Comprehensive Everglades Restoration Plan (CERP)

Quality Assurance Oversight Team

Quality Assessment Report

for Water Years 2013 - 2014

(May 1, 2012 – April 30, 2014)

Prepared for:

CERP Design Coordination Team

South Florida Water Management District: Thomas Teets

United States Army Corps of Engineers Program Manager: Howard Gonzales, Jr.

Prepared by:

Quality Assurance Oversight Team

South Florida Water Management District Project Manager: Ming Chen

United States Army Corps of Engineers Project Manager: April Patterson

April 2015

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ACRONYMS and ABBREVIATIONS

ACRA	Allapattah Complex Restoration Area
ADaPT	Automated Data Processing Tool
ADV	Acoustic Doppler Velocimeter
ALS	Australian Laboratory Services
AMEC	AMEC Environmental and Infrastructure
ASR	aquifer storage and recovery
ASTM	American Society for Testing and Materials
AT	assessment team
BBCW	Biscayne Bay Coastal Wetlands
BBSMN	Biscayne Bay Salinity Monitoring Network
BCWPA	Broward County Water Preserve Area
BRL	Brooks Rand Laboratory
CA	Corrective Action
CAS	Columbia Analytical Services
CEPP	Central Everglades Planning Project
CERP	Comprehensive Everglades Restoration Plan
CGM	CERP Guidance Memorandum
COC	Chain of Custody
DBE	DB Environmental Laboratories
DBHYDRO	Hydrometerologic, Water Quality, and Hydrogeologic Data Retrieval System
DCT	Design Coordination Team
DDT	4,4'-Dichlorodiphenyltrichloroethane
DPM	Decompartmentalization Physical Model
DQO	Data Quality Objective
DRER	Department of Regulatory and Economic Resources
DVS	data validation and stewardship
EB	Equipment Blanks
EC	Environment Canada
EDD	Electronic Data Deliverable
ELI	Everglades Laboratories, Inc.
ERDP	Everglades Research Database Production
ESA	Environmental Site Assessment
ESU	Environmental Science Unit
F.A.C.	Florida Administrative Code
FAQ	Frequently Asked Question
FEB	Flow Equalization Basin
FDEP	Florida Department of Environmental Protection
FDOH	Florida Department of Health
FL PRO	Florida Residual Petroleum Organic Method
HASR	Hillsboro Aquifer Storage and Recover

HTRW	Hazardous, Toxic and Radioactive Waste
ICP-MS	Inductively Coupled Plasma-Mass Spectrometry
IDM	Information and Data Management
JEL	Jupiter Environmental Laboratory
L8RT	L8 Reservoir Testing
LCS	Laboratory Control Sample
LDC	Laboratory Data Consultants
LOASR	Lake Okeechobee Aquifer Storage & Recovery
LRL	Laboratory Reporting Limit
MAP	Monitoring and Assessment Plan
MDL	Method Detection Limit
MeHg	Mono-methyl mercury
MS	Matrix Spike
NELAC	National Environmental Laboratory Accreditation Conference
NELAP	National Environmental Laboratory Accreditation Program
OBS	Observations
OP/TP	Orthophosphate/Total Phosphorus
PAH	Polynuclear Aromatic Hydrocarbon
PDT	Project Delivery Team
PE	Performance Evaluation
PI	Principle Investigator
PLMP	Project Level Monitoring Plan
PM	Project Manager
PrMP	Program Management Plan
PSI	Professional Service Industries
QA/QC	Quality Assurance/Quality Control
QAOT	Quality Assurance Oversight Team
QAPP	Quality Assurance Project Plan
QAR	Quality Assessment Report
QASR	Quality Assurance Systems Requirements
QM	Quality Manual
RECOVER	Restoration Coordination and Verification
RSTA	Reservoir Stormwater Treatment Area
SAMP	Routine Sample
SAP	Sampling and Analysis Plan
SAV	Submerged Aquatic Vegetation
SFWMD	South Florida Water Management District
SM	Standard Methods

SME	Subject Matter Expert
SOP	Standard Operating Procedure
SOW	Scope of Work
SPLP	Synthetic Precipitation Leaching Procedure
TAR	TestAmerica Richland
THg	Total Mercury
TOC	Total Organic Carbon
TPH	Total Petroleum Hydrocarbons
USACE	U.S. Army Corps of Engineers
USEPA	U.S. Environmental Protection Agency
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
VOC	Volatile Organic Compounds
WCA	Water Conservation Area
WY	Water Year

EXECUTIVE SUMMARY

The scope of this Quality Assurance Oversight Team (QAOT) Quality Assessment Report (QAR) is to provide the Comprehensive Everglades Restoration Plan (CERP) management team with an assessment of the quality of data generated during Water Years (WYs) 2013 and 2014, which is defined as the time period between May 1, 2012 and April 30, 2014, (or "reporting period"). The goals of the QAR are to identify practices that contribute to data quality, identify data quality problems and best management practices, to report on the activities of the QAOT, and recommend improvements to the quality system for CERP monitoring. This QAR integrates the results of the CERP quality assessment and QAOT activities performed during this reporting period.[1]

The QAOT employed a variety of methods to evaluate the quality assurance/quality control (QA/QC) procedures implemented for CERP that could impact data quality. These methods included a review of QA/QC processes, evaluation of field monitoring activities, and assessment of laboratory performance. Several QAOT/CERP documents were updated as part of the QA/QC review process. The Quality Assurance System Requirements (QASR) manual was updated (Section 4.1.1), three QAOT Standard Operating Procedures (SOPs) were updated (Section 4.1.3), and the QAOT Facts and Information Sheet was revised (Section 4.1.4). The QAOT participated in the review of the Central Everglades Planning Project (CEPP) Adaptive Management Plan (Section 4.2.1). Two water quality and one hydro-meteorological, and ecological monitoring plans were reviewed (Section 4.2.2) and the 2011-2012 QAR was finalized and approved by the Design Coordination Team (DCT) (Section 4.3). Project-level data assessments were conducted for seven CERP projects (Section 4.4). The QAOT also conducted three program-level activities: (1) development/review of six Decompartmentalization Physical Model (DPM) monitoring activities SOPs (Section 4.5.1); (2) two training sessions on QA/Data Management and SFWMD Hydrometerologic, Water Quality, and Hydrogeologic Data Retrieval System (DBHYDRO, Sections 4.5.2/4.5.6); and (3) three outreach workshops (Sections 4.5.3 through 4.5.5).

On-site field audits and/or observations were conducted to assess field monitoring activities (Section 5.1). Field audits for two CERP water quality projects were conducted. Thirteen corrective actions and one observation were reported for one Contractor; six corrective actions were reported for a second Contractor. A summary of use of Inferential Sensors for Quality Control of the Everglades Depth Estimation Network (EDEN) Water-Level Data is presented (Section 5.2) for hydrology monitoring activities. Biological/ecological audits (Section 5.3) were not conducted during this reporting period due to remote locations.

The QAOT completed on-site quality assessments during the reporting period for four laboratories contracted to perform chemistry analysis, one that performs toxicological testing, one that performs microbiological testing and one that performs radiochemical testing (Section 6.1). Findings in the chemistry laboratories included method deviations related to method detection limits (MDLs), calibration errors, and lack of adequate documentation/detail in SOPs. Findings in the toxicological, microbiological and radiochemical audit reports mainly dealt with lack of detail in SOPs. In most cases, corrective

[1] All QAOT reports are available in Documentum or upon request from the QAOT Co-chairs.

actions were undertaken by the laboratories to mitigate the findings. The QAOT provided Performance Evaluation (PE) samples sent to four of the seven laboratories assessed. All reported results fell within the control limits. Four laboratories that may provide analysis for CERP projects were also evaluated by SFWMD for the Phase II Environmental Site Assessment project (Section 6.2). Findings included establishment of lower limits of acceptability for Laboratory Control Samples (LCSs), evaluation of MDLs compared to the project Data Quality Objectives (DQOs), and requirements associated with ADaPT files. One inorganic water and sediment (metals only) PE sample set was provided to laboratories that are or could potentially be used to analyze chemistry samples for CERP (Section 6.3). For the 2013 study, 42% of the results were scored as either Very Good or Good which is slightly lower than the 2010 study (53%) and the 2011 study (62%) for these two categories. The PE sample provider noted that the scoring system changed significantly in the 2013 study, so direct comparisons with other studies should be evaluated with caution. Subsequently, the QAOT determined these scoring changes have minimal impact for QAOT use in determining overall data quality.

An assessment was conducted of CERP data quality represented by a snapshot of analytical data in DBHYDRO and Everglades Research Database Production (ERDP) databases (Section 7.1) and analytical data from one ASR project (Section 7.2), in addition to an assessment of hydrologic data for the reporting period (Section 7.3). An evaluation of analytical chemical and classical water quality data indicated that approximately 2% of the WY 2013 and WY 2014 data snapshot had qualifiers indicating that data quality could be compromised. Water quality collected for the Kissimmee ASR project for all four testing cycles indicated that approximately 3.5% of the samples had quality-related data qualifiers (Section 7.2). For 13 hydrologic data types in DBHYDRO, 3% of the data were missing, 9% were estimated, and ≤1% were not processed during the reporting period (Section 7.3). These percentages are comparable to those reported in the WY11/12 QAR. Laboratory reports for CERP Phase I and Phase II Environmental Site Assessment (ESA) projects were reviewed as part of the laboratories quality systems evaluations with no QA/QC issues noted (Section 7.4). A summary of the 18 active stations with continuous monitoring of water quality for the Picayune Strand project is presented (Section 7.5).

The QAOT continued communication and outreach efforts (Section 10.1) and collaboration with other CERP entities (Section 10.2). Five initiatives identified in previous QARs were completed during the reporting period (Section 10.3).

QA is a continuous process improvement cycle of planning, doing, checking, and acting. The QAOT activities to address nine recommendations identified during previous WYs are summarized in Section 10.0. Four recommendations for improvement were identified by the QAOT during this reporting period (Section 11.0) and will be part of the planning and action focus during the next QAR reporting period. These recommendations include identifying only those analytes critical for CERP and evaluating laboratory performance based only on those analytes; developing a checklist to be used for biological field activities to determine compliance with QASR Chapter 8; continuing with Outreach by inviting appropriate Project Delivery Team (PDT) members to QAOT meetings to enhance their understanding of the role that the QAOT can play in ensuring the success of their projects; and continuing to work closely with Information Management sections at both the USACE and SFWMD to strive for a common database structure for the storage of all CERP data.

1.0 INTRODUCTION

Since passage of the Water Resource Development Act in 2000, the mission of the Comprehensive Everglades Restoration Plan (CERP) has been to restore, protect, and preserve the water resources of central and southern Florida, including the Everglades. CERP Guidance Memorandum (CGM) 41.01 (South Florida Water Management District [SFWMD] and U.S. Army Corps of Engineers [USACE], 2010), establishes the Quality Assurance Oversight Team (QAOT) and its responsibility for *providing guidance on and evaluation of the implementation of CERP Quality Systems through the Quality Assurance Systems Requirements* (*QASR*) *and CGMs. The QAOT develops and provides guidance on procedures, quality assurance/quality control (*QA/QC*) requirements and data verification and validation for CERP monitoring activities. The QAOT* serves as *the forum through which consistency is achieved regarding data quality and QA/QC processes among the various entities involved with hydrological, meteorological, water quality, and biological monitoring activities for CERP*. CGM 41.01 further specifies that the lead QAOT agencies will produce a *QA report on CERP monitoring activities on a biennial basis, evaluating whether the QASR is being implemented by CERP projects and programs and/or their contractors.* This QAR has been prepared to meet that mandate.

The Office of Management and Budget was required to provide guidance for quality, objectivity, integrity, and utility of information disseminated by Federal agencies as a result of the Information Quality Act passed in 2001 (U.S. Congress 2001). Now required by the Government Performance Results Modernization Act of 2010 (U.S. Congress 2011) are agency performance plans and reports that describe how the agency ensures the reliability of the data used to measure progress toward performance goals, including how performance measures are verified and validated and if there are any limitations in the data that prevent attainment of the required level of accuracy.

It is critical that environmental monitoring and assessment data generated for the restoration of the Everglades as part of CERP provide a reliable and defensible basis upon which to formulate appropriate planning decisions. Use of data with unknown, unequal, or untraceable quality could result in decision errors or legal challenges. Therefore, to maximize the integrity of the data, programmatic data quality will be achieved by systematically incorporating QA/QC measures into every aspect of data collection.

The CERP program QASR manual defines protocols and procedures for environmental data gathering activities for the implementation of CERP and defines the quality system to enhance data quality. The QASR establishes fundamental QA/QC procedures that, if implemented, will ensure data generated for CERP are "of acceptable and verifiable quality, generated in a consistent manner to allow sharing and utilization of data" (CERP Monitoring Program, 2004). The QASR manual incorporates, by reference, the Florida Department of Environmental Protection (FDEP) QA Rule Chapter Florida Administrative Code (F.A.C.) 62-160 and Florida Department of Environmental Protection (FDEP) SOP-001/01. The QASR requirements are applicable to all data that will be used for CERP purposes.

