Volusia Blue Spring
Basin Management Action Plan

Division of Environmental Assessment and Restoration
Water Quality Restoration Program
Florida Department of Environmental Protection

with participation from the
Volusia Blue Spring Stakeholders

June 2018

2600 Blair Stone Rd.
Tallahassee, FL 32399
floridadep.gov

Acknowledgments

The Florida Department of Environmental Protection (DEP) adopted the *Volusia Blue Spring Basin Management Action Plan (BMAP)* by Secretarial Order as part of its statewide watershed management approach to restore and protect Florida's water quality. The plan was developed in coordination with stakeholders, identified below, with participation from affected local, regional, and state governmental interests; elected officials and citizens; and private interests.

Florida Department of Environmental Protection
Noah Valenstein, Secretary

Table A-1. Volusia Blue Spring stakeholders

Type of Entity	Name
Responsible Stakeholders	City of DeBary City of DeLand City of Deltona City of Lake Helen City of Orange City Volusia County
Responsible Agencies	Florida Department of Agriculture and Consumer Services Florida Department of Environmental Protection Florida Department of Health Florida Department of Transportation St. Johns River Water Management District
Other Interested Stakeholders	Blue Spring Alliance Florida Fish and Wildlife Conservation Commission Florida Onsite Wastewater Association Homeowners/Citizens Save the Manatee Club Stetson University University of Florida Institute of Food and Agricultural Sciences

See **Appendix A** for links to important sources referenced in this document. For additional information on total maximum daily loads and nutrient management strategies for the Volusia Blue Spring Basin, contact:

Moira Homann, Basin Coordinator
Florida Department of Environmental Protection
Water Quality Restoration Program, Watershed Planning and Coordination Section
2600 Blair Stone Road, Mail Station 3565
Tallahassee, FL 32399-2400
Email: moira.homann@dep.state.fl.us
Phone: (850) 245–8460

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List of Acronyms and Abbreviations

ac	Acre
ATU	Aerobic Treatment Unit
AWT	Advanced Wastewater Treatment
BAF	Biochemical Attenuation Factor
BMAP	Basin Management Action Plan
BMP	Best Management Practice
CASTNET	Clean Air Status and Trends Network
cfs	Cubic Feet Per Second
CMAQ	Community Multi-Scale Air Quality
DEP	Florida Department of Environmental Protection
DMR	Discharge Monitoring Report
DO	Dissolved Oxygen
F.A.C.	Florida Administrative Code
F.A.R.	Florida Administrative Register
FDACS	Florida Department of Agriculture and Consumer Services
FDOH	Florida Department of Health
fDOM	Fluorescent Dissolved Organic Matter
FDOT	Florida Department of Transportation
FF	Farm Fertilizer
FLUCCS	Florida Land Use Cover and Forms Classification System
FOWA	Florida Onsite Wastewater Association
F.S.	Florida Statutes
FSAID	Florida Statewide Agriculture Irrigation Database
FYN	Florida Yards and Neighborhoods
GIS	Geographic Information System
GPD	Gallons Per Day
IA	Implementation Assurance
IDDE	Illicit Discharge Detection and Elimination
IV	Implementation Verification
lb-N/ac	Pounds of Nitrogen Per Acre
lb-N/yr	Pounds of Nitrogen Per Year
in/yr	Inches Per Year
LSJR	Lower St. Johns River
LVS	Linear Vegetation Index
LW	Livestock Waste
MFL	Minimum Flows and Levels
mg/L	Milligram Per Liter
MGD	Million Gallons Per Day
NADP	National Atmospheric Deposition Program
NELAC	National Environmental Laboratory Accreditation Conference
NELAP	National Environmental Laboratory Accreditation Program

NNC	Numeric Nutrient Criteria
NOI	Notice of Intent
NOx-N	Nitrate-Nitrite Nitrogen
NPDES	National Pollutant Discharge Elimination System
NSF	NSF International (formerly National Sanitation Foundation)
NSILT	Nitrogen Source Inventory and Loading Tool
NTN	National Trends Network
OAWP	Office of Agricultural and Water Policy
OFS	Outstanding Florida Spring
OSTDS	Onsite Sewage Treatment and Disposal System
PBTS	Performance-based Treatment System
PFA	Priority Focus Area
PSA	Public Service Announcement
QA/QC	Quality Assurance/Quality Control
RIB	Rapid Infiltration Basin
RPS	Rapid Periphyton Survey
SAV	Submerged Aquatic Vegetation
SBIO	Statewide Biological (Database)
SCI	Stream Condition Index
SJRWMD	St. Johns River Water Management District
SOP	Standard Operating Procedure
STF	Sports Turfgrass Fertilizer
SWIM	Surface Water Improvement and Management
TMDL	Total Maximum Daily Load
TN	Total Nitrogen
TP	Total Phosphorus
UF-IFAS	University of Florida Institute of Food and Agricultural Sciences
UFA	Upper Floridan Aquifer
UTF	Urban Turfgrass Fertilizer
USDA	U.S. Department of Agriculture
USGS	U.S. Geological Survey
WAFR	Wastewater Facility Regulation (Database)
WBID	Waterbody Identification (Number)
WIN	Watershed Information Network
WMD	Water Management District
WRF	Water Reclamation Facility
WWTF	Wastewater Treatment Facility

Executive Summary

Volusia Blue Spring Basin

The Florida Springs and Aquifer Protection Act (Chapter 373, Part VIII, Florida Statutes [F.S.]), provides for the protection and restoration of Outstanding Florida Springs (OFS), which comprise 24 first magnitude springs, 6 additional named springs, and their associated spring runs. The Florida Department of Environmental Protection (DEP) assessed water quality in each OFS and determined that 24 of the 30 OFS are impaired for the nitrate form of nitrogen. Volusia Blue Spring is an impaired first magnitude OFS.

The Volusia Blue Spring Basin Management Action Plan (BMAP) area (**Figure ES-1**) comprises 108 square miles and encompasses portions of the City of DeBary, City of DeLand, City of Deltona, and City of Lake Helen; all of the City of Orange City; and a portion of unincorporated Volusia County.

Volusia Blue Spring Priority Focus Area (PFA)

The PFA (see **Appendix C**) is a subarea within the BMAP boundary. It represents the area in the basin where the aquifer is most vulnerable to inputs and where there are the most connections between groundwater and Volusia Blue Spring. The PFA includes the City of Orange City and portions of Volusia County, City of DeLand, City of DeBary, and City of Deltona (**Figure ES-1**).

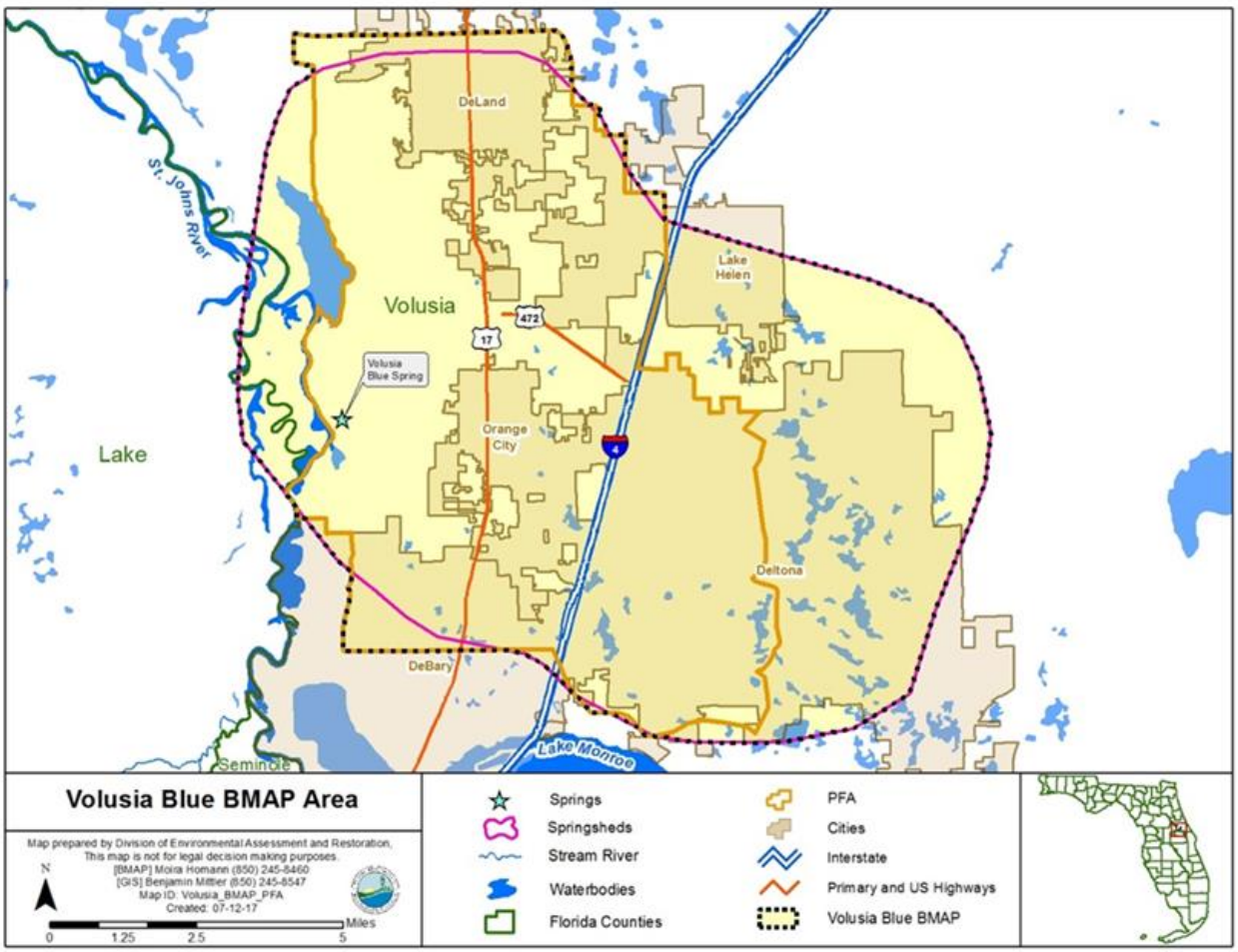

Figure ES-1. Volusia Blue Spring BMAP area and PFA boundaries

Nitrogen Source Identification, Required Reductions, and Options to Achieve Reductions

DEP adopted nutrient total maximum daily loads (TMDLs) for Volusia Blue Spring and Volusia Blue Spring Run in 2014. The TMDLs established a monthly average nitrate target of 0.35 milligrams per liter (mg/L).

Onsite sewage treatment and disposal systems (OSTDS or septic systems; the terms are used interchangeably throughout this document) represent 54 % of the estimated nitrogen loading to groundwater, urban turfgrass fertilizer (UTF) 22 %, and wastewater treatment facilities (WWTFs) and reuse 12 %, (8 % and 4 %, respectively) of the total loading to groundwater based on based on DEP's analysis conducted using the Nitrogen Source Inventory Loading Tool (NSILT).

The total load reduction required to meet the TMDL at the spring vent is 61,653 pounds of nitrogen per year (lb-N/yr). To measure progress towards achieving the necessary load reductions, DEP is establishing the following milestones:

- Initial reduction of 18,496 lb-N/yr (30 %) within 5 years.
- An additional 30,827 lb-N/yr (50 %) within 10 years.
- The remaining 12,331 lb-N/yr (20 %) within 15 years.
- For a total of 61,653 lb-N/yr within 20 years.

The policies and submitted projects included within this BMAP are estimated to achieve a reduction of 170,743 to 230,310 lb-N/yr to groundwater. While reductions to groundwater will benefit the spring, it is uncertain to know with precision how those reductions will impact the necessary reductions at the spring. DEP will continue to monitor the spring to evaluate those reductions as projects are implemented against the required load reductions above. The BMAP is designed to achieve 80 % of the load reductions needed for the spring vent within 10 years of adoption and 100 % within 15 years. DEP will evaluate progress towards these milestones and will report to the Governor and Florida Legislature. DEP will adjust management strategies to ensure the target concentrations are achieved. This may include expanding the area to which the OSTDS remediation policies apply; any such change, however, would be incorporated into an updated BMAP through a formal adoption process.

For the list of projects to improve water quality, see **Appendix B**. Included are owner-implemented best management practices (BMPs) for farm fertilizer (FF), livestock waste (LW), and sports turfgrass fertilizer (STF); WWTF upgrades; projects to reduce UTF application; and OSTDS conversions to sewer.

Successful BMAP implementation requires commitment, dedicated state funding, and follow-up. Stakeholders have expressed their intention to carry out the plan, monitor its effects, and continue to coordinate within and across jurisdictions to achieve nutrient reduction goals. As the TMDLs must be achieved within 20 years, DEP, water management districts (WMDs), Florida Department of Health (FDOH), and Florida Department of Agriculture and Consumer Services (FDACS) will implement management strategies using the annual Legacy Florida appropriation from the legislature of at least $50 million to reduce nitrogen in impaired OFS. DEP, working with the coordinating agencies, will continue to invest existing funds and explore other opportunities and potential funding sources for springs restoration efforts.

Restoration Approaches

Load reduction to the aquifer is needed to achieve the load reduction requirements at the spring vent. To ensure that load reductions are achieved at the spring vent, the following restorations actions are being established. These actions are designed to reduce the amount of nutrients to the aquifer, which will reduce the load at the vent and ultimately achieve the necessary reductions. Monitoring of the vent during implementation will be implemented to monitor progress.

- **New OSTDS** – Upon BMAP adoption, the OSTDS remediation plan prohibits new systems on lots of less than 1 acre within the PFA, unless the system includes enhanced treatment of nitrogen as defined by the OSTDS remediation plan, or unless the OSTDS permit applicant demonstrates that sewer connections will be available within 5 years. Local governments and utilities are expected to develop master wastewater treatment feasibility analyses within 5 years to identify specific areas to be sewered or to have enhanced nitrogen reducing OSTDS within 20 years of BMAP adoption. The OSTDS remediation plan is incorporated as **Appendix D**.

- **Existing OSTDS** – Upon completion of the master wastewater treatment feasibility analyses, FDOH rulemaking, and funding program for homeowners included in the OSTDS remediation plan, but no later than 5 years after BMAP adoption, modification or repair permits issued by FDOH for all OSTDS within the PFA on lots of less than 1 acre will require enhanced treatment of nitrogen, unless sewer connections will be available based on a BMAP-listed project. All OSTDS subject to the policy must include enhanced treatment of nitrogen no later than 20 years after BMAP adoption.

- **WWTFs** − The effluent standards listed in **Table ES-1** will apply to all new and existing WWTFs in the BMAP area (inside and outside the PFA).

Table ES-1. WWTF effluent standards

gpd = Gallons per day

95% of the Permitted Capacity (gpd)	Nitrogen Concentration Limits for Rapid Infiltration Basins (RIBs) and Absorption Fields (mg/L)	Nitrogen Concentration Limits for All Other Land Disposal Methods, Including Reuse (mg/L)
Greater than 100,000	3	3
20,000 to 100,000	3	6
Less than 20,000	6	6

- **UTF** – UTF sources can receive up to 6 % credit for DEP's approved suite of public education and source control ordinances. Entities have the option to collect and provide monitoring data to quantify reduction credits for additional measures.

- **STF –** STF sources include golf courses and other sporting facilities. Golf courses can receive up to 10 % credit for implementing the Golf Course BMP Manual. Other sports fields can receive up to 6 % credit for managing their fertilizer applications to minimize transport to groundwater.

- **FF** – All FF sources are required to implement BMPs or perform monitoring to demonstrate compliance with the TMDL. A 15 % reduction to groundwater is estimated for owner-implemented BMPs. Additional credits could be achieved through better documentation of reductions achieved through BMP implementation or implementation of additional agricultural practices, such as precision irrigation, soil moisture probes, controlled release fertilizer, and cover crops.

- **LW** – All LW sources are required to implement BMPs or perform monitoring. A 10 % reduction to groundwater is estimated for owner-implemented BMPs. Additional credits could be achieved through better documentation of reductions achieved through BMP implementation.

Section 1: Background

1.1 Legislation

Chapter 373, Part VIII, Florida Statutes (F.S.), created the Florida Springs and Aquifer Protection Act to provide for the protection and restoration of Outstanding Florida Springs (OFS), which comprise 24 first magnitude springs, 6 additional named springs, and their associated spring runs. The Florida Department of Environmental Protection (DEP) has assessed water quality in each OFS and has determined that 24 of the 30 OFS are impaired for the nitrate form of nitrogen. Volusia Blue Spring is one of the impaired first magnitude OFS. Development of the basin management action plan (BMAP) to meet the new requirements of the Florida Springs and Aquifer Protection Act for the Volusia Blue Spring Basin was initiated in 2016.

1.2 Water Quality Standards and Total Maximum Daily Loads (TMDLs)

A TMDL represents the maximum amount of a specific pollutant that a waterbody can assimilate while maintaining its designated use and still meet water quality standards, including its applicable water quality criteria. Volusia Blue Spring and Volusia Blue Spring Run are Class III waterbodies, with a designated use of recreation, propagation, and maintenance of a healthy, well-balanced population of fish and wildlife. These waters are impaired by nitrate, which in excess has been demonstrated to adversely affect flora or fauna through the excessive growth of algae. Excessive algal growth results in ecological imbalances in the spring and run and can produce human health problems, foul beaches, inhibit navigation, and reduce the aesthetic value of the resources.

DEP adopted nutrient TMDLs for Volusia Blue Spring and Volusia Blue Spring Run in 2014 (**Table 1**). The TMDLs established a monthly average nitrate target of 0.35 milligrams per liter (mg/L). The period of record for water quality data evaluated for the TMDLs was January 1, 2001 through May 22, 2013.

Table 1. Restoration targets for Volusia Blue Spring and Volusia Blue Spring Run

Waterbody or Spring Name	Waterbody Identification (WBID) Number	Parameter	TMDL (mg/L)
Volusia Blue Spring	28933	Nitrate as monthly average	0.35
Volusia Blue Spring Run	28933A	Nitrate as monthly average	0.35

1.3 BMAP Requirements

Section 403.067(7), F.S., provides DEP the statutory authority for the BMAP Program. A BMAP is a comprehensive set of strategies to achieve the required pollutant load reductions. In addition to the BMAP statutory authority, the Florida Springs and Aquifer Protection Act (Part VIII of Chapter 373, F.S.) describes additional requirements for the 30 Outstanding Florida Springs.

1.4 BMAP Area

The BMAP area (**Figure 1**) comprises 108 square miles and encompasses portions of the City of DeBary, City of DeLand, City of Deltona, and City of Lake Helen; all of the City of Orange City; and a portion of unincorporated Volusia County. The BMAP area includes the surface water basin as well as the groundwater contributing area for the spring (or springshed). The springshed, an area of land that contributes water to a spring or group of springs mainly via groundwater flow, was delineated by St. Johns River Water Management District (SJRWMD) based on U.S. Geological Survey (USGS) potentiometric surface contour maps.

1.5 Priority Focus Area (PFA)

In compliance with the Florida Springs and Aquifer Protection Act, this BMAP delineates a PFA. A PFA is defined as the area(s) of a basin where the Floridan aquifer is generally most vulnerable to pollutant inputs and where there is a known connectivity between groundwater pathways and an OFS. The PFA provides a guide for focusing strategies where science suggests these efforts will best benefit the spring. The document that describes the delineation process for the PFA is on the DEP website. The link to the PFA document is included in **Appendix C**.

1.5.1 Description

Nitrogen sources are more likely to influence groundwater quality under certain conditions. For example, where soils are sandy and well drained, less nitrogen is converted to gas and released into the atmosphere or taken up by plants, compared with other soil types. Therefore, local soil types play a role in how much nitrogen travels from the land surface to groundwater in a specific springshed. Also, the underlying geologic material influences the vulnerability of the underlying aquifers and the rate of lateral movement within the Floridan aquifer toward the spring. These conditions, and others, were considered in the delineation of the Volusia Blue Spring PFA (see **Appendix C**).

Following BMAP adoption, DEP will ensure that the GIS files associated with the PFA boundary are available to the public on the DEP Map Direct webpage.

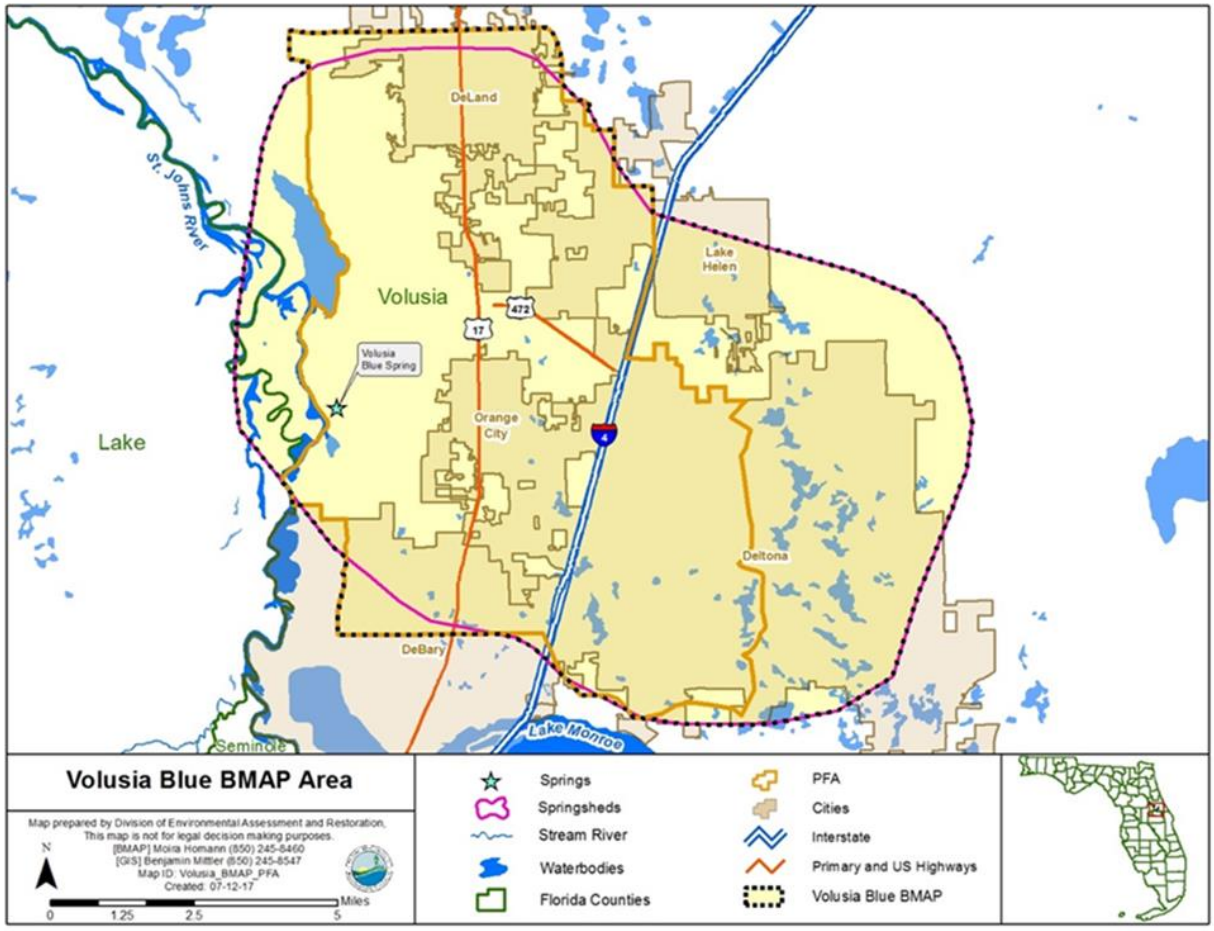

Figure 1. Volusia Blue Spring and Volusia Blue Spring Run BMAP area and PFA boundaries

1.5.2 Additional Requirements

In accordance with Section 373.811, F.S., the following activities are prohibited in the PFA:

- New domestic wastewater disposal facilities, including rapid infiltration basins (RIBs), with permitted capacities of 100,000 gallons per day (gpd) or more, except for those facilities that meet an advanced wastewater treatment (AWT) standard of no more than 3 mg/L total nitrogen (TN) on an annual permitted basis.

