LOCATION HYDRAULIC REPORT

Florida Department of Transportation

District One

State Road (SR) 70 PD&E Study

Limits of Project: County Road (CR) 29 to Lonesome Island Road

Highlands County, Florida

Financial Management Number: 414506-5-22-01

ETDM Number: 14364

Date: April 2023

The environmental review, consultation, and other actions required by applicable federal environmental laws for this project are being, or have been, carried out by the Florida Department of Transportation (FDOT) pursuant to 23 U.S.C. § 327 and a Memorandum of Understanding dated May 26, 2022 and executed by the Federal Highway Administration and FDOT.

LOCATION HYDRAULIC REPORT

SR 70 From CR 29 to Lonesome Island Road
Project Development and Environment Study

Financial Project ID: 414506-5-22-01
ETDM No.: 14364

Florida Department of Transportation
District One

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April 2023

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Appendices

A Project Development and Environment (PD&E) Study was initiated in December 2018 by the Florida Department of Transportation (FDOT), District One, to evaluate the reconstruction, realigning and proposed widening of State Road 70 (SR 70) from County Road 29 (CR 29) to Lonesome Island Road in Highlands County. SR 70 is classified as a rural principal arterial and is part of Florida's Strategic Intermodal System (SIS) network. SR 70 also serves as one of the primary east-west facilities in the region, providing access to agricultural and ranching operations, as well as other major regional roadways (including US 17 and US 441) and freight distribution centers, resulting in significant truck traffic on the corridor.

The FDOT proposes to widen SR 70 from a two-lane undivided roadway to a four-lane divided roadway to maintain important east-west mobility for people and freight in southern Highlands County and alleviate future traffic congestion on the corridor. The proposed improvements to SR 70 will also include a shared use path. The roadway currently operates at Level of Service (LOS) B with it deteriorating to a LOS of E in 2035 if no improvements are made. This will cause higher levels of congestion and longer delays since the roadway will have insufficient capacity to accommodate the future travel demand. However, the LOS rises to B for a four-lane divided roadway. SR 70 carries significant truck traffic (> 27%) and is part of the SIS highway network. SR 70 provides regional access to agricultural lands, industrial areas, commercial developments, and freight distribution facilities across the state of Florida as well as functioning as an important hurricane evacuation route. The FDOT anticipates this project will improve connectivity between the east and west sides of the state, enhance safety along the project corridor, and improve emergency evacuation.

The project is located along SR 70 between CR 29 (Mile Post (MP) 17.255) and Lonesome Island Road (MP 21.573). The approximate total length of the project is 4.3 miles.

The proposed improvements of SR 70 include the reconstruction and realignment of the two existing travel lanes to the south of the existing SR 70 alignment, with future widening to a four-lane divided roadway and addition of a shared use path. Proposed improvements also include the relocation and widening of the existing roadside canals along with the addition of floodplain compensation sites. Additionally, stormwater runoff is collected and conveyed to proposed stormwater management facilities via a series of roadside swales. These stormwater management facilities will provide water quality treatment and water quantity attenuation.

The project is located within the Federal Emergency Management Agency (FEMA) Flood Zone A and drainage basin along the project flows into the Harney Pond Canal. The proposed roadway and associated drainage improvements do not increase the 100-year/24-hour floodplain existing stages due to floodplain impact reduction measures such as the relocation and widening of the existing canals, the addition of floodplain compensation areas, and the modification of existing cross drains to improve overall watershed flow within the project corridor. These improvements will improve the ability for emergency services to utilize SR 70 and ensure the roadway remains a vital evacuation route. The risk assessment of the proposed improvements with applicable mitigation measures has

determined the widening of SR 70 will have minimal encroachments on the floodplain and will not result in significant impacts.

Table ES-1 Summary of Cross drain Improvements

ID	MP	Station	Existing	Proposed
CD-1	17.900	34+05	36” CMP	34” X 53” ECP
CD-2	19.251	105+39	2-53” X 83” CMP	3-53” X 83” CMP
CD-3	21.017	198+63	2-82” X 128” CMP	2-82” X 128” CMP
Note: Alternate pipe types with equivalent capacity to be evaluated at design for adequate base clearance.				

1. Introduction

A Project Development and Environment (PD&E) Study was initiated in December 2018 by the Florida Department of Transportation (FDOT), District One, to evaluate the reconstruction, realigning and proposed widening of State Road 70 (SR 70) from County Road 29 (CR 29) to Lonesome Island Road in Highlands County. SR 70 is classified as a rural principal arterial and is part of Florida's Strategic Intermodal System (SIS) network. SR 70 also serves as one of the primary east-west facilities in the region, providing access to agricultural and ranching operations, as well as other major regional roadways (including US 17 and US 441) and freight distribution centers, resulting in significant truck traffic on the corridor. The purpose of this PD&E study is to evaluate engineering and environmental data and document information that will aid Highlands County, FDOT, and the Office of Environmental Management (OEM) in determining the location, type, and preliminary design of the proposed improvements. The study was conducted to meet the requirements of the National Environmental Policy Act (NEPA) and other related federal and state laws, rules, and regulations.

2. Project Description

The FDOT proposes to widen SR 70 from a two-lane undivided roadway to a four-lane divided roadway to maintain important east-west mobility for people and freight in southern Highlands County and alleviate future traffic congestion on the corridor. The proposed improvements to SR 70 will also include a shared use path. The roadway currently operates at Level of Service (LOS) B with it deteriorating to a LOS of E in 2035 if no improvements are made. This will cause higher levels of congestion and longer delays since the roadway will have insufficient capacity to accommodate the future travel demand. However, the LOS rises to B for a four-lane divided roadway. SR 70 carries significant truck traffic (> 27%) and is part of the SIS highway network. SR 70 provides regional access to agricultural lands, industrial areas, commercial developments, and freight distribution facilities across the state of Florida as well as functioning as an important hurricane evacuation route.

This project is identified in the Capital Improvements Element of the 2030 Comprehensive Plan for Highlands County. A large majority of the corridor will continue to be used for agricultural purposes according to the Highlands County Future Land Use Map. In addition, the Highlands County Comprehensive Plan (Policy 12.6.5) indicates that the project segment is part of the designated SR 70 Commercial-Industrial Corridor Area where industrial and commercial growth will be targeted along the corridor. The FDOT anticipates this project will improve connectivity between the east and west sides of the state, enhance safety along the project corridor, and improve emergency evacuation.

The report is to address base floodplain encroachments resulting from the proposed roadway improvements to SR 70. In accordance with *Executive Order 11988 "Floodplain Management", USDOT Order 5650.2; "Floodplain Management and Protection";* and *Federal-Aid Policy Guide 23 CFR 650A*, floodplains and floodways must be protected. The intent of these regulations is to avoid or minimize highway encroachments and land use developments that reduce storage and increase water surface elevations within the 100-year (base) floodplains.

The project is located along SR 70 between CR 29 (Mile Post (MP) 17.255) and Lonesome Island Road (MP 21.573). The approximate total length of the project is 4.3 miles. The project limits are identified in **Figure 2.1**. **Appendix A3** presents the project location in USGS Quadrangle Map. Additionally, Section, Township and Range information is provided in **Table 2.1**.

The vertical control for this project is the North American Vertical Datum of 1988 (NAVD 88). For data in National Geodetic Vertical Datum of 1929 (NGVD 29), the conversion to NAVD 88 is: NAVD = NGVD - 1.20 (See **Appendix A7** for NOAA Online Vertical Datum Transformation).

Table 2.1 Section, Township, and Range

Sections	Township	Range
36	37S	30E
1	38S	
31, 32, 33, 34	37S	31E
3, 4, 5, 6	38S	

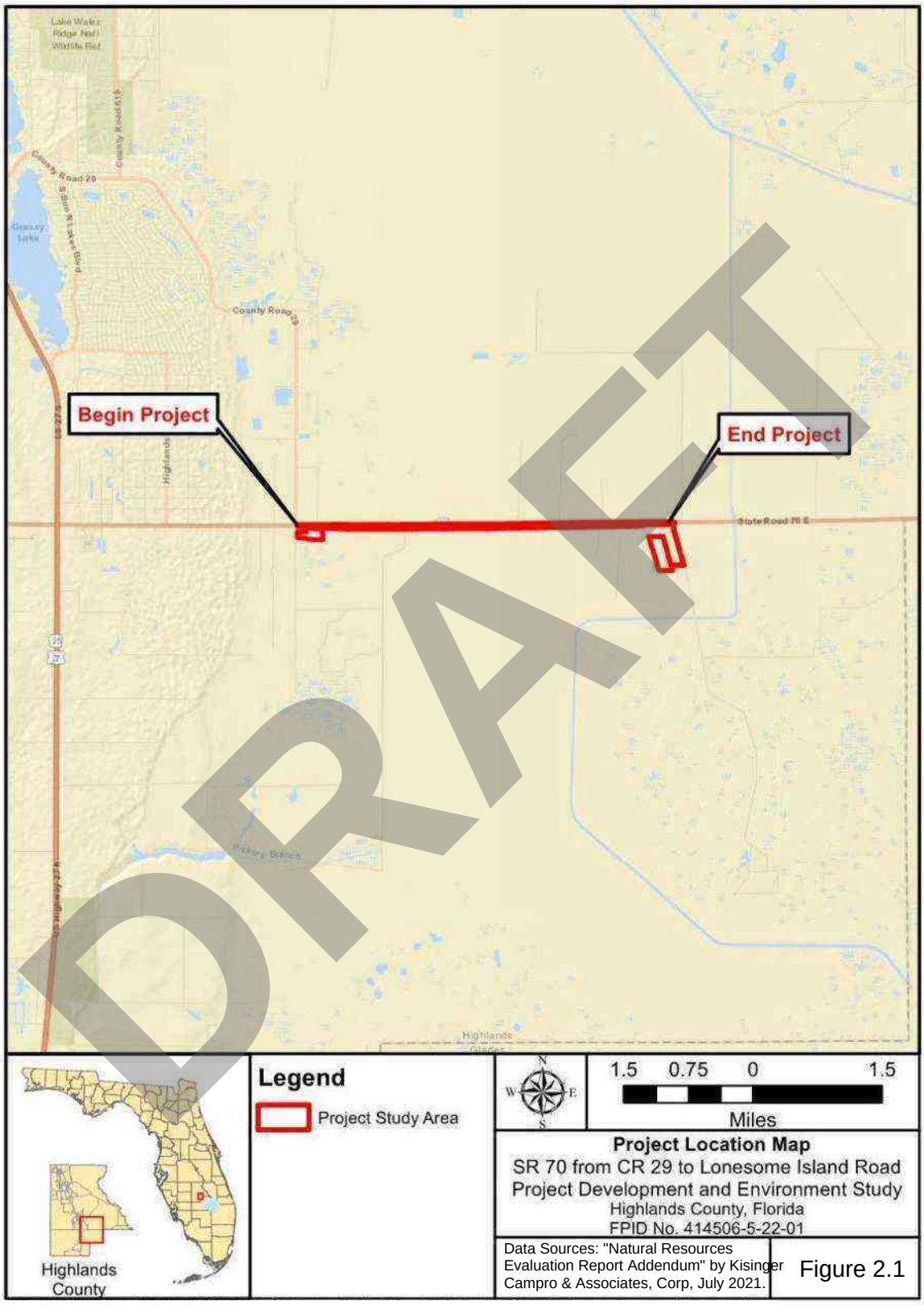
3. Existing Conditions

Currently, SR 70 is a two-lane undivided facility with ten-foot travel lanes and six-foot (four-foot paved) shoulders with stormwater discharging to canals along the north and south sides of the roadway (See **Figure 3.1**). The roadway pavement exhibits distresses including severe rutting, cracking, and potholes consistent with unsuitable soils below the roadway. In addition to pavement issues, the existing roadway configuration does not meet current lateral offset criteria for canal hazards, and the steep front slopes require continuous maintenance due to erosion.

The project is located within Federal Emergency Management Agency's (FEMA) 100-year floodplain and prone to flooding. SR 70 also is part of SIS. Facilities on the SIS are subject to special standards and criteria for number of lanes, design speed, access, level of service and other requirements. The existing SR 70 cross-section and geometrics do not meet SIS criteria. The future widening of the project segment will be built to meet the SIS facility standards and criteria.

The project falls within the C-41 Watershed of the South Florida Water Management District (SFWMD) with ultimate outfall to the Harney Pond Canal (Water Body Identification (WBID) 3204) which is impaired for nutrients. The project is divided into three drainage basins serviced by three existing cross drains that function as equalizers for the canals located along both sides of the existing SR 70 alignment. There are no formal stormwater water treatment facilities.

Figure 2.1 Project Location Map



The project study area is defined as the existing SR 70 ROW and a 300-foot buffer to the south to capture the mainline corridor portion of the proposed project. Additionally, all the proposed pond site alternatives are included for a total project study area of approximately 491.85 acres. The new southern canal is included in the mainline corridor of the project study area. The proposed ponds comprise approximately 316.23 acres of the project study area. To assess the approximate locations and boundaries of existing wetland and upland communities within the project study area, a desktop analysis was conducted, and the following site-specific data were collected and reviewed.

Figure 3.1 Existing Typical Section

3.1 Soils

An assessment of existing soils within the project corridor was performed using the United States Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS) Soil Resource Report. The NRCS Web Soil Survey classifies the soils within the project area as Immokalee sand (8), Felda fine sand (13), Kaliga muck (18), Tequesta muck (26), and Sanibel Muck (35), See **Appendix A4** for additional details.

Table 3.1 presents the soil hydric, area, and approximate percentage of each soil group within the project study area.

3.2 Land Use

The existing land use within the project corridor is characterized by: Improved Pastures (211), Unimproved Pastures (212), Citrus Groves (221), Sod Farms (242), Temperate Hardwood (425), Live Oak (427), Roads and Highways (814), Streams and Waterways (510), Reservoirs (530), Mixed Wetland Hardwoods (617), Freshwater Marshes (641), and Low Density Residential (110). Detail land use information is presented in **Appendix A5.**

Table 3.1 Summary of Soils Survey in the Project Study Area

Map Unit	Map Unit Name	Description	Hydric Y/N	Area within the Project Study Area (*acres*)	Approximate Percent of Project Study Area
8	Immokalee Sand*	0-2% slopes	N**	61.52	30.79%
13	Felda Fine Sand*	0-2% slopes	Y	45.06	22.55%
18	Kaliga Muck*	frequently ponded, 0-1% slopes	Y	72.88	36.48%
26	Tequesta Muck*	frequently ponded, 0-1% slopes	Y	19.00	9.51%
35	Sanibel Muck		Y	1.34	0.67%
			Total Hydric Soils	138.28	69.21%
			Total Non-Hydric Soils	61.52	30.79%
			Total	199.80	100.00%

Note: * Classified as Farmland of Unique Importance
** May have Hydric soil inclusions
Date Sources: "Natural Resources Evaluation Addendum" prepared by Kisinger Campo & Associates, Corp. July 2021

3.3 Cross Drains

There are three existing cross drains that function as equalizers for the canals located along both sides of the existing SR 70 alignment. See **Table 3.2** and **Appendix A1** for Straight Line Diagram of the existing cross drains.

Table 3.2 Existing Cross drains

ID	MP	Station	Description
CD-1	17.900	34+05	36" CMP*
CD-2	19.251	105+39	2-53" X 83" CMP
CD-3	21.017	198+63	2-82" X 128" CMP

Note: * Corrugated Metal Pipe

3.4 Bridge Structures

There are no bridge structures within the project limits.

3.5 Floodplains & Floodways

FEMA's Flood Insurance Rate Maps (FIRM) Panel Nos. 12055C0533C, 12055C0535C, and 12055C0555C (dated to November 18, 2015) for Highlands County (see **Appendix A2**) indicate that portions of the project area are potentially located within the 100-year floodplain Zone A which is defined as an area subject to inundation by the 1% annual-chance flood (100-year flood). Base flood elevation (BFE) has not been determined for Zone A. There are no regulated FEMA floodways within the project limits. The existing 100-year floodplain elevations for FEMA Zone A areas were established and documented in the *Final Floodplain Modeling Report* included as **Appendix B.**

4. Proposed Conditions

The proposed improvements of SR 70 include the reconstruction and realignment of the two existing travel lanes to the south of the existing SR 70 alignment, with future widening to a four-lane divided roadway and addition of a shared use path. Proposed improvements also include the relocation and widening of the existing roadside canals along with the addition of floodplain compensation sites as shown in **Figure 4.1**.

Additionally, stormwater runoff will be collected and conveyed to proposed stormwater management facilities via a series of roadside swales. These stormwater management facilities will provide water quality (treatment) and water quantity (attenuation). The design of the drainage and stormwater facilities will comply with the standards set forth by the *FDOT Drainage Manual*, *FDOT Drainage Design Guide*, and the *SFWMD ERP Applicant's Handbook II*.

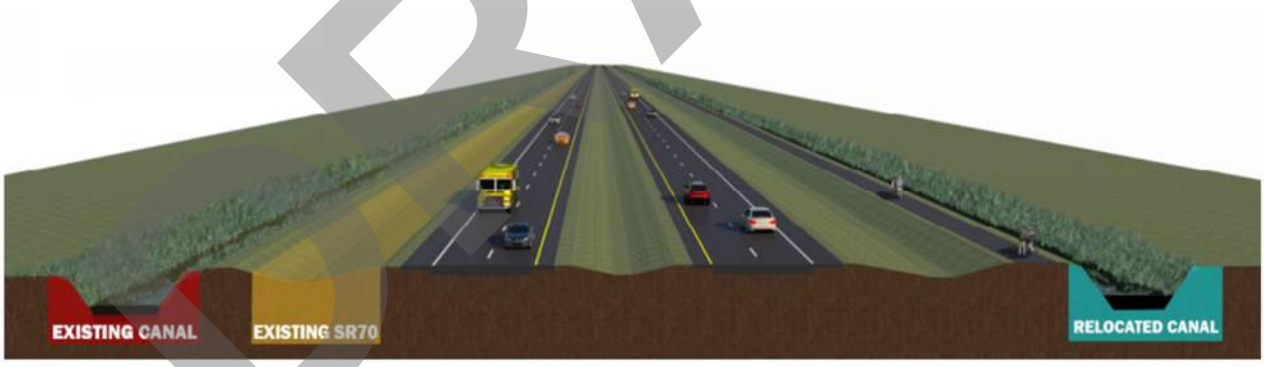


Figure 4.1 Proposed Typical Section

4.1 Cross Drains

The proposed typical section requires modifications to the existing drainage structures to improve drainage conditions. The proposed improvements include replacing CD-1 with a 34" x 53" Embedded-cylinder Pipe (ECP) and adding a third 53" x 83" ECP to CD-2, as outlined in **Table 4.1**."

Table 4.1 Proposed Cross Drain Improvements

ID	MP	Station	Existing	Proposed
CD-1	17.900	34+05	36” (CMP)	34” X 53” ECP
CD-2	19.251	105+39	2-53” X 83” CMP	3-53” X 83” CMP
CD-3	21.017	198+63	2-82” X 128” CMP	2-82” X 128” CMP
Note: Alternate pipe types with equivalent capacity to be evaluated at design for adequate base clearance.				

4.2 Bridge Structures

There are no proposed bridge structures within the project limits.

4.3 Floodplain Impacts and Compensation

The proposed roadway and associated drainage improvements do not increase the 100-year/24-hour floodplain existing stages, due to the relocation and widening of the existing canals, addition of Floodplain Compensation Areas (FPC 1 and FPC 2), and modification of existing cross drains CD-1 and CD-2.

The relocated canal will be widened to provide an additional 22.9 acre-feet of floodplain compensation in 1.5 feet of depth and 35 feet of added base width.

Located adjacent to the proposed SR 70 R/W, FPC 1 is a 19-acre pond site located on the south side of SR 70 from STA 6+12 to 19+08 RT (see **Appendix A6**). This site will provide 19.10 acre-feet of floodplain compensation in 1-foot of depth of excavation. The south side of the project area drains into a series of interconnected irrigation canals spanning the entire watershed. Therefore, with FPC 1 attached to the canals, it will be directly hydraulically connected to the canals to the west and east. FPC 1 can connect directly to this canal using a swale.

FPC 2 is a 31.5-acre pond site located on the south side of SR 70 from STA 224+45 to 230+48 RT. This site will provide approximately 30 acre-feet of floodplain compensation in 1.0-foot of depth of excavation. It would require an easement for access. The south side of the project area drains into a series of interconnected irrigation canals spanning the entire watershed prior to out falling into C-41 Harney Pond Canal. With FPC 2 attached to an offsite agricultural canal, it will be directly hydraulically connected to the canals on the East end of the project. FPC 2 can connect directly to this canal using a swale or an equalizer pipe.

A detailed documentation of the proposed condition floodplain analysis and compensation measures is provided in the *Draft Pond Siting Report* and *Floodplain Model Report* (see **Appendix B** for additional details).

5. Risk Evaluation

The proposed improvements include floodplain impact reduction measures such as the relocation and widening of the existing canals, addition of floodplain compensation areas, and modification of existing cross drains to improve overall watershed flow within the project corridor.

There is no change in flood risk or floodplain impacts associated with this project. The following floodplain statement is a slightly modified version of statement Number 4 in the FDOT *PD&E Manual* (see part 2, Chapter 13), tailored for this project:

> *The construction of fill within the floodplain and the modification of existing drainage structures for this project will be mitigated by floodplain compensation where required. The proposed structures will perform hydraulically in a manner equal to or better than the existing structures, and backwater surface elevations are not expected to increase. These changes may cause minimal increases in flood heights and flood limits; however, will not result in any significant adverse impacts on the natural and beneficial floodplain values or any significant changes in flood risk or damage. There will not be a significant change in the potential for interruption or termination of emergency service or emergency evacuation routes. In fact, construction of the proposed project will greatly enhance existing evacuation facilities in the area. Therefore, it has been determined that this encroachment is not significant.*

6. References

- Federal Emergency Management Agency (FEMA): *Flood Insurance Rate Map (FIRM),* effective November 18, 2015 (12055C0533C, 12055C0535C and 12055C0555C)
- FDOT District One, December 2018. *Preliminary Location Hydraulics Report, Project Development and Environment Study - SR 70 From CR 29 To Lonesome Island Road*.
- Kisinger Campo & Associates Corp, February 2021. *Final Floodplain Modeling Report, Project Development and Environment Study - SR 70 from CR 29 to Lonesome Island Road*.
- South Florida Water Management District. 2016, May 22. *Environmental Resource Permit Applicant's Handbook Volume(s) I & II*.
- South Florida Water Management District. 2010. *Canals in South Florida – A Technical Support Document*.
- USDA SCS Web Soil Survey: https://websoilsurvey.nrcs.usda.gov
- USGS Quadrangle Maps (Childs) (Brighton): https://www.usgs.gov/programs/national-geospatial-program/topographic-maps

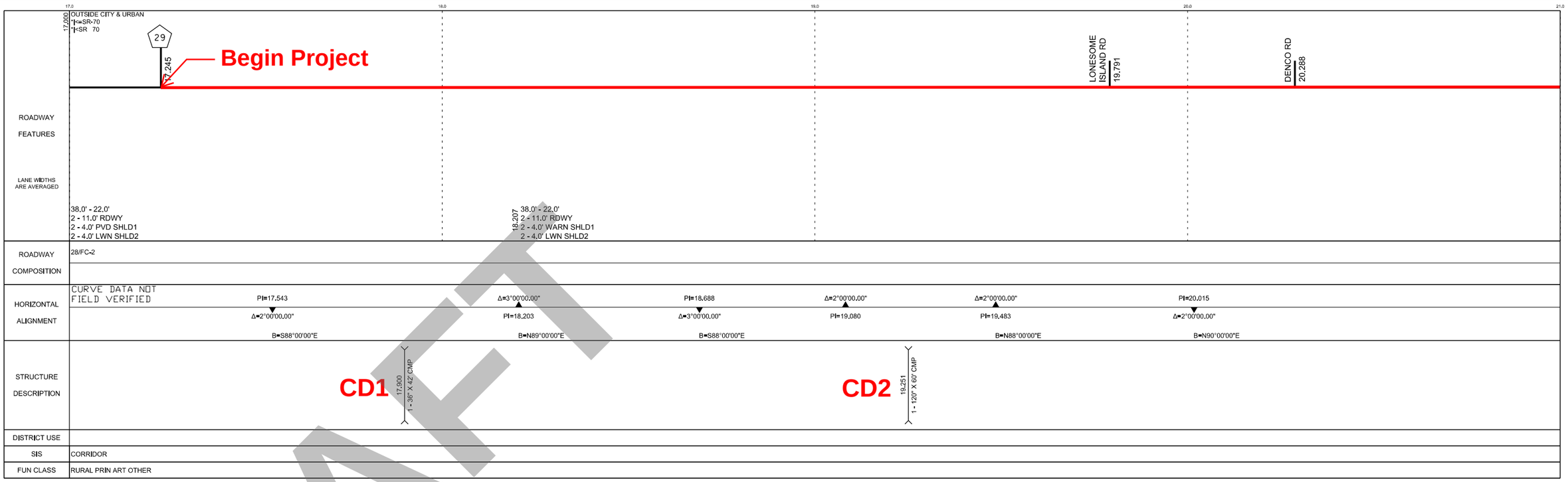
Appendix A1. Straight Line Diagram

	5 YR INV	SLD REV	BMP	EMP	INV	SLD REV
DATE	07/11/2019	08/13/2019	17.245	21.639	01/06/2022	1/12/22-414506-6
BY	FTE	FTE	0.000	36.334		1/12/22(F241)

FLORIDA DEPARTMENT OF TRANSPORTATION FDOT

STRAIGHT LINE DIAGRAM OF ROAD INVENTORY

SECTION STATUS	INT. or US ROUTE NO.	STATE ROAD NO.	COUNTY	DISTRICT	ROADWAY ID	SHEET NO:
02		SR 70	HIGHLANDS	01	09060000	4 OF 7



Appendix A2. FEMA FIRM Maps

NOTES TO USERS

This map is for use in administering the National Flood Insurance Program. It does not necessarily identify all areas subject to flooding, particularly from local drainage sources of small size. The **community map repository** should be consulted for possible updated or additional flood hazard information.

