C-139 Basin Best Management Practices
Demonstration Grant 2008 - 2011

Technical Scope of Work (SOW)

Project Name: C & B Farms Surface Water Impoundment Optimization
Grantee: Charles Obern
Location: C & B Farms, Inc. – Basin 26-319-01 (Reservoir #6)

1. Project scope

This is a one-year project that will evaluate the water quality treatment effectiveness of an above ground surface water impoundment (AGI) after relocating the outfall gravity structure away from the inflow structures and creating small internal berms to better use existing storage and ensure sufficient detention time. The hypothesis is that these modifications should positively affect AGI performance for water quality treatment and in particular reduce the total phosphorus discharge. The project location is shown in Figure 1.

As with other AGIs, once runoff is pumped into it becomes overland flow following the contours of the land, or it quickly traverses via the internal borrow ditches that exist on the inside of the AGI dike. Once cells are built, runoff will need to follow a more circuitous route, which is hypothesized to improve the detention time and treatment capacity.

Figure 1. Location of the project – Basin 26-319-01

2. Monitoring Plan

Water quality and quantity data will be monitored by the grantee during the period of January through December 2009. Autosamplers along with water table level loggers will be installed at the inflow and outflow structures to measure the flow and the phosphorus content in the water before and after each cell. During periods of discharge, water quality composite samples will be collected by a flow proportional automatic sampler and preserved. The composite sample will be: a) removed from the sample collection site and delivered to the laboratory no later than 7 days from the time the individual first sample was drawn, and b) analyzed for total phosphorus (TP) no later than 28 days form the time the first individual sample was drawn. Additionally, grab samples will be collected every time samples are removed from the autosamplers and analyzed for total phosphorus (TP), total dissolved phosphorus (TDP) and soluble reactive phosphorus (SRP).

2.1 Data Quality Indicators (DQIs)

The quantitative DQIs used to express the quality objectives for this project are precision, accuracy, completeness, and detection limit. Criteria for laboratory precision, accuracy, and detection limits are as follows:

Table 1. Analyte and Associated Laboratory Criteria

Analyte	Analytical Method	Precision (% RPD[1])		Accuracy (% R[2])		MDL (mg/L)
		High	Low	High	Low	
TP	SM4500-PF	0-10	0-25	90-110	75-125	0.002
TDP	SM4500P-F	0-10	0-25	90-110	75-125	0.002
SRP	SM4500P-F	0-10	0-25	90-110	75-125	0.004

[1] RPD = Relative Percent Difference; High limit for values > 20 times the MDL; Low limit for values < 20 times the MDL.
[2] %R = Percent Recovery; High limit for values > 20 times the MDL; Low limit for values < 20 times the MDL.

Completeness of the data set is expected to be within 95 and 100 percent. That is, the percent of data lost due to equipment or sampling failure is expected to be less than 5 percent. Once the number of samples to be collected is determined, the number of samples that will comprise a complete data set can be determined.

2.2 Sample Collection Methods

Sample collection will be performed in the manner most appropriate for existing field conditions at the time and following procedures outlined in the FDEP SOP 001/01 FS1000 – FS2100 (Can be found at **http://www.dep.state.fl.us/labs/qa/sops.htm**). Procedures used may involve direct sampling by immersion of sample bottles, collection of a representative sample in an appropriate container such as a cleaned bucket which is

then used to fill the sample bottles. The following table summarizes the sample container size and materials, preservation requirements and holding times.

Table 2. Sample Collection Requirements

Analyte	Preservative	Container Size (ml)/Material	Holding Time
TP	Sulfuric Acid to pH<2	125; Plastic	28 days
TDP	Sulfuric Acid to pH<2 Field Filter	125; Plastic	28 days
SRP	Field Filter Place on wet ice	60; Plastic	48 hours

2.3 Equipment

The equipment to be used for sample collection includes:

- Plastic bucket
- 125 and 60 ml plastic bottles
- 60-ml disposable syringes
- Disposable 0.45 micron filters
- Disposable gloves

2.4. Sampling Protocols for Grab Samples

Protocols have been established when grab samples are taken at the monitoring location with clear water. The grab sample procedures can be seen in Appendix A.

2.5 Laboratory Analysis

Samples should be analyzed in a lab certified under NELAP by the Florida Department of Health (FDH). A current listing of certified labs is kept at **http://www.dep.state.fl.us/labs/cgi-bin/aams/index.asp**.

3. Evaluation Method

The pre-BMP condition for the project is represented by the water quality and quantity data that currently are being monitored at the reservoir. The grantee shall provide at least one complete year of data collected at the project location. Once the changes are made (post-BMP condition) and water quality and quantity data will be collected, a comparison between the pre and post BMP will be done by the grantee to determine the effectiveness of the reservoir modifications.

4. Deliverables & Schedule

The grantee is responsible for completion of the following tasks. Reimbursement will be per deliverable with justification (reports, photo documentation, invoices, as applicable)

upon District verification that requirements were met. The grantee shall not complete any work until a contract is executed with the HSCWD.

Task/	Task Description	Deliverable Description	Due Date[1]	Payment Amount
Task 1	Mapping of internal cell boundaries using a GPS	- Sketch with cell boundaries based on GPS. - Receipts for services.	12/01/08	$2,500.00
Task 2	Build Berms	- Photos of completed work - Receipts for services	12/15/08	$10,000.00
Task 3	Set up of 10 culverts (diameter: 30"; height: 5"; riser: 30 ft long	- Photos of completed work - Receipts for services	12/30/08	$15,000.00
Task 4	Survey land elevation and set weir height	- Survey with land elevation and proposed weir heights. - Receipts for services.	12/31/08	$4,000.00
Task 5	Relocation of discharge structure	- Photos of relocated structure. Optional: a site visit can be coordinated with HSWCD to photo-document. - Receipts for services and equipment.	01/01/09	$15,000.00
Task 6	Set up 2 autosamplers and 2 level loggers at discharge structure and header canal	- Photos of installed autosamplers and level loggers. Optional: a site visit can be coordinated with HSWCD to photo-document. - Receipts for services and equipment.	02/01/09	$20,000.00
Task 7	Collection and analysis of surface water samples[2]			
7.1	February - March/09 Data	Data Report – February - March/09	04/30/09	$1,000.00
7.2	April - May/09 Data	Data Report – April - May/09	06/30/09	$1,000.00
7.3	June - July/09 Data	Data Report – June - July/09	08/30/09	$1,000.00

7.4	August - September/09 Data	Data Report – August - September/09	10/30/09	$1,000.00
7.5	October - November/09 Data	Data Report – October – November/09	12/30/09	$1,000.00
7.6	December/09 – January/10 Data	Data Report – December/09 - January/10	02/30/10	$1,000.00
Task 8	Engineering and Analysis cost	- Report describing project implementation and analysis of BMP performance effectiveness based on water quality and quantity data for the reference and the improvement impoundment segments, as well as discussion of any factors potentially affecting BMP performance and assumptions that could not be evaluated in the analysis. - Receipt for professional services.	04/01/10	$5,000.00
Total Not to Exceed Amount				**$77,500.00**

Notes:
[1] These are tentative dates, which may need to be revised based on weather conditions or logistics related to the agricultural operations. The grantee shall notify Hendry County Soils and Water District if substantial deviation from these dates will occur.
[2]Collection of the samples will start as soon as the autosamplers and loggers are installed. Data Reports (7.1 – 7.6) will be on the minimum frequency indicated above and will not include analysis of the data (only raw data). It will only be for reimbursement of analytical and data collection costs.