The purpose of the QAR is to provide CERP management with an assessment of the state of data quality for CERP. The goals of the QAR are to identify practices that contribute to data quality, identify data quality problems and best management practices, report on the activities of the QAOT, and recommend improvements to the quality system for CERP monitoring. As such, when specific data quality issues are

discussed in this report, a less-than-perfect assessment is meant to identify an opportunity for continuous process improvement, not failure. As directed by the CERP Design Coordination Team (DCT), the QAR is a biennial report which integrates into one document the results of CERP quality assessment and QAOT activities performed during each reporting period.[2] This document provides an assessment of CERP data quality and QAOT activities for the period between May 1, 2012 and April 30, 2014 based on WY 2013 and WY 2014, hereafter referred to as the *reporting period*. This is the sixth QAR developed by the QAOT.

[2] All QAOT reports are available in Documentum or upon request from the QAOT co-chairs.

2.0 SCOPE AND APPLICATION

The scope of this QAR is to describe the state of data quality being generated for CERP for the reporting period between May 1, 2012 and April 30, 2014. The report focuses on CERP environmental monitoring activities from (1) Restoration Coordination and Verification (RECOVER) system-wide monitoring efforts (i.e., Monitoring and Assessment Plan [MAP]); (2) project-level operational monitoring; and (3) permit-driven regulatory monitoring. The QAOT employed a variety of methods to evaluate the QA/QC procedures implemented for CERP that potentially impact data quality.

This report assesses CERP data quality both directly and indirectly. Direct assessments included reviews of field and laboratory data quality indicators, the results of PE sample analysis, assessments of monitoring and analytical procedures, and reviews the findings of, recommendations to, and responses from field and laboratory audits. Indirect assessments of data quality were accomplished by reviewing monitoring plans, SOPs, data, and/or project reports.

3.0 LIST OF KEY PARTICIPANTS AND ORGANIZATIONS

The preparation of this report was supported by the major contributions of QAOT members who provided audit reports, data, contact names, guidance, oversight, and comments. Table 3-1 lists the people who contributed text to this document, including those who provided supporting documentation and review comments.

Table 3-1. Contributors to the WY 2013 - 2014 QAOT Quality Assessment Report

Name of Participant	Organization
Paul Julian	FDEP
Michael Blizzard	FDEP
Cindy Lee Westergard	HSW Engineering, Inc. (SFWMD contractor)
Ming Chen	SFWMD
Linda Crean	SFWMD
Tom Dreschel	SFWMD
Michelle Ferree	SFWMD
John Moorman	SFWMD
Robert Kukleski	SFWMD
Brian Turcotte	SFWMD
Michael Wright	SFWMD
Gary (Quinlong) Wu	SFWMD
Lisa Gued	USACE
Susan Kemp	USACE
Timothy Lewis	USACE
Marie Lopez	USACE
Clay McCoy	USACE
April Patterson	USACE
Sal Resurreccion	USACE
David Splichal	USACE
Jeff Hendel	U.S. Environmental Protection Agency (USEPA)
Pamela Telis	U.S. Geological Survey (USGS)

4.0 CURRENT QA/QC PROCESSES

This section summarizes QAOT activities conducted to improve or assess current QA/QC processes implemented across CERP. These processes, defined in the QASR and QAOT SOPs, define the CERP quality system. Whenever possible, the QAOT implements activities that are pro-active and focused on preventive actions. During the reporting period, the QAOT focused efforts on the following processes:

1) Documents were prepared or revised to provide acceptable QA/QC requirements to Principal Investigators (PIs) – section 4.1
2) Monitoring Plans were reviewed to assess the implementation of QA/QC procedures for CERP – section 4.2
3) The approved 2011-2012 QAR documented QAOT activities during the previous reporting period – section 4.3
4) The implementation of the CERP quality system was assessed for seven CERP projects – section 4.4 and Table 4-2
5) Six Outreach activities were initiated to improve the quality of data by informing the CERP community of appropriate QA/QC practices.

4.1 QAOT Document Updates

4.1.1 Review of the QASR

The QASR was developed to address system-wide and project-specific environmental monitoring QA/QC, including data collection, analysis, and archiving activities, throughout the entire CERP life cycle. All agencies involved in environmental data acquisition during CERP implementation are required to adhere to the provisions of the QASR. The manual serves as the basis of the quality system for all monitoring activities conducted during CERP implementation and details QA/QC requirements, including establishing data quality objectives and guidance for data management. Also included in this manual are procedures and references for water quality, hydrometeorological, and biological sample collection, laboratory methods, and data assessment protocols.

Chapter 8: In December 2012, the QAOT presented to the DCT the final version of Chapter 8, *Biological Monitoring and Assessment Procedures* and Biological/Ecological SOPs. After DCT approval, Chapter 8 was posted on Evergladesplan.org. This chapter identifies and describes procedures and protocols for biological monitoring and assessment. This chapter also directs the reader to the method/technology summary in the appendices. Specific protocols and methodologies used for biological and ecological activities are documented as SOPs available on the QAOT QASR web page (SOPs 8-A-001 thru 8-N-001). The intent is to provide guidance to CERP project managers (PMs), consultants, and contractors for achieving a level of acceptable quality, standardization, and consistency in their data and data-gathering methods. This chapter outlines the minimum data quality and reporting elements, along with a list of recognized methods in use at the time of the drafting of the QASR.

Chapter 10: In March 2013, the QAOT presented to the DCT the final version of Chapter 10, *Information and Data Management*, to the DCT. Upon approval by the DCT, Chapter 10 was posted on Evergladesplan.org in July 2013. Environmental monitoring of CERP programs generates surface water, groundwater, hydrological, meteorological, geological, biological, and ecological data. Since many entities are involved in the collection of these data sets, there is an essential need to ensure standardized data formats and ensure data usability across CERP. Chapter 10 was revised to include the minimum data

standard to be used in CERP projects in an effort to standardize and maintain complete data, and to increase the usability of the data among projects.

4.1.2 CERP Guidance Memoranda

There were no updates to CERP Guidance Memoranda during this time period.

4.1.3 QAOT Standard Operating Procedures

The QAOT has developed five SOPs that define QAOT responsibilities and procedures. SOPs ensure that activities are performed consistently and systematically over time. These SOPs are "living documents" that are revised to reflect procedural changes. The QAOT currently has five approved SOPs:

- SOP-001 Format for SOPs and Document Control Procedures
- SOP-002 Quality Assurance Activities and Responsibilities
- SOP-003 Preparation of the Quality Assessment Report
- SOP-004 Review of Project Monitoring Plans & Scopes of Work
- SOP-005 Administering and Reporting Analytical Performance Evaluation Studies.

During the reporting period, SOP-002, SOP-003 and SOP-005 were revised.

QAOT SOP-002 Quality Assurance Activities and Responsibilities

This SOP outlines the Quality Assurance Management Activities that must be integrated into all CERP monitoring projects. It assigns active responsibility, assistance, oversight, and guidance functions to the QA groups (or individuals) who are responsible for data quality decisions, implementation of QA and QC procedures for CERP projects, and/oversight of the QA process. The SOP was updated to reflect current QA responsibilities that the QAOT and the PMs have during CERP project implementation. This SOP revision was approved on June 5, 2013.

QAOT SOP-003 Preparation of the Quality Assessment Report

This SOP provides guidance for the preparation of the biennial Quality Assessment Report (QAR). The purpose and goals of the QAR are to assess the quality of data being generated for CERP, to identify practices that are contributing to data quality, to report on the activities of the QAOT, and to recommend improvements to the quality system. The SOP was updated to reflect: the change in the frequency of publication from annual to biennial; the Documentum folder organization and SOP outline; and the contents and schedule tables were modified to reflect current agreement by the QAOT. This SOP was revised on May 15, 2013.

QAOT SOP-005 Administering and Reporting Analytical Performance Evaluation Studies

This SOP describes the PE program administered by the QAOT for inorganic parameters in water. The SOP outlines: the selection of laboratories for participation; responsibilities for administering the program; selection of a PE provider; compound classes for inclusion in the study; communication, scheduling and reporting. Revision 1.0 included additional details added to the text, and the attachments were revised to improve clarity and flexibility. This SOP was revised on February 1, 2014.

4.1.4 Revision of QAOT Facts and Information Sheet

The QAOT Facts and Information Sheet was updated in October 2013. The sections regarding Requirements, Guidance, Frequently Asked Questions (FAQs) and points-of-contact were updated to reflect the current status of the QAOT. Statements referring to which agencies comprise the QAOT, role of the QASR (including the update to chapter 8), and how the QAOT was established (CGM 041) were updated. The FAQ section discussed eight topics involving questions that are commonly asked of the QAOT members.

4.2 Monitoring Plan Reviews

4.2.1 CEPP Adaptive Management Plan

During WYs 2013-2014, the Central Everglades Planning Project (CEPP) was in the process of developing the Project Level Monitoring Plan (PLMP) and the QAOT was tasked with reviewing the document.

1. Part I – Adaptive Management Plan
2. Part II - Hydro-meteorological Monitoring Plan
3. Part III – Water Quality Monitoring Plan
4. Part IV – Ecological Monitoring Plan
5. Part V - Nuisance and Exotic Species

Guidance for development of the PLMP was provided to CEPP in CGM 040.02 and QAOTs role was provided in CGM 041.01. QAOT members collectively reviewed the above-mentioned document, with 126 review comments submitted for consideration. The Adaptive Management Plan (Part 1) and water quality monitoring plan (Part III) were reviewed in March 2013 based on the checklist specified in QAOT-SOP-004 for the CEPP review summarized in Table 4-1. Extensive follow-up communication with the project delivery team was conducted regarding incorporation of the hydro-meteorological monitoring plan (Part II) review comments.

4.2.2 Biscayne Bay Coastal Wetlands Project

One water quality monitoring plan was reviewed by the QAOT during the reporting period. A checklist based on the requirements of CGM 040 was used to assess the content and completeness of the elements required for this document. The eight elements and sub-elements identified in Table 4-1 were used to evaluate the adequacy and completeness of the monitoring plan.

The Biscayne Bay Coastal Wetlands (BBCW) project is intended to aid in establishing a productive nursery habitat along the shoreline through redistribution of freshwater flow and the minimization of point source discharges as part of the overarching CERP. The SFWMD Water Quality Monitoring Plan Coordinator requested that the QAOT review the updated water quality monitoring plan (Part 2 – Water Quality Monitoring Plan). The plan was received and reviewed in June 2013; all monitoring plan elements were addressed in sufficient detail. The document was acceptable as provided to the QAOT; no follow-up was required.

Table 4-1. Results of QAOT Water Quality Monitoring Plan and Statement of Work (SOW) Reviews

Monitoring Plan/SOW Element	CEPP	BBCW
1. Title Page		
• Contains project title, revision, and date	A	A
• Contains QA Manager signature	A	A
2. Project Organization and Responsibilities	A	A
3. Data Assessment Organizations and Responsibilities	A	A
4. Data Quality Objectives		
• Data use background: defines project specific data needs; describes media and analyses required to meet the data needs	A	A
• Measurements of quality objectives: required reporting limits, precision, accuracy, comparability, and acceptance criteria	A	A
5. Sample Receipt, Custody, and Holding Time Requirements	A	A
6. Analytical Procedures		
• Preventative maintenance	A	A
• Calibration procedures and frequency	A	A
• Laboratory QC procedures: type and frequency of internal QC measures	A	A
• Performance and system audits	A	A
• Nonconformance/corrective actions for field and laboratory	A	A
• Data reduction/calculation of data quality indicators: describes bias, accuracy, limits of detection, and precision calculations	A	A
7. Report Documentation: Defines Report Format and Data Archival Requirements	A	A
8. Data Assessment Procedures		
• Data verification	A	A
• Data validation	A	A
TOTAL U (% Unacceptable)	0%	0%
TOTAL A (% Acceptable)	100%	100%

Review Codes: A (Acceptable), U (Unacceptable), NA (Not applicable)

4.3 Quality Assessment Report for WY 2011-2012

The 2011-2012 QAR (QAR2012) presented CERP data quality and project performance; QAOT guidance documents, audits and outreach; and recommendations for future data quality improvements during WYs 2011 and 2012. The time period for QAR2012 was between May 1, 2010 and April 30, 2012. QAR2012 was approved by the DCT on February 12, 2013. Highlights of QAOT activities for QAR2012 included the following:

- Preparation/Revision of Process Documents:
    1. Prepared the QAOT Program Management Plan (PrMP) 2011-15
    2. Revised CGMs 040, 041, 042
    3. Revised QASR Chapter 8.0
    4. Revised QAOT SOP-001 (Document Control) and SOP-005 (PE Studies)
    5. Prepared Interagency QAOT Task Notification Forms (2011 & 2012)
- Program-level:
    1. Conducted a comparison of chlorophyll-a sampling and analysis procedures.
    2. Finalized WY2009-2010 QAR; approved by DCT
    3. Reviewed 14 water quality reports
    4. Reviewed 33 DPM SOPs
    5. Developed eight biological/ecological SOPs
    6. Reviewed three monitoring plans
    7. Reviewed RECOVER report, *Scientific and Technical Knowledge Gained in Everglades Restoration (1999-2009)*
    8. Assessed data quality procedures for 10 CERP projects (ACRA, BBCW, BBSMN, BCWPA, C44RSTA, DPM, HASR, Kissimmee ASR, L8RT, and LOASR)
- Databases:
    1. Reviewed data management procedures for biological/ecological data
    2. Assessed the quality of Hydrologic/Hydraulic data, analytical data in DBHYDRO and ERDP, and one ASR project
- Outreach:
    1. Held ethics and data integrity workshops (five sessions)
    2. Conducted QA/QC and data management classes (three classes, nine sessions)
    3. Conducted a two-day Quality Assurance Workshop
- Audits/Assessments:
    1. Field Audits: Six CERP water quality projects
    2. Hydrological, meteorological, and hydraulic data acquisition: 18 USGS stations
    3. Bio/ecological Monitoring Audit: one site
    4. Laboratory Audits: Seven organic and six inorganic
    5. Laboratory PE Studies – 14 Labs
- Action Items: Eight (8) out of 12 QAOT 2009-2010 QAR Action Items were completed; four (4) are still in progress or on-going:

1. QAOT metrics
2. QASR biological/ecological SOPs
3. Inventory of CERP projects and data
4. Address impacts of significant field and laboratory audit findings

- Recommendations:

1. Centralize CERP data (cooperative with PDTs and PIs)
2. Obtain Land Acquisition Team/Hazardous, Toxic and Radioactive Waste past and current data (management & coordination)
3. Assess biological/ecological field procedures against completed SOPs (management & coordination)
4. Develop a systematic review process for Hydrologic/Hydraulic data quality tags (management & coordination)
5. Define a corrective action process for field, laboratory, and PE audits (management & coordination)

4.4 CERP Project Assessments

4.4.1 Laboratory Evaluation for Phase II Environmental Site Assessments for CERP Projects

During WYs 2013-2014, the QAOT evaluated four contract laboratories identified by SFWMD PMs for their work for the Phase II Environmental Site Assessments for CERP projects. Laboratory evaluations included desk review of quality systems documents, data quality assessments, and if necessary, a half day on-site visit at the four laboratories. Summaries of the four laboratory assessments can be found in section 6.2 of this report.

