

POND SITING REPORT ADDENDUM

Florida Department of Transportation

District One

Harborview Road

Limits of Project: From Melbourne Street to I-75

Charlotte County, Florida

Financial Management Number: 434965-2-32-01

ETDM Number: 5351

Date: September 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.

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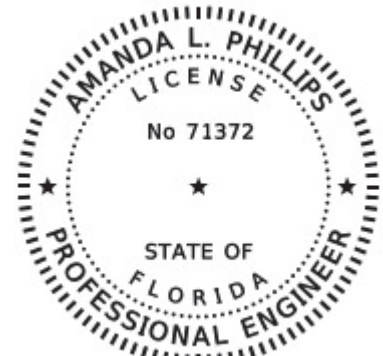
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Executive Summary

The Florida Department of Transportation (FDOT) District One, along with Charlotte County, is proposing improvements to Harborview Road (CR 776) in Charlotte County. The project limits begin just west of Melbourne Street and end just west of I-75, located within Section 25, Township 40S, Range 22E and Sections 20, 29, and 30, Township 40S, Range 23E. Improvements include widening from a two-lane undivided to a four-lane divided highway. This includes construction of two roundabouts one at the intersection of Melbourne Street and the other at the intersection of Frontage Road. The total length of the project is approximately 2.3 miles.

This report identifies Stormwater Management Facility (SMF) alternatives and recommends locations that are hydraulically feasible and environmentally permissible based on the best available information. Potential SMF site locations were analyzed and evaluated for:

- Economic Factors including the acquisition of right-of-way (R/W)
- Hydrology
- Hydraulics and floodplains
- Cultural assessment
- Contamination screening
- Environmental assessment

The PD&E project area consisted of six drainage basins, ending at the entrance to the Charlotte County East Port Environmental Campus, all of which are open basins. Preliminary design pushed the corridor further east adding a seventh basin. There are cross drain outfalls associated with each basin which will be utilized for discharge points for the project.

This report is an addendum to the Final Pond Siting Report. Pond 2D was added as a pond alternative site for Basin 2. Pond 2D and Pond 1-2B are the recommended SMF sites for Basin 2.

Basin 1 extends from 55+00 to 70+60, Melbourne Street to approximately DeLeon Drive. This basin consists of a closed storm drain system along with an open system of roadside swales. The storm drain system flows to an existing SMF then to the 9' x 4' CBC west of Cortez Drive. Swales from this basin discharge to this CBC as well as the double 6' x 5' CBC east of DeLeon Drive.

Basin 2 is from 70+60 to 93+60, DeLeon Drive to approximately Oak View Drive. Within the limits of this basin, runoff sheet flows off the roadway to roadside swales and flows west. There are side drains located under driveways and side streets, which maintain conveyance. The outfall for this basin is the double 6' x 5' CBC east of DeLeon Drive.

Basin 3 is from 93+60 to 115+71, Oak View Drive to approximately Date Street. Within the limits of this basin, runoff sheet flows off the roadway to roadside swales then flows east. There are side drains located under driveways and side streets, which maintain conveyance. The outfall for this basin is the double 24" cross drain west of Mary Lu Mobile Home Park which discharges through the mobile home park by way of a ditch.

Basin 4 is from 115+71 to 152+00, Date Street to approximately Purdy Drive. Within these limits, runoff sheet flows off the roadway to roadside swales and flows east. There are side drains located under driveways and side streets, which maintain conveyance. The outfall for this basin is the 10' x 7' CBC east of Purdy Drive over Rampart Canal.

Basin 5 is from 152+00 to 165+00, the CBC east of Purdy Drive to approximately 150 feet west of the Charlotte County East Port Environmental Campus. Within the limits of this basin, runoff sheet flows off the roadway to roadside swales. There are side drains located under driveways, which maintain conveyance. The outfall for this basin is the both the 10' x 7' CBC east of Purdy Drive and the 24" cross drain west Charlotte County East Port Environmental Campus.

Basin 6 is from 165+00 to 168+00, 150 feet west of the Charlotte County East Port Environmental Campus to the entrance of the campus. Roadway runoff within this basin sheet flows to roadside swales. The outfall for this basin is the 24" cross drain approximately 150 feet west of the entrance to the Charlotte County East Port Environmental Campus.

Basin 7 is from 168+90 to 178+50, the Charlotte County East Port Environmental Campus entrance to the end of the project, approximately 1150 feet east of the campus entrance. The outfall for this is an existing double 12' x 5' bridge culvert that this project has no impact on.

There will be encroachments into the 100-year riverine floodplain along the outfall locations. However an encroachment into the riverine floodplain will be analyzed by development of the County's Charlotte Harbor Model for the west end from Melbourne Street to Oakview Drive. An additional model will be constructed to determine the impacts for the east end of the project from Oakview Drive to west of I-75. Per the SWFWMD pre-application meeting, on September 17, 2019, SWFWMD will accept a detailed model in lieu of equivalent compensating storage for the 100-year 24-hour riverine floodplain impacts. These models will be used as a tool for determining the 100-

year riverine floodplain extents. By utilizing the model, it will be demonstrated that there will be no adverse impacts to the 100-year riverine flood elevations and therefore no Floodplain Compensation sites. The following table identifies the preferred pond site alternatives along with other environmental impacts and total cost.

Pond Qualifiers	Preferred Alternatives			
Basins	1 and 2	1 and 2	3	4
	SMF 1-2B	SMF 2D	SMF 3C	SMF 4B
Location (Station CL Survey)	72+20	76+50	109+00	150+00
Side (Lt, Rt)	LT	LT	LT	LT
SMF Area (Ac)	1.04	0.89	1.29	0.89
Est Ground Elev (ft) At SMF Site	3.00	3.00	8.00	4.00
Proposed LEOP Within Basin	6.60	6.60	7.50	6.5
Control Elevation /Est SHWT Elev	2.3	2.3	5.3	1.4
Basin Hydrology	Open	Open	Open	Open
Treatment System	Wet Detention	Wet Detention	Wet Detention	Wet Detention
Soils Name	Myakka fine sand-Urban land complex, 0 to 2 percent slopes	Myakka fine sand-Urban land complex, 0 to 2 percent slopes	Daytona sand-Urban land complex	Immokalee sand-Urban land complex
Hydrological Soil Group	A/D	A/D	A/D	B/D
Land Use	Open Land	Open Land	Residential, Low Density	Open Land
Recorded Archaeological Sites	TBD	TBD	TBD	TBD
Archaeological Potential	TBD	TBD	TBD	TBD
Recorded Historical Structures	TBD	TBD	TBD	TBD
Recorded Historical Resources	TBD	TBD	TBD	TBD
4(f) Property	No	No	No	No
Tentative Hazard Ranking	No	No	Medium	No
Protected Species Probability	Low	No	Medium	Medium
Potential Wetland/OSW Involvement	Low	No	No	No
Proximity to Inflow (ft)	75	75	200	75
Proximity to Outfall (ft)	75	75	300	75
SMF Easement Required	No	No	Yes	No
Number of Parcels	1	1	1	1
Partial (P) or Whole Take (WT)	P	WT	P	P
Recommended SMF Location In PD&E	Yes	Yes	No	No
Wetland Mitigation Cost	\$9,435	\$0.00	\$0.00	\$0.00
Pond Construction Costs	\$246,329	\$241,054	\$742,848	\$355,694
ROW Cost Estimate	\$568,000	\$2,848,500	\$597,000	\$415,000
TOTAL ESTIMATED COSTS	\$823,764	\$3,089,554	\$1,339,848	\$770,694

Pond Qualifiers	Preferred Alternatives
Basins	5 and 6
	SMF 5-6C
Location (Station CL Survey)	164+60
Side (Lt, Rt)	LT
SMF Area (Ac)	0.39
Est Ground Elev (ft) At SMF Site	5.00
Proposed LEOP Within Basin	6.60
Control Elevation /Est SHWT Elev	3.0
Basin Hydrology	Open
Treatment System	Wet Detention
Soils Name	Immokalee sand-Urban land complex
Hydrological Soil Group	B/D
Land Use	Utilities
Recorded Archaeological Sites	TBD
Archaeological Potential	TBD
Recorded Historical Structures	TBD
Recorded Historical Resources	TBD
4(f) Property	No
Tentative Hazard Ranking	No
Protected Species Probability	Medium
Potential Wetland/OSW Involvement	No
Proximity to Inflow (ft)	75
Proximity to Outfall (ft)	75
SMF Easement Required	No
Number of Parcels	1
Partial (P) or Whole Take (WT)	P
Recommended SMF Location In PD&E	Yes
Wetland Mitigation Cost	\$0.00
Pond Construction Costs	\$116,104
ROW Cost Estimate	\$127,000
TOTAL ESTIMATED COSTS	\$243,104

This Pond Siting Report (PSR) is preliminary and used as an engineering tool to identify potential SMF sites utilizing an alternatives methodology. These facilities are designed to handle nutrient load criteria by utilization of side bank filters. The recommendations are generated using highly variable factors. The SMF site locations are screened using preliminary information based upon many assumptions and judgments. The calculations presented in this report are preliminary and help in estimating the preliminary size of the SMF for each basin. The SMF sizes and the basin limits of the basin associated with each SMF are subject to change throughout the preliminary engineering and project design phases. This project design utilizes the NAVD 1988 Datum. The conversion to NAVD 88 = NGVD 29 – 1.129 feet.

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1. General Project Information

1.1. Introduction

The Florida Department of Transportation (FDOT) District One, along with Charlotte County, is proposing improvements to Harborview Road (CR 776) in Charlotte County. Refer to **Figure 1-1** for the Project Location Map. The project limits begin just west of Melbourne Street and end just west of I-75, in Charlotte County, Florida. The total project length is approximately 2.3 miles. Improvements include widening the roadway from a two-lane undivided rural roadway to a four-lane divided urban roadway.

This report identifies Stormwater Management Facility (SMF) alternatives and recommends locations for each drainage basin that are hydraulically feasible and environmentally permissible based on the best available information. Potential SMF sites were analyzed and evaluated for:

- Economic factors including acquisition of right-of-way (R/W)
- Hydrology
- Hydraulics and floodplains
- Cultural assessment
- Contamination screening
- Environmental assessment

SMF sizes may vary in the final design phases after more geotechnical, right-of-way and design data becomes available. Design of the SMF sites is governed by criteria that pertains to water quality treatment, water quantity attenuation, and recovery requirements as required by FDOT and the Southwest Florida Water Management District (SWFWMD). The SMF alternative locations are shown on the Harborview Road (CR 776) Pond Locations in **Appendix A**.

A Project Development and Environment (PD&E) Study, FPID 434965-1, was performed from Melbourne Street to I-75 in August 2018. One pond site alternative was evaluated for each of the six basins. The ponds were sized to meet the requirements of FDOT and Southwest Florida Water Management District (SWFWMD) and provide treatment for the total on-site impervious area as well as nutrient removal through the use of Upflow Filters, the PD&E ponds did not include attenuation. The purpose of the PD&E study was to provide the Department the total right of way acquisition for each pond site in acres and the associated costs for acquiring the pond site. This pond siting report, FPID 4345965-2, will evaluate each PD&E pond site alternative within the project limits. This PSR

analysis will determine if the PD&E pond sites are viable options, however, sizes have been revised due to the nutrient loading calculation method of Side Bank Filters used for this report.

This PSR is preliminary and used as an engineering tool to identify potential SMF sites utilizing an alternatives methodology. The recommendations are generated using highly variable factors. The SMF site locations are screened using preliminary information based upon many assumptions and judgments. The calculations presented in this report are preliminary and help in estimating the preliminary size of the SMF for each basin. The SMF sizes and the basin limits of the basin associated with each SMF are subject to change throughout the preliminary engineering and project design phases

1.2. Site Locations and Descriptions

Harborview Road is classified as an urban minor arterial from Melbourne Street to west of I-75, and the existing right-of-way width is 80 feet for the majority of the project limits. Harborview Road is a two-lane undivided roadway with 12-foot travel lanes, no paved shoulders, and an open drainage system. There are no pedestrian or bicycle facilities within the project limits, except for sidewalks from Melbourne Street to east of Rolls Landing. The posted speed limit is 45 mph but is reduced to 35 mph within the three horizontal curves. The project limits are within the following section, township, and range in Charlotte County, Florida: Sections 20, 21, 25, 29, and 30 Township 40 S, Range 22, and 23 E. The location of the project can be found on the Project Location Map in **Figure 1-1**. Currently Harborview is a two-lane facility, the proposed typical is the development of a four-lane divided roadway with 11-foot travel lanes, curb and gutter along the inside and outside edges of pavement, and a 19.3-foot grassed median. A 10-foot shared use path will accommodate pedestrian and bicycle traffic along the corridor as indicated in **Figure 1-2**. This project also includes construction of two roundabouts one at the intersection of Melbourne Street and the other at the intersection of Frontage Road west of I-75.

Figure 1-1 Project Location Map

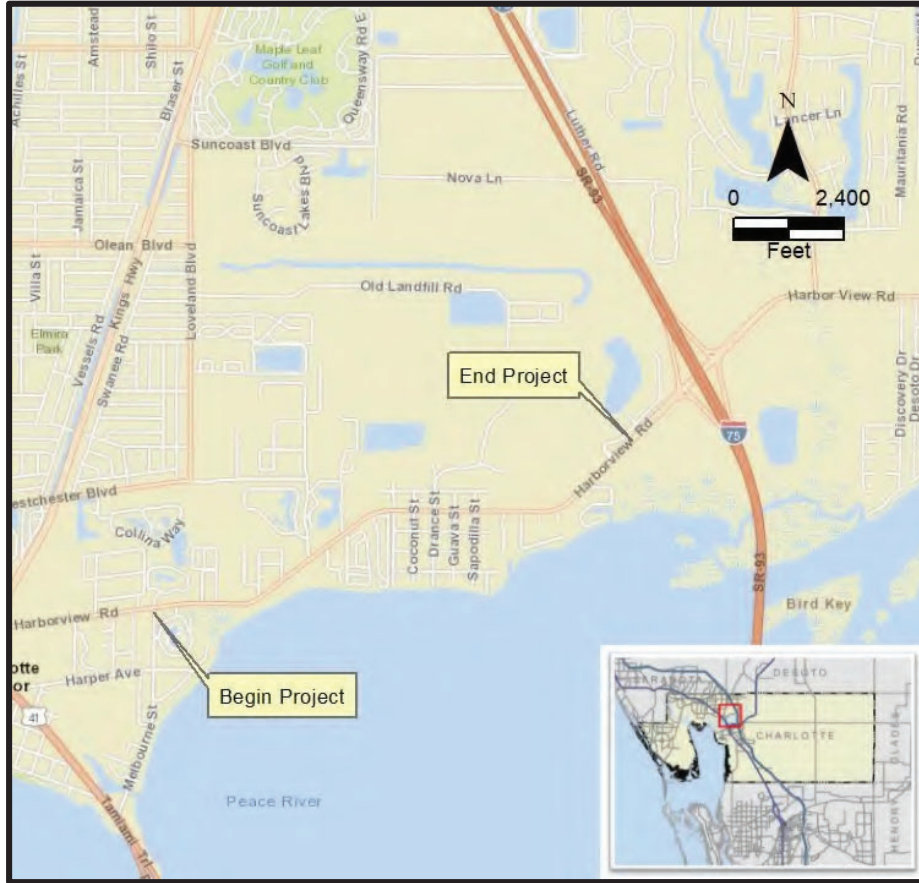
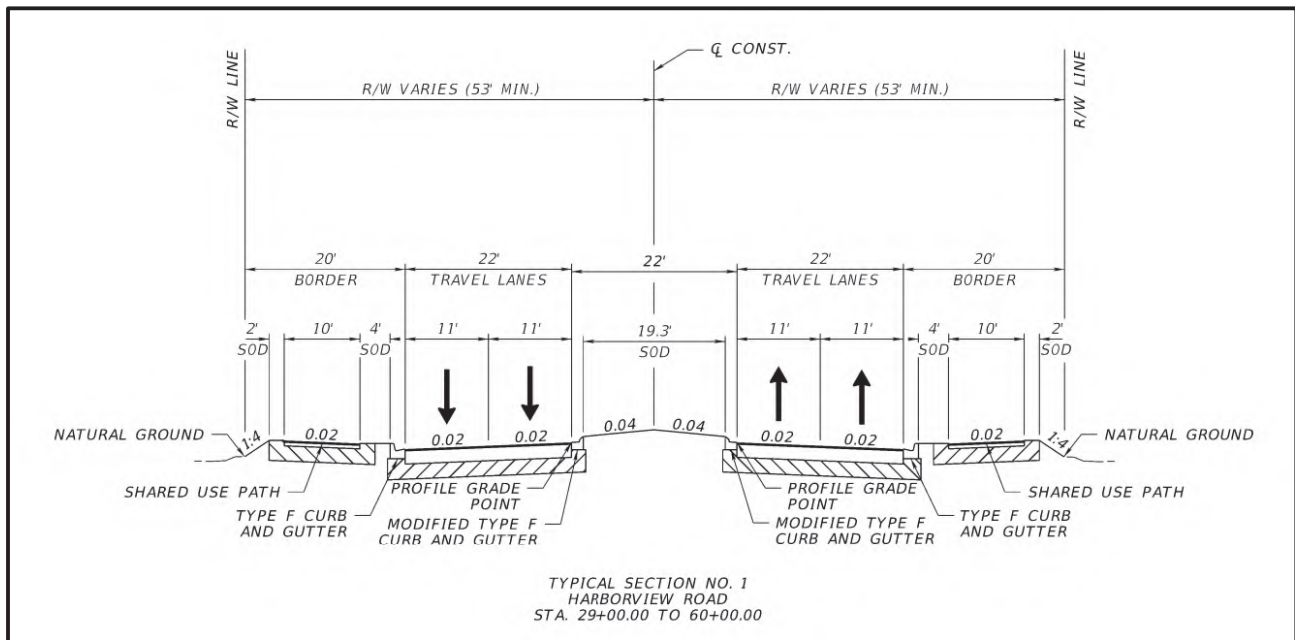


Figure 1-2 Proposed Roadway Typical Section – Harborview Road



1.3. Soil Characteristics

The soils within the limits of the project are categorized according to the Soil Survey of Charlotte County, Florida, 2020, United States Department of Agriculture (USDA). Which can be found in **Appendix B**. The soils along and adjacent the Harborview Road alignment are generally characterized as poorly drained fine sands. The predominant soil types consist of Immokalee (sand), Daytona (sand), Myakka (fine sand), and Oldsmar (sand). See **Table 1-1** for SCS Symbol and depth to Seasonal High-Water Table (SHWT). For purposes of establishing SCS curve numbers, when a dual Hydrologic Soil Group (HSG) rating was used for these soil types the undrained HSG D condition was utilized. Tierra, Inc. performed soil borings along the project corridor. For specific geotechnical data, refer to **Appendix B**. See **Figure 1-3** for the Soil Location Map.

Table 1-1 Predominant Soil Types

Unit Name	Unit Number	Hydrologic Soil Group	Depth to SHWT (inches)
Immokalee sand-Urban land complex	36	B/D	12
Daytona sand-Urban land complex	106	A	50
Myakka fine sand-Urban land complex	123	A/D	12
Oldsmar sand-Urban land	125	A/D	12

Figure 1-3 Soil Location Map



1.4. Floodplain Information

The latest Federal Emergency Management Agency (FEMA) Flood Insurance Rate Maps (FIRM) of Charlotte County were used to identify potential floodplain and floodway encroachments associated with the proposed roadway improvements. According to the FIRM Map Number 12015C0233G and 12015C0231G for the Unincorporated Areas of Charlotte County, dated Preliminary 10/25/2019, the roadway project is inundated by the 100 Year Base Flood limits for Coastal flooding with an NAVD 88 elevation of ten (10). However, an encroachment into the riverine floodplain will be analyzed by development of the County’s Charlotte Harbor Model for the west end from Melbourne Street to Oakview Drive. The model will be augmented to determine the impacts for the east end of the project from Oakview Drive to west of I-75. Copies of the FIRM maps can be found in **Appendix C**.

2. Drainage Reference and Resource Information

2.1. Field Review/Pre-Application Meeting

Site visits and research have been performed to develop a better understanding of the existing drainage patterns within the Harborview Road corridor. Documentation, sketches, and photographs were taken in the field so that this data may be referenced during the design process. Determining the existing drainage patterns was necessary to develop the initial drainage design concepts to manage stormwater runoff within the project limits.

A. pre-application meeting was held with SWFWMD on 09/17/2019, to discuss general permitting issues involving the project. The purpose for this meeting was to inform SWFWMD of the design approach in terms of stormwater management and to receive a conceptual agreement from the water management district. This meeting allowed Atkins staff to establish design criteria and methods necessary to adequately manage stormwater within the project limits. A copy of the meeting notes is provided in **Appendix D** of this report.

2.2. Curve Numbers

The Hydrologic Soil Group (HSG) rating varies between A, A/D and B/D. The Type A HSG is between Laverne Street and Mary Lu Mobile Home Park. The remainder of the corridor has a dual HSG both Type A/D and B/D. For these areas a Type D will be utilized to determine the curve number. The following table summarizes the curve numbers that were used to perform calculations for the hydrologic discharge rates and to model the hydraulics of the proposed stormwater management systems. These curve numbers are from the Drainage Design Guide, Table B-7, and B-8.

Table 2-1 Curve Number

Land Use	HSG	Curve Number
Water	N/A	100
Streets and Roads	A and D	98
Residential Area, 1 acre (20% Imp)	A	51
Residential Area, 1 acre (20% Imp)	D	84
Open Space, good condition / Roadway right-of-way Area	A	39
Open Space, good condition / Roadway right-of-way Area	D	80
Woods, good cover	A	25
Woods, good cover	D	77

2.3. Design Resources

The following is a listing of the references and resources utilized during the preparation of this report.

- FDOT Drainage Manual, Dated January 2023.
- FDOT Design Guide, Dated January 2023.
- Lidar Contours, 2006.
- United States Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS) Soil Survey of Hillsborough County, Florida.
- Federal Emergency Management Agency (FEMA) FIRM.
- Geotechnical Investigation provided by Tierra, Inc.
- SWFWMD Environmental Resource Permit Applicant's Handbook, 2018.
- PD&E Study by Aim Engineering, 2019
- Charlotte Harbor Model, 2019.
- Field Reviews conducted by Atkins Staff, 2019/20.

This project design utilizes the NAVD 1988 Datum. The conversion to NAVD 88 = NGVD 29 – 1.129 feet.

2.4. Design Criteria

SMF sites were sized and located based on the following considerations: roadway alignment, existing storm sewer, open/closed basin criteria, hydraulic constraints, surrounding topography, and SHWT.

The following drainage criteria is prepared to satisfy the FDOT and regulating agencies, such as SWFWMD, United States Army Corps of Engineers (USACOE), and Environmental Protection Agency (EPA). A Pre-application meeting was held with SWFWMD to discuss the project and requirements for permitting. A preliminary pond siting review meeting was held with FDOT staff to discuss general drainage design approach. The meeting minutes are provided in **Appendix E**.

Conveyance: Roadway runoff will be collected in an enclosed storm drain system and roadside swales and discharged into a proposed SMF.

SHGWT: SHGWT elevations were estimated from NRCS Soil Survey maps, geotechnical borings, culvert stain lines and biological indicators in the adjacent wetland. The Summary of Seasonal High Groundwater Table Estimates provided by Tierra can be found in **Appendix F**.

Tailwater Conditions: Roadway runoff from Harborview Road drains via roadside ditches to cross drains. All proposed SMF's discharge to open basins. The tailwater elevation at each cross drain is based on seasonal high water stain lines, high water indicator stain lines, biological indicators in adjacent wetlands, and geotechnical borings.

Table 2-2 Tailwater Conditions

CD #	STATION	CULVERT STAIN LINE ¹ Elevation	BIOLOGICAL SHW ² And MHW Elevation	Stormwater Management Facility
CD-1	63+68	TBD	SHW / 1.678	N/A
CD-2	70+90	TBD	MHW /LT – 3.349 RT – 4.553	SMF 1-2B
CD-3	108+10	TBD		SMF 3C
CD-4	152+22	TBD	MHW /LT – 0.673 RT – 0.417	SMF 4B
CD-5	165+30	TBD		SMF 5-6C

¹ The Seasonal Highwater Elevation shown in the table for the culvert stain lines represents the predominant stain line measured from the top of the headwall and is only an estimate.

² The Biological Seasonal Highwater Elevation shown in the table were performed by an environmental scientist and field work performed on September 24, 2021.

The Charlotte Harbor Model will be utilized to evaluate the 100-year floodplain. The tailwater curves from the model will be utilized as a tailwater condition in the drainage design phase. Seal level rise will be taken into account as well.

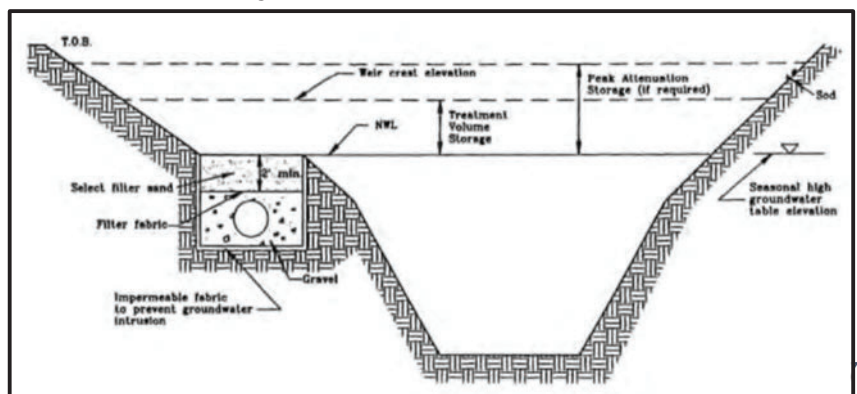
Attenuation: Only Basin 3 for the pond siting report analysis will be designed to store the difference between the pre and post runoff since it discharges through a ditch in the middle of Mary Lu Mobile Home Park. In the drainage design phase, all other proposed SMF's will meet the discharge rate requirement of the 25-year 24-hour FLMOD storm event with no overtopping of the pond for the 100-year 24-hour FLMOD storm event.

Pond Geometry: The ponds are assumed to be square ponds with 20-foot maintenance berms. All meet the one foot of freeboard from the inside top of bank required per Section 5.4.4.2 of the Drainage Manual. The side slopes are 1:4, with side bank filters, and a maintenance berm being 1:20. The pond bottom was set based on the size of the treatment volume with a depth of six feet below SHGWT.

Water Quality: Stormwater treatment for this project is wet detention. Per SWFWMD criteria, the wet detention ponds require the treatment of runoff from the first 1.0-inch over the directly connected impervious area (DCIA) for the Harborview Road R/W. For this project the DCIA utilized is the total of additional pavement. The multiuse path was included as part of the water quality treatment calculations for the suburban and rural typical.

There are two WBID's, 2056E (Sunrise Waterways) and 2056B (Middle Peace River Estuary) that are delisted and verified impaired for dissolved oxygen and/or nutrients, respectively. Although the project is wholly located in WBID 2056E the SWFWMD has taken the position the project does not discharge to the Sunrise Waterways but directly to Middle Peace River Estuary and therefore required to meet impaired WBID conditions. Nutrient Loading calculations are provided to demonstrate that a net improvement of the annual mass loadings of Total Nitrogen (TN) and Total Phosphorus (TP) will be accomplished for each WBID. The BMP Trains calculations using a side bank filter system, **Figure 2-1**, are located in **Appendix G**.

Figure 2-1 Side Bank Filter System



3. Existing Drainage Characteristics

3.1. Watershed Descriptions

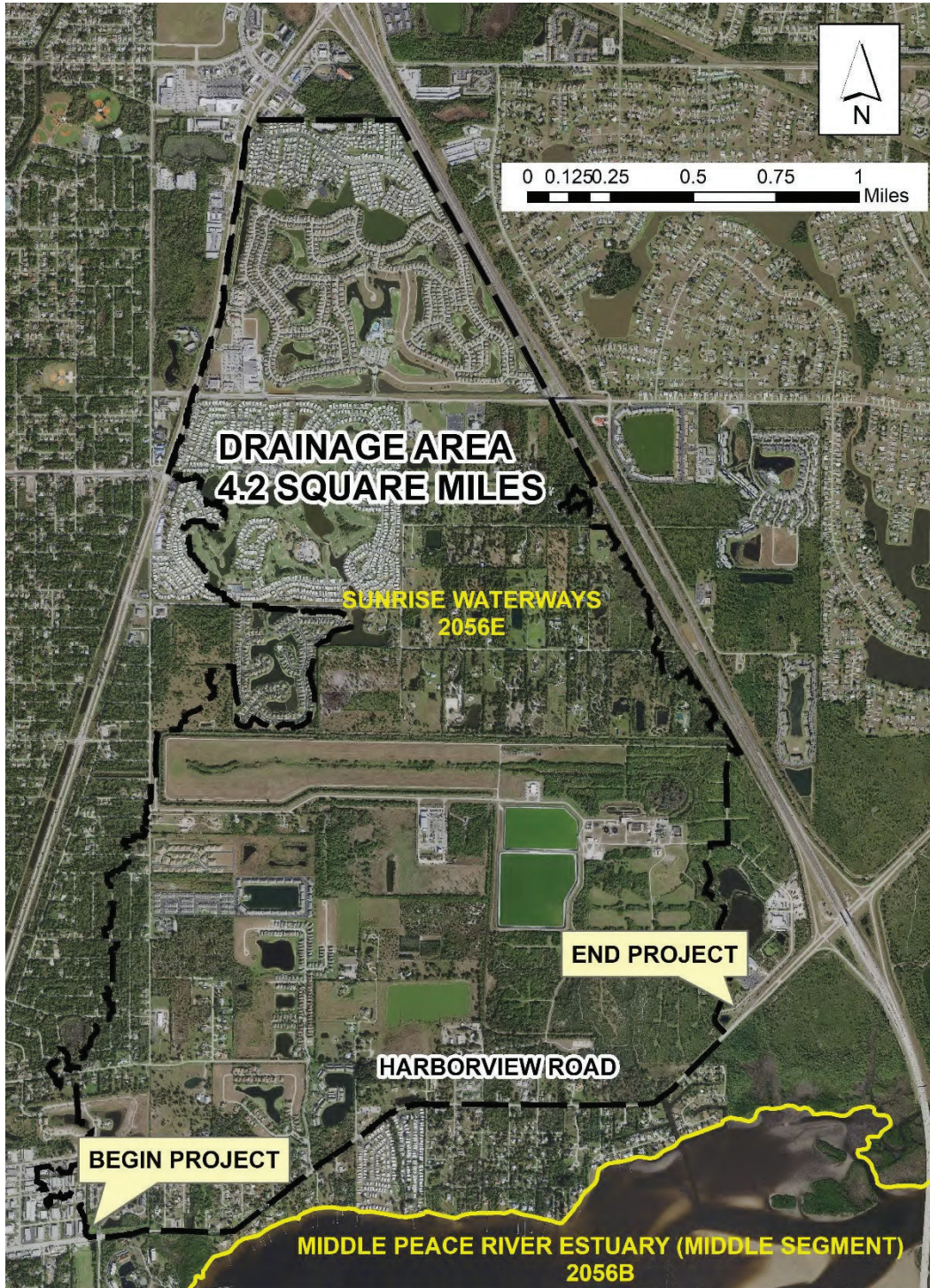
The Sunrise Waterways Watershed (WBID 2056E) boundary contains approximately 34 square miles of area. The basin is located north of the Middle Peace River Estuary (WBID 2056B). The 4.2 square mile area between Kings Highway to the west, and I -75 to the east, constitute the project basin that drains to and through Harborview Road. The overall topography for the project basin slopes from north to south and flows to the Peace River, then Charlotte Harbor which ultimately outfalls to the Gulf of Mexico. See **Figure 3-1** for an aerial depicting the Existing Harborview Basin and WBID.

Within the watershed there are numerous housing developments with stormwater management facilities (SMF), manmade canals, and tributaries that flow to the five cross drains under Harborview Road. There are seven basins within the project limits that flow to roadside ditches that carry surface water to these cross drains as well. There are five cross drains within the project limits which drain north to south. The existing cross drains located within in the project limits are presented in **Table 3-1**. Cross drain locations can be found in the Harborview Road (CR 776) Pond Locations in **Appendix A**.

Table 3-1 Cross Drains

Cross Drain # (PD&E)	Cross Drain # (CR 776 Design Project)	C/L Station	Size Based on Survey	Flow Direction	Outfall
CD-1	CD-1	63+68	9' X 4'	North to South	Peace River
CD-2	CD-2	70+90	DBL 6' X 4.5'	North to South	Peace River
CD-3	CD-3	108+10	DBL 24"	North to South	Peace River
CD-4	CD-4	152+22	10' X 7'	North to South	Peace River
CD-5	CD-5	165+30	24"	North to South	Peace River

Figure 3-1 Existing Harborview Basin



3.2. Seasonal High Water Table Elevations

The estimated SHWT elevations based on geotechnical data collected for the SMF sites are provided in **Table 3-2**. The pond borings done by Tierra are in the Summary of Seasonal High Groundwater Table Estimates in **Appendix F**.

The information used to derive the elevations includes geotechnical data provided by Tierra Inc., the NRCS Soils Survey for Charlotte County and culvert stain lines. Geotechnical investigations will also be performed during the design phase to confirm soil characteristics and seasonal high water table elevations at each preferred SMF site. The pond control elevation used in the PSR analysis is the average SHGWT established by the geotechnical analysis for seasonal high water and provided in **Table 3-2**.

Table 3-2 Geotechnical SHGWT / SMF Control Elevations

SMF Alternative	SHGWT - EL (Geotechnical)	Average SHGWT - EL	Remarks
1A	2.1	2.4	
1B	2.4		
1C	2.7		
1-2A & 2A	>1.8	2.3	1-2A, 1-2B, and 2D include Basin 1 and Basin 2
1-2B & 2B	>2.3		
2C	2.6		
2D	1.8		
3A	5.5	5.2	
3B	4.8		
3C	5.3		
4A	2.2	1.8	
4B	1.4		
5A	1.7	2.1	Includes Bains 5 and Basin 6
5B	1.6		
5C	3.0		

3.3. Existing Wetlands

Wetlands within the vicinity of the project are confined primarily to the cross drain areas. These are basically riverine and estuarine from the Peace River adjacent to the project. There are some other surface waters (OSWs) which are generally roadside swales. The wetland areas are identified in the Threatened and Endangered Species (T&E) and Wetlands Assessment for Pond Siting in **Appendix H**.

3.4. Existing Permits

As previously mentioned within the watershed there are numerous housing developments with stormwater management facilities (SMF), however, the existing roadway is not covered by a SWFWMD permit.

4. Proposed Drainage Design

4.1. Stormwater Management Design Approach

The proposed drainage system has been developed to provide stormwater management for the widening of Harborview Road. Currently, almost all project runoff is directed into the roadway ditches that outfall directly into the receiving. The purpose of this section is to describe the drainage approach to effectively collect and convey roadway runoff for the proposed improvements.

All ponds have been designed to provide the necessary SWFWMD water quality and quantity requirements where applicable. The downstream boundary conditions for all basins is the Peace River. The Peace River is tidally influenced for this project eliminating the need for attenuation. However, Sea Level Rise will be evaluated during the modeling of the pond outfall. The Sea Level Rise of 6.5 inches for a 50-year design is provided in **Appendix I**. Only Basin 3 will provide attenuation due to its outfall through the Mary Lu Mobile Home Park. The stormwater management for Basin 6 will be included in the pond located in Basin 5. Basin 7 will require no stormwater management based on the pre impervious area being more than the post impervious area.

4.1.1. Basin 1

Basin 1 extends from 55+00 to 70+60, Melbourne Street to approximately DeLeon Drive. The runoff from this basin will be collected in a storm drain system and discharge to the 9' x 4' CBC west of Cortez Drive as well as the double 6' x 5' CBC east of DeLeon Drive. The water quality stormwater management for this basin will be compensated for in Basin 2.

4.1.2. Basin 2

Basin 2 is from 70+60 to 93+60, DeLeon Drive to approximately Oak View Drive. Within the limits of this basin the runoff will be collected in a storm drain system and carried to Pond 1-2B and Pond 2D. Pond 1-2B and Pond 2D will be connected with an equalizer pipe. This pond will provide water quality stormwater management for Basin 1 and 2. The outfall for this basin is the double 6' x 5' CBC east of DeLeon Drive that flows to a tidal marsh on the south side of Harborview Road.

4.1.3. Basin 3

Basin 3 is from 93+60 to 115+71, Oak View Drive to approximately Date Street. The runoff from this basin will be collected in a storm drain system and carried to Pond 3C. This pond will provide water

quality and quantity stormwater management since the discharge location for this pond is a 24" cross drain which flows to a residential ditch through Mary Lu Mobile Home Park.

4.1.4. Basin 4

Basin 4 is from 115+71 to 152+00, Date Street to approximately Purdy Drive. This basin has the longest stormdrain system. Runoff from this basin will be collected in a storm drain system and discharge to Pond 4B. This facility will provide water quality stormwater management and discharge to the tidal Rampart Canal 10' x 7' CBC east of Purdy Drive and flow to the Peace River.

4.1.5. Basin 5

Basin 5 is from 152+00 to 165+00, the CBC east of Purdy Drive to approximately 150 feet west of the Charlotte County East Port Environmental Campus. Within the limits of this basin the runoff will be collected in a storm drain system and carried to Pond 5-6C. This facility will provide water quality stormwater management and discharge to a proposed cross drain west of Charlotte County East Port Environmental Campus. This marsh flows to the Peace River.

4.1.6. Basin 6

Basin 6 is from 165+00 to 168+90, 150 feet west of the Charlotte County East Port Environmental Campus to the entrance of the campus. The roadway runoff within this basin will be collected in a storm drain system and carried to Pond 5-6C. The SMF for this basin was deleted after our meeting with District 1. The minutes of that meeting can be found in **Appendix E**.

4.1.7. Basin 7

Basin 7 is from 168+90 to 178+50, the Charlotte County East Port Environmental Campus entrance to the end of the project, approximately 1150 feet east of the campus entrance. The outfall for this is an existing double 12' x 5' bridge culvert that this project has no impact on. Basin 7 will require no stormwater management based on the pre impervious area being more than the post impervious area.

5. Environmental Evaluation

Wetland involvement was evaluated by reviewing aerial imagery and pertinent available data sources including soils data from the U.S.D.A Natural Resources Conservation Service (NRCS), 2011 Florida Land Use Cover and Forms Classification System (FLUCFCS) data from the

SWFWMD, the U.S. Fish and Wildlife Service (USFWS) National Wetlands Inventory (NWI), and information presented in the Project Development and Environment (PD&E) report.

5.1. Jurisdictional Wetland Involvement

Wetlands within the vicinity of the project are confined primarily to the outfall pipe locations for Basin 1, Basin 2, Basin 4, and Basin 5, while other surface waters (OSW) include a few roadside ditches along the corridor.

Impacts to wetlands and OSWs are anticipated to have no net adverse effect on the ecosystem, as the swale and ditch impacts are likely to be temporary (depending on the extent to which the swales and ditches are relocated), and any unavoidable impacts to wetlands will be compensated offsite in accordance with SWFWMD and USACE criteria.

Sites with wetlands are identified depending on how much of the site is wetland. A rating of “No” means 0 percent (%); a rating of “Low” is assigned for percentages between 1 and 24%; a “Medium” rating is for wetland composition between 25 and 49%; and a “High” rating is for assigned to any pond site with wetland composition equal to or greater than 50%. A copy of the Threatened and Endangered Species (T&E) and Wetlands Assessment for Pond Siting can be found in **Appendix H**.

5.2. Cultural Resources

The study methodology included a review of the previous Harborview Road CRAS and pond memo, the Florida Master Site File (FMSF), and the NRHP. A review of relevant historic United States Geological Survey (USGS) quadrangle maps, historic aerial photographs, and the Charlotte County property appraiser’s website.

Based on the results of the background research and field investigations, no archaeological sites or historic resources that are listed, eligible, or that appear potentially eligible for listing in the NRHP are located within the Area of Potential Effects (APE). Therefore, the proposed ponds will result in no historic properties affected. A copy of the Cultural Resource Assessment Survey (CRAS) can be found in **Appendix H**.

5.3. Protected Species

The project site is located within the core foraging area (CFA) of wood stork colonies. This project is anticipated to impact wetlands that are utilized for wood stork foraging. Since wetland mitigation will

include compensation for wood stork habitat, sites with wetlands are ranked as No, Low, Med, or High for potential protected species involvement. The rating system was dependent on (1) the current existing habitat; (2) its general condition for supporting protected wildlife; (3) if any T&E species were observed in the area; and (4) whether species mitigation is possible and reasonable to offset any impacts should that pond site be selected. Habitat exists for some of the T&E species as most of the pond site locations are in undeveloped areas or in undeveloped portions of low-density development. Some of the impacted species are Wood Stork, Wading Birds, Florida Sandhill Crane, and Smalltooth Sawfish. A copy of the Threatened and Endangered Species (T&E) and Wetlands Assessment for Pond Siting can be found in **Appendix H**.

5.4. Contamination Evaluation

A contamination screening was conducted to identify contamination issues from properties or operations located within the vicinity of the project. This evaluation consisted of utilizing aerial photographs, topographic maps, County property appraiser's data base, the Environmental Data Management, and the regulatory review of federal and state records. As well as site reconnaissance to identify new and/or undocumented contamination sites, and to verify locations of documented contamination sites. Risk associated with review are No, Low, Medium, and High. This review identified no High Risk, one (1) Medium Risk, two (2) Low Risk, and eleven (11) No Risk. A copy of the Harborview Road (CR 776) from Melbourne Street to I-75 Contamination Screening Evaluation Report can be found in **Appendix J**.

6. Alternative SMF Sites

6.1. SMF Site Selection

SMF sites were selected based on the preliminary information collected for the report. After the SMF sites were identified, an analysis of each site was performed including hydraulics, wetland impacts, geotechnical survey, construction costs, and R/W acquisition costs. Utilizing a matrix, shown in **Table 6-1**, the recommended preferred sites were identified. The Right of Way estimates for this matrix can be found in **Appendix K**. The pond size calculations and cost are located in **Appendix L**.

