



# POND SITING REPORT

Florida Department of Transportation  
District Five

PROJECT DEVELOPMENT AND ENVIRONMENT STUDY  
I-75 (SR 93) at NW 49<sup>th</sup> Street

Marion County, Florida  
Financial Management Number: 435209-1-22-01  
ETDM Number: 14242

JANUARY 2021

*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 December 14, 2016, and executed by the Federal Highway Administration and FDOT.*

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# PROFESSIONAL ENGINEER CERTIFICATE

I hereby certify that I am a registered professional engineer in the State of Florida practicing engineering with Metric Engineering, Inc. and I have reviewed or approved the evaluation, findings, opinions and conclusions as reported for:

PROJECT: **I-75 (SR 93) at NW 49<sup>th</sup> Street PD&E**  
FINANCIAL PROJECT NUMBER: **435209-1-22-01**  
LOCATION: **Marion County**  
CLIENT: **Florida Department of Transportation**

This Drainage Report includes a summary of data collection efforts, calculations, and an overall drainage review prepared for the I-75 at NW 49<sup>th</sup> Street PD&E Study in Marion County.

I acknowledge that the procedures and references used to develop the results contained in this report are standard to the professional practice of transportation engineering and planning as applied through professional judgements and experience.

Florida Registered Engineer:  
Name: Michael A. Holt, P.E.  
Registration Number: FL # 76111



*THIS ITEM HAS BEEN DIGITALLY SIGNED  
AND SEALED BY:*

**Michael A Holt** Digitally signed by Michael A Holt  
Date: 2021.01.18 14:41:09 -05'00'

*ON THE DATE ADJACENT TO THE SEAL*

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# EXECUTIVE SUMMARY

The Florida Department of Transportation (FDOT) in conjunction with Marion County is conducting a Project Development and Environment (PD&E) Study for a new interchange on Interstate 75 (I-75) at NW 49 Street, located west of the City of Ocala in Marion County, Florida.

The goal of the NW 49<sup>th</sup> Street and I-75 Interchange Project Development and Environment (PD&E) study is to develop a proposed improvement strategy that is technically sound, environmentally sensitive and publicly acceptable. As with every PD&E study, emphasis has been placed on the development, evaluation and documentation of detailed engineering and environmental studies including data collection, conceptual design, environmental analyses, project documentation and the preparation of a Pond Siting Report.

After a comprehensive evaluation process, one alternative was selected as being the most effective option. The preferred alternative (shown on **Appendix A, Figure 2**), diverging diamond interchange, consists of a diamond interchange in which the two directions of traffic on the minor road (NW 49<sup>th</sup> Street) crossover, or diverge, to the opposite side between the signalized crossover intersections at the on/off ramps. This eliminates the need for left-turning vehicles to cross the paths of approaching through vehicles, facilitating operational maneuvers and eliminating the potential for side-impact crashes. This allows for a simple two-phase operation at the two signalized intersections within the interchange (no left turns), thus improving efficiency. The preferred alternative also includes the extension of NW 49<sup>th</sup> Street from NW 44<sup>th</sup> Avenue to Marion County's future NW 35<sup>th</sup> Street extension (currently in final design). The proposed typical section for NW 49<sup>th</sup> Street (shown in **Appendix B**) will feature four 12-foot travel lanes with 7-foot bicycle lanes, a 28-foot raised median, and 6-foot sidewalk. The proposed right-of-way for NW 49<sup>th</sup> Street is 122 feet. NW 49<sup>th</sup> Street will curve towards the south east of I-75 to connect to Marion County's future NW 35<sup>th</sup> Street extension (Phase 2B) connection through the Magnum Materials Mine which is funded for construction in 2021 by the County. At the western limit, the proposed NW 49<sup>th</sup> Street will tie in to the existing NW 49<sup>th</sup> Street at the NW 44<sup>th</sup> Avenue intersection. Improvements at the NW 44<sup>th</sup> Avenue intersection include the addition of a northbound right turn lane and a southbound left turn lane for access to the proposed NW 49<sup>th</sup> Street and interchange ramps. Additionally, based on the preliminary profile of NW 49<sup>th</sup> Street, the intersection of NW 44<sup>th</sup> Avenue would need to be reconstructed to raise the profile approximately 2 feet.

This Pond Siting Report presents the results of hydraulic and hydrologic analyses of the project corridor and proposed improvements. Based on offsite topography and permitted mainline conditions, 5 onsite drainage basins were delineated for this project, along with the appropriate offsite basins. The drainage basin boundaries were delineated using 1-foot contour lidar data, available survey data, and information from ERP #19796-1. The hydrological basins are considered closed basins since they flow to localized depressional areas with no discharge into receiving water bodies. There is no history of flooding along the project corridor. See **Figures 7 and 8** for existing and proposed basin boundaries. Stormwater treatment and attenuation is addressed via a mix of dry linear swales and dry stormwater ponds as described in the following sections of this report.

The project corridor is within Sections 26, 27, 34, & 35 of Township 14 South and Range 21 East. The purpose of this Pond Siting Report is to discuss the proposed stormwater management plan for the project. Two alternative approaches were established for all basins not proposed to contain treatment and attenuation within the right-of-way. One stormwater approach per basin has been identified as the preferred alternative. There are proposed pond sites in offsite areas which will R/W acquisition. Alternative pond sites were not evaluated for the northern (Basin G2) and southern (Basin D) basins as they are proposed to be treated within the right-of-way. Local topography prevents conveyance of stormwater runoff back to the interchange from these two basins, and regrading of the roadside swale areas is anticipated to provide the treatment/attenuation needed for these basins. The Datum used in design calculations and construction plans is 1988 NAVD.

## Existing Drainage Conditions

The proposed I-75 and NW 49<sup>th</sup> Street interchange basin area is located primarily within the jurisdiction of the St. Johns River Water Management District (SJRWMD) and hydrologically within the Silver Springs Watershed Area within the Ocklawaha River Basin. I-75 forms the boundary between two designated Basin Management Action Plans (BMAPs), but runoff from the project area flows to localized depressional areas which are landlocked, and there is no surface flow contributions to the springs associated with these BMAPs. The western edge of I-75 is the dividing boundary between SJRWMD to the east and South West Florida Water Management District (SWFWMD) to the west (see **Figure 2**). Roadway runoff from I-75 corridor is currently collected in roadside dry retention swales. Runoff on the east side of I-75 generally drains from south to north towards a low-lying area. Runoff on west side of I-75 generally drains toward NW 44<sup>th</sup> Ave. There are (3) three cross drains functioning as equalizer pipes and/or emergency “pop-offs” between existing dry retention swales. The dry retention swales utilize a series of ditch blocks to collect and treat runoff from I-75. The existing I-75 corridor is permitted with Saint Johns River Water Management District (SJRWMD Permit #19796-1). Data from this permit and the associated as-builts was used to establish the basin areas for this project (see **Figure 7**), and relevant excerpts are included in **Appendices H & D**. There are no FEMA regulated floodways within the limits of the project. Most of the project area is located outside of the floodplain however, there are areas on the east side of I-75 designated as Zone AE (see **Figure 5**). Existing land use is predominantly mining and agricultural/rural with some commercial sites. Commercial sites are located primarily on the west side of I-75 (see **Figure 4**).

