Operational Project Monitoring Plan

For

L8 Flow Equalization Basin

(L8FEB)

4/11/2022

4/11/2022

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Water Quality Bureau, Water Resources Division
South Florida Water Management District

SFWMD-FIELD-MP-094-04

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1.0 Project Organization

The following documents define the procedures used by South Florida Water Management District (SFWMD or District) Water Quality Monitoring (WQM) Section personnel to meet the Florida Department of Environmental Protection's (FDEP or Department) Quality Assurance (QA) Rule, Florida Administrative Code (F.A.C.) 62-160, and should be referred to for details on key personnel and relevant responsibilities.

- Overall project organization and responsibilities -
  - SFWMD Water Quality Bureau (WQB) and Applied Sciences Bureau (ASB) Quality Management Plan (QMP).

- Field activity and data validation responsibilities -
  - SFWMD Water Quality Monitoring Section's (WQM) Quality Manual (QM), Field Sampling Manual (FSM), and applicable Standard Operating Procedures (SOP).

- Laboratory analysis and data validation responsibilities -
  - SFWMD Analytical Service's (AS) Chemistry Laboratory Quality Manual (CLQM) and applicable SOPs.

2.0 Project Description

2.1 Project Introduction and Background

This document serves as a reference for surface water quality monitoring for the L8 Flow Equalization Basin (L8FEB). The operational plan for this project contains detailed structure specifications including brief descriptions of the mandate required monitoring at each station.

The L-8 Reservoir Test (L8RT) project began in 2002 to provide hydrologic and water quality information required for the design of the proposed Comprehensive Everglades Restoration Plan (CERP) Loxahatchee River Watershed Restoration Project (LRWRP), formerly known as North Palm Beach County - Part 1. The L8RT project was intended to provide water storage within the L-8 Basin that could be used to deliver both wet and dry season restoration flows to the Loxahatchee River and its watershed. Upon completion of the testing project in 2007, the L-8 Reservoir Project was used to partially achieve the goals and objectives of the LRWRP, including ecosystem restoration and related water management and increasing water supply availability while maintaining flood protection for the region.

Plans to convert the Reservoir into a FEB were initiated in 2012 with construction of the perimeter levee revetment around the feature beginning in April 2013. Prior to the construction of L8FEB inflow (G538) and outflow pump station (G539), the L8RT project (with previously permitted inflow and outflow structures) continued to be used for regional water resources benefits. The primary purpose of the interim phase of this project was to provide increased storage within the L-8 Basin. This storage was intended

to support regional benefits by maintaining optimal seasonal and event canal stages, but not to increase flood protection for landowners in the L-8 Basin.

To address water quality concerns associated with existing flows to the Everglades Protection Area (EPA), District, Department, and United States Environmental Protection Agency (USEPA) engaged in technical discussions starting in 2010. Based on this collaborative effort, a suite of additional water quality improvement projects to work in conjunction with the existing Everglades Stormwater Treatment Areas (STAs) were identified to achieve State of Florida phosphorus standards and are described in the District's Restoration Strategies Regional Water Quality Plan (April 27, 2012) and required by Consent Orders (CO) OGC# 12-1148 and 12-1149.

L8FEB was created from a series of interconnected limestone quarry pits and includes Cell 1/2 (~233 acres), Cell 3 (~109 acres), Cell 4 (~94 acres, Cell 5 (~178 acres), Cell 6 (~215 acres), and Cell 7 (~130 acres) (Figure 2). Each cell has a mean depth of approximately 55 ft below ground surface, and the total storage capacity of the L-8 FEB is approximately 45,000 ac-ft. The L8FEB includes 2 stations (Table 1) consisting of one (1) inflowand one (1) outflow station. The primary operational objective of the L8FEB Project is to improve the operations of STA 1 East (ST1E) and STA 1 West (ST1W) by attenuating peak flows and temporarily storing stormwater runoff. An additional objective is to provide interim benefits to the Loxahatchee River that are consistent with the goals of the LRWRP. This can be accomplished by employing multi-purpose L8FEB Project operations until at least the completion of the in-basin storage project.

Groundwater stage and conductance readings will also be recorded via telemetry (refer to the *Operational Monitring Plan for the Continuous Environmental Monitoring Network [CEMN OMP]*, SFWMD-FIELD-MP-096) from 21 groundwater wells arranged in 7 clusters (Figure 2). Data from four offsite wells in the Deer Run Subdivision was used for the project but WQM staff were not responsible for their collection. Data collection at these offsite wells spanned from June 2014 to August 2020. Groundwater data are intended to allow potential impacts from the projects' inflow and outflow activities to be identified. A copy of the approved groundwater monitoring plan is provided in Appendix 4.

2.2 Sampling Mandates

Station locations, sampling frequencies, and parameters to be sampled are dictated by the mandate and/or permits governing this project (Appendix 1). Appendix 2 details the mercury and toxicants monitoring program as required by CERPRA Permit Number 0188365-022. The monitoring described herein was initiated in August 2015 in response to monitoring initial inflows to the reservoir.

The mandates that govern the sampling requirements of this project are as follows:

- FDEP Comprehensive Everglades Restoration Plan Regulation Act (CERPRA) Permit: 0188365; originally issued on 03/30/2007 for the L8RT project. The current iteration (Version -024), which expires on 09/04/2025, was modified as the L8FEB operational permit.

- CMP-015: This compliance monitoring plan (CMP) details permit-mandated monitoring requirements outlined in CERPRA 0188365. This CMP is affiliated with SFWMD-CMP-020, dated 11/11/2014, which details sampling requested by the Florida Department of Environmental Protection's Wastewater program and the U.S. Fish and Wildlife Service (USFWS) during the initiation of the project, anticipating two (2) years of data collection. Effective 09/04/2020, FDEP concurred with the proposed termination of Gross Alpha monitoring at G539.

- CMP-020: This CMP, dated 11/11/2014, details sampling requested by the U.S. Fish and Wildlife Service (USFWS) and the FDEP's Wastewater program during the initiation of the project's operations. Specifically, the CMP requires to the District monitoring selenium and other toxicants in surface waters and mosquitofish within the L8FEB. Effective 01/29/2019, FWS concurred with the proposed termination of other toxicants monitoring within the L8FEB based on the results of the monitoring presented in the 10/15/2018 reports submitted for review (see Appendix 2).

2.3 Project Objectives

The primary objective of this project is to improve the operations of STA 1 East (ST1E) and STA 1 West (ST1W) by attenuating peak flows and temporarily storing stormwater runoff. A secondary objective is to provide interim flows to the Loxahatchee River consistent with the goals of the Loxahatchee River Water Recovery Plan (LRWRP). The water quality data obtained under this program will be used in the preparation of an annual report to the FDEP summarizing the analytical results of all water quality monitoring.

2.3.1 Modification or Termination Conditions

The monitoring described herein will continue as required by CERPRA Permit 0188365, with an expiration date of 09/04/2025. Conditions for modification or termination of the project are detailed in the permit.