Table 4-1 Stormwater Management Facility Alternatives

	SMF Alternatives		
	SMF 1A	SMF 1B	SMF 1C
Location (Station CL Survey)	57+20	63+20	63+00
Side (Lt., Rt.)	RT	LT	RT
SMF Area (Ac)	0.45	0.45	0.45
Est. Ground Elev. (Ft) At SMF Site	3.00	3.00	4.00
Proposed LEOP Within Basin	5.20	5.20	5.20
Control Elev./Est. SHWT Elev.	2.1	2.4	2.7
Basin Hydrology	Open	Open	Open
Treatment System	Wet Detention	Wet Detention	Wet Detention
Soils Name	Immokalee sand- Urban land complex, 0 to 2 percent slopes	Immokalee sand- Urban land complex, 0 to 2 percent slopes	Kesson fine sand, tidal, 0 to 1 percent slopes
Hydrological Soil Group	B/D	B/D	A/D
Land Use	Open Land	Open Land	Residential, High Density & Freshwater Marsh
Recorded Archaeological Sites	TBD	TBD	TBD
Archaeological Potential	TBD	TBD	TBD
Recorded Historical Structures	TBD	TBD	TBD
Recorded Historical Resources	TBD	TBD	TBD
4(f) Property	No	No	No
Tentative Hazard Ranking	No	Low	No
Protected Species Probability	Low	Medium	Medium
Potential Wetland/OSW Involvement	High	Medium	High
Proximity to Inflow (ft)	75	75	75
Proximity to Outfall (ft)	500	75	75
SMF Easement Required	No	No	No
Number of Parcels	1	1	1
Partial (P) or Whole Take (WT)	P	P	P
Recommended SMF Location In PD&E PSR	No	Yes	No
Wetland Mitigation Cost	\$38,480	\$13,875	\$8,880
Pond Construction Costs	\$290,340	\$290,340	\$290,340
ROW Cost Estimate	\$405,000	\$197,000	\$300,000
TOTAL ESTIMATED COSTS	\$733,820	\$501,215	\$599,220
Recommended SMF Site	SMF 1-2B & 2D		

	SMF Alternatives		
	SMF 1-2A & 2A	SMF 1-2B & 2B	SMF 2C
Location (Station CL Survey)	71+45	72+20	77+60
Side (Lt., Rt.)	LT	LT	RT
SMF Area (Ac)	0.89	1.04	0.76
Est. Ground Elev. (Ft) At SMF Site	3.00	3.00	4.00
Proposed LEOP Within Basin	6.60	6.60	6.60
Control Elev./Est. SHWT Elev.	1.8	2.3	2.6
Basin Hydrology	Open	Open	Open
Treatment System	Wet Detention	Wet Detention	Wet Detention
Soils Name	Myakka fine sand- Urban land complex, 0 to 2 percent slopes	Myakka fine sand- Urban land complex, 0 to 2 percent slopes	Myakka fine sand- Urban land complex, 0 to 2 percent slopes
Hydrological Soil Group	A/D	A/D	A/D
Land Use	Open Land	Open Land	Residential, Low Density
Recorded Archaeological Sites	TBD	TBD	TBD
Archaeological Potential	TBD	TBD	TBD
Recorded Historical Structures	TBD	TBD	TBD
Recorded Historical Resources	TBD	TBD	TBD
4(f) Property	No	No	No
Tentative Hazard Ranking	No	No	No
Protected Species Probability	Medium	Low	Medium
Potential Wetland/OSW Involvement	High	Low	Medium
Proximity to Inflow (ft)	300	75	75
Proximity to Outfall (ft)	100	75	75
SMF Easement Required	Yes	No	No
Number of Parcels	1	1	2
Partial (P) or Whole Take (WT)	P	P	P
Recommended SMF Location In PD&E PSR	Yes	Yes	No
Wetland Mitigation Cost	\$109,520	\$9,435	\$925
Pond Construction Costs	\$273,898	\$246,329	\$232,341
ROW Cost Estimate	\$458,000	\$568,000	\$1,521,000
TOTAL ESTIMATED COSTS	\$742,850	\$823,764	\$1,754,266
Recommended SMF Site	SMF 1-2B & 2D		

	SMF Alternatives
	SMF 2D
Location (Station CL Survey)	76+50
Side (Lt., Rt.)	LT
SMF Area (Ac)	0.89
Est. Ground Elev. (Ft) At SMF Site	3.00
Proposed LEOP Within Basin	6.60
Control Elev./Est. SHWT Elev.	2.3
Basin Hydrology	Open
Treatment System	Wet Detention
Soils Name	Myakka fine sand- Urban land complex, 0 to 2 percent slopes
Hydrological Soil Group	A/D
Land Use	Open Land
Recorded Archaeological Sites	TBD
Archaeological Potential	TBD
Recorded Historical Structures	TBD
Recorded Historical Resources	TBD
4(f) Property	No
Tentative Hazard Ranking	No
Protected Species Probability	Low
Potential Wetland/OSW Involvement	Low
Proximity to Inflow (ft)	75
Proximity to Outfall (ft)	75
SMF Easement Required	No
Number of Parcels	1
Partial (P) or Whole Take (WT)	WT
Recommended SMF Location In PD&E PSR	Yes
Wetland Mitigation Cost	\$0
Pond Construction Costs	\$241,054
ROW Cost Estimate	\$2,848,500
TOTAL ESTIMATED COSTS	\$2,724,554
Recommended SMF Site	SMF 1-2B & 2D

	SMF Alternatives		
	SMF 3A	SMF 3B	SMF 3C
Location (Station CL Survey)	101+00	100+00	109+00
Side (Lt., Rt.)	LT	RT	LT
SMF Area (Ac)	1.29	1.29	1.29
Est. Ground Elev. (Ft) At SMF Site	8.00	8.00	8.00
Proposed LEOP Within Basin	7.50	7.50	7.50
Control Elev./Est. SHWT Elev.	5.5	4.8	5.3
Basin Hydrology	Open	Open	Open
Treatment System	Wet Detention	Wet Detention	Wet Detention
Soils Name	Daytona sand-Urban land complex, 0 to 5 percent slopes	Daytona sand-Urban land complex, 0 to 5 percent slopes	Myakka fine sand-Urban land complex, 0 to 2 percent slopes
Hydrological Soil Group	A	A	A/D
Land Use	Mixed Rangeland	Residential, Low Density	Residential, Low Density
Recorded Archaeological Sites	TBD	TBD	TBD
Archaeological Potential	TBD	TBD	TBD
Recorded Historical Structures	TBD	TBD	TBD
Recorded Historical Resources	TBD	TBD	TBD
4(f) Property	No	No	No
Tentative Hazard Ranking	Low	No	Medium
Protected Species Probability	Medium	High	Medium
Potential Wetland/OSW Involvement	No	No	No
Proximity to Inflow (ft)	75	75	200
Proximity to Outfall (ft)	600	600	300
SMF Easement Required	No	No	Yes
Number of Parcels	1	1	1
Partial (P) or Whole Take (WT)	P	P	P
Recommended SMF Location In PD&E PSR	No	No	No
Wetland Mitigation Cost	\$0.00	\$0.00	\$0.00
Pond Construction Costs	\$854,031	\$854,031	\$742,848
ROW Cost Estimate	\$597,000	\$651,000	\$597,000
TOTAL ESTIMATED COSTS	\$1,451,031	\$1,505,031	\$1,339,848
Recommended SMF Site	SMF 3C		

	SMF Alternatives	
	SMF 4A	SMF 4B
Location (Station CL Survey)	147+60	150+00
Side (Lt., Rt.)	RT	LT
SMF Area (Ac)	0.89	0.89
Est. Ground Elev. (Ft) At SMF Site	4.00	4.00
Proposed LEOP Within Basin	6.60	6.60
Control Elev./Est. SHWT Elev.	2.2	1.4
Basin Hydrology	Open	Open
Treatment System	Wet Detention	Wet Detention
Soils Name	Matlacha gravelly fine sand-Urban land complex, 0 to 2 percent slopes	Immokalee sand-Urban land complex, 0 to 2 percent slopes
Hydrological Soil Group	B	B/D
Land Use	Residential, Medium Density	Open Land
Recorded Archaeological Sites	TBD	TBD
Archaeological Potential	TBD	TBD
Recorded Historical Structures	TBD	TBD
Recorded Historical Resources	TBD	TBD
4(f) Property	No	No
Tentative Hazard Ranking	No	No
Protected Species Probability	Medium	Medium
Potential Wetland/OSW Involvement	Low	No
Proximity to Inflow (ft)	75	75
Proximity to Outfall (ft)	75	75
SMF Easement Required	No	No
Number of Parcels	2	1
Partial (P) or Whole Take (WT)	P	P
Recommended SMF Location In PD&E PSR	No	No
Wetland Mitigation Cost	\$4,995	\$0.00
Pond Construction Costs	\$247,293	\$335,694
ROW Cost Estimate	\$964,000	\$415,000
TOTAL ESTIMATED COSTS	\$1,216,288	\$750,694
Recommended SMF Site	*SMF 4B	
*SMF higher cost but chosen due to non-residential area.		

	SMF Alternatives		
	SMF 5-6A	SMF 5-6B	SMF 5-6C
Location (Station CL Survey)	153+20	153+80	164+60
Side (Lt., Rt.)	LT	RT	LT
SMF Area (Ac)	0.39	0.39	0.39
Est. Ground Elev. (Ft) At SMF Site	5.00	5.00	5.00
Proposed LEOP Within Basin	6.60	6.60	6.60
Control Elev./Est. SHWT Elev.	1.7	1.6	3.0
Basin Hydrology	Open	Open	Open
Treatment System	Wet Detention	Wet Detention	Wet Detention
Soils Name	Immokalee sand-Urban land complex, 0 to 2 percent slopes	Matlacha gravelly fine sand-Urban land complex, 0 to 2 percent slopes	Immokalee sand-Urban land complex, 0 to 2 percent slopes
Hydrological Soil Group	B/D	B	B/D
Land Use	Open Land	Residential, Medium Density	Utilities
Recorded Archaeological Sites	TBD	TBD	TBD
Archaeological Potential	TBD	TBD	TBD
Recorded Historical Structures	TBD	TBD	TBD
Recorded Historical Resources	TBD	TBD	TBD
4(f) Property	No	No	No
Tentative Hazard Ranking	No	No	No
Protected Species Probability	Medium	Low	Medium
Potential Wetland/OSW Involvement	No	No	No
Proximity to Inflow (ft)	75	75	75
Proximity to Outfall (ft)	75	75	75
SMF Easement Required	No	No	No
Number of Parcels	1	1	1
Partial (P) or Whole Take (WT)	P	P	P
Recommended SMF Location In PD&E PSR	No	No	Yes
Wetland Mitigation Cost	\$0.00	\$0.00	\$0.00
Pond Construction Costs	\$116,104	\$116,104	\$116,104
ROW Cost Estimate	\$259,000	\$554,000	\$127,000
TOTAL ESTIMATED COSTS	\$375,104	\$670,104	\$243,104
Recommended SMF Site	SMF 5-6C		

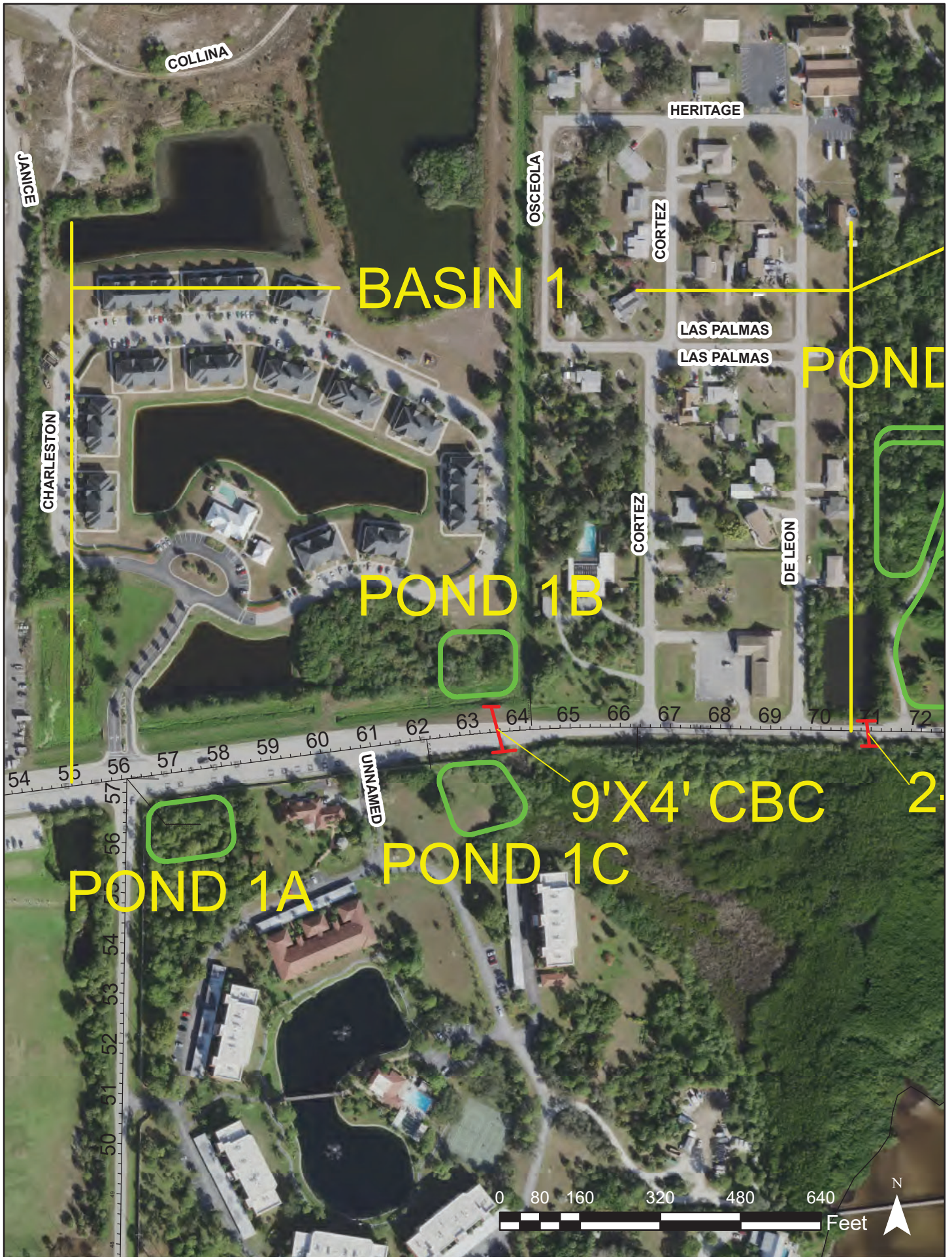
APPENDICES

Appendix A

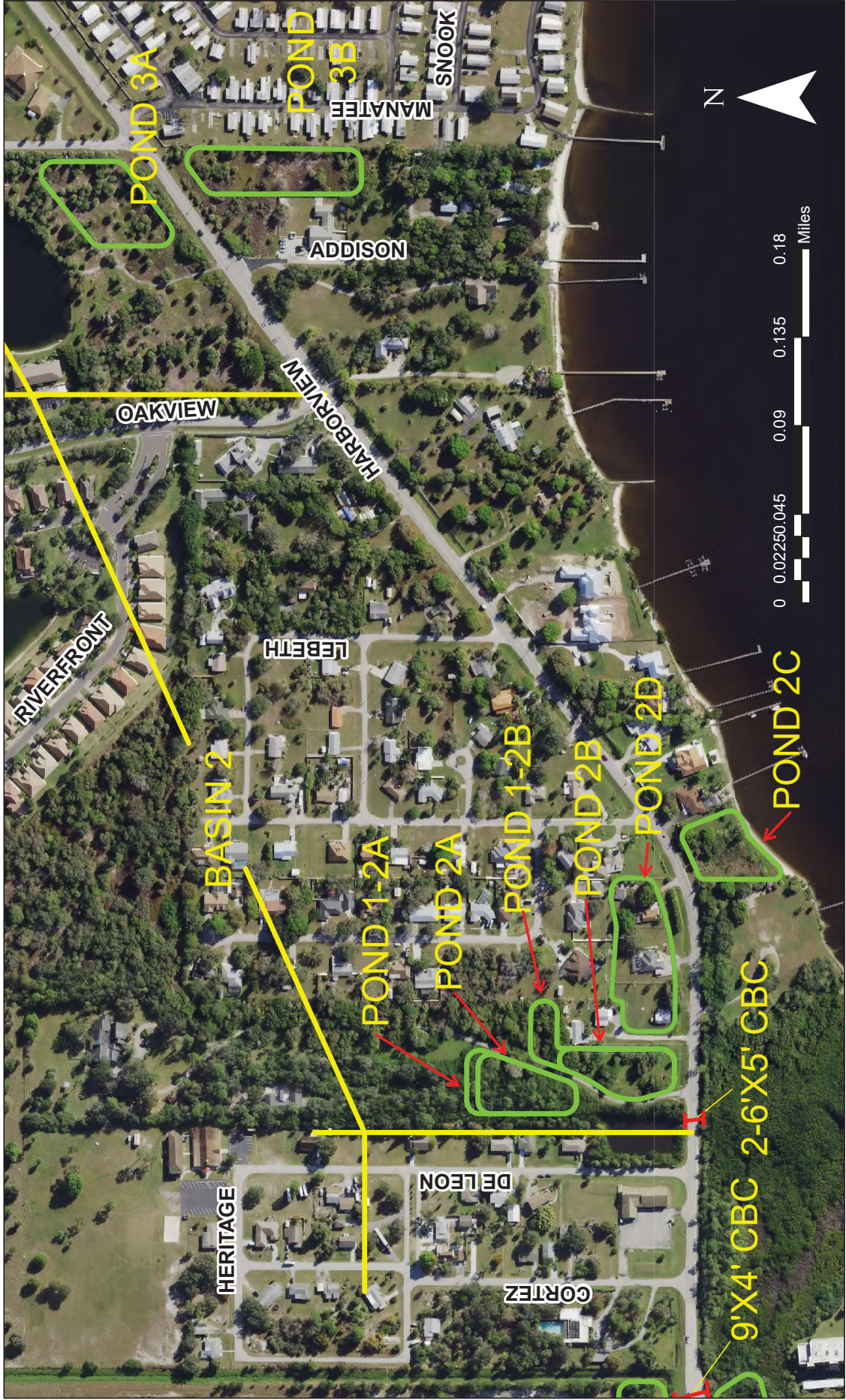
Pond Locations



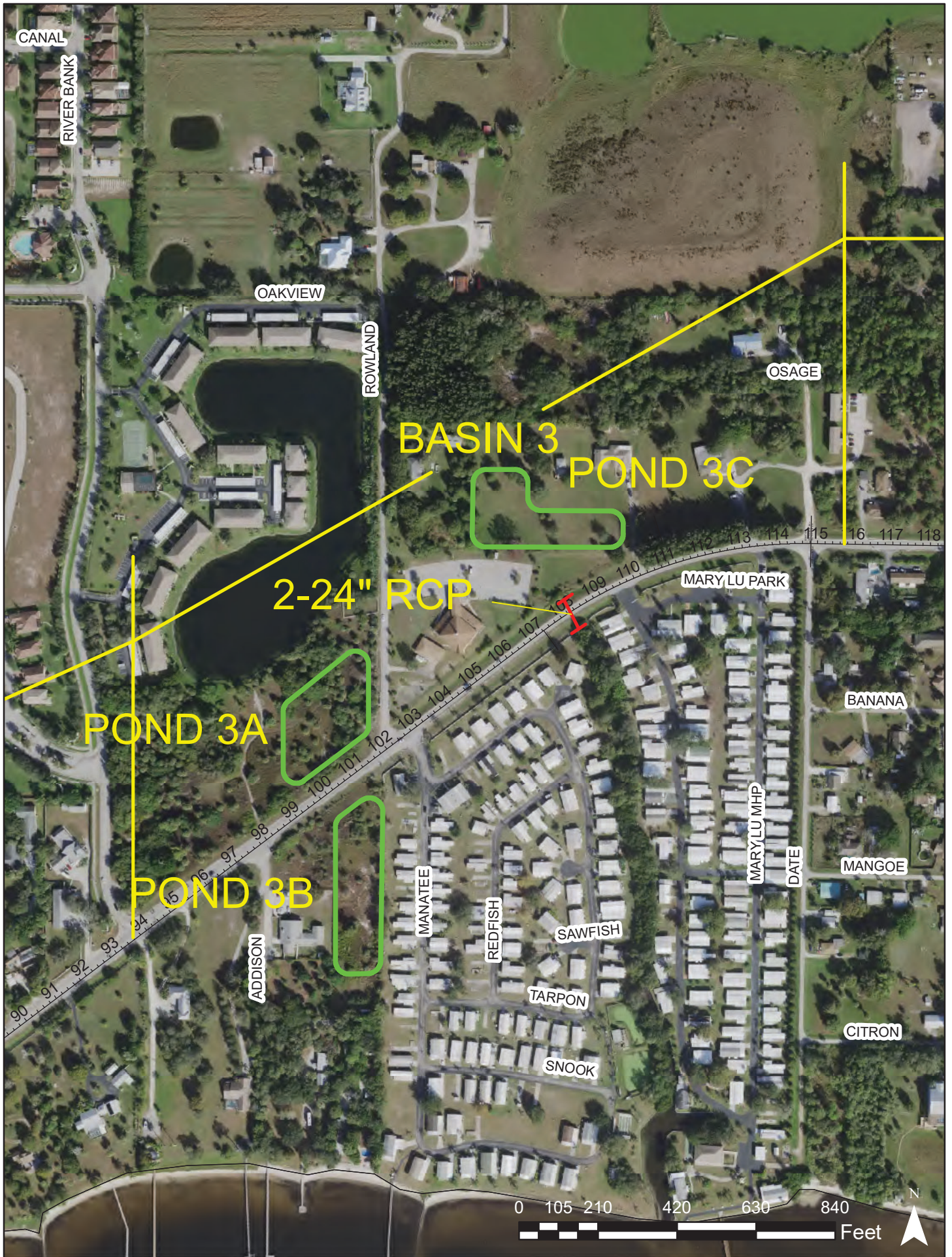
Harborview Road (CR 776) Pond Locations



Basin 1 - Pond Alternatives



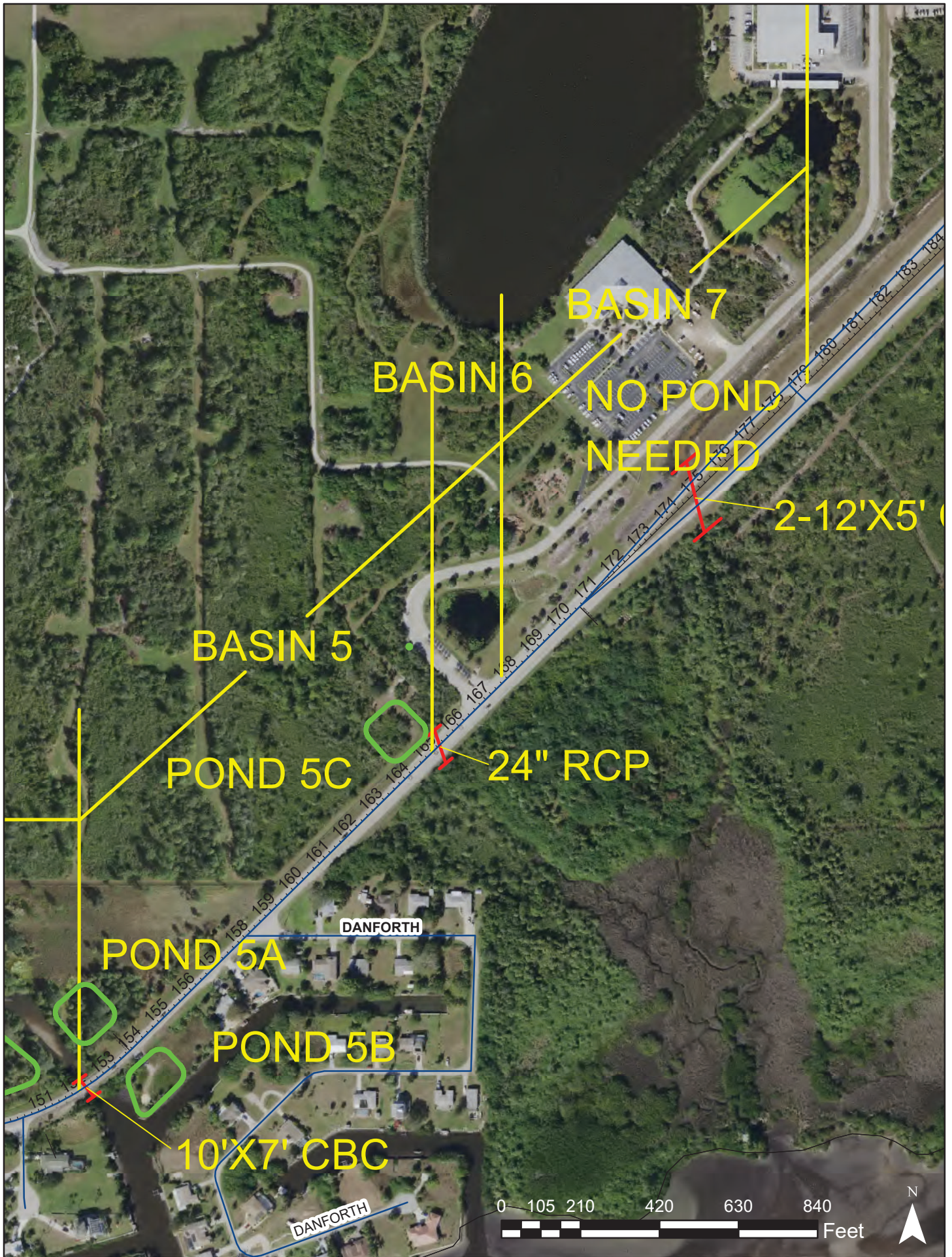
Basin 2- Pond Alternatives



Basin 3 - Pond Alternatives



Basin 4 - Pond Alternatives



Basin 5 and 6 - Pond Alternatives

Appendix B

Soils



United States
Department of
Agriculture

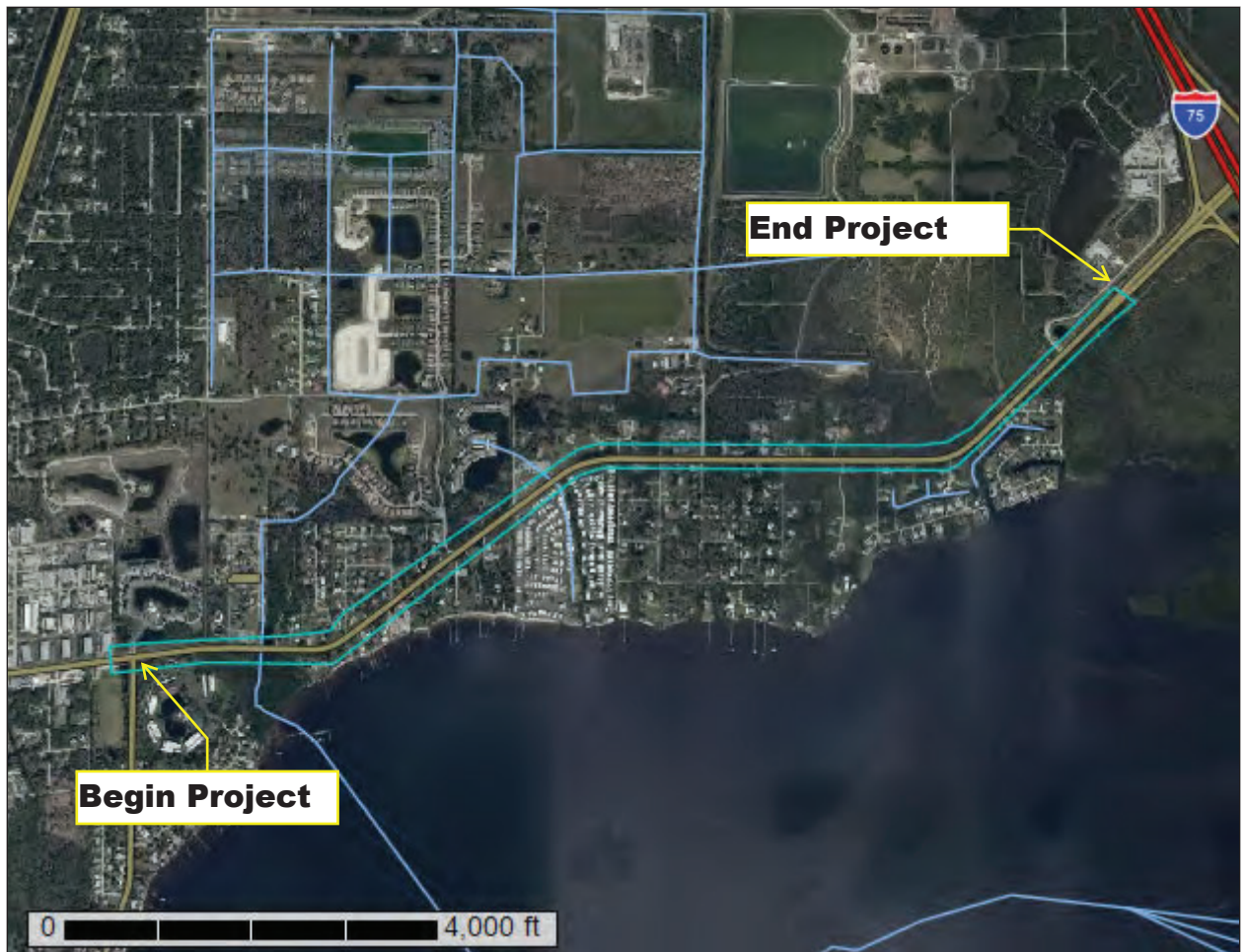
NRCS

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 Charlotte County, Florida

Harborview Road (CR 776)



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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Soil Information for All Uses

Soil Properties and Qualities

The Soil Properties and Qualities section includes various soil properties and qualities displayed as thematic maps with a summary table for the soil map units in the selected area of interest. A single value or rating for each map unit is generated by aggregating the interpretive ratings of individual map unit components. This aggregation process is defined for each property or quality.

Soil Qualities and Features

Soil qualities are behavior and performance attributes that are not directly measured, but are inferred from observations of dynamic conditions and from soil properties. Example soil qualities include natural drainage, and frost action. Soil features are attributes that are not directly part of the soil. Example soil features include slope and depth to restrictive layer. These features can greatly impact the use and management of the soil.

Hydrologic Soil Group (Harbor View (CR 776))

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The soils in the United States are assigned to four groups (A, B, C, and D) and three dual classes (A/D, B/D, and C/D). The groups are defined as follows:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Custom Soil Resource Report

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas. Only the soils that in their natural condition are in group D are assigned to dual classes.

Custom Soil Resource Report
 Map—Hydrologic Soil Group (Harborview (CR 776))

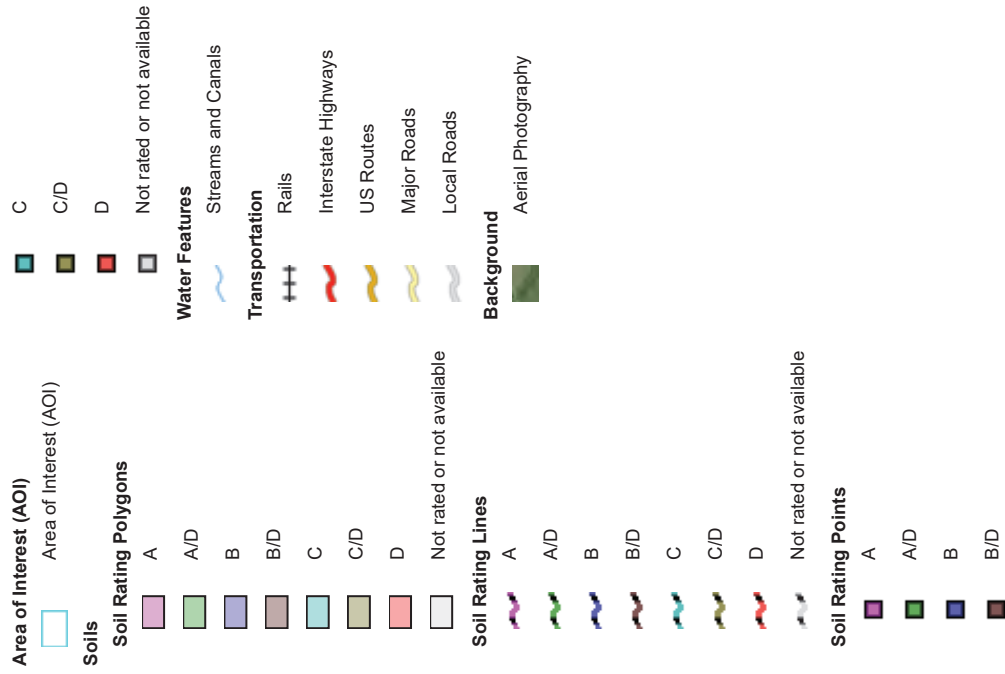


Map Scale: 1:18,400 if printed on A landscape (11" x 8.5") sheet.



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

MAP LEGEND



MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:20,000.

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: Charlotte County, Florida
 Survey Area Data: Version 19, Jun 8, 2020

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

Date(s) aerial images were photographed: Feb 5, 2019—Feb 23, 2019

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.

Table—Hydrologic Soil Group (Harbor View (CR 776))

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
7	Matlacha gravelly fine sand-Urban land complex, 0 to 2 percent slopes	B	2.3	3.0%
17	Daytona sand, 0 to 5 percent slopes	A	0.4	0.5%
24	Kesson fine sand, tidal, 0 to 1 percent slopes	A/D	4.1	5.4%
28	Immokalee sand, 0 to 2 percent slopes	B/D	2.1	2.8%
36	Immokalee sand-Urban land complex, 0 to 2 percent slopes	B/D	20.3	26.9%
106	Daytona sand-Urban land complex, 0 to 5 percent slopes	A	14.0	18.5%
107	EauGallie sand-Urban land complex, 0 to 2 percent slopes	A/D	5.9	7.8%
123	Myakka fine sand-Urban land complex, 0 to 2 percent slopes	A/D	17.5	23.2%
125	Oldsmar sand-Urban land, 0 to 2 percent slopes	A/D	8.9	11.8%
Totals for Area of Interest			75.5	100.0%

Rating Options—Hydrologic Soil Group (Harbor View (CR 776))

Aggregation Method: Dominant Condition
Component Percent Cutoff: None Specified
Tie-break Rule: Higher

Water Features

Water Features include ponding frequency, flooding frequency, and depth to water table.

Depth to Water Table (Harbor View (CR 776))

"Water table" refers to a saturated zone in the soil. It occurs during specified months. Estimates of the upper limit are based mainly on observations of the water table at selected sites and on evidence of a saturated zone, namely grayish colors

Custom Soil Resource Report

(redoximorphic features) in the soil. A saturated zone that lasts for less than a month is not considered a water table.

This attribute is actually recorded as three separate values in the database. A low value and a high value indicate the range of this attribute for the soil component. A "representative" value indicates the expected value of this attribute for the component. For this soil property, only the representative value is used.

Custom Soil Resource Report
 Map—Depth to Water Table (Harbor View (CR 776))

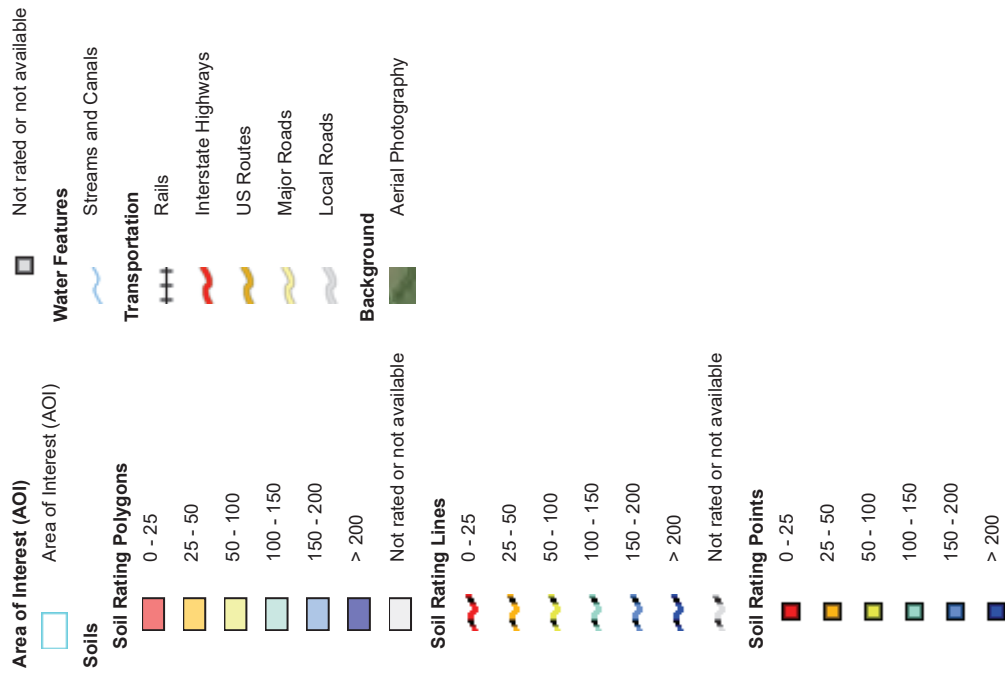


Map Scale: 1:18,400 if printed on A landscape (11" x 8.5") sheet.



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

MAP LEGEND



MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:20,000.

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: Charlotte County, Florida
 Survey Area Data: Version 19, Jun 8, 2020

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

Date(s) aerial images were photographed: Feb 5, 2019—Feb 23, 2019

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.

Custom Soil Resource Report

Table—Depth to Water Table (Harbor View (CR 776))

Map unit symbol	Map unit name	Rating (centimeters)	Acres in AOI	Percent of AOI
7	Matlacha gravelly fine sand-Urban land complex, 0 to 2 percent slopes	76 = 30 inches	2.3	3.0%
17	Daytona sand, 0 to 5 percent slopes	127 = 50 inches	0.4	0.5%
24	Kesson fine sand, tidal, 0 to 1 percent slopes	0 = 0 inches	4.1	5.4%
28	Immokalee sand, 0 to 2 percent slopes	31 = 12 inches	2.1	2.8%
36	Immokalee sand-Urban land complex, 0 to 2 percent slopes	30 = 12 inches	20.3	26.9%
106	Daytona sand-Urban land complex, 0 to 5 percent slopes	127 = 50 inches	14.0	18.5%
107	EauGallie sand-Urban land complex, 0 to 2 percent slopes	30 = 12 inches	5.9	7.8%
123	Myakka fine sand-Urban land complex, 0 to 2 percent slopes	30 = 12 inches	17.5	23.2%
125	Oldsmar sand-Urban land, 0 to 2 percent slopes	30 = 12 inches	8.9	11.8%
Totals for Area of Interest			75.5	100.0%

Rating Options—Depth to Water Table (Harbor View (CR 776))

Units of Measure: centimeters

Aggregation Method: Dominant Component

Component Percent Cutoff: None Specified

Tie-break Rule: Lower

Interpret Nulls as Zero: No

Beginning Month: January

Ending Month: December

November 11, 2020

Scalar Consulting Group, Inc.
13337 North 56th Street
Tampa, Florida 33617

Attn: Mr. Jay Winter, P.E.

**RE: Seasonal High Groundwater Table Estimates
Harborview Road from Melbourne Street to I-75
Charlotte County, Florida
FPN: 434965-2-32-01
Tierra Project No. 6511-19-261**

Mr. Winter:

Tierra, Inc. has estimated the Seasonal High Groundwater Table (SHGWT) levels along the project alignment referenced above. The results of our field exploration program and the data obtained are presented in this letter. A total of 41 hand auger borings were completed and nine (9) piezometers were installed at selected locations along the proposed alignment. The depths of the hand auger borings ranged from approximately 2½ to 6 feet below existing grades.

Review of Published Soil Data

As part of our study, Tierra reviewed published soils information obtained from the “Soil Survey of Charlotte County, Florida” published by the United States Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS). A **Summary of the USDA Soil Survey Information** is included in the **Attachments** of this report.

Subsurface Exploration

Tierra completed hand auger borings along the project alignment to identify the general near-surface subsurface conditions and to estimate the SHGWT. The borings generally encountered sand to sand with silt, occasionally underlain by silty sand to clayey sand at various depths.

Additional geotechnical services will be performed as the project progresses.

Seasonal High Groundwater Estimates

SHGWT estimates were completed at select boring locations along the alignment typically on alternating sides of the existing roadway and at intervals of approximately 300 to 500 feet. The estimated SHGWT levels at the boring locations ranged from at the existing ground surface to a depth of approximately 3 feet below existing grades.

The project alignment runs parallel to Charlotte Harbor. Some SHGWT locations may be tidally influenced. This is especially apparent approximately 300 feet west of Cortez Drive and approximately 300 feet east of Deleon Drive in the area adjacent to the low-lying vegetated area and also potentially from Oma Drive to the project terminus. Tierra recommends the project drainage engineer and project environmental scientist review tidal data and/or biological indicators in conjunction with the groundwater information included herein to establish the

SHWGT in these areas. Our SHGWT estimates along the project corridor do not consider future sea level rise and are based on natural historic indicators.

Our SHGWT estimates also do not take into account Design High Water (DHW) or flood levels or storm surge events. DHW and/or flood levels should be used as appropriate in establishing grades for this roadway based on FDOT design guidelines and standard practice.

A **Summary of Seasonal High Groundwater Table Estimates Table** is presented as an attachment to this report.

Tierra installed nine (9) piezometers within the project limits. The purpose of the piezometers was to monitor groundwater levels to assist in estimating SHGWT levels along the project alignment. The groundwater table levels within the piezometers were monitored and recorded during October 2020. A summary table of the recorded groundwater levels from within the piezometers is included in the **Attachments**.

Tierra, Inc. appreciates the opportunity to be of service to Scalar, Inc. on this project. If you have any questions or comments regarding this information, please contact our office at your earliest convenience.

Sincerely,

TIERRA, INC.

Juan Navarrete, E.I.
Geotechnical Engineer Intern

Marc E. Novak, Ph.D., P.E.
Senior Geotechnical Engineer
Florida License No. 67431

Thomas E. Musgrave, P.E.
Geotechnical Engineer
Florida License No. 81669

Attachments:

Summary of USDA Soil Survey Information
Summary of Seasonal High Groundwater Table Estimates
Summary of Groundwater Table Measurements from Piezometers

Summary of USDA Soil Survey Information
Harborview Road from Melbourne Road to I-75
Charlotte County, Florida
FPN 434965-2-32-01
Tierra Project No. 6511-19-261

USDA Map Symbol and Soil Name	Depth (in)	Soil Classification		Permeability (in/hr)		pH	Seasonal High Water Table	
		USCS	AASHTO	Low	High		Depth (feet)	Months
(24) Kesson, tidal	0-6	SP-SM, SM	A-3, A-2-4	6.0 - 20.0		7.4-8.4	0.0	Jan-Dec
	6-23	SM, SP-SM	A-3, A-2-4	2.0 - 20.0		7.4-8.4		
	23-38	SP-SM, SM	A-2-4, A-3	2.0 - 20.0		7.4-8.4		
	38-80	SP-SM, SM	A-2-4, A-3	2.0 - 20.0		7.4-8.4		
(28) Immokalee	0-9	SP-SM	A-3, A-2-4	6.0 - 20.0		3.5-6.0	0.5-1.5	Jun-Nov
	9-36	SP, SP-SM	A-2-4, A-3	6.0 - 20.0		3.5-6.0		
	36-55	SP-SM, SM	A-3, A-2-4	0.6 - 2.0		3.5-6.0		
	55-80	SM, SP-SM	A-2-4, A-3	6.0 - 20.0		3.5-6.0		
(36) Immokalee - Urban Land	0-9	SP-SM	A-2-4, A-3	6.0 - 20.0		3.5-6.0	0.5-1.5	Jun-Nov
	9-36	SP, SP-SM	A-2-4, A-3	6.0 - 20.0		3.5-6.0		
	36-55	SP-SM, SM	A-3, A-2-4	0.6 - 2.0		3.5-6.0		
	55-80	SM, SP-SM	A-2-4, A-3	6.0 - 20.0		3.5-6.0		
Information is not provided by USDA for urban land.								
(106) Daytona - Urban Land	0-5	SP-SM, SP	A-3, A-2-4	20.0 - 50.0		3.5-6.0	3.5-5.0	Jun-Oct
	5-36	SP, SP-SM	A-3	20.0 - 50.0		3.5-6.0		
	36-47	SP-SM, SM	A-2-4, A-3	2.0 - 6.0		3.5-6.0		
	47-80	SP, SP-SM	A-3, A-2-4	20.0 - 50.0		3.5-6.0		
Information is not provided by USDA for urban land.								
(107) Eaugallie - Urban Land	0-4	SP-SM, SP	A-3, A-2-4	6.0 - 20.0		4.4-6.0	0.5-1.5	Jun-Nov
	4-22	SP-SM, SP	A-3, A-2-4	6.0 - 20.0		4.8-6.0		
	22-27	SP-SM, SM	A-3, A-2-4	6.0 - 20.0		4.5-5.2		
	27-45	SP-SM, SM	A-3, A-2-4	6.0 - 20.0		5.0-6.0		
	45-58	SP-SM, SM	A-2-4, A-3	6.0 - 20.0		4.3-6.0		
	58-80	SC-SM, SM, SC	A-4, A-2-4	2.0 - 6.0		5.1-7.0		
Information is not provided by USDA for urban land.								
(123) Myakka - Urban Land	0-6	SP-SM, SM	A-3, A-2-4	6.0 - 20.0		3.5-6.5	0.5-1.5	Jun-Nov
	6-20	SP-SM, SM	A-3, A-2-4	6.0 - 20.0		3.5-6.5		
	20-36	SP-SM, SM	A-2-4, A-3	0.6 - 6.0		3.5-6.5		
	36-80	SP-SM, SM	A-3, A-2-4	6.0 - 20.0		3.5-6.5		
Information is not provided by USDA for urban land.								
(125) Oldsmar - Urban Land	0-6	SP-SM, SM	A-3, A-2-4	6.0 - 20.0		3.5-7.3	0.5-1.5	Jun-Nov
	6-38	SP-SM, SM	A-2-4, A-3	6.0 - 20.0		3.5-7.3		
	38-50	SP-SM, SM	A-2-4, A-3	0.2 - 6		3.5-7.3		
	50-80	CL, SC-SM	A-4, A-7-6, A-6	0.1 - 0.2		5.1-7.8		
Information is not provided by USDA for urban land.								

