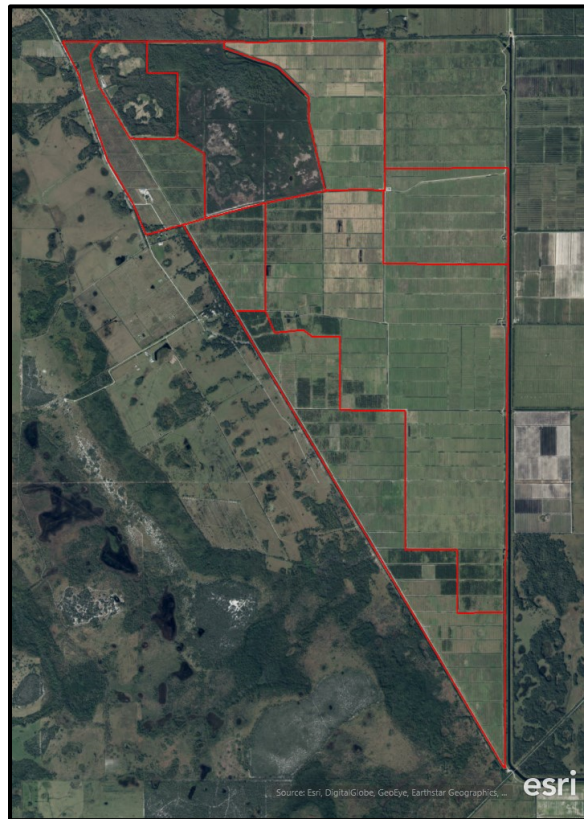


March 1, 2020

Bluefield Water Farm Monitoring Plan



Introduction

The purpose of water farming is to capture onsite rainfall and divert and store surface water from regional canals during periods of time when the discharges of this excess water may harm the coastal estuaries. Withdrawals of excess surface water from regional canals into the water farm are coordinated with and approved by the South Florida Water Management District (SFWMD). These withdrawals are intended to retain excess water and not to release back to the C-23 Canal.

No.: 45529-009

Table of Contents

1. Project Location	3
2. Project Description.....	5
3. Data Collection	6
3.1 Water Quality Data.....	6
3.2 Water Quantity Data	6
3.2.1 Rainfall Gauges	7
3.2.2 Water Level Sensors	13
4. Quarterly and Annual Reports	13

1. Project Location

The Bluefield Water Farm is located in St. Lucie County, Florida on the C-23 Canal (**Figure 1-1**). The project site is located immediately south of the G-78 structure and approximately 15 miles west of the S-97 tidal structure as shown in **Figure 1-2**. The project will take place on parcel 4101-111-0002-010-0 within the Township 37 South and Range 37 East.

