State of Florida
Department of Transportation

Process Guidebook

Prepared for the
Office of Environmental Management

September 16, 2021

Table of Contents

List of Figures

List of Tables

Table of Acronyms

ARC	Florida Acquisition and Restoration Council
AOI	Area of Interest
AWT	Advanced Wastewater Treatment
BAM	Bio-sorption Activated Media
BMAP(s)	Basin Management Action Plan(s)
BMP(s)	Best Management Practice(s)
CEI	Construction Engineering and Inspection (CEI)
CUP	Consumptive Use Permit
DC	District Champion
DDrE(s)	District Drainage Engineer(s) (FDOT)
DE(s)	Drainage Engineer(s)
DRI	Development of Regional Impact
DST	District Stormwater Team
EA	Environmental Assessment
EIS	Environmental Impact Statement
EFH	Essential Fish Habitat
EPA	Environmental Protection Agency
ERP	Environmental Resource Permit
EST	Environmental Screening Tool
ETAT	Environmental Technical Advisory Team
ETDM	Efficient Transportation Decision Making (Process)
FDEP	Florida Department of Environmental Protection
FDOT	Florida Department of Transportation
FEMA	Federal Emergency Management Agency
FIRM(s)	Flood Insurance Rate Map(s)
FWC	Florida Fish and Wildlife Conservation Commission
GIS	Geographic Information System
ICPR	Interconnected Channel and Pond Routing Model
JPA(s)	Joint Project Agreement(s)
L/A	Limited Access
LDCA	Location and Design Concept Acceptance
LOS	Level of Service
MFLs	Minimum Flows and Levels
MOA	Memorandum of Agreement

MOU	Memorandum of Understanding
N	Nitrogen
NEP(s)	National Estuary Program(s)
NEPA	National Environmental Policy Act of 1969
NPDES	National Pollutant Discharge Elimination System
NRE	Natural Resources Evaluation
OEM	Office of Environmental Management
OFW(s)	Outstanding Florida Water(s)
P	Phosphorus
PD&E	Project Development and Environment (Study)
PED	Preliminary Environmental Discussion
PER	Preliminary Engineering Report
PFA	Primary Focus Area
PM	Project Manager
PSR	Pond Siting Report
RAI	Request for Additional Information
ROW	Right-of-Way
RIB(s)	Rapid Infiltration Basin(s)
SHGWT	Seasonal High Groundwater Table
SMARt	Stormwater Management Alternatives Report
SMFs	Stormwater Management Facilities
TMDL(s)	Total Maximum Daily Load(s)
UIC	Underground Injection Control
USACE	United States Army Corps of Engineers
USGS	United States Geological Survey
VMT	Vehicle Miles Travelled
WATERSS	Watershed Approach to Evaluate Regional Stormwater Solutions
WMD(s)	Water Management District(s)

1. Introduction

1.1 Background

The Florida Department of Transportation (FDOT) is required, under Florida Statute 403, to manage stormwater runoff from FDOT properties, roadways, and bridges through various practices and strategies intended to preserve water quality and prevent flooding. FDOT traditionally uses stormwater management strategies including conveyance, exfiltration, infiltration, retention, and detention systems. Though these solutions have been effective in treating runoff from FDOT's highways, non-traditional stormwater management solutions can produce greater environmental benefits to Florida's waters, often at less cost than purchasing right-of-way (ROW) to build stormwater management ponds.

After examining both traditional and innovative approaches to stormwater solutions, FDOT intends to enhance its stormwater management processes to provide the flexibility to include and champion innovative stormwater solutions. With these significant additions to existing Department stormwater solutions and processes, the Department has rebranded this initiative as the Watershed Approach to Evaluate Regional Stormwater Solutions (WATERSS). This process will not only continue to support traditional solutions, where warranted, but through innovation and early coordination, WATERSS will link and integrate stormwater elements through Department of Transportation Development Phases such as Planning, Project Development & Environment (PD&E), and Design, and also enhance strategic partnerships with local, state, and federal water resource agencies, and watershed stakeholders to develop the optimal context solutions. This process supports innovation, encourages collaboration with external partners, and modifies FDOT production processes to pursue stormwater solutions that directly address specific watershed and project needs while balancing social, environmental, and economic objectives.

1.2 Purpose

The purpose of the WATERSS Process Guidebook is to assist practitioners with identifying and screening stormwater management solutions early in the FDOT project development process to realize more effective and cost-prudent stormwater strategies. Specifically, **Chapter 4** provides a step-by-step process for identifying, screening, and evaluating stormwater management solutions through collaboration with various FDOT offices, water resource agencies, and watershed stakeholders. This document also describes conducting degrees of stormwater analysis throughout all phases of FDOT's project development lifecycle. WATERSS enables comparisons of innovative solutions and partnerships with traditional solutions and helps identify the most effective strategy and investment benefits in terms of cost savings or project benefit.

The intended audience of this document is drainage engineers (DEs), PD&E engineers, ETDM Coordinators, and stormwater/environmental practitioners who develop stormwater management solutions for various FDOT transportation projects. This document may be used by FDOT staff and

consulting practitioners supporting innovative stormwater practices. This process is scalable depending on the type, size, complexity, context, and geographic location of the project.

2. Roles & Responsibilities

2.1 Process Participants and Their Roles

Using the WATERSS process to select the stormwater management strategy or strategies and to screen stormwater facility sites requires involvement of multi-disciplined professionals who participate at various points in the overall project development process. Below is a description of individuals and their responsibilities. Unless otherwise stated, the individuals described are internal FDOT employees.

District Champion (DC) – This role is point of contact for coordination and advocacy within and outside FDOT. This person is likely a stormwater, drainage, or environmental expert with permitting and design experience who advocates for watershed solutions and guides the project team through the innovative stormwater process. The District Champion should be an individual(s) who is passionate about problem solving and applying new water quality/quantity solutions to traditional transportation stormwater management. This District Champion could be a representative of FDOT or a consultant as appropriate for the District and region. The District Champion has the critical role of fostering the relationships between FDOT and its partners by maintaining communication throughout the project development process, therefore longevity and the ability to work with people are key components to the District Champion's success. No specific organizational level is targeted.

District characteristics and needs could necessitate having more than one District Champion be assigned within a District. For example, it might be beneficial to have a District Champion for each WMD, for specific counties, or for north or south corridors.

District Stormwater Team (DST) – An advisory team of people comprised of the Project Manager (PM), District Champion, District Drainage Engineer (DDrE), District Permit Coordinator, District PD&E Engineer, NPDES Coordinator, and District Environmental Manager. The PM should contact the DDrE to determine if there is a need for additional members for this team. Typically, the type of project, size, complexity, and project context factor into the makeup of the DST.

The DST is chaired by the PM. The role of the DST is to advise the PM and District Champion on key decisions regarding the project's stormwater strategy through each phase of the project development process, particularly for those steps in which stakeholder input is solicited.

The Project Manager is responsible to evaluate the WATERSS project to determine the appropriate makeup of the DST. The DST should reflect the needs of the District and the specific project. The PM might consult with the DDrE or others, but ultimately, the PM makes the initial decision on whom to invite to become part of the DST. A consultant may take the place of District staff for a particular project.

Drainage Engineer(s) – This individual/team is responsible for reviewing data gathered and providing guidance, quantifying the drainage needs for the project (conceptual and final), and providing support to the PM and DST.

ETDM Coordinator – The person responsible for coordinating the Efficient Transportation Decision Making (ETDM) screening process and analysis. The ETDM Coordinator will coordinate with the PM, DC and Drainage Engineer (DE) to develop the Preliminary Environmental Discussion to support WATERSS. The ETDM Coordinator will likely produce the WATERSS EST GIS Analysis Results summarizing the data produced in the Environmental Screening Tool (EST) and the WATERSS Comment Report summarizing the necessary comments from regulatory and non-regulatory partners for major projects using the Programming Screen.

District Environmental Permits Coordinator – The District Environmental Permits Coordinator will assist with identifying permitting requirements and coordinating with permitting agencies.

Partners – Partners are external stakeholders, regulatory agencies, and non-regulatory agencies with whom FDOT may enter into agreements to construct innovative stormwater solutions and/or achieve environmental lift, to satisfy stormwater management requirements.

Project Manager – The PM assigned to the project which provides overall project management and coordination throughout each phase of FDOT's project development — i.e., Planning, PD&E, Design. The phase PM will work with the WATERSS District Champion to provide continuity between the project phases.

Regulators – External local, state, and federal regulatory agencies [i.e., local water control districts, Florida Department of Environmental Protection (FDEP), Water Management District (WMD), United States Army Corps of Engineers (USACE), etc.] are referred to as the Regulators. These agencies would participate and provide input during the screening process and the stakeholder and regulatory coordination meeting.

Stakeholders – Identified as external stakeholders, this group includes cities, counties, Non-regulatory Environmental Partners (NEPs), private developers, or citizen environmental groups which are potentially impacted or affected by the proposed project that involves an innovative solution. Stakeholders would provide input into defining watershed issues and concerns and may provide feedback or participate in discussions regarding future watershed improvements.

2.2 Communication Protocols

2.2.1 Internal Communication

Once a project is identified in the Planning phase, a determination is made whether to enact the WATERSS process. **Chapter 3** provides a detailed explanation on making this decision. Once WATERSS is enacted, the type, size, and complexity of the project will determine the makeup of the DST.

The PM will lead the DST in close coordination with the District Champion. Internal communication should be coordinated with the PM to advance the WATERSS process as appropriate. The type and complexity of the project will determine the nature and frequency of needed internal communication. Communication can occur through informal means, small group meetings, or scheduled DST Meetings. Communication

between disciplines may be scheduled on a project-by-project basis or, if the same DST members are involved in a number of projects, monthly meetings may be more prudent.

Decision-making meetings of significance should be documented with meetings minutes or internal FDOT memos in the Stormwater Management Alternatives Report (SMARt) as outlined in **SMARt Template**.

2.2.2 External Communication

Early coordination with stakeholders, regulatory agencies, non-regulatory entities, and potential partners is critical to the success of implementing an innovative stormwater strategy. Communication with external stakeholders occurs throughout the WATERSS process and much of this communication may be informal as partnerships become more comfortable. The type and complexity of the project will largely dictate the number of external stakeholders and the nature and frequency of the communication. Communication may occur through informal means, small group meetings, presentations, and during project meeting/workshops. Part 1, Chapter 11 Public Involvement of the FDOT PD&E Manual, should be referenced for guidance on formal external communications as necessary.

Decision-making meetings or meetings of significance should be documented with meeting minutes for inclusion in the SMARt. Documentation of external stakeholder input should be reviewed by those stakeholders for concurrence.

3. Which Projects Should Use WATERSS

3.1 WATERSS Decision Process

The WATERSS process should be applied to projects which would likely benefit from an innovative approach to satisfying current or future project needs for water quality or quantity.

The amount of right-of-way required by traditional stormwater management and treatment facilities for major transportation projects inherently requires significant stormwater management funding; as a result, these projects are prime candidates for the types of innovation and partnerships envisioned through the WATERSS process. Therefore, new alignment and capacity projects should automatically enact the WATERSS process to identify the most cost-effective and environmentally responsible stormwater management opportunities for the project. It may be harder to determine when to enact WATERSS on minor projects such as safety improvements, resurfacing, or other minor infrastructure improvements. Use **Table 1,** the project scope, and confer with the District Champion to help determine when the WATERSS process is appropriate for these minor projects. To simplify the process, if the answer to any of the questions below is "yes", then the WATERSS process should be implemented for the project.

Table 1 Considerations for When to Use the WATERSS Process

Project Characteristics	
1. Will the project require the purchase of right-of-way for stormwater ponds?	✓
2. Will the project need to provide water quality treatment under an ERP permit?	✓
3. Will the project replace significant portions of the existing drainage system?	✓
4. Is the project located within/nearby an impaired waterbody, springshed or high valued resource, especially where a BMAP is in place?	✓
5. Is there an opportunity to earn water quality, floodplain, wetland or mitigation credits as part of this project?	✓
6. Is there motivation and available funding to support innovative stormwater for this project?	✓
7. Are there difficult project constraints, such as limited available right-of-way, that hinder fulfilling stormwater treatment requirements?	✓

Major projects may be anticipated to be classified as Type II Categorical Exclusions, State Environmental Impact Reports, Environmental Assessments (EA), or Environmental Impact Statements (EIS), and will receive the WATERSS geographic information system (GIS) data screening as part of the ETDM Screening Process.

Minor projects such as safety improvements, resurfacing, and other minor improvement projects may receive the WATERSS GIS data screening by using the Area of Interest (AOI) Tool.

3.2 Scoping and Estimating WATERSS

The WATERSS process can involve multiple project strategies with differing levels of staff hours. On some projects, however, if no innovative opportunities are discovered then WATERSS quickly simplifies to traditional pond siting. This variability presents challenges when scoping and estimating projects. Some approaches to accommodate flexibility within consultant contracts are discussed below:

- Additional hours on a "Not to Exceed" contract may afford the needed additional hours but may be difficult to control.
- Contingency activities can add a measure of control, but still not capture the extent of the needed additional effort.
- Planning for a supplemental agreement, to be executed during the contract after initial exploratory WATERSS efforts, has many benefits assuming funding is available when needed.

4. WATERSS Process

4.1 Introduction

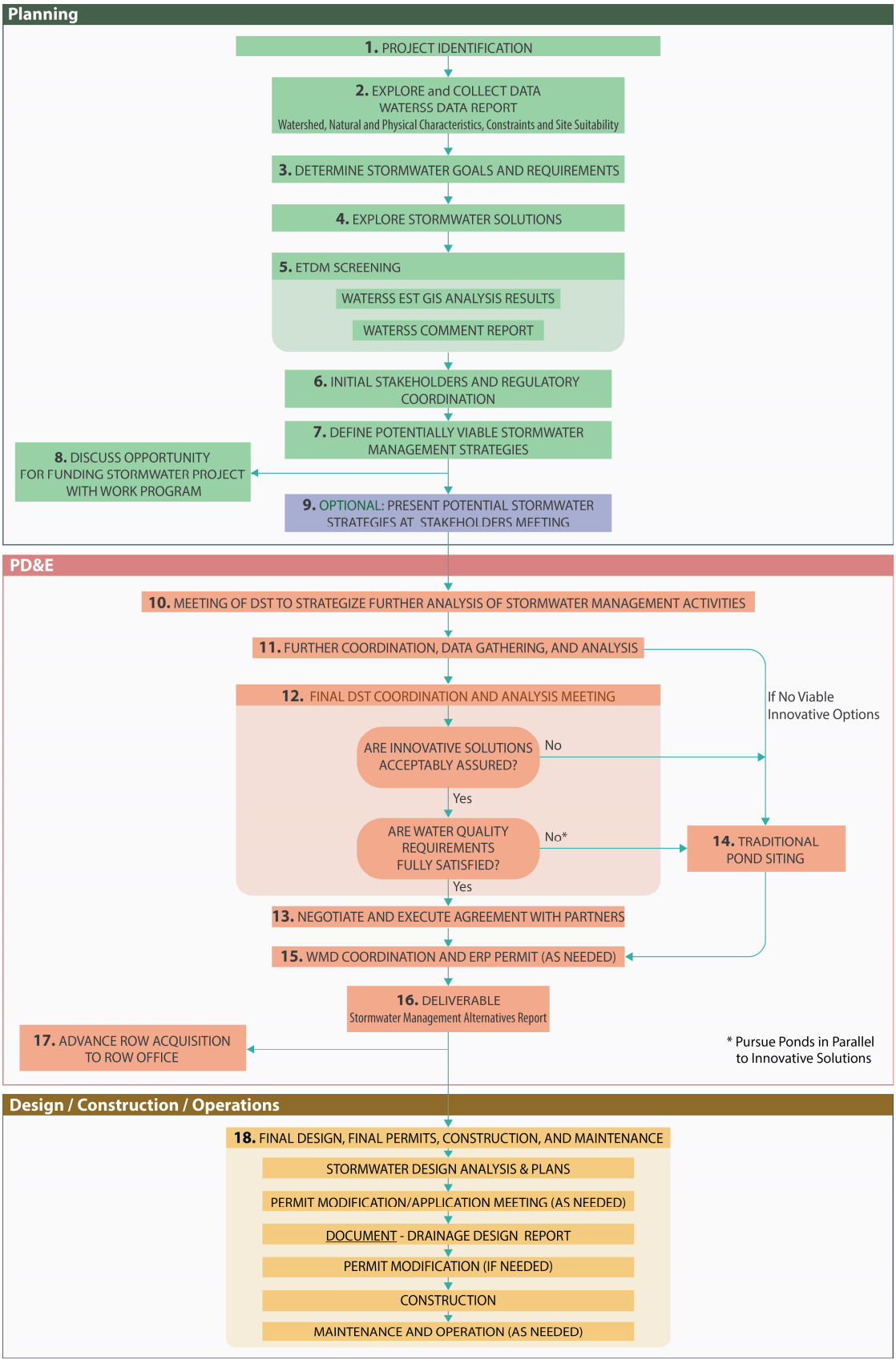
WATERSS involves integrating stormwater management elements throughout all phases of FDOT's projects — i.e., Planning, PD&E, Design, Construction, and Maintenance. This chapter describes in detail the WATERSS process depicted in **Figure 1** on the next page.

This process will guide FDOT staff and consultants as they consider and assess various innovative solutions to address stormwater management goals and requirements for a project.

The process described in this chapter promotes collaboration among various FDOT offices, water resource agencies, and other stakeholders to realize more effective stormwater management practices. Collaboration is achieved by bringing together and involving agencies and stakeholders, beginning in the Planning phase and again during various points in the production process, to explore a range of potential stormwater management solutions. This process is scalable depending on the type, size, complexity, context, and geographic location of the project.

WATERSS enables comparisons of innovative solutions and partnerships with traditional solutions using weighted matrices developed specifically for each project, keeping in mind that regional solutions could benefit multiple transportation projects. Following this process helps identify investment benefits in terms of cost savings and environmental gains when an innovative stormwater management solution is implemented in lieu of traditional ponds.

Figure 1 WATERSS Activities Flowchart



Collaboration is essential for the success of WATERSS. However, collaboration with external entities may involve more time and effort than traditional stormwater pond design, which focuses on isolated activities and design of individual ponds. Therefore, for WATERSS to be successful, the PM for each phase of the project development process should set clear expectations in the project schedule, identify critical deliverables, and involve or consult with the DDrE and DC periodically throughout the process. To help achieve this goal, the WATERSS process discussion in this chapter provides specific direction to the PM written in *italics* at the forefront of every step.

Stormwater management solutions developed through this process will be documented in the project SMARt, which is prepared throughout the Production Phases of the project. With the FDOT's practice of having separate PMs for the Planning Phase, the PD&E Phase, and the Design Phase, the SMARt becomes the essential record of WATERSS activities, agreements, and outcomes. Additionally, the WATERSS DC should ensure the continuity of the process and the handoff of important information between phases.