Summary of Seasonal High Groundwater Table Estimates
Harborview Road from Melbourne Street to I-75
Charlotte County, Florida
FPN 434965-2-32-01
Tierra Project No. 6511-19-261

Boring Name	Boring Location ⁽¹⁾		Boring Location ⁽¹⁾ State Plane Coordinates, Florida West NAD 1983		Ground Elevation ⁽¹⁾ (feet, NAVD88)	Boring Depth (feet)	Measured Groundwater Table			USDA Soil Survey		Estimated SHGWT ⁽⁶⁾	
	Station (feet)	Offset (feet)	Northing	Easting			Date Recorded	Depth ⁽³⁾ (feet)	Elevation (feet, NAVD88)	Map Symbol	Estimated SHGWT ⁽⁴⁾ (feet)	Depth (feet)	Elevation (ft, NAVD88)
SH - 54L	44 + 09	60 LT	956810	636356	6.3	6.0	09/14/20	3.8	2.5	36	0.5 - 1.5	3.0	3.3
SH - 58R	47 + 64	50 RT	956747	636722	3.3	3.5	09/14/20	0.8	2.5	36	0.5 - 1.5	0.0	3.3
SH - 1 ⁽²⁾	---	---	956883	637041	4.8	5.0	10/23/18	3.3	1.5	36	0.5 - 1.5	2.0	2.8
SH - 64R	54 + 00	36 RT	956838	637349	2.8	5.0	09/14/20	2.3	0.5	24	0.0	0.0	2.8
SH - 67L	56 + 98	22 LT	956900	637645	4.6	4.5	09/14/20	1.8	2.8	24/123	0.0; 0.0 - 1.5	1.5	3.1
SH - 2 ⁽²⁾	---	---	956847	637886	3.4	6.5	10/23/18	3.1	0.3	24	0.0	0.5	2.9
SH - 72L	62 + 18	75 LT	956944	638166	2.7	2.5	09/15/20	0.8	1.9	123	0.5 - 1.5	0.0	2.7
SH - 75R	65 + 56	50 RT	956814	638503	4.1	3.0	09/15/20	1.3	2.8	123	0.5 - 1.5	1.0	3.1
SH - 3 ⁽²⁾	---	---	957065	638866	4.2	5.0	10/22/18	2.1	2.1	123	0.5 - 1.5	1.5	2.7
SH - 83R	73 + 22	48 RT	957186	639190	5.0	3.0	09/15/20	1.2	3.8	123	0.5 - 1.5	0.7	4.3
SH - 92L	81 + 85	60 LT	957793	639814	6.2	4.0	09/22/20	2.8	3.4	106	3.5 - 5.0	1.8	4.4
SH - 4 ⁽²⁾	---	---	957935	640170	6.9	5.5	10/23/18	2.9	4.0	106	3.5 - 5.0	2.0	4.9
SH - 98L	88 + 48	70 LT	958200	640337	7.8	5.0	09/21/20	2.9	4.9	106	3.5 - 5.0	2.5	5.3
SH - 101R	91 + 30	57 RT	958268	640639	7.9	5.0	09/22/20	3.5	4.4	106	3.5 - 5.0	3.0	4.9
SH - 5 ⁽²⁾	---	---	958568	640869	7.3	6.5	10/22/18	3.3	4.0	106	3.5 - 5.0	2.5	4.8
SH - 110L	100 + 32	43 LT	958862	641331	7.6	5.0	09/21/20	3.9	3.7	107	0.5 - 1.5	3.0	4.6
SH - 112R	102 + 47	53 RT	958828	641563	7.2	5.0	09/24/20	3.3	3.9	107	0.5 - 1.5	2.5	4.7

Harborview Road Alignment

⁽¹⁾ Boring locations and elevations were provided by the project surveyor. Station and Offset Provided by project surveyor under the current project 434965-2-32-01 and may not reflect current or future baseline or centerline used in project.

⁽²⁾ Boring locations provided by project surveyor under the PD&E study (434965-2-22-01). Station and Offset not reported.

⁽³⁾ Depth below existing grades at time of augering.

⁽⁴⁾ Seasonal high groundwater table depth estimated based on the Charlotte County, Florida USDA Soil Survey information.

⁽⁵⁾ Seasonal high groundwater table estimated based on historic soil stratigraphy, measured groundwater levels, the USDA Soil Survey and experience with similar soil conditions.

Summary of Seasonal High Groundwater Table Estimates
Harborview Road from Melbourne Street to I-75
Charlotte County, Florida
FPN 434965-2-32-01
Tierra Project No. 6511-19-261

Boring Name	Boring Location ⁽¹⁾		Boring Location ⁽¹⁾		Ground Elevation ⁽¹⁾ (feet, NAVD88)	Boring Depth (feet)	Measured Groundwater Table			USDA Soil Survey		Estimated SHGWT ⁽⁶⁾	
	Station (feet)	Offset (feet)	State Plane Coordinates, Florida West NAD 1983				Date Recorded	Depth ⁽³⁾ (feet)	Elevation (feet, NAVD88)	Map Symbol	Estimated SHGWT ⁽⁴⁾ Depth (feet)	Depth (feet)	Elevation (ft, NAVD88)
			Northing	Easting									
SH - 6 ⁽²⁾	---	---	641825	641825	6.8	5.0	10/22/18	2.1	4.7	107	0.5 - 1.5	1.5	5.3
SH - 6B	105 + 22	44 LT	958944	641827	6.7	4.5	09/21/20	1.5	5.2	107	0.5 - 1.5	1.3	5.4
SH - 118R	108 + 17	49 RT	958845	642121	6.7	5.0	09/24/20	2.0	4.7	107	0.5 - 1.5	1.7	5.0
SH - 121L	111 + 18	48 LT	958937	642424	6.9	4.0	09/21/20	1.6	5.3	123	0.5 - 1.5	1.4	5.5
SH - 124R	114 + 46	40 RT	958844	642750	6.2	4.0	09/24/20	1.9	4.3	123	0.5 - 1.5	1.5	4.7
SH - 127L	116 + 54	44 LT	958926	642958	7.1	4.5	09/21/20	2.5	4.6	125	0.5 - 1.5	2.0	5.1
SH - 7 ⁽²⁾	---	---	958860	643196	5.9	5.0	10/23/18	2.3	3.6	125	0.5 - 1.5	1.5	4.4
SH - 131L	121 + 21	41 LT	958922	643426	6.8	4.0	09/21/20	2.3	4.5	125	0.5 - 1.5	2.0	4.8
SH - 134R	124 + 56	45 RT	958835	643760	5.8	4.5	09/24/20	2.2	3.6	125	0.5 - 1.5	2.0	3.8
SH - 137L	127 + 19	45 LT	958924	644023	4.7	4.0	09/21/20	1.5	3.2	125	0.5 - 1.5	1.0	3.7
SH - 8 ⁽²⁾	---	---	958931	644380	3.1	5.0	10/22/18	2.2	0.9	36	0.5 - 1.5	0.5	2.6
SH - 144R	133 + 78	24 RT	958854	644682	3.4	4.0	09/24/20	2.0	1.4	36	0.5 - 1.5	1.0	2.4
SH - 147L	136 + 48	64 LT	958940	644952	3.5	3.0	09/21/20	0.8	2.7	36	0.5 - 1.5	0.8	2.7
SH - 9 ⁽²⁾	---	---	958872	645281	4.8	7.5	10/23/18	5.8	-1.0	36	0.5 - 1.5	2.0	2.8
SH - 10 ⁽²⁾	---	---	959184	645674	3.8	6.5	10/22/18	4.9	-1.1	36	0.5 - 1.5	1.0	2.8
SH - 155R	144 + 99	24 RT	959169	645725	3.8	4.5	09/24/20	2.0	1.8	36	0.5 - 1.5	1.0	2.8
SH - 157L	146 + 56	48 LT	959330	645786	3.0	3.0	09/21/20	0.2	2.8	36	0.5 - 1.5	0.0	3.0

⁽¹⁾ Boring locations and elevations were provided by the project surveyor. Station and Offset Provided by project surveyor under the current project 434965-2-32-01 and may not reflect current or future baseline or centerline used in project.

⁽²⁾ Boring locations provided by project surveyor under the PD&E study (434965-2-22-01). Station and Offset not reported.

⁽³⁾ Depth below existing grades at time of augering.

⁽⁴⁾ Seasonal high groundwater table depth estimated based on the Charlotte County, Florida USDA Soil Survey information.

⁽⁵⁾ Seasonal high groundwater table estimated based on historic soil stratigraphy, measured groundwater levels, the USDA Soil Survey and experience with similar soil conditions.

Summary of Seasonal High Groundwater Table Estimates
Harborview Road from Melbourne Street to I-75
Charlotte County, Florida
FPN 434965-2-32-01
Tierra Project No. 6511-19-261

Boring Name	Boring Location ⁽¹⁾ (B/L Survey Harborview)		Boring Location ⁽¹⁾ State Plane Coordinates, Florida West NAD 1983		Ground Elevation ⁽¹⁾ (feet, NAVD88)	Boring Depth (feet)	Measured Groundwater Table			USDA Soil Survey		Estimated SHGWT ⁽⁶⁾	
	Station (feet)	Offset (feet)	Northing	Easting			Date Recorded	Depth ⁽³⁾ (feet)	Elevation (feet, NAVD88)	Map Symbol	Estimated SHGWT ⁽⁴⁾ Depth (feet)	Depth (feet)	Elevation (ft, NAVD88)
SH - 162L	148 + 93	71 LT	959513	645939	3.5	3.0	09/21/20	0.3	3.2	36	0.5 - 1.5	0.0	3.5
SH - 11 ⁽²⁾	---	---	959472	646032	3.2	5.0	10/23/18	2.1	1.1	36	0.5 - 1.5	0.5	2.7
SH - 165R	155 + 32	41 RT	959882	646472	3.2	3.5	09/24/20	1.7	1.5	28	0.5 - 1.5	0.5	2.7
SH - 12 ⁽²⁾	---	---	960127	646564	5.8	6.0	10/22/18	3.3	2.5	36	0.5 - 1.5	2.5	3.3
SH - 170R	160 + 06	51 RT	960208	646817	5.3	4.0	09/24/20	1.7	3.6	28	0.5 - 1.5	1.0	4.3

Melbourne Street- Charleston Circle North-South Roadway Alignment

SH - 56R	45 + 86	272 RT	956504	636575	3.7	4.0	09/14/20	1.9	1.8	36	0.5 - 1.5	1.0	2.7
SH - 58R	47 + 64	50 RT	956747	636722	3.3	3.5	09/14/20	0.8	2.5	36	0.5 - 1.5	0.0	3.3
SH - 54L	44 + 09	60 LT	956810	636356	6.3	6.0	09/14/20	3.8	2.5	36	0.5 - 1.5	3.0	3.3
SH - 56L	46 + 22	208 LT	956984	636547	5.7	5.0	09/14/20	2.4	3.3	36	0.5 - 1.5	1.8	3.9

⁽¹⁾ Boring locations and elevations were provided by the project surveyor. Station and Offset Provided by project surveyor under the current project 434965-2-32-01 and may not reflect current or future baseline or centerline used in project.

⁽²⁾ Boring locations provided by project surveyor under the PD&E study (434965-2-22-01). Station and Offset not reported.

⁽³⁾ Depth below existing grades at time of augering.

⁽⁴⁾ Seasonal high groundwater table depth estimated based on the Charlotte County, Florida USDA Soil Survey information.

⁽⁵⁾ Seasonal high groundwater table estimated based on historic soil stratigraphy, measured groundwater levels, the USDA Soil Survey and experience with similar soil conditions.

Summary of Piezometer Readings
Harborview Road from Melbourne Street to I-75
Charlotte County, Florida
FPN 434965-2-32-01
Tierra Project No. 6511-19-261

Piezometer Name	Piezometer Location ⁽¹⁾ (B/L Survey Harborview)		Piezometer Location ⁽¹⁾ State Plane Coordinates, Florida West NAD 1983		Ground Elevation ⁽¹⁾ (feet, NAVD 88)	Groundwater Table Measurements ⁽²⁾	
	Station (feet)	Offset (feet)	Northing	Easting		10/8/2020 Elevation (feet, NAVD 88)	10/30/2020 Elevation (feet, NAVD 88)
SH - 67L	56 + 98	22 LT	956900	637645	4.6	1.8	2.0
SH - 77R	67 + 45	53 RT	956849	638706	4.2	2.5	2.3
SH - 98L	88 + 48	70 LT	958200	640337	7.8	4.8	4.5
SH - 101R	91 + 30	57 RT	958268	640639	7.9	4.5	4.1
SH - 6B	105 + 22	44 LT	958944	641827	6.7	4.9	4.8
SH - 124R	114 + 46	40 RT	958844	642750	6.2	4.7	4.5
SH - 134R	124 + 56	45 RT	958835	643760	5.8	3.6	3.4
SH - 147L	136 + 48	64 LT	958940	644952	3.5	2.0	---
SH - 157L	146 + 56	48 LT	959330	645786	3.0	2.5	2.0

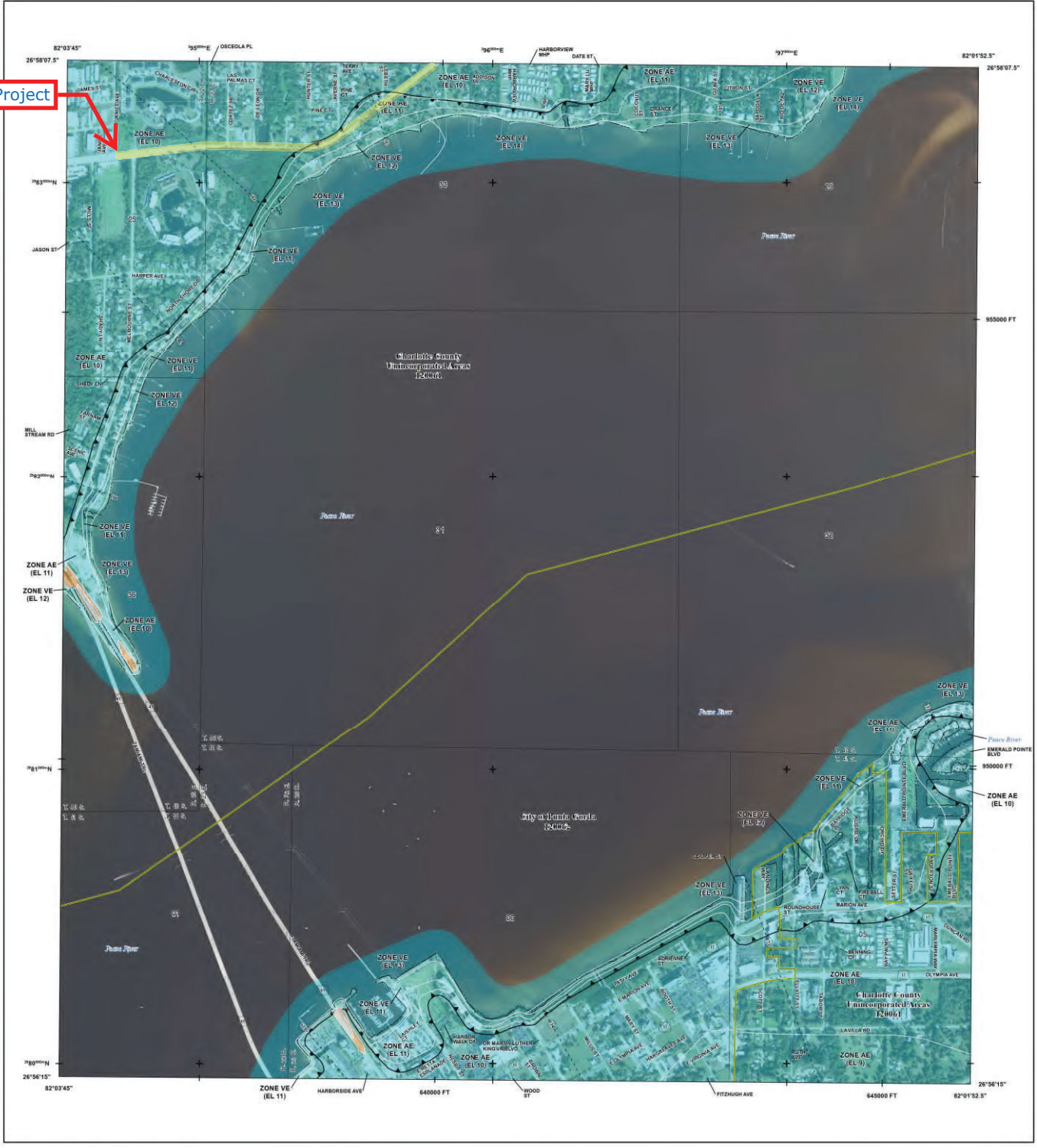
⁽¹⁾ Piezometer Locations and Ground Elevations were provided by the project surveyor.

⁽²⁾ Groundwater elevations calculated by subtracting the measured depth to the groundwater from the surveyed ground elevation.

Appendix C

FEMA Maps

Begin Project



FLOOD HAZARD INFORMATION

- SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT
THE INFORMATION DEPICTED ON THIS MAP AND SUPPORTING DOCUMENTATION ARE ALSO AVAILABLE IN DIGITAL FORMAT AT [HTTPS://MSC.FEMA.GOV](https://MSC.FEMA.gov)
- SPECIAL FLOOD HAZARD AREAS**
 - Without Base Flood Elevation (BFE) Zone A, AE, AH, AR
 - With BFE or Depth Zone AE-AD, AH, VE, AR
 - Regulatory Floodway
 - 0.2% Annual Chance Flood Hazard, Areas of 1% Annual Chance Flood with average depth less than one foot or with drainage areas of less than one square mile Zone X
 - Future Conditions 1% Annual Chance Flood Hazard Zone X
 - Area with Reduced Flood Risk due to Levee See Notes, Zone X
 - Area with Flood Risk due to Levee Zone D
 - OTHER AREAS OF FLOOD HAZARD**
 - Area of Minimal Flood Hazard Zone X
 - Area of Undetermined Flood Hazard Zone D
 - OTHER AREAS**
 - Channel, Culvert, or Storm Sewer
 - Levee, Dike, or Floodwall
 - GENERAL STRUCTURES**
 - Cross Sections with 1% Annual Chance Water Surface Elevation
 - Coastal Transect
 - Coastal Transect Baseline
 - Profile Baseline
 - Hydrographic Feature
 - OTHER FEATURES**
 - Base Flood Elevation Line (BFE)
 - Limit of Study
 - Jurisdiction Boundary

NOTES TO USERS

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Communities receiving land an adjacent FIRM panel must obtain a current copy of the adjacent panel as well as the current FIRM index. These may be obtained directly from the Flood Map Service Center at the number listed above.

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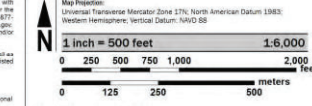
To determine if flood insurance is available in this community, contact your insurance agent or call the National Flood Insurance Program at 1-800-638-8627.

Base map information shown on the FIRM was provided by Charlotte County, dated 2002 and 2016; the Florida Department of Transportation, dated 2017; and the U.S. Department of Agriculture, dated 2018.

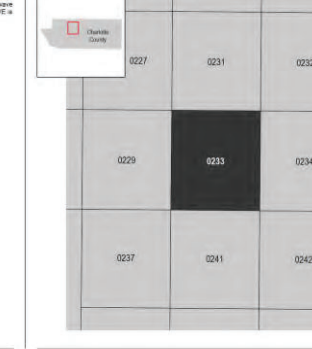
LIMIT OF MODERATE WAVE ACTION: Zone AE has been divided by a Limit of Moderate Wave Action (LMWA). The LMWA represents the approximate landward limit of the 1.5-foot breaking wave. The effect of wave heights between Zone VE and the LMWA (or between the LMWA and the LOMA for areas where Zone VE is not identified) will be similar to, but less severe than, those in the Zone VE.

Limit of Moderate Wave Action (LMWA)

SCALE



PANEL LOCATOR



FEMA
National Flood Insurance Program

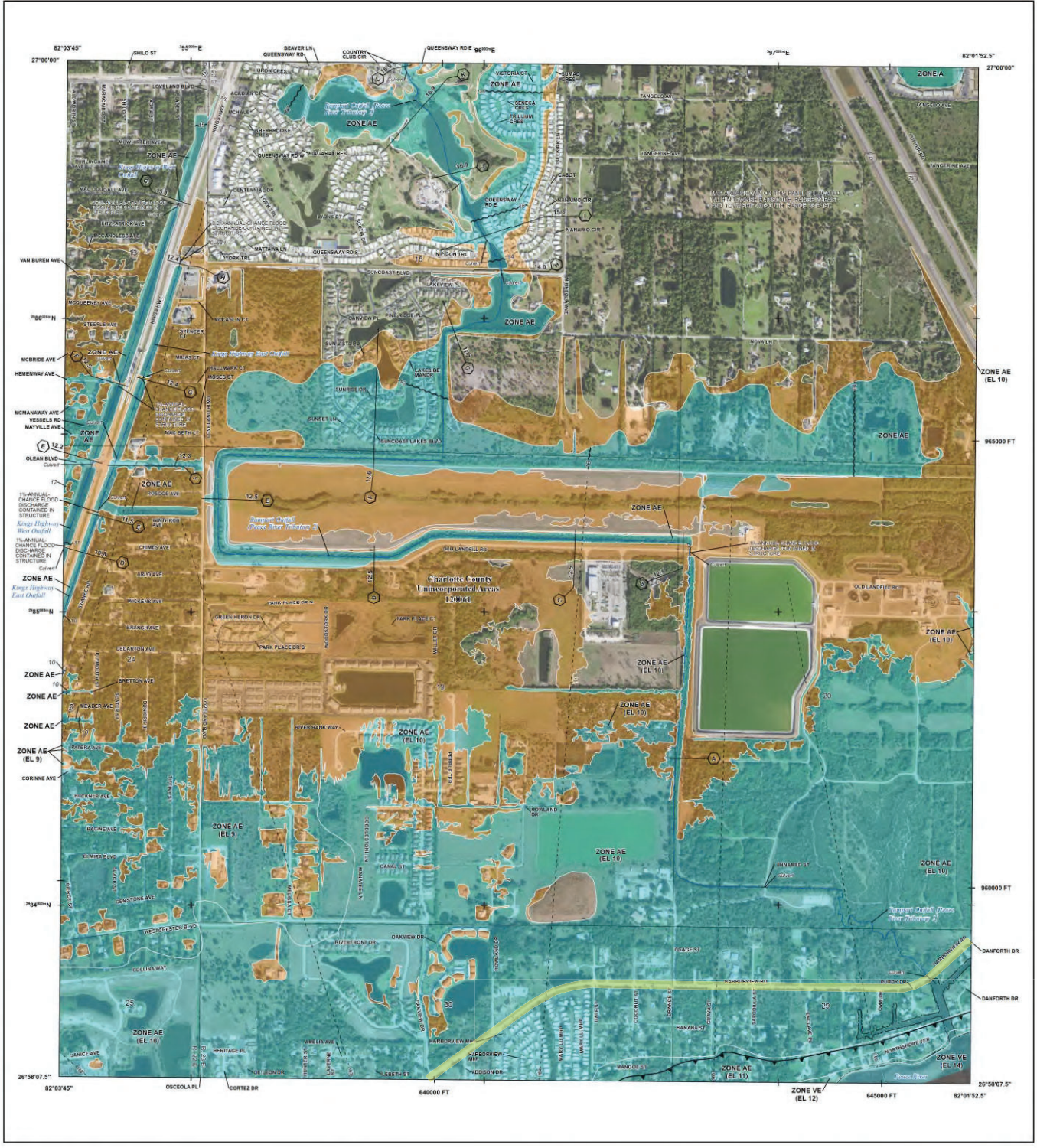
NATIONAL FLOOD INSURANCE PROGRAM
FLOOD INSURANCE RATE MAP

CHARLOTTE COUNTY, FLORIDA
 and Incorporated Areas
 PANEL 233 of 525

Panel Contains:
 COMMUNITY NUMBER PANEL SUFFIX
 CHARLOTTE COUNTY 120061 0233 0
 PINEHURST, CITY OF 120062 0233 0

PRELIMINARY
10/25/2019

VERSION NUMBER 2.4.3.5
 MAP NUMBER 12015C0233G
 MAP REVISED



FLOOD HAZARD INFORMATION

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- Future Conditions 1% Annual Chance Flood Hazard (Zone X)
- Area with Reduced Flood Risk due to Levee (Zone X)
- See Notes, Zone X
- Area with Flood Risk due to Levee (Zone D)

OTHER AREAS OF FLOOD HAZARD

- NO SCREEN Area of Minimal Flood Hazard (Zone X)
- Area of Undetermined Flood Hazard (Zone D)

GENERAL STRUCTURES

- Channel, Culvert, or Storm Sewer
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- Cross Sections with 1% Annual Chance Water Surface Elevation
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Comments regarding lead or adjacent FIRM panels must obtain a current copy of the adjacent panel as well as the current FIRM index. These may be obtained directly from the Flood Map Service Center at the number listed above.

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To determine if flood insurance is available in this community, contact your insurance agent or call the National Flood Insurance Program at 1-800-638-8626.

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LIMIT OF MODERATE WAVE ACTION: Zone AE has been divided by a Limit of Moderate Wave Action (LMWA). The LMWA represents the approximate landward limit of the 1-foot loading wave. The effect of wave heights between Zone VE and the LMWA (or between the LMWA and the LMAA for areas where Zone VE is not identified) will be similar to, but less severe than, those in the Zone VE.

▲ Limit of Moderate Wave Action (LMWA)

SCALE

Map Projection:
 Universal Transverse Mercator Zone 17N; North American Datum 1983;
 Western Hemisphere; Vertical Datum: NAVD 88

1 inch = 500 feet

0 250 500 750 1,000 1,500 2,000 Feet

0 125 250 meters

PANEL LOCATOR

NATIONAL FLOOD INSURANCE PROGRAM

FLOOD INSURANCE RATE MAP

CHARLOTTE COUNTY, FLORIDA
 and Incorporated Areas

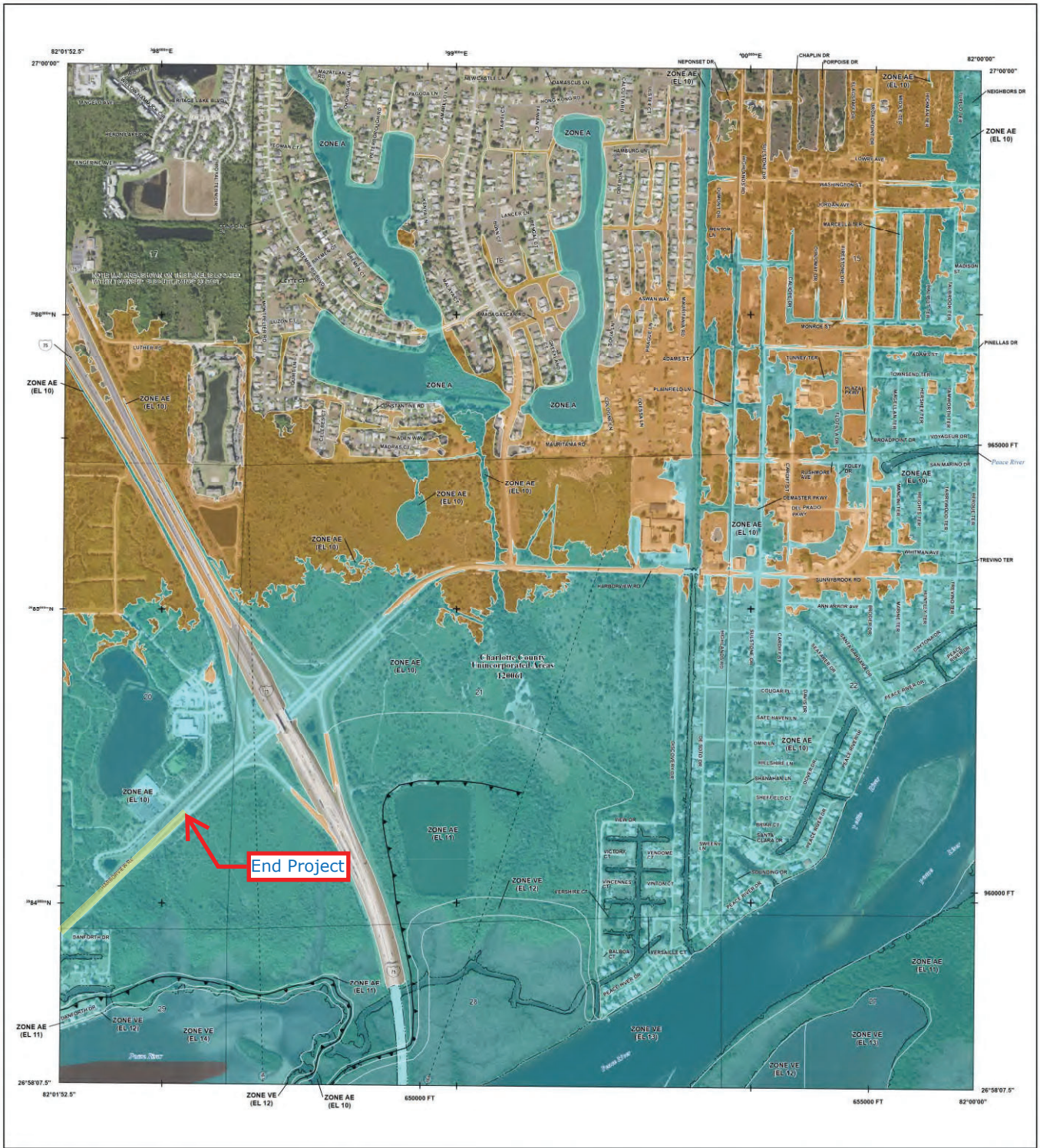
PANEL 231 of 525

Panel Contains:
 COMMUNITY CHARLOTTE COUNTY NUMBER PANEL SUFFIX 120061 0231 6

FEMA
 National Flood Insurance Program

PRELIMINARY
 10/25/2019

VERSION NUMBER 2.4.3.5
 MAP NUMBER 12015C0231G
 MAP REVISED



FLOOD HAZARD INFORMATION

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Comments concerning land use adjacent to FIRM panels must obtain a current copy of the adjacent panel as well as the current FIRM data. These may be obtained directly from the Flood Map Service Center at the number listed above.

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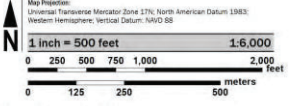
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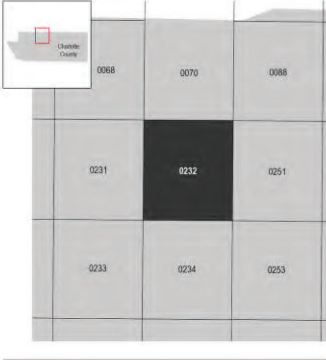
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Limit of Moderate Wave Action (LMWA)

SCALE



PANEL LOCATOR



FEMA
National Flood Insurance Program

NATIONAL FLOOD INSURANCE PROGRAM
FLOOD INSURANCE RATE MAP

CHARLOTTE COUNTY, FLORIDA
 and Incorporated Areas

PANEL 232 of 525

Panel Contains:
 COMMUNITY NUMBER PANEL SUFFIX
 CHARLOTTE COUNTY 120061 0232 6

PRELIMINARY
10/25/2019

VERSION NUMBER 2.4.3.5
 MAP NUMBER 12015C0232G
 MAP REVISED

Appendix D

Pre Application

THIS FORM IS INTENDED TO FACILITATE AND GUIDE THE DIALOGUE DURING A PRE-APPLICATION MEETING BY PROVIDING A PARTIAL "PROMPT LIST" OF DISCUSSION SUBJECTS. IT IS NOT A LIST OF REQUIREMENTS FOR SUBMITTAL BY THE APPLICANT.



**SOUTHWEST FLORIDA WATER MANAGEMENT DISTRICT
RESOURCE REGULATION DIVISION
PRE-APPLICATION MEETING NOTES**

**FILE
NUMBER:
PA 407088**

Date:	09/17/2019		
Time:	11:00		
Project Name:	Harborview Road - Melbourne St to W of I-75		
District Engineer:	Rob McDaniel		
District ES:	Al Gagne		
Attendees:	Melissa Mulvaney, Charles Samuels, Ed Cronyn		
County:	Charlotte	Sec/Twp/Rge:	25/40/22
Total Land Acreage:	2.3 miles	Project Acreage:	2.3 miles

Prior On-Site/Off-Site Permit Activity:

- No permits for the existing segment of roadway.

Project Overview:

- Widening of Harborview Road from a 2-lane to a 4-lane section, between Melbourne and just west of I-75.

Environmental Discussion: (Wetlands On-Site, Wetlands on Adjacent Properties, Delineation, T&E species, Easements, Drawdown Issues, Setbacks, Justification, Elimination/Reduction, Permanent/Temporary Impacts, Secondary and Cumulative Impacts, Mitigation Options, SHWL, Upland Habitats, Site Visit, etc.)

- Project is located in the Peace River ERP Basin. Mitigation banks that serve this area include the Little Pine Island and Boran Ranch mitigation banks.
- Provide the limits of jurisdictional wetlands and surface waters. Roadside ditches or other water conveyances, including permitted and constructed water conveyance features, can be claimed as surface waters per Chapter 62-340 F.A.C. if they do not meet the definition of a swale as stated under Rule 403.803 (14) F.S
- Provide appropriate mitigation using UMAM for impacts, if applicable.
- If the wetland mitigation is appropriate and the applicant is proposing to utilize mitigation bank credit as wetland mitigation, the following applies: Provide letter or credit availability or, if applicable, a letter of reservation from the wetland mitigation bank. The wetland mitigation bank service area and current ledgers can be found out the following link: <https://www.swfwmd.state.fl.us/business/epermitting/environmental-resource-permit>, Goto "ERP Mitigation Bank Wetland Credit Ledgers"
- Demonstrate elimination and reduction of wetland impacts.
- Maintain minimum 15 foot, average 25 foot wetland conservation area setback or address secondary impacts.
- If the project is proposing to attenuate/treat in wetlands. Please demonstrate that adverse impacts to the wetland hydro-periods will not occur by providing hydrographs of the 2.33 year mean annual storm. The graph should start and end at the pop-off elevation with Existing Condition and Proposed Condition hydrographs superimposed for comparison. Please provide a supporting narrative for the hydrographs explaining any variations that are shown. The invert of the agricultural ditches may be the existing 'pop-off' elevation, or SHWL of the wetland and may need to be considered when designing the storm water management system.
- Determine SHWL's at pond locations, wetlands, and OSWs.
- Determine normal pool elevations of wetlands.
- Determine 'pop-off' locations and elevations of wetlands.
- As of October 1, 2017, the District will no longer send a copy of an application that does not qualify for a State Programmatic General Permit (SPGP) to the U.S. Army Corps of Engineers. If a project does not qualify for a SPGP, you will need to apply separately to the Corps using the appropriate federal application form for activities under federal jurisdiction. Please see the Corps' Jacksonville District Regulatory Division Sourcebook for more information about federal permitting. Please call your local Corps office if you have questions about federal permitting. Link: <http://www.saj.usace.army.mil/Missions/Regulatory/Source-Book/>

Site Information Discussion: (SHW Levels, Floodplain, Tailwater Conditions, Adjacent Off-Site Contributing Sources, Receiving Waterbody, etc.)

- WBIDs need to be independently verified by the consultant -

- WBID 2056E – Sunrise Waterways de-listed for nutrients. It is unclear how discharges from this segment of roadway can physically reach the Sunrise Waterways, located west of the proposed project area, west of U.S. 41.
- WBID 2056B - Middle Peace River Estuary (Middle Segment) listed as impaired for Nutrients (Total Nitrogen). Discharges from the proposed section of roadway improvements appear to be directly discharging to this portion of the Peace River.
- Document/justify SHWE's at pond locations, wetlands, and OSWs.
- Determine normal pool elevations of wetlands.
- Determine 'pop-off' locations and elevations of wetlands.
- Provide documentation to support tailwater conditions for quality and quantity design
- Proposed control structures in wetlands should be consistent with existing 'pop-off' elevations of wetlands; demonstrate no adverse impacts to wetland hydroperiod for up to 2.33yr mean annual storm.
- Contamination issues need to be resolved with the FDEP. Check FDEP MapDirect layer for possible contamination points within/adjacent to the project area. [FDEP MapDirect Link](#)
 - Underground petroleum storage tank FDEP Facility ID Nos. 8626521 may be near the project area.
 - For known contamination within site or within 500' beyond the site: with the ERP Application please provide documentation from FDEP that the proposed construction will not result in adverse impacts to surface water/groundwater quality. This is required prior to the ERP Application being deemed complete.
 - FDEP Contacts:
 - For projects located within Sarasota, DeSoto, Highlands and Charlotte Counties: Gary Maier Gary.Maier@FloridaDEP.gov
- Stormwater retention and detention systems are classified as moderate sanitary hazards with respect to public and private drinking water wells. Stormwater treatment facilities shall not be constructed within 100 feet of an existing public water supply well and shall not be constructed within 75 feet of an existing private drinking water well. Subsection 4.2, A.H.V.II.
- Any wells on site should be identified and their future use/abandonment must be designated.

Water Quantity Discussions: (Basin Description, Storm Event, Pre/Post Volume, Pre/Post Discharge, etc.)

- Demonstrate that post development peak discharges from proposed project area will not cause an adverse impact for a 25-year, 24-hour storm event.
- Demonstrate that site will not impede the conveyance of contributing off-site flows.
- For 100-year riverine flood impacts: Delineate the area and quantify volume of fill placement within the floodplain.
- For the western portion of the project, the Charlotte Harbor Watershed Model is available. The eastern portion of the project has not been modeled via a watershed effort.
- Demonstrate that the project will not increase flood stages up- or down-stream of the project area(s).
- Provide equivalent compensating storage for all 100-year, 24-hour riverine floodplain impacts if applicable. Providing cup-for-cup storage in dedicated areas of excavation is the preferred method of compensation; if no impacts to flood conveyance are proposed and storage impacts and compensation occur within the same basin. In this case, tabulations should be provided at 0.5-foot increments to demonstrate encroachment and compensation occur at the same levels. Otherwise, storage modeling will be required to demonstrate no increase in flood stages will occur on off-site properties, using the mean annual, 10-year, 25-year, and 100-year storm events for the pre- and post-development conditions.
- Please be aware that if there is credible historical evidence of past flooding or the physical capacity of the downstream conveyance or receiving waters indicates that the conditions for issuance will not be met without consideration of storm events of different frequency or duration, applicants shall be required to provide additional analyses using storm events of different duration or frequency than the 25-year 24-hour storm event, or to adjust the volume, rate or timing of discharges. [Section 3.0 Applicant's Handbook Volume II]

Water Quality Discussions: (Type of Treatment, Technical Characteristics, Non-presumptive Alternatives, etc.)

- Provide water quality treatment for entire project area and all contributing off-site flows.
- Topography from District Lidar information indicates the project discharges to an impaired water body, must provide a net environmental improvement.
- Applicant must demonstrate a net improvement for the parameters of concern by performing a pre/post pollutant loading analysis based on existing land use and the proposed land use.
- Also, replace treatment function of existing ditches to be filled.

- Presumptive criteria could be used if it can be documented that discharges from the site reach the Sunrise Waterways (WBID 2056E).
- Presumptive Water Quality Treatment for Alterations to Existing Public Roadway Projects:
 - Refer to Section 4.5 A.H.V.II for Alterations to Existing Public Roadway Projects.
 - Refer to Sections 4.8, 4.8.1 and 4.8.2 A.H.V.II for Compensating Stormwater Treatment, Overtreatment, and Offsite Compensation.
 - All co-mingled existing & new impervious that is proposed to be connected to a treatment pond will require treatment for an area equal to the co-mingled existing & new impervious (times ½” for dry treatment or 1” for wet treatment). This applies whether or not equivalent treatment concepts are used.
 - However, if equivalent treatment concepts are used it is possible to strategically locate the pond(s) so that the minimum treatment requirement may be for an area equivalent to the new impervious area only. That is, co-mingled existing & new impervious that is not connected to a treatment pond may bypass treatment (as per Section 4.5(2), A.H.V.II); if the ‘total impervious area’ that is connected to the treatment pond(s) is at least equivalent to the area of new impervious only. The ‘total impervious area’ that is connected to the pond(s) may be composed of co-mingled existing & new impervious.
 - Offsite impervious not required to be treated; but may be useful to be treated when using equivalent treatment concepts.
 - Existing treatment capacity displaced by any road project will require additional compensating volume. Refer to Subsection 4.5(c), A.H.V.II.
- Will acknowledge compensatory treatment to offset pollutant loads associated with portions of the project area that cannot be physically treated.
- Provide additional 50% treatment for any direct discharges to OFW. Refer to ERP Applicant’s Handbook Vol. II Subsection 4.1(f).
- Please be advised that although use of isolated wetlands for ERP treatment purposes is permissible as per Section 4.1(a)(3), A.H.V.II, use of isolated wetlands for treatment purposes may not necessarily meet US Army Corps criteria.
- Net improvement
 - Refer to rule 62-330.301(2), F.A.C.
 - The application must demonstrate a net improvement for nutrients. Applicant may demonstrate a net improvement for the parameters of concern by performing a pre/post pollutant loading analysis based on existing land use and the proposed land use. Refer to ERP Applicant’s Handbook Vol. II Subsection 4.1(g).
 - Effluent filtration is known to be ineffective for treating nutrient related impairments, unless special nutrient adsorption media provided. However, please note special nutrient adsorption media has extremely low conductivity values compared to typical sand type effluent filtration filter media. Note: if treatment volume required for net improvement is less than the treatment volume required for ‘presumptive’ treatment, then use of effluent filtration is ok.