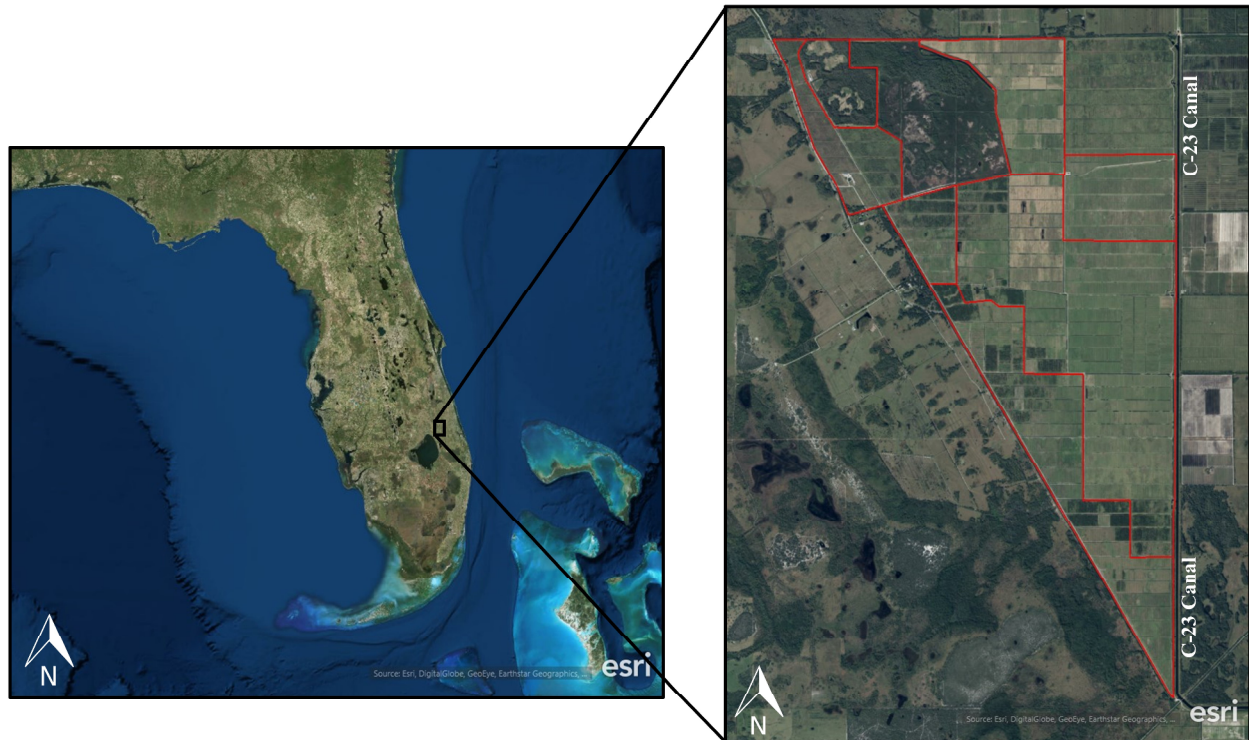


Figure 1-1: Bluefield Water Farm Location



Figure 1-2: Bluefield Regional Map

2. Project Description

The Bluefield Water Farm Northern Everglades Public Private Partnership (NE PPP) will establish a surface water retention system that will be constructed to create a 6,104-acre water storage area. The operational intent of the project is to retain excess water and not to release back to the C-23 Canal. The system will be constructed of six (6) storage cells with a total of five (5) pump stations. The facility will be split into six cells largely due to the presence of an existing impoundment historically used for site irrigation purposes and elevation difference across the site, but separation into multiple cells will also enhance operational flexibility.

Stormwater runoff/excessive surface water will be supplied to the Bluefield Water Farm via the C-23 Canal. Excess water will be pumped into the Bluefield Water Farm using Pump Station 3 with the system intake pulling from the C-23 Canal and discharging into Cell 2. Pump Station 3 will include two (2) diesel pumps with a combined capacity of 111 cfs (50,000 gpm). For redundancy, Pump Station 5 can provide flow into the system if Pump Station 3 is unavailable or cannot adequately supply water and will include two (2) diesel pumps with a combined capacity of 111 cfs (50,000 gpm).

3. Data Collection

3.1 Water Quality Data

Water quality data will be manually collected from sampling sites by the SFWMD. Water quality monitoring shall be conducted at all project inflow and outflow locations using two different schedules. During normal operations, when water is being pumped into the dispersed water management system, water quality sampling will be performed **bimonthly** to confirm the quality of inflow water. Whenever water is going over the outfall weirs of the project, water quality samples will be taken on a daily basis for the first three days and then on a weekly basis thereafter.



Due to the gradual nature of change in water quality within the dispersed water management system and the adjacent regional canal system, water quality monitoring will be performed using grab samples. Two separate set of locations for grab samples will be used: one set for collecting inflow grab samples and one for collecting outflow grab samples. Those locations are identified in **Figure 3-1**.

Water quality sampling will be made for Total Phosphorus and Total Nitrogen with the nitrogen **speciated** by organic and inorganic nitrogen. **Table 3-1** will be used for tracking water quality monitoring information.



3.2 Water Quantity Data

Pump run times will be logged daily and reported to the SFWMD monthly for each of the pumps utilized within the DWM facility by Bluefield Dispersed Water Management, LLC. To calculate the actual amount of water pumped into the facility within a given period, the Bluefield Dispersed Water Management, LLC shall provide logs of run time of pumps located at each of the inflows. Water level sensors will record daily measurements in each of the cells to assist Bluefield Dispersed Water Management, LLC in when to move water between cells. At the outflow cells, water level readings will assist in calculating overflow over the outfall weirs. Bluefield Dispersed Water Management, LLC will report the data monthly to the SFWMD. Rainfall data loggers have a measurement resolution of one second. Average daily rainfall will be calculated by Bluefield Dispersed Water Management, LLC and reported to the SFWMD monthly.

