

EMERA COMPANY

Tampa, Florida

# ANNUAL GROUNDWATER MONITORING AND CORRECTIVE ACTION REPORT

Big Bend Power Station Economizer Ash and Pyrite Pond System 13031 Wyandotte Road Gibsonton, FL 33572

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#### **ACRONYMS**

BBS Big Bend Power Station
CCR Coal Combustion Residuals

CCR Rule Coal Combustion Residuals Rule

CFR Code of Federal Regulations

EAPPS Economizer Ash and Pyrite Pond System

GWPS Groundwater Protection Standard

PE Professional Engineer

RCRA Resource Conservation and Recovery Act

SP Statistical Analysis Plan

SSI Statistically Significant Increase

TEC Tampa Electric Company

USEPA United States Environmental Protection Agency



#### 1. BACKGROUND

On April 17, 2015, the United States Environmental Protection Agency (USEPA) published 40 Code of Federal Regulations (CFR) Parts 257 and 261: Hazardous and Solid Waste Management System; Disposal of Coal Combustion Residuals from Electric Utilities; Final Rule (USEPA, 2015). This regulation addresses the safe disposal of coal combustion residuals (CCR) as solid waste under Subtitle D of the Resource Conservation and Recovery Act (RCRA) and is referred to herein as the CCR Rule. The CCR Rule became effective on October 14, 2015. The rule provides national minimum criteria for "the safe disposal of CCR in new and existing CCR landfills, surface impoundments, and lateral expansions, design and operating criteria, groundwater monitoring and corrective action, closure requirements and post closure care, and recordkeeping, notification, and internet posting requirements." The groundwater monitoring requirements of the CCR Rule apply to the economizer ash and pyrite pond system (EAPPS) at Tampa Electric Company's (TEC) Big Bend Power Station (BBS) in southeast Hillsborough County in Gibsonton, Florida (Figure 1).

This document has been prepared to meet the requirements found in 40 CFR 257.90(e) concerning the Annual Groundwater Monitoring and Corrective Action reporting required by the CCR Rule for the EAPPS and BBS. At a minimum, the annual groundwater monitoring and corrective action report must contain the information described below and the information required by 257.90(e)(1) through (5), to the extent available:

"For existing CCR landfills and existing CCR surface impoundments, no later than January 31, 2018, and annually thereafter, the owner or operator must prepare an annual groundwater monitoring and corrective action report. For new CCR landfills, new CCR surface impoundments, and all lateral expansions of CCR units, the owner or operator must prepare the initial annual groundwater monitoring and corrective action report no later than January 31 of the year following the calendar year a groundwater monitoring system has been established for such CCR unit as required by this subpart, and annually thereafter. For the preceding calendar year, the annual report must document the status of the groundwater monitoring and corrective action program for the CCR unit, summarize key actions completed, describe any problems encountered, discuss actions to resolve the problems, and project key activities for the upcoming year. For purposes of this section, the owner or operator has prepared the annual report when the report is placed in the facility's operating record as required by § 257.105(h)(1)"

This annual report covers the period January 1, 2017 through December 31, 2017. Since this is the first CCR Annual Report, activities conducted in 2016 are also included. Sections of this report that are required by the CCR Rule, but are not applicable during the reporting period, contain the text "Not applicable for this annual reporting period".



Site features/geology/lithology, design of the CCR monitoring well network, the Sampling and Analysis Plan including requirements, procedures, documentation, laboratory analytical procedures and quality control, and the Quality Assurance Plan are provided in the *CCR Rule Groundwater Monitoring Program Plan (GWMP)*, *Big Bend Power Station*, (October 2016).



#### 2. SITE DESCRIPTION

#### 2.1 <u>Site Setting</u>

The BBS is located on the eastern shore of Tampa Bay in Sections 9, 10, 15, and 16, Township 31, Range 19 East of the Gibsonton Quadrangle, with the center of the facility at approximately 27°47'36" north latitude and 82°24'16" west longitude and encompasses approximately 1,492 acres. Topography at the Site ranges from approximately sea level (along the western portion of the BBS) to approximately 10 feet mean sea level (MSL) near the eastern portions of the property along U.S. Highway 41. The location of the BBS and the components of the EAPPS, namely the north and south economizer ash ponds and the suction pond, are shown on **Figure 1** and **Figure 2**.

Construction of BBS began in the late 1960s on two dredge/fill peninsulas. Four coal-fired power generating units are present at the BBS and were placed into service in 1970, 1973, 1976, and 1985. Units 1, 2, and 3 are wet-bottom slag-tap type units that originally used saltwater slag-handling systems and electrostatic precipitators for stack gas emissions control. However, these units are now operating as freshwater systems, subsequently allowing more internal water recycling. Unit 4 is a dry-bottom unit with a closed-loop freshwater bottom ash-sluice system. All units are equipped with electrostatic precipitators and stack gasses are treated with limestone flue gas desulfurization (FGD) and selective catalytic reduction (SCR) systems.

#### 2.2 CCR Units

The EAPPS was built in the early 1980s to support the operation of Big Bend Unit 4 and consists of three lined ponds. The EAPPS is considered one CCR unit by 40 CFR 257.53 and is located approximately 1,000 feet southeast of the active power generating units (**Figure 1**). The north economizer ash pond and economizer ash suction pond are still in operation. The south economizer ash pond has been converted to dry storage of material excavated from the south recycle pond when it was reconstructed and lined in 2010.

The pond bottom and dike crest elevations for each pond are reportedly 5.5 ft NGVD and 31 ft, NGVD respectively. The South Economizer Ash Pond contains an estimated 337,400 cubic yards (cy) of CCR material over a surface area of 7.2 acres. The north pond contains an estimated 90,000 cy of CCR material (Geosyntec, 2016) over a surface area of 5.4 acres. The suction pond has a surface area of 1.6 acres, receives decant water from the north and south economizer ash ponds, and contains only minor amounts of settleable CCR fines material.



#### 2.3 Summary of Site Geology and Hydrogeology

The units that form the hydrogeologic framework in the region include the surficial aquifer system (SAS), the Intermediate Confining Unit (ICU), and the upper Floridan aquifer system (UFAS). Based on Site-specific data as well as hydrogeologic studies of west-central Florida, the intermediate aquifer system has not been identified as being present at this location (Tihanksy and Knochenmus, 2001).

The SAS sediments consist of Pleistocene shell deposits and terrace sands; due to the irregular surface of the underlying limestone, the SAS varies in thicknesses but typically ranges between 20 and 30 feet (ft) thick in the area of the Site (SWFWMD, 2010). The water table across the Site resides in the SAS. The groundwater flow direction in the SAS is generally towards Tampa Bay as the discharge point; however, flow direction is influenced by various surface water features including ponds, drainage ditches, canals, and small creeks locally. Upward vertical flow gradients from the UFAS to the SAS are common based on historical data trends, and in certain cases can lead to artesian conditions (ECT, 2003; 2007).

The ICU resides within the undifferentiated Hawthorn Group. Due to the absence of the intermediate aquifer system, the permeable strata are absent and consequently the less permeable, fine grained clastic clay units are generally more prevalent. These clay units with varying silt, sand content, and marls comprise the semi-confining unit that separates the SAS and the UFAS.

The UFAS consists of a continuous series of carbonate units and is composed of the limestone sequences that occur in the Tampa Member of the Arcadia Formation of the Hawthorn Group as well as the underlying Suwannee Limestone and other carbonate strata. The Tampa Member encompasses sandy limestone containing varying amounts of clays and marls. The thickness of the UFAS may exceed 1,200 ft beneath the facility. Groundwater in the UFAS generally flows regionally from northeast to southwest towards Tampa Bay.

The *GWMP* may be consulted for additional details regarding the regional and Site-specific geology and hydrogeology.

#### 2.4 Aquifer System Description

#### 2.4.1 Identification of Uppermost Aquifer

The uppermost aquifer is defined by 40 CFR 257.53 as the geologic formation nearest the natural ground surface that is an aquifer, as well as lower aquifers that are hydraulically interconnected with this aquifer within the facility's property boundary. The uppermost aquifer at the Site is the SAS.



#### 2.4.2 Groundwater Flow Direction

A surface water feature, Jackson Branch, to the north/northeast of the EAPPS appears to influence local groundwater flow toward the stream in contrast to the general groundwater flow direction at the BBS, which is east to west. The groundwater flow direction near the EAPPS is generally north/northeast.

#### 2.4.3 Groundwater Flow Rates

As described in the *GWMP*, the average linear velocity of groundwater in the SAS ranges from 0.2 to 0.6 ft/day. This flow velocity corresponds to a potential range of flow velocities from approximately 7 to 22 feet per year.



#### 3. GROUNDWATER MONITORING SYSTEM

The groundwater monitoring system (GMS) installed at the EAPPS was designed to monitor the water quality in the SAS downgradient of the EAPPS. The documentation for the design, installation, and development of these wells is found in *Groundwater Monitoring Well Design, Installation, Development, and Decommissioning Report, October 2017.* The GMS consists of two background monitoring wells (identified as BBS-CCR-BW1 and BBS-CCR-BW2) located hydraulically upgradient of EAPPS. The background monitoring wells will be used to derive background concentrations for Appendix III constituents. Three monitoring wells (identified as BBS-CCR1, BBS-CCR-2, and BBS-CCR-3) are located at the waste boundary and at the "hydraulically downgradient perimeter (i.e., the edge) of the CCR unit or at the closest practical distance from this location" [80 FR 21400]. The screen intervals are at or below the actual depth of CCR material in the upper portion of the SAS and therefore meet the performance standards specified in 257.91(a) through (d). The locations of the monitoring wells comprising the GMS are shown on **Figure 2**.

#### 3.1 Status of the Groundwater Monitoring and Corrective Action Program

Groundwater monitoring was initiated at the EAPPS in June 2016 as part of the groundwater monitoring and corrective action program in accordance with the requirements of 40 CFR 257.90(b). Ten sampling events were conducted as part of baseline monitoring between June 2016 and August 2017. The first detection monitoring event was conducted in October 2017.

# 3.2 <u>Identification of Monitoring Wells Installed, Abandoned, or Decommissioned - 257.90 (E)(2)</u>

The monitoring wells comprising the GMS for compliance with the CCR Rule were installed in May 2016 to meet the groundwater monitoring system requirements in 257.91. A monitoring well construction summary is provided in **Table 1.** 



#### 4. SUMMARY OF 2015-2017 CCR RULE ACTIVITIES COMPLETED

#### 4.1 Requirements Completed

The key actions completed during this reporting period are summarized below.

- The required groundwater monitoring system wells were installed in compliance with §257.91. The well locations are depicted in **Figure 2**.
- The groundwater sampling and analysis program was developed and conducted in accordance with §257.93. The statistical procedures to be used for evaluating groundwater monitoring data were also selected as required by §257.93.
- The detection (baseline) monitoring program complying with §257.94(b) was initiated and exceeded the minimum requirement of eight independent samples for each background and downgradient well.
- The design, installation, development, and decommissioning of any monitoring wells, piezometers and other measurement, sampling, and analytical devices was placed in the operating record as required by §\$257.91(e)(1) and 257.105(h)(2), respectively.
- A certification from a qualified professional engineer stating that the groundwater monitoring system was designed and constructed to meet the requirements of the CCR rule was obtained, placed in the operating record, and posted on the publicly accessible Internet site pursuant to the requirements of §§257.91(f), 257.105(h)(3), and 257.107(h)(2), respectively.
- A certification from a qualified professional engineer stating that the selected statistical method is appropriate for evaluating the groundwater monitoring data for the CCR management area to meet the requirements of the CCR rule including a narrative description of the statistical method selected was obtained, placed in the operating record, and posted on the publicly accessible Internet site pursuant to the requirements of §§257.93(f)(6), 257.105(h)(4), and 257.107(h)(3), respectively.
- As required by §257.94, the evaluation of the groundwater monitoring data for statistically significant increases over background levels for the constituents listed in Appendix III was initiated no later than October 17, 2017.

#### 4.2 Completion of Required Reports

The following reports were completed during the reporting period:



- *CCR Rule Groundwater Monitoring Program Plan*, Big Bend Power Station Economizer Ash and Pyrite Pond System, October 2016.
- Groundwater Monitoring Well Design, Installation, Development, and Decommissioning Report, Big Bend Station Economizer Ash and Pyrite Pond System, October 2017, as required by §257.91(e)(1).
- Statistical Analysis Plan, October 2017, as required by §257.93.
- Groundwater Monitoring System Design and Construction Report, Big Bend Station Economizer Ash and Pyrite Pond System, October 2017.

#### 4.3 **Problems Encountered and Resolution**

No problems were encountered during the reporting period.



#### 5. GROUNDWATER MONITORING DATA - 257.90(E)(3)

#### 5.1 <u>Baseline Sampling</u>

TEC conducted ten baseline groundwater sampling events from the GMS between June 2016 and October 2017 and analyzed the samples for Appendix III and Appendix IV constituents as required in 40 CFR 257.93. Background monitoring results were used to establish background constituent concentrations for use in detection and (if necessary) assessment monitoring [40 CFR 257.91(a)(1)]. The analytical results from the 10 sampling events are provided in **Table** 3. The laboratory analytical reports for each event are compiled in **Appendix A**.

#### 5.2 <u>Detection Monitoring</u>

During detection monitoring, indicator (Appendix III) parameters (**Table 2**) were monitored to assess potential releases from the CCR unit into groundwater. Detection monitoring samples must be collected semi-annually from each background and compliance well and analyzed for Appendix III constituents.

The first semi-annual, detection monitoring event was conducted in October 2017. The analytical results are included in **Table 3**, and the laboratory analytical reports are included in **Appendix A**.

#### 5.2.1 Alternative Monitoring Frequency – 257.94(d)(3)

Not applicable for this annual reporting period.

# 5.2.2 Identification of Appendix III Constituents Detected at SSI Over Background – 257.94(e)

Not applicable for this annual reporting period.

#### 5.2.3 Alternative Source Demonstration – 257.94(e)(2)

Not applicable for this annual reporting period.

#### 5.2.4 Transition from Detection to Assessment Monitoring – 257.90(e)(4)

Not applicable for this annual reporting period.

#### 5.3 Assessment Monitoring

None of the provisions of 40 CFR 257.95 are applicable for this annual reporting period.



#### 6. DATA USABILITY EVALUATION

The inorganic data were reviewed based on the following: *CCR Groundwater Monitoring Program Plan*, Big Bend Power Station, Apollo Beach, Florida, September 2016; USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review, August 2014 (OSWER 9355.0-131, EPA 540-R-013-001); the applicability and appropriateness of the analytical methods referenced by the data package; and professional and technical judgment by the data validation team. A Stage 2A data validation report evaluating the quality control (QC) parameters was generated for each detection monitoring event. Additional data qualifiers generated from the data validation were applied where appropriate. The groundwater data generated from each detection monitoring event was deemed usable for meeting the project objectives.

The data validation reports are provided in **Appendix B**.



#### 7. DETECTION MONITORING STATISTICAL ANALYSIS



#### 8. ASSESSMENT MONITORING STATISTICAL ANALYSIS



#### 9. ACTIVITIES PLANNED FOR 2018

The projected key activities for the upcoming year include the following:

- Two semi-annual detection monitoring events will be conducted, and statistical analyses performed.
- The statistical evaluation of groundwater data for statistically significant increases over background for Appendix III constituents for the reporting period was completed by January 15, 2018 in accordance with 257.93.



#### 10. CORRECTIVE MEASURES



#### 11. REMEDY SELECTION

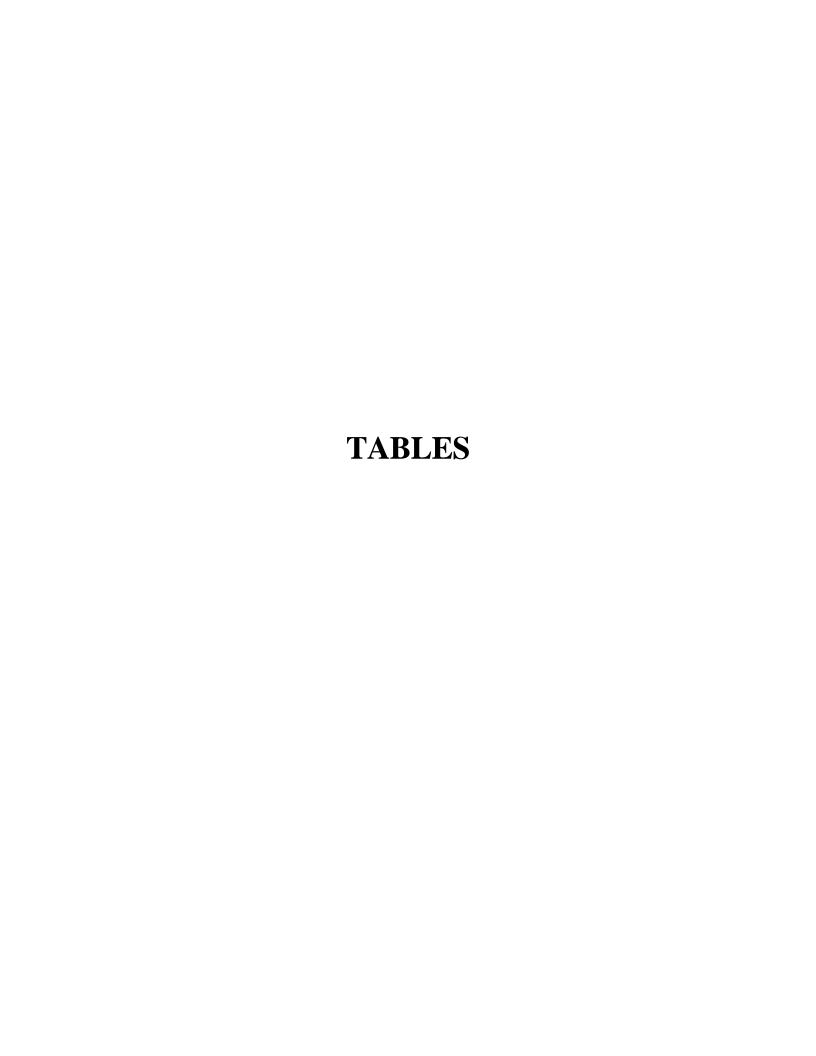


#### 12. CORRECTIVE ACTION



#### 13. REFERENCES

- Environmental Consulting & Technology (ECT). 2003. Supplemental Assessment Report, Tampa Electric Company, Big Bend Station. Tampa, Florida.
- Environmental Consulting & Technology. 2007. Sodium Ground Water Quality Exemption Application for the TECO Big Bend Station. Tampa, Florida.
- Geosyntec Consultants, Inc. 2016. Basins of Design and Preliminary Closure Evaluation Report; Economizer Ash and Pyrite Ponds; Big Bend Power Station, September 2016.
- Geosyntec Consultants, Inc. 2017. Big Bend Power Station Groundwater Monitoring Well Design, Installation, Development, and Decommissioning Report, September 2017.
- Southwest Florida Water Management District, 2010. 2010 Regional Water Supply Plan, Tampa Bay Planning Region. Brooksville, Florida.
- Tihanksy, A.B. and L.A. Knochenmus. 2001. Karst Features and Hydrogeology in West-central Florida-A Field Perspective. US Geological Survey-Water-Resources Investigations Report 01-4011.
- USEPA, April 2015. 40 CFR Part 257, Hazardous and Solid Waste Management System; Disposal of Coal Combustion Residuals from Electric Utilities; Final Rule, EPA-HQ-RCRA-2009-0640.



#### **Table 1: CCR Monitoring Well Construction Details**

TEC Big Bend Station Economizer Ash and Pyrite Pond System Gibsonton, FL

Well ID	Diameter (in)	Designation	Northing (NAD 1983)	Easting (NAD 1983)	Ground Surface Elevation (ft NAVD)	TOC Elevation* (ft NAVD)	Total Depth (ft bls)	Screen Interval (ft bls)	Top of Screen Elevation (ft NAVD)	Bottom of Screen Elevation (ft NAVD)
BBS-CCR-BW1	2	Background	1256638.34	528461.95	29.10	33.40	40	30-40	-0.90	-10.90
BBS-CCR-BW2	2	Background	1256966.67	527897.28	7.70	12.54	19	9-19	-1.30	-11.30
BBS-CCR-1	2	Detection	1257433.85	528211.74	5.00	9.82	17.5	7.5-17.5	-2.50	-12.50
BBS-CCR-2	2	Detection	1257429.29	528769.31	5.00	9.34	17.5	7.5-17.5	-2.50	-12.50
BBS-CCR-3	2	Detection	1257154.61	529023.26	4.90	9.20	18.5	8.5-18.5	-3.60	-13.60

#### Notes

- 1. in = Inches
- 2. ft bls = Feet Below Land Surface
- 3. Horizontal datum surveyed to the North American Datum (NAD) of 1983 US State Plane Florida West.
- 4. Vertical datum surveyed to the North American Vertical Datum (NAVD) of 1988.
- 5. \*Top of casing elevations were revised in September 2016 during final aboveground well completions. The additional PVC stickup was measured in the field and added to the surveyed top of casing elevation.

# Table 2: Summary of Detection and Assessment Monitoring Constituents TEC Big Bend Station Economizer Ash and Pyrite Pond System Gibsonton, FL

Constituent		nt Reference I 40 CFR 257 Appendix IV	Analytical Methods(s)	EPA Primary or Secondary MCL (ug/L)
Arsenic (Total)		X	EPA 200.8 or 6020	10
Antimony (Total)		X	EPA 200.8 or 6020	6
Barium (Total)		X	EPA 6010	2,000
Beryllium (Total)		X	EPA 6010	4
Boron (Total)	X		EPA 6010	NA
Cadmium (Total)		X	EPA 200.8 or 6020	5
Calcium (Total)	X		EPA 6010	NA
Chloride	X		EPA 300.0	250,000
Chromium (Total)		X	EPA 6010	100
Cobalt (Total)		X	EPA 6010	NA
Fluoride	X		EPA 300.0	4,000
Lead (Total)		X	EPA 200.8	15
Lithium (Total)		X	EPA 6010	NA
Mercury (Total)		X	EPA 7470	2
Molybdenum (Total)		X	EPA 6010	NA
рН	X		Field	6.5-8.5 (STD Units)
Radium 226 and 228 (Total)		X	EPA 903	5 (pCi/L)
Selenium (Total)		X	EPA 200.8 or 6020	50
Sulfate	X		EPA 300.0	250,000
TDS	X		SM2540C	500,000
Thallium (Total)		X	EPA 6020	2

#### Notes.

- 1. EPA = US Environmental Protection Agency
- 2. MCL = Maximum Contaminant Level
- 3. ug/L = Micrograms per liter
- 4. STD Units = Standard Units
- 5. pCi/L = picoCuries per liter

TEC Big Bend Economizer Ash and Pyrite Pond System Gibsonton, Florida

		Well ID					BF	BS-CCR-BW1					
	S	ample Date	6/24/2016	7/27/2016	8/26/2016	10/28/2016	11/10/2016	1/26/2017	4/13/2017	6/28/2017	7/20/2017	8/16/2017	10/13/2017
Parameter	Units	MCL	Result Q	Result Q	Result Q	Result Q	Result Q	Result Q	Result Q	Result Q	Result Q	Result Q	Result Q
Top of Casing Elevation	ft NAVD 88		30.13	30.13	30.13	30.13	30.13	30.13	30.13	30.13	30.13	30.13	30.13
Depth to Water	ft BTOC		25.37	26.19	25.78	29.42	29.84	30.49	30.71	29.92	28.89	28.74	30.41
Groundwater Elevation	ft NAVD 88		4.76	3.94	4.35	0.71	0.29	-0.36	-0.58	0.21	1.24	1.39	-0.28
Temperature	С	NA	27.84	28.25	28.11	27.46	27.50	26.98	27.20	27.72	27.89	28.08	27.86
Specific Conductivity (field)	umhos/cm	NA	5620	5420	5140	4860	5000	4940	1580	5010	4960	5000	4570
pH (field )	SU	6.5 - 8.5	6.51	6.38	6.41	6.50	6.52	6.46	6.49	6.47	6.49	6.52	6.55
Dissolved Oxygen	mg/L	NA	0.18	0.17	0.12	0.13	0.13	0.20	0.14	0.42	0.60	0.45	0.40
Redox Potential	mV	NA	-8.60	-7.3	-22.8	-76.2	-71.1	-20.2	-114	-11.4	-23.0	3.6	-18.4
Turbidity (field)	NTU	NA	5.14	7.10	6.47	4.08	1.77	2.04	4.22	0.69	2.38	6.03	2.51
<b>Appendix III Parameters</b>	S												
Boron	mg/L	1.4**	59.1	56.9	53.7 V	51.4	49.7	45.9	49.0	51.7	47.0	48.0	44.2
Calcium	mg/L	NA	781	737	729	675 V	692	728	693	781	744 V	743	691
Chloride	mg/L	250	1140 J-	1120	1030	939 V	993 V	942 V	934	995	915 V	793	809
Fluoride	mg/L	4***	0.199	0.110	0.180	0.194	0.261	0.315	0.256	0.298	0.255 J	0.0100 U	0.334
Sulfate	mg/L	250	1440 J-	1510	1420	1400	1440	1520	1550	1510	1470	1320	217
Total Dissolved Solids	mg/L	500	5050 J-	4190 J-	4290	4120 J-	4170 J-	4510 J	4060 J	4430	4160 J	4340	3890
<b>Appendix IV Parameters</b>	S												
Antimony	ug/L	6	0.600 U	0.600 U	1.77 I	6.00 U	0.600 U	0.600 U	0.600 U	0.600 U	6.00 U	0.600 U	0.6 U
Arsenic	ug/L	10	10.2	8.10	8.89	3.20 U	8.49	0.320 U	8.61	7.68	8.48 I	6.60	9.06
Barium	ug/L	2000	72.9	68.2	61.4	60.0	61.2	54.6	53.6	55.4	51.7	55.6	55.8
Beryllium	ug/L	4	0.200 U	0.200 U	0.200 U	0.200 U	0.200 U	0.200 U	0.200 U	0.200 U	0.200 U	0.200 U	0.200 U
Cadmium	ug/L	5	0.100 U	0.100 U	0.100 U	1.00 U	0.100 U	0.100 U	0.108 I	0.124 I	1.00 U	0.100 U	0.100 U
Chromium	ug/L	100	1.60 U	1.60 U	1.60 U	1.60 U	1.60 U	1.60 U	3.23 I	2.29 I	2.16 I	2.48 J	1.6 U
Cobalt	ug/L	140**	1.40 I	1.33 I	1.52 I	0.963 I	1.45 I	1.50 I	2.0 U	1.71 I	1.97 I	1.66 J	1.86 J
Lead	ug/L	15	0.0800 U	0.200 I	0.111 I	0.800 U	0.102 I	0.113 I	0.129 I	0.0800 U	0.800 U	0.291 J	0.103 J
Lithium	ug/L	140**	8.9 I	20 I	7.4 I	11 I	10 I	18 I	39.7	15 U	17 I	0.050 U	0.050 U
Mercury	ug/L	2	0.0500 U	0.0500 U	0.0500 U	0.0500 U	0.0500 U	0.0500 U	0.0500 U	0.0500 U	0.0500 U	0.0500 U	0.0500 U
Molybdenum	ug/L	35**	4.46 I	2.88 I	11.1 I	6.00 I	6.58 I	7.16 I	15.6 I	16.3 U	13.6 I	1.43 J	4.27 J
Radium 226/228	pCi/L	1	38	35	31	32.3	29.9	32.5	39.7	37.8	37.2	30.1	22.1
Selenium	ug/L	50	2.09	1.92 I	1.73 I	2.00 U	2.51	0.200 U	1.62 I	1.81 I	2.00 U	1.76 J	2.14
Thallium	ug/L	2	0.118 I	0.100 U	0.100 U	1.00 U	0.100 U	0.100 U	0.100 U	0.100 U	1.00 U	0.100 U	0.100 U

TEC Big Bend Economizer Ash and Pyrite Pond System Gibsonton, Florida

		Well ID					E	BBS-CCR-BV	V2				
	Sa	ımple Date	6/24/2016	7/27/2016	8/26/2016	10/28/2016	11/10/2016	1/26/2017	4/13/2017	6/28/2017	7/20/2017	8/16/2017	10/13/2017
Parameter	Units	MCL	Result Q	Result Q	Result Q	Result Q	Result Q	Result Q	Result Q	Result Q	Results Q	Results Q	Results Q
Top of Casing Elevation	ft NAVD 88		9.81	9.81	9.81	9.81	9.81	9.81	9.81	9.81	9.81	9.81	9.81
Depth to Water	ft BTOC		4.72	5.52	5.22	8.06	8.45	9.13	9.24	8.53	7.45	7.33	7.38
Groundwater Elevation	ft NAVD 88		5.09	4.29	4.59	1.75	1.36	0.68	0.57	1.28	2.36	2.48	2.43
Temperature	С	NA	26.42	27.56	27.74	27.22	27.10	25.25	30.71	26.69	27.20	27.69	27.98
Specific Conductivity (field)	umhos/cm	NA	1640	1500	1380	1340	1400	1460	1480	1538	1540	1580	1699
pH (field )	SU	6.5 - 8.5	6.53	6.48	6.48	6.67	6.68	6.62	6.67	6.64	6.66	6.68	6.70
Dissolved Oxygen	mg/L	NA	0.37	0.15	0.10 U	0.37	0.20	0.30	1.32	0.19	0.33	0.43	0.28
Redox Potential	mV	NA	-59.4	-84.1	-59.5	-91.5	-73.8	-74.1	-42.0	-82.4	-94.0	-53.3	-72.1
Turbidity (field)	NTU	NA	6.70	4.86	1.73	3.99	5.86	16.4	19.0	6.1	5.3	3.66	3.96
<b>Appendix III Parameters</b>	S												
Boron	mg/L	1.4**	3.89	4.25	3.70 V	3.90	3.75	3.27	4.08	4.54 J-	4.57	4.39	4.08
Calcium	mg/L	NA	313	271	237	238 J-,V	243	240	260	290 J-	278 V	287	321
Chloride	mg/L	250	123	116	116	125 V	129 V	145 V	140	135	123 V	117	84.9
Fluoride	mg/L	4***	0.409	0.432	0.455	0.440	0.464	0.472	0.478	0.559	0.319 J	0.352	0.513
Sulfate	mg/L	250	414	341	276	246	255	255	323	402	41.7	462	632
Total Dissolved Solids	mg/L	500	1230	1060	980	1010	966 J-	1140	1120	1170	1200	1180	J 1330
<b>Appendix IV Parameters</b>	S												
Antimony	ug/L	6	0.600 U	0.600 U	0.600 U	0.600 U	0.600 U	0.600 U	0.600 U	0.600 U	6.000 U	0.600 U	J 0.600 U
Arsenic	ug/L	10	2.65	1.75 I	2.03	1.62 I	2.59	0.709 I	1.45 I	1.68 I	3.20 U	1.80	J 2.01
Barium	ug/L	2000	51.3	49.8	43.2	46.3	45.8	38.8	42.7	48.8	47.7	49.9	56.2
Beryllium	ug/L	4	0.200 U	0.200 U	0.200 U	0.200 U	0.200 U	0.200 U	0.200 U	0.200 U	0.220 U	0.200 U	J 0.254 J
Cadmium	ug/L	5	0.100 U	0.100 U	0.100 U	0.100 U	0.100 U	0.100 U	0.100 U	0.100 U	1.00 U	0.100 U	J 0.100 U
Chromium	ug/L	100	1.60 U	1.60 U	1.60 U	1.60 U	1.60 U	1.60 U	1.60 U	1.68 I	2.26 I	1.60 U	J 1.60 U
Cobalt	ug/L	140**	1.00 U	0.14 I	0.153 I	0.151 I	0.157 I	0.136 I	2.0 U	0.0959 I	0.400 U	0.110	J 0.129 J
Lead	ug/L	15	0.0800 U	0.0800 U	0.0800 U	0.0800 U	0.0800 U	0.0800 U	0.0800 U	0.0800 U	0.800 U	0.101	J 0.0800 U
Lithium	ug/L	140**	3.8 I	9.1 I	2.0 I	3.8 I	1.7 I	5.2 I	3.4	5.2 I	5.9 I	0.050 U	J 0.050 U
Mercury	ug/L	2	0.0500 U	0.0500 U	0.0500 U	0.0500 U	0.0500 U	0.0500 U	0.0500 U	0.0500 U	0.0500 U	0.0500 U	J 0.0500 U
Molybdenum	ug/L	35**	2.40 I	1.00 U	7.57	1.42 I	1.00 U	2.56 I	9.65 I	10.2 U	8.9 I	4.08	J 2.51 J
Radium 226/228	pCi/L	1	4.8	5.1 J	4.0	4.8	8.0	<b>4.8</b> J	4.5	4.8	4.4	4.9	4.9
Selenium	ug/L	50	0.722 I	0.760 I	0.577 I	0.489 I	0.485 I	0.260 I	0.539 I	0.386 I	2.00 U	0.420	J 0.523 J
Thallium	ug/L	2	0.100 U	0.100 U	0.100 U	0.100 U	0.100 U	0.100 U	0.100 U	0.100 U	1.00 U	0.100 U	J 0.100 U

TEC Big Bend Economizer Ash and Pyrite Pond System Gibsonton, Florida

		Well ID						BBS-CC	CR-1				
	Sa	ample Date	6/24/2016	7/27/2016	8/26/2016	10/28/2016	11/10/2016	1/26/2017	4/13/2017	6/28/2017	7/20/2017	8/16/2017	10/13/2017
Parameter	Units	MCL	Result Q	Result Q	Result Q	Result Q	Result Q	Result Q	Result Q	Result Q	Results Q	Results Q	Results Q
Top of Casing Elevation	ft NAVD 88		7.79	7.79	7.79	7.79	7.79	7.79	7.79	7.79	7.79	7.79	7.79
Depth to Water	ft BTOC		3.51	5.00	5.06	6.78	7.38	7.46	7.64	7.41	5.86	7.03	7.32
Groundwater Elevation	ft NAVD 88		4.28	2.79	2.73	1.01	0.41	0.33	0.15	0.38	1.93	0.76	0.47
Temperature	С	NA	25.48	26.41	27.05	25.78	25.70	24.03	23.70	25.54	25.81	25.80	26.57
Specific Conductivity (field)	umhos/cm	NA	3940	4180	4000	4060	4290	4320	4170	4063	3960	4110	4258
pH (field)	SU	6.5 - 8.5	6.80	6.67	6.71	6.83	6.82	6.79	6.84	6.78	6.81	6.82	6.83
Dissolved Oxygen	mg/L	NA	0.10	0.22	0.14	0.10 U	0.10 U	0.10 U	0.10 U	0.27	0.10	0.28	0.24
Redox Potential	mV	NA	-49.1	-74.1	-34.8	-107.0	-136	-110	-80.4	-80.6	-122.0	-109.0	-83.3
Turbidity (field)	NTU	NA	8.01	3.88	2.08	3.22	0.890	1.99	4.12	3.63	1.58	1.88	0.89
<b>Appendix III Parameters</b>	S												
Boron	mg/L	1.4**	14.4	0.306	11.4	15.7	16.2	15.5 J-	16.4	16.5	16	17	19.9
Calcium	mg/L	NA	541	227	556	556 V	606	579 J-	555	569	576 V	572	596
Chloride	mg/L	250	619	742 J-	695	743 J-	817 V	820 V	124	720	694 J-, V	710	716
Fluoride	mg/L	4***	0.211	0.128	0.454	0.104	0.0871	0.184	0.170	0.208	0.157 J	0.200	0.201
Sulfate	mg/L	250	1240	1320 J-	1240	1230 J-	1290	1350	443	1120	1390	1240	1230
Total Dissolved Solids	mg/L	500	3060 J	3140	2980	3170 J-	3470 J-	3670 J	3110 J	3140	3400 J	2960 J	3470
<b>Appendix IV Parameters</b>	3												
Antimony	ug/L	6	0.600 U	1.03 I	0.600 U	0.600 U	0.600 U	0.602 I	0.600 U	0.600 U	3.00 U	0.600 U	0.600 U
Arsenic	ug/L	10	8.74	7.38	7.94	8.30	8.93	9.04	10.5	9.76	10.3	9.33	9.03
Barium	ug/L	2000	122	30.8	115	122	129	115	116 I	113	112	122	129
Beryllium	ug/L	4	0.200 U	0.200 U	0.200 U	0.200 U	0.200 U	0.200 U	2.00 U	0.200 U	0.200 U	0.200 U	0.200 U
Cadmium	ug/L	5	0.100 U	0.100 U	0.100 U	0.100 U	0.100 U	0.100 U	0.100 U	0.100 U	0.500 U	0.100 U	0.100 U
Chromium	ug/L	100	1.60 U	1.60 U	1.60 U	1.60 U	1.60 U	1.60 U	1.60 U	1.93 I	1.62 I	1.60 U	1.60 U
Cobalt	ug/L	140**	1.00 U	0.450 I	0.485	0.507 I	0.519 I	0.489 I	2.0 U	0.484 I	0.495 I	0.473 J	0.453 J
Lead	ug/L	15	0.0800 U	0.110 I	0.0800 U	0.0800 U	0.0800 U	0.0800 U	0.0979 I	0.0800 U	0.400 U	0.080 U	0.080 U
Lithium	ug/L	140**	8.3 I	15 I	7.4 I	12 I	8.4 I	14 I	10 I	13 I	14 I, J3	0.050 U	0.050 U
Mercury	ug/L	2	0.0500 U	0.0500 U	0.0500 U	0.0500 U	0.0500 U	0.0500 U	0.0500 U	0.0500 U	0.0500 U	0.0500 U	0.0500 U
Molybdenum	ug/L	35**	106	105	80.3	95.5	98.4	92.4	124 I	96.5 I	99.6	86.4	82.5
Radium 226/228	pCi/L	1	39	33	15	42.6	37.3	32.5	35.8 I	41.4	34.7	33.4	35.6
Selenium	ug/L	50	0.696 I	0.960 I	0.385	0.690 I	1.04 I	0.653 I	0.937 I	0.756 I	2.25 I	0.918 J	0.99 J
Thallium	ug/L	2	0.100 U	0.100 U	0.100 U	0.100 U	0.100 U	0.100 U	0.100 U	0.100 U	0.500 U	0.100 U	0.100 U

TEC Big Bend Economizer Ash and Pyrite Pond System Gibsonton, Florida

		Well ID					BI	BS-CCR-2					
	S	ample Date	6/24/2016	7/27/2016	8/26/2016	10/28/2016	11/10/2016	1/26/2017	4/13/2017	6/28/2017	7/20/2017	8/16/2017	10/13/2017
Parameter	Units	MCL	Result Q	Result Q	Result Q	Result Q	Result Q	Result Q	Result Q	Result Q	Results Q	Results Q	Results Q
Top of Casing Elevation	ft NAVD 88		8.14	8.14	8.14	8.14	8.14	8.14	8.14	8.14	8.14	8.14	8.14
Depth to Water	ft BTOC		3.45	5.30	5.35	6.78	6.88	6.93	7.15	6.97	5.06	6.53	6.88
Groundwater Elevation	ft NAVD 88		4.69	2.84	2.79	1.36	1.26	1.21	0.99	1.17	3.08	1.61	1.26
Temperature	С	NA	25.62	26.42	27.35	25.64	25.66	24.27	23.95	25.12	25.74	26.43	26.46
Specific Conductivity (field)	umhos/cm	NA	1580	1700	1570	1500	1540	1560	1540	1485	1630	1560	1350
pH (field )	SU	6.5 - 8.5	6.80	6.68	6.74	6.87	6.89	6.89	6.93	6.87	6.97	6.92	6.87
Dissolved Oxygen	mg/L	NA	0.10	0.13	0.100 U	0.10	0.13	0.10 U	0.10 U	0.24	0.10 U	0.25	0.20
Redox Potential	mV	NA	-71.0	-67.4	-27.3	-183	-186	-182	-138	-131	-154	-233	-188
Turbidity (field)	NTU	NA	4.90	7.16	3.31	3.73	7.10	4.93	3.43	4.71	4.56	3.22	3.03
<b>Appendix III Parameters</b>	S												
Boron	mg/L	1.4**	1.55	2.81	2.86	2.08	2.28	3.86	5.01	3.20	4.94	4.32	8.88
Calcium	mg/L	NA	198	193	192	181 V	181	172	163	173	178 V	171	169
Chloride	mg/L	250	118	140	124	112 V	111 V	115 J+	119	105	114 V	113	70.9
Fluoride	mg/L	4***	0.148	0.183	0.150	0.171	0.168	0.248 J+	0.237	0.214	<b>0.166</b> J	0.155	0.182
Sulfate	mg/L	250	471	542	484	468	468	490 J-	485 J-	415 J-	481	459	432
Total Dissolved Solids	mg/L	500	1170 J-	1170	1120	1130	1110	1140	1150	1080	1140	1080	1030
<b>Appendix IV Parameters</b>	S												
Antimony	ug/L	6	0.600 U	<b>0.830</b> I	0.600 U	0.600 U	0.600 U	0.600 U	0.600 U	0.600 U	0.600 U	1.20	U 0.600 U
Arsenic	ug/L	10	1.83 I	0.990 I	1.25	1.16 I	1.37 I	1.09 I	2.64	1.01 I	0.974	1.02	J 1.14 J
Barium	ug/L	2000	65.0	64.8	61.4	60.6	62.4	54.6	55.8	54.6	54.6	56.8	53.3
Beryllium	ug/L	4	0.200 U	0.200 U	0.200 U	0.200 U	0.200 U	0.200 U	0.200 U	0.200 U	0.423 U	0.200	U 0.200 U
Cadmium	ug/L	5	0.100 U	0.100 U	0.100 U	0.100 U	0.100 U	0.100 U	0.100 U	0.100 U	0.100 U	0.200	U 0.200 U
Chromium	ug/L	100	1.60 U	1.60 U	1.60 U	1.60 U	1.60 U	1.60 U	2.29 I	1.96 I	3.11	1.60	U 1.60 U
Cobalt	ug/L	140**	1.00 U	0.0900 I	0.0776	0.107 I	0.105 I	0.0902 I	2.0 U	0.0875 I	0.0857	0.150	J 0.115 J
Lead	ug/L	15	0.0800 U	0.110 I	0.0800 U	0.129 I	<b>0.0955</b> I	0.0800 U	0.176 I	0.144 I	0.127	0.244	J 0.15 J
Lithium	ug/L	140**	10 I	17 I	11 I	14 I	11 I	13 I	13 I	14 I	16	0.050	U 0.050 U
Mercury	ug/L	2	0.0500 U	0.0500 U	0.0500 U	0.0500 U	0.0500 U	0.0500 U	0.0500 U	0.0500 U			U 0.0500 U
Molybdenum	ug/L	35**	1.73 I	1.00 U	7.78	1.00 U	1.43 I	2.52 I	9.82 I	9.59 U	9.88	3.02	J 1.99 J
Radium 226/228	pCi/L	1	15.0	13.2	32	14.9	14.8	13.9	14.2	14.7	14.4	12.1	13.5
Selenium	ug/L	50	0.376 I	0.280 I	0.200 U	0.333 I	0.259 I	0.200 U	0.200 U	0.200 U	0.474	0.662	J 0.474 J
Thallium	ug/L	2	0.100 U	0.100 U	0.100 U	0.100 U	0.100 U	0.100 U	0.100 U	0.100 U	0.100 U	0.200	U 0.100 U

TEC Big Bend Economizer Ash and Pyrite Pond System Gibsonton, Florida

		Well ID						BBS-CCF	R-3				
	Sa	ample Date	6/24/2016	7/27/2016	8/26/2016	10/28/2016	11/10/2016	1/26/2017	4/13/2017	6/28/2017	7/20/2017	8/16/2017	10/13/2017
Parameter	Units	MCL	Result Q	Result Q	Result Q	Result Q	Result Q	Result Q	Result Q	Result Q	Result Q	Result Q	Result Q
Top of Casing Elevation	ft NAVD 88		6.78	6.78	6.78	6.78	6.78	6.78	6.78	6.78	6.78	6.78	6.78
Depth to Water	ft BTOC		1.51	3.60	3.48	6.54	6.77	6.81	7.13	6.64	4.77	6.04	6.52
Groundwater Elevation	ft NAVD 88		5.27	3.18	3.30	0.24	0.01	-0.03	-0.35	0.14	2.01	0.74	0.26
Temperature	С	NA	26.62	27.28	27.07	26.20	26.10	24.25	24.27	26.15	26.73	26.86	27.18
Specific Conductivity (field)	umhos/cm	NA	1580	1740	1690	1640	1650	1510	1580	1755	1750	1790	1747
pH (field )	SU	6.5 - 8.5	6.42	6.19	6.29	6.42	6.46	6.42	6.49	6.38	6.36	6.42	6.44
Dissolved Oxygen	mg/L	NA	0.54	0.100 U	0.15	0.10 U	0.10 U	0.11	0.14	0.28	0.17	0.29	0.37
Redox Potential	mV	NA	-145	-74.4	-155	-266	-239	-168	-114	-125	-122	-206	-249
Turbidity (field)	NTU	NA	11.5	8.04	6.35	3.26	1.18	1.79	4.22	0.94	0.51	0.47	2.39
<b>Appendix III Parameters</b>	S												
Boron	mg/L	1.4**	0.662	13.2	0.540 V	0.532	0.502	0.381	0.385	0.184	0.211	0.266	0.373
Calcium	mg/L	NA	187	196	200	201 V	200	176	176	192	205 J-, V	187	190
Chloride	mg/L	250	88.9	140	136	140 V	129 V	129 V	124	168	158 V	156	153
Fluoride	mg/L	4***	0.313	0.262	0.286	0.299	0.331	0.391	0.415	0.338	0.230 J	0.338	0.333
Sulfate	mg/L	250	474	516	517	541	492	454	443	493	506	484	503
Total Dissolved Solids	mg/L	500	1200	1220	1210	1220	1220	1200	1120	1280	1310	1290	1310
<b>Appendix IV Parameters</b>	<b>;</b>												
Antimony	ug/L	6	0.600 U	0.770 I	0.600 U	0.600 U	0.600 U	0.600 U	0.600 U	0.600 U	3.00 U	0.600 U	0.600 U
Arsenic	ug/L	10	1.23 I	0.540 I	0.603 I	0.623 I	0.765 I	0.320 U	0.320 U	0.525 I	1.60 U	0.536 J	0.665 J
Barium	ug/L	2000	65.3	67.6	63.6	66.3	63.0	56.2	58.6	61.8	63.4	59.8	59.3
Beryllium	ug/L	4	0.200 U	0.200 U	<b>0.272</b> I	0.200 U	0.200 U	0.200 U	0.200 U	0.200 U	0.356 U		0.200 U
Cadmium	ug/L	5	0.100 U	0.100 U	0.100 U	0.100 U	0.100 U	0.100 U	0.100 U	0.100 U	0.500 U	000	0.100 U
Chromium	ug/L	100	1.60 U	1.60 U	1.60 U	1.60 U	1.60 U	1.60 U	1.60 U	3.12 I	3.43 I	2.02 J	1.60 U
Cobalt	ug/L	140**	1.00 U	0.0900 I	0.125 I	0.124 I	0.117 I	0.0989 I	2.0 U	0.119 I	0.200 U	0.120 0	0.155 J
Lead	ug/L	15	0.125 I	0.0800 I	0.0800 U	0.107 I	0.0800 U	0.0800 U	0.0800 U	0.0800 U	0.400 U	0.0000 6	0.0800 U
Lithium	ug/L	140**	3.7 I	11 I	6.1 I	8.2 I	6.1 I	7.7 I	6.3 I	5.2 I	10 I	0.050 U	0.050 U
Mercury	ug/L	2	<b>0.0580</b> I	0.0500 U	0.0500 U	0.0500 U	0.0500 U	0.0500 U	0.0500 U	0.0500 U	0.0500 U	0.0000	0.0500 U
Molybdenum	ug/L	35**	4.09 I	2.23 I	8.10	3.63 I	3.90 I	5.42 I	11.7 I	11.9 U	10.6 I	3.14 J	3.82
Radium 226/228	pCi/L	1	10.3	12.3	15	18.1	17.5	15	14.4	17.7	20.3	19.6	20
Selenium	ug/L	50	0.262 I	0.270 I	0.200 U	0.200 U	0.253 I	0.200 U	0.200 U	0.200 U	1.00 U		0.285 J
Thallium	ug/L	2	0.100 U	0.100 U	0.100 U	0.100 U	0.100 U	0.100 U	0.100 U	0.100 U	0.500 U	0.100 U	0.100 U

#### Notes:

- 1. U: Laboratory qualifier Indicates that the compound was not detected above the reporting limit.
- 2. I: Laboratory qualifier The reported value is between the laboratory method detection limit and the laboratory practical quantitation limit; estimated value
- 3. J(-): Laboratory qualifier The reported value is an estimated value.
- 4. J: Data validation qualifier The analyte was postively identified; the associated numerical value is the approximate concentration of the analyte in the sample.
- 5. UJ: Data validation qualifier The analyte was not detected above the reported sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.
- 6. J-: Data validation qualifier The analyte was positively identified; however, the associated numerical value is likely to be lower than the concentration of the analyte in the sample due to negative bias of associated QC or calibration data or attributable to matrix interference.
- 7. J+: Data validation qualifier: The analyte was positively identified; however, the assocaited numerical value is likely to be higher than the concentration of the analyte in the sample due to positive bias of associated QC or calibration data or attributable to matrix interference.
- 8. V: Analyte detected in the method blank.
- 9. Q: Laboratory qualifier- Re-analysis of sample beyond the accepted holding time.
- 10. J3: Laboratory qualifier Estimated value; value may not be accurate. Spike recovery or RPD outside of criteria.
- 11. MCLs EPA Maximum Contaminant Levels; primary enforceable standards shown unless otherwise noted. Secondary (non-enforceable) standards shown in italics.
- 12. Detections shown in bold text.
- 13. \*\* Florida GCTLs per FDEP Chapter 62-777 of the Florida Administrative Code.
- 14. \*\*\* Secondary MCL for fluoride is 2 mg/L but not enforceable.
- 15. Background / Upgradient Well shaded green.

#### Abbreviations:

Q - Data qualifier

C - Celsius

ft BTOC - feet below top of well casing

mg/L - milligrams per liter

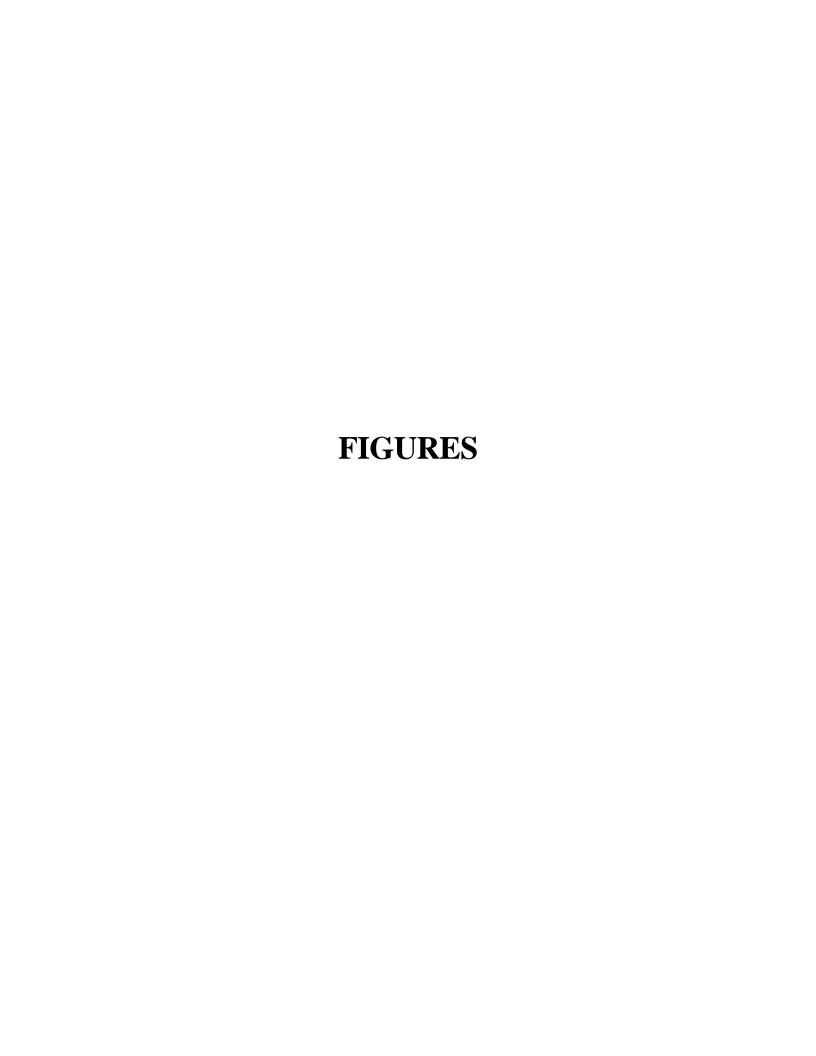
SU - Standard units

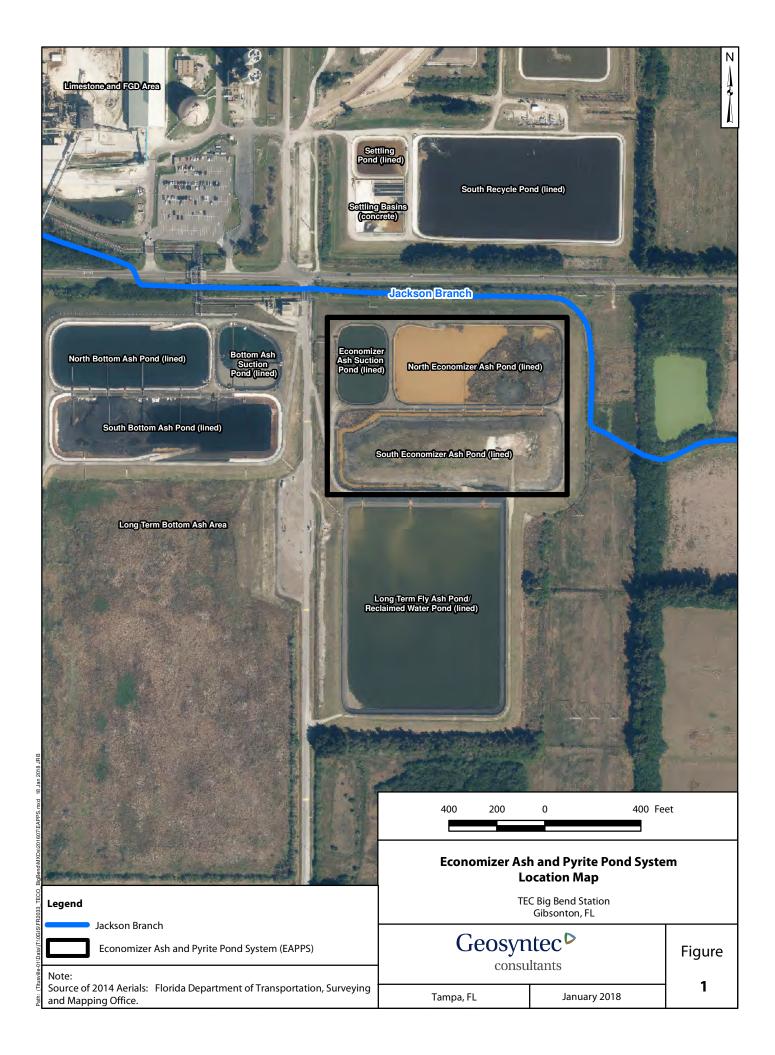
ft NAVD 88 - feet elevation in North American Vertical Datum 1988

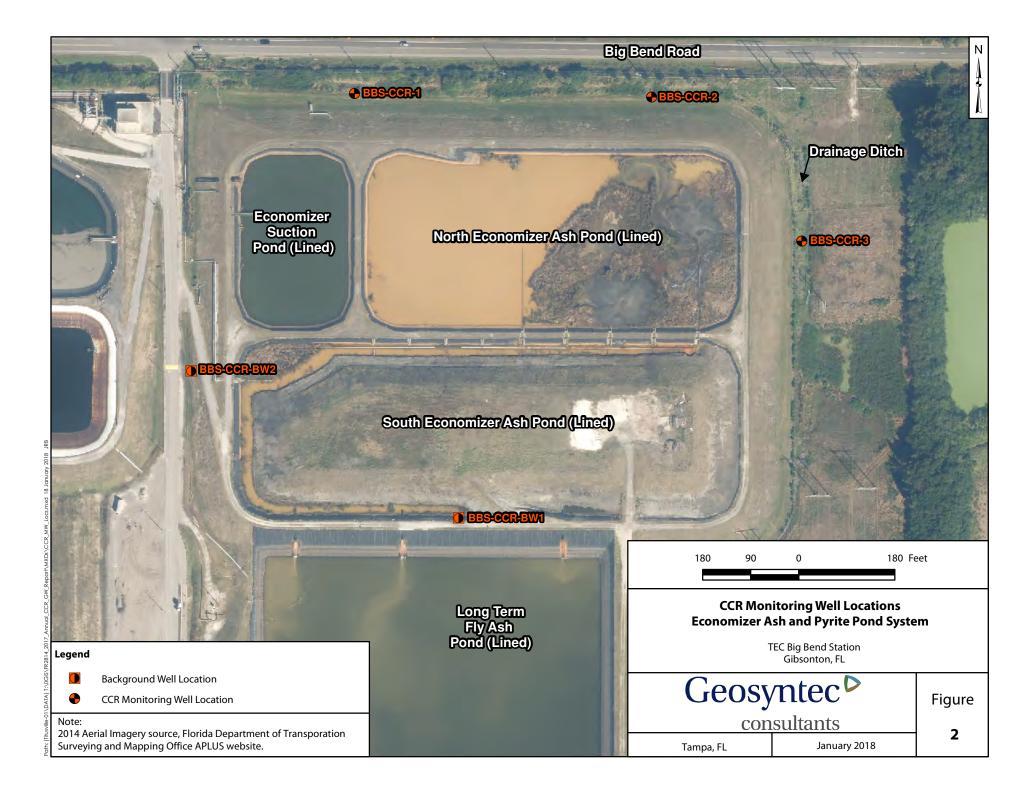
ug/L - micrograms per liter

umhos/cm - micromohs per centimeter

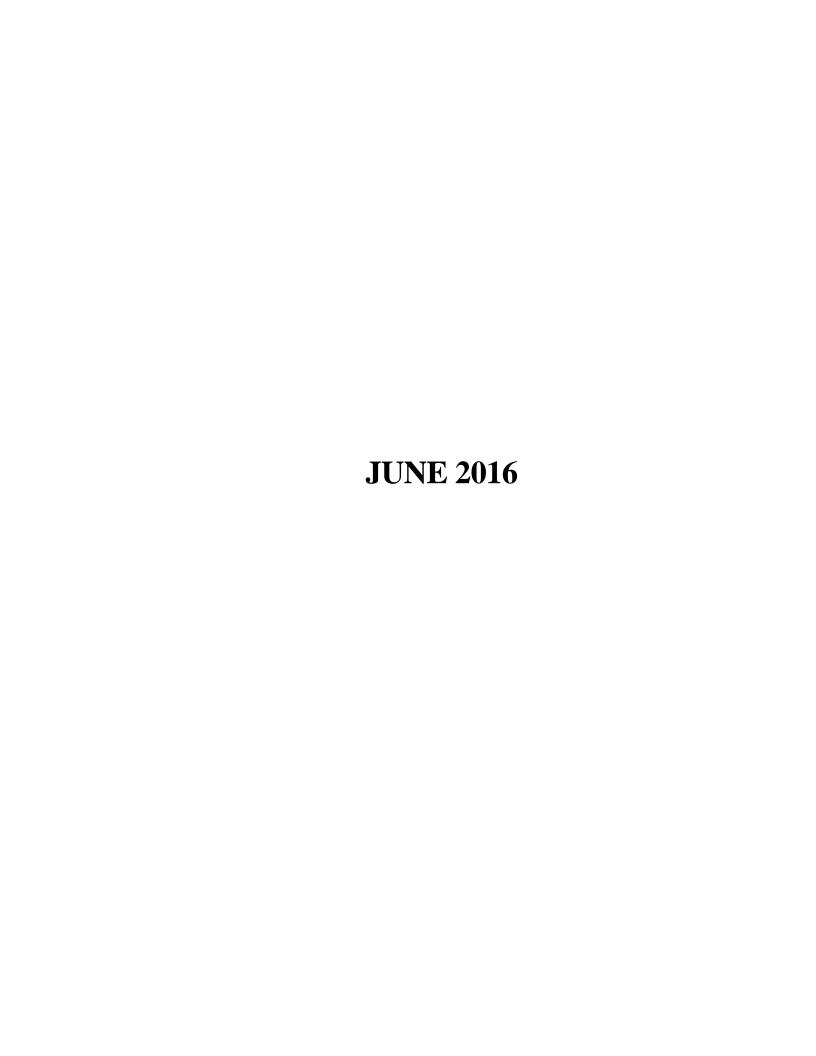
mV - millivolts







# APPENDIX A Laboratory Analytical Reports





#### **Tampa Electric Laboratory Services**

5012 Causeway Blvd Tampa Fl. 33619 \* Ph (813)630-7490 \* Fax (813)630-7360 \* DOH #E54272

Big Bend Power Station Terry Eastley 13031 Wyandott Rd Apollo Beach, FL 33572 tleastley@tecoenergy.com

Work Order - L16F174

Report Date:

07/28/16 14:29

#### **Project - Economizer Ash Pond CCR**

#### **Case Narrative**

REPORT REVISED TO ADD: Co, Ca and Rad-226/228.

8 sample(s) were received on 06/24/16 14:25.

There were no issues noted with the sample(s) associated with this workorder unless noted below.

#### **SM 2540C**

A constant weight could not be acheived after three consectutive weighing and drying cycles for samples PZ-1, PZ-2, PZ-5 and PZ-6. The sample(s) are flagged with a J qualifier.

#### **EPA 300.0**

The recovery of the matrix spike and spike duplicate for Chloride and Sulfate were below the control limits due to matrix interference. The parent sample is flagged with a J qualifier.

#### **EPA 200.8**

The recovery of the matrix spike and spike duplicate for Cadmium was below the control limits due to matrix interference. The parent sample is flagged with a J qualifier.



Sample Qualifer:

# **Tampa Electric Laboratory Services**

5012 Causeway Blvd Tampa Fl. 33619 \* Ph (813)630-7490 \* Fax (813)630-7360 \* DOH #E54272

## **Sample Information**

Client: Big Bend Power Station

Lab Sample ID: L16F174-01 Sampled By: Robert Barthelette

Sample Description: PZ1 Date and Time Collected: 6/24/16 13:32
Sample Collection Method: Grab Date of Sample Receipt: 6/24/16 14:25

## **Laboratory Results**

Sample Qualiter:					Qualifier		Test		Analysis
Parameter	Result	Units	MDL	PQL	Code	Dil	Method	Analyst	Date & Time
Consul Charles Day		ampa Elect	tric Comp	any, Labo	oratory Se	rvices			
General Chemistry Parame	eters eters								
Chloride	619	mg/L	0.200	5.00		10	EPA 300.0	RFL	6/28/16 16:42
Specific Conductance	3940	umhos/cm	100	100		1	FDEP SOP FT 1200	RAB	6/24/16 13:32
Dissolved Oxygen	0.100	mg/L	0.100	0.100		1	FDEP SOP FT 1500	RAB	6/24/16 13:32
Fluoride	0.211	mg/L	0.0100	0.0500		1	EPA 300.0	RFL	6/28/16 16:26
pН	6.80	pH Units	1.00	1.00		1	FDEP SOP FT 1100	RAB	6/24/16 13:32
REDOX Potential	-49.1	mV	-999	-999		1	SM 2580B	RAB	6/24/16 13:32
Total Dissolved Solids	3060	mg/L	24.0	40.0	J-	2	SM 2540C	ТМН	6/28/16 15:09
Sulfate	1240	mg/L	10.0	40.0		20	EPA 300.0	RFL	6/29/16 11:53
Turbidity	8.01	NTU	0.100	0.100		1	FDEP SOP FT 1600	RAB	6/24/16 13:32
Total Mercury by SW846 M	<u> 1ethod 7470/7471</u>								
Mercury	0.0500	ug/L	0.0500	0.200	U	1	EPA 7470A	MCR	7/7/16 10:01
Total Recoverable Metals b	y 200 Series								
Antimony	0.600	ug/L	0.600	2.00	U	1	EPA 200.8	MCR	7/5/16 10:28
Arsenic	8.74	ug/L	0.320	2.00		1	EPA 200.8	MCR	7/5/16 10:28
Cadmium	0.100	ug/L	0.100	0.500	J-, U	1	EPA 200.8	MCR	7/5/16 10:28
Cobalt	1.00	ug/L	1.00	20.0	U	1	EPA 200.7	MCR	7/5/16 13:14
Lead	0.0800	ug/L	0.0800	2.00	U	1	EPA 200.8	MCR	7/5/16 10:28
Selenium	0.696	ug/L	0.200	2.00	I	1	EPA 200.8	MCR	7/5/16 10:28
Thallium	0.100	ug/L	0.100	0.500	U	1	EPA 200.8	MCR	7/5/16 10:28
Total Recoverable Metals b	y SW846 Method	6010B							
Barium	122	ug/L	0.500	20.0		1	EPA 6010B	MCR	7/5/16 13:14
Beryllium	0.200	ug/L	0.200	2.00	U	1	EPA 6010B	MCR	7/5/16 13:14



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### Sample Information

Client: Big Bend Power Station

Lab Sample ID: L16F174-01 Sampled By: Robert Barthelette

Sample Description: PZ1 Date and Time Collected: 6/24/16 13:32
Sample Collection Method: Grab Date of Sample Receipt: 6/24/16 14:25

Sample Qualifer:									
Parameter	Result	Units	MDL	PQL	Qualifier Code	Dil	Test Method	Analyst	Analysis Date & Time
Boron	14400	ug/L	10.0	50.0		1	EPA 6010B	MCR	7/5/16 13:14
Calcium	541000	ug/L	30.0	1000		1	EPA 6010B	MCR	7/8/16 10:58
Chromium	1.60	ug/L	1.60	12.0	U	1	EPA 6010B	MCR	7/5/16 13:14
Molybdenum	106	ug/L	1.00	20.0		1	EPA 6010B	MCR	7/5/16 13:14
			KNL I	aborator	y				
<u>Radium - 226</u>									
Rad - 226	37	pCi/L	0.4	0.4		1	EPA 903.0	KL1	7/1/16 13:23
Rad - 226 Counting Error +/-	2.6	pCi/L				1	EPA 903.0	KL1	7/1/16 13:23
<u>Radium - 228</u>									
Rad - 228	1.6	pCi/L	1.0	1.0		1	EPA Ra-05	KL1	7/5/16 11:17
Rad - 228 Counting Error +/-	0.7	pCi/L				1	EPA Ra-05	KL1	7/5/16 11:17
Radium-226/228									
Rad-226/228	39	pCi/L	1.0	1.0		1	Calc	KL1	7/5/16 11:17
Rad-226/228 Counting Error +/-	2.6	pCi/L				1	Calc	KL1	7/5/16 11:17
			TestAmer	rica Pensa	cola				
Metals (ICP)									
Lithium	0.0083	mg/L	0.0010	0.050	I	1	200.7 Rev 4.4 Z01	GESP	7/1/16 14:31



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### **Sample Information**

Client: Big Bend Power Station

Lab Sample ID: L16F174-02 Sampled By: Robert Barthelette

Sample Description: PZ2 Date and Time Collected: 6/24/16 13:08
Sample Collection Method: Grab Date of Sample Receipt: 6/24/16 14:25

# **Laboratory Results**

Sample Qualifer:									
Parameter	Result	Units	MDL	PQL	Qualifier Code	Dil	Test Method	Analyst	Analysis Date & Time
	T	ampa Elect	ric Comp	any, Labo	oratory Se	rvices			
General Chemistry Paramet	<u>ters</u>								
Chloride	118	mg/L	0.200	5.00		10	EPA 300.0	RFL	6/28/16 17:14
Specific Conductance	1580	umhos/cm	100	100		1	FDEP SOP FT 1200	RAB	6/24/16 13:08
Dissolved Oxygen	0.100	mg/L	0.100	0.100		1	FDEP SOP FT 1500	RAB	6/24/16 13:08
Fluoride	0.148	mg/L	0.0100	0.0500		1	EPA 300.0	RFL	6/28/16 16:58
pH	6.80	pH Units	1.00	1.00		1	FDEP SOP FT 1100	RAB	6/24/16 13:08
REDOX Potential	-71.0	mV	-999	-999		1	SM 2580B	RAB	6/24/16 13:08
Total Dissolved Solids	1170	mg/L	12.0	20.0	J-	1	SM 2540C	ТМН	6/28/16 15:09
Sulfate	471	mg/L	5.00	20.0		10	EPA 300.0	RFL	6/29/16 12:09
Turbidity	4.90	NTU	0.100	0.100		1	FDEP SOP FT 1600	RAB	6/24/16 13:08
Total Mercury by SW846 M	lethod 7470/7471								
Mercury	0.0500	ug/L	0.0500	0.200	U	1	EPA 7470A	MCR	7/7/16 10:05
Total Recoverable Metals by	y 200 Series								
Antimony	0.600	ug/L	0.600	2.00	U	1	EPA 200.8	MCR	7/5/16 10:32
Arsenic	1.83	ug/L	0.320	2.00	I	1	EPA 200.8	MCR	7/5/16 10:32
Cadmium	0.100	ug/L	0.100	0.500	U	1	EPA 200.8	MCR	7/5/16 10:32
Cobalt	1.00	ug/L	1.00	20.0	U	1	EPA 200.7	MCR	7/5/16 13:17
Lead	0.0800	ug/L	0.0800	2.00	U	1	EPA 200.8	MCR	7/5/16 10:32
Selenium	0.376	ug/L	0.200	2.00	I	1	EPA 200.8	MCR	7/5/16 10:32
Thallium	0.100	ug/L	0.100	0.500	U	1	EPA 200.8	MCR	7/5/16 10:32
Total Recoverable Metals by	y SW846 Method	6010B							
Barium	65.0	ug/L	0.500	20.0		1	EPA 6010B	MCR	7/5/16 13:17
Beryllium	0.200	ug/L	0.200	2.00	U	1	EPA 6010B	MCR	7/5/16 13:17



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### Sample Information

Client: Big Bend Power Station

Lab Sample ID: L16F174-02 Sampled By: Robert Barthelette

Sample Description: PZ2 Date and Time Collected: 6/24/16 13:08
Sample Collection Method: Grab Date of Sample Receipt: 6/24/16 14:25

Sample Qualifer:									
Parameter	Result	Units	MDL	PQL	Qualifier Code	Dil	Test Method	Analyst	Analysis Date & Time
Boron	1550	ug/L	10.0	50.0		1	EPA 6010B	MCR	7/5/16 13:17
Calcium	198000	ug/L	30.0	1000		1	EPA 6010B	MCR	7/8/16 11:00
Chromium	1.60	ug/L	1.60	12.0	U	1	EPA 6010B	MCR	7/5/16 13:17
Molybdenum	1.73	ug/L	1.00	20.0	I	1	EPA 6010B	MCR	7/5/16 13:17
			KNL L	aborator	y				
<u>Radium - 226</u>									
Rad - 226	13.4	pCi/L	0.7	0.7		1	EPA 903.0	KL1	7/1/16 13:23
Rad - 226 Counting Error +/-	1.7	pCi/L				1	EPA 903.0	KL1	7/1/16 13:23
<u>Radium - 228</u>									
Rad - 228	1.6	pCi/L	1.0	1.0		1	EPA Ra-05	KL1	7/5/16 11:17
Rad - 228 Counting Error +/-	0.7	pCi/L				1	EPA Ra-05	KL1	7/5/16 11:17
Radium-226/228									
Rad-226/228	15.0	pCi/L	1.0	1.0		1	Calc	KL1	7/5/16 11:17
Rad-226/228 Counting Error +/-	1.7	pCi/L				1	Calc	KL1	7/5/16 11:17
			TestAmer	ica Pensa	cola				
Metals (ICP)									
Lithium	0.010	mg/L	0.0010	0.050	I	1	200.7 Rev 4.4 Z01	GESP	7/1/16 14:35



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## **Sample Information**

Client: Big Bend Power Station

Lab Sample ID: L16F174-03 Sampled By: Robert Barthelette

Sample Description: PZ3 Date and Time Collected: 6/24/16 12:31
Sample Collection Method: Grab Date of Sample Receipt: 6/24/16 14:25

# **Laboratory Results**

Sample Qualifer:									
Parameter	Result	Units	MDL	PQL	Qualifier Code	Dil	Test Method	Analyst	Analysis Date & Time
	T	ampa Elect	tric Comp	any, Labo	oratory Se	rvices			
General Chemistry Paramet	<u>ers</u>								
Chloride	88.9	mg/L	0.0200	0.500		1	EPA 300.0	RFL	6/28/16 17:30
Specific Conductance	1580	umhos/cm	100	100		1	FDEP SOP FT 1200	RAB	6/24/16 12:31
Dissolved Oxygen	0.540	mg/L	0.100	0.100		1	FDEP SOP FT 1500	RAB	6/24/16 12:31
Fluoride	0.313	mg/L	0.0100	0.0500		1	EPA 300.0	RFL	6/28/16 17:30
pH	6.42	pH Units	1.00	1.00		1	FDEP SOP FT 1100	RAB	6/24/16 12:31
REDOX Potential	-145	mV	-999	-999		1	SM 2580B	RAB	6/24/16 12:31
Total Dissolved Solids	1200	mg/L	12.0	20.0		1	SM 2540C	ТМН	6/28/16 15:09
Sulfate	474	mg/L	5.00	20.0		10	EPA 300.0	RFL	6/29/16 12:25
Turbidity	11.5	NTU	0.100	0.100		1	FDEP SOP FT 1600	RAB	6/24/16 12:31
Total Mercury by SW846 Me	ethod 7470/7471								
Mercury	0.0580	ug/L	0.0500	0.200	I	1	EPA 7470A	MCR	7/7/16 10:08
Total Recoverable Metals by	200 Series								
Antimony	0.600	ug/L	0.600	2.00	U	1	EPA 200.8	MCR	7/5/16 10:36
Arsenic	1.23	ug/L	0.320	2.00	I	1	EPA 200.8	MCR	7/5/16 10:36
Cadmium	0.100	ug/L	0.100	0.500	U	1	EPA 200.8	MCR	7/5/16 10:36
Cobalt	1.00	ug/L	1.00	20.0	U	1	EPA 200.7	MCR	7/5/16 13:20
Lead	0.125	ug/L	0.0800	2.00	I	1	EPA 200.8	MCR	7/5/16 10:36
Selenium	0.262	ug/L	0.200	2.00	I	1	EPA 200.8	MCR	7/5/16 10:36
Thallium	0.100	ug/L	0.100	0.500	U	1	EPA 200.8	MCR	7/5/16 10:36
Total Recoverable Metals by	SW846 Method	6010B							
Barium	65.3	ug/L	0.500	20.0		1	EPA 6010B	MCR	7/5/16 13:20
Beryllium	0.200	ug/L	0.200	2.00	U	1	EPA 6010B	MCR	7/5/16 13:20



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### **Sample Information**

Client: Big Bend Power Station

Lab Sample ID: L16F174-03 Sampled By: Robert Barthelette

Sample Description: PZ3 Date and Time Collected: 6/24/16 12:31
Sample Collection Method: Grab Date of Sample Receipt: 6/24/16 14:25

Sample Qualifer:									
Parameter	Result	Units	MDL	PQL	Qualifier Code	Dil	Test Method	Analyst	Analysis Date & Time
Boron	662	ug/L	10.0	50.0		1	EPA 6010B	MCR	7/5/16 13:20
Calcium	187000	ug/L	30.0	1000		1	EPA 6010B	MCR	7/8/16 11:03
Chromium	1.60	ug/L	1.60	12.0	U	1	EPA 6010B	MCR	7/5/16 13:20
Molybdenum	4.09	ug/L	1.00	20.0	I	1	EPA 6010B	MCR	7/5/16 13:20
			KNL L	aboratory	y				
<u>Radium - 226</u>									
Rad - 226	9.6	pCi/L	0.5	0.5		1	EPA 903.0	KL1	7/1/16 13:23
Rad - 226 Counting Error +/-	1.4	pCi/L				1	EPA 903.0	KL1	7/1/16 13:23
<u>Radium - 228</u>									
Rad - 228	1.0	pCi/L	1.0	1.0	U	1	EPA Ra-05	KL1	7/5/16 11:17
Rad - 228 Counting Error +/-	0.6	pCi/L				1	EPA Ra-05	KL1	7/5/16 11:17
Radium-226/228									
Rad-226/228	10.3	pCi/L	1.0	1.0		1	Calc	KL1	7/5/16 11:17
Rad-226/228 Counting Error +/-	1.4	pCi/L				1	Calc	KL1	7/5/16 11:17
			TestAmer	ica Pensa	cola				
Metals (ICP)									
Lithium	0.0037	mg/L	0.0010	0.050	I	1	200.7 Rev 4.4 Z01	GESP	7/1/16 14:38



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## **Sample Information**

Client: Big Bend Power Station

Lab Sample ID: L16F174-04 Sampled By: Robert Barthelette

Sample Description: PZ4 Date and Time Collected: 6/24/16 12:00
Sample Collection Method: Grab Date of Sample Receipt: 6/24/16 14:25

# **Laboratory Results**

Sample Qualifer:									
Parameter	Result	Units	MDL	PQL	Qualifier Code	Dil	Test Method	Analyst	Analysis Date & Time
	T	ampa Elect	ric Comp	any, Labo	oratory Se	rvices			
<b>General Chemistry Parameters</b>									
Chloride	28.7	mg/L	0.0200	0.500		1	EPA 300.0	RFL	6/28/16 18:02
Specific Conductance	1370	umhos/cm	100	100		1	FDEP SOP FT 1200	RAB	6/24/16 12:00
Dissolved Oxygen	0.150	mg/L	0.100	0.100		1	FDEP SOP FT 1500	RAB	6/24/16 12:00
Fluoride	0.151	mg/L	0.0100	0.0500		1	EPA 300.0	RFL	6/28/16 18:02
pH	6.70	pH Units	1.00	1.00		1	FDEP SOP FT 1100	RAB	6/24/16 12:00
REDOX Potential	-74.9	mV	-999	-999		1	SM 2580B	RAB	6/24/16 12:00
Total Dissolved Solids	1090	mg/L	12.0	20.0		1	SM 2540C	TMH	6/28/16 15:09
Sulfate	442	mg/L	5.00	20.0		10	EPA 300.0	RFL	6/29/16 12:41
Turbidity	5.66	NTU	0.100	0.100		1	FDEP SOP FT 1600	RAB	6/24/16 12:00
Total Mercury by SW846 Metho	d 7470/7471								
Mercury	0.0500	ug/L	0.0500	0.200	U	1	EPA 7470A	MCR	7/7/16 10:12
<b>Total Recoverable Metals by 200</b>	<u>Series</u>								
Antimony	0.600	ug/L	0.600	2.00	U	1	EPA 200.8	MCR	7/5/16 10:40
Arsenic	48.6	ug/L	0.320	2.00		1	EPA 200.8	MCR	7/5/16 10:40
Cadmium	0.100	ug/L	0.100	0.500	U	1	EPA 200.8	MCR	7/5/16 10:40
Cobalt	1.00	ug/L	1.00	20.0	U	1	EPA 200.7	MCR	7/5/16 13:23
Lead	0.0800	ug/L	0.0800	2.00	U	1	EPA 200.8	MCR	7/5/16 10:40
Selenium	0.205	ug/L	0.200	2.00	I	1	EPA 200.8	MCR	7/5/16 10:40
Thallium	0.100	ug/L	0.100	0.500	U	1	EPA 200.8	MCR	7/5/16 10:40
<b>Total Recoverable Metals by SW</b>	846 Method	6010B							
Barium	57.2	ug/L	0.500	20.0		1	EPA 6010B	MCR	7/5/16 13:23
Beryllium	0.200	ug/L	0.200	2.00	U	1	EPA 6010B	MCR	7/5/16 13:23



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### Sample Information

Client: Big Bend Power Station

Lab Sample ID: L16F174-04 Sampled By: Robert Barthelette

Sample Description: PZ4 Date and Time Collected: 6/24/16 12:00
Sample Collection Method: Grab Date of Sample Receipt: 6/24/16 14:25

Sample Qualifer:									
Parameter	Result	Units	MDL	PQL	Qualifier Code	Dil	Test Method	Analyst	Analysis Date & Time
Boron	495	ug/L	10.0	50.0		1	EPA 6010B	MCR	7/5/16 13:23
Calcium	231000	ug/L	30.0	1000		1	EPA 6010B	MCR	7/8/16 11:05
Chromium	1.60	ug/L	1.60	12.0	U	1	EPA 6010B	MCR	7/5/16 13:23
Molybdenum	1.66	ug/L	1.00	20.0	I	1	EPA 6010B	MCR	7/5/16 13:23
			KNL I	aborator	y				
<u>Radium - 226</u>									
Rad - 226	9.6	pCi/L	0.6	0.6		1	EPA 903.0	KL1	7/1/16 13:23
Rad - 226 Counting Error +/-	1.5	pCi/L				1	EPA 903.0	KL1	7/1/16 13:23
<u>Radium - 228</u>									
Rad - 228	1.8	pCi/L	1.0	1.0		1	EPA Ra-05	KL1	7/5/16 11:17
Rad - 228 Counting Error +/-	0.8	pCi/L				1	EPA Ra-05	KL1	7/5/16 11:17
Radium-226/228									
Rad-226/228	11.4	pCi/L	1.0	1.0		1	Calc	KL1	7/5/16 11:17
Rad-226/228 Counting Error +/-	1.5	pCi/L				1	Calc	KL1	7/5/16 11:17
			TestAmer	ica Pensa	cola				
Metals (ICP)									
Lithium	0.0028	mg/L	0.0010	0.050	I	1	200.7 Rev 4.4 Z01	GESP	7/1/16 14:42



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## **Sample Information**

Client: Big Bend Power Station

Lab Sample ID: L16F174-05 Sampled By: Robert Barthelette

Sample Description: PZ5 Date and Time Collected: 6/24/16 11:23
Sample Collection Method: Grab Date of Sample Receipt: 6/24/16 14:25

## **Laboratory Results**

Sample Qualifer:									
Parameter	Result	Units	MDL	PQL	Qualifier Code	Dil	Test Method	Analyst	Analysis Date & Time
	Т	ampa Elect	tric Comp	any, Labo	oratory Se	rvices			
General Chemistry Paramet	<u>ers</u>								
Chloride	1140	mg/L	0.400	10.0	J-	20	EPA 300.0	RFL	6/29/16 12:56
Specific Conductance	5620	umhos/cm	100	100		1	FDEP SOP FT 1200	RAB	6/24/16 11:23
Dissolved Oxygen	0.180	mg/L	0.100	0.100		1	FDEP SOP FT 1500	RAB	6/24/16 11:23
Fluoride	0.199	mg/L	0.0100	0.0500		1	EPA 300.0	RFL	6/28/16 19:06
pН	6.51	pH Units	1.00	1.00		1	FDEP SOP FT 1100	RAB	6/24/16 11:23
REDOX Potential	-8.60	mV	-999	-999		1	SM 2580B	RAB	6/24/16 11:23
Total Dissolved Solids	5050	mg/L	48.0	80.0	J-	4	SM 2540C	TMH	6/28/16 15:09
Sulfate	1440	mg/L	10.0	40.0	J-	20	EPA 300.0	RFL	6/29/16 12:56
Turbidity	5.14	NTU	0.100	0.100		1	FDEP SOP FT 1600	RAB	6/24/16 11:23
Total Mercury by SW846 M	ethod 7470/7471								
Mercury	0.0500	ug/L	0.0500	0.200	U	1	EPA 7470A	MCR	7/7/16 10:22
Total Recoverable Metals by	200 Series								
Antimony	0.600	ug/L	0.600	2.00	U	1	EPA 200.8	MCR	7/5/16 10:44
Arsenic	10.2	ug/L	0.320	2.00		1	EPA 200.8	MCR	7/5/16 10:44
Cadmium	0.100	ug/L	0.100	0.500	U	1	EPA 200.8	MCR	7/5/16 10:44
Cobalt	1.40	ug/L	1.00	20.0	I	1	EPA 200.7	MCR	7/5/16 13:26
Lead	0.0800	ug/L	0.0800	2.00	U	1	EPA 200.8	MCR	7/5/16 10:44
Selenium	2.09	ug/L	0.200	2.00		1	EPA 200.8	MCR	7/5/16 10:44
Thallium	0.118	ug/L	0.100	0.500	I	1	EPA 200.8	MCR	7/5/16 10:44
Total Recoverable Metals by	SW846 Method	6010B							
Barium	72.9	ug/L	0.500	20.0		1	EPA 6010B	MCR	7/5/16 13:26
Beryllium	0.200	ug/L	0.200	2.00	U	1	EPA 6010B	MCR	7/5/16 13:26



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### Sample Information

Client: Big Bend Power Station

Lab Sample ID: L16F174-05 Sampled By: Robert Barthelette

Sample Description: PZ5 Date and Time Collected: 6/24/16 11:23
Sample Collection Method: Grab Date of Sample Receipt: 6/24/16 14:25

Sample Qualifer:									
Parameter	Result	Units	MDL	PQL	Qualifier Code	Dil	Test Method	Analyst	Analysis Date & Time
Boron	59100	ug/L	10.0	50.0		1	EPA 6010B	MCR	7/5/16 13:26
Calcium	781000	ug/L	30.0	1000		1	EPA 6010B	MCR	7/8/16 11:08
Chromium	1.60	ug/L	1.60	12.0	U	1	EPA 6010B	MCR	7/5/16 13:26
Molybdenum	4.46	ug/L	1.00	20.0	I	1	EPA 6010B	MCR	7/5/16 13:26
			KNL L	aborator	y				
<u>Radium - 226</u>									
Rad - 226	34	pCi/L	0.4	0.4		1	EPA 903.0	KL1	7/1/16 13:23
Rad - 226 Counting Error +/-	2.3	pCi/L				1	EPA 903.0	KL1	7/1/16 13:23
<u>Radium - 228</u>									
Rad - 228	4.2	pCi/L	1.0	1.0		1	EPA Ra-05	KL1	7/5/16 11:17
Rad - 228 Counting Error +/-	0.9	pCi/L				1	EPA Ra-05	KL1	7/5/16 11:17
Radium-226/228									
Rad-226/228	38	pCi/L	1.0	1.0		1	Calc	KL1	7/5/16 11:17
Rad-226/228 Counting Error +/-	2.3	pCi/L				1	Calc	KL1	7/5/16 11:17
			TestAmer	ica Pensa	cola				
Metals (ICP)									
Lithium	0.0089	mg/L	0.0010	0.050	I	1	200.7 Rev 4.4 Z01	GESP	7/1/16 14:45



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## **Sample Information**

Client: Big Bend Power Station

Lab Sample ID: L16F174-06 Sampled By: Robert Barthelette

Sample Description: PZ6 Date and Time Collected: 6/24/16 10:50
Sample Collection Method: Grab Date of Sample Receipt: 6/24/16 14:25

# **Laboratory Results**

Sample Qualifer:									
Parameter	Result	Units	MDL	PQL	Qualifier Code	Dil	Test Method	Analyst	Analysis Date & Time
	T	ampa Elect	ric Comp	any, Lab	oratory Se	rvices			
<b>General Chemistry Paramet</b>	<u>ters</u>								
Chloride	123	mg/L	0.200	5.00		10	EPA 300.0	RFL	6/28/16 19:53
Specific Conductance	1640	umhos/cm	100	100		1	FDEP SOP FT 1200	RAB	6/24/16 10:50
Dissolved Oxygen	0.370	mg/L	0.100	0.100		1	FDEP SOP FT 1500	RAB	6/24/16 10:50
Fluoride	0.409	mg/L	0.0100	0.0500		1	EPA 300.0	RFL	6/28/16 19:37
pH	6.53	pH Units	1.00	1.00		1	FDEP SOP FT 1100	RAB	6/24/16 10:50
REDOX Potential	-59.4	mV	-999	-999		1	SM 2580B	RAB	6/24/16 10:50
Total Dissolved Solids	1230	mg/L	12.0	20.0	J-	1	SM 2540C	TMH	6/28/16 15:09
Sulfate	414	mg/L	5.00	20.0		10	EPA 300.0	RFL	6/29/16 13:44
Turbidity	6.70	NTU	0.100	0.100		1	FDEP SOP FT 1600	RAB	6/24/16 10:50
Total Mercury by SW846 M	ethod 7470/7471								
Mercury	0.0500	ug/L	0.0500	0.200	U	1	EPA 7470A	MCR	7/7/16 10:26
Total Recoverable Metals by	200 Series								
Antimony	0.600	ug/L	0.600	2.00	U	1	EPA 200.8	MCR	7/5/16 10:47
Arsenic	2.65	ug/L	0.320	2.00		1	EPA 200.8	MCR	7/5/16 10:47
Cadmium	0.100	ug/L	0.100	0.500	U	1	EPA 200.8	MCR	7/5/16 10:47
Cobalt	1.00	ug/L	1.00	20.0	U	1	EPA 200.7	MCR	7/5/16 13:35
Lead	0.0800	ug/L	0.0800	2.00	U	1	EPA 200.8	MCR	7/5/16 10:47
Selenium	0.722	ug/L	0.200	2.00	I	1	EPA 200.8	MCR	7/5/16 10:47
Thallium	0.100	ug/L	0.100	0.500	U	1	EPA 200.8	MCR	7/5/16 10:47
Total Recoverable Metals by	SW846 Method	6010B							
Barium	51.3	ug/L	0.500	20.0		1	EPA 6010B	MCR	7/5/16 13:35
Beryllium	0.200	ug/L	0.200	2.00	U	1	EPA 6010B	MCR	7/5/16 13:35



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### Sample Information

Client: Big Bend Power Station

Lab Sample ID: L16F174-06 Sampled By: Robert Barthelette

Sample Description: PZ6 Date and Time Collected: 6/24/16 10:50
Sample Collection Method: Grab Date of Sample Receipt: 6/24/16 14:25

Sample Qualifer:									
Parameter	Result	Units	MDL	PQL	Qualifier Code	Dil	Test Method	Analyst	Analysis Date & Time
Boron	3890	ug/L	10.0	50.0		1	EPA 6010B	MCR	7/7/16 14:51
Calcium	313000	ug/L	30.0	1000		1	EPA 6010B	MCR	7/8/16 11:10
Chromium	1.60	ug/L	1.60	12.0	U	1	EPA 6010B	MCR	7/5/16 13:35
Molybdenum	2.40	ug/L	1.00	20.0	I	1	EPA 6010B	MCR	7/5/16 13:35
			KNL I	aborator	y				
<b>Radium - 226</b>									
Rad - 226	4.2	pCi/L	0.5	0.5		1	EPA 903.0	KL1	7/1/16 13:23
Rad - 226 Counting Error +/-	0.9	pCi/L				1	EPA 903.0	KL1	7/1/16 13:23
<u>Radium - 228</u>									
Rad - 228	1.0	pCi/L	1.0	1.0	U	1	EPA Ra-05	KL1	7/5/16 11:17
Rad - 228 Counting Error +/-	0.7	pCi/L				1	EPA Ra-05	KL1	7/5/16 11:17
Radium-226/228									
Rad-226/228	4.8	pCi/L	1.0	1.0		1	Calc	KL1	7/5/16 11:17
Rad-226/228 Counting Error +/-	0.9	pCi/L				1	Calc	KL1	7/5/16 11:17
			TestAmer	ica Pensa	cola				
Metals (ICP)									
Lithium	0.0038	mg/L	0.0010	0.050	I	1	200.7 Rev 4.4 Z01	GESP	7/1/16 14:49



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## **Sample Information**

Client: Big Bend Power Station

Lab Sample ID: L16F174-07 Sampled By: Robert Barthelette

Sample Description: MWB-35 Date and Time Collected: 6/24/16 10:19
Sample Collection Method: Grab Date of Sample Receipt: 6/24/16 14:25

# **Laboratory Results**

Sample Qualifer:									
Parameter	Result	Units	MDL	PQL	Qualifier Code	Dil	Test Method	Analyst	Analysis Date & Time
	T	ampa Elect	ric Comp	any, Labo	oratory Se	rvices			
<b>General Chemistry Parameters</b>									
Chloride	15.1	mg/L	0.0200	0.500		1	EPA 300.0	RFL	6/28/16 20:09
Specific Conductance	1520	umhos/cm	100	100		1	FDEP SOP FT 1200	RAB	6/24/16 10:19
Dissolved Oxygen	0.360	mg/L	0.100	0.100		1	FDEP SOP FT 1500	RAB	6/24/16 10:19
Fluoride	0.996	mg/L	0.0100	0.0500		1	EPA 300.0	RFL	6/28/16 20:09
pH	6.80	pH Units	1.00	1.00		1	FDEP SOP FT 1100	RAB	6/24/16 10:19
REDOX Potential	-57.0	mV	-999	-999		1	SM 2580B	RAB	6/24/16 10:19
Total Dissolved Solids	1160	mg/L	12.0	20.0		1	SM 2540C	TMH	6/28/16 15:09
Sulfate	420	mg/L	5.00	20.0		10	EPA 300.0	RFL	6/29/16 14:32
Turbidity	1.22	NTU	0.100	0.100		1	FDEP SOP FT 1600	RAB	6/24/16 10:19
<b>Total Mercury by SW846 Metho</b>	d 7470/7471								
Mercury	0.0500	ug/L	0.0500	0.200	U	1	EPA 7470A	MCR	7/7/16 10:13
<b>Total Recoverable Metals by 200</b>	<u>Series</u>								
Antimony	0.600	ug/L	0.600	2.00	U	1	EPA 200.8	MCR	7/5/16 11:45
Arsenic	4.30	ug/L	0.320	2.00		1	EPA 200.8	MCR	7/5/16 11:45
Cadmium	0.100	ug/L	0.100	0.500	U	1	EPA 200.8	MCR	7/5/16 11:45
Cobalt	1.00	ug/L	1.00	20.0	U	1	EPA 200.7	MCR	7/5/16 13:38
Lead	0.0800	ug/L	0.0800	2.00	U	1	EPA 200.8	MCR	7/5/16 11:45
Selenium	0.533	ug/L	0.200	2.00	I	1	EPA 200.8	MCR	7/5/16 11:45
Thallium	0.100	ug/L	0.100	0.500	U	1	EPA 200.8	MCR	7/5/16 11:45
<b>Total Recoverable Metals by SW</b>	846 Method	6010B							
Barium	46.0	ug/L	0.500	20.0		1	EPA 6010B	MCR	7/5/16 13:38
Beryllium	0.200	ug/L	0.200	2.00	U	1	EPA 6010B	MCR	7/5/16 13:38



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### Sample Information

Client: Big Bend Power Station

Lab Sample ID: L16F174-07 Sampled By: Robert Barthelette

Sample Description: MWB-35 Date and Time Collected: 6/24/16 10:19
Sample Collection Method: Grab Date of Sample Receipt: 6/24/16 14:25

Sample Qualifer:									
Parameter	Result	Units	MDL	PQL	Qualifier Code	Dil	Test Method	Analyst	Analysis Date & Time
Boron	1690	ug/L	10.0	50.0		1	EPA 6010B	MCR	7/7/16 14:54
Calcium	313000	ug/L	30.0	1000		1	EPA 6010B	MCR	7/8/16 11:21
Chromium	1.60	ug/L	1.60	12.0	U	1	EPA 6010B	MCR	7/5/16 13:38
Molybdenum	41.0	ug/L	1.00	20.0		1	EPA 6010B	MCR	7/5/16 13:38
			KNL I	aborator	y				
<u>Radium - 226</u>									
Rad - 226	1.7	pCi/L	0.4	0.4		1	EPA 903.0	KL1	7/1/16 13:23
Rad - 226 Counting Error +/-	0.6	pCi/L				1	EPA 903.0	KL1	7/1/16 13:23
<u>Radium - 228</u>									
Rad - 228	1.0	pCi/L	1.0	1.0	U	1	EPA Ra-05	KL1	7/5/16 11:17
Rad - 228 Counting Error +/-	0.7	pCi/L				1	EPA Ra-05	KL1	7/5/16 11:17
Radium-226/228									
Rad-226/228	2.2	pCi/L	1.0	1.0		1	Calc	KL1	7/5/16 11:17
Rad-226/228 Counting Error +/-	0.7	pCi/L				1	Calc	KL1	7/5/16 11:17
			TestAmer	ica Pensa	cola				
Metals (ICP)									
Lithium	0.0056	mg/L	0.0010	0.050	I	1	200.7 Rev 4.4 Z01	GESP	7/1/16 15:02



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## **Sample Information**

Client: Big Bend Power Station

Lab Sample ID: L16F174-08 Sampled By: Robert Barthelette

Sample Description: MWB-36 Date and Time Collected: 6/24/16 9:50
Sample Collection Method: Grab Date of Sample Receipt: 6/24/16 14:25

# **Laboratory Results**

Sample Qualifer:									
Parameter	Result	Units	MDL	PQL	Qualifier Code	Dil	Test Method	Analyst	Analysis Date & Time
	T	ampa Elect	tric Comp	any, Labo	oratory Se	rvices			
<b>General Chemistry Parameters</b>									
Chloride	154	mg/L	0.200	5.00		10	EPA 300.0	RFL	6/28/16 22:01
Specific Conductance	2640	umhos/cm	100	100		1	FDEP SOP FT 1200	RAB	6/24/16 9:50
Dissolved Oxygen	0.710	mg/L	0.100	0.100		1	FDEP SOP FT 1500	RAB	6/24/16 9:50
Fluoride	1.07	mg/L	0.0100	0.0500		1	EPA 300.0	RFL	6/28/16 21:13
pH	6.91	pH Units	1.00	1.00		1	FDEP SOP FT 1100	RAB	6/24/16 9:50
REDOX Potential	-244	mV	-999	-999		1	SM 2580B	RAB	6/24/16 9:50
Total Dissolved Solids	2330	mg/L	24.0	40.0		2	SM 2540C	TMH	6/28/16 15:09
Sulfate	1170	mg/L	10.0	40.0		20	EPA 300.0	RFL	6/29/16 16:56
Turbidity	1.70	NTU	0.100	0.100		1	FDEP SOP FT 1600	RAB	6/24/16 9:50
Total Mercury by SW846 Metho	od 7470/7471								
Mercury	0.0500	ug/L	0.0500	0.200	U	1	EPA 7470A	MCR	7/7/16 10:33
<b>Total Recoverable Metals by 200</b>	<u>) Series</u>								
Antimony	0.600	ug/L	0.600	2.00	U	1	EPA 200.8	MCR	7/5/16 11:48
Arsenic	27.5	ug/L	0.320	2.00		1	EPA 200.8	MCR	7/5/16 11:48
Cadmium	0.100	ug/L	0.100	0.500	U	1	EPA 200.8	MCR	7/5/16 11:48
Cobalt	1.00	ug/L	1.00	20.0	U	1	EPA 200.7	MCR	7/5/16 13:41
Lead	0.0800	ug/L	0.0800	2.00	U	1	EPA 200.8	MCR	7/5/16 11:48
Selenium	0.414	ug/L	0.200	2.00	I	1	EPA 200.8	MCR	7/5/16 11:48
Thallium	0.100	ug/L	0.100	0.500	U	1	EPA 200.8	MCR	7/5/16 11:48
<b>Total Recoverable Metals by SW</b>	V846 Method	6010B							
Barium	87.4	ug/L	0.500	20.0		1	EPA 6010B	MCR	7/5/16 13:41
Beryllium	0.200	ug/L	0.200	2.00	U	1	EPA 6010B	MCR	7/5/16 13:41



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### **Sample Information**

Client: Big Bend Power Station

Lab Sample ID: L16F174-08 Sampled By: Robert Barthelette

Sample Description: MWB-36 Date and Time Collected: 6/24/16 9:50
Sample Collection Method: Grab Date of Sample Receipt: 6/24/16 14:25

# **Laboratory Results**

Sample Qualifer:									
Parameter	Result	Units	MDL	PQL	Qualifier Code	Dil	Test Method	Analyst	Analysis Date & Time
Boron	4380	ug/L	10.0	50.0		1	EPA 6010B	MCR	7/7/16 14:56
Calcium	554000	ug/L	30.0	1000		1	EPA 6010B	MCR	7/8/16 11:23
Chromium	1.60	ug/L	1.60	12.0	U	1	EPA 6010B	MCR	7/5/16 13:41
Molybdenum	12.8	ug/L	1.00	20.0	I	1	EPA 6010B	MCR	7/5/16 13:41
			KNL L	aborator	y				
<u>Radium - 226</u>									
Rad - 226	3.0	pCi/L	0.5	0.5		1	EPA 903.0	KL1	7/1/16 13:23
Rad - 226 Counting Error +/-	0.7	pCi/L				1	EPA 903.0	KL1	7/1/16 13:23
<u>Radium - 228</u>									
Rad - 228	1.0	pCi/L	1.0	1.0	U	1	EPA Ra-05	KL1	7/5/16 11:17
Rad - 228 Counting Error +/-	0.7	pCi/L				1	EPA Ra-05	KL1	7/5/16 11:17
Radium-226/228									
Rad-226/228	3.0	pCi/L	1.0	1.0		1	Calc	KL1	7/5/16 11:17
Rad-226/228 Counting Error +/-	0.7	pCi/L				1	Calc	KL1	7/5/16 11:17
			TestAmer	ica Pensa	cola				
Metals (ICP)									
Lithium	0.0043	mg/L	0.0010	0.050	I	1	200.7 Rev 4.4 Z01	GESP	7/1/16 15:05

#### **Comments**

- U Indicates that the compound was analyzed for but not detected.
- J- The reported value is an estimated value, see the case narrative for specifics.
- I Estimated value
- The reported value is between the laboratory method detection limit and the laboratory practical quantitation limit.