To obtain more detailed information in areas where **Base Flood Elevations** (BFEs) and/or **floodways** have been determined, users are encouraged to consult the Flood Profiles and Floodway Data and/or Summary of Stillwater Elevations tables contained within the Flood Insurance Study (FIS) report that accompanies this FIRM. Users should be aware that BFEs shown on the FIRM represent rounded whole foot elevations. These BFEs are intended for flood insurance rating purposes only and should not be used as the sole source of flood elevation information. Accordingly, flood elevation information presented in the FIS report should be utilized in conjunction with the FIRM for purposes of construction and/or floodplain management.

Coastal Base Flood Elevations (BFEs) shown on this map apply only landward of 0.0' North American Vertical Datum of 1988 (NAVD 88). Users of this FIRM should be aware that coastal flood elevations are also provided in the Summary of Stillwater Elevations table in the Flood Insurance Study report for this jurisdiction. Elevations shown in the Summary of Stillwater Elevations table should be used for construction and/or floodplain management purposes when they are higher than the elevations shown on this FIRM.

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.

Base map information shown on this FIRM was provided in digital format by the Southwest Florida Water Management District. The original orthophotographic base imagery was provided in color with a on-foot pixel resolution at a scale of 1" = 200' from photography flown January - February 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 on available products associated with this FIRM visit the **Map Service Center (MSC)** website at http://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 MSC website.

If you have **questions about this map,** how to order products, or the National Flood Insurance Program in general, please call the **FEMA Map Information eXchange (FMIX)** at **1-877-FEMA-MAP** (1-877-336-2627) or visit the FEMA website at http://www.fema.gov/national-flood-insurance-program.

DATUM INFORMATION

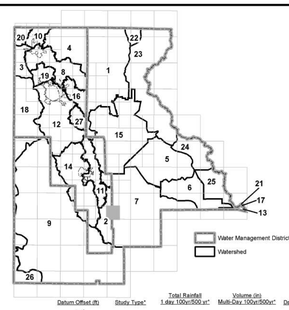
The **projection** used in the preparation of this map was State Plane Florida East. The **horizontal datum** was NAD83, GRS1980 spheroid. Differences in datum, spheroid, projection or State Plane Zone used in the production of FIRMs for adjacent jurisdictions may result in slight positional differences in map features across jurisdiction boundaries. These differences do not affect the accuracy of this FIRM.

Base Flood Elevations (BFEs)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:

Spatial Reference System Division
National Geodetic Survey, NOAA
1315 East-West Highway
Silver Spring, Maryland 20910
(301) 713-3242

Example Datum Offset Calculation
using datum offset table below
NAVD88 = NGVD29 + (datum offset value)

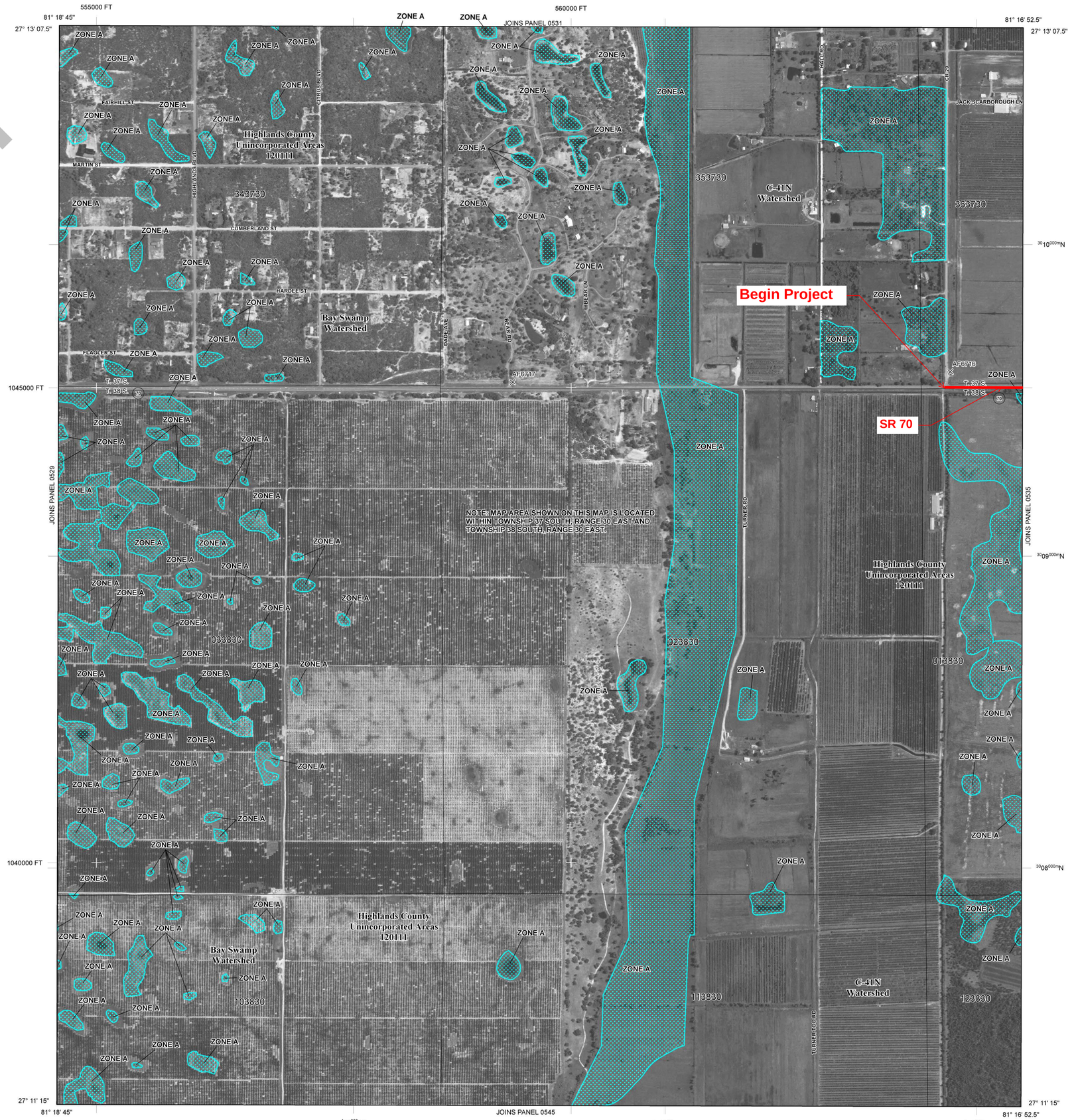
To obtain current elevation, description, and/or location information for **benchmarks** shown on this map, please contact the Information Services Branch of the National Geodetic Survey at **(301) 713-3242** or visit its website at http://www.ngs.noaa.gov/



ID	Watershed	Datum Offset (ft)	Study Type*	Total Rainfall 1-day 100yr/500 yr*	Volume (in) Multi-Day 100yr/500yr*	Date of Model*
1	Arbuckle Creek	-1.13				
2	Bay Swamp	-1.13				
3	Bee Branch	-1.13				
4	Bonnet Creek	-1.13				
5	C-41 AN	-1.13				
6	C-41 AS	-1.13				
7	C-41 N	-1.13				
8	Carter Creek	-1.13				
9	Fisheating Creek	-1.13				
10	Grassy Creek (north)	-1.13				
11	Grassy Creek (central)	-1.13				
12	Josephine Creek	-1.13				
13	L-59E	-1.13				
14	Lake Francis Outlet	-1.13				
15	Lake Istokpoga	-1.13				
16	Lake Lucas	-1.13				
17	Lake Okeechobee	-1.13				
18	Little Charley Bowlegs	-1.13				
19	Little Red Water Lake	-1.13				
20	Old Town Creek	-1.13				
21	S-154C	-1.13				
22	S-65A	-1.13				
23	S-65BC	-1.13				
24	S-65D	-1.13				
25	S-65E	-1.13				
26	Shell Creek	-1.13				
27	Yellow Bluff Creek	-1.13				

* Multiple study types, rainfall volumes, and/or model dates found within specific watersheds; refer to the Flood Insurance Study (FIS) for details.

This digital Flood Insurance Rate Map (FIRM) was produced through a cooperative partnership between the Southwest Florida Water Management District (SWFWMD), South Florida Water Management District (SFWMD), Highlands County, Federal Emergency Management Agency (FEMA) and the associated communities within Highlands County.



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; and areas protected by levees from 1% annual chance flood. See additional note in Watershed Table on left collar[1]

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
$^{4}275^{000m}$E	1000-meter Universal Transverse Mercator grid ticks, Zone 17 W
6000000 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)
M1.5	River Mile
222218	Section - Township - Range
7NX1000	Junction - Points defining locations of flow accumulation or hydraulic connectivity. The first two characters of the Junction name represents the specific watershed (as shown in the map collar locator map) in which the Junction is located (note that boundary Junctions, without an associated floodplain, are also shown).
	Watershed Boundaries

MAP REPOSITORIES
Refer to Map Repositories list on Map Index

EFFECTIVE DATE OF COUNTYWIDE
FLOOD INSURANCE RATE MAP
November 18, 2015

EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL

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" = 500'
250 0 500 1000 FEET
150 0 150 300 METERS

NFIP
NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0533C

FIRM

FLOOD INSURANCE RATE MAP

HIGHLANDS COUNTY, FLORIDA AND INCORPORATED AREAS

PANEL 533 OF 710
(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
HIGHLANDS COUNTY	120111	0533	C

A-2
FEMA Map
(1 of 3)

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
12055C0533C
EFFECTIVE DATE
NOVEMBER 18, 2015

Federal Emergency Management Agency

NOTES TO USERS

This map is for use in administering the National Flood Insurance Program. It does not necessarily identify all areas subject to flooding, particularly from local drainage sources of small size. The **community map repository** should be consulted for possible updated or additional flood hazard information.

To obtain more detailed information in areas where **Base Flood Elevations** (BFEs) and/or **floodways** have been determined, users are encouraged to consult the Flood Profiles and Floodway Data and/or Summary of Stillwater Elevations tables contained within the Flood Insurance Study (FIS) report that accompanies this FIRM. Users should be aware that BFEs shown on the FIRM represent rounded whole foot elevations. These BFEs are intended for flood insurance rating purposes only and should not be used as the sole source of flood elevation information. Accordingly, flood elevation information presented in the FIS report should be utilized in conjunction with the FIRM for purposes of construction and/or floodplain management.

Coastal Base Flood Elevations (BFEs) shown on this map apply only landward of 0.0' North American Vertical Datum of 1988 (NAVD 88). Users of this FIRM should be aware that coastal flood elevations are also provided in the Summary of Stillwater Elevations table in the Flood Insurance Study report for this jurisdiction. Elevations shown in the Summary of Stillwater Elevations table should be used for construction and/or floodplain management purposes when they are higher than the elevations shown on this FIRM.

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.

Base map information shown on this FIRM was provided in digital format by the Southwest Florida Water Management District. The original orthophotographic base imagery was provided in color with a on-foot pixel resolution at a scale of 1" = 200' from photography flown January - February 2008.

This map reflects more detailed and up-to-date **stream channel configurations** than those shown on the previous FIRM for this juristiction. 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 on available products associated with this FIRM visit the **Map Service Center (MSC)** website at http://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 MSC website.

If you have **questions about this map,** how to order products, or the National Flood Insurance Program in general, please call the **FEMA Map Information eXchange (FMIX) at 1-877-FEMA-MAP** (1-877-336-2627) or visit the FEMA website at http://www.fema.gov/national-flood-insurance-program.

DATUM INFORMATION

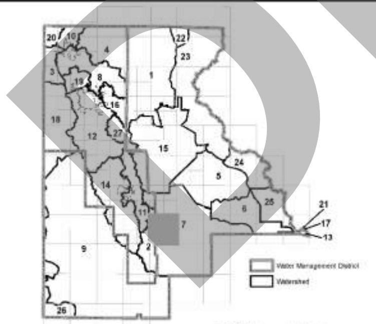
The **projection** used in the preparation of this map was State Plane Florida East. The **horizontal datum** was NAD83, GRS1980 spheroid. Differences in datum, spheroid, projection or State Plane Zone used in the production of FIRMs for adjacent jurisdictions may result in slight positional differences in map features across jurisdiction boundaries. These differences do not affect the accuracy of this FIRM.

Base Flood Elevations (BFEs)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:

Spatial Reference System Division
National Geodetic Survey, NOAA
1315 East-West Highway
Silver Spring, Maryland 20910
(301) 713-3242

Example Datum Offset Calculation
using datum offset table below
NAVD88 = NGVD29 + (datum offset value)

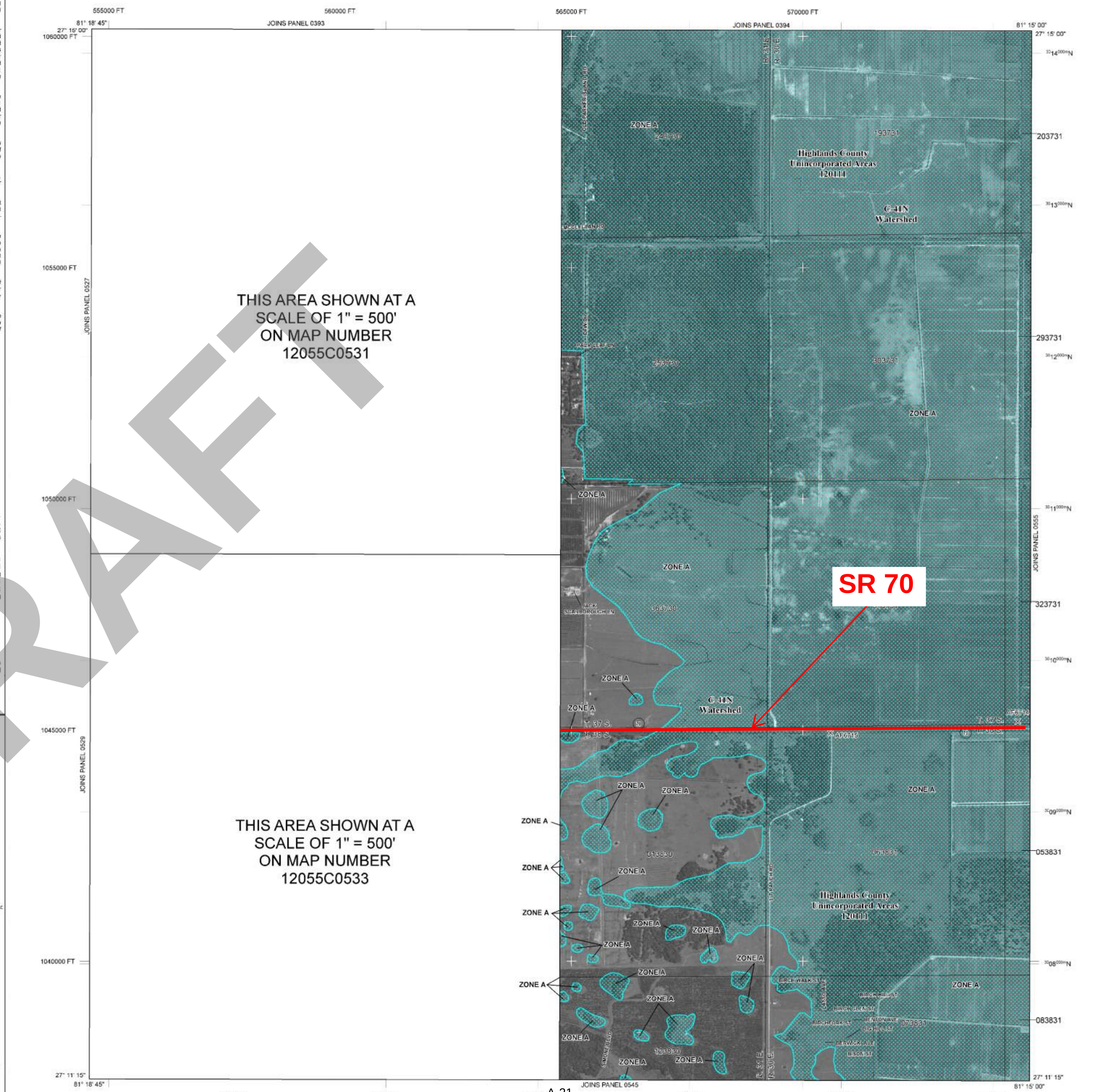
To obtain current elevation, description, and/or location information for **benchmarks** shown on this map, please contact the Information Services Branch of the National Geodetic Survey at **(301) 713-3242** or visit its website at http://www.ngs.noaa.gov/



ID	Watershed	Datum Offset (ft)	Study Type*	Total Rainfall 1 day 100yr/500 yr*	Volume (in) Multi-Day 100yr/500yr*	Date of Model*
1	Arbuckle Creek	-1.13				
2	Bay Swamp	-1.13				
3	Bee Branch	-1.13				
4	[illegible] Creek	-1.13				
5	C-41 AN	-1.13				
6	C-41 AS	-1.13				
7	C-41 N	-1.13				
8	Carter Creek	-1.13				
9	Fisheating Creek	-1.13				
10	Grassy Creek (north)	-1.13				
11	Grassy Creek (central)	-1.13				
12	Josephine Creek	-1.13				
13	L-59E	-1.13				
14	Lake Francis Outlet	-1.13				
15	Lake Istokpoga	-1.13				
16	Lake [illegible]	-1.13				
17	Lake [illegible]	-1.13				
18	Little Charley Bowlegs	-1.13				
19	Little Red Water Lake	-1.13				
20	Old Town Creek	-1.13				
21	S-154C	-1.13				
22	S-65A	-1.13				
23	S-65BC	-1.13				
24	S-65D	-1.13				
25	S-65E	-1.13				
26	Shell Creek	-1.13				
27	Yellow Bluff Creek	-1.13				

* Multiple study types, rainfall volumes, and/or model dates found within specific watersheds; refer to the Flood Insurance Study (FIS) for details

This digital Flood Insurance Rate Map (FIRM) was produced through a cooperative partnership between the Southwest Florida Water Management District (SWFWMD), South Florida Water Management District (SFWMD), Highlands County, Federal Emergency Management Agency (FEMA) and the associated communities within Highlands County.



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; and areas protected by levees from 1% annual chance flood. See additional note in Watershed Table on left collar*

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
$^{42}76^{000m}$E	1000-meter Universal Transverse Mercator grid ticks, Zone 17 W
6000000 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)
• M1.5	River Mile
222218	Section - Township - Range
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- - - - - -	Watershed Boundaries

MAP REPOSITORIES
Refer to Map Repositories list on Map Index

EFFECTIVE DATE OF COUNTYWIDE
FLOOD INSURANCE RATE MAP
November 18, 2015

EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL

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MAP SCALE 1" = 1000'

500 0 1000 2000 FEET
300 0 300 600 METERS

NFIP

NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0535C

FIRM

FLOOD INSURANCE RATE MAP

HIGHLANDS COUNTY, FLORIDA
AND INCORPORATED AREAS

PANEL 535 OF 710
(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
HIGHLANDS COUNTY	120111	0535	C

A-2
FEMA Map
(2 of 3)

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MAP NUMBER
12055C0535C

EFFECTIVE DATE
NOVEMBER 18, 2015

Federal Emergency Management Agency

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National Geodetic Survey, NOAA
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Silver Spring, Maryland 20910
(301) 713-3242

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using datum offset table below
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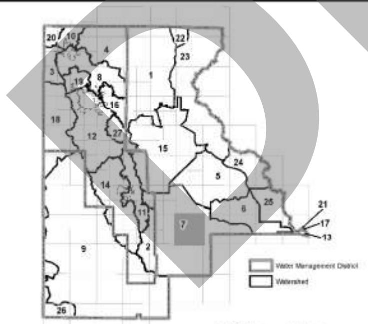

ID	Watershed	Datum Offset (ft)	Study Type*	Total Rainfall 1-day 100yr/500 yr*	Volume (in) Multi-Day 100yr/500yr*	Date of Model*
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6	C-41 AE	-1.13				
7	C-41 N	-1.13				
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16	Lake Lucas	-1.13				
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* Multiple study types, rainfall volumes, and/or model dates found within specific watersheds; refer to the Flood Insurance Study (FIS) for details.