3.0 Geographic Location

3.1 Regional Area

The L-8 Basin encompasses approximately 170 square miles, with the majority located in northwestern Palm Beach County and approximately 2 square miles in southwestern Martin County (Figure 1). L8FEB is located immediately north of the point where STA 1W, STA 1W, and Water Conservation Area (WCA) 1 meet.

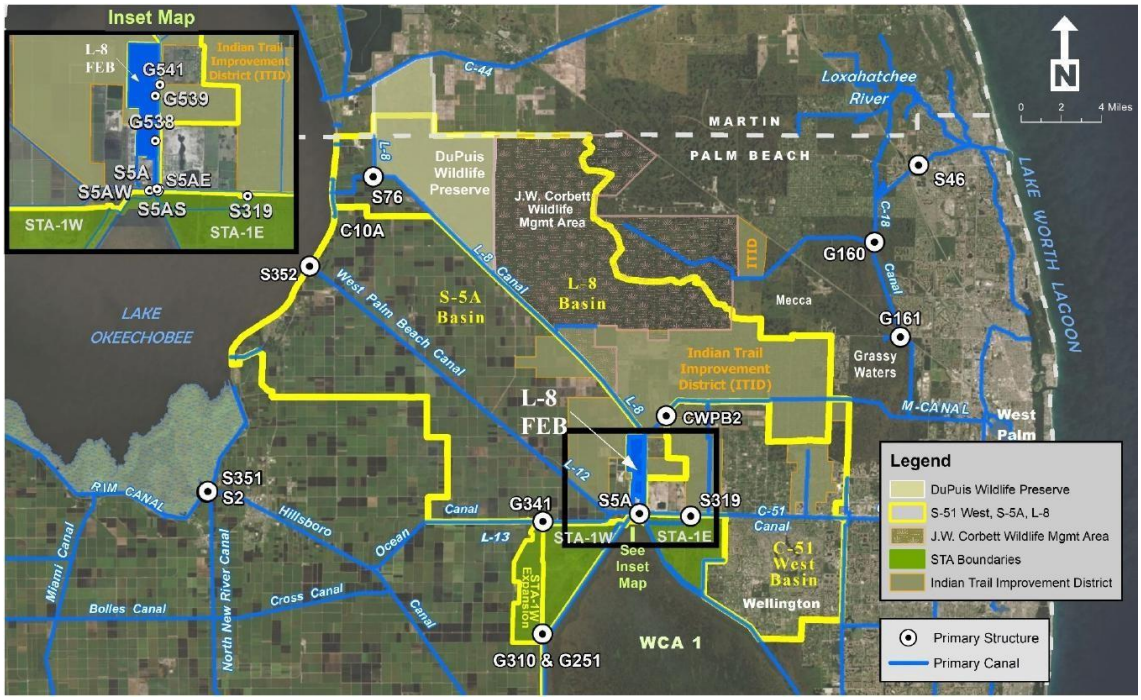

Figure 1: L8FEB Project Location as related to surrounding basins

3.2 Station Location and Access

Monitoring station locations are described in Table 1 and are depicted in Figure 2 and Figure 3.

The gate at entrance of the L-8 Canal levee road is located on the north side of US-98/SR-80/Southern Boulevard on the west side of the L-8 canal and can be accessed with gate code #3301. Gates on roadways in L8FEB are secured with a District lock. The lock requires a W-key, which can be obtained through a request made through the Field Project Manager (FPM) and/or Science Technician Supervisor.