Each laboratory evaluation was conducted by HSW Engineering, Inc., (acting on behalf of the QAOT), and focused on five main components of the following operations:

1. Sample log-in and handling
2. Subcontracting
3. Analytical methods of particular interest
4. Electronic data deliverables (EDDs)
5. Data archiving

For the desk review, the following processes were followed:

1. Reviewed at data package representative of the types of analyses likely to be requested.
2. Confirmed that the laboratory was certified under the National Environmental Laboratory Accreditation Program (NELAP) for the matrices, methods, and analytes of interest.
3. Identified any subcontracted laboratories used by the primary laboratory and confirmed that these subcontracted laboratories were also certified under NELAP for the matrices, methods, and analytes of interest.
4. Reviewed key laboratory information including the laboratory's Quality Manual (QM), relevant SOPs (including, in particular, any significant modifications to the underlying methods), latest MDL studies, latest empirically-derived acceptance limits for analytical bias and precision, and confirmatory evidence that no NELAP certifications have lapsed.

5. Confirmed that the laboratory utilized the up-to-date software versions for accurately producing EDDs in ADaPT automated data review software format in a timely manner.
6. Included the laboratories in all applicable PE studies.

After completing this evaluation, an assessment report was prepared for SFWMD for each laboratory, with corrective action recommendations to be taken by the laboratory to qualify for the project. These reports were reviewed by the QAOT for compliance with the method requirements.

As a following-up, an update was performed of the automated ADaPT data review software project library originally established in 2009 for each laboratory. Essential DQOs applicable to the Phase II ESA projects and acceptable to the QAOT were captured and verified in this single electronic library.

4.4.2 Decompartmentalization Physical Model (DPM) SOP Development

As part of the DPM, the USACE awarded a construction contract to install a 10-culvert control structure on the L-67A (the S-152), remove levee along the L-67C, and use that level material to backfill a portion of the L-67C canal. Also, the USACE and SFWMD combined resources to conduct a large landscape-scale test of the flow characteristics and hydro-geomorphology downstream of the S-152 and along the 3,000-foot stretch of the L-67C levee that was removed. The S-152 culvert structure and canal backfilling and levee gap features were completed in October 2013, and the first high-flow event occurred from November to December, 2013. Sheetflow velocities were increased and matched those of historic velocities (> 3 cm/s) in areas downstream of the S-152 culvert, thus providing the environment needed to understand how to restore the ridge and slough pattern. Sediment movement, flow direction, soil and floc characteristics, canal sediment deposition, fish distributions, and periphyton types were monitored during and after the high-flow event. Preliminary data analyses and comparisons with baseline (low-flow) data (2010-2012) were conducted and indicated positive effects of sheetflow on sediment movement in marsh and canal habitats.

The SFWMD QAOT members provided support in the development of six SOPs used in determining the impact of the DPM. These SOPs were used in the monitoring of water temperature, turbidity, flow velocity, dissolved oxygen, pH, specific conductance, sediment particulate flux, and sediment particulate size. The QAOT will review the SOPs for interagency concurrence in preparation for further DPM testing.

4.4.3 CERP Project Assessment Summary

The QAOT assessed implementation of the CERP quality system by reviewing project monitoring plans, performing project-specific field/laboratory assessments, and reviewing CERP data quality (Table 4-2). The table provides a summary of CERP projects assessed in any way by the QAOT during the reporting period.

Table 4-2. CERP Projects Assessed by the QAOT during the Reporting Period

Project	QA/QC Processes (Section 4)	Field/Lab Assessments (Sections 5/6)	Data (Section 7)
Biscayne Bay Coastal Wetlands (BBCW)	x	x	x
C111 Spreader Canal Western Project		x	x
Central Everglades Planning Project (CEPP)	x		
Decompartmentalization Physical Model (DPM)	x	x	x
Kissimmee Aquifer Storage and Recovery (ASR)			x
Lake Okeechobee Aquifer Storage & Recovery (LOASR)		x	
Phase II Environmental Site Assessment (ESA) supporting many CERP projects		x	x

4.5 QAOT Initiatives

4.5.1 Decompartmentalization Physical Model SOPs

A series of SOPs were developed or revised by HSW Engineering, Inc., (acting on behalf of the QAOT), for the DPM monitoring activities. These SOPs were reviewed by the QAOT to ensure QA/QC consistency for DPM relative to other CERP projects. The six SOPS are:

1. SFWMD-EVER-SOP-DPM-HOBO-01: Continuous Monitoring of Water Column Temperatures using HOBO Temperature Loggers
2. SFWMD-EVER-SOP-DPM-TURBIDITY-02: Measuring Water Column Turbidity using Seapoint OBS and Data Bank Datalogger
3. SFWMD-EVER-SOP-DPM-VELOCITY-03: Measuring Water Flow Velocity using SonTek Handheld FlowTracker ADV
4. SFWMD-EVER-SOP-DPM-HYDROLAB-04: Monitoring of Water Column Dissolved Oxygen, pH, Specific Conductance and Temperature using Hydrolab Minisonde
5. SFWMD-EVER-SOP-DPM-DUAL-05: Determining Particulate Flux in Aquatic Systems using Dual Sediment Tracers
6. SFWMD-EVER-SOP-DPM-BEDFLOC-06: Bed Floc and Soil Collection and Biogeochemical/Particle Size Analysis

These SOPS were used during the first implementation of the DPM in WY2013 and will continue to be used in the subsequent implementations in WY2014 and thereafter.

Product endorsement disclaimer: References to specific brands, equipment, or trade names in this document are made to facilitate understanding and do not imply endoresement by SFWMD or USACE.

4.5.2 Outreach: Quality Assurance and Data Management Training Classes

During WYs 2013-2014, QAOT members, in coordination with other SFWMD sections, conducted training and workshops for employees, CERP partners, other agencies and the general public. During this time period, four new quality system training workshops were developed and 13 training sessions were conducted in the areas of 1) document control and document archival procedures; 2) field measurements, calibrations, documentation, storage, and how to document field training; 3) root cause analysis for corrective actions and simplified six sigma concepts; and 4) field sampling workshop for external environmental consulting firms. Approximately 100 SFWMD employees participated in the quality system training workshops.

4.5.3 Outreach: Field Sampling Workshop – April 26, 2013

As a result of the QAOT field audit of the sample and field data collection processes for the A-2 Phase II ESA project, the SFWMD QAOT members conducted a field sampling "refresher" workshop at the request of the SFWMD Environmental Sciences Unit (ESU) on April 26, 2013 at the DuPuis Management Area, Canal Point, FL. Thirty five (35) field sampling staff and PMs representing five contracted external environmental consulting firms conducting work for the SFWMD ESA Contracts participated in the workshop. The workshop consisted of the following:

- Morning session: Classroom presentations detailing the FDEP QA Rule/SOPs, Ecological Risk Assessment Protocol, documentation requirements, instrument calibration, equipment documentation, and sampling procedures for soil, sediment, surface water and groundwater. Field equipment was calibrated by the participants in an outside environment (picnic tables) following standard procedures with oversight by the workshop instructors.
- Afternoon session: The attendees met in proximity to the Fishing Pier where individual hands-on stations for instruction in ground water, surface water, soil, and sediment sampling were set up. Site preparation included the installation of mock monitoring wells and shade tents for each location. The hands-on instruction and critique were very well received in that the instructors interacted with the external participants in a relaxed environment, resulting in an exchange of ideas and concerns that served to improve the quality of future sampling efforts.

4.5.4 Outreach: 5th QAOT Workshop – June/September 2013

The QAOT hosted two workshops, one on June 20, 2013 (West Palm Beach) and another on September 11, 2013 (Jacksonville). The West Palm Beach workshop focused only on Laboratory Assessment Findings, whereas the Jacksonville workshop focused on the FDEP QA Rule and SOP Updates, Field Sampling Audit Processes, and Laboratory Assessment Findings. The purpose of the workshops was to inform the CERP community of the support the QAOT can provide to their projects through the use of field and laboratory assessments. For the Jacksonville workshop, FDEP provided the audience with the latest information regarding the QA Rule (62-160 FAC). The target audience consisted of CERP PMs and technical experts, and the workshops included teleconference capability for those unable to participate in person. Eighteen (18) participants attended the West Palm Beach workshop; twenty attended the Jacksonville workshop including those who participated via telephone and Webinar. The workshops consisted of the following presentations:

- Laboratory Assessment Findings: The purpose of laboratory assessments is to evaluate, at the bench level, the proficiency that the laboratory has to perform the analysis and to ensure that the laboratories meet the method QA/QC requirements as defined in appropriate project documents. The desired outcome of these assessments is to enhance assurance that laboratories are producing

defensible data for CERP samples by following the methods requested for the project. Background information including description of the QAOT, purpose, outcome, assessment program structure (desk and on-site assessment strategies, and PE sample evaluation) and findings categories were presented. Common critical findings (method deficiencies), along with specific findings unique to an individual laboratory, in addition to a summary of evaluation of PE sample results, were the focus of the presentations.

- Field Sampling Audit Process: The purpose of field sampling audits is to obtain unbiased information for management to assess the sample collection process, to find opportunities for continuous improvement, to directly observe execution of field sampling protocols and to assess training and performance. The presentation included who the audits serve; what goes into the audit; who performs the audit; when to audit; and the audit process (preparation/planning, conducting the audit, and reporting). Examples of recent QAOT audit deficiencies and how the deficiencies are weighted were presented. A brief presentation on the newly formed NELAC National Environmental Field Activities Program including contract requirements, standards, benefits, cost and future strategies were also given at the workshop.
- DEP QA Rule and SOP Update – Proposed Final Revisions: The presentation included a timeline for QA Rule revisions. The following sections of QA Rule 62-160 were discussed: section 120– Definitions and Standards; section 210-Approved Field Procedures; section 240-Record Keeping and Reporting Requirements for Field Procedures; section 300-Laboratory Certification; section 320-Approved Laboratory Methods; section 330-Approval of New and Alternative Laboratory Methods; section 340-Record Keeping and Reporting Requirements for Laboratory Procedures; and section 700-Tables (Data Qualifier Codes). The following issues were presented from the revised SOPs: trip blanks, preservation, containers, and holding times. Additional topics included the use of peristaltic pumps for sampling Volatile Organic Compounds, sterilization of faucets and taps for microbiological sampling, and substantive revisions to certain sampling and laboratory procedures for bioassessment.

Workshop evaluations completed by the attendees, along with verbal feedback, were positive. Copies of the presentations were sent to those who requested them.

4.5.5 Outreach: Environmental Monitoring and Data Quality Workshop

The QAOT participated in the Department of Defense Environmental Monitoring and Data Quality Workshop in Omaha 8-10 April, 2014, in the Zorinsky Federal Building. Over 120 public and private participants attended the three-day workshop which was comprised of plenary and open technical panels focusing on a wide range of topics. The QAOT presented a talk on "Quality Assurance Oversight Team – Laboratory Assessment Findings (Fiscal Years 2012 and 2013)." The emphasis of the presentation focused on Common Critical Findings and Specific Findings discovered during laboratory assessments.