### **Subcontract Laboratories:**

KNL Laboratory E84025

TestAmerica Pensacola E81010



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Tampa Electric Company, Laboratory Services

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Peggy Penner, Manager, Laboratory Services

Sampler(s) / RAB /TECO Initials 06/24/15 Initials Big Bend File Name: 062415 Wells RAB PTLY CLOUDY & HOT Date: Weather: Site: NGVD LIMS # **Loction Code** FE2 Time pH (SU) Temp °C Cond(uMHOS) DO Mg/L Turbidity(NTU) Redox (mv) Sulfite (mg/L) Color Odor TEMP-C COND-F TURB-N-F SO3-TR SCOLOR-W SODOR-W Time LEVEL mg/l PH DO REDOX CCR-PZ-1 25.5 3945 -49.1 LT. YELLOW NONE L16F174-01 13:32 6.8 0.1 8.0 L16F074-02 CCR-PZ-2 13:08 25.6 1576 0.1 4.9 -71.0 LT. YELLOW NONE 500 ml Nuts (2) 1L Rads Diss. (1) Total Containers LIMS # 250ml Cyan (3) 1L Inorg (1) 500ml Inorg (2) 250ml Inorg (3) 1L Mtls (1) 250ml Mtls (3) 1L Rads (1) 500ml Sulfide (2) 500ml Mtls (2) 250ml Nuts (3) 40ml Vial (6) L16F174-01 1 2 ~ L16F074-02 1 1 2 (1) 1L plastic (PP) (2) 500ml plastic (PP) (3) 250ml plastic (PP) (4) 100ml coliform bottle (5) 1L amber glass (AG) (6) 40ml VOA vial (CG) Samples On Ice Sample Reciept Yes No 0107301Y 0218201Y ESS 0307301Y Time 14:25 ESS ESS ESS ESS Pres ID Temp 0.8 Pres ID Pres ID Preservation Preservation Preservation 011663 500 ml bottles(Sulfide) 2ml NAOH/Zinc Acet, to pH >12 1L bottles (rads): 5 ml HNO3 to pH <2 250ml bottles (nuts): 1 ml H2SO4 to pH <2 500 ml bottles (metals): 2 ml HNO3 to pH <2 40 ml Vial (TOC): 0.5 ml H2SO4 to pH <2 250 ml bottles (Cyan) 1g NAOH to pH >12 011663 A checked box indicates that the sample was verified to a pH of <2 250 ml bottles (metal): 1 ml HNO3 to pH <2 1L bottles (diss. rads): filtered with 0.45um, 5 ml HNO3 to pH <2 H Meter Calibration Buffer ID Buffer Value Cal CCV Redox Cal Temp °C Reading my Theo Value my Time Time MPM08 015169A 27.4 226.1 228.4 Meter ID: 7 7.02 8:05 7.04 14:30 Meter ID: 8:00 DEP FT 1100 015170 10 10.05 8:05 QC: (pH +/- 0.2) (Cond +/- 5%) (DO +/- 0.3mg/L) (Redox +/- 10mv) MPM08 14:30 21.1 236.4 236.2 015083A Jnits: SU 4 3.98 8:05 A checked box indicates ICV / CCV passed Zobell Sol ID: Conductivity Meter Calib. 014277 Standard ID Std Value Cal Time Time 014668A 1000 Temp °C Meter ID: MPM08 1000 8:15 DO Meter Cal Time Reading mg/l Theo Value mg/l 7:55 21.1 8.96 8.915 FDEP FT 1200, Units: uMHOS 013576A 10000 10023 8:15 10041 14:20 Meter ID: 8.950 15:05 20.9 9.02 **Turbidity Meter Calibration** Standard ID Std Value Acceptability Range ICV Time CCV Time MPM08 013677 4.86 7:40 **TM07** 5.40 5.94 5.68 Barom. Pres Meter ID: FDEP FT 1600, Units: NTU 013678 53.40 49.93 56.87 53.80 14:00 760 Conduct.(%) Sulfite Info (QC Check) (EPA 377.1) QC Result mg/l Time Titrator ID Na Thio ID DO 3 Pillow ID Starch Ind. ID lodate/lodide ID Therm ID pH DO (mg/l) Redox (mv) MPM08 0.2 5 0.3 10 QC Std: 5ml (NaThio)/500ml DI=10mg/L **Purging Information** Well Capacities (gallons/ ft): 2" = 0.16 4" =0.65 Tubing Inside Diam. Capacities Gallons/ft): 1/4" =0.0026, 3/8" =0.006 Depth to Tubing Screen Intake Water (ft) Column (ft) X Capacity (gal) = Capacity (gal/ft) Depth Volume (gal) Length Volume Volume (gal) Diam/ Comp Interval (ft) Depth (ft) (#) CCR-PZ-1 0 0.06 0.12 2 10 15.29 20.29 2.42 0.0026 21.3 5.14 15.15 0.16 Purge Meth Time Volume (gal) Water Depth (ft) Temp °C Cond (uMHOS) DO (mg/L) Turbidity (NTU) Purge Criteria Status Equipment ID Egpt. Table Rate (ml/min Total Vol. (gal) pH (SU) ph:+/-WLM08 13:23 700 1.29 1.29 6.84 25.50 3946 0.12 9.33 0.2 STABLE Level Meter: 1A 5.34 13:25 700 0.37 6.79 25.47 5.72 Temp\*C+/- 0.2 STABLE Pump: PP 1.66 5.35 3946 0.10 Purge Start: 13:16 13:27 700 0.37 2.03 5.37 6.80 25.48 3945 0.09 8.01 Cond % +/-STABLE Tubing: PE/S 7 DO % Sat. < 20 STABLE Dedicated Yes Purge End: 13:27 urb. NTU < 20 STABLE Tubing? No Purge Complete At 13:17 Gallons to Purge 0.12 Stablility Values = 6.80 25.48 3945 0.09 8.01 Well Capacity (gal) = Well Depth to Water 1 Well Tubing Tubing Cell 1 Eqpt. Depth (ft) -Capacity (gal/ft.) Length (ft) Screen Intake Column (ft) Volume Volume = Volume (gal) (gai) Well# Diam/ Comp Interval (ft) Depth (ft) (ft) (gal) CCR-PZ-2 10 15.64 20.64 5.40 15.24 0.16 2.44 0.0026 21.64 0 0.06 0.12 2 Turbidity (NTU) Eqpt. Table Purge Meth Time Rate (ml/min) Volume (gal) Water Depth (ft) pH (SU) Temp °C Cond (uMHOS) DO (mg/L) Purge Criteria Status Equipment ID Total Vol. (gal) WLM08 12:58 540 0.86 0.86 5.55 6.81 25.62 1540 0.12 8.17 ph:+/-0.2 STABLE Level Meter: 1A 13:00 6.52 0.2 STABLE Pump: PP 540 0.29 1.15 5.54 6.76 25.67 1561 0.11 urge Start: PE/S 12:52 13:02 540 0.29 1.44 5.53 6.75 25.62 1576 0.10 4.86 Cond % +/-5 STABLE Tubing: DO % Sat. < 20 STABLE Dedicated ~ Yes Purge End: Turb. NTU < 20 STABLE Tubing? No 13:02 Purge Complete At 12:53 Gallons to Purge 0.12 Stablility Values = 6.75 25.62 1576 0.10 4.86 Comments: Total Miles **Total Time** 

CCR-PZ-3 CCR-PZ-4 250ml Cyan (3)	12:31 12:00 1L lnorg (1)	FE <sup>z</sup> mg/l	pH (SU)	Temp °C	Cond(uMHOS)	DO Mg/L	Turbidity(NTU)	Redox (mv)	Sulfite (mg/L)	Color	Odor	N	GVD
CCR-PZ-4	12:00	mg/l		TEMP-C									
CCR-PZ-4	12:00		1200		COND-F	DO	TURB-N-F	REDOX	SO3-TR	SCOLOR-W	\$ODOR-W	Time	LEVEL
		17	6.4	26.6	1577	0.5	11.5	-145		YELLOW	MILD		
250ml Cyan (3)	1L Inorg (1)		6.7	26.6	1372	0.2	5.7	-74.9		CLEAR	MILD		
		500ml Inorg (2)	250ml Inorg (3)	1L Mtls (1)	250ml Mtls (3)	1L Rads (1)	500ml Sulfide (2)	500ml Mtls (2)	250ml Nuts (3)	40ml Vial (6)	500 ml Nuts (2)	1L Rads Diss. (1)	Total Containers
		1			<b>2</b> 1	<b>☑</b> 2							8
		1			<b>☑</b> 1	☑ 2							0
	(2) 500ml plastic	c (PP)	(3) 250ml plastic	(PP)	(4) 100ml coliform b	ottle	(5) 1L amber glass (	AG)	(6) 40ml VOA vial	(CG)		Samples On Ice	Sample Reciept
0107301Y	ESS	0218201Y	ESS	0307301Y	ESS		ESS		ESS			Yes No	Time 14:25
servation			Pres ID		Preservation			Pres ID		Preservation		Pres ID	Temp 0.8
HNO3 to pH <2			L 011663 🗹	250ml bottles (nu	its): 1 ml H2SO4 to p	H <2		L C	500 ml bottles(Sulfi	7	Acet. to pH >12		
	H <2											L D	
							<2	LI D				a pH of <2	
		Ruffer Value				1	1	Time			i	T .	Theo Value my
MPM08	L 015169A		-		104	Time							228.4
THE INIOU	DC 11 (F 0/2) Ng Ng 1				OC: (all +/- 0.3) (C-	nod +/- 5%) /DO +/ 0.2:							236.2
										14.50	21.1	200.4	200.2
nlih					and the second second second			Time	-				
					icv	Titile	CCV	inne		Time	Temp °C	Panding mall	Theo Value mg
			1000	0.10	10022	0.15	10041	14:20		A			8.915
											-		
							CCV	Time		15:05	20.9	9.02	8.950
					5.08	7:40	50.00	44.00		S.			
	013676											2000	
		QC Result mg/l	Time	Titrator ID	Na Thio ID	DO 3 Pillow ID	Starch Ind. ID	lodate/lodide ID					Redox (mv)
					L .	L	L		MPM08	0.2	5	0.3	10
	Well Capacities	s (gallons/ ft): 2"	The state of the s									VA-17	1
Diam/ Comp	Screen Interval (ft)	Intake Depth (ft)	Depth (ft)	Water (ft)	= Water Column (ft)	X Capacity (gal) =	Volume (gal)	( Capacity X (gal/ft.)	Length (ft)	+ Volume +	Malana	Administra	
2	10	15.38	20.38	3.46	16.92	0.16	2.71	0.0026	21.38	0	0.06	0.12	
Time	Rate (ml/min)	Volume (gal)	Total Vol. (gal)	Water Depth (ft)	pH (SU)	Temp °C	Cond (uMHOS)	DO (mg/L)	Turbidity (NTU)	Purge Criteria	Status	Equipment ID	Egpt. Table
12:18	330	0.78	0.78	4.92	6.47	26.62	1617	0.79	13.00	ph:+/- 0.2	STABLE	Level Meter:	WLM08
12:20	330	0.17	0.95	4.90	6.41	26.69	1596	0.62	15.10	Temp*C+/- 0.2	STABLE	Pump:	PP
									-	Cond % +/- 5			PE/S
			17.15	1,55	29178		10.7		11.00	DO % Sat.< 20		-	Yes Yes
													☐ No
At 12:10	Gallons to F	urge 0.12	Stablility	Values =	6.42	26.62	1577	0.54	11 50		011,1020	r comig.	
	Screen	Intake	Well	Depth to Water	= Water Column	Well	1 Well Volume	( Tubing X	Tubing Length )	Pump + Volume (gal) +	Cell Volume (gal) =	1 Eqpt. Volume	
		-				0.46				1 0	1 0.06		4
	The same of the same												
											Committee of the Printer		Eqpt. Table
	7.55	-				-	1		-	-			WLM08
								_					PP
11:47	350	0.18	1.35	5.54	6.70	26.64	1372	0.15	5.66	Cond % +/- 5	STABLE	Tubing:	PE/S
		1 2 1								DO % Sat.< 20	STABLE	Dedicated	☑ Yes
										Turb. NTU < 20	STABLE	Tubing?	☐ No
i i k	1 ml HN03 to pl MPM08  alib. MPM08  uMH0S ration TM07  NTU  k) (EPA 377.1) 500ml DI=10mg/L  Diam/ Comp 2 Time 12:18 12:20 12:22  At 12:10  Diam/ Comp 2 Time 11:43 11:45 11:47	L	1 ml HN03 to pH <2   Buffer ID   Buffer Value	MPM08	Time   Note   Note	1 ml HNO3 to pH <2	Time   HNO3 to pH <2   L   011663   Depth   Depth to   Depth to   Depth to   Depth to   Depth to   Depth (ft)   Time   Diam/ Comp   D	Time   HNO3 to pH <2	1 ml HN03 to pH < 2	1 ml HN03 to pH <2	1 ml HNO3 to pH <2	1 mt NNO3 to pt + 2	Tright NO.3 to pH < 2

Total Miles

Total Time

Site:	Big B		Date:	06/24/15		062415_	Wells_RAD	Weather:	PILTCLO	UDY & HOT	Initials	RAB /TEC		V
LIMS#	Loction Code	Time	FE <sup>2</sup>	pH (SU)	Temp °C	Cond(uMHOS)	DO Mg/L	Turbidity(NTU)	Redox (mv)	Sulfite (mg/L)	Color	Odor		ĞVD
			mg/l	PH	TEMP-C	COND-F	DO	TURB-N-F	REDOX	SO3-TR	\$COLOR-W	\$ODOR-W	Time	LEVEL
_16F174-05		11:23		6.5	27.8	5616	0.2	5.1	-8.6		CLEAR	MILD		
L16F174-06	CCR-PZ-6	10:50		6.5	26.4	1638	0.4	6.7	-59.4		CLEAR	MILD		
LIMS#	250ml Cyan (3)	1L Inorg (1)	500ml Inorg (2)	250ml Inorg (3)	1L Mtls (1)	250ml Mtls (3)	1L Rads (1)	500ml Sulfide (2)	500ml Mtls (2)	250ml Nuts (3)	40ml Vial (6)	500 ml Nuts (2)	1L Rads Diss. (1)	Total Containers
16F174-05			1			<b>1</b>	☑ 2							8
16F174-06			1			<b>2</b> 1	<b>2</b> 2							
) 1L plastic (PF	P)	(2) 500ml plastic	c (PP)	(3) 250ml plastic	(PP)	(4) 100ml coliform b	ottle	(5) 1L amber glass	(AG)	(6) 40ml VOA vial	(CG)		Samples On Ice	Sample Reciept
SS	0107301Y	ESS	0218201Y	ESS	0307301Y	ESS		ESS		ESS		•	Yes No	Time 14:25
	Preservation			Pres ID		Preservation			Pres ID		Preservation		Pres ID	Temp 0.8
bottles (rads):	5 ml HNO3 to pH <2			L 011663 🗹	250ml bottles (nu	its): 1 ml H2SO4 to pl	1<2		L C	500 ml bottles(Sulfi	ide) 2ml NAOH/Zinc	Acet. to pH >12	L	
00 ml bottles (m	netals): 2 ml HNO3 to	oH <2		L O	40 ml Vial (TOC)	0.5 ml H2SO4 to pH	<2			250 ml bottles (Cva	n) 1g NAOH to pH	12	L 🗆	
1 - 7 - 1 - 2 - 2 - 2 - 2 - 2 - 2 - 2 - 2 - 2	netal): 1 ml HNO3 to p			L 011663 🗹		Carlo storio de la carlo de la	5um, 5 ml HNO3 to pH	<2	IL F		1 -	nple was verified to	a pH of <2	
H Meter Calibra		Buffer ID	Buffer Value	Cal	Time	icv	Time	ccv	Time	Redox Cal	Time	Temp °C	Reading my	Theo Value my
Meter ID:	MPM08	L 015169A	7	7.02	8:05		71110	7.04	14:30	Meter ID:	8:00	27.4	226.1	228.4
DEP FT 1100	WII WOO	L 015170	10	10.05	8:05	OC: /eH c/ 0.01/0	nd +1 5%) (DO +1 5.5	1	-	MPM08	14:30	21.1	236.4	236.2
Jnits: SU		L 015083A	4	3.98	8:05	Control of the Control of	cates ICV / CCV pass	mg/L) (Redox +/- 10m	9	Zobell Sol ID:	14.30	21.1	230.4	230.2
	to Callb		Std Value	Cal	Time									
Conductivity Me	MPM08	Standard ID L 014668A	1000			ICV	Time	CCV	Time	L 014277		Temp °C		
Meter ID:		L 013576A		1000	8:15	40000	0.45	10011	44.00	DO Meter Cal	Time		Reading mg/l	Theo Value mg/
DEP FT 1200, U			10000		4.5000000000000000000000000000000000000	10023	8:15	10041	14:20	Meter ID:	7:55	21.1	8.96	8.915
urbidity Meter		Standard ID	Std Value		lity Range	ICV	Time	CCV	Time	MPM08	15:05	20.9	9.02	8.950
Meter ID:	TM07	SF- 013677	5.40	4.86	5.94	5.68	7:40			Barom. Pres				
DEP FT 1600, U	Units: NTU	SF- 013678	53.40	49.93	56.87			53.80	14:00	760				
Sulfite Info (QC	Check) (EPA 377.1)		QC Result mg/l	Time	Titrator ID	Na Thio ID	DO 3 Pillow ID	Starch Ind. ID	lodate/lodide ID	Therm ID	pH	Conduct.( %)	DO (mg/l)	Redox (mv)
QC Std: 5ml (Na	Thio)/500ml DI=10mg/	L				L	L	L	L	MPM08	0.2	5	0.3	10
urging Informa	ation	Well Capacities	(gallons/ ft): 2"	= 0.16 4" = 0.65	S	Tubing Inside Diam		t): 1/4" =0.0026 3/8" =	0.006					
Well#	Diam/ Comp	Screen Interval (ft)	Intake Depth (ft)	Well Depth (ft)	Depth to Water (ft)	= Water Column (ft)	Well Capacity (gal) =	1 Well Volume (gal)	( Tubing X Capacity (gal/ft.)	Tubing Length (ft)	+ Volume + (gal)	Volume (gal) =	1 Eqpt. Volume (gal)	
CCR-PZ-5	2	10	36.03	41.03	25.85	15.18	0.16	2.43	0.016	47.03	0	0.06	0.81	
Purge Meth:	Time	Rate (ml/min)	Volume (gal)	Total Vol. (gal)	Water Depth (ft)	pH (SU)	Temp °C	Cond (uMHOS)	DO (mg/L)	Turbidity (NTU)	Purge Criteria	Status	Equipment ID	Egpt. Table
	11:16	1940	7.69	7.69	26.88	6.51	27.85	5585	0.20	11.30	ph:+/- 0.2	STABLE	Level Meter:	WLM08
1A		1970	1.04	8.73	26.86	6.51	27.86	5598	0.19	7.72	Temp°C+/- 0.2	STABLE	Pump:	ESP
	11:18			14.44			27.84	5616	0.18	5.14	Cond % +/- 5	STABLE	Tubing:	PE
ourge Start:			1.05	9.78	26.85	1 0.51				0111			Dedicated	Yes Yes
Purge Start: 11:01	11:18	1980	1.05	9.78	26.85	6.51	27.04		0.16		DO % Sat < 20	STABLE		□ No
Purge Start: 11:01 Purge End:			1.05	9.78	26.85	6.51	27.04		0.16		DO % Sat < 20	STABLE STABLE	Tubing?	
Purge Start: 11:01 Purge End: 11:20	11:20	1980						5616		5 14	DO % Sat < 20 Turb. NTU < 20	STABLE	Tubing?	
Purge Start: 11:01 Purge End: 11:20 Purge Compl	11:20 lete At 11:03	1980  Gallons to F	Purge 0.81		Values =	6.51  = Water Column	27.84  Well Capacity (gal) =	5616 1 Well Volume (gal)	0.18	5.14 Tubing Length (ti)			1 Eqpt	
Purge Start: 11:01 Purge End: 11:20 Purge Compl	11:20 lete At 11:03	1980  Gallons to F  Screen Interval (ft)	Purge 0.81	Stability Well Depth (ft)	Values =  Depth to Water (ft)	6.51  = Water Column (tt)	27.84 Well Capacity (gal) =	1 Well Volume (gal)	0.18  ( Tubing Capacity (gaint.)	Tubing Length (ft)	Turb. NTU < 20  + Pump (gal) +	Cell Volume (gal)	1 Eqpt. Volume (gal)	
rurge Start: 11:01 rurge End: 11:20 rurge Compl Well # CCR-PZ-6	11:20  lete At 11:03  Diam/ Comp 2	1980 Gallons to F Screen Interval (ft) 10	Purge 0.81 Intake Depth (ft) 16.11	Stability Well Depth (ft) 21.11	Values =  Depth to Water (ft)  5.21	6.51  = Water Column (tt)  15.90	27.84  Well Capacity (gal) =	1 Well Volume (gal) 2.54	0.18  ( Tubing Capacity (galm) 0.0026	Tubing Length (ft) 47.03	Turb. NTU < 20  + Pump Volume (gal) +	Cell Volume (gal) =	1 Eqpt. Volume (gal)	East Table
urge Start: 11:01 urge End: 11:20 urge Compl  Well # CCR-PZ-6	11:20  lete At 11:03  Diam/ Comp 2 Time	Gallons to F Screen Interval (ft) 10 Rate (ml/min)	Intake Depth (ft) 16.11 Volume (gal)	Stability Well Depth (ft) 21.11 Total Vol. (gal)	Values =  Depth to Water (ft)  5.21  Water Depth (ft)	6.51  = Water Column (t) 15.90  pH (SU)	27.84  Well C Capacity (gal) =  0.16  Temp °C	1 Well Volume (gal) 2.54 Cond (uMHOS)	0.18  ( Tubing Capacity (galm.) 0.0026  DO (mg/L)	Tubing Length (ft) ) 47.03 Turbidity (NTU)	Turb. NTU < 20  + Pump + Volume (gal)  0  Purge Criteria	Cell Volume (gall)  0.06  Status	1 Eqpt. Volume (gal)  0.18  Equipment ID	Eqpt. Table
Purge Start: 11:01 Purge End: 11:20 Purge Compl Well # CCR-PZ-6 Purge Meth; 1A	11:20  lete At 11:03  Diam/ Comp 2  Time 10:38	Gallons to F Screen Interval (ft) 10 Rate (ml/min) 490	Intake Depth (ft) 16.11 Volume (gal) 0.78	Stability Well Depth (ft) 21.11 Total Vol. (gal) 0.78	Values =  Depth to Water (ft)  5.21  Water Depth (ft)  5.45	6.51  = Water Column (t)  15.90  pH (SU)  6.55	27.84  Well Capacity (gal) =  0.16  Temp °C  26.54	1 Well Volume (gal) 2.54 Cond (uMHOS)	0.18  ( Tubing Capacity (galm.)  0.0026  DO (mg/L)  0.30	Tubing Length (ft) ) 47.03 Turbidity (NTU) 9.78	Turb. NTU < 20  + Pump Volume (gal) +  0  Purge Criteria ph:+/- 0.2	Cell Volume (gal) = 0.06 Status STABLE	1 Eqpt. Volume (gal)  0.18  Equipment ID Level Meter:	WLM08
Purge Start: 11:01 Purge End: 11:20 Purge Compl Well # CCR-PZ-6 Purge Meth; 1A Purge Start:	11:20  lete At 11:03  Diam/ Comp 2  Time 10:38 10:40	Gallons to F Screen Interval (ft) 10 Rate (ml/min) 490 500	Purge 0.81  Intake Depth (ft) 16.11  Volume (gal) 0.78 0.26	Stability Well Depth (ft) 21.11 Total Vol. (gal) 0.78 1.04	Values =  Depth to Water (ft)  5.21  Water Depth (ft)  5.45  5.46	6.51  = Water Column (t)  15.90  pH (SU)  6.55  6.52	27.84  Well Capacity (gal) =  0.16  Temp °C  26.54  26.53	1 Well Volume (gal) 2.54 Cond (uMHOS) 1639 1639	0.18  ( Tubing Capacity (galm.)  0.0026  DO (mg/L)  0.30  0.31	Tubing Length ) 47.03 Turbidity (NTU) 9.78 8.22	Turb. NTU < 20  + Pump Volume (gal)  - Purge Criteria ph:+/- 0.2 Temp?C+/- 0.2	Cell Volume (gal) = 0.06 Status STABLE STABLE	1 Eqpt. Volume (gal) 0.18 Equipment ID Level Meter: Pump:	WLM08
Purge Start: 11:01 Purge End: 11:20 Purge Compl  Well # CCR-PZ-6 Purge Meth; 1A Purge Start: 10:32	11:20  lete At 11:03  Diam/ Comp 2  Time 10:38	Gallons to F Screen Interval (ft) 10 Rate (ml/min) 490	Intake Depth (ft) 16.11 Volume (gal) 0.78	Stability Well Depth (ft) 21.11 Total Vol. (gal) 0.78	Values =  Depth to Water (ft)  5.21  Water Depth (ft)  5.45	6.51  = Water Column (t)  15.90  pH (SU)  6.55	27.84  Well Capacity (gal) =  0.16  Temp °C  26.54	1 Well Volume (gal) 2.54 Cond (uMHOS)	0.18  ( Tubing Capacity (galm.)  0.0026  DO (mg/L)  0.30	Tubing Length (ft) ) 47.03 Turbidity (NTU) 9.78	Turb. NTU < 20	Cell Volume (gal) = 0.06 Status STABLE STABLE STABLE	1 Eqpt. Volume (gal) 0.18 Equipment ID Level Meter: Pump: Tubing:	WLM08 PP PE/S
Purge Start: 11:01 Purge End: 11:20 Purge Compl  Well # CCR-PZ-6 Purge Meth: 1A Purge Start: 10:32 Purge End:	11:20  lete At 11:03  Diam/ Comp 2  Time 10:38 10:40	Gallons to F Screen Interval (ft) 10 Rate (ml/min) 490 500	Purge 0.81  Intake Depth (ft) 16.11  Volume (gal) 0.78 0.26	Stability Well Depth (ft) 21.11 Total Vol. (gal) 0.78 1.04	Values =  Depth to Water (ft)  5.21  Water Depth (ft)  5.45  5.46	6.51  = Water Column (t)  15.90  pH (SU)  6.55  6.52	27.84  Well Capacity (gal) =  0.16  Temp °C  26.54  26.53	1 Well Volume (gal) 2.54 Cond (uMHOS) 1639 1639	0.18  ( Tubing Capacity (galm.)  0.0026  DO (mg/L)  0.30  0.31	Tubing Length ) 47.03 Turbidity (NTU) 9.78 8.22	Turb. NTU < 20   Pump. Volume (gal)   +	Cell Volume (gal)  0.06 Status STABLE STABLE STABLE STABLE STABLE	1 Eqpt. Volume (gail) 0.18 Equipment ID Level Meter: Pump: Tubing: Dedicated	WLM08 PP PE/S Yes
Purge Start: 11:01 Purge End: 11:20 Purge Compl  Well # CCR-PZ-6 Purge Meth; 1A Purge Start:	11:20    Diam/ Comp 2   Time   10:38   10:40   10:42	Gallons to F Screen Interval (ft) 10 Rate (ml/min) 490 500	Purge 0.81  Intake Depth (ft)  16.11  Volume (ga)  0.78  0.26  0.26	Stability Well Depth (ft) 21.11 Total Vol. (gal) 0.78 1.04	Values =  Depth to Water (ft)  5.21  Water Depth (ft)  5.45  5.46	6.51  = Water Column (t)  15.90  pH (SU)  6.55  6.52	27.84  Well Capacity (gal) =  0.16  Temp °C  26.54  26.53	1 Well Volume (gal) 2.54 Cond (uMHOS) 1639 1639	0.18  ( Tubing Capacity (galm.)  0.0026  DO (mg/L)  0.30  0.31	Tubing Length ) 47.03 Turbidity (NTU) 9.78 8.22	Turb. NTU < 20	Cell Volume (gal) = 0.06 Status STABLE STABLE STABLE	1 Eqpt. Volume (gal) 0.18 Equipment ID Level Meter: Pump: Tubing:	WLM PF PE

Total Miles

**Total Time** 

LIMS#	Big B	Time	FE <sup>2</sup>	pH (SU)	Temp °C	Cond(uMHOS)	DO Mg/L	Turbidity(NTU)	Redox (mv)	Sulfite (mg/L)	Color	Odor	N	GVD
LIIVIO #	Loction Code	Time	mg/l	PH (SU)	TEMP-C	COND-F	DO Mg/L	TURB-N-F	REDOX	SO3-TR	\$COLOR-W	\$ODOR-W	Time	LEVEL
16F174-07	MWB-35	10:19	mga	6.8	26.8	1516	0.4	1.2	-57	330 111	LT. YELLOW	NONE		-7.05
16F174-08		9:50		6.9	27.8	2641	0.7	1.7	-244		LT. YELLOW	MODERATE		-7.78
LIMS#	250ml Cyan (3)	:50	500ml Inorg (2)	The state of the s	1L Mtls (1)	250ml Mtls (3)	1L Rads (1)	500ml Sulfide (2)	500ml Mtls (2)	250ml Nuts (3)	40ml Vial (6)	500 ml Nuts (2)	1L Rads Diss. (1)	Total Containers
16F174-07	250iiii Cyaii (5)	,50	1	230mi morg (5)	TE Mus (1)	250m Mils (5)	☑ 2	Sooniii Gaillac (2)		D Zoomi Note (o)				
16F174-08	П		1		ā	<u> </u>	<u> </u>	n						8
) 1L plastic (Pi	P)	(2) 500ml plastic	(PP)	(3) 250ml plastic	(PP)	(4) 100ml coliform be		(5) 1L amber glass (		(6) 40ml VOA vial	(CG)		Samples On Ice	Sample Reciept
SS	0107301Y	ESS	- 25-7-99710	ESS	0307301Y	ESS	, and	ESS	(10)	ESS	(00)		Yes No	Time 14:25
,,,	Preservation	200	02102011	Pres ID	00070011	Preservation			Pres ID	100	Preservation		Pres ID	Temp 0.8
hattles (rade):	5 ml HNO3 to pH <2			L 011663 🗹	250ml hottles (nu	its): 1 ml H2SO4 to ph	1<2		I Fres ID	500 ml hottles/Sulf	ide) 2ml NAOH/Zinc	Acet to nH >12	L D	Temp 0.0
	netals): 2 ml HNO3 to	J.		L 011003 🗆	-	0.5 ml H2SO4 to pH					an) 1g NAOH to pH >			
	netal): 1 ml HNO3 to p			L 011663 🗹	-		5um, 5 ml HNO3 to pH	e2			dicates that the sam		_	
and the same of th		Buffer ID	Duffer Value	1-College College Coll				CCV	Time			Temp °C		Theo Value my
Meter Calibra	MPM08	L 015169A	Buffer Value 7	Cal	8:05	ICV	Time	7.04	14:30	Redox Cal Meter ID:	8:00	27.4	Reading mv 226.1	228.4
eter ID:	MPMU8	L 015170		7.02										
DEP FT 1100		L 015170	10	10.05 3.98	8:05		nd +/- 5%) (DO +/- 0.3r		-	MPM08	14:30	21.1	236.4	236.2
nits: SU	to - C-lib		Std Value	3.98 Cal	8:05		cates ICV / CCV passe	1	Time	Zobell Sol ID:				
nductivity Me	MPM08	Standard ID L 014668A	1000	1000	7ime 8:15	ICV	Time	ccv	Time		Time	Temp °C	Oradias med	Theo Value mg
eter ID:		L 013576A	10000	1000	6,15	10023	8:15	10041	14:20	DO Meter Cal Meter ID:	7:55	21.1	Reading mg/l 8.96	8.915
	Units: uMHOS													8.950
rbidity Meter	TM07	Standard ID L 013677	Std Value 5.40	4.86	lity Range 5.94	5.68	7:40	ccv	Time	MPM08	15:05	20.9	9.02	8.950
eter ID:		L 013678	53.40	49.93	56.87	5.08	7:40	53.80	14:00	Barom. Pres 760				
DEP FT 1600, I		-			Country of the Country of the		200000000000000000000000000000000000000				Control of the Control	0-1-1/81		
	Check) (EPA 377.1		QC Result mg/l	Time	Titrator ID	Na Thio ID	DO 3 Pillow ID	Starch Ind. ID	Iodate/Iodide ID	Therm ID MPM08	pH 0.2	Conduct.( %)	DO (mg/l) 0.3	Redox (mv)
	Thio)/500ml DI=10mg									MPMU8	0.2	5	0.3	10
urging Informa	ition	Well Capacities	(gallons/ft): 2	"= 0.16 4" =0.65	D		. Capacities Gallons/ft			T. Minn	Domes	Call	1 Egpt.	
Well#	Diam/ Comp	Screen Interval (ft)	Intake Depth (ft)	Depth (ft)	Depth to Water (ft)	= Water Column (ft)	Capacity (gal) =	1 Well Volume (gal)	( Capacity (gal/ft.)	X Length (ft)	+ Volume + (gal)	Cell Volume (gal)		
MWB-35	2	5	15	18.71	7.05	11.66	0.16	1.87	0.0026	21	0	0.06	0.11	
urge Meth:	Time	Rate (ml/min)	Volume (gal)	Total Vol. (gal)	Water Depth (ft)	pH (SU)	Temp °C	Cond (uMHOS)	DO (mg/L)	Turbidity (NTU)	Purge Criteria	Status	Equipment ID	Eqpt. Table
	10:04	445	0.82	0.82	7.36	6.80	26.50	1584	0.38	0.94	ph:+/- 0.2	STABLE	Level Meter:	WLM08
1A					44.100		26.59	1567	0.36	1.46	Temp <sup>o</sup> C+/- 0.2	STABLE	Pump:	PP
A 1 A 1 A 1 A 1 A 1 A 1 A 1 A 1 A 1 A 1	10:06	450	0.24	1.06	7.40	6.80	20.59	1001						PE/S
V23 A 20 TO THE	1	450 450	0.24	1.06	7.40	6.80	26.72	1544	0.34	1.59	Cond % +/- 5	STABLE	Tubing:	1 170
urge Start: 9:57	10:06								0.34 0.36	1.59 1.22	Cond % +/- 5 DO % Sat. < 20	STABLE STABLE	Tubing: Dedicated	☑ Yes
urge Start: 9:57	10:06 10:08	450	0.24	1.30	7.42	6.80	26.72	1544				The second secon	-	100
9:57 urge End:	10:06 10:08 10:10	450	0.24	1.30 1.54	7.42	6.80	26.72	1544			DO % Sat.< 20	STABLE	Dedicated	☑ Yes
9:57 urge End: 10:10 urge Compl	10:06 10:08 10:10 ete At 9:58	450 450 Gallons to Pu	0.24 0.24 erge 0.11	1.30 1.54 Stablity	7.42 7.43	6.80 6.80	26.72 26.77	1544 1516	0.36	1.22 1.22	DO % Sat.< 20	STABLE STABLE	Dedicated	☑ Yes
9:57 urge End: 10:10 urge Compl	10:06 10:08 10:10 ete At 9:58	450 450 Gallons to Pu Screen Interval (ft)	0.24 0.24 lntake Depth (ft)	1.30 1.54 Stablity	7.42 7.43 Values = Depth to Water (ft)	6.80 6.80 6.80 = Column (ft)	26.72 26.77 26.77 Well Capacity (gal) =	1544 1516 1516 1 Well Volume (gal)	0.36  0.36  Tubing Capacity (gal/fit.)	1.22 1.22 x Tubing Length (ft)	DO % Sat. < 20 Turb. NTU < 20	STABLE STABLE	Dedicated Tubing?	☑ Yes
9:57 urge End: 10:10 urge Compl Well # MWB-36	10:06 10:08 10:10 10:10 Diam/ Comp	450 450 Gallons to Pt Screen Interval (ft)	0.24 0.24 erge 0.11	1.30 1.54 Stablity Well Depth (ft) 18.73	7.42 7.43 Values = Depth to Water (ft) 7.78	6.80 6.80 6.80 Water Column (ft)	26.72 26.77 26.77 Well Capacity (gal) =	1544 1516 1516 1 Well Volume (gal) 1.75	0.36  0.36  Tubing Capacity (galfit.)  0.0026	1.22 1.22 x Length (ft) )	DO % Sat.< 20 Turb. NTU < 20  + Volume (gal) +	STABLE STABLE  Cell Volume (gal) 0.06	Dedicated Tubing?  1 Eqpt. Volume (gal)  0.11	Yes No
9:57 urge End: 10:10 urge Compl  Well # MWB-36 urge Meth;	10:06 10:08 10:10 10:10 Diam/ Comp 2	450 450  Gallons to Pt Screen Interval (ft) 5 Rate (ml/min)	0.24 0.24 Intake Depth (ft) 15 Volume (gal)	1.30 1.54  Stablity Well Depth (ft) 18.73 Total Vol. (gal)	7.42 7.43  Values = Depth to Water (ft) 7.78  Water Depth (ft)	6.80 6.80  6.80  Water Column (ft)  10.95 pH (SU)	26.72 26.77 26.77 Well Capacity (gal) = 0.16 Temp °C	1544 1516 1516 1 Well Volume (gall) 1.75 Cond (uMHOS)	0.36  0.36  ( Tubng Capacity (galfit ) 0.0026 DO (mg/L)	1.22  1.22  Tubing Length (ft)  21  Turbidity (NTU)	DO % Sat. < 20 Turb, NTU < 20	Cell Votume (gal) : 0.06	Dedicated Tubing?  1 Equt. Volume (gal)  0.11 Equipment ID	Yes No
9:57 urge End: 10:10 urge Compl  Well # MWB-36 urge Meth; 1A	10:06 10:08 10:10 10:10 Diam/ Comp 2 Time 9:38	450 450  Gallons to Pt Screen Interval (ft) 5 Rate (ml/min) 430	0.24 0.24 0.24 Intake Depth (ft) 15 Volume (gal) 1.36	1.30 1.54  Stablity  Well Depth (ft)  18.73  Total Vol. (gal) 1.36	7.42 7.43  Values =  Depth to Water (ft)  7.78  Water Depth (ft)  8.37	6.80 6.80  6.80  Water Column (ft)  10.95 pH (SU) 6.94	26.72 26.77 26.77 Well Capacity (gal) = 0.16 Temp °C 27.84	1544 1516 1516 1 Well Volume (gall) 1.75 Cond (uMHOS) 2644	0.36  0.36  ( Tubng Capacity (galfit ) 0.0026  DO (mg/L) 0.75	1.22  1.22  Tubing Length (ft)  21  Turbidity (NTU)  3.00	DO % Sat. < 20 Turb. NTU < 20  + Volume (gal) +  O  Purge Criteria ph:+/- 0.2	STABLE  Cell Volume (gal)  0.06 Status STABLE	Dedicated Tubing?  1 Eqpt Volume (gal)  0.11  Equipment ID Level Meter:	Yes No  Rept. Table WLM08
9:57 urge End: 10:10 urge Compl  Well # MWB-36 urge Meth: 1A urge Start:	10:06 10:08 10:10 ete At 9:58 Diam/ Comp 2 Time 9:38 9:40	450 450  Screen Interval (ft) 5 Rate (ml/min) 430 430	0.24 0.24 0.24 Intake Depth (ft) 15 Volume (gal) 1.36 0.23	1.30 1.54  Stablity  Well Depth (ft) 18.73 Total Vol. (gal) 1.36 1.59	7.42 7.43  Values =  Depth to Water (ft)  7.78  Water Depth (ft)  8.37  8.38	6.80 6.80  6.80  Water Column (ft)  10.95 pH (SU) 6.94 6.92	26.72 26.77 26.77 Well Capacity (gal) = 0.16 Temp °C 27.84 27.76	1544 1516 1516 1 Well Volume (gall) 1.75 Cond (uMHOS) 2644 2630	0.36  0.36  ( Tubng Capacity (galfit ) 0.0026  DO (mg/L) 0.75 0.71	1.22  1.22  x Tubing Length (ft)  21  Turbidity (NTU)  3.00  2.01	DO % Sat.< 20 Turb, NTU < 20  + Volume (gal) +  O  Purge Criteria ph:+/- 0.2  Temp*C+/- 0.2	Cell Volume (gail)  0.06 Status STABLE STABLE	Dedicated Tubing?  1 Eqpt Volume (gal)  0.11  Equipment ID Level Meter: Pump:	Yes No  Eqpt. Table WLM08 PP
yes Start: 9:57  urge End: 10:10  urge Comple  Well #  MWB-36  urge Meth: 1A  urge Start: 9:26	10:06 10:08 10:10 10:10 Diam/ Comp 2 Time 9:38	450 450  Gallons to Pt Screen Interval (ft) 5 Rate (ml/min) 430	0.24 0.24 0.24 Intake Depth (ft) 15 Volume (gal) 1.36	1.30 1.54  Stablity  Well Depth (ft)  18.73  Total Vol. (gal) 1.36	7.42 7.43  Values =  Depth to Water (ft)  7.78  Water Depth (ft)  8.37	6.80 6.80  6.80  Water Column (ft)  10.95 pH (SU) 6.94	26.72 26.77 26.77 Well Capacity (gal) = 0.16 Temp °C 27.84	1544 1516 1516 1 Well Volume (gall) 1.75 Cond (uMHOS) 2644	0.36  0.36  ( Tubng Capacity (galfit ) 0.0026  DO (mg/L) 0.75	1.22  1.22  Tubing Length (ft)  21  Turbidity (NTU)  3.00	DO % Sat. < 20 Turb, NTU < 20  Pump + Volume (gal) +  0  Purge Criteria ph: +/- 0.2  Temp*C+/- 0.2  Cond % +/- 5	STABLE  Cell Volume (gal)  0.06 Status STABLE STABLE STABLE STABLE	Dedicated Tubing?  1 Eqpt Volume (gail) 0.11 Equipment ID Level Meter: Pump: Tubing:	Yes No  Eqpt. Table WLM08 PP PE/S
yee Start: 9:57  urge End: 10:10  urge Comple  Well #  MWB-36  urge Meth: 1A  urge Start:	10:06 10:08 10:10 ete At 9:58 Diam/ Comp 2 Time 9:38 9:40	450 450  Screen Interval (ft) 5 Rate (ml/min) 430 430	0.24 0.24 0.24 Intake Depth (ft) 15 Volume (gal) 1.36 0.23	1.30 1.54  Stablity  Well Depth (ft) 18.73 Total Vol. (gal) 1.36 1.59	7.42 7.43  Values =  Depth to Water (ft)  7.78  Water Depth (ft)  8.37  8.38	6.80 6.80  6.80  Water Column (ft)  10.95 pH (SU) 6.94 6.92	26.72 26.77 26.77 Well Capacity (gal) = 0.16 Temp °C 27.84 27.76	1544 1516 1516 1 Well Volume (gall) 1.75 Cond (uMHOS) 2644 2630	0.36  0.36  ( Tubng Capacity (galfit ) 0.0026  DO (mg/L) 0.75 0.71	1.22  1.22  x Tubing Length (ft)  21  Turbidity (NTU)  3.00  2.01	DO % Sat.< 20 Turb, NTU < 20  + Volume (gal) +  O  Purge Criteria ph:+/- 0.2  Temp*C+/- 0.2	Cell Volume (gail)  0.06 Status STABLE STABLE	Dedicated Tubing?  1 Eqpt Volume (gal)  0.11  Equipment ID Level Meter: Pump:	Yes No  Rept. Table WLM08 PP

**Total Miles** 

Total Time

# GROUNDWATER WELL SAMPLING EQUIPMENT CALIBRATION

			127	DPD ID: L	in the second	Glycene ID:	L m	Ach	ecked box indica	es reagent expiration	on date has been verifie	d.	
Meter ID:			1.0	100							7		4500 CIO <sub>2</sub> D.
Chlorine Dioxide (mg/l)	Std. Conc. (mg/l)	Std	Spike Valume (ml)	Cal Sample Volume (ml)	Calc. Std. Conc. (mg/l)	DPD Check (mg/l)	Glycene Check	Time	Pass/Fall	DPD Check (mg/l)	Time	Pass/Fall	*Equivalent to Standard Method
							Initial Calibratio	verification ICV		Continuous Call	bration Verification C	ÇV	Method 10126
CIO <sub>2</sub> DPD Check must read	+/- 10% of the	Calcul	ated Std. Concer	ntration, multiplie	d by 2.4.		Glycene check should	d read < 0.10 mg/l C	O <sub>2+</sub>				
MPM08	0.2		5	0.3	10	0.2	Griterion	Comparator ID:		Reagent ID:	L-		
Therm ID	pН		Conduct %	DO mg/l	Redox my	CL2	Calibration	Ferrous Iron					
014277							760						
obell Sol ID:	14.50	+	21.1	200.4	200.2		Barom, Pres	13.03	20.5	5.02	0,000	-	1
Meter ID; MPM08	14:30	1	21.1	236.4	236.2	Pass	MPM08	15:05	20.9	9.02	8.950	Pass	
	8:00	8	27.4	226.1	228.4	Pass	FDEP FT 1500 Meter ID:	7:55	21.1	8.96	8.915	Pass	
Redox Cal	Time		Temp <sup>a</sup> C	Reading mv	Theo Value mv	Pass / Fall	DO Meter Cal	Time	Temp °C	Reading mg/l	Theo Value mg/l	Pass / Fall	
C Std: 5ml (NaThio)/500ml		ne 80000000					L	L	L	L	T 111		
Sulfite Info (QC Check) (E				QC Result mg/l	Time	Titrator ID	Na Thio ID	DO 3 Pillow ID	Starch Ind. ID	lodate/lodide ID			
DEP FT 1600, Units: NTU	***************************************	L	013678	53.40	49.93	56.87				53.80	14:00	Pass	
Meter ID:	TM07	L	013677	0.70	4.86	5.94	5.68	7:40	Pass	50.00	44.00		
urbidity Meter Calibration			Standard ID	Std Value	Acceptability		CCV	Time	Pass/Fail	CCV	Time	Pass/Fail	
DEP FT 1200, Units: uMHO	S	L	013576A (2)	10000			10023	8:15	Pass	10041	14:20	Pass	
Meter ID:	MPM08	L	014668A		1000	8:15			<b>VIII</b>				
Conductivity Meter Calib.			Standard ID	Std Value	Cat	Time	ICV	Time	Pass/Fail	CCV	Time	Pass/Fail	
, ilia. 54	ICV Check	L	014565J				7.06	810	Pass				
Inits: SU		11	015083A		3.98	8:05	ICV	Time	Pass/Fail	•	idicates ICV / CCV par		
DEP FT 1100	IVIPIVIOO	1	015170		10.05	8:05			OC:16H +1- 0.2		+4- 0,3mg/L) (Redox =		
H Meter Calibration feter ID:	MPM08	1.	Buffer ID 015169A	Buffer Value	Cal 7.02	7ime 8:05				7.04	14:30	Pass	
	0.0000000000000000000000000000000000000	S-0000000		Date:		Sampler(s):					Time	Pass/Fail	1

#### DEP-SOP-001/01

#### FS 2200 Groundwater Sampling Form FD 9000-24

# **GROUNDWATER SAMPLING LOG**

MATERIA   DATE   DATE   DATE   G124/15	FACILITY NAME:		Big Be	end			SITE LOCATION:		Apollo	Beach, FL.		
PURSING DATA	Victor Tree	-	17 To 17 To 18 To 18			SAMPLE ID:	L16	174-01		DATE:	6/24/15	
Table   Tabl												
Tright   State   Tright   Tr	WELL DIAMETER (inches	)	TUBING DIAMETER (inc	thes) 1/4	WELL SCR DEPTH 10.29	EEN INTERV feet to	AL (NGVD) 20.29 (feet)	STATIC DEF	PTH (feet): 5.14	PURGE PUMP T OR BAILER:	YPE PP	
Columbe   Colu	WELL VOLUME PURGI	1	1 WELL VOLU	ME = (TOTAL WE	LL DEPTH - STATIC D	EPTH TO WATE	R) X WELL CAPAC	ITY				
O							To turn out to a				=	gallons
TIME	(only fillout if applications)	JME PURGE: able)	1 EQ	UIPMENTVOL	= PUMP VOLUM					W 22		0.40
DEPTH IN WELL (rent)   15.3   DEPT	110 11 11 11 11 11 11 11 11 11 11 11 11			-		gallons + (		ons/foot X		+ 0.06	1	
TIME PURGED (CALLONS) (CAL	DEPTH IN WELL (f	rubing set): 15.3	Amme	DEPTH IN W	ELL (feet): 1	5.3	INITIATED AT:	13:16	ENDED AT:	13:27	PURGED (gallo	ms): 2.03
13:25	TIME	PURGED	VOLUME PURGED	RATE	TO WATER	(standard		(µmhos/cm	OXYGEN (circle mg/L)r			
13:27	13:23	1.29	1.29	0.18	5.34	6.84	25.50	3946	0.12	9.33	LT, YELLOW	NONE
WELL CAPACITY (Islows Perfoul): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.00; 2" = 0.16; 3" = 0.05; 4" = 0.05; 45" = 0.00; 45" = 0.01; 45" = 0.000; 45"	13:25	0.37	1.66	0.19	5.35	6.79	25.47	3946	0.10	5.72	LT. YELLOW	NONE
TUBING NSIDE DIA. CAPACITY (Gal.Fi): 18" = 0 0006.   14" = 0 0006.   15" = 0	13:27	0.37	2.03	0.19	5.37	6.80	25.48	3945	0.09	8.01	LT. YELLOW	NONE
TUBING MSIDE DIA CAPACITY (GILIFE): 18*-000000												
TUBING MSIDE DIA CAPACITY (GILIFE): 18*-000000	MELL CARACITY (C	Hann Day County	75" - 002	4"-004	1 25" = 0.05: 2" =	0.16: 3"	0.77: 4"=0	65: 5" =	102: 6" = 147:	12" = 5.88		
PUMP OR TUBING DEPTH IN WELL (feet): 15.3  FIELD DECONTAMINATION: Y						5/16" = 0.004	3/8" = 0.006;	1/2" = 0.0				
DEPTH IN WELL (feet): 15.3 FLOW RATE (in L.per mirlute): 700 MATERIAL CODE: PELS  FIELD DECONTAMINATION: Y N DIFFERENCE   MIRRID   N DIFFERENCE   N DIFFERENCE   MIRRID   N DIFFERENCE   N DIFFEREN	SAMPLED BY (PR			TECO	SAMPLER (S) SIG	SNATURES:			SAMPLING INITIATED AT:	13:27	SAMPLING ENDED AT: 1	3:32
FIELD-FILTERED:  SAMPLE CONTAINER SPECIFICATION  SAMPLE CONTAINER SPECIFICATION  SAMPLE CONTAINERS SPECIFICATION  SAMPLE PRESERVATION  SAMPLE PRESERVATION  SAMPLE PRESERVATION  TOTAL VOL. ADDED IN FIELD (mil) (1) PH  SAMPLE PRESERVATION  INTENDED ANALYSIS AND/OR METHOD  SAMPLING EQUIPMENT CODE  SAMPLING EQUIPMENT CODE  SAMPLING EQUIPMENT CODE  PP  Method  PP  Metals  PP  Read-1L  2 PE 1L HN03 5ml   SAMPLE PRESERVATION  INTENDED ANALYSIS AND/OR METHOD  ADDED IN FIELD (mil) (1) PH  SAMPLE PRESERVATION  INTENDED ANALYSIS AND/OR METHOD  ANALYSIS AND/OR METHOD  SAMPLING EQUIPMENT CODE  SAMPLING EQUIPMENT CODE  SAMPLING EQUIPMENT CODE  SAMPLE PRESERVATION  INTENDED ANALYSIS AND/OR METHOD  ANALYSIS AND/OR METHOD  PP  SAMPLE CONTAINERS  FILTER SIZE:  Um  DUPLICATE: Y	PUMP OR TUBING	eet): 15.3			SAMPLE PUMP FLOW RATE (mL	per minute):		700	TUBING MATERIAL COD	E: PE	:/S	
SAMPLE CONTAINER SPECIFICATION  SAMPLEID CODE  CONTAINERS  MATERIAL CODE  WOLUME  WESD  MONE  NONE  NONE  NONE  NONE  NONE  NONE  NONE  METHOD  SAMPLING EQUIPMENT CODE  SAMPLING EQUIPMENT CODE  NONE  NONE  NONE  NONE  NONE  NONE  METHOD  SAMPLING EQUIPMENT CODE  SAMPLING EQUIPMENT CODE  SAMPLING EQUIPMENT CODE  NONE  NONE  NONE  NONE  NONE  NONE  NONE  NONE  PP  Metals  PP  Reservative USED  NONE  NONE  NONE  NONE  NONE  NONE  NONE  NONE  PP  Reservative USED  NONE  PP  Redails  PP  Reservative USED  NONE  NONE	The Constitution of the Co	10/11/04/7	DND		FIELD-FILTERED	):X.□	N FILT	ER SIZE:	μm	DUPLICATE:	YONE	1
SAMPLEID CODE CONTAINERS CODE VOLUME PRESERVATIVE USED ADDED IN FIELD (mi) (1) PH METHOD CODE  @Ino-500 1 PE 500ml NONE NONE N/A Inorganics PP  @Met-250 1 PE 250ml HNO3 1ml <2 Metals PP  @Rad-1L 2 PE 1L HNO3 5ml <2 Radiologicals PP  REMARKS:  (1) Sample bottles pre-preserved at laboratory prior to sample collection.  MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polysthylene; PP = Polypropytene; S = Silicone; T = Teflon; O = Other (Spacify)		SAMPLE CON	TAINER		i midion Equipme		ESERVATION		INT	ENDED	SAM	UPLING
@Met-250 1 PE 250ml HNO3 1ml <2 Metals PP  @Rad-1L 2 PE 1L HNO3 5ml <2 Radiologicals PP  REMARKS: (1) Sample bottles pre-preserved at laboratory prior to sample collection.  MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Tefion; O = Other (Spedfy)	SAMPLE ID CODE	#	MATERIAL	. VOLUME								
@Met-250 1 PE 250ml HNO3 1ml <2 Metals PP  @Rad-1L 2 PE 1L HNO3 5ml <2 Radiologicals PP  REMARKS: (1) Sample bottles pre-preserved at laboratory prior to sample collection.  MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Tefion; O = Other (Spedfy)	@Ino-500	1	PE	500ml	NONE	N	IONE	N/A	Inor	ganics		PP
@Rad-1L 2 PE 1L HNO3 5ml <2 Radiologicals PP  REMARKS: (1) Sample bottles pre-preserved at laboratory prior to sample collection.  MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Spedly)	Gillo dod			1								
REMARKS: (1) Sample bottles pre-preserved at laboratory prior to sample collection.  MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Spedfy)	@Met-250	- 1	PE	250ml	HNO3		1ml	<2	Me	etals		PP
(1) Sample bottles pre-preserved at laboratory prior to sample collection.  MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Spedfy)	@Rad-1L	2	PE	1L	HNO3	-	5ml	<2	Radio	logicals		PP
(1) Sample bottles pre-preserved at laboratory prior to sample collection.  MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)												
(1) Sample bottles pre-preserved at laboratory prior to sample collection.  MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Spedfy)												
(1) Sample bottles pre-preserved at laboratory prior to sample collection.  MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Spedfy)												
(1) Sample bottles pre-preserved at laboratory prior to sample collection.  MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Spedfy)			_					1				
MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)	Wite of a contract of the second	Hos no are	onund at lat	L.	or to comple :	llection			·			
minital de de de la company de							vpropylene: S	Silicone:	T = Teflon: Q = O	ther (Spedfy)		
JECUIDMENT CODES: DEDD = Deverse Flow Periodatic Pump: SM = Straw Method (tubing Gravity Design): VT = Vaccuum Trans: O = Other (Speciful)	SAMPLING/PURGIN EQUIPMENT CODE			-					PP = Peristaltic Pur	mp secify)		

<sup>1.</sup> The above do not constitute all of the information requierd by Chapter 62-160, F.A.C.

<sup>2.</sup> STABILIZATION CRITERIA FOR RANGE OF VARIATION OF LAST THREE CONSECUTIVE READINGS (SEE FS 2212, SECTION 3)
pH: ± 0.2 units Temperature: ± 0.2 °C Specific Conductance: ±5% Dissolved Oxygen:all readings ≤ 20% saturation (see Table FS 2200-2);
optionally, ± 0.2 mg/L or ± 10% (whichever is greater) Turbidity:all readings ≤ 20 NTU; optionally ± 5 NTU or 10% (whichever is greater)

## **GROUNDWATER SAMPLING LOG**

MARKER   CR.   CR.   P.   CR.   CR.   P.   CR.	SITE NAME:		Big B	end			SITE LOCATION:		Apollo	Beach, FL.		
NUMBETER (Inches)		(	7 July 2015 10 TO 1			SAMPLE ID:	L16	074-02		DATE:	6/24/15	
DAMPETER (LONGING)   DAMPETER (LONGING)   TABLE (LONGING)   TABL	/ FITTING A 750 L-				- VV		NG DATA	141		AND ADDRESS.		
Complement   Com	WELL DIAMETER (inches	)	DIAMETER (inc		DEPTH 10.64	feet to		TO WATER (fee	5.40	PURGE PUMP T OR BAILER:	PP PP	
Telephetry   Tel	WELL VOLUME PL	JRGE:	1 WELL VO	LUME = (TOT	AL WELL DEPTH-	STATIC DEF	PTH TO WATER)	X WELL CA	PACITY			
SAMPLER   SOUTH   SAMPLE   S			7.20		eu eu eu eu eu eu		0404017V V 7		TUL + FLOW CE		ot =	gallons
DETH IN MORT LIGHNOG TUBNOG   15.6   CONTINUE   CONTINUE   15.6   CONTINUE	(only fillout if applica	JME PURGE: able)	1 EQ	UIPMENT VOL					COLOR THE MA	7 2 44	10000	0.12
The PURISED (CALLONS) CONTAINER AND TELOP (CALLONS) (CA	INITIAL DUMB OR	TURING		EINAL PLIME		gallons + (					TOTAL VOLUM	E
TIME PURISED (CALLONS) (CA	DEPTH IN WELL (fo	eet): 15.6		DEPTH IN W	ELL (feet): 1	5.6	INITIATED AT:	100000000000000000000000000000000000000	ENDED AT:	13:02	2 PURGED (gallo	ns): 1.4
13:00	TIME	PURGED	VOLUME PURGED	RATE	TO WATER	(standard		(µmhos/cm	OXYGEN (circle(mg/Ler			ODOR (describe)
13:02 0.29 1,44 0.15 5.53 6.75 25.62 1576 0.10 4.86 LT.YELLOW NONE  13:02 0.29 1,44 0.15 5.53 6.75 25.62 1576 0.10 4.86 LT.YELLOW NONE	12:58	0.86	0.86	0.14	5.55	6.81	25,62	1540	0.12	8.17	LT. YELLOW	NONE
	13:00	0.29	1.15	0.15	5.54	6.76	25.67	1561	0.11	6.52	LT. YELLOW	NONE
TUBING INSIDE DIA CAPACITY (Gal Jr.); 18" = 0.0006.   14" = 0.0026.   14" = 0.0026.   34" = 0.0006.   34" = 0.0016.   34" = 0.016.   34" =	13:02	0.29	1.44	0.15	5.53	6.75	25.62	1576	0.10	4.86	LT, YELLOW	NONE
TUBING INSIDE DIA CAPACITY (Gali Pi); 18" = 0.0006   14" = 0.002												
TUBING INSIDE DIA CAPACITY (Gal Jr.); 18" = 0.0006.   14" = 0.0026.   14" = 0.0026.   34" = 0.0006.   34" = 0.0016.   34" = 0.016.   34" =												
TUBING INSIDE DIA CAPACITY (Gal Jr.); 18" = 0.0006.   14" = 0.0026.   14" = 0.0026.   34" = 0.0006.   34" = 0.0016.   34" = 0.016.   34" =			-	_						_		
SAMPLED BY (PRINT) / AFFILIATION:   RAB   TECO   SAMPLE PUMP   SAMPLER (S) SIGNATURES:   SAMPLE CALLED (Filed):   13:02   SAMPLE (S) SIGNATURES:   SAMPLE CALLED (Filed):   13:02	WELL CAPACITY (Ga	llons Per Foot):	0.75" = 0.02;	1" = 0.04;	1.25" = 0.06; 2" =	0.16; 3"=	0.37; 4" = 0.	65; 5" = 1	1.02; 6" = 1.47;	12" = 5.88		
SAMPLED BY (PRINT) / AFFILIATION: RAB   TECO	TUBING INSIDE DIA.	CAPACITY (Gal./F	t.): 1/8" = 0.00006;	3/16" = 0.0014	1/4" = 0,0026;				10; 5/8" =	0.016		
TECO	SAMPLED BY (PR	INT)/ AFFILIATI	ON:		SAMPLER (S) SI		ING DATA		SAMPLING		SAMPLING	
Separation   Sep	2000 200 E1V			TECO		RABI	relly		INITIATED AT:	13:02	2 ENDED AT:	13:0
FIELD DECONTAMINATION: Y   N   S   FILTER SIZE:	PUMP OR TUBING DEPTH IN WELL (	eet): 15.6	3	DAGE.	SAMPLE PUMP FLOW RATE (ml	L per minute):	γ	540	TUBING MATERIAL COD	E: PE	E/S	
SAMPLE DECORE CONTAINERS CODE VOLUME SAMPLE PRESERVATION TOTAL VOL.  SAMPLEID CODE CONTAINERS CODE VOLUME USED TOTAL VOL.  SAMPLEID CODE CONTAINERS CODE VOLUME USED TOTAL VOL.  SAMPLEID CODE TOTAL VOL.  ADDED IN FIELD (mi) (n) PH PE SOUND NONE NONE NONE NONE NONE NONE NONE NO	LOTE THE REAL PROPERTY.		Y D N Ø		FIELD-FILTERED	D: Tvde	N P FILT	ER SIZE:	μm	DUPLICATE:	Y N P	]
MATERIAL CODE   CONTAINERS   CODE   VOLUME   PRESERVATIVE   SAMPLEID CODE   CODE   CODE   CODE					, manaragapin		ESERVATION					
### SAMPLETO CODE   CONTAINERS   CODE   C	C	#	MATERIAL	VOLUME								
@Met-250	SAMPLE ID CODE	CONTAINERS	CODE	18,52,554	USED	ADDED	N FIELD (MI) (1)	pri				
@Rad-1L 2 PE 1L HNO3 5ml <2 Radiologicals PP	@Ino-500	1	PE	500ml	NONE	1	ONE	N/A	Inor	ganics		PP
@Rad-1L 2 PE 1L HNO3 5ml <2 Radiologicals PP  REMARKS: (1) Sample bottles pre-preserved at laboratory prior to sample collection.  MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)				1.97						0.01		nn.
REMARKS:  (1) Sample bottles pre-preserved at laboratory prior to sample collection.  MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)					65.763.67		53-47					
(1) Sample bottles pre-preserved at laboratory prior to sample collection.  MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)	@Rad-1L	2	PE	11.	HNO3		5ml	<2	Radio	logicals		PP
(1) Sample bottles pre-preserved at laboratory prior to sample collection.  MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)												
(1) Sample bottles pre-preserved at laboratory prior to sample collection.  MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)												
(1) Sample bottles pre-preserved at laboratory prior to sample collection.  MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)					11							
	(1) Sample bo											
SAMPLING/PURGING  APP = After Peristaltic Pump; B = Bailer; BP = Bladder Pump; ESP = Electric Submirsable Pump; PP = Peristaltic Pump  EQUIPMENT CODES: RFPP = Reverse Flow Peristaltic Pump; SM = Straw Method (tubing Gravity Drain); VT = Vacuum Trap; O = Other (Spedity)											ecify)	

1. The above do not constitute all of the information requierd by Chapter 62-160, F.A.C.

<sup>2.</sup> STABILIZATION CRITERIA FOR RANGE OF VARIATION OF LAST THREE CONSECUTIVE READINGS (SEE FS 2212. SECTION 3) pH: ± 0.2 units Temperature: ± 0.2 °C Specific Conductance: ± 5% Dissolved Oxygen: all readings ≤ 20% saturation (see Table FS 2200-2); optionally, ± 0.2 mg/L or ± 10% (whichever is greater) Turbidity: all readings ≤ 20 NTU; optionally ± 5 NTU or 10% (whichever is greater)

# **GROUNDWATER SAMPLING LOG**

SITE NAME:		Big Be	end			SITE LOCATION:		Apollo	Beach, FL.		
WELL NO:	(	CCR-PZ-3			SAMPLE ID:	L16F	F174-03		DATE:	6/24/15	
A Company					PURG	ING DATA	10 T 10 T				
WELL DIAMETER (inches	,	TUBING DIAMETER (inc	0.94	WELL SCREEN IN DEPTH 10.38		20.38 (feet)	STATIC DEF	PTH (feet): 3.46	PURGE PUMP TO OR BAILER:	YPE PP	
WELL VOLUME PL only fillout if applica	-		The state of the s	AL WELL DEPTH-							
only fillout if applica	able)		= (	D.W. 12	feet -	111/2011/10	feet ) x	0	qallons/foc	ot =	gallons
EQUIPMENT VOLU		1 EQI	JIPMENTVOL	. = PUMP VOLUM	E + (TUBING	3 CAPACITY X T	TUBING LENG	STH ) + FLOW CE	LLVOLUME		
orny mout it applies	,		=(	0	gallons + (	0.0026 gallo	The state of the s	21.38 fe			0.12 gallons
NITIAL PUMP OR	TUBING eet): 15.4	4	FINAL PUMP DEPTH IN W	OR TUBING ELL (feet): 1	5.4	PURGING INITIATED AT:	12:09	PURGING ENDED AT:	12:22	TOTAL VOLUM PURGED (gallo	ns): 1.1
TIME	VOLUME PURGED (GALLONS)	VOLUME PURGED (GALLONS)	PURGE RATE (GPM)	DEPTH TO WATER (FEET)	pH (standard units)	TEMP. (°C)	COND. (µmhos/cm OR µS/cm)	OXYGEN (circle mg/l or % saturation)	TURBIDITY (NTUs)	COLOR (describe)	ODOR (describe)
12:18	0.78	0.78	0.09	4.92	6.47	26.62	1617	0.79	13.00	YELLOW	MILD
12:20	0.17	0.95	0.09	4.90	6.41	26.69	1596	0.62	15.10	YELLOW	MILD
12:22	0.17	1.12	0.09	4.90	6.42	26.62	1577	0.54	11.50	YELLOW	MILD
							D-0				
Action and											
WELL CAPACITY (Ga		0.75" = 0.02;	The second secon			= 0,37; 4" = 0,	.65; 5" = 1/2" = 0.0		12" = 5.88		
TUBING INSIDE DIA.	CAPACITY (Gal./F	1.); 1/8" = 0.00006;	3/16" = 0.0014;	1/4" = 0,0026;	SAMPL	4: 3/8" = 0.006; LING DATA		710; 346 =	0.010	- 1 - Jun 1 - 1 -	
SAMPLED BY (PR	INT)/ AFFILIATI	ON:		SAMPLER (S) SIG	GNATURES:			SAMPLING INITIATED AT:		SAMPLING ENDED AT:	W.
	RAE	3	TECO		Butt	ecy		1;	2:22	12	2:31
PUMP OR TUBING DEPTH IN WELL (f	eet): 15.4	4		SAMPLE PUMP FLOW RATE (ml	_per minute)	. 7	330	TUBING MATERIAL COD	E: PE	/S	
FIELD DECONTAM	MINATION:	YUNU		FIELD-FILTERED Filtration Equipme	ont Type.	N P FILT	ER SIZE:	μm	DUPLICATE:	YONE	I
	SAMPLE COL					RESERVATION			ENDED		APLING .
	SPECIFIC #	MATERIAL	VOLUME	PRESERVATIVE		TAL VOL.	FINAL		IS AND/OR THOD		IPMENT ODE
SAMPLEID CODE	CONTAINERS	CODE	VOLUME	USED	ADDED	IN FIELD (ml) (1)	рН			-	
- CUNGS		124			-	NONE	100	Inne	annine .		PP
@Ino-500	1	PE	500ml	NONE	-	NONE	N/A	mor	ganics		
@Met-250	1	PE	250ml	HNO3		1ml	<2	М	etals		PP
@Rad-1L	2	PE	1L	HNO3		5ml	<2	-	logicals		PP
WINAU-IL	-		1	111100		O.I.I.					
		-									
			+		-						
REMARKS				1				1			
(1) Sample bo	ttles pre-pre	served at lat	oratory pric	or to sample c	ollection.						
MATERIAL CODE				; PE = Polyeth		P = Polypropylene	e; S = Silic	one; T = Teflor	; O= Other (Spe	ecify)	
SAMPLING/PURGIN				= Baller; BP = Blad			The second second		mp		

<sup>1.</sup> The above do not constitute all of the information requierd by Chapter 62-160, F.A.C.

<sup>2.</sup> STABILIZATION CRITERIA FOR RANGE OF VARIATION OF LAST THREE CONSECUTIVE READINGS (SEE FS 2212. SECTION 3) pH: ± 0.2 units Temperature: ± 0.2 °C Specific Conductance: ± 5% Dissolved Oxygen: all readings ≤ 20% saturation (see Table FS 2200-2); optionally, ± 0.2 mg/L or ± 10% (whichever is greater) Turbidily: all readings ≤ 20 NTU; optionally ± 5 NTU or 10% (whichever is greater)

## **GROUNDWATER SAMPLING LOG**

MARIE   CCR-PZ-4	SITE NAME:		Big Be	end			SITE LOCATION:	Tag .	Apollo	Beach, FL.		
DUMBY   TURNS   TURN	and the second second	(				SAMPLE ID:	L16	F174-04		DATE:	6/24/15	
WELL VOLUME = (TOTAL WELL DEPTH - STATIC DEPTH TO WATER)   X WELL CAPACITY   Static policies							ING DATA	uta di sila		Merchanis		
WELL VOLUME = (TOTAL WELL DEPTH-STATIC DEPTH TOWATER)	WELL DIAMETER (inches	0	TUBING DIAMETER (inc	hes) 1/4			18.00 (feet)	STATIC DEF	TH (feet): 3.28	PURGE PUMP T OR BAILER:	YPE PP	
Second   S	WELL VOLUME P	JRGE:			AL WELL DEPTH-	STATIC DEF	TH TO WATER)	X WELL CA	PACITY			100
Control   Cont	(only fillout if applic	able)								The same of the sa	ot =	gallons
NITAL PURP CR TUBING   DEPTH IN WELL (Feels):   13.0   DINAL PURP OR TUBING   DEPTH IN WELL (Feels):   13.0   DINAL PURP OR TUBING   DEPTH IN WELL (Feels):   13.0   DINAL PURP OR TUBING   DEPTH IN WELL (Feels):   13.0   DINAL PURP OR TUBING   DEPTH IN WELL (Feels):   13.0   DINAL PURP OR TUBING   DEPTH IN WELL (Feels):   13.0   DINAL PURP OR TUBING   DEPTH IN WELL (Feels):   13.0   DINAL PURP OR TUBING   DEPTH IN WELL (Feels):   13.0   DINAL PURP OR TUBING   DEPTH IN WELL (Feels):   13.0   DINAL PURP OR TUBING   DEPTH IN WELL (Feels):   13.0   DINAL PURP OR TUBING   DIAL PURP OR TUBING	EQUIPMENT VOLI	JME PURGE: able)	1 EQU	JIPMENTVOL	. = PUMP VOLUM	E + (TUBING	CAPACITY X	TUBING LENG	TH) + FLOW CE	LLVOLUME		
DEPTH N WELL (Bert):   13.0   DEPTH N WELL (Bert):   D				=(		gallons + (	1	ons/foot X		eet)+ 0.06	1	
TIME	INITIAL PUMP OR DEPTH IN WELL (	TUBING reet): 13.0		FINAL PUMP DEPTH IN W		3.0	PURGING INITIATED AT:	11:32	ENDED AT:	11:47	PURGED (galle	ons): 1.3:
11:43	TIME	PURGED	VOLUME PURGED	RATE	TO WATER	(standard		(µmhos/cm	OXYGEN (circlemg/Lor			ODOR (describe)
111;47 0.18 1.35 0.09 5.54 6.70 26.64 1372 0.15 5.66 CLEAR M    11;47	11:43	0.99	0.99	0.09		6.68	26.49	1412	0.32	4.64	CLEAR	MILD
WELL CAPACITY (Califors Per Foot)   0.75" = 0.02:   "1 = 0.001.   125" = 0.006:   31 = 0.001.   125" = 0.006:   31 = 0.001.   125" = 0.006:   31 = 0.001.	11:45	0.18	1.17	0.09	3.53	6.65	26.64	1387	0.18	4.87	CLEAR	MILD
TUBING INSIDE DIA. CAPACITY (Gal/Fi): 18"=0,0006.   14"=0,0016.   14"=0,0006.   34"=0,0006.   12"=0,0106.   12"=	11:47	0.18	1.35	0.09	5.54	6.70	26.64	1372	0.15	5.66	CLEAR	MILD
TUBING INSIDE DIA_CAPACITY (Gal.Fr): 18" = 0,0006   14" = 0,0006   12" = 0,0006							7-1				100000	
TUBING INSIDE DIA. CAPACITY (Gal/Ft): 18" = 0,0006.   10" = 0,0016.   10" = 0,0006.   12" = 0,0016.   12" = 0,0106.   12" =												
TUBING INSIDE DIA. CAPACITY (Gal/Ft): 18" = 0,0006.   10" = 0,0016.   10" = 0,0006.   12" = 0,0016.   12" = 0,0106.   12" =												
TUBING INSIDE DIA. CAPACITY (Gal/Ft): 18" = 0,0006.   10" = 0,0016.   10" = 0,0006.   12" = 0,0016.   12" = 0,0106.   12" =												
TUBING INSIDE DIA_CAPACITY (Gal.Fr): 18" = 0,0006   14" = 0,0006   12" = 0,0006												
TUBING INSIDE DIA. CAPACITY (Gal/Ft): 18" = 0,0006.   10" = 0,0016.   10" = 0,0006.   12" = 0,0016.   12" = 0,0106.   12" =												
TUBING INSIDE DIA. CAPACITY (Gal/Ft): 18" = 0,0006.   10" = 0,0016.   10" = 0,0006.   12" = 0,0016.   12" = 0,0106.   12" =				100			0.07: 47-0	06: 67	100. 0" - 1.17.	437 - 6 00		
SAMPLED BY (PRINT)/ AFFILIATION: RAB TECO PUMP OR TUBING DEPTH IN WELL (feet): 13.0  FIELD DECONTAMINATION: Y N SAMPLE FUMP SAMPLE CONTAINER SPECIFICATION SAMPLE CONTAINER SPECIFICATION SAMPLEID CODE # CONTAINERS ODE  MATERIAL CODE WOLUME  FIELD PITTER SIZE: JM DUPLICATE: Y N SAMPLE PRESERVATION SAMPLE DECONTAINER SPECIFICATION SAMPLE ODE SAMPLE CONTAINERS SPECIFICATION SAMPLE DO NOT SAMPLE PRESERVATION SAMPLE DECONTAINERS SPECIFICATION SAMPLE DECONE # CONTAINERS SPECIFICATION SAMPLE DECONE SAMPLE PRESERVATION SAMPLE PRE	COMMENTAL AND SOCIAL AND	A 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1		The second of the second of			7.7					
TECO				CTTOL	lo i i ini en ioi oi	34. 11. 31. 11.	ING DATA	1	SAMBLING		ISAMPLING	
PUMP OR TUBING DEPTH IN WELL ((feet)): 13.0    SAMPLEPUMP   FLOW RATE (inL per minute):   347   TUBING   MATERIAL CODE:   PE/S	SAMPLED BY (PR			TECO	n.	RAIDRES	to		INITIATED AT:	1:47	ENDED AT:	2:00
FIELD PILTERED: Type N PILTER SIZE:     M   DUPLICATE: Y   N   DUPLICA	PUMP OR TUBING	3		1200	SAMPLEPUMP	June	7	247	TUBING		=/9	
SAMPLE CONTAINER SPECIFICATION SAMPLE ID CODE SAMPLE CONTAINERS SAMPLE PRESERVATION SAMPLE ID CODE SAMPLE ID CODE SAMPLE ID CODE SAMPLE PRESERVATION SAMPLE ID CODE SAMPLE PRESERVATION TOTAL VOL. ADDED IN FIELD (mi) (n) PH SOURCE SAMPLE PRESERVATION SAMPLE PRESERVATION SAMPLE PRESERVATION INTENDED ANALYSIS AND/OR METHOD SAMPLING EQUIPMENT CODE SAMPLING EQUIPMENT CODE  SAMPLING EQUIPMENT CODE  NONE NONE NONE NONE NONE NONE SAMPLING EQUIPMENT CODE  ANALYSIS AND/OR METHOD  NONE SAMPLING EQUIPMENT CODE  ANALYSIS AND/OR METHOD  ANALYSIS AND/OR METHOD  ANALYSIS AND/OR METHOD  SAMPLING EQUIPMENT CODE  SAMPLING EQUIPMENT CODE  SAMPLING EQUIPMENT CODE  ANALYSIS AND/OR METHOD  ANALYSIS AND/OR MET	- 0 0 m 1 m m m m 1 m 1 m	WALLEY OF A SHALL	1000000							SECTION S		1
SAMPLEID CODE	FIELD DECONTAIN		The state of the s		Filtration Equipme	ent Type.		LIT DIELL			1	13-2-14-2
SAMPLEID CODE         # CONTAINERS         CODE         VOLUME         USED         ADDEDIN FIELD(ml) <sub>(1)</sub> pH         METHOD         CODE           @Ino-500         1         PE         500ml         NONE         NONE         N/A         Inorganics         PP           @Met-250         1         PE         250ml         HNO3         1ml         <2			ATION	T	PRESERVATIVE			FINAL	ANALYS	IS AND/OR	EQU	JIPMENT
@Met-250 1 PE 250ml HNO3 1ml <2 Metals PP	SAMPLE ID CODE	# CONTAINERS		VOLUME					ME	THOD	-	ODE
@Met-250 1 PE 250ml HNO3 1ml <2 Metals PP			12000									c.25.7v
@Rad-1L 2 PE 1L HNO3 5ml <2 Radiologicals PP	@Ino-500	1	PE	500ml	NONE	1	NONE	N/A	Inor	ganics		PP
@Rad-1L 2 PE 1L HNO3 5ml <2 Radiologicals PP												
@Rad-1L 2 PE 1L HNO3 5ml <2 Radiologicals PP	SUCCESSION OF THE PARTY OF THE		200		12000		20.7			100	-	DD.
						-				32813		
	@Rad-1L	2	PE	1L	HNO3		5ml	<2	Radio	logicals		PP
				-		-						
						-						
				-	-	-						
DELLINIO.			-								1	
	DEMARKS.							1				
REMARKS: (1) Sample bottles pre-preserved at laboratory prior to sample collection.		ttles pre-pre	served at lab	oratory pric	or to sample co	ollection.						
MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)							P = Polypropylen	e; S = Silic	one; T = Teflon	; O= Other (Spi	ecify)	

<sup>1.</sup> The above do not constitute all of the information requierd by Chapter 62-160, F.A.C.

<sup>2,</sup> STABILIZATION CRITERIA FOR RANGE OF VARIATION OF LAST THREE CONSECUTIVE READINGS (SEE FS 2212. SECTION 3)
pH: ± 0.2 units Temperature: ± 0.2 °C Specific Conductance: ± 5% Dissolved Oxygen: all readings ≤ 20% saturation (see Table FS 2200-2);
optionally, ± 0.2 mg/L or ± 10% (whichever is greater) Turbidity: all readings ≤ 20 NTU; optionally ± 5 NTU or 10% (whichever is greater)

## **GROUNDWATER SAMPLING LOG**

SITE NAME:		Big Be	end		SITE LOCATION: Apollo Beach, FL.							
VELL NO:	C	CR-PZ-5			SAMPLE ID:	L16	F174-05	-42	DATE: 6/24/15			
						NG DATA	-					
VELL DIAMETER (inches	)	TUBING DIAMETER (inc	thes) 5/8	WELL SCREEN DEPTH 31.0	3 feet to			TH (feet): 25.85	PURGE PUMP T OR BAILER:	ESP ESP		
VELL VOLUME Property only fillout if applications of the contraction o	JRGE: able)	1 WELL VO	LUME = (TOT/	AL WELL DEPTH	- STATIC DEP feet -	TH TO WATER	feet) x	PACITY	gallons/foo	nt =	gallons	
EQUIPMENT VOL	JME PURGE:	1 EQL		= PUMP VÕLUI		CAPACITY X		TH) + FLOW CE	- A CHINA CONTRACTOR		330 300	
only mooth applic	00107		=(	0	gallons + (	0.016 gall	ons/foot X	47.03 fe	et)+ 0.06	gallons =	0.81 gallons	
NITIAL PUMP OR DEPTH IN WELL (	TUBING eet): 36.0	GOMOL:	FINAL PUMP DEPTH IN W	ELL (feet):	36.0	PURGING INITIATED AT:	11:01	PURGING ENDED AT:	11:20	TOTAL VOLUM PURGED (gall	ME lons): 9.7	
TIME	VOLUME PURGED (GALLONS)	VOLUME PURGED (GALLONS)	PURGE RATE (GPM)	TO WATER (FEET)	pH (standard units)	TEMP. (°C)	COND. (µmhos/cm OR µS/cm)	DISSOLVED OXYGEN (circle mg/Lar % saturation)	TURBIDITY (NTUs)	COLOR (describe)	ODOR (describe)	
11:16	7.69	7.69	0.51	26.88	6.51	27.85	5585	0.20	11.30	CLEAR	MILD	
11:18	1.04	8.73	0.52	26.86	6.51	27.86	5598	0.19	7.72	CLEAR	MILD	
11:20	1.05	9.78	0.53	26.85	6,51	27.84	5616	0.18	5.14	CLEAR	MILD	
NELL CAPACITY (I TUBING INSIDE DIA SAMPLED BY (PR	A, CAPACITY (Gal INT) / AFFILIATIO RAE	./Ft.): 1/8" = 0.00 ON:		= 0.0014: 1/4" SAMPLER (S) S	SAMPL IGNATURES:	0.16; 3"=0 5/16"=0.004; ING DATA	3/8" = 0.00	6; 1/2" = 0.0  SAMPLING INITIATED AT:	1 = 1.02; 6" = 1 010: 5/8	"=0.016 SAMPLING ENDED AT:	= 5.88	
PUMP OR TUBING DEPTH IN WELL (	eet): 36.0			SAMPLE PUMP FLOW RATE (n	L per minute):		963	MATERIAL CODE	: P			
FIELD DECONTAIN	MINATION:	Y I N V		FIELD-FILTERE Filtration Equipm	D: Y Inent Type.	N FILT	ER SIZE:	μm	DUPLICATE:	Y D NE	2	
	SAMPLE CON SPECIFICA				SAMPLE PRE	SERVATION			NDED		MPLING UIPMENT	
SAMPLE ID CODE		MATERIAL	VOLUME	PRESERVATIVI USED		AL VOL. I FIELD (ml) (1)	PH PH		ANALYSIS AND/OR METHOD		CODE	
@Ino-500	1	PE	500ml	NONE	N	ONE	N/A	Inorganics			ESP	
@Met-250	1	PE	250ml	HNO3		1ml	<2	Me	etals		ESP	
@Rad-1L	2	PE	1L	HNO3		5ml	<2	Radio	logicals		ESP	
								1				
E-E										1		
REMARKS:												
(1) Sample bo	ttles pre-pres	erved at lab	oratory pric	r to sample	collection.	A						

1. The above do not constitute all of the information requierd by Chapter 62-160, F.A.C.

<sup>2.</sup> STABILIZATION CRITERIA FOR RANGE OF VARIATION OF LAST THREE CONSECUTIVE READINGS (SEE FS 2212. SECTION 3)
pH: ± 0.2 units Temperature: ± 0.2 °C Specific Conductance: ± 5% Dissolved Oxygen: all readings ≤ 20% saturation (see Table FS 2200-2);
optionally, ± 0.2 mg/L or ± 10% (whichever is greater) Turbidity: all readings ≤ 20 NTU; optionally ± 5 NTU or 10% (whichever is greater)

# **GROUNDWATER SAMPLING LOG**

SITE NAME:		Big Be	end			SITE LOCATION:		Apollo Beach, FL.				
WELL NO:		CCR-PZ-6			SAMPLE ID:	L16	F174-06		DATE:	6/24/15		
						NG DATA						
WELL DIAMETER (inche	s)	TUBING DIAMETER (Inc	hes) 1/4	WELL SCREEN DEPTH 11.1		21.11 (feet)	STATIC DEF	TH (feet): 5.21	PURGE PUMP TO OR BAILER:	PP PP		
WELL VOLUME P (only fillout if applic	URGE: :able)	1 WELL VO	LUME = (TOT	AL WELL DEPTH	- STATIC DEF	TH TO WATER	) X WELL CA	PACITY	gallons/foc	ot =	gallons	
EQUIPMENT VOL	UME PURGE:	1 EQU		. = PUMP VOLUM			TUBING LENG	TH) + FLOW CE			15.00	
	77791		=(	0	gallons + (	0.0026 gall		47.03 fe			0.18 gallons	
INITIAL PUMP OR DEPTH IN WELL (	TUBING feet): 16.	1	FINAL PUMP DEPTH IN W	OR TUBING ELL (feet):	16.1	PURGING INITIATED AT:	1	PURGING ENDED AT: DISSOLVED	10:42	TOTAL VOLUME PURGED (gallons): 1		
TIME	VOLUME PURGED (GALLONS)	VOLUME PURGED (GALLONS)	PURGE RATE (GPM)	TO WATER (FEET)	pH (standard units)	TEMP. (°C)	COND. (µmhos/cm OR µS/cm)	OXYGEN (circle mg/ler % saturation)	TURBIDITY (NTUs)	COLOR (describe)	ODOR (describe)	
10:38	0.78	0.78	0.13	5.45	6.55	26.54	1639	0.30	9.78	CLEAR	MILD	
10:40	0.26	1.04	0.13	5.46	6.52	26.53	1639	0.31	8.22	CLEAR	MILD	
10:42	0.26	1.30	0.13	5.48	6.53	26.42	1638	0.37	6.70	CLEAR	MILD	
WELL CAPACITY ( TUBING INSIDE DI SAMPLED BY (PF	A. CAPACITY (GE RINT) / AFFILIAT RAI	il./Ft.): 1/8" = 0.00		SAMPLER (S) S	SAMPL SAMPL IGNATURES:	5/16" = 0.004; ING DATA	3/8" = 0.00	6: 1/2" = 0.	= 1.02; 6" = 1 010: 5/8"	"= 0,016 SAMPLING ENDED AT:	0:50	
PUMP OR TUBIN DEPTH IN WELL	(feet): 16.	1		SAMPLE PUMP FLOW RATE (m			493	MATERIAL COD	E: PE	/S		
FIELD DECONTA	MINATION:	Y D N 🗹		FIELD-FILTERE Filtration Equipm	D: ent Type.	N P FILT	ER SIZE:	μm	DUPLICATE:	Y N	2	
	SAMPLE CO SPECIFIC					ESERVATION	over lever		ENDED	SAMPLING		
SAMPLE ID CODE	# CONTAINERS	MATERIAL CODE	VOLUME	PRESERVATIVE USED	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	TAL VOL. N FIELD (ml) (1)	FINAL pH		IS AND/OR THOD		CODE	
@Ino-500	1	PE	500ml	NONE	N	IONE	N/A	Inorganics			PP	
@Met-250	1	PE	250ml	HNO3		1ml	<2	M	etals		PP	
@Rad-1L	2	PE	1L	HNO3		5ml	<2	Radio	logicals		PP	
1												
REMARKS:		120,20,31,00		No. 20 A 24 A	ollooties							
(1) Sample be MATERIAL CODE			oratory pric = Clear Glass			P = Polypropylen	e: S = Silic	one: T = Teflor	: O= Other (Spe	ecify)		
SAMPLING/PURGI EQUIPMENT CODI							-	PP = Peristaltic Pur frap; O = Other (Sp				

1. The above do not constitute all of the information requierd by Chapter 62-160, F.A.C.

<sup>2.</sup> STABILIZATION CRITERIA FOR RANGE OF VARIATION OF LAST THREE CONSECUTIVE READINGS (SEE FS 2212. SECTION 3)
pH: ±0.2 units Temperature: ±0.2 °C Specific Conductance: ±5% Dissolved Oxygen: all readings ≤ 20% saturation (see Table FS 2200-2);
optionally, ±0.2 mg/L or ±10% (whichever is greater) Turbidity: all readings ≤ 20 NTU; optionally ±5 NTU or 10% (whichever is greater)

## **GROUNDWATER SAMPLING LOG**

SITE NAME:		Hard	ee			SITE LOCATION:		Bowling	g Green, Fl.			
WELL NO:		MWB-35			SAMPLE ID:	L16	F174-07		DATE:	6/24/15		
						NG DATA						
WELL DIAMETER (inches	) 0.0	TUBING DIAMETER (inc	11111	WELL SCREEN DEPTH 13.7	1 feet to	18.71 (feet)		271 177 177 177	PURGE PUMP T OR BAILER:	PP PP		
WELL VOLUME PI only fillout if applic	JRGE: able)	1 WELL VO	LUME = (TOT	AL WELL DEPTH		TH TO WATER		PACITY			enllene	
EQUIPMENT VOL	IME DI IDGE:	1 501	IIDMENTVOI	= PLIMP VOLUE	feet -	CAPACITY X	feet ) x	TH) + FLOW CE	qallons/foc	)( =	gallons	
only fillout if applic	able)	1 234		0		0.0026 gall		Oleman Salahari	et)+ 0.06	gallons =	0.11 gallons	
NITIAL PUMP OR DEPTH IN WELL (	TUBING eet): 16.2		FINAL PUMP DEPTH IN W	OR TUBING	16.2	PURGING INITIATED AT:		PURGING ENDED AT:	10:10	TOTAL VOLUM	-	
TIME	VOLUME PURGED (GALLONS)	VOLUME PURGED (GALLONS)	PURGE RATE (GPM)	TO WATER (FEET)	pH (standard units)	TEMP. (°C)	COND. (µmhos/cm OR µS/cm)	OXYGEN (circle mg/l) or % saturation)	TURBIDITY (NTUs)	COLOR (describe)	ODOR (describe)	
10:04	0.82	0.82	0.12	7.36	6.80	26.50	1584	0.38	0.94	LT. YELLOW	NONE	
10:06	0.24	1.06	0.12	7.40	6.80	26.59	1567	0.36	1.46	LT. YELLOW	NONE	
10:08	0.24	1.30	0.12	7.42	6.80	26.72	1544	0.34	1.59	LT. YELLOW	NONE	
10:10	0.24	1.54	0.12	7.43	6.80	26.77	1516	0.36	1.22	LT. YELLOW	NONE	
WELL CAPACITY (I TUBING INSIDE DIA SAMPLED BY (PR PUMP OR TUBING DEPTH IN WELL (I FIELD DECONTAM SAMPLEID CODE	A CAPACITY (Gal.  INT) / AFFILIATIO  RAB  Geel): 16.2  IINATION: Y  SAMPLE CON SPECIFICA	ON:		= 0.0014; 1/4" SAMPLER (S) S	SAMPLE  SAMPL  IGNATURES:  DEPT minute):  ED:  SAMPLE PRI	5/16" = 0.004: ING DATA	3/8" = 0.00	SAMPLING INITIATED AT: 10 TUBING MATERIAL CODI  pm INTE ANALYS	0:10	SAMPLING ENDED AT:  10  /S  Y N SAM EQU	0:19	
@Ino-500	1	PE	500ml	NONE	N	ONE	N/A	Inor	ganics		PP	
@Met-250	1	PE	250ml	HNO3		1ml	<2	Me	etals		PP	
@Rad-1L	2	PE	1L	HNO3		5ml	<2	Radio	logicals		PP	
REMARKS: (1) Sample bo MATERIAL CODE SAMPLING/PURGING	S: AG = Ambe	r Glass; CG	= Clear Glass	PE = Polye	thylene; PF	= Polypropylen		one; T = Teflon PP = Peristaltic Pur Trap; O = Other (Sp		ecify)		

NOTES: 1. The above do not constitute all of the information requierd by Chapter 62-160, F.A.C.

2. STABILIZATION CRITERIA FOR RANGE OF VARIATION OF LAST THREE CONSECUTIVE READINGS (SEE FS 2212. SECTION 3) pH:  $\pm$  0.2 units Temperature:  $\pm$  0.2 °C Specific Conductance:  $\pm$  5% Dissolved Oxygen: all readings  $\leq$  20% saturation (see Table FS 2200-2): optionally,  $\pm$  0.2 mg/L or  $\pm$  10% (whichever is greater) Turbidity: all readings  $\leq$  20 NTU; optionally  $\pm$  5 NTU or 10% (whichever is greater)

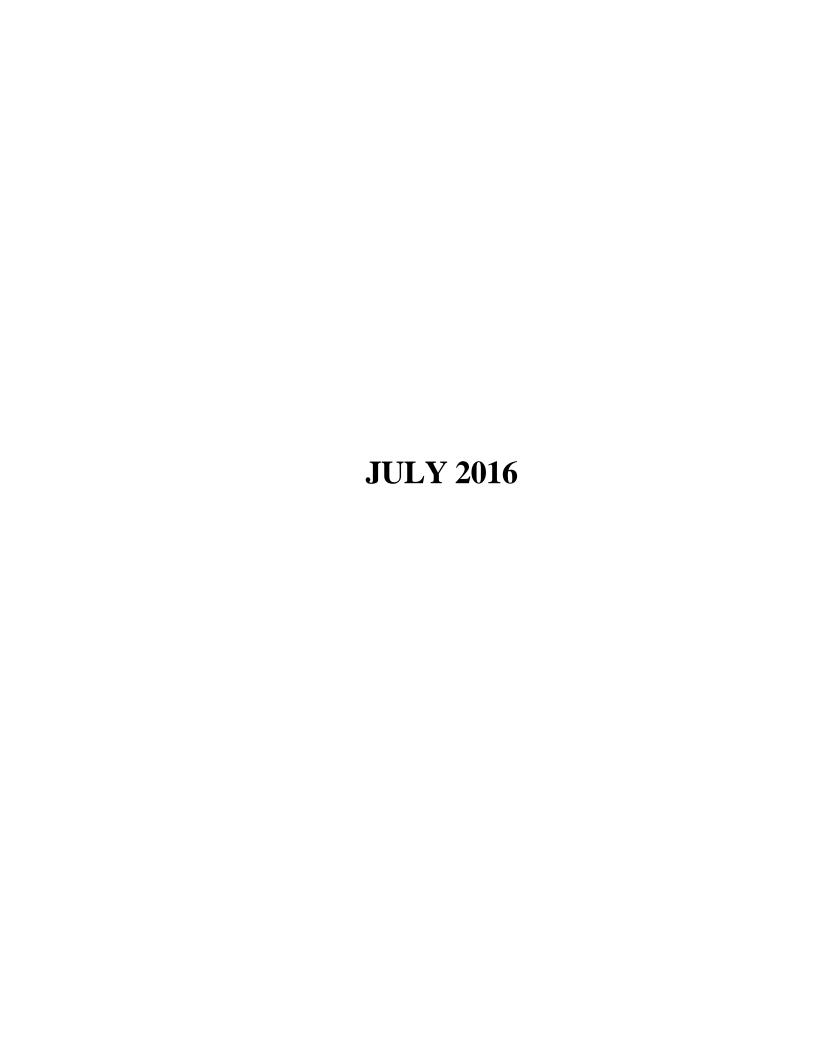
## **GROUNDWATER SAMPLING LOG**

SITE NAME:		Hard	ee		LIL	SITE LOCATION:		Bowling	Green, Fl.		
WELL NO:		WB-36			SAMPLE ID:	L16	F174-08	THE PERSON NAMED IN	DATE:	6/24/15	
					PURGI	NG DATA					
WELL DIAMETER (inches	0.0	TUBING DIAMETER (inc	thes) 1/4	WELL SCREEN DEPTH 13.73		18.73 (feet)	STATIC DEF	TH (feet): 7.78	PURGE PUMP T OR BAILER:	YPE PP	
WELL VOLUME P	JRGE: able)	1 WELL VO	LUME = (TOT	AL WELL DEPTH	- STATIC DEP	TH TO WATER	X WELL CA	PACITY			
137 (4.7)	v resident	740	= (	B/01/B1/18/19	feet -	OLDACITY V	feet ) x	TH) + FLOW CE	gallons/foo	ol =	gallons
conly fillout if application	able)	1 EQ		A STATE OF THE PARTY OF				270.7		2 0.000.00	0.11
INITIAL DUMP OR	TURING		=(	0	gallons + (	0.0026 gall			et)+ 0.06		0.11 gallons
INITIAL PUMP OR DEPTH IN WELL (	eet): 16.2	COMUL.	FINAL PUMP DEPTH IN W	ELL (feet):	16.2	PURGING INITIATED AT:	9:26	PURGING ENDED AT: DISSOLVED	9:42	TOTAL VOLUM PURGED (gallo	ons): 1.82
TIME	VOLUME PURGED (GALLONS)	VOLUME PURGED (GALLONS)	PURGE RATE (GPM)	DEPTH TO WATER (FEET)	pH (standard units)	TEMP. (°C)	COND. (µmhos/cm OR µS/cm)	OXYGEN (circle mg/l br % saturation)	TURBIDITY (NTUs)	COLOR (describe)	ODOR (describe)
9:38	1.36	1.36	0.11	8.37	6.94	27.84	2644	0.75	3.00	LT. YELLOW	MODERATE
9:40	0.23	1.59	0.12	8.38	6.92	27.76	2630	0.71	2.01	LT. YELLOW	MODERATE
9:42	0.23	1.82	0.12	8.38	6.91	27.82	2641	0.71	1.70	LT, YELLOW	MODERATE
WELL CAPACITY (G		.75" = 0.02;	The second secon			0.37; 4" = 0.			12" = 5.88		
TUBING INSIDE DIA.	CAPACITY (Gal./FI.	): 1/8" = 0.00006;	3/16" = 0.0014;	1/4" = 0.0026;	SAMPL	ING DATA	1/2" = 0.0	10; 5/8*= (	0.016	The state of the s	
SAMPLED BY (PR	INT)/AFFILIATIO	ON:	TECO	SAMPLER (S) SI		19		SAMPLING INITIATED AT: 9:	:42	SAMPLING ENDED AT:	9:50
PUMP OR TUBING DEPTH IN WELL (			1200	SAMPLE PUMP FLOW RATE (m	L nor minutal	/	430	TUBING MATERIAL CODE	: PE	:/\$	
ACTOR OF STREET	transfer and the second			FIELD-FILTERE Filtration Equipm			ER SIZE:	μm	DUPLICATE:	YDNE	1
FIELD DECONTAIN	SAMPLE CON		_	Filtration Equipm	THE TANK THE	A		(A)TE	NDED	1	41 2 COTO
	SPECIFICA	MATERIAL	F 92511.00	SAMPLE PRESERVATION  PRESERVATIVE TOTAL VOL. FINAL				ANALYSI	IS AND/OR	SAMPLING EQUIPMENT CODE	
SAMPLE ID CODE	# CONTAINERS	CODE	VOLUME	USED	ADDEDI	N FIELD (ml) (t)	pH	ME	THOD		ODE
@Ino-500	1	PE	500ml	NONE	N	IONE	N/A	Inorg	ganics		PP
@Met-250	1	PE	250ml	HNO3		1ml	<2	Me	etals		PP
@Rad-1L	2	PE	1L	HNO3		5ml	<2	Radio	logicals	1	PP
		-									
REMARKS: (1) Sample bo	ttles pre-pres	erved at lab	oratory pric	or to sample c	ollection.				74		
MATERIAL CODES	AG = Amber G	lass; CG = C	Clear Glass;	PE = Polyethylene	; PP = Poly				ner (Specify)		
SAMPLING/PURGINEQUIPMENT CODE	IG A	PP = After Peris	taltic Pump; B	= Bailer; BP = Bla Pump; SM = Strav	dder Pump; ES v Method (tubin	P = Electric Subra Gravity Drain);	nirsable Pump; VT = Vacuum 1	PP = Peristaltic Pun rap; O = Other (Spe	np edfy)		

NOTES: 1. The above do not constitute all of the information requierd by Chapter 62-160, F.A.C.

2. STABILIZATION CRITERIA FOR RANGE OF VARIATION OF LAST THREE CONSECUTIVE READINGS (SEE FS 2212. SECTION 3) pH: ± 0.2 units Temperature: ± 0.2 °C Specific Conductance: ± 5% Dissolved Oxygen: all readings ≤ 20% saturation (see Table FS 2200-2);

optionally, ± 0.2 mg/L or ± 10% (whichever is greater) Turbidity: all readings ≤ 20 NTU; optionally ± 5 NTU or 10% (whichever is greater)





5012 Causeway Blvd Tampa Fl. 33619 \* Ph (813)630-7490 \* Fax (813)630-7360 \* DOH #E54272

Big Bend Power Station Terry Eastley 13031 Wyandott Rd Apollo Beach, FL 33572

tleastley@tecoenergy.com

Work Order - L16G005

**Report Date:** 

08/18/16 15:52

# Project - CCR Wells Economizer Ash Pond

## **Case Narrative**

8 sample(s) were received on 07/27/16 15:50.

There were no issues noted with the sample(s) associated with this workorder unless noted below.

#### EPA 6010

The recovery of the matix spike and spike duplicate could not be acurately determined due to the amount of target analyte in the smple matrix.

The Parent sample is flagged with a J qualifier.

#### **EPA 300.0**

The recovery of the matrix spike and spike duplicate for Chloride and Sulfate is below the control limts due to matrix interference. The parent sample is flagged with a J qualifier.

#### **EPA 200.8**

The recovery of the matrix spike and spike duplicate for Selenium is below the control limts due to matrix interference. The parent sample is flagged with a J qualifier.

### SM 2540C

A constant weight could not be acheived after three consectutive weighing and drying cycles for sample PZ-2. The sample(s) are flagged with a J qualifier.