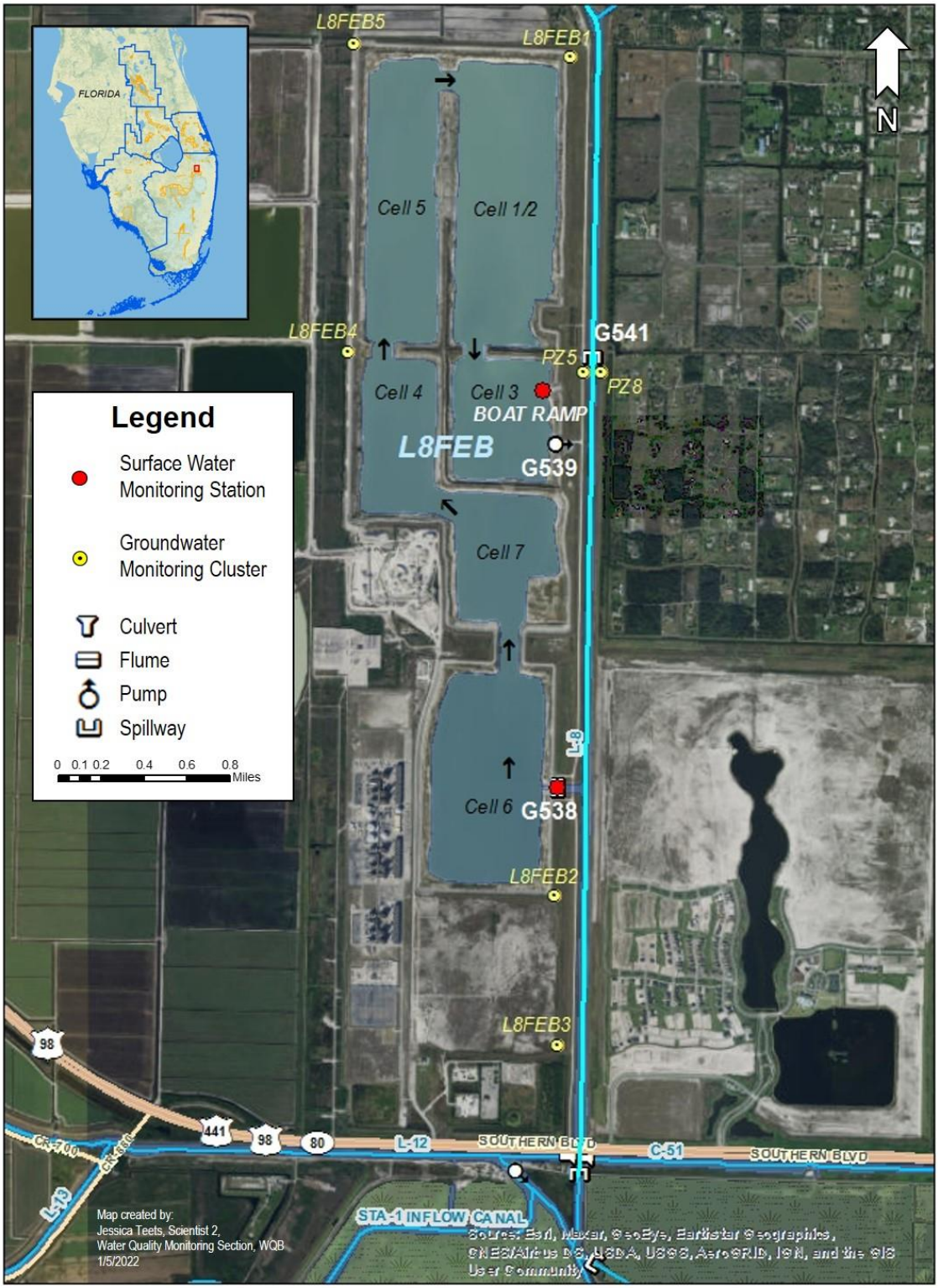

Figure 2: L8FEB Station Locations

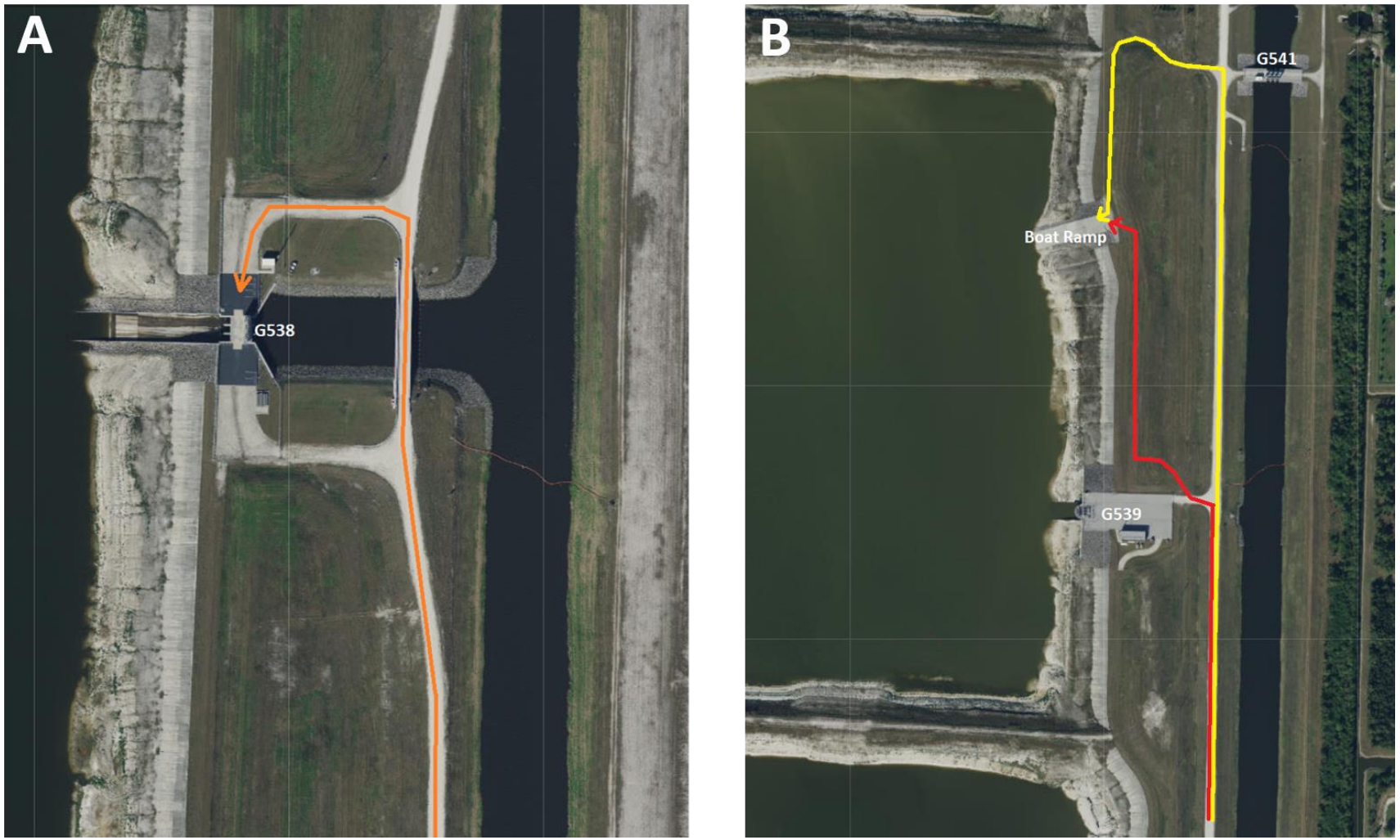

Figure 3: (A) G538 Entry Route; (B) G539 Entry Route(s)

Table 1: L8FEB Monitoring Sampling Stations

Station	Latitude (ddmmss.sss)	Longitude (ddmmss.sss)	Description
G538	264210.700	802154.700	Inflow to L8 FEB from L8 canal.
G539	264311.460	802154.590	Outflow pump station; sample is collected at boat ramp in vicinity of outflow to L8 canal from L8FEB
L8FEB1	264420.213	802151.074	3 well cluster in northeast corner of feature
L8FEB2	264152.100	802155.170	3 well cluster in southeast corner of cell 6
L8FEB3	264125.000	802154.700	3 well cluster in southeastern corner of feature
L8FEB4	264327.190	802235.320	3 well cluster in northwestern side of cell 4
L8FEB5	264419.880	802233.990	3 well cluster in northwest corner of cell 5
PZ5	264324.381	802149.080	4 well cluster located on west side of L8 canal opposite cell 3
PZ8	264324.420	802145.360	2 well cluster located on east side of L8 canal opposite cell 3

The standard positional goal for station coordinates is detailed in the Establishing & Verifying Water Quality Monitoring Station Registration SOP (FIELD-SOP-031). The coordinates are relative to NAD83 HARN horizontal datum.

4.0 Field Activities

4.1 Monitoring Frequencies and Parameters Collected

All monitoring parameters, frequencies of collection and locations are listed in Table 2. Some analytes may be reported by the lab that are not requested by the project.

Table 2: L8FEB Station, Frequency and Parameter TESTS

Station	Collection Method	Frequency	Parameter TESTS
G538 G539[1]	Grab	Bi-weekly Recorded Flow (BWRF)	Total Nitrogen (TN), Total Phosphorus (TP)
	In-situ Grab	BWRF	Chlorides[3] (calculated), Dissolved Oxygen (DO), pH (PH), Specific Conductance (SCOND), Temperature (TEMP)
All 21Wells[2]	Stage Recorder	60 minutes	Stage
	In-Situ Continuous	60 minutes	SCOND

[1]Sample collected at boat ramp located on the east bank of Cell 3 (see Figures 2 and 3B)
[2]Refer to CEMN (SFWMD-FIELD-MP-096)
[3]Chlorides are calculated from Specific conductance using the following District derived equation where Chloride = (0.0000455 x SCOND^2) + (0.0845x SCOND)+ 6.633

Stations collected on a frequency determined by recorded flow are sampled following the SOP outlined in the *Sampling Flow-Related Stations SOP* (SFWMD-FIELD-SOP-027). If no flow (i.e., no operations) is recorded during the prescribed time period, the station is designated as a No Bottle (NOB) sample and the structure is not visited unless other parameters (e.g., TPO4) are required to be collected regardless of flow.

Groundwater wells are collected in accordance to the Groundwater Monitoring Plan (Appendix 3) with the continuous sondes leveraged in the CEMN OMP (SFWMD-FIELD-MP-096).

4.2 Project Specific Guidelines

All surface water grab samples are collected on the upstream side of any structure at a depth of 0.5 meters unless collection of a representative sample is inhibited by vegetation and/or other conditions. If an alternative sampling location is required, a consultation with a Science Technician Supervisor and/or the FPM must take place prior to the sampling being collected; this action must be documented in the field notes.