4.5.6 Outreach: External DBHYDRO Training

A DBHYDRO Environmental Database User's training course was developed and implemented by SFWMD in a total of 35 sessions. QAOT members provided input into this development and implementation. In WY 2013, 111 SFWMD staff members and 12 others completed the DBHYDRO training course. In WY 2014, 205 individuals completed the DBHYDRO training including 79 SFWMD staff members. The training program was then offered externally to scientists and engineers who utilize the public access to DBHYDRO data through the SFWMD website resulting in an additional 126 trainees from outside the SFWMD. These training sessions were conducted via a traditional classroom learning

environment as well as through a web-based application and are now being offered at external locations including USGS field offices and at Florida International University.

5.0 EVALUATION OF FIELD MONITORING

This section summarizes QAOT activities to assess the quality of CERP field monitoring. Assessment input for field data quality may consist of field audits of water quality monitoring and hydrometeorological monitoring and ecological field observations.

5.1 Water Quality Monitoring Activities

This section summarizes QAOT activities to assess CERP field monitoring activities. Field audits for two CERP projects were conducted during the reporting period. Recommendations were included as suggestions that may improve the overall quality of the data or efficiency in sample collection. Corrective Actions (CA) refer to deficiencies that must be addressed in the written response. These deficiencies are in conflict with the current DEP SOPs, contract requirements, the agency's QM or Quality Assurance Project Plan (QAPP), the Sampling and Analysis Plan (SAP).

5.1.1 A2 Flow Equalization Basin

On January 24, 2013, a field audit was conducted to evaluate the sampling and field data collection procedures performed by Professional Service Industries (PSI) for the A-2 Flow Equalization Basin (FEB) ESA. The auditors conducted a review of relevant documentation prior to the on-site audit and as a part of the on-site audit. This documentation included the current version of the PSI QM, the SOW and the Ecological Risk Assessment Protocol. Thirteen corrective actions and one observation were reported in the field audit report; some are listed below.

Decontamination:

- Equipment, sample containers and supplies were not protected from accidental contamination.
- The sample equipment was not thoroughly flushed with enough water to remove the soap and remaining contamination from the equipment.

Quality Control:

- The field equipment blank was not collected properly.

Sample collection procedures:

- One of the team members did not change gloves between sampling stations and other activities that were performed. Gloves came into contact with the sample.
- One of the teams did not collect the samples at the distance indicated in the SOW.
- Samples were not thermally preserved with 15 minutes of sample collection as required by the SOW.
- At least two samples were collected within three feet of the exhaust of the truck which was left running during the sampling and compositing process. Samples should not be collected or stored in the presence of exhaust fumes.

Documentation:

- Several documentation errors in the field logbook were obliterated so the error could not be read and the correction was not initialed.
- Information was missing from the field log book.
- Samples and equipment did not have unique identification.

5.1.2 Lake Okeechobee Aquifer Storage & Recovery (LOASR)

On June 4, 2013, a field audit was conducted to observe water quality monitoring procedures for LOASR. The auditors conducted a review of relevant documentation prior to the on-site audit and as a part of the on-site audit. This documentation included selected SOPs, the project QAPP and the project SAP. Six corrective actions were reported in the field audit report.

Calibration:

- The true values for the secondary turbidity standards had not been verified in the last quarter. The specified standard range (e.g. 0 to10 Nephelometric Turbidity Units) was used as the acceptance criterion for the secondary standards instead of the range dependant percentage as specified in FT1600. Documentation for the instrument calibration with primary standards was not included in the documentation requested for the audit.

Documentation:

- Preservation codes were not indicated on the chain-of-custody form submitted to the laboratory, including thermal (ice) preservation.
- The weather was cloudy for most of the sample collection but changed to a drizzle by the time the cryptosporidium was collected. This was not documented in the field notes or in the groundwater sampling log.
- The fitting used to attach the tubing to the outflow valve was not documented as having been used or cleaned. The cleaning of the flow meter used for the cryptosporidium sample collection was not documented.
- Of the three corrections noted in the documentation associated with the audited sampling event, two corrections were crossed out with a single line, initialed and dated as the standard method required. One of the corrections on one of the sonde maintenance pages was crossed out but not initialed and dated.

Sample collection procedures:

- The pH for cyanide sample was not checked in the field as method required.

5.2 Hydrology Monitoring Activities

5.2.1 Using Inferential Sensors for Quality Control of the Everglades Depth Estimation Network (EDEN) Water-Level Data

QAOT members participated in the EDEN during the reporting period. The EDEN was initiated to provide scientists working on the restoration of the Everglades with spatially continuous quality-assured and quality-controlled hydrologic data at any location within the freshwater part of the Greater Everglades. The EDEN offers a consistent and documented dataset that can be used by scientists and water-resource managers to (1) guide large-scale field operations, (2) integrate hydrologic and ecological data and analysis, and (3) support biological and ecological assessments that measure ecosystem responses to CERP. In addition, EDEN, with the integration of real-time data and models, provides opportunities for real-time evaluation of water-level conditions and water-resource management operation. The EDEN database is a 24-year dataset of baseline conditions (1991to 2014) prior to the full implementation of the CERP and offers investigators a single repository for historic daily and hourly water-level data.

EDEN consists of over 250 real-time gages providing hydrologic data for freshwater and tidal areas of the Greater Everglades. These data are used to generate daily water-level maps of the Everglades and are used to assess biotic responses to hydrologic change resulting from CERP. The generation of EDEN daily water-level maps is dependent on high quality real-time data from water-level gages. Real-time data are automatically checked for outliers by assigning minimum and maximum thresholds for each gage. Smaller errors in the real-time data, such as gradual drift of malfunctioning pressure transducers, are more difficult to immediately identify with visual inspection of time-series plots and may only be identified during on-site inspections of the gages. Correcting smaller errors in the data often is very time consuming and water-level data may not be verified for several months. To provide daily water-level maps on a near real-time basis, EDEN needed an automated process to identify errors in water-level data and to provide estimates for missing or erroneous water-level data.

The ADAM software developed for the EDEN project is a Microsoft Excel® and Access® database tool created for fast and accurate QA review of the real-time water-level elevation data for the EDEN network, for estimation or replacement of missing or erroneous data, and for digital archiving of original and processed data. The ADAM software is conceptually based on 'inferential sensor' technology that is often used in industrial applications. Rather than installing and maintaining a sensor in a harsh environment (for example, a high temperature exhaust port) to measure a process, an inferential sensor (or virtual sensor) is developed to make very accurate estimates of the process measured by the hard sensor. The inferential sensor becomes a redundant sensor. The inferential sensors in the ADAM software are empirical models for each EDEN station that provide redundant signals to the water-level gauges in the field without the risk of damage due to the environmental setting (floods and hurricanes, for example). In the event that the sensor at a station does malfunction, ADAM provides accurate estimates for the period of missing or erroneous data. The ADAM software also is used in the QA/QC of the data. The virtual signals are compared to the real-time data and if the difference between the two signals exceeds a certain tolerance, corrective action to the data and (or) the gauging station can be taken. The ADAM software is automated so that each morning the real-time EDEN data are compared to the inferential sensor signals and digital reports highlighting potential erroneous real-time data are generated for appropriate support personnel.

The ADAM software uses a sequence for steps for quality assuring data. The first step provides information about the quality of the data. This is accomplished through a set of 14 univariate filters that identifies missing data and data that violates user-defined thresholds, related maximum, minimum, and rate of change values. The output of the univariate filters comprise a filtered dataset that is deemed of good quality to use for estimating missing data. The second ADAM step creates the inferential sensors (empirical models) for each station in the network using the subset of good 'filtered' data as model input. The inferential sensors are used to replace missing or erroneous data and to quality assure the measured data.

Incorporation of ADAM into the daily review process for EDEN has improved the consistency and utility of the EDEN data. The development and application of inferential sensors is easily transferable to other real-time hydrologic monitoring networks.

5.3 Biological/Ecological Monitoring Activities

Quality reviews of Biological/Ecological monitoring activities were not performed or reported during this time period due to remote locations.

6.0 LABORATORY ASSESSMENTS

This section summarizes QAOT activities to assess the quality of laboratories that may generate data for CERP under existing SOWs or contracts with the SFWMD or USACE. Sections 6.1 and 6.2, and Table 6-1, summarize laboratory assessments performed during the reporting period. Section 6.3 summarizes results from the QAOT sponsored PE Study, and Table 6-2 summarizes the evaluation of the laboratory results. QAOT Laboratory Assessments:

The QAOT completed assessments of four contract laboratories performing organic and/or inorganic chemical analyses, one that performs toxicological testing, one that performs microbiological testing and one that performs radiochemical testing during the reporting period. The purpose of a laboratory assessment is to evaluate, at the bench-level, a laboratory's analytical proficiency and to ensure that it meets the QA/QC requirements defined in USEPA methods specified in the project's documents. The primary focus of the QAOT assessment program is to provide a mechanism to verify, document, and improve, the analytical procedures used by the laboratory that generate measurement data. The desired outcome is to enhance assurance that laboratories are producing defensible data for CERP samples by following the analytical methods requested for the project.

The assessment process consisted of three components used to evaluate laboratory performance:

- Remote Desk Assessment
- On-Site Assessment
- PE Samples

The remote desk assessment includes a review of the laboratory's documentation (SOPs, QM, control charts, MDLs, standard data package, and previous National Environmental Laboratory Accreditation Conference [NELAC] PE sample results). The on-site assessment entails in-depth review of analytical procedures used by the laboratory with emphasis on the review of bench-level data including detailed discussion with the analysts. The PE samples are provided by commercial vendors (purchased by the QAOT) and the laboratories' results are compared to the vendors quality control limits generated by NELAC protocols. Previous QAOT and the most recent NELAC audit reports and laboratory responses were reviewed to identify findings applicable to the methods under review. During the audit, the auditor verified implementation of any previous audit-based corrective actions pertaining to the methods being assessed.

For both the remote and on-site assessments, the findings are characterized as:

- Observations: No impact on data quality (e.g., typographical errors in SOPs).
- Recommendations: Deviations from method requirements that could impact data quality (e.g., not calibrating volumetric glassware).
- Deficiencies: Deviations from method requirements that will impact data quality (e.g., analyte response factors not evaluated properly resulting in not reporting analytes at low levels [false negatives]).

The following sections summarize the assessments for the seven laboratories evaluated during the reporting period. Note that not all deficiencies or recommendations are listed in the following summary section.

6.1.1 Brooks-Rand Labs, Seattle, WA

Brooks Rand Laboratories (BRL) of Seattle, WA was assessed for the following methods: trace-level total mercury (THg, method 1631E), and mono-methylmercury (MeHg, method 1630). The laboratory contributed data to the BBCW project. The on-site assessment was conducted on May 3-4, 2012. The Final Report for BRL was issued on June 12, 2012.

Desk/Onsite Assessments:

- There were no deficiencies noted for the desk assessment review of documentation, including SOPs. For the onsite visit, there were no deficiencies observed in the preparation and analytical procedures used by the laboratory.

PE Samples:

- For the QAOT sponsored winter 2011 Inter-Laboratory PE study, the laboratory earned the highest rating possible for THg. The laboratory conducted its second annual inter-laboratory study for THg and MeHg in water. Results from the BRL study showed that the laboratory performed acceptably for both parameters.

Previous Audits and Corrective Actions:

- The corrective actions from the last NELAC audit (September 30 – October 2, 2009 by FDOH) were verified during the QAOT May 2012 audit. The majority of deficiencies involved the need for the laboratory to revise pre-printed forms and to use a standard lower than the MDL for MeHg (which was accepted by NELAC). The last QAOT audit occurred in May 2009 (THg and MeHg; see QAR 2010 for specifics). During the May 2012 audit, implementation was confirmed for those corrective actions issued during the last QAOT audit (May 2009) for each of the observations or findings applicable to the audited methods.

6.1.2 DB Environmental Laboratories, Rockledge, FL

DB Environmental Laboratories (DBE) of Rockledge, FL was assessed for the following USEPA methods: alkalinity (310.1), sulfide (DBE SOP based on EPA 376.1/SM 4500-S E) and Total Organic Carbon (TOC, DBE SOP MVP/COE 3-73). Standard Methods for sulfate (4110B), orthophosphate/total phosphorus (OP/TP, 4500-P F) and UV-254 (5910B) were also assessed. The laboratory contributed data to the BBCW, and Evaluation of Factors Influencing MethylMercury Accumulation in South Florida Marshes projects. The draft desk assessment report was sent to the laboratory on September 12, 2012 and the on-site assessment was conducted on September 19-20, 2012. There were no PE samples sent to the laboratory for this assessment. The Final Report for DBE was issued on February 7, 2013.

Desk Assessment:

- For OP/TP, the initial calibration curve software was graphing points incorrectly, but the results were accurate. Corrective Action (CA): Corrected error in graphing software.
- The MDL for sulfide did not take into account a dilution required for samples that is not required for standards which resulted in an inaccurate MDL determination. CA: Laboratory analyzed low level standards at the proper dilution to determine an accurate MDL.
- The control chart for TOC contained a calculation error which resulted in the lower limit being 0%. CA: Corrected error in the software.

On-Site Assessment:

- For method 5910B, the laboratory was analyzing samples once and reporting the result; method requires reporting the average of two readings. CA: Adopt method requirement.
- The MDL verification sample for TOC was spiked too high when compared to the determined MDL. CA: Analyze MDL verification sample at a lower spike level.

PE Samples:

- None provided by the QAOT.

