	0.000
AuxElev1(ft):			Outlet Ctrl Spec:	Use dc or tw
Aux XSec1:			Inlet Ctrl Spec:	Use dc
AuxElev2(ft):			Stabilizer Option:	None
Aux XSec2:				
Top Width(ft):				
Depth(ft):				
Bot Width(ft):	14.000	14.000		
LtSdSlp(h/v):	1.00	1.00		
RtSdSlp(h/v):	1.00	1.00		

```
---------------------------------------------------------------------------------------------------
         Name: CSPUR              From Node: CSPUR             Length(ft): 1927.00
        Group: BASE                 To Node: CBENDC                Count: 1

               UPSTREAM       DOWNSTREAM                Friction Equation: Automatic
     Geometry: Trapezoidal    Trapezoidal               Solution Algorithm: Automatic
   Invert(ft): 7.390          7.390                                Flow: Both
TClpInitZ(ft): 9999.000       9999.000                  Contraction Coef: 0.100
  Manning's N: 0.042000       0.042000                    Expansion Coef: 0.300
 Top Clip(ft): 0.000          0.000                    Entrance Loss Coef: 0.000
 Bot Clip(ft): 0.000          0.000                        Exit Loss Coef: 0.000
    Main XSec:                                         Outlet Ctrl Spec: Use dc or tw
 AuxElev1(ft):                                          Inlet Ctrl Spec: Use dc
    Aux XSec1:                                        Stabilizer Option: None
 AuxElev2(ft):
    Aux XSec2:
Top Width(ft):
    Depth(ft):
Bot Width(ft): 14.000         14.000
 LtSdSlp(h/v): 1.00           1.00
 RtSdSlp(h/v): 1.00           1.00


---------------------------------------------------------------------------------------------------
         Name: CSUBAB             From Node: CSUBSA            Length(ft): 3600.00
        Group: BASE                 To Node: CSUBSB                Count: 1

               UPSTREAM       DOWNSTREAM                Friction Equation: Automatic
     Geometry: Trapezoidal    Trapezoidal               Solution Algorithm: Automatic
   Invert(ft): 17.500         15.500                               Flow: Both
TClpInitZ(ft): 9999.000       9999.000                  Contraction Coef: 0.100
  Manning's N: 0.042000       0.042000                    Expansion Coef: 0.300
 Top Clip(ft): 0.000          0.000                    Entrance Loss Coef: 0.000
 Bot Clip(ft): 0.000          0.000                        Exit Loss Coef: 0.000
    Main XSec:                                         Outlet Ctrl Spec: Use dc or tw
 AuxElev1(ft):                                          Inlet Ctrl Spec: Use dc
    Aux XSec1:                                        Stabilizer Option: None
 AuxElev2(ft):
    Aux XSec2:
Top Width(ft):
    Depth(ft):
Bot Width(ft): 5.000          5.000
 LtSdSlp(h/v): 2.00           2.00
 RtSdSlp(h/v): 2.00           2.00


---------------------------------------------------------------------------------------------------
         Name: CTORIAB            From Node: CTORIA            Length(ft): 1167.00
        Group: BASE                 To Node: CTORIB                Count: 1

               UPSTREAM       DOWNSTREAM                Friction Equation: Automatic
     Geometry: Trapezoidal    Trapezoidal               Solution Algorithm: Automatic
   Invert(ft): 13.310         13.250                               Flow: Both
TClpInitZ(ft): 9999.000       9999.000                  Contraction Coef: 0.100
  Manning's N: 0.042000       0.042000                    Expansion Coef: 0.300
 Top Clip(ft): 0.000          0.000                    Entrance Loss Coef: 0.000
 Bot Clip(ft): 0.000          0.000                        Exit Loss Coef: 0.000
    Main XSec:                                         Outlet Ctrl Spec: Use dc or tw
 AuxElev1(ft):                                          Inlet Ctrl Spec: Use dc
    Aux XSec1:                                        Stabilizer Option: None
 AuxElev2(ft):
    Aux XSec2:
Top Width(ft):
    Depth(ft):
Bot Width(ft): 5.000          5.000
 LtSdSlp(h/v): 2.00           2.00
 RtSdSlp(h/v): 2.00           2.00


---------------------------------------------------------------------------------------------------
         Name: CTURNAB            From Node: CTURNA            Length(ft): 1233.00
        Group: BASE                 To Node: CTURNB                Count: 1

               UPSTREAM       DOWNSTREAM                Friction Equation: Automatic
     Geometry: Trapezoidal    Trapezoidal               Solution Algorithm: Automatic
   Invert(ft): 13.250         13.200                               Flow: Both
TClpInitZ(ft): 9999.000       9999.000                  Contraction Coef: 0.100
  Manning's N: 0.042000       0.042000                    Expansion Coef: 0.300
 Top Clip(ft): 0.000          0.000                    Entrance Loss Coef: 0.000
 Bot Clip(ft): 0.000          0.000                        Exit Loss Coef: 0.000
```

```
     Main XSec:                                          Outlet Ctrl Spec: Use dc or tw
  AuxElev1(ft):                                           Inlet Ctrl Spec: Use dc
     Aux XSec1:                                         Stabilizer Option: None
  AuxElev2(ft):
     Aux XSec2:
 Top Width(ft):
     Depth(ft):
 Bot Width(ft): 5.000          5.000
  LtSdSlp(h/v): 2.00           2.00
  RtSdSlp(h/v): 2.00           2.00


-------------------------------------------------------------------------------------------------
          Name: WestLTC            From Node: WestLTC           Length(ft): 705.00
         Group: BASE                 To Node: CSUBSA                 Count: 1

               UPSTREAM       DOWNSTREAM                 Friction Equation: Automatic
      Geometry: Trapezoidal    Trapezoidal               Solution Algorithm: Automatic
    Invert(ft): 17.500         17.500                                 Flow: Both
 TClpInitZ(ft): 9999.000       9999.000                   Contraction Coef: 0.100
   Manning's N: 0.042000       0.042000                     Expansion Coef: 0.300
  Top Clip(ft): 0.000          0.000                     Entrance Loss Coef: 0.000
  Bot Clip(ft): 0.000          0.000                         Exit Loss Coef: 0.000
     Main XSec:                                          Outlet Ctrl Spec: Use dc or tw
  AuxElev1(ft):                                           Inlet Ctrl Spec: Use dc
     Aux XSec1:                                         Stabilizer Option: None
  AuxElev2(ft):
     Aux XSec2:
 Top Width(ft):
     Depth(ft):
 Bot Width(ft): 5.000          5.000
  LtSdSlp(h/v): 2.00           2.00
  RtSdSlp(h/v): 2.00           2.00


=================================================================================
==== Drop Structures ===========================================================
=================================================================================

         Name: DS-Pond 2/3c        From Node: Pond 2/3c          Length(ft): 80.00
        Group: BASE                  To Node: COUT123B                Count: 1

               UPSTREAM       DOWNSTREAM                 Friction Equation: Automatic
     Geometry: Circular       Circular                  Solution Algorithm: Most Restrictive
     Span(in): 48.00          48.00                                  Flow: Both
     Rise(in): 48.00          48.00                     Entrance Loss Coef: 0.200
   Invert(ft): 6.500          6.000                         Exit Loss Coef: 1.000
  Manning's N: 0.012000       0.012000                    Outlet Ctrl Spec: Use dc or tw
 Top Clip(in): 0.000          0.000                        Inlet Ctrl Spec: Use dc
 Bot Clip(in): 0.000          0.000                          Solution Incs: 10

Upstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

Downstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall



*** Weir 1 of 2 for Drop Structure DS-Pond 2/3c ***
                                                                                TABLE
                  Count: 1                      Bottom Clip(in): 0.000
                   Type: Vertical: Mavis           Top Clip(in): 0.000
                   Flow: Both                    Weir Disc Coef: 3.200
               Geometry: Circular              Orifice Disc Coef: 0.600

               Span(in): 6.00                        Invert(ft): 9.170
               Rise(in): 6.00                  Control Elev(ft): 9.500

*** Weir 2 of 2 for Drop Structure DS-Pond 2/3c ***
                                                                                TABLE
                  Count: 1                      Bottom Clip(in): 0.000
                   Type: Vertical: Mavis           Top Clip(in): 0.000
                   Flow: Both                    Weir Disc Coef: 3.200
               Geometry: Rectangular           Orifice Disc Coef: 0.600

               Span(in): 9.50                        Invert(ft): 12.350
               Rise(in): 99999.00              Control Elev(ft): 12.350


-------------------------------------------------------------------------------------------------
         Name: DS-Pond1b           From Node: Pond 1b           Length(ft): 181.00
        Group: BASE                  To Node: CMILNB                 Count: 2
```

```
              UPSTREAM       DOWNSTREAM                 Friction Equation: Automatic
     Geometry: Horz Ellipse   Horz Ellipse              Solution Algorithm: Most Restrictive
     Span(in): 23.00          23.00                                 Flow: Both
     Rise(in): 14.00          14.00                     Entrance Loss Coef: 0.200
   Invert(ft): 12.500         12.240                        Exit Loss Coef: 1.000
  Manning's N: 0.012000       0.012000                    Outlet Ctrl Spec: Use dc or tw
 Top Clip(in): 0.000          0.000                        Inlet Ctrl Spec: Use dc
 Bot Clip(in): 0.000          0.000                          Solution Incs: 10

Upstream FHWA Inlet Edge Description:
Horizontal Ellipse Concrete: Square edge with headwall

Downstream FHWA Inlet Edge Description:
Horizontal Ellipse Concrete: Square edge with headwall



*** Weir 1 of 3 for Drop Structure DS-Pond1b ***
                                                                                      TABLE
                 Count: 1                      Bottom Clip(in): 0.000
                  Type: Vertical: Mavis           Top Clip(in): 0.000
                  Flow: Both                   Weir Disc Coef: 3.200
              Geometry: Circular              Orifice Disc Coef: 0.600

              Span(in): 3.00                        Invert(ft): 16.820
              Rise(in): 3.00                   Control Elev(ft): 17.150

*** Weir 2 of 3 for Drop Structure DS-Pond1b ***
                                                                                      TABLE
                 Count: 1                      Bottom Clip(in): 0.000
                  Type: Vertical: Mavis           Top Clip(in): 0.000
                  Flow: Both                   Weir Disc Coef: 3.200
              Geometry: Rectangular           Orifice Disc Coef: 0.600

              Span(in): 18.00                       Invert(ft): 18.390
              Rise(in): 18.12                  Control Elev(ft): 18.390

*** Weir 3 of 3 for Drop Structure DS-Pond1b ***
                                                                                      TABLE
                 Count: 1                      Bottom Clip(in): 0.000
                  Type: Horizontal                Top Clip(in): 0.000
                  Flow: Both                   Weir Disc Coef: 3.200
              Geometry: Rectangular           Orifice Disc Coef: 0.600

              Span(in): 49.00                       Invert(ft): 19.800
              Rise(in): 37.00                  Control Elev(ft): 19.800


-----------------------------------------------------------------------------------------------
         Name: Horizon             From Node: HorizonPond        Length(ft): 35.00
        Group: BASE                  To Node: CD-201A                Count: 1

              UPSTREAM       DOWNSTREAM                 Friction Equation: Automatic
     Geometry: Circular       Circular                  Solution Algorithm: Most Restrictive
     Span(in): 24.00          24.00                                 Flow: Both
     Rise(in): 24.00          24.00                     Entrance Loss Coef: 0.200
   Invert(ft): 13.790         13.660                        Exit Loss Coef: 1.000
  Manning's N: 0.022000       0.022000                    Outlet Ctrl Spec: Use dc or tw
 Top Clip(in): 0.000          0.000                        Inlet Ctrl Spec: Use dc
 Bot Clip(in): 0.000          0.000                          Solution Incs: 10

Upstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

Downstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

Converted from NGVD to NAVD

*** Weir 1 of 2 for Drop Structure Horizon ***
                                                                                      TABLE
                 Count: 1                      Bottom Clip(ft): 0.000
                  Type: Vertical: Mavis           Top Clip(ft): 0.000
                  Flow: Both                   Weir Disc Coef: 3.200
              Geometry: Trapezoidal           Orifice Disc Coef: 0.600

       Bottom Width(ft): 0.00                       Invert(ft): 15.000
       Left Sd Slp(h/v): 0.17                  Control Elev(ft): 15.000
      Right Sd Slp(h/v): 0.17            Struct Opening Dim(ft): 9999.00

*** Weir 2 of 2 for Drop Structure Horizon ***
                                                                                      TABLE
                 Count: 1                      Bottom Clip(in): 0.000
                  Type: Vertical: Mavis           Top Clip(in): 0.000
```

```
                Flow: Both                    Weir Disc Coef: 3.200
            Geometry: Rectangular           Orifice Disc Coef: 0.600

            Span(in): 12.00                       Invert(ft): 16.300
            Rise(in): 999.00                Control Elev(ft): 16.300


-------------------------------------------------------------------------------------------------
         Name: Police              From Node: PolicePond         Length(ft): 140.00
        Group: BASE                  To Node: CSELVD                Count: 1

              UPSTREAM       DOWNSTREAM                 Friction Equation: Automatic
     Geometry: Circular       Circular                  Solution Algorithm: Most Restrictive
     Span(in): 24.00          24.00                                Flow: Both
     Rise(in): 24.00          24.00                     Entrance Loss Coef: 0.200
   Invert(ft): 12.000         10.520                        Exit Loss Coef: 1.000
  Manning's N: 0.012000       0.012000                    Outlet Ctrl Spec: Use dc or tw
 Top Clip(in): 0.000          0.000                        Inlet Ctrl Spec: Use dc
 Bot Clip(in): 0.000          0.000                          Solution Incs: 10

Upstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

Downstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

Converted from NGVD to NAVD

*** Weir 1 of 2 for Drop Structure Police ***
                                                                                    TABLE
                Count: 1                    Bottom Clip(in): 0.000
                 Type: Horizontal              Top Clip(in): 0.000
                 Flow: Both                   Weir Disc Coef: 3.200
            Geometry: Circular             Orifice Disc Coef: 0.600

            Span(in): 3.50                        Invert(ft): 14.000
            Rise(in): 3.50                  Control Elev(ft): 14.000

*** Weir 2 of 2 for Drop Structure Police ***
                                                                                    TABLE
                Count: 1                    Bottom Clip(in): 0.000
                 Type: Vertical: Mavis         Top Clip(in): 0.000
                 Flow: Both                   Weir Disc Coef: 3.200
            Geometry: Rectangular          Orifice Disc Coef: 0.600

            Span(in): 10.00                       Invert(ft): 17.250
            Rise(in): 999.00                Control Elev(ft): 17.250


-------------------------------------------------------------------------------------------------
         Name: PostOffice          From Node: PostOfficePond     Length(ft): 27.00
        Group: BASE                  To Node: CD-200A               Count: 1

              UPSTREAM       DOWNSTREAM                 Friction Equation: Automatic
     Geometry: Circular       Circular                  Solution Algorithm: Most Restrictive
     Span(in): 12.00          12.00                                Flow: Both
     Rise(in): 12.00          12.00                     Entrance Loss Coef: 0.200
   Invert(ft): 14.380         12.510                        Exit Loss Coef: 1.000
  Manning's N: 0.012000       0.012000                    Outlet Ctrl Spec: Use dc or tw
 Top Clip(in): 0.000          0.000                        Inlet Ctrl Spec: Use dc
 Bot Clip(in): 0.000          0.000                          Solution Incs: 10

Upstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

Downstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall



*** Weir 1 of 2 for Drop Structure PostOffice ***
                                                                                    TABLE
                Count: 1                    Bottom Clip(in): 0.000
                 Type: Horizontal              Top Clip(in): 0.000
                 Flow: Both                   Weir Disc Coef: 3.200
            Geometry: Circular             Orifice Disc Coef: 0.600

            Span(in): 3.00                        Invert(ft): 14.800
            Rise(in): 3.00                  Control Elev(ft): 14.800

*** Weir 2 of 2 for Drop Structure PostOffice ***
                                                                                    TABLE
                Count: 1                    Bottom Clip(in): 0.000
                 Type: Vertical: Mavis         Top Clip(in): 0.000
                 Flow: Both                   Weir Disc Coef: 3.200
```

```
              Geometry: Rectangular           Orifice Disc Coef: 0.600

              Span(in): 8.00                        Invert(ft): 17.650
              Rise(in): 999.00                Control Elev(ft): 17.650


================================================================================================
==== Weirs =====================================================================================
================================================================================================

         Name: LTCRanch            From Node: OffLTC
        Group: BASE                  To Node: CLTCA
         Flow: Both                    Count: 1
         Type: Vertical: Mavis      Geometry: Trapezoidal

            Bottom Width(ft): 0.00
       Left Side Slope(h/v): 300.00
      Right Side Slope(h/v): 300.00
                 Invert(ft): 18.700
      Control Elevation(ft): 18.700
     Struct Opening Dim(ft): 9999.00
                                         TABLE
            Bottom Clip(ft): 0.000
               Top Clip(ft): 0.000
       Weir Discharge Coef: 3.200
     Orifice Discharge Coef: 0.600



------------------------------------------------------------------------------------------------
         Name: Weir-1a             From Node: Pond 1a
        Group: BASE                  To Node: Pond 1b
         Flow: Both                    Count: 1
         Type: Vertical: Mavis      Geometry: Trapezoidal

            Bottom Width(ft): 50.00
       Left Side Slope(h/v): 6.00
      Right Side Slope(h/v): 6.00
                 Invert(ft): 18.450
      Control Elevation(ft): 18.450
     Struct Opening Dim(ft): 9999.00
                                         TABLE
            Bottom Clip(ft): 0.000
               Top Clip(ft): 0.000
       Weir Discharge Coef: 3.200
     Orifice Discharge Coef: 0.600



------------------------------------------------------------------------------------------------
         Name: Weir-2/3a           From Node: Pond 2/3a
        Group: BASE                  To Node: Pond 2/3b
         Flow: Both                    Count: 1
         Type: Vertical: Mavis      Geometry: Trapezoidal

            Bottom Width(ft): 70.00
       Left Side Slope(h/v): 6.00
      Right Side Slope(h/v): 6.00
                 Invert(ft): 13.610
      Control Elevation(ft): 13.610
     Struct Opening Dim(ft): 9999.00
                                         TABLE
            Bottom Clip(ft): 0.000
               Top Clip(ft): 0.000
       Weir Discharge Coef: 3.200
     Orifice Discharge Coef: 0.600



================================================================================================
==== Hydrology Simulations =====================================================================
================================================================================================

         Name: 025y-072h
     Filename: C:\21340000000\DRAINAGE\ICPR-PR\025y-072h.R32

      Override Defaults: Yes
    Storm Duration(hrs): 72.00
          Rainfall File: Sfwmd72
    Rainfall Amount(in): 9.50

Time(hrs)       Print Inc(min)
--------------- ---------------
80.000          5.00
```

```
---------------------------------------------------------------------------------------------------
         Name: fdot 050y-024h
     Filename: C:\213400000000\DRAINAGE\ICPR-PR\fdot 050y-024h.R32

      Override Defaults: Yes
    Storm Duration(hrs): 24.00
          Rainfall File: Fdot-24
    Rainfall Amount(in): 10.80

Time(hrs)       Print Inc(min)
--------------- ---------------
30.000          5.00

---------------------------------------------------------------------------------------------------
         Name: fdot 100y-024h
     Filename: C:\213400000000\DRAINAGE\ICPR-PR\fdot 100y-024h.R32

      Override Defaults: Yes
    Storm Duration(hrs): 24.00
          Rainfall File: Fdot-24
    Rainfall Amount(in): 12.30

Time(hrs)       Print Inc(min)
--------------- ---------------
30.000          5.00

---------------------------------------------------------------------------------------------------
         Name: fdot 10y-002h
     Filename: C:\213400000000\DRAINAGE\ICPR-PR\fdot 10y-002h.R32

      Override Defaults: Yes
    Storm Duration(hrs): 2.00
          Rainfall File: Fdot-2
    Rainfall Amount(in): 4.40

Time(hrs)       Print Inc(min)
--------------- ---------------
30.000          5.00

---------------------------------------------------------------------------------------------------
         Name: fdot 10y-004h
     Filename: C:\213400000000\DRAINAGE\ICPR-PR\fdot 10y-004h.R32

      Override Defaults: Yes
    Storm Duration(hrs): 4.00
          Rainfall File: Fdot-4
    Rainfall Amount(in): 5.40

Time(hrs)       Print Inc(min)
--------------- ---------------
30.000          5.00

---------------------------------------------------------------------------------------------------
         Name: fdot 10y-008h
     Filename: C:\213400000000\DRAINAGE\ICPR-PR\fdot 10y-008h.R32

      Override Defaults: Yes
    Storm Duration(hrs): 8.00
          Rainfall File: Fdot-8
    Rainfall Amount(in): 6.40

Time(hrs)       Print Inc(min)
--------------- ---------------
30.000          5.00

---------------------------------------------------------------------------------------------------
         Name: fdot 10y-024h
     Filename: C:\213400000000\DRAINAGE\ICPR-PR\fdot 10y-024h.R32

      Override Defaults: Yes
    Storm Duration(hrs): 24.00
          Rainfall File: Fdot-24
    Rainfall Amount(in): 8.50

Time(hrs)       Print Inc(min)
--------------- ---------------
30.000          5.00

---------------------------------------------------------------------------------------------------
         Name: fdot 10y-072h
     Filename: C:\213400000000\DRAINAGE\ICPR-PR\fdot 10y-072h.R32

      Override Defaults: Yes
    Storm Duration(hrs): 78.00
          Rainfall File: Fdot-72
```

Rainfall Amount(in): 10.00

Time(hrs)	Print Inc(min)
78.000	5.00

Name: fdot 10y-168h
Filename: C:\21340000000\DRAINAGE\ICPR-PR\fdot 10y-168h.R32

Override Defaults: Yes
Storm Duration(hrs): 168.00
Rainfall File: Fdot-168
Rainfall Amount(in): 11.90

Time(hrs)	Print Inc(min)
174.000	5.00

Name: fdot 10y-240h
Filename: C:\21340000000\DRAINAGE\ICPR-PR\fdot 10y-240h.R32

Override Defaults: Yes
Storm Duration(hrs): 240.00
Rainfall File: Fdot-240
Rainfall Amount(in): 13.80

Time(hrs)	Print Inc(min)
246.000	5.00

==========
==== Routing Simulations ==========
==========

Name: 025y-072h Hydrology Sim: 025y-072h
Filename: C:\21340000000\DRAINAGE\ICPR-PR\025y-072h.I32

Execute: Yes Restart: No Patch: No
Alternative: No

Max Delta Z(ft): 1.00 Delta Z Factor: 0.00500
Time Step Optimizer: 10.000
Start Time(hrs): 0.000 End Time(hrs): 80.00
Min Calc Time(sec): 0.5000 Max Calc Time(sec): 60.0000
Boundary Stages: Boundary Flows:

Time(hrs)	Print Inc(min)
24.000	30.000
50.000	5.000
70.000	15.000
150.000	30.000

Group	Run
BASE	Yes

Name: fdot 050y-024h Hydrology Sim: fdot 050y-024h
Filename: C:\21340000000\DRAINAGE\ICPR-PR\fdot 050y-024h.I32

Execute: Yes Restart: No Patch: No
Alternative: No

Max Delta Z(ft): 1.00 Delta Z Factor: 0.00500
Time Step Optimizer: 10.000
Start Time(hrs): 0.000 End Time(hrs): 30.00
Min Calc Time(sec): 0.5000 Max Calc Time(sec): 60.0000
Boundary Stages: Boundary Flows:

Time(hrs)	Print Inc(min)
30.000	5.000

Group	Run
BASE	Yes

```
-------------------------------------------------------------------------------------------------
         Name: fdot 100y-024h      Hydrology Sim: fdot 100y-024h
     Filename: C:\213400000000\DRAINAGE\ICPR-PR\fdot 100y-024h.I32

      Execute: Yes         Restart: No           Patch: No
  Alternative: No

        Max Delta Z(ft): 1.00                    Delta Z Factor: 0.00500
    Time Step Optimizer: 10.000
        Start Time(hrs): 0.000                    End Time(hrs): 30.00
     Min Calc Time(sec): 0.5000              Max Calc Time(sec): 60.0000
        Boundary Stages:                         Boundary Flows:


Time(hrs)       Print Inc(min)
--------------- ---------------
30.000          5.000

Group           Run
--------------- -----
BASE            Yes


-------------------------------------------------------------------------------------------------
         Name: fdot 10y-002h       Hydrology Sim: fdot 10y-002h
     Filename: C:\213400000000\DRAINAGE\ICPR-PR\fdot 10y-002h.I32

      Execute: Yes         Restart: No           Patch: No
  Alternative: No

        Max Delta Z(ft): 1.00                    Delta Z Factor: 0.00500
    Time Step Optimizer: 10.000
        Start Time(hrs): 0.000                    End Time(hrs): 30.00
     Min Calc Time(sec): 0.5000              Max Calc Time(sec): 60.0000
        Boundary Stages:                         Boundary Flows:


Time(hrs)       Print Inc(min)
--------------- ---------------
30.000          5.000

Group           Run
--------------- -----
BASE            Yes


-------------------------------------------------------------------------------------------------
         Name: fdot 10y-004h       Hydrology Sim: fdot 10y-004h
     Filename: C:\213400000000\DRAINAGE\ICPR-PR\fdot 10y-004h.I32

      Execute: Yes         Restart: No           Patch: No
  Alternative: No

        Max Delta Z(ft): 1.00                    Delta Z Factor: 0.00500
    Time Step Optimizer: 10.000
        Start Time(hrs): 0.000                    End Time(hrs): 30.00
     Min Calc Time(sec): 0.5000              Max Calc Time(sec): 60.0000
        Boundary Stages:                         Boundary Flows:


Time(hrs)       Print Inc(min)
--------------- ---------------
30.000          5.000

Group           Run
--------------- -----
BASE            Yes


-------------------------------------------------------------------------------------------------
         Name: fdot 10y-008h       Hydrology Sim: fdot 10y-008h
     Filename: C:\213400000000\DRAINAGE\ICPR-PR\fdot 10y-008h.I32

      Execute: Yes         Restart: No           Patch: No
  Alternative: No

        Max Delta Z(ft): 1.00                    Delta Z Factor: 0.00500
    Time Step Optimizer: 10.000
        Start Time(hrs): 0.000                    End Time(hrs): 30.00
     Min Calc Time(sec): 0.5000              Max Calc Time(sec): 60.0000
        Boundary Stages:                         Boundary Flows:
```

Time(hrs)	Print Inc(min)
30.000	5.000

Group	Run
BASE	Yes

Name: fdot 10y-024h Hydrology Sim: fdot 10y-024h
Filename: C:\21340000000\DRAINAGE\ICPR-PR\fdot 10y-024h.I32

Execute: Yes Restart: No Patch: No
Alternative: No

Max Delta Z(ft): 1.00 Delta Z Factor: 0.00500
Time Step Optimizer: 10.000
Start Time(hrs): 0.000 End Time(hrs): 30.00
Min Calc Time(sec): 0.5000 Max Calc Time(sec): 60.0000
Boundary Stages: Boundary Flows:

Time(hrs)	Print Inc(min)
30.000	5.000

Group	Run
BASE	Yes

Name: fdot 10y-072h Hydrology Sim: fdot 10y-072h
Filename: C:\21340000000\DRAINAGE\ICPR-PR\fdot 10y-072h.I32

Execute: Yes Restart: No Patch: No
Alternative: No

Max Delta Z(ft): 1.00 Delta Z Factor: 0.00500
Time Step Optimizer: 10.000
Start Time(hrs): 0.000 End Time(hrs): 78.00
Min Calc Time(sec): 0.5000 Max Calc Time(sec): 60.0000
Boundary Stages: Boundary Flows:

Time(hrs)	Print Inc(min)
78.000	5.000

Group	Run
BASE	Yes

Name: fdot 10y-168h Hydrology Sim: fdot 10y-168h
Filename: C:\21340000000\DRAINAGE\ICPR-PR\fdot 10y-168h.I32

Execute: Yes Restart: No Patch: No
Alternative: No

Max Delta Z(ft): 1.00 Delta Z Factor: 0.00500
Time Step Optimizer: 10.000
Start Time(hrs): 0.000 End Time(hrs): 174.00
Min Calc Time(sec): 0.5000 Max Calc Time(sec): 60.0000
Boundary Stages: Boundary Flows:

Time(hrs)	Print Inc(min)
174.000	5.000

Group	Run
BASE	Yes

```
        Name: fdot 10y-240h       Hydrology Sim: fdot 10y-240h
    Filename: C:\213400000000\DRAINAGE\ICPR-PR\fdot 10y-240h.I32

     Execute: Yes         Restart: No            Patch: No
 Alternative: No

       Max Delta Z(ft): 1.00                    Delta Z Factor: 0.00500
   Time Step Optimizer: 10.000
       Start Time(hrs): 0.000                    End Time(hrs): 246.00
    Min Calc Time(sec): 0.5000              Max Calc Time(sec): 60.0000
       Boundary Stages:                         Boundary Flows:


Time(hrs)       Print Inc(min)
--------------- ---------------
246.000         5.000

Group           Run
--------------- -----
BASE            Yes
```

Name	Group	Simulation	Max Time Stage hrs	Max Stage ft	Warning Stage ft	Max Delta Stage ft	Max Surf Area ft2	Max Time Inflow hrs	Max Inflow cfs	Max Time Outflow hrs	Max Outflow cfs
CBENDB	BASE	025y-072h	62.43	13.76	14.90	0.0021	18497	63.65	178.35	62.24	167.10
CBENDC	BASE	025y-072h	62.46	13.57	14.40	0.0025	81684	62.18	189.87	62.60	189.16
CCHRI	BASE	025y-072h	62.44	13.32	14.20	0.0026	60719	62.13	216.37	62.45	215.29
CCORPA	BASE	025y-072h	62.38	16.32	18.00	0.0050	1914	61.31	121.85	61.32	121.85
CCORPB	BASE	025y-072h	62.40	15.93	17.57	0.0040	6905	61.18	134.63	61.20	131.58
CD-100A	BASE	025y-072h	62.37	15.96	19.36	0.0028	220	60.33	24.68	60.33	24.67
CD-101A	BASE	025y-072h	61.84	17.52	20.08	0.0019	122	61.25	22.23	61.27	22.22
CD-200A	BASE	025y-072h	62.46	15.39	20.82	0.0020	120	63.26	3.42	64.34	3.51
CD-201A	BASE	025y-072h	62.46	14.88	19.84	0.0024	122	60.50	2.76	60.50	2.69
CD-202A	BASE	025y-072h	62.40	14.69	18.78	0.0047	119	60.25	3.76	60.26	3.68
CD-203A	BASE	025y-072h	60.26	17.17	18.08	0.0010	166	60.25	5.27	60.26	5.27
CD-203B	BASE	025y-072h	0.00	15.54	18.08	-0.0721	246	60.47	16.71	0.00	25.36
CD-203C	BASE	025y-072h	61.00	17.68	18.08	0.0017	12245	60.42	10.23	61.00	7.78
CD-203D	BASE	025y-072h	60.47	15.34	18.08	0.0236	120	60.42	5.23	60.47	5.49
CD-300A	BASE	025y-072h	62.23	14.21	17.40	0.0018	120	60.67	11.07	60.68	11.01
CD-301	BASE	025y-072h	62.36	13.78	17.37	0.0025	126	60.25	16.94	60.25	16.93
CDUNNB	BASE	025y-072h	62.44	14.04	15.60	0.0022	12277	63.97	170.09	63.65	173.77
CFECRA	BASE	025y-072h	61.93	18.59	19.63	0.0015	36506	60.76	74.61	66.53	70.30
CFECRB	BASE	025y-072h	61.95	18.45	19.63	0.0016	108276	66.53	70.30	66.08	71.06
CI95A	BASE	025y-072h	61.11	19.93	21.31	0.0022	43627	60.17	99.11	60.29	79.93
CI95B	BASE	025y-072h	61.18	19.79	21.31	0.0031	45222	60.29	79.93	61.13	57.81
CI95C	BASE	025y-072h	61.21	19.64	21.21	-0.0063	4955	60.52	87.63	61.57	140.55
CI95D	BASE	025y-072h	61.19	19.63	21.21	0.0035	14550	61.57	140.55	61.04	83.75
CI95E	BASE	025y-072h	61.25	19.44	21.07	0.0025	7022	61.17	110.20	61.21	110.15
CI95F	BASE	025y-072h	61.25	19.43	21.07	0.0025	20519	61.21	110.15	61.25	109.95
CI95G	BASE	025y-072h	61.25	19.21	20.89	0.0024	11181	61.10	132.82	61.12	132.57
CI95H	BASE	025y-072h	61.26	19.19	20.89	0.0024	33647	61.12	132.57	61.17	132.01
CLTCA	BASE	025y-072h	61.31	19.11	20.51	0.0023	20190	60.51	121.42	60.54	112.28
CLTCB	BASE	025y-072h	61.46	19.05	20.51	0.0023	58622	60.54	112.28	60.63	82.77
CLTCC	BASE	025y-072h	61.64	18.94	20.31	0.0021	10243	60.56	90.33	60.57	85.74
CLTCD	BASE	025y-072h	61.68	18.91	20.31	0.0022	30320	60.57	85.74	60.76	74.61
CMILNB	BASE	025y-072h	62.42	15.79	17.39	-0.0033	5087	61.20	133.51	61.20	130.02
COUT123A	BASE	025y-072h	61.47	11.53	13.60	0.0030	1157	62.37	220.40	62.38	220.44
COUT123B	BASE	025y-072h	61.44	11.46	13.60	0.0031	36700	61.43	287.28	61.52	287.62
COUT123C	BASE	025y-072h	61.87	6.94	9.00	0.0024	93226	61.52	287.62	61.87	284.03
CSELVB	BASE	025y-072h	62.42	15.64	17.15	-0.0033	6983	61.20	152.17	61.25	147.53
CSELVC	BASE	025y-072h	62.45	15.35	16.66	0.0025	13038	61.25	150.28	64.34	147.65
CSELVD	BASE	025y-072h	62.46	15.17	16.48	0.0046	4742	64.34	149.70	64.27	151.00
CSELVE	BASE	025y-072h	62.47	14.86	16.02	0.0023	12625	64.27	152.79	64.24	157.30
CSELVF	BASE	025y-072h	62.46	14.65	15.79	0.0047	6469	64.24	157.72	64.13	160.65
CSELVG	BASE	025y-072h	62.45	14.37	15.41	0.0027	10798	64.13	164.83	63.97	166.34
CSPUR	BASE	025y-072h	62.46	13.58	14.40	0.0025	66046	60.50	52.35	61.48	26.37
CSUBSA	BASE	025y-072h	60.11	20.21	21.30	0.0029	34959	59.92	48.26	60.08	32.36
CSUBSB	BASE	025y-072h	61.28	19.84	21.30	0.0022	99217	60.08	62.31	76.12	19.83
CTORIA	BASE	025y-072h	61.59	18.15	19.18	0.0016	14337	65.16	72.89	65.07	73.10
CTORIB	BASE	025y-072h	61.36	17.94	19.18	0.0022	41425	65.07	73.10	64.76	74.23
CTURNA	BASE	025y-072h	61.29	17.89	18.81	0.0017	13903	61.23	118.41	61.28	118.32
CTURNB	BASE	025y-072h	62.37	16.37	19.00	0.0012	34126	61.28	118.32	61.36	118.31
HorizonPond	BASE	025y-072h	68.18	16.52	18.24	0.0003	461142	60.08	40.24	68.18	1.53
OffLTC	BASE	025y-072h	65.59	19.07	20.51	0.0002	2637125	61.50	47.15	69.21	30.29
OUTFALL	BASE	025y-072h	0.00	1.52	9.00	0.0000	53	61.87	284.03	0.00	0.00
PolicePond	BASE	025y-072h	64.11	17.91	18.39	0.0014	100066	60.08	31.34	64.31	2.05
Pond 1a	BASE	025y-072h	62.99	18.93	19.00	0.0006	63471	60.00	38.49	60.11	35.20
Pond 1b	BASE	025y-072h	63.03	18.93	19.00	0.0015	87285	60.11	35.20	63.03	2.22
Pond 2/3a	BASE	025y-072h	63.73	14.48	15.00	0.0004	89635	60.33	53.45	60.42	52.39
Pond 2/3b	BASE	025y-072h	63.76	14.48	15.00	0.0020	22583	60.42	52.39	60.44	43.45
Pond 2/3c	BASE	025y-072h	63.78	14.47	15.00	0.0019	90825	60.44	43.45	63.97	9.58
PostOfficePond	BASE	025y-072h	63.10	18.91	18.51	0.0015	153983	60.17	33.40	63.26	3.42

Name	Group	Simulation	Max Time Stage hrs	Max Stage ft	Warning Stage ft	Max Delta Stage ft	Max Surf Area ft2	Max Time Inflow hrs	Max Inflow cfs	Max Time Outflow hrs	Max Outflow cfs
SEDBASIN	BASE	025y-072h	62.40	16.07	19.29	0.0045	5116	61.32	121.85	61.18	120.00
SUBPONDB1A	BASE	025y-072h	62.27	22.41	22.00	0.0022	4306	60.00	2.62	63.82	0.18
SUBPONDB1B	BASE	025y-072h	64.06	22.31	22.00	0.0021	8103	60.00	4.65	64.83	0.23
WestLTC	BASE	025y-072h	71.55	19.75	21.30	0.0003	2499367	61.42	74.71	77.52	15.43
CBENDB	BASE fdot	050y-024h	16.18	13.55	14.90	0.0010	21732	17.24	174.77	17.27	164.54
CBENDC	BASE fdot	050y-024h	16.20	13.35	14.40	0.0011	80075	17.26	180.80	16.33	180.46
CCHRI	BASE fdot	050y-024h	16.17	13.08	14.20	0.0010	59340	15.89	204.01	16.18	203.79
CCORPA	BASE fdot	050y-024h	13.80	15.97	18.00	0.0050	1859	13.80	110.05	13.80	110.05
CCORPB	BASE fdot	050y-024h	16.12	15.27	17.57	0.0043	6993	18.41	120.15	14.24	130.04
CD-100A	BASE fdot	050y-024h	16.10	15.30	19.36	0.0021	281	12.17	11.16	12.18	11.16
CD-101A	BASE fdot	050y-024h	15.92	16.03	20.08	0.0004	122	13.67	15.15	13.64	15.15
CD-200A	BASE fdot	050y-024h	16.21	14.78	20.82	0.0041	120	21.06	4.29	21.08	4.30
CD-201A	BASE fdot	050y-024h	16.21	14.31	19.84	0.0016	122	21.25	2.50	21.25	2.50
CD-202A	BASE fdot	050y-024h	16.16	14.17	18.78	0.0013	119	12.17	1.62	12.17	1.60
CD-203A	BASE fdot	050y-024h	12.17	16.80	18.08	0.0003	164	12.17	2.26	12.17	2.26
CD-203B	BASE fdot	050y-024h	0.00	15.54	18.08	-0.0721	246	12.43	9.34	0.00	25.36
CD-203C	BASE fdot	050y-024h	12.92	17.07	18.08	0.0004	10708	12.33	4.95	12.92	4.66
CD-203D	BASE fdot	050y-024h	12.50	14.72	18.08	0.0236	244	12.33	2.60	12.35	2.60
CD-300A	BASE fdot	050y-024h	15.97	13.82	17.40	0.0007	120	12.58	6.41	12.59	6.38
CD-301	BASE fdot	050y-024h	16.13	13.57	17.37	0.0008	126	12.17	7.11	12.09	7.12
CDUNNB	BASE fdot	050y-024h	16.18	13.70	15.60	0.0010	13400	17.24	170.38	17.24	165.82
CFECRA	BASE fdot	050y-024h	21.81	18.57	19.63	0.0012	36321	24.02	73.90	24.05	74.12
CFECRB	BASE fdot	050y-024h	21.55	18.36	19.63	0.0010	107135	24.05	74.12	25.21	75.26
CI95A	BASE fdot	050y-024h	13.99	19.55	21.31	0.0048	41369	12.00	52.22	15.02	46.51
CI95B	BASE fdot	050y-024h	21.18	19.42	21.31	0.0012	42994	15.02	46.51	14.93	46.53
CI95C	BASE fdot	050y-024h	21.33	19.38	21.21	-0.0065	4841	13.64	61.54	18.06	123.61
CI95D	BASE fdot	050y-024h	21.27	19.37	21.21	0.0022	14209	18.06	123.61	13.78	61.46
CI95E	BASE fdot	050y-024h	21.51	19.33	21.07	0.0010	6953	13.92	82.65	13.94	82.72
CI95F	BASE fdot	050y-024h	21.54	19.32	21.07	0.0011	20325	13.94	82.72	13.99	82.64
CI95G	BASE fdot	050y-024h	22.26	19.28	20.89	0.0010	11248	13.63	96.57	13.67	96.53
CI95H	BASE fdot	050y-024h	22.34	19.27	20.89	0.0010	33890	13.67	96.53	13.74	96.45
CLTCA	BASE fdot	050y-024h	22.52	19.26	20.51	0.0010	20555	12.21	84.03	12.24	80.51
CLTCB	BASE fdot	050y-024h	22.46	19.20	20.51	0.0011	59672	12.24	80.51	24.52	73.29
CLTCC	BASE fdot	050y-024h	22.10	19.04	20.31	0.0011	10369	12.32	75.08	24.00	73.72
CLTCD	BASE fdot	050y-024h	22.11	19.00	20.31	0.0012	30739	24.00	73.72	24.02	73.90
CMILNB	BASE fdot	050y-024h	16.14	15.13	17.39	-0.0032	5087	18.40	132.54	18.40	130.59
COUT123A	BASE fdot	050y-024h	15.26	11.27	13.60	0.0009	1139	16.08	208.32	16.08	208.34
COUT123B	BASE fdot	050y-024h	15.26	11.18	13.60	0.0010	35927	15.21	261.32	15.28	261.24
COUT123C	BASE fdot	050y-024h	15.55	6.68	9.00	0.0009	91768	15.28	261.24	15.55	260.70
CSELVB	BASE fdot	050y-024h	16.16	14.99	17.15	0.0020	6983	18.40	142.78	14.37	145.22
CSELVC	BASE fdot	050y-024h	16.19	14.72	16.66	0.0013	13038	14.37	148.26	18.27	148.62
CSELVD	BASE fdot	050y-024h	16.20	14.57	16.48	0.0045	4742	18.27	151.87	18.07	155.35
CSELVE	BASE fdot	050y-024h	16.20	14.29	16.02	0.0018	12625	18.07	157.64	17.97	156.37
CSELVF	BASE fdot	050y-024h	16.20	14.13	15.79	0.0030	6469	17.97	157.18	17.68	159.97
CSELVG	BASE fdot	050y-024h	16.19	13.93	15.41	-0.0019	10792	17.68	165.59	17.24	166.00
CSPUR	BASE fdot	050y-024h	16.20	13.35	14.40	0.0011	64921	12.42	26.97	15.23	22.96
CSUBSA	BASE fdot	050y-024h	24.02	19.92	21.30	0.0012	34880	30.00	15.17	30.00	15.44
CSUBSB	BASE fdot	050y-024h	21.39	19.72	21.30	0.0010	97515	11.63	17.93	30.00	18.05
CTORIA	BASE fdot	050y-024h	14.21	18.03	19.18	0.0022	14008	23.45	76.18	23.38	76.31
CTORIB	BASE fdot	050y-024h	13.84	17.74	19.18	0.0037	40028	23.38	76.31	24.77	76.95
CTURNA	BASE fdot	050y-024h	13.74	17.68	18.81	0.0023	13444	13.64	104.80	13.72	104.78
CTURNB	BASE fdot	050y-024h	13.81	16.03	19.00	0.0023	31747	13.72	104.78	13.83	104.77
HorizonPond	BASE fdot	050y-024h	22.39	16.66	18.24	0.0004	472635	12.00	12.97	22.39	2.19
OffLTC	BASE fdot	050y-024h	22.75	19.27	20.51	0.0001	3067447	14.17	33.99	27.16	45.75
OUTFALL	BASE fdot	050y-024h	0.00	1.52	9.00	0.0000	53	15.55	260.70	0.00	0.00
PolicePond	BASE fdot	050y-024h	19.93	18.27	18.39	0.0035	109835	12.00	10.15	19.93	3.40
Pond 1a	BASE fdot	050y-024h	21.09	19.10	19.00	0.0006	64223	12.00	10.78	12.04	10.65
Pond 1b	BASE fdot	050y-024h	21.11	19.09	19.00	0.0004	88913	12.04	10.65	21.11	3.15

Name	Group	Simulation	Max Time Stage hrs	Max Stage ft	Warning Stage ft	Max Delta Stage ft	Max Surf Area ft2	Max Time Inflow hrs	Max Inflow cfs	Max Time Outflow hrs	Max Outflow cfs
Pond 2/3a	BASE	fdot 050y-024h	19.66	14.72	15.00	0.0006	91085	12.08	26.24	12.19	25.98
Pond 2/3b	BASE	fdot 050y-024h	19.68	14.71	15.00	0.0010	23619	12.19	25.98	12.23	22.01
Pond 2/3c	BASE	fdot 050y-024h	19.71	14.71	15.00	0.0010	92882	12.23	22.01	19.90	11.01
PostOfficePond	BASE	fdot 050y-024h	21.06	19.14	18.51	0.0050	166879	12.08	12.88	21.06	4.29
SEDBASIN	BASE	fdot 050y-024h	16.10	15.40	19.29	-0.0048	4755	13.80	110.05	18.41	114.84
SUBPONDB1A	BASE	fdot 050y-024h	21.15	22.90	22.00	0.0006	4806	12.00	0.67	19.63	0.19
SUBPONDB1B	BASE	fdot 050y-024h	22.01	23.03	22.00	0.0006	9246	12.00	1.19	22.11	0.25
WestLTC	BASE	fdot 050y-024h	25.76	19.99	21.30	0.0004	2941301	13.92	52.49	30.00	15.17
CBENDB	BASE	fdot 100y-024h	15.83	14.00	14.90	0.0010	18645	20.18	189.37	15.35	176.46
CBENDC	BASE	fdot 100y-024h	15.83	13.81	14.40	0.0013	83405	15.42	200.73	16.12	200.68
CCHRI	BASE	fdot 100y-024h	15.80	13.56	14.20	0.0012	62177	15.49	229.07	15.84	228.75
CCORPA	BASE	fdot 100y-024h	15.79	16.70	18.00	0.0050	1961	13.16	120.17	13.16	120.19
CCORPB	BASE	fdot 100y-024h	15.83	16.41	17.57	0.0043	6843	12.72	129.74	12.74	128.09
CD-100A	BASE	fdot 100y-024h	15.76	16.45	19.36	0.0023	122	12.17	12.82	12.18	12.82
CD-101A	BASE	fdot 100y-024h	15.50	17.55	20.08	0.0016	122	13.58	17.77	13.64	17.74
CD-200A	BASE	fdot 100y-024h	16.00	15.88	20.82	0.0041	120	20.39	5.13	21.88	5.17
CD-201A	BASE	fdot 100y-024h	15.94	15.31	19.84	0.0023	122	21.25	3.13	21.63	3.22
CD-202A	BASE	fdot 100y-024h	15.81	15.11	18.78	0.0014	119	12.17	1.89	12.17	1.86
CD-203A	BASE	fdot 100y-024h	12.18	16.86	18.08	0.0004	165	12.17	2.66	12.17	2.66
CD-203B	BASE	fdot 100y-024h	0.00	15.54	18.08	-0.0721	246	12.43	10.89	0.00	25.36
CD-203C	BASE	fdot 100y-024h	12.89	17.23	18.08	0.0004	11103	12.33	5.76	12.89	5.42
CD-203D	BASE	fdot 100y-024h	15.68	14.94	18.08	0.0236	218	12.33	3.03	12.34	3.03
CD-300A	BASE	fdot 100y-024h	15.64	14.52	17.40	0.0008	120	12.58	7.42	12.59	7.39
CD-301	BASE	fdot 100y-024h	15.77	14.03	17.37	0.0009	126	12.17	8.26	12.17	8.19
CDUNNB	BASE	fdot 100y-024h	15.84	14.36	15.60	0.0018	12277	20.95	176.63	20.18	181.53
CFECRA	BASE	fdot 100y-024h	21.60	18.73	19.63	0.0014	37113	24.08	78.41	25.36	78.73
CFECRB	BASE	fdot 100y-024h	19.85	18.54	19.63	0.0014	109631	25.36	78.73	25.41	79.98
CI95A	BASE	fdot 100y-024h	13.27	19.77	21.31	0.0050	42687	12.10	58.16	13.08	54.79
CI95B	BASE	fdot 100y-024h	21.20	19.67	21.31	0.0012	44510	13.08	54.79	13.33	54.32
CI95C	BASE	fdot 100y-024h	21.25	19.63	21.21	-0.0064	4947	13.14	73.19	13.38	134.54
CI95D	BASE	fdot 100y-024h	21.29	19.62	21.21	0.0022	14529	13.38	134.54	13.24	73.04
CI95E	BASE	fdot 100y-024h	22.05	19.57	21.07	0.0011	7102	13.37	97.35	13.38	97.46
CI95F	BASE	fdot 100y-024h	22.06	19.56	21.07	0.0012	20776	13.38	97.46	13.42	97.35
CI95G	BASE	fdot 100y-024h	22.46	19.51	20.89	0.0012	11461	13.25	114.63	13.27	114.61
CI95H	BASE	fdot 100y-024h	22.55	19.50	20.89	0.0012	34183	13.27	114.61	13.30	114.57
CLTCA	BASE	fdot 100y-024h	22.86	19.49	20.51	0.0012	20992	11.58	84.00	11.61	80.30
CLTCB	BASE	fdot 100y-024h	22.81	19.43	20.51	0.0013	61348	11.61	80.30	24.91	78.00
CLTCC	BASE	fdot 100y-024h	22.14	19.25	20.31	0.0013	10638	24.00	78.22	24.00	78.26
CLTCD	BASE	fdot 100y-024h	22.14	19.22	20.31	0.0014	31681	24.00	78.26	24.08	78.41
CMILNB	BASE	fdot 100y-024h	15.86	16.26	17.39	0.0048	5087	21.97	130.76	21.97	131.47
COUT123A	BASE	fdot 100y-024h	15.38	11.60	13.60	0.0010	1153	15.73	234.23	15.73	234.24
COUT123B	BASE	fdot 100y-024h	15.36	11.51	13.60	0.0010	36978	15.33	296.13	15.40	296.09
COUT123C	BASE	fdot 100y-024h	15.58	7.07	9.00	0.0010	93947	15.40	296.09	15.58	295.75
CSELVB	BASE	fdot 100y-024h	15.87	16.10	17.15	0.0046	6983	12.74	144.35	12.81	148.19
CSELVC	BASE	fdot 100y-024h	15.91	15.79	16.66	0.0027	13038	12.81	151.05	21.87	150.58
CSELVD	BASE	fdot 100y-024h	15.92	15.61	16.48	0.0043	4742	21.87	154.69	21.71	159.61
CSELVE	BASE	fdot 100y-024h	15.91	15.28	16.02	0.0025	12625	21.71	162.72	21.62	163.89
CSELVF	BASE	fdot 100y-024h	15.89	15.05	15.79	0.0050	6469	21.62	164.49	21.37	166.72
CSELVG	BASE	fdot 100y-024h	15.86	14.74	15.41	0.0026	10600	21.37	171.26	20.95	173.22
CSPUR	BASE	fdot 100y-024h	15.83	13.82	14.40	0.0013	67246	12.42	31.56	13.14	24.77
CSUBSA	BASE	fdot 100y-024h	24.03	20.12	21.30	0.0013	36670	30.00	15.70	30.00	15.90
CSUBSB	BASE	fdot 100y-024h	22.06	19.96	21.30	0.0010	101638	11.47	18.18	30.00	17.46
CTORIA	BASE	fdot 100y-024h	15.60	18.17	19.18	0.0023	14375	23.63	80.77	24.94	80.94
CTORIB	BASE	fdot 100y-024h	15.38	17.93	19.18	0.0040	41412	24.94	80.94	24.84	81.75
CTURNA	BASE	fdot 100y-024h	15.34	17.88	18.81	0.0023	14221	13.19	113.38	13.20	113.36
CTURNB	BASE	fdot 100y-024h	15.78	16.74	19.00	0.0023	36708	13.20	113.36	13.16	113.56
HorizonPond	BASE	fdot 100y-024h	22.29	16.76	18.24	0.0004	481336	12.00	14.98	22.29	2.76
OffLTC	BASE	fdot 100y-024h	23.01	19.50	20.51	0.0001	3574408	14.08	39.97	28.17	51.31

Name	Group	Simulation	Max Time Stage hrs	Max Stage ft	Warning Stage ft	Max Delta Stage ft	Max Surf Area ft2	Max Time Inflow hrs	Max Inflow cfs	Max Time Outflow hrs	Max Outflow cfs
OUTFALL	BASE	fdot 100y-024h	0.00	1.52	9.00	0.0000	53	15.58	295.75	0.00	0.00
PolicePond	BASE	fdot 100y-024h	19.46	18.48	18.39	0.0033	115598	12.00	11.66	19.62	4.22
Pond 1a	BASE	fdot 100y-024h	19.47	19.24	19.00	0.0005	65150	12.00	12.33	11.85	12.00
Pond 1b	BASE	fdot 100y-024h	19.50	19.23	19.00	0.0004	90330	11.85	12.00	19.50	4.06
Pond 2/3a	BASE	fdot 100y-024h	19.47	15.06	15.00	0.0006	93124	12.08	30.00	11.77	27.97
Pond 2/3b	BASE	fdot 100y-024h	19.49	15.05	15.00	0.0011	25076	11.77	27.97	11.78	23.67
Pond 2/3c	BASE	fdot 100y-024h	19.53	15.04	15.00	0.0011	95771	11.78	23.67	19.64	13.01
PostOfficePond	BASE	fdot 100y-024h	20.34	19.35	18.51	0.0050	178518	12.08	14.78	20.39	5.13
SEDBASIN	BASE	fdot 100y-024h	15.81	16.55	19.29	0.0045	5375	13.16	120.19	12.72	117.87
SUBPONDB1A	BASE	fdot 100y-024h	21.24	23.45	22.00	0.0007	5364	12.00	0.77	20.68	0.20
SUBPONDB1B	BASE	fdot 100y-024h	22.10	23.58	22.00	0.0007	10125	12.00	1.38	22.13	0.26
WestLTC	BASE	fdot 100y-024h	26.00	20.18	21.30	0.0005	3274715	13.92	61.69	30.00	15.70
Pond 2/3a	BASE	fdot 10y-024h	20.22	14.17	15.00	0.0006	87732	12.08	20.45	12.22	20.22

Simulation	Node	Group	Time	Stage	Warning Stage	Surface Area	Total Inflow	Total Outflow	Total Vol In	Total Vol Out
			hrs	ft	ft	ft2	cfs	cfs	af	af
025y-072h	Pond 2/3c	BASE	0.00	9.50	15.00	57967	0.00	0.00	0.0	0.0
025y-072h	Pond 2/3c	BASE	0.50	9.50	15.00	57967	0.00	0.00	0.0	0.0
025y-072h	Pond 2/3c	BASE	1.00	9.50	15.00	57967	0.00	0.00	0.0	0.0
025y-072h	Pond 2/3c	BASE	1.50	9.50	15.00	57967	0.00	0.00	0.0	0.0
025y-072h	Pond 2/3c	BASE	2.00	9.50	15.00	57967	0.00	0.00	0.0	0.0
025y-072h	Pond 2/3c	BASE	2.50	9.50	15.00	57967	0.00	0.00	0.0	0.0
025y-072h	Pond 2/3c	BASE	3.00	9.50	15.00	57967	0.00	0.00	0.0	0.0
025y-072h	Pond 2/3c	BASE	3.50	9.50	15.00	57967	0.00	0.00	0.0	0.0
025y-072h	Pond 2/3c	BASE	4.00	9.50	15.00	57967	0.00	0.00	0.0	0.0
025y-072h	Pond 2/3c	BASE	4.50	9.50	15.00	57967	0.00	0.00	0.0	0.0
025y-072h	Pond 2/3c	BASE	5.00	9.50	15.00	57967	0.00	0.00	0.0	0.0
025y-072h	Pond 2/3c	BASE	5.50	9.50	15.00	57967	0.00	0.00	0.0	0.0
025y-072h	Pond 2/3c	BASE	6.00	9.50	15.00	57967	0.00	0.00	0.0	0.0
025y-072h	Pond 2/3c	BASE	6.50	9.50	15.00	57967	0.00	0.00	0.0	0.0
025y-072h	Pond 2/3c	BASE	7.00	9.50	15.00	57967	0.00	0.00	0.0	0.0
025y-072h	Pond 2/3c	BASE	7.50	9.50	15.00	57967	0.00	0.00	0.0	0.0
025y-072h	Pond 2/3c	BASE	8.00	9.50	15.00	57967	0.00	0.00	0.0	0.0
025y-072h	Pond 2/3c	BASE	8.50	9.50	15.00	57967	0.00	0.00	0.0	0.0
025y-072h	Pond 2/3c	BASE	9.01	9.50	15.00	57967	0.00	0.00	0.0	0.0
025y-072h	Pond 2/3c	BASE	9.51	9.50	15.00	57967	0.00	0.00	0.0	0.0
025y-072h	Pond 2/3c	BASE	10.00	9.50	15.00	57967	0.00	0.00	0.0	0.0
025y-072h	Pond 2/3c	BASE	10.50	9.50	15.00	57967	0.00	0.00	0.0	0.0
025y-072h	Pond 2/3c	BASE	11.00	9.50	15.00	57967	0.00	0.00	0.0	0.0
025y-072h	Pond 2/3c	BASE	11.50	9.50	15.00	57967	0.00	0.00	0.0	0.0
025y-072h	Pond 2/3c	BASE	12.00	9.50	15.00	57967	0.00	0.00	0.0	0.0
025y-072h	Pond 2/3c	BASE	12.50	9.50	15.00	57967	0.00	0.00	0.0	0.0
025y-072h	Pond 2/3c	BASE	13.00	9.50	15.00	57967	0.00	0.00	0.0	0.0
025y-072h	Pond 2/3c	BASE	13.50	9.50	15.00	57967	0.00	0.00	0.0	0.0
025y-072h	Pond 2/3c	BASE	14.00	9.50	15.00	57967	0.00	0.00	0.0	0.0
025y-072h	Pond 2/3c	BASE	14.50	9.50	15.00	57967	0.00	0.00	0.0	0.0
025y-072h	Pond 2/3c	BASE	15.00	9.50	15.00	57967	0.00	0.00	0.0	0.0
025y-072h	Pond 2/3c	BASE	15.50	9.50	15.00	57967	0.00	0.00	0.0	0.0
025y-072h	Pond 2/3c	BASE	16.00	9.50	15.00	57967	0.00	0.00	0.0	0.0
025y-072h	Pond 2/3c	BASE	16.50	9.50	15.00	57967	0.00	0.00	0.0	0.0
025y-072h	Pond 2/3c	BASE	17.00	9.50	15.00	57967	0.00	0.00	0.0	0.0
025y-072h	Pond 2/3c	BASE	17.50	9.50	15.00	57967	0.00	0.00	0.0	0.0
025y-072h	Pond 2/3c	BASE	18.00	9.50	15.00	57967	0.00	0.00	0.0	0.0
025y-072h	Pond 2/3c	BASE	18.50	9.50	15.00	57967	0.00	0.00	0.0	0.0
025y-072h	Pond 2/3c	BASE	19.00	9.50	15.00	57967	0.00	0.00	0.0	0.0
025y-072h	Pond 2/3c	BASE	19.50	9.50	15.00	57967	0.00	0.00	0.0	0.0
025y-072h	Pond 2/3c	BASE	20.00	9.50	15.00	57967	0.00	0.00	0.0	0.0
025y-072h	Pond 2/3c	BASE	20.50	9.50	15.00	57967	0.00	0.00	0.0	0.0
025y-072h	Pond 2/3c	BASE	21.00	9.50	15.00	57967	0.00	0.00	0.0	0.0
025y-072h	Pond 2/3c	BASE	21.50	9.50	15.00	57967	0.00	0.00	0.0	0.0
025y-072h	Pond 2/3c	BASE	22.00	9.50	15.00	57967	0.00	0.00	0.0	0.0
025y-072h	Pond 2/3c	BASE	22.50	9.50	15.00	57967	0.00	0.00	0.0	0.0
025y-072h	Pond 2/3c	BASE	23.00	9.50	15.00	57967	0.00	0.00	0.0	0.0
025y-072h	Pond 2/3c	BASE	23.50	9.50	15.00	57967	0.00	0.00	0.0	0.0
025y-072h	Pond 2/3c	BASE	24.00	9.50	15.00	57967	0.00	0.00	0.0	0.0
025y-072h	Pond 2/3c	BASE	24.50	9.50	15.00	57967	0.00	0.00	0.0	0.0
025y-072h	Pond 2/3c	BASE	24.58	9.50	15.00	57967	0.00	0.00	0.0	0.0
025y-072h	Pond 2/3c	BASE	24.67	9.50	15.00	145	15.10	0.00	0.1	0.0
025y-072h	Pond 2/3c	BASE	24.75	9.50	15.00	145	15.23	0.00	0.2	0.0
025y-072h	Pond 2/3c	BASE	24.83	9.50	15.00	145	15.40	0.00	0.3	0.0
025y-072h	Pond 2/3c	BASE	24.92	9.50	15.00	57977	0.00	0.01	0.3	0.0
025y-072h	Pond 2/3c	BASE	25.00	9.50	15.00	57987	-1.29	0.02	0.3	0.0
025y-072h	Pond 2/3c	BASE	25.08	9.51	15.00	58000	-1.13	0.03	0.3	0.0
025y-072h	Pond 2/3c	BASE	25.17	9.51	15.00	58016	-0.97	0.04	0.3	0.0
025y-072h	Pond 2/3c	BASE	25.25	9.51	15.00	58033	-0.80	0.05	0.3	0.0
025y-072h	Pond 2/3c	BASE	25.33	9.52	15.00	58053	0.74	0.06	0.3	0.0
025y-072h	Pond 2/3c	BASE	25.42	9.52	15.00	58074	0.82	0.07	0.3	0.0
025y-072h	Pond 2/3c	BASE	25.50	9.52	15.00	58097	0.88	0.09	0.3	0.0
025y-072h	Pond 2/3c	BASE	25.58	9.53	15.00	58121	0.93	0.10	0.3	0.0
025y-072h	Pond 2/3c	BASE	25.67	9.53	15.00	58146	0.97	0.11	0.3	0.0
025y-072h	Pond 2/3c	BASE	25.75	9.54	15.00	58172	1.01	0.12	0.3	0.0
025y-072h	Pond 2/3c	BASE	25.83	9.54	15.00	58199	1.04	0.13	0.3	0.0
025y-072h	Pond 2/3c	BASE	25.92	9.55	15.00	58226	1.07	0.14	0.3	0.0
025y-072h	Pond 2/3c	BASE	26.00	9.55	15.00	58253	1.10	0.15	0.3	0.0
025y-072h	Pond 2/3c	BASE	26.08	9.55	15.00	58281	1.12	0.16	0.3	0.0
025y-072h	Pond 2/3c	BASE	26.17	9.56	15.00	58310	1.14	0.17	0.4	0.0
025y-072h	Pond 2/3c	BASE	26.25	9.56	15.00	58338	1.15	0.18	0.4	0.0
025y-072h	Pond 2/3c	BASE	26.33	9.57	15.00	58367	1.17	0.19	0.4	0.0
025y-072h	Pond 2/3c	BASE	26.42	9.57	15.00	58396	1.18	0.19	0.4	0.0
025y-072h	Pond 2/3c	BASE	26.50	9.58	15.00	58425	1.19	0.20	0.4	0.0
025y-072h	Pond 2/3c	BASE	26.58	9.59	15.00	58454	1.20	0.21	0.4	0.0
025y-072h	Pond 2/3c	BASE	26.67	9.59	15.00	58483	1.21	0.22	0.4	0.0
025y-072h	Pond 2/3c	BASE	26.75	9.60	15.00	58513	1.22	0.22	0.4	0.0
025y-072h	Pond 2/3c	BASE	26.83	9.60	15.00	58542	1.23	0.23	0.4	0.0
025y-072h	Pond 2/3c	BASE	26.92	9.61	15.00	58571	1.24	0.24	0.4	0.0
025y-072h	Pond 2/3c	BASE	27.00	9.61	15.00	58600	1.24	0.25	0.4	0.0
025y-072h	Pond 2/3c	BASE	27.08	9.62	15.00	58630	1.25	0.25	0.4	0.0
025y-072h	Pond 2/3c	BASE	27.17	9.62	15.00	58659	1.26	0.26	0.5	0.0

Simulation	Node	Group	Time	Stage	Warning Stage	Surface Area	Total Inflow	Total Outflow	Total Vol In	Total Vol Out
			hrs	ft	ft	ft2	cfs	cfs	af	af
025y-072h	Pond 2/3c	BASE	27.25	9.63	15.00	58688	1.26	0.26	0.5	0.0
025y-072h	Pond 2/3c	BASE	27.33	9.63	15.00	58717	1.27	0.27	0.5	0.0
025y-072h	Pond 2/3c	BASE	27.42	9.64	15.00	58746	1.27	0.28	0.5	0.0
025y-072h	Pond 2/3c	BASE	27.50	9.64	15.00	58776	1.28	0.28	0.5	0.0
025y-072h	Pond 2/3c	BASE	27.58	9.65	15.00	58805	1.28	0.29	0.5	0.0
025y-072h	Pond 2/3c	BASE	27.67	9.65	15.00	58834	1.29	0.29	0.5	0.0
025y-072h	Pond 2/3c	BASE	27.75	9.66	15.00	58863	1.29	0.30	0.5	0.0
025y-072h	Pond 2/3c	BASE	27.83	9.66	15.00	58892	1.30	0.30	0.5	0.0
025y-072h	Pond 2/3c	BASE	27.92	9.67	15.00	58921	1.30	0.30	0.5	0.0
025y-072h	Pond 2/3c	BASE	28.00	9.67	15.00	58950	1.30	0.31	0.5	0.0
025y-072h	Pond 2/3c	BASE	28.08	9.68	15.00	58979	1.31	0.32	0.6	0.0
025y-072h	Pond 2/3c	BASE	28.17	9.68	15.00	59008	1.31	0.33	0.6	0.1
025y-072h	Pond 2/3c	BASE	28.25	9.69	15.00	59036	1.32	0.34	0.6	0.1
025y-072h	Pond 2/3c	BASE	28.33	9.69	15.00	59065	1.32	0.34	0.6	0.1
025y-072h	Pond 2/3c	BASE	28.42	9.70	15.00	59093	1.32	0.35	0.6	0.1
025y-072h	Pond 2/3c	BASE	28.50	9.70	15.00	59121	1.33	0.36	0.6	0.1
025y-072h	Pond 2/3c	BASE	28.58	9.71	15.00	59149	1.33	0.37	0.6	0.1
025y-072h	Pond 2/3c	BASE	28.67	9.71	15.00	59177	1.33	0.38	0.6	0.1
025y-072h	Pond 2/3c	BASE	28.75	9.72	15.00	59204	1.34	0.39	0.6	0.1
025y-072h	Pond 2/3c	BASE	28.83	9.72	15.00	59231	1.34	0.40	0.6	0.1
025y-072h	Pond 2/3c	BASE	28.92	9.73	15.00	59259	1.34	0.41	0.6	0.1
025y-072h	Pond 2/3c	BASE	29.00	9.73	15.00	59286	1.34	0.42	0.7	0.1
025y-072h	Pond 2/3c	BASE	29.08	9.74	15.00	59312	1.35	0.43	0.7	0.1
025y-072h	Pond 2/3c	BASE	29.17	9.74	15.00	59339	1.35	0.43	0.7	0.1
025y-072h	Pond 2/3c	BASE	29.25	9.74	15.00	59365	1.35	0.44	0.7	0.1
025y-072h	Pond 2/3c	BASE	29.33	9.75	15.00	59391	1.35	0.45	0.7	0.1
025y-072h	Pond 2/3c	BASE	29.42	9.75	15.00	59417	1.36	0.46	0.7	0.1
025y-072h	Pond 2/3c	BASE	29.50	9.76	15.00	59443	1.36	0.47	0.7	0.1
025y-072h	Pond 2/3c	BASE	29.58	9.76	15.00	59469	1.36	0.48	0.7	0.1
025y-072h	Pond 2/3c	BASE	29.67	9.77	15.00	59494	1.36	0.49	0.7	0.1
025y-072h	Pond 2/3c	BASE	29.75	9.77	15.00	59520	1.37	0.49	0.7	0.1
025y-072h	Pond 2/3c	BASE	29.83	9.78	15.00	59545	1.37	0.50	0.7	0.1
025y-072h	Pond 2/3c	BASE	29.92	9.78	15.00	59570	1.37	0.50	0.8	0.1
025y-072h	Pond 2/3c	BASE	30.00	9.78	15.00	59595	1.37	0.50	0.8	0.1
025y-072h	Pond 2/3c	BASE	30.08	9.79	15.00	59620	1.37	0.51	0.8	0.1
025y-072h	Pond 2/3c	BASE	30.17	9.79	15.00	59645	1.37	0.51	0.8	0.1
025y-072h	Pond 2/3c	BASE	30.25	9.80	15.00	59670	1.37	0.52	0.8	0.1
025y-072h	Pond 2/3c	BASE	30.33	9.80	15.00	59694	1.38	0.52	0.8	0.1
025y-072h	Pond 2/3c	BASE	30.42	9.81	15.00	59719	1.38	0.52	0.8	0.1
025y-072h	Pond 2/3c	BASE	30.50	9.81	15.00	59743	1.38	0.53	0.8	0.1
025y-072h	Pond 2/3c	BASE	30.58	9.81	15.00	59768	1.38	0.53	0.8	0.1
025y-072h	Pond 2/3c	BASE	30.67	9.82	15.00	59792	1.38	0.53	0.8	0.1
025y-072h	Pond 2/3c	BASE	30.75	9.82	15.00	59817	1.38	0.54	0.9	0.1
025y-072h	Pond 2/3c	BASE	30.83	9.83	15.00	59841	1.39	0.54	0.9	0.2
025y-072h	Pond 2/3c	BASE	30.92	9.83	15.00	59865	1.39	0.54	0.9	0.2
025y-072h	Pond 2/3c	BASE	31.00	9.84	15.00	59889	1.39	0.55	0.9	0.2
025y-072h	Pond 2/3c	BASE	31.08	9.84	15.00	59913	1.39	0.55	0.9	0.2
025y-072h	Pond 2/3c	BASE	31.17	9.84	15.00	59937	1.39	0.55	0.9	0.2
025y-072h	Pond 2/3c	BASE	31.25	9.85	15.00	59961	1.39	0.56	0.9	0.2
025y-072h	Pond 2/3c	BASE	31.33	9.85	15.00	59985	1.39	0.56	0.9	0.2
025y-072h	Pond 2/3c	BASE	31.42	9.86	15.00	60009	1.39	0.56	0.9	0.2
025y-072h	Pond 2/3c	BASE	31.50	9.86	15.00	60033	1.40	0.57	0.9	0.2
025y-072h	Pond 2/3c	BASE	31.58	9.86	15.00	60056	1.40	0.57	0.9	0.2
025y-072h	Pond 2/3c	BASE	31.67	9.87	15.00	60080	1.40	0.57	1.0	0.2
025y-072h	Pond 2/3c	BASE	31.75	9.87	15.00	60103	1.40	0.58	1.0	0.2
025y-072h	Pond 2/3c	BASE	31.83	9.88	15.00	60127	1.40	0.58	1.0	0.2
025y-072h	Pond 2/3c	BASE	31.92	9.88	15.00	60150	1.40	0.58	1.0	0.2
025y-072h	Pond 2/3c	BASE	32.00	9.89	15.00	60174	1.40	0.59	1.0	0.2
025y-072h	Pond 2/3c	BASE	32.08	9.89	15.00	60197	1.41	0.59	1.0	0.2
025y-072h	Pond 2/3c	BASE	32.17	9.89	15.00	60220	1.41	0.59	1.0	0.2
025y-072h	Pond 2/3c	BASE	32.25	9.90	15.00	60243	1.41	0.60	1.0	0.2
025y-072h	Pond 2/3c	BASE	32.33	9.90	15.00	60267	1.41	0.60	1.0	0.2
025y-072h	Pond 2/3c	BASE	32.42	9.91	15.00	60290	1.41	0.60	1.0	0.2
025y-072h	Pond 2/3c	BASE	32.50	9.91	15.00	60313	1.41	0.60	1.1	0.2
025y-072h	Pond 2/3c	BASE	32.58	9.91	15.00	60336	1.41	0.61	1.1	0.2
025y-072h	Pond 2/3c	BASE	32.67	9.92	15.00	60358	1.41	0.61	1.1	0.2
025y-072h	Pond 2/3c	BASE	32.75	9.92	15.00	60381	1.41	0.61	1.1	0.2
025y-072h	Pond 2/3c	BASE	32.83	9.93	15.00	60404	1.42	0.62	1.1	0.2
025y-072h	Pond 2/3c	BASE	32.92	9.93	15.00	60427	1.42	0.62	1.1	0.3
025y-072h	Pond 2/3c	BASE	33.00	9.93	15.00	60449	1.42	0.62	1.1	0.3
025y-072h	Pond 2/3c	BASE	33.08	9.94	15.00	60472	1.42	0.63	1.1	0.3
025y-072h	Pond 2/3c	BASE	33.17	9.94	15.00	60494	1.42	0.63	1.1	0.3
025y-072h	Pond 2/3c	BASE	33.25	9.95	15.00	60517	1.42	0.63	1.1	0.3
025y-072h	Pond 2/3c	BASE	33.33	9.95	15.00	60539	1.42	0.63	1.2	0.3
025y-072h	Pond 2/3c	BASE	33.42	9.95	15.00	60562	1.42	0.64	1.2	0.3
025y-072h	Pond 2/3c	BASE	33.50	9.96	15.00	60584	1.43	0.64	1.2	0.3
025y-072h	Pond 2/3c	BASE	33.58	9.96	15.00	60606	1.43	0.64	1.2	0.3
025y-072h	Pond 2/3c	BASE	33.67	9.96	15.00	60629	1.43	0.64	1.2	0.3
025y-072h	Pond 2/3c	BASE	33.75	9.97	15.00	60651	1.43	0.65	1.2	0.3
025y-072h	Pond 2/3c	BASE	33.83	9.97	15.00	60673	1.43	0.65	1.2	0.3
025y-072h	Pond 2/3c	BASE	33.92	9.98	15.00	60695	1.43	0.65	1.2	0.3
025y-072h	Pond 2/3c	BASE	34.00	9.98	15.00	60717	1.43	0.65	1.2	0.3

Simulation	Node	Group	Time	Stage	Warning Stage	Surface Area	Total Inflow	Total Outflow	Total Vol In	Total Vol Out
			hrs	ft	ft	ft2	cfs	cfs	af	af
025y-072h	Pond 2/3c	BASE	34.08	9.98	15.00	60739	1.43	0.66	1.2	0.3
025y-072h	Pond 2/3c	BASE	34.17	9.99	15.00	60761	1.43	0.66	1.2	0.3
025y-072h	Pond 2/3c	BASE	34.25	9.99	15.00	60783	1.43	0.66	1.3	0.3
025y-072h	Pond 2/3c	BASE	34.33	10.00	15.00	60804	1.44	0.67	1.3	0.3
025y-072h	Pond 2/3c	BASE	34.42	10.00	15.00	60826	1.44	0.67	1.3	0.3
025y-072h	Pond 2/3c	BASE	34.50	10.00	15.00	60848	1.44	0.67	1.3	0.3
025y-072h	Pond 2/3c	BASE	34.58	10.01	15.00	60869	1.44	0.67	1.3	0.3
025y-072h	Pond 2/3c	BASE	34.67	10.01	15.00	60891	1.44	0.68	1.3	0.3
025y-072h	Pond 2/3c	BASE	34.75	10.01	15.00	60913	1.44	0.68	1.3	0.3
025y-072h	Pond 2/3c	BASE	34.83	10.02	15.00	60934	1.44	0.68	1.3	0.4
025y-072h	Pond 2/3c	BASE	34.92	10.02	15.00	60955	1.44	0.68	1.3	0.4
025y-072h	Pond 2/3c	BASE	35.00	10.03	15.00	60977	1.44	0.69	1.3	0.4
025y-072h	Pond 2/3c	BASE	35.08	10.03	15.00	60998	1.44	0.69	1.4	0.4
025y-072h	Pond 2/3c	BASE	35.17	10.03	15.00	61020	1.45	0.69	1.4	0.4
025y-072h	Pond 2/3c	BASE	35.25	10.04	15.00	61041	1.45	0.69	1.4	0.4
025y-072h	Pond 2/3c	BASE	35.33	10.04	15.00	61062	1.45	0.69	1.4	0.4
025y-072h	Pond 2/3c	BASE	35.42	10.04	15.00	61083	1.45	0.70	1.4	0.4
025y-072h	Pond 2/3c	BASE	35.50	10.05	15.00	61104	1.45	0.70	1.4	0.4
025y-072h	Pond 2/3c	BASE	35.58	10.05	15.00	61125	1.45	0.70	1.4	0.4
025y-072h	Pond 2/3c	BASE	35.67	10.06	15.00	61147	1.45	0.70	1.4	0.4
025y-072h	Pond 2/3c	BASE	35.75	10.06	15.00	61167	1.45	0.71	1.4	0.4
025y-072h	Pond 2/3c	BASE	35.83	10.06	15.00	61188	1.45	0.71	1.4	0.4
025y-072h	Pond 2/3c	BASE	35.92	10.07	15.00	61209	1.45	0.71	1.5	0.4
025y-072h	Pond 2/3c	BASE	36.00	10.07	15.00	61230	1.46	0.71	1.5	0.4
025y-072h	Pond 2/3c	BASE	36.08	10.07	15.00	61251	1.46	0.72	1.5	0.4
025y-072h	Pond 2/3c	BASE	36.17	10.08	15.00	61272	1.46	0.72	1.5	0.4
025y-072h	Pond 2/3c	BASE	36.25	10.08	15.00	61292	1.46	0.72	1.5	0.4
025y-072h	Pond 2/3c	BASE	36.33	10.08	15.00	61313	1.46	0.72	1.5	0.4
025y-072h	Pond 2/3c	BASE	36.42	10.09	15.00	61334	1.46	0.72	1.5	0.4
025y-072h	Pond 2/3c	BASE	36.50	10.09	15.00	61354	1.46	0.73	1.5	0.5
025y-072h	Pond 2/3c	BASE	36.58	10.10	15.00	61375	1.46	0.73	1.5	0.5
025y-072h	Pond 2/3c	BASE	36.67	10.10	15.00	61395	1.47	0.73	1.5	0.5
025y-072h	Pond 2/3c	BASE	36.75	10.10	15.00	61416	1.47	0.73	1.6	0.5
025y-072h	Pond 2/3c	BASE	36.83	10.11	15.00	61436	1.47	0.74	1.6	0.5
025y-072h	Pond 2/3c	BASE	36.92	10.11	15.00	61457	1.47	0.74	1.6	0.5
025y-072h	Pond 2/3c	BASE	37.00	10.11	15.00	61477	1.47	0.74	1.6	0.5
025y-072h	Pond 2/3c	BASE	37.08	10.12	15.00	61498	1.47	0.74	1.6	0.5
025y-072h	Pond 2/3c	BASE	37.17	10.12	15.00	61518	1.47	0.74	1.6	0.5
025y-072h	Pond 2/3c	BASE	37.25	10.12	15.00	61538	1.48	0.75	1.6	0.5
025y-072h	Pond 2/3c	BASE	37.33	10.13	15.00	61559	1.48	0.75	1.6	0.5
025y-072h	Pond 2/3c	BASE	37.42	10.13	15.00	61579	1.48	0.75	1.6	0.5
025y-072h	Pond 2/3c	BASE	37.50	10.13	15.00	61599	1.48	0.75	1.7	0.5
025y-072h	Pond 2/3c	BASE	37.58	10.14	15.00	61620	1.48	0.75	1.7	0.5
025y-072h	Pond 2/3c	BASE	37.67	10.14	15.00	61640	1.48	0.76	1.7	0.5
025y-072h	Pond 2/3c	BASE	37.75	10.15	15.00	61660	1.48	0.76	1.7	0.5
025y-072h	Pond 2/3c	BASE	37.83	10.15	15.00	61680	1.48	0.76	1.7	0.5
025y-072h	Pond 2/3c	BASE	37.92	10.15	15.00	61700	1.48	0.76	1.7	0.5
025y-072h	Pond 2/3c	BASE	38.00	10.16	15.00	61720	1.49	0.77	1.7	0.5
025y-072h	Pond 2/3c	BASE	38.08	10.16	15.00	61740	1.49	0.77	1.7	0.5
025y-072h	Pond 2/3c	BASE	38.17	10.16	15.00	61760	1.49	0.77	1.7	0.6
025y-072h	Pond 2/3c	BASE	38.25	10.17	15.00	61780	1.49	0.77	1.7	0.6
025y-072h	Pond 2/3c	BASE	38.33	10.17	15.00	61800	1.49	0.77	1.8	0.6
025y-072h	Pond 2/3c	BASE	38.42	10.17	15.00	61820	1.49	0.78	1.8	0.6
025y-072h	Pond 2/3c	BASE	38.50	10.18	15.00	61840	1.49	0.78	1.8	0.6
025y-072h	Pond 2/3c	BASE	38.58	10.18	15.00	61860	1.49	0.78	1.8	0.6
025y-072h	Pond 2/3c	BASE	38.67	10.18	15.00	61880	1.49	0.78	1.8	0.6
025y-072h	Pond 2/3c	BASE	38.75	10.19	15.00	61899	1.49	0.78	1.8	0.6
025y-072h	Pond 2/3c	BASE	38.83	10.19	15.00	61919	1.50	0.79	1.8	0.6
025y-072h	Pond 2/3c	BASE	38.92	10.19	15.00	61939	1.50	0.79	1.8	0.6
025y-072h	Pond 2/3c	BASE	39.00	10.20	15.00	61959	1.50	0.79	1.8	0.6
025y-072h	Pond 2/3c	BASE	39.08	10.20	15.00	61978	1.50	0.79	1.8	0.6
025y-072h	Pond 2/3c	BASE	39.17	10.20	15.00	61998	1.50	0.79	1.9	0.6
025y-072h	Pond 2/3c	BASE	39.25	10.21	15.00	62017	1.50	0.79	1.9	0.6
025y-072h	Pond 2/3c	BASE	39.33	10.21	15.00	62037	1.50	0.80	1.9	0.6
025y-072h	Pond 2/3c	BASE	39.42	10.21	15.00	62056	1.50	0.80	1.9	0.6
025y-072h	Pond 2/3c	BASE	39.50	10.22	15.00	62076	1.50	0.80	1.9	0.6
025y-072h	Pond 2/3c	BASE	39.58	10.22	15.00	62095	1.50	0.80	1.9	0.6
025y-072h	Pond 2/3c	BASE	39.67	10.22	15.00	62115	1.50	0.80	1.9	0.7
025y-072h	Pond 2/3c	BASE	39.75	10.23	15.00	62134	1.51	0.81	1.9	0.7
025y-072h	Pond 2/3c	BASE	39.83	10.23	15.00	62153	1.51	0.81	1.9	0.7
025y-072h	Pond 2/3c	BASE	39.92	10.23	15.00	62172	1.51	0.81	1.9	0.7
025y-072h	Pond 2/3c	BASE	40.00	10.24	15.00	62192	1.51	0.81	2.0	0.7
025y-072h	Pond 2/3c	BASE	40.08	10.24	15.00	62211	1.51	0.81	2.0	0.7
025y-072h	Pond 2/3c	BASE	40.17	10.24	15.00	62230	1.51	0.82	2.0	0.7
025y-072h	Pond 2/3c	BASE	40.25	10.25	15.00	62249	1.51	0.82	2.0	0.7
025y-072h	Pond 2/3c	BASE	40.33	10.25	15.00	62268	1.51	0.82	2.0	0.7
025y-072h	Pond 2/3c	BASE	40.42	10.25	15.00	62287	1.51	0.82	2.0	0.7
025y-072h	Pond 2/3c	BASE	40.50	10.26	15.00	62306	1.51	0.82	2.0	0.7
025y-072h	Pond 2/3c	BASE	40.58	10.26	15.00	62325	1.51	0.82	2.0	0.7
025y-072h	Pond 2/3c	BASE	40.67	10.26	15.00	62344	1.51	0.83	2.0	0.7
025y-072h	Pond 2/3c	BASE	40.75	10.27	15.00	62363	1.51	0.83	2.1	0.7
025y-072h	Pond 2/3c	BASE	40.83	10.27	15.00	62382	1.51	0.83	2.1	0.7

Simulation	Node	Group	Time	Stage	Warning Stage	Surface Area	Total Inflow	Total Outflow	Total Vol In	Total Vol Out
			hrs	ft	ft	ft2	cfs	cfs	af	af
025y-072h	Pond 2/3c	BASE	40.92	10.27	15.00	62401	1.52	0.83	2.1	0.7
025y-072h	Pond 2/3c	BASE	41.00	10.28	15.00	62420	1.52	0.83	2.1	0.7
025y-072h	Pond 2/3c	BASE	41.08	10.28	15.00	62438	1.52	0.84	2.1	0.7
025y-072h	Pond 2/3c	BASE	41.17	10.28	15.00	62457	1.52	0.84	2.1	0.8
025y-072h	Pond 2/3c	BASE	41.25	10.29	15.00	62476	1.52	0.84	2.1	0.8
025y-072h	Pond 2/3c	BASE	41.33	10.29	15.00	62495	1.52	0.84	2.1	0.8
025y-072h	Pond 2/3c	BASE	41.42	10.29	15.00	62513	1.52	0.84	2.1	0.8
025y-072h	Pond 2/3c	BASE	41.50	10.30	15.00	62532	1.52	0.84	2.1	0.8
025y-072h	Pond 2/3c	BASE	41.58	10.30	15.00	62550	1.52	0.85	2.2	0.8
025y-072h	Pond 2/3c	BASE	41.67	10.30	15.00	62569	1.52	0.85	2.2	0.8
025y-072h	Pond 2/3c	BASE	41.75	10.31	15.00	62587	1.52	0.85	2.2	0.8
025y-072h	Pond 2/3c	BASE	41.83	10.31	15.00	62606	1.52	0.85	2.2	0.8
025y-072h	Pond 2/3c	BASE	41.92	10.31	15.00	62624	1.52	0.85	2.2	0.8
025y-072h	Pond 2/3c	BASE	42.00	10.32	15.00	62643	1.52	0.85	2.2	0.8
025y-072h	Pond 2/3c	BASE	42.08	10.32	15.00	62661	1.52	0.86	2.2	0.8
025y-072h	Pond 2/3c	BASE	42.17	10.32	15.00	62679	1.52	0.86	2.2	0.8
025y-072h	Pond 2/3c	BASE	42.25	10.33	15.00	62698	1.53	0.86	2.2	0.8
025y-072h	Pond 2/3c	BASE	42.33	10.33	15.00	62716	1.53	0.86	2.3	0.8
025y-072h	Pond 2/3c	BASE	42.42	10.33	15.00	62734	1.53	0.86	2.3	0.8
025y-072h	Pond 2/3c	BASE	42.50	10.34	15.00	62752	1.53	0.86	2.3	0.8
025y-072h	Pond 2/3c	BASE	42.58	10.34	15.00	62770	1.53	0.87	2.3	0.9
025y-072h	Pond 2/3c	BASE	42.67	10.34	15.00	62788	1.53	0.87	2.3	0.9
025y-072h	Pond 2/3c	BASE	42.75	10.35	15.00	62806	1.53	0.87	2.3	0.9
025y-072h	Pond 2/3c	BASE	42.83	10.35	15.00	62825	1.53	0.87	2.3	0.9
025y-072h	Pond 2/3c	BASE	42.92	10.35	15.00	62843	1.53	0.87	2.3	0.9
025y-072h	Pond 2/3c	BASE	43.00	10.35	15.00	62861	1.53	0.87	2.3	0.9
025y-072h	Pond 2/3c	BASE	43.08	10.36	15.00	62879	1.53	0.88	2.3	0.9
025y-072h	Pond 2/3c	BASE	43.17	10.36	15.00	62896	1.53	0.88	2.4	0.9
025y-072h	Pond 2/3c	BASE	43.25	10.36	15.00	62914	1.53	0.88	2.4	0.9
025y-072h	Pond 2/3c	BASE	43.33	10.37	15.00	62932	1.53	0.88	2.4	0.9
025y-072h	Pond 2/3c	BASE	43.42	10.37	15.00	62950	1.53	0.88	2.4	0.9
025y-072h	Pond 2/3c	BASE	43.50	10.37	15.00	62968	1.53	0.88	2.4	0.9
025y-072h	Pond 2/3c	BASE	43.58	10.38	15.00	62986	1.54	0.88	2.4	0.9
025y-072h	Pond 2/3c	BASE	43.67	10.38	15.00	63003	1.54	0.89	2.4	0.9
025y-072h	Pond 2/3c	BASE	43.75	10.38	15.00	63021	1.54	0.89	2.4	0.9
025y-072h	Pond 2/3c	BASE	43.83	10.39	15.00	63038	1.54	0.89	2.4	0.9
025y-072h	Pond 2/3c	BASE	43.92	10.39	15.00	63056	1.54	0.89	2.5	1.0
025y-072h	Pond 2/3c	BASE	44.00	10.39	15.00	63074	1.54	0.89	2.5	1.0
025y-072h	Pond 2/3c	BASE	44.08	10.40	15.00	63091	1.54	0.89	2.5	1.0
025y-072h	Pond 2/3c	BASE	44.17	10.40	15.00	63109	1.54	0.90	2.5	1.0
025y-072h	Pond 2/3c	BASE	44.25	10.40	15.00	63126	1.54	0.90	2.5	1.0
025y-072h	Pond 2/3c	BASE	44.33	10.40	15.00	63144	1.54	0.90	2.5	1.0
025y-072h	Pond 2/3c	BASE	44.42	10.41	15.00	63161	1.54	0.90	2.5	1.0
025y-072h	Pond 2/3c	BASE	44.50	10.41	15.00	63179	1.54	0.90	2.5	1.0
025y-072h	Pond 2/3c	BASE	44.58	10.41	15.00	63196	1.54	0.90	2.5	1.0
025y-072h	Pond 2/3c	BASE	44.67	10.42	15.00	63213	1.54	0.90	2.5	1.0
025y-072h	Pond 2/3c	BASE	44.75	10.42	15.00	63231	1.54	0.91	2.6	1.0
025y-072h	Pond 2/3c	BASE	44.83	10.42	15.00	63248	1.54	0.91	2.6	1.0
025y-072h	Pond 2/3c	BASE	44.92	10.43	15.00	63265	1.54	0.91	2.6	1.0
025y-072h	Pond 2/3c	BASE	45.00	10.43	15.00	63282	1.54	0.91	2.6	1.0
025y-072h	Pond 2/3c	BASE	45.08	10.43	15.00	63300	1.54	0.91	2.6	1.0
025y-072h	Pond 2/3c	BASE	45.17	10.43	15.00	63317	1.55	0.91	2.6	1.0
025y-072h	Pond 2/3c	BASE	45.25	10.44	15.00	63334	1.55	0.91	2.6	1.0
025y-072h	Pond 2/3c	BASE	45.33	10.44	15.00	63351	1.55	0.92	2.6	1.1
025y-072h	Pond 2/3c	BASE	45.42	10.44	15.00	63368	1.55	0.92	2.6	1.1
025y-072h	Pond 2/3c	BASE	45.50	10.45	15.00	63385	1.55	0.92	2.7	1.1
025y-072h	Pond 2/3c	BASE	45.58	10.45	15.00	63402	1.55	0.92	2.7	1.1
025y-072h	Pond 2/3c	BASE	45.67	10.45	15.00	63419	1.55	0.92	2.7	1.1
025y-072h	Pond 2/3c	BASE	45.75	10.46	15.00	63436	1.55	0.92	2.7	1.1
025y-072h	Pond 2/3c	BASE	45.83	10.46	15.00	63453	1.55	0.92	2.7	1.1
025y-072h	Pond 2/3c	BASE	45.92	10.46	15.00	63470	1.55	0.93	2.7	1.1
025y-072h	Pond 2/3c	BASE	46.00	10.46	15.00	63487	1.55	0.93	2.7	1.1
025y-072h	Pond 2/3c	BASE	46.08	10.47	15.00	63504	1.55	0.93	2.7	1.1
025y-072h	Pond 2/3c	BASE	46.17	10.47	15.00	63520	1.55	0.93	2.7	1.1
025y-072h	Pond 2/3c	BASE	46.25	10.47	15.00	63537	1.55	0.93	2.8	1.1
025y-072h	Pond 2/3c	BASE	46.33	10.48	15.00	63554	1.55	0.93	2.8	1.1
025y-072h	Pond 2/3c	BASE	46.42	10.48	15.00	63570	1.55	0.93	2.8	1.1
025y-072h	Pond 2/3c	BASE	46.50	10.48	15.00	63587	1.55	0.94	2.8	1.1
025y-072h	Pond 2/3c	BASE	46.58	10.48	15.00	63604	1.55	0.94	2.8	1.2
025y-072h	Pond 2/3c	BASE	46.67	10.49	15.00	63620	1.55	0.94	2.8	1.2
025y-072h	Pond 2/3c	BASE	46.75	10.49	15.00	63637	1.55	0.94	2.8	1.2
025y-072h	Pond 2/3c	BASE	46.83	10.49	15.00	63654	1.56	0.94	2.8	1.2
025y-072h	Pond 2/3c	BASE	46.92	10.50	15.00	63670	1.56	0.94	2.8	1.2
025y-072h	Pond 2/3c	BASE	47.00	10.50	15.00	63687	1.56	0.94	2.8	1.2
025y-072h	Pond 2/3c	BASE	47.08	10.50	15.00	63703	1.56	0.95	2.9	1.2
025y-072h	Pond 2/3c	BASE	47.17	10.50	15.00	63720	1.56	0.95	2.9	1.2
025y-072h	Pond 2/3c	BASE	47.25	10.51	15.00	63736	1.56	0.95	2.9	1.2
025y-072h	Pond 2/3c	BASE	47.33	10.51	15.00	63752	1.56	0.95	2.9	1.2
025y-072h	Pond 2/3c	BASE	47.42	10.51	15.00	63769	1.56	0.95	2.9	1.2
025y-072h	Pond 2/3c	BASE	47.50	10.52	15.00	63785	1.56	0.95	2.9	1.2
025y-072h	Pond 2/3c	BASE	47.58	10.52	15.00	63801	1.56	0.95	2.9	1.2
025y-072h	Pond 2/3c	BASE	47.67	10.52	15.00	63818	1.56	0.96	2.9	1.2

Simulation	Node	Group	Time	Stage	Warning Stage	Surface Area	Total Inflow	Total Outflow	Total Vol In	Total Vol Out
			hrs	ft	ft	ft2	cfs	cfs	af	af
025y-072h	Pond 2/3c	BASE	47.75	10.52	15.00	63834	1.56	0.96	2.9	1.2
025y-072h	Pond 2/3c	BASE	47.83	10.53	15.00	63850	1.56	0.96	3.0	1.2
025y-072h	Pond 2/3c	BASE	47.92	10.53	15.00	63867	1.56	0.96	3.0	1.3
025y-072h	Pond 2/3c	BASE	48.00	10.53	15.00	63883	1.56	0.96	3.0	1.3
025y-072h	Pond 2/3c	BASE	48.08	10.54	15.00	63899	1.56	0.96	3.0	1.3
025y-072h	Pond 2/3c	BASE	48.17	10.54	15.00	63915	1.56	0.96	3.0	1.3
025y-072h	Pond 2/3c	BASE	48.25	10.54	15.00	63931	1.57	0.96	3.0	1.3
025y-072h	Pond 2/3c	BASE	48.33	10.54	15.00	63947	1.57	0.97	3.0	1.3
025y-072h	Pond 2/3c	BASE	48.42	10.55	15.00	63964	1.58	0.97	3.0	1.3
025y-072h	Pond 2/3c	BASE	48.50	10.55	15.00	63980	1.58	0.97	3.0	1.3
025y-072h	Pond 2/3c	BASE	48.58	10.55	15.00	63997	1.59	0.97	3.1	1.3
025y-072h	Pond 2/3c	BASE	48.67	10.56	15.00	64013	1.60	0.97	3.1	1.3
025y-072h	Pond 2/3c	BASE	48.75	10.56	15.00	64030	1.60	0.97	3.1	1.3
025y-072h	Pond 2/3c	BASE	48.83	10.56	15.00	64047	1.61	0.97	3.1	1.3
025y-072h	Pond 2/3c	BASE	48.92	10.57	15.00	64064	1.62	0.98	3.1	1.3
025y-072h	Pond 2/3c	BASE	49.00	10.57	15.00	64082	1.63	0.98	3.1	1.3
025y-072h	Pond 2/3c	BASE	49.08	10.57	15.00	64099	1.63	0.98	3.1	1.3
025y-072h	Pond 2/3c	BASE	49.17	10.57	15.00	64117	1.64	0.98	3.1	1.4
025y-072h	Pond 2/3c	BASE	49.25	10.58	15.00	64135	1.65	0.98	3.1	1.4
025y-072h	Pond 2/3c	BASE	49.33	10.58	15.00	64153	1.65	0.98	3.2	1.4
025y-072h	Pond 2/3c	BASE	49.42	10.58	15.00	64171	1.66	0.98	3.2	1.4
025y-072h	Pond 2/3c	BASE	49.50	10.59	15.00	64189	1.67	0.99	3.2	1.4
025y-072h	Pond 2/3c	BASE	49.58	10.59	15.00	64207	1.67	0.99	3.2	1.4
025y-072h	Pond 2/3c	BASE	49.67	10.59	15.00	64226	1.68	0.99	3.2	1.4
025y-072h	Pond 2/3c	BASE	49.75	10.60	15.00	64244	1.69	0.99	3.2	1.4
025y-072h	Pond 2/3c	BASE	49.83	10.60	15.00	64263	1.69	0.99	3.2	1.4
025y-072h	Pond 2/3c	BASE	49.92	10.60	15.00	64282	1.70	0.99	3.2	1.4
025y-072h	Pond 2/3c	BASE	50.00	10.61	15.00	64301	1.70	0.99	3.2	1.4
025y-072h	Pond 2/3c	BASE	50.25	10.62	15.00	64358	1.72	1.00	3.3	1.4
025y-072h	Pond 2/3c	BASE	50.50	10.63	15.00	64418	1.76	1.00	3.3	1.5
025y-072h	Pond 2/3c	BASE	50.75	10.64	15.00	64480	1.81	1.01	3.4	1.5
025y-072h	Pond 2/3c	BASE	51.00	10.65	15.00	64546	1.86	1.01	3.4	1.5
025y-072h	Pond 2/3c	BASE	51.25	10.66	15.00	64615	1.91	1.02	3.4	1.5
025y-072h	Pond 2/3c	BASE	51.50	10.67	15.00	64687	1.96	1.02	3.5	1.5
025y-072h	Pond 2/3c	BASE	51.75	10.69	15.00	64764	2.01	1.03	3.5	1.6
025y-072h	Pond 2/3c	BASE	52.00	10.70	15.00	64843	2.06	1.04	3.6	1.6
025y-072h	Pond 2/3c	BASE	52.25	10.72	15.00	64926	2.12	1.04	3.6	1.6
025y-072h	Pond 2/3c	BASE	52.50	10.73	15.00	65014	2.21	1.05	3.6	1.6
025y-072h	Pond 2/3c	BASE	52.75	10.75	15.00	65111	2.32	1.06	3.7	1.7
025y-072h	Pond 2/3c	BASE	53.00	10.77	15.00	65215	2.43	1.06	3.7	1.7
025y-072h	Pond 2/3c	BASE	53.25	10.79	15.00	65327	2.55	1.07	3.8	1.7
025y-072h	Pond 2/3c	BASE	53.50	10.81	15.00	65449	2.69	1.08	3.8	1.7
025y-072h	Pond 2/3c	BASE	53.75	10.83	15.00	65580	2.84	1.09	3.9	1.7
025y-072h	Pond 2/3c	BASE	54.00	10.85	15.00	65723	2.98	1.10	4.0	1.8
025y-072h	Pond 2/3c	BASE	54.25	10.88	15.00	65875	3.12	1.11	4.0	1.8
025y-072h	Pond 2/3c	BASE	54.50	10.91	15.00	66038	3.28	1.12	4.1	1.8
025y-072h	Pond 2/3c	BASE	54.75	10.94	15.00	66212	3.45	1.13	4.2	1.8
025y-072h	Pond 2/3c	BASE	55.00	10.97	15.00	66398	3.60	1.15	4.2	1.9
025y-072h	Pond 2/3c	BASE	55.25	11.01	15.00	66593	3.76	1.16	4.3	1.9
025y-072h	Pond 2/3c	BASE	55.50	11.04	15.00	66799	3.93	1.17	4.4	1.9
025y-072h	Pond 2/3c	BASE	55.75	11.08	15.00	67018	4.11	1.19	4.5	1.9
025y-072h	Pond 2/3c	BASE	56.00	11.12	15.00	67248	4.27	1.20	4.6	2.0
025y-072h	Pond 2/3c	BASE	56.25	11.16	15.00	67488	4.43	1.22	4.6	2.0
025y-072h	Pond 2/3c	BASE	56.50	11.21	15.00	67739	4.62	1.23	4.7	2.0
025y-072h	Pond 2/3c	BASE	56.75	11.25	15.00	68004	4.82	1.25	4.8	2.0
025y-072h	Pond 2/3c	BASE	57.00	11.30	15.00	68280	5.01	1.27	4.9	2.1
025y-072h	Pond 2/3c	BASE	57.25	11.35	15.00	68567	5.19	1.29	5.0	2.1
025y-072h	Pond 2/3c	BASE	57.50	11.40	15.00	68868	5.42	1.30	5.2	2.1
025y-072h	Pond 2/3c	BASE	57.75	11.46	15.00	69185	5.69	1.32	5.3	2.1
025y-072h	Pond 2/3c	BASE	58.00	11.52	15.00	69520	5.98	1.34	5.4	2.2
025y-072h	Pond 2/3c	BASE	58.25	11.58	15.00	69873	6.27	1.36	5.5	2.2
025y-072h	Pond 2/3c	BASE	58.50	11.64	15.00	70244	6.58	1.38	5.6	2.2
025y-072h	Pond 2/3c	BASE	58.75	11.71	15.00	70637	6.99	1.41	5.8	2.3
025y-072h	Pond 2/3c	BASE	59.00	11.79	15.00	71062	7.55	1.43	5.9	2.3
025y-072h	Pond 2/3c	BASE	59.25	11.87	15.00	71531	8.42	1.45	6.1	2.3
025y-072h	Pond 2/3c	BASE	59.50	11.96	15.00	72073	9.65	1.48	6.3	2.3
025y-072h	Pond 2/3c	BASE	59.75	12.09	15.00	72811	15.93	1.52	6.6	2.4
025y-072h	Pond 2/3c	BASE	60.00	12.35	15.00	74282	30.05	1.52	7.0	2.4
025y-072h	Pond 2/3c	BASE	60.25	12.77	15.00	76674	41.37	2.10	7.8	2.4
025y-072h	Pond 2/3c	BASE	60.50	13.23	15.00	80008	43.21	3.48	8.6	2.5
025y-072h	Pond 2/3c	BASE	60.75	13.64	15.00	83541	37.17	5.13	9.5	2.6
025y-072h	Pond 2/3c	BASE	61.00	13.90	15.00	85866	24.70	6.38	10.1	2.7
025y-072h	Pond 2/3c	BASE	61.25	14.05	15.00	87135	18.54	7.12	10.6	2.8
025y-072h	Pond 2/3c	BASE	61.50	14.15	15.00	88040	16.64	7.67	10.9	3.0
025y-072h	Pond 2/3c	BASE	61.75	14.23	15.00	88750	15.20	8.12	11.2	3.2
025y-072h	Pond 2/3c	BASE	62.00	14.30	15.00	89307	14.12	8.48	11.6	3.3
025y-072h	Pond 2/3c	BASE	62.25	14.35	15.00	89751	13.32	8.78	11.8	3.5
025y-072h	Pond 2/3c	BASE	62.50	14.39	15.00	90105	12.62	9.02	12.1	3.7
025y-072h	Pond 2/3c	BASE	62.75	14.42	15.00	90379	11.94	9.21	12.4	3.9
025y-072h	Pond 2/3c	BASE	63.00	14.44	15.00	90581	11.30	9.36	12.6	4.1
025y-072h	Pond 2/3c	BASE	63.25	14.46	15.00	90718	10.70	9.47	12.8	4.3
025y-072h	Pond 2/3c	BASE	63.50	14.47	15.00	90797	10.13	9.53	13.0	4.5

Simulation	Node	Group	Time	Stage	Warning Stage	Surface Area	Total Inflow	Total Outflow	Total Vol In	Total Vol Out
			hrs	ft	ft	ft2	cfs	cfs	af	af
025y-072h	Pond 2/3c	BASE	63.75	14.47	15.00	90824	9.63	9.57	13.2	4.7
025y-072h	Pond 2/3c	BASE	64.00	14.47	15.00	90811	9.23	9.58	13.4	4.9
025y-072h	Pond 2/3c	BASE	64.25	14.46	15.00	90762	8.77	9.56	13.6	5.1
025y-072h	Pond 2/3c	BASE	64.50	14.45	15.00	90674	8.27	9.52	13.8	5.3
025y-072h	Pond 2/3c	BASE	64.75	14.44	15.00	90546	7.78	9.46	14.0	5.5
025y-072h	Pond 2/3c	BASE	65.00	14.42	15.00	90389	7.44	9.38	14.1	5.6
025y-072h	Pond 2/3c	BASE	65.25	14.40	15.00	90215	7.23	9.29	14.3	5.8
025y-072h	Pond 2/3c	BASE	65.50	14.38	15.00	90032	7.05	9.19	14.4	6.0
025y-072h	Pond 2/3c	BASE	65.75	14.36	15.00	89844	6.91	9.09	14.6	6.2
025y-072h	Pond 2/3c	BASE	66.00	14.34	15.00	89652	6.78	8.98	14.7	6.4
025y-072h	Pond 2/3c	BASE	66.25	14.31	15.00	89459	6.67	8.88	14.8	6.6
025y-072h	Pond 2/3c	BASE	66.50	14.29	15.00	89266	6.57	8.77	15.0	6.8
025y-072h	Pond 2/3c	BASE	66.75	14.27	15.00	89073	6.48	8.66	15.1	7.0
025y-072h	Pond 2/3c	BASE	67.00	14.25	15.00	88882	6.40	8.56	15.3	7.1
025y-072h	Pond 2/3c	BASE	67.25	14.23	15.00	88692	6.31	8.45	15.4	7.3
025y-072h	Pond 2/3c	BASE	67.50	14.21	15.00	88505	6.24	8.34	15.5	7.5
025y-072h	Pond 2/3c	BASE	67.75	14.18	15.00	88319	6.17	8.24	15.6	7.7
025y-072h	Pond 2/3c	BASE	68.00	14.16	15.00	88137	6.10	8.13	15.8	7.8
025y-072h	Pond 2/3c	BASE	68.25	14.14	15.00	87955	5.97	8.03	15.9	8.0
025y-072h	Pond 2/3c	BASE	68.50	14.12	15.00	87770	5.83	7.93	16.0	8.2
025y-072h	Pond 2/3c	BASE	68.75	14.10	15.00	87580	5.68	7.82	16.1	8.3
025y-072h	Pond 2/3c	BASE	69.00	14.08	15.00	87387	5.55	7.71	16.2	8.5
025y-072h	Pond 2/3c	BASE	69.25	14.05	15.00	87193	5.44	7.60	16.4	8.6
025y-072h	Pond 2/3c	BASE	69.50	14.03	15.00	86999	5.35	7.50	16.5	8.8
025y-072h	Pond 2/3c	BASE	69.75	14.01	15.00	86805	5.26	7.39	16.6	8.9
025y-072h	Pond 2/3c	BASE	70.00	13.99	15.00	86614	5.17	7.28	16.7	9.1
025y-072h	Pond 2/3c	BASE	70.50	13.94	15.00	86236	5.03	7.08	16.9	9.4
025y-072h	Pond 2/3c	BASE	71.00	13.90	15.00	85868	4.89	6.88	17.1	9.7
025y-072h	Pond 2/3c	BASE	71.50	13.86	15.00	85510	4.76	6.68	17.3	10.0
025y-072h	Pond 2/3c	BASE	72.00	13.82	15.00	85163	4.63	6.49	17.5	10.2
025y-072h	Pond 2/3c	BASE	72.50	13.78	15.00	84802	4.18	6.29	17.7	10.5
025y-072h	Pond 2/3c	BASE	73.00	13.73	15.00	84389	3.75	6.06	17.8	10.8
025y-072h	Pond 2/3c	BASE	73.50	13.68	15.00	83945	3.35	5.83	18.0	11.0
025y-072h	Pond 2/3c	BASE	74.00	13.62	15.00	83440	2.59	5.56	18.1	11.2
025y-072h	Pond 2/3c	BASE	74.50	13.55	15.00	82808	1.63	5.24	18.2	11.5
025y-072h	Pond 2/3c	BASE	75.00	13.47	15.00	82114	1.25	4.89	18.3	11.7
025y-072h	Pond 2/3c	BASE	75.50	13.39	15.00	81425	1.04	4.56	18.3	11.9
025y-072h	Pond 2/3c	BASE	76.00	13.32	15.00	80759	0.89	4.25	18.3	12.0
025y-072h	Pond 2/3c	BASE	76.50	13.24	15.00	80121	0.79	3.97	18.4	12.2
025y-072h	Pond 2/3c	BASE	77.00	13.17	15.00	79515	0.71	3.70	18.4	12.4
025y-072h	Pond 2/3c	BASE	77.50	13.11	15.00	78940	0.64	3.46	18.4	12.5
025y-072h	Pond 2/3c	BASE	78.00	13.04	15.00	78395	0.59	3.25	18.5	12.7
025y-072h	Pond 2/3c	BASE	78.50	12.99	15.00	77921	0.55	3.05	18.5	12.8
025y-072h	Pond 2/3c	BASE	79.00	12.93	15.00	77600	0.51	2.87	18.5	12.9
025y-072h	Pond 2/3c	BASE	79.50	12.88	15.00	77295	0.48	2.70	18.5	13.0
025y-072h	Pond 2/3c	BASE	80.00	12.83	15.00	77006	0.45	2.55	18.6	13.1
025y-072h	Pond 2/3c	BASE	80.50	12.78	15.00	76732	0.42	2.42	18.6	13.2
025y-072h	Pond 2/3c	BASE	81.00	12.73	15.00	76470	0.70	2.30	18.6	13.3
025y-072h	Pond 2/3c	BASE	81.50	12.69	15.00	76220	0.59	2.19	18.6	13.4
025y-072h	Pond 2/3c	BASE	82.00	12.65	15.00	75981	-0.75	2.09	18.6	13.5
025y-072h	Pond 2/3c	BASE	82.50	12.61	15.00	75752	0.69	1.99	18.6	13.6
025y-072h	Pond 2/3c	BASE	83.00	12.57	15.00	75532	-0.82	1.91	18.6	13.7
025y-072h	Pond 2/3c	BASE	83.50	12.53	15.00	75319	1.47	1.84	18.6	13.8
025y-072h	Pond 2/3c	BASE	84.00	12.50	15.00	75114	0.00	1.78	18.7	13.8
025y-072h	Pond 2/3c	BASE	84.50	12.46	15.00	74915	0.58	1.72	18.7	13.9
025y-072h	Pond 2/3c	BASE	85.00	12.43	15.00	74722	-0.64	1.67	18.7	14.0
025y-072h	Pond 2/3c	BASE	85.50	12.39	15.00	74532	1.48	1.63	18.7	14.0
025y-072h	Pond 2/3c	BASE	86.00	12.36	15.00	74346	0.54	1.60	18.7	14.1
025y-072h	Pond 2/3c	BASE	86.50	12.33	15.00	74163	0.53	1.59	18.8	14.2
025y-072h	Pond 2/3c	BASE	87.00	12.30	15.00	73979	1.83	1.58	18.8	14.2
025y-072h	Pond 2/3c	BASE	87.50	12.26	15.00	73796	-0.99	1.57	18.8	14.3
025y-072h	Pond 2/3c	BASE	88.00	12.23	15.00	73614	-0.98	1.56	18.8	14.4
025y-072h	Pond 2/3c	BASE	88.50	12.20	15.00	73432	1.85	1.55	18.8	14.4
025y-072h	Pond 2/3c	BASE	89.00	12.17	15.00	73251	1.24	1.54	18.9	14.5
025y-072h	Pond 2/3c	BASE	89.50	12.14	15.00	73070	0.00	1.53	18.9	14.6
025y-072h	Pond 2/3c	BASE	90.00	12.11	15.00	72890	0.00	1.53	18.9	14.6
025y-072h	Pond 2/3c	BASE	90.50	12.08	15.00	72710	1.88	1.52	18.9	14.7
025y-072h	Pond 2/3c	BASE	91.00	12.04	15.00	72531	-0.76	1.51	18.9	14.8
025y-072h	Pond 2/3c	BASE	91.50	12.01	15.00	72352	0.49	1.50	18.9	14.8
025y-072h	Pond 2/3c	BASE	92.00	11.98	15.00	72174	1.87	1.49	19.0	14.9
025y-072h	Pond 2/3c	BASE	92.50	11.95	15.00	71997	0.48	1.48	19.0	14.9
025y-072h	Pond 2/3c	BASE	93.00	11.92	15.00	71820	-1.08	1.47	19.0	15.0
025y-072h	Pond 2/3c	BASE	93.50	11.89	15.00	71643	2.35	1.46	19.1	15.1
025y-072h	Pond 2/3c	BASE	94.00	11.86	15.00	71468	-1.45	1.45	19.1	15.1
025y-072h	Pond 2/3c	BASE	94.50	11.83	15.00	71293	-1.48	1.44	19.0	15.2
025y-072h	Pond 2/3c	BASE	95.00	11.80	15.00	71118	1.94	1.43	19.0	15.2
025y-072h	Pond 2/3c	BASE	95.50	11.77	15.00	70945	1.59	1.42	19.1	15.3
025y-072h	Pond 2/3c	BASE	96.00	11.74	15.00	70772	-1.95	1.41	19.1	15.4
025y-072h	Pond 2/3c	BASE	96.50	11.71	15.00	70600	1.07	1.40	19.1	15.4
025y-072h	Pond 2/3c	BASE	97.00	11.68	15.00	70428	1.61	1.39	19.1	15.5
025y-072h	Pond 2/3c	BASE	97.50	11.65	15.00	70257	-1.17	1.38	19.1	15.5
025y-072h	Pond 2/3c	BASE	98.00	11.62	15.00	70086	1.98	1.37	19.1	15.6

Simulation	Node	Group	Time	Stage	Warning Stage	Surface Area	Total Inflow	Total Outflow	Total Vol In	Total Vol Out
			hrs	ft	ft	ft2	cfs	cfs	af	af
025y-072h	Pond 2/3c	BASE	98.50	11.59	15.00	69916	2.45	1.37	19.2	15.6
025y-072h	Pond 2/3c	BASE	99.00	11.56	15.00	69747	2.46	1.36	19.3	15.7
025y-072h	Pond 2/3c	BASE	99.50	11.53	15.00	69579	2.01	1.35	19.4	15.8
025y-072h	Pond 2/3c	BASE	100.00	11.50	15.00	69412	0.00	1.34	19.5	15.8
025y-072h	Pond 2/3c	BASE	100.50	11.47	15.00	69245	-1.61	1.33	19.4	15.9
025y-072h	Pond 2/3c	BASE	101.00	11.44	15.00	69079	2.50	1.32	19.5	15.9
025y-072h	Pond 2/3c	BASE	101.50	11.41	15.00	68914	-1.63	1.31	19.5	16.0
025y-072h	Pond 2/3c	BASE	102.00	11.38	15.00	68750	-2.70	1.30	19.4	16.0
025y-072h	Pond 2/3c	BASE	102.50	11.35	15.00	68586	-2.13	1.29	19.3	16.1
025y-072h	Pond 2/3c	BASE	103.00	11.33	15.00	68423	-2.14	1.28	19.2	16.1
025y-072h	Pond 2/3c	BASE	103.50	11.30	15.00	68261	-1.29	1.27	19.1	16.2
025y-072h	Pond 2/3c	BASE	104.00	11.27	15.00	68099	-1.30	1.26	19.1	16.2
025y-072h	Pond 2/3c	BASE	104.50	11.24	15.00	67939	1.13	1.25	19.1	16.3
025y-072h	Pond 2/3c	BASE	105.00	11.21	15.00	67779	1.70	1.24	19.1	16.3
025y-072h	Pond 2/3c	BASE	105.50	11.19	15.00	67620	0.93	1.23	19.2	16.4
025y-072h	Pond 2/3c	BASE	106.00	11.16	15.00	67462	1.72	1.22	19.2	16.4
025y-072h	Pond 2/3c	BASE	106.50	11.13	15.00	67305	-0.78	1.21	19.3	16.5
025y-072h	Pond 2/3c	BASE	107.00	11.10	15.00	67149	1.39	1.20	19.3	16.5
025y-072h	Pond 2/3c	BASE	107.50	11.08	15.00	66993	-1.38	1.19	19.3	16.6
025y-072h	Pond 2/3c	BASE	108.00	11.05	15.00	66839	2.14	1.18	19.3	16.6
025y-072h	Pond 2/3c	BASE	108.50	11.02	15.00	66685	-1.80	1.17	19.3	16.7
025y-072h	Pond 2/3c	BASE	109.00	11.00	15.00	66533	-2.32	1.16	19.2	16.7
025y-072h	Pond 2/3c	BASE	109.50	10.97	15.00	66381	2.67	1.15	19.2	16.8
025y-072h	Pond 2/3c	BASE	110.00	10.94	15.00	66230	1.77	1.14	19.3	16.8
025y-072h	Pond 2/3c	BASE	110.50	10.92	15.00	66081	-1.11	1.12	19.3	16.9
025y-072h	Pond 2/3c	BASE	111.00	10.89	15.00	65932	-1.12	1.11	19.3	16.9
025y-072h	Pond 2/3c	BASE	111.50	10.87	15.00	65784	1.46	1.10	19.3	17.0
025y-072h	Pond 2/3c	BASE	112.00	10.84	15.00	65636	2.73	1.09	19.4	17.0
025y-072h	Pond 2/3c	BASE	112.50	10.81	15.00	65491	2.22	1.08	19.5	17.1
025y-072h	Pond 2/3c	BASE	113.00	10.79	15.00	65346	-1.49	1.07	19.5	17.1
025y-072h	Pond 2/3c	BASE	113.50	10.76	15.00	65202	-1.93	1.06	19.4	17.1
025y-072h	Pond 2/3c	BASE	114.00	10.74	15.00	65059	2.77	1.05	19.4	17.2
025y-072h	Pond 2/3c	BASE	114.50	10.71	15.00	64918	-2.49	1.04	19.4	17.2
025y-072h	Pond 2/3c	BASE	115.00	10.69	15.00	64777	1.84	1.03	19.4	17.3
025y-072h	Pond 2/3c	BASE	115.50	10.67	15.00	64637	1.84	1.02	19.5	17.3
025y-072h	Pond 2/3c	BASE	116.00	10.64	15.00	64499	-1.22	1.01	19.5	17.4
025y-072h	Pond 2/3c	BASE	116.50	10.62	15.00	64362	-2.55	1.00	19.4	17.4
025y-072h	Pond 2/3c	BASE	117.00	10.59	15.00	64225	-1.58	0.99	19.4	17.4
025y-072h	Pond 2/3c	BASE	117.50	10.57	15.00	64090	-1.60	0.98	19.3	17.5
025y-072h	Pond 2/3c	BASE	118.00	10.55	15.00	63956	1.52	0.97	19.3	17.5
025y-072h	Pond 2/3c	BASE	118.50	10.52	15.00	63823	-1.26	0.96	19.3	17.6
025y-072h	Pond 2/3c	BASE	119.00	10.50	15.00	63691	-1.27	0.94	19.2	17.6
025y-072h	Pond 2/3c	BASE	119.50	10.48	15.00	63560	-1.28	0.93	19.2	17.6
025y-072h	Pond 2/3c	BASE	120.00	10.45	15.00	63431	-1.65	0.92	19.1	17.7
025y-072h	Pond 2/3c	BASE	120.50	10.43	15.00	63303	-1.01	0.91	19.1	17.7
025y-072h	Pond 2/3c	BASE	121.00	10.41	15.00	63176	-1.01	0.90	19.0	17.8
025y-072h	Pond 2/3c	BASE	121.50	10.39	15.00	63050	-1.02	0.89	19.0	17.8
025y-072h	Pond 2/3c	BASE	122.00	10.37	15.00	62925	-1.32	0.88	18.9	17.8
025y-072h	Pond 2/3c	BASE	122.50	10.34	15.00	62802	-1.70	0.87	18.9	17.9
025y-072h	Pond 2/3c	BASE	123.00	10.32	15.00	62680	-1.34	0.86	18.8	17.9
025y-072h	Pond 2/3c	BASE	123.50	10.30	15.00	62559	-2.18	0.85	18.7	17.9
025y-072h	Pond 2/3c	BASE	124.00	10.28	15.00	62440	1.59	0.84	18.7	18.0
025y-072h	Pond 2/3c	BASE	124.50	10.26	15.00	62322	-1.74	0.82	18.7	18.0
025y-072h	Pond 2/3c	BASE	125.00	10.24	15.00	62205	-0.83	0.81	18.7	18.0
025y-072h	Pond 2/3c	BASE	125.50	10.22	15.00	62089	-0.84	0.80	18.6	18.1
025y-072h	Pond 2/3c	BASE	126.00	10.20	15.00	61975	-1.77	0.79	18.6	18.1
025y-072h	Pond 2/3c	BASE	126.50	10.18	15.00	61862	-1.78	0.78	18.5	18.1
025y-072h	Pond 2/3c	BASE	127.00	10.16	15.00	61750	1.62	0.77	18.5	18.2
025y-072h	Pond 2/3c	BASE	127.50	10.14	15.00	61641	-1.11	0.76	18.5	18.2
025y-072h	Pond 2/3c	BASE	128.00	10.12	15.00	61532	-1.43	0.75	18.5	18.2
025y-072h	Pond 2/3c	BASE	128.50	10.10	15.00	61425	-1.44	0.73	18.4	18.3
025y-072h	Pond 2/3c	BASE	129.00	10.09	15.00	61319	1.33	0.72	18.4	18.3
025y-072h	Pond 2/3c	BASE	129.50	10.07	15.00	61214	1.33	0.71	18.5	18.3
025y-072h	Pond 2/3c	BASE	130.00	10.05	15.00	61111	-1.46	0.70	18.5	18.4
025y-072h	Pond 2/3c	BASE	130.50	10.03	15.00	61010	-1.47	0.69	18.4	18.4
025y-072h	Pond 2/3c	BASE	131.00	10.01	15.00	60910	-1.16	0.68	18.3	18.4
025y-072h	Pond 2/3c	BASE	131.50	10.00	15.00	60811	-1.17	0.67	18.3	18.4
025y-072h	Pond 2/3c	BASE	132.00	9.98	15.00	60714	-1.18	0.65	18.2	18.5
025y-072h	Pond 2/3c	BASE	132.50	9.96	15.00	60618	-1.19	0.64	18.2	18.5
025y-072h	Pond 2/3c	BASE	133.00	9.95	15.00	60524	-1.19	0.63	18.1	18.5
025y-072h	Pond 2/3c	BASE	133.50	9.93	15.00	60431	-1.20	0.62	18.1	18.5
025y-072h	Pond 2/3c	BASE	134.00	9.91	15.00	60340	-1.21	0.61	18.0	18.6
025y-072h	Pond 2/3c	BASE	134.50	9.90	15.00	60251	-1.21	0.60	18.0	18.6
025y-072h	Pond 2/3c	BASE	135.00	9.88	15.00	60163	-1.22	0.59	17.9	18.6
025y-072h	Pond 2/3c	BASE	135.50	9.87	15.00	60077	-1.23	0.57	17.9	18.6
025y-072h	Pond 2/3c	BASE	136.00	9.85	15.00	59992	-1.23	0.56	17.8	18.7
025y-072h	Pond 2/3c	BASE	136.50	9.84	15.00	59909	-1.24	0.55	17.8	18.7
025y-072h	Pond 2/3c	BASE	137.00	9.82	15.00	59827	-1.25	0.54	17.7	18.7
025y-072h	Pond 2/3c	BASE	137.50	9.81	15.00	59747	-1.25	0.53	17.7	18.7
025y-072h	Pond 2/3c	BASE	138.00	9.80	15.00	59669	-1.26	0.52	17.6	18.8
025y-072h	Pond 2/3c	BASE	138.50	9.78	15.00	59592	-1.27	0.50	17.6	18.8
025y-072h	Pond 2/3c	BASE	139.00	9.77	15.00	59517	-1.27	0.49	17.5	18.8

Simulation	Node	Group	Time	Stage	Warning Stage	Surface Area	Total Inflow	Total Outflow	Total Vol In	Total Vol Out
			hrs	ft	ft	ft2	cfs	cfs	af	af
025y-072h	Pond 2/3c	BASE	139.50	9.76	15.00	59444	-1.28	0.47	17.5	18.8
025y-072h	Pond 2/3c	BASE	140.00	9.75	15.00	59375	-1.29	0.45	17.4	18.8
025y-072h	Pond 2/3c	BASE	140.50	9.73	15.00	59309	-1.30	0.42	17.4	18.9
025y-072h	Pond 2/3c	BASE	141.00	9.72	15.00	59246	-1.30	0.40	17.3	18.9
025y-072h	Pond 2/3c	BASE	141.50	9.71	15.00	59186	-1.31	0.38	17.3	18.9
025y-072h	Pond 2/3c	BASE	142.00	9.70	15.00	59129	-1.31	0.37	17.2	18.9
025y-072h	Pond 2/3c	BASE	142.50	9.69	15.00	59075	-1.32	0.35	17.2	18.9
025y-072h	Pond 2/3c	BASE	143.00	9.68	15.00	59023	-1.67	0.33	17.1	18.9
025y-072h	Pond 2/3c	BASE	143.50	9.68	15.00	58974	-1.33	0.32	17.0	18.9
025y-072h	Pond 2/3c	BASE	144.00	9.67	15.00	58927	-1.34	0.30	17.0	19.0
025y-072h	Pond 2/3c	BASE	144.50	9.66	15.00	58881	-1.34	0.30	16.9	19.0
025y-072h	Pond 2/3c	BASE	145.00	9.65	15.00	58836	-1.34	0.29	16.9	19.0
025y-072h	Pond 2/3c	BASE	145.50	9.64	15.00	58792	-1.35	0.28	16.8	19.0
025y-072h	Pond 2/3c	BASE	146.00	9.64	15.00	58749	-1.35	0.28	16.8	19.0
025y-072h	Pond 2/3c	BASE	146.50	9.63	15.00	58707	-1.35	0.27	16.7	19.0
025y-072h	Pond 2/3c	BASE	147.00	9.62	15.00	58666	-1.36	0.26	16.6	19.0
025y-072h	Pond 2/3c	BASE	147.50	9.62	15.00	58627	-1.36	0.25	16.6	19.0
025y-072h	Pond 2/3c	BASE	148.00	9.61	15.00	58589	-1.37	0.24	16.5	19.0
025y-072h	Pond 2/3c	BASE	148.50	9.60	15.00	58552	-1.72	0.23	16.5	19.1
025y-072h	Pond 2/3c	BASE	149.00	9.60	15.00	58517	-1.37	0.23	16.4	19.1
025y-072h	Pond 2/3c	BASE	149.50	9.59	15.00	58483	-1.38	0.22	16.3	19.1
025y-072h	Pond 2/3c	BASE	150.00	9.58	15.00	58450	-1.38	0.21	16.3	19.1
025y-072h	Pond 2/3c	BASE	150.50	9.58	15.00	58418	-1.38	0.20	16.2	19.1
025y-072h	Pond 2/3c	BASE	151.00	9.57	15.00	58388	-1.39	0.19	16.2	19.1
025y-072h	Pond 2/3c	BASE	151.50	9.57	15.00	58359	-1.39	0.18	16.1	19.1
025y-072h	Pond 2/3c	BASE	152.00	9.56	15.00	58331	-1.39	0.18	16.1	19.1
025y-072h	Pond 2/3c	BASE	152.50	9.56	15.00	58305	-1.75	0.17	16.0	19.1
025y-072h	Pond 2/3c	BASE	153.00	9.55	15.00	58279	-1.40	0.16	15.9	19.1
025y-072h	Pond 2/3c	BASE	153.50	9.55	15.00	58255	-1.40	0.15	15.9	19.1
025y-072h	Pond 2/3c	BASE	154.00	9.55	15.00	58233	-1.76	0.14	15.8	19.1
025y-072h	Pond 2/3c	BASE	154.50	9.54	15.00	58211	-1.76	0.14	15.7	19.2
025y-072h	Pond 2/3c	BASE	155.00	9.54	15.00	58191	-1.76	0.13	15.7	19.2
025y-072h	Pond 2/3c	BASE	155.50	9.54	15.00	58171	-1.77	0.12	15.6	19.2
025y-072h	Pond 2/3c	BASE	156.00	9.53	15.00	58153	-1.77	0.11	15.5	19.2
025y-072h	Pond 2/3c	BASE	156.50	9.53	15.00	58137	-1.77	0.11	15.4	19.2
025y-072h	Pond 2/3c	BASE	157.00	9.53	15.00	58121	-1.77	0.10	15.4	19.2
025y-072h	Pond 2/3c	BASE	157.50	9.52	15.00	58106	-1.78	0.09	15.3	19.2
025y-072h	Pond 2/3c	BASE	158.00	9.52	15.00	58092	-1.78	0.08	15.2	19.2
025y-072h	Pond 2/3c	BASE	158.50	9.52	15.00	58080	-1.78	0.08	15.2	19.2
025y-072h	Pond 2/3c	BASE	159.00	9.52	15.00	58068	-1.78	0.07	15.1	19.2
025y-072h	Pond 2/3c	BASE	159.50	9.52	15.00	58058	-1.78	0.07	15.0	19.2
025y-072h	Pond 2/3c	BASE	160.00	9.51	15.00	58048	-1.78	0.06	14.9	19.2
025y-072h	Pond 2/3c	BASE	160.50	9.51	15.00	58039	-1.79	0.05	14.9	19.2
025y-072h	Pond 2/3c	BASE	161.00	9.51	15.00	58031	-1.79	0.05	14.8	19.2
025y-072h	Pond 2/3c	BASE	161.50	9.51	15.00	58024	-1.79	0.04	14.7	19.2
025y-072h	Pond 2/3c	BASE	162.00	9.51	15.00	58017	-1.79	0.04	14.6	19.2
025y-072h	Pond 2/3c	BASE	162.50	9.51	15.00	58011	-1.79	0.04	14.6	19.2
025y-072h	Pond 2/3c	BASE	163.00	9.51	15.00	58006	-1.79	0.03	14.5	19.2
025y-072h	Pond 2/3c	BASE	163.50	9.51	15.00	58001	-1.79	0.03	14.4	19.2
025y-072h	Pond 2/3c	BASE	164.00	9.51	15.00	57997	-1.79	0.03	14.3	19.2
025y-072h	Pond 2/3c	BASE	164.50	9.50	15.00	57994	-1.79	0.02	14.3	19.2
025y-072h	Pond 2/3c	BASE	165.00	9.50	15.00	57990	-1.79	0.02	14.2	19.2
025y-072h	Pond 2/3c	BASE	165.50	9.50	15.00	57987	-1.79	0.02	14.1	19.2
025y-072h	Pond 2/3c	BASE	166.00	9.50	15.00	57985	-1.79	0.02	14.0	19.2
025y-072h	Pond 2/3c	BASE	166.50	9.50	15.00	57983	-1.80	0.01	14.0	19.2
025y-072h	Pond 2/3c	BASE	167.00	9.50	15.00	57981	-1.80	0.01	13.9	19.2
025y-072h	Pond 2/3c	BASE	167.50	9.50	15.00	57979	-1.80	0.01	13.8	19.2
025y-072h	Pond 2/3c	BASE	168.00	9.50	15.00	57977	-1.80	0.01	13.7	19.2
025y-072h	Pond 2/3c	BASE	168.50	9.50	15.00	57976	-1.80	0.01	13.7	19.2
025y-072h	Pond 2/3c	BASE	169.00	9.50	15.00	57975	-1.80	0.01	13.6	19.2
025y-072h	Pond 2/3c	BASE	169.50	9.50	15.00	57974	-1.80	0.01	13.5	19.2
025y-072h	Pond 2/3c	BASE	170.00	9.50	15.00	57973	-1.80	0.01	13.4	19.2
025y-072h	Pond 2/3c	BASE	170.00	9.50	15.00	57973	-1.80	0.01	13.4	19.2

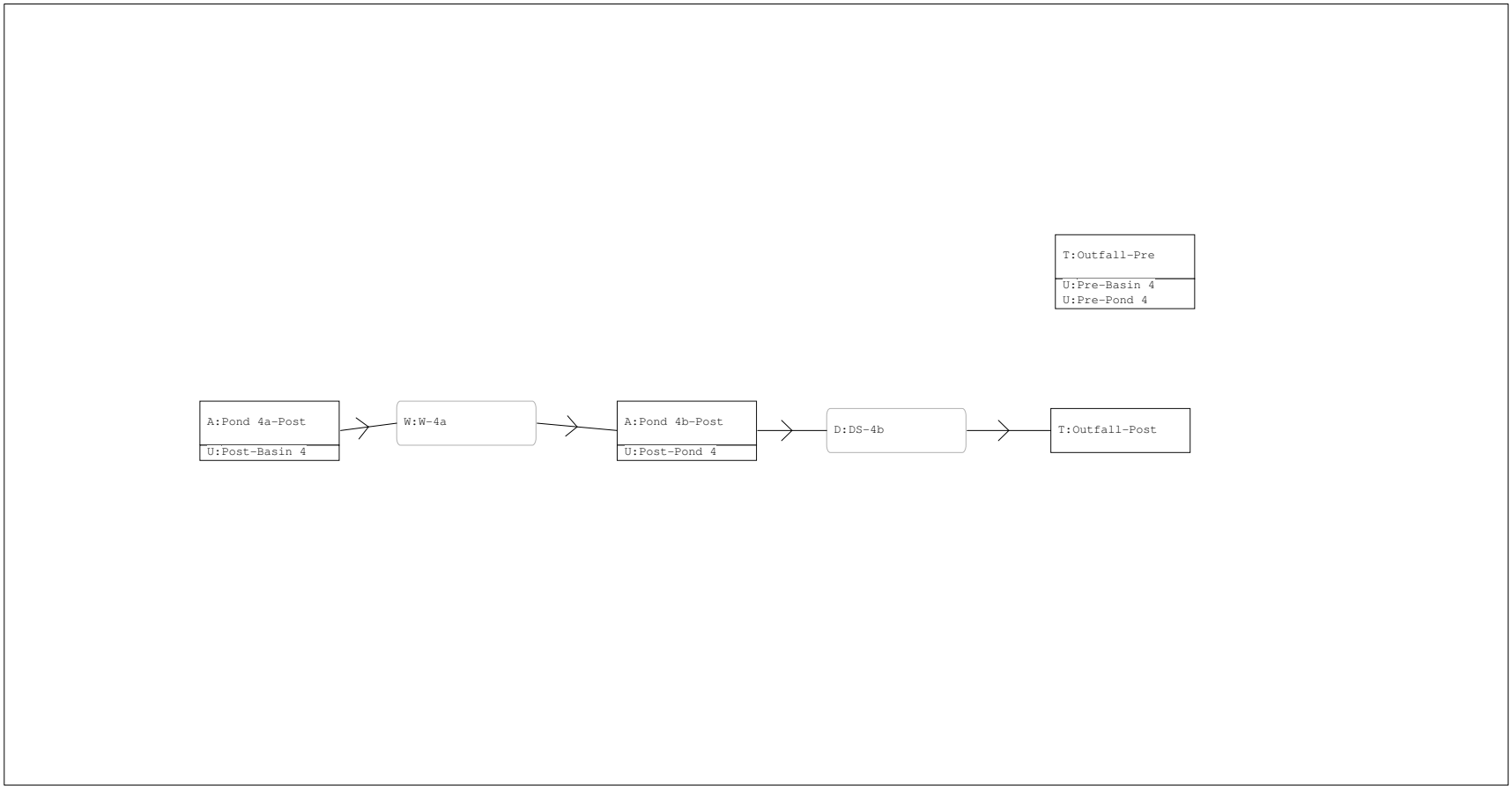
Appendix E
ICPR Modeling

Existing and Proposed Basin 4 Nodal Diagram
Existing and Proposed Basin 4 Input Report
Existing and Proposed Basin 4 Node Max/Min Report
Proposed Basin 4 Node Time Series Report

Nodes
A Stage/Area
V Stage/Volume
T Time/Stage
M Manhole

Basins
O Overland Flow
U SCS Unit CN
S SBUH CN
Y SCS Unit GA
Z SBUH GA

Links
P Pipe
W Weir
C Channel
D Drop Structure
B Bridge
R Rating Curve
H Breach
E Percolation
F Filter
X Exfil Trench



Interconnected Channel and Pond Routing Model (ICPR) ©2002 Streamline Technologies, Inc.

==========
==== Basins ====
==========

Name: Post-Basin 4 Node: Pond 4a-Post Status: Onsite
Group: BASE Type: SCS Unit Hydrograph CN

Unit Hydrograph: Uh256 Peaking Factor: 256.0
Rainfall File: Sfwmd72 Storm Duration(hrs): 72.00
Rainfall Amount(in): 9.500 Time of Conc(min): 19.53
Area(ac): 7.130 Time Shift(hrs): 0.00
Curve Number: 95.22 Max Allowable Q(cfs): 999999.000
DCIA(%): 0.00

Proposed roadway.

Name: Post-Pond 4 Node: Pond 4b-Post Status: Onsite
Group: BASE Type: SCS Unit Hydrograph CN

Unit Hydrograph: Uh256 Peaking Factor: 256.0
Rainfall File: Sfwmd72 Storm Duration(hrs): 72.00
Rainfall Amount(in): 9.500 Time of Conc(min): 10.00
Area(ac): 2.670 Time Shift(hrs): 0.00
Curve Number: 87.12 Max Allowable Q(cfs): 999999.000
DCIA(%): 0.00

Developed pond site.

Name: Pre-Basin 4 Node: Outfall-Pre Status: Onsite
Group: BASE Type: SCS Unit Hydrograph CN

Unit Hydrograph: Uh256 Peaking Factor: 256.0
Rainfall File: Sfwmd72 Storm Duration(hrs): 72.00
Rainfall Amount(in): 9.500 Time of Conc(min): 22.86
Area(ac): 7.130 Time Shift(hrs): 0.00
Curve Number: 88.39 Max Allowable Q(cfs): 999999.000
DCIA(%): 0.00

Pre-existing roadway.

Name: Pre-Pond 4 Node: Outfall-Pre Status: Onsite
Group: BASE Type: SCS Unit Hydrograph CN

Unit Hydrograph: Uh256 Peaking Factor: 256.0
Rainfall File: Sfwmd72 Storm Duration(hrs): 72.00
Rainfall Amount(in): 9.500 Time of Conc(min): 10.00
Area(ac): 2.670 Time Shift(hrs): 0.00
Curve Number: 80.00 Max Allowable Q(cfs): 999999.000
DCIA(%): 0.00

Existing condition pond site.

==========
==== Nodes ====
==========

Name: Outfall-Post Base Flow(cfs): 0.000 Init Stage(ft): 5.000
Group: BASE Warn Stage(ft): 8.400
Type: Time/Stage

Roadside Ditch on the north side of MIdway Rd.
Top of bank = 7.0'.

Time(hrs)	Stage(ft)
0.00	5.000
9999.00	5.000

Name: Outfall-Pre Base Flow(cfs): 0.000 Init Stage(ft): 5.000
Group: BASE Warn Stage(ft): 8.400
Type: Time/Stage

Roadside Ditch on the north side of MIdway Rd.
Top of bank = 7.0'.

Time(hrs)	Stage(ft)
0.00	5.000
9999.00	5.000

Name: Pond 4a-Post Base Flow(cfs): 0.000 Init Stage(ft): 8.000

Group: BASE — Warn Stage(ft): 9.800
Type: Stage/Area

Dry pre-treatment pond.

Stage(ft)	Area(ac)
8.000	0.7300
9.800	0.8600
10.800	0.9300

Name: Pond 4b-Post — Base Flow(cfs): 0.000 — Init Stage(ft): 5.000
Group: BASE — Warn Stage(ft): 9.800
Type: Stage/Area

Wet pond.