Beginning at the southern limits, basins were established as basins D, E, and F. The northern half of the project area (originally permitted as basin G) was divided into G1 and G2, and offsite basins were identified along the western and eastern alignments of the NW 49 Street overpass. These basins are described in more detail in **Section 5.0** of this report.

## Proposed Drainage Conditions

Drainage and stormwater management facilities were estimated for the preferred alternative. In general the northern and southern limits of the existing drainage boundaries along I-75 were maintained in the proposed conditions, while the eastern/western boundaries were adjusted as necessary to include the interchange and NW 49<sup>th</sup> Street. In addition to Basins D, E, F, G1, &

G2 as described above, the eastern alignment of the NW 49<sup>th</sup> Street overpass was designated as Basin 49. These basins are described in **Section 6.0** of this report.

The proposed stormwater management plans include offsite dry retention ponds and roadside dry retention swales with intermittent ditch blocks. Preferred ponds are shown in **Figure 9** and summarized in **Table 1** below. These measures will provide required treatment and attenuation. Additional right-of-way will be required for proposed pond sites. The preferred stormwater management facilities are not expected to have significant environmental, wildlife, floodplain, or cultural resource impacts.

The project will not have adverse impacts to the area’s water quality and quantity. The design of the stormwater management facilities for the project is governed by the rules set forth by the SJRWMD and FDOT. Water quality and water quantities requirement will comply with the guidelines as defined in Chapter 40D-4 of the Florida Administration Code (F.A.C) and the SJRWMD Environmental Resource Permit (ERP) Applicant’s Handbook. Due to the landlocked nature of the basins and floodplains within the area, critical duration analysis should be performed during final design to comply with FDOT Rule Chapter 14-86 F.A.C. For the purposes of this report, the SJRWMD 25 year/24 hour and 25 year/96 hour and the FDOT 100 year/10 day storm have been evaluated. Attenuation was calculated volumetrically based on the differences in pre-post runoff volume for preliminary estimation of pond sizes. The ponds were subsequently designed/modeled to demonstrate appropriate performance characteristics per regulatory requirements using ICPR4. The results are included in **Appendix C**, and summary tables showing the pre-development vs. post-development conditions for the modeled storm events are included with the post-development model results.

**Table-1 Summary of Preferred Stormwater Management Approach**

Basin	Preferred Ponds	Pond Selection Justification
D	Dry Retention Swales	The preferred dry retention swales are located within the proposed FDOT R/W. Additional pond sites are not necessary since the swales will provide sufficient storage for treatment, attenuation and floodplain compensation.
E	Pond E-3	Pond E-3 is preferred and will provide volume sufficient for treatment and attenuation.
F	Pond F-1	Pond F-1 is preferred and will provide volume sufficient for treatment and attenuation.
G1	Pond G1-1	Pond G1-1 is preferred and will provide volume sufficient for treatment and attenuation.
G2	Dry Retention Swales	The preferred dry retention swales are located within the proposed FDOT R/W. Additional pond sites are not necessary since the swales will provide sufficient storage for treatment, attenuation and floodplain compensation.
49	Pond 49-1	Pond 49-1 is preferred and will provide volume sufficient for treatment and attenuation.

## 1.0 INTRODUCTION

The Florida Department of Transportation (FDOT) in conjunction with Marion County is planning to provide a new I-75 interchange at NW 49<sup>th</sup> Street just west of the City of Ocala, Florida. The proposed interchange is needed to support the economic viability of the Ocala 489, a 489-acre industrial and commercial development, which is intended to serve as an economic engine for job creation in the region.

The project is in both the St Johns River Water Management District (SJRWMD) and the Southwest Florida Water Management District (SWFWMD). I-75 acts as the divider between the two Water Management Districts. Please refer to the WMD Boundary Map (**Figure 2**). I-75 is under the jurisdiction of and permitted by SJRWMD and NW 44<sup>th</sup> Ave is permitted by SWFWMD. An inter-agency agreement between the Water Management Districts will be required to designate the responsible agency for this project. The project location and vicinity are shown in **Figure 1**. The proposed typical section is provided in **Appendix B**.

This Pond Siting Report presents the results of hydraulic and hydrologic evaluation of the project corridor and proposed improvements. This report discusses the preferred stormwater management plan for the project, identifies potential pond locations, and discusses the right-of-way requirements associated with preferred pond sites. A description of the proposed pond sites is in Section 8.0 of this report and preferred and alternate pond site exhibits are shown in **Figure 9**.

## 2.0 PROJECT DESCRIPTION

The project is located 4.5 miles northwest of the City of Ocala and 2 miles north of US 27. Please refer to Project Location Map and USGS Map (**Figures 1 and 3**). The proposed interchange on I-75 at NW 49<sup>th</sup> Street will serve the growing community in the area.

After a comprehensive evaluation process, one alternative was selected as being the most effective option. The preferred alternative (shown on **Appendix A, Figure 2**), diverging diamond interchange, consists of a diamond interchange in which the two directions of traffic on the minor road (NW 49<sup>th</sup> Street) crossover, or diverge, to the opposite side between the signalized crossover intersections at the on/off ramps. This eliminates the need for left-turning vehicles to cross the paths of approaching through vehicles, facilitating operational maneuvers and eliminating the potential for side-impact crashes. This allows for a simple two-phase operation at the two signalized intersections within the interchange (no left turns), thus improving efficiency. The preferred alternative also includes the extension of NW 49<sup>th</sup> Street from NW 44<sup>th</sup> Avenue to Marion County's future NW 35<sup>th</sup> Street extension (currently in final design). The proposed typical section for NW 49<sup>th</sup> Street (shown in **Appendix B**) will feature four 12-foot travel lanes with 7-foot bicycle lanes, a 28-foot raised median, and 6-foot sidewalk. The proposed right-of-way for NW 49<sup>th</sup> Street is 122 feet. NW 49<sup>th</sup> Street will curve towards the south east of I-75 to connect to Marion County's future NW 35<sup>th</sup> Street extension (Phase 2B) connection through the Magnum Materials Mine which is funded for construction in 2021 by the County. At the western limit, the proposed NW 49<sup>th</sup> Street will tie in to the existing NW 49<sup>th</sup> Street at the NW 44<sup>th</sup> Avenue intersection. Improvements at the NW 44<sup>th</sup> Avenue intersection include the addition of a northbound right turn lane and a southbound left turn lane for access

to the proposed NW 49<sup>th</sup> Street and interchange ramps. Additionally, based on the preliminary profile of NW 49<sup>th</sup> Street, the intersection of NW 44<sup>th</sup> Avenue would need to be reconstructed to raise the profile approximately 2 feet.