6.1.3 Jupiter Environmental Laboratories, Jupiter, FL

Jupiter Environmental Laboratories (JEL) of Jupiter, FL was assessed for the following USEPA methods: Toxic Characteristic Leaching Procedure (TCLP, method 1311) and separatory funnel extraction (3510C), followed by analyses for organochlorine pesticides (8081A). The low-level mercury method (1631E) was also assessed. The laboratory contributed data to the Site 1 Impoundment/Fran Reich Preserve project. The draft Desk Assessment Report was sent to the laboratory on May 18, 2012 and the on-site assessment was conducted on August 7, 2012. There were no PE samples sent to the laboratory for this assessment. The Final Report for JEL was issued on February 22, 2013.

Desk Assessment:

- TCLP tumbling rotation rate and temperature of solution not recorded; method blank was not filtered; matrix spike (MS) was not tumbled, nor analyzed. Corrective Action (CA): Document rotation rate/temperature; adopt method requirements for blank and MS.
- For mercury, the laboratory reported results with two significant figures, but the method requires three; there was a reporting error for the method blank where the MDL>LRL (Laboratory Reporting Limit). CA: Report results to three significant figures; correct report sheet for the method blank.

On-Site Assessment:

- For the pesticide analyses, the laboratory was not evaluating calibration curves properly (which could lead to false positives), analyzing/reporting results even though continuing calibrations failed, and was not documenting endrin/DDT breakdown. CA: Adopt method requirements.
- The analyst responsible for mercury analysis was unsure of instrument software capabilities and blank subtraction techniques. CA: Ensure analysts are properly trained.

PE Samples:

- None provided by the QAOT.

6.1.4 AMEC Environment and Infrastructure, Inc., Newberry, FL

AMEC Environment and Infrastructure (AMEC) of Newberry, FL. was assessed for the following toxicity tests: Pimphales promelas, chronic (1000.0), Ceriodaphnia dubia, chronic (1002.0), Cyprinella leedsi, acute (2000.0) and Ceriodaphnia dubia, acute (2002.0). The laboratory contributed data to the Kissimmee ASR project. The draft Desk Assessment Report was sent to the laboratory on April 24, 2013 and the on-site assessment was conducted on May 8, 2013. PE samples were sent to the laboratory on August 19, 2013. The Final Report for AMEC was issued on September 16, 2013.

Desk Assessment:

- Solution temperatures for the toxicity tests were not within limits listed in the SOP, but were within limits listed in the method. Corrective action (CA): Update the SOP to reflect method requirements.

- The reviewed client sample Report showed conflicting information for some conditions between the Report, SOP and method. CA: Raw data package showed method procedures were followed, but reported incorrectly. The laboratory will review all information in the Reports to ensure accuracy.

On-Site Assessment:

- Entry error for a 7-day test actually showed a test duration of 9-days. CA: Ensure manual entries into the software program are accurate by performing second-level review.
- One of the logbooks did not contain the sample receipt technician's signature/initials. CA: Emphasis on proper documentation.

PE Samples:

- The laboratory successfully analyzed the QAOT supplied PE samples for all four organisms assessed.

6.1.5 Everglades Laboratories, Inc., West Palm Beach, FL

Everglades Laboratories, Inc. (ELI) of West Palm Beach, FL was assessed for the following microbiological tests: Fecal Coliform (Standard Method 9221E); and Total Coliform/E. coli (EPA Method 1604). The laboratory contributed data to the Kissimmee ASR project. The draft Desk Assessment Report was sent to the laboratory on May 13, 2013 and the on-site assessment was conducted on June 19, 2013. PE samples were sent to the laboratory on August 12, 2013. The Final Report for ELI was issued on November 6, 2013.

Desk Assessment:

- There was a reference to method 110.2 (Color) in the SOP for Fecal Coliform. CA: Laboratory removed this reference from the SOP.
- The Fecal Coliform SOP also contained conflicting references to the method used (18th, 19th and 21st editions all listed in the SOP). CA: Update SOP to latest edition of Standard Methods.

On-Site Assessment:

- Reporting format for both QC and sample results were confusing in that the laboratory was using chemical software to report microbiological results. CA: Evaluate how results are being reported to adopt/revise the format to accurately present results.

PE Samples:

- The laboratory successfully analyzed the QAOT supplied PE samples for all three microbiological tests assessed.

6.1.6 TestAmerica Richland, Richland, WA

TestAmerica Richland (TAR) of Richland, WA was assessed for the following EPA published radiochemical tests: Gross Alpha (9310), Radium-226 (902.1), Radium-228 (904); and Uranium by American Society for Testing and Materials (ASTM) D5174. The laboratory contributed data to the Kissimmee ASR project. The draft Desk Assessment Report was sent to the laboratory on May 23, 2013 and the on-site assessment was conducted on June 5, 2013. A PE sample for Uranium was sent to the laboratory on August 19, 2013. The Final Report for TAR was issued on November 14, 2013.

Desk Assessment:

- For Uranium, the Laboratory Control Sample (LCS) acceptance limits listed on the Report did not match the limits listed in the SOP or method. CA: Correct method limits on Report.
- The method reference for Radium-226 in the Report did not match the reference stated in the SOP. CA: Correct the method reference in the Report.

On-Site Assessment:

- For the Uranium test, the manufacturer's built in QC software was not completely understood by the analyst. CA: Contact manufacturer to ensure analyst understands the software package.
- Crust was observed on the planchet for samples analyzed for Gross Alpha; tweezers used for planchet transfer were not cleaned between uses. CA: Ensure proper transfer of liquid to planchets.

PE Samples:

- The laboratory successfully analyzed the QAOT supplied PE sample for Uranium (PE samples were not provided for the other parameters due to unavailability).

6.1.7 South Florida Water Management District Chemistry Laboratory, West Palm Beach, FL

The SFWMD Chemistry Laboratory of West Palm Beach, FL was assessed for 23 tests using various EPA methods, Standard Methods (SM) and other sources (journal article and trademarked/patented procedure). The laboratory contributed data to many CERP projects including BBCW, C-111 and DPM. The draft Desk Assessment Report was sent to the laboratory on February 14, 2013 and the on-site assessment was conducted on March 4-7, 2013. PE samples were sent to the laboratory on February 7, 2013. The Final Report for SFWMD Chemistry Laboratory was issued on December 11, 2013. Since there were so many tests assessed (23), refer to the actual Assessment Report for SFWMD Chemistry Laboratory for additional specific findings.

Desk Assessment:

- Some MDLs, sample duplicate, continuing calibration verification acceptance criteria, and LCS recovery limits listed in SOPs, and the referenced methods, did not match what was reported on the hardcopy Reports sent to the customer. CA: Update documentation to correct inconsistency.
- There were procedures listed in some SOPs (e.g., chlorophyll by spectrophotometric determination) that have not been performed by the laboratory for some time. CA: Remove unnecessary procedures from the SOPs, and update SOPs to provide clarity, enhance understanding and to reflect actual laboratory practices (e.g., correct the equations used in the calculation of sample results).

On-Site Assessment:

- For the determination of alkalinity by SM2320B, the laboratory is not minimizing the sample exposure to air during analysis. CA: pursue purchase of sample cup caps to ensure method requirement is met.
- The laboratory is not placing the dried samples into a dessicator for method SM2540D, Total Suspended Solids. CA: Follow method requirement.

PE Samples:

- Results were reported for 20 tests, plus metals analyses (10 metals in water matrix; 3 metals in a solid matrix). The laboratory successfully analyzed the QAOT supplied PE samples for the representative parameters assessed.

6.2 Evaluation of Laboratories for the Phase II Environmental Site Assessment Projects:

The QAOT evaluated four laboratories identified by the PMs for work in the Phase II ESA Projects. These evaluations were broad in scope with the purpose of preparing an evaluation report, including the laboratory's corrective actions, for QAOT and PM review for compliance with method and contractual requirements.

6.2.1 SunLabs, Inc, Tampa, FL

SunLabs, Inc. of Tampa, FL was assessed for the following USEPA methods: synthetic precipitation leaching procedure (method 1312), organochlorine pesticides, (method 8081B), organophosphorus pesticides (method 8270), chlorinated herbicides (method 8321), polynuclear aromatic hydrocarbons (PAHs by method 8270), metals (method 6010C) and TOC (method 5310B). An on-site assessment was conducted on March 19, 2013. The Final Report for SunLabs was issued in April 2013.

Laboratory specific findings were documented in the report, including:

- For samples undergoing SPLP extraction, the laboratory should indicate the sample collection date as the date the samples were collected in the field, not the date when the SPLP extraction occurred. Data generated for SPLP extractions occurring past allowed holding times should be qualified by the laboratory accordingly.

- Hardcopy reports should include all QC data for subcontracted analyses (e.g., results of method blanks, laboratory duplicates, and/or MS/MSDs) with necessary FDEP data qualifiers applied to the affected data.

6.2.2 Millennium Laboratories, Inc., Tampa, FL

Millennium Laboratories, Inc. of Tampa, FL was assessed for the following USEPA methods: organochlorine pesticides, (method 8081), organophosphorus pesticides (method 8270), polynuclear aromatic hydrocarbons (PAHs by method 8270), metals (method 6010B) and total petroleum hydrocarbons (TPH, Florida Petroleum Range Organics Method). An on-site assessment was conducted on April 18, 2013. The Final Report for Millennium was issued in June 2013.

Laboratory specific findings were documented in the report, including:

- The laboratory should consider expanding the target analytes in the standard LCS mix to include all analytes for organophosphorus pesticides, and not just a representative subset.

- The laboratory must follow method 8081 requirements for analysis (frequency) and evaluation (percent breakdown) of the endrin/DDT breakdown check sample, and take corrective action if the breakdown checks are not acceptable.

6.2.3 ALS Environmental, Jacksonville, FL

ALS Environmental of Jacksonville, FL was assessed for the following USEPA methods: organochlorine pesticides, (methods 8081A/B), polynuclear aromatic hydrocarbons (PAHs by 8270D), metals (6010B/C, 6020A, 7471B), TOC (9060 modified) and total petroleum hydrocarbons (TPH, Florida Petroleum Range

Organics Method). An on-site assessment was not conducted. The Final Report for ALS was issued in September 2013.

Laboratory specific findings were documented in the report, including:

- The SOP for analysis of TOC in soil and sediment should be revised to eliminate conflicting or erroneous information. The analysis is being performed correctly when compared to the method, and the SOP should be updated to reflect the proper procedures.

- The laboratory must use control limits of 63%-143% recovery for the LCS for TPH in soil by the FL Florida Petroleum Range Organics Method, unless empirically-derived limits are more stringent.

- The laboratory should consider analyzing separate PE samples appropriate (low spiking concentration) for low-level PAH analysis by Selected Ion Monitoring, rather than PE samples formulated for analysis under the standard, full-scan procedure.

6.2.4 Jupiter Environmental Laboratories, Inc., Jupiter, FL

Jupiter Environmental Laboratories, Inc. (JEL) of Jupiter, FL was assessed for the following USEPA methods: organochlorine pesticides, (methods 8081), organophosphorus pesticides (method 8270C), chlorinated herbicides (method 8321), and metals (method 6020A). An on-site assessment was not conducted. The Final Report for Jupiter was issued in October 2013.

Laboratory specific findings were documented in the report, including:

- The laboratory should confirm that the required analytical and QC procedural steps noted in the February 2013 QAOT assessment report, (see section 6.1.3), are now implemented by the analysts and should update all affected SOPs accordingly. There were three findings in the February 2013 report that the laboratory agreed must be addressed that were not being performed for this ESA assessment which occurred 6-months later.

- The chlorinated herbicides and organophosphorus pesticides SOPs should be updated to include more information on initial calibrations, analysis of MSDs, and including all target compounds in the spiking mixture for LCS and MS/MSDs instead of a representative subset of target compounds.

- The laboratory should revise the SOP for analysis of organochlorine pesticides to include the SFWMD required procedure for quantifying toxaphene and technical chlordane.

6.3 Inorganic Performance Evaluation Samples

During the reporting period, inorganic PE samples were submitted to laboratories under contract with the SFWMD or the USACE that could potentially perform chemical analyses to support CERP. The purpose of the PE study was to assess laboratory performance on single blind samples. One PE study was conducted during the reporting period. Environment Canada (EC) was the PE sample provider for the study. More than 30 laboratories participated in the study, making analyses statistically robust. Five analyte classes were selected by the QAOT for the study: major ions and nutrients, trace elements, total

phosphorus, low-level mercury in water; and trace elements in sediment. The sample concentrations ranged from low to high and were consistent with values commonly found in natural environments in Canada; however, some of the high concentrations were outside of the normal range for analytes detected in CERP project samples. For each compound class, EC scored laboratory performance as Very Good, Good, Fair, and Poor based on their analytical results Z-score, and number of biased parameters. Table 6-2 summarizes the results of the PE study. For a full listing of parameters analyzed by the laboratories along with detailed analysis on laboratory results by EC, refer to the report archived in Documentum, or request a copy from the QAOT Co-chairs.

