FINAL
POND SITING REPORT

FLORIDA'S TURNPIKE (SR 91) WIDENING WITH EXPRESS LANES FROM SOUTH OF SR 500 TO OSCEOLA PARKWAY

OSCEOLA COUNTY, FLORIDA

FINANCIAL PROJECT ID NUMBER: 436194-1-52-01

Prepared For:

Date: December 04, 2020

PROFESSIONAL ENGINEER CERTIFICATION

I hereby certify that I am a registered professional engineer in the State of Florida practicing with Moffatt & Nichol and that I have prepared or approved the evaluation, findings, opinions, conclusions, or technical advice hereby reported for:

Project: Widening Turnpike from of Neptune Road (MP 242.072) to north of the Osceola Parkway (MP 248.844)

The engineering work represented by this document was performed through the following duly authorized engineering business:

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This FINAL Pond Siting Report contains preliminary hydrological analysis and other information that fulfills the purpose and need for the Florida's Turnpike (SR 91) Widening from South of SR 500 to Osceola Parkway, Osceola County, Florida. I acknowledge that the procedures and references used to develop the results contained in this report are standard to the professional practice of hydrologic analysis and hydraulic engineering as applied through professional judgment and experience.

Any engineering analysis, documents, conclusions, or recommendations replied upon from other professional sources or provided with responsibility by the client are referenced accordingly in the following report.

Gary J.D. Elwer State of Florida, Professional Engineer, License No. **42553**
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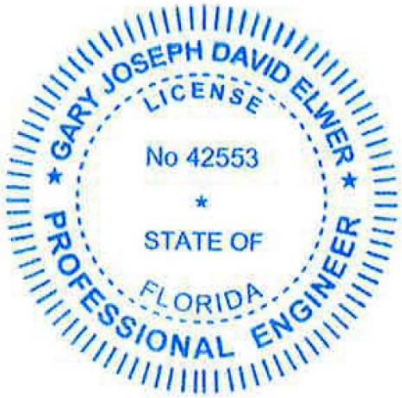

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EXECUTIVE SUMMARY

The Florida Department of Transportation (FDOT), Florida's Turnpike Enterprise (FTE)- proposes to widen the Florida's Turnpike (SR 91) from a four (4)-lane rural typical section to an eight (8)-lane typical section by adding two lanes to the inside in each direction. The intent of this Pond Siting Report is to provide documentation of the preliminary analysis of the pond site alternatives for the stormwater management and floodplain facilities for the design project. This report's purpose is to determine the best location for each facility based on several factors summarized in the report.

Unless otherwise shown, elevations and stages shown in tables are referenced to the North American Vertical Datum (NAVD) 1988. Elevations shown in parenthesis are referenced to the National Geodetic Vertical Datum (NGVD) 1929. The datum conversion is as follows:

NAVD '88 = NGVD 29-0.95' or NGVD '29 = NAVD '88+0.95

The summary of the preliminary recommended pond sites is shown below:

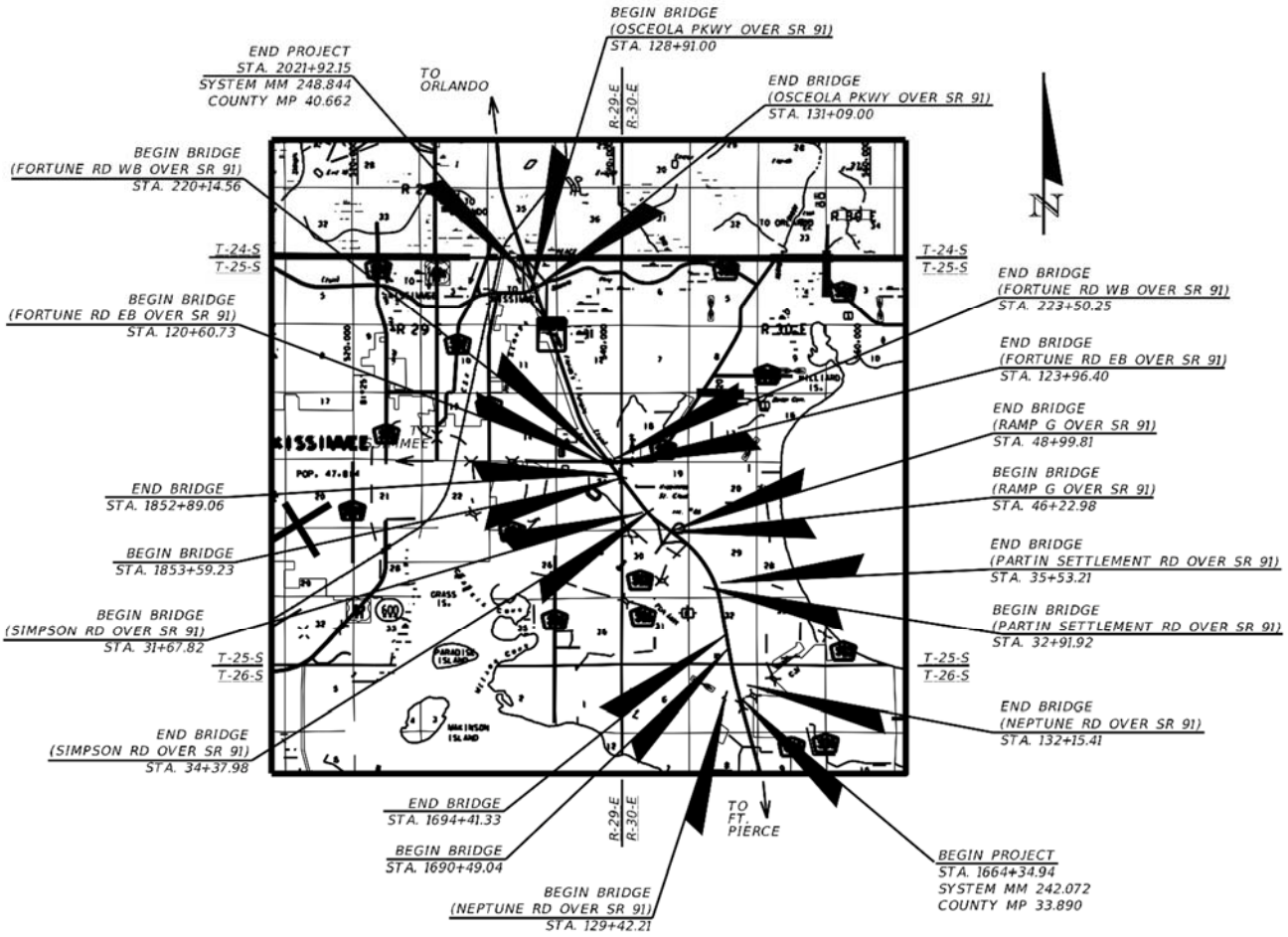
Summary of Recommended Pond Sites

Basin	Recommended Pond Alternative
1	Pond 1-A
2	Pond 2-D
3	Ponds 3-C and 3-D
4	Ponds 4-B and 4-D
5	Pond 5-A
6	Pond 6-A
7	Pond 7-A
8	None
9	Pond 9-C
10	Pond 10-C (existing ponds)
11	Ponds 11-A and 11-C (existing ponds)
FPC-Fish	Pond FPC Fish 1and Pond 2-B
FPC-Fennel	Pond FPC Fennel 2
FPC-Bass	Ponds FPC Bass 2, 3, 4, 5 and 6
FPC-Mill	Pond FPC Mill 4

SECTION 1.0 – INTRODUCTION

The Florida Department of Transportation (FDOT), Florida's Turnpike Enterprise (FTE) proposes to widen the Turnpike (SR 91) from a four (4)-lane rural typical section to an eight (8)-lane corridor by adding two lanes to the inside in each direction. The intent of this Pond Siting report is to provide documentation of the preliminary analysis of the pond site alternatives for the stormwater management and floodplain facilities for the design project. Below is the project location.

Figure 1-1: Project Location Map



SECTION 2.0 –PROJECT DESCRIPTION

The project limits are between Station 1664+34.94 to Station 2021+92.15 and lies within Sections 2, 11, 12, 13, and 24 of Township 25 South, Range 29 East, Sections 19, 29, 30, and 32 of Township 25 South, Range 30 East and Section 5 of Township 26 South, Range 30 East. Refer to the **Figure 2-1 USGS Quadrangle Map**. The project involves the widening of SR 91 from a four (4) lane rural typical section to an eight (8) lane corridor in Osceola County between just north of Neptune Road (**MP 242.072**) to north of the Osceola Parkway (**MP 248.844**).

The project deviated from the original scope of widening to the outside in order to avoid disturbing a gas line along the left side of the corridor. Therefore, the roadway horizontal alignment was shifted to the right along most of the project limits. Due to the reconstruction required, the vertical alignment was also raised to minimize existing base clearance issues. The proposed project improvements are illustrated on **Figure 2-2 Typical Section**.

Stormwater treatment and attenuation ponds are only required for the additional amount of new impervious area. Floodplain compensation ponds are required for any impacts to the existing floodplains.

Unless otherwise shown, elevations and stages shown in tables are referenced to the North American Vertical Datum (NAVD) 1988. Elevations shown in parenthesis are referenced to the National Geodetic Vertical Datum (NGVD) 1929. The datum conversion is as follows:

NAVD ’88 = NGVD 29-0.95’ or NGVD ’29 = NAVD ‘88+0.95

SECTION 3.0 – DATA COLLECTION

Project information was obtained from a variety of sources as listed below:

- Existing Turnpike Plans (1960's)
- Aerial Photography
- LIDAR Osceola 2016 3DEP 2.5-ft https://hub.arcgis.com/datasets/aa4bd98a11c9406984033f323bd766eb
- FDEP Florida's Water Permitting Portal (http://flwaterpermits.com/) (SFWMD Permits
- Osceola County Property Appraiser's web page (https://ira.property-appraiser.org/gis/)
- U.S. Department of Agriculture, Natural Resources Conservation Service (NRCS)
- U.S. Department of Agriculture, Soil Conservation Service (SCS)
- Osceola County Interactive Mapping website: (https://www.osceola.org/agencies-departments/community-development/offices/planning-office/comprehensive-plan/comprehensive-plan-documents/future-land-use-maps.stml)
- FEMA Flood Insurance Rate Maps (FIRM) Maps
- Flood Risk Report, Osceola County, Florida, 03080101, 03090101, Report Number 01, (05/16/2013)
- Flood Insurance Study, Osceola County, Florida (Revised June 18, 2013)
- Bass Slough Basin, Stormwater management Plan, Osceola County/ SFWMD
- 2020 General Tolling Requirements (GTR)
- 2020 Turnpike Design Handbook (TDH)
- 2020 Turnpike Supplement to the FDOT Drainage Manual
- 2020 FDOT Drainage Manual
- 2020 FDOT Design Manual (FDM)

SECTION 4.0 – DESIGN CRITERIA

4.1 Anticipated Permits

The project will require several types of permits during design and construction.

SFWMD ERP
The project's proposed reconstruction improvements will require a modification of South Florida Water Management District Permit No 48-01443-P (Application No. 160425-20).

USACE Permit:
A separate Section 404 Dredge and Fill Permit from the U.S. Army Corps of Engineers is expected to address wetland/other surface waters impacts.

EPA (FDEP)
The project will have an acre or more of soil disturbing activities and will therefore require National Pollution Discharge Elimination System (NPDES). A Stormwater Pollution Prevention Plan (SWPPP) will be prepared and is included in compliance with the National Pollution Discharge Elimination System (NPDES) permitting criteria administered by Florida Department of Environmental Protection (FDEP).

Wildlife Permits (USFWS & FFWCC)
Wildlife permits from the U.S. Fish and Wildlife Service (USFWS) or the Florida Fish and Wildlife Conservation Commission (FFWCC) may also be required for the mainline and potentially the pond sites.

- USFWS-No Biological Opinion/Incidental Take Permits are anticipated but the final determination is pending results of the caracara and bonneted bat surveys. No pond site alternative was observed to contain the bonneted bat or caracara at this time.
- FFWCC-A Conservation permit to relocate gopher tortoises will be required for the mainline project. Pond Alternative 8C contained additional gopher tortoise burrows but was not a preferred alternative.

Listed Species Effect Determinations

All pond site alternatives were inspected for the potential to contain federal and state listed species. This assessment can be found in **Appendix D**, *Tech Memo Federal Wildlife Assessment of the Pond Site Alternatives*. The following federal and state Listed Species Preliminary Effect Determinations Summary are excerpts from the tech memo. Please note that the coordination listed below occurred early in the project development and did not include pond alternatives. The FTE will re-initiate coordination to verify that USFWS and FFWCC concur with the proposed effect determinations based on the new design and pond alternatives.

Federal Listed Species

- Wood stork –According to the USFWS South Florida Programmatic Concurrence for the wood stork, projects that impact more than 0.5 acres of SFH within a wood stork CFA that also provide appropriate habitat compensation to offset the loss of SFH will have an effect determination of "may affect, not likely to adversely affect." During the 2016 informal consultation meeting regarding the mainline ROW impacts, USFWS stated that if the ditch impacts will be replaced with similar ditches, the applicant should focus on the wetland impacts for the foraging analysis and make sure that the hydroperiod is replaced in kind. A Wood Stork Foraging Habitat Assessment will be used to estimate the biomass of wood stork forage provided per unit quantity of wetland habitat. The direction of the new design will increase the amount of the ditch and wetland impact

along the mainline, but it is anticipated that these impacts will be replaced with linear pond facilities that will replace suitable foraging habitat. The Turnpike will reinitiate coordination with USFWS to verify that they concur with the proposed "may affect, not likely to adversely affect" determination.

- Everglade snail kite - No snail kites were observed during field assessments. Even though the corridor contains and is adjacent to marshes, no observed occurrences were documented during field reviews, and there is no documented nesting within one mile of the corridor. Based on this information as well as the lack of lake systems, it is presumed that this species does not occur within the project footprint or within any of the proposed pond site alternatives. Therefore a "no effect" determination was proposed for this species. During the 2016 informal consultation meeting about the mainline LA R/W impacts USFWS concurred with the Turnpike's determination that the proposed project will have no effect on this species. The Turnpike will reinitiate coordination with USFWS to verify that that they concur with the "no effect" determination.

- Bald eagle - The closest documented bald eagle nest is approximately one-half mile from the project corridor and none of the pond site alternatives area within 660 feet of any documented bald eagle nests. This project will have "no effect" on the bald eagle. Turnpike will reinitiate coordination with USFWS to verify that they concur with this proposed effect determination.

- Florida scrub-jay - During the 1992/1993 FFWCC statewide survey, scrub-jay habitat was identified along the Turnpike; however, this location has since been developed with a neighborhood and retention pond. Because historical scrub jay habitat was documented in the region, each pond site was inspected for the suitable habitat and species potential. Suitable habitat structure (i.e. low growing scrub oak, or type 1 or type 2 habitat) to support this species was not present along the mainline or any of the pond site alternatives. Therefore, a "no effect" determination is proposed for this species. During the 2016 informal consultation meeting about the mainline LA R/W impacts USFWS concurred with the Turnpike's determination that the proposed project will have no effect on this species. The Turnpike will reinitiate coordination with USFWS to verify that that they still concur with this determination.

- Crested caracara - Suitable nesting habitat within the project corridor is confined to the southern end of the project, while foraging opportunities are available within the ROW, primarily in the form of roadkill and in some pond site alternatives in the form of pasture.
  Stantec performed a caracara specific survey from January to April in 2017. No caracaras were observed during the survey. We are also aware that an additional caracara survey occurred along Neptune road at the southern end of the corridor in 2019 that also did not yield any observations of caracara. Because it has been more than two years since the 2017 survey, suitable caracara habitat within the project corridor will likely require an additional survey. An effect determination for this species will be based on the results of the new survey.

- Red-cockaded woodpecker - The closest documented red-cockaded woodpecker cluster is approximately 10 miles to the west of the project corridor. Furthermore, the pine trees within the project corridor are not managed and/or at an age to support this species. During the 2016 informal consultation meeting about the mainline LA R/W impacts, USFWS concurred with our determination that the proposed project will have "no effect" on this species. The Turnpike will reinitiate coordination with USFWS to verify that that they still concur with this proposed effect determination.

- Florida grasshopper sparrow - Although the project corridor occurs within the consultation area for this bird, this species is highly unlikely to occur within the project corridor because there are no documented occurrences of this species within one mile of the project corridor, suitable habitat for this species is not present within the project corridor, and no individuals were observed during the field assessment. During the 2016 informal consultation meeting about the mainline LA R/W impacts USFWS concurred with our proposed determination that the project will have "no effect" on this species. The Turnpike will reinitiate coordination with USFWS to verify that that they still concur with this determination.

- Eastern indigo snake – According to the Programmatic Key for the eastern indigo snake (January 2010, updated August 2017), the proposed project effect determination for this species is "may affect, not likely to adversely affect" because the project will impact less than twenty five acres of xeric habitat supporting less than twenty five active or inactive gopher tortoise burrows; and Florida Turnpike Enterprise commits to following the USFWS indigo snake standard protection measures and coordinate with the FFWCC to secure any and all permits needed to relocate the gopher tortoises and associated commensal species prior to construction. Any indigo snake encountered during excavation will be allowed to vacate the area prior to additional site manipulation. The Turnpike will reinitiate coordination with USFWS to verify that that they still concur with this effect determination.

- Sand and blue-tailed mole skink – The project corridor was recently reassessed in accordance to the 2020 updated USFWS guidance for the sand skink and blue-tailed mole skink. Several areas of the mainline ROW and several pond alternatives meet the USFWS 2020 criteria for potential skink occurrence (Please see the Appendix D Tech Memo). However, these areas are largely inappropriate habitat including densely vegetated areas, high water table, poorly drained, wetland, or completely regarded areas. As such, a "may affect, not likely to adversely affect" determination is made for this species. During the 2016 informal consultation meeting about the mainline LA R/W impacts USFWS stated that if the corridor does not contain elevations of at least 82 feet within one of the 20 well-drained soils types that contain this species, then the proposed project will have no effect on this species. The Turnpike will reinitiate coordination with USFWS to verify that that they still concur with this effect determination.

- Florida bonneted bat - USFWS has a consultation key for the Florida bonneted bat. According to the consultation key, if a project is partially or totally within the Florida bonneted bat consultation area, contains potential roosting habitat, and has a project footprint greater than five acres then a full autistic/roost survey is required. The southern portion of the project corridor, south of the East Irlo Bronson Memorial Highway, is located within the consultation area. The project footprint will be larger than five acres. Due to the location and size of the project a survey for Florida bonneted bats will be required for this project. The results of the bonneted bat survey will dictate the effect determination for this species.

- Florida panther - Florida panthers have been documented within Osceola County, but the project corridor is within the northern most documented extent for panthers based on telemetry (FWC 2018) and mortality data (FFWCC 2020). Based on the 2018 FFWCC telemetry data, the closest panther occurrence is over seven miles south of the project corridor. No effect to this species is anticipated; however, the Turnpike will reinitiate coordination with USFWS to verify that that they concur with this proposed effect determination.

- Lake Wales plants - These plants typically occur in intact scrub associated with the Lake Wales Ridge. All upland areas within the mainline and pond sites have experienced habitat manipulation

such as conversion to pasture, residential areas, or transportation facility. This manipulation has significantly reduced the potential for these species to persist. Additionally, the project corridor is not located within the Lake Wales Ridge. No Lake Wales Ridge plants were observed during field assessments. Based of the project's location a "no effect" determination was proposed for these species was made. The Turnpike will reinitiate coordination with USFWS to verify that that they still concur with this effect determination.

- Critical Habitat - No critical habitat for any federally listed species was identified within the project corridor including the pond site alternatives.

State Listed Species

- Gopher tortoise - A field assessment conducted by Stantec in 2016 identified five burrows within the mainline ROW, while the recent pond assessments identified nine burrows within Pond 8-Alt C. A final (100 percent) survey for this species will be conducted along the mainline LA R/W and at the preferred pond sites approximately 90 days prior to construction. All burrows within 25 feet of construction limits will be relocated with the benefit of a FFWCC permit. As such, a no adverse effects are anticipated for this species. The Turnpike will initiate coordination with FFWCC to verify that that they concur with this effect determination. The gopher tortoise was the only listed species to be observed along the mainline and a pond alternative. Because the Turnpike routinely relocates these species from roadway projects prior to construction, this species did not affect the ranking of that pond sites.

- Florida pine snake- Some habitat is available within the project, particularly within the dryer pond site alternatives. If Florida pine snakes are found during construction or during gopher tortoise relocation activities, FTE will follow current FWC guidance and allow the species to leave the construction area on its own volition before resuming construction. Based on this commitment, a no adverse effects are anticipated for the pine snake. The Turnpike will initiate coordination with FFWCC to verify that that they concur with this effect determination.

- Florida sandhill crane- No sandhill cranes have been observed during field reviews, nor have any nest sites been identified. Several of the large wetland systems have the potential to provide nesting habitat for this species. The preferred pond sites will continue to be observed for any signs of nesting cranes. At this point, the project is not expected to impact any sandhill cranes. As such, no adverse effect is anticipated for this species. The Turnpike will initiate coordination with FFWCC to verify that that they concur with this effect determination.

- Florida burrowing owl- Little potential nesting habitat is available although foraging habitat is available in the pasture areas associated with some of the pond sites. There were no direct observations of this species foraging within the corridor during field reviews and there were no documented species within this region. As such no adverse effect is anticipated for this species from the proposed project. The Turnpike will initiate coordination with FFWCC to verify that that they concur with this effect determination.

- Southeastern American kestrel- A limited amount of suitable kestrel foraging habitat exists within the project corridor within some of the pond alternatives. However, there have been no documented sightings of the kestrel within one (1) mile of the project corridor and there were no direct observation of a southeastern kestrel or a nest during field reviews. As such, **no adverse effects are anticipated for the Southeastern American kestrel.** The Turnpike will initiate coordination with FFWCC to verify that that they concur with this effect determination.

- Wading Birds- The closest wading bird rookery is documented over four (4) miles to the southeast of the project corridor. No observed wading bird rookeries will be impacted by the proposed project and indirect impacts to wading birds are not anticipated. Therefore, **no adverse effect is anticipated** for wading bird population in the region. The Turnpike will initiate coordination with FFWCC to verify that that they concur with this effect determination.

4.2 Drainage Criteria

The project is within the jurisdiction of the South Florida Water Management District's (SFWMD) Lake Tohopekaliga Basin of the Upper Kissimmee River Watershed. Sub-basins include St. Cloud, Fish Lake, Bass Slough, and Mill Slough, all open basins. Based on conversations with SFWMD (2016), the corridor has no Special Basin Requirements for Total Maximum Daily Load (TMDL), Allowable Discharge Rates, or Outstanding Florida Waters. No Class I or Class II Waters are within the project limits. The Lake Tohopekaliga Nutrient Reduction Plan has identified nutrients are not an issue to Lake Tohopekaliga water quality. Floodplain impacts will be compensated cup-for-cup. FEMA Floodplains are illustrated on **Figure 4-1**.

The original Turnpike project was constructed in the early 1960's prior to permitting requirements. The only existing ERP permits with pond requirements are for roadway improvements to Shady Lane (Toll Plaza) and at Osceola Parkway, see **Table 4-1** for existing permits. For this project, water quality treatment requirements are based on treating 2.5 inches of runoff from the net additional impervious area. Where applicable, existing permitted treatment volumes and existing treatment facilities will be maintained.

In areas where wet detention cannot be achieved, dry detention volume shall provide 75% of the wet detention volume amount and shall be located above the SHWT. In areas where both wet detention and dry detention cannot be achieved, compensation within the same SFWMD basin is allowed. Recovery shall be one half the treatment volume within 24 hours.

With the project located in Osceola County, the post development peak discharge rate for the 10-year, 72-hour design storm event shall be attenuated equal to, or less than the pre-development rate to meet water quantity requirements. New FTE LA R/W areas will be required to meet limiting discharge criteria of 0.5 cfs per acre. Storms will be routed with the SFWMD's 72- hour rainfall distribution.

Table 4-1: Existing Permits

Application Number	Permit Number	Date Issued	Consultant	Permit Limits
140403-5 & 160425-20	48-01443-P	11/9/2014 6/12/2016	WGI	Turnpike Widening from Osceola Pkwy to Beachline Expwy
040325-19	56-01913-P	4/27/2004	PBSJ	Exemption for Turnpike Median Guardrail
910805-419	49-00619-S	2/12/1992	PBSJ	Kissimmee/St. Cloud Toll Facility
911101-6	49-00637-S	7/9/1992	Sverdrup	Dart Road (Osceola Pkwy at SR 91)
940627-1	49-00619-S	7/12/1994	PBSJ	Kissimmee/St. Cloud Toll Facility

4.3 FDOT Pond Configuration and Design Criteria

The following criteria is from the *FDOT Drainage Manual*, January 2020, 5.4 Design Standards. Provide a minimum of 20-feet of horizontal clearance between the top edge of control structure and the right-of-way line. Provide at least 15-feet adjacent to pond at a slope of 1:8 or flatter. Provide 30-feet minimum radius on the inside edge of maintenance berm and be a minimum of 1-foot above the maximum design stage (freeboard).

- Sod all side slopes: to the control elevation for wet ponds; to pond bottom for dry ponds.
- Fencing requires a Design Variation.
- Provide access easement if not accessible directly from the road LA R/W.
- Ponds above existing grade need to be checked for seepage and piping.
- Berm style weir in berms must be transversable with structural and Geotechnical design.
- Wet ponds provide a minimum permanent pool depth of 6-feet.
- Watersheds with positive outlets, but with historical flooding, must assess the Rule 14-86 up to the 100-year/24-hour design storm event.
- If basins where proper treatment (volume, rate, quality) cannot be feasibly obtained, treatment of existing untreated areas that discharge to the same receiving body may be substituted in lieu of treating the project.

Aesthetics

Pond aesthetics will be addressed during the project's final design phase. It is anticipated that landscaping along the side slopes can be incorporated into the design of the ponds. To account for an irregular shape, an additional 10% is added to the required pond R/W for the purposes of this report.

SECTION 5.0 – EXISTING AND PROPOSED CONDITIONS

5.1 Existing Drainage Conditions

The general drainage pattern within the corridor is via roadside ditches constructed in the early 1960's to convey the runoff to lateral ditches, canals, cross drains or wetlands. The flow path is primarily from the northeast to southwest via sheet flow, drainage ditches, sloughs and cross drains under SR 91 that ultimately discharge into Lake Tohopekaliga. **Figure 5-1,** in **Appendix A**, illustrates the basins and sub-basins within the project corridor.

Most of the adjacent property parcels do not directly discharge to Turnpike drainage systems. The developed properties have been permitted by SFWMD and primarily discharge to existing channels, cross drains and sloughs. The project is subdivided into eleven basins and are shown on **Figure 5-2**, **Drainage Map** in **Appendix A**.

Soils
The general **Soil Map** (**Figure 5-3, Appendix A**) was obtained from the Soil Conservation Services (SCS) for Osceola County Soils. Classifications along the corridor were defined by the United States Department of Agriculture (USDA) Soil Conservation Service (SCS) which is currently known as the Natural Resource Conservation Service (NRCS). The predominate soil types are Myakka Fine Sand and Basinger Fine Sand. The terrain is relatively flat with elevations within the corridor ranging from 52.9 to 101.4. Hydraulic Soil Group (HSG) D is assumed for the project. Refer to **Table 5-1** Summary of Soils.

Land Use
The study area is comprised of large residential development intermixed with commercial development. The very few remaining undeveloped areas are mostly remnant farm areas, wetlands, and floodplain prone areas. **Figure 5-4** illustrates the development in the study area.

Table 5-1: Summary of Soils

Soil Name	Soil Number	%	HSG	High Water Table	Unified	AASHTO	Permeability (In/Hr)	Suitability for local roads and streets
Adamsville Sand	1	1.05	C	2.0-3.5	SP-SM	A-3, A-2-4	6.0-20	Moderate: wetness
Basinger Fine Sand	5	26.51	A/D	0-1.0	SP, SP-SM	A-3, A-2-4	>20	Severe: wetness
Immokalee Fine Sand	16	15.75	A/D	0-1.0	SP, SP-SM	A-3, A-2-4	6.0-20 Changes with depth	Severe: wetness
Myakka Fine Sand	22	42.26	A/D	0-1.0	SP, SM, SP-SM	A-3, A-2-4	6.0-20.0 Changes with depth	Severe: wetness
Placid Fine Sand	32	3.15	A/D	+2-1.0	SP, SP-SM, SM	A-3, A-2-4	6.0-20	Severe: wetness, ponding
Pomello Fine Sand, 0 to 5 % slope	34	1.05	C	2.0-3.5	SP, SP-SM, SM	A-3, A-2-4	>20 Changes with depth	Slight
Samsula Muck	40	1.57	A/D	+2-1.0	PT, SP-SM, SM, SP	A-3, A-2-4	6.0-20	Severe: low strength, wetness
Smyrna Fine Sand	42	8.66	A/D	0-1.0	SP,SP-SM, SM	A-3, A-2-4	6.0-20 Changes with depth	Severe: wetness

5.2 Existing Drainage Basins

A general discussion of the drainage patterns for each sub-basin follows. Low road stations and elevations, biological indicators, and geotechnical estimates of seasonal highwater elevations, 100-year flood stages, pond outfall station, basin outfall locations and stationing are summarized in **Appendix B, Design Critical Elevations**.

Existing 4-lane roadway runoff sheet flows to conveyance ditches. Runoff is collected by median and outside ditches and drain to the existing cross drains, usually at the basin outfall. Most cross drains convey water across the LA R/W from east to west.

St. Cloud Basin is comprised of one sub-basin which is identified and located as follows:

- **Basin 1** – Area contributing from Station 1658+02.00 to Station 1692+60.55 and conveys the runoff from the existing Neptune Road bridge high point to existing Turnpike bridge over SR 500. Two wetlands within the basin contain conservation easements within the LA R/W identified in permit 49-00619-S and are identified on the Drainage Maps. There are no floodplains within the basin.

  The west side of the Turnpike within the LA R/W discharges through **CD-1** to the east side located at Station 1660+00, then drains south to the north side of Neptune Road R/W, then east to the St. Cloud Canal. Off-site runoff enters this basin at an off-site cross drain located on SR 500 (east of the Turnpike) conveys runoff from Simmons Road through the St Cloud Commons development into the wetland between the off-ramp and the Turnpike mainline (no permit found). This area discharges under the NB off-ramp through **CD-2**, continues south to the basin outfall.

Fish Lake Basin is comprised of two (2) sub-basins which are identified and located as follows:

- **Basin 2** – Area contributing from Station 1692+60.55 to Station 1742+80.52 and primarily conveys runoff within the LA R/W between SR 500 and Partin Settlement Road. Each side of the turnpike drains toward cross drain **CD-3**, the basin outfall.

  Adjacent parcels to the basin primarily discharge north or south to wetlands or towards SR 500. CD-3 at Station 1721+01 carries runoff from east to west, ultimately discharging into Fish Lake. The Fish Lake floodplain is contained within the left ditch and is within LA R/W on the right.

  The St. Cloud Commons development (SFWMD Permit 49-02555-P) located northeast of the SR 500/SR 91 interchange was designed with no positive outfall.

- **Basin 3** – Area contributing from Station 1742+80.52 to Station 1793+62.52 and conveys the runoff between Partin Settlement Road and the south side of the bridge at Shady Lane (toll plaza). This area drains via Fennel Slough to Fish Lake. The Remington Golf & Country Club subdivision located on the east side of the basin consists of interconnected ponds which ultimately discharge to the north outside of FTE's LA R/W through **CD-4**. A ditch block located on the SB on-ramp was permitted in a modification of permit 49-00619-S. The Fennel Slough floodplain is within the left and right LA R/W.

Bass Slough Basin is comprised of five sub-basins which are identified and located as follows:

- **Basin 4** – Area contributing from Station 1793+62.52 to Station 1827+95.29 and primarily conveys runoff within the LA R/W between the bridges at Shady Lane and Simpson Road. The adjacent developed parcels ultimately discharge via conveyance ditches located on the south side of Simpson Road. **CD-5** and **CD-6** located on the east and west side of SR 91 convey runoff under Simpson Road toward the basin outfall at **CD-7**. The Bass Slough floodplain is within the left LA R/W.

- **Basin 5** – Area contributing from Station 1827+95.29 to Station 1849+41.88 and conveys the runoff south to **CD-7** to Bass Slough located west of SR 91. **CD-7** is located at Station 1828+00 and conveys runoff from east to west to Bass Slough. The Bass Slough floodplain is within the west LA R/W.

- **Basin 6** – Area contributing from Station 1849+41.88 to Station 1881+86.28 outfalls downstream of the SR 91 bridge crossing of Bass Slough. Bass Slough splits on the west side of SR 91 with the historical path heading west through an easement, and the primary path along the left roadside ditch heading south. The historical path is a FEMA designated floodway. The basin divide illustrates the limits for the design of the treatment and attenuation ponds.

  Wetlands are isolated and located near the Bass Slough bridge. Adjacent parcels south of Fortune Road are conveyed via offsite ditches and discharge to Bass Slough. One pond located on the south side of Fortune Rd (Old Boggy Creek Road) conveys treated runoff from roadway improvements west of the pond via 24”x53” RCP permitted 49-01025-P. Modifications included the roadway improvements east of the pond to the high point of the bridge. From the high point of the bridge east, stormwater runoff is taken to the existing pond located in the Grande Court Apartments, Application 050318-19/Permit 49-01201-P. The portions of the basin north of Fortune Road drain south through **CD- 9** and **CD-8** on the left and right side, respectively.

- **Basin 7** – Area contributing from Station 1881+86.28 to Station 1923+43.78 and conveys runoff via roadside swale to existing **CD-10** at station 1892+80. Conveyance within the basin is from west to east through offsite Bass Slough wetland system. Wetlands/other surface waters are isolated to the cross drain. The subdivision on the east discharges through interconnected ponds and south to the wetland system under permit 49-00462-05. There are two parcels located on the west side of SR 91 which discharge to the LA R/W which were permitted but never fully developed. At Station 1885+00 left, a swale discharges from the trailer park for which no permit was found.

- **Basin 8**– Area contributing from Station 1923+43.78 to Station 1979+89.52 and conveys runoff via roadside swale to existing **CD-11** at station 1933+80. Conveyance within the basin is from west to east through offsite Bass Slough wetland system. Wetlands/other surface waters are isolated to the cross drain. The Buenaventura Lakes (BVL) subdivision located on the east discharges from the north to south through interconnected ponds and south to the wetland system under permit 49-00132-S. There are two parcels located on the west side of SR 91 which discharge to FTE’s LA R/W which were permitted under 49-00978-P and 49-00376-S. Bass Slough is within the LA R/W between stations 1928+00 to 1955+00 with the flow to the south and is a designated as a FEMA floodway.

Mill Slough Basin is comprised of three sub-basins which are identified as follows.

- **Basin 9**– Area contributing from Station 1979+89.52 to Station 2004+95.06 and is conveyed north to **CD-12** at Mill Slough. The Mill Slough floodplain travels through the cross drains associated with the Osceola Parkway Interchange. Mill Slough is not designated as a FEMA floodway. Flow is northeast to the southwest in the Mill Slough system.

- **Basin 10**– Area contributing from Station 2004+95.06 to Station 2014+18.15 at Osceola Parkway and conveyed east to west through **CD-12**. The basin divide illustrates the limits for the design of the treatment and attenuation ponds. The Buenaventura Lakes subdivision lies within the Bass Slough basin and modeling shows no discharge to Mill Slough.

  The pond at the end of Bill Beck Blvd was originally permitted for compensating storage for the Osceola Parkway Turnpike Interchange project. Under permit 49-00978-P, the permit modified the dry pond to a wet detention pond and continues to provide volume for the Interchange. Two ponds within the interchange ramps (south of the Osceola Parkway) and one pond located on the southwest side of Osceola Parkway were permitted under 49-00653-S.

- **Basin 11**–Area contributing from 2014+18.15 to Station 2024+89.18 flows west and east to branches of Mill Slough. These areas flow south under Osceola Parkway via **CD-13** on the west and **CD-14** on the east. Two ponds within the interchange ramps (north of Osceola Parkway) and one pond located on the northwest side of Osceola Parkway were permitted under 49-00653-S.

5.3 Proposed Drainage Basins

Proposed drainage basins match the existing conditions basins, as widening is to the inside along the mainline consisting of 2 additional lanes in each direction. Side street basins were modified as necessary to match existing drainage divides. The project includes evaluation of 33 potential pond alternative sites and 12 floodplain compensation pond site alternatives. Proposed basin by basin Drainage Maps (**Figures 8-1** through **8-11**) illustrate the three alternative pond sites. The drainage pattern in the proposed condition will remain the same as in the existing condition. Stormwater runoff will be conveyed to the proposed ponds by either an open ditch system, or storm sewer before discharging to the outfall locations.

There are locations where offsite drainage will be collected along with the roadway runoff and conveyed to the project right of way. However, according to House Bill 599, no additional treatment is required for the offsite area. Therefore, the pond sizing includes water quality and attenuation for the onsite project area only. The new proposed alignment of the ramps and side streets will incorporate storm sewer systems to minimize R/W impacts in most instances.

The preliminary ponds sites were designed to have 10% more capacity than required at this time to account for the Highway Beautification Policy as defined in the FDOT Drainage Manual, Section 5.4.4.2. The slight overdesign allows for the final design of the ponds to occur using more naturalistic and curvilinear shapes, landscape shelves, tree plantings, selective clearing, and other aesthetic improvements within the proposed pond Right-of-Way.

Cross Drains

There are 14 cross drains within the project limits and are shown on the Basin Maps. The proposed alignment will be shifted right requiring most of the existing mainline cross drains to be extended to the right and maintain existing drainage flow paths. Side streets also have a potential for cross drains to be extended. Cross drain sizes are not expected to increase.

Bridge Structures

There is one bridge structure location over Bass Slough at Station 1853+00 in Basin 6. Refer to the Bridge Hydraulic Report for calculations. In the proposed condition, the proposed bridge will clear the Bass Slough channel. The removal of the existing center piers will improve the hydraulic condition at the crossing. A HEC-RAZ Model is being developed to model the proposed bridge replacement.

There are three bridges culverts in the project area **CD-12, CD-13**, and **CD-14**. **CD-12** and **CD-14** convey the East Branch of Mill Slough under the mainline and Osceola Parkway, respectively. **CD-13** conveys the West Branch of Mill Slough under the Osceola Parkway.

SECTION 6.0 – FLOODPLAINS AND WETLANDS INFORMATION

6.1 Floodplains and Floodways

The project corridor has five (5) locations of floodplain involvement: Fish Lake, Fennel Slough, two (2) Bass Slough locations, and Mill Slough. The Federal Emergency Management Agency (FEMA) produced the *Flood Insurance Study (FIS), Osceola County, Florida, and incorporated areas, revised June 18, 2013* (Flood Insurance Study Number 12097CV000A). In this study, the Bass Slough and Mill Slough's floodways were studied and documented (refer to **Appendix C**). Floodplain information obtained from Flood Insurance Rate Maps (FIRM) and prepared by the Federal Emergency Management Agency (FEMA) were used to identify floodplain and floodway encroachments. Map numbers 12097C0060G, 12097C0080G, and 12097C0090G dated June 18, 2013 are included in **Appendix C** and are illustrated on the Drainage Maps.

A Flood Risk Report - Osceola County, Florida, 03080101, 03090101 Osceola County, City of Kissimmee, City of St. Cloud, Reedy Creek Improvement District Florida, Report Number 105/16/2013 Final did not identify any key emergency routes overtopped during frequent flooding events along the project corridor. Refer to **Appendix C** for report.

The project floodplain impacts occur primarily at the major cross drains and are classified as Zone A and Zone AE. Zone A is defined as areas where no base flood elevations have been determined. Floodplains located in Zone AE have been modeled and have base flood elevations and floodway elevations determined. Floodway areas in Zone AE defines the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood height. The project's floodplain involvement along the corridor is discussed below.

Actual floodplain impacts will be determined once roadway design is substantially completed and location of MSE walls, shoulder gutter locations and sound walls are determined. 1:6 roadway slopes were used from edge of shoulder to existing ground to establish a conservative impact volume. Preliminary estimates of floodplain encroachments are contained in Appendix B.

Fish Lake

Fish Lake's floodplain is within Zone A, where no base flood elevations are determined. The 307 acres area east of the Turnpike is bound by Partin Settlement Road to the north, Sharp Road to the south and a ridge to the east. The original Turnpike construction plans identified the DHW elevation as 62.05 at **CD-3**.

Floodplain Impacts

Wetland and floodplain impacts are anticipated as a result of the proposed project at the Fish Lake floodplain. Wetlands have been delineated in the ditches that parallel SR 91 and will be impacted by the proposed widening. Floodplain compensation will be provided in adjacent conveyance ditches, or in proposed Floodplain Compensation (FPC) ponds to be determined during final design. Preliminary estimates of floodplain encroachments to the Fish Lake floodplain are 4.37 ac-ft and 3.07 ac-ft, LT and RT, respectively.

Fennel Slough

Fennel Slough's floodplain is Zone A, which no base flood elevations are determined. Fennel Slough drains approximately 475 acres from northeast to west through a series of wetlands and manmade ditches. The basin outfalls through **CD-4** with a design high water elevation of 62.55.

Floodplain Impacts

Wetland and floodplain impacts are anticipated as a result of the proposed project at the Fish Lake floodplain. Wetlands in the ditches that parallel SR 91 will be impacted by the proposed widening. Floodplain compensation will be provided in adjacent conveyance ditches, or in proposed FPC ponds to be

determined during final design. Preliminary estimates of floodplain encroachments to the Fennel Slough floodplain are 1.09 ac-ft and 9.09 ac-ft, LT and RT, respectively.

Bass Slough

Bass Slough's floodplain is located within Zone AE region with base flood elevations determined within the project corridor. Bass Slough travels along the right side of the LA R/W from Station 1955+00 towards 1928+00. The slough discharges from BVL to the Lakeside Estates development through control structures. Conveyance through Lakeside Estates is via ditches and pipe systems until discharging into their outfall pond north of Fortune Road. The slough then passes under Boggy Creek Road through a double box culvert continuing south via a channel towards Florida Turnpike. Bass Slough then travels under the Turnpike's bridge structure where the flow splits.

At this point the contributing area is 1,633 acres. Some flow is directed along the historical path of Bass Slough west by the Florida Christian College and wrapping under Bill Beck Boulevard and then behind Gateway High School. Most flow travels along the left side of Turnpike's roadside swale (between Stations 1830+00 toward 1828+00) until it reaches a **CD-7** where it is routed westwards meeting the historical branch once again. No documentation was found to indicate when or how the historical path was substantially filled at the LA R/W. The combined flow then continues southward towards US 192/441 and ultimately discharges to Lake Tohopekaliga.

The crossing of Bass Slough at SR 91 is part of the Bass Slough (Lower River) study area evaluated by FEMA and shown on panel 90 of 900, dated June 18, 2013. The bridge lies between cross sections J and K and within the flood zone and floodway Zone AE (EL 69).

Floodplain Impacts

Wetland and floodplain impacts are anticipated as a result of the proposed project at Bass Slough. Wetlands have been delineated in the ditches the parallel SR 91 and will be impacted by the proposed widening (Station 1928+00 to 1955+00, RT) and Bass Slough bridge replacement. Floodplain compensation will be provided in adjacent conveyance ditches. The proposed project will meet the "No Rise" criteria and not impact the published base flood elevations. (See Figure 4 of the study). Preliminary estimates of floodplain impacts for the parallel impact of the Bass Slough main channel and the Bass Slough bridge are 9.82 ac-ft and 2.90 ac-ft, respectively.

Mill Slough

Mill Slough's floodplain is within the project corridor designated as Zone A, where no base flood elevations are determined. Downstream of the project Mill Slough is designated as Zone AE. Mill Slough was described in detailed in permit application of 950609-2 as follows. The Mill Slough basin is located in south central Orange County and north central Osceola County. Mill Slough was bisected by the Turnpike in the early 1960's creating an east and west branch. The east branch drains the area bound by the Turnpike, SR 417, Landstar Boulevard, and Osceola Parkway. (approximately 1,477 acres). The Buenaventura Lake Basin III (approximately 647 acres) development outfalls to the east branch of Mill Slough and to Bass Slough to the south. Mill Slough ultimately discharges into Lake Tohopekaliga. This branch crosses under the Turnpike at Station 2003+ 81 (**CD-12**).

The west branch drains the area bounded by SR 417, John Young Parkway, Osceola Parkway and the Turnpike (approximately 2,084 acres). Hunter's Creek Phase 1 (approximately 841 acres) and portion of Southchase Planned Urban Development (PUD) drains to the west branch. The east and west branches join approximately 1,050 feet south of the Turnpike forming the main channel that continues south 4.2 miles to Lake Tohopekaliga. The main channel drains through a large residential area.

Floodplain Impacts

Wetland and floodplain impacts are anticipated as a result of the project at the Mill Slough floodplain. Wetlands have been delineated in the ditches parallel to SR 91 and will be impacted by the proposed widening. Floodplain compensation will be provided in adjacent conveyance ditches, or in proposed FPC ponds to be determined during final design. Preliminary estimates of floodplain encroachments to the Mill Slough floodplain are 0.07 ac-ft and 0.36 ac-ft, LT and RT, respectively.

6.2 Wetlands

Technical Memorandum Federal Wildlife Assessment of the Pond Site Alternatives dated August 21, 2020, by Stantec, discusses the wetlands and wildlife assessment along the corridor. Refer to **Appendix D** for of the Technical memorandum. Wetlands are shown on the Basin Maps in **Appendix A**. Excerpts from the memorandum follows.

During field visits conducted during the months of July and August 2016, the limits of wetlands proximal to the existing and proposed ROW were flagged and surveyed. During these events, 14 wetlands and a continuous OSW ditch feature was identified and flagged within the corridor. In addition, seasonal high-water elevations were established throughout the corridor based on biological indicators. Wetlands near to the Osceola Parkway Interchange were mapped based on the wetland limits provided by the Wantman Group under a separate permit.

In addition to the mainline, each of the proposed pond sites were evaluated for wetlands and suitable habitat for listed species in the spring and summer of 2020. Wetlands in close proximity to the preferred pond sites will be flagged and surveyed once the preferred ponds are selected and finalized.

SECTION 7.0 – STORMWATER PONDS

7.1 Methodology

Excel worksheets were developed to determine treatment and attenuation volumes for conceptual ponds and right-of-way for open basins. There are no closed basins in the project corridor.

Generally, pond sizes can be assumed by basing the area of the control elevation for wet ponds at the required treatment volume area with 1-ft of depth. An additional 2-feet of pond depth was assumed for attenuation and 1-foot of required freeboard. This results in a total depth of 4-feet to the low side of the maintenance berm. All side slopes were assumed at 1:6.

However, due to the high groundwater condition within our project corridor, it was assumed that the project ponds would only have 2-feet of depth available for treatment and attenuation. Including the 1-ft freeboard, the pond results in a total depth of 3-feet to the low side of the maintenance berm. To maintain the same treatment and attenuation volume, the pond bottom area (Control Elevation) was multiplied by 1.5. This retains the volume calculated for a 3-feet deep pond versus a 2-feet deep pond. (3’ x 1’) = (1.5’ x 2’).

A 20-foot maintenance berm was assumed at a 1:20 slope. Tie-down heights vary according to the existing grade and seasonal high groundwater table. The pond calculations sized the pond assuming length of one side equals twice the width. Side slopes and heights are added to the widths and lengths described above to determine a minimum. A final addition of 10% is added to account for the FDOT requirement for aesthetics.

Table 7-1: Summary of Required Treatment Volume

Basin ID	Begin Station	End Station	Total Area (Acres)	Total Imper. Area (Acres)	Existing Imper. Area (Acres)	New Imper. Area (Acres)	Treat. Vol. Check 2.5" over Imper. Area (Ac-Ft)	Controlling Treatment Volume (Ac-Ft)	Comments
1	1658+02.00	1692+60.55	47.39	12.55	7.94	4.61	0.960	0.96	
2	1692+60.55	1742+80.52	45.84	20.41	10.33	10.08	2.100	2.10	
3	1742+80.52	1793+62.52	60.94	18.61	12.35	6.26	1.304	1.30	
4	1793+62.52	1827+95.29	35.32	13.57	7.83	5.74	1.196	1.20	
5	1827+95.29	1849+41.88	19.62	7.19	4.29	2.90	0.604	0.60	
6	1849+41.88	1881+86.28	34.26	10.88	6.49	4.39	0.915	0.91	
7	1881+86.28	1923+43.78	37.61	13.08	7.58	5.50	1.146	1.15	
8	1923+43.78	1979+89.52	60.40	19.78	11.51	8.27	1.723	1.72	
9	1979+89.52	2004+95.06	24.66	9.91	6.11	3.80	0.792	0.79	
10	2004+95.06	2014+18.15	17.87	8.26	7.08	1.18	1.721	1.72	Permitted, therefore using total imp. area
11	2014+18.15	2024+89.18	22.22	7.21	7.86	-0.65	1.502	1.50	Permitted, therefore using total imp. area
Total			**406.13**	**141.45**	**89.37**	**52.08**	13.96	**13.96**	

Table 7-2: Summary of Required Pond R/W

Basin ID	Treat. Volume (Ac-Ft)	Pond Bottom Footprint Area (Acre)	Pond Footprint Width (Ft)	Pond Footprint Length (Ft)	Adding side slopes and berms - Width (Ft)	Adding side slopes and berms - Length (Ft)	Right-of Way (Acre)	Required Right-of-Way * (Acre)	Proposed Pond Footprint Width (Ft)	Proposed Pond Footprint Length (Ft)
1	0.96	1.441	177	354	301	478	3.31	3.64	281	563
2	2.10	3.150	262	524	386	648	5.74	6.31	371	742
3	1.30	1.956	206	413	330	537	4.07	4.48	312	625
4	1.20	1.794	198	395	322	519	3.83	4.22	303	606
5	0.60	0.906	140	281	264	405	2.46	2.70	243	485
6	0.91	1.372	173	346	297	470	3.20	3.52	277	554
7	1.15	1.719	193	387	317	511	3.72	4.10	299	597
8	1.72	2.584	237	475	361	599	4.96	5.46	345	690
9	0.79	1.188	161	322	285	446	2.91	3.21	264	528
10	1.72	2.581	237	474	361	598	4.96	5.46	345	689
11	1.50	2.253	222	443	346	567	4.50	4.95	328	657
Total	13.96						43.7	48.04		

Note: * Required R/W includes 10% Beautification Policy

Required pond right-of-way shown in **Table 7-2** was used to place the appropriate size footprint on the Drainage Map as alternative pond sites. The actual acreage used may vary based on the shape of the pond deviating from the assumed 1:2 ratio of width to length.

Basin 11 calculations show no additional pond volume required. However, ponds will still be required to account for re-alignment of the Osceola Parkway encroachment into the existing ponds 11-C1 and 11-C2 within the interchange and could also be used to provide compensation for Basin 10. The actual requirements will be determined during final design.

Several sub-basins do not have available pond sites within their respective basins to meet criteria and will rely on compensating treatment in other sub-basins. As discussed by FTE staff during project meetings, compensating treatment will be allowed by SFWMD within any sub-basin because the entire project lies within the same major basin.

Table 7-3 shown on the following page is a comparison of required treatment volume versus provided treatment volume per sub-basin.

Base Clearance

The preliminary roadway profile was based on many factors including base clearance. A preliminary roadway profile showing an estimated seasonal high water table elevation is provided in **Appendix B** Roadway design is currently ongoing and final base clearance analysis will be included with the drainage design report

Hydroplaning

Hydroplaning analysis has been completed and will be included as part of the Drainage Design Report. Calculations will not be included with the Pond Siting Report.

Table 7-3: Treatment Volume Comparison

Basin ID	Pond ID	Treat. Vol. Provided (Ac-Ft)	Basin Provided Total (Ac-Ft)	BasinTreat. Vol. Required (Ac-Ft)
1	1-A	2.23	2.23	0.96
2	2-D	2.00	2.00	2.10
3	3-C1	1.28	2.35	1.30
	3-C2	0.29		
	3-C3	0.62		
	3-D	0.16		
4	4-B	0.94	1.94	1.20
	4D-1	0.56		
	4D-2	0.44		
5	5A	1.67	1.67	0.60
6	6A	3.55	3.55	0.91
7	7 A	3.05	3.05	1.15
8	FPC Only		0.00	1.72
9	9-C	1.32	1.32	0.79
10	10-C1	0.22	0.49	1.72
	10-C2	0.27		
11	11-A	0.62	1.77	1.50
	11-C1	0.50		
	11 C2	0.64		
TOTAL			20.36	13.95

Natural Resource Analysis

A preliminary wetland assessment was made for each pond alternative that is based on the UMAM assessment methodology. Pond alternatives were assigned either a low (~0.3), medium (~0.6), or high (~0.8) score based on the location, hydrology, and amount of exotic vegetation or whether the site is dominated by a natural community type versus a site that has been cleared by agricultural or other uses in the past. This score was multiplied by the impact acres to estimate the amount of required mitigation for the pond assessment matrix. Upland cut drainage features [Other Surface Waters (OSW)] were not assessed a mitigation value as they typically do not require mitigation.

Wildlife assessments of pond alternatives including onsite observations and a review of documented occurrences. It is assumed that wetland, surface waters and ditches could provide SFH for wood storks during periods of inundation unless they are overgrown with vegetation. Any observations of state or federal listed species was included in each assessment description. No federal listed species were observed or historically documented within any of the pond site alternatives. As such, the listed species category in the pond assessment matrix was assigned a "low" ranking for all sites.

SECTION 8.0 – RESULTS

8.1 Stormwater Pond Ranking

The alternatives were ranked as having a 1- low, 2- medium, or 3- high impact potential for a suitable pond site based on the geographical location (size, hydraulics, and estimated seasonal high water table).

Low Impact – Preferred Site

A low impact rating implies:

a. The runoff from the project can be effectively intercepted, transported, and treated/attenuated in the pond.
b. The outfall tailwater condition is favorable.
c. Average construction cost.

Medium Impact – Acceptable Site

A medium rating implies:

a. The available pond volume is sufficient to treat/attenuate the required volume of stormwater runoff.
b. The outfall tailwater is sufficient.
c. Average construction cost.

High Impact – Undesirable Site

A high rating implies:

a. The available pond volume is not sufficient to treat/attenuate the required volume of stormwater runoff.
b. The outfall condition is unfavorable.
c. Higher that average construction cost.

For the proposed improvements, stormwater treatment and peak discharge attenuation is required. The objective of this Pond Siting Report is to provide the following preliminary data for the proposed widening:

- Define on-site drainage basins, and compute new and existing pavement areas.
- Estimate stormwater management treatment and attenuation volume requirements meeting current SFWMD design and permit criteria.
- Identify potential pond site locations.
- Assess environmental and social impacts for each potential pond site.
- Provide recommendations to satisfy current stormwater management criteria.

Each potential pond site has been evaluated for impacts to:

- Wetlands
- Floodplain
- Protected Species/Habitat
- Social Resources
- Utility Conflicts
- Land Use
- Hydraulics /Conveyance
- Right-of-Way

Due to soil conditions and seasonal high groundwater elevations, it is anticipated that construction of wet detention ponds will be necessary. Three stormwater management alternatives were initially considered for evaluation within each basin and floodplain. The criteria of avoiding wetlands and floodplain areas is not practical in some basins. Other general objectives include using existing FTE-owned property or remainder

parcels already impacted by the roadway alignment; minimizing impacts to individual parcels; and minimizing the number of parcels impacted.

Right-of-Way

Right of Way cost estimate totals were developed by FDOT Florida Turnpike Enterprise in accordance with the FDOT Guidance Document 2. The totals are cost estimates and not appraisals. The estimates have a confidence level C indicating a Below-Average confidence. The conceptual estimate was used for comparison purposes only, and is included in **Appendix D**.

Osceola County Property Appraiser information is also included in **Appendix D** illustrating the various properties that were included in the Pond Siting Report.

Archaeological Analysis

The desktop analysis of the project was performed by Janus Research and is documented in a memo dated February 13, 2020. Excerpts of this analysis are contained in **Appendix D**. The following are portions of this analysis. The analysis identified no areas of high archaeological probability within any of the pond or FPC sites. Most of the study area is low in elevation, contains poorly drained or very poorly drained soils which suggest a low probability for archaeological sites. Many of the ponds are also within an existing wetland or floodplain which also indicates low archaeological site potential. Nine pond sites (Ponds 2C, 5B, 6A, 6B, 6C, 7A, 8C, 9C, and 10A) and two FPC sites (FPC Fennel 2 and Mill 1) are considered to have moderate archaeological potential due to relatively better drained soils or elevation or proximity to a source of freshwater. The remaining ponds have low archaeological potential. Although the Florida Master Site File (FMSF) GIS Data show one previously recorded archaeological site, 8OS1771, spanning the northeastern corners of Pond 2A and FPC Fish 2, a review of the associated report indicates that the site was adjacent to a former slough. Further review also indicates that the recorded location is within a floodplain and emergent wetland, locations which are considered to have low archaeological potential. Additionally, site 8OS1771 was determined National Register–ineligible by the State Historic Preservation Office (SHPO). Areas of archaeological probability for all the ponds and FPC locations are shown on the aerials in attachment 2 and on the USGS Quadrangle map in attachment 3 of this analysis (**Appendix D**).

Two previously recorded historic structures (8OS2681, 2802 E. Irlo Bronson Memorial Highway and 8OS2682, 2804 E. Irlo Bronson Memorial Highway) are within the historic resources study area for Pond 1-B, but outside of the pond footprint. Both are concrete block structures determined National Register–ineligible by the SHPO in 2014. Property appraiser data indicates the potential for four unrecorded historic structures within or partially within the footprints of Pond 1-B and 2-C. The ponds and parcels with buildings include:

- Pond 1-B: 1592 Mickey Johnson Court (c. 1948)
- Pond 1-B: 1598 Mickey Johnson Court (c. 1959)
- Pond 1-C: 2721 Ames Haven Road (c. 1958)
- Pond 1-C: 2681 Ames Haven Road (c. 1958).

A preliminary review of the buildings in Google Earth suggests that may not represent significant resources. Two FDOT bridges (920075 and 920079) are also within the study area of Ponds 3-C and 9B, respectively but are likely National Register-ineligible and would not be impacted by the ponds. The locations of these previously recorded and unrecorded historic resources are shown on the Basin Maps.

Contamination Screening Evaluation

A Level I Contamination Screening Evaluation Report (CSER), dated March 19, 2020, was prepared by GEC, Inc. and excerpts are included in **Appendix D** by reference. The purpose of the evaluation was to assess the risk of encountering petroleum or hazardous substance contamination of soil, groundwater, surface water, or sediment that could adversely affect this project. The results of the screening resulted in the identification of 1 High Risk, 6 Medium Risk, and 31 Low Risk sites within the project corridor. This information is included in the Pond Site Evaluation Matrices in **Appendix E**.

Ranking

In determining the recommended pond sites, avoiding residential and commercial relocations was given top priority. Second priority was given to potential wetland impacts, then floodplain impacts. Line items in the matrices that have a monetary value do not receive a numeric value. The recommendations were based on both the ranking value and the estimated cost. Ponds not adjacent to the basin outfall have a length to the outfall. An assumed pipe value of $125.00 per foot was used to estimate the additional outfall cost.

8.2 Alternative Pond Site Evaluation

An evaluation matrix for all pond site alternatives are shown in **Appendix E.** The pond site alternatives are compared primarily on hydraulic factors, estimated right-of-way costs, and for various potential impacts to the environment including wetland impacts, floodplain impacts, habitat impacts, social impacts, utility conflicts, and land use. Pond site alternatives were compared using a matrix format.

Treatment and Attenuation Pond Alternatives

Basin 1

Pond 1-A is located on the right side of the Turnpike immediately north of the Conservation Area. This location is close to the outfall for the basin to the St Cloud Canal and would require approximately 400 feet of outfall pipe. The pond was sized to provide compensation treatment for the project. There are Overhead (OH) electrical lines with power to a billboard along the west edge of the pond site.

This side is currently undeveloped and classified as Pastureland 1-Vacant. The pond site is a 12.85-acre portion of the 28.88-acre property identified as Osceola County Parcel ID 25-29-3140-0033-0010.

The sparse canopy and actively grazing cows within and adjacent to this pond site alternative do offer potential habitat for several listed species including potential nesting and foraging habit for the crested caracara. This site was included in one of the observation points for the 2017 caracara survey for this species that was covering the mainline ROW expansion. No caracara were observed from this survey station or any of the survey stations throughout the corridor. Cabbage palms (*Sabal palmetto*) potentially suitable for caracara nesting were observed within 1,000 feet of this pond site alternative. This proposed pond site is also located within the USFWS consultation area for the Florida bonneted bat. The Florida bonneted bat could utilize trees within and adjacent to this site for roosting and the surrounding area for foraging. The only tree cavity observed on the site was less than 3 feet off the ground within a black gum tree. Consultation with USFWS will be required to determine if surveys for bonneted bats and caracaras are required within this site.

Utilities include overhead electric along west edge of pond, potential power to billboard.

This site is adjacent to Low Risk contamination sites: Historical Rail Line, Lift Station Generator, and 1598 Mickey Johnson Court.

This site has a Low probability archaeological potential.

Pond 1-B is located on the right side of the project along the NB off-ramp and frontage along SR 500. The location is mid-basin and would require approximately 2,000 feet of outfall pipe. There are utilities along SR 500 R/W frontage and a 30" gas main is along the western edge of the pond site.

This site is currently undeveloped and classified as Vacant Commercial. There is a billboard within the pond area. The pond site is the entire 4.74-acre property identified as Osceola County Parcel ID 32-25-29-0000-0225-0000.

Various piles of trash and large debris were observed in this site, but specific contamination hazards were not observed. This proposed pond site is located within the USFWS consultation area for the Florida bonneted bat. The canopy (live oaks) within this site does offer potential roosting habitat for the bonneted bat; however, evidence of roosting bats was not observed during the field assessment. Coordination with the USFWS will be required to determine if a bonneted bat survey will be required for this pond site alternative.

Site is adjacent to Medium Risk (Site No. 8 – FTE Mile Post 244) and Low Risk contamination sites (Lift Station Generator, 1598 Mickey Johnson Court, Generators, Grand Slam Cellular, Spill incident, and Super Mini Mart). Site No. 8 extends into the pond footprint. Surficial debris was observed on-site that includes roofing material, that may include asbestos.

Utilities include service lines along roadway SR 500 R/W frontage, 30" gas main along west end of property, pond access crosses gas main.

Site is adjacent to recorded historic structures 8OS2681 and 8OS2681 and unrecorded 1592 and 1598 Mickey Johnson Court.

This site has a Low probability archaeological potential.

Pond 1-C is located on the left side of the project approximately mid-basin and would require approximately 2,000 feet of outfall pipe. This site is developed and classified as Single Family- Improved. There is a billboard within the pond area. The pond site is the entire 5.55-acre property identified as Osceola County Parcel ID 32-25-30-0000-0220-000. There are utilities along Ames Haven Road frontage to several out-building and billboard on the site.

A mixed forested wetland is located along the eastern perimeter of the property within the Florida Turnpike LA R/W. This wetland extends into the northern corner of the property and borders the northern corner of the proposed pond site contour. The quality of this wetland would be estimated as "medium".

This proposed pond site is located within the USFWS consultation area for the Florida bonneted bat. The canopy within this site does offer potential roosting habitat for the bonneted bat; however, evidence of roosting bats was not observed during the field assessment. Coordination with the USFWS will be required to determine if a bonneted bat survey will be required for this pond site alternative.

Utilities include service for residence and several outbuildings, power to billboards, pond access crosses buried gas main.

Site is adjacent to Neptune Middle School (Low Risk contamination site). The site is within footprint of an unrecorded historic structures, 2721 and 2681 Ames Haven Road.

This site has a Low probability archaeological potential.

Basin 2

Pond 2-A is located on the left side of the project approximately mid-basin, adjacent to the project outfall ditch to Fish Lake. The site is partially developed and classified as County-IMP. There is a wetland and floodplain within the entire pond area, and therefore, not a good pond site. The access to the site would require a crossing of the 30" gas main. The pond site is a 6.56-acre portion of the 26.74-acre property identified as Osceola County Parcel ID 29-25-30-4653-0001-0030.

This site is wholly within a large wetland system Pond 2-A impacts 6.37 acres of wetland. A large ditch lies between Pond 2-A and FPC Fish 3. This large wetland system has been delineated previously by the Osceola Sherriff's Office development adjacent to the ponds (SFWMD App No. 050608-10) and is currently under a conservation easement. The quality of this wetland would be estimated as "low". There are no state or federal protected wildlife concerns on this site and no additional survey would be required for wildlife on this site.

Utilities include a 30" gas main crossing access to pond.

Site is not adjacent to or within any Contamination Risk Rated (CRR) sites.

The site is within pond footprint Recorded Archaeological site 8OS1771. This site has a Low probability archaeological potential.

Pond 2-B is located on the right side of the project approximately mid-basin, upstream to the project outfall ditch to Fish Lake, adjacent to outfall. The site is undeveloped and classified as Pastureland 1-Vac. There are no known utilities at this site. There are wetlands and floodplain within the pond area, and therefore, not a good pond site. This site is being considered as a floodplain compensation pond. The pond site is a 6.83-acre portion of the 28.93-acre property identified as Osceola County Parcel ID 32-25-30-0000-0016-0000.

This site is predominantly wet prairie. An upland buffer area is located along the northern edge of this site and separates the wet prairie from an east-west running ditch located along the northern perimeter. This site contains a total of approximately 5.77 ac. of wetlands. The quality of this wetland would be estimated as "medium". This site would generally be regarded as having a ground cover that is too overgrown and wet for caracara. There are no state or federal protected wildlife concerns on this site and no additional survey would be required for wildlife on this site.

There are no known utilities at this site.

Site is adjacent to former citrus groves (Low Risk contamination site).

This site has a Low probability archaeological potential.

Pond 2-C is located on the right side of the project. The site is developed and classified as Pastureland 1-IMP. There are no floodplains within the pond area. The site is 800 LF to outfall. There are utilities for the residence/farmstead. The pond site is a 11.58-acre portion of the 14.62-acre property identified as Osceola County Parcel ID 32-25-30-0000-0080-0000. This site was recently purchased by a third party for development.

A canal is located along the southern perimeter of the site and runs east-west. Several other excavated drainage ditches/swales are located within the site that appears to drain the site during periods of high water to the large wetland systems that occur to the north of the site. Several areas of this proposed pond site include portions of a large marsh system (1.35 acres within the pond footprint) that extends offsite to the north. There is also a small depressional area at the southern limit that is a marsh system dominated by smartweed and flat sedge. The quality of these onsite wetlands would be estimated as "low".

The sparse canopy and actively grazing cows within and adjacent to this pond site alternative do offer potential suitable foraging habitat for the caracara. However, preferred nesting trees (solitary cabbage palms) were not observed within the site. This site was included in one of the observation points for the 2017 caracara survey for this species that was covering the mainline ROW expansion. Coordination with USFWS will be required to determine if an additional survey for caracaras are required within this site.

Utilities include service to residence and farmstead.

Site is adjacent to former citrus groves (Low Risk contamination site) with cattle pens (Medium Risk contamination site) on site.

The site has a potential unrecorded Historic Building within study area at 1312 Simmons Road.

Pond 2-D is located on the right side of the project. The site consists of two partial parcels (3.36 acres and 3.35 acres = 6.71 acres) partially developed and classified as County-Imp. and County-Vac. The site is predominately improved pasture with a few specimens of live oak. This site does not have known utilities within the pond area. It appears that the southern end of this site may experience infrequent periods of inundation. There does not appear to be on-site wetlands. There is a drainage ditch adjacent to the southern terminus of the site. The pond site is a 3.36-acre portion of the 6.54 acre property identified as Osceola County Parcel ID 29-25-30-0000-0170-0000, and 3.35-acre portion of the 5.93-acre property identified as Osceola County Parcel ID 29-25-30-0000-0165-0000.

This site contains potential suitable foraging habitat for the caracara; however, preferred nesting trees (solitary cabbage palms) were not observed within the site. This site does have the potential to provide foraging habitat to caracaras potentially located within adjacent properties; therefore, coordination with USFWS is likely required to determine if surveys for caracaras are required for this site.
There are no known utilities at this site.

Site is within a former citrus grove (Medium Risk contamination site) and adjacent to Site No. 16, Fire-Rescue Support Services Center (Low Risk contamination site).

This site has a Low probability archaeological potential.

Basin 3

Ponds 3-A and 3-B sites are located entirely within a hardwood forested wetland. Based on the observation of lichen lines on trees, the seasonal high-water level for this wetland appears to be a few inches above the surface. A stormwater pond located south of Pond 3-B connects and drains into this system via control structure. This pond site appears to be under conservation easement and is likely onsite mitigation associated with the adjacent Remington Golf and Country Club (SFWMD Application No. 940211-2).

Pond 3-A is located on the right side of the project, near the outfall ditch to Fish Lake. The site is 300 LF to outfall. The site is undeveloped and classified as No AG acreage-Vac. The pond is located within Fennel Slough (wetlands and floodplain). The pond site is a 4.32-acre portion of the 92.30-acre property identified as Osceola County Parcel ID 20-25-30-4814-0001-00H0.

Pond 3-A contains 3.79 ac. of wetlands. The quality of this wetland would be estimated as “high” based on the total size and vegetative composition of the site. This site is also under a conservation easement. There are no state or federal protected wildlife concerns on this site and no additional survey would be required for wildlife on this site.

There are no known utilities at this site.

Site is not adjacent to or within any CRR sites.

This site has a Low probability archaeological potential.

Pond 3-B is located on the right side of the project, adjacent to the outfall ditch to Fish Lake. The site is undeveloped and classified as No AG acreage-Vac. The pond is located within Fennel Slough (wetlands and floodplain). The pond site is a 4.59-acre portion of the 92.30-acre property identified as Osceola County Parcel ID 20-25-30-4814-0001-00H0. Pond 3-B contain 3.80 ac. of wetlands. The quality of this wetland would be estimated as "high" based on the total size and vegetative composition of the site. This site is also under a conservation easement. There are no state or federal protected wildlife concerns on this site and no additional survey would be required for wildlife on this site.

There are no known utilities at this site.

Site is not adjacent to or within any CRR sites.

This site has a Low probability archaeological potential.

Pond 3-C consists of three separate ponds (3-C1, 3-C2, and 3-C3) within the southern half of the Shady Lane Interchange. The site is within FTE LA R/W. The pond site property is not identified by Osceola County Property Appraiser's office. Pond 3-C1 is located within the northbound loop on-ramp. An upland cut OSW (1.33 ac) is in the middle of the loop ramp. No additional survey would be required for listed wildlife on this site. Pond 3-C2 on the left side of the mainline does not contain a wetland but functions as a dry pond. Pond 3-C3 is located around the outside of the loop on the right side of the mainline. Pond 3-C3 also has a primrose willow dominate OSW and a 0.45 ac wetland along the R/W line. The quality of this wetland would be estimated as "low". There are no state or federal protected wildlife concerns on this site and no additional survey would be required for wildlife on this site.
Utilities include a gas main located along the eastern edge of Pond 3-C2 and the buried electric associated with the interchange has a lighting system.

All three sites are adjacent to Florida's Turnpike Resurfacing (Low Risk contamination site).

This site has a Low probability archaeological potential.

Pond 3-D consists of the ditch immediately downstream of an existing pond that provides treatment from previous improvements to Shady Lane. The site is within FTE LA R/W. This pond will expand the existing pond immediately upstream to treat additional improvements made for this project. This site contains an OSW ditch.

Utilities include buried electric along ramp.

Site is adjacent to Florida's Turnpike Resurfacing (Low Risk contamination site).

This site has a Low probability archaeological potential.

Basin 4

Pond 4-A is located on the left side of the project, adjacent to the project outfall into Bass Slough. The site is undeveloped and classified as County-Vac. The pond is located within Bass Slough (wetlands and floodplain). A 30" gas line lies along the western edge of the property. Pond access crosses gas main. The pond site is the entire 3.20-acre property identified as Osceola County Parcel ID 19-25-30-0000-0140-0000 and a 1.78-acre portion of the 8.50-acre property identified as Osceola County Parcel ID 19-25-30-0000-0020-0000.

This site is located entirely within a wetland (~ 4.44 AC.) that is part mixed forested wetland and part freshwater marsh. Based on the observation of lichen lines on trees, the seasonal high-water level for this wetland appears to be well over the surface. Evidence of seasonal inundation within the marsh section of

this site indicates that it may offer SFH for wood storks. The quality of this wetland would be estimated as "medium". There are no state or federal protected wildlife concerns on this site and no additional survey would be required for wildlife on this site.

Utilities include a gas main along the eastern edge of the site. Pond access crosses two (2) gas mains.

Site is adjacent to Gateway High School (Low Risk contamination site).

This site has a Low probability archaeological potential.

Pond 4-B is located on the right side of the project approximately mid-basin. The site is undeveloped and classified as County-IMP. There is a wetland and floodplain within the pond area. The pond site is a 3.82-acre portion of the 92.30-acre property identified as Osceola County Parcel ID 20-25-30-4814-0001-00H0.

This site is predominantly upland with a hardwood swamp (~ 0.66 ac.) located in the southern portion of the site. This site appears to be under conservation easement and is likely onsite mitigation associated with the adjacent Remington Golf and Country Club (SFWMD Application No. 940211-2). The quality of this wetland would be estimated as "medium". This site offers potentially suitable habitat for several federally listed species. A solitary cabbage palm, suitable for caracara nesting, was observed in the upland portion of the site; however, the dense saw palmetto ground cover does not allow for suitable foraging habitat for the caracara. Furthermore, there is a lack of suitable caracara foraging habitat in proximity to this site; therefore, it is unlikely that caracara would utilize this site for nesting. The need for a caracara survey for this site is unlikely but will be verified with USFWS if this site is determined to be the preferred alternative. Gopher tortoises were not observed during the field assessment; however, a gopher tortoise survey may be required within the upland section of this site to confirm the presence or absence of tortoises.

There are no known utilities at this site.

Site is adjacent to the Osceola Regional Juvenile Detention Center (Low Risk contamination site).

This site has a Low probability archaeological potential.

Pond 4-C is located on the left side of the project at the southern end of the basin. The site is currently undeveloped and classified as Vacant Commercial. The pond site is a 3.75-acre portion of the 14.07-acre property identified as Osceola County Parcel ID 30-25-30-4960-0001-0020. The pond outfall is to the left mainline ditch with the basin outfall at the north end of the basin.

This site is predominantly a disturbed upland; however, two small wetland ponds are also located within this site. Review of satellite imagery of the site from 2005 revealed that this site used to be on a small golf course. The two small ponds were connected by a ditch system and appeared to outfall within a stormwater pond within a residential area to the north of the site. Total wetland extent within this site is approximately 0.40 ac. The quality of these wetlands would be estimated as "low". This site may have the potential to offer suitable habitat for several listed species. Cabbage palms offer nesting opportunities for caracara, but the lack of proximal suitable foraging habitat makes the chances of caracara utilizing this sight as low. The need for a caracara survey for this site is unlikely but will be verified with USFWS if this site is determined to be the preferred alternative. Gopher tortoise burrows were not observed during the field assessment, but the upland sections of this site may provide suitable gopher tortoise habitat. A gopher tortoise survey of this site might be required if it is selected as a pond site for this project.

Pond access crosses 30" gas main.

Site is within the Crystalbrook Golf Course (High Risk contamination site).

This site has a Low probability archaeological potential.

Pond 4-D consists of two separate ponds within the northern end of the Shady Lane Interchange. The site is within FTE LA R/W. The pond site property is not identified by Osceola County Property Appraiser's office**. Pond 4-D1** is on the left outside of the southbound off-ramp to Shady Lane. Pond 4-D2 is located

between Shady Lane and the southbound off-ramp, left of the mainline. There are no state or federal protected wildlife concerns on this site and no additional survey would be required for wildlife on this site.

A 30" gas main is along the east edge of the Pond 4-D2.

Site is adjacent to the Crystalbrook Golf Course (High Risk contamination site). The site is also adjacent to Florida's Turnpike Resurfacing (Low Risk contamination site).

This site has a Low probability archaeological potential.

Pond 4-E is located north of Simpson Road left of the mainline. The site has 2.66 acres of herbaceous and forested wetland. The quality of this wetland would be estimated as "low". The site is within FTE LA R/W. The pond site property is not identified by Osceola County Property Appraiser's office. . There are no state or federal protected wildlife concerns on this site and no additional survey would be required for wildlife on this site.

Utilities include a 30" gas main along the eastern edge of the pond site.

Site is not adjacent to or within any CRR sites.

This site has a Low probability archaeological potential.

Basin 5

Pond 5-A is located on the left side of the project adjacent to the basin outfall Bass Slough. The site is currently undeveloped and classified as Public Sch-VAC. There is a wetland and floodplain within the pond area. The pond site is a 5.51-acre portion of the 8.50-acre property identified as Osceola County Parcel ID 19-25-30-0000-0020-0000.

This site is characterized as a mosaic of upland hammock, hydric hammock, and mixed hardwood wetlands. Approximate wetland coverage for Pond 5-A is 1.15 acres. The quality of this wetland would be estimated as "medium". There are no state or federal protected wildlife concerns on this site and no additional survey would be required for wildlife on this site.

Pond access crosses two (2) gas mains.

Site is adjacent to Osceola County – Admin Center Building 1000 & 2000 (Low Risk contamination site).

This site has a Low probability archaeological potential.

Pond 5-B was combined into Pond 6-A, and therefore, no longer exists as a separate alternative.

Pond 5-C is located on the left side of the project adjacent to the basin outfall Bass Slough. The property is un-developed and classified as Public Sch-VAC. There is a wetland and floodplain within the pond area. A 30" gas line lies along the east side of the pond site. The pond site is a 5.10-acre portion of the 8.50-acre property identified as Osceola County Parcel ID 19-25-30-0000-0020-0000.

This site is characterized as a mosaic of upland hammock, hydric hammock, and mixed hardwood wetlands. Approximate wetland coverage for Pond 5-C is 4.06 ac. The quality of this wetland would be estimated as "medium". This site does not appear to offer suitable habitat for any federally listed species known to occur within Osceola County. Gopher tortoises within the uplands are unlikely based on the high-water table.

Pond access crosses two (2) gas mains.

Site is adjacent to Gateway High School (Low Risk contamination site).

This site has a Low probability archaeological potential.

Basin 6

Pond 6-A is located on the right side of the project at the southern end of the basin. The site is improved and classified as Pastureland 1-Imp. Bass Slough lies along the western edge of the property. The pond site is a 9.45 portion of the 66.02 -acre property identified as Osceola County Parcel ID 19-25-30-00U0-0050-0000.

This site offers suitable foraging habitat for the caracara; however, preferred nesting trees (solitary cabbage palms) were not observed within the site. The cabbage palms that were observed were tightly grouped together with thick Brazilian pepper. The proximity to other trees (Brazilian pepper) makes these cabbage palms vulnerable to predator access and thus unsuitable nesting habitat for caracaras. This site does have the potential to provide foraging habitat to caracaras potentially located within adjacent properties; therefore, a coordination with USFWS is likely required to determine if surveys for caracaras are required for this site. Gopher tortoise burrows were not observed during the field assessment, but if this pond is selected a survey might be required to confirm the absence or presence of gopher tortoises.

There are no known utilities at this site.

Site is within Historical Citrus Grove (Medium Risk contamination site).

This site has a Moderate probability archaeological potential.

Pond 6-B is located on the left side of the project approximately 1,000’ west of the LA R/W. The site contains an abandoned homesite and is classified as Miscellaneous-Improved. The site is the entire 4.83-acre property identified as Osceola County Parcel ID 13-25-29-0000-0125-0000.

This site is an upland hammock. An abandon and derelict home littered with garbage was observed within the southeast corner of this site. Gopher tortoise burrows were not observed during the field assessment, but if this site is selected a survey will be required to confirm the absence or presence of gopher tortoises prior to construction. No additional survey would be required for listed wildlife on this site.

Residential utilities on site.

Site is adjacent to Lil Champ Food Store #1264 (Low Risk contamination site).

This site has a Moderate probability archaeological potential.

Pond 6-C is located on the left side of the project close to the project outfall to Bass Slough. The site is improved (Johnson University Florida) and is classified as College-Imp. The pond site is a 3.21-acre portion of the 40.78-acre property identified as Osceola County Parcel ID 24-25-29-0000-0015-0000. It appears that the site is being used as a sports field.

This site is located within an open grassed field on the Johnson University property. Most of this site is a maintained field of Bahia grass. The eastern side of the field appears to be graded and contains a swale running along its perimeter. A sand volleyball court is located on the western side of the field. The eastern edge of this site is within a roadside ditch along the west side of the Florida Turnpike. There are no state or federal protected wildlife concerns on this site and no additional survey would be required for wildlife on this site.
Utilities include overhead electric and has a 20" and 30" gas main crossing access to pond.

Site is adjacent to SPILLS Incident at SB Turnpike MM 246 (Low Risk contamination site).
This site has a Moderate probability archaeological potential.

Basin 7

Pond 7-A is located on the left side of the project near the basin outfall to Bass Slough. This site is vacant and classified as No Ag Acreage-Vac. A 30" gas line is along the eastern edge of the property. The pond site is a 9.90-acre portion of the 22.71-acre property identified as Osceola County Parcel 13-25-29-00U0-0050-0000.

This site is a disturbed upland pine community. A wetland (~ 0.75acre) is located at the northwest corner of this site. The quality of this wetland would be estimated as "low". This site offers suitable habitat for the gopher tortoise, though neither tortoises nor burrows were observed during the field assessment. If this site is a selected a gopher tortoise survey will likely be required. No additional survey would be required for listed wildlife on this site.

Utilities includes overhead electric along east side of pond site and has a 20" and 30" gas main crossing access to pond.

Site is adjacent to Site No. 31, Rocking A Construction (Medium Risk contamination site).

This site has a Moderate probability archaeological potential.

Pond 7-B is located on the left side of the project near the basin outfall to Bass Slough. This site is vacant and classified as No Ag Acreage-Vac. A 30" gas line is along the eastern edge of the property. The pond site is a 8.61-acre portion of the 22.71-acre property identified as Osceola County Parcel 13-25-29-00U0-0050-0000.

This site is predominantly a disturbed upland pine community. Several small depressional wetlands exist along the western side of this site as well as immediately outside the pond limits. The combined coverage of these wetlands within the site is approximately 2.92 acre. The quality of these wetlands would be estimated as "low". An east-west running, linear ditch runs across the southeastern corner of this site. A review of satellite imagery reveals that this ditch appears to connect the nearby Turnpike Southbound roadside drainage to a lake located west of this pond site alternative.

Based on FEMA floodplain limits, it is assumed the lake would drain to the LA R/W. This condition has not been found in permit documentation. This pond site alternative offers suitable habitat for the gopher tortoise, though neither tortoises nor burrows were observed during the field assessment. If this site is a selected a gopher tortoise survey will likely be required. No additional survey would be required for listed wildlife on this site.

Utilities includes overhead electric along east side of pond site and has a 20" and 30" gas main crossing access to pond.

Site is adjacent to Site No. 31, Rocking A Construction (Medium Risk contamination site).

This site has a Low probability archaeological potential.

Pond 7-C is located on the left side of the project near the middle of the basin. This site is vacant and classified as No Ag Acreage-Vac. A 30" gas line is along the eastern edge of the property. The pond site is a 6.28-acre portion of the 30.95-acre property identified as Osceola County Parcel 13-25-29-00U0-0012-0000.

This site is predominantly a disturbed upland pine community. Two small depressional wetlands (combined acreage ~ 0.05 ac.) are located along the eastern side of the site and a larger hardwood swamp (~ 1.42 ac.) containing red maple is located on the western side of the site. The quality of this wetland would be estimated as "low". This site offers suitable habitat for the gopher tortoise, though neither tortoises nor

burrows were observed during the field assessment. If this site is a selected a gopher tortoise survey will likely be required. No additional survey would be required for listed wildlife on this site.

Utilities includes overhead and buried electric along east side of pond site and has a 20" and 30" gas main crossing access to pond.

Site is adjacent to Site No. 31, Rocking A Construction (Medium Risk contamination site).

This site has a Low probability archaeological potential.

Basin 8

Pond 8-A is located along the existing roadside ditch and would be a linear pond within the LA R/W. The site outfalls through a cross drain into the Bass Slough. The site has wetlands within the limits.

This site is located along the FTE southbound LA R/W and is predominantly a wetland coniferous forest (~ 3.41 acre). The quality of this wetland would be estimated as "low". There are no state or federal protected wildlife concerns on this site and no additional survey would be required for wildlife on this site.

Adjacent utilities include an overhead electric, buried electric and fiber optic cable. A 30" gas main is along the pond edge and crosses the access.

Site is not adjacent to or within any CRR sites.

This site has a Low probability archaeological potential.

Pond 8-B is in the vacant Nueva Andalucia platted development (lots 1-14 & A) and a portion of Quail Hollow sub-division (lots 36-50). The pond site is located at the southern end of the basin close to the basin outfall into Bass Slough. The Nueva Andalucia development is vacant, the Quail Hollow sub-division contains residential homesites, classified as vacant and Single Family -Improved, respectively. The pond site is approximately 7.00-acre property identified as Osceola County Parcel 11-25-29-0000-0010-0000- through -0140, -00A0 and 12-25-29-2007-0001-0360 through -0500, respectively.

This site may offer suitable habitat for the gopher tortoise, though neither tortoises nor burrows were observed during the field assessment. If this site is a selected a gopher tortoise survey will likely be required. No additional survey would be required for listed wildlife on this site.

Utilities include residential service. A 20" gas main is along the pond edge and crosses the access to the pond.

Site is not adjacent to or within any CRR sites.

This site has a Low probability archaeological potential.

Pond 8-C is located on the right side of the project at the north end of the basin. This site consists of the vacant portion of property owned by the Kissimmee Utility Authority and a portion of the developed Buenaventura Lake sub-division (10 lots). The pond site is approximately 6.88-acres identified as a portion of Osceola County Parcel 13-25-29-2198-0010 and Buenaventura Lake sub-division lots Osceola County Parcel 07-25-30-2694-0158-0010 through-0080, -0180, and 0190, classified as Municipal-Vacant and Single Family-Improved, respectively.

The northern section is elevated and appears to be a push pile of sediment. Trash and debris, including a broken, empty 50-gallon barrel, were observed in this northern section which indicate the potential for contamination issues. This site offers habitat for several listed and protect species. During the field assessment nine gopher tortoise burrows were identified, and their locations marked with a GPS. If this site is chosen as a pond site, a 100% gopher tortoise survey and gopher tortoise relocation will be required. A

nest platform with an osprey (*Pandion haliaetus*) nest was also observed. This nest platform was likely installed for the electrical substation located directly north of the site. If this site is selected this nesting platform needs to be relocated during the non-nesting season. No additional survey would be required for listed wildlife on this site.

Utilities include residential service. Overhead electric lines cuts through pond side slope.

Site is not adjacent to or within any CRR sites. Some surficial debris was observed on site that does not appear to present a contamination concern.

This site has a Moderate probability archaeological potential.

Basin 9

Pond 9-A is located along the existing left roadside ditch and would be a linear pond within the LA R/W. The site outfalls into the Mill Slough. A 30" gas main is along the pond edge, coordination with FGT is required.

This site is located along the FTE southbound LA R/W and is predominantly a wetland coniferous forest (~2.69 ac.). Based on our preliminary field assessment with SFWMD staff, this wetland would be considered an upland cut system that would not require mitigation. There are no state or federal protected wildlife concerns on this site and no additional survey would be required for wildlife on this site.

Utilities include overhead electric, underground electric and fiber optic. The 30" gas main travels along length of pond switching from front slope to back slope, making the pond site **non-viable**.

Site is not adjacent to or within any CRR sites.

This site has a Low probability archaeological potential.

Pond 9-B is located on the right side of the project near the basin outfall into Mill Slough. This site is developed and classified as Single Family-Improved The pond site is approximately 3.68-acre identified as a portion of Buenaventura Lake sub-division lots Osceola County Parcel ID 07-25-30-2698-0180 through-0280.

Neither wetlands nor any suitable habitat for listed species were identified within this pond site alternative. No additional survey would be required for listed wildlife on these sites.

Utilities include residential services.

Site is not adjacent to or within any CRR sites.

This site has a Low probability archaeological potential.

Pond 9-C is located on the left side of the project adjacent to the basin outfall to Mill Slough. This site is vacant and classified as Vacant Industrial with XFOB. The pond site is a 5.05-acre portion of the 44.21-acre property identified as Osceola County Parcel 02-25-29-00U0-0025-0000.

Listed species were not observed during the field assessment; however, these sites have the potential to offer habitat for the gopher tortoise. If these sites are selected, then a gopher tortoise survey will likely be required to document the presence of absence of this species. No additional survey would be required for listed wildlife on these sites.

A 30" gas main crosses the pond access.

Site is not adjacent to or within any CRR sites.

This site has a Moderate probability archaeological potential.

Basin 10

Pond 10-A is located on the left side of the project adjacent to the basin outfall to Mill Slough. This site is not improved and classified as Vacant Commercial with XFOB. The pond site is a 1.52-acre portion of the 24.14-acre property identified as Osceola County Parcel 02-25-29-00U0-0032-0000.

A water control structure was found within the northern section of this site. Evaluation of satellite imagery revealed that the northwestern part of this site was used as a retention/detention pond as far back as 2010 that is associated with the Gateway Commons mass grading project (SFWMD Application No. 020408-32). A depressed, linear feature appears to divide the upland flatwoods on the southwestern side from the hydric flatwoods (~ 0.38 ac.) on the southeastern side. The quality of this wetland would be estimated as "medium". There are no state or federal protected wildlife concerns on this site and no additional survey would be required for wildlife on this site.

A 30" gas main crosses the pond access.

Site is adjacent to L G DeFelice Co (Low Risk contamination site).

This site has a Moderate probability archaeological potential.

Pond 10-B is located on the left side of the project adjacent to the basin outfall to Mill Slough. This site is not improved and classified as Vacant Commercial with XFOB. The pond site is a 1.52-acre portion of the 24.14-acre property identified as Osceola County Parcel 02-25-29-00U0-0032-0000.

This site is predominantly a hydric flatwood (~ 1.26 ac.). The quality of this wetland would be estimated as "medium". There are no state or federal protected wildlife concerns on this site and no additional survey would be required for wildlife on this site.

A 30" gas main crosses the pond access.

Site is adjacent to L G DeFelice Co (Low Risk contamination site).

This site has a Low probability archaeological potential.

Ponds 10-C1 and **10-C2** are existing ponds at Osceola Parkway within FTE LA R/W.

The wetland portion of this site could offer SFH for wood storks during periods of inundation. Based on the previous SFWMD permit Pond 10-C1 and 10-C2 would be considered an upland cut system that would not require mitigation. There are no state or federal protected wildlife concerns on this site and no additional survey would be required for wildlife on this site.

Utilities include Buried electric and fiber optic cable.

Pond 10-C1 site is adjacent to L G DeFelice Co (Low Risk contamination site). Pond 10-C2 site is not adjacent to or within any CRR sites.

This site has a Low probability archaeological potential.

Basin 11

Pond 11-A is located along the existing left roadside ditch and would be a linear pond within the LA R/W. The site outfalls into the Mill Slough. Removal of the toll plaza within the site is anticipated.

This site is predominantly a ruderal upland. Approximately 0.20 acre of herbaceous wetlands are located within the limits of this pond site alternative. The quality of this wetland would be estimated as "low".

During the field assessment, a sign was observed just outside of the western edge of this site. This sign stated that the land west of the pond site alternative is a mitigation area. The mitigating area appears to be primarily composed of a wet ditch with wetland vegetation. There are no state or federal protected wildlife concerns on this site and no additional survey would be required for wildlife on this site.

Utilities include buried fiber optic cable, water lines and electric power.

Site adjacent to FTE Turnpike MP 248 (Low Risk contamination site).

This site has a Low probability archaeological potential.

Pond 11-B is located on the left side of the project adjacent to the basin outfall into Mill Slough. This site is improved and classified as Vacant Commercial. The pond site is a 2.18-acre portion of the 55.66-acre property identified as Osceola County Parcel 02-25-29-1448-0001-0090.

This site is disturbed uplands with no clear intended use. There are no state or federal protected wildlife concerns on this site and no additional survey would be required for wildlife on this site.

There are no known utilities at this site.

Site is not adjacent to or within any CRR sites.

This site has a Low probability archaeological potential.

Ponds 11-C1 and **11-C2** are existing ponds at Osceola Parkway Interchange within FTE LA R/W.

The wetland section of the pond sites are ~ 1.01 ac. for 11-C1 and 1.32ac. for 11-C2. Based on the previous SFWMD permit Pond 11 C1 and C2 would be considered an upland cut system that would not require mitigation. There are no state or federal protected wildlife concerns on this site and no additional survey would be required for wildlife on this site.

Utilities include buried electric, sanitary, and fiber optic cable.

Pond 11-C1 is adjacent to FTE Turnpike MP 248 (Low Risk contamination site). Pond 11-C2 is not adjacent to or within any CRR sites.

This site has a Low probability archaeological potential.

Floodplain Compensation Pond Alternatives

Three (3) Floodplain Compensation (FPC) Pond locations were determined per involvement with Fish Lake Fennel Slough, Bass Slough, and Mill Slough floodplains. The sizes are conservative approximations as the final design will determine the actual floodplain impacts and required compensation. The following describes the locations:

Fish Lake Floodplain - Refer to Figure 8-2

Floodplain Compensation Pond Fish 1 (FPC Fish 1) is located on the right side of the project upstream of the basin outfall ditch to Fish Lake. Refer to Figure 8-2 The site is undeveloped and classified as Pastureland 1-Vac. There is a floodplain within the pond area. The pond site is a 6.47-acre portion of the 28.93-acre property identified as Osceola County Parcel ID 32-25-30-0000-0016-0000.

The western half of this site contains a wet prairie. The eastern half of this site is predominantly a disturbed hardwood wetland. Based on the observation of lichen lines on trees, the seasonal high-water level for this wetland appears to be at or above the surface. An upland buffer separates the wet prairie and hardwood wetland to the south from an east-west running ditch along the northern edge of this site. A small pond is located near the eastern perimeter of this site. The quality of this wetland would be estimated as “medium”. This site would generally be regarded as having a ground cover that is too overgrown and wet for caracara.

There are no state or federal protected wildlife concerns on this site and no additional survey would be required for wildlife on this site.

There are no known utilities at this site.

Site is adjacent to former citrus groves (Low Risk contamination site).

This site has a Low probability archaeological potential.

Floodplain Compensation Pond Fish 2 (FPC Fish 2**)** is located on the left side of the project downstream of the basin outfall ditch to Fish Lake. It is an undeveloped portion of the overall parcel that is classified County -Imp. The pond site is a 1.07-acre portion of the 26.74-acre property identified as Osceola County Parcel 29-25-30-4653-0001-0039.

This 1.01 acre site is wholly within a large wetland system. This large wetland system has been delineated previously as part of the Osceola Sherriff's Office development immediately adjacent to the ponds (SFWMD App No. 050608-10) and is currently under a conservation easement. The quality of this wetland would be estimated as "low". There are no state or federal protected wildlife concerns on this site and no additional survey would be required for wildlife on this site.

There are no known utilities at this site.

Site is not adjacent to or within any CRR sites.

Recorded Archaeological site 8OS1771 (Low probability) within pond footprint.

Floodplain Compensation Pond Fish 3 (FPC Fish 3) is located on the left side of the project downstream of the basin outfall ditch to Fish Lake. It is an undeveloped portion of the overall parcel that is classified County -Imp. The pond site is a 1.90-acre portion of the 26.74-acre property identified as Osceola County Parcel 29-25-30-4653-0001-0039.

This 1.90 acre site is wholly within a large wetland system is of wetland. This large wetland system has been delineated previously as part of the Osceola Sherriff's Office development immediately adjacent to the ponds (SFWMD App No. 050608-10) and is currently under a conservation easement. The quality of this wetland would be estimated as "low". There are no state or federal protected wildlife concerns on this site and no additional survey would be required for wildlife on this site.

There are no known utilities at this site.

Site is adjacent to Osceola County Sheriff Office Fuel Facility (Low Risk contamination site).

This site has a Low probability archaeological potential.

Floodplain Compensation Pond Fish 4 (FPC Fish 4) is located on the right side of the project upstream of the basin outfall ditch to Fish Lake. It is an undeveloped portion of the overall parcel that is classified Pastureland 1-IMP. The pond site is a 2.98-acre portion of 14.62-acre property identified as Osceola County Parcel ID 32-25-30-0000-0080-0000. This site was recently purchased by a third party for development.

A 0.94 acre excavated ditch is located along the western perimeter that appears to drain the wetlands to the north of the site during periods of high water. The quality of this wetland would be estimated as "low".

The sparse canopy and actively grazing cows within and adjacent to this site offer potential habitat for several listed species. This site contains potential suitable foraging habitat for the caracara; however, preferred nesting trees (solitary cabbage palms) were not observed within the site. In fact, this site was included in one of the observation points for the 2017 caracara survey for this species that was covering the mainline ROW expansion. Coordination with USFWS will be required to determine if an additional survey for caracaras are required within this site.

There are no known utilities at this site.

Site is not adjacent to or within any CRR sites.

There is a potential unrecorded Historic Building within study area at 1312 Simmons Road (Low probability.

Fennel Slough - Refer to Figure 8-3

Floodplain Compensation Pond Fennel 1 (FPC Fennel 1) is in the Fennel Slough on the right side of the project near the upstream end of CD-4. The site is undeveloped and classified as No AG acreage-Vac. The pond is located within Fennel Slough (wetlands and floodplain). The pond site is a 2.62-acre portion of the 92.30-acre property identified as Osceola County Parcel ID 20-25-30-4814-0001-00H0.

This site is located entirely within a hardwood forested wetland (approximately 2.02 ac.). Based on the observation of lichen lines on trees, the seasonal high-water level for this wetland appears to be a few inches above the surface. A stormwater pond located south of Pond 3-Alt B connects and drains into these systems via control structure. This pond site appears to be under conservation easement and are likely onsite mitigation associated with the adjacent Remington Golf and Country Club (SFWMD Application No. 940211-2). The quality of this wetland would be estimated as “high”. There are no state or federal protected wildlife concerns on this site and no additional survey would be required for wildlife on this site.

There are no known utilities at this site.

Site is not adjacent to or within any CRR sites.

This site has a Low probability archaeological potential.

Floodplain Compensation Pond Fennel 2 (FPC Fennel 2) is located on the left side of the project within the existing roadside conveyance ditch. The site discharges north to CD-4.

This site is located within FTE LA R/W and is entirely composed of wetland scrub (~ 1.97 ac.). The quality of this wetland would be estimated as “low”. There are no state or federal protected wildlife concerns on this site and no additional survey would be required for wildlife on this site.

Utilities include buried fiber optic cable and electric power. There is a 30"gas main along east side of pond.

Site is not adjacent to or within any CRR sites.

This site has a Moderate probability archaeological potential.

Floodplain Compensation Pond Fennel 3 (FPC Fennel 3) is located on the left side of the project within the existing roadside conveyance ditch. The site discharges south to CD-4.

This site is located within FTE LA R/W and is entirely composed of wetland scrub (~1.67 ac.). The quality of this wetland would be estimated as "low". There are no state or federal protected wildlife concerns on this site and no additional survey would be required for wildlife on this site.

Utilities include buried fiber optic cable and electric power. There is a 30"gas main along east side of pond.

Site is not adjacent to or within any CRR sites.

This site has a Low probability archaeological potential.

Bass Slough - Refer to Figure 8-4, Figure 8-5, and Figure 8-8

Floodplain Compensation Pond Bass 1 (FPC Bass 1) is located on the left side of the project adjacent to the Bass Slough floodplain and floodway (elevation 64). The site is undeveloped and classified as Vacant Commercial. The site is a 3.56-acre portion of a 24.02-acre property identified as Osceola County Parcel 19-25-30-0000-0100-0000.

This site is located entirely within a wetland (~ 3.24 acre) that is part freshwater marsh and part hardwood swamp. The marsh section of this site may provide SFH for wood storks during periods of inundation. The quality of this wetland would be estimated as "medium". There are no state or federal protected wildlife concerns on this site and no additional survey would be required for wildlife on this site.

Utilities include a gas line along eastern edge of pond.

Site is adjacent to Florida's Turnpike Resurfacing (Low Risk contamination site).

This site has a Low probability archaeological potential.

Floodplain Compensation Pond Bass 2 (FPC Bass 2) is located on the left side of the project adjacent to the Bass Slough floodplain and floodway (elevation 65). The site is undeveloped and classified as Public Sch-Vac. The site is a 2.97-acre portion of an 8.5-acre property identified as Osceola County Parcel 19-25-30-0000-0020-0000.

This site is characterized as a mosaic of upland hammock, hydric hammock, and mixed hardwood wetlands (approximately 1.66 acre). This site does not appear to offer suitable habitat for any federally listed species known to occur within Osceola County. Gopher tortoises within the uplands are unlikely based on the high-water table. The quality of this wetland would be estimated as "medium". There are no state or federal protected wildlife concerns on this site and no additional survey would be required for wildlife on this site.

Utilities include a gas line along eastern edge of pond.

Site is adjacent to Florida's Turnpike Resurfacing and Osceola County Admin Building (Low Risk contamination sites).

This site has a Moderate probability archaeological potential.

Floodplain Compensation Pond Bass 3 (FPC Bass 3) is located on the left side of the project within the existing roadside conveyance ditch in FTE LA R/W. The site discharges west through CD-11 into Bass Slough and floodway (elevation 79) located on the right conveyance ditch within the LA R/W.

This site is located along the FTE LA R/W and is predominantly a wetland coniferous forest (~ 10.13 acre). Please note that based on our preliminary field assessment with SFWMD staff, portions of the wetlands within this site would require mitigation (3.41 ac) based on whether they were cut from hydric soils and/or if they are clearly a linear feature. The quality of this wetland would be estimated as "low". There are no state or federal protected wildlife concerns on this site and no additional survey would be required for wildlife on this site.

Utilities include a gas line along eastern edge of pond.

Site is not adjacent to or within any CRR sites.

This site has a Low probability archaeological potential.

Floodplain Compensation Pond Bass 4 (FPC Bass 4) is located on the left side of the project within the existing roadside conveyance ditch in FTE LA R/W. The site discharges south to the downstream side of the Bass Slough bridge into Bass Slough and floodway (elevation 69). There is 0.39 acres of Bass Slough that is considered wetlands. The quality of this wetland would be estimated as "low". There are no state or federal protected wildlife concerns on this site and no additional survey would be required for wildlife on this site.

Utilities include a gas line along eastern edge of pond and overhead electric along the western edge.

Site is adjacent to SPILLS Incident at SB Turnpike MM 246 (Low Risk contamination site).

This site has a Low probability archaeological potential.

Floodplain Compensation Pond Bass 5 (FPC Bass 5) is located on the right side of the project within the existing roadside conveyance ditch in FTE LA R/W. The site discharges north through into Bass Slough and floodway (elevation 79). There is 0.14 acres of Bass Slough that is considered wetlands. The quality of this wetland would be estimated as "low". There are no state or federal protected wildlife concerns on this site and no additional survey would be required for wildlife on this site.

There are no known utilities at this site.

Site is not adjacent to or within any CRR sites.

This site has a Low probability archaeological potential.

Floodplain Compensation Pond Bass 6 (FPC Bass 6) is located on the right side of the project within the existing roadside conveyance ditch in FTE LA R/W. The site discharges south into Bass Slough and floodway (elevation 79). The site is considered upland cut ditches and would not require mitigation. There are no state or federal protected wildlife concerns on this site and no additional survey would be required for wildlife on this site.

There are no known utilities at this site.

Site is not adjacent to or within any CRR sites.

This site has a Low probability archaeological potential.

Mill Slough - Refer to Figure 8-9, Figure 8-10, and Figure 8-11

Floodplain Compensation Pond Mill 1 (FPC Mill 1) is located on the left side of the project adjacent to the Mill Slough floodplain. Mill Slough was studied in detail downstream of this location. The site is undeveloped and classified as Vacant Industrial, with XFOB. The site is a 4.00-acre portion of a 44.20-acre property identified as Osceola County Parcel 02-25-29-00U0-0025-0000.

Listed species were not observed during the field assessment; however, these sites have the potential to offer habitat for the gopher tortoise. If these sites are selected, then a gopher tortoise survey will likely be required to document the presence of absence of this species. No additional survey would be required for listed wildlife on these sites.

A gas main crosses the pond access.

Site is not adjacent to or within any CRR sites.

This site has a Moderate probability archaeological potential.

Floodplain Compensation Pond Mill 2 (FPC Mill 2) is located on the left side of the project adjacent to the Mill Slough floodplain. Mill Slough was studied in detail downstream of this location. The site is undeveloped and classified as Vacant Commercial with XFOB. The site is a 4.14-acre portion of a 24.13-acre property identified as Osceola County Parcel 02-25-29-00U0-0032-0000.

A small portion of hydric flatwoods (~ 0.18 ac.) is present in the southeastern section of the site. The quality of this system would be estimated as "medium". There are no state or federal protected wildlife concerns on this site and no additional survey would be required for wildlife on this site.

A 30" gas main crosses the pond access.

Site is adjacent to L G DeFelice Co (Low Risk contamination site).

This site has a Low probability archaeological potential.

Floodplain Compensation Pond Mill 3 (FPC Mill 3) is located on the left side of the project adjacent to the Mill Slough floodplain. The site is undeveloped and classified as Vacant Commercial with XFOB. The site is a 2.95-acre portion of a 55.66-acre property identified as Osceola County Parcel 02-25-29-1448-0001-0090.This site is disturbed uplands with no clear intended use. There are no state or federal protected wildlife concerns on this site and no additional survey would be required for wildlife on this site.

There are no known utilities at this site.

Site is not adjacent to or within any CRR sites.

This site has a Low probability archaeological potential.

Floodplain Compensation Pond Mill 4 (FPC Mill 4) is located on the left side of the project adjacent to the Mill Slough floodplain and within FTE LA R/W. There are no state or federal protected wildlife concerns on this site and no additional survey would be required for wildlife on this site.

There are no known utilities at this site.

Site is adjacent to L G DeFelice Co (Low Risk contamination site).

This site has a Low probability archaeological potential.

Floodplain Compensation Pond Mill 5 (FPC Mill 5) is located on the left side of the project adjacent to the Mill Slough West Branch and associated floodplain and adjacent to Pond 11-A within FTE LA R/W.

This site contains 0.03-acres of a low quality wetland. There are no state or federal protected wildlife concerns on this site and no additional survey would be required for wildlife on this site.

Utilities include a buried BFOT and Water line.

Site is adjacent to FTE Turnpike MP 248 (Low Risk contamination site).

This site has a Low probability archaeological potential.

SECTION 9.0 CONCLUSIONS

The proposed stormwater management system design will meet all SFWMD ERP, FDOT/FTE criteria and will require an individual SFWMD ERP Permit.

Overall, the proposed basins discharge to the same primary outfall locations, maintain existing drainage patterns, and provide for general public safety.

9.1 Recommended Pond Site Alternatives

Table 9-1 below, presents the Recommended Alternative for each basin.

Table 9-1: Summary of Recommended Pond Sites

Basin	Recommended Pond Alternative
1	Pond 1-A
2	Pond 2-D
3	Ponds 3-C and 3-D
4	Ponds 4-B and 4-D
5	Pond 5-A
6	Pond 6-A
7	Pond 7-A
8	None
9	Pond 9-C
10	Pond 10-C (existing ponds)
11	Ponds 11-A and 11-C (existing ponds)
FPC-Fish	Pond FPC Fish 1 & Pond 2-B
FPC-Fennel	Pond FPC Fennel 2
FPC-Bass	Ponds FPC Bass 2, 3, 4, 5 and 6
FPC-Mill	Pond FPC Mill 4

APPENDIX A
Figures

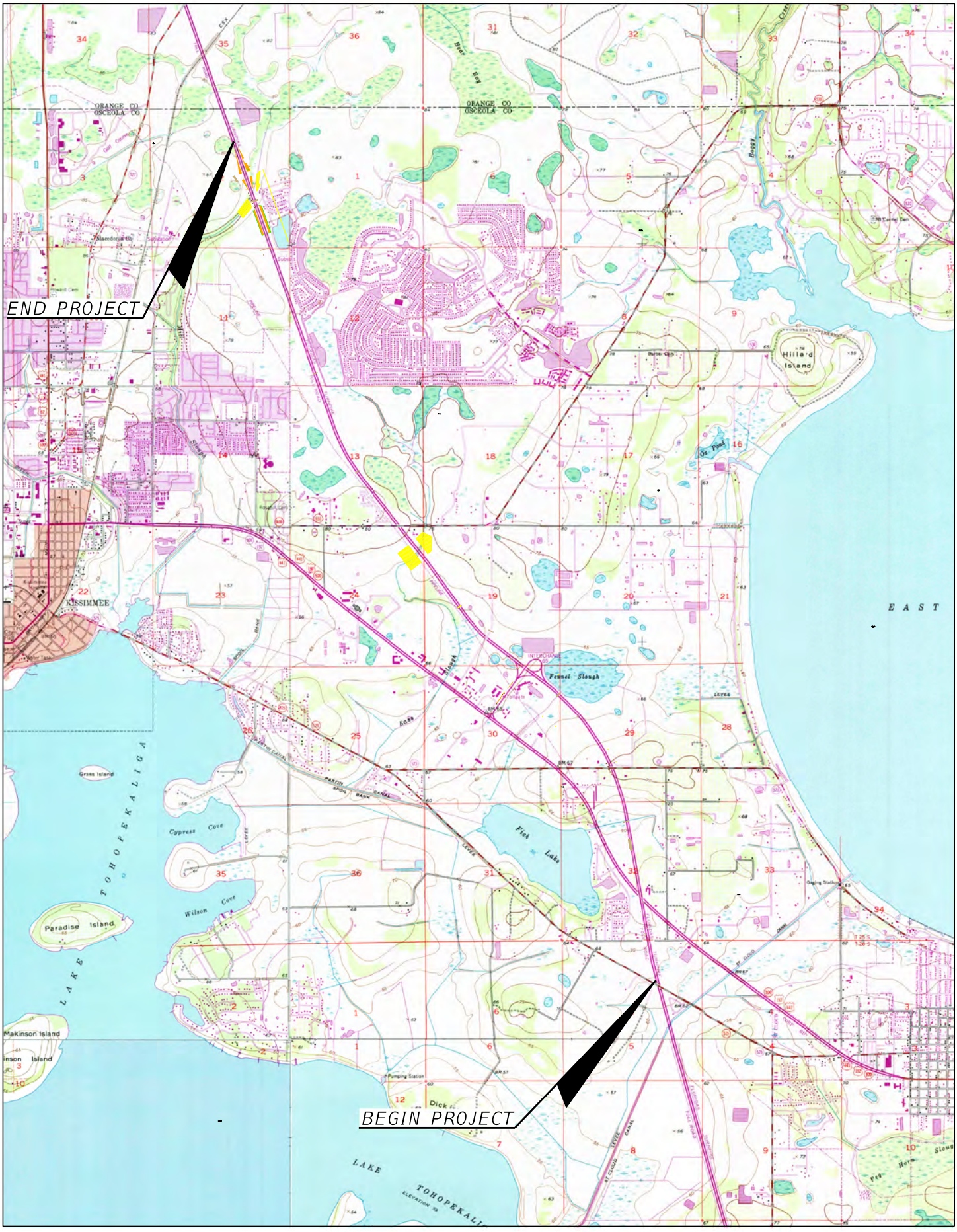
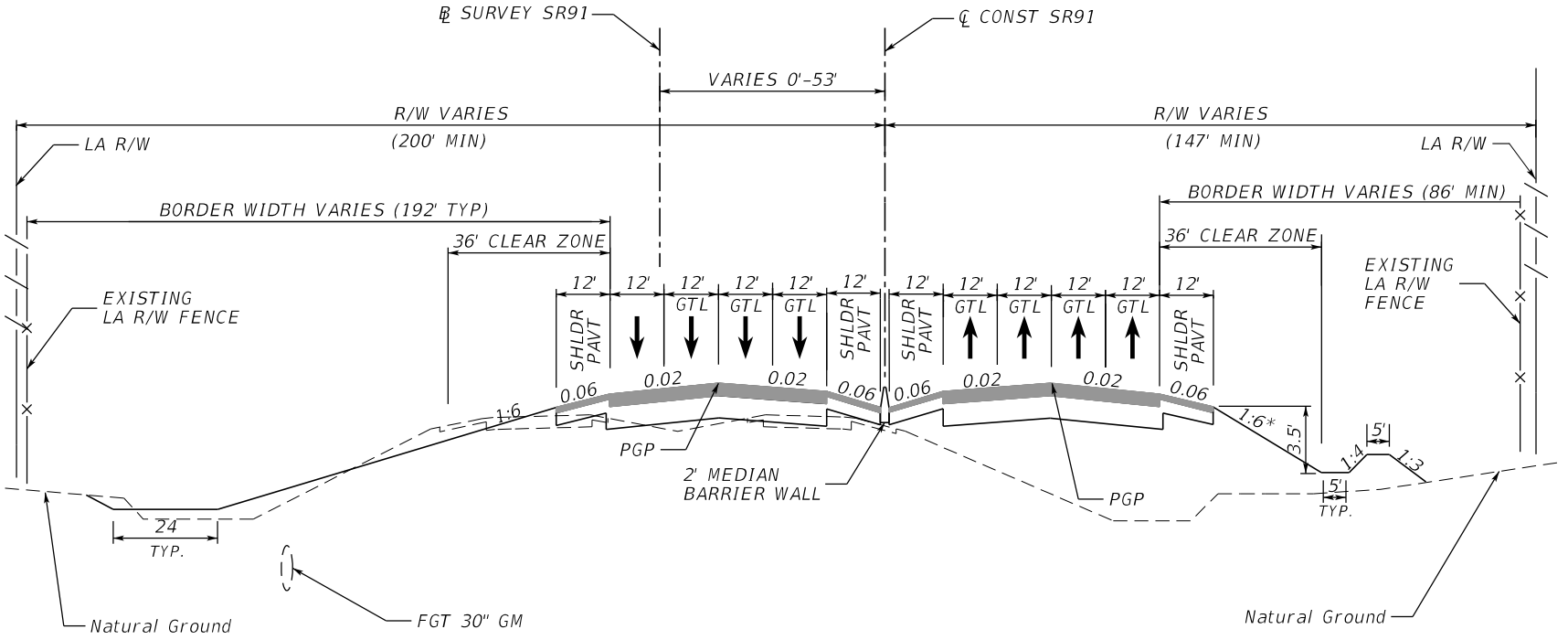


FIGURE 2-1

USGS QUADRANGLE MAP

A-1



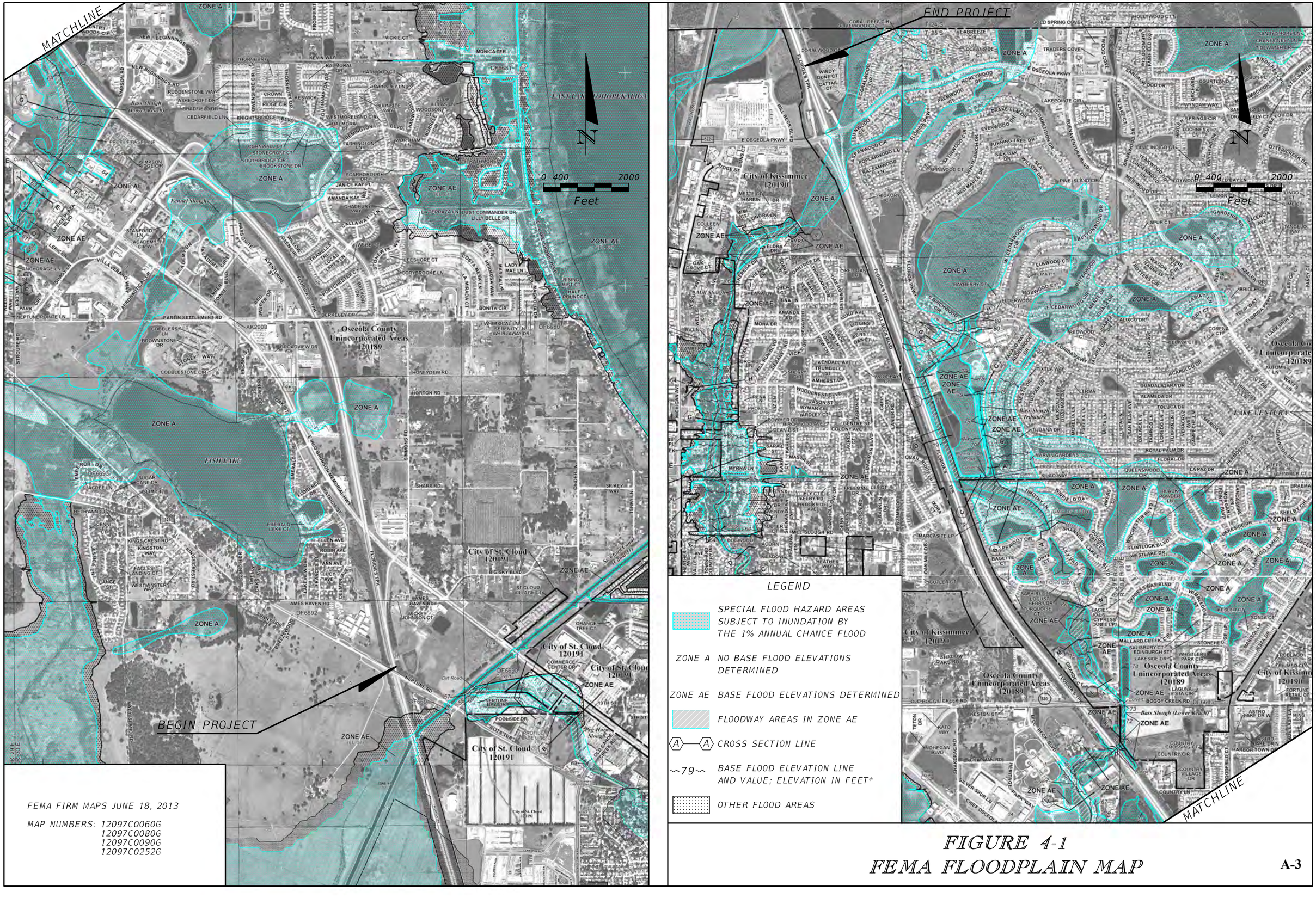
TURNPIKE (SR91) MAINLINE

STA 1664+34.94 TO STA. 2009+80.00

TRAFFIC DATA

CURRENT YEAR = 2018 AADT = 66,300 TRUCK DHHV = 385
ESTIMATED OPENING YEAR = 2025 AADT = 84,600 TRUCK DDHV = 492
ESTIMATED DESIGN YEAR = 2045 AADT = 127,000 TRUCK DDHV = 738
K = 10.5% D = 61.5% T = 16.7% (24 HOUR)
DESIGN HOUR T = 9.0%
DESIGN SPEED = 70 MPH
POSTED SPEED = 70 MPH

FIGURE 2-2
TYPICAL SECTION



FEMA FIRM MAPS JUNE 18, 2013

MAP NUMBERS: 12097C0060G
12097C0080G
12097C0090G
12097C0252G

FIGURE 4-1
FEMA FLOODPLAIN MAP

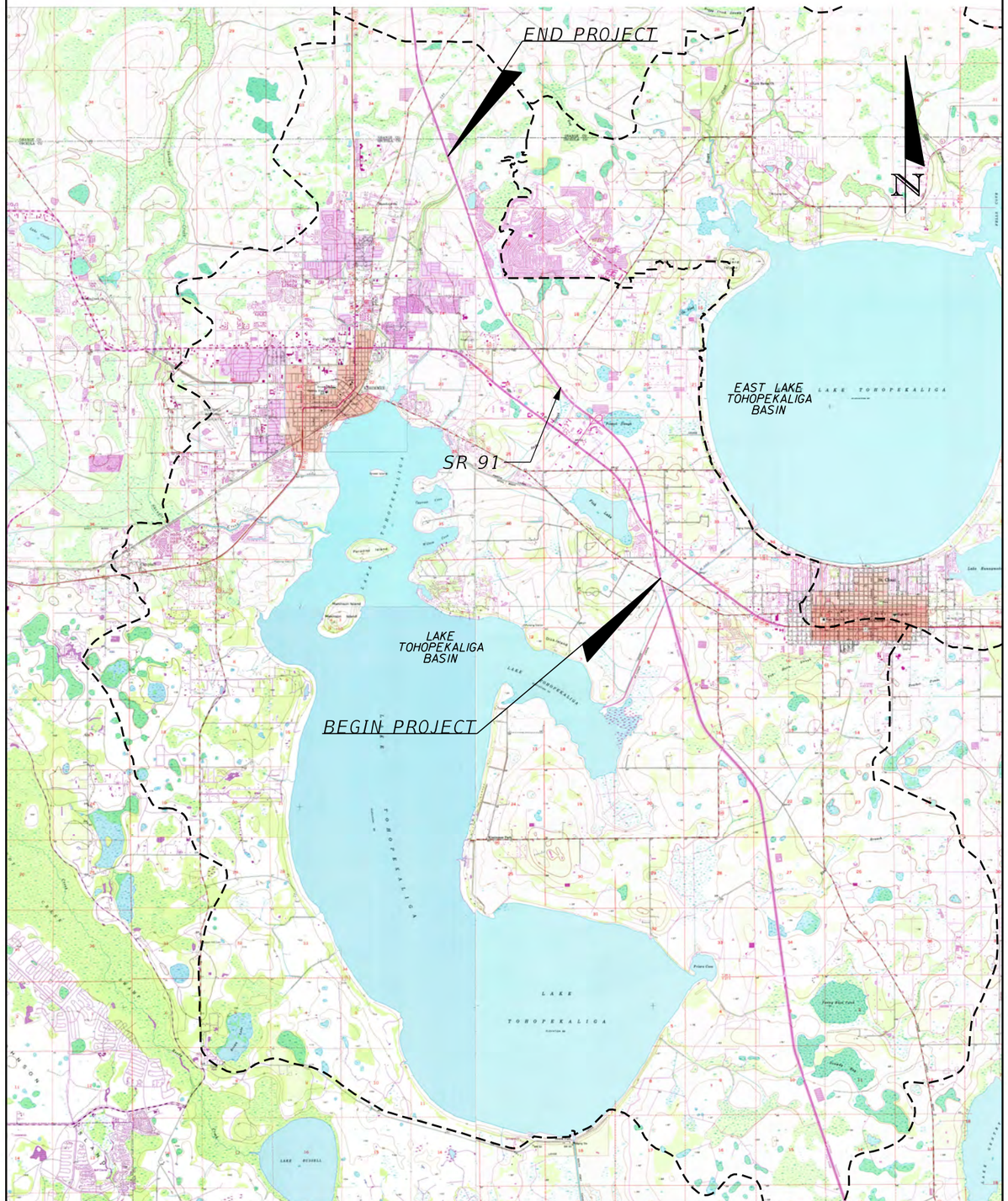
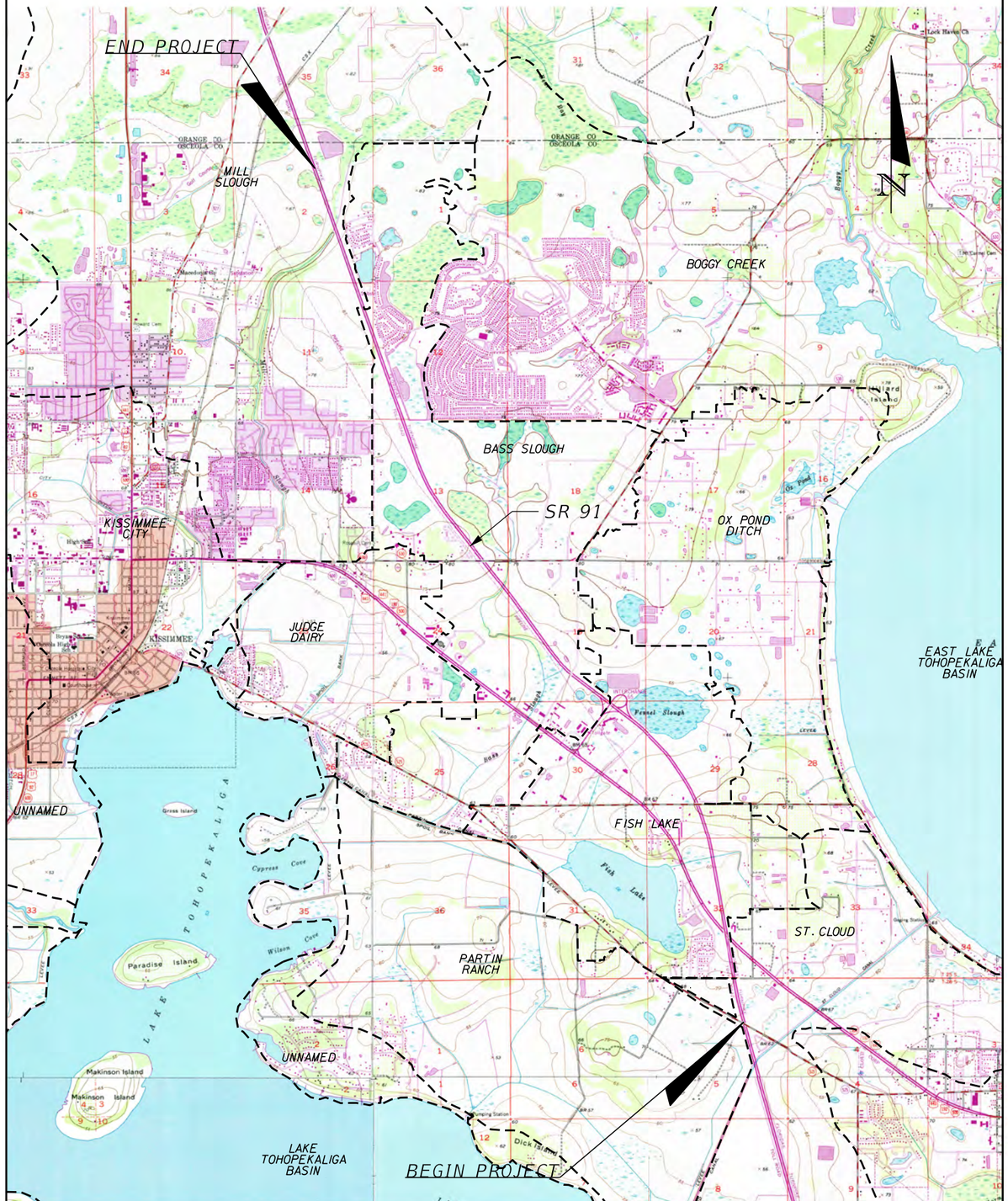


FIGURE 5-1
SFWMD'S LAKE TOHOPEKALIGA BASIN



SFWMD"S LAKE TOHOPEKALIGA SUBBASINS

DO NOT USE THE INFORMATION ON THIS SHEET FOR CONSTRUCTION PURPOSES.

THIS SHEET IS IN THE PLANS FOR DOCUMENTATION AND TO ASSIST CONSTRUCTION PERSONNEL WITH DRAINAGE CONCERNS.

NOTE:
1. EXISTING STRUCTURES INFORMATION IS NOT SHOWN FOR SR 500 BECAUSE OF ONGOING CONSTRUCTION. UPON COMPLETION, STRUCTURES WILL BE ADDED.
2. ALL ELEVATIONS ARE NAVD '88 DATUM. (NAVD '88 EL. X.XX' = NGVD '29 EL. - 0.95')
3. REFER TO REGIONAL DRAINAGE BASIN MAP IN THE DRAINAGE REPORT FOR CROSS DRAIN DRAINAGE BASINS.

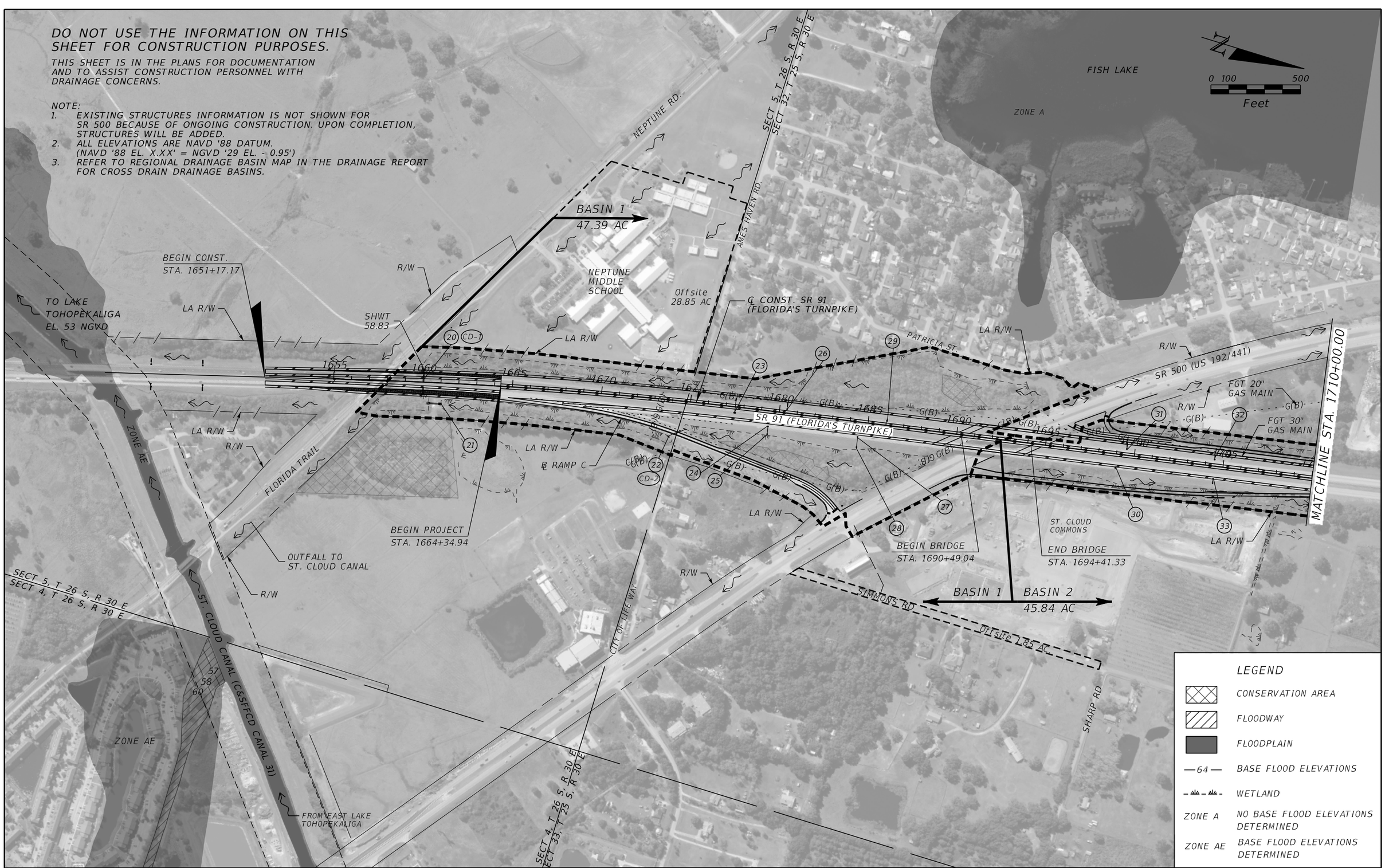


FIGURE 5-2
DRAINAGE MAP (1/6)

FISH LAKE

ZONE A

SECT 31, T 25 S, R 30 E
SECT 32, T 25 S, R 30 E

PARTIN SETTLEMENT RD.

CR 523

TO FISH LAKE

N

0 100 500
Feet

R/W

G(B)

PERM. EASEMENT

SECT 30, T 25 S, R 30 E
SECT 29, T 25 S, R 30 E

62.58' 100YR FLOODPLAIN EL.

MATCHLINE STA. 1780+00.00

FGT 20" GAS MAIN

HW 62.6

CD-4

52

℄ CONST SR 500

R/W

SR 500 (US 192/441)

OSCEOLA COUNTY PROPERTY APPRAISER

RED JASPER DR

CENTRAL MINI STORAGE

AMBER POINTE

LA R/W

MATCHLINE STA. 1710+00.00

ZONE A

OSCEOLA COUNTY SHERIFF

PERM. EASEMENT

59.78' 100YR FLOODPLAIN EL.

COUNTY EMERGENCY MANAGEMENT

FGT 30" GAS MAIN

LA R/W

GATEWAY BAPTIST CHURCH

62.67' 100YR FLOODPLAIN EL.

FENNEL SLOUGH

SR 91 (FLORIDA'S TURNPIKE)

℄ CONST. SR 91 (FLORIDA'S TURNPIKE)

59.86' 100YR FLOODPLAIN EL.

SECT 32, T 25 S, R 30 E
SECT 29, T 25 S, R 30 E

BASIN 2 | BASIN 3
60.94 AC.

REMINGTON COMMUNITY DISTRICT

SIMMONS ROAD

REMINGTON BLVD

PM WELLS CHARTER ACADEMY

NOTE:
1. EXISTING STRUCTURES ON PARTIN SETTLEMENT RD WHICH ARE TO BE REMOVED ARE NOT SHOWN.
2. HIGH WATER (HW) ELEVATIONS ARE FROM ORIGINAL CONTRACT 10.6 PLANS.
3. ALL ELEVATIONS ARE NAVD '88 DATUM. (NAVD '88 EL. X.XX' = NGVD '29 EL. - 0.95').

DO NOT USE THE INFORMATION ON THIS SHEET FOR CONSTRUCTION PURPOSES.

THIS SHEET IS IN THE PLANS FOR DOCUMENTATION AND TO ASSIST CONSTRUCTION PERSONNEL WITH DRAINAGE CONCERNS.

LEGEND

- FLOODPLAIN
- CONSERVATION AREA
- WETLAND
- ZONE A — NO BASE FLOOD ELEVATIONS DETERMINED

FIGURE 5-2
DRAINAGE MAP (2/6)

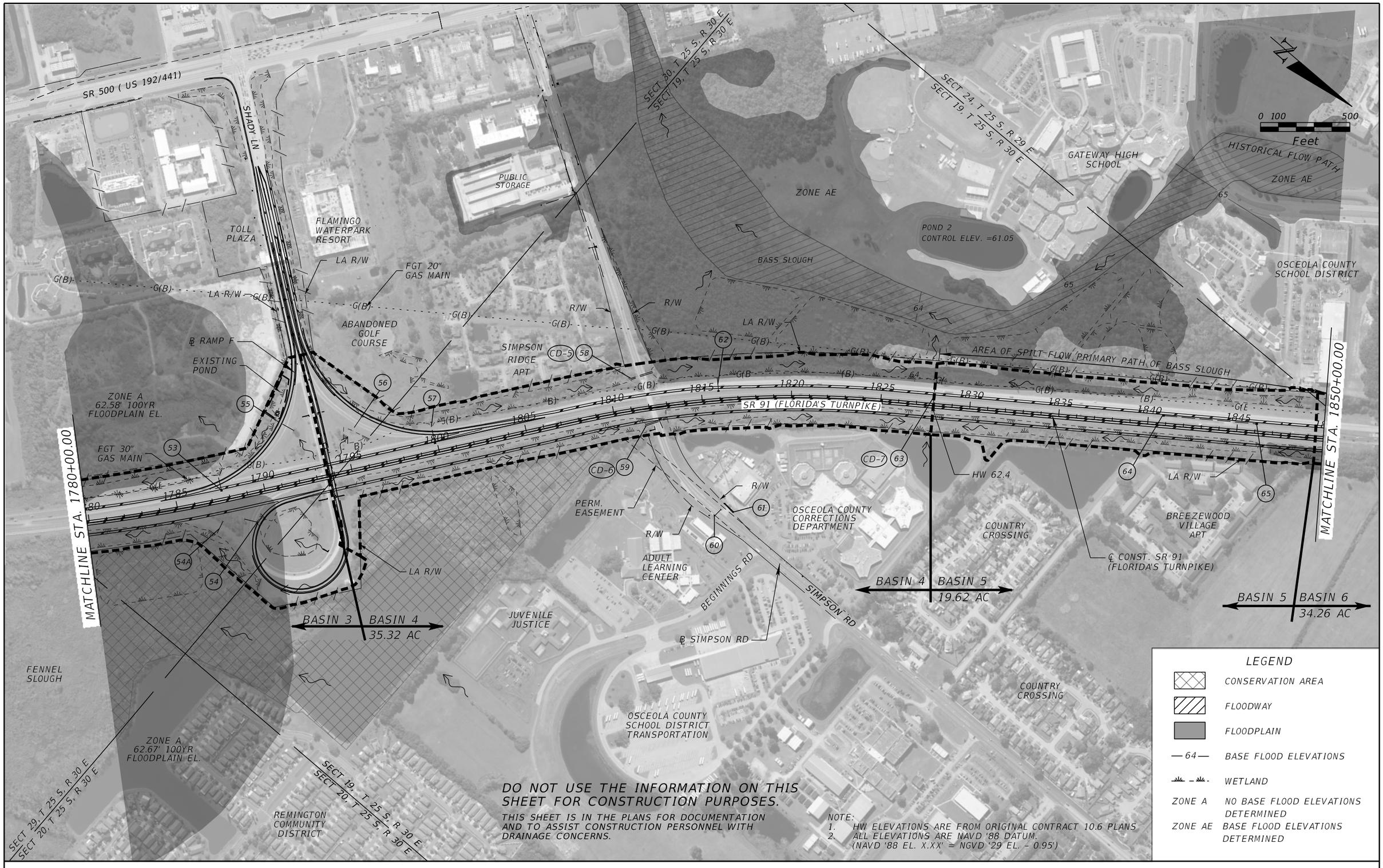


FIGURE 5-2

DRAINAGE MAP (3/6)

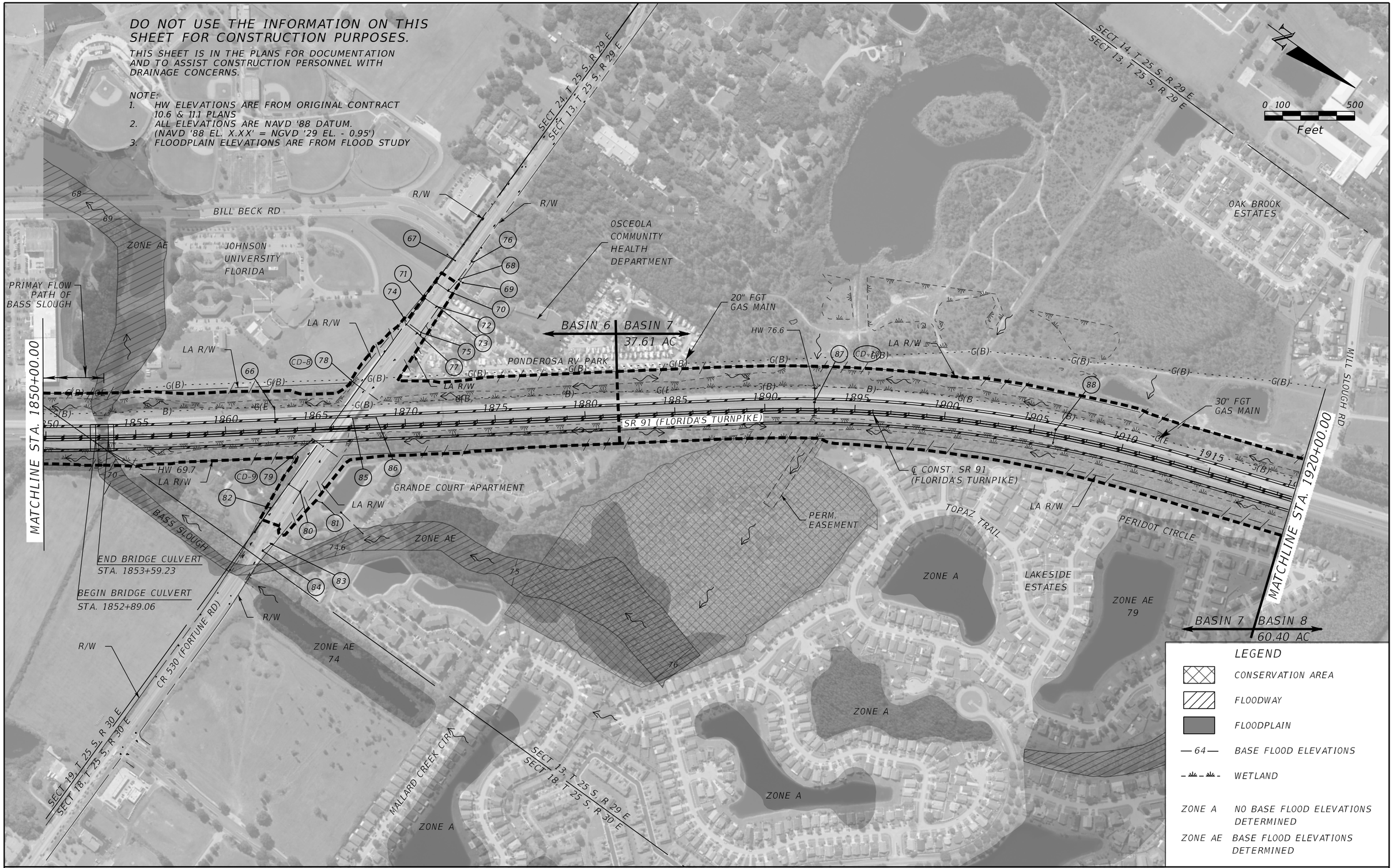


FIGURE 5-2
DRAINAGE MAP (4/6)

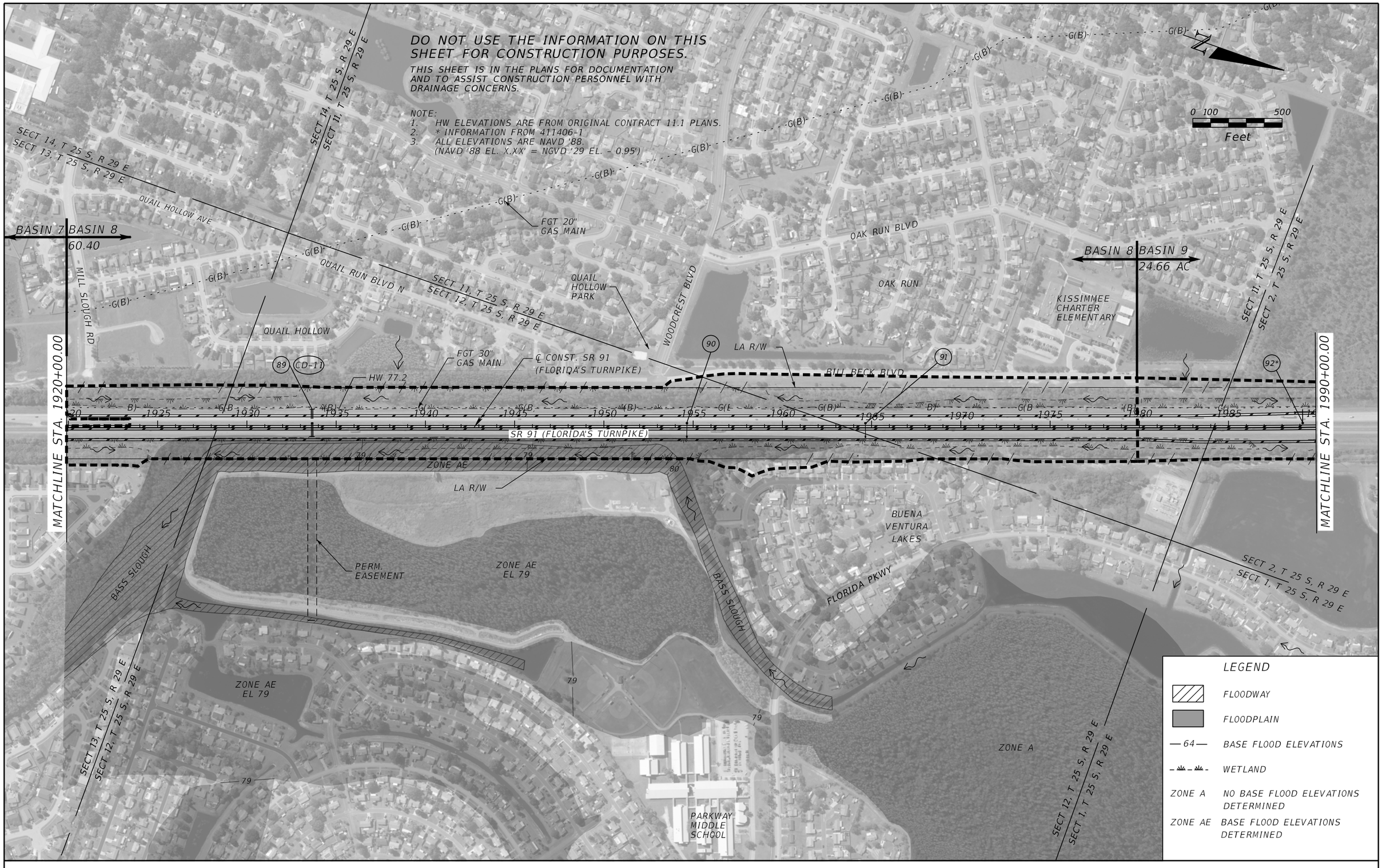


FIGURE 1-5
DRAINAGE MAP (5/6)

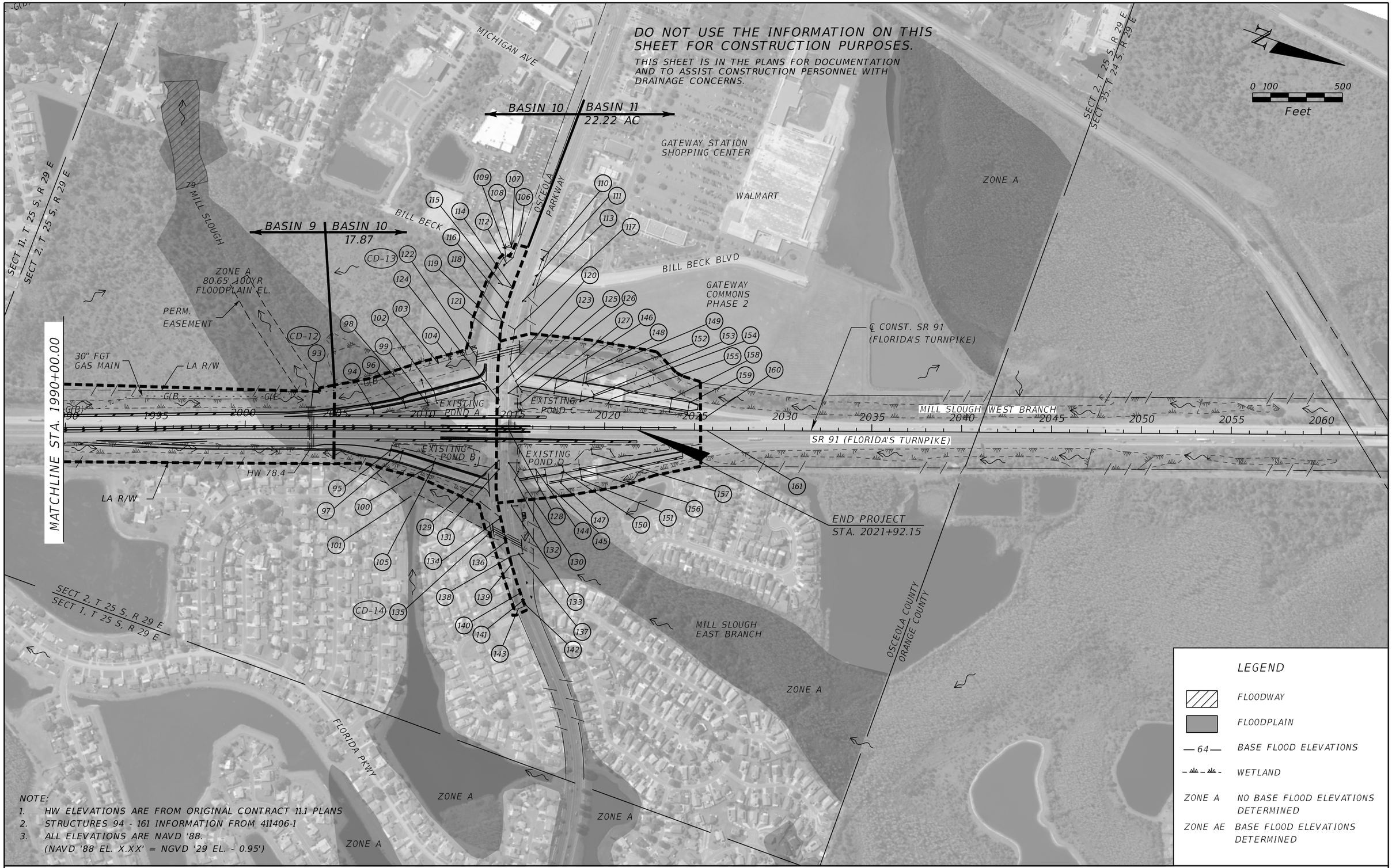


FIGURE 5-2
DRAINAGE MAP (6/6)

MATCHLINE

BEGIN PROJECT

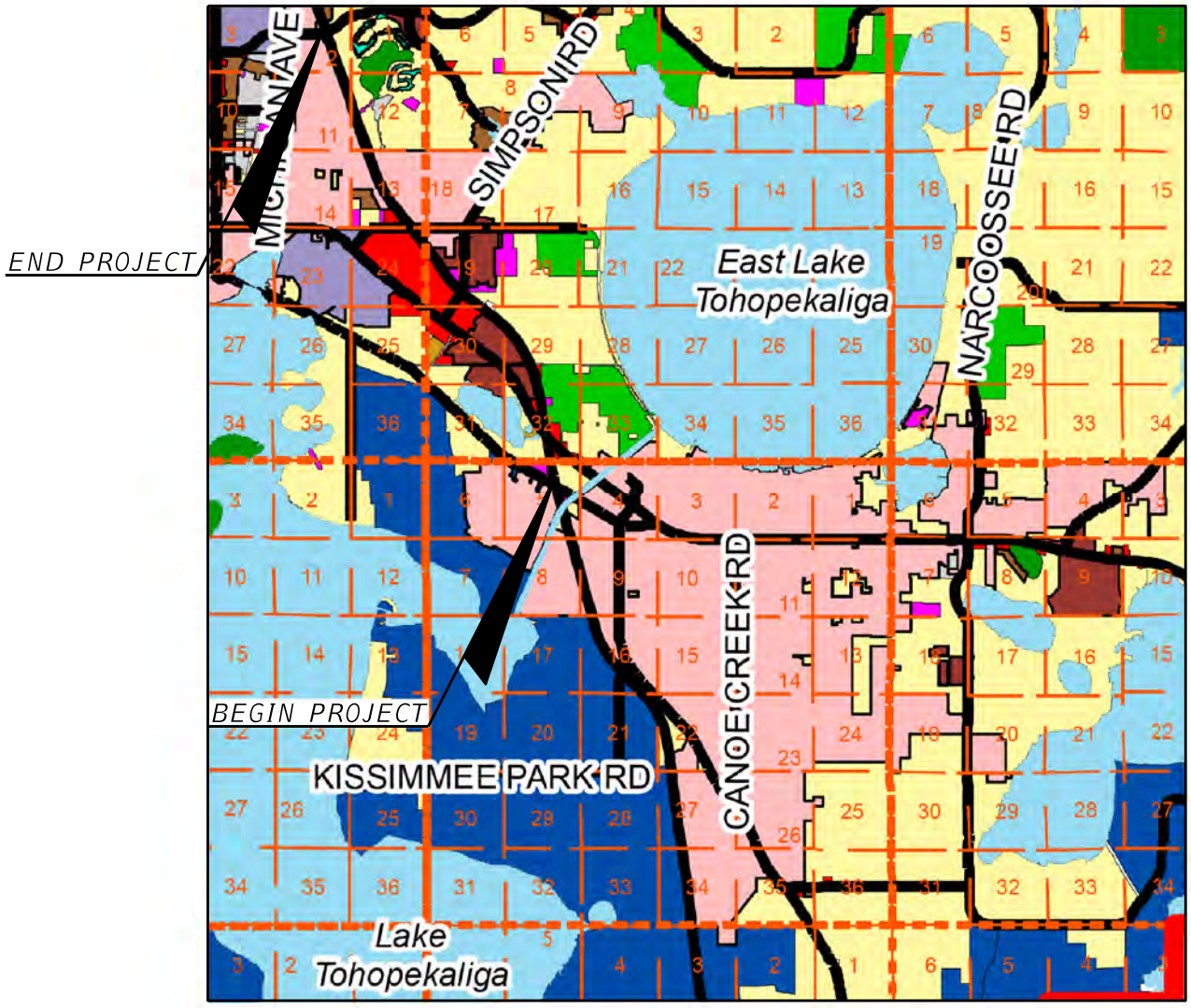
END PROJECT

0 400 2000
Feet

MATCHLINE

FIGURE 5-3
SOIL MAP

A-11



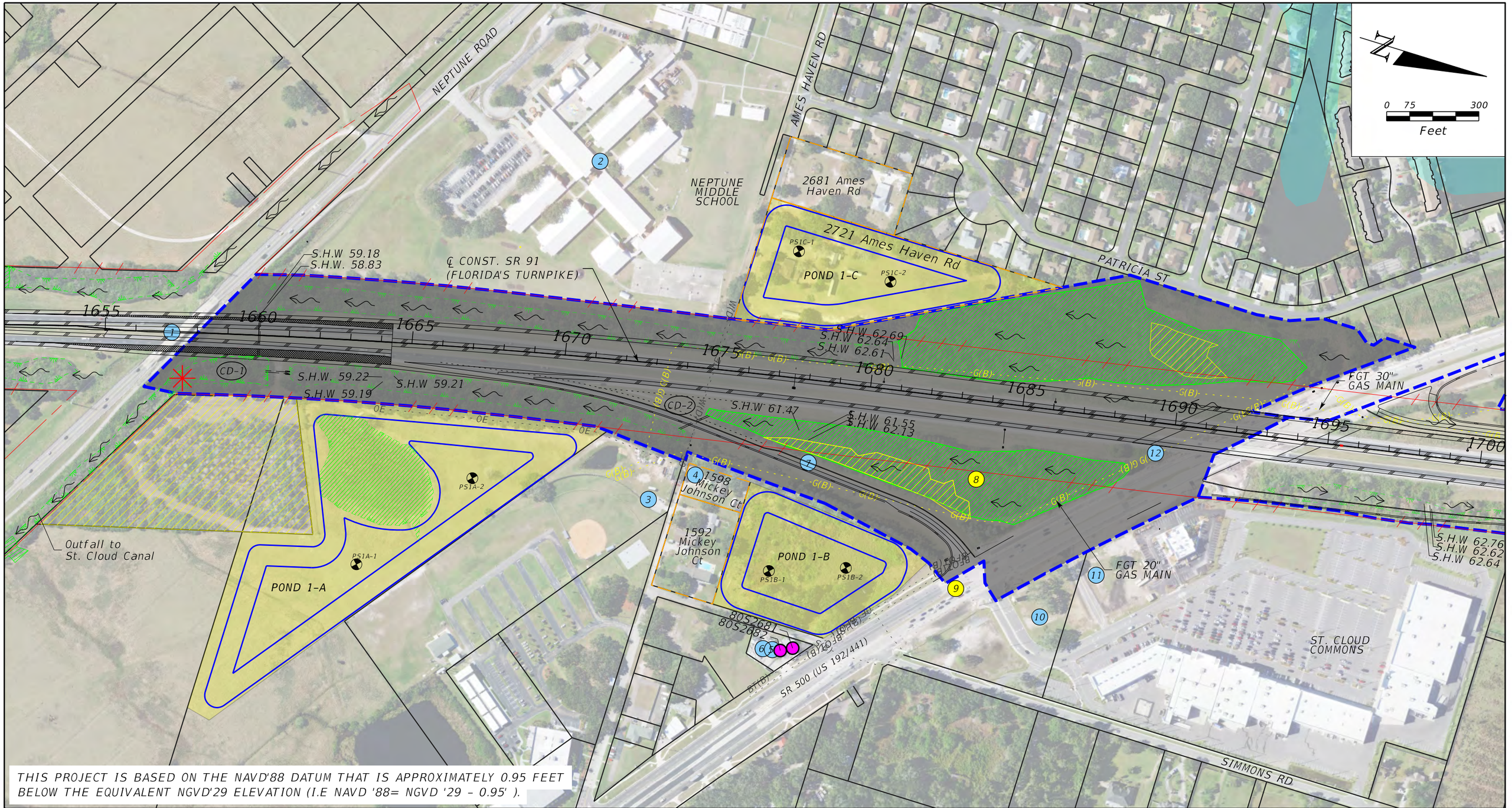
Osceola County 2040 Future Land Use

Legend

- Urban Growth Boundary
- Yeehaw Transportation Distribution Center
- Community Center
- Employment Center
- Neighborhood Center
- Urban Center
- Celebration
- Commercial
- Conservation
- Harmony
- High Density Residential
- Industrial
- Institutional
- Low Density Residential
- Medium Density / Intensity
- Mixed Use
- Natural Resource Utility
- Poinciana
- Rural / Agricultural
- Rural Enclave
- Rural Settlement
- Tourist Commercial
- Other Jurisdictions

FIGURE 5-4

FUTURE LAND USE



THIS PROJECT IS BASED ON THE NAVD'88 DATUM THAT IS APPROXIMATELY 0.95 FEET BELOW THE EQUIVALENT NGVD'29 ELEVATION (I.E NAVD '88= NGVD '29 – 0.95').