Bluefield Dispersed Water Management, LLC shall install the water level and rainfall sensors. Water level conditions will be monitored using sensors within each of the Water Farm cells. Each water quantity recorder will act independently and shall include the sensor, power supply, and data logger within a single housing. Data from the water level and rainfall recorders will be collected manually by Bluefield Dispersed Water Management, LLC.

Tables 3-2a, 3-2b and 3-2c will be used for tracking water quantity monitoring information.

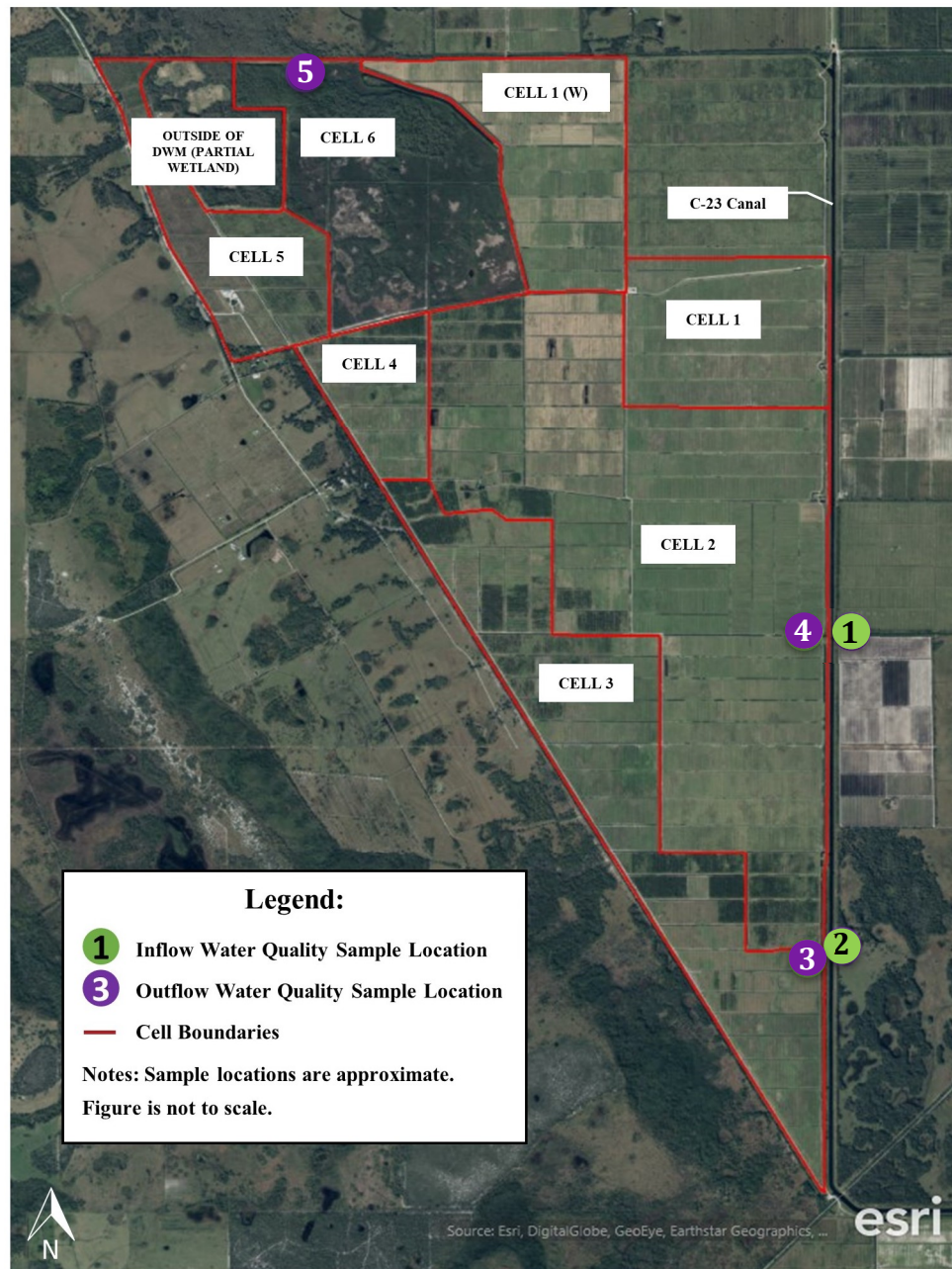


Figure 3-1: Proposed Locations for Inflow and Outflow Water Quality Sampling

3.2.1 Rainfall Gauges

A rainfall gauge (i.e., recorder) shall be installed at each of the pump stations used during water farming operations as depicted in **Figure 3-Error! Reference source not found.** The pump stations include PS 3, PS 5, North Reservoir Pump Station, and Block B-1 Pump Station. The hardware for the rain gauges shall be



Table 3-1: Water Quality Monitoring

Water Quality Parameters	Location Inflow	Location Outflow	Date Sampled
Total Phosphorus			
Total Organic Nitrogen			
Total Inorganic Nitrogen			
Total Phosphorus			
Total Organic Nitrogen			
Total Inorganic Nitrogen			
Total Phosphorus			
Total Organic Nitrogen			
Total Inorganic Nitrogen			
Total Phosphorus			
Total Organic Nitrogen			
Total Inorganic Nitrogen			
Total Phosphorus			
Total Organic Nitrogen			
Total Inorganic Nitrogen			



Table 3-2a: Water Quantity Monitoring – Pump Run Times

[illegible]

Table 3-2b: Water Quantity Monitoring – Water Elevations

[illegible]

Table 3-2c: Water Quantity Monitoring – Localized Rainfall

[illegible]