The sampling location for G539 is at the boat ramp located on the east bank of Cell 3 (Figure 3). Because of the dramatic differences in stage at any given time, it must be determined if the Total Depth (TD) is 1 meter or greater prior to sample collection at this station. If TD is 1 m or greater, samples are collected at a depth of 0.5 m from the surface of the water. If TD is < 1 m, the sample must be collected at one-half of the TD with both depths documented. If TD is ≥ 0.10 m and ≤ 0.20 m, a consultation with a Science Technician Supervisor and/or the FPM must take place prior to the sample being collected.

Chlorides are calculated from Specific conductance using the New Regression Derivation Expanded equation derived by District staff. The justification can be found on the WQM SharePoint in the 4425 Share/Chloride library as and Microsoft EXCEL file entitled NewRegressionDerivationExpanded(1).xlxs (https://sfwmdoffice.sharepoint.com/:f:/s/collab/wqm/Eo8qY2MMUZlOuQjYXYaCG9kBUWYHYw13AunjfyeW3u3XEg).

4.3 Grab Sampling Procedures

Sample collection for this project follows the procedures and requirements found in the *Grab Sampling Protocol* section of the WQM FSM. Project-specific deviations are detailed in Section 4.2.

4.4 Field Parameters

The collection of field parameters follows the procedures and requirements outlined in the *Instrument Calibration and Field Measurements* section of the WQM FSM. Project-specific deviations are detailed in Section 4.2.

4.5 Field Quality Control Requirements

Field quality control requirements shall follow the procedures found in the *Field Quality Control Measurements and Requirements* section of the WQM FSM. Project-specific deviations are detailed in Section 4.2.

4.6 Autosampler Collection

There is no requirement for the use of autosamplers for this project.

4.7 Sample Submission

If the District laboratory is to be used, samples are transported to the laboratory and submitted for analyses in accordance with the requirements specified in the WQM FSM. Samples are submitted to the laboratory on the same day as collection or via courier the following day. Sample acceptance criteria are detailed in Section 6 of the CLQM. If samples are submitted to another laboratory, it must meet the contract laboratory requirements as specified in Section 5.2 below.

5.0 Data Quality Objectives (DQOs)

5.1 Data Usage and Reporting

The data from this project are compiled and are summarized in an annual report in accordance with the conditions outlined in the CERPRA Permit 0188365 named in Appendix 1.

5.2 Data Quality

All monitoring described herein shall meet the requirements conveyed in the FDEP's QA Rule, 62-160 F.A.C. The District has adopted a uniform set of DQOs following criteria detailed within the *Analytical Methods and Default QA/QC Targets* table of the CLQM.

Field parameter DQOs are described in the *Field Instrument Minimum Accuracy Requirements* table found in the *Instrument Calibration and Field Measurements* section of the FSM. The most recent version of the FSM details the specific field testing DQOs at the time of sample collection.

Samples are analyzed according to the provisions within the FDEP QA Rule 62-160 F.A.C. and the CLQM. The most recent version of the CLQM details DQOs at the time of sample collection for each specific laboratory analysis. Data are qualified in accordance with the FSM, CLQM and applicable data validation SOPs.

No contract laboratory is being used.

5.3 Completeness Target

The completeness target (i.e., the number of samples successfully collected and analyzed, as a percentage of those that were planned) has been set at 95% annually for this project. Sampling attempts shall be included in the completeness target. At times samples will not be able to be collected due to no flow or low water conditions, unsafe station conditions, equipment malfunction, site maintenance, tropical storms/hurricanes or other unforeseen problems that might affect sample collection and/or quality. If samples cannot be collected on an attempt, collectors shall document the sample as a "NOB" to

indicate an attempt was made and/or the sample could not be collected for the documented reasons.

6.0 Data and Records Management

The District evaluates data in accordance with the data quality objectives stated in the District's FSM and CLQM. All data submittals shall conform to existing District guidelines.

6.1 Contract Deliverables

There are no contract deliverables for this project.

6.2 Data and Record Storage

After the data validation process, all data and records are maintained so that end users can retrieve and review information relative to a sampling event. Field records are maintained in accordance with the *Archive Records Storage and Retention SOP* (SFWMD-FIELD-SOP-022). All analytical data and specified metadata are sent to the DBHYDRO database for long-term storage and retrieval.

The District shall maintain master copies of field and laboratory generated records. It is the responsibility of the District to maintain both records of current and historical methodologies and operating procedures so that at any given time the conditions that were applied to a sampling event can be evaluated.

Field records storage protocols are outlined in the *Archive Records Storage and Retention* (SFWMD-FIELD-SOP-022). Corrections of field data or records must follow the applicable WQM *Correction of Field Records SOP* (SFWMD-FIELD-SOP-032) and the FSM. Corrections to data in DBHYDRO must follow *Data Investigations and Corrections* (SFWMD-DVS-SOP-010).

7.0 References

FDEP (Florida Department of Environmental Protection). Quality Assurance Rule, 62-160 Florida Administrative Code (F.A.C.). April 16, 2018.

FDEP (Florida Department of Environmental Protection) Guidance for the Selection of Analytical Methods and the Evaluation of MDLs and PQLs List Referenced in Chapter 62-4.246(4), F.A.C. November 10, 2020.

SFWMD (South Florida Water Management District). *Archive Records Storage and Retention*, SFWMD-FIELD-SOP-022, Water Quality Monitoring Section

SFWMD (South Florida Water Management District). *Chemistry Laboratory Quality Manual (CLQM)*, SFWMD-LAB-QM-2022-001 or most current effective version. Analytical Services Section.

SFWMD (South Florida Water Management District). *Continuous Environmental Monitoring Network (CEMN)*, SFWMD-FIELD-SOP-096, Water Quality Monitoring Section.

SFWMD (South Florida Water Management District). *Correction of Field Records*, SFWMD-FIELD-SOP-032, Water Quality Monitoring Section

SFWMD (South Florida Water Management District). *Data Investigations and Corrections*, SFWMD-DVS-SOP-010, Data Validation Services Unit.

SFWMD (South Florida Water Management District). *Field Quality Manual (QM)*, SFWMD-FIELD-QM-001, Water Quality Monitoring Section.

SFWMD (South Florida Water Management District). *Field Sampling Manual (FSM)*, SFWMD-FIELD-FSM-001, Water Quality Monitoring Section.

SFWMD (South Florida Water Management District). *Sampling Flow-Related Stations*, SFWMD-FIELD-SOP-027, Water Quality Monitoring Section.

SFWMD (South Florida Water Management District). *Station Registration*, SFWMD-FIELD-SOP-031, Water Quality Monitoring Section

SFWMD (South Florida Water Management District). *Water Quality and Applied Sciences Bureaus Quality Management Plan (QMP)*, SFWMD-QS-QM-001. Applied Sciences and Water Quality Bureaus.