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ZONE A	No Base Flood Elevations determined.
ZONE AE	Base Flood Elevations determined.
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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.
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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; and areas protected by levees from 1% annual chance flood. See additional note in Watershed Table on left collar[3]

OTHER AREAS

ZONE X	Areas determined to be outside the 0.2% annual chance floodplain.
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OTHERWISE PROTECTED AREAS (OPAs)

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	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
4275000mE	1000-meter Universal Transverse Mercator grid ticks, Zone 17 W
6000000 FT	5000-foot grid values: Florida State Plane coordinate system, East zone (FIPSZONE 0901), Transverse Mercator projection
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● M1.5	River Mile
222218	Section - Township - Range
7NX1000 ♦	Junction - Points defining locations of flow accumulation or hydraulic connectivity. The first two characters of the Junction name represents the specific watershed (as shown in the map collar locator map) in which the Junction is located (note that boundary Junctions, without an associated floodplain, are also shown).
- - - - - -	Watershed Boundaries

MAP REPOSITORIES
Refer to Map Repositories list on Map Index

EFFECTIVE DATE OF COUNTYWIDE
FLOOD INSURANCE RATE MAP
November 18, 2015

EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL

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 1000 2000 FEET
300 0 300 600 METERS

NFIP

NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0555C

FIRM

FLOOD INSURANCE RATE MAP

HIGHLANDS COUNTY, FLORIDA AND INCORPORATED AREAS

PANEL 555 OF 710

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
HIGHLANDS COUNTY	120111	0555	C

A-2
FEMA Map
(3 of 3)

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
12055C0555C

EFFECTIVE DATE
NOVEMBER 18, 2015

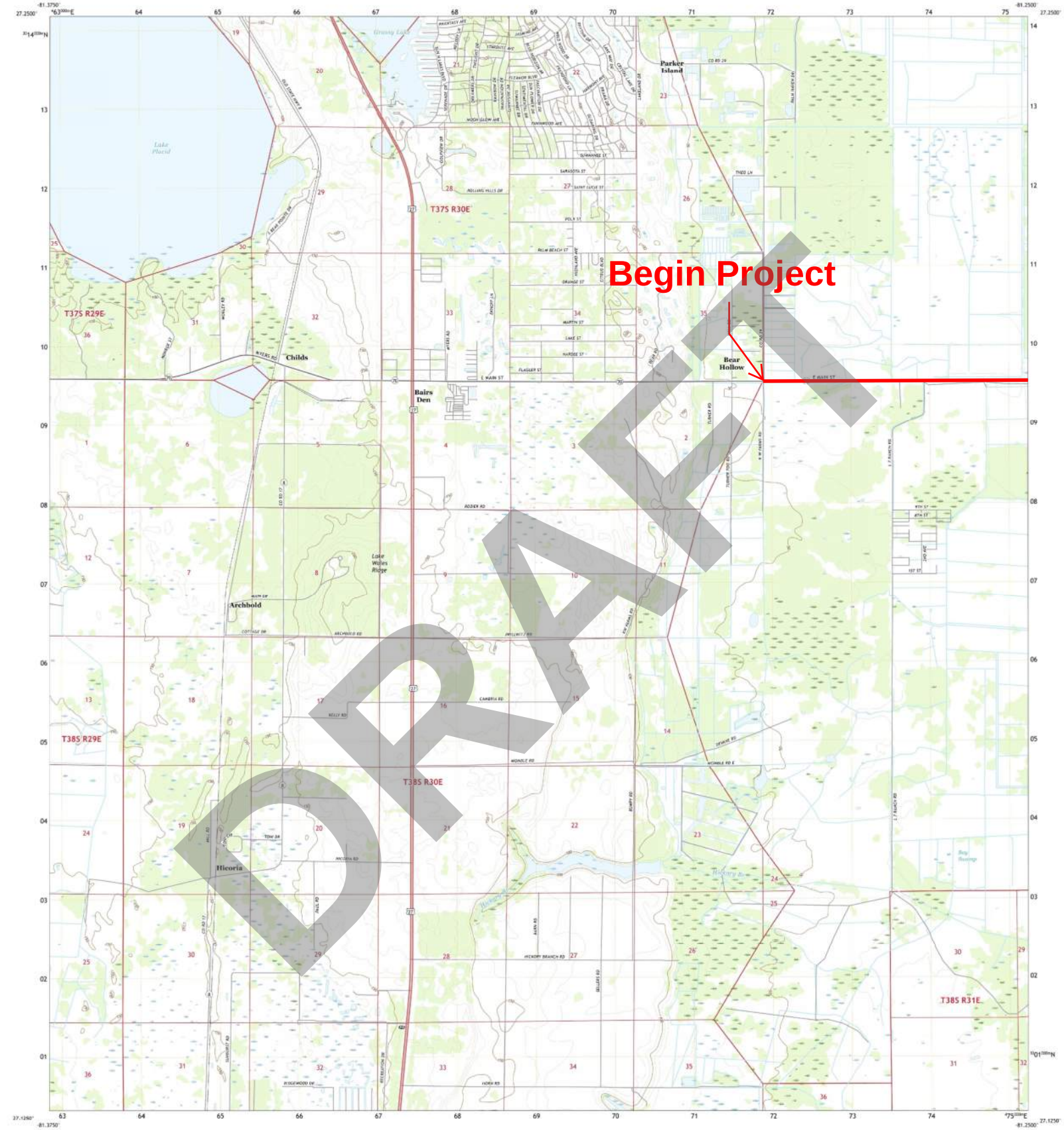
Federal Emergency Management Agency

Appendix A3. Quadrangle Maps

U.S. DEPARTMENT OF THE INTERIOR
U.S. GEOLOGICAL SURVEY

The National Map US Topo

CHILDS QUADRANGLE
FLORIDA - HIGHLANDS COUNTY
7.5-MINUTE SERIES



USGS Childs Quadrangle Map

Produced by the United States Geological Survey
North American Datum of 1983 (NAD83)
World Geodetic System of 1984 (WGS84). Projection and
1 000 meter grid: Universal Transverse Mercator, Zone 17R
This map is not a legal document. Boundaries may be
generalized for this map scale. Private lands within government
reservations may not be shown. Obtain permission before
entering private lands.

Imagery ..... NAIP, November 2015 - February 2016
Roads ..... U.S. Census Bureau, 2016
Names ..... GNIS, 1979 - 2018
Hydrography ..... National Hydrography Dataset, 2003 - 2017
Contours ..... National Elevation Dataset, 2012
Boundaries ..... Multiple sources; see metadata file 2014 - 2016
Public Land Survey System ..... BLM, 2017
Wetlands ..... FWS National Wetlands Inventory 2010

UTM GRID AND 2017 MAGNETIC NORTH DECLINATION AT CENTER OF SHEET

SCALE 1:24 000

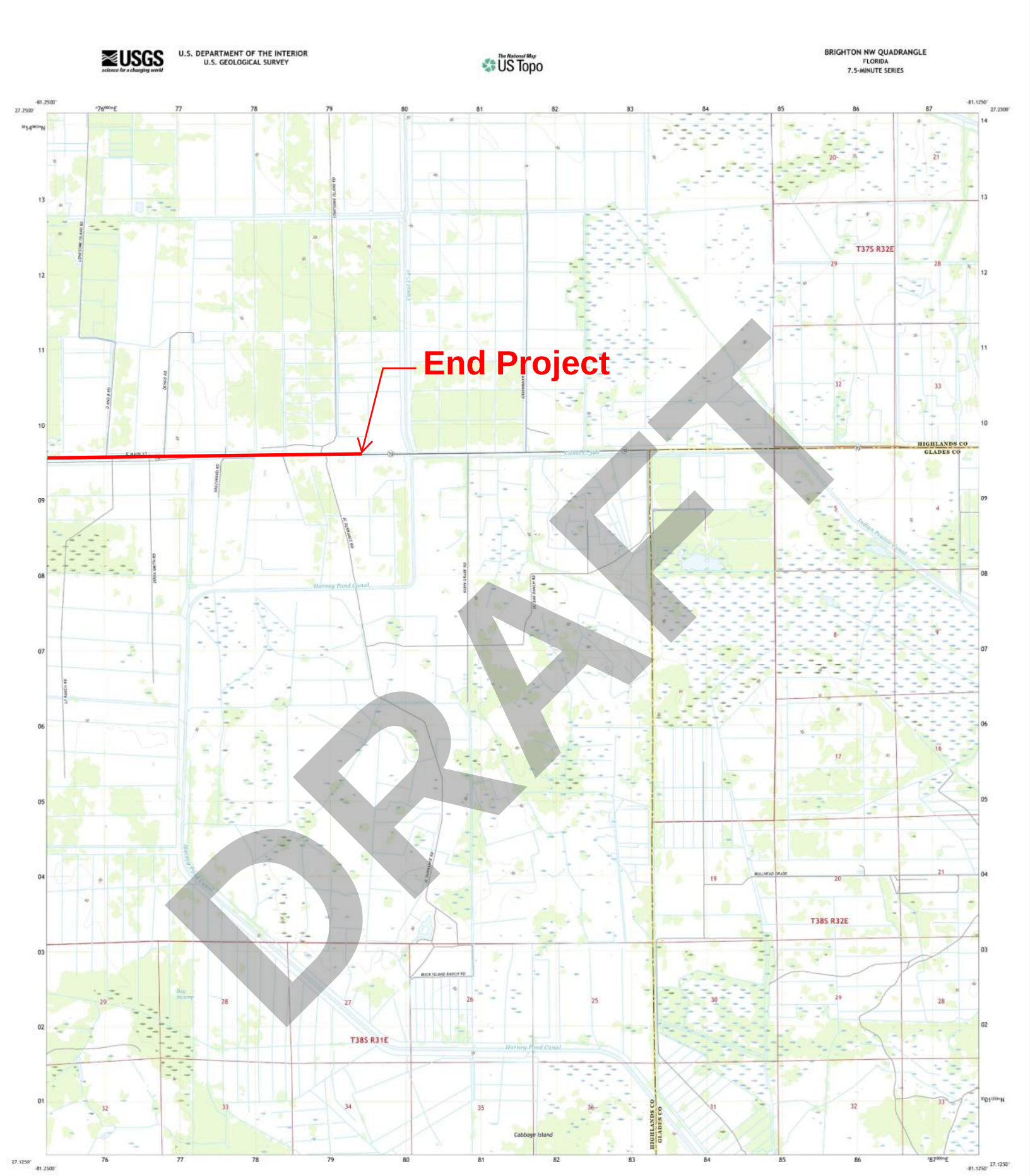
CONTOUR INTERVAL 10 FEET
NORTH AMERICAN VERTICAL DATUM OF 1988

This map was produced to conform with the
National Geospatial Program US Topo Product Standard, 2011.
A metadata file associated with this product is draft version 0.6.18

ROAD CLASSIFICATION

1 Lake June in Winter
2 Lake Placid
3 Basinger SW
4 Venus NW
5 Brighton NW
6 Venus SW
7 Venus
8 Brighton SW

CHILDS, FL
2018



USGS Brighton Quadrangle Map

Appendix A4. Custom Soil Resource Report

United States Department of Agriculture

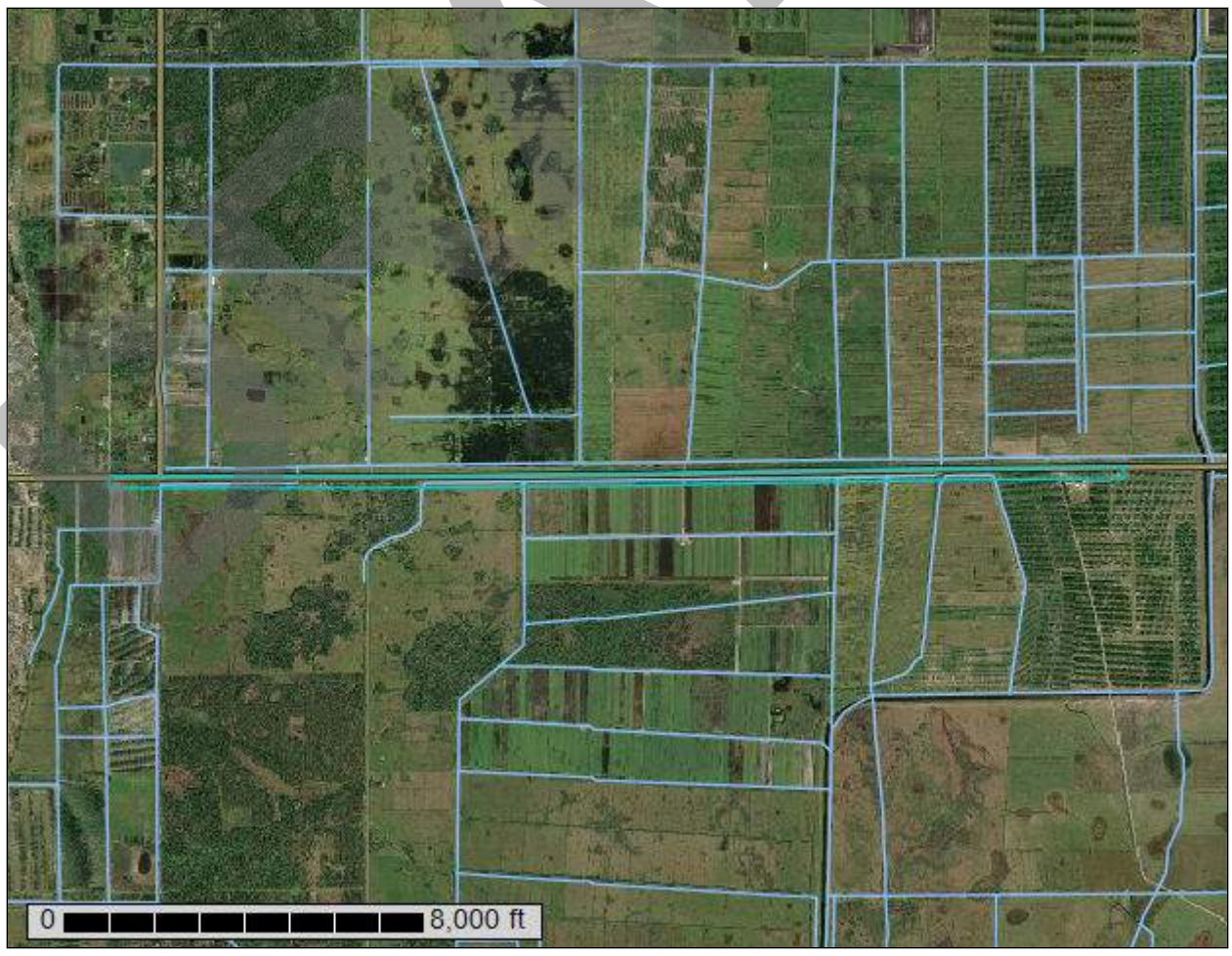
NRCS

Natural Resources Conservation Service

A product of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local participants

Custom Soil Resource Report for Highlands County, Florida

414506-6 SR70 Reconstruction



December 7, 2018

Preface

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (https://offices.sc.egov.usda.gov/locator/app?agency=nrcs) or your NRCS State Soil Scientist (http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Web Soil Survey, the site for official soil survey information.

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Contents

How Soil Surveys Are Made

Soil surveys are made to provide information about the soils and miscellaneous areas in a specific area. They include a description of the soils and miscellaneous areas and their location on the landscape and tables that show soil properties and limitations affecting various uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They observed and described many soil profiles. A soil profile is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed or from the surface down to bedrock. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

Currently, soils are mapped according to the boundaries of major land resource areas (MLRAs). MLRAs are geographically associated land resource units that share common characteristics related to physiography, geology, climate, water resources, soils, biological resources, and land uses (USDA, 2006). Soil survey areas typically consist of parts of one or more MLRA.

The soils and miscellaneous areas in a survey area occur in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept, or model, of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil

scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

The objective of soil mapping is not to delineate pure map unit components; the objective is to separate the landscape into landforms or landform segments that have similar use and management requirements. Each map unit is defined by a unique combination of soil components and/or miscellaneous areas in predictable proportions. Some components may be highly contrasting to the other components of the map unit. The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The delineation of such landforms and landform segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, onsite investigation is needed to define and locate the soils and miscellaneous areas.

Soil scientists make many field observations in the process of producing a soil map. The frequency of observation is dependent upon several factors, including scale of mapping, intensity of mapping, design of map units, complexity of the landscape, and experience of the soil scientist. Observations are made to test and refine the soil-landscape model and predictions and to verify the classification of the soils at specific locations. Once the soil-landscape model is refined, a significantly smaller number of measurements of individual soil properties are made and recorded. These measurements may include field measurements, such as those for color, depth to bedrock, and texture, and laboratory measurements, such as those for content of sand, silt, clay, salt, and other components. Properties of each soil typically vary from one point to another across the landscape.

Observations for map unit components are aggregated to develop ranges of characteristics for the components. The aggregated values are presented. Direct measurements do not exist for every property presented for every map unit component. Values for some properties are estimated from combinations of other properties.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

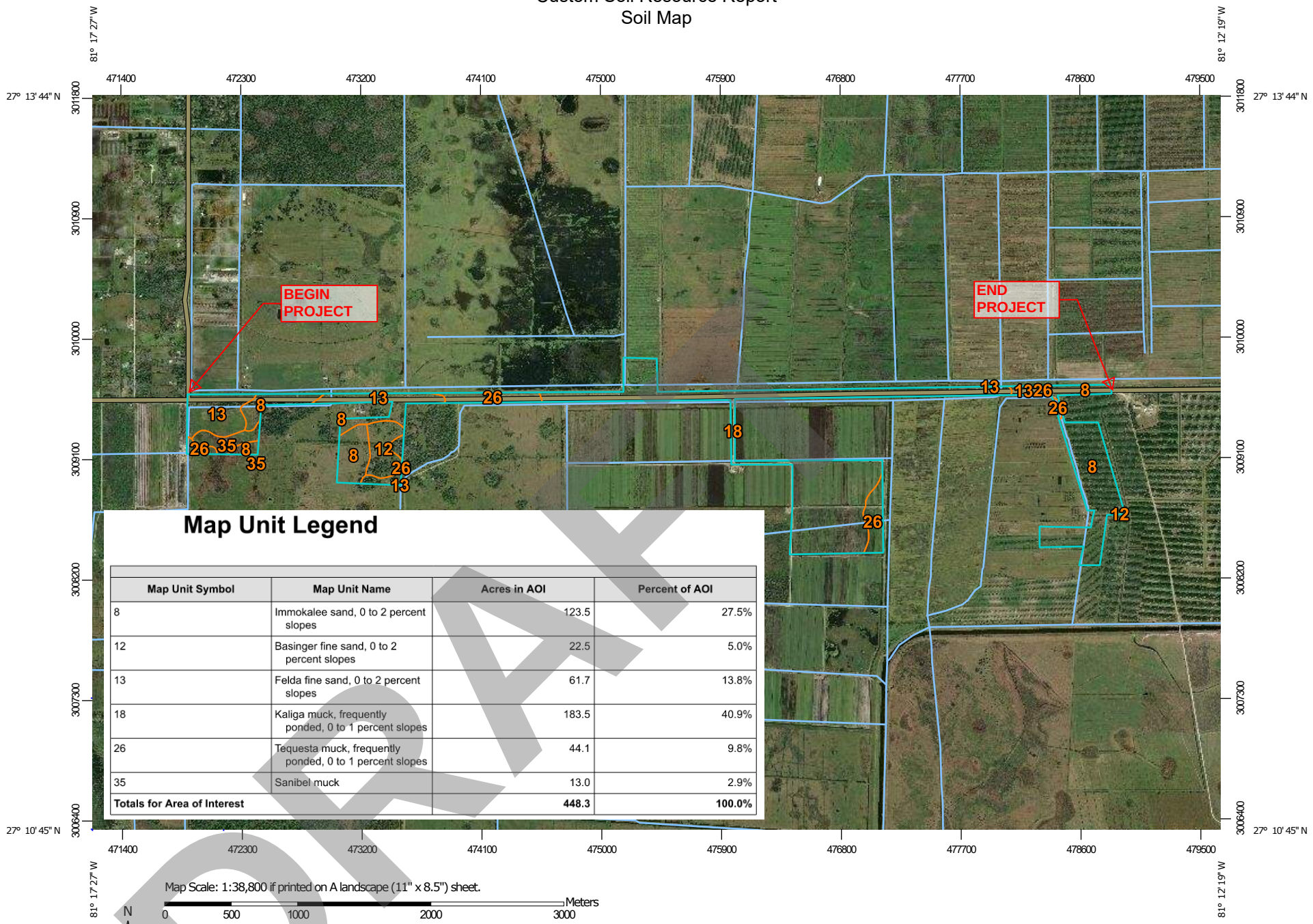
After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and

identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

Soil Map

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.

Custom Soil Resource Report
Soil Map



Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
8	Immokalee sand, 0 to 2 percent slopes	123.5	27.5%
12	Basinger fine sand, 0 to 2 percent slopes	22.5	5.0%
13	Felda fine sand, 0 to 2 percent slopes	61.7	13.8%
18	Kaliga muck, frequently ponded, 0 to 1 percent slopes	183.5	40.9%
26	Tequesta muck, frequently ponded, 0 to 1 percent slopes	44.1	9.8%
35	Sanibel muck	13.0	2.9%
Totals for Area of Interest		**448.3**	**100.0%**

Map Scale: 1:38,800 if printed on A landscape (11" x 8.5") sheet.

N

0 500 1000 2000 3000 Meters

0 1500 3000 6000 9000 Feet

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 17N WGS84

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils
- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Highlands County, Florida
Survey Area Data: Version 17, Sep 17, 2018

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Oct 20, 2011—Dec 9, 2017

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
8	Immokalee sand, 0 to 2 percent slopes	30.4	16.9%
13	Felda fine sand, 0 to 2 percent slopes	36.7	20.4%
17	Malabar fine sand, 0 to 2 percent slopes	4.1	2.3%
18	Kaliga muck, frequently ponded, 0 to 1 percent slopes	79.2	44.0%
26	Tequesta muck, frequently ponded, 0 to 1 percent slopes	29.3	16.3%
Totals for Area of Interest		**179.8**	**100.0%**

Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

Highlands County, Florida

8—Immokalee sand, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: 2s3ll
Elevation: 0 to 150 feet
Mean annual precipitation: 42 to 57 inches
Mean annual air temperature: 70 to 77 degrees F
Frost-free period: 350 to 365 days
Farmland classification: Farmland of unique importance

Map Unit Composition

Immokalee and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Immokalee

Setting

Landform: Flatwoods on marine terraces
Landform position (three-dimensional): Talf
Down-slope shape: Convex, linear
Across-slope shape: Linear
Parent material: Sandy marine deposits

Typical profile

A - 0 to 9 inches: sand
E - 9 to 36 inches: sand
Bh - 36 to 55 inches: sand
C - 55 to 80 inches: sand

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Poorly drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: About 6 to 18 inches
Frequency of flooding: None
Frequency of ponding: None
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 4.0
Available water storage in profile: Very low (about 3.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4w
Hydrologic Soil Group: B/D
Forage suitability group: Sandy soils on flats of mesic or hydric lowlands (G155XB141FL)
Other vegetative classification: South Florida Flatwoods (R155XY003FL)
Hydric soil rating: No

Minor Components

Valkaria

Percent of map unit: 5 percent
Landform: Drainageways on flatwoods on marine terraces
Landform position (three-dimensional): Tread, dip, talf
Down-slope shape: Linear
Across-slope shape: Linear, concave
Other vegetative classification: Slough (R155XY011FL)
Hydric soil rating: Yes

Oldsmar

Percent of map unit: 4 percent
Landform: Flatwoods on marine terraces
Landform position (three-dimensional): Talf
Down-slope shape: Convex, linear
Across-slope shape: Linear
Other vegetative classification: South Florida Flatwoods (R155XY003FL)
Hydric soil rating: No

Pomello

Percent of map unit: 3 percent
Landform: Ridges on marine terraces, knolls on marine terraces
Landform position (two-dimensional): Backslope, summit
Landform position (three-dimensional): Side slope, interfluve, riser
Down-slope shape: Convex, linear
Across-slope shape: Linear
Ecological site: Sand Pine Scrub (R155XY001FL)
Other vegetative classification: Sand Pine Scrub (R155XY001FL)
Hydric soil rating: No

Satellite

Percent of map unit: 2 percent
Landform: Drainageways on flatwoods on marine terraces
Landform position (three-dimensional): Tread, dip, talf
Down-slope shape: Linear
Across-slope shape: Linear, concave
Other vegetative classification: Sand Pine Scrub (R155XY001FL)
Hydric soil rating: No

Felda

Percent of map unit: 1 percent
Landform: Drainageways on marine terraces, flatwoods on marine terraces
Landform position (three-dimensional): Tread, dip, talf
Down-slope shape: Linear
Across-slope shape: Concave, linear
Ecological site: Slough (R155XY011FL)
Other vegetative classification: Slough (R155XY011FL)
Hydric soil rating: Yes

13—Felda fine sand, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: 2tzvy
Elevation: 0 to 180 feet
Mean annual precipitation: 40 to 60 inches
Mean annual air temperature: 70 to 77 degrees F
Frost-free period: 350 to 365 days
Farmland classification: Farmland of unique importance

Map Unit Composition

Felda and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Felda

Setting

Landform: Drainageways on marine terraces, flatwoods on marine terraces
Landform position (three-dimensional): Tread, dip, talf
Down-slope shape: Linear
Across-slope shape: Concave, linear
Parent material: Sandy and loamy marine deposits

Typical profile

A - 0 to 4 inches: fine sand
Eg - 4 to 35 inches: fine sand
Btg - 35 to 43 inches: fine sandy loam
Cg - 43 to 80 inches: extremely paragravelly fine sand

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Poorly drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 6.00 in/hr)
Depth to water table: About 3 to 18 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 4 percent
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 4.0
Available water storage in profile: Low (about 5.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3w
Hydrologic Soil Group: A/D