Stage(ft)	Area(ac)
5.000	0.4900
8.800	0.7400
9.800	0.8800
10.800	1.0400

Drop Structures

Name: DS-4b — From Node: Pond 4b-Post — Length(ft): 94.00
Group: BASE — To Node: Outfall-Post — Count: 1

	UPSTREAM	DOWNSTREAM		
Geometry:	Circular	Circular	Friction Equation:	Automatic
Span(in):	30.00	30.00	Solution Algorithm:	Most Restrictive
Rise(in):	30.00	30.00	Flow:	Both
Invert(ft):	2.100	2.000	Entrance Loss Coef:	0.200
Manning's N:	0.012000	0.012000	Exit Loss Coef:	1.000
Top Clip(in):	0.000	0.000	Outlet Ctrl Spec:	Use dc or tw
Bot Clip(in):	0.000	0.000	Inlet Ctrl Spec:	Use dc
			Solution Incs:	10

Upstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

Downstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

*** Weir 1 of 2 for Drop Structure DS-4b ***

TABLE

Count: 1 — Bottom Clip(in): 0.000
Type: Vertical: Mavis — Top Clip(in): 0.000
Flow: Both — Weir Disc Coef: 3.200
Geometry: Circular — Orifice Disc Coef: 0.600

Span(in): 3.00 — Invert(ft): 4.670
Rise(in): 3.00 — Control Elev(ft): 5.000

*** Weir 2 of 2 for Drop Structure DS-4b ***

TABLE

Count: 1 — Bottom Clip(in): 0.000
Type: Vertical: Mavis — Top Clip(in): 0.000
Flow: Both — Weir Disc Coef: 3.200
Geometry: Rectangular — Orifice Disc Coef: 0.600

Span(in): 24.00 — Invert(ft): 7.900
Rise(in): 9999.00 — Control Elev(ft): 7.900

Weirs

Name: W-4a — From Node: Pond 4a-Post
Group: BASE — To Node: Pond 4b-Post
Flow: Both — Count: 1
Type: Vertical: Mavis — Geometry: Trapezoidal

Bottom Width(ft): 50.00
Left Side Slope(h/v): 6.00
Right Side Slope(h/v): 6.00
Invert(ft): 8.400
Control Elevation(ft): 8.400
Struct Opening Dim(ft): 9999.00

TABLE

Bottom Clip(ft): 0.000

```
                Top Clip(ft): 0.000
          Weir Discharge Coef: 3.200
      Orifice Discharge Coef: 0.600



================================================================================
==== Hydrology Simulations =====================================================
================================================================================

         Name: 025Y-72H
     Filename: C:\213400000000\drainage\ICPR-B4\025Y-72H.R32

      Override Defaults: Yes
    Storm Duration(hrs): 72.00
          Rainfall File: Sfwmd72
    Rainfall Amount(in): 9.50

Time(hrs)       Print Inc(min)
--------------- ---------------
100.000         5.00

--------------------------------------------------------------------------------------------------------
         Name: fdot 10y-002h
     Filename: C:\213400000000\drainage\ICPR-B4\fdot 10y-002h.R32

      Override Defaults: Yes
    Storm Duration(hrs): 2.00
          Rainfall File: Fdot-2
    Rainfall Amount(in): 4.40

Time(hrs)       Print Inc(min)
--------------- ---------------
30.000          5.00

--------------------------------------------------------------------------------------------------------
         Name: fdot 10y-004h
     Filename: C:\213400000000\drainage\ICPR-B4\fdot 10y-004h.R32

      Override Defaults: Yes
    Storm Duration(hrs): 4.00
          Rainfall File: Fdot-4
    Rainfall Amount(in): 5.40

Time(hrs)       Print Inc(min)
--------------- ---------------
30.000          5.00

--------------------------------------------------------------------------------------------------------
         Name: fdot 10y-008h
     Filename: C:\213400000000\drainage\ICPR-B4\fdot 10y-008h.R32

      Override Defaults: Yes
    Storm Duration(hrs): 8.00
          Rainfall File: Fdot-8
    Rainfall Amount(in): 6.40

Time(hrs)       Print Inc(min)
--------------- ---------------
30.000          5.00

--------------------------------------------------------------------------------------------------------
         Name: fdot 10y-024h
     Filename: C:\213400000000\drainage\ICPR-B4\fdot 10y-024h.R32

      Override Defaults: Yes
    Storm Duration(hrs): 24.00
          Rainfall File: Fdot-24
    Rainfall Amount(in): 8.50

Time(hrs)       Print Inc(min)
--------------- ---------------
30.000          5.00

--------------------------------------------------------------------------------------------------------
         Name: fdot 10y-072h
     Filename: C:\213400000000\drainage\ICPR-B4\fdot 10y-072h.R32

      Override Defaults: Yes
    Storm Duration(hrs): 78.00
          Rainfall File: Fdot-72
    Rainfall Amount(in): 10.00

Time(hrs)       Print Inc(min)
--------------- ---------------
78.000          5.00
```

```
------------------------------------------------------------------------------------------------------
         Name: fdot 10y-168h
     Filename: C:\213400000000\drainage\ICPR-B4\fdot 10y-168h.R32

      Override Defaults: Yes
    Storm Duration(hrs): 168.00
          Rainfall File: Fdot-168
    Rainfall Amount(in): 11.90

Time(hrs)       Print Inc(min)
--------------- ---------------
174.000         5.00

------------------------------------------------------------------------------------------------------
         Name: fdot 10y-240h
     Filename: C:\213400000000\drainage\ICPR-B4\fdot 10y-240h.R32

      Override Defaults: Yes
    Storm Duration(hrs): 240.00
          Rainfall File: Fdot-240
    Rainfall Amount(in): 13.80

Time(hrs)       Print Inc(min)
--------------- ---------------
246.000         5.00

==============================================================================================
==== Routing Simulations ======================================================================
==============================================================================================

         Name: 025Y-72H            Hydrology Sim: 025Y-72H
     Filename: C:\213400000000\drainage\ICPR-B4\025Y-72H.I32

      Execute: Yes         Restart: No           Patch: No
  Alternative: No

        Max Delta Z(ft): 1.00                    Delta Z Factor: 0.00500
    Time Step Optimizer: 10.000
        Start Time(hrs): 0.000                    End Time(hrs): 360.00
     Min Calc Time(sec): 0.5000              Max Calc Time(sec): 60.0000
        Boundary Stages:                         Boundary Flows:



Time(hrs)       Print Inc(min)
--------------- ---------------
360.000         60.000

Group           Run
--------------- -----
BASE            Yes


------------------------------------------------------------------------------------------------------
         Name: fdot 10y-002h       Hydrology Sim: fdot 10y-002h
     Filename: C:\213400000000\drainage\ICPR-B4\fdot 10y-002h.I32

      Execute: Yes         Restart: No           Patch: No
  Alternative: No

        Max Delta Z(ft): 1.00                    Delta Z Factor: 0.00500
    Time Step Optimizer: 10.000
        Start Time(hrs): 0.000                    End Time(hrs): 30.00
     Min Calc Time(sec): 0.5000              Max Calc Time(sec): 60.0000
        Boundary Stages:                         Boundary Flows:



Time(hrs)       Print Inc(min)
--------------- ---------------
30.000          5.000

Group           Run
--------------- -----
BASE            Yes


------------------------------------------------------------------------------------------------------
         Name: fdot 10y-004h       Hydrology Sim: fdot 10y-004h
     Filename: C:\213400000000\drainage\ICPR-B4\fdot 10y-004h.I32

      Execute: Yes         Restart: No           Patch: No
  Alternative: No

        Max Delta Z(ft): 1.00                    Delta Z Factor: 0.00500
    Time Step Optimizer: 10.000
        Start Time(hrs): 0.000                    End Time(hrs): 30.00
```

Min Calc Time(sec): 0.5000 Max Calc Time(sec): 60.0000
Boundary Stages: Boundary Flows:

Time(hrs)	Print Inc(min)
30.000	5.000

Group	Run
BASE	Yes

Name: fdot 10y-008h Hydrology Sim: fdot 10y-008h
Filename: C:\213400000000\drainage\ICPR-B4\fdot 10y-008h.I32

Execute: Yes Restart: No Patch: No
Alternative: No

Max Delta Z(ft): 1.00 Delta Z Factor: 0.00500
Time Step Optimizer: 10.000
Start Time(hrs): 0.000 End Time(hrs): 30.00
Min Calc Time(sec): 0.5000 Max Calc Time(sec): 60.0000
Boundary Stages: Boundary Flows:

Time(hrs)	Print Inc(min)
30.000	5.000

Group	Run
BASE	Yes

Name: fdot 10y-024h Hydrology Sim: fdot 10y-024h
Filename: C:\213400000000\drainage\ICPR-B4\fdot 10y-024h.I32

Execute: Yes Restart: No Patch: No
Alternative: No

Max Delta Z(ft): 1.00 Delta Z Factor: 0.00500
Time Step Optimizer: 10.000
Start Time(hrs): 0.000 End Time(hrs): 30.00
Min Calc Time(sec): 0.5000 Max Calc Time(sec): 60.0000
Boundary Stages: Boundary Flows:

Time(hrs)	Print Inc(min)
30.000	5.000

Group	Run
BASE	Yes

Name: fdot 10y-072h Hydrology Sim: fdot 10y-072h
Filename: C:\213400000000\drainage\ICPR-B4\fdot 10y-072h.I32

Execute: Yes Restart: No Patch: No
Alternative: No

Max Delta Z(ft): 1.00 Delta Z Factor: 0.00500
Time Step Optimizer: 10.000
Start Time(hrs): 0.000 End Time(hrs): 78.00
Min Calc Time(sec): 0.5000 Max Calc Time(sec): 60.0000
Boundary Stages: Boundary Flows:

Time(hrs)	Print Inc(min)
78.000	5.000

Group	Run
BASE	Yes

Name: fdot 10y-168h Hydrology Sim: fdot 10y-168h
Filename: C:\21340000000\drainage\ICPR-B4\fdot 10y-168h.I32

Execute: Yes Restart: No Patch: No
Alternative: No

Max Delta Z(ft): 1.00 Delta Z Factor: 0.00500
Time Step Optimizer: 10.000
Start Time(hrs): 0.000 End Time(hrs): 174.00
Min Calc Time(sec): 0.5000 Max Calc Time(sec): 60.0000
Boundary Stages: Boundary Flows:

Time(hrs)	Print Inc(min)
174.000	5.000

Group	Run
BASE	Yes

Name: fdot 10y-240h Hydrology Sim: fdot 10y-240h
Filename: C:\21340000000\drainage\ICPR-B4\fdot 10y-240h.I32

Execute: Yes Restart: No Patch: No
Alternative: No

Max Delta Z(ft): 1.00 Delta Z Factor: 0.00500
Time Step Optimizer: 10.000
Start Time(hrs): 0.000 End Time(hrs): 246.00
Min Calc Time(sec): 0.5000 Max Calc Time(sec): 60.0000
Boundary Stages: Boundary Flows:

Time(hrs)	Print Inc(min)
246.000	5.000

Group	Run
BASE	Yes

Existing and Proposed - Node Min/Max Report
Midway Roadway Basin 4
06/18/2013

Name	Group	Simulation	Max Time Stage hrs	Max Stage ft	Warning Stage ft	Max Delta Stage ft	Max Surf Area ft2	Max Time Inflow hrs	Max Inflow cfs	Max Time Outflow hrs	Max Outflow cfs
Outfall-Post	BASE	025Y-72H	0.00	5.000	8.400	0.0000	0	60.85	11.131	0.00	0.000
Outfall-Pre	BASE	025Y-72H	0.00	5.000	8.400	0.0000	0	60.08	30.069	0.00	0.000
Pond 4a-Post	BASE	025Y-72H	60.85	9.314	9.800	-0.0045	35931	60.08	23.130	60.19	10.948
Pond 4b-Post	BASE	025Y-72H	60.85	9.305	9.800	0.0050	35313	60.08	19.652	60.85	11.131
Pond 4a-Post	BASE	fdot 10y-024h	15.03	8.696	9.800	0.0029	33990	12.00	5.867	11.74	5.625

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Simulation	Node	Group	Time	Stage	Warning Stage	Surface Area	Total Inflow	Total Outflow	Total Vol In	Total Vol Out
			hrs	ft	ft	ft2	cfs	cfs	af	af
025Y-72H	Pond 4b-Post	BASE	0.00	5.000	9.800	21344	0.000	0.000	0.0	0.0
025Y-72H	Pond 4b-Post	BASE	1.02	5.000	9.800	21344	0.000	0.000	0.0	0.0
025Y-72H	Pond 4b-Post	BASE	2.02	5.000	9.800	21344	0.000	0.000	0.0	0.0
025Y-72H	Pond 4b-Post	BASE	3.02	5.000	9.800	21344	0.000	0.000	0.0	0.0
025Y-72H	Pond 4b-Post	BASE	4.02	5.000	9.800	21344	0.000	0.000	0.0	0.0
025Y-72H	Pond 4b-Post	BASE	5.02	5.000	9.800	21344	0.000	0.000	0.0	0.0
025Y-72H	Pond 4b-Post	BASE	6.02	5.000	9.800	21344	0.000	0.000	0.0	0.0
025Y-72H	Pond 4b-Post	BASE	7.02	5.000	9.800	21344	0.000	0.000	0.0	0.0
025Y-72H	Pond 4b-Post	BASE	8.02	5.000	9.800	21345	0.005	0.003	0.0	0.0
025Y-72H	Pond 4b-Post	BASE	9.02	5.001	9.800	21346	0.011	0.006	0.0	0.0
025Y-72H	Pond 4b-Post	BASE	10.02	5.002	9.800	21349	0.016	0.010	0.0	0.0
025Y-72H	Pond 4b-Post	BASE	11.02	5.003	9.800	21353	0.021	0.013	0.0	0.0
025Y-72H	Pond 4b-Post	BASE	12.02	5.005	9.800	21357	0.026	0.016	0.0	0.0
025Y-72H	Pond 4b-Post	BASE	13.02	5.006	9.800	21363	0.030	0.019	0.0	0.0
025Y-72H	Pond 4b-Post	BASE	14.02	5.008	9.800	21369	0.034	0.022	0.0	0.0
025Y-72H	Pond 4b-Post	BASE	15.02	5.011	9.800	21375	0.038	0.024	0.0	0.0
025Y-72H	Pond 4b-Post	BASE	16.02	5.013	9.800	21382	0.042	0.027	0.0	0.0
025Y-72H	Pond 4b-Post	BASE	17.02	5.016	9.800	21389	0.045	0.029	0.0	0.0
025Y-72H	Pond 4b-Post	BASE	18.02	5.018	9.800	21397	0.048	0.032	0.0	0.0
025Y-72H	Pond 4b-Post	BASE	19.02	5.021	9.800	21404	0.051	0.034	0.0	0.0
025Y-72H	Pond 4b-Post	BASE	20.02	5.024	9.800	21412	0.053	0.036	0.0	0.0
025Y-72H	Pond 4b-Post	BASE	21.02	5.027	9.800	21421	0.056	0.038	0.0	0.0
025Y-72H	Pond 4b-Post	BASE	22.02	5.030	9.800	21429	0.069	0.041	0.0	0.0
025Y-72H	Pond 4b-Post	BASE	23.02	5.058	9.800	21510	0.303	0.057	0.1	0.0
025Y-72H	Pond 4b-Post	BASE	24.02	5.100	9.800	21631	0.328	0.075	0.1	0.0
025Y-72H	Pond 4b-Post	BASE	25.02	5.151	9.800	21778	0.450	0.092	0.1	0.0
025Y-72H	Pond 4b-Post	BASE	26.02	5.213	9.800	21954	0.490	0.109	0.2	0.1
025Y-72H	Pond 4b-Post	BASE	27.02	5.275	9.800	22132	0.499	0.124	0.2	0.1
025Y-72H	Pond 4b-Post	BASE	28.02	5.335	9.800	22305	0.506	0.137	0.2	0.1
025Y-72H	Pond 4b-Post	BASE	29.02	5.394	9.800	22474	0.512	0.148	0.3	0.1
025Y-72H	Pond 4b-Post	BASE	30.02	5.452	9.800	22639	0.518	0.159	0.3	0.1
025Y-72H	Pond 4b-Post	BASE	31.02	5.508	9.800	22801	0.523	0.168	0.4	0.1
025Y-72H	Pond 4b-Post	BASE	32.02	5.564	9.800	22960	0.527	0.177	0.4	0.1
025Y-72H	Pond 4b-Post	BASE	33.02	5.618	9.800	23116	0.532	0.185	0.5	0.1
025Y-72H	Pond 4b-Post	BASE	34.02	5.672	9.800	23269	0.536	0.193	0.5	0.2
025Y-72H	Pond 4b-Post	BASE	35.02	5.724	9.800	23419	0.539	0.201	0.5	0.2
025Y-72H	Pond 4b-Post	BASE	36.02	5.776	9.800	23567	0.543	0.208	0.6	0.2
025Y-72H	Pond 4b-Post	BASE	37.02	5.827	9.800	23714	0.550	0.214	0.6	0.2
025Y-72H	Pond 4b-Post	BASE	38.02	5.877	9.800	23859	0.554	0.221	0.7	0.2
025Y-72H	Pond 4b-Post	BASE	39.02	5.927	9.800	24002	0.557	0.227	0.7	0.2
025Y-72H	Pond 4b-Post	BASE	40.02	5.976	9.800	24142	0.560	0.233	0.8	0.3
025Y-72H	Pond 4b-Post	BASE	41.02	6.025	9.800	24281	0.562	0.239	0.8	0.3
025Y-72H	Pond 4b-Post	BASE	42.02	6.072	9.800	24417	0.564	0.244	0.9	0.3
025Y-72H	Pond 4b-Post	BASE	43.02	6.119	9.800	24551	0.566	0.250	0.9	0.3
025Y-72H	Pond 4b-Post	BASE	44.02	6.165	9.800	24683	0.568	0.255	1.0	0.3
025Y-72H	Pond 4b-Post	BASE	45.02	6.211	9.800	24813	0.570	0.260	1.0	0.4
025Y-72H	Pond 4b-Post	BASE	46.02	6.255	9.800	24942	0.572	0.264	1.0	0.4
025Y-72H	Pond 4b-Post	BASE	47.02	6.299	9.800	25068	0.574	0.269	1.1	0.4
025Y-72H	Pond 4b-Post	BASE	48.02	6.343	9.800	25193	0.576	0.273	1.1	0.4
025Y-72H	Pond 4b-Post	BASE	49.02	6.390	9.800	25327	0.628	0.278	1.2	0.5
025Y-72H	Pond 4b-Post	BASE	50.02	6.441	9.800	25474	0.654	0.283	1.2	0.5
025Y-72H	Pond 4b-Post	BASE	51.02	6.501	9.800	25645	0.755	0.289	1.3	0.5
025Y-72H	Pond 4b-Post	BASE	52.02	6.572	9.800	25849	0.838	0.296	1.4	0.5
025Y-72H	Pond 4b-Post	BASE	53.02	6.664	9.800	26113	1.066	0.304	1.4	0.5
025Y-72H	Pond 4b-Post	BASE	54.02	6.788	9.800	26469	1.330	0.315	1.5	0.6
025Y-72H	Pond 4b-Post	BASE	55.02	6.945	9.800	26920	1.605	0.329	1.7	0.6
025Y-72H	Pond 4b-Post	BASE	56.02	7.135	9.800	27462	1.883	0.345	1.8	0.6
025Y-72H	Pond 4b-Post	BASE	57.02	7.357	9.800	28100	2.210	0.362	2.0	0.7
025Y-72H	Pond 4b-Post	BASE	58.02	7.624	9.800	28863	2.753	0.382	2.2	0.7
025Y-72H	Pond 4b-Post	BASE	59.01	7.960	9.800	29826	3.798	0.499	2.5	0.7
025Y-72H	Pond 4b-Post	BASE	60.00	8.797	9.800	32226	19.045	5.889	3.4	1.0
025Y-72H	Pond 4b-Post	BASE	61.01	9.298	9.800	35274	10.271	11.058	4.6	1.7
025Y-72H	Pond 4b-Post	BASE	62.01	9.078	9.800	33932	6.163	8.652	5.3	2.5
025Y-72H	Pond 4b-Post	BASE	63.01	8.833	9.800	32435	4.285	6.221	5.7	3.1
025Y-72H	Pond 4b-Post	BASE	64.01	8.655	9.800	31820	3.388	4.648	6.0	3.6
025Y-72H	Pond 4b-Post	BASE	65.01	8.516	9.800	31422	2.434	3.535	6.3	3.9
025Y-72H	Pond 4b-Post	BASE	66.01	8.396	9.800	31075	1.527	2.665	6.4	4.2
025Y-72H	Pond 4b-Post	BASE	67.01	8.283	9.800	30752	1.239	1.940	6.6	4.4
025Y-72H	Pond 4b-Post	BASE	68.01	8.223	9.800	30580	1.236	1.595	6.7	4.5
025Y-72H	Pond 4b-Post	BASE	69.01	8.173	9.800	30436	0.893	1.330	6.7	4.6
025Y-72H	Pond 4b-Post	BASE	70.01	8.129	9.800	30311	0.823	1.117	6.8	4.7
025Y-72H	Pond 4b-Post	BASE	71.01	8.102	9.800	30233	0.823	0.995	6.9	4.8
025Y-72H	Pond 4b-Post	BASE	72.01	8.086	9.800	30188	0.821	0.926	7.0	4.9
025Y-72H	Pond 4b-Post	BASE	73.01	8.039	9.800	30053	0.182	0.742	7.0	5.0
025Y-72H	Pond 4b-Post	BASE	74.01	7.974	9.800	29867	0.034	0.535	7.0	5.0
025Y-72H	Pond 4b-Post	BASE	75.01	7.919	9.800	29710	0.010	0.420	7.0	5.0
025Y-72H	Pond 4b-Post	BASE	76.01	7.871	9.800	29572	0.004	0.400	7.0	5.1
025Y-72H	Pond 4b-Post	BASE	77.01	7.823	9.800	29433	0.002	0.396	7.0	5.1
025Y-72H	Pond 4b-Post	BASE	78.01	7.774	9.800	29295	0.001	0.393	7.0	5.1
025Y-72H	Pond 4b-Post	BASE	79.01	7.726	9.800	29158	0.001	0.389	7.0	5.2
025Y-72H	Pond 4b-Post	BASE	80.01	7.678	9.800	29020	0.000	0.386	7.0	5.2
025Y-72H	Pond 4b-Post	BASE	81.01	7.631	9.800	28883	0.000	0.383	7.0	5.2
025Y-72H	Pond 4b-Post	BASE	82.01	7.583	9.800	28747	0.000	0.379	7.0	5.3
025Y-72H	Pond 4b-Post	BASE	83.01	7.536	9.800	28612	0.000	0.376	7.0	5.3

Simulation	Node	Group	Time	Stage	Warning Stage	Surface Area	Total Inflow	Total Outflow	Total Vol In	Total Vol Out
			hrs	ft	ft	ft2	cfs	cfs	af	af
025Y-72H	Pond 4b-Post	BASE	84.01	7.489	9.800	28476	0.000	0.372	7.0	5.3
025Y-72H	Pond 4b-Post	BASE	85.01	7.442	9.800	28342	0.000	0.369	7.0	5.4
025Y-72H	Pond 4b-Post	BASE	86.01	7.395	9.800	28208	0.000	0.365	7.0	5.4
025Y-72H	Pond 4b-Post	BASE	87.01	7.349	9.800	28075	0.000	0.362	7.0	5.4
025Y-72H	Pond 4b-Post	BASE	88.01	7.302	9.800	27943	0.000	0.358	7.0	5.5
025Y-72H	Pond 4b-Post	BASE	89.01	7.256	9.800	27811	0.000	0.354	7.0	5.5
025Y-72H	Pond 4b-Post	BASE	90.01	7.211	9.800	27680	0.000	0.351	7.0	5.5
025Y-72H	Pond 4b-Post	BASE	91.01	7.165	9.800	27549	0.000	0.347	7.0	5.5
025Y-72H	Pond 4b-Post	BASE	92.01	7.120	9.800	27420	0.000	0.343	7.0	5.6
025Y-72H	Pond 4b-Post	BASE	93.01	7.075	9.800	27291	0.000	0.340	7.0	5.6
025Y-72H	Pond 4b-Post	BASE	94.01	7.030	9.800	27163	0.000	0.336	7.0	5.6
025Y-72H	Pond 4b-Post	BASE	95.01	6.986	9.800	27036	0.000	0.332	7.0	5.7
025Y-72H	Pond 4b-Post	BASE	96.01	6.942	9.800	26909	0.000	0.329	7.0	5.7
025Y-72H	Pond 4b-Post	BASE	97.01	6.898	9.800	26784	0.000	0.325	7.0	5.7
025Y-72H	Pond 4b-Post	BASE	98.01	6.854	9.800	26659	0.000	0.321	7.0	5.7
025Y-72H	Pond 4b-Post	BASE	99.01	6.811	9.800	26535	0.000	0.317	7.0	5.8
025Y-72H	Pond 4b-Post	BASE	100.01	6.768	9.800	26412	0.000	0.314	7.0	5.8
025Y-72H	Pond 4b-Post	BASE	101.01	6.726	9.800	26290	0.000	0.310	7.0	5.8
025Y-72H	Pond 4b-Post	BASE	102.01	6.683	9.800	26169	0.000	0.306	7.0	5.8
025Y-72H	Pond 4b-Post	BASE	103.01	6.642	9.800	26049	0.000	0.302	7.0	5.9
025Y-72H	Pond 4b-Post	BASE	104.01	6.600	9.800	25929	0.000	0.298	7.0	5.9
025Y-72H	Pond 4b-Post	BASE	105.01	6.559	9.800	25811	0.000	0.294	7.0	5.9
025Y-72H	Pond 4b-Post	BASE	106.01	6.518	9.800	25694	0.000	0.291	7.0	5.9
025Y-72H	Pond 4b-Post	BASE	107.01	6.477	9.800	25578	0.000	0.287	7.0	6.0
025Y-72H	Pond 4b-Post	BASE	108.01	6.437	9.800	25463	0.000	0.283	7.0	6.0
025Y-72H	Pond 4b-Post	BASE	109.01	6.397	9.800	25349	0.000	0.279	7.0	6.0
025Y-72H	Pond 4b-Post	BASE	110.01	6.358	9.800	25236	0.000	0.275	7.0	6.0
025Y-72H	Pond 4b-Post	BASE	111.01	6.319	9.800	25124	0.000	0.271	7.0	6.1
025Y-72H	Pond 4b-Post	BASE	112.01	6.280	9.800	25013	0.000	0.267	7.0	6.1
025Y-72H	Pond 4b-Post	BASE	113.01	6.242	9.800	24904	0.000	0.263	7.0	6.1
025Y-72H	Pond 4b-Post	BASE	114.01	6.204	9.800	24795	0.000	0.259	7.0	6.1
025Y-72H	Pond 4b-Post	BASE	115.01	6.167	9.800	24688	0.000	0.255	7.0	6.1
025Y-72H	Pond 4b-Post	BASE	116.01	6.130	9.800	24582	0.000	0.251	7.0	6.2
025Y-72H	Pond 4b-Post	BASE	117.01	6.093	9.800	24478	0.000	0.247	7.0	6.2
025Y-72H	Pond 4b-Post	BASE	118.01	6.057	9.800	24375	0.000	0.243	7.0	6.2
025Y-72H	Pond 4b-Post	BASE	119.01	6.022	9.800	24273	0.000	0.238	7.0	6.2
025Y-72H	Pond 4b-Post	BASE	120.01	5.987	9.800	24172	0.000	0.234	7.0	6.2
025Y-72H	Pond 4b-Post	BASE	121.01	5.952	9.800	24073	0.000	0.230	7.0	6.3
025Y-72H	Pond 4b-Post	BASE	122.01	5.918	9.800	23975	0.000	0.226	7.0	6.3
025Y-72H	Pond 4b-Post	BASE	123.01	5.884	9.800	23878	0.000	0.222	7.0	6.3
025Y-72H	Pond 4b-Post	BASE	124.01	5.851	9.800	23783	0.000	0.218	7.0	6.3
025Y-72H	Pond 4b-Post	BASE	125.01	5.818	9.800	23689	0.000	0.213	7.0	6.3
025Y-72H	Pond 4b-Post	BASE	126.01	5.786	9.800	23597	0.000	0.209	7.0	6.4
025Y-72H	Pond 4b-Post	BASE	127.01	5.754	9.800	23506	0.000	0.205	7.0	6.4
025Y-72H	Pond 4b-Post	BASE	128.01	5.723	9.800	23417	0.000	0.201	7.0	6.4
025Y-72H	Pond 4b-Post	BASE	129.01	5.693	9.800	23330	0.000	0.196	7.0	6.4
025Y-72H	Pond 4b-Post	BASE	130.01	5.663	9.800	23244	0.000	0.192	7.0	6.4
025Y-72H	Pond 4b-Post	BASE	131.01	5.633	9.800	23159	0.000	0.188	7.0	6.4
025Y-72H	Pond 4b-Post	BASE	132.01	5.604	9.800	23076	0.000	0.183	7.0	6.5
025Y-72H	Pond 4b-Post	BASE	133.01	5.576	9.800	22995	0.000	0.179	7.0	6.5
025Y-72H	Pond 4b-Post	BASE	134.01	5.548	9.800	22916	0.000	0.175	7.0	6.5
025Y-72H	Pond 4b-Post	BASE	135.01	5.521	9.800	22838	0.000	0.170	7.0	6.5
025Y-72H	Pond 4b-Post	BASE	136.01	5.495	9.800	22762	0.000	0.166	7.0	6.5
025Y-72H	Pond 4b-Post	BASE	137.01	5.469	9.800	22687	0.000	0.161	7.0	6.5
025Y-72H	Pond 4b-Post	BASE	138.01	5.443	9.800	22615	0.000	0.157	7.0	6.5
025Y-72H	Pond 4b-Post	BASE	139.01	5.419	9.800	22544	0.000	0.153	7.0	6.5
025Y-72H	Pond 4b-Post	BASE	140.01	5.395	9.800	22475	0.000	0.148	7.0	6.6
025Y-72H	Pond 4b-Post	BASE	141.01	5.371	9.800	22408	0.000	0.144	7.0	6.6
025Y-72H	Pond 4b-Post	BASE	142.01	5.348	9.800	22343	0.000	0.139	7.0	6.6
025Y-72H	Pond 4b-Post	BASE	143.01	5.326	9.800	22280	0.000	0.135	7.0	6.6
025Y-72H	Pond 4b-Post	BASE	144.01	5.305	9.800	22218	0.000	0.130	7.0	6.6
025Y-72H	Pond 4b-Post	BASE	145.01	5.284	9.800	22159	0.000	0.126	7.0	6.6
025Y-72H	Pond 4b-Post	BASE	146.01	5.264	9.800	22101	0.000	0.121	7.0	6.6
025Y-72H	Pond 4b-Post	BASE	147.01	5.245	9.800	22045	0.000	0.117	7.0	6.6
025Y-72H	Pond 4b-Post	BASE	148.01	5.226	9.800	21992	0.000	0.112	7.0	6.6
025Y-72H	Pond 4b-Post	BASE	149.01	5.208	9.800	21940	0.000	0.108	7.0	6.7
025Y-72H	Pond 4b-Post	BASE	150.01	5.191	9.800	21891	0.000	0.103	7.0	6.7
025Y-72H	Pond 4b-Post	BASE	151.01	5.174	9.800	21843	0.000	0.098	7.0	6.7
025Y-72H	Pond 4b-Post	BASE	152.01	5.158	9.800	21798	0.000	0.094	7.0	6.7
025Y-72H	Pond 4b-Post	BASE	153.01	5.143	9.800	21754	0.000	0.089	7.0	6.7
025Y-72H	Pond 4b-Post	BASE	154.01	5.129	9.800	21713	0.000	0.085	7.0	6.7
025Y-72H	Pond 4b-Post	BASE	155.01	5.115	9.800	21674	0.000	0.080	7.0	6.7
025Y-72H	Pond 4b-Post	BASE	156.01	5.102	9.800	21637	0.000	0.075	7.0	6.7
025Y-72H	Pond 4b-Post	BASE	157.01	5.090	9.800	21602	0.000	0.071	7.0	6.7
025Y-72H	Pond 4b-Post	BASE	158.01	5.078	9.800	21569	0.000	0.066	7.0	6.7
025Y-72H	Pond 4b-Post	BASE	159.01	5.068	9.800	21539	0.000	0.061	7.0	6.7
025Y-72H	Pond 4b-Post	BASE	160.01	5.058	9.800	21510	0.000	0.057	7.0	6.7
025Y-72H	Pond 4b-Post	BASE	161.01	5.049	9.800	21484	0.000	0.052	7.0	6.7
025Y-72H	Pond 4b-Post	BASE	162.01	5.040	9.800	21460	0.000	0.047	7.0	6.7
025Y-72H	Pond 4b-Post	BASE	163.01	5.033	9.800	21439	0.000	0.043	7.0	6.7
025Y-72H	Pond 4b-Post	BASE	164.01	5.026	9.800	21419	0.000	0.038	7.0	6.7
025Y-72H	Pond 4b-Post	BASE	165.01	5.020	9.800	21402	0.000	0.033	7.0	6.7
025Y-72H	Pond 4b-Post	BASE	166.01	5.015	9.800	21387	0.000	0.029	7.0	6.8
025Y-72H	Pond 4b-Post	BASE	167.01	5.010	9.800	21374	0.000	0.024	7.0	6.8

Simulation	Node	Group	Time	Stage	Warning Stage	Surface Area	Total Inflow	Total Outflow	Total Vol In	Total Vol Out
			hrs	ft	ft	ft2	cfs	cfs	af	af
025Y-72H	Pond 4b-Post	BASE	168.01	5.007	9.800	21364	0.000	0.019	7.0	6.8
025Y-72H	Pond 4b-Post	BASE	169.01	5.004	9.800	21355	0.000	0.015	7.0	6.8
025Y-72H	Pond 4b-Post	BASE	170.01	5.002	9.800	21350	0.000	0.010	7.0	6.8
025Y-72H	Pond 4b-Post	BASE	171.01	5.000	9.800	21346	0.000	0.005	7.0	6.8
025Y-72H	Pond 4b-Post	BASE	172.01	5.000	9.800	21344	0.000	0.000	7.0	6.8
025Y-72H	Pond 4b-Post	BASE	173.01	5.000	9.800	21344	0.000	0.000	7.0	6.8
025Y-72H	Pond 4b-Post	BASE	174.01	5.000	9.800	21344	0.000	0.000	7.0	6.8
025Y-72H	Pond 4b-Post	BASE	175.01	5.000	9.800	21344	0.000	0.000	7.0	6.8
025Y-72H	Pond 4b-Post	BASE	176.01	5.000	9.800	21344	0.000	0.000	7.0	6.8
025Y-72H	Pond 4b-Post	BASE	177.01	5.000	9.800	21344	0.000	0.000	7.0	6.8
025Y-72H	Pond 4b-Post	BASE	178.01	5.000	9.800	21344	0.000	0.000	7.0	6.8
025Y-72H	Pond 4b-Post	BASE	179.01	5.000	9.800	21344	0.000	0.000	7.0	6.8
025Y-72H	Pond 4b-Post	BASE	180.01	5.000	9.800	21344	0.000	0.000	7.0	6.8
025Y-72H	Pond 4b-Post	BASE	180.01	5.000	9.800	21344	0.000	0.000	7.0	6.8

SFWMD Permit No. 56-00538-S

South Florida
Water Management District
Post Office Box V 3301 Gun Club Road
West Palm Beach, Florida 33402
Telephone (305) 686-8800
Florida WATS Line 1-800-432-2045

John R. Wodraska, Executive Director

IN REPLY REFER TO:

February 14, 1985

Rinker Material Corporation
P.O. Drawer K
West Palm Beach, Fl 33402

RE: General Permit: 56-00538-S, (Application No. 12194-D)
Permittee: Rinker Material Corporation
Project: Rinker West Fort Pierce Plant
Location: St. Lucie County, S1/T36S/R39E

Gentlemen:

This letter is to acknowledge receipt of your Intent to Construct Works pursuant to Rule 40E-40, Florida Administrative Code.

Based on the information provided, District rules have been adhered to and an Operation Permit for Phase One is in effect for this project as described in the enclosed staff report and subject to the special conditions listed in the staff report on page (s) 4 and 5.

Please update your records by attaching this letter to your files and discard letter dated February 4, 1985.

Sincerely,

Charles W. Pemble

Charles W. Pemble, P.E. Director
Water Management Division
Resource Control Department

CWP/mr:
cc: DER
Mr. Timer Powers
County of St. Lucie Engineer
North St. Lucie River Drainage District
bcc: Day
White
Carol
File
Inspection

Stanley W. Hole
Chairman - Naples
William E. Sadowski
Vice Chairman - Miami

J. Neil Gallagher
St. Cloud
Nathaniel P. Reed
Hobe Sound
Kathleen Shea Abrams
Miami Shores
John F. Flanigan
North Palm Beach
Timer E. Powers
Indiantown
Kent Price
Okeechobee
Nancy H. Roen
Plantation

South Florida
Water Management District
Post Office Box V 3301 Gun Club Road
West Palm Beach, Florida 33402
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February 4, 1985

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P.O. DRAWER K
West Palm Beach, Fl 33402

RE: General Permit No: 56-00538-S, (Application No. 12194-D)
Permittee: Rinker Materials Corporation
Project: Rinker West Fort Pierce Plant
Location: St. Lucie Cnty., S1/T36S/R39E

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Sincerely,

Charles W. Pemble

Charles W. Pemble, P.E., Director
Water Management Division
Resource Control Department

CWP/mr:
Enclosure
cc: Dept. of Environmental Regulation
Mr. Timer Powers
Cnty. of St. lucie Engineer
North St. lucie River Drainage District

Stanley W. Hole, Chairman - Naples
William E. Sadowski, Vice Chairman - Miami
J. Neil Gallagher, St. Cloud
Nathaniel P. Reed, Hobe Sound
Kathleen Shea Abrams, Marc Shores
John F. Flanigan, North Palm Beach
Timer E. Powers, Indiantown
Kent Price, Okeechobee
Nancy H. Roen, Plantation

FORM 0076
Rev. 6/84

GENERAL PERMIT DUE
FEBRUARY 15, 1985

SURFACE WATER MANAGEMENT STAFF REVIEW SUMMARY

APPLICATION NO: 12194-D

PROJECT NAME: Rinker West Fort Pierce Plant

LOCATION: St. Lucie County, S1/T36S/R39E

APPLICANTS NAME & ADDRESS: Rinker Materials Corporation
P O Drawer K
West Palm Beach, FL 33402

OWNER: SAME

DEVELOPER: SAME

ENGINEER: SAME

REVIEWER RATING OF PROJECT DESIGN

1.	Suitability of land for proposed use	(GOOD)	FAIR	POOR	NOT APPLICABLE
2.	Water quantity impacts	(GOOD)	FAIR	POOR	NOT APPLICABLE
3.	Water quality impacts	(GOOD)	FAIR	POOR	NOT APPLICABLE
4.	Environmental impacts	GOOD	FAIR	POOR	(NOT SIGNIFICANT)
5.	Water conservation	(GOOD)	FAIR	POOR	NOT APPLICABLE
6.	Flood protection	GOOD	(FAIR)	POOR	NOT APPLICABLE
7.	Relief from rainstorm inconvenience	GOOD	(FAIR)	POOR	NOT APPLICABLE
8.	System maintainability	GOOD	(FAIR)	POOR	NOT APPLICABLE
9.	Overall use of land with respect to water resource	(GOOD)	FAIR	POOR	NOT APPLICABLE
10.	Water management system with respect to feasible alternatives	GOOD	(FAIR)	POOR	NOT APPLICABLE

1-28-85

FORM 0078
Rev. 10/84

[redacted]CE WATER MANAGEMENT EVALUAT[redacted]

APPLICATION NUMBER 12194-D DATE 12-19-84

PROJECT NAME Rinker West Fort Pierce Plant

LOCATION St. Lucie COUNTY

SECTION 1 /TOWNSHIP 36 SOUTH/RANGE 39 EAST

PROJECT AREA 37.56 ACRES DRAINAGE AREA 37.56 ACRES

FACILITIES

1. EXISTING: On-site lake.

2. PROPOSED: Site grading will direct runoff to a swale which will convey runoff to the existing on-site lake. There will be no discharge from the lake.

DRAINAGE BASIN North St.Lucie River Drainage District RECEIVING BODY n/a

RUNOFF FORMULA n/a ALLOWABLE DISCHARGE n/a CFS

REQUIRED DETENTION 19.3 AC-FT
DETENTION METHOD on-site lake
DETENTION PROVIDED 19.3 AC-FT

	Project Evaluation for Total Project
FLOOD PROTECTION	
LOCAL ROAD CRITERIA	n/a YEAR, n/a HR STORM
FLOOD CONTOUR	n/a FEET NGVD
MINIMUM ROAD GRADE	n/a FEET NGVD
PARKING LOT CRITERIA	5 YEAR, 1 HR STORM
FLOOD CONTOUR	17.8 FEET NGVD
MINIMUM PARKING LOT GRADE	21.95 FEET NGVD
BASIN DESIGN FREQUENCY	25 YEAR, 72 HR STORM
FLOOD CONTOUR	18.8 FEET NGVD
DESIGN DISCHARGE	0 CFS
100 YEAR FLOOD	
FLOOD CONTOUR	19.8 FEET NGVD
MINIMUM FLOOR ELEVATION	22.7 FEET NGVD
FIA FLOOD ELEVATION	n/a FEET NGVD

WATER QUALITY

A. ADVERSE IMPACTS EXPECTED
YES ☐ NO ☒

B. BEST MANAGEMENT PRACTICES UTILIZED

Total on-site retention of 3-year 1-hour storm. No discharge in the 25-year 72-hour design storm.

ENVIRONMENTAL

A. SIGNIFICANT ADVERSE IMPACTS EXPECTED
YES ☐ NO ☒

B. COMMENTS

LAND USE

PRESENT ZONING IH, ALLOWED DENSITY - DU/A

PROPOSED USE Concrete Plant, PROPOSED DENSITY - DU/A

COMPATIBLE YES ☒ NO ☐

POTABLE WATER On-site well (GP 84-169W)
PERMITTED ALLOCATION n/a MGD
PRESENT WITHDRAWAL n/a MGD
PROJECT DEMAND n/a MGD
WASTEWATER TREATMENT On-site septic tank

ADDITIONAL COMMENTS: none.

FORM 0077
Rev. 10/84

APPLICABLE LAND AREA

	Project	Phase Construction
Total	37.56 acres;	18.76 acres
Water Management	14.01 acres;	7.87 acres
Impervious	17.66 acres;	6.94 acres
Dwelling	- units;	- units
Commercial/Industrial	17.66 acres;	6.94 acres

Location: On the north side of Midway Raod and west side of Florida's Turnpike.

City - County St. Lucie

Special District North St. Lucie River Drainage District

SFWMD Basin SAME

Operation Entity Rinker Materials Corporation

The staff recommends that the following be issued:

____General Permit

____Construction and Operation Permit

____Construction Permit

_X_Operation Permit for Phase 1

____Letter of Conceptual Approval

____Right-of-Way Occupancy Permit

APPLICATION REVIEW:		SUPERVISOR/CHECKER
TECHNICAL	A.Leavens	R.Tomasello
WATER QUALITY	M.Cullum	R.Tomasello
ENVIRONMENTAL	C.Padera	C.Padera

APPROVED:

DIVISION DIRECTOR: Charles W. Pemble DATE: 1-28-85

Charles W. Pemble, P.E.,
Director, Water Management Division
Resource Control Department

Subject to the following 12 Standard Limiting and 8 Special Conditions (for conceptual approvals only, these conditions as a minimum will apply to subsequent construction permitting).

LIMITING CONDITIONS

1. THE PERMITTEE SHALL PROSECUTE THE WORK AUTHORIZED IN A MANNER SO AS TO MINIMIZE ANY ADVERSE IMPACT OF THE WORKS ON FISH, WILDLIFE, NATURAL ENVIRONMENTAL VALUES, AND WATER QUALITY. THE PERMITTEE SHALL INSTITUTE NECESSARY MEASURES DURING THE CONSTRUCTION PERIOD, INCLUDING FULL COMPACTION OF ANY FILL MATERIAL PLACED AROUND NEWLY INSTALLED STRUCTURES, TO REDUCE EROSION, TURBIDITY, NUTRIENT LOADING AND SEDIMENTATION IN THE RECEIVING WATERS.

2. WATER QUALITY DATA FOR THE WATER DISCHARGED FROM THE PERMITTEE'S PROPERTY OR INTO SURFACE WATERS OF THE STATE SHALL BE SUBMITTED TO THE DISTRICT AS REQUIRED. PARAMETERS TO BE MONITORED MAY INCLUDE THOSE LISTED IN CHAPTER 17-3. IF WATER QUALITY DATA IS REQUIRED, THE PERMITTEE SHALL PROVIDE DATA AS REQUIRED, ON VOLUMES OF WATER DISCHARGED, INCLUDING TOTAL VOLUME DISCHARGED DURING THE DAYS OF SAMPLING AND TOTAL MONTHLY DISCHARGES FROM THE PROPERTY OR INTO SURFACE WATERS OF THE STATE.

3. THE PERMITTEE SHALL COMPLY WITH ALL APPLICABLE LOCAL SUBDIVISION REGULATIONS AND OTHER LOCAL REQUIREMENTS. IN ADDITION THE PERMITTEE SHALL OBTAIN ALL NECESSARY FEDERAL, STATE, LOCAL AND SPECIAL DISTRICT AUTHORIZATIONS PRIOR TO THE START OF ANY CONSTRUCTION OR ALTERATION OF WORKS AUTHORIZED BY THIS PERMIT.

4. THE OPERATION PHASE OF THIS PERMIT SHALL NOT BECOME EFFECTIVE UNTIL A FLORIDA REGISTERED PROFESSIONAL ENGINEER CERTIFIES THAT ALL FACILITIES HAVE BEEN CONSTRUCTED IN ACCORDANCE WITH THE DESIGN APPROVED BY THE DISTRICT. WITHIN 30 DAYS AFTER COMPLETION OF CONSTRUCTION OF THE SURFACE WATER MANAGEMENT SYSTEM, THE PERMITTEE SHALL SUBMIT THE CERTIFICATION AND NOTIFY THE DISTRICT THAT THE FACILITIES ARE READY FOR INSPECTION AND APPROVAL. UPON APPROVAL OF THE COMPLETED SURFACE WATER MANAGEMENT SYSTEM, THE PERMITTEE SHALL REQUEST TRANSFER OF THE PERMIT TO THE RESPONSIBLE ENTITY APPROVED BY THE DISTRICT.

5. ALL ROADS SHALL BE SET AT OR ABOVE ELEVATIONS REQUIRED BY THE APPLICABLE LOCAL GOVERNMENT FLOOD CRITERIA.

6. ALL BUILDING FLOORS SHALL BE SET AT OR ABOVE ELEVATIONS ACCEPTABLE TO THE APPLICABLE LOCAL GOVERNMENT.

7. OFF-SITE DISCHARGES DURING CONSTRUCTION AND DEVELOPMENT SHALL BE MADE ONLY THROUGH THE FACILITIES AUTHORIZED BY THIS PERMIT. NO ROADWAY OR BUILDING CONSTRUCTION SHALL COMMENCE ON-SITE UNTIL COMPLETION OF THE PERMITTED DISCHARGE STRUCTURE AND DETENTION AREAS. WATER DISCHARGED FROM THE PROJECT SHALL BE THROUGH STRUCTURES HAVING A MECHANISM SUITABLE FOR REGULATING UPSTREAM WATER STAGES. STAGES MAY BE SUBJECT TO OPERATING SCHEDULES SATISFACTORY TO THE DISTRICT.

8. NO CONSTRUCTION AUTHORIZED HEREIN SHALL COMMENCE UNTIL A RESPONSIBLE ENTITY ACCEPTABLE TO THE DISTRICT HAS BEEN ESTABLISHED AND HAS AGREED TO OPERATE AND MAINTAIN THE SYSTEM. THE ENTITY MUST BE PROVIDED WITH SUFFICIENT OWNERSHIP SO THAT IT HAS CONTROL OVER ALL WATER MANAGEMENT FACILITIES AUTHORIZED HEREIN. UPON RECEIPT OF WRITTEN EVIDENCE OF THE SATISFACTION OF THIS CONDITION, THE DISTRICT WILL ISSUE AN AUTHORIZATION TO COMMENCE CONSTRUCTION.

9. THE PERMIT DOES NOT CONVEY TO THE PERMITTEE ANY PROPERTY RIGHT NOR ANY RIGHTS OR PRIVILEGES OTHER THAN THOSE SPECIFIED IN THE PERMIT AND CHAPTER 40E-4, FAC.

10. THE PERMITTEE SHALL HOLD AND SAVE THE DISTRICT HARMLESS FROM ANY AND ALL DAMAGES, CLAIMS, OR LIABILITIES WHICH MAY ARISE BY REASON OF THE CONSTRUCTION, OPERATION, MAINTENANCE OR USE OF ANY FACILITY AUTHORIZED BY THE PERMIT.

11. THIS PERMIT IS ISSUED BASED ON THE APPLICANT'S SUBMITTED INFORMATION WHICH REASONABLY DEMONSTRATES THAT ADVERSE OFF-SITE WATER RESOURCE RELATED IMPACTS WILL NOT BE CAUSED BY THE COMPLETED PERMIT ACTIVITY. IT IS ALSO THE RESPONSIBILITY OF THE PERMITTEE TO INSURE THAT ADVERSE OFF-SITE WATER RESOURCE RELATED IMPACTS DO NOT OCCUR DURING CONSTRUCTION.

12. PRIOR TO DEWATERING, PLANS SHALL BE SUBMITTED TO THE DISTRICT FOR APPROVAL. INFORMATION SHALL INCLUDE AS A MINIMUM: PUMP SIZES, LOCATIONS AND HOURS OF OPERATION FOR EACH PUMP. IF OFF-SITE DISCHARGE IS PROPOSED, OR OFF-SITE ADVERSE IMPACTS ARE EVIDENT, AN INDIVIDUAL WATER USE PERMIT MAY BE REQUIRED. THE PERMITTEE IS CAUTIONED THAT SEVERAL MONTHS MAY BE REQUIRED FOR CONSIDERATION OF THE WATER USE PERMIT APPLICATION.

SPECIAL CONDITIONS

1. MINIMUM BUILDING FLOOR ELEVATION: 22.7' NGVD.

2. MINIMUM ROAD CROWN ELEVATION: 21.95' NGVD.

3. NO CONSTRUCTION WITHIN PHASE 2 SHALL COMMENCE UNTIL A MODIFICATION OF THIS PERMIT IS APPROVED BY THIS DISTRICT.

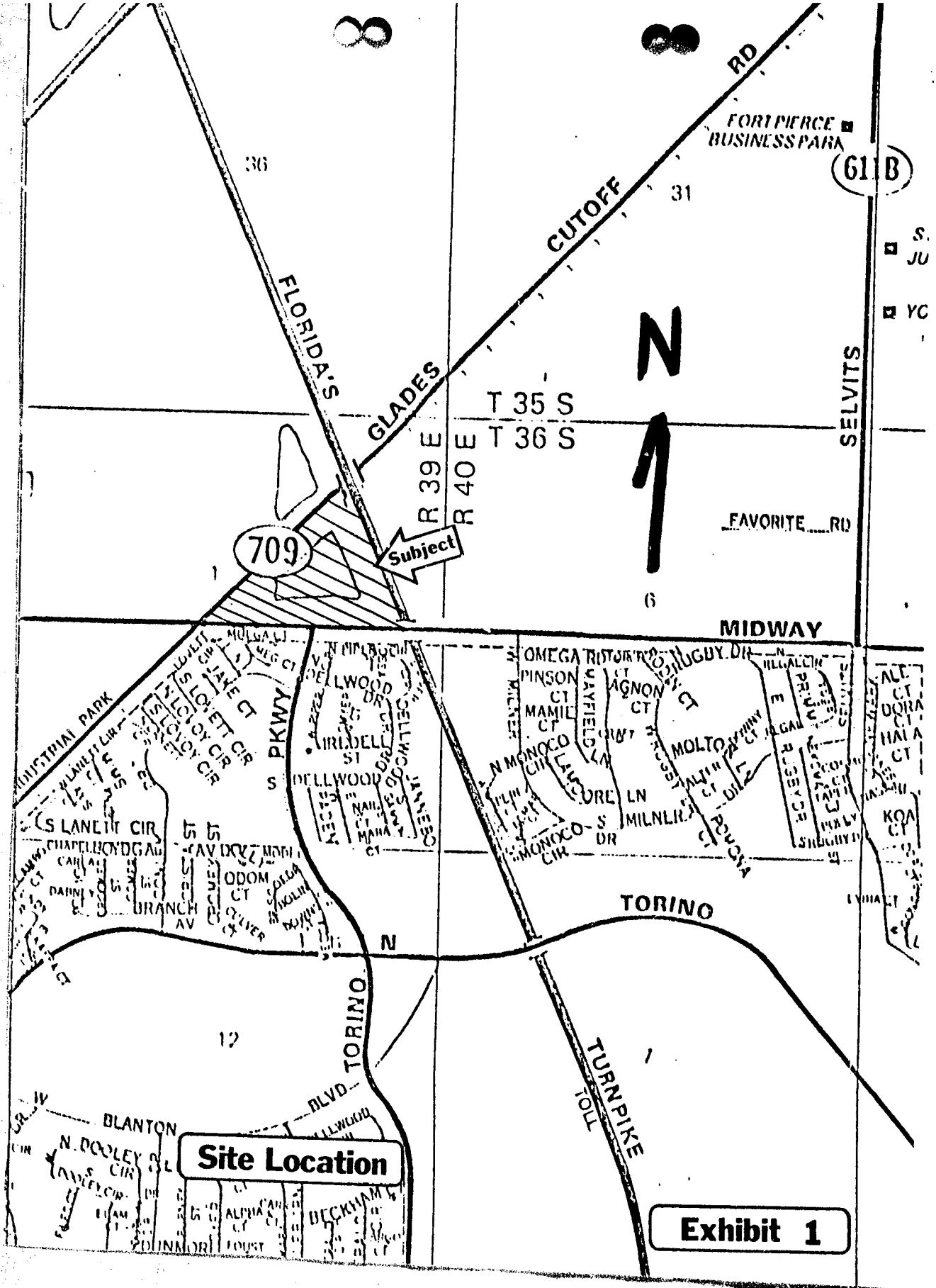
4. OPERATION OF THE SURFACE WATER MANAGEMENT SYSTEM SHALL BE THE RESPONSIBILITY RINKER MATERIALS CORPORATION.

5. PRIOR TO THE INITIATION OF ANY WITHDRAWAL OF WATER (IRRIGATION, DEWATERING, PUBLIC WATER SUPPLY, ETC.), IT WILL BE NECESSARY TO APPLY FOR A WATER USE PERMIT. THE PERMITTEE IS CAUTIONED THAT A MINIMUM OF 90 DAYS IS REQUIRED FOR CONSIDERATION OF THE WATER USE PERMIT APPLICATION. THE PERMITTEE IS CAUTIONED, THAT THE ISSUANCE OF THE SURFACE WATER MANAGEMENT PERMIT SHALL NOT BE CONSTRUED TO BE A GUARANTEE THAT WATER WILL BE AVAILABLE.

6. MEASURES SHALL BE TAKEN DURING CONSTRUCTION TO INSURE THAT SEDIMENTATION AND/OR TURBIDITY PROBLEMS ARE NOT CREATED IN THE RECEIVING WATER.

7. THE PERMITTEE SHALL BE RESPONSIBLE FOR THE CORRECTION OF ANY WATER QUALITY PROBLEMS THAT RESULT FROM THE CONSTRUCTION OR OPERATION OF THE SURFACE WATER MANAGEMENT SYSTEM.

8. THIS DISTRICT RESERVES THE RIGHT TO REQUIRE THAT WATER QUALITY TREATMENT METHODS BE INCORPORATED INTO THE DRAINAGE SYSTEM IF SUCH MEASURES ARE SHOWN TO BE NECESSARY.



FORT PIERCE BUSINESS PARK
611B
CUTOFF
RD
FLORIDA'S
GLADES
T 35 S
T 36 S
R 39 E
R 40 E
N
SELVITS
FAVORITE RD
709
Subject
MIDWAY
PKWY
TORINO
N
TURNPIKE
TOLL
BLANTON
BLVD
Site Location
Exhibit 1

PHASE 1 IS 95% COMPLETED. PHASE 2 IS PROPOSED DEVELOPMENT.

EXHIBIT 2

℄ GLADES CUT-OFF ROAD

℄ FEC. R.R. ROW.

℄ FLORIDA TURNPIKE

PARCEL 2

PHASE 2

PARCEL 1

PHASE 1

LAKE

LAKE ELEV. 20.10 (12/12/84)

SEASONAL HIGH WATER TABLE = 17.50

23.00

22.00

22.10

22.30

23.10

22.50

RIDGE ℄

SWALE 0.2%

INV. EL. 18.90

EL. 18.65 ℄ OPENING ℄ MIDWAY ROAD

MONUMENT 24.95 EL.

CORRUGATED STEEL PIPE 36"Ø

CANAL WATER EL. = 17.85

CANAL NO. 103

(2) 30" Ø CONCRETE PIPE

INV. EL. 16.27

INV. EL. 15.98

MONUMENT EL. 23.18

CANAL WATER EL. 17.34

270'

100'

130'

N

0 100 200 300

GRAPHIC SCALE

Exhibit 5

OVERLAY SCREEN AUDIT

REVISED		
DATE	REMARKS	INITIAL

RINKER MATERIALS CORP & SUBSIDIARIES
WEST PALM BEACH, FL

WEST FT. PIERCE
DRAINAGE DATA

DRAWN BY: MLK	83-0111	DRAWING NO.
DATE: 3-5-84		
CHECKED BY:		SHEET
DATE:		

(61) #62-00638-8

ALL RUNOFF AND PROCESS WATER TO BE CONTAINED ON RINKER MATERIALS CORP. PROPERTY.

TOP OF SUBGRADE FOR SPUR TO BE 1.5' BELOW TOP OF RAIL EXTENDING OUT 10' EACH SIDE OF ℄ SPUR WITH 2:1 SLOPE

SEE DWG A-4B FOR LOCATION OF BM #10, EL 23.16

SEE DWG. C-9 FOR DRAINAGE TRENCHES UNDER SPUR.

0.0 EXISTING GRADES

[0.0] PROPOSED GRADES ON FILL

[0.00] PROPOSED GRADES ON PAVING OR STRUCTURES

POND W.L. 17.77

W.L. 20.10 12/6/91

℄ SPUR STA. 12 ON 260 N

TOP OF RAIL 23.50

INV. 21.50

RAMP

DOCK

WAREHOUSE

RIDGE

2:1 SLOPE

OFFICE

SHOP

STEEL YARD

8' SHOULDER

NOT INCLUDED

CONSTRUCTION PRINT
THIS PRINT IS RELEASED FOR CONSTRUCTION SUPERSEDING ALL OLD PRINTS
DESTROY ALL OLD PRINTS
DATE: 12-9-92
RINKER MATERIALS CORP.
ENGINEERING DEPT.

TOP OF IRON PIPE
19.3 DITCH
TOP OF MONUMENT 23.16 INV. 16.32
100' BASE LINE
(2) 24" ℄ CONC. PIPES
INV. 16.15

350N 300N 250N 200N 150N

850W 800W 750W 700W 650W 600W 550W 500W 450W 400W 350W 300W 250W 200W 150W 100W 50W

℄ MIDWAY ROAD

CANAL No. 103

Water El. 17.34 12/9/91

GRAPHIC SCALE 0 30 60

REVISED		
DATE	REMARKS	INITIALS
5-1-84	RELOCATING BATCH PLANT	BKS
7-11-94	MATCH LINE	PAB

RINKER MATERIALS CORP.
WEST PALM BEACH, FLORIDA

WEST FT. PIERCE
GRADING

DRAWN BY: AE
DATE: 12-4-91
CHECKED BY: BKS
DATE: 12/12/91

DRAWING NO. A-4A
SHEET

BRUNING 4023 SCTRY

PRINT MATCH LINE

EXHIBIT 3

(GA)#56-00.5.98-4

0.0 EXISTING GRADES

0.0 PROPOSED GRADES ON FILL

0.00 PROPOSED GRADES ON PAVING OR STRUCTURES

TOP OF SUBGRADE FOR SPUR TO BE 1.5' BELOW TOP OF RAIL EXTENDING 300N OUT 10' EACH SIDE OF ℄ SPUR WITH 2:1 SLOPE

ALL RUNOFF AND PROCESS WATER TO BE CONTAINED ON RINKER MATERIALS CORP. PROPERTY.

500N
450N
400N
350N
300N
250N
200N
150N
100N
50N
L 00 BASE LINE

POND
W.L. 17.77

℄ OF SPUR IS ON STA. 260 N.

TOP OF RAIL

RAMP

RIDGE

BLOCK PLANT

BLOCK STORAGE

MIDWAY ROAD

℄ RAILROAD (F.E.C.)

CANAL NO. 103

10' LANDSCAPE STRIP

MATCH LINE

INV. 17.13 18" C.M.P.

INV. 17.58

INV. 18.69 RIP RAP HEAD WALL

90'-0

36" Ø CORRU. PIPE INV. 16.65

RIP RAP OUT FALL

TOP OF MONUMENT 24.95

WATER EL. 17.73

WATER EL. 1.25 12/3/79

0 30 60
GRAPHIC SCALE

CONSTRUCTION PRINT
THIS PRINT IS RELEASED FOR CONSTRUCTION SUPERSEDING ALL PRIOR ISSUED PRINTS
DATED DEC 02 1981
DESTROY ALL PRIOR PRINTS
RINKER MATERIALS CORP.
ENGINEERING DEPT.

REVISED		
DATE	REMARKS	INITIALS
1/15/82	ADD BLOCK PLANT	BKS
3/4/82	ADJ PROPOSED GRADES	BKS
8-11-82	RELOCATION BATCH PLANT	BKS
7-9-84	MATCH LINE	B.G.B.
7-19-84	CHG. RECEIV. FLOW	B.G.B.

RINKER MATERIALS CORP.
WEST PALM BEACH, FLORIDA

WEST FT PIERCE
GRADING

DRAWN BY: GR
DATE: 12-4-81
CHECKED BY: BKS
DATE: 12/7/81

DRAWING NO. A-4B
SHEET

EXHIBIT 4

(DP) #86-00538-S

FORM 9079
4/84

STAFF DISTRIBUTION LIST

PROJECT Rinker West Fort Pierce Plant APPLICATION NO. 12194-D

INTERNAL DISTRIBUTION

- Brannen, W.
- Brockway, R.
- Fanson, R.
- X Gleason, P.
- X Hall, A.
- X Inspection
- X Legal
- X Pemble, C.
- X Reviewer Leavens, A.
- X Tomasello, R.
- X Wedderburn, L.
- White, R.
- Horinkova, V.

EXTERNAL DISTRIBUTION

Dept. of Environmental Regulation:

- WPB
- Other
- Fort Myers
- Orlando
- Tallahassee
- X Port St. Lucie

Governing Board Member:

- ABRAMS Dr. K.
- FLANIGAN Mr. J.
- GALLAGHER Mr. N.
- HOLE Mr. S.
- X POWERS Mr. T.
- PRICE Mr. K.
- ROEN Ms. N.
- REED Mr. N.
- SADOWSKI MR. W.

EXTERNAL DISTRIBUTION continued

- X Applicant Rinker Materials Corporation
- X Applicant's Consultant Rinker Materials Corporation
- Applicant's Agent
- X Engineer, County of St. Lucie
- Engineer, City of
- Local Drainage Districts:
- X North St. Lucie River Drainage District

Bldg & Zoning:

- Boca Raton
- Boynton Beach
- Royal Palm Beach
- Tequesta
- West Palm Beach

County:

- Broward - Dir., Water Mgmt Division
- Collier - Cnty Agricultural Agent
- Dade - Cnty DERM
- Lee - Cnty Dir. of Long Range Plan.
- Cnty Mosquito Control
- Cnty Div. of E.P.S.
- Martin - Cnty Planning & Zoning
- Palm Beach - Cnty Bldg Dept.
- Cnty Area Planning Board
- Cnty School Brd, Plant Plan.
- Polk - Cnty Water Resources Dept.

- Fred Vidzes, Big Cypress Basin
- Kissimmee River Coordinating Council
- Other:

EXHIBIT 5

WATER USE INFORMATION

FOR SURFACE WATER MANAGEMENT PERMITS

APPLICATION NO. 12194-D DATE: 12/26/84

SWM REVIEWER: LEAVENS

PROJECT NAME: WEST FT. PIERCE

APPLICANT: RINKER MATERIALS CORP.
ADDRESS: P.O. DRAWER K
W. PALM BEACH, FL 33402

PROJECT ENGINEER: DONALD BEERS, P.E.
ADDRESS: 1501 BELVEDERE RD.
W. PALM BEACH, FL 33406

COUNTY & S/T/R: ST. LUCIE S1/T36/R39E

POTABLE WATER SUPPLIER: ~~N/A~~ ON SITE, WELL GP 84-169W

WATER USE CATEGORY: ~~STORM WATER MANAGEMENT SYST.~~
INDUSTRIAL SITE CONCRETE PLANT

PROPOSED NUMBER OF UNITS: ~~37.56 AC~~ 9000 sq ft Industrial office and warehouse

IRRIGATION WATER USE:

ACREAGE AND CROPS TO BE IRRIGATED:

RESPONSE: Maureen Foster 12/27/84

PERMITTED ALLOCATION: N/A } No Allocation or pumpage on a GP

PRESENT WITHDRAWAL: N/A

PROJECT DEMAND: (POTABLE WATER) N/A
(IRRIGATION)
.0008 MGD

SOUTH FLORIDA WATER MANAGEMENT DISTRICT
P.O. BOX "V"
WEST PALM BEACH, FL. 33402
TELEPHONE:(305) 686-8800 TOLL FREE: 1-800-432-2045

(FOR USE BY SFWMD PERSONNEL ONLY) DATE REC'D: APPL. NO.: 12194-D

APPLICATION TO SOUTH FLORIDA WATER MANAGEMENT DISTRICT FOR A PERMIT FOR:
( ) WATER USE
(X) SURFACE WATER MANAGEMENT (DRAINAGE) ([ ] CONCEPTUAL APPROVAL)
( ) UTILIZATION OF DISTRICT WORKS
( ) MODIFICATION OF EXISTING PERMIT NUMBER: _____

OWNER'S NAME: Rinker Materials Corporation
ADDRESS: P.O. Drawer K
CITY: West Palm Beach STATE: Florida ZIP: 33402 PHONE: 833-5555
DEVELOPER'S NAME: Rinker Materials Corporation
ADDRESS: P.O. Drawer K
CITY: West Palm Beach STATE: Florida ZIP: 33402 PHONE: 833-5555

PROJECT ENGINEER: Donald Beers, P.E.
ADDRESS: 1501 Belvedere Road
CITY: West Palm Beach STATE: Florida ZIP: 33406 PHONE: 833-5555

PROJECT NAME: West Ft. Pierce
LOCATION: Ft. Pierce (CITY), St. Lucie (COUNTY), 1 (SECTION(S)), 36 S (TOWNSHIP(S)), 39 E (RANGE(S))

PURPOSE: Storm Water Management ZONING: I-H
(RESIDENTIAL, AGRICUL., PUB. WTR. SUPPLY, ETC.)

PROJECT SIZE: 37.561 ACRES
PROJECT IS: (X) PROPOSED (X) EXISTING ( ) TO BE MODIFIED Phase I 90% completed
IF THIS APPLICATION IS FOR WATER USE, WHAT IS THE SOURCE OF WATER? _____

IF THIS APPLICATION IS FOR DRAINAGE, WHERE WILL THE WATER DISCHARGE? Canal No. 103

IF THIS IS A REQUEST TO MODIFY AN EXISTING PERMIT, DESCRIBE THE REQUESTED CHANGES: _____

IF THIS APPLICATION INCLUDES USE OF DISTRICT WORKS, DESCRIBE THE USE: _____
(CULVERT, BOAT DOCK, FENCE, BEAUTIFICATION, ETC. NOTE! INCLUDE CANAL NAME)

NOTE! IN ALL CASES AN ACCURATE LOCATION MAP WITH THE PROJECT BOUNDARIES CLEARLY SHOWN MUST BE SUBMITTED. ALSO, IF THIS IS A PROPOSED OR EXPANDED PROJECT SUBMIT A CURRENT AERIAL PHOTOGRAPH SHOWING THE PROJECT BOUNDARIES.

RULES 40E-2.101, 40E-4.101, and 40E-6.101 F.A.C. SPECIFY DATA REQUIREMENTS TO CONSTITUTE A COMPLETE PERMIT APPLICATION. A LIST OF THE REFERENCED RULES IS PROVIDED ON THE BACK OF THIS FORM. ANY NECESSARY CHECKLIST MAY BE OBTAINED FROM THE DISTRICT AT THE ABOVE ADDRESS.

RECEIVED
DEC 19 1984
RESOURCE CONTROL DEPARTMENT

_____ DATE: _____
OWNER'S SIGNATURE (IF NOT THE OWNER, CERTIFY BELOW)

I HEREBY CERTIFY THAT I AM AN AUTHORIZED AGENT OF THE OWNER:

John C. Lunsford TITLE: Senior Engineer

NOTE! MANY PROJECTS ALSO REQUIRE APPROVAL BY OTHER STATE AND FEDERAL AGENCIES. SFWMD INFORMS SOME AGENCIES OF PERMIT APPLICATIONS RECEIVED BUT THE RESPONSIBILITY FOR REQUESTING APPROVALS RESTS WITH THE OWNER.

FORM RC-1
Rev. 12/82

WATER USE

40E-2.101 Content of Application.

(1) Applications for permits required by this chapter shall be filed with the District. The application shall contain:

(a) Form RC-1 "Application to the South Florida Water Management District" ;

(b) The information required in subsection 373.229(1), Florida Statutes; and

(c) Information sufficient to show that the use meets the criteria and conditions established in rule 40E-2.301.

(2) In addition to the information specified in subsection (1), the application shall contain:

(a) for public water supply uses, the information required in Appendix 1 of the District's "Basis of Review for Public Water System Water Use Applications-August 1980";

(b) for industrial water uses, the information required in Appendix 1 of the District's "Basis of Review of Applications for Industrial Water Use within the South Florida Water Management District-October 1980";

(c) for mining water uses, the information required in Appendix 1 of the District's "Basis of Review of Applications for Mining Water Use (Dewatering) within the South Florida Water Management District-December 1980."

(3) The application must be signed by the user or his authorized agent.

Specific Authority 373.044, 373.113 F.S.
Law Implemented 373.103(1), 373.219, 373.223, 373.229 F.S.
History - New 9-3-81, 12-1-82.

SURFACE WATER MANAGEMENT (DRAINAGE)

40E-4.101 Content of Application.

(1) Applications for permits required by this chapter shall be filed with the District. The application shall contain:

(a) Form RC-1 "Application to the South Florida Water Management District"

(b) The information required in subsection 373.413(2) Florida Statutes;

(c) Drawings, calculations, and engineering details sufficient to define the nature, scope, intent and functioning of the work proposed; and

(d) The information required in Appendix 1 of the document described in paragraph 40E-4.091(1)(a).

(2) The application must be signed by the owner and his authorized agent, if applicable.

Specific Authority 373.044, 373.113 F.S.
Law Implemented 373.413, 373.416, 373.426 F.S.
History—New 9-3-81, Amended 1-31-82, 12-1-82.
Formerly 16K-4.03(2), 16K-4.07(2), 16K-4.09(2)

UTILIZATION OF DISTRICT WORKS OR LANDS

40E-6.101 Content of Application.

(1) Applications for permits required by this chapter shall be filed with the District. The application shall contain the following information:

(a) Form RC-1 "Application to the South Florida Water Management District" ;

(b) The applicant's name and address including zip code;

(c) The owner's name and complete address if applicant or user is other than the owner;

(d) The project location relative to County, Section, Township and Range; Lot, Block and Subdivision; or a metes and bounds description;

(e) Whether the proposed use is a modification of an existing use, or is a new use;

(f) A description of the proposed use of or encroachment on works of the District;

(g) A description of the portion of the works of the District to be used;

(h) Three copies of a scaled or fully dimensioned 8½" x 14" drawing reflecting the proposed use in plan and elevation views and as related to the applicable work of the District tied to a known reference point in the immediate area of the proposed use;

(i) Information sufficient to demonstrate that the proposed use meets the criteria established in the District's "Criteria Manual for Use of Works of the District-June 1981".

(2) Applications shall be signed by the applicant or his authorized agent.

Specific Authority 373.044, 373.113 F.S.
Law Implemented 373.085(1) F.S.
History—New 9-3-81, Amended 12-1-82.
Formerly 16K-5.04(1)

RINKER MATERIALS CORP.
BLOCKS — CONCRETE — STEEL — BUILDING SUPPLIES
FIRST WITH THE BEST
P. O. DRAWER K WEST PALM BEACH, FLORIDA 33402 TELEPHONE (305) 833-5555

November 15, 1984

RECEIVED
NOV 19 1984
RESOURCE CONTROL DEPARTMENT

Mr. Alan Leavens
Resource Control Dept.
So. Fla. Water Management District
P.O. Box V
West Palm Beach, Fl 33402

RE: Water use General Permit #84-169W at Rinker Materials' West Ft. Pierce Concrete Plant

Dear Alan,

This is to confirm our meeting of Tuesday, November 13, 1984 between yourself, Richard Tomasello with SFWMD, Michael Kirk with Rinker Materials, and myself.

Our problem is concerning a letter dated October 10, 1984 from Patrick Gleason, Director of the SFWMD Water Use Division, to John Lissenden, Senior Engineer with Rinker Materials Corp. The letter included five (5) limiting conditions.

One of the limiting conditions required application for a surface water management permit prior to withdrawal of water from our well.

The building permit for the plant was issued by St. Lucie County on April 26, 1982. The plant is now 90% complete and scheduled for opening the beginning of January 1985.

Although we are willing to fully cooperate with the SFWMD in this matter, we do not feel it fair that the application or processing of a surface water management permit should effect the opening of our completed facility.

It was yours and Mr. Tomasello's feelings that if an application was submitted for a surface water management permit, the SFWMD would not interfere with the scheduled opening of our plant.

Sincerely,

Don Beers, P.E.

DB/ys

cc: SFWMD - Richard Tomasello, P.E.
Dr. Gleason
Gail Milleson
RMC - CDE, BB,SL, JCL, MK
FILE - WFT- Permits

RINKER
BLOCKS — CONCRETE — STEEL — BUILDING SUPPLIES
FIRST WITH THE BEST
P. O. DRAWER K WEST PALM BEACH, FLORIDA 33402 TELEPHONE (305) 833-5555

January 24, 1984

TO WHOM IT MAY CONCERN:

This letter is authorization for John Lissenden, Senior Engineer, to sign applications for site work and utility permitting for Rinker Materials Corporation.

RINKER MATERIALS CORPORATION

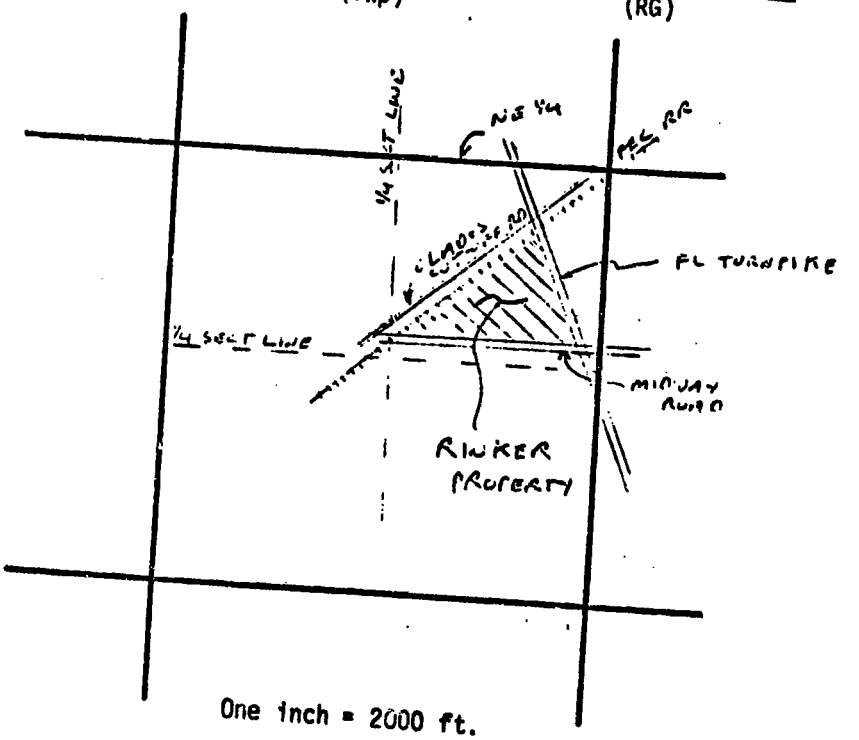
M. E. Rinker, President

Applicant RINKER MATERIALS CORP.

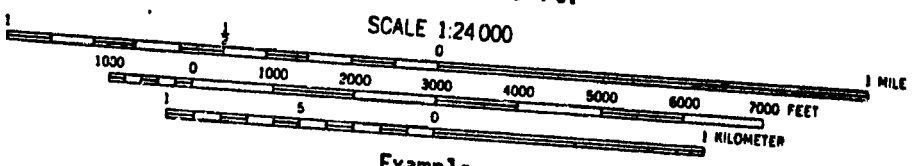
Section Map

Locate your property as well as possible on the section below. (A section is one square mile). Indicate the Section, Township and Range of your property. Information on the Section in which you are located is available from county general highway maps, U.S. Geological topographic maps, Notice of Taxes, Dolph County Street Atlases, the Florida Department of Transportation and other sources.

Section 1 Township (Twp) 36 S Range (RG) 39 E

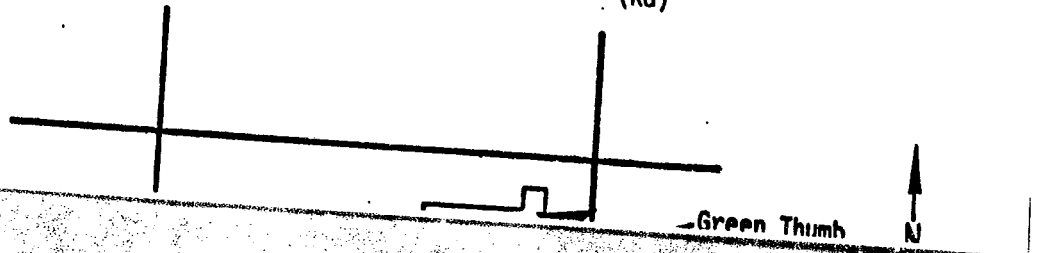


One inch = 2000 ft.



Example

Section 23 Township (Twp) 44 Range (RG) 43



RINKER Site West Ft Pierce

TOTAL Site	37.56
Lake	14.01
Pervious	5.89
Impervious	17.66
Avg Ground	22.0
Water Table	17.5

S = $\frac{10.9}{12}$ × 5.89 = 5.35 $\frac{5.35}{37.56 \times 12}$ = 1.71 × .75 = 1.28"

Stage Storage

LAKE V 14.01 From 17.5 To 23

17.5,	0
18	7.0
19	21.01
20	35.02
21	49.03
22	63.04
23	77.05

5yr 1hr P = 2.8

2.5 × .84 = 2.11 × 37.56 ÷ 12 = 6.6 AF parking ok

25yr P_{24} = 7.5" Q = 6.16 ; 19.3 AF stage 18.8 ±

100yr P_{72} = 12.23 Q = 10.82 ; 33.86 AF stage 19.8 ±

SFWMD Permit No. 56-01995-P

SOUTH FLORIDA WATER MANAGEMENT DISTRICT

BEG. PERMIT NUMBER:

56-01995-P

APPLICATION NUMBER:

031216-16

-56-01995-P-

FORM [illegible]
Rev [illegible]

APPLICATION/PERMIT FILE RECORD & ACTION SHEET

Name: Mayo Warehouse Permit No. 56-01995-P

Application No. 031216-16

This file contains:

☐ ORIGINAL APPLICATION ☐ PERMIT ☐ SPECIAL CONDITION SHEET(S)

☐ STAFF CALCULATION SHEET(S) ☐ DRAWING(S) ☐ STAFF REPORT

Chronological Correspondence/Action Record

Date	Subject	By	Comments
7/30/04	Staff Report Mailed	GH	K. Cranford
8/11/04	Permit Issued		M. Parrott

SOUTH FLORIDA WATER MANAGEMENT DISTRICT
ENVIRONMENTAL RESOURCE PERMIT NO. 56-01995-P
DATE ISSUED: AUGUST 11, 2004

FORM #0145
Rev. 08/99

PERMITTEE: JOHN A. MAYO
(MAYO WAREHOUSE)
PO BOX 292256,
DAVIE , FL 33329-2256

PROJECT DESCRIPTION: CONCEPTUAL APPROVAL OF A SURFACE WATER MANAGEMENT SYSTEM TO SERVE AN 8.84 ACRE PROJECT KNOWN AS MAYO WAREHOUSE. (NO CONSTRUCTION IS AUTHORIZED BY THIS PERMIT.)

PROJECT LOCATION: ST LUCIE COUNTY, SECTION 6 TWP 36S RGE 40E

PERMIT DURATION: See Special Condition No:1. See attached Rule 40E-4.321, Florida Administrative Code.

This Permit is issued pursuant to Application No. 031216-16 , date November 5, 2003. Permittee agrees to hold and save the South Florida Water Management District and its successors harmless from any and all damages, claims or liabilities which may arise by reason of the construction, operation, maintenance or use of activities authorized by this Permit. This Permit is issued under the provisions of Chapter 373 , Part IV Florida Statutes (F.S.), and the Operating Agreement Concerning Regulation Under Part IV, Chapter 373 F.S., between South Florida Water Management District and the Department of Environmental Protection. Issuance of this Permit constitutes certification of compliance with state water quality standards where neccessary pursuant to Section 401, Public Law 92-500, 33 USC Section 1341 , unless this Permit is issued pursuant to the net improvement provisions of Subsections 373.414(1)(b), F.S., or as otherwise stated herein.

This Permit may be transferred pursuant to the appropriate provisions of Chapter 373, F.S, and Sections 40E-1.6107(1) and (2), and 40E-4.351(1), (2), and (4), Florida Administrative Code (F.A.C.). This Permit may be revoked, suspended, or modified at any time pursuant to the appropriate provisions of Chapter 373, F.S. and Sections 40E-4.351(1), (2), and (4), F.A.C.

This Permit shall be subject to the General Conditions set forth in Rule 40E-4.381, F.A.C., unless waived or modified by the Governing Board. The Application, and the Environmental Resource Permit Staff Review Summary of the Application, including all conditions, and all plans and specifications incorporated by reference, are a part of this Permit. All activities authorized by this Permit shall be implemented as set forth in the plans, specifications, and performance criteria as set forth and incorporated in the Environmental Resource Permit Staff Review Summary. Within 30 days after completion of construction of the permitted activity, the Permittee shall submit a written statement of completion and certification by a registered professional engineer or other appropriate individual, pursuant to the appropriate provisions of Chapter 373, F.S. and Sections 40E-4.361 and 40E-4.381, F.A.C.

In the event the property is sold or otherwise conveyed, the Permittee will remain liable for compliance with this Permit until transfer is approved by the District pursuant to Rule 40E-1.6107, F.A.C.

SPECIAL AND GENERAL CONDITIONS ARE AS FOLLOWS:

SEE PAGES 2 - 3 OF 6 (18 SPECIAL CONDITIONS).
SEE PAGES 4 - 6 OF 6 (19 GENERAL CONDITIONS).

FILED WITH THE CLERK OF THE SOUTH FLORIDA WATER MANAGEMENT DISTRICT

On ORIGINAL SIGNED BY:
By ELIZABETH VEGUILLA
DEPUTY CLERK

SOUTH FLORIDA WATER MANAGEMENT DISTRICT, BY ITS GOVERNING BOARD

By ORIGINAL SIGNED BY: LORI OJALA
SECRETARY

SPECIAL CONDITIONS

1. The conceptual phase of this permit shall expire on August 12, 2006.

2. Operation of the surface water management system shall be the responsibility of the permittee.

3. Discharge Facilities:

   Structure: CS-1
   1-3" WIDE RECTANGULAR NOTCH weir with crest at elev. 20.3' NGVD.
   1-3" dia. CIRCULAR ORIFICE with invert at elev. 18.65' NGVD.
   1-drop inlet with crest at elev. 22.5' NGVD.
   Receiving body : NSLRWCD C-103 Canal
   Control elev : 18.65 feet NGVD.

   Structure: CS-2
   1-6" WIDE RECTANGULAR NOTCH weir with crest at elev. 20.05' NGVD.
   1-drop inlet with crest at elev. 22' NGVD.
   Receiving body : Wetland
   Control elev : 18.65 feet NGVD.

4. The permittee shall be responsible for the correction of any erosion, shoaling or water quality problems that result from the construction or operation of the surface water management system.

5. Measures shall be taken during construction to insure that sedimentation and/or turbidity violations do not occur in the receiving water.

6. The District reserves the right to require that additional water quality treatment methods be incorporated into the drainage system if such measures are shown to be necessary.

7. Facilities other than those stated herein shall not be constructed without an approved modification of this permit.

8. A stable, permanent and accessible elevation reference shall be established on or within one hundred (100) feet of all permitted discharge structures no later than the submission of the certification report. The location of the elevation reference must be noted on or with the certification report.

9. The permittee shall provide routine maintenance of all of the components of the surface water management system in order to remove all trapped sediments/debris. All materials shall be properly disposed of as required by law. Failure to properly maintain the system may result in adverse flooding conditions.

10. This permit is issued based on the applicant's submitted information which reasonably demonstrates that adverse water resource related impacts will not be caused by the completed permit activity. Should any adverse impacts caused by the completed surface water management system occur, the District will require the permittee to provide appropriate mitigation to the District or other impacted party. The District will require the permittee to modify the surface water management system, if necessary, to eliminate the cause of the adverse impacts.

11. Minimum building floor elevation: BASIN: Site - 23.30 feet NGVD.

12. Minimum parking lot elevation: Basin: Site - 22.00 feet NGVD.

13. All commercial/industrial parcels shall provide a minimum dry pre-treatment volume of 1/2 inch of runoff prior to discharge into the master surface water management system.

14. Prior to any future construction, the permittee shall apply for and receive a permit modification. As part of the permit application, the applicant for that phase shall

provide documentation verifying that the proposed construction is consistent with the design of the master surface water management system, including the land use and site grading assumptions.

15. The District reserves the right to require remedial measures to be taken by the permittee if monitoring or other information demonstrates that adverse impacts to onsite or offsite wetlands, upland conservation areas or buffers, or other surface waters have occurred due to project related activities.

16. At the time of construction approval, the permittee shall submit two certified copies of the recorded conservation easement for the upland buffer. The data should also be supplied in a digital CAD (.dxf) or GIS (ESRI Coverage) format. The files should be in the Florida State Plane coordinate system, East Zone (3601) with a data datum of NAD83, HARN with the map units in feet. This data should reside on a CD or floppy disk and be submitted to the District's Environmental Resource Compliance Division in the service area office where the application was submitted.

    The recorded easement shall be in substantial conformance with Exhibit 8. Any proposed modifications to the approved form must receive prior written consent from the District. The easement must be free of encumbrances or interests in the easement which the District determines are contrary to the intent of the easement. In the event it is later determined that there are encumbrances or interests in the easement which the District determines are contrary to the intent of the easement, the permittee shall be required to provide release or subordination of such encumbrances or interests.

17. Upon submittal of an application for construction approval, the permittee shall submit a maintenance plan for the upland buffer along the north property line for review by District staff. The plan shall be subject to the approval of District staff and the environmental criteria in effect at the time of the construction permit application. A maintenance program shall be implemented on a regular basis to ensure the integrity and viability of the upland buffer area as permitted. Maintenance shall be conducted in perpetuity to ensure that the conservation area is maintained free from Category 1 exotic vegetation (as defined by the Florida Exotic Pest Plant Council at the time of permit issuance) immediately following a maintenance activity. Coverage of exotic and nuisance plant species shall not exceed 5% of total cover between maintenance activities. In addition, the permittee shall manage the conservation areas such that exotic/nuisance plant species do not dominate any one section of those areas.

18. Issuance of this permit deletes 8.84 from District permit number 56-01444-P (Midway Industrial Park).

GENERAL CONDITIONS

1. All activities authorized by this permit shall be implemented as set forth in the plans, specifications and performance criteria as approved by this permit. Any deviation from the permitted activity and the conditions for undertaking that activity shall constitute a violation of this permit and Part IV, Chapter 373. F S.

2. This permit or a copy thereof, complete with all conditions, attachments, exhibits, and modifications shall be kept at the work site of the permitted activity. The complete permit shall be available for review at the work site upon request by District staff. The permittee shall require the contractor to review the complete permit prior to commencement of the activity authorized by this permit.

3. Activities approved by this permit shall be conducted in a manner which does not cause violations of State water quality standards. The permittee shall implement best management practices for erosion and pollution control to prevent violation of State water quality standards. Temporary erosion control shall be implemented prior to and during construction, and permanent control measures shall be completed within 7 days of any construction activity. Turbidity barriers shall be installed and maintained at all locations where the possibility of transferring suspended solids into the receiving waterbody exists due to the permitted work. Turbidity barriers shall remain in place at all locations until construction is completed and soils are stabilized and vegetation has been established. All practices shall be in accordance with the guidelines and specifications described in Chapter 6 of the Florida Land Development Manual; A Guide to Sound Land and Water Management (Department of Environmental Regulation, 1988), incorporated by reference in Rule 40E-4.091, F.A.C. unless a project-specific erosion and sediment control plan is approved as part of the permit. Thereafter the permittee shall be responsible for the removal of the barriers. The permittee shall correct any erosion or shoaling that causes adverse impacts to the water resources.

4. The permittee shall notify the District of the anticipated construction start date within 30 days of the date that this permit is issued. At least 48 hours prior to commencement of activity authorized by this permit, the permittee shall submit to the District an Environmental Resource Permit Construction Commencement Notice Form Number 0960 indicating the actual start date and the expected construction completion date.

5. When the duration of construction will exceed one year, the permittee shall submit construction status reports to the District on an annual basis utilizing an annual status report form. Status report forms shall be submitted the following June of each year.

6. Within 30 days after completion of construction of the permitted activity, the permitee shall submit a written statement of completion and certification by a professional engineer or other individual authorized by law, utilizing the supplied Environmental Resource/Surface Water Management Permit Construction Completion/Certification Form Number 0881A, or Environmental Resource/Surface Water Management Permit Construction Completion Certification - For Projects Permitted prior to October 3, 1995 Form No. 0881B, incorporated by reference in Rule 40E-1.659, F.A.C. The statement of completion and certification shall be based on onsite observation of construction or review of as-built drawings for the purpose of determining if the work was completed in compliance with permitted plans and specifications. This submittal shall serve to notify the District that the system is ready for inspection. Additionally, if deviation from the approved drawings are discovered during the certification process, the certification must be accompanied by a copy of the approved permit drawings with deviations noted. Both the original and revised specifications must be clearly shown. The plans must be clearly labeled as "as-built" or "record" drawings. All surveyed dimensions and elevations shall be certified by a registered surveyor.

7. The operation phase of this permit shall not become effective: until the permittee has complied with the requirements of condition (6) above, and submitted a request

for conversion of Environmental Resource Permit from Construction Phase to Operation Phase, Form No. 0920; the District determines the system to be in compliance with the permitted plans and specifications; and the entity approved by the District in accordance with Sections 9.0 and 10.0 of the Basis of Review for Environmental Resource Permit Applications within the South Florida Water Management District, accepts responsibility for operation and maintenance of the system. The permit shall not be transferred to such approved operation and maintenance entity until the operation phase of the permit becomes effective. Following inspection and approval of the permitted system by the District, the permittee shall initiate transfer of the permit to the approved responsible operating entity if different from the permittee. Until the permit is transferred pursuant to Section 40E-1.6107, F.A.C., the permittee shall be liable for compliance with the terms of the permit.

8. Each phase or independent portion of the permitted system must be completed in accordance with the permitted plans and permit conditions prior to the initiation of the permitted use of site infrastructure located within the area served by that portion or phase of the system. Each phase or independent portion of the system must be completed in accordance with the permitted plans and permit conditions prior to transfer of responsibility for operation and maintenance of the phase or portion of the system to a local government or other responsible entity.

9. For those systems that will be operated or maintained by an entity that will require an easement or deed restriction in order to enable that entity to operate or maintain the system in conformance with this permit, such easement or deed restriction must be recorded in the public records and submitted to the District along with any other final operation and maintenance documents required by Sections 9.0 and 10.0 of the Basis of Review for Environmental Resource Permit applications within the South Florida Water Management District, prior to lot or units sales or prior to the completion of the system, whichever comes first. Other documents concerning the establishment and authority of the operating entity must be filed with the Secretary of State, county or municipal entities. Final operation and maintenance documents must be received by the District when maintenance and operation of the system is accepted by the local government entity. Failure to submit the appropriate final documents will result in the permittee remaining liable for carrying out maintenance and operation of the permitted system and any other permit conditions.

10. Should any other regulatory agency require changes to the permitted system, the permittee shall notify the District in writing of the changes prior to implementation so that a determination can be made whether a permit modification is required.

11. This permit does not eliminate the necessity to obtain any required federal, state, local and special district authorizations prior to the start of any activity approved by this permit. This permit does not convey to the permittee or create in the permittee any property right, or any interest in real property, nor does it authorize any entrance upon or activities on property which is not owned or controlled by the permittee, or convey any rights or privileges other than those specified in the permit and Chapter 40E-4 or Chapter 40E-40, F.A.C..

12. The permittee is hereby advised that Section 253.77, F.S. states that a person may not commence any excavation, construction, or other activity involving the use of sovereign or other lands of the State, the title to which is vested in the Board of Trustees of the Internal Improvement Trust Fund without obtaining the required lease, license, easement, or other form of consent authorizing the proposed use. Therefore, the permittee is responsible for obtaining any necessary authorizations from the Board of Trustees prior to commencing activity on sovereignty lands or other state-owned lands.

13. The permittee must obtain a Water Use permit prior to construction dewatering, unless the work qualifies for a general permit pursuant to Subsection 40E-20.302(3), F.A.C., also known as the "No Notice" Rule.

14. The permittee shall hold and save the District harmless from any and all damages, claims, or liabilities which may arise by reason of the construction, alteration, operation, maintenance, removal, abandonment or use of any system authorized by the

permit.

15. Any delineation of the extent of a wetland or other surface water submitted as part of the permit application, including plans or other supporting documentation, shall not be considered binding, unless a specific condition of this permit or a formal determination under Section 373.421(2), F.S., provides otherwise.

16. The permittee shall notify the District in writing within 30 days of any sale, conveyance, or other transfer of ownership or control of a permitted system or the real property on which the permitted system is located. All transfers of ownership or transfers of a permit are subject to the requirements of Rules 40E-1.6105 and 40E-1.6107, F.A.C.. The permittee transferring the permit shall remain liable for corrective actions that may be required as a result of any violations prior to the sale, conveyance or other transfer of the system.

17. Upon reasonable notice to the permittee, District authorized staff with proper identification shall have permission to enter, inspect, sample and test the system to insure conformity with the plans and specifications approved by the permit.

18. If historical or archaeological artifacts are discovered at any time on the project site, the permittee shall immediately notify the appropriate District service center.

19. The permittee shall immediately notify the District in writing of any previously submitted information that is later discovered to be inaccurate.

40E-4.321 Duration of Permits

(1) Unless revoked or otherwise modified the duration of an environmental resource permit issued under this chapter or Chapter 40E-40, F.A.C. is as follows:

(a) For a conceptual approval, two years from the date of issuance or the date specified as a condition of the permit, unless within that period an application for an individual or standard general permit is filed for any portion of the project. If an application for an environmental resource permit is filed, then the conceptual approval remains valid until final action is taken on the environmental resource permit application. If the application is granted, then the conceptual approval is valid for an additional two years from the date of issuance of the permit. Conceptual approvals which have no individual or standard general environmental resource permit applications filed for a period of two years shall expire automatically at the end of the two year period.

(b) For a conceptual approval filed concurrently with a development of regional impact (DRI) application for development approval (ADA) and a local government comprehensive plan amendment, the duration of the conceptual approval shall be two years from whichever one of the following occurs at the latest date:

1. the effective date of the local government's comprehensive plan amendment.
2. the effective date of the local government development order.
3. the date on which the District issues the conceptual approval, or
4. the latest date of the resolution of any Chapter 120.57, F.A.C., administrative proceeding or other legal appeals.

(c) For an individual or standard general environmental resource permit, five years from the date of issuance or such amount of time as made a condition of the permit.

(d) For a noticed general permit issued pursuant to chapter 40-E-400, F.A.C., five years from the date the notice of intent to use the permit is provided to the District.

(2)(a) Unless prescribed by special permit condition, permits expire automatically according to the timeframes indicated in this rule. If application for extension is made in writing pursuant to subsection (3), the permit shall remain in full force and effect until:

1. the Governing Board takes action on an application for extension of an individual permit, or
2. staff takes action on an application for extension of a standard general permit.

(b) Installation of the project outfall structure shall not constitute a vesting of the permit.

(3) The permit extension shall be issued provided that a permittee files a written request with the District showing good cause prior to the expiration of the permit. For the purpose of this rule, good cause shall mean a set of extenuating circumstances outside of the control of the permittee. Requests for extensions, which shall include documentation of the extenuating circumstances and how they have delayed this project, will not be accepted more than 180 days prior to the expiration date.

(4) Substantial modifications to Conceptual Approvals will extend the duration of the Conceptual Approval for two years from the date of issuance of the modification. For the purposes of this section, the term "substantial modification" shall mean a modification which is reasonably expected to lead to substantially different water resource or environmental impacts which require a detailed review.

(5) Substantial modifications to individual or standard general environmental resource permits issued pursuant to a permit application extend the duration of the permit for three years from the date of issuance of the modification. Individual or standard general environmental resource permit modifications do not extend the duration of a conceptual approval.

(6) Permit modifications issued pursuant to subsection 40E-4.331(2)(b), F.A.C. (letter modifications) do not extend the duration of a permit.

(7) Failure to complete construction or alteration of the surface water management system and obtain operation phase approval from the District within the permit duration shall require a new permit authorization in order to continue construction unless a permit extension is granted.

Specific authority 373.044, 373.113 F.S. Law implemented 373.413, 373.416, 373.419, 373.426 F.S. History—New 9-3-81. Amended 1-31-82, 12-1-82, Formerly 16K-4.07(4), Amended 7-1-86, 4/20/94, Amended 7-1-95, 4/20/94, 10-3-95

NOTICE OF RIGHTS

Section 120.569(1), Fla. Stat. (1999), requires that "each notice shall inform the recipient of any administrative hearing or judicial review that is available under this section, s. 120.57, or s. 120.68; shall indicate the procedure which must be followed to obtain the hearing or judicial review, and shall state the time limits which apply." Please note that this Notice of Rights is not intended to provide legal advice. Not all the legal proceedings detailed below may be an applicable or appropriate remedy. You may wish to consult an attorney regarding your legal rights.

Petition for Administrative Proceedings

1. A person whose substantial interests are affected by the South Florida Water Management District's (SFWMD) action has the right to request an administrative hearing on that action. The affected person may request either a formal or an informal hearing, as set forth below. A point of entry into administrative proceedings is governed by Rules 28-106.111 and 40E-1.511, Fla. Admin. Code, (also published as an exception to the Uniform Rules of Procedure as Rule 40E-0.109), as set forth below. Petitions are deemed filed upon receipt of the original documents by the SFWMD Clerk.

a. Formal Administrative Hearing: If a genuine issue(s) of material fact is in dispute, the affected person seeking a formal hearing on a SFWMD decision which does or may determine their substantial interests shall file a petition for hearing pursuant to Sections 120.569 and 120.57(1), Fla. Stat. or for mediation pursuant to Section 120.573, Fla. Stat. within 21 days, except as provided in subsections c. and d. below, of either written notice through mail or posting or publication of notice that the SFWMD has or intends to take final agency action. Petitions must substantially comply with the requirements of Rule 28-106.201(2), Fla. Admin. Code, a copy of the which is attached to this Notice of Rights.

b. Informal Administrative Hearing: If there are no issues of material fact in dispute, the affected person seeking an informal hearing on a SFWMD decision which does or may determine their substantial interests shall file a petition for hearing pursuant to Sections 120.569 and 120.57(2), Fla. Stat. or for mediation pursuant to Section 120.573, Fla. Stat. within 21 days, except as provided in subsections c. and d. below, of either written notice through mail or posting or publication of notice that the SFWMD has or intends to take final agency action. Petitions must substantially comply with the requirements of Rule 28-106.301(2), Fla. Admin. Code, a copy of the which is attached to this Notice of Rights.

c. Administrative Complaint and Order:
If a Respondent objects to a SFWMD Administrative Complaint and Order, pursuant to Section 373.119, Fla. Stat. (1997), the person named in the Administrative Complaint and Order may file a petition for a hearing no later than 14 days after the date such order is served. Petitions must substantially comply with the requirements of either subsection a. or b. above.

d. State Lands Environmental Resource Permit: Pursuant to Section 373.427, Fla. Stat., and Rule 40E-1.511(3), Fla. Admin. Code (also published as an exception to the Uniform Rules of Procedure as Rule 40E-0.109(2)(c)), a petition objecting to the SFWMD's agency action regarding consolidated applications for Environmental Resource Permits and Use of Sovereign Submerged Lands (SLERPs), must be filed within 14 days of the notice of consolidated intent to grant or deny the SLERP. Petitions must substantially comply with the requirements of either subsection a. or b. above.

e. Emergency Authorization and Order:
A person whose substantial interests are affected by a SFWMD Emergency Authorization and Order, has a right to file a petition under Sections 120.569, 120.57(1), and 120.57(2), Fla. Stat., as provided in subsections a. and b. above. However, the person, or the agent of the person responsible for causing or contributing to the emergency conditions shall take whatever action necessary to cause immediate compliance with the terms of the Emergency Authorization and Order.

f. Order for Emergency Action: A person whose substantial interests are affected by a SFWMD Order for Emergency Action has a right to file a petition pursuant to Rules 28-107.005 and 40E-1.611, Fla. Admin. Code, copies of which are attached to this Notice of Rights, and Section 373.119(3), Fla. Stat., for a hearing on the Order. Any subsequent agency action or proposed agency action to initiate a formal revocation proceeding shall be separately noticed pursuant to section g. below.

g. Permit Suspension, Revocation, Annulment, and Withdrawal: If the SFWMD issues an administrative complaint to suspend, revoke, annul, or withdraw a permit, the permittee may request a hearing to be conducted in accordance with Sections 120.569 and 120.57, Fla. Stat., within 21 days of either written notice through mail or posting or publication of notice that the SFWMD has or intends to take final agency action. Petitions must substantially comply with the requirements of Rule 28-107.004(3), Fla. Admin. Code, a copy of the which is attached to this Notice of Rights.

2. Because the administrative hearing process is designed to formulate final agency action, the filing of a petition means that the SFWMD's final action may be different from the position taken by it previously. Persons whose substantial interests may be affected by

any such final decision of the SFWMD shall have, pursuant to Rule 40E-1.511(2), Fla. Admin. Code (also published as an exception to the Uniform Rules of Procedure as Rule 40E-0.109(2)(c)), an additional 21 days from the date of receipt of notice of said decision to request an administrative hearing. However, the scope of the administrative hearing shall be limited to the substantial deviation.

3. Pursuant to Rule 40E-1.511(4), Fla. Admin. Code, substantially affected persons entitled to a hearing pursuant to Section 120.57(1), Fla. Stat., may waive their right to such a hearing and request an informal hearing before the Governing Board pursuant to Section 120.57(2), Fla. Stat., which may be granted at the option of the Governing Board.

4. Pursuant to Rule 28-106.111(3), Fla. Admin. Code, persons may file with the SFWMD a request for extension of time for filing a petition. The SFWMD, for good cause shown, may grant the extension. The request for extension must contain a certificate that the petitioner has consulted with all other parties, if any, concerning the extension and that the SFWMD and all other parties agree to the extension.

CIRCUIT COURT

5. Pursuant to Section 373.617, Fla. Stat., any substantially affected person who claims that final agency action of the SFWMD relating to permit decisions constitutes an unconstitutional taking of property without just compensation may seek judicial review of the action in circuit court by filing a civil action in the circuit court in the judicial circuit in which the affected property is located within 90 days of the rendering of the SFWMD's final agency action.

6. Pursuant to Section 403.412, Fla. Stat., any citizen of Florida may bring an action for injunctive relief against the SFWMD to compel the SFWMD to enforce the laws of Chapter 373, Fla. Stat., and Title 40E, Fla. Admin. Code. The complaining party must file with the SFWMD Clerk a verified complaint setting forth the facts upon which the complaint is based and the manner in which the complaining party is affected. If the SFWMD does not take appropriate action on the complaint within 30 days of receipt, the complaining party may then file a civil suit for injunctive relief in the 15th Judicial Circuit in and for Palm Beach County or circuit court in the county where the cause of action allegedly occurred.

7. Pursuant to Section 373.433, Fla. Stat., a private citizen of Florida may file suit in circuit court to require the abatement of any stormwater management system, dam, impoundment, reservoir, appurtenant work or works that violate the provisions of Chapter 373, Fla. Stat.

DISTRICT COURT OF APPEAL

8. Pursuant to Section 120.68, Fla. Stat., a party who is adversely affected by final SFWMD action may seek judicial review of the SFWMD's final decision by filing a notice of appeal pursuant to Florida Rule of Appellate Procedure 9.110 in the Fourth District Court of Appeal or in the appellate district where a party resides and filing a second copy of the notice with the SFWMD Clerk within 30 days of rendering of the final SFWMD action.

LAND AND WATER ADJUDICATORY COMMISSION

9. A party to a "proceeding below" may seek review by the Land and Water Adjudicatory Commission (FLAWAC) of SFWMD's final agency action to determine if such action is consistent with the provisions and purposes of Chapter 373, Fla. Stat. Pursuant to Section 373.114, Fla. Stat., and Rules 42-2.013 and 42-2.0132, Fla. Admin. Code, a request for review of (a) an order or rule of the SFWMD must be filed with FLAWAC within 20 days after rendition of the order or adoption of the rule sought to be reviewed; (b) an order of the Department of Environmental Protection (DEP) requiring amendment or repeal of a SFWMD rule must be filed with FLAWAC within 30 days of rendition of the DEP's order, and (c) a SFWMD order entered pursuant to a formal administrative hearing under Section 120.57(1), Fla. Stat., must be filed no later than 20 days after rendition of the SFWMD's final order. Simultaneous with filing, a copy of the request for review must be served on the DEP Secretary, any person named in the SFWMD or DEP final order, and all parties to the proceeding below. A copy of Rule 42-2.013, Fla. Admin. Code is attached to this Notice of Rights.

PRIVATE PROPERTY RIGHTS PROTECTION ACT

10. A property owner who alleges a specific action of the SFWMD has inordinately burdened an existing use of the real property, or a vested right to a specific use of the real property, may file a claim in the circuit court where the real property is located within 1 year of the SFWMD action pursuant to the procedures set forth in Subsection 70.001(4)(a), Fla. Stat.

LAND USE AND ENVIRONMENTAL DISPUTE RESOLUTION

11. A property owner who alleges that a SFWMD development order (as that term is defined in Section 70.51(2)(a), Fla. Stat. to include permits) or SFWMD enforcement action is unreasonable, or unfairly burdens the use of the real property, may file a request for relief with the SFWMD within 30 days of receipt of the SFWMD's order or notice of agency action pursuant to the procedures set forth in Subsections 70.51(4) and (6), Fla. Stat.

MEDIATION

12. A person whose substantial interests are, or may be, affected by the SFWMD's action may choose mediation as an alternative remedy under Section 120.573, Fla. Stat. Pursuant to Rule 28-106.111(2), Fla. Admin. Code, the petition for mediation shall be filed within 21 days of either written notice through mail or posting or

publication of notice that the SFWMD has or intends to take final agency action. Choosing mediation will not affect the right to an administrative hearing if mediation does not result in settlement.

Pursuant to Rule 28-106.402, Fla. Admin. Code, the contents of the petition for mediation shall contain the following information:

(1) the name, address, and telephone number of the person requesting mediation and that person's representative, if any;

(2) a statement of the preliminary agency action;

(3) an explanation of how the person's substantial interests will be affected by the agency determination; and

(4) a statement of relief sought.

As provided in Section 120.573, Fla. Stat. (1997), the timely agreement of all the parties to mediate will toll the time limitations imposed by Sections 120.569 and 120.57, Fla. Stat., for requesting and holding an administrative hearing. Unless otherwise agreed by the parties, the mediation must be concluded within 60 days of the execution of the agreement. If mediation results in settlement of the dispute, the SFWMD must enter a final order incorporating the agreement of the parties. Persons whose substantial interest will be affected by such a modified agency decision have a right to petition for hearing within 21 days of receipt of the final order in accordance with the requirements of Sections 120.569 and 120.57, Fla. Stat., and SFWMD Rule 28-106.201(2), Fla. Admin. Code. If mediation terminates without settlement of the dispute, the SFWMD shall notify all parties in writing that the administrative hearing process under Sections 120.569 and 120.57, Fla. Stat., remain available for disposition of the dispute, and the notice will specify the deadlines that then will apply for challenging the agency action.

VARIANCES AND WAIVERS

13. A person who is subject to regulation pursuant to a SFWMD rule and believes the application of that rule will create a substantial hardship or will violate principles of fairness (as those terms are defined in Subsection 120.542(2), Fla. Stat.) and can demonstrate that the purpose of the underlying statute will be or has been achieved by other means, may file a petition with the SFWMD Clerk requesting a variance from or waiver of the SFWMD rule. Applying for a variance or waiver does not substitute or extend the time for filing a petition for an administrative hearing or exercising any other right that a person may have concerning the SFWMD's action. Pursuant to Rule 28-104.002(2), Fla. Admin. Code, the petition must include the following information:

(a) the caption shall read:
Petition for (Variance from) or (Waiver of) Rule (Citation)

(b) The name, address, telephone number and any facsimile number of the petitioner;

(c) The name, address telephone number and any facsimile number of the attorney or qualified representative of the petitioner, (if any);

(d) the applicable rule or portion of the rule;

(e) the citation to the statue the rule is implementing;

(f) the type of action requested;

(g) the specific facts that demonstrate a substantial hardship or violation of principals of fairness that would justify a waiver or variance for the petitioner;

(h) the reason why the variance or the waiver requested would serve the purposes of the underlying statute; and

(i) a statement of whether the variance or waiver is permanent or temporary. If the variance or waiver is temporary, the petition shall include the dates indicating the duration of the requested variance or waiver.

A person requesting an emergency variance from or waiver of a SFWMD rule must clearly so state in the caption of the petition. In addition to the requirements of Section 120.542(5), Fla. Stat. pursuant to Rule 28-104.004(2), Fla. Admin. Code, the petition must also include:

a) the specific facts that make the situation an emergency; and

b) the specific facts to show that the petitioner will suffer immediate adverse effect unless the variance or waiver is issued by the SFWMD more expeditiously than the applicable timeframes set forth in Section 120.542, Fla. Stat.

WAIVER OF RIGHTS

14. Failure to observe the relevant time frames prescribed above will constitute a waiver of such right.

28-106.201 INITIATION OF PROCEEDINGS
(INVOLVING DISPUTED ISSUES OF MATERIAL FACT)

(2) All petitions filed under these rules shall contain:

(a) The name and address of each agency affected and each agency's file or identification number, if known;

(b) The name, address, and telephone number of the petitioner; the name, address, and telephone number of the petitioner's representative, if any, which shall be the address for service purposes during the course of the proceeding, and an explanation of how the petitioner's substantial interests will be affected by the agency determination;

(c) A statement of when and how the petitioner received notice of the agency decision;

(d) A statement of all disputed issues of material fact. If there are none, the petition must so indicate;

(e) A concise statement of the ultimate facts alleged, as well as the rules and statutes which entitle the petitioner to relief; and

(f) A demand for relief.

28-106.301 INITIATION OF PROCEEDINGS
(NOT INVOLVING DISPUTED ISSUES OF MATERIAL FACT)

(2) All petitions filed under these rules shall contain:

(a) The name and address of each agency affected and each agency's file or identification number, if known;

(b) The name, address, and telephone number of the petitioner; the name, address, and telephone number of the petitioner's representative, if any, which shall be the address for service purposes during the course of the proceeding, and an explanation of how the petitioner's substantial interests will be affected by the agency determination;

(c) A statement of when and how the petitioner received notice of the agency decision;

(d) A concise statement of the ultimate facts alleged, as well as the rules and statutes which entitle the petitioner to relief; and

(e) A demand for relief.

28-107.004 SUSPENSION, REVOCATION, ANNULMENT, OR WITHDRAWAL

(3) Requests for hearing filed in accordance with this rule shall include:

(a) The name and address of the party making the request, for purposes of service;

(b) A statement that the party is requesting a hearing involving disputed issues of material fact, or a hearing not involving disputed issues of material fact; and

(c) A reference to the notice, order to show cause, administrative complaint, or other communication that the party has received from the agency.

42-2.013 REQUEST FOR REVIEW PURSUANT TO SECTION 373.114 OR 373.217

(1) In any proceeding arising under Chapter 373, F.S., review by the Florida Land and Water Adjudicatory Commission may be initiated by the Department or a party by filing a request for such review with the Secretary of the Commission and serving a copy on any person named in the rule or order, and on all parties to the proceeding which resulted in the order sought to be reviewed. A certificate of service showing completion of service as required by this subsection shall be a requirement for a determination of sufficiency under Rule 42-2.0132. Failure to file the request with the Commission within the time period provided in Rule 42-2.0132 shall result in dismissal of the request for review.

(2) The request for review shall identify the rule or order requested to be reviewed, the proceeding in which the rule or order was entered and the nature of the rule or order. A copy of the rule or order sought to be reviewed shall be attached. The request for review shall state with particularity:

(a) How the order or rule conflicts with the requirements, provisions and purposes of Chapter 373, F.S., or rules duly adopted thereunder;

(b) How the rule or order sought to be reviewed affects the interests of the party seeking review;

(c) The oral or written statement, sworn or unsworn, which was submitted to the agency concerning the matter to be reviewed and the date and location of the statement, if the individual or entity requesting the review has not participated in a proceeding previously instituted pursuant to Chapter 120, F.S., on the order for which review is sought;

(d) If review of an order is being sought, whether and how the activity authorized by the order would substantially affect natural resources of statewide or regional significance, or whether the order raises issues of policy, statutory interpretation, or rule interpretation that have regional or statewide significance from a standpoint of agency precedent, and all the factual basas in the record which the petitioner claims support such determination(s); and

(e) The action requested to be taken by the Commission as a result of the review, whether to rescind or modify the order, or remand the proceeding to the water management district for further action, or to require the water management district to initiate rulemaking to adopt, amend or repeal a rule.

28-107.005 EMERGENCY ACTION

(1) If the agency finds that immediate serious danger to the public health, safety, or welfare requires emergency action, the agency shall summarily suspend, limit, or restrict a license.

(2) the 14-day notice requirement of Section 120.569(2)(b), F. S., does not apply and shall not be construed to prevent a hearing at the earliest time practicable upon request of an aggrieved party.

(3) Unless otherwise provided by law, within 20 days after emergency action taken pursuant to paragraph (1) of this rule, the agency shall initiate a formal suspension or revocation proceeding in compliance with Sections 120.569, 120.57. and 120.60, F.S.

40E-1.611 EMERGENCY ACTION

(1) An emergency exists when immediate action is necessary to protect public health, safety or welfare; the health of animals, fish or aquatic life; the works of the District; a public water supply, or recreational, commercial, industrial, agricultural or other reasonable uses of land and water resources.

(2) The Executive Director may employ the resources of the District to take whatever remedial action necessary to alleviate the emergency condition without the issuance of an emergency order, or in the event an emergency order has been issued, after the expiration of the requisite time for compliance with that order.

SOUTH FLORIDA WATER MANAGEMENT DISTRICT
3301 Gun Club Road, West Palm Beach, Florida 33406 • (561) 686-8800 • FL WATS 1-800-432-2045 • TDD (561) 697-2574
Mailing Address: P.O. Box 24680, West Palm Beach, FL 33416-4680 • www.sfwmd.gov

July 30, 2004

John Mayo
P.O. Box 292256
Davie, FL 33329-2256

Subject: Application No. 031216-16, **Mayo Warehouse**
St. Lucie County, S6/T36S/R40E

Enclosed is a copy of the South Florida Water Management District's staff report covering the permit application referenced therein. It is requested that you read this staff report thoroughly and understand its contents. The recommendations as stated in the staff report will be presented to our Governing Board for consideration on **Wednesday, August 11, 2004.**

Should you wish to object to the staff recommendation or file a petition, please provide written objections, petitions and/or waivers (refer to the attached "Notice of Rights") to:

Elizabeth Veguilla, Deputy Clerk
South Florida Water Management District
Post Office Box 24680
West Palm Beach, Florida 33416-4680

The "Notice of Rights" addresses the procedures to be followed if you desire a public hearing or other review of the proposed agency action. You are advised, however, to be prepared to defend your position regarding the permit application when it is considered by the Governing Board for final agency action, even if you agree with the staff recommendation, as the Governing Board may take final agency action which differs materially from the proposed agency action.

Please contact the District if you have any questions concerning this matter.

CERTIFICATE OF SERVICE

I HEREBY CERTIFY that a "Notice of Rights" has been mailed to the addressee this 30th day of July, 2004 in accordance with Section 120.60(3), Florida Statutes.

Sincerely,

Damon Meiers, P.E., Deputy Director
Environmental Resource Regulation Department

DM/gh

CERTIFIED #7003 1010 0004 4768 3101
RETURN RECEIPT REQUESTED

GOVERNING BOARD

Nicolás J. Gutiérrez, Jr., Esq., *Chair*
Pamela Brooks-Thomas, *Vice Chair*
Irela M. Bagué
Michael Collins
Hugh M. English
Lennart E. Lindahl, P.E.
Kevin McCarty
Harkley R. Thornton
Trudi K. Williams, P.E.

EXECUTIVE OFFICE

Henry Dean, *Executive Director*

Last Date For Agency Action: 12-AUG-2004

INDIVIDUAL ENVIRONMENTAL RESOURCE PERMIT STAFF REPORT

Project Name: Mayo Warehouse

Permit No.: 56-01995-P

Application No.: 031216-16

Application Type: Environmental Resource (Conceptual Approval)

Location: St Lucie County, S6/T36S/R40E

Permittee : John A. Mayo

Operating Entity : John A Mayo

Project Area: 8.84 acres

Project Land Use: Industrial

DRAFT
Subject to Governing Board Approval

Drainage Basin: NORTH ST LUCIE

Receiving Body: NSLRWCD C-103 Canal

Class: CLASS III

Special Drainage District: North St Lucie River Water Control District

Total Acres Wetland Onsite:	1.86	
Total Acres Wetland Preserved Onsite:	.00	
Total Acres Impacted Onsite :	1.86	
Offsite Mitigation Credits-Mit.Bank:	2.10	Bluefield Ranch

Conservation Easement To District : Yes

Sovereign Submerged Lands: No

PROJECT PURPOSE:

This application is a request for conceptual approval of a surface water management system serving 8.84 acres of commercial development to be known as Mayo Warehouse. Staff recommends approval with conditions.

PROJECT EVALUATION:

PROJECT SITE DESCRIPTION:

The site is located north of Midway Road, east of the Florida Turnpike, and west of Environment Drive (West Milner Drive) on Lots 1 and 2 of Phase II of the Midway Industrial Park in St. Lucie County. Midway Industrial Park, Phase III (56-01444-P) is located to the north and east of the proposed project. Permit 56-00681-S was issued for the Ft. Pierce Post office on the property to the east of this project. Chiquita Citrus Packers (56-00619-S) and a truss company are located to the west of this project.

There are no permitted surface water management facilities within the project area. The site contains a 1.86 acre wetland which will be mitigated for off site.

PROPOSED PROJECT:

This application is a request for conceptual approval of a surface water management (SWM) system serving 8.84 acres of commercial development to be known as Mayo Warehouse. Future development includes five commercial buildings, two dry detention areas and associated utilities and related pavement areas.

The project area was previously permitted as Phase I of the Midway Industrial Park (Permit No. 56-01444-P). The proposed project is separate from and does not rely on the Midway Industrial Park surface water management system. All required water quality treatment and storm attenuation is provided on-site and a new outfall to the NSLRWCD Canal C-103 is proposed.

Runoff from the site will be collected by a series of inlets and culverts and directed to the dry detention areas of the master SWM system. Once stages in the dry detention area reach the required water quality elevation (20.05 ft NGVD), Control Structure 2 will allow a portion of the treated stormwater to enter the adjacent offsite wetland and maintain the historic wetland hydroperiod. An existing culvert beneath Environment Drive (West Milner Drive) connects the adjacent wetland to another wetland within Midway Industrial Park.

The two proposed dry detention areas are hydraulically connected and the ultimate discharge for the project is through Control Structure 1, which discharges to the NSLRWCD C-103 Canal. The master system will provide the require water quality treatment and storm attenuation before discharging to the C-103 Canal.

Documentation has been received from the St. Lucie County Public Works Department conceptually approving the outfall pipe through the Midway Road right-of-way.

LAND USE:

The "Water Mgnt" area represents the bottom area of the dry detention ponds. The "impervious" acreage represents the proposed sidewalks.

Conceptual:

		Area (ac)	Starting Elev. (ft)	Ending Elev. (ft)	Storage Vol.(ac-ft)	Storage Type
Site	Building Coverage	2.2				N/A
	Pavement	2.96	22	24	.9	Linear
	Impervious	.14	22	24	.04	Linear
	Pervious	2.08	22	24	.63	Linear
	Water Mgnt Acreage	.91	19.65		3.15	Vertical
	Side Slope	.55	19.65	22	1.25	Linear
	Total:	**8.84**				

WATER QUANTITY :

Discharge Rate :

The proposed project is within North St. Lucie River Water Control District (NSLRWCD) and structure CS-1 discharges to NSLRWCD Canal No. 103 and has therefore been designed based on the NSLRWCD discharge criteria of a maximum of 2 inches over a 24 hour period. The maximum allowable discharge is 1.47 ac-ft and the proposed discharge is 1.40 ac-ft.

Documentation has been received from the St. Lucie County Public Works Department conceptually approving the outfall pipe through the Midway Road right-of-way. North St. Lucie River Water Control District has issued Permit 04-0737-103 for the outfall to the C-103 Canal.

Structure CS-2 has been designed to maintain the existing hydroperiod of the adjacent wetland. The pre-development rate into the wetland from the 25 yr, 3 day storm was determined to be 4.26 cfs based on a rainfall depth of 9.1 inches. The post development discharge rate into the adjacent wetland is 4.14 cfs assuming a constant tailwater elevation in the wetland of 18.65 ft NGVD.

Discharge Storm Frequency : 10 YEAR-3 DAY Design Rainfall : 8.3 inches

Basin	Allow Disch (cfs)	Method Of Determination	Peak Disch (cfs)	Peak Stage (ft, NGVD)
Site	.76	Discharge Formula	.76	22.4

Finished Floors :

Building Storm Frequency : 100 YEAR-3 DAY Design Rainfall : 10.1 inches

Basin	Peak Stage (ft, NGVD)	Proposed Min. Finished Floors (ft, NGVD)	FEMA Elevation (ft, NGVD)
Site	23.24	23.3	N/A

Road Design :

Road Storm Frequency : 10 YEAR-1 DAY Design Rainfall: 5.6 inches

Basin	Peak Stage (ft, NGVD)	Proposed Min. Road Crown (ft, NGVD)
Site	21.35	22

Parking Lot Design :

Parking Lot Storm Frequency : 10 YEAR-1 DAY Design Rainfall 5.6 inches

Basin	Peak Stage (ft, NGVD)	Proposed Min.Parking Elev. (ft, NGVD)
Site	21.35	22

Control Elevation :

Basin	Area (Acres)	Ctrl Elev (ft, NGVD)	WSWT Ctrl Elev (ft, NGVD)	Method Of Determination
Site	8.84	18.65	18.65	Wet Season Water Table

Receiving Body :

Basin	Str.#	Receiving Body
Site	CS-1	NSLRWCD C-103 Canal
Site	CS-2	Wetland

Discharge Structures: Note: The units for all the elevation values of structures are (ft, NGVD)

Bleeders:

Basin	Str#	Count	Type	Width	Height	Length	Dia.	Invert Angle	Invert Elev.
Site	CS-1	1	Circular Orifice				3"		18.65

Inlets:

Basin	Str#	Count	Type	Width	Length	Dia.	Crest Elev.
Site	CS-1	1	Fdot Mod E Drop Inlet				22.5

Weirs:

Basin	Str#	Count	Type	Width	Height	Length	Dia.	Elev.
Site	CS-1	1	Rectangular Notch	3"				20.3 (crest)

Water Quality Structures: Note: The units for all the elevation values of structures are (ft, NGVD)

Inlets:

Basin	Str#	Count	Type	Width	Length	Dia.	Crest Elev.
Site	CS-2	1	Fdot Mod E Drop Inlet				22

Weirs:

Basin	Str#	Count	Type	Width	Height	Length	Dia.	Elev.
Site	CS-2	1	Rectangular Notch	6"				20.05 (crest)

WATER QUALITY :

Water quality treatment volume equivalent to 2.5 inches over the total impervious area, which equals 1.17 inches for this project, is provided in the dry detention areas of the master surface water management system. The volumes shown below reflect the 25% reduction for dry detention systems. No adverse water quality impacts are anticipated as a result of the proposed project.

Basin	Treatment Method

Basin		Treatment Method	Vol Req.d (ac-ft)	Vol Prov'd (ac-ft)
Site	Treatment	Dry Detention	.65	.65

WETLANDS:

The site contains one shallow herbaceous 1.86-acre wetland within the center of the site (see Exhibits 3 and 5). Vegetation includes pickerelweed, torpedo grass, bahia grass, and wax myrtle. The wetland has been previously altered by grazing and mowing, and drawdown from adjacent development and nearby drainage ditches. The wetland is of fair to poor quality and because of its location on the site, avoidance of the wetland is not practicable. Therefore, the wetland will be filled as part of the project. Mitigation will be provided at Bluefield Ranch Mitigation Bank.

The northern property line of the site is the edge of another, larger wetland of approximately 3.5 acres. This wetland has also been adversely affected by previous activity, but is a deeper marsh than the onsite wetland. To avoid secondary impacts to the functions of this wetland, the project includes a 25-foot wide upland buffer along the property line (see Exhibits 2 and 8). This buffer will be preserved under a conservation easement (see Legal section). To avoid impacts to the hydrology of the adjacent wetland, the project includes an outfall structure to the wetland from a dry detention area (see Discharge Rate section) to mimic the wetland's current drainage area.

A maintenance plan for the upland buffer zone will be required upon submittal of any future application for construction in accordance with Special Condition 17.

Mitigation Proposal:

The Bluefield Ranch Mitigation Bank is a 2,675-acre bank in western Martin and St. Lucie counties. The land consists of a mosaic of hydric pine flatwoods, freshwater prairie and forested wetlands, xeric oak and mesic pine flatwoods. The ranch has been impacted by previous agricultural activities. Restoration of this ranch includes exotic and nuisance plant and animal removal, hydrologic restoration, permanent protection of existing wetland systems, re-vegetation of wetland and upland systems on-site, and restoration of the natural fire regime appropriate for each community type.

The applicant has purchased 2.1 freshwater herbaceous credits at the Bluefield Ranch Mitigation Bank for the proposed wetland impact. Exhibit 7 is a letter from banker requesting withdrawal from the District's ledger which indicates that credits have been paid in full. A Wetland Rapid Assessment Procedure (WRAP) score of 0.55 was given for the wetland. The score is multiplied by the size of the wetland area. A lift factor of two is then applied to this figure to derive the total amount of credits required.

Cumulative Impact Assessment:

The Bluefield Ranch Mitigation Bank is proposed to offset impacts and is located in the C-23 and Nubbin Slough Basins. Since the Bluefield Ranch Mitigation Bank and the project site are located in different drainage basins, a Cumulative Impact Analysis was performed by the applicant's consultant to examine the potential cumulative impacts to wetland functions within the North Fork of the St. Lucie River Basin. This analysis is included in the permit file.

The analysis estimated that 8,000 acres of wetlands in the North St. Lucie River Basin are in public ownership and approximately 3,400 acres are in private ownership. A vast majority of the wetland systems in public ownership are protected within the North Fork St. Lucie River, the North Fork Save Our Rivers project, and the Savannas State Preserve. The analysis estimated that of the 3,400 acres in private ownership, 233 acres of similar sized wetlands (<5 acres) are at high risk of development from residential, commercial, industrial, etc. projects. The subject project is preserving approximately sixty-one

percent of the on-site forested wetland with the impact being mitigated for out of basin. If this scenario is repeated throughout the basin, approximately seven percent of all privately owned wetlands (less than 5 acres in size) would be mitigated for outside the basin. This represents a very small amount of the total wetlands in the basin. It is expected that the proposed project will not result in unacceptable cumulative impacts to wetlands in the North St. Lucie River Basin.

This cumulative impact analysis may not necessarily hold true for all other projects in the basin, especially those that propose to impact wetlands of greater functional value or that might interact with other water resources or wetland dependent wildlife within the basin.

Based upon the proposed project design, the discussion outlined above, and the mitigation plan, the District has determined that the project will not cause adverse cumulative impacts to the water resources and is not contrary to the public interest.

Wetland Inventory :

CONCEPTUAL NEW -Mayo Warehouse ONSITE

Pre-Development		Post-Development				
	Total Existing	**Impacted**	**Undisturbed**	**Enhanced**	**Preserved**	**Restored/ Created**
Water Herbaceous	1.86	1.86				
Total:	**1.86**	**1.86**				

Wetland Inventory :

MITBANK BLUEFIELD RANCH OFFSITE

Pre-Development	Post-Development
	Mitigation Bank Cr Used
Fresh Water Herbaceous	2.10
Total:	**2.10**

LEGAL ISSUES:

A draft conservation easement (Exhibit 8) for the upland buffer has been prepared. As this application is for conceptual approval only, recordation of the easement is not required at this time. During review of the application for construction authorization, copies of the recorded conservation easement will be submitted to the District.

RELATED CONCERNS:

Water Use Permit Status:

The applicant has indicated that a groundwater well will be used as a source for irrigation water for the project. A Water Use application for landscape irrigation will be submitted concurrently with the first ERP application requesting construction authorization.

The applicant is not requesting construction authorization as part of this application. Therefore, dewatering is not required for the activities included as part of this application. A Water Use application for dewatering will be submitted concurrently with the first ERP application requesting construction authorization.

This permit does not release the permittee from obtaining all necessary Water Use authorization(s) prior to the commencement of activities which will require such authorization, including construction dewatering and irrigation, unless the work qualifies for a No-Notice Short-Term Dewatering permit pursuant to Chapter 40E-20.302(3) or is exempt pursuant to Section 40E-2.051. FAC.

Potable Water Supplier:

Ft. Pierce Utilities Authority

Waste Water System/Supplier:

Ft. Pierce Utilities Authority

Right-Of-Way Permit Status:

A Right-of-Way Permit is not required for this project.

DRI Status:

This project is not a DRI.

Historical/Archeological Resources:

No information has been received that indicates the presence of archaeological or historical resources or that the proposed activities could cause adverse impacts to archaeological or historical resources.

DCA/CZM Consistency Review:

The District has not received a finding of inconsistency from the Florida Department of Environmental Protection or other commenting agencies regarding the provisions of the federal Coastal Zone Management Plan.

Third Party Interest:

No third party has contacted the District with concerns about this application.

Enforcement:

There has been no enforcement activity associated with this application.

STAFF RECOMMENDATION:

The Staff recommends that the following be issued :

Conceptual Approval of a surface water management system to serve an 8.84 acre project known as Mayo Warehouse.

Based on the information provided, District rules have been adhered to.

Staff recommendation is for approval subject to the attached General and Special Conditions.

DRAFT
Subject to Governing Board Approval

STAFF REVIEW:

NATURAL RESOURCE MANAGEMENT DIVISION APPROVAL

ENVIRONMENTAL EVALUATION

Melinda Parrott

SUPERVISOR

Donald L. Medellin

DIVISION DIRECTOR :

Robert G. Robbins

DATE: 7/29/04

SURFACE WATER MANAGEMENT DIVISION APPROVAL

ENGINEERING EVALUATION

Kelly Cranford, P.E.

SUPERVISOR

Hugo A. Carter, P.E.

DIVISION DIRECTOR :

Anthony M. Waterhouse, P.E.

DATE: 7/29/04

GENERAL CONDITIONS

1. All activities authorized by this permit shall be implemented as set forth in the plans, specifications and performance criteria as approved by this permit. Any deviation from the permitted activity and the conditions for undertaking that activity shall constitute a violation of this permit and Part IV, Chapter 373, F.S.

2. This permit or a copy thereof, complete with all conditions, attachments, exhibits, and modifications shall be kept at the work site of the permitted activity. The complete permit shall be available for review at the work site upon request by District staff. The permittee shall require the contractor to review the complete permit prior to commencement of the activity authorized by this permit.

3. Activities approved by this permit shall be conducted in a manner which does not cause violations of State water quality standards. The permittee shall implement best management practices for erosion and pollution control to prevent violation of State water quality standards. Temporary erosion control shall be implemented prior to and during construction, and permanent control measures shall be completed within 7 days of any construction activity. Turbidity barriers shall be installed and maintained at all locations where the possibility of transferring suspended solids into the receiving waterbody exists due to the permitted work. Turbidity barriers shall remain in place at all locations until construction is completed and soils are stabilized and vegetation has been established. All practices shall be in accordance with the guidelines and specifications described in Chapter 6 of the Florida Land Development Manual; A Guide to Sound Land and Water Management (Department of Environmental Regulation, 1988), incorporated by reference in Rule 40E-4.091, F.A.C. unless a project-specific erosion and sediment control plan is approved as part of the permit. Thereafter the permittee shall be responsible for the removal of the barriers. The permittee shall correct any erosion or shoaling that causes adverse impacts to the water resources.

4. The permittee shall notify the District of the anticipated construction start date within 30 days of the date that this permit is issued. At least 48 hours prior to commencement of activity authorized by this permit, the permittee shall submit to the District an Environmental Resource Permit Construction Commencement Notice Form Number 0960 indicating the actual start date and the expected construction completion date.

5. When the duration of construction will exceed one year, the permittee shall submit construction status reports to the District on an annual basis utilizing an annual status report form. Status report forms shall be submitted the following June of each year.

6. Within 30 days after completion of construction of the permitted activity, the permitee shall submit a written statement of completion and certification by a professional engineer or other individual authorized by law, utilizing the supplied Environmental Resource/Surface Water Management Permit Construction Completion/Certification Form Number 0881A, or Environmental Resource/Surface Water Management Permit Construction Completion Certification - For Projects Permitted prior to October 3, 1995 Form No. 0881B, incorporated by reference in Rule 40E-1.659, F.A.C. The statement of completion and certification shall be based on onsite observation of construction or review of as-built drawings for the purpose of determining if the work was completed in compliance with permitted plans and specifications. This submittal shall serve to notify the District that the system is ready for inspection. Additionally, if deviation from the approved drawings are discovered during the certification process, the certification must be accompanied by a copy of the approved permit drawings with deviations noted. Both the original and revised specifications must be clearly shown. The plans must be clearly labeled as "as-built" or "record" drawings. All surveyed dimensions and elevations shall be certified by a registered surveyor.

7. The operation phase of this permit shall not become effective: until the permittee has complied with the requirements of condition (6) above, and submitted a request for conversion of Environmental Resource Permit from Construction Phase to Operation Phase, Form No. 0920; the District determines the system to be in compliance with the permitted plans and specifications; and the entity

approved by the District in accordance with Sections 9.0 and 10.0 of the Basis of Review for Environmental Resource Permit Applications within the South Florida Water Management District, accepts responsibility for operation and maintenance of the system. The permit shall not be transferred to such approved operation and maintenance entity until the operation phase of the permit becomes effective. Following inspection and approval of the permitted system by the District, the permittee shall initiate transfer of the permit to the approved responsible operating entity if different from the permittee. Until the permit is transferred pursuant to Section 40E-1.6107, F.A.C., the permittee shall be liable for compliance with the terms of the permit.

8. Each phase or independent portion of the permitted system must be completed in accordance with the permitted plans and permit conditions prior to the initiation of the permitted use of site infrastructure located within the area served by that portion or phase of the system. Each phase or independent portion of the system must be completed in accordance with the permitted plans and permit conditions prior to transfer of responsibility for operation and maintenance of the phase or portion of the system to a local government or other responsible entity.

9. For those systems that will be operated or maintained by an entity that will require an easement or deed restriction in order to enable that entity to operate or maintain the system in conformance with this permit, such easement or deed restriction must be recorded in the public records and submitted to the District along with any other final operation and maintenance documents required by Sections 9.0 and 10.0 of the Basis of Review for Environmental Resource Permit applications within the South Florida Water Management District, prior to lot or units sales or prior to the completion of the system, whichever comes first. Other documents concerning the establishment and authority of the operating entity must be filed with the Secretary of State, county or municipal entities. Final operation and maintenance documents must be received by the District when maintenance and operation of the system is accepted by the local government entity. Failure to submit the appropriate final documents will result in the permittee remaining liable for carrying out maintenance and operation of the permitted system and any other permit conditions.

10. Should any other regulatory agency require changes to the permitted system, the permittee shall notify the District in writing of the changes prior to implementation so that a determination can be made whether a permit modification is required.

11. This permit does not eliminate the necessity to obtain any required federal, state, local and special district authorizations prior to the start of any activity approved by this permit. This permit does not convey to the permittee or create in the permittee any property right, or any interest in real property, nor does it authorize any entrance upon or activities on property which is not owned or controlled by the permittee, or convey any rights or privileges other than those specified in the permit and Chapter 40E-4 or Chapter 40E-40, F.A.C..

12. The permittee is hereby advised that Section 253.77, F.S. states that a person may not commence any excavation, construction, or other activity involving the use of sovereign or other lands of the State, the title to which is vested in the Board of Trustees of the Internal Improvement Trust Fund without obtaining the required lease, license, easement, or other form of consent authorizing the proposed use. Therefore, the permittee is responsible for obtaining any necessary authorizations from the Board of Trustees prior to commencing activity on sovereignty lands or other state-owned lands.

13. The permittee must obtain a Water Use permit prior to construction dewatering, unless the work qualifies for a general permit pursuant to Subsection 40E-20.302(3), F.A.C., also known as the "No Notice" Rule.

14. The permittee shall hold and save the District harmless from any and all damages, claims, or liabilities which may arise by reason of the construction, alteration, operation, maintenance, removal, abandonment or use of any system authorized by the permit.

GENERAL CONDITIONS

15. Any delineation of the extent of a wetland or other surface water submitted as part of the permit application, including plans or other supporting documentation, shall not be considered binding, unless a specific condition of this permit or a formal determination under Section 373.421(2), F.S., provides otherwise.

16. The permittee shall notify the District in writing within 30 days of any sale, conveyance, or other transfer of ownership or control of a permitted system or the real property on which the permitted system is located. All transfers of ownership or transfers of a permit are subject to the requirements of Rules 40E-1.6105 and 40E-1.6107, F.A.C.. The permittee transferring the permit shall remain liable for corrective actions that may be required as a result of any violations prior to the sale, conveyance or other transfer of the system.

17. Upon reasonable notice to the permittee, District authorized staff with proper identification shall have permission to enter, inspect, sample and test the system to insure conformity with the plans and specifications approved by the permit.

18. If historical or archaeological artifacts are discovered at any time on the project site, the permittee shall immediately notify the appropriate District service center.

19. The permittee shall immediately notify the District in writing of any previously submitted information that is later discovered to be inaccurate.

SPECIAL CONDITIONS

1. The conceptual phase of this permit shall expire on August 12, 2006.

2. Operation of the surface water management system shall be the responsibility of the permittee.

3. Discharge Facilities:

   Structure: CS-1
   1-3" WIDE RECTANGULAR NOTCH weir with crest at elev. 20.3' NGVD.
   1-3" dia. CIRCULAR ORIFICE with invert at elev. 18.65' NGVD.
   1-drop inlet with crest at elev. 22.5' NGVD.
   Receiving body : NSLRWCD C-103 Canal
   Control elev : 18.65 feet NGVD.

   Structure: CS-2
   1-6" WIDE RECTANGULAR NOTCH weir with crest at elev. 20.05' NGVD.
   1-drop inlet with crest at elev. 22' NGVD.
   Receiving body : Wetland
   Control elev : 18.65 feet NGVD.

4. The permittee shall be responsible for the correction of any erosion, shoaling or water quality problems that result from the construction or operation of the surface water management system.

5. Measures shall be taken during construction to insure that sedimentation and/or turbidity violations do not occur in the receiving water.

6. The District reserves the right to require that additional water quality treatment methods be incorporated into the drainage system if such measures are shown to be necessary.

7. Facilities other than those stated herein shall not be constructed without an approved modification of this permit.

8. A stable, permanent and accessible elevation reference shall be established on or within one hundred (100) feet of all permitted discharge structures no later than the submission of the certification report. The location of the elevation reference must be noted on or with the certification report.

9. The permittee shall provide routine maintenance of all of the components of the surface water management system in order to remove all trapped sediments/debris. All materials shall be properly disposed of as required by law. Failure to properly maintain the system may result in adverse flooding conditions.

10. This permit is issued based on the applicant's submitted information which reasonably demonstrates that adverse water resource related impacts will not be caused by the completed permit activity. Should any adverse impacts caused by the completed surface water management system occur, the District will require the permittee to provide appropriate mitigation to the District or other impacted party. The District will require the permittee to modify the surface water management system, if necessary, to eliminate the cause of the adverse impacts.

11. Minimum building floor elevation: BASIN: Site - 23.30 feet NGVD.

12. Minimum parking lot elevation: Basin: Site - 22.00 feet NGVD.

13. All commercial/industrial parcels shall provide a minimum dry pre-treatment volume of 1/2 inch of runoff prior to discharge into the master surface water management system.

14. Prior to any future construction, the permittee shall apply for and receive a permit modification. As part of the permit application, the applicant for that phase shall provide documentation verifying that the proposed construction is consistent with the design of the master surface water management system, including the land use and site grading assumptions.

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7. Facilities other than those stated herein shall not be constructed without an approved modification of this permit.

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14. Prior to any future construction, the permittee shall apply for and receive a permit modification. As part of the permit application, the applicant for that phase shall provide documentation verifying that the proposed construction is consistent with the design of the master surface water management system, including the land use and site grading assumptions.

SPECIAL CONDITIONS

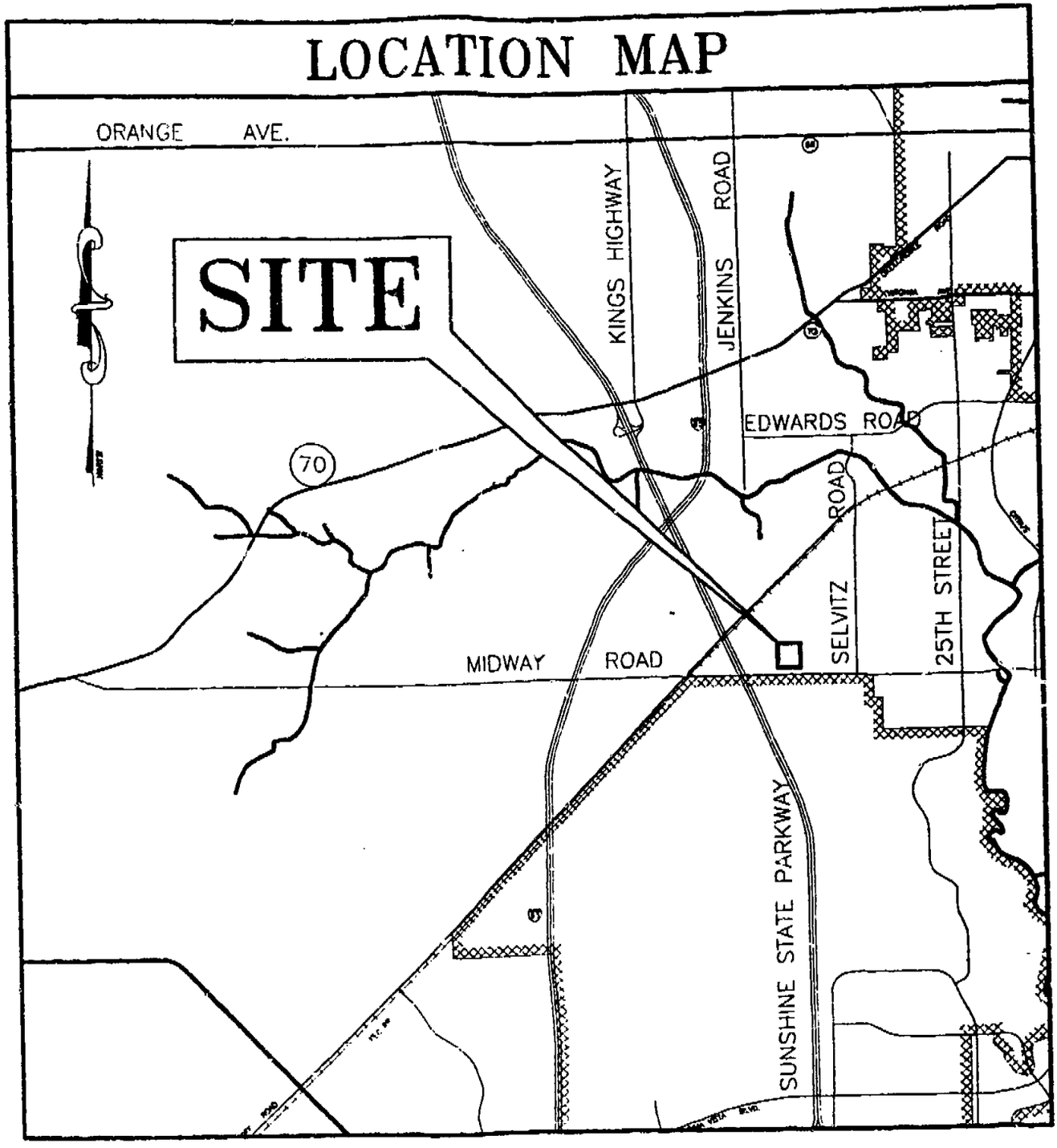
15. The District reserves the right to require remedial measures to be taken by the permittee if monitoring or other information demonstrates that adverse impacts to onsite or offsite wetlands, upland conservation areas or buffers, or other surface waters have occurred due to project related activities.