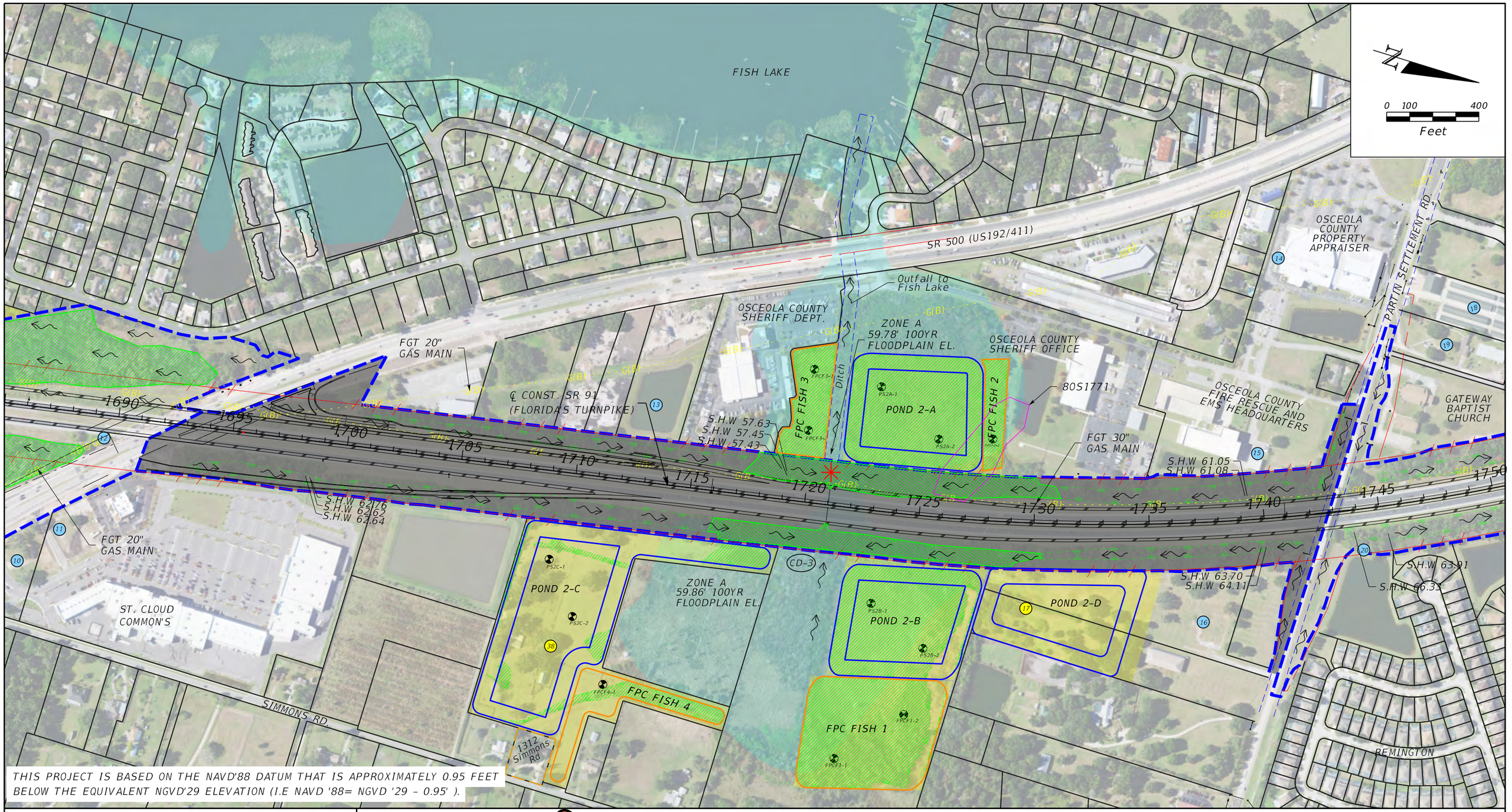
POND SITE ALTERNATIVES

FIGURE 8-1: BASIN 1 MAP

LEGEND

- Basin
- Basin Outfall
- XX.XX Bioloigcal Indicator
- Boring Location
- Floodplain
- Gopher Tortoise Burrows
- Osprey Nest
- Pond Parcel
- Parcel Line
- Previously Recorded Historic Site
- Previously Recorded Historic Structure
- Parcel with Historic AYRB Date
- LA R/W Line
- R/W Line
- Unrecorded Historic Bridge
- Other Surface Water
- Wetland
- High Risk Contamination Site
- Medium Risk Contamination Site
- Low Risk Contamination Site
- Easement
- Conservation Area
- Floodway
- Floodplain Compensation Pond

A-13



THIS PROJECT IS BASED ON THE NAVD'88 DATUM THAT IS APPROXIMATELY 0.95 FEET BELOW THE EQUIVALENT NGVD'29 ELEVATION (I.E NAVD '88= NGVD '29 – 0.95').

POND SITE ALTERNATIVES

FIGURE 8-2: BASIN 2 MAP

LEGEND

- Basin
- Basin Outfall
- XX.XX Bioloigcal Indicator
- Boring Location
- Floodplain
- Gopher Tortoise Burrows
- Osprey Nest
- Pond Parcel
- Parcel Line
- Previously Recorded Historic Site
- Previously Recorded Historic Structure
- Parcel with Historic AYRB Date
- LA R/W Line
- R/W Line
- Unrecorded Historic Bridge
- Other Surface Water
- Wetland
- High Risk Contamination Site
- Medium Risk Contamination Site
- Low Risk Contamination Site
- Easement
- Conservation Area
- Floodway
- Floodplain Compensation Pond

SR 500 (US 192/441)

OSCEOLA COUNTY PROPERTY APPRAISER

FGT 20" GAS MAIN

PARTIN SETTLEMENT RD.

OSCEOLA COUNTY SHERIFF OFFICE

FGT 30" GAS MAIN

OSCEOLA COUNTY FIRE RESCUE AND EMS HEADQUARTERS

GATEWAY BAPTIST CHURCH

AMBER POINTE APARTMENTS

Outfall to Fish Lake

SHADY LN.

EXIST. POND

FDOT Bridge No. 920075

POND 3-D

POND 3-C2

ZONE A 62.58' 100YR FLOODPLAIN EL.

FPC FENNEL 3

FPC FENNEL 2

S.H.W 62.90
S.H.W 63.14
S.H.W 62.86

S.H.W 61.37
S.H.W 61.21

S.H.W 61.09

1735 1740 1745 1750 1755 1760 1765 1770 1775 1780 1785 1790 1795

POND 3-C3

POND 3-C1

CD-4

POND 3-A

POND 3-B

S.H.W 60.78
S.H.W 61.58
S.H.W 61.69

S.H.W 61.65

S.H.W 61.45
S.H.W 61.48
S.H.W 61.51

ZONE A 62.67' 100YR FLOODPLAIN EL.

FPC FENNEL 1

℄ CONST. SR 91 (FLORIDA'S TURNPIKE)

REMINGTON

THIS PROJECT IS BASED ON THE NAVD'88 DATUM THAT IS APPROXIMATELY 0.95 FEET BELOW THE EQUIVALENT NGVD'29 ELEVATION (I.E NAVD'88= NGVD'29 – 0.95').

0 100 400
Feet

POND SITE ALTERNATIVES

FIGURE 8-3: BASIN 3 MAP

LEGEND

- Basin
- Basin Outfall
- XX.XX Bioloigcal Indicator
- Boring Location
- Floodplain
- Gopher Tortoise Burrows
- Osprey Nest
- Pond Parcel
- Parcel Line
- Previously Recorded Historic Site
- Previously Recorded Historic Structure
- Parcel with Historic AYRB Date
- LA R/W Line
- R/W Line
- Unrecorded Historic Bridge
- Other Surface Water
- Wetland
- High Risk Contamination Site
- Medium Risk Contamination Site
- Low Risk Contamination Site
- Easement
- Conservation Area
- Floodway
- Floodplain Compensation Pond

FLAMINGO WATERPARK RESORT

SHADY LN

FGT 20" GAS MAIN

POND 4-D2

POND 4-D1

ABANDONED GOLF COURSE

SIMPSON RD

SIMPSON RIDGE APARTMENTS

FGT 30" GAS MAIN

S.H.W 62.49
S.H.W 62.46
S.H.W 62.28

POND 4-C

BASS SLOUGH

ZONE AE

FPC BASS 1

POND 4-A

POND 4-E

1790 1795 1800 1805 1810 1815 1820 1825 1830 1835

CD-5 CD-6 CD-7

FDOT Bridge No. 920135

FDOT Bridge No. 920075

S.H.W 62.75
S.H.W 62.79

POND 4-B

S.H.W 61.67

℄ CONST. SR 91 (FLORIDA'S TURNPIKE)

OSCEOLA COUNTY CORRECTIONS DEPT.

EDUCATION FOUNDATION OF OSCEOLA COUNTY

22 23 24 25 26 64

0 100 400
Feet

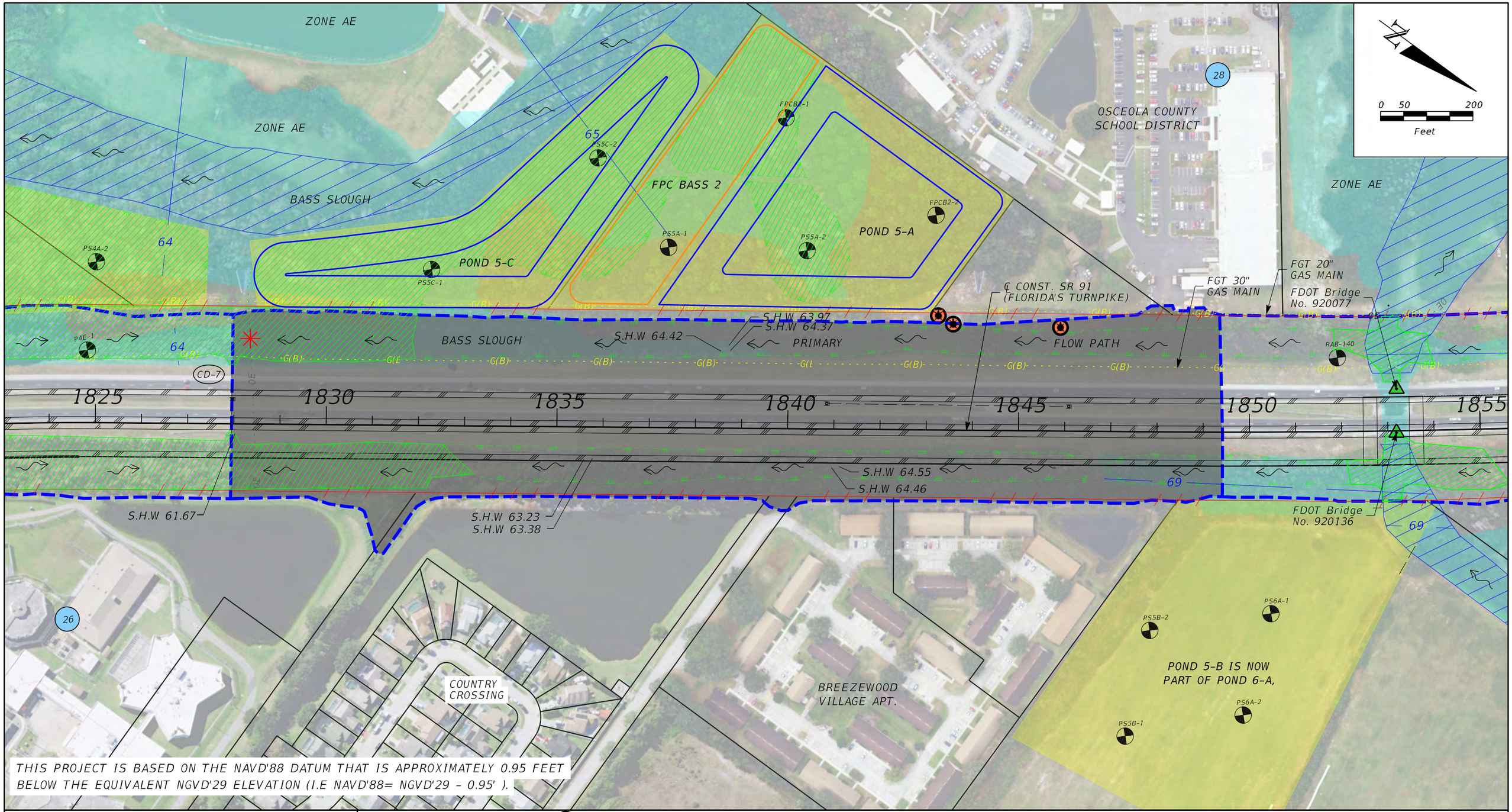
THIS PROJECT IS BASED ON THE NAVD'88 DATUM THAT IS APPROXIMATELY 0.95 FEET BELOW THE EQUIVALENT NGVD'29 ELEVATION (I.E NAVD'88= NGVD'29 – 0.95').

POND SITE ALTERNATIVES

FIGURE 3-4: BASIN 4 MAP

LEGEND

- Basin
- Basin Outfall
- XX.XX Bioloigcal Indicator
- Boring Location
- Floodplain
- Gopher Tortoise Burrows
- Osprey Nest
- Pond Parcel
- Parcel Line
- Previously Recorded Historic Site
- Previously Recorded Historic Structure
- Parcel with Historic AYRB Date
- LA R/W Line
- R/W Line
- Unrecorded Historic Bridge
- Other Surface Water
- Wetland
- High Risk Contamination Site
- Medium Risk Contamination Site
- Low Risk Contamination Site
- Easement
- Conservation Area
- Floodway
- Floodplain Compensation Pond



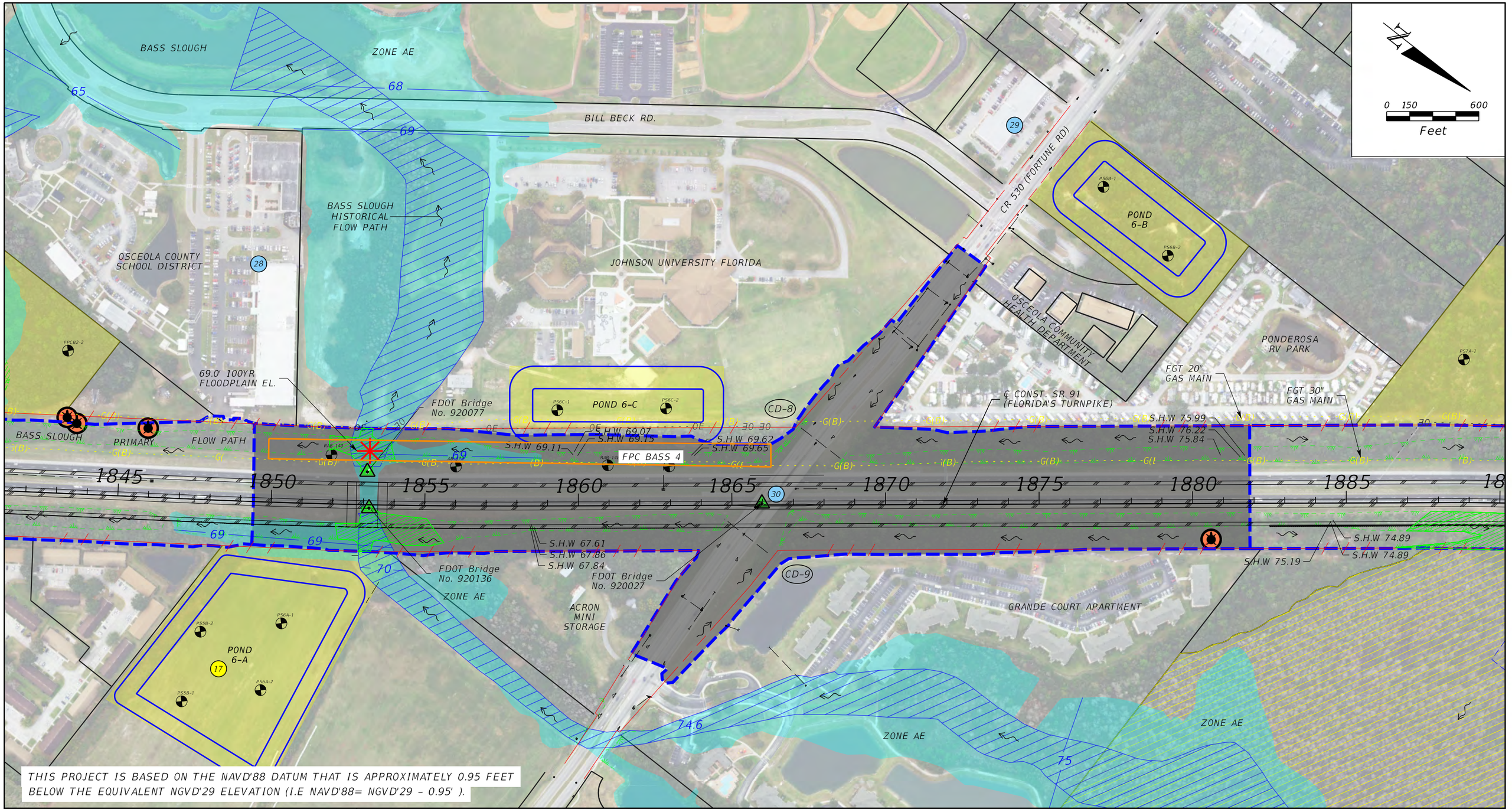
THIS PROJECT IS BASED ON THE NAVD'88 DATUM THAT IS APPROXIMATELY 0.95 FEET BELOW THE EQUIVALENT NGVD'29 ELEVATION (I.E NAVD'88= NGVD'29 – 0.95').

POND SITE ALTERNATIVES

FIGURE 8-5: BASIN 5 MAP

LEGEND

- Basin
- Basin Outfall
- XX.XX Bioloigcal Indicator
- Boring Location
- Floodplain
- Gopher Tortoise Burrows
- Osprey Nest
- Pond Parcel
- Parcel Line
- Previously Recorded Historic Site
- Previously Recorded Historic Structure
- Parcel with Historic AYRB Date
- LA R/W Line
- R/W Line
- Unrecorded Historic Bridge
- Other Surface Water
- Wetland
- High Risk Contamination Site
- Medium Risk Contamination Site
- Low Risk Contamination Site
- Easement
- Conservation Area
- Floodway
- Floodplain Compensation Pond



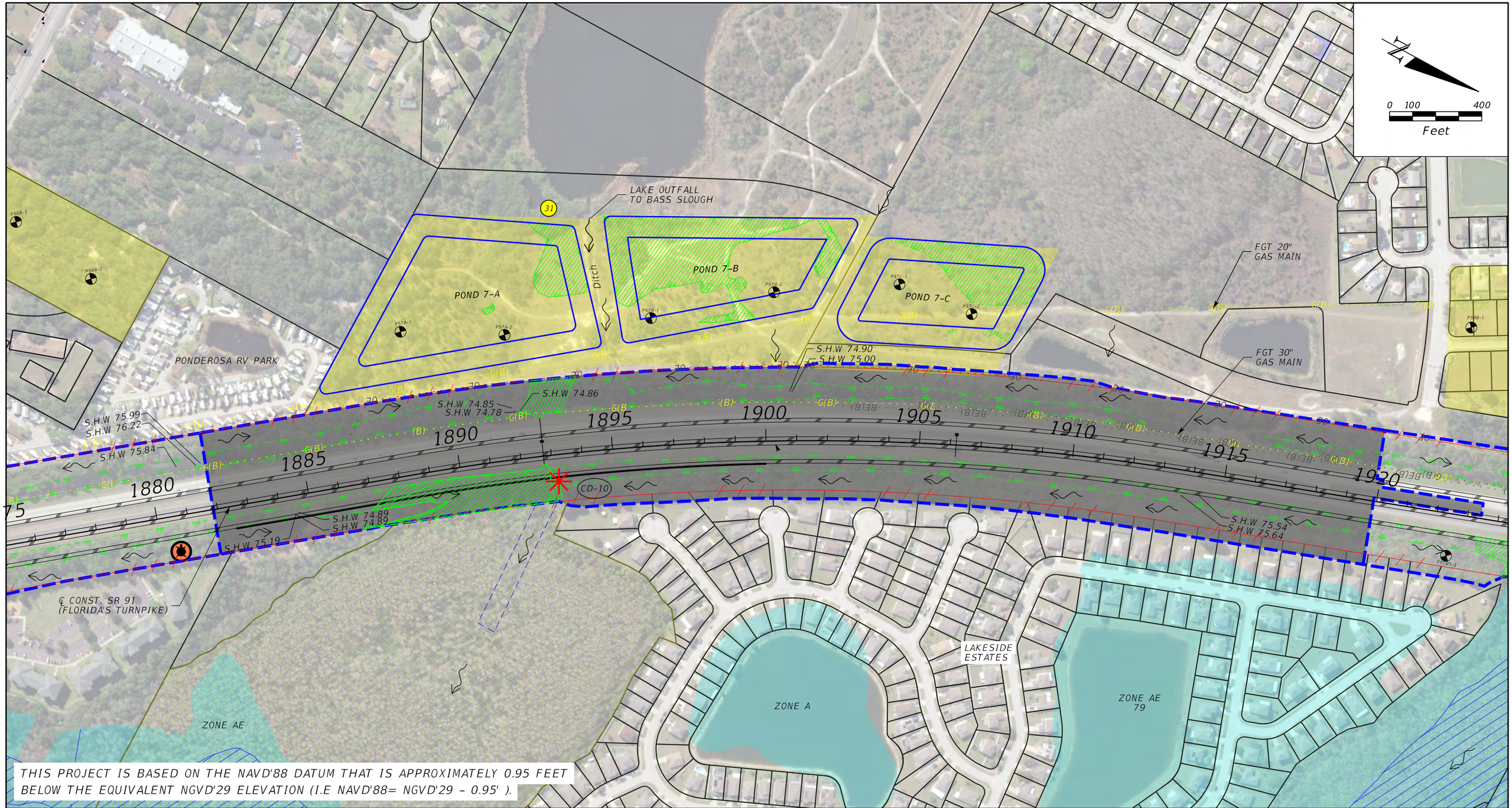
THIS PROJECT IS BASED ON THE NAVD'88 DATUM THAT IS APPROXIMATELY 0.95 FEET BELOW THE EQUIVALENT NGVD'29 ELEVATION (I.E NAVD'88= NGVD'29 – 0.95').

POND SITE ALTERNATIVES

FIGURE 8-6: BASIN 6 MAP

LEGEND

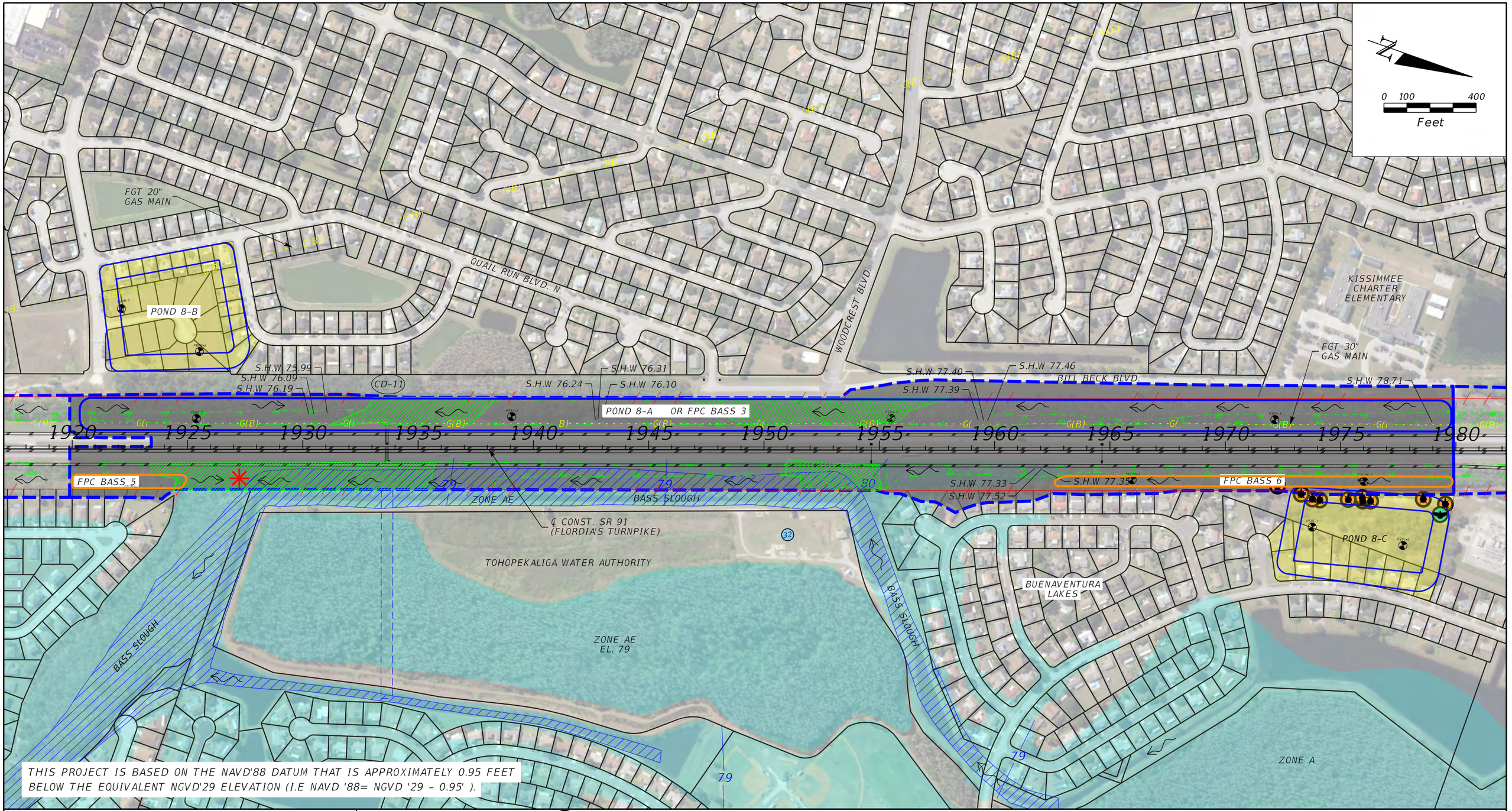
- Basin
- Basin Outfall
- XX.XX Bioloigcal Indicator
- Boring Location
- Floodplain
- Gopher Tortoise Burrows
- Osprey Nest
- Pond Parcel
- Parcel Line
- Previously Recorded Historic Site
- Previously Recorded Historic Structure
- Parcel with Historic AYRB Date
- LA R/W Line
- R/W Line
- Unrecorded Historic Bridge
- Other Surface Water
- Wetland
- High Risk Contamination Site
- Medium Risk Contamination Site
- Low Risk Contamination Site
- Easement
- Conservation Area
- Floodway
- Floodplain Compensation Pond



POND SITE ALTERNATIVES
FIGURE 8-7: BASIN 7 MAP

LEGEND

- Basin
- Basin Outfall
- XX.XX Bioloigcal Indicator
- Boring Location
- Floodplain
- Gopher Tortoise Burrows
- Osprey Nest
- Pond Parcel
- Parcel Line
- Previously Recorded Historic Site
- Previously Recorded Historic Structure
- Parcel with Historic AYRB Date
- LA R/W Line
- R/W Line
- Unrecorded Historic Bridge
- Other Surface Water
- Wetland
- High Risk Contamination Site
- Medium Risk Contamination Site
- Low Risk Contamination Site
- Easement
- Conservation Area
- Floodway
- Floodplain Compensation Pond



POND SITE ALTERNATIVES

FIGURE 8-8: BASIN 8 MAP

LEGEND

- Basin
- Basin Outfall
- XX.XX Bioloigcal Indicator
- Boring Location
- Floodplain
- Gopher Tortoise Burrows
- Osprey Nest
- Pond Parcel
- Parcel Line
- Previously Recorded Historic Site
- Previously Recorded Historic Structure
- Parcel with Historic AYRB Date
- LA R/W Line
- R/W Line
- Unrecorded Historic Bridge
- Other Surface Water
- Wetland
- High Risk Contamination Site
- Medium Risk Contamination Site
- Low Risk Contamination Site
- Easement
- Conservation Area
- Floodway
- Floodplain Compensation Pond

Q:\ORL\43619415201\drainage\Appendx Basins (Restored) 6-11.dgn

RED OAK DR

KISSIMMEE CHARTER ACADEMY

℄ CONST. SR 91 (FLORIDA'S TURNPIKE)

PS9C-1

FPC MILL 1

PS9C-2

FPCM1-1

POND 9-C

FPCM1-2

ZONE A 80.65' 100YR FLOODPLAIN EL.

MILL SLOUGH

FPCM2-2

PS10B-2

PS10B-1

FGT 30" GAS MAIN

FDOT Bridge No. 920079

S.H.W 78.74

S.H.W 78.90

S.H.W 78.68

PS9A-1

POND 9-A

PS9A-2

G(B)

BE(B)

1980

1985

1990

1995

2000

2005

FPCB6-2

CD-12

S.H.W 78.37

S.H.W 78.44

PS8C-2

POND 9-B

PS9B-2

HICKORY CT

PS9B-1

PROPOSED DRAINAGE EASEMENT (MILL SLOUGH)

ASPENWOOD CIR

BUENAVENTURA LAKES

0 50 200

Feet

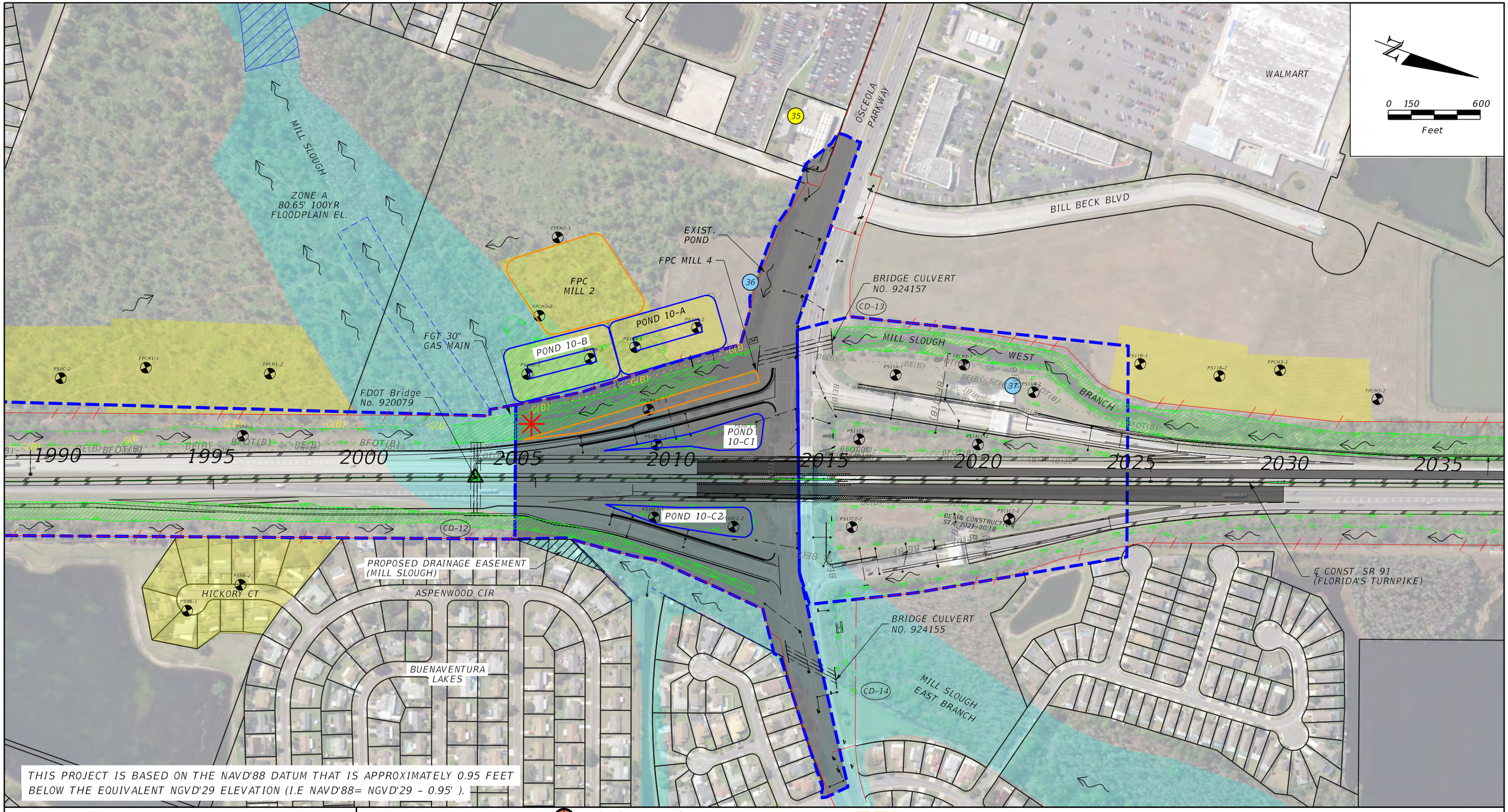
THIS PROJECT IS BASED ON THE NAVD'88 DATUM THAT IS APPROXIMATELY 0.95 FEET BELOW THE EQUIVALENT NGVD'29 ELEVATION (I.E NAVD'88= NGVD'29 – 0.95').

POND SITE ALTERNATIVES

FIGURE 8-9: BASIN 9 MAP

LEGEND

- Basin
- Basin Outfall
- XX.XX Bioloigcal Indicator
- Boring Location
- Floodplain
- Gopher Tortoise Burrows
- Osprey Nest
- Pond Parcel
- Parcel Line
- Previously Recorded Historic Site
- Previously Recorded Historic Structure
- Parcel with Historic AYRB Date
- LA R/W Line
- R/W Line
- Unrecorded Historic Bridge
- Other Surface Water
- Wetland
- High Risk Contamination Site
- Medium Risk Contamination Site
- Low Risk Contamination Site
- Easement
- Conservation Area
- Floodway
- Floodplain Compensation Pond



POND SITE ALTERNATIVES

FIGURE 8-10: BASIN 10 MAP

LEGEND

- Basin
- Basin Outfall
- XX.XX Bioloigcal Indicator
- Boring Location
- Floodplain
- Gopher Tortoise Burrows
- Osprey Nest
- Pond Parcel
- Parcel Line
- Previously Recorded Historic Site
- Previously Recorded Historic Structure
- Parcel with Historic AYRB Date
- LA R/W Line
- R/W Line
- Unrecorded Historic Bridge
- Other Surface Water
- Wetland
- High Risk Contamination Site
- Medium Risk Contamination Site
- Low Risk Contamination Site
- Easement
- Conservation Area
- Floodway
- Floodplain Compensation Pond

Q:\ORL\43619415201\drainage\Appendx Basins (Restored) 6-11.dgn

BILL BECK BLVD.

0 50 200
Feet

FPCM2-1
FGT 30" GAS MAIN
36
BRIDGE CULVERT NO. 924157
FPC MILL 5
FPCM2-2
PS10A-2
PS10A-1
PS10B-2
PS10B-1
CD-13
MILL SLOUGH
FPCM5-1
PS11A-1
POND 11A
37
PS11A-2
WEST BRANCH
BFOT(B)
PS11B-1
POND 11-B
PS11B-2
FPCM3-1
FPC MILL 3
FPCM3-2
FPCM4-1
FDOT Bridge No. 920079
PS10C1-2
PS10C1-1
PS11C1-1
POND 11-C1
PS11C1-2
2005
2010
2015
2020
2025
2030
PS10C2-1
PS10C2-2
PS11C2-1
POND 11-C2
PS11C2-2
PROPOSED DRAINAGE EASEMENT (MILL SLOUGH)
CD-14
℄ CONST. SR 91 (FLORIDA'S TURNPIKE)
MILL SLOUGH EAST BRANCH

THIS PROJECT IS BASED ON THE NAVD'88 DATUM THAT IS APPROXIMATELY 0.95 FEET BELOW THE EQUIVALENT NGVD'29 ELEVATION (I.E NAVD'88= NGVD'29 – 0.95').

POND SITE ALTERNATIVES

FIGURE 8-11: BASIN 11 MAP

LEGEND

- Basin
- Basin Outfall
- XX.XX Bioloigcal Indicator
- Boring Location
- Floodplain
- Gopher Tortoise Burrows
- Osprey Nest
- Pond Parcel
- Parcel Line
- Previously Recorded Historic Site
- Previously Recorded Historic Structure
- Parcel with Historic AYRB Date
- LA R/W Line
- R/W Line
- Unrecorded Historic Bridge
- Other Surface Water
- Wetland
- High Risk Contamination Site
- Medium Risk Contamination Site
- Low Risk Contamination Site
- Easement
- Conservation Area
- Floodway
- Floodplain Compensation Pond

APPENDIX B
Calculations

Floodplain Impacts - Fish Lake

By: RS Checked by: AKC

Date: 8/12/2020 Date: 8/13/2020

EXISTING 100 YR FLOODPLAIN IMPACTS

Elevation	Begin Station	End Station	Side	Begin Area	End Area	Average Area	Length	Volume
ft				ft2	ft2	ft2	ft	ft3
59.78	1708+00.00	1708+50.00	LT	0.0	1.6	0.5	50	27
59.78	1708+50.00	1709+00.00	LT	1.6	0.9	1.2	50	61
59.78	1709+00.00	1709+50.00	LT	0.9	1.0	0.9	50	45
59.78	1709+50.00	1710+00.00	LT	1.0	1.8	1.3	50	66
59.78	1710+00.00	1710+50.00	LT	1.8	8.2	4.6	50	228
59.78	1710+50.00	1711+00.00	LT	8.2	9.0	8.6	50	428
59.78	1711+00.00	1711+50.00	LT	9.0	0.7	4.1	50	204
59.78	1711+50.00	1712+00.00	LT	0.7	0.4	0.6	50	28
59.78	1712+00.00	1712+50.00	LT	0.4	4.3	2.0	50	101
59.78	1712+50.00	1713+00.00	LT	4.3	9.0	6.5	50	325
59.78	1713+00.00	1713+50.00	LT	9.0	9.2	9.1	50	455
59.78	1713+50.00	1714+00.00	LT	9.2	18.1	13.4	50	670
59.78	1714+00.00	1714+50.00	LT	18.1	26.4	22.1	50	1106
59.78	1714+50.00	1715+00.00	LT	26.4	25.3	25.9	50	1293
59.78	1715+00.00	1715+50.00	LT	25.3	43.2	33.9	50	1693
59.78	1715+50.00	1716+00.00	LT	43.2	62.7	52.6	50	2632
59.78	1716+00.00	1716+50.00	LT	62.7	54.4	58.5	50	2924
59.78	1716+50.00	1717+00.00	LT	54.4	54.8	54.6	50	2729
59.78	1717+00.00	1717+50.00	LT	54.8	57.8	56.3	50	2813
59.78	1717+50.00	1718+00.00	LT	57.8	54.5	56.1	50	2805
59.78	1718+00.00	1718+50.00	LT	54.5	56.5	55.4	50	2772
59.78	1718+50.00	1719+00.00	LT	56.5	155.5	101.9	50	5094
59.78	1719+00.00	1719+50.00	LT	155.5	163.1	159.3	50	7964
59.78	1719+50.00	1720+00.00	LT	163.1	149.0	156.0	50	7800
59.78	1720+00.00	1720+50.00	LT	149.0	135.2	142.1	50	7103
59.78	1720+50.00	1721+00.00	LT	135.2	229.8	180.4	50	9021
59.78	1721+00.00	1721+50.00	LT	229.8	167.1	197.6	50	9879
59.78	1721+50.00	1722+00.00	LT	167.1	183.5	175.2	50	8760
59.78	1722+00.00	1722+50.00	LT	183.5	178.4	180.9	50	9047
59.78	1722+50.00	1723+00.00	LT	178.4	186.3	182.3	50	9116
59.78	1723+00.00	1723+50.00	LT	186.3	189.5	187.9	50	9393
59.78	1723+50.00	1724+00.00	LT	189.5	208.8	199.0	50	9952
59.78	1724+00.00	1724+50.00	LT	208.8	189.5	199.0	50	9952
59.78	1724+50.00	1725+00.00	LT	189.5	160.4	174.7	50	8736
59.78	1725+00.00	1725+50.00	LT	160.4	156.0	158.2	50	7908
59.78	1725+50.00	1726+00.00	LT	156.0	165.9	160.9	50	8046
59.78	1726+00.00	1726+50.00	LT	165.9	142.4	154.0	50	7700
59.78	1726+50.00	1727+00.00	LT	142.4	126.2	134.2	50	6710
59.78	1727+00.00	1727+50.00	LT	126.2	93.9	109.6	50	5481
59.78	1727+50.00	1728+00.00	LT	93.9	73.0	83.2	50	4162
59.78	1728+00.00	1728+50.00	LT	73.0	62.7	67.8	50	3389
59.78	1728+50.00	1729+00.00	LT	62.7	57.2	59.9	50	2995
59.78	1729+00.00	1729+50.00	LT	57.2	45.0	51.0	50	2548
59.78	1729+50.00	1730+00.00	LT	45.0	38.1	41.5	50	2073
59.78	1730+00.00	1730+50.00	LT	38.1	30.1	34.0	50	1701
59.78	1730+50.00	1731+00.00	LT	30.1	20.2	25.0	50	1251
59.78	1731+00.00	1731+50.00	LT	20.2	9.8	14.7	50	737
59.78	1731+50.00	1732+00.00	LT	9.8	2.3	5.7	50	283
59.78	1732+00.00	1732+50.00	LT	2.3	0.9	1.6	50	79
59.78	1732+50.00	1733+00.00	LT	0.9	0.4	0.6	50	31
59.78	1733+00.00	1733+50.00	LT	0.4	0.3	0.3	50	16
59.78	1733+50.00	1734+00.00	LT	0.3	0.0	0.1	50	5
							Total Vol:	**190,342**
							Total AC-FT =	**4.37**

Floodplain Impacts - Fish Lake

By: RS Checked by: AKC

Date: 8/12/2020 Date: 8/13/2020

EXISTING 100 YR FLOODPLAIN IMPACTS								
Elevation	Begin Station	End Station	Side	Begin Area	End Area	Average Area	Length	Volume
ft				ft2	ft2	ft2	ft	ft3
59.86	1713+50.00	1714+00.00	RT	0.0	5.3	1.8	50	88
59.86	1714+00.00	1714+50.00	RT	5.3	11.4	8.1	50	406
59.86	1714+50.00	1715+00.00	RT	11.4	11.8	11.6	50	579
59.86	1715+00.00	1715+50.00	RT	11.8	19.7	15.6	50	780
59.86	1715+50.00	1716+00.00	RT	19.7	24.4	22.0	50	1101
59.86	1716+00.00	1716+50.00	RT	24.4	23.4	23.9	50	1195
59.86	1716+50.00	1717+00.00	RT	23.4	33.0	28.1	50	1403
59.86	1717+00.00	1717+50.00	RT	33.0	50.4	41.4	50	2070
59.86	1717+50.00	1718+00.00	RT	50.4	76.4	63.0	50	3149
59.86	1718+00.00	1718+50.00	RT	76.4	82.3	79.3	50	3967
59.86	1718+50.00	1719+00.00	RT	82.3	78.0	80.1	50	4007
59.86	1719+00.00	1719+50.00	RT	78.0	84.4	81.2	50	4060
59.86	1719+50.00	1720+00.00	RT	84.4	99.6	91.9	50	4595
59.86	1720+00.00	1720+50.00	RT	99.6	94.1	96.8	50	4840
59.86	1720+50.00	1721+00.00	RT	94.1	164.7	127.7	50	6387
59.86	1721+00.00	1721+50.00	RT	164.7	51.7	102.9	50	5145
59.86	1721+50.00	1722+00.00	RT	51.7	111.5	79.7	50	3985
59.86	1722+00.00	1722+50.00	RT	111.5	120.6	116.0	50	5801
59.86	1722+50.00	1723+00.00	RT	120.6	123.3	122.0	50	6099
59.86	1723+00.00	1723+50.00	RT	123.3	140.5	131.8	50	6592
59.86	1723+50.00	1724+00.00	RT	140.5	142.5	141.5	50	7075
59.86	1724+00.00	1724+50.00	RT	142.5	132.8	137.6	50	6880
59.86	1724+50.00	1725+00.00	RT	132.8	129.2	131.0	50	6549
59.86	1725+00.00	1725+50.00	RT	129.2	132.2	130.7	50	6534
59.86	1725+50.00	1726+00.00	RT	132.2	134.8	133.5	50	6674
59.86	1726+00.00	1726+50.00	RT	134.8	124.4	129.5	50	6477
59.86	1726+50.00	1727+00.00	RT	124.4	105.2	114.7	50	5734
59.86	1727+00.00	1727+50.00	RT	105.2	87.2	96.1	50	4803
59.86	1727+50.00	1728+00.00	RT	87.2	87.5	87.3	50	4365
59.86	1728+00.00	1728+50.00	RT	87.5	66.4	76.7	50	3835
59.86	1728+50.00	1729+00.00	RT	66.4	32.7	48.6	50	2428
59.86	1729+00.00	1729+50.00	RT	32.7	17.5	24.7	50	1235
59.86	1729+50.00	1730+00.00	RT	17.5	28.8	22.9	50	1145
59.86	1730+00.00	1730+50.00	RT	28.8	16.1	22.2	50	1108
59.86	1730+50.00	1731+00.00	RT	16.1	20.6	18.3	50	916
59.86	1731+00.00	1731+50.00	RT	20.6	11.4	15.8	50	790
59.86	1731+50.00	1732+00.00	RT	11.4	12.0	11.7	50	586
59.86	1732+00.00	1732+50.00	RT	12.0	4.0	7.7	50	383
59.86	1732+50.00	1733+00.00	RT	4.0	0.0	1.3	50	67
							Total Vol:	**133,837**
							Total AC-FT =	**3.07**

Note: Elevations taken from Bass Slough floodplain study completed in 1999 by Inwood Consulting.
Calculations using the prismodial method for estimating volumes.
Normal water level assumed to be at existing ground elevation.

Floodplain Impacts - Fennel Slough

By: RS Checked by: AKC

Date: 9/1/2020 Date: 9/12/2020

EXISTING 100 YR FLOODPLAIN IMPACTS

Elevation	Begin Station	End Station	Side	Begin Area	End Area	Average Area	Length	Volume
ft				ft2	ft2	ft2	ft	ft3
62.58	1768+50.00	1769+00.00	LT	0.0	4.2	1.4	50	70
62.58	1769+00.00	1769+50.00	LT	4.2	14.1	8.6	50	432
62.58	1769+50.00	1770+00.00	LT	14.1	21.0	17.4	50	870
62.58	1770+00.00	1770+50.00	LT	21.0	5.1	12.1	50	607
62.58	1770+50.00	1771+00.00	LT	5.1	7.7	6.3	50	317
62.58	1771+00.00	1771+50.00	LT	7.7	17.6	12.3	50	615
62.58	1771+50.00	1772+00.00	LT	17.6	23.0	20.2	50	1012
62.58	1772+00.00	1772+50.00	LT	23.0	14.6	18.6	50	931
62.58	1772+50.00	1773+00.00	LT	14.6	31.0	22.3	50	1114
62.58	1773+00.00	1773+50.00	LT	31.0	43.3	37.0	50	1848
62.58	1773+50.00	1774+00.00	LT	43.3	50.4	46.8	50	2339
62.58	1774+00.00	1774+50.00	LT	50.4	52.6	51.5	50	2576
62.58	1774+50.00	1775+00.00	LT	52.6	74.2	63.1	50	3155
62.58	1775+00.00	1775+50.00	LT	74.2	38.3	55.3	50	2763
62.58	1775+50.00	1776+00.00	LT	38.3	38.0	38.2	50	1908
62.58	1776+00.00	1776+50.00	LT	38.0	34.5	36.2	50	1812
62.58	1776+50.00	1777+00.00	LT	34.5	71.3	51.8	50	2589
62.58	1777+00.00	1777+50.00	LT	71.3	31.7	50.1	50	2507
62.58	1777+50.00	1778+00.00	LT	31.7	37.1	34.4	50	1718
62.58	1778+00.00	1778+50.00	LT	37.1	80.4	57.4	50	2868
62.58	1778+50.00	1779+00.00	LT	80.4	53.1	66.3	50	3314
62.58	1779+00.00	1779+50.00	LT	53.1	44.7	48.9	50	2443
62.58	1779+50.00	1780+00.00	LT	44.7	42.8	43.7	50	2186
62.58	1780+00.00	1780+50.00	LT	42.8	43.8	43.3	50	2163
62.58	1780+50.00	1781+00.00	LT	43.8	45.5	44.6	50	2232
62.58	1781+00.00	1781+50.00	LT	45.5	22.0	33.0	50	1652
62.58	1781+50.00	1782+00.00	LT	22.0	16.7	19.3	50	966
62.58	1782+00.00	1782+50.00	LT	16.7	0.0	5.6	50	279
							Total Vol:	**47,286**
							Total AC-FT =	**1.09**

EXISTING 100 YR FLOODPLAIN IMPACTS

Elevation	Begin Station	End Station	Side	Begin Area	End Area	Average Area	Length	Volume
ft				ft2	ft2	ft2	ft	ft3
62.67	1748+00.00	1748+50.00	RT	0.0	2.7	0.9	50	45
62.67	1748+50.00	1749+00.00	RT	2.7	8.0	5.1	50.00	256
62.67	1749+00.00	1749+50.00	RT	8.0	11.1	9.5	50.00	475
62.67	1749+50.00	1750+00.00	RT	11.1	17.1	14.0	50.00	700
62.67	1750+00.00	1750+50.00	RT	17.1	20.7	18.9	50.00	944
62.67	1750+50.00	1751+00.00	RT	20.7	23.6	22.2	50.00	1109
62.67	1751+00.00	1751+50.00	RT	23.6	27.0	25.3	50.00	1265
62.67	1751+50.00	1752+00.00	RT	27.0	30.4	28.7	50.00	1435
62.67	1752+00.00	1752+50.00	RT	30.4	34.5	32.5	50.00	1623
62.67	1752+50.00	1753+00.00	RT	34.5	43.9	39.1	50.00	1955
62.67	1753+00.00	1753+50.00	RT	43.9	39.6	41.7	50.00	2085
62.67	1753+50.00	1754+00.00	RT	39.6	39.1	39.3	50.00	1967
62.67	1754+00.00	1754+50.00	RT	39.1	40.9	40.0	50.00	2001
62.67	1754+50.00	1755+00.00	RT	40.9	42.5	41.7	50.00	2085
62.67	1755+00.00	1755+50.00	RT	42.5	44.1	43.3	50.00	2165
62.67	1755+50.00	1756+00.00	RT	44.1	44.3	44.2	50.00	2211
62.67	1756+00.00	1756+50.00	RT	44.3	46.7	45.5	50.00	2276
62.67	1756+50.00	1757+00.00	RT	46.7	40.2	43.4	50.00	2172
62.67	1757+00.00	1757+50.00	RT	40.2	39.7	40.0	50.00	1998
62.67	1757+50.00	1758+00.00	RT	39.7	48.5	44.0	50.00	2200
62.67	1758+00.00	1758+50.00	RT	48.5	55.5	51.9	50.00	2597

Floodplain Impacts - Fennel Slough

By: RS Checked by: AKC

Date: 9/1/2020 Date: 9/12/2020

EXISTING 100 YR FLOODPLAIN IMPACTS								
Elevation	Begin Station	End Station	Side	Begin Area	End Area	Average Area	Length	Volume
ft				ft2	ft2	ft2	ft	ft3
62.67	1758+50.00	1759+00.00	RT	55.5	54.8	55.1	50.00	2757
62.67	1759+00.00	1759+50.00	RT	54.8	52.6	53.7	50.00	2687
62.67	1759+50.00	1760+00.00	RT	52.6	41.5	47.0	50.00	2348
62.67	1760+00.00	1760+50.00	RT	41.5	51.7	46.5	50.00	2325
62.67	1760+50.00	1761+00.00	RT	51.7	52.0	51.8	50.00	2591
62.67	1761+00.00	1761+50.00	RT	52.0	54.1	53.0	50.00	2651
62.67	1761+50.00	1762+00.00	RT	54.1	57.4	55.7	50.00	2786
62.67	1762+00.00	1762+50.00	RT	57.4	40.1	48.5	50.00	2425
62.67	1762+50.00	1763+00.00	RT	40.1	55.4	47.5	50.00	2377
62.67	1763+00.00	1763+50.00	RT	55.4	66.1	60.7	50.00	3033
62.67	1763+50.00	1764+00.00	RT	66.1	61.4	63.8	50.00	3188
62.67	1764+00.00	1764+50.00	RT	61.4	62.7	62.1	50.00	3104
62.67	1764+50.00	1765+00.00	RT	62.7	57.6	60.2	50.00	3008
62.67	1765+00.00	1765+50.00	RT	57.6	69.4	63.4	50.00	3172
62.67	1765+50.00	1766+00.00	RT	69.4	82.5	75.9	50.00	3793
62.67	1766+00.00	1766+50.00	RT	82.5	79.2	80.8	50.00	4041
62.67	1766+50.00	1767+00.00	RT	79.2	90.6	84.8	50.00	4241
62.67	1767+00.00	1767+50.00	RT	90.6	95.5	93.0	50.00	4651
62.67	1767+50.00	1768+00.00	RT	95.5	81.5	88.4	50.00	4419
62.67	1768+00.00	1768+50.00	RT	81.5	96.9	89.1	50.00	4454
62.67	1768+50.00	1769+00.00	RT	96.9	109.6	103.2	50.00	5159
62.67	1769+00.00	1769+50.00	RT	109.6	93.3	101.3	50.00	5065
62.67	1769+50.00	1770+00.00	RT	93.3	108.5	100.8	50.00	5040
62.67	1770+00.00	1770+50.00	RT	108.5	107.1	107.8	50.00	5391
62.67	1770+50.00	1771+00.00	RT	107.1	91.6	99.3	50.00	4964
62.67	1771+00.00	1771+50.00	RT	91.6	90.5	91.1	50.00	4553
62.67	1771+50.00	1772+00.00	RT	90.5	107.9	99.1	50.00	4953
62.67	1772+00.00	1772+50.00	RT	107.9	114.5	111.2	50.00	5561
62.67	1772+50.00	1773+00.00	RT	114.5	117.8	116.2	50.00	5808
62.67	1773+00.00	1773+50.00	RT	117.8	113.2	115.5	50.00	5775
62.67	1773+50.00	1774+00.00	RT	113.2	123.7	118.4	50.00	5922
62.67	1774+00.00	1774+50.00	RT	123.7	143.7	133.6	50.00	6679
62.67	1774+50.00	1775+00.00	RT	143.7	132.3	137.9	50.00	6897
62.67	1775+00.00	1775+50.00	RT	132.3	163.5	147.6	50.00	7381
62.67	1775+50.00	1776+00.00	RT	163.5	187.2	175.2	50.00	8761
62.67	1776+00.00	1776+50.00	RT	187.2	191.4	189.3	50.00	9464
62.67	1776+50.00	1777+00.00	RT	191.4	271.7	230.3	50.00	11517
62.67	1777+00.00	1777+50.00	RT	271.7	211.9	241.2	50.00	12058
62.67	1777+50.00	1778+00.00	RT	211.9	209.6	210.7	50.00	10537
62.67	1778+00.00	1778+50.00	RT	209.6	219.6	214.6	50.00	10730
62.67	1778+50.00	1779+00.00	RT	219.6	228.0	223.8	50.00	11190
62.67	1779+00.00	1779+50.00	RT	228.0	221.5	224.7	50.00	11237
62.67	1779+50.00	1780+00.00	RT	221.5	161.0	190.5	50.00	9524
62.67	1780+00.00	1780+50.00	RT	161.0	211.0	185.5	50.00	9273
62.67	1780+50.00	1781+00.00	RT	211.0	157.2	183.5	50.00	9174
62.67	1781+00.00	1781+50.00	RT	157.2	185.6	171.2	50.00	8562
62.67	1781+50.00	1782+00.00	RT	185.6	219.5	202.3	50.00	10117
62.67	1782+00.00	1782+50.00	RT	219.5	220.8	220.1	50.00	11007
62.67	1782+50.00	1783+00.00	RT	220.8	183.0	201.6	50.00	10081
62.67	1783+00.00	1783+50.00	RT	183.0	159.4	171.1	50.00	8554
62.67	1783+50.00	1784+00.00	RT	159.4	132.4	145.7	50.00	7284
62.67	1784+00.00	1784+50.00	RT	132.4	121.2	126.7	50.00	6336
62.67	1784+50.00	1785+00.00	RT	121.2	54.4	85.6	50.00	4279
62.67	1785+00.00	1785+50.00	RT	54.4	61.8	58.0	50.00	2902
62.67	1785+50.00	1786+00.00	RT	61.8	40.3	50.6	50.00	2532

Floodplain Impacts - Fennel Slough

By: RS Checked by: AKC
Date: 9/1/2020 Date: 9/12/2020

EXISTING 100 YR FLOODPLAIN IMPACTS								
62.67	1786+00.00	1786+50.00	RT	40.3	3.5	18.6	50.00	929
62.67	1786+50.00	1787+00.00	RT	3.5	60.1	26.1	50.00	1303
62.67	1787+00.00	1787+50.00	RT	60.1	230.6	136.2	50.00	6808
62.67	1787+50.00	1788+00.00	RT	230.6	243.1	236.8	50.00	11842
62.67	1788+00.00	1788+50.00	RT	243.1	134.4	186.1	50.00	9305
62.67	1788+50.00	1789+00.00	RT	134.4	23.9	71.6	50.00	3581
62.67	1789+00.00	1789+50.00	RT	23.9	0.0	8.0	50.00	398
							Total Vol:	**396,044**
							Total AC-FT =	**9.09**

Note: Elevations taken from Bass Slough floodplain study completed in 1999 by Inwood Consulting.
Calculations using the prismodial method for estimating volumes.
Normal water level assumed to be at existing ground elevation.

Floodplain Impacts - Bass Slough

By: RS Checked by: AKC

Date: 9/9/2020 Date: 9/12/2020

EXISTING 100 YR FLOODPLAIN IMPACTS								
Elevation	Begin Station	End Station	Side	Begin Area	End Area	Average Area	Length	Volume
ft				ft2	ft2	ft2	ft	ft3
DOWNSTREAM BASS SLOUGH								
69	1846+00.00	1846+50.00	RT	0.0	43.0	14.3	50	717
69	1846+50.00	1847+00.00	RT	43.0	123.0	79.6	50	3979
69	1847+00.00	1847+50.00	RT	123.0	151.7	137.1	50	6854
69	1847+50.00	1848+00.00	RT	151.7	139.8	145.7	50	7285
69	1848+00.00	1848+50.00	RT	139.8	130.0	134.9	50	6744
69	1848+50.00	1849+00.00	RT	130.0	137.8	133.9	50	6694
69	1849+00.00	1849+50.00	RT	137.8	126.2	132.0	50	6598
69	1849+50.00	1850+00.00	RT	126.2	117.5	121.8	50	6091
69	1850+00.00	1850+50.00	RT	117.5	119.0	118.2	50	5912
69	1850+50.00	1851+00.00	RT	119.0	119.2	119.1	50	5955
69	1851+00.00	1851+50.00	RT	119.2	109.4	114.3	50	5713
69	1851+50.00	1852+00.00	RT	109.4	110.2	109.8	50	5490
69	1852+00.00	1852+50.00	RT	110.2	102.6	106.4	50	5319
69	1852+50.00	1853+00.00	RT	102.6	0.0	34.2	50	1710
69	1853+00.00	1853+50.00	RT	0.0	192.7	64.2	50	3212
69	1853+50.00	1854+00.00	RT	192.7	205.8	199.2	50	9961
69	1854+00.00	1854+50.00	RT	205.8	208.3	207.0	50	10351
69	1854+50.00	1855+00.00	RT	208.3	184.8	196.4	50	9820
69	1855+00.00	1855+50.00	RT	184.8	157.7	171.1	50	8554
69	1855+50.00	1856+00.00	RT	157.7	133.8	145.6	50	7281
69	1856+00.00	1856+50.00	RT	133.8	0.0	44.6	50	2230
							Total Vol:	**126,471**
							Total AC-FT =	**2.90**

UPSTREAM BASS SOUGH								
79	1925+50.00	1926+00.00	RT	0.0	235.8	78.6	50	3929
79	1926+00.00	1926+50.00	RT	235.8	229.0	232.4	50	11618
79	1926+50.00	1927+00.00	RT	229.0	219.5	224.2	50	11211
79	1927+00.00	1927+50.00	RT	219.5	231.5	225.5	50	11273
79	1927+50.00	1928+00.00	RT	231.5	68.3	141.8	50	7092
79	1928+00.00	1928+50.00	RT	68.3	65.7	67.0	50	3349
79	1928+50.00	1929+00.00	RT	65.7	64.8	65.3	50	3263
79	1929+00.00	1929+50.00	RT	64.8	67.4	66.1	50	3307
79	1929+50.00	1930+00.00	RT	67.4	71.1	69.2	50	3462
79	1930+00.00	1930+50.00	RT	71.1	75.3	73.2	50	3659
79	1930+50.00	1931+00.00	RT	75.3	73.0	74.2	50	3709
79	1931+00.00	1931+50.00	RT	73.0	66.4	69.7	50	3484
79	1931+50.00	1932+00.00	RT	66.4	57.8	62.0	50	3101
79	1932+00.00	1932+50.00	RT	57.8	44.7	51.1	50	2553
79	1932+50.00	1933+00.00	RT	44.7	42.4	43.5	50	2177
79	1933+00.00	1933+50.00	RT	42.4	44.2	43.3	50	2167
79	1933+50.00	1934+00.00	RT	44.2	64.6	54.1	50	2705
79	1934+00.00	1934+50.00	RT	64.6	72.8	68.6	50	3432
79	1934+50.00	1935+00.00	RT	72.8	76.8	74.7	50	3737
79	1935+00.00	1935+50.00	RT	76.8	73.5	75.1	50	3757
79	1935+50.00	1936+00.00	RT	73.5	75.1	74.3	50	3715
79	1936+00.00	1936+50.00	RT	75.1	76.9	76.0	50	3799
79	1936+50.00	1937+00.00	RT	76.9	77.6	77.2	50	3862
79	1937+00.00	1937+50.00	RT	77.6	75.1	76.3	50	3816
79	1937+50.00	1938+00.00	RT	75.1	71.7	73.4	50	3670
79	1938+00.00	1938+50.00	RT	71.7	75.4	73.5	50	3677
79	1938+50.00	1939+00.00	RT	75.4	71.5	73.4	50	3671
79	1939+00.00	1939+50.00	RT	71.5	73.8	72.7	50	3633
79	1939+50.00	1940+00.00	RT	73.8	74.4	74.1	50	3705
79	1940+00.00	1940+50.00	RT	74.4	70.9	72.6	50	3631
79	1940+50.00	1941+00.00	RT	70.9	73.5	72.2	50	3611

Floodplain Impacts - Bass Slough

By: RS Checked by: AKC

Date: 9/9/2020 Date: 9/12/2020

EXISTING 100 YR FLOODPLAIN IMPACTS								
Elevation	Begin Station	End Station	Side	Begin Area	End Area	Average Area	Length	Volume
ft				ft2	ft2	ft2	ft	ft3
UPSTREAM BASS SLOUGH								
79	1941+00.00	1941+50.00	RT	73.5	77.4	75.5	50	3773
79	1941+50.00	1942+00.00	RT	77.4	77.2	77.3	50	3864
79	1942+00.00	1942+50.00	RT	77.2	79.2	78.2	50	3909
79	1942+50.00	1943+00.00	RT	79.2	76.7	78.0	50	3898
79	1943+00.00	1943+50.00	RT	76.7	74.6	75.6	50	3782
79	1943+50.00	1944+00.00	RT	74.6	77.6	76.1	50	3803
79	1944+00.00	1944+50.00	RT	77.6	82.9	80.2	50	4010
79	1944+50.00	1945+00.00	RT	82.9	79.1	81.0	50	4048
79	1945+00.00	1945+50.00	RT	79.1	77.8	78.4	50	3922
79	1945+50.00	1946+00.00	RT	77.8	74.1	75.9	50	3797
79	1946+00.00	1946+50.00	RT	74.1	72.8	73.4	50	3672
79	1946+50.00	1947+00.00	RT	72.8	67.3	70.0	50	3501
79	1947+00.00	1947+50.00	RT	67.3	63.6	65.4	50	3272
79	1947+50.00	1948+00.00	RT	63.6	63.2	63.4	50	3169
79	1948+00.00	1948+50.00	RT	63.2	67.8	65.5	50	3273
80	1948+50.00	1949+00.00	RT	67.8	106.0	86.2	50	4309
80	1949+00.00	1949+50.00	RT	106.0	106.7	106.3	50	5317
80	1949+50.00	1950+00.00	RT	106.7	107.8	107.3	50	5363
80	1950+00.00	1950+50.00	RT	107.8	106.9	107.3	50	5367
80	1950+50.00	1951+00.00	RT	106.9	107.6	107.3	50	5363
80	1951+00.00	1951+50.00	RT	107.6	107.3	107.5	50	5374
80	1951+50.00	1952+00.00	RT	107.3	105.3	106.3	50	5315
80	1952+00.00	1952+50.00	RT	105.3	106.5	105.9	50	5295
80	1952+50.00	1953+00.00	RT	106.5	107.8	107.1	50	5357
80	1953+00.00	1953+50.00	RT	107.8	104.6	106.2	50	5310
80	1953+50.00	1954+00.00	RT	104.6	99.3	101.9	50	5097
80	1954+00.00	1954+50.00	RT	99.3	97.6	98.4	50	4920
80	1954+50.00	1955+00.00	RT	97.6	90.0	93.7	50	4687
80	1955+00.00	1955+50.00	RT	90.0	270.7	172.3	50	8614
80	1955+50.00	1956+00.00	RT	270.7	272.6	271.7	50	13584
80	1956+00.00	1956+50.00	RT	272.6	259.1	265.8	50	13291
80	1956+50.00	1957+00.00	RT	259.1	252.8	255.9	50	12796
80	1957+00.00	1957+50.00	RT	252.8	239.8	246.3	50	12314
80	1957+50.00	1958+00.00	RT	239.8	252.7	246.2	50	12311
80	1958+00.00	1958+50.00	RT	252.7	268.0	260.3	50	13016
80	1958+50.00	1959+00.00	RT	268.0	248.1	258.0	50	12900
80	1959+00.00	1959+50.00	RT	248.1	237.4	242.7	50	12135
80	1959+50.00	1960+00.00	RT	237.4	213.0	225.1	50	11254
80	1960+00.00	1960+50.00	RT	213.0	203.5	208.3	50	10414
80	1960+50.00	1961+00.00	RT	203.5	192.7	198.1	50	9904
80	1961+00.00	1961+50.00	RT	192.7	141.8	166.6	50	8330
80	1961+50.00	1962+00.00	RT	141.8	109.0	125.0	50	6252
80	1962+00.00	1962+50.00	RT	109.0	76.1	92.0	50	4602
80	1962+50.00	1963+00.00	RT	76.1	82.3	79.2	50	3959
80	1963+00.00	1963+50.00	RT	82.3	82.3	82.3	50	4116
80	1963+50.00	1964+00.00	RT	82.3	0.0	27.4	50	1372
							Total Vol:	**427,705**
							Total AC-FT =	**9.82**

Note: Elevations taken from Bass Slough floodplain study completed in 2001 by Flood Insurance Rate Map (FIRM).
Calculations using the prismodial method for estimating volumes.
Normal water level assumed to be at existing ground elevation.

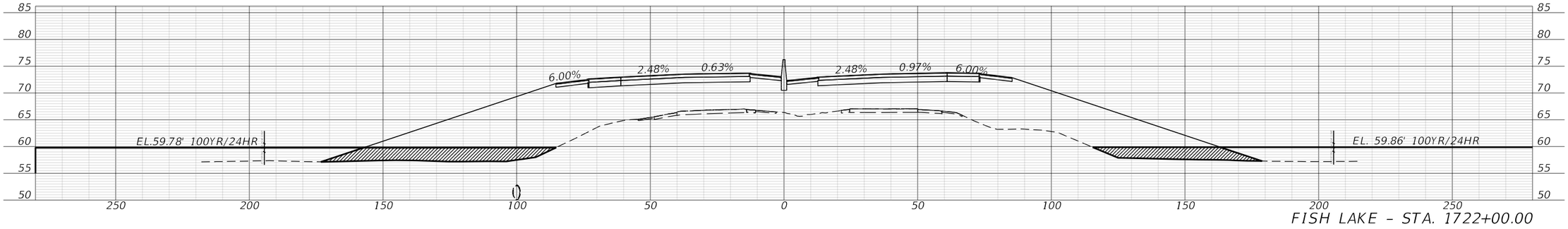
Floodplain Impacts - Mill Slough

By: RS Checked by: AKC
Date: 9/15/2020 Date: 9/15/2020

EXISTING 100 YR FLOODPLAIN IMPACTS								
Elevation	Begin Station	End Station	Side	Begin Area	End Area	Average Area	Length	Volume
ft				ft2	ft2	ft2	ft	ft3
80.65	2004+00.00	2004+50.00	LT	0.0	7.5	2.5	50	125
80.65	2004+50.00	2005+00.00	LT	7.5	7.5	7.5	50	375
80.65	2005+00.00	2005+50.00	LT	7.5	7.5	7.5	50	375
80.65	2005+50.00	2006+00.00	LT	7.5	7.5	7.5	50	375
80.65	2006+00.00	2006+50.00	LT	7.5	7.5	7.5	50	375
80.65	2006+50.00	2007+00.00	LT	7.5	7.5	7.5	50	375
80.65	2007+00.00	2007+50.00	LT	7.5	7.5	7.5	50	375
80.65	2007+50.00	2008+00.00	LT	7.5	7.5	7.5	50	375
80.65	2008+00.00	2008+50.00	LT	7.5	7.5	7.5	50	375
80.65	2008+50.00	2009+00.00	LT	7.5	0.0	2.5	50	125
							Total Vol:	**3,125**
							Total AC-FT =	**0.07**

EXISTING 100 YR FLOODPLAIN IMPACTS								
Elevation	Begin Station	End Station	Side	Begin Area	End Area	Average Area	Length	Volume
ft				ft2	ft2	ft2	ft	ft3
80.65	2004+00.00	2004+50.00	RT	0.0	35.9	12.0	50	598
80.65	2004+50.00	2005+00.00	RT	35.9	35.9	35.9	50	1794
80.65	2005+00.00	2005+50.00	RT	35.9	35.9	35.9	50	1794
80.65	2005+50.00	2006+00.00	RT	35.9	35.9	35.9	50	1794
80.65	2006+00.00	2006+50.00	RT	35.9	35.9	35.9	50	1794
80.65	2006+50.00	2007+00.00	RT	35.9	35.9	35.9	50	1794
80.65	2007+00.00	2007+50.00	RT	35.9	35.9	35.9	50	1794
80.65	2007+50.00	2008+00.00	RT	35.9	35.9	35.9	50	1794
80.65	2008+00.00	2008+50.00	RT	35.9	35.9	35.9	50	1794
80.65	2008+50.00	2009+00.00	RT	35.9	0.0	12.0	50	598
							Total Vol:	**15,546**
							Total AC-FT =	**0.36**

Note: Flood elevation from as-built plans for 243071-1-52-01. 81.6 NGVD -0.95' = 80.65 NAVD
Calculations using the prismodial method for estimating volumes.
Impact area approximated through the limits of impact.



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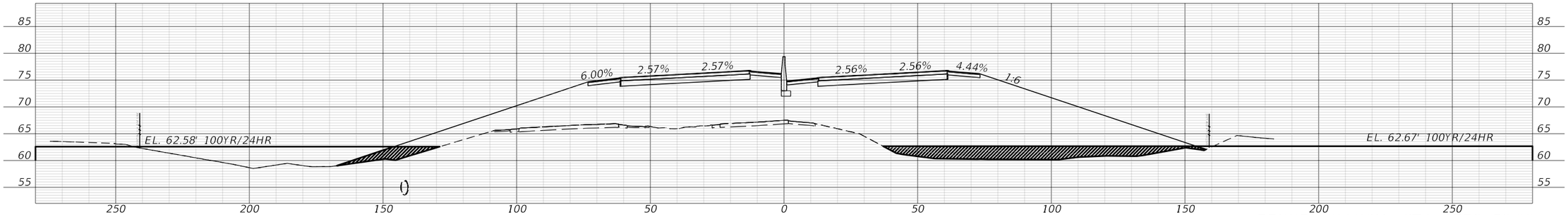
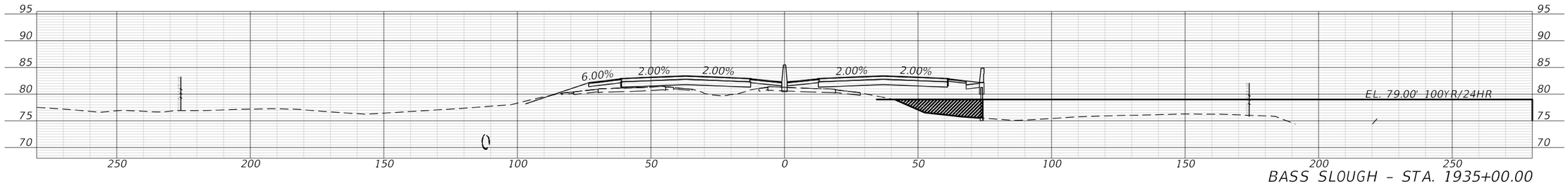


FENNEL SLOUGH –STA. 1779+50.00



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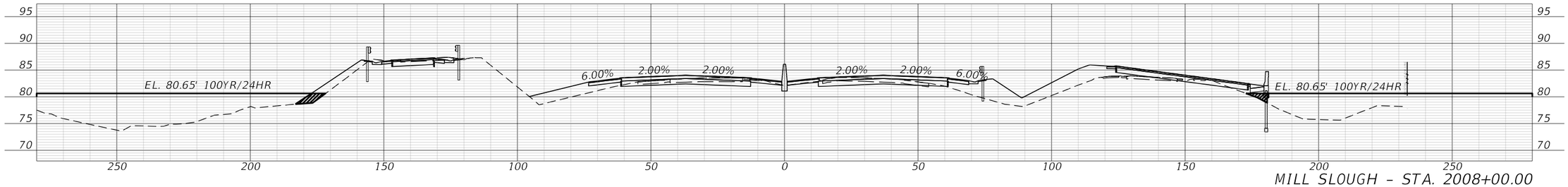

MILL SLOUGH – STA. 2008+00.00

LEGEND

100 YR FLOODPLAIN IMPACT

TYPICAL FLOODPLAIN IMPACT CROSS SECCTIONS

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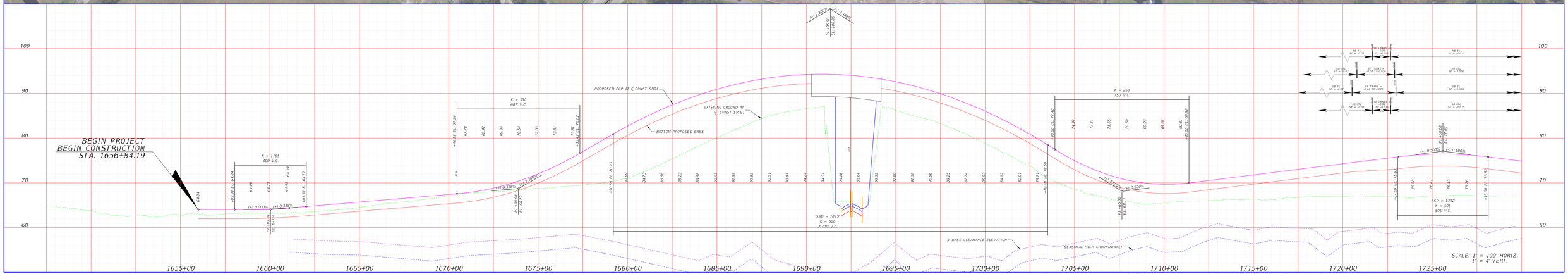
Florida's Turnpike (SR 91)

Mainline Widening with Express Lanes
From MP 242.00 to MP 248.93

Line & Grade Submittal

FPID Number 436194-1-32-01
Florida Department of Transportation





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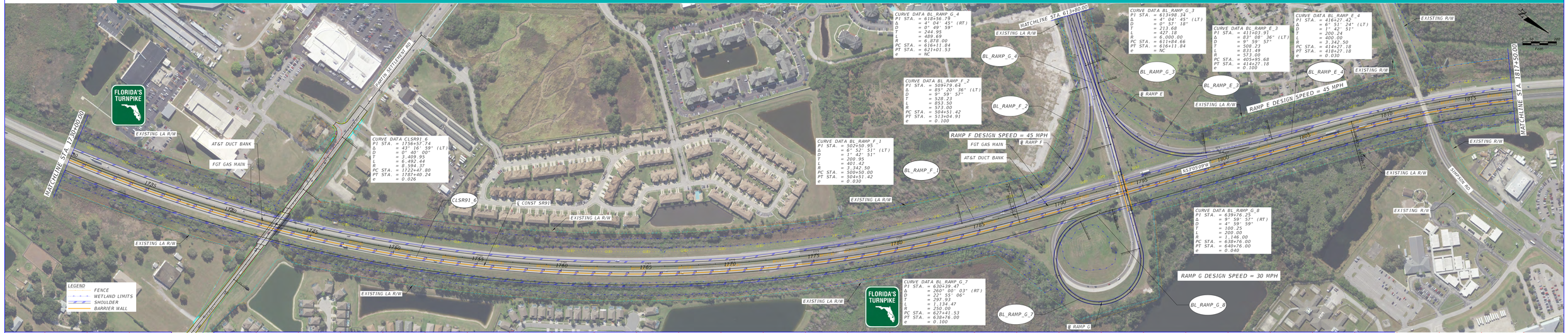
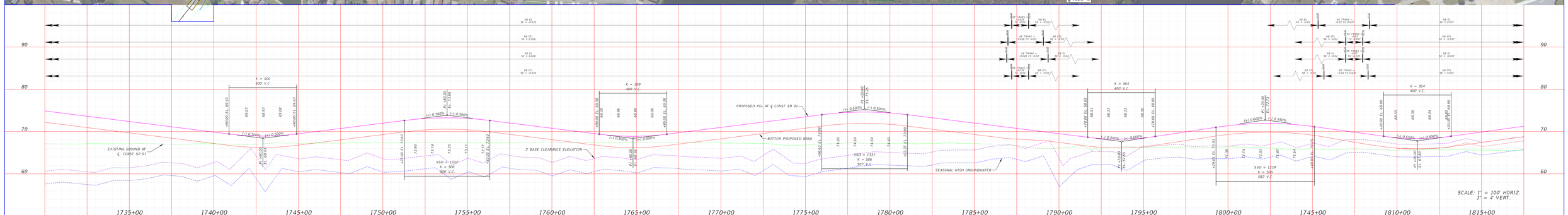
Florida's Turnpike (SR 91)

Mainline Widening with Express Lanes
From MP 242.00 to MP 248.93

Line & Grade Submittal

FPID Number 436194-1-32-01
Florida Department of Transportation





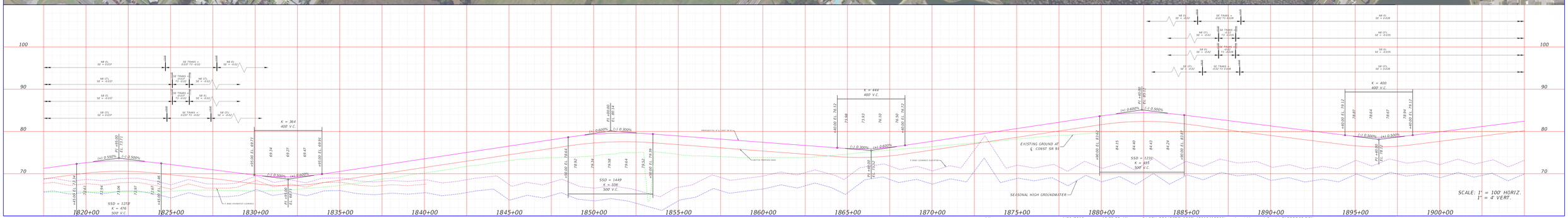
Florida's Turnpike (SR 91)

Mainline Widening with Express Lanes
From MP 242.00 to MP 248.93

Line & Grade Submittal

FPID Number 436194-1-32-01
Florida Department of Transportation





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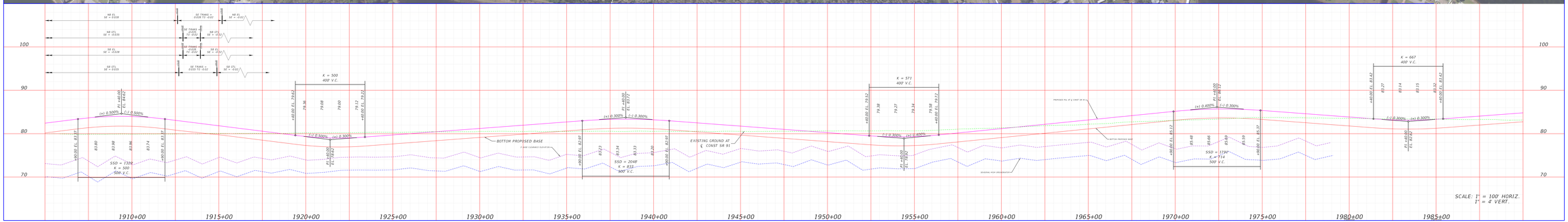
Florida's Turnpike (SR 91)

Mainline Widening with Express Lanes
From MP 242.00 to MP 248.93

Line & Grade Submittal

FPID Number 436194-1-32-01
Florida Department of Transportation





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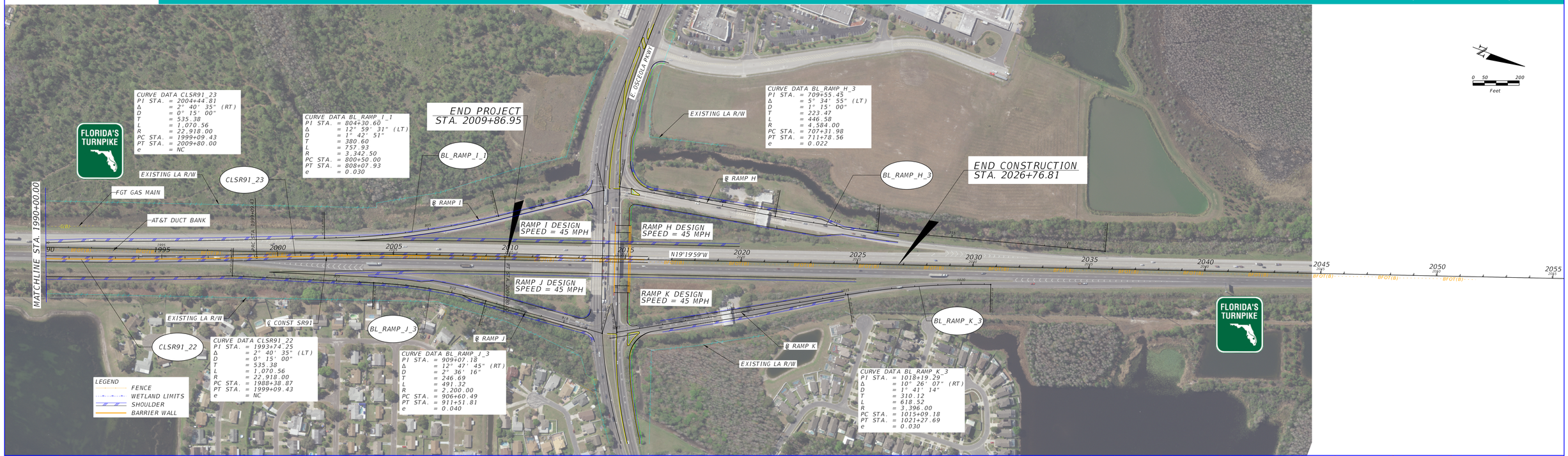
Florida's Turnpike (SR 91)

Mainline Widening with Express Lanes
From MP 242.00 to MP 248.93

Line & Grade Submittal

FPID Number 436194-1-32-01
Florida Department of Transportation





Florida's Turnpike (SR 91)

Mainline Widening with Express Lanes
From MP 242.00 to MP 248.93

Line & Grade Submittal

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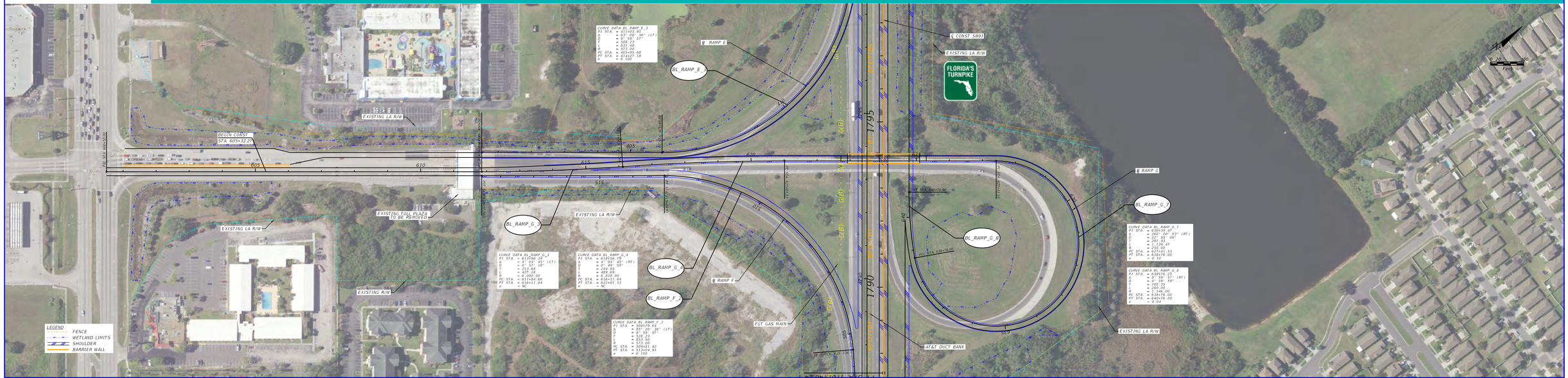
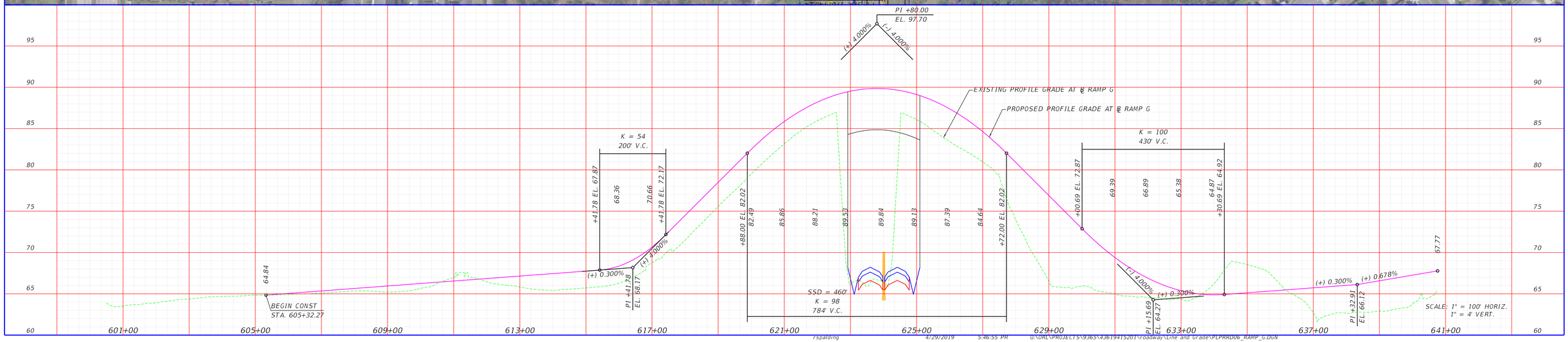
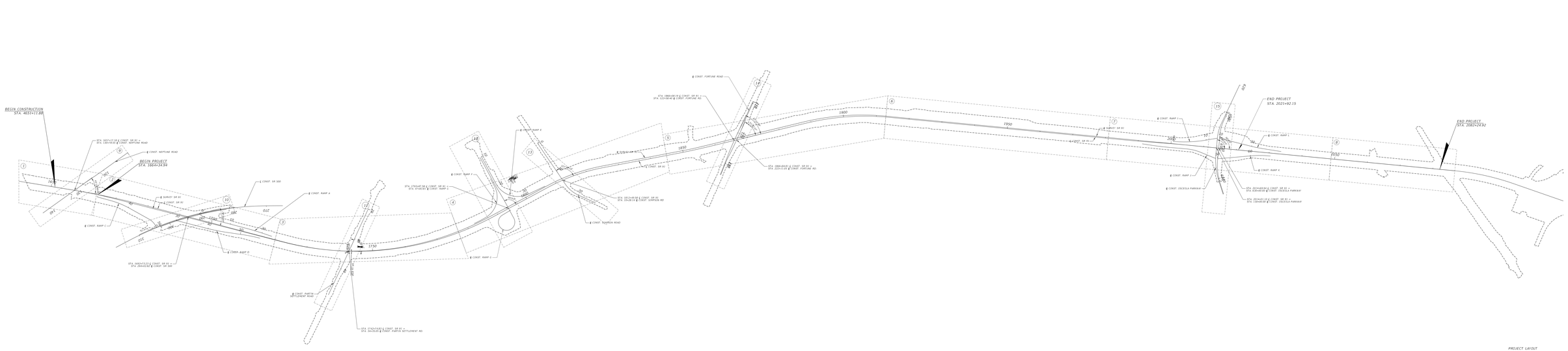
Florida Department of Transportation



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END PROJECT
STA. 2082+24.92
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℄ CONST. NEPTUNE ROAD
℄ CONST. FORTUNE ROAD
℄ CONST. SUNPOX ROAD
℄ CONST. PARTIN SETTLEMENT ROAD
℄ CONST. RAMP A
℄ CONST. RAMP B
℄ CONST. RAMP C
℄ CONST. RAMP D
℄ CONST. RAMP E
℄ CONST. RAMP F
℄ CONST. RAMP G
℄ CONST. RAMP I
℄ CONST. RAMP J
℄ CONST. RAMP K
℄ CONST. OSCEOLA PARKWAY
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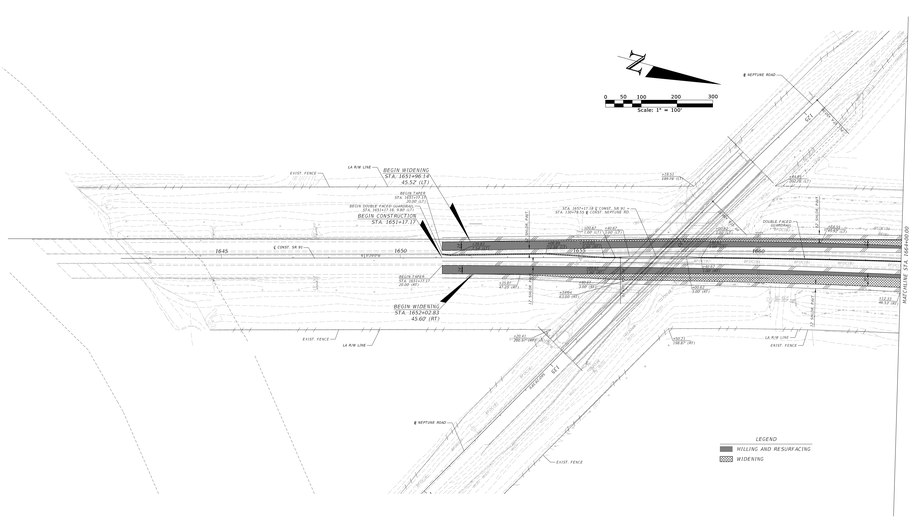
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BEGIN TAPER
STA. 1651+97.19
BEGIN DOUBLE FACED GUARDRAIL
STA. 1651+17.19 (LT)
BEGIN CONSTRUCTION
STA. 1651+17.17
BEGIN TAPER
STA. 1651+17.17
45.00' (RT)
BEGIN WIDENING
STA. 1652+02.83
45.60' (RT)
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1645
1650
1655
1660
DOUBLE FACED GUARDRAIL
SEE INDEX OF SHEETS
SEE SHEET 48
SEE SHEET 46
SEE SHEET 49
SEE SHEET 50
SEE SHEET 51
SEE SHEET 52
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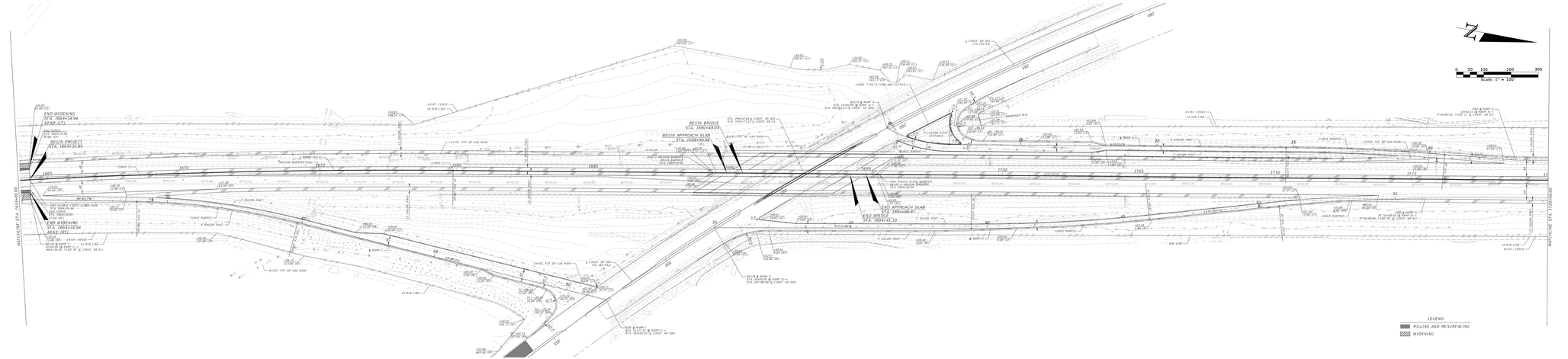
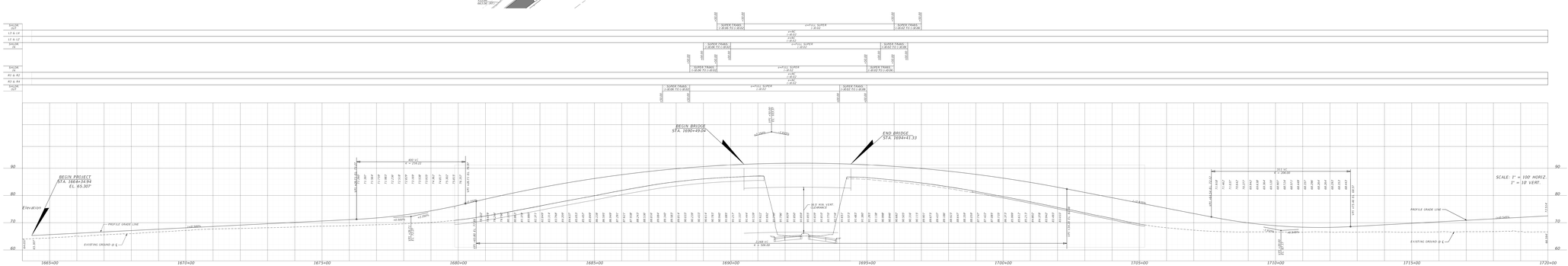




SHEET NO:	48

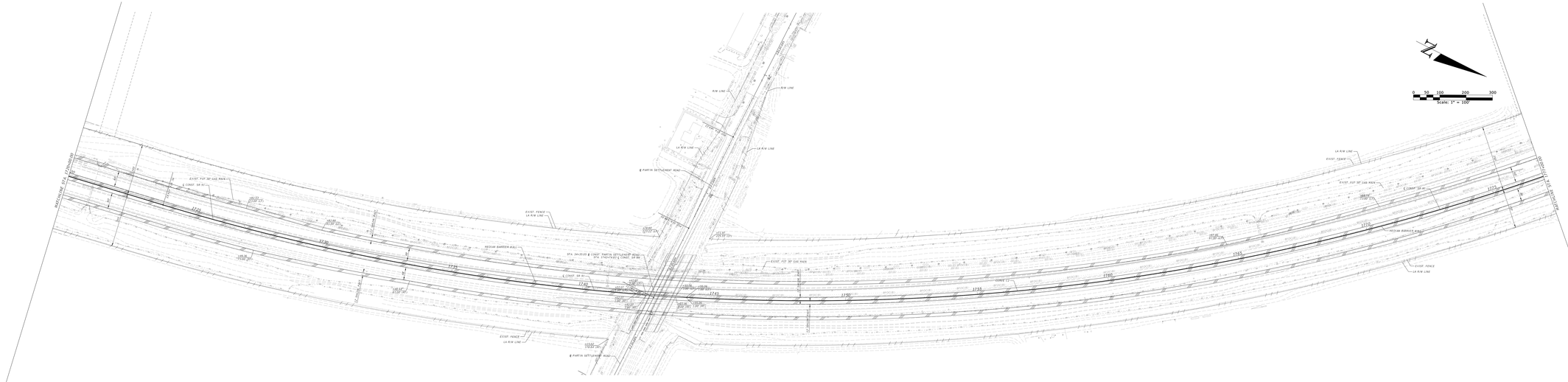
PLAN-PROFILE

DEPARTMENT OF TRANSPORTATION	STATE OF FLORIDA
COUNTY	OSCEOLA
ROAD NO.	91
FINANCIAL PROJECT ID	439944-52-00

DESIGNED	M. PLUMITALLO, P.E. 575
DRAWN	A. BOLDUC
CHECKED	M. PLUMITALLO, P.E. 575
QUALITY ASSURANCE	J. BRUNSON, P.E. 57893
PROJECT MANAGER	R. MCCOMBS, P.E. 57893

DATE	DESCRIPTION	REVISIONS	DESCRIPTION	DATE
00/00/00	.....	.....	.....	00/00/00

THE ELECTRONIC SEALING OF THESE PLANS SHALL APPLY ONLY TO THE TECHNICAL PROVISIONS ESTABLISHED BY THE SEALING ENGINEER AND SHALL NOT APPLY TO ANY ADDITIONAL TEXT OR DRAWINGS ADDED OR DELETED FROM THE ORIGINAL SEALED PLANS.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MATCHLINE STA 1775+00.00
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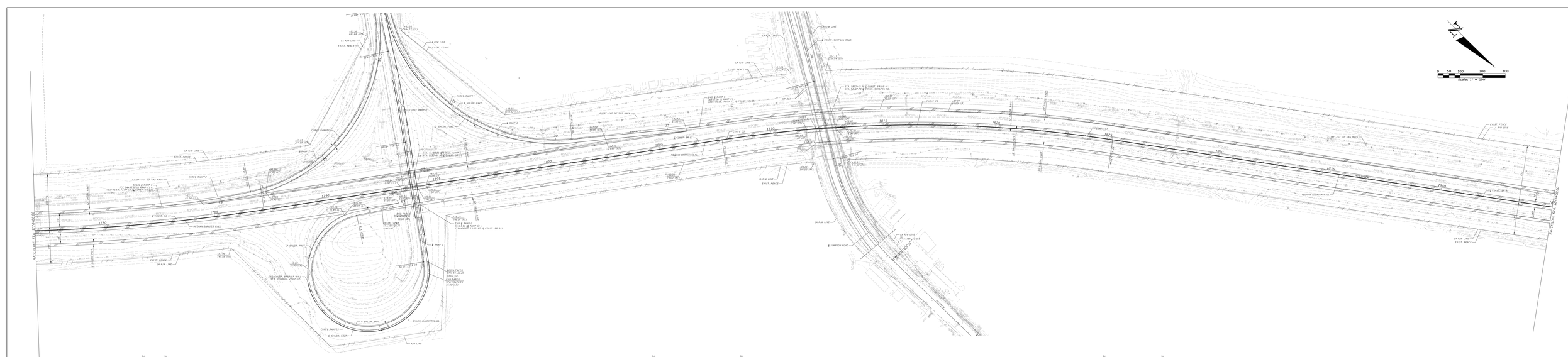
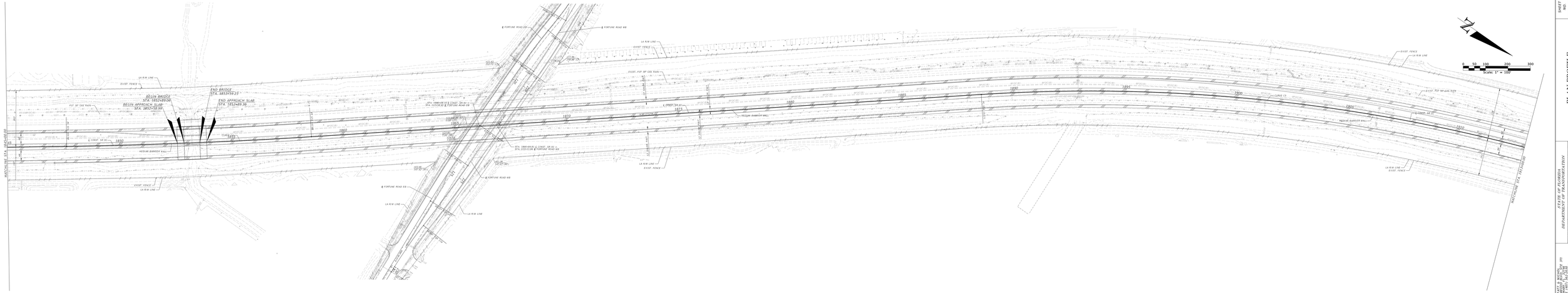
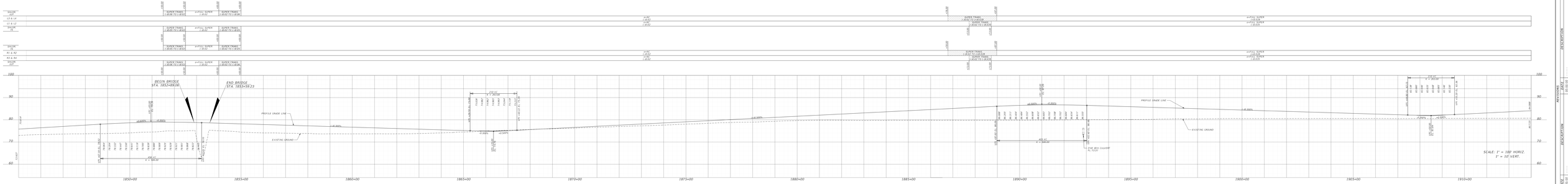
Scale: 1" = 100'
R/W LINE
LA R/W LINE
℄ PARTIN SETTLEMENT ROAD
EXIST. FENCE
MEDIAN BARRIER WALL
EXIST. FO 30" GAS MAIN
EXIST. FO 36" GAS MAIN
℄ CONST. SR 91
STA. 1641+55.00 ℄ CONST. PARTIN SETTLEMENT ROAD
STA. 1743+73.83 ℄ CONST. SR 91
SLOPE TO C-51
SLOPE TO C-52
SLOPE TO C-53
SLOPE TO C-54
SLOPE TO C-55
SLOPE TO C-56
SLOPE TO C-57
SLOPE TO C-58
SLOPE TO C-59
SLOPE TO C-60
SLOPE TO C-61
SLOPE TO C-62
SLOPE TO C-63
SLOPE TO


BASELINE STA 1770+00.00
LA R/W LINE
EXIST. FENCE
CURVE RAMP1
CURVE RAMP2
CURVE RAMP3
CURVE RAMP4
CURVE RAMP5
CURVE RAMP6
CURVE RAMP7
CURVE RAMP8
CURVE RAMP9
CURVE RAMP10
CURVE RAMP11
CURVE RAMP12
CURVE RAMP13
CURVE RAMP14
CURVE RAMP15
CURVE RAMP16
CURVE RAMP17
CURVE RAMP18
CURVE RAMP19
CURVE RAMP20
CURVE





SCALE: 1" = 100' HORIZ.
1" = 10' VERT.

SHEET NO.	51

PLAN-PROFILE

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

DISTRICT	COUNTY	FINANCIAL PROJECT ID
5	OSCEOLA	438094-1-52-01

ROAD NO.	
91	

ANTARES & BUCHS, PLLC FIRM #30
1450 W. CYPRESS CREEK RD., SUITE 109
FORT LAUDERDALE, FL 33309
(954) 771-4500

PREPARED BY: MICHAEL A. BUCHS, P.E.
FLORIDA LICENSE NO. 59187

REVISIONS			
NO.	DESCRIPTION	DATE	BY
1		00/00/00	
2		00/00/00	
3		00/00/00	
4		00/00/00	
5		00/00/00	
6		00/00/00	

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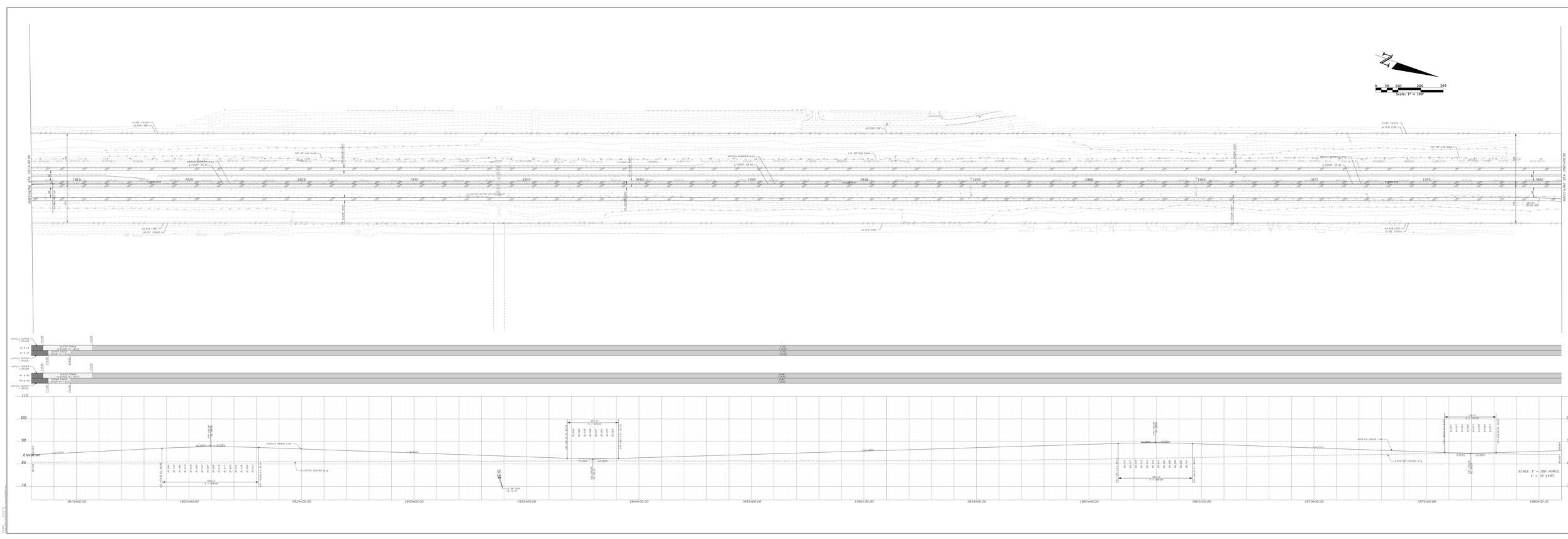


PLAN-PROFILE

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
91	OSCEOLA	436941-52-01

INTERSTATE & RESERVED
SR 91 (I-4) FROM 0.3 MI. W. OF
OSCEOLA/POLK COUNTY LINE
(MAINLINE) TO 0.3 MI. E. OF
CR 532 (WINTER GARDEN RD.)

PROTECT & RESERVE
FOR FUTURE SR 91 (I-4) ADD
LANES & RECONSTRUCT

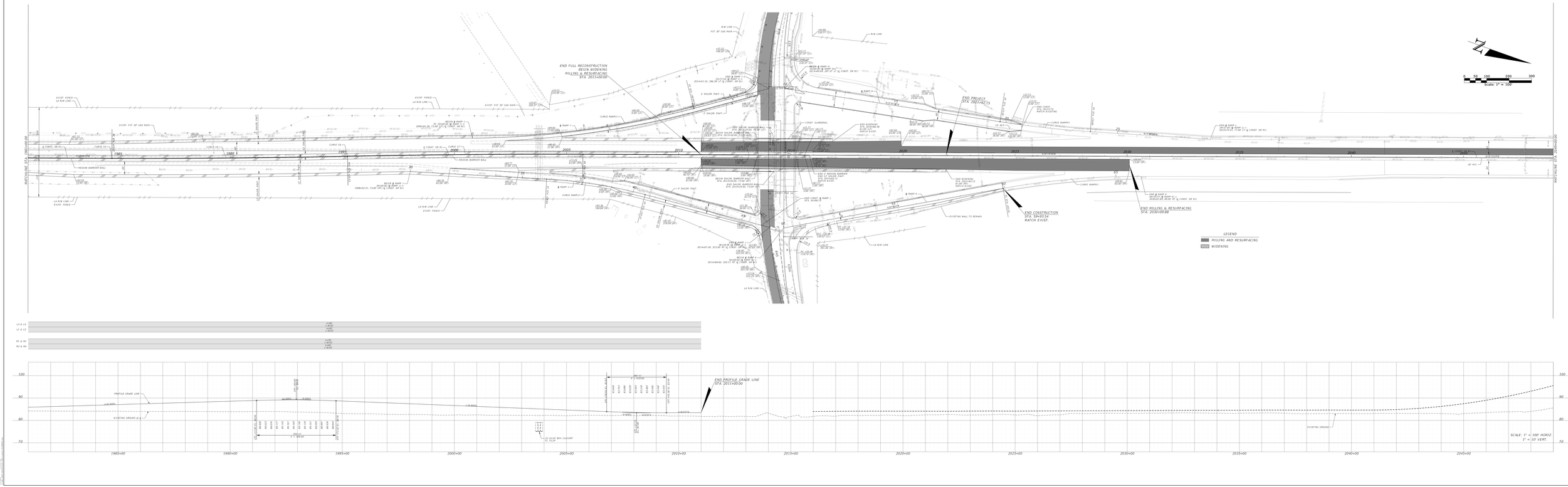
SHEET NO. 52

REVISIONS

DATE	DESCRIPTION	DATE	DESCRIPTION
00/00/00		00/00/00	

NOTICE: FOR OPTIMUM PRINTING RESULTS, REPORT TO THE PRINTER THAT THIS SHEET IS 36" X 48" IN SIZE.

B-22



PLAN-PROFILE

SHEET NO. 53

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

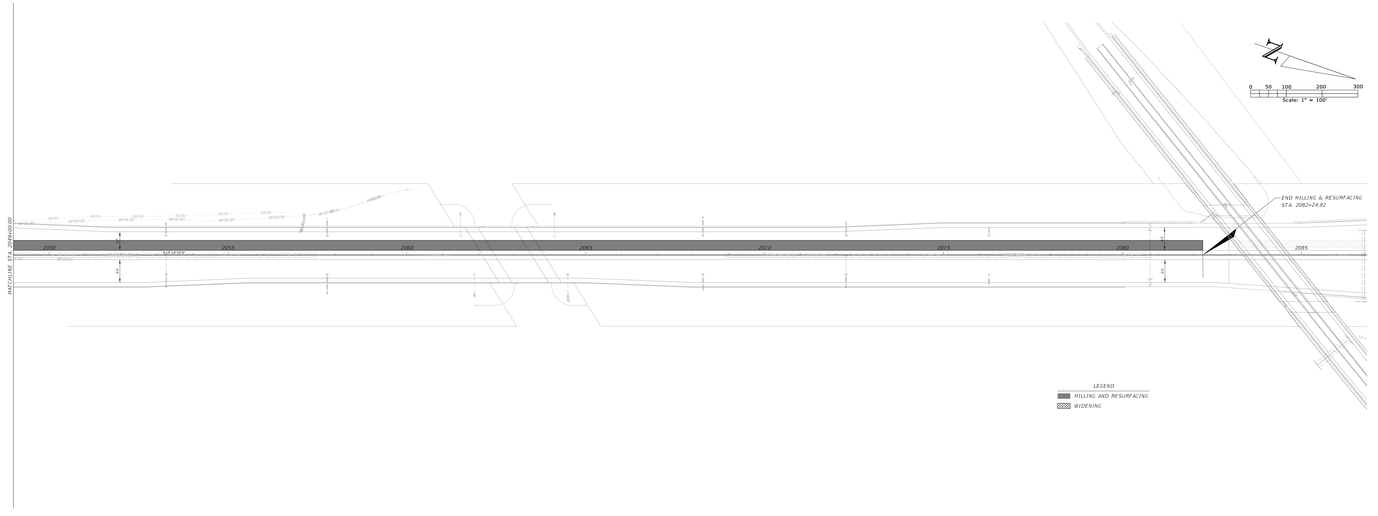
ROAD NO.	COUNTY	FINANCIAL PROJECT ID
91	OSCEOLA	436941-52-01

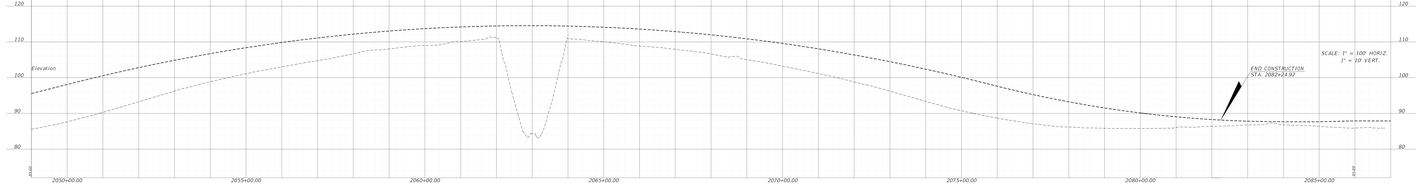
DATE: 08/08/08
DESCRIPTION: .....
DATE: 08/08/08
DESCRIPTION: .....

REVISIONS

DATE: 08/08/08
DESCRIPTION: .....
DATE: 08/08/08
DESCRIPTION: .....

B-23





SHEET NO. 54

PLAN-PROFILE

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

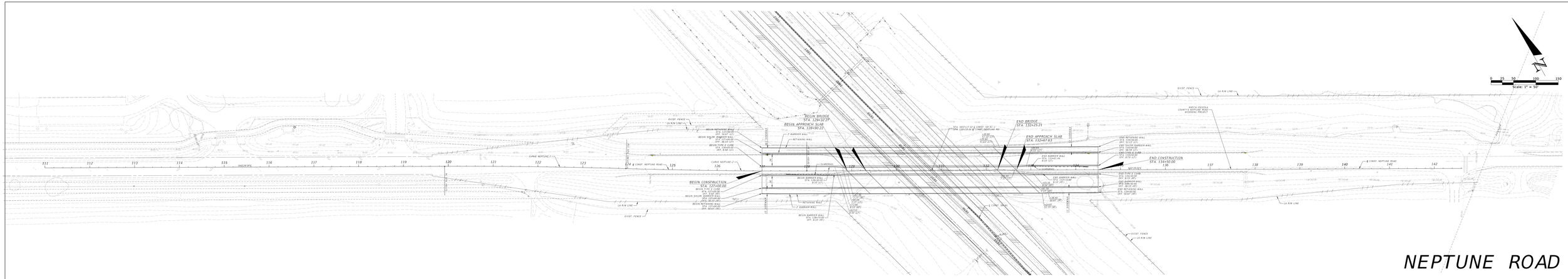
ROAD NO.	COUNTY	FINANCIAL PROJECT ID
91	OSCEOLA	436094-1-52-01

MITCHELL & WEDDINGTON
3025 SHEARER BLVD., STE. 371
ORLANDO, FLORIDA 32804
(407) 898-0000 FAX 898-0000
CERT OF AUTH. NO. 4897

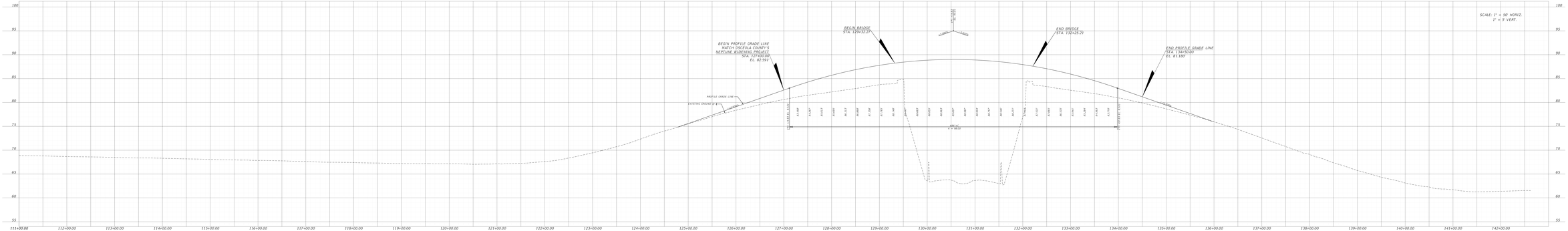
REGISTER OF RECORD
REGISTERED AUTHORITY
FL REGISTRATION NO. 00010

REVISIONS

DATE	DESCRIPTION	DATE	DESCRIPTION
01/01/00	.....	01/01/00	.....



NEPTUNE ROAD



PLAN-PROFILE

SHEET NO. 55

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

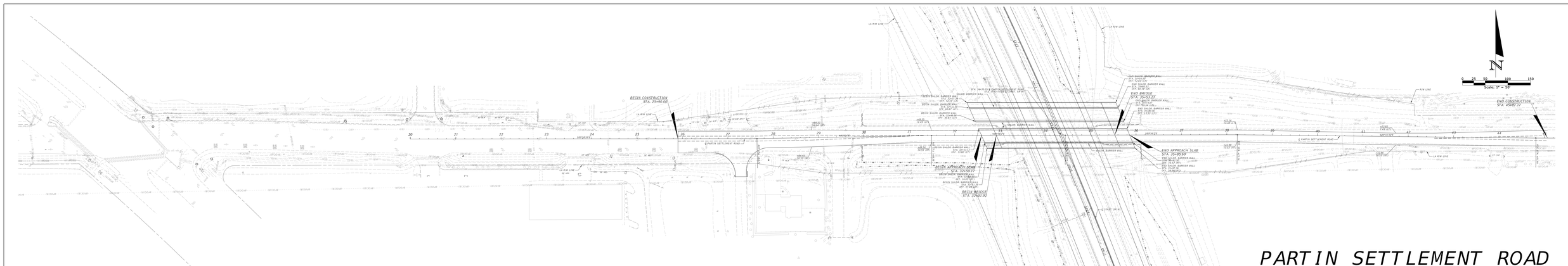
ROAD NO.	COUNTY	FINANCIAL PROJECT ID
91	OSCEOLA	436994-52-01

MATCHLINE & BOUNDARY
3025 CORE MAIN DRIVE, SUITE 371
(AKA MAIN STREET, SUITE 400)
Phone (407) 482-1500
CERT OF AUTH. NO. 4877

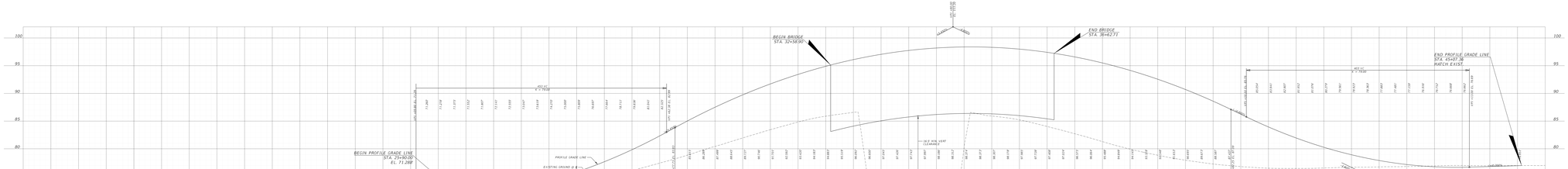
PROPERTY OF RECORD
PROJECT NO. 4877
FL REGISTRATION NO. 8850

REVISIONS

DATE	DESCRIPTION	DATE	DESCRIPTION
01/01/00	.....	01/01/00	.....



PARTIN SETTLEMENT ROAD



SHEET NO.	57
PLAN-PROFILE	

DEPARTMENT OF TRANSPORTATION	STATE OF FLORIDA
DISTRICT	FINANCIAL PROJECT ID
5	439944-52-00
ROAD NO.	COUNTY
SR 91	OSCEOLA

CONTRACTOR	CONTRACT NO.
RIVERSIDE & MCCOOL, JV 225 CORPORATE BLVD., SUITE 201 CAPE CORAL, FL 33991	RIVERSIDE & MCCOOL, JV 225 CORPORATE BLVD., SUITE 201 CAPE CORAL, FL 33991

REVISIONS			
DESCRIPTION	DATE	DESCRIPTION	DATE
.....	00/00/00	.....	00/00/00

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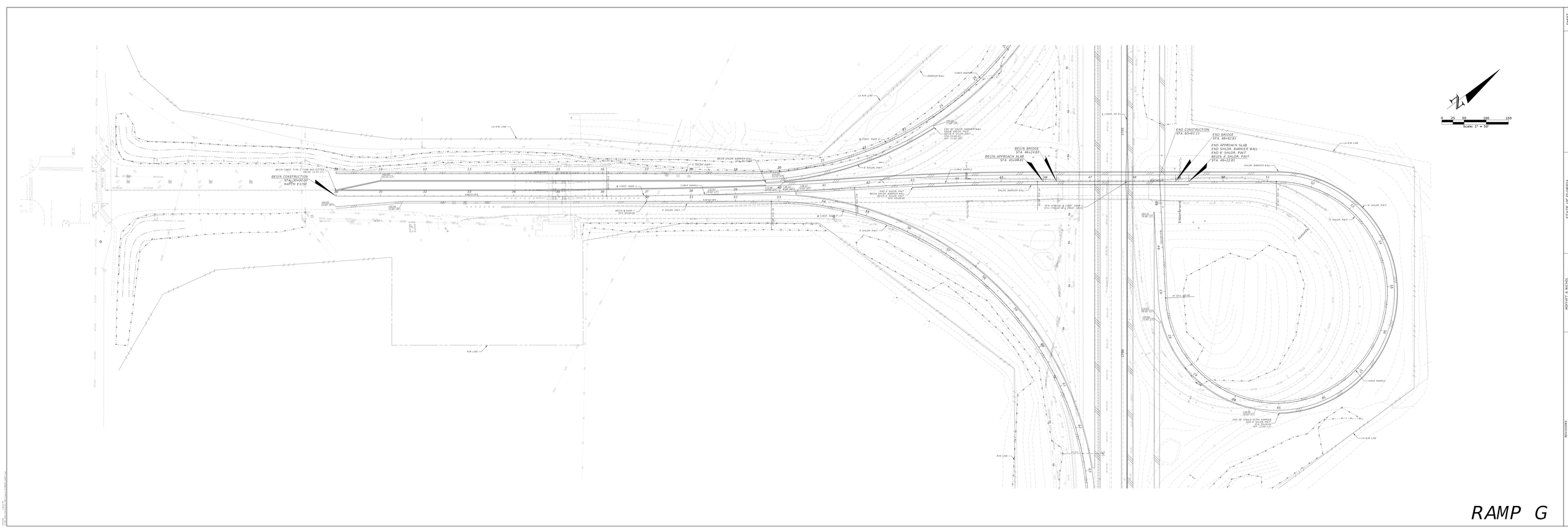
B-25



RAMP G

PLAN

SHEET NO. 58

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

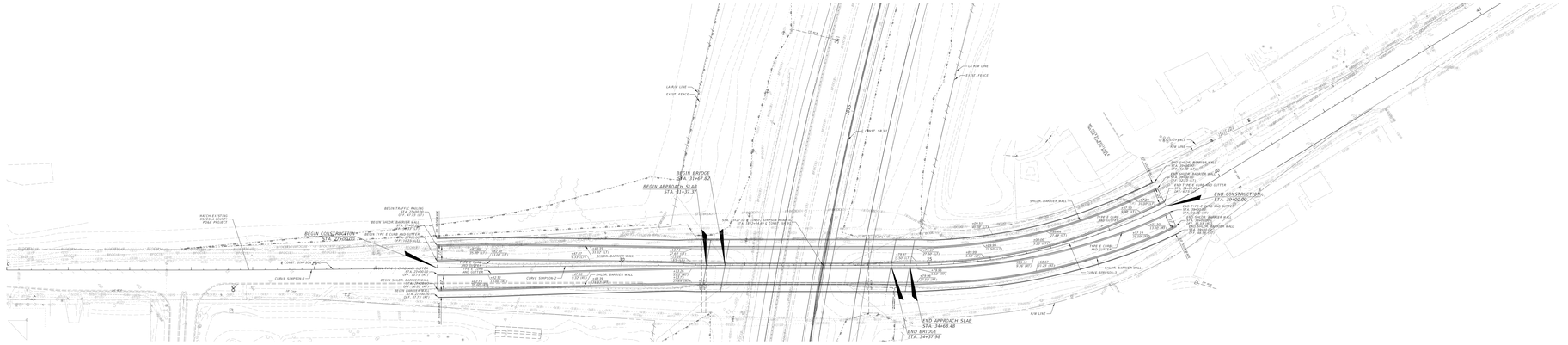
ROAD NO.	COUNTY	FINANCIAL PROJECT ID
91	OSCEOLA	436094-1-52-01

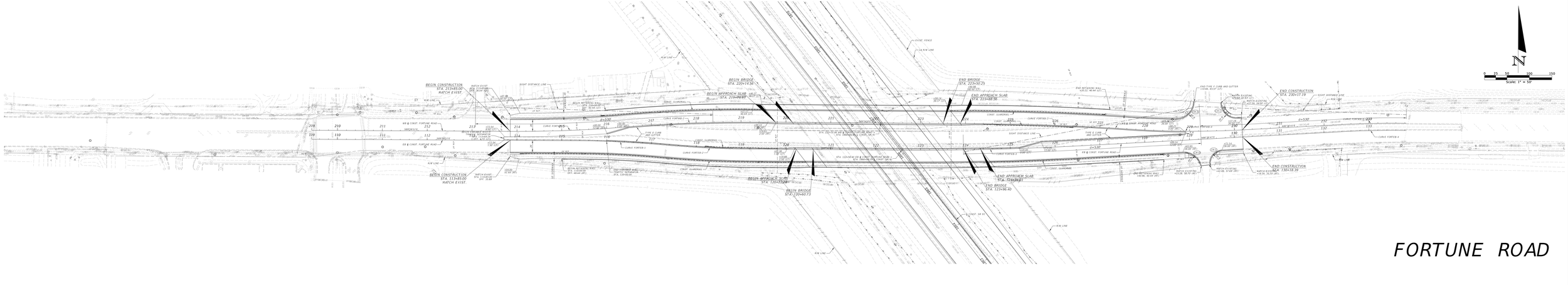
MOTHER & WOOD
ENGINEERING & SURVEY, INC.
1825 ORLANDO BLVD. SUITE 377
KAMPAS, FLORIDA 32708
CERT. OF AUTH. NO. 4877

ENGINEER OF RECORD
REVISED IN DWG. 10
FL REGISTRATION NO. 69839

REVISIONS

DATE	DESCRIPTION	DATE	DESCRIPTION
08/08/08		08/08/08	


BEGIN BRIDGE
STA. 31+07.82
BEGIN APPROACH SLAB
STA. 31+37.31
BEGIN CONSTRUCTION
STA. 27+00.00
MATCH EXISTING
OSCEOLA COUNTY
ROAD PROJECT
BEGIN TRAFFIC RAILING
STA. 31+07.82
BEGIN SHLDR. BARRIER WALL
STA. 31+07.82
BEGIN SHLDR. BARRIER WALL
STA. 31+37.31
BEGIN TYPE E CURB AND GUTTER
STA. 31+37.31
BEGIN TYPE E CURB AND GUTTER
STA. 31+37.31
BEGIN SHLDR. BARRIER WALL
STA. 31+37.31
BEGIN BARRIER WALL
STA. 31+37.31
BEGIN TYPE E CURB AND GUTTER
STA. 31+37.31
CURVE SIMPSON I
CURVE SIMPSON II
CURVE SIMPSON I
CURVE SIMPSON II
END APPROACH SLAB
STA. 34+68.48
END BRIDGE
STA. 34+37.98
END CONSTRUCTION
STA. 39+00.00
END TYPE E CURB AND GUTTER
STA. 39+00.00
END SHLDR. BARRIER WALL
STA. 39+00.00
END SHLDR. BARRIER WALL
STA. 39+00.00
END TYPE E CURB AND GUTTER
STA. 39+00.00
END TYPE E CURB AND GUTTER
STA. 39+00.00
END SHLDR. BARRIER WALL
STA. 39+00.00
END BARRIER WALL
STA. 39+00.00
END TYPE E CURB AND GUTTER
STA. 39+00.00
SHLDR. BARRIER WALL
SHLDR. BARRIER WALL
SHLDR. BARRIER WALL



FORTUNE ROAD

SHEET NO. 60

PLAN

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
91	OSCEOLA	436094-52-01

REVISIONS

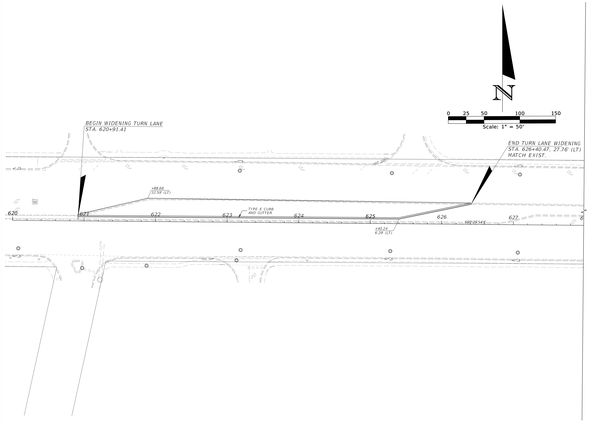
DATE	DESCRIPTION	DATE	DESCRIPTION
06/08/00		06/08/00	

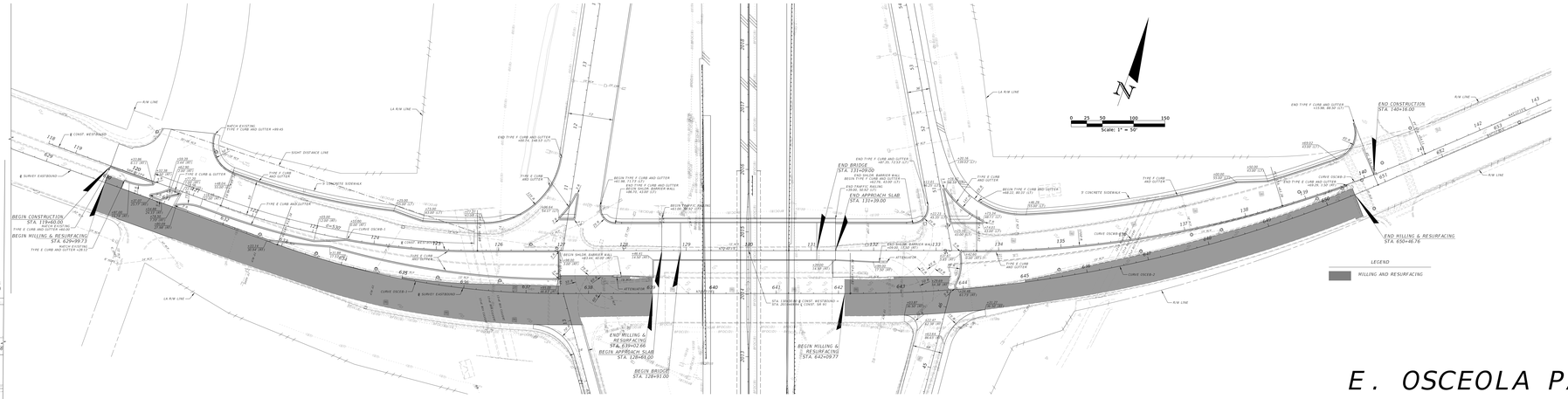
REVISIONS

DATE	DESCRIPTION	DATE	DESCRIPTION
06/08/00		06/08/00	

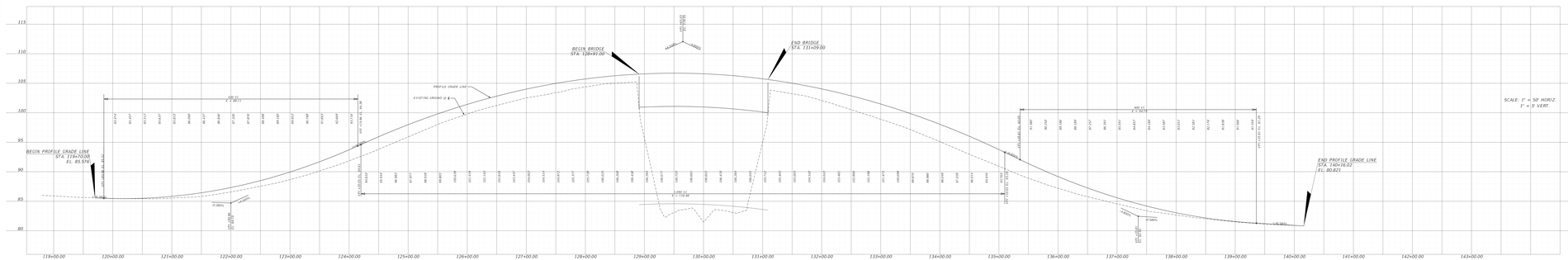
PLAN

B-29





E. OSCEOLA PARKWAY



SHEET NO: 61

PLAN-PROFILE

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION
FINANCIAL PROJECT ID: 438094-1-52-01
COUNTY: OSCEOLA
ROAD NO.: 91

ARCADIS U.S., INC.
10205 CENTURION PKWY N
JACKSONVILLE, FL 32256
PHONE: 904.256.1199
CERTIFICATE OF AUTHORIZATION #: EB 0007

REGISTERED ENGINEER
CHRISTOPHER M. MCCURRY
LICENSE NO. 67880

REVISIONS
NO. | DESCRIPTION | DATE
1 | ..... | 00/00/00
2 | ..... | 00/00/00

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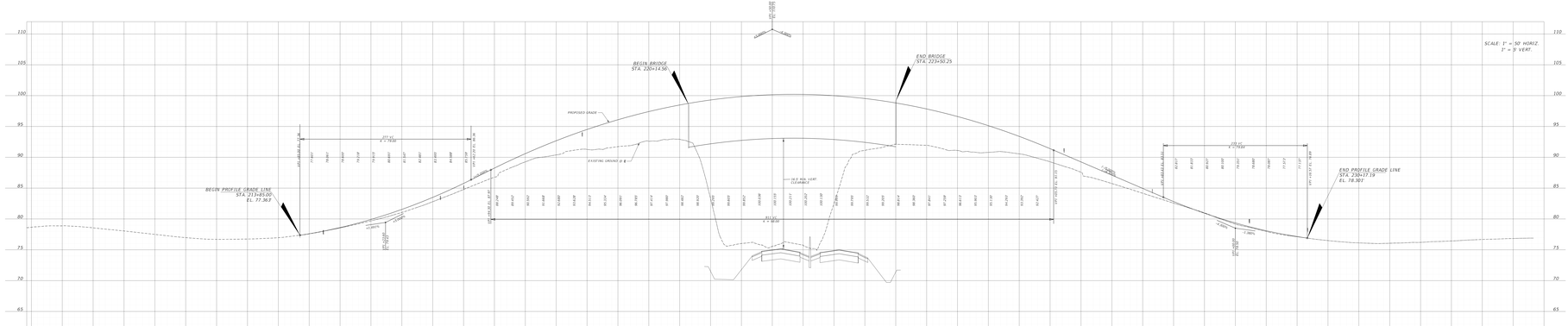
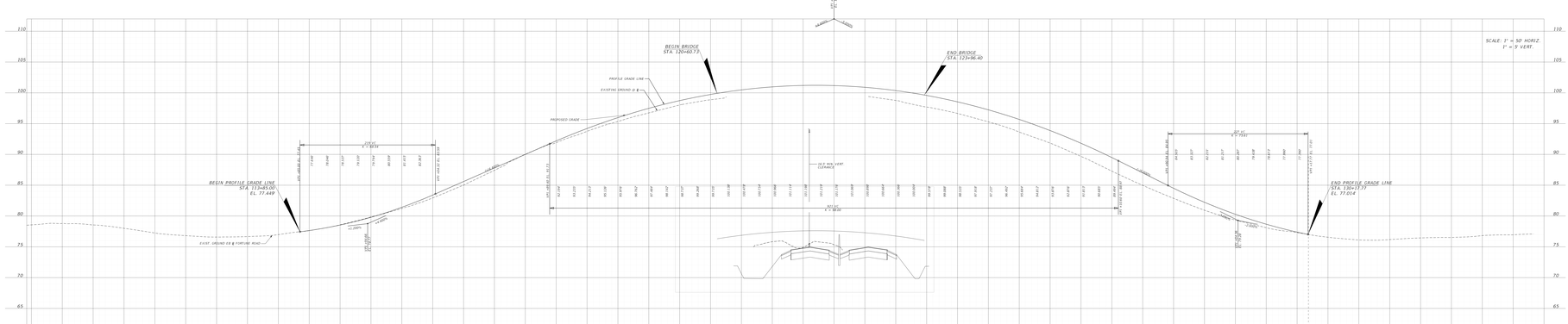


FORTUNE ROAD WESTBOUND



FORTUNE ROAD EASTBOUND

SHEET NO.: 62

PROFILE

ATKINS NA FLORIDA
1000 N. ASHLEY DRIVE, SUITE 1000
TAMPA, FL 33602

DEPARTMENT OF TRANSPORTATION | COUNTY | FINANCIAL PROJECT ID
OSCEOLA | 438094-1-52-01

ROAD NO. | COUNTY
91 | OSCEOLA

INTERSTATE RESOLUTION STUDY FOR
FORTUNE ROAD
FROM I-4 TO OSCEOLA PARKWAY
OSCEOLA COUNTY, FLORIDA

NO.	DATE	DESCRIPTION
1	00/00/00	
2	00/00/00	

REVISIONS

NO.	DATE	DESCRIPTION
1	00/00/00	
2	00/00/00	

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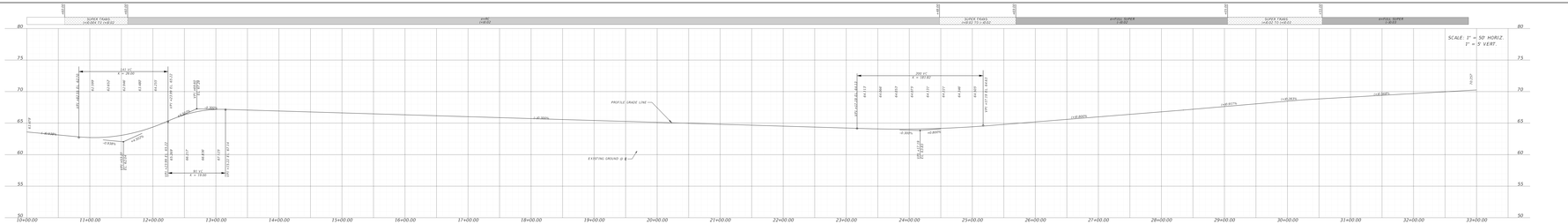
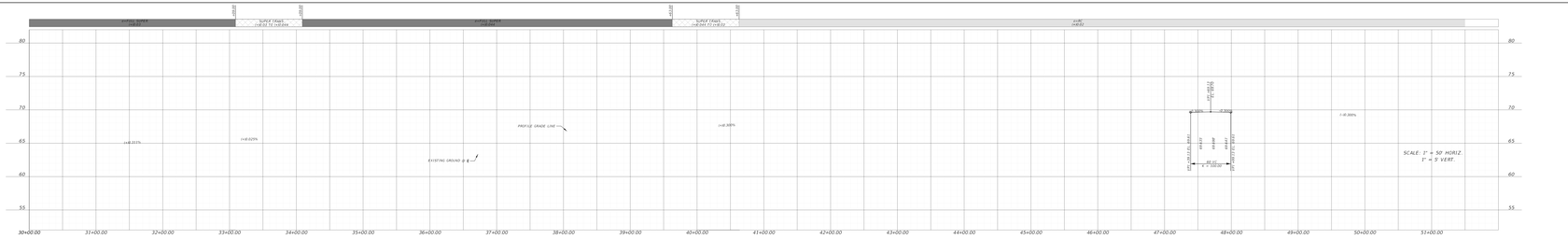
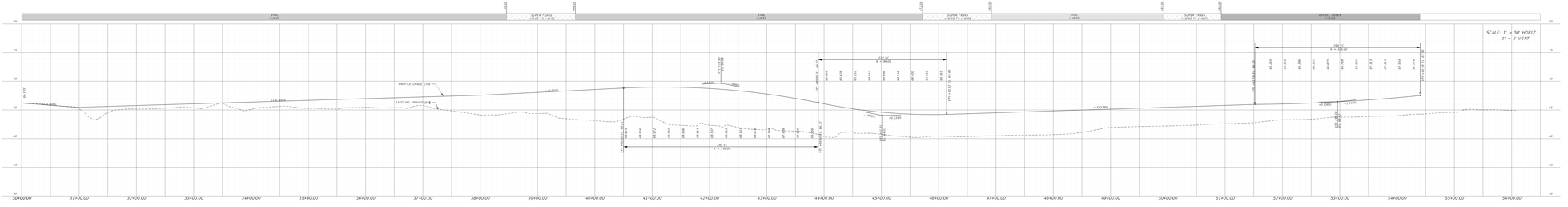


RAMP A



RAMP C



RAMP D

SHEET NO. 63

PROFILE

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

DISTRICT 5 | COUNTY OSCEOLA | FINANCIAL PROJECT ID 436943-1-52-01

ROAD NO. 91

INTERSTATE ROUTES (TOLL) | SR 91 (I-4) FROM W. OF CR 532 TO E. OF SR 536 | CONTRACT E5Y49

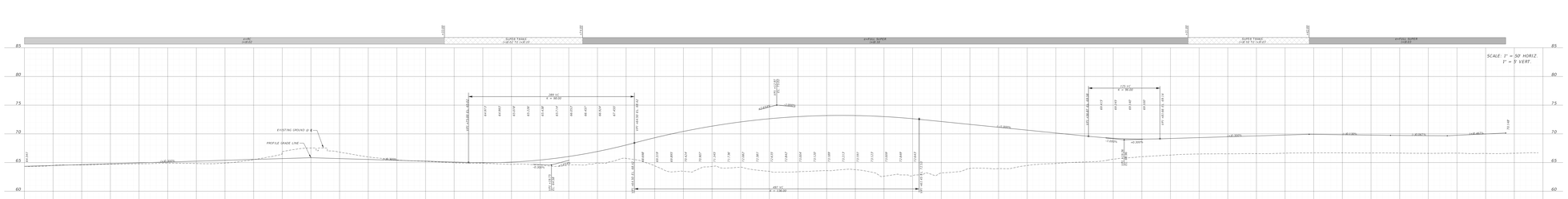
DESIGNED - ... | DRAWN - ... | CHECKED - ... | QUANTITIES - ...

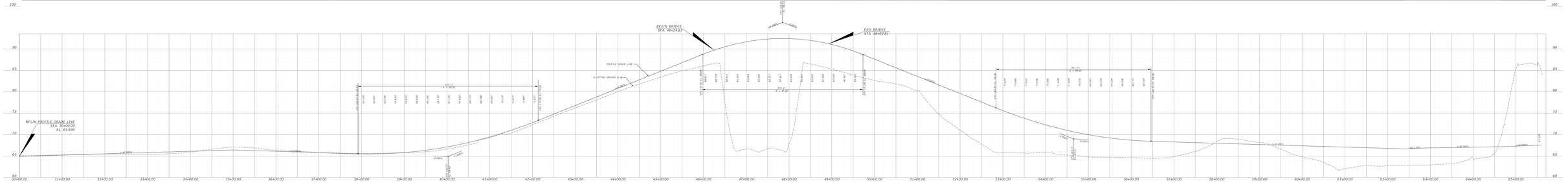
NO.	DESCRIPTION	DATE
1	...	...
2	...	...

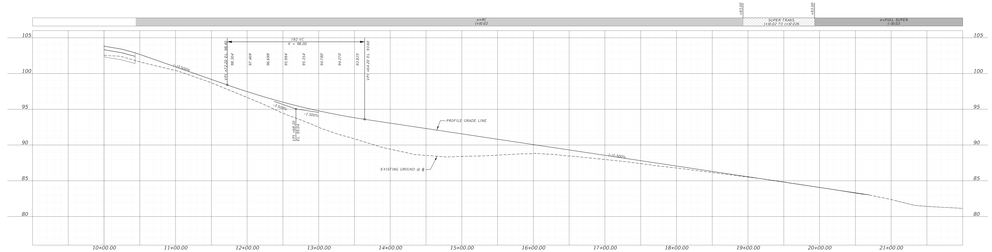
REVISIONS

THE SIGNATURE APPEARING HEREON WAS AUTHORIZED BY [illegible] ON [illegible]. IT IS NOT PERMISSIBLE TO ADD A SIGNATURE TO ANY ELECTRONICALLY GENERATED DOCUMENT AFTER THE ORIGINAL DOCUMENT HAS BEEN SIGNED AND SEALED.

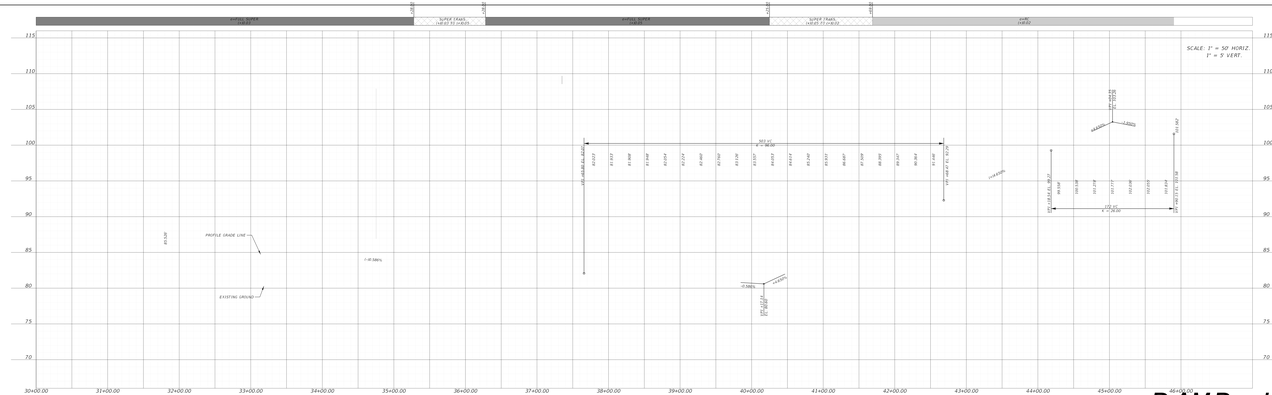
B-33


SCALE: 1" = 50' HORIZ.
1" = 5' VERT.
EXISTING GROUND @ ℄
PROFILE GRADE LINE
-3.000%
-0.300%
+2.000%
+0.300%
+1.500%
+0.300%
+0.300%
+0.300

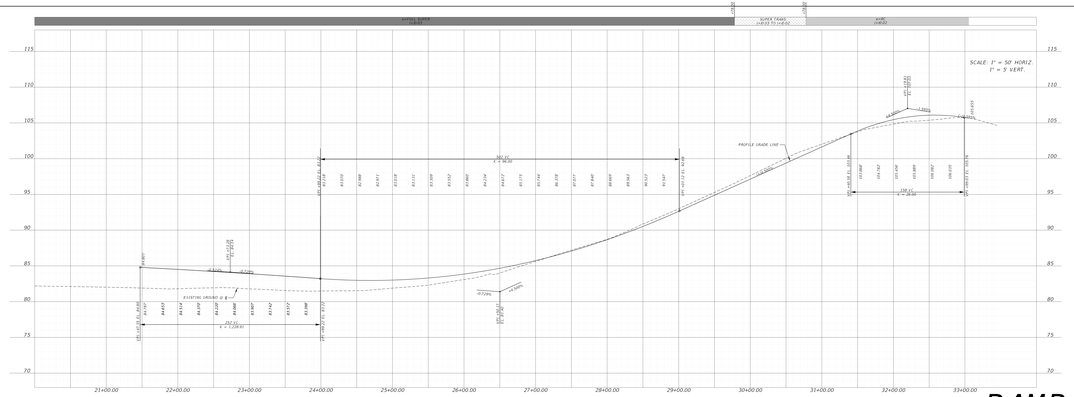

BEGIN PROFILE GRADE LINE
STA. 30+00.00
EL. 64.930
BEGIN BRIDGE
STA. 46+24.81
END BRIDGE
STA. 48+92.81
PROFILE GRADE LINE
EXISTING GROUND
SUPERELEVATION DIAGRAM
SUPERELEVATION DIAGRAM
SUPERELEVATION DIAGRAM



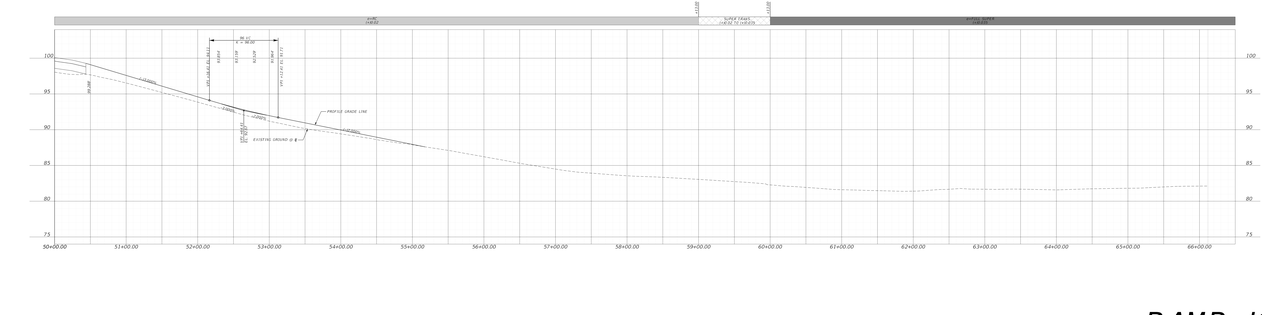
RAMP H



RAMP J



RAMP I



RAMP K

SHEET NO. 66

PROFILE

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

DISTRICT 5 | COUNTY OSCEOLA

ROAD NO. 90 | FINANCIAL PROJECT ID 438944-52-00

DESIGNED BY: M. ANTOLICK, P.E. 73
DRAWN BY: M. ANTOLICK, P.E. 73
CHECKED BY: M. ANTOLICK, P.E. 73
DATE: 01/31/2020

REVISIONS
DESCRIPTION | DATE
DESCRIPTION | DATE
DESCRIPTION | DATE

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DO NOT USE THE INFORMATION ON THIS SHEET FOR CONSTRUCTION PURPOSES.

THIS SHEET IS IN THE PLANS FOR DOCUMENTATION AND TO ASSIST CONSTRUCTION PERSONNEL WITH DRAINAGE CONCERNS.

FISH LAKE

0 100 500
Feet

ZONE A

OFF-SITE BASIN 55 AC.

SECT 5, T 26 S, R 30 E
SECT 32, T 25 S, R 30 E

LAKEVIEW DR.

FRANCES ST.

AVES HAVEN RD.

LUCY AVE

ANN AVE

ROBIN AVE

ELLEN AVE

PATRICIA ST.

EMERALD LAKE CT.

FLORENCE DR

BASIN 1

NEPTUNE RD.

NEPTUNE MIDDLE SCHOOL

POND 1C ENTIRE PARCEL 5.55 AC

BASIN 1

BASIN 2

R/W

LA R/W

BEGIN PROJECT
STA. 1664+34.94

TO LAKE TOHOPEKALIGA
EL. 53 NGVD

ZONE AE
57

B.I. 59.18
B.I. 58.83

℄ CONST. SR 91
(FLORIDA'S TURNPIKE)

POND 1C

B.I. 62.69
B.I. 62.61
B.I. 62.64

SR 500 (US 192/441)

1655 1660 1665 1670 1675 1680 1685 1690 1695 1700 1705 1710

CD-1

CD-2

B.I. 59.21
B.I. 58.22
B.I. 59.16

SR 91 (FLORIDA'S TURNPIKE)

GIBI

POND 1A

FLORIDA TRAIL

B.I. 61.47
B.I. 61.55
B.I. 62.13

POND 1B

END BRIDGE
STA. 1694+12.72

BEGIN BRIDGE
STA. 1690+16.22

B.I. 62.76
B.I. 62.62
B.I. 62.64

POND 2C

SECT 5, T 26 S, R 30 E
SECT 4, T 26 S, R 30 E

CITY LIFE CHURCH

CITY OF LIFE WAY

POND 1A PARTIAL PARCEL
~~10.07 AC~~
12.85 AC

POND 1B ENTIRE PARCEL 4.74 AC

SIMMONS RD

ST. CLOUD CANAL (C&SFFCD CANAL 31)

57
58
60

ZONE AE

SHARP RD

FROM EAST LAKE TOHOREKALIGA

NOTE: DUE TO THE CONSTRUCTION OF SR 500, THE EXISTING STRUCTURES WILL BE REMOVED WITH THE INTERCHANGE IMPROVEMENTS. FOR CLARITY, THE STRUCTURE INFORMATION IS NOT SHOWN.

LEGEND

	FLOODWAY
	FLOODPLAIN
—64—	BASE FLOOD ELEVATIONS
	CONSERVATION AREA
	OTHER SURFACE WATER
B.I.	BIOLOGICAL INDICATOR
—64—	GEOTECHINAL INDICATOR
	WETLANDS
ZONE A	NO BASE FLOOD ELEVATIONS DETERMINED
ZONE AE	BASE FLOOD ELEVATIONS DETERMINED

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

MOFFATT & NICHOL
1025 GREENWOOD BLVD, STE 371
LAKE MARY, FL 32746
PHONE (407) 562-2030
CERT. OF AUTH. NO. 4877

ENGINEER OF RECORD:
GARY J.D. ELWER, P.E.
FL REGISTRATION NO. 42553

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
91	OSCEOLA	436194-1-52-01

RW POND PARCEL AREAS

SHEET NO. 1/6

rspalding 8/17/2020 3:09:04 PM Default Q:\ORL\9365\4361941201\drainage\DRMPRD01.dgn

DO NOT USE THE INFORMATION ON THIS SHEET FOR CONSTRUCTION PURPOSES.

THIS SHEET IS IN THE PLANS FOR DOCUMENTATION AND TO ASSIST CONSTRUCTION PERSONNEL WITH DRAINAGE CONCERNS.

0 100 500
Feet

FISH LAKE
PERM. EASEMENT
ZONE A
FPC FENNEL 3
B.I. 62.6
SR 500 (US 192/441)
R/W
BASIN 2
BASIN 3
CR 523 (PARTIN SETTLEMENT RD.)
OSCEOLA COUNTY PROPERTY APPRAISER
DMV KISSIMMEE
RED JASPER DR
CENTRAL MINT STORAGE
AMBER POINTE
LA R/W
FPC FENNEL 2
POND 3B
POND 3B PARTIAL PARCELS 4.59 AC
FPC FENNEL 1
FPC FENNEL 1 PARTIAL PARCEL 2.62 AC
PERM. EASEMENT
POND 2A PARTIAL PARCELS 6.56 AC
COUNTY EMERGENCY MANAGEMENT
FPC FISH 3 PARTIAL PARCEL 1.90 AC
FPC FISH 3
POND 2A
FPC FISH 2
FPC FISH 2 PARTIAL PARCEL 1.07 AC
LA R/W
GATEWAY BAPTIST CHURCH
B.I. 62.3
℄ CONST. SR 91 (FLORIDA'S TURNPIKE)
SR 91 (FLORIDA'S TURNPIKE)
FENNEL SLOUGH
ZONE A
POND 2C
POND 2C PARTIAL PARCEL ~~6.61 AC~~ 11.58 AC
POND 2B PARTIAL PARCEL 6.83 AC
POND 2B
POND 2D
POND 2D SEVERAL PARTIAL PARCELS (3.35 AC P1) (3.36 AC P2)
P1
P2
FPC FISH 4
FPC FISH 4 PARTIAL PARCEL 2.98 AC
FPC FISH 1
FPC FISH 1 PARTIAL PARCEL 6.47 AC
PORTCHESTER CT.
LUCAS LAKES LN.
REMINGTON BLVD

NOTE:
1. EXISTING STRUCTURES ON PARTIN SETTLEMENT RD WHICH ARE TO BE REMOVED ARE NOT SHOWN.
2. HW ELEVATIONS ARE FROM EXISTING CONTRACT 10.6 PLANS AND CONVERTED TO NAVD88.

LEGEND

- FLOODWAY
- FLOODPLAIN
- —64— BASE FLOOD ELEVATIONS
- CONSERVATION AREA
- OTHER SURFACE WATER
- B.I. BIOLOGICAL INDICATOR
- —64— GEOTECHINAL INDICATOR
- WETLANDS
- ZONE A NO BASE FLOOD ELEVATIONS DETERMINED
- ZONE AE BASE FLOOD ELEVATIONS DETERMINED

THE OFFICIAL RECORD OF THIS SHEET IS THE ELECTRONIC FILE DIGITALLY SIGNED AND SEALED UNDER RULE 61G15-23.004, F.A.C.