Sovereign Lands Discussion: (Determining Location, Correct Form of Authorization, Content of Application, Assessment of Fees, Coordination with FDEP)

- Several section of the project may be located within state owned sovereign submerged lands (SSSL). Be advised that a title determination will be required from FDEP to verify the presence and/or location of SSSL.
- If use of SSSL is proposed, authorization will be required. Refer to Chapter 18-21, F.A.C. and Chapter 18-20, F.A.C. for guidance on projects that impact SSSL and Aquatic Preserves.
- A public easement may be required for sections of the road that cross SSSL. Refer to Chapter 18-21.005, F.A.C.

Operation and Maintenance/Legal Information: (Ownership or Perpetual Control, O&M Entity, O&M Instructions, Homeowner Association Documents, Coastal Zone requirements, etc.)

- The permit must be issued to entity that owns or controls the property.
- Provide evidence of ownership or control by deed, easement, contract for purchase, etc. Evidence of ownership or control must include a legal description. A Property Appraiser summary of the legal description is NOT acceptable.

Application Type and Fee Required:

- SWERP – Sections A, C, and E of the ERP Application.
- Consult the [fee schedule](#) for different thresholds.

Other: (Future Pre-Application Meetings, Fast Track, Submittal Date, Construction Start Date, Required District Permits – WUP, WOD, Well Construction, etc.)

- An application for an individual permit to construct or alter a dam, impoundment, reservoir, or appurtenant work, requires that a notice of receipt of the application must be published in a newspaper within the affected area. Provide documentation that such noticing has been accomplished. Note that the published notices of receipt for an ERP can be in accordance with the language provided in Rule 40D-1.603(10), F.A.C.
- Provide a copy of the legal description (of all applicable parcels within the project area) in one of the following forms:
 - a. Deed with complete Legal Description attachment.
 - b. Plat.
 - c. Boundary survey of the property(ies) with a sketch.
- The plans and drainage report submitted electronically must include the appropriate information required under Rules 61G15-23.005 and 61G15-23.004 (Digital), F.A.C. The following text is required by the Florida Board of Professional Engineers (FBPE) to meet this requirement when a digitally created seal is not used and must appear where the signature would normally appear:

ELECTRONIC (Manifest): *[NAME] State of Florida, Professional Engineer, License No. [NUMBER]
This item has been electronically signed and sealed by [NAME] on the date indicated here using a SHA authentication code. Printed copies of this document are not considered signed and sealed and the SHA authentication code must be verified on any electronic copies*

DIGITAL: *[NAME] State of Florida, Professional Engineer, License No. [NUMBER]; This item has been digitally signed and sealed by [NAME] on the date indicated here using a Digital Signature; Printed copies of this document are not considered signed and sealed and the signature must be verified on any electronic copies.*

- Provide soil erosion and sediment control measures for use during construction. Refer to ERP Applicant's Handbook Vol. 1 Part IV Erosion and Sediment Control.
- Demonstrate that excavation of any stormwater ponds does not breach an aquitard (see Subsection 2.1.1, A.H.V.II) such that it would allow for lesser quality water to pass, either way, between the two systems. In those geographical areas of the District where there is not an aquitard present, the depth of the pond(s) shall not be excavated to within two (2) feet of the underlying limestone which is part of a drinking water aquifer. [Refer to Subsection 5.4.1(b), A.H.V.II]

Disclaimer: The District ERP pre-application meeting process is a service made available to the public to assist interested parties in preparing for submittal of a permit application. Information shared at pre-application meetings is superseded by the actual permit application submittal. District permit decisions are based upon information submitted during the application process and Rules in effect at the time the application is complete.

Appendix E

PSR Meeting

Meeting Minutes

Project:	FPID 434965-2-52-01 / Harborview Road from Melbourne Street to I-75		
Subject:	Drainage Pond Location Meeting		
Date and time:	May 17, 2021 – 1:30 PM	Meeting no:	
Meeting place:	Teams Meeting	Minutes by:	Charles Samuels
Present:		Representing:	
	Richard Uptegraff		Atkins
	Charles Samuels		Atkins
	Jay Winter		Scalar
	Katie Castor		Scalar
	Brent Setchell		FDOT
	Sergio Figueroa		FDOT
	Nicole Monies		FDOT

The meeting was held via Teams Meeting video conferencing.

- Richard Uptegraff opened the meeting with an introduction by all attendees.
 - Jay Winter brought up discussion about the shared sue path and his meeting with the County coming up.
 - Brent mentioned that the shared use path would need to be taken into account for treatment calculations.
 - Charles presented the pond locations which was followed by Brents comments about meeting nutrient criteria. Discussion ensued for each location with Brent suggesting to eliminate the ponds located on home sites as well as the elimination of Pond 6 since it was so small.
 - Katie brought up the issue that one of the Pond 2 sites was located on Conservation land.
 - Richard ended the meeting with no further discussion.
- Action Items:
 - No Action Items were brought up.

Appendix F

POND SHGWT

Summary of Seasonal High Groundwater Table Estimates
Harborview Road from Melbourne Road to I-75
Charlotte County, Florida
FPN 434965-2-32-01
Tierra Project No. 6511-19-261

Boring Name	Boring Location ⁽¹⁾		Boring Location ⁽²⁾		Ground Elevation ⁽²⁾ (feet, NAVD88)	Boring Depth (feet)	Measured Groundwater Table			USDA Soil Survey		Estimated SHGWT ⁽⁶⁾	
	Station (feet)	Offset (feet)	State Plane Coordinates, Florida West NAD 1983				Date Recorded	Depth ⁽³⁾ (feet)	Elevation (feet, NAVD88)	Map Symbol	Estimated SHGWT ⁽⁴⁾ (feet)	Depth (feet)	Elevation (ft, NAVD88)
			Northing	Easting									
PBA - 1A-1	57 + 38	135 RT	956659	636706	2.1	3.0	06/30/21	0.6	1.5	36	0.5 - 1.5	0.0	2.1
PBA - 1B-1	63 + 21	135 LT	957002	637254	2.9	5.0	06/30/21	1.8	1.1	36	0.5 - 1.5	0.5	2.4
PBA - 1C-1	63 + 32	154 RT	956715	637291	4.2	6.5	06/30/21	4.9	-0.7	24	0.0	1.5	2.7
PBA - 2A-1	72 + 10	529 LT	957399	638164	1.8	2.5	06/30/21	0.2	1.6	123	0.5 - 1.5	ABG ⁽⁶⁾	>1.8
PBA - 2A-2	71 + 81	394 LT	957264	638133	1.0	4.5	06/30/21	0.7	0.3	123	0.5 - 1.5	ABG ⁽⁶⁾	>1.0
PBA - 2B-1	72 + 83	368 LT	957237	638234	2.8	6.5	06/30/21	0.9	1.9	123	0.5 - 1.5	0.0	2.8
PBA - 2B-2	72 + 09	141 LT	957011	638157	2.3	3.0	06/30/21	0.7	1.6	123	0.5 - 1.5	ABG ⁽⁶⁾	>2.3
SH - 72L	72 + 19	75 LT	956944	638166	2.7	2.5	09/15/20	0.8	1.9	123	0.5 - 1.5	0.0	2.7
PBA - 2C-1	77 + 94	140 RT	956790	638791	3.6	4.0	06/30/21	2.1	1.5	123	0.5 - 1.5	1.0	2.6
PBA - 2C-2	77 + 31	171 RT	956732	638727	3.6	4.5	07/11/21	2.1	1.5	123	0.5 - 1.5	1.0	2.6
PBA - 3A-1	102 + 26	191 LT	958523	640566	8.0	5.5	06/29/21	5.2	2.8	106	3.5 - 5.0	2.5	5.5
PBA - 3A-2	99 + 89	96 LT	958305	640433	7.6	5.5	06/29/21	5.2	2.4	106	3.5 - 5.0	2.0	5.6
PBA - 3B-1	99 + 92	175 RT	958091	640599	7.3	5.0	07/11/21	3.6	3.7	106	3.5 - 5.0	2.0	5.3
PBA - 3B-2	98 + 25	383 RT	957824	640591	7.3	5.0	07/11/21	4.0	3.3	106	3.5 - 5.0	2.5	4.8
PBA - 3C-1	108 + 01	357 LT	959014	640945	7.8	4.5	07/11/21	2.8	5.0	123	0.5 - 1.5	2.0	5.8
PBA - 3C-2	109 + 42	163 LT	958931	641193	7.3	5.0	07/11/21	2.9	4.4	123	0.5 - 1.5	2.0	5.3
PBA - 4A-1	147 + 56	89 RT	958787	645060	2.7	4.0	06/29/21	1.7	1.0	7	1.5 - 3.5	0.5	2.2
PBA - 4A-2	146 + 82	223 RT	958653	644985	2.9	4.5	06/29/21	1.6	1.3	7	1.5 - 3.5	0.5	2.4

⁽¹⁾ Station and offset were obtained by Tierra using project design files based on the surveyed boring locations provided in state plane coordinates .

⁽²⁾ Boring locations and ground elevations were provided by the project surveyor. The state plane coordinates reference Florida West NAD 1983.

⁽³⁾ Depth below existing grades at time of augering.

⁽⁴⁾ Seasonal high groundwater table depth estimated based on the Charlotte County, Florida USDA Soil Survey information.

⁽⁵⁾ Seasonal high groundwater table estimated based on historic soil stratigraphy, measured groundwater levels, the USDA Soil Survey and experience with similar soil conditions.

⁽⁶⁾ ABG= Seasonal high groundwater table is estimated to be Above Grade at the boring location. Tierra recommends the project biologist determine above grade seasonal high groundwater table level based on biological and wetland indicators.

Summary of Seasonal High Groundwater Table Estimates
Harborview Road from Melbourne Road to I-75
Charlotte County, Florida
FPN 434965-2-32-01
Tierra Project No. 6511-19-261

Boring Name	Boring Location ⁽¹⁾ (B/L Survey Harborview)		Boring Location ⁽²⁾ State Plane Coordinates, Florida West NAD 1983		Ground Elevation ⁽²⁾ (feet, NAVD88)	Boring Depth (feet)	Measured Groundwater Table			USDA Soil Survey		Estimated SHGWT ⁽⁶⁾	
	Station (feet)	Offset (feet)	Northing	Eastings			Date Recorded	Depth ⁽³⁾ (feet)	Elevation (feet, NAVD88)	Map Symbol	Estimated SHGWT ⁽⁴⁾ (feet)	Depth (feet)	Elevation (ft, NAVD88)
PBA - 4B-1	149 + 26	212 LT	959099	645188	2.4	5.0	06/29/21	2.5	-0.1	36	0.5 - 1.5	0.5	1.9
PBA - 4B-2	149 + 94	88 LT	958992	645270	2.4	5.0	06/29/21	2.4	0.0	36	0.5 - 1.5	1.0	1.4
PBA - 5A-1	153 + 28	156 LT	959184	645482	3.2	5.5	06/29/21	4.8	-1.6	36	0.5 - 1.5	1.5	1.7
PBA - 5B-1	153 + 93	133 RT	959016	645726	2.3	3.5	07/11/21	1.0	1.3	7	1.5 - 3.5	0.5	1.8
PBA - 5B-2	153 + 04	118 RT	958960	645642	2.6	8.5	07/11/21	3.0	-0.4	7	1.5 - 3.5	1.0	1.6
PBA - 5C-1	164 + 53	39 LT	959884	646360	3.5	4.0	06/29/21	2.3	1.2	36	0.5 - 1.5	0.5	3.0

⁽¹⁾ Station and offset were obtained by Tierra using project design files based on the surveyed boring locations provided in state plane coordinates .

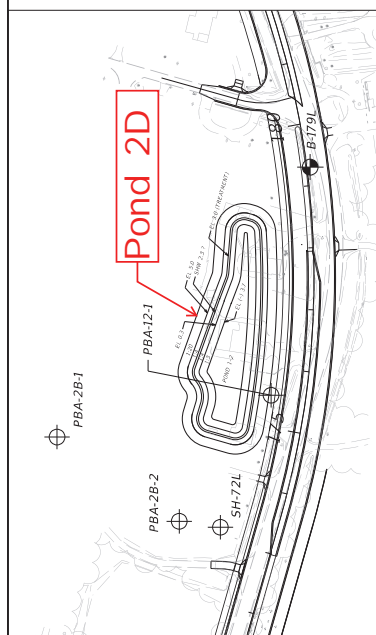
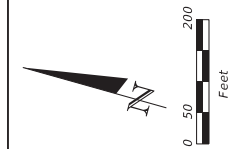
⁽²⁾ Boring locations and ground elevations were provided by the project surveyor. The state plane coordinates reference Florida West NAD 1983.

⁽³⁾ Depth below existing grades at time of augering.

⁽⁴⁾ Seasonal high groundwater table depth estimated based on the Charlotte County, Florida USDA Soil Survey information.

⁽⁵⁾ Seasonal high groundwater table estimated based on historic soil stratigraphy, measured groundwater levels, the USDA Soil Survey and experience with similar soil conditions.

⁽⁶⁾ ABG= Seasonal high groundwater table is estimated to be Above Grade at the boring location. Tierra recommends the project biologist determine above grade seasonal high groundwater table level based on biological and wetland indicators.

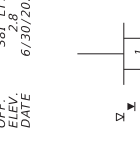


BORING LOCATION PLAN

- LEGEND**
- 1. GRAY TO BROWN SAND TO SAND WITH SILT OCCASIONALLY WITH ROCK AND SHELL (A-3)
 - 2. LIGHT BROWN TO BROWN SAND WITH TRACE ORGANICS (A-3)
 - 3. GRAY TO ORANGE-BROWN TO BROWN CLAYEY SAND TO CLAYEY SILT (A-2/6/A-4)
 - 4. DARK BROWN TO BLACK ORGANIC SAND TO MUCK (A-8)
 - 5. GRAY TO BROWN SILTY SAND OCCASIONALLY WITH ROCK AND SHELL (A-2.4)
 - A-3 ASHTO GROUP SYMBOL AS DETERMINED BY VISUAL REVIEW AND LABORATORY TESTING ON SELECTED SAMPLES FOR CONFIRMATION OF VISUAL REVIEW.
 - N NUMBERS TO THE LEFT OF BORINGS INDICATE SPT VALUE FOR 12 INCHES OF PENETRATION (UNLESS OTHERWISE NOTED).
 - 50/4 NUMBER OF BLOWS FOR 4 INCHES OF PENETRATION
 - HA HAND AUGERED TO VERIFY UTILITY CLEARANCE
 - NAVD 88 NORTH AMERICAN VERTICAL DATUM OF 1988
 - ⊕ APPROXIMATE AUGER BORING LOCATION
 - ⊕ APPROXIMATE SPT BORING LOCATION
 - ⊕ ESTIMATED SEASONAL HIGH GROUNDWATER TABLE AT OR ABOVE GRADE
 - ⊕ ESTIMATED SEASONAL HIGH GROUNDWATER TABLE
 - ⊕ GROUNDWATER LEVEL ENCOUNTERED DURING FIELD EXPLORATIONS

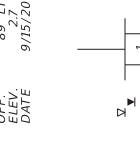
NOTE: BORINGS DENOTED WITH AN ASTERISK (*) WERE LOCATED BY THE PROJECT SURVEYOR. OTHER BORING LOCATIONS WERE RECORDED IN THE FIELD BY TIERRA, INC. USING GARMIN ETREX MANUFACTURES. REPORTED ACCURACY OF ±10 FEET. THE GPS COORDINATES RECORDED BY TIERRA WERE UTILIZED IN CONJUNCTION WITH PROJECT DESIGN FILES TO OBTAIN STATION, OFFSET AND ELEVATION.

BOR # PBA-2B-1*
 REF. A.
 Q.CONST. 381' LT.
 OFF. 2.8
 ELEV. 6/30/2021
 DATE



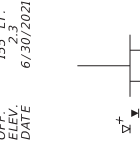
BORING TERMINATED AT ELEVATION -3.7 FT (NAVD 88)

BOR # SH-72L*
 REF. A.
 Q.CONST. 89' LT.
 OFF. 2.7
 ELEV. 9/15/2020
 DATE



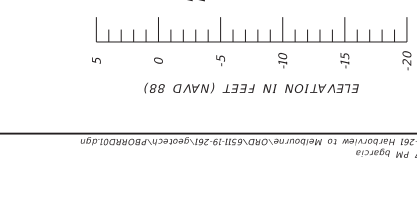
BORING TERMINATED AT ELEVATION 0.2 FT (NAVD 88)

BOR # PBA-12-1
 REF. A.
 Q.CONST. 56' LT.
 OFF. 3.4
 ELEV. 2/7/2023
 DATE



BORING TERMINATED AT ELEVATION -1.6 FT (NAVD 88)

BOR # B-179L
 REF. A.
 Q.CONST. 5' RT.
 OFF. 3.0
 ELEV. 1/23/2023
 DATE
 DRILLER C. WILSON
 HAMMER AUTOMATIC
 R/G D-25



BORING TERMINATED AT ELEVATION -17.0 FT (NAVD 88)

GRANULAR MATERIALS- RELATIVE DENSITY	SAFETY HAMMER SPT NVALUE (BLOWS/FT.)	AUTOMATIC HAMMER SPT NVALUE (BLOWS/FT.)
VERY LOOSE 4 to 10	LESS THAN 4 3 to 8	LESS THAN 3 3 to 8
LOOSE 10 to 20	10 to 20 10 to 24	9 to 24 10 to 24
MEDIUM DENSE 20 to 30	GREATER THAN 20 GREATER THAN 50	GREATER THAN 40
VERY DENSE		
SILTS AND CLAYS CONSISTENCY	SPT NVALUE (BLOWS/FT.)	SPT NVALUE (BLOWS/FT.)
VERY SOFT	LESS THAN 2	LESS THAN 1
SOFT	2 to 4	1 to 3
STIFF	4 to 10	3 to 8
VERY STIFF	10 to 30	8 to 15
HARD	15 to 30 GREATER THAN 30	12 to 24 GREATER THAN 24

POND 1-2

DATE	DESCRIPTION	REVISIONS	ENGINEER OF RECORD	STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION	ROAD NO.	COUNTY	FINANCIAL PROJECT ID	SHEET NO.
			MARC E. NOVAK, PH.D., P.E. TIERRA, INC. 7351 TEMPLE TERRACE HIGHWAY TAMPA, FLORIDA 33637		CR 776	CHARLOTTE	434965-2-52-01	
POND SOIL SURVEY (1)								

Appendix G

BMPTrains

Complete Report (not including cost) Ver 4.3.3

Project: CR 776 (Harborview Road)
Date: 11/18/2021 2:55:04 PM

Site and Catchment Information

Analysis: Net Improvement

Catchment Name	Basin 1 and 2
Rainfall Zone	Florida Zone 4
Annual Mean Rainfall	52.00

Pre-Condition Landuse Information

Landuse	User Defined Values
Area (acres)	10.80
Rational Coefficient (0-1)	0.26
Non DCIA Curve Number	84.00
DCIA Percent (0-100)	13.64
Nitrogen EMC (mg/l)	1.160
Phosphorus EMC (mg/l)	0.157
Runoff Volume (ac-ft/yr)	12.184
Groundwater N (kg/yr)	0.000
Groundwater P (kg/yr)	0.000
Nitrogen Loading (kg/yr)	17.426
Phosphorus Loading (kg/yr)	2.359

Post-Condition Landuse Information

Landuse	User Defined Values
Area (acres)	10.80
Rational Coefficient (0-1)	0.50
Non DCIA Curve Number	84.00
DCIA Percent (0-100)	51.08
Wet Pond Area (ac)	0.11
Nitrogen EMC (mg/l)	1.160
Phosphorus EMC (mg/l)	0.157
Runoff Volume (ac-ft/yr)	23.340

Groundwater N (kg/yr)	0.000
Groundwater P (kg/yr)	0.000
Nitrogen Loading (kg/yr)	33.382
Phosphorus Loading (kg/yr)	4.518

Catchment Number: 1 Name: Basin 1 and 2

Project: CR 776 (Harborview Road)

Date: 11/18/2021

Multiple BMP in Series Design Parameters

BMP in Series Number: 1

BMP Type: Wet Detention

Permanent Pool Volume (ac-ft) 0.380

Permanent Pool Volume (ac-ft) for 31 days residence 1.982

Annual Residence Time (days) 6

Littoral Zone Efficiency Credit

Wetland Efficiency Credit

BMP in Series Number: 2

BMP Type: Filtration

Treatment Depth (in) 1.000

Hydraulic Capture Efficiency (%) 75

Media Type B&G CTS12

Media N Reduction (%) 60

Media P Reduction (%) 90

BMP in Series Number: 3

BMP Type: None

BMP in Series Number: 4

BMP Type: None

Watershed Characteristics

Catchment Area (acres) 10.80

Contributing Area (acres) 10.690

Non-DCIA Curve Number 84.00

DCIA Percent 51.08

Rainfall Zone Florida Zone 4

Rainfall (in) 52.00

Surface Water Discharge

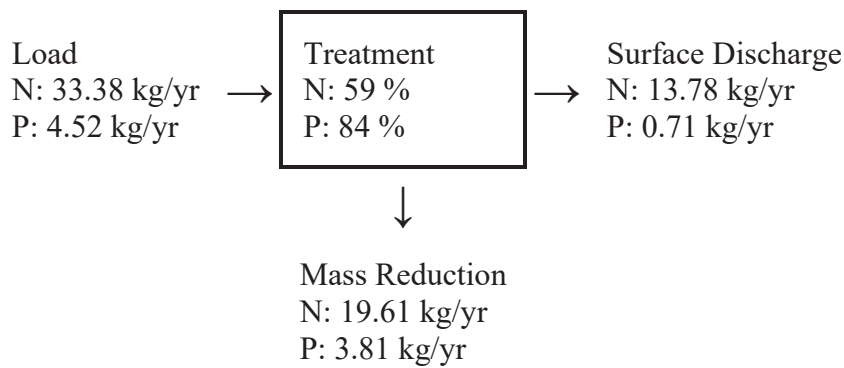
Required TN Treatment Efficiency (%) 48

Provided TN Treatment Efficiency (%) 59

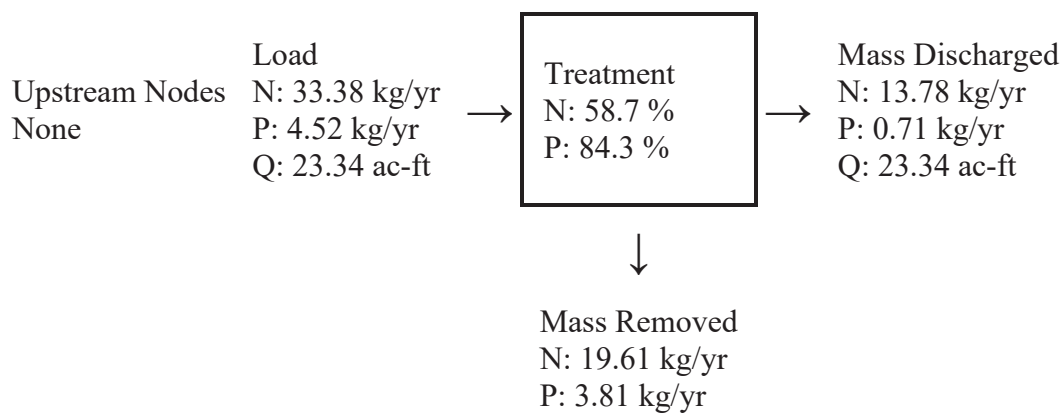
Required TP Treatment Efficiency (%) 48

Provided TP Treatment Efficiency (%) 84

Load for Multiple BMP in Series



Load Diagram for Multiple BMP (As Used In Routing)



Summary Treatment Report Version: 4.3.3

Project: CR 776 (Harborview Road)

Analysis Type: Net Improvement

Date:11/18/2021

BMP Types:

Routing Summary

Catchment 1 - (Basin 1 and 2) Multiple BMP

Catchment 1 Routed to Outlet

Based on % removal values to the nearest percent

Total nitrogen target removal met? **Yes**

Total phosphorus target removal met? **Yes**

Summary Report

Nitrogen

Surface Water Discharge

Total N pre load	17.43 kg/yr	
Total N post load	33.38 kg/yr	
Target N load reduction	48 %	
Target N discharge load	17.43 kg/yr	
Percent N load reduction	59 %	
Provided N discharge load	13.78 kg/yr	30.37 lb/yr
Provided N load removed	19.61 kg/yr	43.23 lb/yr

Phosphorus

Surface Water Discharge

Total P pre load	2.359 kg/yr	
Total P post load	4.518 kg/yr	
Target P load reduction	48 %	
Target P discharge load	2.359 kg/yr	
Percent P load reduction	84 %	
Provided P discharge load	.708 kg/yr	1.56 lb/yr
Provided P load removed	3.811 kg/yr	8.402 lb/yr

Pond 2D

Complete Report (not including cost) Ver 4.3.5

Project:

Date: 7/11/2023 9:32:08 AM

Site and Catchment Information

Analysis: Net Improvement

Catchment Name	Basin 1 and 2_2D
Rainfall Zone	Florida Zone 4
Annual Mean Rainfall	52.00

Pre-Condition Landuse Information

Landuse	User Defined Values
Area (acres)	21.36
Rational Coefficient (0-1)	0.24
Non DCIA Curve Number	84.00
DCIA Percent (0-100)	10.91
Nitrogen EMC (mg/l)	1.160
Phosphorus EMC (mg/l)	0.157
Runoff Volume (ac-ft/yr)	22.449
Groundwater N (kg/yr)	0.000
Groundwater P (kg/yr)	0.000
Nitrogen Loading (kg/yr)	32.108
Phosphorus Loading (kg/yr)	4.346

Post-Condition Landuse Information

Landuse	User Defined Values
Area (acres)	21.36
Rational Coefficient (0-1)	0.40
Non DCIA Curve Number	84.00
DCIA Percent (0-100)	34.40
Wet Pond Area (ac)	0.56
Nitrogen EMC (mg/l)	1.160
Phosphorus EMC (mg/l)	0.157
Runoff Volume (ac-ft/yr)	35.631
Groundwater N (kg/yr)	0.000
Groundwater P (kg/yr)	0.000
Nitrogen Loading (kg/yr)	50.962
Phosphorus Loading (kg/yr)	6.897

Catchment Number: 1 Name: Basin 1 and 2_2D

Project:

Date: 7/11/2023

Wet Detention Design

Permanent Pool Volume (ac-ft)	2.180
Permanent Pool Volume (ac-ft) for 31 days residence	3.026
Annual Residence Time (days)	22
Littoral Zone Efficiency Credit	
Wetland Efficiency Credit	

Watershed Characteristics

Catchment Area (acres)	21.36
Contributing Area (acres)	20.800
Non-DCIA Curve Number	84.00
DCIA Percent	34.40
Rainfall Zone	Florida Zone 4
Rainfall (in)	52.00

Surface Water Discharge

Required TN Treatment Efficiency (%)	37
Provided TN Treatment Efficiency (%)	37
Required TP Treatment Efficiency (%)	37
Provided TP Treatment Efficiency (%)	62

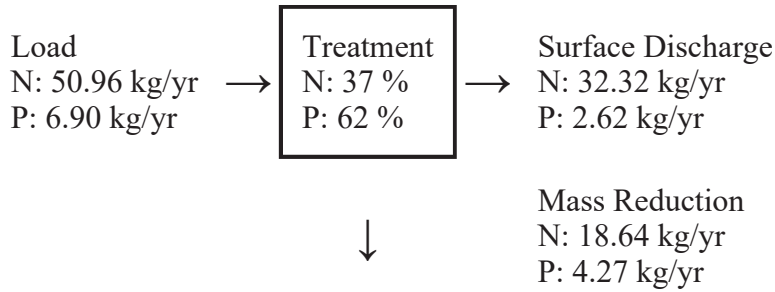
Media Mix Information

Type of Media Mix	Not Specified
Media N Reduction (%)	
Media P Reduction (%)	

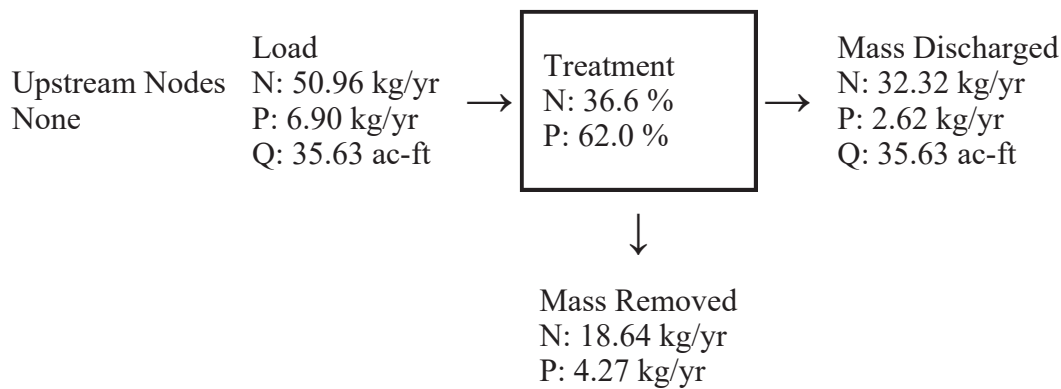
Groundwater Discharge (Stand-Alone)

Treatment Rate (MG/yr)	0.000
TN Mass Load (kg/yr)	0.000
TN Concentration (mg/L)	0.000
TP Mass Load (kg/yr)	0.000
TP Concentration (mg/L)	0.000

Load Diagram for Wet Detention (stand-alone)



Load Diagram for Wet Detention (As Used In Routing)



Summary Treatment Report Version: 4.3.5

Project:

Analysis Type: Net Improvement

Date: 7/11/2023

BMP Types:

Catchment 1 - (Basin 1 and 2_2D)

Routing Summary

Wet Detention

Catchment 1 Routed to Outlet

Based on % removal values to the nearest percent

Total nitrogen target removal met? **Yes**

Total phosphorus target removal met? **Yes**

Summary Report

Nitrogen

Surface Water Discharge

Total N pre load 32.11 kg/yr

Total N post load 50.96 kg/yr

Target N load reduction	37 %	
Target N discharge load	32.11 kg/yr	
Percent N load reduction	37 %	
Provided N discharge load	32.32 kg/yr	71.27 lb/yr
Provided N load removed	18.64 kg/yr	41.1 lb/yr

Phosphorus

Surface Water Discharge

Total P pre load	4.346 kg/yr	
Total P post load	6.897 kg/yr	
Target P load reduction	37 %	
Target P discharge load	4.346 kg/yr	
Percent P load reduction	62 %	
Provided P discharge load	2.623 kg/yr	5.78 lb/yr
Provided P load removed	4.275 kg/yr	9.426 lb/yr

Complete Report (not including cost) Ver 4.3.3

Project: CR 776 (Harborview Road)

Date: 11/18/2021 2:56:32 PM

Site and Catchment Information

Analysis: Net Improvement

Catchment Name	Basin 3
Rainfall Zone	Florida Zone 4
Annual Mean Rainfall	52.00

Pre-Condition Landuse Information

Landuse	User Defined Values
Area (acres)	6.95
Rational Coefficient (0-1)	0.33
Non DCIA Curve Number	84.00
DCIA Percent (0-100)	24.90
Nitrogen EMC (mg/l)	1.160
Phosphorus EMC (mg/l)	0.157
Runoff Volume (ac-ft/yr)	10.045
Groundwater N (kg/yr)	0.000
Groundwater P (kg/yr)	0.000
Nitrogen Loading (kg/yr)	14.368
Phosphorus Loading (kg/yr)	1.945

Post-Condition Landuse Information

Landuse	User Defined Values
Area (acres)	6.95
Rational Coefficient (0-1)	0.65
Non DCIA Curve Number	84.00
DCIA Percent (0-100)	73.45
Wet Pond Area (ac)	0.60
Nitrogen EMC (mg/l)	1.160
Phosphorus EMC (mg/l)	0.157
Runoff Volume (ac-ft/yr)	17.894

Groundwater N (kg/yr)	0.000
Groundwater P (kg/yr)	0.000
Nitrogen Loading (kg/yr)	25.593
Phosphorus Loading (kg/yr)	3.464

Catchment Number: 1 Name: Basin 3

Project: CR 776 (Harborview Road)

Date: 11/18/2021

Multiple BMP in Series Design Parameters

BMP in Series Number: 1

BMP Type: Wet Detention

Permanent Pool Volume (ac-ft) 2.850

Permanent Pool Volume (ac-ft) for 31 days residence 1.520

Annual Residence Time (days) 58

Littoral Zone Efficiency Credit

Wetland Efficiency Credit

BMP in Series Number: 2

BMP Type: Filtration

Treatment Depth (in) 1.000

Hydraulic Capture Efficiency (%) 71

Media Type B&G CTS12

Media N Reduction (%) 60

Media P Reduction (%) 90

BMP in Series Number: 3

BMP Type: None

BMP in Series Number: 4

BMP Type: None

Watershed Characteristics

Catchment Area (acres) 6.95

Contributing Area (acres) 6.350

Non-DCIA Curve Number 84.00

DCIA Percent 73.45

Rainfall Zone Florida Zone 4

Rainfall (in) 52.00

Surface Water Discharge

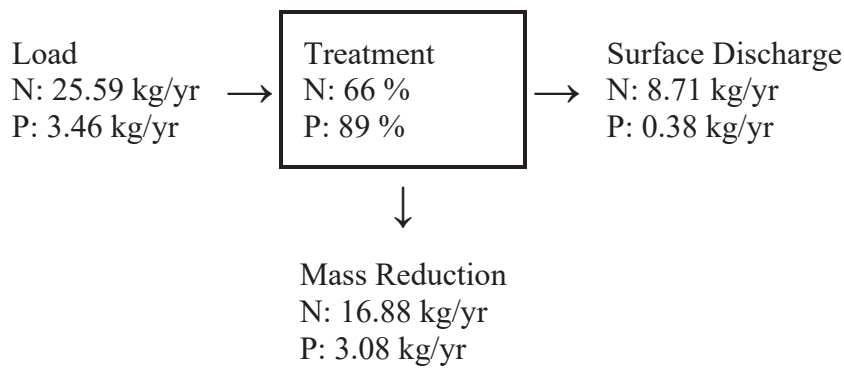
Required TN Treatment Efficiency (%) 44

Provided TN Treatment Efficiency (%) 66

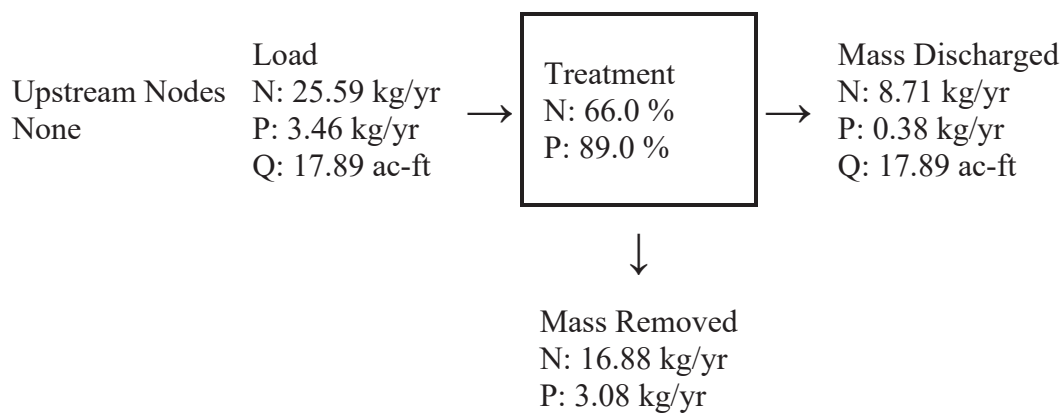
Required TP Treatment Efficiency (%) 44

Provided TP Treatment Efficiency (%) 89

Load for Multiple BMP in Series



Load Diagram for Multiple BMP (As Used In Routing)



Summary Treatment Report Version: 4.3.3

Project: CR 776 (Harborview Road)

Analysis Type: Net Improvement

Date:11/18/2021

BMP Types:

Catchment 1 - (Basin 3)

Routing Summary

Catchment 1 Routed to Outlet

Multiple BMP

Based on % removal values to the nearest percent

Total nitrogen target removal met? **Yes**

Total phosphorus target removal met? **Yes**

Summary Report

Nitrogen

Surface Water Discharge

Total N pre load	14.37 kg/yr	
Total N post load	25.59 kg/yr	
Target N load reduction	44 %	
Target N discharge load	14.37 kg/yr	
Percent N load reduction	66 %	
Provided N discharge load	8.71 kg/yr	19.21 lb/yr
Provided N load removed	16.88 kg/yr	37.22 lb/yr

Phosphorus

Surface Water Discharge

Total P pre load	1.945 kg/yr	
Total P post load	3.464 kg/yr	
Target P load reduction	44 %	
Target P discharge load	1.945 kg/yr	
Percent P load reduction	89 %	
Provided P discharge load	.381 kg/yr	.84 lb/yr
Provided P load removed	3.083 kg/yr	6.798 lb/yr

Complete Report (not including cost) Ver 4.3.3

Project: CR 776 (Harborview Road)
Date: 11/18/2021 2:57:36 PM

Site and Catchment Information

Analysis: Net Improvement

Catchment Name	Basin 3
Rainfall Zone	Florida Zone 3
Annual Mean Rainfall	52.00

Pre-Condition Landuse Information

Landuse	User Defined Upland
Area (acres)	10.36
Rational Coefficient (0-1)	0.02
Non DCIA Curve Number	83.00
DCIA Percent (0-100)	22.26
Nitrogen MC (mg/l)	1.60
Phosphorus MC (mg/l)	0.57
Runoff Volume (ac-ft/yr)	13.998
Erosion Water N (G/yr)	0.000
Erosion Water P (G/yr)	0.000
Nitrogen Load (G/yr)	20.508
Phosphorus Load (G/yr)	2.776

Post-Condition Landuse Information

Landuse	User Defined Upland
Area (acres)	10.36
Rational Coefficient (0-1)	0.66
Non DCIA Curve Number	83.00
DCIA Percent (0-100)	75.98
Retention Pond Area (ac)	0.17
Nitrogen MC (mg/l)	1.60
Phosphorus MC (mg/l)	0.57
Runoff Volume (ac-ft/yr)	2.500

Ero4ndwater N (G /yr)	0u000
Ero4ndwater P (G /yr)	0u000
Nitro- en . oadin- (G /yr)	32u1 W0
Phosphor4s . oadin- (G /yr)	5u711

Catchment Number: 1 Name: Basin 4

Project: CR 776 (Harborview Road)

Date: 11/18/2021

Multiple BMP in Series Design Parameters

BMP in Series N4mber: 1

BMP Type: k et Detention

Permanent Pool Uol4me (ac\ft) 0u700

Permanent Pool Uol4me (ac\ft) for 91 days residence 2u505

Ann4al Residence Time (days) V

. ittoral Zone g fficiency Credit

k etland g fficiency Credit

BMP in Series N4mber: 2

BMP Type: Filtration

Treatment Depth (in) 1u000

Hydra4lic Capt4re g fficiency (%) 71

Media Type B&E CTS12

Media N Red4ction (%) 60

Media P Red4ction (%) W0

BMP in Series N4mber: 9

BMP Type: None

BMP in Series N4mber: 3

BMP Type: None

Watershed Characteristics

Catchment Area (acres) 10u36

Contrib4tin- Area (acres) 10u270

Non\DCIA C4rve N4mber 83u00

DCIA Percent 75u98

Rainfall Zone Florida Zone 3

Rainfall (in) 52.00

Surface Water Discharge

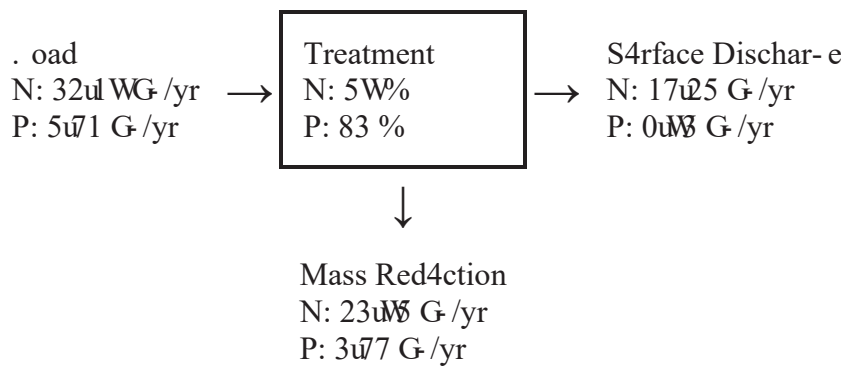
Required TN Treatment efficiency (%) 51

Provided TN Treatment efficiency (%) 51

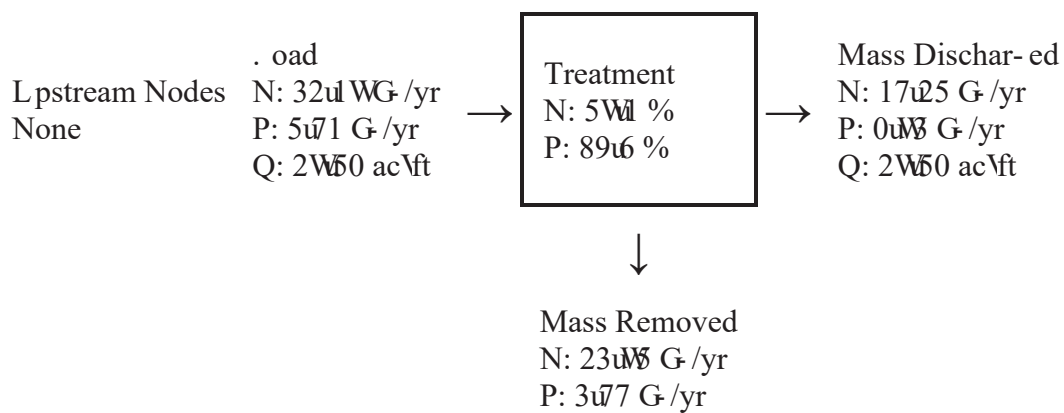
Required TP Treatment efficiency (%) 51

Provided TP Treatment efficiency (%) 83

Load for Multiple BMP in Series



Load Diagram for Multiple BMP (As Used In Routing)



Summary Treatment Report Version: 4.3.3

Project: CR 776 (Harborview Road)

Analysis Type: Net Improvement

Date: 11/18/2021

BMP Types:

Catchment 1 V(Basin 3)

Routing Summary

Catchment 1 Routed to Outlet

Multiple BMP

Based on % removal values to the nearest percent

Total nitrogen removal met? **Yes**

Total phosphorus removal met? **Yes**

Summary Report

Nitrogen

Surface Water Discharge

Total N pre load	2051 G/yr	
Total N post load	321 WG/yr	
Tar-nitrogen load reduction	51 %	
Tar-nitrogen discharge load	2051 G/yr	
Percent N load reduction	51%	
Provided N discharge load	1725 G/yr	9809 lb/yr
Provided N load removed	2326 G/yr	5501 lb/yr

Phosphorus

Surface Water Discharge

Total P pre load	2776 G/yr	
Total P post load	511 G/yr	
Tar-phosphorus load reduction	51 %	
Tar-phosphorus discharge load	2776 G/yr	
Percent P load reduction	83 %	
Provided P discharge load	108 G/yr	207 lb/yr
Provided P load removed	3772 G/yr	10529 lb/yr

Complete Report (not including cost) Ver 4.3.3

Project: CR 776 (Harborview Road)
Date: 11/18/2021 2:58:49 PM

Site and Catchment Information

Analysis: Net Improvement

Catchment Name	Basin 5 and 6
Rainfall Zone	Florida Zone 4
Annual Mean Rainfall	52.00