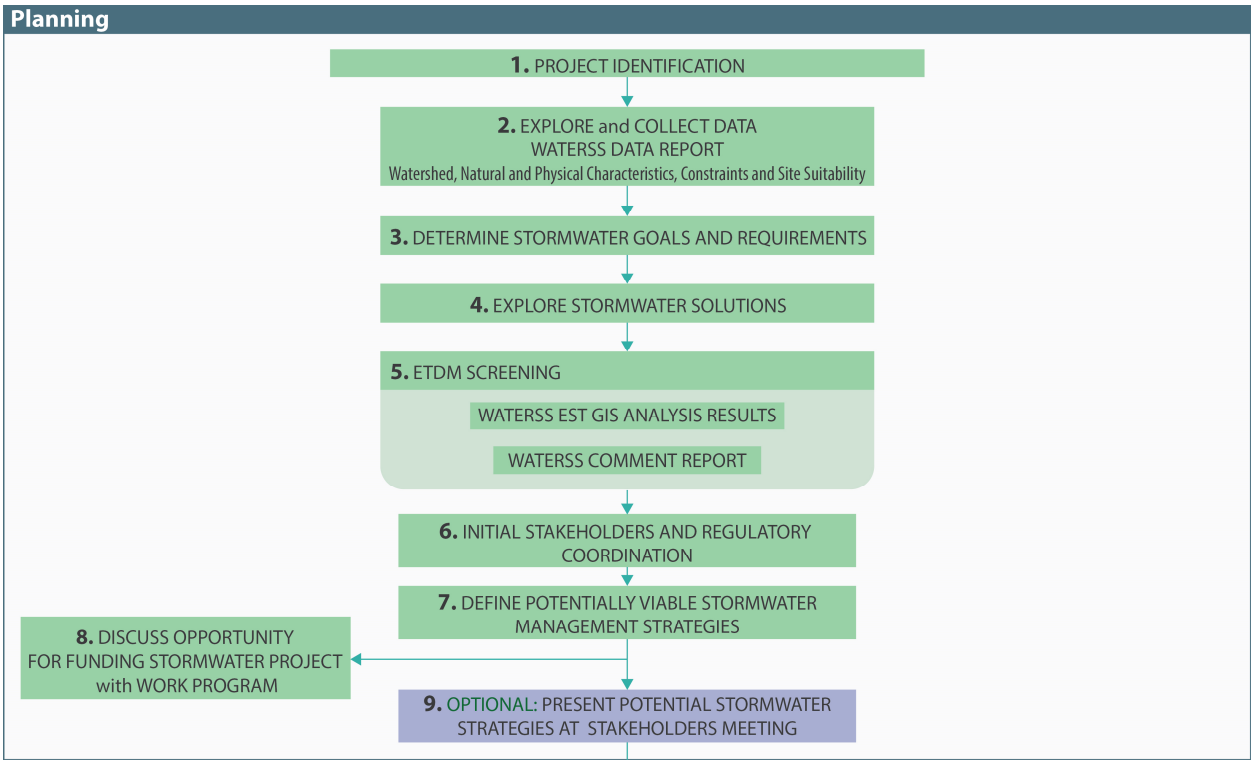
4.2 Planning Phase Activities

Planning Phase activities involve data collection and evaluation to identify potential project stormwater impacts, partners, and stormwater management solutions. These activities result in stormwater information that is needed to complete the water quality and stormwater analysis scope for the PD&E Study. The WATERSS timeline is between 3.5 to 5 years (approximately 1 year, 8- 9 months, for Planning and 2- 3 years in the PD&E phase), which corresponds to the traditional FDOT Planning and PD&E process durations.

If there is no Planning Phase on a project and the ETDM Process is not going to be pursued during the PD&E Phase, the EST may be utilized to access the AOI Tool from which GIS data may be extracted, potential partnerships inferred, and then confirmed manually rather than through the Environmental Technical Advisory Team (ETAT). After the AOI Tool exploration, the process would be similar to Steps 6 through 9 but would occur during PD&E.

The Planning Phase activities shown in **Figure 2** complement the ETDM process which is FDOT's procedure for screening qualified transportation projects to identify potential environment effects in the Planning phase. The WATERSS Analysis, within the ETDM Screening Process, is when FDOT initiates collaboration with regulatory agencies to identify preliminary stormwater management solutions for a project. Collaboration activities within Planning also include stakeholders' coordination meetings to solicit input and discuss the viability of the potential innovative stormwater management solutions and priorities.

Figure 2 WATERSS Planning Phase Activities



Step 1 – Project Identification

PM: Meet with the DC and DE to discuss the project definition, broad scenarios of stormwater needs, and review planning-level project characteristics that impact stormwater management strategies. For screening events that precede an FDOT assignment of the project to either an FDOT PM or a consultant team, the District ETDM coordinator will initiate this discussion with the DDrE and District PD&E Engineer to ensure complete information is provided for WATERSS inclusion in the upcoming screening event.

Before a project is to be screened in the ETDM Planning or Programming screen event, identify the overall project characteristics including project location, environment, and land use context (urban vs. rural project), facility type, alternatives being considered, and project characteristics that influence stormwater management strategies.

Responsible Parties: PM, DC, DE

Outcome: PM, DC, and DE understand potential stormwater needs and the project characteristics that will influence stormwater management strategies.

Approximate Timeline: 2 Weeks

Step 2 – Explore and Collect Data

PM: Collect information on watershed characteristics and other data within the vicinity of the project pertinent to the development of the project's stormwater management solutions. The data collection effort will be supported by two distinct investigations as discussed below. Discuss this information with the DE and DC for verification and analysis.

Stormwater Data Collection using the Environmental Screening Tool

The EST Mapping Tool and AOI Tool has been modified to provide a WATERSS Data Report and WATERSS Data Maps for this purpose. This report and maps reference specific GIS layers which provide water resources data for the DE to utilize. See **Chapter 6 WATERSS Analysis in the EST**, for more details.

1. The information below is likely available from GIS layers within the EST:
    - Available topographic data
    - Existing and future land use maps
    - Tax maps & landowner information (can be provided as part of public involvement research)
    - Soils information
    - Conservation easements
    - Essential Fish Habitat (EFH)
    - Water supply planning regions
    - Identified springsheds (as appropriate)
    - Springs Priority Focus Areas (PFA)
    - Outstanding Florida Waters
    - Designated Wild and Scenic Rivers
    - WMD Minimum Flows and Levels (MFLs) information
    - Aquifer storage and recharge wells
    - Golf courses
    - Total Maximum Daily Loads (TMDLs) with allocations (detailed information is likely available from the District NPDES coordinator)
    - Basin Management Action Plans (BMAPs) (detailed information is likely available from the District NPDES coordinator)
    - 303d listed impaired watersheds (with causative pollutants)
    - Identified public lands
    - Floodplain, Federal Emergency Management Agency (FEMA) Flood Insurance Rate Maps (FIRMs)

- Contamination concerns
- Section 4(f), Section 6(f), and Florida Acquisition and Restoration Council (ARC) protected resources
- Government-owned lands (schools, prisons, WMD lands, etc.)
- Developments of Regional Impact (DRIs) and Sector Plans
- Well protection zone maps
- Coastal management programs
- Designated Sole Source Aquifers; there are two defined in Florida: Volusia-Floridan and Biscayne Aquifers.
- National Wetland Inventory map
- Historic resources
- Canal Maps

Pertinent Historical Records, Permits, and Studies

Information from outside the EST will be found through investigation. The PM should gather, review, and summarize any pertinent information found in the records listed below and other stormwater related information, as may be available:

- Previous planning studies
- Existing areas of recurrent flooding
- Copies of any previous stormwater studies, watershed masterplans or WMD resource reports
- Existing roadway and drainage plan as-builts
- Proposed alternative alignments and conceptual typical sections
- Existing FDOT ROW maps
- Available copies of permits or previous permits for the project site or projects within the vicinity
- Existing agreements [Joint Project Agreements (JPAs), easements, maintenance agreements, etc.]
- Soil types, water table depth, slope and infiltration rates from existing geotechnical data of previous projects
- Available aerial photography (include local data sources)

Responsible Parties: PM, DE, DC, ETDM Coordinator

Outcome: The following documents are prepared for use in **Step 5** – ETDM Screeningand should be included in the SMARt:

1. WATERSS Data Report

2. WATERSS EST GIS Analysis Results, including stormwater management information discovered through research into previous studies and records

Approximate Timeline: 3-4 weeks

Step 3 – Determine Stormwater Goals and Requirements

PM: Obtain concurrence from the DE and DDrE regarding stormwater goals and requirements for the project.

The DE will perform and document a planning level analysis of the stormwater management goals and requirements for the project based on the information summarized in the Explore and Collect Data Step (**Step 2** – Explore and Collect Data). The planning level estimate should be conservative in nature to accommodate future flexibility in design alternatives. Similar alternatives, such as side-by-side alignments may be able to be addressed together, but geographically diverse alternatives may require separate analyses. Having a general knowledge about the scope of the proposed improvements and potential ROW needs at the start of **Step 3** – Determine Stormwater Goals and Requirementsare essential to estimating the stormwater goals and requirements.

1. **Basins without impairment**: Estimate the required treatment and attenuation volumes and/or residence times, volume management and peak flow reduction from the needs, conceptual typical sections, and corridor length. Follow guidance from Chapter 9 of the FDOT Drainage Design Guide.
2. **Open basins**: The post-development discharge rate may not exceed the pre-development rate and, in some areas where formal post-development discharge limitations are imposed by the WMDs, post-development rates are severely restricted.
3. **Nutrient-impaired basins**: Perform a planning level analysis to estimate the annual loading in pounds of additional nitrogen (N) and phosphorus (P) the planned project could generate and the volume of additional runoff. If there is a BMAP developed for the corridor there may already be an allocation defined for FDOT for future or planned projects beyond a “no net increase” condition for water quality.
4. **Project located in a Springs Priority Focus Areas or areas of high recharge:** This could change the focus of the innovative alternatives from P to N and from protection of surface water to protection of groundwater.
5. **Project located in a closed basin, critical water needs area, or within a water control district:** For harvesting identification purposes, estimate the additional annual runoff generated by the proposed alternative.
6. **Minimum Flows and Levels:** If the receiving waters of the project corridor has a minimum flow and level, state how the project might impact the hydrology of the receiving waters.

Responsible Parties: PM, DDrE, DE

Outcome: A planning level stormwater analysis summary of the project's water quality and quantity requirements based on the information summarized in the WATERSS EST GIS Analysis Results. The summary developed in this step should include specific regulatory requirements pertaining to open/closed basins, critical water needs, allowable nutrient loadings, minimum flows and levels, springs and Outstanding Florida Water (OFW) discharges, etc. This will be useful in **Step 5** – ETDM Screening for crafting the Preliminary Environmental Discussion (PED) and should be included in the SMARt.

Approximate Timeline: 2-3 weeks

Step 4 – Explore Stormwater Solutions

PM: This step conducts an initial desktop-level discovery of potential resource improvement solutions that could involve partnerships. This is an early identification of potential areas of cooperation based on **Step 3** – Determine Stormwater Goals and Requirements*, intended to inform the PED. Discuss this information with the DE and DC to verify the information and opportunities identified.*

The potential partnerships and FDOT initiatives are explored by (1) using the AOI Tool, (2) consulting **Table 2** (below) and **Appendix B**, and (3) by querying the District National Pollutant Discharge Elimination System (NPDES) Coordinator regarding ongoing TMDL and BMAP activities. WMD websites and FDEP Map Direct may also provide additional information. Innovative stormwater is, by its very nature, challenging to completely capture in tables and types of Best Management Practices (BMPs). Unique solutions may present themselves depending on individual stakeholders and watershed characteristics.

Table 2 Geographical Areas and Typical BMPs

Typical BMPs	Springsheds	Coastal Bays/Estuaries & Florida Keys	Lakes & Rivers with Nutrient Impairment	MFLs & Water Supply Hardship Areas	Ultra-Urban Areas	Other Areas
Regional treatment ponds	X	X	X			X
Stormwater harvesting	X	X	X	X	X	X
Onsite or offsite BAM retention ponds, or roadway ditches with option to pump in hot groundwater	X	X	X			
BAM up-flow filters					X	
Allowing disposal of advanced wastewater treatment (AWT) effluent or other offsite flows into FDOT systems for infiltration	X	X	X	X		X
Convert septic tanks to public sewer or personal treatment system	X	X	X		X	
Construct new/feed existing BAM Rapid Infiltration Basins (RIBs), BAM retention ponds, BAM spray fields (water quality focus)	X	X				
Groundwater Injection (water quantity focus)	X	X		X	X	
Improving waterbody circulation		X	X		X	
Removal of legacy muck deposits	X	X	X		X	
“Water farming” – capturing harmful freshwater flows		X	X			
Canal restoration and nutrient treatment		X	X		X	
Augmenting freshwater inflows				X		
Tributary nutrient treatment	X	X	X			
Storage of stormwater within downstream golf courses	X	X	X		X	X
Joint-use ponds with adjacent developments	X	X	X		X	X
Extract, treat, and return water to WMD canals	X	X	X			X

Conclude the Explore and Collect Data Step with a narrative in the SMARt describing the existing project stormwater conditions, potential partnerships, and innovative stormwater solutions that may be applied. Submit the narrative to the DDrE for review.

Responsible Parties: PM, DE, DDrE

Outcome: Potential strategies to inform WATERSS Summary and ultimately, the PED. A narrative, in the SMARt, describing potential stormwater management projects, partnerships, and innovative stormwater solutions.

Approximate Timeline: 3 months

Step 5 – ETDM Screening

*PM: Obtain WATERSS EST GIS Analysis Results of existing conditions (from **Step 2*** – Explore and Collect Data*) and the planning level stormwater analysis (from **Step 3*** – Determine Stormwater Goals and Requirements*) from the DE and provide to the ETDM Coordinator to be added in the Water Resources section of the PED. After ETAT and Natural Resources Evaluation (NRE) comment, discuss the WATERSS Comment Report (see discussion below), received from the ETDM Programming Screening event, with the DC and DE.*

PED

The DE uses the results of **Step 2** – Explore and Collect Data and **Step 3** – Determine Stormwater Goals and Requirements to prepare the Water Resources section of the PED that discusses (1) existing conditions, (2) stormwater management goals and requirements for the project, (3) how FDOT plans to address water resources issues when the project advances through the PD&E phase, and (4) initial, potential innovative stormwater solutions available to the project.

The PED is submitted by the ETDM Coordinator, where relevant ETAT members provide comments on water quality and stormwater, resource restoration, water supply, and other issues. See the PD&E Manual, Part 1, Chapter 3, Preliminary Environmental Discussion and Advance Notification and Part 2, Chapter 11, Water Quality and Stormwater.

The WATERSS Comment Report

For major projects, the WATERSS Comment Report is automated in the EST to coalesce:

1. The WATERSS Data Report and WATERSS Data Maps,
2. The WATERSS EST GIS Analysis Results, and
3. ETAT comments pertaining to WATERSS.

Comments from NRE contacts outside of ETDM would also be summarized manually into the WATERSS Comment Report for the pursuit of potential partners.

For minor projects, the WATERSS Comment Report can include the same information but would need to be gathered using the AOI Tool with stakeholders' comments combined manually.

During the ETDM Programming Screen, the ETAT may identify additional cooperative opportunities that can be pursued during the process. ETAT comments may indicate plans and needs for resource remediation, demands for stormwater harvesting, BMAP information and contacts, regional pond opportunities, wastewater disposal needs, and other information that might create cooperative stormwater opportunities with FDOT. **Table 5** in Appendix A highlights a broader list of innovative solutions that may be identified by the ETAT. The ETAT comments may also indicate stormwater specific projects and desired improvements that are planned or underway within the watershed which can impact or benefit the project.

Similarly, NRE comments may be submitted by resource protection groups who have subscribed to be notified when projects fall within their area of interest.

Review the ETAT and NRE comments in the WATERSS Comment Report to determine the watershed issues and opportunities to be discussed with stakeholders. Discuss ETAT and NRE comments with the District Champion. If appropriate, revise, refine, and finalize the stormwater goals and requirements of the project in response to these comments.

Responsible Parties: DE, DC, ETDM Coordinator

Outcome: Water Quality and Stormwater for the PED; WATERSS Comment Report finalized; ETAT and NRE comments with cooperative opportunities or regional stormwater projects for consideration on the project.

Approximate Timeline: 4 months

Step 6 – Initial Stakeholders and Regulatory Coordination

*PM: Coordinate with stakeholders, identified in **Step 5** –* ETDM Screening*, to discuss innovative stormwater solutions and watershed priorities; this coordination may take the form of conversations and/or meetings as prudent. With large projects involving multiple partners or in a particularly environmentally vulnerable region, it may be prudent to hold a larger meeting to provide consistent messaging and enhance regional communication among stakeholders. If a smaller number of potential partners are identified, individual meetings may be more appropriate.*

Introduce the project to stakeholders and discuss cooperative or regional stormwater management opportunities and understand the stakeholders' priorities. During the initial stakeholders' coordination, the DC will present the stormwater goals and initial opportunities being considered based on the District's

understanding of water resources issues in the project area and the results of the WATERSS Comment Report. The project information listed below should be discussed with stakeholders, as appropriate:

1. Project overview,
2. Critical environmental concerns or known watershed needs and information,
3. Project baseline schedule including critical milestones,
4. Stormwater goals and requirements,
5. ETAT comments and stormwater management opportunities,
6. Potential innovative stormwater solutions that may be considered by FDOT on the project, and
7. Preliminary Stormwater Costs (often based on the preliminary expected cost of traditional ponds) and Project Funding.

Contacts with stakeholders provide a forum for the project stakeholders to discuss the stormwater goals and requirements previously identified and to brainstorm the viability of mutually beneficial innovative stormwater solutions with respect to meeting stormwater management goals and requirements, benefits, costs, priorities, and risks. Additionally, these discussions may discover collaborative opportunities that were not previously identified during the ETDM Programming Screen event. The DC will continue to engage with individual stakeholders should this meeting result in additional follow up discussions regarding potential opportunities with individual stakeholders.

The PM should document meeting notes and resolutions reached from these discussions, email them to all participants, and include them in the SMARt.

Responsible Parties: PM, DC, DST, stakeholders

Outcome: List of potential partnership stormwater management solutions and innovative solutions to be further analyzed. Document the stakeholders and meeting notes generated from initial stakeholder coordination in the SMARt. This could be in the form of smaller meeting discussion notes or the documentation generated from larger group meetings (i.e., sign-in sheet, agenda, figures, comments, meeting minutes, etc.).

Document follow-up decisions and resolutions, as this is intended to be an on-going process.

Approximate Timeframe: 3 months

Step 7 – Determine Potentially Viable Stormwater Management Strategies

PM: The focus of this step is to (1) screen out intuitively non-viable stormwater management solutions, (2) develop a draft Innovative Solutions Evaluation Matrix template, to be completed in ***Step 10*** – Meeting of DST to Strategize Further Analysis of Stormwater Management Activities*, and (3) initially communicate remaining viable opportunities identified in* ***Step 6*** – Initial Stakeholders and Regulatory Coordination*.*

Though the DC and DE are targeted to support this activity, the PM should include any of the DST as needed.