The datum used for this project is in 1988 NAVD. The conversion from 1929 NGVD to 1988 NAVD is (-)0.925. (See **Appendix I**)

### 3.0 DATA COLLECTION

Data was collected and reviewed from the following sources:

- Federal Emergency Management Agency (FEMA) Flood Insurance Rate Maps (FIRMs)
- Natural Resources Conservation Service (NRCS) maps
- United States Geological Survey (USGS) maps
- Site Visits
- Interviews with FDOT Maintenance Staff
- State LiDAR Data
- Marion County Tax Maps
- Marion County LiDAR data
- SJRWMD E-Permit Site
- SWFWMD E-Permit Site
- Topographic Survey
- FDEP Map Direct GIS data

### 4.0 DESIGN CRITERIA

The design criteria for stormwater management facilities for this project are governed by the rules and criteria set forth by the permitting agency and the FDOT. I-75 has dry retention swale systems in this area permitted by St. Johns River Water Management District (SJRWMD) which discharge primarily to the east. As a portion of the interchange footprint will be within SWFWMD, an interagency agreement is expected for a single permit with SJRWMD. For this reason, the criteria from the 2013 SJRWMD Applicant's Handbook and the 2013 SJRWMD Permit Information Manual are considered for the PD&E Study, in conjunction with the 2020 FDOT Drainage Manual.

Per SJRWMD design criteria, discharge from this project will not cause an increase in the total pre-development flood stage. In determining the treatment volume of direct runoff, dry retention system criteria was used for this analysis. All basins within the project area were delineated and evaluated through review of U.S.G.S. Quadrangle Sheets, Aerial Photogrammetry, SJRWMD topographical maps, available topographic survey, existing permit data, existing construction plans and field verification of offsite contributing areas.

#### *Water Quality and Pond Recovery*

- Dry Retention (on-line) systems are expected based on the available geotechnical information. SJRWMD criteria for dry ponds includes:
  1. Treatment Required: Greater of 0.5" over the basin or 1.25" over the impervious area

2. On-line retention of an additional 0.5" of runoff from the drainage area over the larger volume specified above.
3. Recover treatment volume within 72 hours following a storm event assuming average antecedent moisture condition.
4. For closed basins the required runoff storage volumes should recover within 14 days after the storm event.

### *Water Quantity*

The project area drains to offsite floodplains and/or depressional areas which are landlocked. Based on closed basin criteria, dry retention ponds will:

- Attenuate the difference between the pre- and post-development runoff volume for the 100yr-10day, 25yr-24hr and 25yr-96hr storm events.
- Fully recover the stormwater attenuation runoff volume within 14 days through percolation. Ponds that do not draw down within this time via percolation through native soils demonstrate that a subsequent "stacked" design storm event can be contained without increase in discharge as compared to the pre-development basin conditions. Model output and summary tables are included in Appendix C
- As part of the design criteria, systems in the Ocklawaha River Hydrologic Basin must demonstrate:
  - On-site storage and outlet capacity are designed for the 25-year event.
  - If there is discharge into receiving water bodies within the basin, outlet capacity design should be checked and further refined, if necessary, for the 10-year event.
    - Percoordination with the SJRWMD, for outfall into landlocked depressional areas, it is acceptable to show that there is no discharge from the 25-year/96-hour storm event from the receiving depressional areas.

### *Pond Configuration (FDOT Criteria)*

To establish the right-of-way requirements for proposed ponds, the following design features were considered:

- Ponds have been sized to provide 15 to 20 foot of horizontal clearance between the front of the berm and the right-of-way line.
- Maintenance berm shall be at least 15 feet with a slope of 1:8 or flatter.
- Corners of ponds set to provide an acceptable turning radius for maintenance equipment (30-foot minimum inside radius).
- Minimum 1-foot freeboard above maximum design stage below front of maintenance berm.

## **5.0 EXISTING CONDITIONS**

The proposed I-75 and NW 49<sup>th</sup> Street interchange basin area is located primarily within the jurisdiction of the St. Johns River Water Management District (SJRWMD) and hydrologically within the Silver Springs Watershed Area within the Ocklawaha River Basin. I-75 forms the boundary between two designated Basin Management Action Plans (BMAPs), but runoff from

the project area flows to localized depressional areas which are landlocked, and there is no surface flow contribution to the springs associated with these BMAPs. The western edge of I-75 is the dividing boundary between SJRWMD to the east and South West Florida Water Management District (SWFWMD) to the west (see **Figure 2**).

## 5.1 SOILS AND GEOTECHNICAL DATA

The NRCS Soil Survey of Marion County published by United States Department of Agriculture (USDA) has been reviewed for the project. The NRCS USDA Soil Survey map for the project is shown in **Appendix A**. The soil report for this project is also provided in **Appendix J**. The information from the soil survey indicates that the surficial soils consist of fine sandy well-drained soil with very little low permeability loam. In general, the groundwater is expected to be encountered at a depth of 3 to 6 ft below the existing ground. **Table 2** outlines the most commonly occurring soils expected within the project area.

**Table 2 – USDS NRCS Soil Survey Information**

Soil No.	Marion County USDA Soil Name	Hydrologic Soil Group
7	Udalfic Arents, 0 to 5 percent slopes	A
8	Udalfic Arents, 15 to 60 percent slopes	A
9	Arredondo sand, 0 to 5 percent slopes*	A
10	Arredondo sand, 5 to 8 percent slopes	A
17	Blichton sand, 2 to 5 percent slopes	C/D
22	Candler sand, 0 to 5 percent slopes	A
32	Fellowship gravelly loamy sand, gravelly subsoil variant, 5 to 8 percent slopes	D
35	Gainesville loamy sand, 0 to 5 percent slopes*	A
37	Hague sand, 2 to 5 percent slopes*	A
38	Hague sand, 5 to 8 percent slopes	A
43	Kanapaha wet, fine sand, 0 to 5 percent slopes	A/D
44	Kendrick loamy sand, 0 to 5 percent slopes	A
46	Lochloosa fine sand, 0 to 5 percent slopes	A
47	Lochloosa fine sand, 5 to 8 percent slopes	B
50	Micanopy fine sand, 2 to 5 percent slopes	C
57	Borrow pits	N/A
65	Sparr fine sand, 0 to 5 percent slopes	A
69	Tavares sand, 0 to 5 percent slopes	A
75	Wacahoota gravelly sand, gravelly subsoil variant, 5 to 8 percent slopes	B/D
77	Zuber loamy sand, 2 to 5 percent slopes	C
78	Zuber loamy sand, 5 to 8 percent slopes	C
99	Water	N/A

An \* denotes soils expected within the actual area of the interchange ponds.

A report on the findings from preliminary geotechnical exploration was provided in May 2019. Data from this report has been used in modeling the expected performance of the proposed stormwater treatment facilities. The geotechnical data indicated an extreme variability in the soil conditions, and noted the presence of poorly drained clayey/plastic soils throughout much of the project area, with the estimated confining layer at or near the ESHW (i.e. “perched” groundwater conditions). These conditions are reflected in the provided conductivity rates, which show a wide range of values.