Ecological site: Slough (R155XY011FL)
Forage suitability group: Sandy over loamy soils on flats of hydric or mesic lowlands (G155XB241FL)
Other vegetative classification: Slough (R155XY011FL)
Hydric soil rating: Yes

Minor Components

Wabasso
Percent of map unit: 6 percent
Landform: Flatwoods on marine terraces
Landform position (three-dimensional): Tread, talf
Down-slope shape: Convex, linear
Across-slope shape: Linear
Other vegetative classification: South Florida Flatwoods (R155XY003FL)
Hydric soil rating: No

Oldsmar
Percent of map unit: 5 percent
Landform: Flatwoods on marine terraces
Landform position (three-dimensional): Talf
Down-slope shape: Convex, linear
Across-slope shape: Linear
Other vegetative classification: South Florida Flatwoods (R155XY003FL)
Hydric soil rating: No

Valkaria
Percent of map unit: 4 percent
Landform: Drainageways on flatwoods on marine terraces
Landform position (three-dimensional): Tread, dip, talf
Down-slope shape: Linear
Across-slope shape: Linear, concave
Other vegetative classification: Slough (R155XY011FL)
Hydric soil rating: Yes

17—Malabar fine sand, 0 to 2 percent slopes

Map Unit Setting
National map unit symbol: 2svz3
Elevation: 10 to 140 feet
Mean annual precipitation: 42 to 63 inches
Mean annual air temperature: 70 to 77 degrees F
Frost-free period: 350 to 365 days
Farmland classification: Not prime farmland

Map Unit Composition
Malabar and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Malabar

Setting

Landform: Drainageways on marine terraces, flats on marine terraces
Landform position (three-dimensional): Tread, dip, talf
Down-slope shape: Linear
Across-slope shape: Concave, linear
Parent material: Sandy and loamy marine deposits

Typical profile

A - 0 to 5 inches: fine sand
E - 5 to 17 inches: fine sand
Bw - 17 to 42 inches: fine sand
Btg - 42 to 59 inches: fine sandy loam
Cg - 59 to 80 inches: loamy fine sand

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Poorly drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): High (2.00 to 6.00 in/hr)
Depth to water table: About 3 to 18 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 1 percent
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 4.0
Available water storage in profile: Low (about 5.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4w
Hydrologic Soil Group: A/D
Ecological site: Slough (R155XY011FL)
Forage suitability group: Sandy soils on flats of mesic or hydric lowlands (G155XB141FL)
Other vegetative classification: Slough (R155XY011FL)
Hydric soil rating: Yes

Minor Components

Valkaria

Percent of map unit: 5 percent
Landform: Flatwoods on marine terraces, drainageways on marine terraces
Landform position (three-dimensional): Tread, talf, dip
Down-slope shape: Linear
Across-slope shape: Linear, concave
Other vegetative classification: Slough (R155XY011FL)
Hydric soil rating: Yes

Oldsmar

Percent of map unit: 4 percent
Landform: Flatwoods on marine terraces

Landform position (three-dimensional): Talf
Down-slope shape: Convex, linear
Across-slope shape: Linear
Other vegetative classification: South Florida Flatwoods (R155XY003FL)
Hydric soil rating: No

Pineda

Percent of map unit: 4 percent
Landform: Drainageways on marine terraces, flats on marine terraces
Landform position (three-dimensional): Tread, dip, talf
Down-slope shape: Linear
Across-slope shape: Concave, linear
Other vegetative classification: Slough (R155XY011FL)
Hydric soil rating: Yes

Basinger

Percent of map unit: 2 percent
Landform: Depressions on marine terraces
Landform position (three-dimensional): Tread, dip
Down-slope shape: Linear, concave
Across-slope shape: Linear, concave
Hydric soil rating: Yes

18—Kaliga muck, frequently ponded, 0 to 1 percent slopes

Map Unit Setting

National map unit symbol: 2tzw6
Elevation: 0 to 130 feet
Mean annual precipitation: 44 to 55 inches
Mean annual air temperature: 70 to 77 degrees F
Frost-free period: 350 to 365 days
Farmland classification: Farmland of unique importance

Map Unit Composition

Kaliga and similar soils: 80 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Kaliga

Setting

Landform: Depressions on flatwoods on marine terraces
Landform position (three-dimensional): Tread, talf, dip
Down-slope shape: Linear, concave
Across-slope shape: Concave, linear
Parent material: Herbaceous organic material over loamy marine deposits

Typical profile

Oa - 0 to 25 inches: muck
C1 - 25 to 35 inches: fine sandy loam
C2 - 35 to 60 inches: sandy clay loam

C3 - 60 to 80 inches: sandy clay loam

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Very poorly drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 0 to 6 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 4.0
Available water storage in profile: Very high (about 15.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7w
Hydrologic Soil Group: C/D
Forage suitability group: Organic soils in depressions and on flood plains (G155XB645FL)
Other vegetative classification: Freshwater Marshes and Ponds (R155XY010FL)
Hydric soil rating: Yes

Minor Components

Samsula

Percent of map unit: 5 percent
Landform: Depressions on marine terraces
Landform position (three-dimensional): Tread, dip
Down-slope shape: Concave
Across-slope shape: Concave
Other vegetative classification: Freshwater Marshes and Ponds (R155XY010FL)
Hydric soil rating: Yes

Chobee

Percent of map unit: 4 percent
Landform: Depressions on flatwoods on marine terraces
Landform position (three-dimensional): Tread, dip, talf
Down-slope shape: Concave, linear
Across-slope shape: Concave, linear
Other vegetative classification: Freshwater Marshes and Ponds (R155XY010FL)
Hydric soil rating: Yes

Tequesta

Percent of map unit: 4 percent
Landform: Depressions on marine terraces
Landform position (three-dimensional): Tread, dip
Down-slope shape: Concave
Across-slope shape: Concave
Other vegetative classification: Freshwater Marshes and Ponds (R156BY010FL)
Hydric soil rating: Yes

Felda

Percent of map unit: 4 percent

Landform: Depressions on marine terraces, flatwoods on marine terraces
Landform position (three-dimensional): Tread, dip, talf
Down-slope shape: Linear
Across-slope shape: Concave, linear
Ecological site: Slough (R155XY011FL)
Other vegetative classification: Slough (R155XY011FL)
Hydric soil rating: Yes

Placid

Percent of map unit: 3 percent
Landform: Depressions on marine terraces, drainageways on marine terraces
Landform position (three-dimensional): Tread, dip
Down-slope shape: Concave
Across-slope shape: Concave
Other vegetative classification: Freshwater Marshes and Ponds (R155XY010FL)
Hydric soil rating: Yes

26—Tequesta muck, frequently ponded, 0 to 1 percent slopes

Map Unit Setting

National map unit symbol: 2tzwx
Elevation: 0 to 40 feet
Mean annual precipitation: 47 to 61 inches
Mean annual air temperature: 70 to 77 degrees F
Frost-free period: 360 to 365 days
Farmland classification: Farmland of unique importance

Map Unit Composition

Tequesta and similar soils: 87 percent
Minor components: 13 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Tequesta

Setting

Landform: Depressions on marine terraces
Landform position (three-dimensional): Tread, dip
Down-slope shape: Concave
Across-slope shape: Concave
Parent material: Herbaceous organic material over sandy and loamy marine deposits

Typical profile

Oa - 0 to 12 inches: muck
A - 12 to 25 inches: fine sand
Eg - 25 to 44 inches: fine sand
Btg/E - 44 to 56 inches: fine sandy loam
Btg - 56 to 72 inches: fine sandy loam
2Ck - 72 to 80 inches: sand

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Very poorly drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 5.95 in/hr)
Depth to water table: About 0 to 6 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum in profile: 4 percent
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 4.0
Available water storage in profile: High (about 9.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7w
Hydrologic Soil Group: A/D
Forage suitability group: Organic soils in depressions and on flood plains (G156AC645FL)
Other vegetative classification: Freshwater Marshes and Ponds (R156BY010FL)
Hydric soil rating: Yes

Minor Components

Basinger

Percent of map unit: 4 percent
Landform: Depressions on marine terraces
Landform position (three-dimensional): Tread, dip
Down-slope shape: Linear, concave
Across-slope shape: Linear, concave
Hydric soil rating: Yes

Holopaw

Percent of map unit: 3 percent
Landform: Drainageways on marine terraces, flats on marine terraces
Landform position (three-dimensional): Tread, dip, talf
Down-slope shape: Linear, convex
Across-slope shape: Concave, linear
Other vegetative classification: Slough (R155XY011FL)
Hydric soil rating: Yes

Sanibel

Percent of map unit: 3 percent
Landform: Depressions on marine terraces
Landform position (three-dimensional): Tread, dip
Down-slope shape: Concave, linear
Across-slope shape: Concave
Hydric soil rating: Yes

Kaliga

Percent of map unit: 3 percent
Landform: Depressions on flatwoods on marine terraces
Landform position (three-dimensional): Tread, dip, talf

Down-slope shape: Concave, linear
Across-slope shape: Concave, linear
Other vegetative classification: Freshwater Marshes and Ponds (R155XY010FL)
Hydric soil rating: Yes

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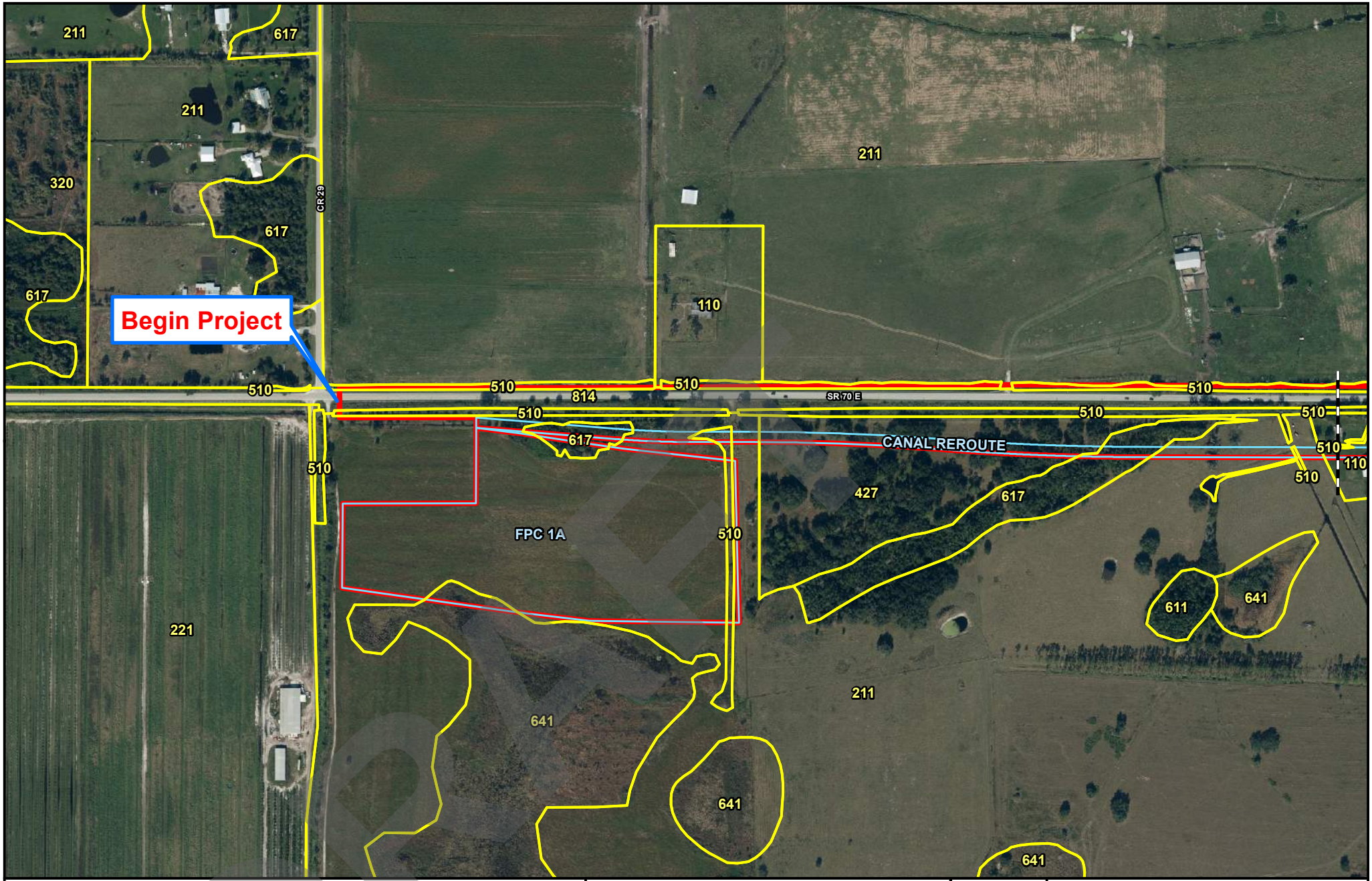
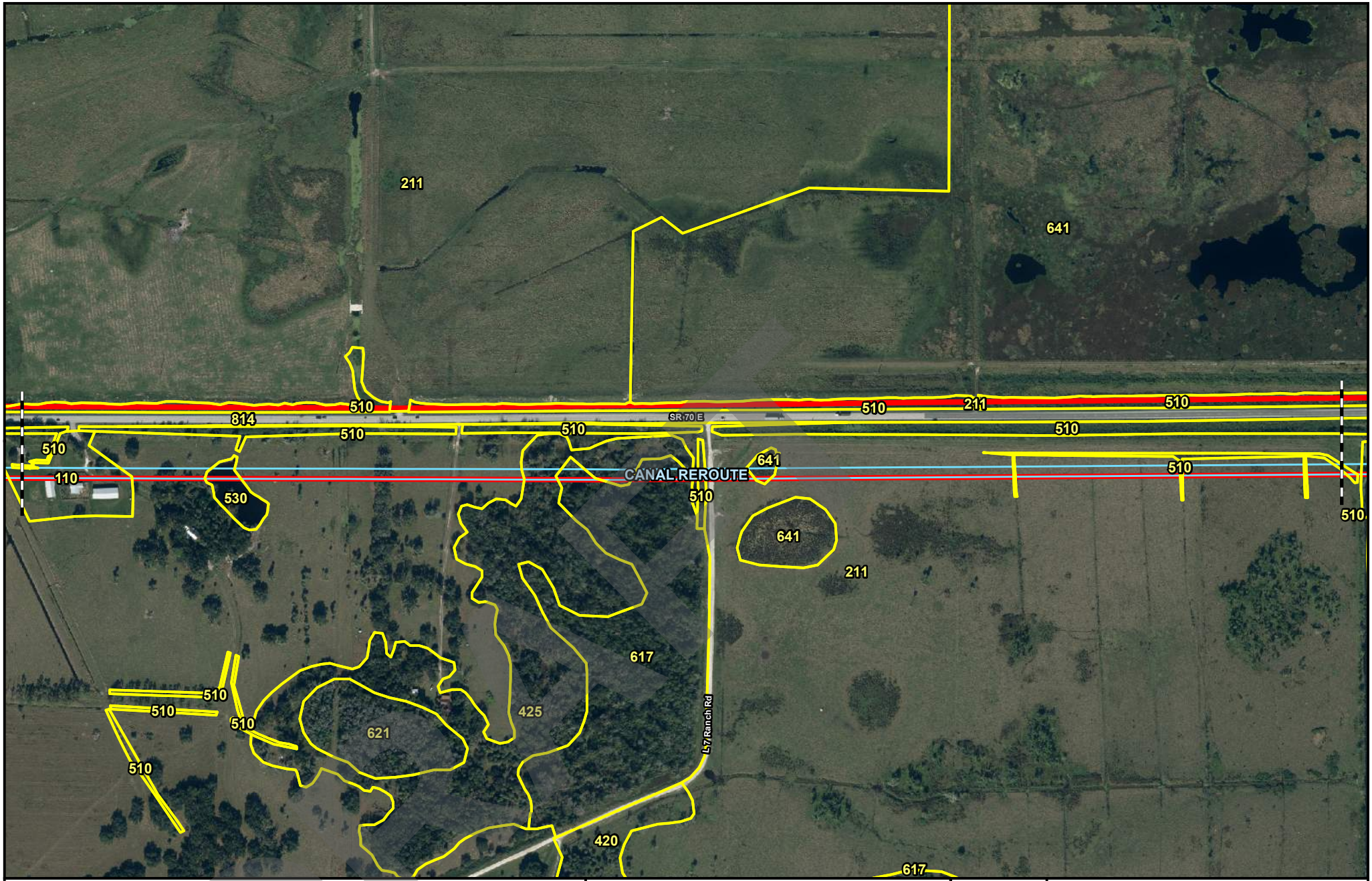
Appendix A5. Land Use Maps



Land Use Map

SR 70 from CR 29 to Lonesome Island Road
Project Development & Environment Study
FPID No. 414506-5-22-01
Highlands County, FL

Data Sources: "Natural Resources Evaluation Report Addendum" prepared by Kisinger Campo & Associates, Corp. July 2021.



Project Study Area

Proposed Pond

110: Residential, Low Density

211: Improved Pastures

242: Sod Farms

420: Upland Hardwood Forests

425: Temperate Hardwood

510: Streams and Waterways

530: Reservoirs

617: Mixed Wetland Hardwoods

621: Cypress - Mixed Hardwoods

641: Freshwater Marshes / Graminoid Prairie - Marsh

814: Roads and Highways

Land Use Map

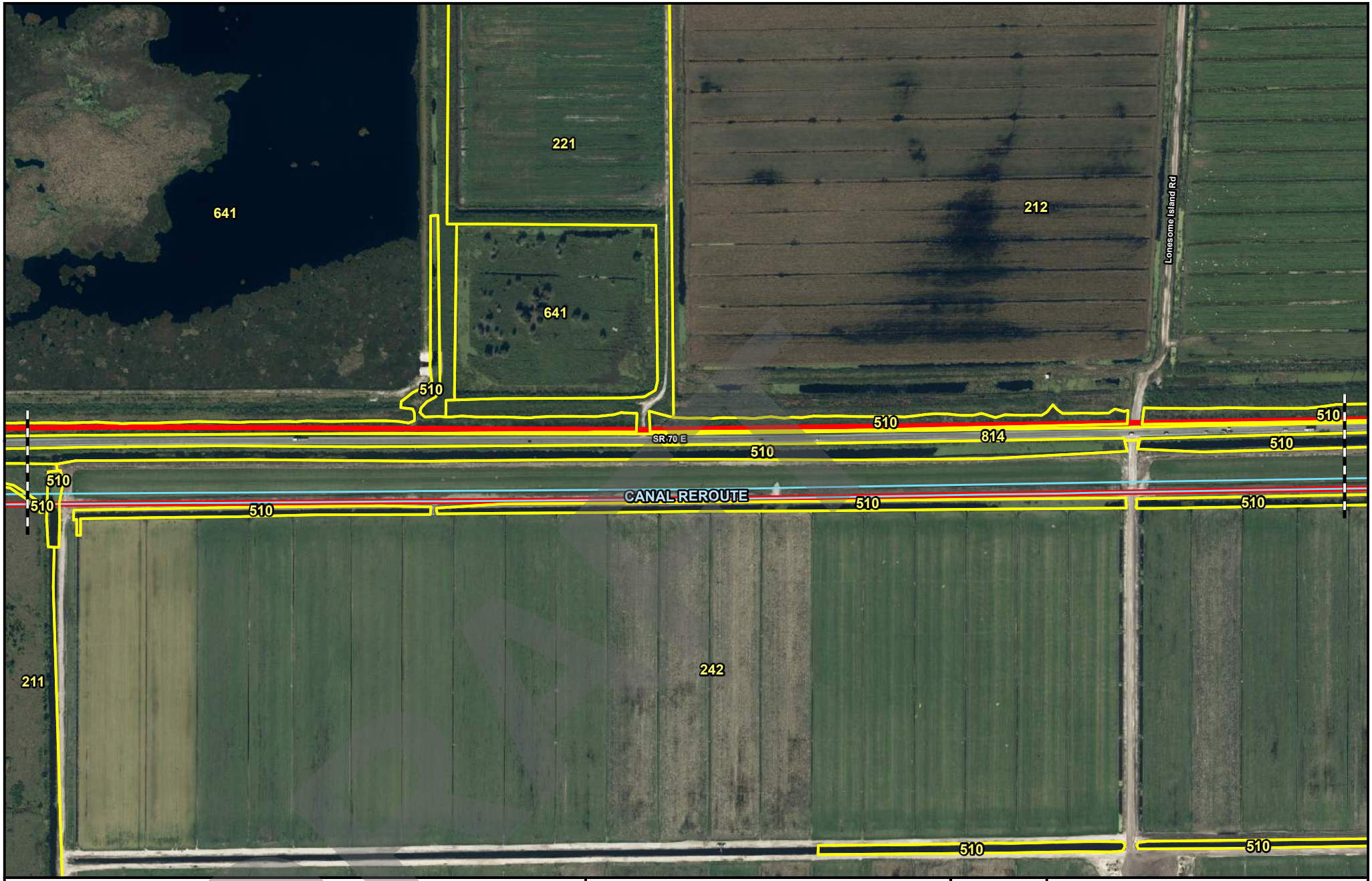
SR 70 from CR 29 to Lonesome Island Road
Project Development & Environment Study
FPID No. 414506-5-22-01
Highlands County, FL

N W E S

500 250 0 500

Feet

Data Sources: "Natural Resources Evaluation Report Addendum" prepared by Kisinger Campo & Associates, Corp. July 2021.



Project Study Area

Proposed Pond

211: Improved Pastures

212: Unimproved Pastures

221: Citrus Groves

242: Sod Farms

510: Streams and Waterways

641: Freshwater Marshes / Graminoid Prairie - Marsh

814: Roads and Highways

Land Use Map

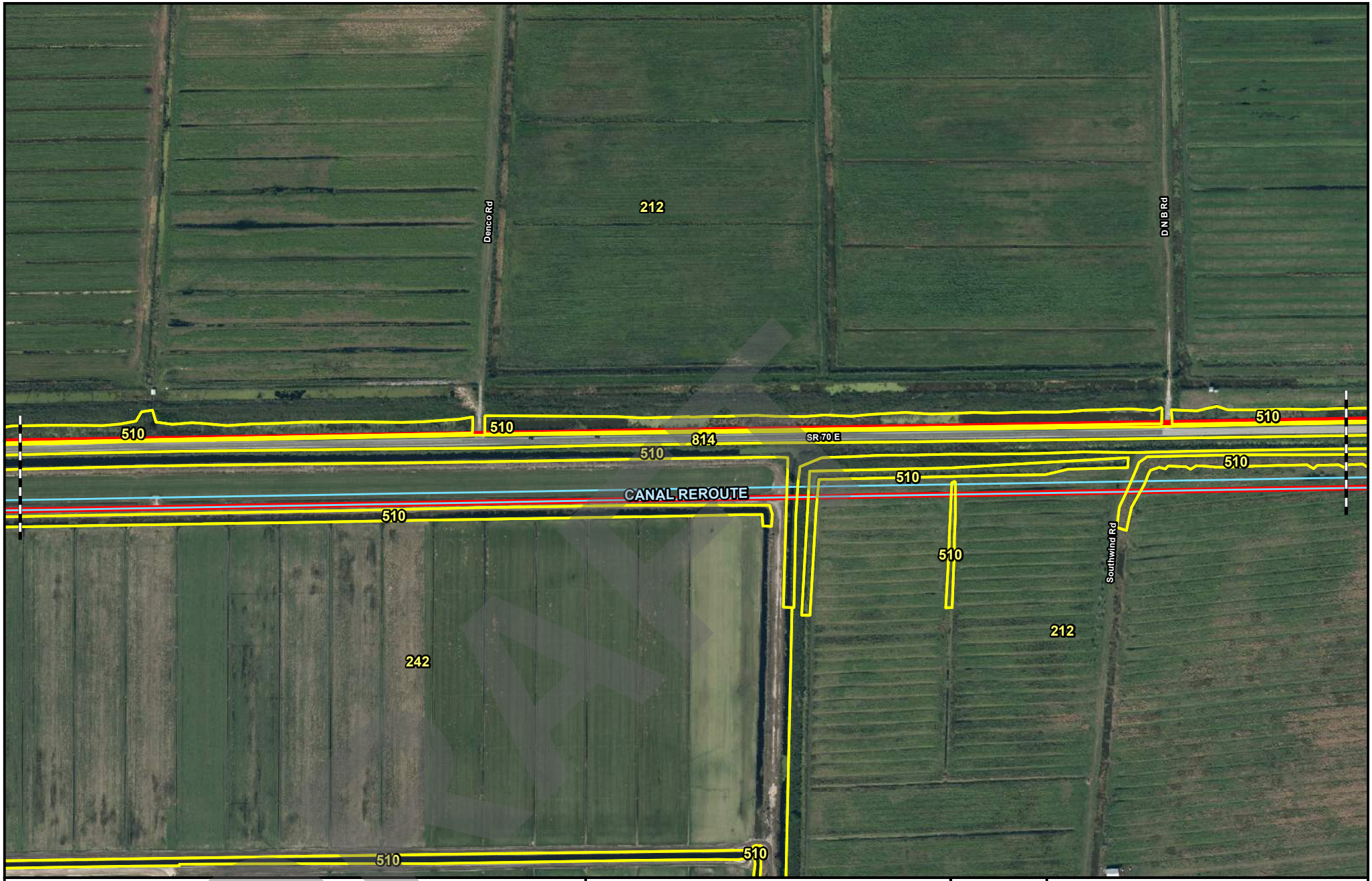
SR 70 from CR 29 to Lonesome Island Road
Project Development & Environment Study
FPID No. 414506-5-22-01
Highlands County, FL

N W E S

500 250 0 500

Feet

Data Sources: "Natural Resources Evaluation Report Addendum" prepared by Kisinger Campo & Associates, Corp. July 2021.