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91	OSCEOLA	436194-1-52-01

RW POND PARCEL AREAS

SHEET NO. 2/6

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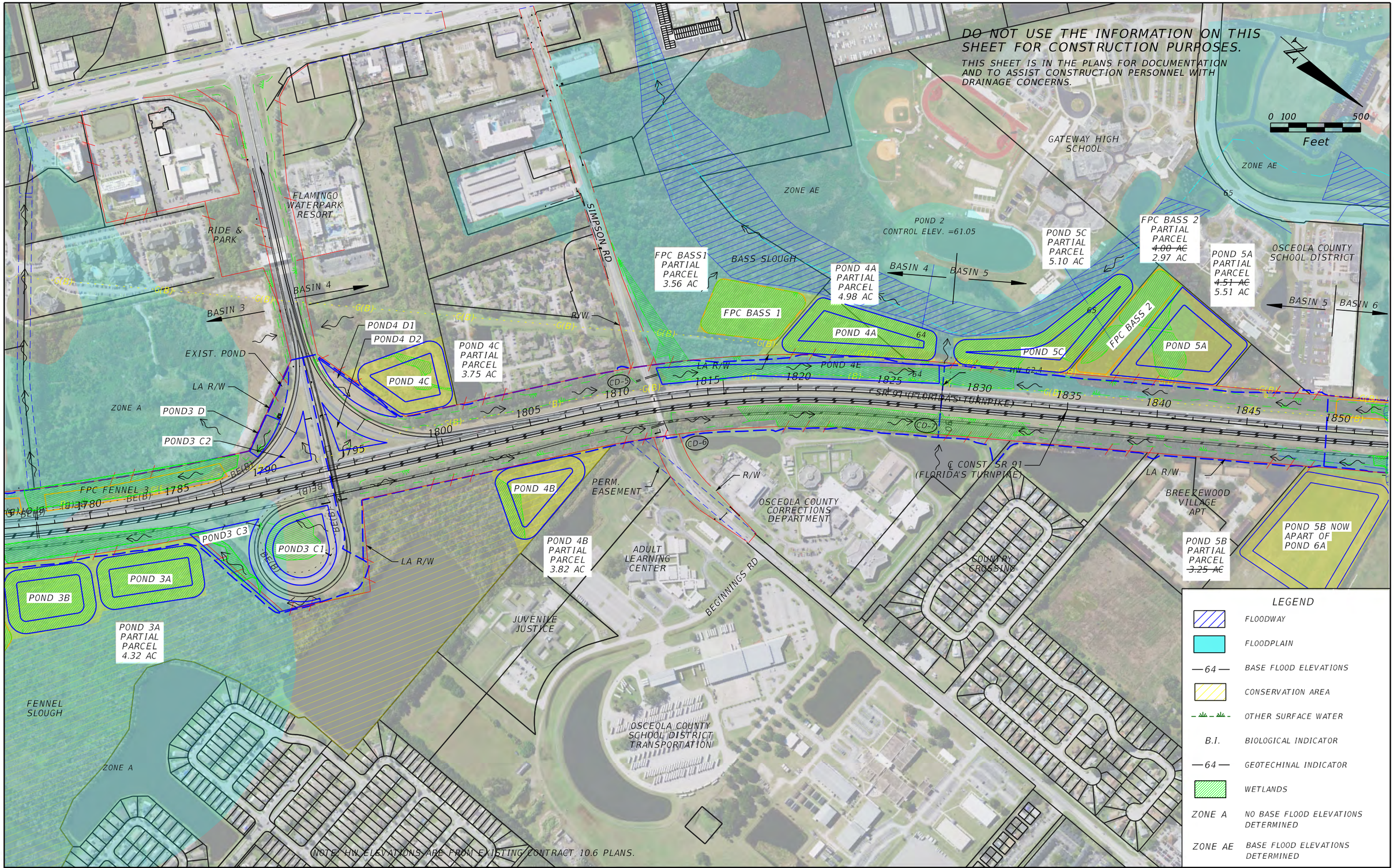

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ROAD NO.	COUNTY	FINANCIAL PROJECT ID
91	OSCEOLA	436194-1-52-01

RW POND PARCEL AREAS

SHEET NO. 3/6

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0 100 500
Feet

BILL BECK RD
R/W
BASIN 6
BASIN 7
POND 6B
POND 6B ENTIRE PARCEL 4.83 AC
POND 7A PARTIAL PARCEL ~~6.07 AC~~ 9.90 AC
POND 7B PARTIAL PARCEL ~~6.10 AC~~ 8.61 AC
POND 7C PARTIAL PARCEL 6.28 AC
JOHNSON UNIVERSITY FLORIDA
ZONE AE
BEGIN BRIDGE STA. 1852+79.62
POND 6C PARTIAL PARCEL 3.21 AC
LA R/W
OSCEOLA COMMUNITY HEALTH DEPARTMENT
PONDEROSA RV PARK
POND 7A
POND 7B
POND 7C
BASIN 7
BASIN 8
HW 69.7
HW 76.6
CD-9
CD-10
CD-8
SR 91 (FLORIDA'S TURNPIKE)
C CONST SR 91 (FLORIDA'S TURNPIKE)
GRANDE COURT APARTMENT
POND 6A
BASS SLOUGH
END BRIDGE STA. 1853+49.62
POND 6A PARTIAL PARCEL ~~5.43 AC~~ 9.45 AC
PERM. EASEMENT
TOPAZ TRAIL
PERIDOT CIRCLE
LAKESIDE ESTATES
FPC BASS 5
CR 530 (FORTUNE RD)
MALLARD CREEK CIR
SECT 19, T 25 S, R 30 E
SECT 18, T 25 S, R 30 E
ZONE A
ZONE AE 74
ZONE AE 75
ZONE AE 76
ZONE AE 79
ZONE AE 74.6
1850 1855 1860 1865 1870 1875 1880 1885 1890 1895 1900 1905 1910 1915 1920

NOTE:
1. ELEVATIONS ARE FROM EXISTING CONTRACT 10.6 & 11.1 PLANS AND CONVERTED TO NAVD88 DATUM

LEGEND

	FLOODWAY
	FLOODPLAIN
—64—	BASE FLOOD ELEVATIONS
	CONSERVATION AREA
	OTHER SURFACE WATER
B.I.	BIOLOGICAL INDICATOR
—64—	GEOTECHINAL INDICATOR
	WETLANDS
ZONE A	NO BASE FLOOD ELEVATIONS DETERMINED
ZONE AE	BASE FLOOD ELEVATIONS DETERMINED

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DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
91	OSCEOLA	436194-1-52-01

RW POND PARCEL AREAS

SHEET NO. 4/6

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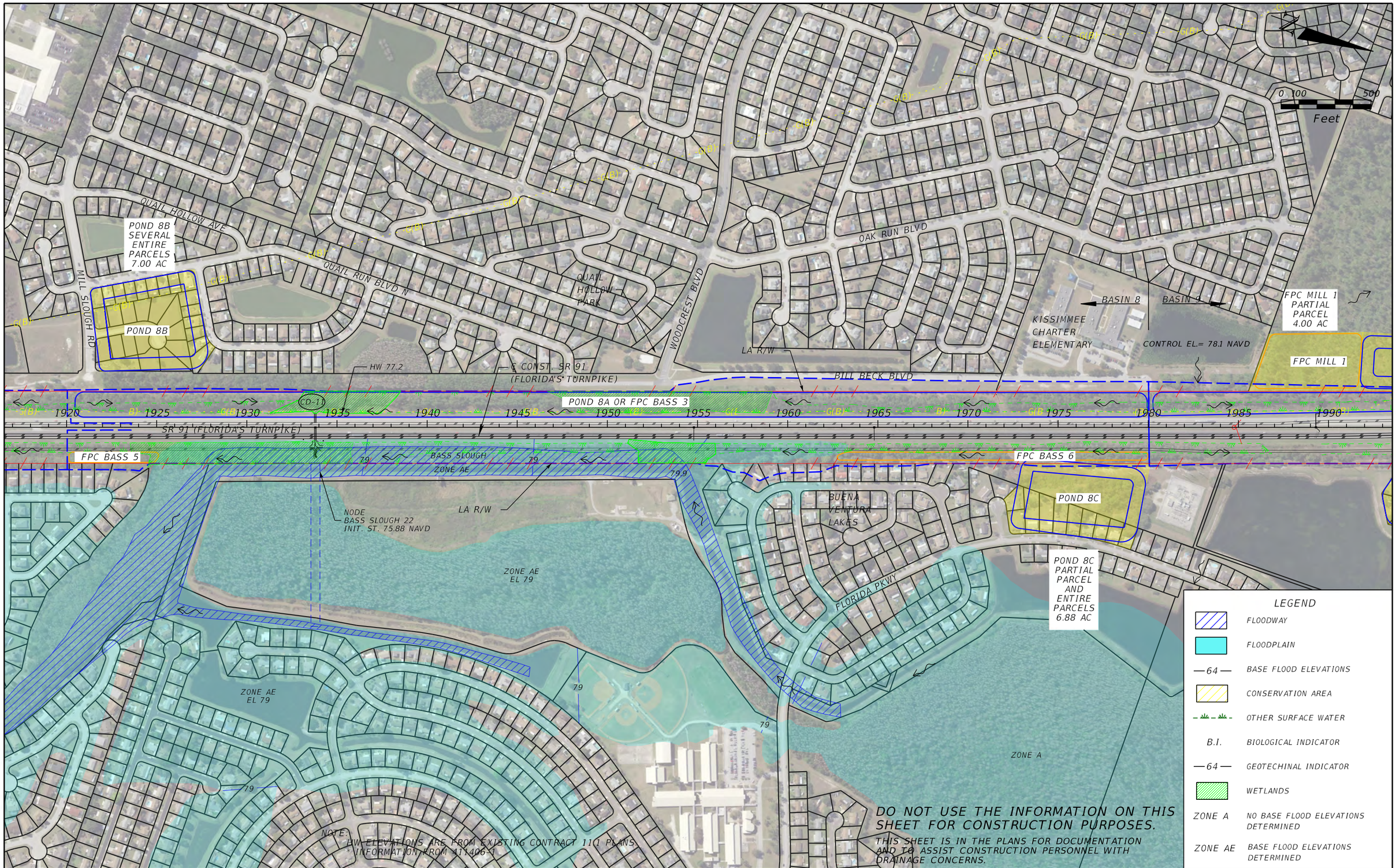

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RW POND PARCEL AREAS

SHEET NO. 5/6

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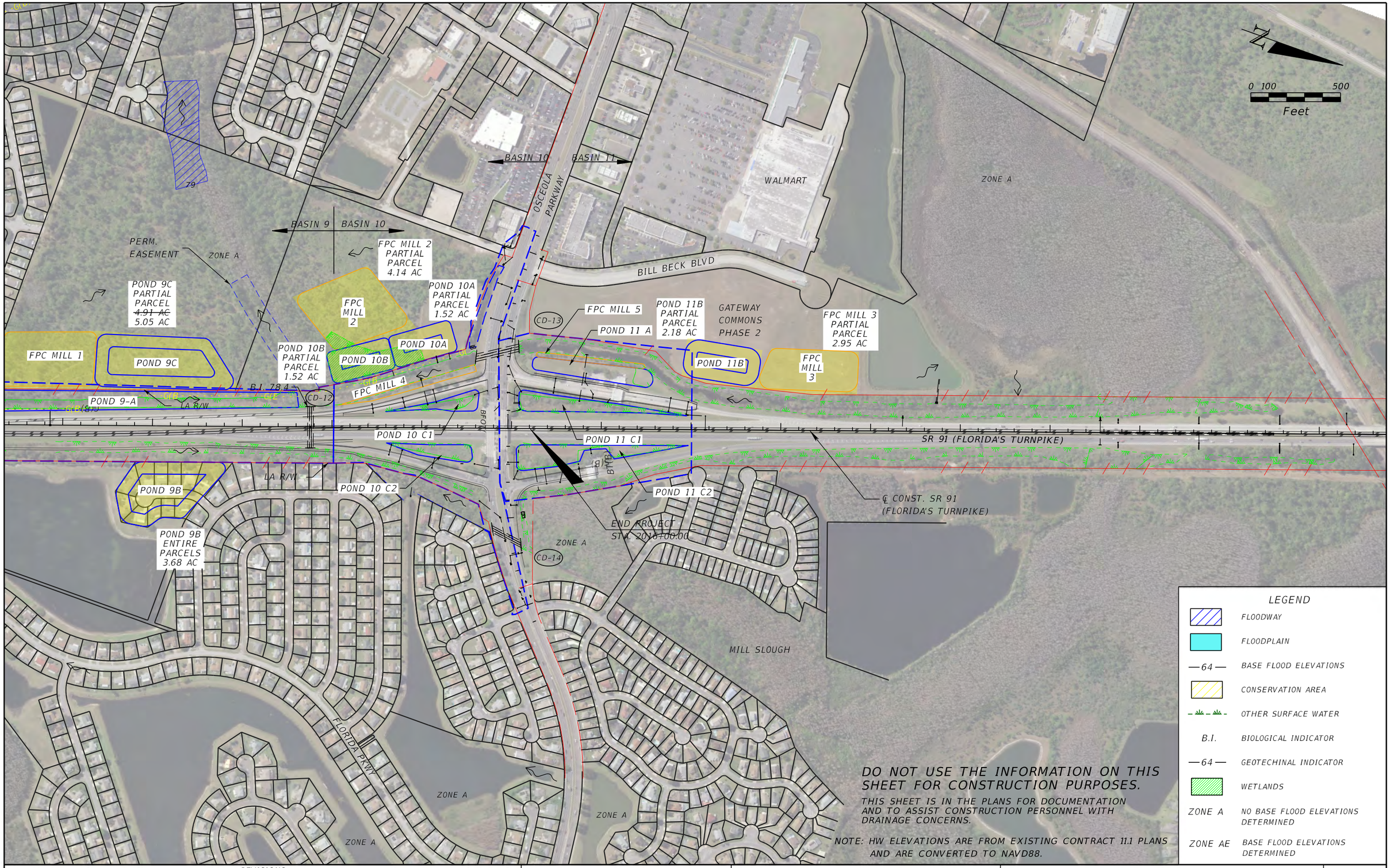

REVISIONS			
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STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
91	OSCEOLA	436194-1-52-01

RW POND PARCEL AREAS

SHEET NO. 6/6

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Summary of Cross Drains

NGVD 1929

NAVD 88 = *NGVD - 0.95*

Cross Drain ID	ROAD	Original Station	Proposed Station	Size	Invert Elevation		SHWT	HW	Basin ID	System	Source
					Left	Right					
CD-1	Turnpike	4660+00	1660+00.00	(2)-36" RCP	55.57 55.78	55.67 55.67	58.83		Basin 1	St. Cloud Canal	Survey
CD-2	*Turnpike Ramp*			(2) - 30" RCP	59.71 59.76	59.71 59.67			Basin 1	St. Cloud Canal	Survey
CD-3	*Turnpike*	4721+00	1721+01.00	10' x 8' CBC	54.21 55.18 =54.23 55.18	54.39 55.2 =54.25 55.20		63 =62.05 63.2 =62.25	Basin 2	St Cloud Canal	Survey Plans 10.6 Florida's Turnpike Mainline PD&E Study
CD-4	*Turnpike*	4777+00	1776+95.00	(2)-9'x5' CBC	57.42 57.42 58.1 =57.15	57.59 57.59 58.2 =57.25		62.6 63.5 =62.55	Basin 3	Fennel Slough	Survey Florida's Turnpike Mainline PD&E Study
CD-5	*Simpson Rd*	33+26		(2)-48" RCP	59.43 59.40	59.27 59.21			Basin 4	Fennel Slough	Survey Florida's Turnpike Mainline PD&E Study
CD-6	*Simpson Rd*	36+65 36+35		(2)-48" RCP	59.30 59.34 60.2 =59.25	59.03 58.96 60 =59.05		63.3 =62.35	Basin 4	Fennel Slough	Survey Florida's Turnpike Mainline PD&E Study
CD-7	*Turnpike*	4828+00.00 1827+98.00		10' x 4' CBC	59.2 =58.25 59.2 =58.25 58.56	59.3 =58.35 59.3 =58.35 58.64	61.7 = 61.67	 63.3 =62.35 	Basin 5	Bass Slough	Plans 10.6 Florida's Turnpike Mainline PD&E Study Survey
CD-8	*Fortune Rd*	28+25		24" RCP	68.2	69.42			BASIN 6	Bass Slough	Survey
CD-9	*Fortune Rd*	33+00.00		24" RCP	69.93	71.08			BASIN 6	Bass Slough	Survey
CD-10	*Turnpike*	4892+75 1892+80.00		6' x 3' CBC	 74.03 =73.08 73.42	 73.74 =72.79 73.19	74.8 	76.7 77.5 =76.55 76.6	Basin 7	Bass Slough	Plans 10.6 Florida's Turnpike Mainline PD&E Study Survey
CD-11	*Turnpike*	4933+75.01 1933+76.00		(3)-36" RCP	 75.3 =74.35 74.91	 75.17 =74.2 74.6	76.1 	77.4 77.4 =76.45 	Basin 8	Bass Slough	Plans 10.6 Florida's Turnpike Mainline PD&E Study Survey
CD-12 Bridge Culvert No. 920079	*Turnpike*	5008+00 2003+81 		(3) 10'x4' CBC (3)-10'x4' RBC 	- 75.59 =74.64 75.59 75.14	- 75.7 =74.75 75.7 75.34	- 78.05 =77.1 	- 76.6 80.23 =79.28 80.23 	Basin 9	Mill Slough	Svedrup Plans 11.1 Florida's Turnpike Mainline PD&E Study Wantman Survey
CD-13 Bridge Culvert No. 924157	*E. Osceola Parkway*	625+82 -		(4)-12.5'x6' CBC (4)- 10'x6' RCB (3) -13'x6'	- NA 74.27 BOT EL	- NA	- - -	- - -	Basin 10	Mill Slough	Sverdrup URS PD&E WGI survey
CD-14 Bridge Culvert No.924155	*E. Osceola Parkway*	635+90 - -		(3)-10'x4' CBC (4)-10'x6' RCB (3)-12'x4'	- - BOT EL 75.14 W/BOT EL 75.00 E	- -	- - -	- - -	Basin 11	Mill Slough	Sverdrup URS PD&E WGI survey

Designed By: Kyle Prince 1/24/2020
Checked By: Ramone Spalding 1/24/2020

Current Profile Low Road PGL				
Basin ID	**Begin Station**	**End Station**	**Low Point Station**	**Low Point Elevation (NAVD 88) ft**
1	1657+88.00	1694+26.11	1664+40.00	65.31
2	1694+26.11	1742+72.54	1711+33.39	67.57
3	1742+72.54	1793+75.65	1793+65.00	68.09
4	1793+75.65	1828+09.27	1811+14.96	67.84
5	1828+09.27	1849+55.75	1831+84.72	68.29
6	1849+55.75	1882+00.00	1866+08.76	74.96
7	1882+00.00	1920+00.00	1908+68.74	80.66
8	1920+00.00	1980+00.00	1938+95.01	81.52
9	1980+00.00	2005+05.88	1980+00.00	85.58
10	2005+05.88	2014+29.01	2012+55.29	83.87
11	2014+29.01	2025+00.00	2014+29.01	83.92

APPENDIX C
Correspondence and Studies

Elwer, Gary

From: Kirwan, Adriana <Adriana.Kirwan@dot.state.fl.us>
Sent: Monday, November 2, 2020 2:54 PM
To: Elwer, Gary
Cc: Crouch, Adam; Yao, Erin; Crosby, Tiffany; Gaines, Fred
Subject: 436194-1: Limiting discharge

CAUTION: This email originated from outside of the organization.

Gary,

We had a meeting to discuss this topic with FTE Drainage and Permitting. The approach is to analyze pre-development discharge Vs. post-development discharge for existing FTE ROW. The limiting discharge is applied to just the areas where new FTE ROW is acquired. In other words, you calculate the allowable discharge (pre-discharge) for existing FTE ROW as usual and you calculate the limiting discharge for only the new FTE ROW and add these 2 together to obtain the total allowable discharge.

Hope this helps and please call me or email me if you have any questions,

Adriana Kirwan, P.E.
Drainage Engineer

HNTB CORPORATION
GEC to Florida's Turnpike
Florida's Turnpike Milepost 263, Building 5315, Ocoee, FL 34761
Tel (407) 264-3080 **Cell** (407) 698-6544

Adriana.kirwan@dot.state.fl.us

DRAFT
Turnpike Widening from Neptune Road to Osceola Parkway
436194-1
Meeting Notes
Internal Turnpike WebEx Meeting
6/1/2020 from 4:00 to 4:45 PM

Attendees: Fred Gaines, Tiffany Crosby, Erin Yao, Adriana Kirwan, Adam Crouch, and Gary Elwer

Purpose of Meeting: To discuss the reasons behind the request for a pre-application SFWMD meeting.

The project's SFWMD pre-app meeting was held in 2016. Significant changes were made to the project's alignment and drainage approach since the Pre-Application meeting. M&N wanted to verify criteria with SFWMD before completing the Pond Siting Report to avoid making major changes due to SFWMD interpretation. The following are the criteria M&N was going to ask for direction/clarification from SFWMD.

- The project would not be held to any limiting discharge rate criteria. Spoke with EOR for SR 500 where their project was held to limiting discharge after initial permit was obtained.
- Wanted to clarify that only 'New" impervious area was required for treatment.
- Wanted to verify compensation treatment would be allowed within the basin (versus sub basins).
- Maintain discharge rate occurring at project outfalls.
- Drainage approach changed from only linear ponds to some off-site ponds keeping linear ponds to a minimum.
- Some off-site stormwater ponds likely to have significant wetland and floodplain impacts to avoid taking homes/businesses. Besides compensating treatment in other areas, does SFWMD have any guidance on other methods to minimize and avoid wetland impacts?

Fred stated that the 2016 meeting minutes documented criteria should not have changed, as no revisions have been made to the SFWMD Environmental Resource Permit Information Manual since before 2016. He suggested that it would be better to have a pre-application meeting once the PSR has finalized the drainage approach to a point where the complexities can be discussed.

Additionally, the Turnpike has successfully permitted all of concerns identified above. Turnpike does not have concerns that this project will be held to a different standard or rules than previously permitted throughout SFWMD.

Based on the conversation today, there does not appear to be a need for the pre-app meeting this week with SFWMD. M&N will move forward with the criteria identified in the 2016 pre-app meeting, compensating treatment can occur anywhere within the Lake Toho basin and is not sub-basin specific, and this project will not be held to limiting discharge rate criteria.

End of Notes

436194-1 Turnpike Widening
Notes from Draft PSR review GoTo Meeting with FTE
1:00 to 2:30 PM May 14, 2020

MEETING NOTES

FTE Attendees: Adriana Kirwan (Drainage) and Tiffany Crosby (Environmental)
M&N attendees: Gary Elwer, Adam Crouch, Ramone Spalding - Drainage

RE: Discussion of DRAFT Pond Siting Report

Gary presented and discussed the Pond Siting Report by reviewing the Basin Maps and the Pond Evaluation Matrix, basin by basin. The following were noted during the open discussion.

Stormwater

- There were very few good locations for stormwater management facilities due to the high development, wetlands, and conservations areas along the corridor.
- Some basins may need to be compensated in other basins. Therefore, some ponds may expand while other may not be used.
- Central Office prefers joint use ponds if possible/convenient in constrained areas. M&N to research into existing permits and determine which off-site ponds have additional capacity and/or the potential for future expansion.
- Keep future widening in mind as the ponds are designed.
- Will need to be creative during design to minimize wetland and floodplain impacts.

Wetlands

- Need to add ranking for wetland impacts. Tiffany will be discussing the ranking with Mike Dinardo, Stantec, directly.
- The different types of wetland should have different ranking, low quality wetlands versus high quality (Bayheads).
- Wetland impacts are ranked below relocating home/business impacts.

Floodplain

- The floodplain impacts have not been determined for the project because the design profile was still being refined at the time of submittal. Floodplain compensation ponds shown in the Draft Pond Siting Report were approximated. The entire corridor is overgrown with Brazilian Peppers obscuring the ground/water elevations at most pond sites.

- M&N will send updated schedule to add time to define the flood stages within each floodplain and preliminary cross section design (slopes versus MSE wall).
- Use conservative floodplain calculations to more accurately estimate preliminary floodplain impacts.

General

- Concerns with the FGT Gas lines were discussed. What will ground elevation be in the vicinity? If any changes to grading or water storage in the vicinity will need to be coordinated with FGT. Add comment in matrix noting potential FGT impact where applicable.
- Mike Dinardo, Tiffany, and Gary to have coordination meeting after SFWMD pre-application meeting to discuss wetland impacts and pond sites.

Schedule

Turnpike requested that the Pre-Final Pond Siting Report be delayed until after the SFWMD meeting to verify the allowable discharge and the determination of preliminary floodplain encroachment volumes.

M&N currently working on the existing floodplain elevation determinations for Fish Lake, Fennel Slough, Bass Slough, and Mill Slough. Roadway design will need to complete cross sections along the flood prone areas to allow floodplain encroachment determinations to occur.

Action Items

- Turnpike to setup a Pre-Pre-application meeting with SFWMD, potentially the week of June 1. The purpose of the meeting is to verify the discussion (criteria) made in the project's 2016's pre-application meeting with SFWMD and to re-introduce the project to the District.
- Turnpike to setup meeting with M&N the week of May 25th to review roll plot of project and draft agenda, prior to the SFWMD meeting.
- M&N to prepare Roll Plot for SFWMD meeting and prepare agenda.
- M&N to research permits for potential joint use ponds along the corridor.
- M&N to prepare a revised schedule for the submittal of the Pre-Final and Final Pond Siting Reports.

ATKINS

Florida's Turnpike Headquarters
P.O. Box 613069
Florida's Turnpike Milepost 263, Building 5315
Ocoee, Florida 34761-3069
Telephone: +1.407.532.3999

SFWMD PRE-APPLICATION MEETING
FPID 436194-1 Widen Turnpike Mainline w/ Express Lanes
From US 192 (MP 242) to Osceola Parkway (MP 249), Osceola County
Friday, September 30, 2016 – 9:00 AM

Attendees:
Mark Daron – SFWMD
Marc Ady – SFWMD
Kathy Dobbins – Moffatt & Nichol
Mike Dinardo – Stantec
Steve Soldati - HNTB
Elizabeth Bartell - HNTB
Becky Davis – Moffatt & Nichol
Fred Gaines - Atkins

I. Introductions

- Introductions were made.
- A list of attendees can be found on attached Sign-in Sheet.

II. Project Description

- Limits of the widening project were described beginning just north of Neptune Road and ending north of Osceola Parkway. The north end of the project will tie into the recently permitted segment that continues north to SR 528.
- Attached to the agenda, the proposed mainline Typical Section was used to explain the transition from the existing 4-lane divided highway to the proposed 8-lane section which includes 2-lanes general use and 2-lane express lanes for northbound and southbound.
- Vertical Datum for the project will be NAVD 88.
- M&N proposes to use the existing wet ditches outside of the wetland limits as treatment facilities. A ditch block with an orifice will be built perpendicular to the road and with a minimum 12' width for maintenance vehicle. It was noted that the adjacent ditches were constructed when the road was originally built in the 1960s.

III. Environmental Issues

- Wetlands and other surface waters (OSW) have been flagged along the corridor based on biological indicators.
- 19 SHW locations each with 3-SHW points have been established in the field.
- Turnpike/Stantec is ready to Schedule Field Review of wetland limits and SHW elevations. SFWMD suggested emailing a field review request to Jennifer Thomson.
- There are two existing mitigation wetlands within the US 192 Interchange that have conservation easements to the Florida Department of Environmental Protection (FDEP, then the Florida Department of Natural Resources). SFWMD indicated that Turnpike will need to coordinate the conservation easements through FDEP.

IV. Design Criteria

- The project lies within Lake Tohopekaliga Basin of the Upper Kissimmee River Watershed. The subbasins include Mill Slough, Bass Slough, Fish Lake, and St. Cloud.
- Although there are no Special Basin Requirements for TMDL or Allowable Discharge Rate, SFWMD stated that if there was direct discharge to Lake Toho, phosphorus calculations may

need to be provided. M&N will review the Lake Toho Study (*Lake Toho Nutrient Reduction Plan*) to determine whether phosphorus calculations are necessary. If phosphorus removal is necessary, some of the existing ditches may need to be modified to provide dry treatment to attain the necessary nutrient removal.

- SFWMD indicated that the proposed treatment approach is not standard and there are some questions that need to be resolved internally within SFWMD regarding the approach. SFWMD stated that the approach does not meet the District's wet treatment criteria but since not trying for dry treatment credit it may not be an issue. M&N/Turnpike discussed how this approach was permitted by the St. Johns River Water Management District on a section of I-95 in Brevard County in a similar area of high ground water table to reduce impacts to wetlands and other surface waters that provide suitable foraging habitat for wood storks. A discussion centered on the differences between the proposed approach and residential swales as the system will not percolate vertically but more horizontally. SFWMD also indicated that the proposed ditch block with orifice does not provide similar treatment as the standard wet pond permanent pool design. Nevertheless, SFWMD recognizes the potential environmental benefits for the approach and indicated that it is acceptable at this time to continue with the approach. SFWMD will let Turnpike know within one week of the meeting if there are any fatal flaws with the approach.
- Treatment Volume
  - The project will treat only new additional impervious and will provide the existing treatment volume of any existing permitted stormwater facility that is impacted by the improvements.
  - Compensation within the same SFWMD basin is allowed
  - Wet Detention
    - The greater of 1" runoff over drainage area
    - OR 2.5" x impervious area (excluding water bodies)
    - Recover ½ treatment volume within 24 hr
    - NWL
- Water Quantity
  - Pre/Post 10 year 72 hour storm event for Osceola County
  - Storms will be routed using the SFWMD 72 hour rainfall distribution.
- Floodplain
  - With no reported overtopping with hurricanes, the project will provide:
  - No net reduction in 10 yr floodplain
  - Cup for cup for 100 year floodplain
  - Not to exceed 1' unless est. by WMD or FEMA for 100yr
- Cross Drains
  - 2 bridges are located within the project. There is a bridge at Bass Slough and a bridge culvert at Mill Slough.

V. Permitting

- Existing Permits
  - Turnpike Widening from Osceola Pkwy to Beachline Expwy (48-01443-P) (2014)
  - Exemption for Turnpike Median Guardrail (56-01913-P)
  - Kissimmee/St Cloud Toll Facility (49-00619-S) (1992)
  - Sunpass Challenge (2002 - Exit)
- Existing Permits Adjacent to R/W - M&N will review Turnpike/Dart Boulevard (Osceola Parkway) Interchange permit for any modifications.

VI. Estimated Permit Submittal

- With 45% Plans submittal projected for 4/17, the estimated permit submittal will be mid-2017.

VII. Action Items

- **SFWMD will let FTE & M&N know if the proposed use of the existing ditches as treatment facilities is not a viable option. M&N and FTE will assume SFWMD approves of the approach unless we hear differently.** ***SFWMD contacted FTE on 10/19/16 indicating that SFWMD is fine with the wet treatment ditch with ditch block and orifice approach as long as a maintenance plan for the treatment ditch is developed addressing nuisance and exotic vegetation.***
- **M&N to research permit for Turnpike/Dart Blvd (Osceola Parkway) Interchange.**

Dobbins, Kathy

From: Jeff Smith <Jeff.Smith@OSCEOLA.ORG>
Sent: Thursday, November 03, 2016 12:31 PM
To: Dobbins, Kathy; Linette Matheny
Subject: RE: Potable wellfields in Osceola County

Kathy,
As far as I know there are no well fields in that area that we are aware of, we do the permitting on all wells since 1999 and nothing like that has gone in since then.

Jeff Smith

From: Dobbins, Kathy [mailto:kdobbins@moffattnichol.com]
Sent: Thursday, November 03, 2016 10:16 AM
To: Linette Matheny
Cc: Jeff Smith
Subject: RE: Potable wellfields in Osceola County

Linette,
Thanks for the info. I'll try that site.

Jeff,
I'm looking for potable wellfields not individual/homeowner wells. It looks the health department has individual sites and not wellfields.
Do you know if there are any in Osceola County? There is one in the northeast corner of SR 417 and SR 91 in Orange County.
Thanks in advance for any information you might have.

Kathy Dobbins, P.E.
Moffatt & Nichol
1025 Greenwood Blvd. Ste. 371 | Lake Mary, FL 32746
P 407.562.2030 | **F** 407.562.2031

From: Linette Matheny [mailto:Linette.Matheny@osceola.org]
Sent: Thursday, November 03, 2016 10:05 AM
To: Dobbins, Kathy <kdobbins@moffattnichol.com>
Cc: Terry Torrens <Terry.Torrens@OSCEOLA.ORG>; Jeff Smith <Jeff.Smith@OSCEOLA.ORG>
Subject: RE: Potable wellfields in Osceola County

The health department keeps the database of wells. I have cc'd Jeff Smith on this email.

Linette R. Matheny, PE
407.742.0543

From: Dobbins, Kathy [mailto:kdobbins@moffattnichol.com]
Sent: Thursday, November 03, 2016 10:00 AM
To: Linette Matheny
Cc: Terry Torrens
Subject: Potable wellfields in Osceola County

Linette,

I'm looking to see if there are any potable wellfields in the vicinity of the Florida Turnpike from Neptune Road to just north of the Osceola County line.
Can you direct me to either a web site OR whom I would need to discuss this issue?

Thanks and have a great day,

Kathy Dobbins, P.E.
Moffatt & Nichol
1025 Greenwood Blvd. Ste. 371 | Lake Mary, FL 32746
P 407.562.2030 | **F** 407.562.2031

Please Note: Florida has a very broad Public Records Law. E-mails to this entity or its employees may be considered a public record. Your e-mail communication, including your email address may be disclosed to the public and media at any time.

Dobbins, Kathy

From: Bartell, Elizabeth <Elizabeth.Bartell@dot.state.fl.us>
Sent: Thursday, June 02, 2016 10:23 AM
To: May, Robert; Dobbins, Kathy
Cc: Davis, Rebecca; Yao, Erin; Soldati, Steve
Subject: RE: 436194-1 Widening from MP 242-MP 248.93 - Drainage Kickoff Meeting - Follow-Up

Bob – Thank you for the quick and thorough response.

Kathy – Please see Bob's response and let me know if you need any further clarification.

Thanks,
Liz

Elizabeth Bartell, PE, CFM
Drainage Engineer

HNTB CORPORATION
Florida's Turnpike Milepost 263, Building 5315, Ocoee, FL 34761
Tel (407) 264-3080 | **Mobile** (321) 438-2787

elizabeth.bartell@dot.state.fl.us

From: May, Robert
Sent: Wednesday, June 01, 2016 5:25 PM
To: Bartell, Elizabeth
Subject: RE: 436194-1 Widening from MP 242-MP 248.93 - Drainage Kickoff Meeting - Follow-Up

Liz,

Promised you a response by the end of last week, and obviously missed that commitment. My apologies!

I discussed with staff and we could not come up with any areas that historically flood or have been drainage problem areas. As previously noted, the corridor within the project limits typically displays broad, relatively flat shoulders that are seasonally wet at various locations. However, none were deemed to be "flooding" problems. The ERCAR for the mainline widening from Osceola Parkway to Orlando South identified problems with the drainage structures at the SW corner of the Osceola Parkway interchange (undermined fabriform, broken weir and bleed down pipe, etc.), but that facility was found to be part of the drainage improvements associated with the widening of Dart Boulevard (nka Osceola Parkway) by Osceola County, constructed under a permit they obtained. If this damage has any impact on the Turnpike's drainage system within the interchange, it may be prudent to include the repairs in this widening project to ensure system functionality.

Regarding berm widths, I believe it prudent to default to a minimum 10' berm width between dry double ditches and a minimum 15' berm width between wet double ditches. If soils are relatively stable, these widths should be sufficient, but if soils are relatively unstable, and maintenance access would adversely impact a berm, a wider berm should be considered to better resist usage impacts. Regardless of soil conditions, Maintenance has been requesting a minimum 10' wide (20' preferred) maintenance access be provided for all new capacity projects (between walls, toe of slopes, structures & other physical constrains) to accommodate maintenance access for equipment and maintenance of the area.

Hope this information satisfactorily responds to your inquiry. And again, I apologize for not getting this information to you sooner.

Bob

Robert C. May
Plans Review & Special Projects Manager - Jacobs
Traffic Engineering and Maintenance General Consultant to Florida's Turnpike
Physical Address: Mile Post 263, Florida's Turnpike - Operations Building 5317, Ocoee, FL 34761
US Mail: P.O. Box 613069, Ocoee, FL 34761
Phone: 407-264-3473
Cell: 407-466-3636

From: Bartell, Elizabeth
Sent: Tuesday, May 24, 2016 1:32 PM
To: May, Robert
Subject: RE: 436194-1 Widening from MP 242-MP 248.93 - Drainage Kickoff Meeting - Follow-Up

Thank you, Bob. An answer by the end of this week would be great.

Elizabeth Bartell, PE, CFM
Drainage Engineer

HNTB CORPORATION
Florida's Turnpike Milepost 263, Building 5315, Ocoee, FL 34761
Tel (407) 264-3080 | **Mobile** (321) 438-2787

elizabeth.bartell@dot.state.fl.us

From: May, Robert
Sent: Tuesday, May 24, 2016 12:57 PM
To: Bartell, Elizabeth
Cc: Yao, Erin; Soldati, Steve; rdavis@moffattnichol.com; kdobbins@moffattnichol.com
Subject: RE: 436194-1 Widening from MP 242-MP 248.93 - Drainage Kickoff Meeting - Follow-Up

Liz,

Sounds like a good thing I didn't attend! Seriously, I've forwarded your e-mail to Bernard Mills, Area Maintenance Manager, for him to share with the Asset Maintenance Contractor to see if they are aware of areas with a history of flooding. I am more familiar with areas that are seasonally wet, but not aware of isolated areas of flooding that may be historically documented.

I'm not sure if I'll be able to get a response back today, but should be able to tomorrow. Let me know if your need is more imminent than that.

Bob

Robert C. May
Plans Review & Special Projects Manager - Jacobs
Traffic Engineering and Maintenance General Consultant to Florida's Turnpike
Physical Address: Mile Post 263, Florida's Turnpike - Operations Building 5317, Ocoee, FL 34761

US Mail: P.O. Box 613069, Ocoee, FL 34761
Phone: 407-264-3473
Cell: 407-466-3636

From: Bartell, Elizabeth
Sent: Monday, May 23, 2016 5:00 PM
To: May, Robert
Cc: Yao, Erin; Soldati, Steve; rdavis@moffattnichol.com; kdobbins@moffattnichol.com
Subject: 436194-1 Widening from MP 242-MP 248.93 - Drainage Kickoff Meeting - Follow-Up

Hi Bob,

Maintenance was a hot topic at today's Drainage and Permitting Kick Off Meeting for the subject project! Could you please answer the following questions to help us understand the drainage design requirements:

1. Is there a history of flooding within the project limits?
2. What are the minimum berm widths that maintenance will permit for roadside treatment swales within the project limits?

Let me know if you would like to discuss further before responding.

Thanks,
Liz

Elizabeth Bartell, PE, CFM
Drainage Engineer

HNTB CORPORATION
Florida's Turnpike Milepost 263, Building 5315, Ocoee, FL 34761
Tel (407) 264-3080 | **Mobile** (321) 438-2787

elizabeth.bartell@dot.state.fl.us

Lake Tohopekaliga Nutrient Reduction Plan

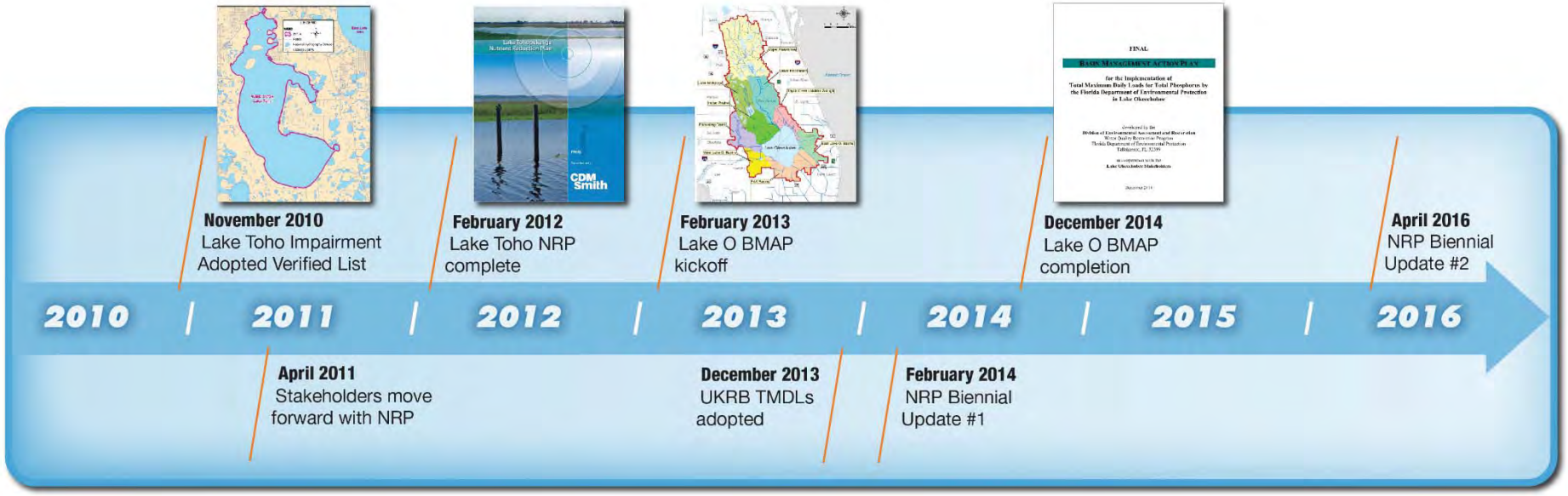
Lake Okeechobee Annual BMAP Meeting

Danielle Honour, P.E., D.WRE

May 3, 2016

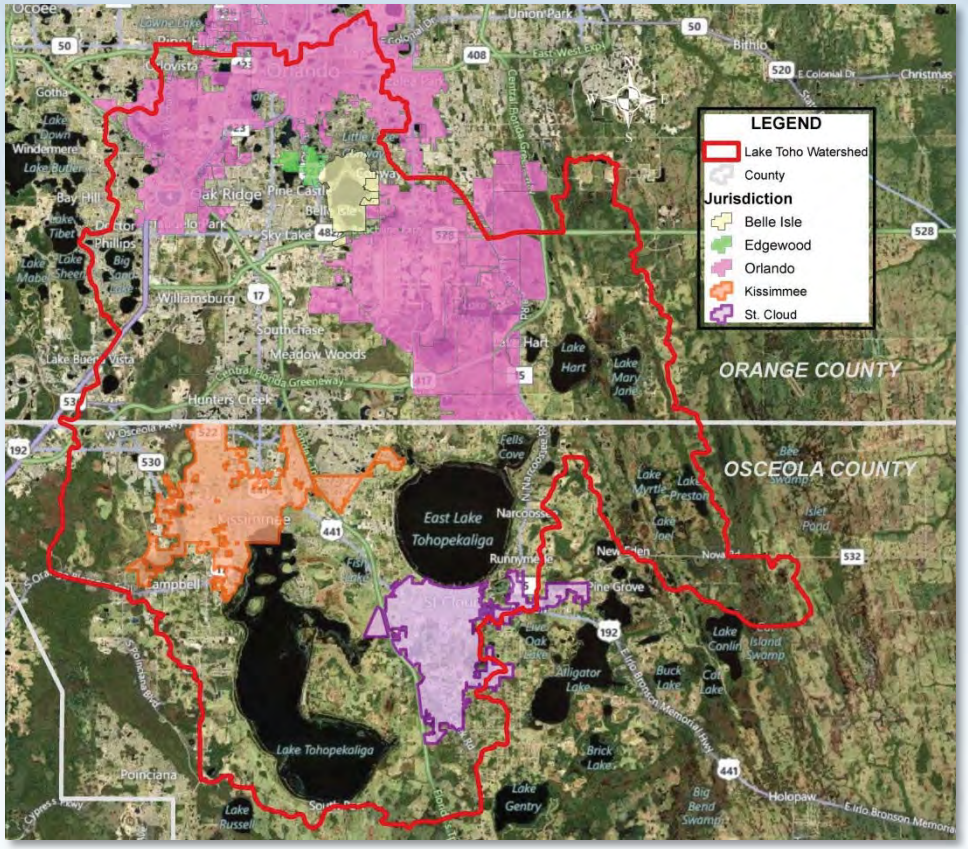


Nutrient Reduction Plan Timeline



Lake Tohopekaliga (Toho) Background

- Upper Kissimmee River Basin
- Headwaters to the Everglades
- Watershed area = 473 sq. mi.
- Lake = 34 sq. mi.
- Class 3 fresh water lake
- Popular for fishing, hunting, boating, bird watching and sightseeing
- Economic importance



What Makes Lake Toho Unique?

- Highly managed since the 1960s
  - Water level stabilization (1960s)
  - Sewage treatment plant effluent discharges (1940s to 1980s)
  - Major drawdowns to improve habitat (1969, 1979, 1987, 2004)
  - Introduction of Hydrilla species into the lake (1980s)
  - Change in Hydrilla management to support endangered snail kites
- Impact of management activities still not fully understood

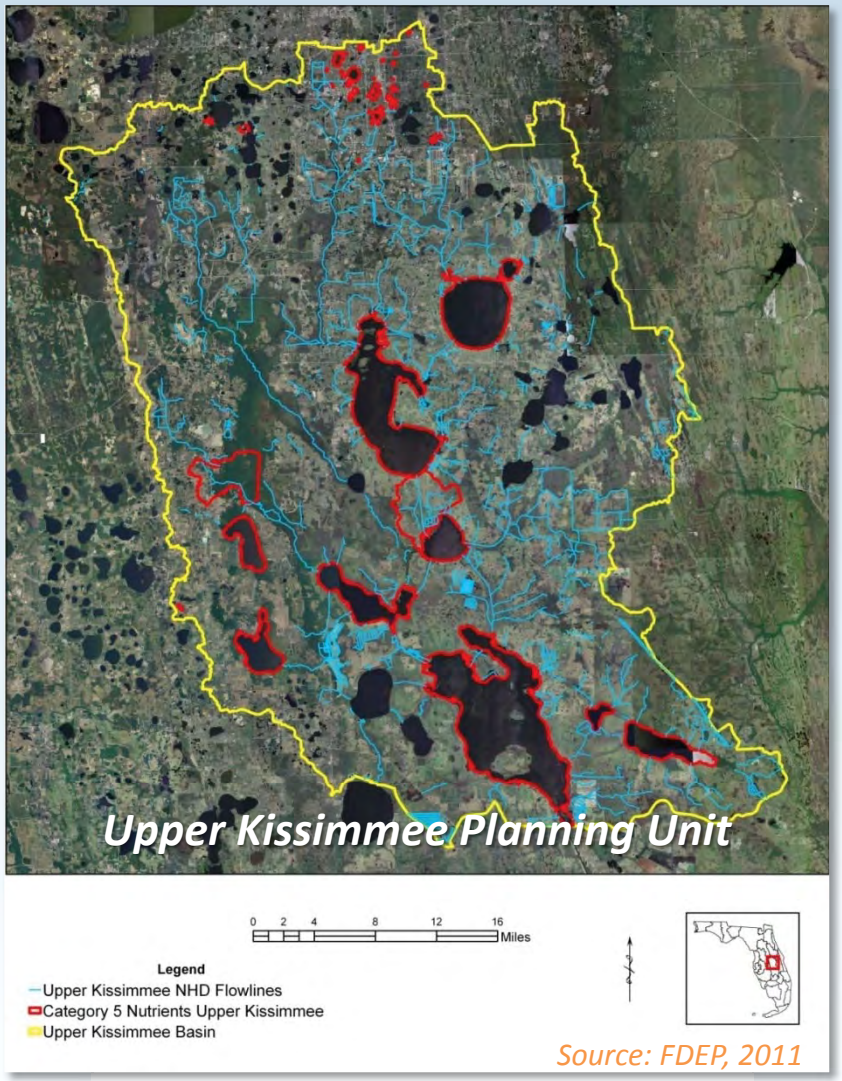






Overview of Lake Toho Impairment

- November 2010: Placed on Verified List by FDEP
  - Category 5: Impaired and Total Maximum Daily Load (TMDL) required
  - *Initially* impaired for nutrients due to increasing trend of Trophic State Index (TSI)
- Osceola County and City of Kissimmee commented
  - Independent analysis showed no TSI Impairment
  - Ambient nutrient concentration not related to algae



Source: FDEP, 2011

Overview of Lake Toho Impairment (*cont.*)



- FDEP reconsidered impairment
  - Agreed more research was needed
  - Imbalance of flora and fauna due to excessive macrophytes (hydrilla)
- December 2011: Nutrient Reduction Plan (NRP) completed
- February 2012: Final Listing
  - Category 4e : Impaired but ongoing restoration activities underway, no TMDL required

http://www.dep.state.fl.us/water/watersheds/assessment/4e-assess.htm

What is a Nutrient Reduction Plan?

Hybrid of a Basin Management Action Plan (BMAP) and Reasonable Assurance Plan (RAP)

- Key Differences:
  - No water quality "targets" are set
  - No allocation of load reductions
  - Not a long term solution: stepping stone
  - Monitoring plan and research priorities will align to the goals and objectives to determine future targets
  - Plan is not formally "adopted"



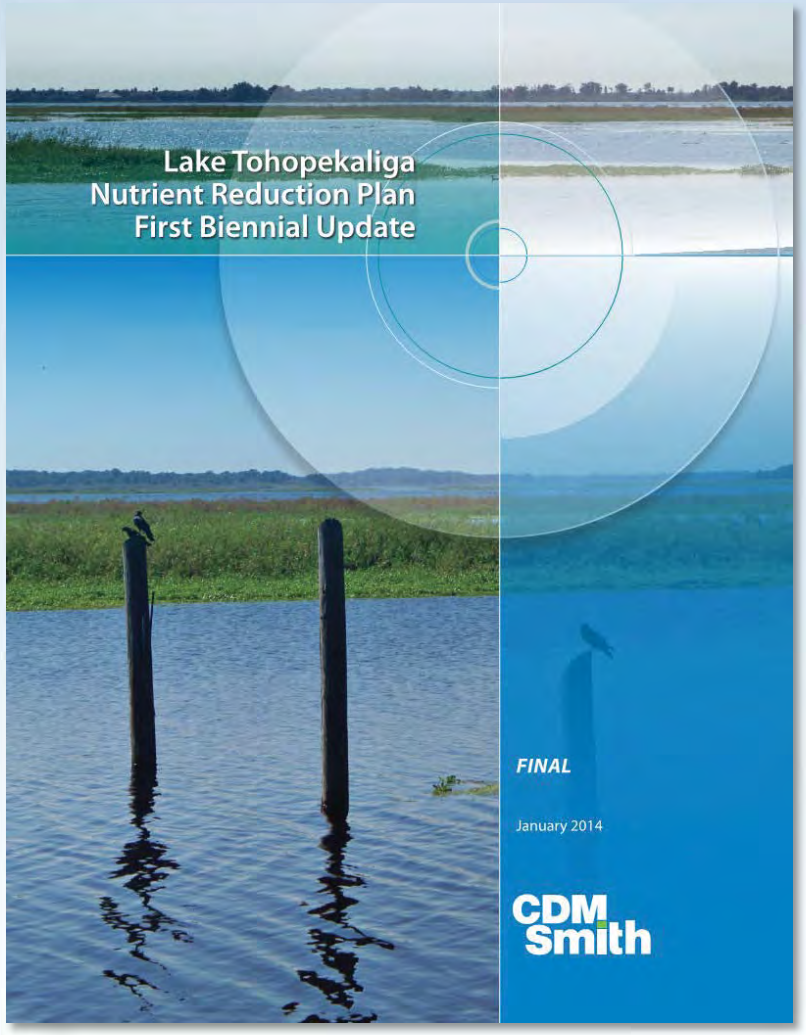
2011 Nutrient Reduction Plan Elements

- Pollutant Load Analysis
  - Runoff-based TN and TP Loads by Jurisdiction
- Management Actions
  - BMPs to reduce TN and TP loads
- Research Priorities
  - Hydrilla Literature Review
- Strategic Monitoring Plan
  - Establish monitoring network
- Track Implementation
- Plan Commitment



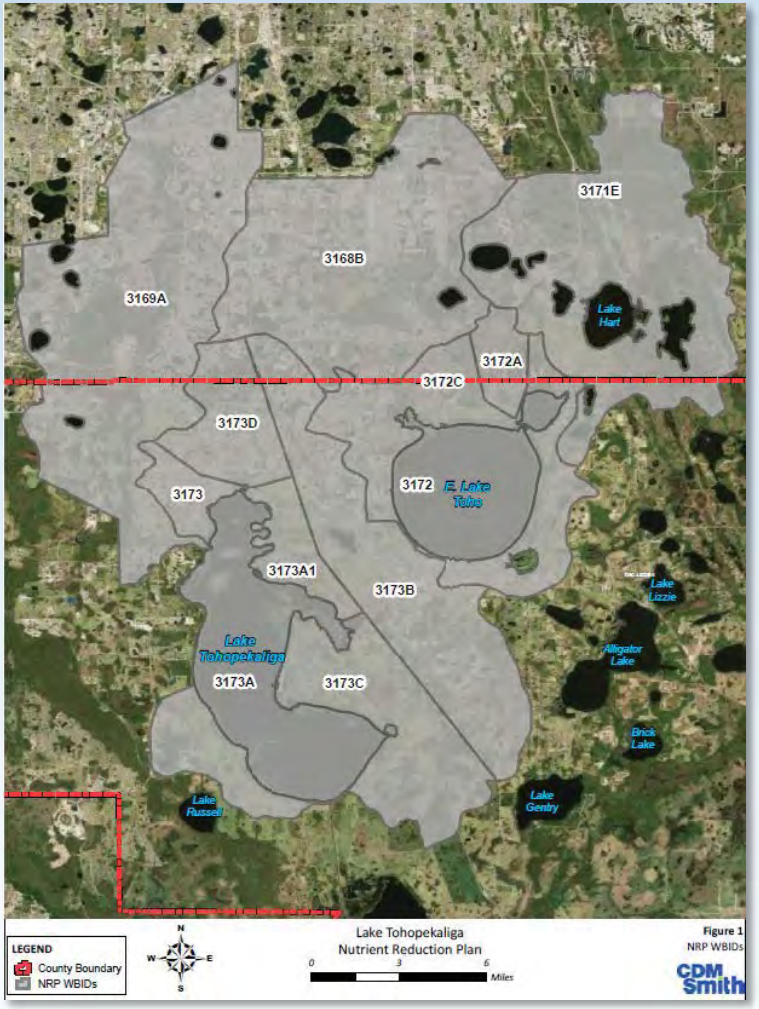
Tracking Implementation – Biennial Update Reports

- Accomplishments by participants
  - Projects
  - Public Education and Outreach
- Research and monitoring
  - Monitoring results and trends
  - Research accomplishments
- Implementation issues
- Future activities
- 2014 Biennial Update
- 2016 Biennial Update submitted and under review



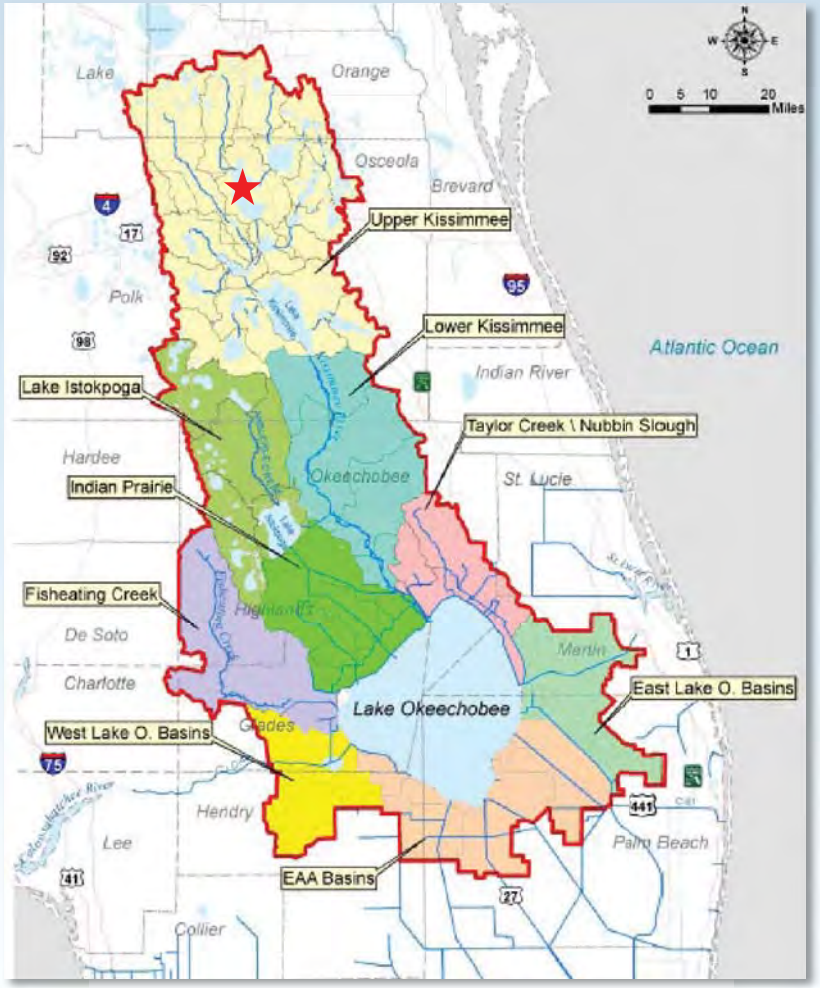
Lake Tohopekaliga Monitoring

- Builds on existing efforts by municipal stakeholders and SFWMD
- Data evaluated by WBIDs
- Consistent with FDEP approach under Impaired Waters Rule
- Analyze statistical long-term trends in Biennial Updates
- Tributary monitoring
- Continued in-lake monitoring



How does Lake Toho fit in with the Lake O BMAP?

- Lake Toho Watershed
  - Located in Upper Kissimmee Sub-Watershed
  - 11% of the area in Lake O Northern Tributary Sub-Watersheds
  - Contains the majority of the urban area (MS4)
  - Lake Toho NRP Average TP: 0.05 mg/l (Lake O Target is 0.04 mg/l)



Source: SFWMD, 2011

TP Loading Summary for Six Northern Sub-Watersheds

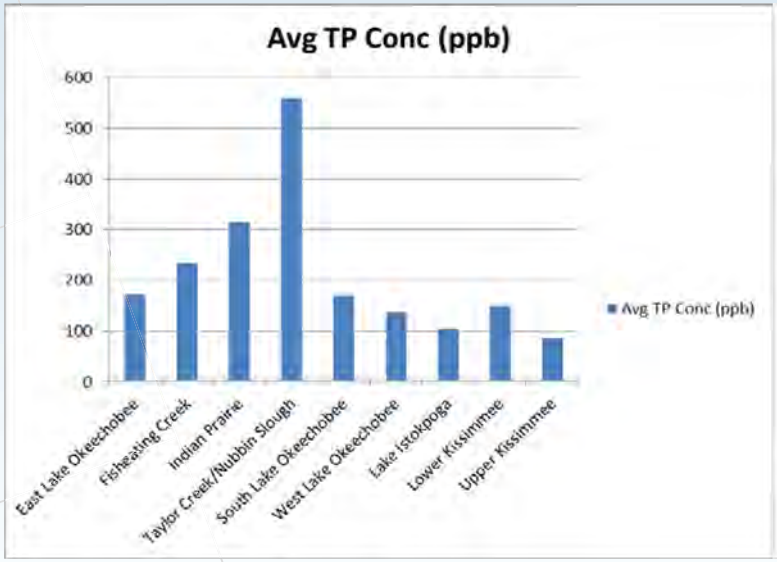
Sub-Watershed	Area (ac)	TP Watershed Load (MT/Year)	% TP Load
Fisheating Creek	318,042	79	18%
Indian Prairie	276,577	72.7	16%
Lake Istokpoga	394,203	26.2	6%
Lower Kissimmee	429,188	103	23%
Taylor Creek/Nubbin Slough	196,733	100.8	22%
Upper Kissimmee*	1,028,421	66.6	15%
Total (Northern LOW)	**2,643,165**	**448.3**	**100%**

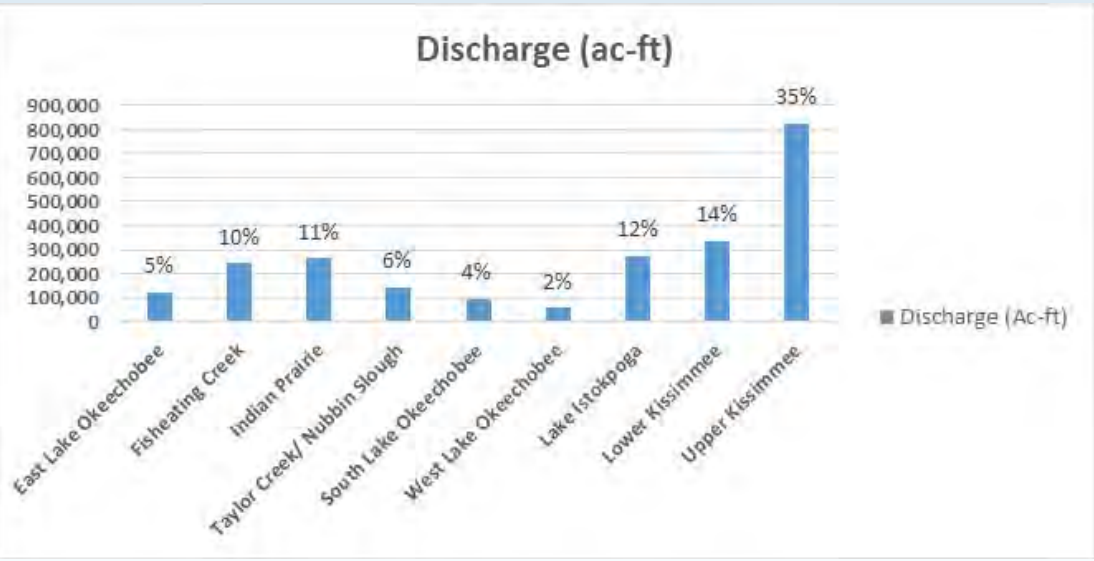
*Lake Toho located in Upper Kissimmee Sub-watershed
** Loads shown represent modeled loads as shown in Table 13 of the Lake Okeechobee BMAP (FDEP, 2014)

Upper Kissimmee Sub-Watershed

- Upper Kissimmee Sub-Watershed
  - Lowest average TP concentration (86 ppb)
  - ***2005 to 2013 Lake Tohopekaliga average TP concentration (50 ppb or 0.05 mg/l)***
  - Highest Discharge (826,015 ac-ft)

Water Years 2001-2012

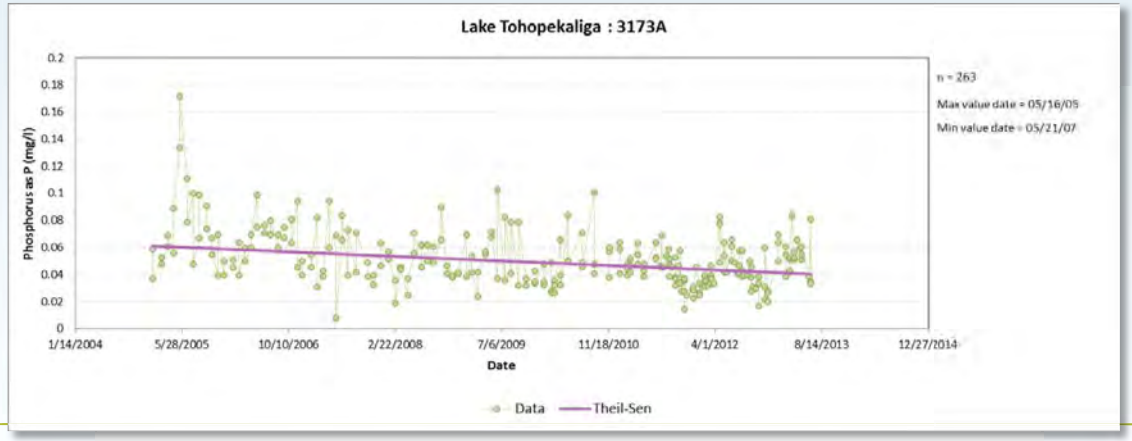




Source: FDEP, 2014

Benefits of the Lake Toho NRP and Applicability to Lake O BMAP

- Gives NRP stakeholders a “head start”
  - Plan development is locally controlled
  - Postponed the development of a TMDL by moving straight to restoration activities
  - Stakeholders already have projects and implementation underway
- Strategic monitoring already in place
- Demonstrated TP has been consistently decreasing in Lake Toho



Questions???



Danielle M. Honour, P.E., D.WRE
honourdm@cdmsmith.com

Sean Dallas
Sean.Dallas@osceola.org

FLOOD INSURANCE STUDY



OSCEOLA COUNTY, FLORIDA
AND INCORPORATED AREAS

Community Name	Community Number
KISSIMMEE, CITY OF	120190
OSCEOLA COUNTY (UNINCORPORATED AREAS)	120189
REEDY CREEK IMPROVEMENT DISTRICT	120577
ST. CLOUD, CITY OF	120191



REVISED
June 18, 2013

Federal Emergency Management Agency

FLOOD INSURANCE STUDY NUMBER
12097CV000A

NOTICE TO
FLOOD INSURANCE STUDY USERS

Communities participating in the National Flood Insurance Program have established repositories of flood hazard data for floodplain management and flood insurance purposes. This Flood Insurance Study may not contain all data available within the repository. It is advisable to contact the community repository for any additional data.

Part or all of this Flood Insurance Study may be revised and republished at any time. In addition, part of this Flood Insurance Study may be revised by the Letter of Map Revision process, which does not involve republication or redistribution of the Flood Insurance Study. It is, therefore, the responsibility of the user to consult with community officials and to check the community repository to obtain the most current Flood Insurance Study components.

Initial Countywide FIS Effective Date: May 7, 2001

First Revised Countywide FIS Date: June 18, 2013

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EXHIBITS

Exhibit 1 – Flood Profiles

Bass Slough (Lower Reach)	Panels	01P-03P
Bass Slough (Upper Reach)	Panels	04P-05P
Bass Slough Tributary	Panel	06P
Boggy Creek	Panel	07P
C-33 Canal	Panel	08P
Canoe Creek (C-34 Canal)	Panels	09P-10P
Davenport Creek	Panels	11P-12P
Davenport Creek Tributary No. 1	Panel	13P
Davenport Creek Tributary No. 2	Panel	14P
East City Canal	Panels	15P-16P
East City Canal Tributary 1	Panel	17P
Mill Slough	Panels	18P-20P
Peg Horn Slough	Panels	21P-22P
Reedy Creek	Panels	23P-24P
Reedy Creek Tributary No. 1	Panel	25P
Reedy Creek Tributary No. 2	Panel	26P
Reedy Creek Tributary No. 3	Panel	27P

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Exhibit 1 – Flood Profiles (continued)

Shingle Creek	Panels	28P-29P
St. Johns River	Panels	30P-31P
Tributary No. 1	Panel	32P
West Branch Shingle Creek	Panels	33P-35P
West City Canal	Panel	36P
WPA Canal	Panels	37P-39P
WPA Canal Tributary 1	Panels	40P-42P
WPA Canal Tributary 1-1	Panel	43P

Exhibit 2 – Flood Insurance Rate Map Index (Published Separately)
Flood Insurance Rate Maps (Published Separately)

FLOOD INSURANCE STUDY

OSCEOLA COUNTY, FLORIDA, AND INCORPORATED AREAS

1.0 INTRODUCTION

1.1 Purpose of Study

This Flood Insurance Study (FIS) revises and updates information on the existence and severity of flood hazards in the geographic area of Osceola County, including the Cities of Kissimmee and St. Cloud; Reedy Creek Improvement District; and the unincorporated areas of Osceola County (referred to collectively herein as Osceola County), and aids in the administration of the National Flood Insurance Act of 1968 and the Flood Disaster Protection Act of 1973. This study has developed flood-risk data for various areas of the community that will be used to establish actuarial flood insurance rates and to assist the community in its efforts to promote sound floodplain management. Minimum floodplain management requirements for participation in the National Flood Insurance Program (NFIP) are set forth in the Code of Federal Regulations at 44 CFR, 60.3.

The Reedy Creek Improvement District is located in more than one county; the flood hazard information for the portion of this community located in Orange County is included in the FIS report for Orange County, Florida, and Incorporated Areas (Reference 1).

In some states or communities, floodplain management criteria or regulations may exist that are more restrictive or comprehensive than the minimum Federal requirements. In such cases, the more restrictive criteria take precedence, and the State (or other jurisdictional agency) will be able to explain them.

The Flood Insurance Rate Map (FIRM) and FIS report for this countywide study have been produced in digital format. Flood hazard information was converted to meet the Federal Emergency Management Agency (FEMA) FIRM database specifications and geographic information standards and is provided in a digital format so that it can be incorporated into a local Geographic Information System and be accessed more easily by the community.

1.2 Authority and Acknowledgments

The sources of authority for this FIS report are the National Flood Insurance Act of 1968 and the Flood Disaster Protection Act of 1973.

For this revision of the countywide FIS, new hydrologic and hydraulic analyses were prepared by BakerAECOM, LLC, for FEMA, under Contract No. HSFEHQ-09-D-0368, Task R4-TO66. This revised study was completed in March 2011.

For the initial countywide FIS, the hydrologic and hydraulic analyses were prepared by Engineering Methods & Applications, Inc., for FEMA, under Inter-Agency Agreement No. EMW-95-C-4705. That work was completed in July 1996.

The initial countywide FIS was prepared to include all jurisdictions within Osceola County in a countywide FIS. Information on the authority and acknowledgements for each jurisdiction with a previously printed FIS report included in the countywide FIS is shown below:

Kissimmee, City of:	The hydrologic and hydraulic analyses for the FIS report dated January 2, 1981, were prepared by the U.S. Army Corps of Engineers (USACE), Jacksonville District, for the Federal Insurance Administration (FIA), under Inter-Agency Agreement No. IAA-H-1878, Project Order No. 10. That work was completed in June 1979.
Osceola County (Unincorporated areas):	The hydraulic analyses for the FIS report dated August 3, 1981, were prepared by the USACE, Jacksonville District, for FEMA, under Inter-Agency Agreement No. IAA-H-1878, Project Order No. 10, Amendment No. 1. That work was completed in January 1980. The hydrologic and hydraulic analyses for the FIS report dated March 16, 1989, were prepared by the USACE, Jacksonville District for FEMA, under Inter-Agency Agreement No. IAA-H-1878, Project Order No. 10, Amendment No. 1. That work was completed in January 1980. The hydrologic and hydraulic analyses for the FIS report dated November 20, 1996, were prepared by Post, Buckley, Schuh & Jernigan, Inc.
St. Cloud, City of:	The hydrologic and hydraulic analyses for the FIS report dated March 1980 were prepared by the USACE, Jacksonville District, for the FIA, under Inter-Agency Agreement No. IAA-H-1878, Project Order No. 10. That work was completed in February 1979. For the FIS report dated April 3, 1996, flooding information was taken from the FIS for the unincorporated areas of Osceola County because of corporate limits changes and flooding mismatches between the City of St. Cloud and the unincorporated areas of Osceola County (Reference 2).

The authority and acknowledgments for Reedy Creek Improvement District are not included because there was no previously printed FIS report for this community.

Base map information shown on the FIRM was provided in digital format by Osceola County Planning Office.

The coordinate system used for producing the FIRM is the Florida State Plane FIPS 0901. Corner coordinates shown on the FIRMs are in latitude and longitude referenced to the UTM projection, North American Datum (NAD 83) HARN and the GRS80. Distance units were measured in feet.

1.3 Coordination

An initial Consultation Coordination Officer (CCO) meeting (also occasionally referred to as the Scoping meeting) is held with representatives of the communities, FEMA, and the study contractors to explain the nature and purpose of the FIS and to identify the streams to be studied by detailed methods. A final CCO (often referred to as the Preliminary DFIRM Community Coordination, or PDCC, meeting) is held with representatives of the communities, FEMA, and the study contractors to review the results of the study.

For this revision of the countywide FIS, the initial CCO meeting was held on November 3, 2009, and attended by community officials, representatives of the St. Johns River and South Florida Water Management Districts, the State of Florida, FEMA Region IV, and the study contractor, Baker AECOM, LLC.

The final CCO meeting was held on August 16, 2011 to review and accept the results of this FIS. Those who attended this meeting included representatives of St. Cloud, Kissimmee, Osceola County, AECOM, and FEMA. All problems raised at that meeting have been addressed in this study.

The dates of the historical initial and final CCO meetings held for the communities within the boundaries of Osceola County are shown in Table 1, "Historical CCO Meeting Dates."

Table 1: Historical CCO Meeting Dates

Community Name	Initial CCO Date	Final CCO Date
Kissimmee, City of	December 13, 1977	March 13, 1980
Osceola County and Incorporated Areas (countywide)	September 22, 1994	September 29, 1998
Osceola County (Unincorporated Areas)	February 23, 1978	March 2, 1981
St. Cloud, City of	December 13, 1977	July 10, 1979

2.0 AREA STUDIED

2.1 Scope of Study

This FIS report covers the geographic area of Osceola County, Florida, including the incorporated communities listed in Section 1.1. The scope and methods of this study were proposed to, and agreed upon, by FEMA and Osceola County.

For this revision, a total of 9.8 additional stream miles were studied using detailed methods. Floodplain boundaries of streams that had been previously studied by detailed methods were redelineated based on more detailed and up-to-date topographic mapping for this FIS report.

All or portions of the flooding sources in Table 2, "Flooding Sources Studied by Detailed Methods," were studied by detailed methods. Limits of detailed study are indicated on the Flood Profiles (Exhibit 1) and on the FIRM (Exhibit 2). The areas studied by detailed methods were selected with priority given to all known flood hazards and areas of projected development or proposed construction.

Table 2: Flooding Sources Studied by Detailed Methods

Flooding Source	Reach Length (miles) or Area (square miles)	Limits of Study
Alligator Canal	1.3	[2]
Alligator Lake	16.4	For its entire shoreline within Osceola County
Bass Slough[1]	5.5	From mouth to a point approximately 1,260 feet upstream of Birchwood Circle
Bass Slough Tributary[1]	0.4	From the confluence with Bass Slough to a point approximately 2,040 feet upstream
Boggy Creek	1.6	[2]
Brick Lake	4.3	For its entire shoreline within Osceola County
Brown Lake	0.1 sq. mi.	[2]
C-33 Canal	2.4	From its confluence with Alligator Lake to its confluence with Lake Gentry
Canal 32-C	2.0	[2]
Canoe Creek (C-34 Canal)	3.5	From Canoe Creek Road to Lake Gentry

Table 2: Flooding Sources Studied by Detailed Methods (continued)

Flooding Source	Reach Length (miles) or Area (square miles)	Limits of Study
Coon Lake	1.8	For its entire shoreline within Osceola County
Cox Creek	1.7	[2]
Cypress Lake	0.01 sq. mi.	[2]
Davenport Creek	7.5	From its confluence with Reedy Creek to Oak Island Drive
Davenport Creek Tributary No. 1	1.0	From its confluence with Davenport Creek to Oak Island Drive
Davenport Creek Tributary No. 2	1.6	From its confluence with Davenport Creek to a point approximately 0.86 mile upstream of confluence
Dead River	0.5	[2]
East City Canal	3.2	From its confluence with Lake Tohopekaliga to just downstream of Oak Street
East City Canal Tributary 1[1]	0.4	From the confluence with East City Canal to a point approximately 2,370 feet upstream
East Lake Tohopekaliga	20.1	[2]
Gator Bay Branch	1.1	[2]
Heart Lake	0.01 sq. mi.	[2]
Jackson Canal	1.7	[2]
Jim Branch	0.6	[2]
Kissimmee River	3.0	[2]
Lake Bullock	1.4	
Lake Cecil	1.6	[2]
Lake Center	3.3	For its entire shoreline within Osceola County
Lake Davenport	1.0	For its entire shoreline within Osceola County
Lake Gentry	0.7	For its entire shoreline within Osceola County

Table 2: Flooding Sources Studied by Detailed Methods (continued)

Flooding Source	Reach Length (miles) or Area (square miles)	Limits of Study
Lake Hatchineha	21.8	For its entire shoreline within Osceola County
Lake Joel	2.5	For its entire shoreline within Osceola County
Lake Kissimmee	48.2	[2]
Lake Lizzie	4.9	For its entire shoreline within Osceola County
Lake Marian[1]	8.3	[2]
Lake Martha	0.01 sq. mi.	[2]
Lake Myrtle	4.3	For its entire shoreline within Osceola County
Lake Poinsett	3.1	[2]
Lake Preston	5.4	For its entire shoreline within Osceola County
Lake Runnymede	3.3	[2]
Lake Russell	4.6	[2]
Lake Tohopekaliga	39.2	[2]
Lake Wilson	1.5	[2]
Live Oak Lake	3.1	[2]
Lonesome Camp Swamp	0.7	[2]
Mill Slough	4.1	[2]
NP (unnamed streams)	117.6	[2]
Orange Hammock Slough	1.4	[2]
Orchid Creek	0.7	[2]
Paradise Island	0.1 sq. mi.	[2]
Pearl Lake	1.5	[2]
Peg Horn Slough	3.2	From a point approximately 150 feet upstream of its confluence with St. Cloud Canal (Canal 31) to a point approximately 950 feet upstream of Missouri Avenue
Pennywash Creek	0.7	[2]

Table 2: Flooding Sources Studied by Detailed Methods (continued)

Flooding Source	Reach Length (miles) or Area (square miles)	Limits of Study
Reedy Creek	18.1	[2]
Reedy Creek Tributary No. 1	1.9	From its confluence with Reedy Creek to a point approximately 0.47 mile upstream of San Miguel Road
Reedy Creek Tributary No. 2	1.3	From its confluence with Reedy Creek to a point approximately 900 feet upstream of Marigold Avenue
Reedy Creek Tributary No. 3	2.8	From its confluence with Reedy Creek to San Remo Road
Rocky Pond	0.6 sq. mi.	[2]
Sardine Lake	1.4	[2]
Scrub Slough	1.6	[2]
Shingle Creek	9.2	From its confluence with Lake Tohopekaliga to a point approximately 100 feet upstream of Osceola Parkway
Short Canal	2.7	[2]
South Port Canal	0.4	[2]
St. Cloud Canal (Canal 31)	1.9	[2]
St. Johns River	20.2	[2]
Tributary No. 1	0.03	[2]
Trout Lake	3.1	For its entire shoreline within Osceola County
West Branch Shingle Creek[4]	6.7	From its confluence with Shingle Creek to a point approximately 4,200 feet upstream of Scott Boulevard
West City Canal	2.3	From its confluence with Lake Tohopekaliga to just upstream of Oak Street
WPA Canal	5.2	From just upstream of Old Canoe Creek Road to St. Cloud Airfield
WPA Canal Tributary 1[1]	2.7	From the confluence with WPA Canal to a point approximately 2.7 miles upstream

Table 2: Flooding Sources Studied by Detailed Methods (continued)

Flooding Source	Reach Length (miles) or Area (square miles)	Limits of Study
WPA Canal Tributary 1-1[1]	0.8	From the confluence with WPA Canal Tributary 1 to a point approximately 4,000 feet upstream
Other Lakes/Ponds[3]	151.9 sq. mi.	[2]

[1] Flooding source with new or revised analyses incorporated as part of the current study update

[2] Data not available

[3]Lakes and ponds were calculated from the Osceola County, Fl, GIS waterbodies datalayer

[4]In this revision, West Branch Shingle Creek Tributary has been combined with and described under West Branch Shingle Creek (per LOMR 08-04-1601P)

All or portions of numerous streams were studied by approximate methods in previous studies; most of these studies were refined and Zone A was re-established in this revision. The flooding sources studied by approximate methods are listed in Table 3. Approximate analyses were used to study those areas having a low development potential or minimal flood hazards.

Table 3: Flooding Sources Studied by Approximate Methods

Flooding Source	Reach Length (miles) or Area (square miles)
Bass Slough	0.5
Beef Camp Branch	1.3
Blanket Bay Slough	7.7
Blue Cypress Creek	18.8
Boggy Branch	2.1
Bonnet Creek[1]	1.1
Bonnet Gully	2.6
Buck Lake	0.8 sq. mi.
Bull Creek	19.2
Cabbage Slough	2.4
Cat Lake	3.2 sq. mi.
Cow Log Branch	6.1
Cox Creek	6.4

Table 3: Flooding Sources Studied by Approximate Methods (continued)

Flooding Source	Reach Length (miles) or Area (square miles)
Crabgrass Creek	10.7
Cypress Lake	0.1 sq. mi.
Davenport Creek	0.9
Dead River	3.6
Elbow Branch	3.1
Fish Lake	0.4 sq. mi.
Gap Creek	2.9
Garrett Branch	3.5
Gator Branch	6.6
Hammock Branch	1.9
Hatchineha Canal	2.4
Hog Pen Slough	0.3 sq. mi.
Indian Branch	2.7
Jackson Canal	4.5
Jane Green Creek	3.6
Jim Branch	0.8
Kissimmee River	12.9
Lake Jackson	3.2
Lake Marian	8.0
Little Creek	3.2
Little North Prong	1.9
Major Sloush	0.2 sq. mi.
Mill Slough	0.9
North Branch Crabgrass Creek	2.2
North Fork Taylor Creek	5.2
NP (unnamed streams)	916.0
NP - Priority 1- Poinciana	0.6
NP - Priority 4 – Kennansville	14.7
Orchid Creek	7.5
Padgett Branch	0.8

Table 3: Flooding Sources Studied by Approximate Methods (continued)

Flooding Source	Reach Length (miles) or Area (square miles)
Pagett Branch	3.5
Peg Horn Slough	0.4
Pennywash Creek	9.0
Pine Island Slough	13.7
Rauslerson Branch	3.8
Reedy Creek	8.1
Rocky Pond	1.9 sq. mi.
Scrub Slough	2.6
Short Canal	2.5
Sixmile Creek	1.7
South Fork Taylor Creek	6.8
South Port Canal	5.0
South Prong Alafia River	2.1
Taylor Creek	2.1
Tenmile Creek	5.7
Tracy Branch	5.4
Tyson Creek	5.7
West Branch Crabgrass Creek	7.9
Wolf Creek	2.8
WPA Canal1	0.1
Yoke Branch	3.3
Other Lakes/Ponds[2]	41.6 sq. mi.

[1]Not restudied; data taken from previous countywide FIS report

[2]Lakes and ponds were calculated from the Osceola County, Fl, GIS waterbodies datalayer

This revision to the countywide FIS also incorporates the determination of letters issued by FEMA resulting in Letters of Map change as shown in Table 4, "Letters of Map Revision (LOMRs) Incorporated into Current Study." Note that LOMR Case Number 08-04-1601P combined West Branch Shingle Creek Tributary and West Branch Shingle Creek, so all other tables in this revision to the countywide FIS do not list West Branch Shingle Creek Tributary separately from West Branch Shingle Creek.

Table 4: Letters of Map Revision (LOMRs)
Incorporated into Current Study

Case Number	Flooding Source(s)	Communities Affected	Effective Date
01-04-537P	Buck Lake	Osceola County, Florida (Unincorporated Areas)	12/07/2001
03-04-309P	Tributary No. 1	Osceola County, Florida (Unincorporated Areas)	12/22/2003
08-04-1601P	West Branch Shingle Creek West Branch Shingle Creek Tributary	Osceola County, Florida (Unincorporated Areas) City of Kissimmee	8/24/2009
09-04-6066P	WPA Canal	Osceola County, Florida (Unincorporated Areas)	7/30/2010
11-04-0259P	Unnamed Flooding Area	Osceola County, Florida (Unincorporated Areas)	3/22/2011

2.2 Community Description

Osceola County is located in central Florida. The county has an approximate total land area of 1,506 square miles. Osceola County is bordered by Orange County to the north, Brevard County to the northeast, Indian River County to the southeast, Okeechobee County to the south, and Polk County to the west. The population of Osceola County was estimated to be 270,618 in 2009 (Reference 3).

The floodplains of Osceola County consist of lowlands adjacent to the streams and lakes. The topography of Osceola County is relatively flat with some gently rolling hills. Ground elevations in Osceola County range from less than 5 feet NAVD 88 to 190 feet NAVD 88.

Osceola County's climate is semitropical, characterized by warm, humid summers, and mild dry winters. Daily maximum temperatures average 90 degrees Fahrenheit (°F) in summer, and average daily minimums are approximately 50°F in the winter. Temperature extremes of over 100°F or under 20°F are rare. The mean annual temperature is 72°F. The average annual precipitation over the study area is approximately 52 inches, and approximately 72 percent occurs from May to October, the rainy season.

Osceola County's soils consist of 11 soil associations. Three of these are either moderately well drained or excessively drained. The rest are soils that vary between poorly drained to very poorly drained (Reference 4).

In 2009 accommodation and food services was the larges economic sector, but agriculture makes up 63% of the land use. Cattle, citrus and commercial sod are the major agricultural products. The State of Florida has purchased 102,500 acres for land preservation; most of this acreage is included in the wildlife management areas Bull Creek, Triple N Ranch, and Three Lakes. The Nature Conservancy also maintains 4,730 acres (Reference 5).

2.3 Principal Flood Problems

Floods can occur in Osceola County at any time during the year; however, they are most frequent from June to October. Floods on the lakes can result from prolonged heavy rainfall over the study area combined with high antecedent lake stages. Floods on the streams can result from prolonged heavy rainfall over a large area. The flooding is usually more severe from rainfall associated with hurricanes or tropical storms and when antecedent rainfall has resulted in saturated ground conditions, which causes infiltration to be minimal. Cloudburst storms can occur at any time, but do not constitute a serious flood hazard in the study area.

Because Osceola County was practically undeveloped before the 1900s, flood records are scarce. The flood history, however, has been quite similar to that of the adjacent upper St. John's River basin, where records show that floods much greater than any of recent record occurred in 1871, and 1898, and that the floods of 1910, 1914, 1924, and 1933 were probably comparable with more recent major occurrences. In recent years, floods causing significant damage in Osceola County occurred in 1945, 1947, 1948, 1949, 1953, 1956, 1958, 1960, and 1968. Among these, the 1953 and 1960 floods were the highest of record.

The stages produced by the 1953 flood are generally the most severe of the floods on record. The flood-producing rainfall was one of the heaviest ever recorded in the study area, approximately 47 inches from June through October. Damages were severe throughout the study area and especially large for the cattle and food crop industries.

The flood of 1960 occurred when above normal seasonal rainfall coincided with the heavy rains of Hurricane Donna and Tropical Storm Florence in September. Discharges on the Kissimmee River below Lake Kissimmee peaked at 6,830 cubic feet per second (cfs) on September 30. This was near the maximum recorded discharge of 8,820 cfs which occurred in 1948.

In December 1997, heavy rains following a month of wet weather caused flash flooding of seventeen mobile homes and caused $400,000 in damages in St. Cloud. In October 2005, flooding damages occurred in St. Cloud when Hurricane Wilma resulted in 10 inches of rain across north and northwest Osceola County (Reference 6).

Slow moving thunderstorms over Osceola County on July 11, 2009, produced 4-5 inches of rain in less than 2 hours, resulting in accumulation of deep water northwest of Kissimmee. One hundred and nine homes were flooded, with 16 receiving major damage. Property damage as the result of this flooding was estimated at $4 million (Reference 6).

2.4 Flood Protection Measures

The USACE has constructed numerous flood protection measures in Osceola County. Regulation of the Kissimmee Lakes took place over a six-year period, from 1964 to 1970. It began with East Lake Tohopekaliga and proceeded down the west chain of lakes to Lake Kissimmee. Regulation of the west chain of lakes through Lake Kissimmee was essentially complete by 1965. Work then proceeded up the east chain of lakes reaching Lake Alligator by 1967. The regulation of the portion of the east chain of lakes from

Alligator to East Lake Tohopekaliga was accomplished from September 1967 to May 1970. Between 1964 to 1970 interim regulation schedules were adopted as soon as lake outlet works were completed. The plan was to implement permanent schedules upon completion of all works, including works on the Kissimmee River (C-38). However, even though numerous efforts were made, all parties concerned could not reach a unanimous decision, and each effort ended by recommending or awaiting additional studies. In 1975, after a comprehensive hydrologic study of Kissimmee basin, and two public meetings, the Central and Southern Florida Flood Control District prepared a report entitled "Report to the Governing Board on Regulatory Levels for Lakes in the Upper Kissimmee Basin." The schedules were approved by the USACE and adopted on February 9, 1976. Because of the possibility of further revision to Kissimmee Lakes regulation, the 1976 schedules have been adopted as interim schedules.

East Lake Tohopekaliga and a small tributary lake named Ajay are regulated by S-59, located in the St. Cloud Canal (C-31) between East Lake Tohopekaliga and Lake Tohopekaliga. Regulation did not begin until 1964, although construction of S-59 and C-31 was completed in April 1963. This was principally because regulation was contingent upon Lake Tohopekaliga outlet works, which were not completed in April 1963. The original regulation schedule was modified in 1967 and was used until 1976, when the existing schedule was introduced. The levels are regulated between 53.5 to 57.0 feet NAVD 88.

Lake Tohopekaliga is regulated by 5-61, located in Southport Canal (C-35) at the south shore of the lake. Construction of S-61 and C-35 was completed in October 1963 and regulation of Lake Tohopekaliga began in early 1964. In 1971 and again in 1979 the regulation schedules for Lakes Tohopekaliga, East Tohopekaliga, Kissimmee, Cypress, and Hatchineha were modified for implementation of the draw down of water levels in Lake Tohopekaliga. The drawdowns were conducted in cooperation with the Florida Game and Fresh Water Fish Commission for enhancement of fish habitat in the lake. The levels are regulated between 50.5 to 54.0 feet NAVD 88.

Lakes Kissimmee, Hatchineha, and Cypress are regulated by a final structure, S-65, located at the outlet of Lake Kissimmee at the head of C-38. The original General Design Memorandum plan called for Lakes Hatchineha and Bypass to be regulated together, but independently of Lake Kissimmee by a structure in the canal connecting Lakes Hatchineha and Kissimmee. Levels of Hatchineha and Cypress were to be one foot higher than those for Lake Kissimmee. However, it was determined feasible to combine the regulation whereby the Kissimmee schedule would be raised 0.5 foot and Hatchineha and Cypress would be lowered 0.4 foot. Regulation began after the completion of S-65 in August 1964. The levels are regulated between 47.3 to 51.3 feet NAVD 88.

Lake Gentry is regulated by S-63 located in C-34 at the south end of the lake. Water levels in C-34, downstream of S-63, are further stepped down by S-63A before it discharges into Lake Cypress. Regulation began in May 1967 with completion of S-63, S-63A, and C-34. The levels are regulated between 58.0 to 60.5 feet NAVD 88.

Lakes Alligator, Center, Coon, Trout, Lizzie, and Brick are controlled by two structures, S-58 located in C-32 which connects Lakes Trout and Joel, and S-60 located in C-23 between Lakes Alligator and Gentry. The southern outlet S-60 and C-33 were completed

in December 1966, thereby providing some regulatory control. However, it was not until the northern outlet (S-58) was completed in October 1969 that full control was possible. The levels are regulated between 60.4 to 62.9 feet NAVD 88.

Lakes Joel, Myrtle, and Preston are regulated by a single structure, S-57 located in C-30 connecting Lakes Myrtle and Mary Jane. Regulation began in September 1969 upon completion of S-57 and C-30. The levels are regulated between 58.4 to 60.9 feet NAVD 88.

Lakes Hart and Mary Jane are regulated by a single structure, S-62 located in C-29 which discharges into Lake Ajay. Regulation began in May 1970 after completion of S-62 and C-29 in October 1969. The levels are regulated between 58.4 to 60.0 NAVD 88.

The South Florida Water Management District has proposed a management plan for the Shingle Creek basin. The plan is the result of the combined efforts of the South Florida Water Management District, the Cities of Orlando and Kissimmee, and the Counties of Range and Osceola. The key elements of the plan are:

1. A floodplain management program through zoning or other appropriate means.

2. A capital improvement program that provides for the following structural improvements to alleviate existing flooding problems:

    a. Excavation of the channel north of the turnpike in Orange County to provide greater runoff relief during the 1-percent-annual-chance flood.

    b. Improvements to bridges at McLeaod Road, Orlando-Vineland Road, Interstate Route 4, and Americana Boulevard in Orange County and State Routes 600 and 531 in Osceola County.

    c. Installation of a 2,700 cfs water control structure south of Oak Ridge Road in Orange County to prevent overdrainage and control erosion.

    d. Creation of a floodway bypass of Shingle Creek between Old Tampa Highway and U.S. 17-92, in Osceola County, to reduce flood stages during major storm events and specifically the 1-percent-annual-chance flood in the lower reaches.

FEMA specifies that all levees must have a minimum of 3 foot freeboard against 1-percent-annual-chance flooding to be considered a safe flood protection structure.

Levees exist in the study area that provide the county with some degree of protection against flooding. However, it has been ascertained that these levees do not protect the county from rare events such as the 1-percent-annual-chance flood. The criteria used to evaluate protection against the 1-percent-annual-chance flood are 1) adequate design, including freeboard, 2) structural stability, and 3) proper operation and maintenance. Levees that do not protect against the 1-percent-annual-chance flood are not considered in the hydraulic analysis of the 1-percent-annual-chance floodplain.

As of this revised FIS report, there are no certified levees per Reg. 44 CFR 65.10 in Osceola County.

3.0 ENGINEERING METHODS

For the flooding sources studied by detailed methods in the community, standard hydrologic and hydraulic study methods were used to determine the flood-hazard data required for this study. Flood events of a magnitude that is expected to be equaled or exceeded once on the average during any 10-, 50-, 100-, or 500-year period (recurrence interval) have been selected as having special significance for floodplain management and for flood insurance rates. These events, commonly termed the 10-, 50-, 100-, and 500-year floods, have a 10-, 2-, 1-, and 0.2-percent chance, respectively, of being equaled or exceeded during any year. Although the recurrence interval represents the long-term, average period between floods of a specific magnitude, rare floods could occur at short intervals or even within the same year. The risk of experiencing a rare flood increases when periods greater than 1 year are considered. For example, the risk of having a flood that equals or exceeds the 1-percent-annual-chance flood in any 50-year period is approximately 40 percent (4 in 10); for any 90-year period, the risk increases to approximately 60 percent (6 in 10). The analyses reported herein reflect flooding potentials based on conditions existing in the community at the time of completion of this study. Maps and flood elevations will be amended periodically to reflect future changes.

3.1 Hydrologic Analyses

For this countywide study, hydrologic analyses were carried out to establish peak discharge frequency relationships for each flooding source studied by detailed and approximate methods affecting the community. A summary of peak discharge-drainage area relationships for streams studied by detailed methods is shown in Table 5, "Summary of Discharges."

The stillwater elevations for the 10-, 2-, 1-, and 0.2-percent-annual-chance floods for all lacustrine flooding sources have been determined and are summarized in Table 6, "Summary of Stillwater Elevations." All locations are for the entire shoreline within Osceola County.

3.1.1 Methods for Flooding Sources with New or Revised Analyses in Current Study

Peak flood discharges for 10-, 2-, 1-, and 0.2-percent-annual-chance recurrence intervals were developed for all streams studied by detailed methods (Reference 7). Peak discharges were developed for only the 1-percent-annual-chance recurrence interval for streams studied by approximate methods. The USGS regression equations for natural basins in Florida described in USGS Water-Resources Investigations Report (WRIR) 82-4012, *Technique for Estimating Magnitude and Frequency of Floods on Natural-Flow Streams in Florida,* was used for Bass Slough (Lower Reach), Bass Slough (Upper Reach), Bass Slough Tributary, WPA Canal Tributary 1, WPA Canal Tributary 1-1 and all approximately study streams (Reference 8). The USGS nationwide urban regression equations described in USGS Water-Supply Paper 2207, *Flood*

Characteristics of Urban Watersheds in the United States, were used for East City Canal Tributary 1 (Reference 9).

The basin delineations and drainage areas were determined using a digital terrain model (DTM) based on a 10' x 10' grid size digital elevation model (DEM) generated from a 1/3 arc-second National Elevation Dataset DEM, as well as 2006 LiDAR supplied by the City of Kissimmee.

3.1.2 Methods for Flooding Sources Incorporated from Previous Studies

This section describes the methodology used in previous studies of flooding sources incorporated into this FIS that were not revised for this countywide study. Hydrologic analyses were carried out to establish peak discharge-frequency relationships for each flooding source studied by detailed methods affecting the community.

Precountywide Analyses

Osceola County (Unincorporated Areas)

No long-term stream gages are located along Boggy Creek, Reedy Creek, Mill Slough, and the St. Cloud Canal in the unincorporated areas of Osceola County; the hydrologic data for these flooding sources were obtained from other studies (References 10-14).

Rainfall-frequency estimates were obtained by statistical analysis of records from eight long-term rainfall stations in and near Orange and Seminole Counties, Florida (Reference 15). Results of the rainfall study are summarized below.

	Rainfall (inches)			
Duration	10-percent-annual-chance	2-percent-annual-chance	1-percent-annual-chance	0.2-percent-annual-chance
24-hours	6.6	9.7	11.3	16.4
2 days	7.1	10.0	11.7	16.8
3 days	7.7	10.6	12.3	17.3
4 days	8.2	11.2	12.9	17.8
5 days	8.7	11.8	13.5	18.3
7 days	9.6	12.9	14.1	19.3
30 days	18.2	23.0	25.1	28.4

The amount of rainfall that will run off (rainfall excess) from a particular basin is less than the rainfall due to soil permeability, vegetation cover, and other characteristics. To estimate the rainfall excess, the Soil Conservation Service (SCS, now the Natural Resources Conservation Service) has developed runoff curve numbers that relate rainfall to direct runoff (Reference 16). The runoff curve numbers were used to calculate the infiltration losses based on the soil type and land use.

The volumetric-runoff method was used to analyze Brown and Buck Lakes, and Lakes Cecile, Davenport, Runnymede, and Wilson. This method involved analyzing several storms with respect to various lake basins to determine the percentage of rainfall that can be expected to run off the land and into the lakes, determining the rainfall recess, and determining the infiltration losses (Reference 16). The next step involved applying the 50-day rainfall, calculating the volume of rain falling directly on the lake by multiplying the rainfall depth by the lake areas, and calculating the volume of rainfall runoff from the land area in to the lake by determining the rainfall excess (Reference 15). The sum of the volume of rain falling on the lake and the volume of rain running off the land gives the total volume of rainfall the lake will receive during the particular storm. Area-capacity curves were developed for the lakes. The computed rainfall volumes were applied to the area-capacity curves revealing lake stage and inundated area for each particular storm.

Elevations for floods of the selected recurrence intervals on Lake Russell were determined from the hydrologic analyses for Reedy Creek (Reference 12).

Elevations for floods of the selected recurrence intervals of Lake Tohopekaliga, East Lake Tohopekaliga, and St. Cloud Canal were determined from flood routings conducted by the USACE, Jacksonville District, in conjunction with the flood control project (Reference 14). Elevations in Lake Runnymede are controlled by East Lake Tohopekaliga. Elevations in the St. Cloud Canal are controlled by Lake Tohopekaliga. In addition, there are flooding effects from Lake Mary Jane and West City Canal present in the county.

Cities of Kissimmee and St. Cloud

Rainfall-frequency estimates for Dakota Avenue Canal and Mill Slough in the City of St. Cloud and the City of Kissimmee, respectively, were obtained from the U.S. Weather Bureau Technical Paper No. 40 for the 10-, 2-, and 1-percent-annual-chance frequencies (Reference 17). The rainfall estimate for the 0.2-percent-annual-chance frequency was determined by graphical extrapolation of the rainfall-frequency curve established from Technical Paper No. 40 (Reference 17). The 24-hour rainfall-frequency estimates are as follows:

	Rainfall (inches)			
Duration	10-percent-annual-chance	2-percent-annual-chance	1-percent-annual-chance	0.2-percent-annual-chance
24-hours	7.5	9.4	10.4	12.9

The aforementioned SCS runoff curve numbers were used to calculate the infiltration losses based on the soil type and land use (Reference 16).

No stream gages are located on Dakota Avenue Canal and Mill Slough, which are both studied in detail in the City of St. Cloud and the City of Kissimmee,

respectively. The hydrology for these streams for the selected recurrence intervals was achieved using the SCS methodology to determine the unit hydrographs (Reference 16). Flood hydrographs were developed by applying the 24-hour rainfall excess to the unit hydrographs using the SCS Type-II storm distribution (Reference 16). The flood hydrographs were then routed and combined using the HEC-1 Flood Hydrograph package (Reference 18). The previously studied length of Dakota Avenue Canal was removed from this revision of the countywide FIS as the canal was replaced with an underground drainage system.

Elevations for floods of the selected recurrence intervals of Lake Tohopekaliga in the City of Kissimmee were determined from flood routings conducted by the USACE, Jacksonville District, in conjunction with the flood control project (Reference 14).

Revised Analyses for Countywide FIS

The hydrologic analyses used to estimate peak discharges for the St. Johns River were obtained from the St. Johns River Water Management District's report, *The Mean Annual, 10-Year, 25-Year, and 1-percent-annual-chance Flood Profiles for the Upper St. Johns River Under Existing Conditions* (Reference 19).

Hydrologic analyses for the other flooding sources were developed using the HEC-1 computer program (Reference 18). Rainfall values were determined from analysis of rain gage data for locations in and around Osceola County. Data was provided by the South Florida Water Management District and the National Weather Service (References 21 and 22). A 4-day storm was used based on historical patterns.

Times of concentration were determined using either the SCS velocity method or the SCS lag equation (Reference 23). Rainfall infiltration calculations were based on SCS curve number methods. Curve numbers were calculated based on SCS Osceola County soil map land use as determined from 1990 Florida Department of Transportation aerials and site visits (References 24 and 4).

Snyder Unit hydrographs were used to determined basin runoff. Peak rate factors were determined based on slopes of the basin and corresponding SCS peak rate values, and calibration.

Table 5: Summary of Discharges

Flooding Source and Location	Drainage Area (Square Miles)	Peak Discharge (Cubic Feet per Second) 10-percent-annual-chance	2-percent-annual-chance	1-percent-annual-chance	0.2-percent-annual-chance
BASS SLOUGH					
At mouth	4.9	544	971	1,184	1,794
Approximately 1,800 feet upstream of Neptune Road	4.0	486	870	1,061	1,609
Just downstream of Bill Beck Boulevard	3.1	378	682	834	1,281
Just downstream of Boggy Creek Road	2.1	256	469	577	905
Approximately 1.1 miles upstream of Boggy Creek Road	1.5	236	430	527	815
Approximately 3,700 feet downstream of Birchwood Circle	0.8	126	235	291	466
BASS SLOUGH TRIBUTARY					
At confluence with Bass Slough	0.6	76	145	181	303
BOGGY CREEK					
At Swamp Outflow	55.7	3,000	5,090	6,310	8,920
C-33 CANAL[1]					
At outlet for Alligator Lake	15.4	8,758	12,112	13,617	16,950
CANOE CREEK[1] (C-34 CANAL)					
At outlet for Lake Gentry	22.52	5,592	7,761	8,730	10,796

[1]Peak discharges computed with UNET (Reference 25)

Table 5: Summary of Discharges (continued)

Flooding Source and Location	Drainage Area (Square Miles)	Peak Discharge (Cubic Feet per Second)			
		10-percent-annual-chance	2-percent-annual-chance	1-percent-annual-chance	0.2-percent-annual-chance
DAVENPORT CREEK					
At mouth	27.13	2,126	3,396	3,991	5,320
Approximately 0.6 mile downstream of State Route 545	26.73	1,932	3,099	3,648	4,866
At State Route 545	25.56	1,516	2,524	2,986	4,066
Approximately 0.4 mile upstream of State Route 545	25.28	1,496	2,511	2,970	4,042
Approximately 0.3 mile downstream of Interstate Route 4	24.94	1,487	2,491	2,944	4,066
Approximately 0.6 mile downstream of Keefer Trail	22.49	1,417	2,368	2,798	3,813
At Keefer Trail	22.20	1,416	2,358	2,785	3,791
Approximately 0.6 mile upstream of Keefer Trail	14.88	363	628	820	1,346
At confluence of Davenport Creek Tributary No. 2	8.53	898	1,466	1,718	2,341
Approximately 1,000 feet downstream of confluence of Davenport Creek Tributary No. 1	5.54	389	578	663	871
At Oak Island Road	0.40	9	18	21	178
DAVENPORT CREEK TRIBUTARY NO. 1					
Approximately 100 feet downstream of North Goodman Road	3.96	95	224	348	693

Table 5: Summary of Discharges (continued)

Flooding Source and Location	Drainage Area (Square Miles)	Peak Discharge (Cubic Feet per Second) 10-percent-annual-chance	2-percent-annual-chance	1-percent-annual-chance	0.2-percent-annual-chance
DAVENPORT CREEK TRIBUTARY NO. 2					
Approximately 0.9 mile upstream of mouth	1.56	679	1,066	1,239	1,626
EAST CITY CANAL[1]					
At mouth	6.37	1,128	1,531	1,661	2,018
EAST CITY CANAL TRIBUTARY 1					
At confluence with East City Canal	0.9	375	575	687	932
MILL SLOUGH					
At U.S. Route 441	11.6	710	1,040	1,360	2,050
At Mill Slough Road	10.7	660	970	1,300	1,900
PEG HORN SLOUGH					
At mouth	2.28	714	1,003	1,090	1,258
At Neptune Road	2.01	612	840	896	1,008
At Old Landfill entrance road	1.19	351	416	420	427
At Canoe Creek Road	0.46	209	398	465	508
REEDY CREEK					
At Cypress Lake	282.0	3,300	5,000	5,700	6,350
At Lake Russell	264.0	2,700	4,000	4,500	5,100
At U.S. Route 92 bridge	209.0	800	1,100	1,100	1,100

[1]Peak discharges computed with UNET (Reference 25)

Table 5: Summary of Discharges (continued)

Flooding Source and Location	Drainage Area (Square Miles)	Peak Discharge (Cubic Feet per Second) 10-percent-annual-chance	2-percent-annual-chance	1-percent-annual-chance	0.2-percent-annual-chance
REEDY CREEK TRIBUTARY NO. 1					
At mouth	1.83	458	656	32	893
At Marigold Avenue	1.63	336	445	484	559
At San Miguel Road	1.04	145	179	194	231
REEDY CREEK TRIBUTARY NO. 2					
At mouth	0.42	241	357	408	511
At Marigold Avenue	0.19	45	55	5	69
REEDY CREEK TRIBUTARY NO. 3					
At mouth	1.02	223	280	299	344
At Doverplum Avenue	0.90	204	253	264	290
At K.O.A. Street	0.09	63	64	64	64
SHINGLE CREEK					
Approximately 0.3 mile downstream of U.S. Route 17	100.15	5,029	7,561	9,256	13,787
At U.S. Route 17	99.53	5,026	7,552	9,275	13,775
At State Route 531	98.99	5,014	7,541	9,268	13,756
Approximately 0.2 mile upstream of State Route 531	98.09	4,989	7,520	9,246	13,721
At Old Tampa Highway	97.19	4,967	7,500	9,227	13,688
Approximately 1.2 miles upstream of CSX Transportation	78.18	4,208	7,005	8,296	11,618

Table 5: Summary of Discharges (continued)

Flooding Source and Location	Drainage Area (Square Miles)	Peak Discharge (Cubic Feet per Second) 10-percent-annual-chance	2-percent-annual-chance	1-percent-annual-chance	0.2-percent-annual-chance
SHINGLE CREEK (continued)					
At State Route 530	76.27	4,183	6,966	8,247	11,549
Approximately 1.1 miles upstream of State Route 530	75.14	4,167	6,942	8,218	11,515
Approximately 1.5 miles downstream of Osceola Parkway	71.54	4,121	6,866	8,124	11,353
At Osceola Parkway	64.67	4,079	6,713	7,929	11,041
TRIBUTARY NO. 1					
At CSX Transportation	2.2	[2]	[2]	602	[2]
At Old Lake Wilson Road	0.2	[2]	[2]	336	[2]
WEST BRANCH SHINGLE CREEK [3]					
Approximately 0.7 mile upstream of mouth	16.81	2,616	3,790	4,351	5,640
Approximately 650 feet downstream of Poinciana Boulevard	12.19	2,519	3,673	4,223	5,456
Approximately 0.7 mile downstream of Camelot Country Way	4.52	1,952	2,726	3,033	3,790
Approximately 0.2 mile upstream of Scott Boulevard	1.53	759	1,039	1,153	1,415

[2] Data Not Available

[3] Includes West Branch Shingle Creek Tributary listed separately in previous FIS reports

Table 5: Summary of Discharges (continued)

Flooding Source and Location	Drainage Area (Square Miles)	Peak Discharge (Cubic Feet per Second)			
		10-percent-annual-chance	2-percent-annual-chance	1-percent-annual-chance	0.2-percent-annual-chance
WEST BRANCH SHINGLE CREEK (continued)					
Approximately 200 feet downstream of mall entrance	0.48	216	296	332	411
WEST CITY CANAL[1]					
At mouth	6.37	1,107	1,418	1,549	1,854
WPA CANAL					
At mouth	13.61	1,196	1,479	1,749	2,769
Approximately 0.8 mile downstream of Florida Turnpike	6.45	580	871	982	1,268
At Florida Turnpike	5.20	357	374	429	613
Approximately 700 feet upstream of Old Canoe Creek Road	3.91	359	460	527	665
At Canoe Creek Road	3.22	250	331	362	454
Approximately 650 feet downstream of West New Nolte Road	2.31	123	168	185	305
At West New Nolte Road	0.86	116	158	175	224
Approximately 0.3 mile upstream of West New Nolte Road	0.69	97	105	108	120

[1]Peak discharges computed with UNET (Reference 25)

Table 5: Summary of Discharges (continued)

Flooding Source and Location	Drainage Area (Square Miles)	Peak Discharge (Cubic Feet per Second) 10-percent-annual-chance	2-percent-annual-chance	1-percent-annual-chance	0.2-percent-annual-chance
WPA CANAL TRIBUTARY 1					
At confluence with WPA Canal	4.4	166	317	399	695
Just upstream of confluence of WPA Canal Tributary 1-1	3.4	138	265	334	584
Approximately 1.7 miles upstream of confluence of WPA Canal Tributary 1-1	1.7	84	162	205	363
WPA CANAL TRIBUTARY 1-1					
At confluence with WPA Canal Tributary 1	0.7	137	253	312	488

[1]Peak discharges computed with UNET (Reference 25)

[2] Data Not Available

[3] Includes West Branch Shingle Creek Tributary listed separately in previous FIS reports

Table 6: Summary of Stillwater Elevations

Flooding Source and Location	Elevation (feet NAVD88)			
	10-percent-annual-chance	2-percent-annual-chance	1-percent-annual-chance	0.2-percent-annual-chance
ALLIGATOR LAKE	64.4	65.2	65.5	66.1
BRICK LAKE	64.5	65.2	65.5	66.2
BROWN LAKE	63.1	63.7	64.0	64.8
BUCK LAKE	*	*	104.3	107.5
CLAY HOLE POND	*	*	65.5	*
COON LAKE	64.5	65.3	65.6	66.2
EAGLE POND	*	*	65.4	*
EAST LAKE TOHOPEKALIGA	57.6	59.5	61.0	63.0
LAKE BULLOCK	64.6	65.4	65.7	66.3
LAKE CECILE	75.4	75.9	76.2	77.0
LAKE CENTER	64.6	65.4	65.7	66.3
LAKE DAVENPORT	111.0	111.6	112.1	112.7
LAKE GENTRY	64.3	65.4	65.8	66.7
LAKE HATCHINEHA	*	*	55.8	*
LAKE JOEL	62.1	62.9	63.2	64.0
LAKE KISSIMMEE	52.4	*	54.3	*
LAKE LIZZIE	64.4	65.2	65.6	66.1
LAKE MARIAN	*	*	59.1	*
LAKE MARY JANE	54.9	56.5	57.1	58.6
LAKE MYRTLE	62.1	62.9	63.2	64.0
LAKE PRESTON	62.1	62.9	63.2	64.0
LAKE RUNNYMEDE	57.6	59.5	61.0	63.0
LAKE TOHOPEKALIGA	54.9	56.5	57.1	58.6
LAKE WILSON	105.2	106.2	106.5	107.5
LIVE OAK LAKE	64.4	69.2	65.6	66.1
OTTER POND	*	*	68.7	*
PEARL LAKE	64.5	65.2	65.5	66.2

*Data not available

Table 6: Summary of Stillwater Elevations (continued)

Flooding Source and Location	Elevation (feet NAVD88)			
	10-percent-annual-chance	2-percent-annual-chance	1-percent-annual-chance	0.2-percent-annual-chance
SARDINE LAKE	64.4	65.2	65.6	66.1
TROUT LAKE	64.5	65.3	65.6	66.2

*Data not available

3.2 Hydraulic Analyses

Analyses of the hydraulic characteristics of flooding from the sources studied were carried out to provide estimates of the elevations of floods of the selected recurrence intervals. Users should be aware that flood elevations shown on the FIRM represent rounded whole-foot elevations and may not exactly reflect the elevations shown on the Flood Profiles or in the Floodway Data tables in the FIS report. Flood elevations shown on the FIRM are primarily intended for flood insurance rating purposes. For construction and/or floodplain management purposes, users are cautioned to use the flood elevation data presented in this FIS in conjunction with the data shown on the FIRM.

Except where noted, cross sections were obtained from field surveys. All bridges, dams, and culverts were field surveyed to obtain elevation data and structural geometry. Cross sections were located at close intervals upstream and downstream of bridge and culverts to compute the significant backwater effects of these structures.

Locations of selected cross sections used in the hydraulic analyses are shown on the Flood Profiles (Exhibit 1). For stream segments for which a floodway was computed (Section 4.2), selected cross section locations are also shown on the FIRM (Exhibit 2).

Table 7, “Manning’s ‘n’ Values,” contains the channel and overbank "n" values for the streams studied by detailed methods.

Table 7: Manning’s “n” Values

Flooding Source	Channel “n”	Overbank “n”
Bass Slough	0.025	0.025-0.10
Bass Slough Tributary	0.025	0.035-0.075
Big Wateree Creek Tributary 4	*	*
Boggy Creek	0.030	0.020
C-33 Canal	0.025-0.17	0.03-0.18
Canoe Creek (C-34 Canal)	0.025-0.17	0.03-0.18
Davenport Creek	0.025-0.17	0.03-0.18
Davenport Creek Tributary No. 1	0.025-0.17	0.03-0.18

Table 7: Manning's "n" Values (continued)

Flooding Source	Channel "n"	Overbank "n"
Davenport Creek Tributary No. 2	0.025-0.17	0.03-0.18
East City Canal	0.025-0.17	0.03-0.18
East City Canal Tributary 1	0.025-0.11	0.035-0.11
Mill Slough in City of Kissimmee	0.04	0.50
Mill Slough in Osceola County (Unincorporated Areas)	0.030	0.020
Peg Horn Slough	0.025-0.17	0.03-0.18
Reedy Creek	0.030	0.020
Reedy Creek Tributary No. 1	0.025-0.17	0.03-0.18
Reedy Creek Tributary No. 2	0.025-0.17	0.03-0.18
Reedy Creek Tributary No. 3	0.025-0.17	0.03-0.18
Shingle Creek	0.025-0.17	0.03-0.18
St. Johns River	0.025-0.17	0.03-0.18
West Branch Shingle Creek*	0.025-0.17	0.03-0.18
West City Canal	0.025-0.17	0.03-0.18
WPA Canal	0.025-0.17	0.03-0.18
WPA Canal Tributary 1	0.025-0.095	0.025-0.095
WPA Canal Tributary 1-1	0.025	0.045-0.095

*Includes West Branch Shingle Creek Tributary listed separately in previous FIS reports

Flood profiles were drawn showing the computed water-surface elevations for floods of the selected recurrence intervals.

The hydraulic analyses for this study were based on unobstructed flow. The flood elevations shown on the Flood Profiles (Exhibit 1) are thus considered valid only if hydraulic structures remain unobstructed, operate properly, and do not fail.

3.2.1 Methods for Flooding Sources with New or Revised Analyses in Current Study

Water-surface profiles for the 10-, 2-, 1- and 0.2-percent-annual-chance recurrence intervals were computed for detailed analyses, and the water-surface profile for the 1-percent-annual-chance recurrence interval was computed for approximate analyses. The USACE HEC-RAS step-backwater computer program version 4.0 was utilized for hydraulic analyses of Bass Slough (Lower Reach), Bass Slough (Upper Reach), Bass Slough Tributary, WPA Canal Tributary 1,

WPA Canal Tributary 1-1, East City Canal Tributary 1 and all approximately study streams (Reference 26).

Hydraulic cross section geometries were obtained from the Digital Terrain Model (DTM) and supplemented with surveyed hydraulic data at various locations throughout the detailed studied reaches. All hydraulic structures were field surveyed for detailed analyses. The Watershed Information System (WISE) software was used for preprocessing HEC-RAS data (Reference 27). No floodway was calculated for streams studied by approximate methods.

Starting conditions for the hydraulic models were set to normal depth using starting slopes calculated from channel elevation values taken from the DTM, or set based on effective water-surface elevations as appropriate. Manning's n-values were estimated using high-resolution imagery and field photos for both channel and overbank areas.

The Interconnected Channel and Pond Routing (ICPR) model was used to determine the 1-percent-annual-chance flood elevations for Lake Marian and ponding areas located on its northern and eastern side. The ICPR model was also used to determine the 1-percent-annual-chance flood elevations for ponding areas located west of Reedy Creek and south of Reedy Creek Tributary No. 2. ICPR basins were delineated based on topographic maps with a contour interval of 1 foot. Dimensions of the cross drainage structures at basin boundaries were obtained from field survey. Land use data was obtained from South Florida Water Management District and soil data was obtained from Natural Resources Conservation Service's Soil Data Mart.

3.2.2 Methods for Flooding Sources Incorporated from Previous Studies

Precountywide Analyses

For each jurisdiction within Osceola County that has a previously printed FIS report, the hydraulic analyses described in those reports has been compiled and is summarized below.

Water-surface elevations of floods of the selected recurrence intervals were computed using the USACE HEC-2 step-backwater computer program (Reference 28). Starting water-surface elevations were based on the computed water-surface elevation for the receiving stream or lake.

For Reedy Creek, C-1 Canal, C-2 Canal, and C-3 Canal, 1-percent-annual-chance water-surface elevations were determined using the UNET hydraulic model.

In the City of Kissimmee, the hydrologic analyses for the area generally bounded to the north by Vine Street, to the east by Robinson Street, to the south by Sumner Street, and to the west by Main Street determined that the flooded area is subject to shallow flooding where average depths of flooding are less than 3 feet.

Roughness factors (Manning's "n") used in the hydraulic computations were chosen by engineering judgment and were based on field inspection of the floodplain areas.

Revised Analyses for Countywide FIS

Cross sections were obtained from a variety of sources. The primary source was new field surveys. Other cross sections were obtained from the South Florida Water Management District and from the previous FISs.

Water-surface elevations of floods of the selected recurrence intervals were computed using the USACE UNET one-dimensional, unsteady flow and HEC-2 water-surface profile computer programs; UNET was used for C-33 Canal, Canoe Creek (C-34 Canal), East City Canal, West City Canal, and Lakes Center, Gentry, Joel, Lizzie, Myrtle, and Preston and Alligator, Brick, Coon, and Trout Lakes; HEC-2 was used for Davenport Creek, Davenport Creek Tributary No. 1, Davenport Creek Tributary No. 2, Peg Horn Slough, Reedy Creek Tributary No. 1, Reedy Creek Tributary No. 2, and Reedy Creek Tributary No. 3, Shingle Creek, West Branch Shingle Creek, West Branch Shingle Creek Tributary, and WPA Canal (References 25 and 28). For the St. Johns River, the hydraulic analyses were taken from *The Mean Annual, 10-Year, 25-Year, and 100-Year Flood Profiles for the Upper St. Johns River Under Existing Conditions* (Reference 19). Starting water-surface elevations for streams were taken to be normal depth; for lakes, the highest operating elevations specified by the South Florida Water Management District were used (Reference 19).

Gage data for historical storm events was used for calibration and verification of the UNET and HEC-2 models. Gage data were obtained from the South Florida Water Management District and the USGS (References 29 and 30). USGS gages were used for the Alligator Chain of Lakes at the S-60 spillway on the C-33 Canal (ID 02260800); at the S-57 culvert on the C-30 Canal (ID 02261500); on the east shore of Cypress Lake near the mouth of Canoe Creek (ID 02266600); on Shingle Creek at the Kissimmee Airport (ID 02263800); on Shingle Creek at Campbell (ID 02264495); and on Davenport Creek near Loughman (ID 02266480). South Florida Water Management District gages were used on the Kissimmee East-West Canal (ID KISSD-H and KISSD-E).

3.3 Vertical Datum

All FIS reports and FIRMs are referenced to a specific vertical datum. The vertical datum provides a starting point against which flood, ground, and structure elevations can be referenced and compared. Until recently, the standard vertical datum used for newly created or revised FIS reports and FIRMs was the National Geodetic Vertical Datum of 1929 (NGVD). With the completion of the North American Vertical Datum of 1988 (NAVD), many FIS reports and FIRMs are now prepared using NAVD as the referenced vertical datum.

All flood elevations shown in this FIS report and on the FIRM are referenced to the NAVD. These flood elevations must be compared to structure and ground elevations referenced to the same vertical datum. It is important to note that adjacent counties may be referenced to NGVD, which may result in differences in base flood elevations across county lines.

Ground, structure, and flood elevations may be compared and/or referenced to NGVD29 by applying a standard conversion factor. The conversion factor to NGVD29 is +0.9. This value is an average for the entire county.

The BFEs shown on the FIRM represent whole-foot rounded values. For example, a BFE of 102.4 feet will appear as 102 feet on the FIRM and 102.6 will appear as 103. Therefore, users who wish to convert the elevations in this FIS report to NGVD should apply the stated conversion factor to elevations shown on the Flood Profiles and supporting data tables in the FIS report, which are shown at a minimum to the nearest 0.1 foot.

For more information regarding conversion between the NGVD and NAVD, see the FEMA publication entitled *Converting the National Flood Insurance Program to the North American Vertical Datum of 1988* (Reference 31), visit the National Geodetic Survey website at www.ngs.noaa.gov, or contact the National Geodetic Survey at the following address:

NGS Information Services
NOAA, N/NGS12
National Geodetic Survey
SSMC-3, #9202
1315 East-West Highway
Silver Spring, Maryland 20910-3282
(301) 713-3242

Temporary vertical monuments are often established during the preparation of a flood hazard analysis for the purpose of establishing local vertical control. Although these monuments are not shown on the FIRM, they may be found in the Technical Support Data Notebook associated with the FIS report and FIRM for this community. Interested individuals may contact FEMA to access these data.

To obtain current elevation, description, and/or location information for benchmarks shown on this map, please contact the Information Services Branch of the NGS at (301) 713-3242, or visit their website at www.ngs.noaa.gov.

4.0 FLOODPLAIN MANAGEMENT APPLICATIONS

The NFIP encourages State and local governments to adopt sound floodplain management programs. To assist in this endeavor, each FIS report provides 1-percent-annual-chance floodplain data, which may include a combination of the following: 10-, 2-, 1-, and 0.2-percent-annual-chance flood elevations; delineations of the 1- and 0.2-percent-annual-chance floodplains; and a 1-percent-annual-chance floodway. This information is presented on the FIRM and in many components of the FIS report, including Flood Profiles, Floodway Data tables, and Summary of Stillwater Elevation tables. Users should reference the data presented in the FIS report as well as additional information that may be available at the local community map repository before making flood elevation and/or floodplain boundary determinations.

4.1 Floodplain Boundaries

To provide a national standard without regional discrimination, the 1-percent-annual-chance flood has been adopted by FEMA as the base flood for floodplain management purposes. The 0.2-percent-annual-chance flood is employed to indicate additional areas of flood risk in the community. For each stream studied by detailed or limited detailed methods, the 1- and 0.2-percent-annual-chance floodplain boundaries have been delineated using the flood elevations determined at each cross section.

Between cross sections, the boundaries were interpolated based on contours developed from the Digital Terrain Model (Reference 32).

The 1- and 0.2-percent-annual-chance floodplain boundaries for streams studied by detailed methods are shown on the FIRM. On this map, the 1-percent-annual-chance floodplain boundary corresponds to the boundary of the areas of special flood hazards (Zones A and AE), and the 0.2-percent-annual-chance floodplain boundary corresponds to the boundary of areas of moderate flood hazards. In cases where the 1- and 0.2-percent-annual-chance floodplain boundaries are close together, only the 1-percent-annual-chance floodplain boundary has been shown. Small areas within the floodplain boundaries may lie above the flood elevations, but cannot be shown due to limitations of the map scale and/or lack of detailed topographic data.

For the flooding sources studied by approximate methods, only the 1-percent-annual-chance floodplain boundary is shown on the FIRM (Exhibit 2).

4.2 Floodways

Encroachment on floodplains, such as structures and fill, reduces flood-carrying capacity, increases flood heights and velocities, and increases flood hazards in areas beyond the encroachment itself. One aspect of floodplain management involves balancing the economic gain from floodplain development against the resulting increase in flood hazard. For purposes of the NFIP, a floodway is used as a tool to assist local communities in this aspect of floodplain management. Under this concept, the area of the 1-percent-annual-chance floodplain is divided into a floodway and a floodway fringe. The floodway is the channel of a stream, plus any adjacent floodplain areas, that must be kept free of encroachment so that the base flood can be carried without substantial increases in flood heights. Minimum Federal standards limit such increases to 1 foot, provided that hazardous velocities are not produced. The floodways in this study are presented to local agencies as minimum standards that can be adopted directly or that can be used as a basis for additional floodway studies.

The floodways presented in this study were computed for certain stream segments on the basis of equal-conveyance reduction from each side of the floodplain. Floodway widths were computed at cross sections. Between cross sections, the floodway boundaries were interpolated. The results of the floodway computations are tabulated for selected cross sections and provided in Table 8, “Floodway Data.” The computed floodway is shown on the FIRM (Exhibit 2). In cases where the floodway and 1-percent-annual-chance floodplain boundaries are either close together or collinear, only the floodway boundary is shown on the FIRM.

No floodway was computed Davenport Creek Tributary 1, Davenport Creek Tributary 2, St. Johns River, and Tributary No. 1.

Near the confluence of streams studied in detail, floodway computations were made without regard to flood elevations on the receiving water body. Therefore, "Without Floodway" elevations presented in Table 8, "Floodway Data," for certain downstream cross sections of Bass Slough Tributary, East City Canal Tributary 1, Reedy Creek Tributary No. 1, Reedy Creek Tributary No. 2, Shingle Creek, West City Canal, WPA Canal Tributary 1, and WPA Canal Tributary 1-1 are lower than the regulatory flood elevations in that area, which must take into account the 1-percent-annual-chance flooding due to backwater from other sources.

Encroachment into areas subject to inundation by floodwaters having hazardous velocities aggravates the risk of flood damage and heightens potential flood hazards by further increasing velocities. A listing of stream velocities at selected cross sections is provided in Table 8. To reduce the risk of property damage in areas where the stream velocities are high, the community may wish to restrict development in areas outside the floodway.

The area between the floodway and 1-percent-annual-chance floodplain boundaries is termed the floodway fringe. The floodway fringe encompasses the portion of the floodplain that could be completely obstructed without increasing the water-surface elevation (WSEL) of the base flood more than 1 foot at any point. Typical relationships between the floodway and the floodway fringe and their significance to floodplain development are shown in Figure 1.

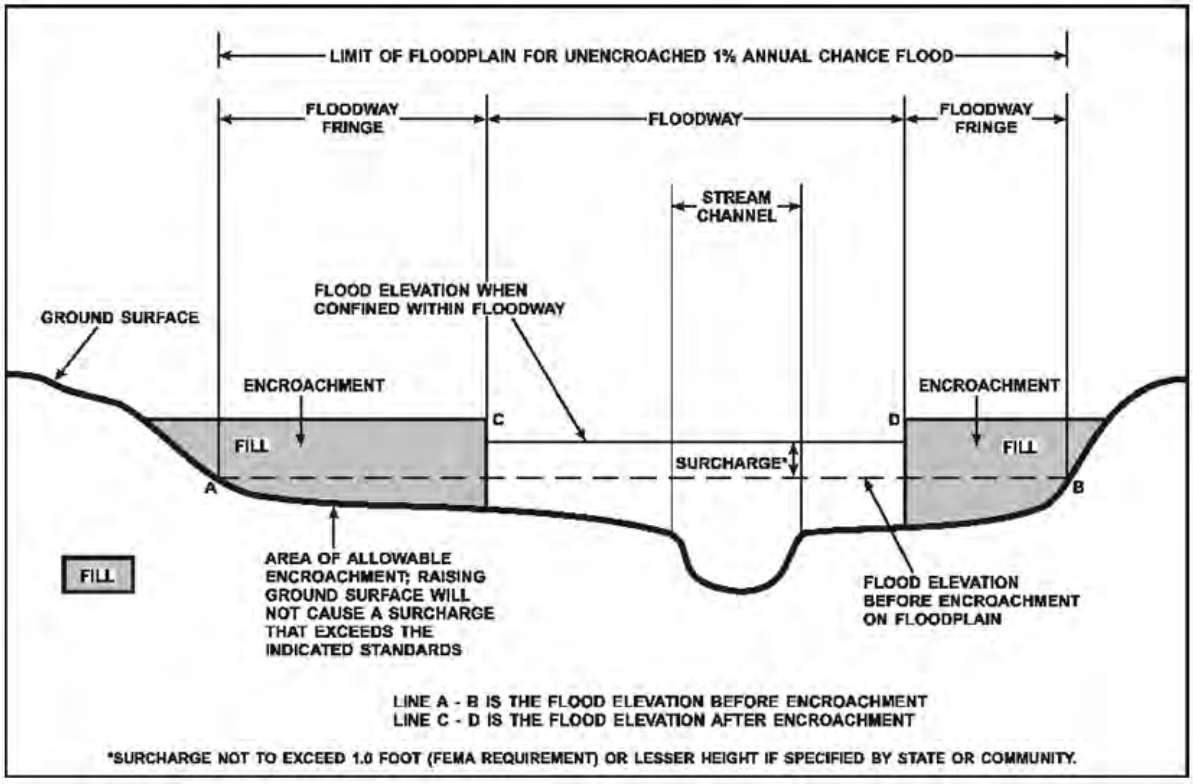

Figure 1. Floodway Schematic

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY (FEET NAVD 88)	WITHOUT FLOODWAY (FEET NAVD 88)	WITH FLOODWAY (FEET NAVD 88)	INCREASE (FEET)
BASS SLOUGH (LOWER REACH)								
A	2,000	58	200	5.9	58.5	58.5	59.2	0.7
B	2,999	320	1,501	0.8	60.8	60.8	61.1	0.3
C	4,500	500	1,677	0.6	60.9	60.9	61.3	0.4
D	6,000	235	618	1.7	61.1	61.1	61.7	0.6
E	7,000	143	487	2.2	63.0	63.0	63.8	0.8
F	7,500	62	201	5.3	63.5	63.5	64.1	0.6
G	9,000	450	1,939	0.6	64.3	64.3	64.7	0.4
H	10,500	93	272	3.9	64.4	64.4	64.8	0.4
I	12,655	324	636	1.3	67.3	67.3	67.9	0.6
J	14,008	268	1,432	0.6	68.9	68.9	69.7	0.8
K	15,003	94	128	6.5	70.2	70.2	70.2	0.0
L	16,508	129	223	2.6	74.4	74.4	74.6	0.2
M	18,008	204	374	1.5	74.7	74.7	75.0	0.3
N	19,008	283	203	2.8	75.7	75.7	76.1	0.4

[1] Stream distance in feet above mouth

TABLE 8

FEDERAL EMERGENCY MANAGEMENT AGENCY

OSCEOLA COUNTY, FL

AND INCORPORATED AREAS

FLOODWAY DATA

BASS SLOUGH (LOWER REACH)

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY (FEET NAVD 88)	WITHOUT FLOODWAY (FEET NAVD 88)	WITH FLOODWAY (FEET NAVD 88)	INCREASE (FEET)
BASS SLOUGH (UPPER REACH)								
A	21,799	70	253	2.1	78.8	78.8	79.1	0.3
B	23,008	182	658	0.8	79.3	79.3	79.8	0.5
C	24,008	283	1,113	0.3	79.4	79.4	79.8	0.4
D	25,508	152	491	0.6	79.4	79.4	79.9	0.5
E	26,508	124	276	1.1	79.4	79.4	79.9	0.5
F	27,008	139	422	0.7	79.5	79.5	79.9	0.4
G	28,008	128	321	0.9	79.5	79.5	80.1	0.6
H	28,791	76	217	1.3	79.5	79.5	80.1	0.6

[1] Stream distance in feet above mouth

TABLE 8

FEDERAL EMERGENCY MANAGEMENT AGENCY
OSCEOLA COUNTY, FL
AND INCORPORATED AREAS

FLOODWAY DATA

BASS SLOUGH (UPPER REACH)

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY (FEET NAVD 88)	WITHOUT FLOODWAY (FEET NAVD 88)	WITH FLOODWAY (FEET NAVD 88)	INCREASE (FEET)
BASS SLOUGH TRIBUTARY								
A	217[1]	50	91	2.0	79.4	75.8[2]	76.8	1.0
B	1,000[1]	30	90	2.0	79.4	77.4[2]	77.9	0.5
C	2,040[1]	50	200	0.9	79.4	78.1[2]	79.0	0.9
BOGGY CREEK								
A	5,600[3]	1,020	2,900	1.8	61.0	61.0	62.0	1.0

[1] Stream distance in feet above confluence with Bass Slough

[2] Elevation computed without consideration of backwater effects from Bass Slough

[3] Stream distance in feet above confluence with East Lake Topopekaliga

TABLE 8

FEDERAL EMERGENCY MANAGEMENT AGENCY

OSCEOLA COUNTY, FL

AND INCORPORATED AREAS

FLOODWAY DATA

BASS SLOUGH TRIBUTARY & BOGGY CREEK

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY (FEET NAVD 88)	WITHOUT FLOODWAY (FEET NAVD 88)	WITH FLOODWAY (FEET NAVD 88)	INCREASE (FEET)
C-33 CANAL								
A	380	212	545	0.3	65.5	65.5	65.5	0.0
B	2,920	243	459	0.3	65.5	65.5	65.5	0.0
C	3,770	17	222	0.3	65.8	65.8	65.8	0.0
D	6,020	129	784	0.1	65.8	65.8	65.8	0.0
E	8,620	125	964	0.1	65.8	65.8	65.8	0.0
F	11,405	251	1,133	0.1	65.8	65.8	65.8	0.0
G	12,405	245	1,165	0.1	65.8	65.8	65.8	0.0

[1] Stream distance in feet above confluence with Alligator Lake
[2] At time of peak water-surface elevation

TABLE 8

FEDERAL EMERGENCY MANAGEMENT AGENCY
OSCEOLA COUNTY, FL
AND INCORPORATED AREAS

FLOODWAY DATA

C-33 CANAL

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY (FEET NAVD 88)	WITHOUT FLOODWAY (FEET NAVD 88)	WITH FLOODWAY (FEET NAVD 88)	INCREASE (FEET)
CANOE CREEK (C-34 CANAL)								
A	0	123	998	3.4	56.1	56.1	56.1	0.0
B	450	37	988	3.4	64.1	64.1	64.1	0.0
C	5,628	88	1,506	0.3	64.6	64.6	64.6	0.0
D	15,389	20	346	1.4	65.8	65.8	65.8	0.0

[1] Stream distance in feet above Canoe Creek Road
[2] At time of peak water-surface elevation

TABLE 8

FEDERAL EMERGENCY MANAGEMENT AGENCY
OSCEOLA COUNTY, FL
AND INCORPORATED AREAS

FLOODWAY DATA

CANOE CREEK (C-34 CANAL)

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY (FEET NAVD 88)	WITHOUT FLOODWAY (FEET NAVD 88)	WITH FLOODWAY (FEET NAVD 88)	INCREASE (FEET)
DAVENPORT CREEK								
A	4,500	734	3,963	1.0	80.2	80.2	81.2	1.0
B	5,330	440[2]	2,627	1.5	81.8	81.8	82.4	0.6
C	6,730	359	2,112	1.7	84.4	84.4	84.8	0.4
D	8,130	292	1,723	2.1	86.0	86.0	86.8	0.8
E	9,230	112	794	4.6	88.9	88.9	89.5	0.6
F	10,520	223	2,087	1.4	92.9	92.9	93.6	0.7
G	11,820	231	1,596	1.9	93.5	93.5	94.2	0.7
H	13,385	136	819	3.6	95.1	95.1	95.5	0.4
I	14,045	42	453	6.5	96.2	96.2	96.7	0.5
J	15,745	191	1,782	1.7	98.8	98.8	99.6	0.8
K	16,872	384	3,259	0.9	102.6	102.6	103.2	0.6
L	18,342	228	1,923	1.5	103.2	103.2	103.8	0.6
M	20,392	286	1,627	1.7	104.9	104.9	105.6	0.7
N-R*								

[1] Stream distance in feet above confluence with Reedy Creek
[2] Value represents total width; however, floodway is not shown inside Reedy Creek Improvement District
* Floodway data not available

TABLE 8

FEDERAL EMERGENCY MANAGEMENT AGENCY
OSCEOLA COUNTY, FL
AND INCORPORATED AREAS

FLOODWAY DATA

DAVENPORT CREEK

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY (FEET NAVD 88)	WITHOUT FLOODWAY (FEET NAVD 88)	WITH FLOODWAY (FEET NAVD 88)	INCREASE (FEET)
EAST CITY CANAL								
A	3,374	76	447	3.5	57.8	57.8	57.9	0.1
B	4,124	96	363	4.2	58.5	58.5	58.5	0.0
C	4,932	90	414	3.7	61.1	61.1	61.1	0.0
D	5,433	80	409	3.7	61.5	61.5	61.5	0.0
E	8,232	100	62	2.3	65.1	65.1	65.1	0.0
F	8,733	170	807	1.4	65.3	65.3	65.3	0.0
G	10,127	250[3]	1,119	1.0	65.9	65.9	65.9	0.0
H	10,629	265[3]	1,799	0.5	66.0	66.0	66.0	0.0
I	11,278	250[3]	1,611	0.5	66.0	66.0	66.0	0.0
J	11,980	250	1,292	0.6	66.0	66.0	66.0	0.0
K	13,158	75	381	2.0	66.2	66.2	66.3	0.1
L	14,362	60	291	0.2	66.5	66.5	66.7	0.2
M	15,729	41	108	0.3	66.9	66.9	66.9	0.0
N	16,516	41	96	0.5	67.7	67.7	67.7	0.0

[1] Stream distance in feet above confluence with Lake Tohopekaliga
[2] At time of peak water-surface elevation
[3] Value is inaccurate, as the floodway has been adjusted in this area to match topographic-based floodplain redelineation

TABLE 8

FEDERAL EMERGENCY MANAGEMENT AGENCY
OSCEOLA COUNTY, FL
AND INCORPORATED AREAS

FLOODWAY DATA

EAST CITY CANAL

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY (FEET NAVD 88)	WITHOUT FLOODWAY (FEET NAVD 88)	WITH FLOODWAY (FEET NAVD 88)	INCREASE (FEET)
EAST CITY CANAL TRIBUTARY 1								
A	500	42	274	2.5	65.1	63.7[2]	64.4	0.7
B	1,000	46	233	3.0	65.1	63.8[2]	64.5	0.7
C	2,000	93	763	0.9	66.0	66.0	67.0	1.0
D	2,373	66	577	1.2	66.0	66.0	67.0	1.0

[1] Stream distance in feet above confluence with East City Canal

[2] Elevation computed without consideration of backwater effects from East City Canal

TABLE 8

FEDERAL EMERGENCY MANAGEMENT AGENCY

OSCEOLA COUNTY, FL

AND INCORPORATED AREAS

FLOODWAY DATA

EAST CITY CANAL TRIBUTARY 1

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY (FEET NAVD 88)	WITHOUT FLOODWAY (FEET NAVD 88)	WITH FLOODWAY (FEET NAVD 88)	INCREASE (FEET)
MILL SLOUGH								
A	6,161	90	460	3.0	57.1	57.1	58.1	1.0
B	7,090	140	450	3.0	57.9	57.9	58.6	0.7
C	9,090	230	830	1.6	59.5	59.5	60.3	0.8
D	10,590	50	250	5.5	60.5	60.5	61.5	1.0
E	11,391	40	250	5.2	64.0	64.0	64.5	0.5
F	13,350	202	606	2.1	67.3	67.3	68.2	0.9
G	14,410	45	248	5.2	69.1	69.1	69.8	0.7
H	15,450	59	295	4.4	72.3	72.3	72.5	0.2
I	17,900	81	438	3.0	76.2	76.2	76.7	0.5
J	20,150	181	695	1.9	79.1	79.1	79.9	0.8

[1] Stream distance in feet above confluence with Lake Tohopekaliga

TABLE 8

FEDERAL EMERGENCY MANAGEMENT AGENCY

OSCEOLA COUNTY, FL

AND INCORPORATED AREAS

FLOODWAY DATA

MILL SLOUGH

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY (FEET NAVD 88)	WITHOUT FLOODWAY (FEET NAVD 88)	WITH FLOODWAY (FEET NAVD 88)	INCREASE (FEET)
PEG HORN SLOUGH								
A	1,300	34	215	5.1	60.7	60.7	61.2	0.5
B	3,022	205	879	1.2	62.4	62.4	62.7	0.3
C	5,432	47	413	2.2	63.0	63.0	63.5	0.5
D	7,200	55	517	1.7	65.4	65.4	66.1	0.7
E	9,491	56	524	0.8	66.1	66.1	67.0	0.9
F	9,831	21	188	2.2	66.1	66.1	67.0	0.9
G	10,346	46	420	1.0	66.7	66.7	67.6	0.9
H	14,436	55	524	0.9	68.0	68.0	68.9	0.9
I	14,751	22	198	2.3	68.0	68.0	68.8	0.8
J	15,575	54	471	1.0	69.8	69.8	70.6	0.8
K	16,150	46	243	1.9	69.8	69.8	70.6	0.8
L	17,117	444	1,587	0.3	71.6	71.6	71.9	0.3

[1] Stream distance in feet above confluence with St. Cloud Canal (Canal 31)

TABLE 8

FEDERAL EMERGENCY MANAGEMENT AGENCY

OSCEOLA COUNTY, FL

AND INCORPORATED AREAS

FLOODWAY DATA

PEG HORN SLOUGH

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY (FEET NAVD 88)	WITHOUT FLOODWAY (FEET NAVD 88)	WITH FLOODWAY (FEET NAVD 88)	INCREASE (FEET)
REEDY CREEK								
A	3.55	5,568	23,325	0.2	57.7	57.7	58.7	1.0
B	4.73	5,455	12,337	0.4	58.7	58.7	59.6	0.9
C	5.95	2,754	14,138	0.4	60.4	60.4	61.4	1.0
D	6.74	1,513	11,487	0.4	60.7	60.7	61.7	1.0
E	8.81	1,514	10,628	0.4	62.3	62.3	63.3	1.0
F	9.45	1,384	9,590	0.4	63.0	63.0	64.0	1.0
G	9.79	712	5,325	0.7	63.3	63.3	64.3	1.0
H	10.89	1,306	9,011	0.4	64.3	64.3	65.3	1.0
I	11.98	2,471	15,454	0.2	64.7	64.7	65.7	1.0
J	13.05	2,495	14,137	0.2	65.1	65.1	66.1	1.0
K	14.07	3,192	15,140	0.2	65.4	65.4	66.4	1.0
L	15.10	5,081	24,716	0.1	65.6	65.6	66.6	1.0
M	16.12	2,918	15,285	0.2	65.8	65.8	66.8	1.0
N	16.67	2,040	8,894	0.2	66.0	66.0	67.0	1.0
O	17.17	4,644	20,654	0.1	66.1	66.1	67.1	1.0
P	18.18	4,640	19,641	0.1	66.2	66.2	67.2	1.0
Q	19.35	7,514	17,744	0.1	66.4	66.4	67.4	1.0
R	20.33	84	307	3.6	67.0	67.0	67.9	0.9

[1] Stream distance in miles above confluence with Cypress Lake

TABLE 8

FEDERAL EMERGENCY MANAGEMENT AGENCY

OSCEOLA COUNTY, FL

AND INCORPORATED AREAS

FLOODWAY DATA

REEDY CREEK

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY (FEET NAVD 88)	WITHOUT FLOODWAY (FEET NAVD 88)	WITH FLOODWAY (FEET NAVD 88)	INCREASE (FEET)
REEDY CREEK TRIBUTARY NO. 1								
A	5,650	51	172	4.3	65.3	62.2[2]	63.2	1.0
B	6,620	64	217	2.2	65.3	63.9[2]	64.5	0.6
C	10,678	599	1,462	0.1	67.5	67.5	67.7	0.2
D	12,468	1,200	3,179	0.1	67.6	67.6	67.8	0.2
REEDY CREEK TRIBUTARY NO. 2								
A	1,950	69	192	2.1	64.8	62.4[2]	63.4	1.0
B	2,870	46	134	3.0	65.2	65.2	65.4	0.2
C	4,020	33	86	0.7	67.0	67.0	67.0	0.0
D	5,356	533	96	0.1	67.4	67.4	67.4	0.0

[1] Steam distance in feet above confluence with Reedy Creek
[2] Elevation computed without consideration of backwater effects from Reedy Creek

TABLE 8

FEDERAL EMERGENCY MANAGEMENT AGENCY
OSCEOLA COUNTY, FL
AND INCORPORATED AREAS

FLOODWAY DATA

REEDY CREEK TRIBUTARY NO. 1 & NO. 2

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY (FEET NAVD 88)	WITHOUT FLOODWAY (FEET NAVD 88)	WITH FLOODWAY (FEET NAVD 88)	INCREASE (FEET)
REEDY CREEK TRIBUTARY NO. 3								
A	4,377	67	271	1.0	65.6	65.6	66.0	0.4
B	7,197	82	343	0.8	65.9	65.9	66.2	0.3
C	8,497	191	390	0.7	66.0	66.0	66.3	0.3
D	9,787	991	1,885	0.1	66.1	66.1	66.4	0.3
E	10,987	197	422	0.2	66.2	66.2	66.5	0.3
F	12,507	39	82	0.8	67.6	67.6	67.7	0.1
G	12,927	36	56	1.1	67.7	67.7	67.8	0.1

[1] Stream distance in feet above confluence with Reedy Creek

TABLE 8

FEDERAL EMERGENCY MANAGEMENT AGENCY

OSCEOLA COUNTY, FL

AND INCORPORATED AREAS

FLOODWAY DATA

REEDY CREEK TRIBUTARY NO. 3

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY (FEET NAVD 88)	WITHOUT FLOODWAY (FEET NAVD 88)	WITH FLOODWAY (FEET NAVD 88)	INCREASE (FEET)
SHINGLE CREEK								
A	5,100	1,280	4,584	2.0	57.1	56.3[2]	57.3	1.0
B	9,230	675	3,762	2.5	61.3	61.3	62.2	0.9
C	11,002	734	3,944	1.6	62.7	62.7	63.5	0.8
D	14,726	1,713	12,828	0.7	64.9	64.9	65.6	0.7
E	19,856	717	5,258	1.6	65.7	65.7	66.7	1.0
F	33,578	805	5,479	1.5	73.0	73.0	73.6	0.6
G	35,878	1,600	11,425	0.7	73.4	73.4	74.0	0.6
H	43,128	1,099	7,583	1.1	75.4	75.4	76.2	0.8

[1] Stream distance in feet above confluence with Lake Tohopekaliga
[2] Elevation computed without consideration of backwater effects from Lake Tohopekaliga

TABLE 8

FEDERAL EMERGENCY MANAGEMENT AGENCY
OSCEOLA COUNTY, FL
AND INCORPORATED AREAS

FLOODWAY DATA

SHINGLE CREEK

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY (FEET NAVD 88)	WITHOUT FLOODWAY (FEET NAVD 88)	WITH FLOODWAY (FEET NAVD 88)	INCREASE (FEET)
WEST BRANCH SHINGLE CREEK								
A	3,733	2,092	5,393	0.8	64.9	63.0[2]	63.5	0.5
B	6,750	1,077	4,123	1.0	64.9	64.8[2]	65.3	0.5
C	9,553	746	4,108	1.0	65.5	65.5	66.2	0.7
D	10,139	256	1,608	2.6	66.4	66.4	67.0	0.6
E	14,039	3,529	26,114	0.1	67.4	67.4	68.0	0.6
F	18,449	3,029	17,973	0.2	67.5	67.5	68.0	0.5
G	22,831	2,100	11,888	0.3	67.8	67.8	68.8	1.0
H	24,951	2,509	26,545	0.1	67.8	67.8	68.8	1.0
I	30,072	1,320	6,432	0.4	68.0	68.0	69.0	1.0
J	30,677	465	2,811	1.0	68.0	68.0	69.0	1.0
K	31,607	418	2,000	0.6	68.2	68.2	69.2	1.0
L	32,287	457	2,462	0.5	68.3	68.3	69.3	1.0
M	33,647	204	641	1.8	68.7	68.7	69.5	0.8
N	34,658	8	34	9.7	71.0	71.0	71.5	0.5

[1] Stream distance in feet above confluence with Shingle Creek
[2] Elevation computed without consideration of backwater effects from Shingle Creek

TABLE 8

FEDERAL EMERGENCY MANAGEMENT AGENCY
OSCEOLA COUNTY, FL
AND INCORPORATED AREAS

FLOODWAY DATA

WEST BRANCH SHINGLE CREEK

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY (FEET NAVD 88)	WITHOUT FLOODWAY (FEET NAVD 88)	WITH FLOODWAY (FEET NAVD 88)	INCREASE (FEET)
WEST CITY CANAL								
A	800	73	360	4.3	57.1	57.0[2]	57.1	0.1
B	1,378	72	641	2.5	57.4	57.4	57.5	0.1
C	2,328	107	610	2.6	57.8	57.8	57.8	0.0
D	4,097	61	351	1.7	59.1	59.1	59.2	0.1
E	4,699	49	253	2.3	59.2	59.2	59.3	0.1
F	5,676	56	313	1.9	61.8	61.8	61.8	0.0
G	6,299	80	382	1.6	62.3	62.3	62.3	0.0
H	6,674	200	643	0.9	62.3	62.3	62.4	0.1
I	7,593	300	968	0.5	62.8	62.8	62.8	0.0
J	8,432	150	755	0.7	63.1	63.1	63.2	0.1
K	9,641	70	238	1.7	63.7	63.7	63.8	0.1
L	11,458	54	325	0.7	67.6	67.6	67.6	0.0

[1] Stream distance in feet above confluence with Lake Tohopekaliga
[2] Elevation computed without consideration of backwater effects from Lake Tohopekaliga

TABLE 8

FEDERAL EMERGENCY MANAGEMENT AGENCY
OSCEOLA COUNTY, FL
AND INCORPORATED AREAS

FLOODWAY DATA

WEST CITY CANAL

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY (FEET NAVD 88)	WITHOUT FLOODWAY (FEET NAVD 88)	WITH FLOODWAY (FEET NAVD 88)	INCREASE (FEET)
WPA CANAL								
A	750	250	823	2.1	57.9	57.9	58.3	0.4
B	2,875	1,001	3,697	0.5	58.2	58.2	58.7	0.5
C	6,875	1,033	5,716	0.3	58.4	58.4	58.9	0.5
D	12,285	50	201	4.9	63.8	63.8	63.9	0.1
E	13,350	52	299	1.4	67.7	67.7	68.3	0.6
F	15,608	543	1,324	0.1	67.9	67.9	68.9	1.0
G	17,024	56	269	0.3	68.0	68.0	68.9	0.9
H	20,476	47	192	1.9	69.1	69.1	69.8	0.7
I	21,154	42	143	2.5	69.5	69.5	69.7	0.2
J	21,927	40	173	2.1	70.3	70.3	70.5	0.2
K	22,167	29	126	2.9	70.4	70.4	70.6	0.2
L	22,337	46	236	1.5	70.9	70.9	71.7	0.8
M	24,233	34	109	1.6	71.6	71.6	72.5	0.9
N	24,423	48	170	1.0	72.9	72.9	73.6	0.7
O	28,538	363	397	0.3	73.4	73.4	73.9	0.5

[1] Stream distance in feet above confluence with Lake Tohopekaliga

TABLE 8

FEDERAL EMERGENCY MANAGEMENT AGENCY

OSCEOLA COUNTY, FL

AND INCORPORATED AREAS

FLOODWAY DATA

WPA CANAL

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY (FEET NAVD 88)	WITHOUT FLOODWAY (FEET NAVD 88)	WITH FLOODWAY (FEET NAVD 88)	INCREASE (FEET)
WPA CANAL TRIBUTARY 1								
A	1,500	171	475	0.8	71.4	70.9[2]	71.9	1.0
B	2,500	330	517	0.8	74.2	74.2	75.1	0.9
C	3,500	485	848	0.5	74.7	74.7	75.6	0.9
D	11,000	1,448	4,403	0.1	74.8	74.8	75.8	1.0
E	12,500	1,140	2,027	0.2	74.8	74.8	75.8	1.0
F	14,000	1,269	2,260	0.1	74.8	74.8	75.8	1.0

[1] Stream distance in feet above confluence with WPA Canal

[2] Elevation computed without consideration of backwater effects from WPA Canal

TABLE 8

FEDERAL EMERGENCY MANAGEMENT AGENCY

OSCEOLA COUNTY, FL

AND INCORPORATED AREAS

FLOODWAY DATA

WPA CANAL TRIBUTARY 1

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY (FEET NAVD 88)	WITHOUT FLOODWAY (FEET NAVD 88)	WITH FLOODWAY (FEET NAVD 88)	INCREASE (FEET)
WPA CANAL TRIBUTARY 1-1								
A	2,000	88	180	1.7	74.8	74.1[2]	74.3	0.2
B	4,000	312	425	0.7	74.8	74.6[2]	75.4	0.8

[1] Stream distance in feet above confluence with WPA Canal Tributary 1

[2] Elevation computed without consideration of backwater effects from WPA Canal Tributary 1

TABLE 8

FEDERAL EMERGENCY MANAGEMENT AGENCY

OSCEOLA COUNTY, FL

AND INCORPORATED AREAS

FLOODWAY DATA

WPA CANAL TRIBUTARY 1-1

5.0 INSURANCE APPLICATIONS

For flood insurance rating purposes, flood insurance zone designations are assigned to a community based on the results of the engineering analyses. These zones are as follows:

Zone A

Zone A is the flood insurance rate zone that corresponds to the 1-percent-annual-chance floodplains that are determined in the FIS report by approximate methods. Because detailed hydraulic analyses are not performed for such areas, no base (1-percent-annual-chance) flood elevations (BFEs) or depths are shown within this zone.

Zone AE

Zone AE is the flood insurance rate zone that corresponds to the 1-percent-annual-chance floodplains that are determined in the FIS report by detailed methods. Whole-foot BFEs derived from the detailed hydraulic analyses are shown at selected intervals within this zone.

Zone X

Zone X is the flood insurance rate zone that corresponds to areas outside the 0.2-percent-annual-chance floodplain, areas within the 0.2-percent-annual-chance floodplain, areas of 1-percent-annual-chance flooding where average depths are less than 1 foot, areas of 1-percent-annual-chance flooding where the contributing drainage area is less than 1 square mile (sq. mi.), and areas protected from the base flood by levees. No BFEs or depths are shown within this zone.

6.0 FLOOD INSURANCE RATE MAP

The FIRM is designed for flood insurance and floodplain management applications.

For flood insurance applications, the map designates flood insurance rate zones as described in Section 5.0 and, in the 1-percent-annual-chance floodplains that were studied by detailed methods, shows selected whole-foot BFEs or average depths. Insurance agents use zones and BFEs in conjunction with information on structures and their contents to assign premium rates for flood insurance policies.

For floodplain management applications, the map shows by tints, screens, and symbols, the 1- and 0.2-percent-annual-chance floodplains, floodways, and the locations of selected cross sections used in the hydraulic analyses and floodway computations.

The current FIRM presents flooding information for the entire geographic area of Osceola County. Previously, separate Flood Hazard Boundary Maps and/or FIRMs were prepared for each incorporated community and the unincorporated areas of the County identified as flood-prone. This countywide FIRM also includes flood-hazard information that was presented separately on Flood Boundary and Floodway Maps (FBFMs), where applicable. Historical data relating to the maps prepared for each community are presented in Table 9, “Community Map History.”

COMMUNITY NAME	INITIAL IDENTIFICATION	FLOOD HAZARD BOUNDARY MAP REVISIONS DATE	FIRM EFFECTIVE DATE	FIRM REVISIONS DATE
Kissimmee, City of	July 19, 1974	April 30, 1976	July 2, 1981	May 7, 2001
Osceola County (Unincorporated Areas)	January 31, 1975	August 12, 1977	February 3, 1982	March 16, 1989 November 20, 1996 May 7, 2001
Reedy Creek Improvement District	May 7, 2001	None	May 7, 2001	None
St. Cloud, City of	June 28, 1974	February 20, 1976	September 17, 1980	October 23, 1981 April 3, 1996 May 7, 2001

TABLE 9

FEDERAL EMERGENCY MANAGEMENT AGENCY

OSCEOLA COUNTY, FL
AND INCORPORATED AREAS

COMMUNITY MAP HISTORY

7.0 OTHER STUDIES

Flood Hazard Studies for St. Cloud, Kissimmee, and the unincorporated areas of Orange County have been prepared by the USACE, Jacksonville District. The flood elevations determined in this FIS do not conflict with the flood elevations determined for those FISs.

The USACE, Jacksonville District prepared an expanded floodplain information report on the Boggy Creek basin, dated April 1979 (Reference 10). The flood stages in that report agree with the flood stages in this FIS.

The USACE, Jacksonville District, prepared a flood hazard information report on Reedy Creek in June 1976 (Reference 12). The flood stages presented in that report agree with those contained in this FIS.

In June 1973, the USACE published a floodplain information report on Mill Slough (Reference 13). That report included 1-percent-annual-chance and standard project flood profiles for Mill Slough, which agree with the 1-percent-annual-chance flood profiles contained in this FIS.

The USACE, Jacksonville District prepared a reconnaissance report on the Kissimmee River basin, which was published in September 1979 (Reference 33). That report describes the procedures to be used in evaluating the feasibility of modifying the existing flood control system for improving water quality and enhancing fish and wildlife resources in the Kissimmee River basin. The study will update the hydrologic analyses conducted previously by the USACE in the Kissimmee River basin.

Reynolds, Smith, and Hills, Architects-Engineers-Planners for Orange County, Osceola County, South Florida Water Management District, and the Florida Division of State Planning prepared a floodplain information report (Reference 11). The flood stages in that report agree with those contained in this FIS.

FIS reports have been prepared for the unincorporated areas of Okeechobee and Polk Counties and countywide FISs have been prepared for Brevard, Indian River, and Orange Counties (References 34, 35, 36, 37, and 1).

This FIS report supersedes or is compatible with all previous studies published on streams studied in this report and should be considered authoritative for the purposes of the NFIP.

8.0 LOCATION OF DATA

Information concerning the pertinent data used in the preparation of this study can be obtained by contacting Federal Insurance and Mitigation Division, FEMA Region IV, Koger-Center — Rutgers Building, 3003 Chamblee Tucker Road, Atlanta, GA 30341.

9.0 BIBLIOGRAPHY AND REFERENCES

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10.0 REVISION DESCRIPTIONS

This section has been added to provide information regarding significant revisions made since the original FIS was printed. Future revisions may be made that do not result in the republishing of the FIS report. To assure that the user is aware of all revisions, it is advisable to contact the community repository of flood-hazard data located at:

- City of Kissimmee
  Engineering Department, Suite 301
  101 North Church Street
  Kissimmee, Florida 34741

- Osceola County (Unincorporated Areas)
  Stormwater Section, Suite 1400
  1 Courthouse Square
  Kissimmee, Florida 34741

- Reedy Creek Improvement District Administrative Building
  1900 Hotel Plaza Boulevard
  Lake Buena Vista, Florida 32830

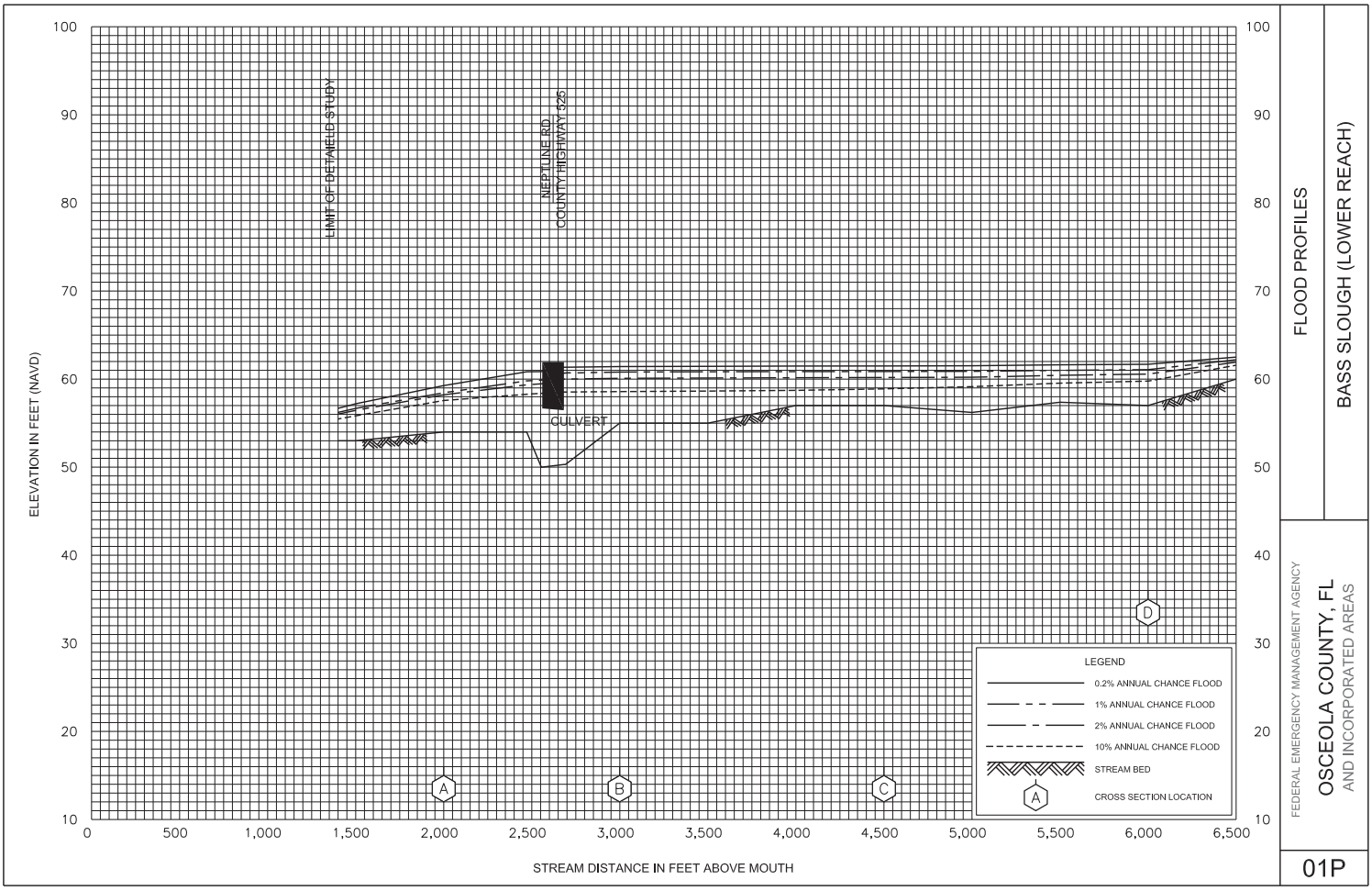
- St. Cloud City Hall
  Public Works Department, Building A, 2nd Floor
  1300 9th Street
  St. Cloud, Florida 34769

10.1 First Revision June 18, 2013

This June 18, 2013 revision was initiated in support of the FEMA Risk MAP Program.