Prepare a list of potential strategies and the draft Innovative Solutions Evaluation Matrix template, to be completed for each viable strategy in **Step 10** – Meeting of DST to Strategize Further Analysis of Stormwater Management Activities. Consult with the DC and DE to eliminate unviable solutions and document reasons and rationale behind eliminating unviable solutions. Summarize the remaining viable strategies in writing to the DST and solicit their feedback.

Step 7 – Determine Potentially Viable Stormwater Management Strategies (this step) does not overtly compare solutions, but only eliminates solutions that are flawed or otherwise do not meet the stormwater management goals and requirements. Transportation projects may include one or more innovative strategies in combination with traditional stormwater ponds depending on the drainage basin(s) in the project segment, discussed in more detail in **Step 10** – Meeting of DST to Strategize Further Analysis of Stormwater Management Activities.

Innovative Solutions Evaluation Matrix

The PM, DE, and DC develop the Innovative Solutions Evaluation Matrix template for the comparison of solutions using the information obtained from the previous Planning Phase activities (Steps 1 through 6). A description of the factors and the scoring method should be included with the matrix to justify the factors and scoring chosen. If it is determined that one or more factors has significant bearing on the project, then weighting of the factors can be used with additional documentation on the weights assigned.

The evaluation factors may include stormwater goals and requirements, cost, challenges in permitting, reliability of partners, maintainability, constructability, schedule, environmental considerations, and other factors (see

Table 3, below). This criteria for selection of viable solutions will be used for detailed evaluation of alternative solutions during **Step 10** – Meeting of DST to Strategize Further Analysis of Stormwater Management Activities. This initial screening includes both partnership and non-partnership innovative solutions.

The matrix should be reviewed and agreed upon by the DST. The DE should address all comments received from the DST and revise the matrix as necessary.

For innovative stormwater solutions initially deemed viable, meet with the WMD and other regulatory agencies with potential jurisdiction to explore the ability to obtain permits. Appropriate members of the DST should participate in the meeting with regulatory agencies. Enquire about any atypical permit submittal requirements, extended permit review time, and special permit conditions for each solution. If there are unexpected questions from regulatory agencies, the district may wish to involve Central Office Drainage and Office of Environmental Management staff in discussions with the agencies.

For regional ponds, whether or not they are hydraulically connected to the upstream roadway project, local water quality and quantity should still be addressed in the project vicinity so as to not impact local properties, even if the innovative solution is regional in nature. Investigate the permitability of minor increases in pollutant loading and water flow rate to existing outfalls along the project; if the WMD requires the Department to address local increases, explore whether WMD concerns may be alleviated by obtaining an easement over the conveyance between the roadway and the regional pond.

Table 3 Factors for Screening of Solutions

Factor	Description/Issues to Consider
Project Needs for Water Quality	Will the solution provide all the water quality credits needed for the project?
Schedule Compatibility	Identify if negotiation and implementation of the solution to obtain water quality credits can be completed within the current project production schedule.
Cost/Benefit	The cost of solution vs. the benefit to FDOT, i.e., reduction in maintenance costs, ROW costs, construction costs, mitigation costs, etc.
Partner Reliability	Identify if the partner of a solution can be relied upon to work with FDOT for the duration of the solution.
Ease of Permitting	Identify if there have been preliminary discussions with the regulatory agencies, and document the feedback received. Is this solution permittable or will extensive negotiations be needed?
Water Quantity/Floodplain Benefit	Identify if the solution will provide water quantity or floodplain benefits and if so, quantify the benefits to be realized from the project.
Public Perception/Acceptance	Identify if the solution will be generally accepted by the public. Will extensive public involvement be required?
Threatened and Endangered Species and Associated Costs	Identify if there are threatened or endangered species which may be directly or indirectly impacted or benefited by the solution. Identify any costs associated with avoiding or mitigating these impacts. Identify any benefits to the species.
EFH Credits	Identify if any EFH credits may be realized by the implementation of the solution and the associated benefit(s) that would be provided to FDOT. Identify if the EFH credits would satisfy mitigation requirements for the project and if there would be additional credits for future projects.
Wetland Credits	Identify if any wetland credits may be realized by the implementation of the solution and the associated benefit(s) that would be provided to FDOT. Identify if the anticipated wetland credits would potentially satisfy mitigation requirements for the project and if there would be additional credits for future projects. Identify any additional justification that would be required by the agencies.
Seagrass Credits	Identify if any seagrass credits may be realized by the implementation of the solution and the associated benefit(s) that would be provided to FDOT. Identify if the seagrass credits would satisfy mitigation requirements for the project and if there would be additional credits for future projects.

Factor	Description/Issues to Consider
Section 4(f) Involvement	Identify the presence of potential Section 4(f) properties which may have a use under the definition of Section 4(f).
Conservation Lands	Identify the presence of any conservation lands which may affect the suitability of a solution.
Cultural Resources Involvement	Identify the potential presence of cultural resources including archaeological and historical resources which could affect the suitability of a solution.
Public Wellfield Issues	Identify the proximity to any public wellfield locations and protection zones and if the solution could potentially have a direct impact.
Contamination – Hazardous Materials	Identify if the area to be utilized for the solution is contaminated. Consider the costs associated with the clean-up of the area, and if the contamination will limit the area available for stormwater facilities.
Construction	Identify any construction related impacts of the solution and associated costs, such as additional drainage piping to transport stormwater and access for construction.
Maintenance	Identify the costs and frequencies of maintenance needed to maintain the solution.
Aesthetics	Identify if there are any associated costs or benefits for aesthetics of the solution, such as the cost to install and maintain plantings.
Priority of Regulatory Agencies	Identify if this solution is a priority of the regulatory agencies.
Multiple Benefits/Future Credits/Future Capacity for Other Projects	Identify if the solution will potentially provide for multiple types of credits such as water quality and seagrass. Identify if the project will potentially have credits available for future projects.

Discussion Topics with Partnership Solutions

For each innovative solution that is a candidate for future evaluation and has potential partners identified, discussions should be initiated so that all parties understand partnership expectations and know FDOT's participation boundaries in preparation for negotiations. Information to prepare includes the following:

1. Funding from FDOT,
2. FDOT and partner schedule requirements,
3. Partners' support in permitting,
4. Partners' support in public involvement,

5. Stability of partners' commitments, and
6. Other expected components of negotiations.
7. Division of responsibility for operation and/or maintenance.

The DC will closely support the PM during discussions with potential partners. The Office of General Counsel should be prudently included in negotiations with potential partners to discuss the expected legal documents needed to finalize partnership agreements.

If the partnership requires consultant expertise outside of FDOT (e.g., wastewater treatment plant design), develop a scope the services of a specialty consultant to advise FDOT during discussions and negotiations with partners.

The DST will prepare a work plan for each partnership strategy that is recommended for a detailed evaluation. The DC will use this work plan to facilitate dialogue with the respective stakeholders and secure commitments for all participant's share of the stormwater management solution.

If no viable innovative solutions emerge in the initial screening, the PD&E could be scoped to investigate future additional innovative solutions that are discovered and traditional ponds.

Responsible Parties: PM, DC, DE, DST

Outcome: A list of viable solutions are identified for a further detailed evaluation intended to be further evaluated in **Step 10** – Meeting of DST to Strategize Further Analysis of Stormwater Management Activities and to be presented at optional follow up stakeholder meetings. Document this interim list of strategies in a memorandum to the DST for inclusion in the SMARt and, if needed, text for a specialty consultant to be added to the PD&E SOS.

Approximate Timeframe: 6 months

Step 8 – Discuss Opportunity for Funding Stormwater Project with Work Program

PM: Discuss with the Work Program Office the funding needs for innovative stormwater solutions, funding opportunities for separate stormwater projects, and/or potential partnership funding.

If an innovative stormwater solution has been identified which will require advance funding or additional funding beyond that which is programmed or if there are partnership opportunities, discuss partnership funding needs, timelines, and the potential effect these could have on the Work Program development process. The District Work Program Office should verify whether funding will be available to support innovative solutions and/or accelerated schedules and, if the need for a separate stormwater management project is identified, discuss funding options and programming timelines. If a separate stormwater project is programmed to satisfy the permitting needs for the highway project, the schedules

for the two projects should be carefully planned to allow for the credits from the stormwater project to be available in time to satisfy the permit requirements of the highway project.

During this step it may also be necessary to look for other funding sources within FDOT that could be utilized. Innovative projects have been known to use mitigation funds, research dollars, etc.

Responsible Parties: PM, DC, Work Program Office Staff

Outcome: The Work Program Office is alerted to funding needs and timelines for advance funding needs, potential partnerships, and separate stormwater projects. Meetings and funding determinations should be documented and included in the SMARt.

Timeframe: 1 month

Step 9 – Optional: Present Potential Stormwater Strategies at Stakeholders Meeting

PM: This step is intended to provide an optional check-in point with stakeholders and potential partners with whom you have been coordinating. Invoking this option is useful if the trail of conversations with stakeholders has grown cold and/or a conclusive update needs to be conveyed to a large number of agencies and entities. If you wish to invoke this option, convene a meeting to update stakeholders and solicit input from them regarding viable stormwater management solutions. Prepare meeting notes to document innovative solutions discussed, the stakeholders' input, and any recommendations made for strategies that should be considered during the PD&E phase. Meeting notes should be sent to stakeholders for their record and included in the SMARt.

Present to the stakeholders the potential viable partnership solutions which FDOT may pursue during the next project development phases and provide the stakeholders and regulators with an opportunity to provide input. The DC will inform the group about any potential innovative stormwater solutions which are being pursued. This is also an opportunity to learn about any other projects that may be worth considering.

If during this meeting, new solutions are discovered from stakeholders' input, include these new strategies with the viability solutions to be analyzed in **Step 10** – Meeting of DST to Strategize Further Analysis of Stormwater Management Activities.

Responsible Parties: PM, DC, stakeholders, and DST as needed.

Outcome: Meeting notes and a memorandum that document the findings of the meeting. Resolution of discussions with stakeholders documented in the SMARt.

Approximate Timeframe: 4-6 weeks

4.3 WATERSS Activities during the PD&E Phase

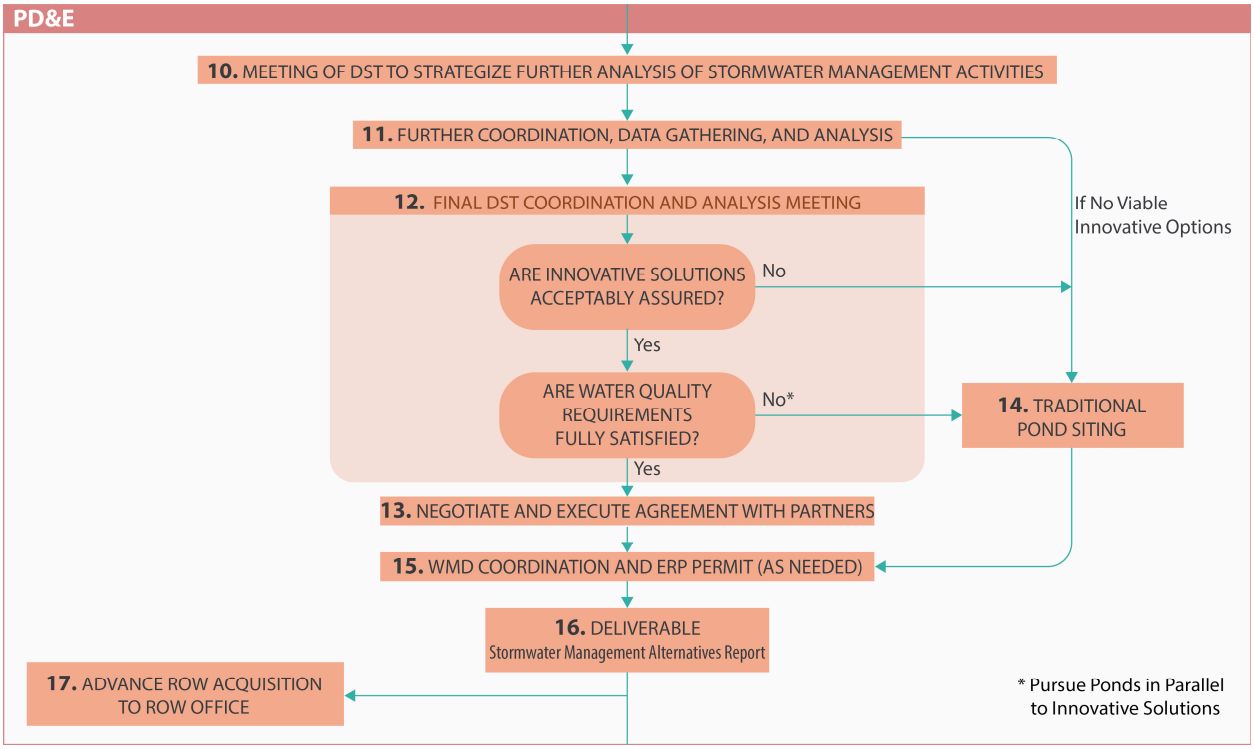
PM: Depending on the outcome of the Planning Phase activities, innovative opportunities being carried forward and parallel evaluation (if needed) should be included in the scope of work for the stormwater section of the PD&E Study. Parallel evaluation is a process where both innovative stormwater solutions and traditional ponds are evaluated concurrently. The DC and DDrE should be asked to review the stormwater portion of the PD&E scope of services. To inform the scope of work for the PD&E study, review the Planning Phase information to determine data collection needs to complete a detailed evaluation of viable innovative stormwater management solutions. Data collection tasks may include site visits and the gathering of field data such as survey or geotechnical exploration. Engage environmental specialists from the District Office of Environmental Management (OEM) and the District Environmental Permits Coordinator to see if opportunities exist for capitalizing on wetland, seagrass, EFH, and species credits which may become available with the implementation of selected innovative solutions. If needed, text for a specialty consultant to be added to the PD&E SOS.

The WATERSS timeline is between 3.5 to 5 years, which corresponds to the traditional FDOT Planning and PD&E process durations. Approximately 1 year and 8-9 months for Planning and 2-3 years in the PD&E phase. The pursuit of partnership solutions will likely require more time than non-partnership solutions; therefore, scheduling the evaluation of partnership solutions tasks should include realistic time to pursue permitting strategies and negotiate agreements with partners.

The activities in **Figure 3** (on the next page) are expected to take place during the PD&E Phase. The desired outcome of the PD&E Phase WATERSS activities are stormwater management solutions that can proceed to final design and permitting without major modifications. For projects where PD&E occurs simultaneously with Design, WATERSS may be used with prudent modification to the process and special attention to the project schedule.

The project's SMARt is finalized during this PD&E Phase to describe the activities and results of the entire WATERSS process, and the input obtained from stakeholders.

Figure 3 WATERSS Activities in PD&E



Step 10 – Meeting of DST to Strategize Further Analysis of Stormwater Management Activities

PM: This step serves as a kick-off of the PD&E Phase, where the DST discusses and strategizes the evaluation of the viable stormwater strategies from ***Step 7*** – Determine Potentially Viable Stormwater Management Strategies *that occurred in the Planning Phase. During* ***Step 7*** – Determine Potentially Viable Stormwater Management Strategies*, the PM, DC and DE eliminated unviable strategies;* ***Step 10*** – Meeting of DST to Strategize Further Analysis of Stormwater Management Activities *has the entire DST discussing and planning the evaluation of the remaining stormwater approaches. Some strategies from* ***Step 7*** – Determine Potentially Viable Stormwater Management Strategies *may end up being dismissed by the team; further investigation of the remaining strategies should be assigned to DST members according to their expertise. Establish timeframes for these follow up investigations and set a date for the Final Coordination and Analysis Meeting (****Step 12*** – Final DST Coordination and Analysis Meeting*). If innovative solutions will be pursued, establish a target date after which fulfilling the project schedule necessitates that the Pond Siting Process must begin, even if in parallel to the pursuit of innovative strategies. If, after discussion, no viable innovative solutions remain, secure the concurrence of the DST to engage traditional pond siting.*

Step 11 – Further Coordination, Data Gathering, and Analysis

PM: This step is intended to further investigate any additional information needed to assess the assurance of innovative stormwater solutions and to accurately rank alternatives. The PM should ensure that all investigations completed in this step are provided to the DST for review and comment.

Coordination with the prospective partners continues during this step. In addition to technical investigations (i.e., preliminary soil borings or surveys), specific to the solutions being proposed with potential partners, the topics listed under Partnership Solutions in **Step 6** – Initial Stakeholders and Regulatory Coordination should be discussed with potential partners. The results of the investigations may be shown to the WMDs (and other partners as appropriate) to better ascertain their ability to permit the alternative solutions and to determine what additional information is needed to resolve the level of alternatives' certainty. Details of this coordination activity and ongoing meetings with stakeholders and regulatory agencies is documented in the SMARt.

Responsible Parties: PM, DE, and DST

Outcome: Viable, permittable solutions that have sufficient research to be compared with each other and with traditional ponds to determine a recommended solution for pursuit. The results of additional investigations (geotechnical, survey, landscape, etc.) and ongoing meetings with stakeholders and regulatory agencies should be documented in the SMARt.

Approximate Timeframe: 1-3 months

Step 12 – Final DST Coordination and Analysis Meeting

*PM: This is a critical decision point in deciding which solution(s) will be used for the project. Therefore, ensure that (1) all further investigations from **Step 11*** – Further Coordination, Data Gathering, and Analysis*are complete and sent beforehand to the DST to allow time for review, (2) all needed members of the DST are present, and (3) the meeting is scheduled long enough to allow ample discussion. With sufficient data now available, convene the DST to decide on the final stormwater management approach for the project using the Innovative Solutions Evaluation Matrix developed in **Step 7*** – Determine Potentially Viable Stormwater Management Strategies*. Recognize that the innovative solutions involving partners may take longer than expected and have inherently more uncertainty associated with them. Use the outcomes listed at the end of this step's discussion as a checklist for the agenda outcomes for this meeting. Make sure the DST reviews and concurs the entry to the SMARt that results from this meeting.*

Are Innovative Solutions Acceptably Assured?

After the investigations discussed in the previous activities are complete and the Innovative Solutions Evaluations Matrix is revised, one or more solutions may be identified as strategies that can be pursued with confidence. Usually, innovative solutions will show a better cost/benefit ratio than traditional ponds;

bear in mind, however, that the uncertainty associated with innovative solutions may outweigh the potential benefits and that trust between partners can become a critical component to the decision-making process. Shared-use ponds with private developers can be challenging unless the agreement with the developer is approved prior to the design phase and includes a public entity as maintenance backup against future financial failure by the developer. If innovative solutions need additional time to become implementable, the schedule could be revised, or traditional ponds may be pursued in parallel with innovative alternatives to allow the needed time for the innovative solution to be realized. Recognize that a concurrent water quality project might need to be completed and in place before FDOT project permitting can realize the credits from that project.

If, at this point, there are no innovative solutions which are sufficiently assured, traditional Pond Siting Process should be started.