8.0 Revisions and Modifications

Version	Date	Section	Change/Reason
00	02/10/2016	All	Original version.
01	08/27/2018	All Table 1 Table 2 Figure 1 Figure 2A&B Appendix 3 3.2	Updated according to OMP Template MPT-001-02. Updated GPS coordinates. Merged tables. Updated station names as registered in DBHYDRO. Added CA and MG to One-Time Start-Up Parameter List for interpretation of Chromium analysis. Added specific sampling notes to Table 2. Updated Figure 1; boat ramp, fish stations. Added maps. Added groundwater monitoring plan. Added language regarding sampling for G539 at boat ramp.
02	04/10/2019	2.2 Table 2 References Appendix 1	Updated plan to reflect USFWS concurrence to terminate other toxicants monitoring within the L8FEB effective 01/29/19. Added Appendix 1.
03	10/08/2020	All Table 1 Appendix 2	Updated format to template;Removed terminated sampling stations from Table 1 & Appendix 2; Added language for Gross ALPHA termination effective 9/4/20; updated Table 1 and Appendix 2; Inserted CDPN SFWMD-FIELD-MP-096 reference.
04	xx/xx/2022	All2.1 3.1 Table 1 3.2 8.0 Appendix 2 Appendix 3 Appendices	Updated to match the most current MP Template language (Template Version Date April 28, 2021); updated references to the CEMN OMP (SFWMD-FIELD-MP-096) throughout text and in Section 7.0; updated signature page; updated historical references to the offsite monitoring wells in the Deer Run Subdivision and modified references to the number of groundwater wells and clusters in the project area; added a map of the L8FEB project in relation to adjacent basins (Figure 1); updated Table 1 with current latitude, longitude, and groundwater stations; updated Figure 2 with current surface water and groundwater station locations; revised Figure 3; standardized *Revisions and Modifications* table; updated Frequency, Collection Method, and Tests; replaced Groundwater Monitoring Plan for the L-8 Flow Equalization Basin (L-8 FEB) Project with the most recent plan; rearranged Appendix 1 and Appendix 2 so the “Station Requirements by Mandate” table would be found in Appendix 1

Appendix 1: Station Requirements by Mandate

Mandate	Stations	Collection Method	Frequency	Parameter TESTS
CERPRA Permit 0188365	G538 G539	Grab	Biweekly Recorded Flow (BWRF)	Total Nitrogen (TN), Total Phosphorus (TP)
		In-situ Grab	BWRF	Chloride[1] (calculated), Dissolved Oxygen (DO), PH, Specific Conductance (SCOND), Temperature (TEMP)
	All Ground Water Wells	Stage recorder	60 minutes	Stage
		In Situ Continuous	60 minutes	SCOND

[1]Chlorides are calculated from Specific conductance using the following District derived equation where Chloride = (0.0000455 x SCOND^2) + (0.0845x SCOND)+ 6.633

Appendix 2: Mercury and Other Toxicants Monitoring Plan

[L8FEB]

CERPRA Permit No. 0188365-022

The Florida Department of Environmental Protection issued concurrence January 20, 2015 approving transfer of L8FEB mercury monitoring from Phase 3 – Tier 1: Routine Operational Monitoring from Year 4 to Year 9 to Phase 3 – Tier 3: Routine Operational Monitoring After Year 9. This implemented the termination of all site-specific mercury monitoring. Future assessment would be based on regional monitoring.

The USFWS email concurrence to terminate Other Toxicants monitoring in the L8FEB is reproduced below.

From: Breen, Timothy <timothy_breen@fws.gov>
Sent: January 29, 2019 7:51 AM
To: Reilly, Laura <lreilly@sfwmd.gov>
Subject: Protocol Assessment for Other Toxicants Monitoring for L-8 FEB

Laura:

The Service has reviewed the results of toxicant monitoring contained within the October 18, 2018 L-8 FEB report. Specifically, Heath Rauschenberger from our North Florida ES Office in Jacksonville reviewed the report and does not anticipate any adverse effects to listed species from the levels of toxicants identified in the report. He did note that one of the samples of selenium (Table 6; 0.83 mg/Kg; 5/31/18) for mosquitofish was within the identified range (0.75-1.00 mg/Kg) of threshold concentrations for fish and wildlife. However, one of the references cited within the Hink et al. 2009 paper (Hamilton 2004) showed toxicity thresholds for fish and wildlife that were all greater than 2.0 mg/Kg.

The Service concurs with the proposed elimination of other toxicants monitoring within the L-8 based on the results of the monitoring presented in the October 18, 2018 report submitted for our review. Please feel free to contact Heath Rauschenberger or me directly if you have any specific questions.

Thanks,
Tim

--
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U.S. Fish and Wildlife Service
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timothy_breen@fws.gov
http://www.fws.gov/verobeach

Appendix 3: Groundwater Monitoring Plan

Groundwater Monitoring Plan for the L-8 Flow Equalization Basin (L-8 FEB) Project

Updated
01/27/2022

Prepared by
South Florida Water Management District

1.0 Project Organization

This South Florida Water Management District (SFWMD or District) Groundwater Monitoring Plan follows all standard operating procedures (SOPs) for site installation, data collection, data processing and QA/QC established by the Water Quality Bureau's Field Sampling Manual SFWMD-FIELD-FSM-001 (FSM) and Quality Management Plan SFWMD-QS-QM-001. Refer to these documents for details on key personnel and relevant responsibilities.

1.1 Project Purpose

The L-8 Flow Equalization Basin (L-8 FEB) project is intended to 1) increase the water qualitytreatment performance of Stormwater Treatment Area (STA) 1 East (STA-1E) and STA 1 West(STA-1W) by attenuating peak storm water flows, then sending them to the STAs at a rate more consistent with improving phosphorus uptake which will assist in meeting the Water Quality Based Effluent Limit (WQBEL); 2) support interim Loxahatchee River restoration efforts;and 3) provide additional flood control flexibility.

2.0 Project Description

The L-8 FEB project utilized the existing L-8 Reservoir that was part of the larger Loxahatchee River Watershed Restoration Project (formally North Palm Beach County, Part 1) CERP project. This was in response to the June 2012 agreement reached by the State of Florida andthe U.S. Environmental Protection Agency on a strategy to improve water quality entering theEverglades which required the L-8 Reservoir be re-purposed as the L-8 FEB.

The L-8 FEB will be used for storage of runoff from the S-5A and C-51W basins thereby reducing discharges from these basins to the C-51 canal and ultimately to tide. To achieve this,water will be withdrawn from and discharged to the L-8 Canal during the operation of the L-8 FEB. Inflow and outflow water quality is expected to be reflective of the canals within the basin. The L-8 FEB is intended as a temporary water storage facility with no expectation of water treatment during the detention of water within the project.

3.0 Monitoring Locations

Water level monitoring will be conducted to evaluate how groundwater conditions might be affected by normal operations of the L-8 FEB. Monitoring of groundwater levels is proposed at five locations (see **Figure** 1) along the perimeter of the project. A well cluster was constructedat each location consisting of one upper (45-75 feet depth range), one middle (65-100 feet depth range), and one lower (119-150 feet depth range) monitoring well. In addition, the Districthas installed two piezometer clusters near the discharge on the east side of the L-8 FEB. Monitoring well construction diagrams are provided in **Attachment A**.