- New onsite sewage treatment and disposal systems (OSTDS) on lots of less than one acre inside the PFA, unless additional nitrogen treatment is provided, as specified in the OSTDS plan (see **Appendix D** for details).

- New facilities for the disposal of hazardous waste.

- The land application of Class A or Class B domestic wastewater biosolids not in accordance with a DEP-approved nutrient management plan establishing the rate at which all biosolids, soil amendments, and sources of nutrients at the land application site can be applied to the land for crop production while minimizing the amount of pollutants and nutrients discharged to groundwater or waters of the state.

- New agriculture operations that do not implement BMPs, measures necessary to achieve pollution reduction levels established by DEP, or groundwater monitoring plans approved by a water management district (WMD) or DEP.

1.5.2.1 Biosolids and Septage Application Sites

In the PFA, the aquifer contributing to the spring is highly vulnerable to contamination by nitrogen sources and soils have a high to moderate tendency to leach applied nitrogen. DEP previously documented elevated nitrate concentrations in groundwater beneath septage application zones in spring areas. To assure that nitrogen losses to groundwater are minimized from permitted application of biosolids and septage in the PFA, the following requirements apply to newly-permitted application sites and existing application sites upon permit renewal.

All permitted biosolids application sites that are agricultural operations must be enrolled in the FDACS BMP Program or be within an agricultural operation enrolled in the FDACS BMP Program for the applicable crop type. Implementation of applicable BMPs will be verified by FDACS in accordance with Chapter 5M-1, Florida Administrative Code (F.A.C.). Permitted biosolids application sites that are new agricultural operations must also comply with Subsection 373.811(5), F.S. Biosolids application sites must be certified as viable agricultural operations by an acknowledged agricultural professional such as an agricultural consultant or agricultural extension agent. Effective nutrient management practices must be ongoing at the application zones in the permit. Plant uptake and harvesting are vital components of the nutrient management plan to remove nitrogen and prevent it from leaching to groundwater. If DEP determines that the site is not a viable agricultural site implementing a nutrient management plan, corrective action will be required.

Groundwater monitoring for nitrate is required for all biosolids and septage land application sites in the PFA to assure compliance with nutrient management objectives in this BMAP. However, groundwater monitoring is not required if the site nutrient management plan limits biosolids application rates of TN with no adjustment for available nitrogen normally allowed by subsections 62-640.500(5) and (6), F.A.C. (e.g., for a recommended fertilizer rate of 160 pounds of nitrogen per acre, only 160 pounds of TN per acre shall be applied). For septage application, groundwater monitoring is not required if the site nutrient management plan limits application rates to 30,000 gallons per acre for sites accepting mixtures of septage and grease (food establishment sludge) or to 40,000 gallons per acre for sites accepting septage without grease.

The permit renewal application will include a trend analysis for nitrate in groundwater monitoring wells during the previous permit cycle, and an evaluation of the potential for the facility to cause or contribute to exceedance of the TMDL.

1.6 Other Scientific and Historical Information

In preparing this BMAP, DEP collected and evaluated credible scientific information on the effect of nutrients, particularly forms of nitrogen, on springs and springs systems. Some of the information collected is specific to Volusia Blue Spring, while other references provide information on spring restoration topics such as nitrogen-reducing technologies, the treatment performance of OSTDS, and runoff following fertilizer applications.

1.7 Stakeholder Involvement

Stakeholder involvement is critical to develop, gain support for, and secure commitments in a BMAP. The BMAP process engages stakeholders and promotes coordination and collaboration to address the pollutant load reductions necessary to achieve the TMDLs. DEP invites stakeholders to participate in the BMAP development process and encourages public participation and consensus to the greatest practicable extent. **Table A-1** identifies the stakeholders who participated in the development of this BMAP.

During the development of the Volusia Blue Spring BMAP, DEP held a series of meetings involving stakeholders and the general public. The purpose of these meetings was to consult with stakeholders to gather information, evaluate the best available science, develop an OSTDS remediation plan (including a public education plan), define management strategies and milestones, and establish monitoring requirements. All the technical meetings were open to the public and noticed in the *Florida Administrative Register* (F.A.R.). Additionally, a public meeting on the BMAP was held on August 31, 2017 and was noticed in the F.A.R. and in local newspapers.

Upon BMAP adoption, DEP intends to facilitate annual meetings with stakeholders to review progress towards achieving the TMDLs.

1.8 Description of BMPs Adopted by Rule

Table 2 identifies the adopted BMPs and BMP manuals that may be relevant to this BMAP.

Table 2. BMPs and BMP manuals adopted by rule as of June 2017

Agency	F.A.C. Chapter	Chapter Title
FDACS Office of Agricultural Water Policy (OAWP)	5M-6	Florida Container Nursery BMP Guide
FDACS OAWP	5M-8	BMPs for Florida Vegetable and Agronomic Crops
FDACS OAWP	5M-9	BMPs for Florida Sod

Agency	F.A.C. Chapter	Chapter Title
FDACS OAWP	5M-11	BMPs for Florida Cow/Calf Operations
FDACS OAWP	5M-12	Conservation Plans for Specified Agricultural Operations
FDACS OAWP	5M-13	BMPs for Florida Specialty Fruit and Nut Crop Operations
FDACS OAWP	5M-14	BMPs for Florida Equine Operations
FDACS OAWP	5M-16	BMPs for Florida Citrus
FDACS OAWP	5M-17	BMPs for Florida Dairies
FDACS OAWP	5M-18	Florida Agriculture Wildlife BMPs
FDACS OAWP	5M-19	BMPs for Florida Poultry
FDACS Division of Agricultural Environmental Services	5E-1	Fertilizer
FDACS Division of Aquaculture	5L-3	Aquaculture BMPs
FDACS Florida Forest Service	5I-6	BMPs for Silviculture
FDACS Florida Forest Service	5I-8	Florida Forestry Wildlife BMPs for State Imperiled Species
DEP	62-330	Environmental Resource Permitting

Section 2: Implementation to Achieve TMDLs

2.1 Allocation of Pollutant Loads

DEP collected and evaluated credible scientific information on the effect of nutrients, particularly forms of nitrogen, on the Volusia Blue Spring, described below.

2.1.1 Nutrients in the Spring and Spring System

DEP developed the Nitrogen Source Inventory Loading Tool (NSILT) to provide information on the major sources of nitrogen in the groundwater contributing area and spring contributing area. The NSILT is a GIS-and spreadsheet-based tool that provides spatial estimates of the relative contribution of nitrogen from major nitrogen sources while considering the transport pathways and processes affecting the various forms of nitrogen as they move from the land surface through the soil and geologic strata.

The first major factor to consider in estimating the loading to groundwater in the NSILT is the attenuation of nitrogen as it moves from its source through the environment, before it reaches the Upper Floridan aquifer (UFA). The movement of nitrogen from the land surface to groundwater is controlled by biological and chemical processes that occur as part of the nitrogen cycle, as well as hydrogeological processes. Many of these processes attenuate (impede or remove) the amount of nitrogen transported to groundwater. An understanding of how water moves through the subsurface and the processes that transform the different forms of nitrogen is essential for estimating nitrogen loading to groundwater from various sources.

A second major factor to consider in estimating the loading to groundwater is the geologic features in the springshed and the related "recharge rate." Water movement between the shallow groundwater (surficial aquifer, where present) and the deeper aquifer (the UFA) is slowed by a low-permeability layer of clay, silt, and fine sand that retards the vertical movement of infiltrating water from the surface. The UFA occurs in limestone that can be prone to dissolving, and over geologic time, the development of numerous karst features (sinkholes, caves, and conduits). These features allow water from the land surface to move directly and relatively rapidly into the aquifer and in some areas for groundwater in the aquifer to move rapidly to the springs.

Potential recharge rates from the surface to the UFA are affected by variations in the geologic materials and presence of karst features. DEP estimated the recharge rate ranges and grouped them into three rate categories, which were applied in the NSILT:

- Low recharge (Less than 5 inches per year [in/yr]).
- Medium recharge (5 to 15 in/yr).
- High recharge (15 in/yr or greater).

In the NSILT, DEP applied different attenuation factors to different types of sources, so that various biological, chemical, and hydrogeological effects could be estimated. The attenuation that was applied means that the amount of nitrogen that left a source (such as a livestock operation or a yard that was just fertilized) reduces the amount of nitrogen predicted to reach the aquifer. In the NSILT, the average attenuation rates range from 90 % (for atmospheric deposition) to 25 % (for wastewater disposal in a RIB). This means that, for these examples, it is expected that only 10 % of nitrogen from atmospheric deposition reaches the aquifer, while 75 % of nitrogen from a RIB would be expected to reach groundwater, because the remainder is attenuated by various chemical and biological processes.

Phosphorus is naturally abundant in the geologic material underlying much of Florida and is often present in high concentrations in surface water and groundwater. Monitoring and evaluation of phosphorus and influences on the springs continues as the nitrate TMDLs are implemented.

2.1.2 Estimated Nitrogen Loads

Table 3 lists the estimated nitrogen loads to groundwater by source. Note that urban stormwater loads are included in urban turfgrass fertilizer (UTF) estimates, while agricultural stormwater loads are included in farm fertilizer (FF) and livestock waste (LW) loading estimates. Nitrogen loading to surface water will be reduced through the activities and strategies for the sources identified in this chapter for groundwater loading.

Table 3. Estimated nitrogen load to groundwater by source in the springshed

Nitrogen Source	Estimated Total Nitrogen Load to Groundwater (lb-N/yr)	Percent Contribution (%)
OSTDS	278,365	54
UTF	110,965	22
Atmospheric Deposition	25,872	5
FF	10,295	2
Sports Turfgrass Fertilizer (STF)	20,295	4
LW	4,131	1
Wastewater Treatment Facility (WWTF)	41,693	8
WWTF–Reuse	22,478	4
Total	**514,094**	**100**

2.1.3 Assumptions and Considerations

The NSILT estimates are based on the following assumptions and considerations:

- **NSILT Nitrogen Inputs** – The methods used to estimate nitrogen inputs for each pollutant source were based on a detailed synthesis of information, including direct water quality measurements, census data, surveys, WWTF

permits, published scientific studies and reports, and information obtained in meetings with agricultural producers. For some pollutant source categories, nitrogen inputs were obtained using assumptions and extrapolations, and as a result, these inputs could be subject to further refinement if more detailed information becomes available.

- **OSTDS Load Contribution** – A per capita contribution to an OSTDS of 9.012 lb-N/year was used to calculate the loading from OSTDS. The average household contribution was estimated based on 2010 U.S. Census Data on average number of people per household (2.38 for Volusia County) and additional information on the amount of time spent away from home by the school-age population and labor force (adjusted effective persons per household of 2.00 for Volusia County).

- **Nitrogen Attenuation Factors** – To estimate the amount of nitrogen loading to the aquifer, DEP applied two nitrogen attenuation factors. Biological and chemical processes that occur as part of the nitrogen cycle, as well as hydrogeological processes, control the movement of nitrogen from the land surface to groundwater. Biochemical attenuation accounts for biochemical processes that convert or transform the different forms of nitrogen, while hydrogeological attenuation accounts for spatial variations that affect the rate of water infiltrating through geological media to recharge the UFA. Given the relatively large range of literature-reported values of nitrogen biochemical attenuation for each source category, DEP used an average biochemical attenuation factor for each source based on land use practices and hydrogeological (i.e., recharge) conditions in the contributing areas.

Other assumptions and considerations for BMAP implementation include the following:

- **Unquantified Project Benefits** – Nitrogen reductions for some of the projects and activities listed in this BMAP cannot currently be quantified. However, because of their positive impact, it is assumed that these actions will help reduce pollutant loads, and estimated loading reductions may be determined at a later date and assigned to these activities.

- **Atmospheric Deposition** – Atmospheric sources of nitrogen are local, national, and international. Atmospheric sources are generally of low nitrogen concentration compared with other sources and are further diminished through additional biological and chemical processes before they reach groundwater. Atmospheric deposition sources and trends be re-evaluated periodically.

- **OSTDS Inventory and Loading Calculations** – The total number of OSTDS in the basin is estimated based on local information and FDOH data. Future BMAPs and the associated OSTDS loading calculations may be adjusted based on improved data on the number, location, and type (conventional and enhanced nitrogen reducing) of existing septic systems and may include additional OSTDS installed since BMAP adoption.

- **PFA**– The PFA provides a guide for focusing strategies where science suggests efforts will best benefit the spring. The PFA boundary may be adjusted in the future if additional relevant information becomes available.

- **Project Collection Period –** The BMAP project collection period is limited to projects after a certain date, based on the data used to calculate the reductions needed. Reductions from older projects are already accounted for in the baseline loading. Projects completed in the springshed after January 1, 2010, were considered for inclusion in this BMAP. The collection period overlaps the TMDL period of record (January 1, 2001 through May 22, 2013) to account for groundwater travel time to the spring.

- **Legacy Sources** – Land uses or management practices not currently active in the basin may still be affecting the nitrate concentration of Volusia Blue Spring and Volusia Blue Spring Run. The movement of water from the land surface through the soil column to the UFA and through the UFA to the spring system varies both spatially and temporally and is influenced by localized soil and aquifer conditions. As a result, there may be a lag in time between when nitrogen input to the UFA occurred and ultimately when that load arrives at Volusia Blue Spring. The impact of this delay is not fully known.

- **Implementation Schedule** – BMAP implementation will be a 20-year process. This plan defines nitrogen reduction milestones for 5-year (30 %), 10-year (50 %), and 15-year (20 %) implementation, so that the TMDLs will be met no later than the 20-year goal (see **Section 2.1.6** for further details). Further, the total reductions and the project credits may be adjusted under the adaptive management approach used for the BMAP. This approach requires regular follow-up to ensure that management strategies are carried out and that their incremental effects are assessed. This process acknowledges that there is some uncertainty associated with the outcomes of proposed management strategies and the estimated response of concentration at the spring. As more information is gathered and progress towards each 5-year milestone is reviewed, additional management strategies to achieve the TMDLs will be developed or existing strategies refined to better address the sources of nitrogen loading.

- **Changes in Spring Flows** – The role of this BMAP is specifically to promote the implementation of projects that reduce the nitrogen load to groundwater while the minimum flow and levels (MFLs) established for Volusia Blue Spring addresses water flows and levels. To maximize efforts between the two programs, spring protection projects should provide both water quality and quantity benefits.

2.1.4 Loading by Source

From the NSILT, the pie chart in **Figure 2** depicts the estimated percentage of nitrogen loading to groundwater by source in the springshed. Septic systems represent 54 % of the nitrogen load to groundwater, UTF 22 %, WWTFs and WWTFs reuse combined 12 %, STF 4 %, and LW and FF combined 3 %. Stormwater loading to groundwater is incorporated in the various source categories.

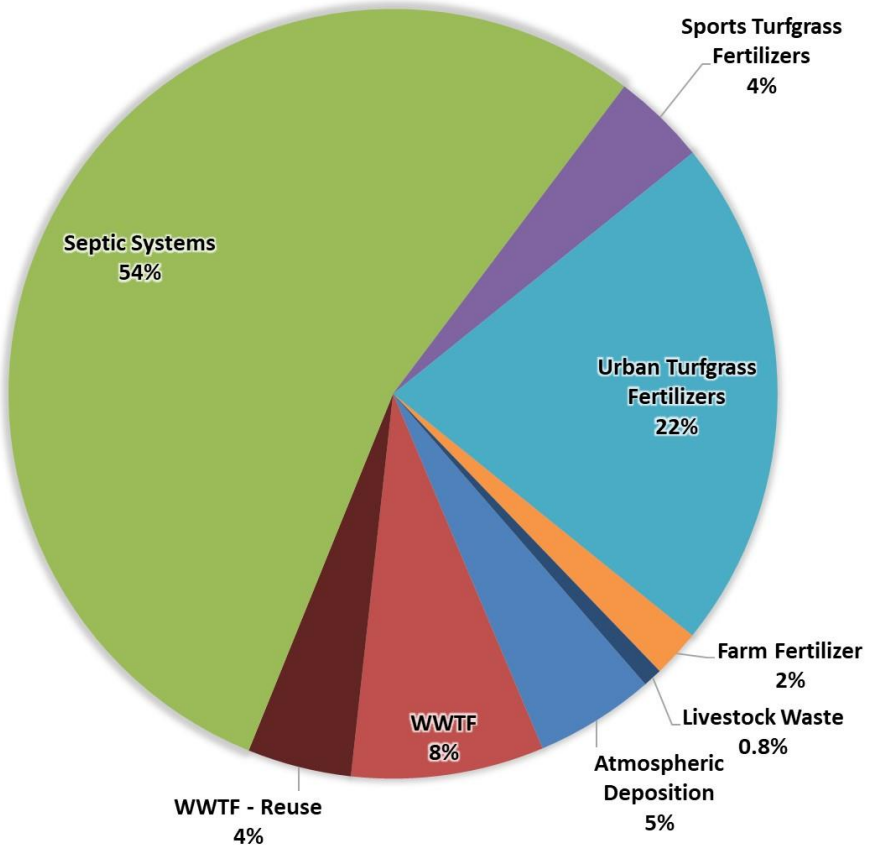

Figure 2. Loading to groundwater by source in Volusia Blue BMAP area

2.1.5 Loading Allocation

The nitrogen source reductions are based on the 2001 through 2017 measured loads (concentration and flow data using the upper 95th percent confidence interval) in dry weather periods (November through April) at the Volusia Blue spring vent compared to the loads that would result from the TMDL concentration of 0.35 mg/L and the dry weather flows from 2001 through 2017 (using the upper 95th percent confidence interval). In the Volusia Blue springshed, during the wet season, spring vent flow is higher and lower concentrations of nitrate are observed, likely as a result of lower nitrate freshwater (from rainfall) quickly entering the system. Analyzing Volusia Blue's response to source inputs and the resulting impacts to the aquifer, the most realistic approximation of this spring system's condition appears to occur during dry season conditions. Therefore, the load calculated for the dry season months was used as the required reduction to meet the TMDL. Additionally, using this load will ensure that the TMDL target (condition) is achieved during wet and dry conditions.

Table 4 lists the measured nitrate load at the spring vent and the TMDL loading based on a target nitrate concentration of 0.35 mg/L. The difference between the spring vent loading and the TMDL loading estimates is the required reduction to meet the TMDLs. The total load that is required to be reduced in the basin is being allocated to the entire basin and actions defined by the BMAP to reduce loading to the aquifer are needed to implement this allocated load.

These calculated loads are representative of the reduction required to meet the TMDL and are not necessarily the same as the NSILT load to the groundwater surface, due to each spring system responding differently to localized variables affecting the aquifer. These variables may include surface water inflow, fate and transport within the aquifer system, structural nature of the spring system, impact of upwelling deep aquifer water, complexity of the conduit system feeding the spring vent, and differences in seasonal (wet/dry) conditions.

For the spring systems where the impact of these variables may be more accurately determined, an adjustment to the calculated load based on the NSILT load to groundwater may be made by determining if an increase or decrease is required. If the impact of these aquifer variables is not well understood, the initial calculated load will be used and modified as more information is collected and incorporated.

Table 4. Total nitrate reduction required to meet the TMDLs

Description	Nitrogen Loads (lb-N/yr)	Notes Regarding Data Used
Total Load at Spring Vent	162,550	Upper 95 % confidence interval – headspring nitrate and flow data (dry weather periods) from 2001 to 2017
TMDL Load	100,897	TMDL target is 0.35 mg/L and upper 95 % confidence interval of headspring flow data (dry weather periods) from 2001 to 2017
Required Reduction	**61,653**	

2.1.6 Description of 5-, 10-, and 15-year Milestones/Reduction Schedule

The overall load reduction targets are 30 % of the total within 5 years; 80 % of the total within 10 years; and 100 % of the total within 15 years. DEP will evaluate progress towards these milestones and will report to the Governor and Florida Legislature. DEP will adjust management strategies that reduce loading to the aquifer to ensure the target concentrations are achieved. This may include expanding the area to which the OSTDS remediation policies apply; any such change, however, would be incorporated into an updated BMAP through a formal adoption process.

Table 5 lists the estimated nitrogen reductions needed by milestone. Progress will be tracked yearly, and adjustments made as needed. At the five-year milestone, progress will be assessed, and load reductions adjusted as necessary. Entities have flexibility in the types and locations of projects as long as they achieve the overall required load reductions. The monitoring of existing groundwater and springs sampling locations is essential. **Section 2.2** describes detailed source reduction strategies.

Table 5. Nitrogen reduction schedule (lb-N/yr)

5-Year Milestone (30 % of Total)	10-Year Milestone (50 % of Total)	15-Year Milestone (20 % of Total)	Total Nitrogen Reduction (100 %)
18,496	30,827	12,331	**61,653**

2.2 Prioritization of Management Strategies

The management strategies listed in **Appendix B, Appendix D,** and **Appendix F** are ranked with a priority of high, medium, or low. In 2016, the Florida Legislature amended the Watershed Restoration Act (Section 403.067, F.S.), creating additional requirements for all new or revised BMAPs. BMAPs must now include planning-level details for each listed project, along with their priority ranking.