Project Study Area

Proposed Pond

212: Unimproved Pastures

242: Sod Farms

510: Streams and Waterways

814: Roads and Highways

Land Use Map

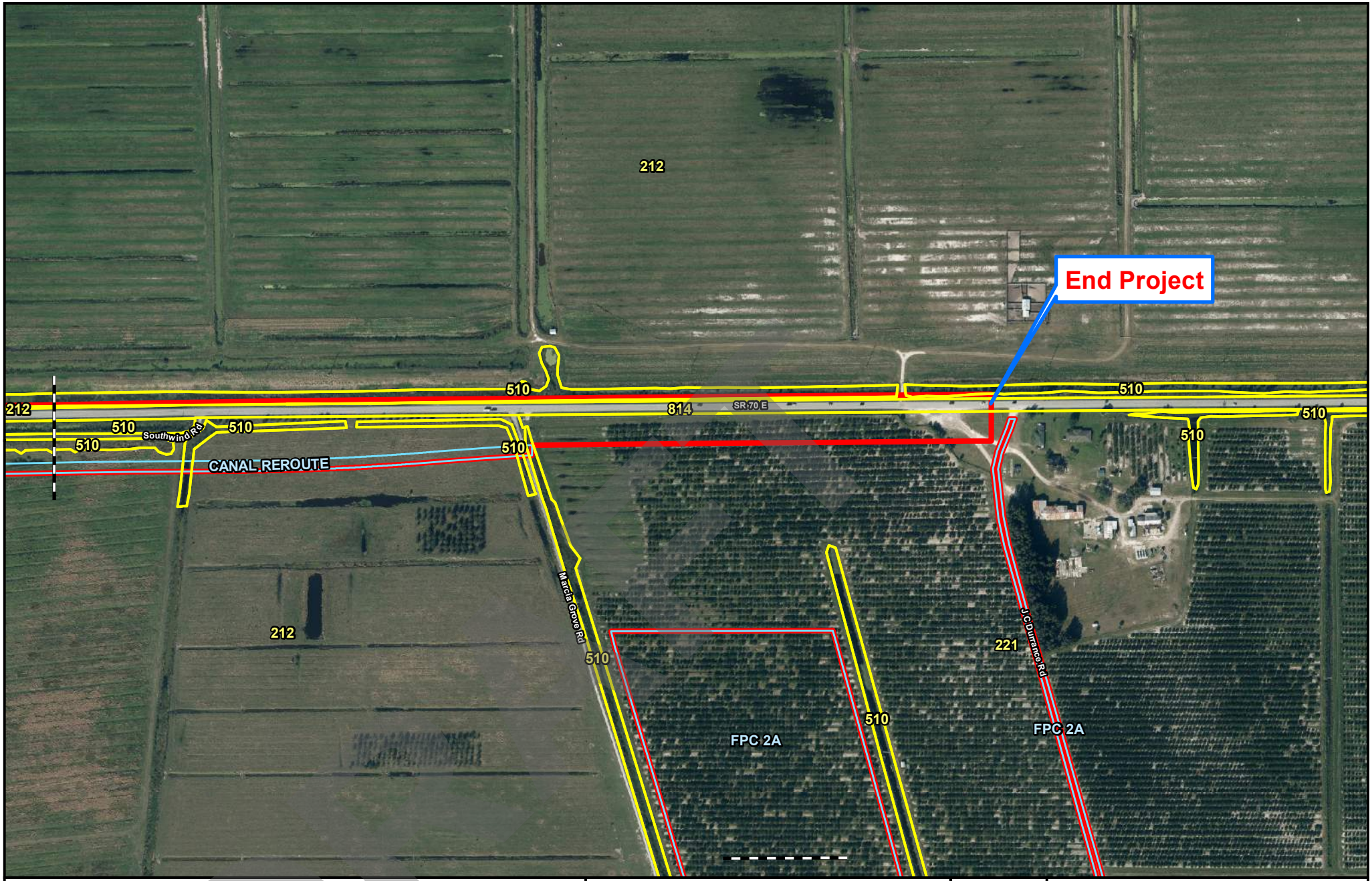
SR 70 from CR 29 to Lonesome Island Road
Project Development & Environment Study
FPID No. 414506-5-22-01
Highlands County, FL

N W E S

500 250 0 500

Feet

Data Sources: "Natural Resources Evaluation Report Addendum" prepared by Kisinger Campo & Associates, Corp. July 2021.



Project Study Area

Proposed Pond

212: Unimproved Pastures

221: Citrus Groves

510: Streams and Waterways

814: Roads and Highways

Land Use Map

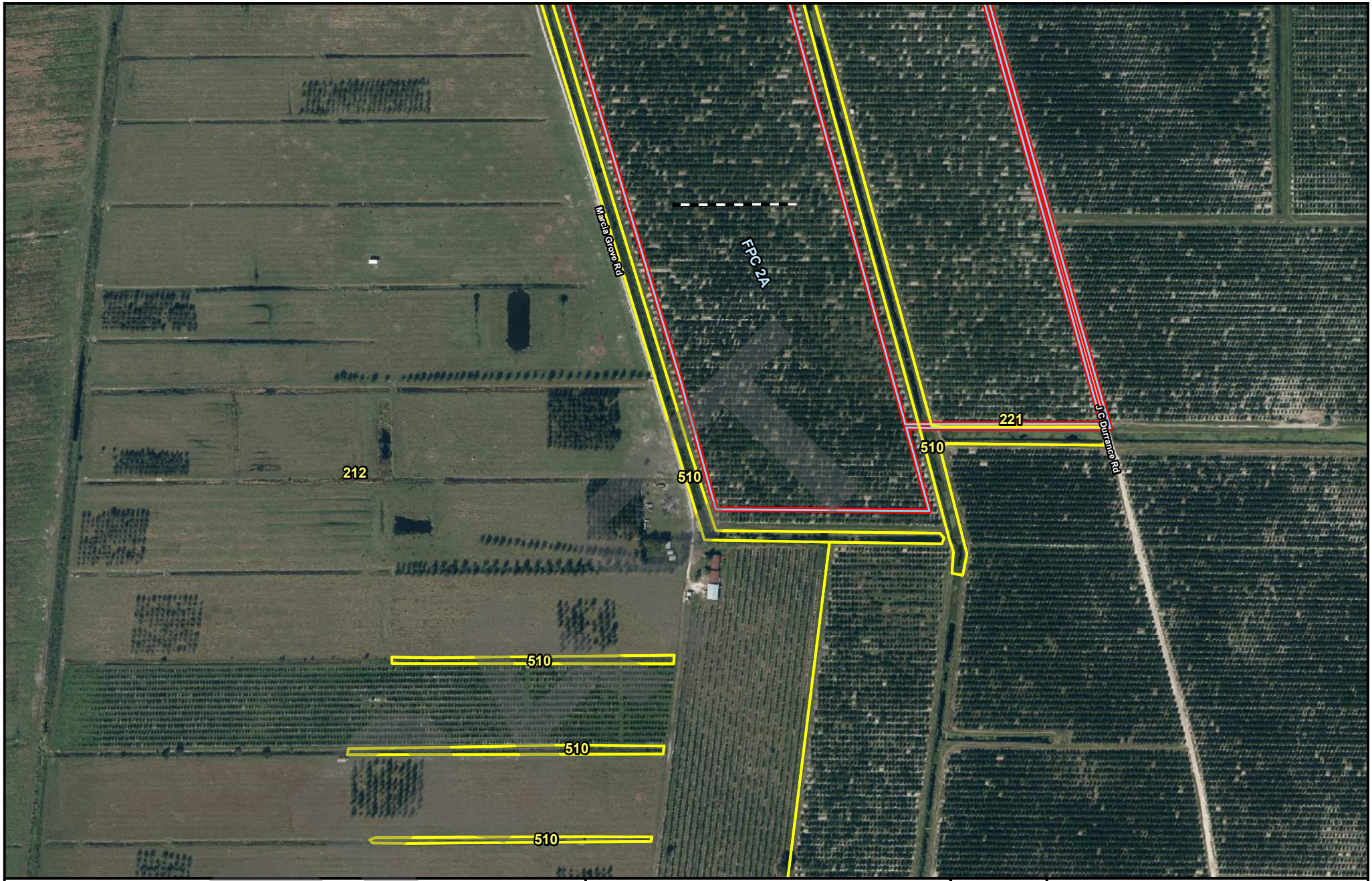
SR 70 from CR 29 to Lonesome Island Road
Project Development & Environment Study
FPID No. 414506-5-22-01
Highlands County, FL

N W E S

500 250 0 500

Feet

Data Sources: "Natural Resources Evaluation Report Addendum" prepared by Kisinger Campo & Associates, Corp. July 2021.



Project Study Area

Proposed Pond

212: Unimproved Pastures

221: Citrus Groves

510: Streams and Waterways

Land Use Map

SR 70 from CR 29 to Lonesome Island Road
Project Development & Environment Study
FPID No. 414506-5-22-01
Highlands County, FL

N W E S

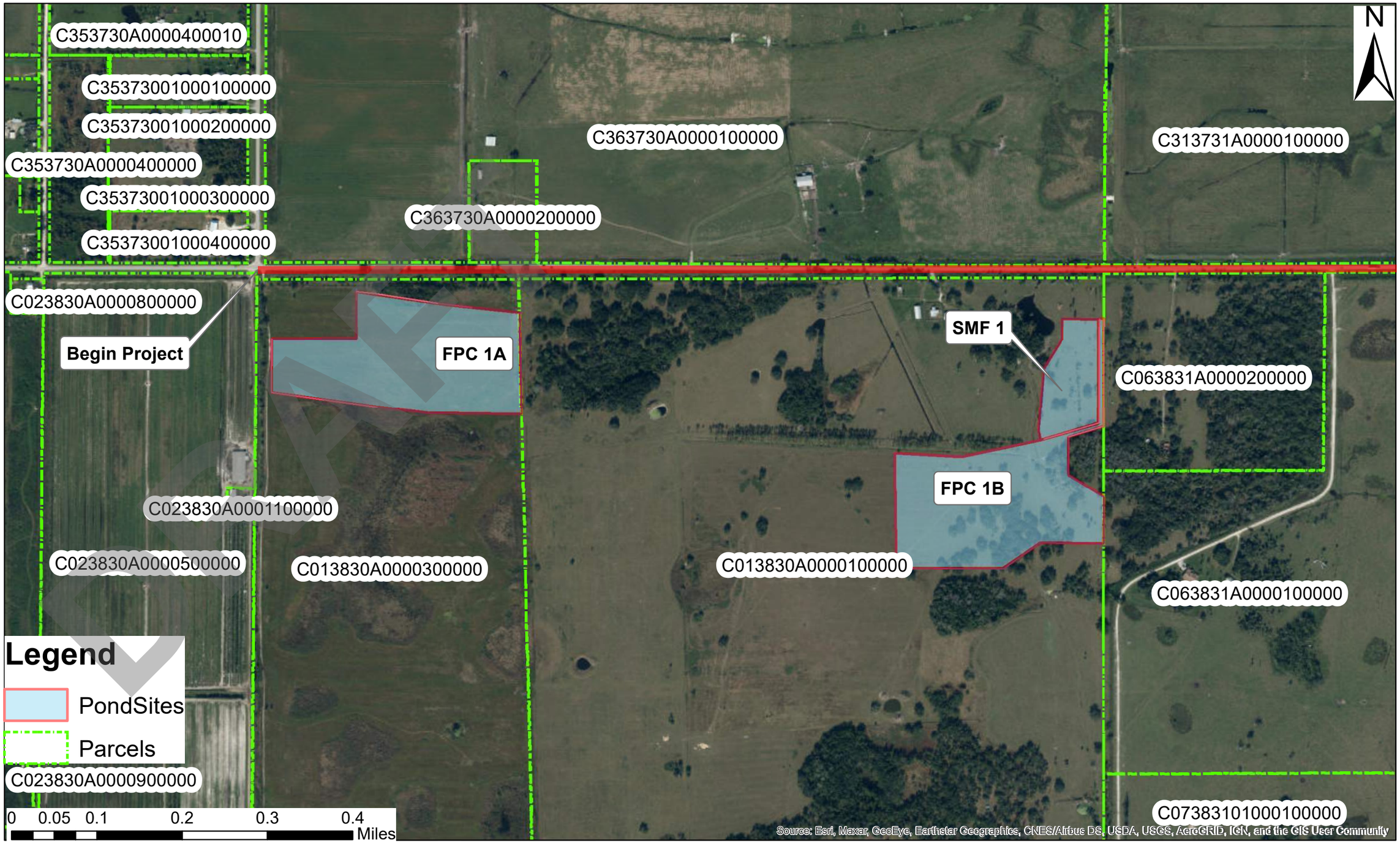
500 250 0 500

Feet

Data Sources: “Natural Resources Evaluation Report Addendum” prepared by Kisinger Campo & Associates, Corp. July 2021.

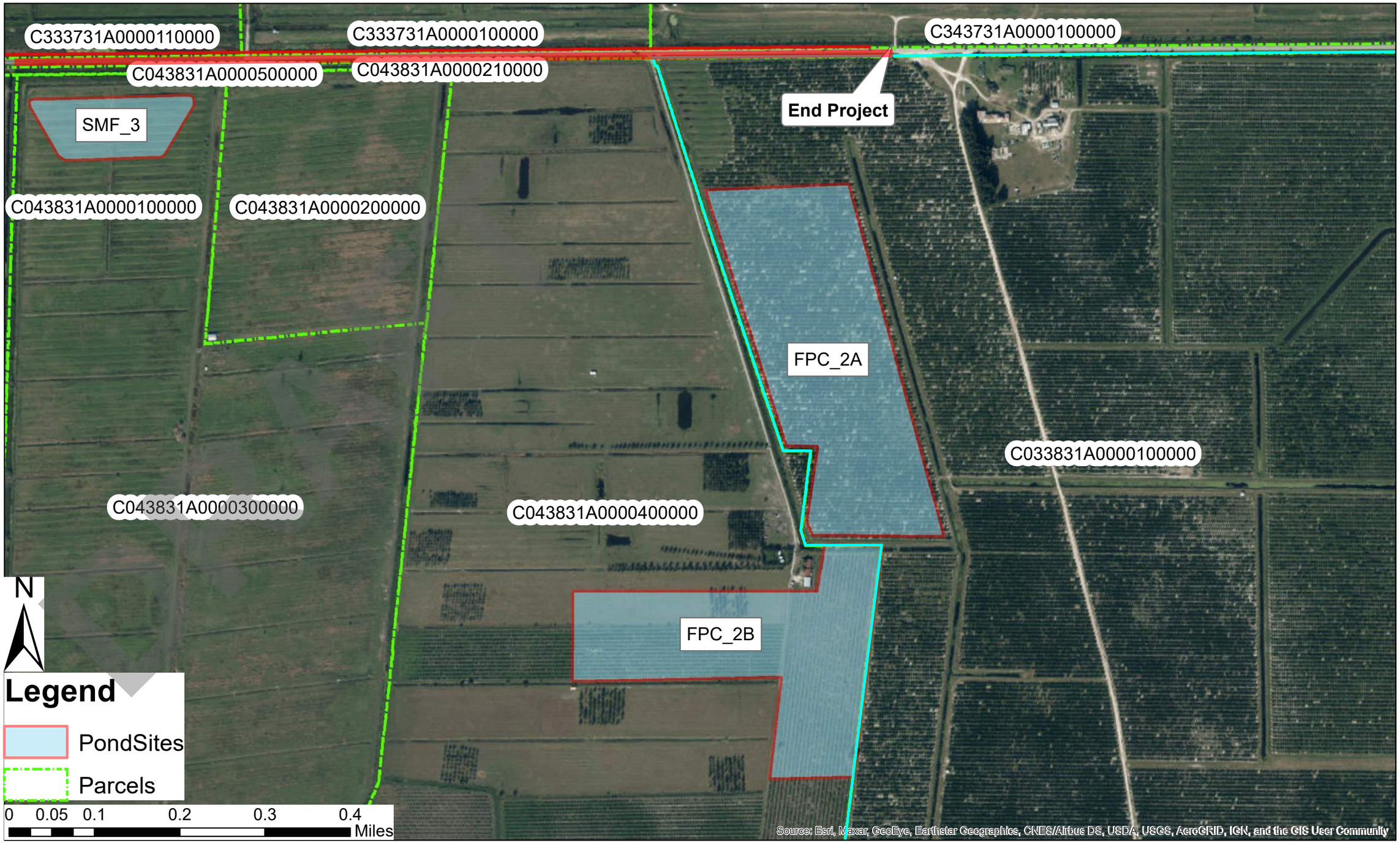
Appendix A6. Pond Sites & Parcels

A6-1: Pond Sites & Parcels



A6-2: Pond Sites & Parcels

A6-3: Pond Sites & Parcels



Appendix A7. NOAA Online Vertical Datum Transformation

NOAA NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION
UNITED STATES DEPARTMENT OF COMMERCE

ONLINE VERTICAL DATUM TRANSFORMATION

INTEGRATING AMERICA'S ELEVATION DATA

Home | About VDatum | Download | Docs & Support | Contact Us

Horizontal Information

	Source	Target
Reference Frame:	NAD83(2011/2007/CORS96/HARN) - North American techl	NAD83(2011/2007/CORS96/HARN) - North American techl
Coor. System:	Geographic (Longitude, Latitude)	Geographic (Longitude, Latitude)
Unit:	meter (m)	meter (m)
Zone:	AL E - 0101	AL E - 0101

Vertical Information

	Source	Target
Reference Frame:	NGVD 1929	NAVD 88
Unit:	foot (U.S. Survey) (US_ft)	foot (U.S. Survey) (US_ft)
	(•) Height ( ) Sounding	(•) Height ( ) Sounding
	[ ] GEOID model: GEOID12B	[ ] GEOID model: GEOID12B

Point Conversion | ASCII File Conversion

Input			Output	
Longitude:	-81.246943	Convert	Longitude:	-81.2469430000
Latitude:	27.208478	Reset	Latitude:	27.2084780000
Height:	0	DMS	Height:	-1.198
	Drive to on map / Reset Map			Drive to on map / Reset Map
	[ ] to DMS		Vertical Uncertainty:	18.78829 cm

Vertical_Area: /core/vcn

Alternating Horz. Datum | Ellipsoidal Datum | Orthometric Datum | Tidal Datum

Appendix B
Excerpts from Floodplain Model Report

Final

Floodplain Modeling Report

SR 70
Project Development and Environment Study

from CR 29 to Lonesome Island Road
Highlands County, Florida

Financial Project ID: 414506 5 22 01
ETDM Number: 14364

Florida Department of Transportation
District One

Prepared By:
Kisinger Campo & Associates Corp.
201 N. Franklin Street, Suite 400
Tampa, Florida
Florida Certificate of Authorization No. 02317

February 2021

EXECUTIVE SUMMARY

The Florida Department of Transportation (FDOT) is conducting a Project Development and Environment (PD&E) study to evaluate the proposed widening of SR 70 from CR 29 to Lonesome Road in Highlands County. The purpose of this PD&E study is to evaluate engineering and environmental data and document information that will aid FDOT, Highlands County and the Federal Highway Administration (FHWA) in determining the type, preliminary design and location of proposed improvements. The study is being conducted to meet the requirements of the National Environmental Policy Act (NEPA) and other related federal and state laws. This report includes reducing the proposed floodplain compensation sites through modeling.

Existing Conditions

SR 70 is classified as a Rural Principal Arterial, is an evacuation route and is a two-lane undivided roadway with 12-foot lanes and 5-foot paved shoulders. Stormwater runoff is collected in roadside canals and discharges to Canal C-41. There is no stormwater treatment in the existing condition, all roadway runoff discharges directly into canals.

The corridor is approximately 4.3 miles in length with varying ROW. The existing ROW is generally 50-60 feet in in width. The existing pavement exhibits sever rutting and cracking as well as the presence of potholes. These symptoms are consistent with unsuitable soils beneath the roadway.

The posted speed limit is 60 miles per hour (mph) from CR 29 to Lonesome Island Road. There are no bus stops, sidewalks, or other pedestrian features located within the project limits.

Project Need

The FDOT proposes to widen SR 70 from a two-lane undivided roadway to a four-lane divided roadway to maintain important east-west mobility for people and freight in southern Highlands County and alleviate future traffic congestion on the corridor. The proposed improvements to SR 70 will also include a shared use path. The roadway currently operates at Level of Service (LOS) B with it deteriorating to a LOS of E in 2035 if no improvements are made. This will cause higher levels of congestion and longer delays since the roadway will have insufficient capacity to accommodate the future travel demand. However, the LOS rises to B for a four-lane divided roadway. SR 70 carries significant truck traffic (> 27%) and is part of the Strategic Intermodal System (SIS) highway network. SR 70 provides regional access to agricultural lands, industrial areas, commercial developments and freight distribution facilities across the state of Florida as well as functioning as an important hurricane evacuation route.

This project is identified in the Capital Improvements Element of the 2030 Comprehensive Plan for Highlands County. A large majority of the corridor will continue to be used for agricultural purposes according to the Highlands County Future Land Use Map. In addition, the Highlands County Comprehensive Plan (Policy 12.6.5) indicates that the project segment is part of the designated SR 70 Commercial-Industrial Corridor Area where industrial and commercial growth will be targeted along the corridor. The FDOT anticipates this project will improve connectivity

between the east and west sides of the state, enhance safety along the project corridor, and improve emergency evacuation.

The project is located along SR 70 between the intersection of CR29 and SR 70 (MP 17.255) and the intersection of Lonesome Island Road and SR 70 (MP 21.573). This project lies in Section 1 of Township 38S and Range 30E; Section 31, 32, 33, 34 of Township 37S and Range 31E; Section 3, 4, 5, 6 of Township 38S and Range 31E; Section 36 of Township 37S and Range 30E (**Figures 2A and 2B**). Drainage basins along the project flow into the Harney Pond Canal (**Figure 7**). The project is located within the South Florida Water Management District (SFWMD).

The existing conditions floodplain model was used to establish 100-year floodplain elevations and flow rates for the FEMA Zone A areas. An initial proposed model was created by removing storage within the basins that were impacted due to the proposed roadway widening. Additionally, estimated stage/area data for the relocated canal was added to their respective nodes. Compensation sites (FPC 1 and FPC 2) were added to the proposed model and were sized appropriately until the proposed 100-year floodplain elevations were less than or equal to the existing 100-year floodplain elevations. The calculations presented in this report are preliminary and help in estimating the size of the floodplain ponds for the roadway widening project.