Sample Qualifer:

# **Tampa Electric Laboratory Services**

5012 Causeway Blvd Tampa Fl. 33619 \* Ph (813)630-7490 \* Fax (813)630-7360 \* DOH #E54272

## **Sample Information**

Client: Big Bend Power Station

Lab Sample ID: L16G005-01 Sampled By: Robert Barthelette

Sample Description: PZ1 Date and Time Collected: 7/27/16 13:45
Sample Collection Method: Grab Date of Sample Receipt: 7/27/16 15:50

## **Laboratory Results**

Dayamatay	D14	II	MDI	DOI	Qualifier	D:I	Test Mathad	Amalessa	Analysis
Parameter	Result	Units	MDL	PQL	Code	Dil	Method	Analyst	Date & Time
General Chemistry Paramet		ampa Elect	ric Comp	any, Labo	oratory Se	rvices			
Chloride		mg/L	2.00	50.0	T	100	EPA 300.0	TMII	9/11/17 10:20
	742				J-	100		TMH	8/11/16 10:29
Specific Conductance	4180	umhos/cm	100	100		1	FDEP SOP FT 1200	RAB	7/27/16 13:4:
Dissolved Oxygen	0.220	mg/L	0.100	0.100		1	FDEP SOP FT 1500	RAB	7/27/16 13:4:
Fluoride	0.128	mg/L	0.0100	0.0500		1	EPA 300.0	TMH	8/10/16 18:40
pH	6.67	pH Units	1.00	1.00		1	FDEP SOP FT 1100	RAB	7/27/16 13:45
REDOX Potential	-74.1	mV	-999	-999		1	SM 2580B	RAB	7/27/16 13:45
Total Dissolved Solids	3140	mg/L	24.0	40.0		2	SM 2540C	RFL	8/3/16 12:00
Sulfate	1320	mg/L	50.0	200	J-	100	EPA 300.0	ТМН	8/11/16 10:2
Turbidity	3.88	NTU	0.100	0.100		1	FDEP SOP FT 1600	RAB	7/27/16 13:4
Total Mercury by SW846 Mo	ethod 7470/7471								
Mercury	0.0500	ug/L	0.0500	0.200	U	1	EPA 7470A	RLC	8/5/16 9:08
Total Recoverable Metals by	200 Series								
Antimony	1.03	ug/L	0.600	2.00	I	1	EPA 200.8	RC	8/2/16 10:09
Arsenic	7.38	ug/L	0.320	2.00		1	EPA 200.8	RC	8/2/16 10:09
Cadmium	0.100	ug/L	0.100	0.500	U	1	EPA 200.8	RC	8/3/16 11:15
Cobalt	0.450	ug/L	0.0400	2.00	I	1	EPA 200.8	RC	8/2/16 10:09
Lead	0.110	ug/L	0.0800	2.00	I	1	EPA 200.8	RC	8/3/16 11:15
Selenium	0.960	ug/L	0.200	2.00	I	1	EPA 200.8	RC	8/2/16 10:09
Thallium	0.100	ug/L	0.100	0.500	U	1	EPA 200.8	RC	8/3/16 11:15
Thamum  Total Recoverable Metals by				3.000	U	1		KC	0/3/10 11.1.
Barium	30.8	ug/L	0.500	20.0		1	EPA 6010B	MCR	8/3/16 17:05
Beryllium	0.200	ug/L	0.200	2.00	U	1	EPA 6010B	MCR	8/3/16 17:05



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### Sample Information

Client: Big Bend Power Station

Lab Sample ID: L16G005-01 Sampled By: Robert Barthelette

Sample Description: PZ1 Date and Time Collected: 7/27/16 13:45
Sample Collection Method: Grab Date of Sample Receipt: 7/27/16 15:50

Sample Qualifer:									
Parameter	Result	Units	MDL	PQL	Qualifier Code	Dil	Test Method	Analyst	Analysis Date & Time
Boron	306	ug/L	10.0	50.0		1	EPA 6010B	MCR	8/3/16 17:05
Calcium	227000	ug/L	30.0	1000		1	EPA 6010B	MCR	8/4/16 11:42
Chromium	1.60	ug/L	1.60	12.0	U	1	EPA 6010B	MCR	8/3/16 17:05
Molybdenum	105	ug/L	1.00	20.0		1	EPA 6010B	MCR	8/3/16 17:05
			KNL I	aborator	y				
<u>Radium - 226</u>									
Rad - 226	31	pCi/L	0.4	0.4		1	EPA 903.0	KL1	8/2/16 11:46
Rad - 226 Counting Error +/-	1.6	pCi/L				1	EPA 903.0	KL1	8/2/16 11:46
<u>Radium - 228</u>									
Rad - 228	1.7	pCi/L	0.8	0.8		1	EPA Ra-05	KL1	8/8/16 11:15
Rad - 228 Counting Error +/-	0.6	pCi/L				1	EPA Ra-05	KL1	8/8/16 11:15
Radium-226/228									
Rad-226/228	33	pCi/L	0.8	0.8		1	Calc	KL1	8/8/16 11:15
Rad-226/228 Counting Error +/-	1.6	pCi/L				1	Calc	KL1	8/8/16 11:15
			TestAmer	ica Pensa	cola				
Metals (ICP)									
Lithium	0.015	mg/L	0.0010	0.050	I	1	200.7 Rev 4.4 Z01	GESP	8/3/16 16:14



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## **Sample Information**

Client: Big Bend Power Station

Lab Sample ID: L16G005-02 Sampled By: Robert Barthelette

Sample Description: PZ2 Date and Time Collected: 7/27/16 13:16
Sample Collection Method: Grab Date of Sample Receipt: 7/27/16 15:50

# **Laboratory Results**

Sample Qualifer:									
Parameter	Result	Units	MDL	PQL	Qualifier Code	Dil	Test Method	Analyst	Analysis Date & Time
	T	ampa Elect	ric Comp	any, Labo	oratory Se	rvices			
<b>General Chemistry Parameters</b>	<u>i</u>								
Chloride	140	mg/L	2.00	50.0		100	EPA 300.0	TMH	8/11/16 11:30
Specific Conductance	1700	umhos/cm	100	100		1	FDEP SOP FT 1200	RAB	7/27/16 13:16
Dissolved Oxygen	0.130	mg/L	0.100	0.100		1	FDEP SOP FT 1500	RAB	7/27/16 13:16
Fluoride	0.183	mg/L	0.0100	0.0500		1	EPA 300.0	TMH	8/11/16 10:59
pH	6.68	pH Units	1.00	1.00		1	FDEP SOP FT 1100	RAB	7/27/16 13:16
REDOX Potential	-67.4	mV	-999	-999		1	SM 2580B	RAB	7/27/16 13:16
Total Dissolved Solids	1170	mg/L	24.0	40.0		2	SM 2540C	RFL	8/3/16 12:00
Sulfate	542	mg/L	50.0	200		100	EPA 300.0	ТМН	8/11/16 11:30
Turbidity	7.16	NTU	0.100	0.100		1	FDEP SOP FT 1600	RAB	7/27/16 13:16
<b>Total Mercury by SW846 Meth</b>	od 7470/7471								
Mercury	0.0500	ug/L	0.0500	0.200	U	1	EPA 7470A	RLC	8/5/16 9:11
<b>Total Recoverable Metals by 20</b>	0 Series								
Antimony	0.830	ug/L	0.600	2.00	I	1	EPA 200.8	RC	8/2/16 10:13
Arsenic	0.990	ug/L	0.320	2.00	I	1	EPA 200.8	RC	8/2/16 10:13
Cadmium	0.100	ug/L	0.100	0.500	U	1	EPA 200.8	RC	8/3/16 11:19
Cobalt	0.0900	ug/L	0.0400	2.00	I	1	EPA 200.8	RC	8/2/16 10:13
Lead	0.110	ug/L	0.0800	2.00	I	1	EPA 200.8	RC	8/3/16 11:19
Selenium	0.280	ug/L	0.200	2.00	I	1	EPA 200.8	RC	8/2/16 10:13
Thallium	0.100	ug/L	0.100	0.500	U	1	EPA 200.8	RC	8/3/16 11:19
<b>Total Recoverable Metals by SV</b>	W846 Method	6010B							
Barium	64.8	ug/L	0.500	20.0		1	EPA 6010B	MCR	8/3/16 17:08
Beryllium	0.200	ug/L	0.200	2.00	U	1	EPA 6010B	MCR	8/3/16 17:08



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### Sample Information

Client: Big Bend Power Station

Lab Sample ID: L16G005-02 Sampled By: Robert Barthelette

Sample Description: PZ2 Date and Time Collected: 7/27/16 13:16
Sample Collection Method: Grab Date of Sample Receipt: 7/27/16 15:50

Sample Qualifer:									
Parameter	Result	Units	MDL	PQL	Qualifier Code	Dil	Test Method	Analyst	Analysis Date & Time
Boron	2810	ug/L	10.0	50.0		1	EPA 6010B	MCR	8/3/16 17:08
Calcium	193000	ug/L	30.0	1000	J-	1	EPA 6010B	MCR	8/4/16 11:45
Chromium	1.60	ug/L	1.60	12.0	U	1	EPA 6010B	MCR	8/3/16 17:08
Molybdenum	1.00	ug/L	1.00	20.0	U	1	EPA 6010B	MCR	8/3/16 17:08
			KNL I	aborator	y				
<u>Radium - 226</u>									
Rad - 226	12.8	pCi/L	0.4	0.4		1	EPA 903.0	KL1	8/2/16 11:46
Rad - 226 Counting Error +/-	1.1	pCi/L				1	EPA 903.0	KL1	8/2/16 11:46
<u>Radium - 228</u>									
Rad - 228	0.9	pCi/L	0.9	0.9	U	1	EPA Ra-05	KL1	8/4/16 10:47
Rad - 228 Counting Error +/-	0.6	pCi/L				1	EPA Ra-05	KL1	8/4/16 10:47
Radium-226/228									
Rad-226/228	13.2	pCi/L	0.9	0.9		1	Calc	KL1	8/4/16 10:47
Rad-226/228 Counting Error +/-	1.1	pCi/L				1	Calc	KL1	8/4/16 10:47
			TestAmer	ica Pensa	cola				
Metals (ICP)									
Lithium	0.017	mg/L	0.0010	0.050	I	1	200.7 Rev 4.4 Z01	GESP	8/3/16 16:31



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### **Sample Information**

Client: Big Bend Power Station

Lab Sample ID: L16G005-03 Sampled By: Robert Barthelette

Sample Description: PZ3 Date and Time Collected: 7/27/16 12:45
Sample Collection Method: Grab Date of Sample Receipt: 7/27/16 15:50

## **Laboratory Results**

Sample Qualifer:									
Parameter	Result	Units	MDL	PQL	Qualifier Code	Dil	Test Method	Analyst	Analysis Date & Time
	T	ampa Elect	ric Comp	any, Lab	oratory Se	rvices			
<b>General Chemistry Parame</b>	<u>ters</u>								
Chloride	140	mg/L	2.00	50.0		100	EPA 300.0	TMH	8/11/16 11:50
Specific Conductance	1740	umhos/cm	100	100		1	FDEP SOP FT 1200	RAB	7/27/16 12:45
Dissolved Oxygen	0.100	mg/L	0.100	0.100	U	1	FDEP SOP FT 1500	RAB	7/27/16 12:45
Fluoride	0.262	mg/L	0.0100	0.0500		1	EPA 300.0	TMH	8/11/16 11:40
pН	6.19	pH Units	1.00	1.00		1	FDEP SOP FT 1100	RAB	7/27/16 12:45
REDOX Potential	-74.4	mV	-999	-999		1	SM 2580B	RAB	7/27/16 12:45
Total Dissolved Solids	1220	mg/L	24.0	40.0		2	SM 2540C	RFL	8/3/16 12:00
Sulfate	516	mg/L	50.0	200		100	EPA 300.0	TMH	8/11/16 11:50
Turbidity	8.04	NTU	0.100	0.100		1	FDEP SOP FT 1600	RAB	7/27/16 12:45
Total Mercury by SW846 M	<u>lethod 7470/7471</u>								
Mercury	0.0500	ug/L	0.0500	0.200	U	1	EPA 7470A	RLC	8/5/16 9:15
Total Recoverable Metals by	y 200 Series								
Antimony	0.770	ug/L	0.600	2.00	I	1	EPA 200.8	RC	8/2/16 10:16
Arsenic	0.540	ug/L	0.320	2.00	I	1	EPA 200.8	RC	8/2/16 10:16
Cadmium	0.100	ug/L	0.100	0.500	U	1	EPA 200.8	RC	8/3/16 11:23
Cobalt	0.0900	ug/L	0.0400	2.00	I	1	EPA 200.8	RC	8/2/16 10:16
Lead	0.0800	ug/L	0.0800	2.00	I	1	EPA 200.8	RC	8/3/16 11:23
Selenium	0.270	ug/L	0.200	2.00	I	1	EPA 200.8	RC	8/2/16 10:16
Thallium	0.100	ug/L	0.100	0.500	U	1	EPA 200.8	RC	8/3/16 11:23
Total Recoverable Metals by	y SW846 Method	<u>6010B</u>							
Barium	67.6	ug/L	0.500	20.0		1	EPA 6010B	MCR	8/3/16 17:10
Beryllium	0.200	ug/L	0.200	2.00	U	1	EPA 6010B	MCR	8/3/16 17:10



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### Sample Information

Client: Big Bend Power Station

Lab Sample ID: L16G005-03 Sampled By: Robert Barthelette

Sample Description: PZ3 Date and Time Collected: 7/27/16 12:45
Sample Collection Method: Grab Date of Sample Receipt: 7/27/16 15:50

## **Laboratory Results**

Sample Qualifer:									
					Qualifier		Test		Analysis
Parameter	Result	Units	MDL	PQL	Code	Dil	Method	Analyst	Date & Time
Boron	13200	ug/L	10.0	50.0		1	EPA 6010B	MCR	8/3/16 17:10
Calcium	196000	ug/L	30.0	1000		1	EPA 6010B	MCR	8/4/16 11:47
Chromium	1.60	ug/L	1.60	12.0	U	1	EPA 6010B	MCR	8/3/16 17:10
Molybdenum	2.23	ug/L	1.00	20.0	I	1	EPA 6010B	MCR	8/3/16 17:10
			KNL L	aborator	y				
<u>Radium - 226</u>									
Rad - 226	10.9	pCi/L	0.4	0.4		1	EPA 903.0	KL1	8/2/16 11:46
Rad - 226 Counting Error +/-	0.9	pCi/L				1	EPA 903.0	KL1	8/2/16 11:46
<u>Radium - 228</u>									
Rad - 228	1.4	pCi/L	0.9	0.9		1	EPA Ra-05	KL1	8/8/16 11:15
Rad - 228 Counting Error +/-	0.6	pCi/L				1	EPA Ra-05	KL1	8/8/16 11:15
Radium-226/228									
Rad-226/228	12.3	pCi/L	0.9	0.9		1	Calc	KL1	8/8/16 11:15
Rad-226/228 Counting Error +/-	0.9	pCi/L				1	Calc	KL1	8/8/16 11:15
			TestAmer	ica Pensa	cola				
Metals (ICP)									
Lithium	0.011	mg/L	0.0010	0.050	I	1	200.7 Rev 4.4 Z01	GESP	8/3/16 16:34



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### Sample Information

Client: Big Bend Power Station

Lab Sample ID: L16G005-04 Sampled By: Robert Barthelette

Sample Description: PZ4 Date and Time Collected: 7/27/16 12:00
Sample Collection Method: Grab Date of Sample Receipt: 7/27/16 15:50

## **Laboratory Results**

Sample Qualifer:									
Parameter	Result	Units	MDL	PQL	Qualifier Code	Dil	Test Method	Analyst	Analysis Date & Time
	T	ampa Elect	ric Comp	any, Labo	oratory Se	rvices			
<b>General Chemistry Parameters</b>									
Chloride	35.8	mg/L	0.0200	0.500		1	EPA 300.0	TMH	8/11/16 12:00
Specific Conductance	1450	umhos/cm	100	100		1	FDEP SOP FT 1200	RAB	7/27/16 12:00
Dissolved Oxygen	0.150	mg/L	0.100	0.100		1	FDEP SOP FT 1500	RAB	7/27/16 12:00
Fluoride	0.0900	mg/L	0.0100	0.0500		1	EPA 300.0	TMH	8/11/16 12:00
pH	6.55	pH Units	1.00	1.00		1	FDEP SOP FT 1100	RAB	7/27/16 12:00
REDOX Potential	-71.7	mV	-999	-999		1	SM 2580B	RAB	7/27/16 12:00
Total Dissolved Solids	1080	mg/L	24.0	40.0		2	SM 2540C	RFL	8/3/16 12:00
Sulfate	499	mg/L	50.0	200		100	EPA 300.0	TMH	8/11/16 12:10
Turbidity	3.21	NTU	0.100	0.100		1	FDEP SOP FT 1600	RAB	7/27/16 12:00
<b>Total Mercury by SW846 Method</b>	d 7470/7471								
Mercury	0.0500	ug/L	0.0500	0.200	U	1	EPA 7470A	RLC	8/5/16 9:18
<b>Total Recoverable Metals by 200</b>	<u>Series</u>								
Antimony	0.730	ug/L	0.600	2.00	I	1	EPA 200.8	RC	8/2/16 10:20
Arsenic	46.7	ug/L	0.320	2.00		1	EPA 200.8	RC	8/2/16 10:20
Cadmium	0.100	ug/L	0.100	0.500	U	1	EPA 200.8	RC	8/3/16 11:26
Cobalt	0.0500	ug/L	0.0400	2.00	I	1	EPA 200.8	RC	8/2/16 10:20
Lead	0.0800	ug/L	0.0800	2.00	U	1	EPA 200.8	RC	8/3/16 11:26
Selenium	0.260	ug/L	0.200	2.00	I	1	EPA 200.8	RC	8/2/16 10:20
Thallium	0.100	ug/L	0.100	0.500	U	1	EPA 200.8	RC	8/3/16 11:26
<b>Total Recoverable Metals by SW</b>	846 Method	6010B							
Barium	61.7	ug/L	0.500	20.0		1	EPA 6010B	MCR	8/3/16 17:13
Beryllium	0.200	ug/L	0.200	2.00	U	1	EPA 6010B	MCR	8/3/16 17:13



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### Sample Information

Client: Big Bend Power Station

Lab Sample ID: L16G005-04 Sampled By: Robert Barthelette

Sample Description: PZ4 Date and Time Collected: 7/27/16 12:00
Sample Collection Method: Grab Date of Sample Receipt: 7/27/16 15:50

## **Laboratory Results**

Sample Qualifer:									
Parameter	Result	Units	MDL	PQL	Qualifier Code	Dil	Test Method	Analyst	Analysis Date & Time
Boron	13500	ug/L	10.0	50.0		1	EPA 6010B	MCR	8/3/16 17:13
Calcium	237000	ug/L	30.0	1000		1	EPA 6010B	MCR	8/4/16 11:50
Chromium	1.60	ug/L	1.60	12.0	U	1	EPA 6010B	MCR	8/3/16 17:13
Molybdenum	1.00	ug/L	1.00	20.0	U	1	EPA 6010B	MCR	8/3/16 17:13
			KNL L	aborator	y				
<u>Radium - 226</u>									
Rad - 226	10.8	pCi/L	0.3	0.3		1	EPA 903.0	KL1	8/8/16 11:25
Rad - 226 Counting Error +/-	1.0	pCi/L				1	EPA 903.0	KL1	8/8/16 11:25
<u>Radium - 228</u>									
Rad - 228	2.1	pCi/L	0.8	0.8		1	EPA Ra-05	KL1	8/8/16 11:15
Rad - 228 Counting Error +/-	0.6	pCi/L				1	EPA Ra-05	KL1	8/8/16 11:15
Radium-226/228									
Rad-226/228	12.9	pCi/L	0.8	0.8		1	Calc	KL1	8/8/16 11:15
Rad-226/228 Counting Error +/-	1.0	pCi/L				1	Calc	KL1	8/8/16 11:15
			TestAmer	ica Pensa	cola				
Metals (ICP)									
Lithium	0.0077	mg/L	0.0010	0.050	I	1	200.7 Rev 4.4 Z01	GESP	8/3/16 16:37



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### **Sample Information**

Client: Big Bend Power Station

Lab Sample ID: L16G005-05 Sampled By: Robert Barthelette

Sample Description: PZ5 Date and Time Collected: 7/27/16 11:18
Sample Collection Method: Grab Date of Sample Receipt: 7/27/16 15:50

## **Laboratory Results**

Sample Qualifer:									
Parameter	Result	Units	MDL	PQL	Qualifier Code	Dil	Test Method	Analyst	Analysis Date & Time
	T	ampa Elect	ric Comp	any, Lab	oratory Se	rvices			
<b>General Chemistry Parameters</b>									
Chloride	1120	mg/L	2.00	50.0		100	EPA 300.0	TMH	8/11/16 12:30
Specific Conductance	5420	umhos/cm	100	100		1	FDEP SOP FT 1200	RAB	7/27/16 11:18
Dissolved Oxygen	0.170	mg/L	0.100	0.100		1	FDEP SOP FT 1500	RAB	7/27/16 11:18
Fluoride	0.110	mg/L	0.0100	0.0500		1	EPA 300.0	TMH	8/11/16 12:20
pH	6.38	pH Units	1.00	1.00		1	FDEP SOP FT 1100	RAB	7/27/16 11:18
REDOX Potential	-7.30	mV	-999	-999		1	SM 2580B	RAB	7/27/16 11:18
Total Dissolved Solids	4190	mg/L	24.0	40.0	J-	2	SM 2540C	RFL	8/3/16 12:00
Sulfate	1510	mg/L	50.0	200		100	EPA 300.0	ТМН	8/11/16 12:30
Turbidity	7.10	NTU	0.100	0.100		1	FDEP SOP FT 1600	RAB	7/27/16 11:18
<b>Total Mercury by SW846 Meth</b>	od 7470/7471								
Mercury	0.0500	ug/L	0.0500	0.200	U	1	EPA 7470A	RLC	8/5/16 9:22
<b>Total Recoverable Metals by 20</b>	0 Series								
Antimony	0.600	ug/L	0.600	2.00	U	1	EPA 200.8	RC	8/2/16 10:32
Arsenic	8.10	ug/L	0.320	2.00		1	EPA 200.8	RC	8/2/16 10:32
Cadmium	0.100	ug/L	0.100	0.500	U	1	EPA 200.8	RC	8/3/16 11:40
Cobalt	1.33	ug/L	0.0400	2.00	I	1	EPA 200.8	RC	8/2/16 10:32
Lead	0.200	ug/L	0.0800	2.00	I	1	EPA 200.8	RC	8/3/16 11:40
Selenium	1.92	ug/L	0.200	2.00	I	1	EPA 200.8	RC	8/2/16 10:32
Thallium	0.100	ug/L	0.100	0.500	U	1	EPA 200.8	RC	8/3/16 11:40
<b>Total Recoverable Metals by SV</b>	W846 Method	6010B							
Barium	68.2	ug/L	0.500	20.0		1	EPA 6010B	MCR	8/3/16 17:16
Beryllium	0.200	ug/L	0.200	2.00	U	1	EPA 6010B	MCR	8/3/16 17:16



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### Sample Information

Client: Big Bend Power Station

Lab Sample ID: L16G005-05 Sampled By: Robert Barthelette

Sample Description: PZ5 Date and Time Collected: 7/27/16 11:18
Sample Collection Method: Grab Date of Sample Receipt: 7/27/16 15:50

## **Laboratory Results**

Sample Qualifer:									
					Qualifier		Test		Analysis
Parameter	Result	Units	MDL	PQL	Code	Dil	Method	Analyst	Date & Time
Boron	56900	ug/L	10.0	50.0		1	EPA 6010B	MCR	8/3/16 17:16
Calcium	737000	ug/L	30.0	1000		1	EPA 6010B	MCR	8/4/16 11:52
Chromium	1.60	ug/L	1.60	12.0	U	1	EPA 6010B	MCR	8/3/16 17:16
Molybdenum	2.88	ug/L	1.00	20.0	I	1	EPA 6010B	MCR	8/3/16 17:16
			KNL L	aborator	у				
<u>Radium - 226</u>									
Rad - 226	31	pCi/L	0.3	0.3		1	EPA 903.0	KL1	8/8/16 11:25
Rad - 226 Counting Error +/-	1.6	pCi/L				1	EPA 903.0	KL1	8/8/16 11:25
<u>Radium - 228</u>									
Rad - 228	4.5	pCi/L	0.8	0.8		1	EPA Ra-05	KL1	8/8/16 11:15
Rad - 228 Counting Error +/-	0.8	pCi/L				1	EPA Ra-05	KL1	8/8/16 11:15
<b>Radium-226/228</b>									
Rad-226/228	35	pCi/L	0.8	0.8		1	Calc	KL1	8/8/16 11:15
Rad-226/228 Counting Error +/-	1.6	pCi/L				1	Calc	KL1	8/8/16 11:15
			TestAmer	ica Pensa	cola				
Metals (ICP)									
Lithium	0.020	mg/L	0.0010	0.050	I	1	200.7 Rev 4.4 Z01	GESP	8/3/16 16:41



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### **Sample Information**

Client: Big Bend Power Station

Lab Sample ID: L16G005-06 Sampled By: Robert Barthelette

Sample Description: PZ6 Date and Time Collected: 7/27/16 10:15
Sample Collection Method: Grab Date of Sample Receipt: 7/27/16 15:50

## **Laboratory Results**

Sample Qualifer:									
Parameter	Result	Units	MDL	PQL	Qualifier Code	Dil	Test Method	Analyst	Analysis Date & Time
	T	ampa Elect	ric Comp	any, Labo	oratory Se	rvices			
<b>General Chemistry Parameters</b>	<u>i</u>								
Chloride	116	mg/L	2.00	50.0		100	EPA 300.0	TMH	8/11/16 12:50
Specific Conductance	1500	umhos/cm	100	100		1	FDEP SOP FT 1200	RAB	7/27/16 10:15
Dissolved Oxygen	0.150	mg/L	0.100	0.100		1	FDEP SOP FT 1500	RAB	7/27/16 10:15
Fluoride	0.432	mg/L	0.0100	0.0500		1	EPA 300.0	TMH	8/11/16 12:40
pH	6.48	pH Units	1.00	1.00		1	FDEP SOP FT 1100	RAB	7/27/16 10:15
REDOX Potential	-84.1	mV	-999	-999		1	SM 2580B	RAB	7/27/16 10:15
Total Dissolved Solids	1060	mg/L	24.0	40.0		2	SM 2540C	RFL	8/3/16 12:00
Sulfate	341	mg/L	50.0	200		100	EPA 300.0	TMH	8/11/16 12:50
Turbidity	4.86	NTU	0.100	0.100		1	FDEP SOP FT 1600	RAB	7/27/16 10:15
<b>Total Mercury by SW846 Meth</b>	od 7470/7471								
Mercury	0.0500	ug/L	0.0500	0.200	U	1	EPA 7470A	RLC	8/5/16 9:25
<b>Total Recoverable Metals by 20</b>	0 Series								
Antimony	0.600	ug/L	0.600	2.00	U	1	EPA 200.8	RC	8/2/16 10:36
Arsenic	1.75	ug/L	0.320	2.00	I	1	EPA 200.8	RC	8/2/16 10:36
Cadmium	0.100	ug/L	0.100	0.500	U	1	EPA 200.8	RC	8/3/16 11:44
Cobalt	0.140	ug/L	0.0400	2.00	I	1	EPA 200.8	RC	8/2/16 10:36
Lead	0.0800	ug/L	0.0800	2.00	U	1	EPA 200.8	RC	8/3/16 11:44
Selenium	0.760	ug/L	0.200	2.00	I	1	EPA 200.8	RC	8/2/16 10:36
Thallium	0.100	ug/L	0.100	0.500	U	1	EPA 200.8	RC	8/3/16 11:44
<b>Total Recoverable Metals by SV</b>	W846 Method	6010B							
Barium	49.8	ug/L	0.500	20.0		1	EPA 6010B	MCR	8/3/16 17:18
Beryllium	0.200	ug/L	0.200	2.00	U	1	EPA 6010B	MCR	8/3/16 17:18



Sample Qualifer:

# **Tampa Electric Laboratory Services**

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### Sample Information

Client: Big Bend Power Station

Lab Sample ID: L16G005-06 Sampled By: Robert Barthelette

Sample Description: PZ6 Date and Time Collected: 7/27/16 10:15
Sample Collection Method: Grab Date of Sample Receipt: 7/27/16 15:50

## **Laboratory Results**

Sumple Quanter.									
					Qualifier		Test		Analysis
Parameter	Result	Units	MDL	PQL	Code	Dil	Method	Analyst	Date & Time
Boron	4250	ug/L	10.0	50.0		1	EPA 6010B	MCR	8/3/16 17:18
Calcium	271000	ug/L	30.0	1000		1	EPA 6010B	MCR	8/4/16 12:02
Chromium	1.60	ug/L	1.60	12.0	U	1	EPA 6010B	MCR	8/3/16 17:18
Molybdenum	1.00	ug/L	1.00	20.0	U	1	EPA 6010B	MCR	8/3/16 17:18
			KNL L	aboratory	7				
<u>Radium - 226</u>									
Rad - 226	4.6	pCi/L	0.4	0.4		1	EPA 903.0	KL1	8/8/16 11:25
Rad - 226 Counting Error +/-	0.7	pCi/L				1	EPA 903.0	KL1	8/8/16 11:25
<u>Radium - 228</u>									
Rad - 228	0.8	pCi/L	0.8	0.8	U	1	EPA Ra-05	KL1	8/8/16 11:15
Rad - 228 Counting Error +/-	0.5	pCi/L				1	EPA Ra-05	KL1	8/8/16 11:15
Radium-226/228									
Rad-226/228	5.1	pCi/L	0.8	0.8		1	Calc	KL1	8/8/16 11:15
Rad-226/228 Counting Error +/-	0.7	pCi/L				1	Calc	KL1	8/8/16 11:15
			TestAmer	ica Pensa	cola				
Metals (ICP)									
Lithium	0.0091	mg/L	0.0010	0.050	I	1	200.7 Rev 4.4 Z01	GESP	8/3/16 16:44



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### **Sample Information**

Client: Big Bend Power Station

Lab Sample ID: L16G005-07 Sampled By: Robert Barthelette

Sample Description: MWB-35 Date and Time Collected: 7/27/16 10:42
Sample Collection Method: Grab Date of Sample Receipt: 7/27/16 15:50

## **Laboratory Results**

Sample Qualifer:									
Parameter	Result	Units	MDL	PQL	Qualifier Code	Dil	Test Method	Analyst	Analysis Date & Time
	T	ampa Elect	ric Comp	any, Labo	oratory Se	rvices			
<b>General Chemistry Parameters</b>									
Chloride	15.4	mg/L	0.0200	0.500		1	EPA 300.0	TMH	8/11/16 13:00
Specific Conductance	1310	umhos/cm	100	100		1	FDEP SOP FT 1200	RAB	7/27/16 10:42
Dissolved Oxygen	0.160	mg/L	0.100	0.100		1	FDEP SOP FT 1500	RAB	7/27/16 10:42
Fluoride	0.933	mg/L	0.0100	0.0500		1	EPA 300.0	TMH	8/11/16 13:00
pН	6.64	pH Units	1.00	1.00		1	FDEP SOP FT 1100	RAB	7/27/16 10:42
REDOX Potential	-77.9	mV	-999	-999		1	SM 2580B	RAB	7/27/16 10:42
Total Dissolved Solids	856	mg/L	24.0	40.0		2	SM 2540C	RFL	8/3/16 12:00
Sulfate	211	mg/L	50.0	200		100	EPA 300.0	TMH	8/11/16 13:31
Turbidity	1.15	NTU	0.100	0.100		1	FDEP SOP FT 1600	RAB	7/27/16 10:42
<b>Total Mercury by SW846 Metho</b>	d 7470/7471								
Mercury	0.0500	ug/L	0.0500	0.200	U	1	EPA 7470A	RLC	8/5/16 9:37
<b>Total Recoverable Metals by 200</b>	Series								
Antimony	0.600	ug/L	0.600	2.00	U	1	EPA 200.8	RC	8/2/16 10:40
Arsenic	2.92	ug/L	0.320	2.00		1	EPA 200.8	RC	8/2/16 10:40
Cadmium	0.100	ug/L	0.100	0.500	U	1	EPA 200.8	RC	8/3/16 11:47
Cobalt	0.0500	ug/L	0.0400	2.00	I	1	EPA 200.8	RC	8/2/16 10:40
Lead	0.0800	ug/L	0.0800	2.00	U	1	EPA 200.8	RC	8/3/16 11:47
Selenium	0.460	ug/L	0.200	2.00	I	1	EPA 200.8	RC	8/2/16 10:40
Thallium	0.100	ug/L	0.100	0.500	U	1	EPA 200.8	RC	8/3/16 11:47
<b>Total Recoverable Metals by SW</b>	846 Method	6010B							
Barium	43.2	ug/L	0.500	20.0		1	EPA 6010B	MCR	8/3/16 17:27
Beryllium	0.200	ug/L	0.200	2.00	U	1	EPA 6010B	MCR	8/3/16 17:27



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### Sample Information

Client: Big Bend Power Station

Lab Sample ID: L16G005-07 Sampled By: Robert Barthelette

Sample Description: MWB-35 Date and Time Collected: 7/27/16 10:42
Sample Collection Method: Grab Date of Sample Receipt: 7/27/16 15:50

## **Laboratory Results**

Sample Qualifer:									
Parameter	Result	Units	MDL	PQL	Qualifier Code	Dil	Test Method	Analyst	Analysis Date & Time
Boron	2260	ug/L	10.0	50.0		1	EPA 6010B	MCR	8/3/16 17:27
Calcium	231000	ug/L	30.0	1000		1	EPA 6010B	MCR	8/4/16 12:04
Chromium	1.60	ug/L	1.60	12.0	U	1	EPA 6010B	MCR	8/3/16 17:27
Molybdenum	11.8	ug/L	1.00	20.0	I	1	EPA 6010B	MCR	8/3/16 17:27
			KNL I	aborator	y				
<u>Radium - 226</u>									
Rad - 226	1.6	pCi/L	0.5	0.5		1	EPA 903.0	KL1	8/8/16 11:25
Rad - 226 Counting Error +/-	0.5	pCi/L				1	EPA 903.0	KL1	8/8/16 11:25
<u>Radium - 228</u>									
Rad - 228	0.8	pCi/L	0.8	0.8	U	1	EPA Ra-05	KL1	8/8/16 11:15
Rad - 228 Counting Error +/-	0.5	pCi/L				1	EPA Ra-05	KL1	8/8/16 11:15
Radium-226/228									
Rad-226/228	1.9	pCi/L	0.8	0.8		1	Calc	KL1	8/8/16 11:15
Rad-226/228 Counting Error +/-	0.5	pCi/L				1	Calc	KL1	8/8/16 11:15
			TestAmer	ica Pensa	cola				
Metals (ICP)									
Lithium	0.0080	mg/L	0.0010	0.050	I	1	200.7 Rev 4.4 Z01	GESP	8/3/16 16:57



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### **Sample Information**

Client: Big Bend Power Station

Lab Sample ID: L16G005-08 Sampled By: Robert Barthelette

Sample Description: MWB-36 Date and Time Collected: 7/27/16 9:47
Sample Collection Method: Grab Date of Sample Receipt: 7/27/16 15:50

## **Laboratory Results**

Sample Qualifer:									
Parameter	Result	Units	MDL	PQL	Qualifier Code	Dil	Test Method	Analyst	Analysis Date & Time
	T	ampa Elect	tric Comp	any, Labo	oratory Se	rvices			
<b>General Chemistry Parameters</b>									
Chloride	105	mg/L	2.00	50.0		100	EPA 300.0	TMH	8/11/16 13:51
Specific Conductance	2050	umhos/cm	100	100		1	FDEP SOP FT 1200	RAB	7/27/16 9:47
Dissolved Oxygen	0.280	mg/L	0.100	0.100		1	FDEP SOP FT 1500	RAB	7/27/16 9:47
Fluoride	0.756	mg/L	0.0100	0.0500		1	EPA 300.0	TMH	8/11/16 13:41
pH	6.90	pH Units	1.00	1.00		1	FDEP SOP FT 1100	RAB	7/27/16 9:47
REDOX Potential	-157	mV	-999	-999		1	SM 2580B	RAB	7/27/16 9:47
Total Dissolved Solids	1530	mg/L	24.0	40.0		2	SM 2540C	RFL	8/3/16 12:00
Sulfate	767	mg/L	50.0	200		100	EPA 300.0	ТМН	8/11/16 13:51
Turbidity	4.09	NTU	0.100	0.100		1	FDEP SOP FT 1600	RAB	7/27/16 9:47
Total Mercury by SW846 Metho	od 7470/7471								
Mercury	0.0500	ug/L	0.0500	0.200	U	1	EPA 7470A	RLC	8/5/16 9:41
<b>Total Recoverable Metals by 200</b>	<u> 0 Series</u>								
Antimony	0.600	ug/L	0.600	2.00	U	1	EPA 200.8	RC	8/2/16 10:44
Arsenic	17.3	ug/L	0.320	2.00		1	EPA 200.8	RC	8/2/16 10:44
Cadmium	0.100	ug/L	0.100	0.500	U	1	EPA 200.8	RC	8/3/16 11:51
Cobalt	0.0600	ug/L	0.0400	2.00	I	1	EPA 200.8	RC	8/2/16 10:44
Lead	0.0800	ug/L	0.0800	2.00	U	1	EPA 200.8	RC	8/3/16 11:51
Selenium	0.580	ug/L	0.200	2.00	J-,I	1	EPA 200.8	RC	8/2/16 10:44
Thallium	0.100	ug/L	0.100	0.500	U	1	EPA 200.8	RC	8/3/16 11:51
<b>Total Recoverable Metals by SW</b>	V846 Method	6010B							
Barium	69.9	ug/L	0.500	20.0		1	EPA 6010B	MCR	8/3/16 17:30
Beryllium	0.200	ug/L	0.200	2.00	U	1	EPA 6010B	MCR	8/3/16 17:30



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### **Sample Information**

Client: Big Bend Power Station

Lab Sample ID: L16G005-08 Sampled By: Robert Barthelette

Sample Description: MWB-36 Date and Time Collected: 7/27/16 9:47
Sample Collection Method: Grab Date of Sample Receipt: 7/27/16 15:50

## **Laboratory Results**

Sample Qualifer:									
Parameter	Result	Units	MDL	PQL	Qualifier Code	Dil	Test Method	Analyst	Analysis Date & Time
Boron	4680	ug/L	10.0	50.0		1	EPA 6010B	MCR	8/3/16 17:30
Calcium	344000	ug/L	30.0	1000		1	EPA 6010B	MCR	8/4/16 12:07
Chromium	1.60	ug/L	1.60	12.0	U	1	EPA 6010B	MCR	8/3/16 17:30
Molybdenum	11.5	ug/L	1.00	20.0	I	1	EPA 6010B	MCR	8/3/16 17:30
			KNL L	aboratory	7				
<u>Radium - 226</u>									
Rad - 226	3.2	pCi/L	0.3	0.3		1	EPA 903.0	KL1	8/8/16 11:25
Rad - 226 Counting Error +/-	0.6	pCi/L				1	EPA 903.0	KL1	8/8/16 11:25
<u>Radium - 228</u>									
Rad - 228	0.9	pCi/L	0.8	0.8		1	EPA Ra-05	KL1	8/8/16 11:15
Rad - 228 Counting Error +/-	0.5	pCi/L				1	EPA Ra-05	KL1	8/8/16 11:15
Radium-226/228									
Rad-226/228	4.1	pCi/L	0.8	0.8		1	Calc	KL1	8/8/16 11:15
Rad-226/228 Counting Error +/-	0.6	pCi/L				1	Calc	KL1	8/8/16 11:15
			TestAmer	ica Pensa	cola				
Metals (ICP)									
Lithium	0.0081	mg/L	0.0010	0.050	I	1	200.7 Rev 4.4 Z01	GESP	8/3/16 17:01

### **Comments**

- U Indicates that the compound was analyzed for but not detected.
- J- The reported value is an estimated value, see the case narrative for specifics.
- I Estimated value
- The reported value is between the laboratory method detection limit and the laboratory practical quantitation limit.

### **Subcontract Laboratories:**

KNL Laboratory E84025

TestAmerica Pensacola E81010



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Tampa Electric Company, Laboratory Services

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Peggy Penner, Manager, Laboratory Services

Site:	Big B	end	Date:	07/27/16	File Name:	072716_	_Wells_RAB	Weather:	PTLY CL	OUDY HOT	Initials	RAB /TEC	O Initials	RAS
LIMS#	<b>Loction Code</b>	Time	FE <sup>2</sup>	pH (SU)	Temp °C	Cond(uMHOS)	DO Mg/L	Turbidity(NTU)	Redox (mv)	Sulfite (mg/L)	Color	Odor	N	IGVD
11/2			mg/l	PH	TEMP-C	COND-F	DO	TURB-N-F	REDOX	SO3-TR	SCOLOR-W	\$ODOR-W	Time	LEVEL
L16G005-01	CCR-PZ-1	13:45		6.67	26.41	4185	0.22	3.88	-74.10		CLEAR	NONE		
L16G005-02	CCR-PZ-2	13:16		6.68	26.42	1697	0.13	7.16	-67.40		LT YELLOW	NONE		
LIMS#	250ml Cyan (3)	1L Inorg (1)	500ml Inorg (2)	250ml Inorg (3)	1L Mtls (1)	250ml Mtis (3)	1L Rads (1)	500ml Sulfide (2)	500ml Mtls (2)	250ml Nuts (3)	40ml Vial (6)	500 ml Nuts (2)	1L Rads Diss. (1)	Total Contains
L16G005-01	]		1			☑ 2	☑ 2							
16G005-02			1			☑ 2	<b>☑</b> 2							10
1) 1L plastic (PP)		(2) 500ml plastic	(PP)	(3) 250ml plastic	(PP)	(4) 100ml coliform b	oottle	(5) 1L amber glass (	(AG)	(6) 40ml VOA vial	(CG)		Samples On Ice	Sample Reciept
ss	0107301Y	ESS	0218201Y	ESS	0307301Y	ESS		ESS	7.5-7	ESS	(/		Yes No	Time 15:50
F	Preservation			Pres ID		Preservation			Pres ID		Preservation		Pres ID	Temp 0.4
	ml HNO3 to pH <2				250ml bottles (nu	its): 1 ml H2SO4 to p	H <2		1 E	500 ml bottles/Sulf	ide) 2ml NAOH/Zinc	Acet to pH >12	L D	
	als): 2 ml HNO3 to	DH <2				: 0.5 ml H2SO4 to pH			li E		an) 1g NAOH to pH >		L O	
	al): 1 ml HNO3 to p						15um, 5 ml HNO3 to pH	<2	r E		dicates that the sam			
H Meter Calibration		Buffer ID	Buffer Value	Cal	Time	ICV	Time	CCV	Time	Redox Cal	Time	Temp °C	Reading my	Theo Value n
leter ID:	MPM08	L 015169J	7	7.02	8:25	104	Tille	7.02	16:05	Meter ID:	8:30	22.1	236.0	234.9
DEP FT 1100	iii iiioo	L 015170	10	10.04	8:25	QC: (pH +/- 0.2) /C/	ond +/- 5%) (DO +/- 0.3r			MPM08	16:10	21.0	235.3	234.9
nits: SU		L 015083A	4	4.01	8:25		icates ICV / CCV passe			Zobell Sol ID:	10.10	21.0	200.0	250.2
onductivity Meter	r Calib.	Standard ID	Std Value	Cal	Time	ICV	Time	CCV	Time	L 015222A				
leter ID:	MPM08	L 014668B	1000	1000	8:05	101	T.M.C		Time	DO Meter Cal	Time	Temp °C	Reading mg/l	Theo Value n
DEP FT 1200, Uni		L 013457B	10000	,,,,,	0.00	10263	8:15	10326	16:00	Meter ID:	7:55	21.0	8.90	8.915
urbidity Meter Ca		Standard ID	Std Value	Agrantah	ility Range	ICV	Time	CCV	Time	MPM08	16:50	20.4	9.22	9.021
leter ID:	TM07	L 013677	5.40	4.86	5.94	5.49	7:50	CCV	Time	Barom. Pres	16.50	20.4	9.22	9.021
DEP FT 1600, Uni		L 013678	53.40	49.93	56.87	5.45	7.50	53.40	16:10	760				
THE PARTY NAMED IN	neck) (EPA 377.1)			Time	2000			all Lancing and Lancing				E-1000000000000000000000000000000000000		The State of
	io)/500ml DI=10mg/		QC Result mg/l	Lime	Titrator ID	Na Thío ID	DO 3 Pillow ID	Starch Ind. ID	lodate/lodide ID	Therm ID MPM08	pH	Conduct.( %)	DO (mg/l)	Redox (mv
urging Informatio			(nallone/#): 2"	'= 0.16 4" =0.65		Tubing Incide Diam	n. Capacities Gallons/ft		0.000	INPINIOS	0.2	5	0.3	10
organg anormatic		Well Capacities	(ganons/ tt/, 2	Well	Depth to	Water	Well	1 Well	/ Tubing	Tubing	Pump	Cell	1 Eqpt.	1
101-11-11	8	Screen	Intake	Depth	Water (ft)	= Column (ft)	X Capacity (gal) =	Volume (gal)	( Capacity )	X Length )	+ Volume +	Volume =		
Well # CCR-PZ-1	Diam/ Comp	Interval (ft)	Depth (ft) 15.29	20.29	T		0.40	1991	***			1		
		Rate (ml/min)	NAME OF TAXABLE PARTY.		5.00	15.29	0.16	2.45	0.0026	21.3	0	0.06	0.12	
Purge Meth:	Time		Volume (gal)	Total Vol. (gal)	Water Depth (ft)	pH (SU)	Temp °C	Cond (uMHOS)	DO (mg/L)	Turbidity (NTU)	Purge Criteria	Status	Equipment ID	Eqpt. Tab
	10.00		0.00	0.00		0.00					Control Target			
1A	13:29	390	0.82	0.82	5.11	6.67	26.37	4186	0.36	5.13	ph:+/- 0.2	STABLE	Level Meter:	
urge Start:	13:31	390 400	0.21	1.03	5.11	6.65	26.39	4187	0.37	3.63	Temp/C+/- 0.2	STABLE	Pump:	PP
urge Start: 13:21		390									Temp <sup>o</sup> C+/- 0.2 Cond % +/- 5	STABLE STABLE	Pump: Tubing:	PP PE/S
rurge Start: 13:21 rurge End:	13:31	390 400	0.21	1.03	5.11	6.65	26.39	4187	0.37	3.63	Temp*C+/- 0.2 Cond % +/- 5 DO % Sat < 20	STABLE STABLE STABLE	Pump: Tubing: Dedicated	PP PE/S Yes
Purge Start: 13:21 Purge End: 13:33	13:31 13:33	390 400 400	0.21 0.21	1.03 1.24	5.11 5.11	6.65 6.67	26.39 26.41	4187 4185	0.37 0.22	3.63 3.88	Temp <sup>o</sup> C+/- 0.2 Cond % +/- 5	STABLE STABLE	Pump: Tubing:	PE/S
Purge Start: 13:21 Purge End:	13:31 13:33	390 400	0.21 0.21	1.03 1.24 Stablility	5.11 5.11 v Values =	6.65 6.67	26.39 26.41 26.41	4187 4185 4185	0.37 0.22 0.22	3.63 3.88 3.88	Temp*C+/- 0.2 Cond % +/- 5 DO % Sat < 20 Turb. NTU < 20	STABLE STABLE STABLE STABLE	Pump: Tubing: Dedicated Tubing?	PP PE/S Yes
turge Start: 13:21 turge End: 13:33	13:31 13:33	390 400 400 Gallons to P	0.21 0.21	1.03 1.24 Stablility	5.11 5.11 / Values =	6.65 6.67 6.67	26.39 26.41	4187 4185 4185	0.37 0.22 0.22	3.63 3.88 3.88	Temp*C+/- 0.2 Cond % +/- 5 DO % Sat < 20	STABLE STABLE STABLE STABLE	Pump: Tubing: Dedicated	PP PE/S Yes
urge Start: 13:21 urge End: 13:33 urge Complet Well #	13:31 13:33 te At 13:22	390 400 400 Gallons to P	0.21 0.21 urge 0.12	1.03 1.24 Stablility Well Depth (ft)	5.11 5.11 / Values = Depth to Water (ft)	6.65 6.67 6.67 Water Column (ft)	26.39 26.41 26.41 Well Capacity (gal) =	4185 4185 4185 1 Weil Volume (gal)	0.37 0.22 0.22 ( Tubing Capacity X (gal/ft.)	3.63 3.88 3.88	Temp*C+/- 0.2 Cond % +/- 5 DO % Sat < 20 Turb.NTU < 20  + Pump Volume (gal) +	STABLE STABLE STABLE STABLE	Pump: Tubing: Dedicated Tubing?	PP PE/S Yes
urge Start: 13:21 urge End: 13:33 urge Complet Well # CCR-PZ-2	13:31 13:33 te At 13:22	390 400 400 Gallons to P	0.21 0.21 urge 0.12	1.03 1.24 Stablility	5.11 5.11 / Values =	6.65 6.67 6.67	26.41 26.41	4185 4185 4185	0.37 0.22 0.22	3.63 3.88 3.88 Tubing Length	Temp*C+/- 0.2 Cond % +/- 5 DO % Sat < 20 Turb. NTU < 20  Pump + Volume +	STABLE STABLE STABLE STABLE Cell Volume	Pump: Tubing: Dedicated Tubing?	PP PE/S Yes
urge Start: 13:21 urge End: 13:33 urge Complet Well # CCR-PZ-2 Purge Meth;	13:31 13:33 te At 13:22 Diam/ Comp 2	390 400 400  Gallons to P Screen Interval (ft) 10 Rate (ml/min)	0.21 0.21 urge 0.12 Intake Depth (ft) 15.64 Volume (gal)	1.03 1.24  Stablility Well Depth (ft) 20.64 Total Vol. (gal)	5.11 5.11 / Values = Depth to Water (ft)	6.65 6.67 6.67 = Water Column (tt)	26.39 26.41 26.41 Well Capacity (gal) =	4185 4185 4185 1 Weil Volume (gal)	0.37 0.22 0.22 ( Tubing Capacity X (gal/ft.)	3.63 3.88 3.88 Tubing Length (tt)	Temp*C+/- 0.2 Cond % +/- 5 DO % Sat < 20 Turb.NTU < 20  + Pump Volume (gal) +	STABLE STABLE STABLE STABLE Cell Volume (gal)	Pump: Tubing: Dedicated Tubing?	PP PE/S Yes No
rurge Start: 13:21 rurge End: 13:33 rurge Complet Well # CCR-PZ-2	13:31 13:33 te At 13:22 Diam/ Comp 2 Time 13:02	390 400 400  Gallons to P Screen Interval (ft) 10 Rate (ml/min) 340	0.21 0.21 urge 0.12 Intake Depth (ft) 15.64	1.03 1.24 Stablility Well Depth (ft) 20.64	5.11 5.11 / Values = Depth to Water (ft)   5.30	6.65 6.67 6.67 = Water Column (ft)	26.39 26.41 26.41 Well X Capacity (gal) =	4185 4185 4185 1 Weil Volume (gal) 2.45	0.37 0.22 0.22 ( Tubing Capacity (gal/ft.) x 0.0026	3.63 3.88 3.88 Tubing Length (tt) 21.64	Temp*C+/- 0.2 Cond %+/- 5 DO % Sat < 20 Turb. NTU < 20  + Pump Volume (gal)  0	STABLE STABLE STABLE STABLE  Cell Volume (gal)  0.06	Pump: Tubing: Dedicated Tubing?	PP PE/S Yes No
urge Start: 13:21 urge End: 13:33 urge Complet  Well # CCR-PZ-2 Purge Meth: 1A	13:31 13:33 te At 13:22 Diam/ Comp 2	390 400 400  Gallons to P Screen Interval (ft) 10 Rate (ml/min)	0.21 0.21 urge 0.12 Intake Depth (ft) 15.64 Volume (gal)	1.03 1.24  Stablility Well Depth (ft) 20.64 Total Vol. (gal)	5.11 5.11 / Values = Depth to Water (ft) 5.30 Water Depth (ft)	6.65 6.67 6.67 = Water Column (tt) 15.34 pH (SU)	26.39 26.41 26.41 Well Capacity (gal) = 0.16 Temp °C	4185 4185  4185  1 Weil Volume (gal) 2.45  Cond (uMHOS)	0.37 0.22  0.22  ( Tubing Capacity (gal/ft.) 0.0026 DO (mg/L)	3.63 3.88 3.88  Tubing Length (tt) 21.64 Turbidity (NTU)	Temp*C+/- 0.2 Cond %+/- 5 DO % Sat < 20 Turb. NTU < 20  Pump Volume (gai)  0 Purge Criteria	STABLE STABLE STABLE STABLE  Cell Volume (gral)  0.06 Status	Pump: Tubing: Dedicated Tubing?  1 Eqpt. Volume (gail) 0.12 Equipment ID	PP PE/S Yes No
rurge Start: 13:21 rurge End: 13:33 rurge Complet Well # CCR-PZ-2 Purge Meth;	13:31 13:33 te At 13:22 Diam/ Comp 2 Time 13:02	390 400 400  Gallons to P Screen Interval (ft) 10 Rate (ml/min) 340	0.21 0.21 urge 0.12 Intake Depth (ft) 15.64 Volume (gal) 0.54	1.03 1.24  Stablility Well Depth (ft) 20.64 Total Vol. (gal) 0.54	5.11 5.11  / Values = Depth to Water (ft)  5.30 Water Depth (ft) 5.38	6.65 6.67 6.67 = Water Column (tt) 15.34 pH (SU) 6.70	26.39 26.41  26.41  Well X Capacity (gal) =  0.16 Temp °C 26.45	4187 4185 4185 1 Weil Volume (gal) 2.45 Cond (uMHOS) 1677	0.37 0.22 0.22 ( Tubing Capacity X (gal/ft.)	3.63 3.88  3.88  Tubing Length (tr)  21.64  Turbidity (NTU)  11.30	Temp*C+/- 0.2 Cond % +/- 5 DO % Sat < 20 Turb. NTU < 20  Pump Volume + (gal)  Purge Criteria ph;+/- 0.2	STABLE STABLE STABLE STABLE  Cell Volume (gril)  0.06 Status STABLE	Pump: Tubing: Dedicated Tubing?  1 Eqpt. Volume (gal) 0.12 Equipment ID Level Meter:	PP PE/S Yes No Rept. Tat
rurge Start: 13:21 rurge End: 13:33 rurge Complet Well # CCR-PZ-2 Purge Meth: 1A rurge Start:	13:31 13:33 te At 13:22 Diam/ Comp 2 Time 13:02 13:04	390 400 400 Gallons to P  Screen interval (ft) 10  Rate (ml/min) 340 350	0.21 0.21 urge 0.12 Intake Depth (ft) 15.64 Volume (gal) 0.54 0.18	1.03 1.24  Stablility Well Depth (ft) 20.64 Total Vol. (gal) 0.54 0.72	5.11 5.11  / Values =  Depth to Water (ft)  5.30  Water Depth (ft)  5.38  5.38	6.65 6.67 6.67 = Water Column (ft) 15.34 pH (SU) 6.70 6.68	26.39 26.41 26.41 Well Capacity (gal) =  0.16  Temp °C  26.45  26.42	4187 4185 4185 1 Weil Volume (gal) 2.45 Cond (uMHOS) 1677 1698	0.37 0.22 0.22 ( Tubing Capacity X (gal/ft.)	3.63 3.88  3.88  Tubing Length (h)  21.64  Turbidity (NTU)  11.30 8.49	Temp*C+/- 0.2 Cond %+/- 5 DO % Sat < 20 Turb. NTU < 20  + Pump Volume (gal) +  0 Purge Criteria ph:+/- 0.2 Temp*C+/- 0.2	STABLE STABLE STABLE STABLE  Cell Volume (gril)  0.06 Status STABLE STABLE	Pump: Tubing: Dedicated Tubing?  1 Eqpt. Volume (gal) 0.12 Equipment ID Level Meter: Pump:	PP PE/S Yes No Rept. Tall WLM08 PP
rurge Start: 13:21 rurge End: 13:33 rurge Complet Well # CCR-PZ-2 Purge Meth: 1A rurge Start: 12:56	13:31 13:33 te At 13:22 Diam/ Comp 2 Time 13:02 13:04	390 400 400 Gallons to P  Screen interval (ft) 10  Rate (ml/min) 340 350	0.21 0.21 urge 0.12 Intake Depth (ft) 15.64 Volume (gal) 0.54 0.18	1.03 1.24  Stablility Well Depth (ft) 20.64 Total Vol. (gal) 0.54 0.72	5.11 5.11  / Values =  Depth to Water (ft)  5.30  Water Depth (ft)  5.38  5.38	6.65 6.67 6.67 = Water Column (ft) 15.34 pH (SU) 6.70 6.68	26.39 26.41 26.41 Well Capacity (gal) =  0.16  Temp °C  26.45  26.42	4187 4185 4185 1 Weil Volume (gal) 2.45 Cond (uMHOS) 1677 1698	0.37 0.22 0.22 ( Tubing Capacity X (gal/ft.)	3.63 3.88  3.88  Tubing Length (h)  21.64  Turbidity (NTU)  11.30 8.49	Temp*C+/- 0.2 Cond %+/- 5 DO % Sat < 20 Turb. NTU < 20  Pump Volume (gal)  Purge Criteria ph:+/- 0.2 Temp*C+/- 0.2 Cond %+/- 5	STABLE STABLE STABLE STABLE  Celi Volume (gral)  0.06 Status STABLE STABLE STABLE	Pump: Tubing: Dedicated Tubing?  1 Eqpt. Volume (gal) 0.12 Equipment ID Level Meter: Pump: Tubing:	PP PE/S Yes No  Eqpt. Tab WLM08 PP PE/S
urge Start: 13:21 urge End: 13:33 urge Complet  Well # CCR-PZ-2 Purge Meth; 1A urge Start: 12:56 urge End:	13:31 13:33 te At 13:22 Diam/ Comp 2 Time 13:02 13:04 13:06	390 400 400 Gallons to P  Screen interval (ft) 10  Rate (ml/min) 340 350	0.21 0.21  urge 0.12  Intake Depth (ft) 15.64  Volume (gal) 0.54 0.18 0.18	1.03 1.24  Stablility Well Depth (R) (20.64 Total Vol. (gal) 0.54 0.72 0.90	5.11 5.11  / Values =  Depth to Water (ft)  5.30  Water Depth (ft)  5.38  5.38	6.65 6.67 6.67 = Water Column (ft) 15.34 pH (SU) 6.70 6.68	26.39 26.41 26.41 Well Capacity (gal) =  0.16  Temp °C  26.45  26.42	4187 4185 4185 1 Weil Volume (gal) 2.45 Cond (uMHOS) 1677 1698	0.37 0.22 0.22 ( Tubing Capacity X (gal/ft.)	3.63 3.88  3.88  Tubing Length (h)  21.64  Turbidity (NTU)  11.30 8.49	Temp*C+/- 0.2  Cond % +/- 5  DO % Sat < 20  Turb. NTU < 20  + Volume (gala) + (gala) + (gala)  Purge Criteria ph:+/- 0.2  Temp*C+/- 0.2  Cond % +/- 5  DO % Sat < 20	STABLE STABLE STABLE STABLE STABLE  Cell Volume (gril) 0.06 Status STABLE STABLE STABLE STABLE STABLE	Pump: Tubing: Dedicated Tubing?  1 Eqpt. Volume (gail)  0.12 Equipment ID Level Meter: Pump: Tubing: Dedicated	PP PE/S Yes No  Eqpt. Tab WLM08 PP PE/S Yes

Sampler(s) /

LIMS#	Big B	Time	FE <sup>2</sup>	pH (SU)	Temp °C	Cond(uMHOS)	Wells_RAB	Weather: Turbidity(NTU)	Redox (mv)	OUDY HOT	Color	RAB /TEC		NGVD
LIIVIS #	Localon Code	Time	mg/l	PH (SU)	TEMP-C	COND-F	DO Mg/L	TURB-N-F	REDOX	Sulfite (mg/L) SO3-TR	\$COLOR-W	SODOR-W	Time	LEVEL
L16G005-03	CCR-PZ-3	12:45	mg/	6.19	27.28	1744	0.09	8.04	-74.40	303-11	YELLOW	MODERATE	Time	LLVLL
L16G005-04	CCR-PZ-4	12:00		6.55	27.60	1446	0.15	3.21	-71.70		LT YELLOW	MILD		
LIMS#	250ml Cyan (3)	1L Inorg (1)	500ml Inorg (2)	100000	1L Mtls (1)	250ml Mtls (3)	1L Rads (1)	500ml Sulfide (2)	500ml Mtls (2)	250ml Nuts (3)	40ml Vial (6)	500 ml Nuts (2)	1L Rads Diss. (1)	Total Containers
	250mi Cyan (5)	TE morg (1)	1	230m morg (3)		2 2	✓ 2	Soothi Suilide (2)		250111114015 (5)	G 40/111 Viai (0)	300 mm (40t3 (2)	II Rada Diss. (1)	-30 -
16G005-04			1			<u> </u>	<u> </u>	i i		n		ō		10
1) 1L plastic (PP		(2) 500ml plastic	(PP)	(3) 250ml plastic		(4) 100ml coliform b		(5) 1L amber glass		(6) 40ml VOA vial			Samples On Ice	Sample Reciept
SS	0107301Y	ESS	0218201Y	ESS	0307301Y	ESS	0.00	ESS	(1.0)	ESS	,00)		Yes No	Time 15:50
	Preservation	200	OLIGIOIT	Pres ID	00010011	Preservation		1200	Pres ID	200	Preservation		Pres ID	Temp 0.4
	5 ml HNO3 to pH <2			L 011663 🗹	250ml hottles (nu	its): 1 ml H2SO4 to pl	4-2		I Fies ID	1 500 ml bottles/Sulf	de) 2ml NAOH/Zinc	Acat to all >12	L L	Temp 0,4
	etals): 2 ml HNO3 to p	H-2		1 011003		: 0.5 ml H2SO4 to pH					n) 1g NAOH to pH >		L	
-	etal): 1 ml HNO3 to pl			L 011663 [v]			5um, 5 ml HNO3 to pH	-2		a Loo iiii bomoo (o)	licates that the sam			
H Meter Calibrat		Buffer ID	Buffer Value	Cal	Time	ICV			-			Temp °C	_	The Makes and
Meter Calibrat	MPM08	L 015169J	7	7.02	8:25	icv	Time	7.02	Time 16:05	Redox Cal Meter ID:	7ime 8:30	22.1	Reading mv 236.0	Theo Value mv 234.9
DEP FT 1100	IVII- IVIUO	L 015170	10	10.04	8:25	00. (-11 +1 0.0) (0.1				Meter ID: MPM08		21.0		234.9
Inits: SU		L 015083A	4	4.01	8:25		and +/- 5%) (DO +/- 0.3 cates ICV / CCV passe		0	Zobell Sol ID:	16:10	21.0	235.3	230.2
conductivity Met	er Calib	Standard ID	Std Value	Cal	Time	ICV	Time	ccv	Time	L 22A				
Meter ID:	MPM08	L 014668B	1000	1000	8:05	ICV	Tille	CCV	Time	DO Meter Cal	Time	Temp °C	Reading mg/l	Theo Value mg/
DEP FT 1200, U		L 013457B	10000	1000	0.00	10263	8:15	10326	16:00	Meter ID:	7:55	21.0	8.90	8.915
urbidity Meter C		Standard ID	Std Value	Acceptabi	Et. Danes	ICV		CCV		MPM08		20.4	9.22	9.021
leter ID:	TM07	L 013677	5.40	4.86	5.94	5.49	7:50	CCV	Time	Barom, Pres	16:50	20.4	9.22	9.021
DEP FT 1600, U		L 013678	53.40	49.93	56.87	5.49	7.50	53.40	16:10	760			-	
and and a local party of	Control of the Assessment	010070	QC Result mg/l		100 C 110 C 1	MA THE UP	00 2 0 11 10					Conduct ( of )	DO / - W	B-4-4-4-3
	heck) (EPA 377.1) hio)/500ml DI=10mg/l		QC Result mg/l	Time	Titrator ID	Na Thio ID	DO 3 Pillow ID	Starch Ind. ID	lodate/lodide ID	Therm ID MPM08	рН 0.2	Conduct.( %)	DO (mg/l) 0.3	Redox (mv)
Purging Informat			(nallone/ fil): 2	'= 0.16 4" =0.65		Tubing Incide Diam	. Capacities Gallons/f	N: 4/4" -0 0026 2/8" -	0.005	INILIMIO	0.2	3	0.3	10
urging informat	lon	vven Capacities	(ganons/10, 2	Well	Don't to	VIII AND ADDRESS OF THE PARTY O	Well	1 Well		Tehna	Pump	Cell	1 Eqpt	
Well#	Diam/ Comp	Screen Interval (ft)	Intake Depth (ft)	Depth (ft)	Water (ft)	Column (ft)	( Capacity (gal) =	Volume (gal)	( Tubing X (gal/ft.)	(ft) /	+ Volume + (gal)	Volume (gal)	= Volume (gal)	ļ
CCR-PZ-3	2	10	15.38	20.38	3.60	16.78	0.16	2.68	0.0026	21.38	0	0.06	0.12	
Purge Meth:	Time	Rate (ml/min)	Volume (gal)	Total Vol. (gal)	Water Depth (ft)	pH (SU)	Temp °C	Cond (uMHOS)	DO (mg/L)	Turbidity (NTU)	Purge Criteria	Status	Equipment ID	Eqpt. Table
1A	12:27	240	0.51	0.51	4.76	6.23	27.31	1756	0.11	7.58	ph:+/- 0.2	STABLE	Level Meter:	WLM08
urge Start:	12:29	240	0.13	0.64	4.77	6.20	27.25	1751	0.10	6.83	Temp°C+/- 0.2	STABLE	Pump:	PP
12:19	12:31	240	0.13	0.77	4.78	6.19	27.28	1744	0.09	8.04	Cond % +/- 5	STABLE	Tubing:	PE/S
urge End:											DO % Sat.< 20	STABLE	Dedicated	Yes
12:31											Turb, NTU < 20	STABLE	Tubing?	☐ No
urge Comple	ete At 12:21	Gallons to P	urge 0.12		Values =	6.19	27.28	1744	0.09	8.04				
Well #	Diam/ Comp	Screen Interval (ft)	Intake Depth (ft)	Well Depth (ft)	Depth to Water (ft)	= Water Column (ft)	Well Capacity (gal) =	1 Well Volume (gal)	Tubing Capacity (gal/ft.)	Tubing Length )	+ Volume (gal) +	Volume (gal, =	1 Eqpt. Volume (gal)	
CCR-PZ-4	2	10	14	18	3.24	14.76	0.16	2.36	0.0026	47.03	0	0.06	0.18	
Purge Meth:	Time	Rate (ml/min)	Volume (gal)	Total Vol. (gal)	Water Depth (ft)	pH (SU)	Temp °C	Cond (uMHOS)	DO (mg/L)	Turbidity (NTU)	Purge Criteria	Status	Equipment ID	Eqpt. Table
1A	11:38	230	0.49	0.49	3.46	6.53	27.55	1447	0.35	4.10	ph:+/- 0.2	STABLE	Level Meter:	WLM08
Purge Start:	11:40	230	0.12	0.61	3.47	6.54	27.54	1445	0.22	3.83	Temp <sup>o</sup> C+/- 0.2	STABLE	Pump:	PP
11:30	11:42	230	0.12	0.73	3.47	6.55	27.60	1446	0.15	3.21	Cond % +/- 5	STABLE	Tubing:	PE/S
Purge End:	/=										DO % Sat.< 20	STABLE	Dedicated	☑ Yes
11:42	District the second					1			M		Turb. NTU < 20	STABLE	Tubing?	□ No
	44.00	Callege to F	urge 0.18	Ctoblity!	Values =	6.55	27.60	1446	0.15	3.21	1-			
urge Comple	ete At 11:33	Gallons to F	aige U. 10	Stabilty	values -	0.55	27.00	1440	0.15	3.21				

Site:	Big B	end	Date:	07/27/16	File Name:	072716	Wells_RAB	Weather:	PTLY CLC	OUDY HOT	Initials	RAB /TEC	O Initials	MAD
LIMS#	Loction Code	Time	FE <sup>2</sup>	pH (SU)	Temp °C	Cond(uMHOS)	DO Mg/L	Turbidity(NTU)	Redox (mv)	Sulfite (mg/L)	Color	Odor	N	IGÝD
Ziiiio ii	200000110000		mg/l	PH	TEMP-C	COND-F	DO	TURB-N-F	REDOX	SO3-TR	\$COLOR-W	\$ODOR-W	Time	LEVEL
16G005-05	CCR-PZ-5	11:18		6.38	28.25	5424	0.2	7.10	-7.30		CLOUDY	NONE		
16G005-06	CCR-PZ-6	10:15	1	6.48	27.56	1500	0.2	4.86	-84.10		LT YELLOW	MILD		
LIMS#	250ml Cyan (3)	1L Inorg (1)	500ml Inorg (2)	250ml Inorg (3)	1L Mtls (1)	250ml Mtls (3)	1L Rads (1)	500ml Sulfide (2)	500ml Mtls (2)	250ml Nuts (3)	40ml Vial (6)	500 ml Nuts (2)	1L Rads Diss. (1)	Total Containers
16G005-05		.Emerg (1)	1				☑ 2							10
			1			<b>☑</b> 2								10
1) 1L plastic (PP	1	(2) 500ml plasti	c (PP)	(3) 250ml plastic	(PP)	(4) 100ml coliform b	ottle	(5) 1L amber glass (	(AG)	(6) 40ml VOA vial	(CG)		Samples On Ice	Sample Reciept
SS	0107301Y	ESS	0218201Y		0307301Y	ESS		ESS		ESS	120		Yes No	Time 15:50
	Preservation			Pres ID		Preservation			Pres ID		Preservation	1000	Pres ID	Temp 0.4
	5 ml HNO3 to pH <2				250ml bottles (nu	its): 1 ml H2SO4 to p	H <2		L E	500 ml bottles/Sulf	fide) 2ml NAOH/Zinc	Acet, to pH >12	L O	
	etals): 2 ml HNO3 to p	H <2				: 0.5 ml H2SO4 to ph			r E		an) 1g NAOH to pH >		L D	
	etal): 1 ml HNO3 to pl					e and to the design of the first	5um, 5 ml HNO3 to pH	<2			dicates that the sam		a pH of <2	
H Meter Calibrat		Buffer ID	Buffer Value	Cal	Time	ICV	Time	CCV	Time	Redox Cal	Time	Temp °C	Reading my	Theo Value my
	MPM08	L 015169.		7.02	8:25	icv	Time	7.02	16:05	Meter ID:	8:30	22.1	236.0	234.9
Meter ID:	IVIFIVIUO	L 015170	-	10.04	8:25	00: (=11 :1 0 2) 10	ond +/- 5%) (DO +/- 0.3r		1	MPM08	16:10	21.0	235.3	236.2
DEP FT 1100		L 015083A	1.0	4.01	8:25		icates ICV / CCV passe		r	Zobell Sol ID:	10.10	21.0	200.0	200.2
Inits: SU	C-Eb	Standard ID	Std Value	Cal	Time	ICV	Time	CCV	Time	L 015222A	Δ	-	1	
onductivity Met	MPM08	L 014668E		1000	8:05	icv	Time	CCV	time	DO Meter Cal	Time	Temp °C	Reading mg/l	Theo Value mg
leter ID:	310 (325-5)			1000	8:05	10000	0.45	10326	16:00		7:55	21.0	8,90	8.915
DEP FT 1200, U		L 013457E				10263	8:15			Meter ID:				9.021
urbidity Meter C		Standard ID	Std Value	Acceptabi		icv	Time	CCV	Time	MPM08	16:50	20.4	9.22	9.021
Meter ID:	TM07	SF- 013677		4.86	5.94	5.49	7:50		10.10	Barom. Pres	-			
DEP FT 1600, U		SF- 013678		49.93	56.87			53.40	16:10	760				
	Check) (EPA 377.1)		QC Result mg/l	Time	Titrator ID	Na Thio ID	DO 3 Pillow ID	Starch Ind. ID	lodate/lodide ID	Therm ID	pH	Conduct.( %)	DO (mg/l)	Redox (mv)
	hio)/500ml DI=10mg/					L	L	L	L	MPM08	0.2	5	0.3	10
Purging Informat	tion	Well Capacitie	s (gallons/ ft): 2"	" = 0.16 4" =0.65			n. Capacities Gallons/ft		0.006					T
Well#	Diam/ Comp	Screen Interval (ft)	Intake Depth (ft)	Depth - (ft)	Depth to Water (ft)	= Water Column (ft)	Well X Capacity (gal) =	1 Well Volume (gal)	( Tubing X (gal/ft.)	Tubing Length (ft)	+ Volume + (gal)	Celi Volume (gal) =	1 Eqpt. Volume (gal)	
CCR-PZ-5	2	10	36.03	41.03	26.19	14.84	0.16	2.37	0.0026	47.03	0	0.06	0.18	
Purge Meth:	Time	Rate (ml/min)	Makanaka			14.04								The State of the Land of the L
			Volume (gal)	Total Vol. (gal)	Water Depth (ft)		Temp °C	Cond (uMHOS)	DO (mg/L)	Turbidity (NTU)	Purge Criteria	Status	Equipment ID	Eqpt. Table
	11:09	-	5.94		Water Depth (ft)			Cond (uMHOS) 5389	DO (mg/L) 0.19	Turbidity (NTU)	Purge Criteria ph:+/- 0.2	Status STABLE	Equipment ID  Level Meter:	Eqpt. Table WLM08
1A	11:09	1500	5.94	5.94		pH (SU)	Temp °C		-					
1A Purge Start:	11:11	1500 1500	5.94 0.79	5.94 6.73	26.94	pH (SU) 6.38	Temp °C 28.24	5389	0.19	16.20	ph:+/- 0.2	STABLE	Level Meter:	WLM08
1A Purge Start: 10:54		1500	5.94	5.94	26.94 26.93	pH (su) 6.38 6.38	Temp °C 28.24 28.28	5389 5410	0.19 0.18	16.20 8.47	ph:+/- 0.2 Temp*C+/- 0.2	STABLE STABLE	Level Meter: Pump:	WLM08 ESP
1A Purge Start: 10:54 Purge End:	11:11	1500 1500	5.94 0.79	5.94 6.73	26.94 26.93	pH (su) 6.38 6.38	Temp °C 28.24 28.28	5389 5410	0.19 0.18	16.20 8.47	ph:+/- 0.2 Temp*C+/- 0.2 Cond % +/- 5	STABLE STABLE STABLE	Level Meter: Pump: Tubing:	WLM08 ESP PE
1A Purge Start: 10:54 Purge End: 11:13	11:11 11:13	1500 1500 1500	5.94 0.79 0.79	5.94 6.73 7.52	26.94 26.93 26.94	pH (su) 6.38 6.38 6.38	Temp °C 28.24 28.28 28.25	5389 5410 5424	0.19 0.18 0.17	16.20 8.47 7.10	ph:+/- 0.2 Temp*C+/- 0.2 Cond % +/- 5 DO % Sat. < 20	STABLE STABLE STABLE STABLE	Level Meter: Pump: Tubing: Dedicated	WLM08 ESP PE Ves
1A Purge Start: 10:54 Purge End: 11:13 Purge Comple	11:11 11:13 ete At 10:54	1500 1500 1500 1500 Gallons to	5.94 0.79 0.79 0.79	5.94 6.73 7.52 Stability	26.94 26.93 26.94 Values =	pH (SU) 6.38 6.38 6.38 6.38	Temp °C 28.24 28.28	5389 5410 5424 5424	0.19 0.18 0.17	16.20 8.47 7.10	ph:+/- 0.2 Temp*C+/- 0.2 Cond % +/- 5 DO % Sat. < 20	STABLE STABLE STABLE STABLE	Level Meter: Pump: Tubing: Dedicated Tubing?	WLM08 ESP PE Ves
1A Purge Start: 10:54 Purge End: 11:13 Purge Comple	11:11 11:13 ete At 10:54	1500 1500 1500 1500 Gallons to I	5.94 0.79 0.79 0.79 Purge 0.18	5.94 6.73 7.52 Stability Well Depth (ft)	26.94 26.93 26.94 Values =  Depth to Water (ft)	pH (SU) 6.38 6.38 6.38 6.38  6.38  6.38	Temp °C 28.24 28.28 28.25 28.25  28.25  Well X Capacity (gal) =	5389 5410 5424 5424 1 Well Volume (gal)	0.19 0.18 0.17  0.17  Tubing Capacity (gal/ft.)	16.20 8.47 7.10 7.10 Tubing Length (ft)	ph:+/- 0.2 Temp*C+/- 0.2 Cond % +/- 5 DO % Sat.< 20 Turb.NTU < 20 + Volume (gal) +	STABLE STABLE STABLE STABLE STABLE STABLE  Cell Volume (gal)	Level Meter: Pump: Tubing: Dedicated Tubing?	WLM08 ESP PE Ves
1A turge Start: 10:54 turge End: 11:13 turge Comple Well # CCR-PZ-6	11:11 11:13 ete At 10:54 Diam/ Comp	1500 1500 1500 1500 Gallons to	5.94 0.79 0.79 0.79 Purge 0.18 Intake Depth (ft) 16.11	5.94 6.73 7.52 Stability Well Depth (ft) 21.11	26.94 26.93 26.94 Values =  Depth to Water (ft)  5.52	pH (SU) 6.38 6.38 6.38 6.38  6.38  1.38  1.38  1.38	Temp °C 28.24 28.28 28.25 28.25  28.25  X Capacity (gal) = 0.16	5389 5410 5424 5424 1 Well Volume (gal) 2.49	0.19 0.18 0.17  0.17  ( Tubing Capacity (galm.) 10.0026	16.20 8.47 7.10 7.10 x Tubing Length (ft) (ft) 47.03	ph:+/- 0.2 Temp*C+/- 0.2 Cond % +/- 5 DO % Sat < 20 Turb.NTU < 20  + Volume (pai) + 0	STABLE STABLE STABLE STABLE STABLE Output ST	Level Meter: Pump: Tubing: Dedicated Tubing?  1 Eqpt Volume (gal)  0.18	WLM08 ESP PE Yes No
1A Purge Start: 10:54 Purge End: 11:13 Purge Comple Well # CCR-PZ-6 Purge Meth;	11:11 11:13 ete At 10:54 Diam/ Comp 2	1500 1500 1500 1500 Screen (nterval (ft) 10 Rate (ml/min)	5.94 0.79 0.79 0.79 Purge 0.18 Intake Depth (ft) 16.11 Volume (gal)	5.94 6.73 7.52  Stability Well Depth (ft) 21.11 Total Vol. (gal)	26.94 26.93 26.94  Values =  Depth to Water (ft)  5.52  Water Depth (ft)	pH (SU) 6.38 6.38 6.38 6.38  6.38  6.38  1	Temp °C  28.24  28.28  28.25  28.25  X Capacity (gal) =  0.16  Temp °C	5389 5410 5424  5424  1 Well Volume (gal) 2.49  Cond (uMHOS)	0.19 0.18 0.17  0.17  ( Tubing Capacity (galff.)  0.0026  DO (mg/L)	16.20 8.47 7.10  7.10  7.10  47.03  Turbidity (NTU)	ph:+/- 0.2 Temp*C+/- 0.2 Cond % +/- 5 DO % Sat < 20 Turb.NTU < 20  + Volume (psi) +  0 Purge Criteria	STABLE STABLE STABLE STABLE STABLE Output STABLE STABLE STABLE STABLE STABLE STABLE STABLE STABLE	Level Meter: Pump: Tubing: Dedicated Tubing?  1 Eqpt Volume (gall)  0.18 Equipment ID	WLM08 ESP PE ☐ Yes ☑ No Eqpt. Table
1A Purge Start: 10:54 Purge End: 11:13 Purge Comple Well # CCR-PZ-6 Purge Meth; 1A	11:11 11:13 ete At 10:54 Diam/ Comp 2 Time 10:00	1500 1500 1500 1500 Screen (nterval (ft) 10 Rate (ml/min) 420	5.94 0.79 0.79 0.79 Purge 0.18 Intake Depth (ft) 16.11 Volume (gal) 0.78	5.94 6.73 7.52 Stability Well Depth (ft) 21.11 Total Vol. (gal) 0.78	26.94 26.93 26.94  Values =  Depth to Water (ft)  5.52  Water Depth (ft)  5.71	PH (SU) 6.38 6.38 6.38 6.38  6.38  6.38  Figure 1	Temp °C 28.24 28.28 28.25  28.25  Well Capacity (gal) =  0.16 Temp °C 27.47	5389 5410 5424 5424 1 Well Volume (gall) 2.49 Cond (uMHOS) 1500	0.19 0.18 0.17  0.17  ( Tubing Capacity (galff.)  0.0026 DO (mg/L)  0.21	16.20 8.47 7.10  7.10  7.10  47.03  Turbidity (NTU) 4.91	ph:+/- 0.2 Temp*C+/- 0.2 Cond % +/- 5 DO % Sat < 20 Turb. NTU < 20  + Volume (pai) 0 Purge Criteria ph:+/- 0.2	STABLE STABLE STABLE STABLE STABLE  Cell Volume (pdl) 0.06 Status STABLE	Level Meter: Pump: Tubing: Dedicated Tubing?  1 Eqpt Volume (gal)  0.18 Equipment ID Level Meter:	WLM08 ESP PE ☐ Yes ☑ No  Eqpt. Tabl WLM08
1A Purge Start: 10:54 Purge End: 11:13 Purge Comple  Well # CCR-PZ-6 Purge Meth: 1A Purge Start:	11:11 11:13 ete At 10:54 Diam/ Comp 2 Time 10:00 10:02	1500 1500 1500 1500 Screen interval (ft) 10 Rate (ml/min) 420 420	5.94 0.79 0.79 0.79 Purge 0.18 Intake Depth (ft) 16.11 Volume (gal) 0.78 0.22	5.94 6.73 7.52 Stability Well Depth (ft) 21.11 Total Vol. (gal) 0.78 1.00	26.94 26.93 26.94  Values =  Depth to Water (ft) 5.52  Water Depth (ft) 5.71 5.70	6.38 6.38 6.38 6.38  6.38  6.38  6.38  6.40  6.46 6.47	Temp °C  28.24  28.28  28.25  28.25  X Capacity (gal) =  0.16  Temp °C  27.47  27.56	5389 5410 5424  5424  1 Well Volume (gal) 2.49  Cond (uMHOS) 1500 1501	0.19 0.18 0.17  0.17  Tubing Capacity (galft) 0.0026 DO (mg/L) 0.21 0.18	16.20 8.47 7.10  7.10  Tubing (n) 47.03  Turbidity (NTU) 4.91 3.31	ph:+/- 0.2 Temp*C+/- 0.2 Cond % +/- 5 DO % Sat < 20 Turb. NTU < 20  + Pump Volume (pai) +  0 Purge Criteria ph:+/- 0.2 Temp*C+/- 0.2	STABLE STABLE STABLE STABLE STABLE  Cell Volume (gal) 0.06 Status STABLE STABLE	Level Meter: Pump: Tubing: Dedicated Tubing?  1 Eqpt Volume (gal)  0.18 Equipment ID Level Meter: Pump:	WLM08 ESP PE ☐ Yes ☑ No ☐
1A Purge Start: 10:54 Purge End: 11:13 Purge Comple  Well # CCR-PZ-6 Purge Meth:	11:11 11:13 ete At 10:54 Diam/ Comp 2 Time 10:00	1500 1500 1500 1500 Screen (nterval (ft) 10 Rate (ml/min) 420	5.94 0.79 0.79 0.79 Purge 0.18 Intake Depth (ft) 16.11 Volume (gal) 0.78	5.94 6.73 7.52 Stability Well Depth (ft) 21.11 Total Vol. (gal) 0.78	26.94 26.93 26.94  Values =  Depth to Water (ft)  5.52  Water Depth (ft)  5.71	PH (SU) 6.38 6.38 6.38 6.38  6.38  6.38  Figure 1	Temp °C 28.24 28.28 28.25  28.25  Well Capacity (gal) =  0.16 Temp °C 27.47	5389 5410 5424 5424 1 Well Volume (gall) 2.49 Cond (uMHOS) 1500	0.19 0.18 0.17  0.17  ( Tubing Capacity (galff.)  0.0026 DO (mg/L)  0.21	16.20 8.47 7.10  7.10  7.10  47.03  Turbidity (NTU) 4.91	ph:+/- 0.2 Temp*C+/- 0.2 Cond % +/- 5 DO % Sat < 20 Turb. NTU < 20  + Volume (pail) +  0 Purge Criteria ph:+/- 0.2 Temp*C+/- 0.2 Cond % +/- 5	STABLE STABLE STABLE STABLE STABLE  Cell Volume (gal)  0.06 Status STABLE STABLE STABLE STABLE	Level Meter: Pump: Tubing: Dedicated Tubing?  1 Eqpt. Volume (gal)  0.18 Equipment ID Level Meter: Pump: Tubing:	WLM08 ESP PE ☐ Yes ☑ No ☐ No ☐ No ☐ Pqpt. Table WLM08 PP PE/S
1A Purge Start: 10:54 Purge End: 11:13 Purge Comple Weil # CCR-PZ-6 Purge Meth: 1A Purge Start:	11:11 11:13 ete At 10:54 Diam/ Comp 2 Time 10:00 10:02	1500 1500 1500 1500 Screen interval (ft) 10 Rate (ml/min) 420 420	5.94 0.79 0.79 0.79 Purge 0.18 Intake Depth (ft) 16.11 Volume (gal) 0.78 0.22	5.94 6.73 7.52 Stability Well Depth (ft) 21.11 Total Vol. (gal) 0.78 1.00	26.94 26.93 26.94  Values =  Depth to Water (ft) 5.52  Water Depth (ft) 5.71 5.70	6.38 6.38 6.38 6.38  6.38  6.38  6.38  6.40  6.46 6.47	Temp °C  28.24  28.28  28.25  28.25  X Capacity (gal) =  0.16  Temp °C  27.47  27.56	5389 5410 5424  5424  1 Well Volume (gal) 2.49  Cond (uMHOS) 1500 1501	0.19 0.18 0.17  0.17  Tubing Capacity (galft) 0.0026 DO (mg/L) 0.21 0.18	16.20 8.47 7.10  7.10  Tubing (n) 47.03  Turbidity (NTU) 4.91 3.31	ph:+/- 0.2 Temp*C+/- 0.2 Cond % +/- 5 DO % Sat.< 20 Turb. NTU < 20	STABLE STABLE STABLE STABLE STABLE  Cell Volume (gall)  0.06 Status STABLE STABLE STABLE STABLE STABLE	Level Meter: Pump: Tubing: Dedicated Tubing?  1 Eapt Volume (gal)  0.18 Equipment ID Level Meter: Pump: Tubing: Dedicated	WLM08 ESP PE ☐ Yes ☑ No ☐ No ☐ No ☐ PPP PE/S ☑ Yes
1A Purge Start: 10:54 Purge End: 11:13 Purge Comple  Well # CCR-PZ-6 Purge Meth; 1A Purge Start: 9:53	11:11 11:13 ete At 10:54 Diam/ Comp 2 Time 10:00 10:02	1500 1500 1500 1500 Screen interval (ft) 10 Rate (ml/min) 420 420	5.94 0.79 0.79 0.79 Purge 0.18 Intake Depth (ft) 16.11 Volume (gal) 0.78 0.22	5.94 6.73 7.52 Stability Well Depth (ft) 21.11 Total Vol. (gal) 0.78 1.00	26.94 26.93 26.94  Values =  Depth to Water (ft) 5.52  Water Depth (ft) 5.71 5.70	6.38 6.38 6.38 6.38  6.38  6.38  6.38  6.40  6.46 6.47	Temp °C  28.24  28.28  28.25  28.25  X Capacity (gal) =  0.16  Temp °C  27.47  27.56	5389 5410 5424  5424  1 Well Volume (gal) 2.49  Cond (uMHOS) 1500 1501	0.19 0.18 0.17  0.17  Tubing Capacity (galft) 0.0026 DO (mg/L) 0.21 0.18	16.20 8.47 7.10  7.10  Tubing (n) 47.03  Turbidity (NTU) 4.91 3.31	ph:+/- 0.2 Temp*C+/- 0.2 Cond % +/- 5 DO % Sat < 20 Turb. NTU < 20  + Volume (pail) +  0 Purge Criteria ph:+/- 0.2 Temp*C+/- 0.2 Cond % +/- 5	STABLE STABLE STABLE STABLE STABLE  Cell Volume (gal)  0.06 Status STABLE STABLE STABLE STABLE	Level Meter: Pump: Tubing: Dedicated Tubing?  1 Eqpt. Volume (gal)  0.18 Equipment ID Level Meter: Pump: Tubing:	WLM08 ESP PE  Yes  No  Eqpt. Table WLM08 PP PE/S

**Total Miles** 

Total Time

LIMS#	Loction Code	Time	FE <sup>2</sup>	pH (SU)	Temp °C	Cond(uMHOS)	DO Mg/L	Turbidity(NTU)	Redox (mv)	Sulfite (mg/L)	Color	Odor	N	IGVD
			mg/l	PH	TEMP-C	COND-F	DO	TURB-N-F	REDOX	SO3-TR	SCOLOR-W	\$ODOR-W	Time	LEVEL
_16G005-07	MWB-35	10:42		6.64	27.94	1309	0.16	1.15	-77.90		CLEAR	MILD		-7.34
L16G005 08		9:47		6.90	29.67	2051	0.28	4.09	-157.40		LT YELLOW	MODERATE		-7.99
LIMS#	250ml Cyan (3)	1L Inorg (1)	500ml Inorg (2)	250ml Inorg (3)	1L Mtls (1)	250ml Mtls (3)	1L Rads (1)	500ml Sulfide (2)	500ml Mtls (2)	250ml Nuts (3)	40ml Vial (6)	500 ml Nuts (2)	1L Rads Diss. (1)	Total Containers
16G005-07			1	,		☑ 2	2 2							40
16G005 08	-		1			<b>☑</b> 2	☑ 2							10
1) 1L plastic (P	P)	(2) 500ml plastic	(PP)	(3) 250ml plastic	(PP)	(4) 100ml coliform b	ottle	(5) 1L amber glass	(AG)	(6) 40ml VOA vial	(CG)		Samples On Ice	Sample Reciept
SS	0107301Y	ESS	0218201Y	ESS	0307301Y	ESS	2.02	ESS		ESS			Yes No	Time 15:50
	Preservation			Pres ID		Preservation			Pres ID		Preservation		Pres ID	Temp 0.4
L bottles (rads):	5 ml HNO3 to pH <2			L 011663 🗹	250ml bottles (nu	uts): 1 ml H2SO4 to p	H<2		L E	500 ml bottles(Sulf	ide) 2ml NAOH/Zinc	Acet to pH >12	L D	
	netals): 2 ml HNO3 to	pH <2		L 🗆		: 0.5 ml H2SO4 to pH			1 .		an) 1g NAOH to pH >		L O	
	netal): 1 ml HNO3 to p			L 011663 🗹			5um, 5 ml HNO3 to pH	<2	L C		dicates that the san		a pH of <2	
H Meter Calibra		Buffer ID	Buffer Value	Cal	Time	ICV	Time	ccv	Time	Redox Cal	Time	Temp °C	Reading my	Theo Value my
Meter ID:	MPM08	L 015169J	7	7.02	8:25		1	7.02	16:05	Meter ID:	8:30	22.1	236.0	234.9
DEP FT 1100	11100	L 015170	10	10.04	8:25	QC: (pH +/- 0.2) /C/	ond +/- 5%) (DO +/- 0.3)	CALL TO A CONTRACTOR OF THE PARTY OF THE PAR		MPM08	16:10	21.0	235.3	236.2
nits: SU		L 015083A	4	4.01	8:25		cates ICV / CCV passe			Zobell Sol ID:	10.10	2.10	200.0	200.2
onductivity Me	eter Calib.	Standard ID	Std Value	Cal	Time	ICV	Time	ccv	Time	L 222A				
leter ID:	MPM08	L 014668B	1000	1000	8:05		2,000			DO Meter Cal	Time	Temp °C	Reading mg/l	Theo Value mg
DEP FT 1200,		L 013457B	10000		1	10263	8:15	10326	16:00	Meter ID:	7:55	21.0	8.90	8.915
urbidity Meter		Standard ID	Std Value	Acceptab	ility Range	ICV	Time	CCV .	Time	MPM08	16:50	20.4	9.22	9.021
feter ID:	TM07	L 013677	5.40	4.86	5.94	5.49	7:50		1010	Barom. Pres	10.00	2017	0.22	0.021
DEP FT 1600,		L 013678	53.40	49.93	56.87	07,0	1.100	53.40	16:10	760				
	Check) (EPA 377.1		QC Result mg/l	Time	Titrator ID	Na Thio ID	DO 3 Pillow ID	Starch Ind. ID	lodate/lodide ID	Therm ID	pH	Conduct.( %)	DO (mg/l)	Redox (mv)
	Thio)/500ml DI=10mg		QO NOSUL HIGH	Tanc	Titletor ID	L	L	L	L	MPM08	0.2	5	0.3	10
Purging Informa			(gallons/ ft): 2"	= 0.16 4" =0.65		Tubing Inside Diag	. Capacities Gallons/f	n: 1/4" =0.0026 3/8" =	0.006					
				Weil	Depth to	Water	Well	1 Weil	Tubles	Tubing	Pump	Cell	1 Eqpt.	
Well#	Diam/ Comp	Screen Interval (ft)	Intake Depth (ft)	Depth (ft)	Water (ft)	Column (ft)	X Capacity (gal) =	Volume (gal)	( Capacity (gal/ft.)	Langth )	+ Volume + (gai)	Volume (gal)	(gal)	
MWB-35	2	5	15	18.71	7.34	11.37	0.16	1.82	0.006	21	0	0.06	0.19	
Purge Meth:	Time	Rate (ml/min)	Volume (gal)	Total Vol. (gal)	Water Depth (ft)	pH (SU)	Temp °C	Cond (uMHOS)	DO (mg/L)	Turbidity (NTU)	Purge Criteria	Status	Equipment ID	Eqpt. Table
1A	10:28	360	0.57	0.57	7.58	6.70	27.81	1310	0.20	0.57	ph:+/- 0.2	STABLE	Level Meter:	WLM08
urge Start:	10:30	360	0.19	0.76	7.58	6.63	27.85	1309	0.17	0.66	Temp <sup>o</sup> C+/- 0.2	STABLE	Pump:	PP
uige Start.	10:32	360	0.19	0.95	7.59	6.64	27.94	1309	0.16	1.15	Cond % +/- 5	STABLE	Tubing:	PE/S
10:22			1								DO % Sat.< 20	STABLE	Dedicated	✓ Yes
10:22 Purge End:											Turb. NTU < 20	STABLE	Tubing?	☐ No
10:22 Purge End: 10:32	11.		man and	01-117	Malura	6.64	27.94	1309	0.16	1.15				
10:22 Purge End: 10:32	ete At 10:24	Gallons to Pu	rge 0.19	Stability	Values =	0.04				Tubing	Pump	Cell	1 Eqpt. Volume	
10:22 Purge End: 10:32		Screen	Intake	Well Depth (ft)	Depth to Water (ft)	Water	X Capacity (gal) =	1 Well Volume (gal)	( Capacity (galfit.)	Length )	+ Volume (gal) +	Volume (gal)	(gai)	
10:22 Purge End: 10:32 Purge Comple	ete At 10:24  Diam/ Comp			Well Depth	Depth to - Water	= Water = Column		Volume	( Tubing Capacity (galfit.)	Length )	+ Volume (gal) +	(gal)	0.19	
10:22 Jurge End: 10:32 Jurge Comple Well # MWB-36	Diam/ Comp	Screen Interval (ft)	Intake Depth (ft)	Well Depth (ft) 18.73	- Depth to Water (ft) 7.99	= Water Column (ft) 10.74	Capacity (gal) = 0.16	Volume (gal) 1.72	( Capacity (gal/ft.)	Length (ft)	0	(gal) 0.06	(gal) 0.19	Egot Table
10:22 urge End: 10:32 urge Comple Well # MWB-36 Purge Meth;	Diam/ Comp 2 Time	Screen Interval (ft) 5 Rate (ml/min)	Intake Depth (ft) 15 Volume (gal)	Well Depth (ft) 18.73 Total Vol. (gal)	Depth to Water (ft) 7.99 Water Depth (ft)	= Column (ft) 10.74 pH (SU)	0.16 Temp °C	Volume (gal) 1.72 Cond (uMHOS)	( Gapacity (gal/ft.) 0.006  DO (mg/L)	Length (ft)  21  Turbidity (NTU)	0 Purge Criteria	(gal) 0.06 Status	0.19 Equipment ID	The state of the s
10:22 urge End: 10:32 urge Comple Well # MWB-36 Purge Meth: 1A	Diam/ Comp 2 Time 9:30	Screen Interval (ft) 5 Rate (ml/min) 260	Intake Depth (ft) 15 Volume (gal) 0.69	Well Depth (ft) 18.73 Total Vol. (gal) 0.69	Tepth to Water (ft)  7.99  Water Depth (ft)  8.27	= Vater Column (ft) 10.74 pH (SU) 6.90	0.16 Temp °C 29.64	Volume (gal)  1.72  Cond (uMHOS)  2083	( Capacity (galfit.) 0.006  DO (mg/L) 0.33	Length (ft)  21  Turbidity (NTU)  4.37	0 Purge Criteria ph:+/- 0.2	0.06 Status STABLE	0.19 Equipment ID Level Meter:	WLM08
10:22 Purge End: 10:32 Purge Comple Well # MWB-36 Purge Meth: 1A Purge Start:	Diam/ Comp 2 Time 9:30 9:32	Screen Interval (ft) 5 Rate (ml/min) 260 250	Intake Depth (ft) 15 Volume (gal) 0.69 0.13	Well Depth (ft) 18.73 Total Vol. (gal) 0.69 0.82	7.99 Water Depth (ft)  8.27  8.26	= Water Column (ft) 10.74 pH (SU) 6.90 6.90	0.16 Temp °C 29.64 29.69	Volume (gall)  1.72  Cond (uMHOS)  2083  2065	( Capacity (galfit) 0.006 DO (mg/L) 0.33 0.26	Length (n) 21 Turbidity (NTU) 4.37 4.46	0 Purge Criteria ph:+/- 0.2 Temp*C+/- 0.2	0.06 Status STABLE STABLE	0.19 Equipment ID Level Meter: Pump:	WLM08 PP
10:22 Purge End: 10:32 Purge Comple Well # MWB-36 Purge Meth: 1A Purge Start: 9:20	Diam/ Comp 2 Time 9:30	Screen Interval (ft) 5 Rate (ml/min) 260	Intake Depth (ft) 15 Volume (gal) 0.69	Well Depth (ft) 18.73 Total Vol. (gal) 0.69	Tepth to Water (ft)  7.99  Water Depth (ft)  8.27	= Vater Column (ft) 10.74 pH (SU) 6.90	0.16 Temp °C 29.64	Volume (gal)  1.72  Cond (uMHOS)  2083	( Capacity (galfit.) 0.006  DO (mg/L) 0.33	Length (ft)  21  Turbidity (NTU)  4.37	0 Purge Criteria ph:+/- 0.2 Temp*C+/- 0.2 Cond % +/- 5	0.06 Status STABLE STABLE STABLE	0.19 Equipment ID Level Meter: Pump: Tubing:	WLM08 PP PE/S
10:22 Purge End: 10:32 Purge Comple Well # MWB-36 Purge Meth: 1A Purge Start:	Diam/ Comp 2 Time 9:30 9:32	Screen Interval (ft) 5 Rate (ml/min) 260 250	Intake Depth (ft) 15 Volume (gal) 0.69 0.13	Well Depth (ft) 18.73 Total Vol. (gal) 0.69 0.82	7.99 Water Depth (ft)  8.27  8.26	= Water Column (ft) 10.74 pH (SU) 6.90 6.90	0.16 Temp °C 29.64 29.69	Volume (gall)  1.72  Cond (uMHOS)  2083  2065	( Capacity (galfit ) 0.006 DO (mg/L) 0.33 0.26	Length (n) 21 Turbidity (NTU) 4.37 4.46	0 Purge Criteria ph:+/- 0.2 Temp*C+/- 0.2	0.06 Status STABLE STABLE	0.19 Equipment ID Level Meter: Pump:	PP

Total Time

Total Miles

## **GROUNDWATER WELL SAMPLING EQUIPMENT CALIBRATION**

				Date:	07/27/16	Sampler(s):	RAB		Initials	RB			
pH Meter Calibration			Buffer ID	Buffer Value	Cai	Time	I			ccv	Time	Pass/Fail	1
Meter ID:	MPM08	L	015169J	7	7.02	8:25				7.02	16:05	Pass	
FDEP FT 1100		L	015170	10	10.04	8:25			QC:(pH +/- 0.2	(Cond +/- 5%) (DC	+/- 0.3mg/L) (Redox =	/- 10mv)	
Units: SU		L	015083A	4	4.01	8:25	ICA	Time	Pass/Fail	A checked box in	ndicates ICV / CCV pa	ssed	
	ICV Check	L	014565K	7			7.02	825	Pass				
Conductivity Meter Calib.			Standard ID	Std Value	Cal	Time	ICV	Time	Pass/Fail	GCV	Time	Pass/Fail	
Meter ID:	MPM08	L	014668B	1000	1000	8:05							1
FDEP FT 1200, Units: uMH0	os	L	013457B	10000			10263	8:15	Pass	10326	16:00	Pass	
Turbidity Meter Calibration	n		Standard ID	Std Value	Acceptability	Range	CCV	Time	Pass/Fail	CCV	Time	Pass/Fail	
Meter ID:	TM07	L	013677	5.40	4.86	5.94	5.49	7:50	Pass				
FDEP FT 1600, Units: NTU		L	013678	53.40	49.93	56.87				53.40	16:10	Pass	
Sulfite Info (QC Check) (	EPA 377.1)			QC Result mg/l	Time	Titrator ID	Na Thio ID	DO 3 Pillow ID	Staren Ind. ID	lodate/lodide ID			
QC Std: 5ml (NaThio)/500m	I DI=10mg/L						L	L	L	L			
Redox Cal	Time		Temp *C	Reading my	Theo Value mv	Pass / Fall	DO Meter Cal	Time	Temp °C	Reading mg/l	Theo Value mg/l	Pass / Fall	
							FDEP FT 1500						
Meter ID:	8:30		22.1	236.0	234.9	Pass	Meter ID:	7:55	21.0	8.90	8.915	Pass	
MPM08	16:10		21.0	235.3	236.2	Pass	MPM08	16:50	20.4	9.22	9.021	Pass	
Zobell Sol ID:							Barom. Pres						
L 015222A							760						
Therm ID	pН		Conduct: %	DO mg/l	Redox my	CL2	Calibration	Ferrous Iron					
MPM08	0.2		5	0.3	10	0.2	Criterion	Comparator ID:		Reagent ID:	L- 5		
CIO <sub>2</sub> DPD Check must read	+/- 10% of the	Calc	ulated Std. Conce	ntration, multiplie	ed by 2.4.		Glycene check shou	ld read < 0.10 mg/l C	IO <sub>2</sub> .				
							Initial Calibratio	n Verification ICV		Continuous Call	bration Verification C	cv	Method 1012
Chlorine Dioxide (mg/l)	Std, Cane (mg/l)	St	d. Spike Volume (ml)	Cal Sample Volume (mi)	Calc. Std. Conc. (mg/l)	DPD Check (mg/l)	Glycene Check	Time	Pass/Fall	DPD Check (mg/l)	Time	Pass/Fall	*Equivalent to Standard Metho
Meter ID:		1	1.0	100									4500 CIO <sub>2</sub> D.
		_		DPD ID: L	346	Glycene ID:	10. 200	N al-	walters beautiful	de de contrat mantesti	on date has been verifie		

COMMENTS:

CL2 Std. ID: L

### DEP-SOP-001/01

### FS 2200 Groundwater Sampling Form FD 9000-24

## GROUNDWATER SAMPLING LOG

FACILITY NAME:		Big Be	end			SITE LOCATION:		Apollo	Beach, FL.		
WELL NO:		CCR-PZ-1			SAMPLE ID:	L160	G005-01		DATE:	7/27/16	
						NG DATA					
WELL DIAMETER (inches	)	TUBING DIAMETER (inc				AL (NGVD) 20.29 (feet)		PTH (feet): 5.00	PURGE PUMP T OR BAILER:	YPE PP	
WELL VOLUME PURG (only fillout if applicable)	E;	1 WELL VOLU	ME = (TOTAL WE	LL DEPTH - STATIC	DEPTH TO WATE	R) X WELL CAPAC			0.000		0.00
1		7000	= (		feet-	CARACITY V	feet ) x	TH) + FLOW CE	gallons/fool		gallons
EQUIPMENT VOLU (only fillout if applic	JME PURGE: able)	1 EQI	JIPMENT VOL						0.00		0.12 gallons
			=(	O TURING	gallons + (	0.0026 gall		21.3 (eet)		gallons = TOTAL VOLU	ME
INITIAL PUMP OR DEPTH IN WELL (f	eet): 15.2		DEPTH IN W	to the second second	5.29	PURGING INITIATED AT:	13:21	PURGING ENDED AT: DISSOLVED	13:33	PURGED (gall	lans): 1.24
TIME	VOLUME PURGED (GALLONS)	VOLUME PURGED (GALLONS)	PURGE RATE (GPM)	DEPTH TO WATER (FEET)	pH (standard units)	TEMP. (°C)	COND. (µmhos/cm OR µS/cm)	OXYGEN (circle mg/l or % saturation)	TURBIDITY (NTUs)	COLOR (describe)	ODOR (describe)
13:29	0.82	0.82	0.10	5.11	6.67	26.37	4186	0.36	5.13	CLEAR	NONE
13:31	0.21	1.03	0.11	5.11	6.65	26.39	4187	0.37	3.63	CLEAR	NONE
13:33	0,21	1.24	0.11	5.11	6.67	26.41	4185	0.22	3.88	CLEAR	NONE
WELL CAPACITY (G. TUBING INSIDE DIA. SAMPLED BY (PR	CAPACITY (Gal,/I	ION:		1/4" = 0.0026; SAMPLER(S)	5/16" = 0.004	10.37; 4" = 0 15; 3/8" = 0.006; LING DATA	1/2" = 0.0		0.016	SAMPLING BENDED AT:	13:45
PUMP OR TUBINO	3		12.00	SAMPLE PUMP FLOW RATE (	>	1	397	TUBING MATERIAL COD	E: PE	/S	
DEPTH IN WELL (							TER SIZE:	μm	DUPLICATE:	YUNE	7
FIELD DECONTAN	SAMPLE CO	Y N N		FIELD-FILTER Filtration Equip		7	2,61.00		ENDED	1	AMPLING
	SPECIFIC #			PRESERVATIV	and the transfer the transfer to	ESERVATION TAL VOL.	FINAL	ANALYS	SIS AND/OR	EQ	UIPMENT
SAMPLE ID CODE	CONTAINERS		VOLUME	USED		N FIELD (ml) (1)	pH	ME	THOD		CODE
@Ino-500	1_	PE	500ml	NONE	1	NONE	N/A	Inor	ganics		PP
@Met-250	2	PE	250ml	HNO3		1ml	<2	М	etals		PP
@Rad-1L	2	PE	1L	HNO3	TIC Ex	5ml	<2	Radio	ologicals	1 3	PP
									-		
					7						
REMARKS: (1) Sample bo	ttles pre-pre	served at lab	oratory pri	or to sample	collection.						
MATERIAL CODES		Glass; CG =	Clear Glass;	PE = Polyethyle	ne; PP = Po	Advantage of the last of the l		T = Teflon; O= C			
SAMPLING/PURGI	NG	APP = After Peris	taltic Pump; B	= Bailer; BP = B	ladder Pump; E	SP = Electric Sub	mirsable Pump; VT = Vacuum	PP = Peristaltic Pu Trap; O = Other (S)	mp pecify)		

<sup>1.</sup> The above do not constitute all of the information requierd by Chapter 62-160, F.A.C.

<sup>2,</sup> STABILIZATION CRITERIA FOR RANGE OF VARIATION OF LAST THREE CONSECUTIVE READINGS (SEE FS 2212, SECTION 3) pH: ± 0.2 units Temperature: ± 0.2 °C Specific Conductance: ±5% Dissolved Oxygen:all readings ≤ 20% saturation (see Table FS 2200-2); optionally, ± 0.2 mg/L or ± 10% (whichever is greater) Turbidity:all readings ≤ 20 NTU; optionally ± 5 NTU or 10% (whichever is greater)

## **GROUNDWATER SAMPLING LOG**

SITE NAME:		Big B	end			SITE LOCATION:		Apollo	Beach, FL.		
WELL NO:	(	CR-PZ-2	1111		SAMPLE ID	L160	3005-02		DATE:	7/27/16	
						NG DATA			1000		
WELL DIAMETER (inches	)	TUBING DIAMETER (inc	thes) 1/4	DEPTH 10.64		20.64 (feet)	STATIC DEPTH TO WATER (fee		PURGE PUMP 1 OR BAILER:	PP PP	
WELL VOLUME PL	JRGE:	1 WELL VO	LUME = (TOT	AL WELL DEPTH -	STATIC DE	PTH TO WATER)	X WELL CA	PACITY			
to a control	223		= (	A some oracles	feet-		feet ) x	TILL FLOWER	gallons.foo	ot =	gallons
EQUIPMENT VOLU (only fillout if applica	JME PURGE: able)	1 EQ	UIPMENT VOL	= PUMP VOLUM						10000	0.12
INITIAL DUMP OF	TURING		TEINIAL DUNAS	O OR TUBING	gallons + (		ons/foot X	DURGING	(1)+ 0.06	gallons =	0.12 gallon:
INITIAL PUMP OR DEPTH IN WELL (f	eet): 15.64	COMOL.	DEPTH IN W	ELL (feet): 15	.64	PURGING INITIATED AT:	12:56	ENDED AT:	13:00	TOTAL VOLUM 6 PURGED (gall	ans): 0.90
TIME	VOLUME PURGED (GALLONS)	VOLUME PURGED (GALLONS)	PURGE RATE (GPM)	TO WATER (FEET)	pH (standard units)	TEMP. (°C)	COND. (µmhos/cm OR µS/cm)	OXYGEN (circlemg/lar % saturation)	TURBIDITY (NTUs)	COLOR (describe)	ODOR (describe)
13:02	0.54	0.54	0.09	5.38	6.70	26.45	1677	0.25	11.30	LT YELLOW	NONE
13:04	0.18	0.72	0.09	5.38	6.68	26.42	1698	0.15	8.49	LT YELLOW	NONE
13:06	0.18	0.90	0.09	5.39	6.68	26.42	1697	0.13	7.16	LT YELLOW	NONE
										10	
		1		9		11.		1			
WELL CAPACITY (Go TUBING INSIDE DIA.		0.75" = 0.02; (.): 1/8" = 0.00006;	1" = 0.04; 3/16" = 0.0014	1961 - 7 17 17 M - C - 17 17 17	5/16" = 0.004		1/2" = 0,0				
				le 11 15/ 55 (61 61	The second second second	ING DATA	-	ISAMBI ING	4"	ISAMPI ING	
SAMPLED BY (PR	RAE		TECO	SAMPLER (S) SU	Bitta	tel		SAMPLING INITIATED AT:	13:0	SAMPLING ENDED AT:	13:10
PUMP OR TUBING DEPTH IN WELL (f			TECO	SAMPLE PUMP FLOW RATE (mL		γ	347	TUBING MATERIAL COD	12.	E/S	
FIELD DECONTAN	A Laboratory	Y D N D		The second second second second second			ER SIZE:	μт	DUPLICATE:	Y N N E	2
FIELD DECONTAIN	SAMPLE CON	NTAINER		FIELD-FILTERED Filtration Equipme		ESERVATION		I INTI	ENDED	1	MPLING
	SPECIFIC.	MATERIAL	VOLUME	PRESERVATIVE	то	TAL VOL.	FINAL	ANALYS	IS AND/OR THOD		JIPMENT CODE
SAMPLEID CODE	CONTAINERS	CODE	VOLUME	USED	ADDED	N FIELD (ml) (1)	pH	1,12			110
@Ino-500	1	PE	500ml	NONE	1	NONE	N/A	Inor	ganics		PP
@Met-250	2	PE	250ml	HNO3		1ml	<2	M	etals		PP
@Rad-1L	2	PE	1L	HNO3		5ml	<2	Radio	logicals		PP
			-								
			1								
REMARKS:			1				-			0	
(1) Sample bo					TALL AND DESCRIPTION OF THE PERSON OF THE PE		-6-5	77.77 P. C. W. W.			
MATERIAL CODE:			= Clear Glass			P = Polypropylene				ecity)	
SAMPLING/PURGIN EQUIPMENT CODE	S:	RFPP = Reverse	Flow Peristallic	= Bailer; BP = Blac Pump; SM = Straw	Method (tubin	g Gravity Drain);	VT = Vacuum 1	rap; O = Other (Sp	edfy)		

NOTES: 1. The above do not constitute all of the information requierd by Chapter 62-160, F.A.C.

<sup>2.</sup> STABILIZATION CRITERIA FOR RANGE OF VARIATION OF LAST THREE CONSECUTIVE READINGS (SEE FS 2212. SECTION 3) pH:  $\pm$  0.2 units Temperature:  $\pm$  0.2 °C Specific Conductance:  $\pm$  5% Dissolved Oxygen: all readings s 20% saturation (see Table FS 2200-2); optionally,  $\pm$  0.2 mg/L or  $\pm$  10% (whichever is greater) Turbidity: all readings s 20 NTU; optionally  $\pm$  5 NTU or 10% (whichever is greater)

## **GROUNDWATER SAMPLING LOG**

NAME:		Big Be	end		=	LOCATION:		Apollo	Beach, FL.		
WELL NO:	C	CR-PZ-3			SAMPLE ID:	L160	3005-03		DATE:	7/27/16	
					The state of the s	NG DATA	/* =				
WELL DIAMETER (inches		TUBING DIAMETER (inc		WELL SCREEN IN DEPTH 10.38	feet to	20.38 (feet)	STATIC DEF		PURGE PUMP TO OR BAILER:	PP PP	
WELL VOLUME PL (only fillout if application)	JRGE: able)	1 WELL VO	DLUME = (TOT = (	AL WELL DEPTH -	STATIC DEF	TH TO WATER)	X WELL CA	PACITY	gallons/foc	ot =	gallons
EQUIPMENT VOLU (only fillout if application)	JME PURGE: able)	1 EQ	UIPMENTVOL	L, = PUMP VOLUMI		0.0000		TH) + FLOW CE 21.38 fe		gallons =	0.12 gallons
INITIAL PUMP OR DEPTH IN WELL (f	TUBING (eet): 15.38		FINAL PUMF DEPTH IN W	OR TUBING	gallons+(	PURGING INITIATED AT:		PURGING ENDED AT:	12:31	TOTAL VOLUM PURGED (gall	ME
TIME	VOLUME PURGED (GALLONS)	VOLUME PURGED (GALLONS)	PURGE RATE (GPM)	DEPTH TO WATER (FEET)	pH (standard units)	TEMP. (°C)	COND. (µmhos/cm OR µS/cm)	DISSOLVED OXYGEN (circle(ng/l))r % saturation)	TURBIDITY (NTUs)	COLOR (describe)	ODOR (describe)
12:27	0.51	0.51	0.06	4.76	6.23	27.31	1756	0.11	7.58	YELLOW	MODERATE
12:29	0.13	0.64	0.07	4.77	6.20	27.25	1751	0.10	6.83	YELLOW	MODERATE
12:31	0.13	0.77	0.07	4.78	6.19	27.28	1744	0.09	8.04	YELLOW	MODERATE
WELL CAPACITY (Ga		0.75** = 0.02;	1" = 0.04;	1,25" = 0.06; 2" =	0.16; 3"=	0.37; 4" = 0.	65; 5*=	1.02; 6" = 1.47;	12" = 5.88		
SAMPLED BY (PR	RAB		TECC		NATURES:	uy			2:31	SAMPLING ENDED AT: 1	2:45
PUMP OR TUBING DEPTH IN WELL (f	eet): 15.4	,		SAMPLE PUMP FLOW RATE (mL	. per minute):	1	240	TUBING MATERIAL CODI	E: PE	/S	
FIELD DECONTAM	INATION:	N D		FIELD-FILTERED Filtration Equipme	ent Type.	N FILT	ER SIZE:	μm	DUPLICATE:	Y D N E	9
	SAMPLE CON SPECIFICA				SAMPLEPRI	ESERVATION			NDED		MPLING
SAMPLE ID CODE	# CONTAINERS	MATERIAL CODE	VOLUME	PRESERVATIVE USED		TAL VOL N FIELD (ml) (1)	FINAL pH		THOD		JIPMENT CODE
@Ino-500	1	PE	500ml	NONE	N	IONE	N/A	Inorg	ganics		PP
@Met-250	2	PE	250ml	HNO3		1ml	<2	Me	etals		PP
@Rad-1L	2	PE	1L	HNO3		5ml	<2	Radio	logicals		PP
		^									
кемакка (1) Sample bo	ttles pre-pres	erved at lab	oratory pric	or to sample co	ollection.						
MATERIAL CODE		Name of Street or other Designation of the Owner, where the Owner, which is	3 = Clear Glass			= Polypropylene				cify)	
SAMPLING/PURGIN EQUIPMENT CODE	IG A	PP = After Perist	taltic Pump; B Flow Peristaltic	= Bailer; BP = Blad Pump; SM = Straw	der Pump; ES Method (tubin	iP = Electric Subm g Gravity Drain);	irsable Pump; VT = Vacuum T	PP = Peristaltic Pur rap; O = Other (Sp	np edfy)		

<sup>1.</sup> The above do not constitute all of the information requierd by Chapter 62-160, F.A.C.

<sup>2.</sup> STABILIZATION CRITERIA FOR RANGE OF VARIATION OF LAST THREE CONSECUTIVE READINGS (SEE FS 2212. SECTION 3)
pH: ± 0.2 units Temperature: ± 0.2 ℃ Specific Conductance: ± 5% Dissolved Oxygen: all readings ≤ 20% saturation (see Table FS 2200-2);
optionally, ± 0.2 mg/L or ± 10% (whichever is greater) Turbidity: all readings ≤ 20 NTU; optionally ± 5 NTU or 10% (whichever is greater)

## GROUNDWATER SAMPLING LOG

SITE NAME:		Big Be	end			SITE LOCATION:		Apollo	Beach, FL.		
WELL NO:	C	CR-PZ-4			SAMPLE ID:	L160	3005-04		DATE:	7/27/16	
						ING DATA					
WELL DIAMETER (inches	2)	TUBING DIAMETER (inc		WELL SCREEN IN DEPTH 8.00	feet to	18.00 (feet)	STATIC DEP TO WATER (	TH (feet): 3.24	PURGE PUMP T OR BAILER:	YPE PP	
WELL VOLUME P				AL WELL DEPTH-	STATIC DEF	TH TO WATER)	X WELL CA	PACITY			
only fillout if applic	cable)		= (	-	feet -		feet) x	AN COUNTY	qallons/foc	ot =	gallons
Conly fillout if application	UME PURGE: :able)	1 EQL	JIPMENT VOL	. = PUMP VOLUME 0	= + (TUBING	O.0026 gallo			eet) + 0.06	gallons =	0.18 gallons
INITIAL PUMP OR DEPTH IN WELL (	TUBING feet): 14.00	775.	FINAL PUMP DEPTH IN W	OR TUBING ELL (feet): 14.	00	PURGING INITIATED AT:	11:30	PURGING ENDED AT:	11:42	TOTAL VOLUM PURGED (gallo	E ns): 0.7
TIME	VOLUME PURGED (GALLONS)	VOLUME PURGED (GALLONS)	PURGE RATE (GPM)	DEPTH TO WATER (FEET)	pH (standard units)	TEMP. (°C)	COND. (µmhos/cm OR µS/cm)	DISSOLVED OXYGEN (circle mg/l or % saturation)	TURBIDITY (NTUs)	COLOR (describe)	ODOR (describe)
11:38	0.49	0.49	0.06	3.46	6.53	27.55	1447	0.35	4.10	LT YELLOW	MILD
11:40	0.12	0.61	0.06	3.47	6.54	27.54	1445	0.22	3.83	LT YELLOW	MILD
11:42	0.12	0.73	0.06	3.47	6.55	27.60	1446	0.15	3.21	LT YELLOW	MILD
-						_					
SAMPLED BY (PP		ON:	TECO	SAMPLER (S) SIG		ING DATA		SAMPLING INITIATED AT:	1:42	SAMPLING ENDED AT:	2:00
PUMP OR TUBINO DEPTH IN WELL (	G		,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	SAMPLE PUMP FLOW RATE (mL		1	230	TUBING MATERIAL COD	E: PE	/S	
FIELD DECONTAI	77V 10.737 7 7 72			FIELD-FILTERED Filtration Equipme			ER SIZE:	μm	DUPLICATE:	YONE	
, ICCO DECONTO	SAMPLE CON	TAINER		Filtration Equipme		RESERVATION		INT	ENDED		IPLING
	SPECIFICA	MATERIAL	VOLUME	PRESERVATIVE USED		TAL VOL.	FINAL		IS AND/OR THOD		PMENT ODE
SAMPLE ID CODE	# CONTAINERS	CODE	1,546,114	USED	ADDED	IN FIELD (ml) (1)	- PO				
@Ino-500	111	PE	500ml	NONE	1	NONE	N/A	Inor	ganics	13	op.
@Met-250	2	PE	250ml	HNO3		1ml	<2	M	etals		pp .
@Rad-1L	2	PE	1L	HNO3		5ml	<2		logicals		op .
(grad-12	-			1,1100							
				/ = 0							
REMARKS: (1) Sample bo				or to sample co						- 100	
MATERIAL CODE		r Glass; CG	= Clear Glass	PE = Polyeth	ylene; P	P = Polypropylene				ecify)	_
SAMPLING/PURGI	NG A	APP = After Peris	taltic Pump; B	= Bailer; BP = Blad Pump: SM = Straw	der Pump; E Method (tubir	sp = Electric Subm ng Gravity Drain):	VT = Vacuum	rap; O = Other (Sp	ecify)		

<sup>1.</sup> The above do not constitute all of the information requierd by Chapter 62-160, F.A.C.