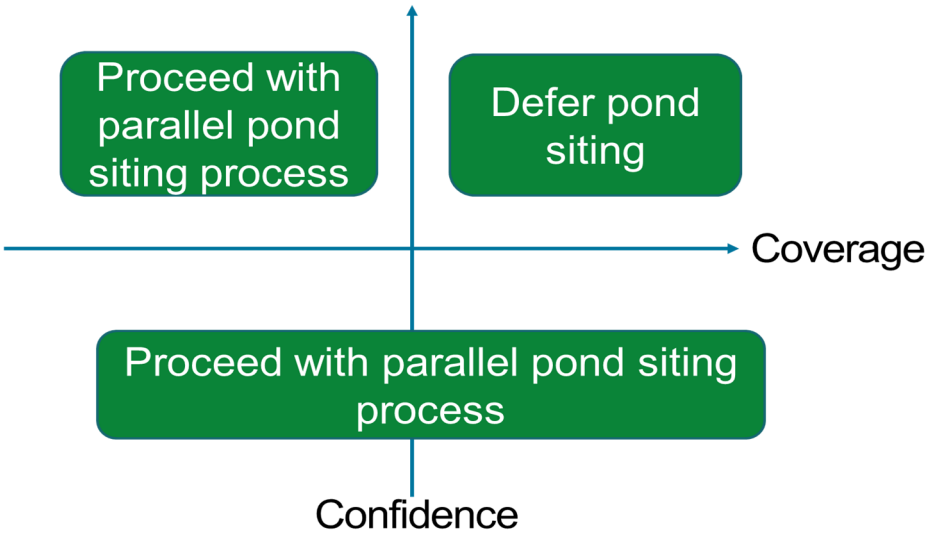
Are Water Quality Requirements Fully Satisfied?

PM: If innovative solutions do not fully satisfy water quality, flow attenuation, and floodplain requirements, and if ROW acquisition is needed to site traditional ponds, begin the traditional Pond Siting Process.

Discharge attenuation and floodplain compensation are sometimes not addressed by an innovative solution. For example, a regional pond typically addresses both water quality and quantity requirements but could also generate floodplain compensation volume; converting septic tanks to sewer, however, addresses only water quality requirements. A lack of credit towards water quantity and floodplain requirements may depreciate the advantage of a proposed innovative solution.

Where corridors cross several basins, a combination of solutions may be needed to address the project stormwater requirements in each basin. As innovative solutions are finalized, the degree to which regulatory requirements are satisfied in each stormwater basin will become known. Thus, when the coverage of a single innovative approach does not fully satisfy stormwater regulatory requirements on the project, different solutions may be applied, including traditional stormwater retention or detention ponds. **Figure 4**, below, illustrates different parallel pond siting scenarios.

Figure 4 **Parallel Pond Siting Scenarios Depending on Coverage and Confidence of Innovative Solutions**



Responsible Parties: PM, DST

Outcome: Documentation in the SMARt of DST (1) deliberations over each strategy considered, (2) decision on which strategies to pursue, including issues affecting their confidence in each project, (3) analysis of the basin by basin satisfaction of stormwater permitting criteria – water quality, attenuation, floodplain compensation - on the project, (4) particular recommendations on the pursuit of innovative solutions identified for pursuit, and (5) finalized Innovative Solutions Evaluations Matrix evaluations. Such recommendations could speak to negotiation issues with partners, required internal FDOT coordination such as with the Work Program Office, changes to the project schedule, discussions with permitting agencies, or any other prudent effort to secure a chosen stormwater strategy.

Approximate Timeline: 3 weeks

Step 13 – Negotiate and Execute Agreement with Partners

PM: For the chosen strategies, facilitate negotiations and the execution of formal agreements with partners. Make every effort to secure the FDOT Management endorsements and work program funding needed to close deals made with partners in a timely manner, since partners' positions can change with shifts in leadership, priorities, and budget.

Formal agreements involving partnership solutions are developed by FDOT legal staff and executed between FDOT and its partners. The type of legal agreement will depend on the partnering entity. For example, with state or federal regulatory agencies, FDOT often executes a Memorandum of Agreement

(MOA) or a Memorandum of Understanding (MOU), but with local governments FDOT typically executes a JPA.

Responsible Parties: PM, DC (as needed), and District Legal Office

Outcome: Executed MOU/MOA/JPA with partners

Approximate Timeline: 3-6 months

Step 14 – Traditional Pond Siting

PM: Facilitate the Pond Siting Process; monitor progress to guard the project schedule. Examine the pond siting scope developed at the beginning of the PD&E Phase to determine whether it still reasonably reflects the expected effort now that stormwater strategies are determined.

Once it has been determined by the DST that traditional ponds may be needed to meet regulatory requirements, and that the acquisition of ROW will be required to accommodate these proposed ponds, the Pond Siting Process should commence. The Pond Siting Process discussed in **Pond Siting** Process**,** is followed to select and document specific sites for the construction of Stormwater Management Facilities (SMFs).

Responsible Parties: PM, DE, DDrE

Outcome: Traditional pond sites identified and supporting documentation recorded in the SMARt.

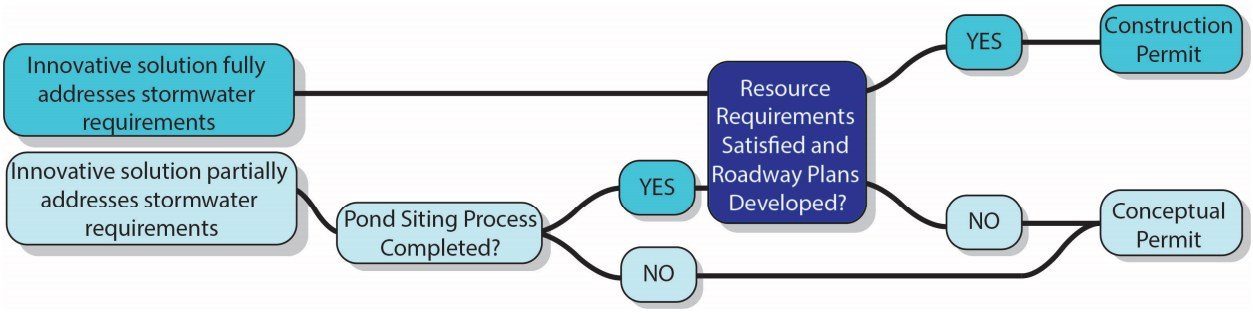
Approximate Timeline: 9-10 months

Step 15 – WMD Coordination and ERP Permit (as needed)

PM: Review project permit strategies and assist the District Environmental Permits Coordinator in determining the type of permit to pursue and coordinating with permitting agencies.

With innovative solutions selected and agreements in place, the stormwater component of the Environmental Resource Permit (ERP) may now be ready for at least a conceptual WMD permit. Different permitting scenarios can be employed, depending on the types of stormwater management solutions selected, as shown in **Figure 5**, below:

Figure 5 Project Permitting Scenarios Involving Full and Partial Innovative Solutions



Standalone water resource projects would require an ERP application and permit issued independent of the FDOT roadway project. In these situations, a "credit" can be reflected in the ERP permit to link to the roadway ERP permit. For more assurance on innovative solutions, a conceptual permit can provide early verification of the ability to permit the innovative approach as well as allow time to respond to and obtain information that comes out of the RAI process.

If the Design Phase occurs immediately after the PD&E Phase, the information needed to obtain a Construction ERP will be available; if not, construction permits may still be obtained with sufficient information on the stormwater management system, but without the details of a formal roadway drainage system. For example, plans may indicate the basin boundaries flowing to existing outfalls without the design details of roadway design conveyance systems – pipes or ditches – to the typical ponds before these outfalls; if necessary, these plans may be updated later by permit modification. Conservative estimates in impervious areas and pond volumes in the early design and planning stages should be considered so minor design changes can be accommodated without needing a permit modification in later stages.

Also, if projects are insufficiently developed to obtain a full construction permit, a conceptual permit may be pursued that will lock in agency acceptance of an innovative solution. The decision to obtain a conceptual permit or construction permit should be made on a project-by-project basis with coordination with the District Environmental Permits Coordinator and should consider the trade-off between earlier permitting benefits versus having to do permit modifications if the design changes. In most instances, the same permits needed for the traditional route will be needed for the innovative route, unless the innovative solution is enacted/permitted by others and FDOT's contribution is financial only.

Until a preferred alternative is selected, innovative stormwater strategies may be applicable for multiple alternatives being considered. Permitting of the innovative stormwater solutions prior to Location and Design Concept Acceptance (LDCA) should be explored if the benefit is appropriate to the specific project.

Conceptual Permits

If a conceptual permit is being used, the Department will be required to develop plans that are sufficient for conceptual permits. These may contain more detail than PD&E plans, but the required contents of

such plans should be sufficient to convey the concept of the design to the WMDs. Conceptual permit modifications may be required if the project changes in design; however, acquiring the initial permit early can be essential to 'locking-in' the innovative idea, solidifying partnerships, establishing credits, and identifying the needed ROW. Per Chapter 62-330.056, Florida Administrative Code, a conceptual approval permit provides the permit holder with a rebuttable presumption that the engineering design and scientific principles upon which the conceptual approval permit is based are likely to meet applicable rule criteria. This is based on the extent of detail provided in the conceptual approval permit. If changes are proposed to the design, or if there have been changes to state water quality standards, special basins, or site characteristics, the applicant must modify the conceptual approval permit if it wishes to continue to rely on it as a basis that reasonable assurance exists. For more information on conceptual permits, please refer to Chapter 62-330, Florida Administrative Code.

Responsible Parties: District Environmental Permits Coordinator, PM, DE, DDrE, and DC

Outcome: Appropriate WMD permit(s) issued

Approximate Timeline: 6 months – 1 year

Step 16 – Deliverable: Stormwater Management Alternatives Report

PM: Finalize the SMARt and ensure that the report is reviewed by the DST, DDrE, and the District OEM.

The SMARt summarizes the stormwater activities and resulting strategy decisions in both the Planning and PD&E Phases; it may now be finalized. This report is discussed further in **Chapter 7** and a template is provided in **SMARt Template**.

Responsible Parties: PM, DE, DC, DDrE

Outcome: Completed SMARt

Approximate Timeline: 4 months

Step 17 – Advance ROW Acquisition to ROW Office

PM: *Contact the District ROW Office to evaluate advance acquisition opportunities. Coordinate with the District Environmental Management Office as advance ROW acquisition involves environmental review and must not limit the choice of reasonable alternatives for the project or otherwise influence decisions on any approvals required for the project.*

If advance acquisition for stormwater management solutions needs to begin before the completion of the Environmental Document, meet with the ROW Office to discuss the advance procurement of ROW. This activity is typically applicable for a regional pond, a harvesting pond, an easement over a joint-use pond, or some other approach involving a pond. All advance acquisition parcels must be acquired in accordance

with the Advance Acquisition Procedures covered in Topic No. 575-000-000, *Right of Way Procedures Manual*.

Responsible Parties: PM, ROW Office, District PD&E Engineer, and DE

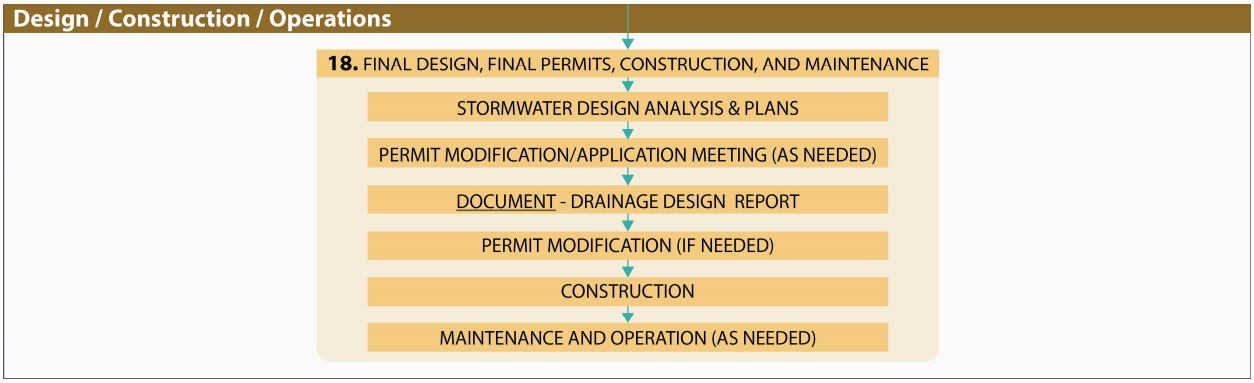
Outcome: Needed ROW acquired for stormwater management solutions.

Approximate Timeline: Depends on negotiations with the owner(s).

4.4 Design/Construction/Operations

The activities below in **Figure 6** are expected to take place during the Design Phase with consideration of the Construction, Maintenance, and Operation Phases. Depending on the outcome of the PD&E Phase activities, implementation of innovative stormwater solutions which have been selected for the project or finalization of any solutions, which were not completed in the previous phase, should be included in the scope of work for the drainage portion of the project. Coordination with other offices within the district such as the Specifications Office, Environmental Management Office, or Legal may be required based on the solutions for each project. Solutions which were selected and have partners or stakeholders will require continued coordination as the project advances through the Design and Construction phase.

Figure 6 WATERSS Activities in Design, Construction, and Operations



Step 18 – Final Design, Final Permits, Construction, and Maintenance

PM: *As needed, the DC continues to keep the appropriate stakeholders informed and involved. Coordinate with the District Environmental Management Office for any drainage/design changes that need to be considered in an Environmental Re-evaluation, and with the Environmental Permit Coordinator to obtain permits or permit modifications.*

Design and stormwater plans production are finalized in accordance with *the FDOT Design Manual, FDOT Drainage Manual* and the *Drainage Design Guide (DDG)*. Construction permits are obtained for the project as required. Guidance on permitting can be found in *Part 1, Chapter 12, Environmental Permits* of the

PD&E Manual and the Permitting Handbook. If traditional pond siting selections are changed during design, documentation and analysis of any changes during the design should be completed in accordance with Part I, Chapter 13 of the FDOT PD&E Manual. Stakeholder coordination and communication should be continued by the DC during this time, including the transfer of maintenance responsibility to partners, if agreed upon as part of the partnership.

The Drainage Design Report is the standard roadway drainage design documentation (ditch calculations, spread, storm drain tabs, etc.) currently required on FDOT projects; it is separate from the SMARt, and is not a part of the ERP application submittal. The roadway design process may result in adjustments to the parameters and assumptions that were made to determine the stormwater project requirements. For example, basin divides may change as the roadway drainage conveyance system is designed. Once the roadway plans are finalized it may be necessary to adjust the innovative solutions to account for the final design. This may result in the need to prepare a re-evaluation in accordance with Part I, Chapter 13 of the FDOT PD&E Manual and to modify any agency permit obtained to memorialize the revisions prior to project construction.

Some innovative solutions may need additional operation and maintenance outside of what is typically required for traditional stormwater ponds (pumps, irrigation systems, force mains, lift stations, etc.). In most scenarios, FDOT would prefer the partner to provide long term Operations and Maintenance, and this should be clearly designated in the legal agreement (JPA, MOU, etc.). In addition, some innovative solutions may require monitoring or metrics to ensure success beyond the completion of construction that may require procurement of specialty services.

Responsible Parties: PM, DC, District Environmental staff, District Environmental Permits Coordinator, District DDrE, District Construction staff, and District Maintenance staff.

Outcome: Completed project including transfer of maintenance to partners, if applicable.

Approximate Timeline: Varies according to project complexity.

5. WATERSS and the Project Workflow

5.1 Including WATERSS Into the Project Timeline

The WATERSS process is intended to start much earlier than traditional stormwater and drainage investigations typically accomplished in PD&E and Design. This process relies on many of the roles mentioned in **Chapter 2** of this document to become engaged very early in a project timeline. This early engagement will allow for the full exploration of potential innovative opportunities while still meeting project schedules.

There are specific rules and guidance regarding the incorporation of decisions and analysis from the Planning Phase into the National Environmental Policy Act of 1969 (NEPA) process (accomplished in the PD&E phase). Planning and Environmental Linkages is discussed in Part 1 Chapter 4 of the PD&E Manual, Section 4.2.2.

The WATERSS process diagrams, illustrated in **Chapter 4** of this document, describe the intended steps to be taken in the Planning, PD&E, and Design phases. Many of these steps incorporate similar tasks that are traditionally accomplished, but they are accomplished earlier in a project timeline. For projects where PD&E occurs simultaneously with Design, WATERSS may be used with prudent modification to the process and special attention to the project schedule.

5.2 Merging WATERSS and Project Engineering Analysis

Integration of WATERSS earlier into the project development process, will require the DE, PD&E Engineer and Design Engineer to collaborate on the various engineering decisions during the PD&E phase. Determinations such as typical section design, alternative development, and stormwater management considerations can be impacted by WATERSS solutions, and in many cases can and should be an iterative process. In order to achieve appropriate engineering decisions and avoid having to re-evaluate or update these solutions in future phases, all three groups should coordinate and agree on the engineering solutions developed during the PD&E phase. This level of collaboration early in the project decision process is expected to provide better solutions and eliminate significant future re-work.

5.3 Merging WATERSS and Stormwater Related Documentation

There are many stormwater related documents that arise from a typical project workflow, depending on project applicability. These documents may include a Pond Siting Report, Location Hydraulics Report, Bridge Hydraulics Report, Water Quality Impact Evaluation Checklist (WQIE), Conceptual Drainage Design Report, etc.

The main deliverable for the WATERSS process is the SMARt and is discussed further in **Chapter 7**. During the WATERSS process and stormwater alternatives analysis, some of the typical stormwater related documents may be incorporated into the SMARt or may no longer be relevant. For example, Section 11.4.3.2 of Part 2, Chapter 11 of the PD&E Manual, discusses a Conceptual Drainage Design Report for when ponds and a PSR aren't feasible (usually urban fully built-out locations). The SMARt could take the place of that report, providing the approach for permitting without ponds. The WQIE would typically become an appendix within the SMARt. In the case of incorporating documents into the SMARt, it may be beneficial to include a summary of the typical document as a separate section or as an appendix to the SMARt. These decisions can be made by the PM depending on project specific information and applicability.

5.4 Merging WATERSS and PD&E Documentation

In addition to the various stormwater related documents that may be required during a PD&E study, the summary analyses, coordination, commitments, and findings of the WATERSS efforts must also be captured in the Preliminary Engineering Report (PER) and Environmental Document (i.e., EA, EIS, Type I or II Categorical Exclusion, State Environmental Impact Report, or Project Environmental Impact Report).

The overall discussion within these reports should convey:

a. A general description of the stormwater management solution(s) being utilized for the proposed transportation action. This should also discuss and document if the solution(s) differ by segments within the project, and if the determination of the proposed transportation action (i.e., preferred alternative) was in part determined by the comparative impacts/benefits of the stormwater management solution(s).

b. The coordination efforts to date, and what agencies or groups have been involved in the coordination

c. The results of this coordination and effort

d. What commitments have been made or are being pursued (Part 2, Chapter 22 of the Florida PD&E Manual provides further guidance on the appropriate requirements for recording and tracking FDOT commitments within PD&E documentation).

e. A discussion of what effects the results of the WATERSS efforts may or will have on the project's avoidance, minimization, mitigation, enhancement, and costs.

f. Other project specific information that is relevant to the Engineering Analysis or Environmental Analyses as needed.

