STATEMENT OF WORK
For Springs Protection Initiative:
Springs Protection Initiative Science (SPIS)-SURFACE WATER HYDROLOGY WORKGROUP

I. INTRODUCTION/BACKGROUND

Spring systems are among the most significant of ecologic resources in the State of Florida. Declines in the ecological character of some of the key spring systems in the state have increased the interest and support for restoration efforts. The District has identified the Springs Protection Initiative as a Strategic Initiative to address issues in our springs and to support the District's water quality and natural systems core mission areas. In order to manage the springs effectively, an increased understanding of the relative influence and manageability of factors that affect these systems is needed. To address this need, an interdisciplinary scientific work plan has been developed to support the research to improve the scientific foundation of spring systems. Effective execution of this work plan requires expertise and analytical resources not available within the District and additional support for this work has been procured through the University of Florida (UF). The District and UF will work collaboratively implement the Springs Protection Initiative-Interdisciplinary Scientific Support work plan. The Group will work collaboratively to implement the plan, analyze the results, interpret and document the findings, and co-publish the work in appropriate peer-reviewed scientific journals.

The proposed project is synergistic with projects from other groups within the Springs Initiative at the District and other organizations. The contribution of this project to the Springs Initiative will be to estimate N and P loading to groundwater from the soil zone. The project deliverables will be used to improve the spatial modeling of subsurface N and P attenuation and transport in the spring shed and to inform resource allocation to meet management criteria. In addition, several key soil parameterizations for HSPF simulations will be developed to better obtain sorption estimates during model simulations under a range of soil types.

As part of the Water Supply Impact Study (WSIS) HSPF, surface water models were created for all the sub basins, which discharge to the St. Johns River. As part of the Surface Water Hydrology Work Group contribution to the Springs Initiative Investigation, the models in the Lower Ocklawaha and Orange Creek Basins will be used as a staring point. The spring shed for Silver Springs extends westward beyond the limits of the current HSPF models and into Southwest Water Management District. In addition to the areas west of our current HSPF models, the non-contributing watersheds were not modeled as part of the WSIS. The non-contributing areas will have to be modeled to provide the ground water modeling work group with recharge to their models in these areas.
HSPF water quality models will be developed over all the watersheds within the spring shed of Silver Springs.

It is anticipated that three modeling scenarios will be run. The first scenario will use the current conditions of the watershed. This will use current land use; infrastructure and BMPs. Past conditions scenario will be run if needed to determine impact on discharge and water quality prior to the implementation of BMPs. The third scenario will include any recommended improvements to the watershed.

II. OBJECTIVES

- Surface Water Run off to hydrodynamic models
- Silver River surface water quality and Half Mile Creek water quality
- Recharge for ground water models providing both volume and quality of recharge to the groundwater-modeling group.
- Changes over time in runoff, water quality & recharge

III. SCOPE OF WORK

The first step in the modeling will be to coordinate the surface water and groundwater modeling areas. This will determine the number of surface water model that will be required and the time periods to model. Meteorological and hydrological data will need to be acquired for the area outside of the current HSPF models. Meeting and co-ordination with local governments will be held to discuss current infrastructure, master stormwater plans and stormwater capital improvement projects. The watersheds used in the existing HSPF model, which contains the Silver River, will need to be re-delineated for calibration. The models to the west and the non-contributing models will be set up using the parameters from the adjacent WSIS models. Model scenarios for past and proposed improvements will be setup and run.

HSPF water quality models will be developed over all the watersheds within the spring shed of Silver Springs. The District is anticipating using the AgCHEM module in HSPF to track the downward flux in nutrients delivered to the groundwater modeling effort. The University will assist the District in developing the parameters used in the water quality models.
University shall conduct field and laboratory experiments and provide expert advice on sampling and experimental techniques. The University shall conduct sample analyses, field and laboratory experiments. District staff may assist the University with experimental work, field sampling, logistics, and data analysis. The University shall analyze field-based N and P loadings for nitrogen and phosphorous concentration quarter using certified laboratory techniques. Estimates of seasonal N and P loading at all well sites will be developed based on observed soil N and P measurements, land use and soil type and extrapolation from observations. The District and the University will develop HSPF N and P loading parameterization schemes for land use based on observations and initial model assumptions.