The QAOT selected 13 laboratories to participate in the WY 2013 inorganic PE study conducted in June 2013. Results for 26 parameters were reported by the participating laboratories: 23% were Very Good, 19% were Good, 31% were Fair, and 27% were Poor. EC emphasized that scoring and performance ratings are intended to provide participating laboratories with indicators of their performance when compared to other laboratories in the same field. They are not intended to convey any concept of pass or fail. Also, the scoring and performance ratings by themselves can be misleading as they are based on percentages of passing Z scores or unbiased results for each analyte class, with some analyte classes comprising several analytes (e.g., major ions and nutrients or trace metals) and others comprising only a single analyte (e.g., total phosphorus).

The PE sample provider noted that the scoring system changed significantly in the 2013 study, so direct comparisons with other studies should be evaluated with caution. It should be noted that the PE studies serve as a snapshot of each laboratory only at a given point in time and the same scoring system is used for all laboratories for a specific PE study. In addition, PE studies by their nature vary from study to study based on diverse analyte concentrations of submitted PE samples and potential matrix effects. The QAOT uses additional tools, including laboratory and field audits, to supplement assessment of data quality and the changes in the scoring system for this PE study were determined by the QAOT to have minimal effect on the data quality assessment process.

Table 6-1. Summary of Laboratory Assessment Activities during the Reporting Period

Laboratory	Organics Lab Assessment	Inorganics Lab Assessment	Other Lab Assessment	PE Sample Studies[#]
ALS Environmental, Inc., Jacksonville, FL	X[*]	X[*]		X
Accutest Laboratories Southeast, Inc., Orlando, FL				X
AMEC, Newberry, FL			X[a]	X
Brooks Rand LLC, Seattle, WA		X		X
Dade County DRER Lab, Miami, FL				X
DB Environmental, Rockledge, FL		X		X
Everglades Labs, West Palm Beach, FL			X[b]	X
Florida DEP Central Laboratory, Tallahassee, FL				X
Florida International University Southeast Environmental Research Center, Miami, FL				X
Florida Spectrum Environmental Services, Ft. Lauderdale, FL				X
Jupiter Environmental Laboratories, Jupiter, FL	X	X[*]		X
Millenium Laboratories, Tampa, FL		X[*]		X
South Florida Water Management District Laboratory, West Palm Beach, FL		X		X
SunLabs, Tampa, FL		X[*]		X
TestAmerica Richland, Richland, WA			X[c]	X
TestAmerica Savannah, Savannah, GA				X

#: PE studies include either participation in the WY2013 PE Study or analysis of PE Samples provided by the QAOT in conjunction with the QAOT laboratory assessment.

*: Performed for the ESA projects.

a: Assessed for Whole Effluent Toxicity testing.
b: Assessed for Microbiological testing parameters.
c. Assessed for Radiochemical analyses.

Table 6-2. Summary of Laboratory Performance Ratings for the WY 2013 PE Study[a,b]

Laboratory	Major Ions and Nutrients	Trace Elements	Total Phosphorus	Trace Elements in Sediment
ALS Environmental, Inc., Jacksonville, FL	-	-	-	GOOD
Accutest Laboratories Southeast, Inc., Orlando, FL	-	-	-	POOR
Brooks Rand LLC, Seattle, WA	-	-	-	POOR
DB Environmental Labs, Inc., Rockledge, FL	FAIR*	-	VERY GOOD*	-
Dade County DRER Lab, Miami, FL	FAIR*	FAIR*	VERY GOOD*	-
FDEP Central Laboratory, Tallahassee, FL	GOOD*	FAIR*	VERY GOOD*	GOOD
Florida International University Southeast Environmental Research Center, Miami, FL	FAIR	-	POOR	-
Florida Spectrum Environmental Services, Ft. Lauderdale, FL	POOR*	GOOD*	POOR*	-
Jupiter Laboratories, Jupiter, FL	-	-	-	FAIR
Millennium Laboratories, Inc., Tampa, FL	-	-	-	VERY GOOD
SFWMD Chemistry Laboratory, West Palm Beach, FL	FAIR*	POOR*	VERY GOOD*	-
SunLabs, Inc., Tampa, FL	-	-	-	FAIR
TestAmerica Laboratories, Inc., Savannah, GA	POOR*	GOOD*	VERY GOOD*	-

[a] Very Good represents the uppermost rating; Good represents a possible inaccuracy in reporting due to a random error in the analytical sequence; Fair represents analysis that fails in a significant percentage of the results provided; and Poor represents a provider that fails in almost all parameters.

[b] "-" indicates that this parameter was not analyzed by the laboratory.

*: Indicates participation by the laboratory for the same parameters in the most recent previous study conducted by the QAOT (Winter 2011).

7.0 QUALITY OF DATA

The QAOT conducted two types of assessments to gauge the quality of data generated for CERP: a review of data qualifiers assigned during data validation was conducted to assess data quality issues related to unacceptable QC results and a review of several data reports was conducted to assess the quality system under which the data were collected. Although these assessments were not comprehensive, they provide a measure of data quality status.

7.1 CERP Analytical Data in SFWMD Databases

The CERP data for WYs 2013 and 2014 were downloaded from the SFWMD's corporate databases DBHYDRO and ERDP on June 5, 2014[3]. A total of 12,047 data points[4] were generated from 1,472 samples for three projects. The projects included are C-111 Spreader Canal (C111), DPM, and BBCW. C111 (6,235 records) was the largest data set, followed by DPM (4,934 records) and BBCW (878 records). Approximately 78% of the samples collected were standard environmental samples and 22% were field quality control (QC) samples (Figure 7-1). Field blanks (deionized water matrix) made up 56% of the field QCs and the other 44% were either field duplicate or replicate samples. Laboratory QC (laboratory duplicates and spikes, etc.) are not included in the databases.

[3] The analysis contained herein reflects the status of the data at the time the data were downloaded and does not account for changes made to the data since June 5, 2014.

[4] Total depth was not counted as a test but rather treated as metadata.

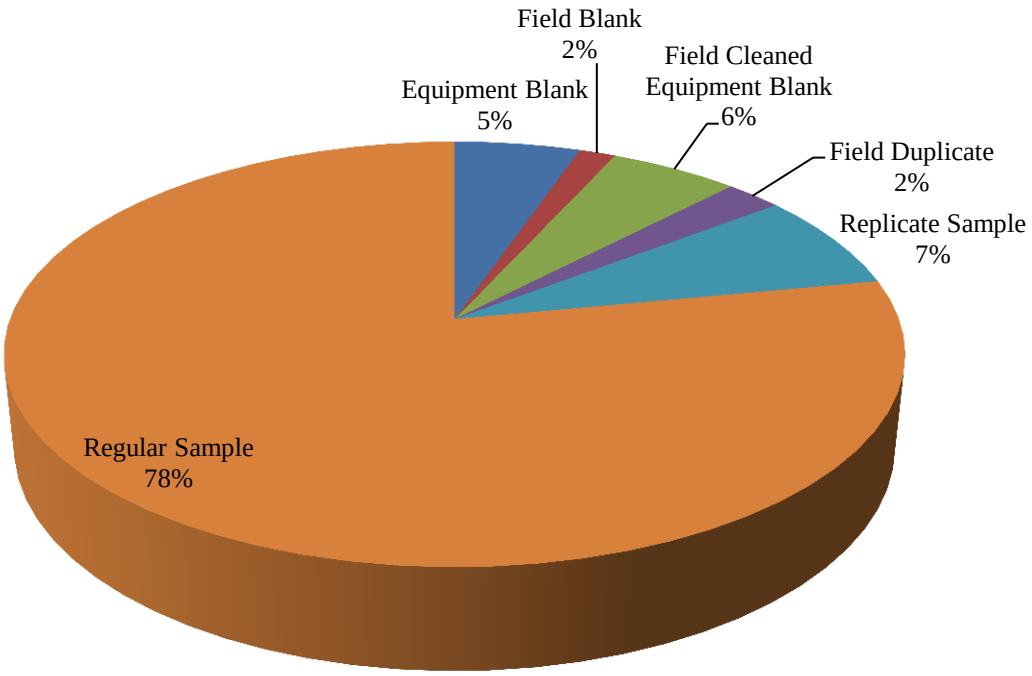

Figure 7-1. CERP WY 2013 and 2014 Water Quality Data According to Sample Type

The matrices accounted for in the data set include surface water (83% of the data), deionized water for QC samples (8%), fish tissue (7%), and sediment (2%). Samples were analyzed by either the SFWMD's Chemistry Laboratory or FDEP's Central Laboratory. Seventy-seven percent of the laboratory samples were analyzed by the SFWMD Chemistry Laboratory and 23% by the FDEP Central Laboratory. Both laboratories analyzed water and fish tissue samples, but FDEPs Central Laboratory analyzed all sediment samples.

A total of 192 different analytical tests were performed. For the purpose of data analysis, test parameters were grouped into nine categories. Table 7-1 shows the distribution of samples analyzed by category. Nutrients (25%), Field Data (15%), Organics (14%), Metals/Cations (12%), and General Chemistry (11%) were the largest categories. Table 7-2 shows the distribution of categories among the laboratories/field and by matrix. Both the FDEP Central Laboratory and the SFWMD Chemistry Laboratory were equally responsible for biological attribute data (e.g., gender). The FDEP Central Laboratory analyzed all sediment samples, performed all metals for fish tissue, all organics analyses for all matrices, all methyl mercury analyses, about half of the total mercury in fish tissue, and all total mercury in water. In contrast, the SFWMD Chemistry Laboratory analyzed all general chemistry water samples, all metal/cation water samples, all nutrients in water, and all physical parameters for water.

Table 7-1. Data Distribution by Test Analysis Category.

Category	#Data	% of Total
BIOLOGICAL	216	1%
FIELD DATA	2,148	15%
GENERAL CHEMISTRY	1,657	11%
METAL/CATIONS	1,740	12%
METHYL MERCURY	34	<1%
NUTRIENT	3,677	25%
ORGANIC	1,977	14%
PHYSICAL	503	3%
TOTAL MERCURY	95	1%

In addition to internal data validation conducted by the laboratory, all data collected were also subjected to a Level 2 validation by the SFWMD's Data Validation Unit. Level 2 validation includes verification of login information and presence of all parameters requested, plus additional review of field QCs, MDLs, practical quantitation limits, and dilutions. Data not meeting certain criteria are qualified in accordance with rules set in the SFWMD Field Sampling QM. The data qualifier definitions table is included in Table 7-3. Although data qualification is not a direct reflection the overall quality of the data or the laboratories that provided the data, an analysis of data qualification can be used as an indicator of possible data quality issues.

Out of the 12,047 data records, 59% were not qualified. Another additional 39% were qualified with a "U" (indicating a value below the method detection limit), "T" (value reported is less than the method detection limit) or "I" only (indicating a value between the method detection limit and quantification limit). These are qualifiers applied for issues not related to quality of the measurement. Only 2% of the total data were assigned other data qualifiers. Table 7-4 lists the data qualifiers by test analysis category. For most categories, 2% or less of the data were assigned qualifiers other than "U", "T" or "I", and the higher percentage of these qualifiers were applied to Organic and THg data, 7% and 12% respectively.

Table 7-5 summarizes the data qualifiers assigned to CERP projects in DBHYDRO and ERDP.

Table 7-2. Distribution of Categories by Laboratory/Field.

Laboratory/Field	Category	Matrix	#Data
FDEP	BIOLOGICAL	Fish Tissue	110
SFWMD	BIOLOGICAL	Fish Tissue	106
FDEP	GENERAL CHEMISTRY	Sediment	12
SFWMD	GENERAL CHEMISTRY	Fresh water	1,645
FDEP	METAL/CATIONS	Fish Tissue	50
SFWMD	METAL/CATIONS	Fresh water	1,690
FDEP	METHYL MERCURY	Fresh water	34
SFWMD	NUTRIENT	Fresh water	3,677
FDEP	ORGANIC	Fish Tissue	454
FDEP	ORGANIC	Sediment	268
FDEP	ORGANIC	Fresh water	1,255
SFWMD	PHYSICAL	Fresh water	503
FDEP	TOTAL MERCURY	Fish Tissue	27
FDEP	TOTAL MERCURY	Fresh water	36
SFWMD	TOTAL MERCURY	Fish Tissue	32
FIELD	FIELD DATA	Fresh water	2,148

Table 7-3. Data Qualifier Codes and Corresponding Qualifier Comments

Code	Comments
A	Value reported is the arithmetic mean (average) of two or more determinations. This code shall be used if the results of two or more discrete and separate samples are averaged. These samples shall have been processed and analyzed (e.g., laboratory replicate samples, field duplicates, etc.) independently. Do not use this code if the data are the result of replicate analysis on the same sample aliquot, extract or digestate. Under most conditions, replicate values shall be reported as individual analyses.
I	The reported value is between the laboratory method detection limit and the laboratory practical quantitation limit.
J	Estimated value; value may not be accurate. This code shall be used in the following instances: 1. Surrogate recovery limits have been exceeded; 2. No known quality control criteria exist for the component; 3. The reported value failed to meet the established quality control criteria for either precision or accuracy; 4. The sample matrix interfered with the ability to make any accurate determination; or 5. The data are questionable because of improper laboratory or field protocols (e.g., composite sample was collected instead of a grab sample). 6. The field calibration verification did not meet calibration acceptance criteria. 7. Any field blanks presents contamination. Note: "J" value shall not be used if another code applies (e.g., K, L, M, T, V, Y, I).
Q	Sample held beyond the acceptable holding time. This code shall be used if the value is derived from a sample that was prepared or analyzed after the approved holding time restrictions for sample preparation or analysis.
T	Value reported is less than the laboratory method detection limit. The value is reported for informational purposes only and shall not be used in statistical analysis.
U	Indicates that the compound was analyzed for, but not detected. This symbol shall be used to indicate that the specified component **was not** detected. The value associated with the qualifier shall be the laboratory method detection limit. Unless requested by the client, less than the method detection limit values shall not be reported (see "T" above).
Y	The laboratory analysis was from an improperly preserved sample. The data may not be accurate.