The overall discussion in the PER and Environmental Document should be brief and focus on the areas discussed above. If more detail is needed or relevant, the WATERSS efforts should be acknowledged by reference to the SMARt.

5.5 Including WATERSS in the PD&E Evaluation Matrix

Innovative stormwater solutions will need to be included in the Alternatives Analysis and Evaluation Matrix. This evaluation will need to capture the advantages and disadvantages of the innovative stormwater solutions and/or traditional ponds which may include topics such as lifecycle costs, anticipated impacts, and anticipated environmental benefits. The quantification of environmental benefits will be necessary to include for alternative evaluations as well as public involvement and agency coordination. The potential benefits will be project specific and should be classified and quantified as appropriate.

An example evaluation matrix is below in **Table 4**. Note that the example below can and should be modified to be project specific to account for the potential differences between WATERSS and traditional stormwater solutions as determined by each project. Also note that WATERSS solutions may affect scores for other categories within the matrix and should be captured appropriately to identify benefits or impacts. The intention of discussing, and providing an example evaluation matrix, is not to create a template form that should be adhered to, but rather to communicate the importance of recognizing that certain WATERSS solutions may affect the comparative evaluation and performance of the project's alternative alignments. As such, it is critical that as WATERSS is incorporated into the PD&E process, the project team recognize and account for any opportunities where this could occur, and that the team discuss and document these circumstances in selection of the preferred alternative.

Table 4 Alternatives Evaluation Matrix Example

Evaluation Categories and Criteria	Alt A	Alt A WATERSS	Alt B	Alt B WATERSS	No-Build
Project Cost					
Design Phase					
ROW Acquisition					
Construction					
Construction Engineering and Inspection (CEI)					
Mitigation or Environmental Mitigation					
Utility Relocation Costs					
Operations and Maintenance Costs (for transit projects)					
Total Costs					

Evaluation Categories and Criteria	Alt A	Alt A WATERSS	Alt B	Alt B WATERSS	No-Build
Social and Economic Environment					
Number of parcels					
Business					
Residential					
Number of relocations					
Business					
Residential					
Religious and Worship Centers					
Cemeteries					
Schools					
Hospitals and Medical Centers					
Cultural Environment					
Section 4(f)					
Historic Sites and Districts					
Archaeological Sites					
Recreational Areas and Protected Lands					
Natural Environment					
Wetlands and Other Surface Waters					
Protected Species and Habitat					
Farmland					
Floodplains					
Environmental Benefits (Mitigation Credits, etc.)					
Physical Environment					

	Evaluation Categories and Criteria	Alt A	Alt A WATERSS	Alt B	Alt B WATERSS	No-Build
	Contamination/Hazardous Waste Sites					
	Noise Receptors					
	Water Resources					
	Air Quality					
	Utilities					
	Bicycles and Pedestrians					

5.6 Merging WATERSS and Public Involvement

The WATERSS efforts should be included in Public Involvement materials when the information is ready and appropriate to be shared. Because the intention of WATERSS is to identify and implement innovative strategies for stormwater treatment, it will be meaningful information for the local communities and public interested in the project. The WATERSS efforts may influence the public's opinion of a particular alternative over another, or on the project as a whole. Water quality and water quantity are becoming increasingly important considerations to the Florida population and the presentation of this information at public meetings will be necessary. Exhibits, presentations slides, handouts, and other commonly utilized public involvement material should all be considered to present WATERSS information to the public.

Outreach and notices to stakeholders during project public involvement activities should include any WATERSS partners that have been engaged during the WATERSS process.

5.7 Merging WATERSS and Agency Coordination

The WATERSS process requires multiple aspects of agency coordination as discussed in previous sections. However, during the PD&E phase it is also necessary to obtain agency feedback and concurrence on a variety of other issues as well. These include impacts to wetlands, floodplains, species and habitats, estuarian systems, contamination sites, ROW and relocations, and noise. Because WATERSS solutions may provide options which can further avoid, mitigate, or eliminate impacts to these other areas of consideration, it will be necessary to document these results in not only the PER and environmental documents but also some of the other technical reports as well. This will ensure that the regulatory agencies are provided an explanation and understanding of how impacts to these resources were minimized or avoided. In some instances, WATERSS solutions may lead to reduced mitigation

requirements and therefore will need to be presented to the regulatory agencies responsible for granting their concurrence and approval on these matters.

As noted above, when discussing the PD&E Evaluation Matrix, the potential benefits of alternatives that incorporate innovative stormwater solutions through the WATERSS process should be quantified in the matrix. This information will need to be relayed to agencies during their reviews to capture the potential impacts or benefits of each alternative.

6. WATERSS Analysis in the EST

6.1 WATERSS Analysis

A WATERSS Analysis has been integrated and is available in the EST to be utilized in one of two ways: 1) as part of the Programming Screen within the Mapping Tool or 2) through the AOI Tool. The WATERSS Analysis will provide GIS data layers summarized in the WATERSS Data Report and WATERSS Data Maps.

WATERSS activities in the EST are intended to discover opportunities for innovative, cooperative stormwater quality and flood protection projects between FDOT, agencies and potential partners.

EST Programming Screen

For major projects, the DE prepares the Water Resources section of the PED. The PED is submitted by the ETDM Coordinator, where relevant ETAT members use the EST to review project information, including the PED information, and provide comments on water quality and stormwater, resource restoration, water supply, and other issues. See the *PD&E Man*ual*, Part 1, Chapter 3, Preliminary Environmental Discussion and Advance Notification* and *Part 2, Chapter 11, Water Quality and Stormwater*.

EST AOI Tool

For minor projects, the DE enters the project into the AOI Tool and runs the WATERSS Analysis Tool to gather the WATERSS Data Report and Maps. This information can be used to develop a package of information to share with the regulatory agencies and non-regulatory environmental advocacy organizations that do not have access to the EST. Comments can be received outside of the EST following the existing processes.

6.2 ETAT Review

During the ETDM Programming Screen, the ETAT will have the capability to review the WATERSS Data Report and WATERSS Data Maps and submit comments in the EST for each screened alternative or indicate that the comments submitted for one alternative are applicable to all. Comments may describe resource improvement opportunities with respect to targeting watershed-wide goals and improvements.

This could include regional strategies such as flooding and conveyance improvements, infrastructure upgrades, preservation, wetland restoration, and mitigation projects. The ETAT may also provide comments related to known cooperative partnerships, benefits, costs, permitting issues, and timeframes. They may also submit points of contact for future cooperative partnership opportunities.

It should be noted, the responsibility of the ETAT has been augmented to include receiving and logging WATERSS comments from groups within their agencies who are engaged in resource improvement. ETAT members are asked to coordinate internally and assemble these comments for the agency.

7. WATERSS Deliverables

The Stormwater Management Alternatives Report (SMARt) documents the WATERSS process and supports the recommended stormwater management method(s) for the project. The SMARt is prepared during the PD&E Study and finalized in Design much like the current Pond Siting Reports. In both cases a version of the reports will need to have a completed version for the PD&E study and then a final updated version during design. The intent of the SMARt is to report on the coordination efforts; the stormwater solutions analyzed, and those solutions considered but eliminated; and document the stormwater management solutions which will satisfy the water quality and attenuation needs of the project.

The SMARt will include the following sections:

1. Project Identification
2. Data Collection
3. Project Coordination & Public Involvement
4. Stormwater Alternatives Analysis
5. Preferred Alternative

If traditional pond siting is pursued, the SMARt will contain the preliminary drainage design of the project and, as needed, all traditional pond sites analyzed for design.

A SMARt Template is provided in **SMARt Template**.

Appendix A Stormwater Management Terms and Concepts

A.1 Stormwater Management Terms

The terms below are commonly used in stormwater management documents, regulations, and guidance:

Total Maximum Daily Load (TMDL)

TMDL is a regulatory term describing a plan for restoring impaired waters that identifies the maximum amount of a pollutant that a body of water can receive while still meeting water quality standards for that body of water.

Basin Management Action Plan (BMAP)

A BMAP is a comprehensive set of strategies designed for restoring impaired waters by reducing pollutant loadings to meet the allowable loadings established in a TMDL. Pending and adopted BMAPS are located at https://floridadep.gov/dear/water-quality-restoration/content/basin-management-action-plans-bmaps

Regional / Joint-Use Ponds

Regional or Joint-Use ponds are typically located offsite and downstream from the FDOT facility. FDOT stormwater runoff is commonly routed to the pond via pipes, manmade ditches, and canals. Regional / Joint-Use ponds may receive runoff from other areas within the watershed in addition to the FDOT ROW, which could be considered compensatory treatment volume depending on the regulatory requirements. In certain circumstances, legal measures are needed to determine capacity accounting, ownership and maintenance agreements of the pond.

Stormwater Harvesting

Stormwater harvesting is divided into two categories: (1) onsite use by the FDOT for irrigation, and (2) offsite use by others for raw water supply, wetland re-hydration, or other non-potable usages. Any re-usage of stormwater involving potential human contact, such as spray irrigation, requires coarse filtration (usually with a sand filter) to remove potentially harmful cyanobacteria.

Onsite harvesting is relatively simple, since control of the harvested stormwater does not leave the FDOT property. Offsite harvesting requires a legal agreement between FDOT and the recipient of the stormwater.

Bio-sorption Activated Media (BAM)

BAM is a physical soil amendment used to provide a carbon source, moisture, anaerobic condition, and large surface area to host denitrifying bacteria. BAM is typically used to achieve nutrient removal in nutrient-impaired basins, such as springsheds. Nutrient removal credits for BAM are set by the WMDs and may be calculated by the BMPTRAINS stormwater program; further design information is in Chapter 9 of the **Drainage Design Guide**.

Springsheds

Contributing basins for springs (springsheds) are mapped by FDEP and the WMDs as a part of water quality and water quantity efforts. Excessive nutrients, particularly forms of nitrogen, are the primary water quality problem in springs. The water quality in springs generally reflects the water quality of the contributing groundwater.

Groundwater Injection

Environmental Protection Agency's (EPA) Underground Injection Control (UIC) rules, promulgated under the Safe Drinking Water Act of 1974, require stormwater to be treated to drinking water standards before injection. Due to federal regulations, underground injection can be challenging to permit through FDEP and requires additional groundwater monitoring in a designated zone of influence.

Land Use Modification

It is possible to satisfy pollutant load reductions by changing the use of a property. A regional pollutant loading analysis can be used to demonstrate significant net improvement in downstream water quality and to show that the increase in runoff from the proposed roadway improvements had no adverse impact to adjacent or downstream property owners. The regional analysis and the additional time required to negotiate the offsite land acquisition are typical additional issues for consideration with this type of stormwater management approach.

Resource Improvement Projects

Funding effective resource improvement projects can be more effective than the onsite treatment of FDOT runoff. BMAP meetings afford an opportunity to discover these types of projects. Examples include septic tank conversion to sewer, improvements to wastewater treatment plants, living shorelines, muck dredging and other similar activities. When substituting these types of projects in lieu of traditional ponds, the ERP documentation must include an analysis demonstrating that the downstream resource is benefited more by the resource improvement project than by the installation of traditional ponds.

A.2 Stormwater Management Practices

Stormwater practices are always evolving based on further data and research. **Table 5**, below, describes stormwater management practices beyond traditional roadside ponds, citing useful design information in

meeting stormwater quality and quantity goals for each BMP. For each practice, a short description along with the pros and cons and special permitting hurdles, costs, schedule, and design constraints are provided.

Many of the practices below are designed to only address water *quality*, not flow attenuation (water *quantity*) or floodplain compensation. These requirements can also be met via innovative solutions. For example, storage BMPs, such as joint-use ponds or regional ponds, also provide opportunity to attenuate the peak discharge and provide floodplain compensation and are usually designed to help satisfy these permit requirements.

Table 5 Matrix of Typical Innovative Stormwater Management Practices

BMP	Specific Characteristics	Applicability	Goals	Effectiveness in Meeting Stormwater Quality and Quantity Goals	Pros and Cons	Permitting Hurdles	Costs	Schedule	Design Constraints
Surface Water BMPs									
Regional Pond	Downstream pond sized to accommodate runoff from the upstream basin rather than only onsite runoff from the development.	Desirable when pond ROW costs are high or land for ponds is unavailable or when environmental constraints are present.	Reduce long term pond costs and improve downstream water quality.	Highly effective in that land beyond the onsite project is treated and attenuated.	Pros: improved water quality and attenuation, reduced long term costs. Cons: (1) difficult to coordinate agreements and permit; and (2) possible long piped outfalls.	Minor increase in pollutants and flows to waters of the state immediately downstream between the roadway and the regional pond.	Potential increased ROW costs are recouped by maintenance being the responsibility of the local municipalities.	Longer production schedule may be needed to accommodate negotiations with local municipalities and overcoming permitting hurdles.	Sometimes pre-treatment is required onsite, perhaps trapping sediments
Joint-use Pond	Pond designed to accommodate runoff from two or more landowners. A formal agreement is crafted to outline terms of cooperation.	(1) Often occurs at the request of adjacent property owners to better integrate proposed pond locations into their properties; (2) sometimes initiated by FDOT to store runoff in downstream golf courses; and (3) sometimes adjacent developments are required to take FDOT runoff as a condition of county approvals.	Reduce pond ROW acquisition and long-term maintenance and operation costs.	Standard ERP water quality rules are satisfied.	Pros: combining ponds into a single pond reduces costs due to economy of scale; typically, maintenance is assumed by a partner. Cons: (1) co-mingling runoff can expose FDOT to National Pollutant Discharge Elimination System (NPDES) responsibilities for offsite runoff; and (2) can be difficult to coordinate agreements	(1) Permits must be obtained/modified for all parties involved; (2) phased construction must be coordinated for future roadway or development expansion; and (3) legal agreement must address FDOT's right to maintain pond (or hold another public agency as surety) if the responsible party defaults.	Combining ponds into a single pond reduces ROW costs due to economy of scale; maintenance is often assumed by the offsite party.	Longer production schedule may be needed to accommodate negotiations with the cooperating party.	The overflow from the combined pond must be able to adequately drain both upstream properties.
Stormwater Harvesting	Stormwater is collected and harvested for irrigation, raw water supply, wetland re-hydration, MFLs, or some other beneficial usage.	Useful when a high demand exists for non-potable water.	Reduce downstream pollutant loadings and provide an alternate water supply.	Highly effective in that downstream discharge volume is reduced, lowering pollutant loading; usually has only minimal reduction in attenuating peak flow.	Pros: improved water quality and water supply. Cons: difficult to match with water consumers; partners can pull out late in the production schedule.	None, unless water consumer tries to negotiate Consumptive Use Permit (CUP) credits as part of the harvesting.	None, if pumping and infrastructure costs are borne by the water consumer.	Longer production schedule may be needed to discover and negotiate with the water consumer.	(1) No privately-owned pumping/piping infrastructure within limited access (L/A) ROW; (2) re-use with potential human contact must provide filtration; and (3) avoid the need for a CUP by avoiding the pumping of groundwater.

BMP	Specific Characteristics	Applicability	Goals	Effectiveness in Meeting Stormwater Quality and Quantity Goals	Pros and Cons	Permitting Hurdles	Costs	Schedule	Design Constraints
Land Use Modification	Changing existing land usage to a usage generating less of the pollutant of concern, usually nutrients.	Desirable when pond ROW costs are high or land for ponds is unavailable.	Cost savings.	Standard ERP water quality rules are satisfied due to a reduced pollutant loading.	Pros: cost savings. Cons: involves negotiating with external property owners.	(1) Potential adverse impacts to adjacent properties; and (2) will require additional coordination for the specific permit language and conditions.	Costs are reduced by avoiding expensive ROW adjacent to the highway.	Additional production time may be needed to negotiate with land owners – no ROW condemnation authority.	None.
Upstream Compensatory Treatment	Treating upstream offsite runoff in lieu of onsite runoff.	Desirable when pond ROW costs are high or land for ponds is unavailable.	Cost savings.	Standard ERP water quality rules are satisfied.	Pros: cost savings. Cons: permitting hurdles.	(1) Potential adverse impacts to adjacent properties; and (2) will require additional coordination for the specific permit language and conditions.	Costs are reduced by the selection of an alternate treatment site.	Additional production time may be needed to find and design a suitable upstream treatment alternative.	Requires design of offsite treatment BMP.
Basin/Resource Improvements	In lieu of onsite stormwater treatment, modifications to the basin or downstream resource (e.g., septic tank conversions, circulation enhancements, etc.) are constructed to improve the waterbody's health.	Desirable (1) when pond ROW costs are high or land for ponds is unavailable; and/or (2) when greater environmental benefit is sought.	Potential cost savings and improved downstream environmental benefit.	Highly effective due to significantly increased environmental benefit.	Pros: improved environmental benefit and reduced costs. Cons: significant amount of permitting coordination, agreements may be required with stakeholders.	With no specific rules to address this approach, regulatory leadership must provide strong evidence of the improvement's effectiveness.	Significant cost savings can be realized in comparison with pond ROW acquisition.	Longer production schedule may be needed to accommodate discussions with the permitting agencies and/or municipality, and any agreements required.	Specialty design services may be required depending on the mitigation strategy.
Groundwater BMPs									
Well Injection (not District 6 coastal zone)	Injecting runoff into the ground via a pipe rather than discharging it downstream.	Useful in springsheds and other areas where groundwater recharge is desirable; typically targets pond bleed down flows.	Increase groundwater recharge; decrease pollutant loadings to surface waters.	Effective in increasing groundwater recharge and reducing downstream surface water pollutant loadings by reducing discharge volume.	Pros: improved groundwater recharge; decreased surface water pollutant loadings. Cons: may need to include a special BAM design within the discharge well.	(1) FDEP working to secure flexibility in EPA's UIC rules to allow this option - untested at this point in time; and (2) will require additional coordination for the specific permit language and conditions.	Additional costs are incurred to construct the injection system; currently, the WMDs offer no incentives such as reduced treatment requirements.	Separate permitting process with independent timelines.	Requires well injection design downstream of overflow weir.
Bio-sorption Activated Media (BAM)	Media provides a carbon source to promote the cultivation of denitrifying bacteria; also removes phosphorus, though infrequently used for that nutrient.	Useful in springsheds and coastal areas to denitrify during infiltration; useful to treat phosphorus within impaired basins.	Remove nutrients from runoff; eliminate ROW for ponds by using BAM within roadside ditches.	Highly effective in removing nutrients.	Pros: improved groundwater quality; can eliminate the need for stormwater ponds in rural typical sections. Cons: design and specifications for BAM are not yet codified into FDOT's Manuals and Specs.	Design practice is new to most WMDs, though included in the BMPTRAINS program; performance measures/expectations are not well established, Research is underway by FDOT.	Additional costs for BAM material which is sometimes offset by reduced pond ROW; when used to remove phosphorus, the design life of the media is predicted to be about 20 years and may then need replacement.	Longer production schedule may be needed to coordinate design and specifications.	Required residence time within BAM layer may require additional storage in ditches or retention ponds.