<sup>2.</sup> STABILIZATION CRITERIA FOR RANGE OF VARIATION OF LAST THREE CONSECUTIVE READINGS (SEE FS 2212. SECTION 3)
pH: ± 0.2 units Temperature: ± 0.2 °C Specific Conductance: ± 5% DissolvedOxygen: all readings ≤ 20% saturation (see Table FS 2200-2);
optionally, ± 0.2 mg/L or ± 10% (whichever is greater) Turbidity: all readings ≤ 20 NTU; optionally ± 5 NTU or 10% (whichever is greater)

### GROUNDWATER SAMPLING LOG

SITE NAME:		Big Be	end			SITE LOCATION:		Apollo I	Beach, FL.		
WELL NO:	-	CR-PZ-5			SAMPLE ID:	L160	3005-05	10.00	DATE:	7/27/16	
						NG DATA					
WELL DIAMETER (inches	3)	TUBING DIAMETER (incl	hes) 1/4	WELL SCREEN IN DEPTH 31.03	feet to	41.03 (feet	STATIC DEP TO WATER (	TH feet): 26.19	PURGE PUMP T OR BAILER:	YPE ESP	
WELL VOLUME P	JRGE: able)	1 WELL VOI	LUME = (TOTA	AL WELL DEPTH-	STATIC DEP	TH TO WATER)		PACITY	T. Harrison		- J.W.J
EQUIPMENTVOL	IME DUDGE:	1 501	= (	. = PUMP VOLUME	feet -	CAPACITY X	feet ) x	TH ) + FLOW CE	gallons/fox	ot =	gallons
(only fillout if applic	able)	1 EQU		0	gallons + (	0.0026 gall		47.03 fee		gallons =	0.18 gallons
INITIAL PUMP OR DEPTH IN WELL (	TUBING (eet): 36.03		FINAL PUMP DEPTH IN W	OR TUBING	.03	PURGING INITIATED AT:		PURGING ENDED AT;		TOTAL VOLUM PURGED (gallo	AF.
TIME	VOLUME PURGED (GALLONS)	VOLUME PURGED (GALLONS)	PURGE RATE (GPM)	TO WATER (FEET)	pH (standard units)	TEMP. (°C)	COND. (µmhos/cm OR µS/cm)	OXYGEN (circle mg/ler % saturation)	TURBIDITY (NTUs)	COLOR (describe)	ODOR (describe)
11:09	5.94	5.94	0.40	26.94	6.38	28.24	5389	0.19	16.20	CLOUDY	NONE
11:11	0.79	6.73	0.40	26.93	6.38	28.28	5410	0.18	8.47	CLOUDY	NONE
11:13	0.79	7.52	0.40	26.94	6.38	28.25	5424	0.17	7.10	CLOUDY	NONE
WELL CAPACITY ( TUBING INSIDE DIA		0.75" = 0.02; /Ft.): 1/8" = 0.00	1" = 0.0 006: 3/16"	1.25" = 0.0 = 0.0014; 1/4" =	0.0026:	0.16; 3" = 0 5/16" = 0.004; ING DATA	3/8" = 0.00	5: 1/2" = 0.0	1.02; 6" = 1 10; 5/8	" = 0.016	5.88
SAMPLED BY (PF	RAE		TECO		STALLE	+			:13	SAMPLING ENDED AT: 1	1:18
PUMP OR TUBING DEPTH IN WELL (	eet): 36.0			SAMPLE PUMP FLOW RATE (mL	per minute):	1	500	TUBING MATERIAL CODE	. Р	E	
FIELD DECONTAN	MINATION:	V D N D		FIELD-FILTERED Filtration Equipme	t Type.	N FILT	ER SIZE:	μm	DUPLICATE:	Y I NE	]
	SAMPLE CON SPECIFICA			The state and st	SAMPLE PRE	SERVATION			NDED		MPLING
SAMPLE ID CODE		MATERIAL CODE	VOLUME	PRESERVATIVE USED		AL VOL. N FIELD (ml) (1)	FINAL		S AND/OR THOD		CODE
@Ino-500	1	PE	500ml	NONE	N	ONE	N/A	Inorg	ganics	E	ESP
@Met-250	2	PE	250ml	HNO3		1ml	<2	Me	etals	E	ESP
@Rad-1L	2	PE	1L	HNO3		5ml	<2	Radio	logicals	Е	ESP
REMARKS: (1) Sample bo				r to sample co		= Polypropylene	e: S = Silico	one: T = Teflon:	O= Other (Spe	ecify)	
MATERIAL CODE SAMPLING/PURGIN EQUIPMENT CODE	IG AG = AMDE	APP = After Perist RFPP = Reverse F	altic Pump; B	= Bailer; BP = Blad Pump; SM = Straw	der Pump; ES Method (tubing						

NOTES: 1. The above do not constitute all of the information requierd by Chapter 62-160, F.A.C.

2. STABILIZATION CRITERIA FOR RANGE OF VARIATION OF LAST THREE CONSECUTIVE READINGS (SEE FS 2212. SECTION 3) pH: ± 0.2 unils Temperature: ± 0.2 °C Specific Conductance: ± 5% Dissolved Oxygen: all readings ≤ 20% saturation (see Table FS 2200-2); optionally, ± 0.2 mg/L or ± 10% (whichever is greater) Turbidity: all readings ≤ 20 NTU; optionally ± 5 NTU or 10% (whichever is greater)

### **GROUNDWATER SAMPLING LOG**

SITE NAME:		Big Be	end		W 1	SITE LOCATION:		Apollo	Beach, FL.		
WELL NO:		CCR-PZ-6			SAMPLE ID:	L160	G005-06		DATE:	7/27/16	
		Total Street				NG DATA					
WELL DIAMETER (inche	5)	TUBING DIAMETER (inc		WELL SCREEN DEPTH 11.1	1 feet to	21.11 (feet)	_		PURGE PUMP T OR BAILER:	YPE PP	
WELL VOLUME P	URGE:	1 WELL VO	LUME = (TOT	AL WELL DEPTH	- STATIC DEP	TH TO WATER		PACITY			100
EQUIPMENT VOL		4.50	= (	- DUMPNOLLI	feet -	CARACITY Y	feet) x	TH) + FLOW CE	gallons/foo	ot =	gallons
only fillout if applic	able)	TEQU						47.03 fe		gallons =	0.18 gallons
INITIAL PUMP OR	TURING		=(	OR TUBING	gallons+(	0.0026 gall		PURGING		TOTAL VOLUM PURGED (gallo	
DEPTH IN WELL (	feet): 16.1	1	FINAL PUMP DEPTH IN W	ELL (feet): 16	6.11	PURGING INITIATED AT:	1	ENDED AT:	10:04	PURGED (gallo	ns): 1.2
TIME	VOLUME PURGED (GALLONS)	VOLUME PURGED (GALLONS)	PURGE RATE (GPM)	TO WATER (FEET)	pH (standard units)	TEMP. (°C)	COND. (µmhos/cm OR µS/cm)	OXYGEN (circle mg/l or % saturation)	TURBIDITY (NTUs)	COLOR (describe)	ODOR (describe)
10:00	0.78	0.78	0.11	5.71	6.46	27.47	1500	0.21	4.91	LT YELLOW	MILD
10:02	0.22	1.00	0.11	5.70	6.47	27.56	1501	0.18	3.31	LT YELLOW	MILD
10:04	0.22	1.22	0.11	5,68	6.48	27.56	1500	0.15	4.86	LT YELLOW	MILD
WELL CAPACITY ( TUBING INSIDE DI SAMPLED BY (PR	A. CAPACITY (Ga	il./F1.): 1/8" = 0.00		= 0.0014: 1/4"   SAMPLER (S) S	= 0.0026: SAMPL	0.16; 3"=0 5/16"=0.004; ING DATA	3/8" = 0.00		14/	" = 0.016 SAMPLING ENDED AT:	5.88 0:15
PUMP OR TUBING DEPTH IN WELL (	Greet): 16.1	1	- 77	SAMPLE PUMP FLOW RATE (m	L per minute):	1	420	TUBING MATERIAL CODE	1.0	/S	
FIELD DECONTAIN	N THE COLUMN	Y D N Ø		FIELD-FILTERE Filtration Equipm		NE FILT	ER SIZÉ:	μm	DUPLICATE:	Y D NE	
	SAMPLE COI SPECIFIC			r itration Equipm	SAMPLE PRE	SERVATION		INTE	NDED	SAN	APLING.
SAMPLE ID CODE	Law Alcond	MATERIAL	VOLUME	PRESERVATIVE USED		AL VOL. I FIELD (ml) (1)	FINAL pH		S AND/OR THOD		IPMENT ODE
@Ino-500	1	PE	500ml	NONE	N	ONE	N/A	Inorg	ganics		РР
@Met-250	2	PE	250ml	HNO3		1ml	<2	Me	etals		PP
@Rad-1L	2	PE	1L	HNO3		5ml	<2	Radio	logicals		PP
REMARKS: (1) Sample bo MATERIAL CODE SAMPLING/PURGIR EQUIPMENT CODE	S: AG = Amb	er Glass; CG	= Clear Glass	PE = Polyet	hylene; PP	= Polypropylen		one; T = Teflon; PP = Peristaltic Pun rap; O = Other (Spe	The second second second	ecify)	

1. The above do not constitute all of the information requierd by Chapter 62-160, F.A.C.

<sup>2.</sup> STABILIZATION CRITERIA FOR RANGE OF VARIATION OF LAST THREE CONSECUTIVE READINGS (SEE FS 2212. SECTION 3)
pH: ± 0.2 units Temperature: ± 0.2 °C Specific Conductance: ± 5% Dissolved Oxygen: all readings ≤ 20% saturation (see Table FS 2200-2);

### DEP-SOP-001/01

### FS 2200 Groundwater Sampling Form FD 9000-24

## **GROUNDWATER SAMPLING LOG**

SITE NAME:		Big B	end			SITE LOCATION:		Apollo	Beach, FL.		
WELL NO:		MWB-35			SAMPLE ID:	L160	3005-07		DATE:	7/27/16	
						NG DATA			THE REST		
WELL DIAMETER (inche	0.0	TUBING DIAMETER (inc	thes) 3/8	WELL SCREEN DEPTH 13.7		18.71 (feet)	STATIC DEF	PTH (feet): 7.34	PURGE PUMP T OR BAILER:	YPE PP	
WELL VOLUME P (only fillout if applic	JRGE: able)	1 WELL VO	LUME = (TOT	AL WELL DEPTH		TH TO WATER)		PACITY			
EQUIPMENT VOL	JME PURGE:	1 FOI	= (	= PUMP VOLUM	feet -	CAPACITY X	feet ) x	TH) + FLOW CE	gallons/foc	01 =	gallons
(only fillout if applic	able)		=(	0	gallons + (		ons/foot X	26 11 524 11 15	et)+ 0.06	gallons =	0.19 gallor
INITIAL PUMP OR DEPTH IN WELL (	TUBING eet): 15.00	OOMOL.		OR TUBING ELL (feet): 15	5.00	PURGING INITIATED AT:	-	PURGING ENDED AT:	10:32	TOTAL VOLU PURGED (gal	
TIME	VOLUME PURGED (GALLONS)	VOLUME PURGED (GALLONS)	PURGE RATE (GPM)	TO WATER (FEET)	pH (standard units)	TEMP. (°C)	COND. (µmhos/cm OR µS/cm)	DISSOLVED OXYGEN (circle mg/lar % saturation)	TURBIDITY (NTUs)	COLOR (describe)	ODOR (describe)
10:28	0.57	0.57	0.10	7.58	6.70	27.81	1310	0.20	0.57	CLEAR	MILD
10:30	0.19	0.76	0.10	7.58	6.63	27.85	1309	0.17	0.66	CLEAR	MILD
10:32	0.19	0.95	0.10	7.59	6.64	27.94	1309	0.16	1.15	CLEAR	MILD
WELL CAPACITY ( TUBING INSIDE DIA SAMPLED BY (PR	CAPACITY (Gal	ON:	A THE STATE OF	SAMPLER (S) SI	SAMPL	0.16; 3"=0 5/16"=0.004: ING DATA	3/8" = 0.00	6: 1/2" = 0.0  SAMPLING INITIATED AT:	1.02; 6" = 1 10: 5/8"	SAMPLING	5.88
PUMP OR TUBING DEPTH IN WELL (	1.55 - 626		1200	SAMPLE PUMP FLOW RATE (m	L nor minutals	J	360	TUBING MATERIAL CODE			0.72
FIELD DECONTAR	( ) ( ) ( ) ( ) ( ) ( ) ( ) ( )	O N 🗹		FIELD-FILTERE Filtration Equipm			ER SIZE:	μm	DUPLICATE:	YUNE	1
.,	SAMPLE CON	TAINER		Filtration Equipm	21-1-1	SERVATION		INTE	NDED		APLING
SAMPLE ID CODE	# CONTAINERS	MATERIAL CODE	VOLUME	PRESERVATIVE USED	TOT	AL VOL N FIELD (ml) (1)	FINAL pH	ANALYSI	S AND/OR HOD	EQU	IPMENT ODE
@Ino-500	1	PE	500ml	NONE	N	ONE	N/A	Inorg	anics		PP
@Met-250	2	PE	250ml	HNO3		1ml	<2	Me	tals	7.	PP
@Rad-1L	2	PE	1L	HNO3		5ml	<2		ogicals		PP
REMARKS: (1) Sample bo	tles pre pres	enved at lab	oratory prior	r to eample o	ollection						
MATERIAL CODE			= Clear Glass			= Polypropylene	; S = Silico	one; T = Teflon;	O= Other (Spe	cify)	

<sup>1.</sup> The above do not constitute all of the information requierd by Chapter 62-160, F.A.C.

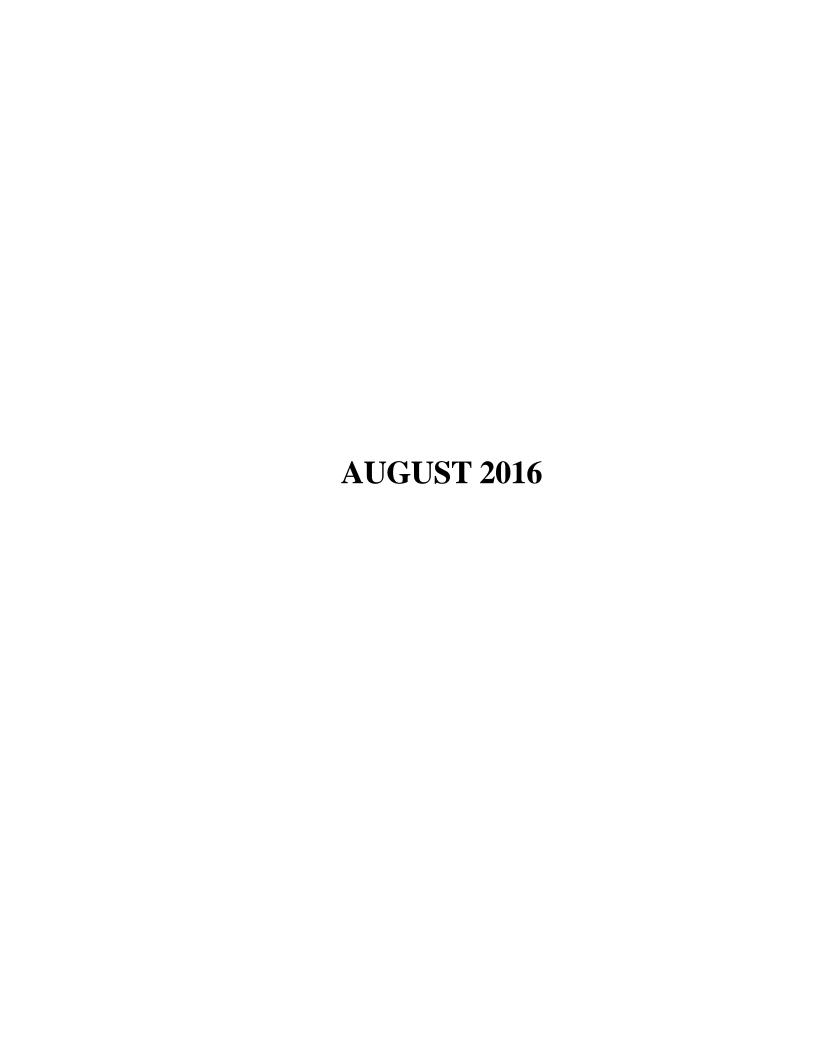
<sup>2.</sup> STABILIZATION CRITERIA FOR RANGE OF VARIATION OF LAST THREE CONSECUTIVE READINGS (SEE FS 2212. SECTION 3) pH: ± 0.2 units Temperature: ± 0.2 °C Specific Conductance: ± 5% Dissolved Oxygen: all readings ≤ 20% saturation (see Table FS 2200-2); optionally, ± 0.2 mg/L or ± 10% (whichever is greater) Turbidity: all readings ≤ 20 NTU; optionally ± 5 NTU or 10% (whichever is greater)

## **GROUNDWATER SAMPLING LOG**

SITE NAME:		Big Be	end			SITE LOCATION:		Apollo	Apollo Beach, FL.				
WELL NO:		MWB-36			SAMPLE ID:	L160	3005 08	DATE: 7/27/16					
						NG DATA							
WELL DIAMETER (inche	s) 0.0	TUBING DIAMETER (inc	hes) 3/8			18.73 (feet)	STATIC DEL	TH (feet): 7.99	PURGE PUMP T OR BAILER:	YPE PP			
WELL VOLUME P	URGE:			AL WELL DEPTH	- STATIC DEF		•						
			= (		feet -		feet) x		gallons/foc	<u> </u>	gallons		
(only fillout if applic	UME PURGE: cable)	1 EQL	JIPMENTVOL	. = PUMP VOLUN	E + (TUBING	CAPACITY X T	UBING LENG	STH ) + FLOW CE			6.6		
	WI IDIA IO		=(	0	gallons + (	The second second			et)+ 0.06	- American III	0.19 gallons		
DEPTH IN WELL (	feet): 15.00		FINAL PUMP DEPTH IN W		5.00	INITIATED AT:	9:20	PURGING ENDED AT:	9:34	TOTAL VOLUM PURGED (gallo	ons): 0.95		
TIME	VOLUME PURGED (GALLONS)	VOLUME PURGED (GALLONS)	PURGE RATE (GPM)	DEPTH TO WATER (FEET)	pH (standard units)	TEMP.	COND. (µmhos/cm OR µS/cm)	OXYGEN (circle mg/l or % saturation)	TURBIDITY (NTUs)	COLOR (describe)	ODOR (describe)		
9:30	0.69	0.69	0.07	8.27	6.90	29.64	2083	0.33	4.37	LT YELLOW	MODERATE		
9:32	0.13	0.82	0.07	8.26	6.90	29.69	2065	0.26	4.46	LT YELLOW	MODERATE		
WELL NO:   MWB-36	0.28	4.09	LT YELLOW	MODERATE									
							1. 2.7.1						
									-				
									100				
et comment	C. TIL	1421				-				7 - 1			
ELECTRONIC GOLDS CONTROL STATE						A STATE OF THE STA							
						ING DATA				To it include			
SAMPLED BY (PF				SAMPLER (S) SI	GNATURES:			SAMPLING INITIATED AT:	:34	SAMPLING ENDED AT:	9:47		
PUMP OR TUBING	3		TECO	SAMPLE PUMP	V		250	TUBING	170.		.47		
				-				MATERIAL COD	DUPLICATE:	YDNE	1		
FIELD DECONTAR	SAMPLE CON	TAINER		Filtration Equipm				I INCT	ENDED	1	117 10001		
	SPECIFICA		I SUNDO DE CO	PRESERVATIVE			FINAL	ANALYS	IS AND/OR	EQU	SAMPLING EQUIPMENT		
SAMPLE ID CODE	# CONTAINERS	CODE	VOLUME	USED	ADDED	N FIELD (ml) (1)	pН	ME	THOD		ODE		
@lno-500	1	DE	500ml	NONE	N	ONE	N/A	Inor	ganics	1	PP		
@#IO-500			GOOTH	NONE		OHL	14/7	11101	gariioo				
@Met-250	2	PE	250ml	HNO3		1ml	<2	Me	etals	1	PP		
@Rad-1L	2	PE	1L	HNO3		5ml	<2	Radio	logicals		PP		
					-								
							-						
		JULIU VIII	Luci nun	.NOT.0.101 IC	W 1 X . C								
, , , , , , , , , , , , , , , , , , , ,						0.00764.00 - 901-	-						
				PE = Polyethylene:					her (Spedfy)				
SAMPLING/PURGINEQUIPMENT CODE	S: R	FPP = Reverse F	low Peristallic F	nmo' SM = Straw	Method (tubing	Gravity Drain): \	T = Vacuum T	PP = Peristaltic Puri rap: O = Other (Spi	ecify)				

<sup>1.</sup> The above do not constitute all of the information requierd by Chapter 62-160, F.A.C.

<sup>2.</sup> STABILIZATION CRITERIA FOR RANGE OF VARIATION OF LAST THREE CONSECUTIVE READINGS (SEE FS 2212. SECTION 3)
pH: ± 0.2 units Temperature: ± 0.2 °C Specific Conductance: ± 5% Dissolved Oxygen: all readings ≤ 20% saturation (see Table FS 2200-2);
optionally, ± 0.2 mg/L, or ± 10% (whichever is greater) Turbidity: all readings ≤ 20 NTU; optionally ± 5 NTU or 10% (whichever is greater)





5012 Causeway Blvd Tampa Fl. 33619 \* Ph (813)630-7490 \* Fax (813)630-7360 \* DOH #E54272

Big Bend Power Station Terry Eastley 13031 Wyandott Rd Apollo Beach, FL 33572 tleastley@tecoenergy.com

Work Order - L16H075

**Report Date:** 

09/15/16 15:45

# Project - CCR Wells Economizer Ash Pond

## **Case Narrative**

6 sample(s) were received on 08/26/16 14:38.

There were no issues noted with the sample(s) associated with this workorder unless noted below.

The Radiological analysis was subcontracted to KNL Laboratories. The report is attached.

Lithium analysis was subcontracted to TestAmerica Labs. The report is attached.



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### **Sample Information**

Client: Big Bend Power Station

Lab Sample ID: L16H075-01 Sampled By: Robert Barthelette

Sample Description: PZ1 Date and Time Collected: 8/26/16 12:52
Sample Collection Method: Grab Date of Sample Receipt: 8/26/16 14:38

### **Laboratory Results**

					Qualifier		Test		Analysis
Parameter	Result	Units	MDL	PQL	Code	Dil	Method	Analyst	Date & Time
	,	Tampa Elec	tric Compa	any, Labo	ratory Se	rvices			
<b>General Chemistry Parameters</b>									
Chloride	695	mg/L	0.400	10.0		20	EPA 300.0	TMH	8/29/16 17:35
Specific Conductance	4000	umhos/cm	100	100		1	FDEP SOP FT 1200	RAB	8/26/16 12:52
Dissolved Oxygen	0.140	mg/L	0.100	0.100		1	FDEP SOP FT 1500	RAB	8/26/16 12:52
Fluoride	0.454	mg/L	0.0100	0.0500		1	EPA 300.0	TMH	8/29/16 17:25
pH	6.71	pH Units	1.00	1.00		1	FDEP SOP FT 1100	RAB	8/26/16 12:52
REDOX Potential	-34.8	mV	-999	-999		1	SM 2580B	RAB	8/26/16 12:52
Total Dissolved Solids	2980	mg/L	24.0	40.0		2	SM 2540C	RFL	8/31/16 11:00
Sulfate	1240	mg/L	10.0	40.0		20	EPA 300.0	TMH	8/29/16 17:35
Turbidity	2.08	NTU	0.100	0.100		1	FDEP SOP FT 1600	RAB	8/26/16 12:52
Total Mercury by SW846 Metho	od 7470/7471								
Mercury	0.0500	ug/L	0.0500	0.200	U	1	EPA 7470A	RLC	8/30/16 15:05
<b>Total Recoverable Metals by 200</b>	<b>Series</b>								
Antimony	0.600	ug/L	0.600	2.00	U	1	EPA 200.8	MCR	8/30/16 11:25
Arsenic	7.94	ug/L	0.320	2.00		1	EPA 200.8	MCR	8/30/16 11:25
Cadmium	0.100	ug/L	0.100	0.500	U	1	EPA 200.8	MCR	8/30/16 11:25
Cobalt	0.485	ug/L	0.0400	2.00	I	1	EPA 200.8	MCR	8/30/16 11:25
Lead	0.0800	ug/L	0.0800	2.00	U	1	EPA 200.8	MCR	8/30/16 11:25
Selenium	0.385	ug/L	0.200	2.00	I	1	EPA 200.8	MCR	8/30/16 11:25
Thallium	0.100	ug/L	0.100	0.500	U	1	EPA 200.8	MCR	8/30/16 11:25
<b>Total Recoverable Metals by SW</b>	846 Method	6010B							
Barium	115	ug/L	0.500	20.0		1	EPA 6010B	RLC	8/29/16 11:45
Beryllium	0.200	ug/L	0.200	2.00	U	1	EPA 6010B	RLC	8/29/16 11:45
Boron	11400	ug/L	10.0	50.0	V	1	EPA 6010B	RLC	8/30/16 12:04
Calcium	556000	ug/L	30.0	1000		1	EPA 6010B	RLC	8/30/16 9:08
Chromium	1.60	ug/L	1.60	12.0	U	1	EPA 6010B	RLC	8/29/16 11:45
Molybdenum	80.3	ug/L	1.00	20.0		1	EPA 6010B	RLC	8/30/16 12:04



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### **Sample Information**

Client: Big Bend Power Station

Lab Sample ID: L16H075-02 Sampled By: Robert Barthelette

Sample Description: PZ2 Date and Time Collected: 8/26/16 12:23
Sample Collection Method: Grab Date of Sample Receipt: 8/26/16 14:38

### **Laboratory Results**

					Qualifier		Test	Analysis				
Parameter	Result	Units	MDL	PQL	Code	Dil	Method	Analyst	Date & Time			
		Tampa Elec	tric Compa	any, Labo	ratory Se	rvices						
<b>General Chemistry Parame</b>	eters											
Chloride	124	mg/L	0.400	10.0		20	EPA 300.0	TMH	8/29/16 17:55			
Specific Conductance	1570	umhos/cm	100	100		1	FDEP SOP FT 1200	RAB	8/26/16 12:23			
Dissolved Oxygen	0.100	mg/L	0.100	0.100	U	1	FDEP SOP FT 1500	RAB	8/26/16 12:23			
Fluoride	0.150	mg/L	0.0100	0.0500		1	EPA 300.0	TMH	8/29/16 17:45			
pH	6.74	pH Units	1.00	1.00		1	FDEP SOP FT 1100	RAB	8/26/16 12:23			
REDOX Potential	-27.3	mV	-999	-999		1	SM 2580B	RAB	8/26/16 12:23			
Total Dissolved Solids	1120	mg/L	24.0	40.0		2	SM 2540C	RFL	8/31/16 11:00			
Sulfate	484	mg/L	10.0	40.0		20	EPA 300.0	TMH	8/29/16 17:55			
Turbidity	3.31	NTU	0.100	0.100		1	FDEP SOP FT 1600	RAB	8/26/16 12:23			
Total Mercury by SW846 M	<u> 1ethod 7470/7471</u>											
Mercury	0.0500	ug/L	0.0500	0.200	U	1	EPA 7470A	RLC	8/30/16 15:27			
Total Recoverable Metals by	y 200 Series											
Antimony	0.600	ug/L	0.600	2.00	U	1	EPA 200.8	MCR	8/30/16 11:29			
Arsenic	1.25	ug/L	0.320	2.00	I	1	EPA 200.8	MCR	8/30/16 11:29			
Cadmium	0.100	ug/L	0.100	0.500	U	1	EPA 200.8	MCR	8/30/16 11:29			
Cobalt	0.0776	ug/L	0.0400	2.00	I	1	EPA 200.8	MCR	8/30/16 11:29			
Lead	0.0800	ug/L	0.0800	2.00	U	1	EPA 200.8	MCR	8/30/16 11:29			
Selenium	0.200	ug/L	0.200	2.00	U	1	EPA 200.8	MCR	8/30/16 11:29			
Thallium	0.100	ug/L	0.100	0.500	U	1	EPA 200.8	MCR	8/30/16 11:29			
Total Recoverable Metals by	y SW846 Method	6010B										
Barium	61.4	ug/L	0.500	20.0		1	EPA 6010B	RLC	8/29/16 11:48			
Beryllium	0.200	ug/L	0.200	2.00	U	1	EPA 6010B	RLC	8/29/16 11:48			
Boron	2860	ug/L	10.0	50.0	V	1	EPA 6010B	RLC	8/30/16 12:06			
Calcium	192000	ug/L	30.0	1000		1	EPA 6010B	RLC	8/30/16 9:10			
Chromium	1.60	ug/L	1.60	12.0	U	1	EPA 6010B	RLC	8/29/16 11:48			
Molybdenum	7.78	ug/L	1.00	20.0	I	1	EPA 6010B	RLC	8/30/16 12:06			



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### **Sample Information**

Client: Big Bend Power Station

Lab Sample ID: L16H075-03 Sampled By: Robert Barthelette

Sample Description: PZ3 Date and Time Collected: 8/26/16 11:33
Sample Collection Method: Grab Date of Sample Receipt: 8/26/16 14:38

### **Laboratory Results**

					Qualifier	•	Test		Analysis
Parameter	Result	Units	MDL	PQL	Code	Dil	Method	Analyst	Date & Time
	,	Tampa Elec	etric Compa	any, Labo	ratory Se	ervices			
<b>General Chemistry Parame</b>	<u>eters</u>								
Chloride	136	mg/L	0.400	10.0		20	EPA 300.0	TMH	8/29/16 18:16
Specific Conductance	1690	umhos/cm	100	100		1	FDEP SOP FT 1200	RAB	8/26/16 11:33
Dissolved Oxygen	0.150	mg/L	0.100	0.100		1	FDEP SOP FT 1500	RAB	8/26/16 11:33
Fluoride	0.286	mg/L	0.0100	0.0500		1	EPA 300.0	TMH	8/29/16 18:06
pH	6.29	pH Units	1.00	1.00		1	FDEP SOP FT 1100	RAB	8/26/16 11:33
REDOX Potential	-155	mV	-999	-999		1	SM 2580B	RAB	8/26/16 11:33
Total Dissolved Solids	1210	mg/L	24.0	40.0		2	SM 2540C	RFL	8/31/16 11:00
Sulfate	517	mg/L	10.0	40.0		20	EPA 300.0	TMH	8/29/16 18:16
Turbidity	6.35	NTU	0.100	0.100		1	FDEP SOP FT 1600	RAB	8/26/16 11:33
<b>Total Mercury by SW846 M</b>	Method 7470/7471								
Mercury	0.0500	ug/L	0.0500	0.200	U	1	EPA 7470A	RLC	8/30/16 15:12
Total Recoverable Metals b	y 200 Series								
Antimony	0.600	ug/L	0.600	2.00	U	1	EPA 200.8	MCR	8/30/16 11:32
Arsenic	0.603	ug/L	0.320	2.00	I	1	EPA 200.8	MCR	8/30/16 11:32
Cadmium	0.100	ug/L	0.100	0.500	U	1	EPA 200.8	MCR	8/30/16 11:32
Cobalt	0.125	ug/L	0.0400	2.00	I	1	EPA 200.8	MCR	8/30/16 11:32
Lead	0.0800	ug/L	0.0800	2.00	U	1	EPA 200.8	MCR	8/30/16 11:32
Selenium	0.200	ug/L	0.200	2.00	U	1	EPA 200.8	MCR	8/30/16 11:32
Thallium	0.100	ug/L	0.100	0.500	U	1	EPA 200.8	MCR	8/30/16 11:32
<b>Total Recoverable Metals b</b>	y SW846 Method	6010B							
Barium	63.6	ug/L	0.500	20.0		1	EPA 6010B	RLC	8/29/16 11:50
Beryllium	0.272	ug/L	0.200	2.00	I	1	EPA 6010B	RLC	8/29/16 11:50
Boron	540	ug/L	10.0	50.0	V	1	EPA 6010B	RLC	8/30/16 12:09
Calcium	200000	ug/L	30.0	1000		1	EPA 6010B	RLC	8/30/16 9:13
Chromium	1.60	ug/L	1.60	12.0	U	1	EPA 6010B	RLC	8/29/16 11:50
Molybdenum	8.10	ug/L	1.00	20.0	I	1	EPA 6010B	RLC	8/30/16 12:09



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### **Sample Information**

Client: Big Bend Power Station

Lab Sample ID: L16H075-05 Sampled By: Robert Barthelette

Sample Description: PZ5 Date and Time Collected: 8/26/16 10:56
Sample Collection Method: Grab Date of Sample Receipt: 8/26/16 14:38

### **Laboratory Results**

		(		Qualifier		Test		Analysis	
Parameter	Result	Units	MDL	PQL	Code	Dil	Method	Analyst	Date & Time
	,	Tampa Elec	ctric Compa	any, Labo	ratory Se	ervices			
<b>General Chemistry Parame</b>	<u>eters</u>								
Chloride	1030	mg/L	0.400	10.0		20	EPA 300.0	TMH	8/29/16 18:36
Specific Conductance	5140	umhos/cm	100	100		1	FDEP SOP FT 1200	RAB	8/26/16 10:56
Dissolved Oxygen	0.120	mg/L	0.100	0.100		1	FDEP SOP FT 1500	RAB	8/26/16 10:56
Fluoride	0.180	mg/L	0.0100	0.0500		1	EPA 300.0	TMH	8/29/16 18:26
pH	6.41	pH Units	1.00	1.00		1	FDEP SOP FT 1100	RAB	8/26/16 10:56
REDOX Potential	-22.8	mV	-999	-999		1	SM 2580B	RAB	8/26/16 10:56
Total Dissolved Solids	4290	mg/L	120	200		10	SM 2540C	RFL	8/31/16 11:00
Sulfate	1420	mg/L	10.0	40.0		20	EPA 300.0	TMH	8/29/16 18:36
Turbidity	6.47	NTU	0.100	0.100		1	FDEP SOP FT 1600	RAB	8/26/16 10:56
Total Mercury by SW846 M	<u> 1ethod 7470/7471</u>								
Mercury	0.0500	ug/L	0.0500	0.200	U	1	EPA 7470A	RLC	8/30/16 15:15
Total Recoverable Metals b	y 200 Series								
Antimony	1.77	ug/L	1.20	4.00	I	2	EPA 200.8	MCR	8/30/16 12:26
Arsenic	8.89	ug/L	0.320	2.00		1	EPA 200.8	MCR	8/30/16 11:37
Cadmium	0.100	ug/L	0.100	0.500	U	1	EPA 200.8	MCR	8/30/16 11:37
Cobalt	1.52	ug/L	0.0400	2.00	I	1	EPA 200.8	MCR	8/30/16 11:37
Lead	0.111	ug/L	0.0800	2.00	I	1	EPA 200.8	MCR	8/30/16 11:37
Selenium	1.73	ug/L	0.200	2.00	I	1	EPA 200.8	MCR	8/30/16 11:37
Thallium	0.100	ug/L	0.100	0.500	U	1	EPA 200.8	MCR	8/30/16 11:37
<b>Total Recoverable Metals b</b>	y SW846 Method	6010B							
Barium	61.4	ug/L	0.500	20.0		1	EPA 6010B	RLC	8/29/16 11:56
Beryllium	0.200	ug/L	0.200	2.00	U	1	EPA 6010B	RLC	8/29/16 11:56
Boron	53700	ug/L	10.0	50.0	V	1	EPA 6010B	RLC	8/30/16 12:11
Calcium	729000	ug/L	30.0	1000		1	EPA 6010B	RLC	8/30/16 9:15
Chromium	1.60	ug/L	1.60	12.0	U	1	EPA 6010B	RLC	8/29/16 11:56
Molybdenum	11.1	ug/L	1.00	20.0	I	1	EPA 6010B	RLC	8/30/16 12:11



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### **Sample Information**

Client: Big Bend Power Station

Lab Sample ID: L16H075-06 Sampled By: Robert Barthelette

Sample Description: PZ6 Date and Time Collected: 8/26/16 10:10
Sample Collection Method: Grab Date of Sample Receipt: 8/26/16 14:38

### **Laboratory Results**

### Sample Qualifier:

					Qualifier		Test	Analysis		
Parameter	Result	Units	MDL	PQL	Code	Dil	Method	Analyst	Date & Time	
		Tampa Elec	tric Compa	any, Labo	ratory Se	rvices				
<b>General Chemistry Parameters</b>										
Chloride	116	mg/L	0.400	10.0		20	EPA 300.0	TMH	8/29/16 19:16	
Specific Conductance	1380	umhos/cm	100	100		1	FDEP SOP FT 1200	RAB	8/26/16 10:10	
Dissolved Oxygen	0.100	mg/L	0.100	0.100	U	1	FDEP SOP FT 1500	RAB	8/26/16 10:10	
Fluoride	0.455	mg/L	0.0100	0.0500		1	EPA 300.0	TMH	8/29/16 18:46	
pH	6.48	pH Units	1.00	1.00		1	FDEP SOP FT 1100	RAB	8/26/16 10:10	
REDOX Potential	-59.5	mV	-999	-999		1	SM 2580B	RAB	8/26/16 10:10	
Total Dissolved Solids	980	mg/L	24.0	40.0		2	SM 2540C	RFL	8/31/16 11:00	
Sulfate	276	mg/L	10.0	40.0		20	EPA 300.0	TMH	8/29/16 19:16	
Turbidity	1.73	NTU	0.100	0.100		1	FDEP SOP FT 1600	RAB	8/26/16 10:10	
Total Mercury by SW846 Metho	d 7470/7471									
Mercury	0.0500	ug/L	0.0500	0.200	U	1	EPA 7470A	RLC	8/30/16 15:19	
<b>Total Recoverable Metals by 200</b>	Series									
Antimony	0.600	ug/L	0.600	2.00	U	1	EPA 200.8	MCR	8/30/16 11:40	
Arsenic	2.03	ug/L	0.320	2.00		1	EPA 200.8	MCR	8/30/16 11:40	
Cadmium	0.100	ug/L	0.100	0.500	U	1	EPA 200.8	MCR	8/30/16 11:40	
Cobalt	0.153	ug/L	0.0400	2.00	I	1	EPA 200.8	MCR	8/30/16 11:40	
Lead	0.0800	ug/L	0.0800	2.00	U	1	EPA 200.8	MCR	8/30/16 11:40	
Selenium	0.577	ug/L	0.200	2.00	I	1	EPA 200.8	MCR	8/30/16 11:40	
Thallium	0.100	ug/L	0.100	0.500	U	1	EPA 200.8	MCR	8/30/16 11:40	
<b>Total Recoverable Metals by SW</b>	846 Method	6010B								
Barium	43.2	ug/L	0.500	20.0		1	EPA 6010B	RLC	8/29/16 11:59	
Beryllium	0.200	ug/L	0.200	2.00	U	1	EPA 6010B	RLC	8/29/16 11:59	
Boron	3700	ug/L	10.0	50.0	V	1	EPA 6010B	RLC	8/30/16 12:14	
Calcium	237000	ug/L	30.0	1000		1	EPA 6010B	RLC	8/30/16 9:18	
Chromium	1.60	ug/L	1.60	12.0	U	1	EPA 6010B	RLC	8/29/16 11:59	
Molybdenum	7.57	ug/L	1.00	20.0	I	1	EPA 6010B	RLC	8/30/16 12:14	

### **Comments**

- U Indicates that the compound was analyzed for but not detected.
- J- The reported value is an estimated value, see the case narrative for specifics.
- I Estimated value
- V Analyte detected in the method blank



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**Subcontract Laboratories:** 



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### Total Recoverable Metals by SW846 Method 6010B - Quality Control

					Cuiles	Carres		%Rec		RPD	
Analyte	Result	MDL	PQL	Units	Spike Level	Source Result	%Rec	%Rec Limits	RPD	Limit	Qualifier
Batch 16H0239 - EPA 6010B											
Blank (16H0239-BLK1)					Prepared &	Analyzed:	08/29/16				
Barium	0.500	0.500	20.0	ug/L							U
Beryllium	0.200	0.200	2.00	ug/L							U
Calcium	30.0	30.0	1000	ug/L							U
Chromium	1.60	1.60	12.0	ug/L							U
LCS (16H0239-BS1)					Prepared &	Analyzed:	08/29/16				
Barium	969	0.500	20.0	ug/L	1000.0		96.9	80-120			
Beryllium	1010	0.200	2.00	ug/L	1000.0		101	80-120			
Chromium	998	1.60	12.0	ug/L	1000.0		99.8	80-120			
Matrix Spike (16H0239-MS1)		Sour	Source: L16H075-06 Pre			Analyzed:	08/29/16				
Barium	962	0.500	20.0	ug/L	1000.0	43.2	91.9	75-125			
Beryllium	954	0.200	2.00	ug/L	1000.0	U	95.4	75-125			
Chromium	946	1.60	12.0	ug/L	1000.0	U	94.6	75-125			
Matrix Spike Dup (16H0239-MSD1)		Sour	ce: L16H07	75-06	Prepared &	Analyzed:	08/29/16				
Barium	1000	0.500	20.0	ug/L	1000.0	43.2	95.7	75-125	3.90	20	
Beryllium	993	0.200	2.00	ug/L	1000.0	U	99.3	75-125	4.02	20	
Chromium	983	1.60	12.0	ug/L	1000.0	U	98.3	75-125	3.81	20	
Batch 16H0254 - EPA 6010B											
Blank (16H0254-BLK1)					Prepared: 0	08/29/16 Aı	nalyzed: 08	3/30/16			
Boron	47.3	10.0	50.0	ug/L							I
Molybdenum	1.00	1.00	20.0	ug/L							U
LCS (16H0254-BS1)					Prepared: 0	08/29/16 A1	nalyzed: 08	3/30/16			
Boron	1050	10.0	50.0	ug/L	1000.0		105	80-120			V
Molybdenum	955	1.00	20.0	ug/L	1000.0		95.5	80-120			



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### Total Recoverable Metals by SW846 Method 6010B - Quality Control

Analyte  Batch 16H0254 - EPA 6010B	Result	MDL	PQL	Units	Spike Level	Source Result	%Rec	%Rec Limits	RPD	RPD Limit	Qualifier		
Matrix Spike (16H0254-MS1)		Sour	ce: L16H17	77-02	Prepared: 0	08/29/16 Aı	nalyzed: 08	3/30/16					
Boron	4580	10.0	50.0	ug/L	1000.0	3330	126	75-125			J-,V		
Molybdenum	1020	1.00	20.0	ug/L	1000.0	15.1	101	75-125					
Matrix Spike Dup (16H0254-MSD1)		Sour	Source: L16H177-02			Prepared: 08/29/16 Analyzed: 08/30/16							
Boron	4550	10.0	50.0	ug/L	1000.0	3330	123	75-125	0.687	20	V		
Molybdenum	1000	1.00	20.0	ug/L	1000.0	15.1	98.8	75-125	1.69	20			



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## Total Mercury by SW846 Method 7470/7471 - Quality Control

Analyte	Result	MDL	PQL	Units	Spike Level	Source Result	%Rec	%Rec Limits	RPD	RPD Limit	Qualifier
3											
Batch 16H0256 - EPA 7470A											
Blank (16H0256-BLK1)					Prepared &	: Analyzed:	08/30/16				
Mercury	0.0500	0.0500	0.200	ug/L							U
LCS (16H0256-BS1)					Prepared &	Analyzed:	08/30/16				
Mercury	0.946	0.0500	0.200	ug/L	1.0000		94.6	80-120			
Matrix Spike (16H0256-MS1)		Sour	ce: L16H07	75-05	Prepared &	: Analyzed:	08/30/16				
Mercury	0.838	0.0500	0.200	ug/L	1.0000	U	83.8	75-125			
Matrix Spike Dup (16H0256-MSD1)		Sour	ce: L16H07	75-05	Prepared &	Analyzed:	08/30/16				
Mercury	0.866	0.0500	0.200	ug/L	1.0000	U	86.6	75-125	3.33	20	



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## **Total Recoverable Metals by 200 Series - Quality Control**

					Cmiles	Carman		%Rec		RPD	
Analyte	Result	MDL	PQL	Units	Spike Level	Source Result	%Rec	%Rec Limits	RPD	Limit	Qualifier
Batch 16H0242 - EPA 200.8											
Blank (16H0242-BLK1)					Prepared: (	08/29/16 Ar	nalvzed: 08	3/30/16			
Antimony	0.600	0.600	2.00	ug/L			<u> </u>				U
Arsenic	0.320	0.320	2.00	ug/L							U
Cadmium	0.100	0.100	0.500	ug/L							U
Cobalt	0.0400	0.0400	2.00	ug/L							U
Lead	0.0800	0.0800	2.00	ug/L							U
Selenium	0.200	0.200	2.00	ug/L							U
Thallium	0.100	0.100	0.500	ug/L							U
LCS (16H0242-BS1)					Prepared: (	08/29/16 Ar	alyzed: 08	3/30/16			
Antimony	95.8	0.600	2.00	ug/L	100.00		95.8	85-115			
Arsenic	94.7	0.320	2.00	ug/L	100.00		94.7	85-115			
Cadmium	92.4	0.100	0.500	ug/L	100.00		92.4	85-115			
Cobalt	95.2	0.0400	2.00	ug/L	100.00		95.2	85-115			
Lead	97.0	0.0800	2.00	ug/L	100.00		97.0	85-115			
Selenium	94.4	0.200	2.00	ug/L	100.00		94.4	85-115			
Thallium	96.6	0.100	0.500	ug/L	100.00		96.6	85-115			
Matrix Spike (16H0242-MS1)		Sour	ce: L16H16	68-01	Prepared: (	08/29/16 Ar	alyzed: 08	3/30/16			
Antimony	97.5	3.00	10.0	ug/L	100.00	1.04	97.5	70-130			
Arsenic	107	1.60	10.0	ug/L	100.00	10.3	97.0	70-130			
Cadmium	87.4	0.500	2.50	ug/L	100.00	U	87.4	70-130			
Cobalt	93.1	0.200	10.0	ug/L	100.00	0.368	92.7	70-130			
Lead	87.9	0.400	10.0	ug/L	100.00	0.469	87.4	70-130			
Selenium	92.3	1.00	10.0	ug/L	100.00	0.773	92.3	70-130			
Thallium	88.8	0.500	2.50	ug/L	100.00	U	88.8	70-130			
Matrix Spike Dup (16H0242-MSD1)		Sour	ce: L16H16	<b>68-01</b>	Prepared: (	08/29/16 Ar	alyzed: 08	3/30/16			
Antimony	98.5	3.00	10.0	ug/L	100.00	1.04	98.5	70-130	1.03	20	
Arsenic	109	1.60	10.0	ug/L	100.00	10.3	98.9	70-130	1.78	20	
Cadmium	87.5	0.500	2.50	ug/L	100.00	U	87.5	70-130	0.122	20	
Cobalt	96.4	0.200	10.0	ug/L	100.00	0.368	96.0	70-130	3.47	20	
Lead	87.6	0.400	10.0	ug/L	100.00	0.469	87.1	70-130	0.334	20	
Selenium	94.0	1.00	10.0	ug/L	100.00	0.773	94.0	70-130	1.82	20	
Thallium	88.3	0.500	2.50	ug/L	100.00	U	88.3	70-130	0.611	20	
				=							



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## **General Chemistry Parameters - Quality Control**

Analyte	Result	MDL	PQL	Units	Spike Level	Source Result	%Rec	%Rec Limits	RPD	RPD Limit	Qualifier
Batch 16H0250 - EPA 300.0											
Blank (16H0250-BLK1)					Prepared &	Analyzed:	08/29/16				
Chloride	0.0200	0.0200	0.500	mg/L							U
Fluoride	0.0100	0.0100	0.0500	mg/L							U
Sulfate	0.500	0.500	2.00	mg/L							U
LCS (16H0250-BS1)					Prepared &	Analyzed:	08/29/16				
Chloride	5.26	0.0200	0.500	mg/L	5.0000		105	90-110			
Fluoride	5.20	0.0100	0.0500	mg/L	5.0000		104	90-110			
Sulfate	5.01	0.500	2.00	mg/L	5.0000		100	90-110			
Matrix Spike (16H0250-MS1)		Sour	ce: L16H17	74-01	Prepared &	Analyzed:	08/29/16				
Chloride	456	0.400	10.0	mg/L	100.00	353	103	90-110			
Fluoride	107	0.200	1.00	mg/L	100.00	0.967	106	90-110			
Sulfate	757	10.0	40.0	mg/L	100.00	666	91.8	90-110			
Matrix Spike Dup (16H0250-MSD1)		Sour	ce: L16H17	74-01	Prepared &	Analyzed:	08/29/16				
Chloride	452	0.400	10.0	mg/L	100.00	353	99.3	90-110	0.803	20	
Fluoride	106	0.200	1.00	mg/L	100.00	0.967	105	90-110	0.953	20	
Sulfate	753	10.0	40.0	mg/L	100.00	666	87.8	90-110	0.535	20	J-
Batch 16H0279 - SM 2540C											
Blank (16H0279-BLK1)					Prepared &	Analyzed:	08/31/16				
Total Dissolved Solids	12.0	12.0	20.0	mg/L							U
LCS (16H0279-BS1)					Prepared &	Analyzed:	08/31/16				
Total Dissolved Solids	996	12.0	20.0	mg/L	1000.0		99.6	80-120			



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## **General Chemistry Parameters - Quality Control**

					Spike	Source		%Rec		RPD	
Analyte	Result	MDL	PQL	Units	Level	Result	%Rec	Limits	RPD	Limit	Qualifier

Batch 16H0279 - SM 2540C

Duplicate (16H0279-DUP1)		Sour	ce: L16H06	57-01	Prepared & Analyzed: 08/31/16		
Total Dissolved Solids	12.0	12.0	20.0	mg/L	U	10	U

Tampa Electric Company, Laboratory Services

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Peggy Penner, Manager, Laboratory Services

Laboratory Services certifies that the test result in this report meet all requirements of the NELAC standards, unless indicated otherwise in the body of the report. Unless otherwise noted, all methods followed are per the most current published version of 40 CFR Part 136, Table B. Results reported on this report pertain to the above referenced sample only.

L16H075-01 Purge End: 12:05 Purge End: 12:40 Purge Start: 12:28 Meter ID: FDEP FT 1100 500 ml bottles (metals): 2 ml HNO3 to pH <2 Sulfite Info (QC Check) (EPA 377.1)
QC Std: 5ml (NaThio)/500ml DI=10mg/L 1L bottles (rads): 5 ml HNO3 to pH <2 (1) 1L plastic (PP) Purge Complete At ourge Start: ourge Meth urge Complete At Purge Meth DEP FT 1600, Units: NTU urbidity Meter Calibration Meter ID: Jnits: SU H Meter Calibration 250 ml bottles (metal): 1 ml HNO3 to pH <2 L16H075-02 L16H075-01 Well # CCR-PZ-2 Well # CCR-PZ-1 DEP FT 1200, Units: uMHOS onductivity Meter Calib. LIMS# LIMS# 11:53 A 1A Loction Code 250ml Cyan (3) CCR-PZ-1 CCR-PZ-2 0107301Y Diam/ Comp Diam/ Comp MPM08 TM07 MPM08 12:38 12:40 12:03 12:05 12:01 12:36 Time Time Big Bend 12:29 Gallons to Purge 0.12 11:55 Gallons to Purge 0.12 Screen Interval (ft) ESS (2) 500ml plastic (PP) Rate (ml/min Rate (ml/min, Standard ID 1L Inorg (1) Time Screen Interval (ft) Standard ID Buffer ID 12:52 12:23 300 280 380 380 015083D 014215A 014668C 0151710 015169J 013168 013167 Date: 500ml Inorg (2) QC Result mg/l (gallons/ft): 2" = 0.16 4" =0.65 0218201Y 1000 1000 Std Value 5.40 Volume (gal) Depth (ft) Volume (gai) 53.30 0.16 0.59 15.64 0.20 0.80 15.29 mg/l FE2 10 4 ESS (3) 250ml plastic (PP) 250ml Inorg (3) Total Vol. (gal) 0.80 08/25/16 Total Vol. (gal) 013189 013189 🗹 pH (SU) Cal 7.01 10.05 4.01 Cal 1000 Pres ID PH 6.71 20.64 20.29 0.75 0.59 1.00 49.84 6.74 Depth Well Depth Well Time Acceptability Range 4.86 5.94 Stablility Values = Stability Values = Preservation
250ml bottles (nuls): 1 ml H2SO4 to pH <2 40 ml Vial (TOC): 0.5 ml H2SO4 to pH <2 1L bottles (diss. rads): filtered with 0.45um, 5 ml HNO3 to pH <2 File Name: Water Depth (it) Water Depth (II) 0307301Y 1L Mils (1) Temp °C 27.05 TEMP-C Depth to Water (ft) 27.35 5.43 5.20 5.19 56.76 Time 8:44 8:26 Time 8:26 8:26 5.42 5.35 Water (ft) 5.06 ESS 3 (4) 100ml coliform bottle A checked box indicates ICV / CCV passed QC: (pH +/- 0.2) (Cond +/- 5%) (DO +/- 0.3mg/L) (Redox +/- 10mv) Cond(uMHOS) 250ml Mtls (3) Na Thio ID Water Column (ft) COND-F рн (su) 6.70 ng Inside Diam. Capacities Gallons/ft): 1/4" Column (it) pH (SU) 5.45 1570 6.74 6.72 6.73 15.29 6.71 15.23 9833 082516\_Wells\_RAB icv icv Š 2 1 Well Capacity (gal) Capacity (gal) DO 3 Pillow ID 1L Rads (1) 2 DO Mg/L 0.14 27.02 Temp °C 27.35 27.50 27.37 Temp °C 27.05 26.89 0.07 27.35 0.16 0.16 Time 7:53 8:48 Time Time (5) 1L amberglass ( ESS 500ml Sulfide (2) Turbidity(NTU) Cond (uMHOS) Starch Ind ID =0.0026, Weather: TURB-N-F Volume (gal) 53.40 3.31 3998 2.08 1570 1552 1570 1550 2.45 3995 3997 2.44 1 Well Volume (gal) CCV 9869 CCV 7.09 CCV 3/8" =0.006 (AG) lodate/lodide ID Redox (mv) REDOX -34.8 -27.3 500ml Mtls (2) DO (mg/L) PTLY CLOUDY & HOT Capacity (galfit.) DO (mg/L) 0.0026 Time 14:05 Pres ID 0.30 0.20 0.0026 14:00 0.31 0.14 0.08 14:12 0.07 Time Time Meter ID: MPM08 Therm ID MPM08 Barom. Pres 760 Redox Cal DO Meter Cal 250 ml bottles (Cyan) 1g NAOH to pH >12 (6) 40ml VOA vial (CG) ESS 500 ml battles(Sulfide) 2ml NAOH/Zinc Acet. to pH >12 Meter ID: Zobell Sol ID: A checked box indicates that the sample was verified to a pH of <2 250ml Nuts (3) Sulfite (mg/L) rurbidity (NTU) urbidity (NTU) SO3-TR MPM08 21.64 (Industrial Disputs Length (8) 2.26 5.55 3.31 3.14 21.3 10.00 2.08 3.31 015222B + + Temp\*C+/- 0.2 Cond % +/- 5 Purge Criteria ph:+/- 0.2 DO % Sat. < 20 Turb. NTU < 20 Temp\*C+/- 0.2 Cand % +/- 5 00 % Sat < 20 Turb. NTU < 20 LT. YELLOW Purge Criteria 40ml Vial (6) ph:+/-\$COLOR-W Volume (gal) Initials CLEAR 8:15 14:10 Color Volume (gal) 14:45 Time 8:20 0.2 Time 0.2 RAB /TECO Initials 500 ml Nuts (2) STABLE SODOR-W NONE Total Time STABLE STABLE STABLE STABLE STABLE STABLE STABLE Temp °C NONE STABLE Temp °C STABLE Odor Volume (gal) 21.3 20.9 21.2 29.0 0.06 0.06 iduct.( %) Cell Volume (gal) Ch 11 Samples On Ice 1L Rads Diss. (1) Dedicated Tubing? Pump: Dedicated Tubing? Tubing: Tubing: Level Meter: Level Meter: Equipment ID Equipment ID 8.90 9.13 237.0 221.0 0.3 Pres ID Time Volume (gal) 0.12 0.12 Volum (gai) RASS NGVD Time 14:38 Temp 2.1 Theo Value mv 236.2 225.8 Total Containers Theo Value mg/l Egpt. Table Egpt. Table Redox (mv) WLM08 LEVEL 8.880 WLM08 8.932 PE/S PE/S Yes 6 No Yes PP PP o

Sampler(s) /

LIMS#	Loction Code 1	ime	FE <sup>2</sup>	(NS) Ha	Temp °C	CondiuMHOS	DO Mail	Turbidity(NTU)	Baday (mu)	Sulfite (moll )	Color	Odor	_	NGVD
			mg/l	PH	TEMP-C	COND-F	8	TURB-N-F	REDOX	SO3-TR	SCOLOR-W	\$ODOR-W	Time	LEVEL
L16H075-03	CCR-PZ-3	11:33		6.29	27.07	1692	0.15	6.35	-155		YELLOW	MILD		
MC #	200-10-10					200								
L16H075-03			_	1		2	2							1
														ď
(1) 1L plastic (PP)	3	(2) 500ml plastic	c (PP)	(3) 250ml plastic (PP)	(PP)	(4) 100ml coliform bottle	ottle	(5) 1L amberglass (AG)	AG)	(6) 40ml VOA vial (CG)	06)		Samples On Ice	Sample Reciept
ESS	0107301Y	ESS	0218201Y	ESS	307301Y	ESS		ESS		ESS			Yes   No	Time 14:38
	Preservation	;33		Pres ID		Preservation			Pres ID		Preservation		Pres ID	Temp 2.1
bottles (rads): 5	1L bottles (rads): 5 ml HNO3 to pH <2			(	250ml bottles (nu	250ml bottles (nuls): 1 ml H2SO4 to pH <2	12	1	L C	500 ml bottles(Sulfide) 2ml NAOH/Zinc Acet, to pH >12	le) 2ml NAOH/Zinc A		L 0	
10 ml bottles (me	500 ml bottles (metals): 2 ml HNO3 to pH <2	DH <2			40 ml Vial (TOC):	40 ml Vial (TOC): 0.5 ml H2SO4 to pH <2	2				250 ml bottles (Cyan) 1g NAOH to pH >12	2		
i0 ml bottles (me	250 ml bottles (metal): 1 ml HNO3 to pH <2	H-22		-	1L bottles (diss. r	ads): filtered with 0.45	1L bottles (diss. rads): filtered with 0.45um, 5 ml HNO3 to pH <2	<2			A checked box indicates that the sample was verified to a pH of $<$ 2	ole was verified to	a pH of <2	1
oH Meter Calibration	tion	Buffer ID	Buffer Value		Time	ICV	Time	CCV	Time	Redox Cal	Time	Temp °C	Reading my	Theo Value my
Neter ID:	MPM08	L 015169J	7	7.01	8:26			7.09	14:05	Meter ID:	8:15	21.2	237.0	236.2
FDEP FT 1100		L 015171C		10.05	8:26	QC: (pH +/- 0.2) (Co	nd +/- 5%) (DO +/- 0.3r	QC: (pH +/- 0.2) (Cond +/- 5%) (DO +/- 0.3mg/L) (Redox +/- 10mv)		MPM08	14:10	29.0	221.0	225.8
Inits; SU		L 015083D	4	4.01	8:26	A checked box indic	A checked box indicates ICV / CCV passed	a		Zobell Sol ID:				
Conductivity Meter Calib.	er Calib.	Standard ID	(0)	Cal	Time	icv	Time	99	Time	L 22B				
leter ID;	WPW08	0146680		1000	8:44	0000	0.40	0000	44-00	DO Meter Cal	Time	O. dual	Reading mg/l	Theo Value mg/l
Turbidity Meter Calibration	alibration	Standard ID	Std Value	Acceptable	Acceptability Range	ICV ICV	Time	CCV	Time	MPMOR	14:45	20.9	9 13	8 932
Neter ID:	TM07	L 013167		4.86	5.94	5.45	7:53			Barom, Pres				
FDEP FT 1600, Units: NTU	nits: NTU	L 013168	53.30	49.84	56.76			53.40	14:12	760				
lifite info (QC C	Sulfite Info (QC Check) (EPA 377.1)		QC Result mg/l	Time	Titrator ID	Na Thio ID	DO 3 Pillow ID	Starch Ind. ID	lodate/lodide ID	Therm ID	рН	Conduct.( %)	DO (mg/l)	Redox (mv)
QC Std: 5ml (NaThio)	QC Std: 5ml (NaThio)/500ml DI=10mg/L		s (nallons/ ft): 2"	Well Canacities (nallons/ #1: 2" = 0.16 4" =0.65		Tuhing Inside Diam	Canacities Gallons/R	Tuhing Inside Diam Canacities Gallons/Ht 1/4" =0 0026, 3/8" =0 006	L	MPM08	0.2	51	0.3	10
Wiells	Diami Como	Screen	Intake Deoth (ft)	Well Depth	Depth to Water (ft)	= Water X	Well X Capacity (gal) =	1 Well Volume (gal)	( Capacity X	Length ) +	Pump Volume +	Cell Volume =	1 Eggs Volume (gal)	
CCR-PZ-3	2	10	15.38	20.38	3.48	16.90	0.16	2.70	0.0026	21.38	0	0.06	0.12	
Purge Meth:	Time	Rate (ml/min)	Volume (gal)	Total Vol. (gal)	Water Depth (tt)	pH (SU)	Temp °C	Cond (uMHOS)	DO (mg/L)	Turbidity (NTU)	Purge Criteria	Status	Equipment ID	Eqpt Table
1A	11:12	300	0.71	0.71	3.79	6.32	27.09	1717	0.06	2.80	ph:+/- 0.2	STABLE	Level Meter:	WLM08
Purge Start:	11:14	310	0.16	0.87	3.81	6.29	27.02	1705	0.07	3.49	Temp*C+/- 0.2	STABLE	Pump:	PP
11:03	11:16	300	0.16	1.03	3.81	6.29	27.07	1692	0.15	6.35	Cond % +/- 5	STABLE	Tubing:	PE/S
Purge End:											DO % Sat < 20	STABLE	Dedicated	Yes
ourge Complete At	00	11:04 Gallons to Purge	urge 0.12	Stablility Values =	Values =	6.29	27.07	1692	0.15	6.35		diction.	9	
Well #	9	Screen	Intake Deoth (ff)	Well Depth	Depth to Water (ft)	= Water x	West Capacity (gal) =	1 Well Volume	( Tubing X	Tubing Length	Pump Pump + Volume (gal) +	Cell Volume (gal( =	1 Eggs Volume (gal)	
0	2	10	14	18		18.00	0.16	2.88	0.0026	47.03	0	0.06	0.18	
Purge Meth:	Time	Rate (ml/min)	Volume (gal)	Total Vol. (gal)	Water Depth (ft)	pH (SU)	Temp °C	Cond (uMHOS)	DO (mg/L)	Turbidity (NTU)	Purge Criteria	Status	Equipment ID	Eqpt. Table
											ph:+/- 0.2		Level Meter:	WLM08
Purge Start:											Temp*C+/- 0.2		Pump:	PP
											Cond % +/- 5		Tubing:	PE/S
Purge End:											DO % Sat < 20		Dedicated	
		College to Burns	0.40	21.12							Turb. NTU < 20		Tubing?	No.

Purge End: 10:51 Purge Start: 10:34 L16H075-02 

L16H075-01 Comments: Purge Meth: 500 ml bottles (metals): 2 ml HNO3 to pH <2 urge Complete At DEP FT 1600, Units: NTU DEP FT 1200, Units: uMHOS Vieter ID: oH Meter Calibration IL bottles (rads): 5 ml HNO3 to pH <2 Well # CCR-PZ-5 DEP FT 1100 250 ml bottles (metal): 1 ml HNO3 to pH <2 1) 1L plastic (PP) urge Start: urge Meth Well # CCR-PZ-6 urge Complete At feter ID: L16H075-01 L16H075-02 urge End: urging Information C Std: 5ml (NaThio)/500ml DI=10mg/L urbidity Meter Calibration leter ID: TM07 onductivity Meter Calib. nits: SU leter ID: LIMS# Ifite Info (QC Check) (EPA 377.1) LIMS# 9:49 10:02 1A Loction Code 250ml Cyan (3) 01073017 CCR-PZ-6 CCR-PZ-5 Diam/ Comp Diam/ Comp MPM08 MPM08 10:51 Time 10:47 10:02 9:58 10:49 Time Big Bend 10:34 Gallons to Purge 0.18 9:50 Gallons to Purge 0.18 SF SF ESS (2) 500ml plastic (PP) Well Capacities (gallons/ ft): 2" = 0.16 4" = 0.65 Standard ID SF- 013167 Time Rate (ml/min) Rate (ml/min) 1L Inorg (1) Screen Interval (ft) Screen Interval (ft) Standard ID Buffer ID 10:10 1500 1500 10:56 015083D 550 550 1500 014215A 0151691 10 10 014668C 0151710 013168 Date: 500ml (norg (2) Std Value Buffer Value Std Value 5,40 0218201Y Volume (gal) Volume (gal) Intake Depth (ft) Depth (ft) 36.03 1000 53.30 16.11 0.29 0.29 0.79 0.79 mg/l 5.15 10 ESS (3) 250ml plastic (PP) 250ml Inorg (3) 08/25/16 File Name: Total Vol. (gal) Total Vol. (gal) Pres ID 013189 🖸 013189 L bottles (diss. rads): filtered with 0.45um, 5 ml HNO3 to pH <2 21.11 PH (SU) 41.03 49.84 4.01 1.33 1.62 5.15 5.94 6.73 Depth (ft) 7.01 6.48 6.41 Depth (A) Acceptability Range 4.86 5.94 1000 Time Stability Values = Stability Values = Cal 뫈 250ml bottles (nuts): 1 ml H2SO4 to pH <2 40 ml Vial (TOC): 0.5 ml H2SO4 to pH <2 Water Depth (n) Water Depth (tt) 1L Mtls (1) 0307301Y ESS Temp °C 25.78 Depth to Water (N) 56.76 28.11 TEMP-C Depth to Water (ft) 26.58 26.62 26.60 5.49 5.22 8:44 8:26 8:26 5.50 5.48 Time 8:26 Time 11 QC: (pH +/- 0.2) (Cond +/- 5%) (DO +/- 0.3mg/L) (Redox +/- 10mv) (4) 100ml coliform bottle 3 A checked box indicates ICV / CCV passed rubing Inside Diam. Capacities Gallons/ft): 1/4" =0.0026 3/8" =0.006 250ml Mtls (3) Cand(uMHOS) Water Column (ft) 082516 Wells RAB Na Thio ID COND-F 15.89 pH (SU) Water Column (n) 6.41 PH (SU) 5140 1381 6.50 6.41 15.25 1CV 5.45 9833 6.48 õ ICV X Capacity (gal) = Well
X Capacity (gal) = SS DO 3 Pillow ID 1L Rads (1) DO Mg/L 27.61 27.67 27.74 28.13 28.14 28.11 Temp °C Temp °C 28.11 0.12 27.74 0.16 0.16 8:48 Time Time Time 7:53 8 ESS (5) 1L amber glass (AG) 500ml Sulfide (2) Turbidity(NTU) Cond (uMHOS) Cond (uMHOS) Starch Ind. ID Weather: TURB-N-F 1 Well Volume (gal) 1 Well Volume (gal) 5066 5140 5024 53.40 9869 6.47 1383 2.54 5140 7.09 1383 2.44 9 CCV 1381 CCV 1.73 1381 lodate/lodide ID 500ml Mtls (2) Redox (mv) 0.0026 DO (mg/L) Tubing Capacity (galnt.) Capacity (galnt.) DO (mg/L) 0.0026 PTLY CLOUDY & HOT Pres ID 0.09 0.13 0.12 0.14 14:12 14:00 Time 14:05 -22.8 -59.5 REDOX 0.09 Time Time Redox Cal 250 ml bottles (Cyan) 1g NAOH to pH >12 500 ml bottles(Sulfide) 2ml NAOHIZinc Acet. to pH >12 ESS A checked box indicates that the sample was verified to a pH of <2 (6) 40ml VOA vial (CG) Meter ID: DO Meter Cal Zobell Sol ID: Therm ID Barom Pres Meter ID: Sulfite (mg/L) 250ml Nuts (3) Turbidity (NTU) Turbidity (NTU) MPM08 MPM08 SO3-TR 17.20 MPM08 (m) 47.03 and distance 3.02 47.03 9.08 2.09 6.47 760 1.73 1.73 015222B + + Purge Criteria Purge Criteria DO % Sal. < 20 Cond % +/- 5 Cond % +/- 5 urb. NTU < 20 DO % Sat. < 20 urb. NTU < 20 emp\*C+/- 0.2 ph:+/- 0.2 emp\*C+/- 0.2 ph:+/-40ml Vial (6) \$COLOR-W Volume (gst) Volume (gal) CLEAR Initials 14:10 14:45 8:15 Time Color Time 8:20 0.2 0 0 0.2 + RAB /TECO Initials 500 ml Nuts (2) STABLE STABLE Conduct.(%) Temp °C 21.2 \$0DOR-W STABLE STABLE STABLE STABLE STABLE STABLE NONE Temp °C Volume (gal) 0.06 Cell Volume (gal) 0.06 20.9 21.3 29.0 Status Status cn Yes | No Dedicated Tubing? Tubing: Dedicated Pump: Reading mv 237.0 1L Rads Diss. (1) Pump: Equipment ID Tubing: Equipment ID evel Meter Tubing? evel Meter: Samples On Ice DO (mg/l) 0.3 Reading mg/l 221.0 9.13 1 Egpt. Volume (gal) 8.90 Pres ID 0.18 0.18 Volume (gal) Time Po NGVD Time 14:38 • Temp 2.1 Theo Value mg/l 8.880 Theo Value mv 236.2 **Total Containers** Eqpt. Table Eqpt. Table WLM08 ESP Redox (mv) 8.932 LEVEL WLM08 225.8 Yes No No Yes PP 10 10

Sampler(s) I

Total Time

Total Miles

# GROUNDWATER WELL SAMPLING EQUIPMENT CALIBRATION

pH Meter Calibration		Buffer ID	Buffer Value	ō	Time				COV	Time	PassiFail
Meter ID:	MPM08	L 0151691 🖸		7.01	8:26				7.09	14:05	P365
FDEP FT 1100		U 0151710	10	10.05	8:26			QC (pH +/- 0.2)	Cond +/- 5%) (DO	QC:(pH +/=0.2) (Cond +/=5%) (DQ +/=0.3mg/L) (Redox =/=10my):	/- 10my
Units: SU		015083D	4	4.01	8:26	YOL	Time	PassFait	A checked box in	A checked box indicates ICV t CCV passed	SSed
	ICV Check L	014565L	7			7.05	8:30	Pass			
Conductivity Meter Callb.		Standard ID	Std Value	(P.)	Time	VOI	Time	PassiFati	(33	Time	Pass/Fail
Meter ID:	MPM08	014668C		1000	8:44						
FDEP FT 1200, Units: uMHOS	44	L 014215A €				9833	8:48	Pass	9869	14:00	Pass
Turbidity Meter Calibration	Ħ	Standard ID	Std Value	Acceptability Range	Range	200	Time	PassFall	(32	Time	Pass/Fail
Meter ID;	TM07	_		4.86	5.94	5.45	7:53	Pass			
FDEP FT 1600, Units: NTU		L 013168 X	53.30	49.84	56.76				53.40	14:12	Pass
Sulfite info (QC Check) (EPA 377 f)	(EPA 377 1)		QC Result mg/l	Time	Titrator ID	Na Thia ID	DO 3 Pillow ID	Starch Ind ID	ch ind ID lodate/lodide ID		
QC Std: 5ml (NaThio)/500ml DI=10mg/L	nt DJ=10mg/L						1	L	1		
Redox Cal	Time	Temp*C	Reading mv	Theo Value mv	Pass / Fall	DO Meter Cal	Time	Temp °C	Reading mg/l	Theo Value mg/l Pass / Fall	Pass / Fall
						D051 14 43G4			200		
Meter ID:	8:15	21.2	237.0	236.2	Pass	Meter ID;	8:20	21.3	8.90	8.880	Pass
MPM08	14:10	29.0	221.0	225.8	Pass	MPM08	14:45	20.9	9.13	8.932	Pass
Zobell Sol ID:						Barom, Pres					
L 0152228						760					B 20
Therm ID	ЬН	Conduct %	DO mg/l	Redox mv	CL2	Calibration	Ferrous Iron				
MPM08	0.2	5	0.3	10	0.2	Criterion	Comparator ID:		Reagent ID:		
CIO <sub>2</sub> DPD Check must read +/- 10% of the Calculated Std. Concentration, multiplied by 2.4.	d +/- 10% of the C	alculated Std. Conce	entration, multiplie	d by 2.4.		Glycene check shoul	Glycene check should read < 0.10 mg/l ClO <sub>2</sub> .	020			
						Initial Calibratio	Infilal Calibration Verification ICV		Continuous Calit	Continuous Calibration Verilication CCV	S
Chiorine Dioxide (mg/l)	Std. Conc (mgff)	Std. Spike Volume (ml)	Cal Sample Volume (ml)	Calo, Std., Conc. (mg/l)	DPD Check (mg/l)	Glycene Check	Time	Pass/Fall	OPD Check (mg/l)	Time	PassiFall
Meter ID:		1.0	100								
		m	DPD ID: L	11	Glycene ID:	3	A che	ecked box indicate	s reagent expiratio	A checked box indicates reagent expiration date has been verified	ed.

#### DEP-SOP-001/01

## FS 2200 Groundwater Sampling Form FD 9000-24

## **GROUNDWATER SAMPLING LOG**

FACILITY NAME:		Big Be	end			SITE LOCATION:		Apollo	Beach, FL.		
WELL NO:	(	CR-PZ-1			SAMPLE ID:	L161	1075-01		DATE:	8/25/16	
					PURGI	NG DATA	V				
WELL DIAMETER (inches		TUBING DIAMETER (inc	thes) 1/4	WELL SCRI DEPTH 10.29	EEN INTERV feet to	AL (NGVD) 20.29 (feet)	STATIC DEF	PTH (feet): 5.06	PURGE PUMP T OR BAILER:	YPE PP	
WELL VOLUME PURGI (only fillout if applicable)		1 WELL VOLU	ME = (TOTAL WE	LL DEPTH - STATIC DE	PTH TO WATE	R) X WELLCAPAC	ITY				
			= (		feet-		feet) x		gallons/foo		gallons
EQUIPMENT VOLU (only fillout if application)		1 EQI	JIPMENT VOL	= PUMP VOLUME	E + (TUBING	CAPACITY X T	TUBING LENG	STH ) + FLOW CE	LLVOLUME		
			=(	0	gallons + (	0.0026 gallo	ons/foot X	21.3 feet)		gallons =	0.12 gallons
INITIAL PUMP OR DEPTH IN WELL (F	TUBING et): 15.29		FINAL PUMP DEPTH IN W	OR TUBING ELL (feet): 15.	.29	PURGING INITIATED AT:	12:28	PURGING ENDED AT:	12:40	TOTAL VOLUM PURGED (gall	иЕ ons): 1,2(
TIME	VOLUME PURGED (GALLONS)	VOLUME PURGED (GALLONS)	PURGE RATE (GPM)	DEPTH TO WATER (FEET)	pH (standard units)	TEMP. (°C)	COND. (µmhos/cm OR µS/cm)	DISSOLVED OXYGEN (circle mg/l or % saturation)	TURBIDITY (NTUs)	COLOR (describe)	ODOR (describe)
12:36	0.80	0.80	0.10	5.19	6.70	26.89	3997	0.08	3.14	CLEAR	NONE
12:38	0.20	1.00	0.10	5.20	6.71	27.02	3998	0.20	2.26	CLEAR	NONE
12:40	0.20	1.20	0.10	5.22	6.71	27.05	3995	0.14	2.08	CLEAR	NONE
WELL CAPACITY (Go				1,25" = 0.06; 2" = 1/4" = 0.0026;	0.16; 3" = 5/16" = 0.004;	0.37; 4" = 0.36; 3/8" = 0.006;	65; 5" = 1/2" = 0.0		12" = 5.88 0.016		
					SAMPL	ING DATA					
SAMPLED BY (PR	NT)/AFFILIATI RAE		TECO		ENATURES:	+		SAMPLING INITIATED AT:	12:40	SAMPLING ENDED AT: 1	2:52
PUMP OR TUBING DEPTH IN WELL (for	et): 15.3	1		SAMPLE PUMP FLOW RATE (mL	per minute)		380	TUBING MATERIAL CODE	E: PE	/S	
FIELD DECONTAM	INATION: Y			FIELD-FILTERED Filtration Equipme	LT.X.	N FILT	ER SIZE:	μm	DUPLICATE:	YDNE	
	SAMPLE CON	ITAINER		Fill allow Equipme	SAMPLEPRE	SERVATION		INTE	NDED		MPLING
C. 193 March 3	SPECIFIC/	MATERIAL	Francis -	PRESERVATIVE		AL VOL.	FINAL	ANALYS	IS AND/OR	EQL	JIPMENT CODE
SAMPLE ID CODE	CONTAINERS	CODE	VOLUME	USED	ADDED	N FIELD (ml) (1)	pН	ME	THOD		ODE
@Ino-500	1	PE	500ml	NONE	N	ONE	N/A	Inorg	ganics		PP
@Met-250	2	PE	250ml	HNO3		1ml	<2	Me	etals		PP
@Rad-1L	2	PE	1L	HNO3		5ml	<2		logicals		PP
REMARKS: (1) Sample bot MATERIAL CODES: SAMPLING/PURGIN EQUIPMENT CODES	AG = Amber C	Blass; CG = C	lear Glass;	or to sample co PE = Polyethylene; = Bailer; BP = Blad Pump; SM = Straw	PP = Poly			= Teflon; O= Ot PP = Peristaltic Pur			

NOTES:

Revision Date: February 1, 2004

<sup>1.</sup> The above do not constitute all of the information requierd by Chapter 62-160, F.A.C.

<sup>2.</sup> STABILIZATION CRITERIA FOR RANGE OF VARIATION OF LAST THREE CONSECUTIVE READINGS (SEE FS 2212, SECTION 3)
pH: ± 0.2 units Temperature: ± 0.2 °C Specific Conductance: ±5% Dissolved Oxygen:all readings ≤ 20% saturation (see Table FS 2200-2);
optionally, ± 0.2 mg/L or ± 10% (whichever is greater) Turbidity:all readings ≤ 20 NTU; optionally ± 5 NTU or 10% (whichever is greater)

## **GROUNDWATER SAMPLING LOG**

WELL DIAMETER (inches) DIAMETER (inches) WELL VOLUME PURGE: (only fillout if applicable)  EQUIPMENT VOLUME PURGE: (only fillout if applicable)  INITIAL PUMP OR TUBING DEPTH IN WELL (feet): 15.64  TIME VOLUME PURGED FOOL (GALLONS) (GOLLONS) (GOLLO	1 EQU COMOL. VOLUME PURGED GALLONS) 0.75 0.75	LUME = (TOT) = (  JIPMENT VOL = (  FINAL PUMP DEPTH IN W  PURGE RATE (GPM)  0.07  0.08  0.08	0 POR TUBING ELL (feet): 1! DEPTH TO WATER (FEET) 5.42 5.43 5.43	NTERVAL 1 feet to - STATIC DEPT feet- 4E + (TUBING of gallons + ( 5.64  pH (standard units) 6.73 6.72 6.74  - 0.16; 3" = 0 5/16" = 0.004;	NG DATA 20.64 (feet) TH TO WATER) CAPACITY X 1 0.0026 gall PURGING INITIATED AT:  TEMP. (°C) 27.37 27.50 27.35	feet ) x  TUBING LENG* ons/foot X  11:53  COND. (ymhos/cm) 1550  1552  1570	PACITY  TH ) + FLOW CEL  21.64 feet  PURGING ENDED AT:  DISSOLVED OXYGEN (circle(mg)) % saturation)  0.31  0.30  0.07		gallons =	
DIAMETER (inches)   DIAM WELL VOLUME PURGE: (only filout if applicable)   1  EQUIPMENT VOLUME PURGE: (only filout if applicable)    INITIAL PUMP OR TUBING DEPTH IN WELL (feet): 15.64  TIME   VOLUME PURGED FOOLY (GALLONS) (GILONS) (GILONS	METER (ind 1 WELL VOI 1 EQU COMOL. VOLUME PURGED GALLONS) 0.75 0.75	LUME = (TOT) = (  JIPMENT VOL = (  FINAL PUMP DEPTH IN W  PURGE RATE (GPM)  0.07  0.08  0.08	DEPTH 10.64 AL WELL DEPTH  = PUMP VOLUM  0 POR TUBING (ELL (feet): 14 DEPTH TO WATER (FEET) 5.42 5.43 5.43	NTERVAL 1 feet to - STATIC DEPT feet- 4E + (TUBING of gallons + ( 5.64  pH (standard units) 6.73 6.72 6.74  - 0.16; 3" = 0 5/16" = 0.004;	20.64 (feet) TH TO WATER) CAPACITY X 1 0.0026 gall PURGING INITIATED AT:  TEMP. (°C) 27.37 27.50 27.35	X WELL CAI feet ) x "UBING LENG" ons/foot X  11:53 COND. (jumhos/cm) 0R µS/cm) 1550 1552 1570	PACITY  TH ) + FLOW CEL  21.64 feet  PURGING ENDED AT:  DISSOLVED OXYGEN (circle(mg)) % saturation)  0.31  0.30  0.07	gallons/foo L VOLUME )+ 0.06 12:05 TURBIDITY (NTUs) 10.00 5.55 3.31	gallons = TOTAL VOLUM PURGED (gallo COLOR (describe) LT. YELLOW LT. YELLOW	0.12 gallons (HE cms): 0.91 ODOR (describe) NONE NONE
DIAMETER (inches)   DIAM WELL VOLUME PURGE: (only filout if applicable)   1  EQUIPMENT VOLUME PURGE: (only filout if applicable)    INITIAL PUMP OR TUBING DEPTH IN WELL (feet): 15.64  TIME   VOLUME PURGED FOOLY (GALLONS) (GILONS) (GILONS	METER (ind 1 WELL VOI 1 EQU COMOL. VOLUME PURGED GALLONS) 0.75 0.75	LUME = (TOT) = (  JIPMENT VOL = (  FINAL PUMP DEPTH IN W  PURGE RATE (GPM)  0.07  0.08  0.08	DEPTH 10.64 AL WELL DEPTH  = PUMP VOLUM  0 POR TUBING (ELL (feet): 14 DEPTH TO WATER (FEET) 5.42 5.43 5.43	feet to	CAPACITY X 1 0.0026 gall PURGING INITIATED AT:  TEMP. ("C) 27.37 27.50 27.35	X WELL CAI feet ) x "UBING LENG" ons/foot X  11:53 COND. (jumhos/cm) 0R µS/cm) 1550 1552 1570	PACITY  TH ) + FLOW CEL  21.64 feet  PURGING ENDED AT:  DISSOLVED OXYGEN (circle(mg)) % saturation)  0.31  0.30  0.07	gallons/foo L VOLUME )+ 0.06 12:05 TURBIDITY (NTUs) 10.00 5.55 3.31	gallons = TOTAL VOLUM PURGED (gallo COLOR (describe) LT. YELLOW LT. YELLOW	0.12 gallons (HE (Ins.): 0.91 ODOR (describe) NONE NONE
(only fillout if applicable)  EQUIPMENT VOLUME PURGE: (only fillout if applicable)  INITIAL PUMP OR TUBING DEPTH IN WELL (feet): 15.64  TIME VOLUME PURGED (GALLONS) (G  12:01 0.59  12:03 0.16  12:05 0.16  12:05 0.16  WELL CAPACITY (Gallons Per Foot): 0.75" at 12:05  WELL CAPACITY (Gallons Per Foot): 15.64  WELL CAPACITY (Gallons Per Foot): 15.65  EVALUATE: TUBING INSIDE DIA, CAPACITY (Gall/Ft.): 1/8  SAMPLED BY (PRINT) / AFFILIATION: RAB  PUMP OR TUBING DEPTH IN WELL (feet): 15.65  FIELD DECONTAMINATION: Y SAMPLE CONTAMINATION: Y SAMPLE CONTAMINATION: Y METALONS AND PURCEIFICATION SPECIFICATION AT METALONS AND PURCEIFICATION SPECIFICATION AT METALONS AND PURCEIFICATION AT M	1 EQU COMOL. VOLUME PURGED GALLONS) 0.75 0.75	=( JIPMENT VOL  =( FINAL PUMP DEPTH IN W PURGE RATE (GPM)  0.07  0.08  0.08	OP TUBING (FEEL): 1!  DEPTH TO WATER (FEET)  5.42  5.43  5.43	gallons + ( 5.64  pH (standard units)  6.73  6.72  6.74  -0.16; 3" = 0 5/16" = 0.004;	CAPACITY X 1 0.0026 gall PURGING INITIATED AT:  TEMP. (°C) 27.37 27.50 27.35	feet ) x  TUBING LENG* ons/foot X  11:53  COND. (ymhos/cm) 1550  1552  1570	TH) + FLOW CEL 21.64 feet PURGING ENDED AT: DISSOLVED OXYGEN (circle (mg/l) r % saturation) 0.31 0.30 0.07	12:05 12:05 TURBIDITY (NTUs) 10:00 5:55 3:31	gallons = TOTAL VOLUM FURGED (gallo COLOR (describe) LT. YELLOW LT. YELLOW	0.12 gallons (HE (Ins.): 0.91 ODOR (describe) NONE NONE
EQUIPMENT VOLUME PURGE: (only fillout if applicable)  INITIAL PUMP OR TUBING DEPTH IN WELL (feet): 15.64  TIME VOLUME PURGED F (GALLONS) (G  12:01 0.59  12:03 0.16  12:05 0.16  12:05 0.16  WELL CAPACITY (Gallons Per Foot): 0.75": 178  TUBING INSIDE DIA. CAPACITY (Gal /FL): 178  SAMPLED BY (PRINT) / AFFILIATION: RAB  PUMP OR TUBING DEPTH IN WELL (feet): 15.6  FIELD DECONTAMINATION: Y  SAMPLE CONTAMINATION: Y  M  M  M  M  M  M  M  M  M  M  M  M  M	VOLUME PURGED GALLONS) 0.59 0.75 0.91	FINAL PUMP DEPTH IN W PURGE RATE (GPM)  0.07  0.08  0.08	0 POR TUBING ELL (feet): 1! DEPTH TO WATER (FEET) 5.42 5.43 5.43	gallons + ( 5.64  pH (standard units)  6.73  6.72  6.74	0.0026 gall PURGING INITIATED AT:  TEMP. (°C)  27.37  27.50  27.35	TUBING LENG Ons/foot X  11:53 COND. (ymhos/cm) OR µS/cm) 1550 1552 1570	21.64 feet PURGING ENDED AT: DISSOLVED OXYGEN (circle(mg/Lar % saturation) 0.31 0.30 0.07	12:05 12:05 TURBIDITY (NTUs) 10:00 5:55 3:31	gallons = TOTAL VOLUM FURGED (gallo COLOR (describe) LT. YELLOW LT. YELLOW	0.12 gallons (HE (Ins.): 0.91 ODOR (describe) NONE NONE
(only filout if applicable)  INITIAL PUMP OR TUBING DEPTH IN WELL (feet): 15.64  TIME PURGED (GALLONS) (G  12:01 0.59  12:03 0.16  12:05 0.16  12:05 0.16  WELL CAPACITY (Gallons Per Foot): 0.75" - TUBING INSIDE DIA. CAPACITY (Gal/Ft.): 1/8  SAMPLED BY (PRINT)/ AFFILIATION: RAB  PUMP OR TUBING DEPTH IN WELL (feet): 15.6  FIELD DECONTAMINATION: Y SAMPLE CONTAMINATION: Y SAMPLE CONTAMINATION: Y M M SPECIFICATION  SPECIFICATION  ** M**	VOLUME PURGED GALLONS) 0.59 0.75 0.91	=( FINAL PUMP DEPTH IN W PURGE RATE (GPM) 0.07 0.08 0.08	0 POR TUBING ELL (feet): 1! DEPTH TO WATER (FEET) 5.42 5.43 5.43	gallons + (  5.64  pH (standard units)  6.73  6.72  6.74	0.0026 gall PURGING INITIATED AT:  TEMP. (°C)  27.37  27.50  27.35	11:53 COND. (ymhos/cm) OR yS/cm) 1550 1552 1570	21.64 feet PURGING ENDED AT: DISSOLVED OXYGEN (circle(mg/Lar % saturation) 0.31 0.30 0.07	12:05 TURBIDITY (NTUs) 10.00 5.55 3.31	TOTAL VOLUM 5 PURGED (gallo COLOR (describe) LT. YELLOW LT. YELLOW	DOOR (describe)  NONE  NONE
TIME VOLUME PURGED FOOLS (GALLONS) (	VOLUME PURGED GALLONS) 0.59 0.75 0.91	FINAL PUMP DEPTH IN W PURGE RATE (GPM) 0.07 0.08 0.08	POR TUBING (ELL (feet): 1!  DEPTH TO WATER (FEET)  5.42  5.43  5.43	pH (standard units) 6.73 6.72 6.74	PURGING INITIATED AT:  TEMP. (°C)  27.37  27.50  27.35	11:53 COND. (pmhos/cm) OR pS/cm) 1550 1552 1570	PURGING ENDED AT: DISSOLVED OXYGEN (circle(mg/)) or % saturation) 0.31 0.30 0.07	12:05 TURBIDITY (NTUs) 10.00 5.55 3.31	TOTAL VOLUM 5 PURGED (gallo COLOR (describe) LT. YELLOW LT. YELLOW	DOOR (describe)  NONE  NONE
TIME VOLUME PURGED FOOLS (GALLONS) (	VOLUME PURGED GALLONS) 0.59 0.75 0.91	PURGE RATE (GPM) 0.07 0.08 0.08	DEPTH TO WATER (FEET) 5.42 5.43 5.43	pH (standard units) 6.73 6.72 6.74	TEMP. (°C)  27.37  27.50  27.35	COND. (µmhos/cm OR µS/cm) 1550 1552 1570	DISSOLVED OXYGEN (circle(mg/)) r % saturation) 0.31 0.30 0.07	TURBIDITY (NTUs) 10.00 5.55 3.31	COLOR (describe) LT. YELLOW	ODOR (describe) NONE NONE
TIME	VOLUME PURGED GALLONS) 0.59 0.75 0.91	RATE (GPM) 0.07 0.08 0.08	TO WATER (FEET) 5.42 5.43 5.43	(standard units) 6.73 6.72 6.74	(°C) 27.37 27.50 27.35	(µmhos/cm OR µS/cm) 1550 1552 1570	OXYGEN (circle(mg/L)) % saturation)  0.31  0.30  0.07	10.00 5.55 3.31	(describe)  LT. YELLOW  LT. YELLOW	(describe)  NONE  NONE
12:03 0.16  12:05 0.16  12:05 0.16  WELL CAPACITY (Gallons Per Fool): 0.75" - TUBING INSIDE DIA, CAPACITY (Gal/FL): 1/8  SAMPLED BY (PRINT)/ AFFILIATION: RAB PUMP OR TUBING DEPTH IN WELL (feet): 15.6  FIELD DECONTAMINATION: Y  SAMPLE CONTAMINATION: Y  SAMPLE CONTAMINATION: Y  M  M  M  M  M  M	0.75	0.08	5.43 5.43	6.72 6.74	27.50 27.35	1552 1570	0.30	5.55 3.31	LT. YELLOW	NONE
WELL CAPACITY (Galions Per Fool): 0.75"= TUBING INSIDE DIA, CAPACITY (Gal/FL): 1/8  SAMPLED BY (PRINT)/ AFFILIATION: RAB PUMP OR TUBING DEPTH IN WELL (feet): 15.6  FIELD DECONTAMINATION: Y SAMPLE CONTAMINATION: SPECIFICATION SPECIFICATION # M	0.91	0.08	5.43	6.74	27.35	1570	0.07	3.31	The State of the S	- C-77 A 70
WELL CAPACITY (Galions Per Foot): 0.75": TUBING INSIDE DIA, CAPACITY (Gal /FL): 1/8  SAMPLED BY (PRINT) / AFFILIATION: RAB  PUMP OR TUBING DEPTH IN WELL (feet): 15.6  FIELD DECONTAMINATION: Y  SAMPLE CONTAIN SPECIFICATION # M	= 0.02;	1" = 0.04;	1.25" = 0.06; 2"	= 0.16; 3" = 0 5/16" = 0.004;	),37; 4 <sup>**</sup> = 0,	05; 5"=1			LT. YELLOW	NONE
SAMPLED BY (PRINT) / AFFILIATION: RAB PUMP OR TUBING DEPTH IN WELL (feet):  SAMPLE CONTAMINATION: SAMPLE CONTA	9.000	7.717.71		5/16" = 0.004;	12/1	***	.02; 6° = 1.47;	427-1500		
TUBING INSIDE DIA, CAPACITY (Gal/FL): 1/8  SAMPLED BY (PRINT)/ AFFILIATION: RAB  PUMP OR TUBING DEPTH IN WELL (feet): 15.6  FIELD DECONTAMINATION: Y  SAMPLE CONTAMINATION: SPECIFICATION # M	9.000	7.717.71		5/16" = 0.004;	12/1	***	.02; 6* = 1.47;	12" = E 00		
TUBING INSIDE DIA, CAPACITY (Gal/FL): 1/8  SAMPLED BY (PRINT)/ AFFILIATION: RAB  PUMP OR TUBING DEPTH IN WELL (feet): 15.6  FIELD DECONTAMINATION: Y  SAMPLE CONTAMINATION: SPECIFICATION # M	9.000	7.717.71		5/16" = 0.004;	12/1	***	.02; 6* = 1.47;	12" - 5 00		
TUBING INSIDE DIA, CAPACITY (Gal/Ft.): 1/8  SAMPLED BY (PRINT)/ AFFILIATION:  RAB  PUMP OR TUBING DEPTH IN WELL (feet): 15.6  FIELD DECONTAMINATION: Y  SAMPLE CONTAMINATION: SPECIFICATION  # M	9.000	7.717.71		5/16" = 0.004;	12/1	***	.02; 6" = 1.47;	12" - E 00		
SAMPLED BY (PRINT)/ AFFILIATION: RAB PUMP OR TUBING DEPTH IN WELL (feet): 15.6 FIELD DECONTAMINATION: SAMPLE CONTAIN SPECIFICATION # M			1 113 4184441			1/2" = 0.01	10: 5/8" = 0.			
RAB PUMP OR TUBING DEPTH IN WELL (feet): 15.6  FIELD DECONTAMINATION: Y   SAMPLE CONTAIN SPECIFICATION # M				SAMPLI	NG DATA	10.00				
PUMP OR TUBING DEPTH IN WELL (feet): 15.6  FIELD DECONTAMINATION: Y   SAMPLE CONTAIN SPECIFICATION # M		TECO	SAMPLER (S) SI	GNATURES:	eed		SAMPLING INITIATED AT:	12:05	SAMPLING ENDED AT:	12:23
FIELD DECONTAMINATION: Y SAMPLE CONTAIN SPECIFICATION # M		TECO	SAMPLE PUMP FLOW RATE (m		V	293	TUBING MATERIAL CODE:			
SAMPLE CONTAIN SPECIFICATION # M	D N D		FIELD-FILTERE Filtration Equipm		N P FILT	ER SIZE:	μm	DUPLICATE:	Y D N E	
# M			i ilitalion Equipin	SAMPLE PRE	SERVATION		INTEN	IDED		/PLING
SAMPLEID CODE CONTAINERS	MATERIAL CODE	VOLUME	PRESERVATIVE		AL VOL	FINAL	ANALYSIS METI			IPMENT ODE
	CODE	1,41-41	USED	ADDEDIN	FIELD (ml) (1)	pn	172.1			4.74
@Ino-500 1	PE	500ml	NONE	NO	ONE	N/A	Inorg	anics		PP
@Met-250 2	PE	250ml	HNO3	1	Iml	<2	Mel	als		PP
@Rad-1L 2	PE	1L	HNO3		5ml	<2	Radiolo	ogicals	1	PP
				-						
		-			-				+	
REMARKS:		-								
(1) Sample bottles pre-preserve		oratory pric								
MATERIAL CODES: AG = Amber Gla SAMPLING/PURGING APP = EQUIPMENT CODES: RFPP		= Clear Glass	; PE = Polyet	nulane: PD	= Polypropylene	; S = Silico	ne; T = Teflon;		ecify)	

1. The above do not constitute all of the information requierd by Chapter 62-160, F.A.C.

optionally, ± 0.2 mg/L or ± 10% (whichever is greater) Turbidily: all readings ≤ 20 NTU; optionally ± 5 NTU or 10% (whichever is greater)

NOTES:

<sup>2.</sup> STABILIZATION CRITERIA FOR RANGE OF VARIATION OF LAST THREE CONSECUTIVE READINGS (SEE FS 2212. SECTION 3)

pH: ± 0.2 units Temperature: ± 0.2 ℃ Specific Conductance: ± 5% Dissolved Oxygen: all readings ≤ 20% saluration (see Table FS 2200-2);

## **GROUNDWATER SAMPLING LOG**

SITE NAME:		Big Be	end			SITE LOCATION:		Apollo	Beach, FL.		
WELL NO:		CR-PZ-3			SAMPLE ID:	LIOI	1075-03		DATE:	8/25/16	
						ING DATA	1				
WELL DIAMETER (inches	3)	TUBING DIAMETER (inc	ches) 1/4	WELL SCREEN IN DEPTH 10.38		20.38 (feet)	STATIC DEF	TH (feet): 3.48	PURGE PUMP TO OR BAILER:	PP PP	
WELL VOLUME P	URGE: able)	1 WELL VO	DLUME = (TOT	AL WELL DEPTH -	STATIC DEF	TH TO WATER)	X WELL CA	PACITY	gallons/foo	( =	qallons
EQUIPMENT VOLI (only fillout if applic	JME PURGE: able)	1 EQI		= PUMP VOLUM 0	E + (TUBING	0.0026 gallo	UBING LENG	21.38 fe		gallons = (	0.12 gallons
INITIAL PUMP OR DEPTH IN WELL (I	TUBING reet): 15.38		FINAL PUMP DEPTH IN W	OR TUBING	.38	PURGING INITIATED AT:		PURGING ENDED AT:		TOTAL VOLUME PURGED (gallon	
TIME	VOLUME PURGED (GALLONS)	VOLUME PURGED (GALLONS)	PURGE RATE (GPM)	DEPTH TO WATER (FEET)	pH (standard units)	TEMP.	COND. (µmhos/cm OR µS/cm)	DISSOLVED OXYGEN (circle(mg/l)) % saturation)	TURBIDITY (NTUs)	COLOR (describe)	ODOR (describe)
11:12	0.71	0.71	0.08	3.79	6.32	27.09	1717	0.06	2.80	YELLOW	MILD
11:14	0.16	0.87	0.08	3.81	6.29	27.02	1705	0.07	3.49	YELLOW	MILD
11:16	0.16	1.03	0.08	3.81	6,29	27.07	1692	0.15	6.35	YELLOW	MILD
		1								- 5	
WELL CAPACITY (G		11.7		A STATE OF THE STA	2012/2017	0.37; 4" = 0.			12" = 5.88		
TUBING INSIDE DIA.	CAPACITY (Gal./Ft	): 1/8" = 0.00006;	3/16" = 0,0014	1/4" = 0.0026;	SAMPL	ING DATA	1/2" = 0.0	10; 5/8"=	0.016	-11-7-	
SAMPLED BY (PR	INT)/AFFILIATIO		TECO	SAMPLER (S) SIG				SAMPLING INITIATED AT: 11	:16	SAMPLING ENDED AT: 11	:33
PUMP OR TUBING DEPTH IN WELL (	eet): 15.4			SAMPLE PUMP FLOW RATE (mL	per minute):		303	TUBING MATERIAL CODE	: PE	/S	
FIELD DECONTAN	reprint to the second			FIELD-FILTERED Filtration Equipme			ER SIZE:	μm	DUPLICATE:	YOND	
	SAMPLE CON SPECIFICA			Time day and and		ESERVATION			NDED		PLING
SAMPLE ID CODE	CONTAINERS	MATERIAL CODE	VOLUME	PRESERVATIVE USED		TAL VOL. N FIELD (ml) (1)	FINAL		S AND/OR THOD		PMENT
@Ino-500	1	PE	500ml	NONE	N	NONE	N/A	Inorg	ganics	Р	P
			-				1. 15 1				
@Met-250	2	PE	250ml	HNO3		1ml	<2	Me	etals	Р	P
@Rad-1L	2	PE	1L	ниоз		5ml	<2	Radio	logicals	P	P
REMARKS			-								
(1) Sample bo	ttles pre-pres	erved at lab	oratory pric	or to sample co	llection.						
MATERIAL CODE			s = Clear Glass			P = Polypropylene			The state of the s	cify)	
SAMPLING/PURGIN	IG A	PP = After Perist	taltic Pump; B	= Bailer; BP = Blad Pump: SM = Straw	der Pump; ES	P = Electric Subm	irsable Pump;	PP = Peristaltic Pun	np ecify)		

NOTES: 1. The above do not constitute all of the information requierd by Chapter 62-160, F.A.C.

optionally, ± 0.2 mg/L or ± 10% (whichever is greater) Turbidity: all readings ≤ 20 NTU; optionally ± 5 NTU or 10% (whichever is greater)

<sup>2.</sup> STABILIZATION CRITERIA FOR RANGE OF VARIATION OF LAST THREE CONSECUTIVE READINGS (SEE FS 2212. SECTION 3) pH: ± 0.2 units Temperature: ± 0.2 °C Specific Conductance: ± 5% Dissolved Oxygen; all readings 5 20% saturation (see Table FS 2200-2);

# **GROUNDWATER SAMPLING LOG**

SITE NAME:		Big Be	end			SITE LOCATION:		Apollo	Beach, FL.		
WELL NO:	(	CR-PZ-5			SAMPLE ID:	L16	H075-02		DATE:	8/25/16	
						NG DATA				77-71	
WELL DIAMETER (inches	;)	TUBING DIAMETER (inc	thes) 1/4	WELL SCREEN I DEPTH 31.03		41.03 (fee	STATIC DEF	TH (feet): 25.78	PURGE PUMP T OR BAILER:	YPE ESP	
WELL VOLUME P (only fillout if applic	JRGE: able)	1 WELL VO		AL WELL DEPTH		TH TO WATER		PACITY	of the second	100	
EQUIPMENT VOL	JME PURGE:	1 EQL	= ( JIPMENT VOL	. = PUMP VOLUM	feet - IE + (TUBING	CAPACITY X	feet) x TUBING LENG	TH) + FLOW CE	gallons/for ELL VOLUME	ot =	gallons
(only fillout if applic	able)	1477	=(	0	gallons+(	0.0026 gall		47.03 fe		gallons =	0.18 gallons
INITIAL PUMP OR DEPTH IN WELL (	TUBING eet): 36.03	)	FINAL PUMP DEPTH IN W	OR TUBING ELL (feet): 36	5.03	PURGING INITIATED AT:		PURGING ENDED AT:	10:51	TOTAL VOLUM	ИE
TIME	VOLUME PURGED (GALLONS)	VOLUME PURGED (GALLONS)	PURGE RATE (GPM)	TO WATER (FFFT)	pH (standard units)	TEMP. (°C)	COND. (µmhos/cm OR µS/cm)	DISSOLVED OXYGEN (circle mg/l or % saturation)	TURBIDITY (NTUs)	COLOR (describe)	ODOR (describe)
10:47	5.15	5.15	0.40	26.62	6.41	28.13	5024	0.14	17.20	CLEAR	NONE
10:49	0.79	5.94	0.40	26.60	6.41	28.14	5066	0.13	9.08	CLEAR	NONE
10:51	0.79	6.73	0.40	26.58	6.41	28.11	5140	0.12	6.47	CLEAR	NONE
WELL CAPACITY (	Gallons Per Foot):	0.75" = 0.02;	1" = 0.1	04; 1.25" = 0	.06; 2"=0	.16; 3"=0	.37; 4"	= 0.65; 5"	= 1.02; 6" = 1	1.47; 12"=	5.88
TUBING INSIDE DIA	-477		0006: 3/16"		SAMPL	5/16" = 0.004; NG DATA	3/8" = 0.00		010: 5/8	** = 0.016	
SAMPLED BY (PR	INT)/AFFILIATI RAE		TECO	RAG		-		SAMPLING INITIATED AT: 10	0:51	SAMPLING ENDED AT:	0:56
PUMP OR TUBING	eet): 36.0			SAMPLE PUMP FLOW RATE (mi	V	1	500	TUBING MATERIAL COD	E: P	E	4000
FIELD DECONTAN		V D N D		FIELD-FILTERED	): v[]	7.12	ER SIZE:	μm	DUPLICATE:	Y D NE	1
	SAMPLE CON SPECIFICA			Fittration Equipme	SAMPLE PRE	SERVATION		INTE	NDED	SAM	MPLING
SAMPLEID CODE	# CONTAINERS	MATERIAL CODE	VOLUME	PRESERVATIVE USED		AL VOL. I FIELD (ml) (1)	FINAL pH		IS AND/OR THOD		IPMENT CODE
@Ino-500	1	PE	500ml	NONE	N	ONE	N/A	Inor	ganics	E	ESP
@Mat 250	2	PE	250ml	HNO3		1ml	<2	M	etals		SP
@Met-250 @Rad-1L	2	PE	1L	HNO3		5ml	<2		logicals		SP
@Rad-1L	2			111403		2111		readio	logicals		.01
REMARKS:											
(1) Sample bo			oratory pric			= Polypmouton	s; S = Silico	one: T = Teffon	; O= Other (Spe	eife)	
MA TERIAL CODE				Bailer; BP = Blac Pump; SM = Straw		= Polypropyten				ruiy)	

1. The above do not constitute all of the information requierd by Chapter 62-160, F.A.C.

NOTES:

<sup>2.</sup> STABILIZATION CRITERIA FOR RANGE OF VARIATION OF LAST THREE CONSECUTIVE READINGS (SEE FS 2212. SECTION 3) pH: ± 0.2 units Temperature: ± 0.2 °C Specific Conductance: ± 5% Dissolved Oxygen: all readings ≤ 20% saturation (see Table FS 2200-2); optionally, ± 0.2 mg/L, or ± 10% (whichever is greater) Turbidily; all readings ≤ 20 NTU; optionally ± 5 NTU or 10% (whichever is greater)

## **GROUNDWATER SAMPLING LOG**

SITE NAME:		Big Be	end			SITE LOCATION;		Apollo	Beach, FL.		
WELL NO:	(	CR-PZ-6	V		SAMPLE ID:	L16	H075-01		DATE:	8/25/16	
						NG DATA	-		-	100	
WELL DIAMETER (inche	s)	TUBING DIAMETER (inc	hes) 1/4	WELL SCREEN I DEPTH 11.11		21.11 (feet)	STATIC DEF	TH (feet): 5.22	PURGE PUMP TO OR BAILER:	PP PP	
WELL VOLUME P (only fillout if appli	PURGE: cable)	1 WELL VO	LUME = (TOT	AL WELL DEPTH		TH TO WATER		PACITY	anlian fan		gallons
EQUIPMENT VOL	UME PURGE:	1 EQL	JIPMENT VOL	. = PUMP VOLUM	feet - E + (TUBING	CAPACITY X	feet) x TUBING LENG	TH) + FLOW CE	gallons/foo LL VOLUME	=	gallons
only fillout if appli	cable)		=(	0	gallons + (	0.0026 gall	ons/foot X	47.03 fe	et)+ 0.06	gallons =	0.18 gallons
INITIAL PUMP OF DEPTH IN WELL	TUBING (feet): 16.11	, oomos.	FINAL PUMP DEPTH IN W		.11	PURGING INITIATED AT:	9:49	PURGING ENDED AT:	10:02	TOTAL VOLUM PURGED (gallo	ME cns): 1.9
TIME	VOLUME PURGED (GALLONS)	VOLUME PURGED (GALLONS)	PURGE RATE (GPM)	TO WATER (FEET)	pH (standard units)	TEMP. (°C)	COND. (µmhos/cm OR µS/cm)	DISSOLVED OXYGEN (circle(mg/l) r % saturation)	TURBIDITY (NTUs)	COLOR (describe)	ODOR (describe)
9:58	1.33	1.33	0.15	5.48	6.50	27.61	1383	0.13	3.02	CLEAR	NONE
10:00	0.29	1.62	0.15	5.49	6.47	27.67	1383	0.09	2.09	CLEAR	NONE
10:02	0.29	1.91	0.15	5.50	6.48	27.74	1381	0.09	1.73	CLEAR	NONE
WELL CAPACITY (	A. CAPACITY (Ga	L/FL): 1/8" = 0.00		= 0.0014: 1/4" =	0.0026; SAMPL	0.16; 3" = 0 5/16" = 0.004; ING DATA	3/8" = 0.00	6; 1/2" = 0,0		= 0.016	5.88
SAMPLED BY (PF	RAE		TECO	SAMPLERISISIO	exect!			SAMPLING INITIATED AT: 10	0:02	SAMPLING ENDED AT: 1	0:10
PUMP OR TUBIN DEPTH IN WELL	G (feet): 16.1		0.0	SAMPLE PUMP FLOW RATE (ml	per minute):	40.00	553	TUBING MATERIAL CODI	E: PE	'S	
FIELD DECONTA	MINATION:	YOND		FIELD-FILTERED Filtration Equipme	D: Type.	N FILT	ER SIZE:	μm	DUPLICATE:	Y D NE	7
	SAMPLE CON SPECIFICA			101 502 50 50 50 50 50 50 50 50 50 50 50 50 50		SERVATION			NDED		MPLING .
SAMPLE ID CODE		MATERIAL CODE	VOLUME	PRESERVATIVE USED		TAL VOL. N FIELD (ml) (1)	FINAL pH		IS AND/OR THOD		IPMENT ODE
@Ino-500	1	PE	500ml	NONE	N	ONE	N/A	Inorg	ganics		PP
@Met-250	2	PE	250ml	HNO3		1ml	<2	Me	etals		PP
@Rad-1L	2	PE	1L	HNO3		5ml	<2	Radio	logicals		PP
								F			
REMARKS: (1) Sample bo	ottles pre-pres	erved at lab	oratory pric	r to sample co	ollection.						
MATERIAL CODE			= Clear Glass			= Polypropylene	e; S = Silice	one; T = Teflon	O= Other (Spec	ify)	

NOTES: 1. The above do not constitute all of the information requierd by Chapter 62-160, F.A.C.