Table 1: Summary of Floodplain Sites

Pond Site	Location	R/W Area (Acres)
FPC 1	6+12 to 19+08 RT	19.0
FPC 2	224+45 to 230+48 RT	31.5

1.0 GENERAL PROJECT INFORMATION

1.1 INTRODUCTION

The Florida Department of Transportation (FDOT) is performing a Project Development and Environment (PD&E) study to evaluate the widening of approximately 4.3 miles of SR 70 from CR 29 to Lonesome Island Road in Highlands County. This report discusses the reduction of required floodplain compensation by modeling of the floodplain. Two floodplain compensation sites are required for the proposed floodplain impacts. The project limits are shown on **Exhibit 1-1**. This report includes reducing the proposed floodplain compensation sites through modeling.

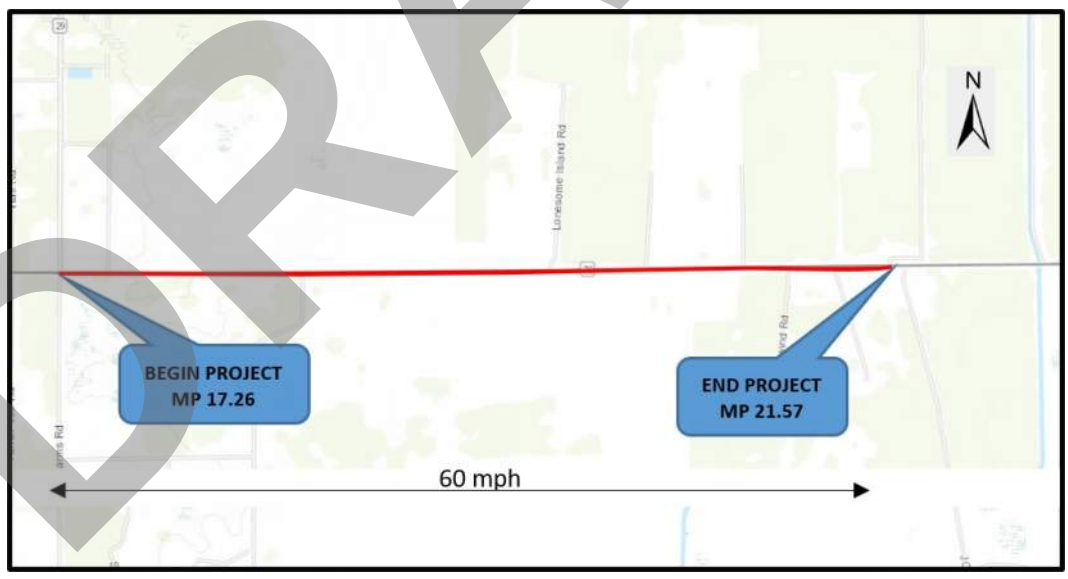


Exhibit 1-1 Project Location Map

1.2 SITE LOCATION AND DESCRIPTION

The project will improve operational capacity along SR 70 from CR 29 to Lonesome Island Road in Highlands County. The existing two-lane undivided rural roadway **(Exhibit 1-2)** will be widened to a four-lane divided roadway with a shared use path. Widening along the existing roadway would involve relocating both the

2.0 DRAINAGE REFERENCE AND RESOURCE INFORMATION

2.1 MEETINGS

A pre-application meeting with the South Florida water Management District will be held at a future date.

2.2 RAINFALL INTENSITY DATA

The project includes both open and closed basins. The following storms were modeled in the existing and proposed conditions: SFWMD 25-year/72-hour storm (8.52 inches), SFWMD 100-year/72-hour storm (11 inches), FLMOD 2.33-year/24-hour storm (4 inches), FLMOD 10-year/24-hour storm (7.44 inches), FLMOD 25-year/24-hour storm (7.68 inches), FLMOD 50-year/24-hour storm (8.03 inches), FLMOD 100-year/24-hour storm (9.14 inches), and a No Rainfall condition. Additionally, the SFWMD FLMOD 100-year/24-hour storm (9.14 inches) was modeled for closed basins in the existing and proposed conditions.

2.3 RESOURCE FOR ANALYSIS

The following sources were used to locate and size the floodplain compensation sites:

- FDOT Drainage Manual
- FDOT Drainage Design Guide
- SFWMD ERP Applicant's Handbook II
- Contours derived from Lidar, SFWMD, 2007
- USDA SCS Web Soil Survey
- USGS Quadrangle Maps (Childs, Brighton)
- Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map (FIRM), effective November 18, 2015 (12055C0533C, 12055C0535C and 12055C0555C)
- TR-55, Urban Hydrology for Small Watersheds
- C-41 Watershed, AHED Watersheds, SFWMD

The following SFWMD permits were used to obtain conveyance information outside of the right of way: 22-00117-S, 28-00097-S, 28-00140-S, 28-00211-S, 28-00285-S, 28-00286-S, 28-00388-S, 28-00408-P, 28-00589-P, and 28-00670-P. The Datum used in ICPR 4 floodplain model is NAVD88 and requires a datum shift of approximately -0.365 meters (1.20 feet) from NGVD 29 to convert.

3.0 EXISTING DRAINAGE CHARACTERISTICS

3.1 WATERSHED DESCRIPTIONS

The existing drainage patterns were determined using United States Geological Survey (USGS) quadrangle maps and LiDAR contours. The off-site drainage basins are shown in the exhibits in **Appendix A**. The roadway drains through roadside

ditches to the three (3) existing crossdrains within the project limits.

Table 2: Crossdrain Summary

No.	MP	Station	Existing Description	Proposed Description
CD-1	17.900	34+05	36" CMP	34" X 53" ECP
CD-2	19.251	105+39	2-53" X 83" CMP	3-53" X 83" CMP
CD-3	21.017	198+63	2-82" X 128" CMP	2-82" X 128" CMP

4.0 PROPOSED DRAINAGE DESIGN

Stormwater runoff from SR 70 will be collected and conveyed to stormwater management facilities through roadside swales. These stormwater management facilities will provide water quality (treatment) and water quantity (attenuation). The design of the drainage and stormwater facilities will comply with the standards set forth by the FDOT Drainage Manual, FDOT Drainage Design Guide, and the SFWMD ERP Applicant's Handbook II.

The existing conditions floodplain model yielded initial 100-year floodplain elevations and flow rates for FEMA Zone A areas. This model was then modified into the proposed condition by first accounting for encroachment from the proposed roadway by removing the stage/area, and thus the storage capacity, from the ICPR4 nodes. Additionally, estimated stage/area data for the relocated and widened canal was added to their respective nodes. This model was run as a preliminary proposed condition to determine if any further compensation was necessary. Floodplain compensation sites, FPC 1 and FPC 2, were added and sized appropriately to reduce the proposed 100-year floodplain elevations so that they were less than or equal to the existing 100-year floodplain elevations. Refer to the floodplain calculations in **Appendix B**.

5.0 ICPR4 MODEL

5.1 MODEL BOUNDARY AND BASIN DELINEATION

The boundary for this model was modified from the existing C-41 AHED Watershed boundary provided by the SFWMD to exclude areas that did not produce runoff that would flow across the project area (**Appendix A, Figure 11**). This reduced the initial effort required in constructing the hydrologic network and reduced the runtime required for each simulation. Only the portion draining through the project area and into C-41 was included in the model. This eliminates areas to the east of C-41 as well as the southernmost reaches. Additional modifications were made based on ArcHydro flow estimates. The eastern boundary was set at the C-41 canal. The northern boundary was set along CR 621 E and cuts through a parcel of farmland to the northeast until intersecting with the eastern boundary. The western boundary below SR 70 was altered to extend no further than the beginning of the ridge except for the southwestern-most portion, which extends

Road intersection. North of SR 70, the western boundary extends to Old SR 8. The southern boundary terminates in farmland. A map of the study area is included in **Appendix A** (**Figure 7**).

Basins were delineated using ArcHydro toolsets under the assumption that the terrain was deranged. This can be corroborated by the topography indicated in the HHD_NW_DEM. Initially, the SWFWMD work-flow was used, though this was later modified using the ESRI work-flow for deranged systems. The methodology utilized the guidelines and recommendations put forth by the SWFWMD SOP for the selection of sinks. This process is shown below. Following this, basins were manually grouped to better represent the local hydrology and account for man-made divides. This included pumps to drop structures that serve to connect or disconnect the boundaries generated in ArcGIS.

1. Perform Sink Evaluation
2. Selection of Sinks Process
3. Create Sink Structures
4. Fill Sinks
5. Flow Direction
6. Adjust Flow Direction in Sinks
7. Sink Watershed Delineation

5.2 HYDRAULIC CHARACTERISTICS

5.2.1 LANDUSE

The land use required to calculate the CN's within ICPR4 were obtained from the SWFWMD for the 2014-2016 years. This file was then modified to better represent the extensive network of agricultural canals which were initially miscategorized. Additionally, wetland areas were checked and amended against SFWMD information to provide the most accurate information for the model inputs.

5.2.2 SOILS

Soil data was obtained through the USDA NRCS Web Soil Survey (SSURGO) and was classified into hydrologic soil groups (HSG) within ArcGIS prior to import into the ICPR4 model. The HSG for the area of interest were A, A/D, B/D, C/D, and D. Additionally, an HSG of W was included as an override condition for areas that are permanently inundated.

5.2.3 CURVE NUMBER

The curve number lookup table used for both the Existing and Proposed Conditions Models was created based on classifications found in the 2020 FDOT Drainage Manual. Some classifications pertaining to agricultural lands were found in Table 2-2A, b, and c of the TR-55 manual (210-VI-TR-55, Second Ed., June 1986) which includes classifications for Fallow, Brush,

roadway-adjacent node.

The FEMA FIRM maps 12055C0533C, 12055C0535C, and 12055C0555C describe the model area as Zone A, indicating that no base flood elevations have been determined. However, the flood hazard area presented in the FEMA maps was estimated to be approximately 33.8' based on matching contours and covers a larger area than the ICPR model. The ICPR model shows the floodplain in greater detail as shown on the flood maps (**Appendix B**). The model shows the flooding of the adjacent farmland based on the grading of the crop rows. The model also shows there are similarities between the two floodplain approximations, namely the hazard area coverage towards the beginning of the project to the south of SR 70 and along the ridge towards the end of the project to the south of SR 70.

5.7 MODEL RESULTS

The 100-year floodplain elevations were initially established for FEMA Zone A areas using the existing floodplain model. The model shows that the 100-year/24-hour floodplain stages did not increase in any node in the proposed conditions model due to the sufficient storage provided by the floodplain compensation sites, revising CD-1 from 36" round to elliptical 34" X 53" pipe and the addition of a third equalizer pipe at CD-2. The results of each storm simulation appear in **Appendix B**.

6.0 FPC SITE INFORMATION

6.1 FLOODPLAIN COMPENSATION SITE LOCATIONS

Floodplain compensation sites will be required for the floodplain impacts located along the project corridor. Aerial photographs, field reconnaissance, and information from the Highlands County Property Appraiser were used to locate these potential sites. During the design phase of the project, the FPC configurations may vary from the assumptions in this report based on actual conditions. A determination will need to be done during the design phase of the project to determine any changes to the 100-year floodplain elevations. Refer to **Appendix B** for floodplain encroachment/compensation calculations for Alternative 2. Below is a discussion of the proposed floodplain compensation ponds.

6.2.1 FLOODPLAIN COMPENSATION SITE 1

FPC 1 is a 19-acre pond site located on the south side of SR 70 from Sta. 6+12 to 19+08 RT. This site will provide 19.10 acre-feet of floodplain compensation in 1.0 feet of depth of excavation. The existing ground elevation for FPC 1 was determine by creating a stage/area polygon in ICPR4 and generating tabular data using HHD_NW_DEM as the elevation surface. Soils within this site include Felda fine sand (13) with an HSG Type

A/D and Immokalee sand (8) with an HSG Type B/D. FPC 1 lies within node N-0350 which includes both offsite and onsite areas as well as the canal. The south side of the project area drains into a series of interconnected irrigation canals spanning the entire watershed. Therefore, with FPC 1 attached to the canal in N-0350, it will be directly hydraulically connected to the canals to the west and east. FPC 1 can connect directly to this canal using a swale. Though no borings have been taken in this area to determine the SHGWT, an estimation was performed using the NRCS soil survey depth to water table using the 33.8' elevation determined from the FEMA map. The SHGWT was estimated to be 32.8' and the floodplain site will be excavated to this elevation. This site impacts approximately 0.14 acres of forested wetlands. FPC 1 is located adjacent to the proposed SR 70 R/W.

6.2.2 FLOODPLAIN COMPENSATION SITE 2

FPC 2 is a 31.5 acre pond site located on the south side of SR 70 from Sta. 224+45 to 230+48 RT. This site will provide approximately 30 acre-feet of floodplain compensation in 0.5 feet of depth of excavation. Soils within this site are classified as Immokalee sand (8) with an HSG Type B/D. FPC 2 lies within N-0810 which includes both onsite and offsite areas that consist mostly of orchards/tree farms. The south side of the project area drains into a series of interconnected irrigation canals spanning the entire watershed prior to out falling into C-41 Harney Pond Canal. Therefore, with FPC 2 attached to an offsite agricultural canal within N-0810, it will be directly hydraulically connected to the canals on the East end of the project. FPC 2 can connect directly to this canal using a swale or an equalizer pipe. Though no borings have been taken in this area to determine the SHGWT, an estimation was performed using the NRCS soil survey depth to water table using the 33.8' elevation determined from the FEMA map. The SHGWT was estimated to be 32.8' and the floodplain site will be excavated to this elevation. This site impacts no wetlands. An easement is proposed from SR 70 to FPC 2 for access.

7.0 CONCLUSIONS

The ICPR model of the floodplain determined that a 19-acre site (FPC 1) at Sta. 6+12 to 19+08 on the south side of SR 70 and a 31.5-acre site (FPC 2) at Sta. 224+45 to 230+48 RT on the south side of SR 70 will provide the required floodplain compensation for the proposed roadway improvements.

Users of this report are cautioned that the following floodplain compensation site sizes and locations were determined from preliminary data and calculations and reasonable engineering judgment and assumptions. Pond sizes and configurations may change during final design as more detailed information on seasonal high water elevations, property boundaries, etc. becomes available.

APPENDIX A
FIGURES

Figure 9: FPC Site 1

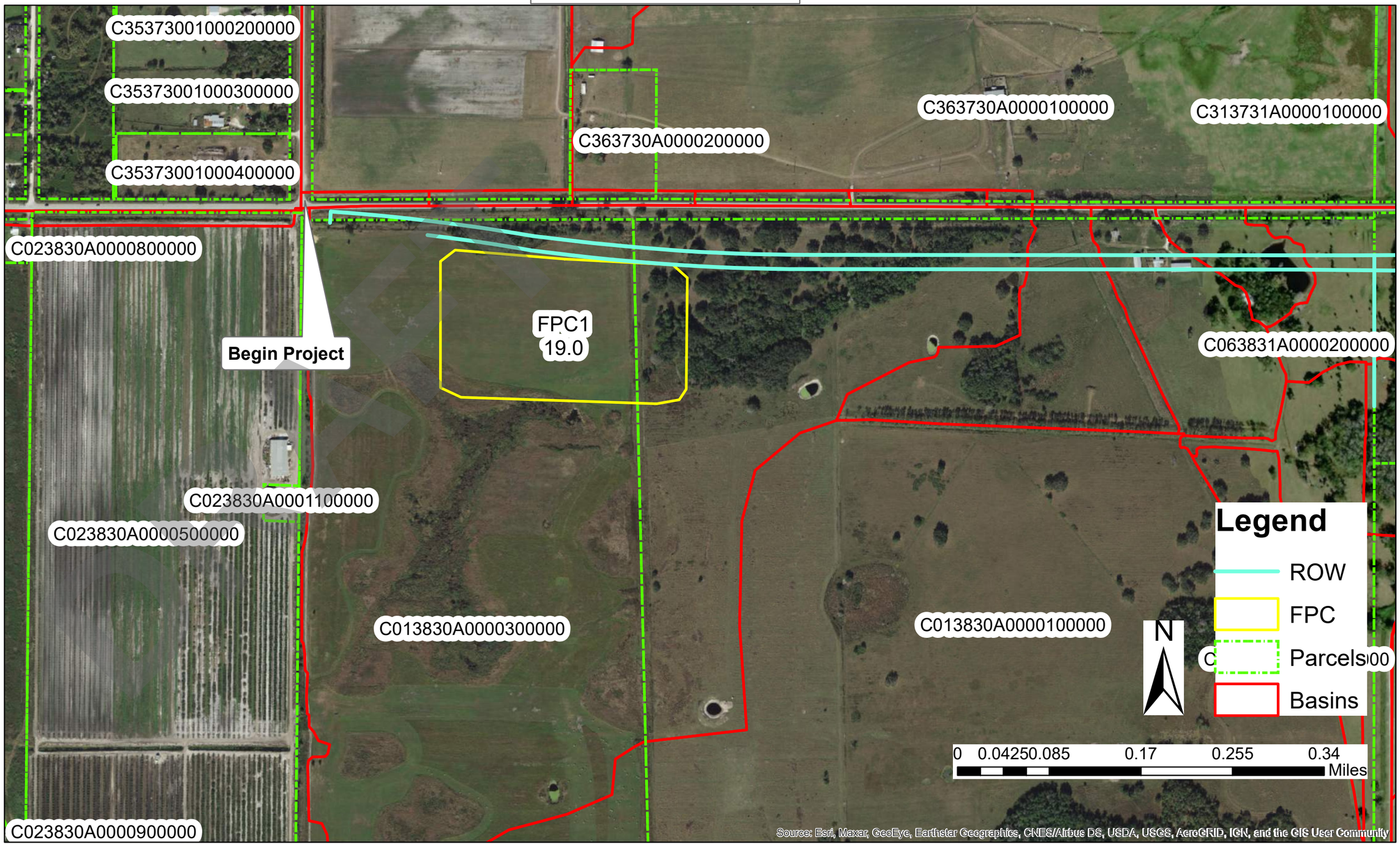
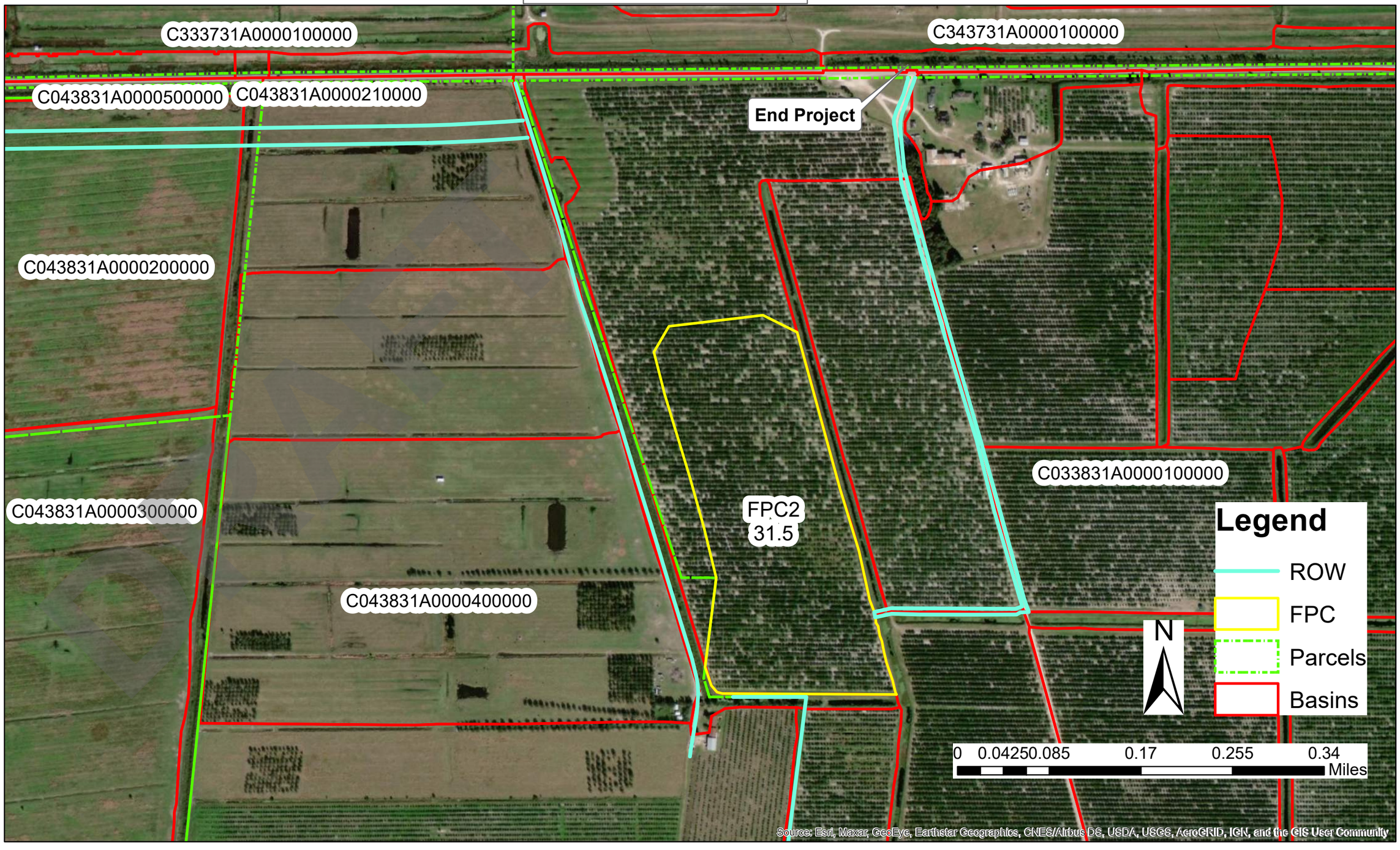


Figure 10: FPC Site 2



APPENDIX B

FLOODPLAIN CALCULATIONS

100-Year/24-Hour			
Node	Existing Condition	Proposed Condition	Change
A10	28.95	28.95	0.00
A20	28.95	28.95	0.00
A30	28.95	28.95	0.00
A40	29.23	29.23	0.00
A50	29.15	29.15	0.00
A60	28.95	28.95	0.00
BN10	28.19	28.19	0.00
BN20	27.85	27.85	0.00
BN30	27.02	27.02	0.00
BN40	26.94	26.94	0.00
BN50	29.49	29.49	0.00
BN60	29.49	29.49	0.00
BS10	27.70	27.70	0.00
BS20	27.37	27.37	0.00
BS30	26.99	26.99	0.00
BS40	26.11	26.11	0.00
CANAL4	26.97	26.78	-0.19
DA-1A	31.07	31.07	0.00
DA-1B	30.78	30.78	0.00
DA-1C	29.93	29.93	0.00
FN	28.04	28.04	0.00
FS	27.95	27.95	0.00
N-0050	33.77	33.60	-0.17
N-0060	29.71	29.70	-0.01
N-0070	31.13	30.92	-0.21
N-0120	31.14	30.94	-0.20
N-0140	29.59	29.53	-0.06
N-0150	29.59	29.53	-0.06
N-0160	29.59	29.53	-0.06
N-0180	30.81	30.68	-0.13
N-0190	31.29	31.13	-0.16
N-0200	30.84	30.71	-0.13
N-0210	34.60	34.31	-0.29
N-0220	31.60	31.50	-0.10
N-0250	35.35	35.14	-0.21
N-0270	35.47	35.18	-0.29
N-0290	38.94	38.48	-0.46
N-0300	37.56	37.38	-0.18
N-0330	35.69	35.63	-0.06
N-0350/FPC1	39.33	39.03	-0.32
N-0360	40.55	40.55	0.00
N-0370	36.09	36.09	0.00
N-0400	40.84	40.84	0.00