This revision involved countywide remapping of Osceola County, Florida. The revision included new detailed studies, refinement and establishment of approximate zones,

redelineation of existing studies, and creation of new FIRMs using new topographic and base map data.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60
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40
30
20
10
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4,000
4,500
5,000
5,500
6,000
6,500
STREAM DISTANCE IN FEET ABOVE MOUTH
LIMIT OF DETAILED STUDY
NEPTUNE RD.
COUNTY HIGHWAY 525
CULVERT
A
B
C
D
LEGEND
0.2% ANNUAL CHANCE FLOOD
1% ANNUAL CHANCE FLOOD
2% ANNUAL CHANCE FLOOD
10% ANNUAL CHANCE FLOOD
STREAM BED
A
CROSS SECTION LOCATION
FLOOD PROFILES
BASS SLOUGH (LOWER REACH)
FEDERAL EMERGENCY MANAGEMENT AGENCY
OSCEOLA COUNTY, FL
AND INCORPORATED AREAS
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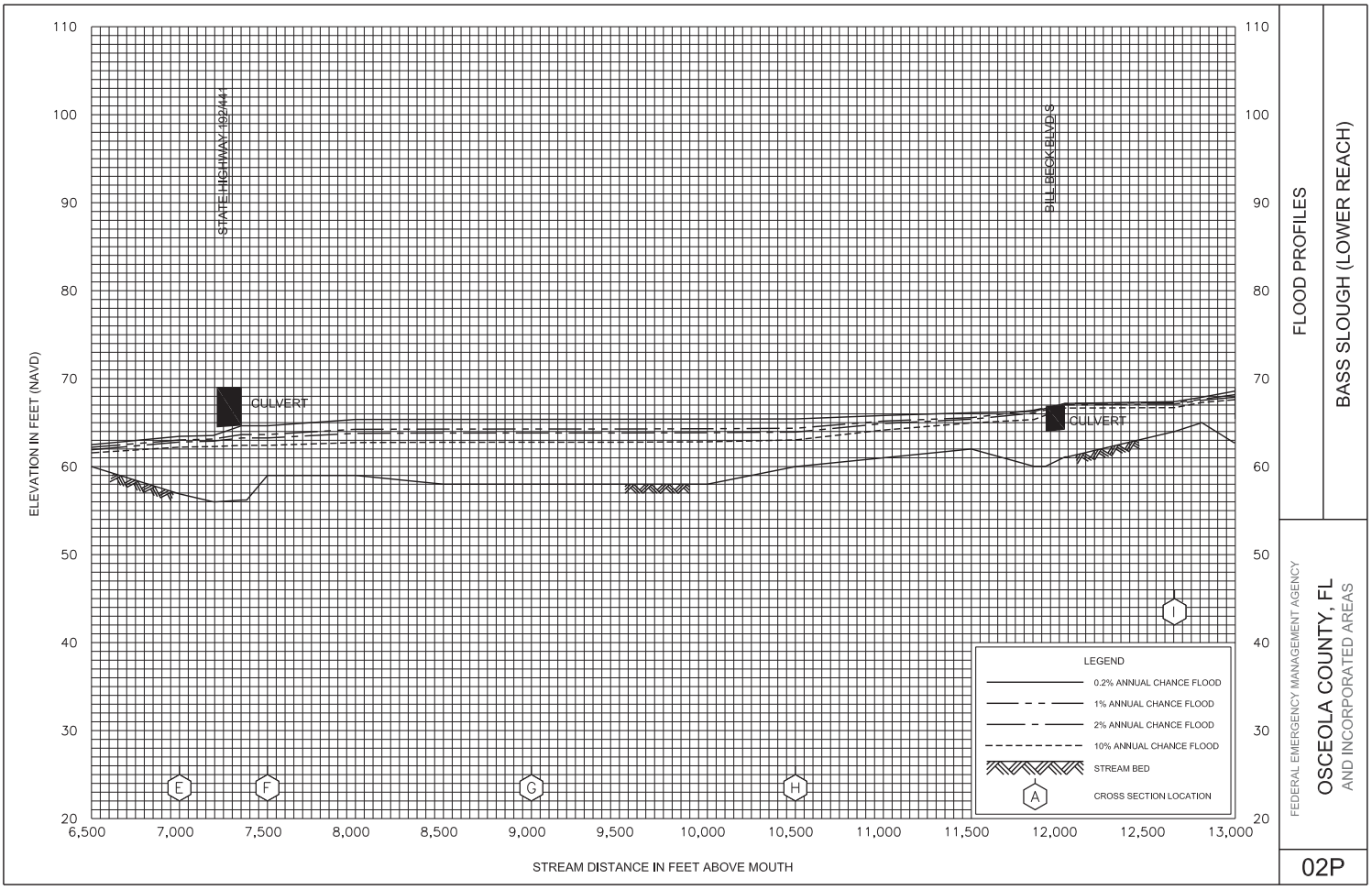

FLOOD PROFILES

BASS SLOUGH (LOWER REACH)

FEDERAL EMERGENCY MANAGEMENT AGENCY

OSCEOLA COUNTY, FL

AND INCORPORATED AREAS

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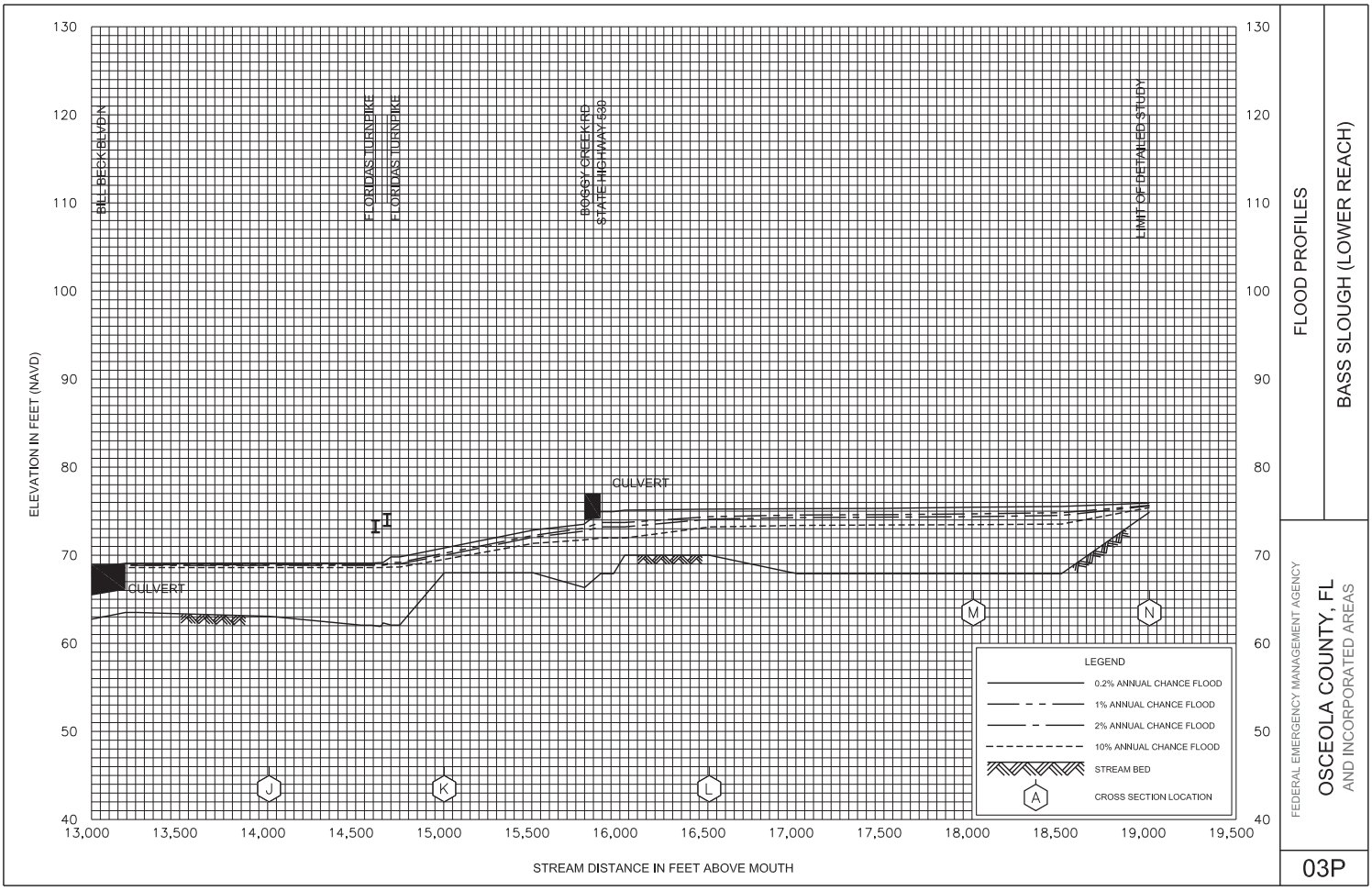

FLOOD PROFILES

BASS SLOUGH (LOWER REACH)

FEDERAL EMERGENCY MANAGEMENT AGENCY

OSCEOLA COUNTY, FL

AND INCORPORATED AREAS

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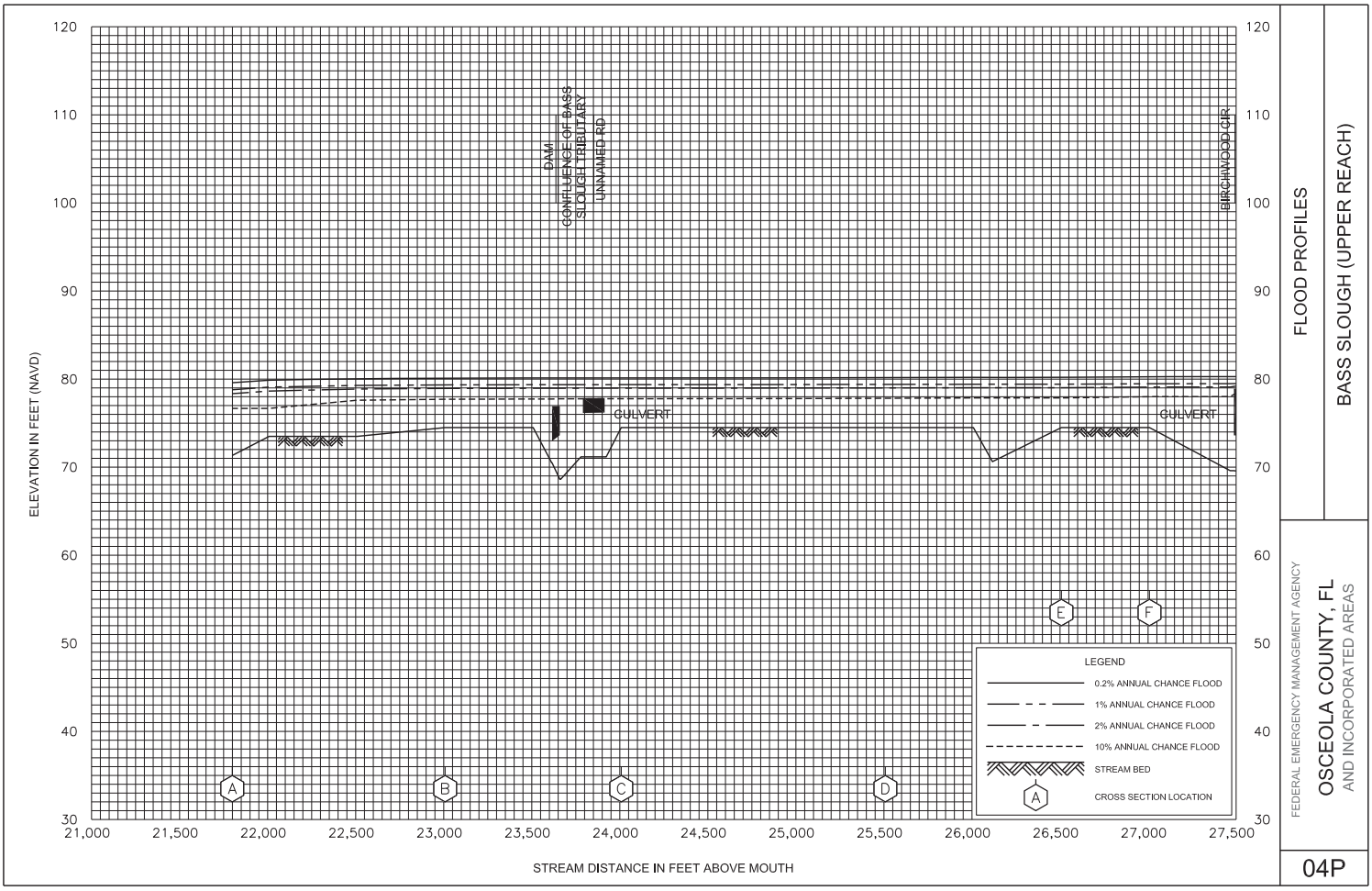
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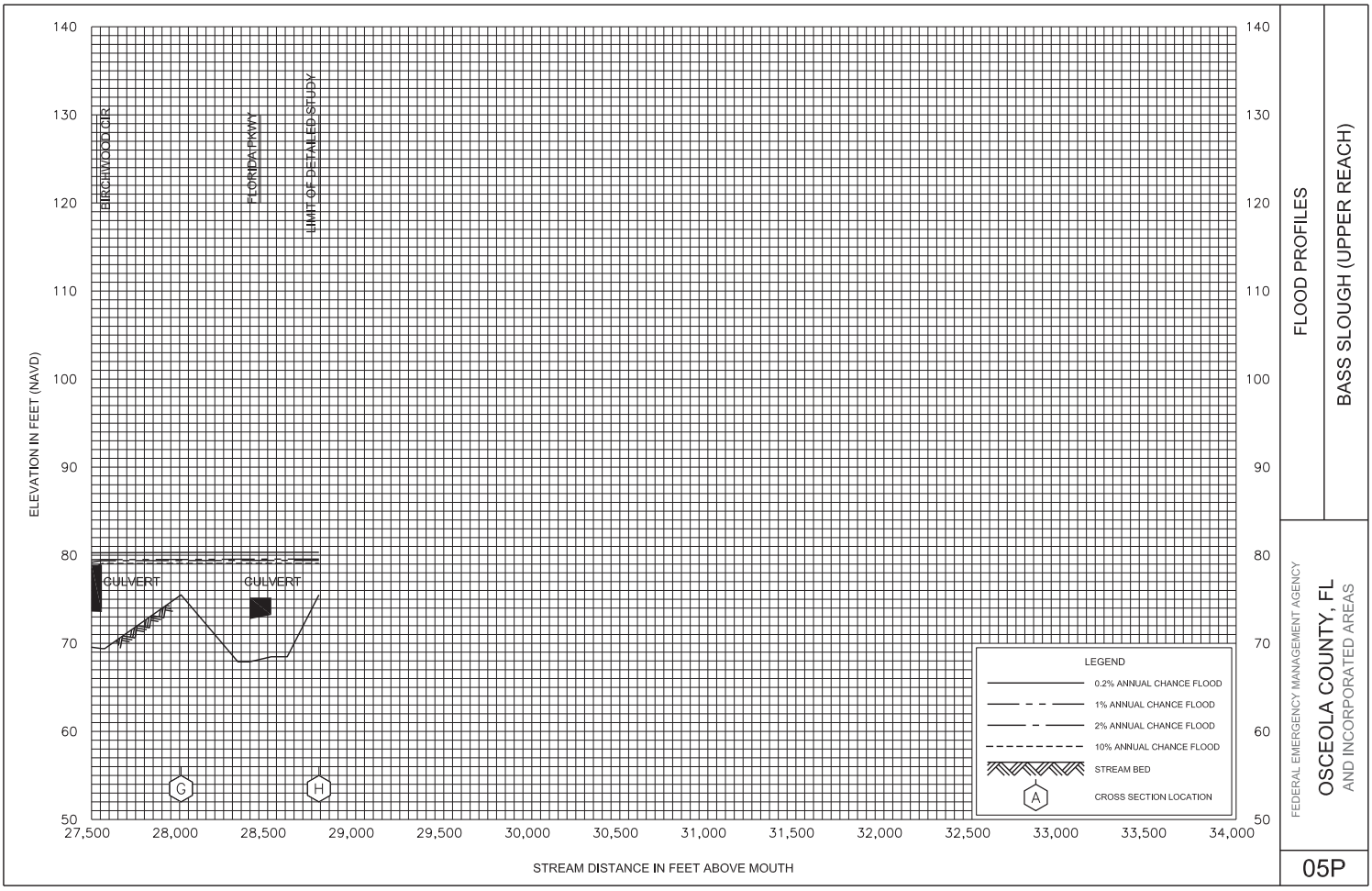
STREAM DISTANCE IN FEET ABOVE MOUTH
DAM
CONFLUENCE OF BASS SLOUGH TRIBUTARY
UNNAMED RD
BIRCHWOOD CIR
CULVERT
CULVERT
A
B
C
D
E
F
LEGEND
0.2% ANNUAL CHANCE FLOOD
1% ANNUAL CHANCE FLOOD
2% ANNUAL CHANCE FLOOD
10% ANNUAL CHANCE FLOOD
STREAM BED
CROSS SECTION LOCATION
FLOOD PROFILES
BASS SLOUGH (UPPER REACH)
FEDERAL EMERGENCY MANAGEMENT AGENCY
OSCEOLA COUNTY, FL
AND INCORPORATED AREAS
04P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STREAM DISTANCE IN FEET ABOVE MOUTH
BIRCHWOOD CIR
FLORIDA PKWY
LIMIT OF DETAILED STUDY
CULVERT
CULVERT
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H
LEGEND
0.2% ANNUAL CHANCE FLOOD
1% ANNUAL CHANCE FLOOD
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STREAM BED
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CROSS SECTION LOCATION
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OSCEOLA COUNTY, FL
AND INCORPORATED AREAS
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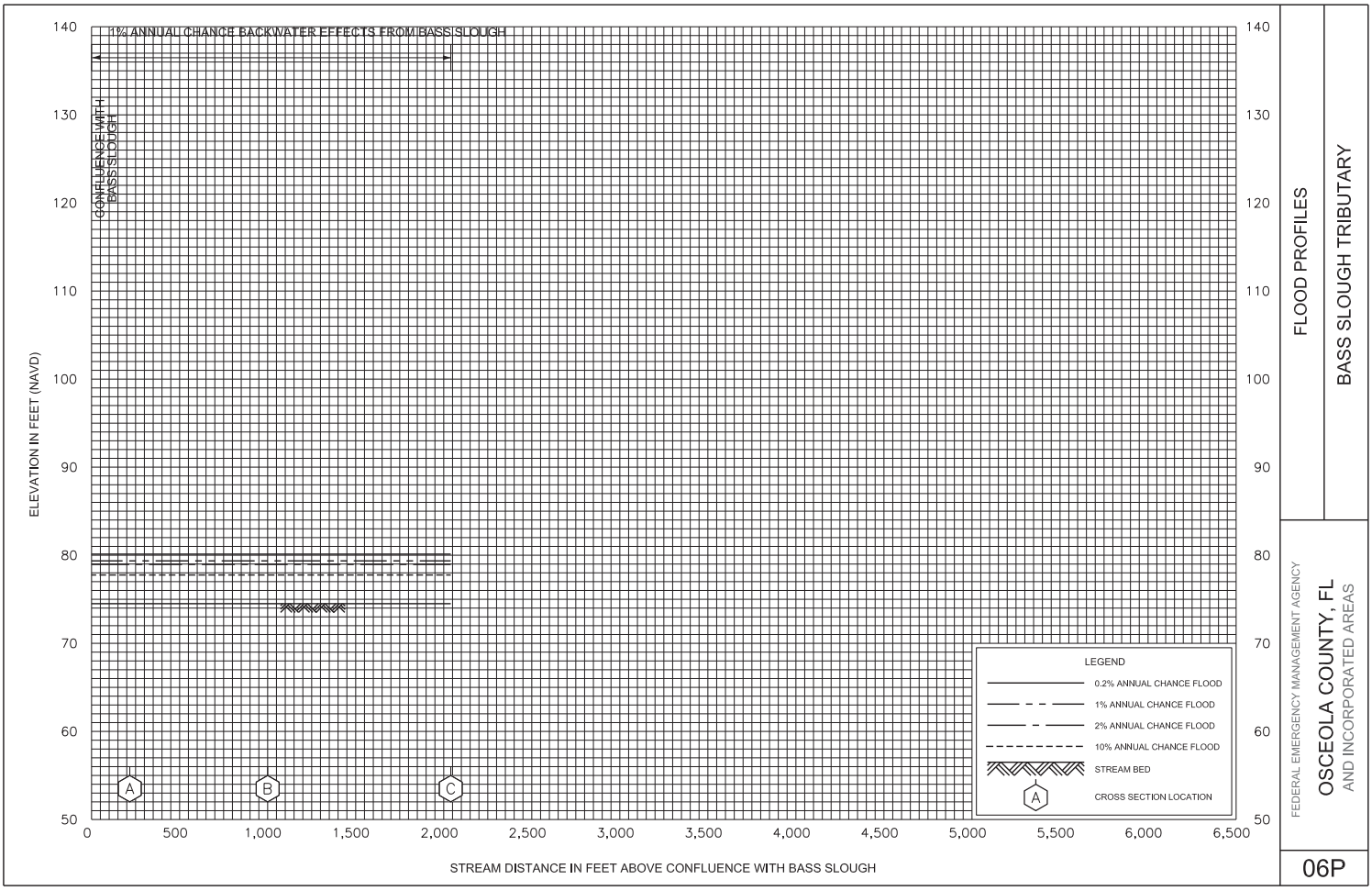
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CONFLUENCE WITH BASS SLOUGH
ELEVATION IN FEET (NAVD)
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100
90
80
70
60
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1,000
1,500
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5,000
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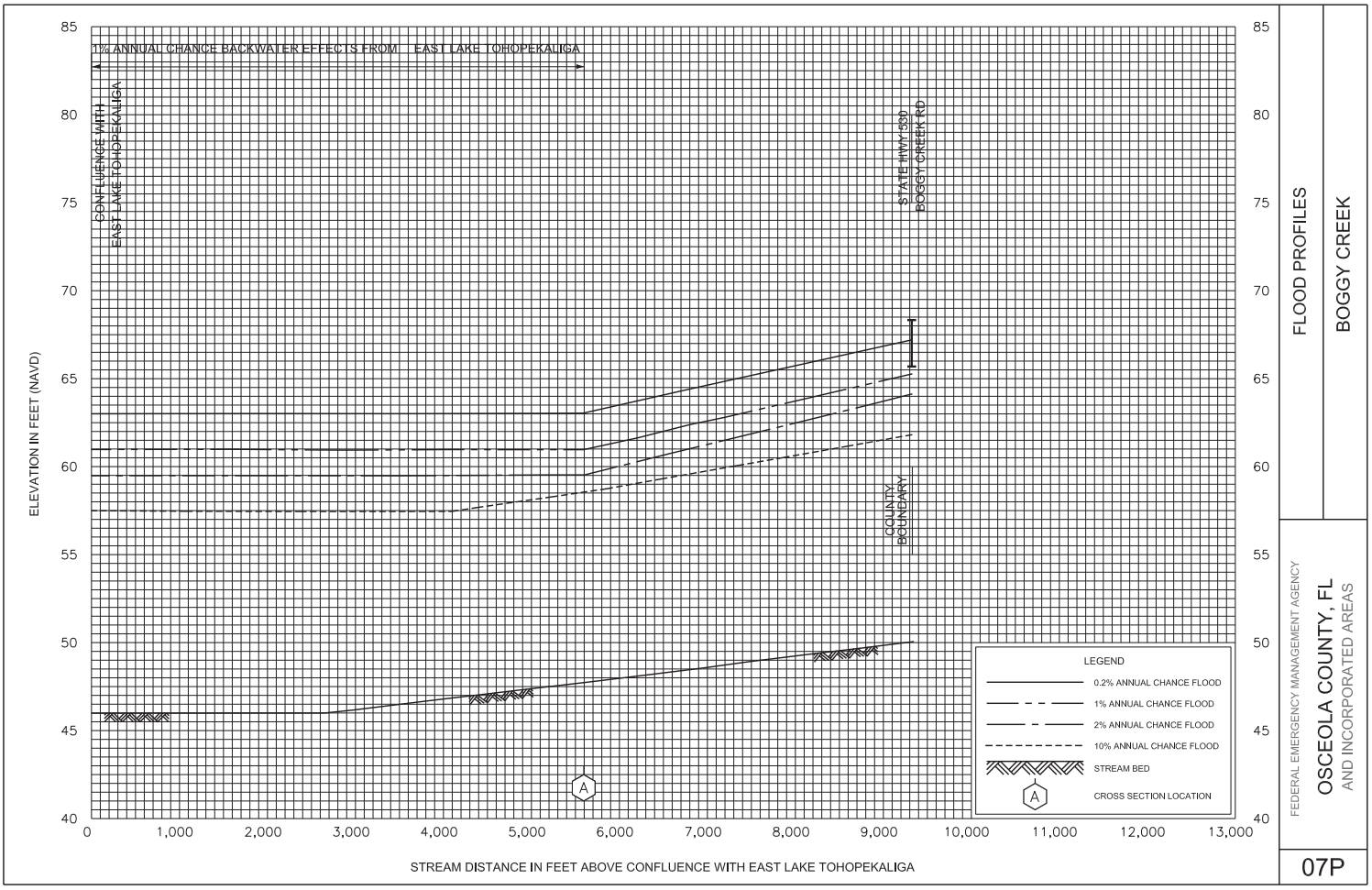
STREAM DISTANCE IN FEET ABOVE CONFLUENCE WITH BASS SLOUGH
A
B
C
LEGEND
0.2% ANNUAL CHANCE FLOOD
1% ANNUAL CHANCE FLOOD
2% ANNUAL CHANCE FLOOD
10% ANNUAL CHANCE FLOOD
STREAM BED
A
CROSS SECTION LOCATION
FLOOD PROFILES
BASS SLOUGH TRIBUTARY
FEDERAL EMERGENCY MANAGEMENT AGENCY
OSCEOLA COUNTY, FL
AND INCORPORATED AREAS
06P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CONFLUENCE WITH EAST LAKE TOHOPEKALIGA
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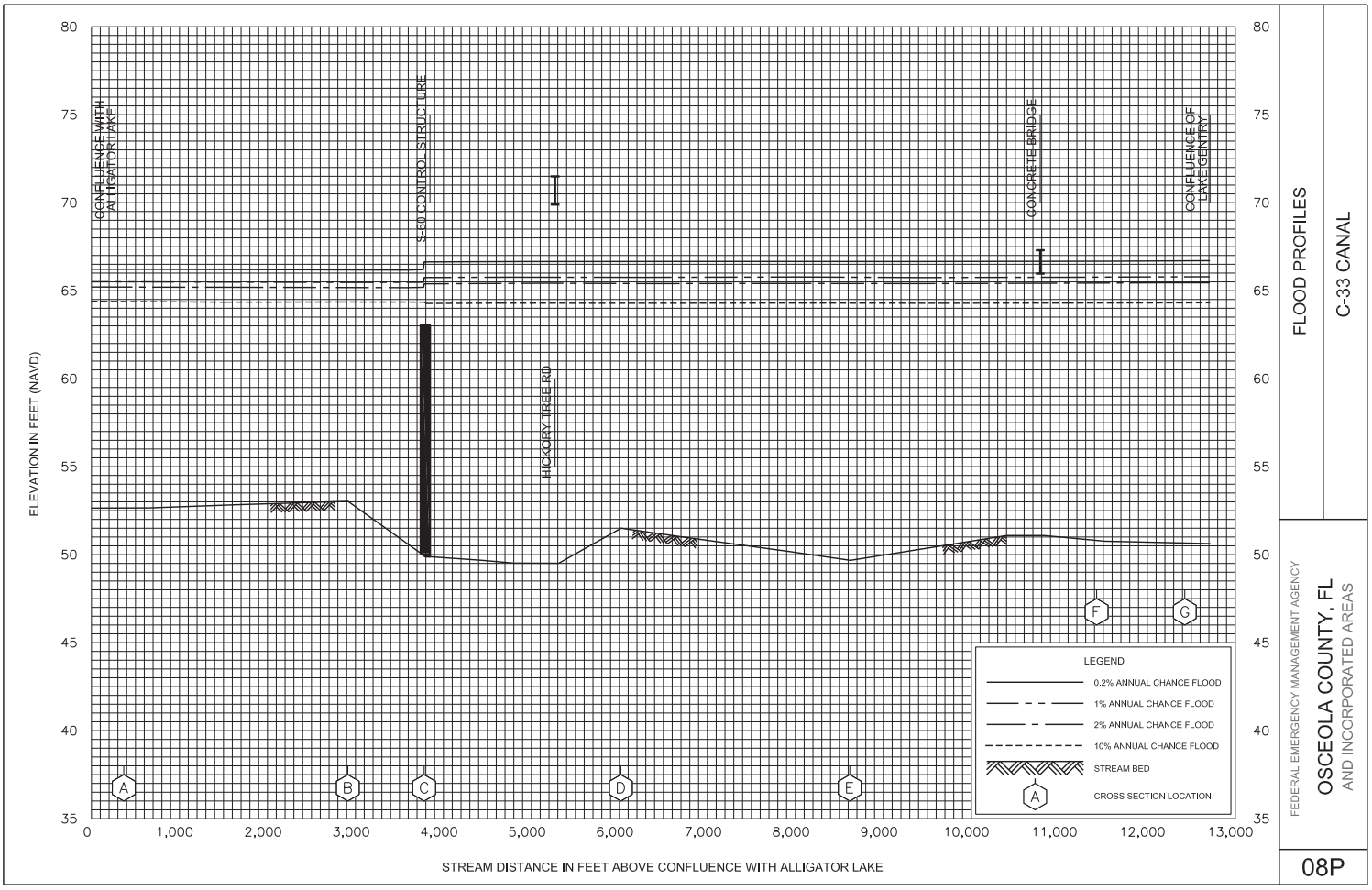
COUNTY BOUNDARY
ELEVATION IN FEET (NAVD)
STREAM DISTANCE IN FEET ABOVE CONFLUENCE WITH EAST LAKE TOHOPEKALIGA
LEGEND
0.2% ANNUAL CHANCE FLOOD
1% ANNUAL CHANCE FLOOD
2% ANNUAL CHANCE FLOOD
10% ANNUAL CHANCE FLOOD
STREAM BED
CROSS SECTION LOCATION
A
FLOOD PROFILES
BOGGY CREEK
FEDERAL EMERGENCY MANAGEMENT AGENCY
OSCEOLA COUNTY, FL
AND INCORPORATED AREAS
07P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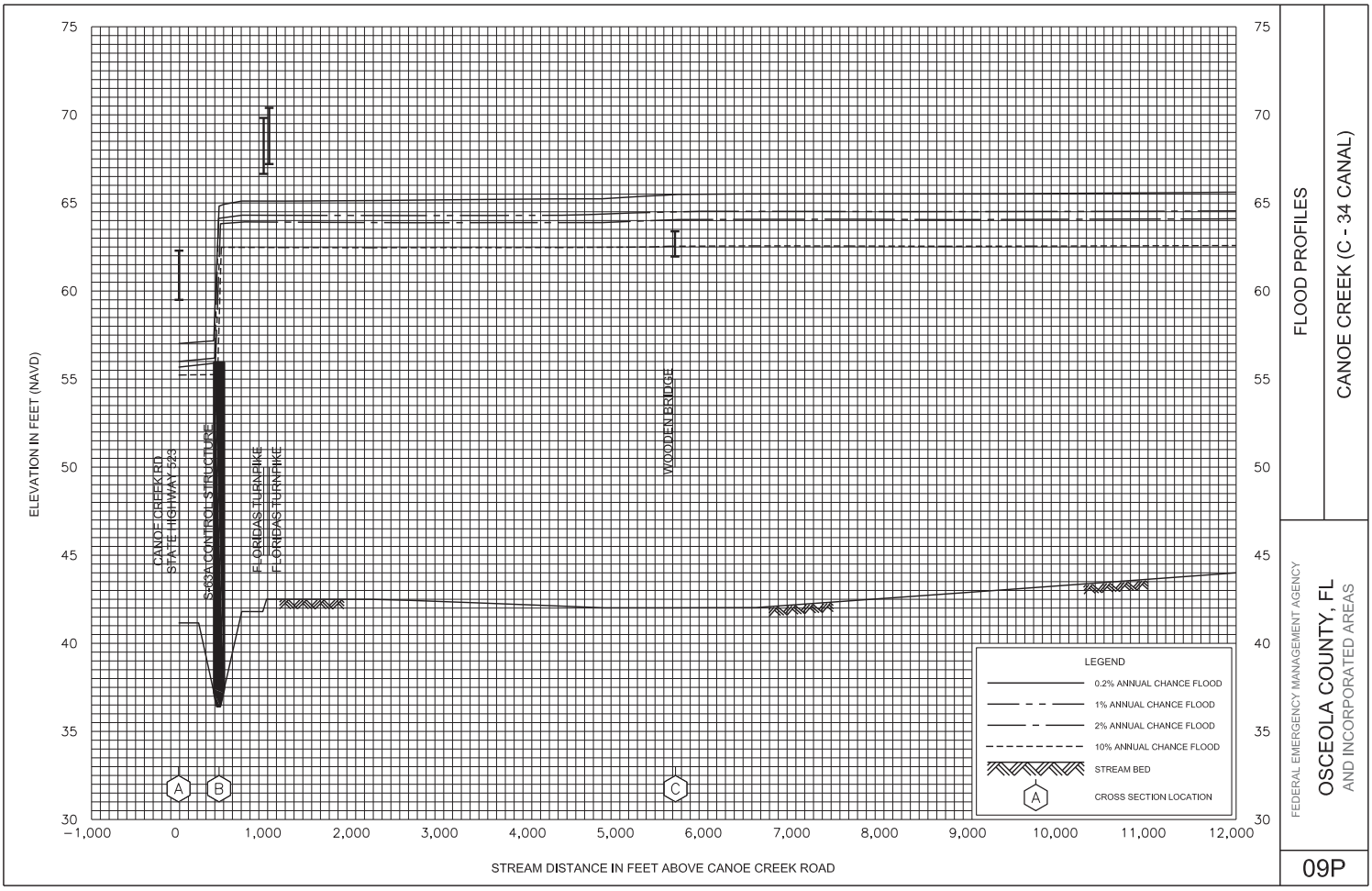
5,000
6,000
7,000
8,000
9,000
10,000
11,000
12,000
13,000
STREAM DISTANCE IN FEET ABOVE CONFLUENCE WITH ALLIGATOR LAKE
CONFLUENCE WITH ALLIGATOR LAKE
S-60 CONTROL STRUCTURE
HICKORY TREE RD
CONCRETE BRIDGE
CONFLUENCE OF LAKE GENTRY
A
B
C
D
E
F
G
LEGEND
0.2% ANNUAL CHANCE FLOOD
1% ANNUAL CHANCE FLOOD
2% ANNUAL CHANCE FLOOD
10% ANNUAL CHANCE FLOOD
STREAM BED
CROSS SECTION LOCATION
FLOOD PROFILES
C-33 CANAL
FEDERAL EMERGENCY MANAGEMENT AGENCY
OSCEOLA COUNTY, FL
AND INCORPORATED AREAS
08P



FLOOD PROFILES

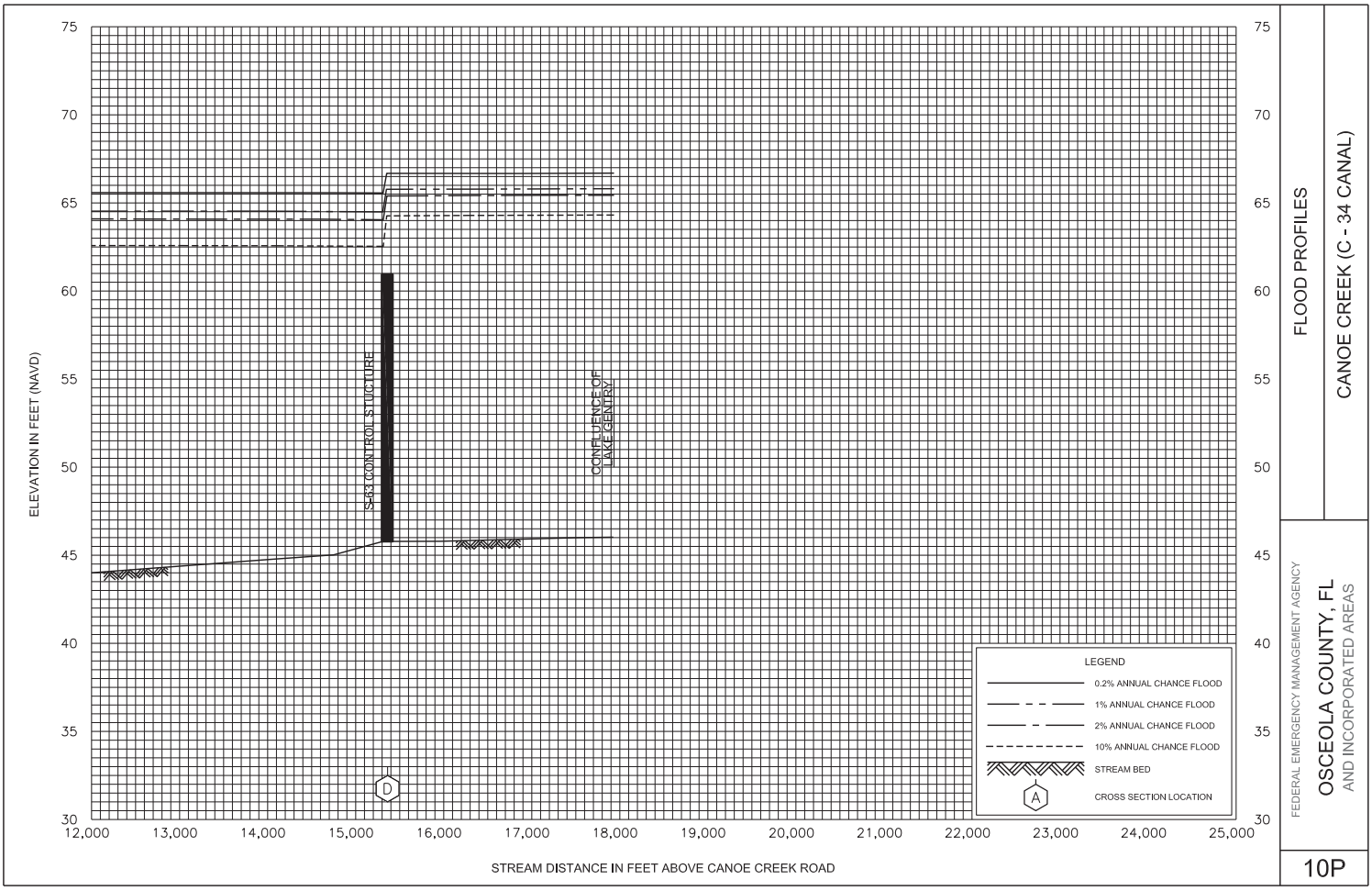
CANOE CREEK (C - 34 CANAL)

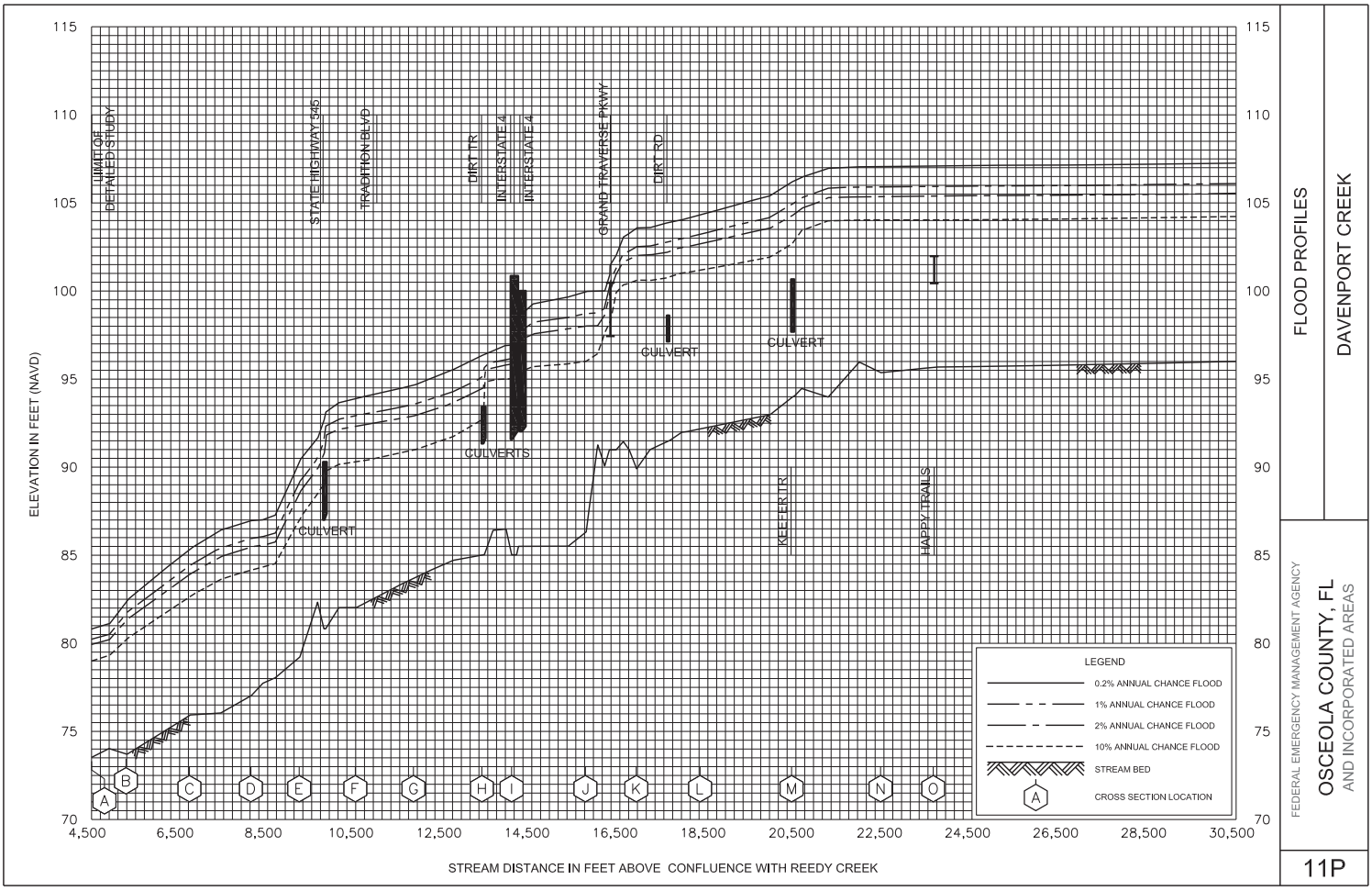
FEDERAL EMERGENCY MANAGEMENT AGENCY

OSCEOLA COUNTY, FL

AND INCORPORATED AREAS

09P


ELEVATION IN FEET (NAVD)
75
70
65
60
55
50
45
40
35
30
12,000
13,000
14,000
15,000
16,000
17,000
18,000
19,000
20,000
21,000
22,000
23,000
24,000
25,000
STREAM DISTANCE IN FEET ABOVE CANOE CREEK ROAD
S-63 CONTROL STUCTURE
CONFLUENCE OF LAKE GENTRY
D
LEGEND
0.2% ANNUAL CHANCE FLOOD
1% ANNUAL CHANCE FLOOD
2% ANNUAL CHANCE FLOOD
10% ANNUAL CHANCE FLOOD
STREAM BED
A
CROSS SECTION LOCATION
FLOOD PROFILES
CANOE CREEK (C - 34 CANAL)
FEDERAL EMERGENCY MANAGEMENT AGENCY
OSCEOLA COUNTY, FL
AND INCORPORATED AREAS
10P



FLOOD PROFILES

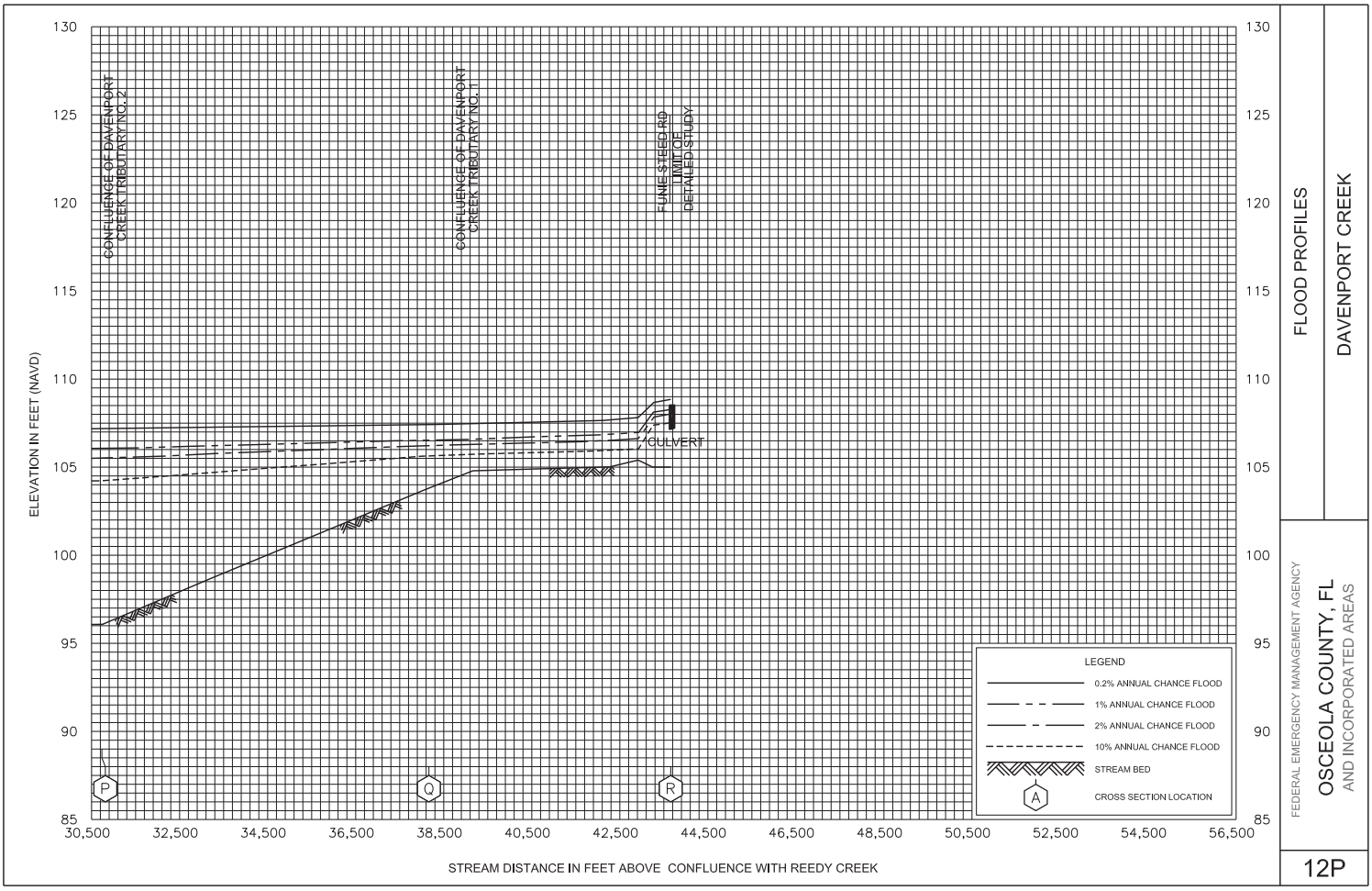
DAVENPORT CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

OSCEOLA COUNTY, FL

AND INCORPORATED AREAS

11P



FLOOD PROFILES

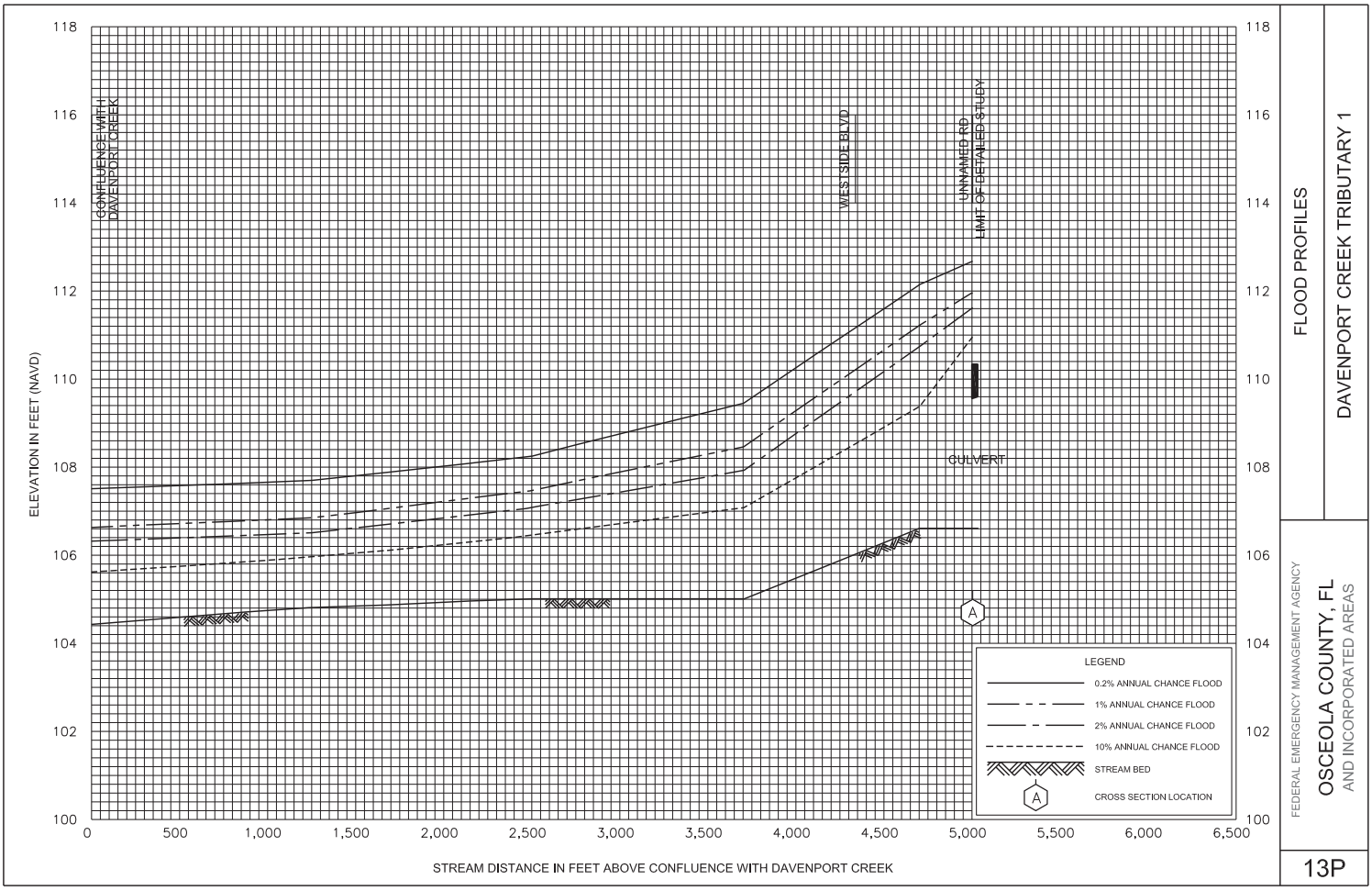
DAVENPORT CREEK

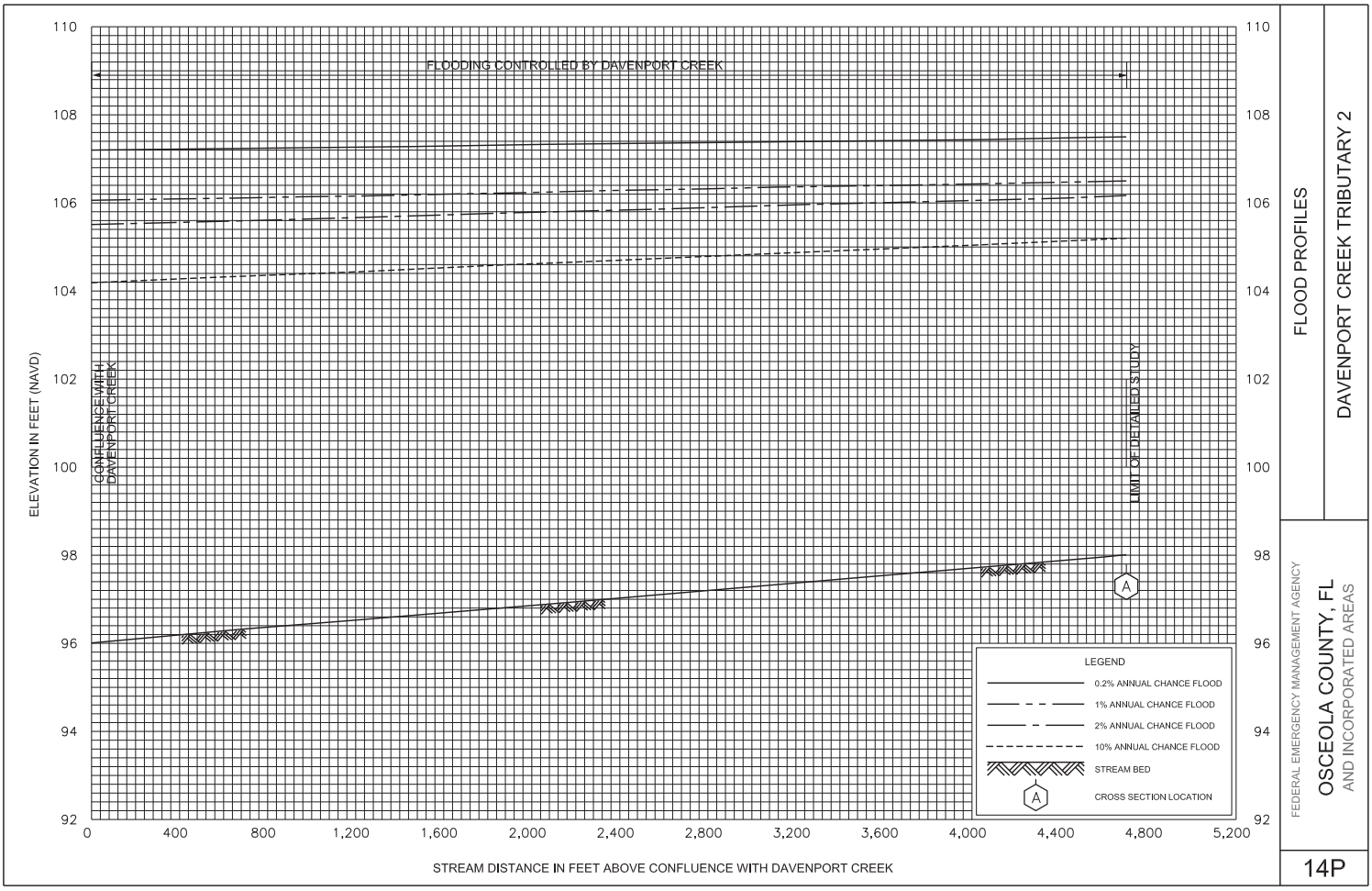
FEDERAL EMERGENCY MANAGEMENT AGENCY

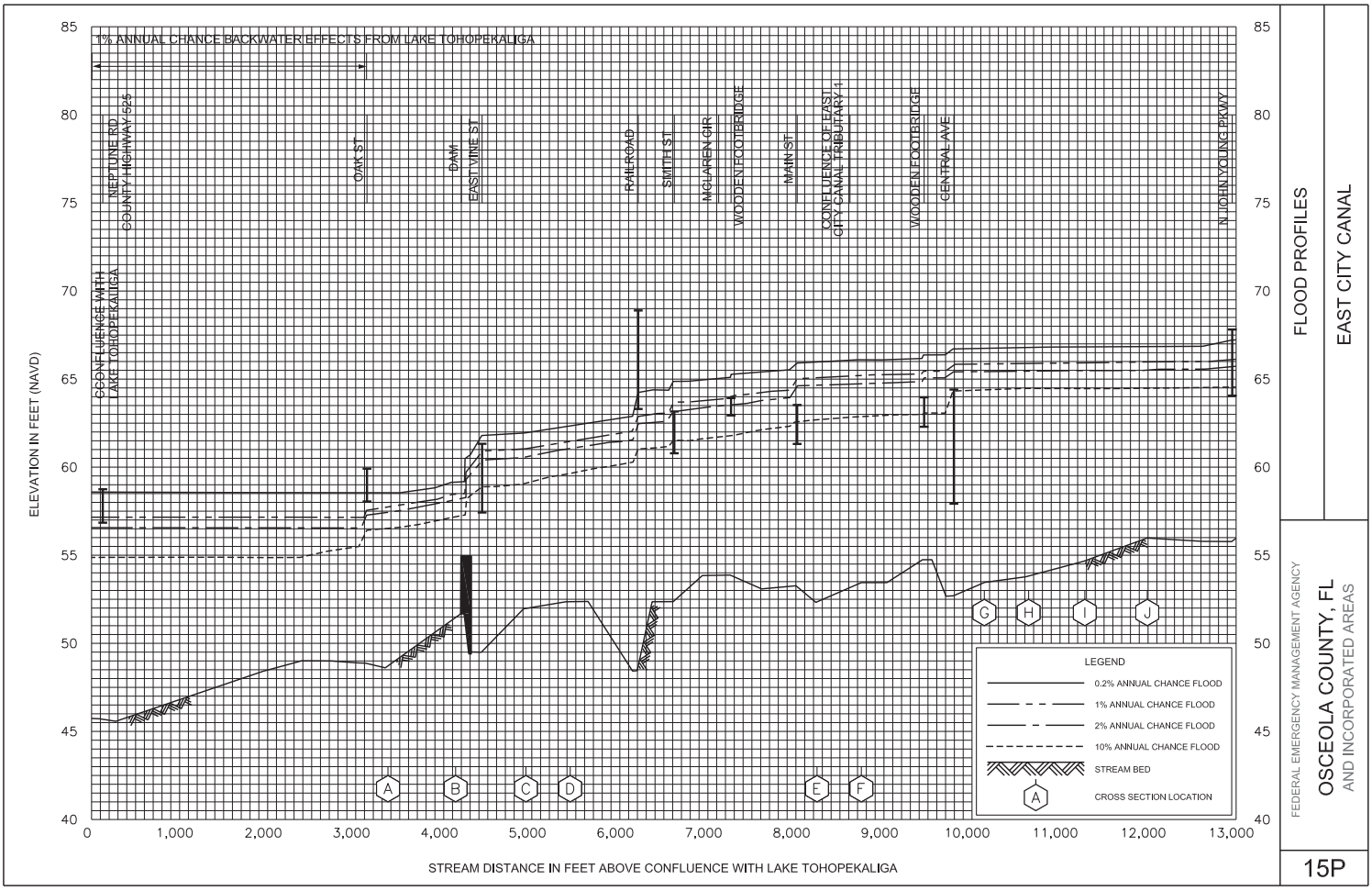
OSCEOLA COUNTY, FL

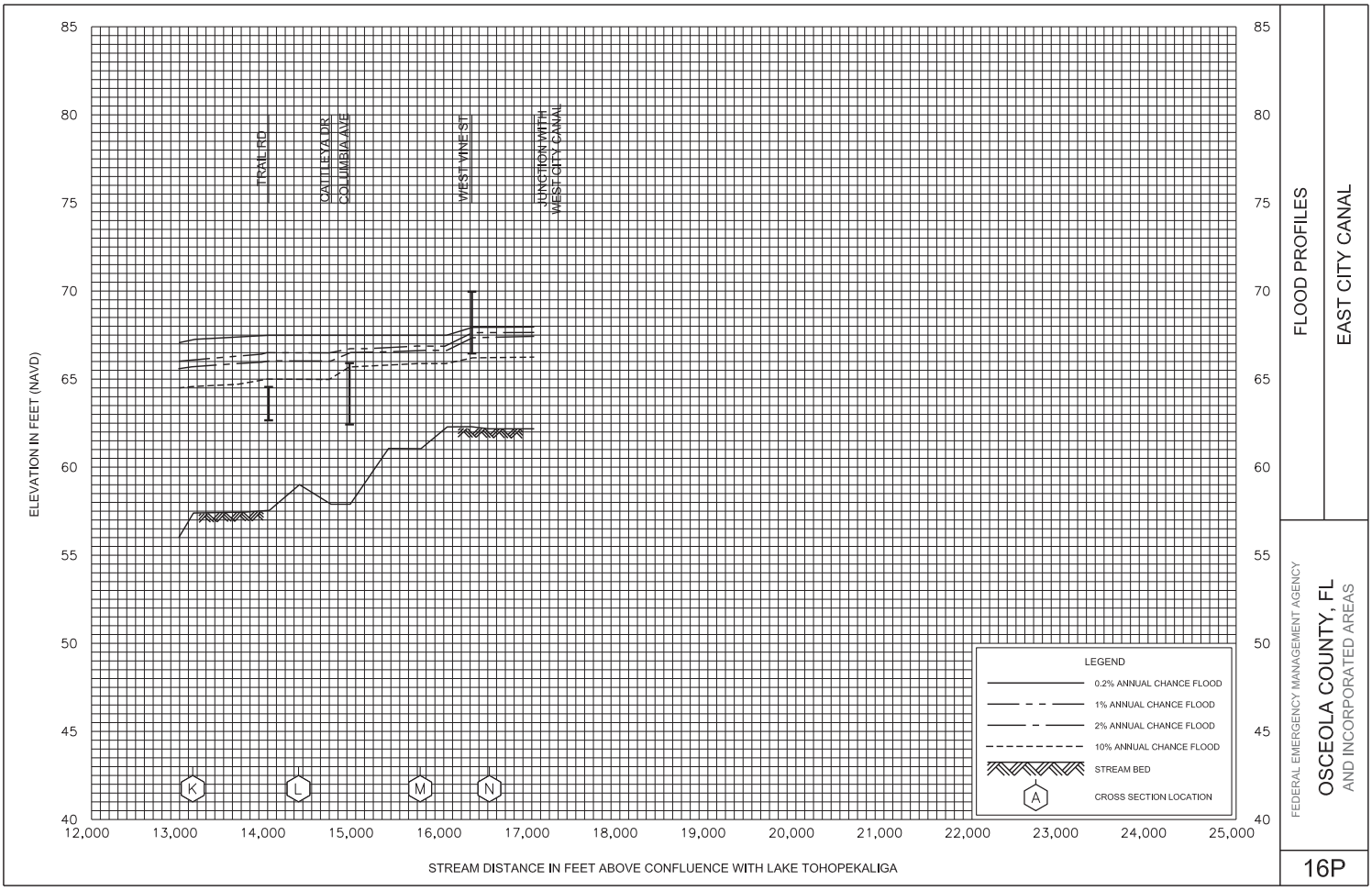
AND INCORPORATED AREAS

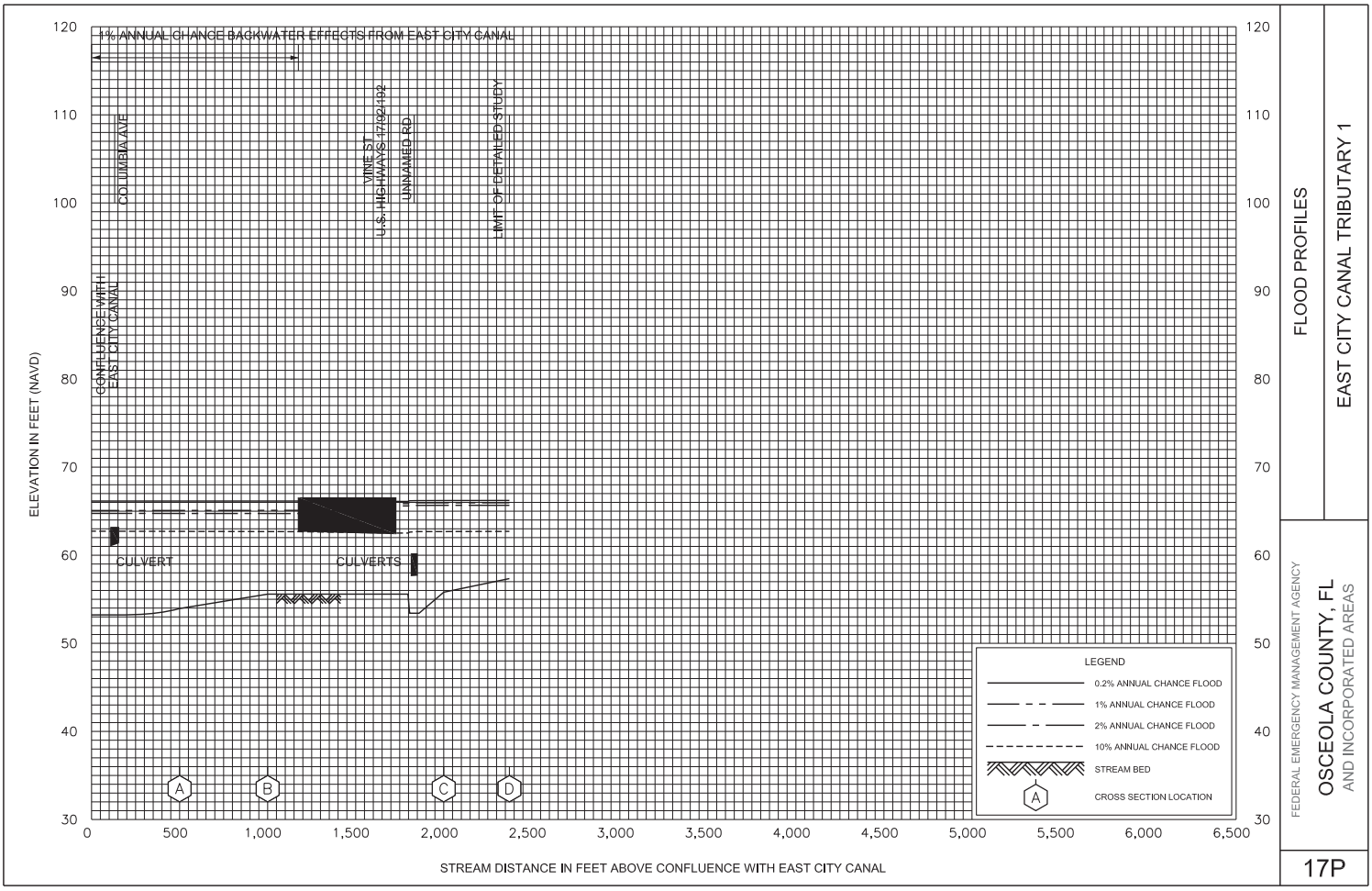
12P


ELEVATION IN FEET (NAVD)
118
116
114
112
110
108
106
104
102
100
0
500
1,000
1,500
2,000
2,500
3,000
3,500
4,000
4,500
5,000
5,500
6,000
6,500
STREAM DISTANCE IN FEET ABOVE CONFLUENCE WITH DAVENPORT CREEK
CONFLUENCE WITH DAVENPORT CREEK
WEST SIDE BLVD
UNNAMED RD
LIMIT OF DETAILED STUDY
CULVERT
A
LEGEND
0.2% ANNUAL CHANCE FLOOD
1% ANNUAL CHANCE FLOOD
2% ANNUAL CHANCE FLOOD
10% ANNUAL CHANCE FLOOD
STREAM BED
CROSS SECTION LOCATION
FLOOD PROFILES
DAVENPORT CREEK TRIBUTARY 1
FEDERAL EMERGENCY MANAGEMENT AGENCY
OSCEOLA COUNTY, FL
AND INCORPORATED AREAS
13P


FLOODING CONTROLLED BY DAVENPORT CREEK
CONFLUENCE WITH DAVENPORT CREEK
LIMIT OF DETAILED STUDY
ELEVATION IN FEET (NAVD)
STREAM DISTANCE IN FEET ABOVE CONFLUENCE WITH DAVENPORT CREEK
110
108
106
104
102
100
98
96
94
92
0
400
800
1,200
1,600
2,000
2,400
2,800
3,200
3,600
4,000
4,400
4,800
5,200
A
LEGEND
0.2% ANNUAL CHANCE FLOOD
1% ANNUAL CHANCE FLOOD
2% ANNUAL CHANCE FLOOD
10% ANNUAL CHANCE FLOOD
STREAM BED
CROSS SECTION LOCATION
FLOOD PROFILES
DAVENPORT CREEK TRIBUTARY 2
FEDERAL EMERGENCY MANAGEMENT AGENCY
OSCEOLA COUNTY, FL
AND INCORPORATED AREAS
14P


1% ANNUAL CHANCE BACKWATER EFFECTS FROM LAKE TOHOPEKALIGA
CONFLUENCE WITH LAKE TOHOPEKALIGA
NEPTUNE RD
COUNTY HIGHWAY 525
OAK ST
DAM
EAST VINE ST
RAILROAD
SMITH ST
MCLAREN CIR
WOODEN FOOTBRIDGE
MAIN ST
CONFLUENCE OF EAST CITY CANAL TRIBUTARY 11
WOODEN FOOTBRIDGE
CENTRAL AVE
N JOHN YOUNG PKWY
ELEVATION IN FEET (NAVD)
STREAM DISTANCE IN FEET ABOVE CONFLUENCE WITH LAKE TOHOPEKALIGA
LEGEND
0.2% ANNUAL CHANCE FLOOD
1% ANNUAL CHANCE FLOOD
2% ANNUAL CHANCE FLOOD
10% ANNUAL CHANCE FLOOD
STREAM BED
CROSS SECTION LOCATION
FLOOD PROFILES
EAST CITY CANAL
FEDERAL EMERGENCY MANAGEMENT AGENCY
OSCEOLA COUNTY, FL
AND INCORPORATED AREAS
15P


ELEVATION IN FEET (NAVD)
85
80
75
70
65
60
55
50
45
40
12,000
13,000
14,000
15,000
16,000
17,000
18,000
19,000
20,000
21,000
22,000
23,000
24,000
25,000
STREAM DISTANCE IN FEET ABOVE CONFLUENCE WITH LAKE TOHOPEKALIGA
TRAIL RD
CATTLEYA DR
COLUMBIA AVE
WEST VINE ST
JUNCTION WITH WEST CITY CANAL
K
L
M
N
LEGEND
0.2% ANNUAL CHANCE FLOOD
1% ANNUAL CHANCE FLOOD
2% ANNUAL CHANCE FLOOD
10% ANNUAL CHANCE FLOOD
STREAM BED
A
CROSS SECTION LOCATION
FLOOD PROFILES
EAST CITY CANAL
FEDERAL EMERGENCY MANAGEMENT AGENCY
OSCEOLA COUNTY, FL
AND INCORPORATED AREAS
16P



FLOOD PROFILES

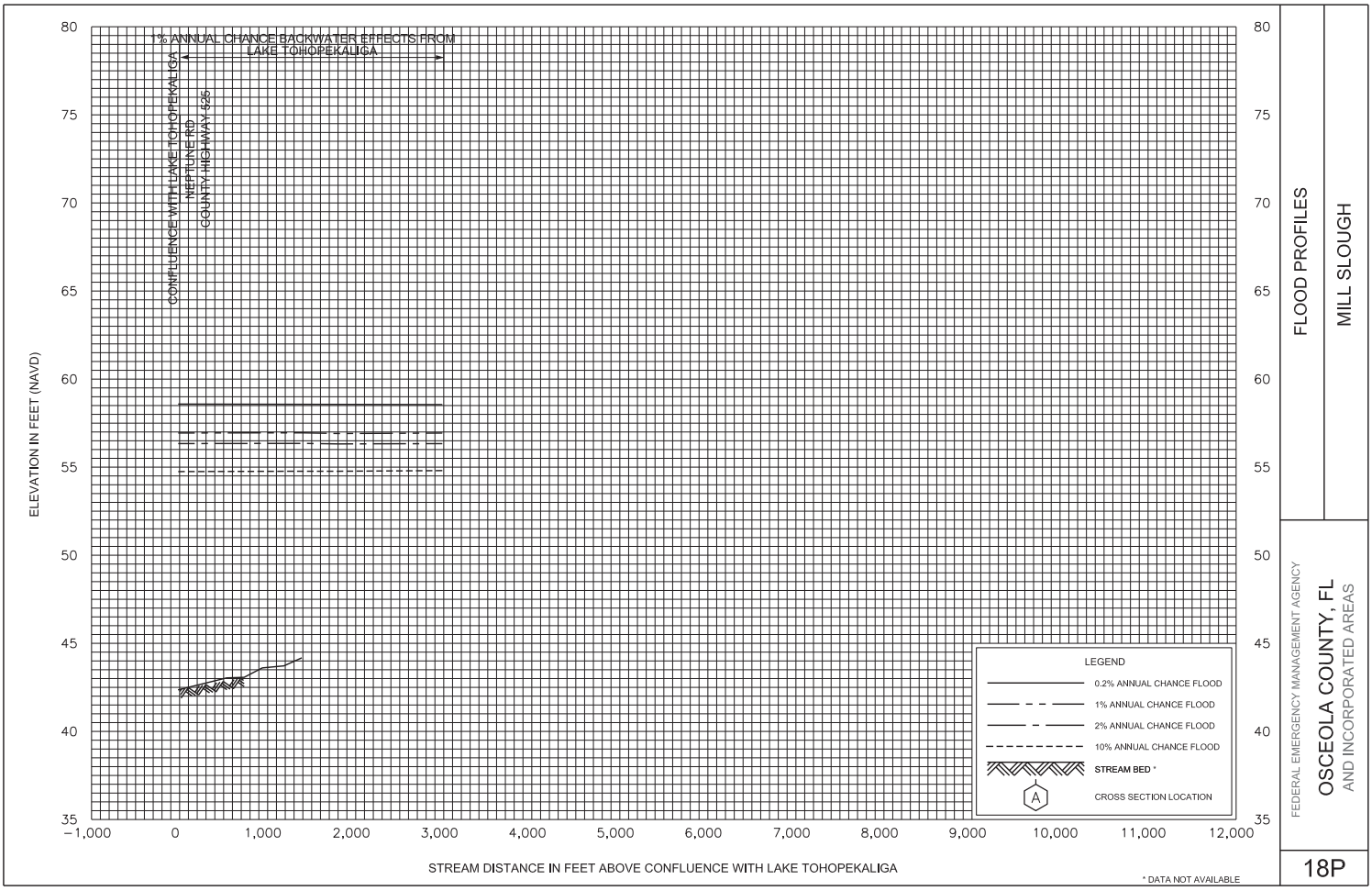
EAST CITY CANAL TRIBUTARY 1

FEDERAL EMERGENCY MANAGEMENT AGENCY

OSCEOLA COUNTY, FL

AND INCORPORATED AREAS

17P



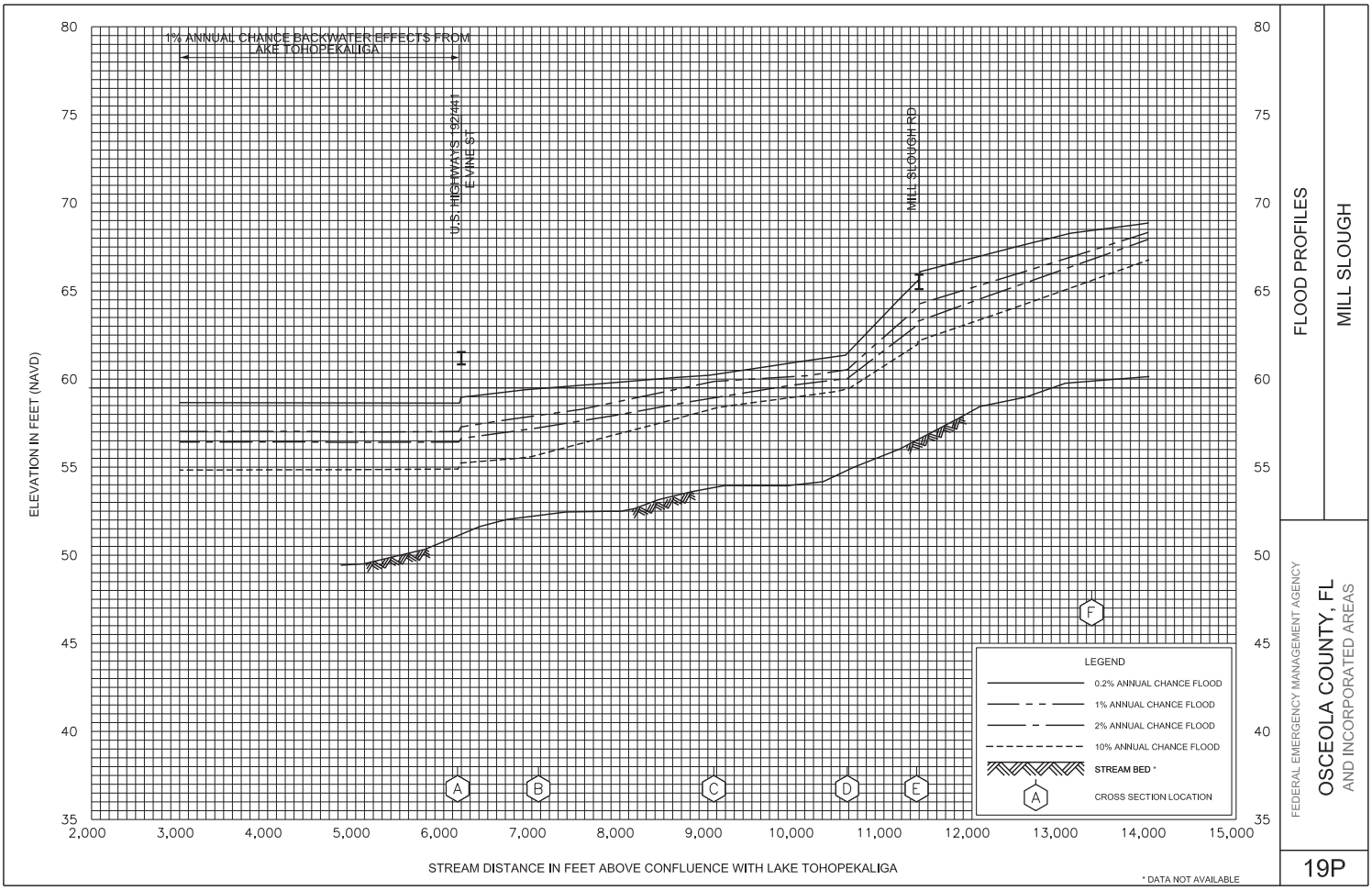
FLOOD PROFILES

MILL SLOUGH

FEDERAL EMERGENCY MANAGEMENT AGENCY

OSCEOLA COUNTY, FL
AND INCORPORATED AREAS

18P



FLOOD PROFILES

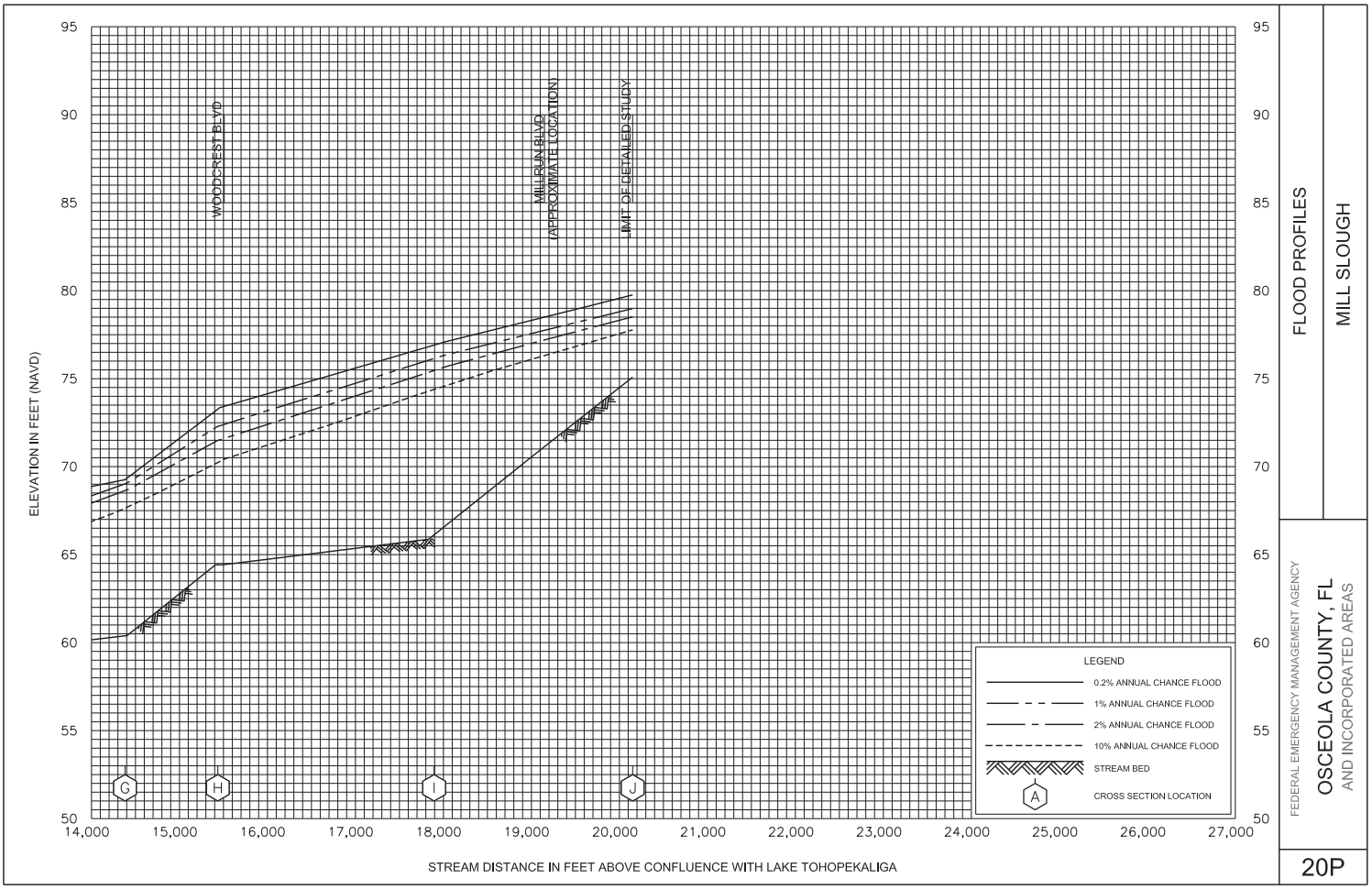
MILL SLOUGH

FEDERAL EMERGENCY MANAGEMENT AGENCY

OSCEOLA COUNTY, FL

AND INCORPORATED AREAS

19P



FLOOD PROFILES

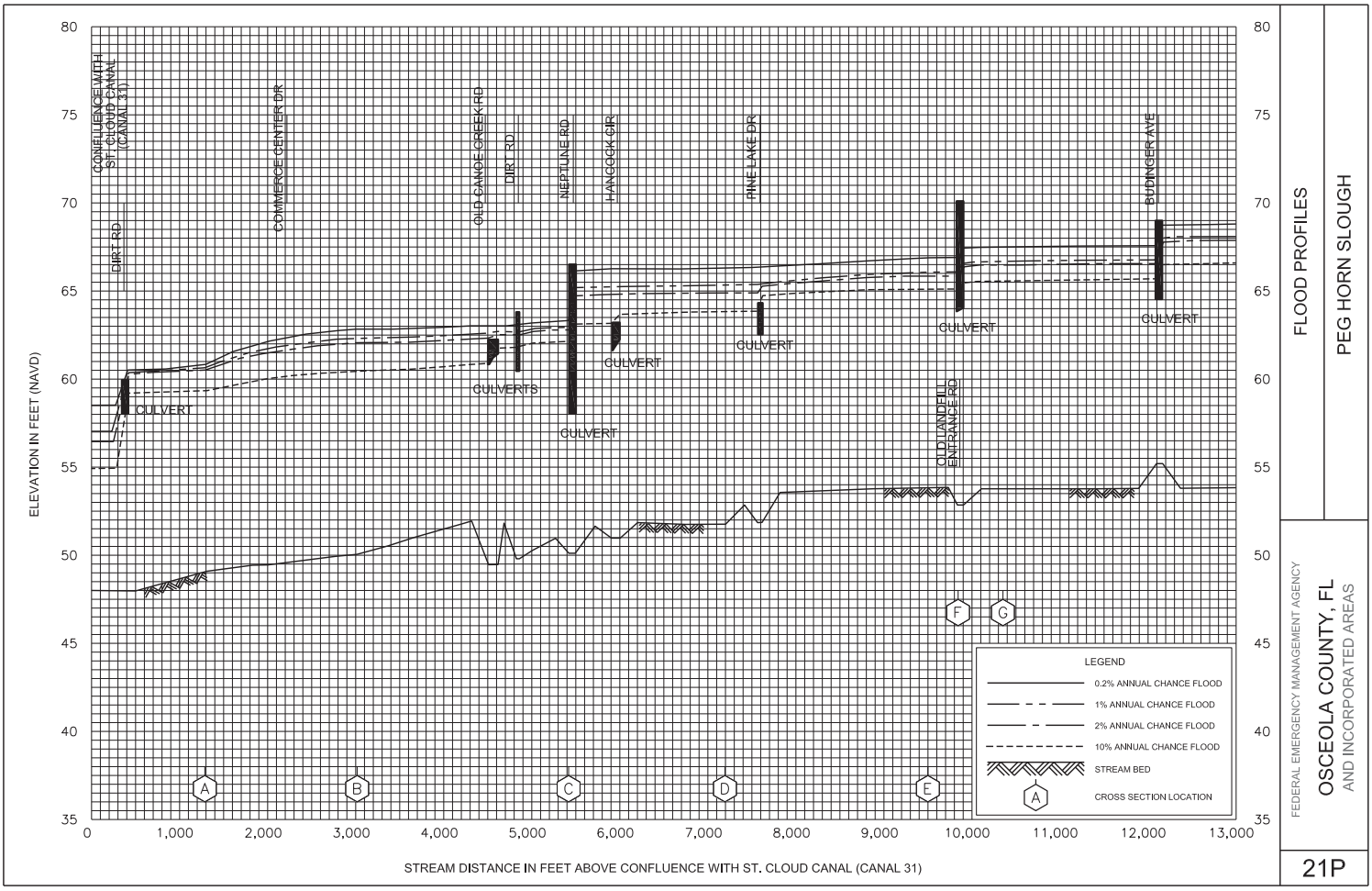
MILL SLOUGH

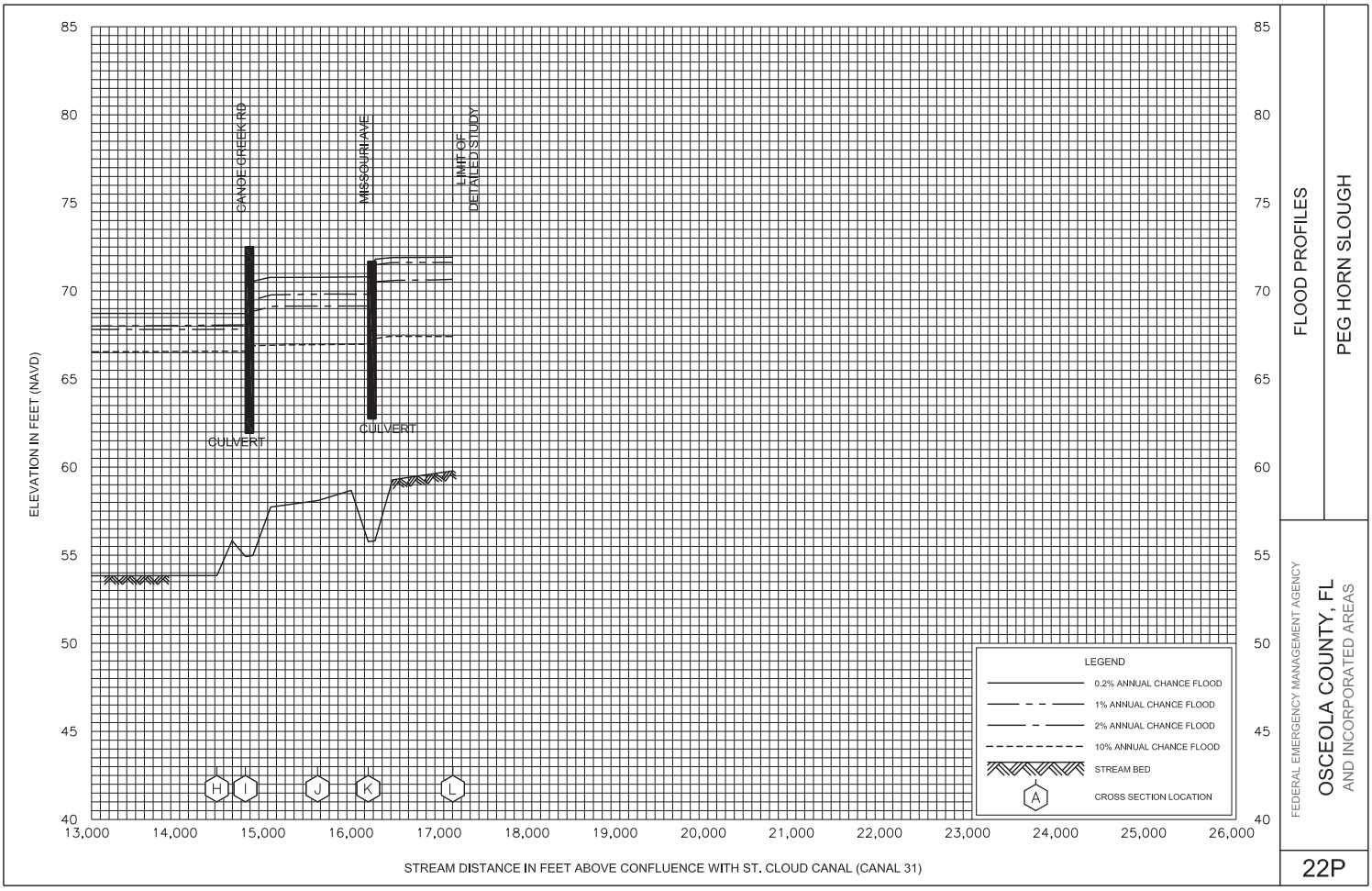
FEDERAL EMERGENCY MANAGEMENT AGENCY

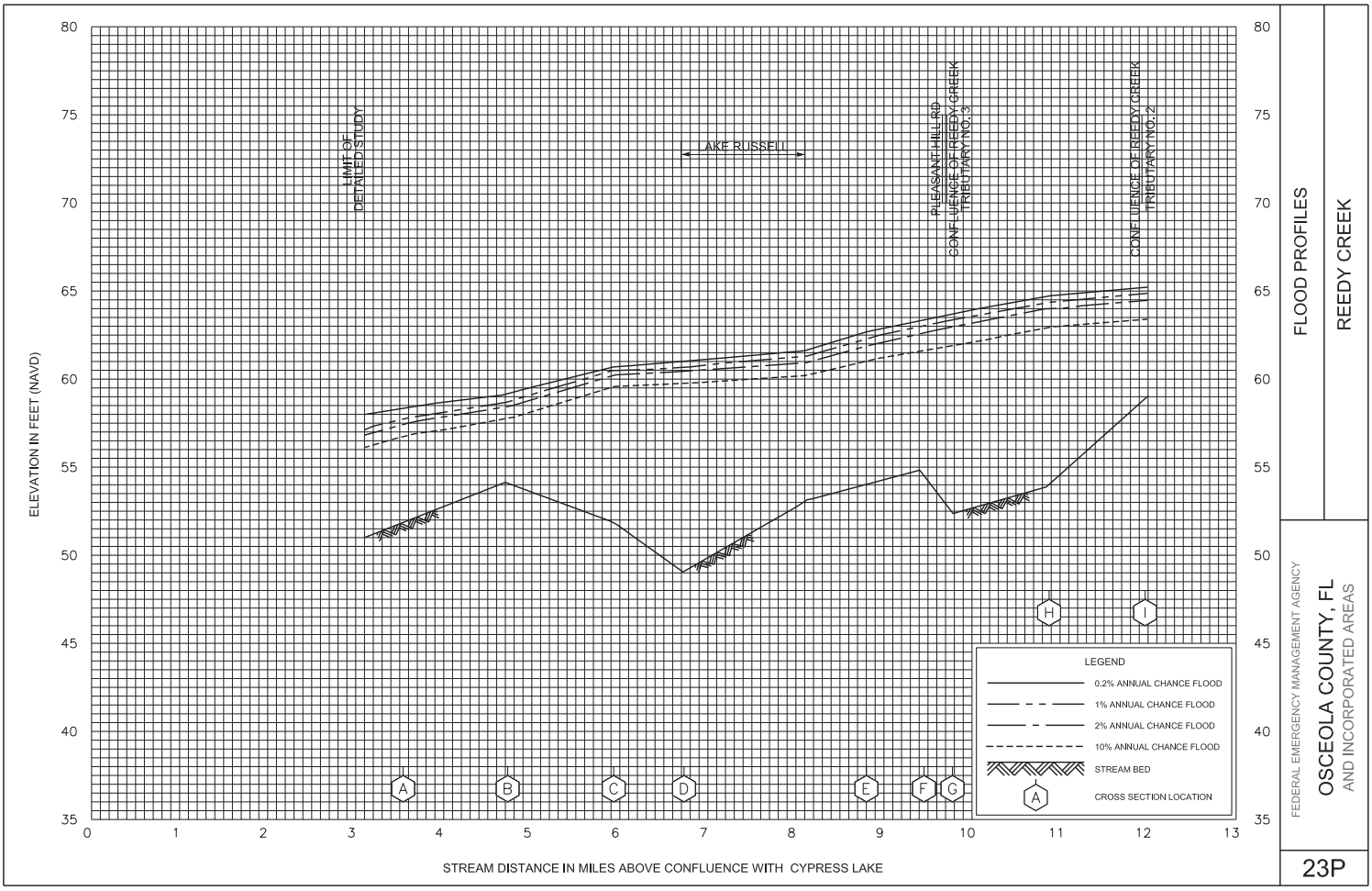
OSCEOLA COUNTY, FL

AND INCORPORATED AREAS

20P


ELEVATION IN FEET (NAVD)
STREAM DISTANCE IN FEET ABOVE CONFLUENCE WITH ST. CLOUD CANAL (CANAL 31)
CONFLUENCE WITH ST. CLOUD CANAL (CANAL 31)
DIRT RD
COMMERCE CENTER DR
OLD CANOE CREEK RD
DIRT RD
NEPTUNE RD
HANCOCK DR
PINE LAKE DR
BUDINGER AVE
CULVERT
CULVERTS
CULVERT
CULVERT
CULVERT
CULVERT
CULVERT
CUT/LANDFILL ENTRANCE RD
A
B
C
D
E
F
G
LEGEND
0.2% ANNUAL CHANCE FLOOD
1% ANNUAL CHANCE FLOOD
2% ANNUAL CHANCE FLOOD
10% ANNUAL CHANCE FLOOD
STREAM BED
CROSS SECTION LOCATION
FLOOD PROFILES
PEG HORN SLOUGH
FEDERAL EMERGENCY MANAGEMENT AGENCY
OSCEOLA COUNTY, FL
AND INCORPORATED AREAS
21P


85
80
75
70
65
60
55
50
45
40
ELEVATION IN FEET (NAVD)
13,000
14,000
15,000
16,000
17,000
18,000
19,000
20,000
21,000
22,000
23,000
24,000
25,000
26,000
STREAM DISTANCE IN FEET ABOVE CONFLUENCE WITH ST. CLOUD CANAL (CANAL 31)
GANDY CREEK RD
MISSOURI AVE
LIMIT OF DETAILED STUDY
CULVERT
CULVERT
H
I
J
K
L
LEGEND
0.2% ANNUAL CHANCE FLOOD
1% ANNUAL CHANCE FLOOD
2% ANNUAL CHANCE FLOOD
10% ANNUAL CHANCE FLOOD
STREAM BED
A
CROSS SECTION LOCATION
FLOOD PROFILES
PEG HORN SLOUGH
FEDERAL EMERGENCY MANAGEMENT AGENCY
OSCEOLA COUNTY, FL
AND INCORPORATED AREAS
22P



FLOOD PROFILES

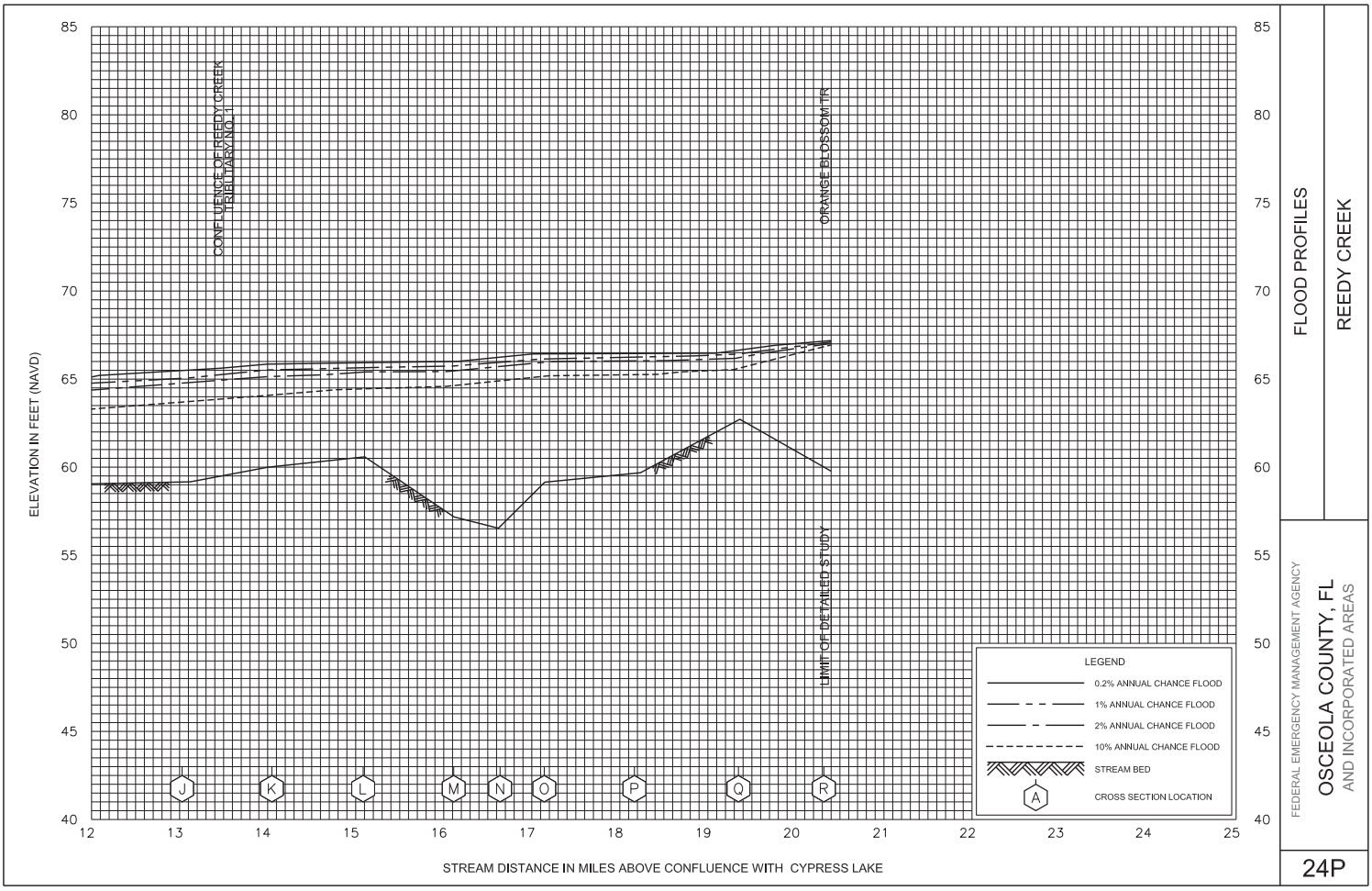
REEDY CREEK

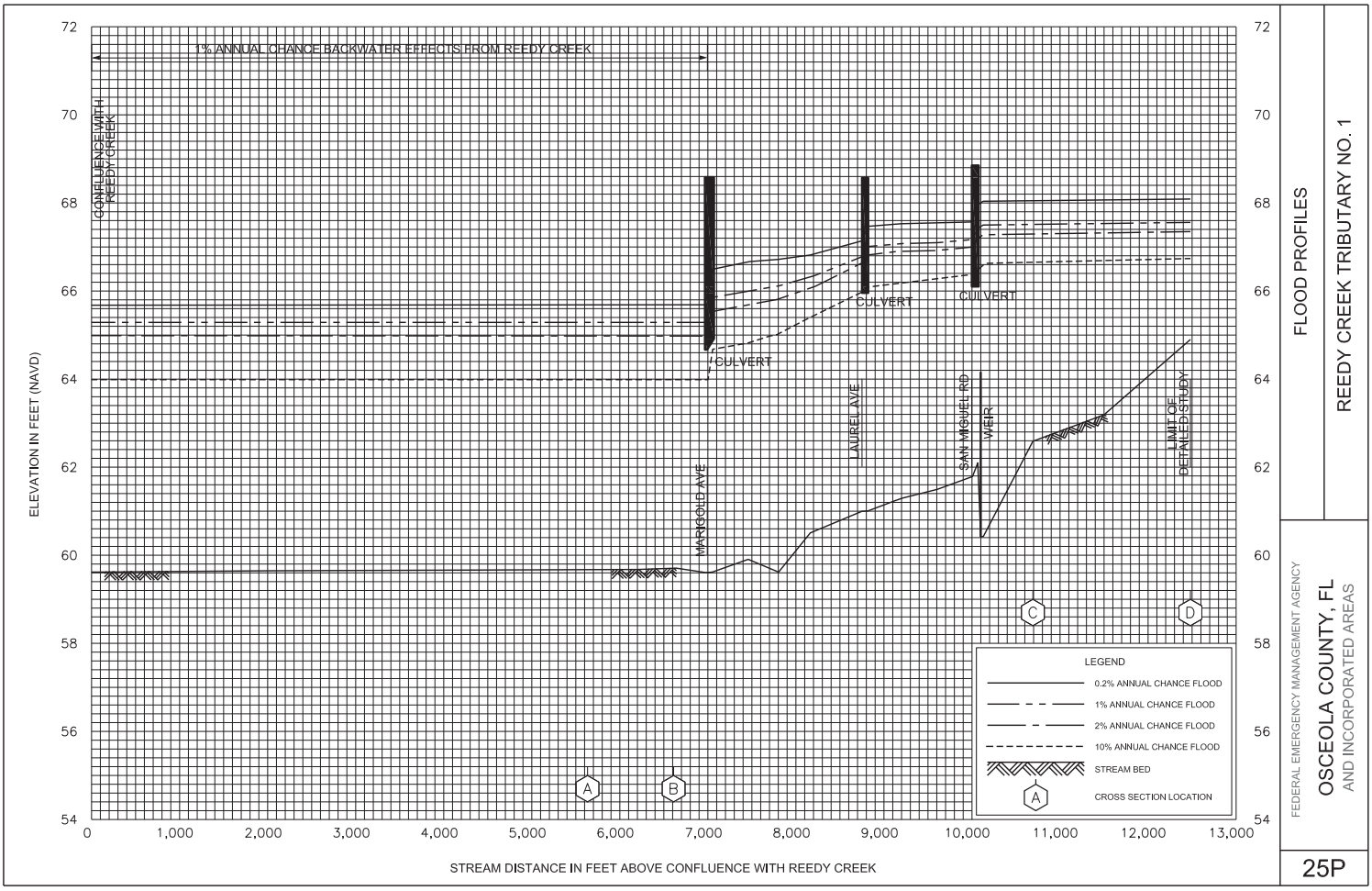
FEDERAL EMERGENCY MANAGEMENT AGENCY

OSCEOLA COUNTY, FL

AND INCORPORATED AREAS

23P


ELEVATION IN FEET (NAVD)
85
80
75
70
65
60
55
50
45
40
12
13
14
15
16
17
18
19
20
21
22
23
24
25
STREAM DISTANCE IN MILES ABOVE CONFLUENCE WITH CYPRESS LAKE
CONFLUENCE OF REEDY CREEK TRIBUTARY NO.1
ORANGE BLOSSOM TR
LIMIT OF DETAILED STUDY
J
K
L
M
N
O
P
Q
R
LEGEND
0.2% ANNUAL CHANCE FLOOD
1% ANNUAL CHANCE FLOOD
2% ANNUAL CHANCE FLOOD
10% ANNUAL CHANCE FLOOD
STREAM BED
A
CROSS SECTION LOCATION
FLOOD PROFILES
REEDY CREEK
FEDERAL EMERGENCY MANAGEMENT AGENCY
OSCEOLA COUNTY, FL
AND INCORPORATED AREAS
24P



FLOOD PROFILES

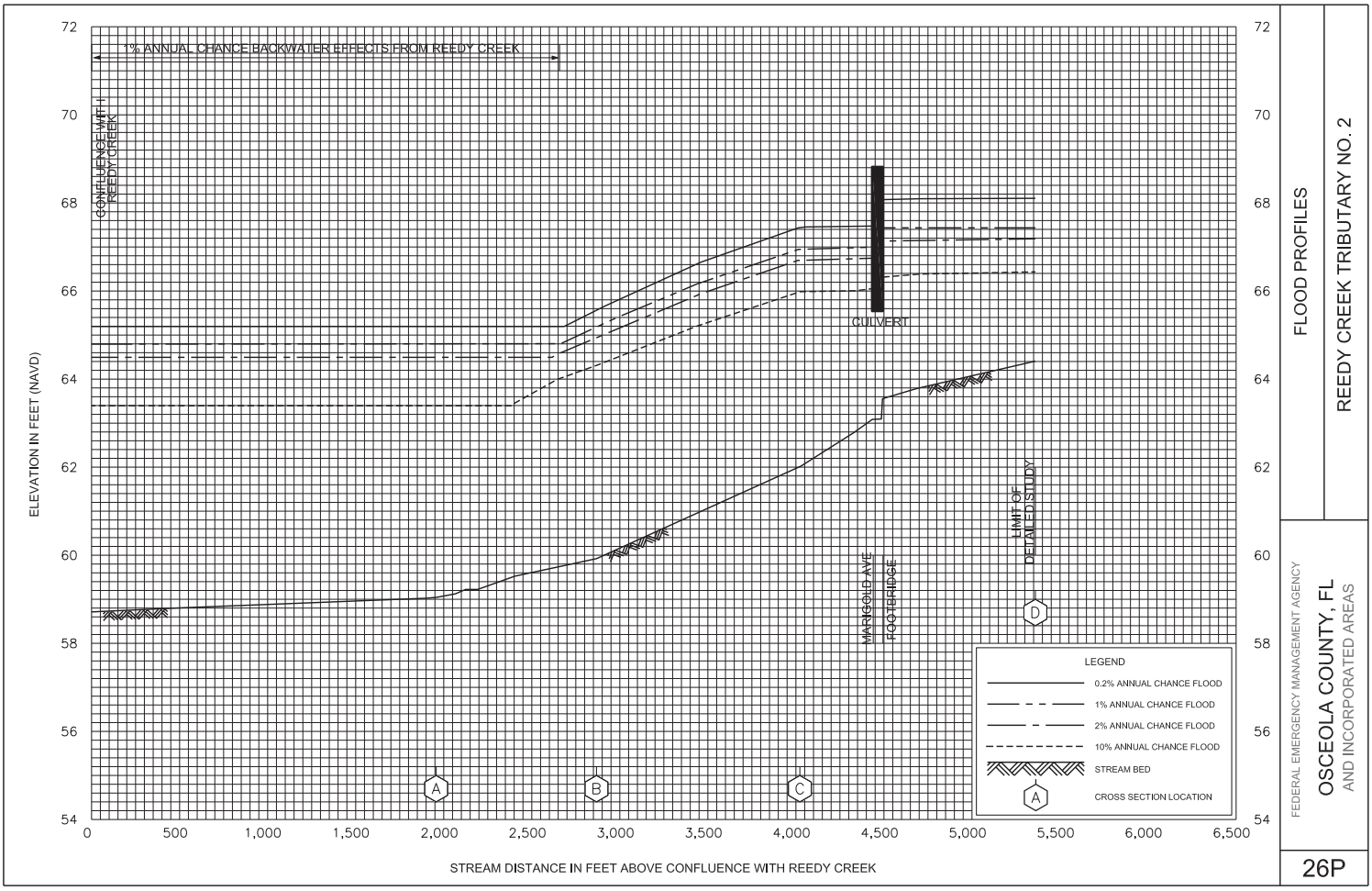
REEDY CREEK TRIBUTARY NO. 1

FEDERAL EMERGENCY MANAGEMENT AGENCY

OSCEOLA COUNTY, FL

AND INCORPORATED AREAS

25P



FLOOD PROFILES

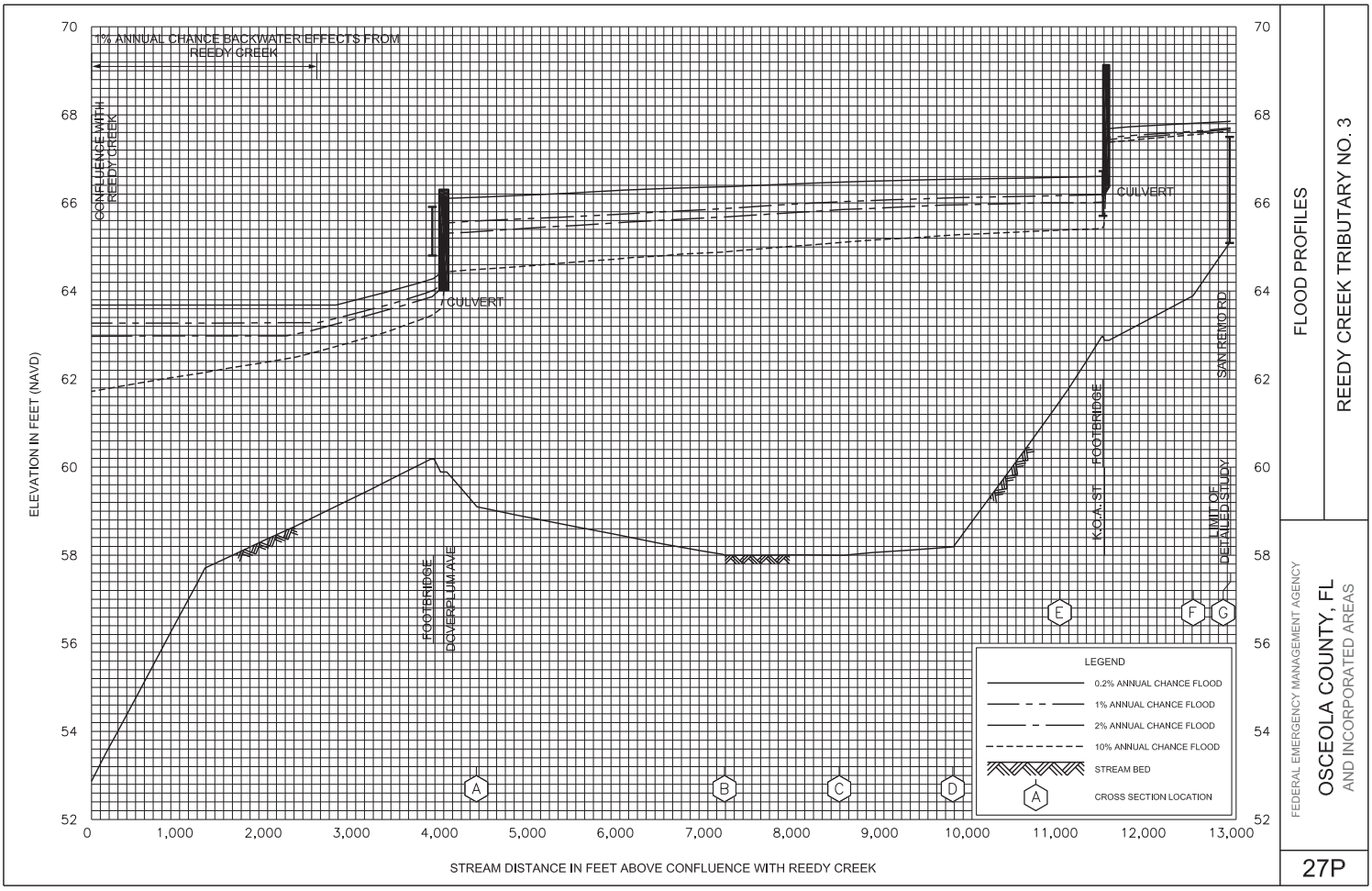
REEDY CREEK TRIBUTARY NO. 2

FEDERAL EMERGENCY MANAGEMENT AGENCY

OSCEOLA COUNTY, FL

AND INCORPORATED AREAS

26P



FLOOD PROFILES

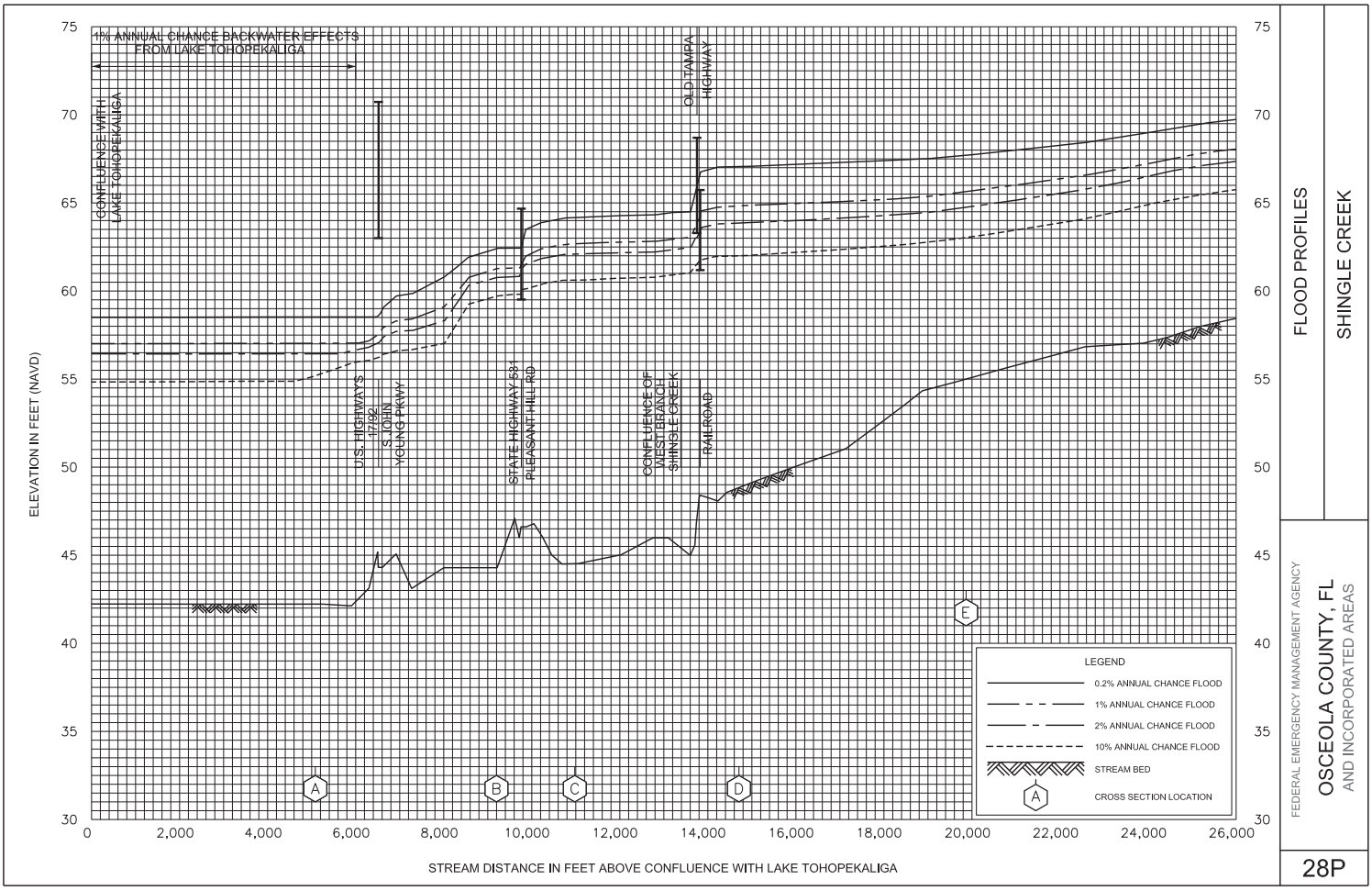
REEDY CREEK TRIBUTARY NO. 3

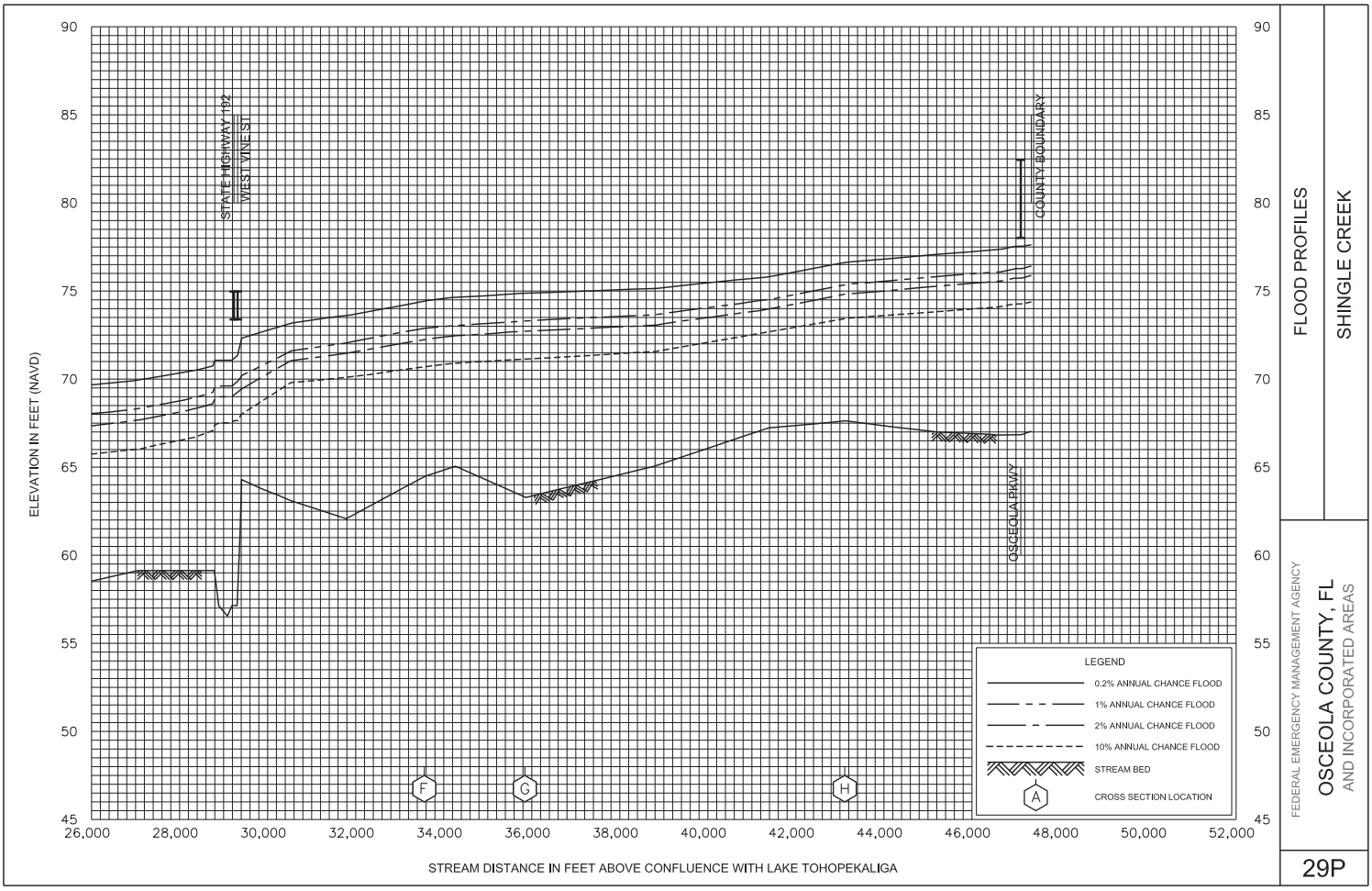
FEDERAL EMERGENCY MANAGEMENT AGENCY

OSCEOLA COUNTY, FL

AND INCORPORATED AREAS

27P


1% ANNUAL CHANCE BACKWATER EFFECTS FROM LAKE TOHOPEKALIGA
CONFLUENCE WITH LAKE TOHOPEKALIGA
U.S. HIGHWAY 17/92
ST JOHN YOUNG PKWY
STATE HIGHWAY 531 PLEASANT HILL RD
CONFLUENCE OF WEST BRANCH SHINGLE CREEK
RAILROAD
OLD TAMPA HIGHWAY
ELEVATION IN FEET (NAVD)
STREAM DISTANCE IN FEET ABOVE CONFLUENCE WITH LAKE TOHOPEKALIGA
LEGEND
0.2% ANNUAL CHANCE FLOOD
1% ANNUAL CHANCE FLOOD
2% ANNUAL CHANCE FLOOD
10% ANNUAL CHANCE FLOOD
STREAM BED
CROSS SECTION LOCATION
FLOOD PROFILES
SHINGLE CREEK
FEDERAL EMERGENCY MANAGEMENT AGENCY
OSCEOLA COUNTY, FL
AND INCORPORATED AREAS
28P



FLOOD PROFILES

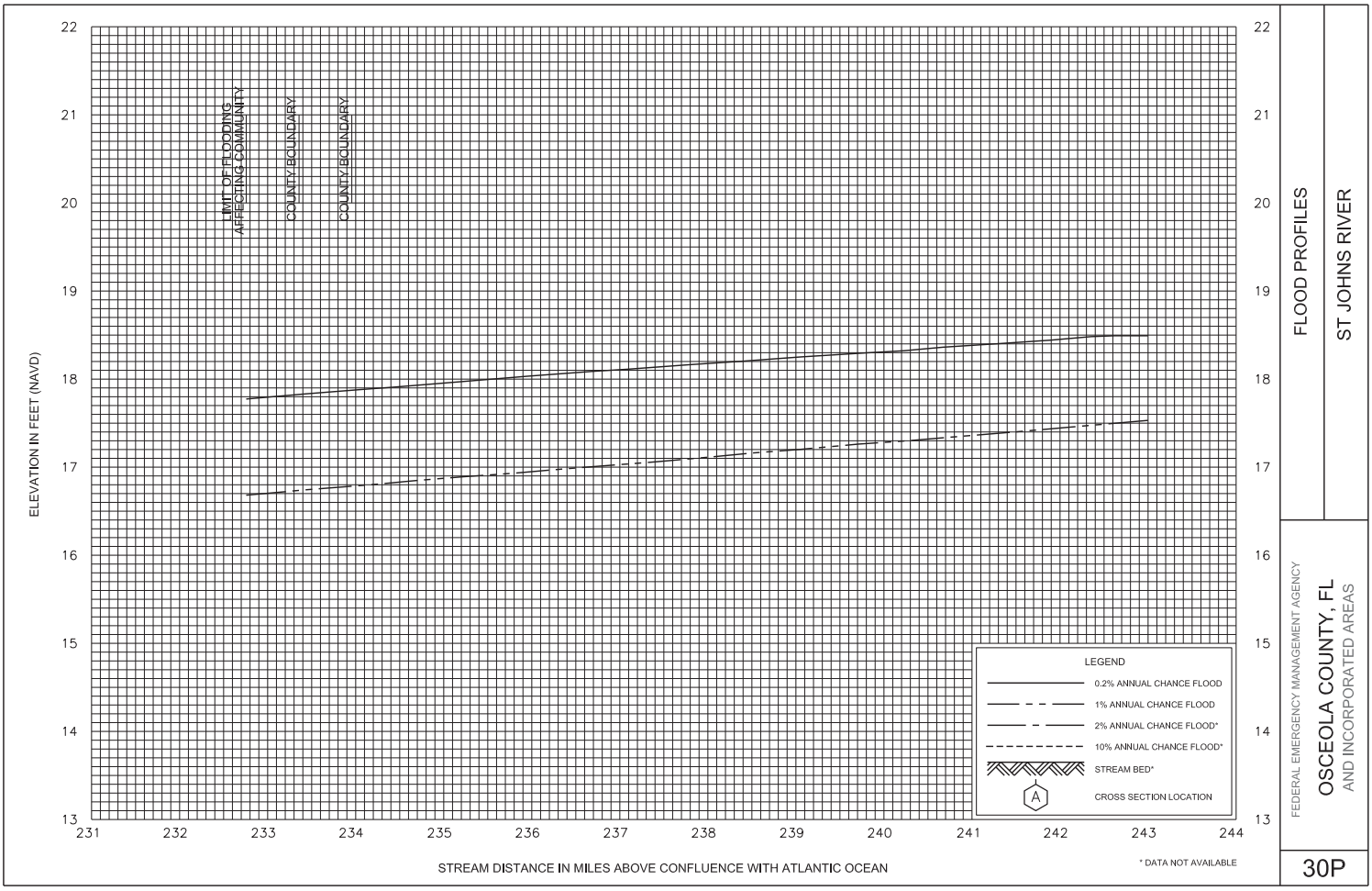
SHINGLE CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

OSCEOLA COUNTY, FL

AND INCORPORATED AREAS

29P



FLOOD PROFILES

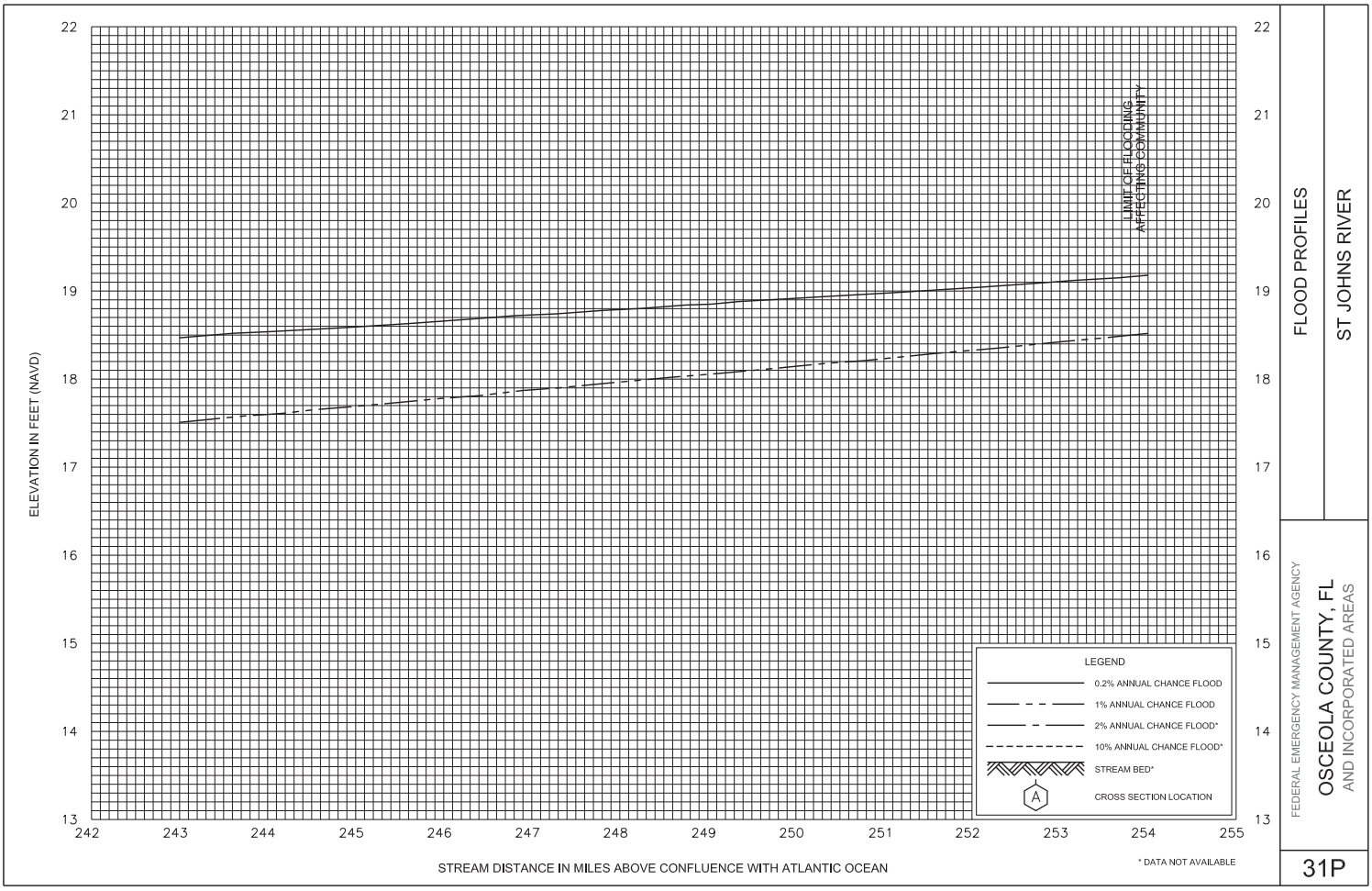
ST JOHNS RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

OSCEOLA COUNTY, FL

AND INCORPORATED AREAS

30P



FLOOD PROFILES

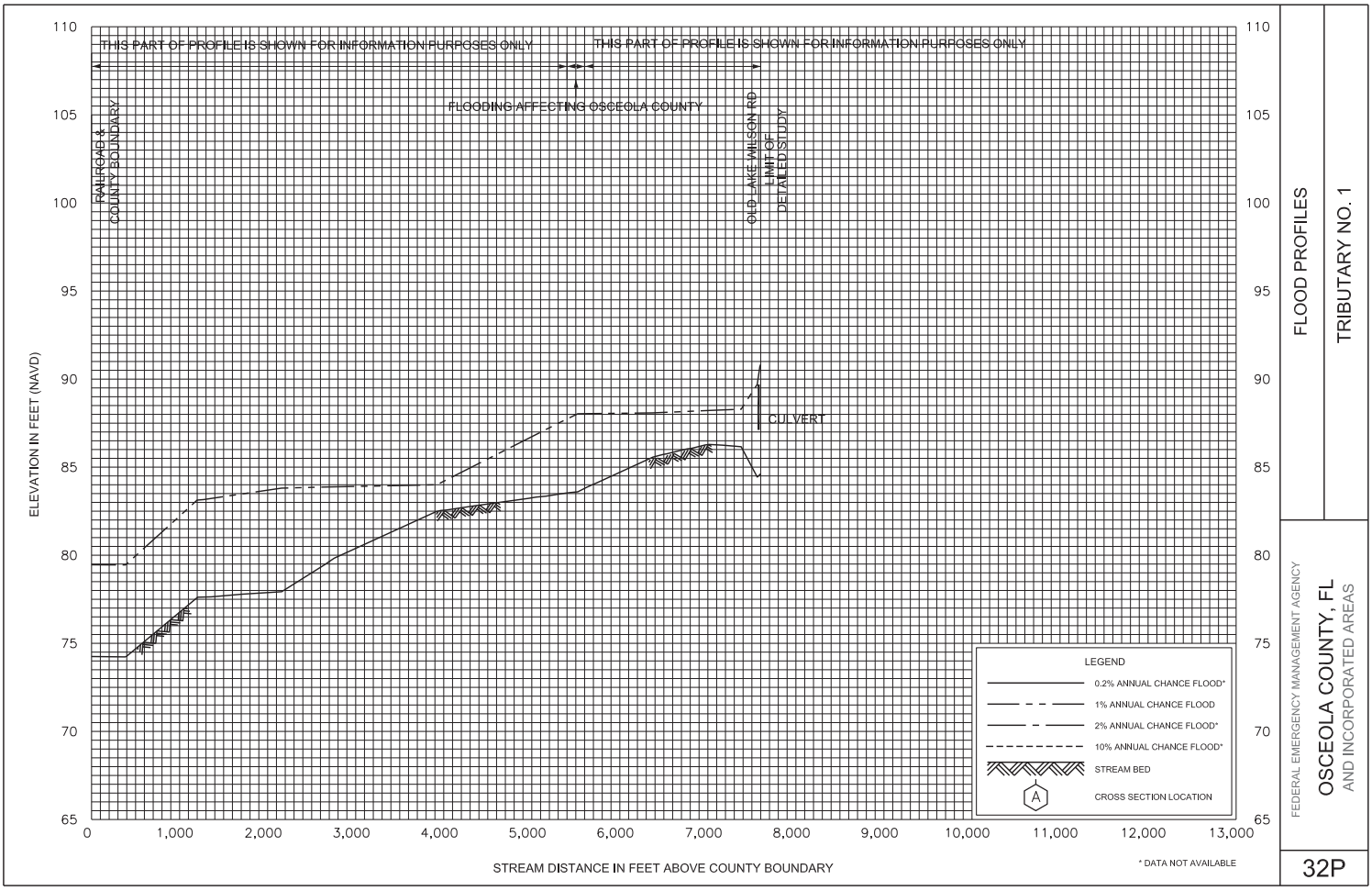
ST JOHNS RIVER

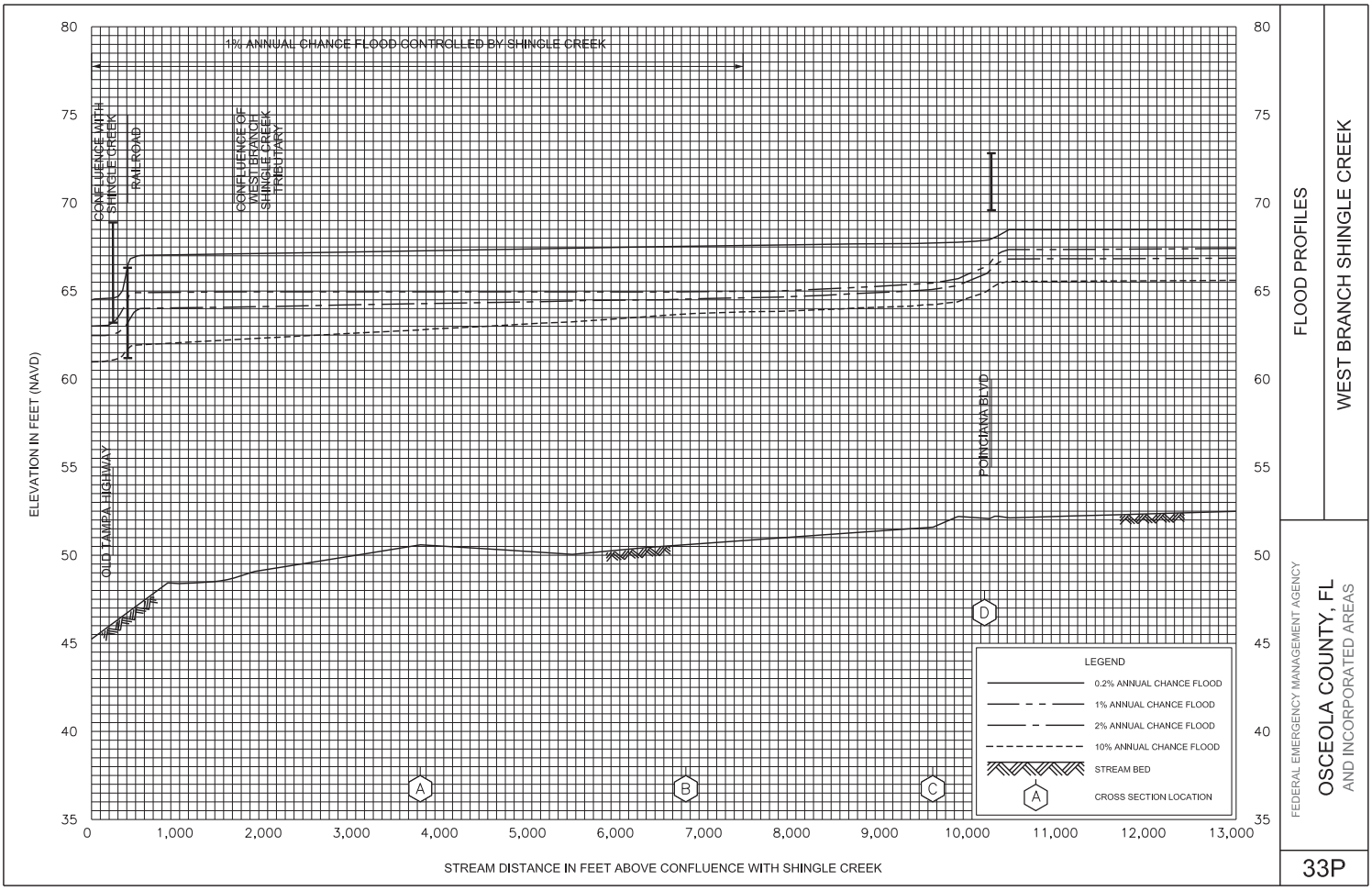
FEDERAL EMERGENCY MANAGEMENT AGENCY

OSCEOLA COUNTY, FL

AND INCORPORATED AREAS

31P


THIS PART OF PROFILE IS SHOWN FOR INFORMATION PURPOSES ONLY
THIS PART OF PROFILE IS SHOWN FOR INFORMATION PURPOSES ONLY
FLOODING AFFECTING OSCEOLA COUNTY
RAILROAD & COUNTY BOUNDARY
OLD LAKE WILSON RD
LIMIT OF DETAILED STUDY
CULVERT
ELEVATION IN FEET (NAVD)
STREAM DISTANCE IN FEET ABOVE COUNTY BOUNDARY
110
105
100
95
90
85
80
75
70
65
0
1,000
2,000
3,000
4,000
5,000
6,000
7,000
8,000
9,000
10,000
11,000
12,000
13,000
LEGEND
0.2% ANNUAL CHANCE FLOOD*
1% ANNUAL CHANCE FLOOD
2% ANNUAL CHANCE FLOOD*
10% ANNUAL CHANCE FLOOD*
STREAM BED
A
CROSS SECTION LOCATION
* DATA NOT AVAILABLE
FLOOD PROFILES
TRIBUTARY NO. 1
FEDERAL EMERGENCY MANAGEMENT AGENCY
OSCEOLA COUNTY, FL
AND INCORPORATED AREAS
32P



FLOOD PROFILES

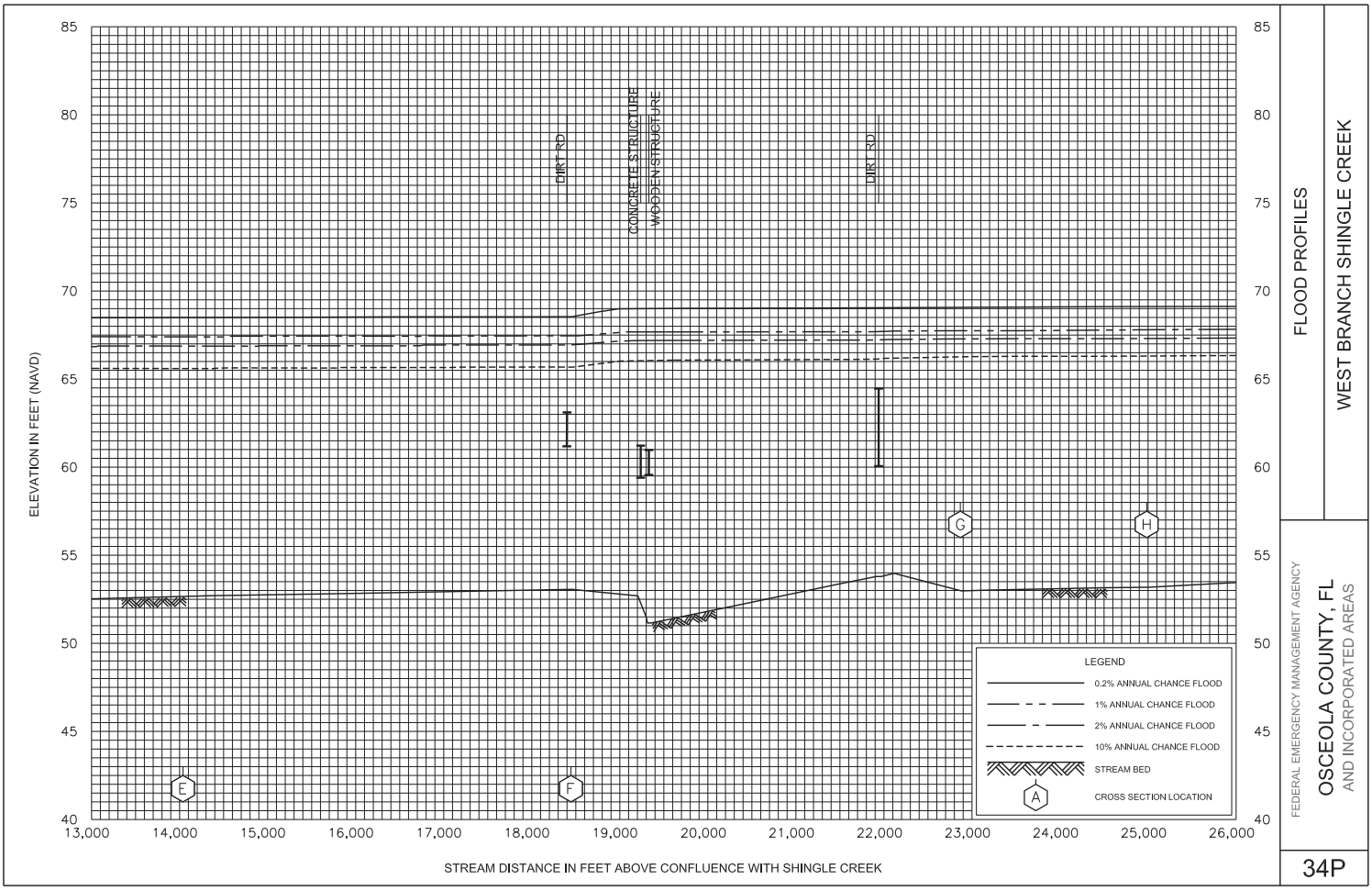
WEST BRANCH SHINGLE CREEK

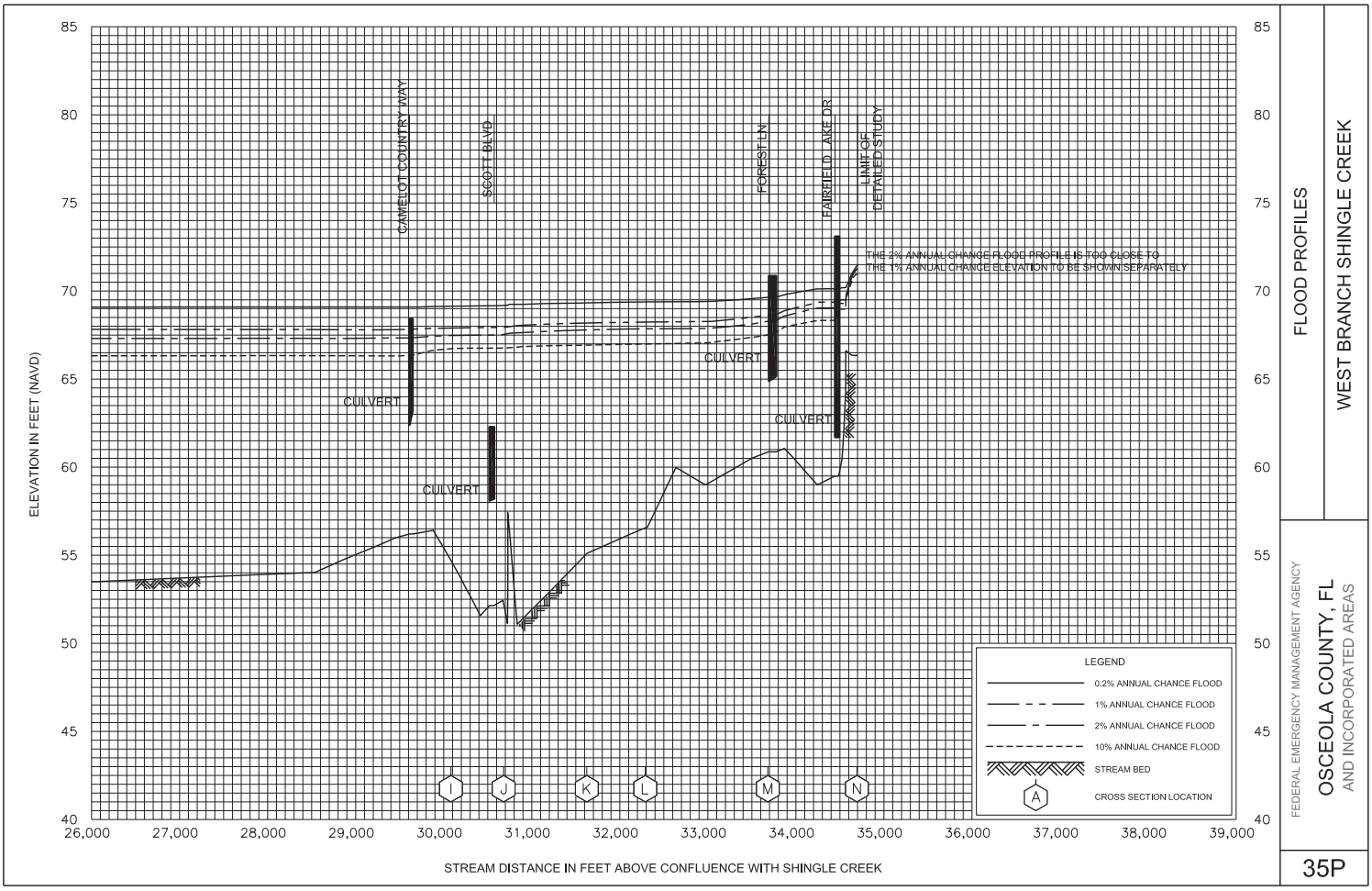
FEDERAL EMERGENCY MANAGEMENT AGENCY

OSCEOLA COUNTY, FL

AND INCORPORATED AREAS

33P


ELEVATION IN FEET (NAVD)
85
80
75
70
65
60
55
50
45
40
13,000
14,000
15,000
16,000
17,000
18,000
19,000
20,000
21,000
22,000
23,000
24,000
25,000
26,000
STREAM DISTANCE IN FEET ABOVE CONFLUENCE WITH SHINGLE CREEK
DIRT RD
CONCRETE STRUCTURE
WOODEN STRUCTURE
DIRT RD
E
F
G
H
LEGEND
0.2% ANNUAL CHANCE FLOOD
1% ANNUAL CHANCE FLOOD
2% ANNUAL CHANCE FLOOD
10% ANNUAL CHANCE FLOOD
STREAM BED
A
CROSS SECTION LOCATION
FLOOD PROFILES
WEST BRANCH SHINGLE CREEK
FEDERAL EMERGENCY MANAGEMENT AGENCY
OSCEOLA COUNTY, FL
AND INCORPORATED AREAS
34P



FLOOD PROFILES

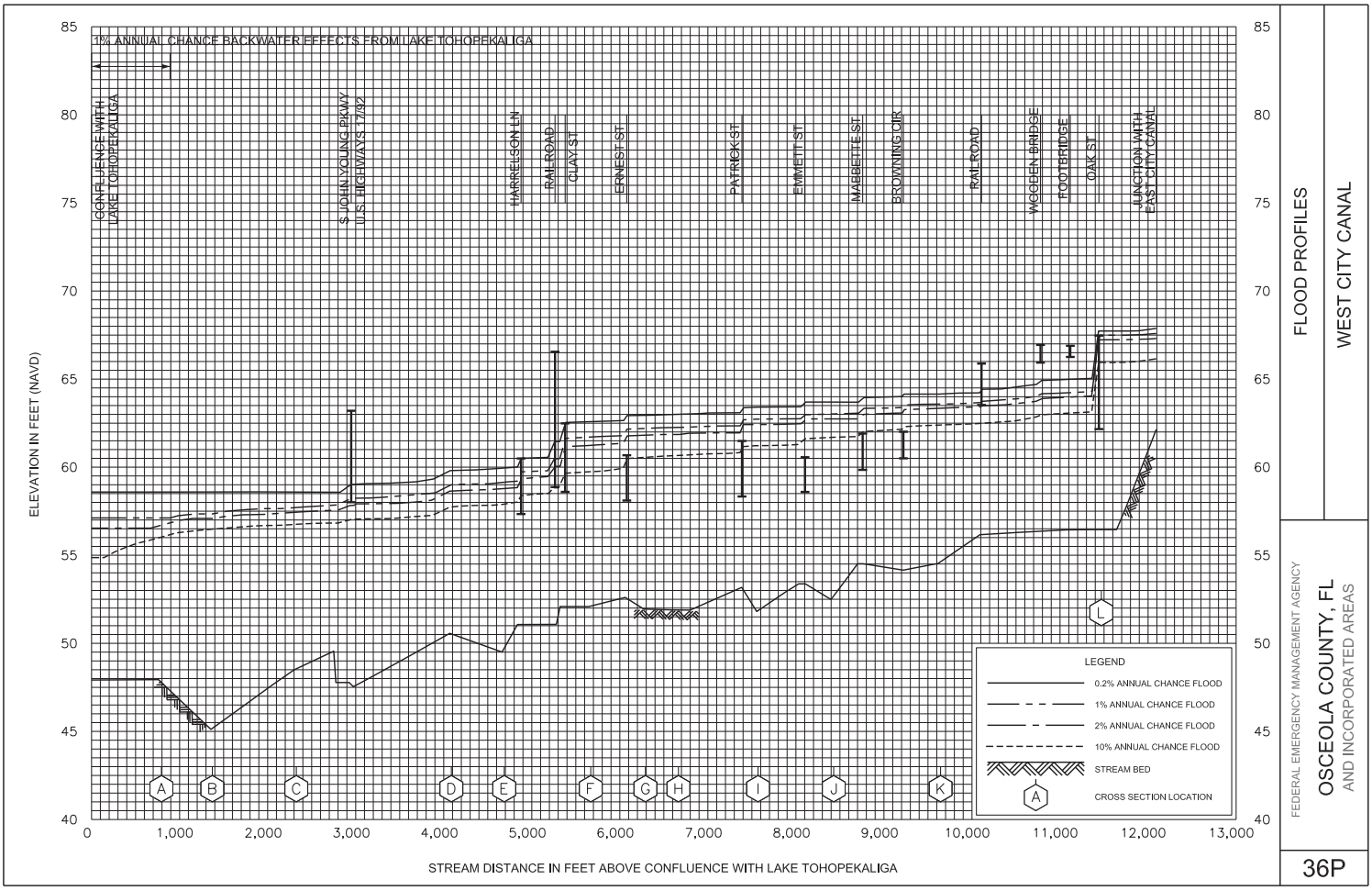
WEST BRANCH SHINGLE CREEK

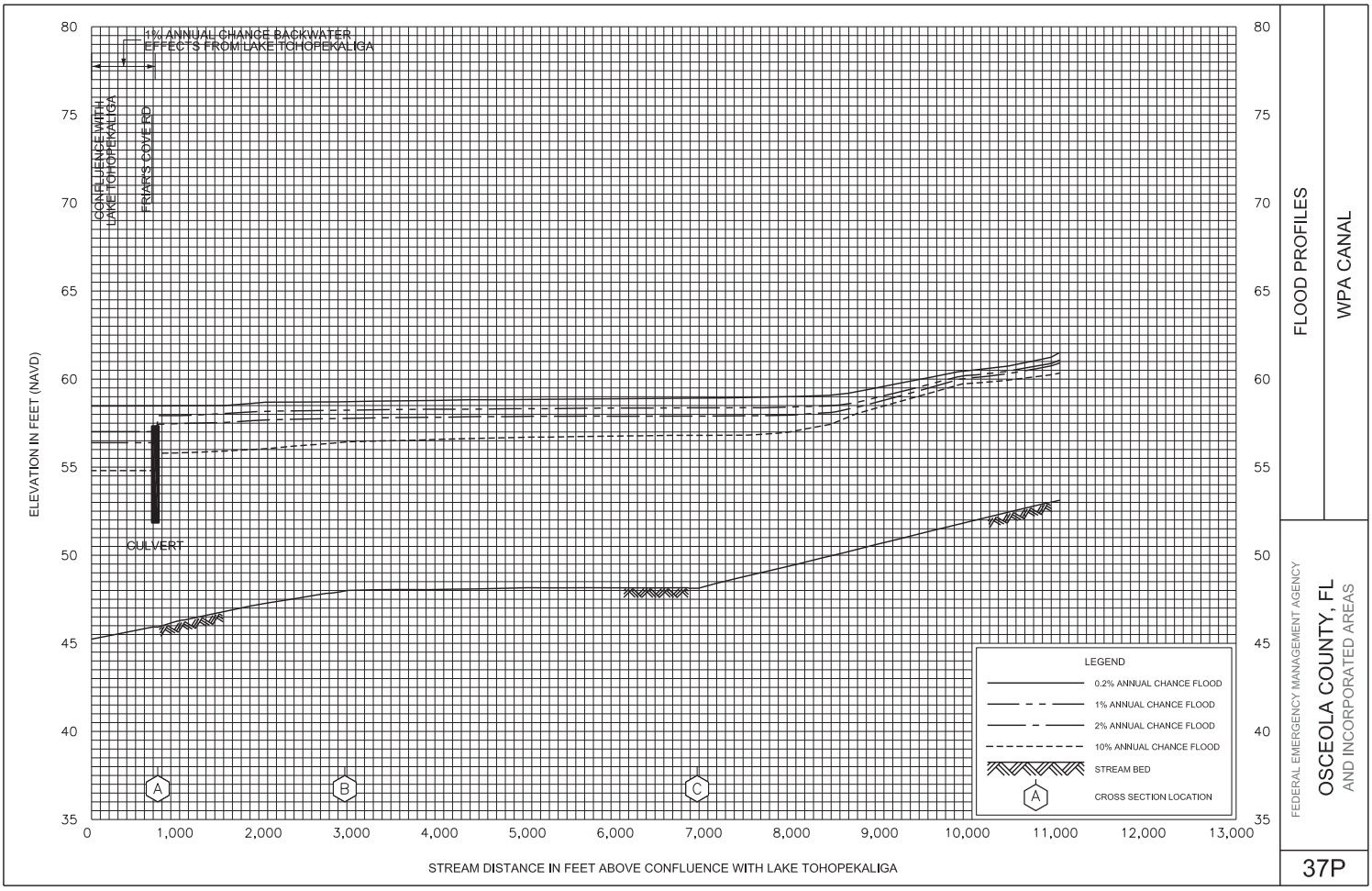
FEDERAL EMERGENCY MANAGEMENT AGENCY

OSCEOLA COUNTY, FL

AND INCORPORATED AREAS

35P


1% ANNUAL CHANCE BACKWATER EFFECTS FROM LAKE TOHOPEKALIGA
CONFLUENCE WITH LAKE TOHOPEKALIGA
S JOHN YOUNG PKWY U.S. HIGHWAYS 17/92
HARRELSON LN
RAILROAD
CLAY ST
ERNEST ST
PATRICK ST
EMMETT ST
MABBETTE ST
BROWNING CIR
RAILROAD
WOODEN BRIDGE
FOOTBRIDGE
OAK ST
JUNCTION WITH EAST CITY CANAL
ELEVATION IN FEET (NAVD)
STREAM DISTANCE IN FEET ABOVE CONFLUENCE WITH LAKE TOHOPEKALIGA
LEGEND
0.2% ANNUAL CHANCE FLOOD
1% ANNUAL CHANCE FLOOD
2% ANNUAL CHANCE FLOOD
10% ANNUAL CHANCE FLOOD
STREAM BED
CROSS SECTION LOCATION
FLOOD PROFILES
WEST CITY CANAL
FEDERAL EMERGENCY MANAGEMENT AGENCY
OSCEOLA COUNTY, FL
AND INCORPORATED AREAS
36P



FLOOD PROFILES

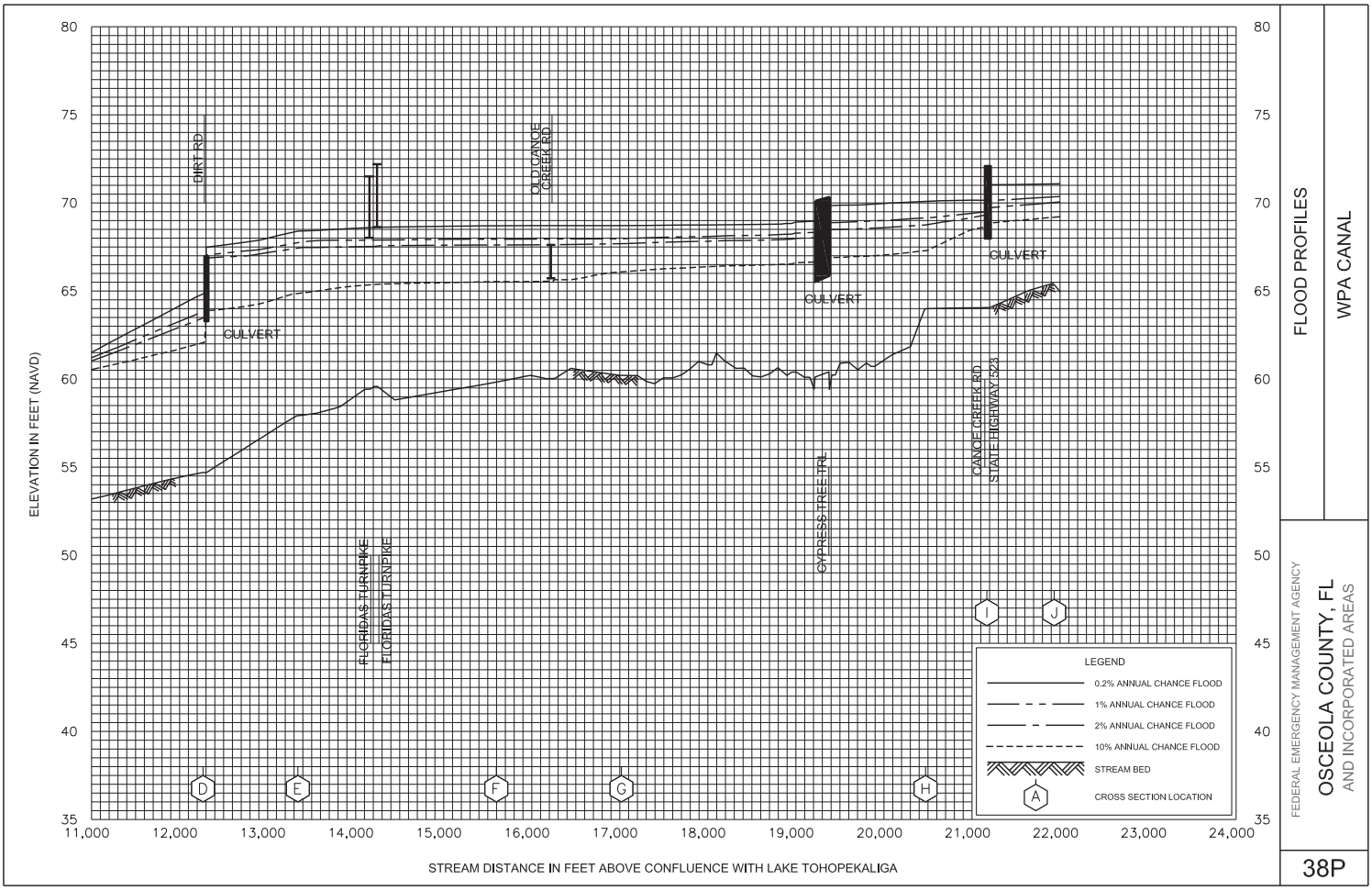
WPA CANAL

FEDERAL EMERGENCY MANAGEMENT AGENCY

OSCEOLA COUNTY, FL

AND INCORPORATED AREAS

37P



FLOOD PROFILES

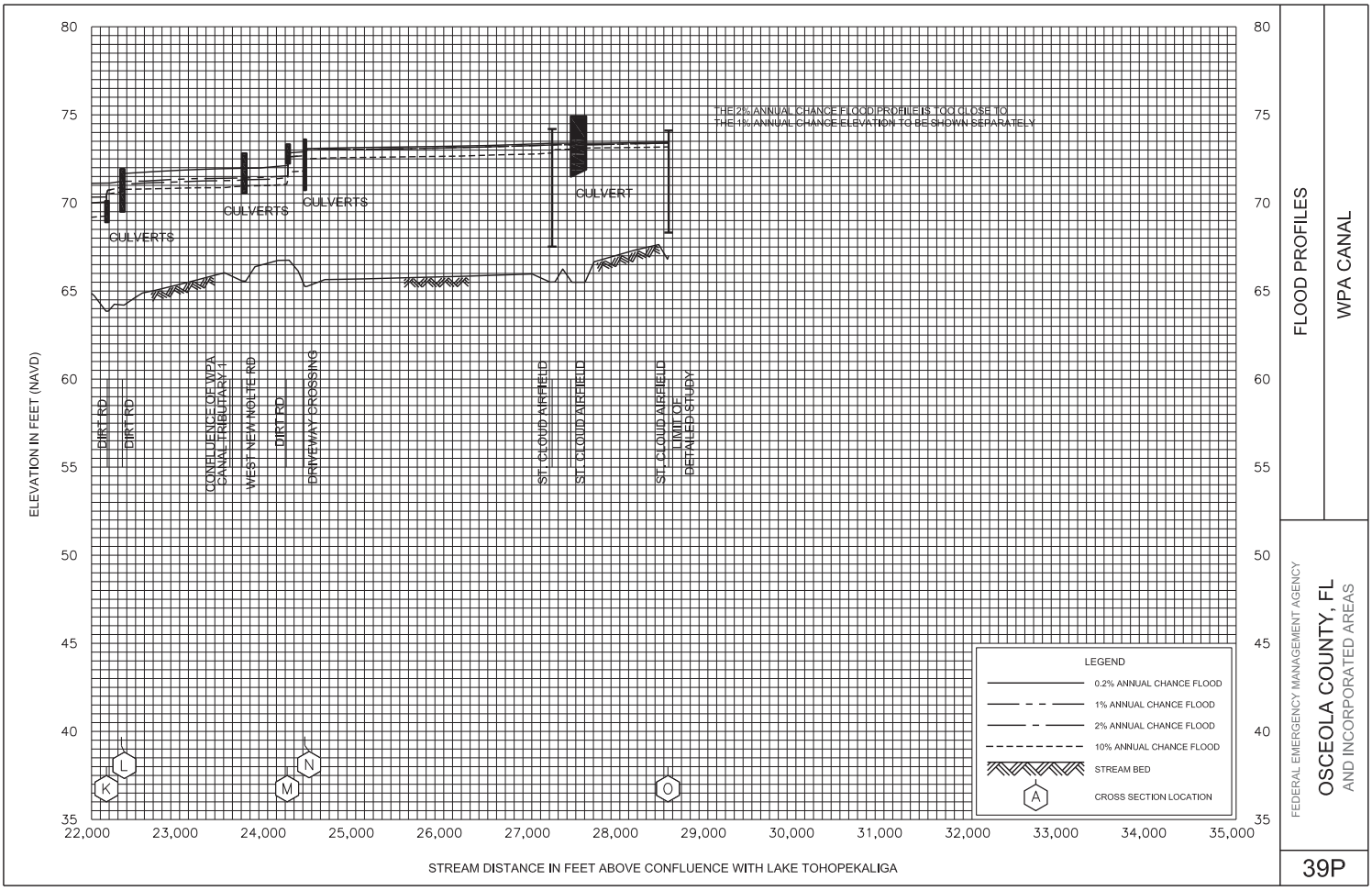
WPA CANAL

FEDERAL EMERGENCY MANAGEMENT AGENCY

OSCEOLA COUNTY, FL

AND INCORPORATED AREAS

38P



FLOOD PROFILES

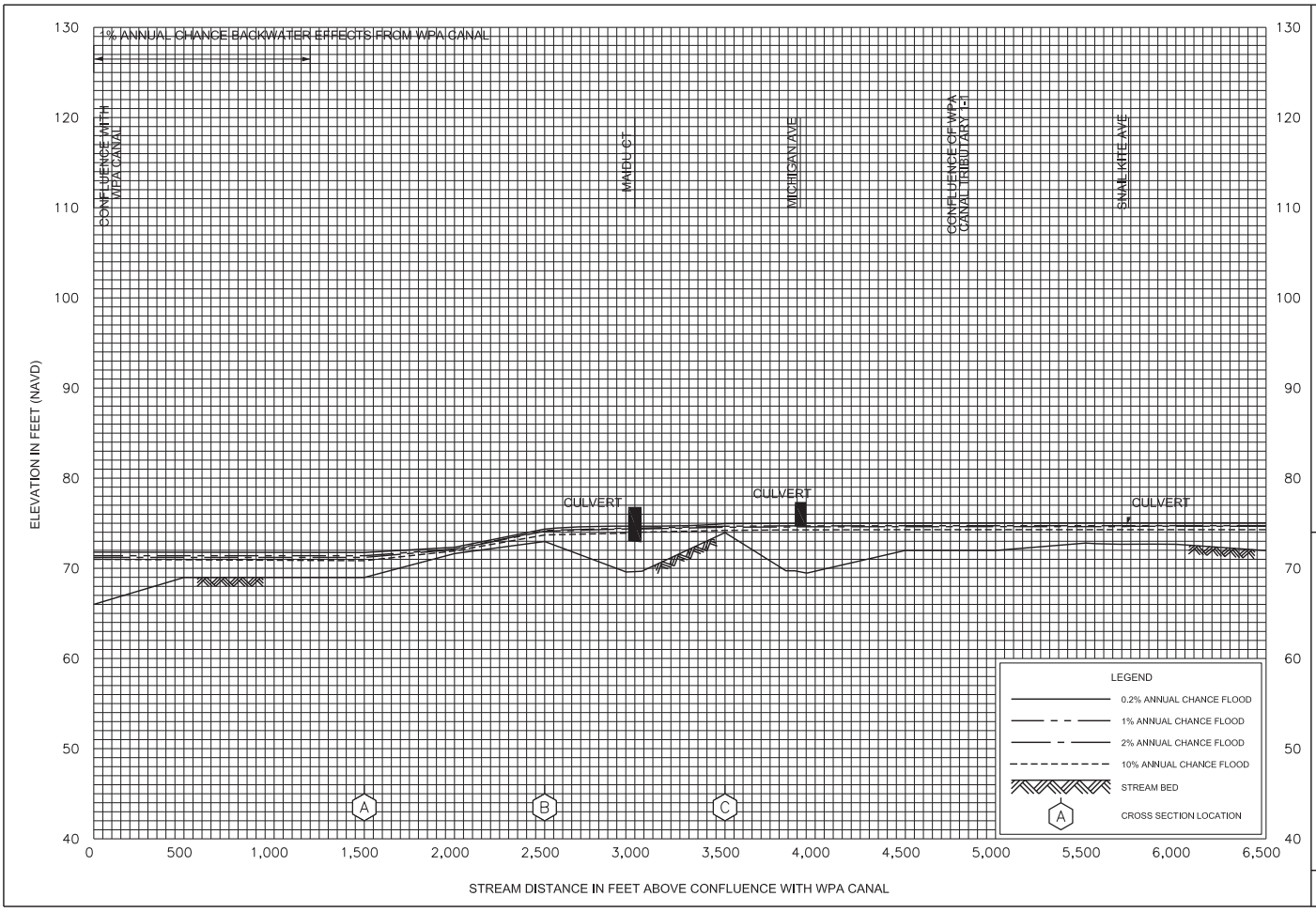
WPA CANAL

FEDERAL EMERGENCY MANAGEMENT AGENCY

OSCEOLA COUNTY, FL

AND INCORPORATED AREAS

39P



FLOOD PROFILES

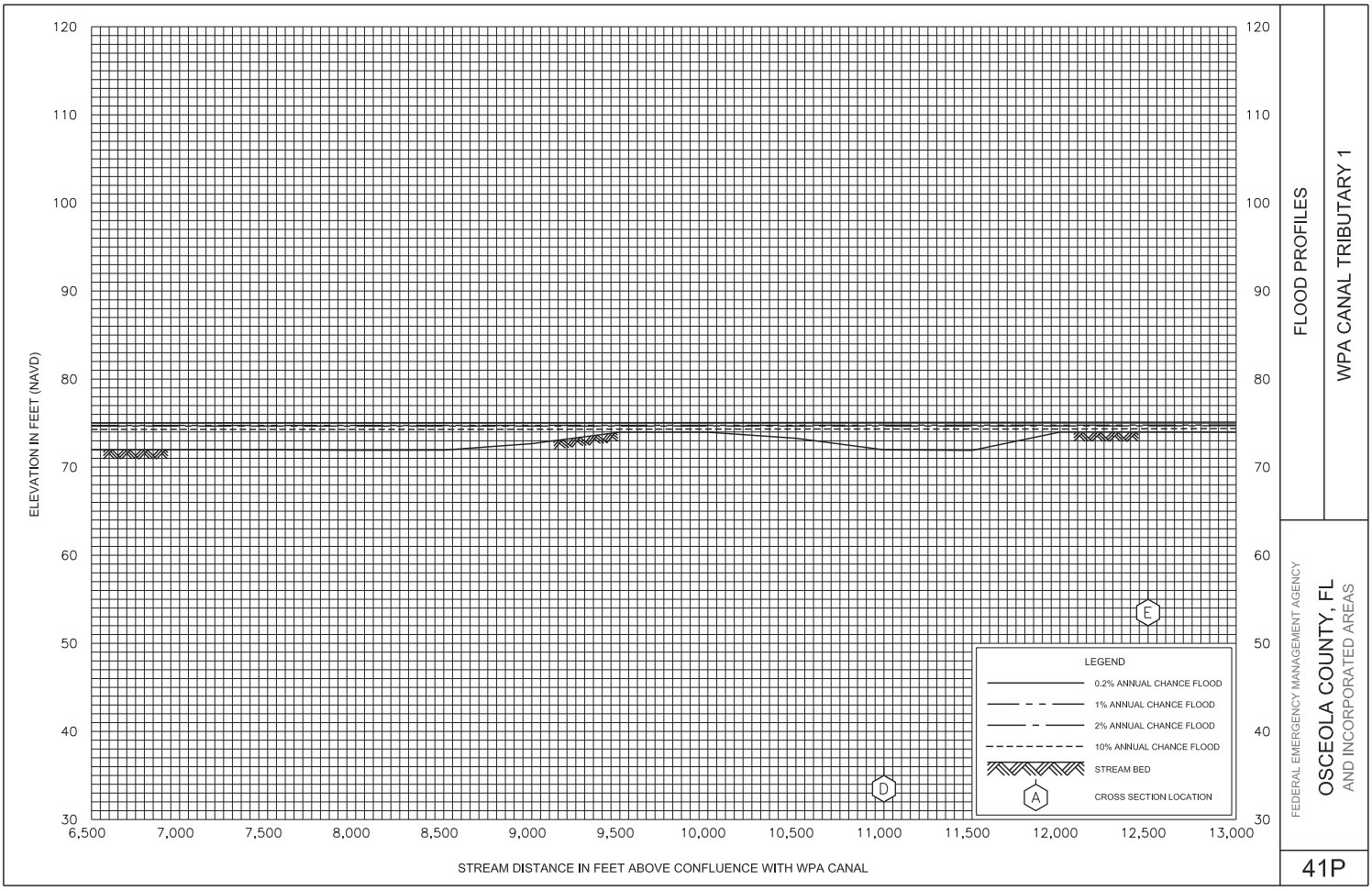
WPA CANAL TRIBUTARY 1

FEDERAL EMERGENCY MANAGEMENT AGENCY

OSCEOLA COUNTY, FL

AND INCORPORATED AREAS

40P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110
100
90
80
70
60
50
40
30
ELEVATION IN FEET (NAVD)
6,500
7,000
7,500
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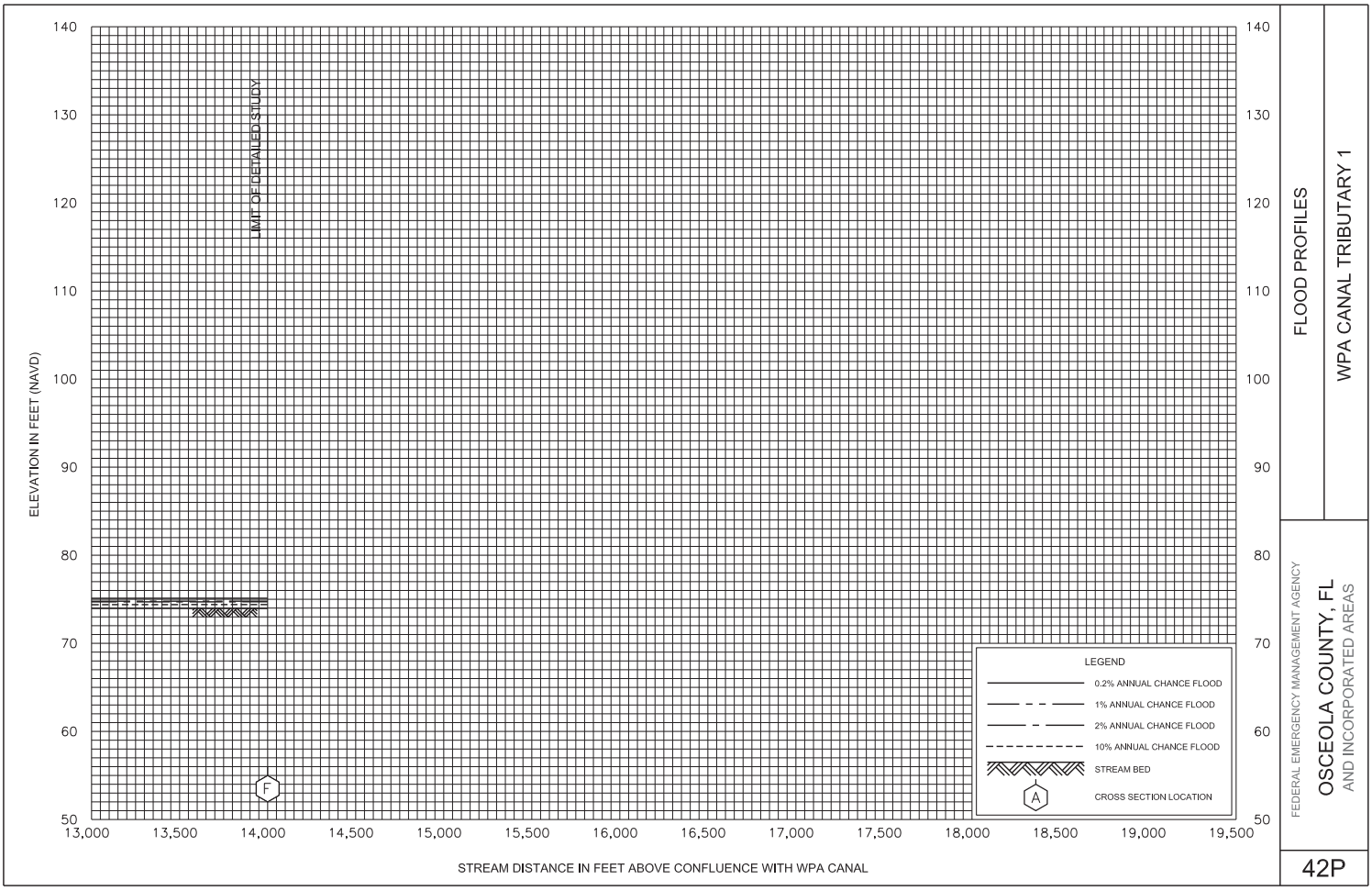
8,500
9,000
9,500
10,000
10,500
11,000
11,500
12,000
12,500
13,000
STREAM DISTANCE IN FEET ABOVE CONFLUENCE WITH WPA CANAL
LEGEND
0.2% ANNUAL CHANCE FLOOD
1% ANNUAL CHANCE FLOOD
2% ANNUAL CHANCE FLOOD
10% ANNUAL CHANCE FLOOD
STREAM BED
CROSS SECTION LOCATION
A
D
E
FLOOD PROFILES
WPA CANAL TRIBUTARY 1
FEDERAL EMERGENCY MANAGEMENT AGENCY
OSCEOLA COUNTY, FL
AND INCORPORATED AREAS
41P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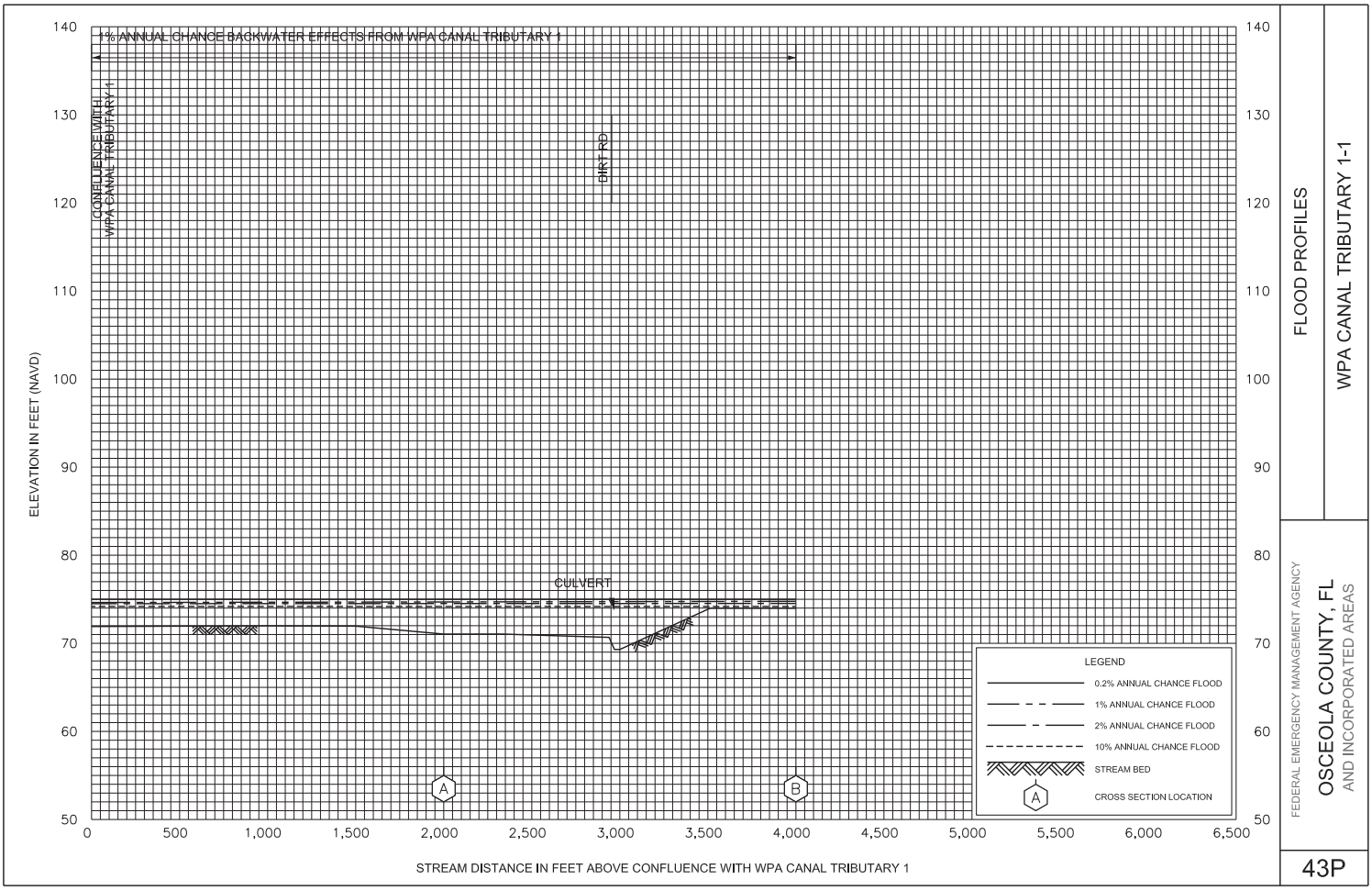
130
120
110
100
90
80
70
60
50
ELEVATION IN FEET (NAVD)
LIMIT OF DETAILED STUDY
F
13,000
13,500
14,000
14,500
15,000
15,500
16,000
16,500
17,000
17,500
18,000
18,500
19,000
19,500
STREAM DISTANCE IN FEET ABOVE CONFLUENCE WITH WPA CANAL
LEGEND
0.2% ANNUAL CHANCE FLOOD
1% ANNUAL CHANCE FLOOD
2% ANNUAL CHANCE FLOOD
10% ANNUAL CHANCE FLOOD
STREAM BED
A
CROSS SECTION LOCATION
FLOOD PROFILES
WPA CANAL TRIBUTARY 1
FEDERAL EMERGENCY MANAGEMENT AGENCY
OSCEOLA COUNTY, FL
AND INCORPORATED AREAS
42P



FLOOD PROFILES

WPA CANAL TRIBUTARY 1-1

FEDERAL EMERGENCY MANAGEMENT AGENCY

OSCEOLA COUNTY, FL

AND INCORPORATED AREAS

43P

NOTES TO USERS

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Boundaries of the **floodways** were computed at cross sections and interpolated between cross sections. The floodways were based on hydraulic considerations with regard to requirements of the National Flood Insurance Program. Floodway widths and other pertinent floodway data are provided in the Flood Insurance Study report for this jurisdiction.