Pre-Condition Landuse Information

Landuse	User Defined Values
Area (acres)	5.01
Rational Coefficient (0-1)	0.28
Non DCIA Curve Number	84.00
DCIA Percent (0-100)	17.29
Nitrogen EMC (mg/l)	1.160
Phosphorus EMC (mg/l)	0.157
Runoff Volume (ac-ft/yr)	6.166
Groundwater N (kg/yr)	0.000
Groundwater P (kg/yr)	0.000
Nitrogen Loading (kg/yr)	8.820
Phosphorus Loading (kg/yr)	1.194

Post-Condition Landuse Information

Landuse	User Defined Values
Area (acres)	5.01
Rational Coefficient (0-1)	0.54
Non DCIA Curve Number	84.00
DCIA Percent (0-100)	56.67
Wet Pond Area (ac)	0.02
Nitrogen EMC (mg/l)	1.160
Phosphorus EMC (mg/l)	0.157
Runoff Volume (ac-ft/yr)	11.683

Groundwater N (kg/yr)	0.000
Groundwater P (kg/yr)	0.000
Nitrogen Loading (kg/yr)	16.710
Phosphorus Loading (kg/yr)	2.262

Catchment Number: 1 Name: Basin 5 and 6

Project: CR 776 (Harborview Road)

Date: 11/18/2021

Multiple BMP in Series Design Parameters

BMP in Series Number: 1

BMP Type: Wet Detention

Permanent Pool Volume (ac-ft) 0.090

Permanent Pool Volume (ac-ft) for 31 days residence 0.992

Annual Residence Time (days) 3

Littoral Zone Efficiency Credit

Wetland Efficiency Credit

BMP in Series Number: 2

BMP Type: Filtration

Treatment Depth (in) 1.000

Hydraulic Capture Efficiency (%) 74

Media Type B&G CTS12

Media N Reduction (%) 60

Media P Reduction (%) 90

BMP in Series Number: 3

BMP Type: None

BMP in Series Number: 4

BMP Type: None

Watershed Characteristics

Catchment Area (acres) 5.01

Contributing Area (acres) 4.990

Non-DCIA Curve Number 84.00

DCIA Percent 56.67

Rainfall Zone Florida Zone 4

Rainfall (in) 52.00

Surface Water Discharge

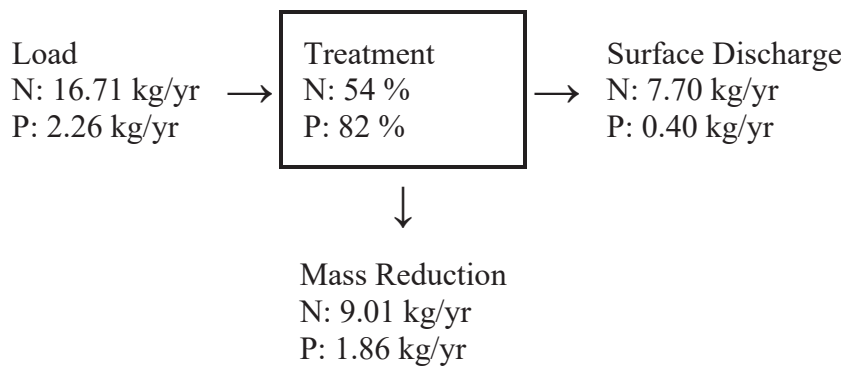
Required TN Treatment Efficiency (%) 47

Provided TN Treatment Efficiency (%) 54

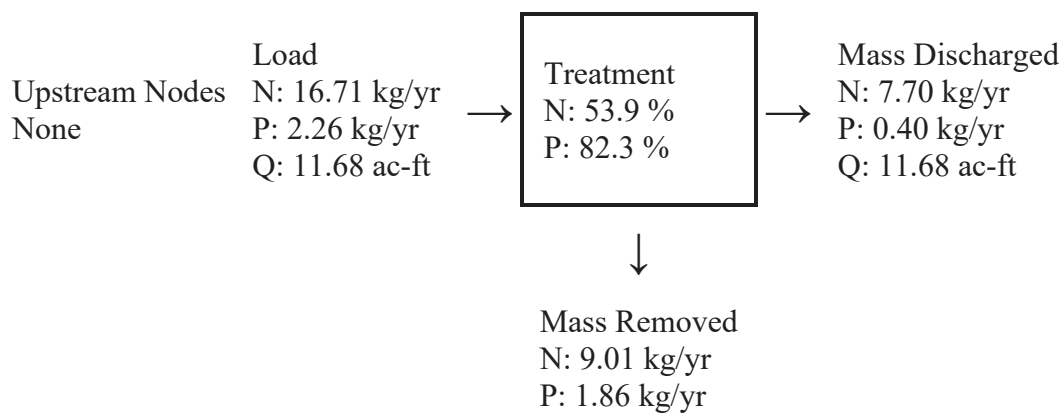
Required TP Treatment Efficiency (%) 47

Provided TP Treatment Efficiency (%) 82

Load for Multiple BMP in Series



Load Diagram for Multiple BMP (As Used In Routing)



Summary Treatment Report Version: 4.3.3

Project: CR 776 (Harborview Road)

Analysis Type: Net Improvement

Date:11/18/2021

BMP Types:

Routing Summary

Catchment 1 - (Basin 5 and 6) Multiple BMP

Catchment 1 Routed to Outlet

Based on % removal values to the nearest percent

Total nitrogen target removal met? **Yes**

Total phosphorus target removal met? **Yes**

Summary Report

Nitrogen

Surface Water Discharge

Total N pre load	8.82 kg/yr	
Total N post load	16.71 kg/yr	
Target N load reduction	47 %	
Target N discharge load	8.82 kg/yr	
Percent N load reduction	54 %	
Provided N discharge load	7.7 kg/yr	16.99 lb/yr
Provided N load removed	9.01 kg/yr	19.86 lb/yr

Phosphorus

Surface Water Discharge

Total P pre load	1.194 kg/yr	
Total P post load	2.262 kg/yr	
Target P load reduction	47 %	
Target P discharge load	1.194 kg/yr	
Percent P load reduction	82 %	
Provided P discharge load	.401 kg/yr	.88 lb/yr
Provided P load removed	1.86 kg/yr	4.102 lb/yr

Appendix H

Threatened and Endangered Species (T&E) and Wetlands Assessment for Pond Siting & Cultural Resource Assessment Survey

Memorandum

Date: July 17, 2023
To: Michael Wilder, Atkins Drainage Project Manager
From: Kristin Caruso, M.S., Scalar Consulting Group Inc.
CC: Jay Winter, P.E., Scalar Consulting Group Inc. Project Manager
Subject: **Pond Siting Environmental Technical Memorandum Addendum**
Threatened and Endangered Species (T&E) and Wetlands Assessment
Harborview Road from Melbourne Street to I-75
FPID No. 434965-2-52-01
Charlotte County, Florida

INTRODUCTION

A technical memorandum was prepared in November 2021 to support the Pond Siting Report (PSR) prepared for this roadway widening project. Following roadway design changes in 2023, it was determined that stormwater pond siting in Basin 2 requires additional analysis. As such, an additional pond site, referred to as Pond 2 Alternative D (Pond 2D) was reviewed for the presence or potential presence of federal and state threatened and endangered (T&E) species and jurisdictional wetlands or surface waters. Methodology for pond site review is described in the original technical memorandum and consisted of desktop research and GIS analysis as well as field review.

The following exhibits include a project location map (Figure 1), land use map (Figure 2), wetlands map (Figure 3), soils map (Figure 4) and listed species map (Figure 5).

Pond Description

Pond 2D (0.89 acres; 0% wetland) is located north of Harborview Road above Bethanie Seventh Day Adventist Church. It is mapped as Residential Medium Density (FLUCCS 1200). It is comprised of residential homes and maintained property with mowed grass. The site is surrounded by development to the north with Harborview Road to the south. The site has minimal to no wildlife habitat value, therefore it was given the species rating of “Low”. No listed or protected species were observed during field surveys. No wetlands or surface waters are present; therefore, the site was given a wetland rating of “No”.

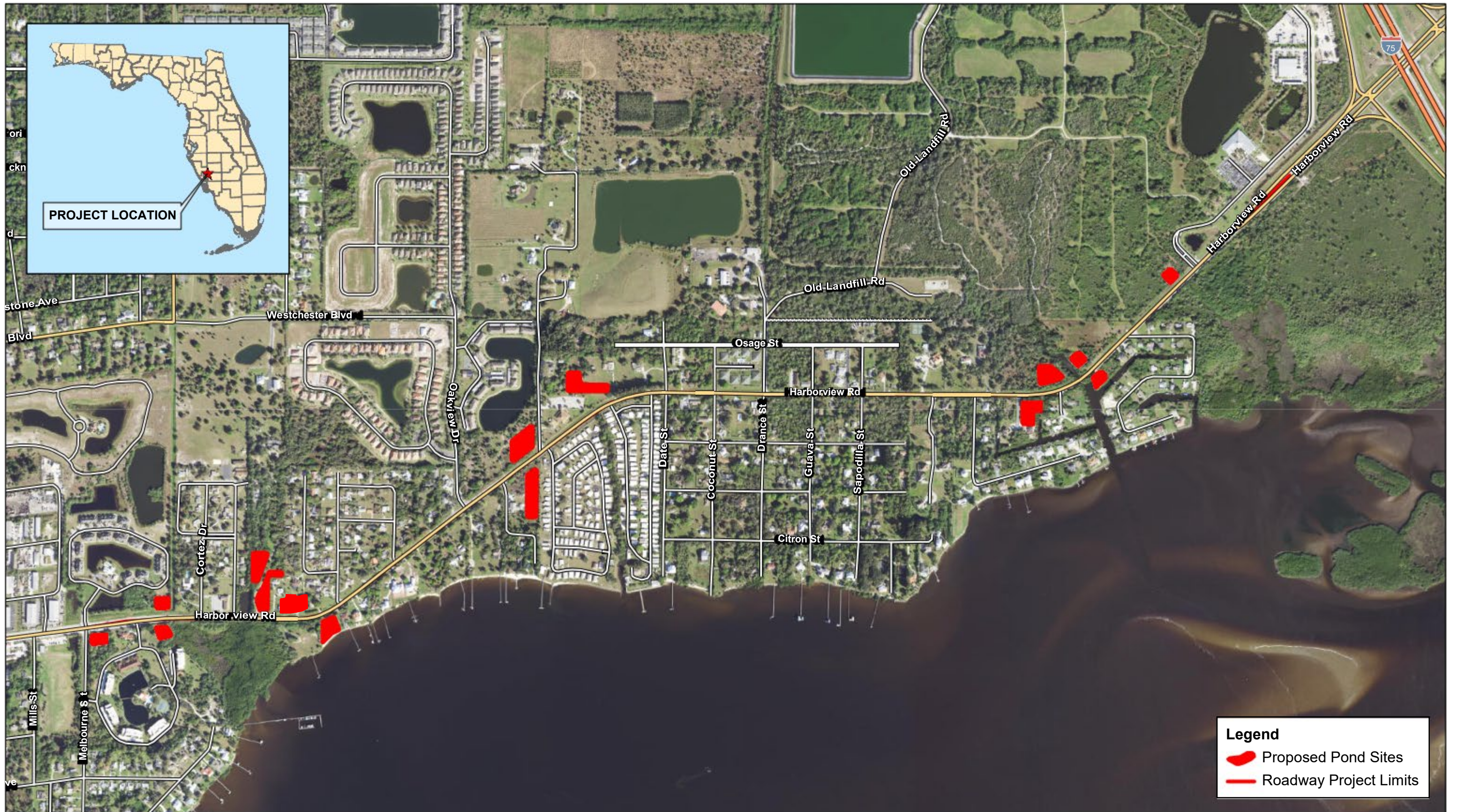
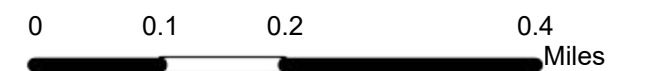
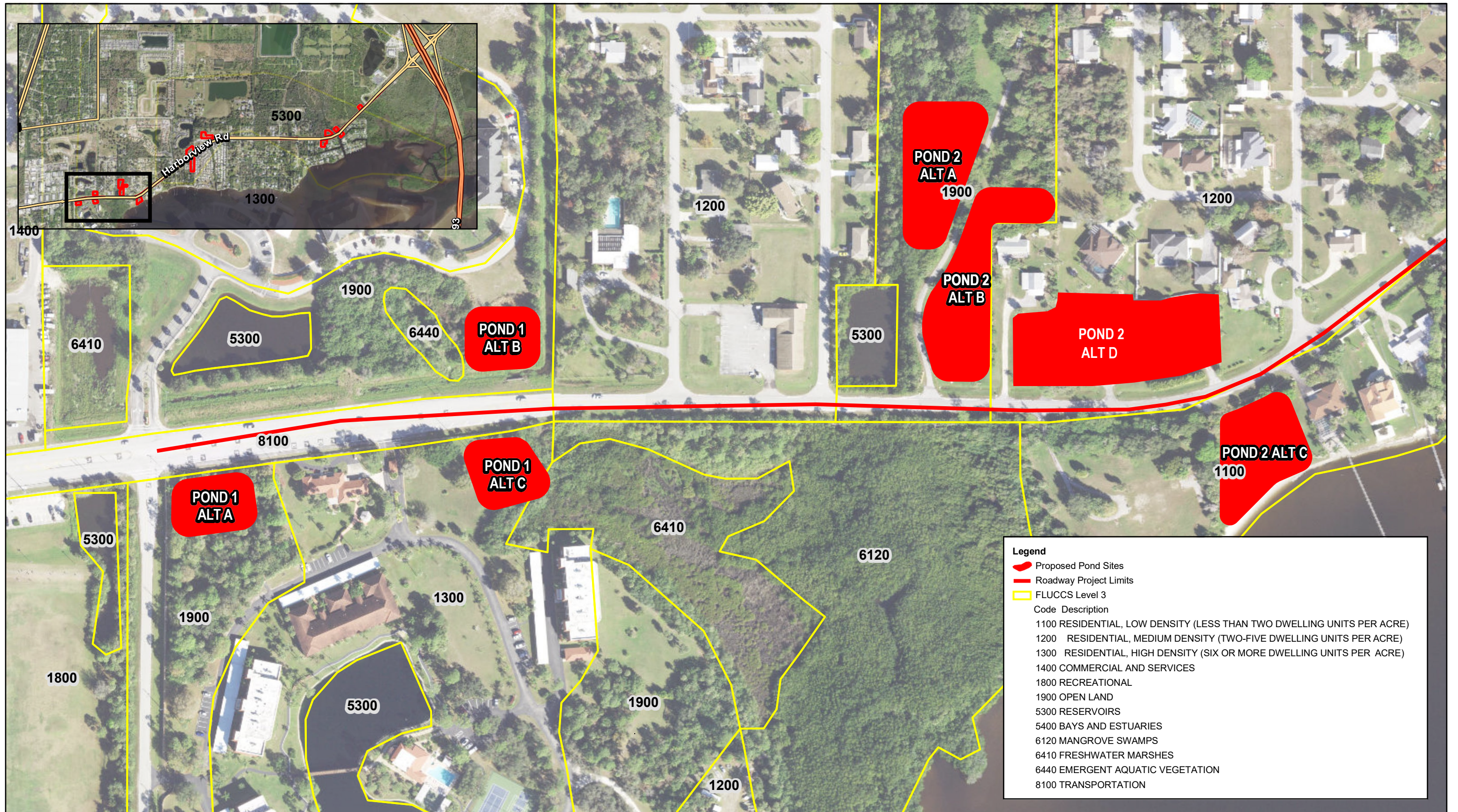


Figure 1. Project Location Map
 FPID No. 434965-2-52-01
 Harborview Road from Melbourne Street to I-75
 Charlotte County, FL

Image Source: ESRI
 Image Date: 2020





Legend

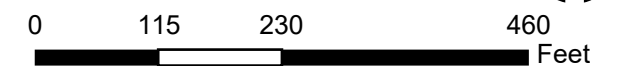
- Proposed Pond Sites
- Roadway Project Limits
- FLUCCS Level 3

Code	Description
1100	RESIDENTIAL, LOW DENSITY (LESS THAN TWO DWELLING UNITS PER ACRE)
1200	RESIDENTIAL, MEDIUM DENSITY (TWO-FIVE DWELLING UNITS PER ACRE)
1300	RESIDENTIAL, HIGH DENSITY (SIX OR MORE DWELLING UNITS PER ACRE)
1400	COMMERCIAL AND SERVICES
1800	RECREATIONAL
1900	OPEN LAND
5300	RESERVOIRS
5400	BAYS AND ESTUARIES
6120	MANGROVE SWAMPS
6410	FRESHWATER MARSHES
6440	EMERGENT AQUATIC VEGETATION
8100	TRANSPORTATION



Figure 2. FLUCCS Map
Sheet 1 of 3
 FPID No. 434965-2-52-01
 Harborview Road from Melbourne Street to I-75
 Charlotte County, FL

Data Source: SWFWMD
 Image Source: ESRI
 Image Date: 2020



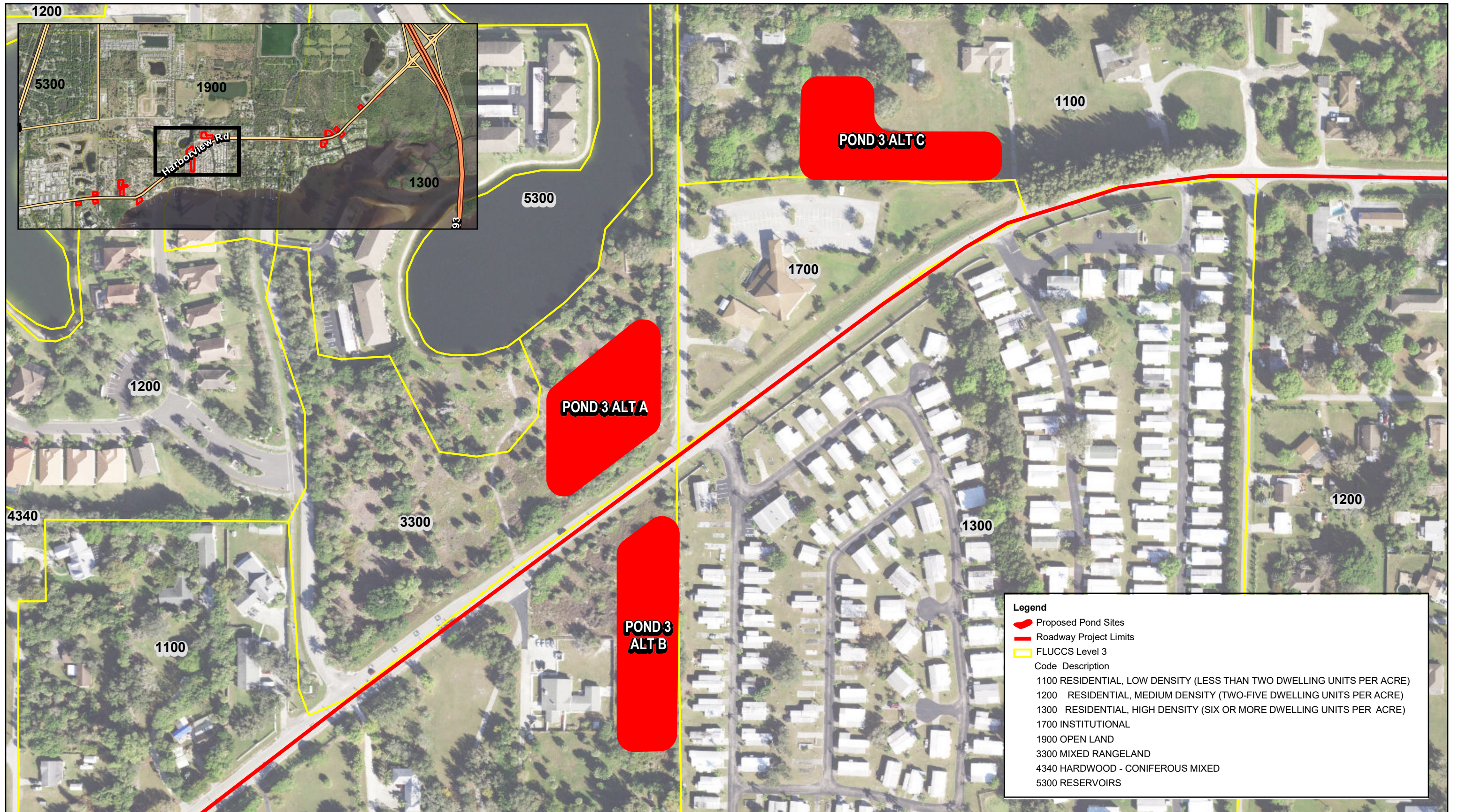
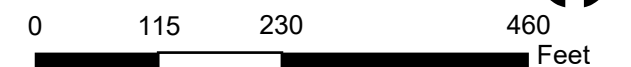


Figure 2. FLUCCS Map
Sheet 2 of 3
 FPID No. 434965-2-52-01
 Harborview Road from Melbourne Street to I-75
 Charlotte County, FL

Data Source: SWFWMD
 Image Source: ESRI
 Image Date: 2020



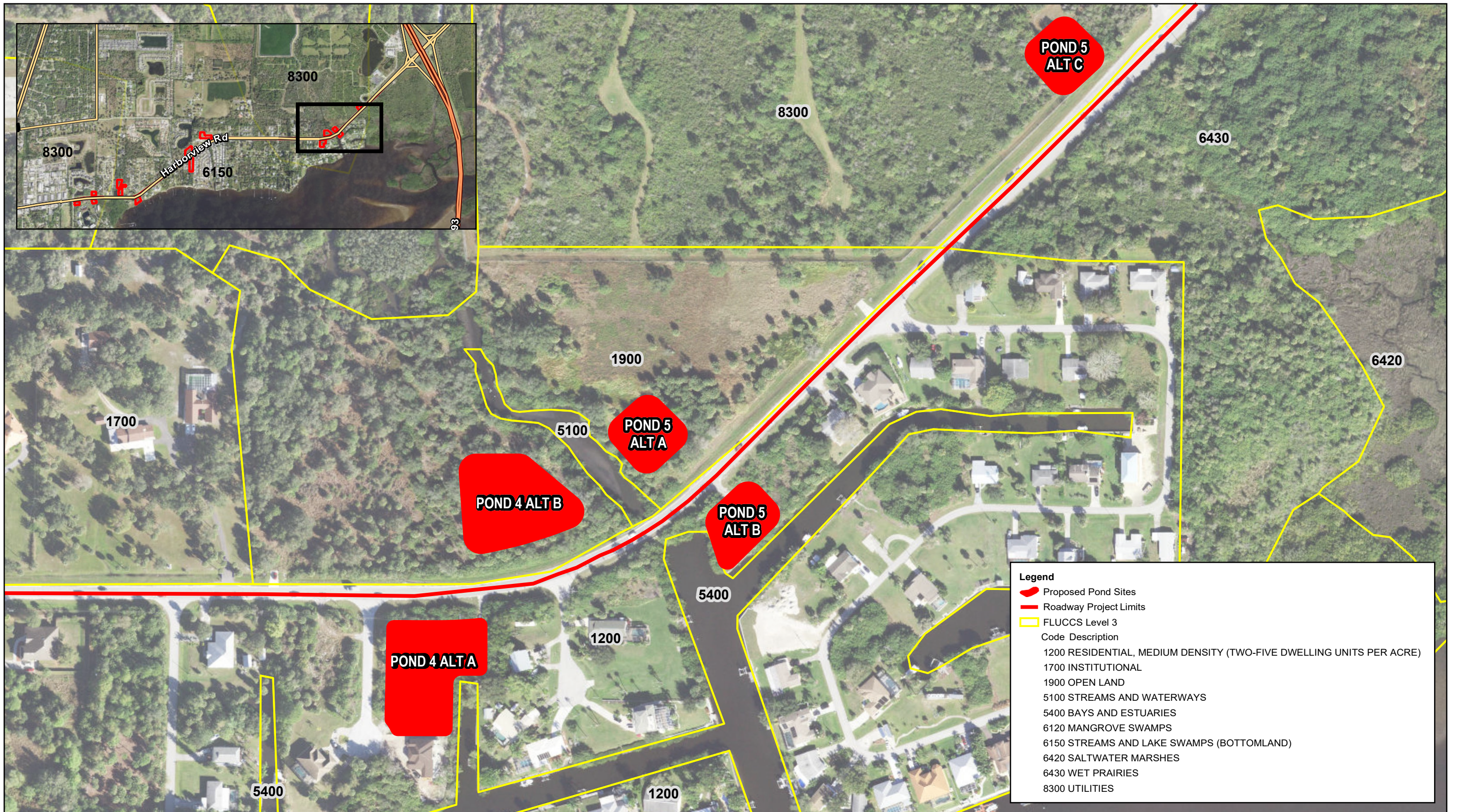


Figure 2. FLUCCS Map
Sheet 3 of 3
 FPID No. 434965-2-52-01
 Harborview Road from Melbourne Street to I-75
 Charlotte County, FL

Data Source: SWFWMD
 Image Source: ESRI
 Image Date: 2020



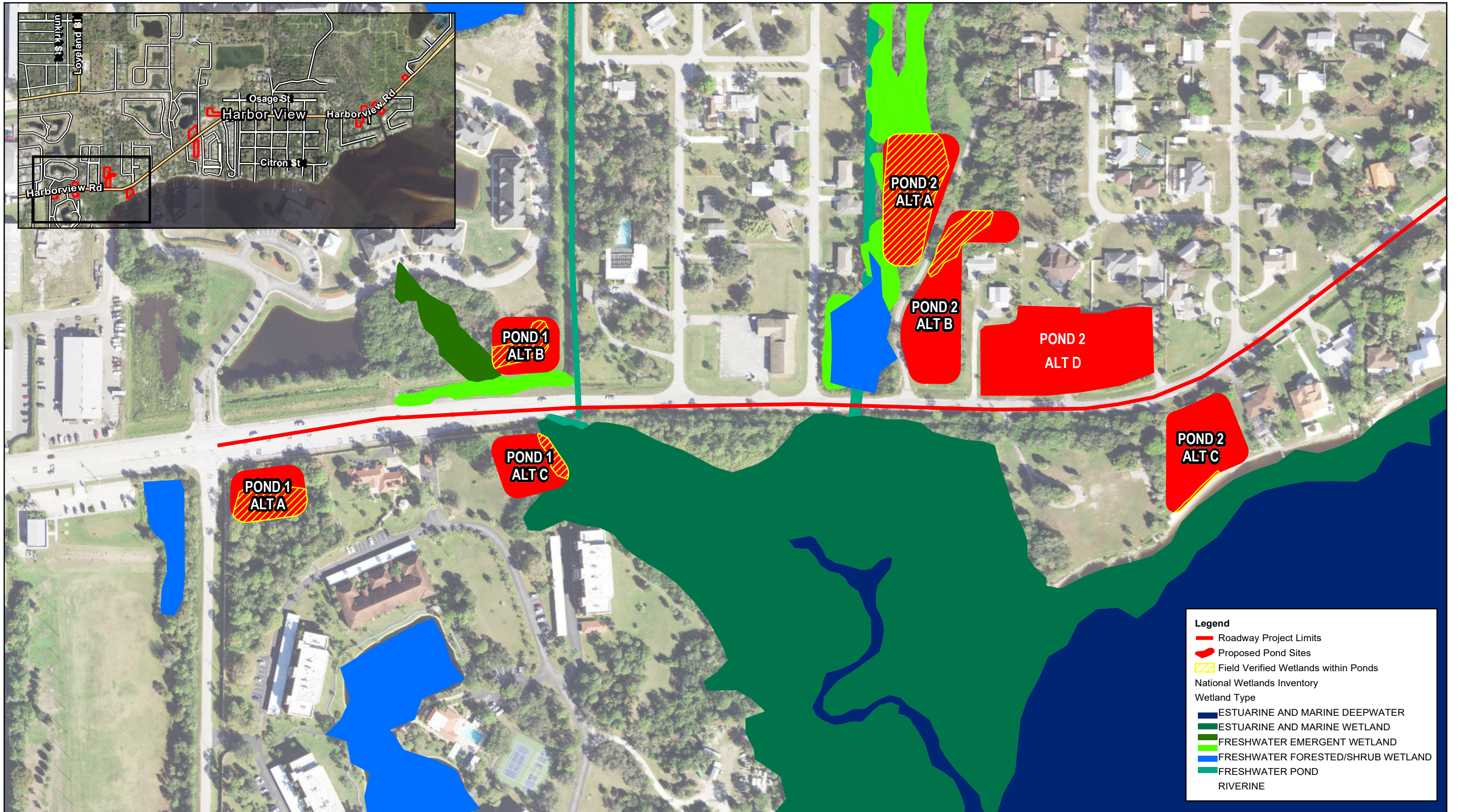
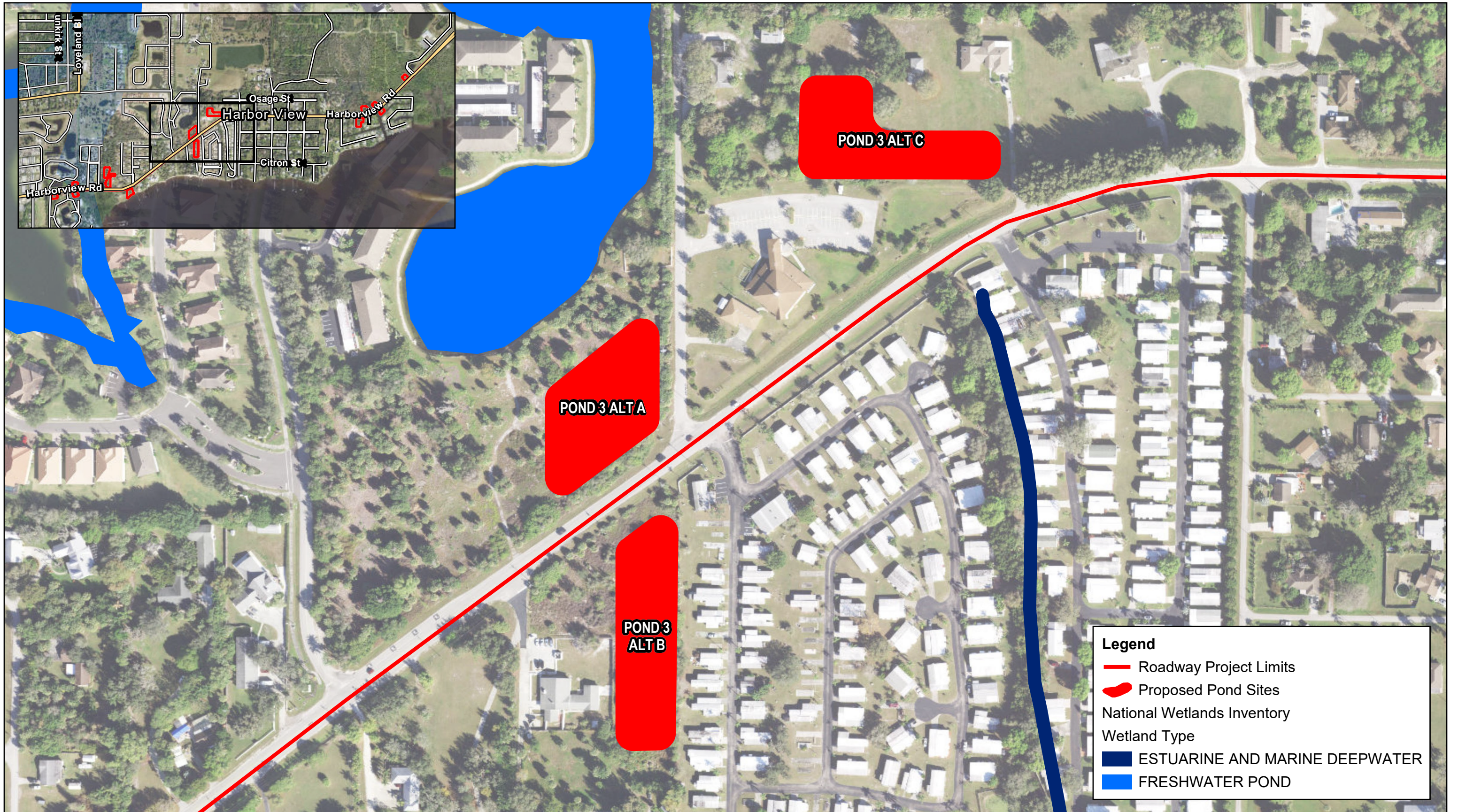


Figure 3. NWI and Wetland Impact Map
Sheet 1 of 3
 FPID No. 434965-2-52-01
 Harborview Road from Melbourne Street to I-75
 Charlotte County, FL



Data Source: USFWS NWI
 Image Source: ESRI
 Image Date: 2020





Legend

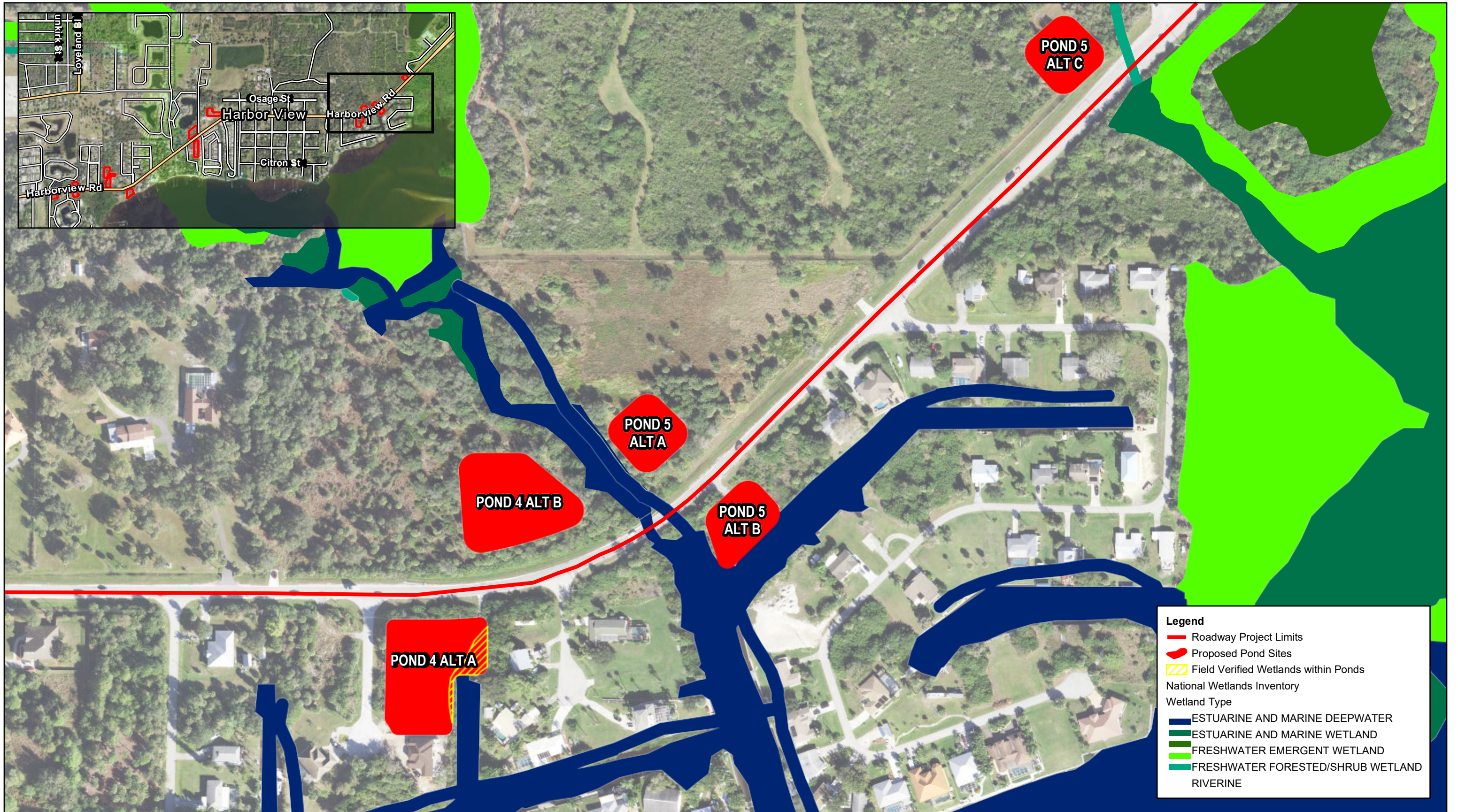
- Roadway Project Limits
- Proposed Pond Sites
- National Wetlands Inventory
- Wetland Type
- ESTUARINE AND MARINE DEEPWATER
- FRESHWATER POND

Figure 3. NWI and Wetland Impact Map
Sheet 2 of 3
 FPID No. 434965-2-52-01
 Harborview Road from Melbourne Street to I-75
 Charlotte County, FL



Data Source: USFWS NWI
 Image Source: ESRI
 Image Date: 2020

0 125 250 500 Feet



Legend

- Roadway Project Limits
- ▭ Proposed Pond Sites
- Field Verified Wetlands within Ponds

National Wetlands Inventory

Wetland Type

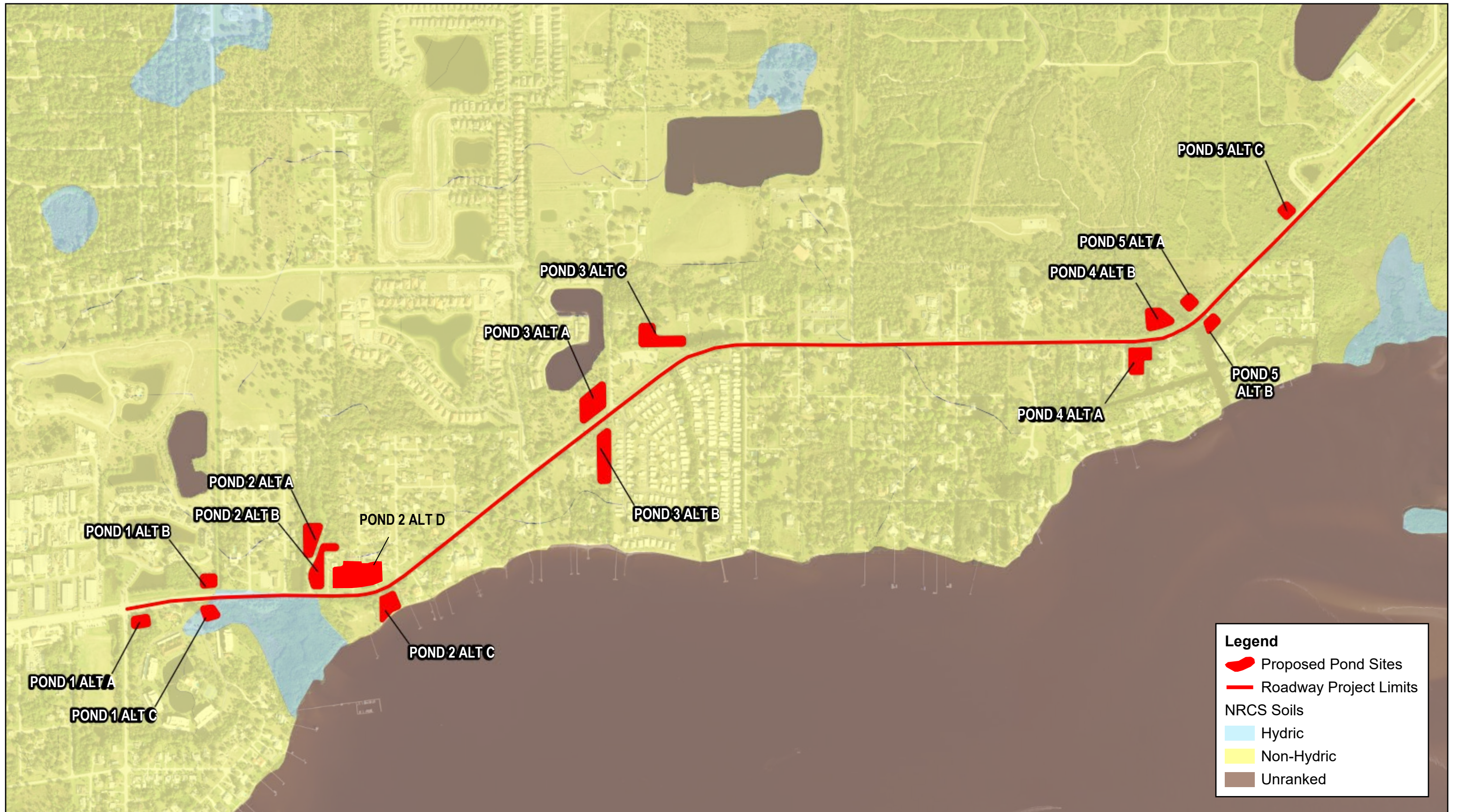
- ▭ ESTUARINE AND MARINE DEEPWATER
- ▭ ESTUARINE AND MARINE WETLAND
- ▭ FRESHWATER EMERGENT WETLAND
- ▭ FRESHWATER FORESTED/SHRUB WETLAND
- ▭ RIVERINE



Figure 3. NWI and Wetland Impact Map
Sheet 3 of 3
 FPID No. 434965-2-52-01
 Harborview Road from Melbourne Street to I-75
 Charlotte County, FL

Data Source: USFWS NWI
 Image Source: ESRI
 Image Date: 2020





Legend







-  Proposed Pond Sites
-  Roadway Project Limits
- NRCS Soils**
-  Hydric
-  Non-Hydric
-  Unranked



Figure 4. Soils Map
 FPID No. 434965-2-52-01
 Harborview Road from Melbourne Street to I-75
 Charlotte County, FL

Data Source: NRCS USDA
 Image Source: ESRI
 Image Date: 2020

0 475 950 1,900
 Feet



RESULTS

Table 1 provides a summary of all pond sites including the newly evaluated Pond 2D.