2. STABILIZATION CRITERIA FOR RANGE OF VARIATION OF LAST THREE CONSECUTIVE READINGS (SEE FS 2212. SECTION 3) pH: ± 0.2 units Temperature: ± 0.2 °C Specific Conductance: ± 5% Dissolved Oxygen: all readings ≤ 20% saturation (see Table FS 2200-2); optionally, ± 0.2 mg/L or ± 10% (whichever is greater) Turbidity: all readings ≤ 20 NTU; optionally ± 5 NTU or 10% (whichever is greater)

Revision Date: February 1, 2004



Report Date: September 7, 2016

TECO

5012 Causeway Blvd.

Tampa, FL 33619

Attn: Peggy Penner

Field Custody:

Client

Client/Field ID:

L16H075-01

Sample Collection: 8-26-16/1252

Lab ID No:

16.9238

Lab Custody Date:

8-31-16/1415

Sample description: Water

CERTIFICATE OF ANALYSIS

					Analysis		Detection
Parameter	Units	Re	sul	ts	Date	Method	Limit
Combined Radium (Radium-226 + Radium 228)	pCi/l	15.0	±	1.1	Calc	Calc	0.7
Radium-226	pCi/1	13.7	±	1.1	9-6-16/1114	EPA 903.0	0.3
Radium-228 Alpha Standard: Th-230	pCi/l	1.3	±	0.5	9-6-16/1039	EPA Ra-05	0.7

James W. Hayes Laboratory Manager

James W. Hages

Test results meet all requirements of the NELAC standards. Statement of estimated uncertainty available upon request. Test results refer only to sample(s) listed. Contact person: Jim Hayes (813) 229-2879.



Report Date: September 7, 2016

TECO

5012 Causeway Blvd. Tampa, FL 33619

Attn: Peggy Penner

Field Custody: Client/Field ID:

Client

L16H075-02

Sample Collection: 8-26-16/1223

Lab ID No:

16.9239

Lab Custody Date:

8-31-16/1415

Sample description:

Water

CERTIFICATE OF ANALYSIS

					Analysis		Detection	
Parameter	Units	Re	esul	ts	Date	Method	Limit	
Combined Radium (Radium-226 + Radium 228)	pCi/l	32	±	1.6	Calc	Calc	0.7	
Radium-226	pCi/l	31	±	1.6	9-6-16/1114	EPA 903.0	0.3	
Radium-228 Alpha Standard: Th-230	pCi/l	1.2	±	0.5	9-6-16/1039	EPA Ra-05	0.7	

James W. Hayes Laboratory Manager

James W. Hages

Test results meet all requirements of the NELAC standards. Statement of estimated uncertainty available upon request. Test results refer only to sample(s) listed. Contact person: Jim Hayes (813) 229-2879.



Report Date: September 7, 2016

TECO

5012 Causeway Blvd. Tampa, FL 33619

Attn: Peggy Penner

Field Custody: Client/Field ID: Client

L16H075-03

Sample Collection: 8-26-16/1133

Lab ID No:

16.9240

Lab Custody Date:

8-31-16/1415

Sample description:

Water

CERTIFICATE OF ANALYSIS

					Analysis		Detection
Parameter	Units	Re	sul	ts	Date	Method	Limit
Combined Radium (Radium-226 + Radium 228)	pCi/l	15.0	±	1.1	Calc	Calc	0.7
Radium-226	pCi/l	13.6	±	1.1	9-6-16/1114	EPA 903.0	0.3
Radium-228 Alpha Standard: Th-230	pCi/l	1.4	±	0.5	9-6-16/1039	EPA Ra-05	0.7

James W. Hayes Laboratory Manager

James W. Hages

Test results meet all requirements of the NELAC standards. Statement of estimated uncertainty available upon request. Test results refer only to sample(s) listed. Contact person: Jim Hayes (813) 229-2879.



Report Date: September 7, 2016

TECO

5012 Causeway Blvd. Tampa, FL 33619

Attn: Peggy Penner

Field Custody:

Client

Client/Field ID:

L16H075-05

Sample Collection: 8-26-16/1056

Lab ID No:

16.9241

Lab Custody Date:

8-31-16/1415

Sample description: Water

CERTIFICATE OF ANALYSIS

					Analysis		Detection
Parameter	Units	Re	esul	ts	Date	Method	Limit
Combined Radium (Radium-226 + Radium 228)	pCi/l	31	±	1.4	Calc	Calc	0.7
Radium-226	pCi/l	27	±	1.4	9-6-16/1114	EPA 903.0	0.3
Radium-228	pCi/l	3.7	±	0.6	9-6-16/1039	EPA Ra-05	0.7

James W. Hages

James W. Hayes Laboratory Manager

Test results meet all requirements of the NELAC standards. Statement of estimated uncertainty available upon request. Test results refer only to sample(s) listed. Contact person: Jim Hayes (813) 229-2879.



Report Date: September 7, 2016

TECO

5012 Causeway Blvd.

Tampa, FL 33619

Alpha Standard: Th-230

Attn: Peggy Penner

Field Custody: Client/Field ID: Client

L16H075-06

Sample Collection:

8-26-16/1010

Lab ID No:

16.9242

Lab Custody Date:

8-31-16/1415

Sample description: Water

CERTIFICATE OF ANALYSIS

				Detection				
Parameter	Units	Re	esul	ts	Date	Method	Limit	
Combined Radium (Radium-226 + Radium 228)	pCi/l	4.0	±	0.5	Calc	Calc	0.7	
Radium-226	pCi/l	3.4	±	0.5	9-6-16/1114	EPA 903.0	0.3	
Radium-228	pCi/l	0.6	±	0.4	9-6-16/1039	EPA Ra-05	0.7	

James W. Hayes

James W. Hayes
Laboratory Manager

Test results meet all requirements of the NELAC standards. Statement of estimated uncertainty available upon request. Test results refer only to sample(s) listed. Contact person: Jim Hayes (813) 229-2879.

## SUBCONTRACT ORDER

# Tampa Electric Company, Laboratory Services

## L16H075

## SENDING LABORATORY:

Tampa Electric Company, Laboratory Services

5012 Causeway Blvd Tampa, FL 33619

Phone: (813) 630-7490 Fax: (813) 630-7360

Project Manager:

Peggy Penner

RECEIVING LABORATORY:

**KNL Laboratory Services** 3202 N. Florida Ave. Tampa, FL 33603

Phone: (813) 229-2879

Fax: -

**Due Date:** 09/12/16 16:00

Analysis	Expires		Laboratory ID	Comments
Sample ID: L16H075-01 PZ1 Sampled: 08/26/16 12:52		Water	169238	
Radium 226 EPA 903.0	02/22/17 12:52			
Radium 226+228, Total	02/22/17 12:52			
Radium 228 Ra-05	02/22/17 12:52			
Containers Supplied:				
RAD Poly HNO3 - 1000mL (C)	RAD Poly HNO3 - 1000	mL (D)		
Sample ID: L16H075-02 PZ2 Sampled: 08/26/16 12:23		Water	169239	
Radium 226 EPA 903.0	02/22/17 12:23			
Radium 226+228, Total	02/22/17 12:23			
Radium 228 Ra-05	02/22/17 12:23			
Containers Supplied:				
RAD Poly HNO3 - 1000mL (C)	RAD Poly HNO3 - 1000s	mL(D)		
Sample ID: L16H075-03 PZ3 Sampled: 08/26/16 11:33		Water	169240	
Radium 226+228, Total	02/22/17 11:33			
Radium 226 EPA 903.0	02/22/17 11:33			
Radium 228 Ra-05	02/22/17 11:33			
Containers Supplied:				
RAD Poly HNO3 - 1000mL (C)	RAD Poly HNO3 - 1000	mL (D)		
Sample ID: L16H075-05 PZ5 Sampled: 08/26/16 10:56		Water	16.9241	
Radium 226 EPA 903.0	02/22/17 10:56			
Radium 226+228, Total	02/22/17 10:56			Ak il
Radium 228 Ra-05	02/22/17 10:56			JK g.l.
Containers Supplied:				a,
RAD Poly HNO3 - 1000mL (C)	RAD Poly HNO3 - 1000	mL (D)		

Received By

Released By

Date & Time

Received By

Date & Time

## SUBCONTRACT ORDER

# Tampa Electric Company, Laboratory Services L16H075

Analysis	Expires	Laboratory ID Comments
Sample ID: L16H075-06 PZ6 Sampled: 08/26/16 10:10	Water	16 9242
Radium 228 Ra-05	02/22/17 10:10	
Radium 226 EPA 903.0	02/22/17 10:10	
Radium 226+228, Total	02/22/17 10:10	
Containers Supplied:		
RAD Poly HNO3 - 1000mL (C)	RAD Poly HNO3 - 1000mL (D)	

9tg.8.14

Released By S-31-16 1415
Date & Time

Received By

Date & Time

Released By Date & Time Received By Date & Time



# FL DOH Certification # E84025

QC Summary: Radium 228 Analysis					
Client Project #: L16 H	075				
Analysis Completion Date:	916116				
Precision Data:	Sample #:	16,9242			
Sample Analysis (pCi/l)	Duplicate Analysis (pCi/l)	Range (pCi/l)	<u>RPD (%)</u>		
	4.7	2,6			
Spike Data:	Sample #:	16.9242			
Sample Analysis (pCi)/L	Spike Added (pCi)c Analy	tical Result (pCi)	Spike Rec (%)		
0.6	4.0	4.7	103%		
LCS Data:					
Analytical Result (pCi)	True Value (pCi)	<u>% I</u>	Recovery		
46	4.4	-	105%		
Lab Blank:	Assistant Denvis Gr	C:/I) An	alysis Date		
and and	Analytical Result (po		31 6 1 16		
Lab Blank	0.0 +1- 0.2		11 6 1 16		



# FL DOH Certification # E84025

QC Summary: Radium 22	26 Analysis		
Client Project # : <u>L / 6</u> #	075		
Analysis Completion Date: _	916114		
Precision Data:	Sample #:	16.9144	
Sample Analysis (pCi/l)	Duplicate Analysis (pCi/l)	Range (pCi/l)	RPD (%)
11.1	12.4	1.3	
Spike Data:	Sample #:	16.9144	_
Sample Analysis (pCi)	Spike Added (pCi) C Analy	tical Result (pCj/	Spike Rec (%)
7.3	make make a rest of the second	12.4	113%
LCS Data:			
Analytical Result (pCi/	True Value (pCi)	%	Recovery
10.1	10.2	·_	100%
Lab Blank:	Analytical Result (p	Ci/I) Ar	nalysis Date
Lab Blank	CP. 2+1- 0		Q1 6 1 16



THE LEADER IN ENVIRONMENTAL TESTING

# **ANALYTICAL REPORT**

TestAmerica Laboratories, Inc.

TestAmerica Tampa 6712 Benjamin Road Suite 100 Tampa, FL 33634

Tel: (813)885-7427

TestAmerica Job ID: 660-75848-1 Client Project/Site: L16H075

## For:

Tampa Electric Company 5010 Causeway Boulevard Tampa, Florida 33619

Attn: Ms. Peggy Penner

Authorized for release by:

Hanker M. Condin

9/9/2016 11:31:10 AM Haukur Gudnason, Project Manager II (813)280-8342

haukur.gudnason@testamericainc.com

Designee for

Keaton Conner, Project Mgmt. Assistant (813)885-7427

keaton.conner@testamericainc.com

LINKS .....

Review your project results through

Total Access

**Have a Question?** 



Visit us at: www.testamericainc.com

The test results in this report meet all 2003 NELAC and 2009 TNI requirements for accredited parameters, exceptions are noted in this report. This report may not be reproduced except in full, and with written approval from the laboratory. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

Client: Tampa Electric Company Project/Site: L16H075 TestAmerica Job ID: 660-75848-1

# **Table of Contents**

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# **Sample Summary**

Client: Tampa Electric Company Project/Site: L16H075

TestAmerica Job ID: 660-75848-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
660-75848-1	L16H075-01	Water	08/26/16 12:52	08/31/16 14:00
660-75848-2	L16H075-02	Water	08/26/16 12:23	08/31/16 14:00
660-75848-3	L16H075-03	Water	08/26/16 11:33	08/31/16 14:00
660-75848-4	L16H075-05	Water	08/26/16 10:56	08/31/16 14:00
660-75848-5	L16H075-06	Water	08/26/16 10:10	08/31/16 14:00

# **Definitions/Glossary**

Client: Tampa Electric Company

Project/Site: L16H075

TestAmerica Job ID: 660-75848-1

## **Qualifiers**

## **Metals**

Qualifier	Qualifier Description
I	The reported value is between the laboratory method detection limit and the laboratory practical quantitation limit.

Indicates that the compound was analyzed for but not detected.

## **Glossary**

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains no Free Liquid
DER	Duplicate error ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision level concentration
MDA	Minimum detectable activity
EDL	Estimated Detection Limit
MDC	Minimum detectable concentration
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)

NC Not Calculated

ND Not detected at the reporting limit (or MDL or EDL if shown)

PQL **Practical Quantitation Limit** 

QC **Quality Control** RER Relative error ratio

RLReporting Limit or Requested Limit (Radiochemistry)

RPD Relative Percent Difference, a measure of the relative difference between two points

TEF Toxicity Equivalent Factor (Dioxin) TEQ Toxicity Equivalent Quotient (Dioxin)

9/9/2016

## **Case Narrative**

Client: Tampa Electric Company

Project/Site: L16H075

TestAmerica Job ID: 660-75848-1

Job ID: 660-75848-1

**Laboratory: TestAmerica Tampa** 

**Narrative** 

**Job Narrative** 660-75848-1

#### Comments

No additional comments.

#### Receipt

The samples were received on 8/31/2016 2:00 PM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 1.0° C.

No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

# **Detection Summary**

Client: Tampa Electric Company

Project/Site: L16H075

Lithium

TestAmerica Job ID: 660-75848-1

200.7 Rev 4.4

Total/NA

Client Sample ID:	L16H075-01					Lab Sa	mple ID: 66	0-75848-1
Analyte	Result	Qualifier	PQL	MDL	Unit	Dil Fac D	Method	Prep Type
Lithium	0.0074	Ī	0.050	0.0010	mg/L		200.7 Rev 4.4	Total/NA
Client Sample ID:	L16H075-02					Lab Sa	mple ID: 66	0-75848-2
Analyte	Result	Qualifier	PQL	MDL	Unit	Dil Fac D	Method	Prep Type
Lithium	0.011	Ī	0.050	0.0010	mg/L		200.7 Rev 4.4	Total/NA
Client Sample ID:	L16H075-03					Lab Sa	mple ID: 66	0-75848-3
Analyte	Result	Qualifier	PQL	MDL	Unit	Dil Fac D	Method	Prep Type
Lithium	0.0061	Ī	0.050	0.0010	mg/L	1	200.7 Rev 4.4	Total/NA
Client Sample ID:	L16H075-05					Lab Sa	mple ID: 66	0-75848-4
Analyte	Result	Qualifier	PQL	MDL	Unit	Dil Fac D	Method	Prep Type
Lithium	0.0074	Ī	0.050	0.0010	mg/L		200.7 Rev 4.4	Total/NA
Client Sample ID:	L16H075-06					Lab Sa	mple ID: 66	0-75848-5
Analyte	Result	Qualifier	PQL	MDL	Unit	Dil Fac D	Method	Prep Type

0.050

0.0010 mg/L

0.0020 I

## **Client Sample Results**

Client: Tampa Electric Company

Date Collected: 08/26/16 10:10

Project/Site: L16H075

TestAmerica Job ID: 660-75848-1

Client Sample ID: L16H075-01 Lab Sample ID: 660-75848-1 Date Collected: 08/26/16 12:52 **Matrix: Water** Date Received: 08/31/16 14:00 Method: 200.7 Rev 4.4 - Metals (ICP) Analyte Result Qualifier PQL **MDL** Unit D Prepared Analyzed Dil Fac 09/03/16 09:37 09/07/16 16:34 Lithium 0.0074 I 0.050 0.0010 mg/L Client Sample ID: L16H075-02 Lab Sample ID: 660-75848-2 Date Collected: 08/26/16 12:23 **Matrix: Water** Date Received: 08/31/16 14:00 Method: 200.7 Rev 4.4 - Metals (ICP) Analyte Result Qualifier PQL **MDL** Unit D Prepared Analyzed Dil Fac 0.050 09/03/16 09:37 09/07/16 17:00 Lithium 0.011 I 0.0010 mg/L Client Sample ID: L16H075-03 Lab Sample ID: 660-75848-3 Date Collected: 08/26/16 11:33 **Matrix: Water** Date Received: 08/31/16 14:00 Method: 200.7 Rev 4.4 - Metals (ICP) Analyte Result Qualifier PQL MDL Unit Prepared Analyzed Dil Fac Lithium 0.0061 I 0.050 0.0010 mg/L 09/03/16 09:37 09/07/16 17:03 Client Sample ID: L16H075-05 Lab Sample ID: 660-75848-4 Date Collected: 08/26/16 10:56 **Matrix: Water** Date Received: 08/31/16 14:00 Method: 200.7 Rev 4.4 - Metals (ICP) Analyte Result Qualifier PQL **MDL** Unit D Prepared Analyzed Dil Fac 09/03/16 09:37 09/07/16 17:07 Lithium 0.050 0.0010 mg/L 0.0074 I Lab Sample ID: 660-75848-5 Client Sample ID: L16H075-06

 Date Received: 08/31/16 14:00

 Method: 200.7 Rev 4.4 - Metals (ICP)

 Analyte
 Result
 Qualifier
 PQL
 MDL
 Unit
 D
 Prepared
 Analyzed
 Dil Fa

 Lithium
 0.0020
 I
 0.050
 0.0010
 mg/L
 09/03/16 09:37
 09/07/16 17:10

**Matrix: Water** 

## QC Sample Results

Client: Tampa Electric Company TestAmerica Job ID: 660-75848-1

Project/Site: L16H075

Method: 200.7 Rev 4.4 - Metals (ICP)

Lab Sample ID: MB 400-321282/1-A Client Sample ID: Method Blank **Matrix: Water** Prep Type: Total/NA **Analysis Batch: 321733** Prep Batch: 321282

MB MB

Analyte Result Qualifier PQL **MDL** Unit Prepared Analyzed Dil Fac 0.050 09/03/16 09:37 09/07/16 16:27 Lithium 0.0010 U 0.0010 mg/L

Lab Sample ID: LCS 400-321282/2-A **Client Sample ID: Lab Control Sample Matrix: Water** Prep Type: Total/NA **Analysis Batch: 321733 Prep Batch: 321282** Spike LCS LCS %Rec. Added Limits Analyte Result Qualifier Unit D %Rec 85 - 115 Lithium 1.00 0.986 mg/L 99

Lab Sample ID: 660-75848-1 MS Client Sample ID: L16H075-01 **Matrix: Water Prep Type: Total/NA Analysis Batch: 321733** Prep Batch: 321282 Sample Sample Spike MS MS %Rec.

Result Qualifier Added Result Qualifier Limits Analyte Unit D %Rec Lithium 0.0074 I 1.00 1.15 mg/L 114 70 - 130

Lab Sample ID: 660-75848-1 MSD Client Sample ID: L16H075-01 **Matrix: Water** Prep Type: Total/NA

**Analysis Batch: 321733** Sample Sample Spike MSD MSD

%Rec. **RPD** Analyte Result Qualifier Added Result Qualifier Unit %Rec Limits RPD Limit Lithium 0.0074 I 1.00 1.15 114 70 - 130 0 mg/L

Prep Batch: 321282

# **QC Association Summary**

Client: Tampa Electric Company Project/Site: L16H075

TestAmerica Job ID: 660-75848-1

## **Metals**

## **Prep Batch: 321282**

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
660-75848-1	L16H075-01	Total/NA	Water	200.7	
660-75848-2	L16H075-02	Total/NA	Water	200.7	
660-75848-3	L16H075-03	Total/NA	Water	200.7	
660-75848-4	L16H075-05	Total/NA	Water	200.7	
660-75848-5	L16H075-06	Total/NA	Water	200.7	
MB 400-321282/1-A	Method Blank	Total/NA	Water	200.7	
LCS 400-321282/2-A	Lab Control Sample	Total/NA	Water	200.7	
660-75848-1 MS	L16H075-01	Total/NA	Water	200.7	
660-75848-1 MSD	L16H075-01	Total/NA	Water	200.7	

## **Analysis Batch: 321733**

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
660-75848-1	L16H075-01	Total/NA	Water	200.7 Rev 4.4	321282
660-75848-2	L16H075-02	Total/NA	Water	200.7 Rev 4.4	321282
660-75848-3	L16H075-03	Total/NA	Water	200.7 Rev 4.4	321282
660-75848-4	L16H075-05	Total/NA	Water	200.7 Rev 4.4	321282
660-75848-5	L16H075-06	Total/NA	Water	200.7 Rev 4.4	321282
MB 400-321282/1-A	Method Blank	Total/NA	Water	200.7 Rev 4.4	321282
LCS 400-321282/2-A	Lab Control Sample	Total/NA	Water	200.7 Rev 4.4	321282
660-75848-1 MS	L16H075-01	Total/NA	Water	200.7 Rev 4.4	321282
660-75848-1 MSD	L16H075-01	Total/NA	Water	200.7 Rev 4.4	321282

Client: Tampa Electric Company

Project/Site: L16H075

Client Sample ID: L16H075-01 Lab Sample ID: 660-75848-1 Date Collected: 08/26/16 12:52

**Matrix: Water** 

Date Received: 08/31/16 14:00

	Batch	Batch		Dil	Initial	Final	Batch	Prepared		
Prep Type	Туре	Method	Run	Factor	Amount	Amount	Number	or Analyzed	Analyst	Lab
Total/NA	Prep	200.7			50 mL	50 mL	321282	09/03/16 09:37	DN1	TAL PEN
Total/NA	Analysis	200.7 Rev 4.4		1			321733	09/07/16 16:34	JMH	TAL PEN
	Instrument	ID: 6500 ICP Duo								

Client Sample ID: L16H075-02 Lab Sample ID: 660-75848-2

Date Collected: 08/26/16 12:23 **Matrix: Water** 

Date Received: 08/31/16 14:00

	Batch	Batch		Dil	Initial	Final	Batch	Prepared		
Prep Type	Туре	Method	Run	Factor	Amount	Amount	Number	or Analyzed	Analyst	Lab
Total/NA	Prep	200.7			50 mL	50 mL	321282	09/03/16 09:37	DN1	TAL PEN
Total/NA	Analysis	200.7 Rev 4.4		1			321733	09/07/16 17:00	JMH	TAL PEN
	Instrumen	t ID: 6500 ICP Duo	1							

Client Sample ID: L16H075-03 Lab Sample ID: 660-75848-3

Date Collected: 08/26/16 11:33 **Matrix: Water** 

Date Received: 08/31/16 14:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	200.7			50 mL	50 mL	321282	09/03/16 09:37	DN1	TAL PEN
Total/NA	Analysis	200.7 Rev 4.4		1			321733	09/07/16 17:03	JMH	TAL PEN
	Instrumer	nt ID: 6500 ICP Duo								

Client Sample ID: L16H075-05 Lab Sample ID: 660-75848-4

Date Collected: 08/26/16 10:56 **Matrix: Water** 

Date Received: 08/31/16 14:00

	Batch	Batch		Dil	Initial	Final	Batch	Prepared		
Prep Type	Type	Method	Run	Factor	Amount	Amount	Number	or Analyzed	Analyst	Lab
Total/NA	Prep	200.7			50 mL	50 mL	321282	09/03/16 09:37	DN1	TAL PEN
Total/NA	Analysis	200.7 Rev 4.4		1			321733	09/07/16 17:07	JMH	TAL PEN
	Instrumer	t ID: 6500 ICP Duo								

Client Sample ID: L16H075-06 Lab Sample ID: 660-75848-5

Date Collected: 08/26/16 10:10 **Matrix: Water** Date Received: 08/31/16 14:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	200.7		-	50 mL	50 mL	321282	09/03/16 09:37	DN1	TAL PEN
Total/NA	Analysis	200.7 Rev 4.4		1			321733	09/07/16 17:10	JMH	TAL PEN
	Instrumer	nt ID: 6500 ICP Duo	)							

**Laboratory References:** 

TAL PEN = TestAmerica Pensacola, 3355 McLemore Drive, Pensacola, FL 32514, TEL (850)474-1001

TestAmerica Tampa

# **Certification Summary**

Client: Tampa Electric Company

Project/Site: L16H075

TestAmerica Job ID: 660-75848-1

# Laboratory: TestAmerica Tampa

The certifications listed below are applicable to this report.

Authority	Program	EPA Region	Certification ID	<b>Expiration Date</b>
Florida	NELAP	4	E84282	06-30-17

# Laboratory: TestAmerica Pensacola The certifications listed below are applicable to this report.

Authority	Program	<b>EPA Region</b>	Certification ID	<b>Expiration Date</b>
Florida	NELAP	4	E81010	06-30-17

# **Method Summary**

Client: Tampa Electric Company

Project/Site: L16H075

TestAmerica Job ID: 660-75848-1

Method	Method Description	Protocol	Laboratory
200.7 Rev 4.4	Metals (ICP)	EPA	TAL PEN

**Protocol References:** 

EPA = US Environmental Protection Agency

**Laboratory References:** 

TAL PEN = TestAmerica Pensacola, 3355 McLemore Drive, Pensacola, FL 32514, TEL (850)474-1001

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112

## SUBCONTRACT ORDER

# Tampa Electric Company, Laboratory Services L16H075

## SENDING LABORATORY:

Tampa Electric Company, Laboratory Services

5012 Causeway Blvd Tampa, FL 33619 Phone: (813) 630-7490

Fax: (813) 630-7360

Project Manager: Peggy Penner

RECEIVING LABORATORY:

TestAmerica Laboratories, Inc. - Tampa

6712 Benjamin Rd., Suite 100

Tampa, FL 33634

Phone:(813) 885-7427

Fax: -

Due Date: 09/12/16	16:00				
Analysis		Expires		Laboratory ID	Comments
Sample 1D: L16H075-01	PZ1		Water		
Sampled: 08/26/16 12:52					
Lithium, Total EPA 6010	···	02/22/17 12:52			
Containers Supplied:					
Poly HNO3 - 250mL (A)					
Sample ID: L16H075-02	PZ2		Water		
Sampled: 08/26/16 12:23					
Lithium, Total EPA 6010		02/22/17 12:23			
Containers Supplied:					
Poly HNO3 - 250mL (A)					
Sample ID: L16H075-03	PZ3		Water		
Sampled: 08/26/16 11:33					
Lithium, Total EPA 6010		02/22/17 11:33			
Containers Supplied:					
Poly HNO3 - 250mL (A)					
Sample ID: L16H075-05	PZ5		Water	:	
Sampled: 08/26/16 10:56					
Lithium, Total EPA 6010		02/22/17 10:56			
Containers Supplied:					
Poly HNO3 - 250mL (A)					
Sample ID: L16H075-06	PZ6		Water		
Sampled: 08/26/16 I0:10				1.2.1	
Lithium, Total EPA 6010		02/22/17 10:10			
Containers Supplied:					
Poly HNO3 - 250mL (A)					



Loc: 660 75848

0.8/1.0 a-09

Beccosed ased By

8-26-16 1455

5-31-1601400

This.

Sall

7-3/-/6 @ 094 Date & Time

Date & Time

1400

Released By

Date & Time

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N - None
O - AsNaO2
P - Na2O4S
Q - Na2SO3
R - Na2SO3
S - H2SO4
T - TSP Dodecalydrate でする。 "SE CANDER IN ENVIRONMENTAL TEST, M Special Instructions/Note: U - Acetone V - MCAA W - pH 4-5 Z - other (specify) Months Company Sample Disposal ( A fee may be assessed if samples are retained longer than 1 month)

Return To Client Disposal, By Lab Mon Preservation Codes: A - HCL B - NaOH C - Zn Acetate D - Nitric Acid E - NaHSO4 F - MeOH G - Amchlor H - Ascorbic Acid Page: Page 1 of 1 660-90161.1 660-75848-1 I - Ice J - DI Water K - EDTA L - EDA Total Number of containers Date/Time: Method of Shipment Sarrier Tracking No(s): Analysis Requested Cooler Temperature(s) °C and Other Remarks: Special Instructions/QC Requirements: keaton.conner@testamericainc.com 13 Received by: Received by: Received by: × × × × × Chain of Custody Record Conner, Keaton muidii TOT\_q\_7.00s\7.00s Perform MS/MSD (Yes or Job) Time: Company TPA Company Field Filtered Sample (Yes or No) Lab PM: E-Mail: BT=Tissue, A=Air (W=water, S=solid, O=waste/oil, Preservation Code: Water Water Water Water Matrix Water Company (C=comp, G=grab) Sample Type 400 Primary Deliverable Rank: 2 Eastern 12:23 Eastern 11:33 Eastern 10:56 Eastern 10:10 Sample Eastern Time 12:52 Date: IAT Requested (days): Due Date Requested: 9/8/2016 Sample Date 9////6 8/26/16 8/26/16 8/26/16 8/26/16 8/26/16 66004821 SSOW#. Date/Time: Project #: Phone: ₩OW Client Information (Sub Contract Lab) Deliverable Requested: I, II, III, IV, Other (specify) Custody Seal No. Phone (813) 885-7427 Fax (813) 885-7049 Sample Identification - Client ID (Lab ID) 850-474-1001(Tel) 850-478-2671(Fax) Possible Hazard Identification 6712 Benjamin Road Suite 100 TestAmerica Tampa FestAmerica Laboratories, Inc. L16H075-01 (660-75848-1) L16H075-02 (660-75848-2) L16H075-03 (660-75848-3) 16H075-05 (660-75848-4) .16H075-06 (660-75848-5) Empty Kit Relinquished by: Custody Seals Intact: 3355 McLemore Drive, Δ Yes Δ No Tampa, FL 33634 Shipping/Receiving Relinquished by: Relinquished by: Unconfirmed State, Zip: FL, 32514 roject Name Pensacola \_16H075 Email: Page 14 of 16 9/9/2016

# **Login Sample Receipt Checklist**

Client: Tampa Electric Company

Job Number: 660-75848-1

Login Number: 75848 List Source: TestAmerica Tampa

List Number: 1

Creator: Southers, Kristin B

Creator. Southers, Mistill B		
Question	Answer	Comment
Radioactivity wasn't checked or is = background as measured by a survey meter.</td <td>True</td> <td></td>	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

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# **Login Sample Receipt Checklist**

Client: Tampa Electric Company

Job Number: 660-75848-1

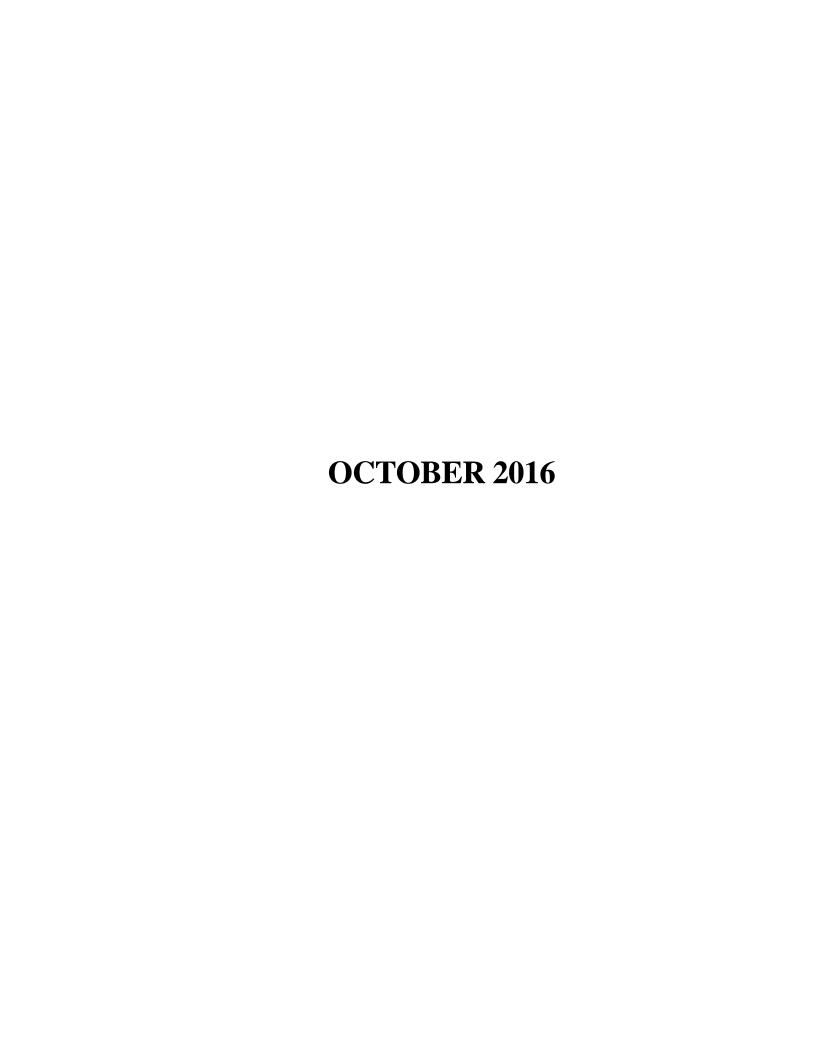
List Source: TestAmerica Pensacola
List Number: 2
List Creation: 09/02/16 11:57 AM

Creator: Johnson, Jeremy N

Creator. Johnson, Jeremy N		
Question	Answer	Comment
Radioactivity wasn't checked or is = background as measured by a survey meter.</td <td>N/A</td> <td></td>	N/A	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	0.0°C IR6
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	N/A	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

TestAmerica Tampa

9/9/2016





5012 Causeway Blvd Tampa Fl. 33619 \* Ph (813)630-7490 \* Fax (813)630-7360 \* DOH #E54272

**Report Date:** 

11/17/16 15:52

Big Bend Power Station Terry Eastley 13031 Wyandott Rd Apollo Beach, FL 33572 tleastley@tecoenergy.com

Project - CCR Wells Economizer Ash Pond

# **Case Narrative**

5 sample(s) were received on 10/28/16 12:45.

L16J027

There were no issues noted with the sample(s) associated with this workorder unless noted below.

#### **EPA 300.0**

Work Order -

The recovery of the matrix spike for Chloride and Sulfate was just below the control limits. The parent sample is flagged with a J qualifier.

#### **EPA 6010**

The recovery of the matrix spike and spike duplicate for Calcium could not be accurately determined due to the amount of target analyte in the sample matrix. The parent sample is flagged with a J qualifier.

#### SM 2540C

A constant weight could not be acheived after three consectutive weighing and drying cycles for samples BBS-CCR-1 and BBS-CCR-BW-1. The sample(s) are flagged with a J qualifier.



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## **Sample Information**

Client: Big Bend Power Station

Lab Sample ID: L16J027-01 Sampled By: Robert Barthelette

Sample Description: BBS-CCR-1 Date and Time Collected: 10/28/16 11:42
Sample Collection Method: Grab Date of Sample Receipt: 10/28/16 12:45

## **Laboratory Results**

#### Sample Qualifier:

					Qualifier		Test		Analysis	
Parameter	Result	Units	MDL	PQL	Code	Dil	Method	Analyst	Date & Time	
	,	Tampa Elec	tric Comp	any, Labo	ratory Se	rvices				
<b>General Chemistry Parameters</b>										
Chloride	743	mg/L	0.400	10.0	J-,V	20	EPA 300.0	TMH	11/1/16 16:05	
Specific Conductance	4060	umhos/cm	100	100		1	FDEP SOP FT 1200	RAB	10/28/16 11:42	
Dissolved Oxygen	0.100	mg/L	0.100	0.100	U	1	FDEP SOP FT 1500	RAB	10/28/16 11:42	
Fluoride	0.104	mg/L	0.0100	0.0500		1	EPA 300.0	TMH	11/1/16 15:55	
pH	6.83	pH Units	1.00	1.00		1	FDEP SOP FT 1100	RAB	10/28/16 11:42	
REDOX Potential	-107	mV	-999	-999		1	SM 2580B	RAB	10/28/16 11:42	
Total Dissolved Solids	3170	mg/L	24.0	40.0	J-	2	SM 2540C	RFL	10/31/16 12:40	
Sulfate	1230	mg/L	10.0	40.0	J-	20	EPA 300.0	TMH	11/1/16 16:05	
Turbidity	3.22	NTU	0.100	0.100		1	FDEP SOP FT 1600	RAB	10/28/16 11:42	
<b>Total Mercury by SW846 Metho</b>	d 7470/7471									
Mercury	0.0500	ug/L	0.0500	0.200	U	1	EPA 7470A	RLC	11/4/16 9:47	
<b>Total Recoverable Metals by 200</b>	<u>Series</u>									
Antimony	0.600	ug/L	0.600	2.00	U	1	EPA 200.8	RLC	11/2/16 9:35	
Arsenic	8.30	ug/L	0.320	2.00		1	EPA 200.8	RLC	11/2/16 9:35	
Cadmium	0.100	ug/L	0.100	0.500	U	1	EPA 200.8	RLC	11/2/16 9:35	
Cobalt	0.507	ug/L	0.0400	2.00	I	1	EPA 200.8	RLC	11/2/16 9:35	
Lead	0.0800	ug/L	0.0800	2.00	U	1	EPA 200.8	RLC	11/2/16 9:35	
Selenium	0.690	ug/L	0.200	2.00	I	1	EPA 200.8	RLC	11/2/16 9:35	
Thallium	0.100	ug/L	0.100	0.500	U	1	EPA 200.8	RLC	11/2/16 9:35	
<b>Total Recoverable Metals by SW</b>	846 Method	6010B								
Barium	122	ug/L	0.500	20.0		1	EPA 6010B	MCR	11/1/16 9:59	
Beryllium	0.200	ug/L	0.200	2.00	U	1	EPA 6010B	MCR	11/1/16 9:59	
Boron	15700	ug/L	10.0	50.0		1	EPA 6010B	MCR	11/2/16 11:23	
Calcium	556000	ug/L	30.0	1000	V	1	EPA 6010B	MCR	11/1/16 11:22	
Chromium	1.60	ug/L	1.60	12.0	U	1	EPA 6010B	MCR	11/1/16 9:59	
Molybdenum	95.5	ug/L	1.00	20.0		1	EPA 6010B	MCR	11/1/16 9:59	



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# **Sample Information**

Client: Big Bend Power Station

Lab Sample ID: L16J027-02 Sampled By: Robert Barthelette

Sample Description: BBS-CCR-2 Date and Time Collected: 10/28/16 11:15
Sample Collection Method: Grab Date of Sample Receipt: 10/28/16 12:45

## **Laboratory Results**

#### Sample Qualifier:

Decrease Acres	D14	II	MDI	DOI	Qualifier	Da	Test	A I4	Analysis
Parameter	Result	Units	MDL	PQL	Code	Dil	Method	Analyst	Date & Time
		Tampa Elec	tric Comp	any, Labo	ratory Se	rvices			
<b>General Chemistry Parameters</b>									
Chloride	112	mg/L	0.400	10.0	V	20	EPA 300.0	TMH	11/1/16 16:45
Specific Conductance	1500	umhos/cm	100	100		1	FDEP SOP FT 1200	RAB	10/28/16 11:15
Dissolved Oxygen	0.100	mg/L	0.100	0.100		1	FDEP SOP FT 1500	RAB	10/28/16 11:15
Fluoride	0.171	mg/L	0.0100	0.0500		1	EPA 300.0	TMH	11/1/16 16:35
pH	6.87	pH Units	1.00	1.00		1	FDEP SOP FT 1100	RAB	10/28/16 11:15
REDOX Potential	-183	mV	-999	-999		1	SM 2580B	RAB	10/28/16 11:15
Total Dissolved Solids	1130	mg/L	24.0	40.0		2	SM 2540C	RFL	10/31/16 12:40
Sulfate	468	mg/L	10.0	40.0		20	EPA 300.0	TMH	11/1/16 16:45
Turbidity	3.73	NTU	0.100	0.100		1	FDEP SOP FT 1600	RAB	10/28/16 11:15
<b>Total Mercury by SW846 Metho</b>	od 7470/7471								
Mercury	0.0500	ug/L	0.0500	0.200	U	1	EPA 7470A	RLC	11/4/16 9:50
<b>Total Recoverable Metals by 20</b>	0 Series								
Antimony	0.600	ug/L	0.600	2.00	U	1	EPA 200.8	RLC	11/2/16 9:39
Arsenic	1.16	ug/L	0.320	2.00	I	1	EPA 200.8	RLC	11/2/16 9:39
Cadmium	0.100	ug/L	0.100	0.500	U	1	EPA 200.8	RLC	11/2/16 9:39
Cobalt	0.107	ug/L	0.0400	2.00	I	1	EPA 200.8	RLC	11/2/16 9:39
Lead	0.129	ug/L	0.0800	2.00	I	1	EPA 200.8	RLC	11/2/16 9:39
Selenium	0.333	ug/L	0.200	2.00	I	1	EPA 200.8	RLC	11/2/16 9:39
Thallium	0.100	ug/L	0.100	0.500	U	1	EPA 200.8	RLC	11/2/16 9:39
<b>Total Recoverable Metals by SV</b>	V846 Method	6010B							
Barium	60.6	ug/L	0.500	20.0		1	EPA 6010B	MCR	11/1/16 10:02
Beryllium	0.200	ug/L	0.200	2.00	U	1	EPA 6010B	MCR	11/1/16 10:02
Boron	2080	ug/L	10.0	50.0		1	EPA 6010B	MCR	11/2/16 11:25
Calcium	181000	ug/L	30.0	1000	V	1	EPA 6010B	MCR	11/1/16 11:25
Chromium	1.60	ug/L	1.60	12.0	U	1	EPA 6010B	MCR	11/1/16 10:02
Molybdenum	1.00	ug/L	1.00	20.0	U	1	EPA 6010B	MCR	11/1/16 10:02



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# **Sample Information**

Client: Big Bend Power Station

Lab Sample ID: L16J027-03 Sampled By: Robert Barthelette

Sample Description: BBS-CCR-3 Date and Time Collected: 10/28/16 10:50
Sample Collection Method: Grab Date of Sample Receipt: 10/28/16 12:45

## **Laboratory Results**

#### Sample Qualifier:

					Qualifier		Test		Analysis		
Parameter	Result	Units	MDL	PQL	Code	Dil	Method	Analyst	Date & Time		
	,	Tampa Elec	tric Comp	any, Labo	ratory Sei	vices					
<b>General Chemistry Parameter</b>	<u>rs</u>										
Chloride	140	mg/L	0.400	10.0	V	20	EPA 300.0	TMH	11/1/16 17:26		
Specific Conductance	1640	umhos/cm	100	100		1	FDEP SOP FT 1200	RAB	10/28/16 10:50		
Dissolved Oxygen	0.100	mg/L	0.100	0.100	U	1	FDEP SOP FT 1500	RAB	10/28/16 10:50		
Fluoride	0.299	mg/L	0.0100	0.0500		1	EPA 300.0	TMH	11/1/16 17:15		
pH	6.42	pH Units	1.00	1.00		1	FDEP SOP FT 1100	RAB	10/28/16 10:50		
REDOX Potential	-266	mV	-999	-999		1	SM 2580B	RAB	10/28/16 10:50		
Total Dissolved Solids	1220	mg/L	24.0	40.0		2	SM 2540C	RFL	10/31/16 12:40		
Sulfate	541	mg/L	10.0	40.0		20	EPA 300.0	TMH	11/1/16 17:26		
Turbidity	3.26	NTU	0.100	0.100		1	FDEP SOP FT 1600	RAB	10/28/16 10:50		
<b>Total Mercury by SW846 Met</b>	thod 7470/7471										
Mercury	0.0500	ug/L	0.0500	0.200	U	1	EPA 7470A	RLC	11/4/16 9:54		
<b>Total Recoverable Metals by 2</b>	200 Series										
Antimony	0.600	ug/L	0.600	2.00	U	1	EPA 200.8	RLC	11/2/16 9:43		
Arsenic	0.623	ug/L	0.320	2.00	I	1	EPA 200.8	RLC	11/2/16 9:43		
Cadmium	0.100	ug/L	0.100	0.500	U	1	EPA 200.8	RLC	11/2/16 9:43		
Cobalt	0.124	ug/L	0.0400	2.00	I	1	EPA 200.8	RLC	11/2/16 9:43		
Lead	0.107	ug/L	0.0800	2.00	I	1	EPA 200.8	RLC	11/2/16 9:43		
Selenium	0.200	ug/L	0.200	2.00	U	1	EPA 200.8	RLC	11/2/16 9:43		
Thallium	0.100	ug/L	0.100	0.500	U	1	EPA 200.8	RLC	11/2/16 9:43		
Total Recoverable Metals by S	SW846 Method	6010B									
Barium	66.3	ug/L	0.500	20.0		1	EPA 6010B	MCR	11/1/16 10:04		
Beryllium	0.200	ug/L	0.200	2.00	U	1	EPA 6010B	MCR	11/1/16 10:04		
Boron	532	ug/L	10.0	50.0		1	EPA 6010B	MCR	11/2/16 11:28		
Calcium	201000	ug/L	30.0	1000	V	1	EPA 6010B	MCR	11/1/16 11:27		
Chromium	1.60	ug/L	1.60	12.0	U	1	EPA 6010B	MCR	11/1/16 10:04		
Molybdenum	3.63	ug/L	1.00	20.0	I	1	EPA 6010B	MCR	11/1/16 10:04		



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### **Sample Information**

Client: Big Bend Power Station

Lab Sample ID: L16J027-04 Sampled By: Robert Barthelette

Sample Description: BBS-CCR-BW-1 Date and Time Collected: 10/28/16 10:14
Sample Collection Method: Grab Date of Sample Receipt: 10/28/16 12:45

## **Laboratory Results**

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					Qualifier		Test	Analysis		
Parameter	Result	Units	MDL	PQL	Code	Dil	Method	Analyst	Date & Time	
	,	Tampa Elec	tric Compa	any, Labo	ratory Se	rvices				
<b>General Chemistry Parame</b>	<u>eters</u>									
Chloride	939	mg/L	0.400	10.0	V	20	EPA 300.0	TMH	11/1/16 17:46	
Specific Conductance	4860	umhos/cm	100	100		1	FDEP SOP FT 1200	RAB	10/28/16 10:14	
Dissolved Oxygen	0.130	mg/L	0.100	0.100		1	FDEP SOP FT 1500	RAB	10/28/16 10:14	
Fluoride	0.194	mg/L	0.0100	0.0500		1	EPA 300.0	TMH	11/1/16 17:36	
pH	6.50	pH Units	1.00	1.00		1	FDEP SOP FT 1100	RAB	10/28/16 10:14	
REDOX Potential	-76.2	mV	-999	-999		1	SM 2580B	RAB	10/28/16 10:14	
Total Dissolved Solids	4120	mg/L	24.0	40.0	J-	2	SM 2540C	RFL	10/31/16 12:40	
Sulfate	1400	mg/L	10.0	40.0		20	EPA 300.0	TMH	11/1/16 17:46	
Turbidity	4.08	NTU	0.100	0.100		1	FDEP SOP FT 1600	RAB	10/28/16 10:14	
Total Mercury by SW846 M	Method 7470/7471									
Mercury	0.0500	ug/L	0.0500	0.200	U	1	EPA 7470A	RLC	11/4/16 9:57	
Total Recoverable Metals b	oy 200 Series									
Antimony	6.00	ug/L	6.00	20.0	U	10	EPA 200.8	RLC	11/2/16 11:17	
Arsenic	3.20	ug/L	3.20	20.0	U	10	EPA 200.8	RLC	11/2/16 11:17	
Cadmium	1.00	ug/L	1.00	5.00	U	10	EPA 200.8	RLC	11/2/16 11:17	
Cobalt	0.963	ug/L	0.400	20.0	I	10	EPA 200.8	RLC	11/2/16 11:17	
Lead	0.800	ug/L	0.800	20.0	U	10	EPA 200.8	RLC	11/2/16 11:17	
Selenium	2.00	ug/L	2.00	20.0	U	10	EPA 200.8	RLC	11/2/16 11:17	
Thallium	1.00	ug/L	1.00	5.00	U	10	EPA 200.8	RLC	11/2/16 11:17	
<b>Total Recoverable Metals b</b>	y SW846 Method	6010B								
Barium	60.0	ug/L	0.500	20.0		1	EPA 6010B	MCR	11/1/16 10:07	
Beryllium	0.200	ug/L	0.200	2.00	U	1	EPA 6010B	MCR	11/1/16 10:07	
Boron	51400	ug/L	10.0	50.0		1	EPA 6010B	MCR	11/2/16 11:31	
Calcium	675000	ug/L	30.0	1000	V	1	EPA 6010B	MCR	11/1/16 11:30	
Chromium	1.60	ug/L	1.60	12.0	U	1	EPA 6010B	MCR	11/1/16 10:07	
Molybdenum	6.00	ug/L	1.00	20.0	I	1	EPA 6010B	MCR	11/1/16 10:07	



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### **Sample Information**

Client: Big Bend Power Station

Lab Sample ID: L16J027-05 Sampled By: Robert Barthelette

Sample Description: BBS-CCR-BW-2 Date and Time Collected: 10/28/16 9:42
Sample Collection Method: Grab Date of Sample Receipt: 10/28/16 12:45

## **Laboratory Results**

#### Sample Qualifier:

					Qualifier		Test		Analysis
Parameter	Result	Units	MDL	PQL	Code	Dil	Method	Analyst	Date & Time
	,	Tampa Elec	tric Comp	any, Labo	ratory Se	rvices			
<b>General Chemistry Parameters</b>									
Chloride	125	mg/L	0.400	10.0	V	20	EPA 300.0	TMH	11/1/16 18:06
Specific Conductance	1340	umhos/cm	100	100		1	FDEP SOP FT 1200	RAB	10/28/16 9:42
Dissolved Oxygen	0.370	mg/L	0.100	0.100		1	FDEP SOP FT 1500	RAB	10/28/16 9:42
Fluoride	0.440	mg/L	0.0100	0.0500		1	EPA 300.0	TMH	11/1/16 17:56
pH	6.67	pH Units	1.00	1.00		1	FDEP SOP FT 1100	RAB	10/28/16 9:42
REDOX Potential	-91.5	mV	-999	-999		1	SM 2580B	RAB	10/28/16 9:42
Total Dissolved Solids	1010	mg/L	24.0	40.0		2	SM 2540C	RFL	10/31/16 12:40
Sulfate	246	mg/L	10.0	40.0		20	EPA 300.0	TMH	11/1/16 18:06
Turbidity	3.99	NTU	0.100	0.100		1	FDEP SOP FT 1600	RAB	10/28/16 9:42
<b>Total Mercury by SW846 Method</b>	d 7470/7471								
Mercury	0.0500	ug/L	0.0500	0.200	U	1	EPA 7470A	RLC	11/4/16 10:27
<b>Total Recoverable Metals by 200</b>	Series								
Antimony	0.600	ug/L	0.600	2.00	U	1	EPA 200.8	RLC	11/2/16 9:50
Arsenic	1.62	ug/L	0.320	2.00	I	1	EPA 200.8	RLC	11/2/16 9:50
Cadmium	0.100	ug/L	0.100	0.500	U	1	EPA 200.8	RLC	11/2/16 9:50
Cobalt	0.151	ug/L	0.0400	2.00	I	1	EPA 200.8	RLC	11/2/16 9:50
Lead	0.0800	ug/L	0.0800	2.00	U	1	EPA 200.8	RLC	11/2/16 9:50
Selenium	0.489	ug/L	0.200	2.00	I	1	EPA 200.8	RLC	11/2/16 9:50
Thallium	0.100	ug/L	0.100	0.500	U	1	EPA 200.8	RLC	11/2/16 9:50
<b>Total Recoverable Metals by SW</b>	846 Method	6010B							
Barium	46.3	ug/L	0.500	20.0		1	EPA 6010B	MCR	11/1/16 10:10
Beryllium	0.200	ug/L	0.200	2.00	U	1	EPA 6010B	MCR	11/1/16 10:10
Boron	3900	ug/L	10.0	50.0		1	EPA 6010B	MCR	11/2/16 11:33
Calcium	238000	ug/L	30.0	1000	J-,V	1	EPA 6010B	MCR	11/1/16 11:32
Chromium	1.60	ug/L	1.60	12.0	U	1	EPA 6010B	MCR	11/1/16 10:10
Molybdenum	1.42	ug/L	1.00	20.0	I	1	EPA 6010B	MCR	11/1/16 10:10

#### **Comments**

- U Indicates that the compound was analyzed for but not detected.
- J- The reported value is an estimated value, see the case narrative for specifics.
- I Estimated value
- V Analyte detected in the method blank

Laboratory Services certifies that the test result in this report meet all requirements of the NELAC standards, unless indicated otherwise in the body of the report. Unless otherwise noted, all methods followed are per the most current published version of 40 CFR Part 136, Table B. Results reported on this report pertain to the above referenced sample only.



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**Subcontract Laboratories:** 



5012 Causeway Blvd Tampa Fl. 33619 \* Ph (813)630-7490 \* Fax (813)630-7360 \* DOH #E54272

### Total Recoverable Metals by SW846 Method 6010B - Quality Control

					Spike	Source		%Rec		RPD	
Analyte	Result	MDL	PQL	Units	Level	Result	%Rec	Limits	RPD	Limit	Qualifier
Batch 16J0236 - EPA 6010B											
Blank (16J0236-BLK1)					Prepared: 1	0/31/16 Ar	nalyzed: 11	/01/16			
Barium	0.500	0.500	20.0	ug/L							U
Beryllium	0.200	0.200	2.00	ug/L							U
Boron	10.0	10.0	50.0	ug/L							U
Calcium	38.1	30.0	1000	ug/L							I
Chromium	1.60	1.60	12.0	ug/L							U
Molybdenum	1.00	1.00	20.0	ug/L							U
LCS (16J0236-BS1)					Prepared: 1	0/31/16 Ar	nalyzed: 11	/01/16			
Barium	1030	0.500	20.0	ug/L	1000.0		103	80-120			
Beryllium	1060	0.200	2.00	ug/L	1000.0		106	80-120			
Boron	1070	10.0	50.0	ug/L	1000.0		107	80-120			
Chromium	1040	1.60	12.0	ug/L	1000.0		104	80-120			
Molybdenum	978	1.00	20.0	ug/L	1000.0		97.8	80-120			
Matrix Spike (16J0236-MS1)		Sour	ce: L16J02	7-05	Prepared: 1	0/31/16 Ar	nalyzed: 11	/01/16			
Barium	1050	0.500	20.0	ug/L	1000.0	46.3	99.9	75-125			
Beryllium	1030	0.200	2.00	ug/L	1000.0	U	103	75-125			
Boron	4890	10.0	50.0	ug/L	1000.0	3900	98.6	75-125			
Chromium	1000	1.60	12.0	ug/L	1000.0	U	100	75-125			
Molybdenum	970	1.00	20.0	ug/L	1000.0	1.42	96.8	75-125			
Matrix Spike Dup (16J0236-MSD1)		Sour	ce: L16J02	7-05	Prepared: 1	0/31/16 Ar	nalyzed: 11	/01/16			
Barium	1080	0.500	20.0	ug/L	1000.0	46.3	104	75-125	3.62	20	
Beryllium	1060	0.200	2.00	ug/L	1000.0	U	106	75-125	2.92	20	
Boron	4950	10.0	50.0	ug/L	1000.0	3900	105	75-125	1.32	20	
Chromium	1040	1.60	12.0	ug/L	1000.0	U	104	75-125	3.52	20	
Molybdenum	1020	1.00	20.0	ug/L	1000.0	1.42	102	75-125	5.04	20	



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### Total Mercury by SW846 Method 7470/7471 - Quality Control

					Spike	Source		%Rec		RPD	
Analyte	Result	MDL	PQL	Units	Level	Result	%Rec	Limits	RPD	Limit	Qualifier
Batch 16K0037 - EPA 7470A											
Blank (16K0037-BLK1)					Prepared:	1/03/16 A	nalyzed: 11	/04/16			
Mercury	0.0500	0.0500	0.200	ug/L							U
LCS (16K0037-BS1)					Prepared:	1/03/16 A	nalyzed: 11	/04/16			
Mercury	1.04	0.0500	0.200	ug/L	1.0000		104	80-120			
Matrix Spike (16K0037-MS1)		Sour	ce: L16K02	28-03	Prepared:	1/03/16 A	nalyzed: 11	/04/16			
Mercury	0.893	0.0500	0.200	ug/L	1.0000	U	89.3	75-125			
Matrix Spike Dup (16K0037-MSD1)		Sour	ce: L16K02	28-03	Prepared: 1	1/03/16 A	nalyzed: 11	/04/16			
Mercury	0.922	0.0500	0.200	ug/L	1.0000	U	92.2	75-125	3.22	20	



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### **Total Recoverable Metals by 200 Series - Quality Control**

					Spike	Source		%Rec		RPD	
Analyte	Result	MDL	PQL	Units	Level	Result	%Rec	Limits	RPD	Limit	Qualifier
Batch 16J0235 - EPA 200.8											
Blank (16J0235-BLK1)					Prepared: 1	10/31/16 Ar	nalyzed: 11	/02/16			
Antimony	0.600	0.600	2.00	ug/L							U
Arsenic	0.320	0.320	2.00	ug/L							U
Cadmium	0.100	0.100	0.500	ug/L							U
Cobalt	0.0400	0.0400	2.00	ug/L							U
Lead	0.0800	0.0800	2.00	ug/L							U
Selenium	0.200	0.200	2.00	ug/L							U
Thallium	0.100	0.100	0.500	ug/L							U
LCS (16J0235-BS1)					Prepared: 1	10/31/16 Ar	nalyzed: 11	/02/16			
Antimony	103	0.600	2.00	ug/L	100.00		103	85-115			
Arsenic	98.4	0.320	2.00	ug/L	100.00		98.4	85-115			
Cadmium	102	0.100	0.500	ug/L	100.00		102	85-115			
Cobalt	104	0.0400	2.00	ug/L	100.00		104	85-115			
Lead	106	0.0800	2.00	ug/L	100.00		106	85-115			
Selenium	95.2	0.200	2.00	ug/L	100.00		95.2	85-115			
Thallium	106	0.100	0.500	ug/L	100.00		106	85-115			
Matrix Spike (16J0235-MS1)		Sour	ce: L16J02	7-01	Prepared: 1	10/31/16 Ar	nalyzed: 11	/02/16			
Antimony	99.1	0.600	2.00	ug/L	100.00	U	99.1	70-130			
Arsenic	92.9	0.320	2.00	ug/L	100.00	8.30	84.6	70-130			
Cadmium	77.6	0.100	0.500	ug/L	100.00	U	77.6	70-130			
Cobalt	85.1	0.0400	2.00	ug/L	100.00	0.507	84.6	70-130			
Lead	88.4	0.0800	2.00	ug/L	100.00	U	88.4	70-130			
Selenium	82.3	0.200	2.00	ug/L	100.00	0.690	81.6	70-130			
Thallium	92.1	0.100	0.500	ug/L	100.00	U	92.1	70-130			
Matrix Spike Dup (16J0235-MSD1)		Sour	ce: L16J02	7-01	Prepared: 1	10/31/16 Ar	nalyzed: 11	/02/16			
Antimony	99.3	0.600	2.00	ug/L	100.00	U	99.3	70-130	0.240	20	
Arsenic	94.6	0.320	2.00	ug/L	100.00	8.30	86.3	70-130	1.88	20	
Cadmium	78.8	0.100	0.500	ug/L	100.00	U	78.8	70-130	1.46	20	
Cobalt	88.2	0.0400	2.00	ug/L	100.00	0.507	87.6	70-130	3.47	20	
Lead	88.2	0.0800	2.00	ug/L	100.00	U	88.2	70-130	0.156	20	
Selenium	84.6	0.200	2.00	ug/L	100.00	0.690	83.9	70-130	2.73	20	
Thallium	92.3	0.100	0.500	ug/L	100.00	U	92.3	70-130	0.295	20	



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### **General Chemistry Parameters - Quality Control**

					Spike	Source		%Rec		RPD	
Analyte	Result	MDL	PQL	Units	Level	Result	%Rec	Limits	RPD	Limit	Qualifier
Batch 16J0241 - SM 2540C											
Blank (16J0241-BLK1)					Prepared &	Analyzed:	10/31/16				
Total Dissolved Solids	12.0	12.0	20.0	mg/L							U
LCS (16J0241-BS1)					Prepared &	: Analyzed:	10/31/16				
Total Dissolved Solids	1020	12.0	20.0	mg/L	1000.0		102	80-120			
Duplicate (16J0241-DUP1)		Sour	ce: L16J02′	7-01	Prepared &	Analyzed:	10/31/16				
Total Dissolved Solids	3200	24.0	40.0	mg/L		3170			1.01	10	J-
Duplicate (16J0241-DUP2)		Sour	ce: L16J14	1-02	Prepared &	Analyzed:	10/31/16				
Total Dissolved Solids	135	12.0	20.0	mg/L		128			5.32	10	
Batch 16K0007 - EPA 300.0											
Blank (16K0007-BLK1)					Prepared &	: Analyzed:	11/01/16				
Chloride	0.101	0.0200	0.500	mg/L							I
Fluoride	0.0100	0.0100	0.0500	mg/L							U
Sulfate	0.500	0.500	2.00	mg/L							U
LCS (16K0007-BS1)					Prepared &	Analyzed:	11/01/16				
Chloride	4.88	0.0200	0.500	mg/L	5.0000		97.5	90-110			V
Fluoride	4.76	0.0100	0.0500	mg/L	5.0000		95.2	90-110			
Sulfate	5.12	0.500	2.00	mg/L	5.0000		102	90-110			
Matrix Spike (16K0007-MS1)		Sour	ce: L16J02′	7-01	Prepared &	: Analyzed:	11/01/16				
Chloride	831	0.400	10.0	mg/L	100.00	743	87.9	90-110			J-,V
Fluoride	105	0.200	1.00	mg/L	100.00	0.104	105	90-110			
Sulfate	1310	10.0	40.0	mg/L	100.00	1230	80.7	90-110			J-



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### **General Chemistry Parameters - Quality Control**

Analyte  Batch 16K0007 - EPA 300.0	Result	MDL	PQL	Units	Spike Level	Source Result	%Rec	%Rec Limits	RPD	RPD Limit	Qualifier
Matrix Spike Dup (16K0007-MSD1)			e: L16J02	-	Prepared &						
Chloride	836	0.400	10.0	mg/L	100.00	743	93.4	90-110	0.659	20	V
Fluoride	106	0.200	1.00	mg/L	100.00	0.104	106	90-110	0.900	20	
Sulfate	1320	10.0	40.0	mg/L	100.00	1230	90.2	90-110	0.726	20	

Tampa Electric Company, Laboratory Services

Peggy Penner, Manager, Laboratory Services

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Laboratory Services certifies that the test result in this report meet all requirements of the NELAC standards, unless indicated otherwise in the body of the report. Unless otherwise noted, all methods followed are per the most current published version of 40 CFR Part 136, Table B. Results reported on this report pertain to the above referenced sample only.

Sampler(s) /
Initials RAB /TECO Initials

Site:	Big Be	end	Date:	10/28/116	File Name:	10/28/116	_Wells_RAB	Weather:	PTLY CLOU	IDY & WARM	Sampler(s) / Initials	RAB /TEC	O Initials	
LIMS #	Loction Code	Time	FE <sup>2</sup>	pH (SU)	Temp °C	Cond(uMHOS)	DO Mg/L	Turbidity(NTU)	Redox (mv)	Sulfite (mg/L)	Color	Odor	N	IGVD
			mg/l	PH	TEMP-C	COND-F	DO	TURB-N-F	REDOX	SO3-TR	\$COLOR-W	\$ODOR-W	Time	LEVEL
L16J027-01	BBS-CCR-1	11:42		6.83	25.78	4064	0.04	3.22	-106.80		CLEAR	NONE	11:47	
L16J027-02	BBS-CCR-2	11:15		6.87	25.64	1505	0.10	3.73	-183.20		LT YELLOW	NONE	10:58	
LIMS#	250ml Cyan (3)	1L Inorg (1)	500ml Inorg (2)	250ml Inorg (3)	1L Mtls (1)	250ml Mtls (3)	1L Rads (1)	500ml Sulfide (2)	500ml Mtls (2)	250ml Nuts (3)	40ml Vial (6)	500 ml Nuts (2)	1L Rads Diss. (1)	Total Containers
L16J027-01		12 111019 (1)	1	200m morg (o)		<ul> <li>✓ 2</li> </ul>	<ul><li>✓ 2</li></ul>							
L16J027-02			1				<u> </u>		П		_	П		10
(1) 1L plastic (PP)		(2) 500ml plastic	· (PP)	(3) 250ml plastic	'PP\	(4) 100ml coliform be		(5) 1L amber glass (A	AG)	(6) 40ml VOA vial	(CG)	_	Samples On Ice	Sample Reciept
ESS	01073001Y	ESS	0218201Y	ESS	0307301Y	ESS	, and	ESS	10)	ESS	(00)		✓ Yes □ No	Time 12:45
	Preservation	200	OZ TOZOTT	Pres ID	00010011	Preservation		200	Pres ID	200	Preservation		Pres ID	Temp 2.7
1L bottles (rads): 5 ml H				L 010688 ✓	250ml hattles (nu	s): 1 ml H2SO4 to ph	-2		Pres ID	EOO mil hattlas/Culfi	de) 2ml NAOH/Zinc /	Annt to mill > 10	L Pres ID	Tellip 2.7
500 ml bottles (metals):	•	I		<u> </u>	,	0.5 ml H2SO4 to pH					n) 1a NAOH to pH >		L -	
,				L 040000 🗷	. ( ,					(-,	, , ,		=	
250 ml bottles (metal): 1	mi HNO3 to pH <2			L 010688 ☑			um, 5 ml HNO3 to pH <2		_		licates that the sam			
pH Meter Calibration		Buffer ID	Buffer Value	Cal	Time	ICV	Time	CCV	Time	Redox Cal	Time	Temp °C	Reading mv	Theo Value mv
Meter ID:	MPMO8	L 016047E	7	7.02	8:20			7.09	12:37	Meter ID:	8:36	21.7	236.0	236.2
FDEP FT 1100		L 016500A	10	10.05	8:20		nd +/- 5%) (DO +/- 0.3m			MPM08	12:32	21.8	232.5	236.2
Units: SU		L 015514B	4	3.99	8:20		cates ICV / CCV passed	1		Zobell Sol ID:	1	<del> </del>		
Conductivity Meter Cal		Standard ID	Std Value	Cal	Time	ICV	Time	CCV	Time	L 016396		T 02		
Meter ID:	MPM08	L 013847E	1000	1000	8:29					DO Meter Cal	Time	Temp °C	Reading mg/l	Theo Value mg/l
FDEP FT 1200, Units: ul	MHOS	L 015370B	10000			9760	8:31	9720	12:28	Meter ID:	8:12	21.6	8.86	8.829
Turbidity Meter Calibra	ition	Standard ID	Std Value	Acceptabi	lity Range	ICV	Time	CCV	Time	MPM08	12:35	21.8	8.83	8.777
Meter ID:	TM07	L 013677	5.28	4.75	5.81	5.35	7:55			Barom. Pres				
FDEP FT 1600, Units: N	TU	L 013678	52.20	48.81	55.59			52.30	12:35	760				
Sulfite Info (QC Check)	(EPA 377.1)		QC Result mg/l	Time	Titrator ID	Na Thio ID	DO 3 Pillow ID	Starch Ind. ID	lodate/lodide ID	Therm ID	рН	Conduct.( %)	DO (mg/l)	Redox (mv)
QC Std: 5ml (NaThio)/50	00ml DI=10mg/L					L	L	L	L	MPM08	0.2	5	0.3	10
Purging Information		Well Capacities	s (gallons/ ft): 2	" = 0.16 4" =0.65		Tubing Inside Diam	. Capacities Gallons/ft)	: 1/4" =0.0026, 3/8" =6						
Well #	Diam/ Comp	Screen Interval (ft)	Intake Depth (ft)	Well Depth (ft)	Depth to Water (ft)	= Water Column (ft)	Well Capacity (gal) =	1 Well Volume (gal)	Tubing Capacity X (gal/ft.)	Tubing Length (ft)	+ Pump Volume (gal) +	Cell Volume (gal)	1 Eqpt. Volume (gal)	
BBS-CCR-1	2	10	17.32	22.32	6.78	15.54	0.16	2.49	0.0026	23.3	0	0.06	0.12	
Purge Meth:	Time	Rate (ml/min)	Volume (gal)	Total Vol. (gal)	Water Depth (ft)	pH (SU)	Temp °C	Cond (uMHOS)	DO (mg/L)	Turbidity (NTU)	Purge Criteria	Status	Equipment ID	Egpt. Table
1A	11:14	700	1.29	1.29	6.94	6.84	25.82	4056	0.05	4.74	ph;+/- 0.2	STABLE	Level Meter:	WLM08
Purge Start:	11:16	700	0.37	1.66	6.94	6.83	25.80	4067	0.04	3.65	Temp°C+/- 0.2	STABLE	Pump:	PP
11:07	11:18	700	0.37	2.03	6.92	6.83	25.78	4064	0.04	3.22	Cond % +/- 5	STABLE	Tubing:	PE/S
Purge End:	11.10	700	0.07	2.00	0.02	0.00	20.70	7007	0.04	0.22	DO % Sat. < 20	STABLE	Ŭ	✓ Yes
11:18											Turb. NTU < 20	STABLE	Dodioatoa	□ No
Purge Complete A	t 11-08	Gallons to P	urge 012	Stablility	Values =	6.83	25.78	4064	0.04	3.22	1000. N10 × 20	O. ABEL	. abing:	110
Well#	Diam/ Comp	Screen Interval (ft)	Intake Depth (ft)	Well Depth (ft)	Depth to	Water Column (ft)	Well	1 Well Volume (gal)	Tubing Capacity X (gal/ft.)	Tubing Length (ft)	Pump + Volume + (gal)	Cell Volume =	1 Eqpt. Volume (gal)	
BBS-CCR-2	2	10	16.84	21.84	6.78	15.06	0.16	2.41	0.0026	22.84	0	0.06	0.12	
Purge Meth:	Time	Rate (ml/min)	Volume (gal)		Water Depth (ft)	pH (SU)	Temp °C	Cond (uMHOS)	DO (mg/L)	Turbidity (NTU)	Purge Criteria	Status		Egpt, Table
		_ `		Total Vol. (gal)				, ,					Equipment ID	
1A	11:04	720	0.95	0.95	6.92	6.85	25.64	1467	0.08	6.03	0.0	STABLE	Level Meter:	WLM08
Purge Start:	11:06	700	0.37	1.32	6.92	6.86	25.62	1485	0.09	3.88	Temp°C+/- 0.2	STABLE	Pump:	PP
10:59	11:08	700	0.37	1.69	6.92	6.87	25.64	1505	0.10	3.73	Cond % +/- 5	STABLE	Tubing:	PE/S
Purge End:				1				1		1	DO % Sat.< 20	STABLE	Dedicated	✓ Yes
11:08											Turb. NTU < 20	STABLE	Tubing?	□ No
Purge Complete A	t 11:00	Gallons to F	orge 0.12	Stablility	Values =	6.87	25.64	1505	0.10	3.73				
Comments:	¥											Total Time	Total	Miles

Sampler(s) /
Initials RAB /TECO Initials

Site:	Big Be	end	Date:	10/28/116	File Name:	10/28/116	Wells_RAB	Weather:	PTLY CLOU	DY & WARM	Sampler(s) / Initials	RAB /TEC	O Initials	
LIMS #	Loction Code	Time	FE <sup>2</sup>	pH (SU)	Temp °C	Cond(uMHOS)	DO Mg/L	Turbidity(NTU)	Redox (mv)	Sulfite (mg/L)	Color	Odor	N	IGVD
			mg/l	PH	TEMP-C	COND-F	DO	TURB-N-F	REDOX	SO3-TR	\$COLOR-W	\$ODOR-W	Time	LEVEL
L16J027-03	BBS-CCR-3	10:50		6.42	26.20	1645	0.03	3.26	-265.90		YELLOW	STRONG	10:27	
	CCR-PZ-4													
LIMS#	250ml Cyan (3)	1L Inorg (1)	500ml Inorg (2)	250ml Inorg (3)	1L Mtls (1)	250ml Mtls (3)	1L Rads (1)	500ml Sulfide (2)	500ml Mtls (2)	250ml Nuts (3)	40ml Vial (6)	500 ml Nuts (2)	1L Rads Diss. (1)	Total Containers
L16J027-03		3 ( )	1	3 (1)			☑ 2							
														5
(1) 1L plastic (PP)		(2) 500ml plastic	c (PP)	(3) 250ml plastic (	PP)	(4) 100ml coliform bo	ottle	(5) 1L amber glass (	AG)	(6) 40ml VOA vial	(CG)		Samples On Ice	Sample Reciept
ESS	01073001Y	ESS	0218201Y	ESS	0307301Y	ESS		ESS		ESS			✓ Yes □ No	Time 12:45
	Preservation			Pres ID		Preservation		•	Pres ID		Preservation		Pres ID	Temp 2.7
1L bottles (rads): 5 ml Hl				L 010688 🗹	250ml bottles (nu	ts): 1 ml H2SO4 to pH	<2		L 🗆	500 ml bottles(Sulfi	ide) 2ml NAOH/Zinc	Acet, to pH >12	L -	, =::
500 ml bottles (metals):				1.	`	0.5 ml H2SO4 to pH				· · · · · ·	an) 1g NAOH to pH >	•	L 🗆	
250 ml bottles (metal): 1	•				, ,		um, 5 ml HNO3 to pH <2	1	L 🗆	` ,	dicates that the sam		anH of <2	
pH Meter Calibration		Buffer ID	Buffer Value	Cal	Time	ICV	Time	CCV	Time	Redox Cal	Time	Temp °C	Reading mv	Theo Value mv
Meter ID:	MPMO8	L 016047E	7	7.02	8:20	150	14116	7.09	12:37	Meter ID:	8:36	21.7	236.0	236.2
FDEP FT 1100	IVII IVIOU	L 016500A	10	10.05	8:20	OC: (pH +/ 0.3) (C-	nd +/- 5%) (DO +/- 0.3m			MPM08	12:32	21.7	232.5	236.2
Units: SU		L 015514B	4	3.99	8:20		cates ICV / CCV passed	• , .	1	Zobell Sol ID:	12.32	21.0	202.0	230.2
Conductivity Meter Cal	ih	Standard ID	Std Value	Cal	Time	ICV	Time	ccv	Time	L 96				
Meter ID:	MPM08	L 013847E	1000	1000	8:29	100	Tille	000	Time	DO Meter Cal	Time	Temp °C	Reading mg/l	Theo Value mg/l
FDEP FT 1200, Units: uN		L 015370B	10000	1000	0.25	9760	8:31	9720	12:28	Meter ID:	8:12	21.6	8.86	8.829
Turbidity Meter Calibra		Standard ID	Std Value	Acceptabi	lity Bangs	ICV	Time	CCV	Time	MPM08	12:35	21.8	8.83	8.777
	TM07	L 013677	5.28	4.75	5.81	5.35	7:55	CCV	rime	Barom. Pres	12.33	21.0	0.03	0.111
Meter ID: FDEP FT 1600, Units: N		L 013678	52.20	48.81	55.59	0.30	7.55	52.30	12:35	760			<del> </del>	
		013076				N. This ID	DO 0 Bill IS					On a durat (CO)	DO (/1)	De dess (see )
Sulfite Info (QC Check) QC Std: 5ml (NaThio)/50	,		QC Result mg/	Time	Titrator ID	Na Thio ID	DO 3 Pillow ID	Starch Ind. ID	lodate/lodide ID	Therm ID MPM08	рН 0.2	Conduct.( %)	DO (mg/l) 0.3	Redox (mv)
	om DI-Torrig/L	Woll Consolds	(gallors/ft) 0	" = 0.16 4" =0.65		Tubing Incide D'ann	. Capacities Gallons/ft):			IVII IVIUO	U.Z	<u> </u>	V.3	10
Purging Information		vven Capacities	ganons/ mj: 2	Well	Depth to	Mater	Well	1 Well		Tubing	Pump	Cell	1 Eqpt.	
Well #	Diam/ Comp	Screen Interval (ft)	Intake Depth (ft)	Depth (ft)	Depth to Water (ft)	Column (ft)	Capacity = (gal)	Volume (gal)	Capacity X (gal/ft.)	Length ) -	+ Volume + (gal)	Volume (gal) =		
BBS-CCR-3	2	10	18.23	23.23	6.54	16.69	0.16	2.67	0.0026	24.23	0	0.06	0.12	
Purge Meth:	Time	Rate (ml/min)	Volume (gal)	Total Vol. (gal)	Water Depth (ft)	pH (SU)	Temp °C	Cond (uMHOS)	DO (mg/L)	Turbidity (NTU)	Purge Criteria	Status	Equipment ID	Eqpt. Table
1A	10:35	340	0.72	0.72	6.98	6.41	26.08	1685	0.04	5.33	ph:+/- 0.2	STABLE	Level Meter:	WLM08
Purge Start:	10:37	340	0.18	0.90	6.98	6.41	26.19	1660	0.04	4.23	Temp°C+/- 0.2	STABLE	Pump:	PP
10:27	10:39	340	0.18	1.08	6.99	6.42	26.20	1645	0.03	3.26	Cond % +/- 5	STABLE	Tubing:	PE/S
Purge End:											DO % Sat.< 20	STABLE	Dedicated	✓ Yes
10:39											Turb. NTU < 20	STABLE	Tubing?	□ No
Purge Complete At	t 10:28	Gallons to F	ourge 0.12	Stablility	Values =	6.42	26.20	1645	0.03	3.26				
Well #	Diam/ Comp	Screen Interval (ft)	Intake Depth (ft)	Well - Depth (ft)	Depth to Water (ft)	Water X	Well Capacity = (gal)	1 Well Volume (gal)	Tubing Capacity X (gal/ft.)	Tubing Length (ft)	Pump + Volume (gal) +	Cell Volume (gal] =	1 Eqpt. Volume (gal)	
CCR-PZ-4	2	10	14	18		18.00	0.16	2.88	0.0026	100	0	0.06	0.32	
Purge Meth:	Time		Volume (gal)	Total Vol. (gal)	Water Depth (ft)	pH (SU)	Temp °C	Cond (uMHOS)	DO (mg/L)	Turbidity (NTU)		Status		Egpt. Table
uige welli.	Time	Rate (ml/min)	volume (gai)	rotal vol. (gal)	vvater Depti1 (tt)	μπ (50)	Tellip C	CONG (GIVINOS)	DO (mg/L)	raibidity (NTO)	Purge Criteria ph:+/- 0.2	Status	Equipment ID Level Meter:	WLM08
Durana Start											pn:+/- 0.2 Temp°C+/- 0.2			PP
Purge Start:		<u> </u>	<del> </del>	1				<del> </del>	1		-		Pump:	PE/S
Down Ford			<del>                                     </del>					1			Cond % +/-		Tubing:	
Purge End:											DO % Sat. < 20		Dedicated Tubing?	✓ Yes   □ No
Purge Complete A	<u> </u>	Gallons to F	Durge 022	Ctobiit.	/aluga =			1			Turb. NTU < 20		rabing?	— INO
		Gallolis to I	urge 0.32	Stablity \	values =			1	1					
Comments:												Total Time	Total	Miles

LIMS #	Big Be Loction Code	Time	Date:	:: II (OII)	File Name:		_Wells_RAB	Weather:		DY & WARM	0-1	RAB /TEC		IGVD
	Loction Code	Time	mg/l	pH (SU)	TEMP-C	Cond(uMHOS)  COND-F	DO Mg/L DO	Turbidity(NTU)  TURB-N-F	Redox (mv) REDOX	Sulfite (mg/L) SO3-TR	Color \$COLOR-W	Odor \$ODOR-W	Time	LEVEL
L16J027-04	BBS-CCR-BW-1	10:14	mg/i	6.50	27.46	4858	0.13	4.08	-76.20	303-11	CLEAR	MILD	9:51	LEVEL
L16J027-04 L16J027-05	BBS-CCR-BW-2	9:42		6.67	27.46	1345	0.13	3.99	-76.20 -91.5		LT. YELLOW	MILD	9:17	
LIMS #			50011(0)			250ml Mtls (3)				050  Note (0)				T-4-LO4-in
	250ml Cyan (3)	1L Inorg (1)	500ml Inorg (2)	250ml Inorg (3)	1L Mtls (1)		1L Rads (1)	500ml Sulfide (2)	500ml Mtls (2)	250ml Nuts (3)	40ml Vial (6)	500 ml Nuts (2)	1L Rads Diss. (1)	Total Contain
100027-04			1			<ul><li>✓ 2</li><li>✓ 2</li></ul>	<ul><li> 2</li><li> 2</li><li> 2</li></ul>	H	H		<u> </u>		H	10
.0002. 00		(0) 500 1 1	<u> </u>	(0) 050 1 1 1	(00)	_			_	(0) (0 1) (04 1)				
1L plastic (PP)	040700041/	(2) 500ml plas	` '	(3) 250ml plastic	,	(4) 100ml coliform bo	ottie	(5) 1L amber glass (	AG)	(6) 40ml VOA vial	(CG)		Samples On Ice	Sample Reciept
SS	01073001Y	ESS	0218201Y	ESS		ESS		ESS		ESS				Time 12:45
	Preservation			Pres ID		Preservation			Pres ID		Preservation		Pres ID	Temp 2.7
bottles (rads): 5 ml F				L 010688 ☑	•	ts): 1 ml H2SO4 to pH					de) 2ml NAOH/Zinc A	-		
	2 ml HNO3 to pH <2			L 🗆	` ,	0.5 ml H2SO4 to pH			<u> </u>	` ,	in) 1g NAOH to pH >		L 🗆	
0 ml bottles (metal):	1 ml HNO3 to pH <2			L 010688 ☑	1L bottles (diss. ra	ads): filtered with 0.45	um, 5 ml HNO3 to pH <2		<u> </u>	A checked box inc	dicates that the sam	ple was verified to	a pH of <2	
Meter Calibration		Buffer ID	Buffer Value	Cal	Time	ICV	Time	CCV	Time	Redox Cal	Time	Temp °C	Reading mv	Theo Value r
eter ID:	MPMO8	L 016047	-	7.02	8:20			7.09	12:37	Meter ID:	8:36	21.7	236.0	236.2
DEP FT 1100		L 016500		10.05	8:20	QC: (pH +/- 0.2) (Co	nd +/- 5%) (DO +/- 0.3m	g/L) (Redox +/- 10mv	)	MPM08	12:32	21.8	232.5	236.2
nits: SU		L 015514	В 4	3.99	8:20	A checked box indi	cates ICV / CCV passed			Zobell Sol ID:				
onductivity Meter Ca	alib.	Standard ID	Std Value	Cal	Time	ICV	Time	CCV	Time	L 016396				
eter ID:	MPM08	L 013847	E 1000	1000	8:29					DO Meter Cal	Time	Temp °C	Reading mg/l	Theo Value m
EP FT 1200, Units: u	IMHOS	L 015370	10000			9760	8:31	9720	12:28	Meter ID:	8:12	21.6	8.86	8.829
rbidity Meter Calibra	ation	Standard ID	Std Value	Acceptable	lity Range	ICV	Time	CCV	Time	MPM08	12:35	21.8	8.83	8.777
eter ID:	TM07	SF- 01367	7 5.28	4.75	5.81	5.35	7:55			Barom. Pres				
DEP FT 1600, Units: N	NTU	SF- 01367	8 52.20	48.81	55.59			52.30	12:35	760				
ulfite Info (QC Check	(EPA 377.1)		QC Result mg/	I Time	Titrator ID	Na Thio ID	DO 3 Pillow ID	Starch Ind. ID	lodate/lodide ID	Therm ID	pН	Conduct.( %)	DO (mg/l)	Redox (mv
C Std: 5ml (NaThio)/5	00ml DI=10mg/L					L	L	L	L	MPM08	0.2	5	0.3	10
urging Information		Well Capaciti	es (gallons/ ft): 2	" = 0.16 4" =0.65		Tubing Inside Diam	. Capacities Gallons/ft)	1/4" =0.0026 3/8" =0	.006					
				Well	Depth to	= Water x	Well Capacity =	1 Well	( Tubing X	Tubing	Pump + Volume +	Cell Volume	1 Eqpt.	
Well #	Diam/ Comp	Screen Interval (ft)	Intake Depth (ft)	Depth (ft)	Water (ft)	Column (ft)	(gal)	Volume (gal)	Capacity X (gal/ft.)	Length ) -	+ Volume + (gal)	(gal) =	Volume (gal)	
BBS-CCR-BW-1	2	10	39.3	44.3	29.42	14.88	0.16	2.38	0.0026	100	0	0.06	0.32	
urge Meth:	Time	Rate (ml/min	Volume (gal)	Total Vol. (gal)	Water Depth (ft)	pH (SU)	Temp °C	Cond (uMHOS)	DO (mg/L)	Turbidity (NTU)	Purge Criteria	Status	Equipment ID	Egpt. Tab
1A	10:06	1600	5.92	5.92	30.33	6.51	27.47	4790	0.14	13.30	ph:+/- 0.2	STABLE	Level Meter:	WLM08
urge Start:	10:08	1600	0.85	6.77	30.33	6.51	27.44	4838	0.14	7.31	Temp°C+/- 0.2	STABLE	Pump:	ESP
				0.77	00.00	0.01		7000	0.17	7.01			Tubing:	PE
·	10.10	1600	1 0.85	7.62	30.33	6.50	27.46	1858	0.13	4.08	Cond 9/ +/ 5	STARLE		
9:52	10:10	1600	0.85	7.62	30.33	6.50	27.46	4858	0.13	4.08	Cond % +/- 5	STABLE	<u> </u>	_
9:52 urge End:	10:10	1600	0.85	7.62	30.33	6.50	27.46	4858	0.13	4.08	DO % Sat.< 20	STABLE	Dedicated	□ Yes
9:52 urge End: 10:10											Cond 70 17		<u> </u>	_
9:52 urge End:			0.85 Purge 0.32	Stability	Values =	6.50	27.46	4858	0.13	4.08	DO % Sat. < 20 Turb. NTU < 20	STABLE STABLE	Dedicated Tubing?	□ Yes
9:52 Irge End: 10:10 Irge Complete A	At 9:53	Gallons to	Purge 0.32	Stability	Values =	6.50 = Water X		4858 1 Well Volume	0.13		DO % Sat.< 20	STABLE	Dedicated Tubing?	□ Yes
9:52 rge End: 10:10 rge Complete A		Gallons to	Purge 0.32	Stability	Values =	6.50 — Water	27.46 Well	4858 1 Well	0.13	4.08 Tubing Length	DO % Sat. < 20 Turb. NTU < 20  Pump  + Volume +	STABLE STABLE  Cell Volume	Dedicated Tubing?  1 Eqpt. Volume	□ Yes
9:52  rge End: 10:10  rge Complete A  Well # BBS-CCR-BW-2	Diam/ Comp	Screen Interval (ft)	Purge 0.32 Intake Depth (ft) 18.49	Stability Well Depth (ft) 23.84	Values =	6.50 = Water Column (ft) x	27.46 Well Capacity (gal) = 0.16	4858 1 Well Volume (gal)	0.13  ( Tubing Capacity X (gal/ft.) 0.0026	4.08 Tubing Length (ft) 24.64	DO % Sat. < 20 Turb. NTU < 20  + Pump Volume (gal)  0	Cell Volume (gal) = 0.06	Dedicated Tubing?  1 Eqpt. Volume (gal)  0.12	□ Yes
9:52  rge End: 10:10  rge Complete A  Well # BBS-CCR-BW-2	At 9:53	Gallons to Screen	Purge 0.32 Intake Depth (ft) 18.49	Stability Well Depth (ft)	Values =  Depth to Water (ft)  8.06	6.50  = Water Column (ft)	27.46 Well Capacity (gal) =	4858 1 Well Volume (gal) 2.52	0.13  ( Tubing Capacity (gal/ft.) X	4.08  Tubing Length (ft)	DO % Sat. < 20 Turb. NTU < 20	STABLE STABLE  Cell Volume (gal) =	Dedicated Tubing?  1 Eqpt. Volume (gal)	☐ Yes ☑ No
9:52 urge End: 10:10 urge Complete A Well # BBS-CCR-BW-2 urge Meth: 1A	Diam/ Comp 2 Time 9:30	Screen Interval (ft) 10 Rate (ml/min 500	Purge 0.32 Intake Depth (ft) 18.49 Volume (gal) 0.66	Stability Well Depth (ft) 23.84 Total Vol. (gal) 0.66	Values =  Depth to Water (ft)  8.06  Water Depth (ft)  8.28	6.50  = Water Column (ft) x  15.78 pH (su) 6.67	27.46 Well Capacity (gal) =  0.16 Temp °C 27.27	4858  1 Well Volume (gal)  2.52  Cond (uMHOS)  1346	0.13  ( Tubing Capacity X (gal/ft.)  0.0026  DO (mg/L)  0.19	4.08  Tubing Length (ft)  24.64  Turbidity (NTU)  5.36	DO % Sat. < 20 Turb. NTU < 20  + Pump (Volume (gal))  - Purge Criteria ph:+/- 0.2	Cell Volume (gal) = 0.06 Status	Dedicated Tubing?  1 Eapt. Volume (gal)  0.12  Equipment ID Level Meter:	☐ Yes ☑ No ☑ Eqpt. Tab
9:52  urge End: 10:10  urge Complete A  Well #  BBS-CCR-BW-2  urge Meth: 1A  urge Start:	Diam/ Comp 2 Time 9:30 9:32	Screen Interval (ft) 10 Rate (ml/min 500 500	Purge 0.32  Intake Depth (ft) 18.49  Volume (gal) 0.66 0.26	Stability  Well Depth (ft)  23.84  Total Vol. (gal)  0.66  0.92	Values =  Depth to Water (ft)  8.06  Water Depth (ft)  8.28  8.29	6.50  = Water Column (ft) x  15.78 pH (sU) 6.67 6.67	27.46 Well Capacity (gal) =  0.16 Temp °C 27.27 27.25	4858  1 Well Volume (gal)  2.52  Cond (uMHOS)  1346  1346	0.13  ( Tubing Capacity X (gal/ft.)  0.0026  D0 (mg/L)  0.19  0.17	4.08  Tubing Length (t)  24.64  Turbidity (NTU)  5.36  4.39	DO % Sat. < 20 Turb. NTU < 20  Pump + Volume (gal) +  0  Purge Criteria ph:+/- 0.2  TempºCt/- 0.2	Cell Volume (gal) = 0.06 Status STABLE STABLE STABLE	Dedicated Tubing?  1 Eqpt. Volume (gal)  0.12  Equipment ID Level Meter: Pump:	☐ Yes ☑ No ☐ Yes ☑ No ☐ No ☐ PP
9:52  urge End: 10:10  urge Complete A  Well #  BBS-CCR-BW-2  urge Meth: 1A  urge Start: 9:25	Diam/ Comp 2 Time 9:30	Screen Interval (ft) 10 Rate (ml/min 500	Purge 0.32 Intake Depth (ft) 18.49 Volume (gal) 0.66	Stability Well Depth (ft) 23.84 Total Vol. (gal) 0.66	Values =  Depth to Water (ft)  8.06  Water Depth (ft)  8.28	6.50  = Water Column (ft) x  15.78 pH (su) 6.67	27.46 Well Capacity (gal) =  0.16 Temp °C 27.27	4858  1 Well Volume (gal)  2.52  Cond (uMHOS)  1346	0.13  ( Tubing Capacity X (gal/ft.)  0.0026  DO (mg/L)  0.19	4.08  Tubing Length (ft)  24.64  Turbidity (NTU)  5.36	DO % Sat. < 20 Turb. NTU < 20  + Pump Volume (gal) +  0  Purge Criteria ph:+/- 0.2  TempeC+/- 0.2  Cond % +/- 5	Cell Volume (gal) =  0.06 Status STABLE STABLE STABLE STABLE	Dedicated Tubing?  1 Eqpt. Volume (gal)  0.12  Equipment ID Level Meter: Pump: Tubing:	□ Yes □ No □ No □ No □ No □ PP □ PE/S
9:52  urge End: 10:10  urge Complete A  Well #  BBS-CCR-BW-2  urge Meth: 1A  urge Start:	Diam/ Comp 2 Time 9:30 9:32	Screen Interval (ft) 10 Rate (ml/min 500 500	Purge 0.32  Intake Depth (ft) 18.49  Volume (gal) 0.66 0.26	Stability  Well Depth (ft)  23.84  Total Vol. (gal)  0.66  0.92	Values =  Depth to Water (ft)  8.06  Water Depth (ft)  8.28  8.29	6.50  = Water Column (ft) x  15.78 pH (sU) 6.67 6.67	27.46 Well Capacity (gal) =  0.16 Temp °C 27.27 27.25	4858  1 Well Volume (gal)  2.52  Cond (uMHOS)  1346  1346	0.13  ( Tubing Capacity X (gal/ft.)  0.0026  D0 (mg/L)  0.19  0.17	4.08  Tubing Length (t)  24.64  Turbidity (NTU)  5.36  4.39	DO % Sat. < 20 Turb. NTU < 20  Pump + Volume (gal) +  0  Purge Criteria ph:+/- 0.2  TempºCt/- 0.2	Cell Volume (gal) = 0.06 Status STABLE STABLE STABLE	Dedicated Tubing?  1 Eqpt. Volume (gal)  0.12  Equipment ID Level Meter: Pump:	□ Yes  No  Rept. Tab. WLM08 PP PE/S

#### DEP-SOP-001/01

#### FS 2200 Groundwater Sampling Form FD 9000-24

### **GROUNDWATER SAMPLING LOG**

FACILITY NAME:		Big Be	end			SITE LOCATION:		Apollo l	Beach, FL.		
WELL NO:	В	BS-CCR-1			SAMPLE ID:	L16	J027-01		DATE:	10/28/116	
				•		NG DATA					
WELL DIAMETER (inches	5)	TUBING DIAMETER (inc	thes) 1/4	WELL SCR DEPTH 12.32	EEN INTERV		STATIC DEF TO WATER	PTH (feet): 6.78	PURGE PUMP T OR BAILER:	YPE PP	
WELL VOLUME PURG (only fillout if applicable	E:	1 WELL VOLU	ME = (TOTAL WE	LL DEPTH - STATIC D	EPTH TO WATER	R) X WELL CAPAC	CITY				
EQUIPMENT VOL	IME PURGE:	1 501	= (	= DLIMP VOLUM	feet -	CADACITY Y	feet ) x	STH ) + FLOW CEI	gallons/foot	t =	gallons
(only fillout if applic		i Luc		0	gallons + (	0.0026 gall		,	0.00		0.12 gallon:
INITIAL PUMP OR DEPTH IN WELL (1	TUBING eet): 17.32		=( FINAL PUMP DEPTH IN W	OR TUBING	.32	PURGING INITIATED AT:	11:07	PURGING ENDED AT:		gallons = TOTAL VOLUI PURGED (gall	ME
TIME	VOLUME PURGED (GALLONS)	CUMUL. VOLUME PURGED (GALLONS)	PURGE RATE (GPM)	DEPTH TO WATER (FEET)	pH (standard units)	TEMP. (°C)	COND. (µmhos/cm OR µS/cm)	DISSOLVED OXYGEN (circle mg/l or % saturation)	TURBIDITY (NTUs)	COLOR (describe)	ODOR (describe)
11:14	1.29	1.29	0.18	6.94	6.84	25.82	4056	0.05	4.74	CLEAR	NONE
11:16	0.37	1.66	0.19	6.94	6.83	25.80	4067	0.04	3.65	CLEAR	NONE
11:18	0.37	2.03	0.19	6.92	6.83	25.78	4064	0.04	3.22	CLEAR	NONE
WELL CAPACITY (G						0.37; <b>4"</b> = 0			<b>12"</b> = 5.88	1	
Tubing inside dia.	CAPACITY (Gal./Fi	.): <b>1/8"</b> = 0.00006;	3/16" = 0.0014;	1/4" = 0.0026;	5/16" = 0.004; SAMPL	3/8" = 0.006; ING DATA	1/2" = 0.0	110; 5/8" = 0	0.016		
SAMPLED BY (PR	INT) / AFFILIATI		TECO	SAMPLER (S) SIG	GNATURES:			SAMPLING INITIATED AT:	11.18	SAMPLING ENDED AT: 1	1:42
PUMP OR TUBING DEPTH IN WELL (1	;		1200	SAMPLE PUMP FLOW RATE (ml	per minute):		700	TUBING MATERIAL CODE		•	1.72
FIELD DECONTAN				FIELD-FILTERED Filtration Equipme	ent Tybe		ER SIZE:	μm	DUPLICATE:	Y N N	1
	SAMPLE CON SPECIFICA				SAMPLE PRE	SERVATION		INTE	NDED		MPLING
SAMPLE ID CODE	# CONTAINERS	MATERIAL CODE	VOLUME	PRESERVATIVE USED		AL VOL. I FIELD (ml) (1)	FINAL pH		S AND/OR THOD		JIPMENT CODE
@Ino-500	1	PE	500ml	NONE	N	ONE	N/A	Inorc	anics		PP
)								Ĭ	,		
@Met-250	2	PE	250ml	HNO3		1ml	<2	Ме	tals		PP
@Rad-1L	2	PE	1L	HNO3		5ml	<2	Radiol	ogicals		PP
							1				
REMARKS:							1	1		1	
` ′ .				or to sample co		nvanidan -: 2	- Ciliaar -: -	- Toflon: 2- 2"	nor (Chooif )		
MATERIAL CODES SAMPLING/PURGIN			Clear Glass; taltic Pump; <b>B</b>	PE = Polyethylene; = Bailer; BP = Blac	-		•	PP = Peristaltic Pum	ner (Specify) np		

NOTES:

optionally, ± 0.2 mg/L or ± 10% (whichever is greater) **Turbidity:** all readings ≤ 20 NTU; optionally ± 5 NTU or 10% (whichever is greater)

<sup>1.</sup> The above do not constitute all of the information requierd by Chapter 62-160, F.A.C.

<sup>2.</sup> STABILIZATION CRITERIA FOR RANGE OF VARIATION OF LAST THREE CONSECUTIVE READINGS (SEE FS 2212. SECTION 3)

pH: ± 0.2 units Temperature: ± 0.2 °C Specific Conductance: ± 5% Dissolved Oxygen: all readings ≤ 20% saturation (see Table FS 2200-2);

### **GROUNDWATER SAMPLING LOG**

SITE NAME:		Big Be	end			SITE LOCATION:		Apollo I	Beach, FL.		
WELL NO:	В	BS-CCR-2	)	SAMPLE ID: <b>L16J027-02</b>					DATE:	10/28/116	
						NG DATA					
WELL DIAMETER (inches	s)	TUBING DIAMETER (inc	hes) 1/4	WELL SCREEN IN DEPTH 11.84		21.84 (feet)	STATIC DEPTH TO WATER (fee		PURGE PUMP T' OR BAILER:	YPE PP	
WELL VOLUME PU	URGE:	1 WELL VO	LUME = (TOT	AL WELL DEPTH -	STATIC DEP	TH TO WATER)	X WELL CA	APACITY			
orny miout ii applica	able)		= (		feet -		feet ) x		gallons/foot	=	gallons
EQUIPMENT VOLU (only fillout if application		1 EQU	JIPMENT VOL	. = PUMP VOLUM	E + (TUBING	CAPACITY X T	UBING LENG	STH) + FLOW CEI	L VOLUME		
			=(	0	gallons + (	1	ons/foot X	22.84 feet	)+ 0.06	gallons =	0.12 gallo
NITIAL PUMP OR DEPTH IN WELL (f			FINAL PUMP DEPTH IN W	OR TUBING ELL (feet): 16	.84	PURGING INITIATED AT:	10:59	PURGING ENDED AT:	11:08	TOTAL VOLUM PURGED (gallo	ИΕ ons): 1.
TIME	VOLUME PURGED (GALLONS)	CUMUL. VOLUME PURGED (GALLONS)	PURGE RATE (GPM)	DEPTH TO WATER (FEET)	pH (standard units)	TEMP. (°C)	COND. (µmhos/cm OR µS/cm)	DISSOLVED OXYGEN (circle(mg/l))r % saturation)	TURBIDITY (NTUs)	COLOR (describe)	ODOR (describe)
11:04	0.95	0.95	0.19	6.92	6.85	25.64	1467	0.08	6.03	LT YELLOW	NONE
11:06	0.37	1.32	0.19	6.92	6.86	25.62	1485	0.09	3.88	LT YELLOW	NONE
11:08	0.37	1.69	0.19	6.92	6.87	25.64	1505	0.10	3.73	LT YELLOW	NONE
WELL CAPACITY (Ga FUBING INSIDE DIA.	,			<b>1.25"</b> = 0.06; <b>2"</b> = <b>1/4"</b> = 0.0026;	0.16; <b>3</b> " = <b>5/16</b> " = 0.004;		55; 5" = 1/2" = 0.0		<b>12"</b> = 5.88		
					_	ING DATA					
SAMPLED BY (PR	INT) / AFFILIATI RAE		TECO	SAMPLER (S) SIG	SNATURES:			SAMPLING INITIATED AT:	11:08	SAMPLING ENDED AT:	11:
PUMP OR TUBING DEPTH IN WELL (f	eet): 16.8	3		SAMPLE PUMP FLOW RATE (mL	per minute):	7	707	TUBING MATERIAL CODE	: PE	/S	
FIELD DECONTAN	IINATION:	Y 🔲 N 🗹		FIELD-FILTERED Filtration Equipme		N ✓ FILTE	R SIZE:	μm	DUPLICATE:	Y □ N 🔽	2
	SAMPLE CON	TAINER		i ili alion Equipme	SAMPLE PRE	SERVATION		INTE	NDED		MPLING
	SPECIFICA #	MATERIAL	VOLUME	PRESERVATIVE		AL VOL.	FINAL	ANALYSI	S AND/OR HOD	EQU	JIPMENT CODE
SAMPLE ID CODE	CONTAINERS	CODE	VOLOME	USED	ADDED IN	I FIELD (ml) (1)	pH	WIL	1105		
@Ino-500	1	PE	500ml	NONE	N	ONE	N/A	Inorg	anics		PP
@110-000	'	1 -	0001111	NONE		ONE	14/71	morg	unios		
@Met-250	2	PE	250ml	HNO3		1ml	<2	Me	tals		PP
@Rad-1L	2	PE	1L	HNO3		5ml	<2	Radiol	ogicals		PP
						-			<u> </u>		
<u> </u>											·
REMARKS:											
(1) Sample bo						I = Dobressor I	. 6-0"	ono: T = T-4:	0-045(0	oifu)	
MATERIAL CODES SAMPLING/PURGIN			= Clear Glass altic Pump: B			= Polypropylene P = Electric Subm				CIIY)	
SAMPLING/PURGIN EQUIPMENT CODE	S: í	RFPP = Reverse F	low Peristaltic I	Pump; SM = Straw	Method (tubing	Gravity Drain);	/T = Vacuum	PP = Peristaltic Pum Γrap; O = Other (Spe	ecify)		

NOTES: 1. The above do not constitute all of the information requierd by Chapter 62-160, F.A.C.

<sup>2.</sup> STABILIZATION CRITERIA FOR RANGE OF VARIATION OF LAST THREE CONSECUTIVE READINGS (SEE FS 2212. SECTION 3)

pH: ± 0.2 units Temperature: ± 0.2 °C Specific Conductance: ± 5% Dissolved Oxygen: all readings ≤ 20% saturation (see Table FS 2200-2); optionally, ± 0.2 mg/L or ± 10% (whichever is greater) Turbidity: all readings ≤ 20 NTU; optionally ± 5 NTU or 10% (whichever is greater)

### **GROUNDWATER SAMPLING LOG**

SITE NAME:		Big Be	end			SITE LOCATION:		Apollo	Beach, FL.		
WELL NO:	В	BS-CCR-3			SAMPLE ID:	L16.	J027-03	•	DATE:	10/28/116	
					PURGI	NG DATA			Į.		
WELL DIAMETER (inches	;)	TUBING DIAMETER (inc	hes) 1/4	WELL SCREEN IN DEPTH 13.23		23.23 (feet)	STATIC DEF		PURGE PUMP T' OR BAILER:	YPE PP	
WELL VOLUME P	URGE:	1 WELL VO		AL WELL DEPTH -			X WELL CA		ļ		
(Offig fillout if applic	able)		= (		feet -		feet) x		gallons/foo	ot =	gallons
EQUIPMENT VOLO (only fillout if applic		1 EQL	JIPMENT VOL	. = PUMP VOLUM	E + (TUBING	CAPACITY X T	UBING LENG	GTH) + FLOW CEI	L VOLUME		
			=(	0	gallons + (	0.0026 gallo	ons/foot X	24.23 fee	et)+ 0.06	т —	0.12 gallons
INITIAL PUMP OR DEPTH IN WELL (1	TUBING <sup>(eet):</sup> 18.23	3	FINAL PUMP DEPTH IN W		.23	PURGING INITIATED AT:	10:27	PURGING ENDED AT:	10:39	TOTAL VOLUM PURGED (galle	ME ons): 1.08
T11.45	VOLUME	CUMUL. VOLUME	PURGE	DEPTH TO	pH	TEMP.	COND.	DISSOLVED OXYGEN	TURBIDITY	COLOR	ODOR
TIME	PURGED (GALLONS)	PURGED (GALLONS)	RATE (GPM)	WATER (FEET)	(standard units)	(°C)	(μmhos/cm OR μS/cm)	(circlemg/lor % saturation)	(NTUs)	(describe)	(describe)
10:35	0.72	0.72	0.09	6.98	6.41	26.08	1685	0.04	5.33	YELLOW	STRONG
10:37	0.18	0.90	0.09	6.98	6.41	26.19	1660	0.04	4.23	YELLOW	STRONG
10:39	0.18	1.08	0.09	6.99	6.42	26.20	1645	0.03	3.26	YELLOW	STRONG
WELL CAPACITY (Ga	allons Per Foot):	<b>0.75</b> " = 0.02;	1" = 0.04;	1.25" = 0.06: 2" =	0.16; 3" =	0.37; <b>4</b> " = 0.6	35; <b>5</b> " =	1.02; <b>6"</b> = 1.47;	<b>12"</b> = 5.88		
TUBING INSIDE DIA.	CAPACITY (Gal./Ft	i.): <b>1/8"</b> = 0.00006;	<b>3/16"</b> = 0.0014;	1/4" = 0.0026;	5/16" = 0.004;		1/2" = 0.0	010; 5/8" = 0	).016		
SAMPLED BY (PR	INT) / AFFILIATI	ON:		SAMPLER (S) SIG		ING DATA		SAMPLING		SAMPLING	
,	RAE		TECO	. ,				INITIATED AT: 10	:39	ENDED AT:	0:50
PUMP OR TUBING DEPTH IN WELL (1	eet): 18.2	2		SAMPLE PUMP FLOW RATE (mL	. per minute):	3	340	TUBING MATERIAL CODE	: PE	/S	
FIELD DECONTAN	MINATION:	y 🔲 N 🗹		FIELD-FILTERED Filtration Equipme	: nt Type	N ✓ FILTE	ER SIZE:	μm	DUPLICATE:	Y 🗆 N 🖪	7
	SAMPLE CON SPECIFICA				SAMPLE PRE	SERVATION		INTE	NDED	SAI	MPLING
044DLE ID 00DE	#	MATERIAL	VOLUME	PRESERVATIVE		AL VOL.	FINAL		S AND/OR HOD		JIPMENT CODE
SAMPLE ID CODE	CONTAINERS	CODE		USED	ADDED IN	N FIELD (ml) (1)	pН				
@Ino-500	1	PE	500ml	NONE	N	ONE	N/A	Inore	anics		PP
@110-300	'	1 -	3001111	NONE	11	ONL	IN/A	morg	ariios		
@Met-250	2	PE	250ml	HNO3		1ml	<2	Me	tals		PP
@Rad-1L	2	PE	1L	HNO3		5ml	<2	Radiol	ogicals		PP
REMARKS: (1) Sample bo	ttles nre-nros	served at lab	oratory pric	or to sample of	Mection						
MATERIAL CODE	- ' '		= Clear Glass	· '		= Polypropylene	e; <b>S</b> = Silic	one; <b>T</b> = Teflon;	O= Other (Spe	ecify)	
SAMPLING/PURGINEQUIPMENT CODE	IG ,	APP = After Perist	altic Pump; B	= Bailer; BP = Blad	der Pump; ES	F = Electric Subm	irsable Pump;	PP = Peristaltic Pum	ıp		

NOTES: 1. The above do not constitute all of the information requierd by Chapter 62-160, F.A.C.