Certain areas not in Special Flood Hazard Areas may be protected by **flood control structures**. Refer to Section 2.4 "Flood Protection Measures" of the Flood Insurance Study report for information on flood control structures for this jurisdiction.

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Flood elevations on this map are referenced to the North American Vertical Datum of 1988. These flood elevations must be compared to structure and ground elevations referenced to the same **vertical datum**. For information regarding conversion between the National Geodetic Vertical Datum of 1929 and the North American Vertical Datum of 1988, visit the National Geodetic Survey website at http://www.ngs.noaa.gov/ or contact the National Geodetic Survey at the following address:

NGS Information Services
NOAA, NINGS12
National Geodetic Survey
SSMC-3, #9202
1315 East-West Highway
Silver Spring, Maryland 20910-3282
(301) 713-3242

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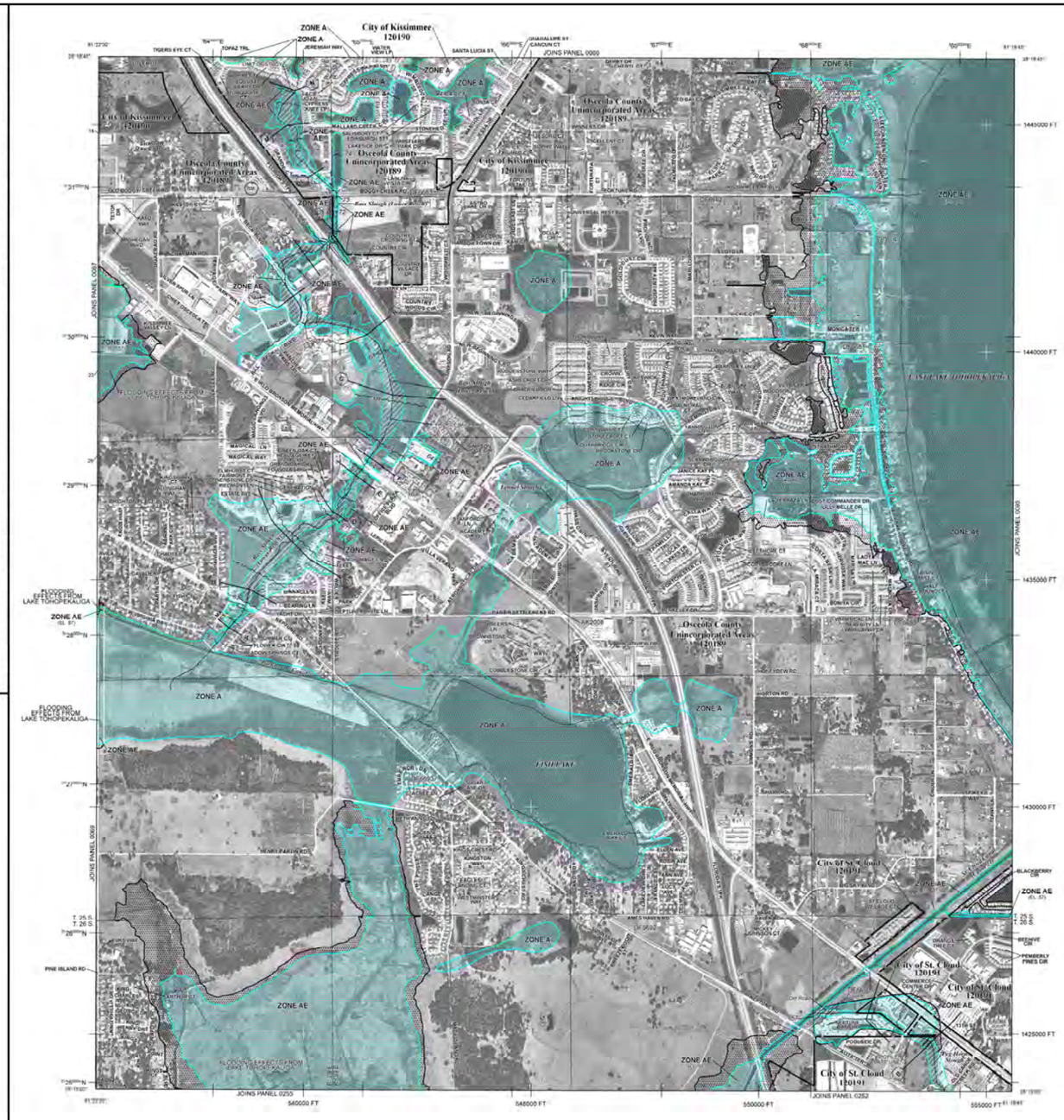

LEGEND

SPECIAL FLOOD HAZARD AREAS SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD

The 1% annual chance flood (100-year flood), also known as the base flood, is the flood that has a 1% chance of being equaled or exceeded in any given year. The Special Flood Hazard Area is the area subject to flooding by the 1% annual chance flood. Areas of Special Flood Hazard include Zones A, AE, AH, AO, AR, A99, V, and VE. The Base Flood Elevation is the water-surface elevation of the 1% annual chance flood.

- **ZONE A** — No Base Flood Elevations determined.
- **ZONE AE** — Base Flood Elevations determined.
- **ZONE AH** — Flood depths of 1 to 3 feet (usually areas of ponding); Base Flood Elevations determined.
- **ZONE AO** — Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding, velocities also determined.
- **ZONE AR** — Special Flood Hazard Area formerly protected from the 1% annual chance flood by a flood control system that was subsequently decertified. Zone AR indicates that the former flood control system is being restored to provide protection from the 1% annual chance or greater flood.
- **ZONE A99** — Areas to be protected from 1% annual chance flood event by a Federal flood protection system under construction; no Base Flood Elevations determined.
- **ZONE V** — Coastal flood zone with velocity hazard (wave action); no Base Flood Elevations determined.
- **ZONE VE** — Coastal flood zone with velocity hazard (wave action); Base Flood Elevations determined.

FLOODWAY AREAS IN ZONE AE

The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights.

OTHER FLOOD AREAS

- **ZONE X** — Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.

OTHER AREAS

- **ZONE X** — Areas determined to be outside the 0.2% annual chance floodplain.
- **ZONE D** — Areas in which flood hazards are undetermined, but possible.

COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS

OTHERWISE PROTECTED AREAS (OPAs)

CBRS areas and OPAs are normally located within or adjacent to Special Flood Hazard Areas.

- 1% annual chance floodplain boundary
- 0.2% annual chance floodplain boundary
- Floodway boundary
- Zone D boundary
- CBRS and OPA boundary
- Boundary dividing Special Flood Hazard Area Zones and boundary dividing Special Flood Hazard Areas of different Base Flood Elevations, flood depths, or flood velocities.
- 513 — Base flood elevation line and value; elevation in feet*
- (EL 987) — Base Flood Elevation value where uniform within zone; elevation in feet*

* Referenced to the North American Vertical Datum of 1988

- A — A — Cross section line
- 23 — 23 — Transect line
- 97°07'30", 32°22'30" — Geographic coordinates referenced to the North American Datum of 1983 (NAD 83), Western Hemisphere
- 4778000mE — 1000-meter Universal Transverse Mercator grid ticks, zone 17
- 500000001 FT — 5000-foot grid values: Florida State Plane coordinate system, East Zone (FIPSZONE = 0901), Transverse Mercator projection
- DX5510 — Bench mark (see explanation in Notes to Users section of this FIRM panel)
- M1.8 — River Mile

MAP REPOSITORIES
Refer to Map Repositories List on Map Index

EFFECTIVE DATE OF COUNTYWIDE
FLOOD INSURANCE RATE MAP
MAY 7, 2001

EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL
JUNE 3, 2003 - To correct datum reference note

JUNE 18, 2013 - To update corporate limits, change Base Flood Elevations, add Base Flood Elevations, change Special Flood Hazard Areas, change zone designations, update maps and incorporate previously issued Letters of Map Revision, and reflect updated topographic information.

For community map revision history prior to countywide mapping, refer to the Community Map History table located in the Flood Insurance Study report for this jurisdiction.

To determine if flood insurance is available in this community, contact your insurance agent or call the National Flood Insurance Program at 1-800-638-6620.

MAP SCALE 1" = 1000'

500 0 500 1,000 1,500 2,000 FEET
150 0 150 300 600 METERS

NFIP

NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0090G

FIRM

FLOOD INSURANCE RATE MAP

OSCEOLA COUNTY, FLORIDA AND INCORPORATED AREAS

PANEL 90 OF 900

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
KISSIMMEE, CITY OF	120190	0090	G
OSCEOLA COUNTY	120189	0090	G
ST. CLOUD, CITY OF	120191	0090	G

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
12097C0090G

MAP REVISED
JUNE 18, 2013

Federal Emergency Management Agency

NOTES TO USERS

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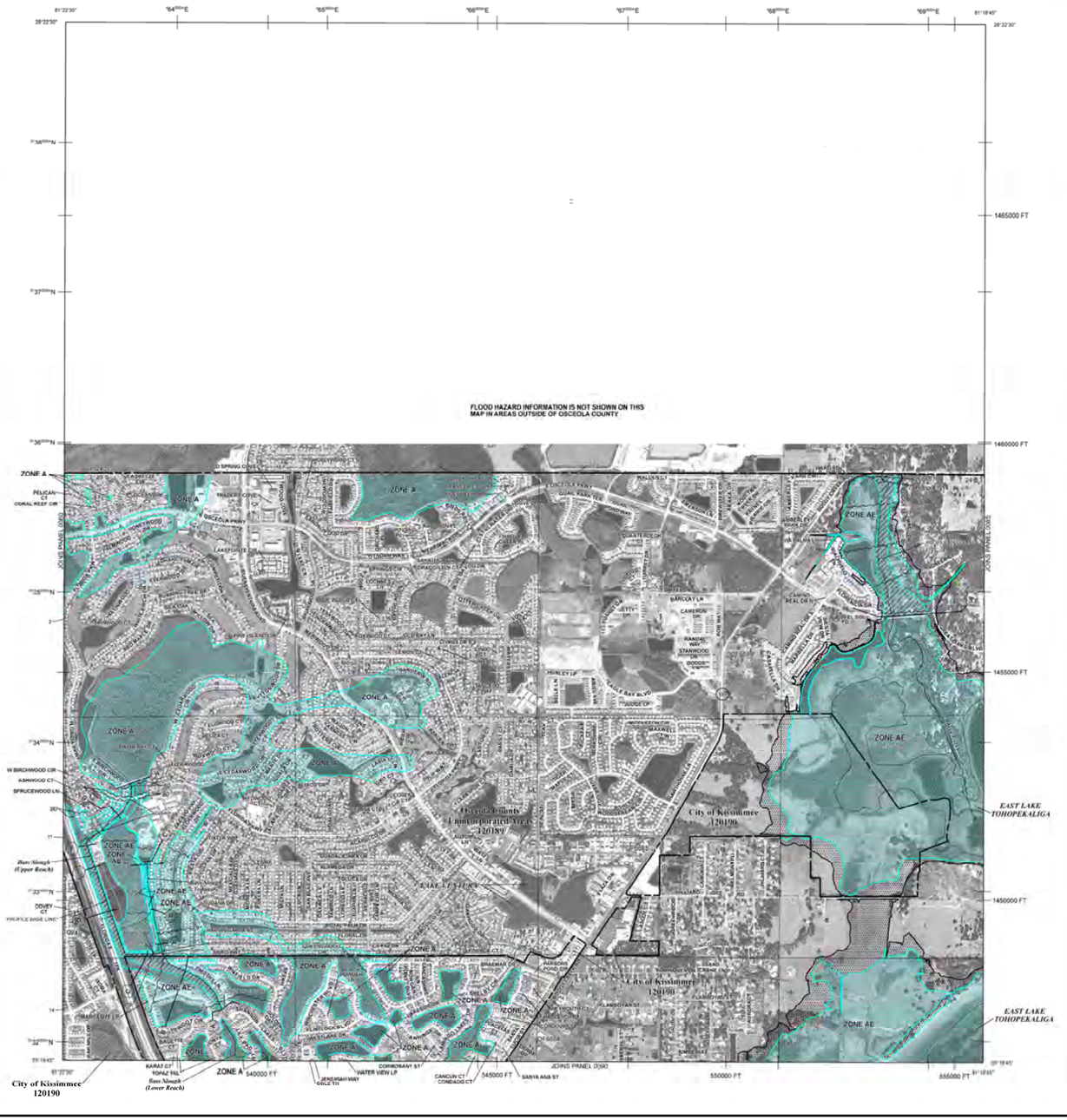

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OTHER FLOOD AREAS

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- M1.6 — River Mile

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EFFECTIVE DATE OF COUNTYWIDE FLOOD INSURANCE RATE MAP
MAY 7, 2001

EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL
JUNE 3, 2021 - To correct datum reference note.

JUNE 18, 2013 - To update corporate limits, change Base Flood Elevations, add Base Flood Elevations, change Special Flood Hazard Areas, change zone designations, update maps and road names, incorporate previously issued Letters of Map Revision, and reflect updated topographic information.

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MAP SCALE 1" = 1000'

NFIP
NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0080G

FIRM
FLOOD INSURANCE RATE MAP
OSCEOLA COUNTY, FLORIDA
AND INCORPORATED AREAS

PANEL 80 OF 900
(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
KISSIMMEE, CITY OF	120190	0080	G
OSCEOLA COUNTY	120189	0080	G

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MAP NUMBER
12097C0080G
MAP REVISED
JUNE 18, 2013

Federal Emergency Management Agency

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To obtain current elevation, description, and/or location information for **bench marks** shown on this map, please contact the Information Services Branch of the National Geodetic Survey at **(301) 713-3242** or visit its website at http://www.ngs.noaa.gov/.

Base map information shown on this FIRM was provided in digital format by the Osceola County Planning Office. Orthophotography was collected in late 2007 early 2008.

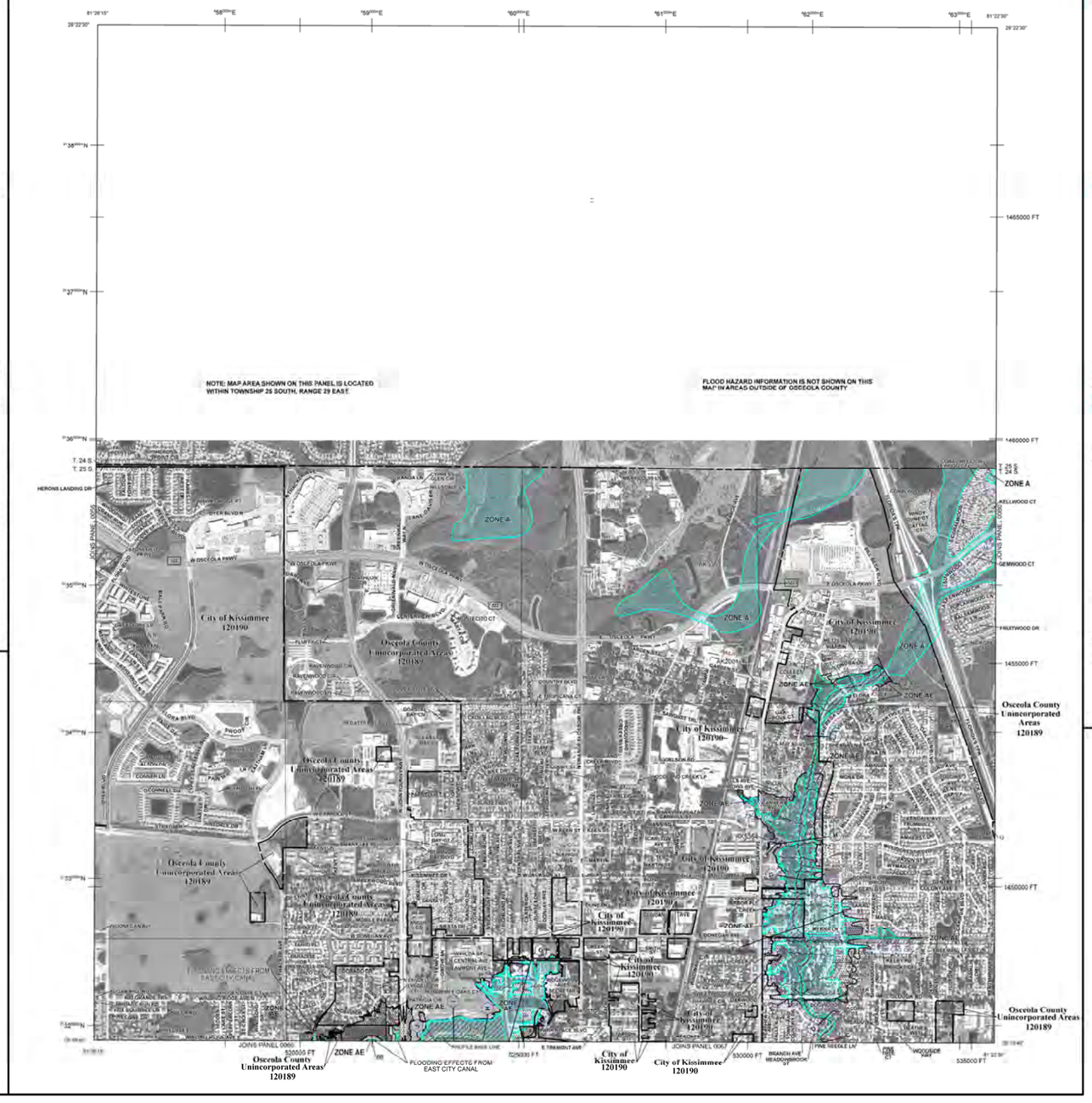
This map reflects more detailed and up-to-date **stream channel configurations** than those shown on the previous FIRM for this jurisdiction. The floodplains and floodways that were transferred from the previous FIRM may have been adjusted to conform to these new stream channel configurations. As a result, the Flood Profiles and Floodway Data tables in the Flood Insurance Study report (which contains authoritative hydraulic data) may reflect stream channel distances that differ from what is shown on this map.

Corporate limits shown on this map are based on the best data available at the time of publication. Because changes due to annexations or de-annexations may have occurred after this map was published, map users should contact appropriate community officials to verify current corporate limit locations.

Please refer to the separately printed **Map Index** for an overview map of the county showing the layout of map panels; community map repository addresses; and a Listing of Communities table containing National Flood Insurance Program dates for each community as well as a listing of the panels on which each community is located.

For information and questions about this map, available products associated with this FIRM including historic versions of this FIRM, how to order products or the National Flood Insurance Program in general, please call the **FEMA Mapping Information eXchange** at 1-877-FEMA-MAP (1-877-336-2627) or visit the FEMA Map Service website at http://www.msc.fema.gov. Available products may include previously issued Letters of Map Change, a Flood Insurance Study Report, and/or digital versions of this map. Many of these products can be ordered or obtained directly from the website. Users may determine the current map date for each FIRM panel by visiting the FEMA Map Service Center website or by calling the FEMA Map Information eXchange.

The **"profile base lines"** depicted on this map represent the hydraulic modeling baselines that match the flood profiles in the FIS report. As a result of improved topographic data, the "profile base line", in some cases, may deviate significantly from the channel centerline or appear outside the SFHA.



LEGEND

SPECIAL FLOOD HAZARD AREAS SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD

The 1% annual chance flood (100-year flood), also known as the base flood, is the flood that has a 1% chance of being equaled or exceeded in any given year. The Special Flood Hazard Area is the area subject to flooding by the 1% annual chance flood. Areas of Special Flood Hazard include Zones A, AE, AH, AO, AR, A99, V, and VE. The Base Flood Elevation is the water-surface elevation of the 1% annual chance flood.

ZONE A	No Base Flood Elevations determined.
ZONE AE	Base Flood Elevations determined.
ZONE AH	Flood depths of 1 to 3 feet (usually areas of ponding); Base Flood Elevations determined.
ZONE AO	Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding, velocities also determined.
ZONE AR	Special Flood Hazard Area formerly protected from the 1% annual chance flood by a flood control system that was subsequently decertified. Zone AR indicates that the former flood control system is being restored to provide protection from the 1% annual chance or greater flood.
ZONE A99	Areas to be protected from 1% annual chance flood event by a Federal flood protection system under construction; no Base Flood Elevations determined.
ZONE V	Coastal flood zone with velocity hazard (wave action); no Base Flood Elevations determined.
ZONE VE	Coastal flood zone with velocity hazard (wave action); Base Flood Elevations determined.

FLOODWAY AREAS IN ZONE AE

The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights.

OTHER FLOOD AREAS

ZONE X	Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.

OTHER AREAS

ZONE X	Areas determined to be outside the 0.2% annual chance floodplain.
ZONE D	Areas in which flood hazards are undetermined, but possible.

COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS

OTHERWISE PROTECTED AREAS (OPAs)

CBRS areas and OPAs are normally located within or adjacent to Special Flood Hazard Areas.

1% annual chance floodplain boundary
0.2% annual chance floodplain boundary
Floodway boundary
Zone D boundary
CBRS and OPA boundary
Boundary dividing Special Flood Hazard Area Zones and boundary dividing Special Flood Hazard Areas of different Base Flood Elevations, flood depths, or flood velocities.
513 — Base Flood Elevation line and value; elevation in feet*
(EL 987) — Base Flood Elevation value where uniform within zone; elevation in feet*
* Referenced to the North American Vertical Datum of 1988
A — A — Cross section line
23 — 22 — Transect line
97°07'30", 32°22'30" — Geographic coordinates referenced to the North American Datum of 1983 (NAD 83), Western Hemisphere
4779000mN — 1000-meter Universal Transverse Mercator grid ticks, zone 17
600000mE — 5000-foot grid values: Florida State Plane coordinate system, East Zone (FIPSZONE = 0901), Transverse Mercator projection
DX5510 — Bench mark (see explanation in Notes to Users section of this FIRM panel)
M1.8 — River Mile

MAP REPOSITORIES
Refer to Map Repositories List on Map Index

EFFECTIVE DATE OF COUNTYWIDE FLOOD INSURANCE RATE MAP
MAY 7, 2001

EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL
JUNE 3, 2003 - To correct datum reference note

JUNE 18, 2013 - To update corporate limits, change Base Flood Elevations, add Base Flood Elevations, change Special Flood Hazard Areas, change zone designations, update maps and incorporate previously issued Letters of Map Revision, and reflect updated topographic information.

For community map revision history prior to countywide mapping, refer to the Community Map History table located in the Flood Insurance Study report for this jurisdiction.

To determine if flood insurance is available in this community, contact your insurance agent or call the National Flood Insurance Program at 1-800-638-6620.

MAP SCALE 1" = 1000'

NFIP
NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0060G

FIRM
FLOOD INSURANCE RATE MAP
OSCEOLA COUNTY, FLORIDA
AND INCORPORATED AREAS

PANEL 60 OF 900
(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
KISSIMMEE, CITY OF	120190	0060	G
OSCEOLA COUNTY	120189	0060	G

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
12097C0060G

MAP REVISED
JUNE 18, 2013

Federal Emergency Management Agency



Flood Risk Report

Osceola County, Florida, 03080101, 03090101

Osceola County
City of Kissimmee
City of St. Cloud
Reedy Creek Improvement District
Florida

Report Number 01
05/16/2013

Final

FEMA

RiskMAP
Increasing Resilience Together

Preface

The Department of Homeland Security (DHS), Federal Emergency Management Agency's (FEMA) Risk Mapping, Assessment, and Planning (Risk MAP) program provides states, tribes, and local communities with flood risk information and tools that they can use to increase their resilience to flooding and better protect their citizens. By pairing accurate floodplain maps with risk assessment tools and planning and outreach support, Risk MAP has transformed traditional flood mapping efforts into an integrated process of identifying, assessing, communicating, planning for, and mitigating flood-related risks.

This Flood Risk Report (FRR) provides non-regulatory information to help local or tribal officials, floodplain managers, planners, emergency managers, and others better understand their flood risk, take steps to mitigate those risks, and communicate those risks to their citizens and local businesses.

Because flood risk often extends beyond community limits, the FRR provides flood risk data for the entire Flood Risk Project as well as for each individual community. This also emphasizes that flood risk reduction activities may impact areas beyond jurisdictional boundaries.

Flood risk is always changing, and there may be other studies, reports, or sources of information available that provide more comprehensive information. The FRR is not intended to be regulatory or the final authoritative source of all flood risk data in the project area. Rather, it should be used in conjunction with other data sources to provide a comprehensive picture of flood risk within the project area.

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FLOOD RISK REPORT

1 Introduction

1.1 About Flood Risk

Floods are naturally occurring phenomena that can and do happen almost anywhere. In its most basic form, a flood is an accumulation of water over normally dry areas. Floods become hazardous to people and property when they inundate an area where development has occurred, causing losses. Mild flood losses may have little impact on people or property, such as damage to landscaping or the generation of unwanted debris. Severe flooding can destroy buildings, ruin crops, and cause critical injuries or death.



Flooding is a natural part of our world and our communities. Flooding becomes a significant hazard, however, when it intersects with the built environment.

1.1.1 Calculating Flood Risk

It is not enough to simply identify where flooding may occur. Just because one knows where a flood occurs does not mean they know the **risk** of flooding. The most common method for determining flood risk, also referred to as vulnerability, is to identify the probability of flooding and the consequences of flooding. In other words:

Flood Risk (or Vulnerability) **= Probability x Consequences**; where
Probability = the likelihood of occurrence
Consequences = the estimated impacts associated with the occurrence

Which picture below shows more flood risk?





The probability of a flood is the likelihood that a flood will occur. The probability of flooding can change based on physical, environmental, and/or contributing engineering factors. Factors affecting the probability that a flood will impact an area range from changing weather patterns to the existence of mitigation projects. The ability to assess the probability of a flood and the level of accuracy for that assessment are also influenced by modeling methodology advancements, better knowledge, and longer periods of record for the water body in question.

The consequences of a flood are the estimated impacts associated with the flood occurrence. Consequences relate to humans activities within an area and how a flood impacts the natural and built environments.

Even if you assume that the flood in both pictures was the same probability—let's say a 10-percent- annual-chance flood—the consequences in terms of property damage and potential injury as a result of the flood in the bottom picture are much more severe. Therefore, the flood risk in the area shown in the bottom picture is higher.

1.1.2 Risk MAP Flood Risk Products

Through Risk MAP, FEMA provides communities with updated Flood Insurance Rate Maps (FIRMs) and Flood Insurance Studies (FISs) that focus on the probability of floods and that show where flooding may occur as well as the calculated 1% annual chance flood elevation. The 1% annual chance flood, also known as the base flood, has a 1%

chance of being equaled or exceeded in any given year. FEMA understands that flood risk is dynamic—that flooding does not stop at a line on a map—and as such, provides the following flood risk products:



Whether or not an area might flood is one consideration. The extent to which it might flood adds a necessary dimension to that understanding.

- Flood Risk Report (FRR): The FRR presents key risk analysis data for the Flood Risk Project.
- Flood Risk Map (FRM): Like the example found in Section 3.1 of this document, the FRM shows a variety of flood risk information in the project area. More information about the data shown on the FRM may be found in Section 2 of this report.
- Flood Risk Database (FRD): The FRD is in GIS format and houses the flood risk data developed during the course of the flood risk analysis that can be used and updated by the community. After the Flood Risk Project is complete, this data can be used in many ways to visualize and communicate flood risk within the Flood Risk Project.

These Flood Risk Products provide flood risk information at both the Flood Risk Project level and community level (for those portions of each community within the Flood Risk Project). They demonstrate how decisions made within a Flood Risk Project can impact properties downstream, upstream, or both. Community-level information is particularly useful for mitigation planning and emergency management activities, which often occur at a jurisdictional level.

1.2 Uses of this Report

The goal of this report is to help inform and enable communities and tribes to take action to reduce flood risk. Possible users of this report include:

- Local elected officials
- Floodplain managers
- Community planners
- Emergency managers
- Public works officials
- Other special interests (e.g., watershed conservation groups, environmental awareness organizations, etc.)



Vulnerability of infrastructure is another important consideration.

State, local, and tribal officials can use the summary information provided in this report, in conjunction with the data in the FRD, to:

- **Update local hazard mitigation plans.** As required by the 2000 Federal Stafford Act, local hazard mitigation plans must be updated at least every five (5) years. Summary information presented in Section 3 of this report and the FRM can be used to identify areas that may need additional focus when updating the risk assessment section of a local hazard mitigation plan. Information found in Section 4 pertains to the different mitigation techniques and programs and can be used to inform decisions related to the mitigation strategy of local plans.

- **Update community comprehensive plans.** Planners can use flood risk information in the development and/or update of comprehensive plans, future land use maps, and zoning regulations. For example, zoning codes may be changed to better provide for appropriate land uses in high-hazard areas.
- **Update emergency operations and response plans.** Emergency managers can identify low-risk areas for potential evacuation and sheltering and can help first responders avoid areas of high-depth flood water. Risk assessment results may reveal vulnerable areas, facilities, and infrastructure for which planning for continuity of operations plans (COOP), continuity of government (COG) plans, and emergency operations plans (EOP) would be essential.
- **Develop hazard mitigation projects.** Local officials (e.g., planners and public works officials) can use flood risk information to re-evaluate and prioritize mitigation actions in local hazard mitigation plans.
- **Communicate flood risk.** Local officials can use the information in this report to communicate with property owners, business owners, and other citizens about flood risks, changes since the last FIRM, and areas of mitigation interest. The report layout allows community information to be extracted in a fact sheet format.
- **Inform the modification of development standards.** Floodplain managers, planners, and public works officials can use information in this report to support the adjustment of development standards for certain locations. For example, heavily developed areas tend to increase floodwater runoff because paved surfaces cannot absorb water, indicating a need to adopt or revise standards that provide for appropriate stormwater retention.



Flooding along the Wabash River in Clark County, Illinois, contributed to a federal disaster declaration on June 24, 2008.

The Flood Risk Database, Flood Risk Map, and Flood Risk Report are "non-regulatory" products. They are available and intended for community use but are neither mandatory nor tied to the regulatory development and insurance requirements of the National Flood Insurance Program (NFIP). They may be used as regulatory products by communities if authorized by state and local enabling authorities.

1.3 Sources of Flood Risk Assessment Data Used

To assess potential community losses, or the consequences portion of the "risk" equation, the following data is typically collected for analysis and inclusion in a Flood Risk Project:

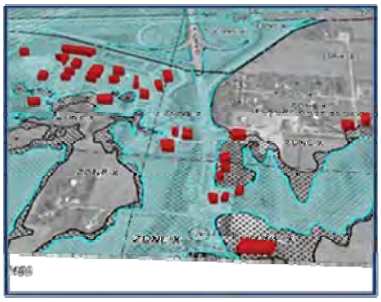


- Information about local assets or resources at risk of flooding
- Information about the physical features and human activities that contribute to that risk
- Information about where the risk is most severe

For most Flood Risk Projects, FEMA uses the following sources of flood risk information to develop this report:

- Hazus estimated flood loss information
- New engineering analyses (e.g., hydrology and hydraulic modeling) to develop new flood boundaries
- Locally supplied data (see Section 7 for a description)
- Sources identified during the Discovery process





FEMA data can be leveraged to identify and measure vulnerability by including local building information (i.e. building type). The examples above show various ways to display flooding intersecting with buildings.

1.4 Related Resources

For a more comprehensive picture of flood risk, FEMA recommends that state and local officials use the information provided in this report in conjunction with other sources of flood risk data, such as those listed below.

- **FIRMs and FISs.** This information indicates areas with specific flood hazards by identifying the limit and extent of the 1-percent-annual-chance floodplain and the 0.2-percent-annual-chance floodplain. FIRMs and FIS Reports do not identify all floodplains in a Flood Risk Project. The FIS Report includes summary information regarding other frequencies of flooding, as well as flood profiles for riverine sources of flooding. In rural areas and areas for which flood hazard data are not available, the 1-percent-annual-chance floodplain may not be identified. In addition, the 1-percent-annual-chance floodplain may not be identified for flooding sources with very small drainage areas (less than 1 square mile).
- **Hazus Flood Loss Estimation Reports.** Hazus can be used to generate reports, maps and tables on potential flood damage that can occur based on new/proposed mitigation projects or future development patterns and practices. Hazus can also run specialized risk assessments, such as what happens when a dam or levee fails. Flood risk assessment tools are available through other agencies as well, including the National Oceanic and Atmospheric Administration (NOAA) and the U.S. Army Corps of Engineers (USACE). Other existing watershed reports may have a different focus, such as water quality, but may also contain flood risk and risk assessment information. See Section 6 for additional resources.
- **Flood or multi-hazard mitigation plans.** Local hazard mitigation plans include risk assessments that contain flood risk information and mitigation strategies that identify community priorities and actions to reduce flood risk. This report was informed by any existing mitigation plans in the Flood Risk Project.
- **Hurricane Evacuation Studies.** Produced through a joint effort by FEMA, NOAA, and USACE, Hurricane Evacuation Studies provide tools and information to the state and county emergency management offices to help determine who should evacuate during hurricane threats, and when those evacuations should occur. The information can be used to supplement or update hurricane evacuation plans and operational procedures for responding to hurricane threats.
- **Tsunami Inundation Maps.** Maps depicting tsunami inundation hazard zones are produced for coastal areas exposed to tsunami threats, typically those on the Pacific Ocean coast. The mapping is accomplished through efforts coordinated by FEMA, NOAA, the U.S. Geological

Survey (USGS), USACE, and numerous state and local agencies. The maps can be used by communities to supplement or update emergency management and evacuation plans.

- **Emergency Action Plans.** Emergency Action Plans are formal documents that identify potential emergency conditions at a dam and specify preplanned actions to be followed to minimize property damage and loss of life. The plans specify actions the dam owner should take to moderate or alleviate the identified problems at the dam. These plans usually contain inundation maps downstream of the dam to show emergency management authorities critical areas for action in case of an emergency. This report consulted available EAPs for those dams that were studied.
- **FEMA Map Service Center (MSC).** The MSC has useful information, including fly sheets, phone numbers, data, etc. Letters of Map Change are also available through the MSC. The user can view FIRM databases and the National Flood Hazard Layer (NFHL) Database.

2 Flood Risk Analysis

2.1 Overview

Flood hazard identification uses FIRMs, and FIS Reports identify where flooding can occur along with the probability and depth of that flooding. Flood risk assessment is the systematic approach to identifying how flooding impacts the environment. In hazard mitigation planning, flood risk assessments serve as the basis for mitigation strategies and actions by defining the hazard and enabling informed decision making. Fully assessing flood risk requires the following:

- Identifying the flooding source and determining the flood hazard occurrence probability
- Developing a complete profile of the flood hazard including historical occurrence and previous impacts
- Inventorying assets located in the identified flood hazard area
- Estimating potential future flood losses caused by exposure to the flood hazard area



Flooding impacts non-populated areas too, such as agricultural lands and wildlife habitats.

Flood risk analyses are different methods used in flood risk assessment to help quantify and communicate flood risk. Flood risk analysis can be performed on a large scale (state, community) level and on a very small scale (parcel, census block). Advantages of large-scale flood risk analysis, especially at the watershed level, include identifying how actions and development in one community can affect areas up- and downstream. On the parcel or census block level, flood risk analysis can provide actionable data to individual property owners so they can take appropriate mitigation steps.

2.2 Analysis of Risk

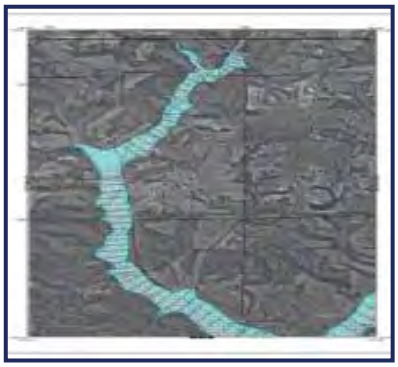
The FRR, FRM, and FRD contain a variety of flood risk analysis information to help describe and visualize flood risk within the project area. Depending on the scope of the Flood Risk Project for this project area, this information may include some or all of the following elements:

- Changes Since Last FIRM
- Water Surface, Flood Depth, and Analysis Grids
- Flood Risk Assessment Information
- Areas of Mitigation Interest

State and Local Hazard Mitigation Plans are required to have a comprehensive all-hazard risk assessment. The flood risk analyses in the FRR, FRM, and FRD can inform the flood hazard portion of a community's or state's risk assessment. Further, data in the FRD can be used to develop information that meets the requirements for risk assessments as it relates to the hazard of flood in hazard mitigation plans.

2.2.1 Changes Since Last FIRM

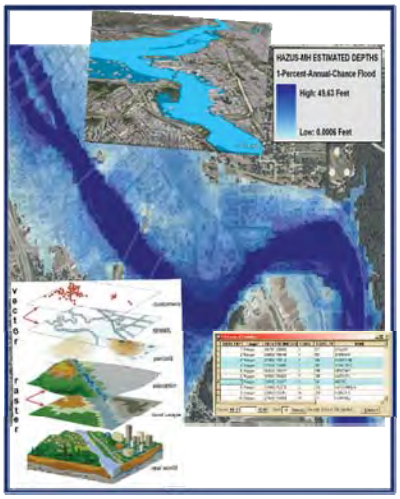
The Changes Since Last FIRM (CSLF) dataset, stored in the FRD and shown in Section 3 of this report, illustrates where changes to flood risk may have occurred since the last FIRM was published for the subject area. Communities can use this information to update their mitigation plans, specifically quantifying "what is at risk" and identifying possible mitigation activities.



The CSLF dataset identifies changes in the Special Flood Hazard Area (SFHA) and floodway boundary changes since the previous FIRM was developed. These datasets quantify land area increases and decreases to the SFHA and floodway, as well as areas where the flood zone designation has changed (e.g., Zone A to AE, AE to VE, shaded Zone X protected by levee to AE for de-accredited levees).

The CSLF dataset is created in areas that were previously mapped using digital FIRMs. The CSLF dataset for this project area includes:

- Floodplain and/or Floodway Boundary Changes: Any changes to the existing floodplain or floodway boundaries are depicted in this dataset
- Floodplain Designation Changes: This includes changed floodplain designations (e.g., Zone A to Zone AE).
- CSLF Information: Within this dataset additional information is provided to help explain the floodplain and floodway boundary changes shown on the FIRM. This information is stored as digital attributes within the CSLF polygons and may include some or all of the following:
  - Changes in peak discharges
  - Changes to the modeling methodology (e.g., tide gage analysis)
  - New flood control structures (e.g., dams, levees, etc.)
  - Changes to hydraulic structures (e.g., bridges, culverts, etc.)
  - Sedimentation and/or Erosion
  - Man-made changes to a watercourse (e.g., realignment or improvement)



Floodplain maps have evolved considerably from the older paper-based FIRMs to the latest digital products and datasets.

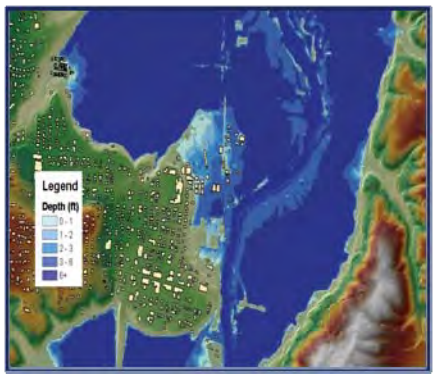
It should be noted that reasons for the floodplain and floodway changes (also known as Contributing Engineering Factors) are intended to give the user a general sense of what caused the change, as opposed to providing a reason for each and every area of change.

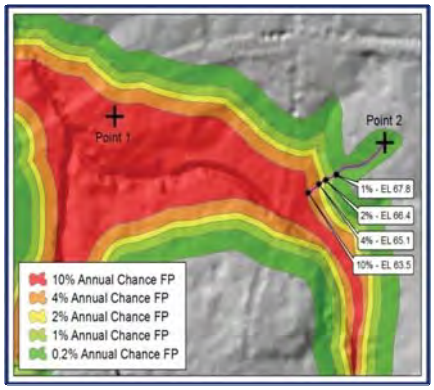
CSLF data can be used to communicate changes in the physical flood hazard area (size, location) as part of the release of new FIRMS. It can also be used in the development or update of hazard mitigation plans to describe changes in hazard as part of the hazard profile.

CSLF data is shown in the FRR, and underlying data is stored in the FRD.

2.2.2 Flood Depth and Analysis Grids

Grids are FEMA datasets provided in the FRD to better describe the risk of the flood hazard. While the FIRM and FIS Report describe "what" is at risk by identifying the hazard areas, water surface, flood depth, and analysis grids can help define "how bad" the risk is within those identified areas. These grids are intended to be used by communities for additional analysis, enhanced visualization, and communication of flood risks for hazard mitigation planning and emergency management. The Flood Depth and Analysis Grids provide an alternative way to visualize how a particular flood characteristic (depth, velocity, etc.) vary within the floodplain. Since they are derived from the engineering modeling results, they are typically associated with a particular frequency-based flooding event (e.g., 1% annual chance event). Grids provided in the FRD for this project area include the following:





Grid data can make flood mapping more informative. The top image is a flood depth grid showing relative depths of water in a scenario flood event. The bottom image is a percent annual chance of flooding grid, which shows inundation areas of various frequency floods.

- **Flood Depth Grids (for the calculated flood frequencies included in the FIS Report):** Flood Depth Grids are created for each flood frequency calculated during the course of a Flood Risk Project. These grids communicate flood depth as a function of the difference between the calculated water surface elevation and the ground. Five grids will normally be delivered for riverine areas for the standard flood frequencies (10-, 4-, 2-, 1-, and 0.2-percent-annual-chance).

  Depth grids form the basis for refined Hazus loss estimates (as presented in a table in Section 3 of this report) and are used to calculate potential flood losses for display on the FRM and for tabular presentation in this report. Depth grids may also be used for a variety of ad-hoc risk visualization and mitigation initiatives.

- **Percent Annual Chance of Flooding Grid:** This is a grid dataset that represents the percent annual chance of flooding for locations along a flooding source. This grid uses the five standard flood frequencies.

- **Percent 30-Year Chance of Flooding Grid:** This is a grid dataset that represents the estimated likelihood of flooding at least once within a 30-year period, which is the average lifespan for a home mortgage, for all locations within the extent of the 1-percent-annual-chance and 0.2-percent-annual-chance floodplain.

- **Water Surface Elevation Grids:** This dataset represents the raw results of the hydrologic and hydraulic analysis before adjustments are made to account for influences associated with other flooding sources.

Grid data can be used to communicate the variability of floodplains, such as where floodplains are particularly deep or hazardous, where residual risks lie behind levees, and where losses may be great after a flood event. For mitigation planning, grid data can inform the hazard profile and vulnerability analysis (what is at risk for different frequencies) and can be used for preliminary benefit-cost analysis screening. For floodplain management, higher regulatory standards can be developed in higher hazard flood prone areas (i.e., 10-percent-chance floodplains or deep floodplains).

Grid data is stored in the FRD, and a list of available grid data is provided in the FRR.

2.2.3 Estimated Flood Loss Information

Flood loss estimates provided in the FRR were developed using a FEMA flood loss estimation tool, Hazus. Originally developed for earthquake risk assessment, Hazus has evolved into a multi-hazard tool developed and distributed by FEMA that can provide loss estimates for floods, earthquakes, and hurricane winds. Hazus is a nationally accepted, consistent flood risk assessment tool to assist individuals and communities to create a more accurate picture of flood risk. Some benefits of using Hazus include the following:



Hazus is a loss estimation methodology developed by FEMA for flood, wind, and earthquake hazards. The methodology and data established by Hazus can also be used to study other hazards.

- Outputs that can enhance state and local mitigation plans and help screen for cost-effectiveness in FEMA mitigation grant programs
- Analysis refinement through updating inventory data and integrating data produced using other flood models
- Widely available support documents and networks (Hazus Users Groups)

Files from the FRD can be imported into Hazus to develop other risk assessment information including:

- Debris generated after a flood event
- Dollar loss of the agricultural products in a study region
- Utility system damages in the region
- Vehicle loss in the study region
- Damages and functionality of lifelines such as highway and rail bridges, potable water, and wastewater facilities

Hazus-estimated loss data can be used in many ways to support local decision making and explanation of flood risk. For mitigation planning purposes, loss data can be used to help meet requirements to develop loss information for the hazard of flood. Also, the FRM can show where flood risk varies by geographic location. For emergency management, Hazus data can help forecast losses based on predicted events, and resources can be assigned accordingly. Loss information can support floodplain management efforts, including those to adopt higher regulatory standards. *Also, awareness of exposed essential facilities and infrastructure encourages mitigation actions to protect citizens from service disruption should flooding occur*.

Hazus estimated loss data is summarized in the FRR and on the FRM and stored in the FRD.

Scenario-Based Flood Loss Estimates:

Scenario-based flood losses have been calculated using Hazus for the 10-, 4-, 2-, 1-, and 0.2-percent-annual-chance flood events. In this report, these losses are expressed in dollar amounts and are provided for the Flood Risk Project area only, even though results are shown for the entire watershed and at the local jurisdiction level.

Loss estimates are based on best available data, and the methodologies applied result in an approximation of risk. These estimates should be used to understand relative risk from flood and potential losses. Uncertainties are inherent in any loss estimation methodology, arising in part from approximations and simplifications that are necessary for a comprehensive analysis (e.g., incomplete inventories, demographics, or economic parameters).

Flood loss estimates are being provided at the project and community levels for multiple flood frequencies including:

- **Residential Asset Loss**: These include direct building losses (estimated costs to repair or replace the damage caused to

the building) for all classes of residential structures including single family, multi-family, manufactured housing, group housing, and nursing homes. This value also includes content losses.

- **Commercial Asset Loss**: These include direct building losses for all classes of commercial buildings including retail, wholesale, repair, professional services, banks, hospitals, entertainment, and parking facilities. This value also includes content and inventory losses.
- **Other Asset Loss**: This includes losses for facilities categorized as industrial, agricultural, religious, government, and educational. This value also includes content and inventory losses.
- **Essential Facility Losses:** Essential facilities are defined in Hazus as facilities which provide services to the community and should be functional after a flood, including schools, police stations, fire stations, medical facilities, and emergency operation centers. These facilities would otherwise be considered critical facilities for mitigation planning purposes. Estimated damages (in terms of loss of function) for essential facilities are determined on a site-specific basis according to latitude and longitude. For this report, Hazus calculates the types and numbers of essential facilities impacted.
- **Infrastructure:** For analysis of infrastructure, Hazus supports the analysis of transportation systems and lifeline utility systems. Transportation systems include highways, railways, light railways, busses, ports and harbors, ferries, and airport systems. Utility systems include potable water systems, wastewater, oil, natural gas, electric power, and communication systems. For this report, Hazus calculates the types of infrastructure impacted.
- **Business Disruption**: This includes the losses associated with the inability to operate a business due to the damage sustained during the flood. Losses include inventory, income, rental income, wage, and direct output losses, as well as relocation costs.
- **Annualized Losses**: Annualized losses are calculated using Hazus by taking losses from multiple events over different frequencies and expressing the long-term average by year. This factors in historic patterns of frequent smaller floods with infrequent but larger events to provide a balanced presentation of flood damage.
- **Loss Ratio:** The loss ratio expresses the scenario losses divided by the total building value for a local jurisdiction and can be a gage to determine overall community resilience as a result of a scenario event. For example, a loss ratio of 5 percent for a given scenario would indicate that a local jurisdiction would be more resilient and recover more easily from a given event, versus a loss ratio of 75 percent which would indicate widespread losses. An annualized loss ratio uses the annualized loss data as a basis for computing the ratio. Loss ratios are not computed for business disruption. These data are presented in the FRR.
- **Hazus Flood Risk Value:** On the FRM, flood risk is expressed in the following five categories: very low, low, medium, high, and very high for census blocks that have flood risk. It is based on the 1-percent-annual-chance total asset loss by census block.

2.2.4 Areas of Mitigation Interest

Many factors contribute to flooding and flood losses. Some are natural, and some are not. In response to these risks, there has been a focus by the federal government, state agencies, and local jurisdictions to mitigate properties against the impacts of flood hazards so that future losses and impacts can be reduced. An area identified as an Area of Mitigation Interest (AoMI) is an important element of defining

a more comprehensive picture of flood risk and mitigation activity in a watershed, identifying target areas and potential projects for flood hazard mitigation, encouraging local collaboration, and communicating how various mitigation activities can successfully reduce flood risk.

This report and the FRM may include information that focuses on identifying Areas of Mitigation Interest that may be contributing (positively or negatively) to flooding and flood losses in the Flood Risk Project. AoMIs are identified through coordination with local stakeholders; through revised hydrologic and hydraulic and/or coastal analyses; by leveraging other studies or previous flood studies; from community mitigation plans, floodplain management plans, and local surveys; and from the mining of federal government databases (e.g., flood claims, disaster grants, and data from other agencies). Below is a list of the types of Areas of Mitigation Interest that may be identified in this Flood Risk Report, shown on the Flood Risk Map, and stored in the Flood Risk Database:

- **Dams**

A dam is a barrier built across a waterway for impounding water. Dams vary from impoundments that are hundreds of feet tall and contain thousands of acre-feet of water (e.g., Hoover Dam) to small dams that are a few feet high and contain only a few acre-feet of water (e.g., small residential pond). "Dry dams," which are designed to contain water only during floods and do not impound water except for the purposes of flood control, include otherwise dry land behind the dam.



Dams vary in size and shape, the amount of water they impound, and their assigned hazard classification.

While most modern, large dams are highly engineered structures with components such as impervious cores and emergency spillways, most smaller and older dams are not. State dam safety programs emerged in the 1960s, and the first Federal Guidelines for Dam Safety were not prepared until 1979. By this time, the vast majority of dams in the United States had already been constructed.



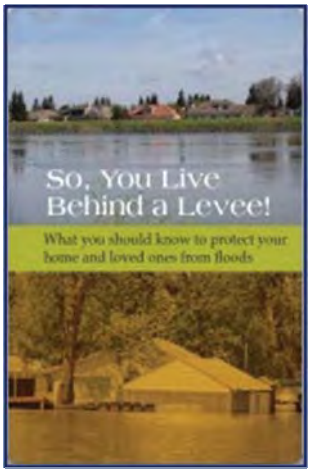
This dam failure caused flooding that damaged several homes and vehicles.

- **Reasons dams are considered AoMIs:**
  - Many older dams were not built to any particular standard and thus may not withstand extreme rainfall events. Older dams in some parts of the country are made out of an assortment of materials. These structures may not have any capacity to release water and could be overtopped, which could result in catastrophic failure.
  - Dams may not always be regulated, given that the downstream risk may have changed since the dam was constructed or since the hazard classification was determined. Years after a dam is built, a house, subdivision, or other development may be constructed in the dam failure inundation zone downstream of the dam. Thus, a subsequent dam failure could result in downstream consequences, including property damage and the potential loss of life. Since these dams are not regulated, it is impossible to predict how safe they are.

- A significant dam failure risk is structural deficiencies associated with older dams that are not being adequately addressed today through needed inspection/maintenance practices.
- For larger dams a flood easement may have been obtained on a property upstream or downstream of the dam. However, there may have been buildings constructed in violation of the flood easement.
- When a new dam is constructed, the placement of such a large volume of material in a floodplain area (if that is the dam location) will displace flood waters and can alter how the watercourse flows. This can result in flooding upstream, downstream, or both.
- For many dams, the dam failure inundation zone is not known. Not having knowledge of these risk areas could lead to unprotected development in these zones.

- **Levees and Major Embankments**

FEMA defines a levee as "a man-made structure, usually an earthen embankment, designed and constructed in accordance with sound engineering practices to contain, control, or divert the flow of water so as to provide protection from temporary flooding." Levees are sometimes referred to as dikes. Soil used to construct a levee is compacted to make the levee as strong and stable as possible. To protect against erosion and scouring, levees can be covered with everything from grass and gravel to harder surfaces like stone (riprap), asphalt, or concrete.



For more information about the risks associated with living behind levees, consult the publication "So, You Live Behind a Levee!" published by the American Society of Civil Engineers at http://content.asce.org/ASCELeveeGuide.html

Similar to dams, levees have not been regulated in terms of safety and design standards until relatively recently. Many older levees were constructed in a variety of ways, from a farmer piling dirt along a stream to prevent nuisance flooding to levees made out of old mining spoil material. As engineered structures, levees are designed to a certain height and can fail if a flood event is greater than anticipated.

A floodwall is a vertical wall that is built to provide protection from a flood in a similar manner as a levee. Typically made of concrete or steel, floodwalls often are erected in urban locations where there is not enough room for a levee. Floodwalls are sometimes constructed on a levee crown to increase the levee's height.

Most new dams and levees are engineered to a certain design standard. If that design is exceeded, they could be overtopped and fail catastrophically, causing more damage than if the levee was not there in the first place. Few levees anywhere in the nation are built to more than a 1-percent-annual-chance flood protection rating, and the areas behind them are still at some risk for flooding. This threat is called residual risk. In some states, residual risk areas can extend up to 15 miles from a riverbank. Although the probability of flooding may be lower because a levee exists, risk is nonetheless still present. The American Society of Civil Engineers' publication "So, You Live Behind a Levee!" provides an in-depth explanation of levee and residual risk.

Major embankments, on the other hand, are rarely designed with any flood protection level in mind. Railroads, road abutments, and canals—especially in the Western United States—are not considered

levees or dams and have issues such as unknown construction materials/methods. These embankments are not regulated from a flood risk standpoint.

- **Reasons levees and major embankments are considered AoMIs:**

  - Like dams, many levees in the United States were constructed using unknown techniques and materials. These levees have a higher failure rate than those that have been designed to today's standards.

  - A levee might not provide the flood risk reduction it once did as a result of flood risk changes over time. Flood risk can change due to a number of factors, including increased flood levels due to climate change or better estimates of flooding, development in the watershed increasing flood levels and settlement of the levee or floodwall, and sedimentation in the levee channel. Increased flood levels mean decreased flood protection. The lack of adequate maintenance over time will also reduce the capability of a levee to contain the flood levels for which it was originally designed.





Canal levee breaches as a result of Hurricane Katrina in New Orleans in 2005. Note damages can be more extensive due to high velocity flood flows than if the levee was not there.

  - Given enough time, any levee will eventually be overtopped or damaged by a flood that exceeds the levee's capacity. Still, a widespread public perception of levees is that they will always provide protection. This perception may lead to not taking mitigation actions such as purchasing flood insurance.

  - A levee is a system that can fail due to its weakest point, and therefore maintenance is critical. Many levees in the United States are poorly maintained or not maintained at all. Maintenance also includes maintaining the drainage systems behind the levees so they can keep the protected area dry.

- **Stream Flow Constrictions**

A stream flow constriction occurs when a human-made structure, such as a culvert or bridge, constricts the flow of a river or stream. The results of this constriction can be increased damage potential to the structure, an increase in velocity of flow through the structure, and the creation of significant ponding or backwater upstream of the structure. Regulatory standards regarding the proper opening size for a structure spanning a river or stream are not consistent and may be non-existent. Some local regulations require structures to pass a volume of water that corresponds to a certain size rain event; however, under sizing, these openings can result in flood damage to the structure itself. After a large flood event, it is not uncommon to have numerous bridges and culverts "washed out."

- **Reasons stream flow constrictions are considered AoMIs:**

  - Stream flow constrictions can back water up on property upstream of the structure if not designed properly.

- These structures can accelerate the flow through the structure causing downstream erosion if not properly mitigated. This erosion can affect the structure itself, causing undermining and failure.
- If the constriction is a bridge or culvert, it can get washed out causing an area to become isolated and potentially more difficult to evacuate.
- Washed-out culverts and associated debris can wash downstream and cause additional constrictions.

- **At-Risk Essential Facilities**

Essential facilities, sometimes called "critical facilities," are those whose impairment during a flood could cause significant problems to individuals or communities. For example, when a community's wastewater treatment is flooded and shut down, not only do contaminants escape and flow into the floodwaters, but backflows of sewage can contaminate basements or other areas of the community. Similarly, when a facility such as a hospital is flooded, it can result in a significant hardship on the community not only during the event but long afterwards as well.

- **Reasons at-risk essential facilities are considered AoMIs:**
  - Costly and specialized equipment may be damaged and need to be replaced.
  - Impairments to facilities such as fire stations may result in lengthy delays in responding and a focus on evacuating the facility itself.
  - Critical records and information stored at these facilities may be lost.

- **Past Flood Insurance Claims and Individual Assistance/Public Assistance Hotspots**

Assistance provided after flood events (flood insurance in any event and Individual Assistance [IA] or Public Assistance [PA] after declared disasters) occurs in flood affected areas. Understanding geographically where this assistance is being provided may indicate unique flood problems.



Clusters of past flood insurance claims can show where there is a repetitive flood problem.

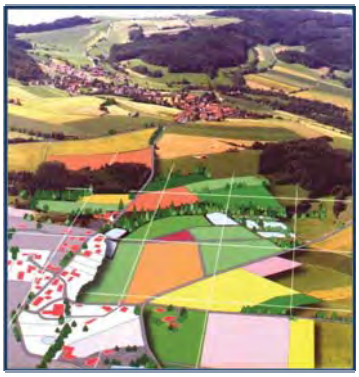
Flood insurance claims are not always equally distributed in a community. Although estimates indicate that 20 to 50 percent of structures in identified flood hazard areas have flood insurance, clusters of past claims may indicate where there is a flood problem. However, clusters of past claims and/or areas where there are high payments under FEMA's IA or PA Programs may indicate areas of significant flood hazard.

- **Reasons past claim hotspots are considered AoMIs:**
  - A past claim hotspot may reflect an area of recent construction (large numbers of flood insurance policies as a result of a large number of mortgages) and an area where the as-built construction is not in accordance with local floodplain management regulations.
  - Sometimes clusters of past claims occur in subdivisions that were constructed before flood protection standards were in place, places with inadequate stormwater management systems, or in areas that may not have been identified as SFHAs.

- Clusters of IA or PA claims may indicate areas where high flood insurance coverage or other mitigation actions are needed.

- **Areas of Significant Land Use Change**

Development, whether it is a 100-lot subdivision or a single lot big box commercial outlet, can result in large amounts of fill and other material being deposited in flood storage areas, thereby increasing flood hazards downstream.



Additionally, when development occurs, hard surfaces such as parking lots, buildings and driveways do not allow water to absorb into the ground, and more of the rainwater becomes runoff flowing directly into streams. As a result, the "peak flow" in a stream after a storm event will be higher and will occur faster. Without careful planning, major land use changes can affect the impervious area of a site and result in a significant increase in flood risk caused by streams that cannot handle the extra storm water runoff.



Rooftops, pavements, patios, and driveways contribute to the impervious area in a watershed. This occurs in both urban areas and rural areas being developed.

Sometimes a major land use change may be for planning purposes only. For example, a land use change that rezones land from a classification such as floodplain that restricts development to a zone such as industrial or high density residential could result in significant new infrastructure and structures in high flood risk areas.

- **Reasons Areas of Significant Land Use Change are considered AoMIs:**
  - Development in areas mapped SFHA reduces flood storage areas, which can make flooding worse at the development site and downstream of it.
  - Impervious surfaces speed up the water flowing in the streams, which can increase erosion and the danger that fast-flowing floodwaters pose to people and buildings.
  - Rezoning flood-prone areas to high densities and/or higher intensity uses can result in more people and property at risk of flooding and flood damage.

- **Key Emergency Routes Overtopped During Frequent Flooding Events**

Roads are not always elevated above estimated flood levels, and present a significant flood risk to motorists during flooding events. When alternate routes are available, risks may be reduced, including risks to life and economic loss.



When large highways close due to flooding, traffic is detoured causing inconvenience and economic loss.

- **Reasons overtopped roads are considered AoMIs:**
  - Such areas, when identified, can be accounted for and incorporated into Emergency Action Plans.

- Roads may be elevated or reinforced to reduce the risk of overtopping during flood events.

- **Drainage or Stormwater-Based Flood Hazard Areas, or Areas Not Identified as Floodprone on the FIRM But Known to Be Inundated**

Flood hazard areas exist everywhere. While FEMA maps many of these, others are not identified. Many of these areas may be located in communities with existing, older, and often inadequate stormwater management systems or in very rural areas. Other similar areas could be a result of complex or unique drainage characteristics. Even though they are not mapped, awareness of these areas is important so adequate planning and mitigation actions can be performed.

- **Reasons drainage or stormwater-based flood hazard areas or unidentified floodprone locations are considered AoMIs:**
  - So further investigation of such areas can occur and, based on scientific data, appropriate mitigation actions can result (i.e., land use and building standards).
  - To create viable mitigation project applications in order to reduce flood losses.

- **Areas of Mitigation Success**

Flood mitigation projects are powerful tools to communicate the concepts of mitigation and result in more resilient communities. Multiple agencies have undertaken flood hazard mitigation actions for decades. Both structural measures—those that result in flood control structures—and non-structural measures have been implemented in thousands of communities. An extensive list of mitigation actions can be found in Section 4.

- **Reasons areas of mitigation success are considered AoMIs:**
  - Mitigation successes identify those areas within the community that have experienced a reduction or elimination of flood risk.
  - Such areas are essential in demonstrating successful loss reduction measures and in educating citizens and officials on available flood hazard mitigation techniques.
  - Avoided losses can be calculated and shown.

- **Areas of Significant Riverine Erosion**

Stream channels are shaped by a number of factors, including: degradation, aggradation, general scour, local scour, deposition, and lateral migration. Streams are constantly progressing towards a state of dynamic equilibrium involving water and sediment.

- **Reasons why areas of significant riverine erosion are considered AoMIs:**
  - Riverine flood damage assessments generally consider inundation alone
  - Bank erosion caused by within channel flows is not recognized as a significant hazard in Federal floodplain management regulations
  - Riverine erosion can undercut structures and roads, causing instability and possible collapse.
  - Landslides and mudslides are a result of erosion
  - Approximately one-third of the nation's streams experience severe erosion problems

- **Other**

Other types of flood risk areas include drainage or stormwater-based flood hazard areas, or areas known to be inundated during storm events.

3 Flood Risk Analysis Results

The following pages provide summary flood risk results for the Flood Risk Project as follows:

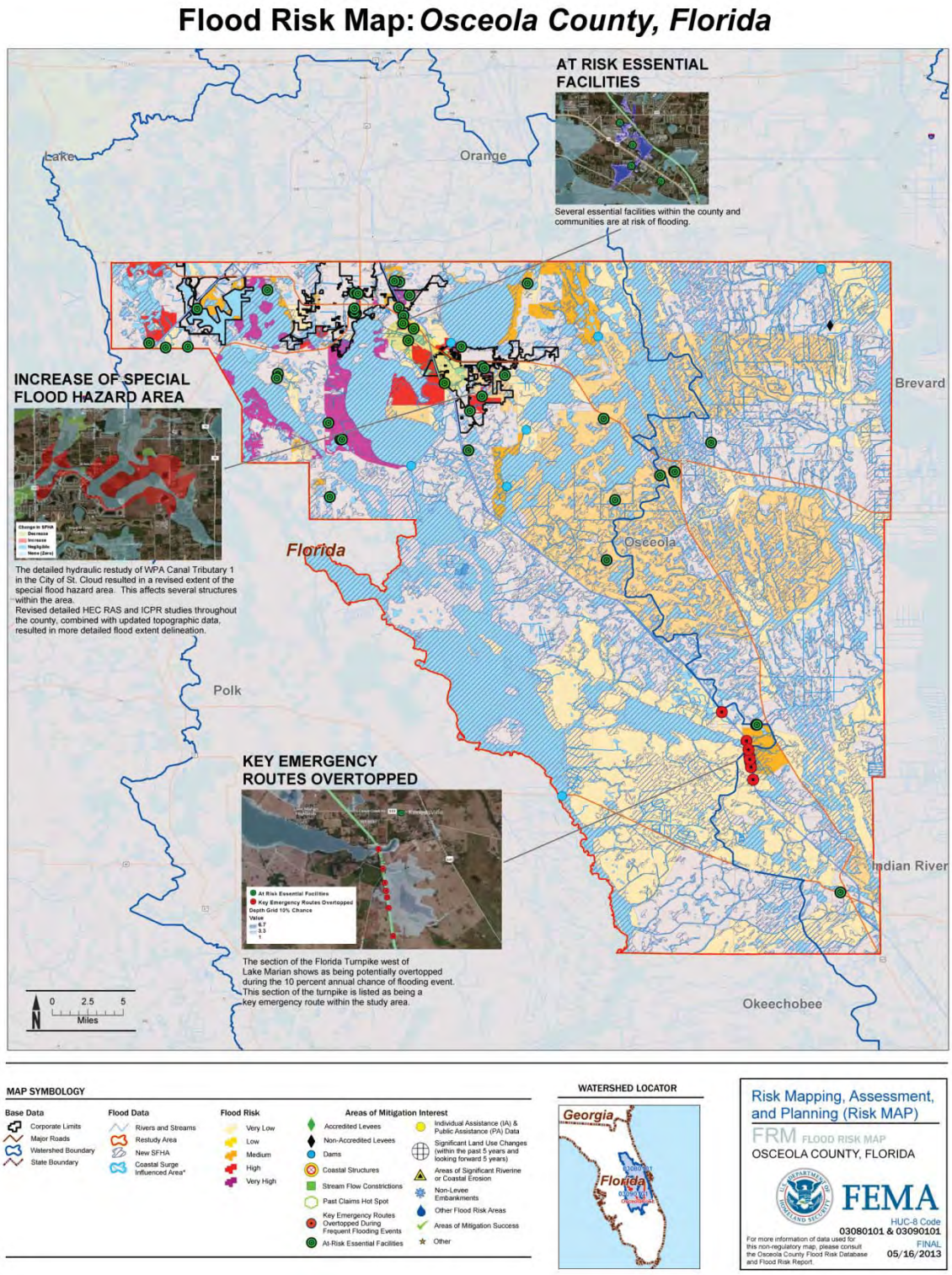
- **Flood Risk Map (FRM).** Within the Flood Risk Project the FRM displays base data reflecting community boundaries, major roads, and stream lines; potential losses that include both the 2010 Average Annualized Loss (AAL) flood loss study supplemented with new Hazus runs for areas with new or updated flood modeling; new Flood Risk Project areas; a bar chart summarizing community per capita loss; and graphics and text that promote access and usage of additional data available through the FRD, FIRM, and National Flood Hazard Layer and viewers (desktop or FEMA website, etc.). This information can be used to assist in Flood Risk Project-level planning as well as for developing mitigation actions within each jurisdiction located within the Flood Risk Project.

  The FRM provides a graphical overview of the Flood Risk Project which highlights areas of risk that should be noted, based on potential losses, exposed facilities, etc., based on data found in the FRD. Refer to the data in the FRD to conduct additional analyses.

- **Flood Risk Project Summary.** Within the Flood Risk Project area, summary data for some or all of the following datasets are provided for the entire project area and also on a jurisdiction by jurisdiction basis:
  - **Changes Since Last FIRM (CSLF).** This is a summary of where the floodplain and flood zones have increased or decreased (only analyzed for areas that were previously mapped using digital FIRMs).
  - **Flood Depth and Analysis Grids.** A general discussion of the data provided in the FRD, including coastal and dam analysis grids if furnished as part of the project.
  - **Flood Risk Assessment Information.** A loss estimation of potential flood damages using different flood scenarios.
  - **Areas of Mitigation Interest.** A description of areas that may require mitigation or additional risk analysis.

3.1 Flood Risk Map

The Flood Risk Map for this Flood Risk Project is shown below. In addition to this reduced version of the map, a full size version is available within the FRD.



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3.2 Osceola County, Florida Flood Risk Project Area Summary

Osceola County is located in central Florida. The county has an approximate total land area of 1,506 square miles. Osceola County is bordered by Orange County to the north, Brevard County to the northeast, Indian River County to the southeast, Okeechobee County to the south, and Polk County to the west. The population of Osceola County was estimated to be 270,618 in 2009 (U.S. Census, March 2011). The floodplains of Osceola County consist of lowlands adjacent to the streams and lakes. The topography of Osceola County is relatively flat with some gently rolling hills. Ground elevations in Osceola County range from less than 5 feet NAVD 88 to 190 feet NAVD 88. Osceola County's climate is semitropical, characterized by warm, humid summers, and mild dry winters. Daily maximum temperatures average 90 degrees Fahrenheit (°F) in summer, and average daily minimums are approximately 50°F in the winter. Temperature extremes of over 100°F or under 20°F are rare. The mean annual temperature is 72°F. The average annual precipitation over the study area is approximately 52 inches, and approximately 72 percent occurs from May to October, the rainy season. Osceola County's soils consist of 11 soil associations. Three of these are either moderately well drained or excessively drained. The rest are soils that vary between poorly drained to very poorly drained (U.S. Department of Agriculture, Soil Conservation Service, April 1979). In 2009 accommodation and food services was the larges economic sector, but agriculture makes up 63% of the land use. Cattle, citrus and commercial sod are the major agricultural products. The State of Florida has purchased 102,500 acres for land preservation; most of this acreage is included in the wildlife management areas Bull Creek, Triple N Ranch, and Three Lakes. The Nature Conservancy also maintains 4,730 acres (Osceola County Property Appraiser, March 2011).

3.2.1 Overview

Osceola County, located in Florida, includes the following communities:

Community Name	CID	Total Community Population	Percent of Population in Watershed	Total Community Land Area (sq mi)	Percent of Land Area in Watershed	NFIP	CRS Rating	Mitigation Plan
City of Kissimmee	120190	59,682	N/A	20.3	N/A	Y	7	Y
City of St. Cloud	120191	35,183	N/A	17.2	N/A	Y	8	Y
Osceola County (Unincorporated Areas)	120189	268,685	N/A	1459.1	N/A	Y	7	Y
Reedy Creek Improvement District	120577	N/A	N/A	38.6	N/A	N	N/A	N/A

Community-specific results are provided on subsequent pages. Data provided below and on subsequent pages only includes areas located within Osceola County and do not necessarily represent community-wide totals.

Section 2 of the Flood Risk Report (FRR) provides more information regarding the source and methodology used to develop the information presented below. Datasets used toward the generation of

results of this project are described in Section 7 of the FRR and are found in the Flood Risk Database (FRD).

3.2.2 Flood Risk Datasets

As a part of this Flood Risk Project, flood risk datasets were created for inclusion in the Flood Risk Database. Those datasets are summarized for this Flood Risk Project below:

- **Changes Since Last FIRM**

  Special Flood Hazard Area (SFHA) boundaries within Osceola County were updated due to new engineering analysis performed within the Flood Risk Project, including Bass Slough, WPA Canal Tributary 1, Lake Marian, and various ponding areas. The updated modeling produced new flood zone areas and new base flood elevations in some areas and leveraged recently developed LiDAR-based topographic data for the Flood Risk Project. The data in this section reflects a comparison between the effective FIRM(s) and the new analysis in this study.

The table below summarizes the increases, decreases, and net change of SFHAs for Osceola County.

Area of Study	Total Area (mi^2)	Increase (mi^2)	Decrease (mi^2)	Net Change (mi^2)
Within SFHA	774.48	27.82	30.70	-2.88
Within Floodway	15.61	0.84	0.71	0.13

Section 2 of the FRR provides more information regarding the source and methodology used to develop this table.

  - Evidence of actual flood losses can be one of the most compelling factors for increasing a community's flood risk awareness. During this Risk MAP project, FEMA confirmed several areas within this watershed as having mitigation potential and encourages the communities within the watershed to continue working with the State Hazard Mitigation Officer to further identify and mitigate these high-risk areas and structures. Specific areas within each jurisdiction are detailed within the individual community summaries.

- **Flood Depth and Analysis Grids**
  - The FRD contains datasets in the form of depth grids for the entire Flood Risk Project that can be used for additional analysis, enhanced visualization, and communication of flood risks for hazard mitigation planning and emergency management. The data provided within the FRD should be used to further isolate areas where flood mitigation potential is high and may be helpful in planning and implementing mitigation strategies. Properties located in areas expected to experience some depth of water should seriously consider mitigation options for implementation. Section 2 of the FRR provides general information regarding the development of and potential uses for this data.

- **Flood Risk Results Information**
  - Osceola County's flood risk analysis incorporates results from a FEMA-performed Hazus analysis which accounts for newly modeled areas in the Flood Risk Project and newly modeled depths for certain flood events. Potential losses were estimated as well as potential loss ratios for multiple

scenarios. Additional information and data layers provided within the FRD should be used to further analyze potential losses and areas where they are likely to occur.

			Estimated Potential Losses for Flood Event Scenarios									
	Total Inventory		10% (10-yr)		2% (50-yr)		1% (100-yr)		0.2% (500-yr)		Annualized ($/yr)	
	Estimated Value	% of Total	Dollar Losses[1]	Loss Ratio[2]	Dollar Losses[1]	Loss Ratio[2]	Dollar Losses[1]	Loss Ratio[2]	Dollar Losses[1]	Loss Ratio[2]	Dollar Losses[1]	Loss Ratio[2]
Residential Building and Contents Losses	$8,277,200,000	79%	$28,200,000	0%	$38,500,000	0%	$47,800,000	1%	$56,700,000	1%	$3,000,000	0%
Commercial Building and Contents Losses	$2,176,500,000	21%	$14,000,000	1%	$20,700,000	1%	$24,700,000	1%	$31,300,000	1%	$1,500,000	0%
Other Building and Contents Losses	$37,300,000	0%	$5,400,000	14%	$9,600,000	26%	$9,700,000	26%	$12,100,000	32%	$500,000	1%
Total Building and Contents Losses	$10,491,000,000	100%	$47,500,000[3]	0%	$68,800,000[3]	1%	$82,200,000[3]	1%	$100,100,000[3]	1%	$5,000,000[3]	0%
Business Disruption	N/A	N/A	$2,100,000[4]	N/A	$2,800,000[4]	N/A	$3,200,000[4]	N/A	$3,700,000[4]	N/A	$100,000[4]	N/A
TOTAL	$10,491,000,000	N/A	$49,600,000[5]	N/A	$71,600,000[5]	N/A	$85,400,000[5]	N/A	$103,800,000[5]	N/A	$5,100,000[5]	N/A

Source: Hazus analysis results stored as the Flood Risk Assessment Dataset in the Flood Risk Database.
[1]Losses shown are rounded to nearest $10,000 for values under $100,000 and to the nearest $100,000 for values over $100,000.
[2]Loss ratio = Dollar Losses ÷ Estimated Value. Loss Ratios are rounded to the nearest integer percent.
[3]Total Building and Contents Losses = Residential Building and Contents Losses + Commercial Building and Contents Losses + Other Building and Contents Losses.
[4]Business Disruption = Inventory Loss + Relocation Cost + Income Loss + Rental Income Loss + Wage Loss + Direct Output Loss.
[5]Total Loss = Total Building and Contents Losses + Business Disruption

- **Areas of Mitigation Interest**
  - Section 2.2.4 of the FRR provides more information regarding areas of mitigation interest, how they are defined for this analysis, and potential mitigation actions that could be considered for each type. The table below summarizes the number of areas of mitigation interest by type for the Unincorporated Areas of Osceola County.

Type of Mitigation Interest	Number of Areas	Data Source
Dam	7	USGS(NID)
Levee	1	USGS(NID)
Stream Flow Pinch Points	0	N/A
Significant Land Use Changes	0	N/A
Past Claims Hot Spot	0	N/A
Key Emergency Routes Overtopped	8	Osceola County
At Risk Critical Facilities	31	Osceola County
Area of Mitigation Success	0	N/A

  - Key Emergency Routes Overtopped were identified by referencing the 4% depth grid from the Flood Risk Database. Roads that were identified by Osceola County as being Key Emergency Routes were then reviewed at locations where they intersected the 4% depth grid. An AOMI point was identified for the areas where the intersection occurred and bridges/culverts didn't appear to contain the flooding. The Florida Turnpike is overtopped in 8 locations based on the above data/criteria.
  - A GIS point shapefile of critical facilities was obtained from Osceola County. Any point located in Zone A or AE was noted as being at risk. In addition, any point that was located near, but not in an approximate Zone A area was also noted to be at risk due to possible inaccuracies in the flooding as a result of less detailed approximate modeling. 31 facilities within the Unincorporated Areas of Osceola County were identified as being At Risk Critical Facilities. These include fire stations, schools, a shelter, distribution facilities, wastewater facilities, communication towers and government facilities.
  - Past claims data at the community level was not available at the time of this report creation. It was only available at a HUC 8 basin level. As a result, community claims can't accurately be depicted in this report. Should claims data become available, areas with multiple or repetitive claims should be taken into consideration during mitigation planning.
  - Dams/Levee data was obtained from USGS. Maintenance information and emergency action plans for these structures are unknown as of the date of this publication.
  - Areas of Mitigation Success were not identified by Osceola County. However, the 2010 Osceola County Local Mitigation Strategy Plan identified potential mitigation projects to address specific hazard concerns. At the date of this publication, it is unknown if any of the projects identified have been completed.

3.3 Communities

The following sections provide an overview of the community's floodplain management program as of the date of this publication, as well as summarize the flood risk analysis performed for each project area in Watershed USA.

3.3.1 City of Kissimmee Summary (CID 120190)

The following pages include Flood Risk data for the City of Kissimmee.

3.3.1.1 Overview

The City of Kissimmee is one of 3 incorporated areas located within Osceola County. The information below provides an overview of the community's floodplain management program information as of the date of this publication.

Community Name	CID	Total Community Population	Percent of Population in Watershed	Total Community Land Area (sq mi)	Percent of Land Area in Watershed	NFIP	CRS Rating	Mitigation Plan
City of Kissimmee	120190	59,682	N/A	20.3	N/A	Y	7	Y

- Participating in the Osceola County Local Strategy Mitigation Plan which expires January 2015
- Past Federal Disaster Declarations for flooding = N/A
- National Flood Insurance Program (NFIP) policy coverage (policies/value) = 1,064 policies totaling approximately $206,426,700
- NFIP-recognized repetitive loss properties = 2 (Property Types N/A)
- NFIP-recognized severe repetitive loss properties = N/A (Data only available at HUC8 level)

Data provided below represents community-wide totals. Section 2 of the Flood Risk Report (FRR) provides more information regarding the source and methodology used to develop the information presented below. Datasets used toward the generation of results of this project are described in Section 7 of the FRR and are found in the Flood Risk Database (FRD).

3.3.1.2 Community Analyses and Results

- **Changes Since Last FIRM**
  - Special Flood Hazard Area (SFHA) boundaries within the City of Kissimmee were updated due to new engineering analysis performed on Bass Slough and East City Canal Tributary 1. The updated modeling produced new flood zone areas and new base flood elevations. Additional boundaries were updated due to the availability of new LiDAR based topographic data. The updated boundary delineation produced revised flood zone areas .The data in this section reflects the comparison between the effective FIRM and the new analysis in this study.

The table below summarizes the increases, decreases, and net change of SFHAs for the community.

Area of Study	Total Area (mi^2)	Increase (mi^2)	Decrease (mi^2)	Net Change (mi^2)
Within SFHA	2.44	0.39	1.54	-1.15
Within Floodway	0.22	0.12	0.46	-0.34

Section 2 of the FRR provides more information regarding the source and methodology used to develop this table.

- **Flood Depth and Analysis Grids**
  - See the FRD for the following depth and analysis grid data (Section 2 of the FRR provides general information regarding the development of and potential uses for this data):
    - Multi-frequency flood depth grids (10-, 4-, 2-, 1-, and 0.2-percent-annual-chance flood events)
    - Percent annual chance of flooding grids
    - Percent chance of flooding over a 30-year period grids
    - Water surface elevation grids (10-, 4-, 2-, 1-, and 0.2-percent-annual-chance flood events)
  - Additional information and data layers provided within the FRD should be used to further isolate these and other areas where flood mitigation potential is high. The FRD includes data which may be helpful in planning and implementing mitigation strategies. Properties located in areas expected to experience some depth of water should seriously consider mitigation options for implementation.

- **Hazus Estimated Loss Information**
  - The City of Kissimmee's flood risk analysis uses results from a FEMA-performed Hazus analysis which accounts for newly modeled areas in the Flood Risk Project and newly modeled depths for certain flood events. Additional information and data layers provided within the FRD should be used to further analyze potential losses and areas where they are likely to occur.

			Estimated Potential Losses for Flood Event Scenarios									
	Total Inventory		10% (10-yr)		2% (50-yr)		1% (100-yr)		0.2% (500-yr)		Annualized ($/yr)	
	Estimated Value	% of Total	Dollar Losses[1]	Loss Ratio[2]	Dollar Losses[1]	Loss Ratio[2]	Dollar Losses[1]	Loss Ratio[2]	Dollar Losses[1]	Loss Ratio[2]	Dollar Losses[1]	Loss Ratio[2]
Residential Building and Contents Losses	$3,361,800,000	46%	$9,200,000	0%	$13,700,000	0%	$18,500,000	1%	$25,300,000	1%	$900,000	0%
Commercial Building and Contents Losses	$3,862,100,000	53%	$3,500,000	0%	$7,500,000	0%	$9,300,000	0%	$11,500,000	0%	$300,000	0%
Other Building and Contents Losses	$7,600,000	0%	$600,000	8%	$2,500,000	33%	$1,900,000	25%	$2,500,000	33%	$30,000	0%
Total Building and Contents Losses	$7,231,500,000	100%	$13,300,000[3]	0%	$23,800,000[3]	0%	$29,800,000[3]	0%	$39,200,000[3]	1%	$1,230,000[3]	0%
Business Disruption	N/A	N/A	$300,000[4]	N/A	$600,000[4]	N/A	$700,000[4]	N/A	$900,000[4]	N/A	$10,000[4]	N/A
TOTAL	$7,231,500,000	N/A	$13,600,000[5]	N/A	$24,400,000[5]	N/A	$30,500,000[5]	N/A	$40,100,000[5]	N/A	$1,240,000[5]	N/A

Source: Hazus analysis results stored as the Flood Risk Assessment Dataset in the Flood Risk Database.
[1]Losses shown are rounded to nearest $10,000 for values under $100,000 and to the nearest $100,000 for values over $100,000.
[2]Loss ratio = Dollar Losses ÷ Estimated Value. Loss Ratios are rounded to the nearest integer percent.
[3]Total Building and Contents Losses = Residential Building and Contents Losses + Commercial Building and Contents Losses + Other Building and Contents Losses.
[4]Business Disruption = Inventory Loss + Relocation Cost + Income Loss + Rental Income Loss + Wage Loss + Direct Output Loss.
[5]Total Loss = Total Building and Contents Losses + Business Disruption

- **Areas of Mitigation Interest**
  - Section 2.2.4 of the FRR provides more information regarding areas of mitigation interest, how they are defined for this analysis, and potential mitigation actions that could be considered for each type. The table below summarizes the number of areas of mitigation interest by type.

Type of Mitigation Interest	Number of Areas	Data Source
Dam	0	N/A
Levee	0	N/A
Stream Flow Pinch Points	0	N/A
Significant Land Use Changes	0	N/A
Past Claims Hot Spot	0	N/A
Key Emergency Routes Overtopped	0	N/A
At Risk Critical Facilities	7	Osceola County
Area of Mitigation Success	0	N/A

  - Key Emergency Routes Overtopped were identified by referencing the 4% depth grid from the Flood Risk Database. Roads that were identified by Osceola County as being Key Emergency Routes were then reviewed at locations where they intersected the 4% depth grid. An AOMI point was identified for the areas where the intersection occurred and bridges/culverts didn't appear to contain the flooding. No areas of overtopping for Key Emergency Routes was identified for the City of Kissimmee
  - A GIS point shapefile of critical facilities was obtained from Osceola County. Any point located in Zone A or Zone AE was noted as being at risk. In addition, any point that was located near, but not in an approximate Zone A area was also noted to be at risk due to possible inaccuracies in the flooding, as a result of less detailed approximate modeling. Seven facilities within the City of Kissimmee were identified as being at risk. This includes a fire station, Cypress Elementary School, an adult family care facility, two government facilities, and two hospitals (Florida Hospital and Osceola Regional Medical Center).
  - Past claims data at the community level was not available at the time of this report creation. It was only available at a HUC 8 basin level. As a result, community claims can't accurately be depicted in this report. Should claims data become available, areas with multiple or repetitive claims should be taken into consideration during mitigation planning.
  - Dams/Levee data was obtained from USGS. Maintenance information and emergency action plans (if applicable) for these structures are unknown as of the date of this publication. No structures were noted as being located within the City of Kissimmee.
  - The City of Kissimmee has adopted the Osceola County Local Mitigation Plan.
  - Areas of Mitigation Success were not identified by the City of Kissimmee. However, the 2010 Osceola County Local Mitigation Strategy Plan identified potential mitigation projects to address specific hazard concerns. At the date of this publication, it is unknown if any of the projects identified have been completed.

3.3.2 City of St. Cloud Summary (CID 120191)

The following pages include Flood Risk data for the City of St. Cloud.

3.3.2.1 Overview

The City of St. Cloud is one of 3 incorporated areas within Osceola County. The information below provides an overview of the community's floodplain management program information as of the date of this publication.

Community Name	CID	Total Community Population	Percent of Population in Watershed	Total Community Land Area (sq mi)	Percent of Land Area in Watershed	NFIP	CRS Rating	Mitigation Plan
City of St. Cloud	120191	35,183	N/A	17.2	N/A	Y	8	Y

- Participating in the Osceola County Local Strategy Mitigation Plan which expires January 2015
- Past Federal Disaster Declarations for flooding = N/A
- National Flood Insurance Program (NFIP) policy coverage (policies/value) = 533 policies totaling approximately $123,494,400
- NFIP-recognized repetitive loss properties = 4 (Property Types N/A)
- NFIP-recognized severe repetitive loss properties = N/A (Data only available at HUC8 level)

Data provided below only represents community-wide totals. Section 2 of the Flood Risk Report (FRR) provides more information regarding the source and methodology used to develop the information presented below. Datasets used toward the generation of results of this project are described in Section 7 of the FRR and are found in the Flood Risk Database (FRD).

3.3.2.2 Community Analyses and Results

- **Changes Since Last FIRM**
  - Special Flood Hazard Area (SFHA) boundaries within the City of St. Cloud were updated due to new engineering analysis performed on WPA Canal Tributary 1. The updated modeling produced new flood zone areas and new base flood elevations. Additional boundaries were updated due to the availability of new LiDAR based topographic data. The updated boundary delineation produced revised flood zone areas .The data in this section reflects the comparison between the effective FIRM and the new analysis in this study.

The table below summarizes the increases, decreases, and net change of SFHAs for the community.

Area of Study	Total Area (mi^2)	Increase (mi^2)	Decrease (mi^2)	Net Change (mi^2)
Within SFHA	2.41	1.01	0.74	0.27
Within Floodway	0.41	0.38	0.05	0.33

Section 2 of the FRR provides more information regarding the source and methodology used to develop this table.

- **Flood Depth and Analysis Grids**
  - See the FRD for the following depth and analysis grid data (Section 2 of the FRR provides general information regarding the development of and potential uses for this data):
    - Multi-frequency flood depth grids (10-, 4-, 2-, 1-, and 0.2-percent-annual-chance flood events)
    - Percent annual chance of flooding grids
    - Percent chance of flooding over a 30-year period grids
    - Water surface elevation grids (10-, 4-, 2-, 1-, and 0.2-percent-annual-chance flood events)
  - Additional information and data layers provided within the FRD should be used to further isolate these and other areas where flood mitigation potential is high. The FRD includes data which may be helpful in planning and implementing mitigation strategies. Properties located in areas expected to experience some depth of water should seriously consider mitigation options for implementation.

- **Hazus Estimated Loss Information**
  - The City of St. Cloud's flood risk analysis uses results from a FEMA-performed Hazus analysis which accounts for newly modeled areas in the Flood Risk Project and newly modeled depths for certain flood events. Additional information and data layers provided within the FRD should be used to further analyze potential losses and areas where they are likely to occur.

			Estimated Potential Losses for Flood Event Scenarios									
	Total Inventory		10% (10-yr)		2% (50-yr)		1% (100-yr)		0.2% (500-yr)		Annualized ($/yr)	
	Estimated Value	% of Total	Dollar Losses[1]	Loss Ratio[2]	Dollar Losses[1]	Loss Ratio[2]	Dollar Losses[1]	Loss Ratio[2]	Dollar Losses[1]	Loss Ratio[2]	Dollar Losses[1]	Loss Ratio[2]
Residential Building and Contents Losses	$1,688,300,000	78%	$1,900,000	0%	$3,800,000	0%	$5,000,000	0%	$6,500,000	0%	$200,000	0%
Commercial Building and Contents Losses	$476,200,000	22%	$600,000	0%	$1,200,000	0%	$1,600,000	0%	$2,700,000	1%	$60,000	0%
Other Building and Contents Losses	$4,000,000	0%	$400,000	10%	$900,000	23%	$1,100,000	28%	$1,500,000	38%	$50,000	1%
Total Building and Contents Losses	$2,168,500,000	100%	$3,000,000[3]	0%	$5,900,000[3]	0%	$7,700,000[3]	0%	$10,800,000[3]	0%	$310,000[3]	0%
Business Disruption	N/A	N/A	$100,000[4]	N/A	$200,000[4]	N/A	$200,000[4]	N/A	$300,000[4]	N/A	$0[4]	N/A
TOTAL	$2,168,500,000	N/A	$3,100,000[5]	N/A	$6,100,000[5]	N/A	$7,900,000[5]	N/A	$11,100,000[5]	N/A	$310,000[5]	N/A

Source: Hazus analysis results stored as the Flood Risk Assessment Dataset in the Flood Risk Database.
[1]Losses shown are rounded to nearest $10,000 for values under $100,000 and to the nearest $100,000 for values over $100,000.
[2]Loss ratio = Dollar Losses ÷ Estimated Value. Loss Ratios are rounded to the nearest integer percent.
[3]Total Building and Contents Losses = Residential Building and Contents Losses + Commercial Building and Contents Losses + Other Building and Contents Losses.
[4]Business Disruption = Inventory Loss + Relocation Cost + Income Loss + Rental Income Loss + Wage Loss + Direct Output Loss.
[5]Total Loss = Total Building and Contents Losses + Business Disruption

- **Areas of Mitigation Interest**
  - Section 2.2.4 of the FRR provides more information regarding areas of mitigation interest, how they are defined for this analysis, and potential mitigation actions that could be considered for each type. The table below summarizes the number of areas of mitigation interest by type.

Type of Mitigation Interest	Number of Areas	Data Source
Dam	0	N/A
Levee	0	N/A
Stream Flow Pinch Points	0	N/A
Significant Land Use Changes	0	N/A
Past Claims Hot Spot	0	N/A
Key Emergency Routes Overtopped	0	N/A
At Risk Critical Facilities	6	Osceola County
Area of Mitigation Success	0	N/A

  - Key Emergency Routes Overtopped were identified by referencing the 4% depth grid from the Flood Risk Database. Roads that were identified by the City of St. Cloud and Osceola County as being Key Emergency Routes were then reviewed at locations where they intersected the 4% depth grid. An AOMI point was identified for the areas where the intersection occurred and bridges/culverts didn't appear to contain the flooding. No locations of overtopping were identified for St. Cloud.
  - A GIS point shapefile of critical facilities was obtained from Osceola County. Any point located in Zone A or AE was noted as being at risk. In addition, any point that was located near, but not in an approximate Zone A area was also noted to be at risk due to possible inaccuracies in the flooding as a result of less detailed approximate modeling. Six facilities were identified as being at risk within the City of St. Cloud. This includes one fire station, two schools (St. Cloud High School and St. Cloud Middle School), one water supply tower, and two wastewater facilities.
  - Past claims data at the community level was not available at the time of this report creation. It was only available at a HUC 8 basin level. As a result, community claims can't accurately be depicted in this report. Should claims data become available, areas with multiple or repetitive claims should be taken into consideration during mitigation planning.
  - Dams/Levee data was obtained from USGS. Maintenance information and emergency action plans (if applicable) for these structures are unknown as of the date of this publication. No structures were identified as being located within the City of St. Cloud.
  - The City of St. Cloud adopted the Osceola County Local Mitigation Strategy with Resolution 2011-002R.
  - Areas of Mitigation Success were not identified by the City of St. Cloud. However, the 2010 Osceola County Local Mitigation Strategy Plan identified potential mitigation projects to address specific hazard concerns. At the date of this publication, it is unknown if any of the projects identified have been completed.

3.3.3 Reedy Creek Improvement District Summary (CID 120577)

The following pages include Flood Risk data for the Reedy Creek Improvement District.

3.3.3.1 Overview

The Reedy Creek Improvement District is a public corporation of the State of Florida and is located in Osceola and Orange Counties. The information below provides an overview of the District's floodplain management program information for the portion of the District located within Osceola County, as of the date of this publication. The District does not participate in the NFIP, so data is only included for sections where data was available.

Community Name	CID	Total Community Population	Percent of Population in Watershed	Total Community Land Area (sq mi)	Percent of Land Area in Watershed	NFIP	CRS Rating	Mitigation Plan
Reedy Creek Improvement District	120577	N/A	N/A	38.6	N/A	N	N/A	N/A

Data provided below only includes areas within the Reedy Creek Improvement District that area located within the Osceola County Flood Risk Project, and do not necessarily represent community-wide totals. Section 2 of the Flood Risk Report (FRR) provides more information regarding the source and methodology used to develop the information presented below. Datasets used toward the generation of results of this project are described in Section 7 of the FRR and are found in the Flood Risk Database (FRD).

3.3.3.2 Community Analyses and Results

- **Changes Since Last FIRM**
  - There are no SFHAs located in Reedy Creek Improvement District on the effective or revised FIRM. Information associated with this CSLF section has been removed from this report.

- **Flood Depth and Analysis Grids**
  - Depth and Analysis grid data was not created for Reedy Creek Improvement District. Section 2 of the FRR provides general information regarding the development of and potential uses for this data.
  - Additional information and data layers provided within the FRD should be used to isolate areas where flood mitigation potential is high. The FRD includes data which may be helpful in planning and implementing mitigation strategies. Properties located in areas expected to experience some depth of water should seriously consider mitigation options for implementation.

Hazus Estimated Loss Information

- The Reedy Creek Improvement District's flood risk analysis uses results from a FEMA-performed Hazus analysis. Additional information and data layers provided within the FRD should be used to further analyze potential losses and areas where they are likely to occur.

			Estimated Potential Losses for Flood Event Scenarios									
	Total Inventory		10% (10-yr)		2% (50-yr)		1% (100-yr)		0.2% (500-yr)		Annualized ($/yr)	
	Estimated Value	% of Total	Dollar Losses[1]	Loss Ratio[2]	Dollar Losses[1]	Loss Ratio[2]	Dollar Losses[1]	Loss Ratio[2]	Dollar Losses[1]	Loss Ratio[2]	Dollar Losses[1]	Loss Ratio[2]
Residential Building and Contents Losses	$91,800,000	53%	$400,000	0%	$500,000	1%	$500,000	1%	$700,000	1%	$40,000	0%
Commercial Building and Contents Losses	$79,500,000	46%	$900,000	1%	$1,200,000	2%	$1,300,000	2%	$1,600,000	2%	$100,000	0%
Other Building and Contents Losses	$2,600,000	1%	$500,000	19%	$600,000	23%	$700,000	27%	$800,000	31%	$60,000	2%
Total Building and Contents Losses	$173,900,000	100%	$1,700,000[3]	1%	$2,200,000[3]	1%	$2,500,000[3]	1%	$3,200,000[3]	2%	$200,000[3]	0%
Business Disruption	N/A	N/A	$100,000[4]	N/A	$200,000[4]	N/A	$200,000[4]	N/A	$200,000[4]	N/A	$10,000[4]	N/A
TOTAL	$173,900,000	N/A	$1,800,000[5]	N/A	$2,400,000[5]	N/A	$2,700,000[5]	N/A	$3,400,000[5]	N/A	$210,000[5]	N/A

Source: Hazus analysis results stored as the Flood Risk Assessment Dataset in the Flood Risk Database.
[1]Losses shown are rounded to nearest $10,000 for values under $100,000 and to the nearest $100,000 for values over $100,000.
[2]Loss ratio = Dollar Losses ÷ Estimated Value. Loss Ratios are rounded to the nearest integer percent.
[3]Total Building and Contents Losses = Residential Building and Contents Losses + Commercial Building and Contents Losses + Other Building and Contents Losses.
[4]Business Disruption = Inventory Loss + Relocation Cost + Income Loss + Rental Income Loss + Wage Loss + Direct Output Loss.
[5]Total Loss = Total Building and Contents Losses + Business Disruption

Areas of Mitigation Interest

- Section 2.2.4 of the FRR provides general information regarding areas of mitigation interest, how they are defined for this analysis, and potential mitigation actions that could be considered for each type. Areas of Mitigation Interest were not identified for Reedy Creek Improvement District and are therefore not included in this report.

4 Actions to Reduce Flood Risk

In order to fully leverage the Flood Risk Datasets and Products created for this Flood Risk Project, local stakeholders should consider many different flood risk mitigation tactics, including, but not limited the items shown in the sub-sections below.

4.1 Types of Mitigation Actions

Mitigation provides a critical foundation on which to reduce loss of life and property by avoiding or lessening the impact of hazard events. This creates safer communities and facilitates resiliency by enabling communities to return to normal function as quickly as possible after a hazard event. Once a community understands its flood risk, it is in a better position to identify potential mitigation actions that can reduce the risk to its people and property.

The mitigation plan requirements in 44 CFR Part 201 encourage communities to understand their vulnerability to hazards and take actions to minimize vulnerability and promote resilience. Flood mitigation actions generally fall into the following categories:

Before Mitigation and After Mitigation





Communities will need to prioritize projects as part of the planning process. FEMA can then help route federal mitigation dollars to fund these projects.

4.1.1 Preventative Measures

Preventative measures are intended to keep flood hazards from getting worse. They can reduce future vulnerability to flooding, especially in areas where development has not yet occurred or where capital improvements have not been substantial. Examples include:

- Comprehensive land use planning
- Zoning regulations
- Subdivision regulations
- Open space preservation
- Building codes
- Floodplain development regulations
- Stormwater management
- Purchase development rights or conservation easements
- Participation in the NFIP Community Rating System (CRS)

NFIP's CRS is a voluntary incentive program that recognizes and encourages community floodplain management activities that exceed the minimum NFIP requirements. As a result, flood insurance premium rates are discounted to reflect the reduced flood risk resulting from community actions meeting the three goals of the CRS: to reduce flood losses, to facilitate accurate insurance rating, and to promote the awareness of flood insurance.

For CRS participating communities, flood insurance premium rates are discounted in increments of 5%; i.e., a Class 1 community would receive a 45% premium discount, while a Class 9 community would receive a 5% discount. (A Class 10 is not participating in the CRS and receives no discount.)

4.1.2 Property Protection Measures

Property protection measures protect existing buildings by modifying the building to withstand floods, or by removing buildings from hazardous locations. Examples include:

- Building relocation
- Acquisition and clearance
- Building elevation
- Barrier installation
- Building retrofit

4.1.3 Natural Resource Protection Activities

Natural resource protection activities reduce the impact of floods by preserving or restoring natural areas such as floodplains, wetlands, and dunes and their natural functions. Examples include:

- Wetland protection
- Habitat protection
- Erosion and sedimentation control
- Best management practices (BMP)
- Prevention of stream dumping activities (anti-litter campaigns)
- Improved forestry practices such as reforesting or selective timbering (extraction)

4.1.4 Structural Mitigation Projects

Structural mitigation projects lessen the impact of floods by modifying the environmental natural progression of the flooding event. Structural protection such as upgrading dams/levees for already existing development and critical facilities may be a realistic alternative. However, citizens should be made aware of their residual risk. Examples include:

- Reservoirs, retention, and detention basins
- Levees and floodwalls
- Channel modifications
- Channel maintenance

4.1.5 Public Education and Awareness Activities

Public education and awareness activities advise residents, business owners, potential property buyers, and visitors about floods, hazardous areas, and mitigation techniques they can use to reduce the flood risk to themselves and their property. Examples include:

- Readily available and readable updated maps
- Outreach projects
- Libraries
- Technical assistance

For more information regarding hazard mitigation techniques, best practices, and potential grant funding sources, visit www.fema.gov or contact your local floodplain manager, emergency manager, or State Hazard Mitigation Officer.

- Real estate disclosure
- Environmental education
- Risk information via the nightly news

4.1.6 Emergency Service Measures

Although not typically considered a mitigation technique, emergency service measures minimize the impact of flooding on people and property. These are actions commonly taken immediately prior to, during, or in response to a hazard event. Examples include:

- Hazard warning system
- Emergency response plan
- COOP and COG planning
- Critical facilities protection
- Health and safety maintenance
- Post flood recovery planning

In Section 3, specific AoMIs were identified. Table 4.1 below identifies possible mitigation actions for each AoMI to consider.

Table 4-1. Mitigation Actions for Areas of Mitigation Interest

AoMI	*Possible Actions to Reduce Flood Risk*
Dams	*Engineering assessment* *Dam upgrades and strengthening* *Emergency Action Plan* *Dam removal* *Easement creation in impoundment and downstream inundation areas*
Levees (accredited and non-accredited) and significant levee-like structures	*Generally same as dams above* *Purchase of flood insurance for at-risk structures*
Stream Flow Pinch Point *Undersized culverts or bridge openings*	*Engineering analysis* *Replacement of structure pre- and post-disaster*
Past Claims and IA/PA Hot Spots	*Acquisition* *Elevation* *Relocation* *Floodproofing*
Major Land Use Changes (past 5 years or next 5 years)	*Higher regulatory standard* *Stormwater BMPs* *Transfer of Development rights* *Compensatory storage and equal conveyance standards*
Key Emergency Routes Overtopped During Frequent Flooding Events	*Elevation* *Creation of alternate routes* *Design as low water crossing*

AoMI	*Possible Actions to Reduce Flood Risk*
Areas of Significant Riverine or Coastal Erosion	*Relocation of buildings and infrastructure* *Regulations and planning* *Natural vegetation* *Hardening*
Drainage or Stormwater- Based Flood Hazard Areas, or Areas Not Identified as Floodprone on the FIRM But Known to be Inundated	*Identification of all flood hazard areas*
Areas of Mitigation Success	*N/A*

4.2 Identifying Specific Actions for Your Community

As many mitigation actions are possible to lessen the impact of floods, how can a community decide which ones are appropriate to implement? There are many ways to identify specific actions most appropriate for a community. Some factors to consider may include the following:

Refer to FEMA Mitigation Planning How To Guide #3 (FEMA 386-3) "Developing the Mitigation Plan - Identifying Mitigation Actions and Implementation Strategies" for more information on how to identify specific mitigation actions to address hazard risk in your community.

- **Site characteristics.** Does the site present unique challenges (e.g., significant slopes or erosion potential)?
- **Flood characteristics.** Are the flood waters affecting the site fast or slow moving? Is there debris associated with the flow? How deep is the flooding?
- **Social acceptance.** Will the mitigation action be acceptable to the public? Does it cause social or cultural problems?
- **Technical feasibility.** Is the mitigation action technically feasible (e.g., making a building watertight to a reasonable depth)?
- **Administrative feasibility.** Is there administrative capability to implement the mitigation action?
- **Legal.** Does the mitigation action meet all applicable codes, regulations, and laws? Public officials may have a legal responsibility to act and inform citizens if a known hazard has been identified.
- **Economic.** Is the mitigation action affordable? Is it eligible under grant or other funding programs? Can it be completed within existing budgets?
- **Environmental.** Does the mitigation action cause adverse impacts on the environment or can they be mitigated? Is it the most appropriate action among the possible alternatives?

FEMA in collaboration with the American Planning Association has released the publication, "Integrating Hazard Mitigation into Local Planning." This guide explains how hazard mitigation can be incorporated into several different types of local planning programs. For more information go to www.planning.org. or http://www.fema.gov/library.

Your local Hazard Mitigation Plan is a valuable place to identify and prioritize possible mitigation actions. The plan includes a mitigation strategy with mitigation actions that were developed through a public

and open process. You can then add to or modify those actions based on what is learned during the course of the Risk MAP project and the information provided within this FRR.

4.3 Mitigation Programs and Assistance

Not all mitigation activities require funding (e.g., local policy actions such as strengthening a flood damage prevention ordinance), and those that do are not limited to outside funding sources (e.g., inclusion in local capital improvements plan, etc.). For those mitigation actions that require assistance through funding or technical expertise, several state and federal agencies have flood hazard mitigation grant programs and offer technical assistance. These programs may be funded at different levels over time or may be activated under special circumstances such as after a presidential disaster declaration.



Communities can link hazard mitigation plans and actions to the right FEMA grant programs to fund flood risk reduction. More information about FEMA HMA programs can be found at http://www.fema.gov/government/grant/hma/index.shtm.

4.3.1 FEMA Mitigation Programs and Assistance

FEMA awards many mitigation grants each year to states and communities to undertake mitigation projects to prevent future loss of life and property resulting from hazard impacts, including flooding. The FEMA Hazard Mitigation Assistance (HMA) programs provide grants for mitigation through the programs listed in Table 4.2 below.

Table 4-2. FEMA Hazard Mitigation Assistance Programs

Mitigation Grant Program	Authorization	Purpose
Hazard Mitigation Grant Program (HMGP)	Robert T. Stafford Disaster Relief and Emergency Assistance Act	Activated after a presidential disaster declaration; provides funds on a sliding scale formula based on a percentage of the total federal assistance for a disaster for long-term mitigation measures to reduce vulnerability to natural hazards
Flood Mitigation Assistance (FMA)	National Flood Insurance Reform Act	Reduce or eliminate claims against the NFIP
Pre-Disaster Mitigation (PDM)	Disaster Mitigation Act	National competitive program focused on mitigation project and planning activities that address multiple natural hazards
Repetitive Flood Claims (RFC)	Bunning-Bereuter-Blumenauer Flood Insurance Reform Act	Reduce flood claims against the NFIP through flood mitigation; properties must be currently NFIP insured and have had at least one NFIP claim
Severe Repetitive Loss (SRL)	Bunning-Bereuter-Blumenauer Flood Insurance Reform Act	Reduce or eliminate the long-term risk of flood damage to SRL residential structures currently insured under the NFIP

The HMGP and PDM programs offer funding for mitigation planning and project activities that address multiple natural hazard events. The FMA, RFC, and SRL programs focus funding efforts on reducing claims against the NFIP. Funding under the HMA programs is subject to availability of annual appropriations, and HMGP funding is also subject to the amount of FEMA disaster recovery assistance provided under a presidential major disaster declaration.

FEMA's HMA grants are awarded to eligible states, tribes, and territories (applicant) that, in turn, provide sub-grants to local governments and communities (sub-applicant). The applicant selects and prioritizes sub-applications developed and submitted to them by sub-applicants and submits them to FEMA for funding consideration. Prospective sub-applicants should consult the office designated as their applicant for further information regarding specific program and application requirements. Contact information for the FEMA Regional Offices and State Hazard Mitigation Officers (SHMO) is available on the FEMA website (www.fema.gov).

4.3.2 Additional Mitigation Programs and Assistance

Several additional agencies including USACE, Natural Resource Conservation Service (NRCS), U.S. Geological Survey (USGS), and others have specialists on staff and can offer further information on flood hazard mitigation. The State NFIP Coordinator and SHMO are state-level sources of information and assistance, which vary among different states.

The Silver Jackets program, active in several states, is a partnership of USACE, FEMA, and state agencies. The Silver Jackets program provides a state-based strategy for an interagency approach to planning and implementing measures for risk reduction.

5 Acronyms and Definitions

5.1 Acronyms

A

AAL	Average Annualized Loss
ALR	Annualized Loss Ratio
AoMI	*Areas of Mitigation Interest*

B

BCA	Benefit-Cost Analysis
BFE	Base Flood Elevation
BMP	Best Management Practices

C

CFR	Code of Federal Regulations
COG	Continuity of Government Plan
COOP	Continuity of Operations Plan
CRS	Community Rating System
CSLF	Changes Since Last FIRM

D

DHS	Department of Homeland Security
DMA 2000	Disaster Mitigation Act of 2000

E

EOP	Emergency Operations Plan

F

FEMA	Federal Emergency Management Agency
FIRM	Flood Insurance Rate Map
FIS	Flood Insurance Study
FMA	Flood Mitigation Assistance
FRD	Flood Risk Database
FRM	Flood Risk Map
FRR	Flood Risk Report
FY	Fiscal Year

G

GIS	Geographic Information System

H

HMA	Hazard Mitigation Assistance
HMGP	Hazard Mitigation Grant Program

I

IA	Individual Assistance

N

NFIA	National Flood Insurance Act
NFIP	National Flood Insurance Program
NRCS	Natural Resource Conservation Service

P

PA	Public Assistance
PDM	Pre-Disaster Mitigation

R

RFC	Repetitive Flood Claims
Risk MAP	Mapping, Assessment, and Planning

S

SFHA	Special Flood Hazard Area
SHMO	State Hazard Mitigation Officer
SRL	Severe Repetitive Loss

U

USACE	U.S. Army Corps of Engineers
USGS	U.S. Geological Survey

5.2 Definitions

0.2-percent-annual-chance flood – The flood elevation that has a 0.2-percent chance of being equaled or exceeded each year. Sometimes referred to as the 500-year flood.

1-percent-annual-chance flood – The flood elevation that has a 1-percent chance of being equaled or exceeded each year. Sometimes referred to as the 100-year flood.

Annualized Loss Ratio (ALR) – Expresses the annualized loss as a fraction of the value of the local inventory (total value/annualized loss).

Average Annualized Loss (AAL) – The estimated long-term weighted average value of losses to property in any single year in a specified geographic area.

Base Flood Elevation (BFE) – Elevation of the 1-percent-annual-chance flood. This elevation is the basis of the insurance and floodplain management requirements of the NFIP.

Berm – A small levee, typically built from earth.

Cfs – Cubic feet per second, the unit by which discharges are measured (a cubic foot of water is about 7.5 gallons).

Coastal High Hazard Area (CHHA)—Portion of the SFHA extending from offshore to the inland limit of a primary frontal dune along an open coast or any other area subject to high velocity wave action from storms or seismic sources.

Consequence (of flood) – The estimated damages associated with a given flood occurrence.

Crest – The peak stage or elevation reached or expected to be reached by the floodwaters of a specific flood at a given location.

Dam – An artificial barrier that has the ability to impound water, wastewater, or any liquid-borne material, for the purpose of storage or control of water.

Design flood event – The greater of the following two flood events: (1) the base flood, affecting those areas identified as SFHAs on a community's FIRM; or (2) the flood corresponding to the area designated as a flood hazard area on a community's flood hazard map or otherwise legally designated.

Erosion – Process by which floodwaters lower the ground surface in an area by removing upper layers of soil.

Essential facilities – Facilities that, if damaged, would present an immediate threat to life, public health, and safety. As categorized in Hazus, essential facilities include hospitals, emergency operations centers, police stations, fire stations, and schools.

Flood – A general and temporary condition of partial or complete inundation of normally dry land areas from (1) the overflow of inland or tidal waters or (2) the unusual and rapid accumulation or runoff of surface waters from any source.

Flood Insurance Rate Map (FIRM) – An official map of a community, on which FEMA has delineated both the SFHAs and the risk premium zones applicable to the community. See also Digital Flood Insurance Rate Map.

Flood Insurance Study (FIS) Report – Contains an examination, evaluation, and determination of the flood hazards of a community, and if appropriate, the corresponding water-surface elevations.

Flood risk – Probability multiplied by consequence; the degree of probability that a loss or injury may occur as a result of flooding. This is sometimes referred to as flood vulnerability.

Flood vulnerability – Probability multiplied by consequence; the degree of probability that a loss or injury may occur as a result of flooding. This is sometimes referred to as flood risk.

Flood borne debris impact – Floodwater moving at a moderate or high velocity can carry floodborne debris that can impact buildings and damage walls and foundations.

Floodwall – A long, narrow concrete or masonry wall built to protect land from flooding.
Floodway (regulatory) – The channel of a river or other watercourse and that portion of the adjacent floodplain that must remain unobstructed to permit passage of the base flood without cumulatively increasing the water surface elevation more than a designated height (usually 1 foot).

Floodway fringe – The portion of the SFHA that is outside of the floodway.

Freeboard – A factor of safety usually expressed in feet above a flood level for purposes of flood plain management. "Freeboard" tends to compensate for the many unknown factors that could contribute to flood heights greater than the height calculated for a selected size flood and floodway conditions, such as wave action, bridge openings, and the hydrological effect of urbanization of the watershed (44CFR§59.1).

Hazus – A GIS-based risk assessment methodology and software application created by FEMA and the National Institute of Building Sciences for analyzing potential losses from floods, hurricane winds and storm surge, and earthquakes.

High velocity flow – Typically comprised of floodwaters moving faster than 5 feet per second.

Levee – A human-made structure, usually an earthen embankment, designed and constructed in accordance with sound engineering practices to contain, control, or divert the flow of water so as to provide protection from temporary flooding. (44CFR§59.1)

Loss ratio – Expresses loss as a fraction of the value of the local inventory (total value/loss).

Mudflow – Mudslide (i.e., mudflow) describes a condition where there is a river, flow or inundation of liquid mud down a hillside usually as a result of a dual condition of loss of brush cover, and the subsequent accumulation of water on the ground preceded by a period of unusually heavy or sustained rain. A mudslide (i.e., mudflow) may occur as a distinct phenomenon while a landslide is in progress, and will be recognized as such by the Administrator only if the mudflow, and not the landslide, is the proximate cause of damage that occurs. (44CFR§59.1)

Primary frontal dune (PFD)—A continuous or nearly continuous mound or ridge of sand with relatively steep seaward and landward slopes immediately landward and adjacent to the beach and subject to erosion and overtopping from high tides and waves during major coastal storms. The inland limit of the primary frontal dune occurs at the point where there is a distinct change from a relatively steep slope to a relatively mild slope.

Probability (of flood) – The likelihood that a flood will occur in a given area.

Risk MAP – Risk Mapping, Assessment, and Planning, a FEMA strategy to work collaboratively with state, local, and tribal entities to deliver quality flood data that increases public awareness and leads to action that reduces risk to life and property.

Riverine – Of or produced by a river. Riverine floodplains have readily identifiable channels.

Special Flood Hazard Area (SFHA) – Portion of the floodplain subject to inundation by the 1-percent-annual or base flood.

Stafford Act – Robert T. Stafford Disaster Relief and Emergency Assistance Act, PL 100-707, signed into law November 23, 1988; amended the Disaster Relief Act of 1974, PL 93-288. This Act constitutes the statutory authority for most federal disaster response activities especially as they pertain to FEMA and FEMA programs.

Stillwater –Projected elevation that flood waters would assume, referenced to National Geodetic Vertical Datum of 1929, North American Vertical Datum of 1988, or other datum, in the absence of waves resulting from wind or seismic effects.

Stream Flow Constrictions – A point where a human-made structure constricts the flow of a river or stream.

6 Additional Resources

ASCE 7 – National design standard issued by the American Society of Civil Engineers (ASCE), *Minimum Design Loads for Buildings and Other Structures*, which gives current requirements for dead, live, soil, flood, wind, snow, rain, ice, and earthquake loads, and their combinations, suitable for inclusion in building codes and other documents.

ASCE 24-05 – National design standard issued by the ASCE, *Flood Resistant Design and Construction*, which outlines the requirements for flood resistant design and construction of structures in flood hazard areas.

National Flood Insurance Program (NFIP), Federal Emergency Management Agency (FEMA), www.floodsmart.gov

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FEMA, 2003b. *Bringing the Plan to Life: Implementing the Hazard Mitigation Plan*, FEMA 386-4. Washington, DC, August 2003.

FEMA, 2004a. *Design Guide for Improving School Safety in Earthquakes, Floods, and High Winds*, FEMA 424. Washington, DC, January 2004.

FEMA, 2004b. *Federal Guidelines for Dam Safety: Emergency Action Planning for Dam Owners*, FEMA 64. Washington, DC, April 2004.

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FEMA, 2006b. *Using the Hazard Mitigation Plan to Prepare Successful Mitigation Projects*, FEMA 386-9. Washington, DC, August 2008.

FEMA, 2006c. "*Designing for Flood Levels Above the BFE," Hurricane Katrina Recovery Advisory 8, Hurricane Katrina in the Gulf Coast: Building Performance Observations, Recommendations, and Technical Guidance*, FEMA 549, Appendix E. Washington, DC, July 2006.

FEMA, 2007a. *Property Acquisition Handbook for Local Communities*, FEMA 317. Washington, DC, September 2007.

FEMA, 2007b. *Public Assistance Guide*, FEMA 322. Washington, DC, June 2007.

FEMA, 2007c. *Using Benefit-Cost Review in Mitigation Planning*, FEMA 386-5. Washington, DC, May 2007.

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FEMA, 2007e. *Selecting Appropriate Mitigation Measures for Floodprone Structures*, FEMA 551. Washington, DC, March 2007.

FEMA, 2007f. *Design Guide for Improving Hospital Safety in Earthquakes, Floods, and High Winds: Providing Protection to People and Buildings,* FEMA 577. Washington, DC, June 2007.

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USGS National Assessment of Shoreline Change Project. http://coastal.er.usgs.gov/shoreline-change/

7 Data Used to Develop Flood Risk Products

GIS base map information was acquired from the following sources:

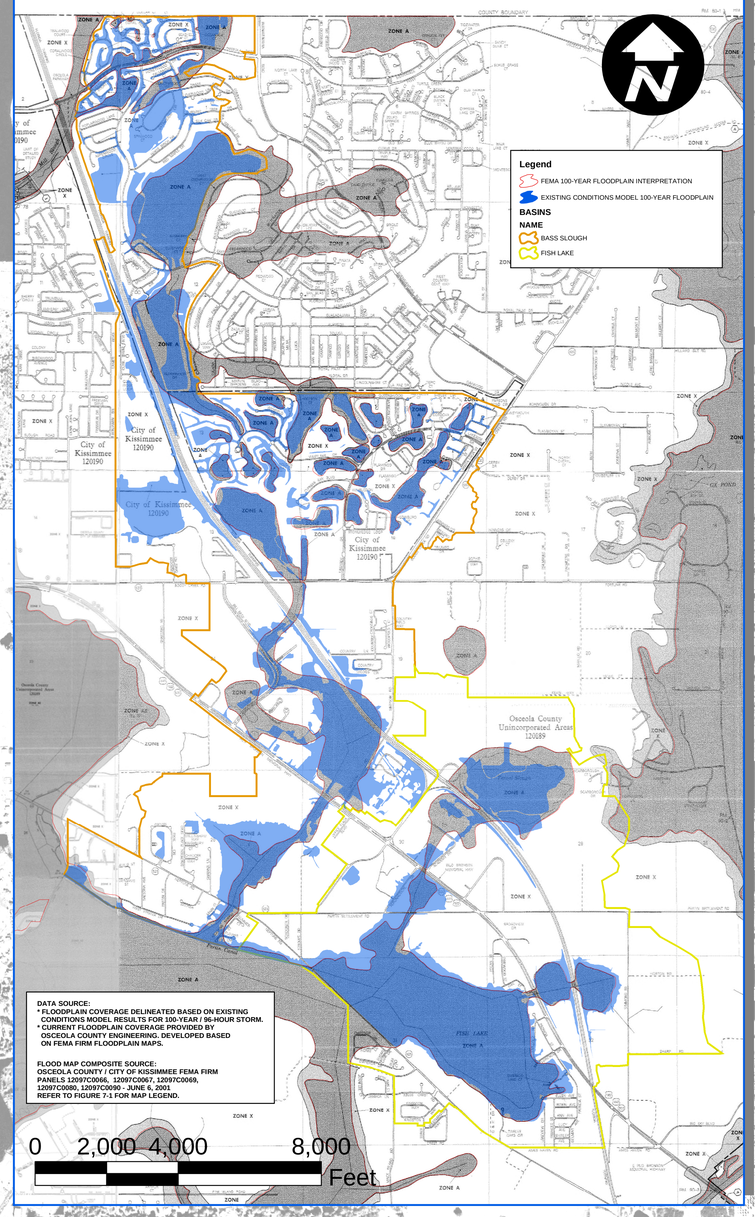
- Osceola County Flood Insurance Study
- Osceola County Floodplain Administrator
- Osceola County GIS Department
- City of St. Cloud
- State of Florida Department of Emergency Management
- USGS

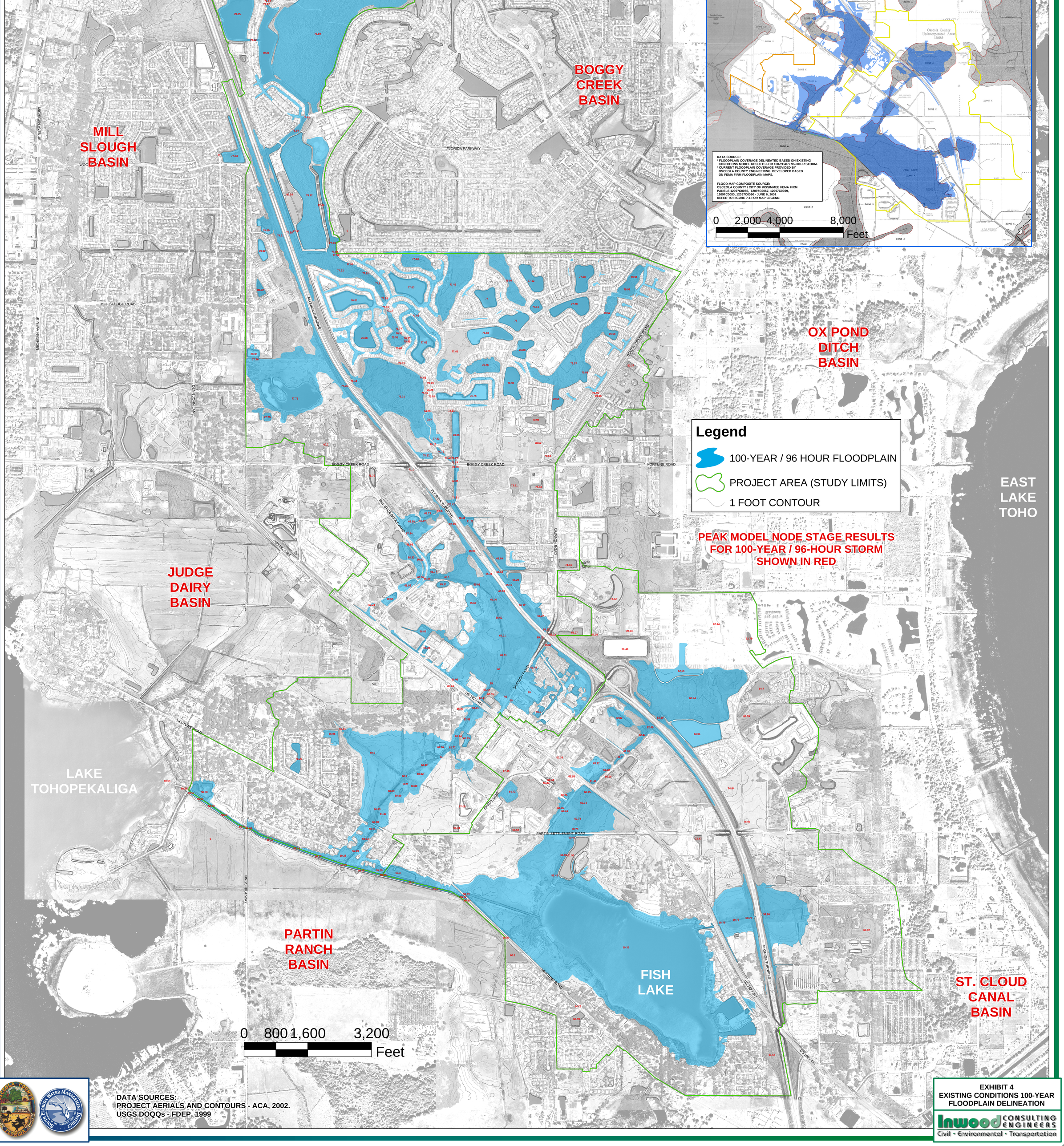
Mitigation Plans and AoMI information were acquired from local community input as well as significant input from Osceola County.

BASS SLOUGH BASIN
STORMWATER MANAGEMENT PLAN

EXISTING CONDITIONS MODEL
100-YEAR FLOODPLAIN

100-YEAR FLOODPLAIN COMPARISON



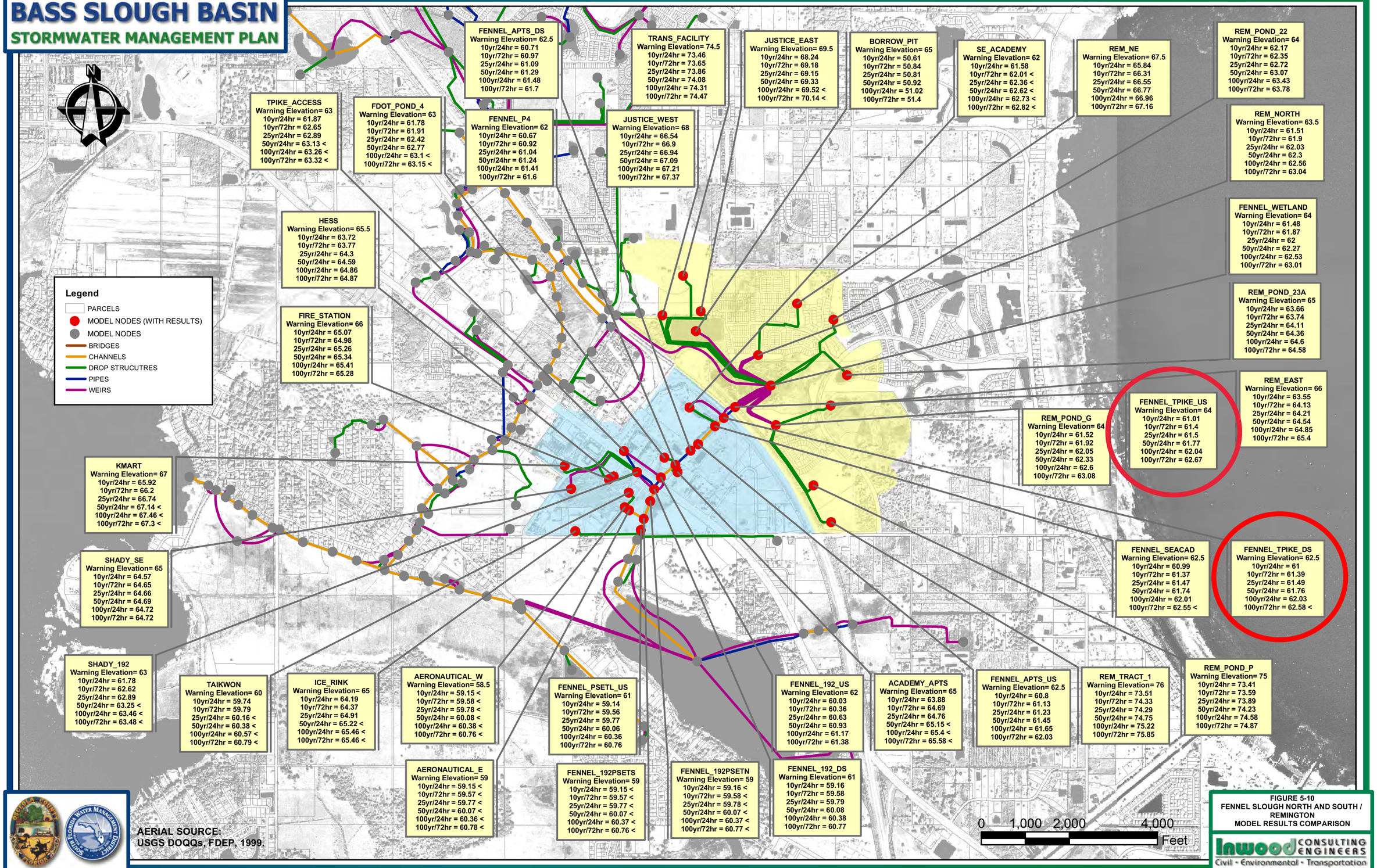


DATA SOURCES:
PROJECT AERIALS AND CONTOURS - ACA, 2002.
USGS DOQQs - FDEP, 1999

EXHIBIT 4
EXISTING CONDITIONS 100-YEAR FLOODPLAIN DELINEATION

Inwood CONSULTING ENGINEERS
Civil · Environmental · Transportation

BASS SLOUGH BASIN
STORMWATER MANAGEMENT PLAN



AERIAL SOURCE:
USGS DOQQs, FDEP, 1999.

FIGURE 5-10
FENNEL SLOUGH NORTH AND SOUTH / REMINGTON
MODEL RESULTS COMPARISON

Inwood CONSULTING ENGINEERS
Civil - Environmental - Transportation

APPENDIX D

Project Support Documentation

To:	Tiffany Crosby FTE Environmental Permit Coordinator	From:	Mike Dinardo, PWS Stantec, Lake Mary Fl
File:	215810540	Date:	November 10, 2020

Reference: Federal Wildlife Assessment of the Pond Site Alternatives
SR 91/Florida Turnpike Widening with Express Lanes MP 242 to MP 248.93
FM No.: 436194-1-52-01
Osceola County

Moffatt & Nichol is currently designing the widening of the Florida's Turnpike from Neptune Road (MP 242) to the Osceola Parkway Interchange (MP 248.93) in Osceola County, Florida. The project is located within Sections 2, 11, 12, 13, and 24, Township 25 South, Range 29 East, Sections 19, 29, 30, and 32, Township 25 South, Range 30 East, and Section 5, Township 26 South, Range 30 East. Please see **Attachment A-Figure 1-Project Location Map.**

The purpose of this technical memorandum is to summarize the results of our assessment of federal and state protected species and wetlands along the mainline corridor and proposed pond site alternatives. This assessment also includes a preliminary qualitative and qualitative assessment of wetlands within each of the pond alternatives.

METHODOLOGY/DATA

Prior to the field investigation, a desktop literature search was performed to identify the soils, land use, potential wetland areas, and potential protected species that may occur within and/or adjacent to the project limits. The following resources were used for the desktop review:

- U.S. Department of Agriculture (USDA), Natural Resource Conservation Service (NRCS), Soil Survey of the Osceola Area, Florida and NRCS web soil survey (Accessed January 2020);
- U.S. Geological Survey (USGS), Topographic Quadrangle maps, 7.5-minute series, Florida, USGS 2012;
- South Florida Water Management District (SFWMD), Florida Land Use Cover Classification System (FLUCCS) GIS Layer, 2009;
- Florida Fish and Wildlife Conservation Commission (FFWCC), *Florida's Imperiled Species Management Plan, Amended December 2018;*

- Florida Fish and Wildlife Conservation Commission, *Eagle Nest Locator website* http://myfwc.maps.arcgis.com/apps/webappviewer/index.html?id=253604118279431984e8bc3ebf1cc8e9*;*
- FFWCC, *Wading Bird Rookeries website* (http://atoll.floridamarine.org/waterBirds/*);*
- U.S. Fish and Wildlife Service (USFWS), *Critical Habitat Portal website (*http://ecos.fws.gov/crithab/*);*
- USFWS, *Information for Planning and Consultation website (*https://ecos.fws.gov/ipac/*);*
- Florida Natural Areas Inventory (FNAI), *Biodiversity Matrix Map Server (*http://www.fnai.org/biointro.cfm*);*
- Florida Fish and Wildlife Conservation Commission, *Fish and Wildlife Research Institute Indigo Snake Occurrences in Florida; (*http://geodata.myfwc.com/pages/downloads*);* and
- U.S. Fish and Wildlife Service, Wood Stork website (http://www.fws.gov/northflorida/WoodStorks/wood-storks.htm).
- Endangered & Threatened Wildlife and Plants. 50 CFR 17.11 and 17.12. (USFWS, 2016); and
- List of Florida's Endangered Plant Species (5B-40 FAC) (FDACS, 2010).

Based on available data, it was determined that the corridor occurs within the USFWS consultation area for the Florida bonneted bat (*Eumops floridanus*), Florida scrub-jay (*Aphelocoma coerulescens)*, Everglade snail kite (*Rostrhamus sociabilis plumbeus)*, crested caracara (*Caracara cheriway*), red cockaded woodpecker (*Picoides borealis*), Florida grasshopper sparrow (*Ammodramus savannarum floridanus*), sand skink (*Neoseps reynoldsi*), blue-tailed mole skink (*Eumeces egregious lividus*), and Lake Wales Ridge plants. Additionally, Osceola County has documented bald eagle nests and occurrences of eastern indigo snake. The Florida Department of Environmental Protection has conservation easements on three parcels of land within and adjacent the project corridor. One parcel is located south of Pond 1-Alt A, northeast of the Neptune Road overpass. The other two parcels are located on the west and east sides of the Turnpike south of US 192/East Irlo Bronson Memorial Highway. There are also conservation easements within a few of the pond alternatives.

Preliminary Coordination

A project coordination meeting with the US Fish and Wildlife Service (USFWS) occurred on November 2, 2016. Meeting Minutes are attached as **Attachment B**. During this meeting all federal species that could potentially occur within the vicinity of the project corridor were reviewed. Based

on the concept of the proposed project, a preliminary effect determination was made for each of these species. Please note that this coordination occurred early in project development and did not include pond alternatives. The FTE will re-initiate coordination to verify that USFWS and FFWCC concur with the effect determinations based on the new pond alternatives.

FEDERAL LISTED SPECIES PRELIMINARY EFFECT DETERMINATIONS

The following federal species were reviewed for potential permitting issues within the mainline ROW widening and pond site alternatives based on site conditions and our GIS database and literature review. Please see **Attachment A-Figure 2-Documented Occurrences Map.**

Wood stork: The wood stork (*Mycteria americana)* is primarily associated with freshwater and estuarine habitats used for nesting, roosting, and foraging. In this region, the wood stork is known to utilize an 18.6-mile Core Foraging Area (CFA) from its nesting area for foraging. According to the USFWS database, the project corridor is located within 18.6 miles of at least two (Lake Conlin and Lake Mary Jane Rookeries) wood stork nesting colonies. The field assessment and surveys did not result in the observation of any wood storks or wood stork nests or rookeries. However, suitable foraging habitat (SFH) was identified (marsh systems) within or adjacent to the project corridor. According to the USFWS South Florida Programmatic Concurrence for the wood stork, projects that impact more than 0.5 acres of SFH within a wood stork CFA that also provide appropriate habitat compensation to offset the loss of SFH will have an effect determination of **"may affect, not likely to adversely affect."** This project will likely impact more than 0.5 acres of SFH, and habitat compensation will likely be completed as a part of permitting through the South Florida Water Management District (SFWMD) and U.S. Army Corps of Engineers (USACE). As this project is jurisdictional to the USFWS South Florida Ecological Services Office, a biomatrix analysis of the foraging prey base loss will be part of the USACE permit submittal documents.

During the 2016 informal consultation meeting regarding the mainline ROW impacts, USFWS stated that if the ditch impacts will be replaced with similar ditches, the applicant should focus on the wetland impacts for the foraging analysis and make sure that the hydroperiod is replaced in kind.

Everglade snail kite: The snail kite prefers large, open, and shallow freshwater marshes and lakes which provides this species primary food source, the apple snail. Snail kites also prefer to nest in low trees or shrubs at the edges of lakes. After the field assessments of the mainline ROW and pond sites it was determined that some pond sites include large marsh systems.

Populations of this species are fairly well documented in Florida and according to the FFWCC GIS data, the closest documented snail kite nest is located approximately 1.25 miles southwest of the project corridor along a canal connecting to Lake Toho. Additionally, large nesting populations of snail kite are documented in both east Lake Toho and Lake Toho.

No snail kites were observed during field assessments. Even though the corridor contains and is adjacent to marshes, no observed occurrences were documented during field reviews, and there is no documented nesting within one mile of the corridor. Based on this information as well as the lack of lake systems, it is presumed that this species does not occur within the project footprint or within any of the proposed pond site alternatives. Therefore a **"no effect"** determination was made for this species**.**

During the 2016 informal consultation meeting about the mainline row impacts USFWS concurred with the determination that the proposed project will have no involvement with this species.