Project status was selected as the most appropriate indicator of a project's priority ranking based primarily on need for funding. Projects with a "completed" status were assigned a low priority. Projects classified as "underway" were assigned a medium priority because some resources have been allocated to these projects, but additional assistance may be needed for the project to be completed. High priority was assigned to projects listed with the project status "planned" as well as certain "completed" projects that are ongoing each year (any project with one of these project types: "street sweeping," "catch basin inserts/inlet filter cleanout," "public education efforts," "fertilizer cessation," "fertilizer reduction," or "aquatic vegetation harvesting"), and select projects that are elevated because substantial, subsequent project(s) are reliant on their completion.

2.3 Load Reduction Strategy

A precise total load reduction to groundwater needed to meet the TMDL is unknown and dependent on a number of complex factors. Ultimately there must be a reduction at the spring

vent of at least 61,653 lb-N/yr. Based on the totals of all the credits from BMAP actions and policies, the range of total reductions to groundwater is between 170,743 and 230,310 lb-N/yr (see **Table 6**). However, due to the proximity of these reductions to the spring and the uncertainties of fate and transport in the karst geology, additional actions may be necessary to ensure that the loading at the vent is achieved within the timeline of the BMAP.

To achieve reductions outside the scope of the policies listed, additional project options are available to local entities but have not been planned. Other efforts that could be pursued would further reduce the nitrogen load to groundwater in the Volusia Blue Spring Basin.

Table 6. Summary of potential credits for the Volusia Blue Spring BMAP to meet the TMDLs

Note: No reductions are estimated for atmospheric deposition sources.

Nitrogen Source	Credits to Load to Groundwater Based on Project Tables (lb-N/yr)	Description
OSTDS	120,138 – 175,586	Credits are based on lots less than 1 acre inside the PFA being remediated by either enhancing an OSTDS or connecting to sewer. An estimated 0 lb-N/yr have been provided as OSTDS remediation projects which may be on these lots or in the larger BMAP area. Any projects outside the PFA or inside the PFA on lots greater than 1 acre would add additional reductions to the estimates listed.
UTF	7,210	DEP-approved credits (6 %) for public education activities as well as credits identified for stakeholder stormwater projects
STF	1,991	6 % BMP credit for sports fields and 10 % BMP credit for golf courses on STF load to groundwater, assuming 100 % BMP implementation on golf courses and sports fields
FF	1,544	15 % BMP credit on FF load to groundwater, assuming 100 % owner--implemented and verified BMPs on all fertilized lands
LW	413	10 % BMP credit on load to groundwater, assuming 100 % owner-implemented and verified BMPs at all livestock facilities
WWTF	38,418	Achieved by BMAP WWTF policy (achieving 3 or 6 mg/L) and verified WWTF projects
Total Credits from BMAP Policies and Submitted Projects	**169,714 – 225,162**	
Advanced Agriculture Practices and Procedures	1,030 – 5,148	Includes 10 % to 50 % reduction from 100 % of fertilized acres with a change in practice
Total Credits	**170,743 – 230,310**	**Load reduction to meet the TMDL at the spring vent is 61,653 lb-N/yr**

2.4 OSTDS Management Strategies

Overall, there are currently over 26,000 OSTDS in the PFA on lots less than one acre, based on FDOH estimates. This BMAP lists one specific project (**Appendix B**) that reduces nitrogen loading from existing OSTDS on variably sized parcels. **Figure 3** shows the locations of all OSTDS in the BMAP area.

In addition to the one listed project, DEP assessed the overall OSTDS loading compared with other nitrogen sources in the PFA, as well as the relative loading in the wider BMAP area. Based on these assessments, OSTDS contribute more than 20 % of nonpoint source nitrogen pollution to the OFS. Per the Volusia Blue Spring NSILT, septic systems contribute 54 % pollutant loading in the springshed area and 39 % of the nitrogen loading in the PFA. Cumulatively, nitrogen loading from OSTDS within this springshed result in the significant degradation of groundwater that impacts the Volusia Blue Spring BMAP area. Therefore, the comprehensive remediation of OSTDS, consistent with the requirements of this BMAP, is necessary to prevent associated groundwater and surface water contamination so that the TMDL can ultimately be achieved and so that increases in nitrogen loads from future growth are limited. The OSTDS remediation plan is incorporated as **Appendix D**.

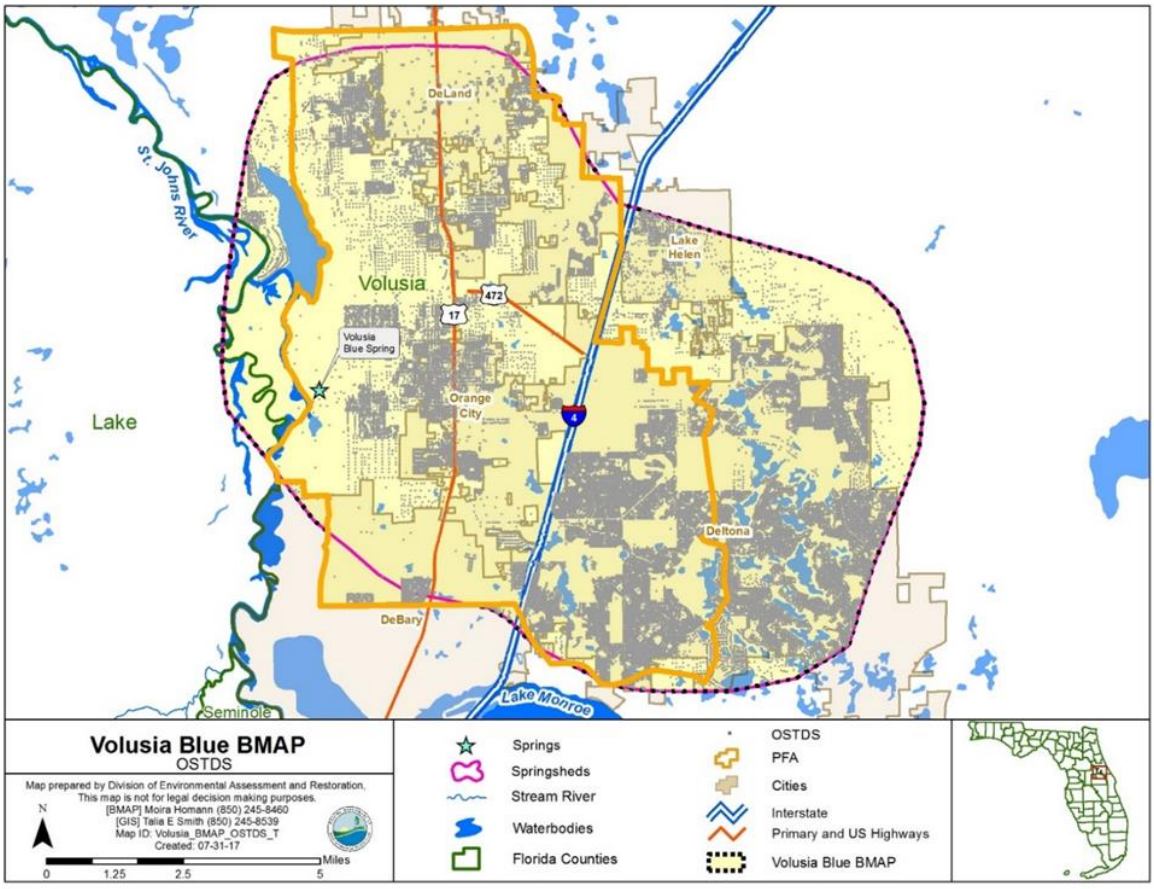

Figure 3. OSTDS locations in the Volusia Blue Spring BMAP area and PFA

In addition to the actions outlined in the OSTDS remediation plan (incorporated into this BMAP as **Appendix D)**, remedial efforts on existing conventional OSTDS could achieve nitrogen reductions. **Table 7** summarizes the nitrogen inputs, attenuation and recharge factors, and loads to groundwater for a conventional OSTDS. The conventional OSTDS nitrogen input is based on a per capita contribution of 9.012 lb-N/yr. This value is multiplied by the effective population, which is the estimated number of people per household with consideration to age distribution to account for school or working age population who likely have access to sewer connected facilities during away from home hours (i.e., 2.00 effective population in counties within the BMAP). Percent reductions for enhanced or replaced systems are applied to the conventional OSTDS nitrogen groundwater loads to evaluate possible improvements to groundwater. Enhanced OSTDS can achieve an estimated 65 % improvement in the load to groundwater compared to a conventional system. OSTDS replaced by sewer reduce the conventional nitrogen inputs by an estimated 95 %, assuming a sewer connection to a WWTF meeting AWT levels.

The results show an estimated nitrogen reduction (i.e., credit) of 5.3 in high recharge areas, 2.9 in medium recharge areas, and 0.6 in low recharge areas for each enhanced OSTDS and an estimated nitrogen reduction of 7.7 in high recharge areas, 4.3 in medium recharge areas, and 0.9 in low recharge areas for each replaced OSTDS. Estimated costs for retrofitting (onsite treatment improvements) or removing (sewering) OSTDS range from $10,000 to $20,000 per system, which would be anticipated to be offset somewhat by cost-share from state funds. These costs can be refined as projects are completed and detailed cost data are available.

Table 7. Estimated individual OSTDS improvements to groundwater

Recharge Category	Conventional OSTDS Load To Groundwater (lb-N/yr/OSTDS)	Credit Per System (lb-N/yr/OSTDS)	
		Enhanced OSTDS	Replaced OSTDS
Nitrogen Input	18	–	–
Attenuation (0.5)	9.0	–	–
Low Recharge (0.1)	0.9	0.6	0.9
Medium Recharge (0.5)	4.5	2.9	4.3
High Recharge (0.9)	8.1	5.3	7.7

2.5 UTF Management Strategies

Fertilizers applied to the turfgrass typically found in residential and urban areas (including residential lawns and public green spaces) are referred to as UTF. These are applied by either the homeowner or a hired lawn service company on residential properties, while on nonresidential properties they may be applied by contractors or maintenance staff.

2.5.1 Fertilizer Ordinance Adoption

As required by the Florida Legislature, as described in Subsection 373.807(3), F.S., local governments with jurisdictional boundaries that include an OFS or any part of a springshed or delineated PFA of an OFS are required to develop, enact, and implement a fertilizer ordinance by

July 1, 2017. The statutes require any ordinance to be based, at a minimum, on the DEP model ordinance for Florida-friendly fertilizer use on urban landscapes.

Volusia County, a charter county, enacted a fertilizer ordinance in 2014 (Ordinance 2014-09) that applies to the unincorporated areas of the county as well as to the municipalities within Volusia County. For this county ordinance, municipalities are allowed to have less stringent requirements for their jurisdictions, respectively. The county ordinance includes the provisions outlined in the DEP model ordinance as well as additional measures and, therefore, meets the statutory requirements; some municipalities have less stringent ordinances in place but still follow the model ordinance and the statutory requirements. These provisions are also eligible for project credit for promoting nitrogen controls at the source.

2.5.2 Prioritized Management Strategies and Milestones

Based on the fertilizer ordinances and public education activities in place at the time of BMAP adoption, the associated credits for UTF reductions to groundwater are 2,447 lb-N/yr (see **Table 8**). Additional environmental benefits could be credited if the counties and municipalities implement other public education efforts and source control ordinances, as described in **Section 2.5.3.** Local stormwater projects that treat urban runoff, including nitrogen from urban fertilizer, are also in place (see **Appendix B**) for an estimated reduction to groundwater of 552 lb-N/yr.

Since there is uncertainty regarding the input data used in the NSILT estimates to calculate the UTF loading to groundwater, DEP will work toward collecting better data by documenting reductions with stakeholders. Also, DEP will work with stakeholders to develop additional measures to reduce fertilizer application.

Table 8. Current project credits to reduce UTF loading to groundwater

Project Category	Project Credits (lb-N/yr) Based on Management Actions in Appendix B
Fertilizer Ordinances and Public Education Activities	2,447
Stormwater Improvements	552
Total Project Credits	**2,998**

2.5.3 Additional UTF Reduction Options

The anticipated reduction from UTF sources is currently limited to 6 % of the estimated load to groundwater. This reduction can be achieved through a 6 % total credit if each local government has an applicable fertilizer ordinance, landscape ordinance, irrigation ordinance, and pet waste ordinance; carries out public education activities; and implements the Florida Yards and Neighborhood (FYN) Program (see **Table 9**).

If all the local governments implement the full suite of public education measures, a 6,658 lb-N/yr reduction can be achieved. Currently, local governments' public education credits total 2,447 lb-N/yr. Thus, an additional 4,211 lb-N/yr reduction could be achieved through public education and source control efforts.

Appendix E contains technical support information that further explains the concepts presented in this section, including nitrogen loading by source category, reduction obligations, and management strategies.

Table 9. Maximum UTF load reductions based on existing public education credit policies

UTF Source Control Measures	Credit Based on Estimated Load to Groundwater (%)	Possible Nitrogen Credits (lb-N/yr)
Fertilizer Ordinance	0.5	555
Pet Waste Ordinance	0.5	555
Landscape Ordinance	0.5	555
Irrigation Ordinance	0.5	555
FYN Program	3.0	3,329
Public Education Program	1.0	1,110
Total Possible Credits	**6.0**	**6,658**

2.6 STF Management Strategies

Sports turfgrass areas fall into two main categories that are evaluated separately: golf courses and sporting facilities such as baseball, football, soccer, and other fields. There are 5 golf courses covering 874 acres in the Volusia Blue Spring BMAP area. The majority of the golf course acreage is located in high recharge areas (646 acres) and medium recharge areas (201 acres). The majority of the sporting facility acreage is located in high recharge area (106 acres).

2.6.1 Prioritized Management Strategies and Milestones

DEP will work with sports field managers and golf course superintendents to ensure relevant BMP implementation and to estimate reductions associated with these efforts. To improve the golf course loading estimate over a literature-based approach, DEP will also confer with golf course superintendents to identify the actual rate of fertilizer application to update the estimate of the golf course load to groundwater. Golf courses are expected to implement the BMPs described in the DEP BMP manual, *Best Management Practices for the Enhancement of Environmental Quality on Florida Golf Courses* for an estimated 10 % reduction in loads to groundwater.

Managers of sports fields can also assist by reducing fertilizer use, using products that reduce leaching, and more efficiently irrigating their sports turf. The estimated credit for better management of nongolf sports turfgrass is 6 % of the starting load to groundwater. Based on these approaches, the initial reduction from STF sources is 1,991 lb-N/yr, as listed in **Table 10**.

Table 10. Maximum load reductions from STF improvements based on existing credit policies

STF Source Control Measures	Credit Based on Estimated Load to Groundwater (%)	Possible Nitrogen Credits (lb-N/yr)
Golf Course BMP Implementation	10	1,933
Sports Fields BMPs	6	58
Total Possible Credits		**1,991**

2.7 Agricultural Sources Management Strategies and Addition Reduction Options

Based on data, including Florida Statewide Agriculture Irrigation Demand (FSAID) IV geodatabase land use, FDACS identified agricultural acreage within the BMAP. An estimated 5,209 acres of land in the springshed are considered agricultural, of which 3,187 acres are livestock lands, 261 acres are identified as crop fertilizer lands, and 1,761 acres are identified as both fertilizer croplands and livestock lands.

2.7.1 FF Loading

Nitrogen in agricultural fertilizer is applied at varying rates, depending on the crop, time of year, and individual farm practices. The NSILT estimated total nitrogen load to groundwater from FF is 10,295 lb-N/year, approximately 2 % of the total nitrogen load to groundwater in the BMAP area**.** FF includes commercial inorganic fertilizer applied to row crops, field crops, pasture, and hay fields.

2.7.2 LW Loading

Agricultural practices specific to LW management were obtained through meetings with University of Florida Institute of Food and Agricultural Sciences (UF-IFAS) extension staff, FDACS field representatives, agricultural producers, and stakeholders. The NSILT estimated the total nitrogen load to groundwater from LW is 4,131 lb-N/year, or 1 % of the total nitrogen load to groundwater in the BMAP area

2.7.3 Prioritized Management Strategies and Milestones

Subsection 403.067, F.S., requires agricultural nonpoint sources in a BMAP area either to implement the applicable FDACS-adopted BMPs, which provides a presumption of compliance with water quality standards, or conduct water quality monitoring prescribed by DEP or SJRWMD that demonstrates compliance with water quality standards. Further, based on the Florida Springs and Aquifer Protection Act, Subsection 373.811(5), F.S., prohibits any new agricultural operations within PFAs that do not implement applicable FDACS BMPs, measures necessary to achieve pollution reduction levels established by DEP, or groundwater monitoring plans approved by WMD- or DEP. Failure to implement BMPs or conduct water quality

monitoring that demonstrates compliance with pollutant reductions may result in enforcement action by DEP (s. 403.067(7)(b), F.S.).

FDACS will work with applicable producers within the BMAP area to implement BMPs. As of September 30, 2016, Notice of Intents (NOIs) covered 88 acres in the Volusia Blue springshed. No producers are conducting water quality monitoring in lieu of implementing BMPs at this time. **Appendix B** lists project information. **Appendix G** provides detailed information on BMPs and agricultural practices in the BMAP area.

With crop-specific BMP enrollment or monitoring for FF areas, an estimated 1,544 lb-N/yr reduction to groundwater can be achieved, based on an average reduction of 15 % in the nitrogen load to groundwater. While DEP has listed larger percentage reductions in nitrogen from agricultural BMPs in estimating benefits to surface waters; the best data available on benefits to groundwater from BMPs indicate that a 15 % reduction in the load to groundwater where owner-implemented BMPs are in place. This number could increase as more data are collected on the impact of BMPs to groundwater.

For livestock operations, owner-implemented BMPs are expected to achieve a reduction of 413 lb-N/yr, using an estimated 10 % reduction from owner-implemented BMP implementation at livestock operations.

Summarizing the reductions discussed above, the total reduction from BMP implementation from all agricultural sources is 1,957 lb-N/yr.

2.7.4 Additional Agricultural Reduction Options

Further reductions may be achieved through implementing additional agricultural projects or practices, including land acquisition and conservation easements.

Table 11 identifies the reductions to groundwater that could be achieved through changes in practices. For example, a 75 % reduction of fertilizer loss to groundwater on 25 % of the fertilized lands would result in an estimated 1,930 lb-N/yr reduction. Note that these estimates are averaged over the entire basin, and the recharge characteristics of a specific site and the fertilization practices for specific crops may change the estimated reduction on specific acres with a conservation easement or change in fertilization.

Beyond enrolling producers in the FDACS BMP Program and verifying implementation, FDACS will work with DEP to improve the data used to estimate agricultural land uses in the springshed. FDACS will also work with producers to identify a suite of agricultural projects and research agricultural technologies that could be implemented on properties where they are deemed technically feasible and if funding is made available. The acreages provided by FDACS are preliminary estimates of the maximum acreages and need to be evaluated and refined over time. As presented here, these projects are based on planning-level information. Actual implementation would require funding as well as more detailed designs based on specific information, such as actual applicable acreages and willing landowners.

Table 11. Potential for additional load reductions to groundwater

% of Fertilized Acres with a Change in Practice	Amount of Fertilized Acres with a Change in Practice	100 % Reduction in Load to Ground-water (lb-N/yr)	75 % Reduction in Load to Ground-water (lb-N/yr)	50 % Reduction in Load to Ground-water (lb-N/yr)	25 % Reduction in Load to Ground-water (lb-N/yr)	10 % Reduction in Load to Ground-water (lb-N/yr)
100	2,553	10,295	7,721	5,148	2,574	1,030
75	1,915	7,721	5,791	3,861	1,930	772
50	1,277	5,148	3,861	2,574	1,287	515
25	638	2,574	1,930	1,287	643	257
10	255	1,030	772	515	257	103

2.8 WWTF Management Strategies

In the Volusia Blue Spring BMAP area, treated effluent containing nitrogen is discharged to sprayfields, RIBs, percolation ponds, and absorption fields, and is reused for irrigation water. WWTF reuse contributes 4 % of the nitrogen loading to groundwater, and WWTF discharges to sprayfields, RIBs, percolation ponds, and absorption fields account for 8 % of the nitrogen loading to groundwater. The estimated nitrogen load from WWTFs is 22,478 lb-N/year for reuse and 41,693 lb-N/year for the remaining land application disposal types. The discharge location (such as proximity to the spring, highly permeable soils) and level of wastewater treatment can be important factors to consider when calculating loadings to groundwater. Additionally, addressing the nitrogen loading from OSTDS could increase the volume of effluent treated and disposed of by WWTFs.

2.8.1 Summary of Facilities

There are several WWTFs located in the Volusia Blue Spring BMAP area, including5 domestic WWTFs permitted to discharge more than 100,000 gallons of treated effluent der day (or 0.1 million gallons per day [mgd]). **Figure 4** shows the locations of domestic WWTFs in the Volusia Blue Spring BMAP area with discharges greater than 0.1 mgd and those with discharges less than 0.1 mgd.

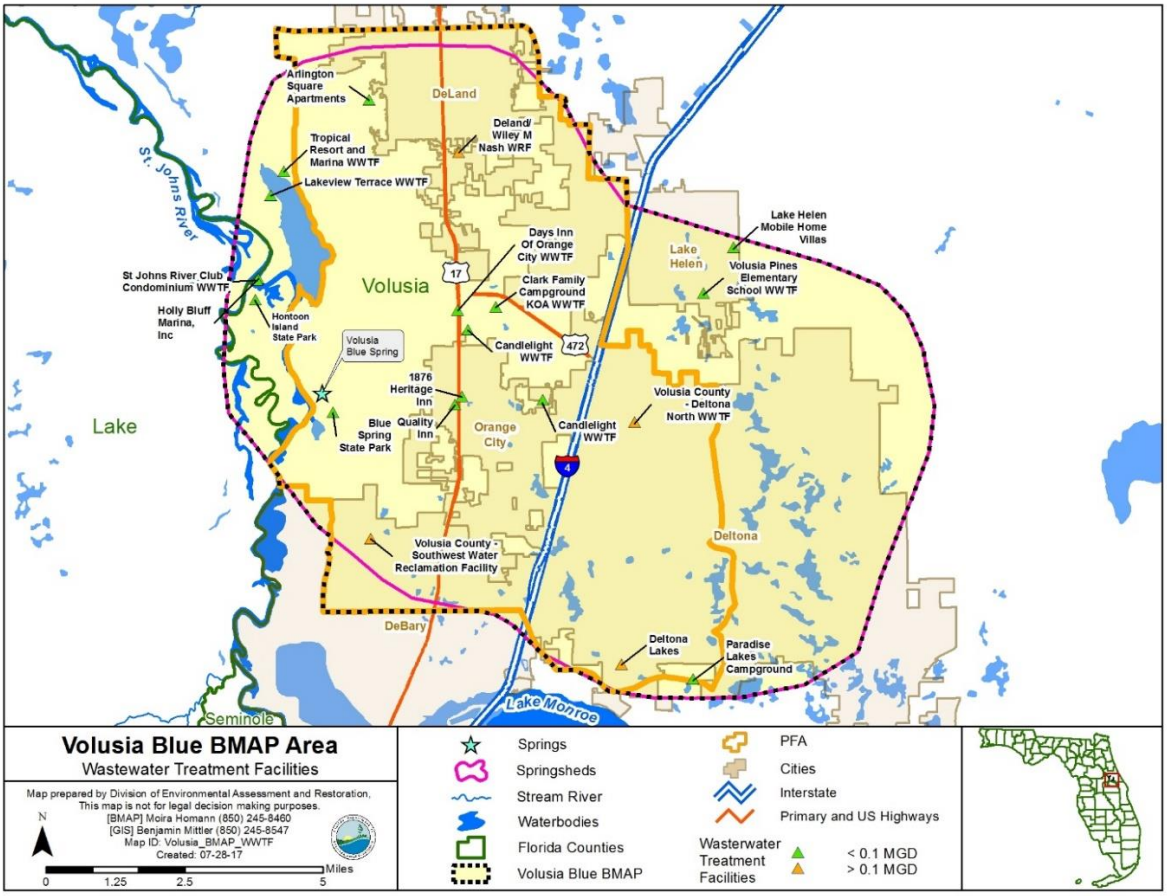

Figure 4. Locations of domestic WWTFs in the Volusia Blue Spring BMAP area

2.8.2 Wastewater Management Standards and Reuse Management

The Florida Springs and Aquifer Protection Act prohibits new domestic wastewater disposal facilities in the PFA, including RIBs with permitted capacities of 100,000 gpd or more, except for those facilities that provide AWT that reduces total nitrogen in the effluent to 3 mg/L or lower, on an annual permitted basis.