Appendix B Guidance on Innovative Stormwater Solutions

The guidance below outlines avenues of exploration for discovering potential partners.

1. If the project is in an impaired basin, contact the District NPDES Coordinator to obtain the BMAP stakeholder information and discuss a list of potential partners and available projects for funding. Request to attend a BMAP meeting if one is scheduled. If a potential stakeholder is identified, contact the PM immediately for potential pursuit, especially if the opportunity is time sensitive.
2. Pursue city, county, National Estuary Program (NEP), WMD, and developer partners.
    a. **Wet Detention:** If wet detention is an option, conduct a mounding analysis to determine if the bleeder can be eliminated and the treatment volume can be recovered with a safety factor of 2.
        i. If so, discuss eliminating the bleeder with the WMD to gain their buy-in.
        ii. If not, a bleeder is needed. Discuss with the WMD if the bleed down water may be injected into the ground via a vertical drain. In springsheds, if the wet pond nitrogen removal is insufficient, consider using BAM within the vertical drain or a side bank filter.
        iii. Consider groundwater modelling to verify if the control elevation bleeder may be set above the water table to maximize groundwater recharge and reduce the pond size by gaining credit for wet retention/groundwater recharge.
    b. **Regional Pond**:
        i. Are several of the project sub-basins draining to the same outfall? Is significant future development expected in the watershed (check with Local Planning Departments or Comprehensive Plans) such that future developments would benefit? If so, a regional option may be feasible. Meet or communicate with local governments' stormwater staff to determine if there is an interest in pursuing a cooperative regional pond.
        ii. Is there a location downstream that would have equal or fewer community impacts than typical on-site ponds? Would this location still offer benefits over traditional on-site ponds?
        iii. Will increased project runoff create or worsen flooding or erosion issues between the project and the pond location? If so, could the project runoff be piped or the conveyance improved, given the number of parcels and the length of piping required?

    The issues below should be explored when pursuing regional ponds with potential partners:

iv. Future local project needs,

v. Willingness to take ownership and ongoing maintenance (typically, FDOT pays for the ROW and construction of the regional pond, and then conveys the pond maintenance responsibilities to a local government, while FDOT holds an easement reserving its permitted stormwater requirements),

vi. The partner's willingness to intercede with landowners involved, including involvement at public meetings with locals, and

vii. Retrofitting existing lands or waterbodies (e.g., lakes or borrow pits) to provide improved water quality/attenuation for the region.

c. **Additional offsite inflows**: If new or additional offsite inflows of stormwater or wastewater are being proposed by potential partners, involve the DDrE and the District NPDES Coordinator to determine the District's willingness to accept these additional inflows.

d. **Stormwater re-use**:

i. If the FDOT project is in an urban or suburban area, contact the local government responsible for water supply. Inquire if they are interested in FDOT's stormwater as a raw water supply.

ii. Are there golf courses along the project that might entertain or even welcome additional stormwater for irrigation? If so, approach the owners (public or private) to explore opportunities for them to accept FDOT runoff.

e. **Joint-use Ponds**: Are large developments (residential or commercial) proposed along the highway? Are there existing developments that are land-locked that might exchange storage on their property for an outfall from their property? If so, contact the developer(s) to explore potential partnerships. FDOT can sometimes use a development's internal stormwater management system to address the portion of the roadway fronting the development. This works best when the adjacent property owner is developing a new site and the requirement to accept FDOT runoff can become part of the property's development order.

f. **Springsheds**: For projects in springsheds, estuaries, or areas of nutrient impairment, consider the use of a nutrient removal product such as Bio-sorption Activated Media (BAM) for additional treatment.

If the project is in a springshed Priority Focus Area (PFA) then additional scrutiny will be given from regulators on groundwater discharges (dry retention ponds) as opposed to surface water discharges where denitrification can occur.

Is the groundwater beneath the project contaminated with nitrates? If so, the nitrogen-laden surface or groundwater may be pumped directly into the underground BAM layer

to achieve large removals. In such cases, ask the WMD or local government to take maintenance responsibility for the pump.

Please note that runoff from livestock (such as cattle or horse ranches) adjacent to the project will likely contain ammonia which requires initial sand filtration before the use of BAM; see the DDG Chapter 9 for more details.

g. **Local Government Projects**: Has local government identified projects that will provide significantly more environmental lift than roadside ponds and is the cost approximately within FDOT's planned stormwater management budget? If so, are plans already prepared or can local project production move quickly enough to satisfy FDOT's project timeline? Are there legal, regulatory, or political roadblocks to FDOT's funding of the local project?

h. **Tidal or Lake Circulation Improvements**: If a BMAP identifies tidal or lake flushing issues, does FDOT have a crossing that may be fitted with a bridge, or larger bridge, to allow the needed flushing. For coastal estuaries, areas of poor seagrass coverage are a possible indicator of salinity problems; for inland lakes, trapped legacy sediments can be caused or exacerbated by inadequate flushing velocities within the lake. Modelling and coordination with WMDs, the USACE, and other agencies would be required to verify if flushing would create a water quality improvement. Also, FWC should be contacted for possible funding participation.

i. **Onsite Irrigation:** Is there irrigation adjacent to the project? If so, consider re-use of the pond treatment volume for irrigation rather than bleeding downstream.

j. **Wetland Re-hydration:** Are nearby wetlands underhydrated?

k. **Compensatory Treatment:** Are there upstream areas where retrofit treatment and attenuation could be done as compensation? Look for land already available to FDOT and runoff with high nutrient loading such as agricultural lands.

l. **Minimum Flows and Levels:** Does the project flow to waterbodies with MFLs? Are there MFL deficient waterbodies nearby where additional runoff may be directed?

m. **Critical Water Needs Areas, Water Supply Hardship Areas:** If in these areas, consult the WMD and local governments to assist in directing project runoff into the ground or stored in local lakes.

Appendix C SMARt Template

STORMWATER MANAGEMENT ALTERNATIVES REPORT

Florida Department of Transportation

District X

Project Title

Limits of Project

County, Florida

Financial Management Number: XXXXX-X

ETDM Number: XXXXXX

Date

The environmental review, consultation, and other actions required by applicable federal environmental laws for this project are being, or have been, carried out by FDOT pursuant to 23 U.S.C. §327 and a Memorandum of Understanding dated December 14, 2016, and executed by Federal Highway Administration and FDOT.

PROFESSIONAL ENGINEER CERTIFICATION

STORMWATER MANAGEMENT ALTERNATIVES REPORT

Project: Project Title

ETDM Number: XXXXX

Financial Project ID: XXXXXX-X-XX-XX

Federal Aid Project Number: XXXX XXX X

This Stormwater Management Alternatives Report contains engineering information for the (road name) Watershed Approach to Evaluate Regional Stormwater Solutions from (south/west project limit) to (north/east project limit) in (county name), Florida. 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 as applied through professional judgment and experience.

I hereby certify that I am a registered professional engineer in the State of Florida practicing with [insert Consulting Firm Name], and that I have prepared or approved the evaluation, findings, opinions, conclusions or technical advice for this project.

[Only Sign and Seal the Final Report

Include "DRAFT" on the Cover of the Draft Report]

This item has been digitally signed and sealed by *[Insert P.E. Name]* on the date adjacent to the seal.

Printed copies of this document are not considered signed and sealed and the signature must be verified on any electronic copies.

TABLE OF CONTENTS

LIST OF FIGURES

Figure Page Number

LIST OF TABLES

Table Page Number

1. PROJECT IDENTIFICATION

1.1 Project Description

The project description must be written to allow a person without prior knowledge of the area to clearly understand what the project is and where the project is located. Include:

- The name of the facility (with alternate names if applicable)
- Limits of the proposed project (length and logical termini). Include a project map illustrating the project limits.
- Name of City and County where the project is located
- A brief description of the existing facility
- Purpose and Need for the proposed transportation improvements
- A brief description of the proposed improvements
- Identify the overall project characteristics including, environment and land use context (urban vs. rural project), and project characteristics that impact stormwater management strategies

The documentation above will be generated by WATERSS **Step 1** – Project Identification.

1.2 List of Technical Documents

Include a list of all technical documents prepared for the WATERSS study, such as a preliminary survey or geotechnical reports. Include the date the document was prepared (the initial draft may include dates of draft technical documents. The Final SMARt lists the dates of the final documents).

2. DATA COLLECTION

2.1 WATERSS Comment Report

Include the WATERSS Comment Report generated during the ETDM screening process or EST AOI investigation, consisting of the following four components:

- WATERSS Data Report - compilation of GIS data layers from the WATERSS Data Report.
- WATERSS EST GIS Analysis Results - summary of the water resource GIS findings, the elements and features in the WATERSS Data Report, and relevant information from historical records, permits, and studies.

- ETAT comments pertaining to WATERSS - WATERSS related comments received from ETAT members, if applicable
- Non-regulatory entity comments - WATERSS related comments received from non-regulatory agencies, if applicable.

The documentation above will be generated by WATERSS **Step 2** – Explore and Collect Data and **Step 5** – ETDM Screening.

2.2 Results of Drainage Investigation

Include a general summary of stormwater management information discovered through research from previous studies and records. This section is meant to summarize findings and the reports should be referenced and included as appendices as appropriate. This could include, but is not limited to the following:

- Previous planning studies
- Copies of any previous stormwater studies or watershed masterplans
- Existing roadway and drainage plans - as built
- Proposed alternative alignments and conceptual typical sections
- Existing FDOT ROW maps
- Available copies of permits or previous permits for the project site or projects within the vicinity
- Existing agreements (JPAs, easements, maintenance agreements, etc.)
- Soil types, depth, slope and infiltration rates from existing geotechnical data from previous projects
- Available aerial photography (include local data sources)

The documentation above will be generated by WATERSS **Step 2** – Explore and Collect Data.

2.3 Planning Level Stormwater Analysis Summary

Summarize the anticipated water quality and quantity requirements based on the project information gathered. Include specific regulatory requirements pertaining to open/closed basins, critical water needs, allowable nutrient loadings, minimum flows and levels, springs and OFW discharges, etc.

The documentation in this section will be generated by WATERSS **Step 3** – Determine Stormwater Goals and Requirements.

3. EXTERNAL COORDINATION & PUBLIC INVOLVEMENT

The WATERSS process will provide new opportunities for external coordination and public involvement. The following sections provides a general discussion of these opportunities and how WATERSS is expected to be incorporated into the PD&E Comments and Coordination Report. In addition to the below guidance, it will also be necessary to follow the policies and procedures identified in Part I, Chapter 11 Public Involvement, and Part 2, Chapter 22 Commitments when integrating WATERSS components into the project development process.

3.1 Regulatory Coordination

Briefly describe the approach taken to coordinate with regulatory agencies. Briefly discuss how regulatory comments were considered in the development and refinement of stormwater management alternatives.

Document the discussions, agreements, and permitting conditions with state and federal regulatory agencies. This includes their verbal or written concerns and what was done to allay or remediate these concerns. Also include permitting timetable issues and adjustments made to keep schedule.

Document follow-up decisions and resolutions, as this is intended to be an on-going process.

This is a report of external discussions and their results from WATERSS **Step 6** – Initial Stakeholders and Regulatory Coordination, **Step 7** – Determine Potentially Viable Stormwater Management Strategies, and **Step 9** – Optional: Present Potential Stormwater Strategies at Stakeholders Meeting.

3.2 Stakeholder Coordination

Briefly describe the approach taken to gain stakeholder involvement. Discuss how stakeholder comments were considered in the development and refinement of stormwater management alternatives.

Document the stakeholders and meeting notes generated from initial stakeholder coordination. This could be in the form of smaller meeting discussion notes or the documentation generated from larger meetings (i.e., sign-in sheet, agenda, figures, comments, meeting minutes, etc.).

Document follow-up decisions and resolutions, as this is intended to be an on-going process.

This is a report of stakeholder discussions and their results from WATERSS **Step 6** – Initial Stakeholders and Regulatory Coordination, **Step 7** – Determine Potentially Viable Stormwater Management Strategies, and **Step 8** – Discuss Opportunity for Funding Stormwater Project with Work Program.

3.3 Public Involvement

Briefly describe any public involvement beyond Sections 3.1 and 3.2 above. Discussions with local residents should be reported here.

4. STORMWATER ALTERNATIVES ANALYSIS

4.1 Stormwater Management Alternatives

Summarize all innovative stormwater management alternatives considered during the WATERSS process. Document the elimination of any stormwater management strategies (**Step 4** – Explore Stormwater Solutions). The selected stormwater management alternative is discussed in **Chapter 5**.

From WATERSS **Step 12** – Final DST Coordination and Analysis Meeting, provide the following information for each alternative considered but not pursued:

- General stormwater project concept, including location(s).
- Partner information.
- Funding and schedule.
- Summarize any permitting analyses or discussions with regulatory agencies.
- Provide results of any further technical investigations pursued for the alternative (i.e., preliminary soil borings, or surveys)
- If the alternative was not pursued, provide a brief summary of why the alternative was not selected.

4.2 Stormwater Management Alternatives Comparative Analysis

Provide a comparative analysis of the benefits and impacts of each stormwater management alternative considers in the WATERSS process. Provide the Innovative Solutions Evaluation Matrix to demonstrate how each alternative compare based on the weighed matrix criteria.

4.3 District Stormwater Team Meetings

Provide the minutes and other documentation from important internal discussions between members of the DST. This includes the activities of WATERSS **Step 10** – Meeting of DST to Strategize Further Analysis of Stormwater Management Activities and the following key components from **Step 12** – Final DST Coordination and Analysis Meeting the Final DST Coordination and Analysis Meeting:

- Summary of deliberations over each strategy considered.
- Decision on which strategies to pursue, including issues affecting their confidence in each project.
- Analysis of the basin by basin satisfaction of stormwater permitting criteria – water quality, attenuation, floodplain compensation – on the project.

- Recommendations on the pursuit of innovative solutions identified for each alternative. Such recommendations could speak to negotiation issues with partners, required internal FDOT coordination such as with the Work Program Office, changes to the project schedule, discussions with permitting agencies, or any other prudent effort to secure a chosen stormwater strategy.

4.4 Other Internal Discussions and Meetings

Provide the minutes and other documentation from important internal discussions between members of the DST and the Work Program Office, Management, Legal, and technical leads such as the DDrE, ROW Administrator, District Environmental Manager, etc.

4.5 Identification of the Preferred Alternative

Summarize the features, benefits and impacts of the preferred alternative and describe the basis for the selection of the preferred stormwater management alternative.

5. DESIGN FEATURES OF THE PREFERRED ALTERNATIVE

For this section of the SMARt, the project should be divided into logical segments according to how stormwater will be managed and permitted. This is often corresponding to stormwater basin outfalls but could also be a larger project area corresponding to a larger downstream watershed.

5.1 Engineering Details of the Preferred Alternative

For each preferred alternative, in each section of the project, the items below should be briefly discussed.

Proposed Stormwater Management Facilities - Describe the preferred stormwater alternative concept by segment and including location(s), function(s), partner information, funding, and schedule. Be careful to numerically demonstrate, for each segment of the project, how applicable permitting requirements are satisfied.

Existing Drainage Conditions - Discuss the roadway existing drainage system(s) regarding the following:

- Conveyance of runoff
- Adequacy of flood protection and reported flooding complaints
- Water quality treatment

Proposed Roadway Drainage Design - Discuss the type of roadway conveyance system to be used, especially any features needed to accommodate the preferred stormwater management alternative.

Design constraints, imposed by the preferred stormwater management alternative, should be clearly identified.

Proposed Bridge Drainage Design (if applicable) - Discuss the type of stormwater conveyance system to be used or compensatory treatment required. Environmental and Floodplain Impacts of the Preferred Stormwater Alternatives

5.2 Environmental and Floodplain Impacts of the Preferred Stormwater Alternatives

This section provides a summary of the environmental impacts of the Preferred Alternative. Individual subsections should correspond to project segments and their project segment preferred alternative and should reference corresponding technical reports for detailed description of the issues.

Wetlands

Summarize or reference the Natural Resource Evaluation (NRE) Report. Briefly discuss the impact of the Preferred Alternative on any wetlands or other surface waters. Include approximate acreage and overall functional loss. If wetlands are impacted, briefly discuss the proposed mitigation measures.

Protected Species and Habitat

Summarize or reference the NRE Report. Briefly discuss the effect of the Preferred Alternative on protected species and habitats. Summarize the results of any formal or informal interagency consultation.

Essential Fish Habitat

Summarize or reference the NRE Report. Briefly discuss the effect of the Preferred Alternative on essential fish habitat. Summarize the results of any interagency consultation.

Contamination

Summarize or reference the results of the Contamination Screening Evaluation Report (CSER). Identify all contamination sites and risk rating category assigned to each stormwater management site.

Identify the need for any Level II assessment during the Design Phase.

Floodplain Analysis

Use the Flood Insurance Rate Map (FIRM) to identify any special flood hazard areas. State if the transportation project is located within a regulatory floodway. Summarize the findings of the Location Hydraulics Report and discuss any mitigation proposed as part of the project.

5.3 Permitting

Provide a summary of the permitting approach for the preferred alternative. This will include stormwater management, but could also encompass floodplain compensation, wetland mitigation, water quality, credit banking, compensatory treatment, etc.

Summarize relevant coordination regarding permitting. Provide copies of all meeting minutes with regulatory agencies and any internal meeting minutes related to the preferred permitting approach in the appendices.

5.4 Legal Agreements

Provide a summary of the legal agreements needed for the completion of each preferred alternative. This summary should include a general outline of the responsibilities of FDOT and partnering stakeholders, including funding, schedules, ownership, property transfer, maintenance, monitoring, etc.

Include meeting minutes of negotiations with stakeholders, the District Legal Office and the Right-of-Way office (if needed) documenting the reasons for the formalized agreement in the appendices as appropriate.

Appendix D Pond Siting Process

D.1 Introduction

This section provides the detailed Pond Siting Process associated with identifying, evaluating, and selecting locations for stormwater management ponds. The need for ponds may be driven by regulatory water quality, attenuation, and/or floodplain compensation requirements.

Pond Siting consists of the methods and procedures followed by the FDOT to justify and document the selection of a specific site(s) for the construction of stormwater management facilities. Even when WATERSS is enacted, if pond sites require the purchase of ROW, the pond siting documentation will be included in the Pond Siting Report and is used for the justification of any ROW acquisition associated with meeting the stormwater management requirements of a proposed roadway project. Thus, the traditional Pond Siting Report is not replaced by the SMARt. This justification is important to satisfy the public necessity requirement in case of an eminent domain lawsuit.