Bald eagle: This large raptor constructs nests in pine trees that are very large and easily identifiable from the ground. Nests are generally located near water bodies that provide a dependable food source. The closest documented bald eagle (*Haliaeetus leucocephalus)* nest is approximately one-half mile from the project corridor and none of the pond site alternatives area within 660 feet of any documented bald eagle nests. In addition, no undocumented bald eagle nests were observed during field reviews of the project corridor. This project will have **"no effect"** on the bald eagle.

Florida scrub-jay: The Florida scrub-jay is a habitat specialist, primarily inhabiting xeric oak scrub habitats. Other habitats utilized include sand pine scrub, xeric pines, and agricultural or residential lands where scrub oaks have been retained. Scrub-jays prefer areas with open sandy patches to cache large quantities of scrub oak acorns, their principal plant food (Woolfenden and Fitzpatrick 1984; Fitzpatrick et at. 1991).

Regionally, the area has historical documentation of this species. During the 1992/1993 FFWCC statewide survey, scrub-jay habitat was identified along the Turnpike; however, this location has since been developed with a neighborhood and retention pond. Because historical scrub jay habitat was documented in the region, each pond site was inspected for the suitable habitat and species potential. Suitable habitat structure (i.e. low growing scrub oak, or type 1 or type 2 habitat) to support this species was not present along the mainline or any of the pond site alternatives. Therefore, a **"no effect"** determination is made for this species.

During the 2016 informal consultation meeting about the mainline row impacts USFWS concurred with our determination that the proposed project would have no involvement with this species.

Crested caracara: The crested caracara inhabits open country, including dry prairie and pasturelands with cabbage palm, cabbage palm/live oak hammocks, and shallow ponds and sloughs. Suitable nesting habitat within the project corridor is confined to the southern end of the project, while foraging opportunities are available within the ROW, primarily in the form of roadkill and in some pond site alternatives in the form of pasture.

Stantec performed a caracara specific survey from January to April in 2017. No caracaras were observed during the survey. We are also aware that an additional caracara survey occurred along Neptune road at the southern end of the corridor in 2019 that also did not yield any observations of caracara. Because it has been more than two years since the 2017 survey, suitable caracara habitat within the project corridor will likely require an additional survey. **The effect determination for this species will be based on the results of the new survey.**

Red-cockaded woodpecker: This woodpecker is unique as it is the only species in North America that nests within the cavity of living pine trees. The preferred cavity tree will typically consist of pine trees greater than 60 years in age that have heart rot fungus that softens the inner core of the tree. This woodpecker generally occupies open mature longleaf pine flatwoods that have a variety of groundcover and foraging opportunities. The closest documented red-cockaded woodpecker cluster is approximately 10 miles to the west of the project corridor. Furthermore, the pine trees within the project corridor are not managed and/or at an age to support this species. Because there are no documented occurrences within one mile of the project corridor and there is no suitable habitat within the project corridor, a **"no effect"** determination is made for this species.

During the 2016 informal consultation meeting about the mainline row impacts USFWS concurred with our determination that the proposed project would have no involvement with this species.

Florida grasshopper sparrow: The Florida grasshopper prefers frequently burned and poorly drained prairie habitat with low vegetation typically less than two feet in height. It is believed that only seven localized populations exist, including areas in Osceola County. Although the project corridor occurs within the consultation area for this bird, this species is highly unlikely to occur within the project corridor because there are no documented occurrences of this

species within one mile of the project corridor, suitable habitat for this species is not present within the project corridor, and no individuals were observed during the field assessment. A **"no effect"** determination is made for this species.

During the 2016 informal consultation meeting about the mainline row impacts USFWS concurred with our determination that the proposed project would have no involvement with this species.

Eastern indigo snake: The eastern indigo snake (*Drymarchon corais couperi)* can be found in a variety of habitat types, including pine flatwoods, scrubby flatwoods, high pine, dry prairie, tropical hardwood hammocks, edges of freshwater marshes, agricultural fields, coastal dunes, as well as human-altered habitats. These snakes are cold-sensitive and require gopher tortoise burrows, other animal holes, or stumps for protection during winter months. These snakes require large tracts of natural, undisturbed habitat, and prefer to forage in and around wetlands.

According to FFWCC's database, the closest documented eastern indigo snake is over 7-miles southeast of the corridor. No indigo snakes were observed during field assessments; however, because of the likelihood of impacting 25 or more acres of potential habitat, additional coordination with USFWS will be required.

USFWS has a Programmatic Key for the eastern indigo snake (January 2010, updated August 2017). According to this key, the project effect determination for this species is **"may affect, not likely to adversely affect"** because the project will impact less than twenty five acres of xeric habitat supporting less than twenty five active or inactive gopher tortoise burrows; and Florida Turnpike Enterprise commits to following the USFWS indigo snake standard protection measures and coordinate with the FFWCC to secure any and all permits needed to relocate the gopher tortoises and associated commensal species prior to construction. Any indigo snake encountered during excavation will be allowed to vacate the area prior to additional site manipulation.

During the 2016 informal consultation meeting about the mainline row impacts USFWS concurred with our determination that the proposed project would have no involvement with this species.

Sand and blue-tailed mole skink: Both the sand skink and blue-tailed mole skink are endemic to xeric habitats along Central Florida sand ridges. According to USFWS, "both species are most commonly associated with habitat dominated by xeric vegetation such as oak-dominated

scrub, turkey oak barrens, high pine, and xeric hammocks. Skinks typically occur in habitats that contain a mosaic of open sandy patches interspersed with forbs, shrubs, and trees. Although sand skink tracks are most typically observed in open sandy areas, both species utilize a variety of other micro-habitats within xeric vegetative communities. Areas containing extensive rooted vegetation may preclude sand skink movement and are less likely to be used by skinks. They appear to be most abundant in the ecotone between areas of abundant leaf litter and/or vegetative cover, where open, swimmable sands exist. Suitable bluetail mole skink habitat is restricted to xeric uplands within the Lake Wales Ridge in Highlands, Osceola, and Polk counties.

USFWS has designated criteria for identifying potential habitat which is highly suitable for sand skinks. The criteria developed includes one of 20 select, well-drained soil types, at or above 82-feet in elevation within the regional location of the Florida ridge system (mainly the Lake Wales Ridge and Mount Dora Ridge) in one of the seven counties (Osceola, Polk, Lake, Highlands, Putnam, Orange, and Marion).

A small section within the project corridor ROW is mapped as having suitable soils and an elevation of 70 to 82 feet. Much of this location has been regraded when the FTE was constructed and is now disturbed upland covered in bahiagrass (*Paspalum notatum*) and other ruderal vegetation and lacking suitable conditions for sand skinks. No pond alternatives are within areas mapped as suitable skink habitat. Because of the restricted range of mapped, no skink soils mapped above 82 feet in elevation, a **"no effect"** determination is made for this species.

During the 2016 informal consultation meeting about the mainline row impacts USFWS stated that if the corridor does not contain elevations of at least 82 feet within one of the 20 well-drained soils types that contain this species, then the proposed project will have no involvement with this species.

Florida bonneted bat: Potential roosting habitat for the Florida bonneted bat includes forest (pine flatwoods, scrubby flatwoods, pine rocklands, royal palm hammocks, mixed or hardwood hammocks, cypress, sand pine scrub, or other forest types) and other areas with tall, mature trees or other areas with suitable roost structures (e.g. utility poles, artificial structures). Roosting habitat contains one or more of the following: tree snags, trees with cavities, hollows, deformities, decay, crevices, or loose bark. Florida bonneted bats have been found roosting in habitat with the following structural features:

- trees greater than 33 feet high, with greater than 8 inches diameter at breast height, with cavity elevations higher than 16 feet above ground level (Braun de Torrez 2019);
- areas with a high incidence of large or mature trees with various deformities (e.g. large cavities, hollows, broken tops, loose bark, and other evidence of decay);
- rock crevices; and/or
- artificial structures that mimic natural roosting conditions (e.g., bat houses, utility poles, buildings), situated in natural or semi-natural habitats.

Bridges are also expected to provide potential roosting habitat based on the species morphology and behavior (Keeley and Tuttle 1999).

Foraging habitat is comprised of relatively open (i.e. uncluttered or reduced numbers of obstacles, such as fewer tree branches and leaves, in the flight environment) areas to find and catch prey, and sources of drinking water. Foraging habitat includes open fresh water, permanent or seasonal freshwater wetlands, within and above wetland and upland forests, wetland and upland shrub, and agricultural lands (Bailey et al. 2017). In urban and residential areas drinking water, prey base, and suitable foraging can be found at golf courses, parking lots, and parks in addition to relatively small patches of natural habitat.

USFWS has a consultation key for the Florida bonneted bat. According to this key, if a project is partially or totally within the Florida bonneted bat consultation area, contains potential roosting habitat, and has a project footprint greater than five acres then a full autistic/roost survey is required. The southern portion of the project corridor, south of the East Irlo Bronson Memorial Highway, is located within the consultation area. The project footprint will be larger than five acres. Due to the location and size of the project a survey for Florida bonneted bats will be required for this project. **The results of the bonneted bat survey will dictate the effect determination for this species.** If a roost is expected to occur within the project area, based on survey, and that roost will be affected, formal consultation with USFWS will be required.

Florida panther: The Florida panther inhabits large forested communities and wetlands. Florida panthers have been documented within Osceola County, but the project corridor is within the northern most documented extent for panthers based on telemetry (FWC 2018) and mortality data (FFWCC 2020). Based on the 2018 FFWCC telemetry data, the closest panther occurrence is over seven miles south of the project corridor. Osceola County is not known for

breeding pairs of panthers, rather the occasional lone male. **No effects to this species is anticipated; however, informal consultation will verify this assumption for the record.**

Lake Wales plants: These plants typically occur in intact scrub associated with the Lake Wales Ridge. All upland areas within the mainline and pond sites have experienced habitat manipulation such as conversion to pasture, residential areas, or transportation facility. This manipulation has significantly reduced the potential for these species to persist. Additionally, the project corridor is not located within the Lake Wales Ridge. No Lake Wales Ridge plants were observed during field assessments. Based of the project's location a **"no effect"** determination for these species was made.

Critical Habitat: The project corridor was evaluated for the occurrence of Critical Habitat as defined by the ESA-1973, as amended and 50 CFR part 424. Critical Habitat is defined as the specific areas within the geographical area occupied by a species on which are found those physical or biological features essential to the conservation of the species and which may require special management considerations or protection. No critical habitat for any federally listed species was identified within the project corridor including the pond site alternatives.

STATE LISTED SPECIES PRELIMINARY EFFECT DETERMINATIONS

The following state species were reviewed for potential permitting issues within the mainline ROW widening and pond site alternatives based on site conditions and our GIS database and literature review.

Gopher tortoise: The gopher tortoise (*Gopherus polyphemus)* prefers areas of well-drained, loose soils that support adequate low-growing herbs. While it is common to find gopher tortoise burrows in most upland communities, the preferred habitats are xeric oak, sandhills, dry pine flatwoods, scrub habitats as well as old fields, pastures and roadsides.

The field assessment identified potentially occupied gopher tortoise burrows within the project corridor. Field assessment conducted by Stantec in 2016 identified five burrows within the mainline ROW, while the recent pond assessments identified nine burrows within Pond 8-Alt C. The gopher tortoise is a highly mobile species that typically relocates to new burrows throughout the year(s) increasing the potential for this species to occur in new locations. Thus, every pond site with suitable, accessible upland habitat could potentially be utilized by this species over the next few years. A final (100 percent) survey for this species will be conducted along the mainline and within the selected pond sites approximately 90 days prior to

construction. All burrows within 25 feet of construction limits will be relocated with the benefit of a FFWCC permit. As such, a **no adverse effects are anticipated** for this species.

Florida pine snake: The Florida pine snake (*Pituophis melanoleucus mugitus*) is a large, tan or rust colored snake with an indistinct pattern of blotches is listed as ***threatened*** by the FWC. The Florida pine snake is another tortoise burrow commensal organism, utilizing both tortoise burrows and the tunnels of pocket gophers (*Geomys pinetis*) for feeding and shelter. Preferred habitat of the pine snake is xeric uplands, and to a lesser extent, flatwoods and other mesic uplands. Some habitat is available within the project, particularly within the dryer pond site alternatives. Pine snakes live nearly their whole lives underground and are very hard to observe directly. Earth work in suitable habitat may impact subterranean pine snakes. If Florida pine snakes are found during construction or during gopher tortoise relocation activities, FTE will follow current FWC guidance and allow the species to leave the construction area on its own volition before resuming construction. Based on this commitment, a **no adverse effects are anticipated** for the pine snake**.**

Florida sandhill crane: The Florida sandhill crane (*Antigone canadensis pratensis*) is tall, long necked and long-legged bird with a red head is listed as ***threatened*** by FWC. The greater sandhill crane (A. *canadensis tabida*) another species of crane is a migratory winter visitor to Florida and is indistinguishable in the field.

The Florida sandhill crane prefers shallow non-forested freshwater wetlands (marsh and prairies), pastures, and open woods and other open habitat such as roadsides and dry prairie for foraging. Nests can be found on the ground in shallow marsh areas and lakes beginning as early as December, but more typically in January and extending through August. Nest sites are typically surrounded by water to reduce predation by small mammals. No sandhill cranes have been observed during field reviews, nor have any nest sites been identified. Several of the large wetland systems have the potential to provide nesting habitat for this species. The preferred pond sites will continue to be observed for any signs of nesting cranes. At this point, the project is not expected to impact any sandhill cranes. As such, **no adverse effect is anticipated for this species.**

Florida burrowing owl: The Florida burrowing owl (*Athene cunicularia floridana*) is a small, long legged owl, ground-dwelling burrowing owl is listed as ***threatened*** by FWC. The Florida burrowing owl prefers high sandy soils with little vegetation growth. Habitats such as prairies, sandhills, farms, or airfields are preferable areas for the Florida burrowing owl to nest.

Burrowing owls exists as a breeding pair or as a loose family colony. In Florida burrowing owls' nest from November through April with young beginning to fly at approximately 6 weeks old. The closest documented occurrence of burrowing owls is over 20 miles south of the corridor.

Little potential nesting habitat is available although foraging habitat is available in the pasture areas associated with some of the pond sites**.** There were no direct observations of this species foraging within the corridor during field reviews and there were no documented species within this region. As such **no adverse effect is anticipated for this species** from the proposed project**.**

Southeastern American kestrel: The southeastern American kestrel (*Falco sparverius paulus*) is a smallest falcon within the United States. This falcon has with blue-grey (male) or reddish brown (female) wings and distinctive black and white facial pattern and a black band at the base of the tail. This non-migratory breeding subspecies is listed as ***threatened*** by the FWC**,** and is most common in peninsular Florida, and rarer in the panhandle. Another subspecies of the American Kestrel (*Falco sparverius sparverius*) which is undistinguishable from the southeastern subspecies is a non-listed wintering migrant bird species that is found throughout Florida between September and March.

Wintering migrant birds of the species are found throughout Florida. Habitats such as pine scrub, dry prairies, mixed pine and hardwood forests, and pine flatwoods are preferable for this species and nest sites include tall dead trees or utility poles. A limited amount of suitable kestrel foraging habitat exists within the project corridor within some of the pond alternatives. However, there have been no documented sightings of the kestrel within one (1) mile of the project corridor and there were no direct observation of a southeastern kestrel or a nest during field reviews. As such, **no adverse effects are anticipated for the Southeastern American kestrel.**

Wading birds: Wading bird rookeries were not observed and are not known to occur within or adjacent to the study area. The closest rookery is documented over four (4) miles to the southeast of the project corridor. Potential foraging habitat for little blue heron (*Egretta caerulea)* and tri-colored heron (*Egretta tricolor*) are classified as *threatened* by the FWC, occurs within the limits of the study area. Little blue heron was observed during field surveys. No observed wading bird rookeries will be impacted by the proposed project and indirect impacts to wading birds are not anticipated. Therefore, **no adverse effect is anticipated** for wading bird population in the region.

FIELD ASSESSMENT OF THE PROJECT CORRIDOR

Ground-based biological surveys were conducted along the corridor between the months of July through August 2016, January through April 2017, and January 2020 through August 2020. The purpose of the surveys was to identify natural habitat types, anthropogenic land use types and to investigate wildlife (including listed species) occurrence along the project corridor. Wildlife surveys were conducted during daylight hours and followed species specific survey guidelines as outlined by the FFWCC and USFWS. During the field visits, all observations of listed plant and wildlife species or indicators of their presence (i.e. remnants, tracks, burrows, calls, scat) within the study corridor (mainline and pond alternatives) were noted by staff biologists. General wildlife observations were also documented during the field visits. Species surveys consisted of meandering transects that covered areas within all suitable habitat types. The following information documents the results of the surveys.

Mainline Right-of-Way

The mainline ROW was evaluated for suitable habitat for federally listed species. Field assessments performed by Stantec in 2016 identified five (5) gopher tortoise burrows within the mainline ROW. Their locations were marked with GPS and are shown in **Attachment A, Figure 2**. Wetlands and Other Surface Waters (OSW) observed along the mainline ROW offer SFH for wood storks. The southern end of this project, located south of E Irlo Bronson Memorial Highway, is located within the consultation area for the Florida bonneted bat. Tree canopy along the mainline ROW within this area could offer potential roosting habitat as well as foraging for this species.

During field visits conducted during the months of July and August 2016, the limits of wetlands proximal to the existing and proposed ROW were flagged and surveyed. During these events, 14 wetlands and a continuous OSW ditch feature was identified and flagged within the corridor. In addition, seasonal high-water elevations were established throughout the corridor based on biological indicators. Wetlands near to the Osceola Parkway Interchange were mapped based on the wetland limits provided by the Wantman Group under a separate permit. **Attachment A, Figure 3** depicts the wetlands flagged along the project corridor.

Pond Alternatives

In addition to the mainline, each of the proposed pond sites were evaluated for suitable habitat for listed species. Preliminary wetland boundaries were also evaluated for the pond sites and the resulting Pond Site Alternatives Wetlands Map is included in **Attachment A, Figure 3**. Wetlands in close proximity to the preferred pond sites will be flagged and surveyed in the fall

of 2020 once the preferred ponds are selected and finalized. A preliminary wetland assessment was made for each alternative that is based on the UMAM assessment methodology. Pond alternatives were assigned either a low (~0.3), medium (~0.6), or high (~0.8) score based on the location, hydrology, and amount of exotic vegetation or whether the site is dominated by a natural community type versus a site that has been cleared by agricultural or other uses in the past. This score will be multiplied by the impact acres to estimate the amount of required mitigation for the pond assessment matrix. Linear upland cut drainage features were not assessed a mitigation value as they typically do not require mitigation.

Wildlife assessments of pond alternatives including onsite observations and a review of documented occurrences. It is assumed that wetland, surface waters and ditches could provide SFH for wood storks during periods of inundation unless they are overgrown with vegetation. Any observations of state or federal listed species was included in each assessment description. It was also noted if a pond alternative would likely require a specific purpose surveys for any listed species.

BASIN 1

Pond 1-Alt A

This site consists of improved pasture, marsh, and a ditch. Dominant vegetation within the pasture is bahiagrass with a few specimens of live oak (*Quercus virginiana*) and Brazilian pepper (*Schinus terebinthifolia*) at the periphery. This site includes approximately 1.35 acres (ac.) of freshwater marsh that is located on the southern side of this site. Characteristic ground cover identified within this marsh includes soft rush (*Juncus effusus*), pickerel weed (*Pontederia cordata*), hairgrass (*Eleocharis baldwinii*), and lanceleaf arrowhead (*Sagittaria lancifolia*). A midstory was absent in this marsh. Two black gum trees (*Nyssa sylvatica*) are located on the marsh border. The quality of this system would be estimated as "medium". The ditch located at the eastern half of the proposed pond drains an offsite wetland to the Neptune Road linear ditch system.

The sparse canopy and actively grazing cows within and adjacent to this pond site alternative do offer potential habitat for several listed species including potential nesting and foraging habit for the crested caracara. This site was included in one of the observation points for the 2017 caracara survey for this species that was covering the mainline ROW expansion. No caracara were observed from this survey station or any of the survey stations throughout the corridor. Cabbage palms (*Sabal palmetto*) potentially suitable for caracara nesting were

observed within 1,000 feet of this pond site alternative. This proposed pond site is also located within the USFWS consultation area for the Florida bonneted bat. The Florida bonneted bat could utilize trees within and adjacent to this site for roosting and the surrounding area for foraging. The only tree cavity observed on the site was less than 3 feet off the ground within a black gum tree. Consultation with USFWS will be required to determine if surveys for bonneted bats and caracaras are required within this site.

Pond 1-Alt B

This site is a disturbed upland. Dominant vegetation within this site is a ruderal ground cover of blackberry (*Rubus* spp.), muscadine grape (*Vitis rotundifolia*), flat-topped goldenrod (*Euthamia minor*), and lantana (*Lantana camara*). A sparse canopy of live oak is located on the eastern perimeter of the site. The midstory of this site contains Brazilian pepper, cabbage palm, and castor bean (*Ricinus communis*). Various piles of trash and large debris were observed in this site, but specific contamination hazards were not observed. Potential contamination issues are being addressed by the project geotechnical team.

This proposed pond site is located within the USFWS consultation area for the Florida bonneted bat. The canopy (live oaks) within this site does offer potential roosting habitat for the bonneted bat; however, evidence of roosting bats or tree cavities was not observed during the field assessment. Coordination with the USFWS will be required to determine if a bonneted bat survey will be required for this pond site alternative.

Pond 1-Alt C

This site contains a single-family home and unimproved pasture. Dominant vegetation within the pasture is bahiagrass, blackberry, goldenrod (*Salidago* spp.), persimmon (*Diospyros virginiana*) and broomgrass (*Andropogon virginicus*) with a few specimens of live (*Quercus virginica*) and laurel oak (*Quercus laurifolia*) along the western perimeter. A mixed forested wetland is located along the eastern perimeter of the property within the Florida Turnpike ROW. This wetland extends into the northern corner of the property and borders the northern corner of the proposed pond site contour. The quality of this system would be estimated as "medium".

This proposed pond site is located within the USFWS consultation area for the Florida bonneted bat. The canopy within this site does offer potential roosting habitat for the bonneted bat; however, evidence of roosting bats or tree cavities was not observed during the field

assessment. Coordination with the USFWS will be required to determine if a bonneted bat survey will be required for this pond site alternative.

BASIN 2

Pond 2-Alt A and Floodplain Compensation (FPC) Site Fish 2 and 3

These sites are wholly within a large disturbed wetland system that has a mix of many species including Carolina willow (*Salix caroliniana*), Brazilian pepper, red maple (*Acer rubrum*), primrose willow (*Ludwigia peruviana*), pennywort, muscadine grape, and blackberry. Pond 2-Alt A is 6.37 acres of wetland, while FPC Fish 2 is 1.01 acres of wetland, and FPC Fish 3 is 1.90 acres of wetland. A large ditch occurs between Pond 2-Alt A and FPC Fish 3. This large wetland system has been delineated previously associated with the Osceola Sherriff's Office development immediately adjacent to the ponds (SFWMD App No. 050608-10) and is currently under a conservation easement. The quality of these system would be estimated as "low".

No additional survey would be required for listed wildlife on these sites.

Pond 2-Alt B

This site is predominantly wet prairie. Dominant vegetation within this site includes *A. glomeratus*, giant plume grass (*Erianthus giganteus*), sand cordgrass (*Spartina bakeri*), *E. baldwinii*, southern shield fern (*Thelypteris kunthii*), pennywort, muscadine grape, and blackberry. A deciduous hardwood forested wetland is located adjacent to the southern edge of this site. An upland buffer area is located along the northern edge of this site and separates the wet prairie from an east-west running ditch located along the northern perimeter. This site contains a total of approximately 5.77 ac. of wetlands. The quality of this system would be estimated as "medium".

This site would generally be regarded as having a ground cover that is too overgrown and wet for caracara. No additional survey would be required for listed wildlife on this site.

Pond 2-Alt C

This site is predominantly improved pasture. Dominant vegetation within the pasture includes bahiagrass, flat-topped goldenrod, and dog fennel (*Eupatorium capillifolium*) with a few specimens of live oak. A canal is located along the southern perimeter of the site and runs east-west. Several other excavated drainage ditches/swales are located within the site that appears

to drain the site during periods of high water to the large wetland systems that occur to the north of the site. These drainage ditches contain smartweed and flat sedge. Please note that a large amount of this site contains hydric soils and that land management practices and drainage has reduced the amount of wetland currently occupying the site. As such, there is the potential that water management district staff may require mitigation for impacts to all or portions of these ditches. There is also the potential that portions of the pasture areas are assessed as wetland.

Several areas of this proposed pond site include portions of a large marsh system (1.35 acres within the pond footprint) that extends offsite to the north. Within the pond footprint these marsh systems are dominated by maidencane, flat sedge species (*Cyperus spp*.), smartweed (*Polygonum denisflorum*) and soft rush. There is also a small depressional area at the southern limit that is a marsh system dominated by smartweed and flat sedge. The quality of these onsite systems would be estimated as "low".

The sparse canopy and actively grazing cows within and adjacent to this pond site alternative do offer potential suitable foraging habitat for the caracara. However, preferred nesting trees (solitary cabbage palms) were not observed within the site. This site was included in one of the observation points for the 2017 caracara survey for this species that was covering the mainline ROW expansion. Coordination with USFWS will be required to determine if an additional survey for caracaras are required within this site.

Pond 2-Alt D

This site is predominantly improved pasture with a few specimens of live oak. It appears that the southern end of this site may experience infrequent periods of inundated. A portion of this site is also mapped as hydric soils. Based on aerial imagery, there does not appears to be onsite wetlands. Because access was prevented by a large 10-foot chain linked fence, the presence or absence of wetlands was not confirmed. There is a drainage ditch adjacent to the southern terminus of the project.

This site contains potential suitable foraging habitat for the caracara; however, because access was prevented, preferred nesting trees (solitary cabbage palms) were not confirmed within the site. This site does have the potential to provide foraging habitat to caracaras; therefore, coordination with USFWS is likely required to determine if surveys for caracaras are required for this site.

FPC Fish 1

The western half of this site contains the same wet prairie as characterized above for Pond 2-Alt B. The eastern half of this site is predominantly a disturbed hardwood wetland. Dominant species within this community type include red maple, Brazilian pepper, wax myrtle (*Myrica cerifera*), primrose willow, southern shield fern, soft rush (*Juncus effusus*), smartweed, muscadine grape, and blackberry. Based on the observation of lichen lines on trees, the seasonal high-water level for this wetland appears to be at or above the surface. An upland buffer separates the wet prairie and hardwood wetland to the south from an east-west running ditch along the northern edge of this site. A small pond is located near the eastern perimeter of this site. This site contains a total of approximately 5.74 ac. of wetlands. The quality of this system would be estimated as "medium". This site would generally be regarded as having a ground cover that is too overgrown and wet for caracara.

FPC Fish 4

This site is predominantly improved pasture that is composed of bahiagrass, and flat sedge species. A 0.94-acre excavated ditch feature is located along the western perimeter that appears to drain the wetlands to the north of the site during periods of high water. This site contains a large amount of hydric soils. Land management and drainage has reduced the amount of wetland currently occupying the site. As such, there is the potential that water management district staff may require mitigation for impacts to all or portions of these ditches. There is also the potential that portions of the pasture areas are assessed as wetland. The quality of this system would be estimated as "low".

The sparse canopy and actively grazing cows within and adjacent to this pond site alternative do offer potential suitable foraging habitat for the caracara; however, preferred nesting trees (solitary cabbage palms) were not observed within the site. In fact, this site was included in one of the observation points for the 2017 caracara survey for this species that was covering the mainline ROW expansion. Coordination with USFWS will be required to determine if an additional survey for caracaras are required within this site.

BASIN 3

Pond 3-Alt A, B & FPC Fennel 1

These three sites are located entirely within a hardwood forested wetland. Pond 3-Alt A and B both contain 3.79 ac. and 3.80 acres of wetlands respectively. FPC Fennel 1 contains approximately 2.02 ac. of wetlands. Dominant vegetation includes red maple, primrose willow, dahoon holly (*Ilex cassine*), southern shield fern, sawgrass (*Cladium jamaicense*), and lizard's tail (*Saururus cernuus*). More specifically, the outer periphery of these sites is dominated by a canopy of red maple while the remaining sections are more herbaceous. Based on the observation of lichen lines on trees, the seasonal high-water level for this wetland appears to be a few inches above the surface. A stormwater pond located south of Pond 3-Alt B connects and drains into these systems via control structure. All three of these pond sites appear to be under conservation easement and are likely onsite mitigation associated with the adjacent Remington Golf and Country Club (SFWMD Application No. 940211-2). The quality of this system would be estimated as "high" based on the total sized of the system and that they are all under a conservation easement. No additional survey would be required for listed wildlife on these sites.

Pond 3-Alt C-1-C3, and D

These three sites are located within the median areas or along the roadside of the existing FTE ROW. Pond 3-C1 has a stormwater pond within an entrance ramp loop onto the Turnpike Northbound. This upland portion of this site contains bahiagrass, and various ruderal pasture grasses. An herbaceous wetland (~1.33 ac.) is located in the middle of this stormwater pond. Vegetation within this wetland includes small graminoid wetland vegetation such as hairgrass (*Eleocharis baldwinii*) and red ludwidgia (*Ludwigia repens*) as well as a variety of broom grasses (*Andropogon* spp.). Pond 3-C3 also has a primrose willow dominate stormwater pond. Pond 3-C2 does not contain a wetland or surface water features but does function as a dry pond. None of the stormwater features within any of these ponds is associated with a water management district permit but it is anticipated that only 0.45 acres of C3 would require mitigation. The quality of this system would be estimated as "low". No additional survey would be required for listed wildlife on these sites.

FPC Fennel 2 and 3

These sites are located along the Turnpike Southbound ROW and are entirely composed of wetland scrub (~ 1.97 ac. for Fennel 2 and 1.67 ac. for Fennel 3). Vegetation is dominated by

Caroliniana willow, primrose willow, Brazilian pepper, and cattail (*Typha* spp.). The dense overgrowth of midstory vegetation currently precludes these sites from providing SFH for wood storks. Based on our preliminary field assessment with SFWMD staff, FPC 2 would be considered an upland cut system that would not require mitigation. Because FPC 3 is cut from hydric soils and historically connected to offsite wetlands, impacts to this system would require mitigation (based on this same field assessment). The quality of this system would be estimated as "low". No additional survey would be required for listed wildlife on these sites.

BASIN 4

Pond 4-Alt A

This site is located entirely within a wetland (~ 4.44 AC.) that is part mixed forested wetland and part freshwater marsh. Dominant vegetation within the forested area includes red maple, bald cypress (*Taxodium distichum*), water oak (*Quercus nigra*), elderberry (*Sambucus canadensis*), dahoon holly, and swamp fern. Vegetation within the marsh area is dominated by primrose willow and smartweed with minor components of Brazilian pepper, swamp fern, pennywort, and wild taro (*Colocasia esculenta*). Based on the observation of lichen lines on trees, the seasonal high-water level for this wetland appears to be well over the surface. The quality of this system would be estimated as "medium". No additional survey would be required for listed wildlife on this site.

FPC Bass 1

This site is located entirely within a wetland (~ 3.24 ac.) that is part freshwater marsh and part hardwood swamp. The FPC pond is located within the same wetland system as Pond 4-Alt A. The marsh is dominated by primrose willow in the midstory and a ground cover of southern shield fern. The hardwood swamp contains some laurel oak, primrose willow, wax myrtle, elderberry, Brazilian pepper, southern shield fern, and blackberry. The quality of this system would be estimated as "medium". No additional survey would be required for listed wildlife on this site.

Pond 4-Alt B

This site is predominantly upland with a hardwood swamp (~ 0.66 ac.) located in the southern portion of the site. Dominant vegetation within the hardwood swamp includes laurel oak (*Quercus laurifolia*), water oak, sweetbay magnolia (*Magnolia virginiana*), wax myrtle, and dahoon holly. Dominant vegetation within the upland section of this site includes saw palmetto

(*Serenoa repens*), gallberry (*Ilex glabra*), blackberry, and the occasional live oak and cabbage palm. This site appears to be under conservation easement and is likely onsite mitigation associated with the adjacent Remington Golf and Country Club (SFWMD Application No. 940211-2). The quality of this system would be estimated as "medium".

This site offers potentially suitable habitat for several federal and state listed species. A solitary cabbage palm, suitable for caracara nesting, was observed in the upland portion of the site; however, the dense saw palmetto ground cover does not allow for suitable foraging habitat for the caracara. Furthermore, there is a lack of suitable caracara foraging habitat in proximity to this site; therefore, it is unlikely that caracara would utilize this site for nesting. The need for a caracara survey for this site is unlikely but will be verified with USFWS if this site is determined to be the preferred alternative. Gopher tortoises were not observed during the field assessment; however, a gopher tortoise survey may be required within the upland section of this site to confirm the presence or absence of tortoises.

Pond 4-Alt C

This site is predominantly a disturbed upland; however, two small wetland ponds are also located within this site. Review of satellite imagery of the site from 2005 revealed that this site used to be on a small golf course. The two small ponds were connected by a ditch system and appeared to outfall within a stormwater pond within a residential area to the north of the site. Presently, this site is covered with ruderal vegetation including Brazilian pepper, blackberry, and cogon grass (*Imperata cylindrica*) and has a few live oak and cabbage palms. Wetland vegetation grows within and around the two ponds and along the ditches that connect to the two ponds and the off-site stormwater pond. Vegetation associated with the ponds include Brazilian pepper, cattail, cogon grass, mosquito fern (*Azolla* spp.), duckweed (*Lemna* spp.), spatterdock (*Nuphar luteum*). Vegetation around the connecting ditches includes Brazilian pepper, *A. glomeratus*, primrose willow, and blackberry. Total wetland extent within this site is approximately 0.40 ac. The quality of this system would be estimated as "low".

This site contains potential suitable foraging habitat for the caracara and was included in one of the observation points for the 2017 caracara survey for this species that was covering the mainline ROW expansion. Coordination with USFWS will be required to determine if an additional survey for caracaras are required within this site.

Pond 4-Alt D1 and 2

This site is located within the existing FTE ROW of the southbound offramp to Shady Lane. This upland portion of this site contains bahiagrass, and various ruderal pasture grasses. An upland cut excavated ditch also occurs within this area that includes a wide variety of wetland vegetation such as hairgrass, duck potato (*Sagittaria latifolia*), and flat sedge. No additional survey would be required for listed wildlife on this site.

Pond 4-Alt E

This site are located along the Turnpike Southbound ROW and is composed of 2.66 acres of herbaceous and forested wetland composed of a variety of vegetation including red maple, slash pine, sugarberry, Carolina willow, wax myrtle, primrose willow, Brazilian pepper, and cattail. The dense overgrowth of midstory vegetation currently precludes these sites from providing SFH for wood storks. Based on our preliminary field assessment with SFWMD staff, this pond would be considered a wetland system that would require mitigation for impacts. The quality of this system would be estimated as "low". No additional survey would be required for listed wildlife on this site.

BASIN 5

Pond 5-Alt A, 5-Alt-C and FPC Bass 2

These three sites are all located adjacent to one another and can be characterized as a mosaic of upland hammock and mixed wetland forest. Approximate wetland coverage for Pond 5-Alt A is 1.15 ac., Pond 5-Alt C is 4.06 ac., and FPC Bass 2 is 1.66 ac. Characteristic vegetation within the upland hammock includes live oak, cabbage palm and saw palmetto. Characteristic vegetation within the mixed wetland forest includes laurel oak, red maple, bald cypress, slash pine, water oak, dahoon holly, sweetbay magnolia, swamp fern, and southern shield fern. The quality of this system would be estimated as "medium". Gopher tortoise occurrences within the uplands are unlikely based on the high-water table. No additional survey would be required for listed wildlife on these sites.

BASIN 6

Pond 6-Alt A

This site is predominantly fallow agricultural field. Dominant vegetation includes caesarweed (*Urena lobata*), natal grass (*Melinis repens*), cogon grass, dog fennel, blackberry, and other

ruderal grasses. A ditch runs along the southern side of the pond site and contains laurel oak, live oak, Virginia chain fern (*Woodwardia virginica*), primrose willow, wax myrtle, elderberry, and muscadine grape. Another ditch is located north of Pond 6-At A but is located outside of the proposed pond contours. This ditch contains Brazilian pepper, cabbage palm, and primrose willow.

This site offers suitable foraging habitat for the caracara; however, preferred nesting trees (solitary cabbage palms) were not observed within the site. The cabbage palms that were observed were tightly grouped together with thick Brazilian pepper. The proximity to other trees (Brazilian pepper) makes these cabbage palms vulnerable to predator access and thus unsuitable nesting habitat for caracaras. This site was included in one of the observation points for the 2017 caracara survey for this species that was covering the mainline ROW expansion. This site does have the potential to provide foraging habitat to caracaras potentially located within adjacent properties; therefore, coordination with USFWS is likely required to determine if surveys for caracaras are required for this site. Gopher tortoise burrows were not observed during the field assessment, but if these ponds are selected a survey might be required to confirm the absence or presence of gopher tortoises.

Pond 6-Alt B

This site is an upland hammock. Dominant vegetation includes live oak, saw palmetto, broom sedge (*A. virginicus*), muscadine grape, and smilax (*Smilax* spp.). An abandon and derelict home that littered with garbage was observed within the southeast corner of this site. Gopher tortoise burrows were not observed during the field assessment, but if this site is selected a survey will be required to confirm the absence or presence of gopher tortoises prior to construction. No additional survey would be required for listed wildlife on this site.

Pond 6-Alt C

This site is located within an open grassed field on the Johnson University property. Most of this site is a maintained field of bahiagrass. The eastern side of the field appears to be graded and contains a swale running along its perimeter. A sand volleyball court is located on the western side of the field. The eastern edge of this site is within a roadside ditch along the west side of the Florida Turnpike. Vegetation within the ditch is dominated by live oak and Brazilian pepper. This site does not appear to offer suitable habitat for any federally listed species known to occur within Osceola County. Gopher tortoises are also unlikely but will need to be

reconfirmed prior to construction. No additional survey would be required for listed wildlife on this site.

FPC Bass 4

This site are located along the Turnpike Southbound ROW and is composed of herbaceous and forested wetland composed of a variety of vegetation including red maple, slash pine, sugarberry, Caroliniana willow, wax myrtle, primrose willow, Brazilian pepper, and cattail. The dense overgrowth of midstory vegetation currently precludes these sites from providing SFH for wood storks. Based on our preliminary field assessment with SFWMD staff, FPC Bass 4 would be considered an upland cut system that would not require mitigation for the majority of the pond site. The exception is the areas (0.39 acres) associated with Bass Slough that are mapped as hydric soils. The quality of this system would be estimated as "low". No additional survey would be required for listed wildlife on this site.

BASIN 7

Pond 7-Alt A

This site is a disturbed upland pine community. Characteristic vegetation includes long leaf pine (*Pinus palustris*), slash pine (*Pinus elliottii*), live oak, wax myrtle, saw palmetto, and prickly pear cactus (*Opuntia humifusa*). A wetland (~ 0.75 ac.) is located within the northwest corner of the site that connects to a large system to the west. The onsite wetlands would be considered low quality. This site offers suitable habitat for the gopher tortoise, though neither tortoises nor burrows were observed during the field assessment. If this site is a selected a gopher tortoise survey will likely be required. No additional surveys would be required for listed wildlife on this site.

Pond 7-Alt B

This site is predominantly a disturbed upland pine community. Dominant vegetation includes slash pine, saw palmetto, wax myrtle, Brazilian pepper, cogon grass, and blackberry. Several depressional wetland systems exist along the western side of this site as well as immediately outside the pond limits. These systems are disturbed (non-descript) and include a wide variety of native and exotic wetland vegetation. This site has a large amount of past manipulation and has ponding along many areas along the west half of the site including the unimproved roads. The wetlands within the site are approximately 2.92 ac. The quality of this system would be estimated as "low". An east-west running, linear ditch runs across the southeastern corner of

this site. A review of satellite imagery reveals that this ditch appears to connect the nearby Turnpike Southbound roadside drainage to a lake located west of this pond site alternative. The onsite wetland systems are smaller than the mapped hydric soils, but water management district may exert jurisdiction on large amounts of the site depending on time of year and the current conditions. The onsite wetlands would be considered low quality. No additional survey would be required for listed wildlife on these sites.

Pond 7-Alt C

This site is predominantly a disturbed upland pine community. Dominant vegetation includes slash pine, saw palmetto, wax myrtle, flat topped golden rod, broomsedge (*Andropogon glomeratus*, cogon grass, and blackberry. Two small depressional wetlands (combined acreage ~ 0.05 ac.) are located along the eastern side of the site and a larger hardwood swamp (~ 1.42 ac.) containing red maple is located on the western side of the site. The onsite wetlands would be considered low quality. No additional survey would be required for listed wildlife on this site.

BASIN 8

Pond 8-Alt A/FPC Bass 3

These sites are located along the Turnpike Southbound ROW and are predominantly a wetland coniferous forest (~ 10.13 ac.). Canopy vegetation within these sites are primarily slash pine with minor components of red maple, wax myrtle, water oak, and dahoon holly. The understory is primarily composed of royal fern (*Osmunda regalis*) and cinnamon fern (*Osmunda cinnamomea*). The non-forested section of this site is maintained (mowed) bahiagrass. The onsite wetlands would be considered low quality. Please note that based on our preliminary field assessment with SFWMD staff, portions of the wetlands within this site would require mitigation (3.41 ac) based on whether they were cut from hydric soils and/or if they are clearly a linear feature. A portion of this site contains soils and elevations that meet the USFWS survey requirement for the sand skink. However, this habitat is surface water ditch or very overgrown pine that is very inappropriate for this species. As such, it is unlikely that surveys for this species would be required in this area. No additional survey would be required for other listed wildlife on these sites.

Pond 8-Alt B

This wholly upland site is within a residential area. The site is composed primarily of vacant lots with bahiagrass and other ruderal ground cover. The western and northern edges of the site contain several single-family homes. A small, overgrown playground is in the southeast corner of the site. Vegetation within the playground is mostly cogon grass with a few specimens of live oak. No additional survey would be required for listed wildlife on these sites.

FPC Bass 5

This site is located along the Turnpike northbound ROW and is composed of herbaceous and forested wetland with a variety of vegetation including red maple, slash pine, sugarberry, Carolina willow, wax myrtle, primrose willow, Brazilian pepper, and cattail. The dense overgrowth of midstory vegetation currently precludes these sites from providing SFH for wood storks. Based on our preliminary field assessment with SFWMD staff, approximately half of FPC Bass 5 would be considered an upland cut system that would not require mitigation with the remaining portion (0.14 ac) associated with Bass Slough and requiring mitigation. The quality of this system would be estimated as "low". No additional surveys would be required for listed wildlife on these sites.

Pond 8-Alt C

This site is predominantly a disturbed, ruderal upland located within a neighborhood. The eastern edge of the site contains several single-family homes. A thicket of blackberry and muscadine grape is located along the eastern edge of the site. A patch of invasive castor bean was observed along the eastern edge of this thicket. The northern part of this site is populated with live oak, laurel oak, and slash pine. The northern section is elevated and appears to be a push pile of sediment. Trash and debris, including a broken, empty 50-gallon barrel, were observed in this northern section which indicate the potential for contamination issues with this site.

This site offers habitat for several listed and protect species. During the field assessment nine gopher tortoise burrows were identified, and their locations marked with a GPS (**Attachment A, Figure 2**). If this site is chosen as a pond site, a 100% gopher tortoise survey and gopher tortoise relocation will be required. A nest platform with an osprey (*Pandion haliaetus*) nest was also observed within the site (**Attachment A, Figure 2**). This nest platform was likely installed for the electrical substation located directly north of the site. If this site is selected this

nesting platform needs to be relocated during the non-nesting season. No additional surveys would be required for listed wildlife on these sites.

FPC Bass 6

This site are located along the Turnpike northbound ROW and is composed of herbaceous and forested wetland composed of a variety of vegetation including red maple, slash pine, sugarberry, Carolina willow, wax myrtle, primrose willow, Brazilian pepper, and cattail. The dense overgrowth of midstory vegetation currently precludes these sites from providing SFH for wood storks. Based on our preliminary field assessment with SFWMD staff, FPC Bass 6 would be considered an upland cut system that would not require mitigation. No additional survey would be required for listed wildlife on these sites.

BASIN 9

Pond 9-Alt A

These sites are located along the Turnpike Southbound ROW and is predominantly a wetland coniferous forest (~2.69 ac.). Canopy vegetation within these sites are primarily slash pine with minor components of red maple, wax myrtle, water oak, and dahoon holly. The understory is primarily composed of royal fern and cinnamon fern. The non-forested section of this site is maintained (mowed) bahiagrass. The onsite wetlands would be considered low quality. Based on our preliminary field assessment with SFWMD staff, this wetland would be considered an upland cut system that would not require mitigation. No additional survey would be required for listed wildlife on these sites.

Pond 9-Alt B

This site is residential neighborhood. It is characterized by 11 single-family homes with maintained (mowed) yards with some tree canopy. Neither wetlands nor any suitable habitat for listed species were identified within this pond site alternative. A portion of this site contains soils and elevations that meet the USFWS survey requirement for the sand skink. However, this habitat is residential home lots that is very inappropriate for this species. As such, it is unlikely that surveys for this species would be required in this area. No additional survey would be required for other listed wildlife on these sites.

Pond 9-Alt C and FPC Mill 1

These upland sites are adjacent to one another and are both predominantly pine flatwoods. Dominant vegetation includes longleaf and slash pine, saw palmetto, gallberry, wax myrtle, Carolina jasmine (*Gelsemium sempervirens*), wire grass, and broom sedge (*A. virginicus*). Listed species were not observed during the field assessment; however, these sites have the potential to offer habitat for the gopher tortoise. If these sites are selected, then a gopher tortoise survey will likely be required to document the presence of absence of this species. No additional survey would be required for listed wildlife on these sites. Both of these sites meets the survey criteria for the sand skink in accordance with USFWS 2020 guidance. However, these areas are density vegetated with little to no open sand. In addition, these areas are mapped as having poorly drained soils. The requirements to surveys for skinks on these sites' skinks is unlikely.

FPC Mill 4

This site is composed of the grass swale between the southbound onramp and the ROW. A large canal associated with Mill Slough is located immediately adjacent to the ROW line. A portion of this site contains soils and elevations that meet the USFWS survey requirement for the sand skink. However, this habitat is ruderal road ROW that is very inappropriate for this species. As such, it is unlikely that surveys for this species would be required in this area. No additional survey would be required for other listed wildlife on these sites.

BASIN 10

Pond 10-Alt A

This site is a mixture of disturbed upland, upland flatwoods, and hydric flatwoods. The northern half of the site is a disturbed upland that is dominated by ruderal ground cover and sparse, young long leaf pine. A water control structure was found within the northern section of this site. Evaluation of satellite imagery revealed that the northwestern part of this site was used as a retention/detention pond as far back as 2010 that is associated with the Gateway Commons mass grading project (SFWMD Application No. 020408-32). The southern half of this site a mix of upland and hydric flatwoods. A depressed, linear feature appears to divide the upland flatwoods on the southwestern side from the hydric flatwoods (~ 0.38 ac.) on the southeastern side. The upland flatwoods is dominated by long leaf pine, gallberry, and saw palmetto. The hydric flatwoods contains long leaf pine, dahoon holly, wax myrtle, red maple, sweet bay magnolia, St. John's wort (*Hypericum* spp.), royal fern, cinnamon fern, pennywort,

blackberry, and *A. glomeratus*. The quality of this system would be estimated as "medium". This site contains soils and elevations that meet the USFWS survey requirement for the sand skink. However, this habitat is overgrown mesic and hydric flatwood that is very inappropriate for this species. As such, it is unlikely that surveys for this species would be required in this area. No additional survey would be required for other listed wildlife on this site.

Pond 10-Alt B

This site is predominantly a hydric flatwood (~ 1.26 ac.). Dominant vegetation includes long leaf pine, wax myrtle, dahoon holly, cinnamon fern, royal fern, swamp fern, *A. glomeratus*, and St. John's wort. A depressed, linear feature appears to divide the hydric flatwoods from a smaller patch of upland flatwoods (northwestern corner). The quality of this system would be estimated as "medium". The upland flatwoods is dominated by long leaf pine, gallberry, and saw palmetto. This site contains soils and elevations that meet the USFWS survey requirement for the sand skink. However, this habitat is primarily overgrown hydric flatwood that is very inappropriate for this species. As such, it is unlikely that surveys for this species would be required in this area. No additional survey would be required for other listed wildlife on this site.

FPC Mill 2

This site is predominantly an mesic flatwoods dominant vegetation includes long leaf pine, wax myrtle, dahoon holly, saw palmetto, and *A. virginicus*. A small portion of hydric flatwoods (~ 0.18 ac.) is present in the southeastern section of the site. Vegetation within this section is similar to the wetland vegetation mentioned for Pond 10-B above. The quality of this system would be estimated as "medium". This site contains soils and elevations that meet the USFWS survey requirement for the sand skink. However, this habitat is overgrown mesic and hydric flatwood that is very inappropriate for this species. As such, it is unlikely that surveys for this species would be required in this area. No additional survey would be required for other listed wildlife on this site.

Pond 10-Alt C1 and Atl C2

These sites are existing detention ponds located within the southwestern and southeastern quadrant of the Florida Turnpike and Osceola Parkway interchange. Upland sections of this site include slash pine, live oak, cabbage palm, and maintained (mowed) bahiagrass. The wetland sections (~ 0.32 ac. for C1 and 0.55 ac. for C2) of this site contains young long leaf pine, Brazilian pepper, cattail, and Carolina willow. The wetland portion of this site could

offer SFH for wood storks during periods of inundation. This site does not appear to offer suitable habitat for any other federally listed species known to occur within Osceola County. Based on the previous SFWMD permit Pond 10 C1 and C2 would be considered an upland cut system that would not require mitigation. No additional survey would be required for listed wildlife on these sites.

BASIN 11

Pond 11-Alt A

This site is predominantly a ruderal upland. Dominant vegetation includes slash pine, long leaf pine, *A. glomeratus, A. virginicus,* dog fennel, blackberry, cogon grass, and bahiagrass. Approximately 0.20 ac. of herbaceous wetlands are located within the limits of this pond site alternative. Dominant vegetation within the herbaceous wetland includes *A. glomeratus*, *A. virginicus,* dog fennel, *E. baldwinii*, and wax myrtle. The quality of this system would be estimated as "low". No additional survey would be required for listed wildlife on this site.

During the field assessment, a sign was observed just outside of the western edge of this site. This sign stated that the land west of the pond site alternative is a mitigation area. The mitigating area appears to be primarily composed of a wet ditch with wetland vegetation.

FPC Mill 5

This site consists of a grassed area between the existing southbound toll facility and a large canal associated with Mill Slough. This site contains 0.03 acres of a low-quality wetland. No additional survey would be required for listed wildlife on these sites.

Pond 11-Atl B and FPC Mill 3

These two sites are disturbed uplands with no clear intended use. Vegetation is dominated by ruderal ground cover. Just outside the eastern limits of these sites the ground grades down into the vegetated edge of a wet ditch. Vegetation along this vegetated edge includes bald cypress, red maple, wax myrtle, salt bush, swamp fern, soft rush and broomsedge. This site contains soils and elevations that meet the USFWS survey requirement for the sand skink. However, this habitat is a cleared and graded empty lot that is very inappropriate for this species. As such, it is unlikely that surveys for this species would be required in this area. No additional survey would be required for other listed wildlife on this site.

Pond 11-Alt C1 and C2

These sites are existing detention ponds located within the northwestern and northeastern quadrant of the Florida Turnpike and Osceola Parkway interchange. The upland section of these sites contains slash pine, live oak, and cogon grass. The upland cut wetland sections (~1.01 ac. for C1 and 1.32 for C2) contains red maple, long leaf pine, Brazilian pepper, willow, elderberry, muscadine grape, and swamp fern. A portion of 11-C1 contains soils and elevations that meet the USFWS survey requirement for the sand skink. However, this habitat is an existing wet pond or recently regarded road ROW that is very inappropriate for this species. As such, it is unlikely that surveys for this species would be required in this area. No additional survey would be required for other listed wildlife on these sites.

SUMMARY

Moffatt & Nichol is currently designing the widening of the Florida's Turnpike from Neptune Road (MP 242) to the Osceola Parkway Interchange (MP 248.93) in Osceola County, Florida.

The purpose of this technical memorandum is to summarize the results of the wildlife assessment for the project corridor and proposed pond site alternatives and establish preliminary effect determinations for federal and state listed species with the potential to occur in Osceola County. Table 1 below provided a summary of the preliminary effect determinations have been made for federally protected species.

Table 1: Federal Listed Species Effect Determination Summary

Common Name	Scientific Name	Listing Status	Proposed Effect Determination
Wood stork	*Mycteria americana*	T	MANLAA
Everglade snail kite	*Rostrhamus sociablis plumbeus*	E	MANLAA
Bald eagle	*Haliaeetus leucocephalus*	N/A*	NE
Florida scrub-jay	*Aphelocoma coerulescens*	T	NE
Crested caracara	*Caracara cheriway*	T	TBD
Red cockaded woodpecker	*Picoides borealis*	E	NE
Florida grasshopper sparrow	*Ammodramus savannarum*	E	NE
Gopher tortoise	*Gopherus polyphemus*	C**	Preconstruction Surveys and Relocation

Eastern indigo snake	*Drymarchon corais couperi*	T	MANLAA
Sand skink	*Neoseps reynoldsi*	T	NE
Blue-tailed mole skink	*Eumeces egregious lividus*	T	NE
Florida bonneted bat	*Eumops floridanus*	E	TBD
Florida panther	*Puma concolor coryi*	E	NE
Lake Wales Ridge Plants	--	T&E	NE

*Protected under the bald and golden eagle protection act and migratory bird treaty.
**Candidate species.

Table 2 below provided a summary of the preliminary effect determinations have been made for state protected species.

Table 2: State Listed Species Effect Determination Summary

Common Name	Scientific Name	Listing Status	Proposed Effect Determination
Florida pine snake	*Pituophis melanoleucus*	T	NAEA*
Florida sandhill crane	*Antigone canadensis pratensis*	T	NAEA
Florida burrowing owl	*Athene cunicularia floridana*	T	NAEA
SE American kestrel	*Falco sparverius paulus*	T	NAEA
Little blue heron	*Egretta caerulea*	T	NAEA
Tri-colored heron	*Egretta tricolor*	T	NAEA

*No adverse effects anticipated

Coordination with USFWS is recommended in late 2020 to obtain concurrence with the preliminary effect determinations (once we have the preferred pond site alternatives) to obtain technical assistance on where surveys for the sand skink would be required.

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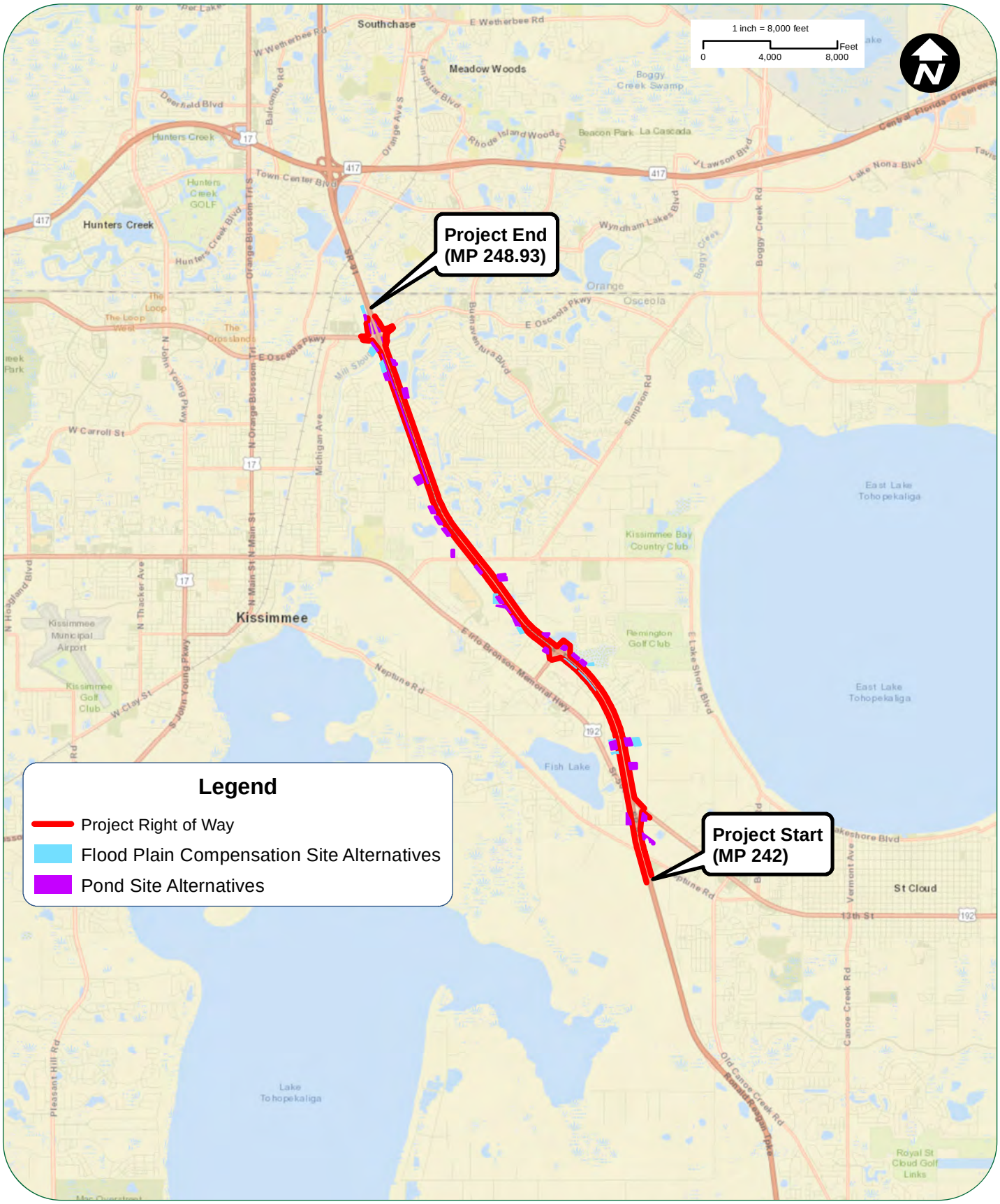
Attachment A



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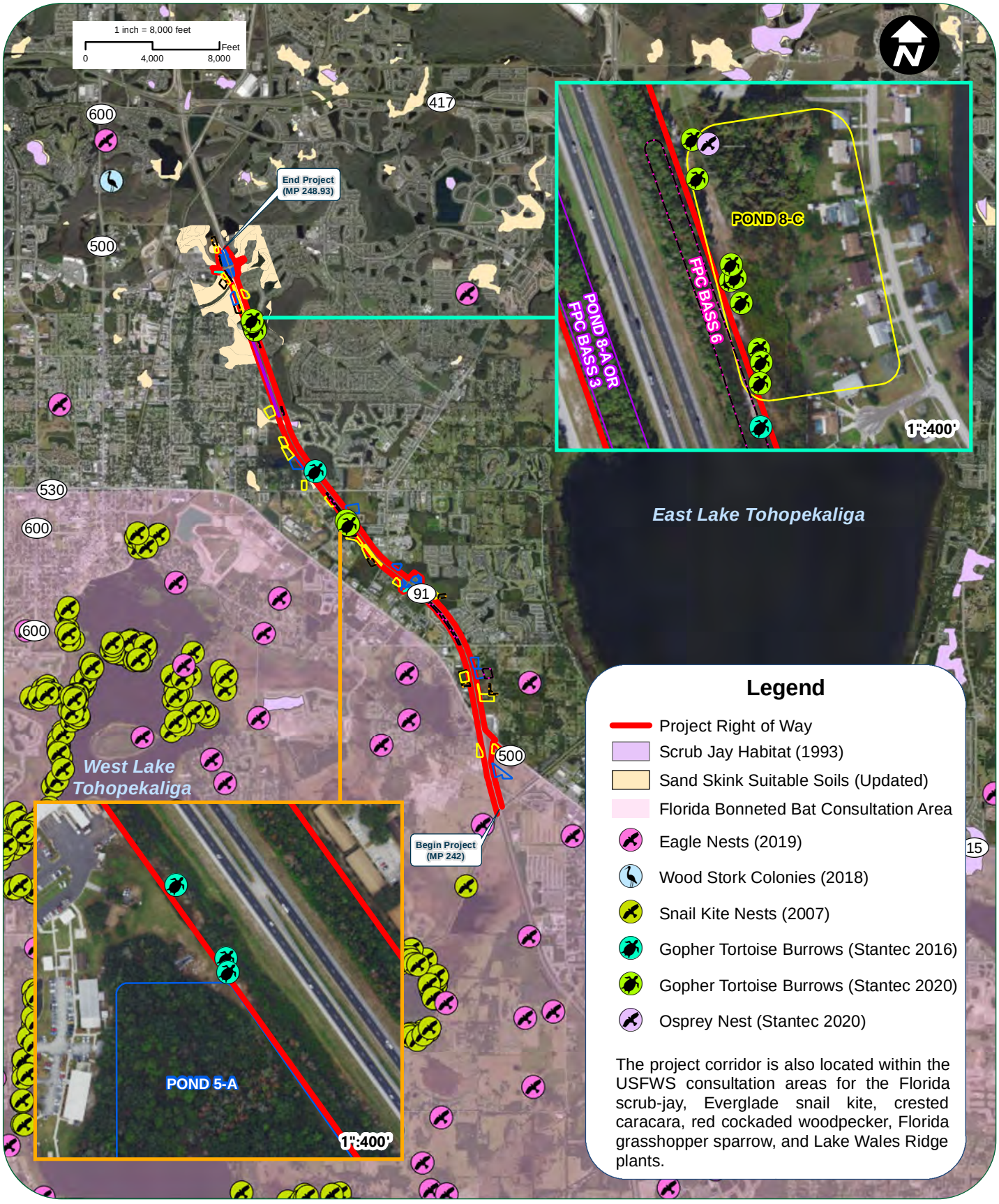

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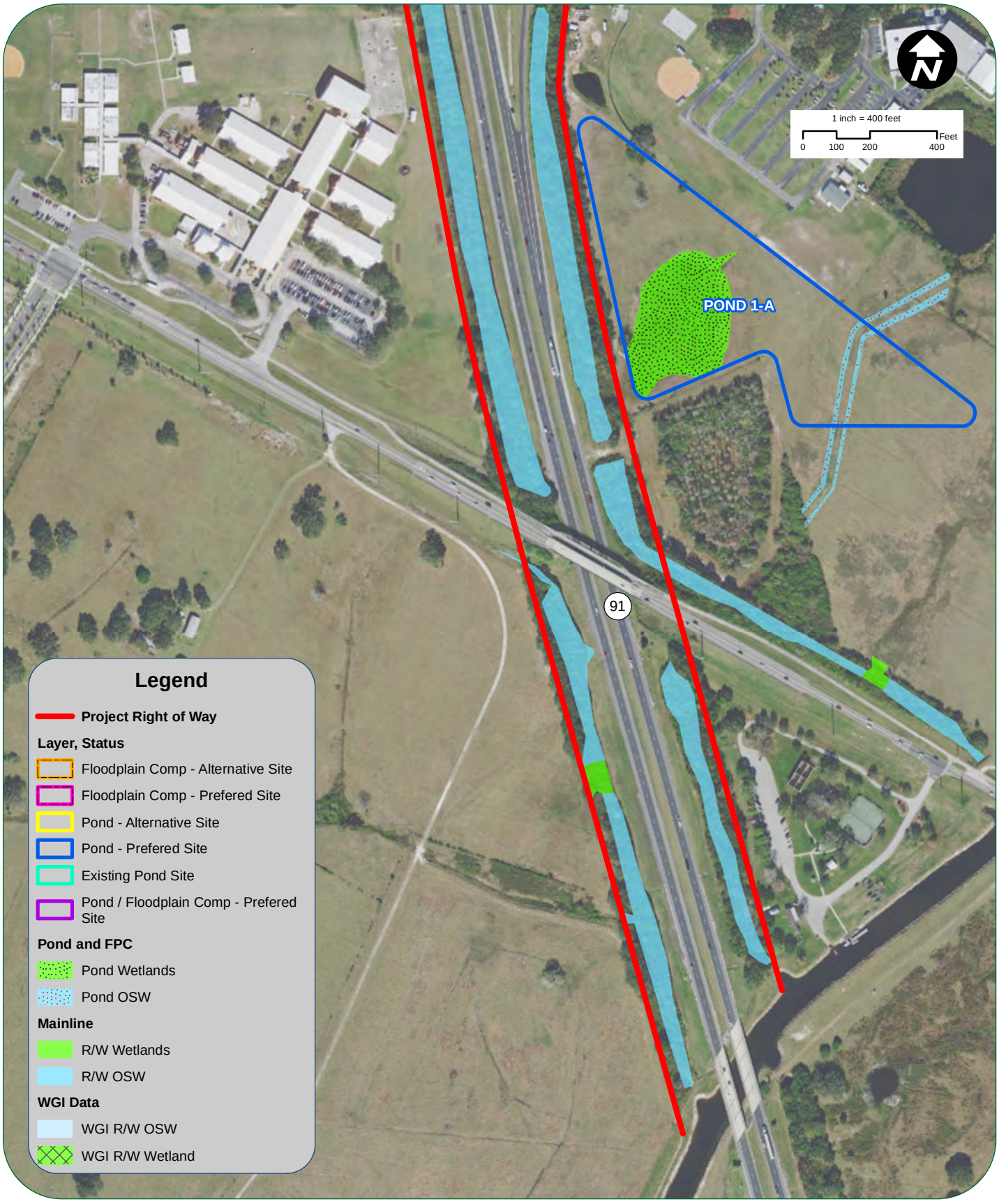

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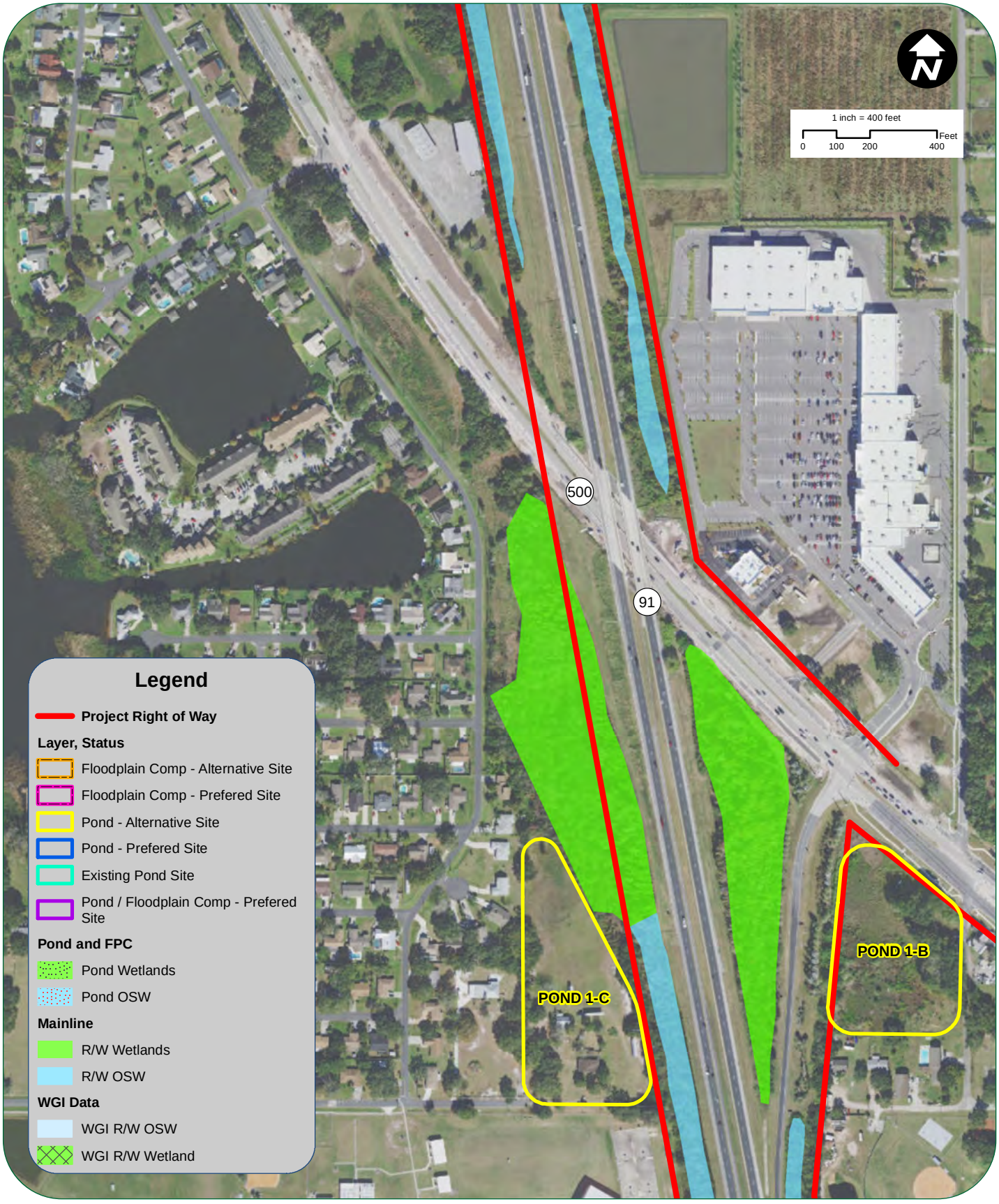

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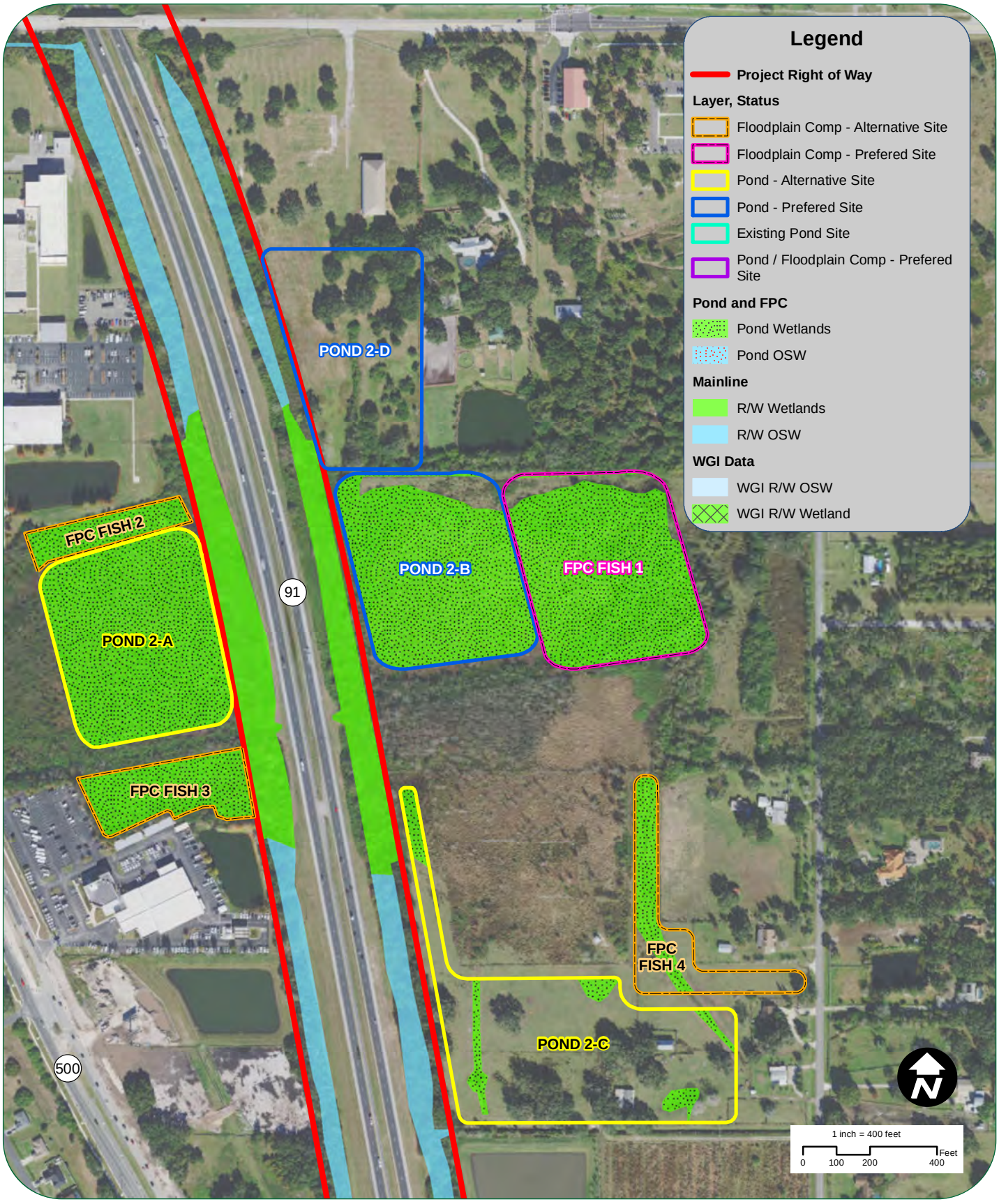

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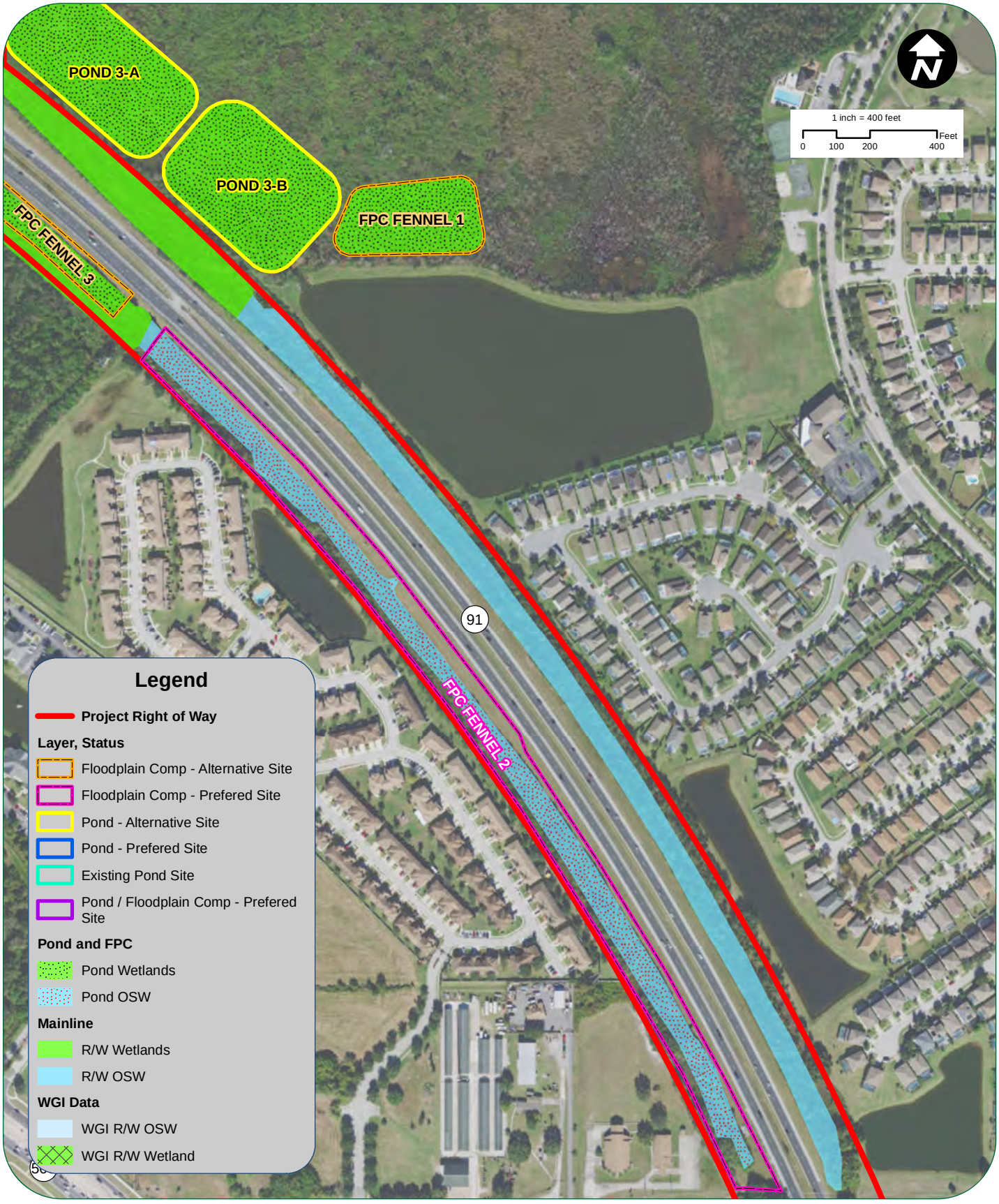

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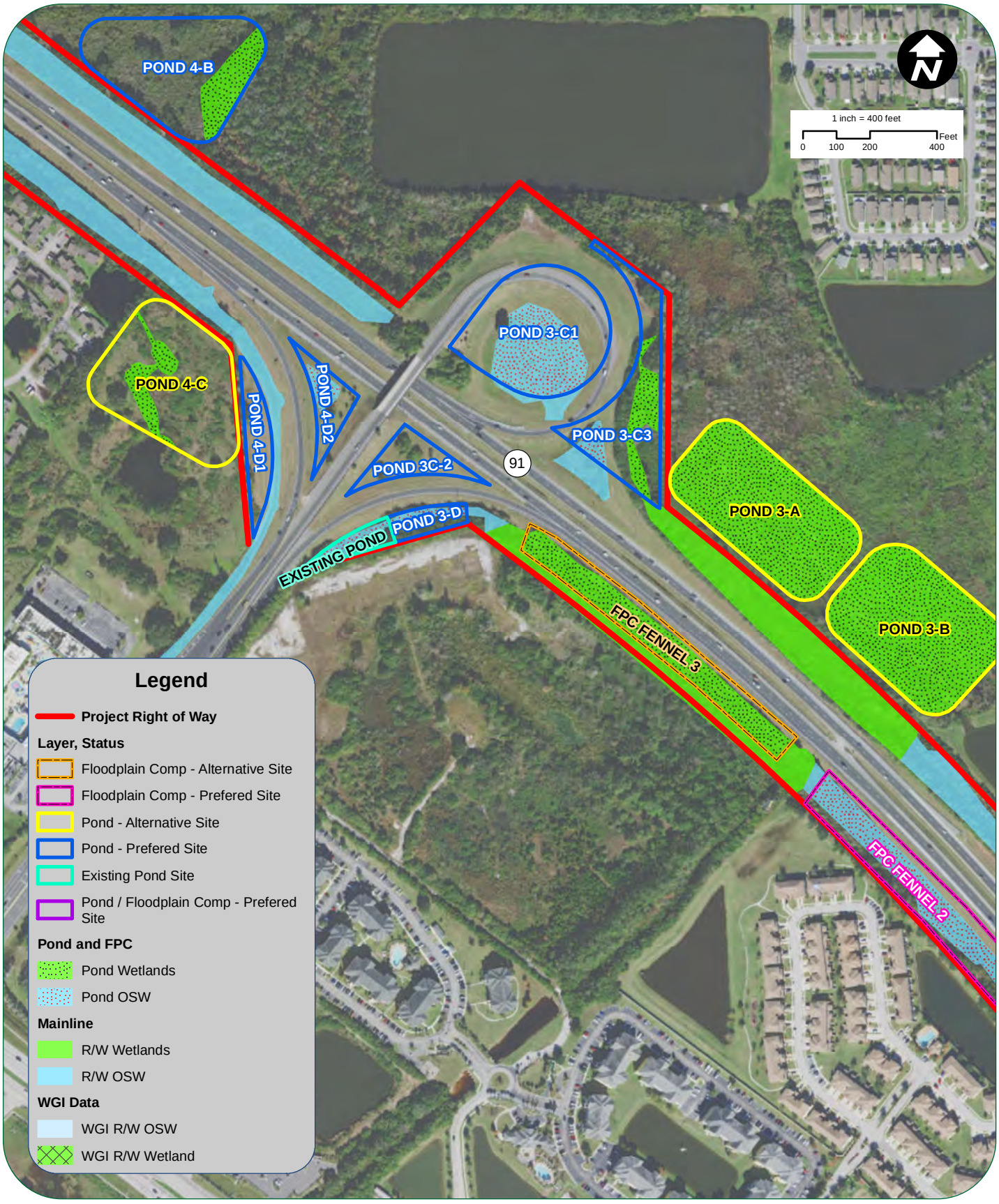

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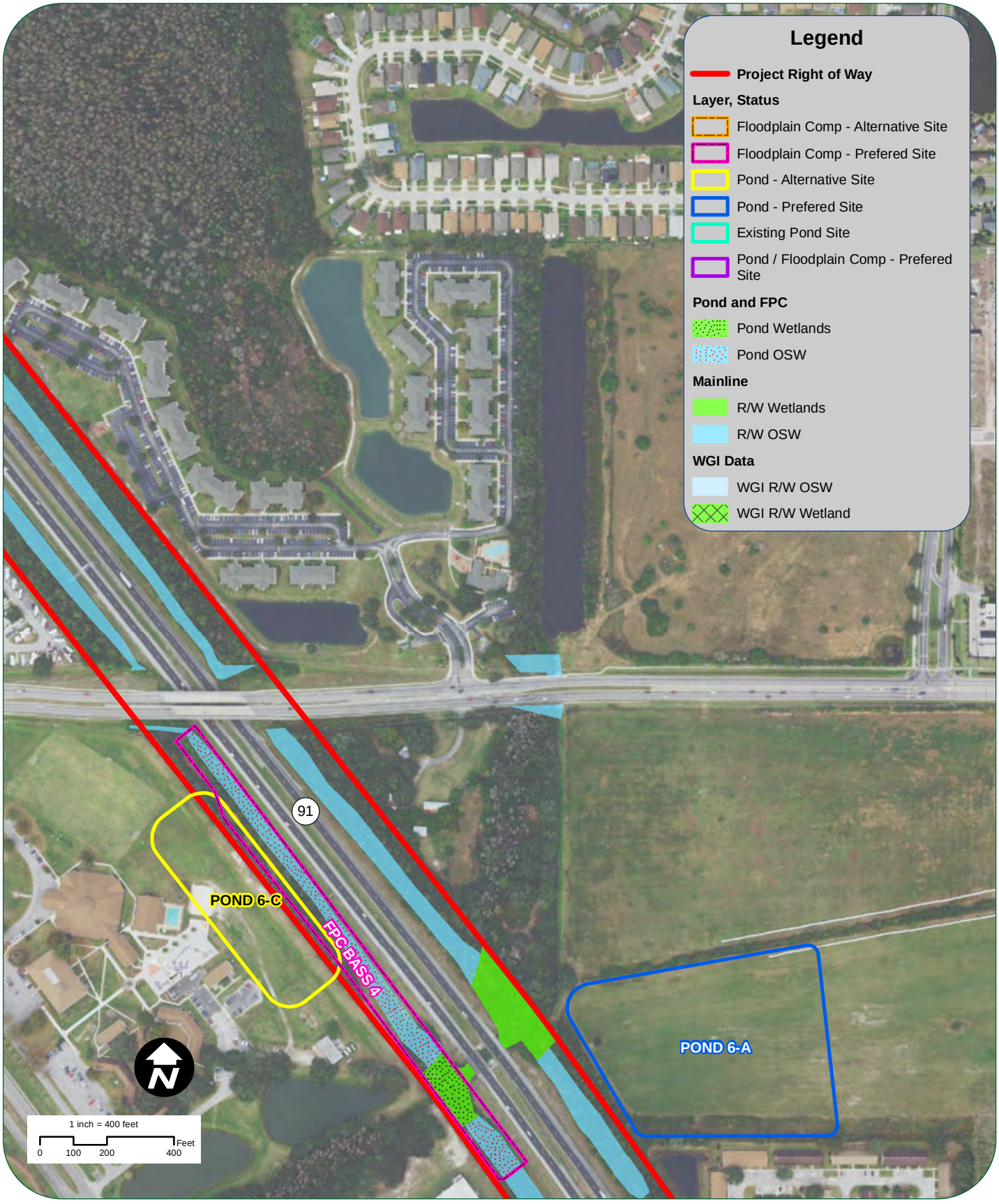

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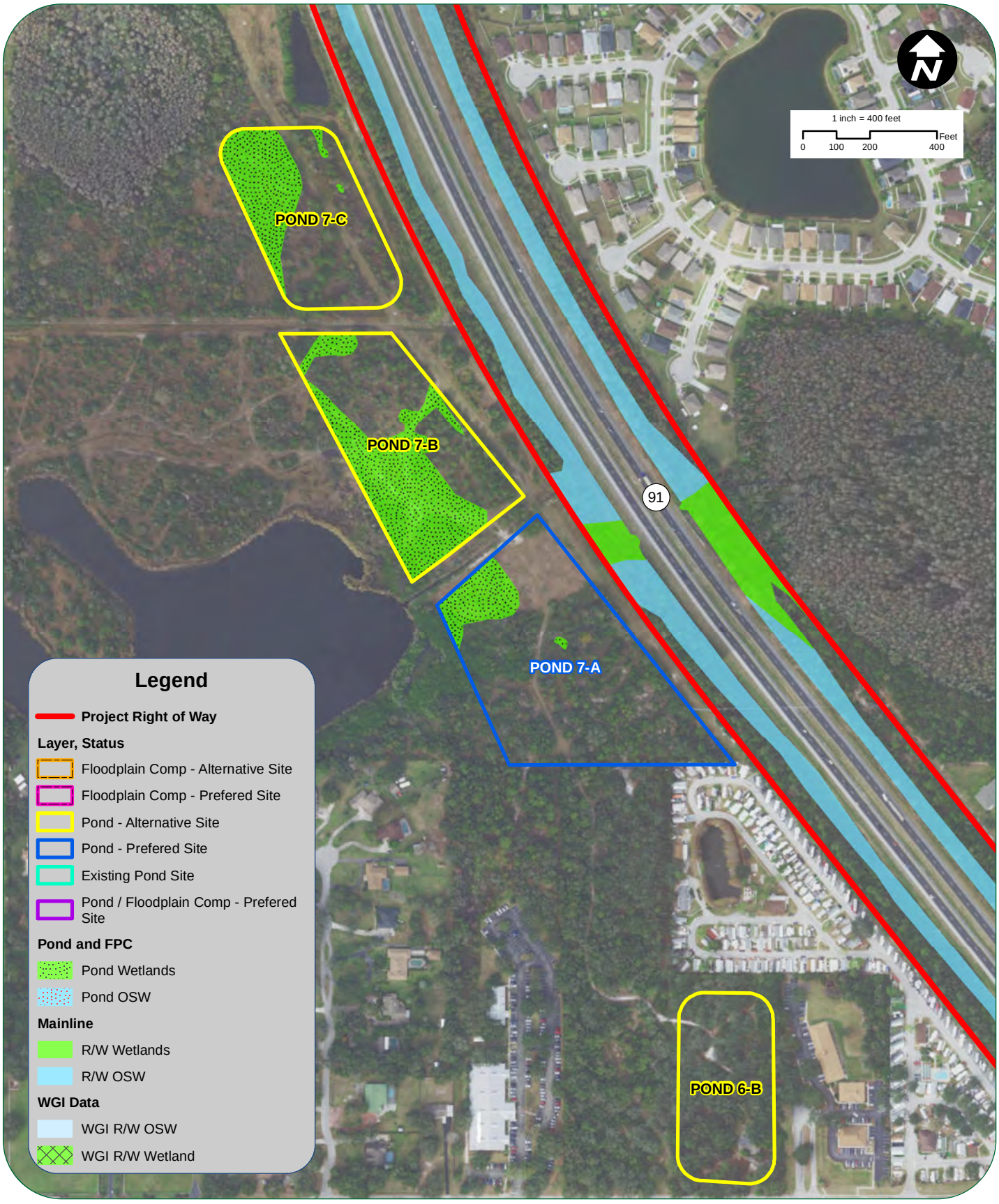

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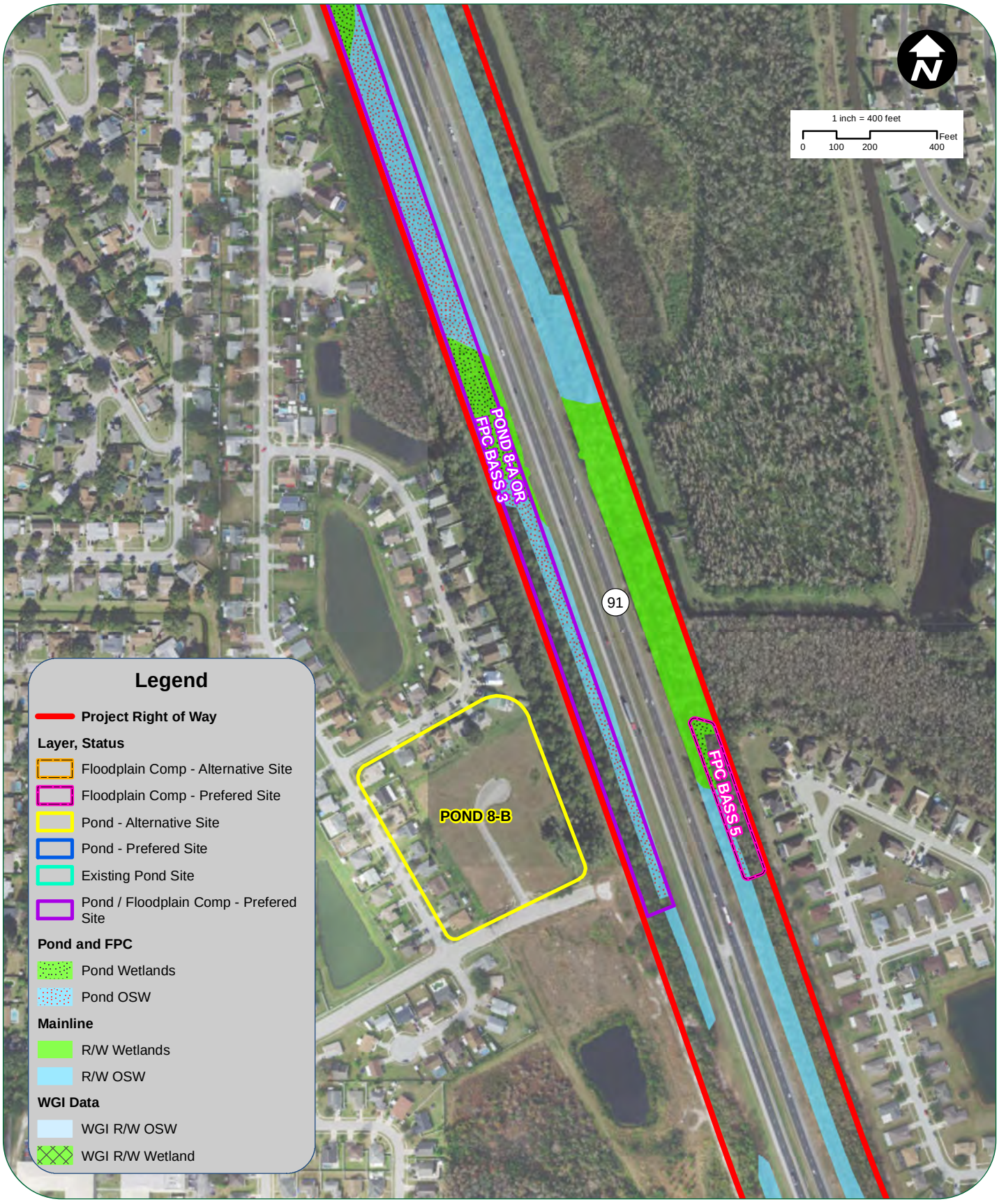
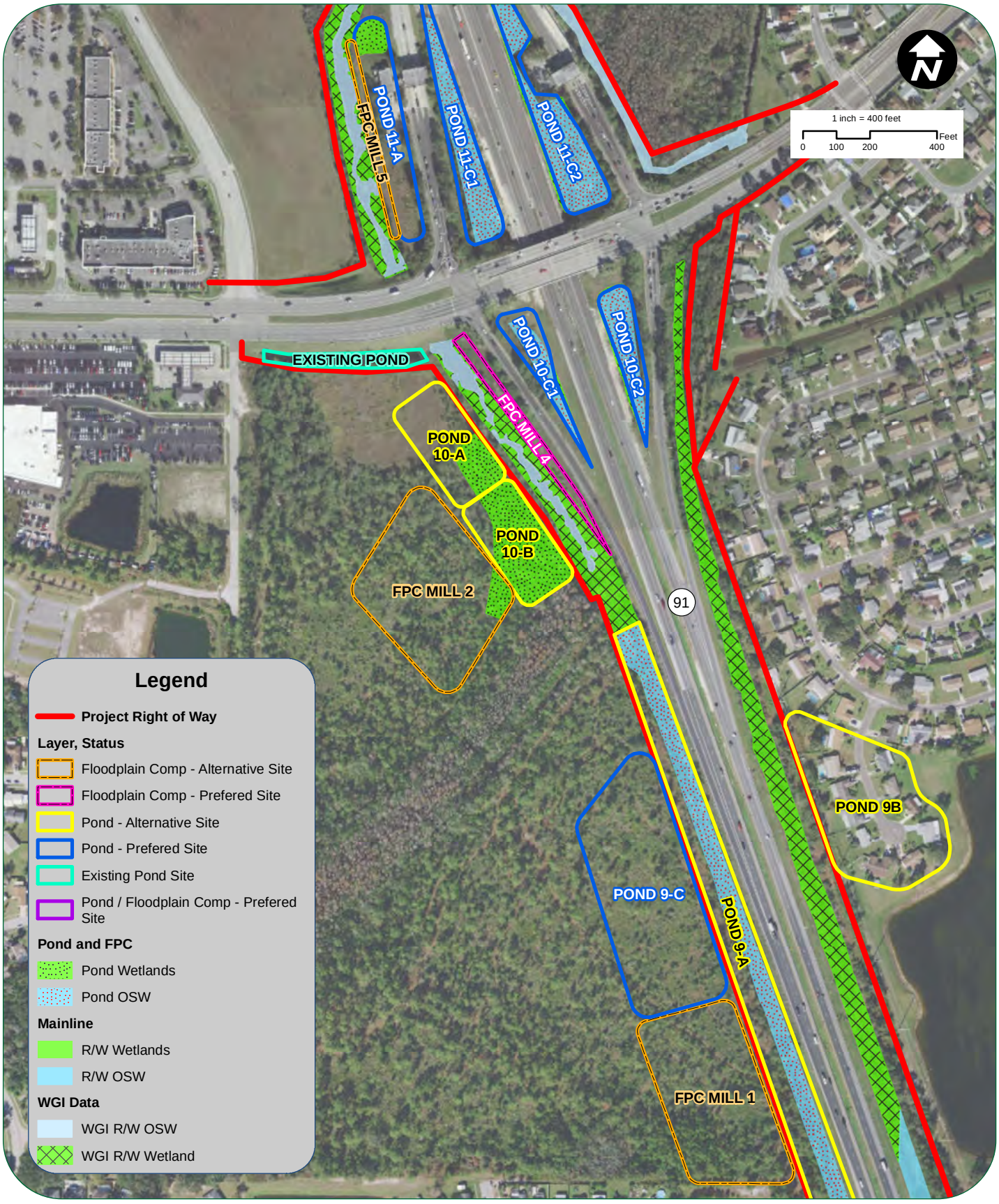


Service Layer Credits: Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community



Service Layer Credits: Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community



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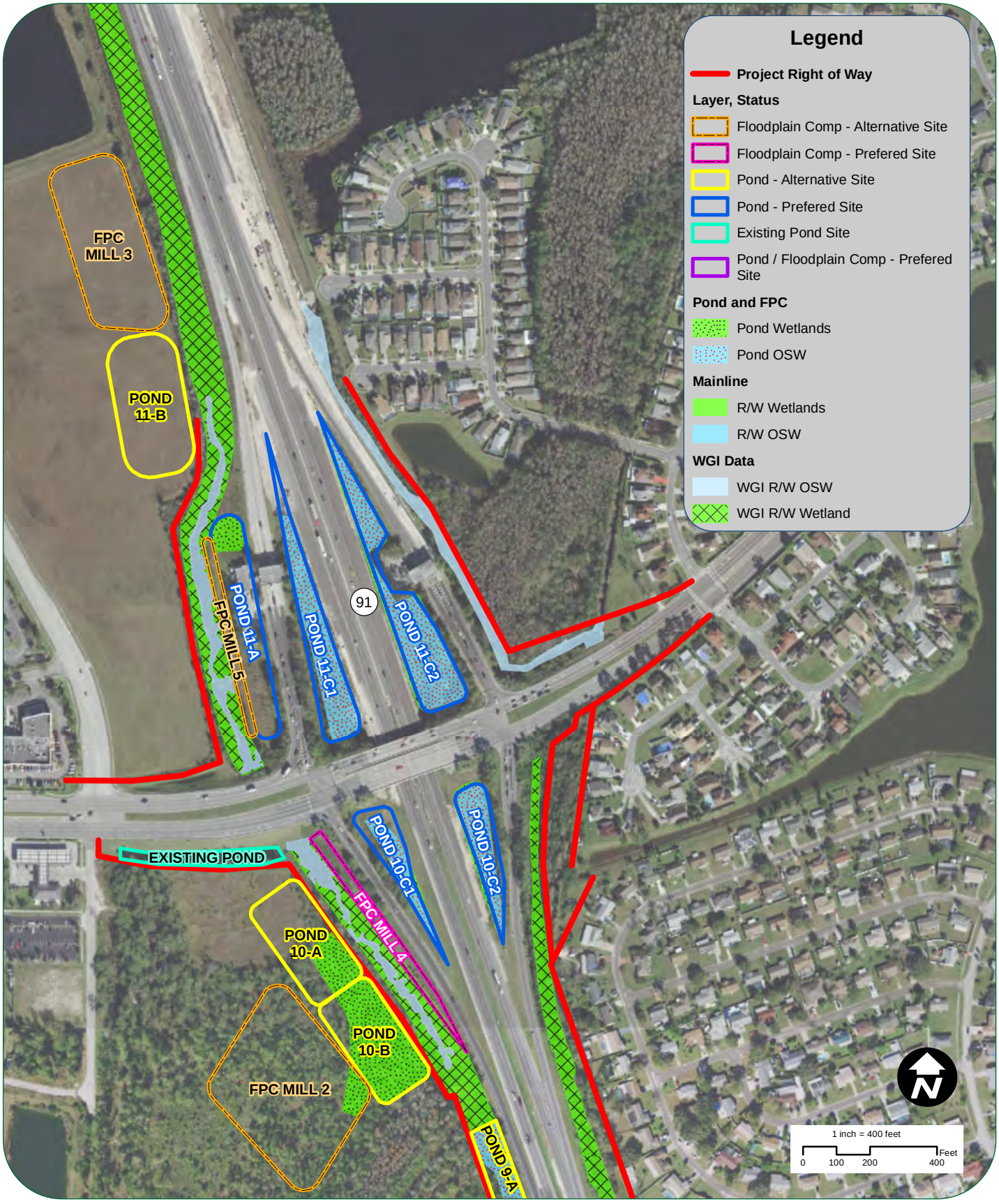

Service Layer Credits: Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

Attachment B

Florida Department of Transportation

RICK SCOTT
GOVERNOR

Florida's Turnpike Enterprise
P.O. Box 613069, Ocoee, FL 34761
407-532-3999

JIM BOXOLD
SECRETARY

USFWS PROJECT COORDINATION MEETING

FPID 436194-1 Widen Turnpike Mainline w/ Express Lanes, from US 192 (MP 242) to Osceola Parkway (MP 249), Osceola County

November 2, 2016 (9:00 AM) – GOTOMEETING

Attendees:
John Wrublik-USFWS
Fred Gaines-Atkins/Turnpike
Tiffany Crosby-Atkins/Turnpike
Mike Dinardo-Stantec

I. Introductions

- Introductions were made between the above listed attendees.

II. Project Description/Background

- Widen Florida's Turnpike US 192 to the Osceola Parkway Interchange, approximately 6 miles (Figure 1)
- Signed SEIR December 2003 (Florida's Turnpike Widening from US 192 (Exit 242) in Osceola County to SR 50 (Clermont – Exit 272) in Orange County, FPID # 411488-1)
- Section 7 Consultation through USACE anticipated
- Current land use (Figure 2)

III. Federally Protected Species

- The project was reviewed concerning federal listed species that have the potential to use the project corridor some of which have a USFWS designated consultation area that overlaps the corridor.
- Each of the following species was discussed for a consensus regarding potential involvement utilizing the provided maps and google earth.

(1) Florida grasshopper sparrow

- Current scientific literature indicates that the majority of remaining populations exist on public lands including Three Lakes WMA in southern Osceola County.
- The project corridor does not contain nor is it adjacent to the habitat required for this species.
- There are no documented occurrences of this species within one (1) mile of the project corridor.
- Although the project corridor occurs within the consultation area for this species it is highly unlikely that Florida grasshopper sparrow occur within the project corridor.

- **USFWS concurred that the proposed project will have no involvement with this species.**

(2) Florida scrub jay

- The 1993 FFWCC statewide survey for this species documented a small amount of scrub habitat along the corridor, although no scrub-jay was identified within the habitat. There are no documented occurrences of these species within one (1) mile of the project corridor.
- Scrub habitat is no longer presence within this corridor and no individuals were observed during the field assessment.
- Although the project corridor occurs within the consultation area for this bird, this species is highly unlikely to occur within the project corridor.

- **USFWS concurred that the proposed project will have no involvement with this species.**

(3) Sand skink & blue-tailed mole skink

- There are no documented occurrences of these species within one (1) mile of the project corridor. According to existing GIS data, no elevations above 82 feet occur along this corridor.

- **USFWS stated that if the corridor does not contain elevations of at least 82 feet within one of the 20 well-drained soils types that contain this species, then the proposed project will have no involvement with this species.**

(4) Red-cockaded woodpecker

- There are no documented occurrences of this species within one (1) mile of the project corridor and suitable habitat for this species is not present.

- **USFWS concurred that the proposed project will have no involvement with this species.**

(5) Snail kite

- There are no documented occurrences of this species within one (1) mile of the project corridor and no individuals were observed during the field assessment.

- **USFWS concurred that the proposed project will have no involvement with this species.**

(6) Wood stork foraging habitat assessment

- The project corridor is within the Core Foraging Area of at least two rookeries (Lake Conlin and Lake Mary Jane Rookeries). A Wood Stork Foraging Habitat Assessment will be used to estimate the biomass of wood stork forage provided per unit quantity of wetland habitat based on vegetation density, wetland hydroperiod, prey size suitability, and competition with other wading bird species for forage.

- **USFWS stated that the ditch impacts will be replaced with similar ditches. As such, in regards to the wood stork key, focus on the wetland impacts for the foraging analysis and make sure that the hydroperiod is replaced.**

(7) Gopher tortoise & the Eastern Indigo Snake

- Surveys for gopher tortoise burrows were conducted in available gopher tortoise habitat located within the project corridor. Five (5) gopher tortoise burrows were identified within

the project corridor. No eastern indigo snakes or state listed gopher tortoise burrow commensal species were observed during the field assessment.

- According to the Eastern Indigo Snake Programmatic Effect Determination Key (USFWS 2013), the project is not likely to adversely affect the eastern indigo snake because the project will impact less than twenty five (25) acres of xeric habitat supporting less than twenty five (25) active or inactive gopher tortoise burrows; and Florida Turnpike Enterprise (FTE) commits to coordinate with the FFWCC to secure any and all permits needed to relocate the gopher tortoises and associated commensal species prior to construction.

- **USFWS concurred that the proposed project will have no involvement with this species.**

(8) Audubon's crested caracara

- Suitable nesting habitat within the project corridor is confined to the southern end of the project. Foraging opportunities are available within the ROW, primarily in the form of roadkill. There are no documented occurrences of this species within one (1) mile of the project corridor. Lots of nesting eagles within the southern corridor that could preclude caracara nesting. Biologists spent over two weeks along the corridor flagging wetlands and did not see caracara.

- **USFWS asked that all caracara habitat be evaluated within the 985 feet of the roadway and surveys occur within the areas that have suitable habitat.**

IV. Action Items

The Florida Turnpike will provide a caracara survey station map to the USFWS for approval before the start of the survey season.

Memo

To: Adam Crouch and Gary Elwer, Moffatt & Nichol
From: Adam M. Schieffer and Kathleen Hoffman, Janus Research
Date: August 25, 2020
Re: Updated Review of Previously Recorded Cultural Resources and Potential Unrecorded Historic Resources Relative to the Potential Pond and Floodplain Compensation (FPC) Site Alternatives for the Turnpike Mainline Widening from South of US 192/SR 441 to Osceola Parkway (MP 242–248) (436194-1), Osceola County, Florida

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In May of 2020, Janus Research conducted a cultural resources desktop analysis of potential pond and floodplain compensation (FPC) siting alternatives for the Turnpike Mainline Widening from South of US 192/SR 441 to Osceola Parkway (MP 242–248) in Osceola County, Florida at the request of Florida's Turnpike Enterprise (FTE), and in association with Moffatt & Nichol. The purpose of the May 2020 pond and FPC siting analysis was to determine the location of any previously recorded cultural resources within or adjacent to the alternatives and to determine archaeological site probability for each of the locations.[1]

Subsequent to the 2020 analysis, changes to the proposed ponds and FPC site alternatives have occurred. While the names and locations of 35 of the previous Pond and FPC sites remained unchanged, 7 new pond sites and 6 new FPC locations have been proposed, 5 ponds were expanded or modified, 1 pond was renamed, 1 pond and 1 FPC swapped locations, 1 pond and 1 FPC were reconfigured within their former footprints, and 1 pond location was removed.

This document contains a set of tables (Attachment 1) and a set of mapping (Attachment 2) detailing the results of an updated search of the Florida Master Site File (FMSF)[2] and Florida Geographic Data Library (FGDL) GIS relative to the latest pond and FPC site alternatives. The study areas for this analysis were consistent with the May 2020 analysis. The study area for archaeological resources consisted of the footprint of the proposed ponds and FPC sites. The study area for historic resources consisted of the footprint of the proposed ponds and FPC sites, as well as a 150-foot buffer off the footprints, to identify adjacent historic resources (Attachment 2).

In addition to the three previously recorded cultural resources and six potentially unrecorded historic resources identified in May 2020 (Attachment 1, Tables 1–4), the updated search of FMSF and FGDL data identified one additional parcel with the potential for historic resources within the study

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[1] Per coordination with Moffatt & Nichol on August 21, 2020, an updated site potential analysis was not conducted as part of the current analysis, and will be prepared for the final pond siting report, once the footprints of the Pond and FPC sites have been further refined.

[2] The FMSF serves as an archive of information about Florida's recorded cultural resources. It 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 official position of the Florida Division of Historical Resources (FDHR) or the State Historic Preservation Officer (SHPO) regarding the significance of a resource.

areas for Pond 2-C and FPC Fish 4 (Attachment 1, Table 3) and four additional potential unrecorded historic bridges within the study areas for Pond 4-E and FPC Bass 4 (Attachment 1, Table 4). Each of the three previously recorded cultural resources within the study areas for the updated pond and FPC sites are listed in Attachment 1, Tables 1 and 2. In addition, all five parcels with historic build dates, and all six bridges with historic construction dates, within the study areas for the updated pond and FPC sites are listed in Attachment 1, Tables 3 and 4. The locations of all of the previously recorded cultural resources and potentially unrecorded historic resources are illustrated relative to the updated study areas on aerial mapping in Attachment 2.

Attachment 1:

Tables of Previously Recorded Cultural Resources and Potential Unrecorded Historic Resources Within the Study Areas for the Pond And FPL Locations

Table 1. Previous Recorded Archaeological Sites Within the Archaeological Resources Study Area

FMSF No.	Site Name	Site Type	SHPO National Register Evaluation*	Relevant Pond/ FPC Site(s)
8OS1771	US 192-1	Sparse Lithic Scatter	Ineligible	Within Footprints of Pond 2-A and FPC Fish 2

* *As recorded in the FMSF; may require re-evaluation*

Table 2. Previous Recorded Historic Resources Within the Historic Resources Study Area

FMSF No.	Site Name	Resource Type	SHPO National Register Evaluation*	Relevant Pond/ FPC Site(s)
8OS2681	2802 E. Irlo Bronson Memorial Highway	c. 1950 Masonry Vernacular Building	Ineligible	Outside Footprint of, but within Study Area for, Pond 1-B
8OS2682	2804 E. Irlo Bronson Memorial Highway	c. 1959 Masonry Vernacular Building	Ineligible	Outside Footprint of, but within Study Area for, Pond 1-B

* *As recorded in the FMSF; may require re-evaluation*

Table 3. Parcels with the Potential for Unrecorded Historic Buildings Within the Historic Resources Study Area

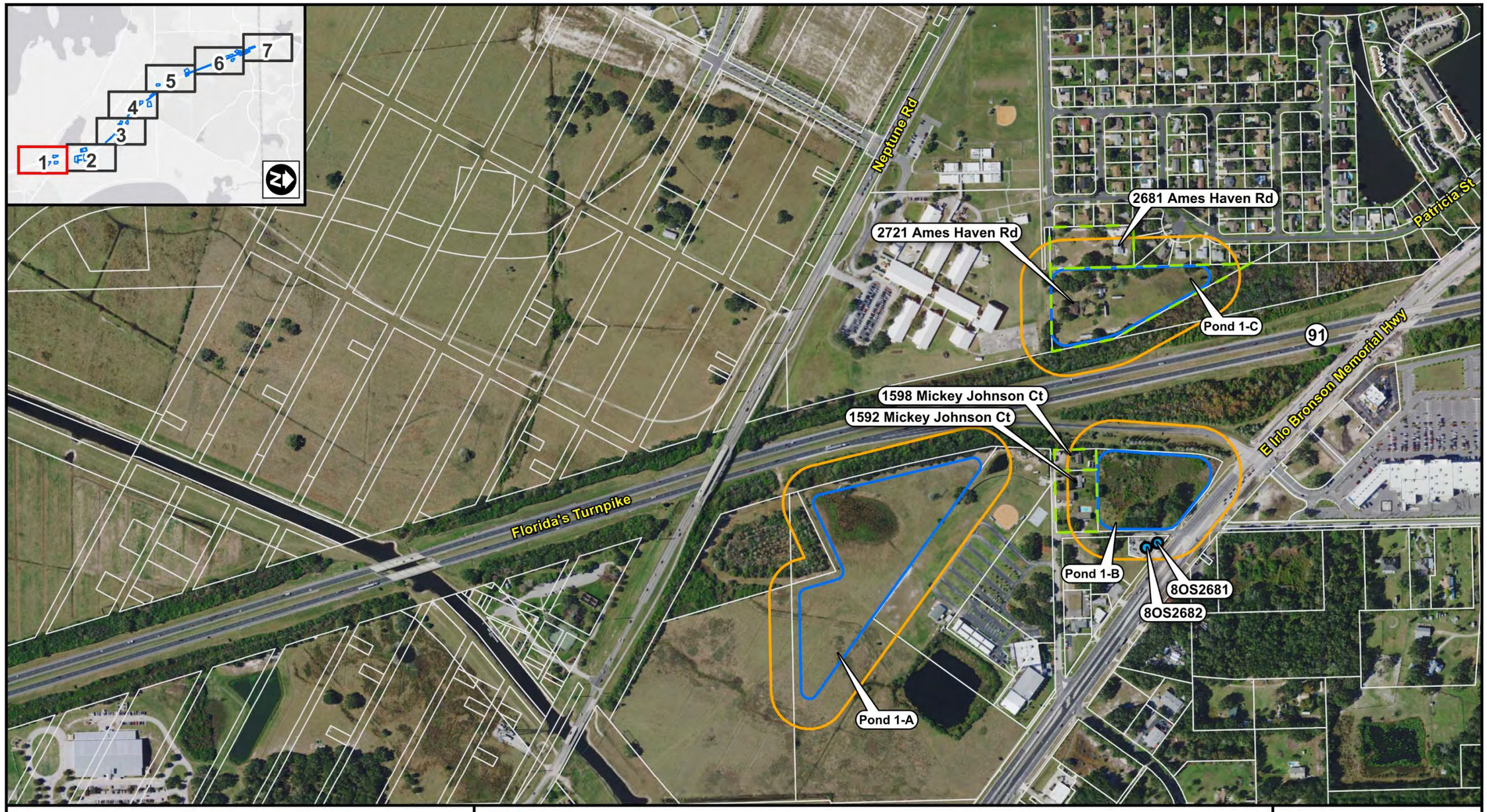
Parcel ID	Address	Actual Year Built Date	Relevant Pond/ FPC Site(s)
322530000000810000	1312 Simmons Road	1958	Within the Study Areas for Pond 2-C and FPC Fish 4
322530000002000000	1592 Mickey Johnson Court	1948	Within the Study Area for Pond 1-B
322530000002100000	1598 Mickey Johnson Court	1959	Within the Study Area for Pond 1-B
322530000002200000	2721 Ames Haven Road	1958	Within the Footprint of Pond 1-C
322530000002300000	2681 Ames Haven Road	1958	Within the Study Area for Pond 1-C

Table 4. Potential Unrecorded Historic Bridges Within the Historic Resources Study Area

FDOT Bridge No.	Facility Carried / Feature Crossed	Year Constructed (Reconstructed)	Relevant Pond/ FPC Site(s)
920027	CR 530 Over SR 91 (Florida's Turnpike)	1963 (2007)	Within the Study Area for FPC Bass 4
920075	SR 91 (Florida's Turnpike) Northbound Ramp A Over SR 91 (Florida's Turnpike)	1963	Within the Study Areas for Pond 3-C2 and Pond 4-D2
920077	SR 91 (Florida's Turnpike) Southbound Over Bass Slough	1963	Within the Study Area for FPC Bass 4
920079	SR 91 (Florida's Turnpike) Over Mill Slough	1963 (1995)	Within the Study Areas for Pond 9-A and FPC Mill 4
920135	Simpson Road Over SR 91 (Florida's Turnpike)	1963	Within the Study Area for Pond 4-E
920136	SR 91 (Florida's Turnpike) Northbound Over Bass Slough	1963	Within the Study Area for FPC Bass 4

Attachment 2:

Previously Recorded Cultural Resources and Potential Unrecorded Historic Resources Relative to the Study Areas for the Pond And FPL Locations Illustrated on Aerial Mapping

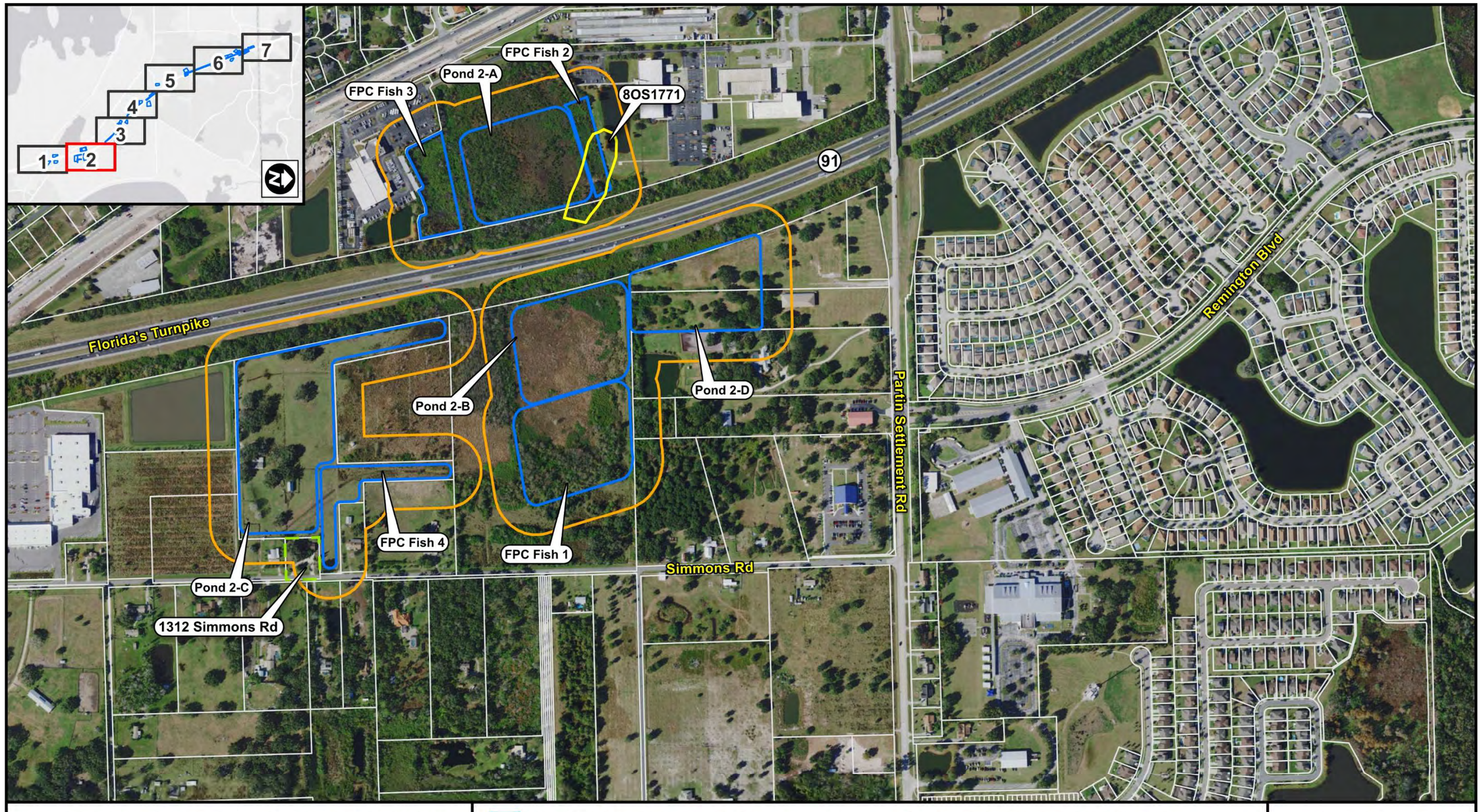


Previously Recorded Cultural Resources and Potential Unrecorded Historic Resources Relative to the Study Areas for the Pond and FPC Locations (Map 1 of 7)

- Pond/FPC Footprint (Archaeological Study Area)
- Historic Resources Study Area
- Previously Recorded Archaeological Site
- Previously Recorded Historic Structure
- Unrecorded Historic Bridge
- Parcel with Historic AYRB Date

Osceola County

0 500 Feet

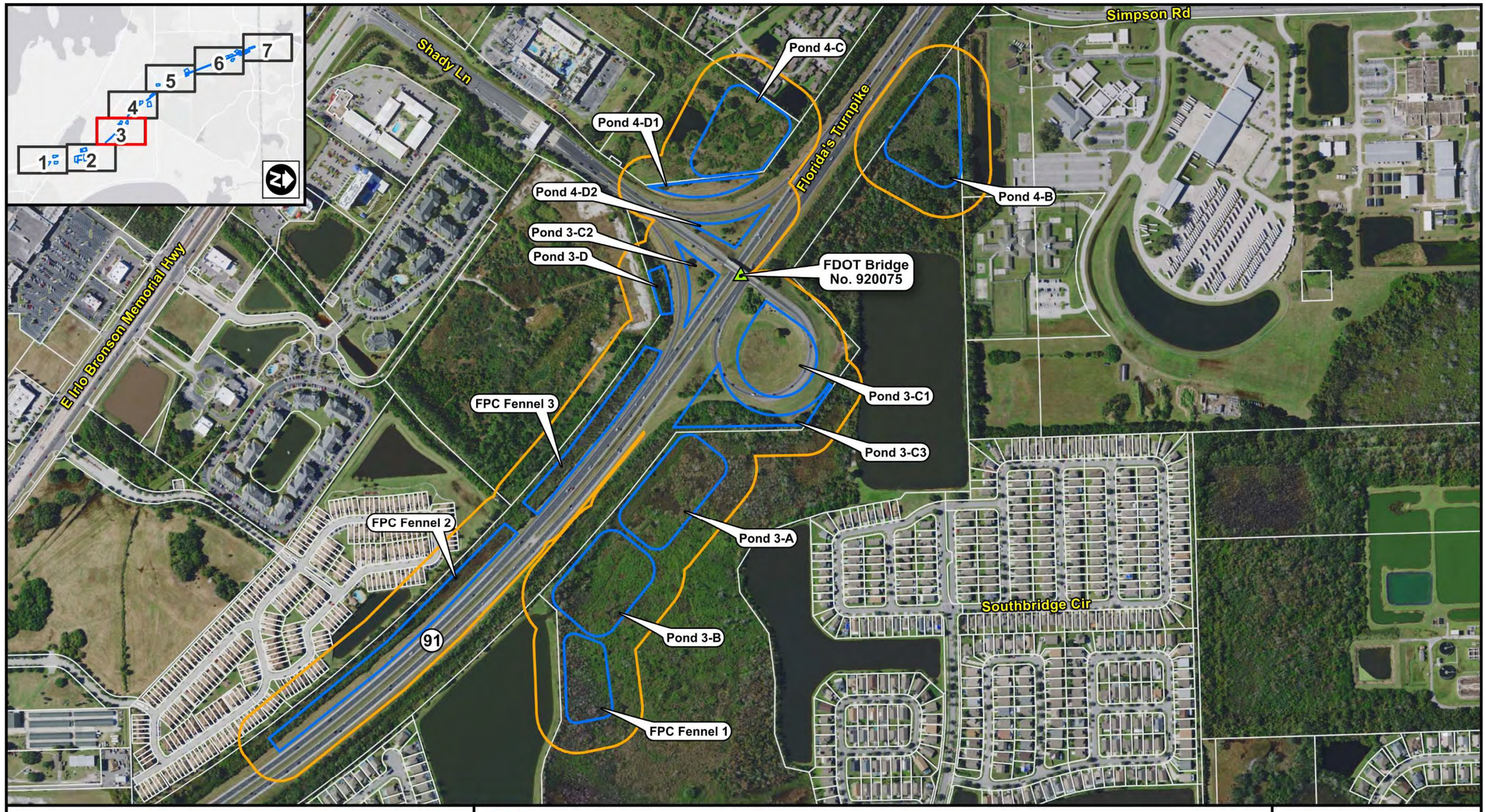


Previously Recorded Cultural Resources and Potential Unrecorded Historic Resources Relative to the Study Areas for the Pond and FPC Locations (Map 2 of 7)

- Pond/FPC Footprint (Archaeological Study Area)
- Historic Resources Study Area
- Previously Recorded Archaeological Site
- Previously Recorded Historic Structure
- Unrecorded Historic Bridge
- Parcel with Historic AYRB Date

Osceola County

0 500 Feet

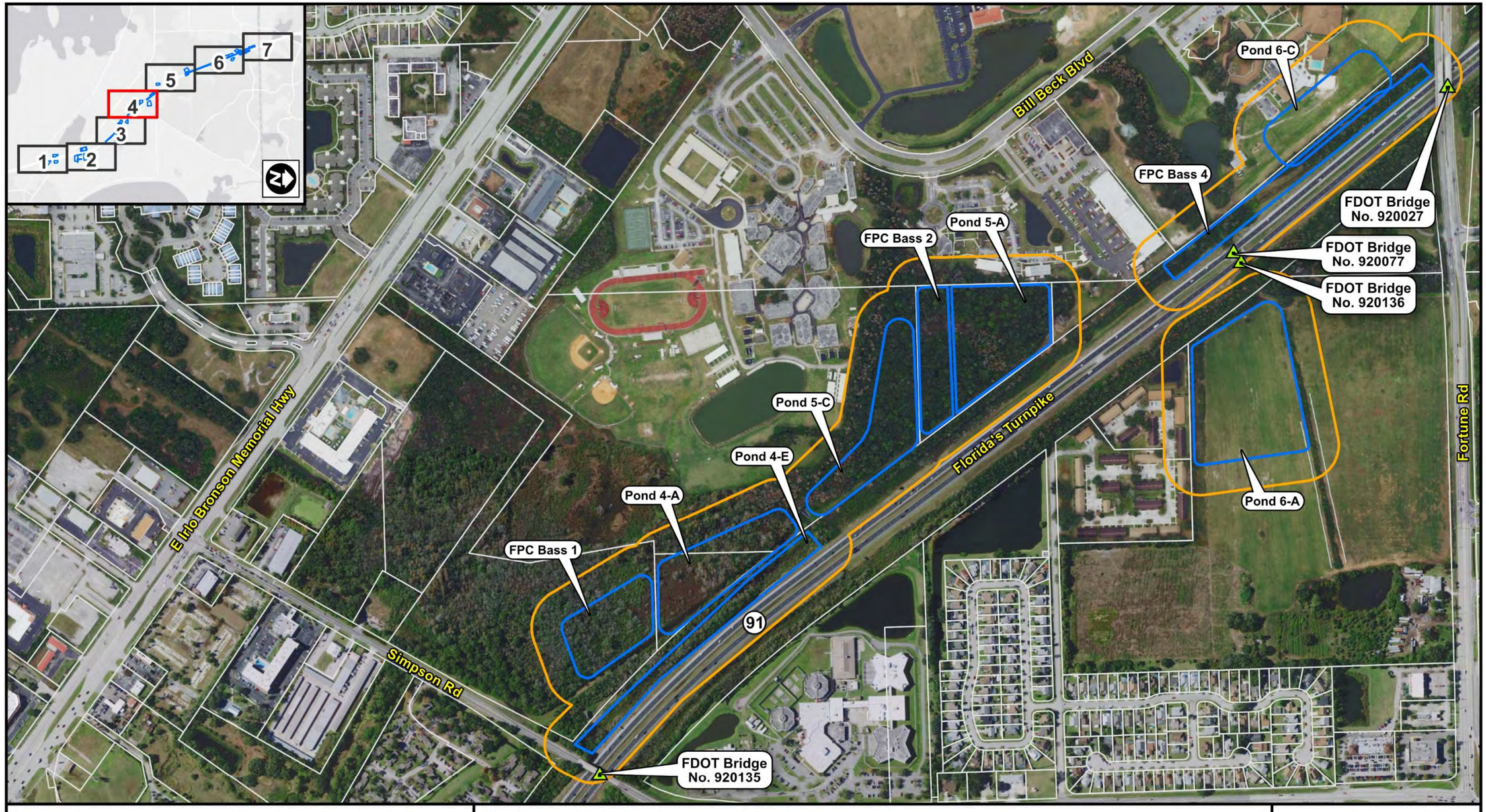


Previously Recorded Cultural Resources and Potential Unrecorded Historic Resources Relative to the Study Areas for the Pond and FPC Locations (Map 3 of 7)

- Pond/FPC Footprint (Archaeological Study Area)
- Historic Resources Study Area
- Previously Recorded Archaeological Site
- Previously Recorded Historic Structure
- Unrecorded Historic Bridge
- Parcel with Historic AYRB Date

Osceola County

0 500 Feet

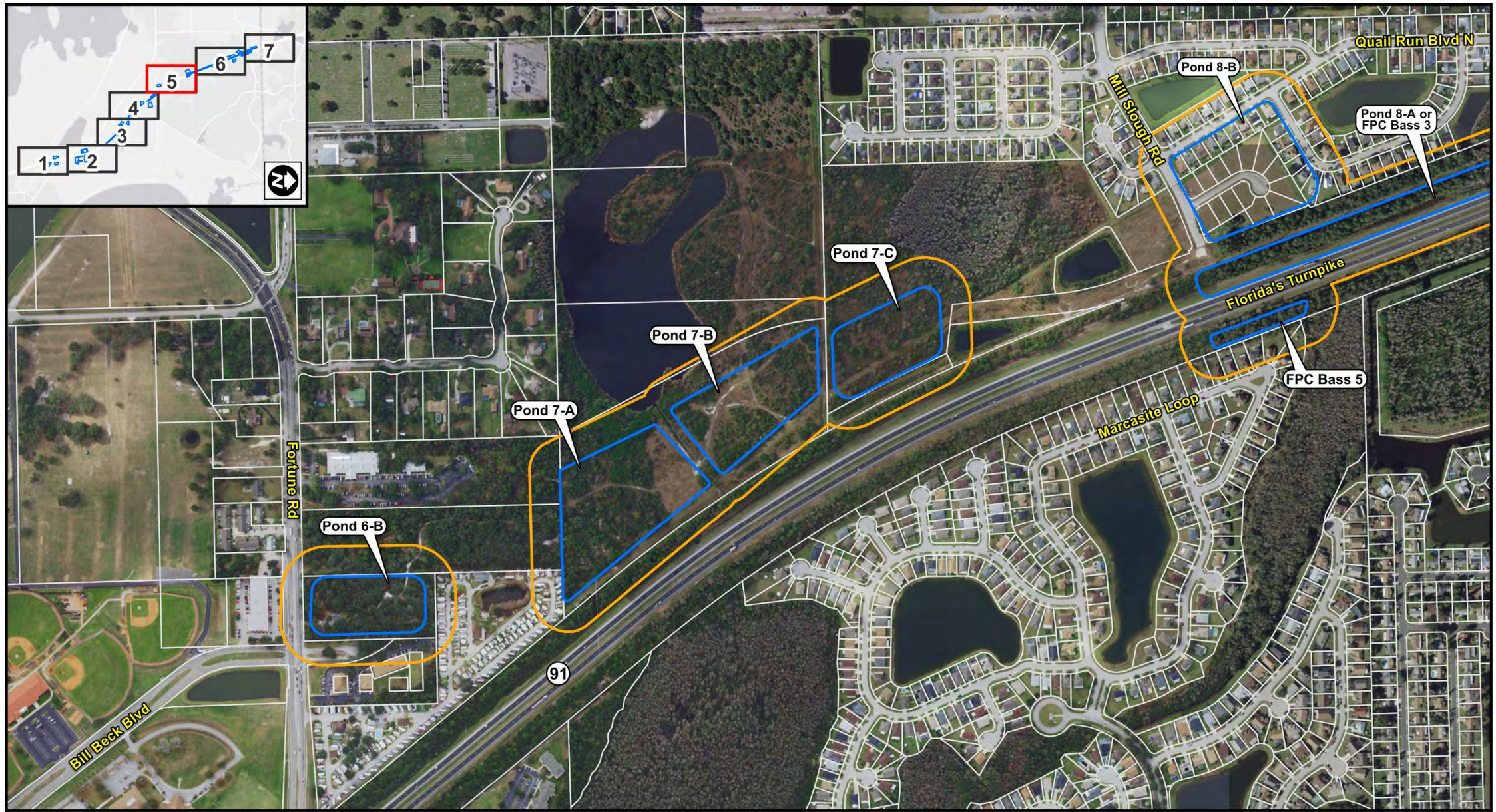


Previously Recorded Cultural Resources and Potential Unrecorded Historic Resources Relative to the Study Areas for the Pond and FPC Locations (Map 4 of 7)

- Pond/FPC Footprint (Archaeological Study Area)
- Historic Resources Study Area
- Previously Recorded Archaeological Site
- Previously Recorded Historic Structure
- Unrecorded Historic Bridge
- Parcel with Historic AYRB Date

Osceola County

0 500 Feet

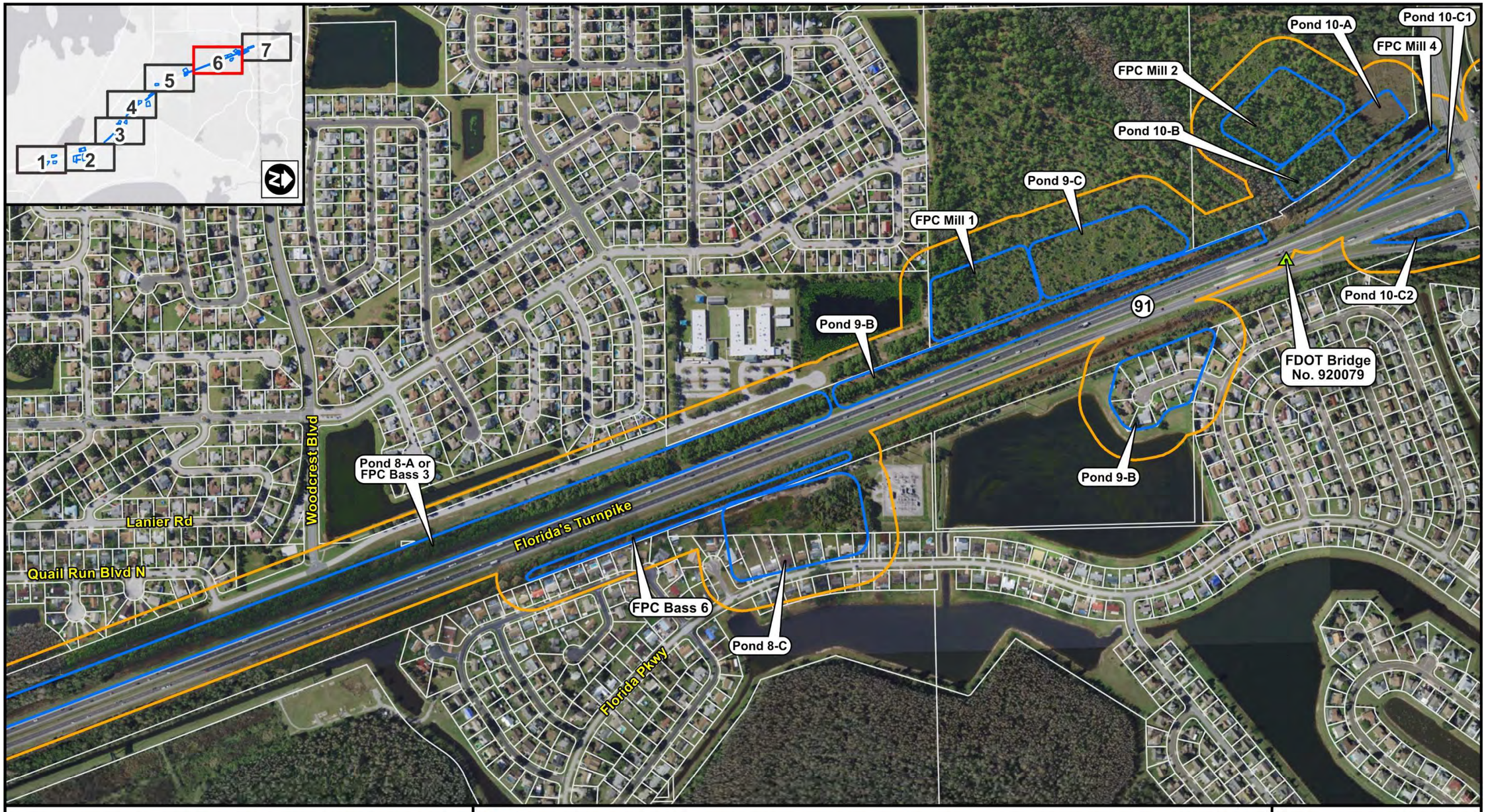


Previously Recorded Cultural Resources and Potential Unrecorded Historic Resources Relative to the Study Areas for the Pond and FPC Locations (Map 5 of 7)

- Pond/FPC Footprint (Archaeological Study Area)
- Historic Resources Study Area
- Previously Recorded Archaeological Site
- Previously Recorded Historic Structure
- Unrecorded Historic Bridge
- Parcel with Historic AYRB Date

Osceola County

0 500 Feet

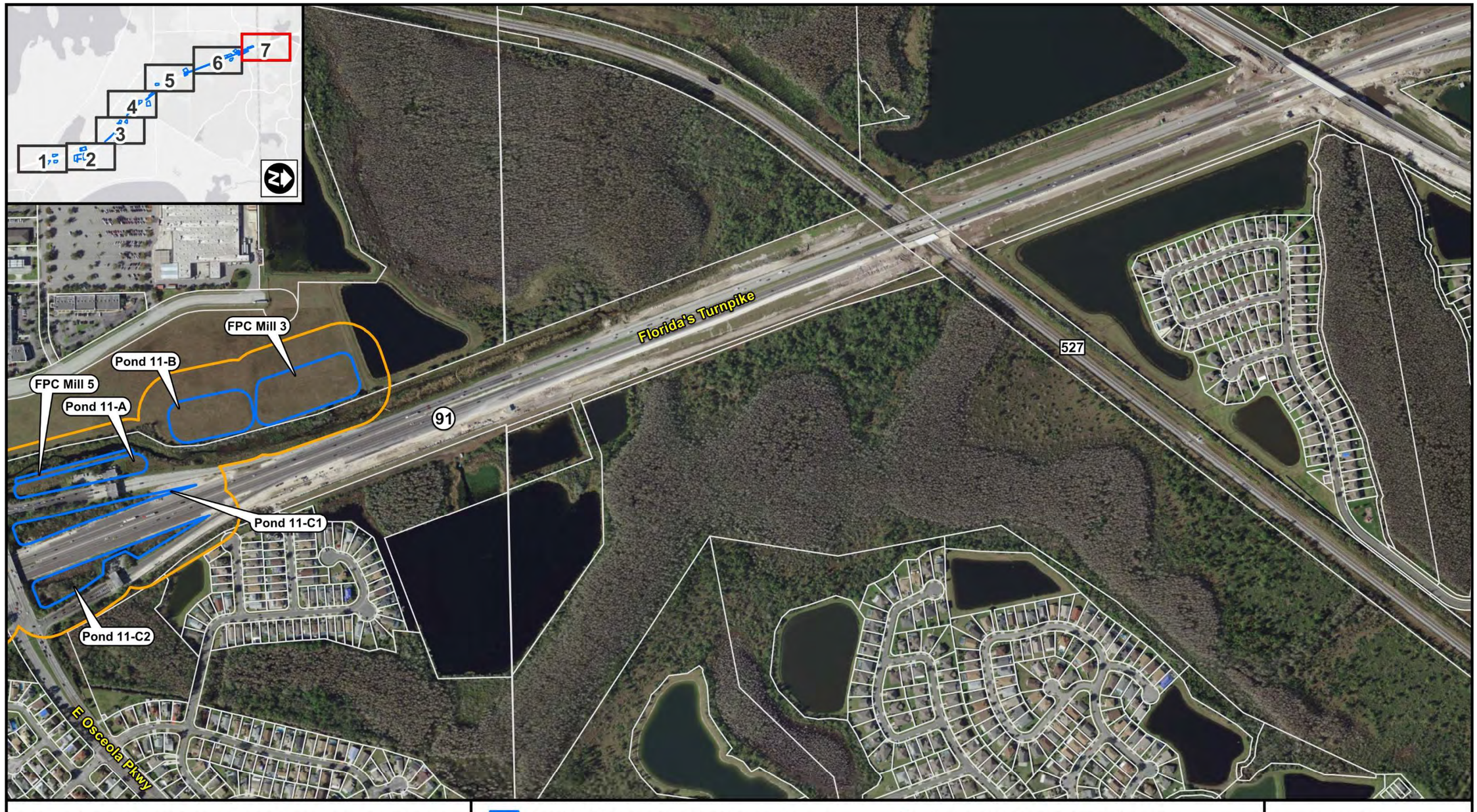


Previously Recorded Cultural Resources and Potential Unrecorded Historic Resources Relative to the Study Areas for the Pond and FPC Locations (Map 6 of 7)

- Pond/FPC Footprint (Archaeological Study Area)
- Historic Resources Study Area
- Previously Recorded Archaeological Site
- Previously Recorded Historic Structure
- Unrecorded Historic Bridge
- Parcel with Historic AYRB Date

Osceola County

0 500 Feet



Previously Recorded Cultural Resources and Potential Unrecorded Historic Resources Relative to the Study Areas for the Pond and FPC Locations (Map 7 of 7)

- Pond/FPC Footprint (Archaeological Study Area)
- Historic Resources Study Area
- Previously Recorded Archaeological Site
- Previously Recorded Historic Structure
- Unrecorded Historic Bridge
- Parcel with Historic AYRB Date

Osceola County

0 500 Feet

Memo

To: Gary Elwer, Moffatt & Nichol
From: Greg Smith and Kathleen Hoffman, Janus Research
Date: February 13, 2020
Re: Desktop Analysis of Potential Pond and Floodplain Compensation (FPC) Site Alternatives for the Turnpike Mainline Widening from South of US 192/SR 441 to Osceola Parkway (MP 242–248), Osceola County, Florida

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At the request of Florida's Turnpike Enterprise (FTE), and in association with Moffatt & Nichol, Janus Research conducted a desktop analysis of potential pond and floodplain compensation (FPC) siting alternatives for the Turnpike Mainline Widening from South of US 192/SR 441 to Osceola Parkway (MP 242–248) in Osceola County, Florida. This memorandum addresses the preliminary proposed locations for 34 pond sites, 11 FPC sites, and one pond/FPC site. These sites are within Sections 2, 11–13, and 24 of Township 25 South, Range 29 East; Sections 19, 29, 30, and 32 of Township 25 South, Range 30 East; and Section 5 of Township 26 South, Range 30 East, on the Kissimmee and (1953 Photorevised [PR] 1987) Saint Cloud North (1953 PR 1987) United States Geological Survey (USGS) quadrangle maps. The proposed project associated with the pond and FPC sites will be the subject of an upcoming cultural resource assessment survey (CRAS). The purpose of this pond and FPC siting analysis was to determine the location of any previously recorded cultural resources within or adjacent to the alternatives and to determine archaeological site probability for each of the locations. The locations of the ponds and FPC sites are shown in Attachment 1.

Methods

An archaeological and historical literature and background information search pertinent to the proposed pond and FPC site locations was conducted to determine the types, chronological placement, and locational patterning of cultural resources within the length of the project area. 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 cultural resource management (CRM) reports. In addition, land use history and environmental variables known to be associated with precontact and historic period archaeological sites were reviewed.

The study area for archaeological resources (Attachment 2) was the footprint of the proposed ponds or FPC sites; for historic resources the APE included a buffer of 150 feet surrounding the proposed footprints to identify any previously recorded resources directly adjacent to siting locations. Background research methods included a search of the FMSF to identify cultural

[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.

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. The soil types and environmental characteristics of the project area were also evaluated to assess previous disturbances in the study area and the potential for in-situ archaeological deposits and significant sites. A review of the General Land Office (GLO) historic plat maps, historic aerial photographs, and an examination of the Kissimmee (1953 PR 1987) and Saint Cloud North (1953 PR 1987) USGS quadrangle maps was also conducted to establish the pre-development environment and land use history of the site alternatives, as well as to identify any potential historic resources within those alternatives.

Background Research

Florida Master Site File

The FMSF search identified nine previously conducted cultural resource surveys within or adjacent to the alternatives (Table 1). However, very little archaeological testing has been conducted within or near the currently proposed pond or FPC siting locations. Those surveys that are most relevant to the current Turnpike pond and FPC locations are discussed below.

Table 1. Previous Surveys Within or Adjacent to the Study Area

FMSF Survey No.	Title	Author(s)	Publication Date
2062	An Archaeological and Historical Survey of Lucas Lakes, Osceola County, Florida	J. Raymond Williams, Terrance L. Simpson, Lyle C. Torp, and Michael S. Garner	1989
2499	Archaeological Resources Assessment Survey, Intersection at Florida's Turnpike and Dart Boulevard, Osceola County, Florida	William D. Browning	1990
3410	A CRAS of the Proposed Dart Boulevard Toll Facility, Osceola and Orange Counties, Florida	Janus Research/Piper Archaeology	1992
4235	Cultural Resource Survey and Assessment of the Turnpike/US 192 Alternative Interchange Project Area, Osceola County, Florida	Wheeler, Ryan J.	1995
4383	Phase I Cultural Resources Investigation of the Proposed 30 IN O.D. Mainline Loop South Portion in the Florida Gas Transmission Company Phase III Expansion Project	R. Christopher Goodwin & Associates, Inc.	1993
9230	CRAS of Florida's Turnpike Mainline PD&E Study from US 192 to SR 50, Orange and Osceola Counties	Janus Research	2003a
9231	CRAS of New Pond Sites Along Florida's Turnpike: An Addendum to the CRAS of the Florida's Turnpike Mainline PD&E Study from US 192 to SR 50, Orange and Osceola Counties	Janus Research	2003b

FMSF Survey No.	Title	Author(s)	Publication Date
12581	Reconnaissance Survey Ivey-Boggy Creek Osceola County, Florida	South Arc, Inc.	2004
20800	CRAS along State Road 500 from Aeronautical Drive to Budinger Road and from Eastern Avenue to Nova Road, Osceola County, Florida	Southeastern Archaeological Research, Inc. (SEARCH)	2014

Ray Williams et al. (1989) conducted *An Archaeological and Historical Survey of Lucas Lakes, Osceola, Florida* (FMSF Manuscript No. 2062). Three late-19th/early-20th Century artifact scatters (8OS 124-126) were encountered between SR 500 and the Turnpike; none of the three were in the location of proposed pond or FPC locations. All three were determined National Register-ineligible.

An *Archaeological/Historical Resource Assessment Survey, Intersection at Florida's Turnpike and Dart Boulevard* was conducted by the Florida Department of Transportation (FDOT) in 1990 (Browning 1990; FMSF Manuscript No. 2499). This survey included a pedestrian and windshield survey of approximately 26 acres at the north end of the current study area in the vicinity of the proposed ponds and FPCs near Mill Slough. Low probability was ascribed to the study area, and no shovel tests were excavated.

The *CRAS of the Turnpike/US 192 Alternative Interchange Project Area, Osceola County, Florida* (Wheeler 1995, FMSF Manuscript No. 4235) noted that the area including proposed Pond 2-A and FPC Fish 2 contained one archaeological site. Site 8OS1771 was a sparse precontact period artifact scatter that was considered National Register–ineligible. SHPO concurred with that evaluation, as discussed further within the *Archaeological Sites* section of the current memorandum.

A multi-county study entitled *Phase I Cultural Resources Investigation of the Proposed 30 IN O.D. Mainline Loop South Portion of the Florida Gas Transmission Company Phase III Expansion Project* was conducted by Goodwin and Associates (1993; FMSF Manuscript No. 4383). Covering 50 feet by 113 miles, a portion of the current study are was included. Five sites were encountered in the vicinity of Ponds 2-B, 2-C, and FPC Fish 1, but not within the footprint of the ponds.

Two projects have been conducted by Janus Research to the *Florida's Turnpike Mainline PD&E Study from US 192 to SR 50* (2003a and 2003b; FMSF Manuscripts No. 9230 and 9231). While four previously recorded historic resources were identified, none were near the present study area.

South Arc (2004; FMSF Manuscript No. 12581) completed the *Reconnaissance Survey, Ivey-Boggy Creek, Osceola County, Florida*. This study focused on 66 acres in the vicinity of Ponds 5-B and 6-A. No sites were encountered during the 2004 survey.

Most recently, a *CRAS along State Road 500 from Aeronautical Drive to Budinger Road and from Eastern Avenue to Nova Road, Osceola County, Florida*, was conducted (SEARCH 2014; FMSF Manuscript No. 20800). This study included 595 acres, with only a portion crossing SR 500 near Fish Lake. While no archaeological sites were recorded, two historic buildings, 8OS2681 and 8OS268, were identified within the historic resources study area for the current project. Both are

considered National Register–ineligible and are discussed further within the *Historic Structures* section of the current memorandum.

Archaeological Sites
One previously recorded archaeological site has been identified within or adjacent to the pond or FPC siting alternatives during the FMSF search (Attachment 2). Site 8OS1771 is a sparse lithic scatter that extends into Pond 2-A and FPC Fish 2. It was recorded by Ryan Wheeler (FMSF Manuscript No. 4235) and determined National Register–ineligible by the SHPO in 1995.

Historic Structures
Two previously recorded historic structures were identified within 150 feet of the pond or FPC siting alternatives during the FMSF search (SEARCH 2014; FMSF Survey Manuscript No. 20800). Structure 8OS2681 (2802 E. Irlo Bronson Memorial Highway) and 8OS2682 (2804 E. Irlo Bronson Memorial Highway) are within the historic resources study area for Pond 1-B, but outside of the pond footprint. Both are concrete block structures determined National Register–ineligible by the SHPO in 2014. The locations of these resources relative to the pond/PFC siting locations are illustrated in Attachment 2.

A search of property appraiser records identified four parcels with Actual Year Built (AYRB) dates prior to 1972 that have a building within or partially within the pond study areas of three ponds, as listed below:

- Pond 1-B1592 Mickey Johnson Court (c. 1948)
- Pond 1-B: 1598 Mickey Johnson Court (c. 1959)
- Pond 1-C: 2721 Ames Haven Road (c. 1958)
- Pond 1-C: 2681 Ames Haven Road (c. 1958)

Of these, only one parcel, 2721 Ames Haven Road, has buildings within the footprint of the pond (Pond 1-C).

Historic Cemeteries
No previously recorded historic cemeteries have been identified within 150 feet of the pond or FPC siting alternatives during the FMSF search.

Historic Resource Groups
A search of the FMSF identified no previously recorded historic resource groups within 150 feet of the pond or FPC siting alternatives.

Historic Linear Resources
No previously recorded linear resources were identified within 150 feet of the pond or FPC siting alternatives during the FMSF search.

Historic Districts
No previously recorded historic districts were identified within 150 feet of the pond or FPC siting alternatives during the FMSF search.

Historic Bridges

A search of the GIS bridge data available through the Florida Geographic Data Library (FGDL) and the FDOT bridge records (2019) identified two potential unrecorded historic bridges within the historic resources study area (Attachment 2). FDOT Bridge No. 920079 (built in 1963) carries the Turnpike over Mill Slough, while FDOT Bridge No. 920075 (built in 1963) carries Ramp A over the Turnpike. These bridges are likely National Register–ineligible and would not be impacted by any ponds or FPC's.

Environmental Setting

A review of the General Land Office (GLO) historic plat maps (Florida Department of Environmental Protection [FDEP] 1845, 1848, 1849a) and surveyor's field notes (FDEP 1843-44, 1849b) was conducted to examine past environmental conditions within the vicinity of the pond and FPC siting alternatives. The surveyor's notes observe that the study area is characterized by a ground cover of 3rd rate pine and palmetto. Baygall, low lying prairie, grassy marshes, cypress swamps, boggy areas, and a number of ponds were also observed across the landscape. Ponds were noted occasionally. No hammocks or upland areas are noted were noted within or adjacent to any of the proposed pond or FPC siting alternatives.

The historic plat maps and surveyor's notes were also reviewed for evidence of early settlement. There are no structures, military forts, roads, encampments, battlefields, homesteads, or historic Native American trails, earthen mounds, or settlements depicted on the plat maps in the vicinity of the pond or FPC siting alternatives. Ponds 3-A, 3-B, and 3-C, as well as FPC Fennel 1, 2, and 3 appear within a "Saw Grass Marsh" that was mapped in the current location of Fennel Slough.

A review of aerial photographs from 1944, 1951, 1959, 1969, and 1970 (FDOT 2019; University of Florida, George A. Smathers Libraries 1999–2019) was conducted to examine land use beginning during the mid-1900s. On the 1944 aerial there were very few changes to the natural landscape evident in the pond or FPC locations. Exceptions include some minor land clearing in the study areas of Pond 1-B and Pond 6-C. This early aerial does suggest some upland areas containing tree clusters that may represent probability areas for precontact period sites. These include, from north to south, Ponds 7-A, 7-B, and 7-C, FPC Mill 1, Pond 9-A, FPC Mill 2, and Ponds 10-B, 10-C1, 10-C2, and 11-C2.

By 1951, only a few changes to the landscape can be noted. Buildings can be seen in the study area for Pond 1-C, as can some agricultural activity in and around Ponds 1-B, 2-A, 2-B, and 2-C, as well as FPCs Fish 1, Fish 2, and Fish 3. In the 1959 aerial, minor surface disturbance of an unknown nature can be seen at Pond 1-A, and several buildings appear in both the historic and archaeological study area of Pond 1-C. On that same aerial, agricultural activity can be seen in the eastern portions of the Pond 5-B and 6-A study area. On the 1969 and 1970 historic aerials, the only observed changes are at the locations of Pond 5-B and 6-A, where agricultural activity covers the entirety of both locations.

The *Soil Survey of Osceola County Area, Florida* (United States Department of Agriculture [USDA] 2006) was reviewed to help determine the predevelopment environment, assess the level of land modification, and identify natural features within the study area indicative of increased archaeological site potential. Of the nine soil types present, seven soils are characterized as very

poorly or poorly drained (Table 2). Many of these are associated with depressions, swamps, drainageways, floodplains, marshes, and existing ponds. Poorly drained soils dominate throughout the study area, especially in the northern portion of the study area in the vicinity of Mill Slough. Moving south, other hydrologic features in the relatively flat project area include Bass Slough, Fennel Slough, and Fish Pond. Areas of archaeological site probability, as discussed in the *Archaeological Probability* section of the current memorandum, are related to the slightly elevated and relatively better drained pond and FPC locations.

Archaeological Probability

The FMSF search and literature review contributed to the determination of archaeological site potential within the pond and FPC locations. Typically, four environmental factors are usually employed in predicting site locations: soil type (soil drainage characteristics), distance to fresh (potable) water, distance to hardwood hammocks, and topography.

Fresh water 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. Modern drainage enhancement in portions of Florida has changed the historical drainage patterns and overall environment in portions of the state during the past century.

The study area is generally higher to the north and lower to the south. Elevations range from 65 feet above sea level at the south and 85 feet to the north. As mentioned in the nineteenth century surveyor's notes, the survey area was described as an open savannah. No knolls, ridges, hammocks, or other areas of higher elevation are depicted in the pond vicinities. Water sources include sloughs and drainageways.

Numerous researchers have successfully used the drainage characteristics of soil in formulating predictive models for site location. In general, archaeological sites are associated with better-drained soils and relatively elevated locations (hammocks, ridges, etc.). Although low, wet areas can contain abundant wildlife and plant resources, they make poor habitation areas. It is the locations adjacent to low lying, wet areas that have the potential to contain archaeological sites.

Table 1. Characteristics of Detailed Soil Types within the Pond Siting Alternatives

Natural Drainage Characteristics	Soil Type	Environmental Association	Proposed Pond/FPC Site
Moderately Well Drained	Pomello fine sand, 0 to 5 percent slopes	Found between high sand ridges and flatwoods, and on slight knolls and low ridges. Natural vegetation includes sand, loblolly, and slash pine, with some sand live oaks. Saw palmetto can be seen, with pineland threeawn, creeping bluestem, indiangrass, and low panicum.	Pond 5-B
Somewhat Poorly Drained	Adamsville sand	Narrow ridges adjacent to sloughs, marshes, lakes, and on low flatwoods knolls. Natural vegetation includes large live oaks, with laurel and water oaks, longleaf and slash pine. Understories include saw palmetto, sumac, American beautyberry, greenbrier, Virginia creeper, wild grape, and blackberry. Sparse forbs and grasses include partridgeberry, braken ferm, uniolas, pineland threeawn, indiangrass, and bluestem species.	Pond 1-B
Poorly Drained	Basinger fine sand	Low, broad flats and sloughs in the flatwoods. Natural vegetation is mostly grasses, with scattered longleaf pine, saw palmetto, and waxmyrtle. Grasses include maidencane, pineland and Florida threeawn, bluestem, panicums, and cordgrass.	Ponds 2-C, 3-C, 4-A, 4-C, 5-A, 5-C, 7-B, 8-A, and 9-B; FPCs Fennel 1, Fennel 2, Fennel 3, Bass 1, Bass 2, and Bass 3
	Basinger fine sand, depressional	Shallow depressions and poorly defined drainageways in flatwoods. Natural vegetation includes water tolerant grasses and small woody shrubs. In swamps there are cypress and blackgum.	Ponds 7-B 8-A,10-A 11-A, 11-B, and 11-C-1; FPCs Bass 3, Mill 1, and Mill 2
	Immokalee fine sand	Broad flatwoods. Natural vegetation includes longleaf and slash pine with and understory of saw palmetto, inkberry, fetterbush, and running oak. Grasses include bluestem, pineland threeawn, indiangrass, switchgrass, and panicum species.	Ponds 1-A, 1-B, 1-C, 6-C, 7-A, and 9-A
	Myakka fine sand	Broad areas in flatwoods. Natural vegetation includes longleaf and slash pine with and understory of saw palmetto, inkberry, fetterbush, and running oak. Grasses include bluestem, pineland threeawn, indiangrass, switchgrass, and panicum species.	Ponds 2-C, 5-A, 5-C, 6-A, 6-B, 7-A, 7-B, 7-C, 8-A, 8-B, 8-C, 9-A, 10-A,B**,** and 10 C-1, 11-A, 11-C1; and 11 C-2, FPCs Bass 2, Bass 3, and Mill 3
	Smyrna fine sand	Broad, flat areas in flatwoods. Natural vegetation includes longleaf and slash pine with and understory of saw palmetto, inkberry, fetterbush, and running oak. Grasses include bluestem, pineland threeawn, indiangrass, switchgrass, and panicum species.	Ponds 4-B, 6-A, 6-C, 8-A, 9-A, 9-B, and 9-C; 10-B, FPCs Mill 1, Mill 2, and Bass 3

Natural Drainage Characteristics	Soil Type	Environmental Association	Proposed Pond/FPC Site
Very Poorly Drained	Placid fine sand	Low, wet depressions and swamps in the flatwoods. Natural vegetation consists mainly of maidencane, sand cordgrass, pickerelweed, giant cordgrass, waxmyrtle, sedges, and rushes. Scattered cypress, bay, tupelo, and cabbage palms trees may occur.	Ponds 2-A 9-A; 10 C-2, 11 C-2, and FPC Fish 2
	Samsula muck	Freshwater marshes and swamps. Natural vegetation consists mainly of sawgrass, maidencane, cattails, giant cutgrass, arrowheads, and sedges. There may be stands of willow, elderberry, and buttonbush, or elsewhere mixed stands of cypress, red maple, loblollybay, black tupelo, and sweetgum with greenbriers and ferns.	Ponds 1-A, 2-A, 2-B, 3-A, and 3-B; FPCs Fish 1, Fish 2, Fish 3, and Fennel 1

USDA 1997:10–11, 13–14, 20–21, 25, 31–33, 36–37

As previously noted in Table 2, the majority of soils in the study area are primarily poorly drained and very poorly drained. There is one proposed pond location that is marked by somewhat poorly drained soil (Pond 1-B) and one with moderately well drained soil (Pond 5-B). Several of the pond locations include more than one soil type and are for this reason those ponds appear more than once in Table 2. In general, most of the ponds are in areas considered to have a low potential for archaeological sites due to the drainage characteristics of the associated soils; many proposed pond locations are currently in water. Several are also located within an existing wetland, pond, or floodplain. No natural features suggestive of a high archaeological probability were identified during this analysis.

One previously recorded archaeological site (8OS1771) extends through the northeastern corners of Pond 2-A and FPC Fish 2 (Wheeler 1995). These pond locations are primarily within an area that was identified as a former slough in the 1995 report. This sparse lithic scatter was determined National Register–ineligible by the SHPO. Current project plans identify the locations of Pond 2-A and FPC Fish 2 as within a floodplain. Based on these factors, Ponds 2A and FPC Fish 2 are considered to have a low potential for yielding additional archaeological material.

Eleven (11) of the pond/FPC siting locations were determined to exhibit moderate probability: Ponds 2C, 5B, 6A, 6B, 6C, 7A, 8C, 9C, and 10A and FPCs Fennel 2 and Mill 1. The remainder of the pond or FPC sites exhibited low archaeological probability. The probability for each pond is shown in Attachment 3.