 $optionally, \pm 0.2 \ mg/L \ or \pm 10\% \ (whichever \ is \ greater) \ \ Turbidity: \ all \ readings \leq 20 \ NTU; \ optionally \pm 5 \ NTU \ or \ 10\% \ (whichever \ is \ greater)$ 

<sup>2.</sup> STABILIZATION CRITERIA FOR RANGE OF VARIATION OF LAST THREE CONSECUTIVE READINGS (SEE FS 2212. SECTION 3)

pH: ± 0.2 units Temperature: ± 0.2 °C Specific Conductance: ± 5% Dissolved Oxygen: all readings ≤ 20% saturation (see Table FS 2200-2);

#### **GROUNDWATER SAMPLING LOG**

NAME:		Big Be	end			LOCATION:		Apollo I	Beach, FL.		
WELL NO:	BBS	S-CCR-BW	<b>V</b> -1		SAMPLE ID:	L16.	J027-04		DATE:	10/28/116	
		ı		I		NG DATA	T				
WELL DIAMETER (inche	s)	TUBING DIAMETER (inc	thes) 1/4	WELL SCREEN IF DEPTH 34.30		44.30 (feet	STATIC DEF TO WATER	PTH (feet): 29.42	PURGE PUMP T OR BAILER:	YPE ESP	
WELL VOLUME P		1 WELL VO	LUME = (TOTA	AL WELL DEPTH -	STATIC DEF	TH TO WATER)	X WELL CA	PACITY			
EQUIPMENT VOL	LIME BURGE.	4.50	= (	DUMPNOLUM	feet -	CADACITY V	feet) x	iTH ) + FLOW CEI	gallons/foo	ot =	gallons
only fillout if applic	cable)	1 EQU	DIPMENT VOL		,			,	0.00		0.20
INITIAL PUMP OF	TUBING		=( FINAL PUMP		gallons + (	0.0026 galle PURGING INITIATED AT:		DUDGING	et)+ 0.06	TOTAL VOLUM	0.32 gallons
DEPTH IN WELL (	1 00.00	COMUL.	DEPTH IN W	ELL (feet): 39 DEPTH	.30	INITIATED AT:		ENDED AT:	10:10	PURGED (gallo	ons): 7.62 I
TIME	VOLUME PURGED (GALLONS)	VOLUME PURGED (GALLONS)	PURGE RATE (GPM)	TO WATER (FEET)	pH (standard units)	TEMP. (°C)	COND. (µmhos/cm OR µS/cm)	OXYGEN (circle(mg/l) or % saturation)	TURBIDITY (NTUs)	COLOR (describe)	ODOR (describe)
10:06	5.92	5.92	0.42	30.33	6.51	27.47	4790	0.14	13.30	CLEAR	MILD
10:08	0.85	6.77	0.43	30.33	6.51	27.44	4838	0.14	7.31	CLEAR	MILD
10:10	0.85	7.62	0.43	30.33	6.50	27.46	4858	0.13	4.08	CLEAR	MILD
WELL CAPACITY ( TUBING INSIDE DI	,	<b>0.75"</b> = 0.02;  ./Ft.): <b>1/8"</b> = 0.00			0.0026;	0.16; 3" = 0 5/16" = 0.004; ING DATA	3/8" = 0.00		= 1.02; 6" = 1 = 10; 5/8	1.47; <b>12"</b> = " = 0.016	= 5.88
SAMPLED BY (PF	RINT) / AFFILIATIO	ON:		SAMPLER (S) SIG			-	SAMPLING INITIATED AT:		SAMPLING ENDED AT:	
D. II 4D. OD. T. I. D. I. I.	RAE	3	TECO					10	:10		0:14
PUMP OR TUBINO DEPTH IN WELL (	feet): 39.3	3		SAMPLE PUMP FLOW RATE (mL	. per minute):		600	TUBING MATERIAL CODE	: Pl	E	
FIELD DECONTAI		Y N V		FIELD-FILTERED Filtration Equipme	: γ 🔲 ent Type.	N ✓ FILT	ER SIZE:	μm	DUPLICATE:	Y 🔲 N 🔽	2
	SAMPLE CON SPECIFICA	ATION			SAMPLE PRE	SERVATION			NDED S AND/OR		MPLING IIPMENT
SAMPLE ID CODE	# CONTAINERS	MATERIAL CODE	VOLUME	PRESERVATIVE USED		AL VOL. I FIELD (ml) <sub>(1)</sub>	FINAL pH		HOD		CODE
@Ino-500	1	PE	500ml	NONE	N	ONE	N/A	Inorg	janics	E	ESP
@Met-250	2	PE	250ml	HNO3		1ml 	<2		tals		ESP
@Rad-1L	2	PE	1L	HNO3		5ml	<2	Radiol	ogicals	E	ESP
REMARKS:		الله اممیسم		ta aarl-			_				
(1) Sample bo	mes ore-ores	serveu ar iab	CHAICKY DISC	u io samble co	mechon						
MATERIAL CODE			= Clear Glass			= Polypropylene	e; <b>S</b> = Silic	one; <b>T</b> = Teflon;	O= Other (Spe	ecify)	

1. The above do not constitute all of the information requierd by Chapter 62-160, F.A.C.

NOTES:

<sup>2.</sup> STABILIZATION CRITERIA FOR RANGE OF VARIATION OF LAST THREE CONSECUTIVE READINGS (SEE FS 2212. SECTION 3)

pH: ± 0.2 units Temperature: ± 0.2 °C Specific Conductance: ± 5% Dissolved Oxygen: all readings ≤ 20% saturation (see Table FS 2200-2); optionally, ± 0.2 mg/L or ± 10% (whichever is greater) Turbidity: all readings ≤ 20 NTU; optionally ± 5 NTU or 10% (whichever is greater)

#### **GROUNDWATER SAMPLING LOG**

NAME:		Big Be	end			LOCATION:		Apollo	Beach, FL.		
WELL NO:	BBS	S-CCR-BW	<b>I-2</b>		SAMPLE ID:	L16.	J027-05		DATE:	10/28/116	
		1				NG DATA	1		•		
WELL DIAMETER (inche	s)	TUBING DIAMETER (inc	thes) 1/4	WELL SCREEN II DEPTH 13.64		23.34 (feet)	STATIC DEF	PTH (feet): 8.06	PURGE PUMP T OR BAILER:	YPE PP	
WELL VOLUME P		1 WELL VO	LUME = (TOT	AL WELL DEPTH	STATIC DEF	TH TO WATER	X WELL CA	APACITY			
	,		= (		feet -		feet) x		gallons/foo	ot =	gallons
EQUIPMENT VOL (only fillout if applic	UME PURGE: able)	1 EQI	JIPMENT VOL		E + (TUBING			STH) + FLOW CE		_	
INITIAL PUMP OR	TURING		=( FINAL PUMP	OR TURING	gallons + (	0.0026 gall		24.64 fee	et)+ 0.06	Gallons = TOTAL VOLUM	0.12 gallons
DEPTH IN WELL (	feet): 18.49	COMOL.	DEPTH IN W	ELL (feet): 18	.49	PURGING INITIATED AT:	9:25	ENDED AT:	9:34		ons): 1.1
TIME	VOLUME PURGED (GALLONS)	VOLUME PURGED (GALLONS)	PURGE RATE (GPM)	DEPTH TO WATER (FEET)	pH (standard units)	TEMP. (°C)	COND. (µmhos/cm OR µS/cm)	DISSOLVED OXYGEN (circle mg/l or % saturation)	TURBIDITY (NTUs)	COLOR (describe)	ODOR (describe)
9:30	0.66	0.66	0.13	8.28	6.67	27.27	1346	0.19	5.36	LT. YELLOW	MILD
9:32	0.26	0.92	0.13	8.29	6.67	27.25	1346	0.17	4.39	LT. YELLOW	MILD
9:34	0.25	1.17	0.13	8.29	6.67	27.22	1345	0.37	3.99	LT. YELLOW	MILD
										<u> </u>	
										+	
WELL CAPACITY (	- ,	<b>0.75"</b> = 0.02;							= 1.02; 6" =		5.88
TUBING INSIDE DI	A. CAPACITY (Gal	l./Ft.): <b>1/8"</b> = 0.00	0006; 3/16"	= 0.0014; <b>1/4"</b> =	SAMPL	5/16" = 0.004; ING DATA	3/8" = 0.00	6; <b>1/2"</b> = 0.0	)10; <b>5/8</b>	3" = 0.016	
SAMPLED BY (PF	RINT) / AFFILIATI	ON:		SAMPLER (S) SIG				SAMPLING INITIATED AT:		SAMPLING ENDED AT:	
DUMP OF TURING	RAE	3	TECO					9:	34	9	9:42
PUMP OR TUBINO DEPTH IN WELL (	feet): 18.5	5		SAMPLE PUMP FLOW RATE (ml			493	TUBING MATERIAL CODE	: PE	:/S	
FIELD DECONTAI		Y 🔲 N 🗹		FIELD-FILTERED Filtration Equipme	ent Type.	N ☑ FILT	ER SIZE:	μm	DUPLICATE:	Y 🔲 N 🖸	2
	SAMPLE CON SPECIFICA	ATION			SAMPLE PRE	SERVATION			NDED S AND/OR		MPLING IIPMENT
SAMPLE ID CODE	# CONTAINERS	MATERIAL CODE	VOLUME	PRESERVATIVE USED		TAL VOL. N FIELD (ml) (1)	FINAL pH		THOD		ODE
@Ino-500	1	PE	500ml	NONE	N	ONE	N/A	Inorg	ganics		PP
										<del>                                     </del>	
@Met-250	2	PE	250ml	HNO3		1ml	<2	Me	etals		PP
@Rad-1L	2	PE	1L	HNO3		5ml	<2	Radiol	logicals		PP
										+	
										+	
										+	
										+	
										<del>                                     </del>	
REMARKS:	1	I	I	1	ı		1	1		_1	
` ' '	- ' '			or to sample co							
MATERIAL CODE			= Clear Glass			P = Polypropylene				ecify)	
SAMPLING/PURGII EQUIPMENT CODE	is:	APP = Atter Perist RFPP = Reverse I	เลเนิด Pump; <b>B</b> Flow Peristaltic I	= ʁaiier; <b>BP</b> = Blad Pump; <b>SM</b> = Straw	ager Pump; ES Method (tubing	or = Electric Subm g Gravity Drain);	ıırsable Pump; <b>VT</b> = Vacuum 1	PP = Peristaltic Pun Γrap; O = Other (Spe	np ecify)		

NOTES: 1. The above do not constitute all of the information requierd by Chapter 62-160, F.A.C.

 $optionally, \pm 0.2 \ mg/L \ or \pm 10\% \ (whichever is \ greater) \ Turbidity: \ all \ readings \leq 20 \ NTU; \ optionally \pm 5 \ NTU \ or \ 10\% \ (whichever is \ greater)$ 

<sup>2.</sup> STABILIZATION CRITERIA FOR RANGE OF VARIATION OF LAST THREE CONSECUTIVE READINGS (SEE FS 2212. SECTION 3)

pH: ± 0.2 units Temperature: ± 0.2 °C Specific Conductance: ± 5% Dissolved Oxygen: all readings ≤ 20% saturation (see Table FS 2200-2);



THE LEADER IN ENVIRONMENTAL TESTING

# **ANALYTICAL REPORT**

TestAmerica Laboratories, Inc.

TestAmerica Tampa 6712 Benjamin Road Suite 100 Tampa, FL 33634 Tel: (813)885-7427

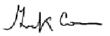
TestAmerica Job ID: 660-77026-1

Client Project/Site: L16J027

### For:

Tampa Electric Company 5012 Causeway Boulevard Tampa, Florida 33619

Attn: Ms. Peggy Penner



Authorized for release by: 11/8/2016 3:31:26 PM

Keaton Conner, Project Mgmt. Assistant (813)885-7427

keaton.conner@testamericainc.com

.....LINKS .....

Review your project results through

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**Have a Question?** 



Visit us at: www.testamericainc.com

The test results in this report meet all 2003 NELAC and 2009 TNI requirements for accredited parameters, exceptions are noted in this report. This report may not be reproduced except in full, and with written approval from the laboratory. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

Client: Tampa Electric Company Project/Site: L16J027 TestAmerica Job ID: 660-77026-1

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# **Sample Summary**

Client: Tampa Electric Company Project/Site: L16J027

TestAmerica Job ID: 660-77026-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
660-77026-1	L16J027-01	Water	10/28/16 11:42	11/02/16 10:40
660-77026-2	L16J027-02	Water	10/28/16 11:15	11/02/16 10:40
660-77026-3	L16J027-03	Water	10/28/16 10:50	11/02/16 10:40
660-77026-4	L16J027-04	Water	10/28/16 10:14	11/02/16 10:40
660-77026-5	L16J027-05	Water	10/28/16 09:42	11/02/16 10:40

# **Definitions/Glossary**

Client: Tampa Electric Company

Project/Site: L16J027

TestAmerica Job ID: 660-77026-1

# **Qualifiers**

### **Metals**

Qualifier	Qualifier Description
I	The reported value is between the laboratory method detection limit and the laboratory practical quantitation limit.

U Indicates that the compound was analyzed for but not detected.

# **Glossary**

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains no Free Liquid
DER	Duplicate error ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision level concentration
MDA	Minimum detectable activity
EDL	Estimated Detection Limit
MDC	Minimum detectable concentration
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not detected at the reporting limit (or MDL or EDL if shown)

PQL Practical Quantitation Limit
QC Quality Control

RER Relative error ratio

RL Reporting Limit or Requested Limit (Radiochemistry)

RPD Relative Percent Difference, a measure of the relative difference between two points

TEF Toxicity Equivalent Factor (Dioxin)
TEQ Toxicity Equivalent Quotient (Dioxin)

TestAmerica Tampa

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11/8/2016

# **Case Narrative**

Client: Tampa Electric Company

Project/Site: L16J027

TestAmerica Job ID: 660-77026-1

Job ID: 660-77026-1

**Laboratory: TestAmerica Tampa** 

Narrative

Job Narrative 660-77026-1

#### Receipt

The samples were received on 11/2/2016 10:40 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was  $0.4^{\circ}$  C.

#### Metals

No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

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# **Detection Summary**

Client: Tampa Electric Company

Project/Site: L16J027

TestAmerica Job ID: 660-77026-1

Client Sample ID: L1	6J027-01					Lab Sa	mple ID: 66	80-77026-1	
Analyte	Result	Qualifier	PQL	MDL	Unit	Dil Fac D	Method	Prep Type	
Lithium	0.012	Ī	0.050	0.0010	mg/L		200.7 Rev 4.4	Total/NA	
Client Sample ID: L1	6J027-02					Lab Sample ID: 660-77026-2			
Analyte	Result	Qualifier	PQL	MDL	Unit	Dil Fac D	Method	Prep Type	
Lithium	0.014	Ī	0.050	0.0010	mg/L		200.7 Rev 4.4	Total/NA	
Client Sample ID: L1	6J027-03					Lab Sa	mple ID: 66	60-77026-3	
Analyte	Result	Qualifier	PQL	MDL	Unit	Dil Fac D	Method	Prep Type	
Lithium	0.0082	Ī	0.050	0.0010	mg/L		200.7 Rev 4.4	Total/NA	
Client Sample ID: L1	6J027-04					Lab Sample ID: 660-77026-4			
Analyte	Result	Qualifier	PQL	MDL	Unit	Dil Fac D	Method	Prep Type	
Lithium	0.011	<u> </u>	0.050	0.0010	mg/L		200.7 Rev 4.4	Total/NA	
Client Sample ID: L1	6J027-05					Lab Sa	mple ID: 66	0-77026-5	
Analyte	Result	Qualifier	PQL	MDL	Unit	Dil Fac D	Method	Prep Type	
Lithium	0.0038	I	0.050	0.0010	mg/L		200.7 Rev 4.4	Total/NA	

# Client Sample Results

Client: Tampa Electric Company

Project/Site: L16J027

TestAmerica Job ID: 660-77026-1

Client Sample ID: L16J027-01 Lab Sample ID: 660-77026-1 Date Collected: 10/28/16 11:42 **Matrix: Water** 

Date Received: 11/02/16 10:40

Method: 200.7 Rev 4.4 - Metals (ICP) Analyte Result Qualifier PQL **MDL** Unit D Prepared Analyzed Dil Fac Lithium 0.012 I 0.050 0.0010 mg/L 11/05/16 10:24 11/06/16 18:37

Client Sample ID: L16J027-02 Lab Sample ID: 660-77026-2 **Matrix: Water** 

Date Collected: 10/28/16 11:15

Date Received: 11/02/16 10:40

Method: 200.7 Rev 4.4 - Metals (ICP) Analyte Result Qualifier PQL **MDL** Unit D Prepared Analyzed Dil Fac 0.050 11/05/16 10:24 11/06/16 18:40 Lithium 0.014 I 0.0010 mg/L

Client Sample ID: L16J027-03 Lab Sample ID: 660-77026-3

Date Collected: 10/28/16 10:50 Date Received: 11/02/16 10:40

Method: 200.7 Rev 4.4 - Metals (ICP) Analyte Result Qualifier PQL MDL Unit Prepared Analyzed Dil Fac 0.0010 mg/L Lithium 0.0082 I 0.050 11/05/16 10:24 11/06/16 18:44

Client Sample ID: L16J027-04 Lab Sample ID: 660-77026-4 **Matrix: Water** 

Date Collected: 10/28/16 10:14 Date Received: 11/02/16 10:40

Method: 200.7 Rev 4.4 - Metals (ICP) Analyte Result Qualifier PQL **MDL** Unit Prepared Analyzed Dil Fac 11/05/16 10:24 11/06/16 18:47 Lithium 0.050 0.0010 mg/L 0.011 I

Lab Sample ID: 660-77026-5 Client Sample ID: L16J027-05 **Matrix: Water** 

Date Collected: 10/28/16 09:42 Date Received: 11/02/16 10:40

Method: 200.7 Rev 4.4 - Metals (ICP) Analyte Result Qualifier **PQL MDL** Unit Prepared Analyzed 0.0010 mg/L 0.050 11/05/16 10:24 11/06/16 18:51 Lithium 0.0038 I

**Matrix: Water** 

# QC Sample Results

Client: Tampa Electric Company TestAmerica Job ID: 660-77026-1

Project/Site: L16J027

Method: 200.7 Rev 4.4 - Metals (ICP)

Lab Sample ID: MB 400-329861/1-A Client Sample ID: Method Blank **Matrix: Water** Prep Type: Total/NA Analysis Batch: 329960 **Prep Batch: 329861** 

MB MB

Analyte Result Qualifier PQL **MDL** Unit Prepared Analyzed Dil Fac 0.050 11/05/16 10:24 11/06/16 17:08 Lithium 0.0010 U 0.0010 mg/L

Lab Sample ID: LCS 400-329861/2-A **Client Sample ID: Lab Control Sample Matrix: Water** Prep Type: Total/NA **Analysis Batch: 329960 Prep Batch: 329861** Spike LCS LCS %Rec. Added Limits Analyte Result Qualifier Unit D %Rec 85 - 115 Lithium 1.00 1.07 mg/L 107

Lab Sample ID: 400-129289-A-3-B MS **Client Sample ID: Matrix Spike Matrix: Water Prep Type: Total/NA** Analysis Batch: 329960 **Prep Batch: 329861** Sample Sample Spike MS MS %Rec. Result Qualifier Added Result Qualifier Limits Analyte Unit D %Rec Lithium 0.020 I 1.00 1.12 mg/L 110 70 - 130

Lab Sample ID: 400-129289-A-3-C MSD **Client Sample ID: Matrix Spike Duplicate Matrix: Water** Prep Type: Total/NA Analysis Batch: 329960 **Prep Batch: 329861** Sample Sample Spike MSD MSD %Rec. **RPD** Analyte Result Qualifier Added Result Qualifier Unit %Rec Limits RPD Limit Lithium 0.020 Ī 1.00 1.13 111 70 - 130 2 mg/L

# **QC Association Summary**

Client: Tampa Electric Company

TestAmerica Job ID: 660-77026-1

Project/Site: L16J027

## **Metals**

# **Prep Batch: 329861**

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
660-77026-1	L16J027-01	Total/NA	Water	200.7	
660-77026-2	L16J027-02	Total/NA	Water	200.7	
660-77026-3	L16J027-03	Total/NA	Water	200.7	
660-77026-4	L16J027-04	Total/NA	Water	200.7	
660-77026-5	L16J027-05	Total/NA	Water	200.7	
MB 400-329861/1-A	Method Blank	Total/NA	Water	200.7	
LCS 400-329861/2-A	Lab Control Sample	Total/NA	Water	200.7	
400-129289-A-3-B MS	Matrix Spike	Total/NA	Water	200.7	
400-129289-A-3-C MSD	Matrix Spike Duplicate	Total/NA	Water	200.7	

## **Analysis Batch: 329960**

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
660-77026-1	L16J027-01	Total/NA	Water	200.7 Rev 4.4	329861
660-77026-2	L16J027-02	Total/NA	Water	200.7 Rev 4.4	329861
660-77026-3	L16J027-03	Total/NA	Water	200.7 Rev 4.4	329861
660-77026-4	L16J027-04	Total/NA	Water	200.7 Rev 4.4	329861
660-77026-5	L16J027-05	Total/NA	Water	200.7 Rev 4.4	329861
MB 400-329861/1-A	Method Blank	Total/NA	Water	200.7 Rev 4.4	329861
LCS 400-329861/2-A	Lab Control Sample	Total/NA	Water	200.7 Rev 4.4	329861
400-129289-A-3-B MS	Matrix Spike	Total/NA	Water	200.7 Rev 4.4	329861
400-129289-A-3-C MSD	Matrix Spike Duplicate	Total/NA	Water	200.7 Rev 4.4	329861

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**Matrix: Water** 

**Matrix: Water** 

**Matrix: Water** 

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Client: Tampa Electric Company

Project/Site: L16J027

Client Sample ID: L16J027-01 Lab Sample ID: 660-77026-1

Date Collected: 10/28/16 11:42 Matrix: Water Date Received: 11/02/16 10:40

	Batch	Batch		Dil	Initial	Final	Batch	Prepared		
Prep Type	Type	Method	Run	Factor	Amount	Amount	Number	or Analyzed	Analyst	Lab
Total/NA	Prep	200.7			50 mL	50 mL	329861	11/05/16 10:24	DN1	TAL PEN
Total/NA	Analysis	200.7 Rev 4.4		1			329960	11/06/16 18:37	GESP	TAL PEN
	Instrument	ID: 6500 ICP Duo								

Lab Sample ID: 660-77026-2 Client Sample ID: L16J027-02

Date Collected: 10/28/16 11:15 Date Received: 11/02/16 10:40

Batch Batch Dil Initial Final Batch Prepared Method **Prep Type** Туре Factor Amount Amount Number or Analyzed Analyst Run Lab 50 mL 329861 11/05/16 10:24 DN1 Total/NA Prep 200.7 50 mL TAL PEN Total/NA Analysis 200.7 Rev 4.4 329960 11/06/16 18:40 GESP TAL PEN

Client Sample ID: L16J027-03 Lab Sample ID: 660-77026-3 **Matrix: Water** 

Date Collected: 10/28/16 10:50

Instrument ID: 6500 ICP Duo

Date Received: 11/02/16 10:40

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	200.7			50 mL	50 mL	329861	11/05/16 10:24	DN1	TAL PEN
Total/NA	Analysis	200.7 Rev 4.4		1			329960	11/06/16 18:44	GESP	TAL PEN
	Instrumer	nt ID: 6500 ICP Duo								

Client Sample ID: L16J027-04 Lab Sample ID: 660-77026-4

Date Collected: 10/28/16 10:14

Date Received: 11/02/16 10:40

	Batch	Batch		Dil	Initial	Final	Batch	Prepared		
Prep Type	Type	Method	Run	Factor	Amount	Amount	Number	or Analyzed	Analyst	Lab
Total/NA	Prep	200.7			50 mL	50 mL	329861	11/05/16 10:24	DN1	TAL PEN
Total/NA	Analysis	200.7 Rev 4.4		1			329960	11/06/16 18:47	GESP	TAL PEN
	Instrumer	t ID: 6500 ICP Duo								

Lab Sample ID: 660-77026-5 Client Sample ID: L16J027-05

Date Collected: 10/28/16 09:42

Date Received: 11/02/16 10:40

	Batch	Batch		Dil	Initial	Final	Batch	Prepared		
Prep Type	Туре	Method	Run	Factor	Amount	Amount	Number	or Analyzed	Analyst	Lab
Total/NA	Prep	200.7			50 mL	50 mL	329861	11/05/16 10:24	DN1	TAL PEN
Total/NA	Analysis	200.7 Rev 4.4		1			329960	11/06/16 18:51	GESP	TAL PEN
	Instrumer	nt ID: 6500 ICP Duo								

**Laboratory References:** 

TAL PEN = TestAmerica Pensacola, 3355 McLemore Drive, Pensacola, FL 32514, TEL (850)474-1001

TestAmerica Tampa

# **Certification Summary**

Client: Tampa Electric Company

Project/Site: L16J027

TestAmerica Job ID: 660-77026-1

# **Laboratory: TestAmerica Tampa**

The certifications listed below are applicable to this report.

Authority	Program	EPA Region	Certification ID	<b>Expiration Date</b>
Florida	NELAP	4	E84282	06-30-17

# Laboratory: TestAmerica Pensacola The certifications listed below are applicable to this report.

Authority	Program	<b>EPA Region</b>	Certification ID	<b>Expiration Date</b>
Florida	NELAP	4	E81010	06-30-17

# **Method Summary**

Client: Tampa Electric Company

Project/Site: L16J027

TestAmerica Job ID: 660-77026-1

Method	Method Description	Protocol	Laboratory
200.7 Rev 4.4	Metals (ICP)	EPA	TAL PEN

**Protocol References:** 

EPA = US Environmental Protection Agency

**Laboratory References:** 

TAL PEN = TestAmerica Pensacola, 3355 McLemore Drive, Pensacola, FL 32514, TEL (850)474-1001

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RENDING	LABOR	ATORY:

Tampa Electric Company, Laboratory Services

5012 Causeway Blvd Tampa, FL 33619 Phone: (813) 630-7490

Fax: (813) 630-7360

Project Manager: Peggy Penner

#### RECEIVING LABORATORY:

TestAmerica Laboratories, Inc. - Tampa

Laboratory 1D

Comments

13

6712 Benjamin Rd., Suite 100

Tampa, FL 33634

Phone: (813) 885-7427

Water

Fax: -

11/11/16 16:00 Due Date:

Analysis		
Sample ID: L16J027-01		BBS-CCR-1
Sampled:	10/28/16 11:42	

Lithium, Total EPA 6010

04/26/17 11:42

Containers Supplied:

Poly HNO3 - 250mL (A)

Sample ID: L16J027-02 BBS-CCR-2 Water

Expires

10/28/16 11:15 Sampled:

Lithium, Total EPA 6010 04/26/17 11:15

Containers Supplied:

Poly HNO3 - 250mL (A)

Sample ID: L16J027-03 BBS-CCR-3 Water Sampled: 10/28/16 10:50

Lithium, Total EPA 6010

04/26/17 10:50

Containers Supplied:

Poly HNO3 - 250mL (A)

Sample ID: L16J027-04 BBS-CCR-BW-1 Water 10/28/16 10:14 Sampled:

Lithium, Total EPA 6010 04/26/17 10:14

Containers Supplied:

Poly HNO3 - 250mL(A)

Sample ID: L16J027-05 BBS-CCR-BW-2 Water

10/28/16 09:42 Sampled:

04/26/17 09:42 Lithium, Total EPA 6010

Containers Supplied:

Poly HNO3 - 250mL (A)



Loc: 660

77026

0.2/0.4 W-09 Cerll 11-2-16@ 1040

Released By

Date & Time

Received By

Date & Time

Page 3 of 3 11/8/2016

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S - H2SO4 T - TSP Dodecahydrate U - Acetone Testa eio THE ECADER S. HAR SECRETARY SAL PERTING Special Instructions/Note: accreditation compliance upon out subcontract laboratories. This sample shipment is forwarded under chain-of-custody. If the laboratory does not back to the TestAmerica laboratory or other instructions will be provided. Any changes to accreditation status should be brought to TestAmerica to said complicance to TestAmerica Laboratories, Inc. W - pH 4-5 Z - other (specify) M · Hexane N · None O · AsNaO2 P · Na2O4S Q · Na2SO3 R · Na2S2O3 Sompany Company Company Sample Disposal ( A fee may be assessed if samples are retained longer than 1 month)

Return To Client Disposal By Lab Archive For Mont Preservation Codes: 9/60 G - Amchlor H - Ascorbic Acid なが A - HCL
B - NaOH
C - Zn Acetate
D - Nitric Acid
E - NaHSO4
F - MeOH COC No: 660-91575.1 Page: Page 1 of 1 660-77026-1 J - DI Water K - EDTA L - EDA Date/Time: -3-18 Total Number of containers 4 スシス Date/Time: Method of Shipment Carrier Tracking No(s): State of Origin: Florida Analysis Requested Cooler Temperature(s) °C and Other Remarks: Special Instructions/QC Requirements: Accreditations Required (See note): NELAP - Florida; NELAP - Texas keaton.conner@testamericainc.com 13 Received by: Received by: Lab PM: Conner, Keaton × Chain of Custody Record × × × × Perform MS/MSD (Yes or No) Time: Field Filtered Sample (Yes or No) E-Mail: Tissue, A=Air (W=water, S=solid, O=waste/oil, an Code: Matrix Water Water Water Water Water ompany Note: Since laboratory accreditations are subject to change. TestAmerica Laboratories, Inc. places the ownership of method, analyte & currently maintain accreditation in the State of Origin listed above for analysis/tests/matrix being analyzed, the samples must be shippe Laboratories, Inc. attention immediately. If all requested accreditations are current to date, return the signed Chain of Custody attesting Preserva Type (C=comp, G=grab) Sample 8/1 Primary Deliverable Rank: 2 Eastern 10:14 Eastern 09:42 Sample Eastern 11:15 Eastern 10:50 Eastern Time 11:42 Date: O FAT Requested (days): Due Date Requested: 11/9/2016 Sample Date 10/28/16 10/28/16 10/28/16 10/28/16 10/28/16 Project #: 66004821 Date/Time: Phone: Client Information (Sub Contract Lab) Deliverable Requested: I, II, III, IV, Other (specify) Custody Seal No. Sample Identification - Client ID (Lab ID) Phone (813) 885-7427 Fax (813) 885-7049 850-474-1001(Tel) 850-478-2671(Fax) Possible Hazard Identification 6712 Benjamin Road Suite 100 TestAmerica Tampa FestAmerica Laboratories, Inc. \_1|6J027-02 (660-77026-2) L16J027-03 (660-77026-3) L16J027-05 (660-77026-5) -16J027-01 (660-77026-1) \_1|6J027-04 (660-77026-4) Empty Kit Relinquished by: Custody Seals Intact: 3355 McLemore Drive, Δ Yes Δ No Shipping/Receiving Tampa, FL 33634 linquished by: Unconfirmed Project Name: L16J027 Client Contact State, Zip: FL, 32514 Pensacola Page 14 of 16 11/8/2016

### **Login Sample Receipt Checklist**

Client: Tampa Electric Company

Job Number: 660-77026-1

Login Number: 77026 List Source: TestAmerica Tampa

List Number: 1

Creator: Southers, Kristin B

oreator. Southers, Kristin D		
Question	Answer	Comment
Radioactivity wasn't checked or is = background as measured by a survey meter.</td <td>N/A</td> <td></td>	N/A	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
s the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is 6mm (1/4").	N/A	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

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### **Login Sample Receipt Checklist**

Client: Tampa Electric Company

Job Number: 660-77026-1

List Number: 77026
List Number: 2
List Source: TestAmerica Pensacola
List Creation: 11/03/16 05:21 PM

Creator: Franklin, Justin H

Creator: Franklin, Justin H		
Question	Answer	Comment
Radioactivity wasn't checked or is = background as measured by a survey meter.</td <td>N/A</td> <td></td>	N/A	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	4.2°C IR-5
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	N/A	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

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### DOH Certification #E84025 **DEP COMPOAP # 870251**

Report Date: November 15, 2016

TECO

5012 Causeway Blvd. Tampa, FL 33619

Attn: Peggy Penner

Field Custody:

Client

Client/Field ID:

L16J027-01

Sample Collection:

10-28-16/1142

Lab ID No:

16.12668

Lab Custody Date:

11-2-16/1610

Sample description:

Water

CERTIFICATE OF ANALYSIS

					Detection			
Parameter	Units	Results		ts	Date	Method	Limit	
Combined Radium (Radium-226 + Radium 228)	pCi/l	42.6	±	2.3	Calc	Calc	0.7	
Radium-226	pCi/l	40.5	±	2.3	11-9-16/1420	EPA 903.0	0.5	
Radium-228 Alpha Standard: Th-230	pCi/l	2.1	±	0.5	11-10-16/1714	EPA Ra-05	0.7	

James W. Hages

James W. Hayes Laboratory Manager

Test results meet all requirements of the NELAC standards. Statement of estimated uncertainty available upon request. Test results refer only to sample(s) listed. Contact person: Jim Hayes (813) 229-2879.



### DOH Certification #E84025 **DEP COMPOAP # 870251**

Report Date: November 15, 2016

TECO

5012 Causeway Blvd. Tampa, FL 33619

Attn: Peggy Penner

Client Field Custody:

Client/Field ID: L16J027-02

Sample Collection: 10-28-16/1115

Lab ID No: 16.12669

11-2-16/1610 Lab Custody Date:

Sample description: Water

#### CERTIFICATE OF ANALYSIS

					Analysis		Detection		
Parameter	Units	Results		ts	Date	Method	Limit		
Combined Radium (Radium-226 + Radium 228)	pCi/l	14.9	±	1.3	Calc	Calc	0.7		
Radium-226	pCi/l	13.8	±	1.3	11-9-16/1420	EPA 903.0	0.5		
Radium-228 Alpha Standard: Th-230	pCi/l	1.1	±	0.5	11-10-16/1714	EPA Ra-05	0.7		

James W. Hayes

James W. Hages

Laboratory Manager

Test results meet all requirements of the NELAC standards. Statement of estimated uncertainty available upon request. Test results refer only to sample(s) listed. Contact person: Jim Hayes (813) 229-2879.



### DOH Certification #E84025 DEP COMPQAP # 870251

Report Date: November 15, 2016

TECO

5012 Causeway Blvd. Tampa, FL 33619

Attn: Peggy Penner

Field Custody:

Client

Client/Field ID:

L16J027-03

Sample Collection:

10-28-16/1050

Lab ID No:

16.12670

Lab Custody Date:

11-2-16/1610

Sample description:

Water

### CERTIFICATE OF ANALYSIS

					Detection			
Parameter	Units	Results		ts	Date	Method	Limit	
Combined Radium (Radium-226 + Radium 228)	pCi/l	18.1	±	1.4	Calc	Calc	0.7	
Radium-226	pCi/l	17.3	±	1.4	11-9-16/1420	EPA 903.0	0.3	
Radium-228 Alpha Standard: Th-230	pCi/l	0.8	±	0.5	11-10-16/1714	EPA Ra-05	0.7	

James W. Hayes Laboratory Manager

James W. Hages

Test results meet all requirements of the NELAC standards. Statement of estimated uncertainty available upon request. Test results refer only to sample(s) listed. Contact person: Jim Hayes (813) 229-2879.



### DOH Certification #E84025 **DEP COMPOAP # 870251**

Report Date: November 15, 2016

TECO

5012 Causeway Blvd. Tampa, FL 33619

Attn: Peggy Penner

Field Custody:

Client

Client/Field ID:

L16J027-04

Sample Collection:

10-28-16/1014

Lab ID No:

16.12671

Lab Custody Date:

11-2-16/1610

Sample description:

Water

### CERTIFICATE OF ANALYSIS

Parameter	Units	Re	sul	ts	Analysis Date	Method	Detection Limit	
Combined Radium (Radium-226 + Radium 228)	pCi/l	32.3	±	2.0	Calc	Calc	0.6	
Radium-226	pCi/l	29.0	±	2.0	11-9-16/1420	EPA 903.0	0.5	
Radium-228	pCi/l	3.3	±	0.6	11-11-16/1033	EPA Ra-05	0.6	

James W. Hages

James W. Hayes Laboratory Manager

Test results meet all requirements of the NELAC standards. Statement of estimated uncertainty available upon request. Test results refer only to sample(s) listed. Contact person: Jim Hayes (813) 229-2879.

### SUBCONTRACT ORDER

### Tampa Electric Company, Laboratory Services L16J027

### SENDING LABORATORY:

RECEIVING LABORATORY:

**KNL Laboratory Services** 

3202 N. Florida Ave. Tampa, FL 33603

Phone: (813) 229-2879

Fax: -

5012 Causeway Blvd Tampa, FL 33619 Phone: (813) 630-7490

Fax: (813) 630-7360

Project Manager: Peggy Penner

**Due Date:** 

11/11/16 16:00

Tampa Electric Company, Laboratory Services

Analysis	Expires		Laboratory ID	Comments
Sample ID: L16J027-01 BBS-CCR-1 Sampled: 10/28/16 11:42		Water	16.12668	
Radium 226 EPA 903.0	04/26/17 11:42		Level 2 Data requred	
Radium 226+228, Total	04/26/17 11:42		Level 2 Data requred	
Radium 228 Ra-05	04/26/17 11:42		Level 2 Data requred	
Containers Supplied:				
RAD Poly HNO3 - 1000mL (C)	RAD Poly HNO3 - 1000mL (	D)		
Sample ID: L16J027-02 BBS-CCR-2 Sampled: 10/28/16 11:15		Water	16.12669	
Radium 226 EPA 903.0	04/26/17 11:15		Level 2 Data requred	
Radium 226+228, Total	04/26/17 11:15		Level 2 Data requred	
Radium 228 Ra-05	04/26/17 11:15		Level 2 Data requred	
Containers Supplied:	DAD DA ADIO A 1000 A	D)		
RAD Poly HNO3 - 1000mL (C)  Sample ID: L16J027-03 BBS-CCR-3	RAD Poly HNO3 - 1000mL (	D) Water		
Sampled: 10/28/16 10:50		water	16.12670	
Radium 226+228, Total	04/26/17 10:50		Level 2 Data requred	
Radium 226 EPA 903.0	04/26/17 10:50		Level 2 Data requred	
Radium 228 Ra-05	04/26/17 10:50		Level 2 Data requred	
Containers Supplied:				
RAD Poly HNO3 - 1000mL (C)	RAD Poly HNO3 - 1000mL (	(D)		
Sample ID: L16J027-04 BBS-CCR-BV Sampled: 10/28/16 10:14	V-1	Water	16.12671	
Radium 226 EPA 903.0	04/26/17 10:14		Level 2 Data requred	
Radium 226+228, Total	04/26/17 10:14		Level 2 Data requred	
Radium 228 Ra-05	04/26/17 10:14		Level 2 Data requred	at ile
Containers Supplied:				94,-17-14
RAD Poly HNO3 - 1000mL (C)	RAD Poly HNO3 - 1000mL	(D)		,

Released By

Date & Time

Received By

Date & Time



### DOH Certification #E84025 DEP COMPQAP # 870251

Report Date: November 14, 2016

TECO

5012 Causeway Blvd. Tampa, FL 33619

Attn: Peggy Penner

Field Custody: Client/Field ID:

Client

L16J027-05

Sample Collection:

10-28-16/0942

Lab ID No:

16.12672

Lab Custody Date:

11-2-16/1610

Sample description: W

Water

### CERTIFICATE OF ANALYSIS

				Detection			
Parameter	Units	Units Results		ts	Date	Method	Limit
Combined Radium (Radium-226 + Radium 228)	pCi/l	4.8	±	0.6	Calc	Calc	0.7
Radium-226	pCi/l	3.4	±	0.6	11-9-16/1420	EPA 903.0	0.3
Radium-228	pCi/l	1.4	±	0.5	11-10-16/1714	EPA Ra-05	0.7

James W. Hayes Laboratory Manager

James W. Hages

Test results meet all requirements of the NELAC standards. Statement of estimated uncertainty available upon request. Test results refer only to sample(s) listed. Contact person: Jim Hayes (813) 229-2879.

### SUBCONTRACT ORDER

## Tampa Electric Company, Laboratory Services

### L16J027

Analysis	Expires		Laboratory ID Comments
Sample ID: L16J027-05 BBS-CCR Sampled: 10/28/16 09:42	-BW-2 W	ater	16.12672
Radium 228 Ra-05	04/26/17 09:42		Level 2 Data requred
Radium 226 EPA 903.0	04/26/17 09:42		Level 2 Data requred
Radium 226+228, Total	04/26/17 09:42		Level 2 Data requred
Containers Supplied:			
RAD Poly HNO3 - 1000mL (C)	RAD Poly HNO3 - 1000mL (D)		

# 11-15-14

Released By Date & Time

Received By

11-2-10/1010 Date & Time



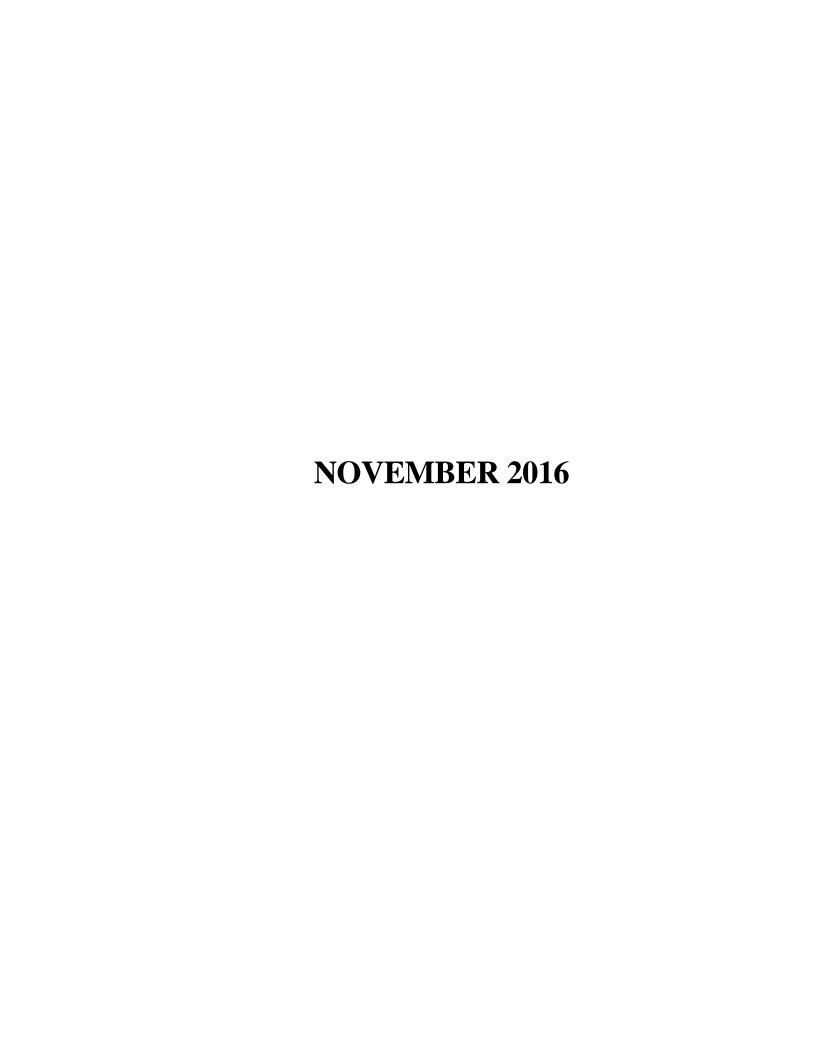
## FL DOH Certification # E84025

QC Summary: Total Rad	ium Analysis	
Client Project #:	>27	
Analysis Completion Date:	11 1 9 1 16	
Precision Data:  Sample Analysis (pCi/l)	Sample #: 14.1  Duplicate Analysis (pCi/l) Range  4.8	(pCi/l) RPD (%)
Spike Data:  Sample Analysis (pCi	Sample #: _/4.	ult (pCi) Spike Rec (%)
LCS Data:  Analytical Result (pCi)  /0,7	True Value (pCi) (	
Lab Blank:  Lab Blank	Analytical Result (pCi/l)  O, 3 +/- 0, 2	Analysis Date /// 9 // L



## FL DOH Certification # E84025

QC Summary: Radium 2	228 Analysis		
Client Project #:	027		
Analysis Completion Date:	11 / 10 / 16		
Precision Data:	Sample #: _	16-12634	
Sample Analysis (pCi/l)	Duplicate Analysis (pCi/l)	Range (pCi/l)	<u>RPD (%)</u>
4.2	3.8	0.4	_
Spike Data:	Sample #: _	16-12634	
Sample Analysis (pCi)	Spike Added (pCi) _ Analytic	cal Result (pCi)	Spike Rec (%)
0,4		4, 2	90%
LCS Data:			
Analytical Result (pCi)	True Value (pCi)	<u>% Re</u>	ecovery
4.5	4.3	!	05
Lab Blank:	Analytical Result (pCi	/I) Anal	ysis Date
Lab Blank	0-1 +/- 0.2		1 10 1 16





5012 Causeway Blvd Tampa Fl. 33619 \* Ph (813)630-7490 \* Fax (813)630-7360 \* DOH #E54272

Big Bend Power Station Terry Eastley 13031 Wyandott Rd Apollo Beach, FL 33572 tleastley@tecoenergy.com

Work Order - L16K034

Report Date:

12/15/16 15:17

## Project - CCR Wells Economizer Ash Pond

**Case Narrative** 

5 sample(s) were received on 11/10/16 13:32.

There were no issues noted with the sample(s) associated with this workorder unless noted below.

### **SM 2540C**

A constant weight could not be acheived after three consectutive weighing and drying cycles for samples CCR-1, CCR-BW1 and CCR-BW2. The sample(s) are flagged with a J qualifier.



5012 Causeway Blvd Tampa Fl. 33619 \* Ph (813)630-7490 \* Fax (813)630-7360 \* DOH #E54272

### **Sample Information**

Client: Big Bend Power Station

Lab Sample ID: L16K034-01 Sampled By: Robert Barthelette

Sample Description: BBS-CCR-1 Date and Time Collected: 11/10/16 11:53
Sample Collection Method: Grab Date of Sample Receipt: 11/10/16 13:32

### **Laboratory Results**

					Qualifier		Test		Analysis			
Parameter	Result	Units	MDL	PQL	Code	Dil	Method	Analyst	Date & Time			
Tampa Electric Company, Laboratory Services												
<b>General Chemistry Parameters</b>												
Chloride	817	mg/L	0.400	10.0	V	20	EPA 300.0	TMH	11/29/16 21:32			
Specific Conductance	4290	umhos/cm	100	100		1	FDEP SOP FT 1200	RAB	11/10/16 11:53			
Dissolved Oxygen	0.100	mg/L	0.100	0.100	U	1	FDEP SOP FT 1500	RAB	11/10/16 11:53			
Fluoride	0.0871	mg/L	0.0100	0.0500		1	EPA 300.0	TMH	11/29/16 21:21			
pH	6.82	pH Units	1.00	1.00		1	FDEP SOP FT 1100	RAB	11/10/16 11:53			
REDOX Potential	-136	mV	-999	-999		1	SM 2580B	RAB	11/10/16 11:53			
Total Dissolved Solids	3470	mg/L	24.0	40.0	J-	2	SM 2540C	RFL	11/14/16 13:20			
Sulfate	1290	mg/L	10.0	40.0		20	EPA 300.0	TMH	11/29/16 21:32			
Turbidity	0.890	NTU	0.100	0.100		1	FDEP SOP FT 1600	RAB	11/10/16 11:53			
Total Mercury by SW846 Method 7470/7471												
Mercury	0.0500	ug/L	0.0500	0.200	U	1	EPA 7470A	RLC	11/15/16 12:19			
<b>Total Recoverable Metals by 200</b>	Series											
Antimony	0.600	ug/L	0.600	2.00	U	1	EPA 200.8	RLC	11/11/16 12:13			
Arsenic	8.93	ug/L	0.320	2.00		1	EPA 200.8	RLC	11/11/16 12:13			
Boron	16200	ug/L	10.0	50.0		1	EPA 200.7	MCR	11/14/16 10:34			
Cadmium	0.100	ug/L	0.100	0.500	U	1	EPA 200.8	RLC	11/11/16 12:13			
Cobalt	0.519	ug/L	0.0400	2.00	I	1	EPA 200.8	RLC	11/11/16 12:13			
Lead	0.0800	ug/L	0.0800	2.00	U	1	EPA 200.8	RLC	11/11/16 12:13			
Selenium	1.04	ug/L	0.200	2.00	I	1	EPA 200.8	RLC	11/11/16 12:13			
Thallium	0.100	ug/L	0.100	0.500	U	1	EPA 200.8	RLC	11/11/16 12:13			
Total Recoverable Metals by SW	846 Method	6010B										
Barium	129	ug/L	0.500	20.0		1	EPA 6010B	MCR	11/14/16 10:34			
Beryllium	0.200	ug/L	0.200	2.00	U	1	EPA 6010B	MCR	11/14/16 10:34			
Calcium	606000	ug/L	30.0	1000		1	EPA 6010B	MCR	11/14/16 13:30			
Chromium	1.60	ug/L	1.60	12.0	U	1	EPA 6010B	MCR	11/14/16 10:34			
Molybdenum	98.4	ug/L	1.00	20.0		1	EPA 6010B	MCR	11/14/16 10:34			



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### **Sample Information**

Client: Big Bend Power Station

Lab Sample ID: L16K034-02 Sampled By: Robert Barthelette

Sample Description: BBS-CCR-2 Date and Time Collected: 11/10/16 11:27
Sample Collection Method: Grab Date of Sample Receipt: 11/10/16 13:32

### **Laboratory Results**

					Qualifier		Test		Analysis
Parameter	Result	Units	MDL	PQL	Code	Dil	Method	Analyst	Date & Time
	ř	Tampa Elec	tric Comp	any, Labo	ratory Se	rvices			
<b>General Chemistry Parameters</b>									
Chloride	111	mg/L	0.200	5.00	V	10	EPA 300.0	TMH	11/29/16 21:52
Specific Conductance	1540	umhos/cm	100	100		1	FDEP SOP FT 1200	RAB	11/10/16 11:27
Dissolved Oxygen	0.130	mg/L	0.100	0.100		1	FDEP SOP FT 1500	RAB	11/10/16 11:27
Fluoride	0.168	mg/L	0.0100	0.0500		1	EPA 300.0	TMH	11/29/16 21:42
pH	6.89	pH Units	1.00	1.00		1	FDEP SOP FT 1100	RAB	11/10/16 11:27
REDOX Potential	-186	mV	-999	-999		1	SM 2580B	RAB	11/10/16 11:27
Total Dissolved Solids	1110	mg/L	24.0	40.0		2	SM 2540C	RFL	11/14/16 13:20
Sulfate	468	mg/L	5.00	20.0		10	EPA 300.0	TMH	11/29/16 21:52
Turbidity	7.10	NTU	0.100	0.100		1	FDEP SOP FT 1600	RAB	11/10/16 11:27
<b>Total Mercury by SW846 Method</b>	d 7470/7471								
Mercury	0.0500	ug/L	0.0500	0.200	U	1	EPA 7470A	RLC	11/15/16 12:22
<b>Total Recoverable Metals by 200</b>	Series								
Antimony	0.600	ug/L	0.600	2.00	U	1	EPA 200.8	RLC	11/11/16 12:17
Arsenic	1.37	ug/L	0.320	2.00	I	1	EPA 200.8	RLC	11/11/16 12:17
Boron	2280	ug/L	10.0	50.0		1	EPA 200.7	MCR	11/14/16 10:36
Cadmium	0.100	ug/L	0.100	0.500	U	1	EPA 200.8	RLC	11/11/16 12:17
Cobalt	0.105	ug/L	0.0400	2.00	I	1	EPA 200.8	RLC	11/11/16 12:17
Lead	0.0955	ug/L	0.0800	2.00	I	1	EPA 200.8	RLC	11/11/16 12:17
Selenium	0.259	ug/L	0.200	2.00	I	1	EPA 200.8	RLC	11/11/16 12:17
Thallium	0.100	ug/L	0.100	0.500	U	1	EPA 200.8	RLC	11/11/16 12:17
Total Recoverable Metals by SW	846 Method	6010B							
Barium	62.4	ug/L	0.500	20.0		1	EPA 6010B	MCR	11/14/16 10:36
Beryllium	0.200	ug/L	0.200	2.00	U	1	EPA 6010B	MCR	11/14/16 10:36
Calcium	181000	ug/L	30.0	1000		1	EPA 6010B	MCR	11/14/16 13:33
Chromium	1.60	ug/L	1.60	12.0	U	1	EPA 6010B	MCR	11/14/16 10:36
Molybdenum	1.43	ug/L	1.00	20.0	I	1	EPA 6010B	MCR	11/14/16 10:36



5012 Causeway Blvd Tampa Fl. 33619 \* Ph (813)630-7490 \* Fax (813)630-7360 \* DOH #E54272

### **Sample Information**

Client: Big Bend Power Station

Lab Sample ID: L16K034-03 Sampled By: Robert Barthelette

Sample Description: BBS-CCR-3 Date and Time Collected: 11/10/16 11:05
Sample Collection Method: Grab Date of Sample Receipt: 11/10/16 13:32

### **Laboratory Results**

					Qualifier		Test		Analysis
Parameter	Result	Units	MDL	PQL	Code	Dil	Method	Analyst	Date & Time
	ŗ	Tampa Elec	tric Compa	any, Labo	ratory Sei	vices			
<b>General Chemistry Parameters</b>									
Chloride	129	mg/L	0.200	5.00	V	10	EPA 300.0	TMH	11/29/16 22:12
Specific Conductance	1650	umhos/cm	100	100		1	FDEP SOP FT 1200	RAB	11/10/16 11:05
Dissolved Oxygen	0.100	mg/L	0.100	0.100	U	1	FDEP SOP FT 1500	RAB	11/10/16 11:05
Fluoride	0.331	mg/L	0.0100	0.0500		1	EPA 300.0	TMH	11/29/16 22:02
pH	6.46	pH Units	1.00	1.00		1	FDEP SOP FT 1100	RAB	11/10/16 11:05
REDOX Potential	-239	mV	-999	-999		1	SM 2580B	RAB	11/10/16 11:05
Total Dissolved Solids	1220	mg/L	24.0	40.0		2	SM 2540C	RFL	11/14/16 13:20
Sulfate	492	mg/L	5.00	20.0		10	EPA 300.0	TMH	11/29/16 22:12
Turbidity	1.18	NTU	0.100	0.100		1	FDEP SOP FT 1600	RAB	11/10/16 11:05
Total Mercury by SW846 Method	d 7470/7471								
Mercury	0.0500	ug/L	0.0500	0.200	U	1	EPA 7470A	RLC	11/15/16 12:26
<b>Total Recoverable Metals by 200</b>	Series								
Antimony	0.600	ug/L	0.600	2.00	U	1	EPA 200.8	RLC	11/11/16 12:20
Arsenic	0.765	ug/L	0.320	2.00	I	1	EPA 200.8	RLC	11/11/16 12:20
Boron	502	ug/L	10.0	50.0		1	EPA 200.7	MCR	11/14/16 10:39
Cadmium	0.100	ug/L	0.100	0.500	U	1	EPA 200.8	RLC	11/11/16 12:20
Cobalt	0.117	ug/L	0.0400	2.00	I	1	EPA 200.8	RLC	11/11/16 12:20
Lead	0.0800	ug/L	0.0800	2.00	U	1	EPA 200.8	RLC	11/11/16 12:20
Selenium	0.253	ug/L	0.200	2.00	I	1	EPA 200.8	RLC	11/11/16 12:20
Thallium	0.100	ug/L	0.100	0.500	U	1	EPA 200.8	RLC	11/11/16 12:20
Total Recoverable Metals by SW	846 Method	6010B							
Barium	63.0	ug/L	0.500	20.0		1	EPA 6010B	MCR	11/14/16 10:39
Beryllium	0.200	ug/L	0.200	2.00	U	1	EPA 6010B	MCR	11/14/16 10:39
Calcium	200000	ug/L	30.0	1000		1	EPA 6010B	MCR	11/14/16 13:35
Chromium	1.60	ug/L	1.60	12.0	U	1	EPA 6010B	MCR	11/14/16 10:39
Molybdenum	3.90	ug/L	1.00	20.0	I	1	EPA 6010B	MCR	11/14/16 10:39



5012 Causeway Blvd Tampa Fl. 33619 \* Ph (813)630-7490 \* Fax (813)630-7360 \* DOH #E54272

### **Sample Information**

Client: Big Bend Power Station

Lab Sample ID: L16K034-04 Sampled By: Robert Barthelette

Sample Description: BBS-CCR-BW1 Date and Time Collected: 11/10/16 10:20
Sample Collection Method: Grab Date of Sample Receipt: 11/10/16 13:32

### **Laboratory Results**

					Qualifier		Test		Analysis
Parameter	Result	Units	MDL	PQL	Code	Dil	Method	Analyst	Date & Time
	,	Tampa Elec	tric Comp	any, Labo	ratory Se	rvices			
<b>General Chemistry Parameter</b>	<u>rs</u>								
Chloride	993	mg/L	0.400	10.0	V	20	EPA 300.0	TMH	11/29/16 22:32
Specific Conductance	5000	umhos/cm	100	100		1	FDEP SOP FT 1200	RAB	11/10/16 10:20
Dissolved Oxygen	0.130	mg/L	0.100	0.100		1	FDEP SOP FT 1500	RAB	11/10/16 10:20
Fluoride	0.261	mg/L	0.0100	0.0500		1	EPA 300.0	TMH	11/29/16 22:22
pН	6.52	pH Units	1.00	1.00		1	FDEP SOP FT 1100	RAB	11/10/16 10:20
REDOX Potential	-71.1	mV	-999	-999		1	SM 2580B	RAB	11/10/16 10:20
Total Dissolved Solids	4170	mg/L	24.0	40.0	J-	2	SM 2540C	RFL	11/14/16 13:20
Sulfate	1440	mg/L	10.0	40.0		20	EPA 300.0	TMH	11/29/16 22:32
Turbidity	1.77	NTU	0.100	0.100		1	FDEP SOP FT 1600	RAB	11/10/16 10:20
<b>Total Mercury by SW846 Met</b>	thod 7470/7471								
Mercury	0.0500	ug/L	0.0500	0.200	U	1	EPA 7470A	RLC	11/15/16 12:29
<b>Total Recoverable Metals by 2</b>	200 Series								
Antimony	0.600	ug/L	0.600	2.00	U	1	EPA 200.8	RLC	11/11/16 12:51
Arsenic	8.49	ug/L	0.320	2.00		1	EPA 200.8	RLC	11/11/16 12:51
Boron	49700	ug/L	10.0	50.0		1	EPA 200.7	MCR	11/14/16 10:41
Cadmium	0.100	ug/L	0.100	0.500	U	1	EPA 200.8	RLC	11/11/16 12:51
Cobalt	1.45	ug/L	0.0400	2.00	I	1	EPA 200.8	RLC	11/11/16 12:51
Lead	0.102	ug/L	0.0800	2.00	I	1	EPA 200.8	RLC	11/11/16 12:51
Selenium	2.51	ug/L	0.200	2.00		1	EPA 200.8	RLC	11/11/16 12:51
Thallium	0.100	ug/L	0.100	0.500	U	1	EPA 200.8	RLC	11/11/16 12:51
Total Recoverable Metals by S	SW846 Method	6010B							
Barium	61.2	ug/L	0.500	20.0		1	EPA 6010B	MCR	11/14/16 10:41
Beryllium	0.200	ug/L	0.200	2.00	U	1	EPA 6010B	MCR	11/14/16 10:41
Calcium	692000	ug/L	30.0	1000		1	EPA 6010B	MCR	11/14/16 13:38
Chromium	1.60	ug/L	1.60	12.0	U	1	EPA 6010B	MCR	11/14/16 10:41
Molybdenum	6.58	ug/L	1.00	20.0	I	1	EPA 6010B	MCR	11/14/16 10:41



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### **Sample Information**

Client: Big Bend Power Station

Lab Sample ID: L16K034-05 Sampled By: Robert Barthelette

Sample Description: BBS-CCR-BW2 Date and Time Collected: 11/10/16 9:49
Sample Collection Method: Grab Date of Sample Receipt: 11/10/16 13:32

### **Laboratory Results**

#### Sample Qualifier:

					Qualifier		Test		Analysis
Parameter	Result	Units	MDL	PQL	Code	Dil	Method	Analyst	Date & Time
	,	Tampa Elec	tric Comp	any, Labo	ratory Se	rvices			
<b>General Chemistry Parameters</b>									
Chloride	129	mg/L	0.200	5.00	V	10	EPA 300.0	TMH	11/29/16 23:13
Specific Conductance	1400	umhos/cm	100	100		1	FDEP SOP FT 1200	RAB	11/10/16 9:49
Dissolved Oxygen	0.200	mg/L	0.100	0.100		1	FDEP SOP FT 1500	RAB	11/10/16 9:49
Fluoride	0.464	mg/L	0.0100	0.0500		1	EPA 300.0	TMH	11/29/16 22:42
pH	6.68	pH Units	1.00	1.00		1	FDEP SOP FT 1100	RAB	11/10/16 9:49
REDOX Potential	-73.8	mV	-999	-999		1	SM 2580B	RAB	11/10/16 9:49
Total Dissolved Solids	966	mg/L	24.0	40.0	J-	2	SM 2540C	RFL	11/14/16 13:20
Sulfate	255	mg/L	5.00	20.0		10	EPA 300.0	TMH	11/29/16 23:13
Turbidity	5.86	NTU	0.100	0.100		1	FDEP SOP FT 1600	RAB	11/10/16 9:49
<b>Total Mercury by SW846 Method</b>	d 7470/7471								
Mercury	0.0500	ug/L	0.0500	0.200	U	1	EPA 7470A	RLC	11/15/16 12:33
<b>Total Recoverable Metals by 200</b>	Series								
Antimony	0.600	ug/L	0.600	2.00	U	1	EPA 200.8	RLC	11/11/16 12:54
Arsenic	2.59	ug/L	0.320	2.00		1	EPA 200.8	RLC	11/11/16 12:54
Boron	3750	ug/L	10.0	50.0		1	EPA 200.7	MCR	11/14/16 10:53
Cadmium	0.100	ug/L	0.100	0.500	U	1	EPA 200.8	RLC	11/11/16 12:54
Cobalt	0.157	ug/L	0.0400	2.00	I	1	EPA 200.8	RLC	11/11/16 12:54
Lead	0.0800	ug/L	0.0800	2.00	U	1	EPA 200.8	RLC	11/11/16 12:54
Selenium	0.485	ug/L	0.200	2.00	I	1	EPA 200.8	RLC	11/11/16 12:54
Thallium	0.100	ug/L	0.100	0.500	U	1	EPA 200.8	RLC	11/11/16 12:54
<b>Total Recoverable Metals by SW</b>	846 Method	6010B							
Barium	45.8	ug/L	0.500	20.0		1	EPA 6010B	MCR	11/14/16 10:53
Beryllium	0.200	ug/L	0.200	2.00	U	1	EPA 6010B	MCR	11/14/16 10:53
Calcium	243000	ug/L	30.0	1000		1	EPA 6010B	MCR	11/14/16 13:40
Chromium	1.60	ug/L	1.60	12.0	U	1	EPA 6010B	MCR	11/14/16 10:53
Molybdenum	1.00	ug/L	1.00	20.0	U	1	EPA 6010B	MCR	11/14/16 10:53

#### Comments

- U Indicates that the compound was analyzed for but not detected.
- J- The reported value is an estimated value, see the case narrative for specifics.
- I Estimated value
- V Analyte detected in the method blank

Laboratory Services certifies that the test result in this report meet all requirements of the NELAC standards, unless indicated otherwise in the body of the report. Unless otherwise noted, all methods followed are per the most current published version of 40 CFR Part 136, Table B. Results reported on this report pertain to the above referenced sample only.



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**Subcontract Laboratories:** 



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### Total Recoverable Metals by SW846 Method 6010B - Quality Control

					Spike	Source		%Rec		RPD	
Analyte	Result	MDL	PQL	Units	Level	Result	%Rec	Limits	RPD	Limit	Qualifier
Batch 16K0104 - EPA 6010B											
Blank (16K0104-BLK1)					Prepared: 1	1/11/16 Ar	nalyzed: 11	/14/16			
Barium	0.500	0.500	20.0	ug/L							U
Beryllium	0.200	0.200	2.00	ug/L							U
Calcium	30.0	30.0	1000	ug/L							U
Chromium	1.60	1.60	12.0	ug/L							U
Molybdenum	1.00	1.00	20.0	ug/L							U
LCS (16K0104-BS1)					Prepared: 1	1/11/16 Ar	nalyzed: 11	/14/16			
Barium	1050	0.500	20.0	ug/L	1000.0		105	80-120			
Beryllium	1030	0.200	2.00	ug/L	1000.0		103	80-120			
Chromium	1040	1.60	12.0	ug/L	1000.0		104	80-120			
Molybdenum	995	1.00	20.0	ug/L	1000.0		99.5	80-120			
Matrix Spike (16K0104-MS1)		Sour	ce: L16K02	29-01	Prepared: 1	1/11/16 Ar	nalyzed: 11	/14/16			
Barium	1100	0.500	20.0	ug/L	1000.0	7.45	109	75-125			
Beryllium	1080	0.200	2.00	ug/L	1000.0	0.622	108	75-125			
Chromium	1070	1.60	12.0	ug/L	1000.0	U	107	75-125			
Molybdenum	1610	1.00	20.0	ug/L	1000.0	567	104	75-125			
Matrix Spike Dup (16K0104-MSD1)		Sour	ce: L16K02	29-01	Prepared: 1	1/11/16 Ar	nalyzed: 11	/14/16			
Barium	1070	0.500	20.0	ug/L	1000.0	7.45	107	75-125	2.23	20	
Beryllium	1050	0.200	2.00	ug/L	1000.0	0.622	105	75-125	2.88	20	
Chromium	1040	1.60	12.0	ug/L	1000.0	U	104	75-125	2.94	20	
Molybdenum	1550	1.00	20.0	ug/L	1000.0	567	97.8	75-125	3.82	20	



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### Total Mercury by SW846 Method 7470/7471 - Quality Control

					Spike	Source		%Rec		RPD	
Analyte	Result	MDL	PQL	Units	Level	Result	%Rec	Limits	RPD	Limit	Qualifier
Batch 16K0106 - EPA 7470A											
Blank (16K0106-BLK1)					Prepared &	Analyzed:	11/15/16				
Mercury	0.0500	0.0500	0.200	ug/L							U
LCS (16K0106-BS1)					Prepared &	Analyzed:	11/15/16				
Mercury	1.00	0.0500	0.200	ug/L	1.0000		100	80-120			
Matrix Spike (16K0106-MS1)		Sour	ce: L16K03	34-01	Prepared &	Analyzed:	11/15/16				
Mercury	0.799	0.0500	0.200	ug/L	1.0000	U	79.9	75-125			
Matrix Spike Dup (16K0106-MSD1)		Sour	ce: L16K03	34-01	Prepared &	Analyzed:	11/15/16				
Mercury	0.808	0.0500	0.200	ug/L	1.0000	U	80.8	75-125	1.09	20	



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### **Total Recoverable Metals by 200 Series - Quality Control**

					Spike	Source		%Rec		RPD	
Analyte	Result	MDL	PQL	Units	Level	Result	%Rec	Limits	RPD	Limit	Qualifier
Batch 16K0095 - EPA 200.8											
Blank (16K0095-BLK1)					Prepared: 1	1/10/16 An	alyzed: 11	/11/16			
Antimony	0.600	0.600	2.00	ug/L							U
Arsenic	0.320	0.320	2.00	ug/L							U
Cadmium	0.100	0.100	0.500	ug/L							U
Cobalt	0.0400	0.0400	2.00	ug/L							U
Lead	0.0800	0.0800	2.00	ug/L							U
Selenium	0.200	0.200	2.00	ug/L							U
Thallium	0.100	0.100	0.500	ug/L							U
LCS (16K0095-BS1)					Prepared: 1	1/10/16 An	alyzed: 11	/11/16			
Antimony	103	0.600	2.00	ug/L	100.00		103	85-115			
Arsenic	103	0.320	2.00	ug/L	100.00		103	85-115			
Cadmium	103	0.100	0.500	ug/L	100.00		103	85-115			
Cobalt	102	0.0400	2.00	ug/L	100.00		102	85-115			
Lead	104	0.0800	2.00	ug/L	100.00		104	85-115			
Selenium	101	0.200	2.00	ug/L	100.00		101	85-115			
Thallium	105	0.100	0.500	ug/L	100.00		105	85-115			
Matrix Spike (16K0095-MS1)		Sour	ce: L16K08	4-01	Prepared: 1	1/10/16 An	alyzed: 11	/11/16			
Antimony	118	6.00	20.0	ug/L	100.00	7.54	111	70-130			
Arsenic	108	3.20	20.0	ug/L	100.00	U	108	70-130			
Cadmium	99.3	1.00	5.00	ug/L	100.00	1.73	97.6	70-130			
Cobalt	108	0.400	20.0	ug/L	100.00	18.3	89.9	70-130			
Lead	95.7	0.800	20.0	ug/L	100.00	1.05	94.6	70-130			
Selenium	159	2.00	20.0	ug/L	100.00	125	34.4	70-130			J-
Thallium	99.5	1.00	5.00	ug/L	100.00	2.59	96.9	70-130			
Matrix Spike Dup (16K0095-MSD1)		Sour	ce: L16K08	4-01	Prepared: 1	1/10/16 An	alyzed: 11	/11/16			
Antimony	119	6.00	20.0	ug/L	100.00	7.54	111	70-130	0.290	20	
Arsenic	110	3.20	20.0	ug/L	100.00	U	110	70-130	2.01	20	
Cadmium	101	1.00	5.00	ug/L	100.00	1.73	98.8	70-130	1.19	20	
Cobalt	111	0.400	20.0	ug/L	100.00	18.3	92.4	70-130	2.33	20	
Lead	95.5	0.800	20.0	ug/L	100.00	1.05	94.5	70-130	0.172	20	
Selenium	161	2.00	20.0	ug/L	100.00	125	35.7	70-130	0.829	20	J-
Thallium	99.9	1.00	5.00	ug/L	100.00	2.59	97.4	70-130	0.409	20	



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### **Total Recoverable Metals by 200 Series - Quality Control**

Analyte	Result	MDL	PQL	Units	Spike Level	Source Result	%Rec	%Rec Limits	RPD	RPD Limit	Qualifier
Batch 16K0104 - EPA 200.7											
Blank (16K0104-BLK1)					Prepared: 1	1/11/16 Aı	nalyzed: 11	/14/16			
Boron	10.0	10.0	50.0	ug/L							U
LCS (16K0104-BS1)					Prepared:	1/11/16 Aı	nalyzed: 11	/14/16			
Boron	1040	10.0	50.0	ug/L	1000.0		104	85-115			
Matrix Spike (16K0104-MS1)		Sour	ce: L16K02	29-01	Prepared:	1/11/16 Aı	nalyzed: 11	/14/16			
Boron	3950	10.0	50.0	ug/L	1000.0	2660	129	70-130			
Matrix Spike Dup (16K0104-MSD1)		Sour	ce: L16K02	29-01	Prepared:	1/11/16 Aı	nalyzed: 11	/14/16			
Boron	3820	10.0	50.0	ug/L	1000.0	2660	116	70-130	3.35	20	



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### **General Chemistry Parameters - Quality Control**

Analyte	Result	MDL	PQL	Units	Spike Level	Source Result	%Rec	%Rec Limits	RPD	RPD Limit	Qualifier
Batch 16K0112 - SM 2540C											
Blank (16K0112-BLK1)					Prepared &	Analyzed:	11/14/16				
Total Dissolved Solids	12.0	12.0	20.0	mg/L							U
LCS (16K0112-BS1)					Prepared &	Analyzed:	11/14/16				
Total Dissolved Solids	1010	12.0	20.0	mg/L	1000.0		101	80-120			
Duplicate (16K0112-DUP1)		Sour	ce: L16K03	34-01	Prepared &	Analyzed:	11/14/16				
Total Dissolved Solids	3530	24.0	40.0	mg/L	•	3470			1.71	10	J-
Duplicate (16K0112-DUP2)		Sour	ce: L16K05	59-02	Prepared &	Analyzed:	11/14/16				
Total Dissolved Solids	95.0	12.0	20.0	mg/L		104			9.05	10	
Batch 16K0150 - EPA 300.0											
Blank (16K0150-BLK1)					Prepared &	Analyzed:	11/29/16				
Chloride	0.0961	0.0200	0.500	mg/L							I
Fluoride	0.0100	0.0100	0.0500	mg/L							U
Sulfate	0.500	0.500	2.00	mg/L							U
LCS (16K0150-BS1)					Prepared &	Analyzed:	11/29/16				
Chloride	4.96	0.0200	0.500	mg/L	5.0000		99.2	90-110			V
Fluoride	4.93	0.0100	0.0500	mg/L	5.0000		98.6	90-110			
Sulfate	4.99	0.500	2.00	mg/L	5.0000		99.8	90-110			
Matrix Spike (16K0150-MS1)		Sour	ce: L16K00	2-01	Prepared &	Analyzed:	11/29/16				
Chloride	481	0.200	5.00	mg/L	50.000	430	101	90-110			V
Fluoride	53.2	0.100	0.500	mg/L	50.000	1.12	104	90-110			
Sulfate	713	5.00	20.0	mg/L	50.000	672	82.7	90-110			J-



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### **General Chemistry Parameters - Quality Control**

					Spike	Source		%Rec		RPD	
Analyte	Result	MDL	PQL	Units	Level	Result	%Rec	Limits	RPD	Limit	Qualifier
Batch 16K0150 - EPA 300.0											
Matrix Spike (16K0150-MS2)		Sour	ce: L16K11	6-01	Prepared &	: Analyzed:	11/30/16				
Chloride	105	0.200	5.00	mg/L	50.000	54.4	101	90-110			V
Fluoride	50.9	0.100	0.500	mg/L	50.000	U	102	90-110			
Sulfate	122	5.00	20.0	mg/L	50.000	75.3	94.0	90-110			
Matrix Spike Dup (16K0150-MSD1)		Sour	ce: L16K00	2-01	Prepared &	Analyzed:	11/29/16				
Chloride	478	0.200	5.00	mg/L	50.000	430	95.3	90-110	0.597	20	V
Fluoride	53.4	0.100	0.500	mg/L	50.000	1.12	105	90-110	0.336	20	
Sulfate	709	5.00	20.0	mg/L	50.000	672	74.6	90-110	0.564	20	J-
Matrix Spike Dup (16K0150-MSD2)		Source: L16K116-01		Prepared &	Analyzed:	11/30/16					
Chloride	106	0.200	5.00	mg/L	50.000	54.4	103	90-110	1.32	20	V
Fluoride	51.6	0.100	0.500	mg/L	50.000	U	103	90-110	1.39	20	
Sulfate	123	5.00	20.0	mg/L	50.000	75.3	96.0	90-110	0.780	20	

Tampa Electric Company, Laboratory Services

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Peggy Penner, Manager, Laboratory Services

Laboratory Services certifies that the test result in this report meet all requirements of the NELAC standards, unless indicated otherwise in the body of the report. Unless otherwise noted, all methods followed are per the most current published version of 40 CFR Part 136, Table B. Results reported on this report pertain to the above referenced sample only.

Sampler(s) /

Site:	Big Be	nd	Date:	11/10/16	File Name:	111016	Wells RAB	Weather:	CLEAR	& MILD	Sampler(s) / Initials	RAB /TEC	O Initials	
LIMS #	Loction Code	Time	FE <sup>2</sup>	pH (SU)	Temp °C	Cond(uMHOS)	DO Mg/L	Turbidity(NTU)	Redox (mv)	Sulfite (mg/L)	Color	Odor		IGVD
			mg/l	PH	TEMP-C	COND-F	DO	TURB-N-F	REDOX	SO3-TR	\$COLOR-W	\$ODOR-W	Time	LEVEL
L16K034-01	BBS-CCR-1	11:53		6.82	25.70	4290	0.08	0.89	-135.5		LT. YELLOW	NONE	11:33	
L16K034-02	BBS-CCR-2	11:27		6.89	25.66	1542	0.13	7.10	-185.6		LT. YELLOW	NONE	11:11	
LIMS #	250ml Cyan (3)	1L Inorg (1)	500ml Inorg (2)	250ml Inorg (3)	1L Mtls (1)	250ml Mtls (3)	1L Rads (1)	500ml Sulfide (2)	500ml Mtls (2)	250ml Nuts (3)	40ml Vial (6)	500 ml Nuts (2)	1L Rads Diss. (1)	Total Containers
L16K034-01	<b>□</b>	3 ( )	1	3 (17)		<b>☑</b> 2	<b>☑</b> 2							
			1			✓ 2	<u> </u>							10
(1) 1L plastic (PP)		(2) 500ml plastic	(PP)	(3) 250ml plastic	(PP)	(4) 100ml coliform be	ottle	(5) 1L amber glass (	AG)	(6) 40ml VOA vial	(CG)		Samples On Ice	Sample Reciept
ESS	0107301Y	ESS	0218201Y	ESS	0307301Y	ESS		ESS	-,	ESS	(,		Yes No	Time 13:32
	Preservation			Pres ID		Preservation		•	Pres ID		Preservation		Pres ID	Temp 1.1
1L bottles (rads): 5 ml H				L 010688 ☑	250ml bottles (nu	ts): 1 ml H2SO4 to ph	1<2		L 🚨	500 ml bottles(Sulfi	de) 2ml NAOH/Zinc	Acet. to pH >12	L □	12111
500 ml bottles (metals):	· · · · · · · · · · · · · · · · · · ·					0.5 ml H2SO4 to pH				`	n) 1g NAOH to pH >		L O	
250 ml bottles (metal): 1	· · · · · · · · · · · · · · · · · · ·			L 010688	<u> </u>	· · · · · · · · · · · · · · · · · · ·	ium, 5 ml HNO3 to pH <2	1	· □	` ,	licates that the sam		a nH of <2	
pH Meter Calibration	mirring to pri 2	Buffer ID	Buffer Value	Cal	Time	ICV	Time	CCV	Time	Redox Cal	Time	Temp °C	Reading mv	Theo Value mv
Meter ID:	MPM08	L 016047H	7	7.02	8:32	100	Tille	7.07	13:25	Meter ID:	8:39	21.6	235.7	236.2
FDEP FT 1100	IVII IVIOO	L 016500A	10	10.05	8:32	QC: (nH +/- 0.2) (Co	nd +/- 5%) (DO +/- 0.3m			MPM08	13:18	21.7	232.3	236.2
Units: SU		L 015514B	4	4.00	8:32		cates ICV / CCV passed		,	Zobell Sol ID:	10.10	21.1	202.0	200.2
Conductivity Meter Cal	lib.	Standard ID	Std Value	Cal	Time	ICV	Time	CCV	Time	L 016396				
Meter ID:	MPM08	L 015981A	1000	1000	8:41		7,1112		11112	DO Meter Cal	Time	Temp °C	Reading mg/l	Theo Value mg/l
FDEP FT 1200. Units: ul		L 015370B	10000			9930	8:45	9815	13:15	Meter ID:	8:18	21.9	8.80	8.761
Turbidity Meter Calibra	-	Standard ID	Std Value	Accentabi	ility Range	ICV	Time	CCV	Time	MPM08	13:20	21.8	8.75	8.777
Meter ID:	TM07	L 013677	5.28	4.75	5.81	5.37	8:00	5.31	13:14	Barom. Pres	13.20	21.0	0.73	0.777
FDEP FT 1600, Units: N		L L#?	0.20	1.10	0.01	0.01	0.00	0.01	10.14	760				
			00 DIt/I	Ti	Titure to a ID	N. This ID	DO 0 Dill ID	Otanah Ind ID	1- d-4- (1- di d- 1D			Canduat (9/)	DO ((1))	D. d ()
Sulfite Info (QC Check) QC Std: 5ml (NaThio)/50			QC Result mg/l	Time	Titrator ID	Na Thio ID	DO 3 Pillow ID	Starch Ind. ID	lodate/lodide ID	Therm ID MPM08	рН 0.2	Conduct.( %)	DO (mg/l) 0.3	Redox (mv) 10
Purging Information	John Di-Tollig/L	Well Canacities	(gallone/ft): 2"	' = 0.16   4" =0.65		Tubing Incide Diam	. Capacities Gallons/ft):	- 1/4" =0 0026 3/8" =	0.006	IVII IVIOO	0.2		0.0	10
r drging information		Well Capacities	ganons/ it). z	Well	Depth to	Water	Well	1 Well	, Tuhing	Tubing	Pump	Cell	1 Eqpt.	
Well #	Diam/ Comp	Screen Interval (ft)	Intake Depth (ft)	Depth (ft)	Depth to Water (ft)	= Column X	Capacity (gal) =	Volume (gal)	Capacity X	Length )	+ Volume + (gal)	Volume = (gal)		
BBS-CCR-1	2	10	17.32	22.32	7.38	14.94	0.16	2.39	0.0026	23.3	0	0.06	0.12	
Purge Meth:	Time	Rate (ml/min)	Volume (gal)	Total Vol. (gal)	Water Depth (ft)	pH (SU)	Temp °C	Cond (uMHOS)	DO (mg/L)	Turbidity (NTU)	Purge Criteria	Status	Equipment ID	Egpt, Table
1A	11:40	500	0.92	0.92	7.50	6.82	25.71	4286	0.08	1.13	ph:+/- 0.2	STABLE	Level Meter:	wlm08
	11:42	480	0.92	1.17	7.50	6.83	25.74	4290	0.07	0.75	Temp°C+/- 0.2	STABLE	Pump:	PP
Purge Start: 11:33	11:44	480			7.50				0.07	0.75	Cond % +/- 5	STABLE	•	
	11.44	400	0.25	1.42	7.50	6.82	25.70	4290	0.06	0.09	DO % Sat.< 20	STABLE	Tubing: Dedicated	PE/S  Yes
Purge End: 11:44											Turb. NTU < 20	STABLE	Tubing?	□ No
Purge Complete A	t 11·3/	Gallons to P	urge 0.12	Stablility	Values =	6.82	25.70	4290	0.08	0.89	14.5.11.6 - 20	STABLE	rubing:	
a. go complete A	11.34		J. U.12	Well	Depth to	Mater	Well	1 Well	, Tubing	Tubing \	Pump	Cell	1 Eqpt.	
		Screen	Intake	Depth (ft)	- Water (ft)	Column x	Capacity (gal) =	Volume	Capacity X	Length )	Fullip Volume + (gal)	Volume _	Volume (gal)	
Well #	Diam/ Comp	Interval (ft)	Depth (ft)			(ft)	0.10	(gal)				(gal)	10 /	
BBS-CCR-2	2	10	16.84	21.84	6.88	14.96	0.16	2.39	0.0026	22.84	0	0.06	0.12	
Purge Meth:	Time	Rate (ml/min)	Volume (gal)	Total Vol. (gal)	Water Depth (ft)	pH (SU)	Temp °C	Cond (uMHOS)	DO (mg/L)	Turbidity (NTU)	Purge Criteria	Status	Equipment ID	Eqpt. Table
1A	11:17	660	0.70	0.70	7.00	6.89	25.64	1515	0.20	5.92	ph:+/- 0.2	STABLE	Level Meter:	wlm08
Purge Start:	11:19	660	0.35	1.05	7.00	6.89	25.61	1540	0.15	6.92	Temp°C+/- 0.2	STABLE	Pump:	PP
11:13	11:21	660	0.35	1.40	7.00	6.89	25.66	1542	0.13	7.10	Cond % +/- 5	STABLE	Tubing:	PE/S
Purge End:											DO % Sat.< 20	STABLE	Dedicated	<u></u> ✓ Yes
11:21											Turb. NTU < 20	STABLE	Tubing?	□ No
Purge Complete A	t 11:14	Gallons to P	urge 0.12	Stablility	Values =	6.89	25.66	1542	0.13	7.10				
Comments:														
												Total Time	Total	Miles
													rotai	

Sampler(s) /

Site:	Big Be	end	Date:	11/10/16	File Name:	111016_	Wells_RAB	Weather:	CLEAR	& MILD	Initials	RAB /TEC	O Initials	
LIMS #	Loction Code	Time	FE <sup>2</sup>	pH (SU)	Temp °C	Cond(uMHOS)	DO Mg/L	Turbidity(NTU)	Redox (mv)	Sulfite (mg/L)	Color	Odor	N	NGVD
			mg/l	PH	TEMP-C	COND-F	DO	TURB-N-F	REDOX	SO3-TR	\$COLOR-W	\$ODOR-W	Time	LEVEL
L16K034-03	BBS-CCR-3	11:05		6.46	26.10	1646	0.05	1.18	-239.20		YELLOW	MODERATE	10:33	
LIMS #	250ml Cyan (3)	1L Inorg (1)	500ml Inorg (2)	250ml Inorg (3)	1L Mtls (1)	250ml Mtls (3)	1L Rads (1)	500ml Sulfide (2)	500ml Mtls (2)	250ml Nuts (3)	40ml Vial (6)	500 ml Nuts (2)	1L Rads Diss. (1)	Total Containers
L16K034-03			1			✓ 2	✓ 2							6
			1											6
(1) 1L plastic (PP)		(2) 500ml plastic	c (PP)	(3) 250ml plastic	(PP)	(4) 100ml coliform be	ottle	(5) 1L amber glass (	(AG)	(6) 40ml VOA vial	(CG)		Samples On Ice	Sample Reciept
ESS	0107301Y	ESS	0218201Y	ESS	0307301Y	ESS		ESS		ESS			Yes No	Time 13:32
	Preservation	_		Pres ID		Preservation		•	Pres ID		Preservation		Pres ID	Temp 1.1
1L bottles (rads): 5 ml H	NO3 to pH <2			L 010688 🗹	250ml bottles (nu	ts): 1 ml H2SO4 to pH	l <2		L	500 ml bottles(Sulfi	de) 2ml NAOH/Zinc	Acet. to pH >12		
500 ml bottles (metals):	2 ml HNO3 to pH <2			L	40 ml Vial (TOC):	0.5 ml H2SO4 to pH	<2			250 ml bottles (Cya	in) 1g NAOH to pH >	·12	_	
250 ml bottles (metal): 1	ml HNO3 to pH <2			L 010688 🗹	1L bottles (diss. r	ads): filtered with 0.45	ium, 5 ml HNO3 to pH <	2	L	A checked box inc	dicates that the sam	ple was verified to	a pH of <2	
pH Meter Calibration		Buffer ID	Buffer Value	Cal	Time	ICV	Time	CCV	Time	Redox Cal	Time	Temp °C	Reading mv	Theo Value mv
Meter ID:	MPM08	L 016047H	7	7.02	8:32			7.07	13:25	Meter ID:	8:39	21.6	235.7	236.2
FDEP FT 1100		L 016500A	10	10.05	8:32	QC: (pH +/- 0.2) (Co	nd +/- 5%) (DO +/- 0.3n	ng/L) (Redox +/- 10mv		MPM08	13:18	21.7	232.3	236.2
Units: SU		L 015514B	4	4.00	8:32	A checked box indi	cates ICV / CCV passed	i	·	Zobell Sol ID:				
Conductivity Meter Ca	lib.	Standard ID	Std Value	Cal	Time	ICV	Time	CCV	Time	L 96				
Meter ID:	MPM08	L 015981A	1000	1000	8:41					DO Meter Cal	Time	Temp °C	Reading mg/l	Theo Value mg/l
FDEP FT 1200, Units: ul	MHOS	L 015370B	10000			9930	8:45	9815	13:15	Meter ID:	8:18	21.9	8.80	8.761
Turbidity Meter Calibra	ation	Standard ID	Std Value	Acceptab	ility Range	ICV	Time	CCV	Time	MPM08	13:20	21.8	8.75	8.777
Meter ID:	TM07	L 013677	5.28	4.75	5.81	5.37	8:00	5.31	13:14	Barom. Pres				
FDEP FT 1600, Units: N	ITU	L L#?								760				
Sulfite Info (QC Check)	) (EPA 377.1)		QC Result mg/l	Time	Titrator ID	Na Thio ID	DO 3 Pillow ID	Starch Ind. ID	lodate/lodide ID	Therm ID	рН	Conduct.( %)	DO (mg/l)	Redox (mv)
QC Std: 5ml (NaThio)/50						L	L	L	L	MPM08	0.2	5	0.3	10
Purging Information		Well Capacities	s (gallons/ ft): 2"	" = 0.16 4" =0.65		Tubing Inside Diam	. Capacities Gallons/ft)	: 1/4" =0.0026 3/8" =0	0.006					
Well #	Diam/ Comp	Screen Interval (ft)	Intake Depth (ft)	Well Depth (ft)	Depth to Water (ft)	= Water Column (ft)	Well Capacity (gal) =	1 Well Volume (gal)	Tubing X Capacity (gal/ft.)	Tubing Length (ft)	Pump + Volume + (gal)	Cell Volume (gal)	1 Eqpt. Volume (gal)	
BBS-CCR-3	2	10	18.23	23.23	6.77	16.46	0.16	2.63	0.0026	24.23	0	0.06	0.12	
Purge Meth:	Time	Rate (ml/min)	Volume (gal)	Total Vol. (gal)	Water Depth (ft)	pH (SU)	Temp °C	Cond (uMHOS)	DO (mg/L)	Turbidity (NTU)	Purge Criteria	Status	Equipment ID	Eqpt. Table
1A	10:45	260	0.76	0.76	7.08	6.43	26.04	1693	0.11	1.42	ph:+/- 0.2	STABLE	Level Meter:	wlm08
	10:47	260	0.76	0.70	7.10	6.45	26.10	1663	0.06	1.67	Temp°C+/- 0.2	STABLE	Pump:	PP
Purge Start: 10:34	10:47	260	0.14	1.04	7.10	6.46	26.10	1646	0.05	1.18	Cond % +/- 5	STABLE	Tubing:	PE/S
	10.49	200	0.14	1.04	7.00	0.40	20.10	1040	0.03	1.10	DO % Sat.< 20	STABLE	Dedicated	✓ Yes
Purge End: 10:49											Turb. NTU < 20	STABLE	Tubing?	□ No
Purge Complete A	t 10:36	Gallons to F	urge 0.12	Stablility	Values =	6.46	26.10	1646	0.05	1.18				.,,
		Screen	Intake	Well Depth (ft)		= Water X	Well Capacity (gal)	1 Well Volume	Tubing Capacity (gal/ft.)	Tubing Length (ft)	Pump + Volume (gal) +	Cell Volume (gal) =	1 Eqpt. Volume (gal)	
Well #	Diam/ Comp	Interval (ft)	Depth (ft)		(11)	(ft)	0.40	(gal)		T		1 0.00		
0	2	10	14	18		18.00	0.16	2.88	0.0026	100	0	0.06	0.32	
Purge Meth:	Time	Rate (ml/min)	Volume (gal)	Total Vol. (gal)	Water Depth (ft)	pH (SU)	Temp °C	Cond (uMHOS)	DO (mg/L)	Turbidity (NTU)	Purge Criteria	Status	Equipment ID	Eqpt. Table
			<u> </u>	-		1				-	ph:+/- 0.2		Level Meter:	wlm08
Purge Start:											Temp°C+/- 0.2		Pump:	PP
						1					Cond % +/- 5		Tubing:	PE/S
Purge End:				1		-				-	DO % Sat.< 20		Dedicated	Yes
Burgo Commission		Callers to 5		6: 11:	/-l					-	Turb. NTU < 20		Tubing?	□ No
Purge Complete A	τ	Gallons to F	Purge 0.32	Stablity	Values =	1				I				
Comments:												Total Time	Total	l Miles

Sampler(s) /

Site:	Big Be	nd	Date:	11/10/16	File Name:	111016_	Wells_RAB	Weather:	CLEAR	& MILD	Initials	RAB /TEC	O Initials	
LIMS #	Loction Code	Time	FE <sup>2</sup>	pH (SU)	Temp °C	Cond(uMHOS)	DO Mg/L	Turbidity(NTU)	Redox (mv)	Sulfite (mg/L)	Color	Odor	1	NGVD
			mg/l	PH	TEMP-C	COND-F	DO	TURB-N-F	REDOX	SO3-TR	\$COLOR-W	\$ODOR-W	Time	LEVEL
L16K034-04	BBS-CCR-BW-1	10:20		6.52	27.50	4996	0.13	1.77	-71.10		CLEAR	NONE	9:58	
L16K034-05	BBS-CCR-BW-2	9:49		6.68	27.10	1397	0.20	5.86	-73.80		LT. YELLOW	NONE	9:28	
LIMS#	250ml Cyan (3)	1L Inorg (1)	500ml Inorg (2)	2) 250ml Inorg (3)	1L Mtls (1)	250ml Mtls (3)	1L Rads (1)	500ml Sulfide (2)	500ml Mtls (2)	250ml Nuts (3)	40ml Vial (6)	500 ml Nuts (2)	1L Rads Diss. (1)	Total Containers
		3 ( )	1	, 3(4)		<b>☑</b> 2								
			1			<b>☑</b> 2	<b>☑</b> 2							10
(1) 1L plastic (PP)	•	(2) 500ml plasti	ic (PP)	(3) 250ml plastic (	(PP)	(4) 100ml coliform bottle			(AG)	(6) 40ml VOA vial	(CG)		Samples On Ice	Sample Reciept
ESS	0107301Y	ESS	0218201Y	ESS	0307301Y	ESS		ESS	<u> </u>	ESS	. ,		✓ Yes □ No	Time 13:32
	Preservation			Pres ID		Preservation		•	Pres ID		Preservation		Pres ID	Temp 1.1 C
1L bottles (rads): 5 ml H				L 010688 🗹	250ml bottles (nu	its): 1 ml H2SO4 to ph	1 <2		L □	500 ml bottles(Sulfi	de) 2ml NAOH/Zinc A	Acet. to pH >12	L	
500 ml bottles (metals):				L D	`	: 0.5 ml H2SO4 to pH			<del>                                     </del>	<u> </u>	n) 1g NAOH to pH >		L D	<u> </u>
250 ml bottles (metal):	·			L 010688 🗹	` '		5um, 5 ml HNO3 to pH <	)		<u> </u>	licates that the sam		a nH of <2	
pH Meter Calibration	1 1111 1 1 1 4 0 1 0 pr 1 4 2	Buffer ID	Buffer Value	Cal	Time	ICV	Time	CCV	Time	Redox Cal	Time	Temp °C	Reading mv	Theo Value mv
Meter ID:	MPM08	L 016047H		7.02	8:32	157	Time	7.07	13:25	Meter ID:	8:39	21.6	235.7	236.2
FDEP FT 1100	IVII IVIOO	L 016500A	+	10.05	8:32	OC: (pH :/ 0.3) (C:	ond +/- 5%) (DO +/- 0.3m			MPM08	13:18	21.7	232.3	236.2
Units: SU		L 015514B		4.00	8:32		icates ICV / CCV passed		•1	Zobell Sol ID:	13.10	21.1	202.0	230.2
Conductivity Meter Ca	alib	Standard ID	Std Value	Cal	Time	ICV	Time	CCV	Time	L 016396			<del> </del>	+
Meter ID:	MPM08	L 015981A	1000	1000	8:41	100	Time	COV	Time	DO Meter Cal	Time	Temp °C	Reading mg/l	Theo Value mg/l
FDEP FT 1200, Units: u		L 015370B	3 10000	1000	0.41	9930	8:45	9815	13:15	Meter ID:	8:18	21.9	8.80	8.761
Turbidity Meter Calibr		Standard ID	Std Value	Acceptabi	ilit. Dansa	ICV	Time	CCV	Time	MPM08	13:20	21.8	8.75	8.777
Meter ID:		SF- 013677		4.75	5.81	5.37	8:00	5.31	13:14	Barom. Pres	13.20	21.0	0.73	0.777
FDEP FT 1600, Units: N	110107	SF- L#?		4.73	3.01	3.37	0.00	3.51	13.14	760			+	
1 DEL 1 1 1000, CIMB. 1110		QC Result mg/l	/I Time	Tituata u ID	Na Thio ID	DO 3 Pillow ID	Starch Ind. ID	lodate/lodide ID	Therm ID		0	DO (/1)	Redox (mv)	
QC Std: 5ml (NaThio)/5			QC Result mg/l	i iiiie	Titrator ID	L Na mio iD	L DO 3 PIIIOW ID	L Starch ind. ID	L L	MPM08	pH 0.2	Conduct.( %)	DO (mg/l) 0.3	10
Purging Information	-	Well Canacitie	e (gallone/ft): 2	2" = 0.16 4" =0.65		Tubing Inside Diam	n. Capacities Gallons/ft	· 1/4" =0 0026 3/8" =		WII WOO	U.2		0.5	10
r drging information		Well Capacitie	s (ganons/ rt). 2	Well		Water	Well	1 Well		Tubing	Pump	Cell	1 Eqpt. Volume	
Well #	Diam/ Comp	Screen Interval (ft)	Intake Depth (ft)	Depth (ft)	Depth to Water (ft)	= Water Column (ft)	Capacity (gal)	Volume (gal)	( Tubing X Capacity (gal/ft.)	Length ) +	Volume +	Volume (gal) =	Volume (gal)	
BBS-CCR-BW-1	2	10	39.3	44.3	29.84	14.46	0.16	2.31	0.0026	100	0	0.06	0.32	
Purge Meth:	Time	Rate (ml/min)	Volume (gal)	Total Vol. (gal)	Water Depth (ft)	pH (SU)	Temp °C	Cond (uMHOS)	DO (mg/L)	Turbidity (NTU)	Purge Criteria	Status	Equipment ID	Eqpt. Table
1A	10:13	2300	7.90	7.90	31.02	6.52	27.50	4927	0.14	6.86	ph:+/- 0.2	STABLE	Level Meter:	wlm08
Purge Start:	10:15	2200	1.16	9.06	30.99	6.52	27.42	4962	0.13	2.66	Temp°C+/- 0.2	STABLE	Pump:	ESP
10:00	10:17	2200	1.16	10.22	30.96	6.52	27.50	4996	0.13	1.77	Cond % +/- 5	STABLE	Tubing:	PE
Purge End:					1		1				DO % Sat.< 20	STABLE	Dedicated	□ Yes
10:17											Turb. NTU < 20	STABLE	Tubing?	✓ No
Purge Complete A	At 10:01	Gallons to I	Purge 0.32	Stability '	Values =	6.52	27.50	4996	0.13	1.77				
		Screen	Intake	Well -	Depth to Water (ft)	= Water	Well Capacity (gal)	1 Well Volume	Tubing X	Tubing	Pump + Volume +	Cell Volume _	1 Eqpt. Volume	
Well #	Diam/ Comp	Interval (ft)	Depth (ft)	Depth (ft)	(ft)	(ft)	, , , , ,	(gal)	Tubing X Capacity (gal/ft.)	Length ) -	(gal)	(gal) =	(gal)	
BBS-CCR-BW-2	2	10	18.49	23.84	8.45	15.39	0.16	2.46	0.0026	24.64	0	0.06	0.12	
Purge Meth:	Time	Rate (ml/min)	Volume (gal)	Total Vol. (gal)	Water Depth (ft)	pH (SU)	Temp °C	Cond (uMHOS)	DO (mg/L)	Turbidity (NTU)	Purge Criteria	Status	Equipment ID	Eqpt. Table
1A	9:36	700	1.29	1.29	8.76	6.68	27.04	1397	0.33	2.96	ph:+/- 0.2	STABLE	Level Meter:	wlm08
Purge Start:	9:38	700	0.37	1.66	8.76	6.68	27.08	1396	0.22	3.45	Temp <sup>o</sup> C+/- 0.2	STABLE	Pump:	PP
9:29	9:40	700	0.37	2.03	8.76	6.68	27.10	1397	0.20	5.86	Cond % +/- 5	STABLE	Tubing:	PE/S
Purge End:	-										DO % Sat.< 20	STABLE	Dedicated	✓ Yes
9:40											Turb. NTU < 20	STABLE	Tubing?	□ No
Purge Complete A	At 9:30	Gallons to I	Purge <b>0.12</b>	Stability '	Values =	6.68	27.10	1397	0.20	5.86				
Comments:						1	•	1	•	1				
I														i
												Total Time	T-4-1	l Miles

#### DEP-SOP-001/01

#### FS 2200 Groundwater Sampling Form FD 9000-24

### **GROUNDWATER SAMPLING LOG**

FACILITY NAME:		Big Be	end			SITE LOCATION:		Apollo Beach, FL.				
WELL NO:	В	BS-CCR-1			SAMPLE ID:	L16F	<b>&lt;</b> 034-01		DATE:	11/10/16		
					PURGI	NG DATA						
WELL DIAMETER (inches	s)	TUBING DIAMETER (inc	hes) 1/4	WELL SCR DEPTH 12.32	EEN INTERV		STATIC DEF	PTH (feet): 7.38	PURGE PUMP TO	YPE PP		
WELL VOLUME PURG	E:	· ` ·		LL DEPTH - STATIC D			<del></del>	()	1			
(only fillout if applicable	)		= (		feet -		feet ) x		gallons/foot	t =	ga	allons
EQUIPMENT VOL		1 EQL	JIPMENT VOL	. = PUMP VOLUM	E + (TUBING	CAPACITY X T	TUBING LENG	GTH ) + FLOW CE	LL VOLUME			
(Offig fillout if applic	able)		=(	0	gallons + (	0.0026 gallo	ons/foot X	23.3 feet)+	0.06	gallons =	0.12	gallons
INITIAL PUMP OR DEPTH IN WELL (1	TUBING feet): 17.32		FINAL PUMP DEPTH IN W	ELL (feet): 17	.32	PURGING INITIATED AT:	11:33	PURGING ENDED AT:	11:44	TOTAL VOLUM PURGED (gallo	ME ons):	1.42
TIME	VOLUME PURGED (GALLONS)	CUMUL. VOLUME PURGED (GALLONS)	PURGE RATE (GPM)	DEPTH TO WATER (FEET)	pH (standard units)	TEMP. (°C)	COND. (µmhos/cm OR µS/cm)	OXYGEN (circle(mg/l))r % saturation)	TURBIDITY (NTUs)	COLOR (describe)	OD( (desc	
11:40	0.92	0.92	0.13	7.50	6.82	25.71	4286	0.08	1.13	LT. YELLOW	NOI	NE
11:42	0.25	1.17	0.13	7.50	6.83	25.74	4290	0.07	0.75	LT. YELLOW	NOI	NE
11:44	0.25	1.42	0.13	7.50	6.82	25.70	4290	0.08	0.89	LT. YELLOW	NOI	NE
WELL CAPACITY (Ga	allons Per Foot):	<b>0.75"</b> = 0.02;	1" = 0.04;	1.25" = 0.06; 2" =	0.16; 3" =	0.37; <b>4"</b> = 0.0	65; <b>5</b> " =	1.02; <b>6"</b> = 1.47;	<b>12"</b> = 5.88			
TUBING INSIDE DIA.	CAPACITY (Gal./Ft	i.): <b>1/8"</b> = 0.00006;	<b>3/16"</b> = 0.0014;	1/4" = 0.0026;	5/16" = 0.004;		1/2" = 0.0	010; 5/8" = 0	0.016			
SAMPLED BY (PR	INT\ / AFFII IATI	ON:		SAMPLER (S) SIG		ING DATA	<b>\</b>			Т		
SAMPLED DT (FIX	RAE		TECO	SAMPLEN (3) SIN	SINATURES.			SAMPLING SAMPLING INITIATED AT: 11:53				
PUMP OR TUBING DEPTH IN WELL (1	}		TEGO	SAMPLE PUMP FLOW RATE (ml	per minute):	4	487	TUBING MATERIAL CODE: PE/S				
FIELD DECONTAN	/INATION: Y	' 🔲 N 🔽		FIELD-FILTERED	): ent Tyhe	N ✓ FILTI	ER SIZE:	μm	DUPLICATE:	Y N		
	SAMPLE CON	TAINER		r iitration Equipme	SAMPLE PRE	SERVATION		INTE	NDED	SAMPLING		
	SPECIFICA #	ATION MATERIAL		PRESERVATIVE		AL VOL.	FINAL	INTENDED ANALYSIS AND/OR		EQUIPMENT		
SAMPLE ID CODE	CONTAINERS	CODE	VOLUME	USED		N FIELD (ml) (1)	pН	MEI	THOD		CODE	
@Ino-500	1	PE	500ml	NONE	N	ONE	N/A	Inorg	janics		PP	
@Met-250	2	PE	250ml	HNO3		1ml	<2	Me	tals		PP	
@Rad-1L	2	PE	1L	HNO3		5ml	<2	Radiol	ogicals		PP	
										1		
										1		
										†		
										†		
REMARKS:	1	<u> </u>		1	1		1			<u> </u>		
(1) Sample bo	ttles pre-pres	served at lab	oratory pric	or to sample co	ollection.							
MATERIAL CODES			Clear Glass;	PE = Polyethylene;		propylene; S =	= Silicone;	T = Teflon; O= Oth	ner (Specify)			
SAMPLING/PURGING	NG A	APP = After Perist	altic Pump; B	= Bailer; BP = Blac	der Pump; ES	P = Electric Subm	nirsable Pump;	PP = Peristaltic Pum	np	· <u> </u>		·

NOTES:

optionally,  $\pm$  0.2 mg/L or  $\pm$  10% (whichever is greater) **Turbidity**: all readings  $\leq$  20 NTU; optionally  $\pm$  5 NTU or 10% (whichever is greater)

<sup>1.</sup> The above do not constitute all of the information requierd by Chapter 62-160, F.A.C.