## 5.2 LAND USE

The existing land use along the proposed NW 49<sup>th</sup> St is a mixture of pasture, woods, commercial uses, and highway. The western portion of the project consists primarily of commercial development and low to medium density residential, and the eastern portion consists mainly of pasture/cropland, woods and mining area. Please refer to **Figure 4** for a Land Use Map.

## 5.3 DRAINAGE PATTERNS

The elevation within the project boundaries varies from 64 to 130 feet. The east side of project (east of I-75) generally drains from south to north towards a defined depressional area just north east of the proposed interchange. The west side of the project (west of I-75) slopes generally west toward NW 44<sup>th</sup> Ave. Please refer to the Pre-Development Drainage Map and USGS Quadrangle Map (**Figures 7 and 3**). Drainage from I-75 is collected in roadside dry retention swales with intermittent ditch blocks along the project corridor. The I-75 corridor was permitted with SJRWMD under permit #19679-1. Data from this permit was used to establish the sub-basin areas for this project (See **Appendix D & H** for excerpts from the plans and and permit).

Offsite runoff generally drains away from the I-75 corridor into localized depressional areas. On the west side, businesses like Barracuda Boat and RV Storage and MARK III Industries collect runoff and drain it into stormwater ponds. The Barracuda dry pond bottom elevation is 73.0 ft NAVD, refer to **Appendix E**. NW 44<sup>th</sup> Ave is owned by the County and drainage is collected in a closed drainage system and discharged into dry retention Pond # 3 (elevation 71.0 ft NAVD). Please refer to **Appendix G** for permitted plans for NW 44<sup>th</sup> Ave. On the east side offsite flow in the area of the interchange is generally from south to north, into an depressional floodplain area (designated Depressional Area 1 in this report).

The project is located within closed basins and runoff generally drains into low lying areas and percolates into ground with no surficial discharge into named receiving water bodies.

Beginning at the southern limits, basins were established as basins D, E, and F according to the originally permitted conditions. The northern half of the project area (originally basin G) was divided into G1 and G2, and an offsite basin was identified along the western and eastern alignments of the NW 49<sup>th</sup> Street overpass. Please refer to existing condition drainage map (**Figure 7**) and basin descriptions below. Note that the modeling for Basins F, G1, and G2 was performed consistent with the permitted conditions, and the nodes broken down in the original sub-basins as described below. An aerial map depicting these sub-basins has been included

with the post-development ICPR node-link diagram for clarity.

### **Basin D**

Basin D limits are from approximately station 2434+00 to 2455+00. Basin D flows to permitted dry swales along the eastern right-of-way, which stage up and pop off to a localized depressional area via a weir located at approximate station 2446+00.

### **Basin E**

Basin E is comprised of the southbound roadway from station 2455+00 to 2475+00. Basin E flows to permitted dry swales located along the western right-of-way. This basin pops off near station 2475 into an offsite bypass ditch along the north side of the Barracuda Boat and RV Storage property which flows west into an inlet and is conveyed to Marion County Pond 3.

### **Basin F**

Basin F is comprised of the northbound roadway from station 2455+00 to 2482+00. Basin F flows to permitted dry swales located along the eastern right-of-way. The ICPR model for Basin F includes Basins F1, F2, F3, and F4. Basin F-4 pops off via a ditch block to the north into Basin G1, with an emergency pop off provided via CD-2 towards the Basin E outfall.

### **Basin G1**

The originally permitted Basin G was divided into basins G1 and G2. Basin G1 goes from Basins E & F to station 2495+00. Runoff from the northbound lanes and the easternmost southbound lane and shoulder flows to permitted treatment swales along the eastern right-of-way and pops off via a ditch block into Basin G2. The ICPR model for Basin G1 includes Basins G1, G2, and G3. Basin G-3 pops off via a ditch block to the north into Basin G2 (sub-basin G4). The outside southbound lanes and shoulder flow to the west, and are conveyed to the north into Basin G2.

### **Basin G2**

Basin G2 goes from station 2495+00 to 2515+00, and also includes the 2 outside southbound lanes beginning at approximate station 2478+00, which flow into roadside ditches and are conveyed to the north towards the permitted swale systems. Runoff from the southbound roadway flows to permitted treatment swales along the western right-of-way (connected to the eastern swales by CD-3). Runoff from the northbound roadway flows to permitted treatment swales along the eastern right-of-way and pop off into an offsite depressional area east of I-75 (designated as Depressional Area 2 for the purposes of this report). The ICPR model for Basin G2 includes Basins G4 thru G7 (east side) and G9 thru G14 (west side). Basin G-6 pops off into Depressional Area 2 via a permitted weir structure at approximate station 2500+50.

### **Offsite Basins**

Offsite basins to the west of I-75 generally flow towards NW 44<sup>th</sup>, with the roadway flowing into a closed storm sewer system conveyed to the Marion County dry retention pond (Pond 3).

A large offsite area to the east of I-75 flows into a localized depressional area (designated Depressional Area 1) which is identified as a FEMA flood zone.

## 5.4 EXISTING CROSS DRAINS

The proposed NW 49<sup>th</sup> Street is a new alignment, thus there are no existing cross drains or bridge structures for review. However, the I-75 corridor within the proposed interchange has (3) three cross drains functioning as equalizer pipes and/or emergency “pop-offs” between the existing dry retention swales on the east and west side. All 3 cross drains will be extended to accommodate the future interchange on and off ramp alignments. The functionality of these cross drains will be maintained, and the recommended improvements do not adversely impact the overall drainage function of I-75. Refer to **Table 3** for existing I-75 cross drain information. The I-75 Straight Line Diagram is in **Appendix K** and identifies each I-75 cross drain. Since these cross drains are equalizer pipes a cross drain analysis will be conducted during the design. No significant floodplain impacts are anticipated due to cross drain extensions, although CD-3 will have very minor impacts which will be compensated within the roadside swales.

**Table 3 - Existing I-75 Cross Drain General Information**

Cross Drain ID	Station Location	Pipe Description	Date of Plan
I-75 CD-1	2447+00	24" RCP	1992
I-75 CD-2	2475+00	24" RCP	1992
I-75 CD-3	2500+00	24" RCP	1992

## 5.5 FLOODING HISTORY AND MAINTENANCE CONCERNS

During a phone interview with the FDOT maintenance staff at the Ocala Operations Center on 5/2/19, it was indicated that no areas of flooding concern were present along the proposed I-75 and NW 49<sup>th</sup> Street Interchange area. The staff member, Jeff Purdy, mentioned the existing roadside ditch along I-75, ditch blocks and median drainage pipes had no maintenance issues. The only maintenance issues that were brought to our attention was the median guardrails are too close to each other and mowing is difficult with the standard mowing equipment.