16. At the time of construction approval, the permittee shall submit two certified copies of the recorded conservation easement for the upland buffer. The data should also be supplied in a digital CAD (.dxf) or GIS (ESRI Coverage) format. The files should be in the Florida State Plane coordinate system, East Zone (3601) with a data datum of NAD83, HARN with the map units in feet. This data should reside on a CD or floppy disk and be submitted to the District's Environmental Resource Compliance Division in the service area office where the application was submitted.

    The recorded easement shall be in substantial conformance with Exhibit 8. Any proposed modifications to the approved form must receive prior written consent from the District. The easement must be free of encumbrances or interests in the easement which the District determines are contrary to the intent of the easement. In the event it is later determined that there are encumbrances or interests in the easement which the District determines are contrary to the intent of the easement, the permittee shall be required to provide release or subordination of such encumbrances or interests.

17. Upon submittal of an application for construction approval, the permittee shall submit a maintenance plan for the upland buffer along the north property line for review by District staff. The plan shall be subject to the approval of District staff and the environmental criteria in effect at the time of the construction permit application. A maintenance program shall be implemented on a regular basis to ensure the integrity and viability of the upland buffer area as permitted. Maintenance shall be conducted in perpetuity to ensure that the conservation area is maintained free from Category 1 exotic vegetation (as defined by the Florida Exotic Pest Plant Council at the time of permit issuance) immediately following a maintenance activity. Coverage of exotic and nuisance plant species shall not exceed 5% of total cover between maintenance activities. In addition, the permittee shall manage the conservation areas such that exotic/nuisance plant species do not dominate any one section of those areas.

18. Issuance of this permit deletes 8.84 from District permit number 56-01444-P (Midway Industrial Park).

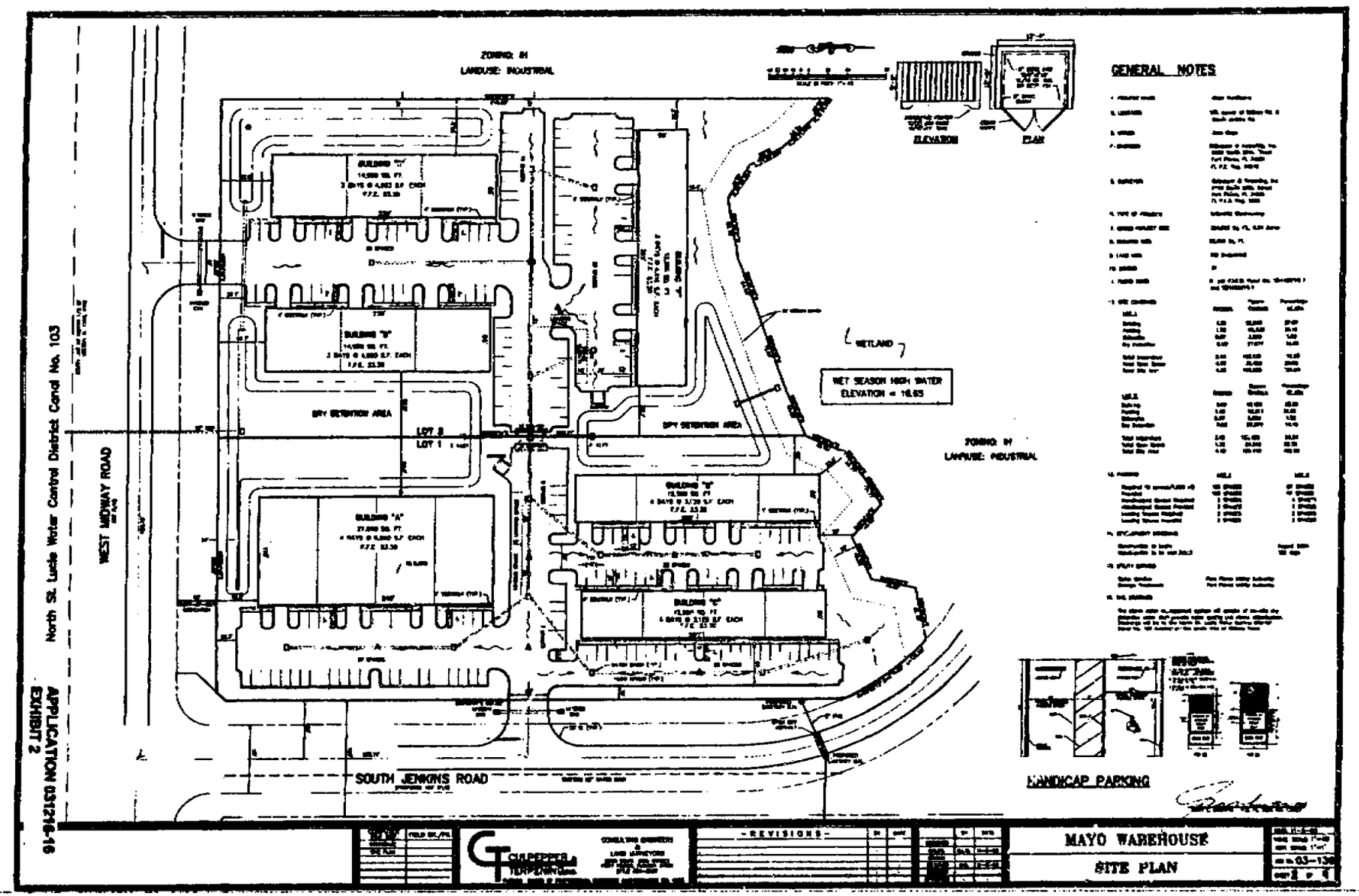


Mayo Warehouse
LOCATION MAP

NORTH
N.T.S.

Application 031216-16

Exhibit 1


ZONING: IH
LANDUSE: INDUSTRIAL
WEST MIDWAY ROAD
North St. Lucie Water Control District Cond. No. 103
APPLICATION 031216-16
EXHIBIT 2
BUILDING "A"
BUILDING "B"
BUILDING "C"
BUILDING "D"
BUILDING "E"
DRY RETENTION AREA
LOT 2
LOT 1
WETLAND
WET SEASON HIGH WATER ELEVATION = 16.65
ZONING: IH
LANDUSE: INDUSTRIAL
SOUTH JENKINS ROAD
ELEVATION
PLAN
GENERAL NOTES
HANDICAP PARKING
REVISIONS
MAYO WAREHOUSE
SITE PLAN

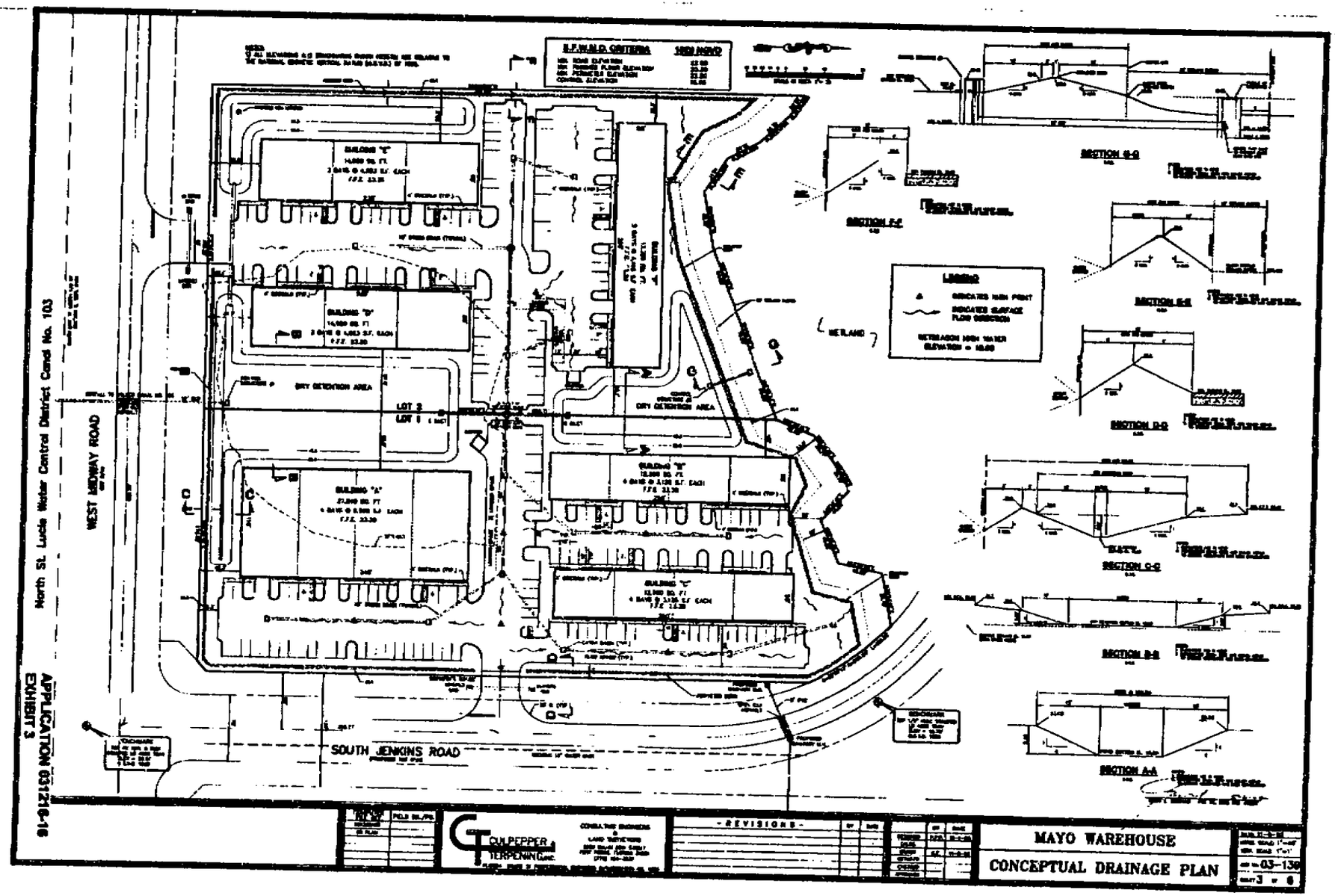
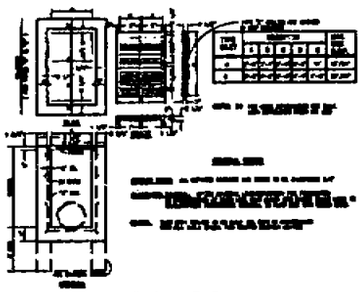


EXHIBIT 3
APPLICATION 031216-16
North St. Lucie Water Control District Canal No. 103
WEST MIDWAY ROAD
SOUTH JENKINS ROAD
S.F.W.M.D. CRITERIA
100 YR/3 DAY
DRY DETENTION AREA
LOT 2
LOT 1
WETLAND
LEGEND
SECTION A-A
SECTION B-B
SECTION C-C
SECTION D-D
SECTION E-E
SECTION G-G
CULPEPPER & TERPENING, INC.
- REVISIONS -
MAYO WAREHOUSE
CONCEPTUAL DRAINAGE PLAN
03-130
SHEET 3 OF 8



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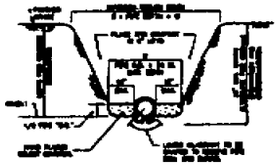
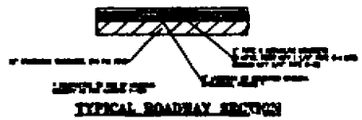


TYPICAL TRENCH SECTION



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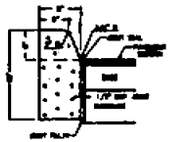

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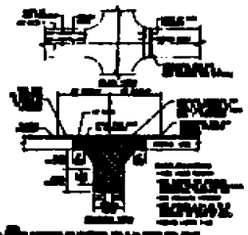
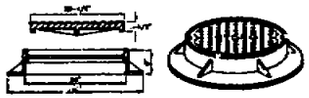
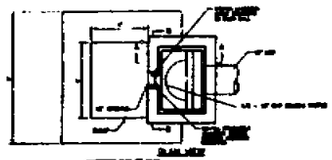
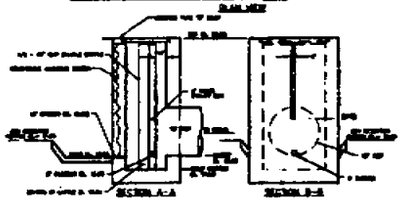


OPEN-CUT DETAIL

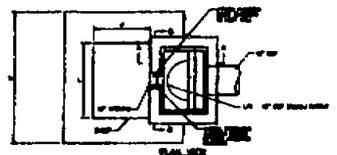


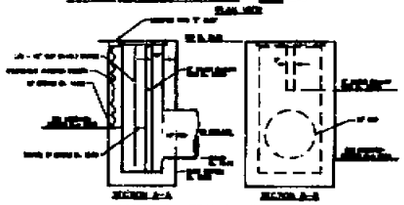
U.S.F. #125 RING & COVER



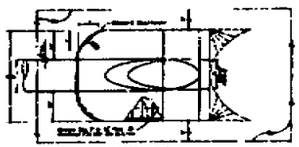


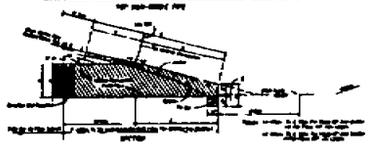
CONTROL STRUCTURE #1



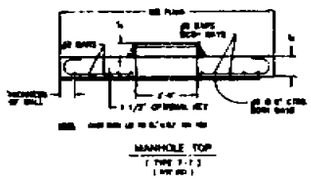


CONTROL STRUCTURE #2



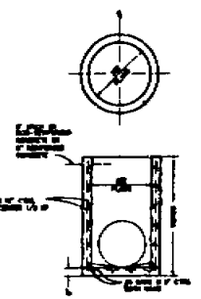


MITERED END SECTION



MANHOLE TOP

STORM MANHOLE TOP



TYPE "P" MANHOLE

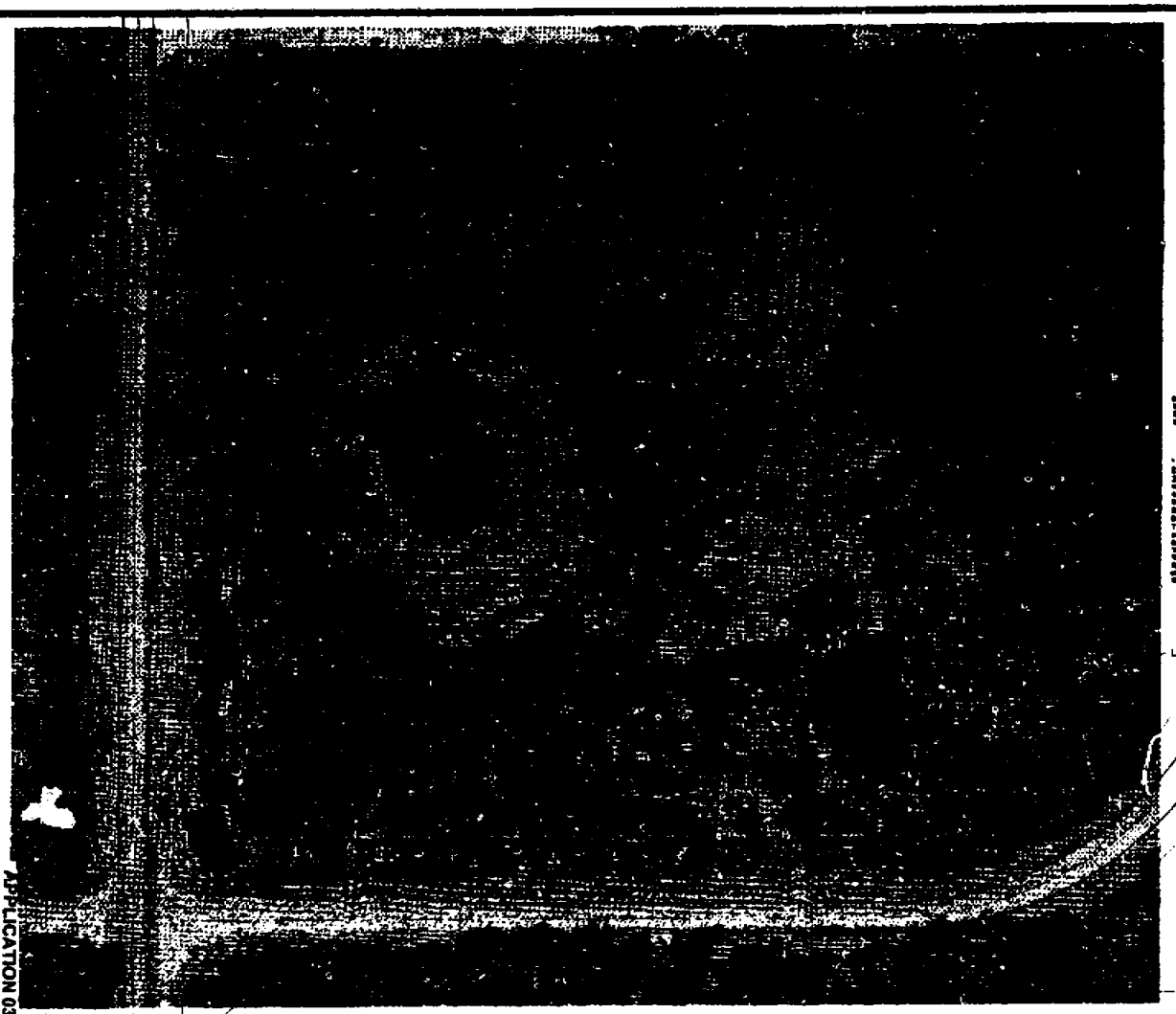
SIDEWALK CONSTRUCTION DETAILS

APPLICATION 031216-18
EXHIBIT 4

GUIDEPPER TERPENING INC.

MAYO WAREHOUSE

PAVING & DRAINAGE DETAILS



GENERAL DESCRIPTION

GENERAL NOTES

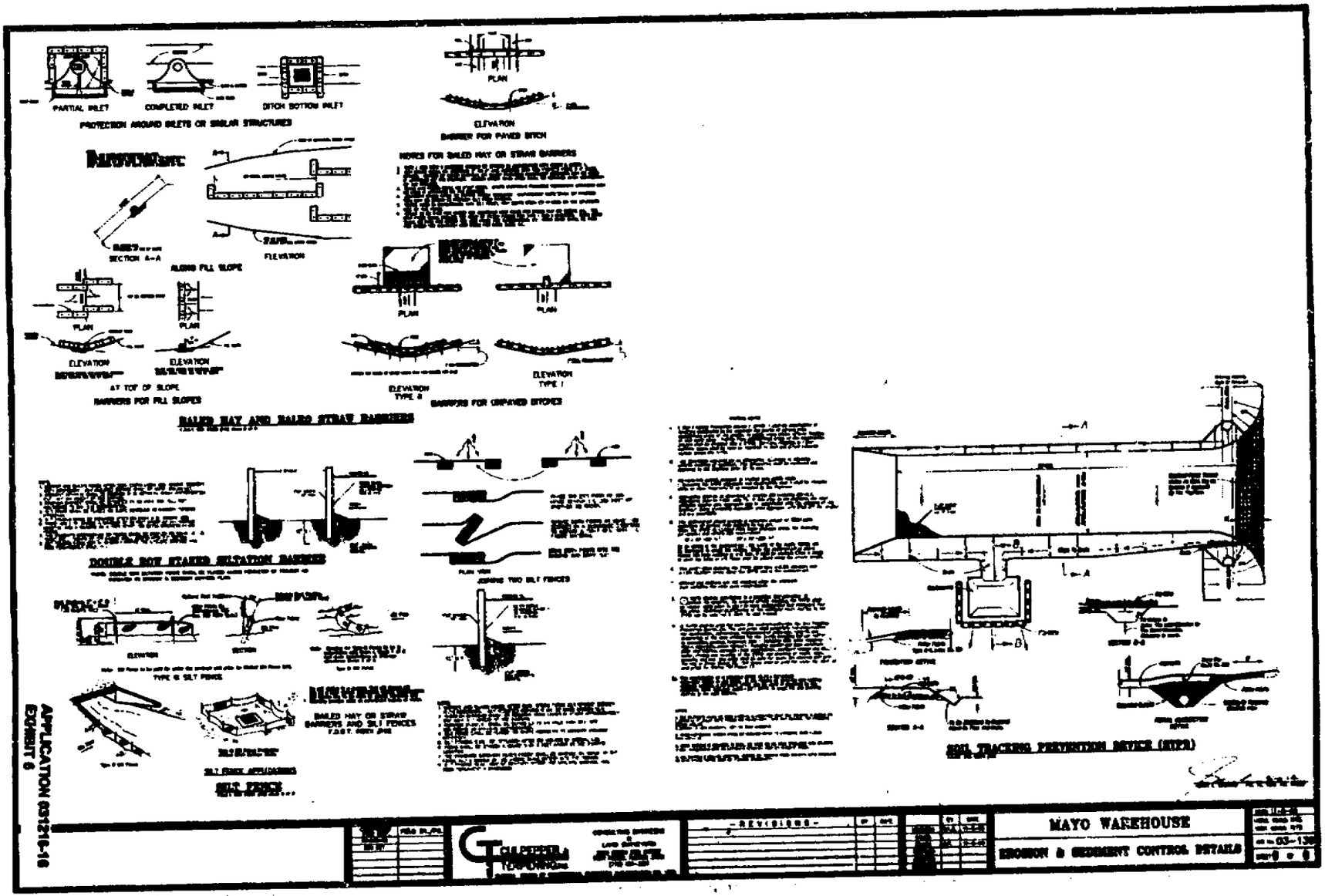
LIMITS OF CLEARING

APPLICATION 031216-16
EXHIBIT 5

CULPEPPER & TERPENING INC.

MAYO WAREHOUSE

LAND CLEARING, EROSION & SEDIMENT CONTROL PLAN


PARTIAL INLET
COMPLETED INLET
DITCH BOTTOM INLET
PROTECTION AROUND INLETS OR SIMILAR STRUCTURES
PLAN
ELEVATION
BARRIER FOR PAVED DITCH
NOTES FOR BALED HAY OR STRAW BARRIERS
SECTION A-A
ELEVATION
ALONG FILL SLOPE
PLAN
PLAN
ELEVATION
ELEVATION
AT TOP OF SLOPE
BARRIERS FOR FILL SLOPES
PLAN
PLAN
ELEVATION TYPE II
ELEVATION TYPE I
BARRIERS FOR DRAINED STORES
BALED HAY AND BALED STRAW BARRIERS
DOUBLE ROW STAKED SILTATION BARRIER
PLAN VIEW
JOINING TWO SILT FENCES
ELEVATION
SECTION
TYPE III SILT FENCE
BALED HAY OR STRAW BARRIERS AND SILT FENCES
SILT FENCE APPLICATIONS
SILT FENCE...
SOIL TRACKING PREVENTION DEVICE (STPD)
APPLICATION 03121G-16
EXHIBIT G
MAYO WAREHOUSE
EROSION & SEDIMENT CONTROL DETAILS

BLUEFIELD RANCH MITIGATION BANK

901 North Olive Avenue
West Palm Beach, Florida 33401
Telephone (561) 355-3900
Fax (561) 659-9811
davemcir@bellsouth.net

June 8, 2004

3 Pages Via Fax to 561-682-6896
Ms. Mindy Parrott
South Florida Water Management District
Natural Resource Management Division
Environmental Resource Regulation Department
West Palm Beach, Florida 33146-4680

JUN 08 2004

031216-16

Bluefield Ranch Mitigation Bank ("BRMB")
SFWMD Environmental Resource Permit No. 56-00002-M
Minor Modification for Withdrawal of Credits

Dear Mindy:

Pursuant to the terms of the above Permit, BRMB hereby requests a withdrawal and transfer of mitigation credits from our bank, as follows:

Transferee: Midway Industrial Park, Phase II, Lots 1&2

Number and Type of Credits to be Transferred: 2.1 herbaceous

Kindly acknowledge, to the applicant and to me, your consent to this request. For your convenience, I have attached a copy of the Bluefield Credit Ledger, reflecting the funding of the endowment trust and the transfer of these credits. And, for your records, I send a copy of the transmittal letter associated with the endowment funding. You'll receive confirmation directly.

Please contact me if you have any questions.

Very truly yours,

David McIntosh, Trustee
BLUEFIELD RANCH MITIGATION BANK

Cc: Mr. John Mayo (954) 236-8832 – 1 Page
Butch Terpening (772) 464-9497 – 1 Page

EXHIBIT 7

DEED OF CONSERVATION EASEMENT

THIS DEED OF CONSERVATION EASEMENT is given this _____ day of_____, 200___, by _____

_____,

(address)_____

_____

("Grantor") to the South Florida Water Management District ("Grantee"). As used herein, the term Grantor shall include any and all heirs, successors or assigns of the Grantor, and all subsequent owners of the "Property" (as hereinafter defined) and the term Grantee shall include any successor or assignee of Grantee.

WITNESSETH

WHEREAS, the Grantor is the owner of certain lands situated in _____ County, Florida, and more specifically described in Exhibit A attached hereto and incorporated herein ("Property"); and

WHEREAS, the Grantor desires to construct (name of project)_____ _____("Project") at a site in _____ County, which is subject to the regulatory jurisdiction of South Florida Water Management District ("District"); and

WHEREAS District Permit No. _____ ("Permit") authorizes certain activities which affect waters in or of the State of Florida; and

WHEREAS, this Permit requires that the Grantor preserve, enhance, restore and/or mitigate wetlands and/or uplands under the District's jurisdiction: and

WHEREAS, the Grantor, in consideration of the consent granted by the Permit, is agreeable to granting and securing to the Grantee a perpetual conservation easement as defined in Section 704.06, Florida Statutes (2000), over the Property.

NOW, THEREFORE, in consideration of the issuance of the Permit to construct and operate the permitted activity, and as an inducement to Grantee in issuing the Permit, together with other good and valuable consideration, the adequacy and receipt of which is hereby acknowledged, Grantor hereby grants, creates, and establishes a perpetual conservation easement for and in favor of the Grantee upon the Property which shall run with the land and be binding upon the Grantor, and shall remain in full force and effect forever.

The scope, nature, and character of this conservation easement shall be as follows:

1. It is the purpose of this conservation easement to retain land or water areas in their natural, vegetative, hydrologic, scenic, open, agricultural or wooded condition and to retain such areas as suitable habitat for fish, plants or wildlife. Those wetland and/or upland areas included in the conservation easement which are to be enhanced or created pursuant to the Permit shall be retained and maintained in the enhanced or created conditions required by the Permit.

To carry out this purpose, the following rights are conveyed to Grantee by this easement:

a. To enter upon the Property at reasonable times with any necessary equipment or vehicles to enforce the rights herein granted in a manner that will not unreasonably interfere with the use and quiet enjoyment of the Property by Grantor at the time of such entry; and

b. To enjoin any activity on or use of the Property that is inconsistent with this conservation easement and to enforce the restoration of such areas or features of the Property that may be damaged by any inconsistent activity or use.

2. Except for restoration, creation, enhancement, maintenance and monitoring activities, or surface water management improvements, which are permitted or required by the Permit, the following activities are prohibited in or on the Property:

a. Construction or placing of buildings, roads, signs, billboards or other advertising, utilities, or other structures on or above the ground;

b. Dumping or placing of soil or other substance or material as landfill, or dumping or placing of trash, waste, or unsightly or offensive materials;

c. Removal or destruction of trees, shrubs, or other vegetation, except for the removal of exotic or nuisance vegetation in accordance with a District approved maintenance plan;

d. Excavation, dredging, or removal of loam, peat, gravel, soil, rock, or other material substance in such manner as to affect the surface;

e. Surface use except for purposes that permit the land or water area to remain in its natural condition;

EXHIBIT 8B

f. Activities detrimental to drainage, flood control, water conservation, erosion control, soil conservation, or fish and wildlife habitat preservation including, but not limited to, ditching, diking and fencing;

g. Acts or uses detrimental to such aforementioned retention of land or water areas;

h. Acts or uses which are detrimental to the preservation of any features or aspects of the Property having historical or archaeological significance.

3. Grantor reserves all rights as owner of the Property, including the right to engage in uses of the Property that are not prohibited herein and which are not inconsistent with any District rule, criteria, permit and the intent and purposes of this Conservation Easement.

4. No right of access by the general public to any portion of the Property is conveyed by this conservation easement.

5. Grantee shall not be responsible for any costs or liabilities related to the operation, upkeep or maintenance of the Property.

6. Grantor shall pay any and all real property taxes and assessments levied by competent authority on the Property.

7. Any costs incurred in enforcing, judicially or otherwise, the terms, provisions and restrictions of this conservation easement shall be borne by and recoverable against the nonprevailing party in such proceedings.

8. Enforcement of the terms, provisions and restrictions of this conservation easement shall be at the reasonable discretion of Grantee, and any forbearance on behalf of Grantee to exercise its rights hereunder in the event of any breach hereof by Grantor, shall not be deemed or construed to be a waiver of Grantee's rights hereunder.

9. Grantee will hold this conservation easement exclusively for conservation purposes. Grantee will not assign its rights and obligations under this conservation easement except to another organization qualified to hold such interests under the applicable state laws.

10. If any provision of this conservation easement or the application thereof to any person or circumstances is found to be invalid, the remainder of the provisions of this conservation easement shall not be affected thereby, as long as the purpose of the

EXHIBIT 8C

conservation easement is preserved.

11. Grantor shall insert the terms and restrictions of this conservation easement in any subsequent deed or other legal instrument by which Grantor divests itself of any interest in the Property.

12. All notices, consents, approvals or other communications hereunder shall be in writing and shall be deemed properly given if sent by United States certified mail, return receipt requested, addressed to the appropriate party or successor-in-interest.

13. This conservation easement may be amended, altered, released or revoked only by written agreement between the parties hereto or their heirs, assigns or successors-in-interest, which shall be filed in the public records in _____ County.

TO HAVE AND TO HOLD unto Grantee forever. The covenants, terms, conditions, restrictions and purpose imposed with this conservation easement shall be binding upon Grantor, and shall continue as a servitude running in perpetuity with the Property.

Grantor hereby covenants with said Grantee that Grantor is lawfully seized of said Property in fee simple; that the Property is free and clear of all encumbrances that are inconsistent with the terms of this conservation easement and all mortgages have been joined or subordinated; that Grantor has good right and lawful authority to convey this conservation easement; and that it hereby fully warrants and defends the title to the conservation easement hereby conveyed against the lawful claims of all persons whomsoever.

IN WITNESS WHEREOF, _____ has hereunto set its authorized hand this _____ day of _____, 200__.

Signed, sealed and delivered
in our presence as witnesses:

_____,
A Florida corporation

_____
Print Name:

By: _____
Print Name: _____
Title: _____

_____
Print Name:

Standard form – July, 2001

EXHIBIT 8D

STATE OF FLORIDA

) ss:

COUNTY OF_____

On this _____ day of_____, 200___ before me, the undersigned notary public, personally appeared _____, personally known to me to be the person who subscribed to the foregoing instrument and did not take an oath, as the (position) _____, of (corporation) _____, a Florida corporation, and acknowledged that he executed the same on behalf of said corporation and that he was duly authorized to do so.

IN WITNESS WHEREOF, I hereunto set my hand and official seal.

NOTARY PUBLIC, STATE OF FLORIDA

_____
Print Name:

My Commission Expires:

South Florida Water Management District
Legal Form Approved
Date: July, 2001

Standard form – July, 2001

EXHIBIT 8E

DESCRIPTION

A PARCEL OF LAND LYING IN THE NORTHWEST 1/4, OF SECTION 6, TOWNSHIP 36 SOUTH, RANGE 40 EAST AND LOTS 1 AND 2 OF THE PLAT ENTITLED MIDWAY INDUSTRIAL PARK – PHASE II, AS RECORDED IN PLAT BOOK 39, AT PAGES 8 AND 8A, OF THE PUBLIC RECORDS, OF ST. LUCIE COUNTY, FLORIDA AND BEING MORE PARTICULARLY DESCRIBED AS FOLLOWS:

COMMENCE AT THE INTERSECTION OF THE WEST LINE OF LOT 2, OF SAID PLAT OF MIDWAY INDUSTRIAL PARK – PHASE II AND THE NORTH RIGHT–OF–WAY LINE OF WEST MIDWAY ROAD (A 120 FOOT WIDE RIGHT–OF–WAY); THENCE NORTH 00°08'53" EAST, ALONG SAID WEST LINE OF LOT 2, A DISTANCE OF 604.81 FEET TO THE POINT OF BEGINNING OF THE CENTER LINE OF A 25 FOOT WIDE CONSERVATION EASEMENT, SAID EASEMENT LINES LYING 12.50 FEET EACH SIDE OF THE FOLLOWING DESCRIBED CENTER LINE; THENCE SOUTH 55°15'31" EAST, A DISTANCE OF 16.25 FEET; THENCE SOUTH 44°13'30" EAST, A DISTANCE OF 39.81 FEET; THENCE SOUTH 28°30'13" EAST, A DISTANCE OF 38.13 FEET; THENCE SOUTH 57°02'46" EAST, A DISTANCE OF 50.23 FEET; THENCE NORTH 79°49'21" EAST, A DISTANCE OF 68.76 FEET; THENCE NORTH 69°34'48" EAST, A DISTANCE OF 65.97 FEET; THENCE NORTH 70°00'26" EAST, A DISTANCE OF 73.27 FEET; THENCE NORTH 66°46'23" EAST, A DISTANCE OF 64.30 FEET; THENCE NORTH 22°25'41" EAST, A DISTANCE OF 44.32 FEET; THENCE NORTH 52°14'20" EAST, A DISTANCE OF 29.74 FEET; THENCE NORTH 58°39'58" EAST, A DISTANCE OF 24.97 FEET; THENCE SOUTH 49°14'41" EAST, A DISTANCE OF 43.77 FEET; THENCE NORTH 65°48'39" EAST, A DISTANCE OF 63.58 FEET; THENCE NORTH 12°02'00" EAST, A DISTANCE OF 44.94 FEET; THENCE NORTH 78°34'42" EAST, A DISTANCE OF 56.75 FEET TO THE EAST LINE OF LOT 1 OF SAID PLAT OF MIDWAY INDUSTRIAL PARK – PHASE II AND THE WESTERLY RIGHT–OF–WAY LINE OF JENKINS ROAD (A 120 FOOT WIDE RIGHT–OF–WAY) AND THE POINT OF TERMINUS OF SAID CENTER LINE.

SAID SIDE EASEMENT LINES TRIMMED OR EXTENDED TO SAID LOT LINES.

SAID PARCEL CONTAINS 0.416 ACRES, MORE OR LESS.

EXHIBIT F

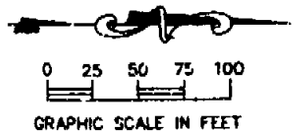
Walter D. Owen 1-30-2004

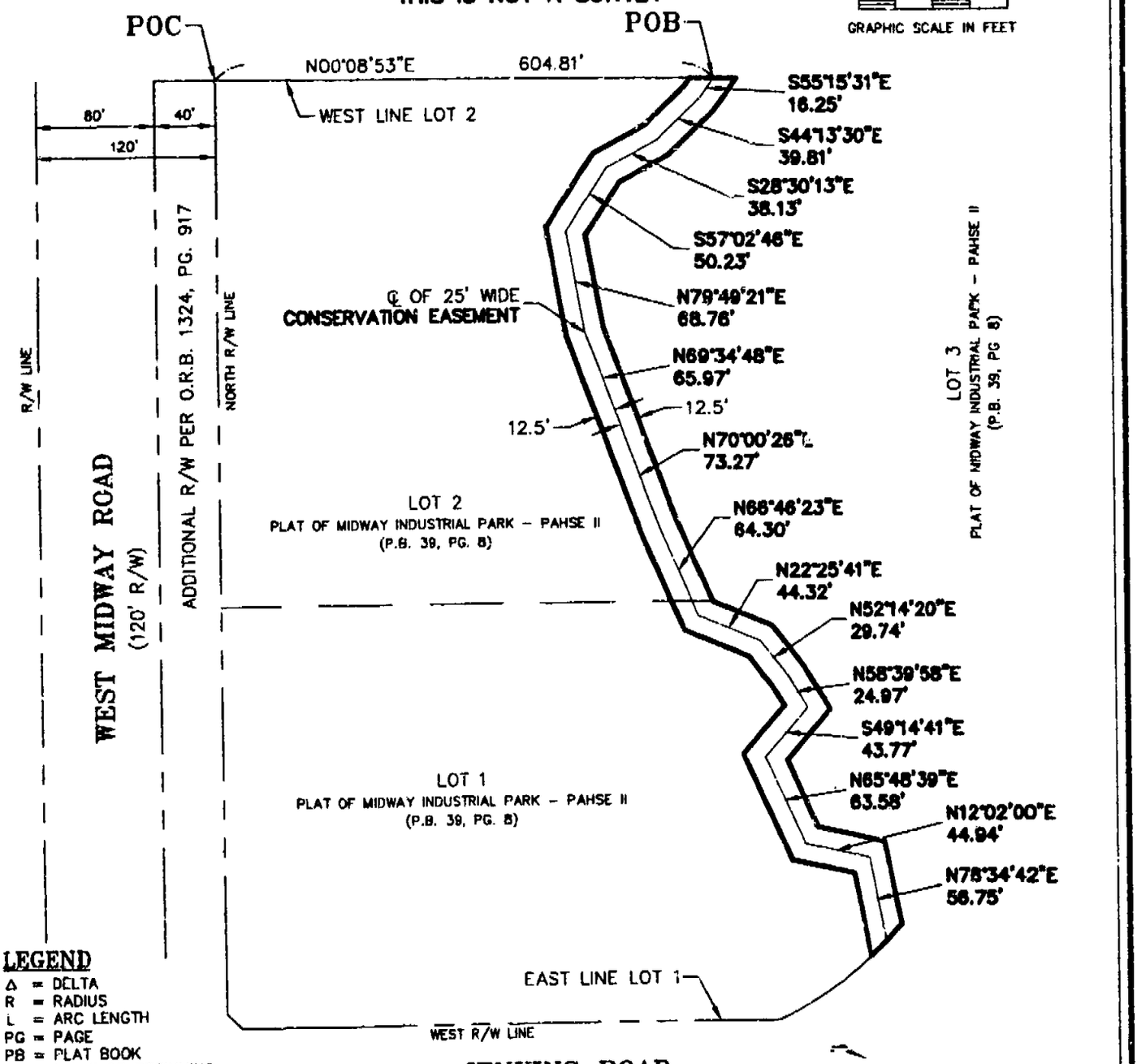
Sheet 1 of 2

SKETCH OF DESCRIPTION OF CONSERVATION EASEMENT Prepared For S.F.W.M.D.	File: 03-139ConEsmt.dwg Date: 8-21-00 Tech: BCS	CULPEPPER & TERPENING, INC. CERTIFICATION No. LB 4286 CONSULTING ENGINEERS & LAND SURVEYORS 2880 SOUTH 25th STREET FORT PIERCE, FLORIDA 34981 (772) 464–3537

SKETCH TO ACCOMPANY DESCRIPTION

THIS IS NOT A SURVEY





LEGEND

- Δ = DELTA
- R = RADIUS
- L = ARC LENGTH
- PG = PAGE
- PB = PLAT BOOK
- POB = POINT OF BEGINNING
- POC = POINT OF COMMENCEMENT
- PLS = PROFESSIONAL LAND SURVEYOR
- R\W = RIGHT-OF-WAY
- ℄ = CENTERLINE
- ± = PLUS OR MINUS
- sq.ft. = SQUARE FEET

THE WEST LINE OF LOT 2 IS ASSUMED TO BEAR N00°08'53"E AND ALL OTHER BEARINGS SHOWN HEREON ARE RELATIVE THERETO.

EXHIBIT 8G

SKETCH OF DESCRIPTION OF CONSERVATION EASEMENT

Prepared For

S.F.W.M.D.

File: 03-139ConEsmt.dwg

Date: 8-21-00

Tech: BCS

CULPEPPER & TERPENING, INC.
CERTIFICATION No. LB 4286

CONSULTING ENGINEERS
&
LAND SURVEYORS
2980 SOUTH 25th STREET
FORT PIERCE, FLORIDA 34981
(772) 464-3537

STAFF REPORT DISTRIBUTION LIST

MAYO WAREHOUSE

Application No: 031216-16

Permit No: 56-01995-P

INTERNAL DISTRIBUTION

X Kelly Cranford, P.E. - 4220
X Melinda Parrott - 4250
X Donald L. Medellin - 4250
X Hugo A. Carter, P.E. - 4220
X A. Waterhouse - 4220
X ERC Martin/St. Lucie - 6880
X J. Golden - 4210
X Permit File
X R. Robbins - 4250

GOVERNING BOARD MEMBERS

- Mr. Harkley R. Thornton
- Mr. Hugh English
- Mr. Kevin McCarty
- Mr. Lennart Lindahl
- Mr. Michael Collins
- Mr. Nicolas Gutierrez, Jr.
- Ms. Irela Bague
- Ms. Pamela Brooks-Thomas
- Ms. Trudi Williams

EXTERNAL DISTRIBUTION

X Permittee - John A. Mayo
X Applicant - Mayo Construction
X Engr Consultant - Culpepper & Termpening Inc

GOVERNMENT AGENCIES

X ACOE
X City of Port St Lucie - Planning Div
X Florida Fish & Wildlife Conservation Commission - Imperiled Species Mgmt Section
X North St Lucie River Water Control District
X St. Lucie County Community Development Director
X St. Lucie County Engineer
X St. Lucie County Environmental Resource Manager

OTHER INTERESTED PARTIES

X Sierra Club - Central Florida Group P.O. Box 941692
X Water Management Institute - Michael N. Vanatta

STAFF REPORT DISTRIBUTION LIST

ADDRESSES

Mayo Construction
1207 Sw 87th Terr
Plantation FL 33324

John A. Mayo
Po Box 292256
Davie FL 33329-2256

Mr. Harkley R. Thornton
Outlook Media
5401 S Kirkman Road, Suite 680
Orlando FL 32819

Mr. Kevin McCarty
Bear Stearns Security Corp.
225 Ne Mizner Blvd, Suite 500
Boca Raton FL 33432

Mr. Michael Collins
Po Box 803
Islamorada FL 33036

Ms. Irela Bague
Irela Bague And Associates, Inc.
3399 Ponce De Leon Blvd., Second Floor, Suite 500
Coral Gables FL 33139-7281

Ms. Trudi Williams
Tkw Consulting Engineers, Inc.
5621 Banner Drive
Ft. Myers FL 33912

ACOE
4400 Pga Blvd.
Suite 500
Palm Beach Gardens FL 33410

Florida Fish & Wildlife Conservation Commission -
Imperiled Species Mgmt Section
620 South Meridian Street
Tallahassee FL 32399-6000

St. Lucie County Community Development Director
2300 Virginia Avenue

Culpepper & Termpening Inc
2980 S 25th St
Fort Pierce FL 34981

Mr. Hugh English
Po Box 129
Labelle FL 33975

Mr. Lennart Lindahl
Lbfh, Inc.
3550 Sw Corporate Pkwy.
Palm City FL 34990

Mr. Nicolas Gutierrez, Jr.
Rafferty, Gutierrez & Sanchez-Aballi, Pa
1101 Brickel Ave, Suite 1400
Miami FL 33131

Ms. Pamela Brooks-Thomas
Ncci, Inc.
901 Peninsula Corporate Circle
Boca Raton FL 33487

City of Port St Lucie - Planning Div
121 Sw Port St Lucie Blvd
Port St Lucie FL 34984-5099

North St Lucie River Water Control District

STAFF REPORT DISTRIBUTION LIST

Fort Pierce FL 34982

St. Lucie County Engineer
2300 Virginia Avenue
Fort Pierce FL 34982

St. Lucie County Environmental Resource Manager
2300 Virginia Avenue
Fort Pierce FL 34982

Sierra Club - Central Florida Group P.O. Box 941692

Maitland FL 32794

Water Management Institute - Michael N. Vanatta
Po Box 6446
Vero Beach FL 32961

erp_staff_route_sheet

SOUTH FLORIDA WATER MANAGEMENT DISTRICT
STAFF REPORT ROUTE SHEET

APP TYPE: IND ENVIRONMENTAL RESOURCE (CONCEPTUAL APPROVAL)

APPLICATION NO: 031216-16

PROJECT NAME: MAYO WAREHOUSE

SCHEDULED FOR 12-AUG-2004 **GOVERNING BOARD**

	Name	Due Date	Date Signed
ENGINEERING EVAL.	Kelly Cranford, P.E.	20-JUL-2004	✓
ENVIRONMENTAL EVAL.	Melinda Parrott	20-JUL-2004	✓
SUPERVISOR SWM	Hugo A. Carter, P.E.	20-JUL-2004	22 Jul 04
SUPERVISOR NRM	Donald L. Medellin	20-JUL-2004	22 Jul 04
DIV. DIR., NRM	Robert G. Robbins MR		7-29-04
DIV. DIR., SWM	Anthony M. Waterhouse		7/29/04

RESOURCE CODES

WETLAND IMPACTS
CONSERVATION EASEMENT
CUMULATIVE IMPACTS ASSESSMENT
CONCEPTUAL PERMIT
OFFSITE WETLAND MITIGATION

Parrott, Melinda

From: Patrick Pecunia [ppecunia@ct-eng.com]
Sent: Thursday, July 22, 2004 5:25 PM
To: Parrott, Melinda
Cc: Gary Basham
Subject: RE: Mayo Warehouse, Recorded Release of Perpetual Conservation Easement

Mindy,
Attached, please find the recorded release of perpetual conservation easement for the Mayo Warehouse project.

Please let me know if this is what you are looking for and if there is anything else you need.

Thanks,
Patrick

Patrick-

The two items missing are

- Signed conservation easement form for buffer area.
- Evidence that the former conservation easement to the county over the wetland has been removed.

If these items are submitted within the next week or so, the project can be recommended for approval at the August 11 Governing Board meeting.

Mindy Parrott
(561) 682-2065

-----Original Message-----
From: Cranford, Kelly
Sent: Friday, July 09, 2004 8:54 AM
To: Parrott, Melinda
Subject: FW: Mayo Warehouse

-----Original Message-----
From: Patrick Pecunia [mailto:ppecunia@ct-eng.com]
Sent: Friday, July 09, 2004 8:41 AM
To: Cranford, Kelly
Subject: Mayo Warehouse

Kelly,

If possible, please send the Mayo Warehouse comments, if any, to this email address.

Permit 56-01995-P
App No. 031216-16

Thanks,
Patrick Pecunia, E.I.

Patrick Pecunia, E.I.
Culpepper & Terpening
2980 South 25th Street
Fort Pierce, FL 34981
Phone: (772) 464-3537 ext 215
Fax: (772) 464-9497

Prepared by and return to:

Johnathan A. Ferguson
Ruden, McClosky, Smith, Schuster & Russell, P.A.
145 NW Central Park Plaza, Suite 200
Port St. Lucie, FL 34986

RELEASE OF PERPETUAL CONSERVATION EASEMENT

This Release of Perpetual Conservation Easement ("Release") is made this 29 day of JUNE, 2004, by and between John A. Mayo ("Owner"), with his address at 1207 S.W. 87th Terrace, Plantation, Florida and St. Lucie County, Florida, a political subdivision of the State of Florida ("County"), with its principal office at 2300 Virginia Avenue, Fort Pierce, Florida.

WITNESSETH:

WHEREAS, John A. Mayo is the owner in fee simple of certain real property in St. Lucie County, Florida, more particularly described in Exhibit "A", attached hereto and incorporated herein by this reference ("Property"); and

WHEREAS, the Property contains a single jurisdictional wetland, approximately 1.87 acres in size, for which the legal description is more particularly described in Exhibit "B", attached hereto and incorporated herein by this reference ("Wetland"); and

WHEREAS, on September 14, 2000, Owner's predecessor in interest, Midway Properties of St. Lucie County, L.C. and Ron Thomas Jones and Cody Jones as ancillary Co-Personal Representatives of the Estate of Thomas C. Jones, granted a Perpetual Conservation Easement ("Easement") to St. Lucie County for the Wetland, said Easement was recorded at Official Record Book 1330, Page 2441, of the public records of St. Lucie County, Florida; and

WHEREAS, the Owner commissioned an environmental study ("Study") of the Wetland which was prepared by R.L. Weigt Environmental Consultants, Inc. and which was completed in October 2003; and

WHEREAS, the Study indicates that the Wetland is isolated and of poor quality because of severe hydrological impacts caused by the development of Midway Road to the south, Jenkins Road to the east and industrial development to the west and the hydrological impact has caused the historically wetland plant species to be replaced by transitional and upland plant species. Furthermore, on-site mitigation opportunities would not be expected to have long term viability due to the unsuitable hydrologic conditions, relatively small size of the wetland and the proposed

JOANNE HARMAN, CLERK OF THE CIRCUIT COURT - SAINT LUCIE COUNTY
File Number: 2441648 OR BOOK 2018 PAGE 2933
Recorded:07/19/04 08:55

industrial development of the site. Finally, preservation of the Wetland will adversely impact the development of the site for uses allowed under its existing Industrial future land use category and Heavy Industrial zoning category; and

WHEREAS, since the granting of the Easement, the Bluefield Ranch Mitigation Bank has been created and is available to provide mitigation credits for property in this part of the St. Lucie County; and

WHEREAS, the Study indicated, pursuant to State formulas, that the Owner would need to obtain 2.1 mitigation credits from the Bluefield Ranch Mitigation Bank in order to utilize the Wetland for future development; and

WHEREAS, the Owner has entered into a contract with Bluefield Ranch Mitigation Bank for 2.1 credits; and

WHEREAS, under the facts and conditions as presented herein, it is appropriate to release the Wetland from the Perpetual Conservation Easement.

NOW, THEREFORE, in consideration of the above and the mutual covenants, terms, conditions and restrictions contained herein and pursuant to and in accordance with the provisions of Section 704.06, Florida Statutes, the Owner and County agree as follows:

1. Recitals.

The recitals set forth above are true and correct and hereby incorporated herein by this reference.

2. County Release.

The County hereby releases completely and unconditionally the Wetland described in Exhibit "B" from all of the terms, conditions and restrictions of the Perpetual Conservation Easement recorded at Official Record Book 1330, Page 2441, of the public records of St. Lucie County, Florida.

3. Mitigation Credits.

In return for the County's release of the Wetland from the restrictions of the Easement, the Owner agrees to obtain 2.1 mitigation credits from the Bluefield Ranch Mitigation Bank which shall be obtained, as evidenced by a receipt from the Bluefield Ranch Mitigation Bank, prior to the recording of this Release.

4. Effect of Remaining Easement.

The Easement shall remain in full force and effect for all other property not specifically addressed by this Release.

OR BOOK 2018 PAGE 2934

5. Existing Easements.

This Release shall have no effect on any other existing easements for public roads and highways, public utilities, railroads and pipelines.

6. Binding Effect.

All of the effects of this Release herein contained run with the land and shall inure to the benefit of and be binding upon the parties hereto and their respective executors, administrators, personal representatives, heirs, successors and assigns.

IN WITNESS WHEREOF, St. Lucie County has executed this Release and John A. Mayo has accepted this Release on the date written above.

ATTEST:

DEPUTY CLERK

BOARD OF COUNTY COMMISSIONERS
ST. LUCIE COUNTY, FLORIDA

BY: _____
CHAIRMAN

APPROVED AS TO FORM AND CORRECTNESS:

COUNTY ATTORNEY

WITNESSES:

Thomas Gill
(Print or type name)

E.L. Henniq
(Print or type name)

OWNER:

JOHN A. MAYO

STATE OF FLORIDA
COUNTY OF Broward

The foregoing instrument was acknowledged before me this 29 day of June, 2004 by JOHN A. MAYO, who is personally known to me or who has produced _____ as identification.

Barbara Ann Cellis
My Commission DD274620
Expires December 28, 2007

NOTARY PUBLIC

OR BOOK 2018 PAGE 2935

PSL:11848:1

EXHIBIT "A"

MIDWAY INDUSTRIAL PARK – PHASE II, LOTS 1 AND 2 AS SHOWN ON THE PLAT RECORDED AT PLAT BOOK 39, PAGE 8, OF THE PUBLIC RECORDS OF ST. LUCIE COUNTY, FLORIDA, LESS THE SOUTH 40 FEET FOR ROAD RIGHT OF WAY AS SHOWN IN OFFICIAL RECORD BOOK 1324, PAGE 917, OF THE PUBLIC RECORDS OF ST. LUCIE COUNTY, FLORIDA.

PSL:11868:1

EXHIBIT B
PAGE 1 OF 3 PAGES

LEGAL DESCRIPTION

Being a portion of Tracts 11 and 12, in the Northwest one-quarter of Section 6, Township 36 South, Range 40 East, of MODEL LAND COMPANY SUBDIVISION, as recorded in Plat Book 4, Page 34, public records of St. Lucie County, Florida, and being more particularly described as follows:

Commence at the Southeast corner of lands deeded to Treasure Coast Truss Co., Inc., as recorded in Official Records Book 422, Page 2789, of the public records of St. Lucie County, Florida, said point lying in the northerly right-of-way line of West Midway Road, an 80 foot wide right-of-way; thence N 89°54'40" E, along the said northerly right-of-way line of West Midway Road, a distance of 216.56 feet; thence N 00°05'14" W a distance of 34.59 feet to the POINT OF BEGINNING of the following described Wetland "B":

Thence N 07°23'01" W a distance of 74.58 feet; thence N 41°45'12" W a distance of 42.44 feet; thence N 04°00'18" W a distance of 56.60 feet; thence N 14°33'50" E a distance of 47.65 feet; thence N 18°21'04" E a distance of 51.26 feet; thence N 44°49'30" E a distance of 95.17 feet; thence S 74°43'07" E a distance of 59.53 feet; thence S 75°41'07" E a distance of 31.35 feet; thence N 36°44'51" E a distance of 26.33 feet; thence S 87°29'11" E a distance of 27.69 feet; thence S 86°23'40" E a distance of 26.39 feet; thence S 86°04'57" E a distance of 65.30 feet; thence S 05°39'17" W a distance of 43.10 feet; thence S 18°47'32" E a distance of 23.19 feet; thence S 00°04'24" W a distance of 71.38 feet; thence S 13°24'37" W a distance of 57.21 feet; thence S 32°41'39" W a distance of 56.21 feet; thence S 39° 25' 46" W a distance of 30.99 feet; thence S 75°46'56" W a distance of 34.17 feet; thence S 43°09'37" W a distance of 12.40 feet; thence S 77°29'48" W a distance of 73.06 feet; thence N 83°05'22" W a distance of 42.85 feet; thence S 68°46'11" W a distance of 64.87 feet to the POINT OF BEGINNING.

Containing 1.87 acres, more or less.

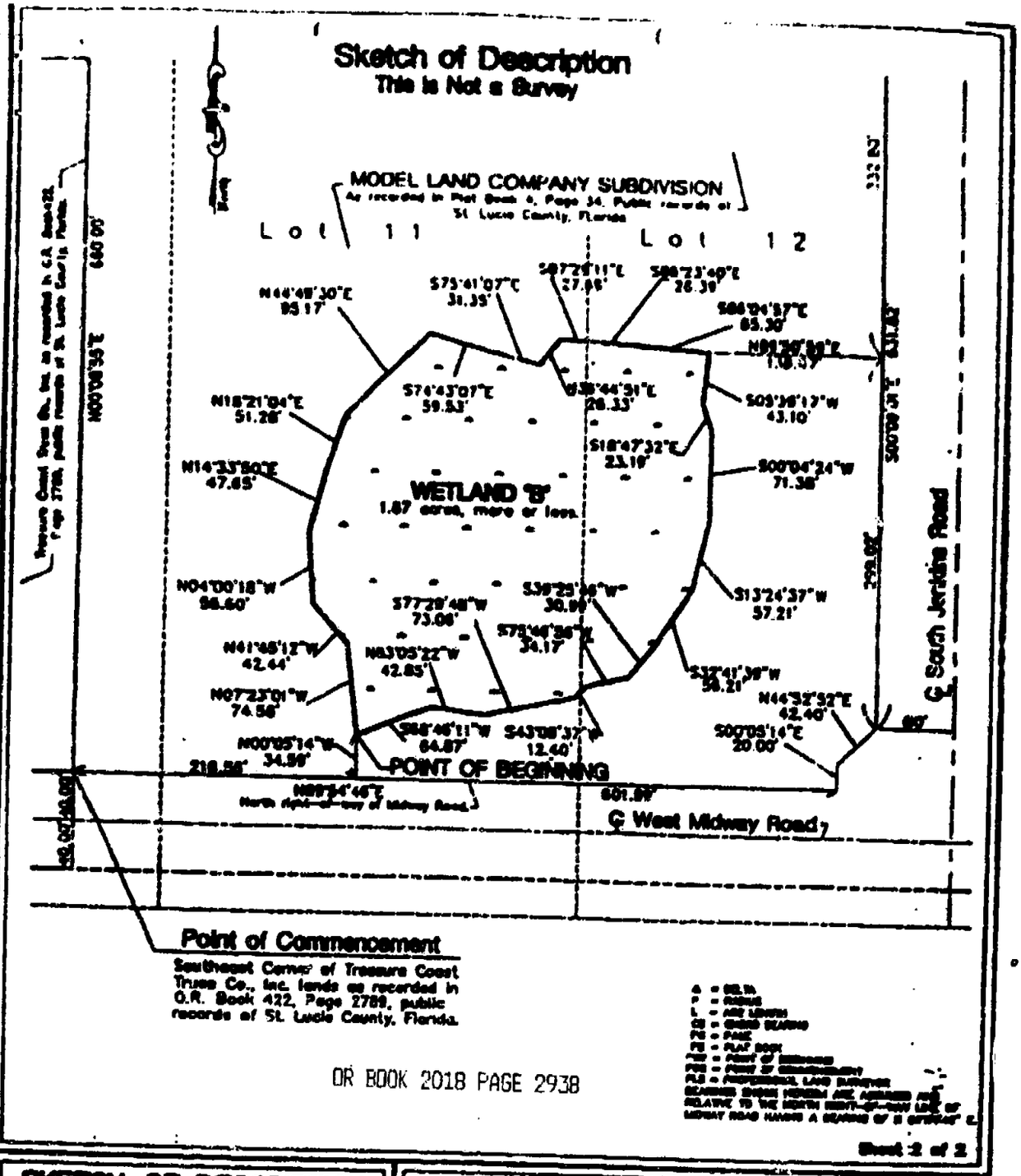
OR BOOK 2018 PAGE 2937

I HEREBY CERTIFY THAT THIS DESCRIPTION AND ACCOMPANYING SKETCH COMPLIES WITH THE MINIMUM TECHNICAL STANDARDS AS SET FORTH IN CHAPTER 61G17-6 ADOPTED BY THE FLORIDA BOARD OF LAND SURVEYORS, PURSUANT TO FLORIDA STATUTE 472.027.
DATE: _____ BY _____ RICHARD C. LAVENTURE, P.L.S. 5208.

Sheet 1 of 2

SKETCH OF DESCRIPTION OF Wetland "B" Prepared For MIDWAY INDUSTRIAL PARK	File: 23DBWET.dwg Date: 5/18/00 Tech: rwb	CULPEPPER & TERPENING, INC. CONSULTING ENGINEERS & LAND SURVEYORS [illegible]

EXHIBIT B
PAGE 2 OF 2 PAGES



OR BOOK 2018 PAGE 2938

SKETCH OF DESCRIPTION of Wetland "B" Prepared For MIDWAY INDUSTRIAL PARK	File: 2308WET.dwg Date: 5/15/00 Tech: rub	CULPEPPER & TERPENING, INC. CONSULTING ENGINEERS & LAND SURVEYORS

Δ = Central Angle
R = Radius
L = Arc Length

□ = Found Permanent Reference Monument LB #4286
● =Found Permanent Control Point "PCP LB #4286)
O = Found #5 Iron Rod & Cap LB#4286

DESCRIPTION

BEING ALL OF LOT 1 AND 2, ACCORDING TO THE PLAT OF MIDWAY INDUSTRIAL PUBLIC RECORDS OF ST. LUCIE COUNTY, FLORIDA, LESS AND EXCEPTING THE BOOK 1324, PAGE 917 PUBLIC RECORDS OF ST. LUCIE COUNTY, FLORIDA ADDITIONAL RIGHT-OF-WAY FOR WEST MIDWAY ROAD RECORDED IN O.R. SOUTH 40.00' THEREOF AS CONVEYED TO ST. LUCIE COUNTY AS PARK-PHASE II, AS RECORDED IN PLAT BOOK 39, PAGES 8 AND 8A.

N/A

031216-16

1) Reproductions of this map are not valid without the signature and original raised seal of a Florida Licensed Surveyor and Mapper.
2) Lands shown hereon were not abstracted by this office for rights-of-way, easements of record, ownership, abandonments, deed restrictions, or Murphy Act Deeds. This information should be obtained through appropriate title verification.
3) Descriptions shown hereon provided by the client and/or their agent.
4) Underground foundations and improvements were not located as part of this survey.
5) Overall parcel contains 8.85 Acres,(385,485 sq.ft) more or less.
6) The last date of field work was OCTOBER, 28, 2003
7) The North right-of-way line of Midway Road, as monumented is assumed to bear S89°54'46"E and all other bearings shown hereon are relative thereto.
8) Flood Note: By graphic plotting only, this property is located in Zone "X", according to Flood Insurance Rate Maps, Community Panel No.s' 12111C0170 F, 12111C0188 F, and 12111275 F, FIRM Index dated June 30, 1999. The exact designation can only be determined by an elevation certificate.
9) Fences shown hereon are considered existing cattle fence for grazing, which encompasses, this entire site north of Midway Rd. At some point, and time, the area was owned by a single owner and used for cattle grazing.
10) Wetlands shown hereon were field flagged by Peter J. Krinsky C.E.P. Enviomental Planner on December 6, 1999 and field located by this office on December 14, 1999.

DATE: 11-7-03

APPLICATION 031216-16
EXHIBIT 1b

BLUEFIELD RANCH MITIGATION BANK

901 North Olive Avenue
West Palm Beach, Florida 33401
Telephone (561) 355-3900
Fax (561) 659-9811
davemcif@bellsouth.net

June 8, 2004

ADDL/REVISED SUBMITTAL

JUN 08 2004

031216-16

3 Pages Via Fax to 561-682-6896
Ms. Mindy Parrott
South Florida Water Management District
Natural Resource Management Division
Environmental Resource Regulation Department
West Palm Beach, Florida 33146-4680

Bluefield Ranch Mitigation Bank ("BRMB")
SFWMD Environmental Resource Permit No. 56-00002-M
Minor Modification for Withdrawal of Credits

Dear Mindy:

Pursuant to the terms of the above Permit, BRMB hereby requests a withdrawal and transfer of mitigation credits from our bank, as follows:

Transferee: Midway Industrial Park, Phase II, Lots 1&2

Number and Type of Credits to be Transferred: 2.1 herbaceous

Kindly acknowledge, to the applicant and to me, your consent to this request. For your convenience, I have attached a copy of the Bluefield Credit Ledger, reflecting the funding of the endowment trust and the transfer of these credits. And, for your records, I send a copy of the transmittal letter associated with the endowment funding. You'll receive confirmation directly.

Please contact me if you have any questions.

Very truly yours,

David McIntosh, Trustee
BLUEFIELD RANCH MITIGATION BANK

Cc: Mr. John Mayo (954) 236-8832 – 1 Page
Butch Terpening (772) 464-9497 – 1 Page

06-08-'04 16:39 FROM-CAMERON,DAVIS ET AL 15616533811 T-988 P02/03 U-898

BLUEFIELD RANCH MITIGATION BANK-CREDIT LEDGER SHEET
State of Florida - SFWMD and DEP

1-A	74.24	5.95	4.31	10.30	5.95	4.31	10.30	5.95	4.31	10.30				5.99	4.31	10.30	Initial balance			
								5.95	4.31	10.30		0.50	0.50	5.99	3.41	9.40	Wal-Mart	56-01554-P	12-Dec-01	31-Dec-01
								5.95	3.41	9.40	2.60		2.60	3.19	3.41	6.60	Kings Crossing	56-01566-P	11-Jul-02	26-Feb-02
1-B	194.00	8.73	6.26	15.01	8.73	6.26	15.01	3.15	3.41	6.60		0.60	0.60	3.19	2.61	5.80	Mariposa Club	56-00058-S-03	3-Apr-02	4-Apr-02
2	2411.00	57.44	41.28	98.72				3.15	3.41	6.60				11.92	8.89	20.81	Release			17-Jul-02
								11.92	8.89	20.81		6.60	6.60	11.92	2.29	14.21	Release (no funding)			17-Jul-02
								11.92	2.29	14.21		1.20	1.20	11.92	1.09	13.01	Jensen Beach HS	43-01320-P	13-Jun-02	6-Aug-02
					0.91	0.91		11.92	1.09	13.01				11.92	2.00	13.92	Okeechobee Med Center	47-00062-P	8-Jul-02	6-Aug-02
								11.92	2.00	13.92		1.70	1.70	11.92	0.30	12.22	Funding			29-Oct-02
								11.92	0.30	12.22	0.30		0.30	11.62	0.30	11.92	Pineapple Commons	43-01361-P	10-Oct-02	4-Nov-02
3		109.82	73.92	176.74				11.62	0.30	11.92				11.62	0.30	11.92	DenRo Auto Sales	18-01433-P	15-Nov-02	10-Mar-03
								11.62	0.30	11.92		0.40	0.40	11.62	(0.10)	11.52	Release (no funding)			6-Dec-02
		5.41	3.69	9.30				11.62	(0.10)	11.52				11.62	(0.10)	11.52	SR 70	56-01926-P	12-Dec-02	10-Mar-03
3					20.00	25.00	45.00	11.62	(0.10)	11.52				11.62	24.90	36.52	Compliance Release			7-Feb-03
								31.62	24.90	56.52	16.80	16.80	33.60	14.82	8.10	22.92	Funding*			10-Mar-03
								14.82	8.10	22.92	0.60	0.00	0.60	14.22	8.10	22.32	Portofino Isles/Glassman	56-00332-S-13	10-Apr-03	18-Feb-03
								14.22	8.10	22.32	1.80	0.00	1.80	12.42	8.10	20.52	Lake Forest Park	56-01356-P	5-May-03	19-Feb-03
								12.42	8.10	20.52	0.00	2.20	2.20	12.42	5.90	18.32	Treasure Cay Luxury Apts	56-01706-P	15-May-03	6-Aug-03
								12.42	5.90	18.32	4.60	0.00	4.60	7.82	5.90	13.72	Conners Gables	47-00490-P	15-May-03	30-May-03
								7.82	5.90	13.72	0.00	0.60	0.60	7.82	5.10	12.92	South Jenkins Road/Walmart	56-01732-P	9-Jul-03	Pending
								7.82	5.10	12.92	0.00	0.80	0.80	7.82	4.30	12.12	Pinehaven/Scolaro	Appl#30813-9		Pending
								7.82	4.30	12.12	2.70	2.40	5.10	5.12	1.90	7.02	Koch Used Cars	56-01743-P	16-Jul-03	Pending
								5.12	1.90	7.02	0.00	1.10	1.10	5.12	0.80	5.92	Sawgrass Lakes Ph. 4	56-00332-S-17	15-Oct-03	19-Sep-03
								5.12	0.80	5.92	1.80	1.20	3.00	3.32	(0.40)	2.92	Fort Pierce Business Park	56-00849-S	9-Jan-04	11-Dec-03
								3.32	(0.40)	2.92	1.80	1.90	3.70	1.42	(2.20)	(0.78)	S & S/US 1 parcel	56-01810-P	11-Dec-03	10-Dec-03
								1.42	(2.20)	(0.78)	1.70	2.40	4.10	(0.28)	(4.60)	(4.88)	Pine Summit	56-01435-P	12-Nov-03	2-Dec-03
								(0.28)	(4.60)	(4.88)	0.60	0.60	0.60	(0.28)	(5.20)	(5.48)	Sawgrass Lakes Ph. 3	56-00332-S-18	11-Dec-03	22-Dec-03
								(0.28)	(5.20)	(5.48)	4.10	0.60	4.70	(4.38)	(5.80)	(10.18)	SR 615-Midway to Edwards	56-00977-S-02	29-Dec-03	Pending
				4.38	5.80	10.18		(4.38)	(5.80)	(10.18)				0.00	0.00	0.00	Leonard Square/Sam's Club	56-01745-P	19-Jan-04	Pending
								0.00	0.00	0.00	0.20	0.00	0.20	(0.20)	0.00	(0.20)	4/8/04 Funding*		8-Apr-04	
				0.20	0.00	0.20		(0.20)	0.00	(0.20)				0.00	0.00	0.00	Chuck & LillianSteele	DEP 56-0214533-001		
								0.00	0.00	0.00	0.00	2.10	2.10	0.00	(2.10)	(2.10)	4/8/04 Funding*		9-Apr-04	
				0.00	2.10	2.10		0.00	(2.10)	(2.10)				0.00	0.00	0.00	Midway Industrial Park II, 1 & 2			
Total		180.39	129.68	310.07	39.30	44.40	83.70				39.30	44.40	81.60				6/8/04 Funding*			
Available balance does not reflect credits reserved or sold for projects not listed above, including																				
													1.50				Gibson Property	43-01438-P	9-Jul-03	Pending
													0.90				St. Lucie Oaks	App#01224-15	under review	
													1.00				Rowan Property	App#01199-6	under review	

Bluefield Ranch Mitigation Bank

901 North Olive Avenue
West Palm Beach, FL 33405
Phone (561) 355-3900
Fax (561) 659-9811
davemci@bellsouth.net

June 8, 2004

REVISED SUBMITTAL

Ms. Elizabeth Kimball
Florida Bank, NA
5210 Belfort Road
Jacksonville, FL 32216

JUN 08 2004

Bluefield Ranch Mitigation Bank Trust Account
Account # 0002027274

031216-16

Dear Elizabeth:

I enclose a check in the amount of $2,354.44, payable to the above-captioned account, and I ask that you deposit it promptly. This check represents the funding of 2.1 wetland mitigation credits at Bluefield Ranch Mitigation Bank, each full credit being funded at the rate of $1,121.16.

I note for our own records, and for those of the South Florida Water Management District, that this deposit represents the funding for the below-listed sale. Such funding keeps our Ledger in compliance with the terms of our Permit.

Number and type of credits: 2.1 herbaceous credits
Buyer: Midway Industrial Park, Phase 11, Lots 1&2.

I ask that you execute the acknowledgement of receipt and deposit below and fax to me AT MY NEW FAX NUMBER (561-659-9811) and to Ms. Mindy Parrott (561-682-6896) a copy of the acknowledgement at your earliest convenience. Please call if you have any questions. Many thanks.

Sincerely,

Deposit received by Florida Bank, NA and deposited as instructed:

_____ _____
Authorized signature Date

SOUTH FLORIDA WATER MANAGEMENT DISTRICT

3301 Gun Club Road, West Palm Beach, Florida 33406 • (561) 686-8800 • FL WATS 1-800-432-2045 • TDD (561) 697-2574
Mailing Address: P.O. Box 24680, West Palm Beach, FL 33416-4680 • www.sfwmd.gov

CON 24-06
Application No. 031216-16
Environmental Resource Regulation

June 3, 2004

Gary Basham, PE, PLS
Culpepper & Terpening, Inc.
2980 South 25th Street
Ft. Pierce, FL 34981

Subject: **Mayo Warehouse**
St. Lucie County, S6/T36S/R40E

Dear Mr. Basham,

Staff has completed a preliminary review of the submitted information. According to Rule 40E-4, Florida Administrative Code (FAC), the District is requesting the following information needed to complete the application.

1. As previously requested, please submit a check for the outstanding $3,000.00 balance in order to allow processing of this application to continue.

2. The applicant proposes to purchase credits at Bluefield Ranch Mitigation Bank for mitigation of the proposed impacts. As previously requested, has the Applicant arranged to reserve these credits with the mitigation banker? Please submit correspondence from the mitigation banker confirming that the credits needed for this project have been reserved for purchase at the Bluefield Ranch Mitigation Bank.

Advisory Comments: The following comment is advisory in nature and does not require a response to the District. However, resolution of these comments is required in order for staff to recommend approval of the requested permit.

A1. Has the Applicant prepared a draft conservation easement for the proposed upland buffer? The submittal included a sketch and legal description for the upland buffer area, but no signed easement form. Please provide a signed draft conservation easement document. Please note that prior to the issuance of a permit, an executed (signed) copy of the easement document must be provided. Also, within 60 days of issuance of a permit for construction, a recorded copy of the easement document will be required to be submitted.

A2. The submitted Boundary Survey indicates that a portion of the wetland to be impacted may be included in a Perpetual Conservation Easement to St. Lucie County. Has this easement been released? As previously requested, please provide a copy of the easement and provide evidence that the easement has been lawfully terminated.

Governing Board

Executive Office

In accordance with 40E-1.603(1) (c) FAC, if the requested information is not received within 30 days of the date of this letter, this application may be processed for denial, if not withdrawn by the applicant. Please attach a copy of the enclosed "Transmittal Form For Requested Additional Information" to each of the required FOUR copies of the requested information.

Should you have any questions, please call Kelly Cranford of the Surface Water Management Division at (561)682-2515 or Mindy Parrott of the Natural Resources Management Division at (561)682-2065.

Sincerely,

Mindy Parrott
Staff Environmental Analyst
Natural Resource Management Division
South Florida Water Management District

cc: DEP
St. Lucie County Community Development Director
St. Lucie County Engineer
St. Lucie County Environmental Resource Manager
North St. Lucie River Water Control District
Applicant

bc: M. Parrott, NRM – 4250
K. Cranford, SWM – 4220
D. Loving - 6880
S. McNabb – 6880
Application File

CULPEPPER & TERPENING, INC.

Consulting Engineers • Land Surveyors

2980 South 25th Street • Ft. Pierce, FL 34981
(772) 464-3537 • Fax (772) 464-9497
www.ct-eng.com

Sender's Email: gbasham@ct-eng.com

May 6 2004

Job 03-139

VIA: FEDERAL EXPRESS

Mr. Hugo A. Carter, P.E.
Senior Supervising Engineer
Surface Water Management Department
South Florida Water Management District
3301 Gun Club Road
West Palm Beach, FL 33406

MAY [illegible] 2004

RE: Mayo Warehouse
St. Lucie County, S6/T36S/R40E
Application No. 031216-16

031216-16

Dear Mr. Carter:

We are in receipt of your letter dated March 3, 2004, regarding the above-referenced project and have enclosed the following information for your review and approval:

- Four (4) signed and sealed sets of the revised conceptual plans
- Four (4) signed and sealed sets of the revised submittal package.

The following is our response to your comments:

1. As previously requested, please submit a check for the outstanding $3,000.00 balance in order to allow processing of this application to continue.

   Please find a copy of the cancelled check included in this submittal.

2. In order for the District to grant conceptual approval for construction not owned by or under contract to the applicant, we need to have written authorization from the owner of the off site property. As previously requested, please provide documentation from the county conceptually approving the drainage connection beneath the Midway Road right-of-way.

   A copy of the North St. Lucie Water Control District permit has been previously submitted and indicates that the owner of the offsite property has granted authorization for discharge into its system.

   Included in this submittal, please find a letter from the St. Lucie County Engineer Mike Powley, P.E., conceptually granting approval for the connection beneath the Miaway Road right-of-way.

3. The submitted Boundary Survey indicates that a portion of the wetland to be impacted may be included in a Perpetual Conservation Easement. To whom is the easement dedicated? What is the extent of the easement? Has this easement been released? Was the easement provided as mitigation for a previous impact? As previously requested, please provide a copy of the easement. Additional mitigation may be required if the conservation easement was recorded as a mitigation requirement. Please provide evidence that the easement has been lawfully terminated.

The existing Perpetual Conservation Easement was dedicated to St. Lucie County. The owner has requested removal of the conservation easement and proposes to purchase off-site mitigation at the Bluefield Mitigation Bank.

4. Seasonal high water elevations for the adjacent wetland were marked in the field on January 22, 2004; however, the submittal did not include the elevations on the plans. What is the seasonal high water elevation? Please provide the elevation on the plans.

The seasonal high water elevation is 18.65' NGVD and has been added to the plans. The control elevation been elevated to 19.65' NGVD.

5. The applicant proposes to purchase credits at Bluefield Ranch Mitigation Bank for mitigation of the proposed impacts. As previously requested, has the Applicant arranged to reserve these credits with the mitigation banker? Please submit correspondence from the mitigation banker confirming that the credits needed for this project have been reserved for purchase at the Bluefield Ranch Mitigation Bank.

Because the reservation of mitigation credits will require a non-refundable deposit, the owner is waiting to reserve the credits until the St. Lucie County Board of County Commissioners approves the easement abandonment. Please refer to the correspondence included herein from John Mayo to David McIntosh, of Bluefield Ranch Mitigation Bank.

6. The recently submitted plans indicate two scenarios for the project, one in which the project provides input into the adjacent wetland as requested, and another in which the adjacent wetland is assumed to be impacted. Because the District has not issued a permit indicating the filling of that wetland, the District must assume it will remain. Therefore, please revise the submittals and calculations to include only the scenario in which the pretreated discharge will be provided to the wetland as requested.

The submittal and calculations have been revised to included only one scenario in which pretreated discharge will be provided to the wetland.

Advisory Comments: The following comment is advisory in nature and does not require a response to the District. However, resolution of these comments is required in order for staff to recommend approval of the requested permit.

Has the Applicant prepared a draft conservation easement for the proposed upland buffer? The submittal included a sketch and legal description for the upland buffer area, but no signed easement form. Please provide a signed draft conservation easement document. Please note that prior to the issuance of a permit, an executed (signed) copy of the easement document must be provided. Also, within 60 days of issuance of a permit for construction, a recorded copy of the easement document will be required to be submitted.

A draft conservation easement for the proposed upland buffer has been included in this submittal.

Thank you for your assistance with this project. Should you have any further questions, please do not hesitate to contact our office.

Sincerely,

CULPEPPER & TERPENING, INC.

Gary L. Basham, PE, PLS
Vice President Engineering & Surveying

GLB:pw
Enclosures

SOUTH FLORIDA WATER MANAGEMENT DISTRICT
3301 Gun Club Road, West Palm Beach, Florida 33406 • (561) 686-8800 • FL WATS 1-800-432-2045 • TDD (561) 697-2574
Mailing Address: P.O. Box 24680, West Palm Beach, FL 33416-4680 • www.sfwmd.gov

CON 24-06
Application No. 031216-16
Environmental Resource Regulation

March 3, 2004

Mr. Gary Basham, PE, PLS
Culpepper & Terpening, Inc.
2980 South 25th Street
Ft. Pierce, FL 34981

Subject: **Mayo Warehouse**
St. Lucie County, S6/T36S/R40E

Dear Mr. Basham,

Staff has completed a preliminary review of the submitted information. According to Rule 40E-4, Florida Administrative Code (FAC), the District is requesting the following information needed to complete the application.

1. As previously requested, please submit a check for the outstanding $3,000.00 balance in order to allow processing of this application to continue.

2. In order for the District to grant conceptual approval for construction not owned by or under contract to the applicant, we need to have written authorization from the owner of the off site property. As previously requested, please provide documentation from the county conceptually approving the drainage connection beneath the Midway Road right-of-way.

3. The submitted Boundary Survey indicates that a portion of the wetland to be impacted may be included in a Perpetual Conservation Easement. To whom is the easement dedicated? What is the extent of the easement? Has this easement been released? Was the easement provided as mitigation for a previous impact? As previously requested, please provide a copy of the easement. Additional mitigation may be required if the conservation easement was recorded as a mitigation requirement. Please provide evidence that the easement has been lawfully terminated.

4. Seasonal high water elevations for the adjacent wetland were marked in the field on January 22, 2004; however, the submittal did not include the elevations on the plans. What is the seasonal high water elevation? Please provide the elevation on the plans.

5. The applicant proposes to purchase credits at Bluefield Ranch Mitigation Bank for mitigation of the proposed impacts. As previously requested, has the Applicant arranged to reserve these credits with the mitigation banker? Please submit

GOVERNING BOARD
Nicolás J. Gutierrez, Jr., Esq., Chair
Pamela Brooks-Thomas, Vice Chair
Irela M. Bagué
Michael Collins
Hugh M. English
Lennart E. Lindahl, P.E.
Kevin McCarty
Harkley R. Thornton
Trudi K. Williams, P.E.
EXECUTIVE OFFICE
Henry Dean, Executive Director

correspondence from the mitigation banker confirming that the credits needed for this project have been reserved for purchase at the Bluefield Ranch Mitigation Bank.

6. The recently submitted plans indicate two scenarios for the project, one in which the project provides input into the adjacent wetland as requested, and another in which the adjacent wetland is assumed to be impacted. Because the District has not issued a permit indicating the filling of that wetland, the District must assume it will remain. Therefore, please revise the submittals and calculations to include only the scenario in which the pretreated discharge will be provided to the wetland as requested.

Advisory Comments: The following comment is advisory in nature and does not require a response to the District. However, resolution of these comments is required in order for staff to recommend approval of the requested permit.

A1. Has the Applicant prepared a draft conservation easement for the proposed upland buffer? The submittal included a sketch and legal description for the upland buffer area, but no signed easement form. Please provide a signed draft conservation easement document. Please note that prior to the issuance of a permit, an executed (signed) copy of the easement document must be provided. Also, within 60 days of issuance of a permit for construction, a recorded copy of the easement document will be required to be submitted.

In accordance with 40E-1.603(1) (c) FAC, if the requested information is not received within 30 days of the date of this letter, this application may be processed for denial, if not withdrawn by the applicant. Please attach a copy of the enclosed "Transmittal Form For Requested Additional Information" to each of the required FOUR copies of the requested information.

Should you have any questions, please call Kelly Cranford of the Surface Water Management Division at (561)682-2515 or Mindy Parrott of the Natural Resources Management Division at (561)682-2065.

Sincerely,

Hugo A. Carter, P.E.
Senior Supervising Engineer
Surface Water Management Department
South Florida Water Management District

HAC/kc
Attachment

cc: DEP
St. Lucie County Community Development Director
St. Lucie County Engineer
St. Lucie County Environmental Resource Manager
North St. Lucie River Water Control District
Applicant

bc: M. Parrott, NRM – 4250
K. Cranford, SWM – 4220
D. Loving - 6880
S. McNabb – 6880
[redacted]

cc: DEP
St. Lucie County Community Development Director
St. Lucie County Engineer
St. Lucie County Environmental Resource Manager
North St. Lucie River Water Control District
Applicant

bc: M. Parrott, NRM – 4250
K. Cranford, SWM – 4220
D. Loving - 6880
S. McNabb – 6880
A[redacted] File

DESCRIPTION

A PARCEL OF LAND LYING IN THE NORTHWEST 1/4, OF SECTION 6, TOWNSHIP 36 SOUTH, RANGE 40 EAST AND LOTS 1 AND 2 OF THE PLAT ENTITLED MIDWAY INDUSTRIAL PARK – PHASE II, AS RECORDED IN PLAT BOOK 39, AT PAGES 8 AND 8A, OF THE PUBLIC RECORDS, OF ST. LUCIE COUNTY, FLORIDA AND BEING MORE PARTICULARLY DESCRIBED AS FOLLOWS:

COMMENCE AT THE INTERSECTION OF THE WEST LINE OF LOT 2, OF SAID PLAT OF MIDWAY INDUSTRIAL PARK – PHASE II AND THE NORTH RIGHT–OF–WAY LINE OF WEST MIDWAY ROAD (A 120 FOOT WIDE RIGHT–OF–WAY); THENCE NORTH 00°08'53" EAST, ALONG SAID WEST LINE OF LOT 2, A DISTANCE OF 604.81 FEET TO THE POINT OF BEGINNING OF THE CENTER LINE OF A 25 FOOT WIDE CONSERVATION EASEMENT, SAID EASEMENT LINES LYING 12.50 FEET EACH SIDE OF THE FOLLOWING DESCRIBED CENTER LINE; THENCE SOUTH 55°15'31" EAST, A DISTANCE OF 16.25 FEET; THENCE SOUTH 44°13'30" EAST, A DISTANCE OF 39.81 FEET; THENCE SOUTH 28°30'13" EAST, A DISTANCE OF 38.13 FEET; THENCE SOUTH 57°02'46" EAST, A DISTANCE OF 50.23 FEET; THENCE NORTH 79°49'21" EAST, A DISTANCE OF 68.76 FEET; THENCE NORTH 69°34'48" EAST, A DISTANCE OF 65.97 FEET; THENCE NORTH 70°00'26" EAST, A DISTANCE OF 73.27 FEET; THENCE NORTH 66°46'23" EAST, A DISTANCE OF 64.30 FEET; THENCE NORTH 22°25'41" EAST, A DISTANCE OF 44.32 FEET; THENCE NORTH 52°14'20" EAST, A DISTANCE OF 29.74 FEET; THENCE NORTH 58°39'58" EAST, A DISTANCE OF 24.97 FEET; THENCE SOUTH 49°14'41" EAST, A DISTANCE OF 43.77 FEET; THENCE NORTH 65°48'39" EAST, A DISTANCE OF 63.58 FEET; THENCE NORTH 12°02'00" EAST, A DISTANCE OF 44.94 FEET; THENCE NORTH 78°34'42" EAST, A DISTANCE OF 56.75 FEET TO THE EAST LINE OF LOT 1 OF SAID PLAT OF MIDWAY INDUSTRIAL PARK – PHASE II AND THE WESTERLY RIGHT–OF–WAY LINE OF JENKINS ROAD (A 120 FOOT WIDE RIGHT–OF–WAY) AND THE POINT OF TERMINUS OF SAID CENTER LINE.

SAID SIDE EASEMENT LINES TRIMMED OR EXTENDED TO SAID LOT LINES.

SAID PARCEL CONTAINS 0.416 ACRES, MORE OR LESS.

ADD'L/REVISED SUBMITTAL

FEB 0 6 2004

031216-16

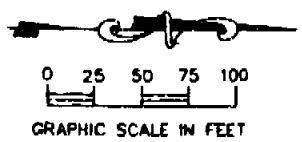
1-30-2004

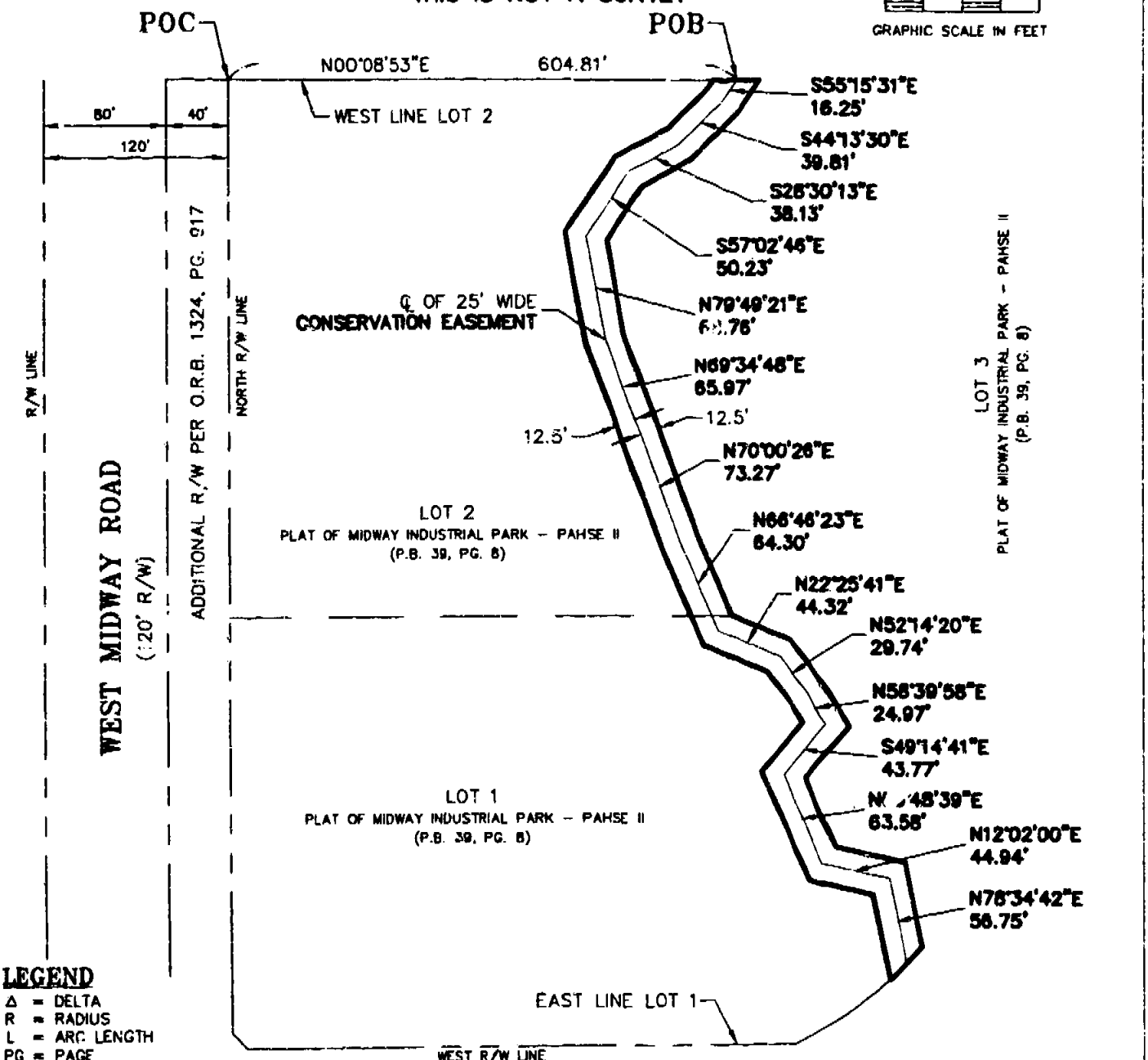
Sheet 1 of 2

SKETCH OF DESCRIPTION OF CONSERVATION EASEMENT Prepared For S.F.W.M.D.	File: 03-139ConEsmt.dwg Date: 8-21-00 Tech: BCS	CULPEPPER & TERPENING INC. CERTIFICATION No. LB 4286 CONSULTING ENGINEERS & LAND SURVEYORS 2980 SOUTH 25th STREET FORT PIERCE, FLORIDA 34981 (772) 464-3537

SKETCH TO ACCOMPANY DESCRIPTION

THIS IS NOT A SURVEY





LEGEND

Δ = DELTA
R = RADIUS
L = ARC LENGTH
PG = PAGE
PB = PLAT BOOK
POB = POINT OF BEGINNING
POC = POINT OF COMMENCEMENT
PLS = PROFESSIONAL LAND SURVEYOR
R\W = RIGHT-OF-WAY
℄ = CENTERLINE
± = PLUS OR MINUS
sq.ft. = SQUARE FEET

THE WEST LINE OF LOT 2 IS ASSUMED TO BEAR N00°08'53"E AND ALL OTHER BEARINGS SHOWN HEREON ARE RELATIVE THERETO.

SKETCH OF DESCRIPTION
OF
CONSERVATION EASEMENT
Prepared For
S.F.W.M.D.

File: 03-139ConEsmt dwg
Date: 8-21-00
Tech: BCS

CULPEPPER & TERPENING, INC.
CERTIFICATION No. LB 4286
CONSULTING ENGINEERS
&
LAND SURVEYORS
2980 SOUTH 25th STREET
FORT PIERCE, FLORIDA 34981
(772) 464-3537

CULPEPPER & TERPENING, INC.

Consulting Engineers • Land Surveyors

2980 South 25th Street • Ft. Pierce, FL 34981
(772) 464-3537 • Fax (772) 464-9497
www.ct-eng.com

Sender's Email: [illegible]

February 3, 2004

Job 03-139

VIA: FEDERAL EXPRESS

Mr. Hugo A. Carter, P.E.
Senior Supervising Engineer
Surface Water Management Department
South Florida Water Management District
3301 Gun Club Road
West Palm Beach, FL 33401

RE: Mayo Warehouse
St. Lucie County, S6/T36S/R40E
Application No. 031216-16

Dear Mr. Carter:

We are in receipt of your letter dated January 15, 2004, regarding the above-referenced project and have enclosed the following documentation for your review:

- Four (4) sets of signed and sealed stormwater management calculations
- Four (4) sets of signed and sealed design plans
- Four (4) sets of signed and sealed sketch and descriptions of the wetland conservation easement

The following information is in response to your comments:

1. We are in receipt of a check for $2,000. Since the proposed project is requesting conceptual approval and impacts more than one acre of wetlands, this application must be processed as a request for an individual permit. Please be advised that the required permit-processing fee for a new (non-agricultural) individual permit is $5,000.00. Please submit a check for the outstanding $3,000.00 balance in order to allow processing of this application to continue.

   Acknowledged – a check has been sent to the District from the owner.

2. Has the county conceptually approved the drainage connection beneath the Midway Road right-of way?

   Once the conceptual permit from the District has been obtained, the plans will be sent to the county for their conceptual approval.

3. Is construction or land clearing included as part of this application? The application form indicates the application is for conceptual approval only. However, the plan sheets included a Land Clearing, Sediment and Erosion Control plan. Please clarify.

Neither construction nor land clearing is part of this application. The Land Clearing, Sediment and Erosion Control plans submitted are for the District's review and comment only.

4. The submitted Boundary Survey indicates that a portion of the wetland to be impacted may be included in a Perpetual Conservation Easement. To whom is the easement dedicated? What is the extent of the easement? Has this easement been released? Was the easement provided as mitigation for a previous impact? Please provide a copy of the easement. Additional mitigation may be required if the conservation easement was recorded as a mitigation requirement.

The perpetual easement will be removed so that the wetland can be mitigated for off-site. A copy of the removed easement will be submitted to the District separately.

5. How was the seasonal high water elevation for the adjacent wetland determined? Please provide documentation of the seasonal high water and normal wet season water elevations within the wetland. Such documentation may consist of lichen lines, algal mats or rafted debris, and buttressed tree trunks, as well as data from monitoring wells. The seasonal high water elevation should be an average of two or more elevations taken from the interior portions of the wetland. Please contact Mindy Parrott, the environmental reviewer, to set up a site inspection for field verification.

Seasonal high water elevations of both the on-site wetland and adjacent off-site wetland were identified on 22 January 2004 by Michael Aiken of R.L. Weigt Environmental Consultants, Inc. (RLW) and Mindy Parrott of SFWMD. High water elevations were identified by using morphological plant adaptations (adventicious roots) on wax myrtle and Brazilian pepper trees.

6. The submitted topographic information indicates that the drainage area will be reduced for the adjacent wetland to the north in the post-construction condition. The adjacent wetland is hydrologically connected to additional preserved wetlands to the north. Has the applicant considered a bubble up structure from the dry detention area into the adjacent wetland's buffer to avoid secondary hydrologic impacts to the adjacent wetland? Please revise the conceptual drainage plan to maintain the pre-development contributing area of the adjacent wetland.

Please note that the plans have been revised to reflect a bubble up structure that will connect the dry detention pond with the wetland buffer located on the north side of the property. Water will then be able to flow into the wetland in order to retain the hydroperiod.

Please note that two sets of design calculations have been submitted reflecting two "scenarios."

<u>Scenario 1 (worst case):</u>

Should the landowner to the north decide remove the wetland and mitigate offsite, the bubble up structure to retain the hydroperiod would be unnecessary. Scenario 1 states that there will not be a bubble up structure and that all water leaving the site will be through the control structure on the south side (to the North St. Lucie Water Control District Canal No. 103). This worst-case scenario is what is currently routed and approved by the NSLRWCD.

Please refer to the North St. Lucie Water Control District Permit included in this submittal.

Scenario 2 (best case):

Scenario 2 states that the wetland to the north will remain in its current state. For this scenario, pre-development discharge calculations were made using the District's Figure D-4. According to the figure, the current discharge to the wetland from the site during the 25-year 72-hour storm is 4.26 cfs. In order to discharge that amount of water to the wetland the following changes have been added to the plans:

- ***The control structure on the south side of the site has been revised. Much less water will be allowed to discharge to the NSLRWCD Canal so that the water can be used to maintain the wetland hydroperiod. As such, the Scenario 2 control structure consists of only a three-inch diameter bleeder at the control elevation. On the north side, a bubble up system will consist of two type "E" inlets connected by a 15-inch RCP Pipe. The first inlet will be in the dry detention pond and will have a 5.50-inch wide weir at the half-inch pre-treatment elevation (19.89-feet NGVD). An overflow will be at elevation 22.00-feet NGVD. The second inlet will be in the wetland buffer at elevation 18.50-feet NGVD. The proposed perimeter berm and flap gates will ensure that water will not be allowed to flow back to the dry detention pond.***

- ***Pre-Development Site Discharge to the Wetland:*** ***4.26 cfs***

- ***Post-Development Site Discharge to the Wetland:*** ***4.28 cfs***

7. The submitted mitigation plan indicates that a Wetland Rapid Assessment Procedure (WRAP) was performed and the wetland's score is 0.55. How was this score arrived at? Please submit the WRAP score sheet for the wetland to be impacted. Also, please contact Mindy Parrott, the natural resource management reviewer, to schedule a site visit to review the WRAP score.

A site visit was conducted between Michael Aiken of RLW and Mindy Parrott of SFWMD on 22 January 2004 to review the WRAP scoring of the on-site wetland proposed for impact. The WRAP scoring sheet was submitted to Ms. Parrott during the site visit. During the meeting Ms. Parrott acknowledged that she agreed with the WRAP score of 0.55.

8. The applicant proposes to purchase credits at Bluefield Ranch Mitigation Bank for mitigation of the proposed impacts. Has the Applicant arranged to reserve these credits with the mitigation banker? Once the WRAP score is verified (see above), please submit correspondence from the mitigation banker confirming that the credits needed for this project have been reserved for purchase at the Bluefield Ranch Mitigation Bank.

The Applicant is currently coordinating with the Bluefield Ranch Mitigation Bank to reserve 2.10 state credits for the proposed wetland impacts. A letter of reservation from the banker will be forwarded to SFWMD upon confirmation.

9. District policies preclude issuing permits where the need for a water use permit is uncertain. Therefore, we need to identify the source of irrigation water before we can deem the permit application complete. If the Applicant intends to use potable or reclaimed water for irrigation, please provide a written confirmation that the supplier has sufficient capacity. If the Applicant intends to use any other source for irrigation withdrawals, please provide enough information to allow staff to determine if it is feasible to issue a water use permit for the proposed project. Since this application is a request for conceptual approval only, a water use application does not need to be submitted concurrently with the Conceptual ERP. However, enough information must be submitted as part of the ERP application to allow staff to determine whether or not a water use permit will be able to be issued for the proposed development. Please contact Tom Colios of the District's Water Use Division at (561) 682-6944 for further information on Water Use Permits from the District.

It is anticipated that irrigation water will be supplied with an onsite well.

The following information is provided to aid staff in determining whether or not a water use permit will be able to be issued for the proposed development.

- *An aerial of the region has been provided for your reference. As can be seen, it does not appear that there are any pollution sources in the project's vicinity.*
- *Based on the project's location, the potential for salt-water intrusion as a result of the withdrawal is minimal*
- *For the purpose of this comment, the amount of irrigation water usage can be estimated as follows:*

  Open Space (see stage-storage calculations) *2.08 acres*

  Proposed Annual Use:

  (1"/week)(52 week/year)(1ft/12") = 4.33 ft/yr

  (4.33 ft/yr)(2.08 ac)(43,560 sf/ac)(7.48 gal/cf) = 2,934,545 gal/yr

  Max. Monthly Use:

  (2,934,545 gal/yr)(1 yr/12 months) = 244,545 gal/month

  Average Daily Use:

  (2,934,545 gal/yr)(1 yr/365 days) = 8,040 gal/day (gpd)

- *Based on the anticipated average daily use, the potential for adverse impacts on existing legal uses as a consequence of the withdrawal should be minimal.*
- *Based on the anticipated average daily use, the potential for adverse impacts on existing off-site land uses as a consequence of the withdrawal should be minimal.*
- *Based on the anticipated average daily use, the potential for adverse environmental impacts as a consequence of the withdrawal should be minimal. It is suggested that the well be located along the south side of the site near the NSLRWCD Canal in order to place it as far from the north wetland as possible.*

Advisory Comments: The following comment is advisory in nature and does not require a response to the District.

A1. How will the 25' upland buffer at the northern end of the site be preserved? Has the Applicant prepared a draft conservation easement for the proposed upland buffer? The protected onsite upland buffer should be dedicated as conservation area and placed under a conservation easement. The conservation easement must meet the requirements of Chapter 704.06 F.S. A copy of the District's conservation easement form is enclosed for your reference. Please provide the following information to process the conservation easement: 1) signed draft conservation easement, 2) site plans or map of conservation areas, 3) legal description and number of acres of conservation easement, and 4) a sketch of the easement area. Please note that prior to the issuance of a permit, an

executed (signed) copy of the easement document must be provided. Also, within 60 days of issuance of a permit for construction, a recorded copy of the easement document will be required to be submitted.

The 25' upland buffer at the northern end of the site will be preserved via a conservation easement – a copy of which has been included in this submittal.

A2. Will dewatering be required for construction of the proposed project, including utility installation? Please coordinate with Tom Colios (561-682-6944) of the Water Use Division to determine if a water use permit for temporary dewatering will be required for this project. Since this application is a request for conceptual approval only, a water use application does not need to be submitted concurrently with the Conceptual ERP. However, a water use application for dewatering will be required concurrent with any application for construction.

It is anticipated that only a short-term dewatering permit will be required for the project. Dewatering will only be needed for the installation of gravity sewer mains and the storm drainage piping. A short-term dewatering permit will be submitted during the construction-permitting process.

Thank you for your assistance with this project. Should you have any further questions, please feel free to contact me directly at (772) 464-3537, Ext. 239, or via email at the address listed above.

Sincerely,

CULPEPPER & TERPENING, INC.

Gary L. Basham, PE, PLS
Vice President Engineering & Surveying

Enclosures

SOUTH FLORIDA WATER MANAGEMENT DISTRICT
3301 Gun Club Road, West Palm Beach, Florida 33406 • (561) 686-8800 • FL WATS 1-800-432-2045 • TDD (561) 697-2574
Mailing Address: P.O. Box 24680, West Palm Beach, FL 33416-4680 • www.sfwmd.gov

CON 24-06
Application No. 031216-16
Environmental Resource Regulation

January 15, 2004

Mr. Gary Basham, PE, PLS
Culpepper & Terpening, Inc.
2980 South 25th Street
Ft. Pierce, FL 34981

Subject: **Mayo Warehouse**
St. Lucie County, S6/T36S/R40E

Dear Mr. Basham,

Staff has completed a preliminary review of the submitted information. According to Rule 40E-4, Florida Administrative Code (FAC), the District is requesting the following information needed to complete the application.

1. We are in receipt of a check for $2,000. Since the proposed project is requesting conceptual approval and impacts more than one acre of wetlands, this application must be processed as a request for an individual permit. Please be advised that the required permit processing fee for a new (non-agricultural) individual permit is $5,000.00. Please submit a check for the outstanding $3,000.00 balance in order to allow processing of this application to continue.

2. Has the county conceptually approved the drainage connection beneath the Midway Road right-of-way?

3. Is construction or land clearing included as part of this application? The application form indicates the application is for conceptual approval only. However, the plan sheets included a Land Clearing, Sediment and Erosion Control plan. Please clarify.

4. The submitted Boundary Survey indicates that a portion of the wetland to be impacted may be included in a Perpetual Conservation Easement. To whom is the easement dedicated? What is the extent of the easement? Has this easement been released? Was the easement provided as mitigation for a previous impact? Please provide a copy of the easement. Additional mitigation may be required if the conservation easement was recorded as a mitigation requirement.

5. How was the seasonal high water elevation for the adjacent wetland determined? Please provide documentation of the seasonal high water and normal wet season water elevations within the wetland. Such documentation may consist of lichen lines, algal mats or rafted debris, and buttressed tree trunks, as well as data from

GOVERNING BOARD
Nicolás J. Gutiérrez, Jr., Esq., *Chair*
Pamela Brooks-Thomas, *Vice Chair*
Irela M. Bagué
Michael Collins
Hugh M. English
Lennart E. Lindahl, P.E.
Kevin McCarty
Harkley R. Thornton
Trudi K. Williams, P.E.
EXECUTIVE OFFICE
Henry Dean, *Executive Director*

monitoring wells. The seasonal high water elevation should be an average of two or more elevations taken from the interior portions of the wetland. Please contact Mindy Parrott, the environmental reviewer, to set up a site inspection for field verification.

6. The submitted topographic information indicates that the drainage area will be reduced for the adjacent wetland to the north in the post-construction condition. The adjacent wetland is hydrologically connected to additional preserved wetlands to the north. Has the applicant considered a bubble up structure from the dry detention area into the adjacent wetland's buffer to avoid secondary hydrologic impacts to the adjacent wetland? Please revise the conceptual drainage plan to maintain the pre-development contributing area of the adjacent wetland.

7. The submitted mitigation plan indicates that a Wetland Rapid Assessment Procedure (WRAP) was performed and the wetland's score is 0.55. How was this score arrived at? Please submit the WRAP score sheet for the wetland to be impacted. Also, please contact Mindy Parrott, the natural resource management reviewer, to schedule a site visit to review the WRAP score.

8. The applicant proposes to purchase credits at Bluefield Ranch Mitigation Bank for mitigation of the proposed impacts. Has the Applicant arranged to reserve these credits with the mitigation banker? Once the WRAP score is verified (see above), please submit correspondence from the mitigation banker confirming that the credits needed for this project have been reserved for purchase at the Bluefield Ranch Mitigation Bank.

9. District policies preclude issuing permits where the need for a water use permit is uncertain. Therefore, we need to identify the source of irrigation water before we can deem the permit application complete. If the Applicant intends to use potable or reclaimed water for irrigation, please provide a written confirmation that the supplier has sufficient capacity. If the Applicant intends to use any other source for irrigation withdrawals, please provide enough information to allow staff to determine if it is feasible to issue a water use permit for the proposed project. Since this application is a request for conceptual approval only, a water use application does not need to be submitted concurrently with the Conceptual ERP. However, enough information must be submitted as part of the ERP application to allow staff to determine whether or not a water use permit will be able to be issued for the proposed development. Please contact Tom Colios of the District's Water Use Division at (561) 682-6944 for further information on Water Use Permits from the District.

Advisory Comments: The following comment is advisory in nature and does not require a response to the District.

A1. How will the 25' upland buffer at the northern end of the site be preserved? Has the Applicant prepared a draft conservation easement for the proposed upland buffer? The protected onsite upland buffer should be dedicated as conservation area and placed under

a conservation easement. The conservation easement must meet the requirements of Chapter 704.06 F.S. A copy of the District's conservation easement form is enclosed for your reference. Please provide the following information to process the conservation easement: 1) signed draft conservation easement, 2) site plans or map of conservation areas, 3) legal description and number of acres of conservation easement, and 4) a sketch of the easement area. Please note that prior to the issuance of a permit, an executed (signed) copy of the easement document must be provided. Also, within 60 days of issuance of a permit for construction, a recorded copy of the easement document will be required to be submitted.

A2. Will dewatering be required for construction of the proposed project, including utility installation? Please coordinate with Tom Colios (561-682-6944) of the Water Use Division to determine if a water use permit for temporary dewatering will be required for this project. Since this application is a request for conceptual approval only, a water use application does not need to be submitted concurrently with the Conceptual ERP. However, a water use application for dewatering will be required concurrent with any application for construction.

Included with this letter/permit is a brochure from the Florida Department of Environmental Protection (DEP) on Florida's National Pollutant Discharge Elimination System (NPDES) program for construction activities.

As the brochure indicates, the U.S. Environmental Protection Agency authorized the DEP in October 2000 to implement the NPDES stormwater permitting program in Florida. The District is assisting DEP by distributing this information to entities which may be subject to regulation under the NPDES program. No response to the District is required.

A **"Generic Permit for Stormwater Discharge For Stormwater Discharge from Large and Small Construction Activities (CGP)"** is required for a construction activity which contributes stormwater discharges to surface waters of the State or into a municipal separate storm sewer system. Phase I regulates "large" construction activity (disturbing five or more acres of total land area) and Phase II regulates "small" construction activity (disturbing between 1 and 5 acres of total land area).

The permit required under DEP's NPDES stormwater permitting program is separate from the Environmental Resource Permit required by the District. Receiving a permit from the District does not exempt you from meeting the NPDES program requirements.

If you have any questions on the NPDES program, there are DEP phone numbers, mailing addresses and internet web page addresses in the brochure. The DEP web site, at www.dep.state.fl.us/water/stormwater/npdes/, provides information associated with the NPDES program including all regulations and forms cited in the brochure.

In accordance with 40E-1.603(1) (b) FAC, if the requested information is not received within 90 days of the date of this letter, this application may be processed for denial, if not withdrawn by the applicant. Please attach a copy of the enclosed "Transmittal Form For Requested Additional Information" to each of the required FOUR copies of the requested information.

Should you have any questions, please call Kelly Cranford of the Surface Water Management Division at (561)682-2515 or Mindy Parrott of the Natural Resources Management Division at (561)682-2065.

Sincerely,

Hugo A. Carter, P.E.
Senior Supervising Engineer
Surface Water Management Department
South Florida Water Management District

HAC/kc
Attachment

cc: DEP
St. Lucie County Community Development Director
St. Lucie County Engineer
St. Lucie County Environmental Resource Manager
North St. Lucie River Water Control District
Applicant

bc: M. Parrott, NRM – 4250
K. Cranford, SWM – 4220
D. Loving - 6880
S. McNabb – 6880
Application File

Subject: **Re: Mayo Warehouse**
Date: Wed, 07 Jan 2004 17:09:58 -0500
From: Kelly Cranford <kcranfor@sfwmd.gov>
Organization: South Florida Water Management District
To: Patrick Pecunia <ppecunia@ct-eng.com>

I've just been able to start reviewing your application. Please verify that you are requesting conceptual approval only (no construction authorization). Conceptual approval can only be granted as part of an individual permit.

Since the project will be impacting more than 1 acre of wetlands, it will be considered an individual application. The fee for a new individual application for projects less than 100 acres is $5000.

If the project is considered to be a modification of the Midway Industrial Park permit, the fee for an individual modification is $3,500. I'm not yet familiar with the Industrial Park permit so I don't know if it is possible to consider this project to be a modification.

Patrick Pecunia wrote:

> Dear Kelly,
>
> According to the SFWMD Permit website, you are the reviewer for the Mayo Warehouse. Gary Basham, P.E., P.L.S. and I (Patrick Pecunia, E.I.) are the engineers for the project. Should you have any questions during your review, please do not hesitate to contact either of us at any time. Our contact information is as follows:
>
> Patrick Pecunia
> Extension 215
> ppecunia@ct-eng.com
>
> Gary Basham
> Extension 239
> gbasham@ct-eng.com
>
> Sincerely,
>
> Patrick Pecunia
>
> ---
>
> Patrick Pecunia
> Culpepper & Terpening
> 2980 South 25th St
> Fort Pierce, FL 34981
> (772)-464-3537

--
Kelly Cranford, P.E.
Senior Engineer
Surface Water Division
South Florida Water Management District
(561)682-2515 Fax (561)682-2307

SOUTH FLORIDA WATER MANAGEMENT DISTRICT
3301 Gun Club Road, West Palm Beach, Florida 33406 • (561) 686-8800 • FL WATS 1-800-432-2045 • TDD (561) 697-2574
Mailing Address: P.O. Box 24680, West Palm Beach, FL 33416-4680 • www.sfwmd.gov

(receipt)

Receipt No. 0000059201 - 0002

Refer to Application: 031216-16
Project Name : MAYO WAREHOUSE

JOHN A MAYO AND CHRISTINA MAYO
PO BOX 292256
DAVIE, FL 33329-2256

RECEIPT OF PERMIT APPLICATION

REVENUE ACCOUNT CODE	TYPE OF APPLICATION	FEE AMOUNT
4615	ERP INDIVIDUAL CONCEPTUAL APPROVAL - NEW	$5,000.00

ITEM	TRANS TYPE	DATE RECEIVED	CHECK NO	AMOUNT RECEIVED
1	PAYMENT MADE BY APPLICANT	12/16/2003	21275	$2,000.00
2	PAYMENT MADE BY APPLICANT	01/21/2004	21311	$3,000.00
			BALANCE DUE	$0.00

PROCESSED BY : FBEEDY
DATE : June 9, 2004
BRANCH OFFICE : WPB

c: Applicant
Accounting
Control
File

GOVERNING BOARD

Nicolás J. Gutierrez, Jr., Esq., *Chair*
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2131

JOHN A. MAYO
CHRISTINA MAYO
PROPERTY ACCOUNT
P.O. BOX 292256
DAVIE, FL 33329-2256

SUNTRUST
SUNTRUST BANK, MIAMI
MIAMI, FL
63-60/660

1/6/2004

PAY TO THE ORDER OF SOUTH FLORIDA WATER MGMT. DIST. $ **3,000.00

Three Thousand and 00/100********** DOLL

SOUTH FLORIDA WATER MGMT. DIST.

MEMO Application 031216-16
ACCOUNT CODE 4615

Christina Mayo
AUTHORIZED SIGNATURE

⑈021311⑈ ⑆066000604⑆0729000855221⑈ ⑈0000300000

SUNTRUST ORL 01232004
063102152
140003882

ALA SOUTHTRUST
>062000080<
40021730 012304 5040 06 95203

PAY TO THE ORDER OF
SOUTHTRUST BANK, NA
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SOUTH FLORIDA WATER
MANAGEMENT DISTRICT
6282

DO NOT SCALE WHEREIN BELOW THIS LINE
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Subject: RE: [Fwd: Mayo Warehouse]
Date: Wed, 31 Dec 2003 10:42:32 -0500
From: Jesse Markle <Jesse-M@lbfh.com>
To: 'Kelly Cranford' <kcranfor@sfwmd.gov>
CC: Ray Garcia <Ray-G@lbfh.com>

Kelly,

I just finished my review of the Mayo Warehouse site. The only comment NSLRWCD has at this time involves the length of the model simulation. We were not provided results passed hour 72, nor was the model run passed that time, making a determination of allowable volume discharged conditional. We are asking for output extending to recovery of the proposed SWM system.

Thanks,

Jesse Markle, E.I.

-----Original Message-----
From: Kelly Cranford [mailto:kcranfor@sfwmd.gov]
Sent: Tuesday, December 30, 2003 9:41 AM
To: Jesse-M@lbfh.com
Subject: [Fwd: Mayo Warehouse]

Kelly Cranford wrote:

> *Have you seen this application yet?*
>
> *It is on the north side of Midway, west of what was supposed to be*
> *Jenkins Rd. It's in Midway Industrial Park, Phase II - which we have*
> *not previously permitted.*
>
> *They are proposing to go under Midway Road and discharge into the C-103.*
>
> --
> *Kelly Cranford, P.E.*
> *Senior Engineer*
> *Surface Water Division*
> *South Florida Water Management District*
> *(561)682-2515 Fax (561)682-2307*

--
Kelly Cranford, P.E.
Senior Engineer
Surface Water Division
South Florida Water Management District
(561)682-2515 Fax (561)682-2307

CULPEPPER & TERPENING, INC.

Consulting Engineers • Land Surveyors

2980 South 25th Street • Ft. Pierce, FL 34981
(772) 464-3537 • Fax (772) 464-9487
www.ct-eng.com

Sender's Email: gbasham@ct-eng.com

December 15, 2003

Job 03-139

VIA: FEDERAL EXPRESS

Mr. Don Medellin, PWS
Senior Supervising Environmental Analyst
Natural Resource Management Division
South Florida Water Management District
3301 Gun Club Road
West Palm Beach, FL 33406

RE: Conceptual Permit Application
Mayo Warehouse

Dear Mr. Medellin:

Enclosed, please find the following materials which will constitute our application package for a conceptual environmental resource permit:

- Four (4) sets of signed and sealed design plans
- Four (4) sets of signed and sealed drainage calculations
- Four (4) sets of the mitigation plan
- Four (4) signed and sealed boundary surveys
- A check in the amount of $2,000 for the permit application fee

Should you have any questions or concerns, please do not hesitate to contact me at (772) 464-3537, Ext. 239.

Sincerely,

CULPEPPER & TERPENING, INC.

Gary L. Basham, PE, PLS
Vice President Engineering & Surveying

GLB:pw

cc: John Mayo

RECEIVED
DEC 16 2003
ENV RES REGULATION

031216-16
ORIGINAL SUBMITTAL
DEC 16 2003
WPB

WETLAND RAPID ASSESSMENT PROCEDURE
FIELD DATA SHEET

Permit Number	Project	Date	Evaluator	Wetland Type
SG01995-P	MIDWAY INDUS PARK LOTS 1 & 2	7 AUGUST 2003	AIKEN, BARLOW	HERBACEOUS

Land Use	Wildlife Utilization (WU)	Wetland Canopy (O/S)	WL Gradcver (GC)
INDUSTRIAL / UNDEV.	1.5	N/A	1.5

Habitat Support/Buffer	Field Hydrology (HYD)	WQ Input & Trtmnt (WQ)
1.5	1.0	2.75

WRAP Score	Wetland ID
0.55	A

	Comments
WU 1.5	SITE LOCATED IN INDUSTRIAL AREA EVIDENCE OF SMALL MAMMAL USE ADEQUATE ADJACENT UPLANDS SITE USED AS PASTURE LAND (HUMAN DISTURBANCE)
O/S N/A	
GC 1.5	GREATER THAN 25% UNDESIRABLE PLANT SPECIES IMPACTED BY AGRICULTURE (PASTURE)
BUFFER 1.5	NOT CONNECTED TO WILDLIFE CORRIDOR GREATER THAN 30' - LESS THAN 300' BUFFER DESIRABLE BUFFER SPECIES TO NORTH & EAST
HYD 1.0	SUCCESSION OF PLANT SPECIES INTO TRANSITIONAL & UPLAND SPECIES UPLAND PLANTS ENCROACHING DECREASED HYDROPERIOD OF HISTORICAL WETLAND
WQ 2.75	UNIMPROVED PASTURE LAND - LAND USE NATURAL UNDERGROWTH LAND - PRE-TREATMENT

WETLAND RAPID ASSESSMENT PROCEDURE

METHODOLOGY FOR SCORING AND ASSESSING HABITAT VARIABLES

Each matrix contains a set of calibration descriptions and corresponding score points. A score of 3 is considered the best a system can function and 0 is for a system that is severely impacted and is exhibiting negligible attributes.

Each system must be evaluated on its own attributes and is not to be compared to a different type of system (i.e., wet prairie vs. marsh vs. cypress dome). An evaluator also has the option to score each parameter in half increments (0.5). This provides the flexibility to score a variable that is not accurately described or fitted by the calibration description. Half increments are utilized on the point scale from 0.5 through 2.5.

If any variable does not apply to the habitat being rated, then the designation "NA" (not applicable) can be applied. When the "NA" is used for a specific variable it is omitted from the final calculations used to rate the habitat.

Each applicable variable is scored. The scores are totaled ($\sum V$) and then the $\sum V$ is divided by the total of the maximum score for that variable ($\sum Vmax$). The final rating score for "Habitat Assessment Variables" will be expressed numerically with a number between 0 and 1.

WRAP Score = $\dfrac{\text{sum of the scores for the rated variables (V)}}{\text{sum of maximum possible scores for rated variables (Vmax)}}$

or

$$\frac{\sum V}{\sum Vmax}$$

Calculations

WILDLIFE UTILIZATION MATRIX

Score

0 ☐ EXISTING WETLAND EXHIBITS NO EVIDENCE OF WILDLIFE UTILIZATION

- Existing wetland is heavily impacted.
- No evidence of wildlife utilization.
- Little or no habitat for native wetland wildlife species.

1 ☐ EXISTING WETLAND EXHIBITS MINIMAL EVIDENCE OF WILDLIFE UTILIZATION

- Minimal evidence of wildlife utilization.
- Little habitat for birds, small mammals and reptiles.
- Sparse or limited adjacent upland food sources.
- Site may be located in residential, industrial, or commercial developments with frequent human disturbances.

1.5

2 ☐ EXISTING WETLAND EXHIBITS MODERATE EVIDENCE OF WILDLIFE UTILIZATION

- Evidence of wetland utilization by small or medium sized mammals and reptiles (observations, tracks, scat, etc.).
- Evidence of aquatic macroinvertebrates, amphibians, and/or forage fishes.
- Adequate adjacent upland food sources.
- Minimal evidence of human disturbance. PASTURE LAND
- Adequate protective cover for wildlife.

3 ☐ EXISTING WETLAND EXHIBITS STRONG EVIDENCE OF WILDLIFE UTILIZATION

- Strong evidence of wildlife utilization including large mammals and reptiles.
- Abundant aquatic macroinvertabrates, amphibians and/or forage fishes.
- Abundant upland food sources.
- Negligible evidence of human disturbance
- Abundant cover and habitat for wildlife within the wetland or adjacent upland.

Sample ID_____

WETLAND OVERSTORY/SHRUB CANOPY OF DESIRABLE SPECIES MATRIX

Score

0 ☐ NO DESIRABLE WETLAND OVERSTORY/SHRUB CANOPY TREES PRESENT

- No desirable wetland trees or shrub species.
- Negligible or little habitat support (i.e. roosting, nesting, foraging) from seedling trees (if present).
- Site subject to recent clear cutting with little evidence of native canopy plant regeneration.

N/A

1 ☐ MINIMAL DESIRABLE WETLAND OVERSTORY/SHRUB CANOPY TREES PRESENT

- Large amounts (approx. 50%) of undesirable tree or shrub species.
- Wetland overstory/shrub canopy immature, potential for habitat support.
- Minimal signs of natural recruitment of native canopy and shrub seedlings.
- Few snags, or if many present, it may be indication of hydrology problems or environmental impacts.
- Disease or insect damage in live canopy trees.

2 ☐ MODERATE AMOUNT OF DESIRABLE WETLAND OVERSTORY/SHRUB CANOPY TREES PRESENT

- Few (<25%) undesirable canopy trees/shrubs.
- Wetland overstory/shrub canopy is providing habitat support.
- Some evidence of natural recruitment of native canopy/shrub seedlings.
- Few snags or den trees.
- Healthy live canopy trees with minimal evidence of disease/insect damage.

3 ☐ ABUNDANT AMOUNT OF DESERIBLE WETLAND OVERSTORY/SHRUB CANOPY TREES PRESENT

- No exotic and <10% invasive canopy/shrub species present.
- Good habitat support provided by wetland overstory/shrub canopy.
- Strong evidence of natural recruitment of native canopy & shrub seedlings.
- Few snags or den trees.
- Healthy live canopy trees with minimal evidence of disease/insect damage.

Sample ID_____

WETLAND VEGETATIVE GROUND COVER OF DESIRABLE SPECIES MATRIX

Score

0 ☐ NO DESIRABLE VEGETATIVE GROUND COVER IS PRESENT

- Ground cover is greater than 75% undesirable vegetation.
- Vegetative ground cover is intensively maintained, managed or impacted.
- Site a freshly mulched created mitigation area with no evidence of seed germination.

1 ☐ MINIMAL DESIRABLE VEGETATIVE GROUND COVER IS PRESENT

- ⊙ Ground cover exhibits large amounts (approx. 50%) undesirable vegetation.
- Ground cover routinely managed for either aesthetics or agricultural production.
- Site a newly planted mitigation area with low plant biomass density.
- Site newly mulched with signs of seed germination.

1.5

2 ☐ MODERATE AMOUNT OF DESIRABLE VEGETATIVE GROUND COVER IS PRESENT

- Few undesirable ground cover plant species are present (less than 25%).
- ⊙ Ground cover slightly impacted (human induced effects).
- Mulched or planted areas established with desirable native plant species.

3 ☐ ABUNDANT DESIRABLE VEGETATIVE GROUND COVER IS PRESENT

- Less than 10% nuisance and inappropriate plant species with no exotic plant species.
- Minimal or no disturbances to ground cover.
- Area subjected to either managed or natural periodic burns for enhancement of ground cover.

Sample ID_____

ADJACENT UPLAND/WETLAND BUFFER MATRIX

Score

0 ☐ NO ADJACENT UPLAND/WETLAND BUFFER

- Buffer non-existent

1 ☐ ADJACENT UPLAND/WETLAND BUFFER AVERAGES 30' OR LESS, CONTAINING DESIRABLE PLANT SPECIES

- Less than 30' average width.
- Mostly desirable plant species which provide cover, food source, and roosting areas for wildlife.
- ⊙ Not connected to wildlife corridors.
- Greater than 300' but dominated (>75%) by invasive exotic or nuisance plant species.

(.5)

2 ☐ ADJACENT UPLAND/WETLAND BUFFER AVERAGES GREATER THAN 30' BUT LESS THAN 300', CONTAINING PREDOMINANTLY DESIRABLE PLANT SPECIES

- ⊙ Greater than 30' but less than 300' average width
- ⊙ Contains desirable plant species which provide cover, food, and roosting areas for wildlife. (ONLY TO N + E)
- Portions connected with contiguous offsite wetland systems, wildlife corridors.
- Greater than 300' but dominated (>75%) by undesirable noninvasive plant species (e.g. pasture grasses).

3 ☐ ADJACENT UPLAND/WETLAND BUFFER AVERAGES GREATER THAN 300' CONTAINING PREDOMINANTLY DESIRABLE PLANT SPECIES

- Greater than 300' wide average width.
- Contains predominantly desirable plant species (<10% nuisance, and NO exotic species) for cover, food, and roosting areas for wildlife.
- Connected to wildlife corridor or contiguous with offsite wetland system or areas that are large enough to support habitat for large mammals or reptiles.

Sample ID_____

FIELD INDICATORS OF WETLAND HYDROLOGY MATRIX

Score

0 ☐ HYDROLOGIC REGIME HAS BECOME SEVERELY ALTERED WITH STRONG EVIDENCE OF SUCCESSION TO TRANSITIONAL/UPLAND OR OPEN WATER PLANT COMMUNITY

- Wetland hydrology severely altered.
- ⊙ Hydroperiod inadequate to support wetland plant species for the particular community type.
- ⊙ Strong evidence that upland plants are encroaching into the historical wetland area as a result of a decreased hydroperiod.
- Die-off of a wetland plant species as a result of an increased hydroperiod.
- In sites with an organic soil substrate, there is substantial soil subsidence.

1 ☐ HYDROLOGIC REGIME INADEQUATE TO MAINTAIN VIABLE WETLAND SYSTEM

1.5

- Site hydroperiod inadequate to maintain the system that is being created, enhanced or preserved.
- ⊙ Succession of wetland plant species into transitional/upland plant species. Appropriate vegetation stressed or dying from too much or too little water.
- In sites with an organic soil substrate, there is evidence os soil subsidence.

2 ☐ HYDROLOGIC REGIME ADEQUATE TO MAINTAIN A VIABLE WETLAND SYSTEM, EXTERNAL FEATURES MAY AFFECT WETLAND HYDROLOGY

- ⊙ Wetland hydroperiod adequate, although conditions possibly interfering with or influencing the hydroperiod of site (i.e., canals, ditches, swales, berms, reduced drainage area, culverts, pumps, control elevation and wellfields present).
- Plants healthy, and exhibit no stress from too little water or too much water.
- In sites with an organic soil substrate, there is little evidence of soil subsidence.

3 ☐ HYDROLOGIC REGIME ADEQUATE TO MAINTAIN A VIABLE WETLAND SYSTEM

- Plants healthy with no stress resulting from an improper hydroperiod.
- Wetland exhibits a natural hydroperiod.
- Wetland not adjacent to canals, ditches, swales, berms, wellfields, or other negative impacts to the wetland within the landscape setting.
- In sites with an organic soil substrate, there is no sign of soil subsidence.

Sample ID_____

WATER QUALITY INPUT AND TREATMENT MATRIX

The water quality variable of the matrix is a measure of the quality of the surface water flowing into the subject wetland from adjacent land uses (LU). The percent and type of surrounding land uses as well as any on-site pretreatment (PT) of surface waters prior to the discharge into wetlands is considered

The scores for land use types are as follows:

	LAND USE CATEGORY	SCORE
☐	open space / natural undeveloped areas	3.0
☒	unimproved pasture / rangeland	(2.5)
☐	citrus grove	2.0
☐	sugarcane	2.0
☐	low density residential	2.0
☐	low intensity commercial	2.0
☐	institutional	2.0
☐	single-family residential	1.5
☐	recreational	1.5
☐	golf course	1.5
☐	moderately intensive commercial	1.5
☐	highways	1.0
☐	industrial	1.0
☐	mining	1.0
☐	multi-family residential	1.0
☐	improved pasture	1.0

Sample ID_____

LAND USE CATEGORY CONTINUED

☐	row crop	1.0
☐	high intensity commercial	0.5
☐	dairy and feedlot	0.0

The scores for land use types are as follows:

PRE-TREATMENT CATEGORY		SCORE
☒	natural undeveloped area	(3.0)
☐	berms which prevent runoff from entering wetland	2.5
☐	wet detention with swales	2.5
☐	wet detention with dry detention	2.5
☐	combination grass swales with dry retention	2.0
☐	turbidity during construction	1.5
☐	wetland system is part of treatment	1.5
☐	grass swales only	1.0
☐	dry retention	1.0
☐	no treatment	0.0

WQIT score is expressed as follows:
(%* surrounding x LU1) + (%* surrounding x LU2) +.... (%* surrounding x LU(n)) = LU total
and,
(%* surrounding x PT1) + (%* surrounding x PT2) +.... (%* surrounding x PT(n)) = PT total
hence,

$$\text{WQIT} = \frac{\text{LU total} + \text{PT total}}{2} \qquad \frac{3.0 + 2.5}{2} = \frac{5.5}{2} = 2.75$$

* % expressed as a decimal

Sample ID_____

Reference Only

Last Date For Agency Action: 12-JUN-20x

INDIVIDUAL ENVIRONMENTAL RESOURCE PERMIT STAFF REPORT

Project Name: Midway Industrial Park Phase III
Permit No.: 56-01444-P
Application No.: 020627-12
Application Type: Environmental Resource (Conceptual Approval Modification And Construction/Operation Modification)
Location: St Lucie County, S31/T35S/R40E
S6/T36S/R40E
Permittee : Midway Properties Of St. Lucie County, L.C.
Estate Of Thomas C. Jones
Operating Entity : Midway Industrial Park Poa
Project Area: 67.58 acres
Project Land Use: Industrial

DRAFT
Subject to Governing Board Approval

Drainage Basin: NORTH ST LUCIE
Sub Basin: NORTH FORK
Receiving Body: NSLR WMD CANAL NO 102
Class: CLASS III
Special Drainage District: North St Lucie River Water Control District

Total Acres Wetland Onsite:	11.35
Total Acres Wetland Preserved Onsite:	11.35
Total Acres Preserv/Mit Compensation Onsite:	1.04

Conservation Easement To District : Yes
Sovereign Submerged Lands: No

PROJECT PURPOSE:

Modification of an Environmental Resource Permit to authorize overall conceptual approval and construction and operation authorization of a surface water management system to serve a 67.58 acre commercial project known as Midway Industrial Park Phase III. Staff recommends approval with conditions.

PROJECT EVALUATION:

PROJECT SITE DESCRIPTION:

The proposed site is located north of Midway Road and east of the Turnpike. The site is bordered by NSLRWMD Canal No. 102 to the north. Currently, the northern portion of the site is used as pasture and the southern portion is dominated by slash pine trees. Isolated wetlands occur within the site. Please see Exhibit 1 for site location information.

PROJECT BACKGROUND:

On July 13, 2000 a Standard General Permit was issued for 42.49 acres of commercial development known as Midway Industrial Park which also provided attenuation for 6.86 acres of offsite lands. The permit authorized construction and operation for the backbone system only which included a dry and wet detention area, a common roadway, and backbone piping and control structures. Each of the eight lots was required to submit an Environmental Resource ermit modification for approval prior to commencement of any construction. Since the permit was issued, several lots have received construction approvals.

The master surface water management system consists of grading, inlets, and culverts will first direct stormwater into a 2.28 acre dry detention area where 1/2" of pretreatment will be provided. Runoff will then continue through an internal structure into a 1.93 acre lake. This wet detention pond will provide the remaining water quality treatment and storm attenuation. Ultimate discharge will then occur through the outfall structure to NSLRWMD Canal No. 102.

PROPOSED PROJECT:

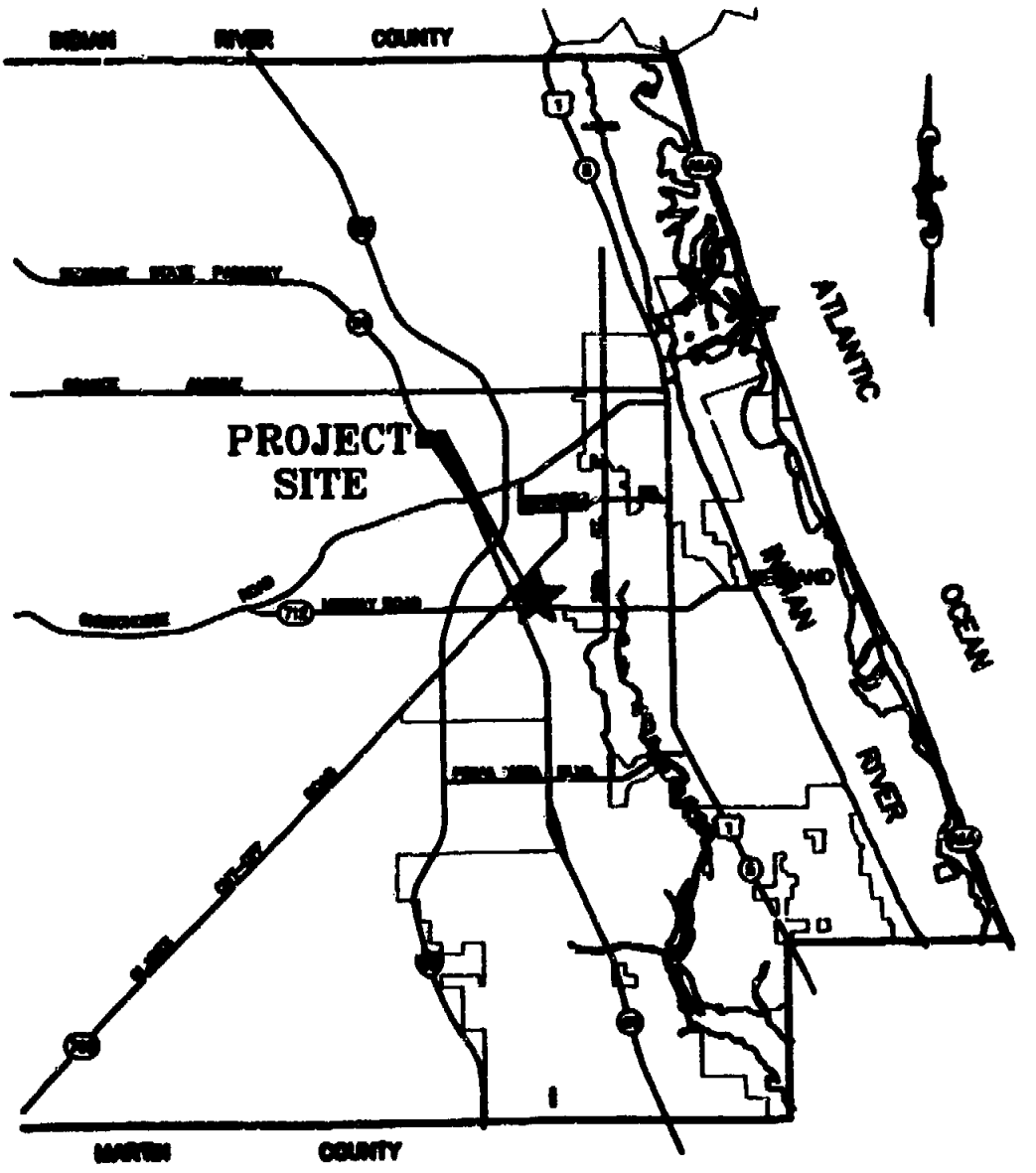
Authorization has been requested for conceptual approval with construction and operation of the master surface water management (SWM) system to serve 67.58 acres of commercial development, known as Midway Industrial Park Phase III. The construction and operation authorization is to build the backbone master SWM system within the Phase III area. Each of the individual lots will be required to submit an Environmental Resource Permit general permit modification application to the District for approval prior to commencement of construction on the lot. Design assumptions for the lots include that each lot will be 70% or less impervious. Please see Exhibits 3A to 3C for complete land use and stage vs. storage assumptions for the future lots.

Dry pre-treatment equal to 1/2-inch over the site area will be provided on each lot. Calculations demonstrating that the pre-treatment requirement is met will be required to be submitted with each lot permit modification. Grading, inlets, and culverts will direct stormwater, after pre-treatment, into the previously permitted and constructed lake which will be increased by 6.20-acres to 8.13-acres and will provide the required remaining water quality treatment and storm attenuation. Overflow into the on-site wetlands, via bubble-up structures with grate elevations above the water quality elevation, will provide additional storage for storm attenuation and hydration of the wetlands. Those lots containing or abutting conservation areas (identified as lots 9, 13, 14, 16 and 17 on Exhibit 2A) shall discharge to wetlands following the required dry pre-treatment, prior to wetland overflow into the master system.

Discharge from the previously permitted Phase I area will continue to discharge into the wet detention area as it presently does. Runoff from the Phase I area will continue to receive dry pre-treatment equal to 1/2 inch over the project area in the existing Phase I master dry detention area prior to discharging into the wet detention area.

Off-site discharge will be into NSLRWCD Canal No. 102 through the previously permitted and constructed control structure, consisting of a 6" diameter bleeder with an invert elevation of 16.5' NGVD and a 0.5' weir at elevation 18.4' NGVD. Please refer to Exhibits 2A to 2G for site plan and details information.

Secondary impacts will occur to on-site wetlands, and will be mitigated through wetland creation and

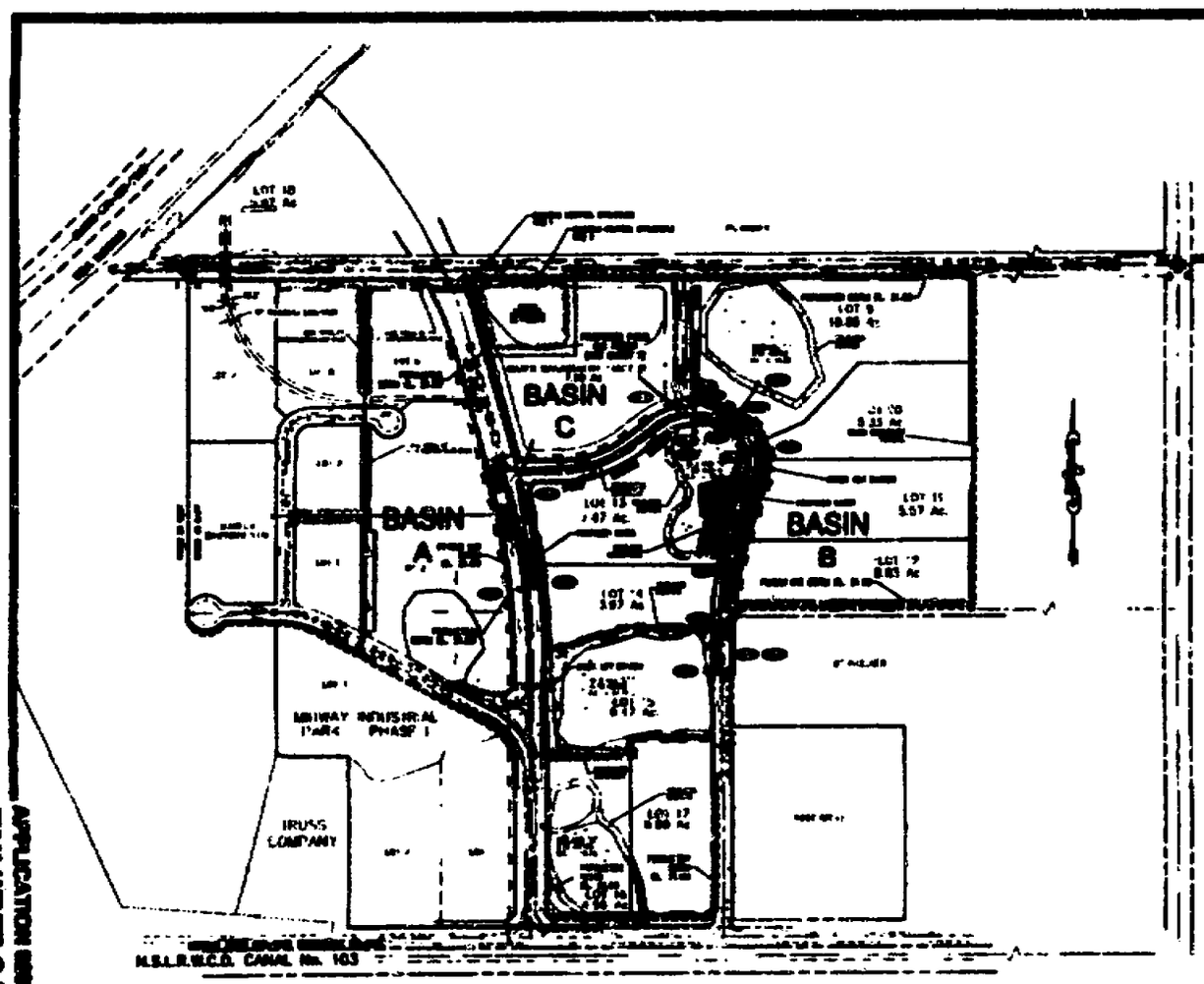


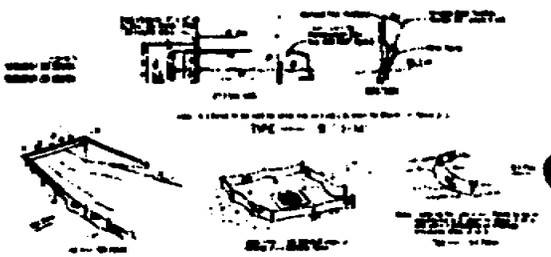
MIDWAY INDUSTRIAL PARK PHASE III
LOCATION MAP

NORTH
N.T.S.