Table 1: Project Groundwater Monitoring Wells

Ground Water Well	Owner	Latitude	Longitude	Total Depth Below Land Surface, ft.	Screen Length, ft.	Frequency
L8FEB1L	SFWMD	26°44'20" N	80°21'55" W	146	10	60 minutes
L8FEB1M	SFWMD			82	5	60 minutes
L8FEB1U	SFWMD			54	5	60 minutes
L8FEB2L	SFWMD	26°41'52" N	80°21'55" W	140	10	60 minutes
L8FEB2M	SFWMD			87	5	60 minutes
L8FEB2U	SFWMD			57	5	60 minutes
L8FEB3L	SFWMD	26°41'25" N	80°21'55" W	138	10	60 minutes
L8FEB3M	SFWMD			98	5	60 minutes
L8FEB3U	SFWMD			71	5	60 minutes
L8FEB4L	SFWMD	26°43'27" N	80°22'35" W	116	10	60 minutes
L8FEB4M	SFWMD			67	5	60 minutes
L8FEB4U	SFWMD			42	5	60 minutes
L8FEB5L	SFWMD	26°44'20" N	80°22'34" W	116	10	60 minutes
L8FEB5M	SFWMD			62	5	60 minutes
L8FEB5U	SFWMD			43	5	60 minutes
PZ5A	SFWMD	26°43'24" N	80°21'49" W	15.5	4.5	60 minutes
PZ5B	SFWMD			35.5	4.5	60 minutes
PZ5C	SFWMD			55.5	4.5	60 minutes
PZ5D	SFWMD			75.5	4.5	60 minutes
PZ8A	SFWMD	26°43'24" N	80°21'45" W	20	4.5	60 minutes
PZ8B	SFWMD			40	4.5	60 minutes

4.0 Data Collection Procedures

4.1 Monitoring and Preventive Maintenance

Data loggers and associated telemetry have been installed for all well clusters and piezometerson District property (L8FEB1, L8FEB2, L8FEB3, L8FEB4, L8FEB5, PZ5, and PZ8), with the capacity to instrument each well within a cluster to monitor water level. The SCADA (supervisory control and data acquisition) Instrumentation & Telemetry Section is responsible for installing, maintaining, and repairing hydrological monitoring instrumentation. Regular preventive maintenance and calibration are implemented to maintain monitoring equipment and facilities in satisfactory operating condition. Systematic inspection, detection, validation, verification and correction of incipient failures are conducted to ensure the quality of data collected.

4.2 Data Processing and Engineering Support

The Hydro Data Management Section is responsible for processing all raw hydro-meteorological data collected from field remote terminal units (RTUs), conducting flow measurement, rating analysis and flow computation, and implementing quality assurance/quality control and data change. The Hydro Data Management Section is also responsible for entering groundwater levels in the District's DBHYDRO database for manual measurements in offsite wells.

5.0 Data Quality Objectives (DQOs)

The DQO process is a tool used to define the type, quality, and quantity of data needed to make

defensible decisions for a project. This process systematically defines the requirementsfor a field investigation and the limits on tolerable error rates. The quantitative components ofthe DQO process for hydro-meteorological data monitoring, including groundwater level, are: accuracy, precision, sampling frequency, reporting frequency, availability, completeness and timeliness. SFWMD guidelines for these quality indicators are as follows:

Accuracy:	Reported resolution 0.01 feet; instrument range 0 – 30 feet.
Precision:	±0.01 feet
Sampling frequency:	1 – 15 minutes
Availability:	Reliability 24 months; maintainability (mean time to repair 95% ofincidents) 72 hours
Completeness:	95% (percentage of reported values received)
Timeliness:	15 minutes maximum real-time delay to report; 1 day maximumdelay for reported values