## 6.0 PROPOSED CONDITIONS

There are two existing I-75 interchanges within the project vicinity. The I-75/US 27 interchange is located approximately 2 miles south of the proposed interchange, and the I-75/SR 326 interchange, approximately 2 miles to the north. An Interchange Justification Report (IJR) completed in May 2016 concluded that the existing I-75 interchange ramp movements and intersections at US 27 and at SR 326 are expected to operate at failing levels of service. A new I-75 interchange at NW 49<sup>th</sup> Street (approximately midway between the two existing interchanges) is proposed to relieve congestion on the adjacent interchanges. The western limit of this project is NW 44 Avenue (west of I-75) and the eastern limit is the future NW 35 Street extension to the northern end of limerock pit (Magnum Materials Mine), just southeast of the new proposed interchange (Phase 2B). It should be noted that this proposed NW 35 Street extension (Phase 2B) connection will be constructed by the County and is funded for construction in 2021, so it will be completed prior to the interchange being constructed.

In general the northern and southern limits of the existing drainage boundaries along I-75 were maintained in the proposed conditions, while the eastern/western boundaries were adjusted as necessary to include the interchange and NW 49<sup>th</sup> Street. Water quality treatment in the proposed condition will be achieved through the construction of stormwater ponds and expansion/regrading of existing roadside retention swales. Proposed pond bottoms were reviewed with respect to a projected minimum conveyance slope to ensure adequate fall from the adjacent ramps. A summary table is provided with the post-development model results in **Appendix C**. Due to the landlocked nature of the the project area, a summary of pre-dev vs. post-dev discharge volumes to the depressional areas is also provided.

- Runoff from the western portion of the new NW 49<sup>th</sup> Street alignment will be collected in a closed drainage system and conveyed into proposed Pond E-3. Discharge from the portion of Ramp D and the I-75 mainline within Basin E will be collected in closed conveyances systems and will discharge into Pond E-3. Pond E-3 will discharge into Basin G2.
- Runoff from proposed Ramp A will directly discharge into Pond F-1 via mix of open and closed conveyance systems. Pond F-1 will discharge into Pond 49-1.
- Runoff from the portion of Ramp B within Basin G1 will be collected in roadside ditches and discharge to Pond G1-1.
- Runoff from the eastern portion of the new NW 49<sup>th</sup> Street alignment will be collected in roadside ditches and discharge to Pond 49-1.
- Due to significant difference in existing ground elevations, roadway runoff south of Basin E and north of basin G1 could not be conveyed to the proposed ponds in the interchange. Therefore, the northern basin (designated as Basin G2) and southern basin (Basin D) will provide treatment and attenuation in the proposed roadside swales.

Runoff from I-75 is currently being treated in the existing roadside treatment swales with series of ditch blocks. The proposed interchange ramps will impact some of the existing swales and ditch blocks. The impacted swales and ditch blocks will be compensated by regrading the existing swales and creating new swales within the proposed right-of-way. Please refer to proposed condition drainage maps (**Figure 8**). Design details for swale grading, ditch blocks locations and pipe connections between swales and proposed ponds shall be analyzed during the final design. Water quality treatment and attenuation for the intersection can be accomplished in the proposed ponds and roadside dry retention swales. The ponds and dry retention swales with intermittent ditch block can provide more than required treatment and attenuation volume. Additional right-of-way acquisition for stormwater management facilities will be required for this project. During design, drainage easements will need to be further evaluated and are anticipated to be required over areas where water is discharged from DOT right of way, such as Depressional Areas 1 and 2 and any subsequent areas that these depressional areas pop-off to during the design storm events.

## 6.1 METHODOLOGY OF POND DETERMINATIONS

Based on the available information, only hydraulically feasible and environmentally permissible pond sites were considered for the final preferred pond locations. Potential pond sites were analyzed and evaluated using the following parameters:

- Hydrologic and hydraulic factors such as existing ground elevations, proposed roadway profile, soil types, and estimated seasonal high water table (SHWT) from geotechnical exploration, as well as nearby permitted ponds.
- Regulatory volume requirements for treatment and/or attenuation.
- Potential for impacts to:
  - Cultural resources
  - Historical resources
  - Adjoining land uses
  - Existing landscapes and/or aesthetic effects
  - Environmental resources such as wetlands and threatened/endangered species
  - Floodplain
  - Major utilities
- Potential for the presence of hazardous materials and/or contamination
- R/W and construction costs.

All pond locations which have been reviewed have little to no impact on the above listed parameters, with the exception for the potential for the presence of contaminants. The ponds proposed in the eastern portion of the project presents a medium risk of contaminants due to current/past land uses. More information can be found in the Contamination Screening Evaluation Report (CSER) submitted under different cover. Please note that rankings for potential impacts to the above noted parameters related to each stormwater alternative are included in the Pond Alternative Evaluation Matrix (**Page 20**).

## 6.2 PROPOSED DRAINAGE PATTERNS

Due to the natural topography and profile of existing I-75, six drainage basins were delineated. Beginning at the southern limits, basins were established as basins D, E, and F according to the originally permitted conditions. The eastern/western boundaries are adjusted as necessary to include the areas of the proposed ramps and ponds. The northern half of the project area (originally permitted as Basin G) was divided into G1 and G2, and an offsite basin was identified along the western and eastern alignments of the NW 49<sup>th</sup> Street overpass. Offsite drainage generally drains away from the proposed interchange and sheet flows into the depressional area to the east. These existing drainage boundaries will be preserved in the proposed conditions. Due to the landlocked nature of the basins and floodplains within the area, critical duration analysis should be performed during final design to comply with FDOT Rule Chapter 14-86 F.A.C. Note that the modeling for Basins F, G1, and G2 was performed consistent with the permitted conditions, and the nodes broken down in the original sub-basins. An aerial map depicting these sub-basins has been included with the post-development ICPR node-link diagram for clarity. Impacts to existing permitted facilities varies by basin, and the modeling approach is described in more detail below.

## Basin D

Basin D limits remain unchanged. Basin D will continue to flow to permitted dry swales along the eastern right-of-way, and will stage up and pop off to a localized depressional area. These swales will be regraded within the proposed R/W to provide the additional volume required to accommodate the limited treatment/attenuation needs for this basin. See **Appendix A** for a conceptual section for the proposed swales. An equalizer pipe will be required to connect storage volumes on each side of the ramp. Volumetric calculations are provided in **Appendix C**.

## Basin E

Overall, Basin E basin limits remain unchanged. The western boundary has been adjusted to include the southbound entrance ramp (Ramp D) in proposed Basin E, as well as the western alignment of NW 49<sup>th</sup> Ave and the portion of the southbound exit ramp (Ramp C) adjacent to Pond E-3. This basin will be collected and conveyed via a mix of open and closed conveyance to a proposed stormwater pond (Pond E-3) located in the southwest quadrant of the proposed interchange. The pond will outfall via piping into Basin G2. Based on the preliminary PD&E alignment of the ramp, it is expected that the majority of the historical storage provided in the permitted swale systems will be impacted, with insufficient right-of-way to restore these volumes. For this reason, it is proposed that runoff will be collected in closed conveyance system routed to the stormwater pond, and treatment requirements have been based on the pre-permitted conditions. Note that a small portion of this area is currently untreated in existing conditions (designated basin E5), and this area will flow north into Basin G2. These calculations are provided in **Appendix C**, with excerpts from the permit denoting the original volumes required/provided in **Appendix H**.

