FINAL AUDIT REPORT

Cardno (formerly Cardno Entrix)
OGC Case No. 15-0333

Field Performance Audit,
Conducted March 23, 2012

Aquatic Ecology and Quality Assurance Section
Water Quality Standards Program
Division of Environmental Assessment and Restoration
Florida Department of Environmental Protection
June 8, 2015

Introduction

This Field Performance audit of Cardno (formerly Cardno Entrix) was conducted by the Florida Department of Environmental Protection (Department or DEP) Aquatic Ecology and Quality Assurance (formerly Standards and Assessment) Section in accordance with Rules 62-160.650 and 62-160.670, Florida Administrative Code, to include the evaluation of specific data quality objectives identified for data used to establish site specific alternative criteria (SSAC) for the Fenholloway and Econfina Rivers. Cardno collected diel and grab field measurements and grab surface water samples in both rivers to provide data for a SSAC petition submitted to the Department by Foley Cellulose, L.L.C. (formerly Buckeye Florida).

The field performance audit is used to verify that a sampling organization is correctly implementing the Department's Standard Operating Procedures (SOPs) for Field Activities, and covers sample collection, field testing, and required field documentation.

This audit report lists the procedural and documentary deficiencies observed by the Department auditors.

Description of Sampling Event and Audit

Department auditors, Michael Blizzard, Russ Frydenborg, and Nia Wellendorf, met Cardno samplers Bob Howell, Brandon Wanner, and Jason Dickey, at the Econfina River for the field performance audit. Chet Thompson of Foley Cellulose accompanied the samplers and auditors. All parties used motorboats to access designated sampling stations for retrieval of water quality sondes deployed in the Econfina River system. Department auditors observed grab sample collection and sonde retrieval at stations E03 and E06. Department staff also accompanied the Cardno team to station E07 for reconnaissance before completing the audit. The sampling team was evaluated for collection of laboratory samples for Color and Total Organic Carbon (TOC) analysis, instantaneous measurement of water quality parameters and calibration verification procedures for the dissolved oxygen, pH, temperature and specific conductance sensors installed on the sondes. During and subsequent to the audit, the auditors requested copies of all field documentation and supporting records for inspection. The DEP SOPs (DEP-SOP-001/01, March 31, 2008) provided the criteria for the audit and all findings.

Findings

Procedures or documentation that did not comply with evaluation criteria are identified in the attached audit report findings table (Table 1). Audit findings of deficiency were minor. The approved corrective actions and implementation time line is included in the findings table.

Preliminary Audit Report and Implementation of Corrective Actions

A preliminary audit report was sent to the Cardno samplers on 5/4/12. The report included a findings table with spaces for the audited party to respond with further information and/or corrective actions. Cardno replied with proposed corrective actions on 7/20/12 (Table 1). The auditors have reviewed the corrective actions and deem them acceptable. Corrective actions were implemented according to the statements in Table 1, and approved by the Department.

Usability Statement

Based on the results of this audit, the data collected by Cardno meet the Department's data quality objectives, and the Aquatic Ecology and Quality Assurance Section recommends that the data may be used for SSAC development under Chapter 62-302, Florida Administrative Code. Cardno sampling personnel follow all appropriate Department Standard Operating Procedures for sample collection and field meter data collection.

Table 1. Audit findings for the field performance audit of Cardno conducted by the Florida Department of Environmental Protection Aquatic Ecology and Quality Assurance Section on March 23, 2012.