DEP requires the nitrogen effluent limits listed below (see **Table 12**) in any new or existing wastewater permit issued to a facility that discharges within the BMAP area, unless the utility/entity can demonstrate reasonable assurance that the reuse or land application of effluent would not cause or contribute to an exceedance of the nitrate concentrations established by the TMDL. To demonstrate reasonable assurance, the utility/entity shall provide relevant water quality data, physical circumstances, or other site-specific credible information needed to show their facility would not cause a nitrate concentration that would be greater than 0.35 mg/L at the spring vent. This demonstration may include factors such as dilution, site-specific geological conditions, research/studies, including dye tracer tests, and groundwater transport modeling. Should DEP concur with the reasonable assurance demonstration request, the TN effluent requirements established here may be modified or waived.

The nitrogen effluent limits listed in **Table 12** will be applied as an annual average to all new and existing WWTFs with a DEP-permitted discharge. The nitrogen effluent limits for existing WWTFs are listed in **Table 13**. New effluent standards will take effect at the time of permit renewal or no later than five years after BMAP adoption, whichever is sooner.

Additionally, new or existing wastewater permits in the BMAP area must require at least quarterly sampling of the effluent discharge for TN and report these sampling results in the discharge monitoring reports (DMRs) submitted to DEP.

DEP encourages the reuse of treated wastewater for irrigation as a water conservation measure. The expansion of reuse water for irrigation can reduce reliance on the Floridan Aquifer for water supply. The nitrogen load to groundwater from reuse water is expected to be reduced through these WWTF policies, as improvements in reuse water quality will both reduce loads from this source and limit future increases in loading from reuse because of higher treatment levels.

Table 12. Wastewater effluent standards for the BMAP area

95% of the Permitted Capacity (gpd)	TN Concentration Limits for RIBs and Absorption Fields (mg/L)	TN Concentration Limits for All Other Land Disposal Methods, Including Reuse (mg/L)
Greater than 100,000	3	3
20,000 to 100,000	3	6
Less than 20,000	6	6

Table 13. Wastewater effluent standards for existing WWTFs

*Note: Facilities with a 6 mg/L limit may eventually require a 3 mg/L limit.

WWTF Name	95% of Permitted Flow (gpd)	Nitrogen Effluent Limit (mg/L)
1876 Heritage Inn WWTF	9,500	6
Arlington Squares Apartments WWTF	5,700	6
Blue Spring State Park WWTF	22,800	3
Candlelight WWTF	23,655	6
Clark Family Campground KOA WWTF	14,250	6
Days Inn of Orange City WWTF	3,800	6
Deland/ Wiley M. Nash Water Reclamation Facility (WRF)	5,700,000	3
Deltona Lakes WRF	1,330,000	3
Lake Helen Mobile Home Villas WWTF	30,400	3
Land O Lakes MHC WWTF	25,650	3
Paradise Lakes Campground WWTF	14,250	6
Quality Inn WWTF	9,500	6
Tropical Resort and Marina WWTF	3,420	6
Volusia County Deltona North WRF	570,000	3
Volusia County Four Townes WWTF	285,000	3
Volusia County Southwest WRF	1,615,000	3
Volusia Pines Elementary School WWTF	9,500	6

2.8.3 Prioritized Management Strategies and Milestones

Based on the current volumes of discharge and effluent concentrations, the estimated reductions to be achieved through the implementation of these revised wastewater standards are 38,418 lb-N/yr. **Appendix B** contains detailed information on projects that have either been completed, are underway, or are planned to reduce nitrogen loading from WWTFs.

2.9 Atmospheric Deposition Management Strategies

2.9.1 Summary of Loading

Atmospheric deposition is largely a diffuse, albeit continual, source of nitrogen. Nitrogen species and other chemical constituents are measured in wet and dry deposition at discrete locations around the U.S. In 2014, Schwede and Lear developed a hybrid model for estimating the total atmospheric deposition of nitrogen and sulfur for the entire U.S., referred to as "TDEP." Deposition data from several monitoring networks—including Clean Air Status and Trends Network (CASTNET), the National Atmospheric Deposition Program (NADP) Ammonia Monitoring Network, the Southeastern Aerosol Research and Characterization Network, and modeled data from the Community Multi-Scale Air Quality (CMAQ) Modeling System—are combined in a multistep process with National Trends Network (NTN) wet deposition values to model total deposition. The TDEP model run used for the NSILT included data from 2011 to 2013.

2.9.2 Description of Approach

Atmospheric sources of nitrogen are local, national, and international. Atmospheric sources are generally of low nitrogen concentration compared with other sources and are further diminished through additional biological and chemical processes before they reach groundwater. Atmospheric deposition sources and trends will be re-evaluated periodically.

2.10 Future Growth Management Strategies

New development primarily falls into to two general source categories: new urban development and new agriculture. Nutrient impacts from new development are addressed through a variety of mechanisms outlined in this BMAP as well as other provisions of Florida law. For instance, wastewater from all new and existing urban development is treated through either domestic WWTFs or OSTDS. New WWTFs must meet the stringent nitrogen limitations set forth in this BMAP. Existing WWTFs also must be upgraded to meet these same BMAP requirements. Florida law requires new development to connect to WWTFs where sewer lines are available. Where sewer is not available within the PFA, this BMAP still prohibits the installation of new OSTDS on lots of less than one-acre unless the system includes enhanced treatment of nitrogen, as described in **Appendix D**. Likewise, all new agricultural operations must implement of FDACS-adopted BMPs and potentially other additional measures (**Section 2.7**) or must conduct water quality monitoring that demonstrates compliance with water quality standards.

Other laws such as local land development regulations, comprehensive plans, ordinances, incentives, environmental resource permit requirements, and consumptive use permit requirements, all provide additional mechanisms for protecting water resources and reducing the impact of new development and other land use changes as they occur (see **Appendix H**). Through this array of laws and the requirements in this BMAP, new development must undertake nitrogen-reduction measures before the development is complete.

2.11 Protection of Surface Water and Groundwater Resources through Land Conservation

Maintaining land at lower intensity uses through land purchases or easements for conservation and recreational use is one strategy that can help reduce water quality impacts in the Volusia Blue Spring BMAP area. **Table 14** identifies the known land conservation purchases in the BMAP area.

Table 14. Stakeholder conservation land purchases in the BMAP area

Lead Entity	Name of Conservation Purchase	Acreage
Volusia County	Lyonia Preserve	358
SJRWMD	Helberg Estate Parcel	36
DEP	Blue Springs State Park	2,650
Volusia County	Lake Beresford Park	354
DEP	Hontoon Island State Park	1,119
Volusia County	Deep Creek Preserve	111
DEP	Lower Wekiva River Preserve State Park	801
Robert Kosanke	Conservation Area 4 (Kosanke, Robert)	0.3
Robert Kosanke	Conservation Area 2 (Kosanke, Robert)	1
Robert Kosanke	Conservation Area 3 (Kosanke, Robert)	0.6
Robert Kosanke	Conservation Area 1 (Kosanke, Robert)	6.0
McCullen Bart	Conservation Easement (Bart, McCullen)	0.2
Emilo Cirelli	Conservation Easement (Cirelli, Emilo)	1.8
Total		**5,439**

2.12 Commitment to Implementation

Successful BMAP implementation requires commitment, dedicated state funding, and follow-up. Stakeholders have expressed their intention to carry out the plan, monitor its effects, and continue to coordinate within and across jurisdictions to achieve nutrient reduction goals. As the TMDLs must be achieved within 20 years, DEP, WMDs, FDOH, and FDACS will implement management strategies using the annual Legacy Florida appropriation from the legislature of at least $50 million to reduce nitrogen in impaired OFS. DEP, working with the coordinating agencies, will continue to invest existing funds and explore other opportunities and potential funding sources for springs restoration efforts.

Section 3: Monitoring and Reporting

3.1 Methods for Evaluating Progress

DEP will work with stakeholders to track project implementation and organize the monitoring data collected each year. The project and monitoring information will be presented in an annual update. Stakeholders have agreed to meet annually after the adoption of the BMAP to follow up on plan implementation, share new information, and continue to coordinate on TMDL restoration–related issues. The following activities may occur at annual meetings:

Implementation data and reporting:

- Collect project implementation information from stakeholders, including FDACS agricultural BMP enrollment and FDOH-issued permits, and compare with the BMAP schedule.
- Discuss the data collection process, including any concerns and possible improvements to the process.
- Review the monitoring plan implementation, as detailed in **Section 3.3**.

Sharing new information:

- Report on results from water quality and biological monitoring and trend information.
- Provide updates on new management strategies in the basin that will help reduce nutrient loading.
- Identify and review new scientific developments on addressing nutrient loads and incorporate any new information into annual progress reports.

Coordinating on TMDL-related issues:

- Provide updates on the basin assessment cycle and activities related to any impairments, TMDLs, and BMAP.
- Obtain reports from other basins where tools or other information may be applicable to the Volusia Blue Spring and Spring Run TMDLs.

3.2 Adaptive Management Measures

Adaptive management involves making adjustments in the BMAP when circumstances change, or monitoring indicates the need for additional or more effective restoration strategies. Adaptive management measures may include the following:

- Implementing procedures to determine whether additional cooperative strategies are needed.

- Using criteria/processes for determining whether and when plan components need revision due to changes in costs, project effectiveness, social effects, watershed conditions, or other factors.

- Revising descriptions of stakeholder roles during BMAP implementation and after BMAP completion.

- Updating information on corrective actions (and any supporting documentation) being implemented as data are gathered to refine project implementation schedules and performance expectations.

Key components of adaptive management are to share information and expertise and to track plan implementation, monitor water quality and pollutant loads, and hold periodic meetings.

3.3 Water Quality and Biological Monitoring

3.3.1 Objectives

Focused objectives are critical for a monitoring strategy to provide the information needed to evaluate implementation success. Since the BMAP implementation involves an iterative process, the monitoring efforts are related to primary and secondary objectives. The primary objectives focus on achieving water quality targets, while the secondary objectives focus on water quality parameters that can be used to provide information for future refinements of the BMAP. The monitoring strategy may be updated as necessary.

Primary objectives:

- Measure the water quality and biological response in the impaired spring and groundwater at the beginning of the BMAP period and during implementation.

- Document nutrient trends in Volusia Blue Spring and Volusia Blue Spring Run and groundwater.

- Focus BMP efforts by using water quality results combined with appropriate project information, land use in conjunction with statistical and spatial analysis tools.

Secondary objectives:

- Identify areas where groundwater data and modeling might help in understanding the hydrodynamics of the system.

- Confirm and refine nutrient removal efficiencies of agricultural and/or urban BMPs.
- Identify and implement more effective nutrient reduction strategies.
- Use nitrogen isotope and tracer sampling for evaluating nitrogen contributions from organic and inorganic sources.

3.3.2 Water Quality Parameters, Frequency, and Network

To achieve the objectives listed above, the monitoring strategy focuses on two types of indicators to track improvements in water quality: core and supplemental (**Tables 15** and **16**, respectively). The core indicators are directly related to the parameters causing impairment in the river or associated springs. Spring monitoring stations, ambient groundwater monitoring stations and certain surface water monitoring stations are core (required) stations. Supplemental indicators are monitored primarily to support the interpretation of core water quality parameters. Certain surface water monitoring stations, biological monitoring stations, flow monitoring stations and are supplemental stations. The monitoring network is established for a variety of purposes.

For this BMAP, nitrate is considered to be the key core parameter measured, to track progress in decreasing nitrogen concentrations in groundwater and the water surfacing at the spring vent. The other parameters are considered supplementary parameters for the BMAP, as they build information about groundwater and the spring but are not direct measurements of impairment.

At a minimum, the core parameters will be tracked to determine the progress that has been made towards meeting the TMDLs and/or achieving the numeric nutrient criteria (NNC). Resource responses to BMAP implementation may also be tracked. A significant amount of time may be needed for changes in water chemistry to be observed.

Table 15. Core water quality indicators

Core Parameters
TN
Total Kjeldahl Nitrogen
Nitrate as Nitrogen
Orthophosphate as Phosphorus
Total Phosphorus (TP)

Table 16. Supplemental water quality indicators and field parameters

Supplemental Parameters
Specific Conductance
Dissolved Oxygen (DO)
pH

Supplemental Parameters
Temperature
Total Suspended Solids
Total Dissolved Solids
Turbidity
Chloride
Nitrogen and Oxygen Isotopes
Biochemical Oxygen Demand
Color

Initially, data from the ongoing sampling effort being conducted by DEP and SJRWMD will be used to determine progress towards the primary objectives. Surface water and groundwater monitoring network locations were selected to track changes in water quality and allow the annual evaluation of progress toward achieving the TMDL.

Figure 5 shows the core well monitoring locations included in the groundwater monitoring network and the sampling locations for the surface water monitoring network. SJRWMD monitors surface water quality at three locations (**Figure 5**) in Volusia Blue Spring and Volusia Blue Spring Run:

- **BLUSPG** – The site is monitored bimonthly (every other month) by SJRWMD staff. It is part of the SJRWMD springs water quality monitoring network. The site is monitored at the diver entrance stairway ("upper swim dock").

- **BLSPR** – The site is monitored monthly by both SJRWMD staff and Volusia County. SJRWMD has monitored this site since the 1990s. It is located at the park swimming area dock ("lower swim dock").

- **Blue Spring CM** – The site is co-located with the USGS flow gauge. SJRWMD installed continuous monitoring sondes at the site in 2014 (replacing sondes deployed by USGS). Analytes monitored include water temperature, pH, conductivity, DO, turbidity, fluorescent dissolved organic matter (fDOM), nitrate, and orthophosphate.

SJRWMD plans to implement annual surveys of algae and aquatic plants in Volusia Blue Spring and the spring run to assess the health of the spring system using equivalent equipment and sampling methodologies. Surveys will be performed between March and June each year. Cover of aquatic macrophytes (by species) and algae (collectively) will be assessed at 5 transect locations (to be determined) along the spring run. At each transect, 5 replicate quadrats (0.5 meters by 0.5 meters) will be deployed systematically across the width of the spring run. Plant cover will be assessed using the Braun-Blanquet ordinal scale. Concurrently with vegetation monitoring, in situ water quality will be measured (water temperature, pH, DO, and

conductivity) with a YSI Exo or similar instrument, and velocity will be measured with a Marsh-McBirney current meter. The results of water quality data collection and any adjustments to monitoring locations will be reported periodically to stakeholders.

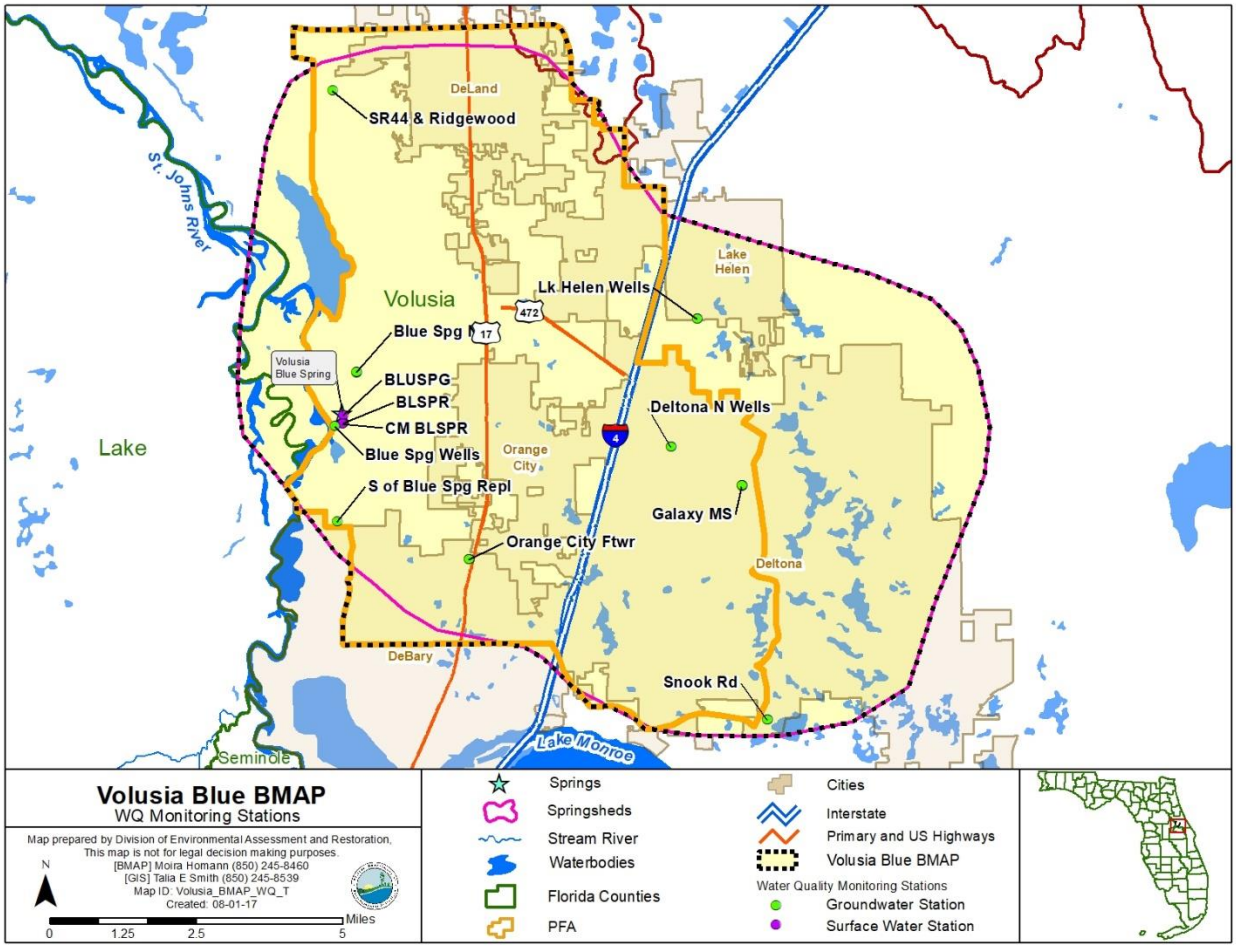

Figure 5. Groundwater and surface water stations sampled in the Volusia Blue Spring Basin

3.3.3 Biological Monitoring

Biological resource responses represent improvements in the overall ecological health of the Volusia Blue Spring Basin (see **Table 18**). Several types of biological monitoring will be carried out to assess the health of the Volusia Blue Spring and spring run.

Table 17. Biological response measures for the spring run

Biological Response Measures
Chlorophyll *a*
Stream Condition Index (SCI) score
Linear Vegetation Survey (LVS) score

Biological Response Measures
Rapid Periphyton Survey (RPS) score
Key fish populations

An RPS will be conducted to assess the abundance and variety of algae. An LVS will be conducted to assess the types and density of vegetation present and to identify the native versus non-native species. An SCI will be conducted to measure the number of different organisms present in the river and/or springs. In addition, habitat assessments will be conducted to assess the conditions and habitat present to support the SCI evaluation. Water quality samples will also be collected with the biological monitoring.

3.3.4 Data Management and Assessment

As of June 30, 2017, water quality data in Florida are entered by the entity collecting the data into the Florida Watershed Information Network (WIN) Database, which has replaced the Florida Storage and Retrieval System (STORET). DEP pulls water quality data directly from WIN and USGS databases for impaired waters evaluations and TMDL development. Data providers are required to upload their data regularly, so the information can be used as part of the water quality assessment process and for annual reporting. Data providers should upload their data to WIN upon completion of the appropriate quality assurance/quality control (QA/QC) checks. All data collected in the last quarter of the calendar year should be uploaded no later than April 1 of the following year. Biological data collected by DEP are stored in the DEP Statewide Biological (SBIO) database. Biological data should be collected and regularly provided to DEP following the applicable standard operating procedures (SOPs). All biological data collected in the last quarter of the calendar year should be uploaded or provided no later than April 1 of the following year.

The water quality and biological data will be analyzed during BMAP implementation to determine trends in water quality and the health of the biological community. A wide variety of statistical methods are available for the water quality trend analyses. The selection of an appropriate data analysis method depends on the frequency, spatial distribution, and period of record available from existing data. Specific statistical analyses were not identified during BMAP development.

3.3.5 QA/QC

Stakeholders participating in the monitoring plan must collect water quality data in a manner consistent with Chapter 62-160, F.A.C., and the DEP SOPs for QA/QC required by rule. The most current version of these procedures is available on the DEP website. For BMAP-related data analyses, entities should use National Environmental Laboratory Accreditation Conference (NELAC) National Environmental Laboratory Accreditation Program (NELAP)–certified laboratories or other labs that meet the certification and other requirements outlined in the DEP SOPs.

Appendices

Appendix A. Important Links

The links below were correct at the time of document preparation. Over time, the locations may change, and the links may no longer be accurate. None of these linked materials are adopted into this BMAP.