## Basin F and F-Off

Basin F basin limits remain unchanged. The existing swale systems are not impacted by the PD&E alignment for proposed improvements, and will continue to function as originally designed/permitted to treat and attenuate runoff from mainline I-75. The ICPR model has been set up to model the permitted conditions, including the historical “pop off” into Basin G1. The northbound exit ramp (Ramp A) has been included in proposed Basin F-Off. This basin will be collected and conveyed via a mix of open and closed conveyance to a proposed stormwater pond (Pond F-1) located in the southeast quadrant of the proposed interchange. The pond outfall will be connected to Pond 49-1. As a conservative measure, stormwater treatment calculations include a portion of “untreated impervious” area from the SE end of the project. Once the final alignment/profile has been established during the design phase, an evaluation of the potential for regrading within the existing right-of-way to provide required regulatory volumes should be conducted.

## Basin G1

Overall, Basin G1 basin limits remain unchanged. The eastern boundary has been adjusted to include the portion of the northbound entrance ramp (Ramp B) in proposed Basin G1. The permitted swales within this basin are not impacted, and will continue to provide treatment/attenuation as designed. The ICPR model has been set up to model the permitted conditions, however swale G3 will be reconfigured to pop off to the east into a proposed stormwater pond (Pond G1-1) located in the northeast quadrant of the proposed interchange. The pond will be connected to Depressional Area 1 via a proposed easement. As a conservative

measure, stormwater treatment calculations include a portion of “untreated impervious” area from the northern end of the project. Once the final alignment/profile has been established during the design phase, an evaluation of the potential for regrading within the existing right-of-way to provide required regulatory volumes for this area should be conducted.

## **Basin G2**

Overall, Basin G2 basin limits remain unchanged. The eastern/western boundaries have been adjusted to include the portions of Ramps B and C within proposed Basin G2. This basin will continue to flow to permitted treatment swales along the eastern/western right-of-way and pop off into Depressional Area 2. These swales, as well as the original weir will be impacted by the proposed ramp. These swales will be regraded within the proposed right-of-way to provide the required treatment, attenuation, and floodplain compensation volumes, and the weir reconstructed to maintain historic discharge location. See **Appendix A** for a typical section of the proposed swales. An equalizer pipe will be required to connect the storage volumes on each side of the ramp. Volumetric calculations are provided in **Appendix C**.

## **Basin 49**

Beginning at the crest of the proposed bridge, the eastern alignment of the NW 49<sup>th</sup> Street overpass was identified as Basin 49. This basin bifurcates a large offsite area historically flowing into Depressional Area 1. While runoff from the eastern and northern portions of this basin will continue to flow unimpeded into this low area, runoff from the southwestern portion of this offsite area will be blocked by the proposed interchange. A cross drain (CD-4) is proposed to maintain discharge in accordance with the historical flow patterns. Runoff from the basin will be collected in a mix of open and closed conveyance systems and conveyed to a proposed stormwater pond (Pond 49-1) located in the northeast quadrant of the interchange. The pond outfall will be connected to Depressional Area 1 via a proposed easement.

The ultimate point of discharge from systems associated with Basins F, F-Off, 49, and G1 is Depressional Area 1. Basins E and G2 ultimately discharge to Depressional Area 2. Model output and summary tables are included in **Appendix C** demonstrating that regulatory requirements regarding treatment, attenuation, and recovery have been met.

## **7.0 FLOODPLAIN & WETLAND INFORMATION**

The Federal Emergency Management Agency (FEMA) has developed Flood Insurance Rate Maps (FIRM) for Marion County. There are no FEMA regulated floodways within the limits of the project. A small segment of the project crosses a FEMA designated Zone AE. The floodplain impact due to the interchange construction will be roughly 3.52 acre-ft. The floodplain encroachment into the project area happens mostly at the northbound entrance ramp to I-75 in the adjacent roadside swales and depressional areas.

Floodplain encroachment can be compensated within the proposed right-of-way in regraded swales with wider footprints to provide storage volume for water quality treatment, attenuation and compensation for floodplain impact. Please refer to **Figure 5** for FEMA floodplain and **Figure 9** for the impacted areas. Most of the project is located outside of the 100-yr floodplain boundary. Additional information is available in the Location Hydraulics report submitted under separate cover.

For wetland impact information please refer to the Natural Resources Evaluation Report submitted under separate cover.

## 8.0 STORMWATER MANAGEMENT ALTERNATIVES

The stormwater runoff will be routed to the proposed stormwater ponds and roadside dry retention swales for water quality treatment and attenuation. There are 6 basins delineated for this project in the proposed conditions. Multiple stormwater management approaches were considered for all basins, and 2 alternatives validated for each basin except for Basins D and G-2, where proposed treatment and attenuation will be contained within the FDOT right-of-way.

The proposed dry retention ponds and dry retention swales were located such that offsite runoff will not be intercepted by these treatment facilities, except as noted in the ICPR models/subbasin maps. Parcel sizes were established to provide room where grading may be needed to channel offsite runoff around the proposed pond. Seasonal highwater elevation for design of the treatment facilities was derived from preliminary geotechnical exploration at or near the proposed pond locations. It should be noted that original geotechnical exploration was based on parcel interchange concepts, and a limited number of borings are located within the actual footprints of the revised pond locations. Design level geotechnical analysis should be performed during design phase to obtain accurate seasonal highwater elevations.

Permit data from existing ponds constructed in nearby projects was considered as appropriate. Estimated seasonal high waters from these ponds ranges from 70' to 75'. The nearby mining pit water surface elevation is around 48 ft NAVD and the recently constructed NW 35<sup>th</sup> /NW 49<sup>th</sup> St county road Pond DRA B-6 used seasonal highwater table elevation of 47.5 ft NAVD for the roadway design. For this analysis a minimum of 1 foot above the estimated seasonal highwater table is used to establish the pond bottom. Generally, the water table profile follows the existing ground at the project site, which falls dramatically approaching the depressional areas.

A table with the ESHW elevations and estimated percolation is included below. Preliminary percolation tests performed within the project area yielded a low percolation rate for many of the borings. However, in the absence of pond design data, percolation tests were performed 1 to 3 feet deep. Typically, these tests are performed near the proposed pond bottom elevation, which on average is 6-feet deep. It is recommended that additional geotechnical exploration be performed during the design phase based on the projected pond depths. SJRWMD criteria requires that dry ponds draw down treatment volumes within 72-hours and attenuation volume (25yr-96hr storm) within 14-days. ICPR modeling and summary tables have been included in **Appendix C**. Ponds that do not meet the recovery criteria via percolation through native soils demonstrate that a subsequent "stacked" design storm event can be contained without increase in discharge as compared to the pre-development basin conditions.