Table 1. Pond Siting T&E and Wetlands Table

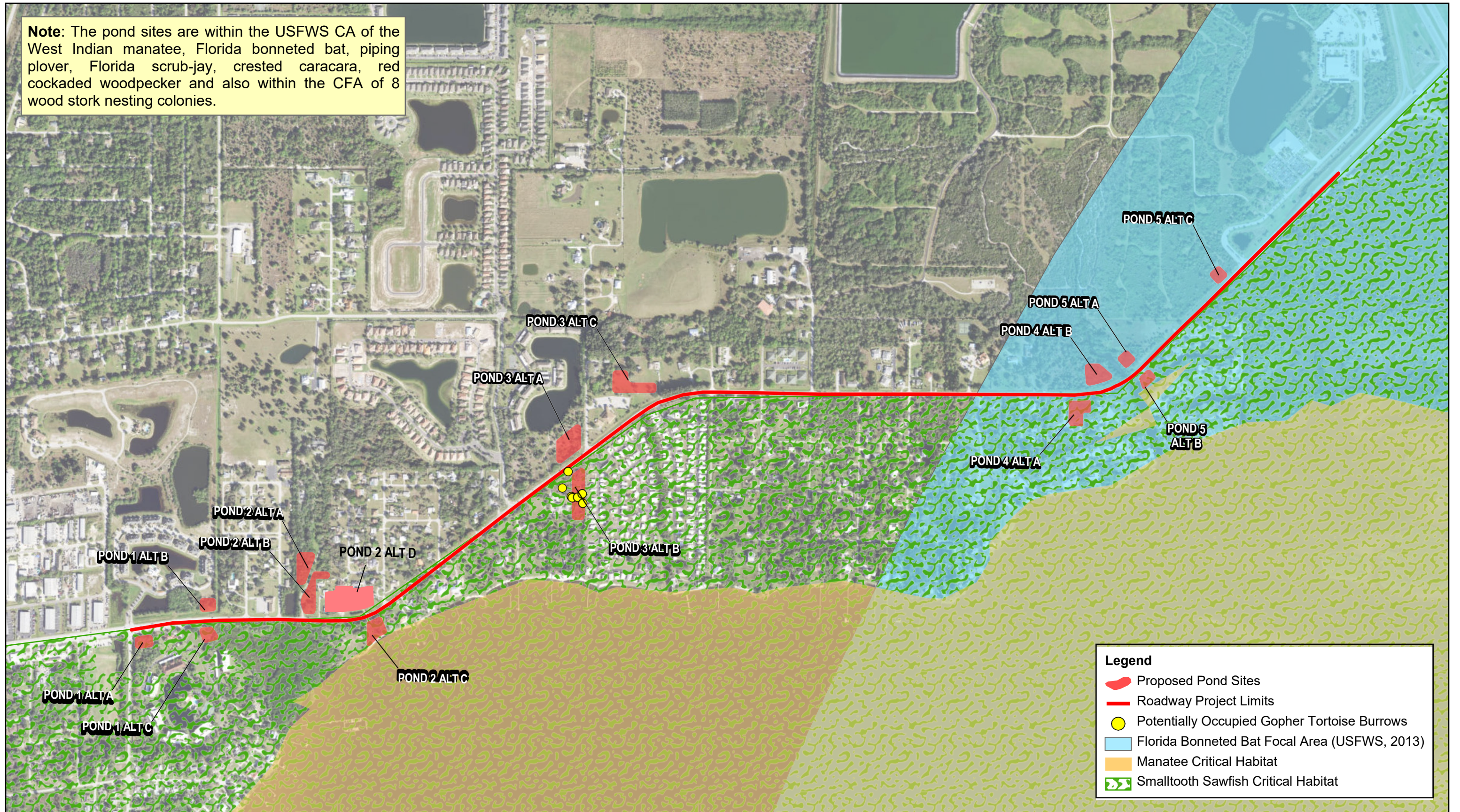
Pond Alternative	Mapped Land Use / FLUCFCS Code		Wetlands / Surface Waters			*Potential Protected Species that would Utilize Habitat	Species Rating	Wetland Rating
	Type	Code	Impact acres and quality	% Coverage of Site	Wetland Mitigation Cost ^			
Pond 1A 0.42 ac	Open Land	1900	0.26 high	62	\$44,720	Wood Stork, Wading Birds, and Florida Sandhill Crane	Low	High
Pond 1B 0.41 ac	Open Land	1900	0.15 medium	37	\$16,125	Wood Stork, Wading Birds, and Florida Sandhill Crane	Medium	Medium
Pond 1C 0.43 ac	Residential, High Density & Marsh	1300 & 6410	0.06 high	14	\$10,320	Wood Stork, Wading Birds, and Florida Sandhill Crane	Medium	High
Pond 2A 0.86 ac	Open Land	1900	0.74 high	86	\$127,280	Wood Stork, Wading Birds, Florida Sandhill Crane, and Smalltooth Sawfish	Medium	High
Pond 2B 1.01 ac	Open Land	1900	0.17 low	17	\$10,965	Wood Stork, Wading Birds, and Florida Sandhill Crane	Low	Low
Pond 2C 0.73 ac	Residential, Low Density	1100	0.01 medium	1	\$1,075	Florida Sandhill Crane, listed shore birds	Medium	Medium
Pond 2D 0.89 ac	Residential, Medium Density	1200	none	0	\$0	Gopher Tortoise	Low	No

Pond Alternative	Mapped Land Use / FLUCFCS Code		Wetlands / Surface Waters			*Potential Protected Species that would Utilize Habitat	Species Rating	Wetland Rating
	Type	Code	Wetlands Impacts acres and quality	% Coverage of Site	Wetland Mitigation Cost ^			
Pond 3A 1.24 ac	Mixed Rangeland	3300	none	0	\$0	Gopher Tortoise and Pine Snake	Medium	No
Pond 3B 1.24 ac	Residential, Low Density	1100	none	0	\$0	Gopher Tortoise and Pine Snake	High	No
Pond 3C 1.24 ac	Residential, Low Density	1100	none	0	\$0	Gopher Tortoise and Pine Snake	Medium	No
Pond 4A 0.87 ac	Residential, Medium Density	1200	0.09 low	10	\$5,805	Wood Stork, Wading Birds, and Florida Bonneted Bat	Medium	Low
Pond 4B 0.85 ac	Open Land	1900	none	0	\$0	Florida Bonneted Bat	Medium	No
Pond 5A 0.37 ac	Open Land	1900	none	0	\$0	Florida Bonneted Bat	Medium	No
Pond 5B 0.37 ac	Residential, Medium Density	1200	none	0	\$0	Florida Bonneted Bat	Low	No
Pond 5C 0.37 ac	Utilities	8300	none	0	\$0	Florida Black Bear and Florida Bonneted Bat	Medium	No

* = The Eastern indigo snake has the potential to occur in any of the pond alternatives.

^ = \$215,000 was used to calculate estimated mitigation cost based on average dual (state/federal) credit cost in July 2023. Wetland quality ranking of low = 0.3 delta, ranking of medium = 0.5 delta, and ranking of high = 0.8 delta. Refer to original environmental PSR tech memo for additional details.

Note: The pond sites are within the USFWS CA of the West Indian manatee, Florida bonneted bat, piping plover, Florida scrub-jay, crested caracara, red cockaded woodpecker and also within the CFA of 8 wood stork nesting colonies.



Legend

- Proposed Pond Sites
- Roadway Project Limits
- Potentially Occupied Gopher Tortoise Burrows
- Florida Bonneted Bat Focal Area (USFWS, 2013)
- Manatee Critical Habitat
- Smalltooth Sawfish Critical Habitat

Figure 5. Listed and Protected Species Map

FPID No. 434965-2-52-01
 Harborview Road from Melbourne Street to I-75
 Charlotte County, FL



Image Source: ESRI
 Image Date: 2020

0 500 1,000 2,000 Feet

CONCLUSIONS AND RECOMMENDATIONS

Listed Species

Pond Sites 1A; 2B; 2D and 5B were documented as having ratings of “Low”. Pond sites 1B and 1C; 2A and 2C; 3A and 3C; 4A and 4B; and 5A and 5C were documented as having ratings of “Medium”. Pond Site 3B was documented as having a rating of “High”.

Gopher tortoise burrows were identified within Pond 3B and are likely to occur in non-hydric soils with low-lying vegetation. Gopher tortoise burrows were identified within Pond 3B and are likely to occur in non-hydric soils with low-lying vegetation. A 100% gopher tortoise burrow survey will be conducted within all appropriate habitat prior to construction, and burrows will be avoided or relocated as needed. A gopher tortoise relocation permit could be required for any unavoidable impacts.

The Eastern Indigo Snake Standard Protection Measures, and Sea Turtle and Smalltooth Sawfish Construction Conditions will be followed during construction. A suitable habitat analysis for the wood stork will be provided to determine biomass lost from surface water impacts. An acoustic survey for the FBB will be conducted to identify any roosting areas within the pond sites and mainline. The placement of stormwater ponds is not anticipated to adversely affect the conservation of fish and wildlife, including endangered or threatened species, or their habitats, since prior to construction species-specific surveys will be conducted to identify any burrows, nest, or roosting areas which would be protected through avoidance, relocation, or mitigation. Also, very minimal habitat is known to be specifically utilized by protected species other than the gopher tortoise. The results of the analysis are summarized in Table 2, Pond Siting T&E and Wetlands Table.

Wetlands

The pond site alternatives that were documented as having a rating of “No” include Sites: 2D, 3A, 3B, and 2C; 4B; and 5A, 5B, and 5C. Pond Sites 2B; and 4A were documented as having a rating of “Low”. Pond Site 1B and 2C were documented as having a rating of “Medium”. Pond sites 1A and 1C, and 2A were documented as having ratings of “High”. All measures will be taken to avoid or minimize wetland and water quality impacts during the final pond site design, resulting in minimal net loss of wetland habitat that may be used for species foraging, breeding, nesting, or other biological processes. The results of the analysis are summarized in Table 1, Pond Siting T&E and Wetlands Table.

Memorandum

Date: November 4, 2021

To: Richard D Uptegraff, P.E., Atkins Drainage Project Manager

From: Kristin Caruso, M.S., Scalar Consulting Group Inc.

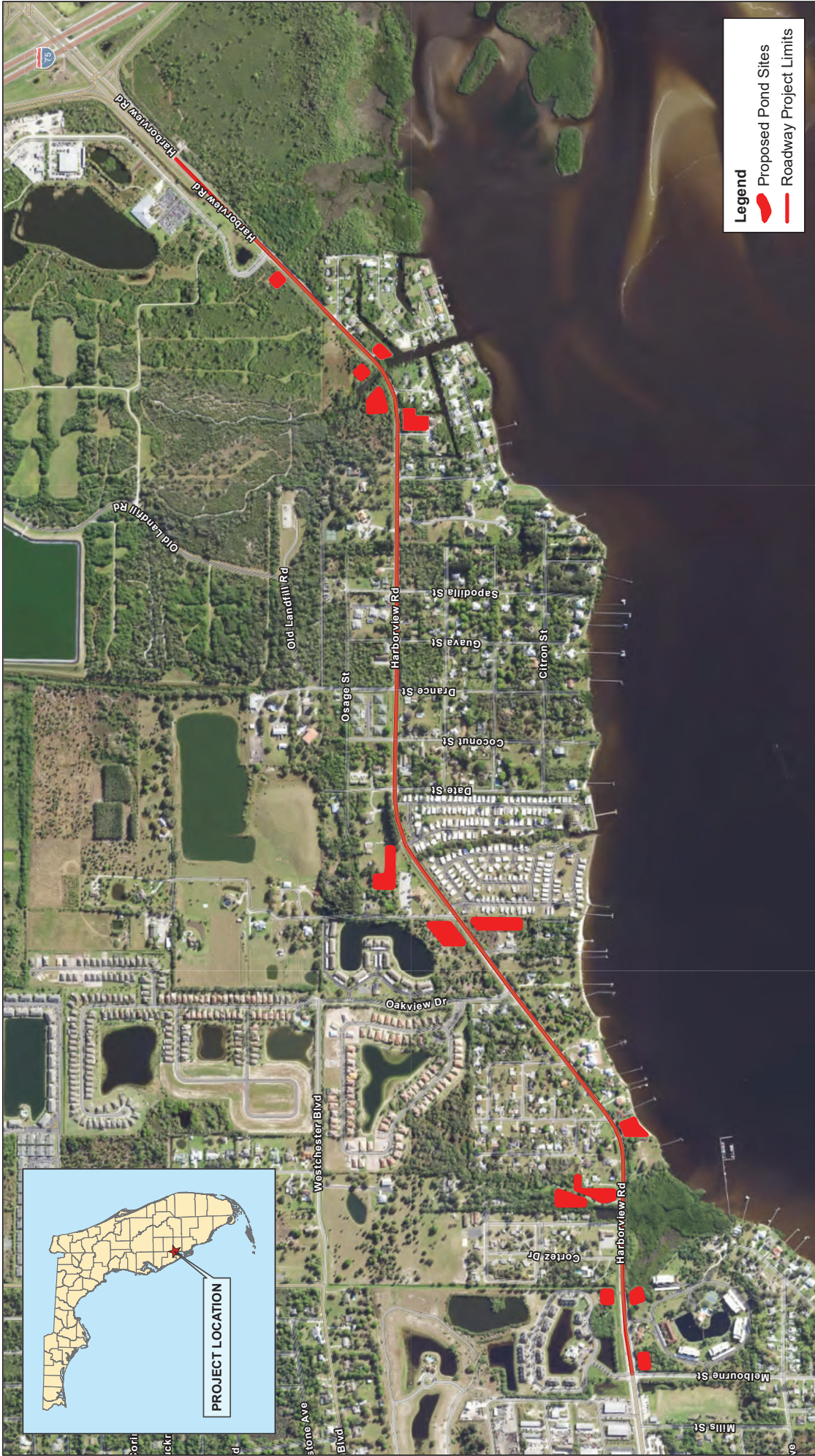
CC: Jay Winter, P.E., Scalar Consulting Group Inc. Project Manager
Charles Samuels, Atkins Drainage Engineer

Subject: Threatened and Endangered Species (T&E) and Wetlands Assessment for Pond Siting
Harborview Road from Melbourne Street to I-75
FPID No. 434965-2-52-01
Charlotte County, Florida

INTRODUCTION

The Florida Department of Transportation (FDOT), District One (D1), in coordination with Charlotte County, is proposing to widen Harborview Road from two to four lanes between Melbourne Road and I-75 to address capacity needs based on projected travel demand generated by future population and economic growth. The total project length is approximately 2.3 miles (See **Figure 1**). The project is located just northeast of Charlotte Harbor and falls within Sections 20, 21, 29 and 30, Township 40 South, Range 23 East, and Section 25, Township 40 South, Range 22 East. The proposed roadwork consists of widening, drainage improvements, and safety-related improvements.

This memorandum (memo) supports the Pond Siting Report (PSR) by addressing the presence or potential presence of federal and state T&E species and jurisdictional wetlands or surface waters within the 14 pond alternatives. We evaluated 5 basins within the project area with 3 alternatives per basin, with the exception of Basin 4 (2 alternatives). Staff scientists completed a review of existing environmental conditions within the proposed pond sites to assess potential environmental impacts. A field survey was conducted on September 24th, 2021. In addition to the field survey, desktop research and GIS analysis were used to assess the environmental conditions present within the proposed pond footprints.



Legend

- Proposed Pond Sites
- Roadway Project Limits

Image Source: ESRI
Image Date: 2020

0 0.1 0.2 0.4 Miles

Figure 1. Project Location Map
 FPID No. 434965-2-52-01
 Harborview Road from Melbourne Street to I-75
 Charlotte County, FL



METHODOLOGY

In addition to reviewing the Natural Resources Evaluation prepared as part of the project's PD&E Study, an extensive desktop analysis was conducted to determine if any T&E, jurisdictional wetlands, or surface waters occurred within or adjacent to the proposed stormwater pond locations. **Table 1** includes potential listed species that could occur within the project area and **Figures 2, 3, and 4** depict existing land use, wetlands, and soils, respectively. The primary GIS sources that were utilized included:

- 2020 ESRI Aerials;
- 2017, 2008, 1995 and 1975 FDOT Aerials;
- 2011 Southwest Florida Water Management District (SWFWMD) Land Use categorized according to Florida Land Use, Cover and Forms Classification System (FLUCCS);
- 2018 United States Department of Agriculture (USDA) Natural Resource Conservation Service (NRCS), soils data;
- 2019 Florida Natural Areas Inventory (FNAI) Protected Species Elemental Occurrence Summary List;
- 2020 United States Fish and Wildlife Service (USFWS) National Wetland Inventory (NWI) data.
- Audubon Florida EagleWatch Public Nest App (2021 nesting data);
- FWC : Wading bird rookeries locator,1999 (FWC 2020); Wood stork Active Colonies, 2010 – 2019 (USFWS, 2020); Florida scrub-jay Habitat and Observations,1992 – 1993;
- USFWS – <https://www.fws.gov/verobeach/Index.html>: Consultation Area and Critical Habitat for threatened and endangered species; and South Florida wood stork (*Mycteria americana*) core foraging areas (CFA) (18.5-mile radius).

Land use classifications as identified in GIS were field verified in accordance to FLUCCS. Site review findings were recorded to characterize vegetative communities present, document the presence of wetland and surface waters within the sites, and evaluate the potential of each site to support T&E species.

A rating system was formulated for the purpose of comparing each pond site that was reviewed. A rating of “No”, “Low”, “Medium” or “High” is provided to identify the potential for protected species involvement associated with the stormwater pond sites.

Table 1. Potential Federal and State Listed Species in Project Area

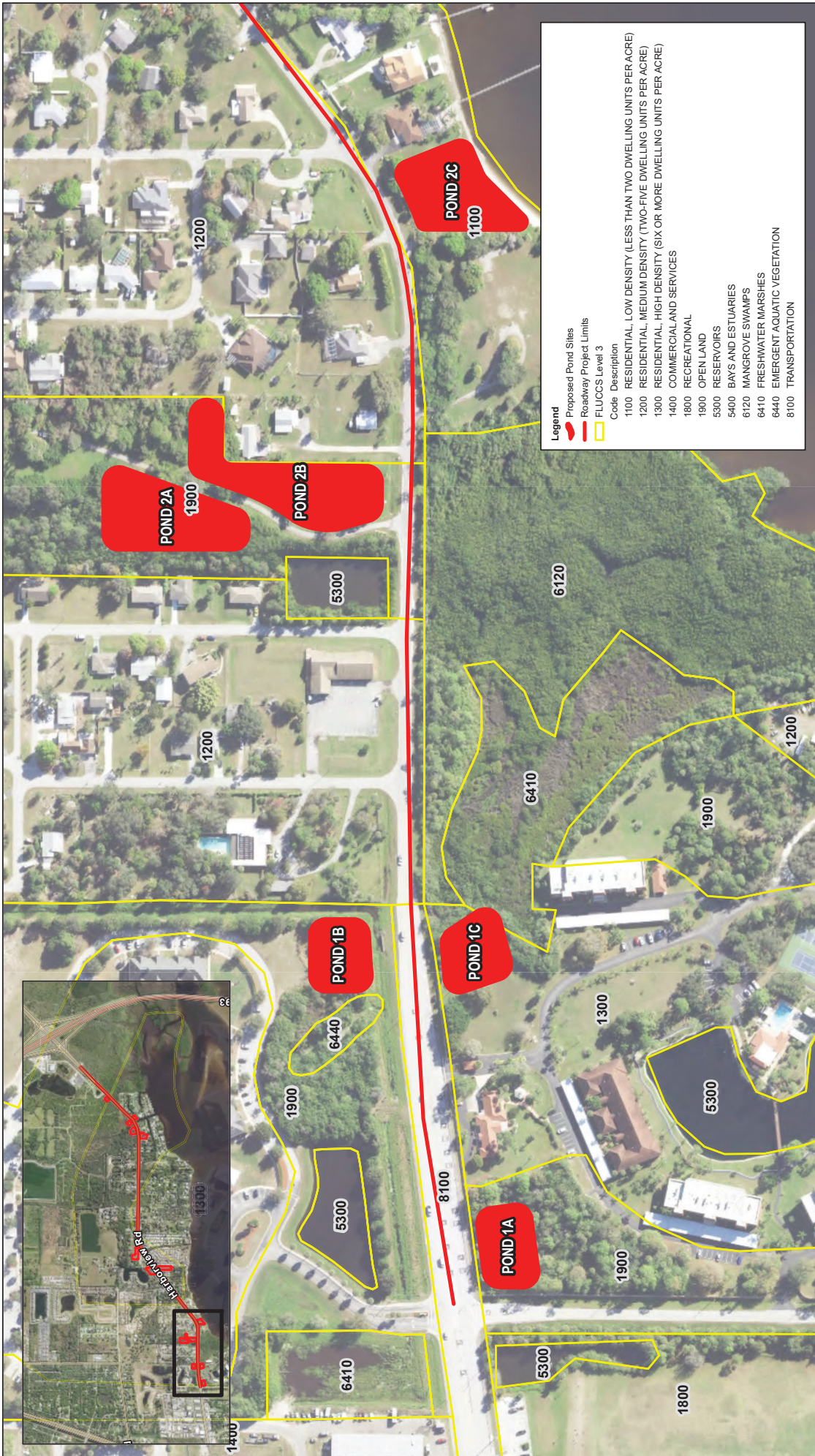
Common Name	Scientific Name	Status* (State/Federal)	Preferred Habitat
<u>Mammals</u>			
West Indian manatee	<i>Trichechus manatus</i>	T/FT	Coastal waters, bays, rivers
Florida bonneted bat	<i>Eumops floridanus</i>	E/FE	Cavities in natural and manmade structures
Florida black bear**	<i>Ursus americanus floridanus</i>	N/N	Flatwoods, swamps, scrub oak ridges, bayheads
<u>Birds</u>			
Wood stork	<i>Mycteria americana</i>	T/FT	Shallow edges of surface waters
Rufa red knot	<i>Calidris canutus rufa</i>	T/FT	Sandy beaches, salt marshes, lagoons, estuarine mudflats, and mangrove swamps
Piping plover	<i>Charadrius melodus</i>	T/FT	Sandy beaches, sand flats, and mudflats along coastal areas
Florida scrub-jay	<i>Aphelocoma coerulescens</i>	T/FT	Relict dune ecosystems or scrub on well drained sandy soils; scrubby oaks
Crested caracara	<i>Polyborus plancus audubonii</i>	T/FT	Prairies with cabbage palms, wooded areas with saw palmetto, scrub oaks, pastures
Red-cockaded woodpecker	<i>Picoides borealis</i>	E/FE	Mature pine forests containing living longleaf pine trees
Bald eagle***	<i>Haliaeetus leucocephalus</i>	N/N	Estuarine, lacustrine, riverine, tidal marsh, tall trees or structures for nesting
Osprey***	<i>Pandion haliaetus</i>	N/N	Open water; areas of cypress, mangrove, pine and swamp hardwoods for nesting
Florida burrowing owl	<i>Athene cunicularia floridana</i>	N/ST	Native prairies and cleared areas with short groundcover
Florida sandhill crane	<i>Grus canadensis pratensis</i>	N/ST	Basin marsh, depression marsh, dry prairies, marl prairie, pastures
Snowy plover	<i>Caradrius nivosus</i>	N/ST	Sandy beaches, sand flats
Southeastern American kestrel	<i>Falco sparverius paulus</i>	N/ST	Sandhill, mesic flatwoods, ruderal, dry prairie

Table 1. Potential Federal and State Listed Species in Project Area

Common Name	Scientific Name	Status* (State/Federal)	Preferred Habitat
<u>Birds</u>			
Black skimmer	<i>Rynchops niger</i>	N/ST	Sandy beaches, shell bars, salt marshes for nesting and foraging
Least tern	<i>Sternula antillarum</i>	N/ST	Coastal beaches, estuaries, bays, lagoons, and rivers
American oystercatcher	<i>Haematopus palliatus</i>	N/ST	Coastal beaches, dunes, salt marshes, mudflats, shell islands
Wading birds: little blue heron, tri-colored heron, and roseate spoonbill	<i>Egretta caerulea</i> , <i>Egretta tricolor</i> , <i>Platalea ajaja</i>	N/ST	Shallow edges of any surface waters
<u>Fish</u>			
Smalltooth sawfish	<i>Pristis pectinata</i>	E/FE	Marine and estuarine waters
Gulf strurgeon	<i>Acipenser oxyrinchus desotoi</i>	T/FT	Marine and estuarine waters
<u>Reptiles</u>			
Kemp's Ridley sea turtle	<i>Lepidochelys kempii</i>	E/FE	Marine/estuarine waters, sandy shorelines
Green sea turtle	<i>Chelonia mydas</i>	T/FT	Marine/estuarine waters, sandy shorelines
Loggerhead sea turtle	<i>Caretta caretta</i>	T/FT	Marine/estuarine waters, sandy shorelines
Hawksbill sea turtle	<i>Eretmochelys imbricata</i>	E/FE	Marine/estuarine waters, sandy shorelines
Leatherback sea turtle	<i>Dermochelys coriacea</i>	E/FE	Marine/estuarine waters, sandy shorelines
Eastern indigo snake	<i>Drymarchon corais couperi</i>	T/FT	Hydric hammock, palustrine, sandhill scrub, upland pine forest, mangrove swamp
American crocodile	<i>Crocodylus acutus</i>	T/FT	Coastal (saltwater/brackish/tidal) waters
American alligator	<i>Alligator mississippiensis</i>	SAT/FT(SA)	Fresh and brackish waters
Gopher tortoise	<i>Gopherus polyphemus</i>	C/ST	Sandhill, scrub, xeric hammock, ruderal, dry prairie, pine flatwood
Pine snake	<i>Pituophis melanoleucus</i>	N/ST	Well-drained sandy soils with a moderate to open canopy

Table 1. Potential Federal and State Listed Species in Project Area

Common Name	Scientific Name	Status* (State/ Federal)	Preferred Habitat
<u>Plants</u>			
Many-flowered grass-pink	<i>Calopogon multiflorus</i>	N/T	Dry to moist flatwoods
Sand butterfly pea	<i>Centrosema Arenicola</i>	N/E	Sandhills, scrubby flatwoods, dry upland woods
Sand-dune spurge	<i>Chamaesyce cumulicola</i>	N/E	Sandhills, beach dunes
Beautiful pawpaw	<i>Deeringothamnus pulchellus</i>	E/E	Open slash pine, longleaf pine flatwoods
Nodding pinweed	<i>Lechea cernua</i>	N/T	Scrub and scrubby flatwoods
Pine pinweed	<i>Lechea divaricata</i>	N/E	Scrub and scrubby flatwoods
Small's flax	<i>Linum carteri var. smallii</i>	N/E	Pine rocklands, pine flatwoods
Florida spiny-pod	<i>Matelea floridana</i>	N/E	Open woodlands, sandhills, open fields
Celestial lily	<i>Nemastylis floridana</i>	N/E	Wet flatwoods, prairies, marshes, cabbage palm hammocks edges
Florida beargrass	<i>Nolina atopocarpa</i>	N/T	Grassy areas of mesic and wet flatwoods
Giant orchid	<i>Pteroglossaspis ecristata</i>	N/T	Sandhill, scrub, pine flatwoods, pine rocklands
Aboriginal prickly apple	<i>Harrisia aboriginum</i>	E/E	Coastal hammocks, shell middens
Scrub bluestem	<i>Schiachyrium niveum</i>	N/E	Coastal grassland
<p>*Status: N = currently listed, nor currently being considered for listing; C = candidate for federal listing; T/FT = listed as threatened species at the federal level by USFWS; E/FE = listed as endangered species at the federal level by USFWS; FT(S/A) = federal threatened due to similarity of appearance; SAT = treated as threatened due to similarity of appearance to a species which is federally listed; ST= listed as threatened by FWC; N/E = species of plants native to Florida that are in imminent danger of extinction within the state; N/T = species of plants native to Florida that are in rapid decline within the state.</p> <p>**The Florida black bear is no longer listed as threatened, however is still protected under the FWC Florida Black Bear Management Plan.</p> <p>***The bald eagle and osprey are afforded federal protection through the Migratory Bird Treaty Act (MBTA) and/or the Bald and Golden Eagle Protection Act (BGEPA).</p>			



Legend

- Proposed Pond Sites
- Roadway Project Limits
- FLUCCS Level 3

Code	Description
1100	RESIDENTIAL, LOW DENSITY (LESS THAN TWO DWELLING UNITS PER ACRE)
1200	RESIDENTIAL, MEDIUM DENSITY (TWO-FIVE DWELLING UNITS PER ACRE)
1300	RESIDENTIAL, HIGH DENSITY (SIX OR MORE DWELLING UNITS PER ACRE)
1400	COMMERCIAL AND SERVICES
1800	RECREATIONAL
1900	OPEN LAND
5300	RESERVOIRS
5400	BAYS AND ESTUARIES
6120	MANGROVE SWAMPS
6410	FRESHWATER MARSHES
6440	EMERGENT AQUATIC VEGETATION
8100	TRANSPORTATION

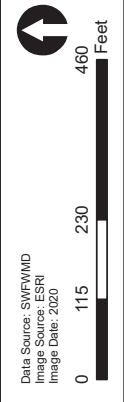


Figure 2. FLUCCS Map
Sheet 1 of 3
 FPID No. 434965-2-52-01
 Harborview Road from Melbourne Street to I-75
 Charlotte County, FL



Legend

- Proposed Pond Sites
- Readway Project Limits
- FLUCCS Level 3

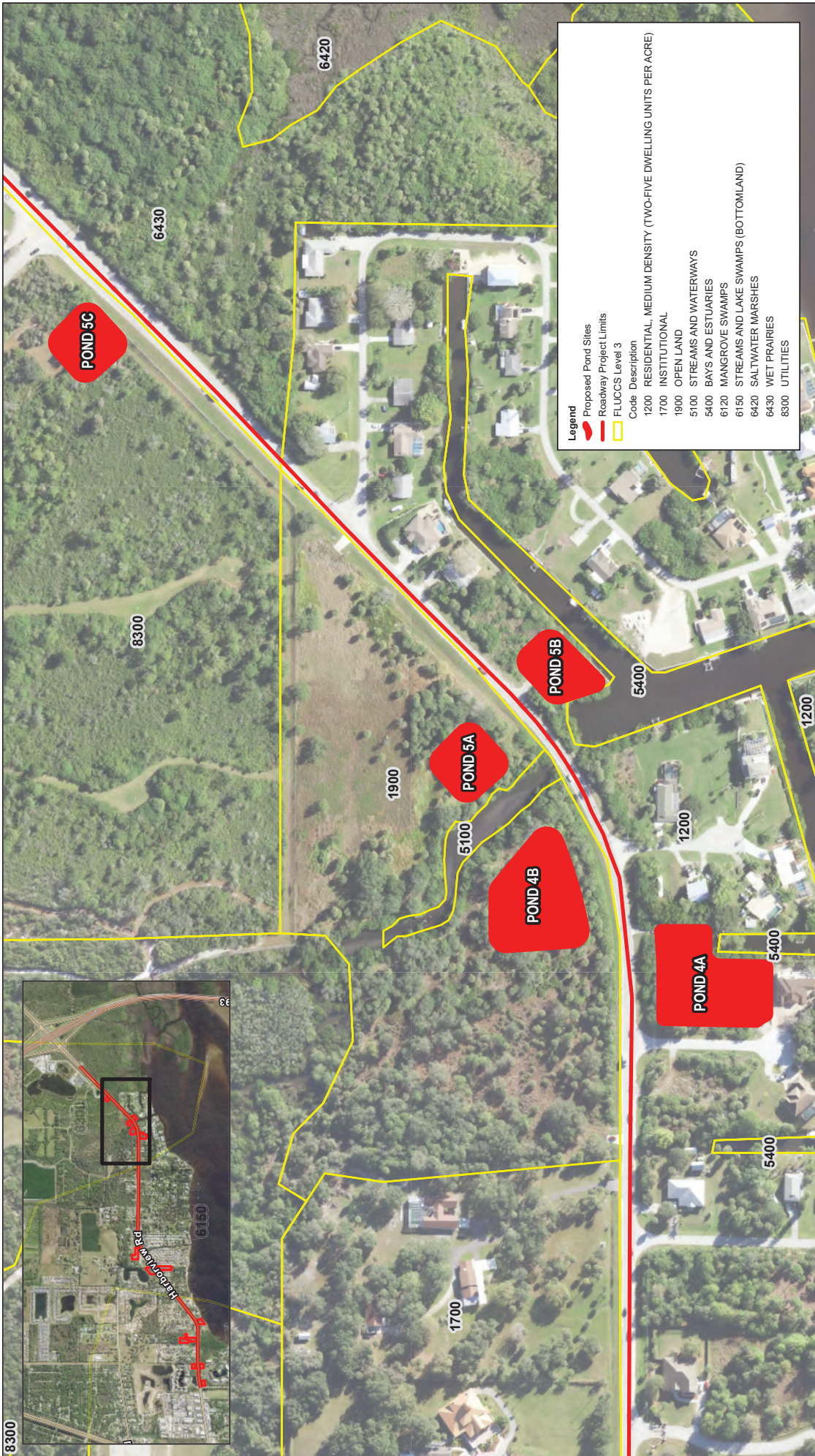
Code	Description
1100	RESIDENTIAL - LOW DENSITY (LESS THAN TWO DWELLING UNITS PER ACRE)
1200	RESIDENTIAL - MEDIUM DENSITY (TWO-FIVE DWELLING UNITS PER ACRE)
1300	RESIDENTIAL - HIGH DENSITY (SIX OR MORE DWELLING UNITS PER ACRE)
1700	INSTITUTIONAL
1900	OPEN LAND
3300	MIXED RANGELAND
5300	RESERVOIRS

Data Source: SWFWMD
 Image Source: ESRI
 Image Date: 2020

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Figure 2. FLUCCS Map
Sheet 2 of 3
 FPID No. 434965-2-62-01
 Harborview Road from Melbourne Street to I-75
 Charlotte County, FL





Legend

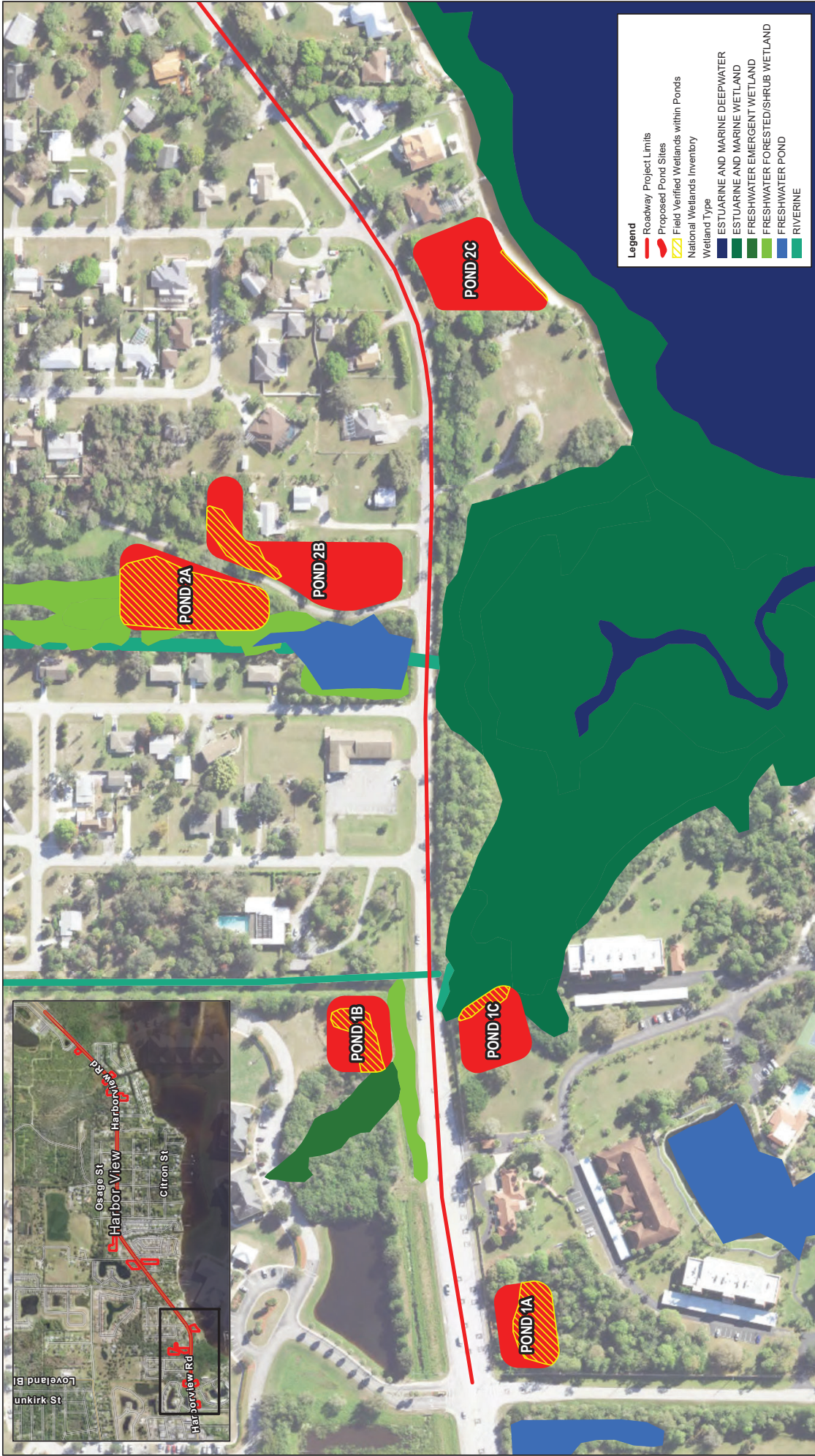
- Proposed Pond Sites
- Roadway Project Limits
- FLUCCS Level 3

Code	Description
1200	RESIDENTIAL, MEDIUM DENSITY (TWO-FIVE DWELLING UNITS PER ACRE)
1700	INSTITUTIONAL
1900	OPEN LAND
5100	STREAMS AND WATERWAYS
5400	BAYS AND ESTUARIES
6120	MANGROVE SWAMPS
6150	STREAMS AND LAKE SWAMPS (BOTTOMLAND)
6420	SALTWATER MARSHES
6430	WET PRAIRIES
8300	UTILITIES

Data Source: SWFWMD
 Image Source: ESRI
 Image Date: 2020

Figure 2. FLUCCS Map
Sheet 3 of 3
 FPID No. 434965-2-52-01
 Harborview Road from Melbourne Street to I-75
 Charlotte County, FL





- Legend**
- Roadway Project Limits
 - Proposed Pond Sites
 - ▨ Field Verified Wetlands within Ponds
 - ▨ National Wetlands Inventory
 - Wetland Type
 - ESTUARINE AND MARINE DEEPWATER
 - ESTUARINE AND MARINE WETLAND
 - FRESHWATER EMERGENT WETLAND
 - FRESHWATER FORESTED/SHRUB WETLAND
 - FRESHWATER POND
 - RIVERINE



Figure 3. NWI and Wetland Impact Map
Sheet 1 of 3
 FPID No. 434965-2-52-01
 Harborview Road from Melbourne Street to I-75
 Charlotte County, FL

Date Source: USFWS NWI
 Image Source: ESRI
 Image Date: 2020

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Legend

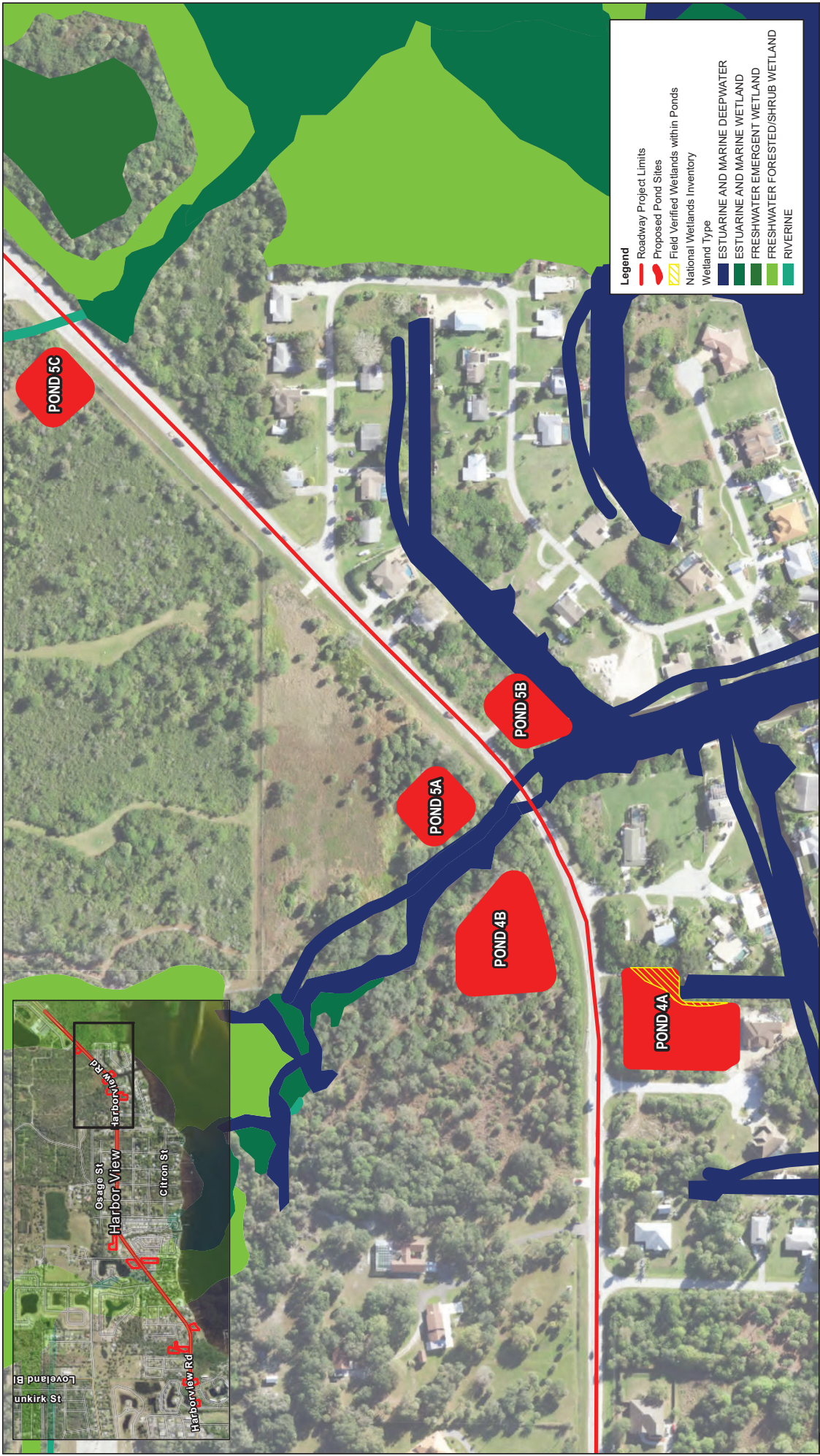
- Roadway Project Limits
- █ Proposed Pond Sites
- █ National Wetlands Inventory
- Wetland Type**
- █ ESTUARINE AND MARINE DEEPWATER
- █ FRESHWATER POND

Date Source: USFWS NWI
 Image Source: ESRI
 Image Date: 2020

0 125 250 500 Feet

Figure 3. NWI and Wetland Impact Map
Sheet 2 of 3
 FPID No. 434965-2-52-01
 Harborview Road from Melbourne Street to I-75
 Charlotte County, FL





Date Source: USFWS NWI
 Image Source: ESRI
 Image Date: 2020



Figure 3. NWI and Wetland Impact Map
Sheet 3 of 3
 FPID No. 434965-2-52-01
 Harborview Road from Melbourne Street to I-75
 Charlotte County, FL



Figure 4. Soils Map
 FPID No. 434965-2-52-01
 Harborview Road from Melbourne Street to I-75
 Charlotte County, FL

Data Source: NRCs USDA
 Image Source: ESRI
 Image Date: 2020



The rating system was dependent on (1) the current existing habitat; (2) its general condition for supporting protected wildlife; (3) if any T&E species were observed in the area; and (4) whether species mitigation is possible and reasonable to offset any impacts should that pond site be selected. Sites with no available habitat, such as fully developed properties, were designated a rating of “No”. Sites with marginal habitat and no observed protected species were designated a rating of “Low”. Sites with moderate habitat and in which protected species could reasonably occur were designated with a rating of “Medium”. Sites with high quality habitat and in which protected species were observed or would be reasonably expected to occur were designated a rating of “High”.

Considering wetlands, the rating was based on the proportion of the pond’s footprint that was comprised of wetlands: a rating of “No” means 0 percent (%); a rating of “Low” is assigned for percentages between 1 and 24%; a “Medium” rating is for wetland composition between 25 and 49%; and a “High” rating is for assigned to any pond site with wetland composition equal to or greater than 50%. To assist with an overall assessment of pond site cost, a wetland mitigation cost was estimated for each pond site. Since a Uniform Mitigation Assessment Methodology (UMAM) assessment was not completed for each individual wetland, we instead allocated approximate delta scores based on low (delta of 0.3), medium (delta of 0.5), and high (delta of 0.8) quality wetland systems. For an approximate wetland mitigation bank cost per dual (state and federal) credit, we assumed \$185,000 based on available banks in the area. A summary of costs and ratings is provided in **Table 2**, Pond Siting T&E and Wetlands Table.