Application 020627-12

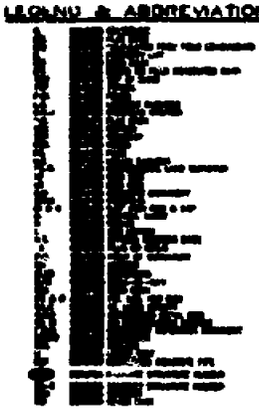
Exhibit 1





SILTATION BARRIER (F.D.O.T. STD. INDEX #102)

LEGEND & ABBREVIATIONS

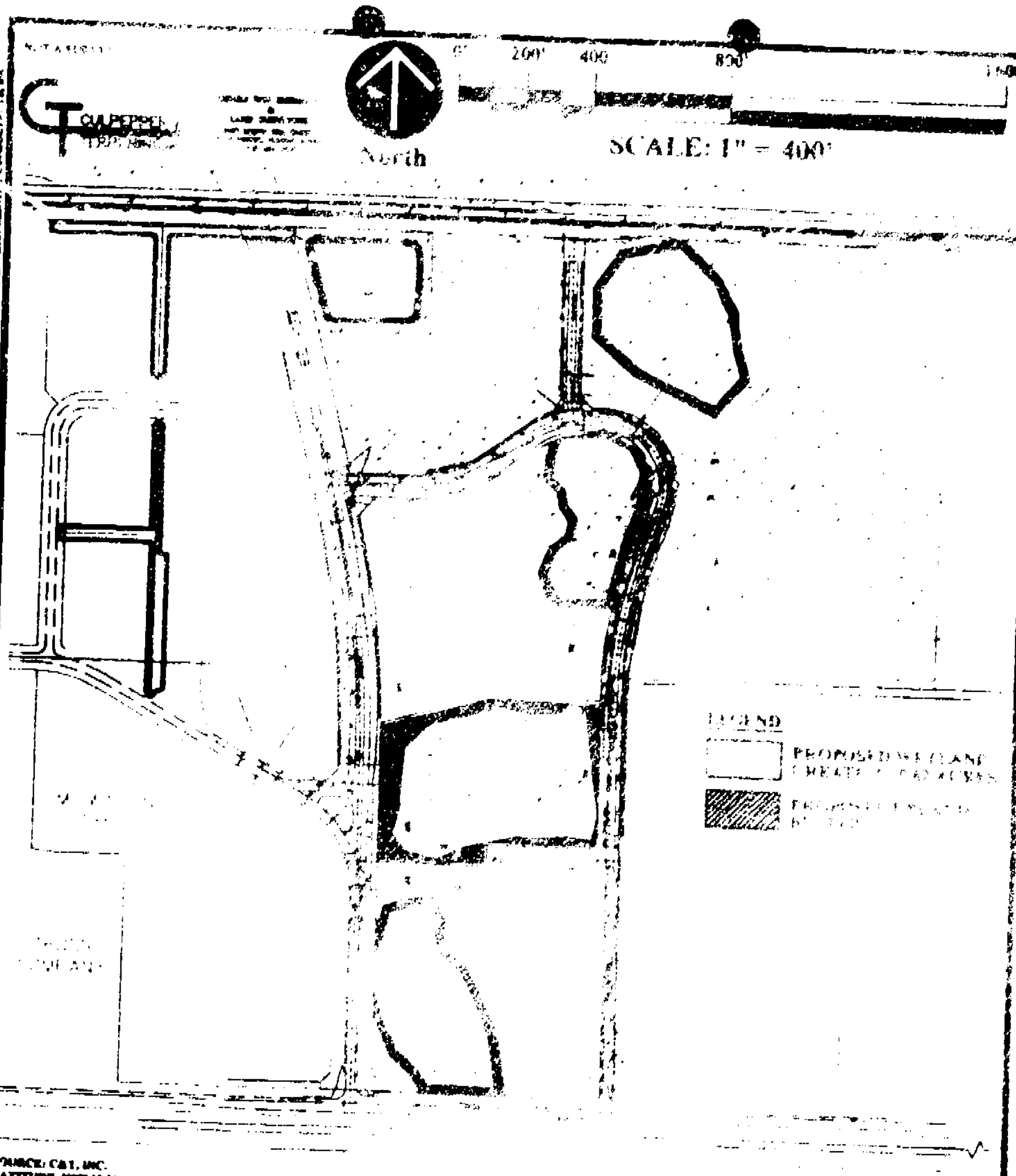


S.F.W.M.D. CRITERIA (NGVD 1929)
CONTROL ELEVATION = 16.50 FT.
MIN. ROAD CROWN EL. = 20.20 FT.
MINIMUM PERIMETER EL. = 20.70 FT.
MINIMUM FINISHED FLOOR = 21.50 FT.

APPLICATION NUMBER 7-13

EXHIBIT 2A

MASTER DRAINAGE MAP



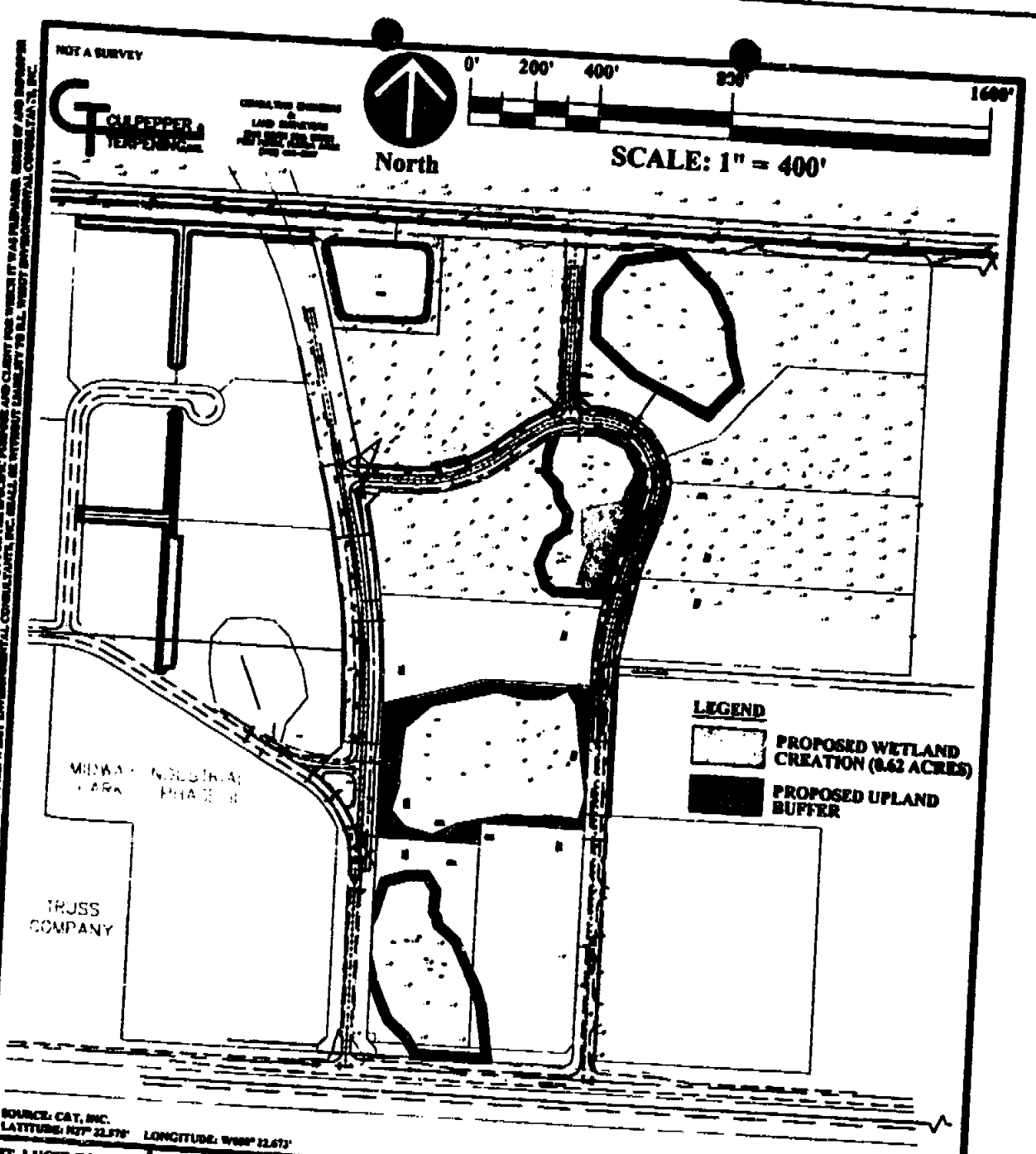
SOURCE: C&I, INC.
LATITUDE: N27° 22.375' LONGITUDE: W080° 1'.472'

ST. LUCIE COUNTY	SEC.	TWP.	R.	RLW JOB NO.	DRAWING NAME:	DATE	FIGURE:
FLORIDA	6	36S	46E	00-025.04	[illegible]	13 MARCH 2003	3 OF 12

MIDWAY INDUSTRIAL PARK PHASE III
ENVIRONMENTAL RESOURCE PERMIT APPLICATION (ERP)
PROPOSED PROJECT AND UPLAND BUFFERS

R. L. WEIGT
ENVIRONMENTAL CONSULTANTS, INC.
E-MAIL: rlw1@adelphia.net

NOT A SURVEY



SOURCE: CAT, INC.
LATITUDE: N27° 22.575' LONGITUDE: W080° 22.673'

ST. LUCIE COUNTY	SEC.	TWP.	R.	R.L.W JOB NO.:	DRAWING NAME:	DATE:	FIGURE:
FLORIDA	6	36S	40E	00-029.04	00-029.04 ERP/PROPOSED UPLAND BUF.DWG	03 MARCH 2003	3 OF 12

MIDWAY INDUSTRIAL PARK PHASE III
ENVIRONMENTAL RESOURCE PERMIT APPLICATION (ERP)
PROPOSED PROJECT AND UPLAND BUFFERS

R. L. WEIGT
ENVIRONMENTAL CONSULTANTS, INC.
8985 S.E. BRIDGE ROAD, SUITE A, HOBE SOUND, FL 33455
PHONE: (772) 546-6255 FAX: (772) 546-2316 E-MAIL: rlwi@adelphia.net

Fort Pierce Main Post Office

PERMIT SUMMARY SHEET

APPLICATION NO. 05038-A

LOCATION St. Lucie County S6/T36S/R40E

PROJECT AREA 17.72 ACRES

BASIN AREA 17.72 ACRES

PROJECT USE Commercial

FACILITIES:

1. EXISTING: The existing site is undeveloped with runoff draining via overland sheet flow to the north and to the south.

2. PROPOSED: The proposed surface water management system consists of sheetflow and swales directing runoff to three dry detention area which are connected by culverts. Discharge is to North St. Lucie River Water Management District Canal No. 103 via 1-8" wide weir with crest at elevation 18.1' NGVD, 1-3" diameter circular bleeder with invert at elevation 15.9' NGVD and 25 LF of 19" by 30" ERCP culvert.

APPLICABLE LAND USE	
TOTAL	11.20 ACRES *
WATER MANAGEMENT	2.04 ACRES
IMPERVIOUS	4.79 ACRES
COMMERCIAL	0.85 ACRES

* See comment number 1.

DRAINAGE BASIN North St. Lucie Drainage District

RECEIVING BODY North St. Lucie Drainage District Canal No. 103

RUN OFF FORMULA 2"/day ALLOWABLE DISCHARGE 2 CFS

REQUIRED DETENTION 0.9 AC-FT
DETENTION METHOD dry detention areas
DETENTION PROVIDED 1.3 AC-FT

FLOOD PROTECTION

LOCAL ROAD CRITERIA	10	YEAR, 24 HOUR STORM
FLOOD CONTOUR	18.90	FEET NGVD
MINIMUM ROAD GRADE	20.00	FEET NGVD

EXHIBIT 4A

SPECIAL CONDITIONS

1. MINIMUM BUILDING FLOOR ELEVATION 24.87 FEET NGVD.

2. MINIMUM ROAD CROWN ELEVATION 20.0 FEET NGVD.

3. DISCHARGE FACILITIES:

   DESCRIPTION: 1-8" WIDE WEIR WITH CREST AT ELEVATION 18.1' NGVD, 1-3" DIAMETER CIRCULAR BLEEDER WITH INVERT AT ELEVATION 16.5' NGVD AND 25 LF OF 19" BY 30" ERCP CULVERT.

   RECEIVING WATER: NORTH ST. LUCIE RIVER WATER MANAGEMENT DISTRICT CANAL NO. 103.

   CONTROL ELEVATION: 16.5 FEET NGVD.

4. THE PERMITTEE SHALL BE RESPONSIBLE FOR THE CORRECTION OF ANY EROSION OR SHOALING PROBLEMS THAT RESULT FROM THE CONSTRUCTION OR OPERATION OF THE SURFACE WATER MANAGEMENT SYSTEM.

5. MEASURES SHALL BE TAKEN DURING CONSTRUCTION TO INSURE THAT SEDIMENTATION AND/OR TURBIDITY PROBLEMS ARE NOT CREATED IN THE RECEIVING WATER.

6. THE PERMITTEE SHALL BE RESPONSIBLE FOR THE CORRECTION OF ANY WATER QUALITY PROBLEMS THAT RESULT FROM THE CONSTRUCTION OR OPERATION OF THE SURFACE WATER MANAGEMENT SYSTEM.

7. THE DISTRICT RESERVES THE RIGHT TO REQUIRE THAT WATER QUALITY TREATMENT METHODS BE INCORPORATED INTO THE DRAINAGE SYSTEM IF SUCH MEASURES ARE SHOWN TO BE NECESSARY.

8. OPERATION OF THE SURFACE WATER MANAGEMENT SYSTEM SHALL BE THE RESPONSIBILITY OF UNITED STATES POSTAL SERVICE.

9. PRIOR TO THE INITIATION OF ANY WITHDRAWAL OF WATER (IRRIGATION, DEWATERING, PUBLIC WATER SUPPLY, ETC.), IT WILL BE NECESSARY TO APPLY FOR A WATER USE PERMIT. THE PERMITTEE IS CAUTIONED THAT A MINIMUM OF 90 DAYS IS REQUIRED FOR CONSIDERATION OF THE WATER USE PERMIT APPLICATION. THE PERMITTEE IS CAUTIONED THAT THE ISSUANCE OF A SURFACE WATER MANAGEMENT PERMIT SHALL NOT BE CONSTRUED TO BE A GUARANTEE THAT WATER WILL BE AVAILABLE.

10. PRIOR TO THE COMMENCEMENT OF CONSTRUCTION OF FUTURE PHASES, PAVING, GRADING, AND DRAINAGE PLANS SHALL BE SUBMITTED TO THE DISTRICT FOR REVIEW AND APPROVAL.

11. NO EXCAVATION SHALL OCCUR WITHIN 200 FEET OF ANY WETLANDS. A MINIMUM OF 25 FEET UNDISTURBED UPLAND BUFFER SHALL BE MAINTAINED AROUND ANY WETLAND ON OR ADJACENT TO THE SITE.

PARKING LOT CRITERIA		
FLOOD CONTOUR	N/A	YEAR, N/A HOUR STORM
MINIMUM PARKING LOT GRADE	N/A	FEET NGVD
BASIN DESIGN FREQUENCY	N/A	FEET NGVD
FLOOD CONTOUR	10	YEAR, 24 HOUR STORM
DESIGN DISCHARGE	18.90	FEET NGVD
100 YEAR FLOOD	2	CFS
FLOOD CONTOUR	21.40	FEET NGVD
MINIMUM FLOOR ELEVATION	24.87	FEET NGVD
FIA FLOOD ELEVATION	N/A	FEET NGVD

COMMENTS:

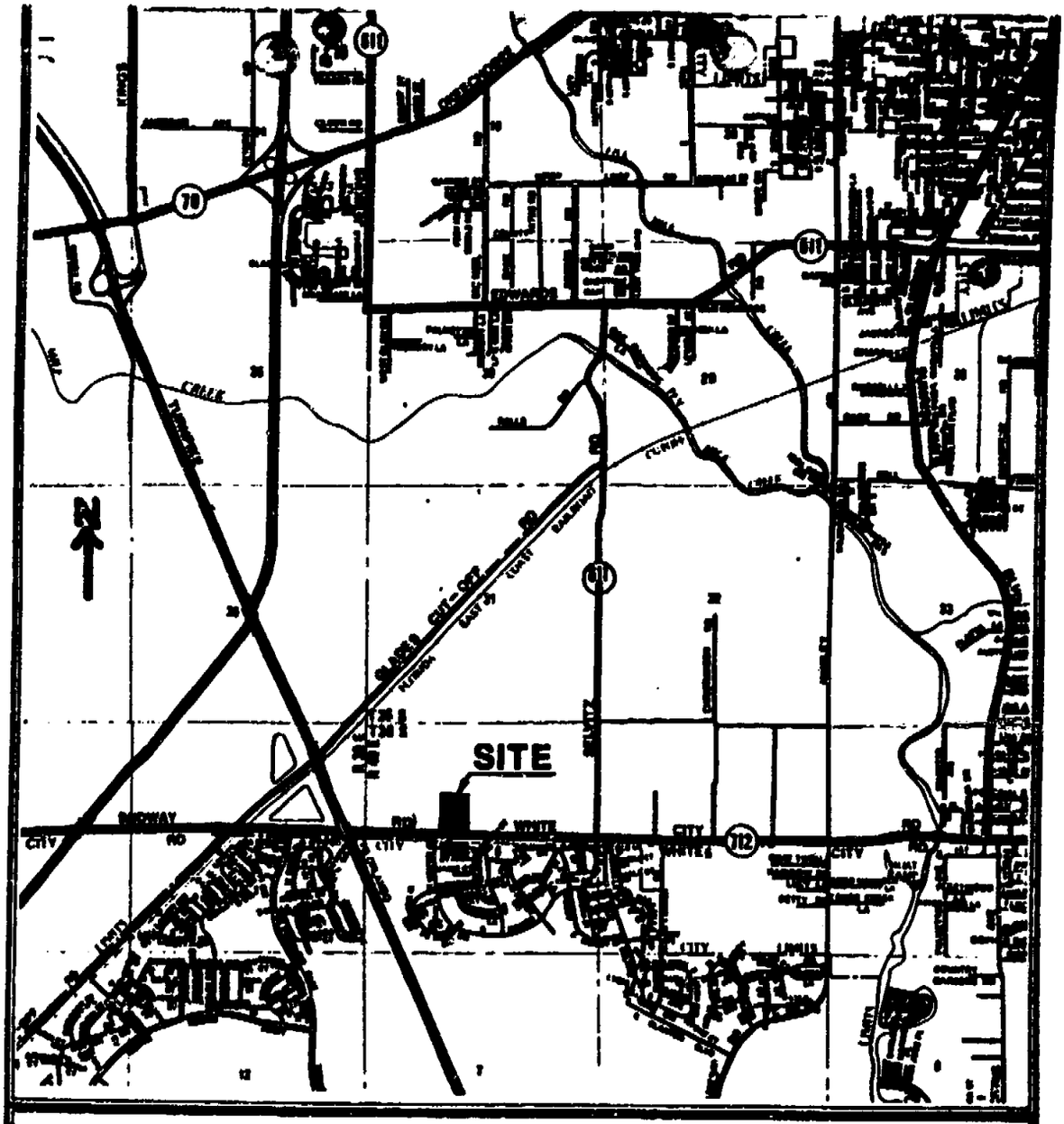
1. On 05-03-88 plans were submitted to the District for construction and operation of a 17.72 acre commercial tract known as Fort Pierce Main Post Office. The proposed development area is 11.2 acres and the remaining 6.52 acres are to be left undeveloped and outside of the drainage basin at this time.

2. Water Quality: Detention provided in excess of the drainage generated by the 3-year 1-hour storm event.

3. Environmental: The Fort Pierce Main Post Office is located north of White City Road (SR 712) and approximately 1/2 mile east of the Florida Turnpike. Pine/palmetto flatwoods vegetation covers the majority of the property. A 1/2 acre isolated wetland and a small portion (1/4 acre) of a larger off-site isolated wet prairie are present in the northeast corner of the site.

   The applicant's consultant has indicated that the northern portion of the parcel will be left undisturbed. This should protect the wetland areas. Excavation should not occur within two hundred feet (200') of the wetlands and the wetlands should be protected by a 25' upland buffer.

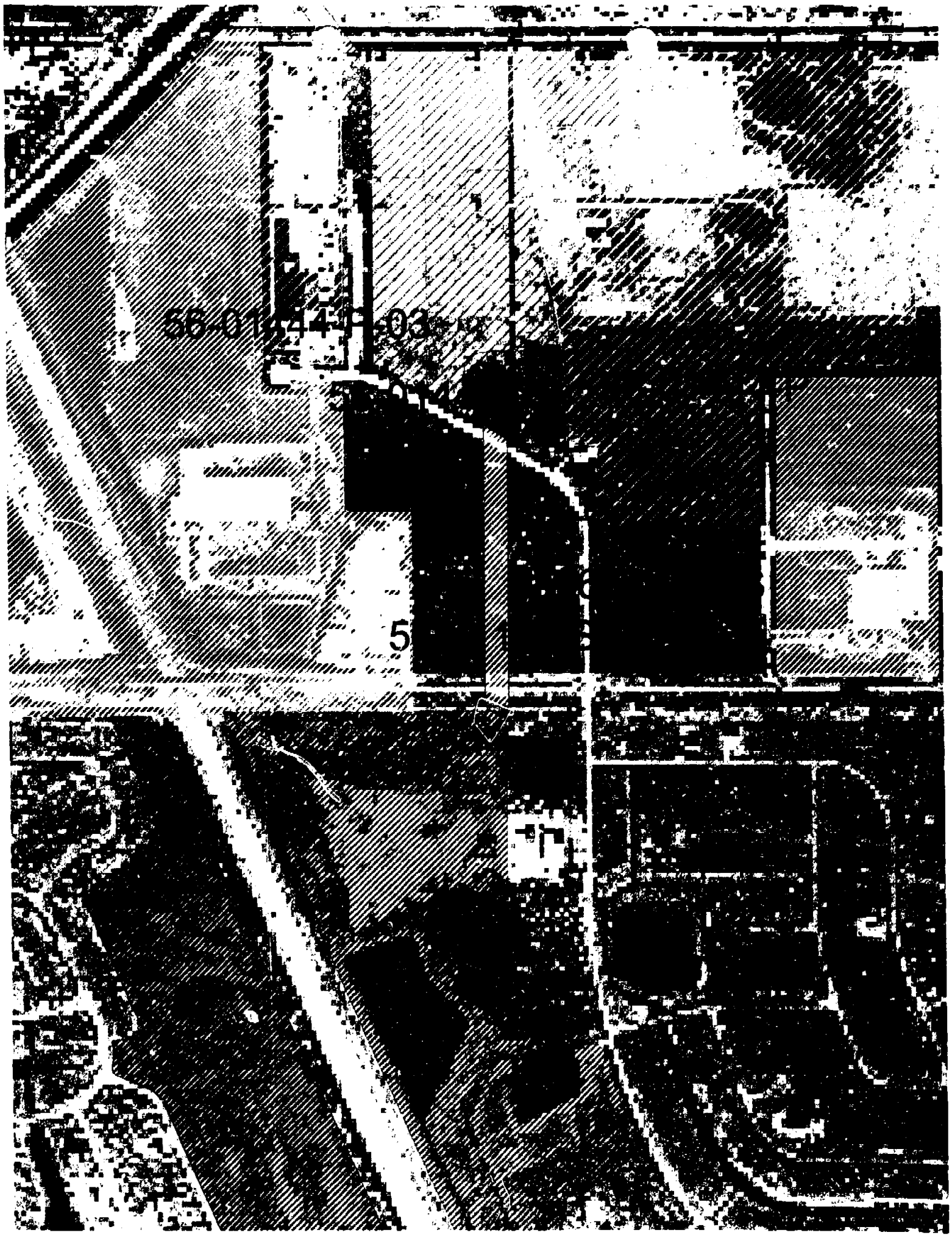
EXHIBIT 4B



LOCATION MAP

FORT PIERCE
MAIN POST OFFICE

EXHIBIT #1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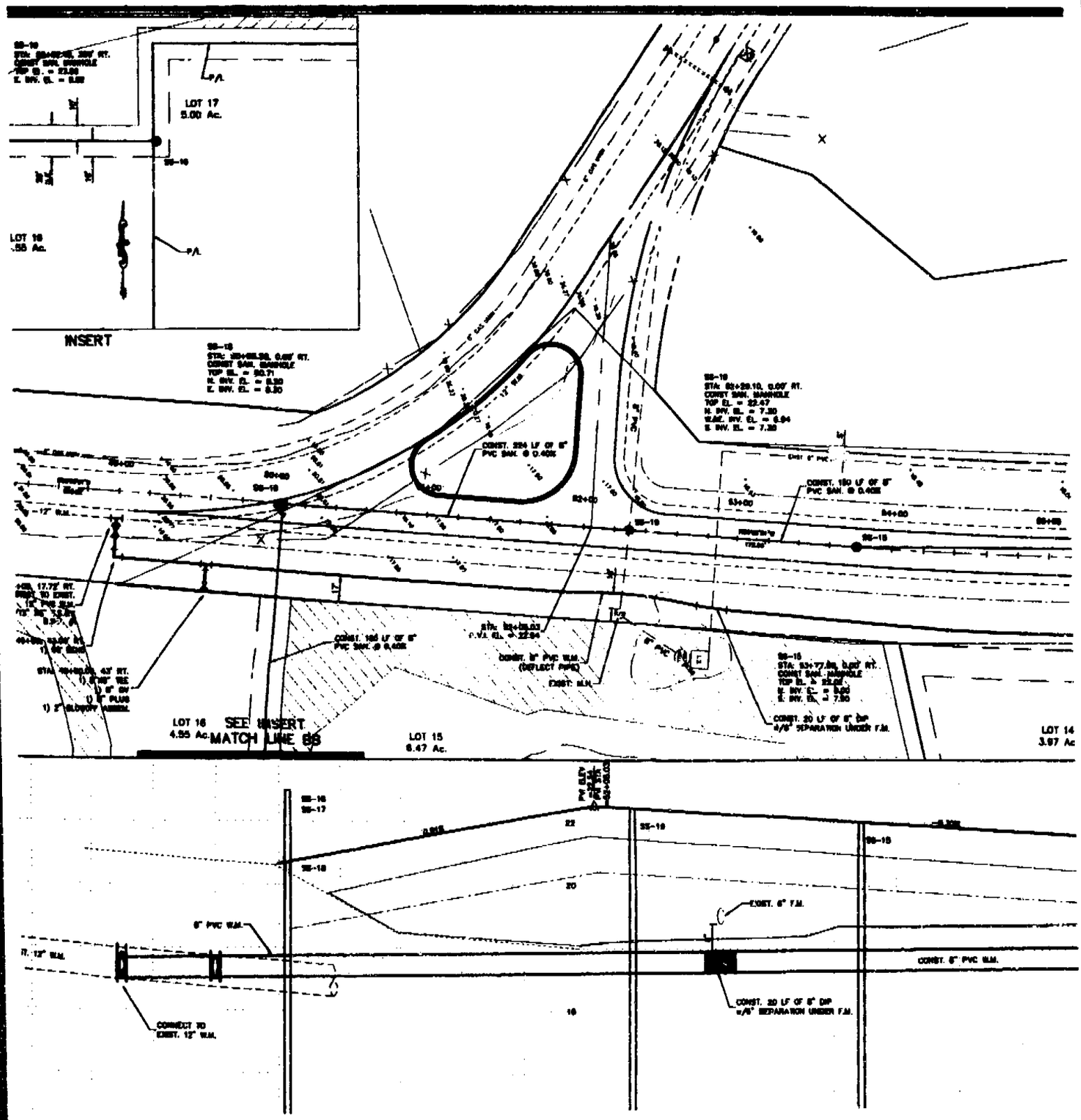
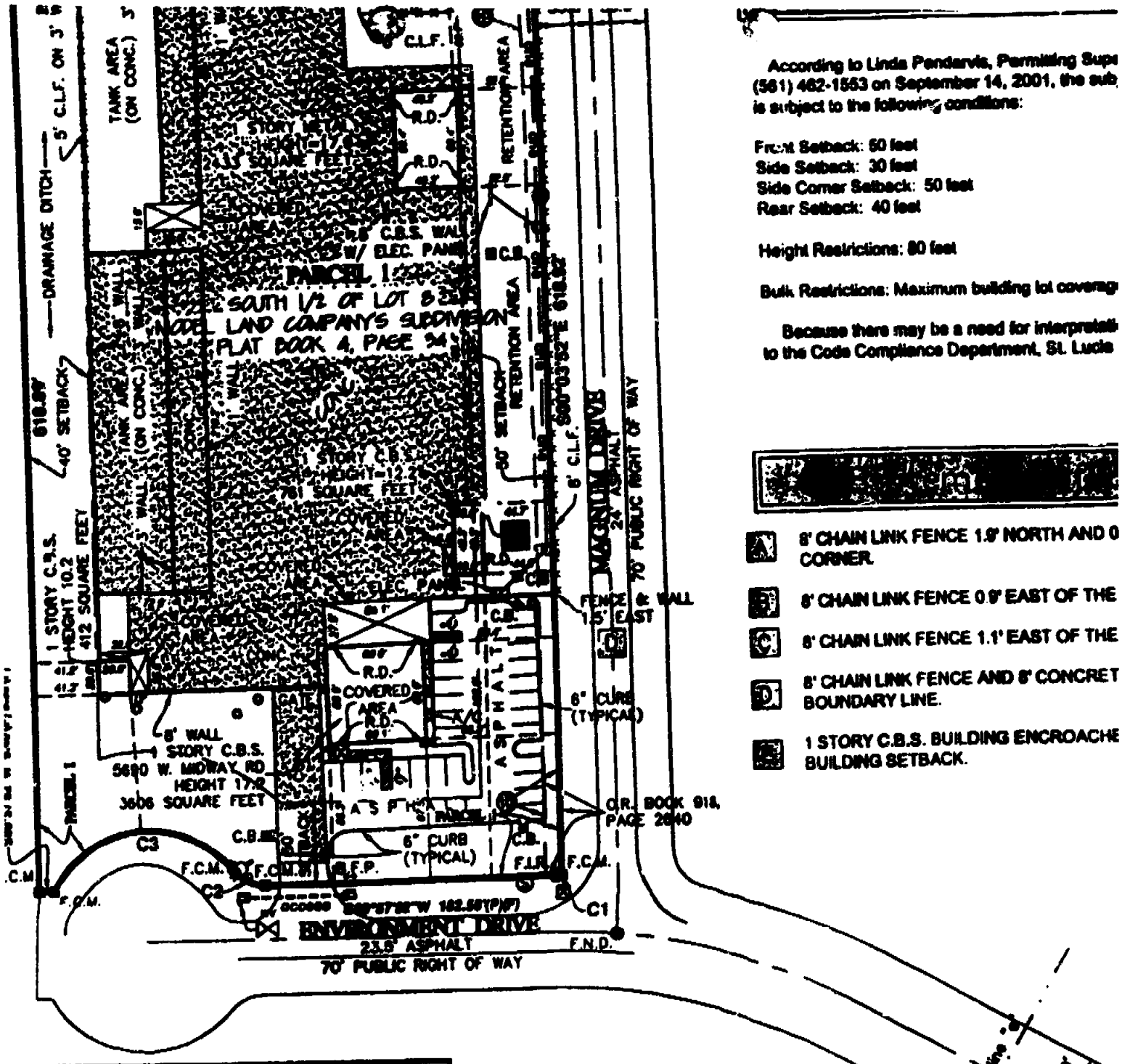

INSERT
LOT 17
5.00 Ac.
LOT 16
.55 Ac.
LOT 16
4.55 Ac.
SEE INSERT
MATCH LINE 6S
LOT 15
6.47 Ac.
LOT 14
3.97 Ac.
CONST. 224 LF OF 8" PVC SAN. @ 0.40%
CONST. 150 LF OF 8" PVC SAN. @ 0.40%
CONST. 165 LF OF 8" PVC SAN. @ 0.40%
CONST. 8" PVC W.M. (DEFLECT PIPE)
EXIST. W.M.
CONST. 20 LF OF 8" DIP w/8' SEPARATION UNDER F.M.
EXIST. 6" F.M.
CONST. 8" PVC W.M.
8" PVC W.M.
CONNECT TO EXIST. 12" W.M.



According to Linda Pendarvis, Permitting Supe
(561) 462-1563 on September 14, 2001, the sub
is subject to the following conditions:

Front Setback: 50 feet
Side Setback: 30 feet
Side Corner Setback: 50 feet
Rear Setback: 40 feet

Height Restrictions: 80 feet

Bulk Restrictions: Maximum building lot coverag

Because there may be a need for interpretati
to the Code Compliance Department, St. Lucie

[redacted]

A 8' CHAIN LINK FENCE 1.9' NORTH AND 0
CORNER.

B 8' CHAIN LINK FENCE 0.9' EAST OF THE

C 8' CHAIN LINK FENCE 1.1' EAST OF THE

D 8' CHAIN LINK FENCE AND 8' CONCRET
BOUNDARY LINE.

1 STORY C.B.S. BUILDING ENCROACHE
BUILDING SETBACK.

E: By graphic plotting only, this property is in Zone(s)
__ of the Flood Insurance Rate Map, Community Panel No.
_____, which bears an effective date of
d is not in a Special Flood Hazard Area. By telephone
_____ to the National Flood Insurance Program (800-638-
ed this community does currently participate in
ld surveying was performed to determine this zone and
ate may be needed to verify this determination or apply
the Federal Emergency Management Agency.

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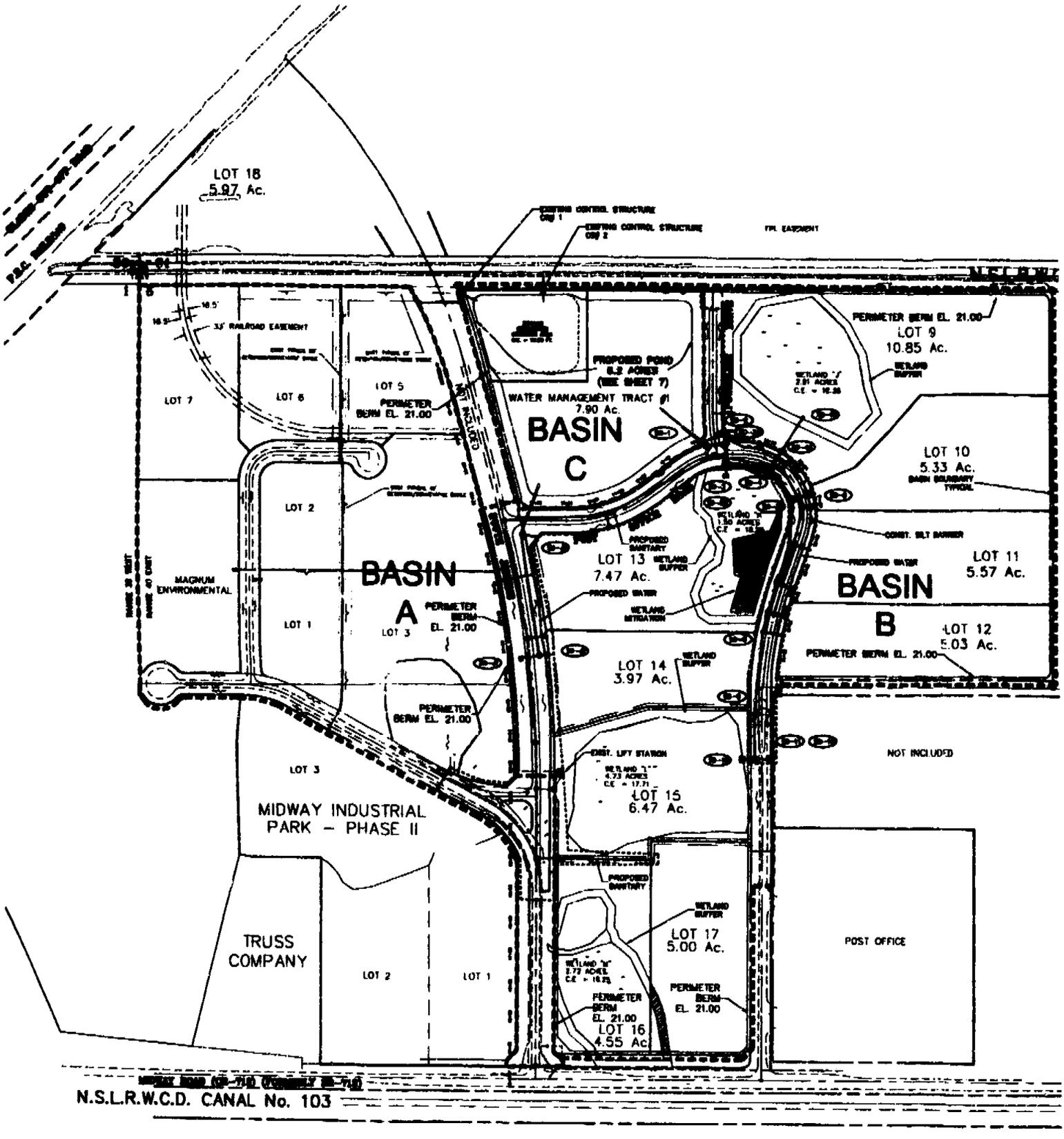


LOT 18
5.97 Ac.
EXISTING CONTROL STRUCTURE
EXISTING CONTROL STRUCTURE
FPL EASEMENT
PERIMETER BERM EL. 21.00
LOT 9
10.85 Ac.
WETLAND BUFFER
PROPOSED POND
WATER MANAGEMENT TRACT #1
7.90 Ac.
BASIN
C
LOT 7
LOT 6
LOT 5
PERIMETER BERM EL. 21.00
NOT INCLUDED
LOT 10
5.33 Ac.
BASIN BOUNDARY TYPICAL
LOT 2
CONST. SILT BARRIER
PROPOSED SANITARY
LOT 13
7.47 Ac.
WETLAND BUFFER
PROPOSED WATER
LOT 11
5.57 Ac.
BASIN
B
MAGNUM ENVIRONMENTAL
BASIN
A
PERIMETER BERM EL. 21.00
LOT 1
LOT 3
PROPOSED WATER
WETLAND MITIGATION
LOT 12
5.03 Ac.
PERIMETER BERM EL. 21.00
LOT 14
3.97 Ac.
WETLAND BUFFER
PERIMETER BERM EL. 21.00
NOT INCLUDED
EXIST. LIFT STATION
LOT 3
LOT 15
6.47 Ac.
MIDWAY INDUSTRIAL
PARK – PHASE II
PROPOSED SANITARY
WETLAND BUFFER
LOT 17
5.00 Ac.
POST OFFICE
TRUSS
COMPANY
LOT 2
LOT 1
PERIMETER BERM EL. 21.00
PERIMETER BERM EL. 21.00
LOT 16
4.55 Ac.
N.S.L.R.W.C.D. CANAL No. 103

3. The applicant's response to comment number 8 in the District's letter requesting additional information (RAI) of July 24, 2002 indicated that the applicant is relying on construction of South Jenkins Road (Midway Rd. - Edwards Rd.) by St. Lucie County, as permitted by the District in 1993. Be advised that construction authorization associated with the referenced permit (56-01127-S) expired on April 15, 1998. Please submit a revised response addressing previous comment 8, taking into consideration the possibility that this roadway may not be permitted or constructed as previously permitted.

Please submit revised construction plans showing construction of only that portion of South Jenkins Road that is necessary for the access and transportation needs of this project, in order to avoid additional secondary impacts to wetlands and other water resources (see Section 4.2.7 of the Basis of Review).

The revised construction drawings show a roadway to be constructed in the South Jenkins Road corridor. This portion of the roadway was designed to accommodate the access and transportation needs of this project only.

4. Please submit the environmental information requested in comments 9, 11 and 12 of the initial RAI. The applicant's responses to these comments (requesting monitoring and maintenance plan, seasonal high water levels and delineation of wetlands) referred to information to be submitted under separate cover. The District has not received the referenced information. Please include responses to all comments in a single coordinated response to this letter, rather than through separate submittals.

The response to Comments No. 9, 11, and 12 of the initial RAI were sent to the District from R.L. Weigt Environmental Consultants, Inc. under separate cover on September 20, 2002. This submittal must have been sent in after the second RAI letter was written. Enclosed is a copy of the response.

5. Will the wetlands have the same watersheds and/or volume of water following development as in the current pre-development condition? The applicant's response to comment 9 of the previous RAI referenced a hydrologic analysis responsive to this comment. Staff could not locate this analysis in the submitted information. Please submit the requested hydrologic analysis. A plan sheet showing the pre- and post-development watersheds of the wetlands would assist in this analysis.

Enclosed is the hydrologic analysis including a plan sheet of the pre-development watershed.

Also enclosed for your reference are five (5) copies of all information. Your prompt review and approval of this information would be greatly appreciated. If you have any questions or comments, please feel free to contact me.

Sincerely,
CULPEPPER & TERPENING, INC.

Eric Zeiss, PE
Project Manager

EZ:pw

Enclosures

cc: Ed Lunsford
Bob Weigt

SURFACE WATER MANAGEMENT EVALUATION

APPLICATION NUMBER 01297-B DATE: March 11, 1987

PROJECT NAME: Chiquita Citrus Packers

LOCATION: St. Lucie COUNTY

SECTION 1, 6, TOWNSHIP 36 SOUTH, RANGE 39, 40 EAST

PROJECT AREA 42.04 ACRES DRAINAGE AREA 42.04 ACRES

FACILITIES:

1. EXISTING: The North St Lucie River Water Control District (NSRWCD) Canal C-102 is located along the northern property line.

2. PROPOSED: The project will be developed in three phases and will consist of a 104,980 sq. ft. citrus packing plant. Phase I (26.26-acres) includes construction of the main packing plant and the surface water management system. Phase II will add an additional 0.44-acres of building area and 0.67-acres of parking area to Phase I. The last phase, the Future Area (15.88-acres), will be reviewed in detail prior to development.

Runoff is directed to approximately 0.58-acres of dry swale areas and then into a 4.53-acre on-site lake via 1-3.5" diameter circular orifice with an invert at elevation 17.0' NGVD and 1-30" wide weir with a crest at elevation 20.0' NGVD. Discharge to the NSRWCD canal C-102 from the lake is via 1-2.32' wide by 0.71' high inverted triangular orifice with an invert at elevation 16.0' NGVD, 1-4.08' wide weir with a crest at elevation 18.5' NGVD, 100LF of 30" diameter CMP culvert, 500 LF of on-site conveyance ditch, and 60 LF of 30" diameter ACMP culvert.

DRAINAGE BASIN N. St. Lucie Drainage District RECEIVING BODY N. Fork of the St. Lucie River via NSLRWCD canal C-102

RUN OFF FORMULA 2.6"/day ALLOWABLE DISCHARGE 9 CFS

REQUIRED DETENTION 3.23 AC-FT
DETENTION METHOD Dry Detention & On-site Lake
DETENTION PROVIDED 11.33 AC-FT

FLOOD PROTECTION		
LOCAL ROAD CRITERIA	10 YEAR, 24	HOUR STORM
FLOOD CONTOUR	17.2	FEET NGVD
MINIMUM ROAD GRADE	21.0	FEET NGVD
PARKING LOT CRITERIA	n/a YEAR, n/a	HOUR STORM
FLOOD CONTOUR	n/a	FEET NGVD
MINIMUM PARKING LOT GRADE	n/a	FEET NGVD
BASIN DESIGN FREQUENCY	25 YEAR, 72	HOUR STORM
FLOOD CONTOUR	19.2	FEET NGVD
DESIGN DISCHARGE	6	CFS
100 YEAR FLOOD		
FLOOD CONTOUR	20.5	FEET NGVD
MINIMUM FLOOR ELEVATION	23.0	FEET NGVD
FIA FLOOD ELEVATION	n/a	FEET NGVD

SPECIAL CONDITIONS

1. MINIMUM BUILDING FLOOR ELEVATION 23.0 FEET NGVD.

2. MINIMUM ROAD CROWN ELEVATION 21.0 FEET NGVD.

3. DISCHARGE FACILITIES:

   DESCRIPTION: 1-2.32' WIDE BY 0.71' HIGH INVERTED TRIANGULAR ORIFICE WITH AN INVERT AT ELEVATION 16.0' NGVD, 1-4.08' WIDE WEIR WITH AN INVERT AT ELEVATION 18.5' NGVD, 100 LF OF 30" DIAMETER CMP CULVERT, 500 LF OF ON-SITE CONVEYANCE DITCH, AND 60 LF OF 30" DIAMETER CMP CULVERT.

   RECEIVING WATER: NO. FORK OF THE ST. LUCIE RIVER VIA NSLRWCD CANAL C-102.

   CONTROL ELEVATION: 16.0 FEET NGVD.

4. THE PERMITTEE SHALL BE RESPONSIBLE FOR THE CORRECTION OF ANY EROSION OR SHOALING PROBLEMS THAT RESULT FROM THE CONSTRUCTION OR OPERATION OF THE SURFACE WATER MANAGEMENT SYSTEM.

5. MEASURES SHALL BE TAKEN DURING CONSTRUCTION TO INSURE THAT SEDIMENTATION AND/OR TURBIDITY PROBLEMS ARE NOT CREATED IN THE RECEIVING WATER.

6. THE PERMITTEE SHALL BE RESPONSIBLE FOR THE CORRECTION OF ANY WATER QUALITY PROBLEMS THAT RESULT FROM THE CONSTRUCTION OR OPERATION OF THE SURFACE WATER MANAGEMENT SYSTEM.

7. THE DISTRICT RESERVES THE RIGHT TO REQUIRE THAT WATER QUALITY TREATMENT METHODS BE INCORPORATED INTO THE DRAINAGE SYSTEM IF SUCH MEASURES ARE SHOWN TO BE NECESSARY.

8. OPERATION OF THE SURFACE WATER MANAGEMENT SYSTEM SHALL BE THE RESPONSIBILITY OF CHIQUITA CITRUS PACKERS, INC.

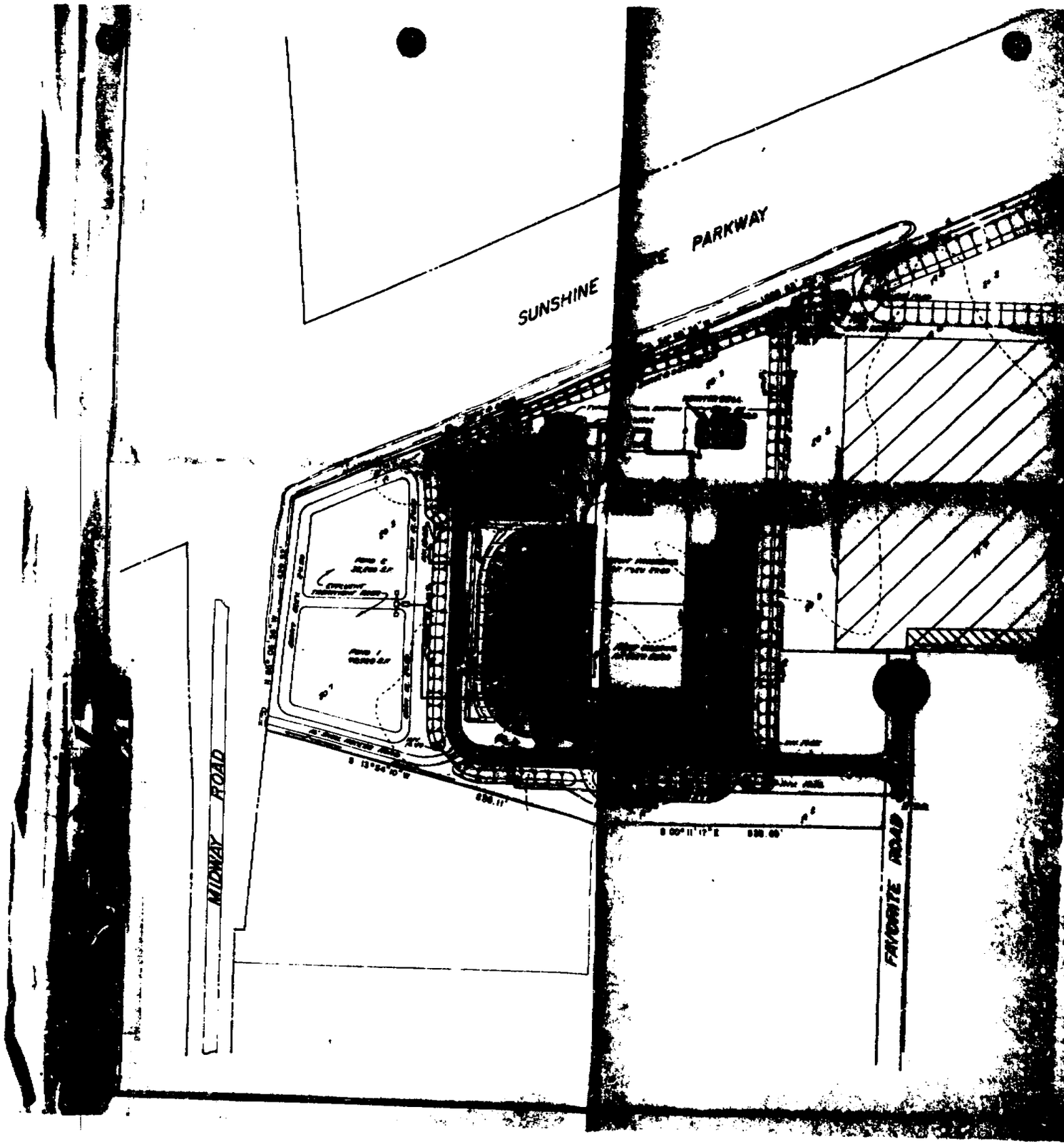
9. LAKE SIDE SLOPES SHALL BE 4:1 (HORIZONTAL:VERTICAL) TO A DEPTH OF TWO FEET BELOW THE CONTROL ELEVATION. SIDE SLOPES SHALL BE NURTURED OR PLANTED FROM 2 FEET BELOW TO 1 FOOT ABOVE CONTROL ELEVATION TO INSURE VEGETATIVE GROWTH.

10. PRIOR TO THE INITIATION OF ANY WITHDRAWAL OF WATER (IRRIGATION, DEWATERING, PUBLIC WATER SUPPLY, ETC.), IT WILL BE NECESSARY TO APPLY FOR A WATER USE PERMIT. THE PERMITTEE IS CAUTIONED THAT A MINIMUM OF 90 DAYS IS REQUIRED FOR CONSIDERATION OF THE WATER USE PERMIT APPLICATION. THE PERMITTEE IS CAUTIONED THAT THE ISSUANCE OF A SURFACE WATER MANAGEMENT PERMIT SHALL NOT BE CONSTRUED TO BE A GUARANTEE THAT WATER WILL BE AVAILABLE.

11. PRIOR TO THE COMMENCEMENT OF CONSTRUCTION OF FUTURE PHASES, PAVING GRADING, AND DRAINAGE PLANS SHALL BE SUBMITTED TO THE DISTRICT FOR REVIEW AND APPROVAL.

12. THE FUTURE AREA DEVELOPMENT SHALL BE LIMITED TO 50% IMPERVIOUS AREA AND SHALL PROVIDE DRY PRETREATMENT PRIOR TO ENTERING THE SURFACE WATER MANAGEMENT SYSTEM. IF THE FUTURE AREA EXCEEDS 50% IMPERVIOUS AREA, ADDITIONAL WATER MANAGEMENT AREA SHALL BE PROVIDED TO MAKE UP THE DIFFERENCE.

56-00619-S



LEGEND

○ HIGH WATER MARK

SOURCE: ST. LUCIE COUNTY PROPERTY APPRAISER, 01-11-2002

ST. LUCIE COUNTY	SEC.	TWP.	R.	RLW JOB NUMBER:	DRAWING NAME:	DATE:	FIGURE:
FLORIDA	6	36S	40E	00-029.03	HIGHWATER.DWG	AUGUST 2002	1 OF 1

MIDWAY INDUSTRIAL PARK PHASE III S

WETLAND MONITORING AND MAINTENANCE PLAN

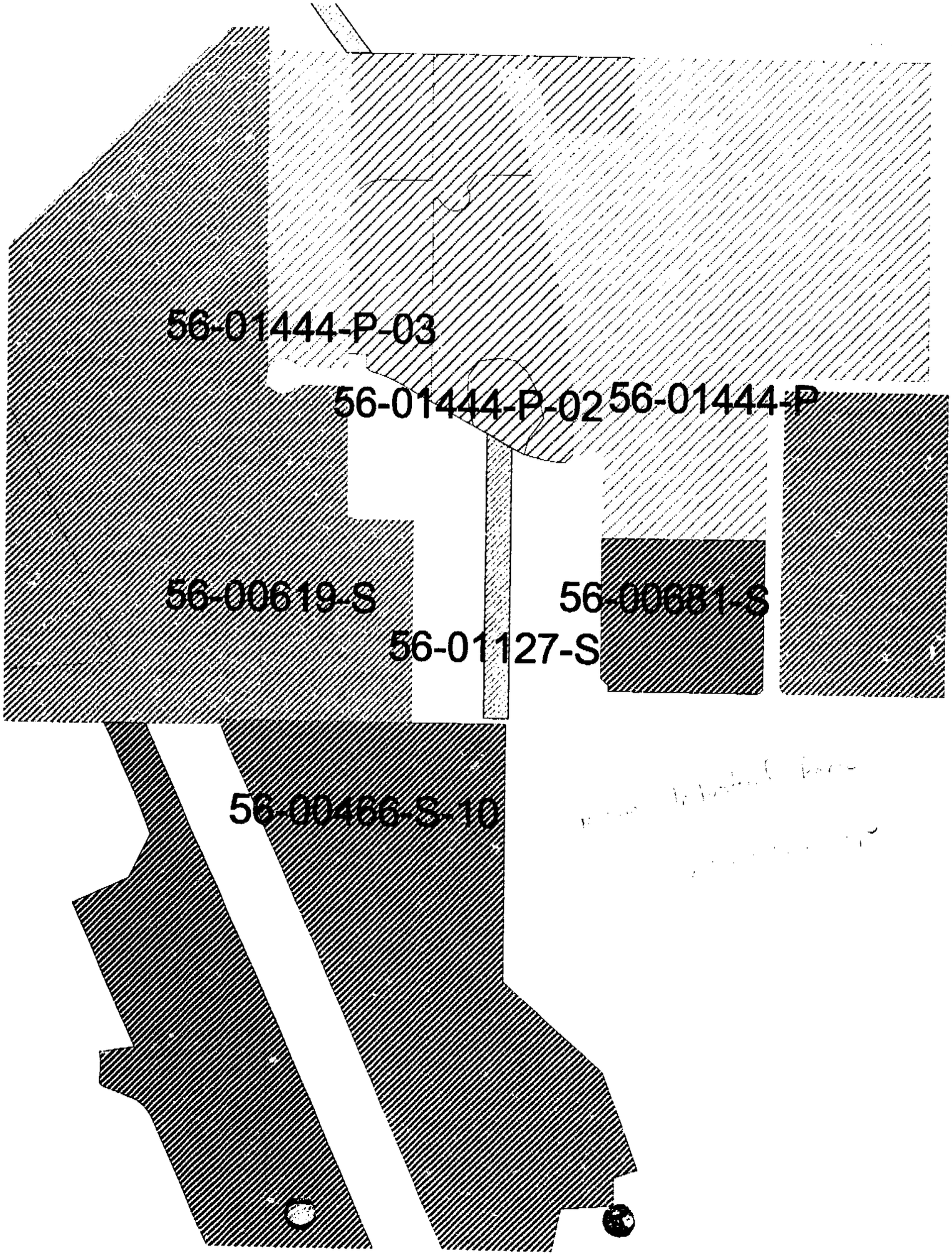
HIGH WATER MARK LOCATION MAP

R. L. WEIGT

ENVIRONMENTAL CONSULTANTS, INC.

8985 S.E. BRIDGE ROAD, SUITE A, HOBE SOUND, FL 33455

(772) 546-6255 FAX (772) 546-2316 E-MAIL rlw1@adelphia.net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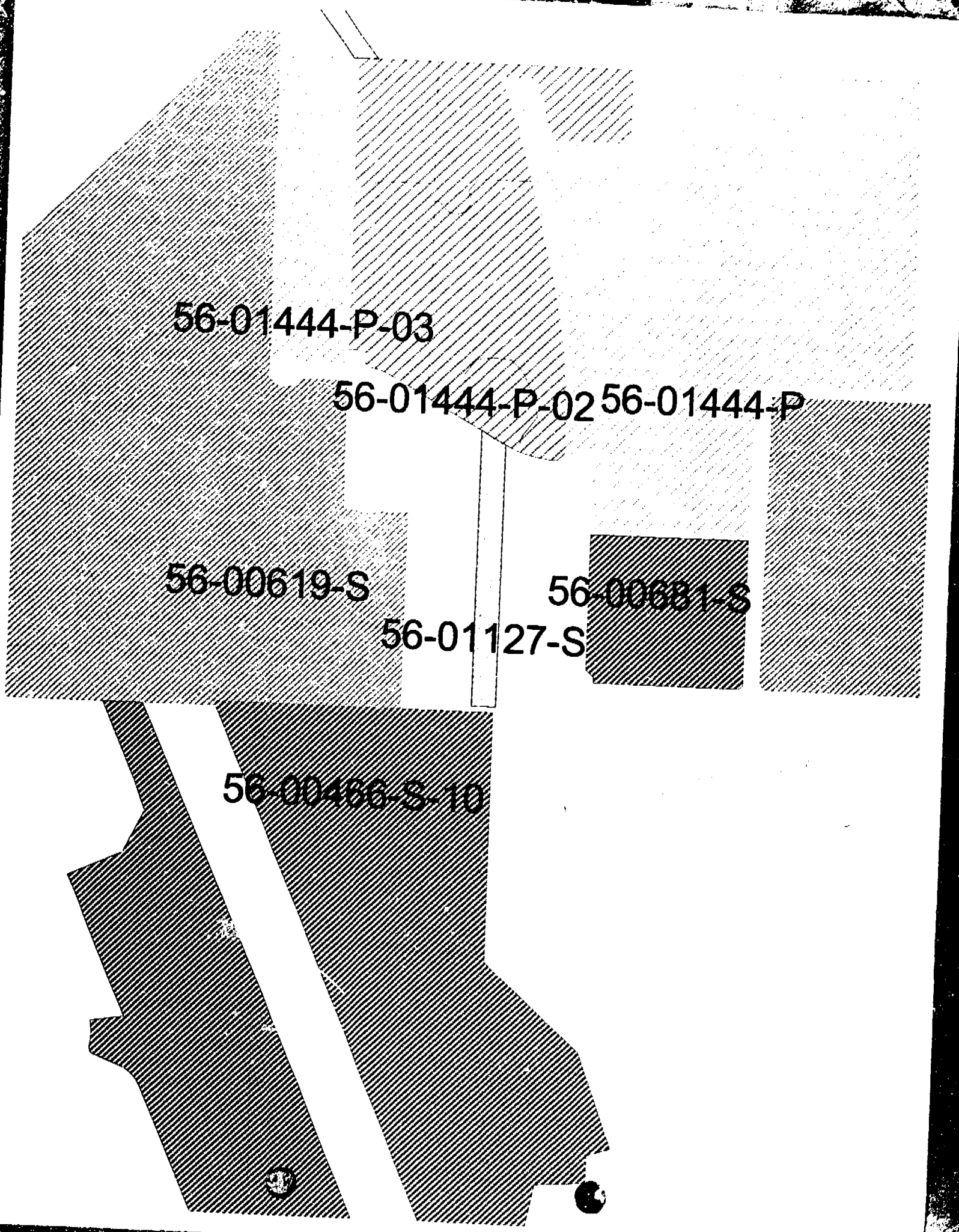
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56-01444-P
56-00619-S
56-00681-S
56-01127-S
56-00486-S-10

SOUTH FLORIDA WATER MANAGEMENT DISTRICT
3301 Gun Club Road, West Palm Beach, Florida 33406 • (561) 686-8800 • FL WATS 1-800-432-2045 • TDD (561) 697-2574
Mailing Address: P.O. Box 24680, West Palm Beach, FL 33416-4680 • www.sfwmd.gov

CON 24-06

Environmental Resource Regulation
Pre-application Numbers 990915-6

July 28, 2000

Peter J. Krinsky, C.E.P.
1672 SW Sandtrap Crescent
Palm City, FL 34990

Dear Mr. Krinsky:

Subject: John Mayo Site (Midway Road Industrial Site)
Pre-Application Environmental Site Inspection
St. Lucie County, S6/T36S/R40E

The District offers the following in response to your November 15, 1999, request for a determination of wetland boundaries and other surface waters located within the subject property.

Scott McNabb, Staff Environmental Analyst, conducted a site inspection of the Midway Road Industrial Site property on July 13, 1994. Based on review of the previous delineation and analysis of the submitted information (aerial photograph and survey), District Staff has determined that the jurisdictional line delineated on the subject property in 1994 is still valid. The information submitted for this property on November 15, 1999, is consistent with the 1994 delineation.

The attached aerial photograph defines the area of the project site (indicated by the red line on the attached aerial). Based on the information provided, portions of this project are wetlands (indicated by black diagonal lines on the attached aerial) as defined by Chapter 62-340 Florida Administrative Code (F.A.C.). If the proposed project will result in greater than one acre of total impacts to wetlands or other surface waters, an Individual Environmental Resource Permit from the District will be required. Proposed work resulting in less than one acre of total impacts to wetlands or other surface waters will require a Standard General Permit from the District.

This correspondence is an informal preapplication wetland determination pursuant to Chapter 373, Florida Statutes. It does not bind the District, its agents or employees, nor does it convey any legal rights, expressed or implied. Persons obtaining this informal preapplication wetland determination are not entitled to rely upon it for purposes of compliance with provision of law or district rules. A binding wetland determination may be obtained by petitioning the South Florida Water Management District for a wetland declaratory statement pursuant to FAC Rule 62-340 or by applying for an Environmental Resource permit.

GOVERNING BOARD

Michael Collins, *Chairman*
Michael D. Minton, *Vice Chairman*
Mitchell W. Berger
Vera M. Carter
Gerardo B. Fernandez
Patrick J. Gleason
Nicolas J. Gutierrez, Jr.
Harkley R. Thornton
Trudi K. Williams

EXECUTIVE OFFICE

Frank R. Finch, P.E., *Executive Director*
James E. Blount, *Chief of Staff*

A file has been set up at the West Palm Beach office with pre-application materials. If you have any further questions, please Kristina Serbesoff at (561) 682-2864.

Sincerely,

for Anita R. Bain

Donald L.Medellin, P.W.S.
Senior Supervising Environmental Analyst
Natural Resource Management Division

DLM/ks – Attachments (Aerial Photograph)

c: USACOE (Stuart)

bc: Kristina Serbesoff
Pre-app file w/attachments
Scott McNabb

Pre-Application Request Form

Pre-Application Number 9909156 Date Requested 9/15/99

Project Name John Mayo Property Consultant/Applicant Peter Krinsky

Reviewer ~~Dan~~ Kris

County St. Lucie S/T/R S 6 T 36S R 40E Project Acreage 4.59 Ac

---

Checklist for Site Inspection/Pre-app File

- ☑ Location Map
- ☑ Four (4) aerials with project boundary delineated
- ☑ Coordinate site inspection with federal/local agencies
- ☑ Consultant has staked wetlands

Other Information _____

_____

CULPEPPER & TERPENING, INC.

Consulting Engineers • Land Surveyors

2980 South 25th Street • Ft. Pierce, FL 34981
P.O. Box 13360 • Ft. Pierce, FL 34979-3360
(561) 464-3537 • Fax (561) 464-9497

November 16, 1999

VIA: Federal Express Mail

Job No. 99-63

Mr. Don Medellin
Natural Resource Management Division
South Florida Water Management District
3301 Gun Club Road
West Palm Beach, FL 33426

RE: John Mayo Property
Sec 6 / Twn 36S / Rng 40E
St. Lucie County, Florida

Dear Mr. Medellin:

As a follow up to your request to Peter J. Krinsky, please find enclosed four (4) blue line aerial photographs for the +/- 4.59-acre above referenced property.

Should you require any additional information, please do not hesitate to contact our office.

Sincerely,

CULPEPPER & TERPENING, INC.

Dawn R. Hilton, P.E.

Enclosures

cc: John Mayo
Peter J. Krinsky

c:\mydoc\Dawn\letter\9963-1

PETER J. KRINSKY, C.E.P. *ENVIRONMENTAL PLANNER*
1672 SW SANDTRAP CRESCENT • PALM CITY, FLORIDA 34990
Phone / Fax (561) 220-4039

RECEIVED
NOV 15 1999
NRM / 4180

November 11, 1999

South Florida Water Management District
PO Box 24680
3301 Gun Club Road
West Palm Beach, Florida 33406

Attn: Don Medellin, Natural Resource Management Division

Re: John Mayo Property - Section 6, Township 36S, Range 40E - St. Lucie County, Florida
Request for On-site Pre-Application Meeting

Dear Don:

Enclosed please find an aerial, soils map, and location plan for a ±4.59 acre property located at the NW corner of the intersection of Midway and West Milner Roads owned by John Mayo. The property known as Parcel B contains ±0.82 acres of isolated wetland edge as delineated on the aerial. The heart of the wetland extends off-site and to the west (into Parcel A, owned by others). The balance of the site contains pine flatwoods to the south and east, and improved pasture to the north.

The purpose of our pre-application visit would be twofold: 1) to perform an informal JD in the field and confirm existing flags delineating limits of the wetland, and 2) discuss the feasibility of wetland permitting by relocating wetland edge to the northernmost portion of the property (contiguous to large existing off-site wetland to the north).

As the site is simple and well defined, I would expect we could do the necessary review in a very short amount of time. I will call you to arrange a meeting in the field with one of your representatives, as soon as you can set up a date. An ERP permit application, also including a final survey of our delineation, will follow shortly thereafter. Thanks.

Sincerely,

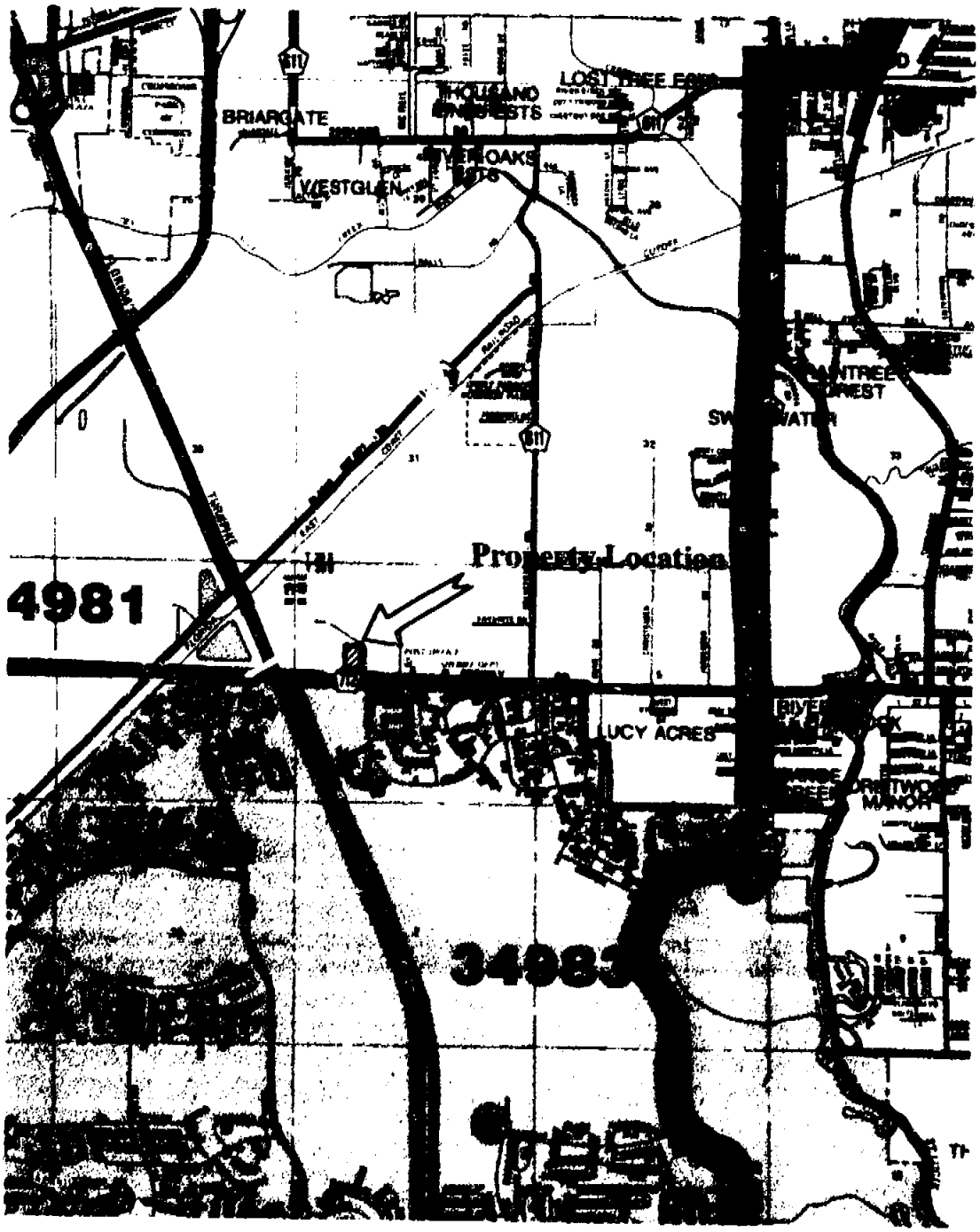
Peter J. Krinsky

Enclosures

PJK/pk

cc: Dawn Hilton - Culpepper & Terpening, Inc.
John Mayo - Property owner

John Mayo Property
St. Lucie County, Florida



Parcel B
±4.59 acres
St. Lucie County, Florida
Section 6, Twp. 36S, Range 40E

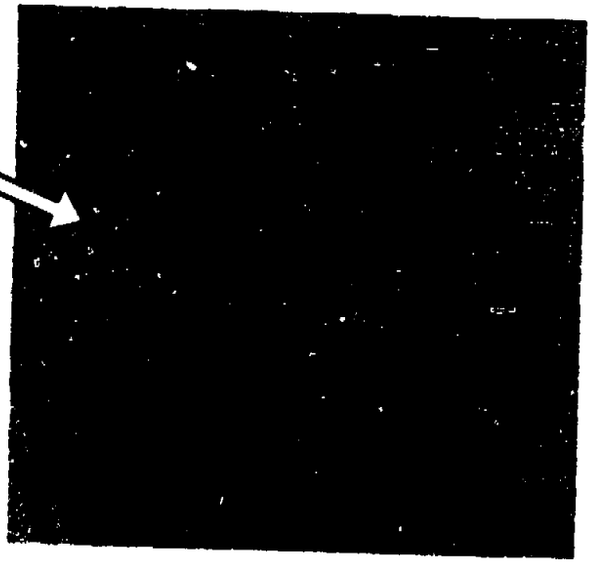
Location Plan for
John Mayo Property
St. Lucie County, Florida

Peter J. Krinsky, C.E.P., Environmental Planner
SITE ASSESSMENT • ENVIRONMENTAL PLANNING • GOVERNMENT PERMITTING
1672 SW Sandtrap Crescent, Palm City, Florida 34990 (561) 220-4039

By:	Date:	Scale:	Job No:	Sheet:
PJK	11/11/99	1"= ±0.7 mi.	J. Mayo	Sheet 1

John Mayo Property
St. Lucie County, Florida

Property Location



Section 6

Soil Map Units

48 Wabasso Sand *

* Not listed as hydric according to Hydric Soils of Florida Handbook

Parcel B
±4.59 acres
St. Lucie County, Florida
Section 6, Twp. 36S, Range 40E

Sheet 27
Soil Survey of St. Lucie County, Florida
USDA, Soil Conservation Service

St. Lucie County Soils Survey
for
John Mayo Property
St. Lucie County, Florida

Peter J. Krinsky, C.E.P., Environmental Planner
SITE ASSESSMENT • ENVIRONMENTAL PLANNING • GOVERNMENT PERMITTING
1672 SW Sandtrap Crescent, Palm City, Florida 34990 (561) 220-4039

By:	Date:	Scale:	Job No:	Sheet:
PJK	11/11/99	1"=±1667'	J. Mayo	Sheet 2

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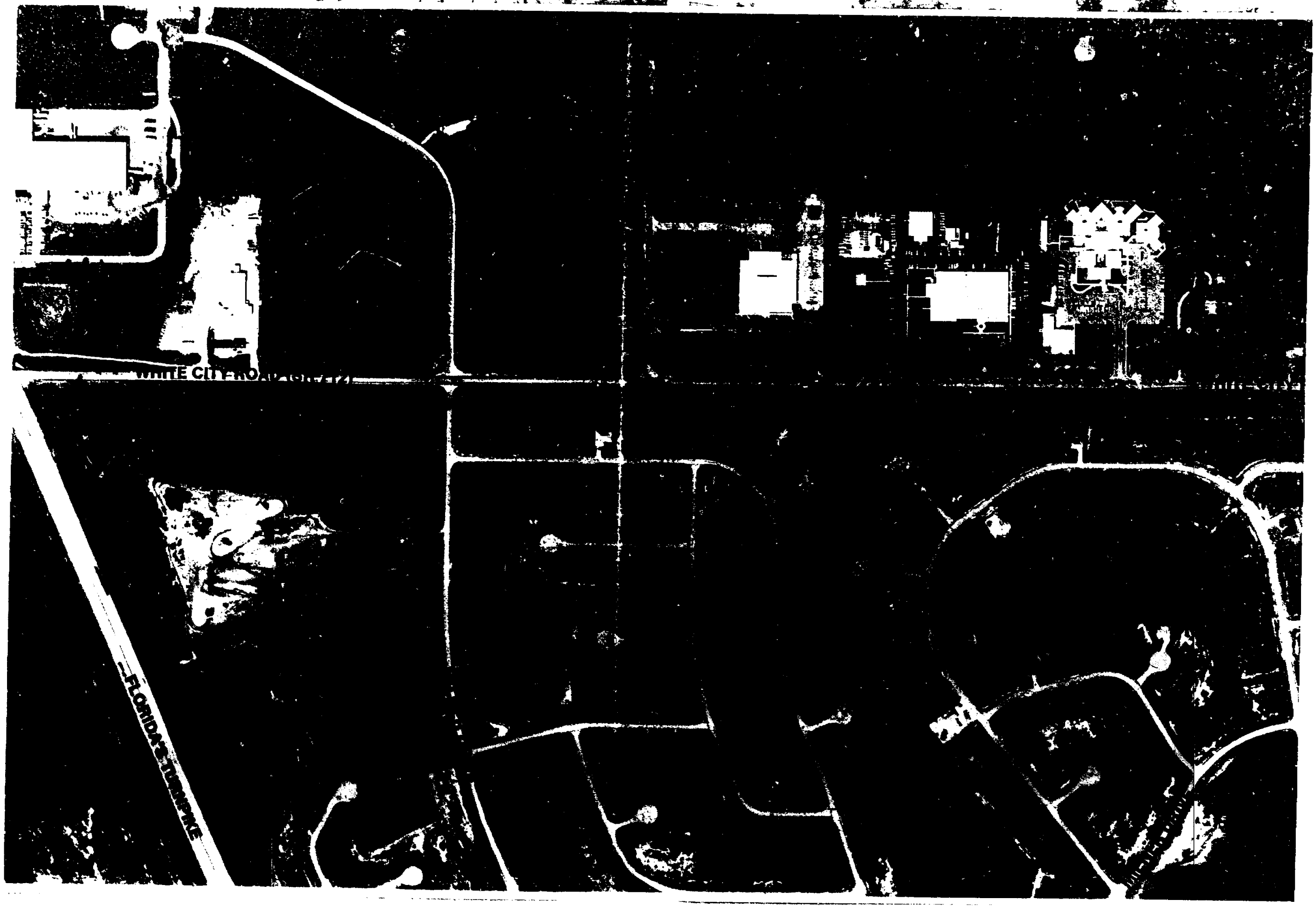


PERMIT APPLICATION ROUTING
Environmental Resource Regulation Division

Application Number: 031216-16 Permit Number: ____

Related Application Number: ____

Applicant: MAYO CONSTRUCTION

Project: MAYO WAREHOUSE

County: St. Lucie Permit Type: ERP Land Use Type: IND

30 Day Deadline: 1/15/04

No Fee Required: ____

Fee Received: $2000.00 Fee Due: $3000.00 (Do Not Issue Permit) Fee Code: PS1

		DATE RECEIVED	DATE OUT
PROCESSED BY:	Mary Waters	12/16/03	12/16/03
ROUTE TO:			
Hugo Carter	Kelly Crawford	____	____
Don Medellin	____	____	____
ENV. RES. COMPL. DIV.	____	____	____
BACK-UP	St. Lucie - Juan	____	____
RIGHT-OF-WAY	7330	____	____
WEEKLY MAIL/FRAN	____	____	____

NRM Signoff: _____ Date: _____

COMMENTS: LOGGED IN AS A NEW INDIVIDUAL ERP FOR CONCEPTUAL APPROVAL. PLEASE VERIFY. IF THIS IS CORRECT, AN ADDITIONAL FEE OF $3000 IS DUE.
ALSO, PLEASE VERIFY WATER BODY.
Original Applications left bound in the books.

FOR RM USE ONLY

Application Submittal Included:
Application Form: 4 Plans: 4 Aerials: 4 Engineer Reports: 4 Adjacent Property Owners Lists: 0

OWNER(S) OF LAND	ENTITY TO RECEIVE PERMIT (IF OTHER THAN OWNER)
NAME **John Mayo**	NAME
ADDRESS **1207 SW 87th Terrace**	ADDRESS
CITY, STATE, ZIP **Plantation, FL 33324**	CITY, STATE, ZIP
COMPANY AND TITLE **Mayo Construction**	COMPANY AND TITLE
TELEPHONE **(954) 236-6551** FAX **(954) 236-8832**	TELEPHONE ( ) FAX ( )
AGENT AUTHORIZED TO SECURE PERMIT (IF AN AGENT IS USED)	**CONSULTANT (IF DIFFERENT FROM AGENT)**
NAME	NAME **Gary Basham, P.E. ,P.L.S.**
COMPANY AND TITLE	COMPANY AND TITLE **Culpepper & Terpening, Inc.**
ADDRESS	ADDRESS **2980 South 25th Street**
CITY, STATE, ZIP	CITY, STATE, ZIP **Ft. Pierce, FL 34981**
TELEPHONE FAX	TELEPHONE **(772) 464-3537** FAX **(772) 464-9497**

031216-16

ORIGINAL SUBMITTAL

DEC 16 2003

WPB

Name of project, including phase if applicable **Mayo Warehouse**
Is this application for part of a multi-phase project? ☐ yes ☒ no
Total applicant-owned area contiguous to the project: **8.84 acres**
Total project area for which a permit is sought: **8.84 acres**
Impervious area for which a permit is sought: **5.30 acres**
What is the total area (metric equivalent for federally funded projects) of work in, on, or over wetlands or other surface waters?
1.87 acres _____ square feet _____ hectares _____ square meters
If a docking facility, the number of proposed new slips: **N/A**

Project location (use additional sheets, if needed)
County: **St. Lucie County**
Section(s) **S ½ of 6** Township(s) **36 S** Range(s) **40E**
Section(s) Township(s) Range(s)
Land Grant name, if applicable **N/A**
Tax Parcel Identification Number **3406-601-0001-000/7** **3406-601-0002-000/4**
Street address, road, or other location: **NW corner of Midway Road and South Jenkins Road**
City, Zip Code if applicable: **NA**

Describe, in general terms, the proposed project, system or activity.

The project will consist of six small warehouse buildings on two lots. Dry detention ponds will provide water quality and attenuation.

If there have been any pre-application meetings, including at the project site, with regulatory staff, please list the date(s), location(s), and names of key staff and project representatives.

October 31, 2003 Gary Basham with Don Medellen, Hugo Carter and Mindy Parrott at the District's West Palm Beach Office

Please identify by number any MSSW/Wetland Resource/ERP/ACOE permits pending, issued or denied for projects at the location and any related enforcement actions.

Agency	Date	No.\Type of Application	Action Taken(Pending/Issued/Denied)

Note:The following information is required for projects proposed to occur in, on or over wetlands or other surface waters that need a federal dredge and fill permit and/or authorization to use state owned submerged lands. Please provide the names ,addresses and zip codes of property owners whose property directly adjoins the project (excluding applicant). Please attach a plan view showing the owner's names and adjoining property lines. Attach additional sheets if necessary.

1)

2)

3)

4)

5)

6)

By signing and submitting this application form, I am applying, or I am applying on behalf of the applicant, for the permit and any proprietary authorizations identified above, according to the supporting data and other incidental information filed with this application. I am familiar with the information contained in this application, and represent that such information is true complete and accurate. I understand this is an application and not a permit, and work prior to approval is a violation. I understand that this application and any permit issued or proprietary authorization issued pursuant thereto, does not relieve me of any obligation for obtaining any other required federal, state, water management district or local permit prior to commencement of construction. I agree, or I agree on behalf of my corporation, to operate and maintain the permitted system unless the permitting agency authorizes transfer of the permit to a responsible operation entity. I understand that knowingly making any false statement or representation in this application is a violation of Section 373.430, F.S., and 18 U.S.C. Section 1001.

John Mayo
Typed/Printed Name of Applicant (If no Agent is used) or Agent (If one is so authorized below)

Signature of Applicant/Agent — 11-5-03 Date

(Corporate Title if applicable)

AN AGENT MAY SIGN ABOVE ONLY IF THE APPLICANT COMPLETES THE FOLLOWING:

I hereby designate and authorize the agent listed above to act on my behalf, or on behalf of my corporation, as the agent in the processing of this application for the permit and/or proprietary authorization indicated above; and to furnish, on request, supplemental information in support of the application. In addition, I designate and authorize the above-listed agent to bind me, or my corporation, to perform any requirement which may be necessary to procure the permit or authorization indicated above. I understand that knowingly making any false statement or representation in this application is a violation of Section 373.430, F.S., and 18 U.S.C. Section 1001.

Typed/Printed Name of Applicant Signature of Applicant Date

(Corporate Title if applicable)

Please note: The applicant's original signature (not a copy) is required above.

PERSON AUTHORIZING ACCESS TO THE PROPERTY MUST COMPLETE THE FOLLOWING:

I either own the property described in this application or I have legal authority to allow access to the property, and I consent, after receiving prior notification, to any site visit on the property by agents or personnel from the Department of Environmental Protection, the Water Management District and the U.S. Army Corps of Engineers necessary for the review and inspection of the proposed project specified in this application. I authorize these agents or personnel to enter the property as many times as may be necessary to make such review and inspection. Further, I agree to provide entry to the project site for such agents or personnel to monitor permitted work if a permit is granted.

John Mayo — 11-5-03
Typed/Printed Name — Signature — Date

(Corporate Title if applicable)

FOR AGENCY USE ONLY

ACOE Application # _____ SJR Application # _____

Date Application Received _____ Date Application Received _____

Proposed Project Lat. ___° ___' ___" Fee Received $ _____

Proposed Project Long. ___° ___' ___" Fee Receipt # _____

Date Received _____ Project Use Codes _____

Assigned Reviewers _____ Reviewer #'s _____

SECTION A

Are any of the activities described in this application proposed to occur in, on, or over wetlands or other surface waters? ☒ yes ☐ no

Is this application being filed by or on behalf of a government entity or drainage district? ☐ yes ☒ no

A. Type of Environmental Resource Permit Requested (check at least one)

- ☐ Noticed General - include information requested in Section B.
- ☐ Standard General (Single Family Dwelling) - include information requested in Sections C and D.
- ☐ Standard General (all other projects) - include information requested in Sections C and E.
- ☐ Individual (Single Family Dwelling) - include information requested in Sections C and D.
- ☐ Individual (all other projects) - include information requested in Sections C and E.
- ☒ Conceptual - include information requested in Sections C and E.
- ☐ Mitigation Bank Permit (construction) - include information requested in Sections C and F.

(If the proposed mitigation bank involves the construction of a surface water management system requiring another permit defined above, check the appropriate box and submit the information requested by the applicable section.)

- ☐ Mitigation Bank (conceptual) - include information requested in Sections C and F.
- ☐ Standard General Stormwater - include information requested in Sections C and H
- ☐ Individual Stormwater - include information requested in Sections C and H

B. Type of activity for which you are applying (check at least one)

- ☒ Construction and operation of a new system including dredging or filling in, on or over wetlands and other surface waters.
- ☐ Alteration and operation of an existing system which was not previously permitted by a WMD or DEP.
- ☐ Modification of a system previously permitted by a WMD or DEP. Provide previous permit numbers:

_____

- ☐ Alteration and operation of a system
- ☐ Abandonment of a system
- ☐ Removal of a system
- ☐ Extension of permit duration
- ☐ Construction and operation of additional phases of a system

C. Are you requesting authorization to use State Owned Submerged Lands? ☐ yes ☒ no
(If yes, include the information requested in Section G.)

D. For activities in, on or over wetlands or other surface waters, check type of federal dredge and fill permit requested:

- ☐ Individual
- ☒ General
- ☐ Programmatic General
- ☐ Nationwide

E. Are you claiming to qualify for an exemption? ☐ yes ☒ no

If yes provide rule number if known _____

RECEIVED

DEC 16 2003

ENV RES REGULATION

SECTION C
ENVIRONMENTAL RESOURCE PERMIT NOTICE OF RECEIPT OF APPLICATION

This information is required in addition to that required in other sections of the application. Please submit five copies of this notice of receipt of application and all attachments. Please submit all information on 8 1/2" x 11" paper.

Project Name: **MAYO WAREHOUSE** County: **ST. LUCIE COUNTY**
Owner: **JOHN MAYO**
Applicant: **MAYO CONSTRUCTION**
Applicant's Address: **1207 SW 87th TERRACE**
PLANTATION, FL 33324

1. Indicate the project boundaries on a USGS quadrangle map reduced or enlarged as necessary to legibly show the entire project. If not apparent from the quad map, attach a location map showing a north arrow and a graphic scale; Section(s), Township(s) and Range(s); and sufficient detail to allow a person unfamiliar with the site to find it.

   PLEASE FIND THE USGS QUADRANGLE MAP INCLUDED WITH THE DRAINAGE CALCULATIONS.

2. Provide the names of all wetlands, or other surface waters that would be dredged, filled, impounded, diverted, drained, or would receive discharge (either directly or indirectly), or would otherwise be impacted by the proposed activity, and specify if they are in an Outstanding Florida Water or Aquatic Preserve:

   PLEASE REFER TO THE WETLAND MITIGATION PLAN ENTITLED "MIDWAY INDUSTRIAL PARK, PHASE II, LOTS 1 & 2" BY R.L. WEIGT ENVIRONMENTAL CONSULTANTS, INC. DATED OCTOBER 2003.

3. Attach a depiction (plan and section views), which clearly shows the works or other facilities proposed to be constructed. Use a scale sufficient to show the location and type of works. Use multiple sheets, if necessary.

   REFER TO THE ATTACHED CONSTRUCTION PLANS AND STORMWATER MANAGEMENT CALCULATIONS

4. Briefly describe the proposed project (such as "construct a deck with boatshelter", "replace two existing culverts", "construct surface water management system to serve 150 acre residential development"):

   PROPOSED CONCEPTUAL STORMWATER MANAGEMENT SYSTEM FOR A WAREHOUSE COMPLEX. THE PROJECT WILL CONSIST OF SIX SMALL WAREHOUSE BUILDINGS ON TWO LOTS.

5. Specify the acreage of wetlands or other surface waters, if any, that are proposed to be disturbed, filled, excavated, or otherwise impacted by the proposed activity:

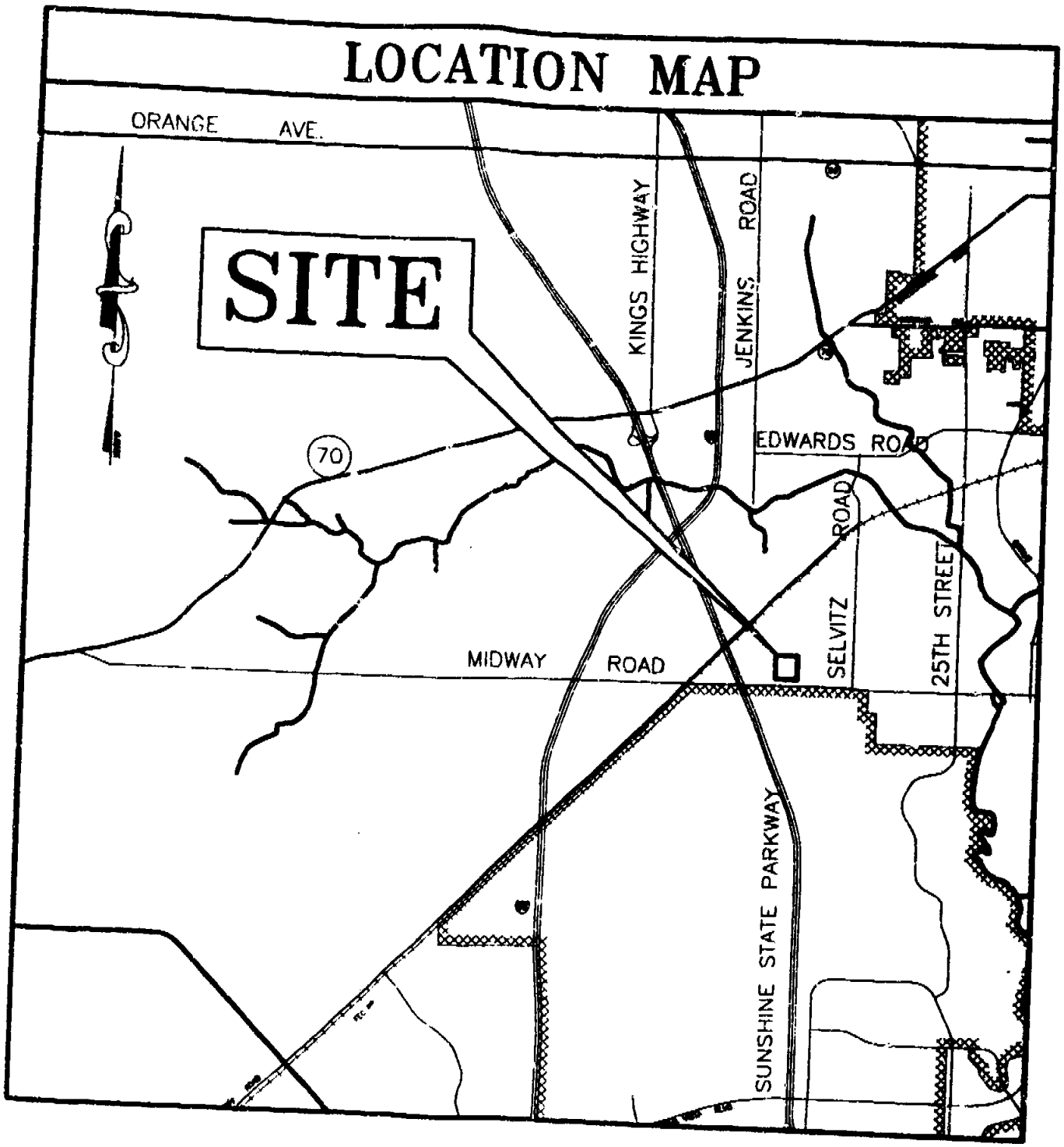
   1.87 ACRES. PLEASE REFER TO THE WETLAND MITIGATION PLAN ENTITLED "MIDWAY INDUSTRIAL PARK, PHASE II, LOTS 1 & 2" BY R.L. WEIGT ENVIRONMENTAL CONSULTANTS, INC. DATED OCTOBER 2003.

6. Provide a brief statement describing any proposed mitigation for impacts to wetlands and other surface waters (attach additional sheets if necessary):

   1.87 ACRES. PLEASE REFER TO THE WETLAND MITIGATION PLAN ENTITLED "MIDWAY INDUSTRIAL PARK, PHASE II, LOTS 1 & 2" BY R.L. WEIGT ENVIRONMENTAL CONSULTANTS, INC. DATED OCTOBER 2003.

FOR AGENCY USE ONLY

Application Name: _____
Application Number: _____
Office where the application can be inspected: _____
Date to be posted _____
Date to be removed: _____


LOCATION MAP
ORANGE AVE.
SITE
KINGS HIGHWAY
JENKINS ROAD
EDWARDS ROAD
70
SELVITZ ROAD
25TH STREET
MIDWAY ROAD
SUNSHINE STATE PARKWAY

SOUTH FLORIDA WATER MANAGEMENT DISTRICT
3301 Gun Club Road, West Palm Beach, Florida 33406 • (561) 686-8800 • FL WATS 1-800-432-2045 • TDD (561) 697-2574
Mailing Address: P.O. Box 24680, West Palm Beach, FL 33416-4680 • www.sfwmd.gov

(receipt)

Receipt No. 0000059201 - 0001

Refer to Application: 031216-16
Project Name : MAYO WAREHOUSE

JOHN A MAYO CHRISTINA MAYO
PO BOX 292255
DAVIE, FL 33329-2256

RECEIPT OF PERMIT APPLICATION

REVENUE ACCOUNT CODE	TYPE OF APPLICATION	FEE AMOUNT
4615	ERP INDIVIDUAL CONCEPTUAL APPROVAL - NEW	$5,000.00

ITEM	TRANS TYPE	DATE RECEIVED	CHECK NO	AMOUNT RECEIVED
1	PAYMENT MADE BY APPLICANT	12/16/2003	21275	$2,000.00
			BALANCE DUE	$3,000.00

PROCESSED BY : MWATERS
DATE : December 18, 2003
BRANCH OFFICE : WPB

c: Applicant
Accounting
Control
File

GOVERNING BOARD
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Pamela Brooks-Thomas, Vice Chair
Irela M. Bague
Michael Collins
Hugh M. English
Lennart E. Lindahl, P.E.
Kevin McCarty
Harkley R. Thornton
Trudi K. Williams, P.E.

EXECUTIVE OFFICE
Henry Dean, Executive Director

SOUTH FLORIDA WATER MANAGEMENT DISTRICT

3301 Gun Club Road, West Palm Beach, Florida 33406 • (561) 686-8800 • FL WATS 1-800-432-2045 • TDD (561) 697-2574
Mailing Address: P.O. Box 24680, West Palm Beach, FL 33416-4680 • www.sfwmd.gov

NOTICE

December 18, 2003

Subject: Environmental Resource Permit Application
Application No. 031216-16
Applicant Mayo Construction
St. Lucie County, S 6/T 36 S/R 40 E

The South Florida Water Management District is currently processing the attached application. If you have any comments or objections concerning this project, please submit them in writing to this office within 30 days of receipt of this notice.

This is also an opportunity for applicable State agencies to concur with or object to the proposed project under the federal consistency provision of the Coastal Zone Management Act. Review must be in accordance with the procedures adopted by the Interagency Management Committee on October 25, 1989. Findings of inconsistency must describe how the project conflicts with your agency's statutory authorities in the Florida Coastal Management Program and provide alternative measures, if any, which would make the project consistent. Commenting agencies must provide a copy of all consistency comments letters to the Florida Coastal Management Program Director, Department of Community Affairs, 2555 Shumard Oak Boulevard, Tallahassee, Florida 32399-2100.

Please refer to the applicants name and application number as referenced above in any correspondence to help facilitate processing. Questions concerning this project should be addressed to Rob Robbins at (561) 682-695[illegible] Waterhouse at (561) 682-6867.

BAC:mw

Attachments

c: US Army Corps of Engineers
Fish and Wildlife Conservation Commission, Bureau of Protected Species Management
Department of State, Division of Historical Resources
Regional Planning Council
Department of Community Affairs

GOVERNING BOARD

Nicolás J. Gutierrez, Jr., Esq., *Chair*
Pamela Brooks-Thomas, *Vice Chair*
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Kevin McCarty
Barkley R. Thornton
Trudi K. Williams, P.E.

EXECUTIVE OFFICE

Henry Dean, *Executive Director*

SOUTH FLORIDA WATER MANAGEMENT DISTRICT

BACK-UP MATERIAL

PERMIT NUMBER:

56-01995-P

APPLICATION NUMBER:

031216-16

APPLICATION SUBMITTAL

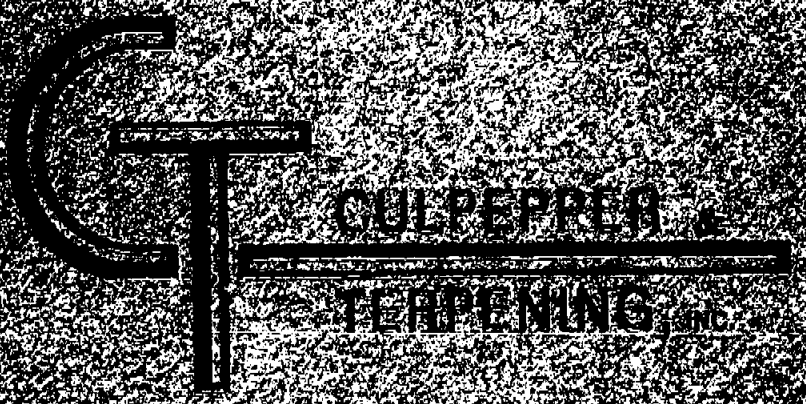
MAY 07 2004

05121610

Mayo Warehouse Facility

Section N ½ of 6
Township: 36S
Range: 40E

St. Lucie County, Florida



CONSULTING ENGINEERS • LAND SURVEYORS

Mayo Warehouse

Table of Contents

Copy of Cancelled Check	1
Conceptual Right-of- Way Approval	2
Design Calculations	3
Draft Conservation Easement	4
Correspondence Between the Owner and the Mitigation Bank	5

5-6-04

GARY L. BASHAM P.E. #44627

2131

JOHN A. MAYO
CHRISTINA MAYO
PROPERTY ACCOUNT
P.O. BOX 292256
DAVIE, FL 33329-2256

SUNTRUST
SUNTRUST BANK, MIAMI
MIAMI, FL
63-60/660

1/6/2004

PAY TO THE ORDER OF SOUTH FLORIDA WATER MGMT. DIST. $ **3,000.00

Three Thousand and 00/100********** DOLL

SOUTH FLORIDA WATER MGMT. DIST.

MEMO application 031216-16
ACCOUNT CODE 4615

Christina Mayo
AUTHORIZED SIGNATURE

⑈021311⑈ ⑆066000604⑆0729000855221⑈ ⑈0000300000

PAY TO THE ORDER OF
SOUTHTRUST BANK, NA
FOR DEPOSIT ONLY
SOUTH FLORIDA WATER
MANAGEMENT DISTRICT
62824678

DO NOT SCALE WITHIN THIS LINE
FOR MAINTENANCE USAGE ONLY

ALA SOUTHTRUST
>062000080<
40021730 012304 5040 06 95203

FEDERAL RESERVE BANK REGULATION CC

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BOARD OF COUNTY COMMISSIONERS

ST. LUCIE COUNTY FLORIDA

PUBLIC WORKS DEPARTMENT

April 28, 2004

Culpepper & Terpening
2980 South 25th Street
Fort Pierce, FL 34981

Attention: Gary Bashem, P.E., P.L.S.

Reference: Mayo Warehouse
Midway Road

Dear Gary,

I am in receipt of your submittal of April 9th for the referenced project. As you indicated, once you have received your Environmental Resource Permit from the South Florida Water Management District, you will formally submit your site plan for approval by St. Lucie County.

Please accept this letter as conceptual approval that once a site plan has been approved and construction begins, you can be approved to construct your outfall pipe across Midway Road. While it is clearly premature to discuss specific details of your proposed plans, please be advised that it will also be necessary to demonstrate that the North St. Lucie River Water Control District has approved your connection into their Canal 103 at that time.

I hope that you will find this information satisfactory. If you should have any questions, or if I can assist you further, please do not hesitate to contact me.

Sincerely,
Michael Powley
Michael Powley, P.E.
County Engineer

Copy: Don West, Public Works Director
Craig Hauschild, Capital Project Engineer
Patrick Pecunia, C&T Project Engineer

JOHN D. BRUHN, District No. 1 • DOUG COWARD, District No. 2 • PAULA A. LEWIS, District No. 3 • FRANNIE HUTCHINSON, District No. 4 • CLIFF BARNES, District No. 5
County Administrator - Douglas M. Anderson

2300 Virginia Avenue • Ft. Pierce, FL 34982
Public Works: (772) 462-1485 • FAX (772) 462-2362
Division of Engineering: (772) 462-1707 Fax 462-2362 • Division of Road & Bridge: (772) 462-2511 FAX 462-2363
Division of Solid Waste: (772) 462-1768 FAX 462-6987
Division of Building & Inspections: (772) 462-1553 Fax 462-1735 • TDD (772) 462-1428
www.co.st-lucie.fl.us

CULPEPPER-TERPENING
2980 South 25th Street
Ft. Pierce, FL 34981
Project #: 03-139

I) **Design Criteria:**

A) Post Development Land Use Designation:

Description	Total Project	Lot 1	Lot 2
Bldg. Coverage	2.20 ac.	1.21 ac.	0.99 ac.
Parking	2.96 ac.	1.53 ac.	1.43 ac.
Sidewalks	0.14 ac.	0.07 ac.	0.07 ac.
Open Space / Dry Detention	3.54 ac.	1.54 ac.	2.00 ac.
Total	8.84 ac.	4.35 ac.	4.49 ac.

B) Pervious/Impervious Calcs:

Impervious Area *(Impervious area includes: Bldg. Coverage, & Pavement)*
5.30 ac

Pervious Area *(Impervious area includes: Open Space / Dry Detention)*
3.54 ac

Percent Impervious
59.95%

Percent Pervious
40.05%

C) Minimum elevations:

1) Roads and Parking:
   a) 10-year, 1-day Peak Stage = 21.35 ft NGVD *(Refer to Routed Hydrograph)*
   Set minimum parking elevation at 22.0' NGVD

2) Finish Floor Elevation (F.F.E.):
   a) The project is located in Flood Zone "X" with a base flood elevation outside of the 500 year storm event per FEMA flood maps 12111C0170F and 12111C0275F, dated 8-19-1991

      A) 100-year, 3-day (Zero Discharge Stage Calculation)
         a) $V_{100y\text{-}72hr}$= 6.61 ac-ft
         b) Interpolate from the site's Stage vs. Storage computations between El.=23.10' & 23.25' NGVD *"Refer to attached"*
         c) $Flood_{elev}$= 23.24 ft NGVD

   b) **Set minimum Finish Floor Elevation at 23.3' NGVD**

3) Perimeter Grade:
   a) 25-year, 3-day Peak Stage = 21.93 NGVD (Refer to Routed Hydrograph)
   Set minimum perimeter grade elevation at 22.5' NGVD

D) Design Storm Allowable Discharge: (Per S.F.W.M.D. Requirements)

1) Because the site lies within the jurisdiction of the North St. Lucie River Water Control District (NSLRWCD), the proposed SWMS is designed in accordance with the criteria established by the NSLRWCD and St. Lucie County.

CULPEPPER-TERPENING
2980 South 25th Street
Ft. Pierce, FL 34981
Project #: 03-139

2) The allowable discharge is per the requirements set forth by the NSLRWCD

c) Allowable discharge =
"The proposed installation will limit stormwater runoff to the volumetric equivalent of not more than 2.0 inches of depth over the area served for any 24-hour period from the 10-year, 72-hour duration rainfall."

(2/12 feet) * 8.84 = 1.47 ac-ft

The NSLRWCD Permit has been obtained.

E) Control Elevation:

1) Control Elevation = **18.65 ft. NGVD**

a) The control elevation for the project is based upon the high water mark of the wetland directly north of the site.

F) SCS Curve Number, Soil Storage, & Tc Derivation:

1) ***Pre-Development Condition:***

a) Drainage Area = 8.84 ac.
b) Impervious Area = 0.00 ac. 98 CN
c) % Impervious = 0.00 %
d) Soil Types:
1) 100 % *Wabasso (D)* 80 CN
e) Weighted Calculation:
CN = 80
f) Soil Storage: (S)
i) (1000/(CN)) - 10 => 2.50 in

g) Time of Concentration (Tc):
Tc = 20 min

2) ***Post-Development Condition:***

a) Drainage Area = 8.84 ac.
b) Impervious Area = 5.30 ac. 98 CN
c) % Impervious = 59.95%
d) Open Space Area = 3.54 ac. 80 CN
e) Weighted Calculation:
CN = 91
f) Soil Storage: (S)
1) (1000/(CN)) - 10 => 1.01 in

g) Time of Concentration (Tc):
Tc = 10 min

h) Engineer's Soil Suitability Certificate:
To the best of my knowledge, the site's soils indicated above will drain/percolate pursuant to the assumptions made in the following drainage calculations. All assumptions are based on the wet season water table conditions for this site.

CULPEPPER-TERPENING
2980 South 25th Street
Ft. Pierce, FL 34981
Project #: 03-139

G) Design Storms: (Per. S.F.W.M.D. Rainfall Depths)

Total Site Area = 8.84 Ac.

1) 10 Yr. - 1 Day P = 5.60 in *(Roads / Parking)*

V = ((5.60 - .2 * 1.014)^2/(5.60 + .8 * 1.014)) * 1"/12" * 8.840 = 3.35 ac.ft.

2) 10 Yr. - 3 Day P = 8.30 in *(Discharge)*

V = ((8.30 - .2 * 1.014)^2/(8.30 + .8 * 1.014)) * 1"/12" * 8.840 = 5.30 ac.ft.

3) 25 Yr. - 3 Day P = 9.10 in *(Perimeter Berm)*

V = ((9.10 - .2 * 1.014)^2/(9.10 + .8 * 1.014)) * 1"/12" * 8.840 = 5.88 ac.ft.

4) 100 Yr. - 3 Day P = 10.10 in *(Finish Floor Elevation)*

V = ((10.10 - .2 * 1.014)^2/(10.10 + .8 * 1.014)) * 1"/12" * 8.840 = 6.61 ac.ft

H) Project surface storage: (Refer to the attached calculations)

II) **Design Criteria: (Post-Development Conditions)**

A) Quality:

1) The project's stormwater management system will consist of an onsite dry detention area to manage the required water quality and storm attenuation as determined below.

a) Per S.F.W.M.D., dry detention volume shall provide for the following, whichever is greater:

1) 1 inch of runoff x total drainage area x 75% reduction for dry detention

i) Calculated Runoff Volume => (1/12 * 8.84 * 0.75 = 0.55 ac-ft

2) 2.5 inches times the impervious area x 75% reduction for dry detention

Site area, for water quality pervious/impervious calculation only

Total Project - (Roof) = site area for water quality pervious/impervious

= 8.84 - (2.20) = 6.64 ac

Impervious area for water quality pervious/impervious calculations only

(Site area for water quality pervious/impervious) - pervious = impervious area, for water quality pervious/impervious

= 6.64 - (3.54) = 3.10 ac

Percentage of impervious for water quality

[Impervious area for water quality *100] / Site area for water quality

= 3.10 / 6.64 46.69%

For 2.5 in times the percentage impervious

= 2.5 * 0.47 1.17 in

Compute volume required for quality detention

[inches to be treated x (total site) = 1.17 * (8.84) * (1/12)] * 0.75 (dry detention reduction)

0.64 ac-ft

Half inch of dry pre-treatment before discharge into the adjacent wetland

= 8.84 * (0.5/12) = 0.37 ac-ft

b) The site's water quality volume = **0.64 ac-ft**

c) Dry detention satisfies the pre-treatment requirement

CULPEPPER-TERPENING
2980 South 25th Street
Ft. Pierce, FL 34981
Project #: 03-139

B) Overflow Elevation:

1) Dry Pre-Treatment Elevation (T_{elev}):

a) Vt = 0.37 ac-ft

b) T_{elev} = 20.04 ft NGVD *"Set Weir Crest EL @ 20.05' NGVD"*

C) Check Bleeder Volume:

1) The project's discharge is controlled by the minimum 3" orifice. The prevailing variable for design was to minimize off-site peak discharge per pre-development allowable discharge.

D) On-site & Off-site Erosion and Sediment Control Methodology:

1) The contractor shall implement best management practices to include the following:
   a) Install silt fence adjacent to perimeter properties.
   b) Install turbidity barriers adjacent to all wetted areas to minimized turbidity blums.
   c) All dry detention slopes, swales, and project perimeter berms shall be sodded to minimize erosion

E) Master Stormwater Management System Maintenance Entity:

1) The SWMS will be management by the property owner:

John A. Mayo
1207 S.W. 87th Terrace
Plantation, FL 33324

Name	Group	Simulation	Max Time Stage hrs	Max Stage ft	Warning Stage ft	Max Delta Stage ft	Max Surf Area ft2	Max Time Inflow hrs	Max Inflow cfs	Max Time Outflow hrs	Max Outflow cfs
BNDY CANAL	BASE	10 yr 24 hr	0.00	16.000	17.000	0.0000	0	21.13	1.235	0.00	0.000
BNDY WETLAND	BASE	10 yr 24 hr	0.00	18.650	20.000	0.1500	0	21.13	2.361	0.00	0.000
Site	BASE	10 yr 24 hr	21.13	21.346	24.000	0.0050	57164	20.00	28.094	21.13	3.596
BNDY CANAL	BASE	25 yr 72 hr	0.00	16.000	17.000	0.0000	0	60.74	2.091	0.00	0.000
BNDY WETLAND	BASE	25 yr 72 hr	0.00	18.650	20.000	0.1500	0	60.74	4.139	0.00	0.000
Site	BASE	25 yr 72 hr	60.74	21.934	24.000	0.0050	64226	59.75	31.756	60.74	6.230

pre-development discharge to wetland ≃ 4.26 per previous submittal

Mayo Warehouse

DRAINAGE AREA (Post-Development)

Stage / Storage Computations

Begin Stage Calculations = 19.65 NGVD
End Stage Calculations = 24.00 NGVD
Calculation Increment = 0.15 ft

	Dry Detention	Dry Detention Slopes	Parking	Misc. Pvmt	Open Space		Acres [1]
Acres =	0.913	0.551	2.960	0.140	2.076	**Total Area =**	**6.640**
Low Rng =	19.65	19.65	22.00	22.00	22.00		
High Rng =	24.00	22.00	24.00	24.00	24.00		

Stage (NGVD)	Vertical Storage (ac.ft.)	Vertical Area (ac.)	Linear Storage (ac.ft.)	Linear Area (ac.)	Linear Storage (ac.ft.)	Linear Area (ac.)	Linear Storage (ac.ft.)	Linear Area (ac.)	Linear Storage (ac.ft.)	Linear Area (ac.)	Total Cumulative Storage (ac.ft.)	Total Area (ac.)	
19.65	0.00	0.91	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	**0.00**	**0.92**	
19.80	0.14	0.91	0.00	0.04	0.00	0.00	0.00	0.00	0.00	0.00	**0.14**	**0.95**	
19.95	0.27	0.91	0.01	0.07	0.00	0.00	0.00	0.00	0.00	0.00	**0.28**	**0.98**	Pre
20.10	0.41	0.91	0.02	0.11	0.00	0.00	0.00	0.00	0.00	0.00	**0.43**	**1.02**	
20.25	0.55	0.91	0.04	0.14	0.00	0.00	0.00	0.00	0.00	0.00	**0.59**	**1.05**	WQ
20.40	0.68	0.91	0.07	0.18	0.00	0.00	0.00	0.00	0.00	0.00	**0.75**	**1.09**	
20.55	0.82	0.91	0.09	0.21	0.00	0.00	0.00	0.00	0.00	0.00	**0.92**	**1.12**	
20.70	0.96	0.91	0.13	0.25	0.00	0.00	0.00	0.00	0.00	0.00	**1.09**	**1.16**	
20.85	1.10	0.91	0.17	0.28	0.00	0.00	0.00	0.00	0.00	0.00	**1.26**	**1.19**	
21.00	1.23	0.91	0.21	0.32	0.00	0.00	0.00	0.00	0.00	0.00	**1.45**	**1.23**	
21.15	1.37	0.91	0.26	0.35	0.00	0.00	0.00	0.00	0.00	0.00	**1.63**	**1.26**	
21.30	1.51	0.91	0.32	0.39	0.00	0.00	0.00	0.00	0.00	0.00	**1.83**	**1.30**	
21.45	1.64	0.91	0.38	0.42	0.00	0.00	0.00	0.00	0.00	0.00	**2.02**	**1.34**	
21.60	1.78	0.91	0.45	0.46	0.00	0.00	0.00	0.00	0.00	0.00	**2.23**	**1.37**	
21.75	1.92	0.91	0.52	0.49	0.00	0.00	0.00	0.00	0.00	0.00	**2.43**	**1.41**	
21.90	2.05	0.91	0.59	0.53	0.00	0.0(	0.00	0.00	0.00	0.00	**2.65**	**1.44**	
22.05	2.19	0.91	0.68	0.55	0.00	0.07	0.00	0.00	0.00	0.05	**2.87**	**1.59**	
22.20	2.33	0.91	0.76	0.55	0.03	0.30	0.00	0.01	0.02	0.21	**3.14**	**1.98**	
22.35	2.47	0.91	0.84	0.55	0.09	0.52	0.00	0.02	0.06	0.36	**3.47**	**2.37**	
22.50	2.60	0.91	0.92	0.55	0.18	0.74	0.01	0.03	0.13	0.52	**3.85**	**2.76**	
22.65	2.74	0.91	1.01	0.55	0.31	0.96	0.01	0.05	0.22	0.67	**4.29**	**3.15**	
22.80	2.88	0.91	1.09	0.55	0.47	1.18	0.02	0.06	0.33	0.83	**4.79**	**3.53**	
22.95	3.01	0.91	1.17	0.55	0.67	1.41	0.03	0.07	0.47	0.99	**5.35**	**3.92**	
23.10	3.15	0.91	1.25	0.55	0.90	1.63	0.04	0.08	0.63	1.14	**5.97**	**4.31**	FFE
23.25	3.29	0.91	1.34	0.55	1.16	1.85	0.05	0.09	0.81	1.30	**6.65**	**4.70**	
23.40	3.42	0.91	1.42	0.55	1.45	2.07	0.07	0.10	1.02	1.45	**7.38**	**5.09**	
23.55	3.56	0.91	1.50	0.55	1.78	2.29	0.08	0.11	1.25	1.61	**8.17**	**5.48**	
23.70	3.70	0.91	1.59	0.55	2.14	2.52	0.10	0.12	1.50	1.76	**9.02**	**5.86**	
23.85	3.83	0.91	1.67	0.55	2.53	2.74	0.12	0.13	1.78	1.92	**9.93**	**6.25**	
24.00	3.97	0.91	1.75	0.55	2.96	2.96	0.14	0.14	2.08	2.08	**10.90**	**6.64**	

Base Floodplain Calcs:

1. Equals total site area minus building coverage
= 8.84 - 2.20 = 6.64 ac

WQ

$\frac{x-20.25}{20.40-20.25} \quad \frac{0.64-0.59}{0.75-0.59} \quad x = 20.30$

Pre

$\frac{x-19.95}{20.10-19.95} \quad \frac{0.34-0.28}{0.43-0.28} \quad x = 20.04$

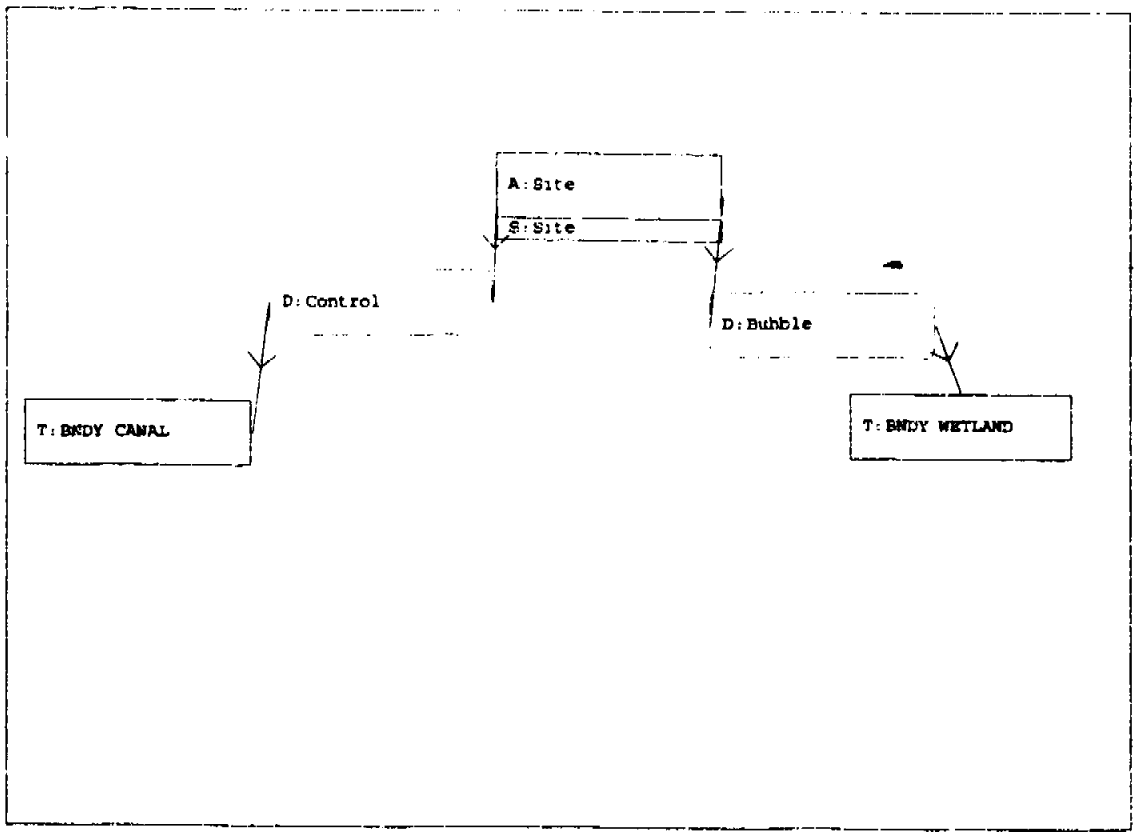
FFE

$\frac{x-23.10}{23.25-23.10} \quad \frac{6.61-5.97}{6.65-5.97} \quad x = 23.24$

Nodes
A Stage/Area
V Stage/Volume
T Time/Stage
N Manhole

Basins
O Overland Flow
U SCS Unit Hydro
S Santa Barbara

Links
P Pipe
W Weir
C Channel
D Drop Structure
B Bridge
R Rating Curve
H Breach



==== Basins ====

Name: Site
Group: BASE
Node: Site
Type: Santa Barbara
Status: Onsite

Rainfall File:
Rainfall Amount(in): 6.000
Area(ac): 8.840
Curve Number: 91.00
DCIA(%): 0.00
Storm Duration(hrs): 0.00
Time of Conc(min): 15.00
Time Shift(hrs): 0.00
Time Increment(min): 15.00
Max Allowable Q(cfs): 999999.000

==== Nodes ====

Name: BNDY CANAL
Group: BASE
Type: Time/Stage
Base Flow(cfs): 0.000
Init Stage(ft): 16.000
Warn Stage(ft): 17.000

Time(hrs)	Stage(ft)
0.00	16.000
999.00	16.000

Name: BNDY WETLAND
Group: BASE
Type: Time/Stage
Base Flow(cfs): 0.000
Init Stage(ft): 18.500
Warn Stage(ft): 20.000

Time(hrs)	Stage(ft)
0.00	18.650
999.00	18.650

Name: Site
Group: BASE
Type: Stage/Area
Base Flow(cfs): 0.000
Init Stage(ft): 18.500
Warn Stage(ft): 24.000

Stage(ft)	Area(ac)
18.500	0.0000
19.650	0.9200
19.800	0.9500
19.950	0.9800
20.100	1.0200
20.250	1.0500
20.400	1.0900
20.550	1.1200
20.700	1.1600
20.850	1.1900
21.000	1.2300
21.150	1.2600
21.300	1.3000
21.450	1.3400
21.600	1.3700
21.750	1.4100
21.900	1.4400
22.050	1.5900
22.200	1.9800
22.350	2.3700
22.500	2.7600
22.650	3.1500
22.800	3.5300
22.950	3.9200
23.100	4.3100
23.250	4.7000
23.400	5.0900
23.550	5.4800
23.700	5.8600
23.850	6.2500
24.000	6.6400

**** Drop Structures ****

Name: Bubble
Group: BASE
From Node: Site
To Node: BNDY WETLAND
Length(ft): 30.00
Count: 1

	UPSTREAM	DOWNSTREAM
Geometry:	Circular	Circular
Span(in):	15.00	15.00
Rise(in):	15.00	15.00
Invert(ft):	10.000	10.000
Manning's N:	0.012000	0.012000
Top Clip(in):	0.000	0.000
Bot Clip(in):	0.000	0.000

Friction Equation: Average Conveyance
Solution Algorithm: Automatic
Flow: Both
Entrance Loss Coef: 3.200
Exit Loss Coef: 0.600
Outlet Ctrl Spec: Use dc or tw
Inlet Ctrl Spec: Use dn
Solution Incs: 10

Upstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

Downstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

*** Weir 1 of 2 for Drop Structure Bubble ***

TABLE

Count: 1
Type: Vertical: Mavis
Flow: Both
Geometry: Rectangular

Span(in): 6.00
Rise(in): 99.00

Bottom Clip(in): 0.000
Top Clip(in): 0.000
Weir Disc Coef: 3.200
Orifice Disc Coef: 0.600

Invert(ft): 20.050
Control Elev(ft): 20.050

*** Weir 2 of 2 for Drop Structure Bubble ***

TABLE

Count: 1
Type: Horizontal
Flow: Both
Geometry: Rectangular

Span(in): 54.00
Rise(in): 36.00

Bottom Clip(in): 0.000
Top Clip(in): 0.000
Weir Disc Coef: 3.200
Orifice Disc Coef: 0.600

Invert(ft): 22.000
Control Elev(ft): 22.000

Name: Control
Group: BASE
From Node: Site
To Node: BNDY CANAL
Length(ft): 200.00
Count: 1

	UPSTREAM	DOWNSTREAM
Geometry:	Circular	Circular
Span(in):	18.00	18.00
Rise(in):	18.00	18.00
Invert(ft):	15.000	15.000
Manning's N:	0.012000	0.012000
Top Clip(in):	0.000	0.000
Bot Clip(in):	0.000	0.000

Friction Equation: Average Conveyance
Solution Algorithm: Automatic
Flow: Both
Entrance Loss Coef: 3.200
Exit Loss Coef: 0.600
Outlet Ctrl Spec: Use dc or tw
Inlet Ctrl Spec: Use dn
Solution Incs: 10

Upstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

Downstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

*** Weir 1 of 2 for Drop Structure Control ***

TABLE

Count: 1
Type: Vertical: Mavis
Flow: Both
Geometry: Circular

Span(in): 3.00
Rise(in): 3.00

Bottom Clip(in): 0.000
Top Clip(in): 0.000
Weir Disc Coef: 3.200
Orifice Disc Coef: 0.600

Invert(ft): 18.650
Control Elev(ft): 18.650

*** Weir 2 of 2 for Drop Structure Control ***

TABLE

Count: 1
Type: Vertical: Mavis
Flow: Both
Geometry: Rectangular

Span(in): 3.00

Bottom Clip(in): 0.000
Top Clip(in): 0.000
Weir Disc Coef: 3.200
Orifice Disc Coef: 0.600

Invert(ft): 20.300

Rise(in): 999.00 Control Elev(ft): 20.300

**** Hydrology Simulations ****

Name: 10 yr 24 hr
Filename: P:\Proj-2003\03-139 John Mayo\Drainage\Scenario 1\10 yr 24 hr.R32

Override Defaults: Yes
Storm Duration(hrs): 24.00
Rainfall File: Sfwmd72
Rainfall Amount(in): 5.60

Time(hrs)	Print Inc(min)
30.000	15.00

Name: 10 yr 72 hr
Filename: P:\Proj-2003\03-139 John Mayo\Drainage\Scenario 1\10 yr 72 hr.R32

Override Defaults: Yes
Storm Duration(hrs): 72.00
Rainfall File: Sfwmd72
Rainfall Amount(in): 8.30

Time(hrs)	Print Inc(min)
200.000	15.00

Name: 25 yr 72 hr
Filename: P:\Proj-2003\03-139 John Mayo\Drainage\Scenario 1\25 yr 72 hr.R32

Override Defaults: Yes
Storm Duration(hrs): 72.00
Rainfall File: Sfwmd72
Rainfall Amount(in): 9.10

Time(hrs)	Print Inc(min)
72.000	15.00

**** Routing Simulations ****

Name: 10 yr 24 hr Hydrology Sim: 10 yr 24 hr
Filename: P:\Proj-2003\03-139 John Mayo\Drainage\Scenario 1\10 yr 24 hr.I32

Execute: Yes Restart: No Patch: No
Alternative: No

Max Delta Z(ft): 1.00 Delta Z Factor: 0.00500
Time Step Optimizer: 10.000
Start Time(hrs): 0.000 End Time(hrs): 30.00
Min Calc Time(sec): 0.5000 Max Calc Time(sec): 60.0000
Boundary Stages: Boundary Flows:

Time(hrs)	Print Inc(min)
30.000	15.000

Group	Run
BASE	Yes

Name: 10 yr 72 hr Hydrology Sim: 10 yr 72 hr
Filename: P:\Proj-2003\03-139 John Mayo\Drainage\Scenario 1\10 yr 72 hr.I32

Execute: No Restart: No Patch: No
Alternative: No

Max Delta Z(ft): 1.00 Delta Z Factor: 0.00500
Time Step Optimizer: 10.000
Start Time(hrs): 0.000 End Time(hrs): 200.00
Min Calc Time(sec): 0.5000 Max Calc Time(sec): 60.0000
Boundary Stages: Boundary Flows:

Time(hrs)	Print Inc(min)
200.000	15.000

Group	Run
BASE	Yes

Name: 25 yr 72 hr Hydrology Sim: 25 yr 72 hr
Filename: P:\Proj-2003\03-139 John Mayo\Drainage\Scenario 1\25 yr 72 hr.I32

Execute: Yes Restart: No Patch: No
Alternative: No

Max Delta Z(ft): 1.00 Delta Z Factor: 0.00500
Time Step Optimizer: 10.000
Start Time(hrs): 0.000 End Time(hrs): 72.00
Min Calc Time(sec): 0.5000 Max Calc Time(sec): 60.0000
Boundary Stages: Boundary Flows:

Time(hrs)	Print Inc(min)
72.000	15.000

Group	Run
BASE	Yes

==== Boundary Conditions ====

DESCRIPTION

A PARCEL OF LAND LYING IN THE NORTHWEST 1/4, OF SECTION 6, TOWNSHIP 36 SOUTH, RANGE 40 EAST AND LOTS 1 AND 2 OF THE PLAT ENTITLED MIDWAY INDUSTRIAL PARK -- PHASE II, AS RECORDED IN PLAT BOOK 39, AT PAGES 8 AND 8A, OF THE PUBLIC RECORDS, OF ST. LUCIE COUNTY, FLORIDA AND BEING MORE PARTICULARLY DESCRIBED AS FOLLOWS:

COMMENCE AT THE INTERSECTION OF THE WEST LINE OF LOT 2, OF SAID PLAT OF MIDWAY INDUSTRIAL PARK – PHASE II AND THE NORTH RIGHT-OF-WAY LINE OF WEST MIDWAY ROAD (A 120 FOOT WIDE RIGHT-OF-WAY); THENCE NORTH 00°08'53" EAST, ALONG SAID WEST LINE OF LOT 2, A DISTANCE OF 604.81 FEET TO THE POINT OF BEGINNING OF THE CENTER LINE OF A 25 FOOT WIDE CONSERVATION EASEMENT, SAID EASEMENT LINES LYING 12.50 FEET EACH SIDE OF THE FOLLOWING DESCRIBED CENTER LINE; THENCE SOUTH 55°15'31" EAST, A DISTANCE OF 16.25 FEET; THENCE SOUTH 44°13'30" EAST, A DISTANCE OF 39.81 FEET; THENCE SOUTH 28°30'13" EAST, A DISTANCE OF 38.13 FEET; THENCE SOUTH 57°02'46" EAST, A DISTANCE OF 50.23 FEET; THENCE NORTH 79°49'21" EAST, A DISTANCE OF 68.76 FEET; THENCE NORTH 69°34'48" EAST, A DISTANCE OF 65.97 FEET; THENCE NORTH 70°00'26" EAST, A DISTANCE OF 73.27 FEET; THENCE NORTH 66°46'23" EAST, A DISTANCE OF 64.30 FEET; THENCE NORTH 22°25'41" EAST, A DISTANCE OF 44.32 FEET; THENCE NORTH 52°14'20" EAST, A DISTANCE OF 29.74 FEET; THENCE NORTH 58°39'58" EAST, A DISTANCE OF 24.97 FEET; THENCE SOUTH 49°14'41" EAST, A DISTANCE OF 43.77 FEET; THENCE NORTH 65°48'39" EAST, A DISTANCE OF 63.58 FEET; THENCE NORTH 12°02'00" EAST, A DISTANCE OF 44.94 FEET; THENCE NORTH 78°34'42" EAST, A DISTANCE OF 56.75 FEET TO THE EAST LINE OF LOT 1 OF SAID PLAT OF MIDWAY INDUSTRIAL PARK – PHASE II AND THE WESTERLY RIGHT-OF-WAY LINE OF JENKINS ROAD (A 120 FOOT WIDE RIGHT-OF-WAY) AND THE POINT OF TERMINUS OF SAID CENTER LINE.

SAID SIDE EASEMENT LINES TRIMMED OR EXTENDED TO SAID LOT LINES.

SAID PARCEL CONTAINS 0.416 ACRES, MORE OR LESS.

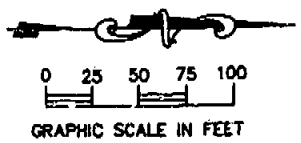
SKETCH & DESCRIPTION
OF
CONSERVATION EASEMENT
Prepared For
S.F.W.M.D.

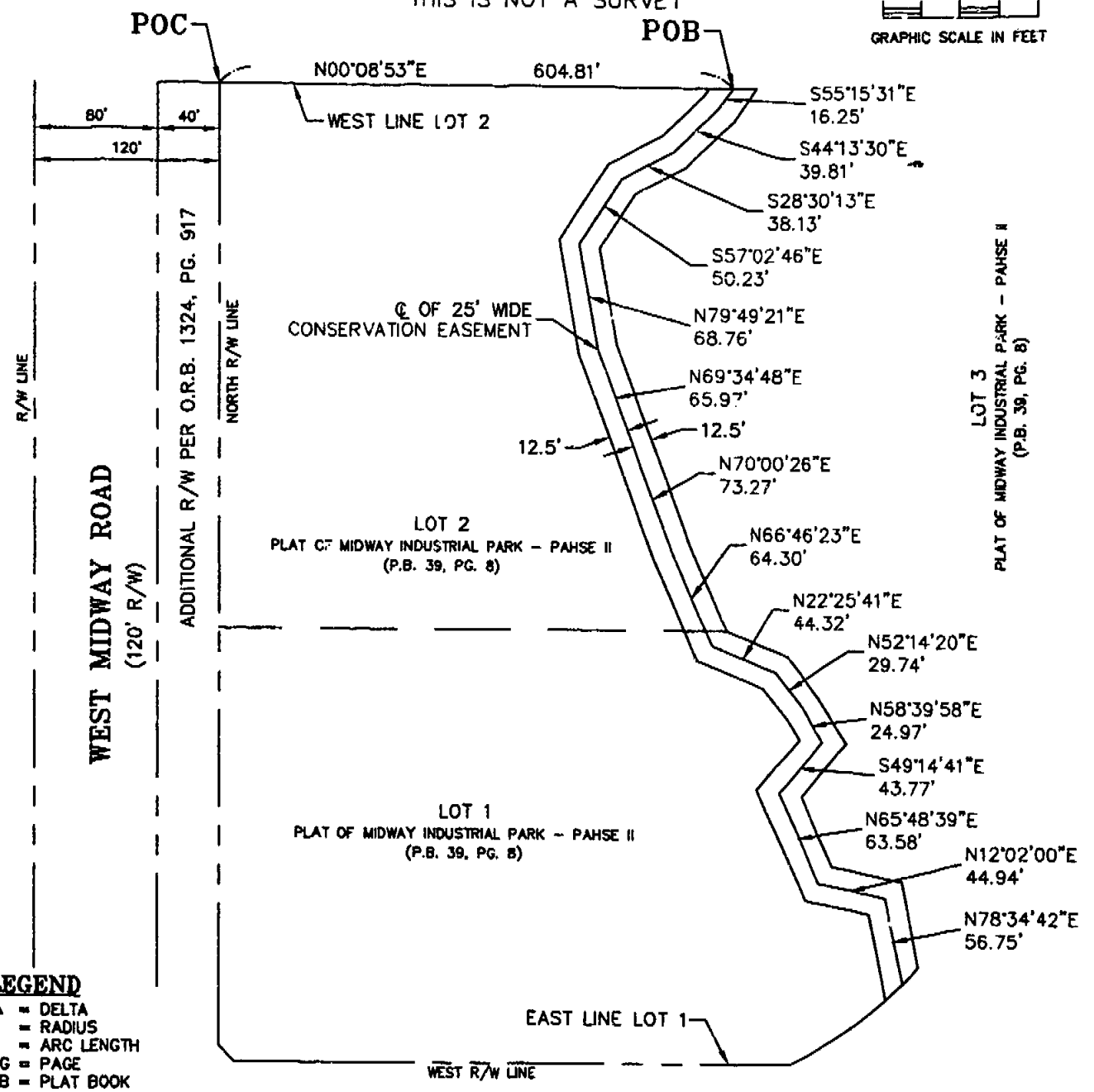
File: 03-139ConEsmt.dwg
Date: 8-21-00
Tech: BCS

CULPEPPER & TERPENING, INC.
CERTIFICATION No. LB 4286
CONSULTING ENGINEERS
&
LAND SURVEYORS
2980 SOUTH 25th STREET
FORT PIERCE, FLORIDA 34981
(772) 464-3537

SKETCH TO ACCOMPANY DESCRIPTION

THIS IS NOT A SURVEY





LEGEND

Δ = DELTA
R = RADIUS
L = ARC LENGTH
PG = PAGE
PB = PLAT BOOK
POB = POINT OF BEGINNING
POC = POINT OF COMMENCEMENT
PLS = PROFESSIONAL LAND SURVEYOR
R\W = RIGHT-OF-WAY
℄ = CENTERLINE
± = PLUS OR MINUS
sq.ft. = SQUARE FEET

THE WEST LINE OF LOT 2 IS ASSUMED TO BEAR N00°08'53"E AND ALL OTHER BEARINGS SHOWN HEREON ARE RELATIVE THERETO.

SKETCH OF DESCRIPTION
OF
CONSERVATION EASEMENT
Prepared For
S.F.W.M.D.

File: 03-139ConEsmt.dwg
Date: 8-21-00
Tech: BCS

CULPEPPER & TERPENING, INC.
CERTIFICATION No. LB 4286
CONSULTING ENGINEERS
&
LAND SURVEYORS
2980 SOUTH 25th STREET
FORT PIERCE, FLORIDA 34981
(772) 464-3537

John A. Mayo
1207 S.W. 87th Terrace
Plantation, FL 33324
(954) 236-6551
(954) 236-8832 Fax

CULPEPPER & TERPENING	
03-139 Copy	
—	JPT
—	RML
	SKM
	GLB
—	EWZ
	DRH
	DLP
	PPP
	MTO
	RWB
	MEB
	CAK
	STT

February 24, 2004

Fax Transmittal

Mr. David McIntosh
Bluefield Ranch Mitigation Bank

Re: Midway Road Industrial Site
Midway Road & Jenkins Road
Wetland Mitigation Credits, Lots 1 & 2

Dear David,

I would like to have your January 27, 2004 letter rewritten with a current date. Our holdup at this moment is a **conservation easement** that is currently around our small wetland. We are going to the county to remove the easement. Once the easement is removed we want to enter into an agreement with Bluefield Ranch Mitigation Bank. We will need your letter prior to our meeting with the County.

Also on your letterhead mention that the 2.10 credits required are available from your organization. Send me a draft of your letter first in the event we need to make some last minute changes. Please call me on cell# 305-965-5573 if you have any questions. Thanks for your time.

Sincerely,

John A Mayo

CC Gary Basham, Culpepper & Terpenning, Inc.

FAXED
FEB 24 2004
BY:

MAYO WAREHOUSE FACILITY

Responses to South Florida Water Management District Comments

Dated

January 15, 2004

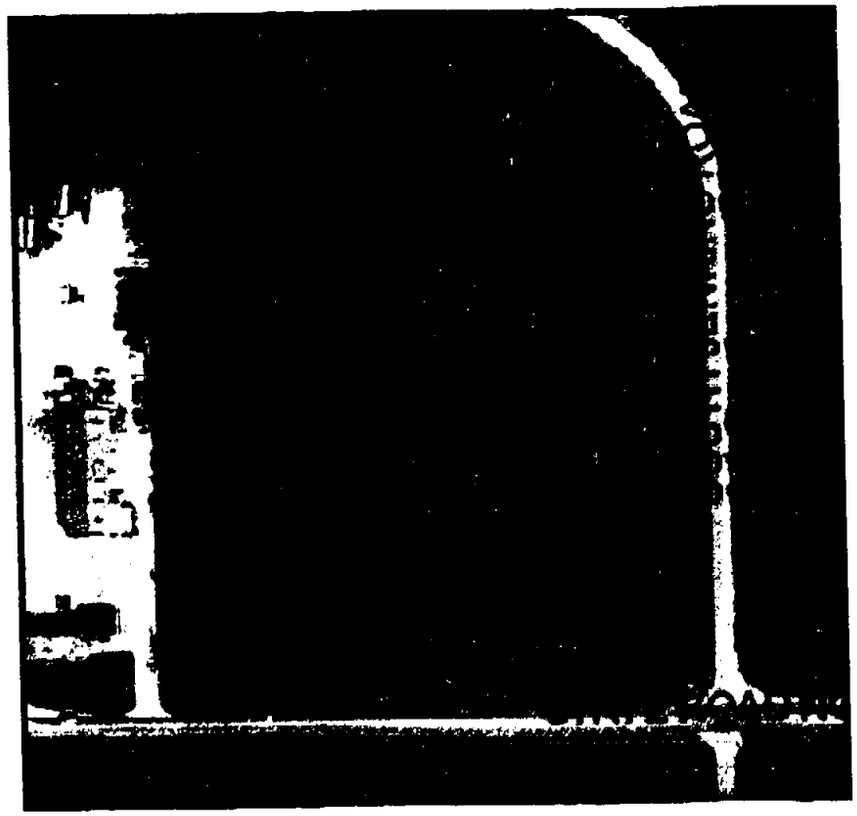
CULPEPPER & TERPENING, INC.

CONSULTING ENGINEERS • LAND SURVEYORS

Mayo Warehouse Facility

Section: N ½ of 6
Township: 36S
Range: 40E

St. Lucie County, Florida



Prepared by:

Culpepper & Terpening
2980 South 25th Street
Fort Pierce, FL 34981

031216-16

2.3.04
GARY L. BASHAM P.E. #44627

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Mayo Warehouse

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ADDL/REVISED SUBMITTAL

FEB 0 6 2004

Mayo Warehouse Revised 1-6-04
SCENARIO 1

Nodes
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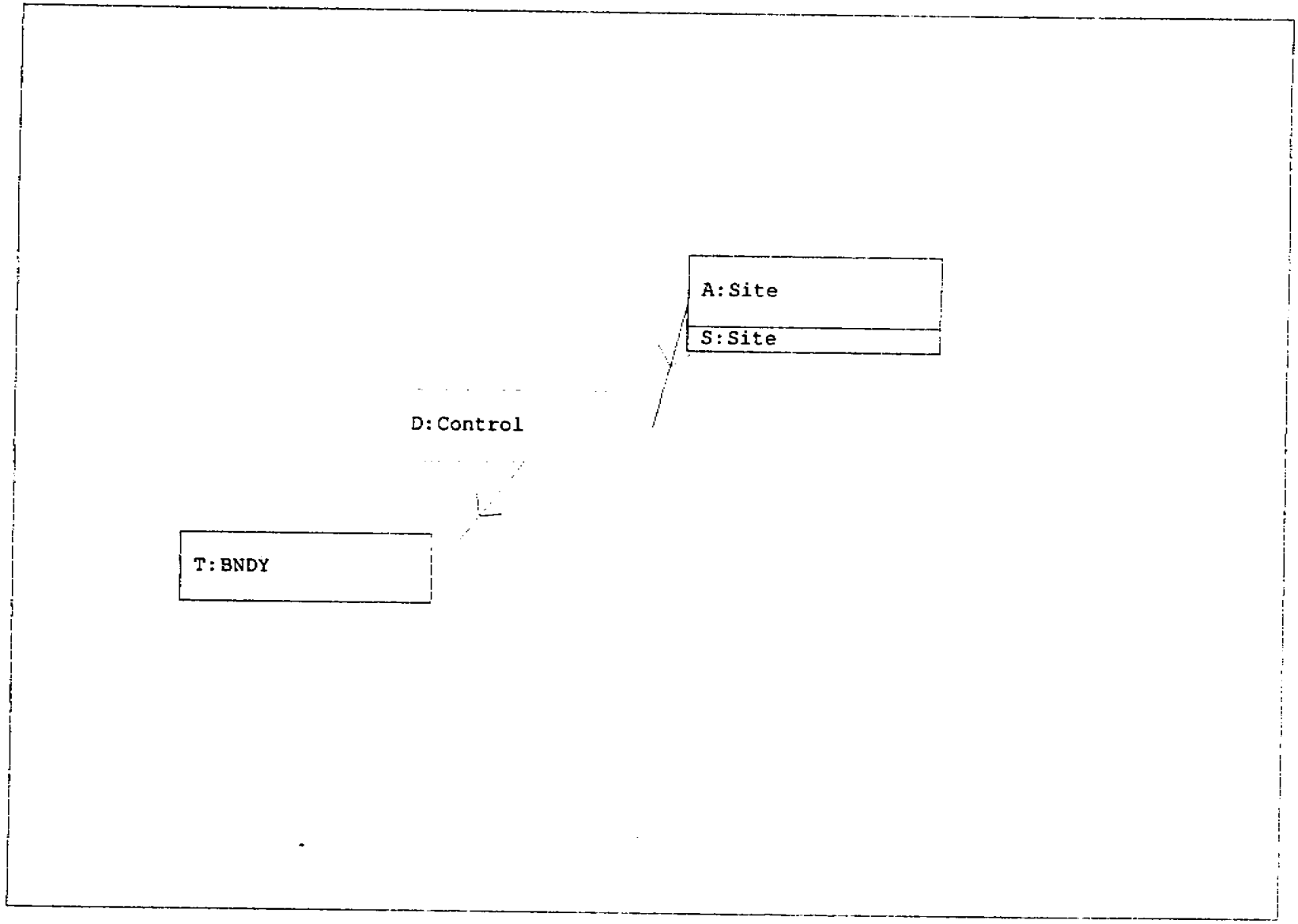


I) **Design Criteria:**

A) Post Development Land Use Designation:

Description	Total Project	Lot 1	Lot 2
Bldg. Coverage	2.20 ac.	1.21 ac.	0.99 ac.
Parking	2.96 ac.	1.53 ac.	1.43 ac.
Sidewalks	0.14 ac.	0.07 ac.	0.07 ac.
Open Space / Dry Detention	3.54 ac.	1.54 ac.	2.00 ac.
Total	8.84 ac.	4.35 ac.	4.49 ac.