- DEP Website: https://floridadep.gov/
- DEP Map Direct Webpage: https://ca.dep.state.fl.us/mapdirect/
- Searchable online version of PFA map: https://www.floridadep.gov/pfamap
- Florida Statutes: http://www.leg.state.fl.us/statutes
    - Florida Watershed Recovery Act (Section 403.067, F.S.)
    - Florida Springs and Aquifer Protection Act (Part VIII of Chapter 373, F.S.)
- Lower St. Johns River (LSJR) Basin Surface Water Improvement and Management (SWIM) Plan: http://sjrwmd.com/SWIMplans/2008_LSJRB_SWIM_Plan_Update.pdf
- DEP Model Fertilizer Ordinance: http://fyn.ifas.ufl.edu/fert_ordinances.html
- NELAC NELAP: https://fldeploc.dep.state.fl.us/aams/index.asp
- DEP SOPs for Water Quality Samples: https://floridadep.gov/dear/quality-assurance/content/dep-sops
- FDACS BMPs – https://www.freshfromflorida.com/Business-Services/Best-Management-Practices-BMPs/Agricultural-Best-Management-Practices
- FDACS BMP and Field Staff Contacts: http://www.freshfromflorida.com/Divisions-Offices/Agricultural-Water-Policy
- F.A.C. (Florida Rules): https://www.flrules.org/
- SJRWMD Springs: http://www.sjrwmd.com/springs/
- UF–IFAS Research: http://research.ifas.ufl.edu/

Appendix B. Projects to Reduce Nitrogen Sources

Prioritization of Management Strategies

The management strategies in **Table B-1** are ranked with a priority of high, medium, or low. In 2016, the Florida Legislature amended the Watershed Restoration Act (Section 403.067, F.S.), creating additional requirements for all new or revised BMAPs. BMAPs must now include planning-level details for each listed project, along with their priority ranking.

Project status was selected as the most appropriate indicator of a project's priority ranking based primarily on need for funding. Projects with a "completed" status were assigned a low priority. Projects classified as "underway" were assigned a medium priority because some resources have been allocated to these projects, but additional assistance may be needed for the project to be completed. High priority was assigned to projects listed with the project status "planned" as well as certain "completed" projects that are ongoing each year (any project with one of these project types: "street sweeping," "catch basin inserts/inlet filter cleanout," "public education efforts," "fertilizer cessation," "fertilizer reduction," or "aquatic vegetation harvesting"), and select projects that are elevated because substantial, subsequent project(s) are reliant on their completion.

Description of the Management Strategies

Responsible entities submitted these management strategies to the department with the understanding that the strategies would be included in the BMAP, thus requiring each entity to implement the proposed strategies in a timely way and achieve the assigned load reduction estimates. However, this list of strategies is meant to be flexible enough to allow for changes that may occur over time. Any change in listed management strategies, or the deadline to complete these actions, must first be approved by the department. Substituted strategies must result in equivalent or greater nutrient reductions than expected from the original strategies.

While the 20-year planning period for this BMAP is 2018−2038, projects completed since January 1, 2010 count toward the overall nitrogen reduction goals.

Estimated nitrogen reductions are subject to refinement based on DEP verification and/or on adjustment to calculations based on loading to groundwater rather than surface water. Agriculture load reductions (FDACS-01 and FDACS-02) assume 100 % enrollment and verification. Projects with a designation of TBD (to be determined) denotes information is not currently available but will be provided by the stakeholder when it is available. Projects with a designation of N/A (not applicable) indicates the information for that category is not relevant to that project. Projects with a designation of "Not Provided" denotes that information was requested by DEP but was not provided by the lead entity.

Table B-1. Stakeholder projects to reduce nitrogen sources

Lead Entity	Project Number	Project Name	Project Description	Project Type	Status	Start Date	Estimated Completion Date	Nitrogen Source Addressed by Project	Estimated Nitrogen Load Reduction (lb/yr)	Cost Estimate	Funding Source	Funding Amount
DeBary	DB-01	Public Education and Outreach	Fertilizer ordinance.	Public Education	Completed	Prior to 2017	N/A	UTF	38	Not Provided	Not Provided	Not Provided
DeLand	DL-01	Public Education and Outreach	Fertilizer ordinance.	Public Education	Completed	Prior to 2017	N/A	UTF	62	Not Provided	Not Provided	Not Provided
DeLand	DL-02	Reclaimed Water Main Extension Phase 3 and 3A	City of Deland reclaimed water main extension Phase 3 and 3A (Crystal Cove and Alexandria Point).	Reclaimed Water Management	Planned	TBD	Not Provided	WWTF	Not Provided	$1,300,000	DEP/ SJRWMD/ DeLand	DEP- $325,000; SJRWMD- $325,000; DeLand- $650,000
DeLand	DL-03	WWTF Upgrades	WWTF aeration and instrumentation upgrades to enhance nutrient removal.	Wastewater Management	Planned	TBD	Not Provided	WWTF	Not Provided	$1,210,000	DEP/ SJRWMD/ DeLand	DEP- $302,000; SJRWMD- $302,000; DeLand- $606,000
DeLand	DL-04	Reclaimed Water Retrofit Project, Phase 1	City of Deland fiscal year 2016/2017 reclaimed water retrofit project, Phase 1.	Reclaimed Water Management	Planned	TBD	Not Provided	WWTF	Not Provided	$1,212,000	DEP/ SJRWMD/ DeLand	DEP- $303,000; SJRWMD- $303,000; DeLand- $606,000
DeLand	DL-05	Reclaimed Water Retrofit Project, Phase 2B	City of DeLand fiscal year 2016/2017 reclaimed water retrofit project, Phase 2B.	Reclaimed Water Management	Planned	TBD	Not Provided	WWTF	Not Provided	$1,518,751	DEP/ SJRWMD/ DeLand	DEP- $379,688; SJRWMD- $379,688; DeLand- $759,375
Deltona	D-01	Public Education and Outreach	Fertilizer ordinance and brochures/flyers.	Public Education	Completed	Prior to 2017	N/A	UTF	504	Not Provided	Not Provided	Not Provided
Deltona	D-02	Deltona Alexander Avenue Water Management Site	Deltona Alexander Avenue water management site: WVWS Project #4A- Deltona Storage/Treatment.	Reclaimed Water Management	Planned	TBD	Not Provided	WWTF	Not Provided	$9,700,000	DEP/ SJRWMD/ Deltona	DEP- $1,875,000; SJRWMD- $1,875,000; DeLand- $5,950,000

Lead Entity	Project Number	Project Name	Project Description	Project Type	Status	Start Date	Estimated Completion Date	Nitrogen Source Addressed by Project	Estimated Nitrogen Load Reduction (lb/yr)	Cost Estimate	Funding Source	Funding Amount
Deltona	D-03	Brickell Drive Stormwater Treatment System	The project intends to improve water quality discharging into Lake Monroe by re-routing an existing ditch through a wetland. The treatment obtained in the wetland will improve water quality and reduce water quantity downstream.	Natural Wetlands as Filters	Planned	2017	2018	UTF	TBD	$600,000	Not Provided	Not Provided
Deltona	D-04	Mapleshade Street Stormwater Improvements	Stormwater management improvements.	Urban BMPs	Completed	Prior to 2017	2014	UTF	TBD	$144,150	Not Provided	Not Provided
Deltona	D-05	Tipton Drive Stormwater Improvements	Stormwater management improvements.	Urban BMPs	Completed	2013	2014	UTF	TBD	$179,275	Not Provided	Not Provided
Deltona	D-06	Courtland Skate Park Flood Control Improvements	Stormwater management improvements.	Urban BMPs	Completed	2014	2014	UTF	TBD	$139,440	Not Provided	Not Provided
Deltona	D-07	Bannock and Holston Street Stormwater Improvements	Stormwater management improvements.	Urban BMPs	Completed	Prior to 2017	2013	UTF	Not Provided	Not Provided	Not Provided	Not Provided
Deltona	D-08	Drysdale Drive and Chapel Drive Stormwater Improvements	Stormwater management improvements.	Urban BMPs	Completed	Prior to 2012	2012	UTF	TBD	$1,024,148	Not Provided	Not Provided
Deltona	D-09	Kraft Drive and Bluefield Drainage Improvements	Stormwater management improvements.	Urban BMPs	Completed	Prior to 2017	2013	UTF	Not Provided	Not Provided	Not Provided	Not Provided
Deltona	D-10	Lackland Drive Retention Pond Improvements	Stormwater management improvements.	Urban BMPs	Completed	Prior to 2017	2012	UTF	Not Provided	Not Provided	Not Provided	Not Provided
Deltona	D-11	Water Quality Pond MC-1	Stormwater management improvements.	Urban BMPs	Completed	Prior to 2017	2013	UTF	TBD	Not Provided	Not Provided	Not Provided
Deltona	D-12	Courtland Blvd and Haulover Stormwater Improvements Project	Stormwater management improvements.	Urban BMPs	Completed	2015	2015	UTF	TBD	$209,330	Not Provided	Not Provided
Deltona	D-13	Danforth Drive Stormwater	Stormwater management improvements.	Urban BMPs	Completed	Prior to 2017	2014	UTF	TBD	Not Provided	Not Provided	Not Provided

Lead Entity	Project Number	Project Name	Project Description	Project Type	Status	Start Date	Estimated Completion Date	Nitrogen Source Addressed by Project	Estimated Nitrogen Load Reduction (lb/yr)	Cost Estimate	Funding Source	Funding Amount
		Drainage Improvements										
Deltona	D-14	Dewberry Drive and Irondale Street Drainage Improvements	Stormwater management improvements.	Urban BMPs	Completed	Prior to 2017	2013	UTF	TBD	Not Provided	Not Provided	Not Provided
Deltona	D-15	Catch Basin Sediment Removal	Cleaning of storm sewer system to include catch basins and connecting pipes from 2012 to 2016. Using MS4 Load Reduction Tool for 2,598 cubic feet of dry mass=150 pounds of TN removed.	BMP Cleanout	Completed	2012	2016	UTF	TBD	Not Provided	Not Provided	Not Provided
Deltona	D-16	Future Deltona Street Sweeper	City is proposing to implement street sweeping program.	Street Sweeping	Planned	2019	Not Provided	UTF	TBD	$200,000	Not Provided	Not Provided
Deltona	D-17	Eastern WRF (Improvements	City constructed new greenfield Eastern WRF to treat to AWT. Currently permitted at 1.0 MGD.	Wastewater Management	Completed	2016	2016	WWTF	TBD	$30,000,000	Not Provided	Not Provided
Deltona	D-18	Green Industries BMP Training	Not Provided	Public Education and Outreach	Not Provided	Not Provided	Not Provided	UTF	Not Provided	Not Provided	Not Provided	Not Provided
FDACS	FDACS-01	Agricultural BMPs - Farm Fertilizer	Implementation of existing BMPs on applicable acreage. Up to 15 % reduction in load to groundwater.	BMPs	Underway	Prior to 2017	2022	FF	1,544	$13,075	Not Provided	Not Provided
FDACS	FDACS-02	Agricultural BMPs - Livestock Waste	Implementation of existing BMPs on applicable acreage. Up to 10 % reduction in load to groundwater.	BMPs	Underway	Prior to 2017	2022	LW	413	$159,331	Not Provided	Not Provided
FDOT	FDOT-01	Street Sweeping	Reduction of TN and TP loading from state highway system.	Street Sweeping	Completed	Prior to 2017	N/A	UTF	13	Not Provided	Not Provided	Not Provided
FDOT	FDOT-02	Fertilizer Cessation	Elimination of fertilizer use along state highway system. Removal of TN and TP loading.	Fertilizer Cessation	Completed	Prior to 2017	Prior to 2017	UTF	132	Not Provided	Not Provided	Not Provided

Lead Entity	Project Number	Project Name	Project Description	Project Type	Status	Start Date	Estimated Completion Date	Nitrogen Source Addressed by Project	Estimated Nitrogen Load Reduction (lb/yr)	Cost Estimate	Funding Source	Funding Amount
FDOT	FDOT-03	Public Education and Outreach	Illicit Discharge Detection and Elimination (IDDE) Inspection Program, National Pollutant Discharge Elimination System (NPDES) flyer distribution, and website.	Public Education Efforts	Completed	Prior to 2017	N/A	UTF	14	Not Provided	Not Provided	Not Provided
FDOT	FDOT-04	Roadside Swales	Retention in swales.	BMP Cleanout	Completed	Prior to 2017	N/A	UTF	29	Not Provided	Not Provided	Not Provided
Golf Courses	GC-01	Golf Course Reduction Credits	10 % BMP credit on golf course load to groundwater, assuming 100 % BMP implementation by golf course owners.	Golf Course BMPs	Planned	TBD	2028	STF	1,933	TBD	N/A	N/A
Lake Helen	LH-01	Public Education and Outreach	Fertilizer ordinance.	Public Education	Completed	Prior to 2017	N/A	UTF	16	Not Provided	Not Provided	Not Provided
Orange City	OC-01	Mill Lake Park and Stormwater Treatment	Improvements to Mill Lake to reduce pollutant loading in the basin, including: pretreatment pond; alum treatment, baffle boxes, aeration systems, sediment removal, increase residence time and planting of native plants. Project description in the attached 2015 SJRWMD cost-share application.	BMP Treatment Train	Underway	Not Provided	2017	UTF	379	$2,990,000	Not Provided	Not Provided
Orange City	OC-02	Maintenance of Stormwater Ponds	Inspection and clearing out of excess vegetation. Working on way to estimate nutrient reduction.	BMP Cleanout	Completed	Prior to 2017	N/A	UTF	Not Provided	Not Provided	Not Provided	Not Provided
Orange City	OC-03	Master Stormwater Capital Improvements Program (1-3 Year Timetable)	Swales and catch basins; and as feasible ponds, aeration, alum treatment, reuse, baffle boxes and recharge.	Urban BMPs	Underway	Not Provided	2019	UTF	Not Provided	$2,867,183	Not Provided	Not Provided

Lead Entity	Project Number	Project Name	Project Description	Project Type	Status	Start Date	Estimated Completion Date	Nitrogen Source Addressed by Project	Estimated Nitrogen Load Reduction (lb/yr)	Cost Estimate	Funding Source	Funding Amount
Orange City	OC-04	Public Education and Outreach	FYN, public service announcements (PSAs), pamphlets, website, fertilizer, pet waste, irrigation, and landscape ordinances.	Public Education	Completed	Prior to 2017	Prior to 2017	UTF	532	Not Provided	Not Provided	Not Provided
Orange City	OC-05	Street Sweeper Project	Acquisition of a street sweeper to start program.	Street Sweeping	Planned	2019	2019	UTF	Not Provided	Not Provided	Not Provided	Not Provided
Orange City	OC-06	Master Stormwater Capital Improvements Program (5-10 Year Timetable)	Swales and catch basins; and as feasible ponds, aeration, alum treatment, reuse, baffle boxes and recharge.	Urban BMPs	Planned	TBD	2026	UTF	Not Provided	$2,251,170	Not Provided	Not Provided
Orange City	OC-07	Septic Tank Replacement	Connecting septic tanks to sewer in strategic locations.	Septic Tank Phaseout	Planned	TBD	Not Provided	OSTDS	Not Provided	Not Provided	Not Provided	Not Provided
Orange City	OC-08	Septic Tank Impact Study	Investigation to determine the water quality benefits in removing septic tanks in Orange City.	Study	Planned	TBD	Not Provided	OSTDS	N/A	$50,000	Not Provided	Not Provided
Orange City	OC-09	Reclaimed Water Extensions	Extending reclaimed water to various locations as needed.	Reclaimed Water Management	Completed	Not Provided	Prior to 2017	WWTF	Not Provided	Not Provided	Not Provided	Not Provided
Sports Fields	SF- 01	Sports Field Reduction Credits	6 % BMP credit on sports field load to groundwater, assuming 100 % BMP implementation by sports field owners.	Sport Field BMPs	Planned	TBD	Not Provided	STF	58	TBD	N/A	N/A
Volusia County	VC-01	Street Sweeping	3,813.3 cubic yards of material removed since January 1, 2010.	Street Sweeping	Completed	Prior to 2017	N/A	UTF	Not Provided	Not Provided	Not Provided	Not Provided
Volusia County	VC-02	Roadside Ditch Cleaning	14,396.4 cubic yards of material removed since January 1, 2010.	BMP Cleanout	Completed	Prior to 2017	N/A	UTF	Not Provided	Not Provided	Not Provided	Not Provided
Volusia County	VC-03	Open Channel Ditch Cleaning	819.6 cubic yards of material removed since January 1, 2010.	BMP Cleanout	Completed	Prior to 2017	N/A	UTF	Not Provided	Not Provided	Not Provided	Not Provided
Volusia County	VC-04	Retention Pond Restoration	15,875 cubic yards of material removed since January 1, 2010.	BMP Cleanout	Completed	Prior to 2017	N/A	UTF	Not Provided	Not Provided	Not Provided	Not Provided

Lead Entity	Project Number	Project Name	Project Description	Project Type	Status	Start Date	Estimated Completion Date	Nitrogen Source Addressed by Project	Estimated Nitrogen Load Reduction (lb/yr)	Cost Estimate	Funding Source	Funding Amount
Volusia County	VC-05	Tanglewood Drive Pond Expansion	Expansion of existing stormwater retention pond. Increased treatment volume.	On-line Retention BMPs	Completed	2010	2011	UTF	N/A	$250,000	Not Provided	Not Provided
Volusia County	VC-06	Miller Lake	Purchasing of property adjacent to Miller Lake to expand storage/treatment volume for stormwater runoff. Increased treatment volume.	On-line Retention BMPs	Completed	2011	2014	UTF	Not Provided	$2,123,000	Not Provided	Not Provided
Volusia County	VC-07	Voorhis Pond	Construction of a new retention pond to provide treatment/storage for stormwater runoff. Provide a new retention pond for stormwater treatment.	On-line Retention BMPs	Completed	2011	2012	UTF	N/A	$150,000	Not Provided	Not Provided
Volusia County	VC-08	Beresford Pond	Construction of a new retention pond to provide treatment/storage for stormwater runoff. Provide a new retention pond for stormwater treatment.	On-line Retention BMPs	Completed	2015	2015	UTF	N/A	$90,000	Not Provided	Not Provided
Volusia County	VC-09	New Hampshire Pond	Construction of a new retention pond to provide treatment/storage for stormwater runoff. Provide a new retention pond for stormwater treatment.	On-line Retention BMPs	Completed	2015	2015	UTF	N/A	$70,000	Not Provided	Not Provided
Volusia County	VC-10	Lake Diana Sidney Control Structure Improvements	Construction of a weir to control the elevation of the water upstream of Lake Diana. Longer residence time in Lake Sidney.	Control Structure	Completed	2011	2011	UTF	Not Provided	$160,000	Not Provided	Not Provided
Volusia County	VC-11	Exfiltration System Installation	Installation of an exfiltration trench system.	Exfiltration Trench	Underway	Not Provided	Not Provided	UTF	N/A	Not Provided	Not Provided	Not Provided
Volusia County	VC-12	Public Education and Outreach	Fertilizer ordinance and FYN Program.	Public Education	Completed	Prior to 2017	N/A	UTF	1,280	Not Provided	Not Provided	Not Provided

Lead Entity	Project Number	Project Name	Project Description	Project Type	Status	Start Date	Estimated Completion Date	Nitrogen Source Addressed by Project	Estimated Nitrogen Load Reduction (lb/yr)	Cost Estimate	Funding Source	Funding Amount
Volusia County	VC-13	Volusia County AWT	Volusia County AWT for the protection of Blue Springs water quality and supply.	Wastewater Management	Underway	May 2016	2017	WWTF	TBD	$12,129,500	DEP/ SJRWMD/ Volusia County	DEP- $3,465,000; SJRWMD/ DEP First Amendment- $2,000,000; SJRWMD- $2,062,500; Volusia County- $4,602,000
Wastewater Utilities	WU-01	WWTF Policy Reductions	Achieved by WWTF policy if implemented BMAP-wide, achieving 3 or 6 mg/L.	Wastewater Management	Planned	TBD	Not Provided	WWTF	38,418	TBD	TBD	TBD
Various	OSTDS-01	Enhancement of Existing OSTDS - Voluntary	Repair, upgrade, replacement, drainfield modification, addition of effective nitrogen reducing features, initial connection to a central sewerage system, or other action to reduce nutrient loading, voluntarily taken by the owner of an OSTDS within the BMAP.	OSTDS Enhancement	Underway	2018	N/A	OSTDS	TBD	TBD	DEP	TBD
Various	OSTDS-02	Enhancement of Existing OSTDS - Required	Repair, upgrade, replacement, drainfield modification, addition of effective nitrogen reducing features, initial connection to a central sewerage system, or other action taken to comply with the OSTDS Remediation Plan for the group of systems identified for remediation (see Appendix D).	OSTDS Enhancement	Planned	TBD	TBD	OSTDS	TBD	TBD	DEP	TBD

Appendix C. PFA

A PFA is defined as the area(s) of a basin where the Floridan Aquifer is generally most vulnerable to pollutant inputs and where there is a known connectivity between groundwater pathways and an OFS. As required by the Florida Springs and Aquifer Protection Act, DEP delineated a PFA for Volusia Blue Spring. The PFA for Volusia Blue Spring is adopted and incorporated by reference into this BMAP. Detailed information on the PFA is available at the following link: http://publicfiles.dep.state.fl.us/dear/PFAs.

Appendix D. OSTDS Remediation Plan

The Florida Aquifer and Springs Protection Act specifies that if, during the development of a BMAP for an OFS, DEP identifies OSTDS as contributors of at least 20 % of the nonpoint source nitrogen pollution in a PFA, or if DEP determines remediation is necessary to achieve the TMDL, the BMAP shall include an OSTDS remediation plan. Based on the Volusia Blue Spring NSILT estimates and GIS coverages, OSTDS contribute approximately 39 % of the pollutant loading in the PFA. Irrespective of the percent contribution from OSTDS, DEP has determined that an OSTDS remediation plan is necessary to achieve the TMDLs and to limit the increase in nitrogen loads from future growth.

D.1 Plan Elements

D.1.1 Installation of New OSTDS

Per statute, new OSTDS on lots of less than one acre are prohibited within the PFA, if the addition of the specific system conflicts with an OSTDS remediation plan incorporated into an OFS BMAP (see Section 373.811(2), F.S.). This OSTDS remediation plan prohibits new conventional systems on lots of less than one acre within the PFA, unless the OSTDS includes enhanced treatment of nitrogen or unless the OSTDS permit applicant demonstrates that sewer connections will be available within 5 years. Local governments and utilities are expected to develop master wastewater treatment feasibility analyses to identify specific areas to be sewered within 20 years of BMAP adoption. To aid in implementation, the DEP Map Direct webpage includes a detailed downloadable springs PFA boundary shapefile. DEP also maintains on its website an interactive map of the PFA and BMAP boundaries; the map can be easily searched for specific street address locations.