RESULTS

Wildlife

Habitat exists for some of the T&E species as most of the pond site locations are in undeveloped areas or in undeveloped portions of low-density development (see **Figure 2**). Proposed pond sites that contain wetlands or surface waters could support the wood stork and other wading birds. Impacts to wood stork suitable foraging habitat and wading bird foraging habitat will be mitigated through credit purchase from Little Pine Island mitigation bank. The Florida bonneted bat (*Eumops floridanus*) (FBB) could potentially roost and forage within the proposed pond sites within mature trees that are greater than 33 feet tall containing cavities, as well as artificial structures like buildings and utility poles that are located in relatively open areas. An acoustic survey will be required for the FBB for this project which will determine presence or absence of the species.

Table 2. Pond Siting T&E and Wetlands Table

Pond Alternative	Mapped Land Use / FLUCFCS Code		Wetlands / Surface Waters			*Potential Protected Species that would Utilize Habitat	Species Rating	Wetland Rating
	Type	Code	Wetlands Impacts (acres)	% Coverage of Site	Wetland Mitigation Cost ^			
Pond 1A 0.42 ac	Open Land	1900	0.26	62	\$38,480	Wood Stork, Wading Birds, and Florida Sandhill Crane	Low	High
Pond 1B 0.41 ac	Open Land	1900	0.15	37	\$13,875	Wood Stork, Wading Birds, and Florida Sandhill Crane	Medium	Medium
Pond 1C 0.43 ac	Residential, High Density & Freshwater Marsh	1300 & 6410	0.06	14	\$8,880	Wood Stork, Wading Birds, and Florida Sandhill Crane	Medium	High
Pond 2A 0.86 ac	Open Land	1900	0.74	86	\$109,520	Wood Stork, Wading Birds, Florida Sandhill Crane, and Smalltooth Sawfish	Medium	High
Pond 2B 1.01 ac	Open Land	1900	0.17	17	\$9,435	Wood Stork, Wading Birds, and Florida Sandhill Crane	Low	Low
Pond 2C 0.73 ac	Residential, Low Density	1100	0.01	1	\$925	Florida Sandhill Crane, Rufa Red Knot, Piping Plover, Snowy Plover, Black Skimmer, Least Tern, and American Oystercatcher	Medium	Medium
Pond 3A 1.24 ac	Mixed Rangeland	3300	none	0	\$0	Gopher Tortoise and Pine Snake	Medium	No

Table 2. Pond Siting T&E and Wetlands Table

Pond Alternative	Mapped Land Use / FLUCFCS Code		Wetlands / Surface Waters			*Potential Protected Species that would Utilize Habitat	Species Rating	Wetland Rating
	Type	Code	Wetlands Impacts (acres)	% Coverage of Site	Wetland Mitigation Cost ^			
Pond 3B 1.24 ac	Residential, Low Density	1100	none	0	\$0	Gopher Tortoise and Pine Snake	High	No
Pond 3C 1.24 ac	Residential, Low Density	1100	none	0	\$0	Gopher Tortoise and Pine Snake	Medium	No
Pond 4A 0.87 ac	Residential, Medium Density	1200	0.09	10	\$4,995	Wood Stork, Wading Birds, and Florida Bonneted Bat	Medium	Low
Pond 4B 0.85 ac	Open Land	1900	none	0	\$0	Florida Bonneted Bat	Medium	No
Pond 5A 0.37 ac	Open Land	1900	none	0	\$0	Florida Bonneted Bat	Medium	No
Pond 5B 0.37 ac	Residential, Medium Density	1200	none	0	\$0	Florida Bonneted Bat	Low	No
Pond 5C 0.37 ac	Utilities	8300	none	0	\$0	Florida Black Bear and Florida Bonneted Bat	Medium	No

* = The Eastern indigo snake has the potential to occur in any of the pond alternatives.

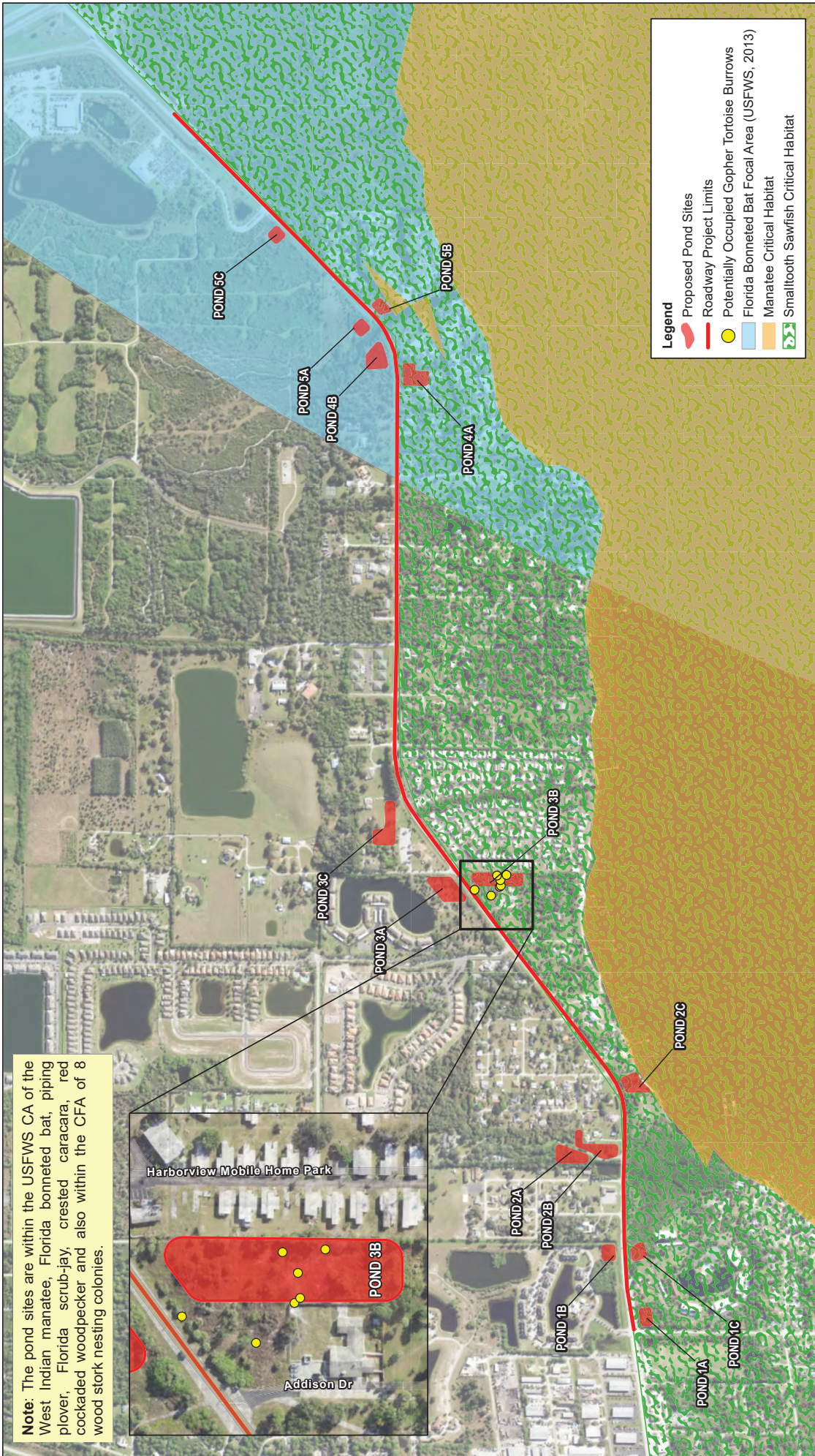
^ = \$185,000 was used to calculate estimated mitigation cost based on average dual (state/federal) credit cost in October 2021

During the field visit, no bald eagle (*Haliaeetus leucocephalus*) or osprey (*Pandion haliaetus*) nests were observed. However, gopher tortoise (*Gopherus polyphemus*) burrows were observed in within one of the pond sites (see **Figure 5**). As necessary, FDOT will obtain a relocation permit from the Florida Fish and Wildlife Conservation Commission (FWC) for this project prior to construction and/or include exclusionary silt fencing where applicable.

Pond Descriptions

Pond 1A (0.42 acres; 62% wetland) is located within the boundary of Roll’s Landing Condo parcel on the southeast corner of Harborview Road and Melbourne Street. It is mapped as Open Land (FLUCCS 1900). The soil is saturated with some inundation located in depressions, present throughout the parcel. There were no wetlands mapped for this pond site, however, during the field visit, a forested wetland composing more than 50% of the pond site was observed with Carolina willow (*Salix caroliniana*) and laurel oak (*Quercus laurifolia*); therefore, the site was given a wetland rating of “High”. The site has minimal wildlife habitat value due to the surrounding developed area, therefore it was given the species rating of “Low”. While this pond site falls within the smalltooth sawfish critical habitat, there are no tidal wetlands accessible to the species in the pond site. This pond site also contains potential roosting habitat for the FBB. No burrows or any listed or protected species were observed within the pond footprint.

Pond 1B (0.41 acres; 37% wetland) is located north of Harborview Road within Charleston Cay parcel west of a jurisdictional surface water and it is mapped as Open Land (FLUCCS 1900). This surface water is hydrologically connected to the Freshwater Marsh (FLUCCS 6410) adjacent the eastbound side of Harborview Road by a culvert under this road. A berm separates Emergent Aquatic Vegetation (FLUCCS 6440), field verified as a freshwater forest wetland, located adjacent this pond site. No burrows or any protected species were observed. There is a forested wetland located within the pond, an extension of the freshwater marsh. The site has moderate wildlife habitat value as a result of the surrounding wetlands and surface waters; therefore, it was given the species rating of “Medium”. Less than half of the pond site contained wetlands; therefore, the site was given a wetland rating of “Medium”.



Note: The pond sites are within the USFWS CA of the West Indian manatee, Florida bonneted bat, piping plover, Florida scrub-jay, crested caracara, red cockaded woodpecker and also within the CFA of 8 wood stork nesting colonies.



Figure 5. Listed and Protected Species Map
 FPID No. 434965-2-52-01
 Harborview Road from Melbourne Street to I-75
 Charlotte County, FL

Pond 1C (0.43 acres; 14% wetland) is located on the eastside of Roll's Landing Condo parcel and is mapped as Residential High Density (FLUCCS 1300) and Freshwater Marsh (FLUCCS 6410). During the field visit, FLUCCS 6410 was reclassified as saltwater marsh due to the salt tolerate plants present. This area contains a Charlotte County conservation easement which protects the tidally influenced wetland occurring to the western side of the pond site. The site has moderate wildlife habitat value due to its undisturbed nature, therefore it was given the species rating of "Medium". This pond site falls within the smalltooth sawfish critical habitat, there are tidal wetlands that are accessible to the species in the pond site. This pond site has no roosting or foraging habitat to support the FBB. No burrows or any protected species were observed. This site would be given the rating of "Low" based on rating criteria mentioned previously, however due to the conservation easement (CE) this site is given a rating of "High". We anticipate that the CE will be affected by the mainline widening, but more impacts to the protected wetland will require greater mitigation requirements.

Pond 2A (0.86 acres; 86% wetland) is located between DeLeon Drive and Hunter Street, north of Harborview Road. It is mapped as Open Land (FLUCCS 1900) and Freshwater Forested/Shrub Wetland (NWI PFO3S and PSSsRh). During the field visit, the wetlands were classified as freshwater forested and compose more than 50% of the pond site; therefore, the site was given a wetland rating of "High". The site has moderate wildlife habitat value due to its undeveloped nature, therefore it was given the species rating of "Medium". This pond site also contains potential roosting habitat for the FBB. No burrows or any listed or protected species were observed.

Pond 2B (1.01 acres; 17% wetland) is located between DeLeon Drive and Laverne Street, north of Harborview Road. It is mapped as Open Land (FLUCCS 1900). During the field review, a forested wetland composing less than 50% of the pond site was observed. The site has minimal wildlife habitat value due to the surrounding developed areas; therefore, it was given the species rating of "Low". This pond site also contains potential roosting and foraging habitat for the FBB. No burrows or any listed or protected species were observed. Minimal wetlands were present; therefore, the site was given a wetland rating of "Low".

Pond 2C (0.73 acres; 1% wetland) is located between Harborview Road and the edge of the Peace River bank and is mapped as Residential Low Density (FLUCCS 1100); the Peace River is considered critical habitat for the West Indian manatee and smalltooth sawfish. There were no wetlands mapped for this pond; however, during the field review, mangroves were observed on the sandy shoreline (see **Appendix A**). The site has moderate wildlife habitat value due to the capability of providing habitat for species like Rufa red knot, piping plover, snowy plover, black skimmer, least tern, and American oystercatcher; therefore, it was given the species rating of “Medium”. While this pond site falls within the smalltooth sawfish critical habitat, there are no tidal wetlands accessible to the species in the pond site. This pond site has no roosting or foraging habitat to support the FBB. No burrows or any listed or protected species were observed. Minimal wetlands were present; however, given the very close proximity to the estuarine system the site was given a wetland rating of “Medium”. This pond site will impact mangroves and shoreline thus requiring shoreline stabilization and heightened consultation for listed species in comparison to the other pond alternatives in this basin.

Pond 3A (1.24 acres; 0% wetland) is located north of Harborview Road and west of Rowland Drive. It is mapped as Mixed Rangeland (FLUCCS 3300) composed of grassland and shrub-brushland. This parcel was once developed, according to historical aerials, with a building siting less than 100 feet west of this pond. The site has minimal wildlife habitat value but has the potential to be utilized by gopher tortoise and other commensal species, therefore it was given the species rating of “Medium”. This pond site also contains potential roosting habitat for the FBB. No listed or protected species were observed during field surveys. No wetlands or surface waters are present; therefore, the site was given a wetland rating of “No”.

Pond 3B (1.24 acres; 0% wetland) is located east of Addison Drive and south of Harborview Road. It is mapped as Residential Low Density (FLUCCS 1100) with developments on three surrounding sides. This pond site also contains potential roosting and foraging habitat for the FBB. While this pond site falls within the smalltooth sawfish critical habitat, there are no tidal wetlands accessible to the species in the pond site. During the field survey, gopher tortoise burrows were observed (See **Figure 5**).

The site has suitable wildlife habitat for gopher tortoise and other commensal species; therefore, it was given the species rating of “High”. No wetlands or surface waters are present; therefore, the site was given a wetland rating of “No”.

Pond 3C (1.24 acres; 0% wetland) is located north of Harborview Road above Bethanie Seventh Day Adventist Church. It is mapped as Residential Low Density (FLUCCS 1100). It is comprised partially of maintained property with mowed grass. The site is surrounded by development on all sides. The site has minimal wildlife habitat value but has the potential to be utilized by gopher tortoise and other commensal species, therefore it was given the species rating of “Medium”. This pond site also contains potential roosting and foraging habitat for the FBB. No listed or protected species were observed during field surveys. No wetlands or surface waters are present; therefore, the site was given a wetland rating of “No”.

Pond 4A (0.87 acres; 10% wetland) is located south of Harborview Road, east of Oma Drive and is mapped as Residential Medium Density (FLUCCS 1200); however, this parcel is vacant. This pond site is located within a FBB focal area and was given a species rating of “Medium” due to the potential roosting and foraging habitat available for the FBB (See **Figure 5**). While this pond site falls within the smalltooth sawfish critical habitat, there are no tidal wetlands accessible to the species in the pond site. No burrows or any listed or protected species were observed. Minimal wetlands or surface waters are present; therefore, the site was given a wetland rating of “Low”.

Pond 4B (0.85 acres; 0% wetland) is located in the northwestern quadrant of Harborview Road and a jurisdictional surface water that is a tributary to the Peace River. It is mapped as Open Land (FLUCCS 1900). This pond site is located within a FBB focal area and was given a species rating of “Medium” due to the potential roosting habitat available for the FBB. No burrows or any listed or protected species were observed. No wetlands or surface waters are present; therefore, the site was given a wetland rating of “No”.

Pond 5A (0.37 acres; 0% wetland) is located in the northeastern quadrant of Harborview Road and a jurisdictional surface water that is tributary to the Peace River. It is mapped as Open Land (FLUCCS 1900). This pond site is located within a FBB focal area and was given a species rating of “Medium” due to the potential roosting habitat available for the FBB. While this pond site falls within the smalltooth sawfish critical habitat, there are no tidal wetlands accessible to the species in the pond site. No burrows or any listed or protected species were observed. No wetlands or surface waters are present; therefore, the site was given a wetland rating of “No”.

Pond 5B (0.37 acres; 0% wetland) is located in the southeastern quadrant of Harborview Road and a jurisdictional surface water that is tributary to the Peace River, also critical habitat for West Indian manatee and smalltooth sawfish. It is mapped as Residential Medium Density (FLUCCS 1200). Historical aerials show that this parcel was developed and has a seawall that separates the estuarine habitat from the land parcel that contains the pond site. The site has minimal wildlife habitat value; therefore, it was given the species rating of “Low”. This pond site also contains potential roosting and foraging habitat for the FBB. No burrows or any listed or protected species were observed. No wetlands or surface waters are present; therefore, the site was given a wetland rating of “No”.

Pond 5C (0.37 acres; 0% wetland) is located at the end of the eastern limits, north of Harborview Road and south of the Environmental Services Campus/ MPO. It is mapped as Utilities (FLUCCS 8300) owned by Charlotte County Board of County Commissions. This pond site is located within a FBB focal area and was given a species rating of “Medium” due to the presence of roosting habitat that could sustain the FBB. No burrows or any listed or protected species were observed. No wetlands or surface waters are present; therefore, the site was given a wetland rating of “No”.

CONCLUSIONS AND RECOMMENDATIONS

Listed Species

Pond Sites 1A; 2B; and 5B were documented as having ratings of “Low”. Pond sites 1B and 1C; 2A and 2C; 3A and 3C; 4A and 4B; and 5A and 5C were documented as having ratings of “Medium”. Pond Site 3B was documented as having a rating of “High”.

Gopher tortoise burrows were identified within Pond 3B and are likely to occur in non-hydric soils with low-lying vegetation. Gopher tortoise burrows were identified within Pond 3B and are likely to occur in non-hydric soils with low-lying vegetation. A 100% gopher tortoise burrow survey will be conducted within all appropriate habitat prior to construction, and burrows will be avoided or relocated as needed. A gopher tortoise relocation permit could be required for any unavoidable impacts. The Eastern Indigo Snake Standard Protection Measures, and Sea Turtle and Smalltooth Sawfish Construction Conditions will be followed during construction. A suitable habitat analysis for the wood stork will be provided to determine biomass lost from surface water impacts. An acoustic survey for the FBB will be conducted to identify any roosting areas within the pond sites and mainline. The placement of stormwater ponds is not anticipated to adversely affect the conservation of fish and wildlife, including endangered or threatened species, or their habitats, since prior to construction species-specific surveys will be conducted to identify any burrows, nest, or roosting areas which would be protected through avoidance, relocation, or mitigation. Also, very minimal habitat is known to be specifically utilized by protected species other than the gopher tortoise. The results of the analysis are summarized in Table 2, Pond Siting T&E and Wetlands Table.

Wetlands

The pond site alternatives that were documented as having a rating of “No” include Sites: 3A, 3B, and 3C; 4B; and 5A, 5B, and 5C. Pond Sites 2B; and 4A were documented as having a rating of “Low”. Pond Site 1B and 2C were documented as having a rating of “Medium”. Pond sites 1A and 1C, and 2A were documented as having ratings of “High”. All measures will be taken to avoid or minimize wetland and water quality impacts during the final pond site design, resulting in minimal net loss of wetland habitat that may be used for species foraging, breeding, nesting, or other biological processes. The results of the analysis are summarized in Table 2, Pond Siting T&E and Wetlands Table.

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Appendix A

Photographic Log of Pond 2C Shoreline

Shoreline of Pond 2C



Photo facing west on the eastside of Pond 2C

Red Mangrove on Shoreline



Photo facing west on the eastside of Pond
2C

Black Mangroves on Shoreline



Photo facing west on the westside of Pond
2C

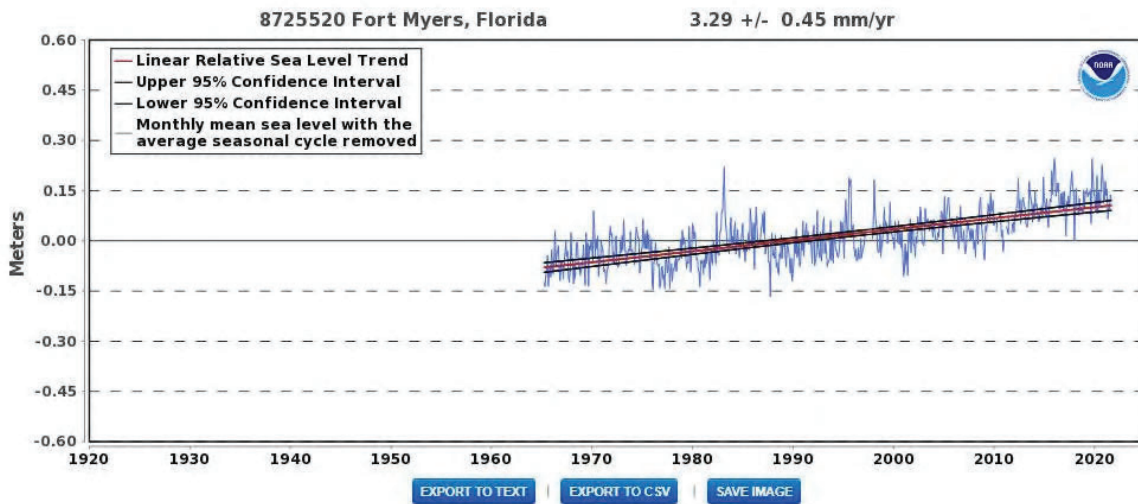
Appendix H.1
Cultural Resource
Assessment Survey
Addendum

See CRAS documentation under
separate cover

Appendix I

Sea Level Rise

**Relative Sea Level Trend
8725520 Fort Myers, Florida**



The relative sea level trend is 3.29 millimeters/year with a 95% confidence interval of +/- 0.45 mm/yr based on monthly mean sea level data from 1965 to 2020 which is equivalent to a change of 1.08 feet in 100 years.

The plot shows the monthly mean sea level without the regular seasonal fluctuations due to coastal ocean temperatures, salinities, winds, atmospheric pressures, and ocean currents. The long-term linear trend is also shown, including its 95% confidence interval. The plotted values are relative to the most recent [Mean Sea Level datum established by CO-OPS](#). The calculated trends for all stations are available as a [table in millimeters/year and in feet/century](#) (0.3 meters = 1 foot). If present, solid vertical lines indicate times of any major earthquakes in the vicinity of the station and dashed vertical lines bracket any periods of questionable data or datum shift.

Seal Level Rise for Harborview Road (CR 776)

Based on the Fort Myers gauge, the rise per year is 3.29 mm.

This translate to a rise of 0.1295 in/yr

For the 50 year design life the seal level rise is 6.47 inches.

$$3.29 \text{ mm/yr} / 25.4 \text{ mm/in} = 0.1295 \text{ in/yr}$$

$$50 \text{ yr} \times 0.1295 \text{ in/yr} = 6.47 \text{ in/50yr}$$

Appendix J

Contamination Screening

Evaluation Report

See CSER documentation under
separate cover

Appendix J.1

Contamination Technical Memorandum For PD&E Re-Evaluation

See CSER documentation under
separate cover

Appendix K

R/W Estimates

CONCEPTUAL ESTIMATE, ALTERNATES / SEGMENTS: PHASE COSTS SUMMARY

The costs below are not based on an appraisal of values!

**** EXEMPT FROM PUBLIC DISCLOSURE - FS: 337.168 ****

ITEM SEG: 4349652, COUNTY: Charlotte, LIMITS: Harbor View Rd, from Melbourne St to I-75

COST ESTIMATE NUMBER: 23005

FOR: C. Samuels, Atkins, Project Management

BY: S. Cross, SRWA, American Acq. DATE: 2/10/2023

Alternate / Segment: Proposed Pond Sites from October 2021 PSR with added Pond Site 2D in February 2023

Description:	Size Acres:	Parcels	Relo.Cnt	Phase: 4B	Phase: 41	Phase: 43	Phase: 45	Total:
Pond Site 1A	0.45	1	0	\$47,000	\$12,000	\$346,000	\$0	\$405,000
Pond Site 1B	0.45	1	0	\$47,000	\$12,000	\$138,000	\$0	\$197,000
Pond Site 1C	0.45	1	0	\$47,000	\$12,000	\$241,000	\$0	\$300,000
Pond Site 2A	0.89	1	0	\$47,000	\$12,000	\$399,000	\$0	\$458,000
Pond Site 2B	1.04	1	0	\$47,000	\$12,000	\$509,000	\$0	\$568,000
Pond Site 2C	0.76	2	0	\$90,000	\$24,000	\$1,407,000	\$0	\$1,521,000
Pond Site 2D	1.22	3	3	\$204,000	\$48,000	\$2,496,000	\$100,500	\$2,848,500
Pond Site 3A	1.29	1	0	\$47,000	\$12,000	\$538,000	\$0	\$597,000
Pond Site 3B	1.29	1	0	\$47,000	\$12,000	\$592,000	\$0	\$651,000
Pond Site 3C	1.29	1	0	\$47,000	\$12,000	\$538,000	\$0	\$597,000
Pond Site 4A	0.89	2	0	\$90,000	\$24,000	\$850,000	\$0	\$964,000
Pond Site 4B	0.89	1	0	\$47,000	\$12,000	\$356,000	\$0	\$415,000
Pond Site 5A	0.39	1	0	\$47,000	\$12,000	\$200,000	\$0	\$259,000
Pond Site 5B	0.39	1	0	\$47,000	\$12,000	\$495,000	\$0	\$554,000
Pond Site 5C (County)	0.39	1	0	\$29,000	\$12,000	\$86,000	\$0	\$127,000
Total All Sheets:	12.08	19	3	\$930,000	\$240,000	\$9,191,000	\$100,500	\$10,461,500

S:\ROW\EST\Estimates\Charlotte_01\23005 4349652 Charlotte - Harborview - Melbourne to I-75\4349652 ROW Est. Ponds Harbor View Rd Summary CE 23005.xlsm\SUMMARY

Notes

Pond Site Exhibits dated October 4, 2021 and sizes were provided October 21, 2021.

Pond Site 5C Assumption: no litigation.

Pond Site 2D added February 2023.



Appendix L

Pond Sizes

And Cost

Harborview Road from Melbourne Road to I-75
 Charlotte County
 Financial Project ID: 434965-2-32-01

Designed By: CAS
 Date: 2/23/2021
 Checked By: RDU
 Date: 3/1/2021

**BASIN 1 AND 2
 PROPOSED POND SIZE ESTIMATE**

TREATMENT CALCULATIONS

Wet Detention
 Treat 1 in. of runoff over the additional Impervious
 Area to be treated 2.69 ac
 Treatment volume required **0.22 ac-ft**

ATTENUATION CALCULATIONS

Will attenuation be necessary? N
 NOAA Atlas 14 Rainfall Data 8.3 in.

Pre-development Conditions

Total Area to be attenuated for 10.80 ac
 Impervious Areas
 Water 0.00 ac
 Pavement (roadways, driveways, concrete, etc.) 1.47 ac
 Pervious Area 9.33 ac

CN Calculations

Soil Type(s) Myakka fine sand
 Hydrologic Group A/D
 SHWT 2.30

		Area	CN	Weighted CN
Impervious Areas				
Water		0.00 ac	100	0.00
Pavement (roadways, driveways, concrete, etc.)		1.47 ac	98	13.37
Pervious	Fair	9.33 ac	84	72.54
CN _{pre} =				85.9

SCS Method for Attenuation Volume:

$$S = \frac{1,000}{CN} - 10$$

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

S_{pre} = 1.64 in.
 Q_{pre} = 6.57 in.
 Pre-development attenuation volume = **5.92 ac-ft**

Harborview Road from Melbourne Road to I-75
 Charlotte County
 Financial Project ID: 434965-2-32-01

Designed By: CAS
 Date: 2/23/2021
 Checked By: RDU
 Date: 3/1/2021

**BASIN 1 AND 2
 PROPOSED POND SIZE ESTIMATE**

ATTENUATION CALCULATIONS (CONT.)

Post-development Conditions

Total Area to be attenuated for 10.80 ac
 Impervious Areas
 Water 0.11 ac
 Pavement (roadways, driveways, concrete, etc.) 5.52 ac
 Pervious area 5.17 ac

CN Calculations

Soil Type(s) Myakka fine sand
 Hydrologic Group A/D
 SHWT 2.30

		Area	CN	Weighted CN
Impervious Areas				
Water		0.11 ac	100	1.02
Pavement (roadways, driveways, concrete, etc.)		5.52 ac	98	50.06
Pervious Area	Fair	5.17 ac	84	40.24
CN _{post} =				91.3

SCS Method for Attenuation Volume:

$$S = \frac{1,000}{CN} - 10$$

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

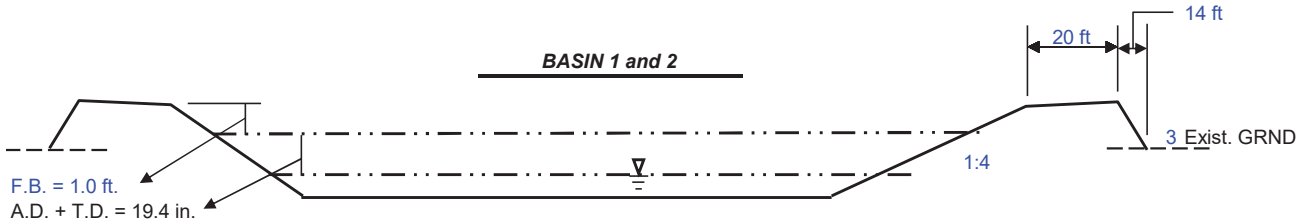
S_{post} = 0.95 in.
 Q_{post} = 7.22 in.
 Post-development attenuation volume = **6.50 ac-ft**

Attenuation volume required (Post-Pre)

0.00 ac-ft --> No Attenuation Required

**BASIN 1 AND 2
 PROPOSED POND SIZE ESTIMATE**

POND SIZE ESTIMATE



Approx. SHWT Elev. =
 2.30

Approx. low edge of pavement elevation (LEOP) = 6.60
 Approx. hydraulic clearance from LEOP = 1.68 ft
 Available depth for A.D. + T.D. = **19.44 in**

HGL Slope 0.001 ft/ft
 LEOP to SMF 1680 ft

Square dimension at bottom of T.D.	71.1 ft
Square dimension at top of A.D.	84.1 ft
Treatment & Attenuation Volume provided	0.22 ac-ft CHECK
Square dimension at top of freeboard (F.B.)	105.5 ft
Outside pond dimensions (including maint. berm & tie-down)	174.3 ft

<i>Treatment Volume Required</i>
0.22 ac-ft
<i>Attenuation Volume Required</i>
0.00 ac-ft

Minimum Total Presumptive Area Required: **0.70 ac**

Pond 2D

Harborview Road from Melbourne Road to I-75
 Charlotte County
 Financial Project ID: 434965-2-32-01

Designed By: MAW
 Date: 7/20/2023
 Checked By: APS
 Date: 7/20/2023

BASIN 1 AND 2
PROPOSED POND SIZE ESTIMATE
Pond 2D

TREATMENT CALCULATIONS

Wet Detention
 Treat 1 in. of runoff over the additional Impervious
 Area to be treated 2.46 ac
 Treatment volume required **0.21 ac-ft**

ATTENUATION CALCULATIONS

Will attenuation be necessary? N
 NOAA Atlas 14 Rainfall Data 8.3 in.

Pre-development Conditions

Total Area to be attenuated for 10.80 ac
 Impervious Areas
 Water 0.00 ac
 Pavement (roadways, driveways, concrete, etc.) 1.47 ac
 Pervious Area 9.33 ac

CN Calculations

Soil Type(s) Myakka fine sand
 Hydrologic Group A/D
 SHWT 2.30

		Area	CN	Weighted CN
Impervious Areas				
Water		0.00 ac	100	0.00
Pavement (roadways, driveways, concrete, etc.)		1.47 ac	98	13.37
Pervious	Fair	9.33 ac	84	72.54
			CN _{pre} =	85.9

SCS Method for Attenuation Volume:

$$S = \frac{1,000}{CN} - 10$$

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

S_{pre} = 1.64 in.
 Q_{pre} = 6.57 in.
 Pre-development attenuation volume = **5.92 ac-ft**

Harborview Road from Melbourne Road to I-75
 Charlotte County
 Financial Project ID: 434965-2-32-01

Designed By: MAW
 Date: 7/20/2023
 Checked By: APS
 Date: 7/20/2023

**BASIN 1 AND 2
 PROPOSED POND SIZE ESTIMATE
 Pond 2D**

ATTENUATION CALCULATIONS (CONT.)

Post-development Conditions

Total Area to be attenuated for 10.80 ac
 Impervious Areas
 Water 0.11 ac
 Pavement (roadways, driveways, concrete, etc.) 5.52 ac
 Pervious area 5.17 ac

CN Calculations

Soil Type(s) Myakka fine sand
 Hydrologic Group A/D
 SHWT 2.30

		Area	CN	Weighted CN
Impervious Areas				
Water		0.11 ac	100	1.02
Pavement (roadways, driveways, concrete, etc.)		5.52 ac	98	50.06
Pervious Area	Fair	5.17 ac	84	40.24
CN _{post} =				91.3

SCS Method for Attenuation Volume:

$$S = \frac{1,000}{CN} - 10$$

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

S_{post} = 0.95 in.
 Q_{post} = 7.22 in.
 Post-development attenuation volume = **6.50 ac-ft**

Attenuation volume required (Post-Pre)

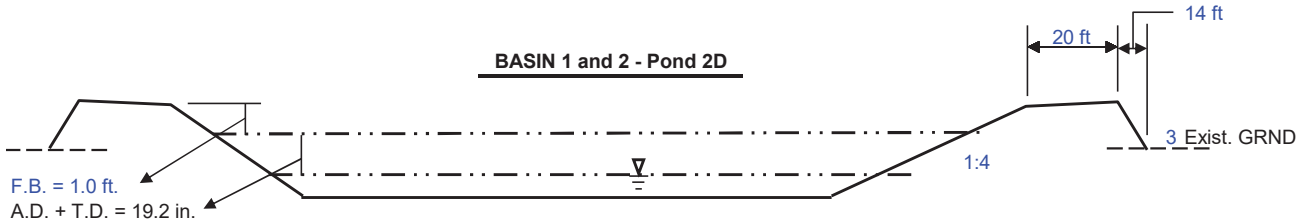
0.00 ac-ft --> No Attenuation Required

Harborview Road from Melbourne Road to I-75
 Charlotte County
 Financial Project ID: 434965-2-32-01

Designed By: MAW
 Date: 7/20/2023
 Checked By: APS
 Date: 7/20/2023

**BASIN 1 AND 2
 PROPOSED POND SIZE ESTIMATE
 Pond 2D**

POND SIZE ESTIMATE



Approx. SHWT Elev. =
 2.30

Approx. low edge of pavement elevation (LEOP) = 6.60
 Approx. hydraulic clearance from LEOP = 1.70 ft
 Available depth for A.D. + T.D. = **19.20 in**

HGL Slope 0.001 ft/ft
 LEOP to SMF 1700 ft

Square dimension at bottom of T.D.	68.3 ft
Square dimension at top of A.D.	81.1 ft
Treatment & Attenuation Volume provided	0.21 ac-ft
Square dimension at top of freeboard (F.B.)	102.7 ft
Outside pond dimensions (including maint. berm & tie-down)	171.5 ft

<i>Treatment Volume Required</i>	0.21 ac-ft
<i>Attenuation Volume Required</i>	0.00 ac-ft

Minimum Total Presumptive Area Required: **0.68 ac**

Harborview Road from Melbourne Road to I-75
 Charlotte County
 Financial Project ID: 434965-2-32-01

Designed By: CAS
 Date: 2/23/2021
 Checked By: RDU
 Date: 3/1/2021

**BASIN 3
 PROPOSED POND SIZE ESTIMATE**

TREATMENT CALCULATIONS

Wet Detention
 Treat 1 in. of runoff over the additional Impervious
 Area to be treated 2.36 ac
 Treatment volume required **0.20 ac-ft**

ATTENUATION CALCULATIONS

Will attenuation be necessary? Y
 NOAA Atlas 14 Rainfall Data 8.3 in.

Pre-development Conditions

Total Area to be attenuated for 6.95 ac
 Impervious Areas
 Water 0.00 ac
 Pavement (roadways, driveways, concrete, etc.) 1.73 ac
 Pervious Area 5.22 ac

CN Calculations

Soil Type(s) Daytona Sand
 Hydrologic Group A
 SHWT 5.20

		Area	CN	Weighted CN
Impervious Areas				
Water		0.00 ac	100	0.00
Pavement (roadways, driveways, concrete, etc.)		1.73 ac	98	24.40
Pervious	Fair	5.22 ac	84	63.08
CN _{pre} =				87.5

SCS Method for Attenuation Volume:

$$S = \frac{1,000}{CN} - 10$$

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

S_{pre} = 1.43 in.
 Q_{pre} = 6.76 in.
 Pre-development attenuation volume = **3.92 ac-ft**

BASIN 3
PROPOSED POND SIZE ESTIMATE

ATTENUATION CALCULATIONS (CONT.)

Post-development Conditions

Total Area to be attenuated for	6.95 ac
Impervious Areas	
Water	0.75 ac
Pavement (roadways, driveways, concrete, etc.)	5.10 ac
Pervious area	1.10 ac

CN Calculations

Soil Type(s)	Daytona sand
Hydrologic Group	A
SHWT	5.20

		Area	CN	Weighted CN
Impervious Areas				
Water		0.75 ac	100	10.79
Pavement (roadways, driveways, concrete, etc.)		5.10 ac	98	71.98
Pervious Area	Fair	1.10 ac	84	13.24
CN _{post} =				96.0

SCS Method for Attenuation Volume:

$$S = \frac{1,000}{CN} - 10$$

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

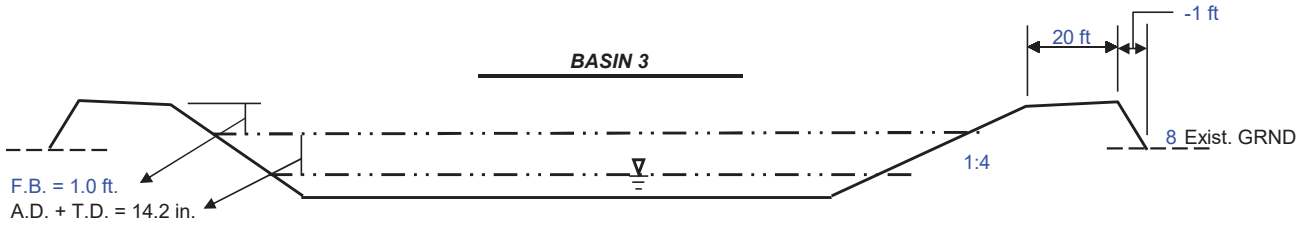
S_{post} = 0.42 in.
 Q_{post} = 7.78 in.
 Post-development attenuation volume = **4.51 ac-ft**

Attenuation volume required (Post-Pre)

0.59 ac-ft

BASIN 3
PROPOSED POND SIZE ESTIMATE

POND SIZE ESTIMATE



Approx. SHWT Elev. =
 5.20

Approx. low edge of pavement elevation (LEOP) = 7.80
 Approx. hydraulic clearance from LEOP = 0.42 ft
 Available depth for A.D. + T.D. = **14.16 in**

HGL Slope 0.001 ft/ft
 LEOP to SMF 420 ft

Square dimension at bottom of T.D.	165.8 ft
Square dimension at top of A.D.	175.2 ft
Treatment & Attenuation Volume provided	0.79 ac-ft
Square dimension at top of freeboard (F.B.)	186.6 ft
Outside pond dimensions (including maint. berm & tie-down)	225.0 ft

<i>Treatment Volume Required</i>
0.20 ac-ft
<i>Attenuation Volume Required</i>
0.59 ac-ft

Minimum Total Presumptive Area Required:

1.16 ac

BASIN 4
PROPOSED POND SIZE ESTIMATE

TREATMENT CALCULATIONS

Wet Detention	
Treat 1 in. of runoff over the additional Impervious	
Area to be treated	3.89 ac
Treatment volume required	0.32 ac-ft

ATTENUATION CALCULATIONS

Will attenuation be necessary?	N
NOAA Atlas 14 Rainfall Data	8.3 in.

Pre-development Conditions

Total Area to be attenuated for	10.46 ac
Impervious Areas	
Water	0.00 ac
Pavement (roadways, driveways, concrete, etc.)	2.33 ac
Pervious Area	8.13 ac

CN Calculations

Soil Type(s)	Oldsmar sand
Hydrologic Group	A/D
SHWT	1.80

		Area	CN	Weighted CN
Impervious Areas				
Water		0.00 ac	100	0.00
Pavement (roadways, driveways, concrete, etc.)		2.33 ac	98	21.81
Pervious	Fair	8.13 ac	84	65.30
			CN _{pre} =	87.1

SCS Method for Attenuation Volume:

$$S = \frac{1,000}{CN} - 10$$

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

S_{pre} = 1.48 in.
 Q_{pre} = 6.72 in.
 Pre-development attenuation volume = **5.85 ac-ft**

BASIN 4
PROPOSED POND SIZE ESTIMATE

ATTENUATION CALCULATIONS (CONT.)

Post-development Conditions

Total Area to be attenuated for	10.46 ac
Impervious Areas	
Water	0.11 ac
Pavement (roadways, driveways, concrete, etc.)	7.88 ac
Pervious area	2.47 ac

CN Calculations

Soil Type(s)	Oldsmarand
Hydrologic Group	A/D
SHWT	1.80

		Area	CN	Weighted CN
Impervious Areas				
Water		0.11 ac	100	1.05
Pavement (roadways, driveways, concrete, etc.)		7.88 ac	98	73.87
Pervious Area	Fair	2.47 ac	84	19.80
CN _{post} =				94.7

SCS Method for Attenuation Volume:

$$S = \frac{1,000}{CN} - 10$$

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

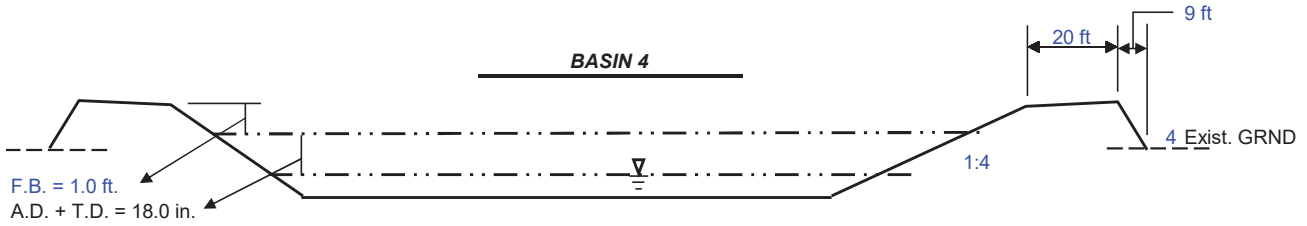
S_{post} = 0.56 in.
 Q_{post} = 7.63 in.
 Post-development attenuation volume = **6.65 ac-ft**

Attenuation volume required (Post-Pre)

0.00 ac-ft -->No Attenuation Required

BASIN 4
PROPOSED POND SIZE ESTIMATE

POND SIZE ESTIMATE



Approx. SHWT Elev. =
 1.80

Approx. low edge of pavement elevation (LEOP) = 6.50
 Approx. hydraulic clearance from LEOP = 1.94 ft
 Available depth for A.D. + T.D. = **18.00 in**

HGL Slope 0.001 ft/ft
 LEOP to SMF 1940 ft

Square dimension at bottom of T.D.	91.0 ft
Square dimension at top of A.D.	103.0 ft
Treatment & Attenuation Volume provided	0.32 ac-ft CHECK
Square dimension at top of freeboard (F.B.)	126.6 ft
Outside pond dimensions (including maint. berm & tie-down)	184.5 ft

Treatment Volume Required	0.32 ac-ft
Attenuation Volume Required	0.00 ac-ft

Minimum Total Presumptive Area Required: **0.78 ac**

Harborview Road from Melbourne Road to I-75
 Charlotte County
 Financial Project ID: 434965-2-32-01

Designed By: CAS
 Date: 2/23/2021
 Checked By: RDU
 Date: 3/1/2021

**BASIN 5 AND 6
 PROPOSED POND SIZE ESTIMATE**

TREATMENT CALCULATIONS

Wet Detention
 Treat 1 in. of runoff over the additional Impervious
 Area to be treated 1.34 ac
 Treatment volume required **0.11 ac-ft**

ATTENUATION CALCULATIONS

Will attenuation be necessary? N
 NOAA Atlas 14 Rainfall Data 8.3 in.