B) Pervious/Impervious Ca[illegible]

Impervious Area *(Impervious area includes: Bldg. Coverage, & Pavement)*

Pervious Area *(Impervious area includes: Open Space / Dry Detention)*
3.54 ac

Percent Impervious
59.95%

Percent Pervious
40.05%

C) Minimum elevations:

1) Roads and Parking:
   a) 10-year, 1-day Peak Stage = 21.65 ft NGVD *(Refer to Routed Hydrograph)*
   Set minimum parking elevation at 22.0' NGVD

2) Finish Floor Elevation (F.F.E.):
   a) The project is located in Flood Zone "X" with a base flood elevation outside of the 500 year storm event per FEMA flood maps 12111C0170F and 12111CO275F, dated 8-19-1991

      A) 100-year, 3-day (Zero Discharge Stage Calculation)
         a) $V_{100y\text{-}72hr}$ = 6.61 ac-ft
         b) Interpolate from the site's Stage vs. Storage computations between El.=23.0' & 23.5' NGVD *"Refer to attached"*
         c) $Flood_{elev}$ = 23.19 ft NGVD

   b) **Set minimum Finish Floor Elevation at 23.2' NGVD**

3) Perimeter Grade:
   a) 25-year, 3-day Peak Stage = 22.44 NGVD (Refer to Routed Hydrograph)
   Set minimum perimeter grade elevation at 22.5' NGVD

D) Design Storm Allowable Discharge: (Per S.F.W.M.D. Requirements)

1) Because the site lies within the jurisdiction of the North St. Lucie River Water Control District (NSLRWCD), the proposed SWMS is designed in accordance with the criteria established by the NSLRWCD and St. Lucie County.

2) The allowable discharge is per the requirements set forth by the NSLRWCD

c) Allowable discharge =
"The proposed installation will limit stormwater runoff to the volumetric equivalent of not more than 2.0 inches of depth over the area served for any 24-hour period from the 10-year, 72-hour duration rainfall."

(2/12 feet) * 8.84 = 1.47 ac-ft

Total Allowable Discharge **1.47 ac-ft** (10 yr - 72 hr Storm)

d) Design Discharge **1.40 ac-ft** (10 yr - 72 hr Storm)

E) Control Elevation:

1) Control Elevation = **18.50 ft. NGVD**

a) The control elevation for the project is based upon the high water mark of the wetland directly north of the site. A copy of the signed and sealed survey has been included with this submittal.

F) SCS Curve Number, Soil Storage, & Tc Derivation:

1) ***Pre-Development Condition:***

a) Drainage Area = 8.84 ac.
b) Impervious Area = 0.00 ac. 98 CN
c) % Impervious = 0.00 %
d) Soil Types:
1) 100 % *Wabasso (T)* 80 CN
e) Weighted Calculation:
CN = 80
f) Soil Storage: (S)
1) (1000/(CN)) - 10 => 2.50 in

g) Time of Concentration (Tc):
Tc = 20 min

2) ***Post-Development Condition:***

a) Drainage Area = 8.84 ac.
b) Impervious Area = 5.30 ac. 98 CN
c) % Impervious = 59.95%
d) Open Space Area = 3.54 ac. 80 CN
e) Weighted Calculation:
CN = 91
f) Soil Storage: (S)
1) (1000/(CN)) - 10 => 1.01 in

g) Time of Concentration (Tc):
Tc = 10 min

h) Engineer's Soil Suitability Certificate:
To the best of my knowledge, the site's soils indicated above will drain/percolate pursuant to the assumptions made in the following drainage calculations. All assumptions are based on the wet season water table conditions for this site.

G) Design Storms: (Per. S.F.W.M.D. Rainfall Depths)

Total Site Area = 8.84 Ac.

1) 10 Yr. - 1 Day P = 5.60 in *(Roads / Parking)*

V = ((5.60 - .2 * 1.014)^2/(5.60 + .8 * 1.014)) * 1'/12" * 8.840 = 3.35 ac.ft.

2) 10 Yr. - 3 Day P = 8.30 in *(Discharge)*

V = ((8.30 - .2 * 1.014)^2/(8.30 + .8 * 1.014)) * 1'/12" * 8.840 = 5.30 ac.ft.

3) 25 Yr. - 3 Day P = 9.10 in *(Perimeter Berm)*

V = ((9.10 - .2 * 1.014)^2/(9.10 + .8 * 1.014)) * 1'/12" * 8.840 = 5.88 ac.ft.

4) 100 Yr. - 3 Day P = 10.10 in *(Finish Floor Elevation)*

V = ((10.10 - .2 * 1.014)^2/(10.10 + .8 * 1.014)) * 1'/12" * 8.840 = 6.61 ac.ft.

H) Project surface storage: (Refer to the attached calculations)

II) **Design Criteria: (Post-Development Conditions)**

A) Quality:

1) The project's stormwater management system will consist of an onsite dry detention area to manage the required water quality and storm attenuation as determined below.

a) Per S.F.W.M.D., dry detention volume shall provide for the following, whichever is greater:

1) 1 inch of runoff x total drainage area x 75% reduction for dry detention

i) Calculated Runoff Volume => (1/12 * 8.84 * 0.75 = 0.55 ac-ft

2) 2.5 inches times the impervious area x 75% reduction for dry detention

Site area, for water quality pervious/impervious calculation only

Total Project - (Roof) = site area for water quality pervious/impervious

= 8.84 - (2.20) = 6.64 ac

Impervious area for water quality pervious/impervious calculations only

(Site area for water quality pervious/impervious) - pervious = impervious area, for water quality pervious/impervious

= 6.64 - (3.54) = 3.10 ac

Percentage of impervious for water quality

[Impervious area for water quality *100] / Site area for water quality

= 3.10 / 6.64 46.69%

For 2.5 in times the percentage impervious

= 2.5 * 0.47 1.17 in

Compute volume required for quality detention

[inches to be treated x (total site) = 1.17 * (8.84) * (1/12)] * 0.75 (dry detention reduction) 0.64 ac-ft

b) The site's water quality volume = **0.64 ac-ft**

c) Dry detention satisfies the pre-treatment requirement

B) Overflow Elevation:

1) Water Quality Treatment Elevation (T_{elev}).

a) Vt = 0.64 ac-ft

b) T_{elev} = 20.15 ft NGVD *"Set Water Quality Weir Crest El. @ 20.15' NGVD"*

C) Check Bleeder Volume:

1) The project's discharge is controlled by the minimum 3" orifice. The prevailing variable for design was to minimize off-site peak discharge per pre-development allowable discharge.

D) On-site & Off-site Erosion and Sediment Control Methodology:

1) The contractor shall implement best management practices to include the following:
   a) Install silt fence adjacent to perimeter properties.
   b) Install turbidity barriers adjacent to all wetted areas to minimized turbidity blums.
   c) All dry detention slopes, swales, and project perimeter berms shall be sodded to minimize erosion

E) Master Stormwater Management System Maintenance Entity:

1) The SWMS will be management by the property owner:

John A Mayo
1207 S.W. 87th Terrace
Plantation, FL 33324

Mayo Warehouse

DRAINAGE AREA (Post-Development)

Stage / Storage Computations

Begin Stage Calculations = 19.50 NGVD
End Stage Calculations = 24.00 NGVD
Calculation Increment = 0.50 ft

	Dry Detention	Dry Detention Slopes	Parking	Misc. Pvmt	Open Space		Acres [1]
Acres =	0.913	0.551	2.960	0.140	2.076	Total Area =	6.640
Low Rng =	19.50	19.50	22.00	22.00	22.00		
High Rng =	24.00	22.00	24.00	24.00	24.00		

Stage (NGVD)	Vertical Storage (ac.ft.)	Vertical Area (ac.)	Linear Storage (ac.ft.)	Linear Area (ac.)	Linear Storage (ac.ft.)	Linear Area (ac.)	Linear Storage (ac.ft.)	Linear Area (ac.)	Linear Storage (ac.ft.)	Linear Area (ac.)	Total Cumulative Storage (ac.ft.)	Total Area (ac.)	
19.5	0.00	0.91	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.92	
20.0	0.46	0.91	0.03	0.11	0.00	0.00	0.00	0.00	0.00	0.00	0.48	1.02	WQ
20.5	0.91	0.91	0.11	0.22	0.00	0.00	0.00	0.00	0.00	0.00	1.02	1.13	
21.0	1.37	0.91	0.25	0.33	0.00	0.00	0.00	0.00	0.00	0.00	1.62	1.24	
21.5	1.83	0.91	0.44	0.44	0.00	0.00	0.00	0.00	0.00	0.00	2.27	1.35	
22.0	2.28	0.91	0.69	0.55	0.00	0.01	0.00	0.01	0.00	0.01	2.97	1.49	
22.5	2.74	0.91	0.96	0.55	0.19	0.74	0.01	0.04	0.13	0.52	4.03	2.76	
23.0	3.20	0.91	1.24	0.55	0.74	1.48	0.04	0.07	0.52	1.04	5.73	4.05	FFE
23.5	3.65	0.91	1.52	0.55	1.67	2.22	0.08	0.11	1.17	1.56	8.08	5.35	
24.0	4.11	0.91	1.79	0.55	2.96	2.96	0.14	0.14	2.08	2.08	11.08	6.64	

Base Floodplain Calcs:

1. Equals total site area minus building coverage
   = 8.84 - 2.20 = 6.64 ac

WQ

$\frac{x-20.0}{20.5-20.0} \quad \frac{0.48-0.46}{1.02-0.46}$

$x = 20.15$

FFE

$\frac{x-23.0}{23.5-23.0} \quad \frac{6.61-5.73}{8.08-5.73}$

$x = 23.19$

Mayo Warehouse Revised 1-6-04
SCENARIO 1

Name	Group	Simulation	Max Time Stage hrs	Max Stage ft	Warning Stage ft	Max Delta Stage ft	Max Surf Area ft2	Max Time Inflow hrs	Max Inflow cfs	Max Time Outflow hrs	Max Outflow cfs
Site	BASE	10 yr 24 hr	24.10	21.647	24.000	0.0050	60598	20.00	28.077	24.10	0.649
Site	BASE	25 yr 72 hr	68.37	22.441	24.000	0.0050	113707	59.75	31.781	68.37	0.759

Scenario 1

Scenario 1

Basins

Name: Site | Node: Site | Status: Onsite
Group: BASE | Type: Santa Barbara

Rainfall File:		Storm Duration(hrs):	0.00
Rainfall Amount(in):	0.000	Time of Conc(min):	15.00
Area(ac):	8.840	Time Shift(hrs):	0.00
Curve Number:	91.00	Time Increment(min):	15.00
DCIA(%):	0.00	Max Allowable Q(cfs):	999999.000

Nodes

Name: BNDY | Base Flow(cfs): 0.000 | Init Stage(ft): 16.000
Group: BASE | Warn Stage(ft): 17.000
Type: Time/Stage

Time(hrs)	Stage(ft)
0.00	16.000
999.00	16.000

Name: Site | Base Flow(cfs): 0.000 | Init Stage(ft): 18.500
Group: BASE | Warn Stage(ft): 24.000
Type: Stage/Area

Stage(ft)	Area(ac)
18.500	0.0000
19.500	0.9200
20.000	1.0200
20.500	1.1300
21.000	1.2400
21.500	1.3500
22.000	1.4900
22.500	2.7600
23.000	4.0500
23.500	5.3500
24.000	6.6400

Drop Structures

Name: Control | From Node: Site | Length(ft): 200.00
Group: BASE | To Node: BNDY | Count: 1

	UPSTREAM	DOWNSTREAM		
Geometry:	Circular	Circular	Friction Equation:	Average Conveyance
Span(in):	18.00	18.00	Solution Algorithm:	Automatic
Rise(in):	18.00	18.00	Flow:	Both
Invert(ft):	15.000	15.000	Entrance Loss Coef:	3.200
Manning's N:	0.012000	0.012000	Exit Loss Coef:	0.600
Top Clip(in):	0.000	0.000	Outlet Ctrl Spec:	Use dc or tw
Bot Clip(in):	0.000	0.000	Inlet Ctrl Spec:	Use dn
			Solution Incs:	10

Upstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

Downstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

*** Weir 1 of 2 for Drop Structure Control ***

TABLE

Count:	1	Bottom Clip(in):	0.000
Type:	Vertical: Mavis	Top Clip(in):	0.000
Flow:	Both	Weir Disc Coef:	3.200
Geometry:	Circular	Orifice Disc Coef:	0.600

Span(in): 3.00 Invert(ft): 18.500
Rise(in): 3.00 Control Elev(ft): 18.500

*** Weir 2 of 2 for Drop Structure Control ***

TABLE

Count: 1 Bottom Clip(in): 0.000
Type: Vertical: Mavis Top Clip(in): 0.000
Flow: Both Weir Disc Coef: 3.200
Geometry: Rectangular Orifice Disc Coef: 0.600

Span(in): 3.00 Invert(ft): 20.150
Rise(in): 2.00 Control Elev(ft): 20.150

Hydrology Simulations

Name: 10 yr 24 hr
Filename: P:\Proj-2003\03-139 John Mayo\Drainage\Scenario 1\10 yr 24 hr.R32

Override Defaults: Yes
Storm Duration(hrs): 24.00
Rainfall File: Sfwmd72
Rainfall Amount(in): 5.60

Time(hrs)	Print Inc(min)
30.000	15.00

Name: 10 yr 72 hr
Filename: P:\Proj-2003\03-139 John Mayo\Drainage\Scenario 1\10 yr 72 hr.R32

Override Defaults: Yes
Storm Duration(hrs): 72.00
Rainfall File: Sfwmd72
Rainfall Amount(in): 8.30

Time(hrs)	Print Inc(min)
200.000	15.00

Name: 25 yr 72 hr
Filename: P:\Proj-2003\03-139 John Mayo\Drainage\Scenario 1\25 yr 72 hr.R32

Override Defaults: Yes
Storm Duration(hrs): 72.00
Rainfall File: Sfwmd72
Rainfall Amount(in): 9.10

Time(hrs)	Print Inc(min)
72.000	15.00

Routing Simulations

Name: 10 yr 24 hr Hydrology Sim: 10 yr 24 hr
Filename: P:\Proj-2003\03-139 John Mayo\Drainage\Scenario 1\10 yr 24 hr.I32

Execute: Yes Restart: No Patch: No
Alternative: No

Max Delta Z(ft): 1.00 Delta Z Factor: 0.00500
Time Step Optimizer: 10.000
Start Time(hrs): 0.000 End Time(hrs): 30.00
Min Calc Time(sec): 0.5000 Max Calc Time(sec): 60.0000
Boundary Stages: Boundary Flows:

Time(hrs)	Print Inc(min)
30.000	15.000

Group	Run
BASE	Yes

Span(in): 3.00
Rise(in): 3.00
Invert(ft): 18.500
Control Elev(ft): 18.500

*** Weir 2 of 2 for Drop Structure Control ***

Count: 1
Type: Vertical: Mavis
Flow: Both
Geometry: Rectangular
TABLE
Bottom Clip(in): 0.000
Top Clip(in): 0.000
Weir Disc Coef: 3.200
Orifice Disc Coef: 0.600

Span(in): 3.00
Rise(in): 2.00
Invert(ft): 20.150
Control Elev(ft): 20.150

==== Hydrology Simulations ====

Name: 10 yr 24 hr
Filename: P:\Proj-2003\03-139 John Mayo\Drainage\Scenario 1\10 yr 24 hr.R32

Override Defaults: Yes
Storm Duration(hrs): 24.00
Rainfall File: Sfwmd72
Rainfall Amount(in): 5.60

Time(hrs)	Print Inc(min)
30.000	15.00

Name: 10 yr 72 hr
Filename: P:\Proj-2003\03-139 John Mayo\Drainage\Scenario 1\10 yr 72 hr.R32

Override Defaults: Yes
Storm Duration(hrs): 72.00
Rainfall File: Sfwmd72
Rainfall Amount(in): 8.30

Time(hrs)	Print Inc(min)
200.000	15.00

Name: 25 yr 72 hr
Filename: P:\Proj-2003\03-139 John Mayo\Drainage\Scenario 1\25 yr 72 hr.R32

Override Defaults: Yes
Storm Duration(hrs): 72.00
Rainfall File: Sfwmd72
Rainfall Amount(in): 9.10

Time(hrs)	Print Inc(min)
72.000	15.00

==== Routing Simulations ====

Name: 10 yr 24 hr
Hydrology Sim: 10 yr 24 hr
Filename: P:\Proj-2003\03-139 John Mayo\Drainage\Scenario 1\10 yr 24 hr.I32

Execute: Yes
Restart: No
Patch: No
Alternative: No

Max Delta Z(ft): 1.00
Delta Z Factor: 0.00500
Time Step Optimizer: 10.000
Start Time(hrs): 0.000
End Time(hrs): 30.00
Min Calc Time(sec): 0.5000
Max Calc Time(sec): 60.0000
Boundary Stages:
Boundary Flows:

Time(hrs)	Print Inc(min)
30.000	15.000

Group	Run
BASE	Yes

Name: 10 yr 72 hr Hydrology Sim: 10 yr 72 hr
Filename: P:\Proj-2003\03-139 John Mayo\Drainage\Scenario 1\10 yr 72 hr.I32

Execute: Yes Restart: No Patch: No
Alternative: No

Max Delta Z(ft): 1.00 Delta Z Factor: 0.00500
Time Step Optimizer: 10.000
Start Time(hrs): 0.000 End Time(hrs): 200.00
Min Calc Time(sec): 0.5000 Max Calc Time(sec): 60.0000
Boundary Stages: Boundary Flows:

Time(hrs)	Print Inc(min)
200.000	15.000

Group	Run
BASE	Yes

Name: 25 yr 72 hr Hydrology Sim: 25 yr 72 hr
Filename: P:\Proj-2003\03-139 John Mayo\Drainage\Scenario 1\25 yr 72 hr.I32

Execute: Yes Restart: No Patch: No
Alternative: No

Max Delta Z(ft): 1.00 Delta Z Factor: 0.00500
Time Step Optimizer: 10.000
Start Time(hrs): 0.000 End Time(hrs): 72.00
Min Calc Time(sec): 0.5000 Max Calc Time(sec): 60.0000
Boundary Stages: Boundary Flows:

Time(hrs)	Print Inc(min)
72.000	15.000

Group	Run
BASE	Yes

Boundary Conditions

Mayo Warehouse Facility
Revised Discharge Calculations
1-6-2004

Project Area =	3.84	ac			
Allowable Rate =	2.00	in/day/ac			
Allowable Volume =	1.47	ac-ft			
Max Vol. Disch. =	1.40	ac-ft	=	1.90	in/day/ac
Allowable Discharge =	0.74	cfs			
Max Discharge =	0.73	cfs	=	1.97	in/day/ac
Average Discharge =	0.32	cfs	=	0.86	in/day/ac

Time	Vol Disch	Q	Q	Vol Disch/24 hrs
hrs	(af)	(cfs)	(in/d/ac)	(ac-ft)
0	0	0		
0.26	0	0	0.00	
0.5	0	0	0.00	
0.77	0	0	0.00	
1.02	0	0	0.00	
1.27	0	0	0.00	
1.52	0	0	0.00	
1.77	0	0	0.00	
2.02	0	0	0.00	
2.27	0	0	0.00	
2.52	0	0	0.00	
2.77	0	0	0.00	
3.02	0	0	0.00	
3.27	0	0	0.00	
3.52	0	0	0.00	
3.77	0	0	0.00	
4.02	0	0	0.00	
4.27	0	0	0.00	
4.52	0	0	0.00	
4.77	0	0	0.00	
5.02	0	0	0.00	
5.27	0	0	0.00	
5.52	0	0	0.00	
5.77	0	0	0.00	
6.02	0	0.001	0.00	
6.27	0	0.002	0.01	
6.52	0	0.004	0.01	
6.77	0	0.006	0.02	
7.02	0	0.008	0.02	
7.27	0	0.01	0.03	
7.52	0	0.012	0.03	
7.77	0	0.015	0.04	
8.02	0	0.017	0.05	
8.27	0	0.02	0.05	
8.52	0	0.023	0.06	
8.77	0	0.026	0.07	
9.02	0	0.029	0.08	
9.27	0	0.032	0.09	
9.52	0	0.034	0.09	
9.77	0.01	0.037	0.10	
10.02	0.01	0.04	0.11	

10.27	0.01	0.043	0.12
10.52	0.01	0.046	0.12
10.77	0.01	0.049	0.13
11.02	0.01	0.052	0.14
11.27	0.01	0.054	0.15
11.52	0.01	0.057	0.15
11.77	0.01	0.06	0.16
12.02	0.01	0.062	0.17
12.27	0.02	0.065	0.18
12.52	0.02	0.067	0.18
12.77	0.02	0.069	0.19
13.02	0.02	0.071	0.19
13.27	0.02	0.073	0.20
13.52	0.02	0.074	0.20
13.77	0.02	0.076	0.20
14.02	0.03	0.079	0.21
14.27	0.03	0.081	0.22
14.52	0.03	0.084	0.23
14.77	0.03	0.086	0.23
15.02	0.03	0.089	0.24
15.27	0.04	0.091	0.25
15.52	0.04	0.094	0.25
15.77	0.04	0.096	0.26
16.02	0.04	0.099	0.27
16.27	0.04	0.1	0.27
16.52	0.05	0.101	0.27
16.77	0.05	0.103	0.28
17.02	0.05	0.104	0.28
17.27	0.05	0.105	0.28
17.52	0.05	0.106	0.29
17.77	0.06	0.108	0.29
18.02	0.06	0.109	0.29
18.27	0.06	0.11	0.30
18.52	0.06	0.111	0.30
18.77	0.06	0.112	0.30
19.02	0.07	0.113	0.30
19.27	0.07	0.114	0.31
19.52	0.07	0.116	0.31
19.77	0.07	0.117	0.32
20.02	0.08	0.118	0.32
20.27	0.08	0.119	0.32
20.52	0.08	0.12	0.32
20.77	0.08	0.121	0.33
21.02	0.09	0.122	0.33
21.27	0.09	0.123	0.33
21.52	0.09	0.124	0.33
21.77	0.09	0.125	0.34
22.02	0.1	0.126	0.34
22.27	0.1	0.127	0.34
22.52	0.1	0.128	0.34
22.77	0.1	0.129	0.35
23.02	0.11	0.13	0.35

23.27	0.11	0.131	0.35	
23.52	0.11	0.131	0.35	
23.77	0.12	0.132	0.36	
24.02	0.12	0.133	0.36	0.12
24.27	0.12	0.135	0.36	0.12
24.52	0.12	0.137	0.37	0.12
24.77	0.13	0.138	0.37	0.13
25.02	0.13	0.14	0.38	0.13
25.27	0.13	0.142	0.38	0.13
25.52	0.14	0.143	0.39	0.14
25.77	0.14	0.145	0.39	0.14
26.02	0.14	0.147	0.40	0.14
26.27	0.14	0.148	0.40	0.14
26.52	0.15	0.15	0.40	0.15
26.77	0.15	0.151	0.41	0.15
27.02	0.15	0.153	0.41	0.15
27.27	0.16	0.154	0.41	0.16
27.52	0.16	0.155	0.42	0.16
27.77	0.16	0.157	0.42	0.16
28.02	0.17	0.158	0.43	0.17
28.27	0.17	0.159	0.43	0.17
28.52	0.17	0.161	0.43	0.17
28.77	0.18	0.162	0.44	0.18
29.02	0.18	0.163	0.44	0.18
29.27	0.18	0.164	0.44	0.18
29.52	0.19	0.166	0.45	0.19
29.77	0.19	0.167	0.45	0.19
30.02	0.19	0.168	0.45	0.19
30.27	0.2	0.169	0.46	0.20
30.52	0.2	0.17	0.46	0.20
30.77	0.2	0.171	0.46	0.20
31.02	0.21	0.172	0.46	0.21
31.27	0.21	0.174	0.47	0.21
31.52	0.22	0.175	0.47	0.22
31.77	0.22	0.176	0.47	0.22
32.02	0.22	0.177	0.48	0.22
32.27	0.23	0.178	0.48	0.23
32.52	0.23	0.179	0.48	0.23
32.77	0.23	0.18	0.48	0.23
33.02	0.24	0.181	0.49	0.24
33.27	0.24	0.182	0.49	0.24
33.52	0.24	0.183	0.49	0.23
33.77	0.25	0.184	0.50	0.24
34.02	0.25	0.185	0.50	0.24
34.27	0.26	0.185	0.50	0.25
34.52	0.26	0.186	0.50	0.25
34.77	0.26	0.187	0.50	0.25
35.02	0.27	0.188	0.51	0.26
35.27	0.27	0.189	0.51	0.26
35.52	0.28	0.19	0.51	0.27
35.77	0.28	0.191	0.51	0.27
36.02	0.28	0.192	0.52	0.26

36.27	0.29	0.192	0.52	0.27
36.52	0.29	0.193	0.52	0.27
36.77	0.3	0.194	0.52	0.28
37.02	0.3	0.195	0.53	0.28
37.27	0.3	0.196	0.53	0.28
37.52	0.31	0.197	0.53	0.29
37.77	0.31	0.197	0.53	0.28
38.02	0.32	0.198	0.53	0.29
38.27	0.32	0.199	0.54	0.29
38.52	0.32	0.2	0.54	0.29
38.77	0.33	0.201	0.54	0.30
39.02	0.33	0.201	0.54	0.29
39.27	0.34	0.202	0.54	0.30
39.52	0.34	0.203	0.55	0.30
39.77	0.34	0.204	0.55	0.30
40.02	0.35	0.204	0.55	0.31
40.27	0.35	0.205	0.55	0.30
40.52	0.36	0.206	0.55	0.31
40.77	0.36	0.206	0.55	0.31
41.02	0.37	0.207	0.56	0.32
41.27	0.37	0.208	0.56	0.32
41.52	0.37	0.209	0.56	0.31
41.77	0.38	0.209	0.56	0.32
42.02	0.38	0.21	0.57	0.32
42.27	0.39	0.211	0.57	0.33
42.52	0.39	0.211	0.57	0.33
42.77	0.4	0.212	0.57	0.33
43.02	0.4	0.213	0.57	0.33
43.27	0.4	0.213	0.57	0.33
43.52	0.41	0.214	0.58	0.34
43.77	0.41	0.215	0.58	0.33
44.02	0.42	0.215	0.58	0.34
44.27	0.42	0.216	0.58	0.34
44.52	0.43	0.216	0.58	0.35
44.77	0.43	0.217	0.58	0.34
45.02	0.44	0.218	0.59	0.35
45.27	0.44	0.218	0.59	0.35
45.52	0.45	0.219	0.59	0.36
45.77	0.45	0.219	0.59	0.35
46.02	0.45	0.22	0.59	0.35
46.27	0.46	0.221	0.60	0.36
46.52	0.46	0.221	0.60	0.36
46.77	0.47	0.222	0.60	0.36
47.02	0.47	0.222	0.60	0.36
47.27	0.48	0.223	0.60	0.37
47.52	0.48	0.224	0.60	0.36
47.77	0.49	0.224	0.60	0.37
48.02	0.49	0.225	0.61	0.37
48.27	0.5	0.225	0.61	0.38
48.52	0.5	0.226	0.61	0.37
48.77	0.5	0.227	0.61	0.37
49.02	0.51	0.227	0.61	0.38

49.27	0.51	0.228	0.61	0.37
49.52	0.52	0.229	0.62	0.38
49.77	0.52	0.23	0.62	0.38
50.02	0.53	0.23	0.62	0.39
50.27	0.53	0.231	0.62	0.38
50.52	0.54	0.232	0.62	0.39
50.77	0.54	0.233	0.63	0.39
51.02	0.55	0.234	0.63	0.39
51.27	0.55	0.235	0.63	0.39
51.52	0.56	0.236	0.64	0.40
51.77	0.56	0.237	0.64	0.39
52.02	0.57	0.238	0.64	0.40
52.27	0.57	0.24	0.65	0.40
52.52	0.58	0.241	0.65	0.40
52.77	0.58	0.242	0.65	0.40
53.02	0.59	0.244	0.66	0.41
53.27	0.59	0.246	0.66	0.40
53.52	0.6	0.248	0.67	0.41
53.77	0.6	0.25	0.67	0.41
54.02	0.61	0.251	0.68	0.41
54.27	0.61	0.254	0.68	0.41
54.52	0.62	0.256	0.69	0.42
54.77	0.62	0.258	0.69	0.41
55.02	0.63	0.26	0.70	0.42
55.27	0.63	0.263	0.71	0.41
55.52	0.64	0.266	0.72	0.42
55.77	0.65	0.268	0.72	0.43
56.02	0.65	0.271	0.73	0.42
56.27	0.66	0.274	0.74	0.43
56.52	0.66	0.277	0.75	0.43
56.77	0.67	0.279	0.75	0.43
57.02	0.67	0.282	0.76	0.43
57.27	0.68	0.286	0.77	0.44
57.52	0.69	0.289	0.78	0.44
57.77	0.69	0.293	0.79	0.44
58.02	0.7	0.304	0.82	0.44
58.27	0.7	0.321	0.86	0.44
58.52	0.71	0.342	0.92	0.45
58.77	0.72	0.369	0.99	0.45
59.02	0.73	0.394	1.06	0.46
59.26	0.73	0.416	1.12	0.45
59.5	0.74	0.462	1.24	0.46
59.75	0.75	0.541	1.46	0.47
60	0.77	0.614	1.65	0.48
60.25	0.78	0.656	1.77	0.49
60.5	0.79	0.678	1.83	0.49
60.76	0.81	0.69	1.86	0.51
61.01	0.82	0.699	1.88	0.52
61.25	0.84	0.704	1.90	0.53
61.5	0.85	0.709	1.91	0.54
61.75	0.86	0.712	1.92	0.54
62	0.88	0.715	1.93	0.56

62.25	0.89	0.717	1.93	0.57
62.5	0.91	0.719	1.94	0.58
62.75	0.92	0.721	1.94	0.59
63	0.94	0.722	1.94	0.60
63.25	0.95	0.723	1.95	0.61
63.5	0.97	0.725	1.95	0.63
63.75	0.98	0.726	1.95	0.63
64	1	0.727	1.96	0.65
64.25	1.01	0.728	1.96	0.65
64.5	1.03	0.728	1.96	0.67
64.75	1.04	0.729	1.96	0.67
65	1.06	0.729	1.96	0.69
65.25	1.07	0.729	1.96	0.70
65.5	1.09	0.73	1.97	0.71
65.75	1.1	0.73	1.97	0.72
66	1.12	0.73	1.97	0.73
66.25	1.13	0.731	1.97	0.74
66.5	1.15	0.731	1.97	0.75
66.75	1.16	0.731	1.97	0.76
67	1.18	0.732	1.97	0.78
67.25	1.19	0.732	1.97	0.78
67.5	1.21	0.732	1.97	0.80
67.75	1.22	0.732	1.97	0.80
68	1.24	0.733	1.97	0.82
68.25	1.25	0.733	1.97	0.82
68.5	1.27	0.733	1.97	0.84
68.75	1.29	0.733	1.97	0.85
69	1.3	0.732	1.97	0.86
69.25	1.32	0.732	1.97	0.87
69.5	1.33	0.732	1.97	0.88
69.75	1.35	0.732	1.97	0.90
70	1.36	0.732	1.97	0.90
70.25	1.38	0.732	1.97	0.92
70.5	1.39	0.732	1.97	0.92
70.75	1.41	0.732	1.97	0.94
71	1.42	0.732	1.97	0.94
71.25	1.44	0.731	1.97	0.96
71.5	1.45	0.731	1.97	0.96
71.75	1.47	0.731	1.97	0.98
72	1.48	0.731	1.97	0.98
72.25	1.5	0.73	1.97	1.00
72.5	1.51	0.73	1.97	1.01
72.75	1.53	0.729	1.96	1.02
73	1.54	0.728	1.96	1.03
73.25	1.56	0.727	1.96	1.04
73.5	1.57	0.726	1.95	1.05
73.75	1.59	0.725	1.95	1.06
74	1.6	0.723	1.95	1.07
74.25	1.62	0.722	1.94	1.08
74.5	1.63	0.721	1.94	1.09
74.75	1.65	0.72	1.94	1.10
75	1.66	0.719	1.94	1.11

75.25	1.68	0.718	1.93	1.12
75.5	1.69	0.717	1.93	1.13
75.75	1.71	0.716	1.93	1.14
76	1.72	0.715	1.93	1.15
76.25	1.74	0.714	1.92	1.16
76.5	1.75	0.712	1.92	1.17
76.75	1.77	0.711	1.91	1.18
77	1.78	0.71	1.91	1.19
77.25	1.79	0.709	1.91	1.19
77.5	1.81	0.707	1.90	1.21
77.75	1.82	0.706	1.90	1.21
78	1.84	0.705	1.90	1.23
78.25	1.85	0.704	1.90	1.23
78.5	1.87	0.702	1.89	1.25
78.75	1.88	0.701	1.89	1.25
79	1.9	0.7	1.88	1.27
79.25	1.91	0.698	1.88	1.27
79.5	1.93	0.697	1.88	1.28
79.75	1.94	0.696	1.87	1.29
80	1.95	0.694	1.87	1.29
80.25	1.97	0.693	1.87	1.31
80.5	1.98	0.691	1.86	1.31
80.75		0.69	1.86	1.33
81	2.01	0.689	1.86	1.33
81.25	2.03	0.687	1.85	1.34
81.5	2.04	0.686	1.85	1.35
81.75	2.05	0.685	1.84	1.35
82	2.07	0.683	1.84	1.37
82.25	2.08	0.682	1.84	1.37
82.5	2.1	0.68	1.83	1.38
82.75	2.11	0.679	1.83	1.38
83	2.12	0.678	1.83	1.39
83.25	2.14	0.676	1.82	1.40
83.5	2.15	0.675	1.82	1.40
83.75	2.17	0.673	1.81	1.40
84	2.18	0.672	1.81	1.40
84.25	2.19	0.67	1.80	1.40
84.5	2.21	0.669	1.80	1.40
84.75	2.22	0.668	1.80	1.40
85	2.24	0.666	1.79	1.40
85.25	2.25	0.665	1.79	1.40
85.5	2.26	0.663	1.79	1.40
85.75	2.28	0.662	1.78	1.40
86	2.29	0.66	1.78	1.40
86.25	2.3	0.659	1.77	1.39
86.5	2.32	0.658	1.77	1.40
86.75	2.33	0.656	1.77	1.39
87	2.34	0.655	1.76	1.39
87.25	2.36	0.653	1.76	1.39
87.5	2.37	0.652	1.76	1.39
87.75	2.38	0.65	1.75	1.38
88	2.4	0.649	1.75	1.39

88.25	2.41	0.647	1.74	1.38
88.5	2.42	0.646	1.74	1.38
88.75	2.44	0.644	1.73	1.38
89	2.45	0.643	1.73	1.38
89.25	2.46	0.641	1.73	1.37
89.5	2.48	0.64	1.72	1.38
89.75	2.49	0.638	1.72	1.37
90	2.5	0.637	1.72	1.37
90.25	2.52	0.635	1.71	1.37
90.5	2.53	0.634	1.71	1.37
90.75	2.54	0.632	1.70	1.36
91	2.56	0.631	1.70	1.37
91.25	2.57	0.629	1.69	1.36
91.5	2.58	0.628	1.69	1.36
91.75	2.6	0.626	1.69	1.36
92	2.61	0.625	1.68	1.36
92.25	2.62	0.623	1.68	1.35
92.5	2.63	0.622	1.67	1.34
92.75	2.65	0.62	1.67	1.35
93	2.66	0.619	1.67	1.34
93.25	2.67	0.617	1.66	1.34
93.5	2.69	0.616	1.66	1.34
93.75	2.7	0.614	1.65	1.34
94	2.71	0.613	1.65	1.33
94.25	2.72	0.611	1.65	1.33
94.5	2.74	0.609	1.64	1.33
94.75	2.75	0.608	1.64	1.33
95	2.76	0.606	1.63	1.32
95.25	2.77	0.605	1.63	1.32
95.5	2.79	0.603	1.62	1.32
95.75	2.8	0.602	1.62	1.32
96	2.81	0.6	1.62	1.31
96.25	2.82	0.599	1.61	1.31
96.5	2.84	0.597	1.61	1.31
96.75	2.85	0.595	1.60	1.31
97	2.86	0.594	1.60	1.30
97.25	2.87	0.592	1.59	1.30
97.5	2.88	0.591	1.59	1.29
97.75	2.9	0.589	1.59	1.30
98	2.91	0.587	1.58	1.29
98.25	2.92	0.586	1.58	1.29
98.5	2.93	0.584	1.57	1.28
98.75	2.95	0.583	1.57	1.29
99	2.96	0.581	1.56	1.28
99.25	2.97	0.579	1.56	1.28
99.5	2.98	0.578	1.56	1.27
99.75	2.99	0.576	1.55	1.27
100	3.01	0.574	1.55	1.27
100.25	3.02	0.573	1.54	1.27
100.5	3.03	0.571	1.54	1.26
100.75	3.04	0.57	1.53	1.26
101	3.05	0.568	1.53	1.26

101.25	3.06	0.566	1.52	1.25
101.5	3.08	0.565	1.52	1.26
101.75	3.09	0.563	1.52	1.25
102	3.1	0.561	1.51	1.25
102.25	3.11	0.56	1.51	1.24
102.5	3.12	0.558	1.50	1.24
102.75	3.13	0.556	1.50	1.23
103	3.15	0.555	1.49	1.24
103.25	3.16	0.553	1.49	1.23
103.5	3.17	0.551	1.48	1.23
103.75	3.18	0.55	1.48	1.23
104	3.19	0.548	1.48	1.22
104.25	3.2	0.546	1.47	1.22
104.5	3.21	0.544	1.46	1.21
104.75	3.22	0.543	1.46	1.21
105	3.24	0.541	1.46	1.21
105.25	3.25	0.539	1.45	1.21
105.5	3.26	0.538	1.45	1.21
105.75	3.27	0.536	1.44	1.20
106	3.28	0.534	1.44	1.20
106.25	3.29	0.532	1.43	1.19
106.5	3.3	0.531	1.43	1.19
106.75	3.31	0.529	1.42	1.19
107	3.32	0.527	1.42	1.18
107.25	3.33	0.525	1.41	1.18
107.5	3.35	0.524	1.41	1.18
107.75	3.36	0.522	1.41	1.18
108	3.37	0.52	1.40	1.18
108.25	3.38	0.518	1.39	1.17
108.5	3.39	0.517	1.39	1.17
108.75	3.4	0.515	1.39	1.16
109	3.41	0.513	1.38	1.16
109.25	3.42	0.511	1.38	1.16
109.5	3.43	0.509	1.37	1.15
109.75	3.44	0.508	1.37	1.15
110	3.45	0.506	1.36	1.15
110.25	3.46	0.504	1.36	1.14
110.5	3.47	0.502	1.35	1.14
110.75	3.48	0.5	1.35	1.14
111	3.49	0.498	1.34	1.13
111.25	3.5	0.497	1.34	1.13
111.5	3.51	0.495	1.33	1.13
111.75	3.52	0.493	1.33	1.12
112	3.53	0.491	1.32	1.12
112.25	3.54	0.489	1.32	1.12
112.5	3.55	0.487	1.31	1.11
112.75	3.56	0.485	1.31	1.11
113	3.57	0.483	1.30	1.11
113.25	3.58	0.482	1.30	1.10
113.5	3.59	0.48	1.29	1.10
113.75	3.6	0.478	1.29	1.10
114	3.61	0.476	1.28	1.09

114.25	3.62	0.474	1.28	1.09
114.5	3.63	0.472	1.27	1.09
114.75	3.64	0.47	1.27	1.08
115	3.65	0.468	1.26	1.08
115.25	3.66	0.466	1.25	1.08
115.5	3.67	0.464	1.25	1.07
115.75	3.68	0.462	1.24	1.07
116	3.69	0.46	1.24	1.07
116.25	3.7	0.458	1.23	1.07
116.5	3.71	0.456	1.23	1.06
116.75	3.72	0.454	1.22	1.06
117	3.73	0.452	1.22	1.06
117.25	3.74	0.45	1.21	1.05
117.5	3.75	0.448	1.21	1.05
117.75	3.76	0.446	1.20	1.05
118	3.77	0.444	1.20	1.05
118.25	3.78	0.442	1.19	1.04
118.5	3.78	0.44	1.18	1.03
118.75	3.79	0.438	1.18	1.03
119	3.8	0.435	1.17	1.03
119.25	3.81	0.433	1.17	1.02
119.5	3.82	0.431	1.16	1.02
119.75	3.83	0.429	1.16	1.02
120	3.84	0.427	1.15	1.02
120.25	3.85	0.425	1.14	1.01
120.5	3.86	0.422	1.14	1.01
120.75	3.86	0.42	1.13	1.00
121	3.87	0.418	1.13	1.00
121.25	3.88	0.416	1.12	1.00
121.5	3.89	0.413	1.11	0.99
121.75	3.9	0.411	1.11	0.99
122	3.91	0.409	1.10	0.99
122.25	3.92	0.406	1.09	0.99
122.5	3.92	0.404	1.09	0.97
122.75	3.93	0.402	1.08	0.97
123	3.94	0.399	1.07	0.97
123.25	3.95	0.397	1.07	0.97
123.5	3.96	0.394	1.06	0.97
123.75	3.97	0.392	1.06	0.96
124	3.97	0.389	1.05	0.95
124.25	3.98	0.387	1.04	0.95
124.5	3.99	0.384	1.03	0.95
124.75	4	0.381	1.03	0.95
125	4.01	0.378	1.02	0.95
125.25	4.01	0.375	1.01	0.93
125.5	4.02	0.371	1.00	0.93
125.75	4.03	0.368	0.99	0.93
126	4.04	0.364	0.98	0.93
126.25	4.04	0.36	0.97	0.92
126.5	4.05	0.357	0.96	0.92
126.75	4.06	0.353	0.95	0.91
127	4.07	0.349	0.94	0.91

127.25	4.07	0.345	0.93	0.90
127.5	4.08	0.342	0.92	0.90
127.75	4.09	0.339	0.91	0.90
128	4.09	0.335	0.90	0.89
128.25	4.1	0.332	0.89	0.89
128.5	4.11	0.329	0.89	0.89
128.75	4.11	0.326	0.88	0.87
129	4.12	0.323	0.87	0.87
129.25	4.13	0.32	0.86	0.87
129.5	4.13	0.318	0.86	0.86
129.75	4.14	0.315	0.85	0.86
130	4.15	0.313	0.84	0.86
130.25	4.15	0.31	0.83	0.85
130.5	4.16	0.308	0.83	0.85
130.75	4.17	0.306	0.82	0.85
131	4.17	0.303	0.82	0.84
131.25	4.18	0.301	0.81	0.83
131.5	4.19	0.3	0.81	0.83
131.75	4.19	0.298	0.80	0.82
132	4.2	0.296	0.80	0.82
132.25	4.2	0.295	0.79	0.81
132.5	4.21	0.293	0.79	0.81
132.75	4.22	0.292	0.79	0.81
133	4.22	0.292	0.79	0.80
133.25	4.23	0.291	0.78	0.80
133.5	4.23	0.29	0.78	0.79
133.75	4.24	0.29	0.78	0.79
134	4.25	0.289	0.78	0.79
134.25	4.25	0.289	0.78	0.78
134.5	4.26	0.288	0.78	0.78
134.75	4.26	0.288	0.78	0.77
135	4.27	0.287	0.77	0.77
135.25	4.28	0.287	0.77	0.77
135.5	4.28	0.286	0.77	0.76
135.75	4.29	0.285	0.77	0.76
136	4.29	0.285	0.77	0.75
136.25	4.3	0.284	0.76	0.75
136.5	4.3	0.284	0.76	0.74
136.75	4.31	0.283	0.76	0.74
137	4.32	0.283	0.76	0.74
137.25	4.32	0.282	0.76	0.73
137.5	4.33	0.282	0.76	0.73
137.75	4.33	0.281	0.76	0.72
138	4.34	0.28	0.75	0.72
138.25	4.35	0.28	0.75	0.72
138.5	4.35	0.279	0.75	0.71
138.75	4.36	0.279	0.75	0.71
139	4.36	0.278	0.75	0.70
139.25	4.37	0.278	0.75	0.70
139.5	4.37	0.277	0.75	0.69
139.75	4.38	0.276	0.74	0.69
140	4.39	0.276	0.74	0.69

140.25	4.39	0.275	0.74	0.68
140.5	4.4	0.275	0.74	0.68
140.75	4.4	0.274	0.74	0.67
141	4.41	0.274	0.74	0.67
141.25	4.41	0.273	0.74	0.66
141.5	4.42	0.273	0.74	0.66
141.75	4.43	0.272	0.73	0.66
142	4.43	0.271	0.73	0.65
142.25	4.44	0.271	0.73	0.66
142.5	4.44	0.27	0.73	0.65
142.75	4.45	0.27	0.73	0.65
143	4.45	0.269	0.72	0.64
143.25	4.46	0.269	0.72	0.64
143.5	4.46	0.268	0.72	0.63
143.75	4.47	0.267	0.72	0.63
144	4.48	0.267	0.72	0.63
144.25	4.48	0.266	0.72	0.62
144.5	4.49	0.266	0.72	0.63
144.75	4.49	0.265	0.71	0.62
145	4.5	0.264	0.71	0.62
145.25	4.5	0.264	0.71	0.61
145.5	4.51	0.263	0.71	0.61
145.75	4.51	0.263	0.71	0.60
146	4.52	0.262	0.71	0.60
146.25	4.52	0.262	0.71	0.60
146.5	4.53	0.261	0.70	0.60
146.75	4.54	0.26	0.70	0.60
147	4.54	0.26	0.70	0.59
147.25	4.55	0.259	0.70	0.59
147.5	4.55	0.259	0.70	0.58
147.75	4.56	0.258	0.69	0.59
148	4.56	0.257	0.69	0.58
148.25	4.57	0.257	0.69	0.58
148.5	4.57	0.256	0.69	0.57
148.75	4.58	0.256	0.69	0.57
149	4.58	0.255	0.69	0.57
149.25	4.59	0.255	0.69	0.57
149.5	4.59	0.254	0.68	0.56
149.75	4.6	0.253	0.68	0.56
150	4.6	0.253	0.68	0.56
150.25	4.61	0.252	0.68	0.56
150.5	4.61	0.252	0.68	0.55
150.75	4.62	0.251	0.68	0.55
151	4.63	0.25	0.67	0.56
151.25	4.63	0.25	0.67	0.55
151.5	4.64	0.249	0.67	0.55
151.75	4.64	0.249	0.67	0.55
152	4.65	0.248	0.67	0.55
152.25	4.65	0.247	0.67	0.54
152.5	4.66	0.247	0.67	0.55
152.75	4.66	0.246	0.66	0.54
153	4.67	0.246	0.66	0.54

153.25	4.67	0.245	0.66	0.54
153.5	4.68	0.244	0.66	0.54
153.75	4.68	0.244	0.66	0.53
154	4.69	0.243	0.65	0.54
154.25	4.69	0.243	0.65	0.53
154.5	4.7	0.242	0.65	0.53
154.75	4.7	0.241	0.65	0.53
155	4.71	0.241	0.65	0.53
155.25	4.71	0.24	0.65	0.52
155.5	4.72	0.24	0.65	0.53
155.75	4.72	0.239	0.64	0.52
156	4.73	0.238	0.64	0.53
156.25	4.73	0.238	0.64	0.52
156.5	4.74	0.237	0.64	0.52
156.75	4.74	0.237	0.64	0.52
157	4.75	0.236	0.64	0.52
157.25	4.75	0.235	0.63	0.52
157.5	4.76	0.235	0.63	0.52
157.75	4.76	0.234	0.63	0.51
158	4.77	0.234	0.63	0.52
158.25	4.77	0.233	0.63	0.51
158.5	4.77	0.232	0.62	0.51
158.75	4.78	0.232	0.62	0.51
159	4.78	0.231	0.62	0.50
159.25	4.79	0.23	0.62	0.51
159.5	4.79	0.23	0.62	0.50
159.75	4.8	0.229	0.62	0.51
160	4.8	0.229	0.62	0.50
160.25	4.81	0.228	0.61	0.51
160.5	4.81	0.227	0.61	0.50
160.75	4.82	0.227	0.61	0.50
161	4.82	0.226	0.61	0.50
161.25	4.83	0.225	0.61	0.50
161.5	4.83	0.225	0.61	0.50
161.75	4.84	0.224	0.60	0.50
162	4.84	0.224	0.60	0.49
162.25	4.85	0.223	0.60	0.50
162.5	4.85	0.222	0.60	0.49
162.75	4.85	0.222	0.60	0.49
163	4.86	0.221	0.60	0.49
163.25	4.86	0.22	0.59	0.49
163.5	4.87	0.22	0.59	0.49
163.75	4.87	0.219	0.59	0.48
164	4.88	0.219	0.59	0.49
164.25	4.88	0.218	0.59	0.48
164.5	4.89	0.217	0.58	0.49
164.75	4.89	0.217	0.58	0.48
165	4.9	0.216	0.58	0.49
165.25	4.9	0.215	0.58	0.48
165.5	4.9	0.215	0.58	0.47
165.75	4.91	0.214	0.58	0.48
166	4.91	0.213	0.57	0.47

166.25	4.92	0.213	0.57	0.48
166.5	4.92	0.212	0.57	0.47
166.75	4.93	0.211	0.57	0.48
167	4.93	0.211	0.57	0.47
167.25	4.93	0.21	0.57	0.47
167.5	4.94	0.209	0.56	0.47
167.75	4.94	0.209	0.56	0.46
168	4.95	0.208	0.56	0.47
168.25	4.95	0.207	0.56	0.46
168.5	4.96	0.207	0.56	0.47
168.75	4.96	0.206	0.55	0.46
169	4.96	0.205	0.55	0.46
169.25	4.97	0.204	0.55	0.46
169.5	4.97	0.204	0.55	0.46
169.75	4.98	0.203	0.55	0.46
170	4.98	0.202	0.54	0.46
170.25	4.99	0.201	0.54	0.46
170.5	4.99	0.201	0.54	0.45
170.75	4.99	0.2	0.54	0.45
171	5	0.199	0.54	0.45
171.25	5	0.199	0.54	0.45
171.5	5.01	0.198	0.53	0.45
171.75	5.01	0.197	0.53	0.45
172	5.01	0.196	0.53	0.44
172.25	5.02	0.195	0.53	0.45
172.5	5.02	0.195	0.53	0.44
172.75	5.03	0.194	0.52	0.45
173	5.03	0.193	0.52	0.44
173.25	5.03	0.192	0.52	0.44
173.5	5.04	0.192	0.52	0.44
173.75	5.04	0.191	0.51	0.44
174	5.05	0.19	0.51	0.44
174.25	5.05	0.189	0.51	0.44
174.5	5.05	0.188	0.51	0.43
174.75	5.06	0.187	0.50	0.43
175	5.06	0.187	0.50	0.43
175.25	5.07	0.186	0.50	0.43
175.5	5.07	0.185	0.50	0.43
175.75	5.07	0.184	0.50	0.42
176	5.08	0.183	0.49	0.43
176.25	5.08	0.182	0.49	0.42
176.5	5.08	0.181	0.49	0.42
176.75	5.09	0.181	0.49	0.42
177	5.09	0.18	0.48	0.42
177.25	5.1	0.179	0.48	0.42
177.5	5.1	0.178	0.48	0.42
177.75	5.1	0.177	0.48	0.41
178	5.11	0.176	0.47	0.42
178.25	5.11	0.175	0.47	0.41
178.5	5.11	0.174	0.47	0.41
178.75	5.12	0.173	0.47	0.41
179	5.12	0.172	0.46	0.41

179.25	5.12	0.171	0.46	0.40
179.5	5.13	0.17	0.46	0.41
179.75	5.13	0.169	0.46	0.40
180	5.14	0.168	0.45	0.41
180.25	5.14	0.167	0.45	0.40
180.5	5.14	0.166	0.45	0.40
180.75	5.15	0.165	0.44	0.40
181	5.15	0.164	0.44	0.40
181.25	5.15	0.163	0.44	0.39
181.5	5.16	0.162	0.44	0.40
181.75	5.16	0.161	0.43	0.39
182	5.16	0.16	0.43	0.39
182.25	5.17	0.159	0.43	0.40
182.5	5.17	0.158	0.43	0.39
182.75	5.17	0.157	0.42	0.39
183	5.18	0.156	0.42	0.39
183.25	5.18	0.155	0.42	0.39
183.5	5.18	0.154	0.41	0.38
183.75	5.19	0.152	0.41	0.39
184	5.19	0.151	0.41	0.38
184.25	5.19	0.15	0.40	0.38
184.5	5.19	0.149	0.40	0.37
184.75	5.2	0.148	0.40	0.38
185	5.2	0.146	0.39	0.37
185.25	5.2	0.145	0.39	0.37
185.5	5.21	0.144	0.39	0.37
185.75	5.21	0.143	0.39	0.37
186	5.21	0.141	0.38	0.36
186.25	5.22	0.14	0.38	0.37
186.5	5.22	0.139	0.37	0.37
186.75	5.22	0.137	0.37	0.36
187	5.22	0.136	0.37	0.36
187.25	5.23	0.135	0.36	0.36
187.5	5.23	0.133	0.36	0.36
187.75	5.23	0.132	0.36	0.35
188	5.24	0.13	0.35	0.36
188.25	5.24	0.129	0.35	0.35
188.5	5.24	0.128	0.34	0.35
188.75	5.24	0.126	0.34	0.34
189	5.25	0.124	0.33	0.35
189.25	5.25	0.123	0.33	0.35
189.5	5.25	0.121	0.33	0.34
189.75	5.25	0.12	0.32	0.34
190	5.26	0.118	0.32	0.34
190.25	5.26	0.116	0.31	0.34
190.5	5.26	0.115	0.31	0.33
190.75	5.26	0.113	0.30	0.33
191	5.27	0.111	0.30	0.34
191.25	5.27	0.109	0.29	0.33
191.5	5.27	0.107	0.29	0.33
191.75	5.27	0.105	0.28	0.32
192	5.27	0.103	0.28	0.32

192.25	5.28	0.101	0.27	0.32
192.5	5.28	0.099	0.27	0.32
192.75	5.28	0.096	0.26	0.32
193	5.28	0.093	0.25	0.31
193.25	5.28	0.089	0.24	0.31
193.5	5.29	0.086	0.23	0.31
193.75	5.29	0.082	0.22	0.31
194	5.29	0.079	0.21	0.30
194.25	5.29	0.076	0.20	0.30
194.5	5.29	0.074	0.20	0.30
194.75	5.29	0.072	0.19	0.29
195	5.3	0.069	0.19	0.30
195.25	5.3	0.067	0.18	0.29
195.5	5.3	0.064	0.17	0.29
195.75	5.3	0.062	0.17	0.29
196	5.3	0.059	0.16	0.28
196.25	5.3	0.056	0.15	0.28
196.5	5.3	0.053	0.14	0.27
196.75	5.3	0.051	0.14	0.27
197	5.31	0.048	0.13	0.28
197.25	5.31	0.046	0.12	0.27
197.5	5.31	0.043	0.12	0.27
197.75	5.31	0.041	0.11	0.26
198	5.31	0.038	0.10	0.26
198.25	5.31	0.036	0.10	0.26
198.5	5.31	0.034	0.09	0.25
198.75	5.31	0.032	0.09	0.25
199	5.31	0.03	0.08	0.24
199.25	5.31	0.028	0.08	0.24
199.5	5.31	0.026	0.07	0.24
199.75	5.31	0.025	0.07	0.23
200	5.31	0.023	0.06	0.23
200.01	5.31	0.023	0.06	0.23

Mayo Warehouse Revised 1-6-04
SCENARIO 1

Simulation	Node	Group	Time hrs	Stage ft	Warning Stage ft	Surface Area ft2	Total Inflow cfs	Total Outflow cfs	Total Vol In af	Total Vol Out af
10 yr 72 hr	Site	BASE	0.00	18.500	24.000	113	0.000	0.000	0.00	0.00
10 yr 72 hr	Site	BASE	0.26	18.500	24.000	113	0.000	0.000	0.00	0.00
10 yr 72 hr	Site	BASE	0.50	18.500	24.000	113	0.000	0.000	0.00	0.00
10 yr 72 hr	Site	BASE	0.77	18.500	24.000	113	0.000	0.000	0.00	0.00
10 yr 72 hr	Site	BASE	1.02	18.500	24.000	113	0.000	0.000	0.00	0.00
10 yr 72 hr	Site	BASE	1.27	18.500	24.000	113	0.000	0.000	0.00	0.00
10 yr 72 hr	Site	BASE	1.52	18.500	24.000	113	0.000	0.000	0.00	0.00
10 yr 72 hr	Site	BASE	1.77	18.500	24.000	113	0.000	0.000	0.00	0.00
10 yr 72 hr	Site	BASE	2.0.	18.500	24.000	113	0.000	0.000	0.00	0.00
10 yr 72 hr	Site	BASE	2.27	18.500	24.000	113	0.000	0.000	0.00	0.00
10 yr 72 hr	Site	BASE	2.52	18.500	24.000	113	0.000	0.000	0.00	0.00
10 yr 72 hr	Site	BASE	2.77	18.500	24.000	113	0.000	0.000	0.00	0.00
10 yr 72 hr	Site	BASE	3.02	18.500	24.000	113	0.000	0.000	0.00	0.00
10 yr 72 hr	Site	BASE	3.27	18.500	24.000	113	0.000	0.000	0.00	0.00
10 yr 72 hr	Site	BASE	3.52	18.500	24.000	113	0.000	0.000	0.00	0.00
10 yr 72 hr	Site	BASE	3.77	18.500	24.000	113	0.000	0.000	0.00	0.00
10 yr 72 hr	Site	BASE	4.02	18.500	24.000	113	0.000	0.000	0.00	0.00
10 yr 72 hr	Site	BASE	4.27	18.500	24.000	113	0.000	0.000	0.00	0.00
10 yr 72 hr	Site	BASE	4.52	18.500	24.000	113	0.000	0.000	0.00	0.00
10 yr 72 hr	Site	BASE	4.77	18.500	24.000	113	0.000	0.000	0.00	0.00
10 yr 72 hr	Site	BASE	5.02	18.500	24.000	113	0.000	0.000	0.00	0.00
10 yr 72 hr	Site	BASE	5.27	18.502	24.000	113	0.001	0.000	0.00	0.00
10 yr 72 hr	Site	BASE	5.52	18.510	24.000	392	0.003	0.000	0.00	0.00
10 yr 72 hr	Site	BASE	5.77	18.519	24.000	748	0.008	0.000	0.00	0.00
10 yr 72 hr	Site	BASE	6.02	18.528	24.000	1140	0.014	0.001	0.00	0.00
10 yr 72 hr	Site	BASE	6.27	18.538	24.000	1539	0.019	0.002	0.00	0.00
10 yr 72 hr	Site	BASE	6.52	18.548	24.000	1936	0.025	0.004	0.00	0.00
10 yr 72 hr	Site	BASE	6.77	18.558	24.000	2326	0.030	0.006	0.00	0.00
10 yr 72 hr	Site	BASE	7.02	18.568	24.000	2708	0.036	0.008	0.00	0.00
10 yr 72 hr	Site	BASE	7.27	18.577	24.000	3076	0.041	0.010	0.00	0.00
10 yr 72 hr	Site	BASE	7.52	18.586	24.000	3436	0.046	0.012	0.00	0.00
10 yr 72 hr	Site	BASE	7.77	18.594	24.000	3785	0.051	0.015	0.01	0.00
10 yr 72 hr	Site	BASE	8.02	18.603	24.000	4125	0.056	0.017	0.01	0.00
10 yr 72 hr	Site	BASE	8.27	18.611	24.000	4456	0.060	0.020	0.01	0.00
10 yr 72 hr	Site	BASE	8.52	18.619	24.000	4778	0.065	0.023	0.01	0.00
10 yr 72 hr	Site	BASE	8.77	18.627	24.000	5091	0.069	0.026	0.01	0.00
10 yr 72 hr	Site	BASE	9.02	18.635	24.000	5396	0.074	0.029	0.01	0.00
10 yr 72 hr	Site	BASE	9.27	18.642	24.000	5693	0.078	0.032	0.01	0.00
10 yr 72 hr	Site	BASE	9.52	18.649	24.000	5983	0.082	0.034	0.01	0.00
10 yr 72 hr	Site	BASE	9.77	18.656	24.000	6266	0.086	0.037	0.02	0.01
10 yr 72 hr	Site	BASE	10.02	18.663	24.000	6542	0.090	0.040	0.02	0.01
10 yr 72 hr	Site	BASE	10.27	18.670	24.000	6813	0.094	0.043	0.02	0.01
10 yr 72 hr	Site	BASE	10.52	18.677	24.000	7077	0.097	0.046	0.02	0.01
10 yr 72 hr	Site	BASE	10.77	18.683	24.000	7336	0.101	0.049	0.02	0.01
10 yr 72 hr	Site	BASE	11.02	18.689	24.000	7590	0.105	0.052	0.03	0.01
10 yr 72 hr	Site	BASE	11.27	18.696	24.000	7839	0.108	0.054	0.03	0.01
10 yr 72 hr	Site	BASE	11.52	18.702	24.000	8084	0.111	0.057	0.03	0.01
10 yr 72 hr	Site	BASE	11.77	18.708	24.000	8325	0.115	0.060	0.03	0.01
10 yr 72 hr	Site	BASE	12.02	18.714	24.000	8562	0.118	0.062	0.04	0.01
10 yr 72 hr	Site	BASE	12.27	18.719	24.000	8796	0.121	0.065	0.04	0.02
10 yr 72 hr	Site	BASE	12.52	18.725	24.000	9027	0.124	0.067	0.04	0.02
10 yr 72 hr	Site	BASE	12.77	18.731	24.000	9256	0.127	0.069	0.04	0.02
10 yr 72 hr	Site	BASE	13.02	18.737	24.000	9483	0.130	0.071	0.05	0.02
10 yr 72 hr	Site	BASE	13.27	18.742	24.000	9708	0.133	0.073	0.05	0.02
10 yr 72 hr	Site	BASE	13.52	18.748	24.000	9933	0.136	0.074	0.05	0.02
10 yr 72 hr	Site	BASE	13.77	18.753	24.000	10158	0.139	0.076	0.05	0.02
10 yr 72 hr	Site	BASE	14.02	18.759	24.000	10379	0.142	0.079	0.06	0.03
10 yr 72 hr	Site	BASE	14.27	18.764	24.000	10596	0.144	0.081	0.06	0.03
10 yr 72 hr	Site	BASE	14.52	18.770	24.000	10808	0.147	0.084	0.06	0.03
10 yr 72 hr	Site	BASE	14.77	18.775	24.000	11016	0.149	0.086	0.07	0.03
10 yr 72 hr	Site	BASE	15.02	18.780	24.000	11220	0.152	0.089	0.07	0.03
10 yr 72 hr	Site	BASE	15.27	18.785	24.000	11421	0.154	0.091	0.07	0.04
10 yr 72 hr	Site	BASE	15.52	18.790	24.000	11618	0.157	0.094	0.08	0.04
10 yr 72 hr	Site	BASE	15.77	18.795	24.000	11811	0.159	0.096	0.08	0.04
10 yr 72 hr	Site	BASE	16.02	18.799	24.000	12002	0.161	0.099	0.08	0.04
10 yr 72 hr	Site	BASE	16.27	18.804	24.000	12190	0.164	0.100	0.09	0.04
10 yr 72 hr	Site	BASE	16.52	18.809	24.000	12379	0.166	0.101	0.09	0.05
10 yr 72 hr	Site	BASE	16.77	18.814	24.000	12567	0.168	0.103	0.09	0.05
10 yr 72 hr	Site	BASE	17.02	18.818	24.000	12755	0.170	0.104	0.10	0.05
10 yr 72 hr	Site	BASE	17.27	18.823	24.000	12942	0.172	0.105	0.10	0.05
10 yr 72 hr	Site	BASE	17.52	18.828	24.000	13129	0.174	0.106	0.10	0.05
10 yr 72 hr	Site	BASE	17.77	18.832	24.000	13316	0.176	0.108	0.11	0.06
10 yr 72 hr	Site	BASE	18.02	18.837	24.000	13502	0.178	0.109	0.11	0.06
10 yr 72 hr	Site	BASE	18.27	18.842	24.000	13687	0.180	0.110	0.11	0.06
10 yr 72 hr	Site	BASE	18.52	18.846	24.000	13872	0.182	0.111	0.12	0.06
10 yr 72 hr	Site	BASE	18.77	18.851	24.000	14057	0.184	0.112	0.12	0.06
10 yr 72 hr	Site	BASE	19.02	18.855	24.000	14241	0.186	0.113	0.13	0.07
10 yr 72 hr	Site	BASE	19.27	18.860	24.000	14424	0.188	0.114	0.13	0.07
10 yr 72 hr	Site	BASE	19.52	18.864	24.000	14606	0.189	0.116	0.13	0.07
10 yr 72 hr	Site	BASE	19.77	18.869	24.000	14788	0.191	0.117	0.14	0.07
10 yr 72 hr	Site	BASE	20.02	18.874	24.000	14969	0.193	0.118	0.14	0.08
10 yr 72 hr	Site	BASE	20.27	18.878	24.000	15150	0.194	0.119	0.14	0.08
10 yr 72 hr	Site	BASE	20.52	18.883	24.000	15329	0.196	0.120	0.15	0.08
10 yr 72 hr	Site	BASE	20.77	18.887	24.000	15508	0.198	0.121	0.15	0.08
10 yr 72 hr	Site	BASE	21.02	18.891	24.000	15687	0.199	0.122	0.16	0.09
10 yr 72 hr	Site	BASE	21.27	18.896	24.000	15864	0.201	0.123	0.16	0.09
10 yr 72 hr	Site	BASE	21.52	18.900	24.000	16041	0.202	0.124	0.17	0.09
10 yr 72 hr	Site	BASE	21.77	18.905	24.000	16217	0.204	0.125	0.17	0.09
10 yr 72 hr	Site	BASE	22.02	18.909	24.000	16392	0.205	0.126	0.17	0.10
10 yr 72 hr	Site	BASE	22.27	18.913	24.000	16566	0.207	0.127	0.18	0.10
10 yr 72 hr	Site	BASE	22.52	18.918	24.000	16740	0.208	0.128	0.18	0.10
10 yr 72 hr	Site	BASE	22.77	18.922	24.000	16912	0.210	0.129	0.19	0.10
10 yr 72 hr	Site	BASE	23.02	18.926	24.000	17084	0.211	0.130	0.19	0.11
10 yr 72 hr	Site	BASE	23.27	18.931	24.000	17256	0.212	0.131	0.20	0.11
10 yr 72 hr	Site	BASE	23.52	18.935	24.000	17426	0.214	0.131	0.20	0.11
10 yr 72 hr	Site	BASE	23.77	18.939	24.000	17596	0.217	0.132	0.20	0.12
10 yr 72 hr	Site	BASE	24.02	18.944	24.000	17803	0.252	0.133	0.21	0.12

Mayo Warehouse Revised 1-6-04
SCENARIO 1

Simulation	Node	Group	Time hrs	Stage ft	Warning Stage ft	Surface Area ft2	Total Inflow cfs	Total Outflow cfs	Total Vol In af	Total Vol Out af
10 yr 72 hr	Site	BASE	24.27	18.951	24.000	18086	0.296	0.135	0.21	0.12
10 yr 72 hr	Site	BASE	24.52	18.960	24.000	18419	0.312	0.137	0.22	0.12
10 yr 72 hr	Site	BASE	24.77	18.968	24.000	18765	0.319	0.138	0.23	0.13
10 yr 72 hr	Site	BASE	25.02	18.977	24.000	19111	0.323	0.140	0.23	0.13
10 yr 72 hr	Site	BASE	25.27	18.985	24.000	19455	0.326	0.142	0.24	0.13
10 yr 72 hr	Site	BASE	25.52	18.996	24.000	19794	0.328	0.143	0.25	0.14
10 yr 72 hr	Site	BASE	25.77	19.002	24.000	20129	0.331	0.145	0.25	0.14
10 yr 72 hr	Site	BASE	26.02	19.011	24.000	20460	0.333	0.147	0.26	0.14
10 yr 72 hr	Site	BASE	26.27	19.019	24.000	20787	0.335	0.148	0.27	0.14
10 yr 72 hr	Site	BASE	26.52	19.027	24.000	21110	0.337	0.150	0.28	0.15
10 yr 72 hr	Site	BASE	26.77	19.035	24.000	21429	0.340	0.151	0.28	0.15
10 yr 72 hr	Site	BASE	27.02	19.043	24.000	21744	0.342	0.153	0.29	0.15
10 yr 72 hr	Site	BASE	27.27	19.050	24.000	22056	0.344	0.154	0.30	0.16
10 yr 72 hr	Site	BASE	27.52	19.058	24.000	22365	0.346	0.155	0.30	0.16
10 yr 72 hr	Site	BASE	27.77	19.066	24.000	22670	0.348	0.157	0.31	0.16
10 yr 72 hr	Site	BASE	28.02	19.073	24.000	22972	0.349	0.158	0.32	0.17
10 yr 72 hr	Site	BASE	28.27	19.081	24.000	23271	0.351	0.159	0.33	0.17
10 yr 72 hr	Site	BASE	28.52	19.088	24.000	23567	0.353	0.161	0.33	0.17
10 yr 72 hr	Site	BASE	28.77	19.095	24.000	23860	0.355	0.162	0.34	0.18
10 yr 72 hr	Site	BASE	29.02	19.103	24.000	24150	0.357	0.163	0.35	0.18
10 yr 72 hr	Site	BASE	29.27	19.110	24.000	24438	0.358	0.164	0.35	0.18
10 yr 72 hr	Site	BASE	29.52	19.117	24.000	24723	0.360	0.166	0.36	0.19
10 yr 72 hr	Site	BASE	29.77	19.124	24.000	25005	0.362	0.167	0.37	0.19
10 yr 72 hr	Site	BASE	30.02	19.131	24.000	25285	0.363	0.168	0.38	0.19
10 yr 72 hr	Site	BASE	30.27	19.138	24.000	25563	0.365	0.169	0.38	0.20
10 yr 72 hr	Site	BASE	30.52	19.145	24.000	25838	0.366	0.170	0.39	0.20
10 yr 72 hr	Site	BASE	30.77	19.152	24.000	26110	0.368	0.171	0.40	0.20
10 yr 72 hr	Site	BASE	31.02	19.158	24.000	26381	0.369	0.172	0.41	0.21
10 yr 72 hr	Site	BASE	31.27	19.165	24.000	26649	0.371	0.174	0.41	0.21
10 yr 72 hr	Site	BASE	31.52	19.172	24.000	26915	0.372	0.175	0.42	0.22
10 yr 72 hr	Site	BASE	31.77	19.178	24.000	27178	0.374	0.176	0.43	0.22
10 yr 72 hr	Site	BASE	32.02	19.185	24.000	27440	0.375	0.177	0.44	0.22
10 yr 72 hr	Site	BASE	32.27	19.191	24.000	27700	0.376	0.178	0.45	0.23
10 yr 72 hr	Site	BASE	32.52	19.198	24.000	27957	0.378	0.179	0.45	0.23
10 yr 72 hr	Site	BASE	32.77	19.204	24.000	28213	0.379	0.180	0.46	0.23
10 yr 72 hr	Site	BASE	33.02	19.210	24.000	28467	0.380	0.181	0.47	0.24
10 yr 72 hr	Site	BASE	33.27	19.217	24.000	28719	0.381	0.182	0.48	0.24
10 yr 72 hr	Site	BASE	33.52	19.223	24.000	28969	0.383	0.183	0.48	0.24
10 yr 72 hr	Site	BASE	33.77	19.229	24.000	29217	0.384	0.184	0.49	0.25
10 yr 72 hr	Site	BASE	34.02	19.235	24.000	29463	0.385	0.185	0.50	0.25
10 yr 72 hr	Site	BASE	34.27	19.241	24.000	29708	0.386	0.185	0.51	0.26
10 yr 72 hr	Site	BASE	34.52	19.247	24.000	29951	0.387	0.186	0.52	0.26
10 yr 72 hr	Site	BASE	34.77	19.253	24.000	30192	0.388	0.187	0.52	0.26
10 yr 72 hr	Site	BASE	35.02	19.259	24.000	30432	0.390	0.188	0.53	0.27
10 yr 72 hr	Site	BASE	35.27	19.265	24.000	30670	0.391	0.189	0.54	0.27
10 yr 72 hr	Site	BASE	35.52	19.271	24.000	30906	0.392	0.190	0.55	0.28
10 yr 72 hr	Site	BASE	35.77	19.277	24.000	31141	0.393	0.191	0.56	0.28
10 yr 72 hr	Site	BASE	36.02	19.283	24.000	31375	0.395	0.192	0.57	0.28
10 yr 72 hr	Site	BASE	36.27	19.289	24.000	31609	0.398	0.192	0.57	0.29
10 yr 72 hr	Site	BASE	36.52	19.295	24.000	31843	0.399	0.193	0.58	0.29
10 yr 72 hr	Site	BASE	36.77	19.300	24.000	32076	0.401	0.194	0.59	0.30
10 yr 72 hr	Site	BASE	37.02	19.306	24.000	32308	0.402	0.195	0.60	0.30
10 yr 72 hr	Site	BASE	37.27	19.312	24.000	32538	0.403	0.196	0.61	0.30
10 yr 72 hr	Site	BASE	37.52	19.318	24.000	32767	0.404	0.197	0.61	0.31
10 yr 72 hr	Site	BASE	37.77	19.323	24.000	32994	0.405	0.197	0.62	0.31
10 yr 72 hr	Site	BASE	38.02	19.329	24.000	33220	0.405	0.198	0.63	0.32
10 yr 72 hr	Site	BASE	38.27	19.335	24.000	33444	0.406	0.199	0.64	0.32
10 yr 72 hr	Site	BASE	38.52	19.340	24.000	33667	0.407	0.200	0.65	0.32
10 yr 72 hr	Site	BASE	38.77	19.346	24.000	33889	0.408	0.201	0.66	0.33
10 yr 72 hr	Site	BASE	39.02	19.351	24.000	34109	0.409	0.201	0.67	0.33
10 yr 72 hr	Site	BASE	39.27	19.357	24.000	34328	0.410	0.202	0.67	0.34
10 yr 72 hr	Site	BASE	39.52	19.362	24.000	34546	0.411	0.203	0.68	0.34
10 yr 72 hr	Site	BASE	39.77	19.367	24.000	34762	0.411	0.204	0.69	0.34
10 yr 72 hr	Site	BASE	40.02	19.373	24.000	34977	0.412	0.204	0.70	0.35
10 yr 72 hr	Site	BASE	40.27	19.378	24.000	35191	0.413	0.205	0.71	0.35
10 yr 72 hr	Site	BASE	40.52	19.383	24.000	35403	0.414	0.206	0.72	0.36
10 yr 72 hr	Site	BASE	40.77	19.389	24.000	35615	0.415	0.206	0.72	0.36
10 yr 72 hr	Site	BASE	41.02	19.394	24.000	35825	0.415	0.207	0.73	0.37
10 yr 72 hr	Site	BASE	41.27	19.399	24.000	36034	0.416	0.208	0.74	0.37
10 yr 72 hr	Site	BASE	41.52	19.404	24.000	36242	0.417	0.209	0.75	0.37
10 yr 72 hr	Site	BASE	41.77	19.409	24.000	36448	0.417	0.209	0.76	0.38
10 yr 72 hr	Site	BASE	42.02	19.415	24.000	36654	0.418	0.210	0.77	0.38
10 yr 72 hr	Site	BASE	42.27	19.420	24.000	36858	0.419	0.211	0.78	0.39
10 yr 72 hr	Site	BASE	42.52	19.425	24.000	37061	0.419	0.211	0.78	0.39
10 yr 72 hr	Site	BASE	42.77	19.430	24.000	37264	0.420	0.212	0.79	0.40
10 yr 72 hr	Site	BASE	43.02	19.435	24.000	37465	0.421	0.213	0.80	0.40
10 yr 72 hr	Site	BASE	43.27	19.440	24.000	37665	0.421	0.213	0.81	0.40
10 yr 72 hr	Site	BASE	43.52	19.445	24.000	37863	0.422	0.214	0.82	0.41
10 yr 72 hr	Site	BASE	43.77	19.450	24.000	38061	0.423	0.215	0.83	0.41
10 yr 72 hr	Site	BASE	44.02	19.455	24.000	38258	0.423	0.215	0.84	0.42
10 yr 72 hr	Site	BASE	44.27	19.460	24.000	38454	0.424	0.216	0.85	0.42
10 yr 72 hr	Site	BASE	44.52	19.464	24.000	38649	0.425	0.216	0.85	0.43
10 yr 72 hr	Site	BASE	44.77	19.469	24.000	38843	0.425	0.217	0.86	0.43
10 yr 72 hr	Site	BASE	45.02	19.474	24.000	39035	0.426	0.218	0.87	0.44
10 yr 72 hr	Site	BASE	45.27	19.479	24.000	39227	0.426	0.218	0.88	0.44
10 yr 72 hr	Site	BASE	45.52	19.484	24.000	39418	0.427	0.219	0.89	0.45
10 yr 72 hr	Site	BASE	45.77	19.488	24.000	39608	0.427	0.219	0.90	0.45
10 yr 72 hr	Site	BASE	46.02	19.493	24.000	39797	0.428	0.220	0.91	0.45
10 yr 72 hr	Site	BASE	46.27	19.498	24.000	39985	0.429	0.221	0.92	0.46
10 yr 72 hr	Site	BASE	46.52	19.502	24.000	40096	0.429	0.221	0.93	0.46
10 yr 72 hr	Site	BASE	46.77	19.507	24.000	40137	0.430	0.222	0.93	0.47
10 yr 72 hr	Site	BASE	47.02	19.512	24.000	40177	0.430	0.222	0.94	0.47
10 yr 72 hr	Site	BASE	47.27	19.516	24.000	40218	0.431	0.223	0.95	0.48
10 yr 72 hr	Site	BASE	47.52	19.521	24.000	40258	0.431	0.224	0.96	0.48
10 yr 72 hr	Site	BASE	47.77	19.526	24.000	40299	0.433	0.224	0.97	0.49
10 yr 72 hr	Site	BASE	48.02	19.530	24.000	40341	0.449	0.225	0.98	0.49
10 yr 72 hr	Site	BASE	48.27	19.536	24.000	40387	0.470	0.225	0.99	0.50

Simulation	Node	Group	Time hrs	Stage ft	Warning Stage ft	Surface Area ft2	Total Inflow cfs	Total Outflow cfs	Total Vol In af	Total Vol Out af
10 yr 72 hr	Site	BASE	48.52	19.541	24.000	40435	0.478	0.226	1.00	0.50
10 yr 72 hr	Site	BASE	48.77	19.547	24.000	40484	0.481	0.227	1.01	0.50
10 yr 72 hr	Site	BASE	49.02	19.553	24.000	40533	0.486	0.227	1.02	0.51
10 yr 72 hr	Site	BASE	49.27	19.558	24.000	40584	0.491	0.228	1.03	0.51
10 yr 72 hr	Site	BASE	49.52	19.564	24.000	40635	0.493	0.229	1.04	0.52
10 yr 72 hr	Site	BASE	49.77	19.570	24.000	40686	0.496	0.230	1.05	0.52
10 yr 72 hr	Site	BASE	50.02	19.576	24.000	40740	0.528	0.230	1.06	0.53
10 yr 72 hr	Site	BASE	50.27	19.583	24.000	40801	0.550	0.231	1.07	0.53
10 yr 72 hr	Site	BASE	50.52	19.591	24.000	40866	0.580	0.232	1.08	0.54
10 yr 72 hr	Site	BASE	50.77	19.599	24.000	40933	0.586	0.233	1.09	0.54
10 yr 72 hr	Site	BASE	51.02	19.606	24.000	41003	0.606	0.234	1.11	0.55
10 yr 72 hr	Site	BASE	51.27	19.615	24.000	41076	0.630	0.235	1.12	0.55
10 yr 72 hr	Site	BASE	51.52	19.624	24.000	41152	0.639	0.236	1.13	0.56
10 yr 72 hr	Site	BASE	51.77	19.632	24.000	41229	0.647	0.237	1.15	0.56
10 yr 72 hr	Site	BASE	52.02	19.642	24.000	41313	0.715	0.238	1.16	0.57
10 yr 72 hr	Site	BASE	52.27	19.653	24.000	41412	0.798	0.240	1.18	0.57
10 yr 72 hr	Site	BASE	52.52	19.666	24.000	41520	0.827	0.241	1.19	0.58
10 yr 72 hr	Site	BASE	52.77	19.679	24.000	41639	0.842	0.242	1.21	0.58
10 yr 72 hr	Site	BASE	53.02	19.692	24.000	41751	0.913	0.244	1.23	0.59
10 yr 72 hr	Site	BASE	53.27	19.708	24.000	41885	0.999	0.246	1.25	0.59
10 yr 72 hr	Site	BASE	53.52	19.724	24.000	42028	1.029	0.248	1.27	0.60
10 yr 72 hr	Site	BASE	53.77	19.741	24.000	42174	1.044	0.250	1.29	0.60
10 yr 72 hr	Site	BASE	54.02	19.759	24.000	42329	1.119	0.251	1.31	0.61
10 yr 72 hr	Site	BASE	54.27	19.778	24.000	42497	1.209	0.254	1.34	0.61
10 yr 72 hr	Site	BASE	54.52	19.799	24.000	42676	1.240	0.256	1.36	0.62
10 yr 72 hr	Site	BASE	54.77	19.819	24.000	42857	1.256	0.258	1.39	0.62
10 yr 72 hr	Site	BASE	55.02	19.841	24.000	43046	1.332	0.260	1.41	0.63
10 yr 72 hr	Site	BASE	55.27	19.864	24.000	43249	1.423	0.263	1.44	0.63
10 yr 72 hr	Site	BASE	55.52	19.889	24.000	43462	1.455	0.266	1.47	0.64
10 yr 72 hr	Site	BASE	55.77	19.913	24.000	43677	1.473	0.268	1.50	0.65
10 yr 72 hr	Site	BASE	56.02	19.939	24.000	43900	1.563	0.271	1.53	0.65
10 yr 72 hr	Site	BASE	56.27	19.967	24.000	44140	1.672	0.274	1.57	0.66
10 yr 72 hr	Site	BASE	56.52	19.995	24.000	44391	1.711	0.277	1.60	0.66
10 yr 72 hr	Site	BASE	56.77	20.025	24.000	44667	1.733	0.279	1.64	0.67
10 yr 72 hr	Site	BASE	57.02	20.055	24.000	44957	1.849	0.282	1.67	0.67
10 yr 72 hr	Site	BASE	57.27	20.088	24.000	45270	1.993	0.286	1.71	0.68
10 yr 72 hr	Site	BASE	57.52	20.122	24.000	45605	2.105	0.289	1.76	0.69
10 yr 72 hr	Site	BASE	57.77	20.159	24.000	45956	2.205	0.293	1.80	0.69
10 yr 72 hr	Site	BASE	58.02	20.197	24.000	46323	2.322	0.304	1.85	0.70
10 yr 72 hr	Site	BASE	58.27	20.238	24.000	46708	2.458	0.321	1.90	0.70
10 yr 72 hr	Site	BASE	58.52	20.281	24.000	47128	2.782	0.342	1.95	0.71
10 yr 72 hr	Site	BASE	58.77	20.331	24.000	47606	3.197	0.369	2.01	0.72
10 yr 72 hr	Site	BASE	59.02	20.391	24.000	48180	3.946	0.394	2.09	0.73
10 yr 72 hr	Site	BASE	59.26	20.463	24.000	48866	5.134	0.416	2.18	0.73
10 yr 72 hr	Site	BASE	59.50	20.637	24.000	50531	15.397	0.462	2.39	0.74
10 yr 72 hr	Site	BASE	59.75	21.006	24.000	54072	28.827	0.581	2.84	0.75
10 yr 72 hr	Site	BASE	60.00	21.422	24.000	58062	24.031	0.614	3.39	0.77
10 yr 72 hr	Site	BASE	60.25	21.692	24.000	61150	13.189	0.656	3.77	0.78
10 yr 72 hr	Site	BASE	60.50	21.840	24.000	62956	8.306	0.678	3.99	0.79
10 yr 72 hr	Site	BASE	60.76	21.929	24.000	64034	5.493	0.690	4.14	0.81
10 yr 72 hr	Site	BASE	61.01	21.988	24.000	64756	4.154	0.699	4.24	0.82
10 yr 72 hr	Site	BASE	61.25	22.028	24.000	67990	3.377	0.704	4.31	0.84
10 yr 72 hr	Site	BASE	61.50	22.060	24.000	71502	2.943	0.709	4.38	0.85
10 yr 72 hr	Site	BASE	61.75	22.085	24.000	74340	2.631	0.712	4.44	0.86
10 yr 72 hr	Site	BASE	62.00	22.106	24.000	76653	2.302	0.715	4.49	0.88
10 yr 72 hr	Site	BASE	62.25	22.123	24.000	78476	1.971	0.717	4.53	0.89
10 yr 72 hr	Site	BASE	62.50	22.136	24.000	79942	1.798	0.719	4.57	0.91
10 yr 72 hr	Site	BASE	62.75	22.147	24.000	81149	1.676	0.721	4.61	0.92
10 yr 72 hr	Site	BASE	63.00	22.158	24.000	82335	1.633	0.722	4.64	0.94
10 yr 72 hr	Site	BASE	63.25	22.167	24.000	83420	1.618	0.723	4.67	0.95
10 yr 72 hr	Site	BASE	63.50	22.177	24.000	84478	1.613	0.725	4.71	0.97
10 yr 72 hr	Site	BASE	63.75	22.186	24.000	85517	1.609	0.726	4.74	0.98
10 yr 72 hr	Site	BASE	64.00	22.194	24.000	86414	1.392	0.727	4.77	1.00
10 yr 72 hr	Site	BASE	64.25	22.200	24.000	87012	1.106	0.728	4.80	1.01
10 yr 72 hr	Site	BASE	64.50	22.203	24.000	87389	1.010	0.728	4.82	1.03
10 yr 72 hr	Site	BASE	64.75	22.206	24.000	87691	0.978	0.729	4.84	1.04
10 yr 72 hr	Site	BASE	65.00	22.208	24.000	87970	0.970	0.729	4.86	1.06
10 yr 72 hr	Site	BASE	65.25	22.211	24.000	88242	0.970	0.729	4.88	1.07
10 yr 72 hr	Site	BASE	65.50	22.213	24.000	88513	0.970	0.730	4.90	1.09
10 yr 72 hr	Site	BASE	65.75	22.216	24.000	88783	0.970	0.730	4.92	1.10
10 yr 72 hr	Site	BASE	66.00	22.218	24.000	89052	0.970	0.730	4.94	1.12
10 yr 72 hr	Site	BASE	66.25	22.221	24.000	89319	0.970	0.731	4.96	1.13
10 yr 72 hr	Site	BASE	66.50	22.223	24.000	89586	0.970	0.731	4.98	1.15
10 yr 72 hr	Site	BASE	66.75	22.225	24.000	89851	0.970	0.731	5.00	1.16
10 yr 72 hr	Site	BASE	67.00	22.228	24.000	90116	0.970	0.732	5.02	1.18
10 yr 72 hr	Site	BASE	67.25	22.230	24.000	90379	0.970	0.732	5.04	1.19
10 yr 72 hr	Site	BASE	67.50	22.233	24.000	90641	0.970	0.732	5.06	1.21
10 yr 72 hr	Site	BASE	67.75	22.235	24.000	90902	0.968	0.732	5.08	1.22
10 yr 72 hr	Site	BASE	68.00	22.237	24.000	91099	0.850	0.733	5.10	1.24
10 yr 72 hr	Site	BASE	68.25	22.237	24.000	91157	0.714	0.733	5.12	1.25
10 yr 72 hr	Site	BASE	68.50	22.237	24.000	91110	0.666	0.733	5.13	1.27
10 yr 72 hr	Site	BASE	68.75	22.236	24.000	91029	0.650	0.733	5.14	1.29
10 yr 72 hr	Site	BASE	69.00	22.235	24.000	90936	0.645	0.732	5.16	1.30
10 yr 72 hr	Site	BASE	69.25	22.234	24.000	90839	0.643	0.732	5.17	1.32
10 yr 72 hr	Site	BASE	69.50	22.234	24.000	90741	0.643	0.732	5.18	1.33
10 yr 72 hr	Site	BASE	69.75	22.233	24.000	90643	0.643	0.732	5.20	1.35
10 yr 72 hr	Site	BASE	70.00	22.232	24.000	90545	0.644	0.732	5.21	1.36
10 yr 72 hr	Site	BASE	70.25	22.231	24.000	90449	0.645	0.732	5.22	1.38
10 yr 72 hr	Site	BASE	70.50	22.230	24.000	90354	0.646	0.732	5.24	1.39
10 yr 72 hr	Site	BASE	70.75	22.229	24.000	90260	0.646	0.732	5.25	1.41
10 yr 72 hr	Site	BASE	71.00	22.228	24.000	90166	0.646	0.732	5.26	1.42
10 yr 72 hr	Site	BASE	71.25	22.227	24.000	90072	0.646	0.732	5.28	1.44
10 yr 72 hr	Site	BASE	71.50	22.227	24.000	89977	0.646	0.731	5.29	1.45
10 yr 72 hr	Site	BASE	71.75	22.226	24.000	89883	0.644	0.731	5.30	1.47
10 yr 72 hr	Site	BASE	72.00	22.224	24.000	89667	0.428	0.731	5.31	1.48
10 yr 72 hr	Site	BASE	72.25	22.219	24.000	89170	0.143	0.730	5.32	1.50
10 yr 72 hr	Site	BASE	72.50	22.213	24.000	88458	0.048	0.730	5.32	1.51

Simulation	Node	Group	Time hrs	Stage ft	Warning Stage ft	Surface Area ft2	Total Inflow cfs	Total Outflow cfs	Total Vol In af	Total Vol Out af
10 yr 72 hr	Site	BASE	72.75	22.206	24.000	67669	0.016	0.729	5.32	1.53
10 yr 72 hr	Site	BASE	73.00	22.198	24.000	86851	0.005	0.728	5.32	1.54
10 yr 72 hr	Site	BASE	73.25	22.191	24.000	86017	0.002	0.727	5.32	1.56
10 yr 72 hr	Site	BASE	73.50	22.183	24.000	85174	0.001	0.726	5.32	1.57
10 yr 72 hr	Site	BASE	73.75	22.176	24.000	84323	0.000	0.725	5.32	1.57
10 yr 72 hr	Site	BASE	74.00	22.168	24.000	83464	0.000	0.725	5.32	1.58
10 yr 72 hr	Site	BASE	74.25	22.160	24.000	82597	0.000	0.723	5.32	1.59
10 yr 72 hr	Site	BASE	74.50	22.152	24.000	81722	0.000	0.722	5.32	1.60
10 yr 72 hr	Site	BASE	74.75	22.144	24.000	80839	0.000	0.721	5.32	1.62
10 yr 72 hr	Site	BASE	75.00	22.136	24.000	79948	0.000	0.720	5.32	1.63
10 yr 72 hr	Site	BASE	75.25	22.128	24.000	79048	0.000	0.719	5.32	1.65
10 yr 72 hr	Site	BASE	75.50	22.120	24.000	78139	0.000	0.718	5.32	1.66
10 yr 72 hr	Site	BASE	75.75	22.111	24.000	77221	0.000	0.717	5.32	1.68
10 yr 72 hr	Site	BASE	76.00	22.103	24.000	76293	0.000	0.716	5.32	1.69
10 yr 72 hr	Site	BASE	76.25	22.094	24.000	75355	0.000	0.715	5.32	1.71
10 yr 72 hr	Site	BASE	76.50	22.086	24.000	74408	0.000	0.714	5.32	1.72
10 yr 72 hr	Site	BASE	76.75	22.077	24.000	73449	0.000	0.712	5.32	1.74
10 yr 72 hr	Site	BASE	77.00	22.068	24.000	72480	0.000	0.711	5.32	1.75
10 yr 72 hr	Site	BASE	77.25	22.060	24.000	71499	0.000	0.710	5.32	1.77
10 yr 72 hr	Site	BASE	77.50	22.051	24.000	70506	0.000	0.709	5.32	1.78
10 yr 72 hr	Site	BASE	77.75	22.042	24.000	69501	0.000	0.707	5.32	1.79
10 yr 72 hr	Site	BASE	78.00	22.032	24.000	68482	0.000	0.706	5.32	1.81
10 yr 72 hr	Site	BASE	78.25	22.023	24.000	67451	0.000	0.705	5.32	1.82
10 yr 72 hr	Site	BASE	78.50	22.014	24.000	66405	0.000	0.704	5.32	1.84
10 yr 72 hr	Site	BASE	78.75	22.004	24.000	65345	0.000	0.702	5.32	1.85
10 yr 72 hr	Site	BASE	79.00	21.994	24.000	64835	0.000	0.701	5.32	1.87
10 yr 72 hr	Site	BASE	79.25	21.985	24.000	64716	0.000	0.700	5.32	1.88
10 yr 72 hr	Site	BASE	79.50	21.975	24.000	64598	0.000	0.698	5.32	1.90
10 yr 72 hr	Site	BASE	79.75	21.965	24.000	64479	0.000	0.697	5.32	1.91
10 yr 72 hr	Site	BASE	80.00	21.955	24.000	64361	0.000	0.696	5.32	1.93
10 yr 72 hr	Site	BASE	80.25	21.946	24.000	64243	0.000	0.694	5.32	1.94
10 yr 72 hr	Site	BASE	80.50	21.936	24.000	64124	0.000	0.693	5.32	1.95
10 yr 72 hr	Site	BASE	80.75	21.926	24.000	64006	0.000	0.691	5.32	1.97
10 yr 72 hr	Site	BASE	81.00	21.917	24.000	63887	0.000	0.690	5.32	1.98
10 yr 72 hr	Site	BASE	81.25	21.907	24.000	63769	0.000	0.689	5.32	2.00
10 yr 72 hr	Site	BASE	81.50	21.897	24.000	63651	0.000	0.687	5.32	2.01
10 yr 72 hr	Site	BASE	81.75	21.888	24.000	63533	0.000	0.686	5.32	2.03
10 yr 72 hr	Site	BASE	82.00	21.878	24.000	63414	0.000	0.685	5.32	2.04
10 yr 72 hr	Site	BASE	82.25	21.868	24.000	63296	0.000	0.683	5.32	2.05
10 yr 72 hr	Site	BASE	82.50	21.858	24.000	63178	0.000	0.682	5.32	2.07
10 yr 72 hr	Site	BASE	82.75	21.849	24.000	63060	0.000	0.680	5.32	2.08
10 yr 72 hr	Site	BASE	83.00	21.839	24.000	62941	0.000	0.679	5.32	2.10
10 yr 72 hr	Site	BASE	83.25	21.829	24.000	62823	0.000	0.678	5.32	2.11
10 yr 72 hr	Site	BASE	83.50	21.820	24.000	62705	0.000	0.676	5.32	2.12
10 yr 72 hr	Site	BASE	83.75	21.810	24.000	62587	0.000	0.675	5.32	2.14
10 yr 72 hr	Site	BASE	84.00	21.800	24.000	62469	0.000	0.673	5.32	2.15
10 yr 72 hr	Site	BASE	84.25	21.791	24.000	62351	0.000	0.672	5.32	2.17
10 yr 72 hr	Site	BASE	84.50	21.781	24.000	62233	0.000	0.670	5.32	2.18
10 yr 72 hr	Site	BASE	84.75	21.771	24.000	62115	0.000	0.669	5.32	2.19
10 yr 72 hr	Site	BASE	85.00	21.762	24.000	61997	0.000	0.668	5.32	2.21
10 yr 72 hr	Site	BASE	85.25	21.752	24.000	61879	0.000	0.666	5.32	2.22
10 yr 72 hr	Site	BASE	85.50	21.742	24.000	61761	0.000	0.665	5.32	2.24
10 yr 72 hr	Site	BASE	85.75	21.733	24.000	61643	0.000	0.663	5.32	2.25
10 yr 72 hr	Site	BASE	86.00	21.723	24.000	61525	0.000	0.662	5.32	2.26
10 yr 72 hr	Site	BASE	86.25	21.713	24.000	61408	0.000	0.660	5.32	2.28
10 yr 72 hr	Site	BASE	86.50	21.704	24.000	61290	0.000	0.659	5.32	2.29
10 yr 72 hr	Site	BASE	86.75	21.694	24.000	61172	0.000	0.658	5.32	2.30
10 yr 72 hr	Site	BASE	87.00	21.684	24.000	61054	0.000	0.656	5.32	2.32
10 yr 72 hr	Site	BASE	87.25	21.675	24.000	60937	0.000	0.655	5.32	2.33
10 yr 72 hr	Site	BASE	87.50	21.665	24.000	60819	0.000	0.653	5.32	2.34
10 yr 72 hr	Site	BASE	87.75	21.655	24.000	60701	0.000	0.652	5.32	2.36
10 yr 72 hr	Site	BASE	88.00	21.646	24.000	60584	0.000	0.650	5.32	2.37
10 yr 72 hr	Site	BASE	88.25	21.636	24.000	60466	0.000	0.649	5.32	2.38
10 yr 72 hr	Site	BASE	88.50	21.626	24.000	60349	0.000	0.647	5.32	2.40
10 yr 72 hr	Site	BASE	88.75	21.617	24.000	60231	0.000	0.646	5.32	2.41
10 yr 72 hr	Site	BASE	89.00	21.607	24.000	60114	0.000	0.644	5.32	2.42
10 yr 72 hr	Site	BASE	89.25	21.598	24.000	59996	0.000	0.643	5.32	2.44
10 yr 72 hr	Site	BASE	89.50	21.588	24.000	59879	0.000	0.641	5.32	2.45
10 yr 72 hr	Site	BASE	89.75	21.578	24.000	59762	0.000	0.640	5.32	2.46
10 yr 72 hr	Site	BASE	90.00	21.569	24.000	59645	0.000	0.638	5.32	2.48
10 yr 72 hr	Site	BASE	90.25	21.559	24.000	59527	0.000	0.637	5.32	2.49
10 yr 72 hr	Site	BASE	90.50	21.550	24.000	59410	0.000	0.635	5.32	2.50
10 yr 72 hr	Site	BASE	90.75	21.540	24.000	59293	0.000	0.634	5.32	2.52
10 yr 72 hr	Site	BASE	91.00	21.530	24.000	59176	0.000	0.632	5.32	2.53
10 yr 72 hr	Site	BASE	91.25	21.521	24.000	59059	0.000	0.631	5.32	2.54
10 yr 72 hr	Site	BASE	91.50	21.511	24.000	58942	0.000	0.629	5.32	2.56
10 yr 72 hr	Site	BASE	91.75	21.502	24.000	58825	0.000	0.628	5.32	2.57
10 yr 72 hr	Site	BASE	92.00	21.492	24.000	58729	0.000	0.626	5.32	2.58
10 yr 72 hr	Site	BASE	92.25	21.482	24.000	58637	0.000	0.625	5.32	2.60
10 yr 72 hr	Site	BASE	92.50	21.473	24.000	58546	0.000	0.623	5.32	2.61
10 yr 72 hr	Site	BASE	92.75	21.463	24.000	58454	0.000	0.622	5.32	2.62
10 yr 72 hr	Site	BASE	93.00	21.454	24.000	58363	0.000	0.620	5.32	2.63
10 yr 72 hr	Site	BASE	93.25	21.444	24.000	58271	0.000	0.619	5.32	2.65
10 yr 72 hr	Site	BASE	93.50	21.435	24.000	58180	0.000	0.617	5.32	2.66
10 yr 72 hr	Site	BASE	93.75	21.425	24.000	58089	0.000	0.616	5.32	2.67
10 yr 72 hr	Site	BASE	94.00	21.416	24.000	57998	0.000	0.614	5.32	2.69
10 yr 72 hr	Site	BASE	94.25	21.406	24.000	57907	0.000	0.613	5.32	2.70
10 yr 72 hr	Site	BASE	94.50	21.397	24.000	57816	0.000	0.611	5.32	2.71
10 yr 72 hr	Site	BASE	94.75	21.387	24.000	57725	0.000	0.609	5.32	2.72
10 yr 72 hr	Site	BASE	95.00	21.378	24.000	57634	0.000	0.608	5.32	2.74
10 yr 72 hr	Site	BASE	95.25	21.368	24.000	57543	0.000	0.606	5.32	2.75
10 yr 72 hr	Site	BASE	95.50	21.359	24.000	57453	0.000	0.605	5.32	2.76
10 yr 72 hr	Site	BASE	95.75	21.349	24.000	57362	0.000	0.603	5.32	2.77
10 yr 72 hr	Site	BASE	96.00	21.340	24.000	57272	0.000	0.602	5.32	2.79
10 yr 72 hr	Site	BASE	96.25	21.330	24.000	57181	0.000	0.600	5.32	2.80
10 yr 72 hr	Site	BASE	96.50	21.321	24.000	57091	0.000	0.599	5.32	2.81
10 yr 72 hr	Site	BASE	96.75	21.312	24.000	57001	0.000	0.597	5.32	2.82
							0.000	0.595	5.32	2.84
										2.85

Simulation	Node	Group	Time hrs	Stage ft	Warning Stage ft	Surface Area ft2	Total Inflow cfs	Total Outflow cfs	Total Vol In af	Total Vol Out af
10 yr 72 hr	Site	BASE	97.00	21.302	24.000	56911	0.000	0.594	5.32	2.86
10 yr 72 hr	Site	BASE	97.25	21.293	24.000	56821	0.000	0.592	5.32	2.87
10 yr 72 hr	Site	BASE	97.50	21.283	24.000	56731	0.000	0.591	5.32	2.88
10 yr 72 hr	Site	BASE	97.75	21.274	24.000	56641	0.000	0.589	5.32	2.90
10 yr 72 hr	Site	BASE	98.00	21.265	24.000	56552	0.000	0.587	5.32	2.91
10 yr 72 hr	Site	BASE	98.25	21.255	24.000	56462	0.000	0.586	5.32	2.92
10 yr 72 hr	Site	BASE	98.50	21.246	24.000	56373	0.000	0.584	5.32	2.93
10 yr 72 hr	Site	BASE	98.75	21.237	24.000	56283	0.000	0.583	5.32	2.95
10 yr 72 hr	Site	BASE	99.00	21.227	24.000	56194	0.000	0.581	5.32	2.96
10 yr 72 hr	Site	BASE	99.25	21.218	24.000	56105	0.000	0.579	5.32	2.97
10 yr 72 hr	Site	BASE	99.50	21.209	24.000	56016	0.000	0.578	5.32	2.98
10 yr 72 hr	Site	BASE	99.75	21.200	24.000	55927	0.000	0.576	5.32	2.99
10 yr 72 hr	Site	BASE	100.00	21.190	24.000	55838	0.000	0.574	5.32	3.01
10 yr 72 hr	Site	BASE	100.25	21.181	24.000	55750	0.000	0.573	5.32	3.02
10 yr 72 hr	Site	BASE	100.50	21.172	24.000	55661	0.000	0.571	5.32	3.03
10 yr 72 hr	Site	BASE	100.75	21.163	24.000	55573	0.000	0.570	5.32	3.04
10 yr 72 hr	Site	BASE	101.00	21.153	24.000	55484	0.000	0.568	5.32	3.05
10 yr 72 hr	Site	BASE	101.25	21.144	24.000	55396	0.000	0.566	5.32	3.06
10 yr 72 hr	Site	BASE	101.50	21.135	24.000	55308	0.000	0.565	5.32	3.08
10 yr 72 hr	Site	BASE	101.75	21.126	24.000	55220	0.000	0.563	5.32	3.09
10 yr 72 hr	Site	BASE	102.00	21.117	24.000	55132	0.000	0.561	5.32	3.10
10 yr 72 hr	Site	BASE	102.25	21.107	24.000	55044	0.000	0.560	5.32	3.11
10 yr 72 hr	Site	BASE	102.50	21.098	24.000	54957	0.000	0.558	5.32	3.12
10 yr 72 hr	Site	BASE	102.75	21.089	24.000	54869	0.000	0.556	5.32	3.13
10 yr 72 hr	Site	BASE	103.00	21.080	24.000	54782	0.000	0.555	5.32	3.15
10 yr 72 hr	Site	BASE	103.25	21.071	24.000	54695	0.000	0.553	5.32	3.16
10 yr 72 hr	Site	BASE	103.50	21.062	24.000	54608	0.000	0.551	5.32	3.17
10 yr 72 hr	Site	BASE	103.75	21.053	24.000	54521	0.000	0.550	5.32	3.18
10 yr 72 hr	Site	BASE	104.00	21.044	24.000	54434	0.000	0.548	5.32	3.19
10 yr 72 hr	Site	BASE	104.25	21.035	24.000	54347	0.000	0.546	5.32	3.20
10 yr 72 hr	Site	BASE	104.50	21.026	24.000	54260	0.000	0.544	5.32	3.21
10 yr 72 hr	Site	BASE	104.75	21.017	24.000	54174	0.000	0.543	5.32	3.22
10 yr 72 hr	Site	BASE	105.00	21.008	24.000	54088	0.000	0.541	5.32	3.24
10 yr 72 hr	Site	BASE	105.25	20.999	24.000	54001	0.000	0.539	5.32	3.25
10 yr 72 hr	Site	BASE	105.50	20.990	24.000	53915	0.000	0.538	5.32	3.26
10 yr 72 hr	Site	BASE	105.75	20.981	24.000	53829	0.000	0.536	5.32	3.27
10 yr 72 hr	Site	BASE	106.00	20.972	24.000	53744	0.000	0.534	5.32	3.28
10 yr 72 hr	Site	BASE	106.25	20.963	24.000	53658	0.000	0.532	5.32	3.29
10 yr 72 hr	Site	BASE	106.50	20.954	24.000	53572	0.000	0.531	5.32	3.30
10 yr 72 hr	Site	BASE	106.75	20.945	24.000	53487	0.000	0.529	5.32	3.31
10 yr 72 hr	Site	BASE	107.00	20.936	24.000	53402	0.000	0.527	5.32	3.32
10 yr 72 hr	Site	BASE	107.25	20.927	24.000	53317	0.000	0.525	5.32	3.33
10 yr 72 hr	Site	BASE	107.50	20.918	24.000	53232	0.000	0.524	5.32	3.35
10 yr 72 hr	Site	BASE	107.75	20.909	24.000	53147	0.000	0.522	5.32	3.36
10 yr 72 hr	Site	BASE	108.00	20.901	24.000	53062	0.000	0.520	5.32	3.37
10 yr 72 hr	Site	BASE	108.25	20.892	24.000	52978	0.000	0.518	5.32	3.38
10 yr 72 hr	Site	BASE	108.50	20.883	24.000	52894	0.000	0.517	5.32	3.39
10 yr 72 hr	Site	BASE	108.75	20.874	24.000	52809	0.000	0.515	5.32	3.40
10 yr 72 hr	Site	BASE	109.00	20.865	24.000	52725	0.000	0.513	5.32	3.41
10 yr 72 hr	Site	BASE	109.25	20.857	24.000	52642	0.000	0.511	5.32	3.42
10 yr 72 hr	Site	BASE	109.50	20.848	24.000	52558	0.000	0.509	5.32	3.43
10 yr 72 hr	Site	BASE	109.75	20.839	24.000	52474	0.000	0.508	5.32	3.44
10 yr 72 hr	Site	BASE	110.00	20.831	24.000	52391	0.000	0.506	5.32	3.45
10 yr 72 hr	Site	BASE	110.25	20.822	24.000	52308	0.000	0.504	5.32	3.46
10 yr 72 hr	Site	BASE	110.50	20.813	24.000	52225	0.000	0.502	5.32	3.47
10 yr 72 hr	Site	BASE	110.75	20.805	24.000	52142	0.000	0.500	5.32	3.48
10 yr 72 hr	Site	BASE	111.00	20.796	24.000	52059	0.000	0.498	5.32	3.49
10 yr 72 hr	Site	BASE	111.25	20.787	24.000	51977	0.000	0.497	5.32	3.50
10 yr 72 hr	Site	BASE	111.50	20.779	24.000	51895	0.000	0.495	5.32	3.51
10 yr 72 hr	Site	BASE	111.75	20.770	24.000	51812	0.000	0.493	5.32	3.52
10 yr 72 hr	Site	BASE	112.00	20.762	24.000	51730	0.000	0.491	5.32	3.53
10 yr 72 hr	Site	BASE	112.25	20.753	24.000	51649	0.000	0.489	5.32	3.54
10 yr 72 hr	Site	BASE	112.50	20.745	24.000	51567	0.000	0.487	5.32	3.55
10 yr 72 hr	Site	BASE	112.75	20.736	24.000	51486	0.000	0.485	5.32	3.56
10 yr 72 hr	Site	BASE	113.00	20.728	24.000	51404	0.000	0.483	5.32	3.57
10 yr 72 hr	Site	BASE	113.25	20.719	24.000	51323	0.000	0.482	5.32	3.58
10 yr 72 hr	Site	BASE	113.50	20.711	24.000	51243	0.000	0.480	5.32	3.59
10 yr 72 hr	Site	BASE	113.75	20.702	24.000	51162	0.000	0.478	5.32	3.60
10 yr 72 hr	Site	BASE	114.00	20.694	24.000	51082	0.000	0.476	5.32	3.61
10 yr 72 hr	Site	BASE	114.25	20.686	24.000	51001	0.000	0.474	5.32	3.62
10 yr 72 hr	Site	BASE	114.50	20.677	24.000	50921	0.000	0.472	5.32	3.63
10 yr 72 hr	Site	BASE	114.75	20.669	24.000	50841	0.000	0.470	5.32	3.64
10 yr 72 hr	Site	BASE	115.00	20.661	24.000	50762	0.000	0.468	5.32	3.65
10 yr 72 hr	Site	BASE	115.25	20.652	24.000	50682	0.000	0.466	5.32	3.66
10 yr 72 hr	Site	BASE	115.50	20.644	24.000	50603	0.000	0.464	5.32	3.67
10 yr 72 hr	Site	BASE	115.75	20.636	24.000	50524	0.000	0.462	5.32	3.68
10 yr 72 hr	Site	BASE	116.00	20.628	24.000	50445	0.000	0.460	5.32	3.69
10 yr 72 hr	Site	BASE	116.25	20.619	24.000	50367	0.000	0.458	5.32	3.70
10 yr 72 hr	Site	BASE	116.50	20.611	24.000	50288	0.000	0.456	5.32	3.71
10 yr 72 hr	Site	BASE	116.75	20.603	24.000	50210	0.000	0.454	5.32	3.72
10 yr 72 hr	Site	BASE	117.00	20.595	24.000	50132	0.000	0.452	5.32	3.73
10 yr 72 hr	Site	BASE	117.25	20.587	24.000	50055	0.000	0.450	5.32	3.74
10 yr 72 hr	Site	BASE	117.50	20.579	24.000	49977	0.000	0.448	5.32	3.75
10 yr 72 hr	Site	BASE	117.75	20.571	24.000	49900	0.000	0.446	5.32	3.76
10 yr 72 hr	Site	BASE	118.00	20.563	24.000	49823	0.000	0.444	5.32	3.77
10 yr 72 hr	Site	BASE	118.25	20.555	24.000	49746	0.000	0.442	5.32	3.78
10 yr 72 hr	Site	BASE	118.50	20.547	24.000	49670	0.000	0.440	5.32	3.78
10 yr 72 hr	Site	BASE	118.75	20.539	24.000	49594	0.000	0.438	5.32	3.79
10 yr 72 hr	Site	BASE	119.00	20.531	24.000	49518	0.000	0.435	5.32	3.80
10 yr 72 hr	Site	BASE	119.25	20.523	24.000	49442	0.000	0.433	5.32	3.81
10 yr 72 hr	Site	BASE	119.50	20.515	24.000	49367	0.000	0.431	5.32	3.82
10 yr 72 hr	Site	BASE	119.75	20.507	24.000	49291	0.000	0.429	5.32	3.83
10 yr 72 hr	Site	BASE	120.00	20.499	24.000	49216	0.000	0.427	5.32	3.84
10 yr 72 hr	Site	BASE	120.25	20.492	24.000	49142	0.000	0.425	5.32	3.85
10 yr 72 hr	Site	BASE	120.50	20.484	24.000	49067	0.000	0.422	5.32	3.86
10 yr 72 hr	Site	BASE	120.75	20.476	24.000	48993	0.000	0.420	5.32	3.86
10 yr 72 hr	Site	BASE	121.00	20.468	24.000	48919	0.000	0.418	5.32	3.87

Simulation	Node	Group	Time hrs	Stage ft	Warning Stage ft	Surface Area ft2	Total Inflow cfs	Total Outflow cfs	Total Vol In af	Total Vol Out af
10 yr 72 hr	Site	BASE	121.25	20.461	24.000	48846	0.000	0.416	5.32	3.88
10 yr 72 hr	Site	BASE	121.50	20.453	24.000	48773	0.000	0.413	5.32	3.89
10 yr 72 hr	Site	BASE	121.75	20.445	24.000	48700	0.000	0.411	5.32	3.90
10 yr 72 hr	Site	BASE	122.00	20.438	24.000	48627	0.000	0.409	5.32	3.91
10 yr 72 hr	Site	BASE	122.25	20.430	24.000	48555	0.000	0.406	5.32	3.92
10 yr 72 hr	Site	BASE	122.50	20.423	24.000	48483	0.000	0.404	5.32	3.92
10 yr 72 hr	Site	BASE	122.75	20.415	24.000	48411	0.000	0.402	5.32	3.93
10 yr 72 hr	Site	BASE	123.00	20.408	24.000	48340	0.000	0.399	5.32	3.94
10 yr 72 hr	Site	BASE	123.25	20.400	24.000	48269	0.000	0.397	5.32	3.95
10 yr 72 hr	Site	BASE	123.50	20.393	24.000	48198	0.000	0.394	5.32	3.96
10 yr 72 hr	Site	BASE	123.75	20.386	24.000	48127	0.000	0.392	5.32	3.97
10 yr 72 hr	Site	BASE	124.00	20.378	24.000	48057	0.000	0.389	5.32	3.97
10 yr 72 hr	Site	BASE	124.25	20.371	24.000	47988	0.000	0.387	5.32	3.98
10 yr 72 hr	Site	BASE	124.50	20.364	24.000	47918	0.000	0.384	5.32	3.99
10 yr 72 hr	Site	BASE	124.75	20.357	24.000	47850	0.000	0.381	5.32	4.00
10 yr 72 hr	Site	BASE	125.00	20.350	24.000	47781	0.000	0.378	5.32	4.01
10 yr 72 hr	Site	BASE	125.25	20.342	24.000	47713	0.000	0.375	5.32	4.01
10 yr 72 hr	Site	BASE	125.50	20.335	24.000	47645	0.000	0.371	5.32	4.02
10 yr 72 hr	Site	BASE	125.75	20.328	24.000	47579	0.000	0.368	5.32	4.03
10 yr 72 hr	Site	BASE	126.00	20.321	24.000	47512	0.000	0.364	5.32	4.04
10 yr 72 hr	Site	BASE	126.25	20.315	24.000	47446	0.000	0.360	5.32	4.04
10 yr 72 hr	Site	BASE	126.50	20.308	24.000	47381	0.000	0.355	5.32	4.05
10 yr 72 hr	Site	BASE	126.75	20.301	24.000	47316	0.000	0.353	5.32	4.06
10 yr 72 hr	Site	BASE	127.00	20.294	24.000	47252	0.000	0.349	5.32	4.07
10 yr 72 hr	Site	BASE	127.25	20.288	24.000	47189	0.000	0.345	5.32	4.07
10 yr 72 hr	Site	BASE	127.50	20.281	24.000	47126	0.000	0.342	5.32	4.08
10 yr 72 hr	Site	BASE	127.75	20.275	24.000	47064	0.000	0.339	5.32	4.09
10 yr 72 hr	Site	BASE	128.00	20.268	24.000	47002	0.000	0.335	5.32	4.09
10 yr 72 hr	Site	BASE	128.25	20.262	24.000	46941	0.000	0.332	5.32	4.10
10 yr 72 hr	Site	BASE	128.50	20.256	24.000	46880	0.000	0.329	5.32	4.11
10 yr 72 hr	Site	BASE	128.75	20.249	24.000	46820	0.000	0.326	5.32	4.11
10 yr 72 hr	Site	BASE	129.00	20.243	24.000	46760	0.000	0.323	5.32	4.12
10 yr 72 hr	Site	BASE	129.25	20.237	24.000	46700	0.000	0.320	5.32	4.13
10 yr 72 hr	Site	BASE	129.50	20.231	24.000	46641	0.000	0.318	5.32	4.13
10 yr 72 hr	Site	BASE	129.75	20.225	24.000	46583	0.000	0.315	5.32	4.14
10 yr 72 hr	Site	BASE	130.00	20.218	24.000	46525	0.000	0.313	5.32	4.15
10 yr 72 hr	Site	BASE	130.25	20.212	24.000	46467	0.000	0.310	5.32	4.15
10 yr 72 hr	Site	BASE	130.50	20.206	24.000	46410	0.000	0.308	5.32	4.16
10 yr 72 hr	Site	BASE	130.75	20.200	24.000	46353	0.000	0.306	5.32	4.17
10 yr 72 hr	Site	BASE	131.00	20.195	24.000	46296	0.000	0.303	5.32	4.17
10 yr 72 hr	Site	BASE	131.25	20.189	24.000	46240	0.000	0.301	5.32	4.18
10 yr 72 hr	Site	BASE	131.50	20.183	24.000	46183	0.000	0.300	5.32	4.19
10 yr 72 hr	Site	BASE	131.75	20.177	24.000	46128	0.000	0.298	5.32	4.19
10 yr 72 hr	Site	BASE	132.00	20.171	24.000	46072	0.000	0.296	5.32	4.20
10 yr 72 hr	Site	BASE	132.25	20.165	24.000	46017	0.000	0.295	5.32	4.20
10 yr 72 hr	Site	BASE	132.50	20.160	24.000	45962	0.000	0.293	5.32	4.21
10 yr 72 hr	Site	BASE	132.75	20.154	24.000	45907	0.000	0.292	5.32	4.22
10 yr 72 hr	Site	BASE	133.00	20.148	24.000	45852	0.000	0.292	5.32	4.22
10 yr 72 hr	Site	BASE	133.25	20.143	24.000	45797	0.000	0.291	5.32	4.23
10 yr 72 hr	Site	BASE	133.50	20.137	24.000	45742	0.000	0.290	5.32	4.23
10 yr 72 hr	Site	BASE	133.75	20.131	24.000	45687	0.000	0.290	5.32	4.24
10 yr 72 hr	Site	BASE	134.00	20.125	24.000	45633	0.000	0.289	5.32	4.25
10 yr 72 hr	Site	BASE	134.25	20.120	24.000	45578	0.000	0.289	5.32	4.25
10 yr 72 hr	Site	BASE	134.50	20.114	24.000	45523	0.000	0.288	5.32	4.26
10 yr 72 hr	Site	BASE	134.75	20.108	24.000	45469	0.000	0.288	5.32	4.26
10 yr 72 hr	Site	BASE	135.00	20.103	24.000	45414	0.000	0.287	5.32	4.27
10 yr 72 hr	Site	BASE	135.25	20.097	24.000	45360	0.000	0.287	5.32	4.28
10 yr 72 hr	Site	BASE	135.50	20.091	24.000	45305	0.000	0.286	5.32	4.28
10 yr 72 hr	Site	BASE	135.75	20.086	24.000	45251	0.000	0.285	5.32	4.29
10 yr 72 hr	Site	BASE	136.00	20.080	24.000	45196	0.000	0.285	5.32	4.29
10 yr 72 hr	Site	BASE	136.25	20.074	24.000	45142	0.000	0.284	5.32	4.30
10 yr 72 hr	Site	BASE	136.50	20.069	24.000	45088	0.000	0.284	5.32	4.30
10 yr 72 hr	Site	BASE	136.75	20.063	24.000	45033	0.000	0.283	5.32	4.31
10 yr 72 hr	Site	BASE	137.00	20.057	24.000	44979	0.000	0.283	5.32	4.32
10 yr 72 hr	Site	BASE	137.25	20.052	24.000	44925	0.000	0.282	5.32	4.32
10 yr 72 hr	Site	BASE	137.50	20.046	24.000	44871	0.000	0.282	5.32	4.33
10 yr 72 hr	Site	BASE	137.75	20.040	24.000	44817	0.000	0.281	5.32	4.33
10 yr 72 hr	Site	BASE	138.00	20.035	24.000	44763	0.000	0.280	5.32	4.34
10 yr 72 hr	Site	BASE	138.25	20.029	24.000	44709	0.000	0.280	5.32	4.35
10 yr 72 hr	Site	BASE	138.50	20.023	24.000	44655	0.000	0.279	5.32	4.35
10 yr 72 hr	Site	BASE	138.75	20.018	24.000	44601	0.000	0.279	5.32	4.36
10 yr 72 hr	Site	BASE	139.00	20.012	24.000	44547	0.000	0.278	5.32	4.36
10 yr 72 hr	Site	BASE	139.25	20.006	24.000	44493	0.000	0.278	5.32	4.37
10 yr 72 hr	Site	BASE	139.50	20.001	24.000	44439	0.000	0.277	5.32	4.37
10 yr 72 hr	Site	BASE	139.75	19.995	24.000	44390	0.000	0.276	5.32	4.38
10 yr 72 hr	Site	BASE	140.00	19.990	24.000	44341	0.000	0.276	5.32	4.39
10 yr 72 hr	Site	BASE	140.25	19.984	24.000	44292	0.000	0.275	5.32	4.39
10 yr 72 hr	Site	BASE	140.50	19.978	24.000	44243	0.000	0.275	5.32	4.40
10 yr 72 hr	Site	BASE	140.75	19.973	24.000	44195	0.000	0.274	5.32	4.40
10 yr 72 hr	Site	BASE	141.00	19.967	24.000	44146	0.000	0.274	5.32	4.41
10 yr 72 hr	Site	BASE	141.25	19.962	24.000	44098	0.000	0.273	5.32	4.41
10 yr 72 hr	Site	BASE	141.50	19.956	24.000	44049	0.000	0.273	5.32	4.42
10 yr 72 hr	Site	BASE	141.75	19.951	24.000	44001	0.000	0.272	5.32	4.43
10 yr 72 hr	Site	BASE	142.00	19.945	24.000	43952	0.000	0.271	5.32	4.43
10 yr 72 hr	Site	BASE	142.25	19.939	24.000	43904	0.000	0.271	5.32	4.44
10 yr 72 hr	Site	BASE	142.50	19.934	24.000	43855	0.000	0.270	5.32	4.44
10 yr 72 hr	Site	BASE	142.75	19.928	24.000	43807	0.000	0.270	5.32	4.45
10 yr 72 hr	Site	BASE	143.00	19.923	24.000	43759	0.000	0.269	5.32	4.45
10 yr 72 hr	Site	BASE	143.25	19.917	24.000	43711	0.000	0.269	5.32	4.46
10 yr 72 hr	Site	BASE	143.50	19.912	24.000	43662	0.000	0.268	5.32	4.46
10 yr 72 hr	Site	BASE	143.75	19.906	24.000	43614	0.000	0.267	5.32	4.47
10 yr 72 hr	Site	BASE	144.00	19.901	24.000	43566	0.000	0.267	5.32	4.48
10 yr 72 hr	Site	BASE	144.25	19.895	24.000	43518	0.000	0.266	5.32	4.48
10 yr 72 hr	Site	BASE	144.50	19.890	24.000	43470	0.000	0.266	5.32	4.49
10 yr 72 hr	Site	BASE	144.75	19.884	24.000	43423	0.000	0.265	5.32	4.49
10 yr 72 hr	Site	BASE	145.00	19.879	24.000	43375	0.000	0.264	5.32	4.50
10 yr 72 hr	Site	BASE	145.25	19.873	24.000	43327	0.000	0.264	5.32	4.50

Simulation	Node	Group	Time hrs	Stage ft	Warning Stage ft	Surface Area ft2	Total Inflow cfs	Total Outflow cfs	Total Vol In af	Total Vol Out af
10 yr 72 hr	Site	BASE	145.50	19.868	24.000	43279	0.000	0.263	5.32	4.51
10 yr 72 hr	Site	BASE	145.75	19.862	24.000	43231	0.000	0.263	5.32	4.51
10 yr 72 hr	Site	BASE	146.00	19.857	24.000	43184	0.000	0.262	5.32	4.52
10 yr 72 hr	Site	BASE	146.25	19.851	24.000	43136	0.000	0.262	5.32	4.52
10 yr 72 hr	Site	BASE	146.50	19.846	24.000	43089	0.000	0.261	5.32	4.53
10 yr 72 hr	Site	BASE	146.75	19.840	24.000	43041	0.000	0.260	5.32	4.54
10 yr 72 hr	Site	BASE	147.00	19.835	24.000	42994	0.000	0.260	5.32	4.54
10 yr 72 hr	Site	BASE	147.25	19.830	24.000	42947	0.000	0.259	5.32	4.55
10 yr 72 hr	Site	BASE	147.50	19.824	24.000	42899	0.000	0.259	5.32	4.55
10 yr 72 hr	Site	BASE	147.75	19.819	24.000	42852	0.000	0.258	5.32	4.56
10 yr 72 hr	Site	BASE	148.00	19.813	24.000	42805	0.000	0.257	5.32	4.56
10 yr 72 hr	Site	BASE	148.25	19.808	24.000	42758	0.000	0.257	5.32	4.57
10 yr 72 hr	Site	BASE	148.50	19.802	24.000	42711	0.000	0.256	5.32	4.57
10 yr 72 hr	Site	BASE	148.75	19.797	24.000	42664	0.000	0.256	5.32	4.58
10 yr 72 hr	Site	BASE	149.00	19.792	24.000	42617	0.000	0.255	5.32	4.58
10 yr 72 hr	Site	BASE	149.25	19.786	24.000	42570	0.000	0.255	5.32	4.59
10 yr 72 hr	Site	BASE	149.50	19.781	24.000	42523	0.000	0.254	5.32	4.59
10 yr 72 hr	Site	BASE	149.75	19.776	24.000	42476	0.000	0.253	5.32	4.60
10 yr 72 hr	Site	BASE	150.00	19.770	24.000	42429	0.000	0.253	5.32	4.60
10 yr 72 hr	Site	BASE	150.25	19.765	24.000	42383	0.000	0.252	5.32	4.61
10 yr 72 hr	Site	BASE	150.50	19.759	24.000	42336	0.000	0.252	5.32	4.61
10 yr 72 hr	Site	BASE	150.75	19.754	24.000	42289	0.000	0.251	5.32	4.62
10 yr 72 hr	Site	BASE	151.00	19.749	24.000	42243	0.000	0.250	5.32	4.63
10 yr 72 hr	Site	BASE	151.25	19.743	24.000	42196	0.000	0.250	5.32	4.63
10 yr 72 hr	Site	BASE	151.50	19.738	24.000	42150	0.000	0.249	5.32	4.64
10 yr 72 hr	Site	BASE	151.75	19.733	24.000	42104	0.000	0.249	5.32	4.64
10 yr 72 hr	Site	BASE	152.00	19.728	24.000	42057	0.000	0.248	5.32	4.65
10 yr 72 hr	Site	BASE	152.25	19.722	24.000	42011	0.000	0.247	5.32	4.65
10 yr 72 hr	Site	BASE	152.50	19.717	24.000	41965	0.000	0.247	5.32	4.66
10 yr 72 hr	Site	BASE	152.75	19.712	24.000	41919	0.000	0.246	5.32	4.66
10 yr 72 hr	Site	BASE	153.00	19.706	24.000	41873	0.000	0.246	5.32	4.67
10 yr 72 hr	Site	BASE	153.25	19.701	24.000	41827	0.000	0.245	5.32	4.67
10 yr 72 hr	Site	BASE	153.50	19.696	24.000	41781	0.000	0.244	5.32	4.68
10 yr 72 hr	Site	BASE	153.75	19.691	24.000	41735	0.000	0.244	5.32	4.68
10 yr 72 hr	Site	BASE	154.00	19.685	24.000	41689	0.000	0.243	5.32	4.69
10 yr 72 hr	Site	BASE	154.25	19.680	24.000	41644	0.000	0.243	5.32	4.69
10 yr 72 hr	Site	BASE	154.50	19.675	24.000	41598	0.000	0.242	5.32	4.70
10 yr 72 hr	Site	BASE	154.75	19.670	24.000	41553	0.000	0.241	5.32	4.70
10 yr 72 hr	Site	BASE	155.00	19.664	24.000	41507	0.000	0.241	5.32	4.71
10 yr 72 hr	Site	BASE	155.25	19.659	24.000	41462	0.000	0.240	5.32	4.71
10 yr 72 hr	Site	BASE	155.50	19.654	24.000	41416	0.000	0.240	5.32	4.72
10 yr 72 hr	Site	BASE	155.75	19.649	24.000	41371	0.000	0.239	5.32	4.72
10 yr 72 hr	Site	BASE	156.00	19.644	24.000	41326	0.000	0.238	5.32	4.73
10 yr 72 hr	Site	BASE	156.25	19.638	24.000	41280	0.000	0.238	5.32	4.74
10 yr 72 hr	Site	BASE	156.50	19.633	24.000	41235	0.000	0.237	5.32	4.74
10 yr 72 hr	Site	BASE	156.75	19.628	24.000	41190	0.000	0.237	5.32	4.74
10 yr 72 hr	Site	BASE	157.00	19.623	24.000	41145	0.000	0.236	5.32	4.75
10 yr 72 hr	Site	BASE	157.25	19.618	24.000	41100	0.000	0.235	5.32	4.75
10 yr 72 hr	Site	BASE	157.50	19.613	24.000	41055	0.000	0.235	5.32	4.76
10 yr 72 hr	Site	BASE	157.75	19.607	24.000	41011	0.000	0.234	5.32	4.76
10 yr 72 hr	Site	BASE	158.00	19.602	24.000	40966	0.000	0.234	5.32	4.77
10 yr 72 hr	Site	BASE	158.25	19.597	24.000	40921	0.000	0.233	5.32	4.77
10 yr 72 hr	Site	BASE	158.50	19.592	24.000	40877	0.000	0.233	5.32	4.77
10 yr 72 hr	Site	BASE	158.75	19.587	24.000	40832	0.000	0.232	5.32	4.78
10 yr 72 hr	Site	BASE	159.00	19.582	24.000	40788	0.000	0.231	5.32	4.78
10 yr 72 hr	Site	BASE	159.25	19.577	24.000	40743	0.000	0.230	5.32	4.79
10 yr 72 hr	Site	BASE	159.50	19.572	24.000	40699	0.000	0.230	5.32	4.79
10 yr 72 hr	Site	BASE	159.75	19.567	24.000	40655	0.000	0.229	5.32	4.80
10 yr 72 hr	Site	BASE	160.00	19.561	24.000	40611	0.000	0.229	5.32	4.80
10 yr 72 hr	Site	BASE	160.25	19.556	24.000	40566	0.000	0.228	5.32	4.81
10 yr 72 hr	Site	BASE	160.50	19.551	24.000	40522	0.000	0.227	5.32	4.81
10 yr 72 hr	Site	BASE	160.75	19.546	24.000	40478	0.000	0.227	5.32	4.82
10 yr 72 hr	Site	BASE	161.00	19.541	24.000	40435	0.000	0.226	5.32	4.82
10 yr 72 hr	Site	BASE	161.25	19.536	24.000	40391	0.000	0.225	5.32	4.83
10 yr 72 hr	Site	BASE	161.50	19.531	24.000	40347	0.000	0.225	5.32	4.83
10 yr 72 hr	Site	BASE	161.75	19.526	24.000	40303	0.000	0.224	5.32	4.84
10 yr 72 hr	Site	BASE	162.00	19.521	24.000	40260	0.000	0.224	5.32	4.84
10 yr 72 hr	Site	BASE	162.25	19.516	24.000	40216	0.000	0.223	5.32	4.85
10 yr 72 hr	Site	BASE	162.50	19.511	24.000	40173	0.000	0.222	5.32	4.85
10 yr 72 hr	Site	BASE	162.75	19.506	24.000	40129	0.000	0.222	5.32	4.85
10 yr 72 hr	Site	BASE	163.00	19.501	24.000	40086	0.000	0.221	5.32	4.86
10 yr 72 hr	Site	BASE	163.25	19.496	24.000	39927	0.000	0.220	5.32	4.86
10 yr 72 hr	Site	BASE	163.50	19.491	24.000	39727	0.000	0.220	5.32	4.87
10 yr 72 hr	Site	BASE	163.75	19.486	24.000	39527	0.000	0.219	5.32	4.87
10 yr 72 hr	Site	BASE	164.00	19.481	24.000	39327	0.000	0.219	5.32	4.88
10 yr 72 hr	Site	BASE	164.25	19.476	24.000	39126	0.000	0.218	5.32	4.88
10 yr 72 hr	Site	BASE	164.50	19.471	24.000	38925	0.000	0.217	5.32	4.89
10 yr 72 hr	Site	BASE	164.75	19.466	24.000	38724	0.000	0.217	5.32	4.89
10 yr 72 hr	Site	BASE	165.00	19.461	24.000	38522	0.000	0.216	5.32	4.90
10 yr 72 hr	Site	BASE	165.25	19.456	24.000	38319	0.000	0.215	5.32	4.90
10 yr 72 hr	Site	BASE	165.50	19.451	24.000	38116	0.000	0.215	5.32	4.90
10 yr 72 hr	Site	BASE	165.75	19.446	24.000	37913	0.000	0.214	5.32	4.91
10 yr 72 hr	Site	BASE	166.00	19.441	24.000	37709	0.000	0.213	5.32	4.91
10 yr 72 hr	Site	BASE	166.25	19.436	24.000	37505	0.000	0.213	5.32	4.92
10 yr 72 hr	Site	BASE	166.50	19.431	24.000	37300	0.000	0.212	5.32	4.92
10 yr 72 hr	Site	BASE	166.75	19.426	24.000	37095	0.000	0.211	5.32	4.93
10 yr 72 hr	Site	BASE	167.00	19.420	24.000	36889	0.000	0.211	5.32	4.93
10 yr 72 hr	Site	BASE	167.25	19.415	24.000	36683	0.000	0.210	5.32	4.93
10 yr 72 hr	Site	BASE	167.50	19.410	24.000	36476	0.000	0.209	5.32	4.94
10 yr 72 hr	Site	BASE	167.75	19.405	24.000	36269	0.000	0.209	5.32	4.94
10 yr 72 hr	Site	BASE	168.00	19.400	24.000	36061	0.000	0.208	5.32	4.95
10 yr 72 hr	Site	BASE	168.25	19.395	24.000	35853	0.000	0.207	5.32	4.95
10 yr 72 hr	Site	BASE	168.50	19.389	24.000	35644	0.000	0.207	5.32	4.96
10 yr 72 hr	Site	BASE	168.75	19.384	24.000	35435	0.000	0.206	5.32	4.96
10 yr 72 hr	Site	BASE	169.00	19.379	24.000	35225	0.000	0.205	5.32	4.96
10 yr 72 hr	Site	BASE	169.25	19.374	24.000	35015	0.000	0.204	5.32	4.97
10 yr 72 hr	Site	BASE	169.50	19.368	24.000	34804	0.000	0.204	5.32	4.97

Simulation	Node	Group	Time hrs	Stage ft	Warning Stage ft	Surface Area ft2	Total Inflow cfs	Total Outflow cfs	Total Vol In af	Total Vol Out af
10 yr 72 hr	Site	BASE	169.75	19.363	24.000	34593	0.000	0.203	5.32	4.98
10 yr 72 hr	Site	BASE	170.00	19.358	24.000	34381	0.000	0.202	5.32	4.98
10 yr 72 hr	Site	BASE	170.25	19.353	24.000	34169	0.000	0.201	5.32	4.99
10 yr 72 hr	Site	BASE	170.50	19.347	24.000	33956	0.000	0.201	5.32	4.99
10 yr 72 hr	Site	BASE	170.75	19.342	24.000	33742	0.000	0.200	5.32	4.99
10 yr 72 hr	Site	BASE	171.00	19.337	24.000	33528	0.000	0.199	5.32	5.00
10 yr 72 hr	Site	BASE	171.25	19.331	24.000	33314	0.000	0.199	5.32	5.00
10 yr 72 hr	Site	BASE	171.50	19.326	24.000	33098	0.000	0.198	5.32	5.01
10 yr 72 hr	Site	BASE	171.75	19.321	24.000	32883	0.000	0.197	5.32	5.01
10 yr 72 hr	Site	BASE	172.00	19.315	24.000	32666	0.000	0.196	5.32	5.01
10 yr 72 hr	Site	BASE	172.25	19.310	24.000	32449	0.000	0.195	5.32	5.02
10 yr 72 hr	Site	BASE	172.50	19.304	24.000	32232	0.000	0.195	5.32	5.02
10 yr 72 hr	Site	BASE	172.75	19.299	24.000	32014	0.000	0.194	5.32	5.03
10 yr 72 hr	Site	BASE	173.00	19.293	24.000	31795	0.000	0.193	5.32	5.03
10 yr 72 hr	Site	BASE	173.25	19.288	24.000	31576	0.000	0.192	5.32	5.03
10 yr 72 hr	Site	BASE	173.50	19.282	24.000	31356	0.000	0.192	5.32	5.04
10 yr 72 hr	Site	BASE	173.75	19.277	24.000	31135	0.000	0.191	5.32	5.04
10 yr 72 hr	Site	BASE	174.00	19.271	24.000	30914	0.000	0.190	5.32	5.05
10 yr 72 hr	Site	BASE	174.25	19.266	24.000	30692	0.000	0.189	5.32	5.05
10 yr 72 hr	Site	BASE	174.50	19.260	24.000	30469	0.000	0.188	5.32	5.05
10 yr 72 hr	Site	BASE	174.75	19.255	24.000	30246	0.000	0.188	5.32	5.06
10 yr 72 hr	Site	BASE	175.00	19.249	24.000	30022	0.000	0.187	5.32	5.06
10 yr 72 hr	Site	BASE	175.25	19.244	24.000	29798	0.000	0.186	5.32	5.07
10 yr 72 hr	Site	BASE	175.50	19.238	24.000	29573	0.000	0.185	5.32	5.07
10 yr 72 hr	Site	BASE	175.75	19.232	24.000	29347	0.000	0.184	5.32	5.07
10 yr 72 hr	Site	BASE	176.00	19.227	24.000	29120	0.000	0.183	5.32	5.08
10 yr 72 hr	Site	BASE	176.25	19.221	24.000	28893	0.000	0.182	5.32	5.08
10 yr 72 hr	Site	BASE	176.50	19.215	24.000	28665	0.000	0.181	5.32	5.08
10 yr 72 hr	Site	BASE	176.75	19.210	24.000	28436	0.000	0.181	5.32	5.09
10 yr 72 hr	Site	BASE	177.00	19.204	24.000	28207	0.000	0.180	5.32	5.09
10 yr 72 hr	Site	BASE	177.25	19.198	24.000	27977	0.000	0.179	5.32	5.10
10 yr 72 hr	Site	BASE	177.50	19.192	24.000	27746	0.000	0.178	5.32	5.10
10 yr 72 hr	Site	BASE	177.75	19.187	24.000	27511	0.000	0.177	5.32	5.10
10 yr 72 hr	Site	BASE	178.00	19.181	24.000	27282	0.000	0.176	5.32	5.11
10 yr 72 hr	Site	BASE	178.25	19.175	24.000	27049	0.000	0.175	5.32	5.11
10 yr 72 hr	Site	BASE	178.50	19.169	24.000	26815	0.000	0.174	5.32	5.11
10 yr 72 hr	Site	BASE	178.75	19.163	24.000	26580	0.000	0.173	5.32	5.12
10 yr 72 hr	Site	BASE	179.00	19.157	24.000	26344	0.000	0.172	5.32	5.12
10 yr 72 hr	Site	BASE	179.25	19.151	24.000	26108	0.000	0.171	5.32	5.12
10 yr 72 hr	Site	BASE	179.50	19.146	24.000	25871	0.000	0.170	5.32	5.13
10 yr 72 hr	Site	BASE	179.75	19.140	24.000	25633	0.000	0.169	5.32	5.13
10 yr 72 hr	Site	BASE	180.00	19.134	24.000	25394	0.000	0.168	5.32	5.14
10 yr 72 hr	Site	BASE	180.25	19.128	24.000	25154	0.000	0.167	5.32	5.14
10 yr 72 hr	Site	BASE	180.50	19.122	24.000	24914	0.000	0.166	5.32	5.14
10 yr 72 hr	Site	BASE	180.75	19.116	24.000	24672	0.000	0.165	5.32	5.15
10 yr 72 hr	Site	BASE	181.00	19.110	24.000	24430	0.000	0.164	5.32	5.15
10 yr 72 hr	Site	BASE	181.25	19.104	24.000	24187	0.000	0.163	5.32	5.15
10 yr 72 hr	Site	BASE	181.50	19.097	24.000	23943	0.000	0.162	5.32	5.16
10 yr 72 hr	Site	BASE	181.75	19.091	24.000	23698	0.000	0.161	5.32	5.16
10 yr 72 hr	Site	BASE	182.00	19.085	24.000	23452	0.000	0.160	5.32	5.16
10 yr 72 hr	Site	BASE	182.25	19.079	24.000	23205	0.000	0.159	5.32	5.17
10 yr 72 hr	Site	BASE	182.50	19.073	24.000	22957	0.000	0.158	5.32	5.17
10 yr 72 hr	Site	BASE	182.75	19.067	24.000	22708	0.000	0.157	5.32	5.17
10 yr 72 hr	Site	BASE	183.00	19.060	24.000	22458	0.000	0.156	5.32	5.18
10 yr 72 hr	Site	BASE	183.25	19.054	24.000	22208	0.000	0.155	5.32	5.18
10 yr 72 hr	Site	BASE	183.50	19.048	24.000	21956	0.000	0.154	5.32	5.18
10 yr 72 hr	Site	BASE	183.75	19.042	24.000	21703	0.000	0.152	5.32	5.19
10 yr 72 hr	Site	BASE	184.00	19.035	24.000	21449	0.000	0.151	5.32	5.19
10 yr 72 hr	Site	BASE	184.25	19.029	24.000	21194	0.000	0.150	5.32	5.19
10 yr 72 hr	Site	BASE	184.50	19.022	24.000	20938	0.000	0.149	5.32	5.19
10 yr 72 hr	Site	BASE	184.75	19.016	24.000	20681	0.000	0.148	5.32	5.20
10 yr 72 hr	Site	BASE	185.00	19.010	24.000	20423	0.000	0.146	5.32	5.20
10 yr 72 hr	Site	BASE	185.25	19.003	24.000	20164	0.000	0.145	5.32	5.20
10 yr 72 hr	Site	BASE	185.50	18.997	24.000	19903	0.000	0.144	5.32	5.21
10 yr 72 hr	Site	BASE	185.75	18.990	24.000	19642	0.000	0.143	5.32	5.21
10 yr 72 hr	Site	BASE	186.00	18.984	24.000	19379	0.000	0.141	5.32	5.21
10 yr 72 hr	Site	BASE	186.25	18.977	24.000	19115	0.000	0.140	5.32	5.22
10 yr 72 hr	Site	BASE	186.50	18.970	24.000	18850	0.000	0.139	5.32	5.22
10 yr 72 hr	Site	BASE	186.75	18.964	24.000	18584	0.000	0.137	5.32	5.22
10 yr 72 hr	Site	BASE	187.00	18.957	24.000	18317	0.000	0.136	5.32	5.22
10 yr 72 hr	Site	BASE	187.25	18.950	24.000	18048	0.000	0.135	5.32	5.23
10 yr 72 hr	Site	BASE	187.50	18.944	24.000	17778	0.000	0.133	5.32	5.23
10 yr 72 hr	Site	BASE	187.75	18.937	24.000	17507	0.000	0.132	5.32	5.23
10 yr 72 hr	Site	BASE	188.00	18.930	24.000	17235	0.000	0.130	5.32	5.24
10 yr 72 hr	Site	BASE	188.25	18.923	24.000	16961	0.000	0.129	5.32	5.24
10 yr 72 hr	Site	BASE	188.50	18.916	24.000	16686	0.000	0.128	5.32	5.24
10 yr 72 hr	Site	BASE	188.75	18.909	24.000	16410	0.000	0.126	5.32	5.24
10 yr 72 hr	Site	BASE	189.00	18.903	24.000	16133	0.000	0.124	5.32	5.25
10 yr 72 hr	Site	BASE	189.25	18.896	24.000	15854	0.000	0.123	5.32	5.25
10 yr 72 hr	Site	BASE	189.50	18.889	24.000	15574	0.000	0.121	5.32	5.25
10 yr 72 hr	Site	BASE	189.75	18.882	24.000	15292	0.000	0.120	5.32	5.25
10 yr 72 hr	Site	BASE	190.00	18.875	24.000	15009	0.000	0.118	5.32	5.26
10 yr 72 hr	Site	BASE	190.25	18.867	24.000	14725	0.000	0.116	5.32	5.26
10 yr 72 hr	Site	BASE	190.50	18.860	24.000	14439	0.000	0.115	5.32	5.26
10 yr 72 hr	Site	BASE	190.75	18.853	24.000	14153	0.000	0.113	5.32	5.26
10 yr 72 hr	Site	BASE	191.00	18.846	24.000	13864	0.000	0.111	5.32	5.27
10 yr 72 hr	Site	BASE	191.25	18.839	24.000	13575	0.000	0.109	5.32	5.27
10 yr 72 hr	Site	BASE	191.50	18.831	24.000	13284	0.000	0.107	5.32	5.27
10 yr 72 hr	Site	BASE	191.75	18.824	24.000	12992	0.000	0.105	5.32	5.27
10 yr 72 hr	Site	BASE	192.00	18.817	24.000	12699	0.000	0.103	5.32	5.27
10 yr 72 hr	Site	BASE	192.25	18.810	24.000	12404	0.000	0.101	5.32	5.28
10 yr 72 hr	Site	BASE	192.50	18.802	24.000	12109	0.000	0.099	5.32	5.28
10 yr 72 hr	Site	BASE	192.75	18.795	24.000	11813	0.000	0.096	5.32	5.28
10 yr 72 hr	Site	BASE	193.00	18.787	24.000	11521	0.000	0.094	5.32	5.28
10 yr 72 hr	Site	BASE	193.25	18.780	24.000	11233	0.000	0.092	5.32	5.28
10 yr 72 hr	Site	BASE	193.50	18.773	24.000	10949	0.000	0.090	5.32	5.29
10 yr 72 hr	Site	BASE	193.75	18.766	24.000	10669	0.000	0.087	5.32	5.29

Simulation	Node	Group	Time hrs	Stage ft	Warning Stage ft	Surface Area ft2	Total Inflow cfs	Total Outflow cfs	Total Vol In af	Total Vol Out af
10 yr 72 hr	Site	BASE	194.00	18.759	24.000	10393	0.000	0.079	5.32	5.29
10 yr 72 hr	Site	BASE	194.25	18.753	24.000	10121	0.000	0.076	5.32	5.29
10 yr 72 hr	Site	BASE	194.50	18.746	24.000	9853	0.000	0.074	5.32	5.29
10 yr 72 hr	Site	BASE	194.75	18.739	24.000	9582	0.000	0.072	5.32	5.29
10 yr 72 hr	Site	BASE	195.00	18.732	24.000	9313	0.000	0.069	5.32	5.30
10 yr 72 hr	Site	BASE	195.25	18.726	24.000	9045	0.000	0.067	5.32	5.30
10 yr 72 hr	Site	BASE	195.50	18.719	24.000	8779	0.000	0.064	5.32	5.30
10 yr 72 hr	Site	BASE	195.75	18.713	24.000	8516	0.000	0.062	5.32	5.30
10 yr 72 hr	Site	BASE	196.00	18.706	24.000	8257	0.000	0.059	5.32	5.30
10 yr 72 hr	Site	BASE	196.25	18.700	24.000	8001	0.000	0.056	5.32	5.30
10 yr 72 hr	Site	BASE	196.50	18.693	24.000	7750	0.000	0.053	5.32	5.30
10 yr 72 hr	Site	BASE	196.75	18.687	24.000	7504	0.000	0.051	5.32	5.30
10 yr 72 hr	Site	BASE	197.00	18.681	24.000	7262	0.000	0.048	5.32	5.31
10 yr 72 hr	Site	BASE	197.25	18.675	24.000	7026	0.000	0.046	5.32	5.31
10 yr 72 hr	Site	BASE	197.50	18.670	24.000	6795	0.000	0.043	5.32	5.31
10 yr 72 hr	Site	BASE	197.75	18.664	24.000	6569	0.000	0.041	5.32	5.31
10 yr 72 hr	Site	BASE	198.00	18.658	24.000	6349	0.000	0.038	5.32	5.31
10 yr 72 hr	Site	BASE	198.25	18.653	24.000	6134	0.000	0.036	5.32	5.31
10 yr 72 hr	Site	BASE	198.50	18.648	24.000	5925	0.000	0.034	5.32	5.31
10 yr 72 hr	Site	BASE	198.75	18.643	24.000	5722	0.000	0.032	5.32	5.31
10 yr 72 hr	Site	BASE	199.00	18.638	24.000	5524	0.000	0.030	5.32	5.31
10 yr 72 hr	Site	BASE	199.25	18.633	24.000	5332	0.000	0.028	5.32	5.31
10 yr 72 hr	Site	BASE	199.50	18.628	24.000	5145	0.000	0.026	5.32	5.31
10 yr 72 hr	Site	BASE	199.75	18.624	24.000	4964	0.000	0.025	5.32	5.31
10 yr 72 hr	Site	BASE	200.00	18.619	24.000	4789	0.000	0.023	5.32	5.31
10 yr 72 hr	Site	BASE	200.01	18.619	24.000	4789	0.000	0.023	5.32	5.31

No. — . 04 . 0737 . 103

dd 12-29-03 dd

NORTH ST. LUCIE RIVER WATER CONTROL DISTRICT

("District")

2721 South Jenkins Road • Fort Pierce, Florida 34981 • (561) 461-5050 • FAX (561) 461-9446

Application to Connect to, or Use, District Facilities, or for Utility Construction*

A. Applicant Information:

Name: John Mayo

Address: 1207 SW 87th Terrace
Plantation, FL 33324

Telephone: (954) 236-6551 Fax: (954) 236-8832

Owner's Engineer of Record (if applicable): Gary L. Basham, PE, PLS

B. Project Information (Check appropriate box and attach drawings to show location and details):

XX Culvert connection to District canal for irrigation or gravity drainage.

