

INTRODUCTION:

The Istokpoga Marsh Watershed Improvement District, hereinafter referred to as “**IMWID**” is located in Highlands County, Florida, generally south and east of Lake Istokpoga, within the Northern Everglades Lake Istokpoga Basin (See Figure 1, Location Map). More specifically, it is located in all or portions of Section(s) 25, 35 & 36, Township 36 South, Range 30 East, Section(s) 1 – 3, 10 – 14, 23 – 26, 35 & 37, Township 37 South, Range 30 East, Section(s) 31 – 33, Township 36 South, Range 31 East, and Section(s) 3 – 10, 15 – 18, and 21 & 22, Township 37 South, Range 31 East.

A watershed workplan for the area known as the Istokpoga Marsh Watershed, in which the IMWID lies, was developed by the Highlands County Board of County Commissioners (BOCC) and the Highlands Soil and Water Conservation District, with support from the United States Department Of Agriculture – Soil Conservation Service (USDA – SCS), in 1962. The IMWID currently consists of approximately 19,420 acres of sod, improved pasture, citrus groves, caladium fields, row crops, nursery operations, unimproved pasture, and aquaculture. In general, stormwater is directed to a network of canals that are owned and operated by the IMWID.

The IMWID was officially established in 1980 by Highlands County Ordinance No. 80-2 as a municipal services and taxing and benefit district, consistent with Highlands County’s powers and duties as established by Section 125.01(5), Florida Statutes (FS)(1979). The Grantee is the landowner of, and entity responsible for, all IMWID facilities.

Irrigation for the IMWID primarily comes from surface water withdrawals from Lake Istokpoga. A 1966 Agreement for Use of Water and Section 373.224, Florida Statutes, provides for irrigation use within IMWID. Additionally, groundwater withdrawals from the Floridan aquifer occur pursuant to consumptive use permits to individual landowners.

The limited water quality treatment or flood attenuation that is currently provided within the existing IMWID canal system and through landowner’s management practices are not sufficient to meet today’s regulatory requirements for new development, but the system was consistent with law and rule when constructed. These canals discharge to the Harney Pond Canal {South Florida Water Management District (SFWMD) C-41 Canal} in two (2) locations, and ultimately to Lake Okeechobee.

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ESTIMATED POLLUTANT LOAD REDUCTION MODEL USED: The IMWID used the WAM model.

BMPs Installed		TSS lbs/yr	TP tons/yr	TN lbs/yr	Sediment lbs/yr	BOD lbs/yr	Other lbs/yr	Other lbs/yr
BMP #1								
Pollutant Loads	Pre-Project		6.04					
	Post-Project		4.53					
	Load Reduction		1.51					
	% Reduction		17					
BMPs Installed		TSS lbs/yr	TP lbs/yr	TN lbs/yr	Sediment lbs/yr	BOD lbs/yr	Other lbs/yr	Other lbs/yr

PROJECT OBJECTIVES:

Specific objectives and environmental benefits of this project are:

- 1) Reduce the volume of water discharged from Lake Istokpoga to the IMWID project canals
- 2) Reduce the volume of stormwater discharged from the IMWID to Lake Okeechobee through retention in Above-Ground Impoundments (AGIs) during wet periods.
- 3) Reduce the load of TP discharged from the IMWID to the Harney Pond Canal, and ultimately to Lake Okeechobee.
- 4) Recycling of stormwater to be used for agricultural irrigation.

PROJECT DESCRIPTION:

The project will reduce the discharge capacity from Lake Istokpoga to the IMWID canal system. The current S-14 structure discharge pipe size will be reduced from an internal diameter of 60" to an internal diameter of 48". The effect of this will be to reduce the maximum flow through the structure to the IMWID canals; the maximum flow through the 60" pipe was 225 cubic feet per second (cfs) while that through the smaller 48" pipe is 132 cfs. This is a flow capacity reduction of 41%. It should be noted that the structure is not operated at 100% flow every day of the year. The analysis of nutrient discharges prior to the Grantee's purchase of land for AGI and dispersed water management activities was completed by Soil and Water Engineering Technology (SWET). Engineers with SWET estimated that annual average flow through the S-14 structure is 7,596 acre-feet (or on average, 10.5 cfs) under current management. Reducing the size of the discharge pipe and implementing BMPs is estimated to decrease the annual average volume of water through the S-14 structure released from Lake Istokpoga to the IMWID would be 4,556 ac-ft/yr (or an average of 6.1 cfs). This change will reduce total phosphorus (TP) loading from the current 0.958 MT/yr to 0.562 MT/yr.