Table 7-4. Total number of Data Qualifiers by Test Analysis Category.

Category	Data Qualifier	Count of Data Qualifier	Total Not U, T or I	% Qualified per Category (Not U, T or I)
FIELD	J	48	48	2%
GENERAL CHEMISTRY	I	9	20	1%
	I,J	6		
	J	14		
	U	271		
METAL/CATIONS	A	6	6	<1%
	I	19		
	U	397		
METHYL MERCURY	I	9	0	0%
	U	17		
NUTRIENT	I	383	81	2%
	I,J	18		
	J	59		
	U	1233		
	Y	2		
ORGANIC	I	25	143	7%
	I,Y	3		
	J	3		
	T	2		
	U	1804		
	U,J	99		
	U,Y	38		
PHYSICAL	I	4	12	2%
	U	472		
TOTAL MERCURY	A	8	11	12%
	I	12		
	U	11		
	Y	3		

Table 7-5. Summary of Data Qualifiers Assigned to CERP Projects in DBHYDRO and ERDP

Data Source	Water Year	Project Code	Laboratories Contributing to Data Set[a]	Sample Type[b]	Number of Results with no Quality Related Qualifiers	Number of Quality Related Qualifiers	Total Number of Results	Percent Results with Quality Related Qualifiers
DBHYDRO	2013	BBCW	FDEP SFWMD Field	QC	143	9	152	5.9
	2013	BBCW		SAMP	318	6	324	1.9
	2014	BBCW	FDEP SFWMD Field	QC	107	6	113	5.3
	2014	BBCW		SAMP	271	18	289	6.2
	2013	C-111	FDEP SFWMD Field	QC	722	24	746	3.2
	2013	C-111		SAMP	2,415	47	2,462	1.9
	2014	C-111	FDEP SFWMD Field	QC	824	25	849	2.9
	2014	C-111		SAMP	2,101	77	2,178	3.5
	Total				**6,901**	**212**	**7113**	**3.0**
ERDP	2013	DPM	SFWMD	QC	341	3	344	0.8
	2013	DPM	SFWMD	SAMP	1,620	44	1,664	2.6
	2014	DPM	SFWMD	QC	436	10	446	2.2
	2014	DPM	SFWMD	SAMP	2,482	25	2,482	1.0
	Total				**4,852**	**82**	**4,934**	**1.7**

[a] Field = Field organization; FDEP=FDEP Central Laboratory; SFWMD = SFWMD Chemistry Laboratory.

[b] DBHYDRO QC sample types include – Equipment Blanks (EB), FB – Field Blank (FB), Field Cleaned Equipment Blank (FCEB), Field Duplicate (FD), and Field Replicate Sample (RS). ERDP QC samples types include EB and FD. The DBHYDRO and ERDP SAMP sample types are routine sample results from both field and laboratory measurements. Note that the QC sample type does not include laboratory QC results, which are reflected in the SAMP qualifiers.

7.2 Kissimmee Aquifer Storage and Recovery (ASR) Data

This project was four-and-a-half years in duration and consisted of a total of four cycles of testing. The period of testing occurred from January 2009 through July 2013. Approximately 2.2 billion gallons (almost 7,000 acre-feet) of water was recharged, stored and recovered through a single well, for the Kissimmee ASR project.

For cycles 1, 2 and 3, the testing was conducted between January 2009 and June 2011, with results reported in QAR-2012. A total of 13,280 routine samples and QC samples (duplicates and blanks) were collected and analyzed during that time period. QC samples comprised 10% of the samples collected.

Cycle 4 testing was conducted between July 2011 and July 2013. For this reporting time period, 2,945 routine samples and QC samples (duplicates and blanks) were collected and analyzed. QC samples again comprised 10% of the samples collected.

The results for all four cycles are summarized in Table 7-6. None of the results were rejected for cycles 1 and 2. Three results for cycle 3 were rejected, and nine results were rejected during cycle 4.

Parameters measured/determined for this project included chloride, specific conductance, total dissolved solids, temperature, pH, gross alpha, TOC, turbidity, total suspended solids, dissolved oxygen, color, total mercury, methyl mercury, total phosphorus, nitrate, nitrite, total Kjeldahl nitrogen, ammonia, sulfate, arsenic, iron, calcium, magnesium, sodium, potassium, molybdenum, alkalinity, hardness and sulfide.

Table 7-6. Summary of Quality-Related Qualifiers from Kissimmee ASR Water Quality Cycle Testing

Test Cycle	Sample Type[a]	Total Number of Samples[b]	Number of Quality Related Qualifiers	Types of Qualifiers[c]					Percent Samples with Quality Related Qualifiers
				Q	V	Y	J	?	
Cycle 1	QC	202	6	0	5		1	0	2.97
	SAMP	2,436	94	2	36	2	54	0	3.86
Total		**2,638**	**100**	**2**	**41**	**2**	**55**	**0**	**3.79**
Cycle 2	QC	476	3	0	1		2	0	0.63
	SAMP	2,057	76	4	10	2	60	0	3.69
Total		**2,533**	**79**	**4**	**11**	**2**	**62**	**0**	**3.12**
Cycle 3	QC	637	41	3	4		34	0	6.44
	SAMP	7,472	223	84	9	0	127	3	2.98
Total		**8,109**	**264**	**87**	**13**	**0**	**161**	**3**	**3.26**
Cycle 4	QC	306	7	0	0	0	7	0	2.29
	SAMP	2,639	86	3	11	0	63	9	3.26
Total		**2,945**	**93**	**3**	**11**	**0**	**70**	**9**	**3.15**

[a] QC sample types included field duplicates and blanks. SAMP types are routine sample results from both field and laboratory measurements

[b] Test America Savannah analyzed the majority of samples during all cycles

[c] Qualifiers: Q: Out of holding time; V: Analyte detected in method blank; Y: Sample unpreserved; J: Estimated value, QC criteria failed; ?: Data is rejected.

- Cycle 1 Results: Approximately 3% of the QC results and 4% of the SAMP results were assigned quality-related data qualifiers (Q, V, Y, or J)
- Cycle 2 Results: Approximately 0.6% of the QC results and 4% of the SAMP results were assigned quality-related data qualifiers (Q, V, Y, or J)
- Cycle 3 Results: Approximately 6% of the QC results and 3% of the SAMP results were assigned quality-related data qualifiers (Q, V, J, or ?).
- Cycle 4 Results: Approximately 2% of the QC results and 3% of the SAMP results were assigned quality-related data qualifiers (Q, V, J, or ?).

7.3 Hydrology Data Quality

An assessment of hydrologic data in DBHYDRO was conducted for the period between May 1, 2012 and April 30, 2014. Due to the interrelated nature of hydrological field data collected at all sites throughout South Florida, it is not feasible or technically reasonable to evaluate the quality of hydrological field data that are specifically collected for, or that may be used for CERP. Therefore, all data in DBHYDRO were evaluated as an indicator of the quality of hydrometeorological field data collected for CERP projects. Thirteen data types were reviewed (Table 7-7). For each data type, the daily values data set was assessed to identify the number of missing, estimated, and not processed values vs. the total number of records in the data set. Data quality tags are assigned to these data in the database to indicate that the data should be used with caution.

Table 7-7. Summary of Hydrologic Data Qualifiers for WY 2013 and WY 2014

Data Type[a]	Number of Records	Number Missing	Percent Missing	Number Estimated	Percent Estimated	Number Not Processed	Percent Not Processed
2013							
BARO	13,140	258	1.96%	216	1.64%	56	0.43%
ETPI	9,125	75	0.82%	0	0.00%	47	0.52%
EVAP	1,937	425	21.94%	0	0.00%	72	3.72%
FLOW	217,675	13,438	6.17%	25,899	11.90%	4,546	2.09%
HUMI	10,220	54	0.53%	173	1.69%	79	0.77%
RADN	6,570	149	2.27%	87	1.32%	12	0.18%
RADP	10,109	377	3.73%	349	3.45%	37	0.37%
RADT	9,490	159	1.68%	180	1.90%	0	0.00%
Rain	118,809	1,832	1.54%	726	0.61%	228	0.19%
STG	402,070	14,005	3.48%	30,625	7.62%	3,733	0.93%
Well	150,118	1,966	1.31%	31,534	21.01%	446	0.30%
WNDG	365	1	0.27%	0	0.00%	0	0.00%
WNDS	10,585	120	1.13%	17	0.16%	70	0.66%
2013 Total	**960,213**	**32,859**	**3.42%**	**89,806**	**9.35%**	**9,326**	**0.97%**
2014							
BARO	13,133	316	2.41%	343	2.61%	38	0.29%
ETPI	9,125	64	0.70%	7	0.08%	44	0.48%
EVAP	1,825	428	23.45%	0	0.00%	59	3.23%
FLOW	221,412	9,146	4.13%	25,566	11.55%	2,158	0.97%
HUMI	10,213	54	0.53%	25	0.24%	14	0.14%
RADN	6,570	465	7.08%	107	1.63%	26	0.40%
RADP	9,848	575	5.84%	382	3.88%	26	0.26%
RADT	9,483	512	5.40%	66	0.70%	0	0.00%
RAIN	118,038	1,621	1.37%	990	0.84%	146	0.12%
STG	398,923	5,939	1.49%	25,320	6.35%	4,655	1.17%
WELL	135,074	700	0.52%	26,689	19.76%	427	0.32%
WNDG	365	1	0.27%	0	0.00%	0	0.00%
WNDS	10,578	187	1.77%	10	0.09%	18	0.17%
2014 Total	**944,587**	**20,008**	**2.12%**	**79,505**	**8.42%**	**7,611**	**0.81%**

[a] BARO (Barometric Pressure [mm Hg]); ETPI (Evaporation Potential, Computed [inches]); EVAP (Evaporation Pan, Measured [inches]); FLOW (Flow [cfs]); HUMI (Relative Humidity [%]); RADN (Net Radiation [kilowatt/M^2]); RADP (Photosynthetic Radiation [micromole/M^2/S]); RADT (Total Solar Radiation [kilowatt/M^2]); Rain (Rainfall [inches]); STG (Water Level, NGVD29 [ft NGVD29]); Well (Ground Water Level [ft NGVD29]); WNDG (Wind Gust [MPH]); WNDS (Wind Speed, Scalar [MPH])

The WY 2013 dataset contained 960,213 records and the WY 2014 dataset contains 944,587 records. The results of the analysis are presented in Table 7-8. Analysis revealed that for both years:

- Measured evaporation data sets contained the largest percentage of missing data (approximately 22%). For all data types, the overall percent missing was 2.8% for the two years' data combined.
- Ground water level data sets contained the largest percent of estimated data (approximately 20%). For all data types, the overall percent estimated was 8.9% for the two years' data combined.

- Percent not processed was ≤ 1% for all data types considered together.

Table 7-8. Comparison of Hydrologic Data Qualifiers for WY11/12 vs. WY13/14

Water Year	Number of Records	Number Missing	Percent Missing	Number Estimated	Percent Estimated	Number Not Processed	Percent Not Processed
2011 Total	1,060,814	24,100	2.27%	95,851	9.04%	4,396	0.41%
2012 Total	1,010,851	18,445	1.82%	91,971	9.10%	5,467	0.54%
2013 Total	960,213	32,859	3.42%	89,806	9.35%	9,326	0.97%
2014 Total	944,587	20,008	2.12%	79,505	8.42%	7,611	0.81%

There appears to be no major differences in data qualifiers applied to hydrologic data for the four years of data summarized in Table 7-8.

7.4 Review of the Phase I/II Environmental Assessment Water Quality Data Reports

Seven laboratory data reports (ALS 9-17-12; ALS 7-30-12; ALS 8-17-12; Jupiter 7-30-12; Jupiter 8-22-12; Jupiter 9-18-12; and Jupiter 9-18-12[2]) from the Mecca Farms and Aerojet Canal projects were provided to QAOT during the reporting period. Samples were analyzed by Jupiter and ALS, respectively. Although these files were not reviewed directly by the QAOT members, similar data reports (A-1 FEB project and L-8 Reservoir project, respectively) were reviewed by HSW and/or the SFWMD's Water Quality Bureau while performing the laboratories' quality system evaluations. QC data provided by both laboratories were acceptable, with trace levels of target metals detected in the method blanks of one laboratory (ALS) not impacting the interpretation of the results for the samples, given the relatively high concentrations detected.

These reports were archived in Documentum on April 29, 2014.