☐ Pump connection to District canal for irrigation or drainage.

☐ Installation of culvert or water control structure in District canal for crossing or water control.

☐ Electric ☐ Telephone ☐ Gas ☐ Cable Television

☐ Other (specify): _____

Location: Section(s) N 1/2 of 6 Township: 36S Range: 40E Canal No. 103
Drainage area served: 8.85 acres (For connection to or use of District facilities.)
Other appropriate description: NW corner of Midway Road and S. Jenkins Road

C. Construction Schedule:

Estimated commencement date: Fall 2004 Estimated completion date: Winter 2004

D. Application, Review or Use Fee: $ 1,075
(Submit fee with this application in accordance with the District's fee schedule.)

ACKNOWLEDGEMENT AND ACCEPTANCE:

I hereby certify that the information shown above is accurate to the best of my knowledge, and that I agree to satisfy or abide by all requirements of this Permit, including "Standard Provisions" itemized on the reverse, and "Special Conditions" imposed by the District, as reflected by my signature below:

Owner-Applicant Signature: _____
Owner-Applicant Name (Type or Print): JOHN A. MAYO
Date: 11-10-03

Special Conditions: (for District Use Only):

****

Application Approved and Permit Issued:

By: _____
For the North St. Lucie River Water Control District

Date of Approval: 1-29-04
Permit Expiration Date: _____

*This Application will become a Permit if and when approved and signed by an authorized representative of the District.

STANDARD PROVISIONS

for

Application/Permit No._____

If this Application for a Permit is approved, I do acknowledge, understand, and agree that:

1. I hereby indemnify and hold the District harmless from claims for property damage or personal injury arising from the installation or use of the permitted facility, and that this indemnification extends to damage to the facility itself that may occur from District operation and maintenance work.

2. Approval of this application does not relieve the Permittee from securing any and all other permits that may be required by other entities or governmental agencies, including, but not limited to, the South Florida Water Management District, the Florida Department of Environmental Protection, and St. Lucie County.

3. The use of, or construction within, the District's right-of-way shall conform to the details of the **attached approved drawings** supporting this application. **Modifications must be approved by the District in writing prior to construction.**

4. If required in the interests of the District's operation and maintenance program, or by any modifications to the District's Standard Provisions, I agree to alter, replace, relocate, or remove the permitted facilities at no cost to the District, all as is more fully set forth by District Policy Resolution duly recorded in O.R. Book 669 at page 699 of the Public Records of St. Lucie County, Florida, but subject to the limitations thereof.

5. The lands to be benefited by this application are, or may be, subject to flooding during periods of high water resulting from heavy rains or other acts of God. This Permit will be accepted subject to this possibility, which is recognized not to be within the control of the District.

6. Any other requirements that may be imposed by the District are binding upon me, my successors and assigns.

7. Any Permit issued as an approval of this application other than one issued in irrevocable, recordable form pursuant to the Policy Resolution referenced in item 4, above, shall not be transferable from the Permittee to a subsequent owner or owners of all, or a portion of, the subject property without the express, written approval of the District.

8. Any Permit issued as approval of this application is strictly subject to all of the rules of the District, duly promulgated from time to time, which are on file and available for examination at the offices of the District by those having interest.

9. If a Permit is granted, I shall notify the District not less than 24 hours prior to the beginning and completion of the work, to enable the coordination and scheduling of inspections.

10. I accept total responsibility for any erosion of, or shoaling in, the District's right-of-way or canals that results from the permitted work, and I shall repair or remove same promptly, at no expense to the District.

11. During and after construction, I shall prevent material from the construction area from being discharged to, or settling in, District canals.

12. Unless authorized by Permit, I shall neither place, construct or plant, nor cause to be placed, constructed or planted, any object or improvement within the District right-of-way without the express written prior approval of the District.

13. Within fifteen (15) days of completion of the work, I shall submit a written statement to the District certifying that the work was performed and completed in accordance with the Permit and the approved drawings. If the work deviates from the Permit or approved drawings, the certification shall state the nature and extent of those deviations.

14. If this Permit is for a drainage connection, then drainage discharge from the area served shall not exceed the volumetric equivalent of 2.0 inches of depth over the area for any 24-hour period (38 gallons per minute per acre) from the 10-year frequency, 72-hour duration rainfall.

15. If a Permit is issued for a hydraulic connection of property with a District canal, I shall not discharge hyacinths or other aquatic vegetation into the District canal.

16. The Permittee, his agents and contractors, shall conduct the work in a manner that will not impair the use, or potential use, of the District right-of-way and facilities. In no case shall drainage or irrigation canals or appurtenant works be obstructed or restricted.

17. All irrigation and drainage connections to District facilities shall be clearly marked with a post of contrasting colors to identify the location and extent of the permitted installation.

18. If access is permitted via an existing culvert crossing installed in District right-of-way, the Permittee is advised that the crossing may be permitted for use by other affected owners, as such crossings are limited in number by the District.

19. The District reserves the right to permit the use of culvert crossings installed in rights-of-ways by other affected owners of District lands, as culvert crossings are subject to distance limitations imposed by the District.

20. All utility installations shall be clearly marked with above-ground signs or markers, as required by the District's "Permit Information and Criteria Manual."

Mayo Warehouse
Pre-Development Discharge to the North Wetland

-Runoff Length: 290 ft = 0.05 mile
- Slope: 1.20 ft / 0. 05 mile = 24 ft/mile **Use Max 5' per Mile**
- 850 cfs/square mile
- (3.21 ac x 850 cfs/square mile) / (640 ac/square mile) = 4.26 cfs

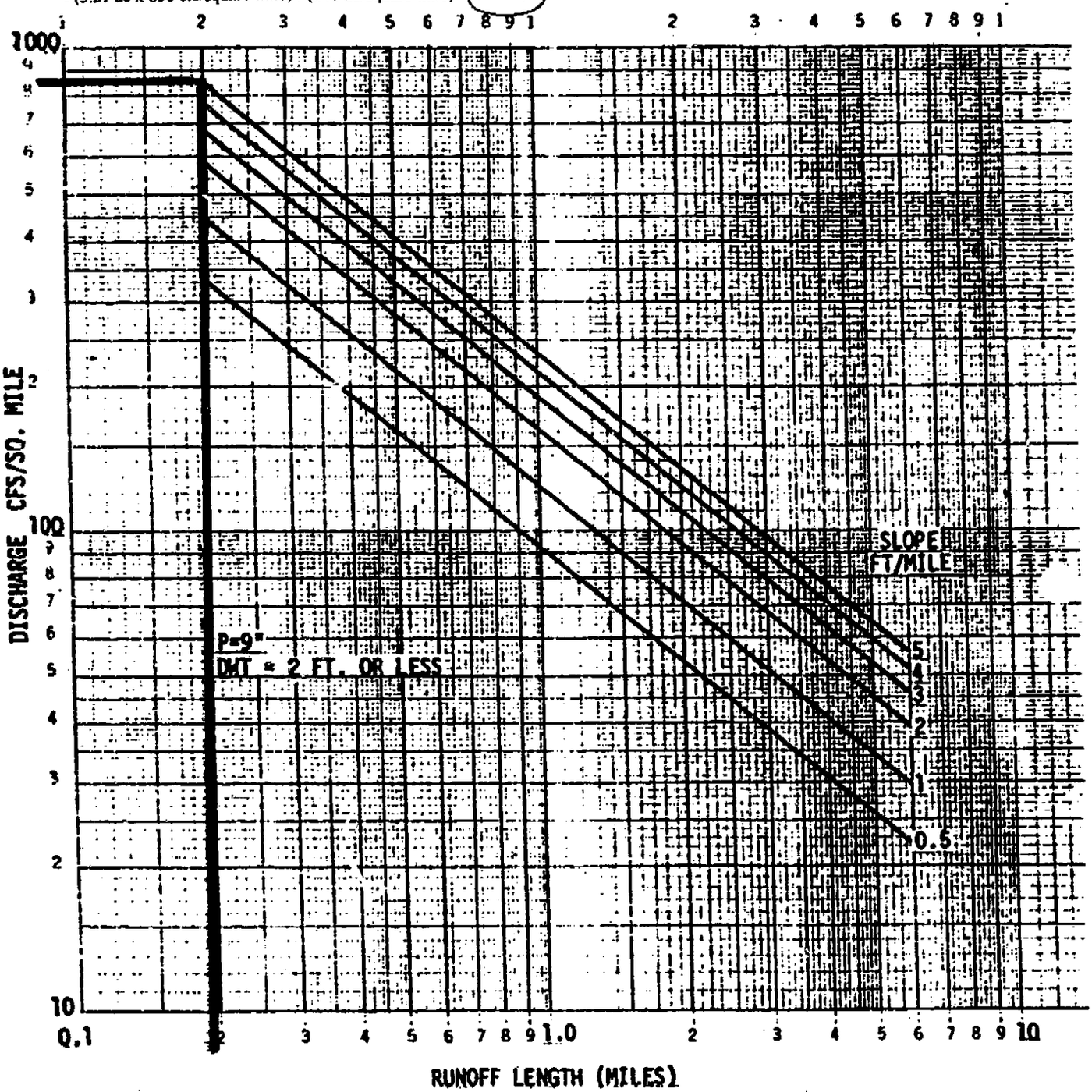


Figure D-4

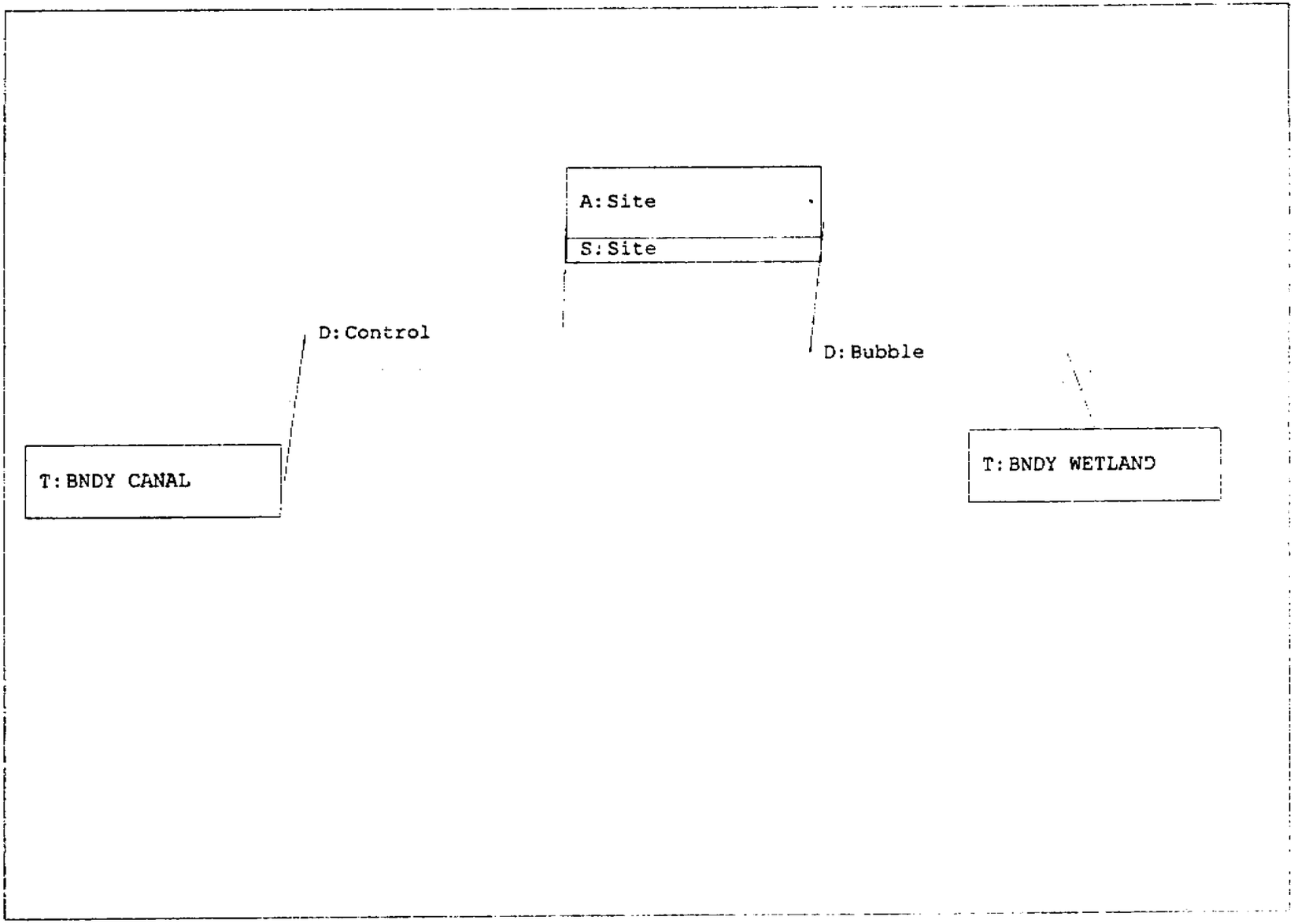
P:\Proj-2003\03-139 John Mayo\Drainage\Scenario 203-139 hydroperiod.doc

Mayo Warehouse Revised
SCENARIO 2

Nodes
A Stage/Area
V Stage/Volume
T Time/Stage
M Manhole

Basins
O Overland Flow
U SCS Unit Hydro
S Santa Barbara

Links
P Pipe
W Weir
C Channel
D Drop Structure
B Bridge
R Rating Curve
H Breach



I) **Design Criteria:**

A) Post Development Land Use Designation:

Description	Total Project	Lot 1	Lot 2
Bldg. Coverage	2.20 ac.	1.21 ac.	0.99 ac.
Parking	2.96 ac.	1.53 ac.	1.43 ac.
Sidewalks	0.14 ac.	0.07 ac.	0.07 ac.
Open Space / Dry Detention	3.54 ac.	1.54 ac.	2.00 ac.
Total	**8.84 ac.**	**4.35 ac.**	**4.49 ac.**

B) Pervious/Impervious Calcs:

Impervious Area *(Impervious area includes: Bldg. Coverage, & Pavement)*
5.30 ac

Pervious Area *(Impervious area includes: Open Space / Dry Detention)*
3.54 ac

Percent Impervious
59.95%

Percent Pervious
40.05%

C) Minimum elevations:

1) Roads and Parking:

a) 10-year, 1-day Peak Stage = 21.30 ft NGVD *(Refer to Routed Hydrograph)*

Set minimum parking elevation at 22.0' NGVD

2) Finish Floor Elevation (F.F.E.):

a) The project is located in Flood Zone "X" with a base flood elevation outside of the 500 year storm event per FEMA flood maps 12111C0170F and 12111C0275F, dated 8-19-1991

A) 100-year, 3-day (Zero Discharge Stage Calculation)

a) $V_{100y\text{-}72hr}$ = 6.61 ac-ft

b) Interpolate from the site's Stage vs. Storage computations between EL=23.0' & 23.5' NGVD *"Refer to attached"*

c) $Flood_{elev}$ = 23.19 ft NGVD

b) **Set minimum Finish Floor Elevation at 23.2' NGVD**

3) Perimeter Grade:

a) 25-year, 3-day Peak Stage = 21.93 NGVD (Refer to Routed Hydrograph)

Set minimum perimeter grade elevation at 22.5' NGVD

D) Design Storm Allowable Discharge. (Per S.F.W.M.D. Requirements)

1) Because the site lies within the jurisdiction of the North St. Lucie River Water Control District (NSLRWCD), the proposed SWMS is designed in accordance with the criteria established by the NSLRWCD and St. Lucie County.

2) The allowable discharge is per the requirements set forth by the NSLRWCD

c) Allowable discharge =
"The proposed installation will limit stormwater runoff to the volume equivalent of not more than 2.0 inches of depth over the area served for any 24-hour period from the 10-year, 72-hour duration rainfall."

(2/12 feet) * 8.84 = 1.47 ac-ft

Because the allowable discharge criteria is met under Scenario 1 (whereby all discharge goes to the canal) the project will also meet the discharge criteria with part of stormwater discharging to the wetland.

d) Discharge Requirements are met under Scenario One

E) Control Elevation:

1) Control Elevation = **18.50 ft. NGVD**

a) The control elevation for the project is based upon the high water mark of the wetland directly north of the site. A copy of the signed and sealed survey has been included with this submittal.

F) SCS Curve Number, Soil Storage, & Tc Derivation:

1) ***Pre-Development Condition:***

a)	Drainage Area =	8.84 ac.		
b)	Impervious Area =	0.00 ac.		98 CN
c)	% Impervious =	0.00 %		
d)	Soil Types:			
	1) 100 %	*Wabasso (D)*		80 CN
e)	Weighted Calculation:			
	CN = 80			
f)	Soil Storage: (S)			
	1) (1000/(CN)) - 10 =>		2.50 in	
g)	Time of Concentration (Tc):			
	Tc = 20 min			

2) ***Post-Development Condition:***

a)	Drainage Area =	8.64 ac.		
b)	Impervious Area =	5.30 ac.		98 CN
c)	% Impervious =	59.95%		
d)	Open Space Area =	3.54 ac.		80 CN
e)	Weighted Calculation:			
	CN = 91			
f)	Soil Storage: (S)			
	1) (1000/(CN)) - 10 =>		1.01 in	
g)	Time of Concentration (Tc):			
	Tc = 10 min			

h) Engineer's Soil Suitability Certificate:
To the best of my knowledge, the site's soils indicated above will drain/percolate pursuant to the assumptions made in the following drainage calculations. All assumptions are based on the wet season water table conditions for this site.

G) Design Storms: (Per. S.F.W.M.D. Rainfall Depths)

Total Site Area = 8.84 Ac.

1) 10 Yr. - 1 Day P = 5.60 in *(Roads / Parking)*

V = ((5.60 - .2 * 1.014)^2/(5.60 + .8 * 1.014)) * 1'/12" * 8.840 = 3.35 ac.ft

2) 10 Yr. - 3 Day P = 8.30 in *(Discharge)*

V = ((8.30 - .2 * 1.014)^2/(8.30 + .8 * 1.014)) * 1'/12" * 8.840 = 5.30 ac.ft.

3) 25 Yr. - 3 Day P = 9.10 in *(Perimeter Berm)*

V = ((9.10 - .2 * 1.014)^2/(9.10 + .8 * 1.014)) * 1'/12" * 8.840 = 5.88 ac.ft.

4) 100 Yr. - 3 Day P = 10.10 in *(Finish Floor Elevation)*

V = ((10.10 - .2 * 1.014)^2/(10.10 + .8 * 1.014)) * 1'/12" * 8.840 = 6.61 ac.ft.

H) Project surface storage: (Refer to the attached calculations)

II) **Design Criteria: (Post-Development Conditions)**

A) Quality:

1) The project's stormwater management system will consist of an onsite dry detention area to manage the required water quality and storm attenuation as determined below.

a) Per S.F.W.M.D., dry detention volume shall provide for the following, whichever is greater:

1) 1 inch of runoff x total drainage area x 75% reduction for dry detention

i) Calculated Runoff Volume => (1/12 * 8.84 * 0.75 = 0.55 ac-ft

2) 2.5 inches times the impervious area x 75% reduction for dry detention

Site area, for water quality pervious/impervious calculation only

Total Project - (Roof) = site area for water quality pervious/impervious

= 8.84 - (2.20) = 6.64 ac

Impervious area for water quality pervious/impervious calculations only

(Site area for water quality pervious/impervious) - pervious = impervious area, for water quality pervious/impervious

= 6.64 - (3.54) = 3.10 ac

Percentage of impervious for water quality

[Impervious area for water quality *100] / Site area for water quality

= 3.10 / 6.64 46.69%

For 2.5 in times the percentage impervious

= 2.5 * 0.47 1.17 in

Compute volume required for quality detention

[inches to be treated x (total site) = 1.17 * (8.84) * (1/12)] * 0.75 (dry detention reduction)

0.64 ac-ft

Half inch of dry pre-treatment before discharge into the adjacent wetland = 8.84 * (0.5/12) = 0.37 ac-ft

b) The site's water quality volume = **0.64 ac-ft**

c) Dry detention satisfies the pre-treatment requirement

B) Overflow Elevation:

1) Dry Pre-Treatment Elevation (T_{elev}):

a) Vt = 0.37 ac-ft

b) T_{elev} = 19.89 ft NGVD *"Set Weir Crest El. @ 19.89' NGVD"*

C) Check Bleeder Volume:

1) The project's discharge is controlled by the minimum 3" orifice. The prevailing variable for design was to minimize off-site peak discharge per pre-development allowable discharge.

D) On-site & Off-site Erosion and Sediment Control Methodology:

1) The contractor shall implement best management practices to include the following:

a) Install silt fence adjacent to perimeter properties.

b) Install turbidity barriers adjacent to all wetted areas to minimized turbidity blums.

c) All dry detention slopes, swales, and project perimeter berms shall be sodded to minimize erosion

E) Master Stormwater Management System Maintenance Entity.

1) The SWMS will be management by the property owner:

John A. Mayo
1207 S.W. 87th Terrace
Plantation, FL 33324

Mayo Warehouse

DRAINAGE AREA (Post-Development)

Stage / Storage Computations

Begin Stage Calculations	**19.50 NGVD**
End Stage Calculations =	**24.00 NGVD**
Calculation Increment =	**0.50 ft**

	Dry Detention	Dry Detention Slopes	Parking	Misc. Pvmt	Open Space		Acres [1]
Acres =	0.913	0.551	2.960	0.140	2.076	**Total Area =**	6.640
Low Rng =	19.50	19.50	22.00	22.00	22.00		
High Rng =	24.00	22.00	24.00	24.00	24.00		

Stage (NGVD)	Vertical Storage (ac.ft.)	Vertical Area (ac.)	Linear Storage (ac.ft.)	Linear Area (ac.)	Linear Storage (ac.ft.)	Linear Area (ac.)	Linear Storage (ac.ft.)	Linear Area (ac.)	Linear Storage (ac.ft.)	Linear Area (ac.)	Total Cumulative Storage (ac.ft.)	Total Area (ac.)
19.5	0.00	0.91	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	**0.00**	**0.92**
20.0	0.46	0.91	0.03	0.11	0.00	0.00	0.00	0.00	0.00	0.00	**0.48**	**1.02**
20.5	0.91	0.91	0.11	0.22	0.00	0.00	0.00	0.00	0.00	0.00	**1.02**	**1.13**
21.0	1.37	0.91	0.25	0.33	0.00	0.00	0.00	0.00	0.00	0.00	**1.62**	**1.24**
21.5	1.83	0.91	0.44	0.44	0.00	0.00	0.00	0.00	0.00	0.00	**2.27**	**1.35**
22.0	2.28	0.91	0.69	0.55	0.00	0.01	0.00	0.01	0.00	0.01	**2.97**	**1.49**
22.5	2.74	0.91	0.96	0.55	0.19	0.74	0.01	0.04	0.13	0.52	**4.03**	**2.76**
23.0	3.20	0.91	1.24	0.55	0.74	1.48	0.04	0.07	0.52	1.04	**5.73**	**4.05**
23.5	3.65	0.91	1.52	0.55	1.67	2.22	0.08	0.11	1.17	1.56	**8.08**	**5.35**
24.0	4.11	0.91	1.79	0.55	2.96	2.96	0.14	0.14	2.08	2.08	**11.08**	**6.64**

Base Floodplain Calcs:

1. Equals total site area minus building coverage
   = 8.84 - 2.20 = 6.64 ac

Pre-vent

$\frac{X - 19.5}{20.0 - 19.5} \quad \frac{0.37 - 0.00}{0.48 - 0.00}$

$X = 19.89$

Mayo Warehouse Revised
SCENARIO 2

Name	Group	Simulation	Max Time Stage hrs	Max Stage ft	Warning Stage ft	Max Delta Stage ft	Max Surf Area ft2	Max Time Inflow hrs	Max Inflow cfs	Max Time Outflow hrs	Max Outflow cfs
BNDY CANAL	BASE	10 yr 24 hr	0.00	15.000	17.000	0.0000	0	21.37	0.387	0.00	0.000
BNDY WETLAND	BASE	10 yr 24 hr	0.00	18.500	20.000	0.0000	0	21.37	2.462	0.00	0.000
Site	BASE	10 yr 24 hr	21.37	21.302	24.000	0.0050	56912	20.00	28.065	21.37	2.848
BNDY CANAL	BASE	25 yr 72 hr	0.00	16.000	17.000	0.0000	0	60.99	0.429	0.00	0.000
BNDY WETLAND	BASE	25 yr 72 hr	0.00	18.500	20.000	0.0000	0	60.99	4.275	0.00	0.000
Site	BASE	25 yr 72 hr	60.99	21.930	24.000	0.0050	64056	59.75	31.765	60.99	4.704

Basins

Name: Site
Group: BASE
Node: Site
Type: Santa Barbara
Status: Onsite

Rainfall File:
Rainfall Amount(in): 0.000
Area(ac): 6.840
Curve Number: 91.00
DCIA(%): 0.00
Storm Duration(hrs): 0.00
Time of Conc(min): 15.00
Time Shift(hrs): 0.00
Time Increment(min): 15.00
Max Allowable Q(cfs): 999999.000

Nodes

Name: BNDY CANAL
Group: BASE
Type: Time/Stage
Base Flow(cfs): 0.000
Init Stage(ft): 16.000
Warn Stage(ft): 17.000

Time(hrs)	Stage(ft)
0.00	16.000
999.00	16.000

Name: BNDY WETLAND
Group: BASE
Type: Time/Stage
Base Flow(cfs): 0.000
Init Stage(ft): 18.500
Warn Stage(ft): 20.000

Time(hrs)	Stage(ft)
0.00	18.500
999.00	18.500

Name: Site
Group: BASE
Type: Stage/Area
Base Flow(cfs): 0.000
Init Stage(ft): 18.500
Warn Stage(ft): 24.000

Stage(ft)	Area(ac)
18.500	0.0000
19.500	0.9200
20.000	1.0200
20.500	1.1300
21.000	1.2400
21.500	1.3500
22.000	1.4900
22.500	2.7600
23.000	4.0500
23.500	5.3500
24.000	6.6400

Drop Structures

Name: Bubble
Group: BASE
From Node: Site
To Node: BNDY WETLAND
Length(ft): 30.00
Count: 1

	UPSTREAM	DOWNSTREAM
Geometry:	Circular	Circular
Span(in):	15.00	15.00
Rise(in):	15.00	15.00
Invert(ft):	10.000	10.000
Manning's N:	0.012000	0.012000
Top Clip(in):	0.000	0.000
Bot Clip(in):	0.000	0.000

Friction Equation: Average Conveyance
Solution Algorithm: Automatic
Flow: Both
Entrance Loss Coef: 3.200
Exit Loss Coef: 0.600
Outlet Ctrl Spec: Use dc or tw
Inlet Ctrl Spec: Use dn
Solution Incs: 10

Upstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

Mayo Warehouse Revised
SCENARIO 2

Downstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

*** Weir 1 of 2 for Drop Structure Bubble ***

Count: 1
Type: Vertical: Mavis
Flow: Both
Geometry: Rectangular

Span(in): 5.50
Rise(in): 999.00

Bottom Clip(in): 0.000
Top Clip(in): 0.000
Weir Disc Coef: 3.200
Orifice Disc Coef: 0.600

Invert(ft): 19.890
Control Elev(ft): 19.890

TABLE

*** Weir 2 of 2 for Drop Structure Bubble ***

Count: 1
Type: Horizontal
Flow: Both
Geometry: Rectangular

Span(in): 54.00
Rise(in): 36.00

Bottom Clip(in): 0.000
Top Clip(in): 0.000
Weir Disc Coef: 3.200
Orifice Disc Coef: 0.600

Invert(ft): 22.000
Control Elev(ft): 22.000

TABLE

Name: Control
Group: BASE

From Node: Site
To Node: BNDY CANAL

Length(ft): 200.00
Count: 1

	UPSTREAM	DOWNSTREAM
Geometry:	Circular	Circular
Span(in):	18.00	18.00
Rise(in):	18.00	18.00
Invert(ft):	15.000	15.000
Manning's N:	0.012000	0.012000
Top Clip(in):	0.000	0.000
Bot Clip(in):	0.000	0.000

Friction Equation: Average Conveyance
Solution Algorithm: Automatic
Flow: Both
Entrance Loss Coef: 3.200
Exit Loss Coef: 0.600
Outlet Ctrl Spec: Use dc or tw
Inlet Ctrl Spec: Use dn
Solution Incs: 10

Upstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

Downstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

*** Weir 1 of 1 for Drop Structure Control ***

Count: 1
Type: Vertical: Mavis
Flow: Both
Geometry: Circular

Span(in): 3.00
Rise(in): 3.00

Bottom Clip(in): 0.000
Top Clip(in): 0.000
Weir Disc Coef: 3.200
Orifice Disc Coef: 0.600

Invert(ft): 18.500
Control Elev(ft): 18.500

TABLE

**** Hydrology Simulations ****

Name: 10 yr 24 hr
Filename: P:\Proj-2003\03-139 John Mayo\Drainage\Scenario 1\10 yr 24 hr.R32

Override Defaults: Yes
Storm Duration(hrs): 24.00
Rainfall File: Sfwmd72
Rainfall Amount(in): 5.60

Time(hrs)	Print Inc(min)
30.000	15.00

Name: 10 yr 72 hr
Filename: P:\Proj-2003\03-139 John Mayo\Drainage\Scenario 1\10 yr 72 hr.R32

Override Defaults: Yes
Storm Duration(hrs): 72.00
Rainfall File: Sfwmd72
Rainfall Amount(in): 8.30

Time(hrs)	Print Inc(min)
200.000	15.00

Name: 25 yr 72 hr
Filename: P:\Proj-2003\03-139 John Mayo\Drainage\Scenario 1\25 yr 72 hr.R32

Override Defaults: Yes
Storm Duration(hrs): 72.00
Rainfall File: Sfwmd72
Rainfall Amount(in): 9.10

Time(hrs)	Print Inc(min)
72.000	15.00

Routing Simulations

Name: 10 yr 24 hr Hydrology Sim: 10 yr 24 hr
Filename: P:\Proj-2003\03-139 John Mayo\Drainage\Scenario 1\10 yr 24 hr.I32

Execute: Yes Restart: No Patch: No
Alternative: No

Max Delta Z(ft): 1.00 Delta Z Factor: 0.00500
Time Step Optimizer: 10.000
Start Time(hrs): 0.000 End Time(hrs): 30.00
Min Calc Time(sec): 0.5000 Max Calc Time(sec): 60.0000
Boundary Stages: Boundary Flows:

Time(hrs)	Print Inc(min)
30.000	15.000

Group	Run
BASE	Yes

Name: 10 yr 72 hr Hydrology Sim: 10 yr 72 hr
Filename: P:\Proj-2003\03-139 John Mayo\Drainage\Scenario 1\10 yr 72 hr.I32

Execute: Yes Restart: No Patch: No
Alternative: No

Max Delta Z(ft): 1.00 Delta Z Factor: 0.00500
Time Step Optimizer: 10.000
Start Time(hrs): 0.000 End Time(hrs): 200.00
Min Calc Time(sec): 0.5000 Max Calc Time(sec): 60.0000
Boundary Stages: Boundary Flows:

Time(hrs)	Print Inc(min)
200.000	15.000

Group	Run
BASE	Yes

Name: 25 yr 72 hr Hydrology Sim: 25 yr 72 hr
Filename: P:\Proj-2003\03-139 John Mayo\Drainage\Scenario 1\25 yr 72 hr.I32

Execute: Yes Restart: No Patch: No
Alternative: No

Max Delta Z(ft): 1.00 Delta Z Factor: 0.00500
Time Step Optimizer: 10.000
Start Time(hrs): 0.000 End Time(hrs): 72.00
Min Calc Time(sec): 0.5000 Max Calc Time(sec): 60.0000
Boundary Stages: Boundary Flows:

Time(hrs)	Print Inc(min)
72.000	15.000

Group	Run
BASE	Yes

==== Boundary Conditions ====

MAYO WAREHOUSE FACILITY

St. Lucie County, Florida

CULPEPPER TERPENING INC.

CONSULTING ENGINEERS • LAND SURVEYORS

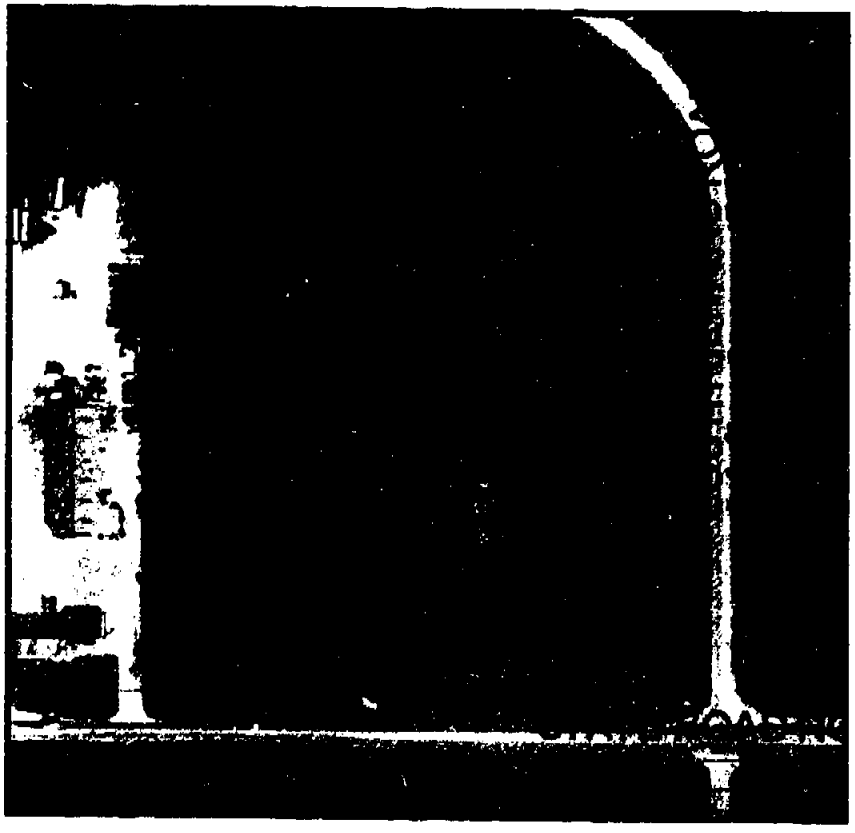
Mayo Warehouse Facility

031216-16

Section: N ½ of 6
Township: 36S
Range: 40E

St. Lucie County, Florida

ORIGINAL SUBMITTAL
DEC 16 2003
WPB



Prepared by:

Culpepper & Terpening
2980 South 25th Street
Fort Pierce, FL 34981

12-15-03
GARY I. BACHAM PE #44627

P:\Proj-2003\03-139 John Mayo\Drainage\03-139 cover.doc

Mayo Warehouse

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FOR AGENCY USE ONLY

ACOE Application #	SJR Application #
Date Application Received	Date Application Received
Proposed Project Lat. ° ' "	Fee Received $
Proposed Project Long. ° ' "	Fee Receipt #
Date Received	Project Use Codes
Assigned Reviewers	Reviewer #'s

SECTION A

Are any of the activities described in this application proposed to occur in, on, or over wetlands or other surface waters? ☒ yes ☐ no

Is this application being filed by or on behalf of a government entity or drainage district? ☐ yes ☒ no

A. Type of Environmental Resource Permit Requested (check at least one)

- ☐ Noticed General - include information requested in Section B.
- ☐ Standard General (Single Family Dwelling) - include information requested in Sections C and D.
- ☐ Standard General (all other projects) - include information requested in Sections C and E.
- ☐ Individual (Single Family Dwelling) - include information requested in Sections C and D.
- ☐ Individual (all other projects) - include information requested in Sections C and E.
- ☒ Conceptual - include information requested in Sections C and F.
- ☐ Mitigation Bank Permit (construction) - include information requested in Sections C and F.

(If the proposed mitigation bank involves the construction of a surface water management system requiring another permit defined above, check the appropriate box and submit the information requested by the applicable section.)

- ☐ Mitigation Bank (conceptual) - include information requested in Sections C and F.
- ☐ Standard General Stormwater - include information requested in Sections C and H
- ☐ Individual Stormwater - include information requested in Sections C and H

B. Type of activity for which you are applying (check at least one)

- ☒ Construction and operation of a new system including dredging or filling in, on or over wetlands and other surface waters.
- ☐ Alteration and operation of an existing system which was not previously permitted by a WMD or DEP.
- ☐ Modification of a system previously permitted by a WMD or DEP. Provide previous permit numbers:

_____

- ☐ Alteration and operation of a system
- ☐ Abandonment of a system
- ☐ Removal of a system
- ☐ Extension of permit duration
- ☐ Construction and operation of additional phases of a system

C. Are you requesting authorization to use State Owned Submerged Lands? ☐ yes ☒ no
(If yes, include the information requested in Section G.)

D. For activities in, on or over wetlands or other surface waters, check type of federal dredge and fill permit requested:

- ☐ Individual
- ☒ General
- ☐ Programmatic General
- ☐ Nationwide

E. Are you claiming to qualify for an exemption? ☐ yes ☒ no
If yes provide rule number if known _____

RECEIVED
DEC 16 2003
ENV RES REGULATION

OWNER(S) OF LAND	ENTITY TO RECEIVE PERMIT (IF OTHER THAN OWNER)
NAME **John Mayo**	NAME
ADDRESS **1207 SW 87th Terrace**	ADDRESS
CITY, STATE, ZIP **Plantation, FL 33324**	CITY, STATE, ZIP
COMPANY AND TITLE **Mayo Construction**	COMPANY AND TITLE
TELEPHONE **(954) 236-6551** FAX **(954) 236-8832**	TELEPHONE ( ) FAX ( )
AGENT AUTHORIZED TO SECURE PERMIT (IF AN AGENT IS USED)	**CONSULTANT (IF DIFFERENT FROM AGENT)** 031216-16
NAME	NAME **Gary Basham, P.E. ,P.L.S.**
COMPANY AND TITLE	COMPANY AND TITLE **Culpepper & Terpening, Inc.** ORIGINAL SUBMITTAL
ADDRESS	ADDRESS **2980 South 25th Street** DEC 15 2003
CITY, STATE, ZIP	CITY, STATE, ZIP **Ft. Pierce, FL 34981** WPB
TELEPHONE FAX	TELEPHONE **(772) 464-3537** FAX **(772) 464-9497**

Name of project, including phase if applicable **Mayo Warehouse**
Is this application for part of a multi-phase project? ☐ yes ☒ no
Total applicant-owned area contiguous to the project: **8.84 acres**
Total project area for which a permit is sought: **8.84 acres**
Impervious area for which a permit is sought: **5.30 acres**
What is the total area (metric equivalent for federally funded projects) of work in, on, or over wetlands or other surface waters?
1.87 acres _____ square feet _____ hectares _____ square meters
If a docking facility, the number of proposed new slips: **N/A**

Project location (use additional sheets, if needed)
County: **St. Lucie County**
Section(s) **S ½ of 6** Township(s) **36 S** Range(s) **40E**
Section(s) Township(s) Range(s)
Land Grant name, if applicable **N/A**
Tax Parcel Identification Number **3406-601-0001-000/7** **3406-601-0002-000/4**
Street address, road, or other location: **NW corner of Midway Road and South Jenkins Road**
City, Zip Code if applicable: **NA**

Describe, in general terms, the proposed project, system or activity.

The project will consist of six small warehouse buildings on two lots. Dry detention ponds will provide water quality and attenuation.

If there have been any pre-application meetings, including at the project site, with regulatory staff, please list the date(s), location(s), and names of key staff and project representatives.

October 31, 2003 Gary Basham with Don Medellen, Hugo Carter and Mindy Parrott at the District's West Palm Beach Office

Please identify by number any MSSW/Wetland Resource/ERP/ACOE permits pending, issued or denied for projects at the location and any related enforcement actions.

Agency	Date	No.\Type of Application	Action Taken(Pending/Issued/Denied)

Note:The following information is required for projects proposed to occur in, on or over wetlands or other surface waters that need a federal dredge and fill permit and/or authorization to use state owned submerged lands. Please provide the names ,addresses and zip codes of property owners whose property directly adjoins the project (excluding applicant). Please attach a plan view showing the owner's names and adjoining property lines. Attach additional sheets if necessary.

1) 2)

3) 4)

5) 6)

By signing and submitting this application form, I am applying, or I am applying on behalf of the applicant, for the permit and any proprietary authorizations identified above, according to the supporting data and other incidental information filed with this application. I am familiar with the information contained in this application, and represent that such information is true complete and accurate. I understand this is an application and not a permit, and work prior to approval is a violation. I understand that this application and any permit issued or proprietary authorization issued pursuant thereto, does not relieve me of any obligation for obtaining any other required federal, state, water management district or local permit prior to commencement of construction. I agree, or I agree on behalf of my corporation, to operate and maintain the permitted system unless the permitting agency authorizes transfer of the permit to a responsible operation entity. I understand that knowingly making any false statement or representation in this application is a violation of Section 373.430, F.S., and 18 U.S.C. Section 1001.

John Mayo
Typed/Printed Name of Applicant (If no Agent is used) or Agent (If one is so authorized below)

Signature of Applicant/Agent — 11-5-03 Date

(Corporate Title if applicable)

AN AGENT MAY SIGN ABOVE ONLY IF THE APPLICANT COMPLETES THE FOLLOWING:

I hereby designate and authorize the agent listed above to act on my behalf, or on behalf of my corporation as the agent in the processing of this application for the permit and/or proprietary authorization indicated above; and to furnish, on request, supplemental information in support of the application. In addition, I designate and authorize the above-listed agent to bind me, or my corporation, to perform any requirement which may be necessary to procure the permit or authorization indicated above. I understand that knowingly making any false statement or representation in this application is a violation of Section 373.430, F.S., and 18 U.S.C. Section 1001.

ped/Printed Name of Applicant Signature of Applicant Date

(Corporate Title if applicable)

Please note: The applicant's original signature (not a copy) is required above.

PERSON AUTHORIZING ACCESS TO THE PROPERTY MUST COMPLETE THE FOLLOWING:

I either own the property described in this application or I have legal authority to allow access to the property, and I consent, after receiving prior notification, to any site visit on the property by agents or personnel from the Department of Environmental Protection, the Water Management District and the U.S. Army Corps of Engineers necessary for the review and inspection of the proposed project specified in this application. I authorize these agents or personnel to enter the property as many times as may be necessary to make such review and inspection. Further, I agree to provide entry to the project site for such agents or personnel to monitor permitted work if a permit is granted.

John Mayo — 11-5-03
Typed/Printed Name Signature Date

(Corporate Title if applicable)

SECTION C
ENVIRONMENTAL RESOURCE PERMIT NOTICE OF RECEIPT OF APPLICATION

This information is required in addition to that required in other sections of the application. Please submit five copies of this notice of receipt of application and all attachments. Please submit all information on 8 1/2" x 11" paper.

Project Name: **MAYO WAREHOUSE** County: **ST. LUCIE COUNTY**
Owner: **JOHN MAYO**
Applicant: **MAYO CONSTRUCTION**
Applicant's Address: **1207 SW 87th TERRACE**
PLANTATION, FL 33324

1. Indicate the project boundaries on a USGS quadrangle map reduced or enlarged as necessary to legibly show the entire project. If not apparent from the quad map, attach a location map showing a north arrow and a graphic scale; Section(s), Township(s), and Range(s); and sufficient detail to allow a person unfamiliar with the site to find it.

   PLEASE FIND THE USGS QUADRANGLE MAP INCLUDED WITH THE DRAINAGE CALCULATIONS.

2. Provide the names of all wetlands, or other surface waters that would be dredged, filled, impounded, diverted, drained, or would receive discharge (either directly or indirectly), or would otherwise be impacted by the proposed activity, and specify if they are in an Outstanding Florida Water or Aquatic Preserve:

   PLEASE REFER TO THE WETLAND MITIGATION PLAN ENTITLED "MIDWAY INDUSTRIAL PARK, PHASE II, LOTS 1 & 2" BY R.L. WEIGT ENVIRONMENTAL CONSULTANTS, INC. DATED OCTOBER 2003.

3. Attach a depiction (plan and section views), which clearly shows the works or other facilities proposed to be constructed. Use a scale sufficient to show the location and type of works. Use multiple sheets, if necessary.

   REFER TO THE ATTACHED CONSTRUCTION PLANS AND STORMWATER MANAGEMENT CALCULATIONS

4. Briefly describe the proposed project (such as "construct a deck with boatshelter", "replace two existing culverts", "construct surface water management system to serve 150 acre residential development"):

   PROPOSED CONCEPTUAL STORMWATER MANAGEMENT SYSTEM FOR A WAREHOUSE COMPLEX. THE PROJECT WILL CONSIST OF SIX SMALL WAREHOUSE BUILDINGS ON TWO LOTS.

5. Specify the acreage of wetlands or other surface waters, if any, that are proposed to be disturbed, filled, excavated, or otherwise impacted by the proposed activity:

   1.87 ACRES. PLEASE REFER TO THE WETLAND MITIGATION PLAN ENTITLED "MIDWAY INDUSTRIAL PARK, PHASE II, LOTS 1 & 2" BY R.L. WEIGT ENVIRONMENTAL CONSULTANTS, INC. DATED OCTOBER 2003.

6. Provide a brief statement describing any proposed mitigation for impacts to wetlands and other surface waters (attach additional sheets if necessary):

   1.87 ACRES. PLEASE REFER TO THE WETLAND MITIGATION PLAN ENTITLED "MIDWAY INDUSTRIAL PARK, PHASE II, LOTS 1 & 2" BY R.L. WEIGT ENVIRONMENTAL CONSULTANTS, INC. DATED OCTOBER 2003.

FOR AGENCY USE ONLY

Application Name: _____
Application Number: _____
Office where the application can be inspected: _____
Date to be posted _____
Date to be removed: _____

SOUTH FLORIDA WATER MANAGEMENT DISTRICT

SUPPLEMENTAL INFORMATION

for

GENERAL ENVIRONMENTAL RESOURCE PERMIT

for

MAYO WAREHOUSE

ST. LUCIE COUNTY, FLORIDA

SECTION E
INFORMATION FOR STANDARD GENERAL, INDIVIDUAL, CONCEPTUAL APPROVAL ENVIRONMENTAL RESOURCE PERMITS FOR PROJECTS NOT RELATED TO A SINGLE FAMILY DWELLING UNIT

Please provide the information requested below if the proposed project requires either a standard general, individual, or conceptual approval environmental resource permit, and is not related to an individual, single family dwelling unit, duplex or quadraplex. The information listed below represents the level of information that is usually required to evaluate an application. The level of information required for a specific project will vary depending on the nature and location of the site and the activity proposed. Conceptual approval permits generally do not require the same level of detail as a construction permit, however, providing a greater level of detail will reduce the need to submit additional information at a later date. If an item does not apply to your project, proceed to the next item. Please submit all information on paper no larger than 24" x 36".

I. SITE INFORMATION

a. Provide a map(s) of the project area and vicinity delineating USDA/SCS soil types;

REFER TO THE ATTACHED STORMWATER MANAGEMENT CALCULATIONS.

b. Provide recent aerials, legible for photointerpretation with a scale of 1" = 400 ft, or more detailed, with project boundaries delineated on the aerial.

REFER TO THE DESIGN PLANS AND ENVIRONMENTAL ASSESSMENT INCLUDED IN THIS SUBMITTAL.

c. Identify the seasonal high water or mean high tide elevation and normal pool or mean low tide elevation for each on site wetland or surface water, including receiving waters into which runoff will be discharged. Include dates, datum, and methods used to determine these elevations.

PLEASE REFER TO THE SKETCH OF WETLAND "B" INCLUDED IN THE STORMWATER MANAGEMENT CALUCLTIONS.

d. Identify the wet season high water tables at the locations representative of the entire project site. Include dates, datum, and methods used to determine these elevations.

PLEASE REFER TO THE SKETCH OF WETLAND "B" INCLUDED IN THE STORMWATER MANAGEMENT CALCULATIONS.

II. ENVIRONMENTAL CONSIDERATIONS

a. Provide results of any wildlife surveys that have been conducted on the site, and provide any comments pertaining to the project from the Florida Game and Fresh Water Fish Commission and the U.S. Fish and Wildlife Service.

PLEASE REFER TO THE MITIGATION PLAN PERFORMED BY R.L. WEIGT ENVIRONMENTAL CONSULTANTS DATED OCTOBER 2003

b. Provide a description of how water quantity, quality, hydroperiod, and habitat will be maintained in on-site wetlands and other surface waters that will be preserved or will remain undisturbed.

NA – WETLAND IMPACTS WILL BE MITIGATED OFF SITE.

c. Provide a narrative description of any proposed mitigation plans, including purpose, maintenance, monitoring, and construction sequence and techniques, and estimated costs.

PLEASE REFER TO THE MITIGATION PLAN PERFORMED BY R.L. WEIGT ENVIRONMENTAL CONSULTANTS DATED OCTOBER 2003.

d. Describe how boundaries of wetlands or other surface waters were determined. If there has ever been a jurisdictional declaratory statement, a formal wetland determination, a formal determination, a validated informal determination, or a revalidated jurisdictional determination, provide the identifying number.

PLEASE REFER TO THE MITIGATION PLAN PERFORMED BY R.L. WEIGT ENVIRONMENTAL CONSULTANTS DATED OCTOBER 2003.

e. Impact Summary Tables:

1. For all projects, complete Table 1, 2 and 3 as applicable.

   PLEASE REFER TO THE MITIGATION PLAN PERFORMED BY R.L. WEIGT ENVIRONMENTAL CONSULTANTS DATED OCTOBER 2003.

2. For docking facilities or other structures constructed over wetlands or other surface waters, provide the information requested in Table 4.

   N/A

3. For shoreline stabilization projects, provide the information requested in Table 5.

   N/A

III. PLANS

Provide clear, detailed plans for the system including specifications, plan (overhead) views, cross sections (with the locations of the cross sections shown on the corresponding plan view), and profile (longitudinal) views of the proposed project. The plans must be signed and sealed by an appropriate registered professional as required by law. Plans must include a scale and a north arrow. These plans should show the following:

a. Project area boundary and total land area, including distances and orientation from roads or other land mark.

REFER TO THE SUBMITTED CONSTRUCTION PLANS AND BOUNDARY SURVEY.

b. Existing land use and land cover (acreage and percentages), and on-site natural communities, including wetlands and other surface waters, aquatic communities, and uplands. Use the Florida Land Use Cover & Classification System (FLUCCS)(Level 3) for projects proposed in the South Florida Water Management District, the St. Johns River Water Management District, and the Suwannee River Water Management District and use the National Wetlands inventory (NWI) for projects proposed in the Southwest Florida Water Management District. Also identify each community with a unique identification number which must be consistent in all exhibits.

PLEASE REFER TO THE MITIGATION PLAN PERFORMED BY R.L. WEIGT ENVIRONMENTAL CONSULTANTS DATED OCTOBER 2003.

c. The existing topography extending at least 100 feet off the project area, and including adjacent wetlands and other surface waters. All topography shall include the location and a description of known benchmarks, referenced to NGVD. For systems waterward of the mean high water (MHW) or seasonal high water lines, show water depths, referenced to mean low water (MLW) in tidal areas or seasonal low water in non-tidal areas, and list the range between MHW and MLW. For docking facilities, indicate the distance to, location of, and depths of the nearest navigational channel and access routes to the channel.

REFER TO THE ATTACHED BOUNDARY AND TOPOGRAPHIC SURVEY.

d If the project is in the known flood plain of a stream or other water course, identify the flood plain boundary and approximate flooding elevation. Identify the 100-year flood elevation and floodplain boundary of any lake, stream or other watercourse located on or adjacent to the site.

THE PROJECT IS LOCATED IN FLOOD ZONE "X" WHICH IS OUT OF THE FLOOD PLAIN PER FIRM MAPS 12111C0170 F AND 12111C0275 F, DATED AUGUST 19,1991.

e. The boundaries of wetlands and other surface waters within the project area. Distinguish those wetlands and other surface waters that have been delineated by any binding jurisdictional determination.

PLEASE REFER TO THE MITIGATION PLAN PERFORMED BY R.L. WEIGT ENVIRONMENTAL CONSULTANTS DATED OCTOBER 2003.

f. Proposed land use, land cover and natural communities (acreage and percentages), including wetlands and other surface waters, undisturbed uplands, aquatic communities, impervious surfaces, and water management areas. Use the same classification system and community identification number used in III (B) above.

POST-DEVELOPMENT LAND USE DESIGNATION:

DESIGNATION	AREA	FLUCCS IDENTIFICATION
PHASE AREA	**= 8.845 AC. (100%)**	**155** *LIGHT INDUSTRIAL*

g. Proposed impacts to wetlands and other surface waters, and any proposed connections/outfalls to other surface waters or wetlands.

PLEASE REFER TO THE MITIGATION PLAN PERFORMED BY R.L. WEIGT ENVIRONMENTAL CONSULTANTS DATED OCTOBER 2003.

h. Proposed buffer zones.

PLEASE REFER TO THE DESIGN PLANS.

i. Pre and post-development drainage patterns and basin boundaries showing the direction of flows, including any off-site runoff being routed through or around the system; and connections between wetlands and other surface waters.

REFER TO THE SUBMITTED STORMWATER MANAGEMENT CALCULATIONS

j. Location of all water management areas with details of size, side slopes, and designed water depths.

REFER TO THE SUBMITTED DESIGN PLANS AND STORMWATER MANAGEMENT CALCULATIONS

k. Location and details of all water control structures, control elevations, any seasonal water level regulation schedules: and the location and description of benchmarks (minimum of one benchmark per structure).

REFER TO THE SUBMITTED DESIGN PLANS AND STORMWATER MANAGEMENT CALACULATIONS

i. Location, dimensions and elevations of all proposed structures, including docks, seawalls, utility lines, roads, and buildings.

REFER TO THE SUBMITTED DESIGN PLANS

m. Location, size, and design capacity of the internal water management facilities.

REFER TO THE SUBMITTED STORMWATER MANAGEMENT CALCULATIONS

n. Rights-of-way and easements for the system, including all on-site and off-site areas to be reserved for water management purposes, and rights-of-way and easements for the existing drainage system, if any.

REFER TO THE SUBMITTED DESIGN PLANS

o. Receiving waters or surface water management systems into which runoff from the developed site will be discharged.

REFER TO THE SUBMITTED DESIGN PLANS AND STORMWATER MANAGEMENT CALACULATIONS

p. Location and details of the erosion, sediment and turbidity control measures to be implemented during each phase of construction and all permanent control measures to be implemented in post-development conditions.

REFER TO THE ATTACHED DESIGN PLANS

q. Location, grading, design water levels, and planting details of all mitigation areas.

PLEASE REFER TO THE SKETCH OF WETLAND "B" INCLUDED IN THE STORMWATER MANAGEMENT CALCULATIONS.

r. Site grading details, including perimeter site grading.

REFER TO THE SUBMITTED DESIGN PLANS AND STORMWATER MANAGEMENT CALCULATIONS

s. Disposal site for any excavated material, including temporary and permanent disposal sites.

ALL EXCAVATED MATERIALS TO BE DISPOSED IN ACCORDANCE WITH STATE AND LOCAL STANDARDS AND SPECIFICATIONS.

t. Dewatering plan details.

DEWATERING PLANS WILL NOT BE NECESSARY AT THIS TIME SINCE IT WILL BE ONLY FOR CONCEPTUAL APPROVAL.

u. For marina facilities, locations of any sewage pumpout facilities, fueling facilities, boat repair and maintenance facilities, and fish cleaning stations.

N/A

v. Location and description of any nearby existing offsite features (such as wetland and other surface waters, stormwater management ponds, and building or other structures) which might be affected by or affect the proposed construction or development.

REFER TO THE SUBMITTED DESIGN PLANS AND BOUNDARY SURVEY.

w. For phased projects, provide a master development plan.

A MASTER DEVELOPMENT PLAN WILL BE SUBMITTED AFTER CONCEPTUAL APPROVAL HAS BEEN GRANTED.

IV. CONSTRUCTION SCHEDULE AND TECHNIQUES

Provide a construction schedule, and a description of construction techniques, sequencing and equipment. This information should specifically include the following:

a. Method for installing any pilings or seawall slabs;

N/A

b. Schedule of implementation of a temporary or permanent erosion and turbidity control measures;

EROSION CONTROL PRACTICES INDICATED ON DESIGN PLANS

c. For projects that involve dredging or excavation in wetlands or other surface waters, describe the method of excavation, and the type of material to be excavated;

PLEASE REFER TO THE MITIGATION PLAN PERFORMED BY R.L. WEIGT ENVIRONMENTAL CONSULTANTS DATED OCTOBER 2003.

d. For projects that involve fill in wetlands or other surface waters, describe the source and type of fill material to be used. For shoreline stabilization projects that involve the installation of riprap, state how these materials are to be placed, (i.e., individually or with heavy equipment), and whether the rocks will be underlain with filter cloth;

PLEASE REFER TO THE MITIGATION PLAN PERFORMED BY R.L. WEIGT ENVIRONMENTAL CONSULTANTS DATED OCTOBER 2003.

e. If dewatering is required, detail the dewatering proposal including the methods that are proposed to contain the discharge, methods of isolating dewatering areas, and indicate the period dewatering structures will be in place; **Note: a consumptive use permit may be required for dewatering.**

DEWATERING WILL NOT BE NECESSARY DURING THE CONCEPTUAL PHASE OF THE PROJECT.

f. Methods for transporting equipment and materials to and from the work site. If barges are required for access, provide the low water depths and draft of the fully loaded barge;

N/A

g. Demolition plan for any existing structures to be removed; and

N/A

h. Identify the schedule and party responsible for completing monitoring, record drawings, and as-built certifications for the project when completed.

RECORD DRAWINGS AND CERTIFICATIONS WILL BE PERFORMED BY THE ENGINEER, CULPEPPER & TERPENING, INC., IMMEDIATELY UPON COMPLETION OF THE PROJECT.

V. DRAINAGE INFORMATION

a. Provide pre-development and post-development drainage calculations, signed and sealed by an appropriate registered professional, as follows:

REFER TO THE ATTACHED STORMWATER MANAGEMENT CALCULATIONS

1. Runoff characteristics, including area, runoff curve number or runoff coefficient, and time of concentration for each drainage basin;
2. Water table elevations (normal and seasonal high) including aerial extent and magnitude of any proposed water table drawdown;
3. Receiving water elevations (normal, wet season, design storm);
4. Design storms used including rainfall depth, duration, frequency, and distribution;
5. Runoff hydrograph(s) for each drainage basin, for all required design storm event(s);
6. Stage-storage computations for any area such as a reservoir, close basin, detention area, or channel, used in storage routing;
7. Stage-discharge computations for any storage areas at a selected control point, such as control structure or natural restriction;
8. Flood routings through on-site conveyance and storage areas;
9. Water surface profiles in the primary drainage system for each required design storm event(s);
10. Runoff peak rates and volumes discharged from the system for each required design storm event(s);
11. Tail water history and justification (time and elevation) and;
12. Pump specifications and operating curves for range of possible operating conditions (if used in system).

b. Provide the results of any percolation tests, where appropriate, and soil borings that are representative of the actual site conditions;

N/A

c. Provide the acreage, and percentages of the total project, of the following:

REFER TO THE ATTACHED STORMWATER MANAGEMENT CALCULATIONS

1. Impervious surfaces, excluding wetlands.
2. Pervious surfaces (green areas not including wetlands).
3. Lakes, canals, retention areas, other open water areas.
4. Wetlands.

d. Provide an engineering analysis of floodplain storage and conveyance (if applicable), including:

REFER TO THE ATTACHED STORMWATER MANAGEMENT CALCULATIONS

1. Hydraulic calculations for all proposed traversing works;
2. Backwater water surface profiles showing upstream impact of traversing works;
3. Location and volume of encroachment within regulated floodplain(s); and
4. Plan for compensating floodplain storage, if necessary, and calculations required for determining minimum building and road flood elevations.

e. Provide an analysis of the water quality treatment system including:

REFER TO THE ATTACHED STORMWATER MANAGEMENT CALCULATIONS

1. A description of the proposed stormwater treatment methodology that addresses the type of treatment, pollution abatement volumes, and recovery analysis; and
2. Construction plans and calculations that address stage-storage and design elevations, which demonstrate compliance with the appropriate water quality treatment criteria.

f. Provide a description of the engineering methodology, assumptions and references for the parameters listed above, and a copy of all such computations, engineering plans, and specifications used to analyze the system. If a computer program is used for the analysis, provide the name of the program, a description of the program, input and output data, two diskette copies, if available, and justification for model selection.

REFER TO THE ATTACHED STORMWATER MANAGEMENT CALCULATIONS

VI. OPERATION AND MAINTENANCE AND LEGAL DOCUMENTATION

a. Describe the overall maintenance and operation schedule for the proposed system.

MAINTENANCE WILL BE PERFORMED ON AN "AS-NEEDED" BASIS BY THE OWNER

b. Identify the entity that will be responsible for operating and maintaining the system in perpetuity if different than the permittee, a draft document enumerating the enforceable affirmative obligations on the entity to properly operate and maintain the system for its expected life, and documentation

of the entity's financial responsibility for long term maintenance. If the proposed operation and maintenance entity is not a property owner's association, provide proof of the existence of an entity, or the future acceptance of the system by an entity which will operate and maintain the system. If a property owner's association is the proposed operation and maintenance entity, provide copies of the articles of incorporation for the association and copies of the declaration, restrictive covenants, deed restrictions, or other operational documents that assign responsibility for the operation and maintenance of the system. Provide information ensuring the continued adequate access to the system for maintenance purposes. Before transfer of the system to the operating entity will be approved, the permittee must document that the transferee will be bound by all terms and conditions of the permit.

MAINTENANCE WILL BE PERFORMED ON AN "AS-NEEDED" BASIS BY THE OWNER

c. Provide copies of all proposed conservation easements, storm water management system easements, property owner's association documents, and plats for the property containing the proposed system.

PLEASE REFER TO THE ATTACHED CONSTRUCTION PLANS.

d. Provide indication of how water and waste water service will be supplied. Letters of commitment from off-site suppliers must be included.

WATER AND WASTEWATER WILL BE PROVIDED BY FORT PIERCE UTILITIES AUTHORITY

e. Provide a copy of the boundary survey and/or legal description and acreage of the total land area of contiguous property owned/controlled the applicant.

REFER TO ATTACHED OWNERSHIP INFORMATION AND BOUNDARY SURVEY

VII. WATER-USE

a. Will the surface water system be used for water supply, including landscape irrigation, recreation, etc.?

NO

b. If a Consumptive Use or Water Use permit has been issued for the project, state the permit number.

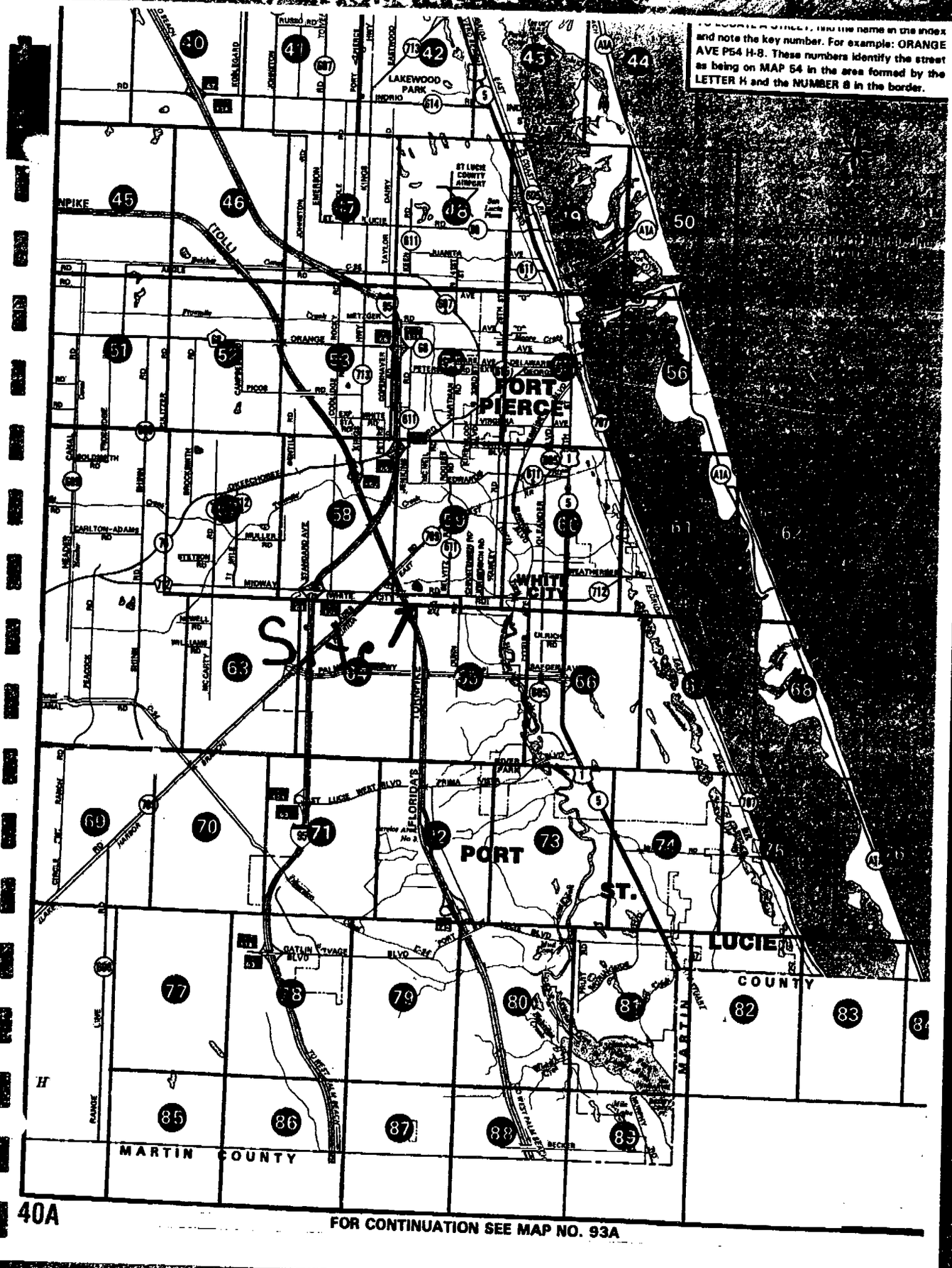
NA.

c. If no Consumptive Use or Water Use permit has been issued for the project, indicate if such a permit will be required and when the application for a permit will be submitted.

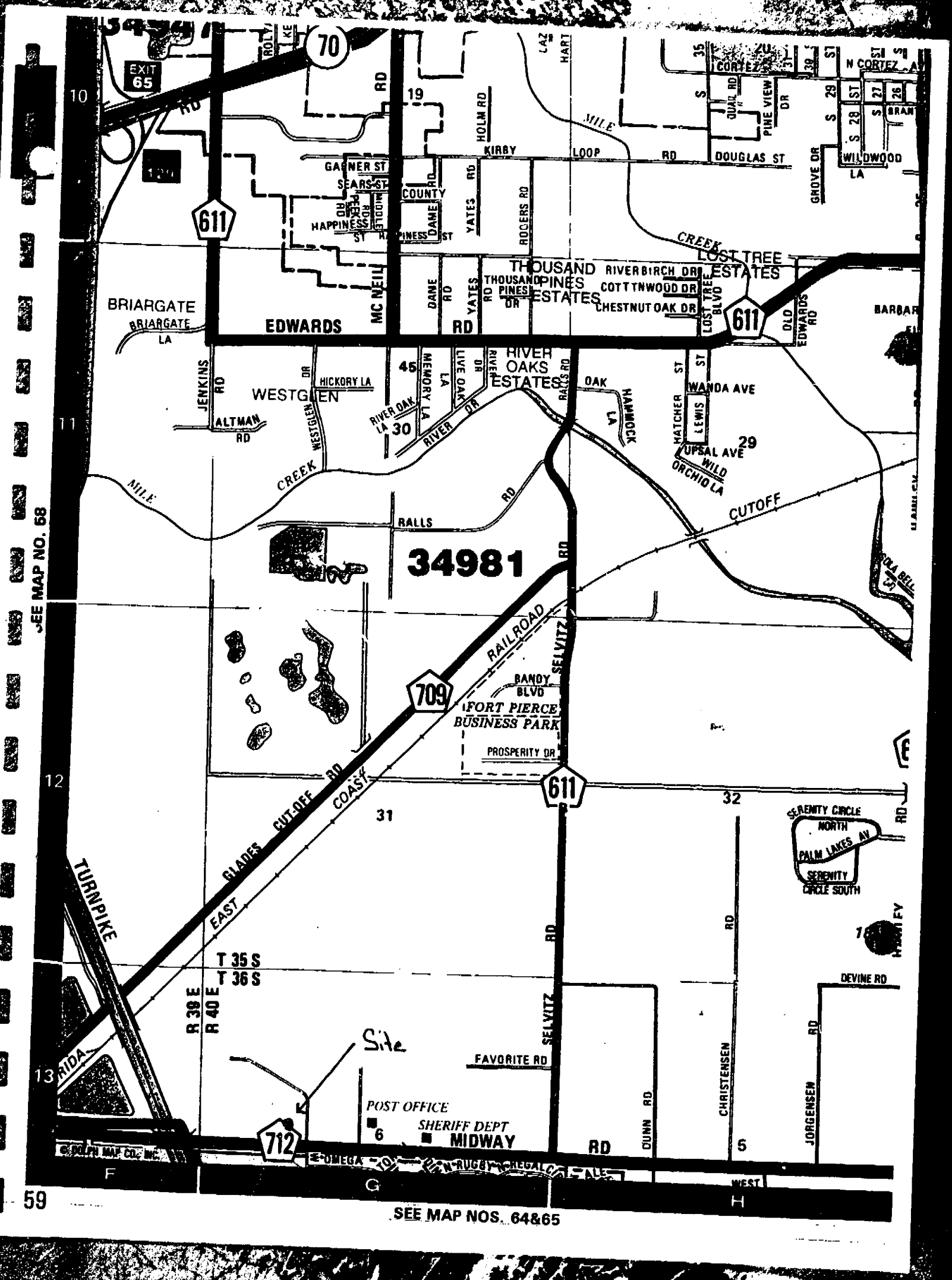
A CONSUMPTIVE USE PERMIT WILL NOT BE NECESSARY FOR THE CONCEPTUAL PERMIT.

d. Indicate how any existing wells located within the project site will be utilized or abandoned.

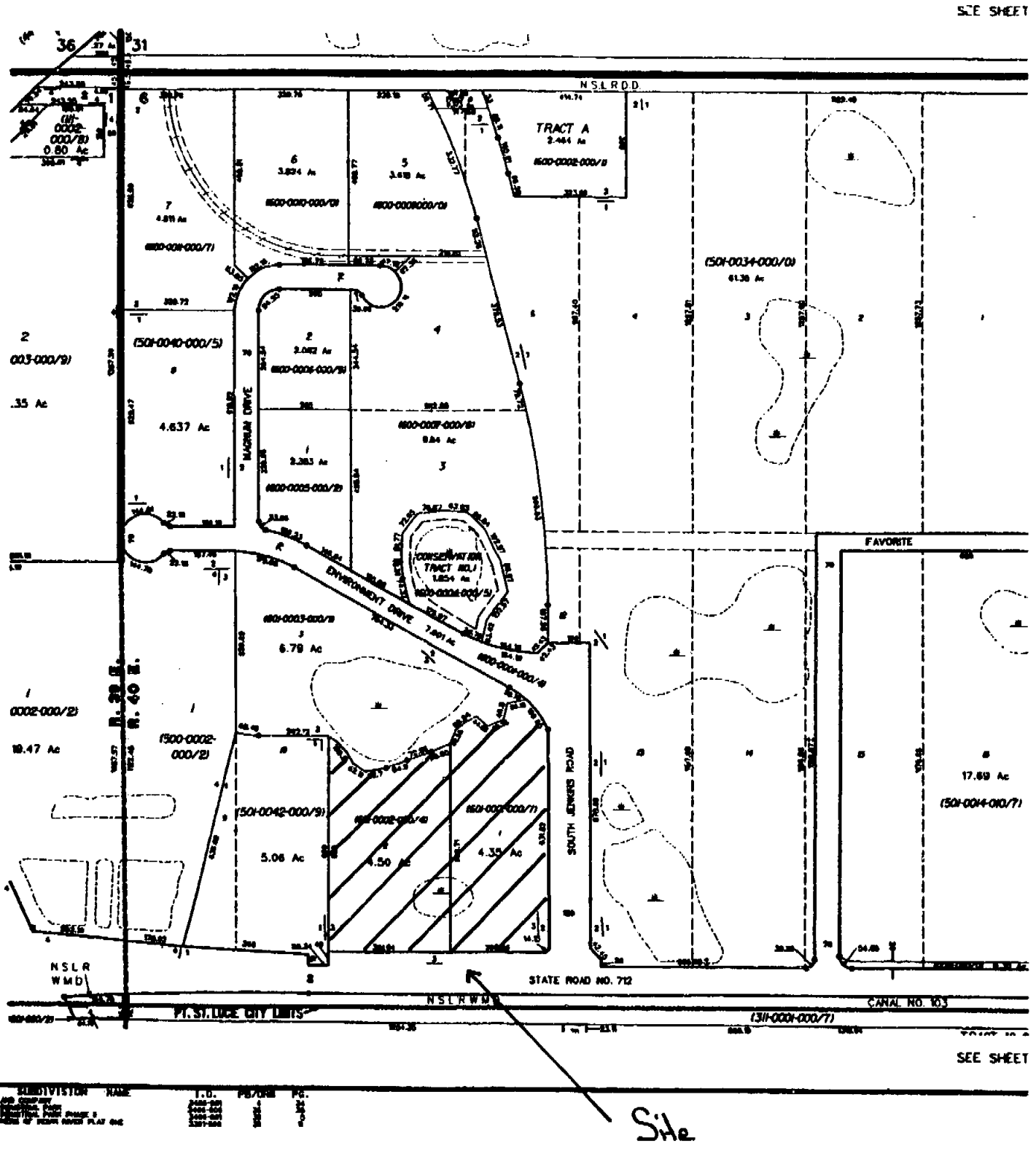
PLEASE REFER TO THE MITIGATION PLAN PERFORMED BY R.L. WEIGT ENVIRONMENTAL CONSULTANTS DATED OCTOBER 2003.



FOR CONTINUATION SEE MAP NO. 93A



EXIT 65
70
611
709
712
BRIARGATE
EDWARDS RD
MC NEIL RD
THOUSAND PINES ESTATES
LOST TREE ESTATES
RIVER OAKS ESTATES
WESTGLEN
MILE CREEK
RALLS RD
CUTOFF
34981
RAILROAD
SELVITZ RD
FORT PIERCE BUSINESS PARK
PROSPERITY DR
GLADES CUT-OFF RD
EAST COAST
TURNPIKE
T 35 S
T 36 S
R 39 E
R 40 E
Site
POST OFFICE
SHERIFF DEPT
MIDWAY RD
FAVORITE RD
DUNN RD
CHRISTENSEN RD
JORGENSEN RD
DEVINE RD
SERENITY CIRCLE NORTH
PALM LAKES AV
SERENITY CIRCLE SOUTH
SEE MAP NO. 58
SEE MAP NOS. 64&65


SEE SHEET
36
31
N.S.L.R.D.D.
TRACT A
2.464 Ac
(500-0002-000/0)
(501-0034-000/0)
61.36 Ac
(501-0040-000/5)
4.637 Ac
.35 Ac
MORGAN DRIVE
CONSERVATION TRACT NO.1
1.854 Ac
(500-0004-000/5)
ENVIRONMENT DRIVE
FAVORITE
6.79 Ac
(500-0002-000/2)
18.47 Ac
(500-0002-000/2)
(501-0042-000/9)
5.06 Ac
4.50 Ac
4.35 Ac
SOUTH JENKINS ROAD
17.69 Ac
(501-0014-000/7)
SEE SHEET 33/01N
T. 38 S.
R. 40 E.
NSLR WMD
STATE ROAD NO. 712
N S L R W M D
CANAL NO. 103
Ft. St. Lucie City Limits
(311-0001-000/7)
SEE SHEET
Site

JUANNE MULMAN, CLERK OF THE CIRCUIT COURT - ST. LUCIE COUNTY
File Number: 1900853 OR BOOK 1380 PAGE 1564
Recorded:04/09/01 11:10

* Doc Assump:	$	0.00
* Doc Tax :	$	2,450.00
* Int Tax :	$	0.00

This Instrument Prepared by:
Frank H. Fee, III, Esquire
Fee, Koblegard & DeRoos
401 South Indian River Drive
Fort Pierce, Florida 34950

Return to: Law Firm of
Pamela Stewart, P.A.
11983 Tamiami Trail N.
Suite 134
Naples, FL 34110
mail

WARRANTY DEED

THIS WARRANTY DEED, executed this 26th day of March, 2001, by

MIDWAY PROPERTIES OF ST. LUCIE COUNTY, L.C., a Florida limited liability company and RON THOMAS JONES and ANNE CODY JONES, as Ancillary Co-Personal Representatives of the Estate of THOMAS C. JONES, deceased

hereinafter called the Grantor, to

JOHN A. MAYO
4820 North River Place
Fort Pierce, Florida 34982

hereinafter called the Grantee:

(Wherever used herein, the terms "Grantor" and "Grantee" shall include singular and plural, heirs, legal representatives, and assigns of individuals, and the successors and assigns of corporations, wherever the context so admits or requires.)

WITNESSETH, That the Grantor, for and in consideration of the sum of $10.00 in hand paid by the Grantee, the receipt whereof is hereby acknowledged, hereby grants, bargains, sells, aliens, remises, releases, conveys and confirms unto the Grantee forever, all that certain land situate, lying and being in the County of St. Lucie, State of Florida, to-wit:

Lots 1 and 2, LESS AND EXCEPTING therefrom the South 40 feet thereof conveyed to St. Lucie County as additional right-of-way for West Midway Road (CR 712), MIDWAY INDUSTRIAL PARK - PHASE II, as per Plat thereof recorded in Plat Book 39, pages 8 and 8A, of the Public Records of St. Lucie County, Florida.

TOGETHER with all the tenements, hereditaments and appurtenances thereto belonging or in anywise appertaining **AND HEREBY DISCLAIMING, relinquishing and abandoning the 30 foot ingress and egress easement as was, through error, shown to exist over and upon the above-described Lot 1, but which easement was neither dedicated nor intended by Grantor to be offered for dedication by the above referenced Plat.**

TO HAVE AND TO HOLD the same in fee simple forever.

AND the Grantor hereby covenants with the Grantee that the Grantor is lawfully seized of said land in fee simple; that the Grantor has good right and lawful authority to sell and convey said land; that the Grantor hereby fully warrants the title to said land and will defend the same against the lawful claims of all persons whomsoever; and that said land is free of all encumbrances, except taxes accruing subsequent to December 31, 2000.

IN WITNESS WHEREOF, the Grantor has caused these presents to be executed the day and year first above written.

Signed, Sealed and Delivered
in the Presence of:

Jessica Spooner
Jessica Spooner, Witness
(Print or Type Name)

Benjamin L. Lindquist, Witness
(Print or Type Name)

Jessica Spooner
Jessica Spooner, Witness
(Print or Type Name)

Benjamin L. Lindquist, Witness
(Print or Type Name)

RON THOMAS JONES, as Ancillary Co-Personal Representative of the Estate of THOMAS C. JONES, deceased

Anne Cody Jones
ANNE CODY JONES, as Ancillary Co-Personal Representative of the Estate of THOMAS C. JONES, deceased

STATE OF GEORGIA
COUNTY OF Thomas

I HEREBY CERTIFY that the foregoing instrument was acknowledged before me this 26th day of March, 2001, by **RON THOMAS JONES, as Ancillary Co-Personal Representative of the Estate of THOMAS C. JONES, deceased,** who is personally known to me or who provided _____ as identification and who did not take an oath.

Sandra Glenn
My Commission Expires: 1-
My Commission Number:

STATE OF GEORGIA
COUNTY OF Thomas

I HEREBY CERTIFY that the foregoing instrument was acknowledged before me this 26th day of March, 2001, by **ANNE CODY JONES, as Ancillary Co-Personal Representative of the Estate of THOMAS C. JONES, deceased,** who is personally known to me or who provided _____ as identification and who did not take an oath.

Sandra Glenn
My Commission Expires: 1-
My Commission Number:

IN WITNESS WHEREOF, the Grantor has caused these presents to be executed the day and year first above written.

Signed, Sealed and Delivered
In the Presence of:

Ann C Cole
Ann C Cole, Witness
(Print or Type Name)

Natasha Parke
Natasha Parke, Witness
(Print or Type Name)

MIDWAY PROPERTIES OF ST. LUCIE COUNTY, L.C., a Florida limited liability company

By: Edwin C. Lunsford Jr.
Edwin C. Lunsford, Jr.
Managing Member

STATE OF FLORIDA
COUNTY OF ST. LUCIE

I HEREBY CERTIFY that the foregoing instrument was acknowledged before me this 26 day of March, 2001, by **EDWIN C. LUNSFORD, JR.**, as Managing Member of **MIDWAY PROPERTIES OF ST. LUCIE COUNTY, L.C.**, a Florida limited liability company, who is personally known to me or who provided _____ as identification and who did not take an oath.

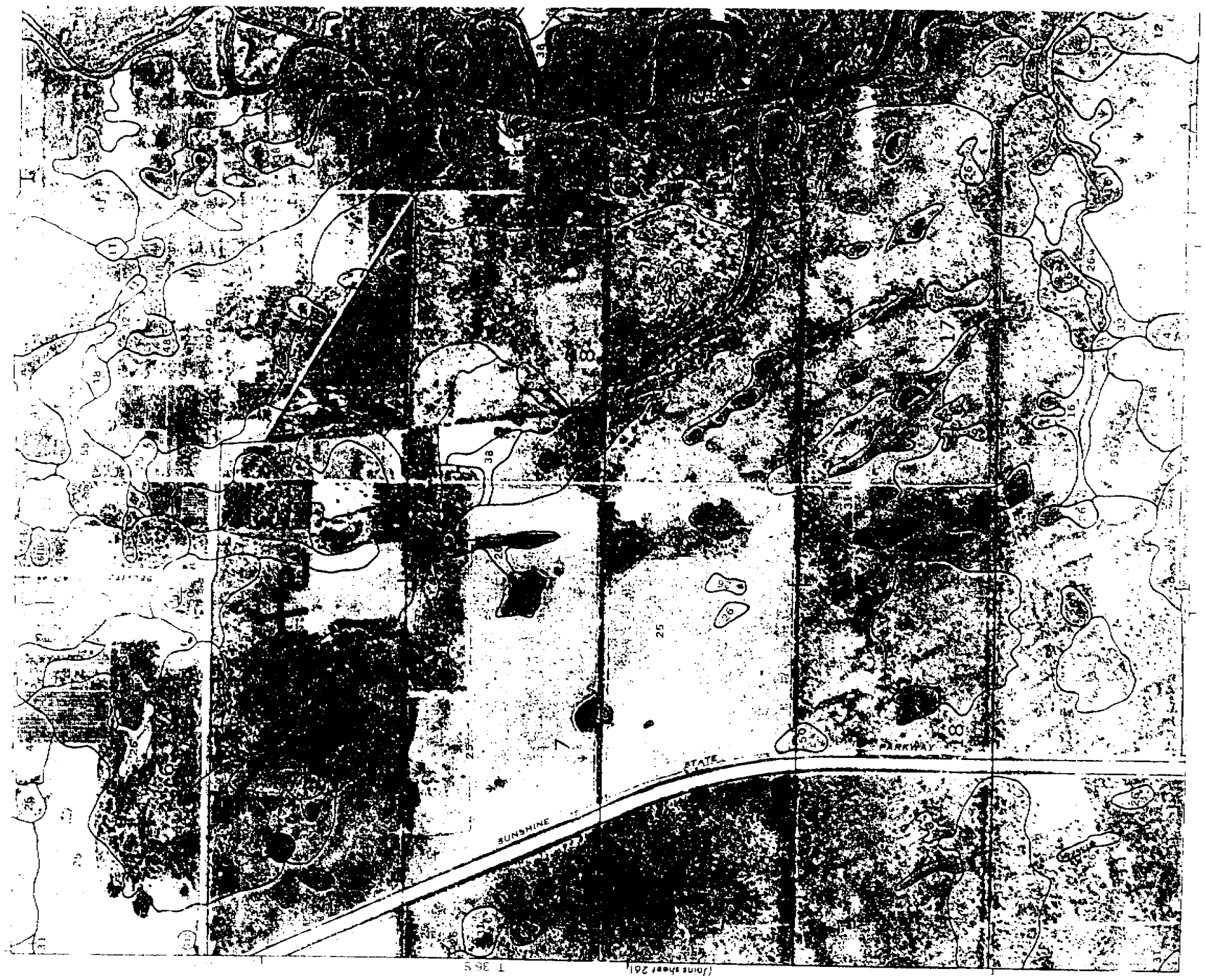
TONI-MARIE Q. TAYLOR
MY COMMISSION # CC 749661
EXPIRES: June 9, 2002
Bonded Thru Notary Public Underwriters

Toni-Marie Q. Taylor
_____, Notary Public
State of Florida at Large
My Commission Expires:
My Commission Number:

Table 2-2a.—Runoff curve numbers for urban areas[1]

Cover description		Curve numbers for hydrologic soil group—			
Cover type and hydrologic condition	Average percent impervious area[2]	A	B	C	D
Fully developed urban areas (vegetation established)					
Open space (lawns, parks, golf courses, cemeteries, etc.)[3]:					
Poor condition (grass cover < 50%)		68	79	86	89
Fair condition (grass cover 50% to 75%)		49	69	79	84
Good condition (grass cover > 75%)		39	61	74	80
Impervious areas:					
Paved parking lots, roofs, driveways, etc. (excluding right-of-way)		98	98	98	98
Streets and roads:					
Paved; curbs and storm sewers (excluding right-of-way)		98	98	98	98
Paved; open ditches (including right-of-way)		83	89	92	93
Gravel (including right-of-way)		76	85	89	91
Dirt (including right-of-way)		72	82	87	89
Western desert urban areas:					
Natural desert landscaping (pervious areas only)[4]		63	77	85	88
Artificial desert landscaping (impervious weed barrier, desert shrub with 1- to 2-inch sand or gravel mulch and basin borders)		96	96	96	96
Urban districts:					
Commercial and business	85	89	92	94	95
Industrial	72	81	88	91	93
Residential districts by average lot size:					
1/8 acre or less (town houses)	65	77	85	90	92
1/4 acre	38	61	75	83	87
1/3 acre	30	57	72	81	86
1/2 acre	25	54	70	80	85
1 acre	20	51	68	79	84
2 acres	12	46	65	77	82
Developing urban areas					
Newly graded areas (pervious areas only, no vegetation)[5]		77	86	91	94
Idle lands (CN's are determined using cover types similar to those in table 2-2c).					

[1]Average runoff condition, and $I_a = 0.2S$.
[2]The average percent impervious area shown was used to develop the composite CN's. Other assumptions are as follows: impervious areas are directly connected to the drainage system, impervious areas have a CN of 98, and pervious areas are considered equivalent to open space in good hydrologic condition. CN's for other combinations of conditions may be computed using figure 2-3 or 2-4.
[3]CN's shown are equivalent to those of pasture. Composite CN's may be computed for other combinations of open space cover type.
[4]Composite CN's for natural desert landscaping should be computed using figures 2-3 or 2-4 based on the impervious area percentage (CN = 98) and the pervious area CN. The pervious area CN's are assumed equivalent to desert shrub in poor hydrologic condition.
[5]Composite CN's to use for the design of temporary measures during grading and construction should be computed using figure 2-3 or 2-4, based on the degree of development (impervious area percentage) and the CN's for the newly graded pervious areas.


SUNSHINE
STATE
PARKWAY
T 38 S
(Joins sheet 26)

ST. LUCIE COUNTY, FLORIDA -- SHEET

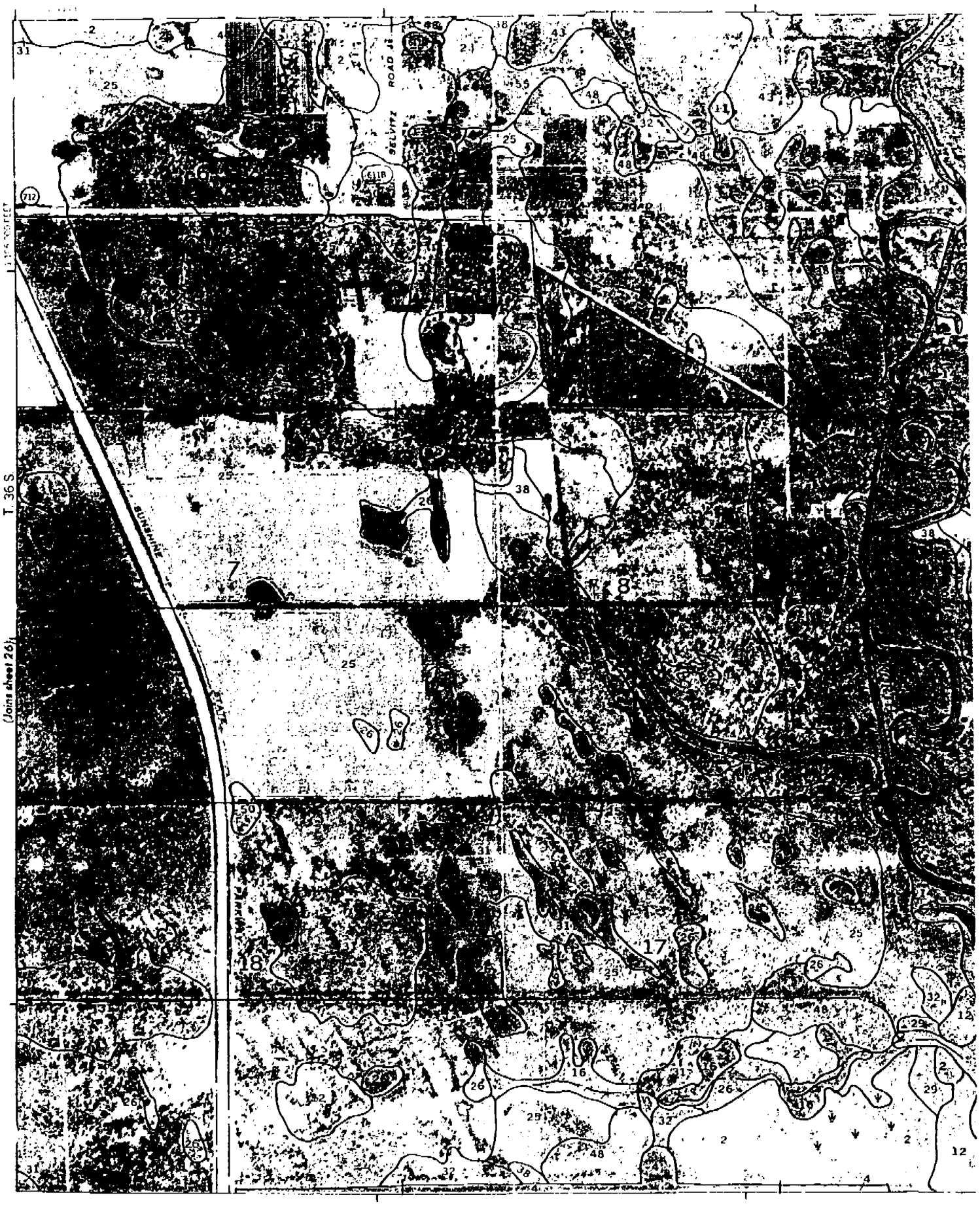


TABLE 17.--SOIL AND WATER FEATURES--Continued

Soil name and map symbol	Hydrologic group	Flooding			High water table			Cemented pan		Subsidence		Risk of corrosion	
		Frequency	Duration	Months	Depth	Kind	Months	Depth	Hardness	Initial	Total	Uncoated steel	Concrete
					Ft			In		In	In		
35*:													
Pompano Variant--	D	Frequent-----	Very long	Jan-Dec	+2-1.0	---	Jan-Dec	---	---	---	---	High-----	Low.
Kaliga Variant---	D	Frequent-----	Very long	Jan-Dec	+2-1.0	Apparent	Jan-Dec	---	---	4-8	14-34	High-----	Low.
36---------- Pople	C/D	None---------	---	---	0-1.0	Apparent	Jun-Nov	---	---	---	---	High-----	Low.
37---------- Riviera	B/D	None---------	---	---	+2-1.0	Apparent	Jun-Dec	---	---	---	---	High-----	High.
38---------- Riviera	B/D	None---------	---	---	0-1.0	Apparent	Jun-Dec	---	---	---	---	High-----	High.
39---------- Salerno	B/D	None---------	---	---	0-1.0	Apparent	Jun-Nov	50-72	Rippable	---	---	High-----	High.
40*:													
Samsula Variant--	A/D	None---------	---	---	+2-0	Apparent	Jun-Feb	---	---	4-8	35-40	High-----	High.
Myakka Variant---	C/D	None---------	---	---	+1-0	Apparent	Jun-Feb	---	---	4-8	8-16	High-----	Moderate.
41---------- Satellite	C	None---------	---	---	1.0-3.5	Apparent	Jun-Nov	---	---	---	---	Low------	Moderate.
42---------- St. Lucie	A	None---------	---	---	>6.0	---	---	---	---	---	---	Low------	Moderate.
43---------- Susanna	C/D	None---------	---	---	0-1.0	Perched	Jun-Oct	15-30	Rippable	---	---	High-----	High.
44---------- Tantile	C/D	None---------	---	---	0-1.0	Perched	Jun-Oct	15-30	Rippable	---	---	High-----	High.
45---------- Terra Ceia	A/D	None to common.	Long------	Jun-Nov	+1-1.0	Apparent	App	---	---	4-8	50-60	Moderate	Moderate.
46---------- Turnbull Variant	D	Frequent-----	Very long	Jan-Dec	+2-0	Apparent	Jan-Dec	---	---	---	---	High-----	Low.
47*. Urban land													
48---------- Wabasso	B/D	None---------	---	---	0-1.0	Apparent	Jun-Oct	---	---	---	---	Moderate	High.
49---------- Wabasso Variant	B/D	None---------	---	---	0-1.0	Apparent	Jun-Oct	---	---	---	---	Moderate	High.
50---------- Waveland	B/D	None---------	---	---	0-1.0	Perched	Jun-Oct	30-50	Rippable	---	---	High-----	High.
51*:													
Waveland----------	B/D	None---------	---	---	+2-1.0	Perched	Jun-Oct	30-50	Rippable	---	---	High-----	High.

See footnote at end of table.

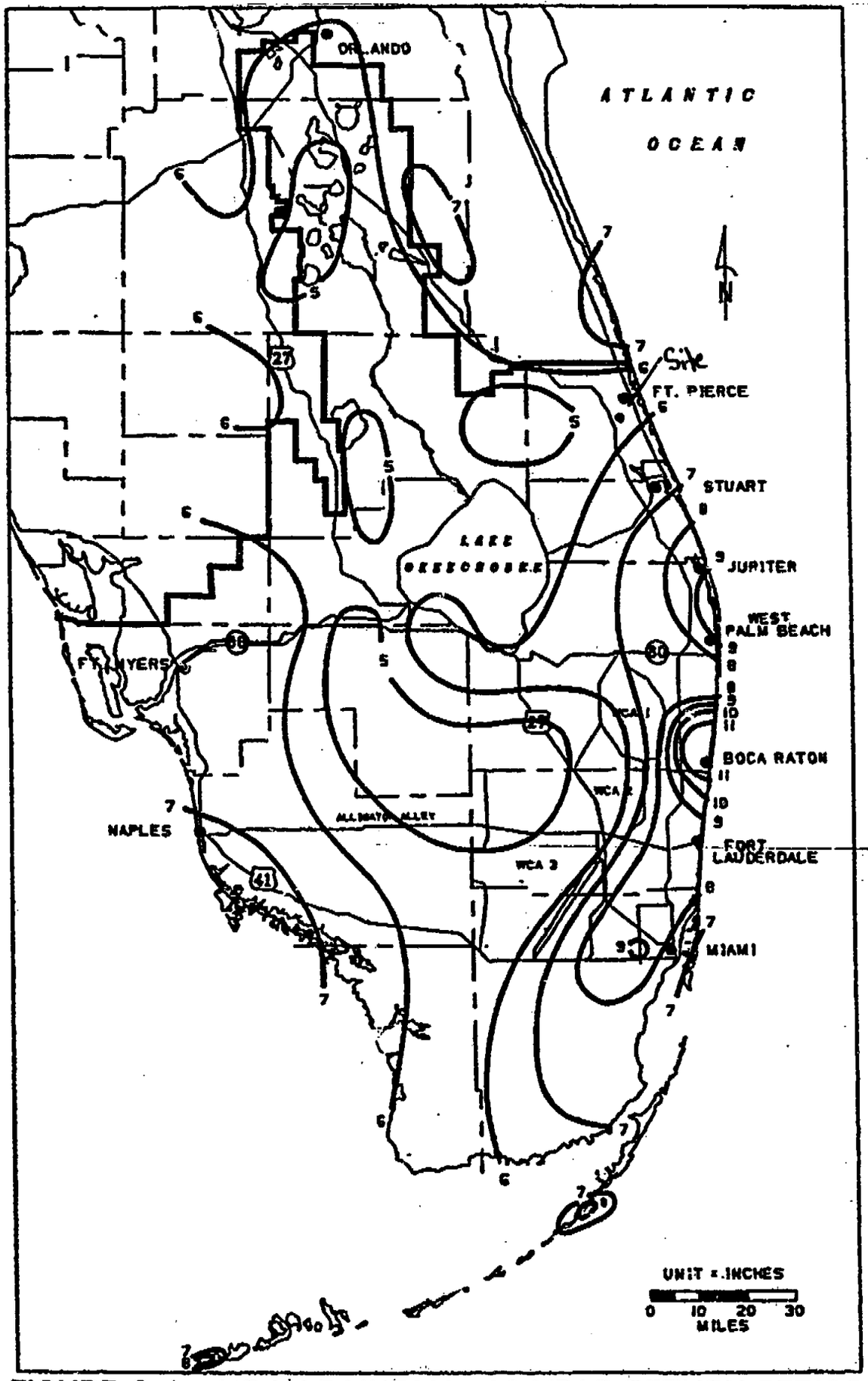


FIGURE C-4. 1-DAY RAINFALL: 10-YEAR RETURN PERIOD

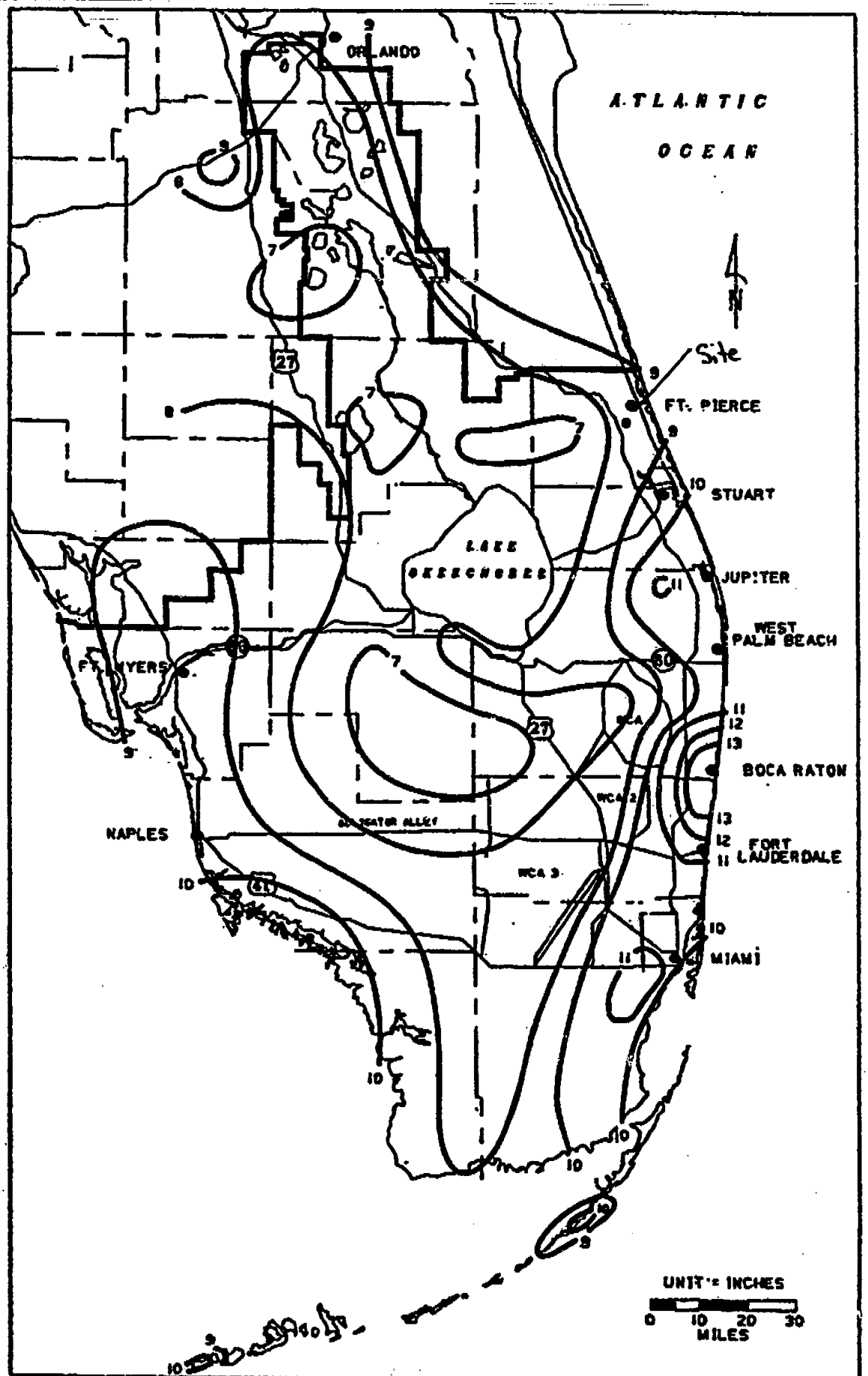


FIGURE C-7. 3-DAY RAINFALL: 10-YEAR RETURN PERIOD

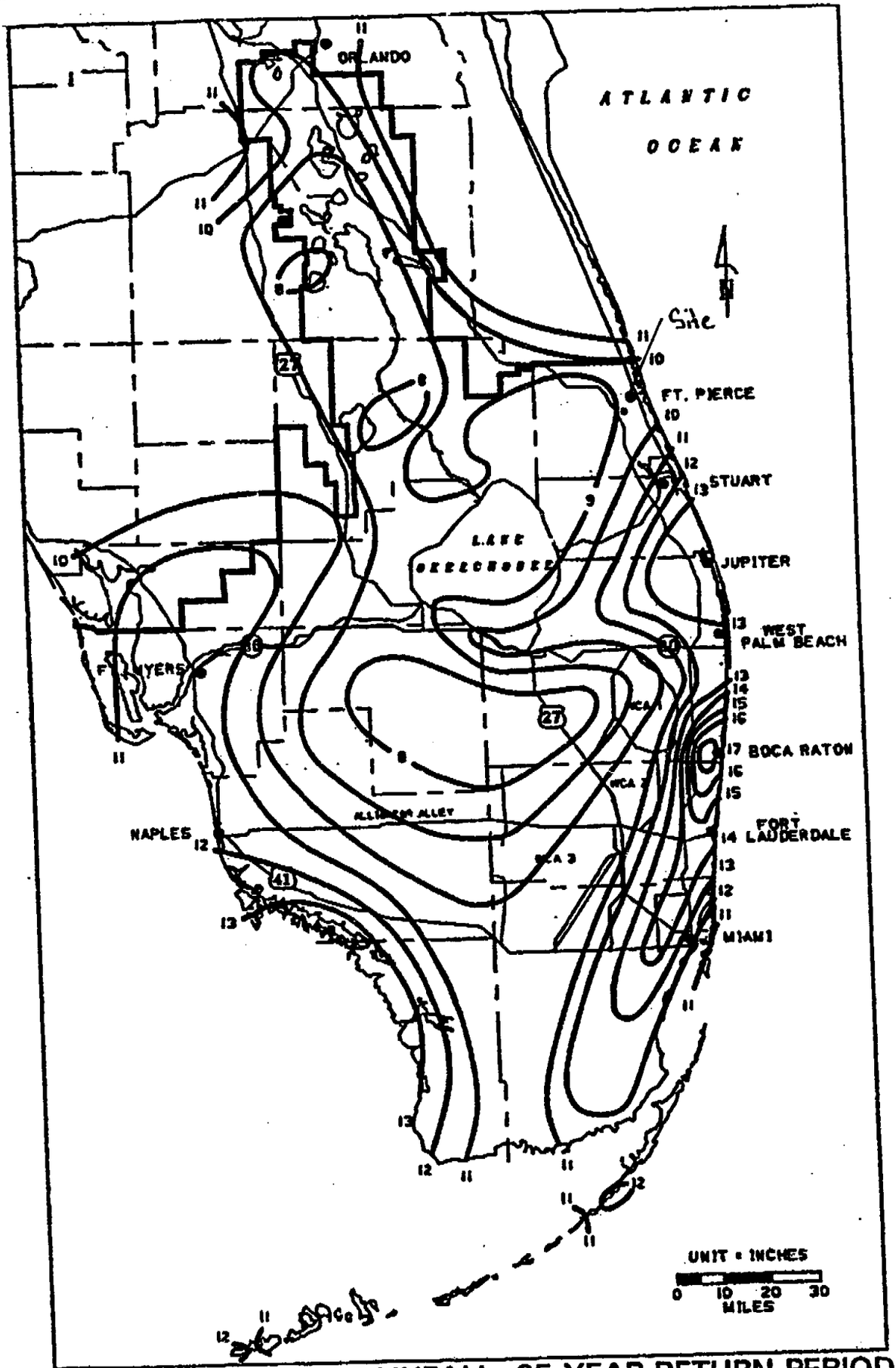


FIGURE C-8. 3-DAY RAINFALL: 25-YEAR RETURN PERIOD

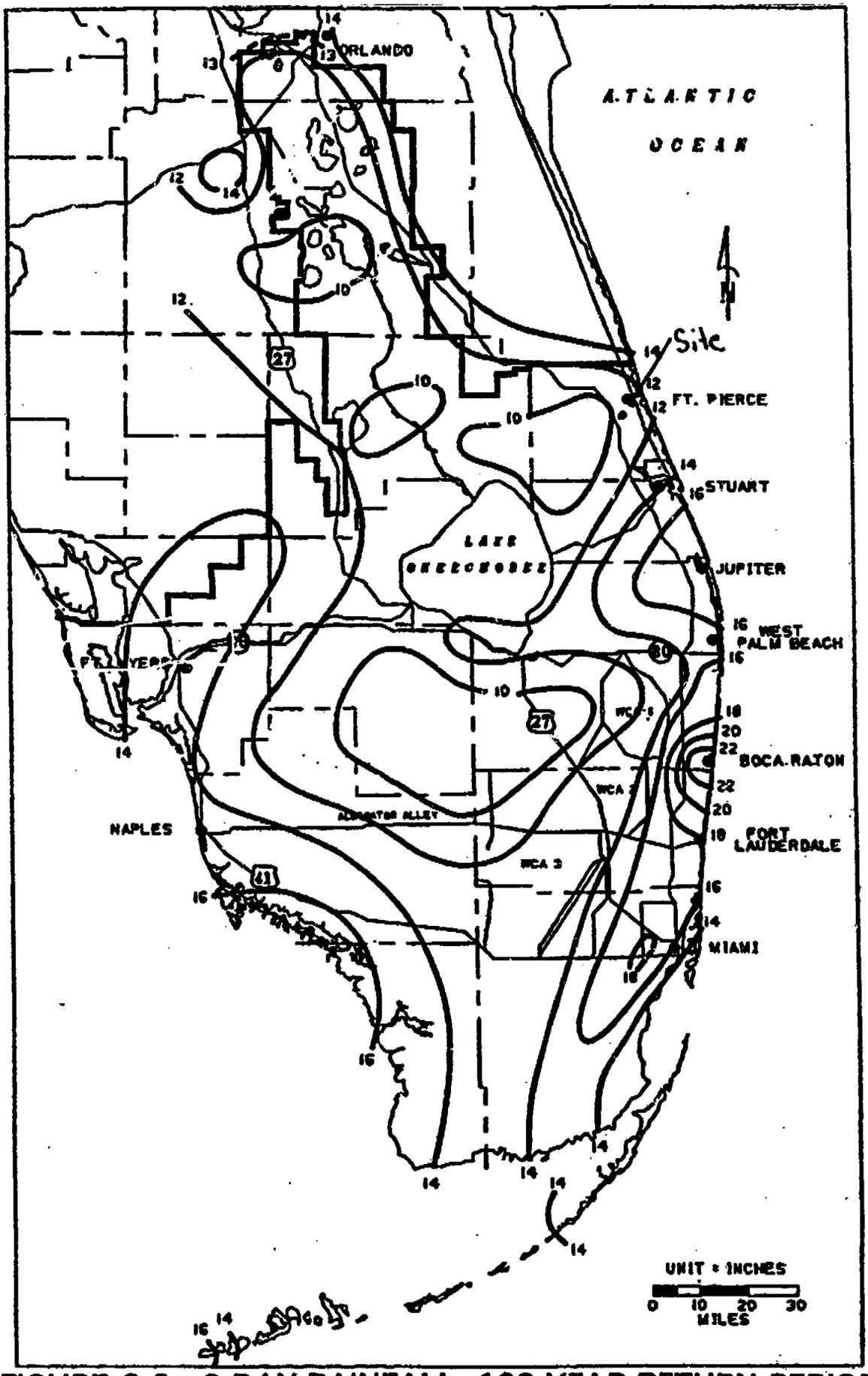


FIGURE C-9. 3-DAY RAINFALL: 100-YEAR RETURN PERIOD

interFlood by a la mode, inc.
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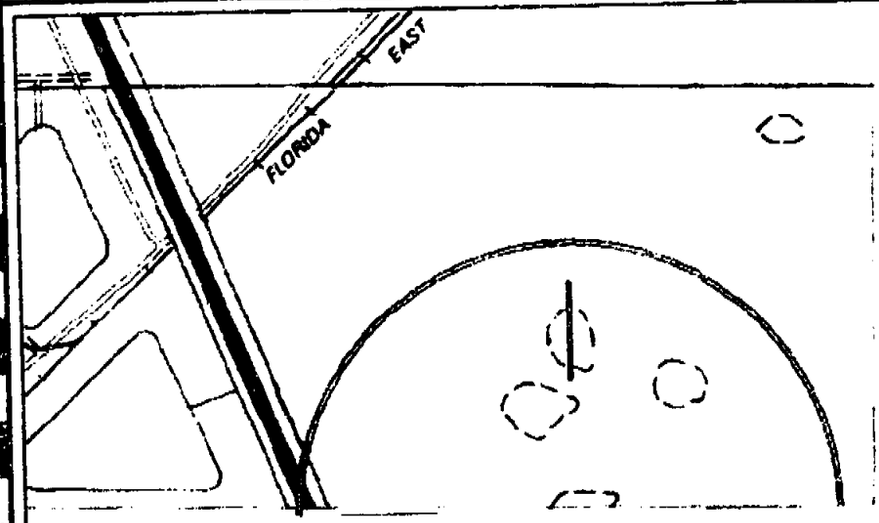
Prepared for:
Culpepper & Terpening
Fort Pierce, FL 34981



NORTH

FLOODSOURCE

Flood Hazards Map

Map Number
12111C0170F

Effective Date
August 19, 1991

For more information about Flood Zones and Flood Zone insurance, contact:

FloodSource Corp
877-77-FLOOD
www.floodsource.com

0' 700' 1400' 2100' 2800'

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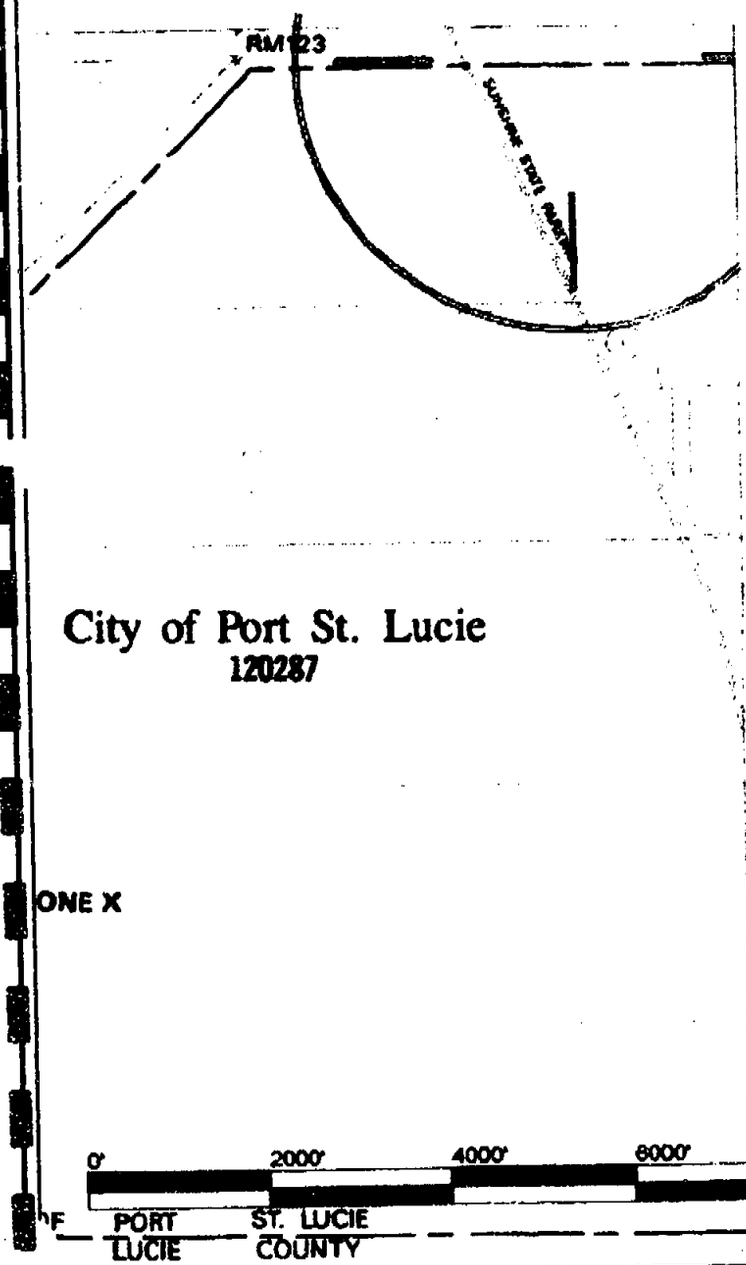
Fort Pierce, FL 34981



NORTH

FLOODSOURCE

Flood Hazards Map

Map Number
12111C0275F

Effective Date
August 19, 1991

For more information about Flood Zones and Flood Zone insurance, contact:

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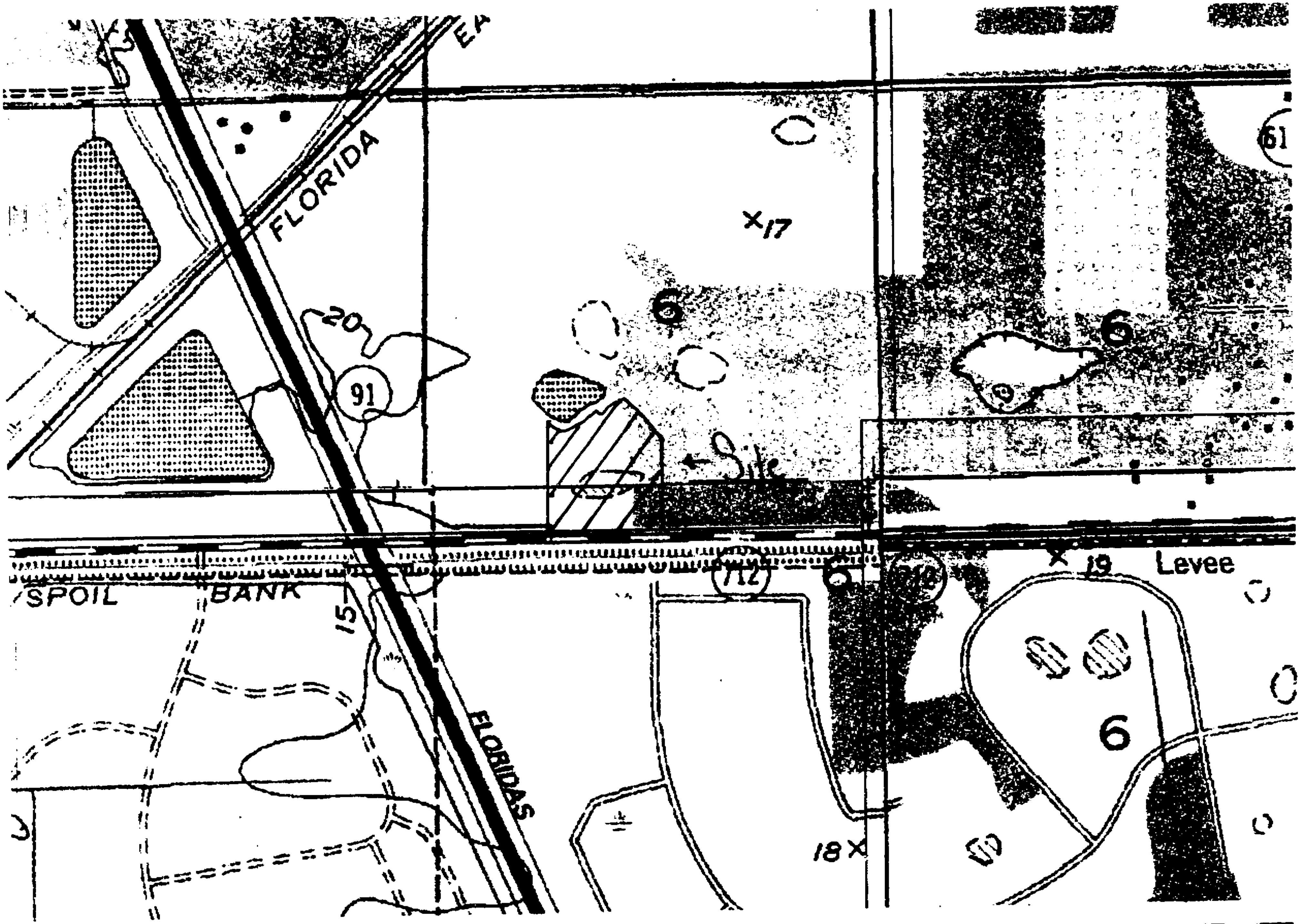

FLORIDA
×17
20
91
← Site
SPOIL
BANK
15
712
×19
Levee
FLORIDAS
6
18×
61

objectives including, but not limited to, restoration of the District's rights-of-way in an acceptable manner.

New Connections and Enlargement of Existing Connections

New connections and the enlargement of existing connections discharging stormwater runoff to District canals shall be designed and installed to limit discharge from the drainage area served by the proposed connection.

For ***gravity connections***, the applicant must demonstrate that the proposed installation will limit stormwater runoff to the volumetric equivalent of not more than 2.0 inches of depth over the area served for any 24-hour period from the 10-year frequency, 72-hour duration rainfall.

For ***pumped connections***, the total pump capacity shall not exceed the volumetric equivalent of 2.0 inches of depth per day from the area to be served by the pump.

The 2.0-inch allowable discharge volume only applies to areas lying within the existing District boundaries. Applications for areas lying outside existing District boundaries will be reviewed and evaluated on a case-by-case basis.

All gravity drainage connections to District canals shall be made in accordance with the details shown on *Exhibit C.*

For drainage design purposes, the applicant may contact the District for information concerning canal tailwater elevations for use at the applicant's own risk. The applicant is encouraged to contact the District concerning any decisions made on assumed tailwater stages in District canals prior to use of the tailwater elevation in any drainage analysis.

For projects involving land areas outside District boundaries which are proposed to drain through the District, special provisions may be required to comply with the water control and water quality objectives of the District. The applicant shall contact the District for a pre-application meeting to discuss the proposed project.

C. Irrigation Connections

Connections to District canals for irrigation withdrawals shall be designed and installed in a manner that is consistent with the water control, operation and maintenance objectives of the District. Irrigation intake works lying within the limits of the canal shall not impair the District's ability to perform normal maintenance operations. Intake works violating this objective shall be removed immediately upon request of the District during the required maintenance period.

Above-ground irrigation system improvements including, but not limited to, pumps, pump houses or appurtenant works shall not be permitted in the District's right-of-way.

I) **Design Criteria:**

A) Post Development Land Use Designation:

Description	Total Project	Lot 1	Lot 2
Bldg. Coverage	2.20 ac.	1.21 ac.	0.99 ac.
Parking	2.96 ac.	1.53 ac.	1.43 ac.
Sidewalks	0.14 ac.	0.07 ac.	0.07 ac.
Open Space / Dry Detention	3.54 ac.	1.54 ac.	2.00 ac.
Total	8.84 ac.	4.35 ac.	4.49 ac.

B) Pervious/Impervious Calcs:

Impervious Area *(Impervious area includes: Bldg. Coverage, & Pavement)*
5.30 ac

Pervious Area *(Impervious area includes: Open Space / Dry Detention)*
3.54 ac

Percent Impervious
59.95%

Percent Pervious
40.05%

C) Minimum elevations:

1) Roads and Parking:
   a) 10-year, 1-day Peak Stage = 21.58 ft NGVD *(Refer to Routed Hydrograph)*
   Set minimum parking elevation at 22.0' NGVD

2) Finish Floor Elevation (F.F E.):
   a) The project is located in Flood Zone "X" with a base flood elevation outside of the 500 year storm event per FEMA flood maps 12111C0170F and 12111CO275F, dated 8-19-1991
      A) 100-year, 3-day (Zero Discharge Stage Calculation)
         a) $V_{100y\text{-}72hr}$= 6.61 ac-ft
         b) Interpolate from the site's Stage vs. Storage computations between El.=23.0' & 23.5' NGVD *"Refer to attached"*
         c) $Flood_{elev}$= 23.19 ft NGVD
   b) **Set minimum Finish Floor Elevation at 24.0' NGVD**

3) Perimeter Grade:
   a) 25-year, 3-day Peak Stage = 22.34 NGVD (Refer to Routed Hydrograph)
   Set minimum perimeter grade elevation at 22.5' NGVD

D) Design Storm Allowable Discharge: (Per S.F.W.M.D. Requirements)

1) Because the site lies within the jurisdiction of the North St. Lucie River Water Control District (NSLRWCD), the proposed SWMS is designed in accordance with the criteria established by the NSLRWCD and St. Lucie County.

2) The allowable discharge is per the requirements set forth by the NSLRWCD

c) Allowable discharge =
"The proposed installation will limit stormwater runoff to the volumetric equivalent of not more than 2.0 inches of depth over the area served for any 24-hour period from the 10-year, 72-hour duration rainfall."

(2/12 feet) * 8.84 = 1.47 ac-ft

Total Allowable Discharge **1.47 ac-ft** (10 yr - 72 hr Storm)

d) Post-Development discharge = **1.40 ac-ft** (10 yr - 72 hr Storm)
48 hr = 0.5 ac-ft
72 hr = 1.9 ac-ft
Difference = 1.4 ac-ft

North St. Lucie River Water Control District Criteria Has Been Met

E) Control Elevation:

1) Control Elevation = **18.50 ft. NGVD**

a) The control elevation for the project is based upon the high water mark of the wetland directly north of the site. A copy of the signed and sealed survey has been included with this submittal.

F) SCS Curve Number, Soil Storage, & Tc Derivation:

1) ***Pre-Development Condition:***

a) Drainage Area = 8.84 ac.
b) Impervious Area = 0.00 ac.
c) % Impervious = 0.00 % 9[illegible] CN
d) Soil Types:
1) 100 % *Wabasso (D)* 80 CN
e) Weighted Calculation:
CN = 80
f) Soil Storage: (S)
1) (1000/(CN)) - 10 => 2.50 in
g) Time of Concentration (Tc):
Tc = 20 min

2) ***Post-Development Condition:***

a) Drainage Area = 8.84 ac.
b) Impervious Area = 5.30 ac. 98 CN
c) % Impervious = 59.95%
d) Open Space Area = 3.54 ac. 80 CN
e) Weighted Calculation:
CN = 91
f) Soil Storage: (S)
1) (1000/(CN)) - 10 => 1.01 in
g) Time of Concentration (Tc):
Tc = 10 min

h) Engineer's Soil Suitability Certificate:
To the best of my knowledge, the site's soils indicated above will drain/percolate pursuant to the assumptions made in the following drainage calculations. All assumptions are based on the wet season water table conditions for this site.

G) Design Storms: (Per. S.F.W.M.D. Rainfall Depths)

Total Site Area = 8.84 Ac.

1) 10 Yr. - 1 Day P = 5.60 in *(Roads / Parking)*

V = ((5.60 - .2 * 1.014)^2/(5.60 + .8 * 1.014)) * 1'/12" * 8.840 = 3.35 ac.ft.

2) 10 Yr. - 3 Day P = 8.30 in *(Discharge)*

V = ((8.30 - .2 * 1.014)^2/(8.30 + .8 * 1.014)) * 1'/12" * 8.840 = 5.30 ac.ft.

3) 25 Yr. - 3 Day P = 9.10 in *(Perimeter Berm)*

V = ((9.10 - .2 * 1.014)^2/(9.10 + .8 * 1.014)) * 1'/12" * 8.840 = 5.88 ac.ft.

4) 100 Yr. - 3 Day P = 10.10 in *(Finish Floor Elevation)*

V = ((10.10 - .2 * 1.014)^2/(10.10 + .8 * 1.014)) * 1'/12" * 8.840 = 6.61 ac.ft.

H) Project surface storage: (Refer to the attached calculations)

II) **Design Criteria: (Post-Development Conditions)**

A) Quality:

1) The project's stormwater management system will consist of an onsite dry detention area to manage the required water quality and storm attenuation as determined below.

a) Per S.F.W.M.D., dry detention volume shall provide for the following, whichever is greater:

1) 1 inch of runoff x total drainage area x 75% reduction for dry detention

i) Calculated Runoff Volume => (1/12 * 8.84 * 0.75 = 0.55 ac-ft

2) 2.5 inches times the impervious area x 75% reduction for dry detention

Site area, for water quality pervious/impervious calculation only

Total Project - (Roof) = site area for water quality pervious/impervious

= 8.84 - (2.20) = 6.64 ac

Impervious area for water quality pervious/impervious calculations only

(Site area for water quality pervious/impervious) - pervious = impervious area, for water quality pervious/impervious

= 6.64 - (3.54) = 3.10 ac

Percentage of impervious for water quality

[Impervious area for water quality *100] / Site area for water quality

= 3.10 / 6.64 46.69%

For 2.5 in times the percentage impervious

= 2.5 * 0.47 1.17 in

Compute volume required for quality detention

[inches to be treated x (total site) = 1.17 * (8.84) * (1/12)] * 0.75 (dry detention reduction)

0.64 ac-ft

b) The site's water quality volume = **0.64 ac-ft**

c) Dry detention satisfies the pre-treatment requirement

11-10-03
CULPEPPER-TERPENING
2980 South 25th Street
Ft Pierce, FL 34981
Project #: 03-139

B) Overflow Elevation:

1) Water Quality Treatment Elevation (T_{elev}):

a) Vt = 0.64 ac-ft

b) T_{elev} = 20.15 ft NGVD ***"Set Water Quality Weir Crest El. @ 20.15' NGVD"***

C) Check Bleeder Volume:

1) The project's discharge is controlled by the minimum 3" orifice. The prevailing variable for design was to minimize off-site peak discharge per pre-development allowable discharge.