<sup>2.</sup> STABILIZATION CRITERIA FOR RANGE OF VARIATION OF LAST THREE CONSECUTIVE READINGS (SEE FS 2212. SECTION 3)

pH: ± 0.2 units Temperature: ± 0.2 °C Specific Conductance: ± 5% Dissolved Oxygen: all readings ≤ 20% saturation (see Table FS 2200-2);

### **GROUNDWATER SAMPLING LOG**

SITE NAME:		Big Be	end		SITE LOCATION: Apollo Beach, FL.							
WELL NO:	В	BS-CCR-2			SAMPLE ID: <b>L16K034-02</b>					11/10/16		
						NG DATA						
WELL DIAMETER (inches	s)	TUBING DIAMETER (inc	hes) 1/4	WELL SCREEN IN DEPTH 11.84		21.84 (feet)	STATIC DEPTH TO WATER (fee	t et): 6.88	PURGE PUMP TY	YPE PP		
WELL VOLUME P	URGE:	,	,	AL WELL DEPTH -					1-			
(only fillout if applic	able)		= (		feet -		feet ) x		gallons/foot	=	gallons	
EQUIPMENT VOL		1 EQI	JIPMENT VOL	. = PUMP VOLUME	E + (TUBING	CAPACITY X T	UBING LENG	GTH) + FLOW CEI	LL VOLUME			
, , , , , ,	,		=(	0	gallons + (	0.0026 gallo	ons/foot X	22.84 feet	)+ 0.06	gallons =	0.12 gallons	
INITIAL PUMP OR DEPTH IN WELL (	TUBING feet): 16.84	1 CUMUL.	FINAL PUMP DEPTH IN W	· / 10	.84	PURGING INITIATED AT:	11:13	PURGING ENDED AT:	11:21	TOTAL VOLUM PURGED (galle	ME ons): 1.40	
TIME	VOLUME PURGED (GALLONS)	VOLUME PURGED (GALLONS)	PURGE RATE (GPM)	DEPTH TO WATER (FEET)	pH (standard units)	TEMP. (°C)	COND. (µmhos/cm OR µS/cm)	DISSOLVED OXYGEN (circle(mg/l) or % saturation)	TURBIDITY (NTUs)	COLOR (describe)	ODOR (describe)	
11:17	0.70	0.70	0.18	7.00	6.89	25.64	1515	0.20	5.92	LT. YELLOW	NONE	
11:19	0.35	1.05	0.18	7.00	6.89	25.61	1540	0.15	6.92	LT. YELLOW	NONE	
11:21	0.35	1.40	0.18	7.00	6.89	25.66	1542	0.13	7.10	LT. YELLOW	NONE	
WELL CAPACITY (G	-II D F()	<b>0.75"</b> = 0.02:	1" = 0.04;	<b>1.25</b> " = 0.06; <b>2</b> " =	0.40: 0!! -	0.37; <b>4</b> " = 0.6	65; <b>5</b> " =	1.02; <b>6"</b> = 1.47;	<b>12"</b> = 5.88			
TUBING INSIDE DIA.	,		3/16" = 0.0014;		5/16" = 0.004;		1/2" = 0.0					
OAMBLED BY (DE	UNITY / AFFILIATI	ON		O A A DI ED (O) OIG		ING DATA		SAMPLING		SAMPLING		
SAMPLED BY (PRINT) / AFFILIATION:  RAB TECO				SAMPLER (S) SIG				INITIATED AT:	11:27			
PUMP OR TUBING DEPTH IN WELL (1	et): 16.8	3		SAMPLE PUMP FLOW RATE (mL	per minute):	6	60	TUBING MATERIAL CODE	:: PE	/S		
FIELD DECONTAIN	MINATION:	Y N		FIELD-FILTERED Filtration Equipme	nt Type.	N 🗹 FILTE	ER SIZE:	μm	DUPLICATE:	Y 🔲 N 🖸	7	
	SAMPLE CON SPECIFICA				SAMPLE PRE	SERVATION		INTE	NDED	SAMPLING		
CAMPI E ID CODE	#	MATERIAL	VOLUME	PRESERVATIVE	_	AL VOL.	FINAL		S AND/OR HOD	EQUIPMENT CODE		
SAMPLE ID CODE	CONTAINERS	CODE		USED	ADDED IN	N FIELD (ml) (1)	pН					
@Ino-500	1	PE	500ml	NONE	N	ONE	N/A	Inore	anics		PP	
@110-300	1	PC	3001111	NONE	IN IN	ONE	IN/A	inorg	gariics		FF	
@Met-250	2	PE 	250ml	HNO3		1ml	<2		tals		PP	
@Rad-1L	2	PE	1L	HNO3		5ml	<2	Radiol	ogicals		PP	
REMARKS:	1	<u> </u>	I	<u>I</u>	1		1	I		I		
(1) Sample bo	ttles pre-pres	served at lab	oratory pric	or to sample co	llection.							
MATERIAL CODE			= Clear Glass			P = Polypropylene	•			cify)		
SAMPLING/PURGIN EQUIPMENT CODE	S:	RFPP = Atter Perist	aiuc Pump; <b>B</b> Flow Peristaltic I	= baller; <b>BP</b> = Blad Pump; <b>SM</b> = Straw	aer Pump; ES Method (tubing	g Gravity Drain); \	rsable Pump; /T = Vacuum	PP = Peristaltic Pum Trap; O = Other (Spe	np ecify)			
NOTES:	1. The above of	do not constitu	te all of the in	nformation requi	erd by Chap	ter 62-160, F.A.	С.					

optionally,  $\pm$  0.2 mg/L or  $\pm$  10% (whichever is greater) Turbidity: all readings  $\leq$  20 NTU; optionally  $\pm$  5 NTU or 10% (whichever is greater)

<sup>2.</sup> STABILIZATION CRITERIA FOR RANGE OF VARIATION OF LAST THREE CONSECUTIVE READINGS (SEE FS 2212. SECTION 3) pH: ± 0.2 units Temperature: ± 0.2 °C Specific Conductance: ± 5% Dissolved Oxygen: all readings ≤ 20% saturation (see Table FS 2200-2);

### **GROUNDWATER SAMPLING LOG**

SITE NAME:		Big Be	end			SITE LOCATION:		Apollo	Beach, FL.			
WELL NO:	В	BS-CCR-3			SAMPLE ID:	L16k	(034-03	•	DATE:	11/10/16		
					PURGI	NG DATA			1			
WELL DIAMETER (inches	s)	TUBING DIAMETER (inc	hes) 1/4	WELL SCREEN IF		23.23 (feet)	STATIC DEF		PURGE PUMP T'	YPE PP		
WELL VOLUME P	URGE:	1 WELL VO		AL WELL DEPTH -			<del></del>	, , , , , , , , , , , , , , , , , , , ,				
(only fillout if applic	able)		= (		feet -		feet) x		gallons/foo	ot =	gallons	
EQUIPMENT VOLI (only fillout if applic		1 EQL	JIPMENT VOL	. = PUMP VOLUM	E + (TUBING	CAPACITY X T	UBING LENG	STH ) + FLOW CE	LL VOLUME			
			=(	0	gallons + (	0.0026 gallo	ons/foot X	24.23 fee	et)+ 0.06	gallons =	0.12 gallons	
INITIAL PUMP OR DEPTH IN WELL (1	TUBING feet): 18.23	3	FINAL PUMP DEPTH IN W		.23	PURGING INITIATED AT:	10:34	PURGING ENDED AT:	10:49	TOTAL VOLU! PURGED (gall	ME ons): 1.04	
	VOLUME	CUMUL. VOLUME	PURGE	DEPTH TO	рН	TEMP.	COND.	DISSOLVED OXYG <u>E</u> N	TURBIDITY	COLOR	ODOR	
TIME	PURGED (GALLONS)	PURGED (GALLONS)	RATE (GPM)	WATER (FEET)	(standard units)	(°C)	(μmhos/cm OR μS/cm)	(circle mg/l or % saturation)	(NTUs)	(describe)	(describe)	
10:45	0.76	0.76	0.07	7.08	6.43	26.04	1693	0.11	1.42	YELLOW	MODERATE	
10:47	0.14	0.90	0.07	7.10	6.45	26.10	1663	0.06	1.67	YELLOW	MODERATE	
10:49	0.14	1.04	0.07	7.08	6.46	26.10	1646	0.05	1.18	YELLOW	MODERATE	
							<u> </u>	<u> </u>				
WELL CAPACITY (Ga TUBING INSIDE DIA.				<b>1.25</b> " = 0.06; <b>2</b> " = <b>1/4</b> " = 0.0026;	0.16; <b>3</b> " = <b>5/16</b> " = 0.004;	0.37; <b>4"</b> = 0.0 <b>3/8"</b> = 0.006;	55; 5" = 1/2" = 0.0		<b>12"</b> = 5.88 0.016			
				In		ING DATA	L	IOAMBI INO		IOAMBI INO		
SAMPLED BY (PR	INT) / AFFILIATI RAE		TECO	SAMPLER (S) SIG	JNATURES:			SAMPLING INITIATED AT:	:49	SAMPLING ENDED AT:	1:05	
PUMP OR TUBING	}		TECO	SAMPLE PUMP			200	TUBING		1	1.05	
DEPTH IN WELL (1	,			FLOW RATE (mL			260 ER SIZE:	MATERIAL CODE			7	
FIELD DECONTAN	SAMPLE CON	Y N V		FIELD-FILTERED Filtration Equipme		N L	LIN SIZE.		DUPLICATE:	Y	_	
	SPECIFICA #		1	PRESERVATIVE	SAMPLE PRE	SERVATION  TAL VOL.	FINAL		NDED S AND/OR	SAMPLING EQUIPMENT		
SAMPLE ID CODE	CONTAINERS	CODE	VOLUME	USED		N FIELD (ml) (1)	pH	MET	HOD	(	CODE	
@Ino-500	1	PE	500ml	NONE	N	ONE	N/A	Inorg	janics		PP	
@Met-250	2	PE	250ml	HNO3		1ml	<2		tals		PP	
@Rad-1L	2	PE	1L	HNO3		5ml	<2	Radiol	ogicals		PP	
			1		1							
REMARKS:	<u>I</u>	<u>I</u>	<u> </u>	I	<u> </u>		1	<u> </u>		1		
(1) Sample bo	ttles pre-pres	served at lab	oratory pric	or to sample co	ollection.							
MATERIAL CODE			= Clear Glass			= Polypropylene			· · · · · · · · · · · · · · · · · · ·	ecify)		
SAMPLING/PURGIN EQUIPMENT CODE	IG A	APP = After Perist RFPP = Reverse F	altic Pump; <b>B</b> Flow Peristaltic I	= Bailer; <b>BP</b> = Blad Pump: <b>SM</b> = Straw	Ider Pump; ES Method (tubing	F = Electric Subm Gravity Drain)	irsable Pump; <b>VT</b> = Vacuum l	PP = Peristaltic Pum	np ecify)			

NOTES: 1. The above do not constitute all of the information requierd by Chapter 62-160, F.A.C.

 $optionally, \pm 0.2 \ mg/L \ or \pm 10\% \ (whichever \ is \ greater) \ \ Turbidity: \ all \ readings \leq 20 \ NTU; \ optionally \pm 5 \ NTU \ or \ 10\% \ (whichever \ is \ greater)$ 

<sup>2.</sup> STABILIZATION CRITERIA FOR RANGE OF VARIATION OF LAST THREE CONSECUTIVE READINGS (SEE FS 2212. SECTION 3)

pH: ± 0.2 units Temperature: ± 0.2 °C Specific Conductance: ± 5% Dissolved Oxygen: all readings ≤ 20% saturation (see Table FS 2200-2);

### **GROUNDWATER SAMPLING LOG**

PURGING DATA   PURGE   PURG	SITE NAME:		Big Be	end			SITE LOCATION:		Apollo l	ollo Beach, FL.				
MELL YOLDME PURGE:   DUMPY CHARLES (PICALON)   PURGE	WELL NO:	BBS	CCR-BW	<i>l</i> -1		SAMPLE ID:	L16	<b>CO34-04</b>		DATE:	11/10/16			
DAME:   Column   DAME:							NG DATA							
SAMPLE DE SON FARLEL   1   1   1   1   1   1   1   1   1	WELL DIAMETER (inche	s)		hes) 1/4			44.30 (feet	STATIC DEF	PTH (feet): 29.84	PURGE PUMP T' OR BAILER:	YPE ESP			
SAMPLE DECONTAINER   PURPLE	WELL VOLUME P	URGE:	1 WELL VO	LUME = (TOT	AL WELL DEPTH -	STATIC DEF	TH TO WATER)	X WELL CA	APACITY					
10   10   10   10   10   10   10   10											ot =	gallons		
NITIAL PUMP OR TUBING   39.30	(only fillout if applic	oable)	1 EQU	JIPMENT VOL		•			,			2.22		
PRIME   PRI	INITIAL PLIMP OR	TURING		,		gallons + (			PLIBGING		TOTAL VOLUM	ME		
TIME VOLLIME VOLLIME VOLLIME VOLLIME VOLLIME VALUED FREED VALUED FREED VALUED FREED VALUED FREED VALUED FREED VALUED FREED VALUE VA	DEPTH IN WELL (		CUMUL.	DEPTH IN W	ELL (feet): 39	.30	INITIATED AT:	10:00	ENDED AT:	10:17	PURGED (gallo	ons): 10.2		
10:15	TIME	PURGED	PURGED	RATE	TO WATER	(standard		(µmhos/cm	OXYGEN (circle mg/l or					
10:17	10:13	7.90	7.90	0.61	31.02	6.52	27.50	4927	0.14	6.86	CLEAR	NONE		
WELL CAPACITY (Galloms Per Fort)   0.75° ± 0.02.   1° ± 0.04.   1.25° ± 0.05.   2° ± 0.16.   3° ± 0.07.   4° ± 0.05;   5° ± 1.02;   6° ± 1.47;   12° ± 5.08	10:15	1.16	9.06	0.58	30.99	6.52	27.42	4962	0.13	2.66	CLEAR	NONE		
SAMPLED BY (PRINT) / AFFILIATION:	10:17	1.16	10.22	0.58	30.96	6.52	27.50	4996	0.13	1.77	CLEAR	NONE		
SAMPLED BY (PRINT) / AFFILIATION:												<del> </del>		
SAMPLED BY (PRINT) / AFFILIATION:														
SAMPLED BY (PRINT) / AFFILIATION:														
SAMPLED BY (PRINT) / AFFILIATION:														
SAMPLED BY (PRINT) / AFFILIATION:														
SAMPLED BY (PRINT) / AFFILIATION:														
SAMPLING DATA  SAMPLED BY (PRINT) / AFFILIATION: RAB TECO  PIMPOR TUPING BY SAMPLE CONTAINER  SAMPLE PRESERVATION  SAMPLE CONTAINER SAMPLE CONTAINER SAMPLE CONTAINER SAMPLE CONTAINER SAMPLE CONTAINER SAMPLE PRESERVATION  SAMPLE DOES   FILTER SIZE:   J/M   DUPLICATE:   V   N   M   DUPLICATE:   V   N	`	,			,			- 1	,			- 5.88		
RAB   TECO		·	·	, <b>, , , , , , , , , , , , , , , , , , </b>		SAMPL				10, 0/0				
FIELD FILTERED:	SAMPLED BY (PF	,		TECO	, ,				INITIATED AT: 10	:17		0:20		
SAMPLE CONTAINER SPECIFICATION   SAMPLE PRESERVATIVE   SAMPLE PRESERVATION   SAMPLE PRESERVATION   SAMPLE PRESERVATION   SAMPLE PRESERVATION   SAMPLE PRESERVATION   SAMPLE PRESERVATION   SAMPLE PRESERVATIVE   SAMPLE PRES	PUMP OR TUBINO DEPTH IN WELL (	3 feet): 39.3			SAMPLE PUMP FLOW RATE (mL	. per minute):	2:	233	TUBING MATERIAL CODE	: PI	E			
SAMPLE CONTAINER SPECIFICATION   SAMPLE PRESERVATIVE   SAMPLE PRESERVATION   SAMPLE PRESERVATION   SAMPLE PRESERVATION   SAMPLE PRESERVATION   SAMPLE PRESERVATION   SAMPLE PRESERVATION   SAMPLE PRESERVATIVE   SAMPLE PRES	FIELD DECONTAI	MINATION:	Y 🔲 N 🗹		FIELD-FILTERED Filtration Equipme	: γ 🗖 ent Type.	N 🗹 FILT	ER SIZE:	μm	DUPLICATE:	Y 🔲 N 🖸	3		
SAMPLE ID CODE							SERVATION							
@Ino-500 1 PE 500ml NONE NONE NONE N/A Inorganics ESP  @Met-250 2 PE 250ml HNO3 1ml <2 Metals ESP  @Rad-1L 2 PE 1L HNO3 5ml <2 Radiologicals ESP  Remarks:  (1) Sample bottles pre-preserved at laboratory prior to sample collection.  MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)  APP = After Peristaltic Pump; BP = Bladder Pump; ESP = Electric Submirsable Pump; PP = Peristaltic Pump; RFPP = Reverse Flow Peristaltic Pump; SM = Straw Method (tubing Gravity Drain); VT = Vacuum Trap, O = Other (Specify)	SAMPLE ID CODE	# CONTAINERS		VOLUME										
@Met-250 2 PE 250ml HNO3 1ml <2 Metals ESP  @Rad-1L 2 PE 1L HNO3 5ml <2 Radiologicals ESP  REMARKS:  (1) Sample bottles pre-preserved at laboratory prior to sample collection.  MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)  APP = After Peristaltic Pump; B = Bailer; BP = Bladder Pump; ESP = Electric Submirsable Pump; PP = Peristaltic Pump  RFPP = Reverse Flow Peristaltic Pump; SM = Straw Method (tubing Gravity Drain); VT = Vacuum Trap; O = Other (Specify)					-	7.5525 11	*** ***** (****) (1)	·						
@Rad-1L 2 PE 1L HN03 5ml <2 Radiologicals ESP    Radiologicals   Respective to the state of the	@Ino-500	1	1 PE 500ml NONE				NONE N/A			anics	ESP			
@Rad-1L 2 PE 1L HN03 5ml <2 Radiologicals ESP    Radiologicals   Respective to the state of the														
@Rad-1L 2 PE 1L HN03 5ml <2 Radiologicals ESP    Radiologicals   Respective to the state of the														
REMARKS:  (1) Sample bottles pre-preserved at laboratory prior to sample collection.  MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)  SAMPLING/PURGING APP = After Peristaltic Pump; B = Bailer; BP = Bladder Pump; ESP = Electric Submirsable Pump; PP = Peristaltic Pump EQUIPMENT CODES: RFPP = Reverse Flow Peristaltic Pump; SM = Straw Method (tubing Gravity Drain); VT = Vacuum Trap; O = Other (Specify)	@Met-250	2	PE	250ml	HNO3		1ml	<2	Me	tals	E	ESP		
(1) Sample bottles pre-preserved at laboratory prior to sample collection.  MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)  SAMPLING/PURGING EQUIPMENT CODES: APP = After Peristaltic Pump; B = Bailer; BP = Bladder Pump; ESP = Electric Submirsable Pump; PP = Peristaltic Pump RFPP = Reverse Flow Peristaltic Pump; SM = Straw Method (tubing Gravity Drain); VT = Vacuum Trap; O = Other (Specify)	@Rad-1L	2	PE	1L	HNO3		5ml	<2	Radiol	ogicals	E	ESP		
(1) Sample bottles pre-preserved at laboratory prior to sample collection.  MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)  SAMPLING/PURGING EQUIPMENT CODES: APP = After Peristaltic Pump; B = Bailer; BP = Bladder Pump; ESP = Electric Submirsable Pump; PP = Peristaltic Pump RFPP = Reverse Flow Peristaltic Pump; SM = Straw Method (tubing Gravity Drain); VT = Vacuum Trap; O = Other (Specify)														
(1) Sample bottles pre-preserved at laboratory prior to sample collection.  MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)  SAMPLING/PURGING EQUIPMENT CODES: APP = After Peristaltic Pump; B = Bailer; BP = Bladder Pump; ESP = Electric Submirsable Pump; PP = Peristaltic Pump RFPP = Reverse Flow Peristaltic Pump; SM = Straw Method (tubing Gravity Drain); VT = Vacuum Trap; O = Other (Specify)														
(1) Sample bottles pre-preserved at laboratory prior to sample collection.  MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)  SAMPLING/PURGING EQUIPMENT CODES: APP = After Peristaltic Pump; B = Bailer; BP = Bladder Pump; ESP = Electric Submirsable Pump; PP = Peristaltic Pump RFPP = Reverse Flow Peristaltic Pump; SM = Straw Method (tubing Gravity Drain); VT = Vacuum Trap; O = Other (Specify)						1					-			
(1) Sample bottles pre-preserved at laboratory prior to sample collection.  MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)  SAMPLING/PURGING EQUIPMENT CODES: APP = After Peristaltic Pump; B = Bailer; BP = Bladder Pump; ESP = Electric Submirsable Pump; PP = Peristaltic Pump RFPP = Reverse Flow Peristaltic Pump; SM = Straw Method (tubing Gravity Drain); VT = Vacuum Trap; O = Other (Specify)						1								
(1) Sample bottles pre-preserved at laboratory prior to sample collection.  MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)  SAMPLING/PURGING EQUIPMENT CODES: APP = After Peristaltic Pump; B = Bailer; BP = Bladder Pump; ESP = Electric Submirsable Pump; PP = Peristaltic Pump RFPP = Reverse Flow Peristaltic Pump; SM = Straw Method (tubing Gravity Drain); VT = Vacuum Trap; O = Other (Specify)						1								
MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)  SAMPLING/PURGING EQUIPMENT CODES: APP = After Peristaltic Pump; B = Bailer; BP = Bladder Pump; ESP = Electric Submirsable Pump; PP = Peristaltic Pump RFPP = Reverse Flow Peristaltic Pump; SM = Straw Method (tubing Gravity Drain); VT = Vacuum Trap; O = Other (Specify)	REMARKS:	1	<u> </u>	1	<u>I</u>	1		1	1		L			
SAMPLING/PURGING  APP = After Peristaltic Pump; B = Bailer; BP = Bladder Pump; ESP = Electric Submirsable Pump; PP = Peristaltic Pump  RFPP = Reverse Flow Peristaltic Pump; SM = Straw Method (tubing Gravity Drain); VT = Vacuum Trap; O = Other (Specify)		ottles pre-pres	erved at lab	oratory pric	or to sample co	ollection.								
											ecify)			
			RFPP = Reverse f	Flow Peristaltic I	Pump; <b>SM</b> = Straw	Method (tubing	g Gravity Drain);	<b>VT</b> = Vacuum 1	re - Peristantic Pum rap; <b>0 =</b> Other (Spe	ecify)				

1. The above do not constitute all of the information requierd by Chapter 62-160, F.A.C.

optionally,  $\pm$  0.2 mg/L or  $\pm$  10% (whichever is greater) Turbidity: all readings  $\leq$  20 NTU; optionally  $\pm$  5 NTU or 10% (whichever is greater)

<sup>2.</sup> STABILIZATION CRITERIA FOR RANGE OF VARIATION OF LAST THREE CONSECUTIVE READINGS (SEE FS 2212. SECTION 3) pH: ± 0.2 units Temperature: ± 0.2 °C Specific Conductance: ± 5% Dissolved Oxygen: all readings ≤ 20% saturation (see Table FS 2200-2);

### **GROUNDWATER SAMPLING LOG**

NAME:		Big Be	end			LOCATION:		Apollo Beach, FL.				
WELL NO:	BBS	S-CCR-BW	<b>/-2</b>		SAMPLE ID:	L16k	<b>&lt;</b> 034-05	DATE: 11/10/16				
				•		NG DATA						
WELL DIAMETER (inche	s)	TUBING DIAMETER (inc	thes) 1/4	WELL SCREEN IF DEPTH 13.64		23.34 (feet)	STATIC DEF	PTH (feet): 8.45	PURGE PUMP T' OR BAILER:	YPE PP		
WELL VOLUME P	URGE:	1 WELL VO	LUME = (TOT	AL WELL DEPTH -	STATIC DEF	TH TO WATER)	X WELL CA	APACITY				
			= (		feet -		feet) x		gallons/foo	t =	gallons	
(only fillout if applic	UME PURGE: able)	1 EQI	JIPMENT VOL	. = PUMP VOLUM	E + (TUBING	CAPACITY X T	TUBING LENG	STH ) + FLOW CE	LL VOLUME			
			=(	0	gallons + (	0.0026 gallo	ons/foot X	24.64 fee	et)+ 0.06	9	0.12 gallons	
DEPTH IN WELL (feet): 18.49 DEPTH IN V		FINAL PUMP DEPTH IN W	٠ , ١٥	.49	PURGING INITIATED AT: 9:29		PURGING ENDED AT:	9:40	TOTAL VOLUM PURGED (gallo	1E ons): 2.03		
TIME	VOLUME PURGED (GALLONS)	VOLUME PURGED (GALLONS)	PURGE RATE (GPM)	DEPTH TO WATER (FEET)	pH (standard units)	TEMP. (°C)	COND. (µmhos/cm OR µS/cm)	DISSOLVED OXYGEN (circle(mg/l) or % saturation)	TURBIDITY (NTUs)	COLOR (describe)	ODOR (describe)	
9:36	1.29	1.29	0.18	8.76	6.68	27.04	1397	0.33	2.96	LT. YELLOW	NONE	
9:38	0.37	1.66	0.19	8.76	6.68	27.08	1396	0.22	3.45	LT. YELLOW	NONE	
9:40	0.37	2.03	0.19	8.76	6.68	27.10	1397	0.20	5.86	LT. YELLOW	NONE	
WELL CAPACITY (	Gallons Per Foot):	<b>0.75"</b> = 0.02;	1" = 0.0	)4; <b>1.25</b> " = 0.	06; <b>2</b> " = 0	).16; <b>3"</b> = 0.	37· <b>4</b> "	= 0.65; <b>5"</b> =	: 1.02; <b>6"</b> = 1	.47; 12" =	: 5.88	
TUBING INSIDE DI	,				0.0026;	<b>5/16"</b> = 0.004;	3/8" = 0.00			" = 0.016	0.00	
SAMPLED BY (PF	INT) / AFFILIATI	ON:		SAMPLER (S) SIG		ING DATA	1	SAMPLING		SAMPLING		
	RAE		TECO	, ,				INITIATED AT:	40	ENDED AT:	9:49	
PUMP OR TUBINO DEPTH IN WELL (	e 18.5	5		SAMPLE PUMP FLOW RATE (mL	per minute):	-	700	TUBING MATERIAL CODE	:: PE	/S		
FIELD DECONTAIN		Y 🔲 N 🗹		FIELD-FILTERED Filtration Equipme			ER SIZE:	μm	DUPLICATE:	Y N D	7	
	SAMPLE CON	TAINER		i ili alion Equipme	SAMPLE PRE			INTE	NDED		 MPLING	
	SPECIFICA	MATERIAL	VOLUME	PRESERVATIVE		AL VOL.	FINAL	ANALYSI	S AND/OR	EQU	EQUIPMENT CODE	
SAMPLE ID CODE	# CONTAINERS	CODE	VOLUME	USED	ADDED IN	N FIELD (ml) (1)	pН	METHOD		CODE		
01 500		25	500 1	110115		ONE		1				
@Ino-500	1	PE	500ml	NONE	N	ONE	N/A	Inorg	janics		PP	
@Met-250	2	PE	250ml	HNO3		1ml	<2	Me	etals		 PP	
@Rad-1L	2	PE	1L	HNO3		5ml	<2		logicals		<u>' '</u> PP	
@rtau-rE		1 -	- 12	111400		OIIII	12	radioi	ogiodio		' '	
REMARKS:												
(1) Sample bo						D.h		7 7 6	0 0" "	-16.)		
MATERIAL CODE SAMPLING/PURGII			i = Clear Glass			= Polypropylene P = Electric Subm				сіту)		
SAMPLING/PURGII EQUIPMENT CODE	S: i	RFPP = Reverse I	Flow Peristaltic	Pump: SM = Straw	Method (tubing	Gravity Drain):	VT = Vacuum 1	PP = Peristaltic Pum	ecify)			

NOTES: 1. The above do not constitute all of the information requierd by Chapter 62-160, F.A.C.

 $optionally, \pm 0.2 \ mg/L \ or \pm 10\% \ (whichever is \ greater) \ Turbidity: \ all \ readings \leq 20 \ NTU; \ optionally \pm 5 \ NTU \ or \ 10\% \ (whichever is \ greater)$ 

<sup>2.</sup> STABILIZATION CRITERIA FOR RANGE OF VARIATION OF LAST THREE CONSECUTIVE READINGS (SEE FS 2212. SECTION 3)

pH: ± 0.2 units Temperature: ± 0.2 °C Specific Conductance: ± 5% Dissolved Oxygen: all readings ≤ 20% saturation (see Table FS 2200-2);



THE LEADER IN ENVIRONMENTAL TESTING

## **ANALYTICAL REPORT**

TestAmerica Laboratories, Inc.

TestAmerica Tampa 6712 Benjamin Road Suite 100 Tampa, FL 33634

Tel: (813)885-7427

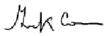
TestAmerica Job ID: 660-77306-1

Client Project/Site: L16K034

### For:

Tampa Electric Company 5012 Causeway Boulevard Tampa, Florida 33619

Attn: Ms. Peggy Penner



Authorized for release by: 11/21/2016 1:39:36 PM

Keaton Conner, Project Mgmt. Assistant (813)885-7427

keaton.conner@testamericainc.com

.....LINKS .....

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Total Access

**Have a Question?** 



Visit us at: www.testamericainc.com

The test results in this report meet all 2003 NELAC and 2009 TNI requirements for accredited parameters, exceptions are noted in this report. This report may not be reproduced except in full, and with written approval from the laboratory. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

Client: Tampa Electric Company Project/Site: L16K034 TestAmerica Job ID: 660-77306-1

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# **Sample Summary**

Client: Tampa Electric Company Project/Site: L16K034

TestAmerica Job ID: 660-77306-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
660-77306-1	L16K034-01	Water	11/10/16 11:53	11/15/16 13:55
660-77306-2	L16K034-02	Water	11/10/16 11:27 1	11/15/16 13:55
660-77306-3	L16K034-03	Water	11/10/16 11:05 1	11/15/16 13:55
660-77306-4	L16K034-04	Water	11/10/16 10:20 1	11/15/16 13:55
660-77306-5	L16K034-05	Water	11/10/16 09:49 1	11/15/16 13:55

# **Definitions/Glossary**

Client: Tampa Electric Company

Project/Site: L16K034

TestAmerica Job ID: 660-77306-1

### **Qualifiers**

### **Metals**

Qualifier	Qualifier Description
Ī	The reported value is between the laboratory method detection limit and the laboratory practical quantitation limit.
U	Indicates that the compound was analyzed for but not detected.

### Glossary

TEF

TEQ

Toxicity Equivalent Factor (Dioxin)

Toxicity Equivalent Quotient (Dioxin)

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains no Free Liquid
DER	Duplicate error ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision level concentration
MDA	Minimum detectable activity
EDL	Estimated Detection Limit
MDC	Minimum detectable concentration
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative error ratio
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points

### **Case Narrative**

Client: Tampa Electric Company

Project/Site: L16K034

TestAmerica Job ID: 660-77306-1

Job ID: 660-77306-1

**Laboratory: TestAmerica Tampa** 

**Narrative** 

Job Narrative 660-77306-1

#### Receipt

The samples were received on 11/15/2016 1:55 PM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was  $2.0^{\circ}$  C.

#### Metals

No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

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# **Detection Summary**

Client: Tampa Electric Company

Project/Site: L16K034

Lithium

TestAmerica Job ID: 660-77306-1

200.7 Rev 4.4

Total/NA

Client Sample ID: I	L16K034-01		Lab Sample ID: 660-7						
Analyte	Result	Qualifier	PQL	MDL	Unit	Dil Fac D	Method	Prep Type	
Lithium	0.0084	Ī	0.050	0.0010	mg/L		200.7 Rev 4.4	Total/NA	
Client Sample ID: I	L16K034-02					Lab Sample ID: 660-77306-2			
Analyte	Result	Qualifier	PQL	MDL	Unit	Dil Fac D	Method	Prep Type	
Lithium	0.011	Ī	0.050	0.0010	mg/L		200.7 Rev 4.4	Total/NA	
Client Sample ID: I	L16K034-03					Lab Sa	mple ID: 66	60-77306-3	
Analyte	Result	Qualifier	PQL	MDL	Unit	Dil Fac D	Method	Prep Type	
Lithium	0.0061	I	0.050	0.0010	mg/L	1	200.7 Rev 4.4	Total/NA	
Client Sample ID: I	L16K034-04					Lab Sa	mple ID: 66	0-77306-4	
Analyte	Result	Qualifier	PQL	MDL	Unit	Dil Fac D	Method	Prep Type	
Lithium	0.010	I	0.050	0.0010	mg/L		200.7 Rev 4.4	Total/NA	
Client Sample ID: I	L16K034-05					Lab Sa	mple ID: 66	0-77306-5	
Analyte	Result	Qualifier	PQL	MDL	Unit	Dil Fac D	Method	Prep Type	

0.050

0.0010 mg/L

0.0017 I

### Client Sample Results

Client: Tampa Electric Company Project/Site: L16K034

TestAmerica Job ID: 660-77306-1

Client Sample ID: L16K034-01 Date Collected: 11/10/16 11:53

Lab Sample ID: 660-77306-1

**Matrix: Water** 

Date Received: 11/15/16 13:55

Method: 200.7 Rev 4.4 - Metals (ICP)

Analyte Result Qualifier PQL **MDL** Unit D Prepared Analyzed Dil Fac Lithium 0.0084 I 0.050 0.0010 mg/L 11/18/16 11:14 11/19/16 15:54

Client Sample ID: L16K034-02 Lab Sample ID: 660-77306-2

Date Collected: 11/10/16 11:27 **Matrix: Water** 

Date Received: 11/15/16 13:55

Method: 200.7 Rev 4.4 - Metals (ICP)

Analyte Result Qualifier PQL **MDL** Unit D Prepared Analyzed Dil Fac 0.050 11/18/16 11:14 11/19/16 15:58 Lithium 0.011 I 0.0010 mg/L

Client Sample ID: L16K034-03 Lab Sample ID: 660-77306-3

Date Collected: 11/10/16 11:05 **Matrix: Water** 

Date Received: 11/15/16 13:55

Method: 200.7 Rev 4.4 - Metals (ICP)

Analyte Result Qualifier PQL MDL Unit Prepared Analyzed Dil Fac Lithium 0.0061 I 0.050 0.0010 mg/L 11/18/16 11:14 11/19/16 16:01

Client Sample ID: L16K034-04 Lab Sample ID: 660-77306-4

Date Collected: 11/10/16 10:20

Date Received: 11/15/16 13:55

Method: 200.7 Rev 4.4 - Metals (ICP) Analyte Result Qualifier PQL **MDL** Unit Prepared Analyzed Dil Fac <u>11/18/16 11:14</u> <u>11/19/16 16:05</u> Lithium 0.050 0.0010 mg/L 0.010 I

Lab Sample ID: 660-77306-5 Client Sample ID: L16K034-05

Date Collected: 11/10/16 09:49

Date Received: 11/15/16 13:55

Method: 200.7 Rev 4.4 - Metals (ICP)

Analyte Result Qualifier **PQL MDL** Unit Prepared Analyzed 0.0010 mg/L 0.050 11/18/16 11:14 11/19/16 16:08 Lithium 0.0017 I

**Matrix: Water** 

**Matrix: Water** 

### QC Sample Results

Client: Tampa Electric Company TestAmerica Job ID: 660-77306-1

Project/Site: L16K034

Lithium

Method: 200.7 Rev 4.4 - Metals (ICP)

Lab Sample ID: MB 400-331677/1-A Client Sample ID: Method Blank **Matrix: Water** Prep Type: Total/NA **Analysis Batch: 331888 Prep Batch: 331677** 

MB MB

Analyte Result Qualifier PQL **MDL** Unit Prepared Analyzed Dil Fac 0.050 <u>11/18/16 11:14</u> <u>11/19/16 14:33</u> Lithium 0.0010 U 0.0010 mg/L

Lab Sample ID: LCS 400-331677/2-A **Client Sample ID: Lab Control Sample Matrix: Water** Prep Type: Total/NA **Analysis Batch: 331888 Prep Batch: 331677** Spike LCS LCS %Rec. Added Limits Analyte Result Qualifier Unit D %Rec 85 - 115 Lithium 1.00 1.11 mg/L 111

Lab Sample ID: 400-129934-G-4-B MS **Client Sample ID: Matrix Spike Matrix: Water Prep Type: Total/NA Analysis Batch: 331888 Prep Batch: 331677** Sample Sample Spike MS MS %Rec. Result Qualifier Added Result Qualifier Limits Analyte Unit D %Rec Lithium 0.014 I 1.00 1.14 mg/L 112 70 - 130

Lab Sample ID: 400-129934-G-4-C MSD **Client Sample ID: Matrix Spike Duplicate Matrix: Water** Prep Type: Total/NA **Analysis Batch: 331888 Prep Batch: 331677** Sample Sample Spike MSD MSD %Rec. **RPD** Analyte Result Qualifier Added Result Qualifier Unit %Rec Limits RPD Limit 0.014 Ī

1.20

mg/L

118

70 - 130

5

1.00

11/21/2016

# **QC Association Summary**

Client: Tampa Electric Company Project/Site: L16K034 TestAmerica Job ID: 660-77306-1

### **Metals**

### **Prep Batch: 331677**

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
660-77306-1	L16K034-01	Total/NA	Water	200.7	
660-77306-2	L16K034-02	Total/NA	Water	200.7	
660-77306-3	L16K034-03	Total/NA	Water	200.7	
660-77306-4	L16K034-04	Total/NA	Water	200.7	
660-77306-5	L16K034-05	Total/NA	Water	200.7	
MB 400-331677/1-A	Method Blank	Total/NA	Water	200.7	
LCS 400-331677/2-A	Lab Control Sample	Total/NA	Water	200.7	
400-129934-G-4-B MS	Matrix Spike	Total/NA	Water	200.7	
400-129934-G-4-C MSD	Matrix Spike Duplicate	Total/NA	Water	200.7	

### **Analysis Batch: 331888**

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
660-77306-1	L16K034-01	Total/NA	Water	200.7 Rev 4.4	331677
660-77306-2	L16K034-02	Total/NA	Water	200.7 Rev 4.4	331677
660-77306-3	L16K034-03	Total/NA	Water	200.7 Rev 4.4	331677
660-77306-4	L16K034-04	Total/NA	Water	200.7 Rev 4.4	331677
660-77306-5	L16K034-05	Total/NA	Water	200.7 Rev 4.4	331677
MB 400-331677/1-A	Method Blank	Total/NA	Water	200.7 Rev 4.4	331677
LCS 400-331677/2-A	Lab Control Sample	Total/NA	Water	200.7 Rev 4.4	331677
400-129934-G-4-B MS	Matrix Spike	Total/NA	Water	200.7 Rev 4.4	331677
400-129934-G-4-C MSD	Matrix Spike Duplicate	Total/NA	Water	200.7 Rev 4.4	331677

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Client: Tampa Electric Company

Project/Site: L16K034

Client Sample ID: L16K034-01

Date Collected: 11/10/16 11:53 Date Received: 11/15/16 13:55

Lab Sample ID: 660-77306-1

Matrix: Water

	Batch	Batch		Dil	Initial	Final	Batch	Prepared		
Prep Type	Type	Method	Run	Factor	Amount	Amount	Number	or Analyzed	Analyst	Lab
Total/NA	Prep	200.7			50 mL	50 mL	331677	11/18/16 11:14	KWN	TAL PEN
Total/NA	Analysis	200.7 Rev 4.4		1			331888	11/19/16 15:54	GESP	TAL PEN
	Instrument	ID: 6500 ICP Duo								

Client Sample ID: L16K034-02 Lab Sample ID: 660-77306-2

Date Collected: 11/10/16 11:27

**Matrix: Water** 

Date Received: 11/15/16 13:55

Batch Batch Dil Initial Final Batch Prepared Method **Prep Type** Туре Factor Amount Amount Number or Analyzed Analyst Run Lab 331677 Total/NA Prep 200.7 50 mL 50 mL 11/18/16 11:14 KWN TAL PEN Total/NA Analysis 200.7 Rev 4.4 331888 11/19/16 15:58 GESP TAL PEN Instrument ID: 6500 ICP Duo

Client Sample ID: L16K034-03 Lab Sample ID: 660-77306-3

Date Collected: 11/10/16 11:05

**Matrix: Water** 

**Matrix: Water** 

Date Received: 11/15/16 13:55

	Batch	Batch		Dil	Initial	Final	Batch	Prepared		
Prep Type	Type	Method	Run	Factor	Amount	Amount	Number	or Analyzed	Analyst	Lab
Total/NA	Prep	200.7			50 mL	50 mL	331677	11/18/16 11:14	KWN	TAL PEN
Total/NA	Analysis	200.7 Rev 4.4		1			331888	11/19/16 16:01	GESP	TAL PEN
	Instrumen	t ID: 6500 ICP Duo								

Client Sample ID: L16K034-04 Lab Sample ID: 660-77306-4

Date Collected: 11/10/16 10:20 Date Received: 11/15/16 13:55

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	200.7			50 mL	50 mL	331677	11/18/16 11:14	KWN	TAL PEN
Total/NA	Analysis	200.7 Rev 4.4		1			331888	11/19/16 16:05	GESP	TAL PEN
	Instrumer	nt ID: 6500 ICP Duc	)							

Lab Sample ID: 660-77306-5 Client Sample ID: L16K034-05

Date Collected: 11/10/16 09:49

**Matrix: Water** 

Date Received: 11/15/16 13:55

	Batch	Batch		Dil	Initial	Final	Batch	Prepared		
Prep Type	Type	Method	Run	Factor	Amount	Amount	Number	or Analyzed	Analyst	Lab
Total/NA	Prep	200.7			50 mL	50 mL	331677	11/18/16 11:14	KWN	TAL PEN
Total/NA	Analysis	200.7 Rev 4.4		1			331888	11/19/16 16:08	GESP	TAL PEN
	Instrumer	nt ID: 6500 ICP Duo								

#### **Laboratory References:**

TAL PEN = TestAmerica Pensacola, 3355 McLemore Drive, Pensacola, FL 32514, TEL (850)474-1001

TestAmerica Tampa

# **Certification Summary**

Client: Tampa Electric Company

Project/Site: L16K034

TestAmerica Job ID: 660-77306-1

### **Laboratory: TestAmerica Tampa**

The certifications listed below are applicable to this report.

Authority	Program	EPA Region	Certification ID	<b>Expiration Date</b>
Florida	NELAP	4	E84282	06-30-17

# Laboratory: TestAmerica Pensacola The certifications listed below are applicable to this report.

Authority	Program	<b>EPA Region</b>	Certification ID	<b>Expiration Date</b>
Florida	NELAP	4	E81010	06-30-17

# **Method Summary**

Client: Tampa Electric Company

Project/Site: L16K034

TestAmerica Job ID: 660-77306-1

Method	Method Description	Protocol	Laboratory
200.7 Rev 4.4	Metals (ICP)	EPA	TAL PEN

**Protocol References:** 

EPA = US Environmental Protection Agency

**Laboratory References:** 

TAL PEN = TestAmerica Pensacola, 3355 McLemore Drive, Pensacola, FL 32514, TEL (850)474-1001

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### **SENDING LABORATORY:**

Tampa Electric Company, Laboratory Services

5012 Causeway Blvd Tampa, FL 33619 Phone: (813) 630-7490

Fax: (813) 630-7360

Project Manager: Peggy Penner RECEIVING LABORATORY:

TestAmerica Laboratories, Inc. - Tampa

6712 Benjamin Rd., Suite 100

Tampa, FL 33634

Phone:(813) 885-7427

Fax: -

Due Date: 11/28/16 16:00

Analysis		Expires		Laboratory ID Comments
Sample ID: L16K034-01	BBS-CCR-1		Water	
Sampled: 11/10/16 11:53				
Lithium, Total EPA 6010		05/09/17 11:53	- · · · · - · · · · · · · · · · · · · ·	•
Containers Supplied:				
Poly HNO3 - 250mL(B)				
Sample ID: L16K034-02	BBS-CCR-2		Water	
Sampled: 11/10/16 11:27				
Lithium, Total EPA 6010		05/09/17 11:27		
Containers Supplied:				
Poly HNO3 - 250mL(B)				
Sample ID: L16K034-03	BBS-CCR-3		Water	
Sampled: 11/10/16 11:05				
Lithium, Total EPA 6010		05/09/17 11:05		
Containers Supplied:				
Poly HNO3 - 250mL (B)				
Sample ID; L16K034-04	BBS-CCR-BW1		Water	
Sampled: 11/10/16 10:20				<u> </u>
Lithium, Total EPA 6010		05/09/17 10:20		<del></del> -
Containers Supplied:				
Poly HNO3 - 250mL (B)				
Sample ID: L16K034-05	BBS-CCR-BW2		Water	- :
Sampled: 11/10/16 09:49				· · · · · · · · · · · · · · · · · · ·



Loc: 660 77306

660-77306 Chain of Custody

05/09/17 09:49

11-10-16 1412

Released By

Lithium, Total EPA 6010

Containers Supplied: Poly HNO3 - 250mL (B)

Date & Time

Received By

18 /2:0 W-09 age 3 of 3

Pensacola

Tampa,

L16K034

# **Login Sample Receipt Checklist**

Client: Tampa Electric Company

Job Number: 660-77306-1

Login Number: 77306 List Source: TestAmerica Tampa

List Number: 1

Creator: Redding, Charles S

Creator. Reduing, Charles 5		
Question	Answer	Comment
Radioactivity wasn't checked or is = background as measured by a survey meter.</td <td>N/A</td> <td></td>	N/A	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	N/A	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

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# **Login Sample Receipt Checklist**

Client: Tampa Electric Company

Job Number: 660-77306-1

Login Number: 77306
List Source: TestAmerica Pensacola
List Number: 2
List Creation: 11/16/16 12:08 PM

Creator: Chambers, Cheryle A

Creator: Chambers, Cheryle A		
Question	Answer	Comment
Radioactivity wasn't checked or is = background as measured by a survey meter.</td <td>N/A</td> <td></td>	N/A	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	0.0°C IR5
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	N/A	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

TestAmerica Tampa

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Report Date: December 8, 2016

TECO

5012 Causeway Blvd. Tampa, FL 33619

Attn: Peggy Penner

Field Custody:

Client

Client/Field ID:

L16K034-01

Sample Collection:

11-10-16/1153

Lab ID No:

16.13251

Lab Custody Date:

11-14-16/1510

Sample description:

Water

### CERTIFICATE OF ANALYSIS

					Analysis		Detection
Parameter	Units	Re	sul	ts	Date	Method	Limit
Combined Radium (Radium-226 + Radium 228)	pCi/l	37.3	±	1.8	Calc	Calc	0.9
Radium-226	pCi/l	35.0	±	1.8	11-28-16/1317	EPA 903.0	0.4
Radium-228 Alpha Standard: Th-230	pCi/l	2.3	±	0.7	11-21-16/1207	EPA Ra-05	0.9

James W. Hayes

James W. Hages

Laboratory Manager

Test results meet all requirements of the NELAC standards. Statement of estimated uncertainty available upon request. Test results refer only to sample(s) listed. Contact person: Jim Hayes (813) 229-2879.



Report Date: December 8, 2016

TECO

5012 Causeway Blvd. Tampa, FL 33619

Attn: Peggy Penner

Field Custody: Client/Field ID: Client

L16K034-02

Sample Collection:

11-10-16/1127

Lab ID No:

16.13252

Lab Custody Date:

11-14-16/1510

Sample description: Water

#### CERTIFICATE OF ANALYSIS

Parameter	Units	Pe	sul	t a	Analysis Date	Method	Detection Limit	
Farameter	UIIICS	Re	Sul	LS	Date	Method	TIMITC	_
Combined Radium (Radium-226 + Radium 228)	pCi/l	14.8	±	1.1	Calc	Calc	0.8	
Radium-226	pCi/l	13.9	±	1.1	11-28-16/1213	EPA 903.0	0.3	
Radium-228 Alpha Standard: Th-230	pCi/l	0.9	±	0.6	11-21-16/1207	EPA Ra-05	0.8	

James W. Hayes Laboratory Manager

James W. Hages

Test results meet all requirements of the NELAC standards. Statement of estimated uncertainty available upon request. Test results refer only to sample(s) listed. Contact person: Jim Hayes (813) 229-2879.



Report Date: December 8, 2016

TECO

5012 Causeway Blvd. Tampa, FL 33619

Attn: Peggy Penner

Field Custody:

Client

Client/Field ID:

L16K034-03

Sample Collection:

11-10-16/1105

Lab ID No:

16.13253

Lab Custody Date:

11-14-16/1510

Sample description: Water

CERTIFICATE OF ANALYSIS

					0			
					Analysis		Detection	
Parameter	Units	Re	sul	ts	Date	Method	Limit	_
Combined Radium (Radium-226 + Radium 228)	pCi/l	17.5	±	1.2	Calc	Calc	0.8	
Radium-226	pCi/l	15.6	±	1.2	11-28-16/1317	EPA 903.0	0.4	
Radium-228 Alpha Standard: Th-230	pCi/l	1.9	±	0.6	11-21-16/1207	EPA Ra-05	0.8	

James W. Hayes Laboratory Manager

James W. Hages

Test results meet all requirements of the NELAC standards. Statement of estimated uncertainty available upon request. Test results refer only to sample(s) listed. Contact person: Jim Hayes (813) 229-2879.



Report Date: December 8, 2016

TECO

5012 Causeway Blvd. Tampa, FL 33619

Attn: Peggy Penner

Field Custody:

Client

Client/Field ID:

L16K034-04

Sample Collection:

11-10-16/1020

Lab ID No:

16.13254

Lab Custody Date:

11-14-16/1510

Sample description: Water

CERTIFICATE OF ANALYSIS

					Analysis		Detection	
Parameter	Units	Results		ts	Date	Method	Limit	
Combined Radium (Radium-226 + Radium 228)	pCi/l	29.9	±	1.6	Calc	Calc	0.9	
Radium-226	pCi/l	26.3	±	1.6	11-28-16/1317	EPA 903.0	0.3	
Radium-228 Alpha Standard: Th-230	pCi/l	3.6	±	0.8	11-21-16/1207	EPA Ra-05	0.9	

James W. Hayes Laboratory Manager

James W. Hages

Test results meet all requirements of the NELAC standards. Statement of estimated uncertainty available upon request. Test results refer only to sample(s) listed. Contact person: Jim Hayes (813) 229-2879.



Report Date: December 8, 2016

TECO

5012 Causeway Blvd. Tampa, FL 33619

Attn: Peggy Penner

Field Custody:

Client

Client/Field ID:

L16K034-05

Sample Collection:

11-10-16/0949

Lab ID No:

16.13255

Lab Custody Date:

11-14-16/1510

Sample description: Wa

Water

CERTIFICATE OF ANALYSIS

					Analysis		Detection
Parameter	Units	Re	esul	ts	Date	Method	Limit
Combined Radium (Radium-226 + Radium 228)	pCi/l	8.0	±	0.8	Calc	Calc	0.8
Radium-226	pCi/l	3.5	±	0.6	11-28-16/1317	EPA 903.0	0.4
Radium-228 Alpha Standard: Th-230	pCi/l	4.5	±	0.8	11-21-16/1207	EPA Ra-05	0.8

James W. Hayes Laboratory Manager

James W. Hages

Test results meet all requirements of the NELAC standards. Statement of estimated uncertainty available upon request. Test results refer only to sample(s) listed. Contact person: Jim Hayes (813) 229-2879.

#### SUBCONTRACT ORDER

## Tampa Electric Company, Laboratory Services L16K034

### SENDING LABORATORY:

RECEIVING LABORATORY:

Tampa Electric Company, Laboratory Services

**KNL Laboratory Services** 

5012 Causeway Blvd

3202 N. Florida Ave.

Tampa, FL 33619 Phone: (813) 630-7490 Tampa, FL 33603 Phone: (813) 229-2879

Fax: (813) 630-7360

Project Manager: Peggy Penner Fax: -

**Due Date:** 

11/28/16 16:00

Analysis	Expires		Laboratory ID	Comments
Sample ID: L16K034-01 BBS-CCR-1 Sampled: 11/10/16 11:53		Water	16 13251	
Radium 226 EPA 903.0	05/09/17 11:53		Level 2 Data requred	
Radium 226+228, Total	05/09/17 11:53		Level 2 Data requred	
Radium 228 Ra-05	05/09/17 11:53		Level 2 Data requred	
Containers Supplied:				
RAD Poly HNO3 - 1000mL (C)	RAD Poly HNO3 - 1000mL (l			
Sample ID: L16K034-02 BBS-CCR-2 Sampled: 11/10/16 11:27		Water	16-13252	
Radium 226 EPA 903.0	05/09/17 11:27		Level 2 Data requred	
Radium 226+228, Total	05/09/17 11:27		Level 2 Data requred	
Radium 228 Ra-05	05/09/17 11:27		Level 2 Data requred	
Containers Supplied: RAD Poly HNO3 - 1000mL (C)	RAD Poly HNO3 - 1000mL (	D)		
Sample ID: L16K034-03 BBS-CCR-3 Sampled: 11/10/16 11:05		Water	1613253	
Radium 226+228, Total	05/09/17 11:05		Level 2 Data requred	
Radium 226 EPA 903.0	05/09/17 11:05		Level 2 Data requred	
Radium 228 Ra-05	05/09/17 11:05		Level 2 Data requred	
Containers Supplied:				
RAD Poly HNO3 - 1000mL (C)	RAD Poly HNO3 - 1000mL (			
Sample ID: L16K034-04 BBS-CCR-B Sampled: 11/10/16 10:20	3W1	Water	16.13254	
Radium 226 EPA 903.0	05/09/17 10:20		Level 2 Data requred	
Radium 226+228, Total	05/09/17 10:20		Level 2 Data requred	
Radium 228 Ra-05	05/09/17 10:20		Level 2 Data requred	n.h
Containers Supplied: RAD Poly HNO3 - 1000mL (C)	RAD Poly HNO3 - 1000mL (	D)		12-9-16

11-10-16

Received By

KNL 111416 1510

Date & Time

Released By

Date & Time

Received By

Date & Time

#### SUBCONTRACT ORDER

# Tampa Electric Company, Laboratory Services L16K034

Analysis	Expires	Laboratory ID Comments
Sample ID: L16K034-05 BBS-CCR Sampled: 11/10/16 09:49	-BW2	Water 16. 13235
Radium 228 Ra-05	05/09/17 09:49	Level 2 Data requred
Radium 226 EPA 903.0	05/09/17 09:49	Level 2 Data requred
Radium 226+228, Total	05/09/17 09:49	Level 2 Data requred
Containers Supplied:		
RAD Poly HNO3 - 1000mL (C)	RAD Poly HNO3 - 1000mL	L(D)

J# 12-9-16

RABULET 11-10-16 1412

Date & Time

Received By

Date & Time

Released By

Date & Time

Received By

Date & Time



# FL DOH Certification # E84025

QC Summary: Radium 2	28 Analysis	
Client Project #: LI6K	034	
Analysis Completion Date:	11/21/14	
Precision Data:	Sample #: 16, 1	3254
Sample Analysis (pCi/l)	Duplicate Analysis (pCi/l) Range (	pCi/l) RPD (%)
	10.4	
<u> </u>		
Spike Data:	Sample #: _ 16, 0	13254
Sample Analysis (pCi)	Spike Added (pCi) _ Analytical Resul	lt (pCi) Spike Rec (%)
3.6	7.54 11.2	101%
LCS Data:		
Analytical Result (pCi)	True Value (pCi/L	% Recovery
3.7	4,3	86%
Lab Blank:	Analytical Result (pCi/l)	Analysis Date

Lab Blank

0.4+1- 0.3

111 21/16



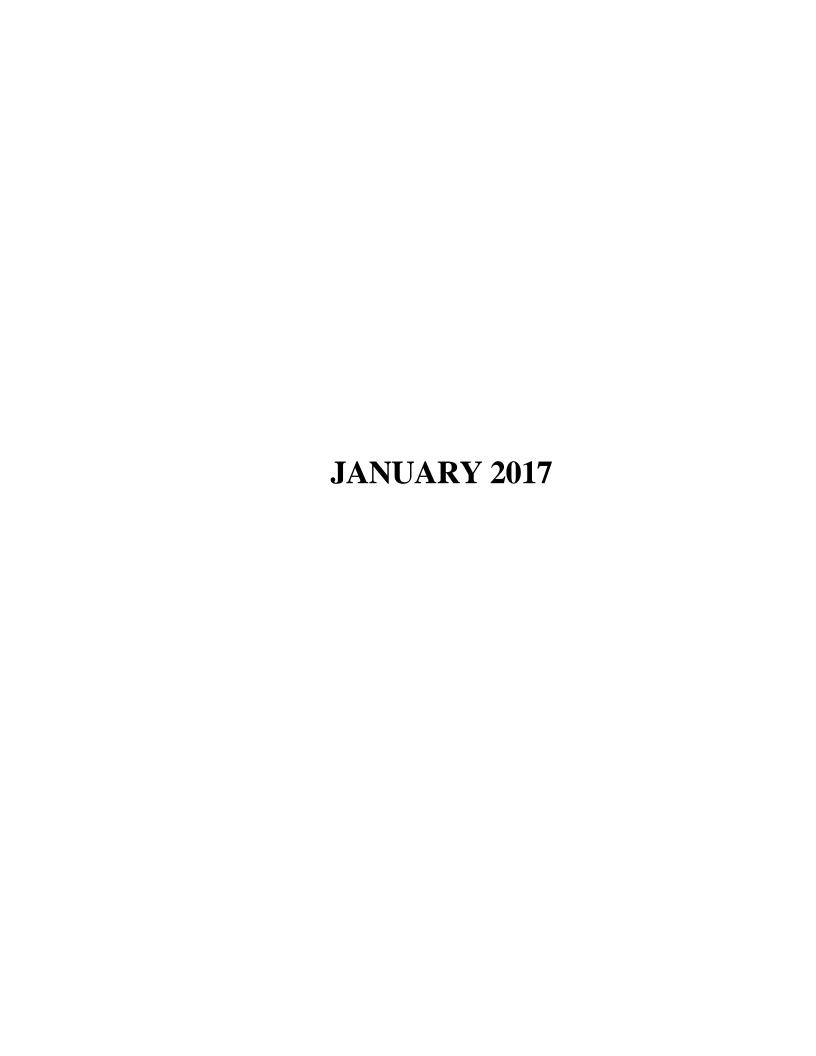
# **FL DOH Certification # E84025**

QC Summary: <b>Total Ra</b> Client Project #:	(034	
Precision Data:	Sample #:	13174
Sample Analysis (pCi/l)		e (pCi/l) RPD (%)
	Sample #: 16, 1	sult (pCix Spike Rec (%)
	4.5	104%
Analytical Result (pCi)	True Value (pCi)	% Recovery  837
Lab Blank:	Analytical Result (pCi/l)	Analysis Date

Lab Blank

03 +1- 0.2

11128116





5012 Causeway Blvd Tampa Fl. 33619 \* Ph (813)630-7490 \* Fax (813)630-7360 \* DOH #E54272

Big Bend Power Station Terry Eastley 13031 Wyandott Rd Apollo Beach, FL 33572 tleastley@tecoenergy.com

Work Order - L17A041

**Report Date:** 

04/25/17 15:40

## **Project - CCR Wells Economizer Ash Pond**

### **Case Narrative**

REPORT REVISED 4/25/2017 to add Beryllium to sample CCR -1

5 sample(s) were received on 01/26/17 14:15.

There were no issues noted with the sample(s) associated with this workorder unless noted below.

Lithium was subcontracted to TestAmerica Labs. The report is attached.

Rad 226/228 was subcontracted to KNL Laboratory. The report is attached.

#### **SM 2540C**

A constant weight could not be acheived after three consectutive weighing and drying cycles for samples CCR1 and CCR-BW-1. The sample(s) are flagged with a J qualifier.

#### **EPA 300.0**

The recovery of the matrix spike and spike duplicate for Chloride, Fluoride and Sulfate were above the control limits due to matrix interference. The parent sample is flagged with a J qualifier.

#### **EPA 6010**

The recovery of the matrix spike and spike duplicate for Calcium and Boron could not be acurately determined due to the amount of target analyte in the sample matrix. The parent sample is flagged with a J qualfier.



5012 Causeway Blvd Tampa Fl. 33619 \* Ph (813)630-7490 \* Fax (813)630-7360 \* DOH #E54272

### **Sample Information**

Client: Big Bend Power Station

Lab Sample ID: L17A041-01 Sampled By: Robert Barthelette

Sample Description: BBS-CCR-1 Date and Time Collected: 1/26/17 12:02
Sample Collection Method: Grab Date of Sample Receipt: 1/26/17 14:15

### **Laboratory Results**

					Qualifier		Test		Analysis
Parameter	Result	Units	MDL	PQL	Code	Dil	Method	Analyst	Date & Time
	ŗ	Tampa Elec	tric Compa	ny, Labo	ratory Se	rvices			
<b>General Chemistry Parameters</b>									
Chloride	820	mg/L	2.00	50.0	V	100	EPA 300.0	RFL	1/27/17 16:05
Specific Conductance	4320	umhos/cm	100	100		1	FDEP SOP FT 1200	RAB	1/26/17 12:02
Dissolved Oxygen	0.100	mg/L	0.100	0.100	U	1	FDEP SOP FT 1500	RAB	1/26/17 12:02
Fluoride	0.184	mg/L	0.0100	0.0500		1	EPA 300.0	RFL	1/27/17 15:55
pH	6.79	pH Units	1.00	1.00		1	FDEP SOP FT 1100	RAB	1/26/17 12:02
REDOX Potential	-110	mV	-999	-999		1	SM 2580B	RAB	1/26/17 12:02
Total Dissolved Solids	3670	mg/L	24.0	40.0	J-	2	SM 2540C	TMH	1/31/17 15:45
Sulfate	1350	mg/L	50.0	200		100	EPA 300.0	RFL	1/27/17 16:05
Turbidity	1.99	NTU	0.100	0.100		1	FDEP SOP FT 1600	RAB	1/26/17 12:02
<b>Total Mercury by SW846 Metho</b>	d 7470/7471								
Mercury	0.0500	ug/L	0.0500	0.200	U	1	EPA 7470A	RLC	1/31/17 14:15
<b>Total Recoverable Metals by 200</b>	Series								
Antimony	0.602	ug/L	0.600	2.00	I	1	EPA 200.8	RLC	1/27/17 12:04
Arsenic	9.04	ug/L	0.320	2.00		1	EPA 200.8	RLC	1/27/17 12:04
Cadmium	0.100	ug/L	0.100	0.500	U	1	EPA 200.8	RLC	1/27/17 12:04
Cobalt	0.489	ug/L	0.0400	2.00	I	1	EPA 200.8	RLC	1/27/17 12:04
Lead	8.00E-5	mg/L	8.00E-5	0.00200	U	1	EPA 200.8	RLC	1/27/17 12:04
Selenium	0.653	ug/L	0.200	2.00	I	1	EPA 200.8	RLC	1/27/17 12:04
Thallium	0.100	ug/L	0.100	0.500	U	1	EPA 200.8	RLC	1/27/17 12:04
<b>Total Recoverable Metals by SW</b>	846 Method	6010B							
Barium	0.115	mg/L	0.000500	0.0200		1	EPA 6010B	MCR	1/31/17 9:56
Beryllium	0.200	ug/L	0.200	2.00	U	1	EPA 6010B	MCR	1/31/17 9:56
Boron	15.5	mg/L	0.0100	0.0500	J-	1	EPA 6010B	MCR	1/31/17 9:56
Calcium	579000	ug/L	30.0	1000	J-	1	EPA 6010B	MCR	1/31/17 11:14
Chromium	1.60	ug/L	1.60	12.0	U	1	EPA 6010B	MCR	1/31/17 9:56
Molybdenum	92.4	ug/L	1.00	20.0		1	EPA 6010B	MCR	1/31/17 9:56



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### **Sample Information**

Client: Big Bend Power Station

Lab Sample ID: L17A041-02 Sampled By: Robert Barthelette

Sample Description: BBS-CCR-2 Date and Time Collected: 1/26/17 11:35
Sample Collection Method: Grab Date of Sample Receipt: 1/26/17 14:15

### **Laboratory Results**

D	D14	II	MDL	DOI.	Qualifier Code	Dil	Test	A l4	Analysis
Parameter	Result	Units		PQL			Method	Analyst	Date & Time
		Tampa Elec	tric Compa	ıny, Labo	ratory Se	rvices			
<b>General Chemistry Parameters</b>									
Chloride	115	mg/L	0.200	5.00	J-,V	10	EPA 300.0	RFL	1/27/17 16:25
Specific Conductance	1560	umhos/cm	100	100		1	FDEP SOP FT 1200	RAB	1/26/17 11:35
Dissolved Oxygen	0.100	mg/L	0.100	0.100	U	1	FDEP SOP FT 1500	RAB	1/26/17 11:35
Fluoride	0.248	mg/L	0.0100	0.0500	J-	1	EPA 300.0	RFL	1/27/17 16:15
pH	6.89	pH Units	1.00	1.00		1	FDEP SOP FT 1100	RAB	1/26/17 11:35
REDOX Potential	-182	mV	-999	-999		1	SM 2580B	RAB	1/26/17 11:35
Total Dissolved Solids	1140	mg/L	12.0	20.0		1	SM 2540C	TMH	1/31/17 15:45
Sulfate	490	mg/L	5.00	20.0	J-	10	EPA 300.0	RFL	1/27/17 16:25
Turbidity	4.93	NTU	0.100	0.100		1	FDEP SOP FT 1600	RAB	1/26/17 11:35
<b>Total Mercury by SW846 Metho</b>	d 7470/7471								
Mercury	0.0500	ug/L	0.0500	0.200	U	1	EPA 7470A	RLC	1/31/17 14:19
<b>Total Recoverable Metals by 200</b>	Series								
Antimony	0.600	ug/L	0.600	2.00	U	1	EPA 200.8	RLC	1/27/17 12:08
Arsenic	1.09	ug/L	0.320	2.00	I	1	EPA 200.8	RLC	1/27/17 12:08
Cadmium	0.100	ug/L	0.100	0.500	U	1	EPA 200.8	RLC	1/27/17 12:08
Cobalt	0.0902	ug/L	0.0400	2.00	I	1	EPA 200.8	RLC	1/27/17 12:08
Lead	8.00E-5	mg/L	8.00E-5	0.00200	U	1	EPA 200.8	RLC	1/27/17 12:08
Selenium	0.200	ug/L	0.200	2.00	U	1	EPA 200.8	RLC	1/27/17 12:08
Thallium	0.100	ug/L	0.100	0.500	U	1	EPA 200.8	RLC	1/27/17 12:08
<b>Total Recoverable Metals by SW</b>	846 Method	6010B							
Barium	0.0546	mg/L	0.000500	0.0200		1	EPA 6010B	MCR	1/31/17 9:59
Beryllium	0.200	ug/L	0.200	2.00	U	1	EPA 6010B	MCR	1/31/17 9:59
Boron	3.86	mg/L	0.0100	0.0500		1	EPA 6010B	MCR	1/31/17 9:59
Calcium	172000	ug/L	30.0	1000		1	EPA 6010B	MCR	1/31/17 11:17
Chromium	1.60	ug/L	1.60	12.0	U	1	EPA 6010B	MCR	1/31/17 9:59
Molybdenum	2.52	ug/L	1.00	20.0	I	1	EPA 6010B	MCR	1/31/17 9:59



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### **Sample Information**

Client: Big Bend Power Station

Lab Sample ID: L17A041-03 Sampled By: Robert Barthelette

Sample Description: BBS-CCR-3 Date and Time Collected: 1/26/17 11:04
Sample Collection Method: Grab Date of Sample Receipt: 1/26/17 14:15

### **Laboratory Results**

					Qualifier		Test		Analysis
Parameter	Result	Units	MDL	PQL	Code	Dil	Method	Analyst	Date & Time
		Tampa Elec	tric Compa	ny, Labo	ratory Se	rvices			
<b>General Chemistry Paramete</b>	<u>rs</u>								
Chloride	129	mg/L	0.200	5.00	V	10	EPA 300.0	RFL	1/27/17 17:06
Specific Conductance	1510	umhos/cm	100	100		1	FDEP SOP FT 1200	RAB	1/26/17 11:04
Dissolved Oxygen	0.110	mg/L	0.100	0.100		1	FDEP SOP FT 1500	RAB	1/26/17 11:04
Fluoride	0.391	mg/L	0.0100	0.0500		1	EPA 300.0	RFL	1/27/17 16:56
pH	6.42	pH Units	1.00	1.00		1	FDEP SOP FT 1100	RAB	1/26/17 11:04
REDOX Potential	-168	mV	-999	-999		1	SM 2580B	RAB	1/26/17 11:04
Total Dissolved Solids	1200	mg/L	12.0	20.0		1	SM 2540C	TMH	1/31/17 15:45
Sulfate	454	mg/L	5.00	20.0		10	EPA 300.0	RFL	1/27/17 17:06
Turbidity	1.79	NTU	0.100	0.100		1	FDEP SOP FT 1600	RAB	1/26/17 11:04
<b>Total Mercury by SW846 Met</b>	thod 7470/7471								
Mercury	0.0500	ug/L	0.0500	0.200	U	1	EPA 7470A	RLC	1/31/17 14:23
Total Recoverable Metals by 2	200 Series								
Antimony	0.600	ug/L	0.600	2.00	U	1	EPA 200.8	RLC	1/27/17 12:11
Arsenic	0.320	ug/L	0.320	2.00	U	1	EPA 200.8	RLC	1/27/17 12:11
Cadmium	0.100	ug/L	0.100	0.500	U	1	EPA 200.8	RLC	1/27/17 12:11
Cobalt	0.0989	ug/L	0.0400	2.00	I	1	EPA 200.8	RLC	1/27/17 12:11
Lead	8.00E-5	mg/L	8.00E-5	0.00200	U	1	EPA 200.8	RLC	1/27/17 12:11
Selenium	0.200	ug/L	0.200	2.00	U	1	EPA 200.8	RLC	1/27/17 12:11
Thallium	0.100	ug/L	0.100	0.500	U	1	EPA 200.8	RLC	1/27/17 12:11
<b>Total Recoverable Metals by S</b>	SW846 Method	6010B							
Barium	0.0562	mg/L	0.000500	0.0200		1	EPA 6010B	MCR	1/31/17 10:01
Beryllium	0.200	ug/L	0.200	2.00	U	1	EPA 6010B	MCR	1/31/17 10:01
Boron	0.381	mg/L	0.0100	0.0500		1	EPA 6010B	MCR	1/31/17 10:01
Calcium	176000	ug/L	30.0	1000		1	EPA 6010B	MCR	1/31/17 11:19
Chromium	1.60	ug/L	1.60	12.0	U	1	EPA 6010B	MCR	1/31/17 10:01
Molybdenum	5.42	ug/L	1.00	20.0	I	1	EPA 6010B	MCR	1/31/17 10:01



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### **Sample Information**

Client: Big Bend Power Station

Lab Sample ID: L17A041-04 Sampled By: Robert Barthelette

Sample Description: BBS-CCR-BW1 Date and Time Collected: 1/26/17 10:32
Sample Collection Method: Grab Date of Sample Receipt: 1/26/17 14:15

### **Laboratory Results**

Parameter	Result	Units	MDL	PQL	Qualifier Code	Dil	Test Method	Amalwat	Analysis Date & Time
rarameter							Method	Analyst	Date & Time
	1	「ampa Elec	tric Compa	ıny, Labo	ratory Sei	vices			
<b>General Chemistry Parameters</b>									
Chloride	942	mg/L	2.00	50.0	V	100	EPA 300.0	RFL	1/27/17 17:46
Specific Conductance	4940	umhos/cm	100	100		1	FDEP SOP FT 1200	RAB	1/26/17 10:32
Dissolved Oxygen	0.200	mg/L	0.100	0.100		1	FDEP SOP FT 1500	RAB	1/26/17 10:32
Fluoride	0.315	mg/L	0.0100	0.0500		1	EPA 300.0	RFL	1/27/17 17:16
pH	6.46	pH Units	1.00	1.00		1	FDEP SOP FT 1100	RAB	1/26/17 10:32
REDOX Potential	-20.2	mV	-999	-999		1	SM 2580B	RAB	1/26/17 10:32
Total Dissolved Solids	4510	mg/L	48.0	80.0	J-	4	SM 2540C	TMH	1/31/17 15:45
Sulfate	1520	mg/L	50.0	200		100	EPA 300.0	RFL	1/27/17 17:46
Turbidity	2.04	NTU	0.100	0.100		1	FDEP SOP FT 1600	RAB	1/26/17 10:32
<b>Total Mercury by SW846 Metho</b>	od 7470/7471								
Mercury	0.0500	ug/L	0.0500	0.200	U	1	EPA 7470A	RLC	1/31/17 14:27
<b>Total Recoverable Metals by 200</b>	) Series								
Antimony	0.600	ug/L	0.600	2.00	U	1	EPA 200.8	RLC	1/27/17 12:15
Arsenic	0.320	ug/L	0.320	2.00	U	1	EPA 200.8	RLC	1/27/17 12:15
Cadmium	0.100	ug/L	0.100	0.500	U	1	EPA 200.8	RLC	1/27/17 12:15
Cobalt	1.50	ug/L	0.0400	2.00	I	1	EPA 200.8	RLC	1/27/17 12:15
Lead	0.000113	mg/L	8.00E-5	0.00200	I	1	EPA 200.8	RLC	1/27/17 12:15
Selenium	0.200	ug/L	0.200	2.00	U	1	EPA 200.8	RLC	1/27/17 12:15
Thallium	0.100	ug/L	0.100	0.500	U	1	EPA 200.8	RLC	1/27/17 12:15
<b>Total Recoverable Metals by SW</b>	846 Method	6010B							
Barium	0.0546	mg/L	0.000500	0.0200		1	EPA 6010B	MCR	1/31/17 10:04
Beryllium	0.200	ug/L	0.200	2.00	U	1	EPA 6010B	MCR	1/31/17 10:04
Boron	45.9	mg/L	0.0100	0.0500		1	EPA 6010B	MCR	1/31/17 10:04
Calcium	728000	ug/L	30.0	1000		1	EPA 6010B	MCR	1/31/17 11:22
Chromium	1.60	ug/L	1.60	12.0	U	1	EPA 6010B	MCR	1/31/17 10:04
Molybdenum	7.16	ug/L	1.00	20.0	I	1	EPA 6010B	MCR	1/31/17 10:04



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### **Sample Information**

Client: Big Bend Power Station

Lab Sample ID: L17A041-05 Sampled By: Robert Barthelette

Sample Description: BBS-CCR-BW2 Date and Time Collected: 1/26/17 10:02
Sample Collection Method: Grab Date of Sample Receipt: 1/26/17 14:15

### **Laboratory Results**

#### Sample Qualifier:

					Qualifier		Test		Analysis
Parameter	Result	Units	MDL	PQL	Code	Dil	Method	Analyst	Date & Time
	,	Tampa Elec	tric Compa	ny, Labo	ratory Sei	rvices			
<b>General Chemistry Parameters</b>									
Chloride	145	mg/L	0.200	5.00	V	10	EPA 300.0	RFL	1/27/17 18:06
Specific Conductance	1460	umhos/cm	100	100		1	FDEP SOP FT 1200	RAB	1/26/17 11:22
Dissolved Oxygen	0.300	mg/L	0.100	0.100		1	FDEP SOP FT 1500	RAB	1/26/17 11:22
Fluoride	0.472	mg/L	0.0100	0.0500		1	EPA 300.0	RFL	1/27/17 17:56
pH	6.62	pH Units	1.00	1.00		1	FDEP SOP FT 1100	RAB	1/26/17 11:22
REDOX Potential	-74.1	mV	-999	-999		1	SM 2580B	RAB	1/26/17 11:22
Total Dissolved Solids	1140	mg/L	12.0	20.0		1	SM 2540C	TMH	1/31/17 15:45
Sulfate	255	mg/L	5.00	20.0		10	EPA 300.0	RFL	1/27/17 18:06
Turbidity	16.4	NTU	0.100	0.100		1	FDEP SOP FT 1600	RAB	1/26/17 11:22
Total Mercury by SW846 Method	17470/7471								
Mercury	0.0500	ug/L	0.0500	0.200	U	1	EPA 7470A	RLC	1/31/17 14:30
<b>Total Recoverable Metals by 200</b>	Series								
Antimony	0.600	ug/L	0.600	2.00	U	1	EPA 200.8	RLC	1/27/17 12:19
Arsenic	0.709	ug/L	0.320	2.00	I	1	EPA 200.8	RLC	1/27/17 12:19
Cadmium	0.100	ug/L	0.100	0.500	U	1	EPA 200.8	RLC	1/27/17 12:19
Cobalt	0.136	ug/L	0.0400	2.00	I	1	EPA 200.8	RLC	1/27/17 12:19
Lead	8.00E-5	mg/L	8.00E-5	0.00200	U	1	EPA 200.8	RLC	1/27/17 12:19
Selenium	0.260	ug/L	0.200	2.00	I	1	EPA 200.8	RLC	1/27/17 12:19
Thallium	0.100	ug/L	0.100	0.500	U	1	EPA 200.8	RLC	1/27/17 12:19
Total Recoverable Metals by SW3	846 Method	6010B							
Barium	0.0388	mg/L	0.000500	0.0200		1	EPA 6010B	MCR	1/31/17 10:06
Beryllium	0.200	ug/L	0.200	2.00	U	1	EPA 6010B	MCR	1/31/17 10:06
Boron	3.27	mg/L	0.0100	0.0500		1	EPA 6010B	MCR	1/31/17 10:06
Calcium	240000	ug/L	30.0	1000		1	EPA 6010B	MCR	1/31/17 11:24
Chromium	1.60	ug/L	1.60	12.0	U	1	EPA 6010B	MCR	1/31/17 10:06
Molybdenum	2.56	ug/L	1.00	20.0	I	1	EPA 6010B	MCR	1/31/17 10:06

#### **Comments**

- U Indicates that the compound was analyzed for but not detected.
- J- The reported value is an estimated value, see the case narrative for specifics.
- I Estimated value
- V Analyte detected in the method blank

Laboratory Services certifies that the test result in this report meet all requirements of the NELAC standards, unless indicated otherwise in the body of the report. Unless otherwise noted, all methods followed are per the most current published version of 40 CFR Part 136, Table B. Results reported on this report pertain to the above referenced sample only.



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**Subcontract Laboratories:** 



5012 Causeway Blvd Tampa Fl. 33619 \* Ph (813)630-7490 \* Fax (813)630-7360 \* DOH #E54272

### Total Recoverable Metals by SW846 Method 6010B - Quality Control

	<b></b> .	\ m-	P.0.7		Spike	Source	0.75	%Rec	P. P. F	RPD	
Analyte	Result	MDL	PQL	Units	Level	Result	%Rec	Limits	RPD	Limit	Qualifier
Batch 17A0279 - EPA 6010B											
Blank (17A0279-BLK1)					Prepared: (	01/30/17 Ar	nalyzed: 01	/31/17			
Barium	0.000500	0.000500	0.0200	mg/L							U
Beryllium	0.200	0.200	2.00	ug/L							U
Boron	0.0100	0.0100	0.0500	mg/L							U
Calcium	30.0	30.0	1000	ug/L							U
Chromium	1.60	1.60	12.0	ug/L							U
Molybdenum	1.00	1.00	20.0	ug/L							U
LCS (17A0279-BS1)					Prepared: (	01/30/17 Ar	nalyzed: 01	/31/17			
Barium	0.922	0.000500	0.0200	mg/L	1.0000		92.2	80-120			
Beryllium	961	0.200	2.00	ug/L	1000.0		96.1	80-120			
Boron	0.948	0.0100	0.0500	mg/L	1.0000		94.8	80-120			
Chromium	925	1.60	12.0	ug/L	1000.0		92.5	80-120			
Molybdenum	934	1.00	20.0	ug/L	1000.0		93.4	80-120			
Matrix Spike (17A0279-MS1)		Sourc	e: L17A04	1-01	Prepared: (	01/30/17 Ar	nalyzed: 01	/31/17			
Barium	0.986	0.000500	0.0200	mg/L	1.0000	0.115	87.1	75-125			
Beryllium	908	0.200	2.00	ug/L	1000.0	U	90.8	75-125			
Boron	16.4	0.0100	0.0500	mg/L	1.0000	15.5	93.3	75-125			
Chromium	885	1.60	12.0	ug/L	1000.0	U	88.5	75-125			
Molybdenum	1010	1.00	20.0	ug/L	1000.0	92.4	92.1	75-125			
Matrix Spike Dup (17A0279-MSD1)		Sourc	e: L17A04	1-01	Prepared: (	01/30/17 Ar	nalyzed: 01	/31/17			
Barium	1.14	0.000500	0.0200	mg/L	1.0000	0.115	103	75-125	14.9	20	
Beryllium	1080	0.200	2.00	ug/L	1000.0	U	108	75-125	17.2	20	
Boron	16.9	0.0100	0.0500	mg/L	1.0000	15.5	139	75-125	2.78	20	J-
Chromium	1050	1.60	12.0	ug/L	1000.0	U	105	75-125	17.0	20	
Molybdenum	1030	1.00	20.0	ug/L	1000.0	92.4	93.9	75-125	1.69	20	



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### Total Mercury by SW846 Method 7470/7471 - Quality Control

Analyte	Result	MDL	PQL	Units	Spike Level	Source Result	%Rec	%Rec Limits	RPD	RPD Limit	Qualifier
Batch 17A0273 - EPA 7470A											
Blank (17A0273-BLK1)					Prepared &	Analyzed:	01/31/17				
Mercury	0.0500	0.0500	0.200	ug/L							U
LCS (17A0273-BS1)					Prepared &	Analyzed:	01/31/17				
Mercury	1.02	0.0500	0.200	ug/L	1.0000		102	80-120			
Matrix Spike (17A0273-MS1)		Sour	e: L17A04	11-02	Prepared &	Analyzed:	01/31/17				
Mercury	1.01	0.0500	0.200	ug/L	1.0000	U	101	75-125			
Matrix Spike Dup (17A0273-MSD1)		Sour	e: L17A04	11-02	Prepared &	Analyzed:	01/31/17				
Mercury	1.01	0.0500	0.200	ug/L	1.0000	U	101	75-125	0.0476	20	



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### **Total Recoverable Metals by 200 Series - Quality Control**

					Spike	Source		%Rec		RPD	
Analyte	Result	MDL	PQL	Units	Level	Result	%Rec	Limits	RPD	Limit	Qualifier
Batch 17A0263 - EPA 200.8											
Blank (17A0263-BLK1)					Prepared: 0	)1/26/17 Aı	nalyzed: 01	/27/17			
Antimony	0.600	0.600	2.00	ug/L							U
Arsenic	0.320	0.320	2.00	ug/L							U
Cadmium	0.100	0.100	0.500	ug/L							U
Cobalt	0.0400	0.0400	2.00	ug/L							U
Lead	8.00E-5	8.00E-5	0.00200	mg/L							U
Selenium	0.200	0.200	2.00	ug/L							U
Thallium	0.100	0.100	0.500	ug/L							U
LCS (17A0263-BS1)					Prepared: 0	)1/26/17 Aı	nalyzed: 01	/27/17			
Antimony	102	0.600	2.00	ug/L	100.00		102	85-115			
Arsenic	97.7	0.320	2.00	ug/L	100.00		97.7	85-115			
Cadmium	104	0.100	0.500	ug/L	100.00		104	85-115			
Cobalt	98.7	0.0400	2.00	ug/L	100.00		98.7	85-115			
Lead	0.102	8.00E-5	0.00200	mg/L	0.10000		102	85-115			
Selenium	98.5	0.200	2.00	ug/L	100.00		98.5	85-115			
Thallium	98.5	0.100	0.500	ug/L	100.00		98.5	85-115			
Matrix Spike (17A0263-MS1)		Sour	ce: L17A04	1-01	Prepared: 0	)1/26/17 Aı	nalyzed: 01	/27/17			
Antimony	97.5	0.600	2.00	ug/L	100.00	0.602	96.9	70-130			
Arsenic	93.9	0.320	2.00	ug/L	100.00	9.04	84.9	70-130			
Cadmium	93.9	0.100	0.500	ug/L	100.00	U	93.9	70-130			
Cobalt	96.2	0.0400	2.00	ug/L	100.00	0.489	95.7	70-130			
Lead	0.0914	8.00E-5	0.00200	mg/L	0.10000	U	91.4	70-130			
Matrix Spike Dup (17A0263-MSD1)		Sour	ce: L17A04	1-01	Prepared: 0	01/26/17 Aı	nalyzed: 01	/27/17			
Antimony	100	0.600	2.00	ug/L	100.00	0.602	99.4	70-130	2.52	20	
Arsenic	91.1	0.320	2.00	ug/L	100.00	9.04	82.1	70-130	3.02	20	
Cadmium	97.1	0.100	0.500	ug/L	100.00	U	97.1	70-130	3.36	20	
Cobalt	93.0	0.0400	2.00	ug/L	100.00	0.489	92.5	70-130	3.47	20	
Lead	0.0935	8.00E-5	0.00200	mg/L	0.10000	U	93.5	70-130	2.29	20	



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### **General Chemistry Parameters - Quality Control**

Analyte	Result	MDL	PQL	Units	Spike Level	Source Result	%Rec	%Rec Limits	RPD	RPD Limit	Qualifier
Batch 17A0275 - EPA 300.0											
Blank (17A0275-BLK1)					Prepared &	Analyzed:	01/27/17				
Chloride	0.123	0.0200	0.500	mg/L							I
Fluoride	0.0100	0.0100	0.0500	mg/L							U
Sulfate	0.500	0.500	2.00	mg/L							U
LCS (17A0275-BS1)					Prepared &	Analyzed:	01/27/17				
Chloride	4.82	0.0200	0.500	mg/L	5.0000		96.4	90-110			V
Fluoride	4.73	0.0100	0.0500	mg/L	5.0000		94.7	90-110			
Sulfate	4.91	0.500	2.00	mg/L	5.0000		98.3	90-110			
Matrix Spike (17A0275-MS1)		Sour	ce: L17A04	11-02	Prepared &	Analyzed:	01/27/17				
Chloride	189	0.200	5.00	mg/L	50.000	115	148	90-110			J-,V
Fluoride	77.9	0.100	0.500	mg/L	50.000	0.248	155	90-110			J-
Sulfate	557	5.00	20.0	mg/L	50.000	490	133	90-110			J-
Matrix Spike Dup (17A0275-MSD1)		Sour	ce: L17A04	11-02	Prepared &	Analyzed:	01/27/17				
Chloride	189	0.200	5.00	mg/L	50.000	115	148	90-110	0.147	20	J-,V
Fluoride	78.2	0.100	0.500	mg/L	50.000	0.248	156	90-110	0.295	20	J-
Sulfate	556	5.00	20.0	mg/L	50.000	490	132	90-110	0.0667	20	J-
Batch 17A0291 - SM 2540C											
Blank (17A0291-BLK1)					Prepared &	Analyzed:	01/31/17				
Total Dissolved Solids	12.0	12.0	20.0	mg/L							U
LCS (17A0291-BS1)					Prepared &	Analyzed:	01/31/17				
Total Dissolved Solids	1030	12.0	20.0	mg/L	1000.0		103	80-120			



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### **General Chemistry Parameters - Quality Control**

					Spike	Source		%Rec		RPD	
Analyte	Result	MDL	PQL	Units	Level	Result	%Rec	Limits	RPD	Limit	Qualifier

Batch 17A0291 - SM 2540C

Duplicate (17A0291-DUP1)		Sour	ce: L17A04	1-01	Prepared & Analyzed: 01/31/17			
Total Dissolved Solids	3480	24.0	40.0	mg/L	3670	5.43	10	J-

Tampa Electric Company, Laboratory Services

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Peggy Penner, Manager, Laboratory Services

Laboratory Services certifies that the test result in this report meet all requirements of the NELAC standards, unless indicated otherwise in the body of the report. Unless otherwise noted, all methods followed are per the most current published version of 40 CFR Part 136, Table B. Results reported on this report pertain to the above referenced sample only.

### DEP-SOP-001/01

### FS 2200 Groundwater Sampling Form FD 9000-24

## **GROUNDWATER SAMPLING LOG**

FACILITY NAME:	Big Bend					SITE LOCATION:		Apollo Beach, FL.				
WELL NO:	В	BS-CCR-1			SAMPLE ID:	L17/	<b>A041-01</b>		DATE:	1/16/17		
					PURGI	NG DATA						
WELL DIAMETER (inches	s)	TUBING DIAMETER (inc	hes) 1/4	WELL SCR DEPTH 12.32	REEN INTERV		STATIC DEF	PTH (feet): 7.46	PURGE PUMP TO	YPE <b>PP</b>		
WELL VOLUME PURG	<u>·</u> E:		-	ELL DEPTH - STATIC D		,		()				
(only fillout if applicable)	)		= (		feet -		feet ) x		gallons/foot	t =	g	allons
EQUIPMENT VOLU		1 EQL	JIPMENT VOL	= PUMP VOLUM	E + (TUBING	CAPACITY X 1	TUBING LENG	GTH) + FLOW CE	LL VOLUME		-	
(only illiout il applic	able)		=(	0	gallons + (	0.0026 gallo	ons/foot X	23.3 feet ) +	0.06	gallons =	0.12	gallons
INITIAL PUMP OR DEPTH IN WELL (f	TUBING feet): 17.32		FINAL PUMP DEPTH IN W		.32	PURGING INITIATED AT:	11:42	PURGING ENDED AT:	11:56	TOTAL VOLUI PURGED (gall	ME ons):	3.10
TIME	VOLUME PURGED (GALLONS)	CUMUL. VOLUME PURGED (GALLONS)	PURGE RATE (GPM)	DEPTH TO WATER (FEET)	pH (standard units)	TEMP. (°C)	COND. (µmhos/cm OR µS/cm)	OXYGEN (circle mg/l or % saturation)	TURBIDITY (NTUs)	COLOR (describe)		OOR cribe)
11:52	2.22	2.22	0.22	7.69	6.78	24.06	4319	0.07	2.63	CLEAR	NC	DNE
11:54	0.44	2.66	0.22	7.68	6.79	24.05	4324	0.07	1.09	CLEAR	NC	DNE
11:56	0.44	3.10	0.22	7.68	6.79	24.03	4324	0.07	1.99	CLEAR	NC	DNE
WELL CAPACITY (Ga	allons Per Foot):	<b>0.75"</b> = 0.02;	1" = 0.04;	<b>1.25"</b> = 0.06; <b>2"</b> =	: 0.16; <b>3"</b> =	0.37; <b>4"</b> = 0.	65; <b>5</b> " =	1.02; <b>6"</b> = 1.47;	<b>12"</b> = 5.88		<u> </u>	
TUBING INSIDE DIA.	CAPACITY (Gal./Ft	i.): <b>1/8"</b> = 0.00006;	<b>3/16"</b> = 0.0014;	1/4" = 0.0026;	5/16" = 0.004;		1/2" = 0.0	010; 5/8" = 0	0.016			
SAMPLED BY (PR	INT\ / AFFII IATI	ON:		SAMPLER (S) SI		ING DATA	L	1				
STATE LEB BY (FIX	RAE		TECO	Orawii EER (O) OI	ON TOTALO.			SAMPLING INITIATED AT:	11:56	SAMPLING ENDED AT: 1	2.02	
PUMP OR TUBING DEPTH IN WELL (f	}		1200	SAMPLE PUMP FLOW RATE (ml	per minute):		840	TUBING MATERIAL CODE		1	2.02	
FIELD DECONTAN	MINATION: Y	N 🔽		FIELD-FILTERED	D: ent Tybe	N ✓ FILT	ER SIZE:	μm	DUPLICATE:	Y N	1	
	SAMPLE CON			r madon Equipme	SAMPLE PRE	SERVATION		INTE	SAMPLING			
	SPECIFICA #	MATERIAL		PRESERVATIVE		AL VOL.	FINAL	ANALYSI	EQI	JIPMENT		
SAMPLE ID CODE	CONTAINERS	CODE	VOLUME	USED		N FIELD (ml) (1)	pН	MEI	HOD	<u> </u>	CODE	
@Ino-500	1	PE	500ml	NONE	N	ONE	N/A	Inorg	janics		PP	
@Met-250	2	PE	250ml	HNO3		1ml	<2	Me	tals		PP	
@Rad-1L	2	PE	1L	HNO3		5ml	<2	Radiol	ogicals		PP	
									_			_
REMARKS:	ttles pro pros	served at lab	oratory pric	or to sample of	ollection			•		•		
(1) Sample bo			Oratory pric Dear Glass;	PE = Polyethylene:		propylene; S =	= Silicone;	<b>T</b> = Teflon: <b>O</b> = Oth	ner (Specify)			
SAMPLING/PURGIN								PP = Peristaltic Pur				

NOTES:

optionally,  $\pm$  0.2 mg/L or  $\pm$  10% (whichever is greater) **Turbidity**: all readings  $\leq$  20 NTU; optionally  $\pm$  5 NTU or 10% (whichever is greater)

<sup>1.</sup> The above do not constitute all of the information requierd by Chapter 62-160, F.A.C.

<sup>2.</sup> STABILIZATION CRITERIA FOR RANGE OF VARIATION OF LAST THREE CONSECUTIVE READINGS (SEE FS 2212. SECTION 3)

pH: ± 0.2 units Temperature: ± 0.2 °C Specific Conductance: ± 5% Dissolved Oxygen: all readings ≤ 20% saturation (see Table FS 2200-2);

## **GROUNDWATER SAMPLING LOG**

SITE NAME:		Big Be	end			SITE LOCATION:		Apollo I	Beach, FL.				
WELL NO:	В	BS-CCR-2		SAMPLE ID: <b>L17A041-02</b>					DATE: <b>1/16/17</b>				
					PURGI	NG DATA			•				
WELL DIAMETER (inches	s)	TUBING DIAMETER (inc	hes) 1/4	WELL SCREEN IN DEPTH 11.84		21.84 (feet)	STATIC DEPTH		PURGE PUMP T' OR BAILER:	YPE PP			
WELL VOLUME P	URGE:	,	,	AL WELL DEPTH -			X WELL CA		1-				
(only fillout if applic	able)		= (		feet -		feet ) x		gallons/foot	=	gallons		
EQUIPMENT VOL		1 EQI	JIPMENT VOL	. = PUMP VOLUM	E + (TUBING	CAPACITY X T	UBING LENG	GTH) + FLOW CE	LL VOLUME				
			=(	0	gallons + (		ons/foot X	22.84 feet	)+ 0.06	gallons =	0.12 gallons		
INITIAL PUMP OR DEPTH IN WELL (1		1	FINAL PUMP DEPTH IN W	OR TUBING ELL (feet): 16	.84	PURGING INITIATED AT:	11:12	PURGING ENDED AT:	11:31	TOTAL VOLUM PURGED (galle			
TIME	VOLUME PURGED (GALLONS)	CUMUL. VOLUME PURGED (GALLONS)	PURGE RATE (GPM)	DEPTH TO WATER (FEET)	pH (standard units)	TEMP. (°C)	COND. (µmhos/cm OR µS/cm)	DISSOLVED OXYGEN (circlemg/lor % saturation)	TURBIDITY (NTUs)	COLOR (describe)	ODOR (describe)		
11:27	3.33	3.33	0.22	7.12	6.89	24.26	1549	0.09	4.51	LT. YELLOW	MILD		
11:29	0.45	3.78	0.23	7.13	6.89	24.17	1551	0.08	3.98	LT. YELLOW	MILD		
11:31	0.45	4.23	0.23	7.13	6.89	24.27	1556	0.08	4.93	LT. YELLOW	MILD		
WELL CAPACITY (Ga	allons Per Foot):	<b>0.75"</b> = 0.02:	1" = 0.04;	<b>1.25"</b> = 0.06; <b>2"</b> =	0.16: 3" =	0.37; 4" = 0.6	i5; <b>5</b> " =	1.02; 6" = 1.47;	<b>12"</b> = 5.88				
TUBING INSIDE DIA.	,		<b>3/16"</b> = 0.0014;		<b>5/16"</b> = 0.004;	<b>3/8"</b> = 0.006;	1/2" = 0.0						
SAMPLED BY (PR	INT) / AFFILIATI	ON.		SAMPLER (S) SIG		ING DATA		SAMPLING		SAMPLING			
	RAE		TECO					INITIATED AT:	11:31	ENDED AT:	11:35		
PUMP OR TUBING DEPTH IN WELL (1	et): 16.8	3		SAMPLE PUMP FLOW RATE (mL	per minute):	8	347	TUBING MATERIAL CODE	: PE	/S			
FIELD DECONTAN		Y 🔲 N 🗹		FIELD-FILTERED Filtration Equipme		N ✓ FILTE	R SIZE:	μm	DUPLICATE:	Y N	7		
	SAMPLE CON			- madon Equipmo	SAMPLE PRE	SERVATION		INTE	NDED	SAI	MPLING		
044DI E ID 00DE	SPECIFICA #	MATERIAL	VOLUME	PRESERVATIVE	-	AL VOL.	FINAL		S AND/OR HOD		JIPMENT CODE		
SAMPLE ID CODE	CONTAINERS	CODE	70201112	USED	ADDED IN	N FIELD (ml) (1)	pН						
@Ino-500	1	PE	500ml	NONE	N	ONE	N/A	Inore	anics		PP		
@110-300	'	FL	300111	NONE	IN IN	ONL	IN/A	morg	janics		11		
@Met-250	2	PE	250ml	HNO3		1ml	<2	Me	tals		PP		
@Rad-1L	2	PE	1L	HNO3		5ml	<2	Radiol	ogicals		PP		
	-	-	-										
DEMARKS	<u> </u>	<u> </u>	<u> </u>										
REMARKS: (1) Sample bo	ttles pre-pres	served at lab	oratory pric	or to sample co	llection.								
MATERIAL CODE			= Clear Glass	•		= Polypropylene	; S = Silic	one; <b>T</b> = Teflon;	O= Other (Spe	ecify)			
SAMPLING/PURGIN EQUIPMENT CODE	NG S:	APP = After Perist RFPP = Reverse F	altic Pump; <b>B</b> Flow Peristaltic I	= Bailer; <b>BP</b> = Blad Pump; <b>SM</b> = Straw	der Pump; ES Method (tubing	GP = Electric Submig Gravity Drain); \	irsable Pump; <b>/T</b> = Vacuum	PP = Peristaltic Pum Trap; O = Other (Spe	np ecify)				
NOTES:				nformation requi				, 1					

1. The above do not constitute all of the information requierd by Chapter 62-160, F.A.C.

<sup>2.</sup> STABILIZATION CRITERIA FOR RANGE OF VARIATION OF LAST THREE CONSECUTIVE READINGS (SEE FS 2212. SECTION 3) pH: ± 0.2 units Temperature: ± 0.2 °C Specific Conductance: ± 5% Dissolved Oxygen: all readings ≤ 20% saturation (see Table FS 2200-2); optionally,  $\pm$  0.2 mg/L or  $\pm$  10% (whichever is greater) Turbidity: all readings  $\leq$  20 NTU; optionally  $\pm$  5 NTU or 10% (whichever is greater)

## **GROUNDWATER SAMPLING LOG**

SITE NAME:		Big Be	end			SITE LOCATION:		Apollo I	Beach, FL.		
WELL NO:	В	BS-CCR-3	3		SAMPLE ID:	L17/	A041-03	•	DATE:	1/16/17	
					PURGI	NG DATA			J.		
WELL DIAMETER (inches	s)	TUBING DIAMETER (inc	thes) 1/4	WELL SCREEN I DEPTH 13.23		23.23 (feet)	STATIC DEF		PURGE PUMP T' OR BAILER:	YPE PP	
WELL VOLUME P	URGE:	1 WELL VO		AL WELL DEPTH			<del></del>	, ,	ļ.		
(only fillout if applic	able)		= (		feet -		feet) x		gallons/foo	ot =	gallons
EQUIPMENT VOL		1 EQU	JIPMENT VOL	= PUMP VOLUM	IE + (TUBING	CAPACITY X T	UBING LENG	STH ) + FLOW CEI	LL VOLUME		
. ,	,		=(	0	gallons + (	0.0026 gallo	ons/foot X	24.23 fee	et)+ 0.06	gallons =	0.12 gallons
INITIAL PUMP OR DEPTH IN WELL (		3	FINAL PUMP DEPTH IN W		3.23	PURGING INITIATED AT:	10:42	PURGING ENDED AT:	10:55	TOTAL VOLUI PURGED (gall	ME ons): 1.37
	VOLUME	CUMUL. VOLUME	PURGE	DEPTH TO	pН	TEMP.	COND.	DISSOLVED OXYGEN	TURBIDITY	COLOR	ODOR
TIME	PURGED (GALLONS)	PURGED (GALLONS)	RATE (GPM)	WATER	(standard units)	(°C)	(μmhos/cm OR μS/cm)	(circlemg/lor	(NTUs)	(describe)	(describe)
10:51	0.95	0.95	0.11	(FEET) 7.32	6.42	24.20	1629	% saturation) 0.13	1.85	YELLOW	MILD
10:53	0.21	1.16	0.11	7.31	6.42	24.21	1620	0.12	1.89	YELLOW	MILD
10:55	0.21	1.37	0.11	7.32	6.42	24.25	1512	0.11	1.79	YELLOW	MILD
	0.21				02	220	.0.2	0			25
WELL CAPACITY (G	,			<b>1.25</b> " = 0.06; <b>2</b> " = <b>1/4</b> " = 0.0026;	5/16" = 0.004;		65; <b>5</b> " = 0.0		<b>12"</b> = 5.88		•
TOBING INSIDE DIA.	CAPACITI (Gai./III	.). 1/6 = 0.00000,	3/10 = 0.0014,	174 = 0.0020,		ING DATA		710, <b>3/6</b> – 0	5.010		
SAMPLED BY (PR	RINT) / AFFILIATI	ON:		SAMPLER (S) SI	GNATURES:			SAMPLING INITIATED AT:		SAMPLING ENDED AT:	
DUMP OD TUDINO	RAE	3	TECO						:55	1	1:04
PUMP OR TUBING DEPTH IN WELL (	feet): 18.2	2		SAMPLE PUMP FLOW RATE (ml			400	TUBING MATERIAL CODE	PE	/S	
FIELD DECONTAN	MINATION:	Y 🔲 N 🗹		FIELD-FILTERED Filtration Equipme	D: ent Type.	N FILTI	ER SIZE:	μm	DUPLICATE:	Y 🔲 N 🖸	<b>~</b>
	SAMPLE CON SPECIFICA				SAMPLE PRE	SERVATION			NDED		MPLING
SAMPLE ID CODE	# CONTAINERS	MATERIAL CODE	VOLUME	PRESERVATIVE USED		AL VOL.	FINAL pH		S AND/OR 'HOD		JIPMENT CODE
57 WHI EE IS 665E	0011711112110	3352		0025	ADDEDII	VIILLD (IIII) (1)	p				
@Ino-500	1	PE	500ml	NONE	N	ONE	N/A	Inorg	anics		PP
<u>@</u>			000			0.12			<u>,</u>		
@Met-250	2	PE	250ml	HNO3		1ml	<2	Me	tals		PP
@Rad-1L	2	PE	1L	HNO3		5ml	<2		ogicals		PP
REMARKS:											
(1) Sample bo									- 0:: 15		
MATERIAL CODE SAMPLING/PURGIN			i = Clear Glass			= Polypropylene P = Electric Subm		one; <b>T</b> = Teflon; <b>PP</b> = Peristaltic Pum		city)	
EQUIPMENT CODE	S:	RFPP = Reverse F	Flow Peristaltic	Pump: SM = Straw	Method (tubing	Gravity Drain)	VT = Vacuum 1	rap: <b>O</b> = Other (Spe	ecify)		

NOTES: 1. The above do not constitute all of the information requierd by Chapter 62-160, F.A.C.

 $optionally, \pm 0.2 \ mg/L \ or \pm 10\% \ (whichever is \ greater) \ \ Turbidity: \ all \ readings \leq 20 \ NTU; \ optionally \pm 5 \ NTU \ or 10\% \ (whichever is \ greater)$ 

<sup>2.</sup> STABILIZATION CRITERIA FOR RANGE OF VARIATION OF LAST THREE CONSECUTIVE READINGS (SEE FS 2212. SECTION 3)

pH: ± 0.2 units Temperature: ± 0.2 °C Specific Conductance: ± 5% Dissolved Oxygen: all readings ≤ 20% saturation (see Table FS 2200-2);

## **GROUNDWATER SAMPLING LOG**

MELL SCREEN NITERVAL   MELL SCREEN NITERVA
TUBBNG
DAMETER (inches)
EQUIPMENT VOLUME PURGE:  1 EQUIPMENT VOLS PUMP VOLUME (*TUBING CAPACITY X TUBING ENGTH*) + FLOW CELL VOLUME  -( 0 gallons + (0.0026 gallons/floxt X 100 feet) + 0.06 gallons = 0.32 gallons  NITUL PUMP OR TUBING 14.00   PURGEN   14.00   PURGEN   14.00   PURGEN   PURGED   PURGEN   (GALLONS)
= (
NITIAL PUMP OR TUBING   DEPTH IN WELL (feel)   14.00   NITIATED AT:   DURGING   DUR
DEPTH N WELL (feet): 14,00   DEPTH N WELL (feet): 14,00   INITIATED AT:
TIME
WELL CAPACITY (Galloss Pier Foot): 0,78" = 0.02; 1" = 0.04; 1,25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.05; 5" = 1.02; 6" = 1.47; 12" = 5.88  **UBING INSIDE DIA. CAPACITY (GalluFt): 18" = 0.0006: 316" = 0.0012; 14" = 0.0026; 316" = 0.0014; 14" = 0.0026; 316" = 0.0016; 38" = 0.006; 17" = 0.010; 86" = 0.016  **SAMPLED BY (PRINT) / AFFILIATION: RAB TECO  **PUMP OR TUBING PROPERTY (Salloss Pier Foot): 10"   SAMPLER (S) SIGNATURES: SIGNATU
SAMPLED BY (PRINT) / AFFILIATION: RAB TECO SAMPLED BY (PRINT) / AFFILIATION: PUMP OR TUBING DEPTH IN WELL (feet):  FIELD DECONTAMINATION: SAMPLE CONTAINER SPECIFICATION SAMPLE PUMP SAMPLE POMP SPECIFICATION SAMPLE PUMP SAMPLE PUMP FLOW RATE (mL per minute): SAMPLE PRESERVATION SAMPLE PRESERVATION SAMPLE PRESERVATION SAMPLE PRESERVATION SAMPLE DOLL FINAL ADDED IN FIELD (ml) (1) PH  SAMPLE PO.010; SAMPLING INITIATED AT: SAMPLING ENDED AT:  TUBING MATERIAL CODE: PE/S  FILTER SIZE:  JMM DUPLICATE: Y N SAMPLING ENDED ANALYSIS AND/OR METHOD CODE  SAMPLING ENDED AT:  TUBING MATERIAL CODE: PE/S  SAMPLING ENDED AT:  SAMPLING ENDED AT:  SAMPLING ENDED ANALYSIS AND/OR METHOD CODE
SAMPLED BY (PRINT) / AFFILIATION: RAB TECO SAMPLED BY (PRINT) / AFFILIATION: PUMP OR TUBING DEPTH IN WELL (feet):  FIELD DECONTAMINATION: SAMPLE CONTAINER SPECIFICATION SAMPLE PUMP SAMPLE POMP SPECIFICATION SAMPLE PUMP SAMPLE PUMP FLOW RATE (mL per minute): SAMPLE PRESERVATION SAMPLE PRESERVATION SAMPLE PRESERVATION SAMPLE PRESERVATION SAMPLE DOLL FINAL ADDED IN FIELD (ml) (1) PH  SAMPLE PO.010; SAMPLING INITIATED AT: SAMPLING ENDED AT:  TUBING MATERIAL CODE: PE/S  FILTER SIZE:  JMM DUPLICATE: Y N SAMPLING ENDED ANALYSIS AND/OR METHOD CODE  SAMPLING ENDED AT:  TUBING MATERIAL CODE: PE/S  SAMPLING ENDED AT:  SAMPLING ENDED AT:  SAMPLING ENDED ANALYSIS AND/OR METHOD CODE
SAMPLED BY (PRINT) / AFFILIATION: RAB TECO SAMPLED BY (PRINT) / AFFILIATION: PUMP OR TUBING DEPTH IN WELL (feet):  FIELD DECONTAMINATION: SAMPLE CONTAINER SPECIFICATION SAMPLE PUMP SAMPLE POMP SPECIFICATION SAMPLE PUMP SAMPLE PUMP FLOW RATE (mL per minute): SAMPLE PRESERVATION SAMPLE PRESERVATION SAMPLE PRESERVATION SAMPLE PRESERVATION SAMPLE DOLL FINAL ADDED IN FIELD (ml) (1) PH  SAMPLE PO.010; SAMPLING INITIATED AT: SAMPLING ENDED AT:  TUBING MATERIAL CODE: PE/S  FILTER SIZE:  JMM DUPLICATE: Y N SAMPLING ENDED ANALYSIS AND/OR METHOD CODE  SAMPLING ENDED AT:  TUBING MATERIAL CODE: PE/S  SAMPLING ENDED AT:  SAMPLING ENDED AT:  SAMPLING ENDED ANALYSIS AND/OR METHOD CODE
SAMPLED BY (PRINT) / AFFILIATION: RAB TECO SAMPLED BY (PRINT) / AFFILIATION: PUMP OR TUBING DEPTH IN WELL (feet):  FIELD DECONTAMINATION: SAMPLE CONTAINER SPECIFICATION SAMPLE PUMP SAMPLE POMP SPECIFICATION SAMPLE PUMP SAMPLE PUMP FLOW RATE (mL per minute): SAMPLE PRESERVATION SAMPLE PRESERVATION SAMPLE PRESERVATION SAMPLE PRESERVATION SAMPLE DOLL FINAL ADDED IN FIELD (ml) (1) PH  SAMPLE PO.010; SAMPLING INITIATED AT: SAMPLING ENDED AT:  TUBING MATERIAL CODE: PE/S  FILTER SIZE:  Imm DUPLICATE: Y N SAMPLING ENDED ANALYSIS AND/OR ANALYSIS AND/OR METHOD CODE  SAMPLING EQUIPMENT CODE
SAMPLED BY (PRINT) / AFFILIATION: RAB TECO SAMPLED BY (PRINT) / AFFILIATION: PUMP OR TUBING DEPTH IN WELL (feet):  FIELD DECONTAMINATION: SAMPLE CONTAINER SPECIFICATION SAMPLE PUMP SAMPLE POMP SPECIFICATION SAMPLE PUMP SAMPLE PUMP FLOW RATE (mL per minute): SAMPLE PRESERVATION SAMPLE PRESERVATION SAMPLE PRESERVATION SAMPLE PRESERVATION SAMPLE DOLL FINAL ADDED IN FIELD (ml) (1) PH  SAMPLE PO.010; SAMPLING INITIATED AT: SAMPLING ENDED AT:  TUBING MATERIAL CODE: PE/S  FILTER SIZE:  Imm DUPLICATE: Y N SAMPLING ENDED ANALYSIS AND/OR ANALYSIS AND/OR METHOD CODE  SAMPLING EQUIPMENT CODE
SAMPLED BY (PRINT) / AFFILIATION: RAB TECO SAMPLED BY (PRINT) / AFFILIATION: PUMP OR TUBING DEPTH IN WELL (feet):  FIELD DECONTAMINATION: SAMPLE CONTAINER SPECIFICATION SAMPLE PUMP SAMPLE POMP SPECIFICATION SAMPLE PUMP SAMPLE PUMP FLOW RATE (mL per minute): SAMPLE PRESERVATION SAMPLE PRESERVATION SAMPLE PRESERVATION SAMPLE PRESERVATION SAMPLE DOLL FINAL ADDED IN FIELD (ml) (1) PH  SAMPLE PO.010; SAMPLING INITIATED AT: SAMPLING ENDED AT:  TUBING MATERIAL CODE: PE/S  FILTER SIZE:  Imm DUPLICATE: Y N SAMPLING ENDED ANALYSIS AND/OR ANALYSIS AND/OR METHOD CODE  SAMPLING EQUIPMENT CODE
SAMPLED BY (PRINT) / AFFILIATION: RAB TECO SAMPLED BY (PRINT) / AFFILIATION: PUMP OR TUBING DEPTH IN WELL (feet):  FIELD DECONTAMINATION: SAMPLE CONTAINER SPECIFICATION SAMPLE PUMP SAMPLE POMP SPECIFICATION SAMPLE PUMP SAMPLE PUMP FLOW RATE (mL per minute): SAMPLE PRESERVATION SAMPLE PRESERVATION SAMPLE PRESERVATION SAMPLE PRESERVATION SAMPLE DOLL FINAL ADDED IN FIELD (ml) (1) PH  SAMPLE PO.010; SAMPLING INITIATED AT: SAMPLING ENDED AT:  TUBING MATERIAL CODE: PE/S  FILTER SIZE:  Imm DUPLICATE: Y N SAMPLING ENDED ANALYSIS AND/OR ANALYSIS AND/OR METHOD CODE  SAMPLING EQUIPMENT CODE
SAMPLED BY (PRINT) / AFFILIATION: RAB TECO SAMPLED BY (PRINT) / AFFILIATION: PUMP OR TUBING DEPTH IN WELL (feet):  FIELD DECONTAMINATION: SAMPLE CONTAINER SPECIFICATION SAMPLE PUMP SAMPLE POMP SPECIFICATION SAMPLE PUMP SAMPLE PUMP FLOW RATE (mL per minute): SAMPLE PRESERVATION SAMPLE PRESERVATION SAMPLE PRESERVATION SAMPLE PRESERVATION SAMPLE DOLL FINAL ADDED IN FIELD (ml) (1) PH  SAMPLE PO.010; SAMPLING INITIATED AT: SAMPLING ENDED AT:  TUBING MATERIAL CODE: PE/S  FILTER SIZE:  Imm DUPLICATE: Y N SAMPLING ENDED ANALYSIS AND/OR ANALYSIS AND/OR METHOD CODE  SAMPLING EQUIPMENT CODE
SAMPLED BY (PRINT) / AFFILIATION: RAB TECO SAMPLED BY (PRINT) / AFFILIATION: PUMP OR TUBING DEPTH IN WELL (feet):  FIELD DECONTAMINATION: SAMPLE CONTAINER SPECIFICATION SAMPLE PUMP SAMPLE POMP SPECIFICATION SAMPLE PUMP SAMPLE PUMP FLOW RATE (mL per minute): SAMPLE PRESERVATION SAMPLE PRESERVATION SAMPLE PRESERVATION SAMPLE PRESERVATION SAMPLE DOLL FINAL ADDED IN FIELD (ml) (1) PH  SAMPLE PO.010; SAMPLING INITIATED AT: SAMPLING ENDED AT:  TUBING MATERIAL CODE: PE/S  FILTER SIZE:  Imm DUPLICATE: Y N SAMPLING ENDED ANALYSIS AND/OR ANALYSIS AND/OR METHOD CODE  SAMPLING EQUIPMENT CODE
SAMPLED BY (PRINT) / AFFILIATION: RAB TECO SAMPLED BY (PRINT) / AFFILIATION: PUMP OR TUBING DEPTH IN WELL (feet):  FIELD DECONTAMINATION: SAMPLE CONTAINER SPECIFICATION SAMPLE PUMP SAMPLE POMP SPECIFICATION SAMPLE PUMP SAMPLE PUMP FLOW RATE (mL per minute): SAMPLE PRESERVATION SAMPLE PRESERVATION SAMPLE PRESERVATION SAMPLE PRESERVATION SAMPLE DOLL FINAL ADDED IN FIELD (ml) (1) PH  SAMPLE PO.010; SAMPLING INITIATED AT: SAMPLING ENDED AT:  TUBING MATERIAL CODE: PE/S  FILTER SIZE:  Imm DUPLICATE: Y N SAMPLING ENDED ANALYSIS AND/OR ANALYSIS AND/OR METHOD CODE  SAMPLING EQUIPMENT CODE
SAMPLED BY (PRINT) / AFFILIATION: RAB TECO  SAMPLER (S) SIGNATURES:  SAMPLING INITIATED AT:  PUMP OR TUBING DEPTH IN WELL (feet):  SAMPLE PUMP FLOW RATE (mL per minute):  FIELD DECONTAMINATION: Y N N FILTERED: Filtration Equipment Type N FILTER SIZE:  SAMPLE SAMPLE SAMPLING MATERIAL CODE: PE/S  FIELD FILTERED: Filtration Equipment Type N N FILTER SIZE:  SAMPLE PRESERVATION  SAMPLE CONTAINER SPECIFICATION  SAMPLE PRESERVATION  SAMPLE D CODE  SAMPLING ENDED AT:  S
RAB TECO  PUMP OR TUBING DEPTH IN WELL (feet):  SAMPLE PUMP FLOW RATE (mL per minute):  FIELD-FILTERED: Flow RATE (mL per minute):  N PILTER SIZE:
DEPTH IN WELL (feet): FLOW RATE (mL per minute): MATERIAL CODE: PE/S  FIELD DECONTAMINATION: Y
FIELD DECONTAMINATION: Y N FIELD-FILTERED: N FILTER SIZE: µm DUPLICATE: Y N M  SAMPLE CONTAINER SPECIFICATION SAMPLE ID CODE # CONTAINERS CODE VOLUME USED TOTAL VOL. ADDED IN FIELD (ml) (1) PH  DUPLICATE: Y N M  SAMPLING EQUIPMENT CODE  SAMPLING EQUIPMENT CODE
SAMPLE CONTAINER SPECIFICATION SAMPLE ID CODE # CONTAINERS CODE VOLUME USED TOTAL VOL. ADDED IN FIELD (ml) (1) PH SAMPLED ANALYSIS AND/OR METHOD CODE  SAMPLING EQUIPMENT CODE  SAMPLING EQUIPMENT CODE
SAMPLE ID CODE # CONTAINERS CODE VOLUME USED TOTAL VOL. FINAL DED IN FIELD (ml) (1) PH ADDED IN FIELD (ml) (ml) (ml) (ml) (ml) (ml) (ml) (ml)
SAMPLE ID CODE # CONTAINERS CODE USED ADDED IN FIELD (ml) (1) PH
©las 500 4 DE 500ml NONE NONE NONE NONE DE
@Ino-500         1         PE         500ml         NONE         NONE         N/A         Inorganics         PP
@Met-250 2 PE 250ml HNO3 1ml <2 Metals PP
@Rad-1L 2 PE 1L HNO3 5ml <2 Radiologicals PP
REMARKS: (1) Sample bottles pre-preserved at laboratory prior to sample collection.
MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O= Other (Specify)
SAMPLING/PURGING APP = After Peristaltic Pump; B = Bailer; BP = Bladder Pump; ESP = Electric Submirsable Pump; PP = Peristaltic Pump

NOTES: 1. The above do not constitute all of the information requierd by Chapter 62-160, F.A.C.