Finding #	Audit Finding	DEP SOP Reference	Cardno Response	DEP Comments
1	It is unknown whether details of cleaning associated with the project were documented for sample containers and sonde sensors. These are typically recorded by description or by reference to an SOP (DEP SOP or internal SOP). The analyzing lab may have certificates of cleanliness provided by vendors or other documentation for cleaned sample containers. The documentation should be linked to the date of the sampling event and the sample containers and sensors used.	FD 2000 sections 1 – 3.1	Sample containers are pre-cleaned by Pace Labs who provides a lot number for each shipment of sample kits. Sonde cleaning is performed using guidance from DEP SOP. Citation of SOP provided on calibration forms.	Approved. Cardno should ensure that sample kit lot numbers or bottle order numbers are linked to the documentation for the dates of specific sampling events or trips. Probe cleaning entries are noted in "Cardno Standards Sample Kit Orders" notebook. Pace Analytical Services, Inc. (PASI) sample container cleaning documentation was not audited.
2	It is not known whether lot numbers and inclusive dates of use were recorded for all reagents, detergents, solvents and other chemicals used for decontamination and for preservation of samples.	FD 2000 section 3.1	During calibration, lot numbers and expiration dates for standards are included on all calibration forms. Date of receipt and dates of use of a standard are recorded in a Lab Logbook accessible by request.	Approved. Probe cleaning entries are noted in "Cardno Standards Sample Kit Orders" notebook. Preservative lots may be associated with PASI bottle orders (order number 13442 exhibited for this audit). PASI preservative records associated with these kits were not audited.
3	The auditors did not inspect sample container labels. It is not known whether each sample container was tagged or labeled with a unique field identification code or scheme that distinguishes the sample from all other samples. It is not known whether the unique identification codes for samples were recorded in a manner that linked the codes to all other field records associated with the samples. Note: The station numbers where samples were collected appear on the station field sheets and COC forms submitted to DEP, but it is uncertain	FD 5000 sections 1.2, 1.4, & 3	Field IDs will integrate sample date as to reflect uniqueness and link the ID back to the data. Previously, field IDs have been uniquely linked to related data via station/date/time in ACCESS database. Implemented 4/1/12	Approved.

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	whether these represent the unique field identification.			
4	The location and use of a fuel-powered boat motor during the sampling event was not recorded.	FD 5000 section 2.16	We have added a statement to our field forms indicating a motorized vessel was used during sampling and all samples were collected at the bow with vessel facing upstream. Implemented 4/1/12	Approved.
5	Date and Time of the actual site sample collection was not recorded on the station field sheet. The sample collection date is recorded on the lab transmittal (COC) record.	FD 5000 section 2.2	Sample date/time correspond to date/time of YSI sonde measurement on field sheets; however, field sheets have been revised to explicitly identify Sample date/time. Implemented 4/1/12	Approved with the understanding by DEP auditors that the actual date and time of sample collection will be indicated, in addition to the date and time of YSI sonde measurement.
6	Site name and address or substituted client code for the submitted samples was not transmitted to the analyzing lab.	FD 5000 sections 3	Site location (Lat/ Long) is included in monthly reports, and will be added to database. Field ID (client code) is traceable to GPS location in both monthly reports and in the database. Implemented 4/1/12	Approved. However, corrective action is not clear. Client code is acceptable if samples are considered sensitive information and if the field records clearly trace the code to a specified location (presumed as described in the Cardno response). No further response is requested.
7	The lab transmittal (COC) forms contained incomplete or ambiguous information about grab sample date and time, since the grab/composite prompt was either not indicated, and/or date time was entered into the "composite start" box. See both 3/15/12 and 3/23/12 COC forms for details.	FD 5000 sections 3	Procedures have been edited such that Dates and Times are only placed in the Composite End/Grab sample column and no blank spaces are added between sample lines. Date/Time will be reflected only in the respective ‘Composite END/GRAB” columns. Implemented 7/1/12	Approved.

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8	Sample preservation used for each container or group of containers was not transmitted to the lab. The prompts on COC forms were not checked, except for on-ice receipt at the lab.	FD 5000 sections 3	Procedures have been edited such that the COC section for preservation and sample analyte have been fully completed. Implemented 4/1/12	Approved.
9	It is not known whether ancillary records such as photographs, videotapes and maps were archived and linked to the sample or station unique field identification codes and the date of the sampling project.	FD 5000 section 5	Photographs are the only ancillary data being collected. Photographs are collected with a date stamp and stored as .jpegs on the Cardno server, organized by study and date.	Approved. Photograph storage was not audited by DEP auditors.
10	Preservation information and verification was not recorded for each sample, as applicable. The information was recorded in the Pace Lab packing record only. The Pace COC form prompts for preservation were unchecked.	FD 5100 section 1	Procedures have been edited such that the COC section for preservation and sample analyte have been fully completed. A section covering preservation has been added to field forms. Implemented 4/1/12	Approved.
11	The collection of field-QC blanks for TOC was not audited during the 3/23/12 sampling event. Based on the sampler's comments, documentation for the blank collected on the date nearest to 3/23/12 is requested, when available.	FQ 1000	Field documentation and COC for the most recent Field-QC blank was provided as Attachment C to Cardno's response to the preliminary audit report. Implemented 4/1/12	Approved. The procedure used to compose the blank should be documented in the project records (e.g., in the monitoring plan).
12	At site# 1, the Foley sample for NCASI color was not submerged in ice within 15 minutes. At site #2, the auditor advised the sampling team to ensure that samples are fully submerged in ice within 15 minutes of collection, as both Cardno and Foley sample containers were observed to be placed on top of the ice in the ice chest.	FS1006 section 5.1	The Foley sample was not collected for reporting purposes; rather, it was being collected as part of an independent (Foley) methods test. It was purposely held from ice so as to allow space for the 'reporting' (Cardno) samples. Reporting (Cardno) samples are being iced within 15 minutes of sampling. Ice is dispersed in cooler and each sample jar is submerged in ice to ensure 100% bottle contact.	Approved.