D) On-site & Off-site Erosion and Sediment Control Methodology:

1) The contractor shall implement best management practices to include the following:
   a) Install silt fence adjacent to perimeter properties.
   b) Install turbidity barriers adjacent to all wetted areas to minimized turbidity blums.
   c) All dry detention slopes, swales, and project perimeter berms shall be sodded to minimize erosion

E) Master Stormwater Management System Maintenance Entity:

1) The SWMS will be management by the property owner:

John A. Mayo
1207 S.W. 87th Terrace
Plantation, FL 33324

Mayo Warehouse

Name	Group	Simulation	Max Time Stage hrs	Max Stage ft	Warning Stage ft	Max Delta Stage ft	Max Surf Area ft2	Max Time Inflow hrs	Max Inflow cfs	Max Time Outflow hrs	Max Outflow cfs
Site	BASE	10 yr 24 hr	23.94	21.576	24.000	0.0050	59728	20.00	28.092	23.94	0.959
Site	BASE	25 yr 72 hr	64.39	22.337	24.000	0.0050	102172	59.75	31.768	64.39	1.160

Mayo Warehouse

DRAINAGE AREA (Post-Development)

Stage / Storage Computations

Begin Stage Calculations = 19.50 NGVD
End Stage Calculations = 24.00 NGVD
Calculation Increment = 0.50 ft

	Dry Detention	Dry Detention Slopes	Parking	Misc. Pvmt	Open Space		Acres [1]
Acres =	0.913	0.551	2.960	0.140	2.076	Total Area =	6.640
Low Rng =	19.50	19.50	22.00	22.00	22.00		
High Rng =	24.00	22.00	24.00	24.00	24.00		

Stage (NGVD)	Vertical Storage (ac.ft.)	Vertical Area (ac.)	Linear Storage (ac.ft.)	Linear Area (ac.)	Linear Storage (ac.ft.)	Linear Area (ac.)	Linear Storage (ac.ft.)	Linear Area (ac.)	Linear Storage (ac.ft.)	Linear Area (ac.)	Total Cumulative. Storage (ac.ft.)	Total Area (ac.)	
19.5	0.00	0.91	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	**0.00**	**0.92**	
20.0	0.46	0.91	0.03	0.11	0.00	0.00	0.00	0.00	0.00	0.00	**0.48**	**1.02**	WQ
20.5	0.91	0.91	0.11	0.22	0.00	0.00	0.00	0.00	0.00	0.00	**1.02**	**1.13**	
21.0	1.37	0.91	0.25	0.33	0.00	0.00	0.00	0.00	0.00	0.00	**1.62**	**1.24**	
21.5	1.83	0.91	0.44	0.44	0.00	0.00	0.00	0.00	0.00	0.00	**2.27**	**1.35**	
22.0	2.28	0.91	0.69	0.55	0.00	0.01	0.00	0.01	0.00	0.01	**2.97**	**1.49**	
22.5	2.74	0.91	0.96	0.55	0.19	0.74	0.01	0.04	0.13	0.52	**4.03**	**2.76**	
23.0	3.20	0.91	1.24	0.55	0.74	1.48	0.04	0.07	0.52	1.04	**5.73**	**4.05**	100 YR 3DAY
23.5	3.65	0.91	1.52	0.55	1.67	2.22	0.08	0.11	1.17	1.56	**8.08**	**5.35**	
24.0	4.11	0.91	1.79	0.55	2.96	2.96	0.14	0.14	2.08	2.08	**11.08**	**6.64**	

WQ

$\frac{x-20.0}{20.5-20.0} \quad \frac{0.64-0.48}{1.02-0.48} \quad x = 20.15$

Base Floodplain Calcs:

1. Equals total site area minus building coverage
= 8.84 - 2.20 = 6.64 ac

100 YR 3DAY

$\frac{x-23.0}{23.5-23.0} \quad \frac{6.61-5.73}{8.08-5.73} \quad x = 23.19$

Mayo Warehouse

Simulation	Node	Group	Time hrs	Stage ft	Warning Stage ft	Surface Area ft2	Total Inflow cfs	Total Outflow cfs	Total Vol In af	Total Vol Out af
10 yr 72 hr	Site	BASE	0.00	18.500	24.000	113	0.000	0.000	0.0	0.0
10 yr 72 hr	Site	BASE	0.26	18.500	24.000	113	0.000	0.000	0.0	0.0
10 yr 72 hr	Site	BASE	0.50	18.500	24.000	113	0.000	0.000	0.0	0.0
10 yr 72 hr	Site	BASE	0.77	18.500	24.000	113	0.000	0.000	0.0	0.0
10 yr 72 hr	Site	BASE	1.02	18.500	24.000	113	0.000	0.000	0.0	0.0
10 yr 72 hr	Site	BASE	1.27	18.500	24.000	113	0.000	0.000	0.0	0.0
10 yr 72 hr	Site	BASE	1.52	18.500	24.000	113	0.000	0.000	0.0	0.0
10 yr 72 hr	Site	BASE	1.77	18.500	24.000	113	0.000	0.000	0.0	0.0
10 yr 72 hr	Site	BASE	2.02	18.500	24.000	113	0.000	0.000	0.0	0.0
10 yr 72 hr	Site	BASE	2.27	18.500	24.000	113	0.000	0.000	0.0	0.0
10 yr 72 hr	Site	BASE	2.52	18.500	24.000	113	0.000	0.000	0.0	0.0
10 yr 72 hr	Site	BASE	2.77	18.500	24.000	113	0.000	0.000	0.0	0.0
10 yr 72 hr	Site	BASE	3.02	18.500	24.000	113	0.000	0.000	0.0	0.0
10 yr 72 hr	Site	BASE	3.27	18.500	24.000	113	0.000	0.000	0.0	0.0
10 yr 72 hr	Site	BASE	3.52	18.500	24.000	113	0.000	0.000	0.0	0.0
10 yr 72 hr	Site	BASE	3.77	18.500	24.000	113	0.000	0.000	0.0	0.0
10 yr 72 hr	Site	BASE	4.02	18.500	24.000	113	0.000	0.000	0.0	0.0
10 yr 72 hr	Site	BASE	4.27	18.500	24.000	113	0.000	0.000	0.0	0.0
10 yr 72 hr	Site	BASE	4.52	18.500	24.000	113	0.000	0.000	0.0	0.0
10 yr 72 hr	Site	BASE	4.77	18.500	24.000	113	0.000	0.000	0.0	0.0
10 yr 72 hr	Site	BASE	5.02	18.500	24.000	113	0.000	0.000	0.0	0.0
10 yr 72 hr	Site	BASE	5.27	18.502	24.000	113	0.001	0.000	0.0	0.0
10 yr 72 hr	Site	BASE	5.52	18.510	24.000	392	0.003	0.000	0.0	0.0
10 yr 72 hr	Site	BASE	5.77	18.519	24.000	749	0.008	0.000	0.0	0.0
10 yr 72 hr	Site	BASE	6.02	18.528	24.000	1140	0.014	0.001	0.0	0.0
10 yr 72 hr	Site	BASE	6.27	18.538	24.000	1539	0.019	0.002	0.0	0.0
10 yr 72 hr	Site	BASE	6.52	18.548	24.000	1936	0.025	0.004	0.0	0.0
10 yr 72 hr	Site	BASE	6.77	18.558	24.000	2326	0.030	0.006	0.0	0.0
10 yr 72 hr	Site	BASE	7.02	18.568	24.000	2706	0.036	0.008	0.0	0.0
10 yr 72 hr	Site	BASE	7.27	18.577	24.000	3076	0.041	0.010	0.0	0.0
10 yr 72 hr	Site	BASE	7.52	18.586	24.000	3436	0.046	0.012	0.0	0.0
10 yr 72 hr	Site	BASE	7.77	18.594	24.000	3785	0.051	0.015	0.0	0.0
10 yr 72 hr	Site	BASE	8.02	18.603	24.000	4125	0.056	0.017	0.0	0.0
10 yr 72 hr	Site	BASE	8.27	18.611	24.000	4456	0.060	0.020	0.0	0.0
10 yr 72 hr	Site	BASE	8.52	18.619	24.000	4778	0.065	0.023	0.0	0.0
10 yr 72 hr	Site	BASE	8.77	18.627	24.000	5091	0.069	0.026	0.0	0.0
10 yr 72 hr	Site	BASE	9.02	18.635	24.000	5396	0.074	0.029	0.0	0.0
10 yr 72 hr	Site	BASE	9.27	18.642	24.000	5693	0.078	0.032	0.0	0.0
10 yr 72 hr	Site	BASE	9.52	18.649	24.000	5983	0.082	0.034	0.0	0.0
10 yr 72 hr	Site	BASE	9.77	18.656	24.000	6266	0.086	0.037	0.0	0.0
10 yr 72 hr	Site	BASE	10.02	18.663	24.000	6542	0.090	0.040	0.0	0.0
10 yr 72 hr	Site	BASE	10.27	18.670	24.000	6813	0.094	0.043	0.0	0.0
10 yr 72 hr	Site	BASE	10.52	18.677	24.000	7077	0.097	0.046	0.0	0.0
10 yr 72 hr	Site	BASE	10.77	18.683	24.000	7336	0.101	0.049	0.0	0.0
10 yr 72 hr	Site	BASE	11.02	18.689	24.000	7590	0.105	0.052	0.0	0.0
10 yr 72 hr	Site	BASE	11.27	18.696	24.000	7839	0.108	0.054	0.0	0.0
10 yr 72 hr	Site	BASE	11.52	18.702	24.000	8084	0.111	0.057	0.0	0.0
10 yr 72 hr	Site	BASE	11.77	18.708	24.000	8325	0.115	0.060	0.0	0.0
10 yr 72 hr	Site	BASE	12.02	18.714	24.000	8562	0.118	0.062	0.0	0.0
10 yr 72 hr	Site	BASE	12.27	18.719	24.000	8796	0.121	0.065	0.0	0.0
10 yr 72 hr	Site	BASE	12.52	18.725	24.000	9027	0.124	0.067	0.0	0.0
10 yr 72 hr	Site	BASE	12.77	18.731	24.000	9256	0.127	0.069	0.0	0.0
10 yr 72 hr	Site	BASE	13.02	18.737	24.000	9483	0.130	0.071	0.0	0.0
10 yr 72 hr	Site	BASE	13.27	18.742	24.000	9708	0.133	0.073	0.0	0.0
10 yr 72 hr	Site	BASE	13.52	18.748	24.000	9933	0.136	0.074	0.1	0.0
10 yr 72 hr	Site	BASE	13.77	18.753	24.000	10158	0.139	0.076	0.1	0.0
10 yr 72 hr	Site	BASE	14.02	18.759	24.000	10379	0.142	0.079	0.1	0.0
10 yr 72 hr	Site	BASE	14.27	18.764	24.000	10596	0.144	0.081	0.1	0.0
10 yr 72 hr	Site	BASE	14.52	18.770	24.000	10806	0.147	0.084	0.1	0.0
10 yr 72 hr	Site	BASE	14.77	18.775	24.000	11016	0.149	0.086	0.1	0.0
10 yr 72 hr	Site	BASE	15.02	18.780	24.000	11220	0.152	0.089	0.1	0.0
10 yr 72 hr	Site	BASE	15.27	18.785	24.000	11421	0.154	0.091	0.1	0.0
10 yr 72 hr	Site	BASE	15.52	18.790	24.000	11618	0.157	0.094	0.1	0.0
10 yr 72 hr	Site	BASE	15.77	18.795	24.000	11811	0.159	0.096	0.1	0.0
10 yr 72 hr	Site	BASE	16.02	18.799	24.000	12002	0.161	0.099	0.1	0.0
10 yr 72 hr	Site	BASE	16.27	18.804	24.000	12190	0.164	0.100	0.1	0.0
10 yr 72 hr	Site	BASE	16.52	18.809	24.000	12379	0.166	0.101	0.1	0.0
10 yr 72 hr	Site	BASE	16.77	18.814	24.000	12567	0.168	0.103	0.1	0.0
10 yr 72 hr	Site	BASE	17.02	18.818	24.000	12755	0.170	0.104	0.1	0.0
10 yr 72 hr	Site	BASE	17.27	18.823	24.000	12942	0.172	0.105	0.1	0.1
10 yr 72 hr	Site	BASE	17.52	18.828	24.000	13129	0.174	0.106	0.1	0.1
10 yr 72 hr	Site	BASE	17.77	18.832	24.000	13316	0.176	0.108	0.1	0.1
10 yr 72 hr	Site	BASE	18.02	18.837	24.000	13502	0.178	0.109	0.1	0.1
10 yr 72 hr	Site	BASE	18.27	18.842	24.000	13687	0.180	0.110	0.1	0.1
10 yr 72 hr	Site	BASE	18.52	18.846	24.000	13872	0.182	0.111	0.1	0.1
10 yr 72 hr	Site	BASE	18.77	18.851	24.000	14057	0.184	0.112	0.1	0.1
10 yr 72 hr	Site	BASE	19.02	18.855	24.000	14241	0.186	0.113	0.1	0.1
10 yr 72 hr	Site	BASE	19.27	18.860	24.000	14424	0.188	0.114	0.1	0.1
10 yr 72 hr	Site	BASE	19.52	18.864	24.000	14606	0.189	0.116	0.1	0.1
10 yr 72 hr	Site	BASE	19.77	18.869	24.000	14788	0.191	0.117	0.1	0.1
10 yr 72 hr	Site	BASE	20.02	18.874	24.000	14969	0.193	0.118	0.1	0.1
10 yr 72 hr	Site	BASE	20.27	18.878	24.000	15150	0.194	0.119	0.1	0.1
10 yr 72 hr	Site	BASE	20.52	18.883	24.000	15329	0.196	0.120	0.1	0.1
10 yr 72 hr	Site	BASE	20.77	18.887	24.000	15508	0.198	0.121	0.2	0.1
10 yr 72 hr	Site	BASE	21.02	18.891	24.000	15687	0.199	0.122	0.2	0.1
10 yr 72 hr	Site	BASE	21.27	18.896	24.000	15864	0.201	0.123	0.2	0.1
10 yr 72 hr	Site	BASE	21.52	18.900	24.000	16041	0.202	0.124	0.2	0.1
10 yr 72 hr	Site	BASE	21.77	18.905	24.000	16217	0.204	0.125	0.2	0.1
10 yr 72 hr	Site	BASE	22.02	18.909	24.000	16392	0.205	0.126	0.2	0.1
10 yr 72 hr	Site	BASE	22.27	18.913	24.000	16566	0.207	0.127	0.2	0.1
10 yr 72 hr	Site	BASE	22.52	18.918	24.000	16740	0.208	0.128	0.2	0.1
10 yr 72 hr	Site	BASE	22.77	18.922	24.000	16912	0.210	0.129	0.2	0.1
10 yr 72 hr	Site	BASE	23.02	18.926	24.000	17084	0.211	0.130	0.2	0.1
10 yr 72 hr	Site	BASE	23.27	18.931	24.000	17256	0.212	0.131	0.2	0.1
10 yr 72 hr	Site	BASE	23.52	18.935	24.000	17426	0.214	0.131	0.2	0.1
10 yr 72 hr	Site	BASE	23.77	18.939	24.000	17596	0.217	0.132	0.2	0.1
10 yr 72 hr	Site	BASE	24.02	18.944	24.000	17803	0.252	0.133	0.2	0.1
10 yr 72 hr	Site	BASE	24.27	18.951	24.000	18086	0.296	0.135	0.2	0.1

Mayo Warehouse

Simulation	Node	Group	Time hrs	Stage ft	Warning Stage ft	Surface Area ft2	Total Inflow cfs	Total Outflow cfs	Total Vol In af	Total Vol Out af
10 yr 72 hr	Site	BASE	24.52	18.960	24.000	18419	0.312	0.137	0.2	0.1
10 yr 72 hr	Site	BASE	24.77	18.968	24.000	18765	0.319	0.138	0.2	0.1
10 yr 72 hr	Site	BASE	25.02	18.977	24.000	19111	0.323	0.140	0.2	0.1
10 yr 72 hr	Site	BASE	25.27	18.985	24.000	19455	0.326	0.142	0.2	0.1
10 yr 72 hr	Site	BASE	25.52	18.994	24.000	19794	0.328	0.143	0.2	0.1
10 yr 72 hr	Site	BASE	25.77	19.002	24.000	20129	0.331	0.145	0.3	0.1
10 yr 72 hr	Site	BASE	26.02	19.011	24.000	20460	0.333	0.147	0.3	0.1
10 yr 72 hr	Site	BASE	26.27	19.019	24.000	20787	0.335	0.148	0.3	0.1
10 yr 72 hr	Site	BASE	26.52	19.027	24.000	21110	0.337	0.150	0.3	0.1
10 yr 72 hr	Site	BASE	26.77	19.035	24.000	21429	0.340	0.151	0.3	0.2
10 yr 72 hr	Site	BASE	27.02	19.043	24.000	21744	0.342	0.153	0.3	0.2
10 yr 72 hr	Site	BASE	27.27	19.050	24.000	22056	0.344	0.154	0.3	0.2
10 yr 72 hr	Site	BASE	27.52	19.058	24.000	22365	0.346	0.155	0.3	0.2
10 yr 72 hr	Site	BASE	27.77	19.066	24.000	22670	0.348	0.157	0.3	0.2
10 yr 72 hr	Site	BASE	28.02	19.073	24.000	22972	0.349	0.158	0.3	0.2
10 yr 72 hr	Site	BASE	28.27	19.081	24.000	23271	0.351	0.159	0.3	0.2
10 yr 72 hr	Site	BASE	28.52	19.088	24.000	23567	0.353	0.161	0.3	0.2
10 yr 72 hr	Site	BASE	28.77	19.095	24.000	23860	0.355	0.162	0.3	0.2
10 yr 72 hr	Site	BASE	29.02	19.103	24.000	24150	0.357	0.163	0.3	0.2
10 yr 72 hr	Site	BASE	29.27	19.110	24.000	24435	0.358	0.164	0.4	0.2
10 yr 72 hr	Site	BASE	29.52	19.117	24.000	24717	0.360	0.166	0.4	0.2
10 yr 72 hr	Site	BASE	29.77	19.124	24.000	24995	0.362	0.167	0.4	0.2
10 yr 72 hr	Site	BASE	30.02	19.131	24.000	25269	0.363	0.168	0.4	0.2
10 yr 72 hr	Site	BASE	30.27	19.138	24.000	25543	0.365	0.169	0.4	0.2
10 yr 72 hr	Site	BASE	30.52	19.145	24.000	25638	0.366	0.170	0.4	0.2
10 yr 72 hr	Site	BASE	30.77	19.152	24.000	26110	0.368	0.171	0.4	0.2
10 yr 72 hr	Site	BASE	31.02	19.158	24.000	26381	0.369	0.172	0.4	0.2
10 yr 72 hr	Site	BASE	31.27	19.165	24.000	26649	0.371	0.174	0.4	0.2
10 yr 72 hr	Site	BASE	31.52	19.172	24.000	26915	0.372	0.175	0.4	0.2
10 yr 72 hr	Site	BASE	31.77	19.178	24.000	27178	0.374	0.176	0.4	0.2
10 yr 72 hr	Site	BASE	32.02	19.185	24.000	27440	0.375	0.177	0.4	0.2
10 yr 72 hr	Site	BASE	32.27	19.191	24.000	27700	0.376	0.178	0.4	0.2
10 yr 72 hr	Site	BASE	32.52	19.198	24.000	27957	0.378	0.179	0.5	0.2
10 yr 72 hr	Site	BASE	32.77	19.204	24.000	28213	0.379	0.180	0.5	0.2
10 yr 72 hr	Site	BASE	33.02	19.210	24.000	28467	0.380	0.181	0.5	0.2
10 yr 72 hr	Site	BASE	33.27	19.217	24.000	28719	0.381	0.182	0.5	0.2
10 yr 72 hr	Site	BASE	33.52	19.223	24.000	28969	0.383	0.183	0.5	0.2
10 yr 72 hr	Site	BASE	33.77	19.229	24.000	29217	0.384	0.184	0.5	0.2
10 yr 72 hr	Site	BASE	34.02	19.235	24.000	29463	0.385	0.185	0.5	0.3
10 yr 72 hr	Site	BASE	34.27	19.241	24.000	29706	0.386	0.185	0.5	0.3
10 yr 72 hr	Site	BASE	34.52	19.247	24.000	29951	0.387	0.186	0.5	0.3
10 yr 72 hr	Site	BASE	34.77	19.253	24.000	30192	0.388	0.187	0.5	0.3
10 yr 72 hr	Site	BASE	35.02	19.259	24.000	30432	0.390	0.188	0.5	0.3
10 yr 72 hr	Site	BASE	35.27	19.265	24.000	30670	0.391	0.189	0.5	0.3
10 yr 72 hr	Site	BASE	35.52	19.271	24.000	30906	0.392	0.190	0.5	0.3
10 yr 72 hr	Site	BASE	35.77	19.277	24.000	31141	0.393	0.191	0.6	0.3
10 yr 72 hr	Site	BASE	36.02	19.283	24.000	31375	0.395	0.192	0.6	0.3
10 yr 72 hr	Site	BASE	36.27	19.289	24.000	31609	0.398	0.192	0.6	0.3
10 yr 72 hr	Site	BASE	36.52	19.295	24.000	31843	0.399	0.193	0.6	0.3
10 yr 72 hr	Site	BASE	36.77	19.300	24.000	32076	0.401	0.194	0.6	0.3
10 yr 72 hr	Site	BASE	37.02	19.306	24.000	32308	0.402	0.195	0.6	0.3
10 yr 72 hr	Site	BASE	37.27	19.312	24.000	32538	0.403	0.196	0.6	0.3
10 yr 72 hr	Site	BASE	37.52	19.318	24.000	32767	0.404	0.197	0.6	0.3
10 yr 72 hr	Site	BASE	37.77	19.323	24.000	32994	0.405	0.197	0.6	0.3
10 yr 72 hr	Site	BASE	38.02	19.329	24.000	33220	0.405	0.198	0.6	0.3
10 yr 72 hr	Site	BASE	38.27	19.335	24.000	33444	0.406	0.199	0.6	0.3
10 yr 72 hr	Site	BASE	38.52	19.340	24.000	33667	0.407	0.200	0.6	0.3
10 yr 72 hr	Site	BASE	38.77	19.346	24.000	33889	0.408	0.201	0.7	0.3
10 yr 72 hr	Site	BASE	39.02	19.351	24.000	34109	0.409	0.201	0.7	0.3
10 yr 72 hr	Site	BASE	39.27	19.357	24.000	34328	0.410	0.202	0.7	0.3
10 yr 72 hr	Site	BASE	39.52	19.362	24.000	34546	0.411	0.203	0.7	0.3
10 yr 72 hr	Site	BASE	39.77	19.367	24.000	34762	0.411	0.204	0.7	0.3
10 yr 72 hr	Site	BASE	40.02	19.373	24.000	34977	0.412	0.204	0.7	0.3
10 yr 72 hr	Site	BASE	40.27	19.378	24.000	35191	0.413	0.205	0.7	0.4
10 yr 72 hr	Site	BASE	40.52	19.383	24.000	35403	0.414	0.206	0.7	0.4
10 yr 72 hr	Site	BASE	40.77	19.389	24.000	35615	0.415	0.206	0.7	0.4
10 yr 72 hr	Site	BASE	41.02	19.394	24.000	35825	0.415	0.207	0.7	0.4
10 yr 72 hr	Site	BASE	41.27	19.399	24.000	36034	0.416	0.208	0.7	0.4
10 yr 72 hr	Site	BASE	41.52	19.404	24.000	36242	0.417	0.209	0.8	0.4
10 yr 72 hr	Site	BASE	41.77	19.409	24.000	36448	0.417	0.209	0.8	0.4
10 yr 72 hr	Site	BASE	42.02	19.415	24.000	36654	0.418	0.210	0.8	0.4
10 yr 72 hr	Site	BASE	42.27	19.420	24.000	36858	0.419	0.211	0.8	0.4
10 yr 72 hr	Site	BASE	42.52	19.425	24.000	37061	0.419	0.211	0.8	0.4
10 yr 72 hr	Site	BASE	42.77	19.430	24.000	37264	0.420	0.212	0.8	0.4
10 yr 72 hr	Site	BASE	43.02	19.435	24.000	37465	0.421	0.213	0.8	0.4
10 yr 72 hr	Site	BASE	43.27	19.440	24.000	37665	0.421	0.213	0.8	0.4
10 yr 72 hr	Site	BASE	43.52	19.445	24.000	37863	0.422	0.214	0.8	0.4
10 yr 72 hr	Site	BASE	43.77	19.450	24.000	38061	0.423	0.215	0.8	0.4
10 yr 72 hr	Site	BASE	44.02	19.455	24.000	38258	0.423	0.215	0.8	0.4
10 yr 72 hr	Site	BASE	44.27	19.460	24.000	38454	0.424	0.216	0.8	0.4
10 yr 72 hr	Site	BASE	44.52	19.464	24.000	38649	0.425	0.216	0.9	0.4
10 yr 72 hr	Site	BASE	44.77	19.469	24.000	38843	0.425	0.217	0.9	0.4
10 yr 72 hr	Site	BASE	45.02	19.474	24.000	39035	0.426	0.218	0.9	0.4
10 yr 72 hr	Site	BASE	45.27	19.479	24.000	39227	0.426	0.218	0.9	0.4
10 yr 72 hr	Site	BASE	45.52	19.484	24.000	39418	0.427	0.219	0.9	0.4
10 yr 72 hr	Site	BASE	45.77	19.488	24.000	39608	0.427	0.219	0.9	0.4
10 yr 72 hr	Site	BASE	46.02	19.493	24.000	39797	0.428	0.220	0.9	0.5
10 yr 72 hr	Site	BASE	46.27	19.498	24.000	39985	0.429	0.221	0.9	0.5
10 yr 72 hr	Site	BASE	46.52	19.502	24.000	40096	0.429	0.221	0.9	0.5
10 yr 72 hr	Site	BASE	46.77	19.507	24.000	40137	0.430	0.222	0.9	0.5
10 yr 72 hr	Site	BASE	47.02	19.512	24.000	40177	0.430	0.222	0.9	0.5
10 yr 72 hr	Site	BASE	47.27	19.516	24.000	40218	0.431	0.223	1.0	0.5
10 yr 72 hr	Site	BASE	47.52	19.521	24.000	40258	0.431	0.224	1.0	0.5
10 yr 72 hr	Site	BASE	47.77	19.526	24.000	40299	0.433	0.224	1.0	0.5
10 yr 72 hr	Site	BASE	48.02	19.530	24.000	40341	0.449	0.225	1.0	0.5
10 yr 72 hr	Site	BASE	48.27	19.536	24.000	40387	0.470	0.225	1.0	0.5
10 yr 72 hr	Site	BASE	48.52	19.541	24.000	40435	0.478	0.226	1.0	0.5
10 yr 72 hr	Site	BASE	48.77	19.547	24.000	40484	0.481	0.227	1.0	0.5

Mayo Warehouse

Simulation	Node	Group	Time hrs	Stage ft	Warning Stage ft	Surface Area ft2	Total Inflow cfs	Total Outflow cfs	Total Vol In af	Total Vol Out af
10 yr 72 hr	Site	BASE	49.02	19.553	24.000	40533	0.486	0.227	1.0	0.5
10 yr 72 hr	Site	BASE	49.27	19.558	24.000	40584	0.491	0.228	1.0	0.5
10 yr 72 hr	Site	BASE	49.52	19.564	24.000	40635	0.493	0.229	1.0	0.5
10 yr 72 hr	Site	BASE	49.77	19.570	24.000	40686	0.496	0.230	1.0	0.5
10 yr 72 hr	Site	BASE	50.02	19.576	24.000	40740	0.528	0.230	1.1	0.5
10 yr 72 hr	Site	BASE	50.27	19.583	24.000	40801	0.566	0.231	1.1	0.5
10 yr 72 hr	Site	BASE	50.52	19.591	24.000	40866	0.580	0.232	1.1	0.5
10 yr 72 hr	Site	BASE	50.77	19.599	24.000	40933	0.586	0.233	1.1	0.5
10 yr 72 hr	Site	BASE	51.02	19.607	24.000	41004	0.606	0.234	1.1	0.5
10 yr 72 hr	Site	BASE	51.27	19.615	24.000	41076	0.630	0.235	1.1	0.6
10 yr 72 hr	Site	BASE	51.52	19.624	24.000	41152	0.639	0.236	1.1	0.6
10 yr 72 hr	Site	BASE	51.77	19.632	24.000	41229	0.647	0.237	1.1	0.6
10 yr 72 hr	Site	BASE	52.02	19.642	24.000	41313	0.715	0.238	1.2	0.6
10 yr 72 hr	Site	BASE	52.27	19.653	24.000	41412	0.796	0.240	1.2	0.6
10 yr 72 hr	Site	BASE	52.52	19.660	24.000	41520	0.827	0.241	1.2	0.6
10 yr 72 hr	Site	BASE	52.77	19.670	24.000	41637	0.848	0.242	1.2	0.6
10 yr 72 hr	Site	BASE	53.02	19.682	24.000	41751	0.913	0.244	1.2	0.6
10 yr 72 hr	Site	BASE	53.27	19.708	24.000	41885	0.999	0.246	1.2	0.6
10 yr 72 hr	Site	BASE	53.52	19.724	24.000	42078	1.029	0.248	1.3	0.6
10 yr 72 hr	Site	BASE	53.77	19.741	24.000	42174	1.044	0.250	1.3	0.6
10 yr 72 hr	Site	BASE	54.02	19.759	24.000	42329	1.119	0.251	1.3	0.6
10 yr 72 hr	Site	BASE	54.27	19.778	24.000	42497	1.209	0.254	1.3	0.6
10 yr 72 hr	Site	BASE	54.52	19.799	24.000	42676	1.247	0.256	1.4	0.6
10 yr 72 hr	Site	BASE	54.77	19.819	24.000	42852	1.246	0.258	1.4	0.6
10 yr 72 hr	Site	BASE	55.02	19.841	24.000	43046	1.332	0.260	1.4	0.6
10 yr 72 hr	Site	BASE	55.27	19.864	24.000	43249	1.423	0.263	1.4	0.6
10 yr 72 hr	Site	BASE	55.52	19.889	24.000	43462	1.455	0.266	1.5	0.6
10 yr 72 hr	Site	BASE	55.77	19.913	24.000	43677	1.473	0.268	1.5	0.6
10 yr 72 hr	Site	BASE	56.02	19.939	24.000	43900	1.563	0.271	1.5	0.7
10 yr 72 hr	Site	BASE	56.27	19.967	24.000	44140	1.672	0.274	1.6	0.7
10 yr 72 hr	Site	BASE	56.52	19.995	24.000	44391	1.711	0.277	1.6	0.7
10 yr 72 hr	Site	BASE	56.77	20.025	24.000	44667	1.733	0.279	1.6	0.7
10 yr 72 hr	Site	BASE	57.02	20.055	24.000	44957	1.849	0.282	1.7	0.7
10 yr 72 hr	Site	BASE	57.27	20.088	24.000	45270	1.993	0.286	1.7	0.7
10 yr 72 hr	Site	BASE	57.52	20.122	24.000	45605	2.105	0.289	1.8	0.7
10 yr 72 hr	Site	BASE	57.77	20.159	24.000	45956	2.205	0.293	1.8	0.7
10 yr 72 hr	Site	BASE	58.02	20.197	24.000	46323	2.322	0.304	1.8	0.7
10 yr 72 hr	Site	BASE	58.27	20.238	24.000	46708	2.458	0.321	1.9	0.7
10 yr 72 hr	Site	BASE	58.52	20.281	24.000	47128	2.782	0.342	2.0	0.7
10 yr 72 hr	Site	BASE	58.77	20.331	24.000	47606	3.197	0.370	2.0	0.7
10 yr 72 hr	Site	BASE	59.02	20.391	24.000	48179	3.946	0.409	2.1	0.7
10 yr 72 hr	Site	BASE	59.26	20.463	24.000	48871	5.283	0.461	2.2	0.7
10 yr 72 hr	Site	BASE	59.50	20.631	24.000	50402	15.236	0.593	2.4	0.7
10 yr 72 hr	Site	BASE	59.75	21.002	24.000	54034	28.818	0.766	2.8	0.8
10 yr 72 hr	Site	BASE	60.00	21.411	24.000	57955	24.108	0.909	3.4	0.8
10 yr 72 hr	Site	BASE	60.25	21.680	24.000	61060	13.174	0.989	3.8	0.8
10 yr 72 hr	Site	BASE	60.50	21.822	24.000	62731	8.332	1.029	4.0	0.8
10 yr 72 hr	Site	BASE	60.75	21.906	24.000	63759	5.498	1.051	4.1	0.8
10 yr 72 hr	Site	BASE	61.01	21.960	24.000	64417	4.166	1.066	4.2	0.9
10 yr 72 hr	Site	BASE	61.25	21.997	24.000	64863	3.377	1.075	4.3	0.9
10 yr 72 hr	Site	BASE	61.50	22.025	24.000	67665	2.943	1.083	4.4	0.9
10 yr 72 hr	Site	BASE	61.75	22.047	24.000	70126	2.631	1.088	4.4	0.9
10 yr 72 hr	Site	BASE	62.00	22.065	24.000	72054	2.302	1.093	4.5	1.0
10 yr 72 hr	Site	BASE	62.25	22.078	24.000	73480	1.971	1.096	4.5	1.0
10 yr 72 hr	Site	BASE	62.50	22.087	24.000	74539	1.798	1.099	4.6	1.0
10 yr 72 hr	Site	BASE	62.75	22.095	24.000	75385	1.676	1.100	4.6	1.0
10 yr 72 hr	Site	BASE	63.00	22.101	24.000	76112	1.633	1.102	4.6	1.0
10 yr 72 hr	Site	BASE	63.25	22.107	24.000	76793	1.618	1.104	4.7	1.1
10 yr 72 hr	Site	BASE	63.50	22.113	24.000	77453	1.613	1.105	4.7	1.1
10 yr 72 hr	Site	BASE	63.75	22.119	24.000	78101	1.609	1.107	4.8	1.1
10 yr 72 hr	Site	BASE	64.00	22.124	24.000	78601	1.392	1.108	4.8	1.1
10 yr 72 hr	Site	BASE	64.25	22.125	24.000	78779	1.106	1.108	4.8	1.2
10 yr 72 hr	Site	BASE	64.50	22.125	24.000	78715	1.010	1.108	4.8	1.2
10 yr 72 hr	Site	BASE	64.75	22.124	24.000	78571	0.978	1.108	4.8	1.2
10 yr 72 hr	Site	BASE	65.00	22.122	24.000	78402	0.970	1.107	4.9	1.2
10 yr 72 hr	Site	BASE	65.25	22.120	24.000	78228	0.970	1.107	4.9	1.2
10 yr 72 hr	Site	BASE	65.50	22.119	24.000	78053	0.970	1.107	4.9	1.3
10 yr 72 hr	Site	BASE	65.75	22.117	24.000	77879	0.970	1.106	4.9	1.3
10 yr 72 hr	Site	BASE	66.00	22.116	24.000	77705	0.970	1.106	4.9	1.3
10 yr 72 hr	Site	BASE	66.25	22.114	24.000	77531	0.970	1.105	5.0	1.3
10 yr 72 hr	Site	BASE	66.50	22.113	24.000	77357	0.970	1.105	5.0	1.4
10 yr 72 hr	Site	BASE	66.75	22.111	24.000	77184	0.970	1.105	5.0	1.4
10 yr 72 hr	Site	BASE	67.00	22.109	24.000	77010	0.970	1.104	5.0	1.4
10 yr 72 hr	Site	BASE	67.25	22.108	24.000	76837	0.970	1.104	5.0	1.4
10 yr 72 hr	Site	BASE	67.50	22.106	24.000	76664	0.970	1.103	5.1	1.5
10 yr 72 hr	Site	BASE	67.75	22.105	24.000	76491	0.969	1.103	5.1	1.5
10 yr 72 hr	Site	BASE	68.00	22.102	24.000	76243	0.858	1.102	5.1	1.5
10 yr 72 hr	Site	BASE	68.25	22.099	24.000	75829	0.714	1.102	5.1	1.5
10 yr 72 hr	Site	BASE	68.50	22.094	24.000	75287	0.666	1.100	5.1	1.5
10 yr 72 hr	Site	BASE	68.75	22.089	24.000	74701	0.650	1.099	5.1	1.6
10 yr 72 hr	Site	BASE	69.00	22.083	24.000	74098	0.645	1.098	5.2	1.6
10 yr 72 hr	Site	BASE	69.25	22.078	24.000	73488	0.643	1.096	5.2	1.6
10 yr 72 hr	Site	BASE	69.50	22.072	24.000	72872	0.643	1.095	5.2	1.6
10 yr 72 hr	Site	BASE	69.75	22.066	24.000	72253	0.643	1.093	5.2	1.7
10 yr 72 hr	Site	BASE	70.00	22.061	24.000	71631	0.644	1.092	5.2	1.7
10 yr 72 hr	Site	BASE	70.25	22.055	24.000	71008	0.645	1.090	5.2	1.7
10 yr 72 hr	Site	BASE	70.50	22.050	24.000	70383	0.646	1.089	5.2	1.7
10 yr 72 hr	Site	BASE	70.75	22.044	24.000	69754	0.646	1.088	5.3	1.7
10 yr 72 hr	Site	BASE	71.00	22.039	24.000	69123	0.646	1.086	5.3	1.8
10 yr 72 hr	Site	BASE	71.25	22.032	24.000	68487	0.646	1.085	5.3	1.8
10 yr 72 hr	Site	BASE	71.50	22.027	24.000	67849	0.646	1.083	5.3	1.8
10 yr 72 hr	Site	BASE	71.75	22.021	24.000	67206	0.644	1.082	5.3	1.8
10 yr 72 hr	Site	BASE	72.00	22.013	24.000	66313	0.000	1.080	5.3	1.9
10 yr 72 hr	Site	BASE	72.01	22.013	24.000	66273	0.000	1.080	5.3	1.9

Basins

Name: Site | Node: Site | Status: Onsite
Group: BASE | Type: Santa Barbara

Rainfall File:		Storm Duration(hrs):	0.00
Rainfall Amount(in):	0.000	Time of Conc(min):	15.00
Area(ac):	8.840	Time Shift(hrs):	0.00
Curve Number:	91.00	Time Increment(min):	15.00
DCIA(%):	0.00	Max Allowable Q(cfs):	9,999,000

Nodes

Name: BNDY | Base Flow(cfs): 0.000 | Init Stage(ft): 16.000
Group: BASE | Warn Stage(ft): 17.000
Type: Time/Stage

Time(hrs)	Stage(ft)
0.00	16.000
999.00	16.000

Name: Site | Base Flow(cfs): 0.000 | Init Stage(ft): 18.500
Group: BASE | Warn Stage(ft): 24.000
Type: Stage/Area

Stage(ft)	Area(ac)
18.500	0.0000
19.500	0.9200
20.000	1.0200
20.500	1.1300
21.000	1.2400
21.500	1.3500
22.000	1.4900
22.500	2.7600
23.000	4.0500
23.500	5.3500
24.000	6.6400

Drop Structures

Name: Control | From Node: Site | Length(ft): 200.00
Group: BASE | To Node: BNDY | Count: 1

	UPSTREAM	DOWNSTREAM		
Geometry:	Circular	Circular	Friction Equation:	Average Conveyance
Span(in):	24.00	24.00	Solution Algorithm:	Automatic
Rise(in):	24.00	24.00	Flow:	Both
Invert(ft):	15.000	15.000	Entrance Loss Coef:	3.200
Manning's N:	0.012000	0.012000	Exit Loss Coef:	0.600
Top Clip(in):	0.000	0.000	Outlet Ctrl Spec:	Use dc or tw
Bot Clip(in):	0.000	0.000	Inlet Ctrl Spec:	Use dn
			Solution Incs:	10

Upstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

Downstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

*** Weir 1 of 2 for Drop Structure Control ***

TABLE

Count:	1	Bottom Clip(in):	0.000
Type:	Vertical: Mavis	Top Clip(in):	0.000
Flow:	Both	Weir Disc Coef:	3.200
Geometry:	Circular	Orifice Disc Coef:	0.600
Span(in):	3.00	Invert(ft):	18.500

Filename: P:\Fr 003\

Execute: Yes
Alternative: No

Max Delta Z(
Time Step Optimi
Start Time(h
Min Calc Time(s
Boundary Sta

Time(hrs)	Prin
72.000	15.0

Group	Run
BASE	Yes

Name: 25 yr
Filename: P:\Fr

Execute: Yes
Alternative: No

Max Delta Z(
Time Step Optimi
Start Time(h
Min Calc Time(s
Boundary Sta

Time(hrs)	Prir
72.000	15.0

Group	Run
BASE	Yes

**** Boundary Condit

Rise(in): 3.00 Control Elev(ft): 18.500

*** Weir 2 of 2 for Drop Structure Control *** TABLE

Count: 1
Type: Vertical: Mavis
Flow: Both
Geometry: Rectangular

Bottom Clip(in): 0.000
Top Clip(in): 0.000
Weir Disc Coef: 3.200
Orifice Disc Coef: 0.600

Span(in): 3.00
Rise(in): 5.00

Invert(ft): 20.150
Control Elev(ft): 20.150

**** Hydrology Simulations ****

Name: 10 yr 24 hr
Filename: P:\Proj-2003\03-139 John Mayo\Drainage\10 yr 24 hr.R32

Override Defaults: Yes
Storm Duration(hrs): 24.00
Rainfall File: Sfwmd72
Rainfall Amount(in): 5.60

Time(hrs)	Print Inc(min)
30.000	15.00

Name: 10 yr 72 hr
Filename: P:\Proj-2003\03-139 John Mayo\Drainage\10 yr 72 hr.R32

Override Defaults: Yes
Storm Duration(hrs): 72.00
Rainfall File: Sfwmd72
Rainfall Amount(in): 8.30

Time(hrs)	Print Inc(min)
72.000	15.00

Name: 25 yr 72 hr
Filename: P:\Proj-2003\03-139 John Mayo\Drainage\25 yr 72 hr.R32

Override Defaults: Yes
Storm Duration(hrs): 72.00
Rainfall File: Sfwmd72
Rainfall Amount(in): 9.10

Time(hrs)	Print Inc(min)
72.000	15.00

**** Routing Simulations ****

Name: 10 yr 24 hr Hydrology Sim: 10 yr 24 hr
Filename: P:\Proj-2003\03-139 John Mayo\Drainage\10 yr 24 hr.I32

Execute: Yes Restart: No Patch: No
Alternative: No

Max Delta Z(ft): 1.00
Time Step Optimizer: 10.000
Start Time(hrs): 0.000
Min Calc Time(sec): 0.5000
Boundary Stages:

Delta Z Factor: 0.00500

End Time(hrs): 30.00
Max Calc Time(sec): 60.0000
Boundary Flows:

Time(hrs)	Print Inc(min)
30.000	15.000

Group	Run
BASE	Yes

Name: 10 yr 72 hr Hydrology Sim: 10 yr 72 hr

Filename: P:\Proj-2003\03-139 John Mayo\Drainage\10 yr 72 hr.I32

Execute: Yes Restart: No Patch: No
Alternative: No

Max Delta Z(ft): 1.00 Delta Z Factor: 0.00500
Time Step Optimizer: 10.000
Start Time(hrs): 0.000 End Time(hrs): 72.00
Min Calc Time(sec): 0.5000 Max Calc Time(sec): 60.0000
Boundary Stages: Boundary Flows:

Time(hrs)	Print Inc(min)
72.000	15.000

Group	Run
BASE	Yes

Name: 25 yr 72 hr Hydrology Sim: 25 yr 72 hr
Filename: P:\Proj-2003\03-139 John Mayo\Drainage\25 yr 72 hr.I32

Execute: Yes Restart: No Patch: No
Alternative: No

Max Delta Z(ft): 1.00 Delta Z Factor: 0.00500
Time Step Optimizer: 10.000
Start Time(hrs): 0.000 End Time(hrs): 72.00
Min Calc Time(sec): 0.5000 Max Calc Time(sec): 60.0000
Boundary Stages: Boundary Flows:

Time(hrs)	Print Inc(min)
72.000	15.000

Group	Run
BASE	Yes

Boundary Conditions

LEGAL DESCRIPTION

Being a portion of Tracts 11 and 12, in the Northwest one-quarter of Section 6, Township 36 South, Range 40 East, of MODEL LAND COMPANY SUBDIVISION, as recorded in Plat Book 4, Page 34, public records of St. Lucie County, Florida, and being more particularly described as follows:

Commence at the Southeast corner of lands deeded to Treasure Coast Truss Co., Inc., as recorded in Official Records Book 422, Page 2789, of the public records of St. Lucie County, Florida, said point lying in the northerly right-of-way line of West Midway Road, an 80 foot wide right-of-way; thence N 89°54'46" E, along the said northerly right-of-way line of West Midway Road, a distance of 216.56 feet; thence N 00°05'14" W a distance of 34.59 feet to the POINT OF BEGINNING of the following described Wetland "B":

Thence N 07°23'01" W a distance of 74.58 feet; thence N 41°45'12" W a distance of 42.44 feet; thence N 04°00'18" W a distance of 56.60 feet; thence N 14°33'50" E a distance of 47.65 feet; thence N 18°21'04" E a distance of 51.28 feet; thence N 44°49'30" E a distance of 95.17 feet; thence S 74°43'07" E a distance of 59.53 feet; thence S 75°41'07" E a distance of 31.35 feet; thence N 36°44'51" E a distance of 26.33 feet; thence S 87°29'11" E a distance of 27.69 feet; thence S 86°23'40" E a distance of 26.39 feet; thence S 86°04'57" E a distance of 65.30 feet; thence S 05°39'17" W a distance of 43.10 feet; thence S 18°47'32" E a distance of 23.19 feet; thence S 00°04'24" W a distance of 71.38 feet; thence S 13°24'37" W a distance of 57.21 feet; thence S 32°41'39" W a distance of 56.21 feet; thence S 39° 25' 46" W a distance of 30.99 feet; thence S 75°46'56" W a distance of 34.17 feet; thence S 43°09'37" W a distance of 12.40 feet; thence S 77°29'48" W a distance of 73.06 feet; thence N 83°05'22" W a distance of 42.85 feet; thence S 68°46'11" W a distance of 64.87 feet to the POINT OF BEGINNING.

Containing 1.87 acres, more or less.

I HEREBY CERTIFY THAT THIS DESCRIPTION AND ACCOMPANYING SKETCH COMPLIES WITH THE MINIMUM TECHNICAL STANDARDS AS SET FORTH IN CHAPTER 61G17-6 ADOPTED BY THE FLORIDA BOARD OF LAND SURVEYORS, PURSUANT TO FLORIDA STATUTE 472.027.
DATE: 11/16/03 ,BY _____ RICHARD W. BUSSELL, PLS NO. 3858.

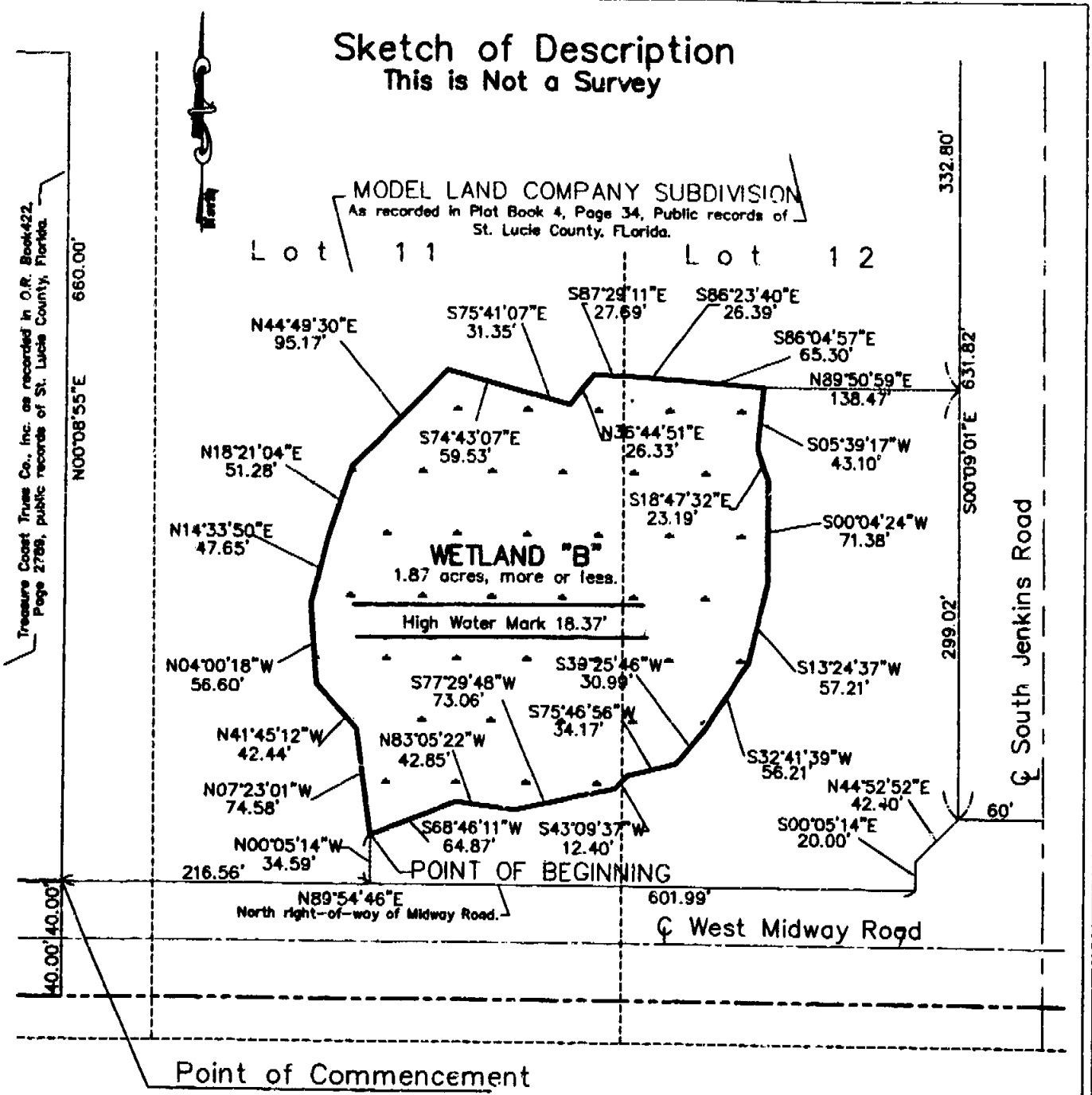
SKETCH OF DESCRIPTION
OF
Wetland "B"
Prepared For
MIDWAY INDUSTRIAL PARK

File: 2305WET.dwg
Date: 5/16/00
Tech: rwb

CULPEPPER & TERPENING, INC.
CONSULTING ENGINEERS & LAND SURVEYORS
2880 SOUTH 25th STREET
FORT PIERCE, FLORIDA 34982
(407) 464-3537

J:\survey\dwg\WETLANDS.dwg, 11/17/2003 11:41:14 AM, \\WS3\Brother MFC9700

Sketch of Description
This is Not a Survey



Point of Commencement

Southeast Corner of Treasure Coast Truss Co., Inc. lands as recorded in O.R. Book 422, Page 2789, public records of St. Lucie County, Florida.

Δ = DELTA
R = RADIUS
L = ARC LENGTH
CB = CHORD BEARING
PG = PAGE
PB = PLAT BOOK
POB = POINT OF BEGINNING
POC = POINT OF COMMENCEMENT
PLS = PROFESSIONAL LAND SURVEYOR

BEARINGS SHOWN HEREON ARE ASSUMED AND RELATIVE TO THE NORTH RIGHT-OF-WAY LINE OF MIDWAY ROAD HAVING A BEARING OF S 89°54'46" E.

Seasonal High Water Mark Added – Rev. 11/11/03 DJW

SKETCH OF DESCRIPTION
OF
Wetland "B"
Prepared For
MIDWAY INDUSTRIAL PARK

File: 2305WET.dwg
Date: 5/16/00
Tech: rwb

CULPEPPER & TERPENING, INC.
CONSULTING ENGINEERS & LAND SURVEYORS
2280 SOUTH 25th STREET
FORT PIERCE, FLORIDA 34982
(561) 464-3557

FORT PIERCE UTILITIES AUTHORITY

"Committed to Quality"

206 South Sixth Street (34950)
Post Office Box 3191
Fort Pierce, Florida 34948-3191

Phone 561-466-1600
FAX 561-489-0396

FAXED
NOV 12 2003
BY

CULPEPPER & TERPENING

JPT	
RML	
[illegible]	
[illegible]	
[illegible]	
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[illegible]	
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MTC	
RWB	
MEB	
CAK	
STT	

November 7, 2003

Patrick P. Pecunia E.I.
Culpepper & Terpening, Inc.
2980 South 25th Street
Fort Pierce, FL 34981

Re: Water/Wastewater Availability - Proposed Warehouse buildings
Corner of Midway Rd. and South Jenkins Rd.

Dear Mr. Pecunia:

As you requested, the Fort Pierce Utilities Authority would like to confirm the availability of water and wastewater service to the above referenced project. Availability however will be contingent upon the completion of construction of the required infrastructure and payment of the applicable fees and charges.

If you have any further questions, please contact this office at extension 3480.

Very truly yours,

FORT PIERCE UTILITIES AUTHORITY

Bo Hutchinson
Environmental Engineer

C:\HUTCHINSON\CULPEPPER & TERPENING, INC.

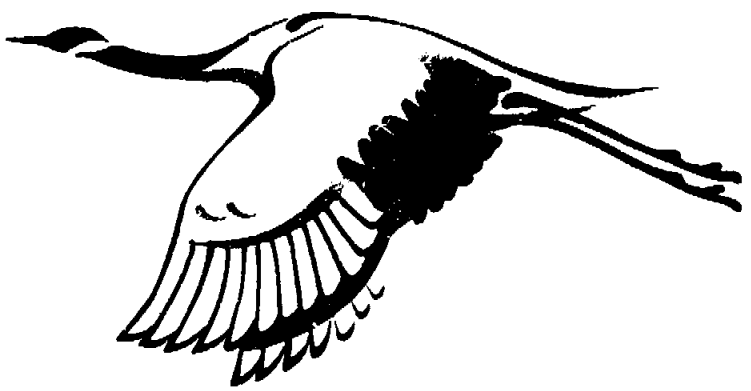
cc David Mellert, Environmental Engineer

MIDWAY INDUSTRIAL PARK
PHASE II, LOTS 1 & 2

St. Lucie County, Florida

Mitigation Plan

October 2003



Prepared for:
John A. Mayo
1207 SW 87th Terrace
Plantation, FL 33324
(954) 236-6551
Fax (954) 236-8832

Prepared by:
R.L. Weigt
Environmental Consultants, Inc.
8985 S.E. Bridge Road
Suite A
Hobe Sound, FL 33455
(772) 546-6255
FAX (772) 546-2316
E-Mail: rlw1@adelphia.net

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ORIGINAL SUBMITTAL

DEC 16 2003

WPB

031216-16

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JOHN A. MAYO

MIDWAY INDUSTRIAL PARK

PHASE II, LOTS 1 & 2

1.00 MITIGATION PLAN

1.01 General

To meet the environmental criteria set forth in South Florida Water Management District's (SFWMD) Basis of Review (BOR), Section 4.0, the Applicant, John A. Mayo, is including this proposed mitigation plan to offset direct wetland impacts for the proposed project site. This mitigation plan includes avoidance and minimization, and a cumulative impacts analysis.

1.02 Wetland Description

The project site contains one (1) State jurisdictional wetland (Figure 1). No Federal jurisdictional wetlands occur on-site. State and Federal wetland jurisdictional determinations are included in Appendix A. The wetland is 1.87 acres in size. The wetland is isolated and has suffered severe hydrological impacts from the development of Midway Road to the south, South Jenkins Road to the east and development to the west. The project site is located within the Midway Industrial Park. The hydrological impact has caused a succession of historically wetland plant species into transitional and upland plant species.

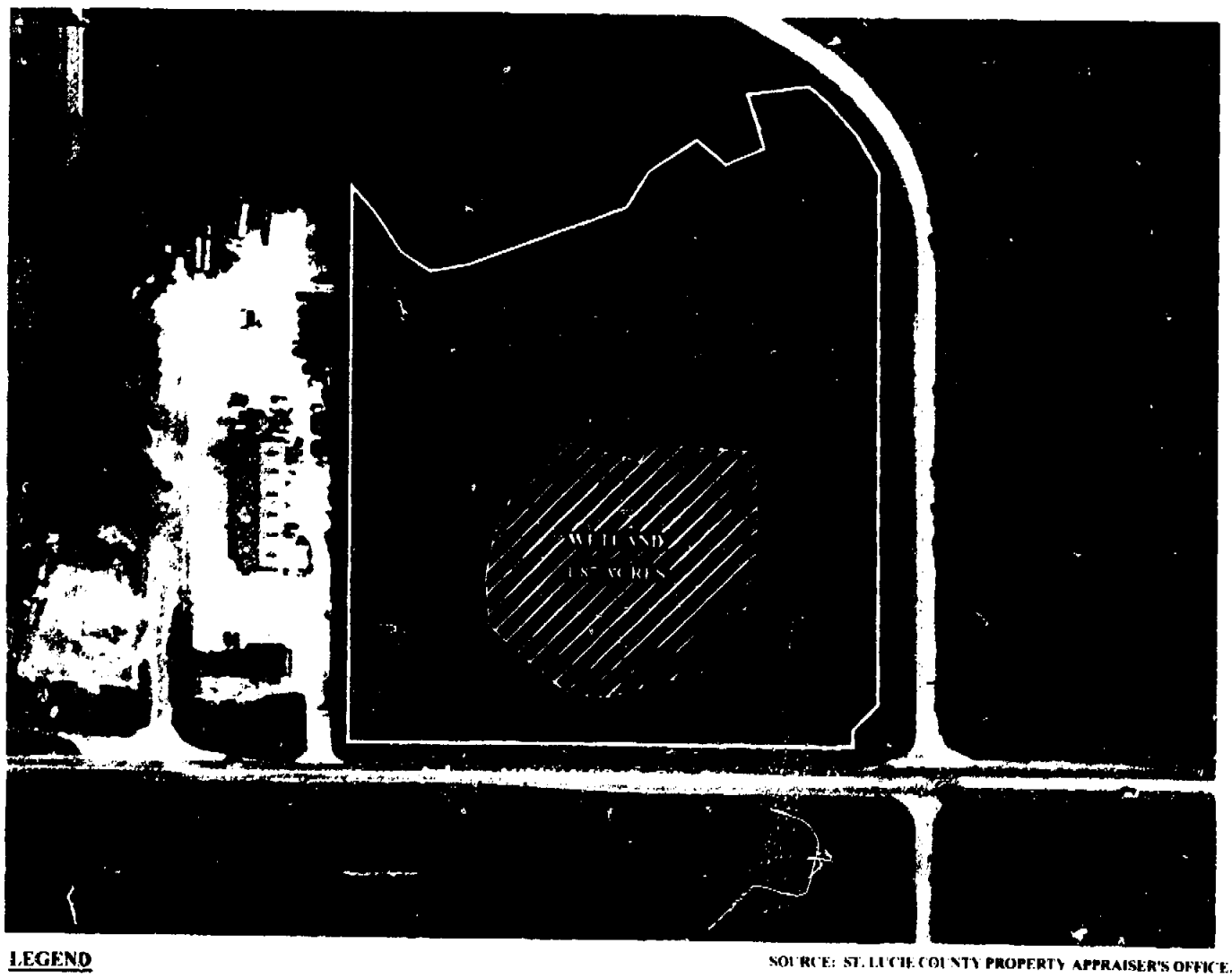
THIS DRAWING, TOGETHER WITH THE CONCEPTS AND DESIGN PRESENTED HEREIN, AS AN INSTRUMENT OF SERVICE, IS INTENDED ONLY FOR THE SPECIFIC PURPOSE AND CLIENT FOR WHICH IT WAS PREPARED. REUSE OF AND IMPROPER RELIANCE ON THIS DRAWING WITHOUT WRITTEN AUTHORIZATION AND ADAPTATION BY R.L. WEIGT ENVIRONMENTAL CONSULTANTS, INC. SHALL BE WITHOUT LIABILITY TO R.L. WEIGT ENVIRONMENTAL CONSULTANTS, INC.

NOT A SURVEY

North

0' 100' 200' 400' 800'

SCALE: 1" = 200'



LEGEND

SOURCE: ST. LUCIE COUNTY PROPERTY APPRAISER'S OFFICE.

- STATE JURISDICTIONAL WETLAND* (1.87 ACRES)

*NOTE: THE US ARMY CORPS OF ENGINEERS (COE) HAS IDENTIFIED THE WETLAND AREA AS ISOLATED AND NON-JURISDICTIONAL.

PROPOSED STATE WETLAND IMPACTS = 1.87 ACRES.

SITE SIZE = 4.59 ACRES.

ST. LUCIE COUNTY	SEC.	TWP.	R.	RLW JOB NO.:	DRAWING NAME:	DATE:	FIGURE:
FLORIDA	6	36S	40E	03-065	2000-AERIAL.DWG	6 OCTOBER 2003	1

MIDWAY INDUSTRIAL PARK PHASE II, LOTS 1 & 2

ENVIRONMENTAL RESOURCE PERMIT

2000 AERIAL PHOTOGRAPH

R. L. WEIGT
ENVIRONMENTAL CONSULTANTS, INC.
8985 S.E. BRIDGE ROAD, SUITE A, HOBE SOUND, FL 33455
PHONE: (772) 546-6255 FAX: (772) 546-2316 E-MAIL rlw1@adelphia.net

1.03 Wetland Impacts

The proposed project will unavoidably impact the on-site wetland located on-site (1.87 acres). Please refer to Table 1 for revised Project Wetland Summary and Table 2 for Project Off-Site Mitigation Summary. Wetland impacts are necessary to allow reasonable use of the industrial site. Wetland functions and values are already significantly reduced and preservation of any portion of the on-site wetland would be incompatible with the proposed development due to significant secondary impacts, the size of the wetland, and allowing reasonable use of the property.

Since on-site mitigation opportunities are not expected to have long-term viability due to unsuitable hydrologic conditions, the relatively small size of the wetland and the proposed on-site industrial development, mitigation is proposed off-site at the Bluefield Ranch Mitigation Bank. It is the Applicant's opinion that the use of the mitigation bank will provide greater improvement in ecological value than on-site mitigation.

1.03.01 *Off-site Mitigation Bank*

The Bluefield Ranch Mitigation Bank (BRMB) is a 2,675 acre bank located in western Martin and St. Lucie Counties The land consists of a mosaic of hydric pine flatwoods, freshwater prairie and forested wetlands, xeric oak, and mesic pine flatwoods. The BRMB has been impacted by previous agricultural activities. Restoration at the bank includes exotic and nuisance plant and animal removal, hydrologic restoration, permanent protection of existing wetlands and re-vegetation of on-site uplands and wetlands. BRMB is also participating in the South Florida Multi-Species Recovery Plan.

Table 1:

PROJECT WETLAND (WL) AND OTHER SURFACE WATER (SW) SUMMARY

WL & SW ID	WL & SW TYPE	WL & SW SIZE	WL & SW NOT IMPACTED	TEMPORARY WL & SW IMPACTS			PERMANENT WL & SW IMPACTS			MITIGATION I D
				WL & SW TYPE	IMPACT SIZE	IMPACT CODE	WL & SW TYPE	IMPACT SIZE	IMPACT CODE	
1	Herbaceous	1.87 acres	---	---	---	---	Herbaceous	1 87 acres	F	BRMB
PROJECT TOTALS:		1.87 acres	0.00		0.00			1.87 acres		

Comments: Wetland impacts will be mitigated at Bluefield Ranch Mitigation Bank.

CODES (multiple entries per cell not allowed):
Wetland Type: from an established wetland classification system (see Section E.111b.)
Impact Type: D=dredge; F=fill; H=change hydrology; S=shading; C=clearing; O=other

Reviewer: _____

Table 2:

PROJECT OFF-SITE MITIGATION SUMMARY

MITIGATION ID	CREATION		RESTORATION		ENHANCEMENT			WETLAND PRESERVE		UPLAND PRESERVE		OTHER
	AREA	TARGET TYPE	AREA	TARGET TYPE	AREA	TARGET TYPE	AREA	TYPE	AREA	TYPE	AREA	TARGET TYPE
1												2.10 Credits at Bluefield Ranch Mitigation Bank
PROJECT TOTALS												

Comments: To off-set proposed wetland impacts, a total of 2.10 State Credits shall be purchased from Bluefield Ranch Mitigation Bank.

CODES (multiple entries per cell not allowed):
Target Type or Type = target or existing habitat type from an established wetland classification system or land use classification for non-wetland mitigation

Reviewer: _____

1.03.02 *BRMB Credit Calculations*

The Applicant proposes to purchase 2.10 State herbaceous credits from the BRMB. No Federal mitigation is offered since no Federal jurisdictional wetlands occur on-site.

A. State Calculations

The WRAP score for the on-site wetland was calculated at 0.55. The WRAP Score was then multiplied to the wetland impact area of 1.87 acres to determine a functional loss of 1.03. A risk factor of two (2) was then applied to the functional loss (2 x 1.03) to determine that 2.10 credits will be required to off-set impacts.

B. Federal Calculations

No Federal jurisdictional wetlands occur on-site; therefore, no Federal mitigation is proposed for this project.

2.00 AVOIDANCE AND MINIMIZATION

Avoidance of the on-site wetlands is not economically feasible for the Applicant. The project site consists of 4.59 acres and has a St. Lucie County land use of IND (Industrial) and a zoning density of IH (Industrial-Heavy). Prior to closing on the property the Applicant was forced to deed over to St. Lucie County 40 linear feet at the front of the property for future widening of Midway Road. This loss of land computes to 25,200 square feet of land and a loss of approximately 6,300 square feet of potential building area. To allow for vehicular access, upland preservation, dry retention, parking and reasonable industrial use on this limited size property the entire wetland is proposed for impacts. A reduced copy of the site plan is included in Figure 2. A minimization scenario was evaluated by the Applicant, Project Engineer, and Environmental Consultant to reduce the amount of impacts to the on-site wetland (Figure 3). This alternative analysis would require an additional two (2) buildings to be deleted, reducing the total amount of buildings to four (4) for a

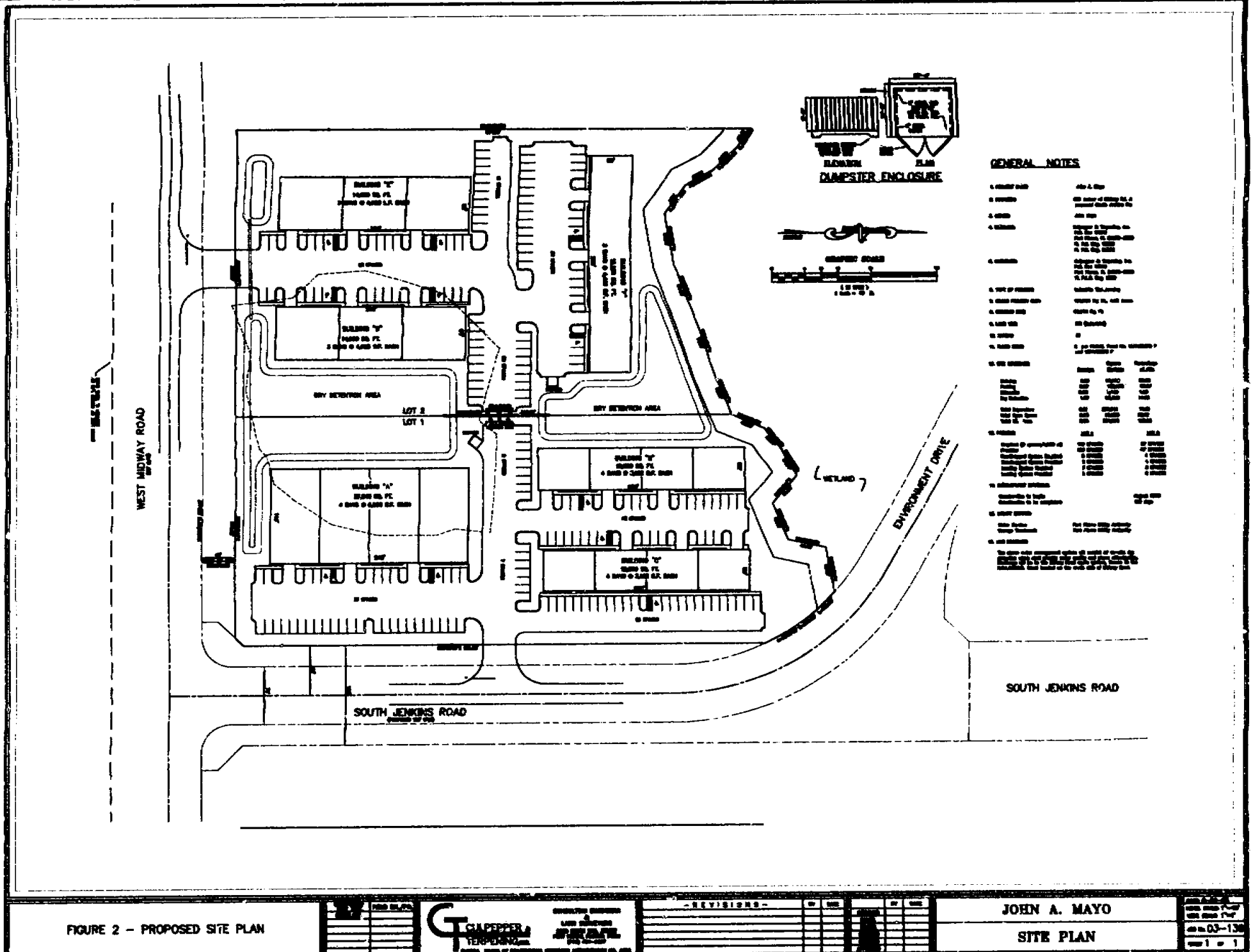


FIGURE 2 – PROPOSED SITE PLAN

CHAPPELL ENGINEERING

JOHN A. MAYO

SITE PLAN

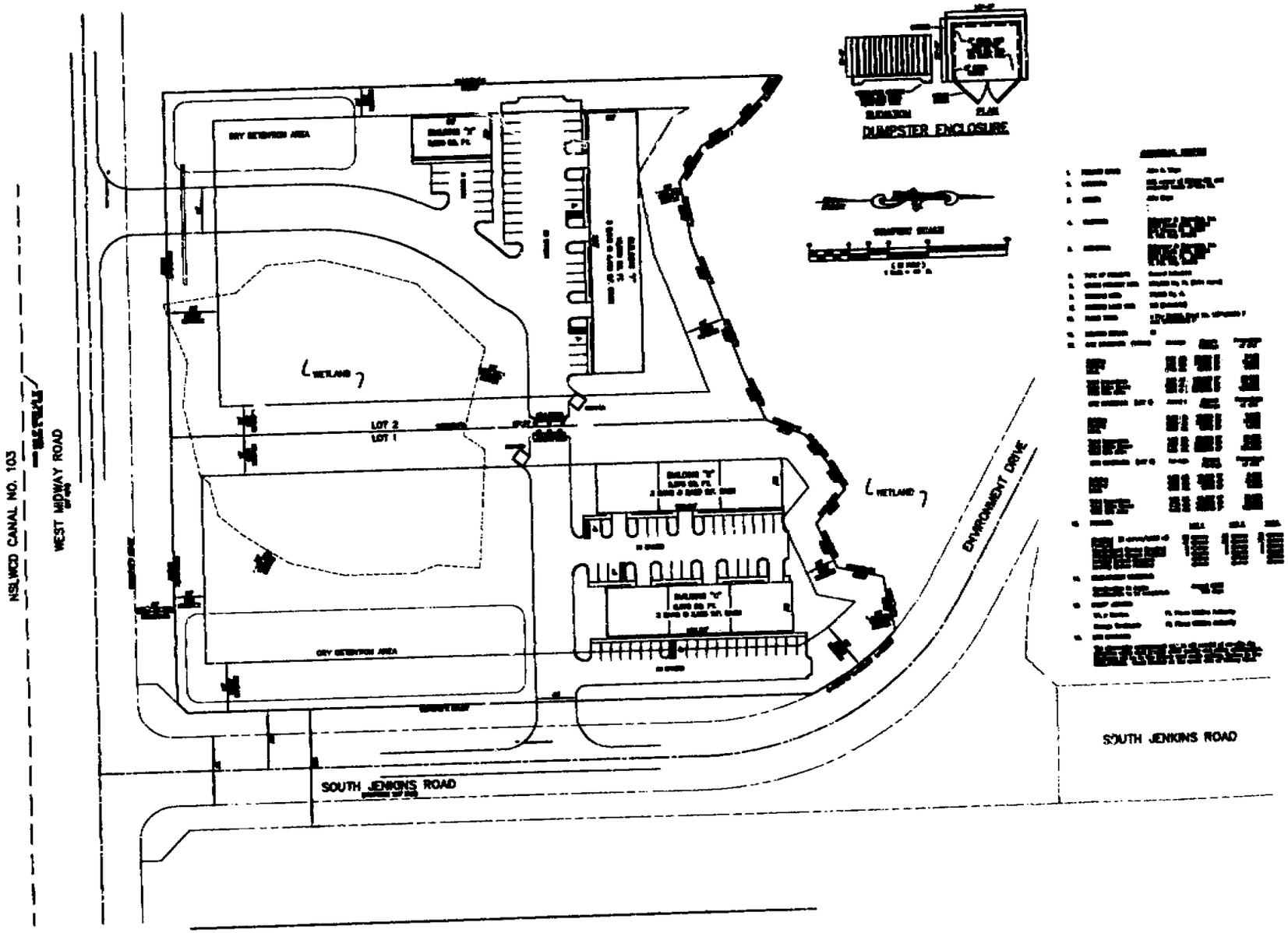


FIGURE 3 – ALTERNATIVE SITE PLAN

JOHN A. MAYO

ALTERNATIVE SITE PLAN

total loss of 42,790 square feet of building area. This type of reduction would make the parcel impossible to develop into an industrial warehouse complex, as it would decrease the allowable buildings by 33% and reduce annual revenues by over $84,711. Any reductions of buildings from the site plan would make the project financially unfeasible.

Since wetland functions and values have been significantly reduced within the wetland (WRAP score = 0.55) and based upon the wetland having reduced and unsuitable hydrologic conditions and its relatively small size (1.87 acres), any portion of this wetland proposed for preservation would be incompatible with the project due to significant secondary impacts. Since on-site preservation opportunities are not expected to have long-term viability due to this unsuitable hydrologic condition and the proposed on-site industrial development, mitigation has been proposed off-site at the BRMB for impacts to all 1.87 acres of the wetland. It is the Applicant's opinion that the use of the mitigation bank will provide a much greater improvement in ecological value than preservation of the on-site impacted wetland.

3.00 CUMULATIVE IMPACTS ANALYSIS

The BRMB is located within the C-23 Basin and the Nubbin Slough Basin. The John A. Mayo project site is located within the North St. Lucie Basin. Since the project site is located within the BRMB service area, but within a different drainage basin, R.L. Weigt Environmental Consultants, Inc. (RLW) performed this Cumulative Impact Analysis.

RLW's methodology for determining potential cumulative impacts to similar wetlands located within similarly used lands consisted of overlaying the National Wetlands Inventory Map (NWI) over the St. Lucie County Zoning Map for the North St. Lucie Basin. It should be noted that wetland locations depicted on the NWI Maps have not been field-verified by RLW, and actual jurisdictional status of these wetlands is unknown. The project site is zoned in St. Lucie County as IH (Industrial-Heavy). The St. Lucie County Zoning Map is shown on Figure 4.

NOT A SURVEY

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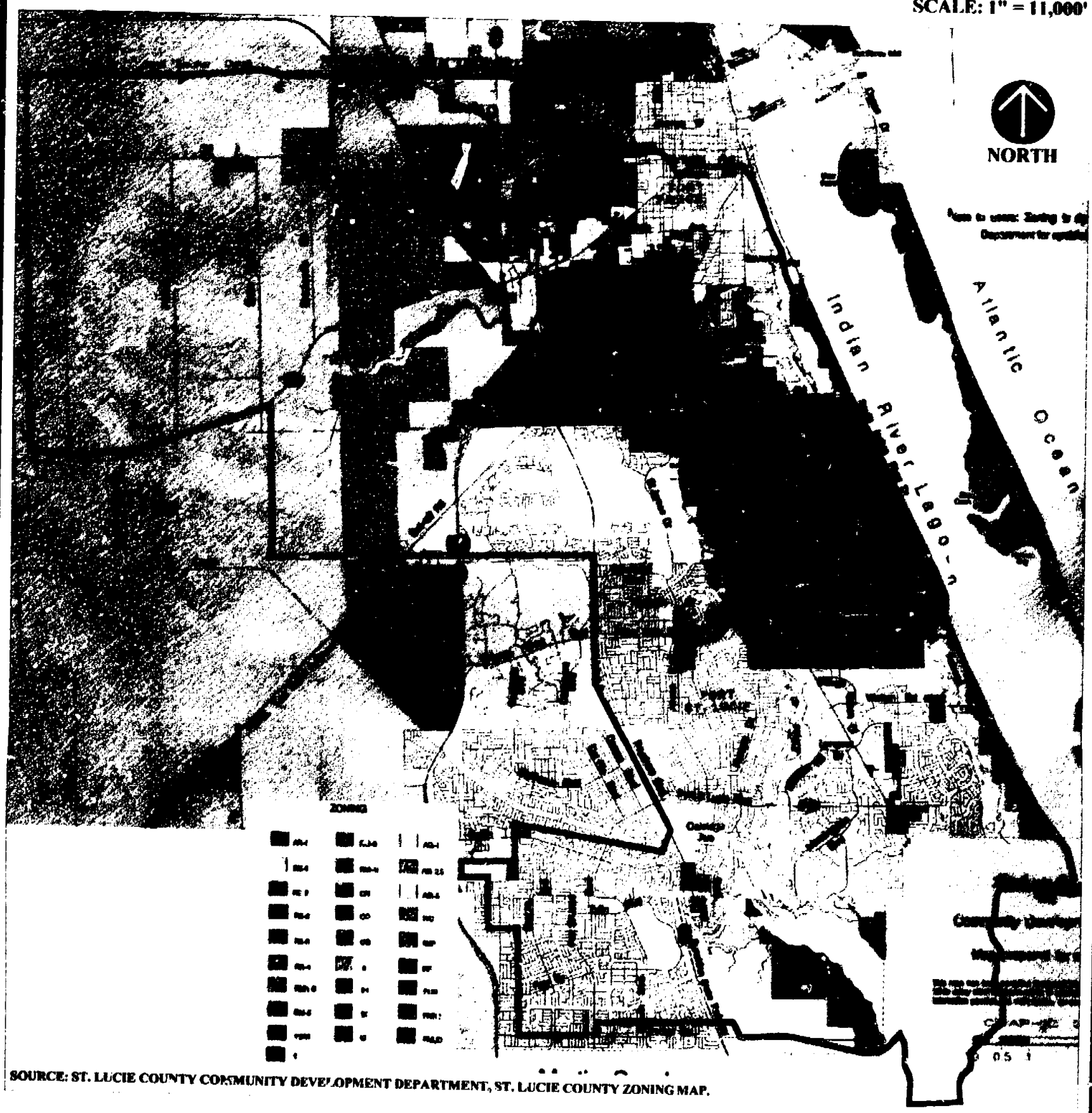
SCALE: 1" = 11,000'



SOURCE: ST. LUCIE COUNTY COMMUNITY DEVELOPMENT DEPARTMENT, ST. LUCIE COUNTY ZONING MAP.

MIDWAY INDUSTRIAL PARK PHASE II, LOTS 1 & 2 CUMULATIVE IMPACTS ANALYSIS ST. LUCIE COUNTY ZONING MAP	SEC.	TWP.	R.	ST. LUCIE COUNTY	R. L. WEIGT ENVIRONMENTAL CONSULTANTS, INC. 8985 S.E. BRIDGE ROAD, SUITE A, HOBE SOUND, FL 33455 PHONE: (772) 546-6255 FAX: (772) 546-2316 E-MAIL: rlw1@adelphia.net	
	6	36S	40E	FLORIDA		
DRAWING NAME: ZONING-MAP.DWG	RLW JOB NO.: 03-065	DATE: OCTOBER 2003		DRAWN BY: M.A.A.	REVIEWED BY: R.L.W.	APPROVED BY: R.L.W.	FIGURE: 4

It is estimated that approximately 8,000 acres of wetlands within the North St Lucie Basin are in public ownership and approximately 3,400 acres are in private ownership (Figure 5) A vast majority of the wetlands in public ownership are protected within the North Fork of the St Lucie River, the North Fork Save Our Rivers Project, and the Savannas State Preserve As indicated on Figure 6, it was further estimated that of the 3,400 acres of wetland in private ownership, approximately 233 acres of similar sized private wetlands (wetlands > 5 0 acres) are located in areas zoned with a higher risk of development and 196 acres of similar sized wetlands are located in areas zoned with a low risk of development Areas at a higher risk of development include zoning designations of residential, commercial, industrial, utilities, RF, RVP, HIRD, PUD, PNRD, and PMUD and areas at a low risk of development include zoning designations of agriculture and conservation.

Assuming that all similar sized wetlands with a high risk of development are impacted within the St Lucie Drainage Basin a total of less than 7% of all privately owned wetlands have the potential to be mitigated out of basin These wetlands represent 2% of all wetlands in the North St Lucie Drainage Basin This cumulative impacts analysis may not necessarily hold true for all other similar projects in the basin, especially those that propose to impact wetlands of greater functional value, are connected to adjacent off-site greenways, interact with other water resources, or have endangered/threatened wildlife Similarly, future projects with wetland impacts located have the potential for on-site mitigation or off-site mitigation within the North St Lucie Basin which further lessens the cumulative amount of wetlands lost within the basin

Although the proposed off-site mitigation will take place at the BRMB in the C-23 basin, wetland functions in the C-23 basin impact the North Fork of the St. Lucie River, where the C-23 canal ultimately discharges Even though the mitigation for the proposed project is outside the North St. Lucie Basin, the mitigation at BRMB will involve enhancement of wetland systems within the same overall watershed.

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SCALE: 1" = 11,000'

NORTH

NORTH ST. LUCIE BASIN

SOURCE: NATIONAL WETLANDS INVENTORY, UNITED STATES DEPARTMENT OF THE INTERIOR AND ST. LUCIE COUNTY ZONING MAP.

LEGEND

- WETLANDS IN PUBLIC OWNERSHIP (±8272 ACRES)
- WETLANDS IN PRIVATE OWNERSHIP (±3403 ACRES)

MIDWAY INDUSTRIAL PARK PHASE II, LOTS 1 & 2 CUMULATIVE IMPACTS ANALYSIS PRIVATE VS. PUBLIC OWNERSHIP	SEC.	TWP.	R.	ST. LUCIE COUNTY	R. L. WEIGT ENVIRONMENTAL CONSULTANTS, INC. 8985 S.E. BRIDGE ROAD, SUITE A, HOBE SOUND, FL 33455 PHONE: (772) 546-6255 FAX: (772) 546-2316 E-MAIL rlw1@adelphia.net
	6	36S	40E	FLORIDA	

DRAWING NAME:	RLW JOB NO.:	DATE:	DRAWN BY:	REVIEWED BY:	APPROVED BY:	FIGURE: 5
PUB VS PRIVATE.DWG	03-068	6 OCTOBER 2003	M.A.A.	R.L.W.	R.L.W.	

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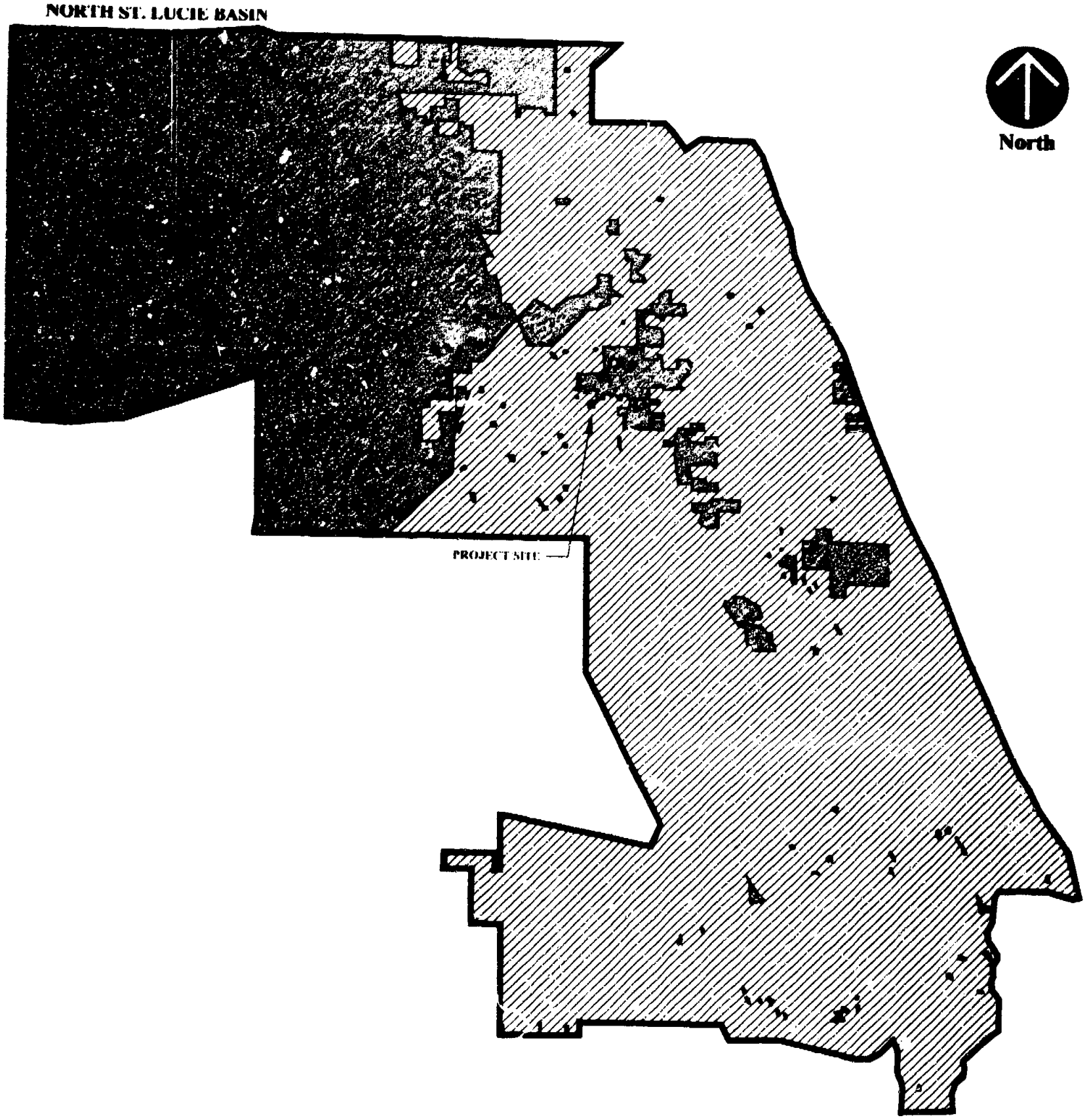
SCALE: 1" = 11,000'

NORTH ST. LUCIE BASIN



SOURCE: ST. LUCIE COUNTY COMMUNITY DEVELOPMENT DEPARTMENT, ST. LUCIE COUNTY ZONING MAP.

LEGEND

- ZONED PROPERTIES AT-RISK OF DEVELOPMENT (ZONING INCLUDES ALL RESIDENTIAL, COMMERCIAL, INDUSTRIAL, UTILITIES, RF, RVP,HIRD, PUD, PNRD, AND PMUD)
- ZONED PROPERTIES WITH LOW RISK OF DEVELOPMENT (ZONING INCLUDES AG-1, AG-2.5, AG-5, R/C, AR-1)
- PRIVATE WETLANDS LESS THAN 5 ACRES AT RISK OF DEVELOPMENT (±233 ACRES)
- PRIVATE WETLANDS LESS THAN 5 ACRES WITH LOW RISK OF DEVELOPMENT (±196 ACRES)

MIDWAY INDUSTRIAL PARK PHASE II, LOTS 1 & 2 CUMULATIVE IMPACTS ANALYSIS WETLANDS AT RISK OF DEVELOPMENT	SEC.	TWP.	R.	ST. LUCIE COUNTY	R. L. WEIGT ENVIRONMENTAL CONSULTANTS, INC. 8985 S.E. BRIDGE ROAD, SUITE A, HOBE SOUND, FL 33455 PHONE: (772) 546-6255 FAX: (772) 546-2316 E-MAIL rlw1@adelphia.net		
	6	36S	40E	FLORIDA			
DRAWING NAME: WETLANDS-AT -RISK.DWG	RLW JOB NO.: 03-065	DATE: 7 OCTOBER 2003		DRAWN BY: M.A.A.	REVIEWED BY: R.L.W.	APPROVED BY: R ..W.	FIGURE: 6

The project site wetland proposed for impact consist of a low quality, isolated emergent wetland system. The wetland exhibits minimal evidence of wildlife utilization and the hydrologic regime has been highly impacted by Midway Road to the south, South Jenkins Road to the east, and industrial development to the west. The majority of the property including the wetland has been impacted by its agricultural use of cattle grazing. The presence of cattle and the surrounding development has caused a succession of wetland plant species into transitional and upland plant species within the wetland. The decreased hydroperiod has significantly lowered the habitat value of the wetland for aquatic macroinvertebrates, amphibians, and forage fishes, in turn, providing little to no feeding and nesting support for wading birds and rare and endangered species. Due to the location of the property industrial area, the wetland is not connected with contiguous off-site wetland systems of wildlife corridors.

A typical, healthy emergent wetland system, such as those located in the North Fork of the St. Lucie River Buffer Preserve and in the Savanna's State Preserve are characterized by dominantly soft-stemmed herbaceous plants and floating and submergent aquatics in deeper areas. These wetlands are inundated for six months or more during the wet season and have a water table within 10 inches of the surface for the remainder of the year. These emergent wetland areas provide essential habitat to the breeding life cycle of aquatic and wetland dependant animals, young and adult amphibians, and reptiles. They also serve as wading bird foraging and nesting areas. State and Federally listed species that depend or utilize these emergent wetland systems of south Florida include: gopher frog, bog frog, American alligator, roseate spoonbill, limpkin, marsh wren, little blue heron, reddish egret, snowy egret, tricolored heron, white ibis, Florida sandhill crane, wood stork, and snail kite.

If similar isolated, hydrologically impacted, low habitat value emergent wetlands were developed within the North St. Lucie Basin, it is the Applicant's opinion that those impacts would not result in unacceptable cumulative impacts to wetlands or water quality within the basin. The North Fork of the St. Lucie River Buffer Preserve contains over 500 acres of tidal swamp, hydric hammock, floodplain forest, hydric flatwoods, sloughs, and emergent wetlands. The Savanna's State

Preserve is a 4,900 acre preserve containing open water sloughs, emergent marshes, and hydric flatwoods which provide essential habitat and water resources within the basin.

4.00 PUBLIC INTEREST CRITERIA

Pursuant to 33 CFR 320.4 and 403.918, Florida Statutes, it is the opinion of the Applicant that the proposed project is clearly in, and will not be contrary to, the Public's Interest. The Applicant's opinion is based on the balancing of the following public interest criteria.

4.01 Effects on Public Health, Safety or Welfare, or the Property of Others

The proposed project will directly benefit the public health, safety, welfare, and property of others. The proposed improvements will benefit water quality through an approved Stormwater Management Plan. The mitigation efforts at BRMB will provide greater improvement in ecological value than on-site mitigation.

The industrial project will be constructed on property purchased by the Applicant for industrial construction.

4.02 Effects on the Conservation of Fish and Wildlife, Including Endangered or Threatened Species, or Their Habitats

The proposed project will unavoidably impact 1.87 acres of State jurisdictional wetlands. No Federal jurisdictional wetland occur on-site. No endangered or threatened species were observed on-site during an environmental assessment of the project site conducted by RLW in May 2000. The on-site wetland systems have a reduced functions and values due to altered hydrologic conditions. The Applicant's mitigation proposal is to purchase 2.10 State credits from the BRMB to meet the goal of no net-loss of wetland

functions and values. The mitigation bank is also participating in the South Florida Multi-Species Recovery Plan.

4.03 Effects on Navigation, the Flow of Water, Erosion, or Shoaling

The proposed project will not affect navigation in waters of the United States.

4.04 Effects on Fishing or Recreational Values and on Marine Productivity in the Vicinity of the Projects

The proposed project will not have any effects on fishing or recreational values on marine productivity.

4.05 Nature of Facility

The proposed project is permanent in nature and will provide the citizens of St. Lucie County with additional construction, building maintenance, and landscaping job opportunities.

4.06 Effects on Historical or Archaeological Resources

There are no known historical or archeological sites located within the proposed construction area. If any sites are found during construction, they will be coordinated with the Florida Department of State, Division of Historical Resources, State Historic Preservation Officer (SHPO).

4.07 Relative Value and Functions Being Performed by the Areas Affected by the Proposed Activities

The project site will impact 1.87 acres of State jurisdictional wetlands (0.0 acres Federal) located within the project boundaries. These wetlands have reduced functions and

values due to adjacent development. Natural hydrological conditions have been altered by surrounding developments.

4.08 Effect on Water Quality

All construction activities will be conducted in accordance with Best Management Practices (BMP's) set forth in FAC 17-25.025(7) to protect water quality. Water quality is not expected to be degraded during construction with the implementation of these BMP's.

During construction, erosion and sediment will be controlled according to FAC 17-25.025(7). Runoff will be routed through temporary basins and turbidity screens, where necessary, to prevent violations of state water quality standards. Temporary material and operations to attain the required pollution controls include, but are not limited to, temporary seeding, filter blankets, chemicals, temporary dikes and ditches, fiber mats, mulch, and sod. All pollution prevention procedures, materials, equipment, and other related items will be maintained in an approved condition until completion.

Post construction water quality on-site will improve with the construction of an approved Surface Water Management Plan. Wetland impacts will be off-set via the purchase of 2.10 State Credits from the BRMB.

4.09 Effects on the Territorial Sea

The proposed project will NOT effect the limits of the territorial sea or coastal waters.

4.10 Consideration of Property Ownership

Construction of the residential development is proposed on property owned by the Applicant.

4.11 Activities Affecting Coastal Zones

The project will not affect the coastal zone

4.12 Activities in Marine Sanctuaries

No portions of the proposed project contain or occur in any marine sanctuaries. This project will not impact any marine sanctuaries.

4.13 Other Federal, State, or Local Requirements

The Applicant is coordinating permits and/or required authorization for construction of the proposed residential project with staff members of the South Florida Water Management District (SFWMD), the U.S. Army Corps of Engineers (COE), and St. Lucie County.

4.14 Safety of Impoundment Structures

No impoundment structures are proposed for this project and BMP's will be utilized where any fill or spoil is stored.

4.15 Floodplain Management

The proposed project does not pose a threat of significant or adverse alteration of on-site flood flow.

4.16 Water Supply and Conservation

The proposed project will not significantly effect the water supply of St. Lucie County. However, the project will provide stormwater retention that allows rainfall and stormwater runoff to infiltrate and recharge the surficial aquifer.

4.17 Environmental Benefits

The proposed project will provide improved on-site water quality via a stormwater management system. To off-set impacts to wetlands, 2.10 State credits will be purchased from the BRMB.

4.18 Economics

The proposed project will provide construction/design and post-development employment for residents of St. Lucie County. New industrial development will expand the economic base of the St. Lucie County community.

4.19 Mitigation

The Applicant proposes to unavoidably impact 1.87 acres of State wetland. No Federal jurisdictional wetlands are located on-site. To mitigate for these impacts, the Applicant proposes to purchase 2.10 State credits from the BRMB.

The BRMB is a 2,675 acre mitigation bank located in western Martin and St. Lucie Counties. The land consists of a mosaic of hydric pine flatwoods, freshwater prairie and forested wetlands, xeric oak, and mesic pine flatwoods. Bluefield Ranch has been impacted by previous agricultural activities. Restoration at the bank includes exotic and nuisance plant and animal removal, hydrologic restoration, permanent protection of existing wetlands and

re-vegetation of on-site uplands and wetlands The BRMB is also participating in the South Florida Multi-Species Recovery Plan.

Pursuant to 33 CFR 320 4 and 403.918(2), Florida Statutes, it is the opinion of the Applicant that the proposed project is clearly in, and will not be contrary to, the public's interest. *Research and Economic Database*). New residential development will be needed to accommodate this greater than 15% anticipated growth.

APPENDIX A

Wetland Jurisdictional Determinations

SOUTH FLORIDA WATER MANAGEMENT DISTRICT
3301 Gun Club Road, West Palm Beach, Florida 33406 • (561) 686-8800 • FL WATS 1-800-432-2045 • TDD (561) 697-2574
Mailing Address: P.O. Box 24680, West Palm Beach, FL 33416-4680 • www.sfwmd.gov

CON 24-06

Environmental Resource Regulation Department
Pre-application Number 000510-9

January 29, 2001

Doreen Studer
R.L. Weigt Environmental Consultants, Inc.
8985 S.E. Bridge Rd., Suite A
Hobe Sound, Florida 33455

Dear Ms. Studer:

Subject: Midway Industrial (RLW File #00-029)
Pre-Application Environmental Site Inspection
St. Lucie County, S 6/T36S/R40E

The District offers the following in response to your request for a determination of wetland boundaries and other surface waters located within the subject property.

Ed Cronyn, an Environmental Analyst in the Natural Resource Management Division, conducted a site inspection on June 14, 2000.

The aerial photograph and boundaries (indicated by the solid border on the attached aerial) define the areas of the site inspection. Based on the information provided, this project contains two wetlands (indicated by diagonal lines) as defined by Chapter 62-340 Florida Administrative Code (F.A.C.). The acreage estimates shown have not been surveyed and may be subject to change. If the proposed project will result in greater than one acre of total impacts to wetlands or other surface waters, an Individual Environmental Resource Permit from the District will be required. Proposed work resulting in less than one acre of total impacts to wetlands or other surface waters will require a Standard General Permit from the District.

The two wetlands, denoted as Wetlands "A" and "B" on the aerial photograph, may be further described as herbaceous freshwater wetlands. Wetland A is dominated by wet prairie species including *Panicum* sp. and wax myrtle. This wetland and surrounding pine flatwoods are in fair to good condition. Wetland B is dominated by exotic species, particularly primrose willow, with an upland fringe of Caesar weed. This wetland is vegetatively in poor condition but retains intact wetland hydrology.

This correspondence is an informal preapplication wetland determination pursuant to Chapter 373, Florida Statutes. It does not bind the District, its agents or employees, nor does it convey any legal rights, expressed or implied. Persons obtaining this informal preapplication wetland determination are not entitled to rely upon it for purposes of

GOVERNING BOARD
Michael Collins, *Chairman*
Michael D. Minton, *Vice Chairman*
Mitchell W. Berger
Vera M. Carter
Gerardo B. Fernandez
Patrick J. Gleason
Nicolas J. Gutierrez, Jr.
Harkley R. Thornton
Trudi K. Williams

EXECUTIVE OFFICE
Frank R. Finch, P.E., *Executive Director*
James E. Blount, *Chief of Staff*

compliance with provision of law or district rules. A binding wetland determination may be obtained by petitioning the South Florida Water Management District for a wetland declaratory statement pursuant to FAC Rule 62-340 or by applying for an Environmental Resource permit.

A file has been set up at the West Palm Beach office with pre-application materials. If you have any further questions, please contact Ed Cronyn at (561) 682-6946.

Sincerely,

Don Medellin
Senior Supervising Environmental Analyst
Natural Resource Management Division

DRM/ec – Attachments (Aerial Photograph, location map)

c: USACOE (Stuart)
St. Lucie County—Anna Smith

Not A Survey

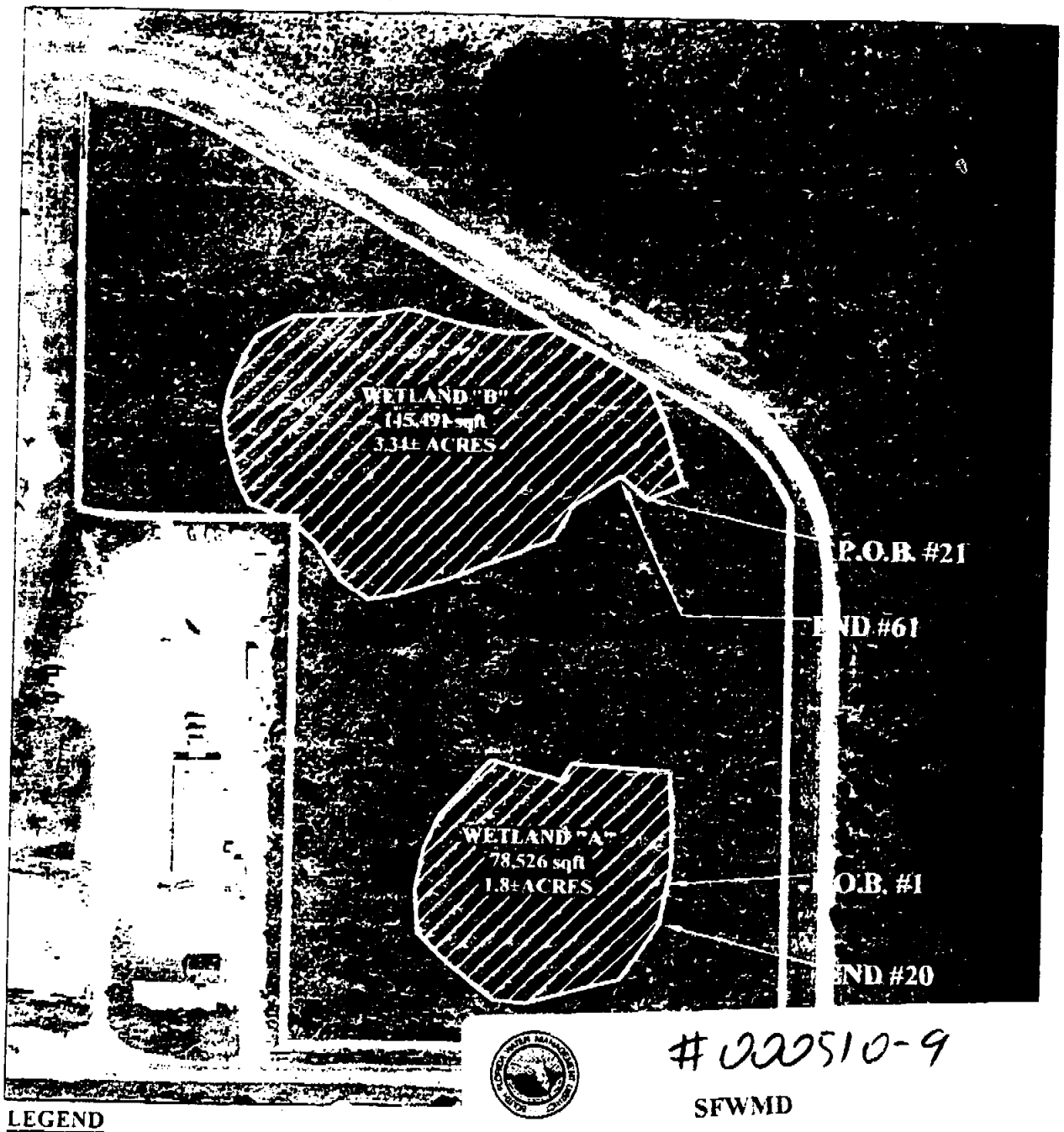
CULPEPPER & TERPENING, INC.

CONSULTING ENGINEERS & LAND SURVEYORS

North

100' 200' 800'

SCALE: 1" = 200'



LEGEND

SFWMD & USACOE JURISDI

SOURCE: CITY OF PORT ST. LUCIE 2-70' RASTER AERIAL

ST. LUCIE COUNTY	SEC.	TWP.	R.	REV JOB NUMB
FLORIDA	6	36S	40E	2000-029.01

MIDWAY INDUSTRIAL PARK PHASE II
WETLAND DELINEATION

JURISDICTIONAL WETLANDS

#020510-9

SFWMD

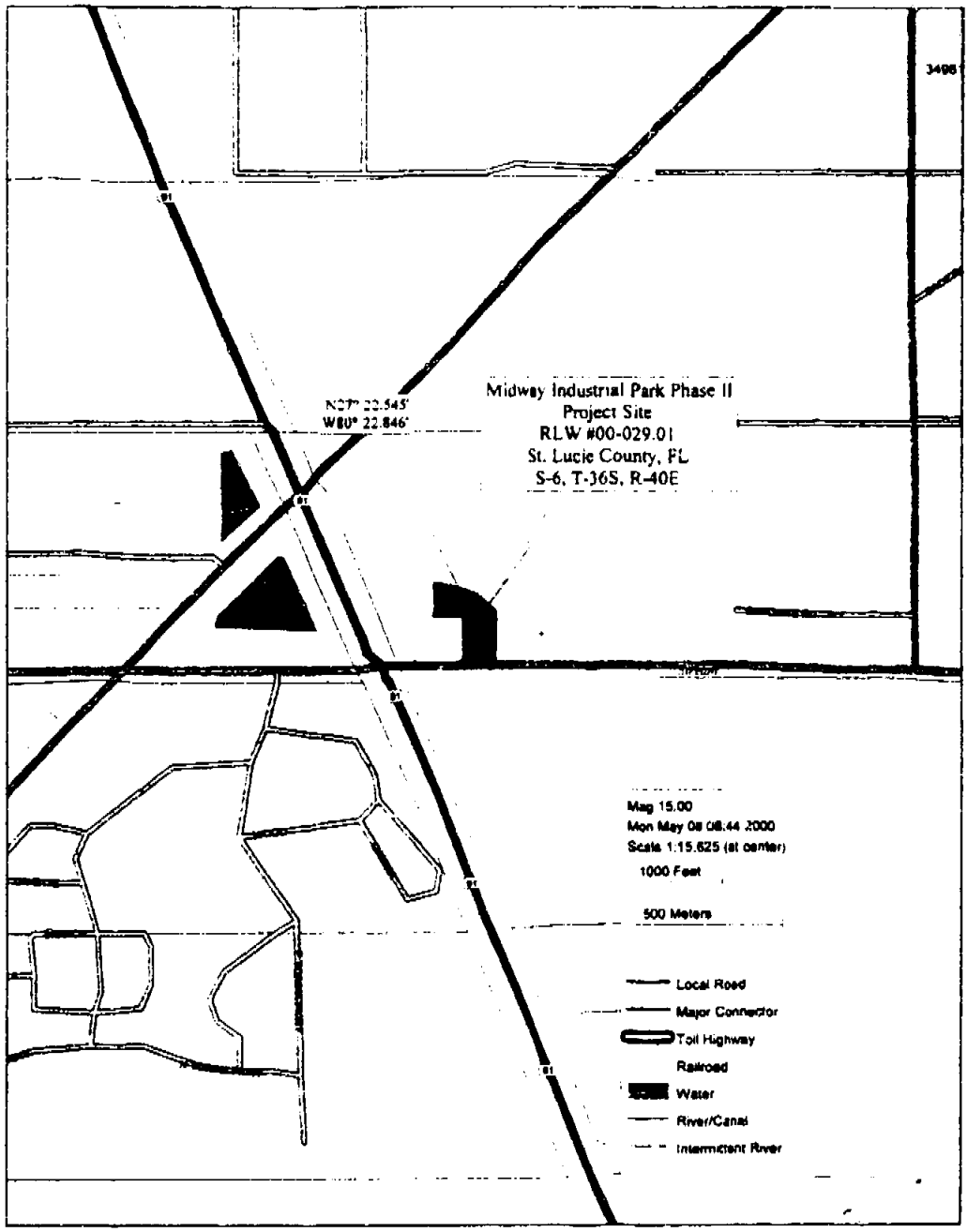
Reviewer: Ed Cronin

Date: 6/14/00 S 6 T 36 R 40

County: St. Lucie

/// = wetland ~~other surface waters~~

Not A Survey



DIRECTIONS TO SITE:

TAKE I-95 TO THE MIDWAY ROAD EXIT AND GO EAST. GO OVER THE TURNPIKE TO JENKINS ROAD AND TURN NORTH TO THE SITE. THE SITE IS ON THE CORNER OF MIDWAY AND JENKINS.

SOURCE: DeLORME MAPPING, INC.

ST. LUCIE COUNTY	SEC.	TWP.	R.	RLW JOB NUMBER:	DRAWING NAME:	DATE:	FIGURE:
FLORIDA	6	36S	40E	00-029.01	LOCATION-WD.DWG	MAY 2000	1 OF 5

MIDWAY INDUSTRIAL PARK PHASE II
WETLAND DELINEATION

LOCATION MAP

R. L. WEIGT
ENVIRONMENTAL CONSULTANTS, INC.
8985 S.E. BRIDGE ROAD, SUITE A, HOBE SOUND, FL 33455
(561) 546-6255 FAX (561) 546-2316 E-MAIL rlweigt@gate.net

DEPARTMENT OF THE ARMY
JACKSONVILLE DISTRICT CORPS OF ENGINEERS
STUART REGULATORY OFFICE
218 ATLANTA AVENUE
STUART, FLORIDA 34994

Regulatory Division
South Permi Branch
200001804(N`-TA)

NOV ` 2001

Ms. Stephanie DeWind
R.L. Weight Environmental Consultants, Inc.
8985 Southeast Bridge Road Suite A
Hobe Sound, Florida 33455

Dear Ms. DeWind:

Reference is made to your request for a "no permit letter" for the Midway Industrial Park Phase II Project located in Section 6, Township 36, Range 40, St. Lucie County, Florida. Your project was assigned number 200001804.

The recent Supreme Court decision, Solid Waste Agency of Northern Cook County v. U.S. Army Corps of Engineers, No. 99-1178 (January 9, 2001) (SWANCC) involved the scope of regulatory authority under Section 404 of the Clean Water Act. The court held that assertion of jurisdiction over "non-navigable, isolated, intrastate" waters based solely on the use of such waters by migratory birds were not considered waters of the United States.

Given this recent ruling by the Supreme Court and a review of your project shows that it falls into the category described by the Supreme Court decision. Therefore, your project as proposed will not require a Department of the Army permit in accordance with Section 404 of the Clean Water Act as it will not involve the discharge of dredged or fill material into waters of the United States. Providing the work is done in accordance with the drawings submitted with your application, a Department of the Army authorization will not be required.

This letter does not give absolute authority to perform the work as specified on your application. The proposed work may be subject to local building restrictions mandated by the National Flood Insurance Program. You should contact your local office that issues building permits to determine if your site is located in a flood-prone or floodway area, and if you must

CC-05.01

comply with the local building requirements mandated by the National Flood Insurance Program. This letter does not obviate the requirement to obtain any other Federal, State or local permits, which may be necessary for your project. Please be advised that this decision shown reflects current policy and regulations and is valid for a period no longer than 5 years from the date of this letter.

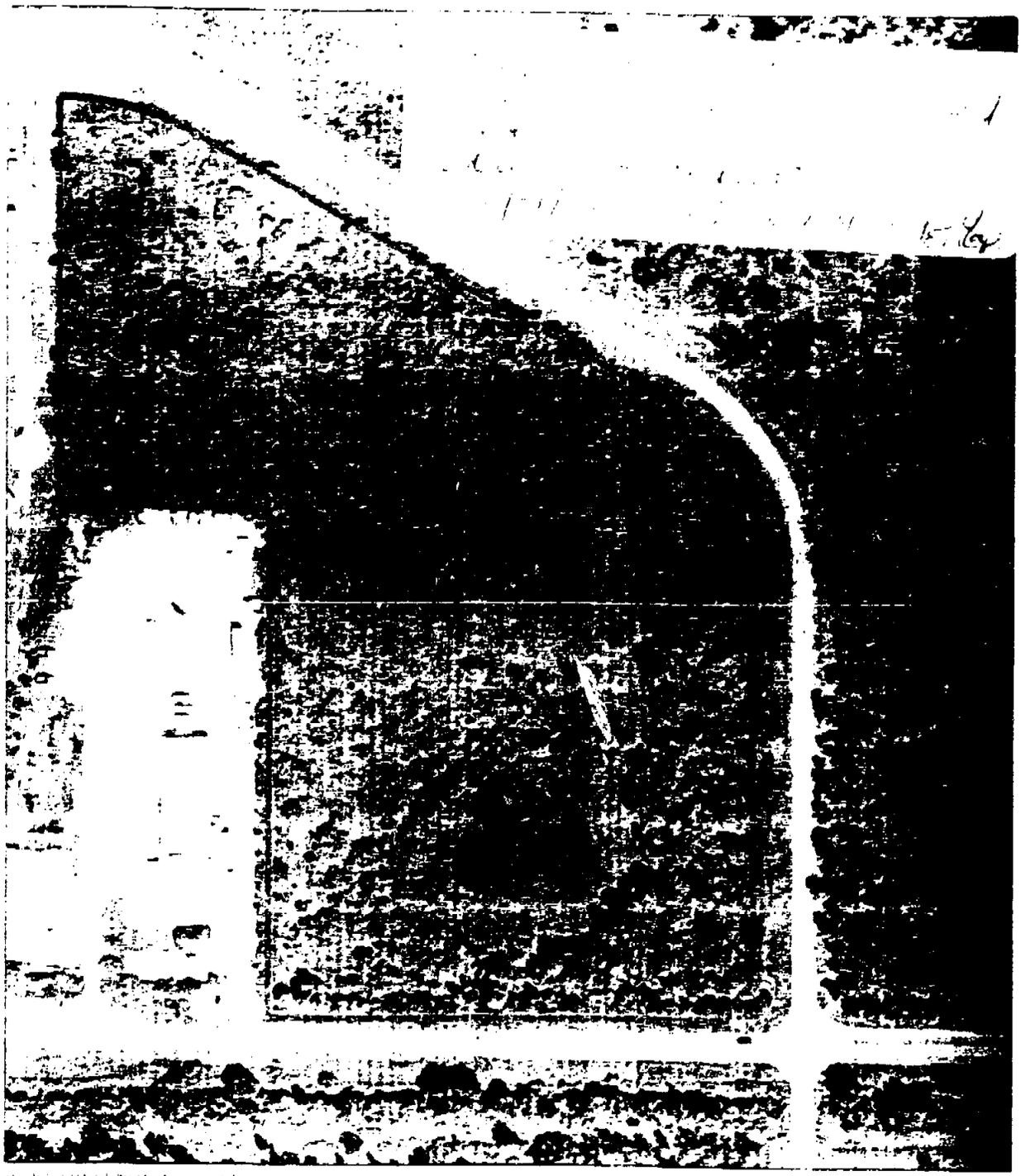
Questions concerning this letter may be addressed to Tori Agramonte at 561-781-8085. Thank you for your cooperation with our regulatory program.

Sincerely,

Tori Agramonte

Marie G. Burns
Acting Chief,
South Permits Branch

Copy Furnished:
EPA, West Palm Beach
FWS, Vero Beach



MIDWAY INDUSTRIAL PARK PHASE II
ENVIRONMENTAL ASSESSMENT

1997 AERIAL PHOTOGRAPH

FIGURE
2-6

SOUTH FLORIDA WATER
MANAGEMENT DISTRICT

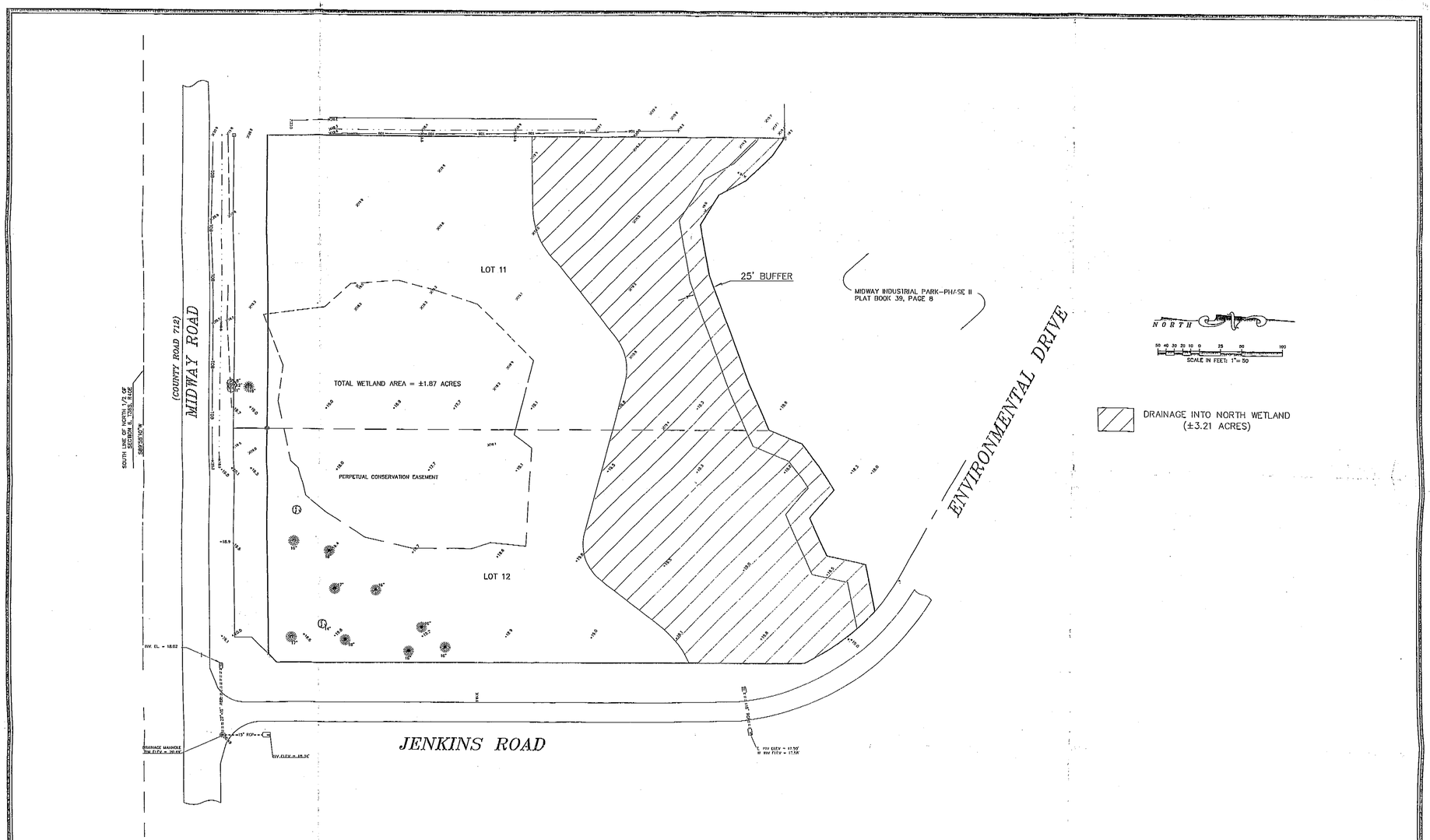
MAPS FOR

PERMIT NUMBER:

56-01995-P

APPLICATION NUMBER:

03/216-16



COMPUTER FILE REF.	FIELD BK./PG.
03-139hydroperiod.dwg	
HYDRO.fsu	

CULPEPPER & TERPENING, INC.
CONSULTING ENGINEERS & LAND SURVEYORS
2980 SOUTH 25th STREET
FORT PIERCE, FLORIDA 34981
(772) 464-3537
STATE OF FLORIDA BOARD OF PROFESSIONAL ENGINEERS AUTHORIZATION NO. 4286

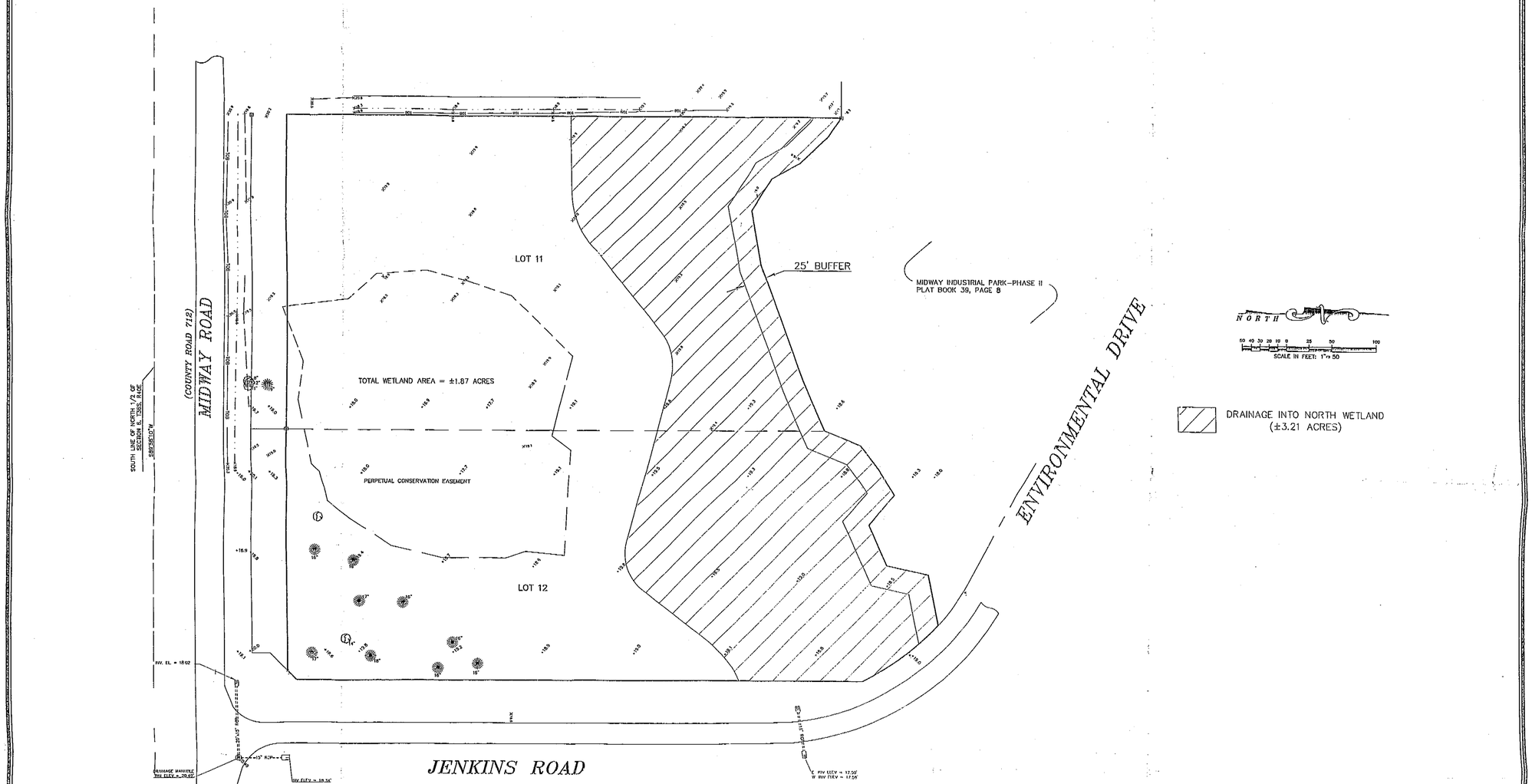
-REVISIONS-	BY	DATE

	BY	DATE
DESIGNED	PPP	1/16/04
CALCS.		
DRAWN	TJW	1/19/04
DETAILED		
CHECKED		
APPROVED		

MAYO WAREHOUSE

HYDROPERIOD EXHIBIT

DATE: 1/19/13
HORIZ. SCALE: 1"=50'
VERT. SCALE: N/A
JOB No. 03-139
SHEET 1 OF 1



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03-139\hydroperiod.dwg	
HYDRO.los	

CULPEPPER & TERPENING, INC.

CONSULTING ENGINEERS
&
LAND SURVEYORS
2960 SOUTH 25th STREET
FORT PIERCE, FLORIDA 34981
(772) 464-3537

STATE OF FLORIDA BOARD OF PROFESSIONAL ENGINEERS AUTHORIZATION NO. 4286

– REVISIONS –	BY	DATE
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	BY	DATE
DESIGNED	PFP	1/18/04
CALCS.		
DRAWN	TJW	1/19/04
DETAILED		
CHECKED	.	.
APPROVED		

MAYO WAREHOUSE

HYDROPERIOD EXHIBIT

DATE: 1/19/13
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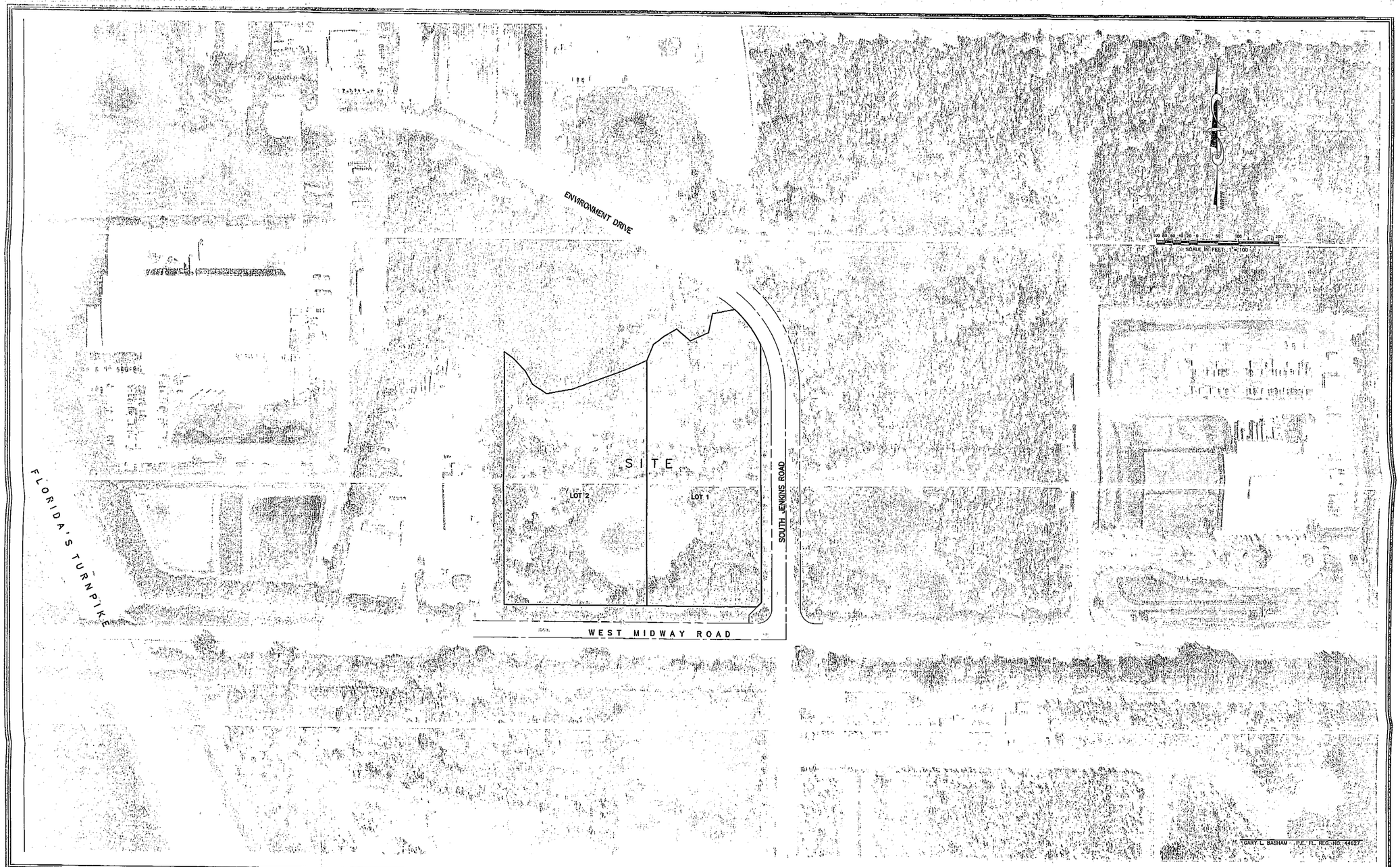
VERT. SCALE: N/A
JOB No. 03-139
SHEET 1 OF 1



GARY L. BASHAM P.E. FL. REG. NO. 44627

COMPUTER FILE REF.	FIELD BK./PG.
03139BASE	

CULPEPPER & TERPENING, INC.
CONSULTING ENGINEERS & LAND SURVEYORS
2980 SOUTH 25th STREET
FORT PIERCE, FLORIDA 34981
(772) 464-3537
FLORIDA BOARD OF PROFESSIONAL ENGINEERS AUTHORIZATION NO. 4286

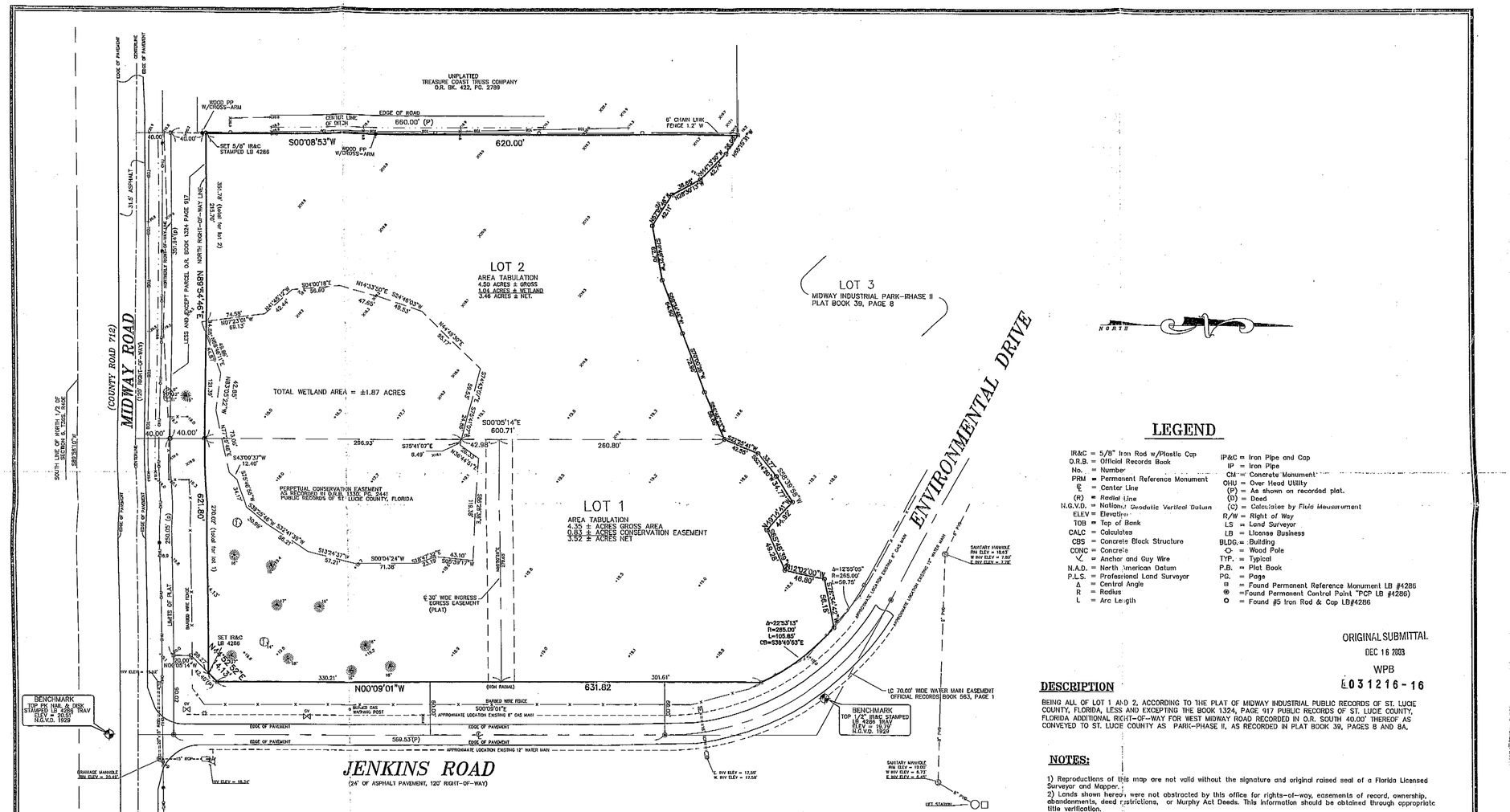
-REVISIONS-	BY	DATE

	BY	DATE
DESIGNED		
CALCS.		
DRAWN		
DETAILED		
CHECKED		
APPROVED		

JOHN A. MAYO

REGIONAL AERIAL

DATE: 8/20/04
HORIZ. SCALE: 1"=100'
VERT. SCALE: N/A
JOB No. 03-139
SHEET 1 OF 1



LEGEND

IR&C = 5/8" Iron Rod w/Plastic Cap
O.R.B. = Official Records Book
No. = Number
PRM = Permanent Reference Monument
℄ = Center Line
(R) = Radial Line
N.G.V.D. = National Geodetic Vertical Datum
ELEV = Elevation
TOB = Top of Bank
CALC = Calculated
CBS = Concrete Block Structure
CONC = Concrete
⚓ = Anchor and Guy Wire
N.A.D. = North American Datum
P.L.S. = Professional Land Surveyor
Δ = Central Angle
R = Radius
L = Arc Length

IP&C = Iron Pipe and Cap
IP = Iron Pipe
CM = Concrete Monument
OHU = Over Head Utility
(P) = As shown on recorded plat.
(D) = Deed
(C) = Calculated by Field Measurement
R/W = Right of Way
LS = Land Surveyor
LB = License Business
BLDG. = Building
○ = Wood Pole
TYP. = Typical
P.B. = Plat Book
PG. = Page
⊡ = Found Permanent Reference Monument LB #4286
⊛ = Found Permanent Control Point "PCP LB #4286)
● = Found #5 Iron Rod & Cap LB#4286

ORIGINAL SUBMITTAL
DEC 16 2003
WPB
L031216-16

DESCRIPTION

BEING ALL OF LOT 1 AND 2, ACCORDING TO THE PLAT OF MIDWAY INDUSTRIAL PUBLIC RECORDS OF ST. LUCIE COUNTY, FLORIDA, LESS AND EXCEPTING THE BOOK 1324, PAGE 917 PUBLIC RECORDS OF ST. LUCIE COUNTY, FLORIDA ADDITIONAL RIGHT-OF-WAY FOR WEST MIDWAY ROAD RECORDED IN O.R. SOUTH 40.00' THEREOF AS CONVEYED TO ST. LUCIE COUNTY AS PARK-PHASE II, AS RECORDED IN PLAT BOOK 39, PAGES 8 AND 8A.

NOTES:

1) Reproductions of this map are not valid without the signature and original raised seal of a Florida Licensed Surveyor and Mapper.
2) Lands shown hereon were not abstracted by this office for rights-of-way, easements of record, ownership, abandonments, deed restrictions, or Murphy Act Deeds. This information should be obtained through appropriate title verification.
3) Descriptions shown hereon provided by the client and/or their agent.
4) Underground foundations and improvements were not located as part of this survey.
5) Overall parcel contains 8.85 Acres,(385,485 sq.ft) more or less.
6) The last date of field work was OCTOBER, 28, 2003
7) The North right-of-way line of Midway Road, as monumented is assumed to bear S89°54'46"E and all other bearings shown hereon are relative thereto.
8) Flood Note: By graphic plotting only, this property is located in Zone "X", according to Flood Insurance Rate Maps, Community Panel No.s' 12111C0170 F, 12111C0188 F, and 12111275 F, FIRM Index dated June 30, 1999. The exact designation can only be determined by an elevation certificate.
9) Fences shown hereon are considered existing cattle fence for grazing, which encompasses, this entire site north of Midway Rd. At some point, and time, the area was owned by a single owner and used for cattle grazing.
10) Wetlands shown hereon were field flagged by Peter J. Krinsky C.E.P. Enviomental Planner on December 8, 1999 and field located by this office on December 14, 1999.

CERTIFIED TO:

PAMELA STEWART, P.A.; JOHN A. MAYO; ATTORNEYS TITLE INSURANCE FUND , INC.; AND FIRST NATIONAL BANK AND TRUST COMPANY OF THE TREASURE COAST.

11-24-2003
DATE

MICHAEL T. OWEN, P.S.M. FLORIDA CERTIFICATE NO. 5556

COMPUTER FILE REF.	FIELD BK./PG.
03-139MAP	

CULPEPPER & TERPENING, INC.
CONSULTING ENGINEERS & LAND SURVEYORS
2980 SOUTH 25th STREET
FORT PIERCE, FLORIDA 34981
(772) 464-3537
CERTIFICATE OF AUTHORIZATION NUMBER: 0000 4286

-REVISIONS-	BY	DATE

	BY	DATE
FIELD		
CALCS.		
DRAWN	PCP	
DETAILED		
CHECKED		
APPROVED		

BOUNDARY SURVEY

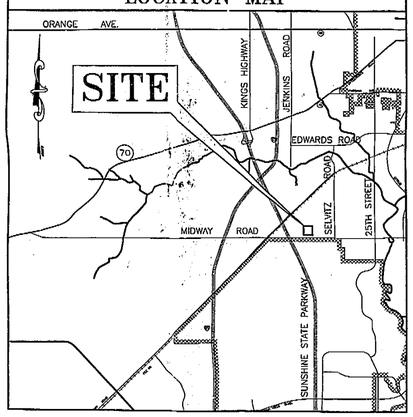
PREPARED FOR
JOHN MAYO

DATE: 11-7-03
HORIZ. SCALE: 1"=50'
VERT. SCALE: N\A
JOB No. 03-139
SHEET 1 OF 1

MAYO WAREHOUSE

IN SECTION 6, TOWNSHIP 36 SOUTH, RANGE 40 EAST, ST. LUCIE COUNTY, FLORIDA

LOCATION MAP



INDEX TO DRAWINGS	
SHT. NO.	DESCRIPTION
1	COVER SHEET
2	SITE PLAN
3	CONCEPTUAL DRAINAGE PLAN
4	PAVING & DRAINAGE DETAILS
5	LAND CLEARING, EROSION & SEDIMENT CONTROL PLAN
6	EROSION & SEDIMENT CONTROL DETAILS

PREPARED BY

CULPEPPER & TERPENING, INC.

CONSULTING ENGINEERS • LAND SURVEYORS

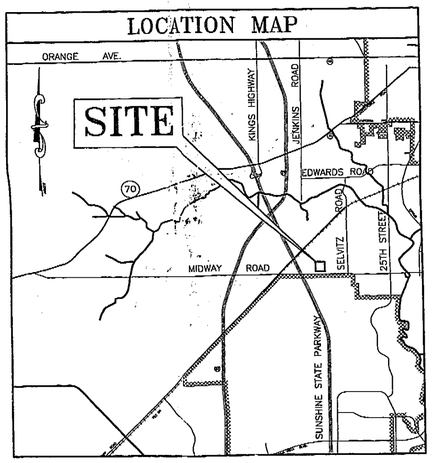
2980 SOUTH 25th STREET • FT. PIERCE, FLORIDA 34981 • (772) 464-3537

ORIGINAL SUBMITTAL
DEC 16 2003
WPB
E031216-16

MAYO WAREHOUSE

IN SECTION 6, TOWNSHIP 36 SOUTH, RANGE 40 EAST, ST. LUCIE COUNTY, FLORIDA

LOCATION MAP



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PREPARED BY

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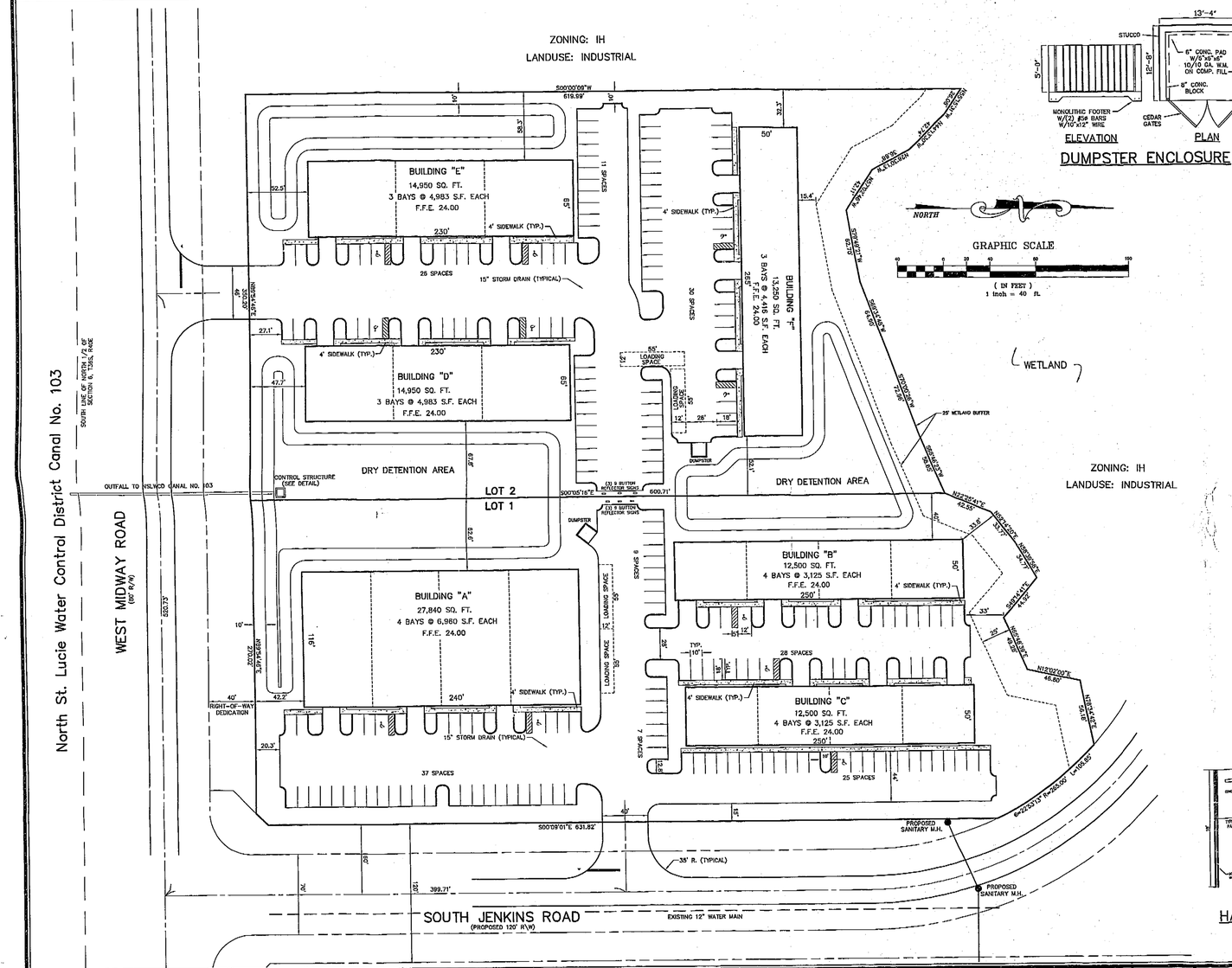
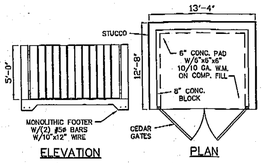
ORIGINAL SUBMITTAL
DEC 16 2003
WPB
E031216-16

03-139COVER.DWG





DUMPSTER ENCLOSURE

GENERAL NOTES

1. PROJECT NAME: Mayo Warehouse
2. LOCATION: NW. corner of Midway Rd. & South Jenkins Rd.
3. OWNER: John Mayo
4. ENGINEER: Culpepper & Terpening, Inc. 2980 South 25th. Street Fort Pierce, FL. 34981 FL P.E. Reg. 24276
5. SURVEYOR: Culpepper & Terpening, Inc. 2980 South 25th. Street Fort Pierce, FL. 34981 FL P.L.S. Reg. 3558
6. TYPE OF PROJECT: Industrial Warehousing
7. GROSS PROJECT SIZE: 384,996 Sq. Ft., 8.84 Acres
8. BUILDING SIZE: 95,990 Sq. Ft.
9. LAND USE: IND (Industrial)
10. ZONING: IH
11. FLOOD ZONE: X per F.I.R.M. Panel No. 12111C0170 F and 12111C0275 F
12. SITE COVERAGE:

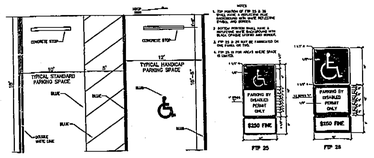
LOT 1	Acreage	Square Footage	Percentage of site
Building	1.21	52,840	27.87
Parking	1.53	66,533	35.10
Sidewalks	0.07	3,080	1.62
Dry Detention	0.63	27,677	14.60
Total Impervious	3.44	150,130	79.20
Total Open Space	0.91	39,426	20.80
Total Site Area	4.35	189,556	100.00

LOT 2	Acreage	Square Footage	Percentage of site
Building	0.99	43,150	22.08
Parking	1.45	62,213	31.83
Sidewalks	0.07	3,060	1.56
Dry Detention	0.63	27,677	14.16
Total Impervious	3.13	136,100	69.64
Total Open Space	1.36	59,340	30.36
Total Site Area	4.49	195,440	100.00

13. PARKING:

	LOT 1	LOT 2
Required (2 spaces/1,000 sf)	106 SPACES	87 SPACES
Provided	106 SPACES	87 SPACES
Handicapped Spaces Required	5 SPACES	4 SPACES
Handicapped Spaces Provided	5 SPACES	4 SPACES
Loading Spaces Required	2 SPACES	2 SPACES
Loading Spaces Provided	2 SPACES	2 SPACES

14. DEVELOPMENT SCHEDULE:
Construction to begin: August 2004
Construction to be completed: 180 days
15. UTILITY SERVICE:
Water Service: Fort Pierce Utility Authority
Sewage Treatment: Fort Pierce Utility Authority
16. SITE DRAINAGE:
The storm water management system will consist of on-site dry detention which shall provide water quality and storm attenuation. Discharge will be to the North St. Lucie Water Control District Canal No. 103 located on the south side of Midway Road.



HANDICAP PARKING

GARY L. BASHAM P.E. FL. REG. NO. 44827

COMPUTER FILE REF.	FIELD BK./PG.
03139BASE	

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CONSULTING ENGINEERS & LAND SURVEYORS
2980 SOUTH 25TH STREET
FORT PIERCE, FLORIDA 34981
(772) 464-3537
FLORIDA BOARD OF PROFESSIONAL ENGINEERS AUTHORIZATION NO. 4265

REVISIONS	BY	DATE

	BY	DATE
DESIGNED		
CALCS.	G.L.B.	11-5-03
DRAWN		
DETAILED	D.F.	11-5-03
CHECKED		
APPROVED		

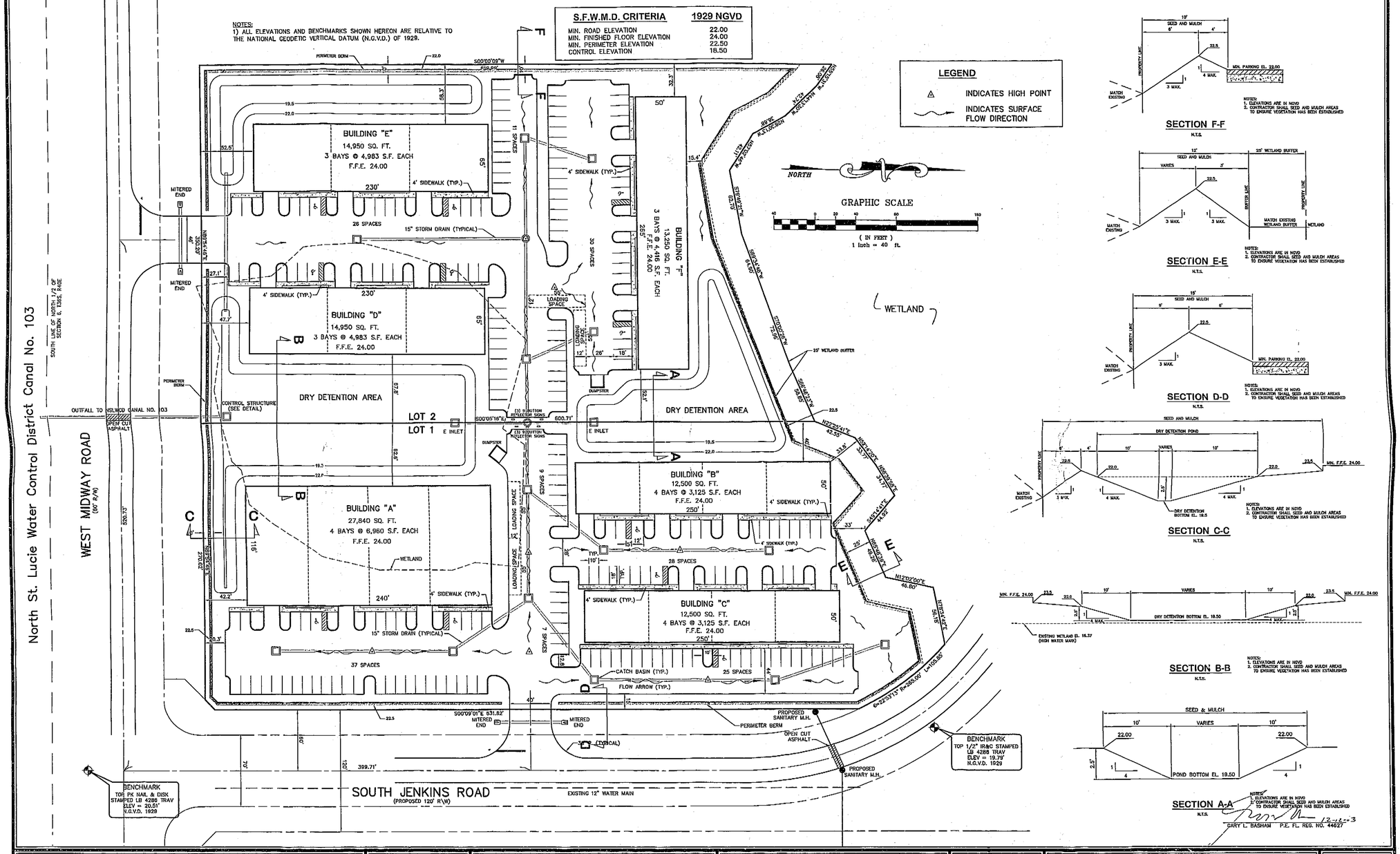
MAYO WAREHOUSE
SITE PLAN

DATE: 11-5-03
HORIZ. SCALE: 1"=40'
VERT. SCALE: 1"=1'
JOB No. 03-139
SHEET 2 OF 5

NOTES:
1) ALL ELEVATIONS AND BENCHMARKS SHOWN HEREON ARE RELATIVE TO THE NATIONAL GEODETIC VERTICAL DATUM (N.G.V.D.) OF 1929.