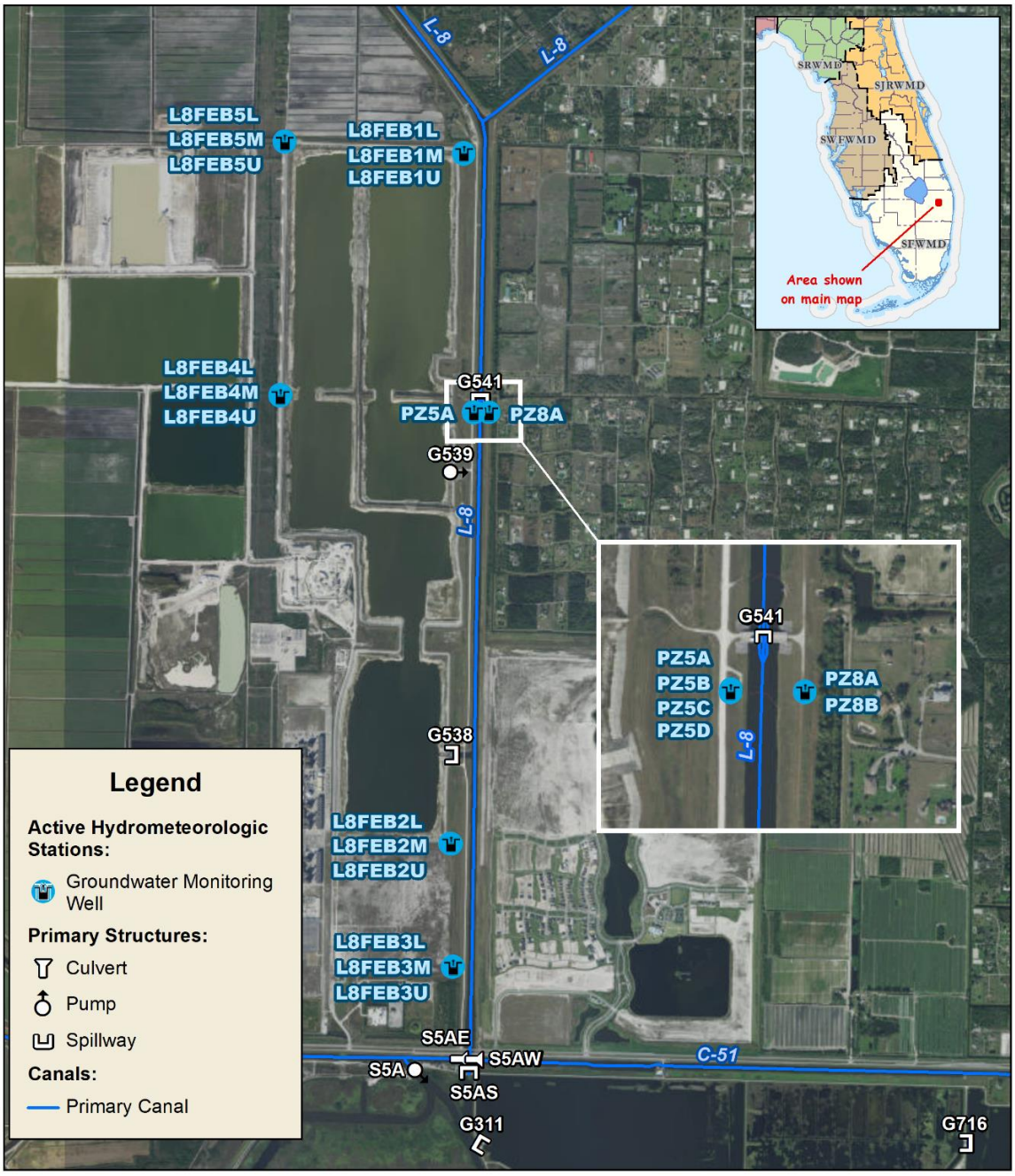


Figure 1. Location of Monitoring Wells

6.0 Data and Records Management

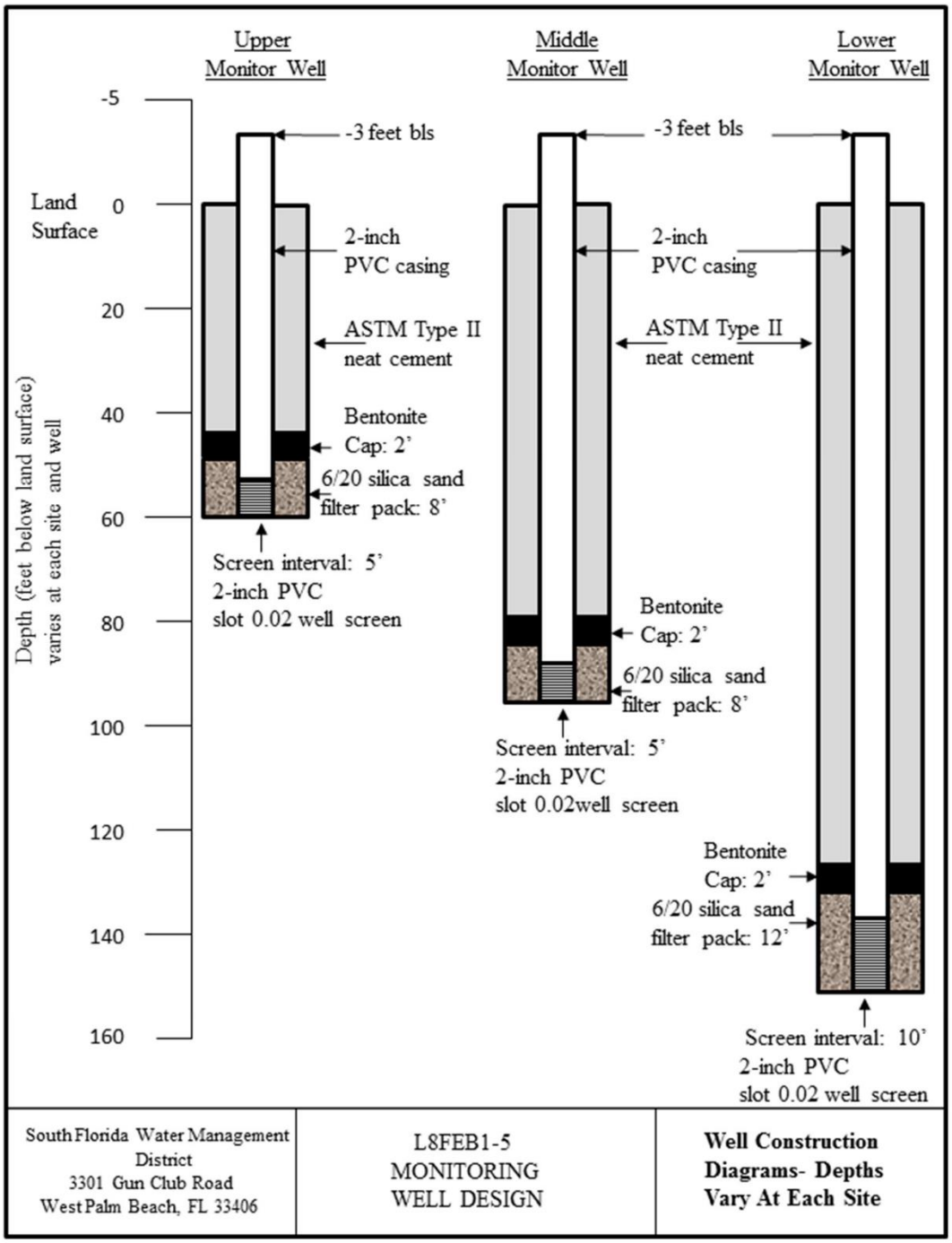
Hydrological data collected from this project is stored in the District's database DBHYDRO website (http://my.sfwmd.gov/dbhydroplsql/show_dbkey_info.main_menu). The District hasestablished structures, policies, and procedures that manage data through a full life cycle to ensure the highest quality data products. Data and records management generally encompasses collection requirements, storing, quality assurance (processing and post-processing), and change requests. The data management program at the District encompasses all the steps required for accurate data to be loaded into DBHYDRO.

7.0 Revisions and Modifications

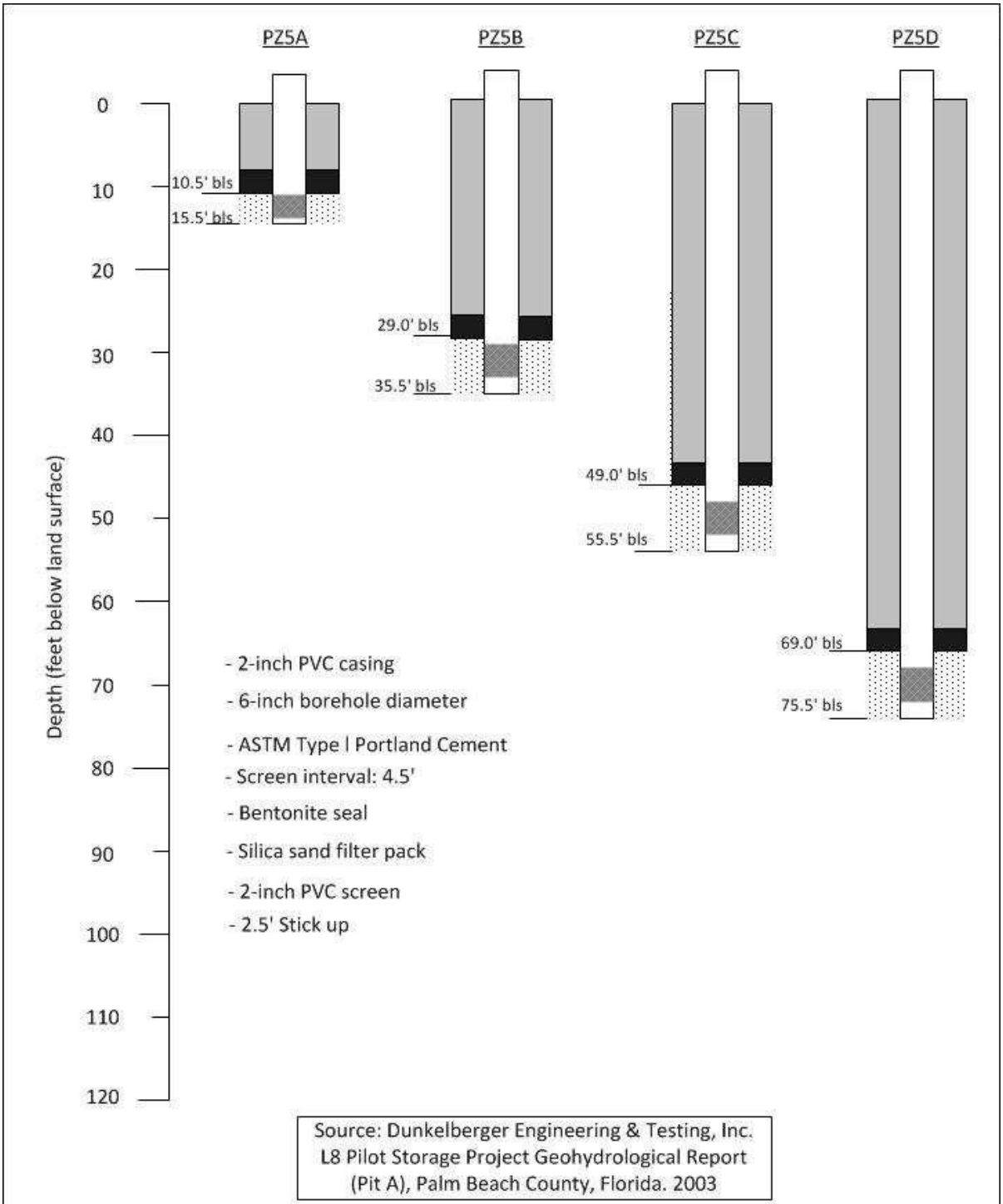
Date	Section	Page Number(s)	Reason
07/14/2014	All	All	Developed as part of the monitoring packageto support FDEP permitapplication.
08/04/2014	3.0, 5.0	3, Attach. A	Changes in response toFDEP comments.
06/11/2015	All	All	Added references to offsite monitoring wells.
08/05/2019	3.0, 4.1, 6.0, AttachA		Deleted references to offsite monitoring wells
12/20/2021	Table 1, Figure 1	3, 5	Changed frequency from 15 minute to 60 minutes at the request of SCADA to increase efficiency of the network. Updated Figure 1 to only include onsite monitoring wells.