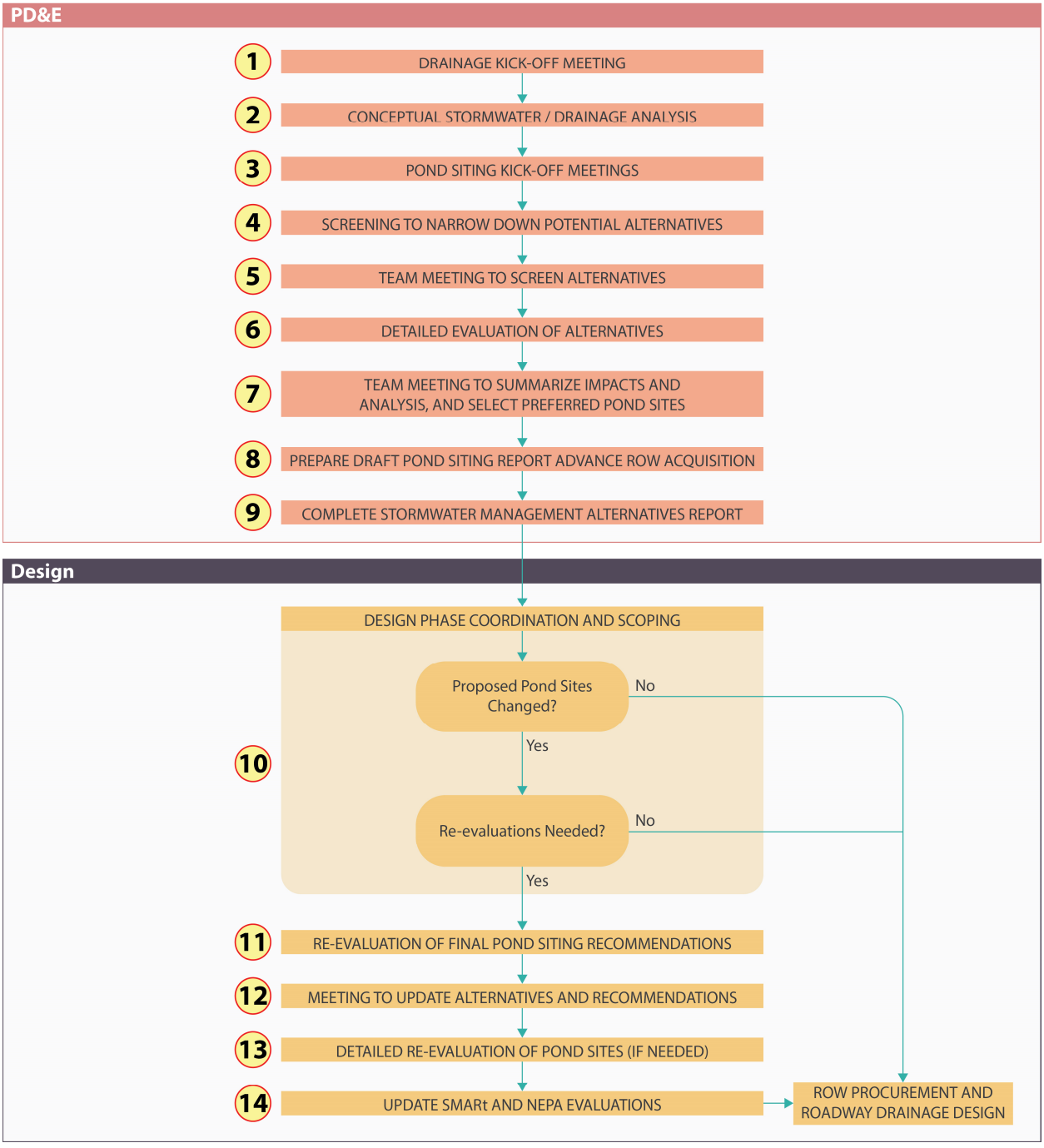
Once it has been determined by the District Stormwater Team (DST) that ponds are needed to meet project requirements, and that the acquisition of right-of-way will be required to accommodate proposed ponds, the Pond Siting Process may commence. This process consists of a multi-discipline effort that supports the need to acquire right-of-way to meet the stormwater management requirements of the project and the location thereof. The overall responsibility of the activities associated with the Pond Siting Process lies with the Project Development & Environmental (PD&E) PM. It is the PM's responsibility to coordinate the efforts of each of the disciplines associated with the Pond Siting Process. Once the PD&E Phase is completed and the Design Phase commences, the responsibility for pond siting shifts to the Design PM.

This procedure outlines the activities associated with the Pond Siting Process during the PD&E Study and the creation of the Pond Siting Report (PSR). If there is a delay between the completion of the PD&E Study and final design, it may be necessary to re-evaluate the findings of the initial PSR. The oversight responsibilities of this re-evaluation lie with the Design PM, including the responsibility to oversee the ultimate coordination with the various individuals in delivering the final right-of-way requirements to the FDOT ROW Office.

The Pond Siting Process shown in **Figure 7** directs designers to prepare proposed pond designs to a level that allows direct comparison of traditional ponds with innovative stormwater solutions. This informs the DST for its decision on which alternative stormwater solutions should be carried forward in parallel to innovative solution. This section lays out the steps and associated tasks for siting ponds during PD&E and Design Phases.

Specific direction given to FDOT PMs is written in *italics* at the forefront of every step of the Pond Siting Process steps explained in this chapter.

Figure 7 Pond Siting Process Flowchart (Step 14 in Figure 1 WATERSS Activities Flowchart)



D.2 Pond Siting Team (PST)

To develop an efficient and effective Pond Siting Process, a multi-disciplinary team, led by the PD&E PM, is established during the PD&E Phase. This team can be comprised of the same members as the District Stormwater Team or different members based on the District's preferences. The PM is responsible for ensuring participation and obtaining information from the team members. The team is made up of professionals, including FDOT personnel and the PD&E Consultant, who provide broad-based input into ROW acquisition for the pond sites. Team members guide the pond siting task with a focus of being cost-effective while striving to avoid and/or minimize social and environmental impact. Once the PD&E Study is complete, the PD&E PM's role is minimized, and pond siting responsibilities will transfer to the Design PM.

The team members are listed below, and their individual pond siting responsibilities are discussed in **Chapter 2**. Note that these individuals must be included in the decisions during the Pond Siting Process:

1. PD&E and Design PMs
2. District Champion (DC)
3. Roadway Engineer
4. Drainage Engineer (DE) (Drainage Office)
5. Environmental Scientist (Planning/Environmental Management (Planning/EMO) Office)
6. Right-of-Way Appraiser/Land Planner (ROW Office)
7. Legal Counsel (District Legal Office)
8. Construction Engineer (District Construction Office)
9. Maintenance Engineer (Area Maintenance Office)
10. Landscape Architect (LA)

D.3 Pond Siting Process

Pond Siting Process During PD&E

The pond siting process is purposefully started in the PD&E Phase to allow sufficient time to evaluate pond sites in preparation for ROW acquisition. During the PD&E Phase, the Pond Siting Process follows these steps:

1. Conceptual Stormwater/Drainage Analysis
2. Pond Siting Kick-off Meeting
3. Initial Evaluation to Narrow Down Potential Alternatives
4. Team Meeting to Screen Alternatives

5. Detailed Evaluation of Alternatives
6. Team Meeting to Summarize Impacts and Analysis, and Select Preferred Pond Sites
7. Prepare Draft PSR and Advance ROW Acquisition
8. Update and Finalize PSR

Step 1 – Conceptual Stormwater/Drainage Analysis

PM: The PM should answer questions and provide additional information as needed by the DE as this analysis continues.

Once it has been determined that either traditional pond sites are needed to meet water quality or water quantity requirements for a project, or the decision has been made by the DST that parallel evaluation will be needed, the DE will begin conceptual analysis. This step involves developing conceptual drainage solutions and recording the information into the draft PSR. The DE begins preliminary examination of the data and develops potential stormwater concepts. This work can occur concurrently with the assembly of preliminary roadway data. Tasks associated with Step 1 include the following:

1. Establish drainage design criteria (may include a pre-permit application meeting with agencies). Criteria should include the following:
    a. Permitting criteria (water quality and quantity as well as discharge limitations).
    b. Rainfall intensity for critical duration events, if required by the Drainage Manual (identify design storm events).
    c. Curve numbers or runoff coefficients.
    d. Times of concentration.
    e. Tailwater criteria (discharge condition and stages).
2. Conduct a review of drainage permit files for the corridor and adjacent developments.
3. Determine drainage basin boundaries using aerial contour maps, old construction plans, and available surveys to identify the primary basins and general outfall locations. In addition, identify high points on the profile to separate the primary basins. Field visits are needed for this determination.
4. Determine major off-site contributing areas.
5. Establish floodplain elevations and potential for encroachment.
6. Identify outfall locations and verify if closed basin criteria apply.
7. Develop generic soils information (obtain from County Soil Conservation Survey or from earlier geotechnical studies conducted in the area).
8. Establish seasonal high ground water table (SHGWT) elevations.

9. Review FDOT right of way for surplus parcels along the corridor.
10. Develop design estimates for water quality and water quantity requirements.
11. Develop an initial system model using a routing program such as Interconnected Channel and Pond Routing Model (ICPR).
12. Determine if water quality and quantity requirements can be met within the existing ROW.
13. Identify alternative pond design options based on project site conditions and available funding. A general rule of thumb for placement of ponds in relatively flat terrain is to target one pond per mile of corridor. In hilly areas, pond locations are typically much more frequent, as driven by the roadway profile. Determine the conceptual feasibility/applicability of the following treatment approaches:
    a. Existing stormwater management facilities – are these adequate to handle the proposed improvements (with or without modifications)?
    b. Dry detention/retention systems.
    c. Potential exfiltration trench options.
    d. Wet detention/retention systems.
14. Identify alternative stormwater management options (consider available funding):
    a. Existing stormwater management facilities – are these adequate to handle the proposed improvements (with or without modifications)?
    b. Potential exfiltration trench options.
    c. Dry detention/retention systems.
    d. Wet detention/retention systems.
15. The DE will coordinate with the ROW Office on some initial sites to discuss at the kick-off meeting.
16. The DE will discuss the area's stormwater management with the DC and local agencies and estimate the impacts of the potential pond sites and the potential for being incorporated into the area plan.

Responsible Parties: DE, DC

Outcome: Conceptual drainage design, including identified types of ponds and their approximate capacity.

Approximate Timeline: 2 months

Step 2 – Pond Siting Kick-off Meeting

*PM: During **Step 1** –* Conceptual Stormwater/Drainage Analysis*, the need for and capacity of on-site ponds were determined. Engage in subsequent steps only if ponds are required and acquisition of ROW is needed.*

Assemble the PST and convene a pond siting kick-off meeting.

The responsibility of the PST is to evaluate pond siting alternatives. Flawed alternatives should be identified at this meeting and be eliminated from further consideration.

Before the meeting, the DE will coordinate with the ROW Office to identify some initial pond sites to discuss at the kick-off meeting.

During the meeting, the following issues should be addressed:

1. Verification of pond design guidelines and criteria (includes district preferences).
2. Identification of potential detention/retention pond sites.
3. Assignment of property ID number to each property to be considered (the ROW Office will provide these numbers.)
4. Assignment of pond site impact analyses to team members.

Responsible Parties: PM and PST

Outcome: A developed framework for further pond site evaluation, including assignment of preliminary pond site analyses to team members.

Approximate Timeline: 2 weeks

Step 3 – Initial Evaluation to Narrow Down Potential Alternatives

*PM: Coordinate initial evaluation of potential pond sites by the PST. This is the follow up to tasks assigned during **Step 2*** – Pond Siting Kick-off Meeting.

This evaluation consists of a general individual review by team members, focusing on their area of expertise, to further narrow down potential alternatives. This effort may include site specific geotechnical testing, survey, constructability reviews, etc.

This review will examine the following:

1. Identify potential environmental impacts and issues (Planning/EMO Office or PD&E consultant):
    a. Natural resources: threatened & endangered species, and wetlands.
    b. Social Resources: Community impacts, mobility, aesthetics, etc.
    c. Cultural Resources: historical resources and archaeological sites and Section 4(f) properties.
    d. Physical impacts: including noise, contamination, air quality, etc.
2. Identify potential relocations (ROW Office).
3. Identify potential development issues (ROW Office – land planner).

4. Identify potential construction issues (Construction Office).
5. Identify potential maintenance issues (Maintenance Office).
6. Identify potential ROW requirements:
    a. Computation of area required (Drainage Office).
    b. Determination of impacts to adjacent properties (ROW Office).
    c. Determination of easement needs (ROW Office).
7. Identify potential ROW costs and damages (ROW Office).
8. Identify potential business damage issues (ROW Office).
9. Consider other social impacts (public input) (Planning/EMO and Drainage Office).

Each member of the PST, when evaluating expected right-of-way takings, should consider the following:

1. Use existing ROW whenever possible.
2. Avoid residential and commercial relocations, if possible.
3. Weigh the impacts of a partial ROW acquisition versus a whole acquisition of the property.
4. Minimize the number of parcels required for pond construction along the corridor.
5. Look at each pond location and how it is situated on the site. Also consider the impacts to the remainder of the parcel and its viability for development. How will it function for its current or future use? Avoid landlocking the remaining property.
6. Review aerials and use vacant land whenever possible and economical. Properties which are fully or partially developed significantly increase the cost of the acquisition particularly when business damages are considered. However, if the use of vacant land will still require partial property acquisition of developed land, this may weigh against the use of said partially vacant land and require the acquisition of the entire property. Establish why a property is vacant and if the property owner has plans for development; land may be vacant because the owner is having difficulty in permitting proposed improvements.
7. Consider the development potential of a property.
8. Look at access management issues and how the remainder of the site will operate. Also consider how maintenance will access the pond site.
9. Avoid pond sites being directly located on state road frontage, if possible.
10. Avoid impacting public and historic facilities, including churches.
11. Avoid and minimize impacts to existing wetland systems and wildlife habitat. When placing ponds near wetlands, check the potential drawdown effects on the wetlands.
12. Avoid placing ponds on or adjacent to contaminated sites. For example, there are various regulatory requirements to ensure proper separation of ponds from contaminated or hazardous

waste sites to ensure that potentially polluted water does not migrate into a project's drainage swales or ponds. If ponds must be located near a contaminated site, there are physical measures that can be considered to restrict such flow (clay core, ditch liner, etc.).

13. Avoid floodplain impacts.
14. Minimize utility relocations and review requirements for utility access for maintenance purposes.
15. Identify if proposed pond sites are candidates for advance acquisition, as might be the case in rapidly developing areas. If so, the ROW Office must have an increased role and the advance ROW process identified in the project schedule.

To identify potential fatal flaws in the alternatives, the PST should:

1. Check wellfield protection zone cone of influence and allowable treatment facilities within wellfield contours.
2. Review U.S. Geological Survey (USGS) Quadrangle Maps and survey data for adequate slope to pond locations. Required piping system depths of 12 feet or deeper cuts are not recommended.
3. Conduct a desktop environmental review of GIS data to identify potential environmental issues. If the GIS data reveal the potential for impacts, conduct a field review to verify conditions.
4. Review land use data and land use plans for potential development that may eliminate potential sites.
5. Avoid placement of either exfiltration trench or dry retention/detention swales adjacent to a contaminated plume, to avoid shifting the plume through exfiltration or infiltration from the drainage system.

Responsible Parties: PST

Outcome: Initial evaluation of potential pond sites.

Approximate Timeline: 2 months

Step 4 – Team Meeting to Screen Alternatives

PM: *Convene the PST to screen pond siting alternatives. PST members should have completed their evaluations before the meeting. At the meeting, discuss and document (1) any needed changes to the standard evaluation matrix, and (2) the project-specific weighting of the matrix's evaluation parameters. Accurately document and justify the changes in parameters and the parameter weights in the SMARt, including meeting minutes that record the basis for conclusions reached at this meeting.*

To establish consistency in the development of PSRs, an evaluation matrix will be used for comparison of alternative pond sites (see **Table 6** and **Table 7**). For the evaluation of stormwater management ponds, the standardized factors (and the corresponding matrix format) shown in **Table 7Table** 7should be considered. Each project's stormwater team has the option, however, of customizing the matrix to satisfy

the particularities of their project. If any of the standardized factors are altered or eliminated, the team will describe in the report the reasons why the factor(s) have been changed or eliminated. This can be done within the matrix description area. If the team decides that one specific factor has a significant bearing on the project, they can decide to weight the factors and discuss the details of the weighting process in the report. The team should use a ranking for each factor that is agreed upon by the entire PST.

During the meeting:

1. Conduct a qualitative evaluation of all alternatives.
2. Prepare a qualitative matrix evaluation.
3. Select a minimum of three alternatives per basin for further evaluation. If three viable alternatives are not available, explain this in the report rather than create a non-competitive alternative to arrive at three sites.
4. As needed, assign refinement of selected alternatives, such as verifying the hydraulic adequacy, to drainage/design team members.

As an immediate follow-up after the meeting,

1. Provide selected (and now refined) alternatives to team members for detailed evaluation.
2. Proceed to evaluate ponds for environmental compliance and inclusion into the PD&E Study.
3. Decide on and pursue the level of survey needed to adequately evaluate potential sites.

Responsible Parties: PM, PST

Outcome: Pond site alternatives are reduced to three sites per basin, with (1) team member assignments allocated for further, more detailed evaluation; (2) evaluation for environmental document compliance engaged; and (3) needed survey requested for the alternative sites still under consideration.

Approximate Timeline: 2-3 weeks

Table 6 Factors for Evaluation

FACTOR	DESCRIPTION/ISSUES TO CONSIDER	COST $	WEIGHTED VALUE
Brief Description of Alternative	Provide a detailed description of the pond site.	N/A	N/A
Parcel Number	Identify the Parcel Number with the Right-of-Way office.	N/A	N/A
Estimated Parcel Size (Acres)	Provide the total area for the required ROW acquisition. The total area is to include the area to meet the water quality/quantity requirements as well as maintenance berm width, slopes, perimeter drainage/conveyance ditch area and access to pond sites for maintenance.	N/A	N/A
Right-of-Way (Zoning)	Describe the status of the parcel in question. For example, the parcel could be currently under a proposed plan for improvement (Rezoning Request) or the site may currently be located on a commercial site with an active business. Consideration should also be given to existing and proposed zoning.	N/A	If there are no zoning issues with the site add 5 points per acre. If there are potential zoning issues, add zero points.
Land Use	Identify the current and/or proposed land use, which could affect the acquisition costs of the parcel. For example, a partial ROW acquisition of a property could have a significant impact on the use of the remaining parcel.	N/A	N/A; however, costs will need to be added to the overall site costs and a weighted value applied accordingly.
Right-of-Way Costs	Identify Right-of-Way Costs associated with the acquisition of the parcel.	$	N/A; however, costs will need to be added to the overall site costs and a weighted value applied accordingly.