IV. TASK IDENTIFICATION & REQUIRED RESOURCES

SJR 1 - Data Collection- Meetings and consultation with local governments

SJR 2 - Calibrate Silver River Surface Water Model - Current Conditions

SJR 3 - Build surface water models of non-contributing areas- Current Conditions

SJR 4 - Build surface water models of Silver River- Past Conditions

SJR 5 - Build surface water models of Silver River- Past Conditions

SJR 6 - Build surface water models of Silver River- Proposed Improvements

SJR 7 - Build surface water models of Silver River-Proposed Improvements

SJR 8 - Provide Model Data to Hydrodynamic Work Group

SJR 9 - Provide Model Data to Groundwater Hydrology Work Group

SJR 10 - Provide Model Data to Physicochemistry Work Group

SJR 11- Final Report

UF 1- N and P leaching and attenuation under various land uses and soil types around each of the well sites.

Sub-task 1. Preliminary estimation of N and P loading and soil N and P flux at 30 well sites using IFAS estimated N and P application rates for crop types across land use types.

Sub-task 2. Preliminary collection of soil cores/lysimeters in vicinity of select well sites and measure N and P content.

Sub-task 3. Develop preliminary HSPF N and P loading parameterization schemes for land use based on observations and initial model assumptions.

Sub-task 4. Additional seasonal soil core / resin bag soil collection in a catena fashion (capturing seasonal N and P loading dynamics in land use surrounding well sites).

Sub-task 5. Revised estimates of seasonal N and P loading at all well sites based on observed soil N and P measurements, land use and soil type and extrapolation from observations.

Sub-task 6. Develop HSPF N and P loading parameterization schemes for land use based on observations and initial model assumptions.

UF 2 - Reporting

Final Report

V. TIME FRAMES & DELIVERABLES

- Provide Model Data to Hydrodynamic Work Group
- Provide Model Data to Groundwater Hydrology Work Group
- Provide Model Data to Physicochemistry Work Group
- Final Report

VI. BUDGET/COST SCHEDULE

Schematic of Project Time Frames

	Q1 13	Q2 13	Q3 13	Q4 13	Q1 14	Q2 14	Q3 14	Q4 14	Q1 15	Q2 15	Q3 15	Q4 15	Q1 16	Q2 16	Q3 16
SJR 1 - Data Collection- Meetings and consultation with local governments															
SJR 2 -Construct and Calibrate Silver River Hydrologic Model															
SJR 3 -Down scale NFSEG HSPF models for groundwater model domain															
SJR 4 -Update Land Use															
SJR 5 -Update hydraulic conditions (BMPs)															

UF 1 - Preliminary estimation of N and P loading and soil N and P flux at 30 well sites															
UF 2 - Preliminary collection of soil cores/lysimeters in vicinity of select well sites and measure N and P content.															
SJR 6 -Run Non Contributing areas															
SJR 7 - Meetings and consultation for scenario development															
UF 3 - Develop preliminary HSPF N and P loading parameterization schemes for land use															
SJR 8 -Modify and re-run models															
SJR 9 -Water Quality Modeling Set up															
SJR 10 -Water Quality Calibration															
SJR 11 -Modify for past land use and re-run models															
SJR 12 -Modify for scenarios and re-run models															
UF 4 - Additional seasonal soil core / resin bag soil collection capturing seasonal N and P loading dynamics															
UF 5 - Revised estimates of seasonal N and P loading at all well sites based on observed soil N and P measurements															
SJR 13 -Draft Report															
SJR 14 -Final Report															
UF 6 - Develop HSPF N															

and P loading parameterization schemes for land use														
Final Report														

VII. FTEs and Contract Dollars

District FTEs

Project: SPI-Surfacewater Hydrology Work Group	**FTE**
Task 1 Data collection	0.2
Task 2. Down scale the NFSEG HSPF hydrology models	0.6
Task 3. Build and calibrate Silver River and downscaled NFSEG models basin water quality model	0.4
Task 4. Scenario modeling according to clients' requests	0.1

UF budget

***Springshed Supergroup / Surface Water Hydrology Workgroup**:* *Nitrogen and Phosphorus Loading and Flux from Soils in the Silver Springs Springshed: HSPF modeling*						
		FY14	**FY15**	**FY16**	**FY17**	
Task	**Deliverable**	**through 9/30/14**	**through 9/30/15**	**through 9/30/16**	**through 6/30/17**	**TASK/ SUBTASK TOTAL**
Task 1. N & P leaching and attenuation under various land uses	Sub-task 1	$ 5,774.00	$ 5,774.00			$ 11,548.00
	Sub-task 2	$ 5,774.00	$111,101.00			$116,875.00
	Sub-task 3		$ 12,406.00			$ 12,406.00
	Sub-task 4			$116,875.00		$116,875.00
	Sub-task 5			$ 5,000.00		$ 5,000.00
	Sub-task 6			$ 4,033.00		$ 4,033.00
Task 2. Reporting	Final Report			$ 5,000.00		$ 5,000.00

TOTAL FOR FY		$ 11,548.00	$129,281.00	$130,908.00	$ 0.00	$271,737.00