FDOH permits the installation of new OSTDS pursuant to Chapter 64E-6, F.A.C., which includes not only systems installed on a property where one has not previously been installed, but also systems installed to replace illegal systems, systems installed in addition to existing systems, and other new systems. FDOH permitting requirements with respect to the definition of "new" or "less than one acre" will be followed for this remediation plan. To meet the enhanced treatment of nitrogen requirement, the system must include at least one of the following nitrogen reducing enhancements:

- Features allowed pursuant to FDOH rule, such as in-ground nitrogen-reducing biofilters (media layer systems).
- Features consistent with and identified in the FDOH Florida Onsite System Nitrogen Removal Strategy Studies report, such as in-tank nitrogen-reducing biofilters.
- Other FDOH-approved treatment systems capable of meeting or exceeding the NSF Standard 245 nitrogen removal rate before disposing the wastewater in the drain field,

such as aerobic treatment units (ATU) and performance-based treatment systems (PBTS). For FDOH-approved treatment systems that meet NSF 245, but do not meet or exceed the minimum treatment level expected from the in-ground nitrogen-reducing biofilters, the drain fields, at minimum, shall be installed with a 24-inch separation between the bottom of the drain field and the seasonal high-water table.

D.1.2 Modification or Repair of Existing OSTDS

Per statute, the OSTDS remediation plan must provide loading reductions consistent with achieving the TMDL within 20 years of plan adoption (see Section 373.807(1)(b)8., F.S.). This plan therefore establishes the following remediation policy for existing systems, based on (a) the potential for reducing nitrogen loads by converting existing OSTDS to enhanced nitrogen removing systems or by connecting homes to central sewer, (b) the total amount of nitrogen load that must be reduced to achieve the TMDL, and (c) the relative contribution of nitrogen load from existing OSTDS.

- Where does the remediation policy for existing systems apply? It applies to all existing OSTDS within the PFA on lots of less than 1 acre.

- When is the remediation policy for existing systems effective? The remediation policy for existing systems does not go into effect upon BMAP adoption. The requirements begin following completion of the master wastewater treatment feasibility analyses, FDOH rulemaking, and funding program to help offset the costs to homeowners, but no later than five years after BMAP adoption.

- What will be required by the remediation policy for existing systems when it becomes effective? Upon the need for repair or replacement, an existing OSTDS must include at least one of the following nitrogen reducing enhancements, unless the OSTDS permit applicant demonstrates that sewer connections will be available within 5 years.

    - Enhanced treatment of nitrogen means inclusion of features allowed pursuant to FDOH rules, such as in-ground nitrogen-reducing biofilters (media layer systems); features consistent with and identified in the FDOH Florida Onsite System Nitrogen Removal Strategy Studies report, such as in-tank nitrogen-reducing biofilters; or other FDOH-approved treatment systems capable of meeting or exceeding the NSF Standard 245 nitrogen removal rate before disposing the wastewater in the drain field, such as ATUs and PBTSs. For FDOH-approved treatment systems that meet NSF 245, but do not meet or exceed the minimum treatment level expected from the in-ground nitrogen-reducing biofilters, the drain fields, at minimum, shall be installed with a 24-inch separation between the bottom of the drain field and the seasonal high-water table.

- FDOH permitting requirements with respect to defining "modification," "repair," and lot size (i.e., acreage) will be followed for this remediation plan.

In addition, a utility is required to provide written notice to OSTDS owners of the availability of sewer lines for connection, no later than 1 year prior to the date the utility's sewerage system will become available, which triggers an obligation for OSTDS owners to comply with the requirements of Section 381.00655, F.S.

D.1.3 Achieving Necessary Load Reductions

All conventional OSTDS in areas subject to the remediation policy for existing systems are required to adopt enhanced treatment of nitrogen or connect to central sewer no later than 20 years after BMAP adoption.

D.1.4 Other Plan Elements

Statutes also require that OSTDS remediation plans contain the following elements.

- An evaluation of credible scientific information on the effect of nutrients, particularly forms of nitrogen, on springs and spring systems. (See **Section D.2**.)
- Options for repair, upgrade, replacement, drain field modification, the addition of effective nitrogen-reducing features, connection to a central sewer system, or other action. (See **Section D.3**.)
- A public education plan to provide area residents with reliable, understandable information about OSTDS and springs. (See **Section D.4**.)
- Cost-effective and financially feasible projects necessary to reduce the nutrient impacts from OSTDS. (See **Section 2** and **Appendix B**.)
- A priority ranking for each project for funding contingent on appropriations in the General Appropriations Act. (See **Section 2** and **Appendix B**.)

The Florida Springs and Aquifer Protection Act defines an OSTDS as a system that contains a standard subsurface, filled, or mound drain field system; an aerobic treatment unit; a graywater system tank; a laundry wastewater system tank; a septic tank; a grease interceptor; a pump tank; a solids or effluent pump; a waterless, incinerating, or organic waste–composting toilet; or a sanitary pit privy that is installed or proposed to be installed beyond the building sewer on land of the owner or on other land on which the owner has the legal right to install such a system. The term includes any item placed within or intended to be used as a part of or in conjunction with,

the system. The term does not include package sewage treatment facilities and other treatment works regulated under Chapter 403, F.S.

D.2 Collection and Evaluation of Credible Scientific Information

As described in **Section 2**, DEP developed the Volusia Blue Spring NSILT, a planning tool that provides estimation of nitrogen loading sources to groundwater based on the best available scientific data for a particular geographic area. The results were peer reviewed by SJRWMD, FDOH, and FDACS. Additional technical support information concerning the NSILT can be found in **Appendix E**.

Monitoring and research:

- Improve understanding of the ecological responses to nutrient enrichment and reductions (DEP/SJRWMD/universities).
- Maintain and expand water quality monitoring programs (SJRWMD/DEP).
- Report annual status and trends (SJRWMD).
- Evaluate new and emerging technologies (SJRWMD).
- Research and develop advanced septic systems (FDOH/DEP/UF–IFAS).

Ongoing projects

- Spring water quality monitoring (SJRWMD).
- Stream water quality monitoring (SJRWMD).

Completed project

- Florida Onsite Sewage Nitrogen Reduction Strategies Study (FDOH).

Proposed projects

- Nutrient hot-spot loading identification (DEP/SJRWMD).
- Groundwater quality monitoring for BMAP assessment (DEP/SJRWMD).
- OSTDS effluent treatment pilot project (Orange City).

DEP developed calculation methods to estimate nitrogen reductions associated with OSTDS enhancement and replacement projects, WWTF projects, golf course BMPs, other sports turfgrass BMPs, and urban turfgrass BMPs.

D.3 Remediation Options

The NSILT estimates that OSTDS contribute approximately 39 % of the pollutant loading to groundwater in the PFA. **Table D-1** identifies the number of existing OSTDS in the PFA and the estimated nitrogen reductions associated with enhancement or connection to sewer. **Figure D-1** shows the areas where OSTDS are located.

Table D-1. Estimated reduction credits for OSTDS enhancement or sewer *

***** Estimated reductions are for either enhancement or sewer per parcel classification. Reductions cannot be combined for the same parcel classification but can be combined between the different classifications. For example, the sewer credit associated with parcels less than one acre in size can be combined with the sewer credit associated with parcels one acre or greater in size.

Recharge Area	BMAP Policy: OSTDS Parcels Less Than One Acre in PFA (# of parcels)	Credit for Enhancement (lb-N/yr)	Credit for Sewer (lb-N/yr)
High	21,419	112,921	165,039
Medium	2,456	7,193	10,513
Low	39	23	33
Total	**23,914**	**120,138**	**175,586**

As required by statute, this OSTDS remediation plan identifies remediation options for existing OSTDS, including repair, upgrade, replacement, drain field modification, the addition of effective nitrogen-reducing features, connection to a central sewer system, or other action. More simply, remediation options can be classified as enhancement or replacement. Enhancement options consist of systems identified in either existing FDOH rules or existing and ongoing FDOH studies, or systems not otherwise prohibited by FDOH. Examples of enhancements include in-ground nitrogen-reducing biofilters (media layer systems); in-tank nitrogen-reducing biofilters; and ATU or PBTS capable of meeting or exceeding the NSF Standard 245 nitrogen removal rate before disposing wastewater in the drain field.

Nitrogen impacts from new development could also be reduced through prohibiting new conventional OSTDS on all lot sizes, throughout the BMAP area, or both.

DEP, FDOH, and local governments will develop programs to help fund the additional costs required to upgrade existing OSTDS to include nutrient reducing features. The funding program will be designed to prioritize OSTDS where it is most economical and efficient to add nutrient reducing features (i.e., systems needing a permit for a repair or modification, within the PFA, and on lots of less than one acre).

To facilitate incorporation of nitrogen reducing features at the time of a permit to repair or modify an existing OSTDS, FDOH will pursue regulatory solutions to accomplish the following objectives:

- Update OSTDS rule language regarding permits, variances, and waivers to include consideration of DEP-adopted OSTDS remediation plans. The

- Update OSTDS rules to allow installation of passive remediation systems, including, but not limited to systems featuring liners, nitrogen reducing material, or both underneath the drain field.

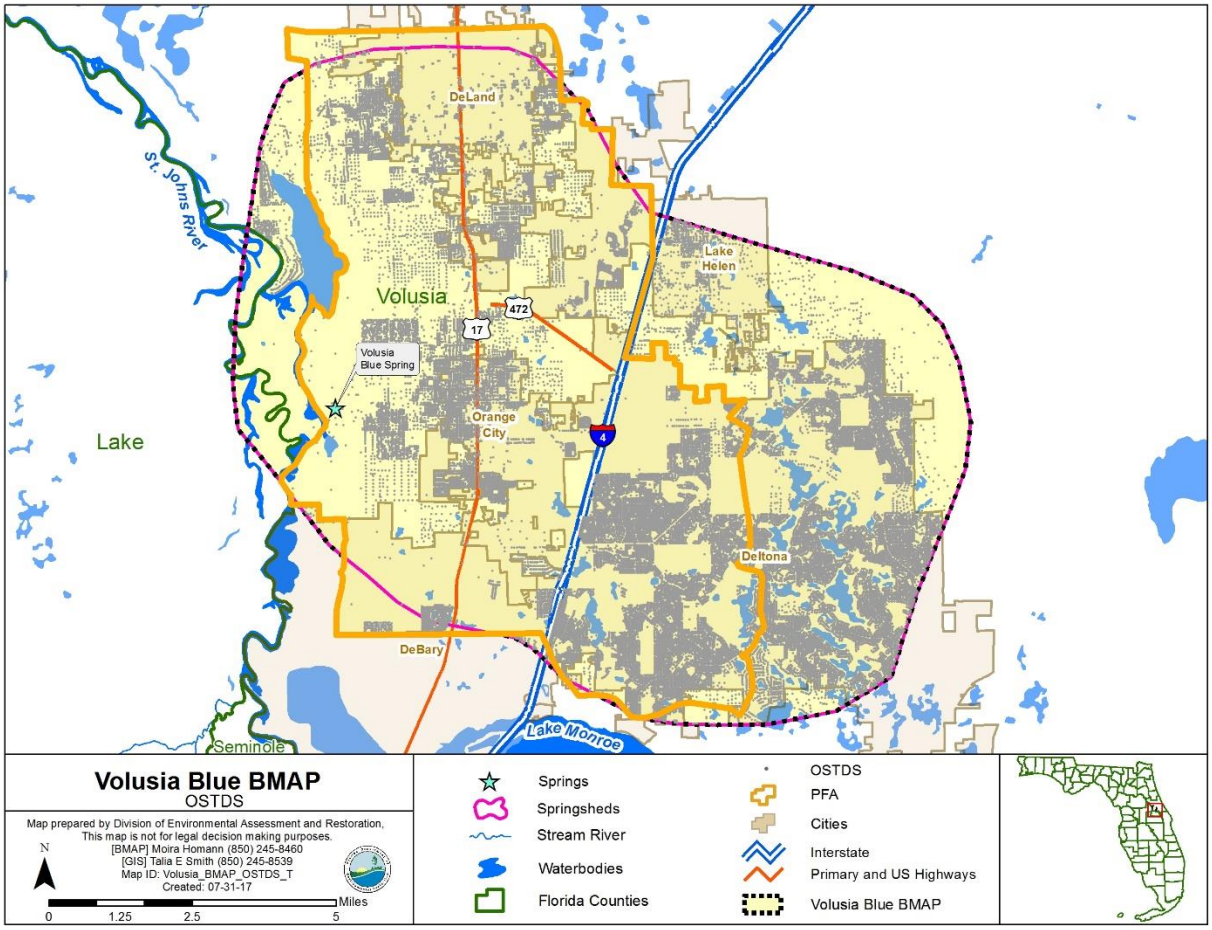

Figure D-1. OSTDS locations in the Volusia Blue BMAP area and PFA

D.4 Public Education Plan

DEP and FDOH will develop and disseminate educational material focused on homeowners and guidance for builders and septic system contractors. The materials will identify the need for advanced, nitrogen reducing OSTDS along with the requirements for installing nitrogen reducing technologies under this OSTDS remediation plan. DEP will coordinate with industry groups such as Florida Home Builders Association and FOWA.

DEP hosted a brainstorming session on August 16, 2016, to gather local input on the primary facets of a public education plan, including key audiences, the identification of major themes for communication/education, and the identification of misconceptions about septic systems.

During the development of this BMAP, the following list of steps, target audiences, consideration of appropriate messaging, and preparation of materials/resources were identified.

- **Step 1** – Understand the data and issues associated with septic systems.
- **Step 2** – Identify existing and short-term activities to address the issues.
- **Step 3** – Undertake a pilot project outreach and social marketing campaign.
- **Step 4** – Identify future actions for basinwide implementation.

Target Audiences

- Environmental groups.
- Environmental festivals and other environmental awareness–type events, including nonconventional events.
- Citizens.
- Homeowners' associations.
- Media.
- Chambers of Commerce.
- OSTDS industry.
- Realtors.

Messaging

- Multiple ideas were suggested to provide more information and to address misconceptions. These ideas were documented and have been archived by DEP as ideas for future campaigns and programs.

Materials

- Utility inserts.
- League of Cities website.
- Social media with consistent message.

- Sponsored ads.
- Community meetings.
- St. Johns River Cleanup Program.

The management strategies listed in **Table D-2** are ranked with a priority of high, medium, or low. In 2016, the Florida Legislature amended the Watershed Restoration Act (Section 403.067, F.S.), creating additional requirements for all new or revised BMAPs. BMAPs must now include planning-level details for each listed project, along with their priority ranking.

Project status was selected as the most appropriate indicator of a project's priority ranking based primarily on need for funding. Projects with a "completed" status were assigned a low priority. Projects classified as "underway" were assigned a medium priority because some resources have been allocated to these projects, but additional assistance may be needed for the project to be completed. High priority was assigned to projects listed with the project status "planned" as well as certain "completed" projects that are ongoing each year (any project with one of these project types: "street sweeping," "catch basin inserts/inlet filter cleanout," "public education efforts," "fertilizer cessation," "fertilizer reduction," or "aquatic vegetation harvesting"), and select projects that are elevated because substantial, subsequent project(s) are reliant on their completion.

Table D-2. Stakeholder education activities to implement the OSTDS remediation plan

Lead Entity	Activity Number	Activity Name	Description of Activity	Activity Status	Partners	Estimated Start Date	Estimated Completion Date	Cost Estimate	Funding Source	Funding Amount
UF–IFAS	IFAS-E-01	OFS OSTDS Campaign, Phase 1	Implement social marketing campaign that links septic systems to springs	Planned	Not Provided	2018	2020	$30,000	Not Provided	Not Provided
UF–IFAS	IFAS-E-02	OFS OSTDS Campaign, Phase 2	Create online clearinghouse of fact sheets, videos, PSAs, etc.	Planned	Not Provided	2018	2018	$7,000	Not Provided	Not Provided
UF–IFAS	IFAS-E-03	OFS OSTDS Campaign, Phase 3	Presentations to realtors and distribution of information kits for home buyers	Planned	Not Provided	2018	2018	$10,000	Not Provided	Not Provided
UF–IFAS	IFAS-E-04	OFS OSTDS Campaign, Phase 4	Six to eight septic system workshops for elected officials	Planned	Not Provided	2018	2019	$5,000	Not Provided	Not Provided
UF–IFAS	IFAS-E-05	OFS OSTDS Campaign, Phase 5	Homeowner workshops with field demonstrations	Planned	Not Provided	2018	2020	$25,000	Not Provided	Not Provided
Volusia County	VC-E-01	OSTDS Education to Elected Officials	Educate elected officials on regulations, impacts, and costs	Completed	Not Provided	Not Provided	Not Provided	Not Provided	Not Provided	Not Provided

Appendix E. Technical Support Information

E.1 NSILT Data

An NSILT was completed on Volusia Blue Spring for the Volusia Blue Spring BMAP. This technical support information identifies the data sources relied upon during NSILT development and documents all the major assumptions used by DEP when applying the NSILT approach to the Volusia Blue Spring BMAP.

The general NSILT approach involves estimating the nitrogen load to the surface for various source categories based on land use. The NSILT subjects the surface loading to recharge and attenuation to derive the estimated load to groundwater at the top of the aquifer. The estimated load to groundwater determines the scope of reduction strategies needed in the BMAP for each source category. For additional information about the general NSILT approach, see any of the NSILT reports posted online at http://publicfiles.dep.state.fl.us/DEAR/NSILT/.

E.1.1 General Data Inputs

Hydrogeology and Aquifer Recharge
Aquifer recharge information is based on the SJRWMD Floridan Aquifer Recharge Map which was updated in 2015.

Land Use
Land use information is from SJRWMD based on the 2009 Florida Land Use Cover and Forms Classification System (FLUCCS) and local county property appraiser offices within the BMAP boundary.

E.1.2 Estimating Nitrogen Inputs to the Land Surface

Atmospheric Deposition
Atmospheric deposition information is derived from the TDEP hybrid model (Schwede and Lear 2014) that inputs wet and dry monitoring network data for the U.S. and calculates an estimated TN deposition load. The Volusia Blue data set is comprised of data from 2011 to 2013.

WWTFs
The average annual input of nitrogen to the land surface was estimated for each effluent land application site in the BMAP area using TN concentration and discharge volume data available in the DEP Wastewater Facility Regulation (WAFR) database. Smaller WWTFs are not always required to monitor and report TN effluent concentrations, and therefore may not have data available in the WAFR database. For these, DEP estimated TN concentrations based on nitrate-nitrogen (NO_3-N) data (assuming the NO_3-N concentration was 38.5 % of the TN, based on a 2009 cooperative study with the Water Reuse Foundation of 40 domestic WWTFs across the state). The range of years for which data were available varied with the individual WWTFs; however, the majority of the data were from July 2013 to June 2014 and included the most recent complete year of data.

OSTDS

The number of OSTDS was initially estimated from the 2009 FDOH model which was correlated with current property appraiser land use information (Hall and Clancy 2009). The results were corrected for parcels identified with more than one OSTDS and the proximity of sewer lines. After the NSILT was produced, FDOH released an updated OSTDS inventory for Volusia County; the two data sets compare favorably.

The population served by the OSTDS was estimated using the 2010 U.S. Census Bureau data for each county. 2010 U.S. Census Bureau data was also used to look at population age distribution to account for school or working age population who likely have access to sewer connected facilities during away from home hours. The collection of data was used to estimate the effective population and OSTDS usage. This resulted in a per capita contribution of 9.012 lb-N/yr and 2.00 persons per household.

UTF

Results from surveys and workshops pertaining to fertilizer application on turfgrass in nearby counties were used to estimate the nitrogen application rates for urban turfgrass in the Volusia Blue Spring BMAP area (Suoto et al. 2009). The results provided input data on percent of the population that fertilize, the applicator, and application rates.

The type of property where fertilizer is applied is estimated for nonresidential and residential parcels. The acreage receiving fertilizer is estimated the same for both parcel types by using county property appraiser data and zoning data. Impervious and pervious land areas are determined for each parcel.

Fertilizer application on commercial and public green spaces was assumed to be performed by lawn service professionals or trained staff using application rates and frequencies similar to those recommended in the Green Industries BMP Manual (DEP 2010). Nonresidential parcels are assumed to be fertilized by a commercial service provider at a rate of 21.78 pounds of nitrogen per acre (lb-N/ac). Residential parcels are evaluated by estimating the percentage of the property fertilized and the probability of fertilization. For residential parcels, these factors are determined by utilizing property values (higher valued properties fertilize more often and in greater amounts) and parcel type (single-family residences fertilize more frequently than other residence types).

STF

Sports turfgrass areas include golf courses and sporting facilities. The nitrogen input for golf courses are estimated using the statewide annual average application rate (previously vetted by golf course professionals) of 141.1 pounds of nitrogen per acre per year (lb-N/ac/yr) (or 72 % of the course area at 4.5 pounds of nitrogen per 1,000 square feet (lb-N/1,000 ft2) (Sartain 2002; DEP 2007).

Sporting facilities were assessed based on property appraiser data. The parcel types likely to contain these facilities were identified and evaluated based on aerial imagery. The fertilizer application rate for nonresidential parcels (21.78 lb-N/ac) was used.

LW

Agricultural practices specific to this area were identified through conversations with the Florida Farm Bureau Federation and a meeting with Volusia County agricultural producers and stakeholders. For cow-calf operations, a stocking rate of 1 cow per 8 acres is used and the estimated quantity of pasture acreage is based on property appraiser data. For other livestock animals, populations are estimated from the 2012 U.S. Department of Agriculture (USDA) census of agriculture and 2009 SJRWMD land use coverage adjusted by percent of land use type in the BMAP area. The nitrogen waste factor for each animal type is based on published literature values (listed in the NSILT document) and subdivided into locations and recharge area.

FF

Agricultural fertilizer is applied at varying rates depending on crop type and farm practices. Estimated application rates are based on UF-IFAS recommendations, and types of crops likely grown are estimated from the county property appraiser database.

Estimated Nitrogen Inputs to Land Surface

The estimated input from each source category above is summed and a relative percent calculated.

E.1.3 Nitrogen Attenuation and Loading to Groundwater

The two types of attenuation that are evaluated are biochemical attenuation factors (BAFs) and hydrogeological attenuation (i.e., recharge).

BAFs and Uncertainty Factors

The BAFs used to account for the processes affecting the movement of nitrogen from each source category in the subsurface are based on literature review of studies in Florida and similar areas. Additionally, research scientists in Florida (UF–IFAS, universities, and USDA Agricultural Research Service), and local stakeholders provided additional guidance. The BAFs in Table E-1 are the result of this evaluation. The BAF is used to estimate what percent of the surface input could infiltrate to groundwater. For example, if 80 % of urban fertilizer is biologically attenuated, then the remaining 20 % could infiltrate to the groundwater.