100-Year/24-Hour			
Node	Existing Condition	Proposed Condition	Change
N-0410	40.58	40.58	0.00
N-0420	41.85	41.85	0.00
N-0440	40.09	40.09	0.00
N-0450	40.64	40.64	0.00
N-0460	44.12	44.12	0.00
N-0480	44.11	44.11	0.00
N-0570	31.00	30.92	-0.08
N-0580	30.78	30.65	-0.13
N-0590	29.53	29.47	-0.06
N-0600	29.59	29.53	-0.06
N-0630	29.39	29.32	-0.07
N-0640	29.50	29.45	-0.05
N-0650	29.48	29.42	-0.06
N-0680	29.59	29.53	-0.06
N-0690	29.58	29.52	-0.06
N-0710	29.53	29.47	-0.06
N-0720	29.47	29.41	-0.06
N-0730	29.41	29.34	-0.07
N-0740	29.39	29.32	-0.07
N-0750	29.22	29.12	-0.10
N-0760	29.20	29.10	-0.10
N-0770	29.29	29.23	-0.06
N-0780	29.93	29.75	-0.18
N-0800	31.44	31.19	-0.25
N-0810/FPC 2	31.46	31.19	-0.27
N-0820	29.09	28.98	-0.11
N-0830	27.40	27.39	-0.01
N-0840	32.12	32.12	0.00
N-0850	31.69	31.68	-0.01
N-0860	33.23	33.23	0.00
N-0870	33.30	33.30	0.00
N-0880	34.78	34.78	0.00
N-0890	34.89	34.89	0.00
N-0900	33.83	33.83	0.00
N-0910	33.86	33.86	0.00
N-0920	34.52	34.52	0.00
N-0940	29.29	29.22	-0.07
N-0960	29.95	29.91	-0.04
N-0970	31.77	31.77	0.00
N-0980	33.76	33.76	0.00
N-0990	33.94	33.94	0.00
N-1000	33.93	33.93	0.00
N-1020	31.72	31.72	0.00

100-Year/24-Hour			
Node	Existing Condition	Proposed Condition	Change
N-1030	31.18	31.18	0.00
N-1040	27.23	27.23	0.00
N-1050	30.71	30.71	0.00
N-1060	31.17	31.17	0.00
N-1070	31.16	31.16	0.00
N-1080	31.63	31.63	0.00
N-1090	31.63	31.63	0.00
N-1100	31.63	31.63	0.00
N-1110	30.92	30.92	0.00
N-1120	30.04	30.04	0.00
N-1130	29.60	29.60	0.00
N-1140	30.02	30.02	0.00
N-1150	27.20	27.20	0.00
N-1180	29.94	29.75	-0.18
N-1200	29.29	29.22	-0.07
N-1220	29.58	29.52	-0.06
N-1230	29.58	29.52	-0.06
N-1240	29.59	29.52	-0.07
N-1250	29.58	29.52	-0.06
N-1260	29.59	29.52	-0.07
N-1280	29.59	29.52	-0.07
N-1290	29.59	29.53	-0.06
N-1300	29.59	29.53	-0.06
N-1310	29.59	29.52	-0.07
N-1320	29.59	29.52	-0.07
N-1330	29.59	29.53	-0.06
N-1340	29.81	29.81	0.00
N-1350	30.13	30.13	0.00
N-1360	30.13	30.13	0.00
N-1370	30.06	30.06	0.00
N-1380	30.05	30.05	0.00
N-1390	32.49	32.49	0.00
N-1400	37.37	37.37	0.00
N-1410	34.01	34.01	0.00
N-1420	36.52	36.52	0.00
N-1430	40.48	40.48	0.00
N-1440	39.13	39.13	0.00
N-1450	39.11	39.11	0.00
N-1460	38.60	38.60	0.00
N-1470	32.19	32.19	0.00
N-1480	36.26	36.26	0.00
N-1500	34.28	34.27	-0.01
N-1540	36.05	36.05	0.00

100-Year/24-Hour			
Node	Existing Condition	Proposed Condition	Change
N-1560	34.71	34.50	-0.21
N-1570	34.08	33.68	-0.40
N-1600	31.39	31.17	-0.22
N-1610	31.15	31.13	-0.02
N-1630	31.90	31.74	-0.16
N-1640	31.40	31.40	0.00
N-1670	87.10	87.10	0.00
N-1680	85.09	85.09	0.00
N-1690	74.27	74.27	0.00
N-1700	67.79	67.79	0.00
N-1710	34.91	34.91	0.00
N-1730	29.49	29.44	-0.05
N-1740	29.49	29.43	-0.05
N-1750	29.44	29.20	-0.25
N-1780	29.40	29.40	0.00
N-1800	29.57	29.57	0.00
N-1810	30.16	30.16	0.00
N-1820	30.23	30.23	0.00
N-1840	31.10	31.10	0.00
N-1880	29.24	29.24	0.00
N-1890	27.03	27.03	0.00
N-1900	27.02	27.02	0.00
N-1910	30.45	30.45	0.00
N-1920	32.80	32.80	0.00
N-1930	39.45	39.45	0.00
N-1940	31.39	31.39	0.00
N-1950	30.64	30.64	0.00
N-1960	30.63	30.63	0.00
N-1970	30.30	30.30	0.00
N-1980	30.30	30.30	0.00
N-2000	31.00	30.92	-0.08
N-2010	35.43	35.43	0.00
N-2020	30.61	30.61	0.00
N-2030	30.48	30.48	0.00
N-2040	30.12	30.12	0.00
N-2050	30.30	30.30	0.00
N-2060	29.53	29.53	0.00
N-2070	29.24	29.24	0.00
N-2080	27.95	27.95	0.00
N-2260	29.49	29.43	-0.06
N-2270	28.28	27.24	-1.04
N-2280	29.50	29.44	-0.06
N-2290	29.49	29.49	0.00

100-Year/24-Hour			
Node	Existing Condition	Proposed Condition	Change
N-2300	31.83	31.83	0.00
N-2310	30.44	30.44	0.00
N-2320	30.62	30.62	0.00
N-2330	38.26	38.26	0.00
N-2340	34.05	34.05	0.00
N-2350	36.00	36.00	0.00
N-2360	36.76	36.76	0.00
N-2370	38.43	38.43	0.00
N-2380	37.03	37.03	0.00
N-2400	31.96	31.96	0.00
N-2410	30.47	30.47	0.00
N-2420	30.26	30.26	0.00
N-2430	31.08	31.08	0.00
N-2440	30.12	30.12	0.00
N-2450	30.12	30.12	0.00
N-2460	30.12	30.12	0.00
N-2470	30.12	30.12	0.00
N-2490	31.13	31.13	0.00
N-2500	29.24	29.24	0.00
N-2510	30.12	30.12	0.00
N-2520	30.63	30.63	0.00
Outfall: C-41 (Harney Pond Canal)	27.01	27.01	0.00
Outfall: C-41A	40.00	40.00	0.00

25-Year/72-Hour			
Node	Existing Condition	Proposed Condition	Change
A10	26.67	26.67	0.00
A20	26.51	26.50	-0.01
A30	26.68	26.68	0.00
A40	28.73	28.73	0.00
A50	28.66	28.66	0.00
A60	28.02	28.02	0.00
BN10	27.48	27.48	0.00
BN20	26.88	26.88	0.00
BN30	26.58	26.58	0.00
BN40	26.79	26.79	0.00
BN50	29.10	29.10	0.00
BN60	29.10	29.10	0.00
BS10	27.41	27.41	0.00
BS20	26.87	26.87	0.00
BS30	27.03	27.03	0.00
BS40	26.11	26.11	0.00
CANAL4	26.66	26.66	0.00
DA-1A	30.95	30.95	0.00
DA-1B	30.32	30.32	0.00
DA-1C	30.10	30.10	0.00
FN	27.91	27.91	0.00
FS	27.84	27.84	0.00
N-0050	33.67	33.55	-0.12
N-0060	29.67	29.66	-0.01
N-0070	30.84	30.72	-0.12
N-0120	30.86	30.74	-0.12
N-0140	29.04	29.00	-0.04
N-0150	29.04	29.00	-0.04
N-0160	29.04	29.00	-0.04
N-0180	30.51	30.39	-0.12
N-0190	30.98	30.87	-0.11
N-0200	30.54	30.43	-0.11
N-0210	34.33	34.29	-0.04
N-0220	31.49	31.47	-0.02
N-0250	35.31	35.15	-0.16
N-0270	35.41	35.20	-0.21
N-0290	38.89	38.77	-0.12
N-0300	37.51	37.43	-0.08
N-0330	35.67	35.64	-0.03
N-0350/FPC1	39.27	39.11	-0.16
N-0360	40.48	40.48	0.00
N-0370	36.06	36.06	0.00
N-0400	40.82	40.82	0.00

100-Year/72-Hour			
Node	Existing Condition	Proposed Condition	Change
A10	27.59	27.59	0.00
A20	27.59	27.59	0.00
A30	27.59	27.59	0.00
A40	30.13	30.13	0.00
A50	30.00	30.00	0.00
A60	28.02	28.02	0.00
BN10	27.91	27.91	0.00
BN20	27.21	27.21	0.00
BN30	27.02	27.02	0.00
BN40	27.37	27.37	0.00
BN50	30.06	30.06	0.00
BN60	30.06	30.06	0.00
BS10	27.67	27.67	0.00
BS20	27.19	27.19	0.00
BS30	27.30	27.30	0.00
BS40	26.52	26.52	0.00
CANAL4	27.09	27.09	0.00
DA-1A	31.20	31.20	0.00
DA-1B	30.66	30.64	-0.02
DA-1C	30.31	30.31	0.00
FN	28.20	28.20	0.00
FS	28.20	28.20	0.00
N-0050	33.77	33.70	-0.07
N-0060	29.84	29.80	-0.04
N-0070	31.33	31.27	-0.06
N-0120	31.35	31.29	-0.06
N-0140	29.79	29.73	-0.06
N-0150	29.79	29.73	-0.06
N-0160	29.79	29.73	-0.06
N-0180	31.00	30.86	-0.14
N-0190	31.53	31.40	-0.13
N-0200	31.04	30.91	-0.13
N-0210	34.60	34.59	-0.01
N-0220	31.77	31.67	-0.10
N-0250	35.39	35.30	-0.09
N-0270	35.51	35.35	-0.16
N-0290	38.95	38.90	-0.05
N-0300	37.56	37.51	-0.05
N-0330	35.74	35.71	-0.03
N-0350/FPC1	39.33	39.21	-0.12
N-0360	40.71	40.71	0.00
N-0370	36.15	36.15	0.00
N-0400	40.95	40.95	0.00

25-Year/72-Hour			
Node	Existing Condition	Proposed Condition	Change
N-0410	40.50	40.50	0.00
N-0420	41.76	41.76	0.00
N-0440	39.90	39.90	0.00
N-0450	40.54	40.54	0.00
N-0460	44.01	44.01	0.00
N-0480	44.00	44.00	0.00
N-0570	30.69	30.61	-0.08
N-0580	30.49	30.37	-0.12
N-0590	29.23	29.17	-0.06
N-0600	29.05	29.01	-0.04
N-0630	29.24	29.17	-0.07
N-0640	29.20	29.13	-0.07
N-0650	29.15	29.08	-0.07
N-0680	29.05	29.01	-0.04
N-0690	29.01	28.98	-0.03
N-0710	29.30	29.28	-0.02
N-0720	29.14	29.07	-0.07
N-0730	29.10	29.04	-0.06
N-0740	29.09	29.03	-0.06
N-0750	29.06	28.94	-0.12
N-0760	29.05	28.92	-0.13
N-0770	29.18	29.08	-0.09
N-0780	29.79	29.55	-0.24
N-0800	31.38	31.20	-0.18
N-0810/FPC 2	31.39	31.21	-0.18
N-0820	28.94	28.81	-0.13
N-0830	27.25	27.17	-0.08
N-0840	32.12	32.12	0.00
N-0850	31.08	31.08	0.00
N-0860	33.20	33.20	0.00
N-0870	33.29	33.29	0.00
N-0880	34.74	34.74	0.00
N-0890	34.83	34.83	0.00
N-0900	33.43	33.43	0.00
N-0910	33.84	33.84	0.00
N-0920	34.51	34.51	0.00
N-0940	29.19	29.11	-0.08
N-0960	29.88	29.88	0.00
N-0970	31.32	31.32	0.00
N-0980	33.69	33.69	0.00
N-0990	33.92	33.92	0.00
N-1000	33.91	33.91	0.00
N-1020	31.61	31.61	0.00

100-Year/72-Hour			
Node	Existing Condition	Proposed Condition	Change
N-0410	40.73	40.73	0.00
N-0420	42.03	42.03	0.00
N-0440	40.14	40.14	0.00
N-0450	40.85	40.85	0.00
N-0460	44.14	44.14	0.00
N-0480	44.13	44.13	0.00
N-0570	31.17	31.08	-0.09
N-0580	30.97	30.84	-0.13
N-0590	29.66	29.61	-0.05
N-0600	29.79	29.74	-0.05
N-0630	29.59	29.52	-0.07
N-0640	29.63	29.58	-0.05
N-0650	29.61	29.55	-0.06
N-0680	29.79	29.74	-0.05
N-0690	29.78	29.72	-0.06
N-0710	29.75	29.70	-0.05
N-0720	29.59	29.53	-0.06
N-0730	29.53	29.46	-0.07
N-0740	29.51	29.45	-0.06
N-0750	29.37	29.26	-0.11
N-0760	29.36	29.24	-0.12
N-0770	29.55	29.38	-0.17
N-0780	30.16	30.10	-0.06
N-0800	31.48	31.35	-0.13
N-0810/FPC 2	31.50	31.36	-0.14
N-0820	29.25	29.13	-0.12
N-0830	27.46	27.32	-0.14
N-0840	32.24	32.24	0.00
N-0850	32.55	32.55	0.00
N-0860	33.28	33.28	0.00
N-0870	33.44	33.44	0.00
N-0880	34.82	34.82	0.00
N-0890	34.91	34.91	0.00
N-0900	34.04	34.04	0.00
N-0910	34.05	34.05	0.00
N-0920	34.60	34.60	0.00
N-0940	29.56	29.37	-0.19
N-0960	30.17	30.12	-0.05
N-0970	32.76	32.76	0.00
N-0980	33.78	33.78	0.00
N-0990	34.06	34.06	0.00
N-1000	34.05	34.05	0.00
N-1020	32.01	32.01	0.00

25-Year/72-Hour			
Node	Existing Condition	Proposed Condition	Change
N-1030	31.18	31.18	0.00
N-1040	27.10	27.10	0.00
N-1050	30.71	30.71	0.00
N-1060	31.16	31.16	0.00
N-1070	31.16	31.16	0.00
N-1080	31.61	31.61	0.00
N-1090	31.61	31.61	0.00
N-1100	31.62	31.62	0.00
N-1110	30.91	30.91	0.00
N-1120	30.03	30.03	0.00
N-1130	29.55	29.55	0.00
N-1140	30.00	30.00	0.00
N-1150	27.03	27.03	0.00
N-1180	29.79	29.55	-0.24
N-1200	29.18	29.10	-0.08
N-1220	28.86	28.67	-0.19
N-1230	28.93	28.90	-0.03
N-1240	28.95	28.92	-0.03
N-1250	28.86	28.57	-0.29
N-1260	29.01	28.97	-0.04
N-1280	29.01	28.98	-0.03
N-1290	29.04	29.00	-0.04
N-1300	29.02	28.99	-0.03
N-1310	28.90	28.74	-0.16
N-1320	28.90	28.82	-0.08
N-1330	29.04	29.04	0.00
N-1340	29.58	29.58	0.00
N-1350	29.92	29.92	0.00
N-1360	29.92	29.92	0.00
N-1370	29.82	29.82	0.00
N-1380	29.76	29.76	0.00
N-1390	32.42	32.42	0.00
N-1400	37.31	37.31	0.00
N-1410	33.92	33.92	0.00
N-1420	36.49	36.49	0.00
N-1430	40.41	40.41	0.00
N-1440	39.04	39.04	0.00
N-1450	39.02	39.02	0.00
N-1460	38.53	38.53	0.00
N-1470	32.11	32.11	0.00
N-1480	36.20	36.20	0.00
N-1500	34.23	34.23	0.00
N-1540	35.99	35.99	0.00

100-Year/72-Hour			
Node	Existing Condition	Proposed Condition	Change
N-1030	31.33	31.33	0.00
N-1040	29.26	29.26	0.00
N-1050	30.89	30.89	0.00
N-1060	31.30	31.30	0.00
N-1070	31.30	31.30	0.00
N-1080	31.75	31.75	0.00
N-1090	31.75	31.75	0.00
N-1100	31.76	31.76	0.00
N-1110	30.99	30.99	0.00
N-1120	30.85	30.85	0.00
N-1130	30.40	30.40	0.00
N-1140	30.84	30.84	0.00
N-1150	27.68	27.68	0.00
N-1180	30.16	30.10	-0.06
N-1200	29.56	29.37	-0.19
N-1220	29.76	29.70	-0.06
N-1230	29.76	29.70	-0.06
N-1240	29.76	29.71	-0.05
N-1250	29.76	29.70	-0.06
N-1260	29.77	29.71	-0.06
N-1280	29.78	29.72	-0.06
N-1290	29.79	29.73	-0.06
N-1300	29.78	29.72	-0.06
N-1310	29.76	29.70	-0.06
N-1320	29.76	29.70	-0.06
N-1330	29.76	29.70	-0.06
N-1340	30.02	30.02	0.00
N-1350	30.21	30.21	0.00
N-1360	30.21	30.21	0.00
N-1370	30.29	30.29	0.00
N-1380	30.28	30.28	0.00
N-1390	32.54	32.54	0.00
N-1400	37.39	37.39	0.00
N-1410	34.03	34.03	0.00
N-1420	36.52	36.52	0.00
N-1430	40.50	40.50	0.00
N-1440	39.16	39.16	0.00
N-1450	39.14	39.14	0.00
N-1460	38.66	38.66	0.00
N-1470	32.25	32.25	0.00
N-1480	36.27	36.27	0.00
N-1500	34.28	34.28	0.00
N-1540	36.05	36.05	0.00

25-Year/72-Hour			
Node	Existing Condition	Proposed Condition	Change
N-1560	34.64	34.54	-0.10
N-1570	33.95	33.72	-0.23
N-1600	31.26	31.10	-0.16
N-1610	31.12	31.12	0.00
N-1630	31.81	31.69	-0.12
N-1640	31.40	31.40	0.00
N-1670	86.61	86.61	0.00
N-1680	84.46	84.46	0.00
N-1690	74.17	74.17	0.00
N-1700	67.57	67.57	0.00
N-1710	34.85	34.85	0.00
N-1730	29.16	29.07	-0.09
N-1740	29.16	29.07	-0.09
N-1750	28.45	28.45	0.00
N-1780	29.26	29.26	0.00
N-1800	29.56	29.56	0.00
N-1810	30.15	30.15	0.00
N-1820	30.18	30.18	0.00
N-1840	31.04	31.04	0.00
N-1880	28.78	28.78	0.00
N-1890	26.72	26.72	0.00
N-1900	26.73	26.73	0.00
N-1910	30.32	30.32	0.00
N-1920	32.67	32.67	0.00
N-1930	39.22	39.22	0.00
N-1940	31.19	31.19	0.00
N-1950	30.65	30.65	0.00
N-1960	30.64	30.64	0.00
N-1970	31.59	31.59	0.00
N-1980	31.59	31.59	0.00
N-2000	30.69	30.60	-0.09
N-2010	35.21	35.21	0.00
N-2020	30.60	30.60	0.00
N-2030	30.36	30.36	0.00
N-2040	30.01	30.01	0.00
N-2050	31.59	31.59	0.00
N-2060	28.47	28.47	0.00
N-2070	28.78	28.78	0.00
N-2080	26.34	26.34	0.00
N-2260	29.16	29.07	-0.09
N-2270	26.82	26.82	0.00
N-2280	29.17	29.08	-0.09
N-2290	29.22	29.21	0.00

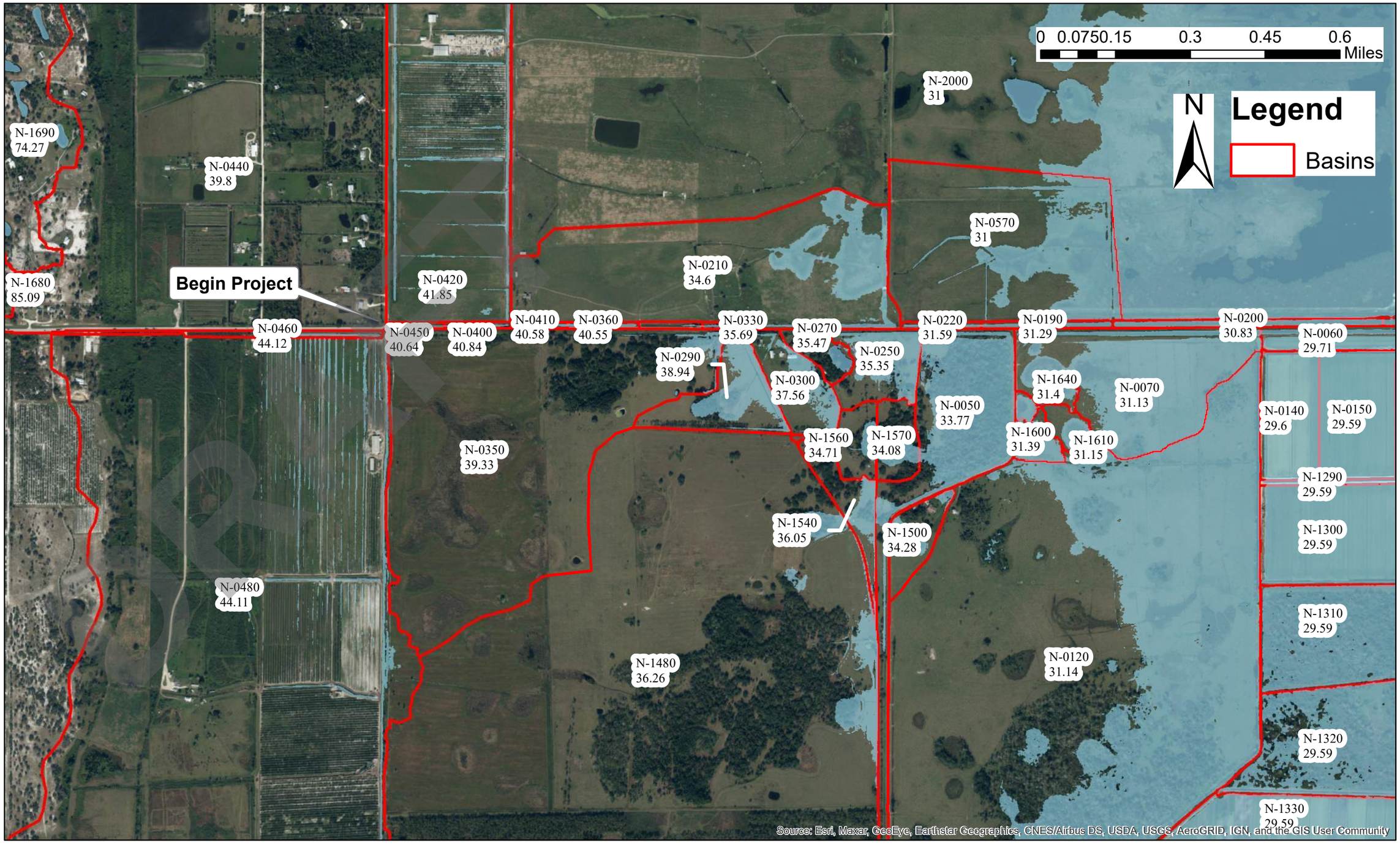
100-Year/72-Hour			
Node	Existing Condition	Proposed Condition	Change
N-1560	34.71	34.66	-0.05
N-1570	34.09	33.94	-0.15
N-1600	31.41	31.34	-0.07
N-1610	31.34	31.29	-0.05
N-1630	31.91	31.84	-0.07
N-1640	31.41	31.41	0.00
N-1670	87.98	87.98	0.00
N-1680	86.64	86.64	0.00
N-1690	74.40	74.40	0.00
N-1700	67.86	67.86	0.00
N-1710	34.95	34.95	0.00
N-1730	29.62	29.56	-0.06
N-1740	29.61	29.56	-0.05
N-1750	29.27	29.13	-0.14
N-1780	29.41	29.41	0.00
N-1800	29.65	29.65	0.00
N-1810	30.42	30.42	0.00
N-1820	30.29	30.29	0.00
N-1840	31.28	31.28	0.00
N-1880	30.13	30.13	0.00
N-1890	27.04	27.04	0.00
N-1900	27.02	27.02	0.00
N-1910	30.57	30.57	0.00
N-1920	32.81	32.81	0.00
N-1930	39.47	39.47	0.00
N-1940	31.42	31.42	0.00
N-1950	30.90	30.90	0.00
N-1960	30.89	30.89	0.00
N-1970	31.78	31.78	0.00
N-1980	31.77	31.77	0.00
N-2000	31.16	31.08	-0.08
N-2010	35.43	35.43	0.00
N-2020	30.84	30.84	0.00
N-2030	30.59	30.59	0.00
N-2040	30.40	30.40	0.00
N-2050	31.78	31.78	0.00
N-2060	30.22	30.22	0.00
N-2070	30.13	30.13	0.00
N-2080	28.87	28.87	0.00
N-2260	29.61	29.56	-0.05
N-2270	28.19	27.67	-0.52
N-2280	29.62	29.57	-0.05
N-2290	30.16	30.16	0.00