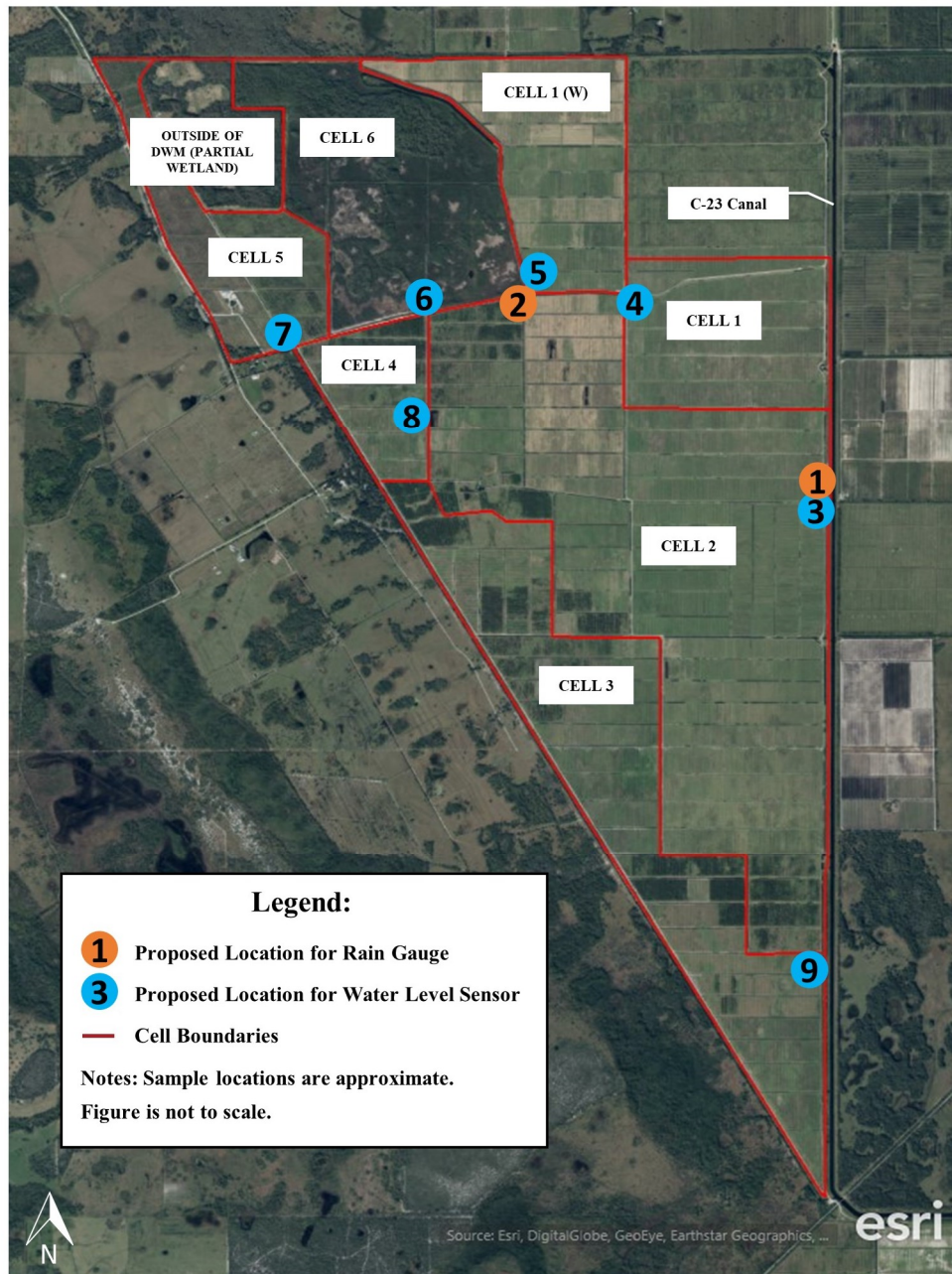


Figure 3-2: Proposed Locations for Rain Gauges and Water Level Sensors

HOBO Rain Gauge with Data Logger Model RG3. These rain gauges are equipped with batteries that are estimated to have a one-year lifespan and are replaceable. At a minimum, a 45-degree free and clear cone of entry will be provided with each rain gauge. Also, surrounding objects will not be closer to the gauge than a distance twice their height above the gauge orifice. Each rain gauge will be supported by 2" diameter rigid galvanized conduit that shall be anchored in at least 1.60 cubic feet of concrete (minimum of 2' deep). The data logger will be calibrated according to the manufacturer's recommendations.

3.2.2 Water Level Sensors

A water level sensor (i.e., recorder) shall be installed within each cell of the facility as depicted in **Figure 3-**. The hardware for the water level sensor shall be HOBO Water Level Data Logger Model U20L-04. These water level sensors are equipped with batteries that are estimated to have a five-year lifespan and are replaceable. Lifespan is estimated based on one minute or greater measurement intervals. It is intended to record based on daily intervals. The sensors will be installed within a PVC well to protect the sensor from external forces. The data logger will be calibrated according to the manufacturer's recommendations. In addition to the water level sensors, water level floats will be utilized at each pump station to automatically turn pumps off if water reaches or exceeds the control elevations established in the Operational Plan.

4. Quarterly and Annual Reports