S.F.W.M.D. CRITERIA	1929 NGVD
MIN. ROAD ELEVATION	22.00
MIN. FINISHED FLOOR ELEVATION	24.00
MIN. PERIMETER ELEVATION	22.50
CONTROL ELEVATION	18.50

LEGEND
- △ INDICATES HIGH POINT
- INDICATES SURFACE FLOW DIRECTION



NOTES:
1. ELEVATIONS ARE IN NGVD
2. CONTRACTOR SHALL SEED AND MULCH AREAS TO ENSURE VEGETATION HAS BEEN ESTABLISHED

SECTION F-F
N.T.S.

NOTES:
1. ELEVATIONS ARE IN NGVD
2. CONTRACTOR SHALL SEED AND MULCH AREAS TO ENSURE VEGETATION HAS BEEN ESTABLISHED

SECTION E-E
N.T.S.

NOTES:
1. ELEVATIONS ARE IN NGVD
2. CONTRACTOR SHALL SEED AND MULCH AREAS TO ENSURE VEGETATION HAS BEEN ESTABLISHED

SECTION D-D
N.T.S.

NOTES:
1. ELEVATIONS ARE IN NGVD
2. CONTRACTOR SHALL SEED AND MULCH AREAS TO ENSURE VEGETATION HAS BEEN ESTABLISHED

SECTION C-C
N.T.S.

SECTION B-B
N.T.S.

NOTES:
1. ELEVATIONS ARE IN NGVD
2. CONTRACTOR SHALL SEED AND MULCH AREAS TO ENSURE VEGETATION HAS BEEN ESTABLISHED

SECTION A-A
N.T.S.

NOTES:
1. ELEVATIONS ARE IN NGVD
2. CONTRACTOR SHALL SEED AND MULCH AREAS TO ENSURE VEGETATION HAS BEEN ESTABLISHED

GARY L. BASHAM P.E. FL. REG. NO. 44027 12-8-03

COMPUTER FILE REF.	FIELD BK./PG.
03139BASE	

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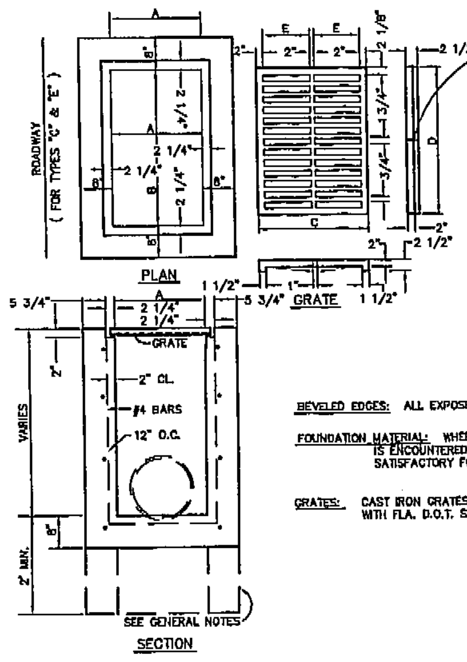
CONSULTING ENGINEERS & LAND SURVEYORS
2880 SOUTH 25th STREET
FORT PIERCE, FLORIDA 34981
(772) 464-3537
FLORIDA BOARD OF PROFESSIONAL ENGINEERS AUTHORIZATION NO. 4286

- REVISIONS -	BY	DATE

	BY	DATE
DESIGNED		
CALCS.		
DRAWN		
DETAILED		
CHECKED		
APPROVED		

MAYO WAREHOUSE
CONCEPTUAL DRAINAGE PLAN

DATE: 11-5-03
HORIZ. SCALE: 1"=40'
VERT. SCALE: 1"=1'
JOB No. 03-139
SHEET 3 OF 6



TYPE "E" GRATES ARE CASTED IN TWO SECTIONS

TYPE INLET	DIMENSION A	B	C	D	E	MAX. SIZE R.C.P.
C	2'-0"	3'-1"	2'-4"	3'-0"	11"	18"/24"
E	3'-0"	4'-6"	3'-4"	4'-4"	1'-5"	24"/42"

NOTE: (1) FOR MORE INFORMATION SEE D.O.T. 1984 STANDARDS INDEX NO. 232

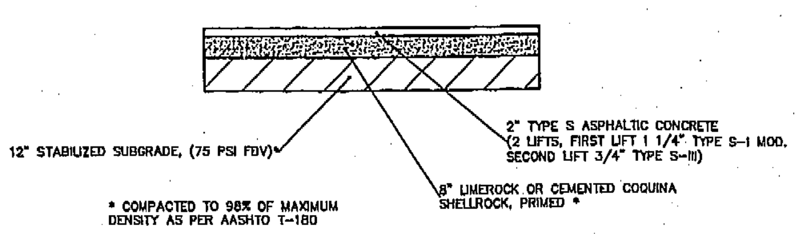
GENERAL NOTES

BEVELED EDGES: ALL EXPOSED CORNERS AND EDGES TO BE CHAMFERED 3/4"

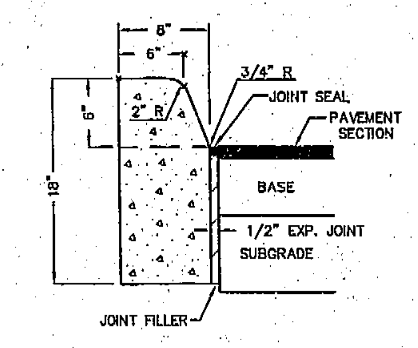
FOUNDATION MATERIAL: WHERE MATERIAL UNSATISFACTORY FOR FOUNDATION IS ENCOUNTERED AT FLOW LINE, OMIT FLOOR AND CARRY WALLS DOWN TO SATISFACTORY FOUNDATION. BACKFILL TO FLOW LINE WITH CLEAN SAND.

GRATES: CAST IRON GRATES TO BE U.S.F. NO. 6212 IN ACCORDANCE WITH FLA. D.O.T. SPECS. FOR TRAFFIC BEARING GRATES.

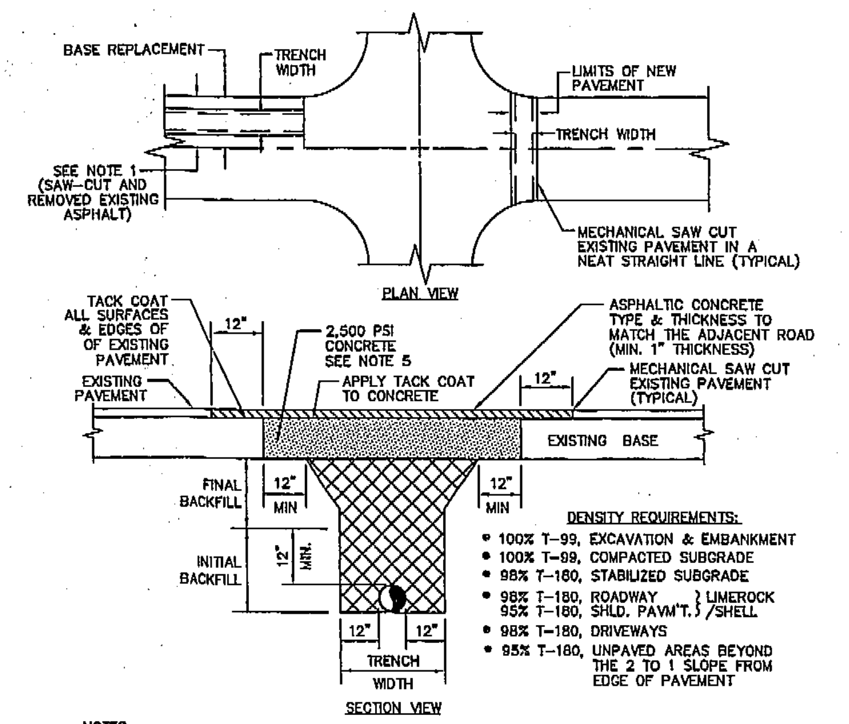
TYPE "C" & "E" INLETS



TYPICAL RESIDENTIAL ROADWAY SECTION



TYPE "D" CURB



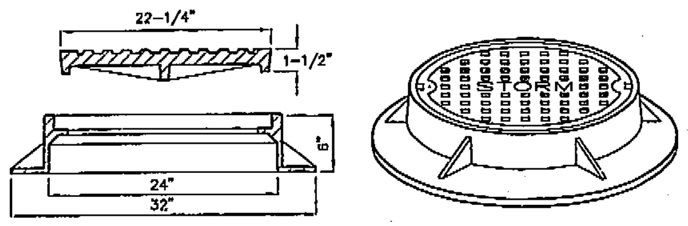
DENSITY REQUIREMENTS:

- 100% T-99, EXCAVATION & EMBANKMENT
- 100% T-99, COMPACTED SUBGRADE
- 98% T-180, STABILIZED SUBGRADE
- 98% T-180, ROADWAY } LIMEROCK
  95% T-180, SHLD. PAVM'T. } /SHELL
- 98% T-180, DRIVEWAYS
- 95% T-180, UNPAVED AREAS BEYOND THE 2 TO 1 SLOPE FROM EDGE OF PAVEMENT

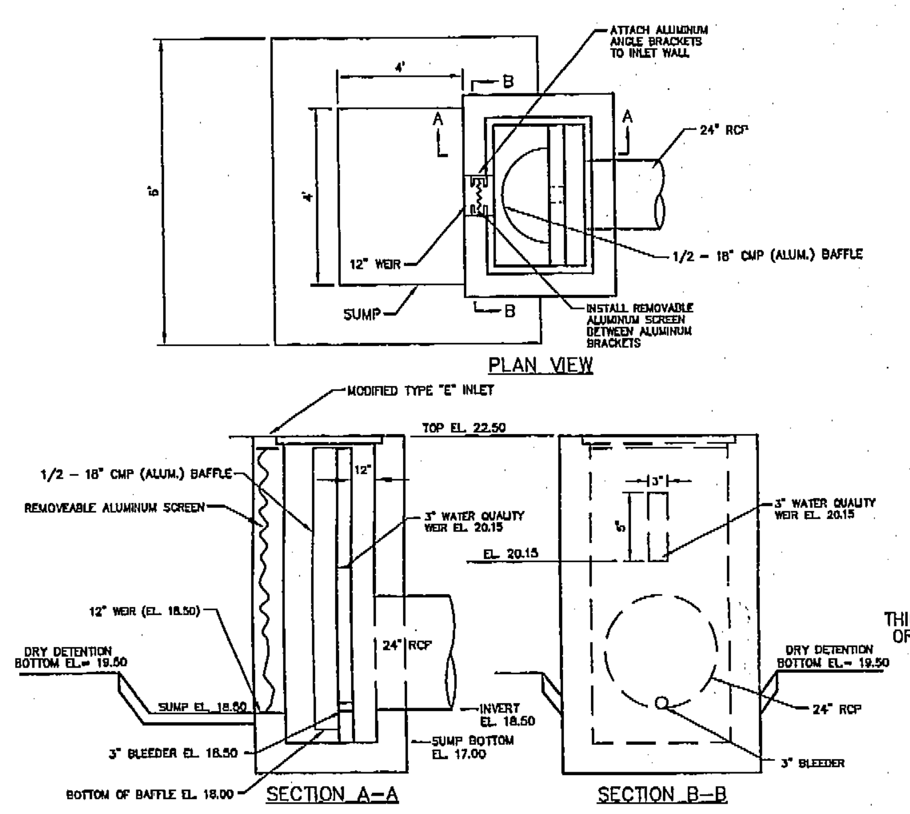
NOTES:

1. PAVEMENT RESTORATIONS FOR LONGITUDINAL CUTS IN ALL STREETS SHALL BE FULL LANE WIDTH, WITH FULL LANE WIDTH RESURFACING FOR EACH LANE WITHIN THE LIMITS OF THE CUT.
2. WHEN AN ARTERIAL OR MAJOR COLLECTOR STREET IS OPEN CUT WITHIN THE LIMITS OF THE ROADWAY INTERSECTION, THE ENTIRE INTERSECTION SHALL BE OVERLAID WITH ASPHALTIC CONCRETE.
3. WHEN STREETS OTHER THAN ARTERIALS OR MAJOR COLLECTORS ARE OPEN CUT MORE THAN TWO TIMES AT THE INTERSECTION, THE ENTIRE INTERSECTION SHALL BE OVERLAID WITH ASPHALTIC CONCRETE. TWO OPEN CUTS OR LESS AT THE INTERSECTION WILL REQUIRE OVERLAYING WITH ASPHALT ONLY IN THE OPEN CUT AREA.
4. THE CONTRACTOR SHALL BE REQUIRED TO DOCUMENT ALL PAVEMENT MARKINGS PRIOR TO OVERLAY. THE CONTRACTOR SHALL THEN PLACE NEW PAVEMENT MARKINGS AT THE SAME LOCATIONS. PAVEMENT MARKINGS SHALL BE IN ACCORDANCE TO F.D.O.T. SECTION 711.
5. 2500 PSI CONCRETE SHALL MATCH EXISTING BASE (6" MIN.)

OPEN-CUT DETAIL

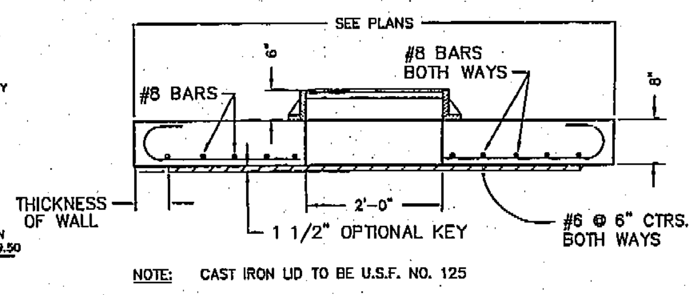


U.S.F. #125 RING & COVER



PROPOSED CONTROL STRUCTURE

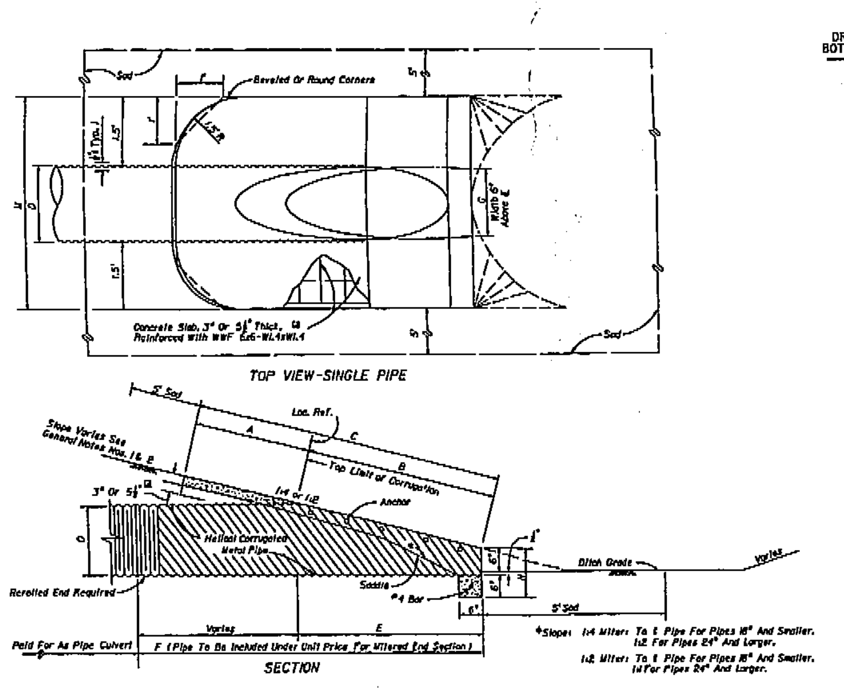
ALL ELEVATIONS BASED ON NGVD



NOTE: CAST IRON LID TO BE U.S.F. NO. 125

MANHOLE TOP
(TYPE 7-T)
(DOT 201)

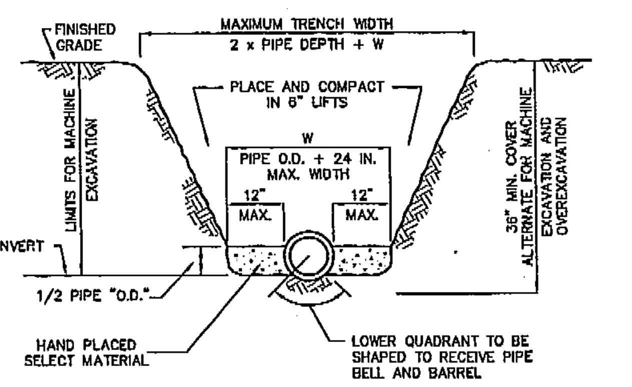
STORM MANHOLE TOP



	D	X	A	B	C	E	F	G	H Single Pipe	H Double Pipe	H Triple Pipe	H Quad. Pipe	N	5½" Concrete Slab (CY) Single Pipe	Double Pipe	Triple Pipe	Quad. Pipe	Sodding (SQ. YDS.) Single Pipe	Double Pipe	Triple Pipe	Quad. Pipe
4:1 Slope	15"	2'-7"	2.5'	3.09'	5.59'	3.0'	7.0'	1.25'	4.33'	6.92'	9.67'	12.08'	1.04'	0.44	0.68	0.91	1.15	22	25	28	31
	18"	2'-10"	2.5'	4.12'	6.62'	4.0'	8.0'	1.41'	4.58'	7.42'	[illegible]	13.08'	1.04'	0.49	0.77	1.03	1.30	24	27	30	33
	24"	3'-5"	2.5'	6.18'	8.68'	6.0'	10.0'	1.73'	5.08'	8.59'	[illegible]	[illegible]	1.04'	0.65	1.09	1.38	1.77	27	30	34	38
	30"	4'-3"	2.5'	8.25'	10.75'	8.0'	12.0'	2.00'	5.58'	9.83'	14.08'	[illegible]	1.04'	0.81	1.34	1.90	2.44	29	34	39	44
	36"	[illegible]	2.5'	10.31'	12.81'	10.0'	14.0'	2.24'	6.08'	[illegible]	[illegible]	[illegible]	1.04'	0.97	1.70	2.41	3.14	32	38	44	49
	42"	6'-0"	2.5'	12.37'	[illegible]	12.0'	16.0'	2.45'	6.58'	12.58'	[illegible]	24.58'	1.04'	1.13	2.08	3.02	4.02	35	42	48	55
	48"	[illegible]	2.5'	14.43'	[illegible]	14.0'	18.0'	2.62'	7.08'	[illegible]	[illegible]	27.33'	1.04'	1.29	2.49	3.69	4.88	38	[illegible]	[illegible]	60
	54"	7'-6"	2.5'	16.49'	18.99'	16.0'	20.0'	2.83'	7.58'	[illegible]	[illegible]	30.58'	1.04'	1.48	[illegible]	4.47	[illegible]	41	49	[illegible]	66
	60"	8'-6"	2.5'	18.55'	21.05'	18.0'	22.0'	3.00'	8.08'	16.58'	25.08'	33.58'	1.04'	1.64	3.49	5.31	7.13	44	53	63	72

DIMENSIONS AND QUANTITIES

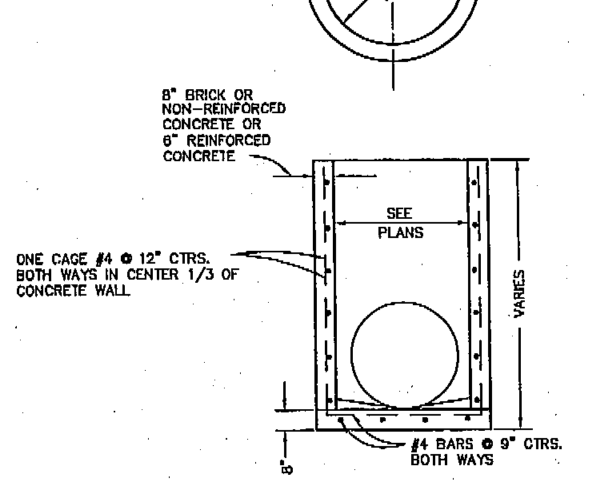
MITERED END SECTION



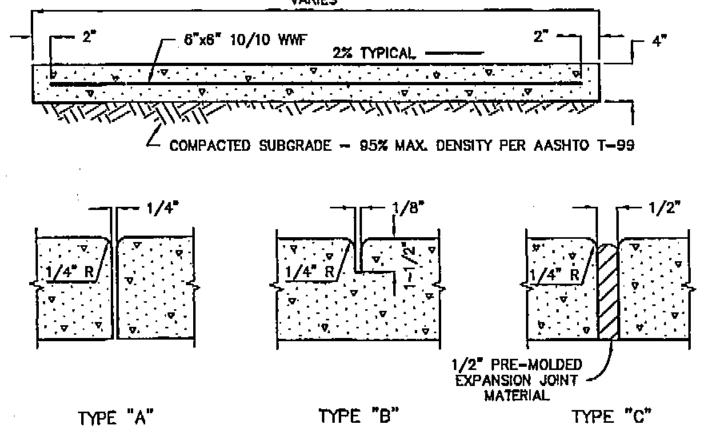
NOTES:

1. THE CONTRACTOR SHALL COMPLY WITH REQUIREMENTS OF THE FLORIDA TRENCH SAFETY ACT.
2. INITIAL BACKFILL SHALL BE HAND PLACED TO 12" ABOVE THE PIPE. BACKFILL SHALL BE MECHANICALLY TAMPED TO A MINIMUM OF 100% OF MAX. DENSITY AS DETERMINED BY AASHTO METHOD T-99.

TYPICAL TRENCH SECTION



TYPE "P" MANHOLE



SIDEWALK JOINTS

TABLE OF SIDEWALK JOINTS

TYPE	LOCATION
"A"	AT P.C. AND P.T. OF CURVES AND AT JUNCTION OF EXISTING AND NEW SIDEWALKS.
"B"	5'-0" CENTER TO CENTER ON NEW SIDEWALKS.
"C"	WHERE NEW SIDEWALK ABUTS CONCRETE CURBS, DRIVEWAYS AND SIMILAR STRUCTURES

SIDEWALK CONSTRUCTION

SIDEWALK CONSTRUCTION DETAILS

12-12-03
GARY L. BASHAM P.E. FL. REG. NO. 44627

COMPUTER FILE REF.	FIELD BK./PG.
03139BASE	

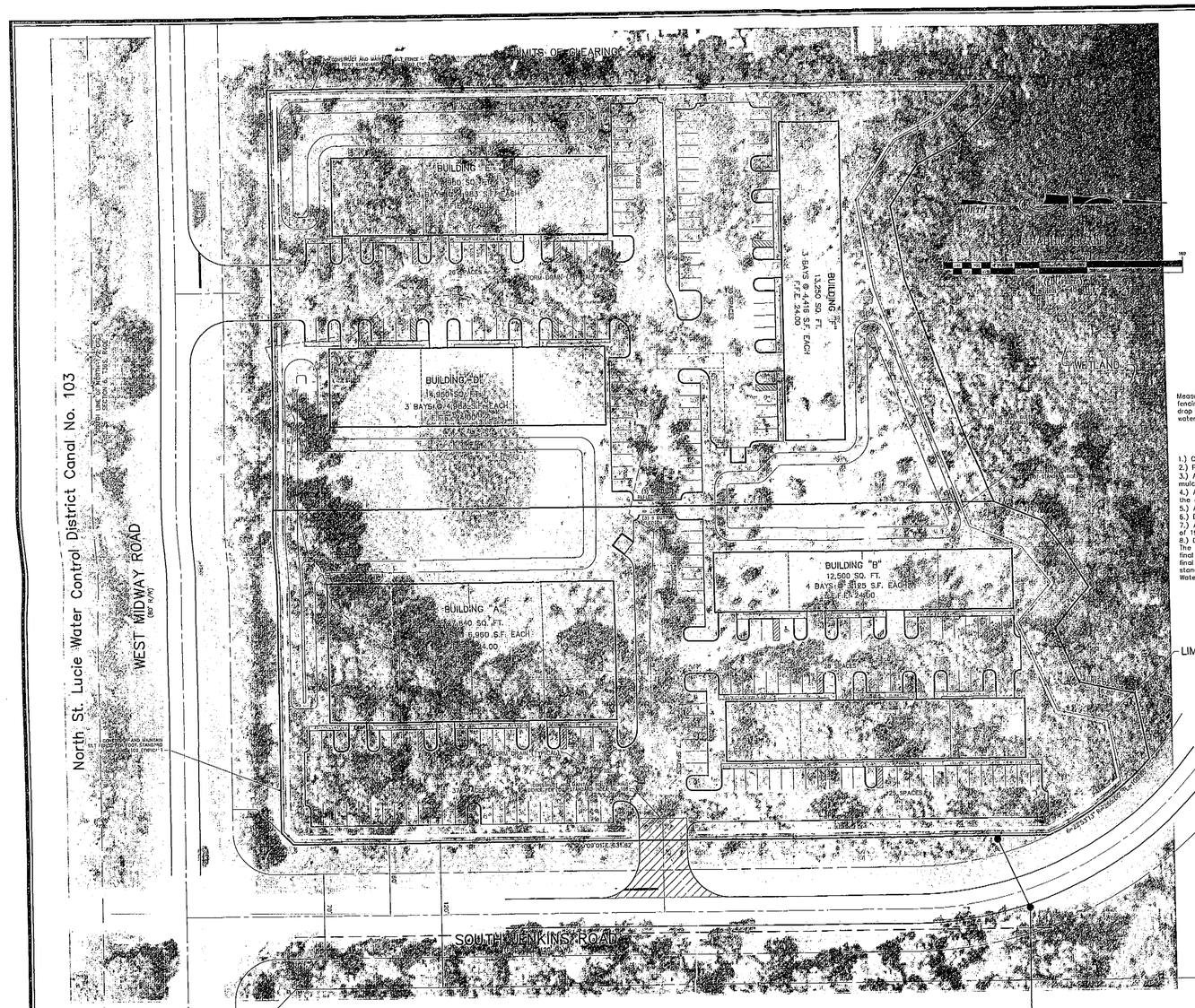
CULPEPPER & TERPENING, INC.
CONSULTING ENGINEERS & LAND SURVEYORS
2980 SOUTH 25th STREET
FORT PIERCE, FLORIDA 34981
(772) 464-3537
FLORIDA BOARD OF PROFESSIONAL ENGINEERS AUTHORIZATION NO. 4286

-REVISIONS-	BY	DATE

	BY	DATE
DESIGNED		
CALCS.		
DRAWN		
DETAILED		
CHECKED		
APPROVED		

JOHN A. MAYO
PAVING & DRAINAGE DETAILS

DATE: 11-5-03
HORIZ. SCALE: NTS
VERT. SCALE: NTS
JOB No. 03-139
SHEET 4 OF 6



GENERAL DESCRIPTION

Measures taken to protect adjacent waterways, ditches and canals during construction will include silt fencing around the limits of clearing, a temporary gravel construction entrance, and straw bales around drop inlets. Silt fencing shall be constructed between the limits of construction, adjacent properties, water ways, and environmentally sensitive areas.

GENERAL NOTES

1.) Contractor is responsible for construction and maintenance of silt fencing and turbidity barriers.
2.) Perimeter silt fencing shall be installed and approved by engineer prior to site clearing.
3.) All disturbed areas that will not be brought to final grade for thirty days or more shall be seeded and mulched.
4.) All vehicles entering and leaving the site must use the temporary gravel construction entrance as shown in the accompanying detail.
5.) All fill areas shall be stabilized with seed and mulch.
6.) Detention areas shall be excavated and sodded prior to mass grading.
7.) All elevations and Landmarks shown hereon are relative to the National Geodetic Vertical Datum (N.G.V.D.) of 1929.
8.) Drainage System:
The storm sewer system and surface water management system shown depicts the general character of the final system and is subject to adjustment during final design and permitting, which will be submitted as the final construction plans. The final drainage system design and construction shall be in accordance with the standard specifications for public works in the St. Lucie County and the requirements of the South Florida Water Management District.

LIMITS OF CLEARING

GARY L. BASHAM P.E. FL. REG. NO. 44527 12-2-03

COMPUTER FILE REF.	FIELD BK./PG.
031308ASE	

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CONSULTING ENGINEERS & LAND SURVEYORS
2980 SOUTH 25th STREET
FORT PIERCE, FLORIDA 34981
(772) 464-3537
FLORIDA BOARD OF PROFESSIONAL ENGINEERS AUTHORIZATION NO. 4295

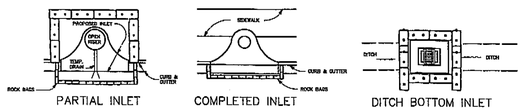
– REVISIONS –	BY	DATE

	BY	DATE
DESIGNED	G.L.B.	11-5-03
CALCS.		
DRAWN	D.F.	11-5-03
DETAILED		
CHECKED		
APPROVED		

MAYO WAREHOUSE

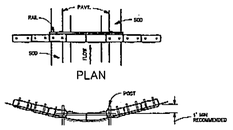
LAND CLEARING, EROSION & SEDIMENT CONTROL PLAN

DATE: 11-5-03
HORIZ. SCALE: 1" = 40'
VERT. SCALE:
JOB No. 03-139
SHEET 5 OF 6



PARTIAL INLET COMPLETED INLET DITCH BOTTOM INLET

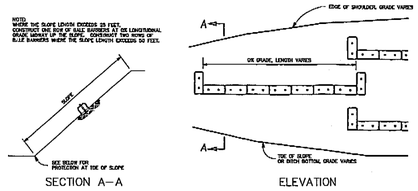
PROTECTION AROUND INLETS OR SIMILAR STRUCTURES



PLAN

ELEVATION

BARRIER FOR PAVED DITCH

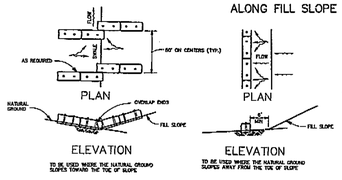


SECTION A—A ELEVATION

ALONG FILL SLOPE

NOTES FOR BALED HAY OR STRAW BARRIERS

1. TYPE I AND TYPE II BARRIERS SHOULD BE SPACED IN ACCORDANCE WITH CHART 1, SHEET 1.
2. HAY BALES SHALL BE TRENCHED 3" TO 4" AND ANCHORED WITH TWO 1"X2"(OR 1"X4") X 4' WOOD STAKES. STAKES OF OTHER MATERIAL OR SHAPE PROVIDING EQUIVALENT STRENGTH MAY BE USED IF APPROVED BY THE ENGINEER. STAKES OTHER THAN WOOD SHALL BE REMOVED UPON COMPLETION OF THE PROJECT.
3. BALES AND POSTS SHALL BE 2"X4" WOOD. OTHER MATERIALS PROVIDING EQUIVALENT STRENGTH MAY BE APPROVED BY THE ENGINEER.
4. ADJACENT BALES SHALL BE ABUTTED FIRMLY TOGETHER. UNAVOIDABLE GAPS SHALL BE PLUGGED WITH HAY OR STRAW TO PREVENT SILT FROM PASSING.
5. WHERE USED IN CONJUNCTION WITH SILT FENCE, HAY BALES SHALL BE PLACED ON THE UPSTREAM SIDE OF THE FENCE.
6. BALES TO BE PAID FOR UNDER THE CONTRACT UNIT PRICE FOR BALED HAY OR STRAW, EA. THE UNIT PRICE SHALL INCLUDE THE COST OF FILTER FABRIC FOR TYPE I AND II BARRIERS. SAND BAGS SHALL BE PAID FOR UNDER THE UNIT PRICE FOR SANDBAGGING, CY. ROCK BAGS SHALL BE PAID FOR UNDER THE CONTRACT UNIT PRICE FOR ROCK BAGS, EA.



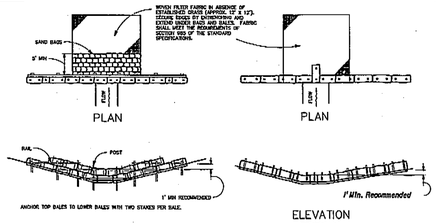
PLAN PLAN

ELEVATION ELEVATION

TO BE USED WHERE THE NATURAL GROUND SLOPES TOWARD THE TOE OF SLOPE. TO BE USED WHERE THE NATURAL GROUND SLOPES AWAY FROM THE TOE OF SLOPE.

AT TOE OF SLOPE

BARRIERS FOR FILL SLOPES



PLAN PLAN

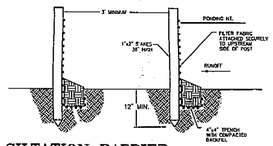
ELEVATION TYPE II ELEVATION TYPE I

BARRIERS FOR UNPAVED DITCHES

BALED HAY AND BALED STRAW BARRIERS

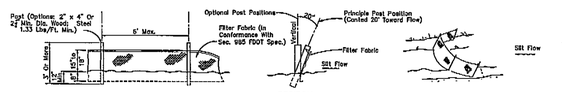
F.D.O.T. STD. INDEX #102 sheet 2 of 3

NOTE:
1. INSPECT AND REPAIR FENCE AFTER EACH STORM EVENT AND REMOVE SEDIMENT WHEN NECESSARY. ANY REQUIRED REPAIRS SHALL BE MADE IMMEDIATELY.
2. SEDIMENT DEPOSITS SHALL BE REMOVED WHEN DEPOSITS REACH APPROXIMATELY ONE HALF THE HEIGHT OF THE BARRIER.
3. REMOVED SEDIMENT SHALL BE DEPOSITED TO AN AREA THAT WILL NOT CONTRIBUTE TO OFF-SITE SEDIMENTATION.
4. SILT FENCE SHALL BE PLACED ON SLOPE CONTOURS TO MAXIMIZE PONDING EFFICIENCY.
5. SILT FENCING SHALL BE REPLACED AFTER SIX MONTHS OF NORMAL USE.
6. POSTS SHALL BE SPACED A MAXIMUM OF 10 FEET APART AT THE BARRIER LOCATION AND A MAXIMUM OF 6 FEET APART FOR EXTRA STRENGTH FILTER FABRIC.
7. THE STANDARD STRENGTH FILTER FABRIC SHALL BE STAPLED OR WIRED TO THE FENCE, AND 8 INCHES OF THE FABRIC SHALL EXTEND INTO THE TRENCH.
8. SILT FENCING SHALL NOT BE REMOVED BEFORE THE UPSLOPE SURFACE HAS BEEN PERMANENTLY STABILIZED.



DOUBLE ROW STAKED SILTATION BARRIER

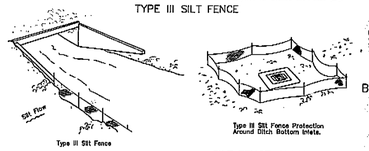
*NOTE: DOUBLE ROW SILTATION FENCE SHALL BE PLACED ALONG PERIMETER OF PROJECT AS INDICATED ON EROSION & SEDIMENT CONTROL PLAN.



ELEVATION SECTION Type III Silt Fence

Note: Silt Fence to be paid for under the contract unit price for Staked Silt Fence (LF).

TYPE III SILT FENCE



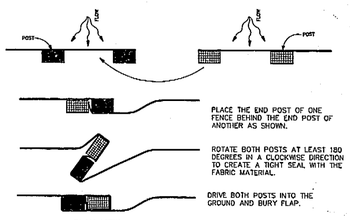
Do not deploy in a manner that silt fences will act as a dam across permanent flowing watercourses. Silt fences are to be used at upland locations and turbidity barriers used at permanent bodies of water.

BALED HAY OR STRAW BARRIERS AND SILT FENCES F.D.O.T. INDEX #102

SILT FENCE APPLICATIONS

SILT FENCE

F.D.O.T. STD. INDEX #102 sheet 3 of 3



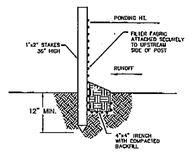
PLACE THE END POST OF ONE FENCE BEHIND THE END POST OF ANOTHER AS SHOWN.

ROTATE BOTH POSTS AT LEAST 180 DEGREES IN A CLOCKWISE DIRECTION TO CREATE A TIGHT SEAL WITH THE FABRIC MATERIAL.

DRIVE BOTH POSTS INTO THE GROUND AND BURY FLAP.

PLAN VIEW

JOINING TWO SILT FENCES



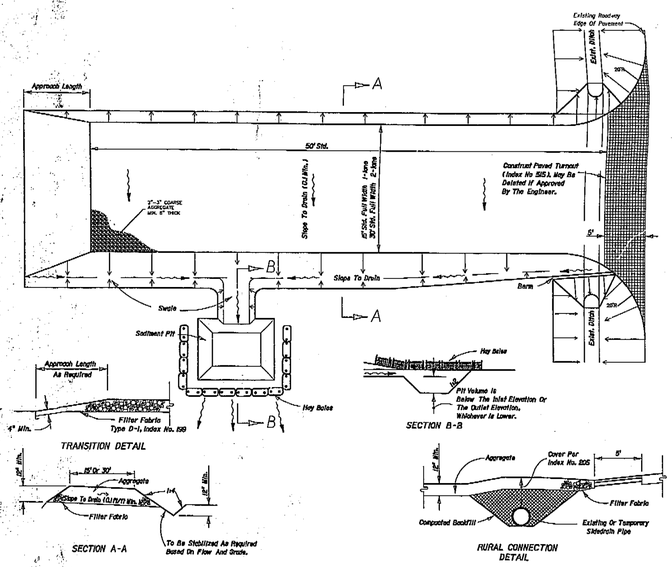
NOTE:
1. INSPECT AND REPAIR FENCE AFTER EACH STORM EVENT AND REMOVE SEDIMENT WHEN NECESSARY. ANY REQUIRED REPAIRS SHALL BE MADE IMMEDIATELY.
2. SEDIMENT DEPOSITS SHALL BE REMOVED WHEN DEPOSITS REACH APPROXIMATELY ONE HALF THE HEIGHT OF THE BARRIER.
3. REMOVED SEDIMENT SHALL BE DEPOSITED TO AN AREA THAT WILL NOT CONTRIBUTE TO OFF-SITE SEDIMENTATION.
4. SILT FENCE SHALL BE PLACED ON SLOPE CONTOURS TO MAXIMIZE PONDING EFFICIENCY.
5. SILT FENCING SHALL BE REPLACED AFTER SIX MONTHS OF NORMAL USE.
6. POSTS SHALL BE SPACED A MAXIMUM OF 6 FEET APART AT THE BARRIER LOCATION.
7. THE STANDARD STRENGTH FILTER FABRIC SHALL BE STAPLED OR WIRED TO THE FENCE, AND 8 INCHES OF THE FABRIC SHALL EXTEND INTO THE TRENCH.
8. SILT FENCING SHALL NOT BE REMOVED BEFORE THE UPSLOPE SURFACE HAS BEEN PERMANENTLY STABILIZED.

GENERAL NOTES

1. A Soil Tracking Prevention Device (STPD) shall be constructed at locations designated by the engineer for points of egress from unstabilized areas of the project to public roads where offsite tracking of sod could occur. Traffic from unstabilized areas of the construction project shall be directed thru a STPD. Barriers, flagging, or other positive means shall be used as required to limit and direct vehicular egress across the STPD.
2. The Contractor may propose an alternative technique to minimize offsite tracking of sediment. The alternative must be reviewed and approved by the Engineer prior to its use.
3. All materials spilled, dropped, or tracked onto public roads (including the STPD aggregate) and construction mat) shall be removed daily, or more frequently if so directed by the Engineer.
4. Aggregates shall be as described in Section 901 excluding 901-2.5. Aggregates shall be FDOT size #1. If this size is not available, the next available smaller size aggregate may be substituted with the approval of the Engineer. Sites containing excessive small aggregate will track off the project and are unsuitable.
5. The sediment pit should provide a retention volume of 3600 cubic feet/acre of surface area draining to the pit. When the STPD is isolated from other drainage areas, the following pit volumes will satisfy this requirement:
   15' x 50' -100 ft³ 30' x 50' -200 ft³
   As an option to the sediment pit, the width of the swale bottom can be increased to obtain the volume. When the sediment pit or swale volume has been reduced to one half, it shall be cleaned. When a swale is used, hay bales or silt fence shall be placed along the entire length.
6. The swale ditch draining the STPD shall have a 0.2% minimum and a 1.0% maximum grade along the STPD and to the sediment pit.
7. Mitered end sections are not required when the sideslope pipe satisfies the clear zone requirements.
8. The STPD shall be maintained in a condition that will allow it to perform its function. To prevent offsite tracking, the STPD shall be rinsed (daily when in use) to move accumulated mud downward thru the stone. Additional stabilization of the vehicular route leading to the STPD may be required to limit the mud tracked.
9. A STPD shall be paid for under the contract unit price for Soil Tracking Prevention Device, EA. The unit price shall constitute full compensation for construction, maintenance, replacement of materials, removal, and restoration of the area utilized for the STPD, including but not limited to excavation, grading, temporary pipe (including MES when required), filter fabric, aggregate, paved turnout (including asphalt and base construction), ditch stabilization, approach route stabilization, sediment removal and disposal, water, rinsing and cleaning of the STPD and cleaning of public roads, grassing and sod. Hay bales shall be paid for under the contract unit price for Hay or Straw Bales, EA. Silt fence shall be paid for under the contract unit price for Staked Silt Fence, LF.
10. The nominal size of a standard STPD is 15' x 50' unless otherwise shown in the plans. If the volume of metering and exiting vehicles warrant, a 30' width STPD may be used if approved by the Engineer. When a double width (30') STPD is used, the pay quantity shall be 2 for each location.

NOTES:

1. THE ENTRANCE SHALL BE MAINTAINED IN A CONDITION THAT WILL PREVENT TRACKING OR FLOWING OF SEDIMENT ONTO PUBLIC RIGHTS-OF-WAY. THIS MAY REQUIRE TOP DRESSING, REPAIR, AND/OR CLEANOUT OF ANY MEASURES USED TO TRAP SEDIMENT.
2. WHEN NECESSARY, WHEELS SHALL BE CLEANED PRIOR TO ENTRANCE ONTO PUBLIC RIGHTS-OF-WAY.
3. WHEN WASHING IS REQUIRED, IT SHALL BE DONE ON AN AREA STABILIZED WITH CRUSHED STONE THAT DRAINS INTO AN APPROVED SEDIMENT TRAP OR SEDIMENT BASIN.
4. ALL MATERIALS SPILLED, DROPPED, WASHED OR TRACKED FROM VEHICLES ONTO ROADWAYS OR INTO STOR... SHALL MUST BE REMOVED IMMEDIATELY.



SOIL TRACKING PREVENTION DEVICE (STPD)

F.D.O.T. STD. INDEX #106

12-12-03

GARY L. BASHAM P.E. FL. REG. NO. 44627

COMPUTER FILE REF.	FIELD BK./PG.
03139BASE	

CULPEPPER & TERPENING, INC.
CONSULTING ENGINEERS & LAND SURVEYORS
2980 SOUTH 25th STREET
FORT PIERCE, FLORIDA 34981
(772) 464-3537
FLORIDA BOARD OF PROFESSIONAL ENGINEERS AUTHORIZATION NO. 4266

- REVISIONS -	BY	DATE

	BY	DATE
DESIGNED	G.L.B.	11-5-03
CALCS.		
DRAWN	D.F.	11-5-03
DETAILED		
CHECKED		
APPROVED		

MAYO WAREHOUSE

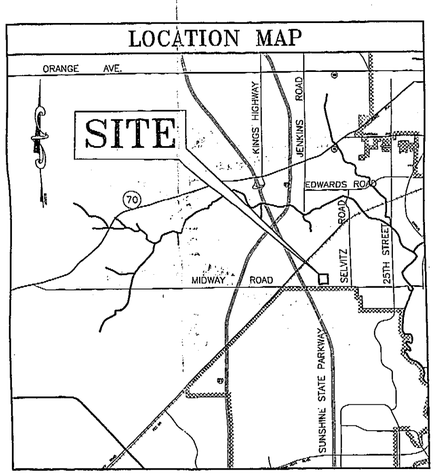
EROSION & SEDIMENT CONTROL DETAILS

DATE: 11-5-03
HORIZ. SCALE: NTS
VERT. SCALE: NTS
JOB No. 03-139
SHEET 6 OF 6

MAYO WAREHOUSE

IN SECTION 6, TOWNSHIP 36 SOUTH, RANGE 40 EAST, ST. LUCIE COUNTY, FLORIDA

LOCATION MAP



INDEX TO DRAWINGS	
SHT. NO.	DESCRIPTION
1	COVER SHEET
2	SITE PLAN
3	CONCEPTUAL DRAINAGE PLAN
4	PAVING & DRAINAGE DETAILS
5	LAND CLEARING, EROSION & SEDIMENT CONTROL PLAN
6	EROSION & SEDIMENT CONTROL DETAILS

PREPARED BY

CULPEPPER & TERPENING, INC.

CONSULTING ENGINEERS • LAND SURVEYORS

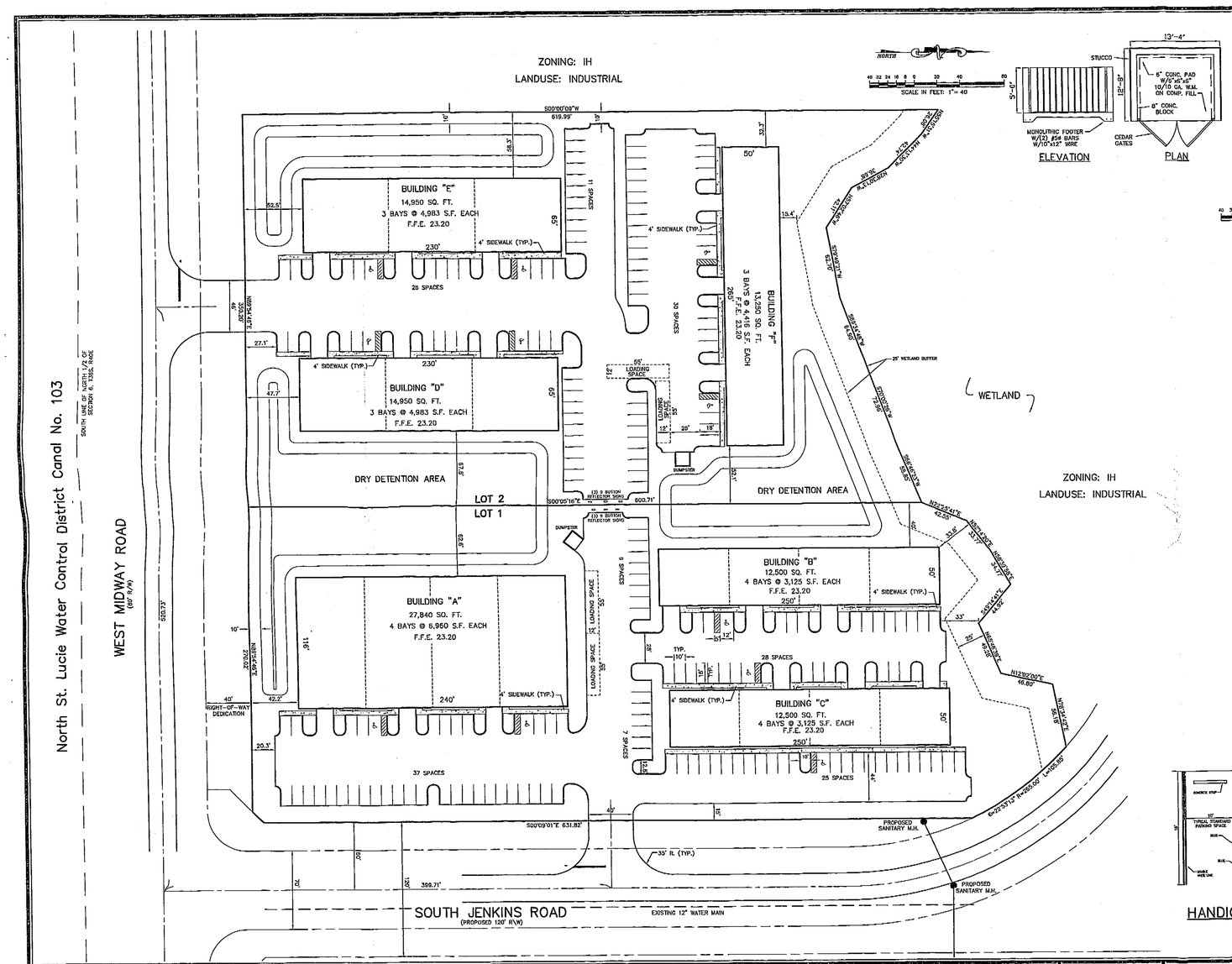
2080 SOUTH 25th STREET • FT. PIERCE, FLORIDA 34981 • (772) 464-3537

ADDL/REVISED SUBMITTAL

FEB 06 2004

E031216-16

03-139COVER.DWG



GENERAL NOTES

1. PROJECT NAME:	Mayo Warehouse
2. LOCATION:	NW. corner of Midway Rd. & South Jenkins Rd.
3. OWNER:	John Mayo
4. ENGINEER:	Culpepper & Terpening, Inc. 2980 South 25th. Street Fort Pierce, FL 34981 Fl. P.E. Reg. 24276
5. SURVEYOR:	Culpepper & Terpening, Inc. 2980 South 25th. Street Fort Pierce, FL 34981 Fl. P.L.S. Reg. 5556
6. TYPE OF PROJECT:	Industrial Warehousing
7. GROSS PROJECT SIZE:	384,996 Sq. Ft., 8.84 Acres
8. BUILDING SIZE:	95,990 Sq. Ft.
9. LAND USE:	IND (Industrial)
10. ZONING:	IH
11. FLOOD ZONE:	X per F.I.R.M. Panel No. 12111C0170 F and 12111C0275 F

SCALE IN FEET: 1"= 40'

12. SITE COVERAGE:

LOT 1	Acreage	Square Footage	Percentage of site
Building	1.21	52,840	27.87
Parking	1.53	66,533	35.10
Sidewalks	0.07	3,080	1.62
Dry Detention	0.63	27,677	14.60
Total Impervious	3.44	150,130	79.20
Total Open Space	0.91	39,426	20.80
Total Site Area	4.35	189,556	100.00

LOT 2	Acreage	Square Footage	Percentage of site
Building	0.99	43,150	22.08
Parking	1.43	62,213	31.83
Sidewalks	0.07	3,060	1.56
Dry Detention	0.63	27,677	14.16
Total Impervious	3.13	136,100	69.64
Total Open Space	1.36	59,340	30.36
Total Site Area	4.49	195,440	100.00

13. PARKING:

	LOT 1	LOT 2
Required (2 spaces/1,000 sf)	108 SPACES	87 SPACES
Provided	106 SPACES	87 SPACES
Handicapped Spaces Required	5 SPACES	4 SPACES
Handicapped Spaces Provided	5 SPACES	4 SPACES
Loading Spaces Required	2 SPACES	2 SPACES
Loading Spaces Provided	2 SPACES	2 SPACES

14. DEVELOPMENT SCHEDULE:

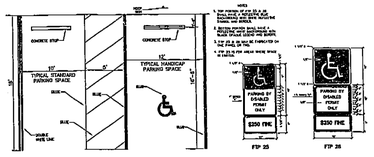
Construction to begin: August 2004
Construction to be completed: 180 days

15. UTILITY SERVICE:

Water Service: Fort Pierce Utility Authority
Sewage Treatment: Fort Pierce Utility Authority

16. SITE DRAINAGE:

The storm water management system will consist of on-site dry detention which shall provide water quality and storm attenuation. Discharge will be to the North St. Lucie Water Control District Canal No. 103 located on the south side of Midway Road.



HANDICAP PARKING

GARY L. BASHAM P.E. FL. REG. NO. 44627

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2980 SOUTH 25th STREET
FORT PIERCE, FLORIDA 34981
(772) 464-3537
FLORIDA BOARD OF PROFESSIONAL ENGINEERS AUTHORIZATION NO. 4288

REVISIONS	BY	DATE
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	BY	DATE
DESIGNED		
CALCS.	G.L.B.	11-5-03
DRAWN		
DETAILED	D.F.	11-5-03
CHECKED		
APPROVED		

MAYO WAREHOUSE
SITE PLAN

DATE: 11-5-03
HORIZ. SCALE: 1"=40'
VERT. SCALE: 1"=1'
JOB No. 03-139
SHEET 2 OF 6

S.F.W.M.D. CRITERIA	1929 NGVD
MIN. ROAD ELEVATION	22.00
MIN. FINISHED FLOOR ELEVATION	23.20
MIN. PERIMETER ELEVATION	22.50
CONTROL ELEVATION	18.50

NOTES:
1) ALL ELEVATIONS AND BENCHMARKS SHOWN HEREON ARE RELATIVE TO THE NATIONAL GEODETIC VERTICAL DATUM (N.G.V.D.) OF 1929.

NORTH

SCALE IN FEET: 1"= 40

North St. Lucie Water Control District Canal No. 103

SOUTH LINE OF NORTH 1/2 OF SECTION 6, T35S, R40E

WEST MIDWAY ROAD (80' R/W)

OUTFALL TO INDIANWOOD CANAL NO. 103

OPEN CUT ASPHALT

SOUTH JENKINS ROAD (PROPOSED 120' R/W)

EXISTING 12" WATER MAIN

PROPOSED WELL LOCATION

PERIMETER BERM

MITERED END

15" STORM DRAIN (TYPICAL)

BUILDING "E"
14,950 SQ. FT.
3 BAYS @ 4,983 S.F. EACH
F.F.E. 23.20

BUILDING "D"
14,950 SQ. FT.
3 BAYS @ 4,983 S.F. EACH
F.F.E. 23.20

BUILDING "F"
13,250 SQ. FT.
3 BAYS @ 4,416 S.F. EACH
F.F.E. 23.20

BUILDING "A"
27,840 SQ. FT.
4 BAYS @ 6,960 S.F. EACH
F.F.E. 23.20

BUILDING "B"
12,500 SQ. FT.
4 BAYS @ 3,125 S.F. EACH
F.F.E. 23.20

BUILDING "C"
12,500 SQ. FT.
4 BAYS @ 3,125 S.F. EACH
F.F.E. 23.20

4' SIDEWALK (TYP.)

LOADING SPACE

DUMPSTER

CONTROL STRUCTURE #1

DRY DETENTION AREA

LOT 2

LOT 1

E INLET

(3) 9" OUTLET INJECTION SIGNS

CONTROL STRUCTURE #2

DRY DETENTION AREA

OVERFLOW DEVICE TO BE USED ONLY IF OFFSITE WETLAND IS IN TACT

WETLAND

25' WETLAND BUFFER

PROPERTY LINE

CATCH BASIN (TYP.)

FLOW ARROW (TYP.)

PROPOSED SANITARY M.H.

OPEN CUT ASPHALT

BENCHMARK
TOP PK NAIL & DISK STAMPED LB 4286 TRAV
ELEV = 20.51
N.G.V.D. 1929

BENCHMARK
TOP 1/2" IRAC STAMPED LB 4286 TRAV
ELEV = 19.79'
N.G.V.D. 1929

LEGEND

△ INDICATES HIGH POINT

INDICATES SURFACE FLOW DIRECTION

SECTION G-G
N.T.S.

SECTION F-F
N.T.S.

SECTION E-E
N.T.S.

SECTION D-D
N.T.S.

SECTION C-C
N.T.S.

SECTION B-B
N.T.S.

SECTION A-A
N.T.S.

NOTES:
1. ELEVATIONS ARE IN NGVD
2. CONTRACTOR SHALL SEED AND MULCH AREAS TO ENSURE VEGETATION HAS BEEN ESTABLISHED

GARY L. BASHAM P.E. FL. REG. NO. 44627

COMPUTER FILE REF.	FIELD BK./PG.
03139BASE	

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CONSULTING ENGINEERS & LAND SURVEYORS
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(772) 464-3537
FLORIDA BOARD OF PROFESSIONAL ENGINEERS AUTHORIZATION NO. 4286

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	BY	DATE
DESIGNED	P.P.P.	11-1-03
CALCS.		
DRAWN	D.F.	11-5-03
DETAILED		
CHECKED		
APPROVED		

MAYO WAREHOUSE
CONCEPTUAL DRAINAGE PLAN

DATE: 11-5-03
HORIZ. SCALE: 1"=40'
VERT. SCALE: 1"=1'
JOB No. 03-139
SHEET 3 OF 6

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TYPE INLET	DIMENSION A	B	C	D	E	MAX. SIZE R.C.P.
C	2'-0"	3'-1"	2'-4"	3'-0"	11"	18"/24"
E	3'-0"	4'-6"	3'-4"	4'-4"	1'-5"	24"/42"

NOTE: (1) FOR MORE INFORMATION SEE D.O.T. 1984 STANDARDS INDEX NO. 232

GENERAL NOTES

BEVELED EDGES: ALL EXPOSED CORNERS AND EDGES TO BE CHAMFERED 3/4"

FOUNDATION MATERIAL: WHERE MATERIAL UNSATISFACTORY FOR FOUNDATION IS ENCOUNTERED AT FLOW LINE, OMIT FLOOR AND CARRY WALLS DOWN TO SATISFACTORY FOUNDATION. BACKFILL TO FLOW LINE WITH CLEAN SAND.

GRATES: CAST IRON GRATES TO BE U.S.F. NO. 6212 IN ACCORDANCE WITH FLA. D.O.T. SPECS. FOR TRAFFIC BEARING GRATES.

TYPE "C" & "E" INLETS

U.S.F. #125 RING & COVER

DIMENSIONS AND QUANTITIES

	D	X	A	B	C	E	F	G	W Single Pipe	W Double Pipe	W Triple Pipe	W Quad. Pipe	H	5½" Concrete Slab (CY) Single Pipe	Double Pipe	Triple Pipe	Quad. Pipe	Sodding (SQ. YDS.) Single Pipe	Double Pipe	Triple Pipe	Quad. Pipe
4:1 Slope	15"	2'-7"	2.5'	3.09'	5.57'	3.0'	7.0'	1.23'	4.33'	6.92'	9.50'	12.08'	1.04'	0.44	0.78	0.98	1.15	22	25	28	31
	18"	2'-10"	2.5'	4.12'	6.62'	4.0'	8.0'	1.41'	4.58'	7.42'	10.25'	13.08'	1.04'	0.49	0.77	1.03	1.10	24	27	30	33
	24"	3'-3"	2.5'	6.18'	8.68'	6.0'	10.0'	1.77'	5.08'	8.50'	11.92'	15.33'	1.04'	0.65	1.02	1.38	1.77	27	30	34	38
	30"	4'-3"	2.5'	8.25'	10.75'	8.0'	12.0'	2.20'	5.58'	9.83'	14.08'	18.33'	1.04'	0.81	1.34	1.90	2.44	29	34	39	44
	36"	5'-1"	2.5'	10.31'	12.8'	10.0'	14.0'	2.34'	6.08'	11.17'	16.25'	21.33'	1.04'	0.97	1.68	2.41	3.14	32	38	44	49
	42"	6'-0"	2.5'	12.37'	14.87'	12.0'	16.0'	2.45'	6.58'	12.58'	18.58'	24.50'	1.04'	1.13	2.08	3.05	4.02	35	42	49	55
	48"	6'-9"	2.5'	14.43'	16.93'	14.0'	18.0'	2.65'	7.08'	14.03'	20.58'	27.33'	1.04'	1.29	2.49	3.69	4.88	38	45	53	60
	54"	7'-6"	2.5'	16.49'	18.97'	16.0'	20.0'	2.83'	7.58'	15.25'	22.92'	30.58'	1.04'	1.48	2.99	4.47	5.98	41	49	58	66
	60"	8'-6"	2.5'	18.55'	21.05'	18.0'	22.0'	3.00'	8.08'	16.58'	25.08'	33.58'	1.04'	1.66	3.49	5.31	7.13	44	53	63	72

MITERED END SECTION

NOTES:

1. THE CONTRACTOR SHALL COMPLY WITH REQUIREMENTS OF THE FLORIDA TRENCH SAFETY ACT.
2. INITIAL BACKFILL SHALL BE HAND PLACED TO 12" ABOVE THE PIPE. BACKFILL SHALL BE MECHANICALLY TAMPED TO A MINIMUM OF 100% OF MAX. DENSITY AS DETERMINED BY AASHTO METHOD T-99.

TYPICAL TRENCH SECTION

TYPICAL ROADWAY SECTION

TYPE "D" CURB

CONTROL STRUCTURE #1

ALL ELEVATIONS BASED ON NGVD
(TO BE USED IF OFFSITE OFFSITE WETLAND TO THE NORTH REMAINS IN TACT)

NOTE: CAST IRON LID TO BE U.S.F. NO. 125

MANHOLE TOP
(TYPE 7-T)
(DOT 201)

STORM MANHOLE TOP

ALTERNATE CONTROL STRUCTURE #1

ALL ELEVATIONS BASED ON NGVD
(TO BE USED IF OFFSITE OFFSITE WETLAND TO THE NORTH IS REMOVED)

TYPE "P" MANHOLE

DENSITY REQUIREMENTS:

- 100% T-99, EXCAVATION & EMBANKMENT
- 100% T-99, COMPACTED SUBGRADE
- 98% T-180, STABILIZED SUBGRADE
- 98% T-180, ROADWAY } LIMEROCK
- 95% T-180, SHLD. PAVM'T. } /SHELL
- 98% T-180, DRIVEWAYS
- 95% T-180, UNPAVED AREAS BEYOND THE 2 TO 1 SLOPE FROM EDGE OF PAVEMENT

NOTES:

1. PAVEMENT RESTORATIONS FOR LONGITUDINAL CUTS IN ALL STREETS SHALL BE FULL LANE WIDTH, WITH FULL LANE WIDTH RESURFACING FOR EACH LANE WITHIN THE LIMITS OF THE CUT.
2. WHEN AN ARTERIAL OR MAJOR COLLECTOR STREET IS OPEN CUT WITHIN THE LIMITS OF THE ROADWAY INTERSECTION, THE ENTIRE INTERSECTION SHALL BE OVERLAID WITH ASPHALTIC CONCRETE.
3. WHEN STREETS OTHER THAN ARTERIALS OR MAJOR COLLECTORS ARE OPEN CUT MORE THAN TWO TIMES AT THE INTERSECTION, THE ENTIRE INTERSECTION SHALL BE OVERLAID WITH ASPHALTIC CONCRETE. TWO OPEN CUTS OR LESS AT THE INTERSECTION WILL REQUIRE OVERLAYING WITH ASPHALT ONLY IN THE OPEN CUT AREA.
4. THE CONTRACTOR SHALL BE REQUIRED TO DOCUMENT ALL PAVEMENT MARKINGS PRIOR TO OVERLAY. THE CONTRACTOR SHALL THEN PLACE NEW PAVEMENT MARKINGS AT THE SAME LOCATIONS. PAVEMENT MARKINGS SHALL BE IN ACCORDANCE TO F.D.O.T. SECTION 711.
5. 2500 PSI CONCRETE SHALL MATCH EXISTING BASE (6" MIN.)

OPEN-CUT DETAIL

CONTROL STRUCTURE #2

ALL ELEVATIONS BASED ON NGVD
(TO BE USED IF OFFSITE OFFSITE WETLAND TO THE NORTH REMAINS IN TACT)

SIDEWALK JOINTS

TABLE OF SIDEWALK JOINTS

TYPE	LOCATION
"A"	AT P.C. AND P.T. OF CURVES AND AT JUNCTION OF EXISTING AND NEW SIDEWALKS.
"B"	5'-0" CENTER TO CENTER ON NEW SIDEWALKS.
"C"	WHERE NEW SIDEWALK ABUTS CONCRETE CURBS, DRIVEWAYS AND SIMILAR STRUCTURES

SIDEWALK CONSTRUCTION

SIDEWALK CONSTRUCTION DETAILS

2-5-04
GARY L. BASHAM P.E. FL. REG. NO. 44627

COMPUTER FILE REF.	FIELD BK./PG.
03139BASE	

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CONSULTING ENGINEERS & LAND SURVEYORS
2980 SOUTH 25th STREET
FORT PIERCE, FLORIDA 34981
(772) 464-3537
FLORIDA BOARD OF PROFESSIONAL ENGINEERS AUTHORIZATION NO. 4286

- REVISIONS -	BY	DATE
REVISED CONTROL STRUCTURE WEIR	D.F.	1-6-04

	BY	DATE
DESIGNED	P.P.P.	11-1-03
CALCS.		
DRAWN	D.F.	11-5-03
DETAILED		
CHECKED		
APPROVED		

MAYO WAREHOUSE

PAVING & DRAINAGE DETAILS

DATE: 11-5-03
HORIZ. SCALE: NTS
VERT. SCALE: NTS
JOB No. 03-139
SHEET 4 OF 6

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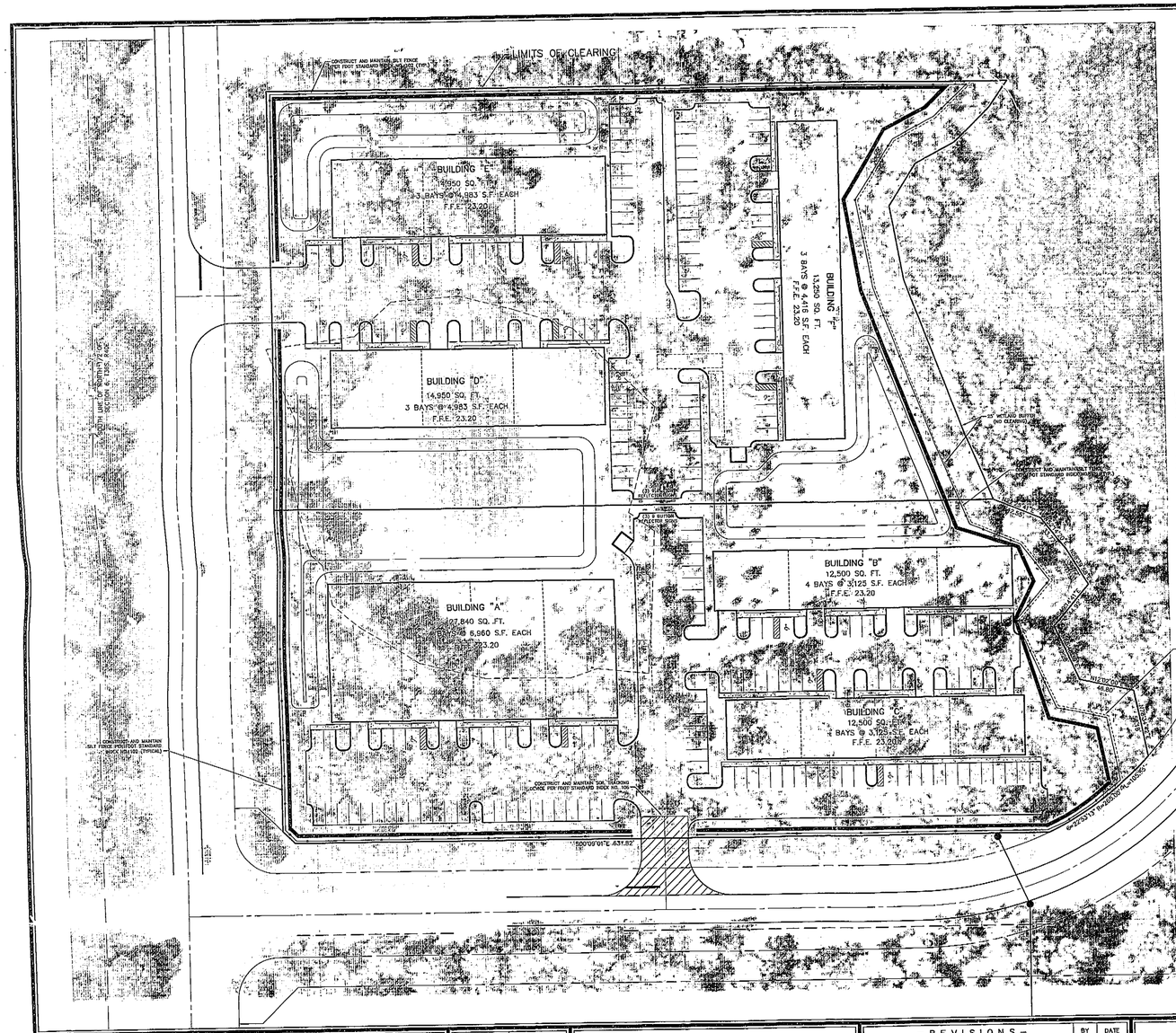

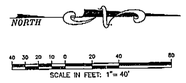

GENERAL DESCRIPTION

Measures taken to protect adjacent waterways, ditches and canals during construction will include silt fencing around the limits of clearing, a temporary gravel construction entrance, and straw bales around drop inlets. Silt fencing shall be constructed between the limits of construction, adjacent properties, water ways, and environmentally sensitive areas.

GENERAL NOTES

1.) Contractor is responsible for construction and maintenance of silt fencing and turbidity barriers.
2.) Perimeter silt fencing shall be installed and approved by engineer prior to site clearing.
3.) All disturbed areas that will not be brought to final grade for thirty days or more shall be seeded and mulched.
4.) All vehicles entering and leaving the site must use the temporary gravel construction entrance as shown in the accompanying detail.
5.) All fill areas shall be stabilized with seed and mulch.
6.) Detention areas shall be excavated and sodded prior to mass grading.
7.) All elevations and benchmarks shown hereon are relative to the National Geodetic Vertical Datum (N.G.V.D.) of 1929.
8.) Drainage System:
The storm sewer system and surface water management system shown depicts the general character of the final system and is subject to adjustment during final design and permitting, which will be submitted as the final construction plans. The final drainage system design and construction shall be in accordance with the standard specifications for public works in the St. Lucie County and the requirements of the South Florida Water Management District.

GARY L. BASHAM P.E. FL. REG. NO. 44627

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- REVISIONS -	BY	DATE

	BY	DATE
DESIGNED	G.L.B.	11-5-03
CALCS.		
DRAWN	D.F.	11-5-03
DETAILED		
CHECKED		
APPROVED		

MAYO WAREHOUSE

LAND CLEARING, EROSION & SEDIMENT CONTROL PLAN

DATE: 11-5-03
HORIZ. SCALE: 1"= 40'
VERT. SCALE:
JOB No. 03-139
SHEET 5 OF 6

PARTIAL INLET   COMPLETED INLET   DITCH BOTTOM INLET

PROTECTION AROUND INLETS OR SIMILAR STRUCTURES

NOTE:
WHERE THE SLOPE LENGTH EXCEEDS 25 FEET, CONSTRUCT ONE ROW OF BALE BARRIERS AT 0% LONGITUDINAL GRADE MIDWAY UP THE SLOPE. CONSTRUCT TWO ROWS OF BALE BARRIERS WHERE THE SLOPE LENGTH EXCEEDS 50 FEET.

SECTION A–A   ELEVATION

ALONG FILL SLOPE

ELEVATION
TO BE USED WHERE THE NATURAL GROUND SLOPES TOWARD THE TOE OF SLOPE

ELEVATION
TO BE USED WHERE THE NATURAL GROUND SLOPES AWAY FROM THE TOE OF SLOPE

AT TOE OF SLOPE

BARRIERS FOR FILL SLOPES

ELEVATION

BARRIER FOR PAVED DITCH

NOTES FOR BALED HAY OR STRAW BARRIERS

1. TYPE I AND TYPE II BARRIERS SHOULD BE SPACED IN ACCORDANCE WITH CHART I, SHEET 1.
2. HAY BALES SHALL BE TRENCHED 3" TO 4" AND ACHORED WITH TWO 1"X2"(OR 1"DIA) X 4' WOOD STAKES. STAKES OF OTHER MATERIAL OR SHAPE PROVIDING EQUIVALENT STRENGTH MAY BE USED IF APPROVED BY THE ENGINEER. STAKES OTHER THAN WOOD SHALL BE REMOVED UPON COMPLETION OF THE PROJECT.
3. RAILS AND POSTS SHALL BE 2"X4" WOOD. OTHER MATERIALS PROVIDING EQUIVALENT STRENGTH MAY BE USED IF APPROVED BY THE ENGINEER.
4. ADJACENT BALES SHALL BE BUTTED FIRMLY TOGETHER. UNAVOIDABLE GAPS SHALL BE PLUGGED WITH HAY OR STRAW TO PREVENT SILT FROM PASSING.
5. WHERE USED IN CONJUNCTION WITH SILT FENCE, HAY BALES SHALL BE PLACED ON THE UPSTREAM SIDE OF THE FENCE.
6. BALES TO BE PAID FOR UNDER THE CONTRACT UNIT PRICE FOR BALED HAY OR STRAW, EA. THE UNIT PRICE SHALL INCLUDE THE COST OF FILTER FABRIC FOR TYPE I AND II BARRIERS. SAND BAGS SHALL BE PAID FOR UNDER THE UNIT PRICE FOR SANDBAGGING, CY. ROCK BAGS SHALL BE PAID FOR UNDER THE CONTRACT UNIT PRICE FOR ROCK BAGS, EA.

ELEVATION
TYPE II

ELEVATION
TYPE I

BARRIERS FOR UNPAVED DITCHES

BALED HAY AND BALED STRAW BARRIERS

F.D.O.T. STD. INDEX #102 sheet 2 of 3

NOTE:
1. INSPECT AND REPAIR FENCE AFTER EACH STORM EVENT AND REMOVE SEDIMENT WHEN NECESSARY. ANY REQUIRED REPAIRS SHALL BE MADE IMMEDIATELY.
2. SEDIMENT DEPOSITS SHALL BE REMOVED WHEN DEPOSITS REACH APPROXIMATELY ONE HALF THE HEIGHT OF THE BARRIER.
3. REMOVED SEDIMENT SHALL BE DEPOSITED TO AN AREA THAT WILL NOT CONTRIBUTE TO OFF–SITE SEDIMENTATION.
4. SILT FENCE SHALL BE PLACED ON SLOPE CONTOURS TO MAXIMIZE PONDING EFFICIENCY.
5. SILT FENCING SHALL BE REPLACED AFTER SIX MONTHS OF NORMAL USE.
6. POSTS SHALL BE SPACED A MAXIMUM OF 10 FEET APART AT THE BARRIER LOCATION AND A MAXIMUM OF 6 FEET APART FOR EXTRA STRENGTH FILTER FABRIC.
7. THE STANDARD STRENGTH FILTER FABRIC SHALL BE STAPLED OR WIRED TO THE FENCE AND 8 INCHES OF THE FABRIC SHALL EXTEND INTO THE TRENCH
8. SILT FENCING SHALL NOT BE REMOVED BEFORE THE UPSLOPE SURFACE HAS BEEN PERMANENTLY STABILIZED.

DOUBLE ROW STAKED SILTATION BARRIER

*NOTE: DOUBLE ROW SILTATION FENCE SHALL BE PLACED ALONG PERIMETER OF PROJECT AS INDICATED ON EROSION & SEDIMENT CONTROL PLAN.

PLACE THE END POST OF ONE FENCE BEHIND THE END POST OF ANOTHER AS SHOWN.

ROTATE BOTH POSTS AT LEAST 180 DEGREES IN A CLOCKWISE DIRECTION TO CREATE A TIGHT SEAL WITH THE FABRIC MATERIAL.

DRIVE BOTH POSTS INTO THE GROUND AND BURY FLAP.

PLAN VIEW

JOINING TWO SILT FENCES

ELEVATION   SECTION

Note: Spacing for Type III Fence to be in accordance with Chart I, Sheet 1 of 3 and ditch installations at drainage structures Sheet 2 of 3.

Type III Silt Fence

Note: Silt Fence to be paid for under the contract unit price for Staked Silt Fence (LF).

TYPE III SILT FENCE

Type III Silt Fence

Type III Silt Fence Protection Around Ditch Bottom Inlets.

Do not deploy in a manner that silt fences will act as a dam across permanent flowing watercourses. Silt fences are to be used at upland locations and turbidity barriers used at permanent bodies of water.

SILT FENCE APPLICATIONS

BAILED HAY OR STRAW BARRIERS AND SILT FENCES
F.D.O.T. INDEX #102

SILT FENCE

F.D.O.T. STD. INDEX #102 sheet 3 of 3

NOTE:
1. INSPECT AND REPAIR FENCE AFTER EACH STORM EVENT AND REMOVE SEDIMENT WHEN NECESSARY. ANY REQUIRED REPAIRS SHALL BE MADE IMMEDIATELY.
2. SEDIMENT DEPOSITS SHALL BE REMOVED WHEN DEPOSITS REACH APPROXIMATELY ONE HALF THE HEIGHT OF THE BARRIER.
3. REMOVED SEDIMENT SHALL BE DEPOSITED TO AN AREA THAT WILL NOT CONTRIBUTE TO OFF–SITE SEDIMENTATION.
4. SILT FENCE SHALL BE PLACED ON SLOPE CONTOURS TO MAXIMIZE PONDING EFFICIENCY.
5. SILT FENCING SHALL BE REPLACED AFTER SIX MONTHS OF NORMAL USE.
6. POSTS SHALL BE SPACED A MAXIMUM OF 6 FEET APART AT THE BARRIER LOCATION.
7. THE STANDARD STRENGTH FILTER FABRIC SHALL BE STAPLED OR WIRED TO THE FENCE AND 8 INCHES OF THE FABRIC SHALL EXTEND INTO THE TRENCH
8. SILT FENCING SHALL NOT BE REMOVED BEFORE THE UPSLOPE SURFACE HAS BEEN PERMANENTLY STABILIZED.

GENERAL NOTES

1. A Soil Tracking Prevention Device (STPD) shall be constructed at locations designated by the engineer for points of egress from unstabilized areas of the project to public roads where offsite tracking of mud could occur. Traffic from unstabilized areas of the construction project shall be directed thru a STPD. Barriers, flagging, or other positive means shall be used as required to limit and direct vehicular egress across the STPD.
2. The Contractor may propose an alternative technique to minimize offsite tracking of sediment. The alternative must be reviewed and approved by the Engineer prior to its use.
3. All materials spilled, dropped, or tracked onto public roads (Including the STPD aggregate and construction mud) shall be removed daily, or more frequently if so directed by the Engineer.
4. Aggregates shall be as described in Section 901 excluding 901-2.3. Aggregates shall be FDOT size #1. If this size is not available, the next available smaller size aggregate may be substituted with the approval of the Engineer. Sizes containing excessive small aggregate will track off the project and are unsuitable.
5. The sediment pit should provide a retention volume of 3600 cubic foot/acre of surface area draining to the pit. When the STPD is isolated from other drainage areas, the following pit volumes will satisfy this requirement:
   15' x 50' +100 ft³   30' x 50' +200 ft³
   As an option to the sediment pit, the width of the swale bottom can be increased to obtain the volume. When the sediment pit or swale volume has been reduced to one half, it shall be cleaned. When a swale is used, hay bales or silt fence shall be placed along the entire length.
6. The swale ditch draining the STPD shall have a 0.2% minimum and a 1.0% maximum grade along the STPD and to the sediment pit.
7. Mitered end sections are not required when the sidedrain pipe satisfies the clear zone requirements.
8. The STPD shall be maintained in a condition that will allow it to perform its function. To prevent offsite tracking, the STPD shall be rinsed (daily when in use) to move accumulated mud downward thru the stone. Additional stabilization of the vehicular route leading to the STPD may be required to limit the mud tracked.
9. A STPD shall be paid for under the contract unit price for Soil Tracking Prevention Device, EA. The unit price shall constitute full compensation for construction, maintenance, replacement of materials, removal, and restoration of the area utilized for the STPD; including but not limited to excavation, grading, temporary pipe (including MES when required), filter fabric, aggregate, paved turnout (including asphalt and base construction), ditch stabilization, approach route stabilization, sediment removal and disposal, water, rinsing and cleaning of the STPD and cleaning of public roads, grassing and sod. Hay bales shall be paid for under the contract unit price for Hay or Straw Baled, EA. Silt Fence shall be paid for under the contract unit price for Staked Silt Fence, LF.
10. The nominal size of a standard STPD is 15' x 50' unless otherwise shown in the plans. If the volume of entering and exiting vehicles warrant, a 30' width STPD may be used if approved by the Engineer. When a double width (30') STPD is used, the pay quantity shall be 2 for each location.

NOTES:
1. THE ENTRANCE SHALL BE MAINTAINED IN A CONDITION THAT WILL PREVENT TRACKING OR FLOWING OF SEDIMENT ONTO PUBLIC RIGHTS–OF–WAY. THIS MAY REQUIRE TOP DRESSING, REPAIR AND/OR CLEANOUT OF ANY MEASURES USED TO TRAP SEDIMENT.
2. WHEN NECESSARY, WHEELS SHALL BE CLEANED PRIOR TO ENTRANCE ONTO PUBLIC RIGHT–OF–WAY.
3. WHEN WASHING IS REQUIRED, IT SHALL BE DONE ON AN AREA STABILIZED WITH CRUSHED STONE THAT DRAINS INTO AN APPROVED SEDIMENT TRAP OR SEDIMENT BASIN.
4. ALL MATERIALS SPILLED, DROPPED, WASHED OR TRACKED FROM VEHICLES ONTO ROADWAYS OR INTO STORM DRAINS MUST BE REMOVED IMMEDIATELY.

SOIL TRACKING PREVENTION DEVICE (STPD)

F.D.O.T. STD. INDEX #106

2-5-04
GARY L. BASHAM P.E. FL. REG. NO. 44627

COMPUTER FILE REF.	FIELD BK./PG.
03139BASE	

CULPEPPER & TERPENING, INC.
CONSULTING ENGINEERS & LAND SURVEYORS
2980 SOUTH 25th STREET
FORT PIERCE, FLORIDA 34981
(772) 464–3537
FLORIDA BOARD OF PROFESSIONAL ENGINEERS AUTHORIZATION NO. 4286

– REVISIONS –	BY	DATE

	BY	DATE
DESIGNED	G.L.B.	11–5–03
CALCS.		
DRAWN	D.F.	11–5–03
DETAILED		
CHECKED		
APPROVED		

MAYO WAREHOUSE

EROSION & SEDIMENT CONTROL DETAILS

DATE: 11–5–03
HORIZ. SCALE: NTS
VERT. SCALE: NTS
JOB No. 03–139
SHEET 6 OF 6

TRANSPORTATION
Douglas S. Ortiz
DOUGLAS S. ORTIZ
ST. LUCIE COUNTY PROPERTY APPRAISER

0 200 400 600 800
SCALE 1"=200'

PREPARED BY THE FLORIDA DEPARTMENT OF TRANSPORTATION
FOR THE FLORIDA DEPARTMENT OF REVENUE
FOR ASSESSMENT PURPOSES ONLY.

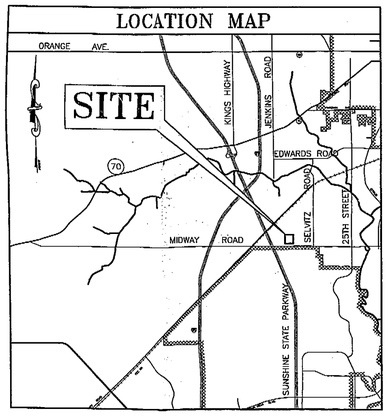
ST. LUCIE COUNTY
FLORIDA

SCALE	1" = 200'	SECTION	TWP.	RANGE	SHEET NO.	MAP
PHOTO DATE	JAN. 1992	06	36 S	40 E	115 B	
PHOTO NO.	PD-6037					

MAYO WAREHOUSE

IN SECTION 6, TOWNSHIP 36 SOUTH, RANGE 40 EAST, ST. LUCIE COUNTY, FLORIDA

LOCATION MAP



INDEX TO DRAWINGS	
SHT. NO.	DESCRIPTION
1	COVER SHEET
2	SITE PLAN
3	CONCEPTUAL DRAINAGE PLAN
4	PAVING & DRAINAGE DETAILS
5	LAND CLEARING, EROSION & SEDIMENT CONTROL PLAN
6	EROSION & SEDIMENT CONTROL DETAILS

ADDL/REVISED SUBMITTAL

MAY 07 2004

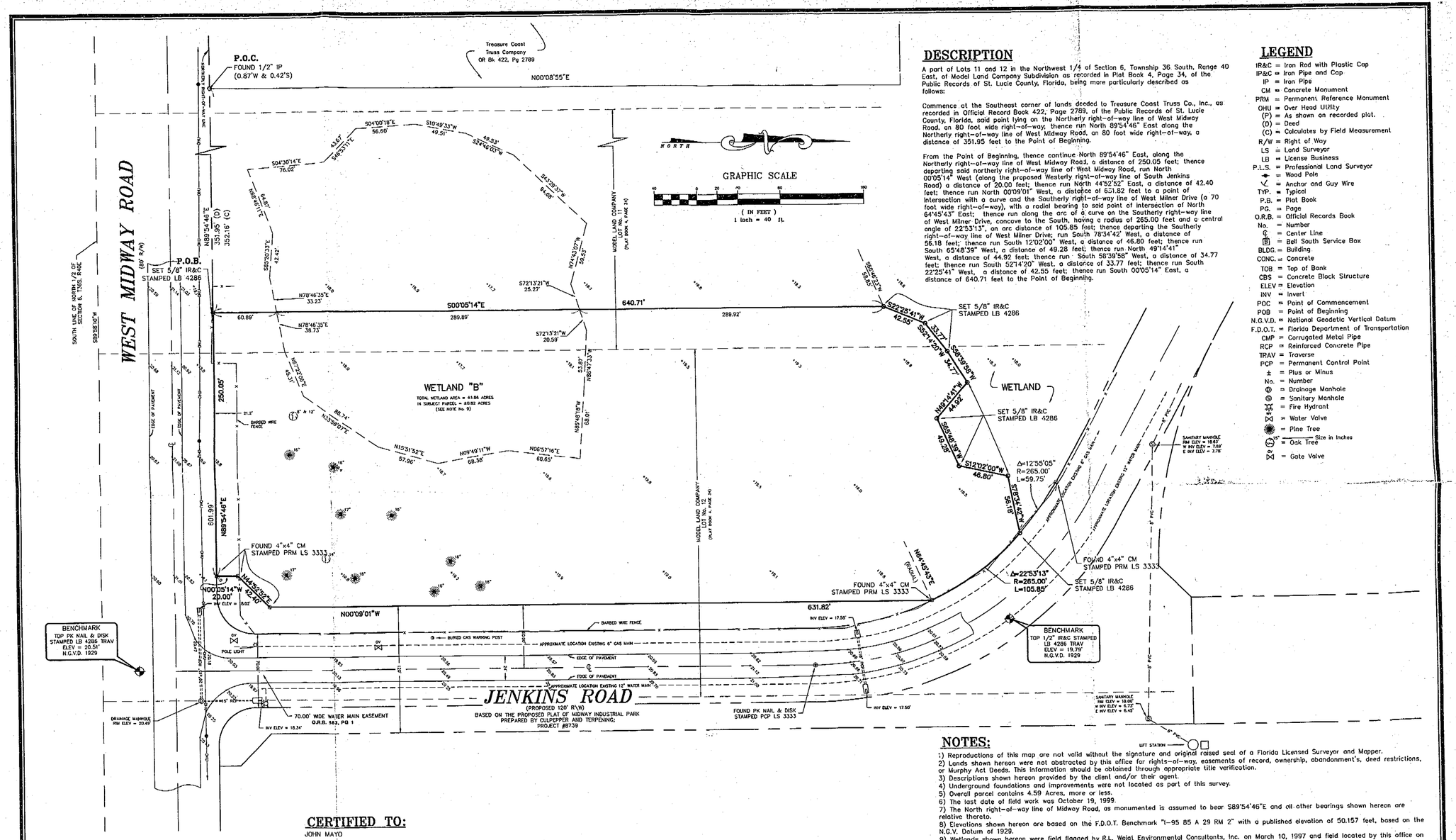
031216-16

PREPARED BY

CULPEPPER & TERPENING, INC.

CONSULTING ENGINEERS • LAND SURVEYORS

2980 SOUTH 25th STREET • FT. PIERCE, FLORIDA 34981 • (772) 464-3537



DESCRIPTION

A part of Lots 11 and 12 in the Northwest 1/4 of Section 6, Township 36 South, Range 40 East, of Model Land Company Subdivision as recorded in Plat Book 4, Page 34, of the Public Records of St. Lucie County, Florida, being more particularly described as follows:

Commence at the Southeast corner of lands deeded to Treasure Coast Truss Co., Inc., as recorded in Official Record Book 422, Page 2789, of the Public Records of St. Lucie County, Florida, said point lying on the Northerly right-of-way line of West Midway Road, an 80 foot wide right-of-way; thence run North 89°54'46" East along the Northerly right-of-way line of West Midway Road, an 80 foot wide right-of-way, a distance of 351.95 feet to the Point of Beginning.

From the Point of Beginning, thence continue North 89°54'46" East, along the Northerly right-of-way line of West Midway Road, a distance of 250.05 feet; thence departing said northerly right-of-way line of West Midway Road, run North 00°05'14" West (along the proposed Westerly right-of-way line of South Jenkins Road) a distance of 20.00 feet; thence run North 44°52'52" East, a distance of 42.40 feet; thence run North 00°09'01" West, a distance of 651.82 feet to a point of intersection with a curve and the Southerly right-of-way line of West Milner Drive (a 70 foot wide right-of-way), with a radial bearing to said point of intersection of North 64°45'43" East; thence run along the arc of a curve on the Southerly right-of-way line of West Milner Drive, concave to the South, having a radius of 265.00 feet and a central angle of 22°53'13", an arc distance of 105.85 feet; thence departing the Southerly right-of-way line of West Milner Drive, run South 78°34'42" West, a distance of 56.18 feet; thence run South 12°02'00" West, a distance of 46.80 feet; thence run South 65°48'39" West, a distance of 49.28 feet; thence run North 49°14'41" West, a distance of 44.92 feet; thence run South 58°39'58" West, a distance of 34.77 feet; thence run South 52°14'20" West, a distance of 33.77 feet; thence run South 22°25'41" West, a distance of 42.55 feet; thence run South 00°05'14" East, a distance of 640.71 feet to the Point of Beginning.

LEGEND

IR&C = Iron Rod with Plastic Cap
IP&C = Iron Pipe and Cap
IP = Iron Pipe
CM = Concrete Monument
PRM = Permanent Reference Monument
OHU = Over Head Utility
(P) = As shown on recorded plat.
(D) = Deed
(C) = Calculates by Field Measurement
R/W = Right of Way
LS = Land Surveyor
LB = License Business
P.L.S. = Professional Land Surveyor
= Wood Pole
= Anchor and Guy Wire
TYP. = Typical
P.B. = Plat Book
PG. = Page
O.R.B. = Official Records Book
No. = Number
℄ = Center Line
= Bell South Service Box
BLDG. = Building
CONC. = Concrete
TOB = Top of Bank
CBS = Concrete Block Structure
ELEV = Elevation
INV = Invert
POC = Point of Commencement
POB = Point of Beginning
N.G.V.D. = National Geodetic Vertical Datum
F.D.O.T. = Florida Department of Transportation
CMP = Corrugated Metal Pipe
RCP = Reinforced Concrete Pipe
TRAV = Traverse
PCP = Permanent Control Point
± = Plus or Minus
No. = Number
= Drainage Manhole
= Sanitary Manhole
= Fire Hydrant
= Water Valve
= Pine Tree
= Size in Inches
= Oak Tree
= Gate Valve

CERTIFIED TO:

JOHN MAYO

NOTES:

1) Reproductions of this map are not valid without the signature and original raised seal of a Florida Licensed Surveyor and Mapper.
2) Lands shown hereon were not abstracted by this office for rights-of-way, easements of record, ownership, abandonment's, deed restrictions, or Murphy Act Deeds. This information should be obtained through appropriate title verification.
3) Descriptions shown hereon provided by the client and/or their agent.
4) Underground foundations and improvements were not located as part of this survey.
5) Overall parcel contains 4.59 Acres, more or less.
6) The last date of field work was October 19, 1999.
7) The North right-of-way line of Midway Road, as monumented is assumed to bear S89°54'46"E and all other bearings shown hereon are relative thereto.
8) Elevations shown hereon are based on the F.D.O.T. Benchmark "I-95 85 A 29 RM 2" with a published elevation of 50.157 feet, based on the N.G.V. Datum of 1929.
9) Wetlands shown hereon were field flagged by R.L. Weigt Environmental Consultants, Inc. on March 10, 1997 and field located by this office on March 17, 1997.
10) Said described property is located within an area having a zone designation "X" by the Federal Emergency Management Agency (FEMA) on Flood Insurance Rate Map No.'s 12111C0170F and 12111C0275F, with a date of identification of August 19, 1991 (on both maps), for community number 120285 (on both maps) in St. Lucie County, Florida which is the current Flood Insurance Rate Map for the community in which said premises is currently located.
11) Fences shown hereon are not considered encroachments based on existing grazing which encompasses this entire area. At some point and time, the area was owned by a single owner and used for cattle grazing.

11/5/99
DATE

Richard C. Laventure
RICHARD C. LAVENTURE, P.L.S. FLORIDA CERTIFICATE NO. 5209

COMPUTER FILE REF.	FIELD BK./PG.
2305MAP1.dwg	
8739SECT.dwg	

CULPEPPER & TERPENING, INC.
CERTIFICATION NO. 4286

CONSULTING ENGINEERS
&
LAND SURVEYORS
2980 SOUTH 25th STREET
FORT PIERCE, FLORIDA 34981
(561) 464-3537

- REVISIONS -	BY	DATE

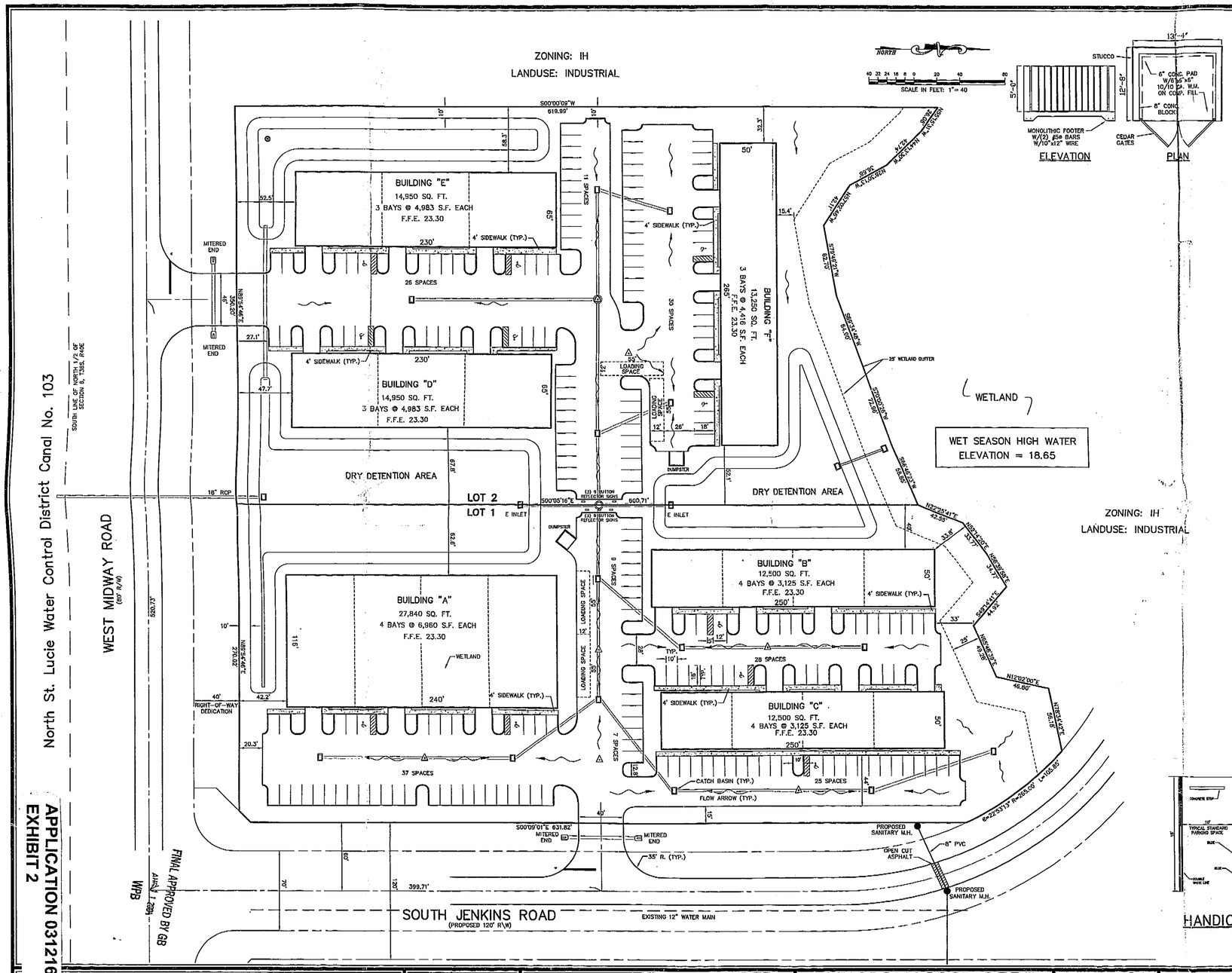
	BY	DATE
FIELD	GM	10/18/99
CALCS.	LAG	4/30/97
DRAWN	BCS	10/18/99
DETAILED		
CHECKED	RCL	10/20/99
APPROVED		

BOUNDARY & TOPOGRAPHIC SURVEY

PREPARED FOR

JOHN MAYO

DATE: 10/18/99
HORIZ. SCALE: 1" = 40'
VERT. SCALE: N/A
JOB No. 2305
SHEET 1 OF 1



GENERAL NOTES

1. PROJECT NAME: Mayo Warehouse
2. LOCATION: NW. corner of Midway Rd. & South Jenkins Rd.
3. OWNER: John Mayo
4. ENGINEER: Culpepper & Terpening, Inc. 2980 South 25th. Street Fort Pierce, FL 34981 FL P.E. Reg. 24276
5. SURVEYOR: Culpepper & Terpening, Inc. 2980 South 25th. Street Fort Pierce, FL 34981 FL P.L.S. Reg. 5556
6. TYPE OF PROJECT: Industrial Warehousing
7. GROSS PROJECT SIZE: 384,996 Sq. Ft., 8.84 Acres
8. BUILDING SIZE: 95,990 Sq. Ft.
9. LAND USE: IND (Industrial)
10. ZONING: IH
11. FLOOD ZONE: X per F.I.R.M. Panel No. 12111C0170 F and 12111C0275 F
12. SITE COVERAGE:

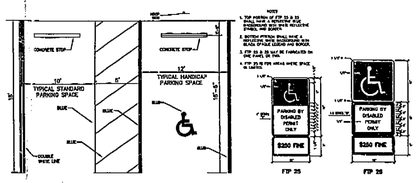
LOT 1	Acreage	Square Footage	Percentage of site
Building	1.21	52,840	27.87
Parking	1.53	66,533	35.10
Sidewalks	0.07	3,080	1.62
Dry Detention	0.63	27,677	14.60
Total Impervious	3.44	150,130	79.20
Total Open Space	0.91	39,426	20.80
Total Site Area	4.35	189,556	100.00

LOT 2	Acreage	Square Footage	Percentage of site
Building	0.99	43,150	22.08
Parking	1.43	82,213	31.83
Sidewalks	0.07	3,060	1.56
Dry Detention	0.63	27,677	14.16
Total Impervious	3.13	136,100	69.64
Total Open Space	1.36	59,340	30.36
Total Site Area	4.49	195,440	100.00

13. PARKING:

	LOT 1	LOT 2
Required (2 spaces/1,000 sf)	106 SPACES	87 SPACES
Provided	106 SPACES	87 SPACES
Handicapped Spaces Required	5 SPACES	4 SPACES
Handicapped Spaces Provided	5 SPACES	4 SPACES
Loading Spaces Required	2 SPACES	2 SPACES
Loading Spaces Provided	2 SPACES	2 SPACES

14. DEVELOPMENT SCHEDULE:
    Construction to begin: August 2004
    Construction to be completed: 180 days
15. UTILITY SERVICE:
    Water Service: Fort Pierce Utility Authority
    Sewage Treatment: Fort Pierce Utility Authority
16. SITE DRAINAGE:
    The storm water management system will consist of on-site dry detention which shall provide water quality and storm attenuation. Discharge will be to the North St. Lucie Water Control District Canal No. 103 located on the south side of Midway Road.



HANDICAP PARKING

GARY L. BASHAM P.E. FL. REG. NO. 44627

APPLICATION 031216-16
EXHIBIT 2

COMPUTER FILE REF.	FIELD BK./PG.
03139BASE	
SITE PLAN	

CULPEPPER & TERPENING, INC.
CONSULTING ENGINEERS & LAND SURVEYORS
2980 SOUTH 25th STREET
FORT PIERCE, FLORIDA 34981
(772) 464-3537
FLORIDA BOARD OF PROFESSIONAL ENGINEERS AUTHORIZATION NO. 4286

-REVISIONS-	BY	DATE
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.	.	.
.	.	.

	BY	DATE
DESIGNED		
CALCS.	G.L.B.	11-5-03
DRAWN		
DETAILED	D.F.	11-5-03
CHECKED	.	.
APPROVED	.	.

MAYO WAREHOUSE

SITE PLAN

DATE: 11-5-03
HORIZ. SCALE: 1"=40'
VERT. SCALE: 1"=1'
JOB No. 03-139
SHEET 2 OF 6

NOTES:
1) ALL ELEVATIONS AND BENCHMARKS SHOWN HEREON ARE RELATIVE TO THE NATIONAL GEODETIC VERTICAL DATUM (N.G.V.D.) OF 1929.

S.F.W.M.D. CRITERIA	1929 NGVD
MIN. ROAD ELEVATION	22.00
MIN. FINISHED FLOOR ELEVATION	23.30
MIN. PERIMEITER ELEVATION	22.50
CONTROL ELEVATION	18.65

NORTH
SCALE IN FEET: 1" = 40

North St. Lucie Water Control District Canal No. 103

SOUTH LINE OF NORTH 1/2 OF SECTION 6, T35S, R39E

WEST MIDWAY ROAD (80' R/W)

OUTFALL TO NSLWCD CANAL NO. 103 18" RCP

OPEN CUT ASPHALT

PERIMETER BERM

CONTROL STRUCTURE #1

DRY DETENTION AREA

LOT 2

LOT 1

E INLET

DU INLETS

CO & SUTTON INSTALLATION SIGN 2

CO & SUTTON INSTALLATION SIGN 1

PROPOSED WELL LOCATION

BUILDING "E"
14,950 SQ. FT.
3 BAYS @ 4,983 S.F. EACH
F.F.E. 23.30

BUILDING "D"
14,950 SQ. FT.
3 BAYS @ 4,983 S.F. EACH
F.F.E. 23.30

BUILDING "F"
13,350 SQ. FT.
3 BAYS @ 4,418 S.F. EACH
F.F.E. 23.30

BUILDING "A"
27,840 SQ. FT.
4 BAYS @ 6,980 S.F. EACH
F.F.E. 23.30

BUILDING "B"
12,500 SQ. FT.
4 BAYS @ 3,125 S.F. EACH
F.F.E. 23.30

BUILDING "C"
12,500 SQ. FT.
4 BAYS @ 3,125 S.F. EACH
F.F.E. 23.30

4' SIDEWALK (TYP.)

15' STORM DRAIN (TYPICAL)

MITERED END

20' LOADING SPACE

DUMPSTER

CONTROL STRUCTURE #2

DRY DETENTION AREA

25' WETLAND BUFFER

WETLAND

CATCH BASIN (TYP.)

FLOW ARROW (TYP.)

PROPOSED SANITARY M.H.

8" PVC

OPEN CUT ASPHALT

EXISTING 12" WATER MAIN

SOUTH JENKINS ROAD
(PROPOSED 120' R/W)

BENCHMARK
TOP 1/2" IR&C STAMPED LB 4286 TRAV
ELEV = 20.51'
N.G.V.D. 1929

BENCHMARK
NAIL PK NAIL & DISK STAMPED LB 4286 TRAV
ELEV = 19.70'
N.G.V.D. 1929

APPROVED
APR 1 1 2004
WRB

APPLICATION 031216-16
EXHIBIT 3

LEGEND

- INDICATES HIGH POINT
- INDICATES SURFACE FLOW DIRECTION
- WETSEASON HIGH WATER ELEVATION = 18.65

SECTION G-G
N.T.S.

SECTION F-F
N.T.S.

SECTION E-E
N.T.S.

SECTION D-D
N.T.S.

SECTION C-C
N.T.S.

SECTION B-B
N.T.S.

SECTION A-A
N.T.S.

NOTES:
1. ELEVATIONS ARE IN NGVD
2. CONTRACTOR SHALL SEED AND MULCH AREAS TO ENSURE VEGETATION HAS BEEN ESTABLISHED

GARY L. BASHAM P.E. FL. REG. NO. 44827
5-6-04

COMPUTER FILE REF.	FIELD BK./PG.
03139BASE	
DR PLAN	

CULPEPPER & TERPENING, INC.
CONSULTING ENGINEERS & LAND SURVEYORS
2280 SOUTH 25th STREET
FORT PIERCE, FLORIDA 34981
(772) 464-3537
FLORIDA BOARD OF PROFESSIONAL ENGINEERS AUTHORIZATION NO. 4286

- REVISIONS -	BY	DATE

	BY	DATE
DESIGNED	P.P.P.	11-1-03
CALCS.		
DRAWN	D.F.	11-5-03
DETAILED		
CHECKED		
APPROVED		

MAYO WAREHOUSE
CONCEPTUAL DRAINAGE PLAN

DATE: 11-5-03
HORIZ. SCALE: 1"=40'
VERT. SCALE: 1"=1'
JOB No. 03-139
SHEET 3 OF 6

TYPE INLET	DIMENSION A	B	C	D	E	MAX. SIZE R.C.P.
C	2'-0"	3'-1"	2'-4"	3'-0"	11"	18"/24"
E	3'-0"	4'-6"	3'-4"	4'-4"	1'-5"	24"/42"

NOTE: (1) FOR MORE INFORMATION SEE D.O.T. 1984 STANDARDS INDEX NO. 232

GENERAL NOTES

BEVELED EDGES: ALL EXPOSED CORNERS AND EDGES TO BE CHAMFERED 3/4"

FOUNDATION MATERIAL: WHERE MATERIAL UNSATISFACTORY FOR FOUNDATION IS ENCOUNTERED AT FLOW LINE, OMIT FLOOR AND CARRY WALLS DOWN TO SATISFACTORY FOUNDATION. BACKFILL TO FLOW LINE WITH CLEAN SAND.

GRATES: CAST IRON GRATES TO BE U.S.F. NO. 6212 IN ACCORDANCE WITH FLA. D.O.T. SPECS. FOR TRAFFIC BEARING GRATES.

TYPE "C" & "E" INLETS

NOTES:

1. THE CONTRACTOR SHALL COMPLY WITH REQUIREMENTS OF THE FLORIDA TRENCH SAFETY ACT.
2. INITIAL BACKFILL SHALL BE HAND PLACED TO 12" ABOVE THE PIPE. BACKFILL SHALL BE MECHANICALLY TAMPED TO A MINIMUM OF 100% OF MAX. DENSITY AS DETERMINED BY AASHTO METHOD T-99.

TYPICAL TRENCH SECTION

TYPICAL ROADWAY SECTION

TYPE "D" CURB

NOTE:

1. PAVEMENT RESTORATIONS FOR LONGITUDINAL CUTS IN ALL STREETS SHALL INCLUDE FULL LANE WIDTH RESURFACING FOR EACH LANE WITHIN THE LIMITS OF THE CUT.
2. WHEN AN ARTERIAL OR MAJOR COLLECTOR STREET IS OPEN CUT WITHIN THE LIMITS OF THE ROADWAY INTERSECTION, THE ENTIRE INTERSECTION SHALL BE OVERLAID WITH ASPHALTIC CONCRETE.
3. WHEN STREETS OTHER THAN ARTERIAL OR MAJOR COLLECTORS ARE OPEN CUT MORE THAN TWO TIMES AT THE INTERSECTION, THE ENTIRE INTERSECTION SHALL BE OVERLAID WITH ASPHALTIC CONCRETE. TWO OPEN CUTS OR LESS AT THE INTERSECTION WILL REQUIRE OVERLAYING WITH ASPHALT ONLY IN THE OPEN CUT AREA.
4. FOR FULL LANE WIDTH RESURFACING, CONTRACTOR SHALL BE REQUIRED TO DOCUMENT ALL PAVEMENT MARKINGS PRIOR TO OVERLAY. CONTRACTOR SHALL THEN PLACE NEW PAVEMENT MARKINGS AT THE SAME LOCATIONS. PAVEMENT MARKINGS SHALL BE IN ACCORDANCE TO F.D.O.T. SECTION 711.

OPEN-CUT DETAIL

U.S.F. #125 RING & COVER

CONTROL STRUCTURE #1

ALL ELEVATIONS BASED ON NGVD

CONTROL STRUCTURE #2

ALL ELEVATIONS BASED ON NGVD

DIMENSIONS AND QUANTITIES

	D	X	A	B	C	E	F	G	U Single Pipe	U Double Pipe	U Triple Pipe	U Quad. Pipe	N	5½" Concrete Slab (CY) Single Pipe	Double Pipe	Triple Pipe	Quad. Pipe	Sodding (SQ. YDS.) Single Pipe	Double Pipe	Triple Pipe	Quad. Pipe
4:1 Slope	15"	2'-7"	2.5'	3.09'	5.59'	3.0'	7.0'	1.23'	4.33'	6.92'	9.50'	12.08'	1.04'	0.44	0.68	0.91	1.15	22	25	28	31
	18"	2'-10"	2.5'	4.18'	6.62'	4.0'	8.0'	1.41'	4.58'	7.42'	10.25'	13.08'	1.04'	0.49	0.77	1.03	1.31	24	27	30	33
	24"	3'-5"	2.5'	6.18'	8.68'	6.0'	10.0'	1.73'	5.08'	8.50'	11.92'	15.33'	1.04'	0.65	1.09	1.38	1.77	27	30	34	38
	30"	4'-3"	2.5'	8.24'	10.75'	8.0'	12.0'	2.00'	5.58'	9.83'	14.08'	18.33'	1.04'	0.81	1.34	1.50	2.44	29	34	39	44
	36"	5'-1"	2.5'	10.31'	12.81'	10.0'	14.0'	2.24'	6.08'	11.17'	16.25'	21.33'	1.04'	0.97	1.60	2.41	3.14	32	38	44	49
	42"	6'-0"	2.5'	12.37'	14.87'	12.0'	16.0'	2.45'	6.58'	12.58'	18.58'	24.58'	1.04'	1.13	2.08	3.05	4.02	35	42	48	55
	48"	6'-9"	2.5'	14.43'	16.93'	14.0'	18.0'	2.65'	7.08'	13.83'	20.58'	27.33'	1.04'	1.29	2.49	3.69	4.88	38	46	53	60
	54"	7'-8"	2.5'	16.49'	18.99'	16.0'	20.0'	2.83'	7.58'	15.25'	22.92'	30.58'	1.04'	1.48	2.90	4.47	5.98	41	49	58	66
	60"	8'-6"	2.5'	18.55'	21.05'	18.0'	22.0'	3.00'	8.08'	16.58'	25.08'	33.58'	1.04'	1.66	3.49	5.31	7.13	44	53	63	72

MITERED END SECTION

NOTE: CAST IRON LID TO BE U.S.F. NO. 125

MANHOLE TOP
(TYPE 7-T)
(DOT 201)

STORM MANHOLE TOP

TYPE "P" MANHOLE

TABLE OF SIDEWALK JOINTS

TYPE	LOCATION
"A"	AT P.C. AND P.T. OF CURVES AND AT JUNCTION OF EXISTING AND NEW SIDEWALKS.
"B"	5'-0" CENTER TO CENTER ON NEW SIDEWALKS.
"C"	WHERE NEW SIDEWALK ABUTS CONCRETE CURBS, DRIVEWAYS AND SIMILAR STRUCTURES

SIDEWALK CONSTRUCTION

SIDEWALK CONSTRUCTION DETAILS

5-6-04
GARY L. BASHAM P.E. FL. REG. NO. 44627

APPLICATION 031216-16
EXHIBIT 4

FINAL APPROVED BY GB
AUG 11 2004
WPB

COMPUTER FILE REF.	FIELD BK./PG.
03139BASE	

CULPEPPER & TERPENING, INC.
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FLORIDA BOARD OF PROFESSIONAL ENGINEERS AUTHORIZATION NO. 4286

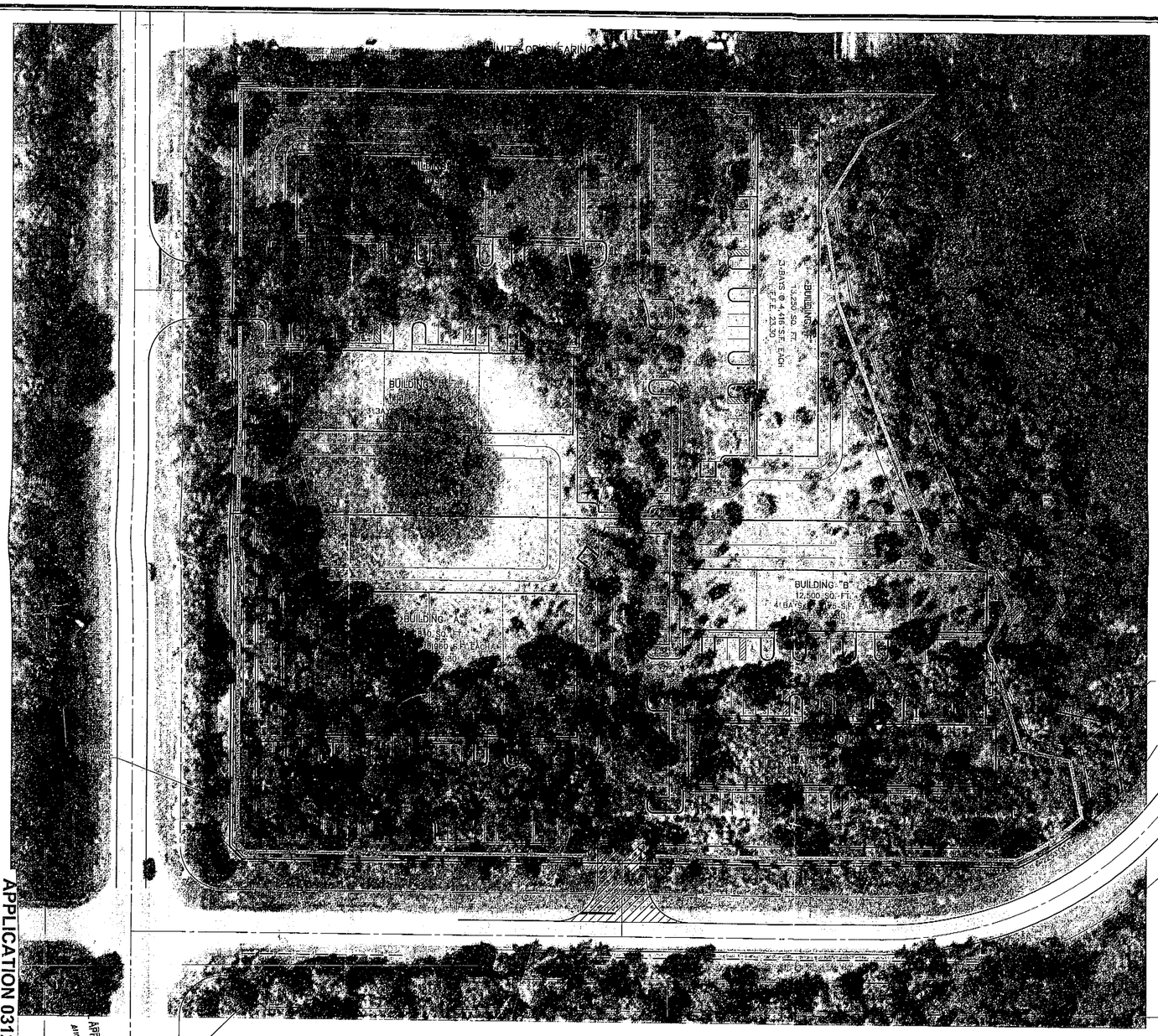
- REVISIONS -	BY	DATE
REVISED CONTROL STRUCTURE WEIR	D.F.	1-6-04
REVISED OPEN-CUT DETAIL AND CONTROL STRUCTURES NO. 1 & 2	D.F.	4-9-04
REVISED CONTROL STRUCTURES 1 AND 2	D.F.	5-5-04

	BY	DATE
DESIGNED	P.P.P.	11-1-03
CALCS.		
DRAWN	D.F.	11-5-03
DETAILED		
CHECKED		
APPROVED		

MAYO WAREHOUSE

PAVING & DRAINAGE DETAILS

DATE: 11-5-03
HORIZ. SCALE: NTS
VERT. SCALE: NTS
JOB No. 03-139
SHEET 4 OF 6



GENERAL DESCRIPTION

Measures taken to protect adjacent waterways, ditches and canals during construction will include silt fencing around the limits of clearing, a temporary gravel construction entrance, and straw bales around drop inlets. Silt fencing shall be constructed between the limits of construction, adjacent properties, water ways, and environmentally sensitive areas.

GENERAL NOTES

1.) Contractor is responsible for construction and maintenance of silt fencing and turbidity barriers.
2.) Perimeter silt fencing shall be installed and approved by engineer prior to site clearing.
3.) All disturbed areas that will not be brought to final grade for thirty days or more shall be seeded and mulched.
4.) All vehicles entering and leaving the site must use the temporary gravel construction entrance as shown in the accompanying detail.
5.) All fill areas shall be stabilized with seed and mulch.
6.) Detention areas shall be excavated and sodded prior to mass grading.
7.) All elevations and benchmarks shown hereon are relative to the National Geodetic Vertical Datum (N.G.V.D.) of 1929.
8.) Drainage System:
The storm sewer system and surface water management system shown depicts the general character of the final system and is subject to adjustment during final design and permitting, which will be submitted as the final construction plans. The final drainage system design and construction shall be in accordance with the standard specifications for public works in the St. Lucie County and the requirements of the South Florida Water Management District.

5-6-04
GARY L. BASHAM P.E. FL. REG. NO. 44627

APPLICATION 031216-16
EXHIBIT 5

APPROVED BY GB
AUG 1 2004
WMB

COMPUTER FILE REF.	FIELD BK./PG.
03139BASE	
ESC	

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CALCS.		
DRAWN	D.F.	11-5-03
DETAILED		
CHECKED		
APPROVED		

MAYO WAREHOUSE

LAND CLEARING, EROSION & SEDIMENT CONTROL PLAN

DATE: 11-5-03
HORIZ. SCALE: 1"= 40'
VERT. SCALE:
JOB No. 03-139
SHEET 5 OF 6

PROTECTION AROUND INLETS OR SIMILAR STRUCTURES

BARRIERS FOR FILL SLOPES

BARRIER FOR PAVED DITCH

NOTES FOR BALED HAY OR STRAW BARRIERS

1. TYPE I AND TYPE II BARRIERS SHOULD BE SPACED IN ACCORDANCE WITH CHART I, SHEET 1.
2. HAY BALES SHALL BE TRENCHED 3" TO 4" AND ACHORED WITH TWO 1"X2"(OR 1"DIA) X 4' WOOD STAKES. STAKES OF OTHER MATERIAL OR SHAPE PROVIDING EQUIVALENT STRENGTH MAY BE USED IF APPROVED BY THE ENGINEER. STAKES OTHER THAN WOOD SHALL BE REMOVED UPON COMPLETION OF THE PROJECT.
3. RAILS AND POSTS SHALL BE 2"X4" WOOD. OTHER MATERIALS PROVIDING EQUIVALENT STRENGTH MAY BE USED IF APPROVED BY THE ENGINEER.
4. ADJACENT BALES SHALL BE BUTTED FIRMLY TOGETHER. UNAVOIDABLE GAPS SHALL BE PLUGGED WITH HAY OR STRAW TO PREVENT SILT FROM PASSING.
5. WHERE USED IN CONJUNCTION WITH SILT FENCE, HAY BALES SHALL BE PLACED ON THE UPSTREAM SIDE OF THE FENCE.
6. BALES TO BE PAID FOR UNDER THE CONTRACT UNIT PRICE FOR BALED HAY OR STRAW, EA. THE UNIT PRICE SHALL INCLUDE THE COST OF FILTER FABRIC FOR TYPE I AND II BARRIERS. SAND BAGS SHALL BE PAID FOR UNDER THE UNIT PRICE FOR SANDBAGGING, CY. ROCK BAGS SHALL BE PAID FOR UNDER THE CONTRACT UNIT PRICE FOR ROCK BAGS, EA.

BARRIERS FOR UNPAVED DITCHES

BALED HAY AND BALED STRAW BARRIERS

F.D.O.T. STD. INDEX #102 sheet 2 of 3

NOTE:
1. INSPECT AND REPAIR FENCE AFTER EACH STORM EVENT AND REMOVE SEDIMENT WHEN NECESSARY. ANY REQUIRED REPAIRS SHALL BE MADE IMMEDIATELY.
2. SEDIMENT DEPOSITS SHALL BE REMOVED WHEN DEPOSITS REACH APPROXIMATELY ONE HALF THE HEIGHT OF THE BARRIER.
3. REMOVED SEDIMENT SHALL BE DEPOSITED TO AN AREA THAT WILL NOT CONTRIBUTE TO OFF-SITE SEDIMENTATION.
4. SILT FENCE SHALL BE PLACED ON SLOPE CONTOURS TO MAXIMIZE PONDING EFFICIENCY.
5. SILT FENCING SHALL BE REPLACED AFTER SIX MONTHS OF NORMAL USE.
6. POSTS SHALL BE SPACED A MAXIMUM OF 10 FEET APART AT THE BARRIER LOCATION AND A MAXIMUM OF 6 FEET APART FOR EXTRA STRENGTH FILTER FABRIC.
7. THE STANDARD STRENGTH FILTER FABRIC SHALL BE STAPLED OR WIRED TO THE FENCE AND 8 INCHES OF THE FABRIC SHALL EXTEND INTO THE TRENCH
8. SILT FENCING SHALL NOT BE REMOVED BEFORE THE UPSLOPE SURFACE HAS BEEN PERMANENTLY STABILIZED.

DOUBLE ROW STAKED SILTATION BARRIER

*NOTE: DOUBLE ROW SILTATION FENCE SHALL BE PLACED ALONG PERIMETER OF PROJECT AS INDICATED ON EROSION & SEDIMENT CONTROL PLAN.

JOINING TWO SILT FENCES

Note: Silt Fence to be paid for under the contract unit price for Staked Silt Fence (LF).

TYPE III SILT FENCE

Note: Spacing for Type III Fence to be in accordance with Chart I, Sheet 1 of 3 and ditch installations at drainage structures Sheet 2 of 3.

Type III Silt Fence

SILT FENCE APPLICATIONS

Do not deploy in a manner that silt fences will act as a dam across permanent flowing watercourses. Silt fences are to be used at upland locations and turbidity barriers used at permanent bodies of water.

BAILED HAY OR STRAW BARRIERS AND SILT FENCES
F.D.O.T. INDEX #102

SILT FENCE

F.D.O.T. STD. INDEX #102 sheet 3 of 3

NOTE:
1. INSPECT AND REPAIR FENCE AFTER EACH STORM EVENT AND REMOVE SEDIMENT WHEN NECESSARY. ANY REQUIRED REPAIRS SHALL BE MADE IMMEDIATELY.
2. SEDIMENT DEPOSITS SHALL BE REMOVED WHEN DEPOSITS REACH APPROXIMATELY ONE HALF THE HEIGHT OF THE BARRIER.
3. REMOVED SEDIMENT SHALL BE DEPOSITED TO AN AREA THAT WILL NOT CONTRIBUTE TO OFF-SITE SEDIMENTATION.
4. SILT FENCE SHALL BE PLACED ON SLOPE CONTOURS TO MAXIMIZE PONDING EFFICIENCY.
5. SILT FENCING SHALL BE REPLACED AFTER SIX MONTHS OF NORMAL USE.
6. POSTS SHALL BE SPACED A MAXIMUM OF 6 FEET APART AT THE BARRIER LOCATION.
7. THE STANDARD STRENGTH FILTER FABRIC SHALL BE STAPLED OR WIRED TO THE FENCE AND 8 INCHES OF THE FABRIC SHALL EXTEND INTO THE TRENCH
8. SILT FENCING SHALL NOT BE REMOVED BEFORE THE UPSLOPE SURFACE HAS BEEN PERMANENTLY STABILIZED.

APPLICATION 031216-16
EXHIBIT 6

FINAL APPROVED BY GB
AUG 11 2004
WPB

GENERAL NOTES

1. A Soil Tracking Prevention Device (STPD) shall be constructed at locations designated by the engineer for points of egress from unstabilized areas of the project to public roads where offsite tracking of mud could occur. Traffic from unstabilized areas of the construction project shall be directed thru a STPD. Barriers, flagging, or other positive means shall be used as required to limit and direct vehicular egress across the STPD.
2. The Contractor may propose an alternative technique to minimize offsite tracking of sediment. The alternative must be reviewed and approved by the Engineer prior to its use.
3. All materials spilled, dropped, or tracked onto public roads (Including the STPD aggregate and construction mud) shall be removed daily, or more frequently if so directed by the Engineer.
4. Aggregates shall be as described in Section 901 excluding 901-2.3. Aggregates shall be FDOT size #1. If this size is not available, the next available smaller size aggregate may be substituted with the approval of the Engineer. Sizes containing excessive small aggregate will track off the project and are unsuitable.
5. The sediment pit should provide a retention volume of 3600 cubic feet/acre of surface area draining to the pit. When the STPD is isolated from other drainage areas, the following pit volumes will satisfy this requirement:
   15' x 50' = 100 ft³   30' x 50' = 200 ft³
   As an option to the sediment pit, the width of the swale bottom can be increased to obtain the volume. When the sediment pit or swale volume has been reduced to one half, it shall be cleaned. When a swale is used, hay bales or silt fence shall be placed along the entire length.
6. The swale ditch draining the STPD shall have a 0.2% minimum and a 1.0% maximum grade along the STPD and to the sediment pit.
7. Mitered end sections are not required when the sidedrain pipe satisfies the clear zone requirements.
8. The STPD shall be maintained in a condition that will allow it to perform its function. To prevent offsite tracking, the STPD shall be rinsed (daily when in use) to move accumulated mud downward thru the stone. Additional stabilization of the vehicular route leading to the STPD may be required to limit the mud tracked.
9. A STPD shall be paid for under the contract unit price for Soil Tracking Prevention Device, EA. The unit price shall constitute full compensation for construction, maintenance, replacement of materials, removal, and restoration of the area utilized for the STPD, including but not limited to excavation, grading, temporary pipe (including MES when required), filter fabric, aggregate, paved turnout (including asphalt and base construction), ditch stabilization, approach route stabilization, sediment removal and disposal, water, rinsing and cleaning of the STPD and cleaning of public roads, grassing and sod. Hay bales shall be paid for under the contract unit price for Hay or Straw Baled, EA. Silt fence shall be paid for under the contract unit price for Staked Silt Fence, LF.
10. The nominal size of a standard STPD is 15' x 50' unless otherwise shown in the plans. If the volume of entering and exiting vehicles warrant, a 30' width STPD may be used if approved by the Engineer. When a double width (30') STPD is used, the pay quantity shall be 2 for each location.

NOTES:
1. THE ENTRANCE SHALL BE MAINTAINED IN A CONDITION THAT WILL PREVENT TRACKING OR FLOWING OF SEDIMENT ONTO PUBLIC RIGHTS-OF-WAY. THIS MAY REQUIRE TOP DRESSING, REPAIR AND/OR CLEANOUT OF ANY MEASURES USED TO TRAP SEDIMENT.
2. WHEN NECESSARY, WHEELS SHALL BE CLEANED PRIOR TO ENTRANCE ONTO PUBLIC RIGHT-OF-WAY.
3. WHEN WASHING IS REQUIRED, IT SHALL BE DONE ON AN AREA STABILIZED WITH CRUSHED STONE THAT DRAINS INTO AN APPROVED SEDIMENT TRAP OR SEDIMENT BASIN.
4. ALL MATERIALS SPILLED, DROPPED, WASHED OR TRACKED FROM VEHICLES ONTO ROADWAYS OR INTO STORM DRAINS MUST BE REMOVED IMMEDIATELY.

SOIL TRACKING PREVENTION DEVICE (STPD)

F.D.O.T. STD. INDEX #106

5-6-04
GARY L. BASHAM P.E. FL. REG. NO. 44627

COMPUTER FILE REF.	FIELD BK./PG.
03139BASE	
ESC DET	

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CALCS.		
DRAWN	D.F.	11-5-03
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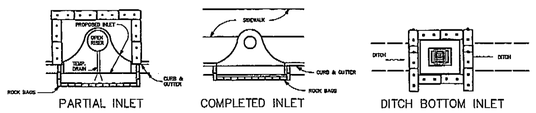
MAYO WAREHOUSE

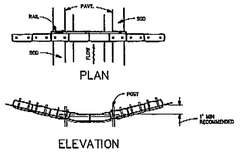
EROSION & SEDIMENT CONTROL DETAILS

DATE: 11-5-03
HORIZ. SCALE: NTS
VERT. SCALE: NTS
JOB No. 03-139
SHEET 6 OF 6



PARTIAL INLET COMPLETED INLET DITCH BOTTOM INLET

PROTECTION AROUND INLETS OR SIMILAR STRUCTURES



PLAN

ELEVATION

BARRIER FOR PAVED DITCH

NOTES FOR BALED HAY OR STRAW BARRIERS

1. TYPE I AND TYPE II BARRIERS SHOULD BE SPACED IN ACCORDANCE WITH CHART 1, SHEET 1.
2. HAY BALES SHALL BE TRENCHED 3" TO 4" AND ANCHORED WITH TWO 1"X2"(OR 1"DIA) X 4' WOOD STAKES. STAKES OF OTHER MATERIAL OR SHAPE PROVIDING EQUIVALENT STRENGTH MAY BE USED IF APPROVED BY THE ENGINEER. STAKES OTHER THAN WOOD SHALL BE REMOVED UPON COMPLETION OF THE PROJECT.
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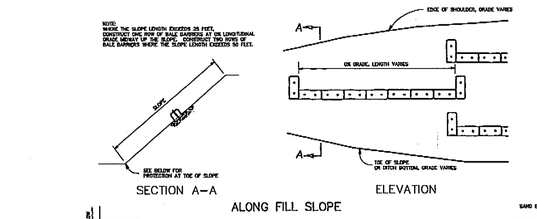
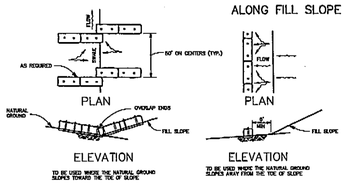


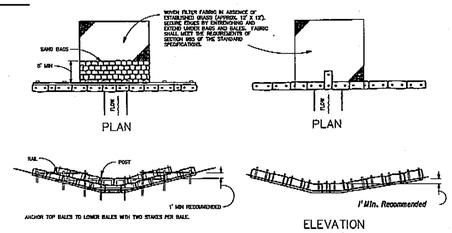
SECTION A–A ELEVATION

ALONG FILL SLOPE



AT TOE OF SLOPE

BARRIERS FOR FILL SLOPES



BARRIERS FOR UNPAVED DITCHES

BALED HAY AND BALED STRAW BARRIERS

F.D.O.T. STD. INDEX #102 sheet 2 of 3

NOTE:
1. INSPECT AND REPAIR FENCE AFTER EACH STORM EVENT AND REMOVE SEDIMENT WHEN NECESSARY. ANY REQUIRED REPAIRS SHALL BE MADE IMMEDIATELY.
2. SEDIMENT DEPOSITS SHALL BE REMOVED WHEN DEPOSITS REACH APPROXIMATELY ONE HALF THE HEIGHT OF THE BARRIER.
3. REMOVED SEDIMENT SHALL BE DEPOSITED TO AN AREA THAT WILL NOT CONTRIBUTE TO OFF-SITE SEDIMENTATION.
4. SILT FENCE SHALL BE PLACED ON SLOPE CONTOURS TO MAXIMIZE PONDING EFFICIENCY.
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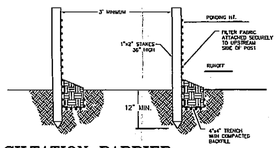
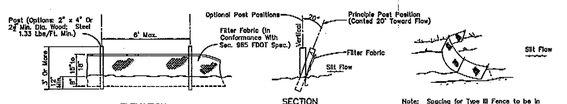
6. POSTS SHALL BE SPACED A MAXIMUM OF 10 FEET APART AT THE BARRIER LOCATION AND A MAXIMUM OF 6 FEET APART FOR EXTRA STRENGTH FILTER FABRIC.
7. THE STANDARD STRENGTH FILTER FABRIC SHALL BE STAPLED OR WIRED TO THE FENCE AND 8 INCHES OF THE FABRIC SHALL EXTEND INTO THE TRENCH.
8. SILT FENCING SHALL NOT BE REMOVED BEFORE THE UPSLOPE SURFACE HAS BEEN PERMANENTLY STABILIZED.



DOUBLE ROW STAKED SILTATION BARRIER

*NOTE: DOUBLE ROW SILTATION FENCE SHALL BE PLACED ALONG PERIMETER OF PROJECT AS INDICATED ON EROSION & SEDIMENT CONTROL PLAN.



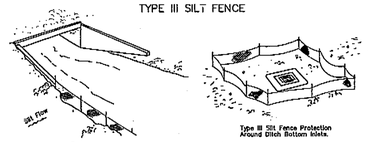
ELEVATION SECTION

Note: Silt Fence to be paid for under the contract unit price for Staked Silt Fence (LF).

TYPE III SILT FENCE

Note: Spacing for Type III Fence to be in accordance with Chart 1, Sheet 1 of 3 and ditch installations at drainage structures Sheet 2 of 3.

Type III Silt Fence



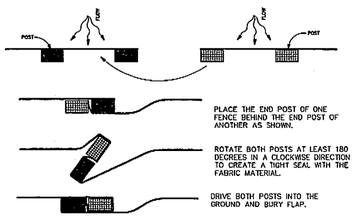
Do not deploy in a manner that silt fences will act as a dam across permanent flowing watercourses. Silt fences are to be used at upland locations and turbidity barriers used at permanent bodies of water.

BAILED HAY OR STRAW BARRIERS AND SILT FENCES
F.D.O.T. INDEX #102

SILT FENCE APPLICATIONS

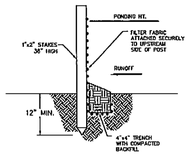
SILT FENCE

F.D.O.T. STD. INDEX #102 sheet 3 of 3



PLAN VIEW

JOINING TWO SILT FENCES

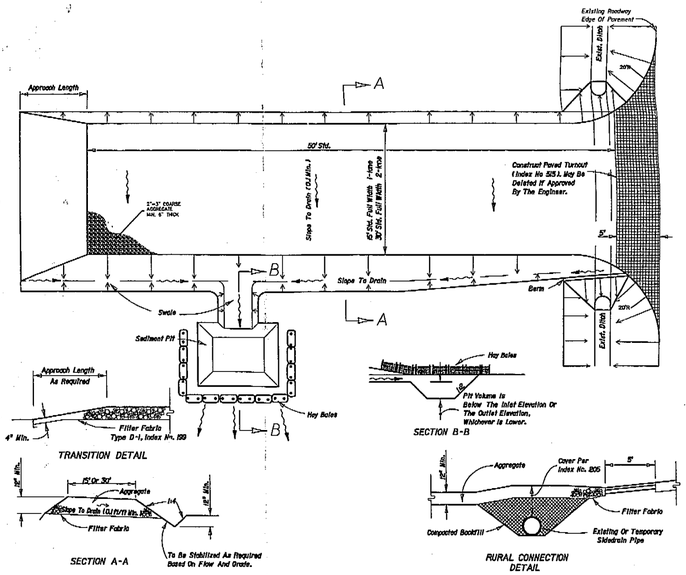


NOTE:
1. INSPECT AND REPAIR FENCE AFTER EACH STORM EVENT AND REMOVE SEDIMENT WHEN NECESSARY. ANY REQUIRED REPAIRS SHALL BE MADE IMMEDIATELY.
2. SEDIMENT DEPOSITS SHALL BE REMOVED WHEN DEPOSITS REACH APPROXIMATELY ONE HALF THE HEIGHT OF THE BARRIER.
3. REMOVED SEDIMENT SHALL BE DEPOSITED TO AN AREA THAT WILL NOT CONTRIBUTE TO OFF-SITE SEDIMENTATION.
4. SILT FENCE SHALL BE PLACED ON SLOPE CONTOURS TO MAXIMIZE PONDING EFFICIENCY.
5. SILT FENCING SHALL BE REPLACED AFTER SIX MONTHS OF NORMAL USE.
6. POSTS SHALL BE SPACED A MAXIMUM OF 6 FEET APART AT THE BARRIER LOCATION.
7. THE STANDARD STRENGTH FILTER FABRIC SHALL BE STAPLED OR WIRED TO THE FENCE AND 8 INCHES OF THE FABRIC SHALL EXTEND INTO THE TRENCH.
8. SILT FENCING SHALL NOT BE REMOVED BEFORE THE UPSLOPE SURFACE HAS BEEN PERMANENTLY STABILIZED.

GENERAL NOTES

1. A Soil Tracking Prevention Device (STPD) shall be constructed at locations designated by the engineer for points of egress from unstabilized areas of the project to public roads where vehicle tracking of mud could occur. Traffic from unstabilized areas of the construction project shall be directed thru a STPD. Barricades, flagging, or other positive means shall be used as required to limit and direct vehicular egress across the STPD.
2. The Contractor may propose an alternative technique to minimize offsite tracking of sediment. The alternative must be reviewed and approved by the Engineer prior to its use.
3. All materials spilled, dropped, or tracked onto public roads (including the STPD aggregate) and construction road) shall be removed daily, or more frequently if so directed by the Engineer.
4. Aggregates shall be as described in Section 901 excluding 901-2.3. Aggregates shall be FDOT size "#1". If this size is not available, the next available smaller size aggregate may be substituted with the approval of the Engineer. Sizes containing excessive small aggregate will track off the project and are unsuitable.
5. The sediment pit should provide a retention volume of 3600 cubic feet/acre of surface area draining to the pit. When the STPD is isolated from other drainage areas, the following pit volumes will satisfy this requirement:
   15' x 50' = 100 ft³ 30' x 50' = 200 ft³
   As an option to the sediment pit, the width of the swale bottom can be increased to obtain the volume. When the sediment pit or swale volume has been reduced to one half, it shall be cleaned. When a swale is used, hay bales or silt fence shall be placed along the entire length.
6. The swale ditch draining the STPD shall have a 0.2% minimum and a 10% maximum grade along the STPD and to the sediment pit.
7. Mitered end sections are not required when the sidedrain pipe satisfies the clear zone requirements.
8. The STPD shall be maintained in a condition that will allow it to perform its function. To prevent offsite tracking, the STPD shall be raked daily when in use) to move accumulated mud downward thru the slope. Additional stabilization of the vehicular route leading to the STPD may be required to limit the mud tracked.
9. A STPD shall be paid for under the contract unit price for Soil Tracking Prevention Device, EA. The unit price shall constitute full compensation for construction, maintenance, replacement of materials, removal, and restoration of the area utilized for the STPD, including but not limited to excavation, grading, temporary pipe (including APE when required), filter fabric, aggregate, paved turnout (including asphalt and base construction), ditch stabilization, approach route stabilization, sediment removal and disposal, water, raising and cleaning of the STPD and cleaning of public roads, grassing and sod. Hay bales shall be paid for under the contract unit price for Hay or Straw Bales, EA. Silt Fence shall be paid for under the contract unit price for Staked Silt Fence, LF.
10. The nominal size of a standard STPD is 15' x 50' unless otherwise shown in the plans. If the volume of entering and exiting vehicles warrant, a 30' width STPD may be used if approved by the Engineer. When a double width (30') STPD is used, the pay quantity shall be 2 for each location.

NOTES:
1. THE ENTRANCE SHALL BE MAINTAINED IN A CONDITION THAT WILL PREVENT TRACKING OR FLOWING OF SEDIMENT ONTO PUBLIC RIGHTS-OF-WAY. THIS MAY REQUIRE TOP DRESSING, REPAIR AND/OR CLEANOUT OF ANY MEASURES USED TO TRAP SEDIMENT.
2. WHEN NECESSARY, WHEELS SHALL BE CLEANED PRIOR TO ENTRANCE ONTO PUBLIC RIGHT-OF-WAY.
3. WHEN WASHING IS REQUIRED, IT SHALL BE DONE ON AN AREA STABILIZED WITH CRUSHED STONE THAT DRAINS INTO AN APPROVED SEDIMENT TRAP OR SEDIMENT BASIN.
4. ALL MATERIALS SPILLED, DROPPED, WASHED OR TRACKED FROM VEHICLES ONTO ROADWAYS OR INTO STORM DRAINS MUST BE REMOVED IMMEDIATELY.



SOIL TRACKING PREVENTION DEVICE (STPD)

F.D.O.T. STD. INDEX #106

11-5-03

GARY L. BASHAM P.E. FL. REG. NO. 44627

APPLICATION 03216-16
EXHIBIT 6

FINAL APPROVED BY GB
AUG 11 2004
WPB

COMPUTER FILE REF.	FIELD BK./PG.
03139BASE	
ESC DET	

CULPEPPER & TERPENING, INC.
CONSULTING ENGINEERS & LAND SURVEYORS
1780 SOUTH 25th STREET
FORT PIERCE, FLORIDA 34981
(772) 464-3537
FLORIDA BOARD OF PROFESSIONAL ENGINEERS AUTHORIZATION NO. 4286

– REVISIONS –	BY	DATE

	BY	DATE
DESIGNED	G.L.B.	11-5-03
CALCS.		
DRAWN	D.F.	11-5-03
DETAILED		
CHECKED		
APPROVED		

MAYO WAREHOUSE

EROSION & SEDIMENT CONTROL DETAILS

DATE: 11-5-03
HORIZ. SCALE: NTS
VERT. SCALE: NTS
JOB No. 03-139
SHEET 6 OF 6