This is not projected to be a change to the concentration of phosphorus in the water, but to the overall load which will allow the AGI to treat a larger proportion of the canal flow. The most recent ten years of data show that the TP concentration at the point where water would be available for intake to the above ground impoundment has averaged 0.627 mg/L, six times higher than that from Lake Istokpoga. Under current conditions, the TP load to the AGI which can be attributed to S-14 discharges is 5.7 MT/yr. Discharge from other sources raise the total load to the AGI up to 6.04 MT/yr. The reduction in annual discharge capacity from S-14 by installing a smaller 48" diameter pipe reduces the TP load to 3.74 MT/yr (when including additional flow from other sources).

This project will also capture excess stormwater that in turn, when available and needed, will be used before other surface water sources for farm irrigation. This will be accomplished through containment of stormwater runoff and gravity discharge back into the IMWID canal system as part of a Dispersed Water Management (DWM) stormwater recycling system. The proposed system would include the phased design and construction of Above-Ground Impoundments (AGIs)

and the installation of pump stations to lift water into the AGI's as well as the design and installation of gravity control structures to allow the release of stormwater back into the IMWID canal system.

Engineers with SWET concluded 1200 acres of AGIs would be needed to provide the environmental protections from IMWID discharges needed for Lake Okeechobee. Construction of AGIs of this size would result in a reduction in average annual discharge volume (stormwater) of approximately 60% from implementing the DWM and stormwater recycle system. Reducing the discharge capacity from Lake Istokpoga further increases the conservation potential of this AGI, though the overall reduction in discharge within the system is likely no more than 10% of the total. Once fully implemented, the system may remove approximately 70% of the TP currently discharged from the IMWID to the Harney Pond Canal and subsequently to Lake Okeechobee. Since the first phase of the project to be completed under this agreement will consist of 308 acre impoundment (or 1/4 of the 1,200 acres needed to get 70% reduction in TP) then it might be assumed that approximately 25% of the AGIs will produce 17 % of the planned 70% reduction in the overall load. This may greatly underestimate the TP reduction from the phase 1 AGI. First, this AGI is located in the vicinity of the discharge points consistently showing the highest annual average TP concentration for all monitoring sites. Second, reducing the discharge capacity upstream will almost double the proportion of total flow that the AGI can treat, also increasing the phosphorus removal capacity of the AGI. Further analysis, or pilot studies, may be necessary to determine if 1,200 acres of AGIs or a combination of AGIs and water quality features (e.g., chemical treatment) will provide the most cost effective means of meeting the water quality and quantity goals of this project.

The 308 acre AGI will consist of approximately 2.7 miles of levee. The levee will be approximately six (6) feet above ground with a 12 foot top width and 3 to 1 side slopes. The impoundment is designed to hold water up to 3.5 feet deep. The project will have an approximately 75 cfs agricultural type inflow pumping station to capture stormwater runoff from the nearby caladium fields through the adjacent IMWID project canal. There will be a discharge structure to return stored water back to the IMWID canals for irrigation use as needed and an emergency overflow structure. A seepage collection system consisting of existing and constructed ditches surrounding the impoundment will be used to collect return groundwater back to the impoundment through small pump at the pumping station. These works are described in the SFWMD Environmental Resource Permit (ERP permit) #28-00678-P. The Grantee will ensure all necessary permits are obtained for the project.

FUNDING

In addition to the \$4 Million the Department of Environmental Protection (FDEP) is providing to the Grantee through this Agreement for construction of the first AGI, the SFWMD and FDACS are also providing funds as described in SFWMD Agreement No. 4600001716, dated March 11, 2009, as amended and agreed upon by the SFWMD, the Grantee and Florida Department of Consumer Services (FDACS).

TASKS and DELIVERABLES:

TASK NUMBER: 1A

TASK NAME: Selection of Design Criteria Professional Firm to develop Design/Build Contract documents

TASK DESCRIPTION: The Grantee shall select a design criteria professional firm from the Highlands County 'Library of Consultants' with experience in developing performance specifications for design-build contracts applicable to "fit for service" agricultural above ground impoundments following Highlands County Purchasing Procedure 60.40 for Outside Purchases, Design-Build Services (Highlands County 2002). Experience including meeting NRCS design criteria for above ground impoundments, meeting ERP requirements for above ground impoundments, designing to avoid off-site hydrological impacts and designing to remediate agri-chemical soil contamination are key performance criteria.

DELIVERABLE: Approved Consultant Services Agreement with selected contractor

ALLOWABLE COSTS: There is no reimbursement for the completion of this task

TASK COMPLETION: Task will be complete three (3) months after execution of this Agreement.