Monthly, the SFWMD will share results of water quality monitoring sampling events with the Bluefield Dispersed Water Management, LLC and the Interagency Working Group. On a monthly basis, the Bluefield Dispersed Water Management, LLC will also share collected data on pumping, water level and rainfall records.

Bluefield Dispersed Water Management, LLC shall submit Quarterly Reports to the SFWMD summarizing operational activities including pumping logs and maintenance activities to demonstrate that the facility is operating as designed and permitted. In addition, the Bluefield Dispersed Water Management, LLC shall prepare and submit management records using a template previously approved by the SFWMD. The report must include pumping information necessary to calculate pumped volumes, documentation that water elevations were maintained consistent with the Operations Plan, all maintenance activities, a description of any changes in structure management, damages to structures, date of damages or changes, the reasons for making changes, and general site conditions (e.g., rainfall data).

In addition to the Quarterly Reports, Bluefield Dispersed Water Management, LLC shall submit to the SFWMD an Annual Report summarizing the inflow volumes, operational and maintenance issues, annual inflow pump calibrations, and any other information applicable to the estimated water quality and quantity benefits of the DWM facility.

Bluefield Dispersed Water Management, LLC shall submit an Annual Certification Statement in conjunction with the Annual Report. The Annual Certification Statement shall indicate that the facility was operated and maintained consistent with the approved plans and permits and continues to operate as designed, scheduled maintenance activities were performed, and provide a brief discussion of any operational issues encountered during the certification year.