The environmental attenuation of nitrogen from specific sources within the categories can vary substantially, both spatially and with depth in the subsurface, and will affect the amount of nitrogen leaching to groundwater and the relative contribution of nitrogen from each source category. The range in nitrogen attenuation can result from variability in soil properties, crop types, agricultural practices, nitrogen storage, volatilization of ammonia to the atmosphere, uptake by vegetation, denitrification, and other removal processes. The potential range in nitrogen attenuation for each source is shown in **Table E-1**.

Table E-1. Range of environmental attenuation of nitrogen from a detailed literature review

N Source Category	Low-Level Attenuation (%)	Attenuation Used for This Analysis (%)	High-Level Attenuation (%)
Atmospheric Deposition	85	90	95
WWTFs-RIBs	10	25	40
WWTFs-Sprayfield	50	60	75
WWTF-Reuse	50	75	85
OSTDS	40	50	75
Livestock Operations	80	90	95
Farm Fertilizers	50	80	85
Urban Fertilizers	50	70	85

Hydrogeological Attenuation (i.e., Recharge)

The recharge rate for the area where the surface input is calculated is based on the SJRWMD recharge map previously described. To account for variations in recharge rates to the UFA, non-attenuated nitrogen inputs in high rate recharge areas are multiplied by a weighting factor of 0.9, while nitrogen inputs are multiplied by a weighting factor of 0.5 for medium rate recharge areas and 0.1 for low. Groundwater discharge areas were not included in the calculations of nitrogen loads to the groundwater contributing area, as these areas do not contribute nitrogen to the aquifer.

Estimated Nitrogen Load to Groundwater

The surface inputs by source category are adjusted by applying the BAFs for the appropriate source category and location-based recharge factors to estimate the load to groundwater by source category. It is important to note that this load is estimated for the top of the aquifer. As the load interacts with the aquifer, additional factors likely modify it prior to discharge at the spring vents.

E.2 NSILT References

Florida Department of Environmental Protection. 2007. *Best management practices for the enhancement of environmental water quality on Florida golf courses*. Tallahassee, FL.

Florida Department of Environmental Protection. 2010. *Florida friendly best management practices for protection of water resources by the green industries*. Tallahassee, FL.

Hall, P., and S.J. Clancy. 2009. *The Florida statewide inventory of onsite sewage treatment and disposal systems (OSTDS): A report on the status of knowledge of the number and locations of OSTDS in each county and best management practices for improving this knowledge.* Prepared for the Florida Department of Health, Bureau of Onsite Sewage Programs, by EarthSTEPS and GlobalMind.

Sartain, J.B. 2002. *Recommendations for N, P, K and Mg for golf course and athletic field fertilization based on Mehlich III extractant*. Document SL191. Gainesville, FL: University of Florida Institute of Food and Agricultural Sciences.

Schwede, D.B., and G.G. Lear. 2014. A novel hybrid approach for estimating total deposition in the United States. *Atmospheric Environment* 92: 207–220.

Souto, L., M. Collins, D. Barr, G. Milch, J. Reed, and M.D. Ritner. 2009. *Wekiva residential fertilizer practices.* Contract# G0078. University of Central Florida for the Florida Department of Environmental Protection

U.S. Department of Agriculture Census of Agriculture website: https://www.agcensus.usda.gov

Water Reuse Foundation, 2009 "A Reconnaissance-Level Quantitative Comparison of Reclaimed Water, Surface Water and Groundwater," Alexandria, Virginia.

Appendix F. Educational Activities to Implement the UTF Management Strategies

The management strategies listed in **Table F-1** are ranked with a priority of high, medium, or low. In 2016, the Florida Legislature amended the Watershed Restoration Act (Section 403.067, F.S.), creating additional requirements for all new or revised BMAPs. BMAPs must now include planning-level details for each listed project, along with their priority ranking.

Project status was selected as the most appropriate indicator of a project's priority ranking based primarily on need for funding. Projects with a "completed" status were assigned a low priority. Projects classified as "underway" were assigned a medium priority because some resources have been allocated to these projects, but additional assistance may be needed for the project to be completed. High priority was assigned to projects listed with the project status "planned" as well as certain "completed" projects that are ongoing each year (any project with one of these project types: "street sweeping," "catch basin inserts/inlet filter cleanout," "public education efforts," "fertilizer cessation," "fertilizer reduction," or "aquatic vegetation harvesting"), and select projects that are elevated because substantial, subsequent project(s) are reliant on their completion.

Table F-1. Stakeholder education activities to implement UTF management

Projects with a designation of TBD (to be determined) denotes information is not currently available but will be provided by the stakeholder when it is available. Projects with a designation of N/A (not applicable) indicates the information for that category is not relevant to that project. Projects with a designation of "Not Provided" denotes that information was requested by DEP but was not provided by the lead entity.

Lead Entity	Activity Number	Activity Name	Description of Activity	Activity Status	Partners	Estimated Start Date	Estimated Completion Date	Cost Estimate	Funding Source	Funding Amount
Deltona	D-E-01	Spring Function Demonstration	During events that may be focused on other environmental or surface water issues, give a visual demonstration of how a spring functions (using the "How a Spring Works" poster) by showing the aquifer has a recharge and discharge area that is a spring. Then show how water gets added, pollutants get introduced, and how much we take out affects the springs minimum flows.	Planned	Not Provided	Not Provided	Not Provided	Not Provided	Not Provided	Not Provided
Deltona	D-E-02	Springshed Model	Create a functioning, portable spring/aquifer model that will demonstrate the process that water takes as the rain moves through the model to end up in the spring run	Planned	Not Provided	Not Provided	Not Provided	$1,500–$2,500	Not Provided	Not Provided
Volusia County	VC-E-02	Education Support of the Blue Spring Alliance	Continue to support the education efforts of the Blue Spring Alliance	Underway	Not Provided	Not Provided	Not Provided	Not Provided	Not Provided	Not Provided
Volusia County	VC-E-03	Education and Outreach Through Explore Volusia	Continue programs related to water quality issues through Explore Volusia	Underway	Not Provided	Not Provided	Not Provided	Not Provided	Not Provided	Not Provided
Volusia County	VC-E-04	Education and Outreach Through Project H2O	Continue and expand education efforts about fertilizer application through project H2O	Underway	Not Provided	Not Provided	Not Provided	Not Provided	Not Provided	Not Provided

Appendix G. FDACS Information on BMPs

G.1 Implementation of Agricultural BMPs

Agricultural nonpoint sources in a BMAP area are required by state law (Subsection 403.067[7], F.S.) either to implement the FDACS-adopted BMPs, which provides a presumption of compliance with water quality standards, or to conduct water quality monitoring prescribed by DEP or SJRWMD. Failure either to implement BMPs or conduct monitoring may result in enforcement action by DEP or SJRWMD.

Growers who implement BMPs may be eligible for cost-share from FDACS, SJRWMD, or others to defray partially the costs of implementation. Through the OAWP, the Florida Forest Service, and the Division of Aquaculture, FDACS develops, adopts, and assists producers in implementing agricultural BMPs to improve water quality and water conservation.

FDACS identified potential land that could be enrolled in the FDACS BMP Program in the Volusia Blue BMAP by creating a composite coverage based on land use data used in the Volusia Blue Spring NSILT to estimate nitrogen loads for agricultural lands and the FSAID IV geodatabase. Acreages for fertilized crops were estimated using the Volusia County Property Appraiser land use data and FSAID IV, which provides more detailed crop and associated irrigation system information. Acreages for cattle grazing lands were estimated using property appraiser land use data, and acreages for all other miscellaneous livestock lands were estimated using 2009 SJRWMD land use data.

Table G-1 summarizes the composite land use data for agriculture in the Volusia Blue BMAP area. The total agricultural lands in the Volusia Blue BMAP area is 5,241 acres. **Table G-2** summarizes the agricultural land by crop type that was estimated to be fertilized and the corresponding acreages. The primary fertilized land use in the Volusia Blue BMAP area is improved agriculture pastures, which comprises 62 % of the fertilized land use in the BMAP area. **Table G-3** summarizes the agricultural lands with livestock and distinguishes between lands used for cattle grazing, miscellaneous livestock, and lands containing both cattle grazing and miscellaneous livestock. It is important to note that some of the agricultural lands include more than one agricultural practice, which will result in some acreage being identified in both **Tables G-2** and **G-3**.

Figure G-1 shows the approximate location of these agricultural lands based on composite land use in the Volusia Blue BMAP area.

Table G-1. Composite agricultural land use in the Volusia Blue BMAP area

Agricultural Land Use Category	Acres
Crop Fertilizer Lands Only	261
Livestock Lands Only	3,187
Crop Fertilizer and Livestock Lands	1,761
Total	**5,209**

Table G-2. Fertilized crop lands in the Volusia Blue BMAP area

Crop Type	Source	Acres
AG Citrus	Property Appraiser	20
Cropland (watermelons, corn, hayfield, berries, tree crops)	Property Appraiser	122
Ornamental	Property Appraiser	98
Pastures, Improved	Property Appraiser	1,247
Pastures, Semi-improved	Property Appraiser	457
Citrus	FSAID IV	7
Greenhouse/Nursery	FSAID IV	72
Total		**2,022**

Table G-3. Livestock lands in the Volusia Blue BMAP area

Livestock Category	Total Acres
Cattle Grazing Lands Only	1,324
Miscellaneous Livestock Lands Only	2,638
Cattle Grazing Lands and Miscellaneous Livestock Lands	1,019
Total	**4,980**

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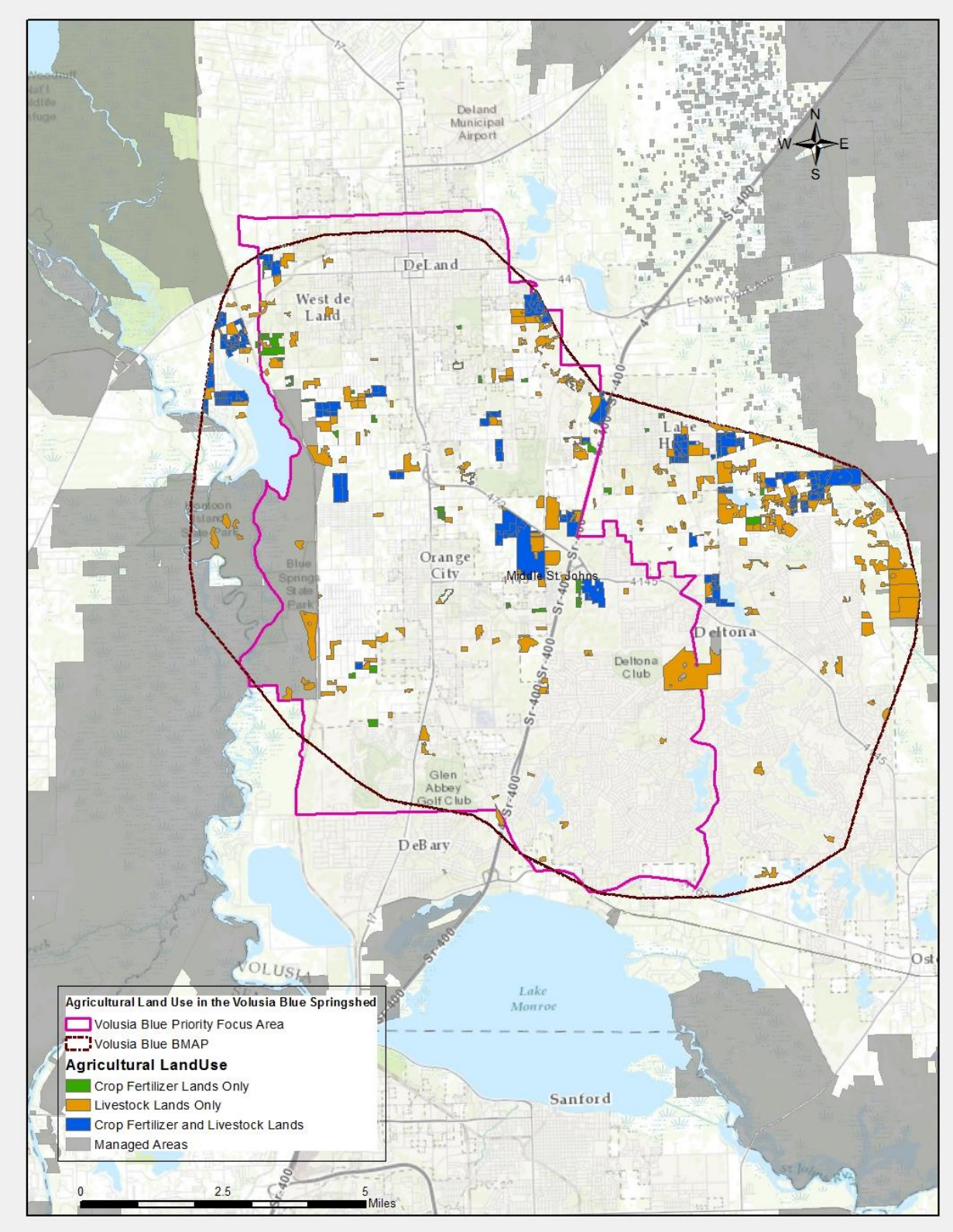

Figure G-1. Composite of agricultural lands in the Volusia Blue BMAP area

Agricultural land use data are critical for determining agricultural nonpoint source loads and developing strategies to reduce those loads in a BMAP area, but there are inherent limitations in the available data. The time of year when land use data are collected (through aerial photography) affects the accuracy of photo interpretation. Flights are often scheduled during the winter months due to weather conditions and reduced leaf canopies, and while these are favorable conditions for capturing aerial imagery, they make photo interpretation for determining agricultural land use more difficult (e.g., more agricultural lands are fallow in the winter months) and can result in inappropriate analysis of the photo imagery. There is also a significant variation in the frequency with which various sources of data are collected and compiled, and older data are less likely to capture the frequent changes that often typify agricultural land use. In addition, agricultural activity being conducted on the land is not always apparent. For example, acreage classified as improved pasture may be used for a cow-calf operation, consist of forage grass that is periodically harvested for hay, or simply be a fallow vegetable field awaiting planting. Finally, the classification method itself may be an issue. For example, property appraiser data assigns an agricultural land use designation to an entire parcel, although agricultural production may only be conducted on a portion of the parcel. Because of error in the collection and characterization of land use data and changes in land use over time, agricultural land use acreage estimates are subject to adjustment.

G.2 Agricultural BMPs

Through OAWP, the Florida Forest Service, and the Division of Aquaculture, FDACS develops, adopts, and assists producers in implementing agricultural BMPs to improve water quality and water conservation. Adopted BMPs are initially verified by DEP as reducing nutrient loss (e.g., total nitrogen and total phosphorus) to the environment. OAWP BMPs are published in commodity-specific manuals that cover key aspects of water quality and water conservation. The BMP categories include:

- Nutrient Management practices that help determine appropriate source, rate, timing, placement of nutrients (including both organic and inorganic sources) to minimize impacts to water resources.

- Irrigation and Water Table Management practices that address methods for irrigating to reduce water and nutrient losses to the environment and to maximize the efficient use and distribution of water.

- Water Resource Protection practices such as buffers, setbacks, and swales to reduce or prevent the transport of nutrients and sediments from production areas to water resources.

The NOI to Implement and BMP checklist are incorporated into each manual.

Information on the BMP manuals and field staff contact information can be obtained here: http://www.freshfromflorida.com/Divisions-Offices/Agricultural-Water-Policy. Printed BMP manuals can be obtained by contacting OAWP field staff.

OAWP outreach to solicit enrollment extends to all types of agricultural operations but is more intensive in BMAP areas because of the relationship of BMPs to the presumption of compliance with water quality standards in a BMAP area. FDACS field staff works with producers to enroll in the FDACS BMP Program by signing a Notice of Intent to Implement BMPs, and enrollment is based on the expectation that producers recognize and address the water quality and conservation issues associated with their operations. Upon completion of all information in the BMP checklist, an NOI must be signed by the landowner or the landowner's authorized agent (who may be the producer if the producer is not the landowner).

G.3 BMP Enrollment

Figure G-2 shows the acres enrolled in the FDACS BMP Program in the Volusia Blue BMAP as of December 31, 2016. **Table G-4** lists the acres enrolled in the FDACS BMP Program by manual and the number of NOIs associated with those acres. Given that the enrolled acres where BMPs are implemented can contain nonproduction acres (such as buildings, parking lots, and fallow acres), only the enrollment for the land classified as agriculture based on the FSAID is included in **Table G-4**.

As of December 31, 2016, NOIs cover 145 agricultural acres in the Volusia Blue BMAP. No producers are conducting water quality monitoring in lieu of implementing BMPs at this time.

Table G-4. Agricultural acreage and BMP enrollment in the Volusia Blue Spring BMAP area as of December 31, 2016

Related FDACS BMP Programs	NOI Acreage Enrolled	Composite Agricultural Land Use Acres with NOIs
Cow/Calf Operations	106	49
Nurseries	25	25
Citrus	14	14
Total	**145**	**88**

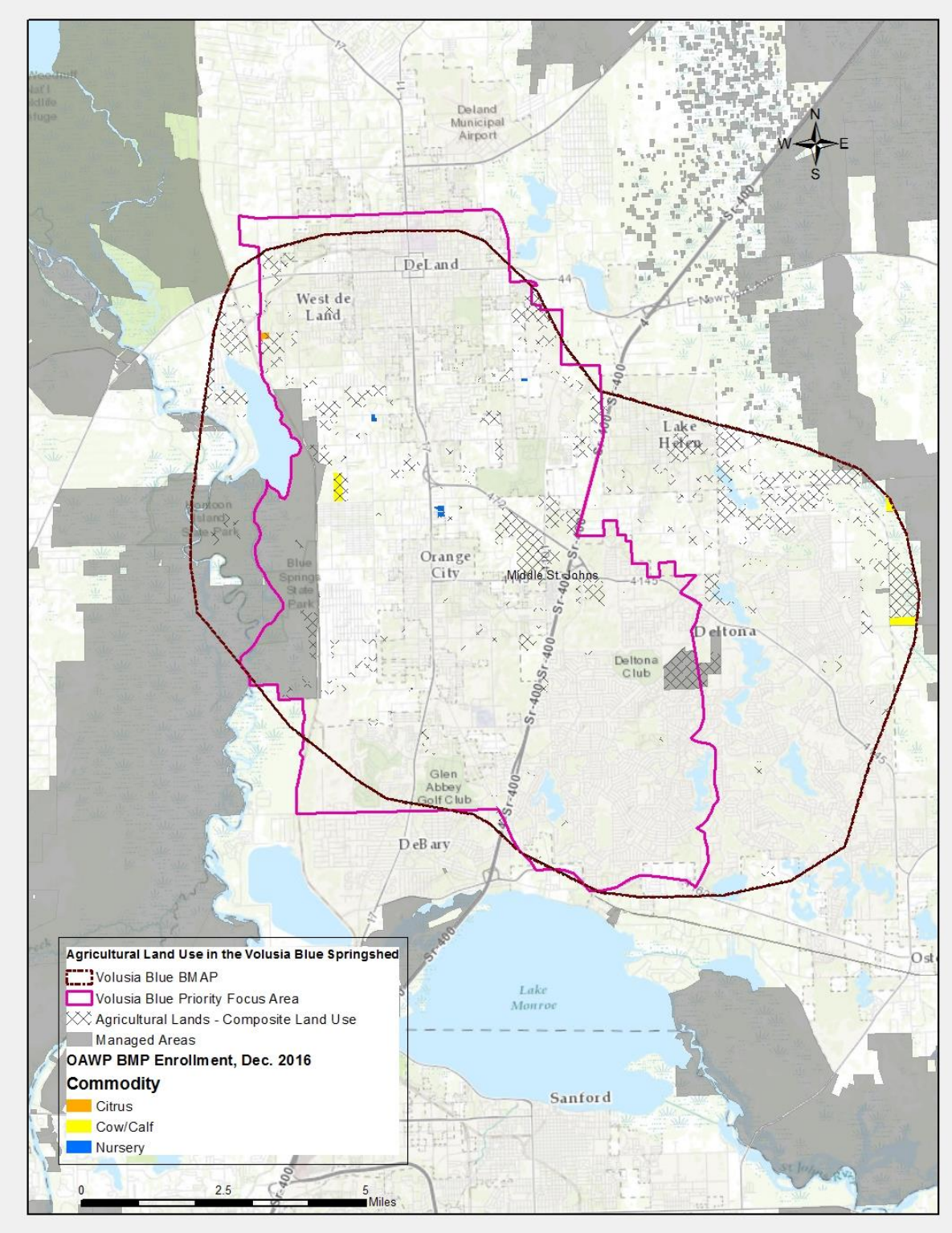

Figure G-2. BMP enrollment in the Volusia Blue BMAP area as of December 31, 2016

G.4 FDACS OAWP Role in BMP Implementation and Follow-Up

OAWP works with producers to submit NOIs to implement the BMPs applicable to their operations, provides technical assistance to growers, and distributes cost-share, as available, to eligible producers for selected practices. OAWP follows up with growers through site visits to evaluate the level of BMP implementation and record keeping, identify areas for improvement, if any, and discuss cost-share opportunities.

When DEP adopts a BMAP that includes agriculture, it is the agricultural producer's responsibility to implement BMPs adopted by FDACS to help achieve load reductions. If land use acreage corrections and BMP implementation do not fully account for the current agricultural load reduction allocation, it may be necessary to develop and implement cost-assisted field- or regional-level treatment options that remove nutrients from farms and other nonpoint sources. In that case, FDACS will work with DEP and SJRWMD to identify appropriate options for achieving further agricultural load reductions.

Section 403.067, F.S. requires that where water quality problems are demonstrated despite the proper implementation of adopted agricultural BMPs, FDACS must reevaluate the practices, in consultation with DEP, and modify them if necessary. Continuing water quality problems will be detected through the BMAP monitoring component and other DEP and SJRWMD activities. If a reevaluation of the BMPs is needed, FDACS will also include SJRWMD and other partners in the process.

G.5 OAWP Implementation Verification Program

OAWP established an Implementation Assurance (IA) Program in 2005 in the Suwannee River Basin as part of the multi-agency/local stakeholder Suwannee River Partnership. In early 2014, OAWP began to streamline the IA Program to ensure consistency statewide and across commodities and BMP manuals. The IA Program was based on interactions with producers during site visits by OAWP staff and technicians as workload allowed. For the visits, field staff and technicians used a standard form (not BMP specific) developed in 2014, that focused on nutrient management, irrigation management, and water resource protection BMPs common to all of the BMPs that were adopted by rule. Once completed, these paper forms were submitted to OAWP staff and compiled into a spreadsheet, and the data were reported annually.

On November 1, 2017, the OAWP's Implementation Verification rule (Chapter 5M-1, F.A.C.) became effective. The Implementation Verification (IV) Program provides the basis for assessing the status of BMP implementation and for identifying enrolled producers who require assistance with BMP implementation. The components of the IV Program are 1) site visits; 2) implementation status reporting on common practices that apply across all BMP manuals; 3) technical assistance; and 4) external reporting. Implementation verification is confirmed by field staff through site visits and by producers through annual common practices status reports.