Attachment A: Typical Monitoring Well Construction

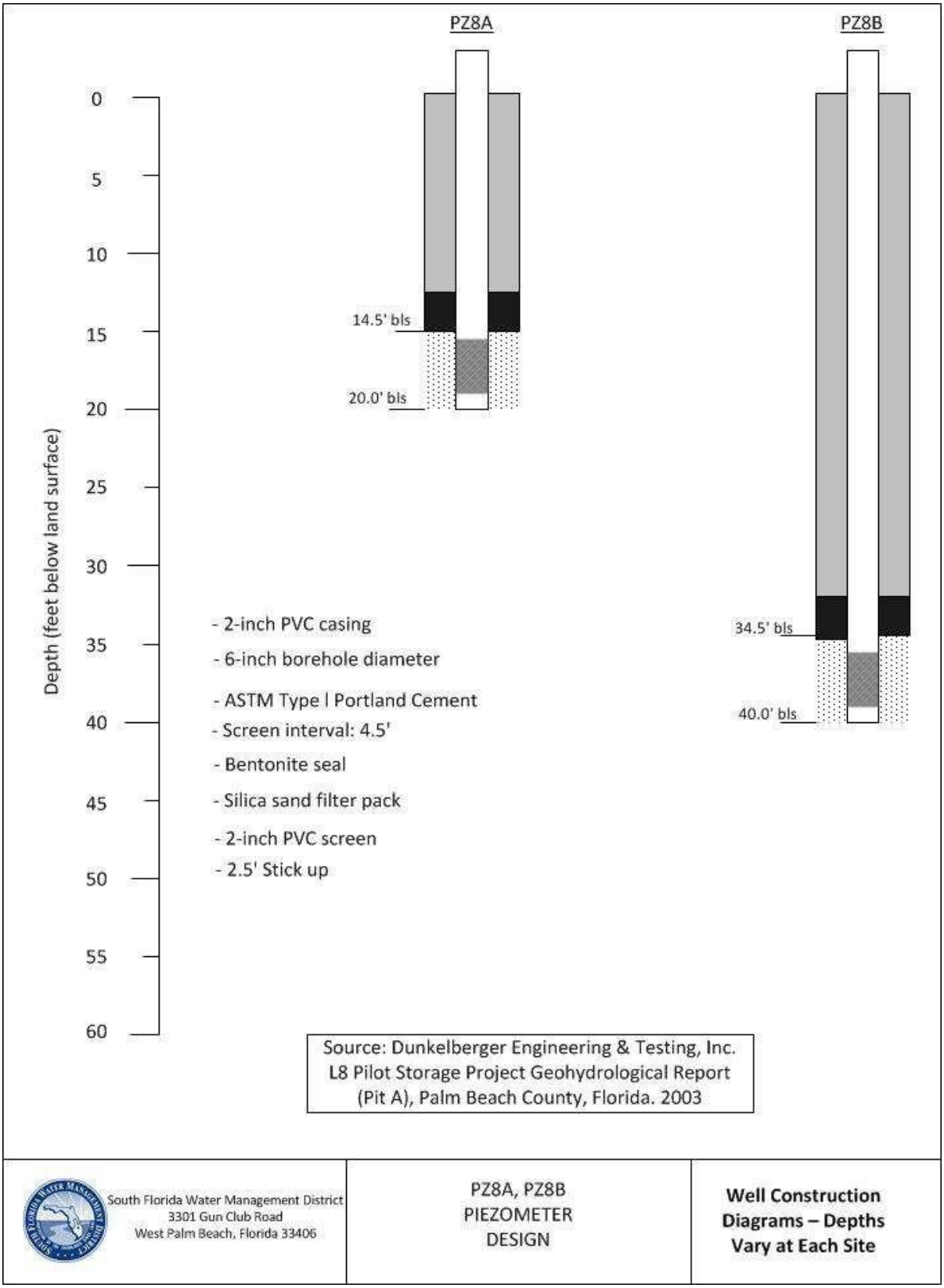
Completed Well Construction-3 Wells Per Site



7/10/14



South Florida Water Management District 3301 Gun Club Road West Palm Beach, Florida 33406	PZ5A, PZ5B, PZ5C, PZ5D PIEZOMETER DESIGN	**Well Construction Diagrams – Depths Vary at Each Site**


PZ8A
PZ8B
Depth (feet below land surface)
0
5
10
15
20
25
30
35
40
45
50
55
60
14.5' bls
20.0' bls
34.5' bls
40.0' bls
- 2-inch PVC casing
- 6-inch borehole diameter
- ASTM Type I Portland Cement
- Screen interval: 4.5'
- Bentonite seal
- Silica sand filter pack
- 2-inch PVC screen
- 2.5' Stick up
Source: Dunkelberger Engineering & Testing, Inc.
L8 Pilot Storage Project Geohydrological Report
(Pit A), Palm Beach County, Florida. 2003
South Florida Water Management District
3301 Gun Club Road
West Palm Beach, Florida 33406
PZ8A, PZ8B
PIEZOMETER
DESIGN
Well Construction
Diagrams – Depths
Vary at Each Site