**Table 4 – Preliminary Geotechnical Information Information**

Pond	Pond Boring #	Reported ESHW	Average ESHW	Reported Vertical Hydraulic Conductivity	Average Vertical Hydraulic Conductivity
49-1	PBS-9	71.2	72.6	2	2.67
	PBS-10	74.2		2	
	PBS-11	72.4		4	
E-3	PBS-1	73.6	75.35	3	16.00
	PBS-2	80.4		5	
	PBS-23	73.2		---	
	PBS-24	74.2		40	
F-1	PBS-13	69.5	76.2	2	3.00
	PBS-14	82.9		4	
G1-1	PBS-36	61.5	62.6	15	10.00
	PBS-38	63.7		5	

Based on the project location in a groundwater recharge and sensitive karst area, a minimum of 3-feet of unconsolidated soil material is required between the surface of the limestone bedrock and the bottom and sides of the stormwater basin. In addition, the maximum basin depth must be less than 10-feet. During design, measures should be taken to prevent stormwater runoff from percolating directly into karst areas. Where feasible, pre-treatment in swales should be provided during design before discharging into the treatment ponds. Detailed geotechnical analysis should be performed during the design phase to identify any locations of karst concern. If karst formations are identified, consideration may be given to the placement of liners below the treatment facilities to avoid stormwater encroachment into limestone and the use of underdrain to discharge the pond into adjacent depressional areas consistent with existing drainage patterns.

Metric also investigated the possibility of purchasing flood rights for the additional runoff from basins 49, F, and G1 that could not be contained within reconstructed swales. Preliminary modeling and volume calculations based on the available LiDAR indicate that the runoff volumes will stage up and pop off into 2 adjacent depressions to the east and north east, requiring the purchase of flood rights in these areas as well. Further review indicates that if one pond is used, then runoff can be contained within depressional area 1 as in historical conditions. Modeling for the flood rights option is included in Appendix C. It should be noted that although the model includes Pond G1-1 as part of this option, it is anticipated that Pond F-1 or Pond 49-1 could be used with similar results. The current FEMA floodplain elevation is 69.70', which is approximately equal to the expected stage from the 100-year/24-hour storm. ICPR routings for the flood rights option with one pond show the stage rising to 73.97' for the 100-year/10-day storm event, as compared to a pre-development stage of 72.16'. Due to limited geotechnical exploration within the depression, and as a conservative measure with respect to estimated right-of-way requirements, ponds are recommended. If additional survey and geotechnical data are obtained during the final design process, more detailed analysis of a flood rights alternative can be performed if desired.

## Basin D

Basin D lies at the southern end (beginning) of the project. While the general trend of the I-75 mainline profile falls from south to north, there is a localized crest along the northbound exit ramp (Ramp A) that makes it infeasible to convey water from the beginning of the project north to the interchange. However, review of the ramp alignment and profile indicates that there is sufficient space within the proposed right-of-way to regrade the swales to replace impacted volumes and provide the required treatment and attenuation. As this alternative does not require any additional right-of-way, no offsite pond location was identified.

## Basin E/F

Basins E & F were originally considered for combined stormwater management. Ponds E-1 (southwestern quadrant of the interchange) and E-2 (southeastern quadrant of the interchange) were reviewed for suitability. The ponds were determined to be inadequate to contain the runoff from the combined basins and they were subsequently split as described below.

## Basin E

The original Pond E-1 was located in the southwestern quadrant of the interchange, using a Marion County owned parcel. Based on review of the preliminary geotechnical data, this option was eliminated due to the reported soil types and parameters. Pond E-2 was renamed F-1 and is described below.

Ponds E-3 and E-4 were established as the viable Basin E alternatives. Pond E-3 is located in the northwestern quadrant of the interchange using both the Marion County owned parcel and an offsite pasture area. Pond E-4 (southwestern quadrant of the interchange) was expanded to include both the Marion County parcel and the Barracuda Boat Storage parcel. While both ponds are of an appropriate size to provide appropriate stormwater management, Pond E-4 would result in business damages. Thus, Pond E-3 is the preferred alternative for Basin E. Preliminary geotechnical data from borings PBS-1, PBS-2, PBS-22, PBS-23, and PBS-24 indicates an average ESHW of 74.8'. The proposed pond bottom is at 80.5'. This allows for enough room to get water from the low point of the proposed Ramp D, which is at 85.05', to the pond.

## Basin F and F-Off

Stormwater management approaches reviewed for this basin include an offsite pond, treatment and attenuation within the existing permitted swales, and "flood rights" within the parcel containing the historic point of discharge for the area associated with the eastern portion of the interchange as described above.

While flood rights is a viable option as described above, Pond F-1 is preferred, and is located in the southeastern quadrant of the interchange in an offsite pasture area. Basin F flows to swales located in the eastern right-of-way, which will not be affected by the design. Therefore, only Basin F-Off flows to Pond F-1. This pond is of an appropriate size to provide the regulatory volumes for Basin F-Off. Right-of-way will need to be acquired for the construction of this pond. Preliminary geotechnical data from borings PBS-13 and PBS-14 indicates an ESHW of 76.2' in the area of this pond. The proposed pond bottom is at 81.0'. This allows for enough

room to get runoff from the low point of the proposed Ramp A, which is expected to be at or above at 88', to the pond.

## **Basin G1**

Stormwater management approaches reviewed for this basin include an offsite pond, treatment and attenuation within the existing permitted swales, and "flood rights" within the parcel containing the historic point of discharge for the area associated with the eastern portion of the interchange as described above.

While flood rights is a viable option as described above, Pond G1-1 is preferred, and is located in the northeastern quadrant of the interchange in an offsite pasture area. Runoff from Basin G1 flows to swales located in the eastern right-of-way, conveniently located adjacent to Pond G1-1. Right-of-way will need to be acquired for the construction of this pond. Preliminary geotechnical data from borings PBS-36 and PBS-38 indicates an ESHW of 62.6' in the area of this pond. The proposed pond bottom is at 74.6'. This allows for enough room to get water from the lowest point of the proposed Ramp B, which is at 79.35', to the pond. The permitted swales within the existing right-of-way are not impacted by proposed improvements, and can remain in service, with the northern-most swale reconfigured to pop-off to the east instead of northward into Basin G2.

## **Basin 49**

Stormwater management approaches reviewed for this basin include an offsite pond, treatment and attenuation within the existing permitted swales, and "flood rights" within the parcel containing the historic point of discharge for the area associated with the eastern portion of the interchange as described above.