In addition, QAOT members from SFWMD completed analytical laboratory data reviews for the following projects: L-8 Reservoir Expansion, Florida Crystals STA1W Expansion, Phase II Site Assessment for STA1W Knights Property, Phase I/Phase II investigation for the Corbett Water management Property and Phase I/Phase II investigation for the Lake Hicpochee project (Duda Property). The analytical data reviews yielded significant QA related findings. For example, deviations were observed between the SOW and the laboratory methods utilized during sample analysis by the contract laboratories. Inconsistencies with method requirements were determined by examination of raw laboratory data. Also, analysis of reported results determined that in some cases, the methods utilized by the laboratories did not achieve sufficient sensitivity to meet stated action levels. In addition, for multiple projects, it was determined that some results were subject to high levels of uncertainty; therefore, methods should be employed by the laboratories which provide a reporting limit below stated action levels. Finally, discrepancies between comparisons of split sample results (e.g., poor precision) were observed, which may lead to ambiguity when comparing the results to the action levels.

7.5 Continuous Water Quality Monitoring Data (Picayune Strand Project)

There were 18 active continuous monitoring stations for the Picayune Strand Project during WYs 2013 and 2014. The water quality parameters monitored were temperature, salinity, and conductivity. The analysis, validation, and loading into DBHYDRO of these data were performed using graphical verification analysis software in accordance with processes detailed in the SFWMD's Analytical Services Section data validation and stewardship (DVS) SOP (SFWMD-DVS-SOP-003). Approximately 1.24 million data points were validated for WY 2013 and WY 2014 (Table 7-9). A total of 13,171 data points were missing (1.06% of possible data) due to equipment malfunctions, telemetry issues, or flat-lined data because of dry conditions. A total of 436,806 data points (35% of validated data points) were qualified as estimated (assigned a 'J' qualifier due to one or more deviations from QC requirements) and 1.45% (17,926 data points) were determined as unusable (assigned the '?' qualifier) due to erratic data because of dry conditions, instrument failure, or a significant deviation from QC requirements. A majority (308,503 data points out of 436,806 data points) were assigned the 'J' data qualifier because the temperature probe calibrations were not verified. The equipment was upgraded at the end of WY 2014 and qualification rates for temperature are expected to decrease moving forward. In addition, prior to October 2013, site maintenance was completed on a quarterly or semi-annual schedule; therefore, calibration failures resulted in large amounts of 'J' qualified data. These sites are now maintained on a monthly schedule with an expected reduction in 'J' qualified data in the future.

Table 7-9. Summary of Water Quality-Related Qualifiers from Picayune Strand

Water Year	Total Number of Data	Number of Quality Related Qualifiers	Types of Qualifiers			Percent Samples with Quality Related Qualifiers
			J (temperature)	J (other)	?	
2013	611,875	244,894	200,120	36,101	8,673	40.0
2014	627,727	209,838	108,383	92,202	9,253	33.4
Total	**1,239,602**	**454,732**	**308,503**	**128,303**	**17,926**	**36.7**

8.0 ALTERNATIVE PROCEDURES APPROVED

This section identifies any alternative procedures approved during the previous two years. Between May 1, 2012 and April 30, 2014, no applications for approval of alternative procedures were submitted to the QAOT.

9.0 SUMMARY OF DEVIATIONS FROM QASR AND CORRECTIVE ACTIONS

This section summarizes any deviations from the QASR or CGMs during the reporting period and any corrective action taken to address the immediate deviation and to avoid re-occurrence.

No deviations from the CERP QASR or specific monitoring plan requirements were identified by the QAOT or key organizations, other than those discussed in Sections 4.0, 5.0, and 6.0.

10.0 Additional QAOT Activities

10.1 Communication and Outreach

Throughout the reporting period, the QAOT presented periodic status reports to the DCT and continued communication efforts with the PDTs. The QAOT Web site was updated to communicate workshops, presentations, and revised documents. The QAOT hosted the fifth annual Quality Assurance Workshop in June 2013 (SFWMD) and September 2013 (USACE). More than 36 SFWMD and 14 USACE employees participated in the training. The first Field Sampling Workshop conducted by the SFWMD in April 2013included 35 participants. See Sections 4.5.2 through 4.5.6 of this QAR for details of these and additional training classes presented by QAOT members.

10.2 QAOT Collaboration with other CERP Entities

It is critical that QAOT members collaborate with other entities to ensure QA/QC measures for CERP are being successfully implemented at both the Program and Project levels. These activities included participation on PDTs, presenting relevant QA/QC topics at symposia, and training those who are actively involved with CERP. Some of these activities are formally included in this report; however, since the QAOT members are actively involved in multiple non-QAOT-related projects, some QA review by the QAOT members merges with other workload duties and is not captured here. The following lists some of the collaboration documented during this time period.

10.2.1 Phase II ESA projects

QAOT members participated in the following areas associated with the Phase II ESA projects: Enhanced Coordination, Review Process, Phase I/II Environmental Assessments, and Water Quality Monitoring Plans in collaboration with the SFWMD Water Quality Bureau and the Environmental Sciences Unit (ESU). This participation included detailed review of contractors' data prior to submitting a draft report with laboratory follow-ups as needed, and development of monitoring protocols in conjunction with FDEP and USFWS. This review process was successfully implemented on three critical projects: Florida Crystals Corporation Property, STA-1 West Expansion, and the Duda & Sons, Inc. Property.

The ADaPT Compound Library was updated for contract laboratories that were analyzing samples for the ESA projects. This ensured consistency with data quality objectives, detection limits and QA/QC data analysis and evaluation between the laboratories resulting in reliable results being reported to the project team.

10.2.2 Central Everglades Planning Project

The QAOT was tasked with reviewing the CEPP PLMP as defined in CGM 041.01 which established QAOT responsibility for developing consistency regarding data quality and QA/QC processes for hydrological, meteorological, water quality and biological/ecological monitoring activities for CERP. See section 4.2.1 for details.

10.3 Status of QAOT Action Items

Quality assurance includes the concept of continuous improvement. The areas targeted for improvement were identified in Section 10.3 (Status of QAOT Action Items) of the 2010 QAR and Section 11.0 (Recommendations for QA/QC Program Improvements) of the 2012 QAR. Table 10-1 summarizes the status of QAOT Action Items.

Table 10-1. Status of QAOT Action Items

Improvement Area	QAOT Initiatives	Status
1. QAOT Metrics (QAR2010) The QAOT should develop metrics that measure whether or not the QAOT has been effective in improving the data generated for CERP.	The PrMP will establish metrics to assess QAOT effectiveness with documentation provided in the QAR.	In Progress; see QAR2012 and QAR2014. Indirect measurements through field and lab audits cannot be quantified. The PrMP was revised in 2011 but metrics to assess QAOT effectiveness were not incorporated. The QAOT has not yet established meaningful metrics that can be quantified using the information currently available. Issue will continue to be addressed during the next revision of the PrMP slated for 2015.
2. QASR Bio/Eco SOPs (QAR2010) The review of the QA/QC Biological/Ecological Questionnaires did not include reviews of training procedures, methods for dealing with questionable data, or SOPs/methods. These areas should be reviewed for adequacy.	SOPs for biological/ecological monitoring are being developed to document methodology, quality assurance and training in the QASR Chapter 8. The QAOT has surveyed SOPs available from various agencies and is the process of developing Chapter 8.	Complete During the reporting time period, SOPs for biological/ecological monitoring were developed to document methodology, quality assurance and training as appendices for QASR Chapter 8.

Improvement Area	QAOT Initiatives	Status
3. Inventory of CERP Projects and Data (QAR2010) Active CERP projects are not easily identified and information about monitoring activities, schedules, and responsible parties is not readily available. Data for CERP are not stored in central locations. This information is needed so that the QAOT can plan audit activities and develop the QAR.	Work with CERP DCT to develop effective procedures to define active CERP projects and data storage locations for those projects.	Complete. During the reporting time period, efforts were made to define active CERP projects and data storage locations were developed with CERP DCT and certain PMs.
4. Address Impact of Significant Field and Laboratory Audit Issues (QAR2010) Significant audit findings that impact data quality should receive elevated attention to minimize impact and avoid re-occurrence. For example, improve recalibration process for water level recorders.	Include in outreach activities: Implement program-wide communication and corrective action for audit findings that impact CERP data quality.	Complete. During the reporting period, CERP PMs were included in QAOT workshops on both laboratory and field audits. Follow-up with laboratories that were evaluated to determine status of recommended corrective actions were summarized in a memo to the SFWMD PMs and QAOT.

Improvement Area	QAOT Initiatives	Status
5. Locating, Storing, and Assessing CERP data (QAR2012 - Table 11-1) Data for most of the projects discussed in QAR2012 are not in DBHYDRO. The established process needs to be communicated to the PIs and PDTs.	Continue to work with DCT and PDTs to communicate the need to implement the procedures.	In Progress.
6. Outreach to Phase II Environmental Site Assessment Project (QAR2012 - Table 11-1) Contact the SFWMD Land Acquisition Team/HTRW team to obtain existing data and develop a process to obtain data as it is received. Review Scope of Work and Monitoring Plan prior to the sampling event. Arrange for field and laboratory audits.	Continue to work with the SFWMD EAU PMs and provide assistance for SOW and data review, as well as laboratory/field audit if needed.	Complete Efforts have been made to help PMs review and revise their SOWs. Field and laboratory audits have been arranged and outreach workshops included. Data were requested and reviewed by the QAOT.
7. Assessment of Biological/Ecological Activities (QAR2012 - Table 11-1) Field audits should be conducted to assess compliance with the new biological/ecological SOPs. Audit forms should be developed for the SOPs.	Develop an SOP and checklist for field audits based on the updated CGM 40 and QASR Chapter 8. Stat to conduct biological/ecological field audits based on the SOP.	In Progress.

Improvement Area	QAOT Initiatives	Status
8. Hydrologic and Hydraulic Data Reviews (QAR2012 - Table 11-1) A process to review data quality tags for CERP monitoring within the DBHYDRO and other databases should be developed so that data review is systematic and that issues are resolved in a timely manner.	Develop a procedure to pull data with quality tags routinely and establish a corrective action process to review and resolve issues.	In Progress.
9. Corrective Action for Field, Laboratory, and PE Audits (QAR2012 - Table 11-1) Develop a process to ensure that data qualifiers are added to compromised data based on audits. Establish a corrective action process and turn-around time so the audit issues are addressed and verified in a timely manner.	Develop a procedure that describes how audit findings will be communicated and reported with the data.	Complete. PE Study SOP has been updated to address the proposed concern and a survey is included. Procedure for corrective actions is included in the revised SOWs for certain CERP projects.

11.0 Recommendations for QA/QC Program Improvements

This section summarizes recommendations resulting from QAOT assessments that could improve CERP QA/QC processes and procedures. As discussed throughout this report, success in implementing the CERP QA/QC program is essential to ensure that CERP data are of consistent high quality, accurate, traceable, comparable, and legally defensible. Section 10.0 defines several recommendations identified during that past two QAR cycles that are still in progress or have been completed. During the current reporting period, four specific recommendations for improvement were identified. These recommendations are summarized in Table 11-1.

Table 11-1. New Areas of Improvement Identified during the Reporting Period

Improvement Area	Proposed QAOT Initiatives
1. PE samples – Laboratory Evaluation A process to evaluate laboratory results for only those analytes applicable to CERP.	Identify analytes that are critical for CERP and evaluate laboratory performance based on only those results.
2. Biological Field Evaluation with SOP A process to evaluate biological field activities against standardized SOPs from QASR Chapter 8.	Develop a checklist to be used for biological field activities to determine compliance with QASR Chapter 8.
3. Outreach Continue to communicate with Project Delivery Teams to ensure they are aware of the importance of data quality to their project.	Invite appropriate PDT members to the bi-monthly QAOT meetings to enhance their understanding of the role the QAOT can play for success for their project.
4. IDM Databases Work closely with IDM to continue to reach the goal of having one database where all CERP data is stored.	QAOT Subject Matter Experts meet regularly with IDM to set goals that can be achievable within budget and time constraints.

12.0 RESOURCE NEEDS

12.1 Management Support from CERP and Participating Agencies

The QAOT was able to achieve several breakthrough accomplishments during the reporting period. The QAOT acknowledges the continual participation, direction, and support from CERP management, as well as the support and cooperation from all participating agencies, especially:

- Florida Department of Environmental Protection (FDEP)
- South Florida Water Management District (SFWMD)
- U.S. Army Corps of Engineers (USACE)
- U.S. Environmental Protection Agency (USEPA)
- U.S. Fish and Wildlife Service (USFWS)
- U.S. Geological Survey (USGS)

Continuous support from CERP management and participating agencies is the key for the continued success of the QAOT. The QAOT cannot function effectively without this essential management support. Thus, continued management support for outreach of QAOT with PDTs, PMs, and module leads is needed.

12.2 Financial Support for QA/QC Activities

Additional QAOT activities such as training workshops, laboratories audits, and QAR assistance are essential in sustaining the excellence of the quality system for CERP monitoring. The current budget from both SFWMD and USACE, however, is very limited. The QAOT will continue to hold meetings every other month; limit the scope of field and laboratory audits and the frequency of laboratory PE studies and start to conduct field audits for biological and ecological monitoring activities for CERP projects as can be allowed within the current budget constraints.

13.0 REFERENCES

All QAOT reports are available in Documentum or upon request from the QAOT Co-chairs.

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