Site visits to agricultural operations by OAWP field staff and contract technicians are the most effective means to determine the status of BMP implementation. These visits also provide an opportunity to identify needs for assistance with implementation and explore potential improvements. Resource limitations prevent site visits from occurring on all enrolled operations every year, and for that reason, site visits are prioritized. The program objective is for field staff to conduct site visits for 5-10 % of active NOIs each year, with approximately 10 % of the site visit locations selected randomly.

Per the IV rule, each year, producers participating in the BMP Program will be requested to participate in reporting on the status of implementation of common practices only for their operations. Lack of response from enrollees with parcels in a BMAP area raises the priority of the operation for a site visit from field staff. Where a need is identified, OAWP may facilitate technical assistance for the producer from UF-IFAS or other resources, including third-party vendors. In some cases, cost share support may be available. Data from producers and site visits will be used to complete the annual reports on the status of BMP implementation as required by s. 403.0675(2), F.S., beginning July 1, 2018.

G.6 Beyond BMPs

Beyond enrolling producers in the FDACS BMP Program and verifying implementation, FDACS will work with DEP to improve the data used to estimate agricultural land uses in the springshed. FDACS will also work with producers to identify a suite of agricultural projects and research agricultural technologies that could be implemented on properties where they are deemed technically feasible and if funding is made available. Acreages provided by FDACS are preliminary estimates that are the maximum acreages and will need to be evaluated and refined over time. FDACS is conducting relevant research in the Suwannee River Basin, summarized in **Table G-5**. At some future point, the findings of this research may be applicable in the Volusia Blue BMAP if they are technically feasible, funding is available, and landowners are willing to implement them.

Table G-5. Beyond BMP implementation

Category	Name	Description
Research	Rotational Production	Conversion of conventional production operations to planned rotational production incorporating grass and cover crops. May include cattle.
Research	Soil Moisture Sensor Deployment and Calibration	Installation, training, monitoring, and research on the use of electronic soil moisture sensors, including correlations to nutrient movement through the root zone.
Research	BMP Effectiveness on CRF	Focused research on the effects of BMP implementation on water quality and water conservation.
Research	Reuse of High-Nutrient-Value Water Sources	Study of potential sources of high-nutrient-value water, potential beneficial reuse sites, legal and regulatory obstacles, and costs.

Appendix H. Future Growth Strategies of Local Jurisdictions

Table H-1. Future growth strategies of local jurisdictions

Lead Entity	Strategy Name	Description	Strategy Type	Status
Volusia County	Ordinance No. 2014-06	Florida-Friendly Fertilizer Use	Ordinance	Completed
Volusia County	Ordinance No. 87-35	Pollution Control	Ordinance	Completed
Volusia County	Ordinance No. 88-15	Stormwater Management	Ordinance	Completed
Volusia County	Ordinance No. 2009-05	Stormwater Discharge Pollutant Control	Ordinance	Completed
Volusia County	Ordinance No. 92-89	Stormwater Utility	Ordinance	Completed
Volusia County	Ordinance No. 91-37	Wastewater Residual Management	Ordinance	Completed
Volusia County	Ordinance No. 96-15	Reclaimed Water Service	Ordinance	Completed
Volusia County	FLU Policy 1.1.1.9	The County shall coordinate with the cities and consider joint agreements to create future water and sewer service areas.	Comprehensive Plan	Completed
Volusia County	FLU Policy 1.1.1.11	Urban areas are required to have central potable water and sanitary sewer service, except for the following: Lot sizes ranging from one (1) acre up to 2.49 acres shall require central potable water but may utilize an individual waste water disposal system. Lot sizes 2.5 acres or larger in size may utilize individual water and wastewater disposal systems.	Comprehensive Plan	Completed
Volusia County	FLU Policy 1.2.2.6	Septic tanks and drainfields shall be sited to protect environmentally sensitive areas from the discharge of improperly treated effluent, consistent with the Conservation and Coastal Management Elements.	Comprehensive Plan	Completed
Volusia County	FLU Policy 1.2.2.12	Agriculture and silviculture operations shall adhere to accepted BMPs for surface water management and erosion control.	Comprehensive Plan	Completed
Volusia County	FLU Objective SG 1.2	To protect and enhance environmentally sensitive corridors, wildlife habitat, connected wetlands, and natural hydrologic functions throughout Volusia County, the County adopts the Environmental Core Overlay or “ECO” Map as a component of the Future Land Use Map series.	Comprehensive Plan	Completed
Volusia County	Sanitary Sewer Policy 6.1.1.3	Volusia County shall continue to require "advanced secondary treatment" of wastewater (including high-level chlorination and sand filtration) at all County owned wastewater treatment plants with capacities of 0.1 MGD or more.	Comprehensive Plan	Completed

Lead Entity	Strategy Name	Description	Strategy Type	Status
Volusia County	Sanitary Sewer Policy 6.1.1.5	Central sewer is not required for non-urban areas, except as required by Chapter 64E-6, F.A.C. Lines should only be extended if the absence of such facilities would result in a threat to the public health or safety or a designated rural area is inside an approved sewer service area with an agreement that describes the method and timing of when these services would be provided, or the comprehensive plan is amended to change rural areas to urban areas.	Comprehensive Plan	Completed
Volusia County	Sanitary Sewer Policy 6.1.1.8	Except as may otherwise be permitted by this sub-element, the extension of wastewater lines and the establishment of central wastewater systems outside of sewer service areas (county, municipal, or other as established by an adopted service area agreement) shall be prohibited unless such extension or facility construction will mitigate existing or potential problems of public health, safety, or welfare or other exceptions under the guidelines delineated in the Future Land Use Element.	Comprehensive Plan	Completed
Volusia County	Sanitary Sewer Policy 6.1.1.13	Septic tanks are only allowed under any one of the following applicable circumstances provided that the septic tank has been approved by FDOH.	Comprehensive Plan	Completed
Volusia County	Sanitary Sewer Policy 6.1.1.14	Volusia County shall require all sewage treatment and disposal systems including septic tanks to be located and constructed in a manner consistent with all applicable local, state, and federal regulations, including the applicable goals, objectives, policies, and level of service standards contained in this comprehensive plan.	Comprehensive Plan	Completed
Volusia County	Sanitary Sewer Policy 6.1.1.15	An existing septic tank system may be upgraded, provided that a central sanitary sewer system is not available. However, connection to a central sanitary sewer system is required where said system is available in lieu of upgrading an existing septic tank system.	Comprehensive Plan	Completed
Volusia County	Sanitary Sewer Policy 6.1.1.16	The establishment of central wastewater service outside of sewer service areas is prohibited except for Rural Communities, Rural Villages, and Rural Recreational areas as provided for by this sub-element or where DEP, the County Development Review Committee or other appropriate agency, has determined that such a facility is necessary to correct existing or potential problems of public health, safety, or welfare.	Comprehensive Plan	Completed

Lead Entity	Strategy Name	Description	Strategy Type	Status
Volusia County	Sanitary Sewer Policy 6.1.1.19	The location and siting of new package treatment plants shall be prohibited in areas where the disposal of effluent will result in the lowering of the ambient quality, where such information is available, of surface water or groundwater unless such discharge can be shown to be of overriding public interest.	Comprehensive Plan	Completed
Volusia County	Sanitary Sewer Policy 6.1.2.1	Volusia County shall replace and/or consolidate, when it is determined to be feasible, smaller package plants owned by the County with "advanced secondary" sewage treatment plants or enlarge existing plants.	Comprehensive Plan	Completed
Volusia County	Sanitary Sewer Policy 6.1.2.5	Existing package treatment plants shall be connected to a central sewer system when connection to said system is available. When an existing privately-owned package treatment facility is phased out and connected to a central public wastewater system, the owner of said private plant may be required to assume the cost of the connection.	Comprehensive Plan	Completed
Volusia County	Sanitary Sewer Policy 6.1.2.6	Volusia County shall require the utilization of a central sewer system where connection to a central system is available. The use of existing septic tanks serving land uses within the sewer service areas may continue in the manner consistent with the requirements specified by the County's comprehensive plan and local and state regulations.	Comprehensive Plan	Completed
Volusia County	Sanitary Sewer Policy 6.1.3.1	Volusia County shall require use of recovered wastewater for irrigation and non-potable use for all new development and other appropriate uses, where such use can be feasibly implemented and permitted by DEP as determined by Volusia County's land development regulations.	Comprehensive Plan	Completed
Volusia County	Sanitary Sewer Policy 6.1.3.2	Volusia County shall comply with state regulations for water quality, especially with respect to wastewater plant operations and effluent disposal and, if necessary, develop an appropriate alternative management strategy which may include reduction in wastewater effluent loadings and discharge rates.	Comprehensive Plan	Completed
Volusia County	Sanitary Sewer Policy 6.1.3.6	Volusia County may, where practical and economically feasible, develop and implement an environmentally sound program for the use of natural systems, such as wetlands, for wastewater disposal provided that the implementation of such a program does not present a hazard to public health.	Comprehensive Plan	Completed
Volusia County	Sanitary Sewer Policy 6.1.3.8	Volusia County shall, to the extent feasible, provide facilities to allow the use of recovered wastewater for agricultural and other purposes, where County or other utility owners supply it.	Comprehensive Plan	Completed

Lead Entity	Strategy Name	Description	Strategy Type	Status
Volusia County	Sanitary Sewer Policy 6.1.5.2	Volusia County shall negotiate sewer service area agreements with adjacent municipalities to better coordinate the orderly, efficient, and economical provision of wastewater service.	Comprehensive Plan	Completed
Volusia County	Drainage Objective 9.1.1	Volusia County shall fund and complete comprehensive watershed studies for all areas currently developed, or developing with essentially urban land uses, and areas where the Future Land Use Map has designated essentially urban land uses within the unincorporated county, as part of an overall Stormwater Master Plan. The County shall continue to assess other watersheds for flooding and pollution problems and for changes in land use.	Comprehensive Plan	Completed
Volusia County	Drainage Objective 9.1.2	Volusia County shall at a minimum maintain current standards regulating the design, construction, and management of drainage systems used for stormwater management.	Comprehensive Plan	Completed
Volusia County	Drainage Policy 9.1.2.6	BMPs for control of erosion and sedimentation shall be employed for all construction, urban development, and agricultural activities in order to protect natural waterbodies, water courses and wetlands from siltation.	Comprehensive Plan	Completed
Volusia County	Drainage Policy 9.1.3.1	Volusia County shall maintain an effluent reuse and disposal program to recharge wetlands and groundwater supplies and providing irrigation water thereby conserving potable water resource and improving surface water quality of the county.	Comprehensive Plan	Completed
Volusia County	Groundwater Policy 10.1.1.11	Prime (or high) aquifer recharge areas appropriate for development shall be developed so as to continue to maintain pre-development net retention and new stormwater management projects in existing developed areas should be designed in a fashion that enhances aquifer recharge.	Comprehensive Plan	Completed
Volusia County	Groundwater Policy 10.1.1.12	Volusia County shall protect recharge lands through both fee simple or less than fee simple acquisition techniques, land use controls, or other methods deemed appropriate.	Comprehensive Plan	Completed
Volusia County	Groundwater Objective 10.1.2	Volusia County shall not allow the degradation of the Floridan and surficial aquifers' water quality.	Comprehensive Plan	Completed
Volusia County	Conservation Objective 12.1.1	To prevent the further degradation of the ambient water quality of the county's surface water resources, and to restore to acceptable levels those surface waters which exceed federal, state and local pollutant standards.	Comprehensive Plan	Completed
Volusia County	Conservation Policy 12.1.1.1	An ongoing surface water quality monitoring network, incorporating the standards and activities provided in the Coastal Management Element shall continue.	Comprehensive Plan	Completed

Lead Entity	Strategy Name	Description	Strategy Type	Status
Volusia County	Conservation Policy 12.1.1.2	The County shall continue to initiate and encourage surface water restoration programs which will, at minimum: identify and initiate the cleanup of highly polluted aquatic systems; identify those areas of the county where on-site sewage disposal systems are determined to be or have the potential to be significant surface water pollution sources; and coordinate with stormwater facility redesign activities where necessary.	Comprehensive Plan	Completed
Volusia County	Conservation Policy 12.1.1.4	Onsite sewage disposal systems and associated drainfields shall continue to be limited within the flood plain of surface water bodies as provided for in land development regulations, to the extent that such systems are designed and located so as to not contribute to the degradation of ambient water quality.	Comprehensive Plan	Completed
Volusia County	Conservation Objective 12.1.2	To protect and enhance the natural hydrologic functions and wildlife habitat attributes of surface water resources, including estuarine and oceanic waters, as well as waters which flow into estuarine and oceanic water, and the floodplains associated with these waters.	Comprehensive Plan	Completed
Volusia County	Conservation Objective 12.1.3	To protect and appropriately utilize the physical and ecological functions of natural drainageways and drainage patterns.	Comprehensive Plan	Completed
Volusia County	Conservation Objective 12.2.1	To provide for the protection of areas determined to be environmentally sensitive, and direct growth away from such areas.	Comprehensive Plan	Completed
City of DeBary	Ordinance Nos. 04-09 and 04-17	Fertilizer Management	Ordinance	Completed
City of DeBary	Ordinance No. 02-09	Control of Illicit Discharges to the Stormwater System and Waters of the State	Ordinance	Completed
City of DeBary	Ordinance No. 05-05	Stormwater Utility	Ordinance	Completed
City of DeBary	Natural Resources Objective 4.3	The City will carry out a program of activities to appropriately manage water resources (including groundwater resources and surface water resources such as lakes, ponds, streams, shorelines, and rivers) consistent with the need for the growth of the community and the needs of the environment.	Comprehensive Plan	Completed
City of DeBary	Natural Resources Policy 4.302	The City will cooperate with the Volusia County Public Health Unit, DEP, and/or other agencies to monitor water quality in surface water bodies. Where trends indicate a reduction of water quality, steps will be taken to identify the sources of pollution and to help mitigate the adverse impacts.	Comprehensive Plan	Completed

Lead Entity	Strategy Name	Description	Strategy Type	Status
City of DeBary	Natural Resources Policy 4.303	While there is not a present indication of the need to provide sewer service to older residential areas, the City may cooperate with Volusia County Utilities and/or other sewer providers to establish the feasibility, the potential cost, and possible methods for extension of sewer service.	Comprehensive Plan	Completed
City of DeBary	Natural Resources Objective 4.7	The City shall implement a green infrastructure program to provide clean air and water through the efficient and sustainable use of the natural resource network to reduce negative impacts of future development patterns and to lessen the need for expensive grey infrastructure installations.	Comprehensive Plan	Completed
City of DeBary	Public Facilities Objective 7B.2	The City will continue to coordinate with all service providers to maximize the use of existing sanitary sewer facilities so as to discourage urban sprawl, support high density mixed use developments within the Southeast Mixed Use Area/Transit Oriented Development Overlay District, and encourage the establishment of a single, coordinated sanitary sewer system to serve the city.	Comprehensive Plan	Completed
City of DeBary	Public Facilities Policy 7B.201	The City will continue to help coordinate the expansion of the various sanitary sewer systems serving the city. A specific purpose of this coordination will be to ensure that areas of the city requiring service will obtain such service in a timely and cost-effective manner.	Comprehensive Plan	Completed
City of DeBary	Public Facilities Policy 7B.302	The City will continue to coordinate all service providers to monitor non-residential land uses to help prevent improper use of the sewer system.	Comprehensive Plan	Completed
City of DeBary	Public Facilities Policy 7C.101	The City will continue improving stormwater management facilities to serve developed areas.	Comprehensive Plan	Completed
City of DeBary	Public Facilities Policy 7C.103	Where available funds for improvement to stormwater management facilities are not specifically restricted, the highest priority will be given to providing services in developed areas experiencing structural flooding. High priority may also be given to water quality improvements related to EPA's TMDL Program for watershed planning and restoration.	Comprehensive Plan	Completed
City of DeBary	Public Facilities Objective 7C.2	The City will carry out a program of activities to help protect the functions of natural drainage features and natural groundwater recharge areas, and to maintain water quality in these natural systems.	Comprehensive Plan	Completed

Lead Entity	Strategy Name	Description	Strategy Type	Status
City of Deland	Ordinance No. 16-8	Where in any street or section of street there is now constructed a public sewer for the purpose of carrying off the sewage, the owner of the property on, adjacent to, along the line of, or within 200 feet of any such sewer so constructed shall, within 30 days after being notified by the city commission or city manager, or sanitary inspector of the city connect the house and building on such property with such public sewer in a proper manner.	Ordinance	Completed
City of Deland	Ordinance No. 16-9	Where in any street or section of streets there is now a public sewer for the purpose of carrying off the sewage, the owner of the property abutting on, adjacent to, along the line of or within 200 feet of any such sewer so constructed shall not install any septic tank or any privy for the use of occupants of any building which has been erected since the construction of such public sewer or which shall hereafter be erected, but in all cases such owners shall, before allowing such building to be occupied, connect such building with such public sewer in a proper manner.	Ordinance	Completed
City of Deland	Conservation Policy 1.2.4	The City of DeLand shall promote water conservation through implementation of reclaimed water distribution to new subdivisions. All new residential subdivisions within the city's reclaimed water service area shall include lines for reclaimed water. All developments with more than 100 equivalent residential units shall provide storage and pumping facilities for peak flow attenuation and reclaimed water augmentation.	Comprehensive Plan	Completed
City of Deland	Ordinance Sec. 127	Upon the construction of a reclaimed water, water and wastewater system, the owner, tenant or occupant of each lot or parcel of land within the city which abuts upon a street or other public way containing a water line or sanitary sewer served or which may be served by the reclaimed water, water or wastewater system, or which is within 200 feet of such water or sewer line, and upon which lot or parcel a building shall have been constructed for residential, commercial or industrial use, shall, if so required by ordinance duly passed, connect such building with such water or sanitary sewer, and shall cease to use any other method for the acquisition of water or disposal of sewage, sewage waste or other polluting matter. All such connections shall be made in accordance with rules and regulations which shall be adopted by the city commission, which rules and regulations may provide for a charge for making any such connection in such reasonable amount as the city commission may fix and establish.	Ordinance	Completed

Lead Entity	Strategy Name	Description	Strategy Type	Status
City of Deland	Ordinance Sec. 30-25	(a) Purpose and intent. The purpose of this section is to protect the health, safety, and welfare of the general public through the administration and regulation of earthwork and drainage and to provide for a mechanism to provide funding for such activities. It is the intent of this chapter that the city will establish stormwater management as a city utility enterprise in accordance with section 403.0893, Florida Statutes, and shall establish a program of utility fees for stormwater management services to be charged to all developed property within the city to accomplish the functions of the utility, which include, but are not limited to, maintenance, planning, design, construction, regulation, surveying, and inspection as they relate to the stormwater management system of the city.	Ordinance	Completed
City of Deltona	Ordinance No. 38.150 - 38.157	Stormwater Discharge Pollutant Control	Ordinance	Completed
City of Deltona	Ordinance No. 38.171	Florida-Friendly Fertilizer Use	Ordinance	Completed
City of Deltona	Ordinance No. 68-115	All persons or corporations developing property (either commercial, industrial or residential) within the service area after the effective date of this chapter shall be required, at the discretion of the city, to immediately connect to the city wastewater system, where available. Except for wastewater customers served by a private wastewater utility within an area certificated as of the effective date of this chapter by the Florida Public Service Commission, all persons or corporations living or doing business within the service area as of the effective date of this chapter shall be required, at the discretion of the city, to connect to the city wastewater system within 180 days of when it becomes available.	Ordinance	Completed

Lead Entity	Strategy Name	Description	Strategy Type	Status
City of Deltona	Ordinance No. 68-67	The commission hereby establishes the reclaimed water policy for the purpose of determining allocation and use of treated wastewater effluent (hereinafter referred to as "reclaimed water") for landscape irrigation of appropriate green areas within the service area of the city. (2) Availability. The city shall make reclaimed water available to residential and commercial customers, within the service area of the city, that own properties requiring landscape irrigation (the foregoing consumer shall hereafter be referred to as a "user"). Reclaimed water will be provided to users in accordance with approved reclaimed water agreements. The city will allocate the reclaimed water as fairly as possible. Determination of the quantity of reclaimed water to be provided shall be at the discretion of the utility director except for those users requiring more than 100,000 GPD would be at the discretion of the city commission.	Ordinance	Completed
City of Orange City	Ordinance No. 17.3-131	Connection to system required; exceptions modified (a)It shall be unlawful for any person to construct, install or repair septic tanks or other wastewater disposal systems in or upon any property which abuts or is within 1,000 feet of a sanitary sewer main available to such property for use.	Ordinance	Completed
City of Orange City	Ordinance No. 17.3-207	Water and sewer availability; connection to public systems. (a)To the full extent permitted by law, all buildings and structures which are located or constructed on property in the Orange City reserve area and which are adjacent to a public right-of-way or easement that has a water main or gravity sanitary sewer located in it are hereby required, except as provided in subsections (b) and (c), to connect with and use the services and facilities of the water and wastewater systems in order to preserve the health, safety and welfare of the citizens and inhabitants of the Orange City reserve area.	Ordinance	Completed
City of Orange City	Ordinance No. 17.3-303	(1) Upon notification from the public works director (director) that *reclaimed water* is available, the property owner (customer) shall disconnect the existing irrigation system from the potable *water* system within six months of the notification. For the purposes of this section, the term available means that a *reclaimed water* line is located within 150 feet from the customer's property boundary.	Ordinance	Completed

Lead Entity	Strategy Name	Description	Strategy Type	Status
City of Orange City	Ordinance No. 17.3-305	(1) Customers with existing irrigation wells may continue to use wells for irrigation purposes after *reclaimed water* is available; however, the customer shall ensure that all irrigation wells are physically disconnected from the city's potable and *reclaimed water* system. (2) The city shall not provide *reclaimed water* service where wells are used as a source of potable *water* and where buffer zones, as required by the Florida Department of Environmental Protection (FDEP), cannot be maintained. (3) Wells intended for use as potable *water* must be permitted in accordance of FDEP Rule 62-610.	Ordinance	Completed
City of Orange City	Ordinance No. 17.3-309	(a) All new development shall be required to design, permit and install a *reclaimed water* distribution system. The *reclaimed* system shall include color coded *reclaimed water* meters that are compatible to the city's meter reading system (Sensus) and backflow protection devices on potable *water* meters. (b) If *reclaimed water* is not currently available to the new development, a "dry" *reclaimed water* distribution system shall be installed. The "dry" *reclaimed* system shall include a *reclaimed water* metering system and backflow protection devices on all potable *water* meters.	Ordinance	Completed