While flood rights is a viable option as described above, Pond 49-1 is preferred, and is located in the parcel north east of the proposed interchange, adjacent to the existing depression area in an offsite pasture area. This pond is of an appropriate size to provide the anticipated volume. Right-of-way will need to be acquired for the construction of this pond. Preliminary geotechnical data from borings PBS-9, PBS-10, and PBS-11 indicates an ESHW of 72.6' in the area of this pond. The proposed pond bottom is at 77.0'. This allows for enough room to get water from the low point of proposed eastern half of the proposed NW 49<sup>th</sup> Avenue, which is at 82.4', to the pond.

## **Basin G2**

Basin G2 lies at the northern segment (end) of the project. Since the general trend of the I-75 mainline profile falls from south to north, it is infeasible to convey water from the end of the project south to the interchange. However, review of the ramp alignment and profile indicates that there is sufficient space within the proposed right-of-way to regrade the swales to replace impacted volumes, as well as to provide the additional treatment and attenuation volume required. While the precise delineation between Basins G1 and G2 can be established in final design, the boundary was established at a logical division of the individual cells of the swale treatment system(s). As this alternative does not require any additional right-of-way, an offsite pond was not identified.

For more information regarding Pond Sizing, including treatment and attenuation requirements and preliminary geotechnical exploration, please refer to analysis provided in **Appendix C**.

## 9.0 ENVIRONMENTAL LOOK AROUND

Marion County was contacted as part of the Environmental Look Around evaluation. The county is currently finalizing the design for NW 35<sup>th</sup>/ NW 49<sup>th</sup> Street Phase 2B project, which is expected to begin construction in FY 2021. The Phase 2B project will go thru the lime rock mine and the project will have a clean break or crest at the north end of the project where the future FDOT project will tie in. As in existing conditions, this will be the basin divide. All runoff south of the crest will be taken into the dry retention pond constructed for the Phase 2A project. Runoff from the FDOT improvements north of the crest will continue to flow northward and will be routed through the proposed FDOT facilities to the historic outfall. Please refer to meeting minutes in **Appendix L**. As part of the evaluation process, the area BMAPs were also investigated, and discussion held regarding the potential to participate in local agency projects as a means of achieving improvements in the levels of nutrient loading in the Silver Springs. Further review indicated that runoff from the project area flows to localized depressional areas with no surficial connection to the Priority Focus Area (PFA) associated with the Silver Springs watershed, and thus is not a contributory area. This was confirmed in a pre-application meeting with SJRWMD. Metric also investigated the possibility of purchasing flood rights as described in Section 8 above. Based on the PD&E analysis, the proposed stormwater management approach for each basin is as described in Section 6 above.

## 10.0 CONCLUSIONS

The Pond Siting Report has been prepared as part of a PD&E Study for the proposed I-75 and NW 49<sup>th</sup> St interchange project. The proposed interchange corridor consists of a new alignment, extending NW 49<sup>th</sup> Street across I-75. The preferred pond sites have been identified to:

- Minimize impacts to residential and commercial properties
- Minimize environmental impacts.
- Minimize floodplain impacts.
- Minimize cultural/sociological impacts

The proposed stormwater management plans include offsite dry retention ponds and roadside dry retention swales with intermittent ditch blocks. These measures will provide required treatment and attenuation volume. Additional right-of-way will be required for proposed pond sites. During design, drainage easements will need to be further evaluated and are anticipated to be required over areas where water is discharged from DOT right of way, such as Depressional Areas 1 and 2 and any subsequent areas that these depressional areas pop-off to during the design storm events. The preferred stormwater management facilities are not expected to have significant environmental, wildlife, floodplain, or cultural resource impacts. See the alternative evaluation matrix (**Table 6**) for specifics for each site.

The preliminary calculations used to support the recommendations are included in **Appendix C**. Please note that the recommendations are based on preliminary data and calculations, using reasonable engineering judgement and assumptions. The pond sizes and locations are subject to change during final design when detailed data becomes available including permeability rate

of soils, estimated seasonal highwater elevations, and final profiles. **Table 5** below shows the summary of recommendations:

**Table 5 - Summary of Stormwater Management Recommendations**

Basin	Preferred Ponds	Pond Selection Justification
D	Dry Retention Swales	The preferred dry retention swales are located within the proposed FDOT R/W. These swales will provide sufficient storage for treatment/attenuation.
E	Pond E-3	Pond E-3 is preferred and will provide volume sufficient for treatment/attenuation.
F	Pond F-1	Pond F-1 is preferred and will provide volume sufficient for treatment/attenuation.
G1	Pond G1-1	Pond G1-1 is preferred and will provide volume sufficient for treatment/attenuation.
G2	Dry Retention Swales	The preferred dry retention swales are located within the proposed FDOT R/W. These swales will provide sufficient storage for treatment, attenuation and floodplain compensation.
49	Pond 49-1	Pond 49-1 is preferred and will provide volume sufficient for treatment/attenuation.

Table-5 Alternative Evaluation Matrix

Basin	Pond Site Alternative	FEMA Flood Zone	Wetland Impacts (acres)	Arch. / Historical Impact Potential	Environmental Impact Risk	Threatened or Endangered Species Impacts	Hazardous Materials & Contamination Potential	Social Impact	Major Utility Conflict Potential (Y/N)	Existing Land Use	Land Use Impacts	Aesthetics Impacts	Future Land Use	LRE Construction Cost	Rankings	Remarks
Basin D	Roadside Swales	None	None	None	Low	Not significant	Low	None	None	Cropland, Woods, Roadway	None	None	Roadway	Not Est.	1	Selected Alternative
	Pond E-3	None	None	Low	Low	Not significant	Low/Medium	None	None	Cropland, Woods, Roadway	Low	Low	Roadway	\$886K	1	Selected Alternative
Basin E	Pond E-4	None	None	Low	Low	Not significant	Low/Medium	None	None	Cropland, Woods, Commercial	High	Low	Roadway	\$886K	2	
	Pond F-1	None	None	Low	Low	Not significant	Low/Medium	None	None	Cropland, Woods	Low	Low	Roadway	\$457K	1	Selected Alternative
Basin F	Flood Rights	None	None	Low	Low	Not significant	Low/Medium	None	None	Cropland, Woods, Commercial	Low	Low	Roadway	N/A	2	
	Pond G1-1	None	None	Low	Low	Not significant	Low/Medium	None	None	Cropland, Woods	Low	Low	Roadway	\$886K	1	Selected Alternative
Basin G1	Flood Rights	None	None	Low	Low	Not significant	Low/Medium	None	None	Cropland, Woods	Low	Low	Roadway	N/A	2	
	Pond G2	Roadside Swales	None	None	Low	Not significant	Low	None	None	Cropland, Woods, Roadway	None	None	Roadway	Not Est.	1	Selected Alternative
Basin G2	Pond 49-1	None	None	Low	Low	Not significant	Low/Medium	None	None	Cropland, Woods	Low	Low	Roadway	\$457K	1	Selected Alternative
	Flood Rights	None	None	Low	Low	Not significant	Low/Medium	None	None	Cropland, Woods	Low	Low	Roadway	N/A	2	