Summary

The desktop analysis identified no areas of high archaeological probability within any of the pond or FPC sites. Most of the study area is low in elevation, contains poorly drained or very poorly drained soils which suggest a low probability for archaeological sites. Many of the ponds are also within an existing wetland or floodplain which also indicates low archaeological site potential. Nine pond sites (Ponds 2C, 5B, 6A, 6B, 6C, 7A, 8C, 9C, and 10A) and two FPC

sites (FPC Fennel 2 and Mill 1) are considered to have moderate archaeological potential due to relatively better drained soils or elevation or proximity to a source of freshwater. The remaining ponds have low archaeological potential. Although the FMSF GIS Data show one previously recorded archaeological site, 8OS1771, spanning the northeastern corners of Pond 2A and FPC Fish 2, a review of the associated report indicates that the site was adjacent to a former slough. Further review also indicates that the recorded location is within a floodplain and emergent wetland, locations which are considered to have low archaeological potential. Additionally, site 8OS1771 was determined National Register–ineligible by the SHPO. Areas of archaeological probability for all the ponds and FPC locations are illustrated on the aerials in Attachment 2 and on the USGS Quadrangle map in Attachment 3.

Two previously recorded historic structures (8OS2681, 2802 E. Irlo Bronson Memorial Highway and 8OS2682, 2804 E. Irlo Bronson Memorial Highway) are within the historic resources study area for Pond 1-B, but outside of the pond footprint. Both are concrete block structures determined National Register–ineligible by the SHPO in 2014. Property appraiser data indicates the potential for four unrecorded historic structures within or partially within the footprints of Pond 1-B and 2-C. The ponds and parcels with buildings include:

- Pond 1-B: 1592 Mickey Johnson Court (c. 1948)
- Pond 1-B: 1598 Mickey Johnson Court (c. 1959)
- Pond 1-C: 2721 Ames Haven Road (c. 1958)
- Pond 1-C: 2681 Ames Haven Road (c. 1958).

A preliminary review of the buildings in Google Earth suggests that may not represent significant resources. Two FDOT bridges (920079 and 920075) are also within the study area of Pond X but are likely National Register-ineligible and would not be impacted by the ponds. The locations of these previously recorded and unrecorded historic resources are show on the aerial maps in Attachment 2.

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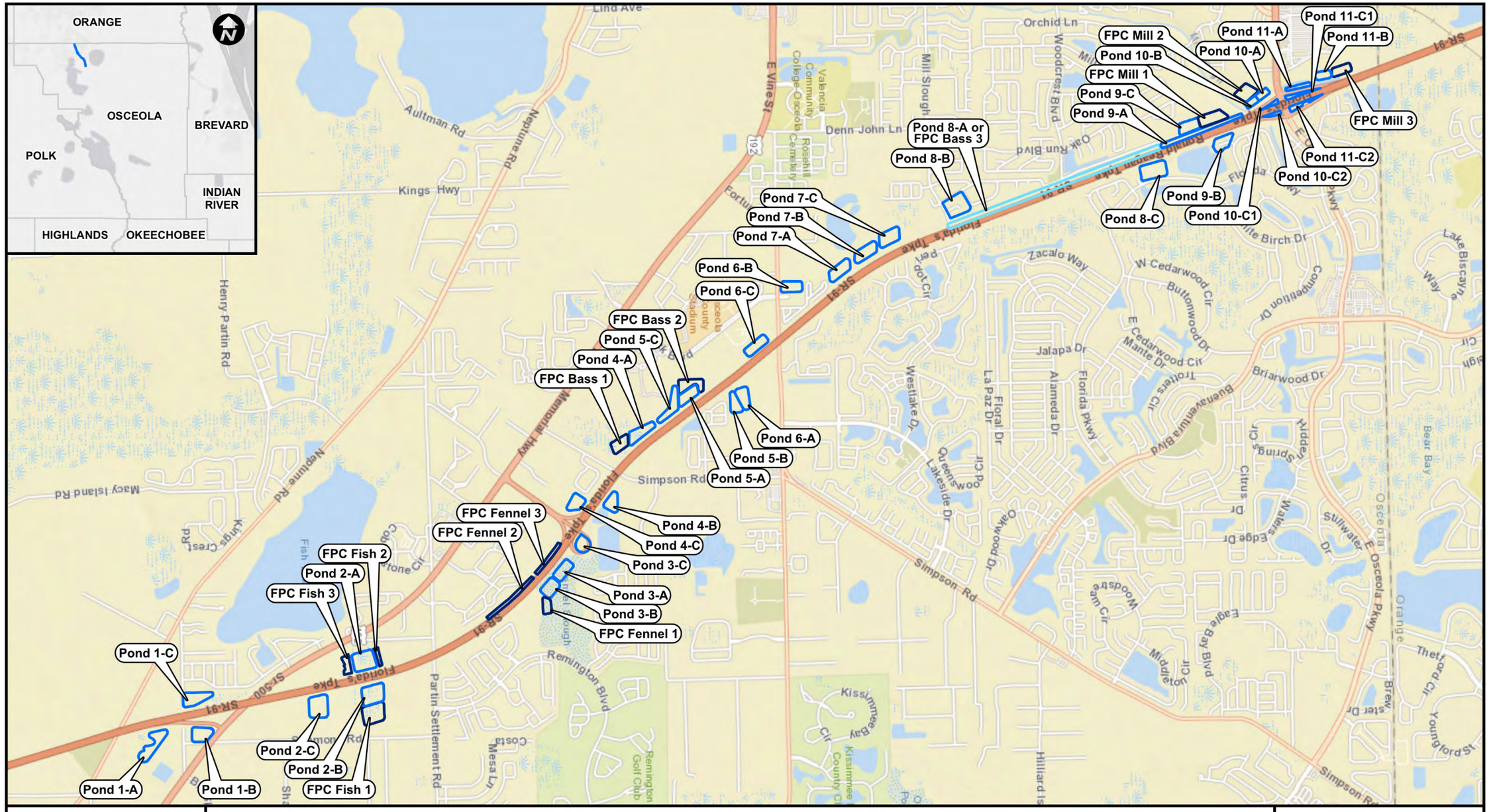
Attachment 1:

General Location of the Ponds and FPC sites



General Location of Ponds and FPC Locations

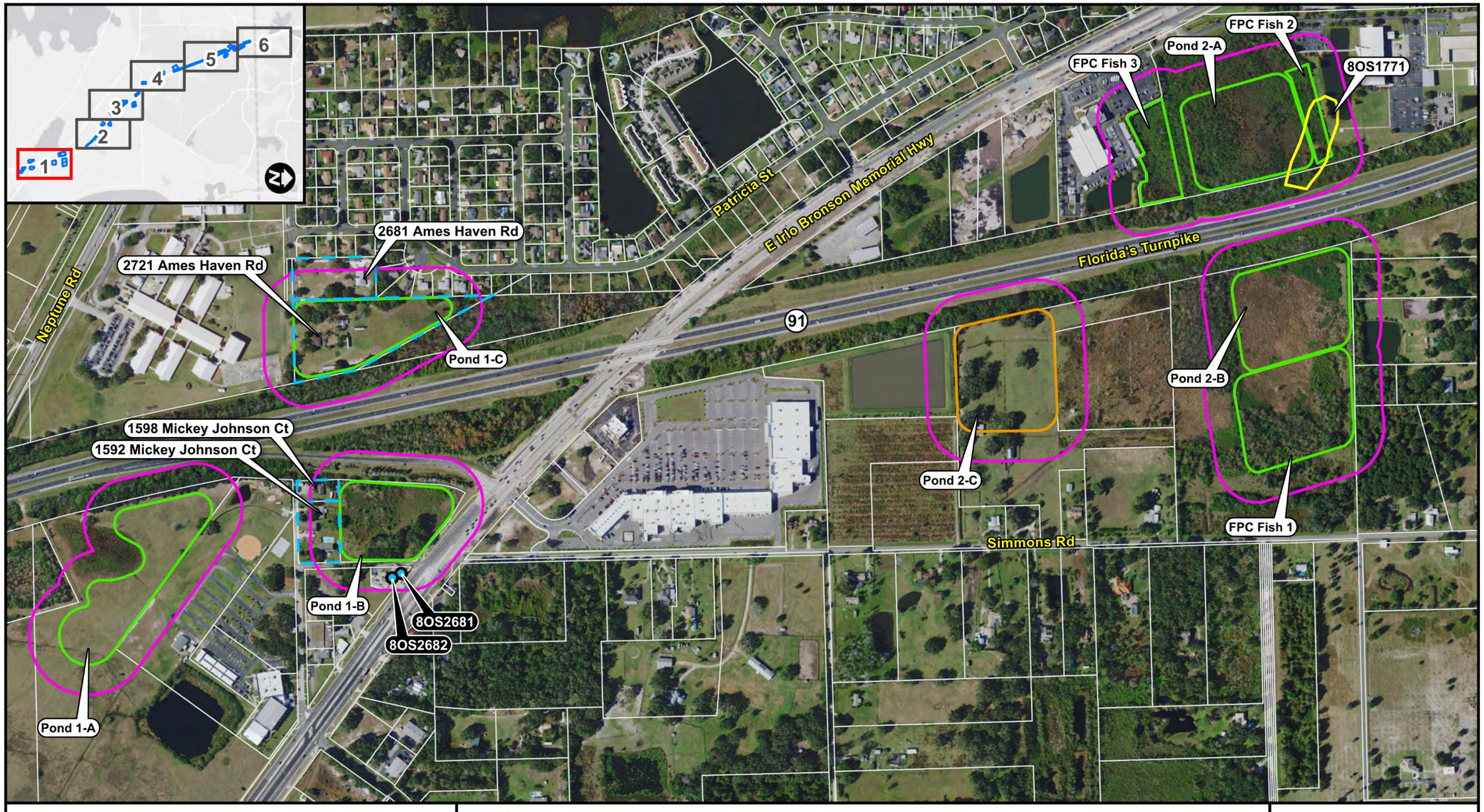
- Pond
- FPC
- Pond/FPC

Osceola County

0 0.5 Miles

Attachment 2:

Pond and FPC Study Area with Previously Recorded Resources, Potential Unrecorded Resources and Archaeological Site Probability

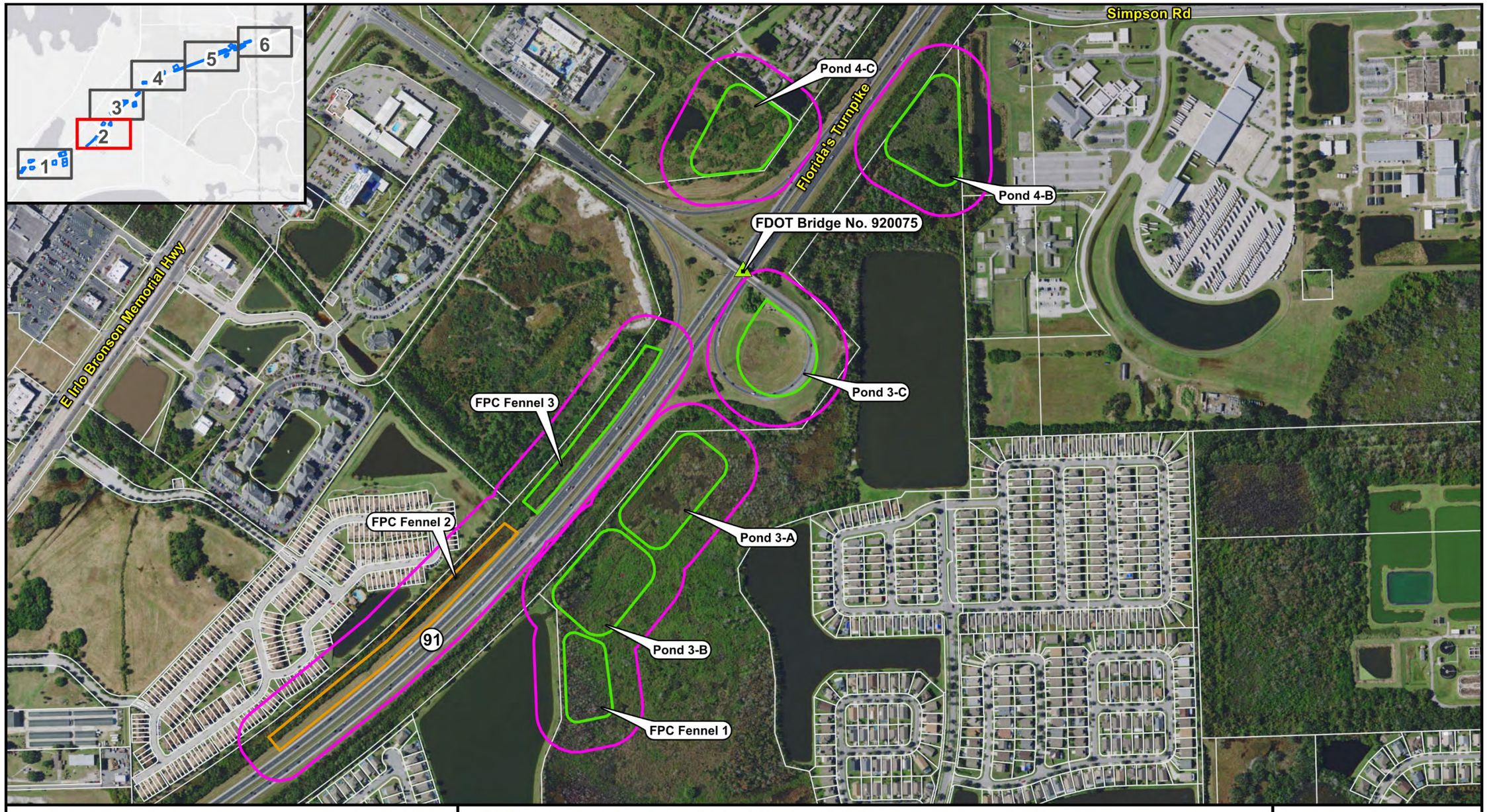


Pond and FPC Study Area with Previously Recorded Resources, Potential Unrecorded Resources and Archaeological Site Probability (Map 1 of 6)

- Archaeological Study Area (Moderate Site Potential)
- Archaeological Study Area (Low Site Potential)
- Historic Resource Study Area
- Previously Recorded Historic Site
- Previously Recorded Historic Structure
- Unrecorded Historic Bridge
- Parcel with Historic AYRB Date

Osceola County

0 500 Feet



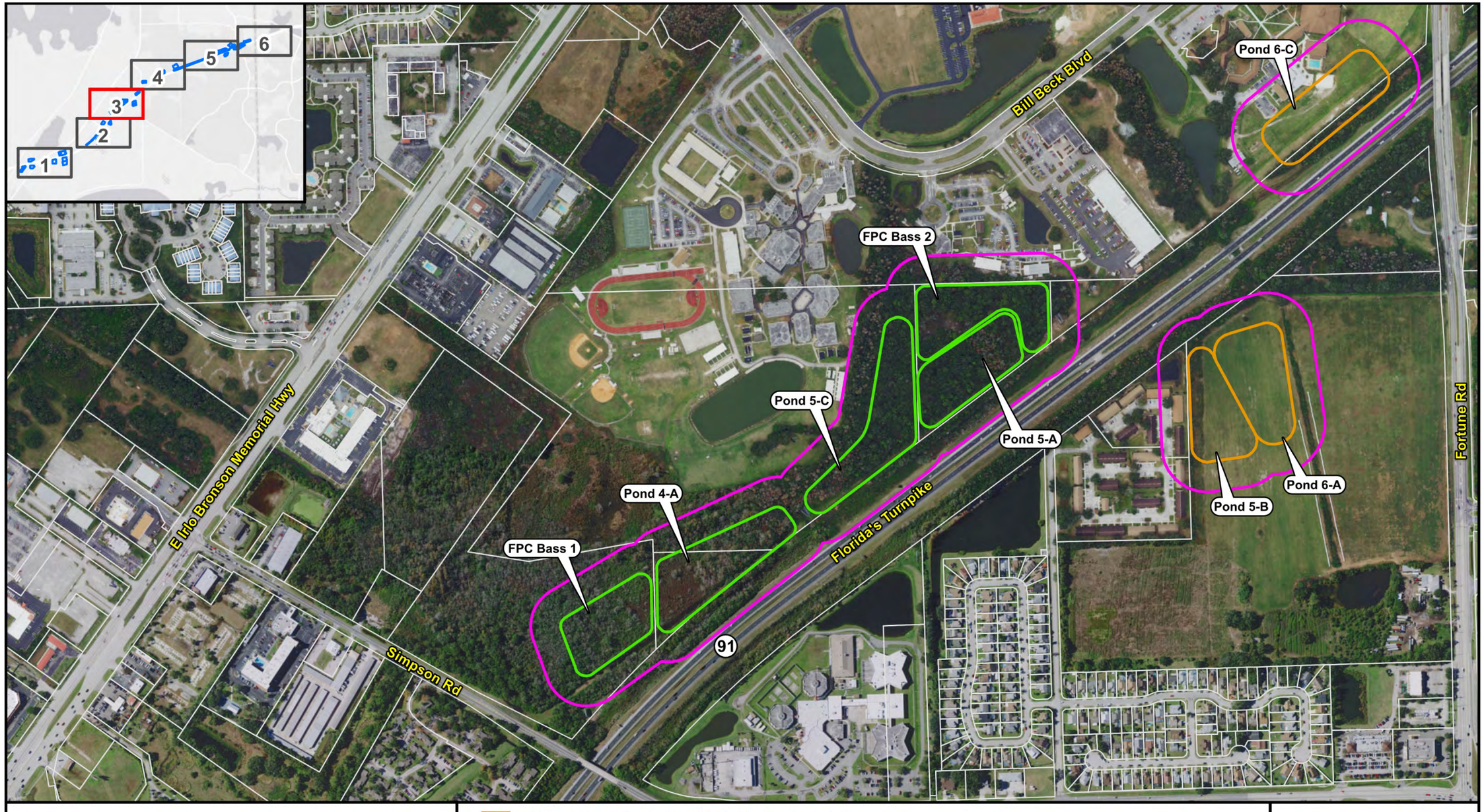
Pond and FPC Study Area with Previously Recorded Resources, Potential Unrecorded Resources and Archaeological Site Probability
(Map 2 of 6)

- Archaeological Study Area (Moderate Site Potential)
- Archaeological Study Area (Low Site Potential)
- Historic Resource Study Area
- Previously Recorded Historic Site
- Previously Recorded Historic Structure
- Unrecorded Historic Bridge
- Parcel with Historic AYRB Date

Osceola County

N

0 500 Feet

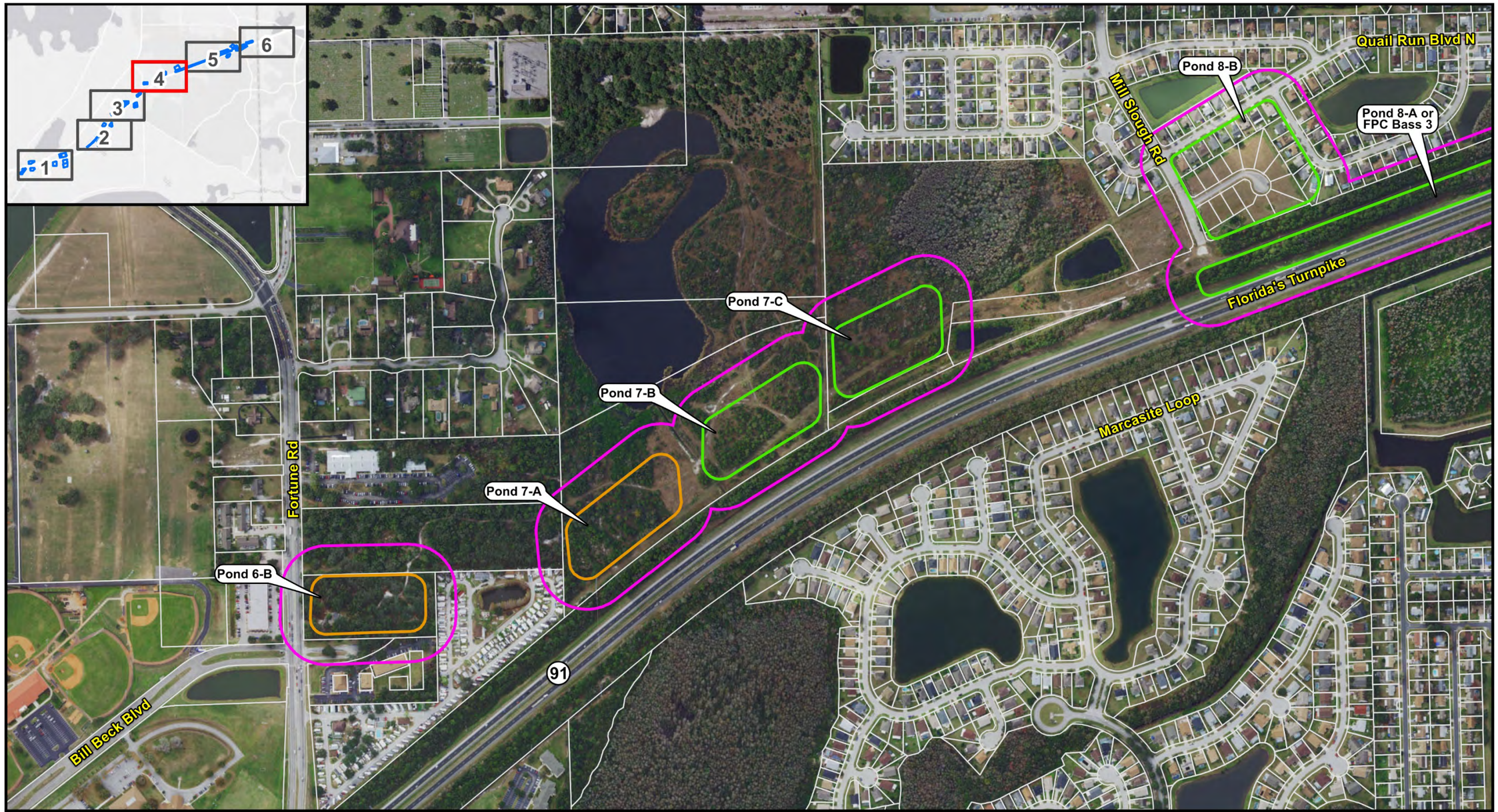


Pond and FPC Study Area with Previously Recorded Resources, Potential Unrecorded Resources and Archaeological Site Probability
(Map 3 of 6)

- Archaeological Study Area (Moderate Site Potential)
- Archaeological Study Area (Low Site Potential)
- Historic Resource Study Area
- Previously Recorded Historic Site
- Previously Recorded Historic Structure
- Unrecorded Historic Bridge
- Parcel with Historic AYRB Date

Osceola County

Feet
0 500

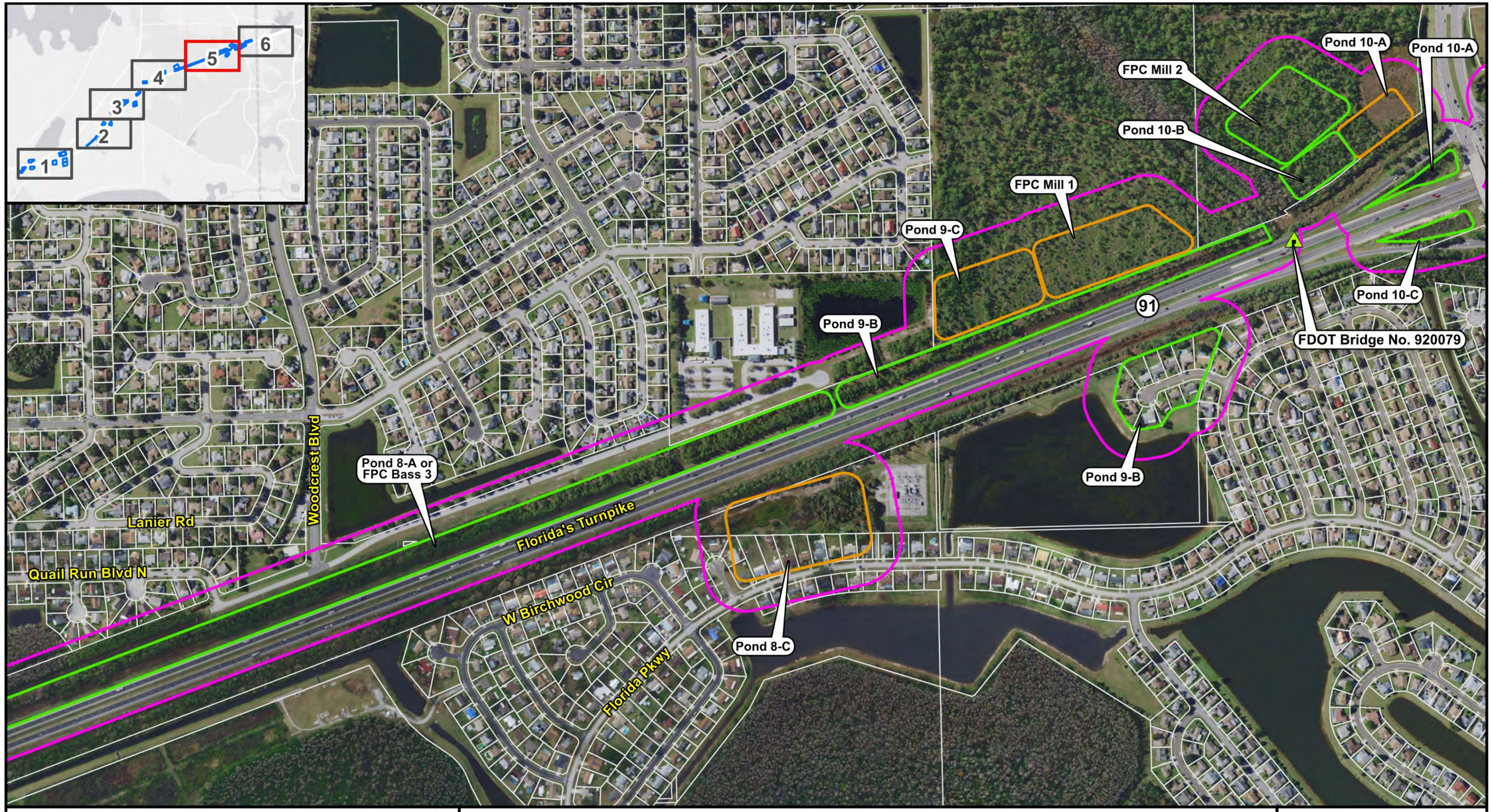


Pond and FPC Study Area with Previously Recorded Resources, Potential Unrecorded Resources and Archaeological Site Probability
(Map 4 of 6)

- Archaeological Study Area (Moderate Site Potential)
- Archaeological Study Area (Low Site Potential)
- Historic Resource Study Area
- Previously Recorded Historic Site
- Previously Recorded Historic Structure
- Unrecorded Historic Bridge
- Parcel with Historic AYRB Date

Osceola County

0 500 Feet

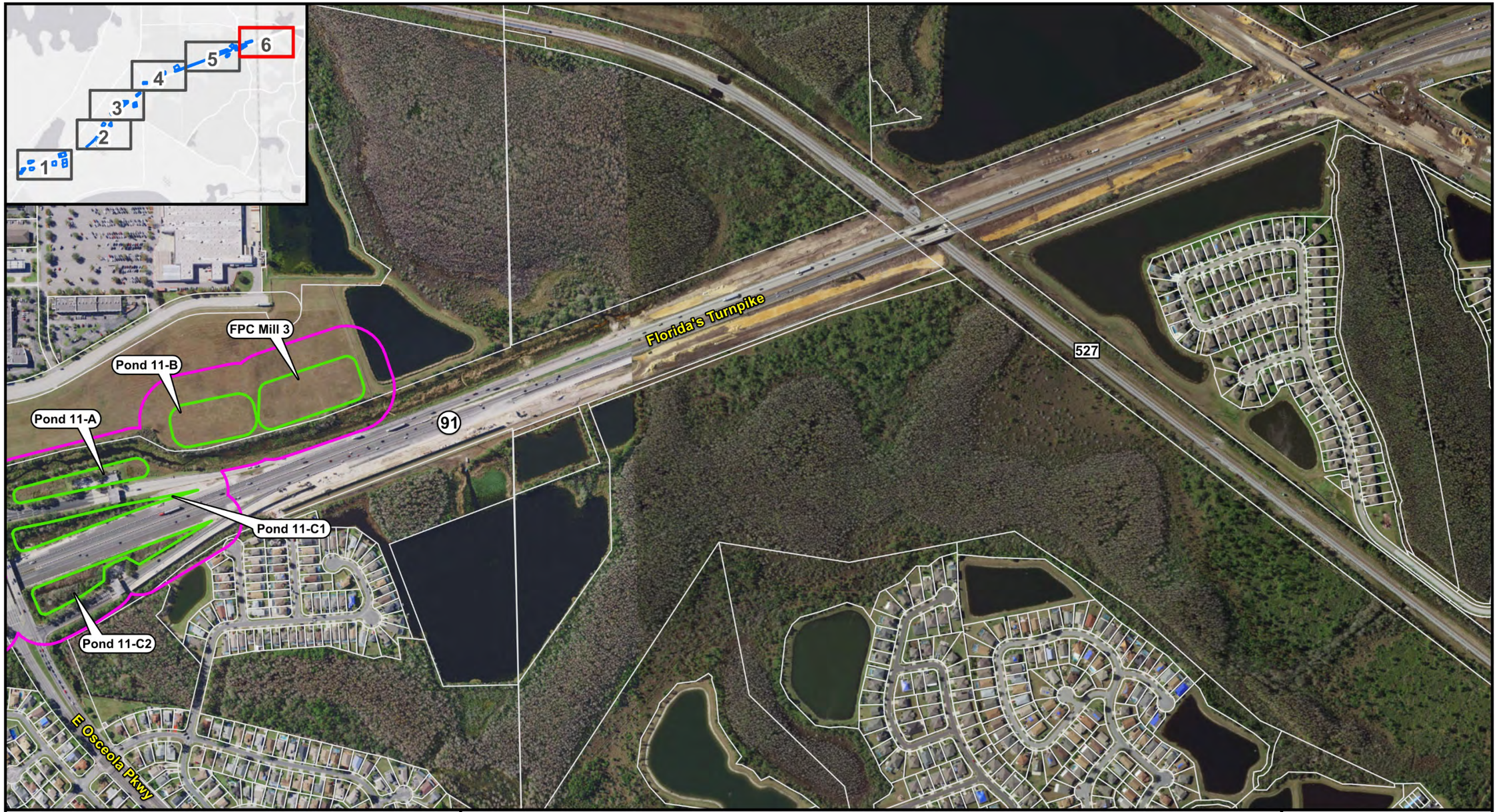


Pond and FPC Study Area with Previously Recorded Resources, Potential Unrecorded Resources and Archaeological Site Probability
(Map 5 of 6)

- Archaeological Study Area (Moderate Site Potential)
- Archaeological Study Area (Low Site Potential)
- Historic Resource Study Area
- Previously Recorded Historic Site
- Previously Recorded Historic Structure
- Unrecorded Historic Bridge
- Parcel with Historic AYRB Date

Osceola County

0 500 Feet



Pond and FPC Study Area with Previously Recorded Resources, Potential Unrecorded Resources and Archaeological Site Probability
(Map 6 of 6)

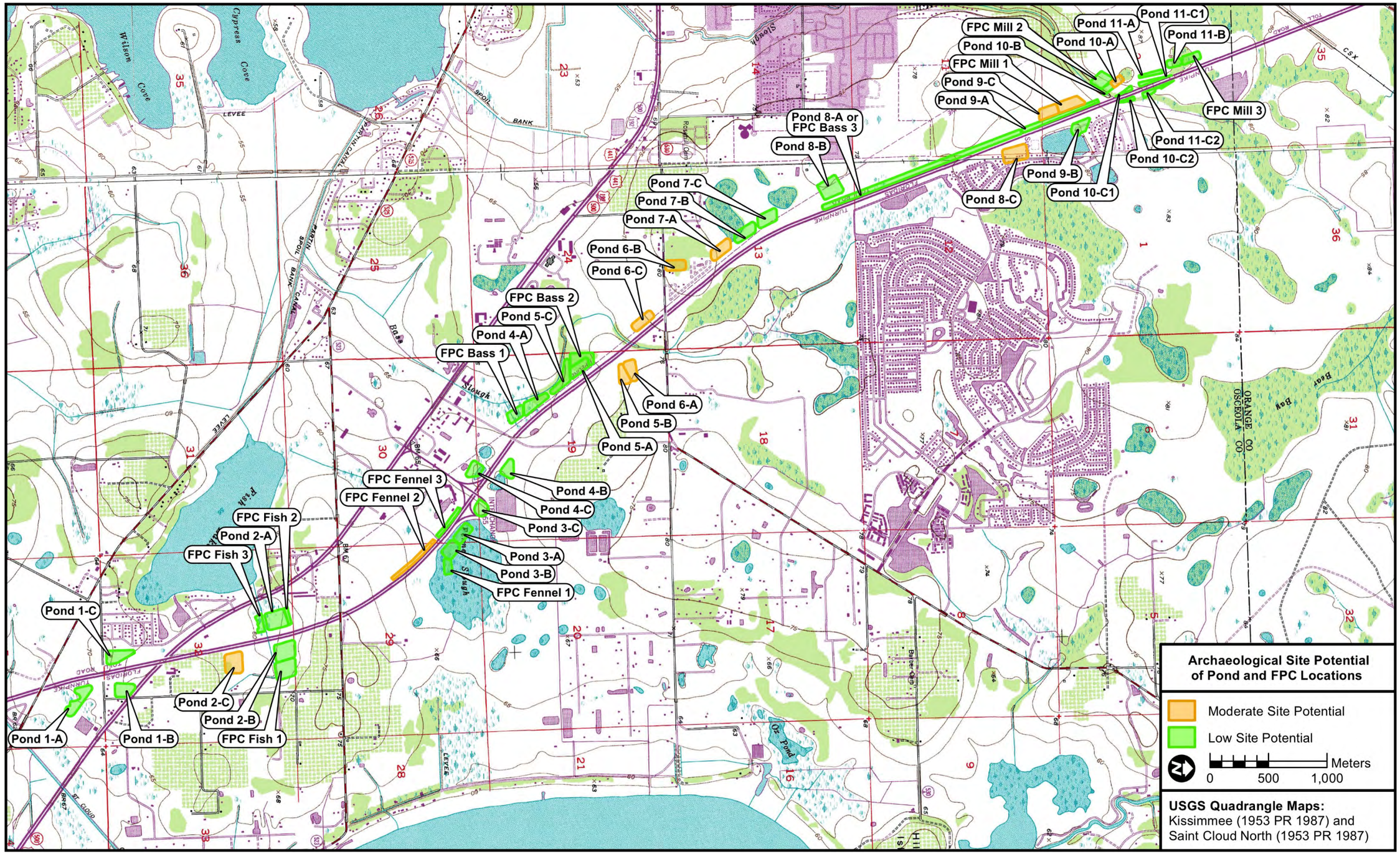
- Archaeological Study Area (Moderate Site Potential)
- Archaeological Study Area (Low Site Potential)
- Historic Resource Study Area
- Previously Recorded Historic Site
- Previously Recorded Historic Structure
- Unrecorded Historic Bridge
- Parcel with Historic AYRB Date

Osceola County

Feet
0 500

Attachment 3:

Archaeological Site Potential of Pond and FPC Locations


Archaeological Site Potential of Pond and FPC Locations
Moderate Site Potential
Low Site Potential
Meters
0
500
1,000
USGS Quadrangle Maps:
Kissimmee (1953 PR 1987) and
Saint Cloud North (1953 PR 1987)
FPC Mill 2
Pond 11-A
Pond 11-C1
Pond 11-B
Pond 10-B
Pond 10-A
FPC Mill 1
Pond 9-C
Pond 9-A
FPC Mill 3
Pond 8-A or FPC Bass 3
Pond 8-B
Pond 11-C2
Pond 10-C2
Pond 9-B
Pond 10-C1
Pond 8-C
Pond 7-C
Pond 7-B
Pond 7-A
Pond 6-B
Pond 6-C
FPC Bass 2
Pond 5-C
Pond 4-A
FPC Bass 1
Pond 6-A
Pond 5-B
Pond 5-A
FPC Fennel 3
FPC Fennel 2
Pond 4-B
Pond 4-C
Pond 3-C
FPC Fish 2
Pond 2-A
FPC Fish 3
Pond 3-A
Pond 3-B
FPC Fennel 1
Pond 1-C
Pond 2-C
Pond 2-B
Pond 1-A
Pond 1-B
FPC Fish 1
Wilson Cove
Cypress Cove
Slough
Bear Bay
ORANGE CO
OSCEOLA CO
Ox Pond
Fish Slough
Fennel Slough
Bass Slough
LEVEE
SPOIL BANK
PARTIN CANAL
FLORIDAS TURNPIKE
TOLL ROAD
ST CLOUD

RON DESANTIS
GOVERNOR

Florida Department of Transportation
Florida's Turnpike Enterprise
P.O. Box 613069, Ocoee, FL 34761
407-532-3999

KEVIN THIBAULT, P.E.
SECRETARY

MEMORANDUM

TO:	Snehal Ambare, P.E.		
CC:	Karen Schaack; Nicole Sorg; Henry Ellis; Chad Marcus; Jorge Moreno; Tyler McConnell		
FROM:	Barbara Strouse		
SUBJECT:	STATE ROAD:	91	
	FPID:	436194-1	
	COUNTY:	Osceola	
	DESCRIPTION:	Widen TPK US 192/441 to Osceola Pkwy	
	COMMON NAME:	US 192(441) to Osceola Pkwy	
DATE:	August 28, 2020	ESTIMATE ID:	2021-003

Below are the cost estimate totals for 436194-1 US 192(441) to Osceola Pkwy, prepared by Nick Chop with CBRE, developed in accordance with the Florida Department of Transportation's Guidance Document 2 (Right of Way Cost Estimates). **The totals are cost estimates and not appraisals.** All multipliers and factors employed were developed in conjunction with other districts and FTE Right of Way personnel. **The priority pond alternate totals are included on page 2, as requested by the EOR.**

SUMMARY OF COSTS

Priority Pond Alternates	See page 2

The cost estimates have confidence levels C; indicating Below-Average confidence.

Please contact me if you have any questions.

Attachments:
ROW Pond Alternate Totals (page 2)

Priority Pond Alternates

Pond	ROW Pond Total
1-A	$2,728,334
2-C	$3,049,257
Fish 4	$722,834
2D - P1	$933,043
2D - P2	$828,036
Bass 2	$720,762
5A	$1,136,073
6A	$2,422,477
7A	$2,130,800
7B	$1,763,990
Mill 1	$934,131
9-C	$1,042,898

MEMORANDUM

TO:	Snehal Ambare, P.E.		
CC:	Karen Schaack; Nicole Sorg; Henry Ellis; Chad Marcus; Jorge Moreno; Tyler McConnell		
FROM:	Barbara Strouse		
SUBJECT:	STATE ROAD:	91	
	FPID:	436194-1	
	COUNTY:	Osceola	
	DESCRIPTION:	Widen TPK US 192/441 to Osceola Pkwy	
	COMMON NAME:	US 192(441) to Osceola Pkwy	
DATE:	January 10, 2020	ESTIMATE ID:	2020-019

Below are the cost estimate totals for 436194-1 US 192(441) to Osceola Pkwy, prepared by Nick Chop with CBRE, developed in accordance with the Florida Department of Transportation's Guidance Document 2 (Right of Way Cost Estimates). **The totals are cost estimates and not appraisals.** All multipliers and factors employed were developed in conjunction with other districts and FTE Right of Way personnel. **The pond alternate totals are included on page 2. The FPC pond preference table on page 2 is based solely on the areas shown in the map and does not consider cost in any capacity as requested by the EOR.**

SUMMARY OF COSTS

Pond Alternates	See page 2

The cost estimates have confidence levels C; indicating Below-Average confidence.

Please contact me if you have any questions.

Attachments:
ROW Pond Alternate Totals (page 2)

Pond Alternates

Pond	ROW Pond Total
1-A	$2,165,234
1-B	$2,813,812
1-C	$1,477,396
2-A	$1,454,269
2-B	$1,508,959
2-C	$1,915,253
3-A	$195,006
3-B	$200,599
3-C	DOT Property
4-A	$212,904
4-B	$184,648
4-C	$3,130,282
5-A	$281,493
5-B	$895,415
5-C	$155,232
6-A	$1,445,357
6-B	$3,252,422
6-C	$1,184,913
7-A	$608,485
7-B	$610,971
7-C	$1,397,554
8-A	DOT Property
8-B	$8,887,661
8-C	$7,283,086
9-A	DOT Property
9-B	$6,173,358
9-C	$4,009,353
10-A	$1,603,349
10-B	$1,603,349
10-C	DOT Property
11-A	DOT Property
11-B	$2,245,040
11-C	DOT Property

FPC Ponds

	#1	#2	#3
Fish	FPC Fish 2	FPC Fish 3	FPC Fish 1
Fennel	FPC Fennel 1	No other FPC shown	No other FPC shown
Bass	FPC Bass 1	FPC Bass 2	No other FPC shown
Mill	FPC Mill 1 & 2		FPC Mill 3

Pond 1-A

Trim | Property Record Card | Tax Collector

Info | Values | Building | Land | XFOB | Sales

Parcel	26-25-29-3140-0033-0010
Owner Name	MARSHALL BARBARA PARTIN PICKERING JANIE PARTIN; CHESNUT LUCINDA PARTIN; FALLON LIDA PARTIN; FENDER DIANE PARTIN; PARTIN FAMILY PROPERTIES LLC; PARTIN DAVID EARL
Mailing Address	5601 N CANOE CREEK RD KENANSVILLE, FL 34739
Physical Address	E IRLO BRONSON MEM HWY, KISSIMMEE FL 34744
Property Type	PASTURELAND 1-VAC
Tax District	300 - OSCEOLA COUNTY
Acres	28.88
Desc.	FLA DRAINLAND CO SUB 1 PB B PG 65 BLK 33 LOTS 1-6, S OF HWY 441 LESS



Identify

Pond 1-B

Trim | Property Record Card | Tax Collector

Info | Values | Building | Land | XFOB | Sales

Parcel	32-25-30-0000-0225-0000
Owner Name	RAMNARINE BICKRAM RAMNARINE SYAM
Mailing Address	7901 FAIRWAY BLVD MIRAMAR, FL 33023-6417
Physical Address	2790 E IRLO BRONSON MEM HWY, KISSIMMEE FL 34744
Property Type	VACANT COMMERCIAL
Tax District	300 - OSCEOLA COUNTY
Acres	4.74
Desc.	THAT PT OF SW 1/4 OF SE 1/4 LYING SW OF HWY 441 & E OF SUNSHINE PKWY LESS S 208.7 FT OF E 417.4 ...



Pond 1-C



32-25-30-0000-0220-0000 11/02/2007

Trim | Property Record Card | Tax Collector

Info | Values | Building | Land | XFOB | Sales

Parcel	32-25-30-0000-0220-0000
Owner Name	ELLIS GREGORY L ELLIS SANDRA
Mailing Address	2721 AMES HAVEN RD KISSIMMEE, FL 34744-6204
Physical Address	2721 AMES HAVEN RD, KISSIMMEE FL 34744
Property Type	SINGLE FAMILY-IMPROVED
Tax District	300 - OSCEOLA COUNTY
Acres	5.548
Desc.	THAT PT OF SW 1/4 OF SE 1/4 LYING W OF SUNSHINE PKWY LESS COM AT S 1/4 COR, E 413.47 FT TO WLY R ...



Pond 2-A



Trim | Property Record Card | Tax Collector

Info | Values | Building | Land | XFOB | Sales

Parcel	29-25-30-4653-0001-0030
Owner Name	OSCEOLA COUNTY
Mailing Address	1 COURTHOUSE SQ STE 2100 KISSIMMEE, FL 34741-5440
Physical Address	2601 E IRLO BRONSON MEM HWY, KISSIMMEE FL 34744
Property Type	COUNTY-IMP
Tax District	300 - OSCEOLA COUNTY
Acres	26.738
Desc.	OSCEOLA COUNTY COMPLEX PB 21 PG 88 LOT 3

Pond 2-B

Trim | Property Record Card | Tax Collector

Info | Values | Building | Land | XFOB | Sales

Parcel	32-25-30-0000-0016-0000
Owner Name	LUZVIMIN D GARZON LIVING TRUST GARZON LUZVIMIN D TR
Mailing Address	870 SALISBURY PARK DR WESTBURY, NY 11590
Physical Address	SIMMONS RD, KISSIMMEE FL 34744
Property Type	PASTURELAND 1-VAC
Tax District	300 - OSCEOLA COUNTY
Acres	28.93
Desc.	N 900.3 FT OF NW 1/4 OF NE 1/4 & N 900.3 FT OF NE 1/4 OF NW 1/4 LYING ELY OF FLA TURNPIKE SUBJ T ...



Pond 2-C

Trim | Property Record Card | Tax Collector

Info | Values | Building | Land | XFOB | Sales

Parcel	32-25-30-0000-0080-0000
Owner Name	RALPH & JOYCE WRIGHT FAMILY TR WRIGHT RALPH CO-TR; WRIGHT NELLIE JOYCE CO-TR
Mailing Address	1348 SIMMONS RD KISSIMMEE, FL 34744
Physical Address	1350 SIMMONS RD, KISSIMMEE FL 34744
Property Type	PASTURELAND 1-IMP
Tax District	300 - OSCEOLA COUNTY
Acres	14.62
Desc.	BEG AT SE COR OF SW 1/4 OF NE 1/4, N 660.01 FT, S 89 DEG W 208.53 FT TO POB; S 89 DEG W 901 FT, ...

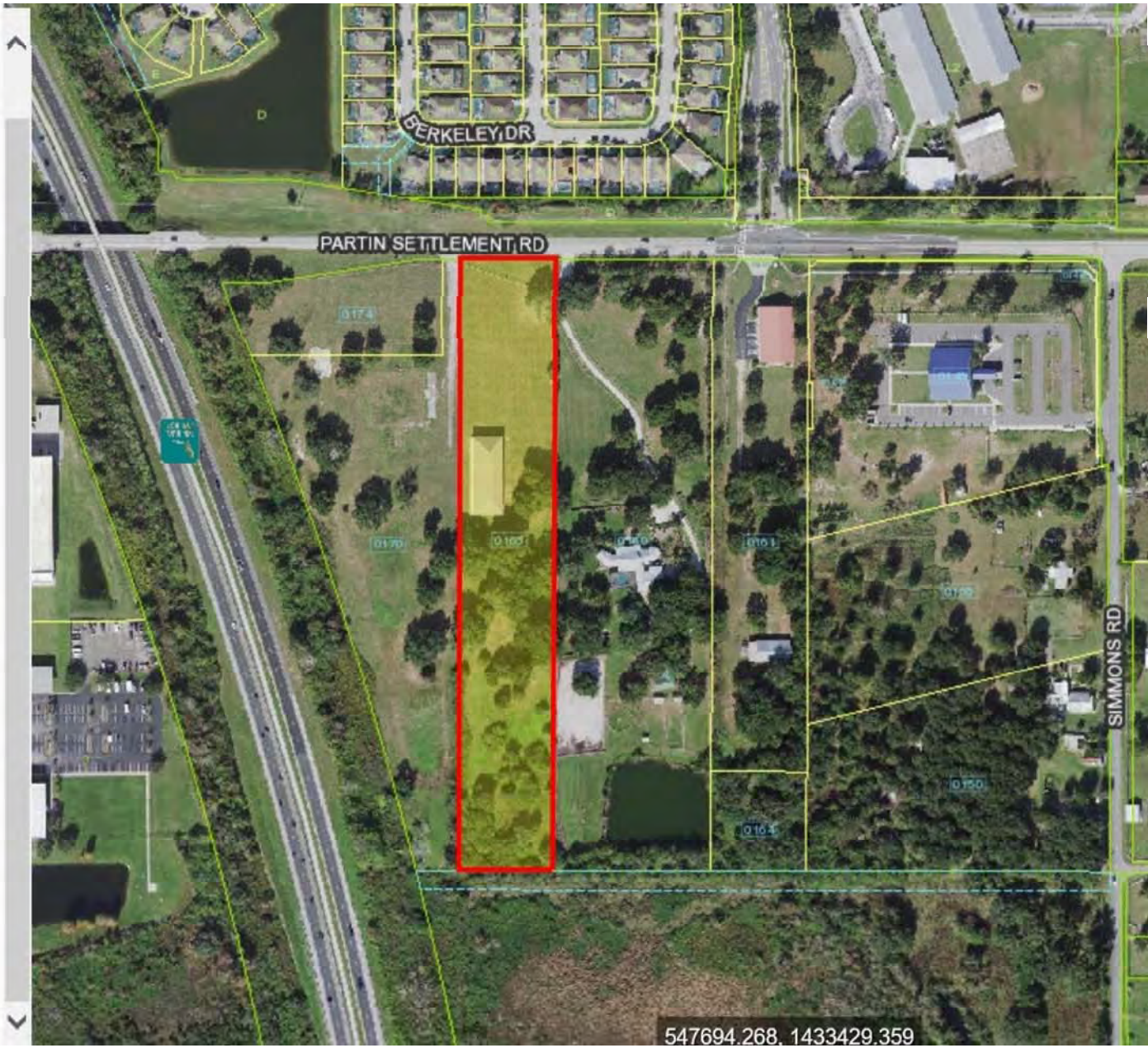


Pond 2-D (1 of 2)

TRIM Notice | Property Record Card
Tax Collector | **NEW – Bird's Eye View**

Info | Values | Building | Land | XFOB | Sales

Parcel	29-25-30-0000-0165-0000
Owner Name	OSCEOLA COUNTY
Mailing Address	ATTN CAROL PLATT KISSIMMEE, FL 34741
Physical Address	PARTIN SETTLEMENT RD, KISSIMMEE FL 34744
Property Type	COUNTY-IMP
Tax District	300 - OSCEOLA COUNTY
Acres	5.929
Desc.	COM AT NE COR OF W 1/2 OF SW 1/4 OF SE 1/4, S 30 FT, W 533.95 FT TO POB; S 1303.32 FT TO S/L OF ...

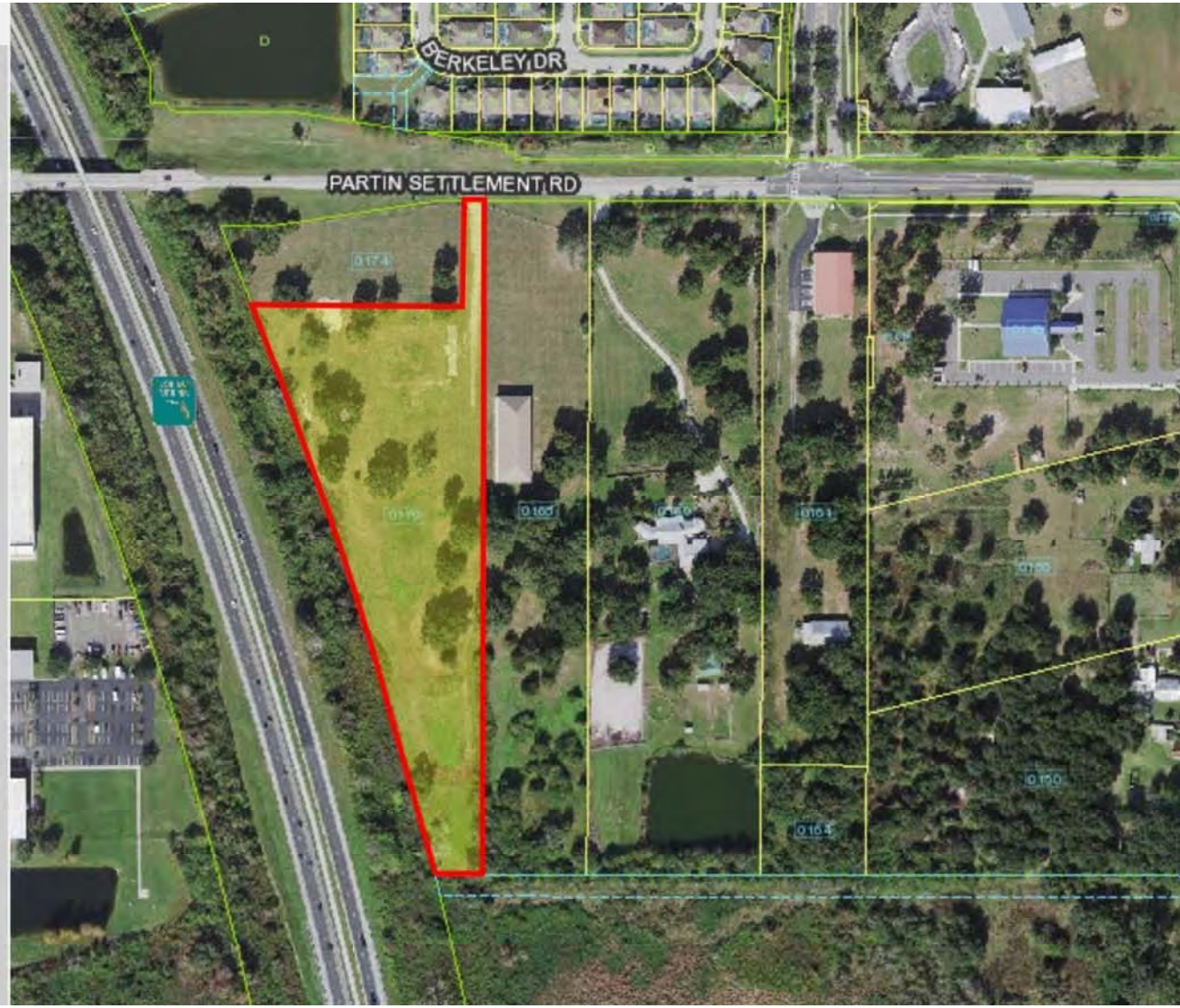


Pond 2-D (2 of 2)

TRIM Notice | Property Record Card
Tax Collector | **NEW – Bird's Eye View**

Info | Values | Building | Land | XFOB | Sales

Parcel	29-25-30-0000-0170-0000
Owner Name	OSCEOLA COUNTY
Mailing Address	ATTN CAROL PLATT KISSIMMEE, FL 34741
Physical Address	2700 PARTIN SETTLEMENT RD, KISSIMMEE FL 34744
Property Type	COUNTY-VAC
Tax District	300 - OSCEOLA COUNTY
Acres	6.546
Desc.	COM AT SE COR OF SE 1/4 OF SW 1/4



Ponds 3-A & 3-B

Trim | Property Record Card | Tax Collector

Info | Values | Building | Land | XFOB | Sales

Parcel	20-25-30-4814-0001-00H0
Owner Name	REMINGTON CDD
Mailing Address	135 W CENTRAL BLVD STE 320 ORLANDO, FL 32801
Physical Address	REMINGTON BLVD, KISSIMMEE FL 34744
Property Type	NO AG ACREAGE-VAC
Tax District	361 - REMINGTON
Acres	92.303
Desc.	REMINGTON PH 1 PB 8 PG 121-124 TRACT H

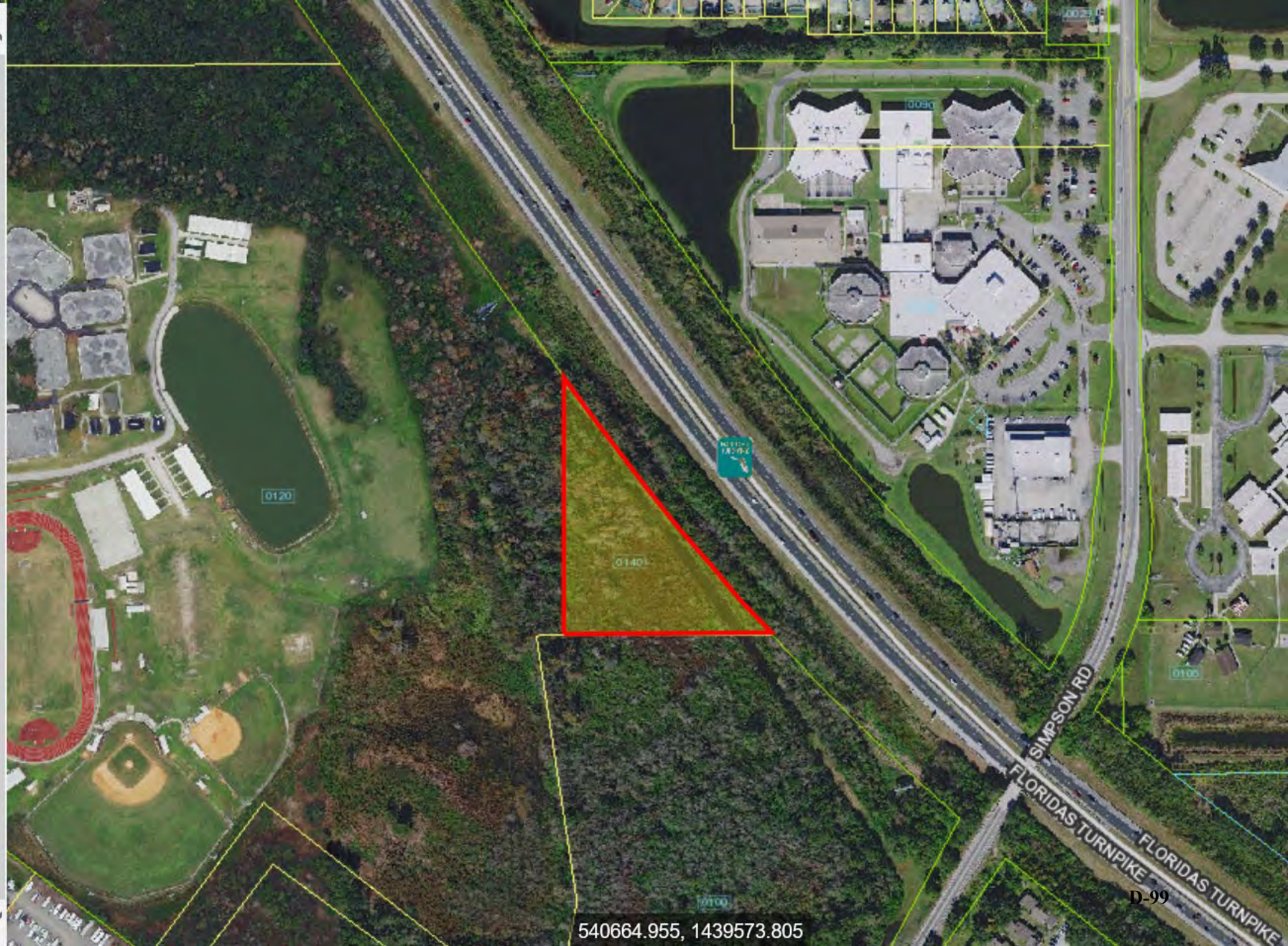


Pond 4-A

Trim | Property Record Card | Tax Collector

Info | Values | Building | Land | XFOB | Sales

Parcel	19-25-30-0000-0140-0000
Owner Name	OSCEOLA COUNTY
Mailing Address	1 COURTHOUSE SQ STE 2100 KISSIMMEE, FL 34741-5440
Physical Address	PANTHER PAWS TRL, KISSIMMEE FL 34744
Property Type	COUNTY-VAC
Tax District	300 - OSCEOLA COUNTY
Acres	3.204
Desc.	THAT PORTION OF NE 1/4 OF SW 1/4 LYING S & W OF SUNSHINE ST PKWY



Pond 4-B

Trim | Property Record Card | Tax Collector

Info | Values | Building | Land | XFOB | Sales

Parcel	20-25-30-4814-0001-00H0
Owner Name	REMINGTON CDD
Mailing Address	135 W CENTRAL BLVD STE 320 ORLANDO, FL 32801
Physical Address	REMINGTON BLVD, KISSIMMEE FL 34744
Property Type	NO AG ACREAGE-VAC
Tax District	361 - REMINGTON
Acres	92.303
Desc.	REMINGTON PH 1 PB 8 PG 121-124 TRACT H



Pond 4-C

Trim | Property Record Card | Tax Collector

Info | Values | Building | Land | XFOB | Sales

Parcel	30-25-30-4960-0001-0020
Owner Name	PARADISE 225 LLC
Mailing Address	1111 KANE CONCOURSE UNIT 217 BAY HARBOR ISLANDS, FL 33154
Physical Address	2259 E IRLO BRONSON MEM HWY, KISSIMMEE FL 34744
Property Type	VACANT COMMERCIAL
Tax District	300 - OSCEOLA COUNTY
Acres	14.07
Desc.	SHADY DEAL SUB PB 2 PG 23 LOT 2 LESS BEG N36-43E 50 FT OF NE COR LOT 2, N36-43E 60 FT, N53-15W 2 ...

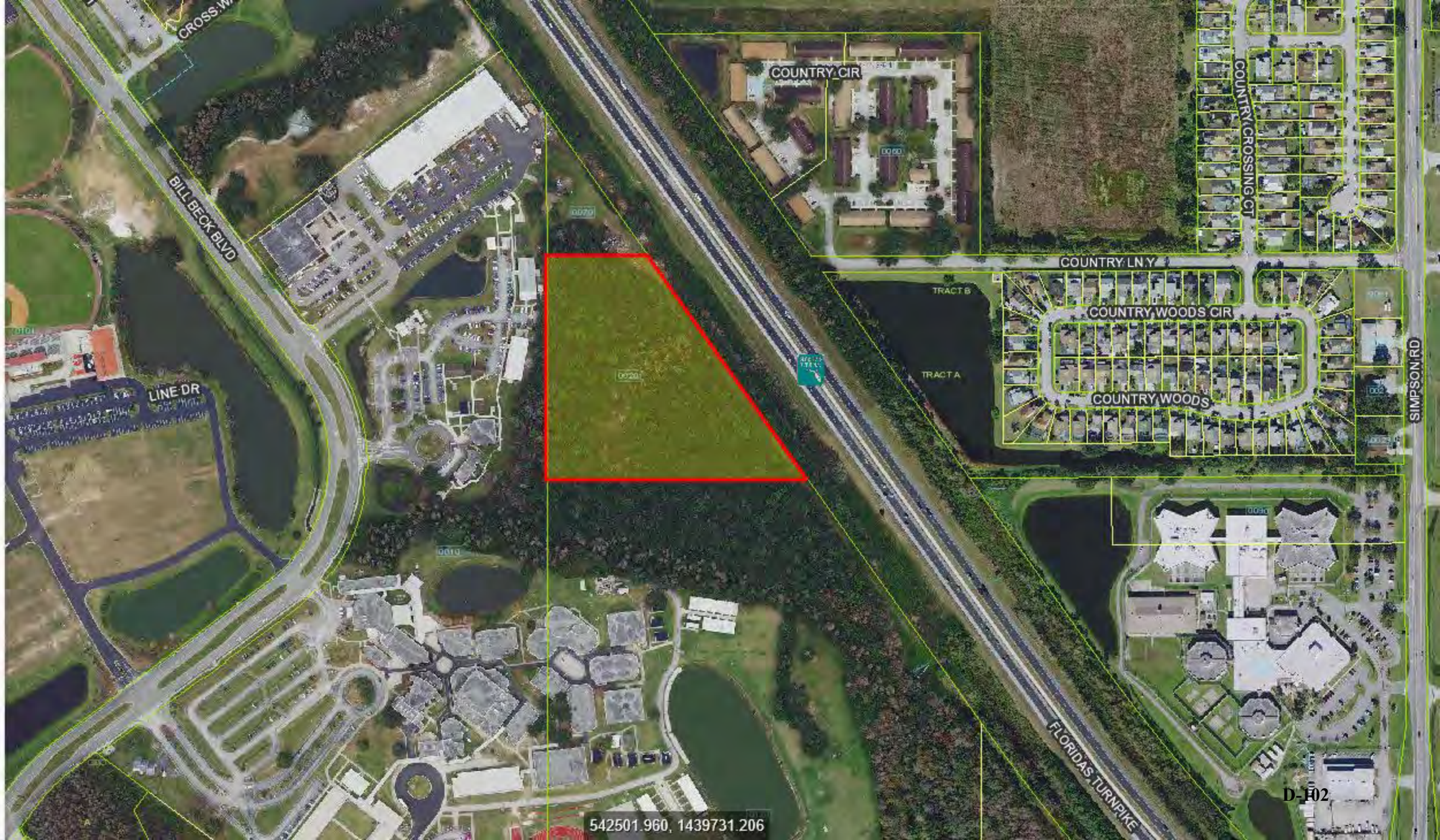


Pond 5-A

Trim | Property Record Card | Tax Collector

Info | Values | Building | Land | XFOB | Sales

Parcel	19-25-30-0000-0020-0000
Owner Name	SCHOOL DIST OF OSCEOLA CO THE
Mailing Address	C/O ADM CPLX FACILITIES PLANNING KISSIMMEE, FL 34744-4492
Physical Address	BILL BECK BLVD, KISSIMMEE FL 34744
Property Type	PUBLIC SCH-VAC
Tax District	300 - OSCEOLA COUNTY
Acres	8.495
Desc.	S 1/2 OF SW 1/4 OF NW 1/4 LYING W OF SUNSHINE ST PKY



Pond 5-C

Trim | Property Record Card | Tax Collector

Info | Values | Building | Land | XFOB | Sales

Parcel	19-25-30-0000-0120-0000
Owner Name	SCHOOL DIST OF OSCEOLA CO THE
Mailing Address	C/O GHS SITE FACILITIES PLANNING KISSIMMEE, FL 34744-4492
Physical Address	PANTHER PAWS TRL, KISSIMMEE FL 34744
Property Type	PUBLIC SCH-VAC
Tax District	300 - OSCEOLA COUNTY
Acres	54.732
Desc.	BEG SW COOR SEC 19, RUN N 89 DEG E 13.35 FT TO NLY R/W LINE SR 441, N 53 DEG W 100 FT, N 37 DEG ...



Pond 6-A



Trim | Property Record Card | Tax Collector

Info | Values | Building | Land | XFOB | Sales

Parcel	19-25-30-00U0-0050-0000
Owner Name	ORTEKA PARTNERS GROUP LLC
Mailing Address	4901 VINELAND RD STE 270 ORLANDO, FL 32811
Physical Address	2220 FORTUNE RD, KISSIMMEE FL 34744
Property Type	PASTURELAND 1-IMP
Tax District	200 - KISSIMMEE
Acres	66.02
Desc.	N 1/2 OF NW 1/4 & NW 1/4 OF SE 1/4 OF NW 1/4 LESS SE 1/4 OF NE 1/4 OF NW 1/4 & LESS RD R/W & LES ...



Identify

Pond 6-B



Trim | Property Record Card | Tax Collector

Info | Values | Building | Land | XFOB | Sales

Parcel	13-25-29-0000-0125-0000
Owner Name	KISSIMMEE LAND HOLDINGS LLC
Mailing Address	645 5TH AVE 21ST FLOOR NEW YORK, NY 10022
Physical Address	1931 FORTUNE RD, KISSIMMEE FL 34744
Property Type	MISCELLANEOUS-IMPROVED
Tax District	300 - OSCEOLA COUNTY
Acres	4.831
Desc.	W 1/2 OF S 700FT OF W 650FT OF S 1/2 OF SE 1/4 LESS R/W

Pond 6-C



Trim | Property Record Card | Tax Collector

Info | Values | Building | Land | XFOB | Sales

Parcel	24-25-29-0000-0015-0000
Owner Name	JOHNSON UNIVERSITY INC
Mailing Address	1011 BILL BECK BLVD KISSIMMEE, FL 34744
Physical Address	1011 BILL BECK BLVD, KISSIMMEE FL 34744
Property Type	COLLEGES-IMP
Tax District	300 - OSCEOLA COUNTY
Acres	40.776
Desc.	FROM NW COR OF NE 1/4, S 40 FT TO S R/W FL 530, N 89 DEG E 556.82 FT, S 10 FT, S 86 DEG E 123.53 ...



dentify

Ponds 7-A 7-B

Trim | Property Record Card | Tax Collector

Info | Values | Building | Land | XFOB | Sales

Parcel	13-25-29-00U0-0050-0000
Owner Name	KISSIMMEE LAND HOLDINGS LLC
Mailing Address	645 5TH AVE 21ST FLOOR NEW YORK, NY 10022
Physical Address	BOGGY CREEK RD, KISSIMMEE FL 34744
Property Type	NO AG ACREAGE-VAC
Tax District	200 - KISSIMMEE
Acres	22.741
Desc.	THAT PART OF NE 1/4 OF SW 1/4 & THAT PART OF NW 1/4 OF SE 1/4 LYING S & W OF SUNSHINE PKY LESS T ...



Pond 7-C

Trim | Property Record Card | Tax Collector

fo | Values | Building | Land | XFOB | Sales

rcel	13-25-29-00U0-0012-0000
wner Name	PUERTA DEL SOL REAL ESTATES LLC
iling Address	4649 PONCE DE LEON BLVD STE 404 CORAL GABLES, FL 33146
ysical dress	MILL SLOUGH RD, KISSIMMEE FL 34744
operty Type	NO AG ACREAGE-VAC
x District	200 - KISSIMMEE
res	30.95
sc.	COM AT NW COR OF SEC, S1362.73FT E 687.01 FT TO POB; N 60 DEG E 322.37 FT, N 30 DEG W 839.17 FT ...



Pond 8B

Trim | Property Record Card | Tax Collector

Info | Values | Building | Land | XFOB | Sales

Parcel	13-25-29-2198-0001-0010
Owner Name	AMH DEVELOPMENT LLC
Mailing Address	30601 AGOURA RD STE 200 AGOURA HILLS, CA 91301
Physical Address	2450 IXORA CT, KISSIMMEE FL 34744
Property Type	VACANT
Tax District	200 - KISSIMMEE
Acres	0.208
Desc.	SUNBELT PH 1 PB 21 PG 66 LOT 1



Pond 8B

Trim | Property Record Card | Tax Collector

Info | Values | Building | Land | XFOB | Sales

Parcel	13-25-29-2198-0001-0020
Owner Name	AMH DEVELOPMENT LLC
Mailing Address	30601 AGOURA RD STE 200 AGOURA HILLS, CA 91301
Physical Address	2454 IXORA CT, KISSIMMEE FL 34744
Property Type	VACANT
Tax District	200 - KISSIMMEE
Acres	0.207
Desc.	SUNBELT PH 1 PB 21 PG 66 LOT 2



Pond 8B

Trim | Property Record Card | Tax Collector

Info | Values | Building | Land | XFOB | Sales

Parcel	13-25-29-2198-0001-0030
Owner Name	AMH DEVELOPMENT LLC
Mailing Address	30601 AGOURA RD STE 200 AGOURA HILLS, CA 91301
Physical Address	2458 IXORA CT, KISSIMMEE FL 34744
Property Type	VACANT
Tax District	200 - KISSIMMEE
Acres	0.207
Desc.	SUNBELT PH 1 PB 21 PG 66 LOT 3



Pond 8B

Trim | Property Record Card | Tax Collector

Info | Values | Building | Land | XFOB | Sales

Parcel	13-25-29-2198-0001-0040
Owner Name	AMH DEVELOPMENT LLC
Mailing Address	30601 AGOURA RD STE 200 AGOURA HILLS, CA 91301
Physical Address	2462 IXORA CT, KISSIMMEE FL 34744
Property Type	VACANT
Tax District	200 - KISSIMMEE
Acres	0.223
Desc.	SUNBELT PH 1 PB 21 PG 66 LOT 4

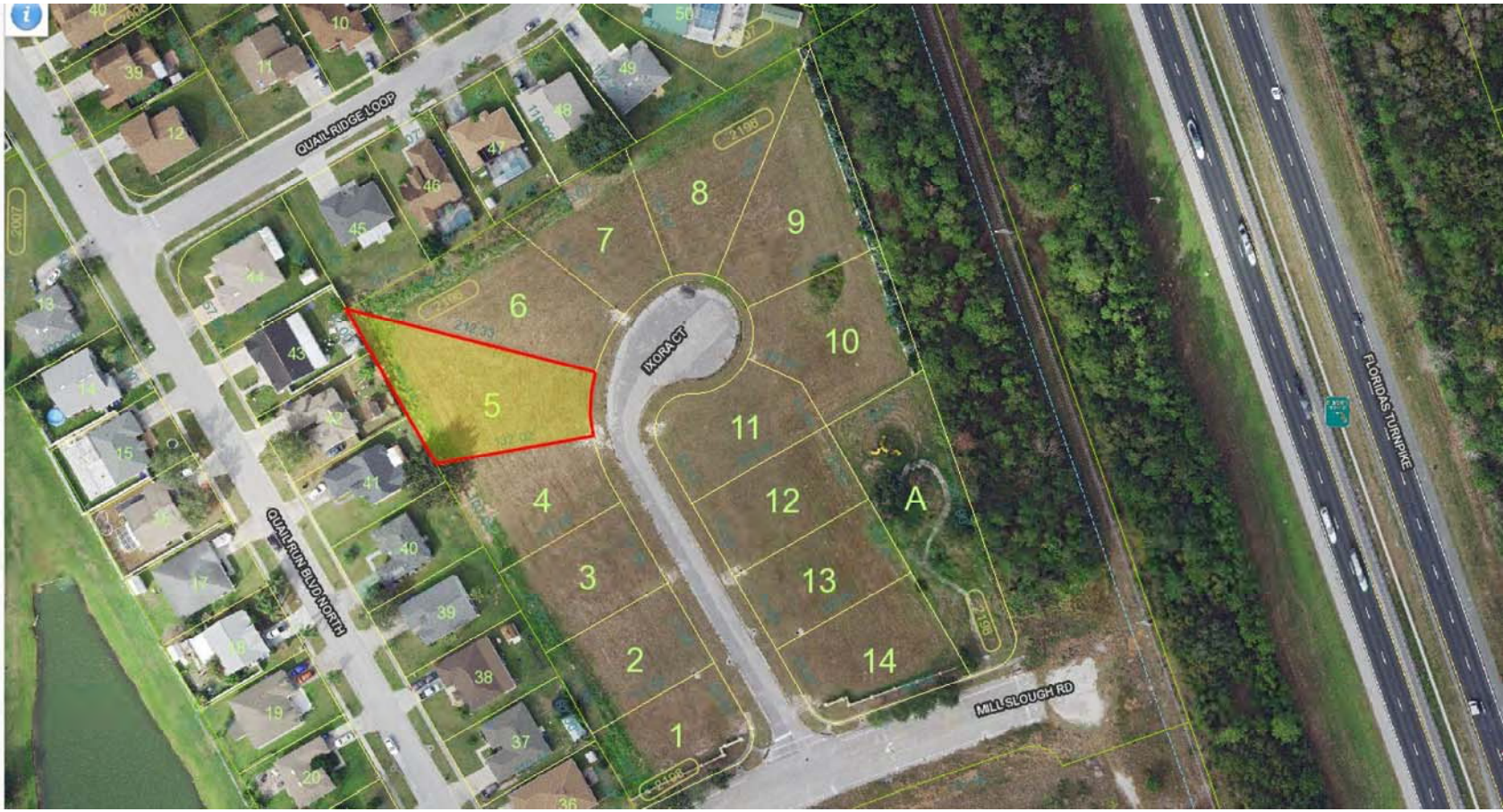


Pond 8B

Trim | Property Record Card | Tax Collector

Info | Values | Building | Land | XFOB | Sales

Parcel	13-25-29-2198-0001-0050
Owner Name	AMH DEVELOPMENT LLC
Mailing Address	30601 AGOURA RD STE 200 AGOURA HILLS, CA 91301
Physical Address	2466 IXORA CT, KISSIMMEE FL 34744
Property Type	VACANT
Tax District	200 - KISSIMMEE
Acres	0.336
Desc.	SUNBELT PH 1 PB 21 PG 66 LOT 5



Basin 8B

Trim | Property Record Card | Tax Collector

Info | Values | Building | Land | XFOB | Sales

Parcel	13-25-29-2198-0001-0060
Owner Name	AMH DEVELOPMENT LLC
Mailing Address	30601 AGOURA RD STE 200 AGOURA HILLS, CA 91301
Physical Address	2470 IXORA CT, KISSIMMEE FL 34744
Property Type	VACANT
Tax District	200 - KISSIMMEE
Acres	0.328
Desc.	SUNBELT PH 1 PB 21 PG 66 LOT 6



Pond 8B

Trim | Property Record Card | Tax Collector

Info | Values | Building | Land | XFOB | Sales

Parcel	13-25-29-2198-0001-0070
Owner Name	AMH DEVELOPMENT LLC
Mailing Address	30601 AGOURA RD STE 200 AGOURA HILLS, CA 91301
Physical Address	2474 IXORA CT, KISSIMMEE FL 34744
Property Type	VACANT
Tax District	200 - KISSIMMEE
Acres	0.22
Desc.	SUNBELT PH 1 PB 21 PG 66 LOT 7



Basin 8B

Trim | Property Record Card | Tax Collector

Info | Values | Building | Land | XFOB | Sales

Parcel	13-25-29-2198-0001-0080
Owner Name	AMH DEVELOPMENT LLC
Mailing Address	30601 AGOURA RD STE 200 AGOURA HILLS, CA 91301
Physical Address	2478 IXORA CT, KISSIMMEE FL 34744
Property Type	VACANT
Tax District	200 - KISSIMMEE
Acres	0.309
Desc.	SUNBELT PH 1 PB 21 PG 66 LOT 8



Basin 8B

Trim | Property Record Card | Tax Collector

Info | Values | Building | Land | XFOB | Sales

Parcel	13-25-29-2198-0001-0090
Owner Name	AMH DEVELOPMENT LLC
Mailing Address	30601 AGOURA RD STE 200 AGOURA HILLS, CA 91301
Physical Address	2482 IXORA CT, KISSIMMEE FL 34744
Property Type	VACANT
Tax District	200 - KISSIMMEE
Acres	0.318
Desc.	SUNBELT PH 1 PB 21 PG 66 LOT 9



Basin 8B

Trim | Property Record Card | Tax Collector

Info | Values | Building | Land | XFOB | Sales

Parcel	13-25-29-2198-0001-0100
Owner Name	AMH DEVELOPMENT LLC
Mailing Address	30601 AGOURA RD STE 200 AGOURA HILLS, CA 91301
Physical Address	2471 IXORA CT, KISSIMMEE FL 34744
Property Type	VACANT
Tax District	200 - KISSIMMEE
Acres	0.291
Desc.	SUNBELT PH 1 PB 21 PG 66 LOT 10



Basin 8B

Trim | Property Record Card | Tax Collector

Info | Values | Building | Land | XFOB | Sales

Parcel	13-25-29-2198-0001-0110
Owner Name	AMH DEVELOPMENT LLC
Mailing Address	30601 AGOURA RD STE 200 AGOURA HILLS, CA 91301
Physical Address	2463 IXORA CT, KISSIMMEE FL 34744
Property Type	VACANT
Tax District	200 - KISSIMMEE
Acres	0.216
Desc.	SUNBELT PH 1 PB 21 PG 66 LOT 11



Pond 8B

Trim | Property Record Card | Tax Collector

Info | Values | Building | Land | XFOB | Sales

Parcel	13-25-29-2198-0001-0120
Owner Name	AMH DEVELOPMENT LLC
Mailing Address	30601 AGOURA RD STE 200 AGOURA HILLS, CA 91301
Physical Address	2459 IXORA CT, KISSIMMEE FL 34744
Property Type	VACANT
Tax District	200 - KISSIMMEE
Acres	0.207
Desc.	SUNBELT PH 1 PB 21 PG 66 LOT 12



Basin 8B

Identify

Trim | Property Record Card | Tax Collector

Info | Values | Building | Land | XFOB | Sales

Parcel	13-25-29-2198-0001-0130
Owner Name	AMH DEVELOPMENT LLC
Mailing Address	30601 AGOURA RD STE 200 AGOURA HILLS, CA 91301
Physical Address	2455 IXORA CT, KISSIMMEE FL 34744
Property Type	VACANT
Tax District	200 - KISSIMMEE
Acres	0.207
Desc.	SUNBELT PH 1 PB 21 PG 66 LOT 13



Basin 8B

Trim | Property Record Card | Tax Collector

Info | Values | Building | Land | XFOB | Sales

Parcel	13-25-29-2198-0001-0140
Owner Name	AMH DEVELOPMENT LLC
Mailing Address	30601 AGOURA RD STE 200 AGOURA HILLS, CA 91301
Physical Address	2451 IXORA CT, KISSIMMEE FL 34744
Property Type	VACANT
Tax District	200 - KISSIMMEE
Acres	0.257
Desc.	SUNBELT PH 1 PB 21 PG 66 LOT 14

https://www.property-appraiser.org/



Basin 8B



Trim | Property Record Card | Tax Collector

Info | Values | Building | Land | XFOB | Sales

Parcel	12-25-29-2007-0001-0360
Owner Name	CASANOVA AIDA E MURILLO MARTA HERIBERTA; BATISTA ALBA
Mailing Address	2427 QUAIL RUN BLVD N KISSIMMEE, FL 34744
Physical Address	2427 QUAIL RUN BLVD N, KISSIMMEE FL 34744
Property Type	SINGLE FAMILY-IMPROVED
Tax District	200 - KISSIMMEE
Acres	0.163
Desc.	QUAIL HOLLOW PHS 3 PB 7 PG 164 LOT 36



Home | Base Maps | Layers | Sales | Identify | Tools | Print

Identify

Basin 8B



Trim | Property Record Card | Tax Collector

Info | Values | Building | Land | XFOB | Sales

Parcel	12-25-29-2007-0001-0370
Owner Name	BONET ANTHONY BONET ALEXA
Mailing Address	2431 QUAIL RUN BLVD NORTH KISSIMMEE, FL 34744
Physical Address	2431 QUAIL RUN BLVD N, KISSIMMEE FL 34744
Property Type	SINGLE FAMILY-IMPROVED
Tax District	200 - KISSIMMEE
Acres	0.157
Desc.	QUAIL HOLLOW PHASE 3 PB 7 PG 164 LOT 37



Basin 8B



Trim | Property Record Card | Tax Collector

Info | Values | Building | Land | XFOB | Sales

Parcel	12-25-29-2007-0001-0380
Owner Name	SANTIAGO LENNIE O LEON NORMA I
Mailing Address	2435 QUAIL RUN BLVD NORTH KISSIMMEE, FL 34744
Physical Address	2435 QUAIL RUN BLVD N, KISSIMMEE FL 34744
Property Type	SINGLE FAMILY-IMPROVED
Tax District	200 - KISSIMMEE
Acres	0.157
Desc.	QUAIL HOLLOW PHS 3 PB 7 PG 164 LOT 38



Basin 8B



12-25-29-2007-0001-0390 10/23/2007

Trim | Property Record Card | Tax Collector

Info | Values | Building | Land | XFOB | Sales

Parcel	12-25-29-2007-0001-0390
Owner Name	DENT CYNTHIA
Mailing Address	2439 QUAIL RUN BLVD KISSIMMEE, FL 34744
Physical Address	2439 QUAIL RUN BLVD N, KISSIMMEE FL 34744
Property Type	SINGLE FAMILY-IMPROVED
Tax District	200 - KISSIMMEE
Acres	0.157
Desc.	QUAIL HOLLOW PHS 3 PB 7 PG 164 LOT 39



Identify

Basin 8B



12-25-29-2007-0001-0400 10/23/2007

Trim | Property Record Card | Tax Collector

Info | Values | Building | Land | XFOB | Sales

Parcel	12-25-29-2007-0001-0400
Owner Name	OSIO JUAN C FLOREZ JOHANA
Mailing Address	2443 QUAIL RUN BLVD N KISSIMMEE, FL 34744
Physical Address	2443 QUAIL RUN BLVD N, KISSIMMEE FL 34744
Property Type	SINGLE FAMILY-IMPROVED
Tax District	200 - KISSIMMEE
Acres	0.157
Desc.	QUAIL HOLLOW PHS 3 PB 7 PG 164 LOT 40



Basin 8B



12-25-29-2007-0001-0410 10/23/2007

Trim | Property Record Card | Tax Collector

Info | Values | Building | Land | XFOB | Sales

Parcel	12-25-29-2007-0001-0410
Owner Name	SILGUERA ELPIDIO T SILGUERA ELIZABETH T
Mailing Address	2447 QUAIL RUN BLVD NORTH KISSIMMEE, FL 34744
Physical Address	2447 QUAIL RUN BLVD N, KISSIMMEE FL 34744
Property Type	SINGLE FAMILY-IMPROVED
Tax District	200 - KISSIMMEE
Acres	0.157
Desc.	QUAIL HOLLOW PHS 3 PB 7 PG 164 LOT 41



Basin 8B



12-25-29-2007-0001-0420 10/23/2007

Trim | Property Record Card | Tax Collector

Info | Values | Building | Land | XFOB | Sales

Parcel	12-25-29-2007-0001-0420
Owner Name	RUIZ RUIZ MARISOL
Mailing Address	7541 CALLE BELLA VIS SABANA SECA, PR 00952-4214
Physical Address	2451 QUAIL RUN BLVD N, KISSIMMEE FL 34744
Property Type	SINGLE FAMILY-IMPROVED
Tax District	200 - KISSIMMEE
Acres	0.157
Desc.	QUAIL HOLLOW PHS 3 PB 7 PG 164 LOT 42



Basin 8B



12-25-29-2007-0001-0430 10/23/2007

Trim | Property Record Card | Tax Collector

Info | Values | Building | Land | XFOB | Sales

Parcel	12-25-29-2007-0001-0430
Owner Name	MARTINEZ JAIME A MULERO ARLENE
Mailing Address	300 BRADLEY ST SYRACUSE, NY 13204-3924
Physical Address	2455 QUAIL RUN BLVD N, KISSIMMEE FL 34744
Property Type	SINGLE FAMILY-IMPROVED
Tax District	200 - KISSIMMEE
Acres	0.157
Desc.	QUAIL HOLLOW PHS 3 PB 7 PG 164 LOT 43 & SE 1 FT OF LOT 44



Basin 8B



Trim | Property Record Card | Tax Collector

Info | Values | Building | Land | XFOB | Sales

Parcel	12-25-29-2007-0001-0440
Owner Name	DILSAVER RUTH
Mailing Address	2459 QUAIL RUN BLVD N KISSIMMEE, FL 34744-3004
Physical Address	2459 QUAIL RUN BLVD N. KISSIMMEE FL 34744
Property Type	SINGLE FAMILY-IMPROVED
Tax District	200 - KISSIMMEE
Acres	0.218
Desc.	QUAIL HOLLOW PHASE 3 PB 7 PG 164 LOT 44 LESS SE 1 FT



Basin 8B



12-25-29-2007-0001-0450 10/23/2007

Trim | Property Record Card | Tax Collector

Info | Values | Building | Land | XFOB | Sales

Parcel	12-25-29-2007-0001-0450
Owner Name	DI DONNA SCOTT T
Mailing Address	1809 QUAIL RIDGE LOOP KISSIMMEE, FL 34744
Physical Address	1809 QUAIL RIDGE LOOP, KISSIMMEE FL 34744
Property Type	SINGLE FAMILY-IMPROVED
Tax District	200 - KISSIMMEE
Acres	0.202
Desc.	QUAIL HOLLOW PHS 3 PB 7 PG 164 LOT 45



Basin 8B



12-25-29-2007-0001-0460 10/23/2007

Trim | Property Record Card | Tax Collector

Info | Values | Building | Land | XFOB | Sales

Parcel	12-25-29-2007-0001-0460
Owner Name	ZARAGOZA ELISAMA ZARAGOZA JEFTE
Mailing Address	1805 QUAIL RIDGE LOOP KISSIMMEE, FL 34744
Physical Address	1805 QUAIL RIDGE LOOP, KISSIMMEE FL 34744
Property Type	SINGLE FAMILY-IMPROVED
Tax District	200 - KISSIMMEE
Acres	0.157
Desc.	QUAIL HOLLOW PHS 3 PB 7 PG 164 LOT 46



Basin 8B



Trim | Property Record Card | Tax Collector

Info | Values | Building | Land | XFOB | Sales

Parcel	12-25-29-2007-0001-0470
Owner Name	JULIAN PAUL JULIAN DEBBIE L
Mailing Address	1803 QUAIL RIDGE LOOP KISSIMMEE, FL 34744-4084
Physical Address	1803 QUAIL RIDGE LOOP, KISSIMMEE FL 34744
Property Type	SINGLE FAMILY-IMPROVED
Tax District	200 - KISSIMMEE
Acres	0.156
Desc.	QUAIL HOLLOW PHS 3 PB 7 PG 164 LOT 47



Basin 8B



12-25-29-2007-0001-0480 10/23/2007

Trim | Property Record Card | Tax Collector

Info | Values | Building | Land | XFOB | Sales

Parcel	12-25-29-2007-0001-0480
Owner Name	ACEVEDO GERENA MIGUEL
Mailing Address	1799 QUAIL RIDGE LOOP KISSIMMEE, FL 34744
Physical Address	1799 QUAIL RIDGE LOOP, KISSIMMEE FL 34744
Property Type	SINGLE FAMILY-IMPROVED
Tax District	200 - KISSIMMEE
Acres	0.166
Desc.	QUAIL HOLLOW PHS 3 PB 7 PG 164 LOT 48

https://www.property-appraiser.org/



Basin 8B



12-25-29-2007-0001-0490 10/23/2007

Trim | Property Record Card | Tax Collector

Info | Values | Building | Land | XFOB | Sales

Parcel	12-25-29-2007-0001-0490
Owner Name	JIMENEZ DAGOBERTO
Mailing Address	1797 QUAIL RIDGE LOOP KISSIMMEE, FL 34744
Physical Address	1797 QUAIL RIDGE LOOP, KISSIMMEE FL 34744
Property Type	SINGLE FAMILY-IMPROVED
Tax District	200 - KISSIMMEE
Acres	0.172
Desc.	QUAIL HOLLOW PHS 3 PB 7 PG 164 LOT 49



Basin 8B



12-25-29-2007-0001-0500 10/23/2007

Trim | Property Record Card | Tax Collector

Info | Values | Building | Land | XFOB | Sales

Parcel	12-25-29-2007-0001-0500
Owner Name	CROWNINGSHIELD THOMAS FRANCIS CROWNINGSHIELD RHONDA D
Mailing Address	1795 QUAIL RIDGE LOOP KISSIMMEE, FL 34744
Physical Address	1795 QUAIL RIDGE LOOP, KISSIMMEE FL 34744
Property Type	SINGLE FAMILY-IMPROVED
Tax District	200 - KISSIMMEE
Acres	0.259
Desc.	QUAIL HOLLOW PHS 3 PB 7 PG 164 LOT 50



Basin 8B

Trim | Property Record Card | Tax Collector

Info | Values | Building | Land | XFOB | Sales

Parcel	13-25-29-2198-0001-00A0
Owner Name	NUEVA ANDALUSIA OWNERS ASSOC 1 INC
Mailing Address	4601 NEPTUNE RD SAINT CLOUD, FL 34769-6753
Physical Address	MILL SLOUGH RD, KISSIMMEE FL 34744
Property Type	RESIDENTIAL COMMON ELEMENTS/AREA VAC
Tax District	200 - KISSIMMEE
Acres	0.388
Desc.	SUNBELT PH 1 PB 21 PG 66 TRACT A PARK



Pond 8C



07-25-30-2694-0158-0010 10/11/2007

Trim | Property Record Card | Tax Collector

Info | Values | Building | Land | XFOB | Sales

Parcel	07-25-30-2694-0158-0010
Owner Name	GALARZA YOLANDA
Mailing Address	919 FLORIDA PKWY KISSIMMEE, FL 34743
Physical Address	919 FLORIDA PKWY, KISSIMMEE FL 34744
Property Type	SINGLE FAMILY-IMPROVED
Tax District	300 - OSCEOLA COUNTY
Acres	0.451
Desc.	BUENAVENTURA LAKES UNIT 6 5TH ADDITION PB 4 PG 25 12/25/29 & 1/25/29 BLK 158 LOT 1



Pond 8C



07-25-30-2694-0158-0020 10/11/2007

Trim | Property Record Card | Tax Collector

Info | Values | Building | Land | XFOB | Sales

Parcel	07-25-30-2694-0158-0020
Owner Name	TAPIA FRANCISCO
Mailing Address	921 FLORIDA PKWY KISSIMMEE, FL 34743-9610
Physical Address	921 FLORIDA PKWY, KISSIMMEE FL 34744
Property Type	SINGLE FAMILY-IMPROVED
Tax District	300 - OSCEOLA COUNTY
Acres	0.382
Desc.	BUENAVENTURA LAKES UNIT 6 5TH ADDITION PB 4 PG 25 BLK 158 LOT 2 12/25/29 & 1/25/29



Pond 8C



07-25-30-2694-0158-0030 10/11/2007

Trim | Property Record Card | Tax Collector

Info | Values | Building | Land | XFOB | Sales

Parcel	07-25-30-2694-0158-0030
Owner Name	PADILLA JOSE PADILLA MARIA
Mailing Address	923 FLORIDA PKWY KISSIMMEE, FL 34743
Physical Address	923 FLORIDA PKWY, KISSIMMEE FL 34744
Property Type	SINGLE FAMILY-IMPROVED
Tax District	300 - OSCEOLA COUNTY
Acres	0.335
Desc.	BUENAVENTURA LAKES UNIT 6 5TH ADDITION PB 4 PG 25 BLK 158 LOT 3 12-25-29 & 1-25-29



Pond 8C

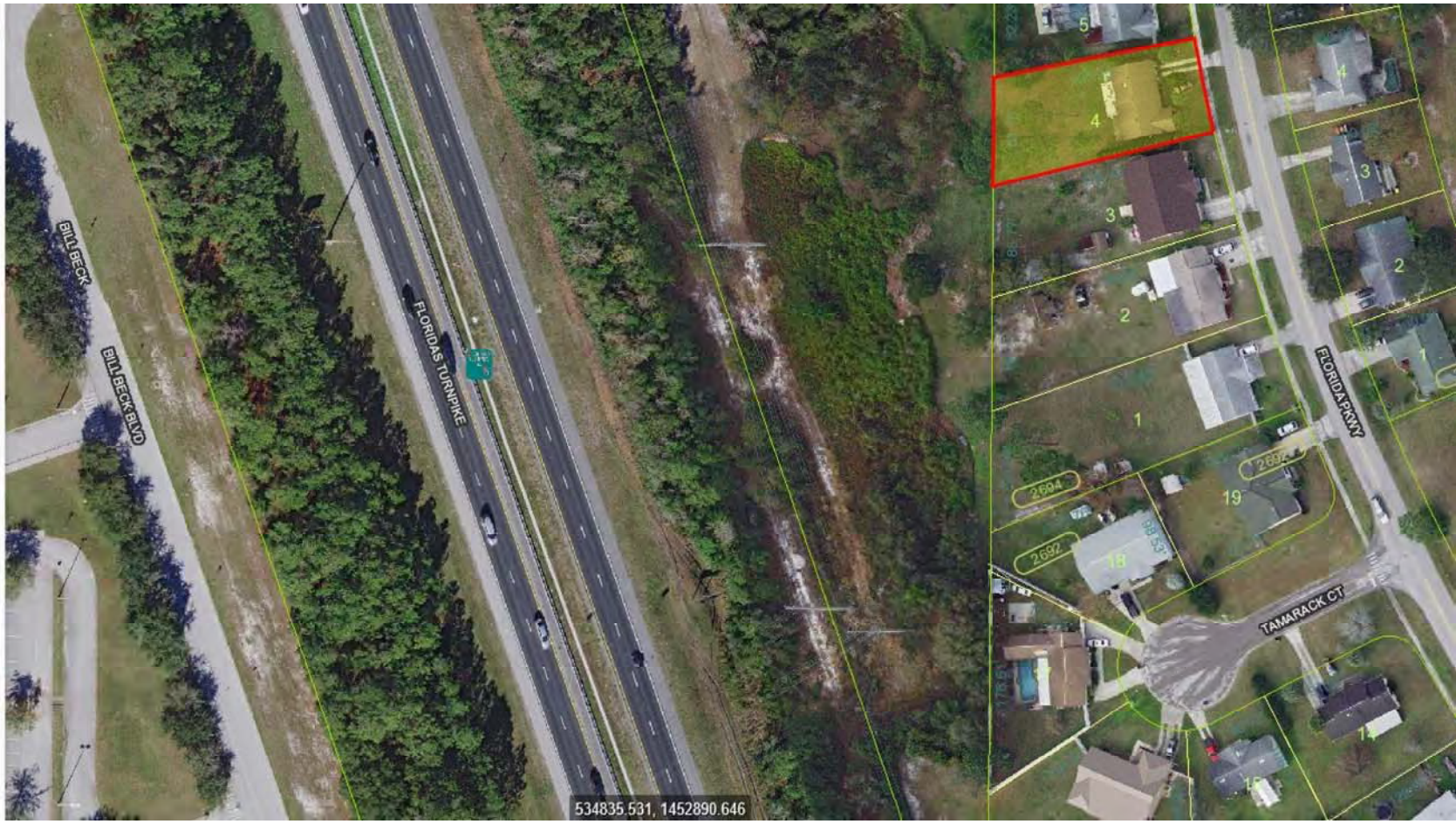


07-25-30-2694-0158-0040 10/11/2007

Trim | Property Record Card | Tax Collector

fo	Values	Building	Land	XFOB	Sales

rcel	07-25-30-2694-0158-0040
wner Name	PARKER DIANE E
ailing Address	925 FLORIDA PKWY KISSIMMEE, FL 34743-9610
ysical ddress	925 FLORIDA PKWY, KISSIMMEE FL 34744
operty Type	SINGLE FAMILY-IMPROVED
x District	300 - OSCEOLA COUNTY
cres	0.297
esc.	BUENAVENTURA LAKES UNIT 6 5TH ADDITION PB 4 PG 25 BLK 158 LOT 4 12-25-29 & 1-25-29



Pond 8C



07-25-30-2694-0158-0050 10/11/2007

Trim | Property Record Card | Tax Collector

Info | Values | Building | Land | XFOB | Sales

Parcel	07-25-30-2694-0158-0050
Owner Name	PEREZ MAGDALENA
Mailing Address	927 FLORIDA PKWY KISSIMMEE, FL 34743-9610
Physical Address	927 FLORIDA PKWY, KISSIMMEE FL 34744
Property Type	SINGLE FAMILY-IMPROVED
Tax District	300 - OSCEOLA COUNTY
Acres	0.268
Desc.	BUENAVENTURA LAKES UNIT 6 5TH ADDITION PB 4 PG 25 BLK 158 LOT 5 12-25-29 & 1-25-29

https://www.property-appraiser.org/



Pond 8C



07-25-30-2694-0158-0060 10/11/2007

Trim | Property Record Card | Tax Collector

Info | Values | Building | Land | XFOB | Sales

Parcel	07-25-30-2694-0158-0060
Owner Name	RUIZ LUIS RUIZ EDITH
Mailing Address	929 FLORIDA PKWY KISSIMMEE, FL 34743-9610
Physical Address	929 FLORIDA PKWY, KISSIMMEE FL 34744
Property Type	SINGLE FAMILY-IMPROVED
Tax District	300 - OSCEOLA COUNTY
Acres	0.246
Desc.	BUENAVENTURA LAKES UNIT 6 5TH ADDITION PB 4 PG 25 BLK 158 LOT 6 12-25-29 & 1-25-29

https://www.property-appraiser.org/



Pond 8C



07-25-30-2694-0158-0070 10/11/2007

Trim | Property Record Card | Tax Collector

Info | Values | Building | Land | XFOB | Sales

Parcel	07-25-30-2694-0158-0070
Owner Name	LARACUENTE ANA VAZQUEZ AURORA; VAZQUEZ HECTOR; VAZQUEZ ROBERT; PERRONI AMELIA
Mailing Address	931 FLORIDA PKWY KISSIMMEE, FL 34743-9610
Physical Address	931 FLORIDA PKWY, KISSIMMEE FL 34744
Property Type	SINGLE FAMILY-IMPROVED
Tax District	300 - OSCEOLA COUNTY
Acres	0.232
Desc.	BUENAVENTURA LAKES UNIT 6 5TH ADDITION PB 4 PG 25 BLK 158 LOT 7

https://www.property-appraiser.org/



Pond 8C



07-25-30-2694-0158-0080 10/11/2007

Trim | Property Record Card | Tax Collector

Info | Values | Building | Land | XFOB | Sales

Parcel	07-25-30-2694-0158-0080
Owner Name	VEGA WILMA
Mailing Address	933 FLORIDA PKWY KISSIMMEE, FL 34743-9610
Physical Address	933 FLORIDA PKWY, KISSIMMEE FL 34743
Property Type	SINGLE FAMILY-IMPROVED
Tax District	300 - OSCEOLA COUNTY
Acres	0.228
Desc.	BUENAVENTURA LAKES UNIT 6 5TH ADDITION PB 4 PG 25 BLK 158 LOT 8 12-25-29 & 1-25-29

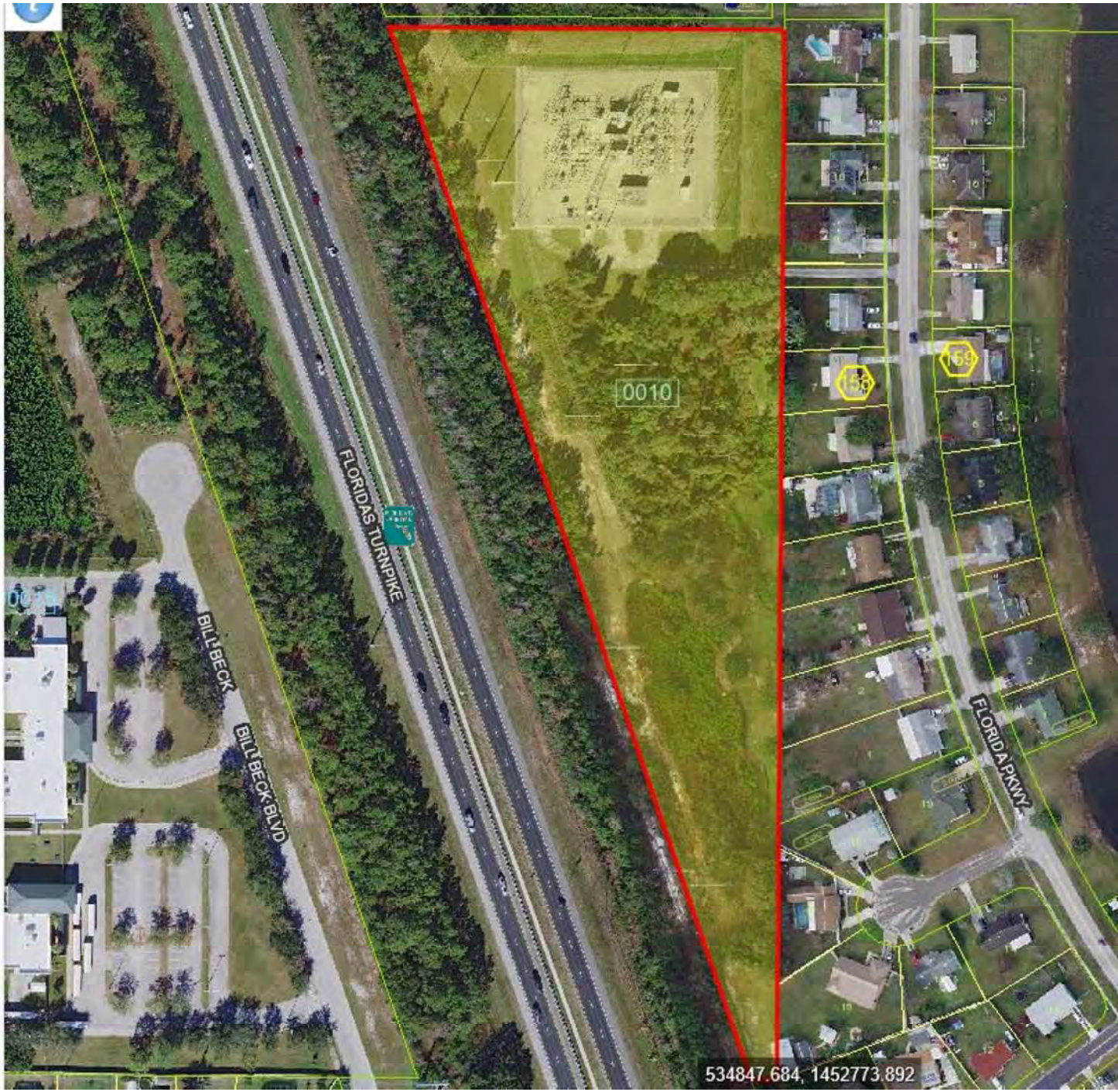


Pond 8C

Trim | Property Record Card | Tax Collector

Info | Values | Building | Land | XFOB | Sales

Parcel	11-25-29-0000-0010-0000
Owner Name	KISSIMMEE UTILITY AUTHORITY
Mailing Address	1701 W CARROLL ST KISSIMMEE, FL 34741
Physical Address	FLORIDA PKWY, KISSIMMEE FL 34744
Property Type	MUNICIPAL-VAC
Tax District	300 - OSCEOLA COUNTY
Acres	8.011
Desc.	NE 1/4 OF NE 1/4 LESS THAT PART LYING WITHIN FLA TURNPIKE R/W AND LESS COM AT NW COR OF NE 1/4 O ...



Pond 8C



07-25-30-2692-0155-0180 10/11/2007

Trim | Property Record Card | Tax Collector

Info | Values | Building | Land | XFOB | Sales

Parcel	07-25-30-2692-0155-0180
Owner Name	DARR KAREN
Mailing Address	803 TAMARACK CT KISSIMMEE, FL 34743-9617
Physical Address	803 TAMARACK CT, KISSIMMEE FL 34743
Property Type	SINGLE FAMILY-IMPROVED
Tax District	300 - OSCEOLA COUNTY
Acres	0.265
Desc.	BUENAVENTURA LAKES UNIT 6 3RD ADD PB 4 PG 11 12/25/29 BLK 155 LOT 18



Pond 8C



07-25-30-2692-0155-0190 10/11/2007

Trim | Property Record Card | Tax Collector

Info | Values | Building | Land | XFOB | Sales

Parcel	07-25-30-2692-0155-0190
Owner Name	SCHELMETY CARMEN
Mailing Address	917 FLORIDA PKWY KISSIMMEE, FL 34743-9610
Physical Address	917 FLORIDA PKWY, KISSIMMEE FL 34743
Property Type	SINGLE FAMILY-IMPROVED
Tax District	300 - OSCEOLA COUNTY
Acres	0.279
Desc.	BUENAVENTURA LAKES UNIT 6 3RD ADD PB 4 PG 11 12/25/29 BLK 155 LOT 19

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Pond 9B



Trim | Property Record Card | Tax Collector

Info | Values | Building | Land | XFOB | Sales

Parcel	07-25-30-2698-0162-0180
Owner Name	CABA RAMON CABA MARIA DOLORES
Mailing Address	983 HICKORY CT KISSIMMEE, FL 34743-8812
Physical Address	983 HICKORY CT, KISSIMMEE FL 34743
Property Type	SINGLE FAMILY-IMPROVED
Tax District	300 - OSCEOLA COUNTY
Acres	0.243
Desc.	BUENAVENTURA LAKES UNIT 8 PB 4 PG 37 BLK 162 LOT 18



Pond 9B



07-25-30-2698-0162-0190 10/10/2007

Trim | Property Record Card | Tax Collector

Info | Values | Building | Land | XFOB | Sales

Parcel	07-25-30-2698-0162-0190
Owner Name	ZABLOCKY GERALD W ZABLOCKY LUCILE
Mailing Address	250 CHESTNUT RIDGE RD JERSEY SHORE, PA 17740-9333
Physical Address	985 HICKORY CT, KISSIMMEE FL 34743
Property Type	SINGLE FAMILY-IMPROVED
Tax District	300 - OSCEOLA COUNTY
Acres	0.179
Desc.	BUENAVENTURA LAKES UNIT 8 PB 4 PG 37 BLK 162 LOT 19



Pond 9B



07-25-30-2698-0162-0200 10/10/2007

Trim | Property Record Card | Tax Collector

Info | Values | Building | Land | XFOB | Sales

Parcel	07-25-30-2698-0162-0200
Owner Name	DIAZ LOPEZ VIDAL OCANA ORTIZ SONIA E
Mailing Address	987 HICKORY CT KISSIMMEE, FL 34743
Physical Address	987 HICKORY CT, KISSIMMEE FL 34743
Property Type	SINGLE FAMILY-IMPROVED
Tax District	300 - OSCEOLA COUNTY
Acres	0.201
Desc.	BUENAVENTURA LAKES UNIT 8 PB 4 PG 37 BLK 162 LOT 20



Pond 9B



07-25-30-2698-0162-0210 10/10/2007

Trim | Property Record Card | Tax Collector

Info | Values | Building | Land | XFOB | Sales

Parcel	07-25-30-2698-0162-0210
Owner Name	SAINT-HILAIRE EDGARD
Mailing Address	989 HICKORY CT KISSIMMEE, FL 34743-8812
Physical Address	989 HICKORY CT, KISSIMMEE FL 34743
Property Type	SINGLE FAMILY-IMPROVED
Tax District	300 - OSCEOLA COUNTY
Acres	0.255
Desc.	BUENAVENTURA LAKES UNIT 8 PB 4 PG 37 BLK 162 LOT 21



Pond 9B



07-25-30-2698-0162-0220 10/10/2007

Trim | Property Record Card | Tax Collector

Info | Values | Building | Land | XFOB | Sales

Parcel	07-25-30-2698-0162-0220
Owner Name	VEGA FRANCISCO SERRANO AMPARO
Mailing Address	991 HICKORY CT KISSIMMEE, FL 34743
Physical Address	991 HICKORY CT, KISSIMMEE FL 34743
Property Type	SINGLE FAMILY-IMPROVED
Tax District	300 - OSCEOLA COUNTY
Acres	0.274
Desc.	BUENAVENTURA LAKES UNIT 8 PB 4 PG 37 BLK 162 LOT 22



Pond 9B

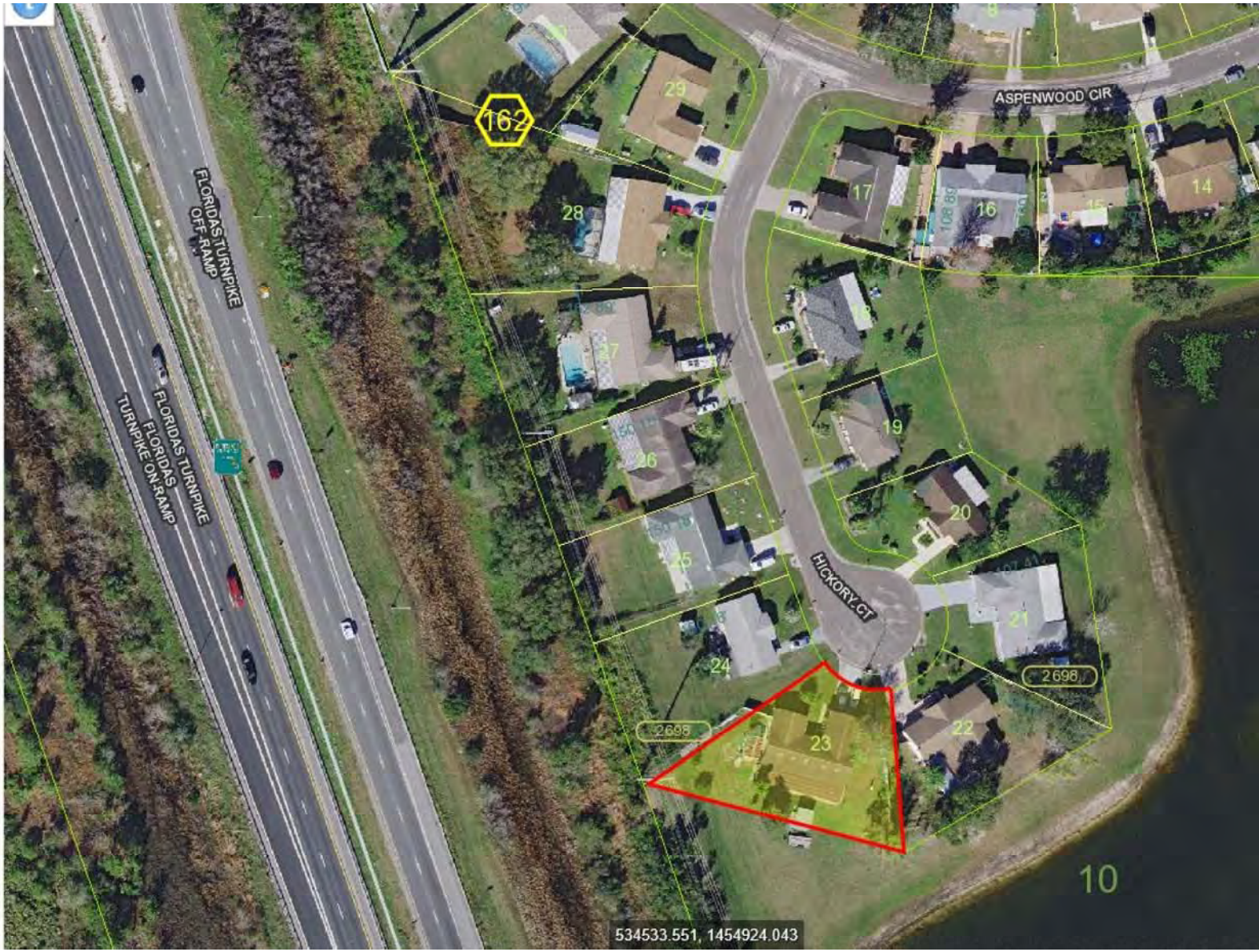


07-25-30-2698-0162-0230 10/10/2007

Trim | Property Record Card | Tax Collector

Info | Values | Building | Land | XFOB | Sales

Parcel	07-25-30-2698-0162-0230
Owner Name	ZAPATA MANFREDO EST
Mailing Address	992 HICKORY CT KISSIMMEE, FL 34743-8812
Physical Address	992 HICKORY CT, KISSIMMEE FL 34743
Property Type	SINGLE FAMILY-IMPROVED
Tax District	300 - OSCEOLA COUNTY
Acres	0.313
Desc.	BUENAVENTURA LAKES UNIT 8 PB 4 PG 37 BLK 162 LOT 23



Pond 9B



07-25-30-2698-0162-0240 10/10/2007

Trim | Property Record Card | Tax Collector

Info | Values | Building | Land | XFOB | Sales

Parcel	07-25-30-2698-0162-0240
Owner Name	JONES CARLA L THOMPSON ASIA C
Mailing Address	990 HICKORY CT KISSIMMEE, FL 34743
Physical Address	990 HICKORY CT, KISSIMMEE FL 34743
Property Type	SINGLE FAMILY-IMPROVED
Tax District	300 - OSCEOLA COUNTY
Acres	0.31
Desc.	BUENAVENTURA LAKES UNIT 8 PB 4 PG 37 BLK 162 LOT 24



Pond 9B



07-25-30-2698-0162-0250 10/10/2007

Trim | Property Record Card | Tax Collector

Info | Values | Building | Land | XFOB | Sales

Parcel	07-25-30-2698-0162-0250
Owner Name	CASILLAS DANIEL CASILLAS BELMARIS
Mailing Address	988 HICKORY CT KISSIMMEE, FL 34743-8812
Physical Address	988 HICKORY CT, KISSIMMEE FL 34743
Property Type	SINGLE FAMILY-IMPROVED
Tax District	300 - OSCEOLA COUNTY
Acres	0.257
Desc.	BUENAVENTURA LAKES UNIT 8 PB 4 PG 37 BLK 162 LOT 25



Pond 9B



07-25-30-2698-0162-0260 10/10/2007

Trim | Property Record Card | Tax Collector

Info | Values | Building | Land | XFOB | Sales

Parcel	07-25-30-2698-0162-0260
Owner Name	GAUVREAU ROSALIE C
Mailing Address	986 HICKORY CT KISSIMMEE, FL 34743-8812
Physical Address	986 HICKORY CT, KISSIMMEE FL 34743
Property Type	SINGLE FAMILY-IMPROVED
Tax District	300 - OSCEOLA COUNTY
Acres	0.257
Desc.	BUENAVENTURA LAKES UNIT 8 PB 4 PG 37 BLK 162 LOT 26



Pond 8B



07-25-30-2698-0162-0270 10/10/2007

Trim | Property Record Card | Tax Collector

Info | Values | Building | Land | XFOB | Sales

Parcel	07-25-30-2698-0162-0270
Owner Name	CONE JOSEPH L CONE JOYCE A
Mailing Address	984 HICKORY CT KISSIMMEE, FL 34743-8812
Physical Address	984 HICKORY CT, KISSIMMEE FL 34743
Property Type	SINGLE FAMILY-IMPROVED
Tax District	300 - OSCEOLA COUNTY
Acres	0.326
Desc.	BUENAVENTURA LAKES UNIT 8 PB 4 PG 37 BLK 162 LOT 27



Pond 9B



07-25-30-2698-0162-0280 10/10/2007

Trim | Property Record Card | Tax Collector

Info | Values | Building | Land | XFOB | Sales

Parcel	07-25-30-2698-0162-0280
Owner Name	PRENDERGAST MICHAEL
Mailing Address	PO BOX 420176 KISSIMMEE, FL 34742-0176
Physical Address	982 HICKORY CT, KISSIMMEE FL 34743
Property Type	SINGLE FAMILY-IMPROVED
Tax District	300 - OSCEOLA COUNTY
Acres	0.49
Desc.	BUENAVENTURA LAKES UNIT 8 PB 4 PG 37 BLK 162 LOT 28



Pond 9B



Trim | Property Record Card | Tax Collector

Info | Values | Building | Land | XFOB | Sales

Parcel	07-25-30-2698-0162-0180
Owner Name	CABA RAMON CABA MARIA DOLORES
Mailing Address	983 HICKORY CT KISSIMMEE, FL 34743-8812
Physical Address	983 HICKORY CT, KISSIMMEE FL 34743
Property Type	SINGLE FAMILY-IMPROVED
Tax District	300 - OSCEOLA COUNTY
Acres	0.243
Desc.	BUENAVENTURA LAKES UNIT 8 PB 4 PG 37 BLK 162 LOT 18



Pond 9B



07-25-30-2698-0162-0190 10/10/2007

Trim | Property Record Card | Tax Collector

Info | Values | Building | Land | XFOB | Sales

Parcel	07-25-30-2698-0162-0190
Owner Name	ZABLOCKY GERALD W ZABLOCKY LUCILE
Mailing Address	250 CHESTNUT RIDGE RD JERSEY SHORE, PA 17740-9333
Physical Address	985 HICKORY CT, KISSIMMEE FL 34743
Property Type	SINGLE FAMILY-IMPROVED
Tax District	300 - OSCEOLA COUNTY
Acres	0.179
Desc.	BUENAVENTURA LAKES UNIT 8 PB 4 PG 37 BLK 162 LOT 19



Pond 9B



07-25-30-2698-0162-0200 10/10/2007

Trim | Property Record Card | Tax Collector

Info | Values | Building | Land | XFOB | Sales

Parcel	07-25-30-2698-0162-0200
Owner Name	DIAZ LOPEZ VIDAL OCANA ORTIZ SONIA E
Mailing Address	987 HICKORY CT KISSIMMEE, FL 34743
Physical Address	987 HICKORY CT, KISSIMMEE FL 34743
Property Type	SINGLE FAMILY-IMPROVED
Tax District	300 - OSCEOLA COUNTY
Acres	0.201
Desc.	BUENAVENTURA LAKES UNIT 8 PB 4 PG 37 BLK 162 LOT 20



Pond 9B



07-25-30-2698-0162-0210 10/10/2007

Trim | Property Record Card | Tax Collector

Info | Values | Building | Land | XFOB | Sales

Parcel	07-25-30-2698-0162-0210
Owner Name	SAINT-HILAIRE EDGARD
Mailing Address	989 HICKORY CT KISSIMMEE, FL 34743-8812
Physical Address	989 HICKORY CT, KISSIMMEE FL 34743
Property Type	SINGLE FAMILY-IMPROVED
Tax District	300 - OSCEOLA COUNTY
Acres	0.255
Desc.	BUENAVENTURA LAKES UNIT 8 PB 4 PG 37 BLK 162 LOT 21



Pond 9B



07-25-30-2698-0162-0220 10/10/2007

Trim | Property Record Card | Tax Collector

Info | Values | Building | Land | XFOB | Sales

Parcel	07-25-30-2698-0162-0220
Owner Name	VEGA FRANCISCO SERRANO AMPARO
Mailing Address	991 HICKORY CT KISSIMMEE, FL 34743
Physical Address	991 HICKORY CT, KISSIMMEE FL 34743
Property Type	SINGLE FAMILY-IMPROVED
Tax District	300 - OSCEOLA COUNTY
Acres	0.274
Desc.	BUENAVENTURA LAKES UNIT 8 PB 4 PG 37 BLK 162 LOT 22



Pond 9B

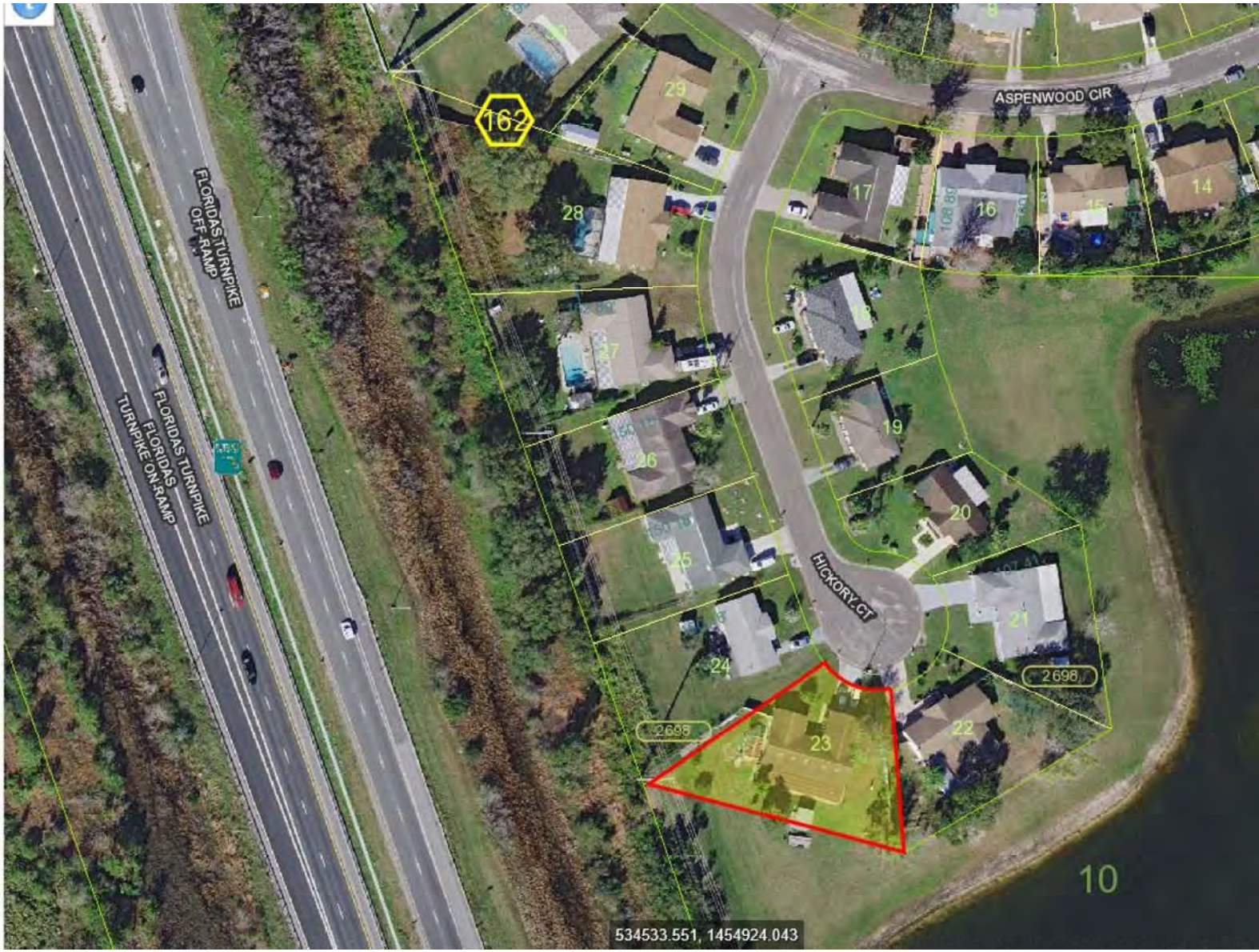


07-25-30-2698-0162-0230 10/10/2007

Trim | Property Record Card | Tax Collector

Info | Values | Building | Land | XFOB | Sales

Parcel	07-25-30-2698-0162-0230
Owner Name	ZAPATA MANFREDO EST
Mailing Address	992 HICKORY CT KISSIMMEE, FL 34743-8812
Physical Address	992 HICKORY CT, KISSIMMEE FL 34743
Property Type	SINGLE FAMILY-IMPROVED
Tax District	300 - OSCEOLA COUNTY
Acres	0.313
Desc.	BUENAVENTURA LAKES UNIT 8 PB 4 PG 37 BLK 162 LOT 23



Pond 9B



07-25-30-2698-0162-0240 10/10/2007

Trim | Property Record Card | Tax Collector

Info | Values | Building | Land | XFOB | Sales

Parcel	07-25-30-2698-0162-0240
Owner Name	JONES CARLA L THOMPSON ASIA C
Mailing Address	990 HICKORY CT KISSIMMEE, FL 34743
Physical Address	990 HICKORY CT, KISSIMMEE FL 34743
Property Type	SINGLE FAMILY-IMPROVED
Tax District	300 - OSCEOLA COUNTY
Acres	0.31
Desc.	BUENAVENTURA LAKES UNIT 8 PB 4 PG 37 BLK 162 LOT 24



Pond 9B



07-25-30-2698-0162-0250 10/10/2007

Trim | Property Record Card | Tax Collector

Info | Values | Building | Land | XFOB | Sales

Parcel	07-25-30-2698-0162-0250
Owner Name	CASILLAS DANIEL CASILLAS BELMARIS
Mailing Address	988 HICKORY CT KISSIMMEE, FL 34743-8812
Physical Address	988 HICKORY CT, KISSIMMEE FL 34743
Property Type	SINGLE FAMILY-IMPROVED
Tax District	300 - OSCEOLA COUNTY
Acres	0.257
Desc.	BUENAVENTURA LAKES UNIT 8 PB 4 PG 37 BLK 162 LOT 25



Pond 9B



07-25-30-2698-0162-0260 10/10/2007

Trim | Property Record Card | Tax Collector

Info | Values | Building | Land | XFOB | Sales

Parcel	07-25-30-2698-0162-0260
Owner Name	GAUVREAU ROSALIE C
Mailing Address	986 HICKORY CT KISSIMMEE, FL 34743-8812
Physical Address	986 HICKORY CT, KISSIMMEE FL 34743
Property Type	SINGLE FAMILY-IMPROVED
Tax District	300 - OSCEOLA COUNTY
Acres	0.257
Desc.	BUENAVENTURA LAKES UNIT 8 PB 4 PG 37 BLK 162 LOT 26



Pond 8B



07-25-30-2698-0162-0270 10/10/2007

Trim | Property Record Card | Tax Collector

Info | Values | Building | Land | XFOB | Sales

Parcel	07-25-30-2698-0162-0270
Owner Name	CONE JOSEPH L CONE JOYCE A
Mailing Address	984 HICKORY CT KISSIMMEE, FL 34743-8812
Physical Address	984 HICKORY CT, KISSIMMEE FL 34743
Property Type	SINGLE FAMILY-IMPROVED
Tax District	300 - OSCEOLA COUNTY
Acres	0.326
Desc.	BUENAVENTURA LAKES UNIT 8 PB 4 PG 37 BLK 162 LOT 27



Pond 9B



07-25-30-2698-0162-0280 10/10/2007

Trim | Property Record Card | Tax Collector

Info | Values | Building | Land | XFOB | Sales

Parcel	07-25-30-2698-0162-0280
Owner Name	PRENDERGAST MICHAEL
Mailing Address	PO BOX 420176 KISSIMMEE, FL 34742-0176
Physical Address	982 HICKORY CT, KISSIMMEE FL 34743
Property Type	SINGLE FAMILY-IMPROVED
Tax District	300 - OSCEOLA COUNTY
Acres	0.49
Desc.	BUENAVENTURA LAKES UNIT 8 PB 4 PG 37 BLK 162 LOT 28



Pond 9-B

Trim | Property Record Card | Tax Collector

Info	Values	Building	Land	XFOB	Sales

Parcel	02-25-29-1721-0001-00A0
Owner Name	CITY OF KISSIMMEE
Mailing Address	101 N CHURCH ST KISSIMMEE, FL 34741-5054
Physical Address	MILL RUN BLVD, KISSIMMEE FL 34744
Property Type	MUNICIPAL-IMP
Tax District	200 - KISSIMMEE
Acres	1.501
Desc.	MILL RUN PARK UNIT 1 PB 6 PG 132-133 TRACT A RETENTION

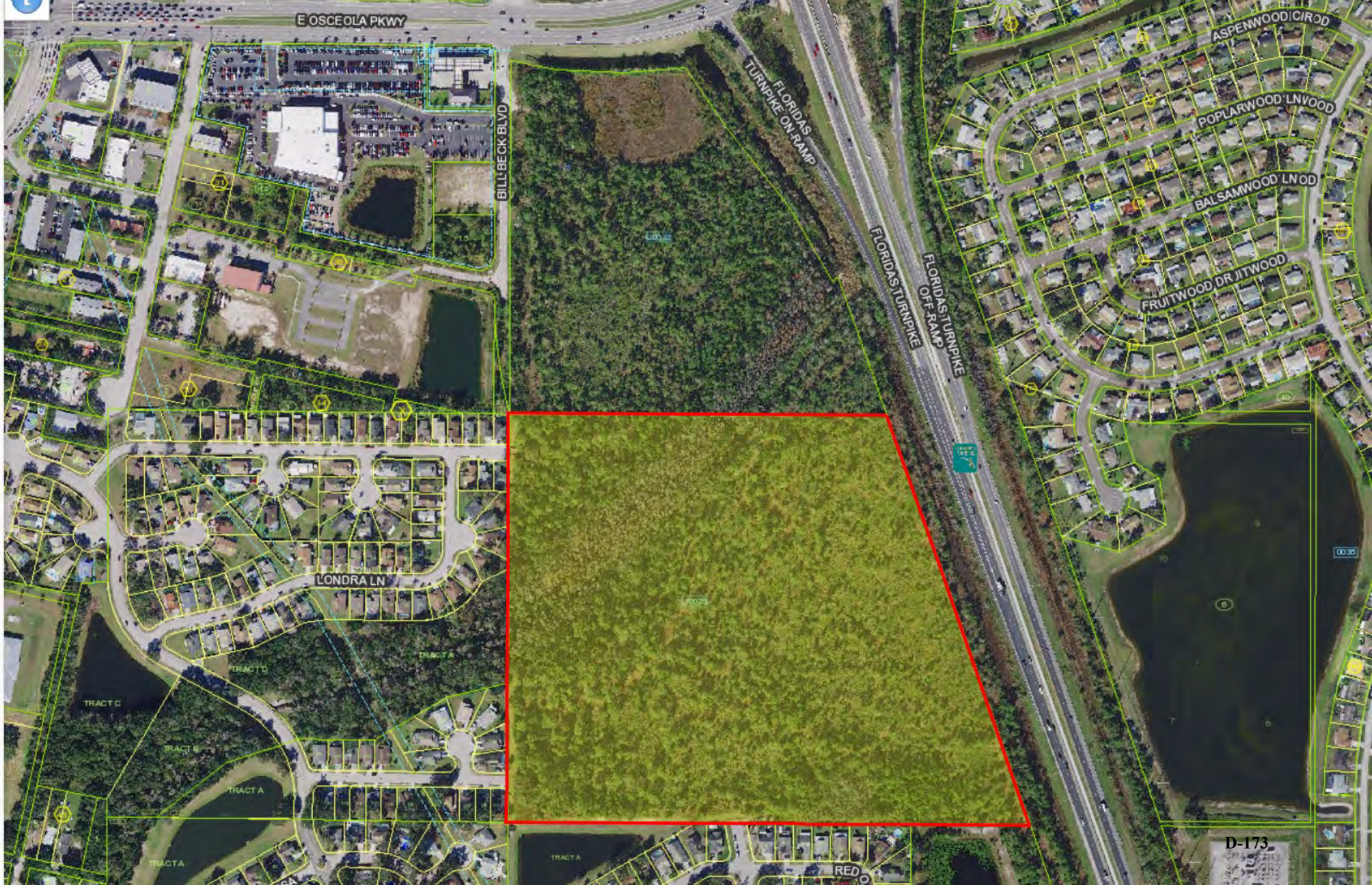


Pond 9-C

Trim | Property Record Card | Tax Collector

Info | Values | Building | Land | XFOB | Sales

Parcel	02-25-29-00U0-0025-0000
Owner Name	WENDELL E SPEARS REVOCABLE TRUST SPEARS RAMONA ANN TR; GRODECKI JAMES P
Mailing Address	PO BOX 1780 WINTER PARK, FL 32790
Physical Address	E OSCEOLA PKWY, KISSIMMEE FL 34744
Property Type	VACANT INDUSTRIAL WITH XFOB
Tax District	200 - KISSIMMEE
Acres	44.205
Desc.	SW 1/4 OF SE 1/4 LYING WLY OF FLA TURNPIKE & SE 1/4 OF SE 1/4 LYING WLY OF FLA TURNPIKE ORD# 1759

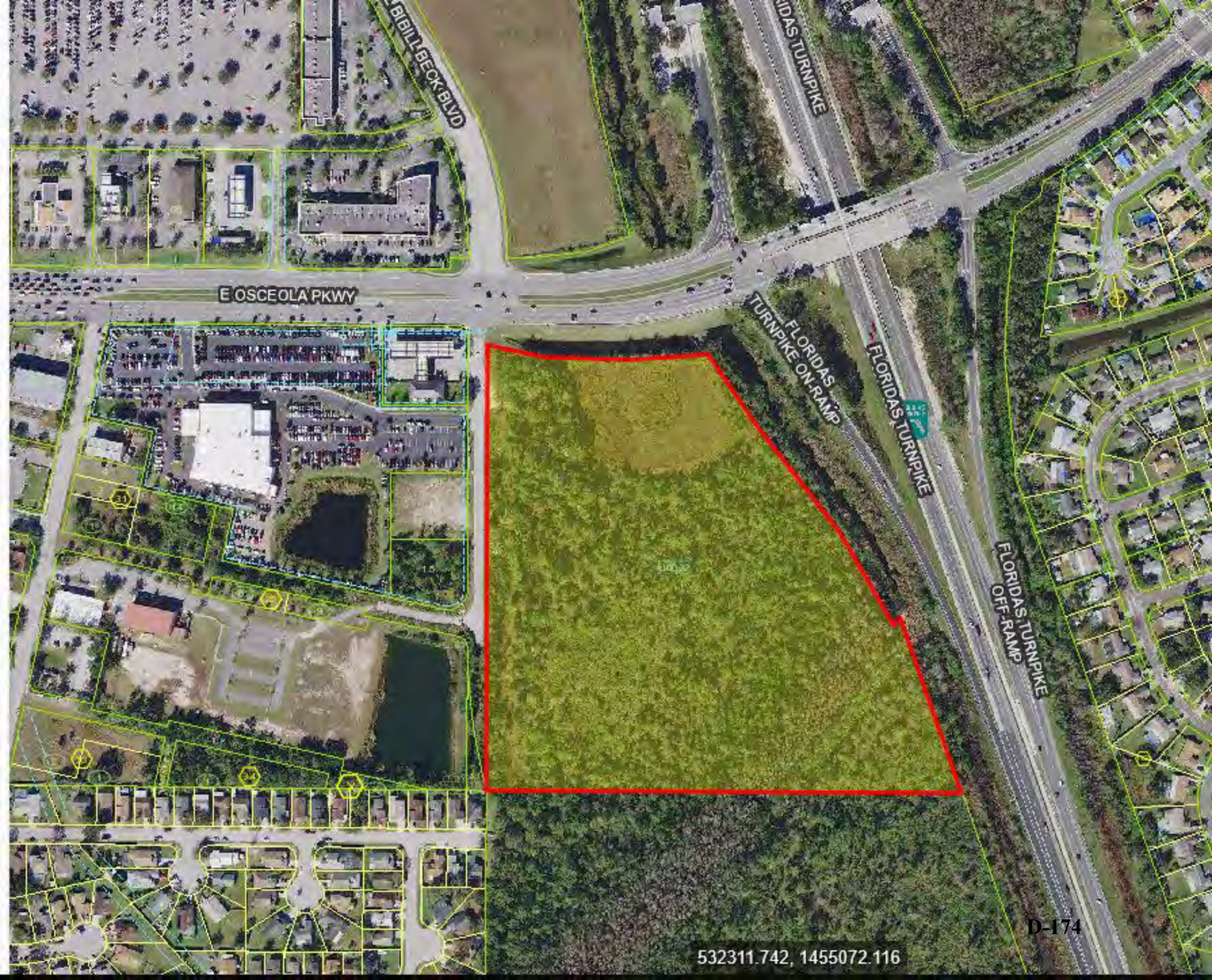


Pond 10-A & 10-B

Trim | Property Record Card | Tax Collector

Info | Values | Building | Land | XFOB | Sales

Parcel	02-25-29-00U0-0032-0000
Owner Name	WENDELL E SPEARS REVOCABLE TRUST GRODECKI JAMES P TR; SPEARS PATRICK F CO-TR
Mailing Address	PO BOX 1780 WINTER PARK, FL 32790
Physical Address	E OSCEOLA PKWY, KISSIMMEE FL 34744
Property Type	VACANT COMMERCIAL WITH XFOB
Tax District	200 - KISSIMMEE
Acres	24.134
Desc.	N 1/2 OF SEC LYING ELY OF RR AND WLY OF FLA TRNPK AND NW 1/4 OF SE 1/4 LYING WLY OF FLA TRNPK LE ...



Identify

Pond 11-B

Trim | Property Record Card | Tax Collector

Info | Values | Building | Land | XFOB | Sales

Parcel	02-25-29-1448-0001-0090
Owner Name	WENDELL E SPEARS REVOCABLE TRUST SPEARS RAMONA ANN TR; GRODECKI JAMES P
Mailing Address	PO BOX 1780 WINTER PARK, FL 32790
Physical Address	E OSCEOLA PKWY, KISSIMMEE FL 34744
Property Type	VACANT COMMERCIAL
Tax District	200 - KISSIMMEE
Acres	55.66
Desc.	GATEWAY COMMONS NORTH PB 13 PG 28-32 LOT 9

https://www.property-appraiser.org/



FPC Fish 1

Trim | Property Record Card | Tax Collector

Info | Values | Building | Land | XFOB | Sales

Parcel	32-25-30-0000-0016-0000
Current Assessed Value	4700
Prev Assessed	4700
Prev Taxable	4700
Current Taxable Value	4700
Current Land	4700
AG Value	564900
XFOB	
Just	569600



FPC Fish 2 & 3



Trim | Property Record Card | Tax Collector

Info | Values | Building | Land | XFOB | Sales

Parcel	29-25-30-4653-0001-0030
Owner Name	OSCEOLA COUNTY
Mailing Address	1 COURTHOUSE SQ STE 2100 KISSIMMEE, FL 34741-5440
Physical Address	2601 E IRLO BRONSON MEM HWY, KISSIMMEE FL 34744
Property Type	COUNTY-IMP
Tax District	300 - OSCEOLA COUNTY
Acres	26.738
Desc.	OSCEOLA COUNTY COMPLEX PB 21 PG 88 LOT 3



FPC Fennel 1

Trim | Property Record Card | Tax Collector

Info | Values | Building | Land | XFOB | Sales

Parcel	20-25-30-4814-0001-00H0
Owner Name	REMINGTON CDD
Mailing Address	135 W CENTRAL BLVD STE 320 ORLANDO, FL 32801
Physical Address	REMINGTON BLVD, KISSIMMEE FL 34744
Property Type	NO AG ACREAGE-VAC
Tax District	361 - REMINGTON
Acres	92.303
Desc.	REMINGTON PH 1 PB 8 PG 121-124 TRACT H



FPC Fennel 4

Trim | Property Record Card | Tax Collector

Info | Values | Building | Land | XFOB | Sales

Parcel	32-25-30-0000-0080-0000
Owner Name	RALPH & JOYCE WRIGHT FAMILY TR WRIGHT RALPH CO-TR; WRIGHT NELLIE JOYCE CO-TR
Mailing Address	1348 SIMMONS RD KISSIMMEE, FL 34744
Physical Address	1350 SIMMONS RD, KISSIMMEE FL 34744
Property Type	PASTURELAND 1-IMP
Tax District	300 - OSCEOLA COUNTY
Acres	14.62
Desc.	BEG AT SE COR OF SW 1/4 OF NE 1/4, N 660.01 FT, S 89 DEG W 208.53 FT TO POB; S 89 DEG W 901 FT, ...



FPC Bass1

Trim | Property Record Card | Tax Collector

Info | Values | Building | Land | XFOB | Sales

Parcel	19-25-30-0000-0100-0000
Owner Name	REINHARTZ FAMILY LTD PRTNRSHP
Mailing Address	6000 ISLAND BLVD APT 2907 AVENTURA, FL 33160-3795
Physical Address	SIMPSON RD, KISSIMMEE FL 34744
Property Type	VACANT COMMERCIAL
Tax District	300 - OSCEOLA COUNTY
Acres	24.023
Desc.	FROM SW COR SEC, E 13.35 FT TO N R/W US 192 & P0B, N 53 DEG W ALONG R/W 100 FT, N 36 DEG E 1109. ...



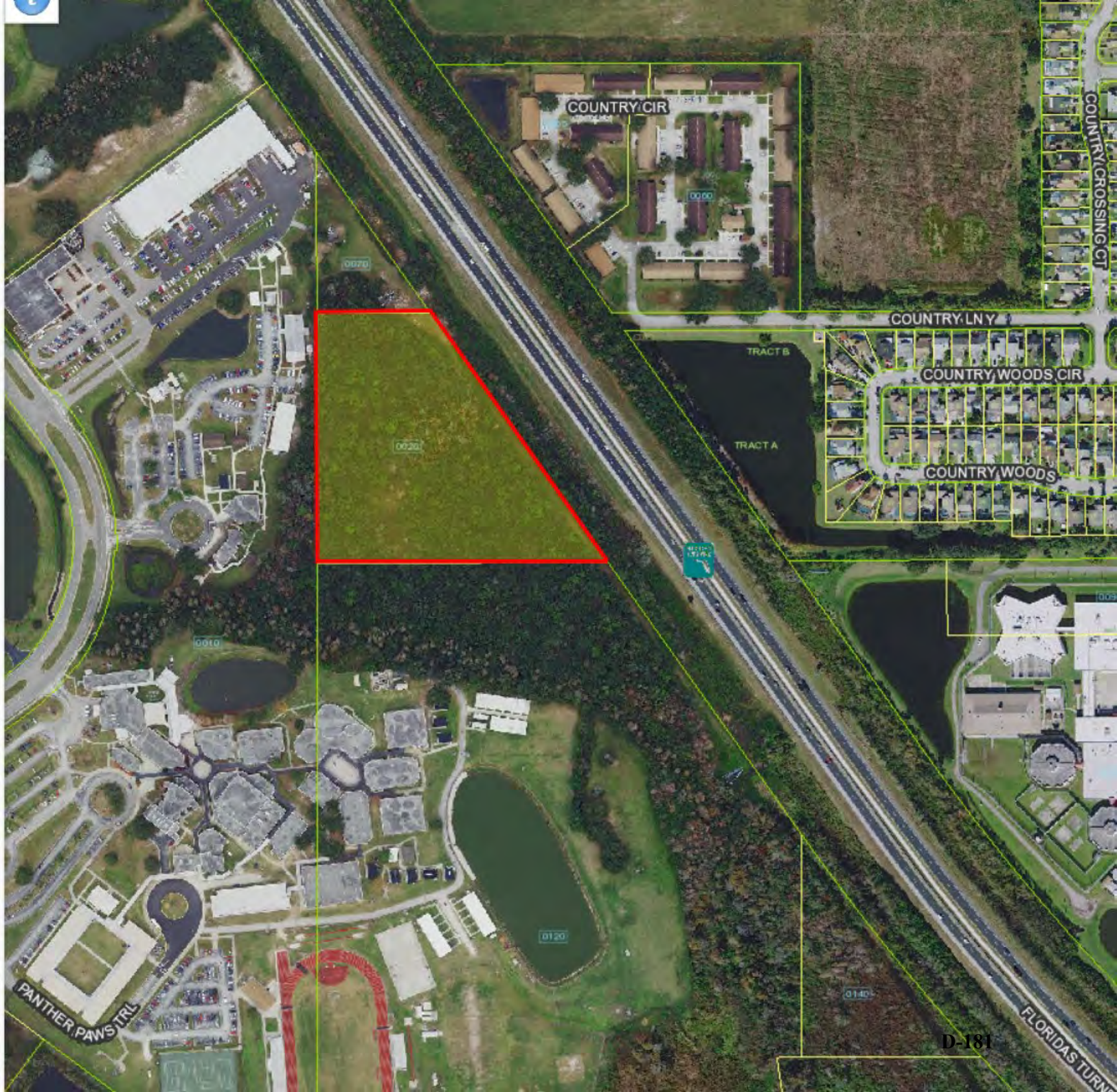
541319.892, 1437324.154

FPC Bass 2

Trim | Property Record Card | Tax Collector

Info | Values | Building | Land | XFOB | Sales

Parcel	19-25-30-0000-0020-0000
Owner Name	SCHOOL DIST OF OSCEOLA CO THE
Mailing Address	C/O ADM CPLX FACILITIES PLANNING KISSIMMEE, FL 34744-4492
Physical Address	BILL BECK BLVD, KISSIMMEE FL 34744
Property Type	PUBLIC SCH-VAC
Tax District	300 - OSCEOLA COUNTY
Acres	8.495
Desc.	S 1/2 OF SW 1/4 OF NW 1/4 LYING W OF SUNSHINE ST PKY

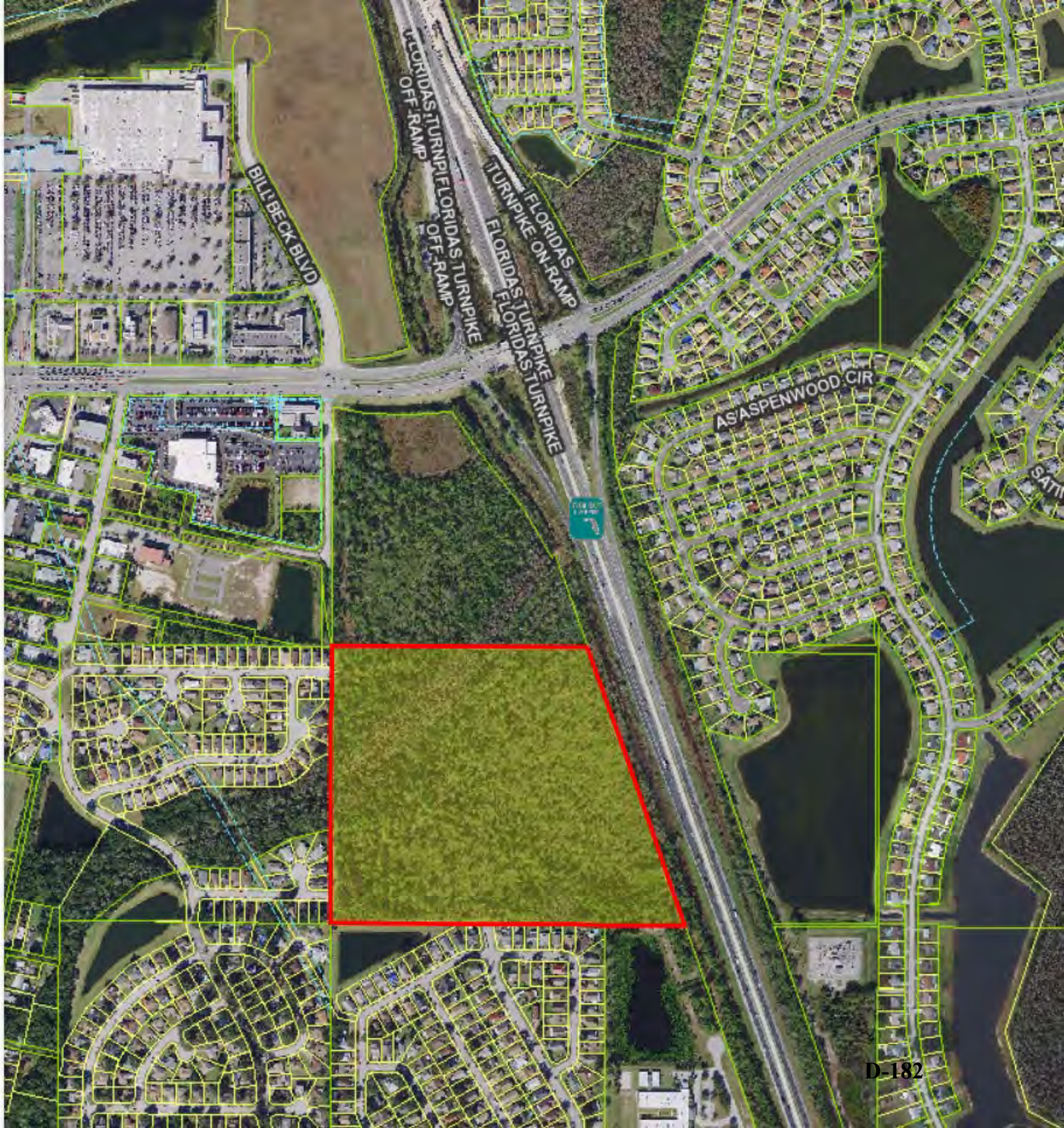


FPC Mill 1

Trim | Property Record Card | Tax Collector

Info | Values | Building | Land | XFOB | Sales

Parcel	02-25-29-00U0-0025-0000
Owner Name	WENDELL E SPEARS REVOCABLE TRUST SPEARS RAMONA ANN TR; GRODECKI JAMES P
Mailing Address	PO BOX 1780 WINTER PARK, FL 32790
Physical Address	E OSCEOLA PKWY, KISSIMMEE FL 34744
Property Type	VACANT INDUSTRIAL WITH XFOB
Tax District	200 - KISSIMMEE
Acres	44.205
Desc.	SW 1/4 OF SE 1/4 LYING WLY OF FLA TURNPIKE & SE 1/4 OF SE 1/4 LYING WLY OF FLA TURNPIKE ORD# 1759



FPC Mill 2

Trim | Property Record Card | Tax Collector

Info | Values | Building | Land | XFOB | Sales

Parcel	02-25-29-00U0-0032-0000
Owner Name	WENDELL E SPEARS REVOCABLE TRUST GRODECKI JAMES P TR; SPEARS PATRICK F CO-TR
Mailing Address	PO BOX 1780 WINTER PARK, FL 32790
Physical Address	E OSCEOLA PKWY, KISSIMMEE FL 34744
Property Type	VACANT COMMERCIAL WITH XFOB
Tax District	200 - KISSIMMEE
Acres	24.134
Desc.	N 1/2 OF SEC LYING ELY OF RR AND WLY OF FLA TRNPK AND NW 1/4 OF SE 1/4 LYING WLY OF FLA TRNPK LE ...

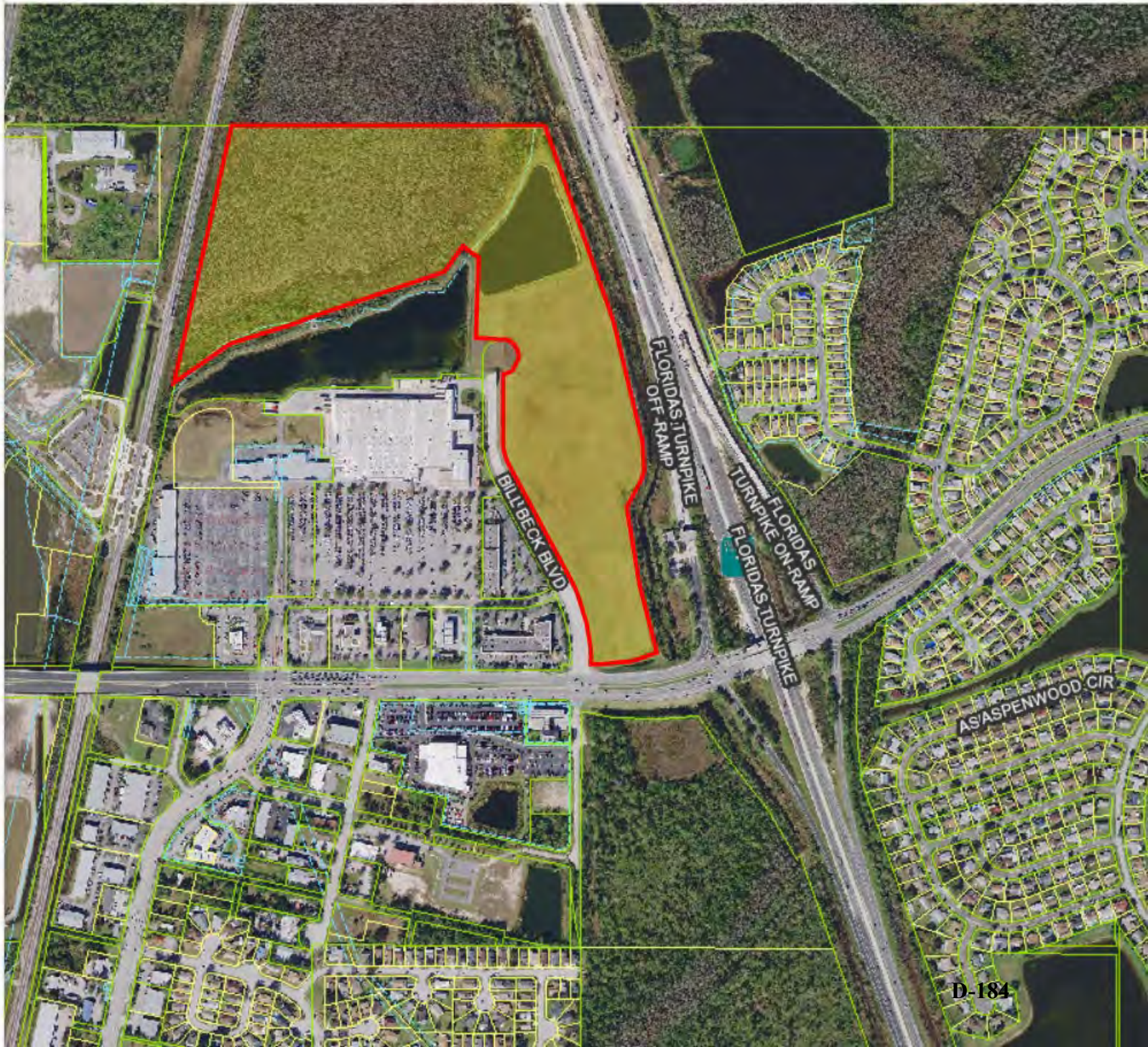


FPC Mill 3

Trim | Property Record Card | Tax Collector

Info | Values | Building | Land | XFOB | Sales

Parcel	02-25-29-1448-0001-0090
Owner Name	WENDELL E SPEARS REVOCABLE TRUST SPEARS RAMONA ANN TR; GRODECKI JAMES P
Mailing Address	PO BOX 1780 WINTER PARK, FL 32790
Physical Address	E OSCEOLA PKWY, KISSIMMEE FL 34744
Property Type	VACANT COMMERCIAL
Tax District	200 - KISSIMMEE
Acres	55.66
Desc.	GATEWAY COMMONS NORTH PB 13 PG 28-32 LOT 9



CONTAMINATION SCREENING EVALUATION REPORT

Florida's Turnpike Enterprise
FLORIDA'S TURNPIKE WIDENING
FROM MILEPOST 242.0 TO MILEPOST 248.9
Osceola County, Florida
FPID No. 436194-1-52-01
GEC Project No. 3892E

March 2020
Revised August 2020
Revised October 2020

March 19, 2020
Revised August 25, 2020
Revised October 29, 2020

Moffatt & Nichol
1025 Greenwood Boulevard, Suite 371
Lake Mary, Florida 32746

Attention: Mr. Bill Terwilleger, P.E.

Subject: Contamination Screening Evaluation Report
FLORIDA'S TURNPIKE WIDENING
FROM MILEPOST 242.0 TO MILEPOST 248.9
Osceola County, Florida
Financial Project ID: 436194-1-52-01
GEC Project No. 3892E

Dear Mr. Terwilleger:

Geotechnical and Environmental Consultants, Inc. (GEC) is pleased to present this Contamination Screening Evaluation Report (CSER) for the above-referenced project. This report describes our evaluation procedures, presents the information we obtained and identifies thirty-eight (38) sites that have been assigned Contamination Risk Ratings.

We appreciate the opportunity to work with Moffatt & Nichol (M&N) and the Florida's Turnpike Enterprise (FTE) on this project. If you have any questions concerning this report, or if we may be of further assistance, please contact us.

Sincerely,

GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS, INC.
2510 Michigan Avenue, Suite D
Kissimmee, Florida 34744-1933

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Engineer Intern

Richard P. McCormick, P.G.
Senior Geologist
Florida License No. 2096

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President
Florida License No. 38704

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Table 1: Potential Contamination Site Summary
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Appendix A: Historical Aerial Photographs
Appendix B: Definitions of Common Report Terms
Appendix C: Contamination Risk Potential Rating Descriptions
Appendix D: EDR Certified Sanborn Map Report
Appendix E: EDR Corridor Report
Appendix F: FDEP Database List
Appendix G: Federal Database List
Appendix H: FDEP OCULUS, Map Direct, and Nexus Portal Information
Appendix I: Interview Documentation

EXECUTIVE SUMMARY

Geotechnical and Environmental Consultants, Inc. (GEC) has been retained by Moffatt & Nichol (M&N), on behalf of the Florida's Turnpike Enterprise (FTE), to provide a Level I Contamination Screening Evaluation Report (CSER) for Florida's Turnpike Widening from Milepost 242.0 to Milepost 248.9 project. This CSER was performed as part of Financial Project ID No. 436194-1-52-01.

The purpose of this evaluation was to assess the risk of encountering petroleum or hazardous substance contamination of soil, groundwater, surface water, or sediment that could adversely affect this project. The CSER activities included a review of public regulatory files and historical data sources, and a site reconnaissance of the project study area.

As a result of this evaluation, we have assigned Contamination Risk Rating (CRR) to 38 sites. The 38 site locations are shown on **Figures 4A-4E** and the contamination status of each site is summarized in **Table 1**.

Using the FDOT CRRs presented in **Appendix C**, we have identified **1 High Risk, 6 Medium Risk** and **31 Low Risk** sites.