Drainage Considerations	Include a description of the system and corresponding outfall location and parameters. Consider pond location such as in the center of the basin, in the low area within the basin, adjacent to the outfall location, and piping needs /costs, etc. Also consider site elevations and the corresponding need to elevate (build-up) the perimeter berm.	$	Meets FDOT's needs – points TBD by Team. Meets most needs – points TBD by Team. Other issues between sites will be depend on construction costs of a facility at each site.
FEMA Flood Zone	Identify the Flood Zone and associated impacts/benefits of a pond within the flood zone. The perimeter berm will affect flood zone storage, while the pond will enhance storage. When right-of-way is acquired within a low-lying area, the construction of the roadway template may affect adjacent properties' ability to use that area for storage.	N/A	Meets FDOT's needs – points TBD by Team. Meets most needs – points TBD by Team. Other issues will depend on the benefit to the floodplain at each site.
Contamination – Hazardous Materials	Identify if the parcel is contaminated; this will limit the ability to use the site. Consideration of this parcel must include the costs associated with the clean-up or protection of the site from contaminated groundwater migration.	N/A	N/A; however, additional costs will need to be added to the overall site costs and a weighted value applied accordingly.
Utilities	Identify existing and proposed utilities within or adjacent to the parcel and the need for access by utility provider. The cost of relocating utilities must be included in the consideration of a parcel.	$	N/A; however, additional costs will need to be added to the overall site costs, and weighted value applied accordingly.
Threatened & Endangered Species (TES) and associated Mitigation Costs	Identify species as Threatened, Endangered, or Protected. Identify the anticipated mitigation costs.	N/A	N/A; however, additional costs will need to be added to the overall site costs, and a weighted value applied accordingly.
Noise	Identify noise impacts and corresponding noise abatement, which may impact the location and placement of pond sites. Consider the need to allow drainage through noise wall.	N/A	N/A; however, additional costs will need to be added to the overall site costs, and a weighted value applied accordingly.

Wetlands /Protected Uplands and associated Mitigation Costs	High values indicate known habitat or historic presence such as Rookery Area. Medium values may be indicative of relatively undisturbed, natural, or stable habitat types. Low values may indicate disturbed habitats. Identify the cost of mitigating for these impacts.	$	N/A; however, additional costs will need to be added to the overall site costs, and a weighted value applied accordingly.
Cultural Resources Involvement and associated Costs	Identify the presence of cultural resources including archaeological and historical resources which could affect the suitability of the site in question and associated costs. Consider the effect, such as a change in drainage, on protected lands.	N/A	N/A; however, costs for additional survey, and other associated costs may need to be added to the overall site costs, and a weighted value applied accordingly.
Section 4(f)	Identify the presence of Section 4(f) properties which could affect the suitability of the site in question and associated costs.	N/A	N/A; however, additional costs for enhancements, landscaping, mitigation, etc. will need to be added to the overall site costs, and a weighted value applied accordingly.
Public Wellfield	The proximity to a wellfield site will have a direct impact on the type of drainage facility which can be placed on the corresponding parcel.	N/A	N/A
Construction	Identify access for construction and associated impacts which may affect construction costs, such as amount of drainage piping required to reach pond.	N/A	No set weighted value is applicable for this item; however, requirements for items identified may have a direct impact on the construction cost. Consider this and add to the overall costs associated with utilizing this site.
Maintenance	Identify the costs of maintaining a facility at this location and the potential for maintenance agreements with others. Consider access costs to the pond site.	$	Working with District Maintenance, staff needs to establish yearly maintenance costs per acre of pond area. This could be a yearly cost, say over a twenty-year period, and brought to present value for inclusion in the overall cost item below. Establish a cost for: • Wet Detention Maint. Cost per Acre $____ • Dry Pond Maint. Cost per Acre $_____

			• Dry Linear Swale Cost per Acre $_____ • Offsite Pond Maintenance by others $_____ At the beginning of the PD&E Study, the PM should consult with the Maintenance Office for current maintenance costs.
Aesthetics	Identify the need for landscape buffers, fencing, variable pond shapes, etc.	N/A	No set weighted value is applicable for this item; however, requirements for fencing, landscaping, littoral shelves, etc. which have a direct impact on the area required to physically set the pond needs to be considered. Costs associated with plants, fencing etc. will need to be added to the overall costs of using the site.
Public Opinion /Adjacent Residency Concerns	Identify possible impacts to current or proposed land use (i.e., schools may dictate a dry pond versus a wet pond).	N/A	N/A; however, this factor may affect the type of system selected for a site.
Other	Joint-Use potential	N/A	If the ability to use joint-use ponds is available, assume a weighted value of 10 per acre-ft of available storage. Otherwise use zero for this value.
Total Applicable Costs	Identify the total cost of the parcel including cost identified from all issues above.	$	Costs vary significantly between rural and urban locations. This value should be used when comparing final costs between alternative pond locations. Engineering judgment will need to be considered and an acceptable cost modifier applied as agreed to by the team members. Use 1 point per 5% differential in cost between alternative sites.
Comments, Advantages, Disadvantages, etc.	Include a detailed description of the Advantages and Disadvantages associated with the parcel in question.	N/A	N/A

Table 7 Pond Siting Evaluation Matrix Example

	Weight of Factor	Factor	Score	Weighted Score	Score	Weighted Score	Score	Weighted Score	Score	Weighted Score
	1-10		1-10		1-10		1-10		1-10	
		Alternative Number	A		B		C		D	
		Brief Description of Alternative	Vacant land near school		Home		Developed		Vacant land	
		Parcel Number	101		105		160		170	
		Parcel Size (Acres)	5		4		3.2		6.5	
1	2	Zoning (Right-of-Way)	5	10	6	12	5	10	6	12
2	7	Land Use	3	21	8	56	3	21	1	7
3	10	Right-of-Way Costs	2	20	8	80	2	20	7	70
4	10	Drainage Considerations	6	60	8	80	6	60	4	40
5	2	FEMA Flood Zone	1	2	3	6	1	2	5	10
6	10	Contamination/Hazardous Materials	7	70	2	20	7	70	3	30
7	6	Utilities	4	24	1	6	4	24	2	12
8	6	Threatened/Endangered Species and Associated Costs	10	60	1	6	5	30	6	36
9	5	Noise	10	50	10	50	3	15	1	5
10	6	Wetlands/Protected Uplands and Associated Costs	2	12	6	36	2	12	7	42
11	6	Cultural Resources Involvement and Associated Costs	6	36	5	30	6	36	6	36
12	6	Section 4(f)	10	60	1	6	1	6	10	60
13	6	Public Wellfield	10	60	1	6	7	42	10	60
14	8	Construction	6	48	3	24	4	32	6	48
15	9	Maintenance	5	45	2	18	10	90	5	45
16	2	Aesthetics	3	6	1	2	10	20	3	6
17	8	Public Opinion/Adjacent Residency Concerns	10	80	6	48	2	16	10	80
18	0	Other	0	0	0	0	0	0	0	0
Comments										
		Score	664		486		506		599	
		Ranking	4		1		2		3	
Note: Rankings are from 1-10, with 10 being the highest score.										

Step 5 – Detailed Evaluation of Alternatives

PM: Coordinate the detailed evaluation of pond alternatives by the PST. The completion of the individual evaluation efforts described below is pivotal to the success of selecting final pond sites in ***Step 6*** – Team Meeting to Summarize Impacts and Analysis, and Select Preferred Pond Sites*.*

An appropriate expert from each resource area should review the evaluation of their respective resource that was completed in **Step 3** – Initial Evaluation to Narrow Down Potential Alternatives and provide a more detailed evaluation of the alternatives with regard to their resources. At a minimum, this includes a desktop evaluation/confirmation of the resources' involvement with the alternative pond sites by the resource experts.

Team members may conduct a field review(s) and obtain survey as deemed necessary. To assess the viability of a potential pond site, the field review should include the verification of potential impacts to resources.

All alternatives remaining viable after this detailed evaluation will be submitted for inclusion in public workshop(s).

Responsible Parties: PST

Outcome: Alternatives identified in Step 5 are fully evaluated in preparation for selecting a preferred pond site in each basin.

Approximate Timeline: 2-3 months

Step 6 – Team Meeting to Summarize Impacts and Analysis, and Select Preferred Pond Sites

PM: Convene the PST to discuss the pond sites evaluation completed in ***Step 5*** – Detailed Evaluation of Alternatives*, review any public comments that were obtained, and select the preferred pond sites.*

During the PD&E public involvement process, reasonable efforts must be made to inform the public/affected property owners of the potential impacts to the community/properties of the proposed improvements. As such, properties identified for potential acquisition for retention/detention ponds should be presented to the public in the same manner as acquisition for geometric requirements. Although the proposed right-of-way acquisition is displayed, the public should be clearly informed that all proposals are preliminary and subject to change as the project develops.

At this meeting, the members of the PST will:

1. Review comments generated from public workshop(s).
2. Update the weighted matrix of alternatives evaluated, if appropriate.
3. Make final matrix recommendations and finalize weighted matrix of alternative pond sites.

At the time the scope of services is established, a decision should be made on when to halt the evaluation, and how much detail is to be written into the report.

1. Projects with a significant time lag between PD&E and Design will need to assess how far the stormwater solutions may be taken during PD&E. Since environmental determinations may be affected by stormwater solutions it will be necessary for the team to identify a point in the analysis where the PD&E study can identify a preferred (transportation) alternative and also ensure that the environmental impacts, mitigation, and/or enhancements from that transportation alternative can be sufficiently analyzed and documented in order to obtain final approval. As such, during the scoping of the PD&E phase this will need to be accounted for.
2. Projects moving straight from PD&E to Design should have a greater amount of detail and a limited number of pond sites established.

In some cases, although a project has a potential for a significant time lapse between the PD&E Study and Design, it may prove beneficial to conduct a more targeted pond siting approach and proceed with advance right-of-way acquisition of those parcels. This approach is prudent particularly with a rapidly developing corridor.

Responsible Parties: PM, PST

Outcome: Selection of preferred pond sites, with the supporting analysis included in environmental document and technical reports to support the environmental document

Approximate Timeline: 2 weeks

Step 7 – Prepare Draft PSR and Advance ROW Acquisition

PM: Coordinate preparation and review of the PSR to include pond siting documentation. If it is in FDOT's interest to pursue advance ROW acquisition, notify the ROW Office; do not wait for completion of the draft PSR for coordination with the property owners and proper public notification. Recognize that, if the future of the project is uncertain, advance ROW should probably not be pursued.

The PSR should be incrementally prepared as the Pond Siting Process unfolds. The PM should coordinate the review of the draft pond siting documentation for inclusion in the draft PSR, draft PER, draft Environmental Document, and the PD&E Public Hearing.

The activities below are performed by the DE in this step:

1. Prepare document containing analyses and evaluation matrix.
2. Complete the drainage system model. Use ICPR or other hydrology & hydraulics modelling software.
3. Submit draft pond siting documentation to the PM for review and comment by team members.

4. Update the document to address team members' comments.

Responsible Parties: PM, DE

Outcome: The Draft PSR should be made available for the PD&E Public Hearing.

Approximate Timeline: 1 month

Step 8 – Update and Finalize PSR

PM: Review comments generated from Public Hearing. Convene the PST to evaluate and address public comments, if needed.

At the PST meeting:

1. Discuss and address comments from the Public Hearing.
2. Re-rank recommended and alternative pond sites, if necessary.
3. Update PSR and recommendations based on team's evaluation.
4. Incorporate final selections into environmental documents and the Preliminary Engineering Report (PER) in accordance with the PD&E Manual.

Responsible Parties: PM, DE, PST

Outcome: PSR and environmental documents are updated as needed.

Approximate Timeline: 2-3 weeks

Pond Siting Process Immediately Preceding Final Design

Step 9 – Design Phase Coordination and Scoping

Design PM: Prior to completion of the Design Scope of Services, hold a coordination meeting between the PD&E PM, the District Consultant Management Office or In-house PM, the ROW Office, and the DDrE, to review the PSR and the corresponding Final Design Scope of Services. Transfer all information pertaining to the project to the design team. At that meeting, communicate all documentation needed to initiate ROW acquisition or discuss the status of any advance ROW acquisition.

Explore the Need for Updating the PSR and Environmental Document Re-evaluations

If the project is moving directly from PD&E to Final Design and no changes are known to have occurred within the corridor, typical roadway drainage design and onsite pond design and ROW acquisition for proposed stormwater ponds may proceed as usual without any of the subsequent steps discussed below in the Pond Siting Process.

If a significant time lag occurs between PD&E and Design or if changes are known to be occurring within the corridor, re-examine the validity of the PSR developed in PD&E by assigning the PST's DE, environmental scientist, and any other specialists as needed, to conduct a field review of recommended pond sites to ensure (1) compatibility with intent of the stormwater design, and (2) that earlier reasons for the pond sites' selection have not been compromised. If pond sites change or are added after Location and Design Concept Acceptance (LDCA), the ROW phase of the project cannot begin until the environmental document re-evaluations are complete for the revised/new pond sites. The PST will be responsible for providing engineering data and input about all issues that have changed since the original PSR was produced.

If changes have occurred that may initiate a re-consideration of the pond's selection or the need for revised environmental document re-evaluations, assemble the original PST (the PD&E Engineer will play a very limited role at this stage) with as many original members as possible. Make comparable replacements for any original team members who are unavailable.

Activities during the Design Phase and Scoping will include:

1. Estimating required scope of services for any pond site re-evaluations, including the need for additional survey and/or geotechnical data.
2. Identifying if there is a need to process a re-evaluation or other necessary phase documentation for the project.

Responsible Parties: PM, ROW Office, PST

Outcome: Design scope of services reflecting events in PD&E, and any needed *environmental document* re-evaluations are identified and scoped. ROW acquisition process is initiated if pond sites have not changed.

Approximate Timeline: 3 weeks

Pond Siting Process During Final Design

PM: Engage Steps 10 - 13 below only if pond sites selected in the PSR have materially changed from their conditions at the time of the completion of the PSR, as determined in Step 10. If pond sites have not changed from the PSR developed in PD&E, proceed directly to standard ROW procurement and roadway drainage design.

Step 10 – Re-Evaluation of Final Pond Siting Recommendations

PM: Provide team members a summary of relevant changes discovered during the field review in ***Step 9*** – Design Phase Coordination and Scoping*, directing the PST to re-evaluate the documentation of the PD&E study related to pond sites. Assign Update of Preliminary Drainage Report to Drainage/Design team members.*

Provide plans to PST members during all formal phase reviews.

Responsible Parties: PM, PST

Outcome: PST members re-evaluate changed pond sites for verification and need for a design change re-evaluation or supplemental EIS.

Approximate Timeline: 1 month

Step 11 – Meeting to Update Alternatives and Recommendations

PM: Re-convene the PST to review pond recommendations and changes.

At this meeting, the PST should:

1. Identify sites that have significant changes requiring re-ranking of recommendations.
2. Identify alternative pond sites for re-evaluation by team members.
3. Identify additional design information, survey and geotechnical data required for final re-evaluation of pond sites.
4. Refine pond site layouts with real site geometrics for the viable recommended sites and identified alternative sites.

Responsible Parties: PM, PST

Outcome: PST members have reviewed changed pond sites and additional engineering data is identified for pursuit. Pond site layouts are refined.

Approximate Timeline: 1 week

Step 12 – Detailed Re-Evaluation of Pond Sites (If Needed)

PM: This step is the follow-through by the PST after the meeting in the previous step.

1. Re-evaluate remaining viable recommended sites and identified alternate sites:
    a. Potential environmental impacts and permit issues (EMO with Drainage support on issues).
    b. Potential relocations (ROW Office).
    c. Potential development issues (ROW Office – Land Planner and Drainage Office).
    d. Potential construction issues (Construction Office).
    e. Potential maintenance issues (Maintenance Office).
    f. Potential ROW costs and impacts (ROW Office).
    g. Potential relocation costs (ROW Office).

h. Property acquisition costs (ROW Office).

i. Potential business damage costs (ROW Office).

j. Potential demolition and remediation costs (ROW Office).

k. Potential social impacts (Planning/EMO and Drainage Offices).

2. Team members conduct field reviews as necessary.

3. Finalize pond site layout with site geometrics for the viable recommended sites and identified alternatives.

Responsible Parties: PM, PST

Outcome: Changes to previous pond sites are evaluated in preparation for PST discussion and updating of documents in **Step 13** – Update PSR and Environmental Document Evaluations.

Approximate Timeline: 3 weeks

Step 13 – Update PSR and Environmental Document Evaluations

PM: Convene the PST to review the findings from the previous step, update the matrix as necessary, recommend final pond sites for project, update the PSR based on team evaluations, and finalize the information needed to complete the environmental document re-evaluation or Supplemental EA/EIS. Send the preferred pond sites to right-of-way mapping as identified in the revised PSR. Send the updated environmental document re-evaluation information to the PD&E PM for incorporation into the re-evaluation document. Send ROW requirements to the ROW Office for procurement.

A sample outline for a PSR is included in **Table 8** below.

Responsible Parties: PM, PST, ROW Office

Outcome: PSR is updated, environmental document re-evaluations are completed, ROW acquisition begins.

Approximate Timeline: 4 weeks (this time frame does not include any needed review and approval time for the environmental document re-evaluation.)

Table 8 Sample Outline for a Typical Pond Siting Report

EXECUTIVE SUMMARY

I. INTRODUCTION
[Exhibit A]

II. PROJECT DESCRIPTION
2.1 Site Description [Exhibit B]
2.2 Roadway Improvements [Exhibit C]

III. SITE INFORMATION

- 3.1 Topography
- 3.2 Hydrologic Data [Exhibit D]
- 3.3 Land Use Description
- 3.4 Wetland and Vegetative Cover
- 3.5 100-year Floodplain
- 3.6 Geology and Hydrogeology
- 3.7 Hazardous Material Assessment
- 3.8 Habitat Assessment (EFH and Endangered Species Issues)
- 3.9 Historical and Archaeological Assessment
- 3.10 Utilities
- 3.11 Existing Drainage Basins (Predevelopment)
- 3.12 Regulatory Issues and Design Criteria [Exhibit E]

IV. DRAINAGE SYSTEM DESCRIPTION

- 4.1 Post Development Conditions
- 4.2 Pond Siting Selection Criteria
- 4.3 Pond Siting Alternative Analysis

V. RIGHT OF WAY ACQUISTION COSTS

VI. RECOMMENDATIONS

EXHIBITS

- Exhibit A- Location Map
- Exhibit B- Existing Roadway Typical Section
- Exhibit C- Proposed Roadway Typical Section
- Exhibit D- Rainfall Data
- Exhibit E- Typical Cross Sections for Stormwater Treatment Ponds
- Exhibit F- Pond H Site Plan
- Exhibit G- Pond Siting Matrix

APPENDICES

- Appendix A- Pond Siting Plan
- Appendix B- Geotechnical Data
    a. Excerpts from Draft Preliminary Report of Geotechnical Exploration
    b. Excerpts from Draft Preliminary Report of Geotechnical Exploration
    c. Excerpts from the PD&E Geotechnical Investigation

d. Excerpts from Soil Survey of Lake County, Florida
e. Excerpts from Soil Survey of Orange County, Florida

Appendix C- Rainfall

Appendix D- Floodplain Data

Appendix E- Pond Siting Calculations

a. Water Quality and Attenuation
b. Pond Area Requirements (Proposed Locations)
c. Pond Area Requirements (Alternative Locations)
d. Recovery Time (Preliminary Evaluation)
e. ICPR Pre-Development Model Input & Results
f. ICPR Post-Development Model Input & Results