Pre-development Conditions

Total Area to be attenuated for 5.01 ac
 Impervious Areas
 Water 0.00 ac
 Pavement (roadways, driveways, concrete, etc.) 0.87 ac
 Pervious Area 4.14 ac

CN Calculations

Soil Type(s) Immokalee sand
 Hydrologic Group B/D
 SHWT 2.10

		Area	CN	Weighted CN
Impervious Areas				
Water		0.00 ac	100	0.00
Pavement (roadways, driveways, concrete, etc.)		0.87 ac	98	16.94
Pervious	Fair	4.14 ac	84	69.48
CN _{pre} =				86.4

SCS Method for Attenuation Volume:

$$S = \frac{1,000}{CN} - 10$$

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

S_{pre} = 1.57 in.
 Q_{pre} = 6.63 in.
 Pre-development attenuation volume = **2.77 ac-ft**

**BASIN 5 AND 6
 PROPOSED POND SIZE ESTIMATE**

ATTENUATION CALCULATIONS (CONT.)

Post-development Conditions

Total Area to be attenuated for	5.01 ac
Impervious Areas	
Water	0.02 ac
Pavement (roadways, driveways, concrete, etc.)	2.84 ac
Pervious area	2.15 ac

CN Calculations

Soil Type(s)	Immokalee sand
Hydrologic Group	B/D
SHWT	2.10

		Area	CN	Weighted CN
Impervious Areas				
Water		0.02 ac	100	0.40
Pavement (roadways, driveways, concrete, etc.)		2.84 ac	98	55.53
Pervious Area	Fair	2.15 ac	84	36.06
			CN _{post} =	92.0

SCS Method for Attenuation Volume:

$$S = \frac{1,000}{CN} - 10$$

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

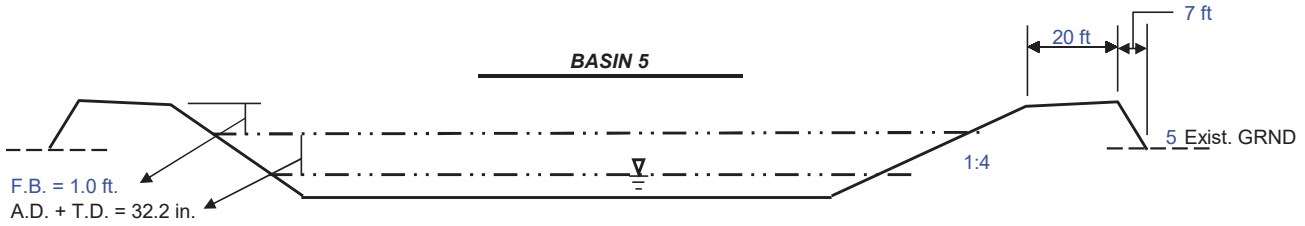
S_{post} = 0.87 in.
 Q_{post} = 7.30 in.
 Post-development attenuation volume = **3.05 ac-ft**

Attenuation volume required (Post-Pre)

0.00 ac-ft --> No Attenuation Required

**BASIN 5 AND 6
 PROPOSED POND SIZE ESTIMATE**

POND SIZE ESTIMATE



Approx. SHWT Elev. =
 2.10

Approx. low edge of pavement elevation (LEOP) = 6.80
 Approx. hydraulic clearance from LEOP = 1.02 ft
 Available depth for A.D. + T.D. = **32.16 in**

HGL Slope 0.001 ft/ft
 LEOP to SMF 1020 ft

Square dimension at bottom of T.D.	31.8 ft
Square dimension at top of A.D.	53.3 ft
Treatment & Attenuation Volume provided	0.11 ac-ft CHECK
Square dimension at top of freeboard (F.B.)	69.4 ft
Outside pond dimensions (including maint. berm & tie-down)	123.8 ft

<i>Treatment Volume Required</i>
0.11 ac-ft
<i>Attenuation Volume Required</i>
0.00 ac-ft

Minimum Total Presumptive Area Required: 0.35 ac



Designed By: MAW
Date: 7/20/2023

**Harborview Road from Melbourne Road to I-75
Pond Construction Costs
Basin 1**

**Unit Prices per FDOT Area 10 Average Unit Cost from 06/01/2022 to 05/31/2023 & Statewide Average Unit Cost 12/01/2022 to 05/31/2023
Area 10 = Charlotte County**

SMF 1A

<i>Pay Item No.</i>	<i>Description</i>	<i>Unit</i>	<i>Quantity</i>	<i>Price</i>	<i>Cost</i>	<i>Source</i>
110-1-1	CLEARING & GRUBBING	AC	0.45	\$31,559.65	\$14,201.84	Statewide
120-1	REGULAR EXCAVATION	CY	363	\$37.21	\$13,507.23	Area 10
120-6	EMBANKMENT	CY	376	\$57.34	\$21,559.84	Area 10
430-175-124	PIPE CULVERT, OPTIONAL MATERIAL, ROUND, 24"S/CD	LF	75	\$161.63	\$12,122.25	Statewide
430-175-130	PIPE CULVERT, OPTIONAL MATERIAL, ROUND, 30"S/CD	LF	600	\$262.79	\$157,674.00	Statewide
440-1-30	UNDERDRAIN, TYPE III	LF	250	\$94.00	\$23,500.00	Statewide
570-1-2	PERFORMANCE TURF, SOD	SY	1337	\$3.30	\$4,412.10	Area 10
	FILTER MEDIA	TN	68.7	\$247.00	\$16,968.90	
	MISC POND COST (10% CONTIGENCY)	LS			\$26,394.62	
				Total	\$290,340.78	



Designed By: MAW
Date: 7/20/2023

Harborview Road from Melbourne Road to I-75
Pond Construction Costs
Basin 1

Unit Prices per FDOT Area 10 Average Unit Cost from 06/01/2022 to 05/31/2023 & Statewide Average Unit Cost 12/01/2022 to 05/31/2023
Area 10 = Charlotte County

SMF 1B

<i>Pay Item No.</i>	<i>Description</i>	<i>Unit</i>	<i>Quantity</i>	<i>Price</i>	<i>Cost</i>	<i>Source</i>
110-1-1	CLEARING & GRUBBING	AC	0.45	\$31,559.65	\$14,201.84	Statewide
120-1	REGULAR EXCAVATION	CY	363	\$37.21	\$13,507.23	Area 10
120-6	EMBANKMENT	CY	376	\$57.34	\$21,559.84	Area 10
430-175-124	PIPE CULVERT, OPTIONAL MATERIAL, ROUND, 24"S/CD	LF	75	\$161.63	\$12,122.25	Statewide
430-175-130	PIPE CULVERT, OPTIONAL MATERIAL, ROUND, 30"S/CD	LF	600	\$262.79	\$157,674.00	Statewide
440-1-30	UNDERDRAIN, TYPE III	LF	250	\$94.00	\$23,500.00	Statewide
570-1-2	PERFORMANCE TURF, SOD	SY	1337	\$3.30	\$4,412.10	Area 10
	FILTER MEDIA	TN	68.7	\$247.00	\$16,968.90	
	MISC POND COST (10% CONTIGENCY)	LS			\$26,394.62	
				Total	\$290,340.78	



Designed By: MAW
 Date: 7/20/2023

**Harborview Road from Melbourne Road to I-75
 Pond Construction Costs
 Basin 1**

**Unit Prices per FDOT Area 10 Average Unit Cost from 06/01/2022 to 05/31/2023 & Statewide Average Unit Cost 12/01/2022 to 05/31/2023
 Area 10 = Charlotte County**

SMF 1C

<i>Pay Item No.</i>	<i>Description</i>	<i>Unit</i>	<i>Quantity</i>	<i>Price</i>	<i>Cost</i>	<i>Source</i>
110-1-1	CLEARING & GRUBBING	AC	0.45	\$31,559.65	\$14,201.84	Statewide
120-1	REGULAR EXCAVATION	CY	363	\$37.21	\$13,507.23	Area 10
120-6	EMBANKMENT	CY	376	\$57.34	\$21,559.84	Area 10
430-175-124	PIPE CULVERT, OPTIONAL MATERIAL, ROUND, 24"S/CD	LF	75	\$161.63	\$12,122.25	Statewide
430-175-130	PIPE CULVERT, OPTIONAL MATERIAL, ROUND, 30"S/CD	LF	600	\$262.79	\$157,674.00	Statewide
440-1-30	UNDERDRAIN, TYPE III	LF	250	\$94.00	\$23,500.00	Statewide
570-1-2	PERFORMANCE TURF, SOD	SY	1337	\$3.30	\$4,412.10	Area 10
	FILTER MEDIA	TN	68.7	\$247.00	\$16,968.90	
	MISC POND COST (10% CONTIGENCY)	LS			\$26,394.62	
				Total	\$290,340.78	



Designed By: MAW
Date: 7/20/2023

Harborview Road from Melbourne Road to I-75
Pond Construction Costs
Basin 2

Unit Prices per FDOT Area 10 Average Unit Cost from 06/01/2022 to 05/31/2023 & Statewide Average Unit Cost 12/01/2022 to 05/31/2023
Area 10 = Charlotte County

SMF 2C

Pay Item No.	Description	Unit	Quantity	Price	Cost	Source
110-1-1	CLEARING & GRUBBING	AC	0.76	\$31,559.65	\$23,985.33	Statewide
120-1	REGULAR EXCAVATION	CY	1085	\$37.21	\$40,372.85	Area 10
120-6	EMBANKMENT	CY	972	\$57.34	\$55,734.48	Area 10
430-175-124	PIPE CULVERT, OPTIONAL MATERIAL, ROUND, 24"S/CD	LF	75	\$161.63	\$12,122.25	Statewide
430-175-130	PIPE CULVERT, OPTIONAL MATERIAL, ROUND, 30"S/CD	LF	75	\$262.79	\$19,709.25	Statewide
440-1-30	UNDERDRAIN, TYPE III	LF	290	\$94.00	\$27,260.00	Statewide
570-1-2	PERFORMANCE TURF, SOD	SY	2672	\$3.30	\$8,817.60	Area 10
	FILTER MEDIA	TN	94	\$247.00	\$23,218.00	
	MISC POND COST (10% CONTIGENCY)	LS			\$21,121.98	
				Total	\$232,341.74	



Designed By: MAW
Date: 7/20/2023

Harborview Road from Melbourne Road to I-75
Pond Construction Costs
Basin 2

Unit Prices per FDOT Area 10 Average Unit Cost from 06/01/2022 to 05/31/2023 & Statewide Average Unit Cost 12/01/2022 to 05/31/2023
Area 10 = Charlotte County

SMF 1-2A

<i>Pay Item No.</i>	<i>Description</i>	<i>Unit</i>	<i>Quantity</i>	<i>Price</i>	<i>Cost</i>	<i>Source</i>
110-1-1	CLEARING & GRUBBING	AC	0.89	\$31,559.65	\$28,088.09	Statewide
120-1	REGULAR EXCAVATION	CY	781	\$37.21	\$29,061.01	Area 10
120-6	EMBANKMENT	CY	1022	\$57.34	\$58,601.48	Area 10
430-175-124	PIPE CULVERT, OPTIONAL MATERIAL, ROUND, 24"S/CD	LF	300	\$161.63	\$48,489.00	Statewide
430-175-130	PIPE CULVERT, OPTIONAL MATERIAL, ROUND, 30"S/CD	LF	75	\$262.79	\$19,709.25	Statewide
440-1-30	UNDERDRAIN, TYPE III	LF	290	\$94.00	\$27,260.00	Statewide
570-1-2	PERFORMANCE TURF, SOD	SY	2814	\$3.30	\$9,286.20	Area 10
	FILTER MEDIA	TN	115.4	\$247.00	\$28,503.80	
	MISC POND COST (10% CONTIGENCY)	LS			\$24,899.88	
				Total	\$273,898.71	



Designed By: MAW
Date: 7/20/2023

Harborview Road from Melbourne Road to I-75
Pond Construction Costs
Basin 1-2

Unit Prices per FDOT Area 10 Average Unit Cost from 06/01/2022 to 05/31/2023 & Statewide Average Unit Cost 12/01/2022 to 05/31/2023
Area 10 = Charlotte County

SMF 1-2B

Pay Item No.	Description	Unit	Quantity	Price	Cost	Source
110-1-1	CLEARING & GRUBBING	AC	1.04	\$31,559.65	\$32,822.04	Statewide
120-1	REGULAR EXCAVATION	CY	781	\$37.21	\$29,061.01	Area 10
120-6	EMBANKMENT	CY	1022	\$57.34	\$58,601.48	Area 10
430-175-124	PIPE CULVERT, OPTIONAL MATERIAL, ROUND, 24"S/CD	LF	75	\$161.63	\$12,122.25	Statewide
430-175-130	PIPE CULVERT, OPTIONAL MATERIAL, ROUND, 30"S/CD	LF	100	\$262.79	\$26,279.00	Statewide
440-1-30	UNDERDRAIN, TYPE III	LF	290	\$94.00	\$27,260.00	Statewide
570-1-2	PERFORMANCE TURF, SOD	SY	2814	\$3.30	\$9,286.20	Area 10
	FILTER MEDIA	TN	115.4	\$247.00	\$28,503.80	
	MISC POND COST (10% CONTIGENCY)	LS			\$22,393.58	
				Total	\$246,329.35	

Pond 2D



Designed By: MAW
Date: 7/20/2023

Harborview Road from Melbourne Road to I-75
Pond Construction Costs
Basin 1-2

Unit Prices per FDOT Area 10 Average Unit Cost from 06/01/2022 to 05/31/2023 & Statewide Average Unit Cost 12/01/2022 to 05/31/2023
Area 10 = Charlotte County

SMF 2D

Pay Item No.	Description	Unit	Quantity	Price	Cost	Source
110-1-1	CLEARING & GRUBBING	AC	1.12	\$31,559.65	\$35,346.81	Statewide
120-1	REGULAR EXCAVATION	CY	781	\$37.21	\$29,061.01	Area 10
120-6	EMBANKMENT	CY	1022	\$57.34	\$58,601.48	Area 10
430-175-124	PIPE CULVERT, OPTIONAL MATERIAL, ROUND, 24"S/CD	LF	75	\$161.63	\$12,122.25	Statewide
430-175-130	PIPE CULVERT, OPTIONAL MATERIAL, ROUND, 30"S/CD	LF	100	\$262.79	\$26,279.00	Statewide
440-1-30	UNDERDRAIN, TYPE III	LF	225	\$94.00	\$21,150.00	Statewide
570-1-2	PERFORMANCE TURF, SOD	SY	2814	\$3.30	\$9,286.20	Area 10
	FILTER MEDIA	TN	110.5	\$247.00	\$27,293.50	
	MISC POND COST (10% CONTIGENCY)	LS			\$21,914.02	
				Total	\$241,054.27	



Designed By: MAW
 Date: 7/20/2023

**Harborview Road from Melbourne Road to I-75
 Pond Construction Costs
 Basin 3**

**Unit Prices per FDOT Area 10 Average Unit Cost from 06/01/2022 to 05/31/2023 & Statewide Average Unit Cost 12/01/2022 to 05/31/2023
 Area 10 = Charlotte County**

SMF 3A

<i>Pay Item No.</i>	<i>Description</i>	<i>Unit</i>	<i>Quantity</i>	<i>Price</i>	<i>Cost</i>	<i>Source</i>
110-1-1	CLEARING & GRUBBING	AC	1.52	\$31,559.65	\$47,970.67	Statewide
120-1	REGULAR EXCAVATION	CY	11684	\$37.21	\$434,761.64	Area 10
120-6	EMBANKMENT	CY	0	\$57.34	\$0.00	Area 10
430-175-124	PIPE CULVERT, OPTIONAL MATERIAL, ROUND, 24"S/CD	LF	75	\$161.63	\$12,122.25	Statewide
430-175-130	PIPE CULVERT, OPTIONAL MATERIAL, ROUND, 30"S/CD	LF	700	\$262.79	\$183,953.00	Statewide
440-1-30	UNDERDRAIN, TYPE III	LF	670	\$94.00	\$62,980.00	Statewide
570-1-2	PERFORMANCE TURF, SOD	SY	2994	\$3.30	\$9,880.20	Area 10
	FILTER MEDIA	TN	100.1	\$247.00	\$24,724.70	
	MISC POND COST (10% CONTIGENCY)	LS			\$77,639.25	
				Total	\$854,031.70	



Designed By: MAW
Date: 7/20/2023

Harborview Road from Melbourne Road to I-75
Pond Construction Costs
Basin 3

Unit Prices per FDOT Area 10 Average Unit Cost from 06/01/2022 to 05/31/2023 & Statewide Average Unit Cost 12/01/2022 to 05/31/2023
Area 10 = Charlotte County

SMF 3B

Pay Item No.	Description	Unit	Quantity	Price	Cost	Source
110-1-1	CLEARING & GRUBBING	AC	1.52	\$31,559.65	\$47,970.67	Statewide
120-1	REGULAR EXCAVATION	CY	11684	\$37.21	\$434,761.64	Area 10
120-6	EMBANKMENT	CY	0	\$57.34	\$0.00	Area 10
430-175-124	PIPE CULVERT, OPTIONAL MATERIAL, ROUND, 24"S/CD	LF	75	\$161.63	\$12,122.25	Statewide
430-175-130	PIPE CULVERT, OPTIONAL MATERIAL, ROUND, 30"S/CD	LF	700	\$262.79	\$183,953.00	Statewide
440-1-30	UNDERDRAIN, TYPE III	LF	670	\$94.00	\$62,980.00	Statewide
570-1-2	PERFORMANCE TURF, SOD	SY	2994	\$3.30	\$9,880.20	Area 10
	FILTER MEDIA	TN	100.1	\$247.00	\$24,724.70	
	MISC POND COST (10% CONTIGENCY)	LS			\$77,639.25	
				Total	\$854,031.70	



Designed By: MAW
Date: 7/20/2023

**Harborview Road from Melbourne Road to I-75
Pond Construction Costs
Basin 3**

**Unit Prices per FDOT Area 10 Average Unit Cost from 06/01/2022 to 05/31/2023 & Statewide Average Unit Cost 12/01/2022 to 05/31/2023
Area 10 = Charlotte County**

SMF 3C

<i>Pay Item No.</i>	<i>Description</i>	<i>Unit</i>	<i>Quantity</i>	<i>Price</i>	<i>Cost</i>	<i>Source</i>
110-1-1	CLEARING & GRUBBING	AC	1.52	\$31,559.65	\$47,970.67	Statewide
120-1	REGULAR EXCAVATION	CY	11684	\$37.21	\$434,761.64	Area 10
120-6	EMBANKMENT	CY	0	\$57.34	\$0.00	Area 10
430-175-124	PIPE CULVERT, OPTIONAL MATERIAL, ROUND, 24"S/CD	LF	100	\$161.63	\$16,163.00	Statewide
430-175-130	PIPE CULVERT, OPTIONAL MATERIAL, ROUND, 30"S/CD	LF	300	\$262.79	\$78,837.00	Statewide
440-1-30	UNDERDRAIN, TYPE III	LF	670	\$94.00	\$62,980.00	Statewide
570-1-2	PERFORMANCE TURF, SOD	SY	2994	\$3.30	\$9,880.20	Area 10
	FILTER MEDIA	TN	100.1	\$247.00	\$24,724.70	
	MISC POND COST (10% CONTIGENCY)	LS			\$67,531.72	
				Total	\$742,848.93	



Designed By: MAW
 Date: 7/20/2023

**Harborview Road from Melbourne Road to I-75
 Pond Construction Costs
 Basin 4**

**Unit Prices per FDOT Area 10 Average Unit Cost from 06/01/2022 to 05/31/2023 & Statewide Average Unit Cost 12/01/2022 to 05/31/2023
 Area 10 = Charlotte County**

SMF 4A

<i>Pay Item No.</i>	<i>Description</i>	<i>Unit</i>	<i>Quantity</i>	<i>Price</i>	<i>Cost</i>	<i>Source</i>
110-1-1	CLEARING & GRUBBING	AC	0.78	\$31,559.65	\$24,616.53	Statewide
120-1	REGULAR EXCAVATION	CY	2188	\$37.21	\$81,415.48	Area 10
120-6	EMBANKMENT	CY	96	\$57.34	\$5,504.64	Area 10
430-175-124	PIPE CULVERT, OPTIONAL MATERIAL, ROUND, 24"S/CD	LF	75	\$161.63	\$12,122.25	Statewide
430-175-130	PIPE CULVERT, OPTIONAL MATERIAL, ROUND, 30"S/CD	LF	75	\$262.79	\$19,709.25	Statewide
440-1-30	UNDERDRAIN, TYPE III	LF	370	\$94.00	\$34,780.00	Statewide
570-1-2	PERFORMANCE TURF, SOD	SY	2861	\$3.30	\$9,441.30	Area 10
	FILTER MEDIA	TN	150.7	\$247.00	\$37,222.90	
	MISC POND COST (10% CONTIGENCY)	LS			\$22,481.23	
				Total	\$247,293.58	



Designed By: MAW
 Date: 7/20/2023

**Harborview Road from Melbourne Road to I-75
 Pond Construction Costs
 Basin 4**

**Unit Prices per FDOT Area 10 Average Unit Cost from 06/01/2022 to 05/31/2023 & Statewide Average Unit Cost 12/01/2022 to 05/31/2023
 Area 10 = Charlotte County**

SMF 4B

<i>Pay Item No.</i>	<i>Description</i>	<i>Unit</i>	<i>Quantity</i>	<i>Price</i>	<i>Cost</i>	<i>Source</i>
110-1-1	CLEARING & GRUBBING	AC	0.78	\$31,559.65	\$24,616.53	Statewide
120-1	REGULAR EXCAVATION	CY	2188	\$37.21	\$81,415.48	Area 10
120-6	EMBANKMENT	CY	96	\$57.34	\$5,504.64	Area 10
430-175-124	PIPE CULVERT, OPTIONAL MATERIAL, ROUND, 24"S/CD	LF	75	\$161.63	\$12,122.25	Statewide
430-175-130	PIPE CULVERT, OPTIONAL MATERIAL, ROUND, 30"S/CD	LF	450	\$262.79	\$118,255.50	Statewide
440-1-30	UNDERDRAIN, TYPE III	LF	370	\$94.00	\$34,780.00	Statewide
570-1-2	PERFORMANCE TURF, SOD	SY	2861	\$3.30	\$9,441.30	Area 10
	FILTER MEDIA	TN	150.7	\$247.00	\$37,222.90	
	MISC POND COST (10% CONTIGENCY)	LS			\$32,335.86	
				Total	\$355,694.46	



Designed By: MAW
Date: 7/20/2023

Harborview Road from Melbourne Road to I-75
Pond Construction Costs
Basin 5-6

Unit Prices per FDOT Area 10 Average Unit Cost from 06/01/2022 to 05/31/2023 & Statewide Average Unit Cost 12/01/2022 to 05/31/2023
Area 10 = Charlotte County

SMF 5-6A

Pay Item No.	Description	Unit	Quantity	Price	Cost	Source
110-1-1	CLEARING & GRUBBING	AC	0.35	\$31,559.65	\$11,045.88	Statewide
120-1	REGULAR EXCAVATION	CY	512	\$37.21	\$19,051.52	Area 10
120-6	EMBANKMENT	CY	208	\$57.34	\$11,926.72	Area 10
430-175-124	PIPE CULVERT, OPTIONAL MATERIAL, ROUND, 24"S/CD	LF	75	\$161.63	\$12,122.25	Statewide
430-175-130	PIPE CULVERT, OPTIONAL MATERIAL, ROUND, 30"S/CD	LF	75	\$262.79	\$19,709.25	Statewide
440-1-30	UNDERDRAIN, TYPE III	LF	130	\$94.00	\$12,220.00	Statewide
570-1-2	PERFORMANCE TURF, SOD	SY	1590	\$3.30	\$5,247.00	Area 10
	FILTER MEDIA	TN	57.6	\$247.00	\$14,227.20	
	MISC POND COST (10% CONTIGENCY)	LS			\$10,554.98	
				Total	\$116,104.80	



Designed By: MAW
Date: 7/20/2023

Harborview Road from Melbourne Road to I-75
Pond Construction Costs
Basin 5-6

Unit Prices per FDOT Area 10 Average Unit Cost from 06/01/2022 to 05/31/2023 & Statewide Average Unit Cost 12/01/2022 to 05/31/2023
Area 10 = Charlotte County

SMF 5-6B

<i>Pay Item No.</i>	<i>Description</i>	<i>Unit</i>	<i>Quantity</i>	<i>Price</i>	<i>Cost</i>	<i>Source</i>
110-1-1	CLEARING & GRUBBING	AC	0.35	\$31,559.65	\$11,045.88	Statewide
120-1	REGULAR EXCAVATION	CY	512	\$37.21	\$19,051.52	Area 10
120-6	EMBANKMENT	CY	208	\$57.34	\$11,926.72	Area 10
430-175-124	PIPE CULVERT, OPTIONAL MATERIAL, ROUND, 24"S/CD	LF	75	\$161.63	\$12,122.25	Statewide
430-175-130	PIPE CULVERT, OPTIONAL MATERIAL, ROUND, 30"S/CD	LF	75	\$262.79	\$19,709.25	Statewide
440-1-30	UNDERDRAIN, TYPE III	LF	130	\$94.00	\$12,220.00	Statewide
570-1-2	PERFORMANCE TURF, SOD	SY	1590	\$3.30	\$5,247.00	Area 10
	FILTER MEDIA	TN	57.6	\$247.00	\$14,227.20	
	MISC POND COST (10% CONTIGENCY)	LS			\$10,554.98	
				Total	\$116,104.80	



Designed By: MAW
Date: 7/20/2023

Harborview Road from Melbourne Road to I-75
Pond Construction Costs
Basin 5-6

Unit Prices per FDOT Area 10 Average Unit Cost from 06/01/2022 to 05/31/2023 & Statewide Average Unit Cost 12/01/2022 to 05/31/2023
Area 10 = Charlotte County

SMF 5-6C

Pay Item No.	Description	Unit	Quantity	Price	Cost	Source
110-1-1	CLEARING & GRUBBING	AC	0.35	\$31,559.65	\$11,045.88	Statewide
120-1	REGULAR EXCAVATION	CY	512	\$37.21	\$19,051.52	Area 10
120-6	EMBANKMENT	CY	208	\$57.34	\$11,926.72	Area 10
430-175-124	PIPE CULVERT, OPTIONAL MATERIAL, ROUND, 24"S/CD	LF	75	\$161.63	\$12,122.25	Statewide
430-175-130	PIPE CULVERT, OPTIONAL MATERIAL, ROUND, 30"S/CD	LF	75	\$262.79	\$19,709.25	Statewide
440-1-30	UNDERDRAIN, TYPE III	LF	130	\$94.00	\$12,220.00	Statewide
570-1-2	PERFORMANCE TURF, SOD	SY	1590	\$3.30	\$5,247.00	Area 10
	FILTER MEDIA	TN	57.6	\$247.00	\$14,227.20	
	MISC POND COST (10% CONTIGENCY)	LS			\$10,554.98	
				Total	\$116,104.80	

EARTHWORK ESTIMATES

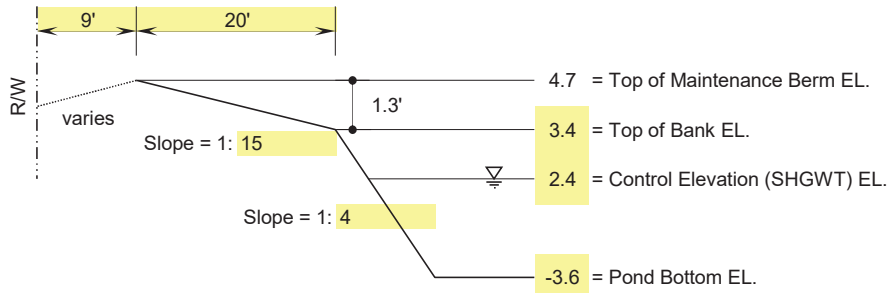
Project: Harborview Road from Melbourne Road to I-75
FPID No.: 43496-52-01
Basin : 1

Designed by: CAS

Date: 11/4/21

Pond 1A, B, and C

Typical Cross Section



A_S (SF) =	12928	= Total Area of Pond Site
A_T (SF) =	8874	= Area at Top of Maintenance Berm
A_{TOB} (SF) =	2938	= Area at Top of Bank
A_C (SF) =	892	= Area at Control Elevation
A_B (SF) =	100	= Area at Bottom of Pond
A_{AVG} (SF) =	1202	= Area at Average Site Elevation

Average Site Elevation = 3.0

EXCAVATION = 9805 CF
 = 363 CY

EMBANKMENT = 10163 CF
 = 376 CY

SOD = 1337 SY

Control Structure: Use DBI Type D Modified

Inflow Pipe: 24" Inflow Pipe (75 LF) to pond w/MES

Outflow Pipe: 30" outflow pipe (600 LF, 75 LF for B and C) from pond w/MES

EARTHWORK ESTIMATES

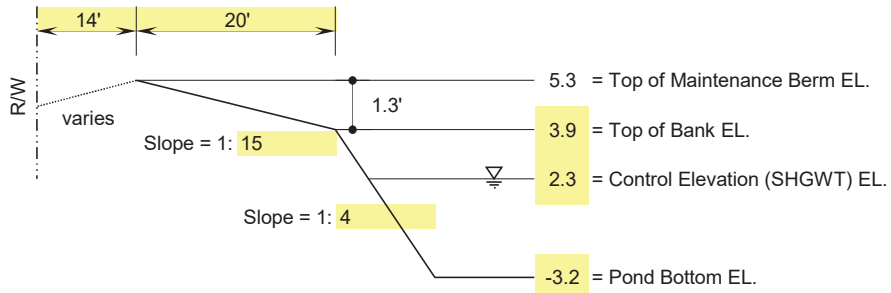
Project: Harborview Road from Melbourne Road to I-75
FPID No.: 43496-52-01
Basin : 2

Designed by: CAS

Date: 11/4/21

Pond 2A, B, and C

Typical Cross Section



A_S (SF) = 28258	= Total Area of Pond Site	Average Site Elevation = 3.0
A_T (SF) = 19404	= Area at Top of Maintenance Berm	
A_{TOB} (SF) = 9860	= Area at Top of Bank	
A_C (SF) = 4207	= Area at Control Elevation	
A_B (SF) = 284	= Area at Bottom of Pond	
A_{AVG} (SF) = 4964	= Area at Average Site Elevation	

EXCAVATION = 29294 CF
 = 1085 CY

EMBANKMENT = 26245 CF
 = 972 CY

SOD = 2672 SY

Control Structure: Use DBI Type D Modified

Inflow Pipe: 24" Inflow Pipe (300 LF A, 75 LF B and C) to pond w/MES

Outflow Pipe: 30" outflow pipe (75 LF A and C, 100 LF B) from pond w/MES

EARTHWORK ESTIMATES

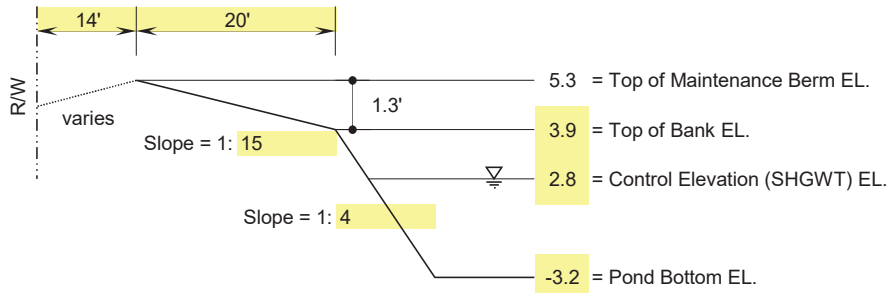
Project: Harborview Road from Melbourne Road to I-75
FPID No.: 43496-52-01
Basin : 1-2

Designed by: CAS

Date: 11/4/21

Pond 1-2A

Typical Cross Section



A_S (SF) =	30380	= Total Area of Pond Site
A_T (SF) =	11130	= Area at Top of Maintenance Berm
A_{TOB} (SF) =	7065	= Area at Top of Bank
A_C (SF) =	5055	= Area at Control Elevation
A_B (SF) =	533	= Area at Bottom of Pond
A_{AVG} (SF) =	5882	= Area at Average Site Elevation

Average Site Elevation = 3.0

EXCAVATION = 21093 CF
 = 781 CY

EMBANKMENT = 27601 CF
 = 1022 CY

SOD = 2814 SY

Control Structure: Use DBI Type D Modified

Inflow Pipe: 24" Inflow Pipe (300 LF) to pond w/MES

Outflow Pipe: 30" outflow pipe (75 LF) from pond w/MES

EARTHWORK ESTIMATES

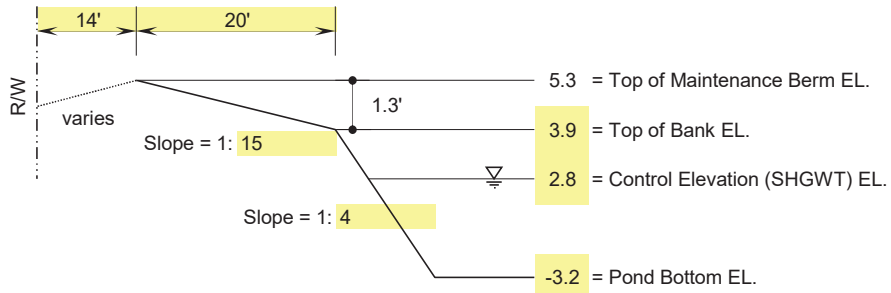
Project: Harborview Road from Melbourne Road to I-75
FPID No.: 43496-52-01
Basin : 1-2

Designed by: CAS

Date: 11/4/21

Pond 1-2A

Typical Cross Section



A_S (SF) =	30380	= Total Area of Pond Site
A_T (SF) =	11130	= Area at Top of Maintenance Berm
A_{TOB} (SF) =	7065	= Area at Top of Bank
A_C (SF) =	5055	= Area at Control Elevation
A_B (SF) =	533	= Area at Bottom of Pond
A_{AVG} (SF) =	5882	= Area at Average Site Elevation

Average Site Elevation = 3.0

EXCAVATION = 21093 CF
 = 781 CY

EMBANKMENT = 27601 CF
 = 1022 CY

SOD = 2814 SY

Control Structure: Use DBI Type D Modified

Inflow Pipe: 24" Inflow Pipe (75 LF) to pond w/MES

Outflow Pipe: 30" outflow pipe (100 LF) from pond w/MES

Pond 2D

EARTHWORK ESTIMATES

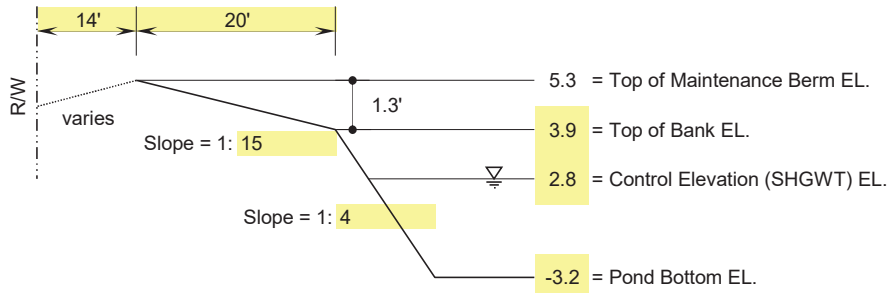
Project: Harborview Road from Melbourne Road to I-75
FPID No.: 43496-52-01
Basin : 1-2

Designed by: MAW

Date: 7/20/23

Pond 2D

Typical Cross Section



A_S (SF) =	30380	= Total Area of Pond Site
A_T (SF) =	11130	= Area at Top of Maintenance Berm
A_{TOB} (SF) =	7065	= Area at Top of Bank
A_C (SF) =	5055	= Area at Control Elevation
A_B (SF) =	533	= Area at Bottom of Pond
A_{AVG} (SF) =	5882	= Area at Average Site Elevation

Average Site Elevation = 3.0

EXCAVATION = 21093 CF
 = 781 CY

EMBANKMENT = 27601 CF
 = 1022 CY

SOD = 2814 SY

Control Structure: Use DBI Type D Modified

Inflow Pipe: 24" Inflow Pipe (75 LF) to pond w/MES

Outflow Pipe: 30" outflow pipe (100 LF) from pond w/MES

EARTHWORK ESTIMATES

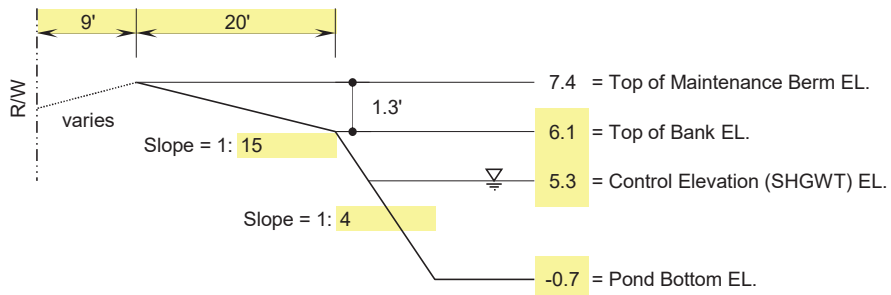
Project: Harborview Road from Melbourne Road to I-75
FPID No.: 43496-52-01
Basin : 3

Designed by: CAS

Date: 11/4/21

Pond 3A, B, and C

Typical Cross Section



A_S (SF) =	66152	= Total Area of Pond Site
A_T (SF) =	47873	= Area at Top of Maintenance Berm
A_{TOB} (SF) =	43031	= Area at Top of Bank
A_C (SF) =	39204	= Area at Control Elevation
A_B (SF) =	22500	= Area at Bottom of Pond
A_{AVG} (SF) =	48576	= Area at Average Site Elevation

Average Site Elevation = 8.0

EXCAVATION = 315455 CF
 = 11684 CY

EMBANKMENT = 0 CF
 = 0 CY

SOD = 2994 SY

Control Structure: Use DBI Type D Modified

Inflow Pipe: 24" Inflow Pipe (75 LF A and B, 100 LF C) to pond w/MES

Outflow Pipe: 30" outflow pipe (700 LF A, and B, 300 FL C) from pond w/MES

EARTHWORK ESTIMATES

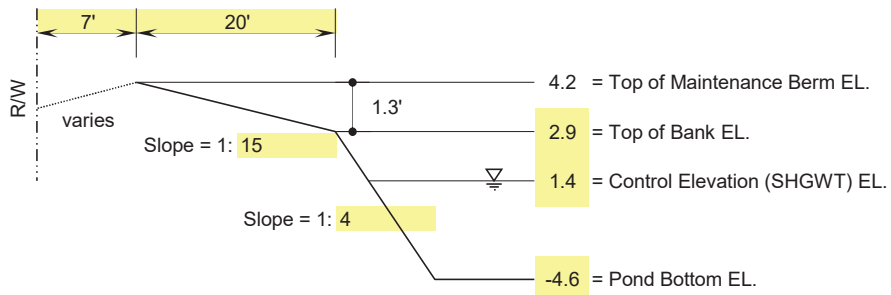
Project: Harborview Road from Melbourne Road to I-75
FPID No.: 43496-52-01
Basin : 4

Designed by: CAS

Date: 11/4/21

Pond 4A and B

Typical Cross Section



A_S (SF) =	34040	= Total Area of Pond Site
A_T (SF) =	16028	= Area at Top of Maintenance Berm
A_{TOB} (SF) =	10615	= Area at Top of Bank
A_C (SF) =	8287	= Area at Control Elevation
A_B (SF) =	1852	= Area at Bottom of Pond
A_{AVG} (SF) =	11801	= Area at Average Site Elevation

Average Site Elevation = 4.0

EXCAVATION = 59080 CF
 = 2188 CY

EMBANKMENT = 2595 CF
 = 96 CY

SOD = 2861 SY

Control Structure: Use DBI Type D Modified

Inflow Pipe: 24" Inflow Pipe (75 LF A and B) to pond w/MES

Outflow Pipe: 30" outflow pipe (75 LF A, 450 LF B) from pond w/MES

EARTHWORK ESTIMATES

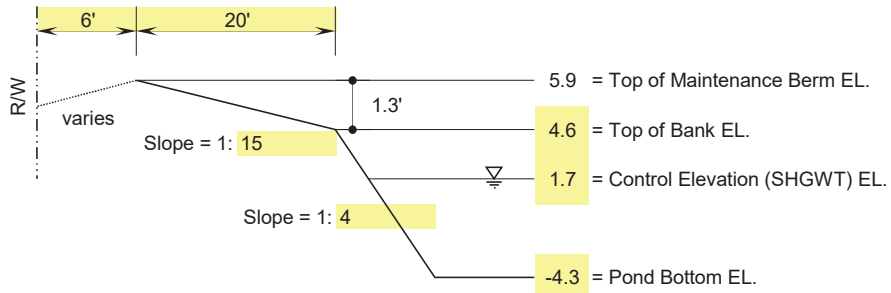
Project: Harborview Road from Melbourne Road to I-75
FPID No.: 43496-52-01
Basin : 5-6

Designed by: CAS

Date: 11/4/21

Pond 5-6A, B, and C

Typical Cross Section



A_S (SF) =	15326	= Total Area of Pond Site
A_T (SF) =	4816	= Area at Top of Maintenance Berm
A_{TOB} (SF) =	2838	= Area at Top of Bank
A_C (SF) =	1013	= Area at Control Elevation
A_B (SF) =	0	= Area at Bottom of Pond
A_{AVG} (SF) =	3029	= Area at Average Site Elevation

Average Site Elevation = 5.0

EXCAVATION = 13833 CF
 = 512 CY

EMBANKMENT = 5616 CF
 = 208 CY

SOD = 1590 SY

Control Structure: Use DBI Type D Modified

Inflow Pipe: 24" Inflow Pipe (75 LF A, B, and C) to pond w/MES

Outflow Pipe: 30" outflow pipe (75 LF A, B, and C) from pond w/MES