Low Risk Sites (31)

Site No.	Site Name	Site Address	Risk Potential
1	Historical Rail Line	Neptune Road	Low
2	Neptune Middle School	2727 Neptune Road	Low
3	Lift Station Generator	Mickey Johnson Court	Low
4	1598 Mickey Johnson Court	1598 Mickey Johnson Court	Low
5	Generators	2802 E Irlo Bronson Memorial Highway	Low
6	Grand Slam Cellular	2804 E Irlo Bronson Memorial Highway	Low
7	SPILLS Incident at US-192 Off Ramp	NB Turnpike off ramp at E Irlo Bronson Memorial Highway	Low
10	Super Mini Mart	2825 E Irlo Bronson Memorial Highway	Low
11	Osceola Farmers Market Office	2801 E Irlo Bronson Memorial Highway	Low
12	SR - 91 Canal Protection Program	FTE Mainline	Low
13	Osceola County Sheriff - Office Fuel Facility	2601/2611 E Irlo Bronson Memorial Highway	Low
14	Osceola County BOCC – Govt Ctr	2501 E Irlo Bronson Memorial Highway	Low
15	Osceola County Communications – Emergency Operations Center	2586 Partin Settlement Road	Low
16	Fire Rescue Support Services Center	2700 Partin Settlement Road	Low
18	Central Florida Power Equipment	2547 Partin Settlement Road	Low
19	Greenscape Mowing Inc	2575 Partin Settlement Road	Low
20	Preston Wells & Sons Inc	2689 Partin Settlement Road	Low

Site No.	Site Name	Site Address	Risk Potential
21	Florida Department of Transportation Toll Plaza	Turnpike Toll Plaza at Mile 244	Low
23	Florida's Turnpike Resurfacing	FTE Mainline	Low
24	Osceola Regional Juvenile Detention Center	2330 New Beginnings Road	Low
25	Osceola County Sheriff's Department	400 Simpson Road	Low
26	Osceola County Jail	402 Simpson Road	Low
27	Gateway High School	93 Panther Paws Trail	Low
28	Osceola County – Admin Center Building 1000 & 2000	817 Bill Beck Boulevard	Low
29	Lil Champ Food Store #1264	1912/1920 Boggy Creek Road	Low
30	SPILLS Incident at SB Turnpike MM 246	SB Turnpike MM 246	Low
32	Toho Water Auth – Buenaventura Lakes WWTP	6890 Birchwood Circle	Low
33	EJV Tires and Auto Repair	3075 Lions Court	Low
34	Napleton South Orlando Chrysler Jeep Dodge	1460 E Osceola Parkway, 1452 E Osceola Parkway	Low
36	L G DeFelice Co	1510 E Osceola Parkway	Low
37	FL Dept of Transportation – Turnpike MP 248	Turnpike Osceola Parkway Toll Plaza	Low

Medium Risk Sites (6)

Site No.	Site Name	Site Address	Risk Potential
8	FL Dept of Transportation - Kiss St Cloud Mile Post 244	Turnpike Mainline Exit 242	Medium
9	SPILLS Incident at 2791 East Irlo Bronson Memorial Highway	2791 E Irlo Bronson Memorial Highway	Medium
17	Historical Citrus Groves	N/A	Low/Medium
31	Rocking A Construction	Boggy Creek Road	Medium
35	Racetrac #607	1470 E Osceola Parkway	Medium
38	Cattle Pen at Pond 2-C	Simmons Road	Medium

High Risk Site (1)

Site No.	Site Name	Site Address	Risk Potential
22	Crystalbrook Golf Club	2259/2261 E Irlo Bronson Memorial Highway	High

Design plans should be reviewed to evaluate potential project impacts and the need for Level II Impact to Construction Assessments (ICAs). It appears that the majority of the improvements

will involve enlarging the embankment to widen the roadway. The pond site recommendations are below.

A total of 59 stormwater pond alternatives have been evaluated to address stormwater management. Not all the proposed stormwater ponds will be selected for use. Level II Impact to Construction Assessments (Level II Assessments) may be required for **8 Medium Risk** and **2 High Risk** pond sites, depending on the final pond locations and configurations.

Pond Site Alternatives (59)

Pond Site No.	Location	Risk Potential	Reasoning
1 – A	Northeast of Neptune crossing of FTE Mainline	Low	Adjacent to Low risk sites: Historical Rail Line, Lift Station Generator, and 1598 Mickey Johnson Court.
1 – B	E of NB off ramp to East Irlo Bronson Memorial Highway	Medium	Adjacent to Medium (Site No. 8 - FTE Mile Post 244) and Low risk sites (Lift Station Generator, 1598 Mickey Johnson Court, Generators, Grand Slam Cellular, Spill Incident, and Super Mini Mart). Site No. 8 extends into the pond footprint. Surficial debris was observed on-site that includes roofing material, that may include asbestos.
1 – C	West of FTE Mainline between Neptune Road and East Irlo Bronson Memorial Highway	Low	Adjacent to Neptune Middle School (Low risk site)
2 – A	West of FTE Mainline between East Irlo Bronson Memorial Highway and Partin Settlement Road	Low	Not adjacent to or within any Contamination Risk Rated (CRR) sites
2 – B	East of FTE Mainline between East Irlo Bronson Memorial Highway and Partin Settlement Road	Low	Adjacent to former citrus groves (Low risk site)
2 – C	East of FTE Mainline between East Irlo Bronson Memorial Highway and Partin Settlement Road	Medium	Adjacent to former citrus groves (Low risk site) with cattle pens(Medium risk site) on site
FPC FISH 4	East of FTE Mainline between East Irlo Bronson Memorial Highway and Partin Settlement Road	Low	Not adjacent to or within any CRR Sites
FPC FISH 1	East of FTE Mainline between East Irlo Bronson Memorial Highway and Partin Settlement Road	Low	Adjacent to former citrus groves (Low risk site)
FPC FISH 2	West of FTE Mainline between East Irlo Bronson Memorial Highway and Partin Settlement Road	Low	Not adjacent to or within any CRR sites

Pond Site No.	Location	Risk Potential	Reasoning
FPC FISH 3	West of FTE Mainline between East Irlo Bronson Memorial Highway and Partin Settlement Road	Low	Adjacent to Osceola County Sheriff Office Fuel Facility (Low risk site)
Pond 2-D	East of FTE Mainline between East Irlo Bronson Memorial Highway and Partin Settlement Road	Medium	Within former citrus groves (Medium risk site) and adjacent to Site No. 16, Fire Rescue Support Services Center (Low risk site)
Pond 3 – A	Southeast of FTE Mainline exit 244 interchange	Low	Not adjacent to or within any CRR sites
Pond 3 – B	Southeast of FTE Mainline exit 244 interchange	Low	Not adjacent to or within any CRR sites
Pond 3 – C1	Within the FTE Mainline exit 244 interchange	Low	Adjacent to Florida's Turnpike Resurfacing (Low risk site)
Pond 3 – C2	Within the FTE Mainline exit 244 interchange	Low	Adjacent to Florida's Turnpike Resurfacing (Low risk site)
Pond 3 – C3	Southeast of the FTE Mainline exit 244 interchange	Low	Adjacent to Florida's Turnpike Resurfacing (Low risk site)
Pond 3 – D	Southwest of the FTE Mainline exit 244 interchange	Low	Adjacent to Florida's Turnpike Resurfacing (Low risk site)
FPC FENNEL 1	East of FTE Mainline between Partin Settlement Road and exit 244 interchange	Low	Not adjacent to or within any CRR sites
FPC FENNEL 2	West side of FTE Mainline between Partin Settlement Road and exit 244 interchange	Low	Not adjacent to or within any CRR sites
FPC FENNEL 3	Southwest of FTE Mainline exit 244 interchange	Low	Not adjacent to or within any CRR sites
Pond 4 – A	Northwest of the Simpson Road crossing of the FTE Mainline	Low	Adjacent to Gateway High School (Low risk site)
Pond 4 – B	Southeast of the Simpson Road crossing of the FTE Mainline	Low	Adjacent to the Osceola Regional Juvenile Detention Center (Low risk site)
Pond 4 – C	Northwest of the FTE Mainline exit 244 interchange	High	Within the Crystalbrook Golf Course (High risk site)
Pond 4 – E	Northwest of the Simson Road crossing of the FTE Mainline	Low	Not adjacent to or within any CRR sites
Pond 4 – D1	Northwest of the FTE Mainline exit 244 interchange	High	Adjacent to Crystalbrook Golf Course (High risk site)
Pond 4 – D2	Within the FTE Mainline exit 244 interchange	Low	Adjacent to Florida's Turnpike Resurfacing (Low risk site)
FPC BASS 1	Northwest of the Simpson Road crossing of the FTE Mainline	Low	Adjacent to Gateway High School (Low risk site)
FPC BASS 2	West of FTE Mainline between Simpson Road and Boggy Creek Road	Low	Adjacent to Gateway High School and Osceola County Admin Building (Low risk sites)

Pond Site No.	Location	Risk Potential	Reasoning
Pond 5 – A	West of FTE Mainline between Simpson Road and Boggy Creek Road	Low	Adjacent to Osceola County – Admin Center Building 1000 & 2000 (Low risk site)
Pond 5 – B	East of FTE Mainline between Simpson Road and Boggy Creek Road	Medium	Within Historical Citrus Grove (Medium risk site) Pond 5-B has been eliminated and was located in the Pond 6-A footprint.
Pond 5 – C	West of FTE Mainline between Simpson Road and Boggy Creek Road	Low	Adjacent to Gateway High School (Low risk site)
Pond 6 – A	East of FTE Mainline between Simpson Road and Boggy Creek Road	Medium	Within Historical Citrus Grove (Medium risk site)
Pond 6 – B	Northwest of the Boggy Creek Road crossing of the FTE Mainline	Low	Adjacent to Lil Champ Food Store #1264 (Low risk site)
Pond 6 – C	Southwest of the Boggy Creek Road crossing of the FTE Mainline	Low	Adjacent to SPILLS Incident at SB Turnpike MM 246 (Low risk site)
FPC BASS 4	Southwest of the Boggy Creek Road crossing of the FTE Mainline	Low	Adjacent to SPILLS Incident at SB Turnpike MM 246 (Low risk site)
Pond 7 – A	Northwest of the Boggy Creek Road crossing of the FTE Mainline	Medium	Adjacent to Site No. 31, Rocking A Construction (Medium risk site)
Pond 7 – B	Northwest of the Boggy Creek Road crossing of the FTE Mainline	Medium	Adjacent to Site No. 31, Rocking A Construction (Medium risk site)
Pond 7 – C	Northwest of the Boggy Creek Road crossing of the FTE Mainline	Medium	Adjacent to Site No. 31, Rocking A Construction (Medium risk site)
Pond 8 – A or FPC BASS 3	West of the FTE Mainline between Boggy Creek Road and Osceola Parkway	Low	Not adjacent to or within any CRR sites
Pond 8 – B	West of the FTE Mainline between Boggy Creek Road and Osceola Parkway	Low	Not adjacent to or within any CRR sites
Pond 8 – C	East of the FTE Mainline between Boggy Creek Road and Osceola Parkway	Low	Not adjacent to or within any CRR sites. Some surficial debris was observed on site that does not appear to present a contamination concern
FPC BASS 5	East of the FTE Mainline between Boggy Creek Road and Osceola Parkway	Low	Not adjacent to or within any CRR sites
FPC BASS 6	East of the FTE Mainline between Boggy Creek Road and Osceola Parkway	Low	Not adjacent to or within any CRR sites
Pond 9 – A	West of the FTE Mainline between Boggy Creek Road and Osceola Parkway	Low	Not adjacent to or within any CRR sites
Pond 9 – B	East of the FTE Mainline between Boggy Creek Road and Osceola Parkway	Low	Not adjacent to or within any CRR sites
Pond 9 – C	West of the FTE Mainline between Boggy Creek Road and Osceola Parkway	Low	Not adjacent to or within any CRR sites
FPC MILL 1	West of the FTE Mainline between Boggy Creek Road and Osceola Parkway	Low	Not adjacent to or within any CRR sites
FPC MILL 2	Southwest of the FTE Mainline interchange with Osceola Parkway	Low	Adjacent to L G DeFelice Co (Low risk site)

Pond Site No.	Location	Risk Potential	Reasoning
FPC MILL 4	Southwest of the FTE Mainline interchange with Osceola Parkway	Low	Adjacent to L G DeFelice Co (Low risk site)
Pond 10 – A	Southwest of the FTE Mainline interchange with Osceola Parkway	Low	Adjacent to L G DeFelice Co (Low risk site)
Pond 10 - B	Southwest of the FTE Mainline interchange with Osceola Parkway	Low	Within the LG DeFelice Co (Low risk site)
Pond 10 – C1	Within the FTE Mainline interchange with Osceola Parkway	Low	Adjacent to L G DeFelice Co (Low risk site)
Pond 10 – C2	Within the FTE Mainline interchange with Osceola Parkway	Low	Not adjacent to or within any CRR sites
Pond 11 – A	Northwest of the FTE Mainline interchange with Osceola Parkway	Low	Adjacent to FL Dept of Transportation – Turnpike MP 248 (Low risk site)
Pond 11 – B	Northwest of the FTE Mainline interchange with Osceola Parkway	Low	Not adjacent to or within any CRR sites
Pond 11 – C1	Within the FTE Mainline interchange with Osceola Parkway	Low	Adjacent to FL Dept of Transportation – Turnpike MP 248 (Low risk site)
Pond 11 – C2	Within the FTE Mainline interchange with Osceola Parkway	Low	Not adjacent to or within any CRR sites
FPC MILL 3	Northwest of the FTE Mainline interchange with Osceola Parkway	Low	Not adjacent to or within any CRR sites
FPC MILL 5	Northwest of the FTE Mainline interchange with Osceola Parkway	Low	Adjacent to FL Dept of Transportation – Turnpike MP 248 (Low risk site)

Design plans should be reviewed to evaluate potential project impacts and the need for Level II ICAs at the following proposed pond locations:

- Pond 1-B is located adjacent to Site No. 8 (former material storage area that appeared to extend into Pond 1-B) and Site No. 9 (historical roadway spill) which have not been assessed. Due to the unknown hazardous materials placed/used on-site, test pits and soil and groundwater sampling for the used-oil group is advised. Roofing debris observed on-site may contain asbestos materials and should be evaluated for proper disposal.
- Pond 2-C contains a cattle pen (Site No. 38) that was first visible in 2003. Due to the potential that cattle were sprayed with pesticides, soil sampling is recommended for arsenic and pesticides (EPA Methods 8081 and 8141) constituents.
- Pond Nos. 2-D, 5-B, and 6-A are located on historical citrus groves and would require soil and groundwater sampling for arsenic, pesticides (EPA Methods 8081 and 8141) and herbicides (EPA Method 8151).
- Pond 4-C and 4-D1 are located on or adjacent to Site No. 22, a historical golf course with known arsenic, chlordane, heptachlor epoxide, and toxaphene contamination impacts.

These ponds would require soil and groundwater sampling for arsenic, pesticides (EPA Methods 8081 and 8141) and herbicides (EPA Method 8151).

- Ponds 7-A, 7-B, and 7-C are located on or adjacent to Site No. 31, a historical excavation and backfill site with no available assessment information. Due to the unknown nature of the backfill materials, test pits and soil and groundwater sampling for the used-oil group is advised.

1.0 INTRODUCTION

1.1 Contract Information

Geotechnical and Environmental Consultants, Inc. (GEC) has been retained by Moffatt & Nichol (M&N), on behalf of the Florida's Turnpike Enterprise (FTE), to provide a Level I Contamination Screening Evaluation Report (CSER) for the FTE Mainline Widening from Milepost 242.0 to Milepost 248.9 project. This CSER was performed as part of Financial Project ID No. 436194-1-52-01.

1.2 Purpose

The purpose of this evaluation is the early identification of potential contamination sites that could impact this project…

The presence of contaminated environmental media (soil, groundwater, surface water, and sediment) can have a significant negative impact on the cost and schedule to complete a roadway improvement project. The purpose of this evaluation was the early identification of potential contamination sites that could impact this project and to provide valuable input for the design, right-of-way acquisition, and construction phases. Right of way acquisition is likely for this project.

2.0 PROJECT DESCRIPTION

The following sections describe the current study area conditions, the project construction plans and elements of the project that could be impacted by soil or groundwater contamination. Common terms used in this report can be found in **Appendix B**.

2.1 Site Description

The project alignment consists of a 6.8-mile long section of Florida's Turnpike between the Neptune Road crossing and the interchange with Osceola Parkway in Osceola County, Florida.

The project alignment consists of a 6.8-mile long section of Florida's Turnpike between the Neptune Road crossing and the interchange with Osceola Parkway in Osceola County, Florida. The Turnpike within the project alignment is a 4-lane, asphalt-paved limited access highway. The project alignment is shown on an excerpt of the United States Geological Survey (USGS) Kissimmee and St Cloud North, Florida Quadrangle Maps (**Figure 1**) in the Appendix.

The study area utilized in this report conforms to the definition presented in Chapter 20 of the FDOT PD&E Manual dated January 14, 2019 and in section 3.0 of this report. The red study area outline shown on **Figures 1** through **4** in the **Appendix** defines a 500-foot radius from the existing and planned roadway and drainage improvements.

2.2 Current Land Use

The current land uses within the study area are shown on the South Florida Water Management District (SFWMD) Map on **Figures 2A-2E** and are summarized as follows:

- Fixed Single Family Units
- Rural Residential
- Fixed Single Family Units
- Medium Density Under Construction
- Fixed Single Family Units
- Mobile Home Units
- Multiple Dwelling Units, Low Rise
- Multiple Dwelling Units, High Rise
- Commercial and Services
- Shopping Centers
- Other Light Industry
- Institutional
- Educational Facilities
- Golf Course
- Community Non-recreational Facilities
- Open Land
- Improved Pastures
- Unimproved Pastures
- Citrus Groves
- Fallow Cropland
- Upland Shrub and Brush Land
- Pine Flatwoods
- Upland Hardwood Forests
- Upland Mixed Coniferous Hardwood
- Channelized Waterways, Canals
- Reservoirs
- Mixed Wetland Hardwoods
- Mixed Shrubs
- Cypress
- Cypress Domes / Heads
- Freshwater Marshes / Graminoid Prairie Marsh
- Wet Prairies
- Roads and Highways
- Electrical Power Facilities
- Sewage Treatment
- Citrus Groves

Other than the golf course and citrus groves, the current land uses do not appear to present a contamination concern. Contamination concerns presented by citrus groves are further discussed in the description of **Site No. 17** in **Table 1.** Contamination concerns presented by the golf course is further discussed in the description of **Site No. 22** in **Table 1.** Historical citrus groves and golf courses may represent contamination concerns due to the past use of chemical fertilizers and pesticides. The fallow croplands do not fall in a location that presents a contamination concern.

2.3 Project Alternatives

Based on the roadway cross sections dated January 7, 2020 and the Pond Site Alternatives plans dated August 13, 2020, we understand the following project elements are proposed along the project alignment:

- Widening of the Florida's Turnpike mainline.
- Reconstruction of 8 bridges.
- Construction of 35 stormwater ponds and floodplain compensation areas.

A total of 59 alternative pond sites and floodplain compensation areas have been evaluated as part of this CSER. The pond sites and floodplain compensation areas are shown on **Figures 1-4** in the **Appendix**.

The design plans were factored into the Contamination Risk Ratings (CRRs) assigned to the contamination risk sites.

3.0 CONTAMINATION SCREENING METHODOLOGY

GEC conducted this evaluation in general accordance with Chapter 20 of the FDOT PD&E Manual dated January 14, 2019. The study area is defined by the following distances from the right-of-way:

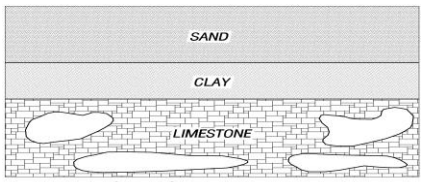
- **All sites within 500 feet**
- **Non-landfill solid waste sites within 1,000 feet**
- **Solid waste landfills, CERCLA, or National Priorities List (NPL) sites within ½ mile**

GEC reviewed relevant information from the FDEP, USEPA, and local agencies in Osceola County to identify known or potential contamination sites within the study area. Historical aerial photographs and other published historical sources were reviewed as part of this CSER. GEC performed a site reconnaissance of the properties within the study area and attempted to interview individuals with knowledge of the study area's environmental status.

Based on the results of the contamination screening activities, GEC assigned Contamination Risk Ratings (CRRs) to sites. The contamination risk rating system was developed by FDOT and incorporates four levels of risk: **No, Low, Medium and High**. For a description of the four risk levels please refer to **Appendix C.**

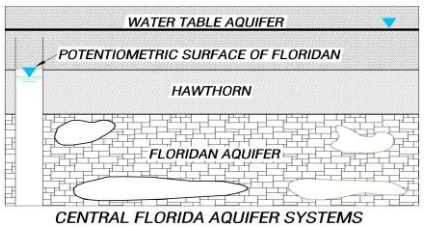
4.0 GEOLOGIC AND GEOGRAPHIC CONDITIONS

4.1 Central Florida Geology



KARST GEOLOGY OF CENTRAL FLORIDA

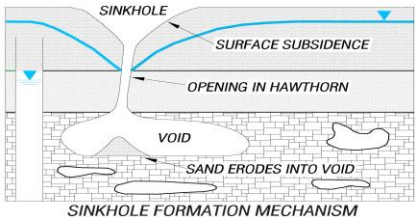
Due to its prevalent geology, referred to as karst, Central Florida is prone to the formation of sinkholes, or large, circular depressions created by local subsidence of the ground surface. The nature and relationship of the three sedimentary layers typical of Central Florida geology cause sinkholes. The deepest, or basement, layer is a massive cavernous limestone formation known as the Floridan aquifer.



CENTRAL FLORIDA AQUIFER SYSTEMS

The Floridan aquifer limestone is overlain by a silty or clayey sand, clay, phosphate, and limestone aquitard (or flow-retarding layer) ranging in thickness from nearly absent to greater than 100 feet and locally referred to as the Hawthorn Group (Hawthorn). The Hawthorn is in turn overlain by a 40 to 70-foot thick surficial layer of sand, bearing the water table aquifer. The likelihood of sinkhole occurrence at a given site within the region is determined by the relationship among these three layers, specifically by the water (and soil)-transmitting capacity of the Hawthorn at that location.

The water table aquifer is comprised of Recent and Pleistocene sands and is separated from the Eocene limestone of the Floridan aquifer by the Miocene sands, clays and limestone of the Hawthorn. Since the thickness and consistency of the Hawthorn is variable across Central Florida, the likelihood of groundwater flow from the upper to the lower aquifer (known as aquifer recharge) will also vary by geographical location.



SINKHOLE FORMATION MECHANISM

In areas where the Hawthorn is absent, water table groundwater (and associated sands) can flow downward to cavities within the limestone aquifer, like sand through an hourglass, recharging the Floridan aquifer, and sometimes causing the formation of surface sinkholes. This process of subsurface erosion associated with recharging the Floridan aquifer is known as raveling. Thus, in Central Florida, areas of effective groundwater recharge to the Floridan aquifer have a higher potential for the formation of surface sinkholes.

Based on the U.S. Geological Survey Map entitled "Recharge and Discharge Areas of the Floridan Aquifer in the St. Johns River Water Management District and Vicinity, Florida," 1984, the study area lies in a low to moderate recharge area. Therefore, we can conclude based

solely on this data that it lies in an area where the relative risk of sinkhole formation ranges from low to moderate compared to the overall risk across Central Florida.

4.2 USGS Quadrangle Map

The study area has been transposed onto the United States Geological Survey (USGS) Kissimmee and St Cloud North Quadrangle Maps, as shown on **Figure 1**. The USGS Quadrangle maps indicate that the natural topography within the study area ranges from approximately +60 to +80 feet above the National Geodetic Vertical Datum (NGVD).

Excavated ponds/borrow pits are visible south of Ames Heaven Road, adjacent to Interchange 65, west of Simpson Road, and between Florida's Turnpike and the Buenaventura Lakes residential complex. Borrow pits may represent a contamination concern due to the potential for unknown buried debris and hazardous material disposal during past earthmoving operations. None of the borrow pits shown on **Figure 1** were found to present a concern to this project.

Historical citrus groves are visible within the southern half of the study area. Historical citrus groves are visible on **Figure 1** and **Figures 4A-4E**. Historical citrus groves may represent a contamination concern due to the potential for residual agricultural chemicals.

No landfills, mines, quarries, or pits are visible within the study area.

4.3 NRCS Soil Survey Review

The National Resources Conservation Service (NRCS) Soil Survey for Osceola County, Florida, dated May 6, 2019, was reviewed for information regarding near-surface soil conditions within the project limits, as shown on **Figure 3**. The following soil types were identified within the study area:

NRCS Soil Table

Unit No.	Soil Name	Hydraulic Soil Group	Estimated Seasonal High Groundwater Table Depth (ft)
1	Adamsville sand, 0 to 2 percent slopes	A	1.5 – 3.5
5	Basinger fine sand, 0 to 2 percent slopes	A/D	0.3 – 1.5
6	Basinger fine sand, depressional, 0 to 1 percent slopes	A/D	+2.0 – 0
10	Delray loamy fine sand, depressional	A/D	+2.0 – 0

Unit No.	Soil Name	Hydraulic Soil Group	Estimated Seasonal High Groundwater Table Depth (ft)
16	Immokalee fine sand, 0 to 2 percent slopes	B/D	0.5 – 1.5
17	Kaliga muck, frequently ponded, 0 to 1 percent slopes	C/D	+2.0 – 0
22	Myakka fine sand, 0 to 2 percent slopes	A/D	0.5 – 1.5
23	Myakka – Urban land complex	A/D	0.5 – 1.5
24	Narcoossee fine sand, 0 to 2 percent slopes	A	2.0 – 3.5
27	Ona fine sand, 0 to 2 percent slopes	B/D	0.5 – 1.5
32	Placid fine sand, frequently ponded, 0 to 1 percent slopes	A/D	+2.0 – 0
34	Pomello fine sand, 0 to 5 percent slopes	A	2.0 – 3.5
36	Pompano fine sand, 0 to 2 percent slopes	B/D	0.5 – 1.5
38	Riviera fine sand, 0 to 2 percent slopes	A/D	0.5 – 1.5
40	Samsula muck, frequently ponded, 0 to 1 percent slopes	A/D	+2.0 – 0
42	Smyrna fine sand, 0 to 2 percent slopes	A/D	0.5 – 3.3
44	Tavares fine sand, 0 to 5 percent slopes	A	3.5 – 5
99	Water	---	---

Hydraulic Soil Group Descriptions:

Group A is sand, loamy sand or sandy loam types of soils. It has low runoff potential and high infiltration rates even when thoroughly wetted. They consist chiefly of deep, well to excessively drained sands or gravels and have a high rate of water transmission.

Group B is silt loam or loam. It has a moderate infiltration rate when thoroughly wetted and consists chiefly or moderately deep to deep, moderately well to well drained soils with moderately fine to moderately coarse textures.

Group C soils are sandy clay loam. They have low infiltration rates when thoroughly wetted and consist chiefly of soils with a layer that impedes downward movement of water and soils with moderately fine to fine structure.

Group D soils are clay loam, silty clay loam, sandy clay, silty clay or clay. This HSG has the highest runoff potential. They have very low infiltration rates when thoroughly wetted and consist chiefly of clay soils with a high swelling potential, soils with a permanent high water table, soils with a claypan or clay layer at or near the surface and shallow soils over nearly impervious material.

In general, the NRCS soil survey map depicts poorly draining, gently to moderately sloping, sandy soils throughout the majority of the Study Area.

The NRCS soil survey map depicts Samsula muck (**Soil Map Unit No. 40**) within the footprint of proposed stormwater ponds 2-A and 2-B and within proposed floodplain compensation areas FPC FISH 1 and FPC FISH 2. This soil type is described as very poorly drained organic soil in depressional areas, fresh water marshes, and swamps. The NRCS Soil Survey predicts seasonal high groundwater levels to be 0 to 2.0 feet above the natural ground surface. This soil type may contain high organic content soils (A-8 or PT), which can have severe limitations for the proposed construction if left untreated. This organic soil type will have restricted use for development and will likely require removal prior to construction.

No landfills, borrow pits, quarries, or other conditions are depicted that would represent potential contamination concerns on, or in the immediate vicinity of, the study area.

Information contained in the NRCS Soil Survey is very general and may be outdated. It may not therefore be reflective of actual soil and groundwater conditions, particularly if recent development in the site vicinity has modified soil conditions or surface/subsurface drainage.

5.0 HISTORICAL DATA REVIEW

5.1 Historical Aerial Photographs

Historical aerial photographs of the study area were reviewed to evaluate past land use and to identify features that may indicate hazardous material or petroleum contamination. Available historical aerial photographs of the study area were accessed from Google Earth, the Florida Department of Transportation, and the University of Florida websites. Aerial photographs for the following years were reviewed: 1944, 1959, 1969, 1971, 1982, 1990, 1994, 1999, 2003, 2008, 2013, and 2018.

The study area was not entirely visible within all of the available historical aerial photograph years. The following years did not include the entire study area:

- 1944 – A short section north of Fortune Road is not included.
- 1959 – The alignment and study area south of the current Florida's Turnpike Exit No. 244 is not included.
- 1969 – The alignment and study area south of the current Florida's Turnpike Exit No. 244 is not included.
- 1990 – The alignment and study area south of Simpson Road is not included.

Our historical aerial photograph review revealed the following observations:

- The study area is mostly undeveloped and appears to be cattle pasture and orange groves in the 1944 through 1971 aerial photographs.
- Florida's Turnpike is visible beginning in the 1969 aerial photographs.
- East Irlo Bronson Memorial Highway (US-192), Partin Settlement Road, and Boggy Creek/Fortune Road are visible beginning in the 1944 aerial photographs.
- Simpson Road is visible beginning in the 1969 aerial photographs.
- Neptune Road is first visible in the 1971 aerial photographs.
- Osceola Parkway is first visible in the 1990 aerial photographs.
- Residential and commercial development within the study area is visible beginning in the 1982 aerial photographs. Development reaches current levels in the early 2010s.
- Orange groves are present within the study area in the 1944 through 2013 aerial photographs.

Table 2 summarizes our aerial photograph review for the 38 potential contamination sites identified within the study area. The Site Numbers shown on **Table 2** correlate to those shown on **Table 1** and in **Figure 4** in the **Appendix**. **Table 1** includes a reference identifying the figure each site is plotted on. The historical aerial photographs are provided in **Appendix A**.

5.2 City Directories

City Directories are historical listings of businesses and residences in a given area, similar to a standard telephone book. The site occupant and addresses listed for previous years can identify past land uses. GEC reviewed the city directory information available at the Osceola County Library, dated 1961 through 2019 at approximately 5-year intervals.

Table 3 summarizes the historical city directory listings within the study area and their applicable CRR Site Numbers. The CRR Site Numbers correspond to the CRR Sites described in **Table 1**. The city directories confirmed the development of the study area and the majority of the listings were between 1994 and 2019. The city directory review did not reveal any gas stations or other commercial/industrial land uses that were not identified in the site reconnaissance, environmental database searches, or historical aerial photograph reviews.

5.3 Fire Insurance Maps

Fire insurance maps are used by insurance companies in assessing fire risk. These maps contain details about building construction, business type, building contents, fuel storage tanks, and other factors affecting fire risk.

Fire insurance maps were not available for the study area. The fire insurance map search confirmation is included in **Appendix D**.

5.4 Historical Quadrangle Maps

GEC reviewed historical quadrangle maps at the www.Historicaerials.com website. The maps for 1954, 1955, 1965, 1972, 1976, 1981, 1987, 2012, 2015, and 2018 were reviewed. The 1954, 1955, 1965, and 1976 maps show only a portion of the study area.

The historical quadrangle map review revealed the following observations:

- The 1954 map included the study area from Neptune Road north to Fortune Road. Neptune Road, US 192, Partin Settlement Road and Boggy Creek/Fortune Road are visible. Historical citrus groves are visible from Partin Settlement Road south to US 192. The majority of the study area is vacant property.

- The 1955/1965 maps show the northern portion of the study area. That portion of the study area is vacant property.

- The 1972 map shows the construction of Florida's Turnpike with associated borrow pits, Interchange 65, and Simpson Road. Some commercial facilities are visible between Interchange 65 and US 192. Residential development is visible between Fish Lake and Florida's Turnpike.

- The 1976 map includes the study area from Neptune Road to about 1.7 miles north of Fortune Road. No significant changes were noted from the 1972 map.

- The 1981 map reveals commercial development, primarily along the US 192 corridor.

- The 1987 map shows an increase in residential development between Fortune Road and the Osceola Parkway locations.

- The 2012-2018 maps depict the construction of the Osceola Parkway and additional residential streets throughout the study area.

The historical quadrangle maps do not depict landfills, quarries, or other conditions that would represent potential contamination concerns in, or in the immediate vicinity of, the study area. No contamination sites were identified on the historical quadrangle maps that were not identified through other records or sources. The quadrangle maps are not included in the appendix due to the proprietary nature of the www.Historicaerials.com website.

5.5 Historical Contamination Screening Evaluation Report

No historical Contamination Screening Evaluation Reports were made available to GEC for the project study area.

Historical Contamination Screening Evaluation Reports refer to any prior reports conducted to assess the contamination potential of the study area not included in the public record review, including previous studies conducted as a part of a FDOT or FTE project.

6.0 PUBLIC RECORD REVIEW

GEC conducted a review of the public record for the study area including information obtained from the USEPA and the FDEP. As a part of our review, GEC subcontracted with EDR for a regulatory database search. The EDR information was reviewed with respect to the search distances described in **Section 4.0**, Contamination Screening Methodology. The EDR Corridor Report is included in **Appendix E**.

6.1 Florida Department of Environmental Protection (FDEP) Databases

The FDEP has compiled several databases that are useful in identifying potential sources of hazardous material or petroleum product contamination. The FDEP databases reviewed for this study and their common abbreviations are provided in **Appendix F.**

6.2 United States Environmental Protection Agency (USEPA) Databases

The federal government has compiled several databases that are useful in identifying potential sources of hazardous material or petroleum product contamination. The federal databases reviewed for this study and their common abbreviations are provided in **Appendix G**.

6.3 FDEP OCULUS Document Management System, Map Direct Website, and Nexus Portal

The FDEP uses the OCULUS Document Management System, Map Direct Website, and Nexus Portal to provide public record information for petroleum or hazardous material releases to the environment, generators of hazardous waste, and solid waste facilities. Information contained in this data management system includes the status of active and abandoned storage tanks, tank inspection reports, tank closure reports, environmental assessment reports, remedial action reports, hazardous waste generator compliance details, and solid waste facility compliance details.

GEC reviewed the OCULUS Document Management System, Map Direct Website, and Nexus Portal within the search distances provided in Section 4.0. The results of our review have been incorporated in our Potential Contamination Site Descriptions in **Table 1**. The FDEP OCULUS, Map Direct and Nexus Portal Information can be found in **Appendix H**.

6.4 EDB Delineated Areas

The Florida Legislature had the FDEP implement the Groundwater Contamination Areas Program in 1988 under Chapter 62-524, FAC. The purpose of the program was to protect public health and groundwater resources by regulating potable water well construction and testing standards for areas of known groundwater contamination. During the period 1962 to 1980, the Florida Department of Agriculture and Consumer Services (FDACS) conducted widespread applications of ethylene dibromide (EDB), an agricultural pesticide, to control nematodes in citrus groves. In 1983, the FDEP began testing groundwater in potable wells throughout Florida due to the discovery of EDB in wells in other states. The delineated areas of EDB groundwater contamination are shown on the FDEP Map Direct website. The potable wells, agricultural or residential, with confirmed impacts were shown on this website with a 1,000-foot buffer zone in an attempt to project future migration of contaminants. However, this does not mean that there is not EDB contamination outside of that 1,000-foot zone.

After reviewing these EDB-delineated areas on the FDEP Map Direct website, no EDB-delineated areas exist within the study area.

6.5 Agricultural Land Use

Historical citrus groves and cattle grazing operations were present within the study area in historical aerial photographs. Ponds 2-D, 5-B, and 6-A are located on historical citrus groves. Pond 2-C contains a cattle pen (Site No. 38).

Although there were no obvious signs of environmental impacts observed on the agricultural properties during the site reconnaissance, residual impacts to the soil or groundwater could exist based on historical agricultural chemical usage at those properties within the study area. Historical citrus land uses are identified as **Site No. 17** in **Table 1**.

6.6 Railroad Corridors

The Kissimmee to St. Cloud Rail Line was constructed along the Neptune Road alignment in 1888. The rail line extended along the south side of Neptune Road west of Canal C-31 and along the north side of Neptune Road east of Canal C-31. This rail line crosses the study area on the south side of Neptune Road and is discussed as **Site No. 1** in **Table 1**.

6.7 Cattle Dip Vats

Cattle dip vats were a response to cattle tick fever in the 1890s. The USDA initiated the cattle dip vat program in 1906 and approximately 3,200 cattle dip vats had been constructed by 1940.

No cattle dip vats were identified within the study area through public record and database review, historical aerial photograph review, or site reconnaissance. A cattle pen (Site No. 38) was observed within the study area (Pond 2-C). Pond 2-C was reviewed in the field and via historical aerial photographs and no cattle dipping vat was identified at that location. Based on available information, we found no evidence that cattle dip vats within the study area contribute to contamination risk for this project.

7.0 INTERVIEWS

On February 25, 2020, GEC submitted a request for information to Mr. Shane Gibbs, Government Operations Consultant for FDEP's Central District, regarding spill sites identified in the EDR Corridor Report within the study area. Mr. Gibbs provided information for 5 spill sites located by EDR. Four of the spill sites were found to be within the study area and are included in **Table 1** as **Site Nos. 7, 9, 29, and 30.**

On March 5, 2020, GEC submitted a records request to Mark Gantz of the Osceola County Fire Rescue Department for information regarding 11 sites (**Site Nos. 5, 6, 11, 13, 16, 18, 25, 33, 34, 39, and 40**) within the study area listed in the Osceola County Hazardous Waste database. Mr. Gantz stated that none of the sites contained any records of releases of hazardous waste.

On March 5, 2020, GEC submitted a records request to Mike Bryant of the Osceola County Hazardous Waste Division regarding 11 sites (**Site Nos. 5, 6, 11, 13, 16, 18, 25, 33, 34, 39, and 40**) within the study area listed in the Osceola County Hazardous Waste database. GEC received a reply that Mr. Bryant was no longer employed by the County. GEC was contacted by Mr. Danny Shaeffer, the director of the Osceola County Solid Waste Division, via phone on March 6, 2020. Mr. Shaeffer stated that due to Mr. Bryant's retirement, detailed records for the hazardous waste status of the sites were not currently available.

No additional interviews were performed in the preparation of this assessment. The interview documentation is included in **Appendix I**.

8.0 SITE RECONNAISSANCE

A GEC representative performed a reconnaissance of the study area on March 10, 2020. The purpose of the reconnaissance was to document conditions and evaluate whether current land

uses could result in hazardous material or petroleum product contamination of environmental media.

The properties within the project study area were visually inspected for evidence of contamination such as stressed vegetation, underground tank vent and fill pipes, dumping, accumulated areas of debris, evidence of buried materials, and ground staining.

Details of the site reconnaissance are incorporated in the Potential Contamination Site Summary Descriptions in **Table 1**. Photographs obtained for each potential contamination site during our site reconnaissance are also included in **Table 1.**

9.0 CONCLUSIONS AND RECOMMENDATIONS

This CSER has identified the 38 sites that, in GEC's opinion, have some risk of contamination impacts to this project. The site locations are shown on **Figures 4A-4E**. **Table 1** summarizes the findings for each rated site.

9.1 Potential Contamination Sites

Low Risk Sites (31)

Site No.	Site Name	Site Address	Risk Potential
1	Historical Rail Line	Neptune Road	Low
2	Neptune Middle School	2727 Neptune Road	Low
3	Lift Station Generator	Mickey Johnson Court	Low
4	1598 Mickey Johnson Court	1598 Mickey Johnson Court	Low
5	Generators	2802 E Irlo Bronson Memorial Highway	Low
6	Grand Slam Cellular	2804 E Irlo Bronson Memorial Highway	Low
7	SPILLS Incident at US-192 Off Ramp	NB Turnpike off ramp at E Irlo Bronson Memorial Highway	Low
10	Super Mini Mart	2825 E Irlo Bronson Memorial Highway	Low
11	Osceola Farmers Market Office	2801 E Irlo Bronson Memorial Highway	Low
12	SR - 91 Canal Protection Program	FTE Mainline	Low
13	Osceola County Sheriff - Office Fuel Facility	2601/2611 E Irlo Bronson Memorial Highway	Low
14	Osceola County BOCC – Govt Ctr	2501 E Irlo Bronson Memorial Highway	Low
15	Osceola County Communications – Emergency Operations Center	2586 Partin Settlement Road	Low
16	Fire Rescue Support Services Center	2700 Partin Settlement Road	Low
18	Central Florida Power Equipment	2547 Partin Settlement Road	Low
19	Greenscape Mowing Inc	2575 Partin Settlement Road	Low
20	Preston Wells & Sons Inc	2689 Partin Settlement Road	Low

Site No.	Site Name	Site Address	Risk Potential
21	Florida Department of Transportation Toll Plaza	Turnpike Toll Plaza at Mile 244	Low
23	Florida's Turnpike Resurfacing	FTE Mainline	Low
24	Osceola Regional Juvenile Detention Center	2330 New Beginnings Road	Low
25	Osceola County Sheriff's Department	400 Simpson Road	Low
26	Osceola County Jail	402 Simpson Road	Low
27	Gateway High School	93 Panther Paws Trail	Low
28	Osceola County – Admin Center Building 1000 & 2000	817 Bill Beck Boulevard	Low
29	Lil Champ Food Store #1264	1912/1920 Boggy Creek Road	Low
30	SPILLS Incident at SB Turnpike MM 246	SB Turnpike MM 246	Low
32	Toho Water Auth – Buenaventura Lakes WWTP	6890 Birchwood Circle	Low
33	EJV Tires and Auto Repair	3075 Lions Court	Low
34	Napleton South Orlando Chrysler Jeep Dodge	1460 E Osceola Parkway, 1452 E Osceola Parkway	Low
36	L G DeFelice Co	1510 E Osceola Parkway	Low
37	FL Dept of Transportation – Turnpike MP 248	Turnpike Osceola Parkway Toll Plaza	Low

Medium Risk Sites (6)

Site No.	Site Name	Site Address	Risk Potential
8	FL Dept of Transportation - Kiss St Cloud Mile Post 244	Turnpike Mainline Exit 242	Medium
9	SPILLS Incident at 2791 East Irlo Bronson Memorial Highway	2791 E Irlo Bronson Memorial Highway	Medium
17	Historical Citrus Groves	N/A	Low/Medium
31	Rocking A Construction	Boggy Creek Road	Medium
35	Racetrac #607	1470 E Osceola Parkway	Medium
38	Cattle Pen at Pond 2-C	Simmons Road	Medium

High Risk Site (1)

Site No.	Site Name	Site Address	Risk Potential
22	Crystalbrook Golf Club	2259/2261 E Irlo Bronson Memorial Highway	High

Design plans should be reviewed to evaluate potential project impacts and the need for Level II Impact to Construction Assessments (ICAs). It appears that the majority of the improvements

will involve enlarging the embankment to widen the roadway. The pond site recommendations are below.

A total of 59 stormwater pond alternatives have been evaluated to address stormwater management. Not all the proposed stormwater ponds will be selected for use. Level II Impact to Construction Assessments (Level II Assessments) may be required for **8 Medium Risk** and **2 High Risk** pond sites, depending on the final pond locations and configurations.

Pond Site Alternatives (59)

Pond Site No.	Location	Risk Potential	Reasoning
1 – A	Northeast of Neptune crossing of FTE Mainline	Low	Adjacent to Low risk sites: Historical Rail Line, Lift Station Generator, and 1598 Mickey Johnson Court.
1 – B	E of NB off ramp to East Irlo Bronson Memorial Highway	Medium	Adjacent to Medium (Site No. 8 - FTE Mile Post 244) and Low risk sites (Lift Station Generator, 1598 Mickey Johnson Court, Generators, Grand Slam Cellular, Spill Incident, and Super Mini Mart). Site No. 8 extends into the pond footprint. Surficial debris was observed on-site that includes roofing material, that may include asbestos.
1 – C	West of FTE Mainline between Neptune Road and East Irlo Bronson Memorial Highway	Low	Adjacent to Neptune Middle School (Low risk site)
2 – A	West of FTE Mainline between East Irlo Bronson Memorial Highway and Partin Settlement Road	Low	Not adjacent to or within any Contamination Risk Rated (CRR) sites
2 – B	East of FTE Mainline between East Irlo Bronson Memorial Highway and Partin Settlement Road	Low	Adjacent to former citrus groves (Low risk site)
2 – C	East of FTE Mainline between East Irlo Bronson Memorial Highway and Partin Settlement Road	Medium	Adjacent to former citrus groves (Low risk site) with cattle pens(Medium risk site) on site
FPC FISH 4	East of FTE Mainline between East Irlo Bronson Memorial Highway and Partin Settlement Road	Low	Not adjacent to or within any CRR Sites
FPC FISH 1	East of FTE Mainline between East Irlo Bronson Memorial Highway and Partin Settlement Road	Low	Adjacent to former citrus groves (Low risk site)
FPC FISH 2	West of FTE Mainline between East Irlo Bronson Memorial Highway and Partin Settlement Road	Low	Not adjacent to or within any CRR sites

Pond Site No.	Location	Risk Potential	Reasoning
FPC FISH 3	West of FTE Mainline between East Irlo Bronson Memorial Highway and Partin Settlement Road	Low	Adjacent to Osceola County Sheriff Office Fuel Facility (Low risk site)
Pond 2-D	East of FTE Mainline between East Irlo Bronson Memorial Highway and Partin Settlement Road	Medium	Within former citrus groves (Medium risk site) and adjacent to Site No. 16, Fire Rescue Support Services Center (Low risk site)
Pond 3 – A	Southeast of FTE Mainline exit 244 interchange	Low	Not adjacent to or within any CRR sites
Pond 3 – B	Southeast of FTE Mainline exit 244 interchange	Low	Not adjacent to or within any CRR sites
Pond 3 – C1	Within the FTE Mainline exit 244 interchange	Low	Adjacent to Florida's Turnpike Resurfacing (Low risk site)
Pond 3 – C2	Within the FTE Mainline exit 244 interchange	Low	Adjacent to Florida's Turnpike Resurfacing (Low risk site)
Pond 3 – C3	Southeast of the FTE Mainline exit 244 interchange	Low	Adjacent to Florida's Turnpike Resurfacing (Low risk site)
Pond 3 – D	Southwest of the FTE Mainline exit 244 interchange	Low	Adjacent to Florida's Turnpike Resurfacing (Low risk site)
FPC FENNEL 1	East of FTE Mainline between Partin Settlement Road and exit 244 interchange	Low	Not adjacent to or within any CRR sites
FPC FENNEL 2	West side of FTE Mainline between Partin Settlement Road and exit 244 interchange	Low	Not adjacent to or within any CRR sites
FPC FENNEL 3	Southwest of FTE Mainline exit 244 interchange	Low	Not adjacent to or within any CRR sites
Pond 4 – A	Northwest of the Simpson Road crossing of the FTE Mainline	Low	Adjacent to Gateway High School (Low risk site)
Pond 4 – B	Southeast of the Simpson Road crossing of the FTE Mainline	Low	Adjacent to the Osceola Regional Juvenile Detention Center (Low risk site)
Pond 4 – C	Northwest of the FTE Mainline exit 244 interchange	High	Within the Crystalbrook Golf Course (High risk site)
Pond 4 – E	Northwest of the Simson Road crossing of the FTE Mainline	Low	Not adjacent to or within any CRR sites
Pond 4 – D1	Northwest of the FTE Mainline exit 244 interchange	High	Adjacent to Crystalbrook Golf Course (High risk site)
Pond 4 – D2	Within the FTE Mainline exit 244 interchange	Low	Adjacent to Florida's Turnpike Resurfacing (Low risk site)
FPC BASS 1	Northwest of the Simpson Road crossing of the FTE Mainline	Low	Adjacent to Gateway High School (Low risk site)
FPC BASS 2	West of FTE Mainline between Simpson Road and Boggy Creek Road	Low	Adjacent to Gateway High School and Osceola County Admin Building (Low risk sites)

Pond Site No.	Location	Risk Potential	Reasoning
Pond 5 – A	West of FTE Mainline between Simpson Road and Boggy Creek Road	Low	Adjacent to Osceola County – Admin Center Building 1000 & 2000 (Low risk site)
Pond 5 – B	East of FTE Mainline between Simpson Road and Boggy Creek Road	Medium	Within Historical Citrus Grove (Medium risk site) Pond 5-B has been eliminated and was located in the Pond 6-A footprint.
Pond 5 – C	West of FTE Mainline between Simpson Road and Boggy Creek Road	Low	Adjacent to Gateway High School (Low risk site)
Pond 6 – A	East of FTE Mainline between Simpson Road and Boggy Creek Road	Medium	Within Historical Citrus Grove (Medium risk site)
Pond 6 – B	Northwest of the Boggy Creek Road crossing of the FTE Mainline	Low	Adjacent to Lil Champ Food Store #1264 (Low risk site)
Pond 6 – C	Southwest of the Boggy Creek Road crossing of the FTE Mainline	Low	Adjacent to SPILLS Incident at SB Turnpike MM 246 (Low risk site)
FPC BASS 4	Southwest of the Boggy Creek Road crossing of the FTE Mainline	Low	Adjacent to SPILLS Incident at SB Turnpike MM 246 (Low risk site)
Pond 7 – A	Northwest of the Boggy Creek Road crossing of the FTE Mainline	Medium	Adjacent to Site No. 31, Rocking A Construction (Medium risk site)
Pond 7 – B	Northwest of the Boggy Creek Road crossing of the FTE Mainline	Medium	Adjacent to Site No. 31, Rocking A Construction (Medium risk site)
Pond 7 – C	Northwest of the Boggy Creek Road crossing of the FTE Mainline	Medium	Adjacent to Site No. 31, Rocking A Construction (Medium risk site)
Pond 8 – A or FPC BASS 3	West of the FTE Mainline between Boggy Creek Road and Osceola Parkway	Low	Not adjacent to or within any CRR sites
Pond 8 – B	West of the FTE Mainline between Boggy Creek Road and Osceola Parkway	Low	Not adjacent to or within any CRR sites
Pond 8 – C	East of the FTE Mainline between Boggy Creek Road and Osceola Parkway	Low	Not adjacent to or within any CRR sites. Some surficial debris was observed on site that does not appear to present a contamination concern
FPC BASS 5	East of the FTE Mainline between Boggy Creek Road and Osceola Parkway	Low	Not adjacent to or within any CRR sites
FPC BASS 6	East of the FTE Mainline between Boggy Creek Road and Osceola Parkway	Low	Not adjacent to or within any CRR sites
Pond 9 – A	West of the FTE Mainline between Boggy Creek Road and Osceola Parkway	Low	Not adjacent to or within any CRR sites
Pond 9 – B	East of the FTE Mainline between Boggy Creek Road and Osceola Parkway	Low	Not adjacent to or within any CRR sites
Pond 9 – C	West of the FTE Mainline between Boggy Creek Road and Osceola Parkway	Low	Not adjacent to or within any CRR sites
FPC MILL 1	West of the FTE Mainline between Boggy Creek Road and Osceola Parkway	Low	Not adjacent to or within any CRR sites
FPC MILL 2	Southwest of the FTE Mainline interchange with Osceola Parkway	Low	Adjacent to L G DeFelice Co (Low risk site)

Pond Site No.	Location	Risk Potential	Reasoning
FPC MILL 4	Southwest of the FTE Mainline interchange with Osceola Parkway	Low	Adjacent to L G DeFelice Co (Low risk site)
Pond 10 – A	Southwest of the FTE Mainline interchange with Osceola Parkway	Low	Adjacent to L G DeFelice Co (Low risk site)
Pond 10 - B	Southwest of the FTE Mainline interchange with Osceola Parkway	Low	Within the LG DeFelice Co (Low risk site)
Pond 10 – C1	Within the FTE Mainline interchange with Osceola Parkway	Low	Adjacent to L G DeFelice Co (Low risk site)
Pond 10 – C2	Within the FTE Mainline interchange with Osceola Parkway	Low	Not adjacent to or within any CRR sites
Pond 11 – A	Northwest of the FTE Mainline interchange with Osceola Parkway	Low	Adjacent to FL Dept of Transportation – Turnpike MP 248 (Low risk site)
Pond 11 – B	Northwest of the FTE Mainline interchange with Osceola Parkway	Low	Not adjacent to or within any CRR sites
Pond 11 – C1	Within the FTE Mainline interchange with Osceola Parkway	Low	Adjacent to FL Dept of Transportation – Turnpike MP 248 (Low risk site)
Pond 11 – C2	Within the FTE Mainline interchange with Osceola Parkway	Low	Not adjacent to or within any CRR sites
FPC MILL 3	Northwest of the FTE Mainline interchange with Osceola Parkway	Low	Not adjacent to or within any CRR sites
FPC MILL 5	Northwest of the FTE Mainline interchange with Osceola Parkway	Low	Adjacent to FL Dept of Transportation – Turnpike MP 248 (Low risk site)

9.2 Level II Impact to Construction Assessments (ICA) Recommendations

Design plans should be reviewed to evaluate potential project impacts and the need for Level II Impact to Construction Assessments (ICAs). It appears that the majority of the improvements will involve enlarging the embankment to widen the roadway. The pond site recommendations are below.

- Pond 1-B is located adjacent to Site No. 8 (former material storage area that appeared to extend into Pond 1-B) and Site No. 9 (historical roadway spill) which have not been assessed. Due to the unknown hazardous materials placed/used on-site, test pits and soil and groundwater sampling for the used-oil group is advised. Roofing debris observed on-site may contain asbestos materials and should be evaluated for proper disposal.
- Pond 2-C contains a cattle pen (Site No. 38) that was first visible in 2003. Due to the potential that cattle were sprayed with pesticides, soil sampling is recommended for arsenic and pesticides (EPA Methods 8081 and 8141) constituents.

- Pond Nos. 2-D, 5-B, and 6-A are located on historical citrus groves and would require soil and groundwater sampling for arsenic, pesticides (EPA Methods 8081 and 8141) and herbicides (EPA Method 8151).
- Pond 4-C and 4-D1 are located on or adjacent to Site No. 22, a historical golf course with known arsenic, chlordane, heptachlor epoxide, and toxaphene contamination impacts. These ponds would require soil and groundwater sampling for arsenic, pesticides (EPA Methods 8081 and 8141) and herbicides (EPA Method 8151).
- Ponds 7-A, 7-B, and 7-C are located on or adjacent to Site No. 31, a historical excavation and backfill site with no available assessment information. Due to the unknown nature of the backfill materials, test pits and soil and groundwater sampling for the used-oil group is advised.

10.0 LIMITATIONS

The findings, opinions, conclusions and recommendations presented herein are based in part on reasonably ascertainable information contained in the public record. GEC does not warrant or guarantee the accuracy or completeness of this information. Some of this public record information may be dated and not representative of conditions at the time of this report was prepared (March 2020), or in the future. Additional limitations are as follows:

- Not discussed in this report are properties that have been historically undeveloped land, are associated with residential use and do not appear to pose a contamination risk, or are professional/commercial establishments that are not associated with hazardous materials or petroleum products.

- This study also does not include surveys of wetlands, endangered species, asbestos containing materials, lead-based paints, or other potential hazardous building materials.

11.0 USE OF THIS REPORT

GEC has prepared this report for the exclusive use of our client, M&N and FTE, and for application to our client's project. GEC will not be held responsible for any other party's interpretation or use of this report's data or recommendations without our written authorization.

GEC performed the services described in this report in a manner consistent with that level of care and skill ordinarily exercised by members of our profession currently practicing in Central Florida. No other representation is made or implied in this document.

The conclusions and recommendations should be disregarded if the final project design differs from the project description in this report. If such changes are contemplated, GEC should be retained to review the new plans to assess the applicability of this report in light of proposed changes.

FIGURES

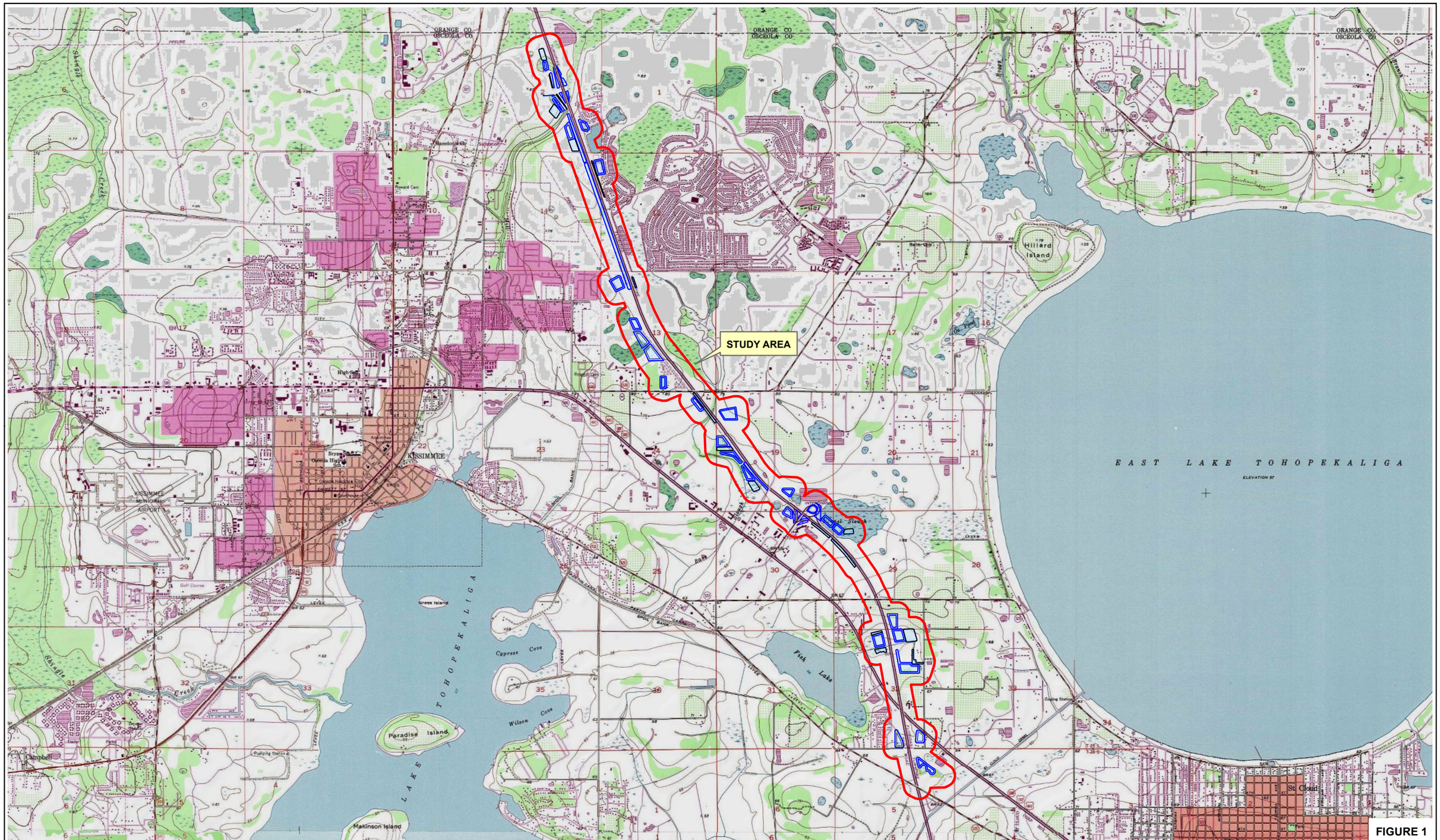


FIGURE 1

USGS Kissimmee, FL Quadrangle Map
Dated: 1987

USGS St. Cloud North, FL Quadrangle Map
Dated: 1987

N

0 2,000 4,000
Feet

RICHARD P. McCORMICK, P.G.
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STATE OF FLORIDA
DEPARTMENT OF TRANSPORATATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
91	OSCEOLA	436194-1-52-01

USGS QUADRANGLE MAP

SHEET NO.
D-217

W:\Projects\J3892GE FTE Mainline Widening From US 192 to Osceola Parkway\CADD 8-17-20\3892E QUAD.mxd 10/30/2020



FIGURE 2A

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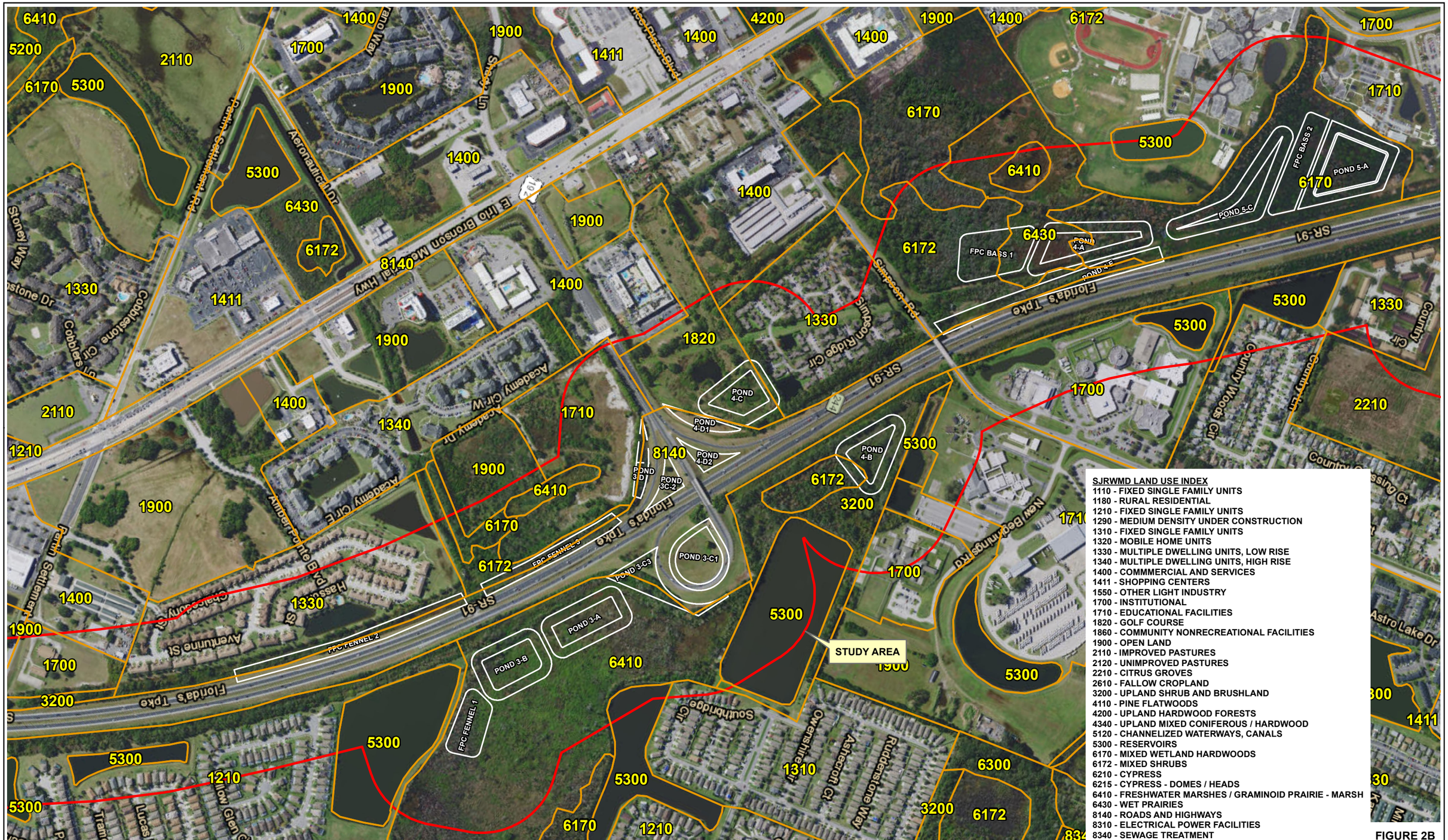
STATE OF FLORIDA DEPARTMENT OF TRANSPORATATION		
ROAD NO.	COUNTY	FINANCIAL PROJECT ID
91	OSCEOLA	436194-1-52-01

SJRWMD LAND USE MAP

SHEET NO. D-218

W:\Projects\J3892GE FTE Mainline Widening From US 192 to Osceola Parkway\CADD 8-17-20\3892E Landuse01.mxd 10/30/2020



SJRWMD LAND USE INDEX

1110 - FIXED SINGLE FAMILY UNITS
1180 - RURAL RESIDENTIAL
1210 - FIXED SINGLE FAMILY UNITS
1290 - MEDIUM DENSITY UNDER CONSTRUCTION
1310 - FIXED SINGLE FAMILY UNITS
1320 - MOBILE HOME UNITS
1330 - MULTIPLE DWELLING UNITS, LOW RISE
1340 - MULTIPLE DWELLING UNITS, HIGH RISE
1400 - COMMMERCIAL AND SERVICES
1411 - SHOPPING CENTERS
1550 - OTHER LIGHT INDUSTRY
1700 - INSTITUTIONAL
1710 - EDUCATIONAL FACILITIES
1820 - GOLF COURSE
1860 - COMMUNITY NONRECREATIONAL FACILITIES
1900 - OPEN LAND
2110 - IMPROVED PASTURES
2120 - UNIMPROVED PASTURES
2210 - CITRUS GROVES
2610 - FALLOW CROPLAND
3200 - UPLAND SHRUB AND BRUSHLAND
4110 - PINE FLATWOODS
4200 - UPLAND HARDWOOD FORESTS
4340 - UPLAND MIXED CONIFEROUS / HARDWOOD
5120 - CHANNELIZED WATERWAYS, CANALS
5300 - RESERVOIRS
6170 - MIXED WETLAND HARDWOODS
6172 - MIXED SHRUBS
6210 - CYPRESS
6215 - CYPRESS - DOMES / HEADS
6410 - FRESHWATER MARSHES / GRAMINOID PRAIRIE - MARSH
6430 - WET PRAIRIES
8140 - ROADS AND HIGHWAYS
8310 - ELECTRICAL POWER FACILITIES
8340 - SEWAGE TREATMENT

FIGURE 2B

N

0 300 600
Feet

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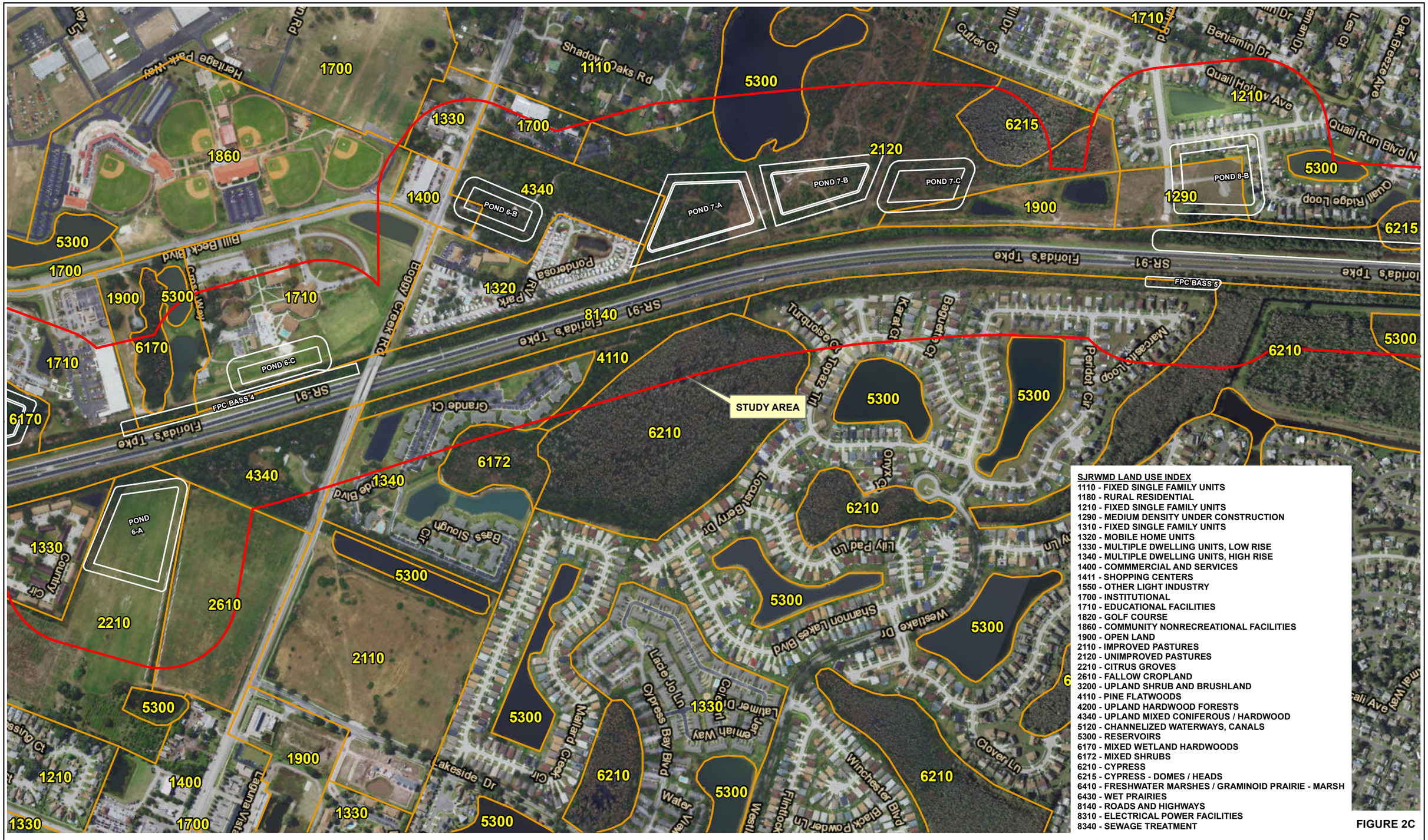
SJRWMD LAND USE MAP

SHEET NO.
D-219


STUDY AREA
POND 6-A
POND 6-B
POND 6-C
POND 7-A
POND 7-B
POND 7-C
POND 8-B
FPC BASS 4
FPC BASS 5
SR-91
Florida's Turnpike
Boggy Creek Rd
Shadow Oaks Rd
Heritage Park Way
Bill Beck Blvd
Ponderosa RV Park
Grande Blvd
Grande Ct
Bass Slough Ct
Country Cir
Lakeside Dr
Cypress Bay Blvd
Water View Ln
Mallard Creek Cir
Lagoon View Ln
Lagoon View Dr
Lagoon View Cir
Lagoon View Ct
Jefferson Way
Lagoon View Loop
Lagoon View Way
Lagoon View Pl
Lagoon View Trl
Lagoon View Ln
Lagoon View Dr
Lagoon View Cir
Lagoon View Ct



STUDY AREA

SJRWMD LAND USE INDEX

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6215 - CYPRESS - DOMES / HEADS
6410 - FRESHWATER MARSHES / GRAMINOID PRAIRIE - MARSH
6430 - WET PRAIRIES
8140 - ROADS AND HIGHWAYS
8310 - ELECTRICAL POWER FACILITIES
8340 - SEWAGE TREATMENT

N

0 300 600
Feet

FIGURE 2D

RICHARD P. McCORMICK, P.G.
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STATE OF FLORIDA
DEPARTMENT OF TRANSPORATATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
91	OSCEOLA	436194-1-52-01

SJRWMD LAND USE MAP

SHEET NO.
D-221

W:\Projects\J3892GE FTE Mainline Widening From US 192 to Osceola Parkway\CADD 8-17-20\3892E Landuse04.mxd 10/30/2020


STUDY AREA
POND 11-B
FPC MILL 3
SR-91 Florida's Tpke
Florida's Tpke SR-91
Orange Ave S
Windrose Dr
Hawk Lake Dr
Harrier Dr
Accipiter Dr
Prairie Hawk Dr
Derby Glen Dr
Grand Dr
Hooktail Ct
Kestrel Dr
Nestlewood Trl
Hawkeye Dr
Tower Center Blvd
Cattail Ct
Windy Pond Ct
Girard Dr
Whispering Oaks Ln
Babylon Way
Adelphi Ln
Chihuly Ct
Cresting Ct
SR-417-TOLL N Central Florida Greeneway
1411
1550
1900
6430
6210
6410
1210
6172
4110
3210
5300
6210
3200
1340
7400
3200
8140
8200
3100
6215
4110
1310
1330
7470
1710
6215
6172
3200
1900
5120
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6430
1900
1210
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1900
1900
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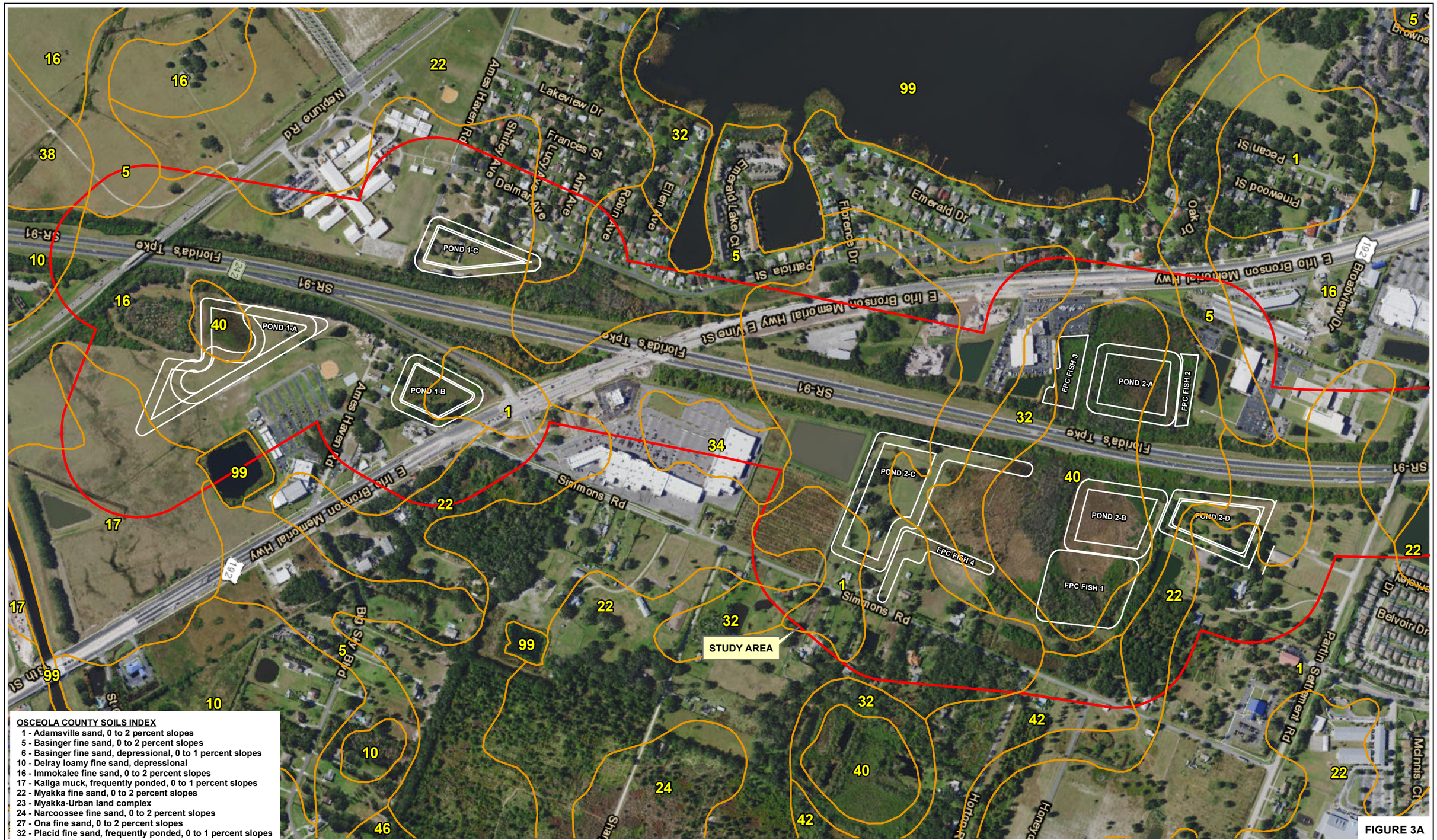
1330
5300
5300
5300



OSCEOLA COUNTY SOILS INDEX

- 1 - Adamsville sand, 0 to 2 percent slopes
- 5 - Basinger fine sand, 0 to 2 percent slopes
- 6 - Basinger fine sand, depressional, 0 to 1 percent slopes
- 10 - Delray loamy fine sand, depressional
- 16 - Immokalee fine sand, 0 to 2 percent slopes
- 17 - Kaliga muck, frequently ponded, 0 to 1 percent slopes
- 22 - Myakka fine sand, 0 to 2 percent slopes
- 23 - Myakka-Urban land complex
- 24 - Narcoossee fine sand, 0 to 2 percent slopes
- 27 - Ona fine sand, 0 to 2 percent slopes
- 32 - Placid fine sand, frequently ponded, 0 to 1 percent slopes
- 34 - Pomello fine sand, 0 to 5 percent slopes
- 36 - Pompano fine sand, 0 to 2 percent slopes
- 38 - Riviera fine sand, 0 to 2 percent slopes
- 40 - Samsula muck, frequently ponded, 0 to 1 percent slopes
- 42 - Smyrna fine sand, 0 to 2 percent slopes
- 44 - Tavares fine sand, 0 to 5 percent slopes
- 99 - Water

N

0 300 600
Feet

FIGURE 3A

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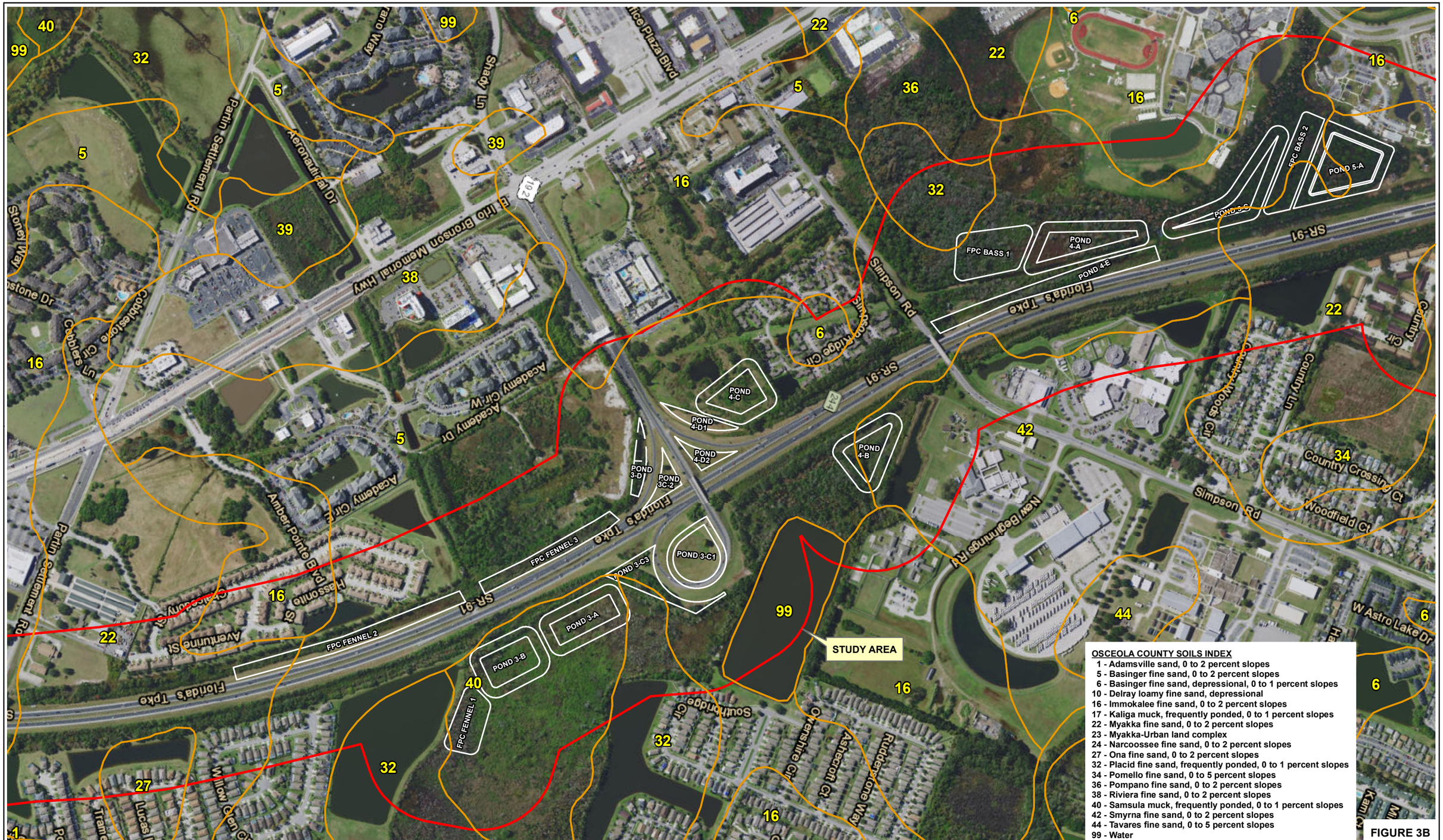
STATE OF FLORIDA
DEPARTMENT OF TRANSPORATATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
91	OSCEOLA	436194-1-52-01

NRCS SOIL SURVEY MAP

SHEET NO.
D-223



OSCEOLA COUNTY SOILS INDEX

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- 40 - Samsula muck, frequently ponded, 0 to 1 percent slopes
- 42 - Smyrna fine sand, 0 to 2 percent slopes
- 44 - Tavares fine sand, 0 to 5 percent slopes
- 99 - Water

FIGURE 3B

N

0 300 600
Feet

RICHARD P. McCORMICK, P.G.
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STATE OF FLORIDA
DEPARTMENT OF TRANSPORATATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
91	OSCEOLA	436194-1-52-01

NRCS SOIL SURVEY MAP

SHEET NO. D-224

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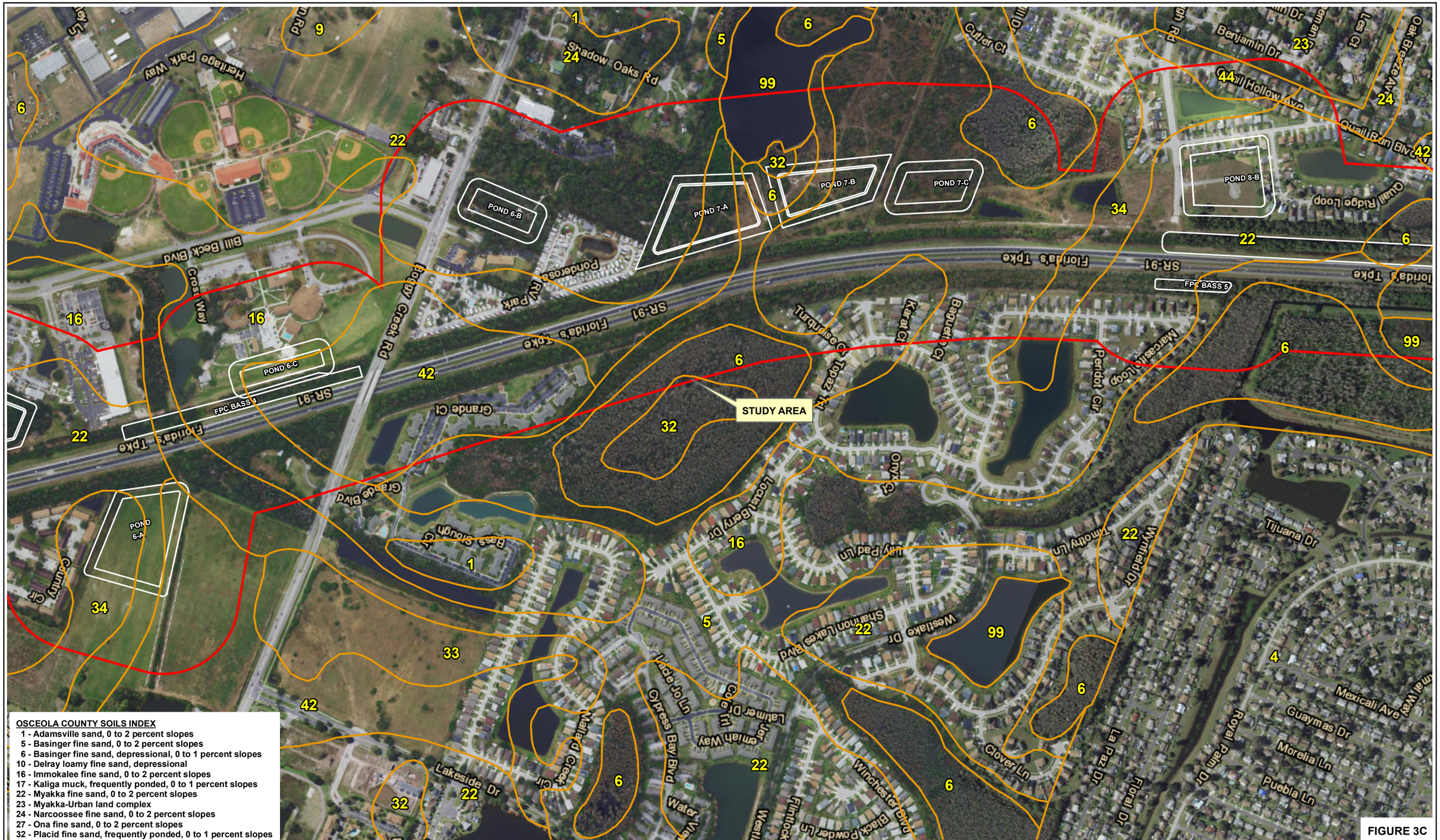

OSCEOLA COUNTY SOILS INDEX

- 1 - Adamsville sand, 0 to 2 percent slopes
- 5 - Basinger fine sand, 0 to 2 percent slopes
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- 34 - Pomello fine sand, 0 to 5 percent slopes
- 36 - Pompano fine sand, 0 to 2 percent slopes
- 38 - Riviera fine sand, 0 to 2 percent slopes
- 40 - Samsula muck, frequently ponded, 0 to 1 percent slopes
- 42 - Smyrna fine sand, 0 to 2 percent slopes
- 44 - Tavares fine sand, 0 to 5 percent slopes
- 99 - Water

N

0 300 600

Feet

FIGURE 3C

RICHARD P. McCORMICK, P.G.
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KISSIMMEE, FL 34744-1933

STATE OF FLORIDA
DEPARTMENT OF TRANSPORATATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
91	OSCEOLA	436194-1-52-01

NRCS SOIL SURVEY MAP

SHEET NO. D-225



OSCEOLA COUNTY SOILS INDEX

- 1 - Adamsville sand, 0 to 2 percent slopes
- 5 - Basinger fine sand, 0 to 2 percent slopes
- 6 - Basinger fine sand, depressional, 0 to 1 percent slopes
- 10 - Delray loamy fine sand, depressional
- 16 - Immokalee fine sand, 0 to 2 percent slopes
- 17 - Kaliga muck, frequently ponded, 0 to 1 percent slopes
- 22 - Myakka fine sand, 0 to 2 percent slopes
- 23 - Myakka-Urban land complex
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- 32 - Placid fine sand, frequently ponded, 0 to 1 percent slopes
- 34 - Pomello fine sand, 0 to 5 percent slopes
- 36 - Pompano fine sand, 0 to 2 percent slopes
- 38 - Riviera fine sand, 0 to 2 percent slopes
- 40 - Samsula muck, frequently ponded, 0 to 1 percent slopes
- 42 - Smyrna fine sand, 0 to 2 percent slopes
- 44 - Tavares fine sand, 0 to 5 percent slopes
- 99 - Water

N

0 300 600
Feet

FIGURE 3D

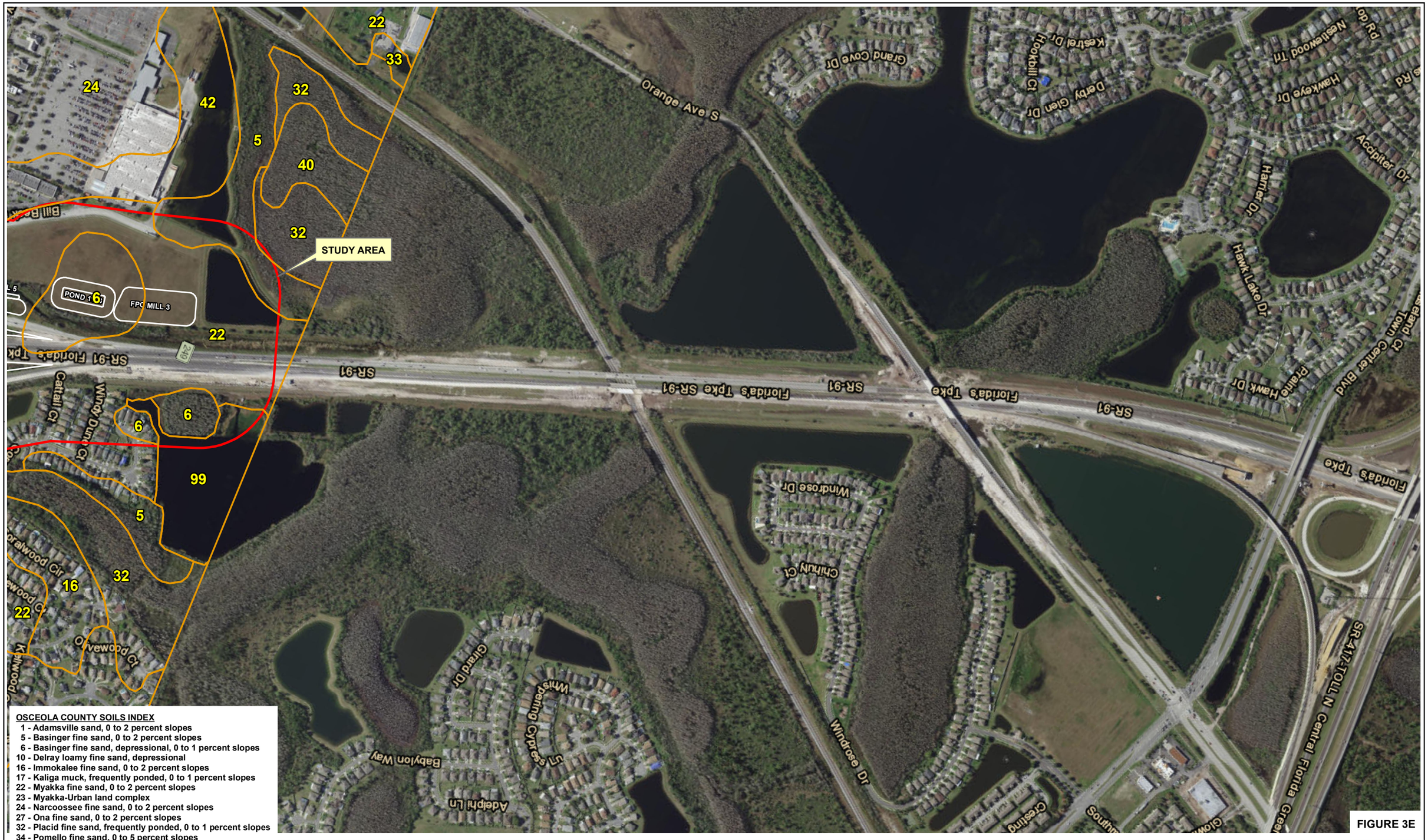
RICHARD P. McCORMICK, P.G.
P.G. LICENSE NUMBER 2096
GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS, INC.
2510 MICHIGAN AVENUE, SUITE D
KISSIMMEE, FL 34744-1933

STATE OF FLORIDA
DEPARTMENT OF TRANSPORATATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
91	OSCEOLA	436194-1-52-01

NRCS SOIL SURVEY MAP

SHEET NO.
D-226



OSCEOLA COUNTY SOILS INDEX

1 - Adamsville sand, 0 to 2 percent slopes
5 - Basinger fine sand, 0 to 2 percent slopes
6 - Basinger fine sand, depressional, 0 to 1 percent slopes
10 - Delray loamy fine sand, depressional
16 - Immokalee fine sand, 0 to 2 percent slopes
17 - Kaliga muck, frequently ponded, 0 to 1 percent slopes
22 - Myakka fine sand, 0 to 2 percent slopes
23 - Myakka-Urban land complex
24 - Narcoossee fine sand, 0 to 2 percent slopes
27 - Ona fine sand, 0 to 2 percent slopes
32 - Placid fine sand, frequently ponded, 0 to 1 percent slopes
34 - Pomello fine sand, 0 to 5 percent slopes
36 - Pompano fine sand, 0 to 2 percent slopes
38 - Riviera fine sand, 0 to 2 percent slopes
40 - Samsula muck, frequently ponded, 0 to 1 percent slopes
42 - Smyrna fine sand, 0 to 2 percent slopes
44 - Tavares fine sand, 0 to 5 percent slopes
99 - Water

FIGURE 3E

N

0 300 600
Feet

RICHARD P. McCORMICK, P.G.
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GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS, INC.
2510 MICHIGAN AVENUE, SUITE D
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STATE OF FLORIDA
DEPARTMENT OF TRANSPORATATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
91	OSCEOLA	436194-1-52-01

NRCS SOIL SURVEY MAP

SHEET NO. D-227



FIGURE 4A

- HIGH RISK RATING SITE LOCATION
- MEDIUM RISK RATING SITE LOCATION
- LOW RISK RATING SITE LOCATION
- SITE NO. 17 - CITRUS GROVE AREA - LOW / MEDIUM RISK

N

0 300 600
Feet

RICHARD P. McCORMICK, P.G.
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KISSIMMEE, FL 34744-1933

STATE OF FLORIDA
DEPARTMENT OF TRANSPORATATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
91	OSCEOLA	436194-1-52-01

POTENTIAL CONTAMINATION SITE LOCATION MAP

SHEET NO. D-228

W:\Projects\J3892GE FTE Mainline Widening From US 192 to Osceola Parkway\CADD 8-17-20\3892E contam 01.mxd 10/29/2020

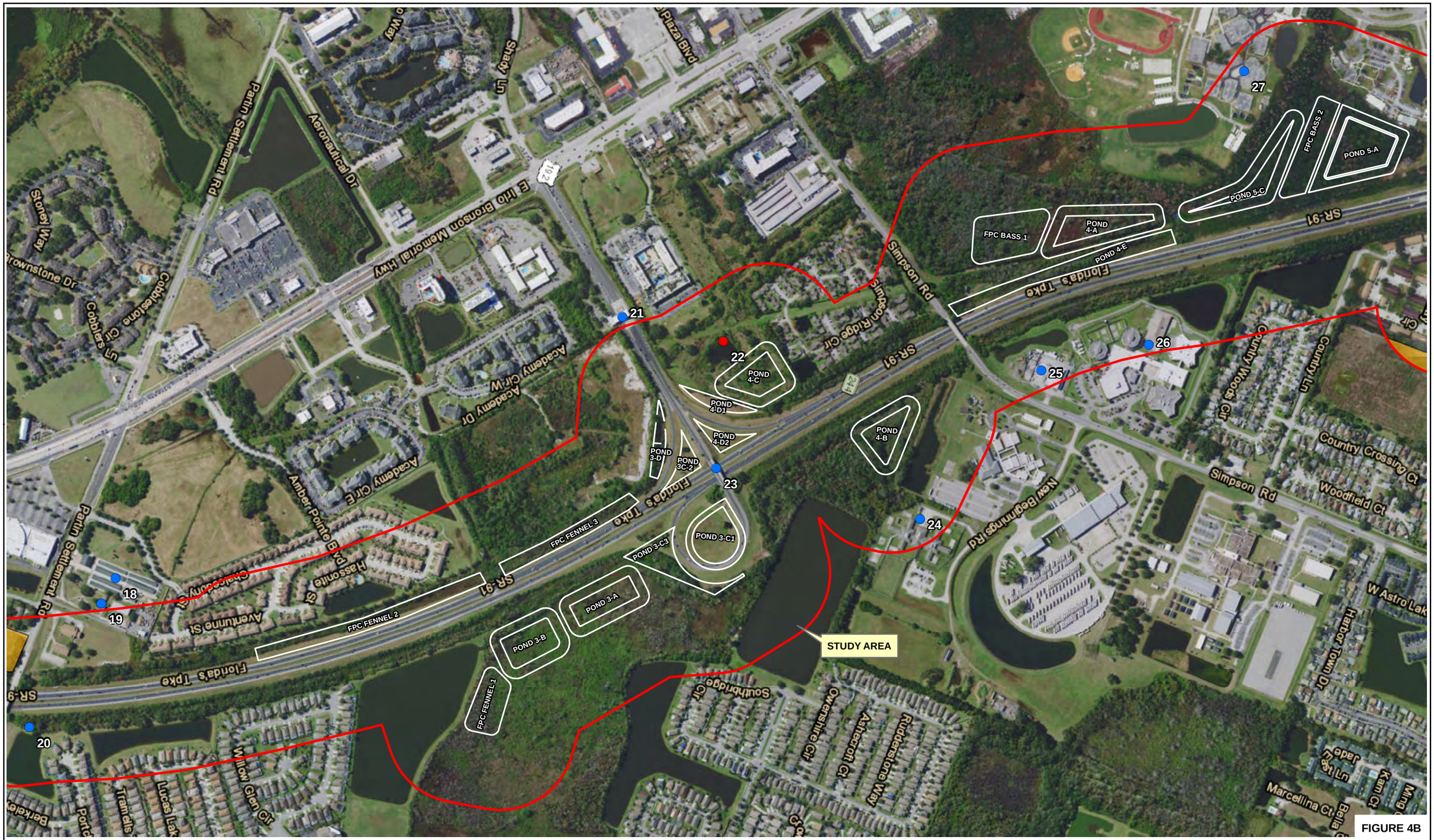

FIGURE 4B

- HIGH RISK RATING SITE LOCATION
- MEDIUM RISK RATING SITE LOCATION
- LOW RISK RATING SITE LOCATION
- SITE NO. 17 - CITRUS GROVE AREA - LOW / MEDIUM RISK

N

0 300 600
Feet

RICHARD P. McCORMICK, P.G.
P.G. LICENSE NUMBER 2096
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2510 MICHIGAN AVENUE, SUITE D
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STATE OF FLORIDA
DEPARTMENT OF TRANSPORATATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
91	OSCEOLA	436194-1-52-01

POTENTIAL CONTAMINATION SITE LOCATION MAP

SHEET NO.
D-229

W:\Projects\J3892GE FTE Mainline Widening From US 192 to Osceola Parkway\CADD 8-17-20\3892E contam 02.mxd 10/29/2020



FIGURE 4C

- HIGH RISK RATING SITE LOCATION
- MEDIUM RISK RATING SITE LOCATION
- LOW RISK RATING SITE LOCATION
- SITE NO. 17 - CITRUS GROVE AREA - LOW / MEDIUM RISK

N

0 300 600
Feet

RICHARD P. McCORMICK, P.G.
P.G. LICENSE NUMBER 2096
GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS, INC.
2510 MICHIGAN AVENUE, SUITE D
KISSIMMEE, FL 34744-1933

STATE OF FLORIDA
DEPARTMENT OF TRANSPORATATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
91	OSCEOLA	436194-1-52-01

POTENTIAL CONTAMINATION SITE LOCATION MAP

SHEET NO.
D-230

W:\Projects\J3892GE FTE Mainline Widening From US 192 to Osceola Parkway\CADD 8-17-20\3892E contam 03.mxd 10/29/2020



FIGURE 4D

- HIGH RISK RATING SITE LOCATION
- MEDIUM RISK RATING SITE LOCATION
- LOW RISK RATING SITE LOCATION
- SITE NO. 17 - CITRUS GROVE AREA - LOW / MEDIUM RISK

N

0 300 600
Feet

RICHARD P. McCORMICK, P.G.
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KISSIMMEE, FL 34744-1933

STATE OF FLORIDA
DEPARTMENT OF TRANSPORATATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
91	OSCEOLA	436194-1-52-01

POTENTIAL CONTAMINATION SITE LOCATION MAP

SHEET NO.
D-231

W:\Projects\J3892GE FTE Mainline Widening From US 192 to Osceola Parkway\CADD 8-17-20\3892E contam 04.mxd 10/29/2020



FIGURE 4E

- HIGH RISK RATING SITE LOCATION
- MEDIUM RISK RATING SITE LOCATION
- LOW RISK RATING SITE LOCATION
- SITE NO. 17 - CITRUS GROVE AREA - LOW / MEDIUM RISK

N

0 300 600
Feet

RICHARD P. McCORMICK, P.G.
P.G. LICENSE NUMBER 2096
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2510 MICHIGAN AVENUE, SUITE D
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STATE OF FLORIDA
DEPARTMENT OF TRANSPORATATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
91	OSCEOLA	436194-1-52-01

POTENTIAL CONTAMINATION SITE LOCATION MAP

SHEET NO.
D-232

Table 11
Summary of Groundwater Levels
Stormwater Pond and Floodplain Compensation Area Alternatives
FTE Mainline Widening MP 242.0 to 248.9
FPID No. 436194-1-52-01
GEC Project No. 3892G

Pond/FPC Location	Boring No.	State Plane Geographic Coordinates		Date of Groundwater Measurement	NRCS Soil Type	NRCS Soil Survey Estimated Seasonal High Depth Range (feet)	* Encountered Groundwater Depth (feet)	** Estimated Seasonal High Groundwater Depth (feet)
		Northing (Y)	Easting (X)					
Pond 1-A	PS1A-1	1426670.037	550117.2329	1/8/2020	16	0.5 - 1.5	2.2	0.5
	PS1A-2	1426948.403	549738.2727	1/8/2020	16	0.5 - 1.5	2.8	1.0
Pond 1-B	PS1B-1	1427959.774	549742.1509	1/8/2020	16	0.5 - 1.5	3.5	1.5
	PS1B-2	1428196.369	549658.7822	1/8/2020	1	1.5 - 3.5	3.6	1.5
Pond 1-C	PS1C-1	1427747.206	548719.9650	1/8/2020	16	0.5 - 1.5	5.4	3.5
	PS1C-2	1428060.994	548726.6436	1/8/2020	16	0.5 - 1.5	2.1	0.5
Pond 2-A	PS2A-1	1432209.666	547798.5634	1/6/2020	40	+2.0 - 0.5	+0.7	AGS
	PS2A-2	1432514.461	547942.4567	1/6/2020	32	+2.0 - 0.5	+0.3	AGS
Pond 2-B	PS2B-1	1432443.201	548710.2113	1/6/2020	40	+2.0 - 0.5	+0.2	AGS
	PS2B-2	1432715.670	548830.4766	1/6/2020	40	+2.0 - 0.5	+0.2	AGS
Pond 2-C	PS2C-1	1431051.572	548938.9659	1/8/2020	22	0.3 - 1.5	2.0	0.5
	PS2C-2	1431220.688	549146.7196	1/8/2020	5	0.3 - 1.5	2.1	0.5
***Pond 2-D	---	---	---	---	1	1.5 - 3.5	---	---
	---	---	---	---	22	0.3 - 1.5	---	---
	---	---	---	---	32	+2.0 - 0.5	---	---
FPC Fish 1	FPCF1-1	1432488.071	549400.9328	1/20/2020	40	+2.0 - 0.5	0.7	AGS
	FPCF1-2	1432720.939	549129.3885	1/20/2020	40	+2.0 - 0.5	0.4	AGS
FPC Fish 2	FPCF2-1	1435981.753	546556.0969	1/6/2020	32	+2.0 - 0.5	+0.5	AGS
	FPCF2-2	1432738.410	547872.8127	1/6/2020	32	+2.0 - 0.5	+0.4	AGS
FPC Fish 3	FPCF3-1	1431909.368	547811.7242	1/6/2020	40	+2.0 - 0.5	+0.6	AGS
	FPCF3-2	1431962.385	548072.4968	1/6/2020	40	+2.0 - 0.5	+0.7	AGS
FPC Fish 4	FPCF4-1	1431434.205	549389.4910	8/25/2020	22	0.3 - 1.5	2.6	1.0
FPC Fennel 1	FPCF1-1	1437197.327	546657.4847	1/9/2020	40	+2.0 - 0.5	+0.4	AGS
	FPCF1-2	1437228.080	546437.7438	1/9/2020	40	+2.0 - 0.5	+0.4	AGS
FPC Fennel 2	FPCF2-1	1435981.753	546556.0969	1/6/2020	22	0.5 - 1.5	+0.5	AGS
	FPCF2-2	1436492.772	546138.7413	1/6/2020	5	0.3 - 1.5	+0.4	AGS
FPC Fennel 3	FPCF3-1	1437125.565	545492.6919	1/10/2020	5	0.3 - 1.5	0.2	AGS
	FPCF3-2	1437398.648	545171.3248	1/10/2020	5	0.3 - 1.5	+0.2	AGS

* +0.5 = Groundwater encountered 0.5 above existing ground surface; GNE = Groundwater not encountered
** AGS = Above Ground Surface
*** Unable to gain site access.

Table 11
Summary of Groundwater Levels
Stormwater Pond and Floodplain Compensation Area Alternatives
FTE Mainline Widening MP 242.0 to 248.9
FPID No. 436194-1-52-01
GEC Project No. 3892G

Pond/FPC Location	Boring No.	State Plane Geographic Coordinates		Date of Groundwater Measurement	NRCS Soil Type	NRCS Soil Survey Estimated Seasonal High Depth Range (feet)	* Encountered Groundwater Depth (feet)	** Estimated Seasonal High Groundwater Depth (feet)
		Northing (Y)	Easting (X)					
Pond 3-A	PS3A-1	1437553.521	545708.2708	1/9/2020	40	+2.0 - 0.5	+3.2	AGS
	PS3A-2	1437773.458	545521.6243	1/9/2020	40	+2.0 - 0.5	+1.2	AGS
Pond 3-B	PS3B-1	1437226.593	546123.5339	1/9/2020	40	+2.0 - 0.5	+0.6	AGS
	PS3B-2	1437404.339	545998.9879	1/9/2020	40	+2.0 - 0.5	+0.5	AGS
Pond 3-C1	PS3C-1	1438181.323	545012.3414	1/10/2020	5	0.3 - 1.5	1.4	0.5
	PS3C-2	1438174.031	544783.8224	1/10/2020	5	0.3 - 1.5	0.7	0.0
Pond 3-C2	RAB-80	1437830.014	544671.1851	6/22/2017	5	0.3 - 1.5	4.0	2.0
	RAB-82	1437894.785	544501.7665	6/22/2017	5	0.3 - 1.5	1.8	0.5
Pond 3-C3	P3C3-1	1437895.862	545182.4896	8/21/2020	5	0.3 - 1.5	4.5	3.0
	P3C3-2	1438259.169	545253.3777	8/21/2020	5	0.3 - 1.5	1.2	0.5
Pond 3-D	P3D-1	1437648.196	544525.3558	8/20/2020	5	0.3 - 1.5	+0.2	AGS
Pond 4-A	PS4A-1	1439668.386	542101.5019	1/7/2020	5	0.3 - 1.5	+0.2	AGS
	PS4A-2	1439953.934	541928.2463	1/7/2020	5	0.3 - 1.5	0.6	AGS
Pond 4-B	PS4B-1	1438973.938	543921.0887	1/8/2020	42	0.5 - 3.3	2.5	1.0
	PS4B-2	1439014.615	543762.7300	1/8/2020	42	0.5 - 3.3	2.8	1.3
Pond 4-C	PS4C-1	1437968.424	543904.3113	1/8/2020	5	0.3 - 1.5	2.0	0.5
	PS4C-2	1438104.556	543777.5740	1/8/2020	5	0.3 - 1.5	2.3	0.5
Pond 4D-1	P4D1-1	1437963.179	544093.3704	8/20/2020	5	0.3 - 1.5	1.5	0.5
Pond 4D-2	RAB-85	1438074.122	544354.3031	6/21/2017	5	0.3 - 1.5	3.5	2.5
	AB-255	1438135.381	544269.5911	7/12/2016	5	0.3 - 1.5	2.7	1.5
Pond 4-E	P4E-1	1439250.465	542763.0781	8/21/2020	5	0.3 - 1.5	0.5	0.0
	P4E-2	1440051.034	542094.0116	8/21/2020	5	0.3 - 1.5	0.3	0.0
Pond 5-A	PS5A-2	1441182.826	541000.4195	1/9/2020	5	0.3 - 1.5	0.0	AGS
	FPCB2-2	1441363.239	540773.7268	1/9/2020	22	0.5 - 1.5	3.4	1.5
Pond 5-C	PS5C-1	1440550.113	541513.3835	1/9/2020	5	0.3 - 1.5	1.8	0.3
	PS5C-2	1440698.704	541105.6234	1/9/2020	5	0.3 - 1.5	2.1	0.6
Pond 6-A	PS5B-1	1442358.904	541442.0958	1/9/2020	34	2.0 - 3.5	4.1	2.0
	PS5B-2	1442266.970	541225.9948	1/9/2020	34	2.0 - 3.5	4.0	2.0
	PS6A-1	1442457.522	541041.8200	1/9/2020	22	0.5 - 1.5	3.1	1.0
	PS6A-2	1442538.357	541254.4274	1/9/2020	22	0.5 - 1.5	2.9	1.0
Pond 6-B	PS6B-1	1443683.780	538271.1912	1/9/2020	22	0.5 - 1.5	5.5	3.5
	PS6B-2	1443986.638	538317.5270	1/9/2020	22	0.5 - 1.5	4.9	3.0
Pond 6-C	PS6C-1	1442735.101	539941.3581	1/9/2020	42	0.5 - 3.3	1.3	0.5
	PS6C-2	1443009.691	539717.8453	1/9/2020	42	0.5 - 3.3	2.2	1.0

* +0.5 = Groundwater encountered 0.5 above existing ground surface; GNE = Groundwater not encountered
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FTE Mainline Widening MP 242.0 to 248.9
FPID No. 436194-1-52-01
GEC Project No. 3892G

Pond/FPC Location	Boring No.	State Plane Geographic Coordinates		Date of Groundwater Measurement	NRCS Soil Type	NRCS Soil Survey Estimated Seasonal High Depth Range (feet)	* Encountered Groundwater Depth (feet)	** Estimated Seasonal High Groundwater Depth (feet)
		Northing (Y)	Easting (X)					
Pond 7-A	PS7A-1	1444953.194	537987.1216	1/9/2020	22	0.5 - 1.5	2.9	1.0
	PS7A-2	1445255.126	537834.0340	1/9/2020	16	0.5 - 1.5	2.7	1.0
Pond 7-B	PS7B-1	1445647.476	537558.1555	1/9/2020	5	0.3 - 1.5	2.9	1.0
	PS7B-2	1445959.120	537292.7114	1/9/2020	22	0.5 - 1.5	1.0	0.0
Pond 7-C	PS7C-1	1446305.435	537075.1586	1/9/2020	22	0.5 - 1.5	1.3	0.0
	PS7C-2	1446557.544	537047.9176	1/8/2020	22	0.5 - 1.5	0.9	0.0
FPC Bass 1	FPCB-1	1439125.132	542331.3088	1/8/2020	5	0.3 - 1.5	1.2	0.0
	FPCB-2	1439371.795	542344.1525	1/8/2020	5	0.3 - 1.5	+0.7	AGS
FPC Bass 2	FPCB2-1	1440976.380	540795.1247	1/7/2020	5	0.3 - 1.5	+0.3	AGS
	PS5A-1	1440936.308	541171.6774	1/9/2020	22	0.5 - 1.5	1.5	0.5
FPC Bass 4	RAB-140	1442246.893	540509.6952	6/10/2017	5	0.3 - 1.5	3.5	2.0
	AB-373	1442589.027	540289.2619	7/6/2016	16	0.5 - 1.5	4.6	4.0
	RAB-148	1442975.036	539980.7061	6/10/2017	42	0.5 - 3.3	GNE	2.0
	RAB-150	1443134.506	539859.7285	6/10/2017	42	0.5 - 3.3	4.5	2.0
FPC Bass 5	FPCB5-1	1448288.919	537000.4299	8/25/2020	22	0.5 - 1.5	3.9	3.0
FPC Bass 6	FPCB6-1	1452385.592	535551.6107	8/25/2020	22	0.5 - 1.5	4.3	3.5
	FPCB6-2	1453336.446	535224.9030	8/25/2020	22	0.5 - 1.5	4.6	3.5
Pond 8-A / FPC Bass 3	PS8A-1	1448470.854	536649.9473	1/9/2020	22	0.5 - 1.5	+0.1	AGS
	PS8A-2	1449756.957	536187.7595	1/9/2020	22	0.5 - 1.5	+0.2	AGS
	PS8A-3	1451310.505	535647.1812	1/9/2020	5	0.3 - 1.5	2.3	0.5
	PS8A-4	1452882.327	535100.5758	1/9/2020	42	0.5 - 3.3	+0.2	AGS
Pond 8-B	PS8B-1	1448006.013	536308.9099	1/8/2020	22	0.5 - 1.5	4.1	2.5
	PB8B-2	1448386.612	536371.3563	1/8/2020	22	0.5 - 1.5	5.2	3.5
Pond 8-C	PS8C-1	1453189.953	535485.6990	1/10/2020	23	0.5 - 1.5	3.8	2.0
	PS8C-2	1453587.241	535429.9645	1/10/2020	23	0.5 - 1.5	3.9	2.0
Pond 9-A	PS9A-1	1454184.294	534629.2652	1/9/2020	42	0.5 - 3.3	+0.3	AGS
	PS9A-2	1455131.772	534288.4470	1/9/2020	42	0.5 - 3.3	+0.3	AGS
Pond 9-B	PS9B-1	1455153.232	534885.7518	1/10/2020	23	0.5 - 1.5	3.6	2.0
	PS9B-2	1455288.360	534747.8986	1/10/2020	23	0.5 - 1.5	2.8	1.5
Pond 9-C	FPCM1-1	1454759.835	534185.9328	1/9/2020	42	0.5 - 3.3	1.4	0.0
	FPCM1-2	1455146.391	534068.1103	1/9/2020	42	0.5 - 3.3	2.0	0.5

* +0.5 = Groundwater encountered 0.5 above existing ground surface; GNE = Groundwater not encountered
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FTE Mainline Widening MP 242.0 to 248.9
FPID No. 436194-1-52-01
GEC Project No. 3892G

Pond/FPC Location	Boring No.	State Plane Geographic Coordinates		Date of Groundwater Measurement	NRCS Soil Type	NRCS Soil Survey Estimated Seasonal High Depth Range (feet)	* Encountered Groundwater Depth (feet)	** Estimated Seasonal High Groundwater Depth (feet)
		Northing (Y)	Easting (X)					
FPC Mill 1	PS9C-1	1454235.999	534325.1426	1/9/2020	42	0.5 - 3.3	2.4	0.5
	PS9C-2	1454510.158	534311.5502	1/9/2020	42	0.5 - 3.3	2.1	0.5
FPC Mill 2	FPCM2-1	1455879.758	533334.0288	1/9/2020	42	0.5 - 3.3	2.2	0.5
	FPCM2-2	1455909.502	533594.7439	1/9/2020	42	0.5 - 3.3	2.2	0.5
FPC Mill 3	FPCM3-1	1458241.170	532948.0024	1/9/2020	6	+2.0 - 1.0	2.4	0.5
	FPCM3-2	1458572.084	532929.1999	1/9/2020	22	0.5 - 1.5	3.3	1.5
FPC Mill 4	FPCM4-1	1456348.145	533762.6766	8/21/2020	22	0.5 - 1.5	1.3	0.5
FPC Mill 5	FPCM5-1	1457266.164	533277.9648	8/21/2020	22	0.5 - 1.5	2.3	1.0
Pond 10-A	PS10A-1	1456237.790	533585.3465	1/9/2020	6	+2.0 - 1.0	0.9	0.0
	PS10A-2	1456406.112	533457.8534	1/9/2020	6	+2.0 - 1.0	0.5	AGS
Pond 10-B	PS10B-1	1455936.832	533786.4681	1/9/2020	42	0.5 - 3.3	1.3	0.0
	PS10B-2	1456112.418	533670.7545	1/9/2020	42	0.5 - 3.3	1.4	0.0
Pond 10-C1	PS10C1-1	1456410.702	533861.0351	1/10/2020	22	0.5 - 1.5	0.3	AGS
	PS10C1-2	1456675.430	533730.2613	1/10/2020	22	0.5 - 1.5	0.7	0.0
Pond 10-C2	PS10C2-1	1456482.947	534086.9338	1/8/2020	22	0.5 - 1.5	+0.4	AGS
	PS10C2-2	1456736.766	534027.9721	1/8/2020	22	0.5 - 1.5	+0.5	AGS
Pond 11-A	PS11A-1	1457067.520	533384.4962	1/10/2020	22	0.5 - 1.5	3.4	2.0
	PS11A-2	1457509.572	533285.7413	1/10/2020	22	0.5 - 1.5	3.4	2.0
Pond 11-B	PS11B-1	1457805.719	533082.0082	1/9/2020	6	+2.0 - 1.0	4.3	2.0
	PS11B-2	1458061.606	533032.2878	1/9/2020	6	+2.0 - 1.0	3.3	1.5
Pond 11-C1	PS11C1-1	1457025.791	533621.8763	1/8/2020	22	0.5 - 1.5	+0.1	AGS
	PS11C1-2	1457396.550	533507.2415	1/9/2020	22	0.5 - 1.5	0.0	AGS
Pond 11-C2	PS11C2-1	1457100.455	533899.0907	1/10/2020	22	0.5 - 1.5	0.2	AGS
	PS11C2-2	1457574.107	533701.5374	1/8/2020	22	0.5 - 1.5	+0.7	AGS

* +0.5 = Groundwater encountered 0.5 above existing ground surface; GNE = Groundwater not encountered
** AGS = Above Ground Surface
*** Unable to gain site access.

APPENDIX E
Pond Site Evaluations Matrices

Appendix E: Pond Site Evaluation Matrices

St. Cloud Basin

Basin 1 Pond Site Evaluation Matrix

Alternative (ID)	**Pond 1-A**			**Pond 1-B**			**Pond 1-C**		
Approximate Stationing	**1664+00, RT**			**1678+00, RT**			**1676+00, LT**		
	Comments	**Rank**	**Cost ($) 2020 dollar**	Comments	Rank	Cost ($) 2020 dollar	Comments	Rank	Cost ($) 2020 dollar
Area	**12.85 acres**			4.74 acres			5.55 acres		
Right-of-Way	**Open field**		**$ 2,728,334.00**	Corner of NB offramp @SR 500, frontage on SR 500		$ 2,813,812.00	Residential property, frontage on Ames haven Road		$ 1,477,396.00
Hydraulics	**Adjacent to outfall, lowest ESGW**	**1**		At mid basin	2		At mid basin	2	
Construction	**400' to outfall**	**1**	**$ 50,000.00**	2,000 LF to outfall	2	$ 250,000.00	2,000 LF to outfall	2	$ 250,000.00
Contamination	**This site is adjacent to Low Risk contamination sites: Historical Rail Line, Lift Station Generator, and 1598 Mickey Johnson Court.**	**1**		Adjacent to (Low and Medium Risk Site) superficial debris - Asbestos potential	2		Adjacent to Neptune Middle school	2	
Utilities	**Overhead electric along west edge, power to billboard**	**2**		Utilities along roadway SR 500 R/W frontage, 30" gas main along west end of property, pond access crosses gas main	2		Utilities for residence and several outbuildings, Power to billboards, pond access crosses buried gas main	2	
*Listed Species	**Potential caracara and bonneted bat surveys**	**2**		Potential bonneted bat surveys	2		Potential bonneted bat surveys	2	
**Wetlands/Surface Waters	**Wetland impacts 2.24 ac**	**2**	**$181,335.50**	No wetlands	0	$ -	No wetlands	0	$ -
Archaeological	**Low Risk potential**	**1**		Adjacent to recorded historic structures 8OS2681 and 8OS2681 and unrecorded1592 and 1598 Mickey Johnson Court	1		Adjacent to Neptune Middle School (Low Risk site). Within footprint unrecorded historic structure, 2721 and 2681 Ames Haven Road	1	
Public Opinion		**1**			1		unfavorable to resident	3	
Total Cost			**$ 2,959,669.50**			$ 3,063,812.00			$ 1,727,396.00
Comments/Advantages/ Disadvantages, etc.	**Adjacent to outfall, lowest ESGW, treats more than required**			Prime commercial frontage on SR 500			Requires residential relocation		
Total Impact Rank		**11**			12			14	

NOTE:

1. Each area of consideration is ranked 1-3, with 1 being the best.
2.* Listed species were ranked from 1 - 3

A low ranking (**1**) indicates that species-specific listed species surveys will not be required.
A medium ranking (**2**) indicates that species-specific listed species surveys are not anticipated but consultation with USFWS will be required to exclude the area from survey requirements.
A high ranking (**3**) indicated that species-specific listed species surveys will likely be required after consultation with USFWS
This does not consider gopher tortoises which will need to be surveyed throughout the corridor.

3. **Wetland rank reflects the approximate acreages of impacts. The wetland mitigation price uses an estimated cost of $135,000.00 per credit (dual state/federal) and a UMAM score of 0.7

Fish Lake Basin
Basin 2 Pond Site Evaluation Matrix

Alternative (ID)	Pond 2-A			Pond 2-B			Pond 2-C			Pond 2-D		
Approximate Stationing	1724+00, LT			1724+00, RT			1710+00, RT			1730+00, RT		
	Comments	Rank	Cost ($) 2020 dollar	Comments	Rank	Cost ($) 2020 dollar	**Comments**	**Rank**	**Cost ($) 2020 dollar**	**Comments**	**Rank**	**Cost ($) 2020 dollar**
Area	6.56 acres			**6.83 acres**			11.58 acres			**6.71 acres**		
Right-of-Way	Heavy underbrush		$ 1,454,269.00	**Open field**		**$ 1,508,959.00**	Open field		$ 3,049,257.00	**Open area with trees, 2 partial parcels - County property**		**$ 1,655,877.00**
Hydraulics	Entire pond in floodplain	3		**Pond partially in floodplain**	**2**		No floodplain involvement	1		**No floodplain involvement**	**1**	
Construction	Adjacent to outfall	1		**Adjacent to outfall**	**1**		800 LF to outfall	2	$ 100,000.00	**1,000 LF to**	**2**	**$ 125,000.00**
Contamination	Not adjacent CRR sites	0		**Adjacent to (Low Site) former citrus grove**	**1**		Adj. to (Low Site) former citrus grove w/ cattle pens	2		**Not adjacent CRR sites**	**0**	
Utilities	30" gas main crossing access to pond	2		**none**	**1**		Utilities for residence/farmstead	2		**none**	**1**	
*Listed Species	No issues or surveys anticipated	1		**No issues or surveys anticipated**	**1**		Potential caracara survey likely	2		**Potential caracara survey likely**	**2**	
**Wetlands/Surface Waters	Wetland impacts 6.37 ac.	1	$ 257,949.82	**Wetland/floodplain impacts 5.77 ac.**	**2**	**$ 467,181.79**	Wetland Impacts1.35	1	$ 54,621.18	**No wetlands 0 ac.**	**0**	**$ -**
Archaeological	Within pond footprint of Recorded Archaeological site 8OS1771, low potential	1		**Low potential**	**1**		Potential unrecorded Historic Building within study area at 1312 Simmons Road	1		**Low potential**	**1**	
Public Opinion	Unknown	1		**Unknown**	**1**		Property exchanged hands recently, being developed	3		**Public land**	**1**	
Total Cost			$ 1,712,218.82			**$ 1,976,140.79**			$ 3,203,878.18			**$ 1,780,877.00**
Comments/Advantages/ Disadvantages, etc.	Significant Floodplain and wetland impacts			**Significant Floodplain and wetland impacts, no residential relocations. Site being considered as a FPC.**			New development			**Potential joint use pond site**		
Total Impact Rank	NOT VIABLE as pond site	10			**10**			14			**8**	

NOTE:
1. Each area of consideration is ranked 1-3, with 1 being the best.
2.* Listed species were ranked from 1 - 3
A low ranking (**1**) indicates that species-specific listed species surveys will not be required.
A medium ranking (**2**) indicates that species-specific listed species surveys are not anticipated but consultation with USFWS will be required to exclude the area from survey requirements.
A high ranking (**3**) indicated that species-specific listed species surveys will likely be required after consultation with USFWS
This does not consider gopher tortoises which will need to be surveyed throughout the corridor.
3. **Wetland rank reflects the approximate acreages of impacts. The wetland mitigation price uses an estimated cost of $135,000.00 per credit (dual state/federal) and a UMAM score of 0.7

Fish Lake Basin (Fennel Slough)
Basin 3 Pond Site Evaluation Matrix

Alternative (ID)	**Pond 3-A**			**Pond 3-B**			**Pond 3-C1, C2, C3**			**Pond 3-D**		
Approximate Stationing	**1782+00, RT**			**1776+00, RT**			**1790+00, RT**			**1790+00, LT**		
	Comments	Rank	Cost ($) 2020 dollar	Comments	Rank	Cost ($) 2020 dollar	**Comments**	**Rank**	**Cost ($) 2020 dollar**	**Comments**	**Rank**	**Cost ($) 2020 dollar**
Area	4.32 acres			4.59 acres								
Right-of-Way			$ 195,006.00			$ 200,599.00	**Within LA R/W in loop**		**$ -**	**Within LA R/W**		**$ -**
Hydraulics	Entire site floodplain and conservation area	3		Entire site floodplain and conservation area	2		**Low ESGW**	**1**		**Downstream of existing pond**	**1**	
Construction	300 LF to outfall	1	$ 37,500.00	Adjacent to outfall	1		**1,200 LF to outfall**	**2**	**$ 150,000.00**	**1,300 LF to outfall**	**2**	**$ 150,000.00**
Contamination	Not adjacent to any CCR site	0		Not adjacent to any CCR site	0		**Adjacent to Turnpike resurfacing project**	**1**		**Adjacent to Turnpike resurfacing project**	**1**	
Utilities	None	1		None	1		**Buried Electric/30" gas main within Pond 3-C2**	**2**		**Buried electric along ramp**	**1**	
*Listed Species	No issues or surveys anticipated	1		No issues or surveys anticipated	1		**No issues or surveys anticipated**	**1**		**No issues or surveys anticipated**	**1**	
**Wetlands/Surface Waters	Wetland/floodplain/ conservation impacts 3.79 ac	3	$ 409,577.52	Wetland/floodplain/ conservation impacts, 3.8 ac	3	$ 410,630.70	**OSW Impacts C1-1.33 ac, C2-0.00 ac, C3-0.14 ac. Wetlands Impacts C1-0.0, C2-0.45 ac, C3-0.0.**	**1**	**$ 18,379.77**	**OSW impacts of 0.12 ac**	**0**	**$ -**
Archaeological	Low probability	1		Low probability	1		**Low probability**	**1**		**Low probability**	**1**	
Public Opinion												
Total Cost			$ 642,083.52			$ 611,229.70			**$ 168,379.77**			**$ 150,000.00**
Comments/Advantages/ Disadvantages, etc.	Significant floodplain and wetland impacts			Significant floodplain and wetland impacts			**Lowest cost, not in conservation area, no R/W involvement**					
Total Impact Rank	NOT VIABLE as pond site	10		NOT VIABLE as pond site	9			**9**			**7**	

NOTE:
1. Each area of consideration is ranked 1-3, with 1 being the best.
2.* Listed species were ranked from 1 - 3
A low ranking (**1**) indicates that species-specific listed species surveys will not be required.
A medium ranking (**2**) indicates that species-specific listed species surveys are not anticipated but consultation with USFWS will be required to exclude the area from survey requirements.
A high ranking (**3**) indicated that species-specific listed species surveys will likely be required after consultation with USFWS
This does not consider gopher tortoises which will need to be surveyed throughout the corridor.
3. **Wetland rank reflects the approximate acreages of impacts. The wetland mitigation price uses an estimated cost of $135,000.00 per credit (dual state/federal) and a UMAM score of 0.7

Bass Slough Basin
Basin 4 Pond Site Evaluation Matrix

Alternative (ID)	**Pond 4-A**			**Pond 4-B**			**Pond 4-C**			**Pond 4-D1, D2**			**Pond 4-E**		
Approximate Stationing	**1820+00, LT**			**1840+00, RT**			**1800+00, LT**			**1795+00,LT**			**1815+00, LT**		
	Comments	Rank	Cost ($) 2020 dollar	**Comments**	**Rank**	**Cost ($) 2020 dollar**	Comments	Rank	Cost ($) 2020 dollar	**Comments**	**Rank**	**Cost ($) 2020 dollar**	Comments	Rank	Cost ($) 2020 dollar
Area	4.98 acres			**3.82 acres**			3.75 acres								
Right-of-Way			$ 212,904.00			**$ 184,648.00**			$ 3,130,282.00	**Within LA R/W**			Within LA R/W		
Hydraulics	ESHW is above the existing ground, within floodplain	3		**High ground water**	**2**		High ground water	2		**Treats interchange and side street, high ground water**	**2**		ESHW is above the existing ground, within floodplain	3	
Construction	Adjacent to outfall			**2,000 LF to project outfall, able to comp. treat basin**	**2**	**$ 250,000.00**	2,700 LF to project outfall	2	$ 337,500.00	**Outfalls to roadside ditch**	**1**		Adjacent to outfall	1	
Contamination	Adjacent to Gateway High School	1		**Adjacent to Osceola Regional Juvenile Detention Center**	**1**		Within the Crystalbrook Golf Course (High Risk site)	3		**D1 adjacent to the Crystalbrook Golf Course (high), D2 adjacent to Turnpike Resurfacing (low)**	**3**		Not adjacent to any CRR Sites	1	
Utilities	30" gas main crossing access along eastern edge and pond access requires 2 gas main crossings	3		**None**	**1**		30" gas main crossing access	2		**30" gas main crossing access**	**2**		30" gas main crossing access and along length of pond	3	
*Listed Species	No issues or surveys anticipated	1		**Potential caracara surveys**	**2**		Potential caracara surveys	2		**No issues or surveys anticipated**	**1**		no issues or surveys anticipated	1	
**Wetlands/Surface Waters	Wetland/Floodplain impacts 4.44 ac.	2	$ 359,941.06	**Wetlands/conservation area impacts 0.66ac**	**2**	**$ 53,378.71**	Wetland impacts 0.4 ac	1	**$ 16,142.37**	**Wetland Impacts D1 - 0.01 ac, OSW Impacts D2 - 0.15 ac**	**1**	**$ 219.70**	Wetland Impacts 2.66 ac/ Floodplain	1	$ 107,730.00
Archaeological	Low probability	1		**Low probability**	**1**		Low probability	1		**Low probability**	**1**		Low probability	1	
Public Opinion															
Total Cost			$ 572,845.06			**$ 488,026.71**			$ 3,483,924.37						
Comments/Advantages/ Disadvantages, etc.	Significant wetland and floodplain impacts			**Lowest cost, relatively small wetland impacts**			High R/W cost, contamination issues						Submerged , wetland /floodplain		
Total Impact Rank	**NOT VIABLE as pond site**	11			**11**		**NOT VIABLE as pond site**	13			**11**		**NOT VIABLE as pond site**	11	

NOTE:
1. Each area of consideration is ranked 1-3, with 1 being the best.
2.* Listed species were ranked from 1 - 3
A low ranking (**1**) indicates that species-specific listed species surveys will not be required.
A medium ranking (**2**) indicates that species-specific listed species surveys are not anticipated but consultation with USFWS will be required to exclude the area from survey requirements.
A high ranking (**3**) indicated that species-specific listed species surveys will likely be required after consultation with USFWS
This does not consider gopher tortoises which will need to be surveyed throughout the corridor.
3. **Wetland rank reflects the approximate acreages of impacts. The wetland mitigation price uses an estimated cost of $135,000.00 per credit (dual state/federal) and a UMAM score of 0.7

Bass Slough Basin
Basin 5 Pond Site Evaluation Matrix

Alternative (ID)	**Pond 5-A**			**Pond 5-B NO LONGER AN ALTERNATIVE**			**Pond 5-C**		
Approximate Stationing	**1838+00, LT**			**1848+00, RT**			**1830+00, LT**		
	Comments	**Rank**	**Cost ($) 2020 dollar**	Comments	Rank	Cost ($) 2020 dollar	Comments	Rank	Cost ($) 2020 dollar
Area	**4.00 acres**						5.1 acres		
Right-of-Way			**$ 1,136,073.00**						$ 155,232.00
Hydraulics	**High groundwater, partially within floodplain**	**2**					ESHW is above the existing ground, within floodplain	3	
Construction	**Adjacent to outfall**	**1**					Adjacent to outfall	1	
Contamination	**Adjacent to Osceola Admin Buildings 1000 & 2000**	**1**					Adjacent to Gateway High School	1	
Utilities	**20" and 30" gas mains crossing access**	**2**					OH - Electric on south end, 20" and 30" gas mains crossing access	2	
*Listed Species	**No issues or surveys anticipated**	**1**					No issues or surveys anticipated	1	
**Wetlands/Surface Waters	**Wetland/floodplains impacts 1.15 ac**	**2**	**$ 93,250.54**				Wetland/floodplains impacts 4.06 ac.	2	$ 329,018.82
Archaeological	**Low probability**	**1**					Low probability	1	
Public Opinion									
Total Cost			**$ 1,229,323.54**						$ 484,250.82
Comments/Advantages/ Disadvantages, etc.	**Lowest cost and fewer wetland impacts**						Significant wetland and floodplain impacts		
Total Impact Rank		**10**		Combined into Pond 6			NOT VIABLE as pond site	11	

NOTE:
1. Each area of consideration is ranked 1-3, with 1 being the best.
2.* Listed species were ranked from 1 - 3
A low ranking (**1**) indicates that species-specific listed species surveys will not be required.
A medium ranking (**2**) indicates that species-specific listed species surveys are not anticipated but consultation with USFWS will be required to exclude the area from survey requirements.
A high ranking (**3**) indicated that species-specific listed species surveys will likely be required after consultation with USFWS
This does not consider gopher tortoises which will need to be surveyed throughout the corridor.
3. **Wetland rank reflects the approximate acreages of impacts. The wetland mitigation price uses an estimated cost of $135,000.00 per credit (dual state/federal) and a UMAM score of 0.7

Bass Slough Basin
Basin 6 Pond Site Evaluation Matrix

Alternative (ID)	**Pond 6-A**			**Pond 6-B**			**Pond 6-C**		
Approximate Stationing	**1850+00, FT**			**1880+00, LT**			**1860+00, LT**		
	Comments	**Rank**	**Cost ($) 2020 dollar**	Comments	Rank	Cost ($) 2020 dollar	Comments	Rank	Cost ($) 2020 dollar
Area	**5.43 acres**			4.83 acres			3.21 acres		
Right-of-Way	**Open field**		**$ 2,422,477.00**	Abandoned residential property		$ 3,252,422.00	Within Johnson University serving as an athletic field		$ 1,184,913.00
Hydraulics	**Requires piping under Bass Slough**	**2**		High end of basin	3		Mid basin	2	
Construction	**Adjacent to outfall**	**1**	**$ -**	Off of Fortune Road, requires piping 1,800 LF down Fortune Road then another 3,200 LF = 5,000 LF	3	$ 625,000.00	1,000 LF to outfall	2	$ 125,000.00
Contamination	**Within Historical Citrus Grove**	**2**		Adjacent to Lil Champ Food Store #1264	1		Adjacent to SPILLS Incident SB Turnpike MM 246	1	
Utilities	**None**	**1**		Residential utilities	2		OH-Electric, 20" and 30" gas main crossing access/maybe in pond	3	
*Listed Species	**Potential caracara surveys**	**2**		No issues or surveys anticipated	1		No issues or surveys anticipated	1	
**Wetlands/Surface Waters	**No wetland/floodplain impacts**	**0**	**$ -**	No wetland/floodplain impacts	0	$ -	No wetland/floodplain impacts	0	$ -
Archaeological	**Moderate probability**	**2**		Moderate probability	2		Moderate probability	2	
Public Opinion		**1**			1		Unfavorable to university	3	
Total Cost			**$ 2,422,477.00**			$ 3,877,422.00			$ 1,309,913.00
Comments/Advantages/ Disadvantages, etc.	**Adjacent to outfall, requires deep pipe under Bass Slough, has comp. treatment potential**			High cost			Impacts University property		
Total Impact Rank		**11**		NOT VIABLE as pond site	13			14	

NOTE:
1. Each area of consideration is ranked 1-3, with 1 being the best.
2.* Listed species were ranked from 1 - 3
A low ranking (**1**) indicates that species-specific listed species surveys will not be required.
A medium ranking (**2**) indicates that species-specific listed species surveys are not anticipated but consultation with USFWS will be required to exclude the area from survey requirements.
A high ranking (**3**) indicated that species-specific listed species surveys will likely be required after consultation with USFWS
This does not consider gopher tortoises which will need to be surveyed throughout the corridor.
3. **Wetland rank reflects the approximate acreages of impacts. The wetland mitigation price uses an estimated cost of $135,000.00 per credit (dual state/federal) and a UMAM score of 0.7

Bass Slough Basin
Basin 7 Pond Site Evaluation Matrix

Alternative (ID)	**Pond 7-A**			**Pond 7-B**			**Pond 7-C**		
Approximate Stationing	**1890+00, LT**			**1898+00, LT**			**1904, LT**		
	Comments	**Rank**	**Cost ($) 2020 dollar**	Comments	Rank	Cost ($) 2020 dollar	Comments	Rank	Cost ($) 2020 dollar
Area	**6.07 acres**			6.10 acres			6.28 acres		
Right-of-Way			**$ 2,422,477.00**			$ 1,763,990.00			$ 1,397,554.00
Hydraulics	**Low end of basin**	**1**		Low end of basin	1		Mid basin	2	
Construction	**Adjacent to outfall**	**1**		Adjacent to outfall	1		900 LF to outfall	2	$ 112,500.00
Contamination	**Adjacent to Rocking A Construction**	**2**		Adjacent to Rocking A Construction	2		Adjacent to Rocking A Construction	2	
Utilities	**OH-Electric along east side, 30" gas main crossing access, 20" gas main adjacent to pond**	**3**	**$ -**	OH-Electric along east side, 30" gas main crossing access, 20" gas main within pond footprint	3	$ -	OH-Electric along east side, 30" gas main crossing access, buried electrical along side of 30" gas main, 20" gas main within pond footprint	3	$ -
*Listed Species	**No issues or surveys anticipated**	**1**		No issues or surveys anticipated	1		No issues or surveys anticipated	1	
**Wetlands/Surface Waters	**Wetland Impacts 0.75 ac.**	**1**	**$ 30,524.39**	Wetland Impacts 2.92 ac.	1	$ 118,202.02	Wetland impacts 1.47 ac.	1	$ 59,500.23
Archaeological	**Moderate probability**	**2**		Low probability	1		Low probability	1	
Public Opinion									
Total Cost			**$ 2,453,001.39**			$ 1,882,192.02			$ 1,569,554.23
Comments/Advantages/ Disadvantages, etc.	**Least amount of wetland impacts**			Potential gas line involvement			High cost, wetland impacts, Gas line involvement		
Total Impact Rank		**11**			10		NOT VIABLE as pond site	12	

NOTE:
1. Each area of consideration is ranked 1-3, with 1 being the best.
2.* Listed species were ranked from 1 - 3
A low ranking (**1**) indicates that species-specific listed species surveys will not be required.
A medium ranking (**2**) indicates that species-specific listed species surveys are not anticipated but consultation with USFWS will be required to exclude the area from survey requirements.
A high ranking (**3**) indicated that species-specific listed species surveys will likely be required after consultation with USFWS
This does not consider gopher tortoises which will need to be surveyed throughout the corridor.
3. **Wetland rank reflects the approximate acreages of impacts. The wetland mitigation price uses an estimated cost of $135,000.00 per credit (dual state/federal) and a UMAM score of 0.7

Bass Slough Basin
Basin 8 Pond Site Evaluation Matrix

Alternative (ID)	**Pond 8-A**			**Pond 8-B**			**Pond 8-C**		
Approximate Stationing	**1940+00, LT**			**1925+00, LT**			**1975+00, RT**		
	Comments	**Rank**	**Cost ($) 2020 dollar**	Comments	Rank	Cost ($) 2020 dollar	Comments	Rank	Cost ($) 2020 dollar
Area	**Within LA R/W**			7.00 acres			6.88 acres		
Right-of-Way	**Within LA R/W**		**$ -**	Impacts 29 residential properties		$ 8,887,661.00	Impacts 10 residential properties + 1 business property		$ 7,283,086.00
Hydraulics	**Adjacent to outfall**	**1**		High end of basin	2		High end of basin	2	
Construction	**400 LF to outfall**	**2**	**$ 50,000.00**	600 LF to outfall	2	$ 75,000.00	1,900 LF to outfall	3	$ 237,500.00
Contamination	**Not adjacent to any CRR Sites**	**0**		Not adjacent to any CRR Sites	0		Not adjacent to any CRR Sites. Some superficial debris was observed, does not appear to present a contamination concern	**1**	
Utilities	**OH-Electric B-FOC, B-Electric B, 30"gas main along side of pond**	**3**		Residential utilities, 20" gas main crossing access and within pond berm	3		Residential Utilities, OH-Electric cuts thru pond side slope	3	
*Listed Species	**No issues or surveys anticipated**	**1**		No issues or surveys anticipated	1		No issues or surveys anticipated	1	
**Wetlands/Surface Waters	**Wetland impacts 3.41 ac ., OSW 6.72 ac**	**2**	**$ 138,192.04**	No wetland/floodplain impacts	0	$ -	No wetland/floodplain impacts	0	$ -
Archaeological	**Low probability**	**1**		Low probability	1		Moderate probability	2	
Public Opinion		**0**		Negative to residents	3		Negative to residents and business	3	
Total Cost			**$ 188,192.04**			$ 8,962,661.00			$ 7,520,586.00
Comments/Advantages/ Disadvantages, etc.	**Lowest cost, no residential or commercial impacts, shortest distance from outfall, unfortunately has significant wetland impacts**			High cost, Impacts 29 residential properties			High cost, Impacts 10 residential properties + 1 business property		
Total Impact Rank	**Pond Site Needed for Floodplain Compensation**	**10**		NOT VIABLE as pond site	12		NOT VIABLE as pond site	15	

NOTE:
1. Each area of consideration is ranked 1-3, with 1 being the best.
2.* Listed species were ranked from 1 - 3
A low ranking (**1**) indicates that species-specific listed species surveys will not be required.
A medium ranking (**2**) indicates that species-specific listed species surveys are not anticipated but consultation with USFWS will be required to exclude the area from survey requirements.
A high ranking (**3**) indicated that species-specific listed species surveys will likely be required after consultation with USFWS
This does not consider gopher tortoises which will need to be surveyed throughout the corridor.
3. **Wetland rank reflects the approximate acreages of impacts. The wetland mitigation price uses an estimated cost of $135,000.00 per credit (dual state/federal) and a UMAM score of 0.7

Mill Slough Basin
Basin 9 Pond Site Evaluation Matrix

Alternative (ID)	**Pond 9-A**			**Pond 9-B**			**Pond 9-C**		
Approximate Stationing	**1991+00, LT**			**1995+00, RT**			**1995+00, LT**		
	Comments	**Rank**	**Cost ($) 2020 dollar**	Comments	Rank	Cost ($) 2020 dollar	Comments	Rank	Cost ($) 2020 dollar
Area	Within LA R/W			3.68 acres			**4.00 acres**		
Right-of-Way	Within LA R/W			Impacts 11 residential properties		$ 6,173,358.00			**$ 4,009,353.00**
Hydraulics	Within floodplain	3		Mid basin	2		**Adjacent to floodplain**	**1**	
Construction	Adjacent to outfall	1	$ -	400 LF to outfall	1	$ 50,000.00	**Adjacent to outfall**	**1**	**$ -**
Contamination	Not adjacent to any CRR site	0		Not adjacent to any CRR site	0		**Not adjacent to any CRR site**	**0**	
Utilities	OH-Electric B-FOC, B-Electric B, 30" gas main along side of pond switching from front slope to back slope.	3		Residential Utilities	3		**30" gas main crossing access**	**2**	
*Listed Species	No issues or surveys anticipated	1		No issues or surveys anticipated	1		**No issues or surveys anticipated**	**1**	
**Wetlands/Surface Waters	OSW impacts 2.69 ac.	0	$ -	No wetland/floodplain impacts	0	$ -	**No wetlands/floodplain impacts**	**0**	**$ -**
Archaeological	Low probability	1		Low probability	1		**Moderate probability**	**2**	
Public Opinion				Negative to residents	3				
Total Cost			$ -			$ 6,223,358.00			**$ 4,009,353.00**
Comments/Advantages/ Disadvantages, etc.	30" gas line along length of pond switching from right adjacent to roadway to left adjacent to LA R/W.			Impacts 11 residential properties, high cost			**High cost**		
Total Impact Rank	NOT VIABLE as a pond site.	**9**		NOT VIABLE as pond site	11			**7**	

NOTE:
1. Each area of consideration is ranked 1-3, with 1 being the best.
2.* Listed species were ranked from 1 - 3
A low ranking (**1**) indicates that species-specific listed species surveys will not be required.
A medium ranking (**2**) indicates that species-specific listed species surveys are not anticipated but consultation with USFWS will be required to exclude the area from survey requirements.
A high ranking (**3**) indicated that species-specific listed species surveys will likely be required after consultation with USFWS
This does not consider gopher tortoises which will need to be surveyed throughout the corridor.
3. **Wetland rank reflects the approximate acreages of impacts. The wetland mitigation price uses an estimated cost of $135,000.00 per credit (dual state/federal) and a UMAM score of 0.7

Mill Slough Basin
Basin 10 Pond Site Evaluation Matrix

Alternative (ID)	**Pond 10-A**			**Pond 10-B**			**Pond 10-C1 & C2**		
Approximate Stationing	**2010+00, LT**			**2008+00, LT**			**2010+00, LT & RT**		
	Comments	Rank	Cost ($) 2020 dollar	Comments	Rank	Cost ($) 2020 dollar	**Comments**	**Rank**	**Cost ($) 2020 dollar**
Area	1.52 acres			1.52 acres			**Within LA R/W**		
Right-of-Way			$ 1,603,349.00			$ 1,603,349.00	**Existing interchange ponds**		**$ -**
Hydraulics	Near outfall	1		Near outfall	1		**Near outfall**	**1**	
Construction	600 LF to outfall	2	$ 75,000.00	Adjacent to outfall	1	$ -	**Maintaining existing outfall**	**1**	**$ -**
Contamination	Adjacent to L G DeFelice Co	1		Adjacent to L G DeFelice Co	1		**C1 adjacent to L G DeFelice Co, C2 not adjacent to any CRR site**	1	
Utilities	30" gas main crossing access	2		30" gas main crossing access	2		**B-Electric, B-FOC**	**1**	
*Listed Species	No issues or surveys anticipated	**1**		No issues or surveys anticipated	1		**No issues or surveys anticipated**	1	
**Wetlands/Surface Waters	Wetland impacts 0.38 ac.	2	$ 30,754.80	Wetland impacts/floodplain impacts 1.26 ac.	2	$ 102,401.69	**OSW C1 - 0.32 ac, C2 - 0.55 ac**	**0**	**$ -**
Archaeological	Moderate probability	2		Low probability	1		**Low probability**	**1**	
Public Opinion									
Total Cost			$ 1,709,103.80			$ 1,705,750.69			**$ -**
Comments/Advantages /Disadvantages, etc.	High cost			High cost			**Low cost, Other surface waters, may need additional storage**		
Total Impact Rank	NOT VIABLE as pond site	11		NOT VIABLE as pond site	9			**6**	

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Mill Slough Basin
Basin 11 Pond Site Evaluation Matrix

Alternative (ID)	**Pond 11-A**			**Pond 11-B**			**Pond 11-C1 &C2**		
Approximate Stationing	**2020+00, LT**			**20260+00, LT**			**2018+00, LT & RT**		
	Comments	**Rank**	**Cost ($) 2020 dollar**	Comments	Rank	Cost ($) 2020 dollar	**Comments**	**Rank**	**Cost ($) 2020 dollar**
Area	**Within LA R/W**			2.18 acres			**Within LA R/W, existing interchange ponds**		
Right-of-Way	**Within LA R/W, at existing toll plaza**		**$ -**	In commercial development		$ 2,245,040.00	**Existing interchange ponds**		**$ -**
Hydraulics	**Existing toll plaza area adjacent to West Branch Mill Slough**	**1**		Other side of Mill Slough West Branch	2		**Expansion of existing ponds**	**1**	
Construction	**Adjacent to outfall**	**1**	**$ -**	Adjacent to outfall	1	$ -	**Adjacent to outfall**	**1**	**$ -**
Contamination	**Adjacent to Turnpike MP 248**	**1**		Not adjacent to any CRR site	0		**C1 Adjacent to Turnpike MP 248, C2 Not adjacent to CRR Site**	**1**	
Utilities	**B- FOC, B-Water, Electric**	**2**		None	1		**B-Electric, B-Sanitary, B-FOC**	**3**	
*Listed Species	**No issues or surveys anticipated**	**1**		No issues or surveys anticipated	1		**No issues or surveys anticipated**	**1**	
**Wetlands/Surface Waters	**Wetland impacts 0.2 ac.**	**1**	**$ 8,274.01**	No wetland impacts	0	$ -	**OSW C1 - 1.01 ac, C-2 - 1.32 ac**	**0**	**$ -**
Archaeological	**Low probability**	**1**		Low probability	1		**Low probability**	**1**	
Public Opinion									
Total Cost			**$ 8,274.01**			$ 2,245,040.00			**$ -**
Comments/Advantages/ Disadvantages, etc.	**May be used as additional pond volume for Basins 10 and 11**			High cost			**Low cost, existing pond**		
Total Impact Rank		**8**		NOT VIABLE as pond site	6			**8**	

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Floodplain Compensation Ponds (FPC)
Fish Lake Pond Site Evaluation

Alternative (ID)	**FPC Fish 1**			**FPC Fish 2**			**FPC Fish 3**			**FPC Fish 4**		
Approximate Stationing	**1724+00, RT**			**1728+00, LT**			**1720+00, LT**			**1720+00, LT**		
	Comments	Rank	Cost ($) 2020 dollar	**Comments**	**Rank**	**Cost ($) 2020 dollar**	Comments	Rank	Cost ($) 2020 dollar	Comments	Rank	Cost ($) 2020 dollar
Area	**6.47 acres**			1.07 acres			1.90 acres			2.98		
Right-of-Way					1			2				$ 722,834.00
Hydraulics	**Partially in floodplain**	**2**		In floodplain - not viable	3		**In floodplain - not viable**	3		Partially in floodplain	2	
Construction	**Adjacent to outfall**	**1**		Adjacent to floodplain	1		Adjacent to floodplain	1				
Contamination	**Adjacent to former citrus grove**	**1**		Not adjacent to any CRR site	0		**Adjacent to Osceola Sheriff Office Fuel Facility**	**1**		Not adjacent to any CRR site	0	
Utilities	**None**	**1**		None	1		None	1		None	1	
*Listed Species	**No issues or surveys anticipated**	**1**		No issues or surveys anticipated	1		No issues or surveys anticipated	1		No issues or surveys	1	
**Wetlands/Surface Waters	**Wetland/floodplains impacts 5.74 ac.**	**2**	**$ 465,124.80**	Wetland/floodplains impacts 1.01 ac.	1	$ 40,919.44	Wetland/floodplains impacts 1.9 ac.	1	$ 76,868.07	Wetland/floodplains impacts 0.94 ac.	1	$ 38,250.59
Archaeological	**Low probability**	**1**		Within pond footprint Recorded Archaeological site 8OS1771	1		Low probability	1		Potential unrecorded Historic Building within study area at 1312 Simmons Road	1	
Public Opinion										Property exchanged hands recently, being developed	3	
Total Cost			**$ 465,124.80**			$ 40,919.44			$ 76,868.07			$ 761,084.59
Comments/Advantages/ Disadvantages, etc.	**Significant wetland impacts**			Submerged site, wetland impacts			Submerged site, wetland impacts					
Total Impact Rank		**9**		NOT VIABLE as pond site	9		NOT VIABLE as pond site	11			9	

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Floodplain Compensation Ponds (FPC)
Fennel Slough Pond Site Evaluation

Alternative (ID)	**FPC Fennel 1**			**FPC Fennel 2**			**FPC Fennel 3**		
Approximate Stationing	**1773+00, RT**			**1770+00, LT**			**1782+00, LT**		
	Comments	Rank	Cost ($) 2020 dollar	Comments	Rank	Cost ($) 2020 dollar	**Comments**	**Rank**	**Cost ($) 2020 dollar**
Area	2.62 ac.			Within LA R/W			**Within LA R/W**		
Right-of-Way	Conservation Area	3		DOT Property	**1**		**DOT Property**	**1**	
Hydraulics	In floodplain	1		Within roadside ditch	1		**Within roadside ditch**	**1**	
Construction	Adjacent to floodplain	1		Adjacent to floodplain	1		**Adjacent to floodplain**	**1**	
Contamination	Not adjacent to any CRR site	0		Not adjacent to any CRR site	0		**Not adjacent to any CRR site**	**0**	
Utilities	None	1		B-FOC, B-Electric, 30"gas main along east side of pond	2		**B-FOC, B-Electric, 30" gas main along east side of pond**	**2**	
*Listed Species	No issues or surveys anticipated	1		No issues or surveys anticipated	1		**No issues or surveys anticipated**	**1**	
**Wetlands/Surface Waters	Wetland/floodplains impacts 2.02 ac., within a Conservation Area	3	$ 218,051.15	OSW impacts 1.97 ac.	0	$ -	**Wetland/floodplains impacts1.67 ac.**	**1**	**$ 67,762.34**
Archaeological	Low probability	1		Moderate probability	2		**Low probability**	**1**	
Public Opinion									
Total Cost			$ 218,051.15			$ -			**$ 67,762.34**
Comments/Advantages/ Disadvantages, etc.							**Lowest cost, lowest wetland impacts**		
Total Impact Rank	NOT VIABLE as pond site	11			8			**8**	

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Floodplain Compensation Ponds (FPC)
Bass Slough Pond Site Evaluation

Alternative (ID)	FPC Bass 1			FPC Bass 2			FPC Bass 3			FPC Bass 4			FPC Bass 5			FPC Bass 6		
Approximate Stationing	1818+00, LT			1842+00, LT			1950+00, LT			1860+00,LT			1922+00, RT			1965+00<RT		
	Comments	Rank	Cost ($) 2020 dollar	Comments	Rank	Cost ($) 2020 dollar	Comments	Rank	Cost ($) 2020 dollar	Comments	Rank	Cost ($) 2020 dollar	Comments	Rank	Cost ($) 2020 dollar	Comments	Rank	Cost ($) 2020 dollar
Area	3.56 acres			2.97 acres			Within LA R/W			Within LA R/W			Within LA R/W			Within LA R/W		
Right-of-Way	In floodplain	2		Adjacent to floodway	3	$ 720,762.00	Roadside Ditch	1		Roadside Ditch	1		Roadside Ditch	1		Roadside Ditch	1	
Hydraulics	Submerged site	3		Partially in floodplain	2		Connected by cross drain	1		Partially in floodplain	2		Adjacent to floodplain	1		Adjacent to floodplain	1	
Construction	Adjacent to floodplain	1	$ -	Adjacent to Floodplain	1	$ -	300 LF from floodplain, across roadway	1	$ 37,500.00	Adjacent to Floodplain	1	$ -	Adjacent to Floodplain	1	$ -	Adjacent to Floodplain	1	$ -
Contamination	Adjacent to Gateway High School	1		Adjacent to low risk sites	1		Not adjacent to any CRR site	0		Adjacent to SPILLS Incident at SB Turnpike MP 246	1		Not adjacent to any CRR site	0		Not adjacent to any CRR site	0	
Utilities	Gas line along east edge of pond	0		Gas line along east end of pond	0		OH-Electric B-FOC, B-Electric B-30" gas main	3		30" gas main along east side of pond, overhead electric on the west side of pond	2		None	0		None	0	
*Listed Species	No issues or surveys anticipated	1		No issues or surveys anticipated	1		No issues or surveys anticipated	1		No issues or surveys anticipated	1		No issues or surveys anticipated	1		No issues or surveys anticipated	1	
**Wetlands/Surface Waters	Wetlands impacts 3.24ac.	2	$ 262,396.86	Wetlands impacts 1.66 ac.	2	$ 134,782.10	Wetland impacts 3.41 ac ., OSW 6.72 ac	1	$ 138,192.04	Wetland impacts 0.39 ac, OSW 1.46 ac	1	$ 15,832.69	Wetland impacts 0.14 ac, OSW 0.10 ac	1	$ 5,642.53	OSW 0.07 ac	0	$ -
Archaeological	Low probability	1		Moderate probability	2		Low probability	1		Low probability	1		Low probability	1		Low probability	1	
Public Opinion																		
Total Cost			$ 262,396.86			$ 855,544.10			$ 175,692.04			$ 15,832.69			$ 5,642.53			$ -
Comments/Advantages/ Disadvantages, etc.	Submerged site			Adjacent to Recommended Pond 5-A - reduce number of R/W acquisitions			Location			Location			Location	6		Location	5	
Total Impact Rank	NOT VIABLE as pond site	11			12			9			10			12			10	

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Floodplain Compensation Ponds (FPC)
Mill Slough Pond Site Evaluation

Alternative (ID)	FPC Mill 1			FPC Mill 2			FPC Mill 3			FPC Mill 4			FPC Mill 5		
Approximate Stationing	1990+00, LT			2006+00, LT			2030+00, LT			2030+00, LT			2030+00, LT		
	Comments	**Rank**	**Cost ($) 2020 dollar**	Comments	Rank	Cost ($) 2020 dollar	Comments	Rank	Cost ($) 2020 dollar	Comments	Rank	Cost ($) 2020 dollar	Comments	Rank	Cost ($) 2020 dollar
Area	**4.91 acres**			4.14 acres			2.95 acres			**Within LA R/W**			**Within LA R/W**		
Right-of-Way		**1**	**$ 934,131.00**	Adjacent to floodplain	1	Not determined	Platted development	3	Not determined						
Hydraulics	**Adjacent to outfall**	**1**		Adjacent to outfall	1		Adjacent to floodplain	1		**canal bank**	**1**		**Canal Bank**	**1**	
Construction	**Adjacent to floodplain**	**1**		Requires easement to construct	2		Adjacent to floodplain	1		**Adjacent to floodplain**	**1**		**Adjacent to floodplain**	**1**	
Contamination	**Not adjacent to any CRR site**	**0**		Adjacent to L G DeFelice Co	1		Not adjacent to any CRR site	**0**		**Adjacent to L G DeFelice Co**	**1**		**Adjacent to SPILLS Incident at Turnpike MP 248**	**1**	
Utilities	**Need to cross gas line for access**	**2**		Need to cross gas line for access	2		None	0		**None**	**0**		**B-BFOT, B-Water**	**1**	
*Listed Species	**No issues or surveys anticipated**	**1**		No issues or surveys anticipated	1		No issues or surveys anticipated	1		**No issues or surveys anticipated**	**1**		**No issues or surveys anticipated**	**1**	
**Wetlands/Surface Waters	**No wetland impacts**	**0**	$ -	Wetland impacts 0.18 ac.	2	$ 14,490.86	No wetland/floodplain impacts	0	$ -	**OSW 0.05 ac**	**0**	$ -	**Wetland impacts 0.03 ac.**	**1**	**$ 1,053.75**
Archaeological	**Moderate probability**	**2**		Low probability	1		Low probability	1		**Low probability**	**1**		**Low probability**	**1**	
Public Opinion															
Total Cost			**$ 934,131.00**			$ 14,490.86			$ -			$ -			**$ 1,053.75**
Comments/Advantages/ Disadvantages, etc.	**No Wetland Impacts**			Wetland impacts			Platted development								
Total Impact Rank		**8**			11		Non viable	7			**5**			**7**	

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