25-Year/72-Hour			
Node	Existing Condition	Proposed Condition	Change
N-2300	31.69	31.69	0.00
N-2310	31.58	31.58	0.00
N-2320	30.63	30.63	0.00
N-2330	37.93	37.93	0.00
N-2340	33.74	33.74	0.00
N-2350	35.93	35.93	0.00
N-2360	36.66	36.66	0.00
N-2370	38.15	38.15	0.00
N-2380	36.99	36.99	0.00
N-2400	31.86	31.86	0.00
N-2410	30.47	30.47	0.00
N-2420	30.25	30.25	0.00
N-2430	31.58	31.57	-0.01
N-2440	30.01	30.01	0.00
N-2450	30.02	30.02	0.00
N-2460	30.02	30.02	0.00
N-2470	30.02	30.02	0.00
N-2490	31.58	31.58	0.00
N-2500	28.84	28.84	0.00
N-2510	30.02	30.02	0.00
N-2520	30.64	30.64	0.00
Outfall: C-41 (Harney Pond Canal)	27.01	27.01	0.00
Outfall: C-41A	40.00	40.00	0.00

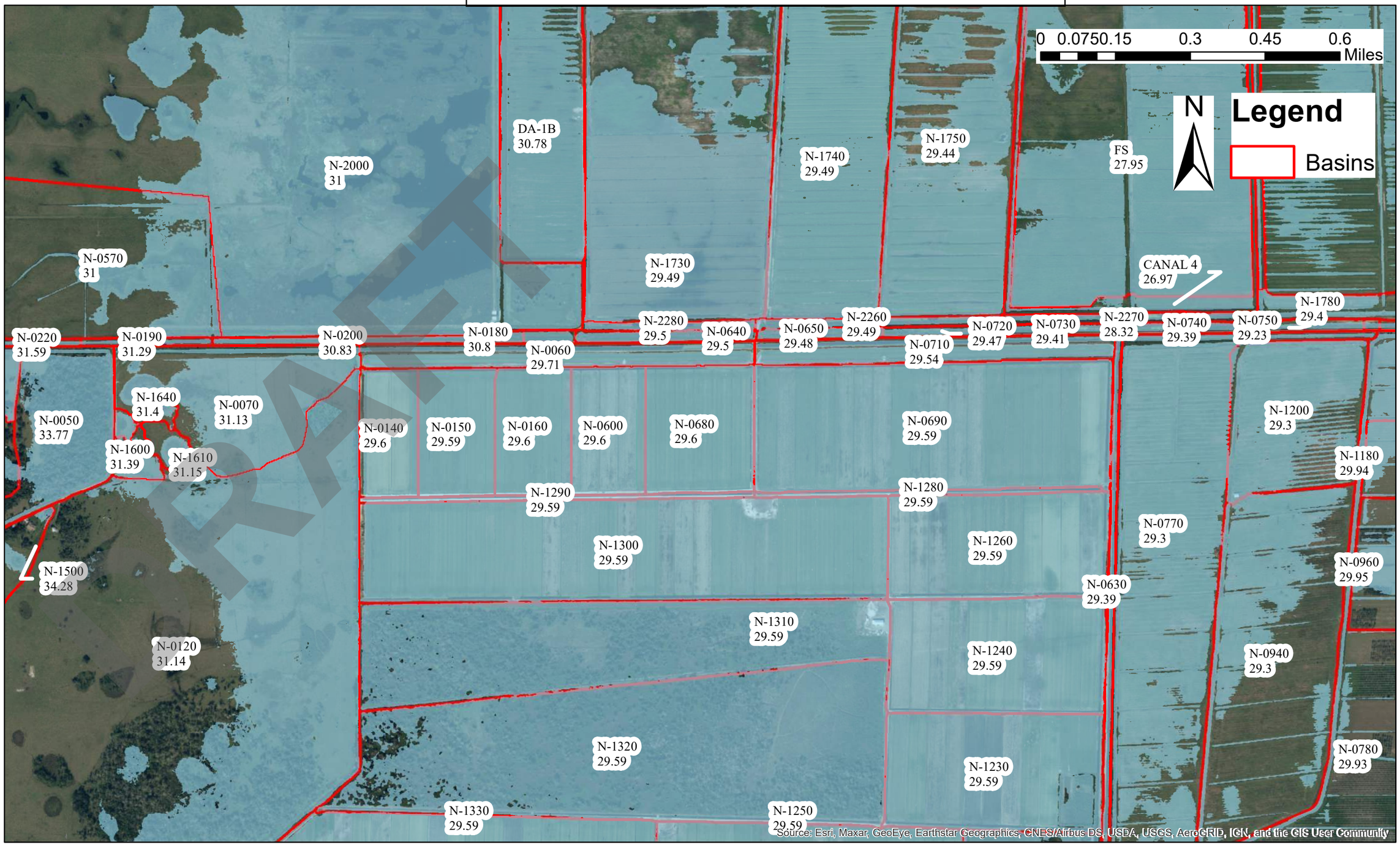
100-Year/72-Hour			
Node	Existing Condition	Proposed Condition	Change
N-2300	31.83	31.83	0.00
N-2310	31.76	31.76	0.00
N-2320	30.87	30.87	0.00
N-2330	38.18	38.18	0.00
N-2340	34.03	34.03	0.00
N-2350	36.02	36.02	0.00
N-2360	36.78	36.78	0.00
N-2370	38.46	38.46	0.00
N-2380	37.03	37.03	0.00
N-2400	32.05	32.05	0.00
N-2410	30.68	30.68	0.00
N-2420	30.46	30.46	0.00
N-2430	31.76	31.76	0.00
N-2440	30.41	30.41	0.00
N-2450	30.41	30.41	0.00
N-2460	30.41	30.41	0.00
N-2470	30.41	30.41	0.00
N-2490	31.76	31.76	0.00
N-2500	30.32	30.32	0.00
N-2510	30.41	30.41	0.00
N-2520	30.88	30.88	0.00
Outfall: C-41 (Harney Pond Canal)	27.01	27.01	0.00
Outfall: C-41A	40.00	40.00	0.00

Floodplain Maps

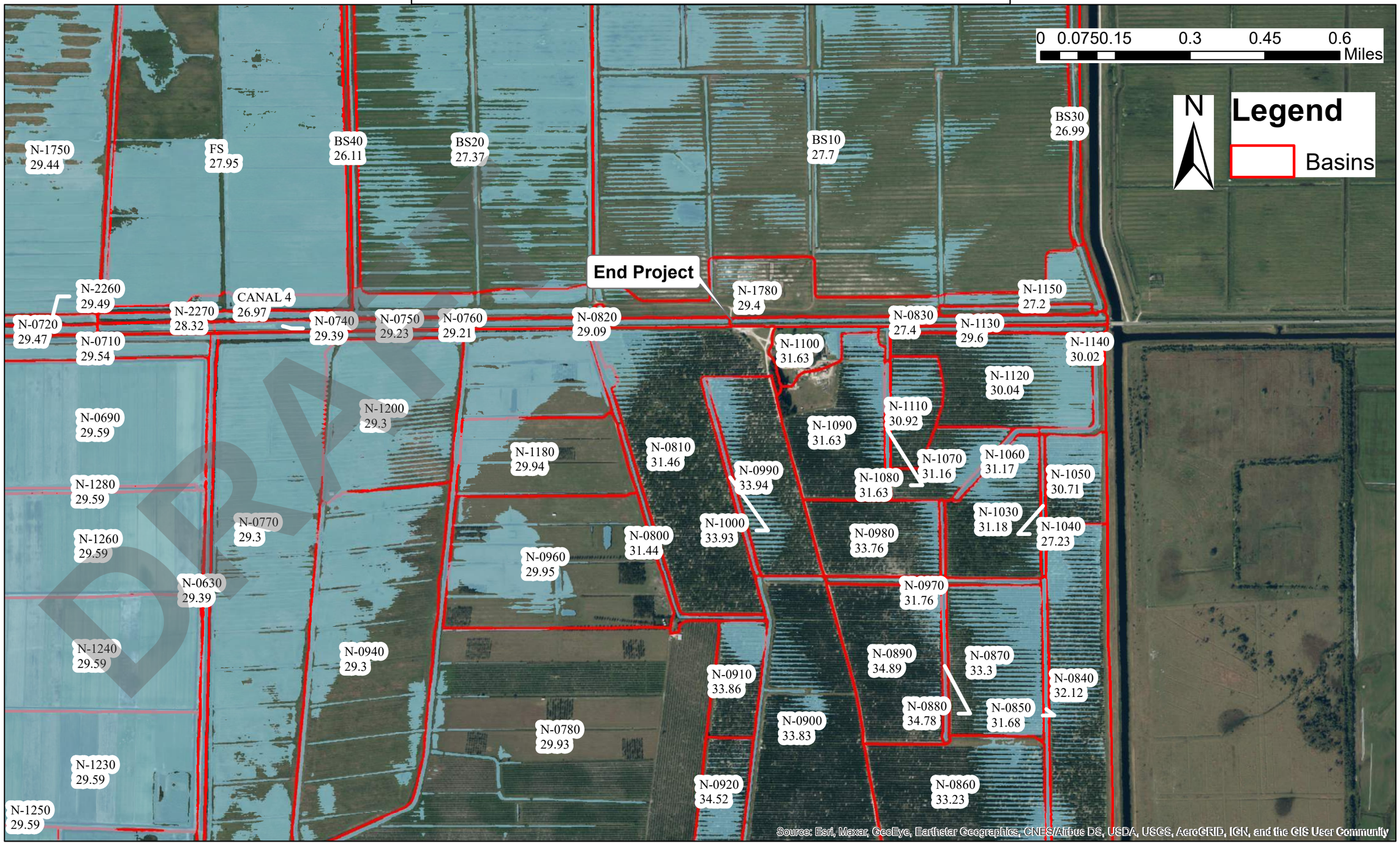
Existing Condition Floodplain ROW: 100-YR/24-HR



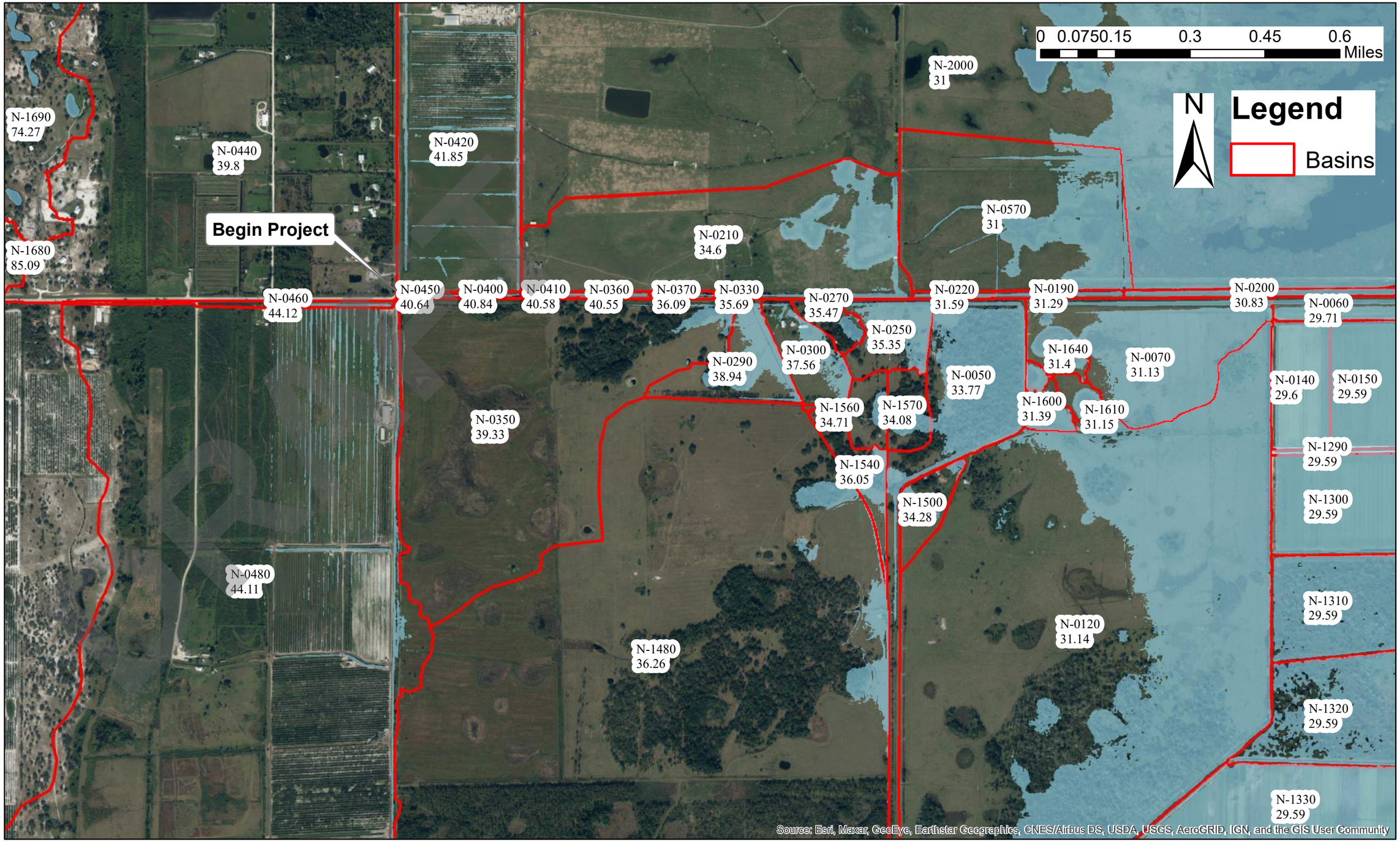
Existing Condition Floodplain ROW: 100-YR/24-HR



Existing Condition Floodplain ROW: 100-YR/24-HR



Proposed Condition Floodplain ROW: 100-YR/24-HR



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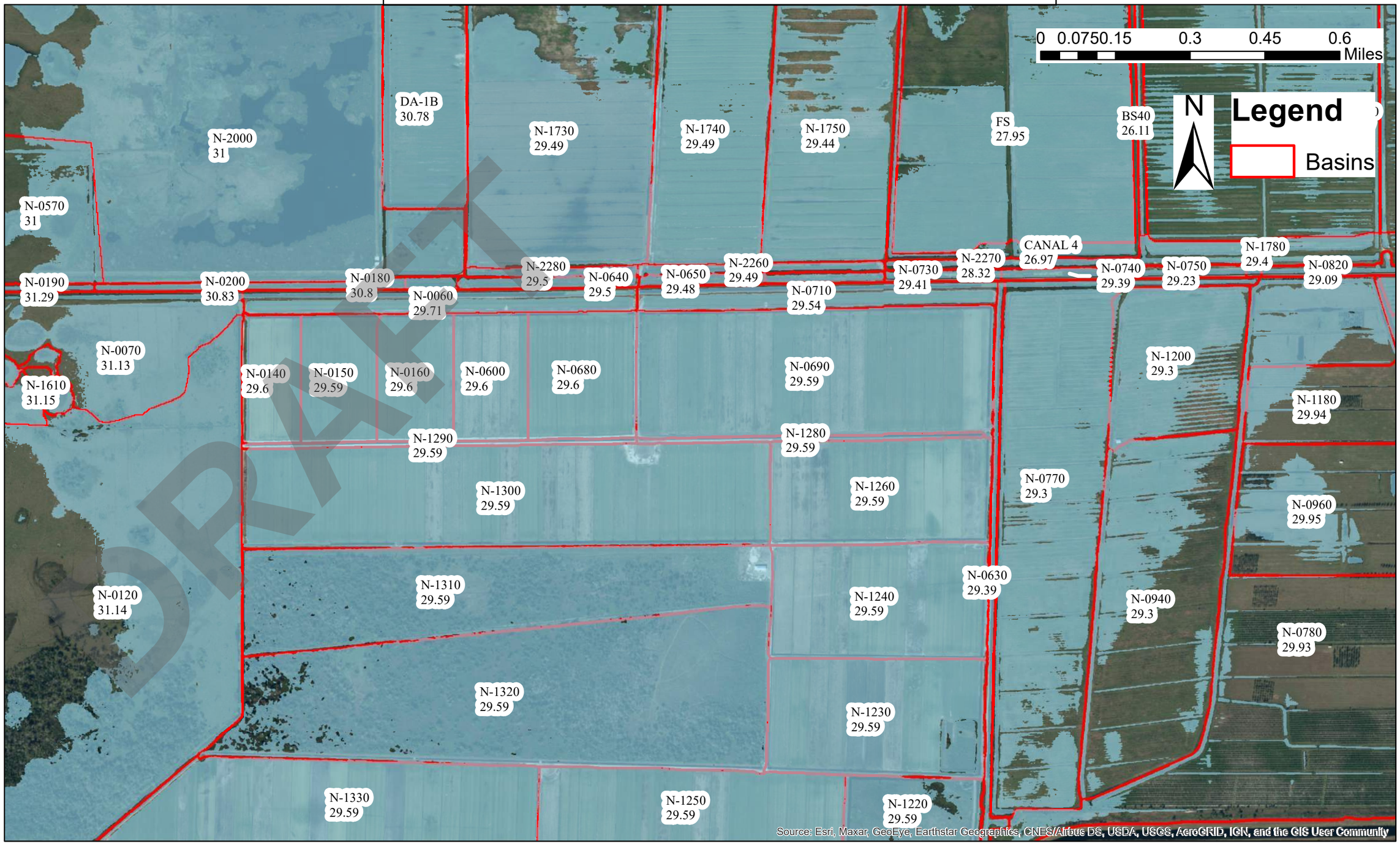
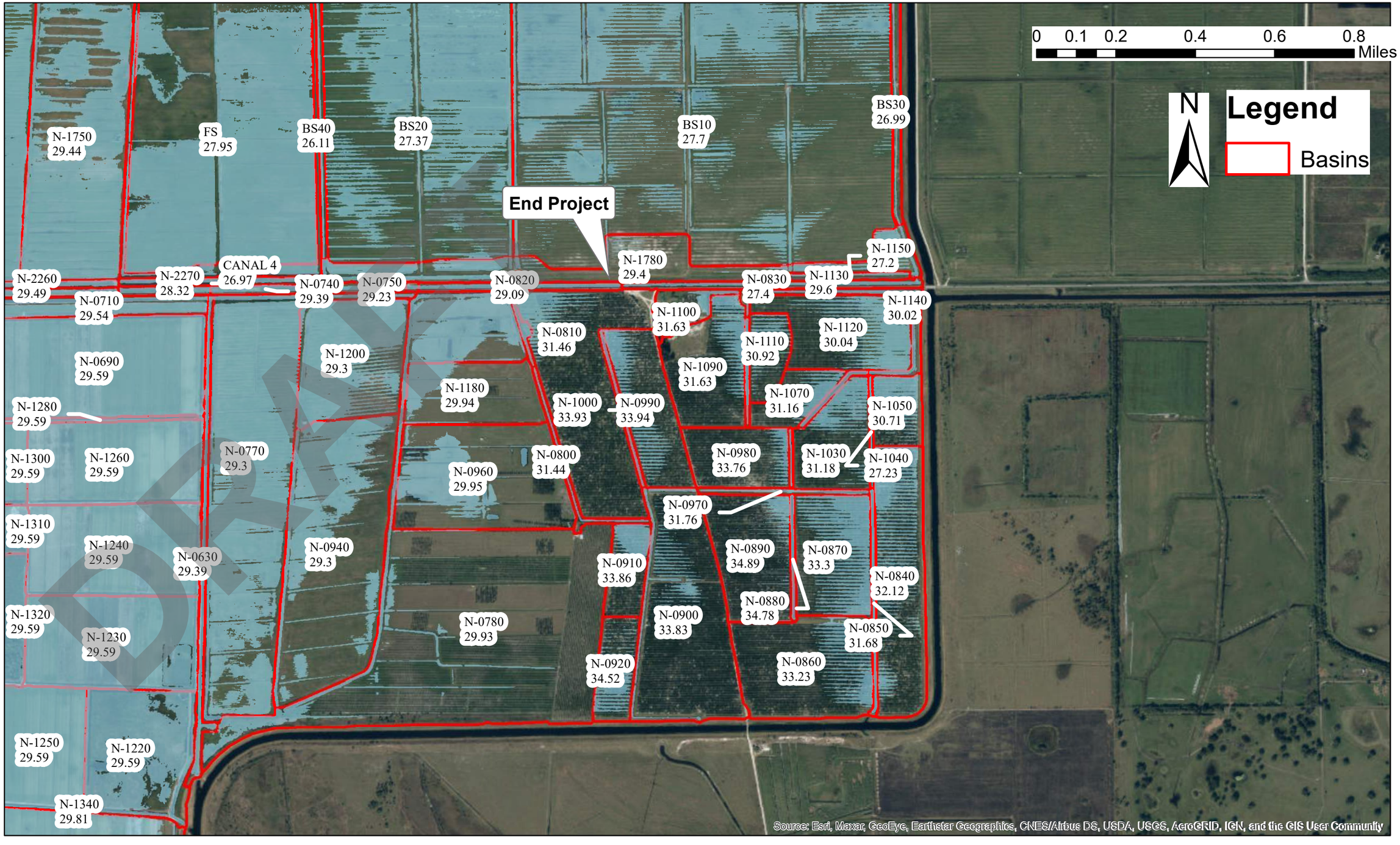


Proposed Condition Floodplain ROW: 100-YR/24-HR



Floodplain Compensation Calculations

STAGE STORAGE CALCULATIONS - FPC 1A/B

Compensation

	ELEV.	AREA (AC)	AVG AREA (AC)	DELTA (FT)	DELTA STORAGE (AC-FT)	SUM STORAGE (AC-FT)
Top	40.00	19.00				127.51
			18.40	0.70	12.88	
100 YR	39.30	17.8				114.63
			17.64	6.50	114.63	
Bottom	32.80	17.47				0.00

R/W area = 18.8 AC.

STAGE STORAGE CALCULATIONS - FPC 2A/B

Compensation

	ELEV.	AREA (AC)	AVG AREA (AC)	DELTA (FT)	DELTA STORAGE (AC-FT)	SUM STORAGE (AC-FT)
Top	35.00	31.50				124.13
			31.13	3.50	108.94	
100 YR	31.50	30.75				15.19
			30.38	0.50	15.19	
Bottom	31.00	30				0.00

R/W area = 61.7 AC.

STAGE STORAGE CALCULATIONS - Expand Channel

Compensation

Base Width Added (ft.)	Depth (ft.)	Length (ft.)	Volume (ft^3)	Added Storage (ac-ft)	
35.00	1.50	19000	997500	22.9	

total Comp. from FPC and Canal

152.71