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13	An intermediate sampling device was not recorded on station field sheets. The auditors observed that the Color sample container was used to collect the TOC sample.	FD 5000 section 2.14	Field data sheets are being edited to include a section on intermediate collection devices. Implemented 4/1/12	Approved.
14	Documentation for post-retrieval verification of the temperature sensors for each sonde was not provided.	FT 1400 section 2.2.2	Temperature sensors are verified prior to each deployment and retrieval. Documentation is provided with monthly update reports.	Approved. Monthly update reports were not audited by DEP auditors. Chronological bracket for temperature calibration verification was not evaluated for this audit.
15	For all field-testing sondes and sensors, it is not known whether vendor service records were retained for all affected instruments associated with the sampling project.	FD 3000 section 3	Vendor service records, when applicable, are retained for all affected instruments associated with the sampling project. Most of the sondes employed in this project are new and have yet to be serviced.	Approved.
16	For all field-testing data, it is not known whether information about all pH and specific conductance calibration standards used for field testing was linked to the calibration information associated with the field testing measurements for the project. The date of receipt and first use, vendor name and catalog number or other specific description of calibration standards were not recorded in the documents submitted to DEP.	FD 4100 sections 1.1, 1.2	Calibration and verification forms contain lot number and expiration dates for standards. They are linked to the sonde ID on that form. All other information on standards such as ship date, date of opening, vendor name, etc., are recorded in a lab notebook available for viewing by request.	Approved. Lab notebook not audited by DEP auditors, but calibration and verification forms contained necessary information for linkage.
17	It is not known whether certificates of assay, grade and other vendor specifications for all calibration standards were retained and recorded.	FD 4100 sections 1.2.2	Information on standard specifications are listed on the standard container. This information is translated to our lab notebook for permanent reference.	Approved. Lab notebook not audited by DEP auditors.

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18	It is not known whether manufacturer-certified calibration specifications were retained for all factory-calibrated instruments used for the sampling project. The expiration date for the NIST thermometer used for temperature verifications was not included in submitted documents. Is a certificate or other specifications for the NIST thermometer available in archives?	FD 4100 sections 1.2.2	Calibration certification, ID and paperwork for NIST are filed with the unit. Unit is up to date on service and calibration.	Approved. DEP auditors reviewed certificates for NIST thermometers used for the project.
19	A description or citation (DEP SOP or internal SOP) for the specific calibration and verification procedures used for each sensor was not included in the documentation. General reference was made to FT 1000 for T, pH and SC.	FD 4100 section 2.11	Calibration and verification forms will include additional references to specific DEP SOP and YSI manual calibration references. Implemented 4/1/12	Approved.
20	For the diel data Access tables, the DO concentration units and an analyst name are not reported with the value for the field measurement result.	FD 4100 sections 2 & 3	Units have been added to each applicable column heading in the access database. Implemented 4/1/12	Approved.
21	Clarification needed for the documentation of initial calibrations and calibration verifications for DO, where linked to station IDs for the sampling project. See "DO Data" tab for comments for sondes Tampa 2, AF 1 and AF 2.	FD 4100 section 2	We have revised internal QAQC protocol to resolve any oversights related to hard or digital data copies. Implemented 4/1/12	Approved.
22	Grab lab sample collection depth and deployed sonde depth were not recorded on field station sheets. Only depth of instantaneous sonde readings were recorded. Are field archives available to document deployed sonde depth?	FD 5000, sections 2.18	Grab lab sample depth is reported on field station sheets as 'Collection Depth (M)'. Sonde deployment depth is continuously recorded by each individual datasonde. These data are archived and available upon request. Reported data (e.g., DO, Temp, Cond) are consistent with that described by the Econfina River Diel DO Monitoring Plan (Cardno ENTRIX, 2012).	Conditionally approved. DEP auditors acknowledge that all depths are either recorded on the field sheet or stored in the datasonde files; however, field sheets should clarify that the 'Collection Depth (M)' field represents the collection depth for the sample bottle and instantaneous sonde readings.