 $optionally, \pm 0.2 \ mg/L \ or \pm 10\% \ (whichever \ is \ greater) \ \ Turbidity: \ all \ readings \leq 20 \ NTU; \ optionally \pm 5 \ NTU \ or \ 10\% \ (whichever \ is \ greater)$ 

<sup>2.</sup> STABILIZATION CRITERIA FOR RANGE OF VARIATION OF LAST THREE CONSECUTIVE READINGS (SEE FS 2212. SECTION 3)

pH: ± 0.2 units Temperature: ± 0.2 °C Specific Conductance: ± 5% Dissolved Oxygen: all readings ≤ 20% saturation (see Table FS 2200-2);

## **GROUNDWATER SAMPLING LOG**

SITE NAME:		Big Be	end			SITE LOCATION:		Apollo	Beach, FL.		
WELL NO:	BBS	S-CCR-BW	<i>I</i> -1		SAMPLE ID:	L17/	<b>A041-04</b>		DATE:	1/16/17	
						NG DATA					
WELL DIAMETER (inche	s)	TUBING DIAMETER (inc	thes) 1/4	WELL SCREEN IN DEPTH 34.30		44 30 (feet)	STATIC DEF	PTH (feet): 30.49	PURGE PUMP TY	YPE ESP	
WELL VOLUME P	URGE:	· · · · · ·		AL WELL DEPTH -					1		
(only fillout if applic	cable)		= (		feet -		feet) x		gallons/foo	ot =	gallons
EQUIPMENT VOL (only fillout if applic	UME PURGE:	1 EQI	JIPMENT VOL	. = PUMP VOLUM	E + (TUBING	CAPACITY X T	TUBING LENG	STH) + FLOW CE			
(om) moden appro	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,		=(	0	gallons + (	0.0026 gallo	ons/foot X	100 fee	et)+ 0.06	gallons =	0.32 gallons
INITIAL PUMP OR DEPTH IN WELL (	TUBING feet): 39.30	)   COMOL.	FINAL PUMP DEPTH IN W	, , 00	.30	PURGING INITIATED AT:	10:15	PURGING ENDED AT:	10:29	TOTAL VOLUM PURGED (gall	ME lons): 6.0
TIME	VOLUME PURGED (GALLONS)	VOLUME PURGED (GALLONS)	PURGE RATE (GPM)	DEPTH TO WATER (FEET)	pH (standard units)	TEMP. (°C)	COND. (μmhos/cm OR μS/cm)		TURBIDITY (NTUs)	COLOR (describe)	ODOR (describe)
10:25	4.39	4.39	0.44	31.32	6.46	26.99	4897	0.21	7.46	CLEAR	NONE
10:27	0.85	5.24	0.43	31.31	6.46	26.99	4999	0.20	2.79	CLEAR	NONE
10:29	0.85	6.09	0.43	31.30	6.46	26.98	4944	0.20	2.04	CLEAR	NONE
											-
WELL CAPACITY ( TUBING INSIDE DI	- ,				0.0026;	0.16; 3" = 0. 5/16" = 0.004; ING DATA	3/8" = 0.00		1.02; <b>6"</b> = 1 010; <b>5/8</b>	1.47; <b>12</b> " = 0.016	= 5.88
SAMPLED BY (PF	RINT) / AFFILIATI		TECO	SAMPLER (S) SIG				SAMPLING INITIATED AT:	1:29	SAMPLING ENDED AT:	10:32
PUMP OR TUBINO DEPTH IN WELL (	3			SAMPLE PUMP FLOW RATE (mL	per minute):	1/	620	TUBING MATERIAL CODE		1	
FIELD DECONTAI	,	Y		FIELD-FILTERED Filtration Equipme			ER SIZE:	μm	DUPLICATE:	Y	<u> </u>
	SAMPLE CON SPECIFICA				SAMPLE PRE	SERVATION		INTE	NDED		MPLING
SAMPLE ID CODE		MATERIAL	VOLUME	PRESERVATIVE USED		AL VOL. N FIELD (ml) (1)	FINAL pH		S AND/OR THOD		UIPMENT CODE
01 500		D-		110115		ONE				<u> </u>	
@Ino-500	1	PE	500ml	NONE	IN	ONE	N/A	inorg	ganics		ESP
@Met-250	2	PE	250ml	HNO3		1ml	<2		etals		ESP
@Rad-1L	2	PE	1L	HNO3		5ml	<2	Radio	logicals		ESP
									-		
REMARKS: (1) Sample bo	ottles pre-pres	served at lab	oratory pric	or to sample co	ollection.						
MATERIAL CODE			i = Clear Glass			= Polypropylene				cify)	
SAMPLING/PURGII EQUIPMENT CODE	NG A	APP = After Perist RFPP = Reverse F	taltic Pump; <b>B</b> Flow Peristaltic I	= Bailer; <b>BP</b> = Blad Pump; <b>SM</b> = Straw	lder Pump; <b>ES</b> Method (tubing	<b>P</b> = Electric Subm Gravity Drain);	nirsable Pump; <b>VT</b> = Vacuum	PP = Peristaltic Pun Trap; O = Other (Spe	np ecify)		

NOTES: 1. The above do not constitute all of the information requierd by Chapter 62-160, F.A.C.

optionally,  $\pm$  0.2 mg/L or  $\pm$  10% (whichever is greater) Turbidity: all readings  $\leq$  20 NTU; optionally  $\pm$  5 NTU or 10% (whichever is greater)

<sup>2.</sup> STABILIZATION CRITERIA FOR RANGE OF VARIATION OF LAST THREE CONSECUTIVE READINGS (SEE FS 2212. SECTION 3)

pH: ± 0.2 units Temperature: ± 0.2 °C Specific Conductance: ± 5% Dissolved Oxygen: all readings ≤ 20% saturation (see Table FS 2200-2);

## **GROUNDWATER SAMPLING LOG**

NAME:						LOCATION:		Apollo	Beach, FL.			
WELL NO:	BBS	-CCR-BW	I-2		SAMPLE ID:	L17/	A041-05		DATE: <b>1/16/17</b>			
i—————————————————————————————————————				L		NG DATA	1		1			
WELL DIAMETER (inches		TUBING DIAMETER (inc	thes) 1/4	WELL SCREEN II DEPTH 13.64		23.34 (feet)	STATIC DEF TO WATER (	TH (feet): 9.13	PURGE PUMP T OR BAILER:	YPE PP		
WELL VOLUME P (only fillout if applic	URGE: able)	1 WELL VO	LUME = (TOT	AL WELL DEPTH -	STATIC DEF	PTH TO WATER)	X WELL CA	PACITY				
EQUIPMENT VOL	UMF PURGF:	1 FOI	= (	= PLIMP VOLUM	feet -	CAPACITY X 1	feet) x	iTH) + FLOW CE	gallons/foo	ot =	gallons	
(only fillout if applic	able)		=(	0	gallons + (	0.0026 gallo		24.64 fe		gallons =	0.12 gallons	
INITIAL PUMP OR DEPTH IN WELL (1			FINAL PUMP DEPTH IN W	OR TUBING	.49	PURGING INITIATED AT:		PURGING ENDED AT:	9:57	TOTAL VOLUM	ИE	
(	VOLUME	VOLUME	PURGE	DEPTH	pH		COND.	DISSOLVED		,,	7 2.50	
TIME	PURGED (GALLONS)	PURGED (GALLONS)	RATE (GPM)	TO WATER (FEET)	(standard units)	TEMP. (°C)	(μmhos/cm OR μS/cm)	OXYGEN (circle(mg/l))r % saturation)	TURBIDITY (NTUs)	COLOR (describe)	ODOR (describe)	
9:53	2.38	2.38	0.16	9.40	6.62	25.22	1455	0.46	14.80	CLEAR	NONE	
9:55	0.30	2.68	0.15	9.39	6.62	25.29	1456	0.33	13.60	CLEAR	NONE	
9:57	0.30	2.98	0.15	9.40	6.62	25.25	1457	0.30	16.40	CLEAR	NONE	
WELL CAPACITY (	,	<b>0.75"</b> = 0.02;							= 1.02; 6" = 1	•	= 5.88	
TUBING INSIDE DIA	A. CAPACITY (Gal.	./Ft.): <b>1/8</b> " = 0.00	0006; <b>3/16</b> " :	= 0.0014; <b>1/4"</b> =	O.0026; SAMPL	5/16" = 0.004; ING DATA	3/8" = 0.00	6; <b>1/2</b> " = 0.0	)10; <b>5/8</b>	" = 0.016		
SAMPLED BY (PR				SAMPLER (S) SIG	GNATURES:			SAMPLING INITIATED AT:		SAMPLING ENDED AT:		
PUMP OR TUBING DEPTH IN WELL (1	RAB		TECO	SAMPLE PUMP FLOW RATE (ml				TUBING MATERIAL CODE	:57	I.	0:02	
							580 ER SIZE:	MATERIAL CODE			7	
FIELD DECONTAN	SAMPLE CON	Y N V		FIELD-FILTERED Filtration Equipme	ent Typle:			·	DUPLICATE:	Y 🔲 N 🛚	_	
	SPECIFICA	TION MATERIAL		PRESERVATIVE	SAMPLE PRE	TAL VOL.	FINAL	ANALYSI	NDED IS AND/OR	EQL	MPLING JIPMENT	
SAMPLE ID CODE	# CONTAINERS	CODE	VOLUME	USED	ADDED IN	N FIELD (ml) (1)	pH	ME	THOD		CODE	
@Ino-500	1	PE	500ml	NONE	N	IONE	N/A	Inore	ganics		PP	
@1110-300	'	1 -	300111	NONE	11	IONE	IV/A	morg	garnes			
@Met-250	2	PE	250ml	HNO3		1ml	-2	Me	etals		PP	
@Rad-1L	2	PE	1L	HNO3		5ml	<2 <2		logicals		PP	
<u>@::uu :2</u>	_					<u> </u>		110010	9		· ·	
REMARKS: (1) Sample bo	ttles pre-pres	erved at lah	oratory pric	r to sample co	ollection.							
MATERIAL CODE			= Clear Glass			P = Polypropylene	e; <b>S</b> = Silice	one; <b>T</b> = Teflon	; <b>0</b> = Other (Spe	ecify)		
SAMPLING/PURGINEQUIPMENT CODE	NG A	APP = After Perist	altic Pump; B	= Bailer; <b>BP</b> = Blac Pump; <b>SM</b> = Straw	Ider Pump; ES	<b>SP</b> = Electric Subm g Gravity Drain):	nirsable Pump; VT = Vacuum T	PP = Peristaltic Pun rap; O = Other (Sp	np ecify)			
NOTES:				nformation requi				(				

<sup>2.</sup> STABILIZATION CRITERIA FOR RANGE OF VARIATION OF LAST THREE CONSECUTIVE READINGS (SEE FS 2212. SECTION 3) pH: ± 0.2 units Temperature: ± 0.2 °C Specific Conductance: ± 5% Dissolved Oxygen: all readings ≤ 20% saturation (see Table FS 2200-2); optionally,  $\pm$  0.2 mg/L or  $\pm$  10% (whichever is greater) Turbidity: all readings  $\leq$  20 NTU; optionally  $\pm$  5 NTU or 10% (whichever is greater)

Sampler(s) /

Site:	Big Be	nd	Date:	01/16/17	File Name:	011617_	Wells_RAB	Weather:	OVERCA	ST & MILD	Sampler(s) / Initials	RAB /TEC	O Initials	
LIMS #	Loction Code	Time	FE <sup>2</sup>	pH (SU)	Temp °C	Cond(uMHOS)	DO Mg/L	Turbidity(NTU)	Redox (mv)	Sulfite (mg/L)	Color	Odor	ı	NGVD
			mg/l	PH	TEMP-C	COND-F	DO	TURB-N-F	REDOX	SO3-TR	\$COLOR-W	\$ODOR-W	Time	LEVEL
L17A041-01	BBS-CCR-1	12:02		6.79	24.03	4324	0.07	1.99	-110.4		CLEAR	NONE	11:42	
L17A041-02	BBS-CCR-2	11:35		6.89	24.27	1556	0.08	4.93	-182.0		LT. YELLOW	MILD	11:12	
LIMS#	250ml Cyan (3)	1L Inorg (1)	500ml Inorg (2)	250ml Inorg (3)	1L Mtls (1)	250ml Mtls (3)	1L Rads (1)	500ml Sulfide (2)	500ml Mtls (2)	250ml Nuts (3)	40ml Vial (6)	500 ml Nuts (2)	1L Rads Diss. (1)	Total Containers
L17A041-01		,	1			<b>☑</b> 2	<b>☑</b> 2							40
			1			<b>☑</b> 2	<b>∀</b> 2							10
(1) 1L plastic (PP)		(2) 500ml plastic	c (PP)	(3) 250ml plastic	(PP)	(4) 100ml coliform be	ottle	(5) 1L amber glass (a	AG)	(6) 40ml VOA vial (	(CG)		Samples On Ice	Sample Reciept
ESS	0107301Y	ESS	0218201Y	ESS	0307301Y	ESS		ESS	,	ESS	<u> </u>		Yes No	Time 14:15
	Preservation			Pres ID		Preservation		•	Pres ID		Preservation	<u>'</u>	Pres ID	Temp 1.5
1L bottles (rads): 5 ml H				L 012554 ☑	250ml bottles (nu	ts): 1 ml H2SO4 to pH	<2		L 🗆	500 ml bottles/Sulfi	de) 2ml NAOH/Zinc A	Acet. to pH >12	L □	1.0
500 ml bottles (metals):						0.5 ml H2SO4 to pH				,	n) 1g NAOH to pH >	· ·	L $\square$	
250 ml bottles (metal): 1	· · · · · · · · · · · · · · · · · · ·			L 012554 🗹	` ,		um, 5 ml HNO3 to pH <2	)	<u> </u>	` ,	licates that the sam		a nH of <2	
pH Meter Calibration	11111111111111111111111111111111111111	Buffer ID	Buffer Value	Cal	Time	ICV	Time	CCV	Time	Redox Cal	Time	Temp °C	Reading mv	Theo Value mv
Meter ID:	MPM08	L 016987H	7	7.01	8:40	7.02	8:42	7.06	14:36	Meter ID:	8:50	24.3	232.1	232.3
FDEP FT 1100	IVIFIVIUO	L 016778B	10	10.05	8:40		nd +/- 5%) (DO +/- 0.3m			MPM08	14:17	24.5	232.1	236.2
Units: SU		L 016917D	4	3.99	8:40		cates ICV / CCV passed			Zobell Sol ID:	19.17	21.0	200.4	230.2
Conductivity Meter Cal	lih	Standard ID	Std Value	Cal	Time	ICV	Time	CCV	Time	L 017384A				
Meter ID:	MPM08	L 015981D	1000	1000	9:00	150	Tille		Time	DO Meter Cal	Time	Temp °C	Reading mg/l	Theo Value mg/l
FDEP FT 1200. Units: ul		L 016236A	10000	1000	3.00	9889	9:05	9896	14:03	Meter ID:	8:30	21.9	8.73	8.777
	-			A 1 11	Et. D.					MPM08	14:53	21.4	ł	-
Turbidity Meter Calibra Meter ID:	TM07	Standard ID L 016722	Std Value 4.76	Acceptabi 4.28	5.24	1CV 4.77	Time 8:05	CCV	Time	MPIVIU8 Barom. Pres	14:53	21.4	8.85	8.846
		L 016723	52.10	48.71	55.49	4.11	0.00	51.70	14:37	760				
FDEP FT 1600, Units: N		- 010723												
Sulfite Info (QC Check)			QC Result mg/l	Time	Titrator ID	Na Thio ID	DO 3 Pillow ID	Starch Ind. ID	lodate/lodide ID	Therm ID	pH	Conduct.( %)	DO (mg/l)	Redox (mv)
QC Std: 5ml (NaThio)/50	JUMI DI=10mg/L						L		_	MPM08	0.2	5	0.3	10
Purging Information		Well Capacities	s (gallons/ ft): 2'	" = 0.16 4" =0.65 Well	Dowth to		. Capacities Gallons/ft) Well	1 Well		Tubi	Dure	Cell	1 Eqpt.	
Well #	Diam/ Comp	Screen Interval (ft)	Intake Depth (ft)	Depth (ft)	Depth to Water (ft)	= Water Column (ft) X	Capacity (gal)	Volume (gal)	Tubing Capacity (gal/ft.)	Tubing Length (ft)	+ Pump Volume + (gal)	Volume (gal)		
BBS-CCR-1	2	10	17.32	22.32	7.46	14.86	0.16	2.38	0.0026	23.3	0	0.06	0.12	
Purge Meth:	Time	Rate (ml/min)	Volume (gal)	Total Vol. (gal)	Water Depth (ft)	pH (SU)	Temp °C	Cond (uMHOS)	DO (mg/L)	Turbidity (NTU)	Purge Criteria	Status	Equipment ID	<u>Egpt. Table</u>
1A	11:52	840	2.22	2.22	7.69	6.78	24.06	4319	0.07	2.63	ph:+/- 0.2	STABLE	Level Meter:	WLM08
Purge Start:	11:54	840	0.44	2.66	7.68	6.79	24.05	4324	0.07	1.09	Temp°C+/- 0.2	STABLE	Pump:	PP
11:42	11:56	840	0.44	3.10	7.68	6.79	24.03	4324	0.07	1.99	Cond % +/- 5	STABLE	Tubing:	PE/S
Purge End:											DO % Sat.< 20	STABLE	Dedicated	✓ Yes
11:56											Turb. NTU < 20	STABLE	Tubing?	□ No
Purge Complete A	t 11:43	Gallons to P	urge 0.12	Stablility	Values =	6.79	24.03	4324	0.07	1.99				
Well #	Diam/ Comp	Screen Interval (ft)	Intake Depth (ft)	Well Depth (ft)	Depth to Water (ft)	Water Column (ft)	Well Capacity (gal) =	1 Well Volume (gal)	Tubing Capacity X (gal/ft.)	Tubing Length ) +	Pump F Volume + (gal)	Cell Volume (gal)	1 Eqpt. Volume (gal)	
BBS-CCR-2	2	10	16.84	21.84	6.93	14.91	0.16	2.39	0.0026	22.84	0	0.06	0.12	
Purge Meth:	Time	Rate (ml/min)	Volume (gal)	Total Vol. (gal)	Water Depth (ft)	pH (SU)	Temp °C	Cond (uMHOS)	DO (mg/L)	Turbidity (NTU)	Purge Criteria	Status	Equipment ID	Egpt, Table
1A	11:27	840	3.33	3.33	7.12	6.89	24.26	1549	0.09	4.51	ph:+/- 0.2	STABLE	Level Meter:	WLM08
				1							0.2	STABLE		WLM08 PP
Purge Start:	11:29	850	0.45	3.78	7.13	6.89	24.17	1551	0.08	3.98	Temp <sup>o</sup> C+/- 0.2 Cond % +/- 5		Pump:	
11:12	11:31	850	0.45	4.23	7.13	6.89	24.27	1556	0.08	4.93	DO % Sat. < 20	STABLE	Tubing:	PE/S  Yes
Purge End:				-				-			DO % Sat.< 20 Turb. NTU < 20	STABLE	Bouloutou	
11:31		Callagate		G. 1		0.55	04.5-	45-0	0.55	4.55	1410. N 1 U < 20	STABLE	Tubing?	⊔ No
Purge Complete A	11:13	Gallons to F	rurge 0.12	Stablility	Values =	6.89	24.27	1556	0.08	4.93				
Comments:												Total Time	Total	Miles

1.77/1041-0.0   0.85 C/CR-3	Site:	Big Be		Date:	01/16/17		_	Wells_RAB	Weather:		ST & MILD	Initials	RAB /TEC		101/15
LIMS #   2004 Cann	LIMS#	Loction Code	Time			•									
LIMS #   2004 Carvill   Limbar   Limb	1.474044.00	DD0 00D 0	11.01	mg/i							S03-1R				LEVEL
11	L1/A041-03	BBS-CCR-3	11:04		6.42	24.25	1512	0.11	1.79	-168.4		YELLOW	MILD	10:42	
	LIMS#	250ml Cyan (3)	1L Inorg (1)	500ml Inorg (2)	250ml Inorg (3)	1L Mtls (1)	250ml Mtls (3)	1L Rads (1)	500ml Sulfide (2)	500ml Mtls (2)	250ml Nuts (3)	40ml Vial (6)	500 ml Nuts (2)	1L Rads Diss. (1)	Total Containers
The parts   PP	_17A041-03			1			<b>☑</b> 2	<b>☑</b> 2							5
Part															3
Preservation	1) 1L plastic (PP)		(2) 500ml plastic	(PP)	(3) 250ml plastic	(PP)	(4) 100ml coliform b	ottle	(5) 1L amber glass (	AG)	(6) 40ml VOA vial	(CG)		Samples On Ice	Sample Reciept
Langer   Second Horizon   Control	SS	0107301Y	ESS	0218201Y	ESS	0307301Y	ESS		ESS		ESS			✓ Yes □ No	Time 14:15
March Californian   March March Ca		Preservation			Pres ID		Preservation			Pres ID		Preservation		Pres ID	Temp 1.5
Sept   Delication (model)   Tell (MOS) pit (2)	L bottles (rads): 5 ml H	INO3 to pH <2			L 012554 🗹	250ml bottles (nu	ts): 1 ml H2SO4 to ph	l <2		L 🗆	500 ml bottles(Sulfi	ide) 2ml NAOH/Zinc	Acet. to pH >12	L □	
Meter Co	00 ml bottles (metals):	2 ml HNO3 to pH <2			ㅁ	40 ml Vial (TOC):	0.5 ml H2SO4 to pH	<2		L $\square$	250 ml bottles (Cya	n) 1g NAOH to pH >	12	L 🗆	
Americ   MPM09	250 ml bottles (metal): 1	I ml HNO3 to pH <2			L 012554 🗹	1L bottles (diss. ra	ads): filtered with 0.45	ium, 5 ml HNO3 to pH <2	!		A checked box inc	dicates that the san	ple was verified to	a pH of <2	
Description   L   019778   10   10.05   8.40   8.40   8.20   Cond 4-5 %) (DO 4-6 3.3mg/L) (Redox 4-10my)   MPM08   14:17   21.5   233.4   23   23   23   23   24   23   24   24	oH Meter Calibration		Buffer ID	Buffer Value	Cal	Time	ICV	Time	CCV	Time	Redox Cal	Time	Temp °C	Reading mv	Theo Value mv
Description	Meter ID:	MPM08	L 016987H	7	7.01	8:40	7.02	8:42	7.06	14:36	Meter ID:	8:50	24.3	232.1	232.3
Description	FDEP FT 1100		L 016778B	10	10.05	8:40	QC: (pH +/- 0.2) (Co	nd +/- 5%) (DO +/- 0.3m	g/L) (Redox +/- 10mv	<b>'</b> )	MPM08	14:17	21.5	233.4	236.2
Address   Composition   Comp	Jnits: SU		L 016917D	4	3.99	8:40	A checked box indi	cates ICV / CCV passed			Zobell Sol ID:				
Comparison   Com	Conductivity Meter Ca	lib.	Standard ID	Std Value	Cal	Time	ICV	Time	CCV	Time	L 84A				
Company   Comp	Meter ID:	MPM08	L 015981D	1000	1000	9:00					DO Meter Cal	Time	Temp °C	Reading mg/l	Theo Value mg/l
	DEP FT 1200, Units: u	MHOS	L 016236A	10000			9889	9:05	9896	14:03	Meter ID:	8:30	21.9	8.73	8.777
DEFFT 1600, Units, NTU	urbidity Meter Calibra	ation	Standard ID	Std Value	Acceptab	ility Range	ICV	Time	CCV	Time	MPM08	14:53	21.4	8.85	8.846
Companies   Comp	Meter ID:	TM07	L 016722	4.76	4.28	5.24	4.77	8:05			Barom. Pres				
Complete Name   Complete Name   Complete	FDEP FT 1600, Units: N	ITU	L 016723	52.10	48.71	55.49			51.70	14:37	760				
Well #   Diant Comp   Screen   Intake   Diant Comp   Screen   Diant Com	Sulfite Info (QC Check	) (EPA 377.1)		QC Result mg/l	Time	Titrator ID	Na Thio ID	DO 3 Pillow ID	Starch Ind. ID	lodate/lodide ID	Therm ID	pН	Conduct.( %)	DO (mg/l)	Redox (mv)
Well #   Diam/Comp   Screen   Intake   Depth (th)   Depth to   Depth to   Depth to   Depth (th)   Depth (th	QC Std: 5ml (NaThio)/5	00ml DI=10mg/L					L	L	L	L	MPM08	0.2	5	0.3	10
BBS-CR-3 2 10 18.23 23.23 6.81 16.42 0.16 2.63 0.0026 24.23 0 0.06 0.12    Purge Meth: Time Rate (m/min)   Volume (gai)   Total Vol. (gai)   Water Depth (t)   PH (SU)   Temp°C   Cond (aMHOS)   DO (mpt.)   Turbidity (NTU)   Purge Criteria   Status   Equipment ID   Eqpt.	Purging Information		Well Capacities	s (gallons/ ft): 2'	' = 0.16 4" =0.65		Tubing Inside Diam	. Capacities Gallons/ft)	: 1/4" =0.0026 3/8" =6	0.006					
BBS-CR-3   2	Well #	Diam/ Comp			Well Depth (ft)	Depth to Water (ft)	Column		Volume	Tubing X Capacity (gal/ft.)	Tubing Length (ft)	+ Volume +	Volume _	_ Volume	
1A 10.51 400 0.95 0.95 7.32 6.42 24.20 1629 0.13 1.85 ph:+/- 0.2 STABLE Level Meter: WLL  Purge Start: 10.53 400 0.21 1.16 7.31 6.42 24.21 1620 0.12 1.89 Femp°C+ 0.2 STABLE Pump: P  10.42 10.55 400 0.21 1.37 7.32 6.42 24.25 1512 0.11 1.79 Cond % +/- 5 Tubing: P  Purge End:			10		23.23	6.81	16.42	0.16	2.63	0.0026	24.23	0	0.06	0.12	
1A 10.51 400 0.95 0.95 7.32 6.42 24.20 1629 0.13 1.85 ph:+/- 0.2 STABLE Level Meter: WLL  Purge Start: 10.53 400 0.21 1.16 7.31 6.42 24.21 1620 0.12 1.89 Femp°C+ 0.2 STABLE Pump: P  10.42 10.55 400 0.21 1.37 7.32 6.42 24.25 1512 0.11 1.79 Cond % +/- 5 Tubing: P  Purge End:	Purge Meth:	Time	Rate (ml/min)	Volume (gal)	Total Vol. (gal)	Water Depth (ft)	pH (SU)	Temp °C	Cond (uMHOS)	DO (mg/L)	Turbidity (NTU)	Purge Criteria	Status	Equipment ID	Egpt, Table
Purge Start:   10:53   400   0.21   1.16   7.31   6.42   24.21   1620   0.12   1.89															WLM08
10:42									1			Temp°C+/- 0.2	STABLE		PP
Purge End:	10:42	10:55	400	0.21		7.32	6.42	24.25	1512	0.11	1.79	Cond % +/- 5		1	PE/S
10:55   Tubing?   Normal Norma				¥								DO % Sat.< 20	STABLE	<u> </u>	
Nell #   Diam/ Comp   Intake   Depth (interval (ft)   Depth (inter	_											Turb. NTU < 20	STABLE		
Vell #   Diam/ Comp   Intake   Depth (ft)   Volume (gal)   Equipment	Puras Complete A	t 10:43	Gallons to P	urge 0.12	Stablility	Values =	6.42	24.25	1512	0.11	1.79				
2 10 14 18 18.00 0.16 2.88 0.0026 100 0 0.06 0.32  Purge Meth: Time Rate (ml/min) Volume (gal) Total Vol. (gal) Water Depth (ft) pH (SU) Temp °C Cond (uMHOS) DO (mg/L) Turbidity (NTU) Purge Criteria Status Equipment ID Eqpt. ph:+/- 0.2 Level Meter: WLI ph:+/- 0.2 Pump: Progression of the purge Start: Purge End: Do % Sat < 20 Dedicated Yourge Complete At Gallons to Purge 0.32 Stablity Values =	urge Complete A		Screen		Well _ Depth (ft)	Depth to Water (ft)	Column	Well Capacity (gal) =	Volume	Tubing X Capacity X (gal/ft.)	Tubing Length (ft)	Pump + Volume (gal) +		Volume	
Purge Meth:         Time         Rate (ml/min)         Volume (gal)         Total Vol. (gal)         Water Depth (ft)         pH (SU)         Temp °C         Cond (uMHOS)         DO (mg/L)         Turbidity (NTU)         Purge Criteria         Status         Equipment ID		Diam/ Comp	Interval (ft)			I		0.16			100	n	0.06	0.32	
Purge Start:   Pur					18		10.00	0.10							Egpt. Table
Purge Start:    Temp°C+/- 0.2   Purp: PR	Well #	2	10	14		Water Denth (ft)	nH (SU)	Temn °C		1)() (ma/l)				Equipment ID	<u>Lypt. rable</u>
Cond % +/- 5   Tubing: PE	Well #	2	10	14		Water Depth (ft)	pH (SU)	Temp °C	Cond (uMHOS)	DO (mg/L)	Turbidity (NTO)	_ <u> </u>	Status		WUN IVV
Purge End:   DO% Sat. < 20   Dedicated	Well# Purge Meth:	2	10	14		Water Depth (ft)	pH (SU)	Temp °C	Cond (uMHOS)	DO (mg/L)	Turbidity (NTO)	ph:+/- 0.2	Status	Level Meter:	WLM08
Purge Complete At Gallons to Purge 0.32 Stablity Values = Turb. NTU < 20 Turb. NT	Well# Purge Meth:	2	10	14		Water Depth (ft)	pH (SU)	Temp °C	Cond (uMHOS)	DO (mg/L)	Turbidity (NTO)	ph:+/- 0.2 Temp°C+/- 0.2	Status	Level Meter: Pump:	PP
Purge Complete At Gallons to Purge 0.32 Stablity Values =	Well # Purge Meth: Purge Start:	2	10	14		Water Depth (ft)	pH (SU)	Temp °C	Cond (uMHOS)	DO (mg/L)	Turbidity (NTO)	ph:+/- 0.2 Temp°C+/- 0.2 Cond % +/- 5	Status	Level Meter: Pump: Tubing:	PP PE/S
0 1 0 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	Well # Purge Meth:	2	10	14		Water Depth (ft)	pH (SU)	Temp °C	Cond (uMHOS)	DO (mg/L)	Tuiblaty (NTO)	ph:+/- 0.2 Temp°C+/- 0.2 Cond % +/- 5 DO % Sat.< 20	Status	Level Meter: Pump: Tubing: Dedicated	PP PE/S Yes
	Well # Purge Meth: Purge Start:	2 Time	10 Rate (ml/min)	14 Volume (gal)	Total Vol. (gal)		pH (SU)	Temp °C	Cond (uMHOS)	DO (mg/L)	Turbidity (NTO)	ph:+/- 0.2 Temp°C+/- 0.2 Cond % +/- 5 DO % Sat.< 20	Status	Level Meter: Pump: Tubing: Dedicated	PP PE/S Ves

Sampler(s) / Initials

Site:	Big Be	nd	Date:	01/16/17	File Name:	011617_	Wells_RAB	Weather:	OVERCA	ST & MILD	Initials	RAB /TEC	O Initials	
LIMS #	Loction Code	Time	FE <sup>2</sup>	pH (SU)	Temp °C	Cond(uMHOS)	DO Mg/L	Turbidity(NTU)	Redox (mv)	Sulfite (mg/L)	Color	Odor	N	IGVD
			mg/l	PH	TEMP-C	COND-F	DO	TURB-N-F	REDOX	SO3-TR	\$COLOR-W	\$ODOR-W	Time	LEVEL
L17A041-04	BBS-CCR-BW-1	10:32		6.46	26.98	4944	0.20	2.04	-20.2		CLEAR	NONE	10:15	
L17A041-05	BBS-CCR-BW-2	10:02		6.62	25.25	1457	0.30	16.40	-74.1		CLEAR	NONE	9:37	
LIMS #	250ml Cyan (3)	1L Inorg (1)	500ml Inorg (2)	250ml Inorg (3)	1L Mtls (1)	250ml Mtls (3)	1L Rads (1)	500ml Sulfide (2)	500ml Mtls (2)	250ml Nuts (3)	40ml Vial (6)	500 ml Nuts (2)	1L Rads Diss. (1)	Total Containers
L17A041-04			1			<b>☑</b> 2	<b>☑</b> 2							10
L17A041-05			1			<b>⊻</b> 2	<b>☑</b> 2							10
(1) 1L plastic (PP)		(2) 500ml plasti	c (PP)	(3) 250ml plastic	(PP)	(4) 100ml coliform be	ottle	(5) 1L amber glass (	AG)	(6) 40ml VOA vial	(CG)		Samples On Ice	Sample Reciept
ESS	0107301Y	ESS	0218201Y	ESS	0307301Y	ESS		ESS		ESS			✓ Yes □ No	Time 14:15
	Preservation			Pres ID		Preservation			Pres ID		Preservation		Pres ID	Temp 1.5 C
1L bottles (rads): 5 ml H	INO3 to pH <2			L 012554 🗹	250ml bottles (nu	ts): 1 ml H2SO4 to pH	l <2		L 🗆	500 ml bottles(Sulfi	de) 2ml NAOH/Zinc	Acet. to pH >12		
500 ml bottles (metals):	2 ml HNO3 to pH <2			L 🗆	40 ml Vial (TOC):	0.5 ml H2SO4 to pH	<2			250 ml bottles (Cya	n) 1g NAOH to pH >	12	L 🗆	
250 ml bottles (metal):	1 ml HNO3 to pH <2			L 012554 🗹	1L bottles (diss. ra	ads): filtered with 0.45	ium, 5 ml HNO3 to pH <2	2	L	A checked box inc	licates that the sam	ple was verified to	a pH of <2	
pH Meter Calibration		Buffer ID	Buffer Value	Cal	Time	ICV	Time	CCV	Time	Redox Cal	Time	Temp <sup>o</sup> C	Reading mv	Theo Value mv
Meter ID:	MPM08	L 016987H	7	7.01	8:40	7.02	8:42	7.06	14:36	Meter ID:	8:50	24.3	232.1	232.3
FDEP FT 1100		L 016778B	10	10.05	8:40	QC: (pH +/- 0.2) (Co	nd +/- 5%) (DO +/- 0.3m	g/L) (Redox +/- 10mv	)	MPM08	14:17	21.5	233.4	236.2
Units: SU		L 016917D	4	3.99	8:40	A checked box indi	cates ICV / CCV passed			Zobell Sol ID:				
Conductivity Meter Ca	lib.	Standard ID	Std Value	Cal	Time	ICV	Time	CCV	Time	L 017384A				
Meter ID:	MPM08	L 015981D	1000	1000	9:00					DO Meter Cal	Time	Temp °C	Reading mg/l	Theo Value mg/l
FDEP FT 1200, Units: u	MHOS	L 016236A	10000			9889	9:05	9896	14:03	Meter ID:	8:30	21.9	8.73	8.777
Turbidity Meter Calibra	ation	Standard ID	Std Value	Acceptabi	lity Range	ICV	Time	CCV	Time	MPM08	14:53	21.4	8.85	8.846
Meter ID:	TM07	SF- 016722	4.76	4.28	5.24	4.77	8:05			Barom. Pres				
FDEP FT 1600, Units: N	ITU	SF- 016723	52.10	48.71	55.49			51.70	14:37	760				
Sulfite Info (QC Check	(EPA 377.1)		QC Result mg/l	Time	Titrator ID	Na Thio ID	DO 3 Pillow ID	Starch Ind. ID	lodate/lodide ID	Therm ID	рН	Conduct.( %)	DO (mg/l)	Redox (mv)
QC Std: 5ml (NaThio)/5	00ml DI=10mg/L					L	L	L	L	MPM08	0.2	5	0.3	10
Purging Information		Well Capacities	s (gallons/ ft): 2"	= 0.16 4" =0.65		<b>Tubing Inside Diam</b>	. Capacities Gallons/ft)	: 1/4" =0.0026 3/8" =0	0.006					
Well #	Diam/ Comp	Screen Interval (ft)	Intake Depth (ft)	Well Depth (ft)	Depth to Water (ft)	= Water Column (ft) x	Well Capacity (gal)	1 Well Volume (gal)	Tubing X Capacity (gal/ft.)	Tubing Length (ft)	Pump Volume + (gal)	Cell Volume (gal) =	1 Eqpt. Volume (gal)	
BBS-CCR-BW-1	2	10	39.3	44.3	30.49	13.81	0.16	2.21	0.0026	100	0	0.06	0.32	
Purge Meth:	Time	Rate (ml/min)	Volume (gal)	Total Vol. (gal)	Water Depth (ft)	pH (SU)	Temp °C	Cond (uMHOS)	DO (mg/L)	Turbidity (NTU)	Purge Criteria	Status	Equipment ID	Eqpt. Table
1A	10:25	1660	4.39	4.39	31.32	6.46	26.99	4897	0.21	7.46	ph:+/- 0.2	STABLE	Level Meter:	WLM08
Purge Start:	10:27	1600	0.85	5.24	31.31	6.46	26.99	4999	0.20	2.79	Temp°C+/- 0.2	STABLE	Pump:	ESP
10:15	10:29	1600	0.85	6.09	31.30	6.46	26.98	4944	0.20	2.04	Cond % +/- 5	STABLE	Tubing:	PE
Purge End:											DO % Sat.< 20	STABLE	Dedicated	Yes
10:29											Turb. NTU < 20	STABLE	Tubing?	<b>☑</b> No
Purge Complete A	t 10:16	Gallons to F	ourge 0.32	Stability	Values =	6.46	26.98	4944	0.20	2.04				
Well #	Diam/ Comp	Screen Interval (ft)	Intake Depth (ft)	Well Depth (ft)	Depth to Water (ft)	= Water Column (ft) x	Well Capacity (gal) =	1 Well Volume (gal)	Tubing X Capacity (gal/ft.)	Tubing Length (ft)	Pump Volume + (gal)	Cell Volume (gal) =	1 Eqpt. Volume (gal)	
BBS-CCR-BW-2	2	10	18.49	23.84	9.13	14.71	0.16	2.35	0.0026	24.64	0	0.06	0.12	
Purge Meth:	Time	Rate (ml/min)	Volume (gal)	Total Vol. (gal)	Water Depth (ft)	pH (SU)	Temp °C	Cond (uMHOS)	DO (mg/L)	Turbidity (NTU)	Purge Criteria	Status	Equipment ID	Eqpt. Table
1A	9:53	600	2.38	2.38	9.40	6.62	25.22	1455	0.46	14.80	ph:+/- 0.2	STABLE	Level Meter:	WLM08
Purge Start:	9:55	570	0.30	2.68	9.39	6.62	25.29	1456	0.33	13.60	Temp°C+/- 0.2	STABLE	Pump:	PP
9:38	9:57	570	0.30	2.98	9.40	6.62	25.25	1457	0.30	16.40	Cond % +/- 5	STABLE	Tubing:	PE/S
Purge End:											DO % Sat.< 20	STABLE	Dedicated	✓ Yes
9:57											Turb. NTU < 20	STABLE	Tubing?	□ No
Purge Complete A	t 9:39	Gallons to F	ourge 0.12	Stability	Values =	6.62	25.25	1457	0.30	16.40				
Comments:				,				-						
												Total Time	Total	Miles



THE LEADER IN ENVIRONMENTAL TESTING

# **ANALYTICAL REPORT**

TestAmerica Laboratories, Inc.

TestAmerica Tampa 6712 Benjamin Road Suite 100 Tampa, FL 33634

Tel: (813)885-7427

TestAmerica Job ID: 660-78617-1

Client Project/Site: L17A041

## For:

Tampa Electric Company 5012 Causeway Boulevard Tampa, Florida 33619

Attn: Ms. Peggy Penner

Authorized for release by:

Hanker M. Condin

1/31/2017 3:25:18 PM Haukur Gudnason, Project Manager II (813)280-8342

haukur.gudnason@testamericainc.com

Designee for

Keaton Conner, Project Mgmt. Assistant (813)885-7427

keaton.conner@testamericainc.com

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Visit us at: www.testamericainc.com

The test results in this report meet all 2003 NELAC and 2009 TNI requirements for accredited parameters, exceptions are noted in this report. This report may not be reproduced except in full, and with written approval from the laboratory. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

Client: Tampa Electric Company Project/Site: L17A041 TestAmerica Job ID: 660-78617-1

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# **Sample Summary**

Water

Water

Client: Tampa Electric Company

**Client Sample ID** 

L17A041-01

L17A041-02

L17A041-03

L17A041-04

L17A041-05

Project/Site: L17A041

Lab Sample ID

660-78617-1

660-78617-2

660-78617-3

660-78617-4

660-78617-5

TestAmerica Job ID: 660-78617-1

01/25/17 10:32 01/27/17 09:02

01/25/17 10:02 01/27/17 09:02

Matrix	Collected	Received	
Water	01/25/17 12:02	01/27/17 09:02	
Water	01/25/17 11:35	01/27/17 09:02	
Water	01/25/17 11:04	01/27/17 09:02	

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# **Definitions/Glossary**

Client: Tampa Electric Company

Project/Site: L17A041

TestAmerica Job ID: 660-78617-1

## **Qualifiers**

## **Metals**

Qualifier	Qualifier Description
I	The reported value is between the laboratory method detection limit and the laboratory practical quantitation limit.

U Indicates that the compound was analyzed for but not detected.

## **Glossary**

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains no Free Liquid
DER	Duplicate error ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision level concentration
MDA	Minimum detectable activity
EDL	Estimated Detection Limit
MDC	Minimum detectable concentration
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated

ND Not detected at the reporting limit (or MDL or EDL if shown)

PQL Practical Quantitation Limit

QC Quality Control RER Relative error ratio

RL Reporting Limit or Requested Limit (Radiochemistry)

RPD Relative Percent Difference, a measure of the relative difference between two points

TEF Toxicity Equivalent Factor (Dioxin)
TEQ Toxicity Equivalent Quotient (Dioxin)

TestAmerica Tampa

## **Case Narrative**

Client: Tampa Electric Company

Project/Site: L17A041

TestAmerica Job ID: 660-78617-1

Job ID: 660-78617-1

**Laboratory: TestAmerica Tampa** 

**Narrative** 

Job Narrative 660-78617-1

### Comments

No additional comments.

#### Receipt

The samples were received on 1/27/2017 9:02 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was  $15.0^{\circ}$  C.

#### Metals

No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

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# **Detection Summary**

Client: Tampa Electric Company

Project/Site: L17A041

TestAmerica Job ID: 660-78617-1

Client Sample ID:	L17A041-01					Lab Sa	mple ID: 66	0-78617-1
Analyte	Result	Qualifier	PQL	MDL	Unit	Dil Fac D	Method	Prep Type
Lithium	0.014	Ī	0.050	0.0010	mg/L		200.7 Rev 4.4	Total/NA
Client Sample ID:	L17A041-02	Lab Sa	Lab Sample ID: 660-78617-2					
Analyte	Result	Qualifier	PQL	MDL	Unit	Dil Fac D	Method	Prep Type
Lithium	0.013	Ī	0.050	0.0010	mg/L		200.7 Rev 4.4	Total/NA
Client Sample ID:	L17A041-03					Lab Sa	mple ID: 66	0-78617-3
Analyte	Result	Qualifier	PQL	MDL	Unit	Dil Fac D	Method	Prep Type
Lithium	0.0077	I	0.050	0.0010	mg/L		200.7 Rev 4.4	Total/NA
Client Sample ID:	L17A041-04					Lab Sa	mple ID: 66	0-78617-4
Analyte	Result	Qualifier	PQL	MDL	Unit	Dil Fac D	Method	Prep Type
Lithium	0.018	I	0.050	0.0010	mg/L		200.7 Rev 4.4	Total/NA
Client Sample ID:	L17A041-05					Lab Sa	mple ID: 66	0-78617-5
Analyte	Result	Qualifier	PQL	MDL	Unit	Dil Fac D	Method	Prep Type
Lithium	0.0052	I	0.050	0.0010	mg/L		200.7 Rev 4.4	Total/NA

## Client Sample Results

Client: Tampa Electric Company

Project/Site: L17A041

TestAmerica Job ID: 660-78617-1

Client Sample ID: L17A041-01 Lab Sample ID: 660-78617-1 Date Collected: 01/25/17 12:02 **Matrix: Water** 

Date Received: 01/27/17 09:02

Method: 200.7 Rev 4.4 - Metals (ICP) Analyte Result Qualifier PQL **MDL** Unit D Prepared Analyzed Dil Fac 01/29/17 10:39 01/30/17 20:11 Lithium 0.014 I 0.050 0.0010 mg/L

Client Sample ID: L17A041-02 Lab Sample ID: 660-78617-2

Date Collected: 01/25/17 11:35

Date Received: 01/27/17 09:02

Method: 200.7 Rev 4.4 - Metals (ICP) Analyte Result Qualifier PQL **MDL** Unit D Prepared Analyzed Dil Fac 0.050 01/29/17 10:39 01/30/17 20:14 Lithium 0.013 I 0.0010 mg/L

Client Sample ID: L17A041-03 Lab Sample ID: 660-78617-3

Date Collected: 01/25/17 11:04 Date Received: 01/27/17 09:02

Method: 200.7 Rev 4.4 - Metals (ICP)

Analyte Result Qualifier PQL MDL Unit Prepared Analyzed Dil Fac Lithium 0.0077 I 0.050 0.0010 mg/L 01/29/17 10:39 01/30/17 20:18

Client Sample ID: L17A041-04 Lab Sample ID: 660-78617-4

Date Collected: 01/25/17 10:32 Date Received: 01/27/17 09:02

Method: 200.7 Rev 4.4 - Metals (ICP)

Analyte Result Qualifier PQL **MDL** Unit Prepared Analyzed Dil Fac 01/29/17 10:39 01/30/17 20:31 Lithium 0.050 0.0010 mg/L 0.018 I

Lab Sample ID: 660-78617-5 Client Sample ID: L17A041-05 **Matrix: Water** 

Date Collected: 01/25/17 10:02 Date Received: 01/27/17 09:02

Method: 200.7 Rev 4.4 - Metals (ICP)

Analyte Result Qualifier **PQL MDL** Unit Prepared Analyzed 0.0010 mg/L 0.050 01/29/17 10:39 01/30/17 20:34 Lithium 0.0052 I

**Matrix: Water** 

**Matrix: Water** 

**Matrix: Water** 

## QC Sample Results

Client: Tampa Electric Company TestAmerica Job ID: 660-78617-1

Project/Site: L17A041

Method: 200.7 Rev 4.4 - Metals (ICP)

Lab Sample ID: MB 400-340211/1-A Client Sample ID: Method Blank **Matrix: Water Prep Type: Total/NA Analysis Batch: 340400 Prep Batch: 340211** 

MB MB

Analyte Result Qualifier PQL **MDL** Unit Prepared Analyzed Dil Fac 0.050 01/29/17 10:39 01/30/17 19:32 Lithium 0.0010 U 0.0010 mg/L

Lab Sample ID: LCS 400-340211/2-A **Client Sample ID: Lab Control Sample Matrix: Water** Prep Type: Total/NA **Analysis Batch: 340400** Prep Batch: 340211 Spike LCS LCS %Rec. Added Limits Analyte Result Qualifier Unit D %Rec 85 - 115 Lithium 1.00 1.06 mg/L 106

Lab Sample ID: 400-133205-A-1-B MS **Client Sample ID: Matrix Spike Matrix: Water Prep Type: Total/NA Prep Batch: 340211 Analysis Batch: 340400** Sample Sample Spike MS MS %Rec. Result Qualifier Added Analyte Result Qualifier Limits Unit D %Rec Lithium 0.0031 I 1.00 1.10 mg/L 110 70 - 130

Lab Sample ID: 400-133205-A-1-C MSD **Client Sample ID: Matrix Spike Duplicate Matrix: Water** Prep Type: Total/NA **Analysis Batch: 340400** Prep Batch: 340211 Sample Sample Spike MSD MSD %Rec. **RPD** Analyte Result Qualifier Added Result Qualifier Unit %Rec Limits RPD Limit Lithium 0.0031 I 1.00 1.09 mg/L 109 70 - 130

# **QC Association Summary**

Client: Tampa Electric Company

TestAmerica Job ID: 660-78617-1

Project/Site: L17A041

## **Metals**

## **Prep Batch: 340211**

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
660-78617-1	L17A041-01	Total/NA	Water	200.7	
660-78617-2	L17A041-02	Total/NA	Water	200.7	
660-78617-3	L17A041-03	Total/NA	Water	200.7	
660-78617-4	L17A041-04	Total/NA	Water	200.7	
660-78617-5	L17A041-05	Total/NA	Water	200.7	
MB 400-340211/1-A	Method Blank	Total/NA	Water	200.7	
LCS 400-340211/2-A	Lab Control Sample	Total/NA	Water	200.7	
400-133205-A-1-B MS	Matrix Spike	Total/NA	Water	200.7	
400-133205-A-1-C MSD	Matrix Spike Duplicate	Total/NA	Water	200.7	

## **Analysis Batch: 340400**

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
660-78617-1	L17A041-01	Total/NA	Water	200.7 Rev 4.4	340211
660-78617-2	L17A041-02	Total/NA	Water	200.7 Rev 4.4	340211
660-78617-3	L17A041-03	Total/NA	Water	200.7 Rev 4.4	340211
660-78617-4	L17A041-04	Total/NA	Water	200.7 Rev 4.4	340211
660-78617-5	L17A041-05	Total/NA	Water	200.7 Rev 4.4	340211
MB 400-340211/1-A	Method Blank	Total/NA	Water	200.7 Rev 4.4	340211
LCS 400-340211/2-A	Lab Control Sample	Total/NA	Water	200.7 Rev 4.4	340211
400-133205-A-1-B MS	Matrix Spike	Total/NA	Water	200.7 Rev 4.4	340211
400-133205-A-1-C MSD	Matrix Spike Duplicate	Total/NA	Water	200.7 Rev 4.4	340211

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**Matrix: Water** 

**Matrix: Water** 

**Matrix: Water** 

Client: Tampa Electric Company

Project/Site: L17A041

Client Sample ID: L17A041-01 Lab Sample ID: 660-78617-1 Date Collected: 01/25/17 12:02 **Matrix: Water** 

Date Received: 01/27/17 09:02

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	200.7			50 mL	50 mL	340211	01/29/17 10:39	DN1	TAL PEN
Total/NA	Analysis	200.7 Rev 4.4		1			340400	01/30/17 20:11	SEH	TAL PEN
	Instrumer	nt ID: 6500 ICP Duc	)							

Lab Sample ID: 660-78617-2 Client Sample ID: L17A041-02

Date Collected: 01/25/17 11:35

Date Received: 01/27/17 09:02

	Batch	Batch		Dil	Initial	Final	Batch	Prepared		
Prep Type	Type	Method	Run	Factor	Amount	Amount	Number	or Analyzed	Analyst	Lab
Total/NA	Prep	200.7			50 mL	50 mL	340211	01/29/17 10:39	DN1	TAL PEN
Total/NA	Analysis	200.7 Rev 4.4		1			340400	01/30/17 20:14	SEH	TAL PEN
	Instrumen	t ID: 6500 ICP Duo								

Client Sample ID: L17A041-03 Lab Sample ID: 660-78617-3 **Matrix: Water** 

Date Collected: 01/25/17 11:04

Date Received: 01/27/17 09:02

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	200.7			50 mL	50 mL	340211	01/29/17 10:39	DN1	TAL PEN
Total/NA	Analysis	200.7 Rev 4.4		1			340400	01/30/17 20:18	SEH	TAL PEN
	Instrumer	nt ID: 6500 ICP Duc	)							

Lab Sample ID: 660-78617-4 Client Sample ID: L17A041-04

Date Collected: 01/25/17 10:32 Date Received: 01/27/17 09:02

	Batch	Batch		Dil	Initial	Final	Batch	Prepared		
Prep Type	Туре	Method	Run	Factor	Amount	Amount	Number	or Analyzed	Analyst	Lab
Total/NA	Prep	200.7			50 mL	50 mL	340211	01/29/17 10:39	DN1	TAL PEN
Total/NA	Analysis	200.7 Rev 4.4		1			340400	01/30/17 20:31	SEH	TAL PEN
	Instrumer	nt ID: 6500 ICP Duo								

Client Sample ID: L17A041-05 Lab Sample ID: 660-78617-5

Date Collected: 01/25/17 10:02 Date Received: 01/27/17 09:02

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	200.7			50 mL	50 mL	340211	01/29/17 10:39	DN1	TAL PEN
Total/NA	Analysis	200.7 Rev 4.4 at ID: 6500 ICP Duo		1			340400	01/30/17 20:34	SEH	TAL PEN

### **Laboratory References:**

TAL PEN = TestAmerica Pensacola, 3355 McLemore Drive, Pensacola, FL 32514, TEL (850)474-1001

TestAmerica Tampa

# **Certification Summary**

Client: Tampa Electric Company

Project/Site: L17A041

TestAmerica Job ID: 660-78617-1

# **Laboratory: TestAmerica Tampa**

The certifications listed below are applicable to this report.

Authority	Program	EPA Region	Certification ID	<b>Expiration Date</b>
Florida	NELAP	4	E84282	06-30-17

# Laboratory: TestAmerica Pensacola The certifications listed below are applicable to this report.

Authority	Program	<b>EPA Region</b>	Certification ID	<b>Expiration Date</b>
Florida	NELAP	4	E81010	06-30-17

# **Method Summary**

Client: Tampa Electric Company

Project/Site: L17A041

TestAmerica Job ID: 660-78617-1

Method	Method Description	Protocol	Laboratory
200.7 Rev 4.4	Metals (ICP)	EPA	TAL PEN

**Protocol References:** 

EPA = US Environmental Protection Agency

**Laboratory References:** 

TAL PEN = TestAmerica Pensacola, 3355 McLemore Drive, Pensacola, FL 32514, TEL (850)474-1001

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### SUBCONTRACT ORDER

# Tampa Electric Company, Laboratory Services L17A041

SENDING	LAROR	ATORY.

Tampa Electric Company, Laboratory Services

5012 Causeway Blvd Tampa, FL 33619 Phone: (813) 630-7490

Fax: (813) 630-7360

Project Manager:

Peggy Penner

## RECEIVING LABORATORY:

TestAmerica Laboratories, Inc. - Tampa

6712 Benjamin Rd., Suite 100

Tampa, FL 33634 Phone :(813) 885-7427

Fax: -

Due Date: 02/09/17 16:00

Analysis		Expires		Laboratory ID Comments
Sample ID: L17A041-01	BBS-CCR-1		Water	;
Sampled: 01/26/17 12:02				
Lithium, Total EPA 6010		07/25/17 12:02		
Containers Supplied:				
Poly HNO3 - 250mL (B)				
Sample ID: L17A041-02	BBS-CCR-2		Water	
Sampled: 01/26/17 11:35				
Lithium, Total EPA 6010		07/25/17 11:35		
Containers Supplied:				
Poly HNO3 - 250mL (B)				
Sample ID: L17A041-03	BBS-CCR-3		Water	
Sampled: 01/26/17 11:04				<u>, a e e e e e e e e e e e e e e e e e e </u>
Lithium, Total EPA 6010		07/25/17 11:04		
Containers Supplied:				
Poly HNO3 - 250mL (B)				
Sample ID: L17A041-04	BBS-CCR-BW1		Water	
Sampled: 01/26/17 10:32				
Lithium, Total EPA 6010		07/25/17 10:32		
Containers Supplied:				
Poly HNO3 - 250mL (B)				
Sample ID: L17A041-05	BBS-CCR-BW2		Water	
Sampled: 01/26/17 10:02				
Lithium, Total EPA 6010		07/25/17 10:02		
Containers Supplied;				
Poly HNO3 - 250mL (B)				

15.2 | 15.0



Loc: 660 78617

660-78617 Chain of Custody

ABSURVE of 126-17 1530 Released By Date & Tin

Released By

Received By

1-27/6 Date & Time 902

Date & Time

Received By

Date & Time

Company

Date/Time:

1.0%

Sooier Temperature(s) °C and Other Remarks:

Received by:

Company

Date/Time: Date/Time:

13

0 - Ashao2 P - Na2045 Q - Na2045 R - Na20203 R - H2504 T - TSP Dodecalydrate U - Aceitne Special Instructions/Note: loke. Since laboratory accreditations are subject to change. TestAmerica Laboratories, Inc. places the ownership of method, analyte & accreditation outpliance upon out subcolutract laboratories. This sample shipment is forwarded under chain-of-custody. If the laboratory does not constitution in the State of Origin listed above for analysis/lests/matrix being analyzed, the samples must be shipped back to the TestAmerica laboratory or other instructions will be provided. Any changes to accreditation status should be brought to TestAmerica Laboratories, inc. attention immediately. If all requested accreditations are current to date, return the signed Chain of Custody attesting to said complicance to TestAmerica Laboratories, inc. attention immediately. If all requested accreditations are current to date, return the signed Chain of Custody attesting to said complicance to TestAmerica Laboratories, inc. W - pH 4-5 Z - other (specify) Months Sample Disposal ( A fee may be assessed if samples are retained longer than 1 month)

Return To Client
Special Instructions/QC Requirements: reservation Codes: G - Amchlor H - Ascorbic Acid A - HCL
B - NaOH
C - Zn Acetate
D - Nitric Acid
E - NaHSO4
F - MeOH COC No: 660-93674.1 360-78617-1 Page: Page 1 of 1 l - Ice J - Di Water K-EDTA L-EDA ディーフ 2 · 23 23 Total Number of containers 32. لمنيد 3, 1 Aethod of Shipment Carrier Tracking No(s) State of Origin: Florida Analysis Requested Accreditations Required (See hote): NELAP - Florida; NELAP - Texas Lab PW: Conner, Keaton E-Maii: keaton.conner@testamericainc.com # ä. . A Received by: × × × × × muithil TOT\_q\_T.005/T.00\$ Periorn MS/MSD (Yee or No) me. Field Filtered Sample (Yes or No) Company Company Preservation Code: Matrix (W=water, S=solid, O=waste/oil, Water Water Water Water Water 620 Type (C≂comp, G=grab) Sample Primary Deliverable Rank: Eastern 11:35 Eastern 11:04 Eastern 10:32 Eastern 10:02 Sample Eastern 12:02 1127 [17 AT Requested (days): Due Date Requested: 2/3/2017 Sample Date 1/25/17 1/25/17 1/25/17 1/25/17 1/25/17 Project #: 66004821 SSOW#: Phone: WO #: Client Information (Sub Contract Lab) Jeliverable Requested: I, II, III, IV, Other (specify) Sample Identification - Client ID (Lab ID) 850-474-1001(Tel) 850-478-2671(Fax) Possible Hazard Identification estAmerica Laboratories, Inc. 17A041-01 (660-78617-1) .17A041-03 (660-78617-3) 17A041-04 (660-78617-4) .17A041-05 (660-78617-5) 17A041-02 (660-78617-2) Empty Kit Relinquished by: dinquished by: 3355 McLemore Drive Shipping/Receiving State, Zip: FL, 32514 Pensacola 17A041

THE LEFT CHANGE OF ROW INC. MICH. STREET, THEN SOME

Chain of Custody Record

Phone (813) 885-7427 Fax (813) 885-7049

6712 Benjamin Road Suite 100 TestAmerica Tampa

elinquished by: elinquished by: Custody Seal No.:

Custody Seals Intact:

Δ Yes Δ No

# **Login Sample Receipt Checklist**

Client: Tampa Electric Company

Job Number: 660-78617-1

Login Number: 78617 List Source: TestAmerica Tampa

List Number: 1

Creator: Moccia, Vanessa M

Ougstion	Anguar Commo
Question	Answer Comme
Radioactivity wasn't checked or is = background as measured by meter.</td <td>a survey N/A</td>	a survey N/A
The cooler's custody seal, if present, is intact.	True
Sample custody seals, if present, are intact.	True
The cooler or samples do not appear to have been compromised of tampered with.	r True
Samples were received on ice.	True
Cooler Temperature is acceptable.	True
Cooler Temperature is recorded.	True
COC is present.	True
COC is filled out in ink and legible.	True
COC is filled out with all pertinent information.	True
Is the Field Sampler's name present on COC?	True
There are no discrepancies between the containers received and t	ne COC. True
Samples are received within Holding Time (excluding tests with im HTs)	nediate True
Sample containers have legible labels.	True
Containers are not broken or leaking.	True
Sample collection date/times are provided.	True
Appropriate sample containers are used.	True
Sample bottles are completely filled.	True
Sample Preservation Verified.	True
There is sufficient vol. for all requested analyses, incl. any request MS/MSDs	d True
Containers requiring zero headspace have no headspace or bubbl <6mm (1/4").	e is N/A
Multiphasic samples are not present.	True
Samples do not require splitting or compositing.	True
Residual Chlorine Checked.	N/A

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# **Login Sample Receipt Checklist**

Client: Tampa Electric Company

Job Number: 660-78617-1

Login Number: 78617
List Number: 2
List Source: TestAmerica Pensacola
List Creation: 01/28/17 02:04 PM

Creator: Franklin, Justin H

Creator: Franklin, Justin H		
Question	Answer	Comment
Radioactivity wasn't checked or is = background as measured by a survey meter.</td <td>N/A</td> <td></td>	N/A	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	0.0°C IR-2
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	N/A	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

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# DOH Certification #E84025 DEP COMPOAP # 870251

Report Date: February 14, 2017

TECO

5012 Causeway Blvd. Tampa, FL 33619

Attn: Peggy Penner

Field Custody:

Client

Client/Field ID:

L17A041-01

Sample Collection: 1-26-17/1202

Lab ID No:

17.1131

Lab Custody Date:

2-1-17/1130

Sample description:

Water

### CERTIFICATE OF ANALYSIS

					Analysis		Detection	
Parameter	Units	Re	sul	ts	Date	Method	Limit	
Combined Radium (Radium-226 + Radium 228)	pCi/l	32.5	±	1.6	Calc	Calc	0.6	
Radium-226	pCi/l	30.5	±	1.6	2-6-17/1114	EPA 903.0	0.3	
Radium-228	pCi/l	2.0	±	0.7	2-9-17/1408	EPA Ra-05	0.6	

J = The reported value failed to meet the established quality control criteria for either precision or accuracy. Sample matrix interference.

> James W. Hayes Laboratory Manager

James W. Hages

Test results meet all requirements of the NELAC standards. Statement of estimated uncertainty available upon request. Test results refer only to sample(s) listed. Contact person: Jim Hayes (813) 229-2879.



# DOH Certification #E84025 DEP COMPQAP # 870251

Report Date: February 14, 2017

TECO

5012 Causeway Blvd. Tampa, FL 33619

Attn: Peggy Penner

Field Custody:

Client

Client/Field ID:

L17A041-02

Sample Collection:

1-26-17/1135

Lab ID No:

17.1132

Lab Custody Date:

2-1-17/1130

Sample description:

Water

### CERTIFICATE OF ANALYSIS

					Detection			
Parameter	Units	Re	sul	ts	Date	Method	Limit	
Combined Radium (Radium-226 + Radium 228)	pCi/l	13.9	±	1.0	Calc	Calc	0.6	
Radium-226	pCi/l	13.0	±	1.0	2-6-17/1114	EPA 903.0	0.4	
Radium-228	pCi/l	0.9	±	0.6	2-9-17/1408	EPA Ra-05	0.6	

Alpha Standard: Th-230

J = The reported value failed to meet the established quality control criteria for either precision or accuracy. Sample matrix interference.

James W. Hayes Laboratory Manager

James W. Hages

Test results meet all requirements of the NELAC standards. Statement of estimated uncertainty available upon request. Test results refer only to sample(s) listed. Contact person: Jim Hayes (813) 229-2879.



# DOH Certification #E84025 DEP COMPQAP # 870251

Report Date: February 14, 2017

TECO

5012 Causeway Blvd. Tampa, FL 33619

Attn: Peggy Penner

Field Custody:

Client

Client/Field ID:

L17A041-03

Sample Collection:

1-26-17/1104

Lab ID No:

17.1133

Lab Custody Date:

2-1-17/1130

Sample description:

Water

### CERTIFICATE OF ANALYSIS

Parameter	Units	Re	sul	ts	Method	Detection Method Limit		
Combined Radium (Radium-226 + Radium 228)	pCi/l	15.0	±	1.1	Calc	Calc	0.6	
Radium-226	pCi/l	13.8	±	1.1	2-6-17/1114	EPA 903.0	0.3	
Radium-228	pCi/l	1.2	±	0.6	2-9-17/1408	EPA Ra-05	0.6	

Alpha Standard: Th-230

J = The reported value failed to meet the established quality control criteria for either precision or accuracy. Sample matrix interference.

James W. Hayes Laboratory Manager

James W. Hages

Test results meet all requirements of the NELAC standards. Statement of estimated uncertainty available upon request. Test results refer only to sample(s) listed. Contact person: Jim Hayes (813) 229-2879.



# DOH Certification #E84025 DEP COMPOAP # 870251

Report Date: February 14, 2017

TECO

5012 Causeway Blvd. Tampa, FL 33619

Attn: Peggy Penner

Field Custody:

Client

Client/Field ID:

L17A041-04

Sample Collection:

1-26-17/1032

Lab ID No:

17.1134

Lab Custody Date:

2-1-17/1130

Sample description:

Water

CERTIFICATE OF ANALYSIS

					Analysis		Detection	
Parameter	Units	Re	sul	ts	Date	Method	Limit	_
Combined Radium (Radium-226 + Radium 228)	pCi/l	32.5	±	1.5	Calc	Calc	0.6	
Radium-226	pCi/l	28.4	±	1.5	2-6-17/1114	EPA 903.0	0.3	
Radium-228	pCi/l	4.1	±	0.8	2-9-17/1408	EPA Ra-05	0.6	

Alpha Standard: Th-230

J = The reported value failed to meet the established quality control criteria for either precision or accuracy. Sample matrix interference.

> James W. Hayes Laboratory Manager

James W. Hages

Test results meet all requirements of the NELAC standards. Statement of estimated uncertainty available upon request. Test results refer only to sample(s) listed. Contact person: Jim Hayes (813) 229-2879.



# DOH Certification #E84025 DEP COMPOAP # 870251

Report Date: February 14, 2017

TECO

5012 Causeway Blvd. Tampa, FL 33619

Attn: Peggy Penner

Field Custody:

Client

Client/Field ID:

L17A041-05

Sample Collection:

1-26-17/1002

Lab ID No:

17.1135

Lab Custody Date:

2-1-17/1130

Sample description:

Water

### CERTIFICATE OF ANALYSIS

	22070				Analysis	Detection		
Parameter	Units	Re	esul	ts	Date	Method	Limit	
Combined Radium (Radium-226 + Radium 228)	pCi/l	4.8	±	0.6	Calc	Calc	0.6	
Radium-226	pCi/l	3.7	±	0.6	2-6-17/1114	EPA 903.0	0.4	
Radium-228	pCi/l	1.1	±	0.6	2-9-17/1408	EPA Ra-05	0.6	

Alpha Standard: Th-230

J = The reported value failed to meet the established quality control criteria for either precision or accuracy. Sample matrix interference.

> James W. Hayes Laboratory Manager

James W. Hages

Test results meet all requirements of the NELAC standards. Statement of estimated uncertainty available upon request. Test results refer only to sample(s) listed. Contact person: Jim Hayes (813) 229-2879.

### SUBCONTRACT ORDER

# Tampa Electric Company, Laboratory Services L17A041

## SENDING LABORATORY:

RECEIVING LABORATORY:

Tampa Electric Company, Laboratory Services

KNL Laboratory Services

5012 Causeway Blvd

3202 N. Florida Ave. Tampa, FL 33603

Tampa, FL 33619 Phone: (813) 630-7490

Phone:(813) 229-2879

Fax: (813) 630-7360

Fax: -

Project Manager: Peggy Penner

**Due Date:** 

02/09/17 16:00

Analysis	Expires		Laboratory ID	Comments
Sample ID: L17A041-01 BBS-CCR-1 Sampled: 01/26/17 12:02		Water	17.1131	
Radium 226 EPA 903.0	07/25/17 12:02		Level 2 Data requred	
Radium 226+228, Total	07/25/17 12:02		Level 2 Data requred	
Radium 228 Ra-05	07/25/17 12:02		Level 2 Data requred	
Containers Supplied:				
RAD Poly HNO3 - 1000mL (C)	RAD Poly HNO3 - 1000mI	L(D)		
Sample ID: L17A041-02 BBS-CCR-2 Sampled: 01/26/17 11:35	m,	Water	17.1132	
Radium 226 EPA 903.0	07/25/17 11:35		Level 2 Data requred	
Radium 226+228, Total	07/25/17 11:35		Level 2 Data requred	
Radium 228 Ra-05	07/25/17 11:35		Level 2 Data requred	
Containers Supplied:				
RAD Poly HNO3 - 1000mL (C)	RAD Poly HNO3 - 1000ml			
Sample ID: L17A041-03 BBS-CCR-3 Sampled: 01/26/17 11:04		Water	17.1133	
Radium 226+228, Total	07/25/17 11:04		Level 2 Data requred	
Radium 226 EPA 903.0	07/25/17 11:04		Level 2 Data requred	
Radium 228 Ra-05	07/25/17 11:04		Level 2 Data requred	
Containers Supplied:				
RAD Poly HNO3 - 1000mL (C)	RAD Poly HNO3 - 1000ml	L (D)		
Sample ID: L17A041-04 BBS-CCR-B	W1	Water	17.1134	
Sampled: 01/26/17 10:32 Radium 226 EPA 903.0	07/25/17 10:32		Level 2 Data required	
THE PART OF THE PA	07/25/17 10:32		Level 2 Data required	
Radium 226+228, Total Radium 228 Ra-05	07/25/17 10:32		Level 2 Data required	
	01/25/17 10.52		Level 2 Data required	-11 //
Containers Supplied: RAD Poly HNO3 - 1000mL (C)	RAD Poly HNO3 - 1000m	L (D)		at visit

Received By

Date & Time

Released By

Date & Time

Received By

Date & Time

## SUBCONTRACT ORDER

# Tampa Electric Company, Laboratory Services L17A041

Analysis	Expires	Laboratory ID Comments
Sample ID: L17A041-05 BBS-CCR Sampled: 01/26/17 10:02	-BW2 Water	17.1135
Radium 228 Ra-05	07/25/17 10:02	Level 2 Data requred
Radium 226 EPA 903.0	07/25/17 10:02	Level 2 Data requred
Radium 226+228, Total	07/25/17 10:02	Level 2 Data requred
Containers Supplied:		
RAD Poly HNO3 - 1000mL (C)	RAD Poly HNO3 - 1000mL (D)	

gr Kin

Robert 2-1-17 113)

Received By

0201-17/1/30 Date & Time

Released By

Date & Time

Received By

Date & Time



# FL DOH Certification # E84025

	L Don Certification	I π L04023	
QC Summary: Radium	228 Analysis		
Client Project #: 17 4	041		
Analysis Completion Date:	219117		
Precision Data:	Sample #:	17,1134	
Sample Analysis (pCi/l)	Duplicate Analysis (pCi/l)	Range (pCi/l)	<u>RPD (%)</u>
7.9	8.2	0.3	3.73
Spike Data:	Sample #:	17,1134	
Sample Analysis (pCi/l)	Spike Added (pCi/l) Analy		Spike Rec (%) 987
LCS Data:			
Analytical Result (pCi/l)	True Value (pCi/l)	<u>% R</u>	ecovery
5.2	4.32	_	120%
Lab Blank:	Analytical Result (pC	Ci/I) Anal	ysis Date

Lab Blank

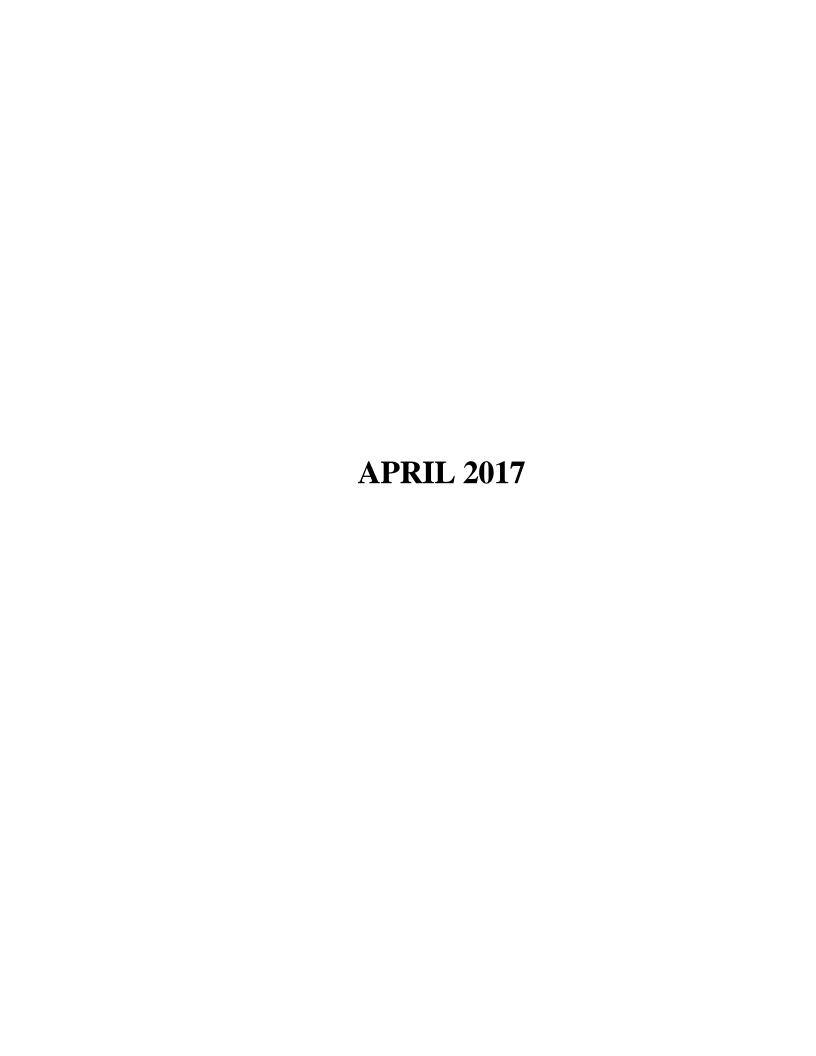
0.1 +/- 0.3



# **FL DOH Certification # E84025**

		111 1101011		
QC Summary: Total Ra	dium Analysis			
Client Project #: L 17 A 041				
Analysis Completion Date:	= 21 6 1 17			
Precision Data:	Sample #:			
Sample Analysis (pCi/l)	Duplicate Analysis (pCi/l)	Range (pCi/l)	<u>RPD (%)</u>	
5.0	5.6	0.6	11.32	
Spike Data:	Sample #: 17. 1213			
Sample Analysis (pCi/l)	Spike Added (pCi/l) Analyt	tical Result (pCi/l)	Spike Rec (%)	
0.8	4.5	5.0	93%	
LCS Data:				
Analytical Result (pCi/l)	True Value (pCi/l)	<u>%</u> F	% Recovery	
	10-1	_	110%	
Lab Blank:	Analytical Result (pC	Ci/I) Ana	alysis Date	

Lab Blank





# **Tampa Electric Laboratory Services**

5012 Causeway Blvd Tampa Fl. 33619 \* Ph (813)630-7490 \* Fax (813)630-7360 \* DOH #E54272

Big Bend Power Station
Terry Eastley
13031 Wyandott Rd
Apollo Beach, FL 33572
tleastley@tecoenergy.com

Work Order - L17D013

**Report Date:** 

05/02/17 15:48

# Project - CCR Wells Economizer Ash Pond

## **Case Narrative**

5 sample(s) were received on 04/13/17 13:42.

There were no issues noted with the sample(s) associated with this workorder unless noted below.

Lithium analysis was subcontracted to TestAmerica. The report is attached.

Radiologicals (Rad 226-228) were subcontracted to KNL Laboratories. The report is attached.

#### **SM 2540C**

A constant weight could not be acheived after three consectutive weighing and drying cycles for samples BBS-CCR-1 and BBS-CCR-BW. The sample(s) are flagged with a J qualifier.

### EPA 300.0

The recovery of the matrix spike and spike duplicate was below the control limits for Sulfate due to matrix interference. The parent sample is flagged with a J qualifier.



5012 Causeway Blvd Tampa Fl. 33619 \* Ph (813)630-7490 \* Fax (813)630-7360 \* DOH #E54272

## **Sample Information**

Client: Big Bend Power Station

Lab Sample ID: L17D013-01 Sampled By: Robert Barthelette

Sample Description: BBS-CCR-1 Date and Time Collected: 4/13/17 12:05
Sample Collection Method: Grab Date of Sample Receipt: 4/13/17 13:42

#### **Laboratory Results**

Samp	le C	Duali	fier:
Samp.	ic Q	uan	mici.

					Qualifier		Test		Analysis
Parameter	Result	Units	MDL	PQL	Code	Dil	Method	Analyst	Date & Time
	,	Tampa Elec	tric Compa	ıny, Labo	ratory Se	rvices			
<b>General Chemistry Parameters</b>									
Chloride	124	mg/L	0.200	5.00		10	EPA 300.0	RFL	4/17/17 11:40
Specific Conductance	4170	umhos/cm	100	100		1	FDEP SOP FT 1200	RAB	4/13/17 12:05
Dissolved Oxygen	0.100	mg/L	0.100	0.100	U	1	FDEP SOP FT 1500	RAB	4/13/17 12:05
Fluoride	0.171	mg/L	0.0100	0.0500		1	EPA 300.0	RFL	4/17/17 10:30
pH	6.84	pH Units	1.00	1.00		1	FDEP SOP FT 1100	RAB	4/13/17 12:05
REDOX Potential	-80.4	mV	-999	-999		1	SM 2580B	RAB	4/13/17 12:05
Total Dissolved Solids	3110	mg/L	24.0	40.0	J-	2	SM 2540C	TMH	4/18/17 14:10
Sulfate	443	mg/L	5.00	20.0		10	EPA 300.0	RFL	4/17/17 11:40
Turbidity	4.12	NTU	0.100	0.100		1	FDEP SOP FT 1600	RAB	4/13/17 12:05
<b>Total Mercury by SW846 Method</b>	<u>1 7470/7471</u>								
Mercury	0.0500	ug/L	0.0500	0.200	U	1	EPA 7470A	MCR	4/18/17 11:25
<b>Total Recoverable Metals by 200</b>	<u>Series</u>								
Antimony	0.600	ug/L	0.600	2.00	U	1	EPA 200.8	MCR	4/18/17 15:17
Arsenic	10.5	ug/L	0.320	2.00		1	EPA 200.8	MCR	4/18/17 15:17
Cadmium	0.100	ug/L	0.100	0.500	U	1	EPA 200.8	MCR	4/18/17 15:17
Cobalt	0.505	ug/L	0.0400	2.00	I,V	1	EPA 200.8	MCR	4/18/17 15:17
Lead	9.79E-5	mg/L	8.00E-5	0.00200	I	1	EPA 200.8	MCR	4/18/17 15:17
Selenium	0.937	ug/L	0.200	2.00	I	1	EPA 200.8	MCR	4/18/17 15:17
Thallium	0.100	ug/L	0.100	0.500	U	1	EPA 200.8	MCR	4/18/17 15:17
<b>Total Recoverable Metals by SW</b>	846 Method	6010B							
Barium	0.116	mg/L	0.00500	0.200	I	10	EPA 6010B	RLC	4/19/17 9:31
Beryllium	2.00	ug/L	2.00	20.0	U	10	EPA 6010B	RLC	4/19/17 9:31
Boron	16.4	mg/L	0.100	0.500		10	EPA 6010B	RLC	4/19/17 9:31
Calcium	555000	ug/L	30.0	1000		1	EPA 6010B	RLC	4/20/17 10:19
Chromium	16.0	ug/L	16.0	120	U	10	EPA 6010B	RLC	4/19/17 9:31
Molybdenum	124	ug/L	10.0	200	I	10	EPA 6010B	RLC	4/19/17 9:31



5012 Causeway Blvd Tampa Fl. 33619 \* Ph (813)630-7490 \* Fax (813)630-7360 \* DOH #E54272

#### **Sample Information**

Client: Big Bend Power Station

Lab Sample ID: L17D013-02 Sampled By: Robert Barthelette

Sample Description: BBS-CCR-2 Date and Time Collected: 4/13/17 11:33 Sample Collection Method: Date of Sample Receipt: 4/13/17 13:42 Grab

## **Laboratory Results**

#### Sample Qualifier:

Parameter					Qualifier		Test		Analysis
Parameter	Result	Units	MDL	PQL	Code	Dil	Method	Analyst	Date & Time
	7	Tampa Elec	tric Compa	ny, Labo	ratory Se	rvices			
<b>General Chemistry Parameters</b>									
Chloride	119	mg/L	0.200	5.00		10	EPA 300.0	RFL	4/17/17 11:00
Specific Conductance	1540	umhos/cm	100	100		1	FDEP SOP FT 1200	RAB	4/13/17 11:33
Dissolved Oxygen	0.100	mg/L	0.100	0.100	U	1	FDEP SOP FT 1500	RAB	4/13/17 11:33
Fluoride	0.237	mg/L	0.0100	0.0500		1	EPA 300.0	RFL	4/17/17 10:50
pH	6.93	pH Units	1.00	1.00		1	FDEP SOP FT 1100	RAB	4/13/17 11:33
REDOX Potential	-138	mV	-999	-999		1	SM 2580B	RAB	4/13/17 11:33
Total Dissolved Solids	1150	mg/L	12.0	20.0		1	SM 2540C	TMH	4/18/17 14:10
Sulfate	485	mg/L	5.00	20.0	J-	10	EPA 300.0	RFL	4/17/17 11:00
Turbidity	3.43	NTU	0.100	0.100		1	FDEP SOP FT 1600	RAB	4/13/17 11:33
<b>Total Mercury by SW846 Metho</b>	d 7470/7471								
Mercury	0.0500	ug/L	0.0500	0.200	U	1	EPA 7470A	MCR	4/18/17 11:28
<b>Total Recoverable Metals by 200</b>	Series_								
Antimony	0.600	ug/L	0.600	2.00	U	1	EPA 200.8	MCR	4/18/17 15:21
Arsenic	2.64	ug/L	0.320	2.00		1	EPA 200.8	MCR	4/18/17 15:21
Cadmium	0.100	ug/L	0.100	0.500	U	1	EPA 200.8	MCR	4/18/17 15:21
Cobalt	0.114	ug/L	0.0400	2.00	I,V	1	EPA 200.8	MCR	4/18/17 15:21
Lead	0.000176	mg/L	8.00E-5	0.00200	I	1	EPA 200.8	MCR	4/18/17 15:21
Selenium	0.200	ug/L	0.200	2.00	U	1	EPA 200.8	MCR	4/18/17 15:21
Thallium	0.100	ug/L	0.100	0.500	U	1	EPA 200.8	MCR	4/18/17 15:21
<b>Total Recoverable Metals by SW</b>	846 Method	6010B							
Barium	0.0558	mg/L	0.000500	0.0200		1	EPA 6010B	RLC	4/19/17 9:41
Beryllium	0.200	ug/L	0.200	2.00	U	1	EPA 6010B	RLC	4/19/17 9:41
Boron	5.01	mg/L	0.0100	0.0500		1	EPA 6010B	RLC	4/19/17 9:41
Calcium	163000	ug/L	30.0	1000		1	EPA 6010B	RLC	4/20/17 10:21
Chromium	2.29	ug/L	1.60	12.0	I	1	EPA 6010B	RLC	4/19/17 9:41
Molybdenum	9.82	ug/L	1.00	20.0	I	1	EPA 6010B	RLC	4/19/17 9:41



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## **Sample Information**

Client: Big Bend Power Station

Lab Sample ID: L17D013-03 Sampled By: Robert Barthelette

Sample Description: BBS-CCR-3 Date and Time Collected: 4/13/17 11:11
Sample Collection Method: Grab Date of Sample Receipt: 4/13/17 13:42

## **Laboratory Results**

#### Sample Qualifier:

D	D14	II	MDL	DOL	Qualifier Code	Dil	Test	A I4	Analysis
Parameter	Result	Units		PQL			Method	Analyst	Date & Time
		Tampa Elec	tric Compa	ny, Labo	ratory Se	rvices			
<b>General Chemistry Parameters</b>									
Chloride	124	mg/L	0.200	5.00		10	EPA 300.0	RFL	4/17/17 11:30
Specific Conductance	1580	umhos/cm	100	100		1	FDEP SOP FT 1200	RAB	4/13/17 11:11
Dissolved Oxygen	0.140	mg/L	0.100	0.100		1	FDEP SOP FT 1500	RAB	4/13/17 11:11
Fluoride	0.415	mg/L	0.0100	0.0500		1	EPA 300.0	RFL	4/17/17 11:30
pH	6.49	pH Units	1.00	1.00		1	FDEP SOP FT 1100	RAB	4/13/17 11:11
REDOX Potential	-114	mV	-999	-999		1	SM 2580B	RAB	4/13/17 11:11
Total Dissolved Solids	1120	mg/L	12.0	20.0		1	SM 2540C	TMH	4/18/17 14:10
Sulfate	443	mg/L	5.00	20.0		10	EPA 300.0	RFL	4/17/17 11:30
Turbidity	4.22	NTU	0.100	0.100		1	FDEP SOP FT 1600	RAB	4/13/17 11:11
<b>Total Mercury by SW846 Metho</b>	d 7470/7471								
Mercury	0.0500	ug/L	0.0500	0.200	U	1	EPA 7470A	MCR	4/18/17 11:32
<b>Total Recoverable Metals by 200</b>	Series								
Antimony	0.600	ug/L	0.600	2.00	U	1	EPA 200.8	MCR	4/18/17 15:24
Arsenic	0.320	ug/L	0.320	2.00	U	1	EPA 200.8	MCR	4/18/17 15:24
Cadmium	0.100	ug/L	0.100	0.500	U	1	EPA 200.8	MCR	4/18/17 15:24
Cobalt	0.110	ug/L	0.0400	2.00	I,V	1	EPA 200.8	MCR	4/18/17 15:24
Lead	8.00E-5	mg/L	8.00E-5	0.00200	U	1	EPA 200.8	MCR	4/18/17 15:24
Selenium	0.200	ug/L	0.200	2.00	U	1	EPA 200.8	MCR	4/18/17 15:24
Thallium	0.100	ug/L	0.100	0.500	U	1	EPA 200.8	MCR	4/18/17 15:24
<b>Total Recoverable Metals by SW</b>	846 Method	6010B							
Barium	0.0586	mg/L	0.000500	0.0200		1	EPA 6010B	RLC	4/19/17 9:44
Beryllium	0.200	ug/L	0.200	2.00	U	1	EPA 6010B	RLC	4/19/17 9:44
Boron	0.385	mg/L	0.0100	0.0500		1	EPA 6010B	RLC	4/19/17 9:44
Calcium	176000	ug/L	30.0	1000		1	EPA 6010B	RLC	4/20/17 10:24
Chromium	1.60	ug/L	1.60	12.0	U	1	EPA 6010B	RLC	4/19/17 9:44
Molybdenum	11.7	ug/L	1.00	20.0	I	1	EPA 6010B	RLC	4/19/17 9:44



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## **Sample Information**

Client: Big Bend Power Station

Lab Sample ID: L17D013-04 Sampled By: Robert Barthelette

Sample Description: BBS-CCR-BW1 Date and Time Collected: 4/13/17 10:32
Sample Collection Method: Grab Date of Sample Receipt: 4/13/17 13:42

## **Laboratory Results**

#### Sample Qualifier:

D4	D14	II\$4	MDL	DOL	Qualifier Code	Dil	Test	A I4	Analysis
Parameter	Result	Units		PQL			Method	Analyst	Date & Time
	1	ampa Elec	tric Compa	ny, Labo	ratory Se	rvices			
<b>General Chemistry Parameters</b>									
Chloride	934	mg/L	2.00	50.0		100	EPA 300.0	RFL	4/17/17 12:21
Specific Conductance	5000	umhos/cm	100	100		1	FDEP SOP FT 1200	RAB	4/13/17 10:32
Dissolved Oxygen	0.410	mg/L	0.100	0.100		1	FDEP SOP FT 1500	RAB	4/13/17 10:32
Fluoride	0.256	mg/L	0.0100	0.0500		1	EPA 300.0	RFL	4/17/17 11:50
pH	6.50	pH Units	1.00	1.00		1	FDEP SOP FT 1100	RAB	4/13/17 10:32
REDOX Potential	9.00	mV	-999	-999		1	SM 2580B	RAB	4/13/17 10:32
Total Dissolved Solids	4060	mg/L	48.0	80.0	J-	4	SM 2540C	TMH	4/18/17 14:10
Sulfate	1550	mg/L	50.0	200		100	EPA 300.0	RFL	4/17/17 12:21
Turbidity	3.60	NTU	0.100	0.100		1	FDEP SOP FT 1600	RAB	4/13/17 10:32
Total Mercury by SW846 Method	7470/7471								
Mercury	0.0500	ug/L	0.0500	0.200	U	1	EPA 7470A	MCR	4/18/17 11:35
<b>Total Recoverable Metals by 200</b>	<u>Series</u>								
Antimony	0.600	ug/L	0.600	2.00	U	1	EPA 200.8	MCR	4/18/17 15:28
Arsenic	8.61	ug/L	0.320	2.00		1	EPA 200.8	MCR	4/18/17 15:28
Cadmium	0.108	ug/L	0.100	0.500	I	1	EPA 200.8	MCR	4/18/17 15:28
Cobalt	1.69	ug/L	0.0400	2.00	I,V	1	EPA 200.8	MCR	4/18/17 15:28
Lead	0.000129	mg/L	8.00E-5	0.00200	I	1	EPA 200.8	MCR	4/18/17 15:28
Selenium	1.62	ug/L	0.200	2.00	I	1	EPA 200.8	MCR	4/18/17 15:28
Thallium	0.100	ug/L	0.100	0.500	U	1	EPA 200.8	MCR	4/18/17 15:28
<b>Total Recoverable Metals by SW8</b>	346 Method	6010B							
Barium	0.0536	mg/L	0.000500	0.0200		1	EPA 6010B	RLC	4/19/17 9:25
Beryllium	0.200	ug/L	0.200	2.00	U	1	EPA 6010B	RLC	4/19/17 9:25
Boron	49.0	mg/L	0.0100	0.0500		1	EPA 6010B	RLC	4/19/17 9:25
Calcium	693000	ug/L	30.0	1000		1	EPA 6010B	RLC	4/20/17 10:27
Chromium	3.23	ug/L	1.60	12.0	I	1	EPA 6010B	RLC	4/19/17 9:25
Molybdenum	15.6	ug/L	1.00	20.0	I	1	EPA 6010B	RLC	4/19/17 9:25



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#### **Sample Information**

Client: Big Bend Power Station

Lab Sample ID: L17D013-05 Sampled By: Robert Barthelette

Sample Description: BBS-CCR-BW2 Date and Time Collected: 4/13/17 10:06
Sample Collection Method: Grab Date of Sample Receipt: 4/13/17 13:42

## **Laboratory Results**

#### Sample Qualifier:

		Qualifier		Test		Analysis			
Parameter	Result	Units	MDL	PQL	Code	Dil	Method	Analyst	Date & Time
	,	Tampa Elec	tric Compa	ıny, Labo	ratory Se	rvices			
<b>General Chemistry Parameters</b>									
Chloride	140	mg/L	0.200	5.00		10	EPA 300.0	RFL	4/17/17 12:41
Specific Conductance	1480	umhos/cm	100	100		1	FDEP SOP FT 1200	RAB	4/13/17 10:06
Dissolved Oxygen	1.32	mg/L	0.100	0.100		1	FDEP SOP FT 1500	RAB	4/13/17 10:06
Fluoride	0.478	mg/L	0.0100	0.0500		1	EPA 300.0	RFL	4/17/17 12:31
pH	6.67	pH Units	1.00	1.00		1	FDEP SOP FT 1100	RAB	4/13/17 10:06
REDOX Potential	-42.0	mV	-999	-999		1	SM 2580B	RAB	4/13/17 10:06
Total Dissolved Solids	1120	mg/L	12.0	20.0		1	SM 2540C	TMH	4/18/17 14:10
Sulfate	323	mg/L	5.00	20.0		10	EPA 300.0	RFL	4/17/17 12:41
Turbidity	19.0	NTU	0.100	0.100		1	FDEP SOP FT 1600	RAB	4/13/17 10:06
<b>Total Mercury by SW846 Metho</b>	d 7470/7471								
Mercury	0.0500	ug/L	0.0500	0.200	U	1	EPA 7470A	MCR	4/18/17 11:39
<b>Total Recoverable Metals by 200</b>	Series								
Antimony	0.600	ug/L	0.600	2.00	U	1	EPA 200.8	MCR	4/18/17 15:32
Arsenic	1.45	ug/L	0.320	2.00	I	1	EPA 200.8	MCR	4/18/17 15:32
Cadmium	0.100	ug/L	0.100	0.500	U	1	EPA 200.8	MCR	4/18/17 15:32
Cobalt	0.129	ug/L	0.0400	2.00	I,V	1	EPA 200.8	MCR	4/18/17 15:32
Lead	8.00E-5	mg/L	8.00E-5	0.00200	U	1	EPA 200.8	MCR	4/18/17 15:32
Selenium	0.539	ug/L	0.200	2.00	I	1	EPA 200.8	MCR	4/18/17 15:32
Thallium	0.100	ug/L	0.100	0.500	U	1	EPA 200.8	MCR	4/18/17 15:32
<b>Total Recoverable Metals by SW</b>	846 Method	6010B							
Barium	0.0427	mg/L	0.000500	0.0200		1	EPA 6010B	RLC	4/19/17 9:28
Beryllium	0.200	ug/L	0.200	2.00	U	1	EPA 6010B	RLC	4/19/17 9:28
Boron	4.08	mg/L	0.0100	0.0500		1	EPA 6010B	RLC	4/19/17 9:28
Calcium	260000	ug/L	30.0	1000		1	EPA 6010B	RLC	4/20/17 10:29
Chromium	1.60	ug/L	1.60	12.0	U	1	EPA 6010B	RLC	4/19/17 9:28
Molybdenum	9.65	ug/L	1.00	20.0	I	1	EPA 6010B	RLC	4/19/17 9:28

#### **Comments**

- U Indicates that the compound was analyzed for but not detected.
- J- The reported value is an estimated value, see the case narrative for specifics.
- I Estimated value
- V Analyte detected in the method blank

Laboratory Services certifies that the test result in this report meet all requirements of the NELAC standards, unless indicated otherwise in the body of the report. Unless otherwise noted, all methods followed are per the most current published version of 40 CFR Part 136, Table B. Results reported on this report pertain to the above referenced sample only.



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**Subcontract Laboratories:** 



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#### Total Recoverable Metals by SW846 Method 6010B - Quality Control

Analyte	Result	MDL	PQL	Units	Spike Level	Source Result	%Rec	%Rec Limits	RPD	RPD Limit	Qualifier
Analyte	Result	MDL	rQL	Units	Level	Resuit	70KeC	Lillius	KrD	LIIIII	Quanner
Batch 17D0115 - EPA 6010B											
Blank (17D0115-BLK1)					Prepared: (	04/17/17 Ar	nalyzed: 04	/19/17			
Barium	0.000500	0.000500	0.0200	mg/L							U
Beryllium	0.200	0.200	2.00	ug/L							U
Boron	0.0100	0.0100	0.0500	mg/L							U
Calcium	30.0	30.0	1000	ug/L							U
Chromium	1.60	1.60	12.0	ug/L							U
Molybdenum	1.00	1.00	20.0	ug/L							U
LCS (17D0115-BS1)					Prepared: (	04/17/17 Ar	nalyzed: 04	/19/17			
Barium	0.944	0.000500	0.0200	mg/L	1.0000		94.4	80-120			
Beryllium	968	0.200	2.00	ug/L	1000.0		96.8	80-120			
Boron	1.02	0.0100	0.0500	mg/L	1.0000		102	80-120			
Chromium	987	1.60	12.0	ug/L	1000.0		98.7	80-120			
Molybdenum	957	1.00	20.0	ug/L	1000.0		95.7	80-120			
Matrix Spike (17D0115-MS1)		Sourc	e: L17D08	5-03	Prepared: (	04/17/17 Ar	nalyzed: 04	/19/17			
Barium	0.928	0.000500	0.0200	mg/L	1.0000	0.0146	91.4	75-125			
Beryllium	942	0.200	2.00	ug/L	1000.0	U	94.2	75-125			
Boron	4.88	0.0100	0.0500	mg/L	1.0000	4.05	83.0	75-125			
Chromium	972	1.60	12.0	ug/L	1000.0	4.76	96.7	75-125			
Molybdenum	988	1.00	20.0	ug/L	1000.0	24.4	96.4	75-125			
Matrix Spike Dup (17D0115-MSD1)		Sourc	e: L17D08	5-03	Prepared: (	04/17/17 Ar	nalyzed: 04	/19/17			
Barium	0.882	0.000500	0.0200	mg/L	1.0000	0.0146	86.8	75-125	5.09	20	
Beryllium	891	0.200	2.00	ug/L	1000.0	U	89.1	75-125	5.55	20	
Boron	4.69	0.0100	0.0500	mg/L	1.0000	4.05	63.8	75-125	4.00	20	J-
Chromium	920	1.60	12.0	ug/L	1000.0	4.76	91.6	75-125	5.41	20	
Molybdenum	937	1.00	20.0	ug/L	1000.0	24.4	91.3	75-125	5.28	20	



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#### Total Mercury by SW846 Method 7470/7471 - Quality Control

					Spike	Source		%Rec		RPD	
Analyte	Result	MDL	PQL	Units	Level	Result	%Rec	Limits	RPD	Limit	Qualifier
D. 1 1-0112											
Batch 17D0122 - EPA 7470A											
Blank (17D0122-BLK1)					Prepared: 0	4/17/17 Ar	nalyzed: 04	/18/17			
Mercury	0.0500	0.0500	0.200	ug/L							U
LCS (17D0122-BS1)					Prepared: 0	4/17/17 Ar	nalyzed: 04	/18/17			
Mercury	1.01	0.0500	0.200	ug/L	1.0000		101	80-120			
Post Spike (17D0122-PS1)		Sour	ce: L17D01	3-01	Prepared: 0	4/17/17 Ar	nalyzed: 04	/18/17			
Mercury	0.928			ug/L	1.0000	-0.134	92.8	0-200			
Post Spike (17D0122-PS2)		Sour	ce: L17D01	3-01	Prepared: 0	4/17/17 Ar	nalyzed: 04	/18/17			
Mercury	0.949			ug/L	1.0000	-0.134	94.9	0-200			



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#### **Total Recoverable Metals by 200 Series - Quality Control**

					Spike	Source		%Rec		RPD	
Analyte	Result	MDL	PQL	Units	Level	Result	%Rec	Limits	RPD	Limit	Qualifier
Batch 17D0123 - EPA 200.8											
Blank (17D0123-BLK1)					Prepared &	Analyzed:	04/18/17				
Antimony	0.600	0.600	2.00	ug/L							U
Arsenic	0.320	0.320	2.00	ug/L							U
Cadmium	0.100	0.100	0.500	ug/L							U
Cobalt	0.269	0.0400	2.00	ug/L							I
Lead	8.00E-5	8.00E-5	0.00200	mg/L							U
Selenium	0.200	0.200	2.00	ug/L							U
Thallium	0.100	0.100	0.500	ug/L							U
LCS (17D0123-BS1)					Prepared &	Analyzed:	04/18/17				
Antimony	102	0.600	2.00	ug/L	100.00		102	85-115			
Arsenic	99.6	0.320	2.00	ug/L	100.00		99.6	85-115			
Cadmium	100	0.100	0.500	ug/L	100.00		100	85-115			
Cobalt	102	0.0400	2.00	ug/L	100.00		102	85-115			V
Lead	0.0997	8.00E-5	0.00200	mg/L	0.10000		99.7	85-115			
Selenium	99.5	0.200	2.00	ug/L	100.00		99.5	85-115			
Thallium	100	0.100	0.500	ug/L	100.00		100	85-115			
Matrix Spike (17D0123-MS1)		Sour	ce: L17D01	3-05	Prepared &	Analyzed:	04/18/17				
Antimony	103	0.600	2.00	ug/L	100.00	U	103	70-130			
Arsenic	101	0.320	2.00	ug/L	100.00	1.45	99.2	70-130			
Cadmium	90.9	0.100	0.500	ug/L	100.00	U	90.9	70-130			
Cobalt	93.2	0.0400	2.00	ug/L	100.00	0.129	93.1	70-130			V
Lead	0.0942	8.00E-5	0.00200	mg/L	0.10000	U	94.2	70-130			
Selenium	89.3	0.200	2.00	ug/L	100.00	0.539	88.7	70-130			
Thallium	96.5	0.100	0.500	ug/L	100.00	U	96.5	70-130			
Matrix Spike Dup (17D0123-MSD1)		Sour	ce: L17D013	3-05	Prepared &	Analyzed:	04/18/17				
Antimony	100	0.600	2.00	ug/L	100.00	U	100	70-130	3.20	20	
Arsenic	97.5	0.320	2.00	ug/L	100.00	1.45	96.1	70-130	3.17	20	
Cadmium	87.6	0.100	0.500	ug/L	100.00	U	87.6	70-130	3.71	20	
Cobalt	92.5	0.0400	2.00	ug/L	100.00	0.129	92.3	70-130	0.803	20	V
Lead	0.0910	8.00E-5	0.00200	mg/L	0.10000	U	91.0	70-130	3.51	20	
Selenium	86.8	0.200	2.00	ug/L	100.00	0.539	86.3	70-130	2.80	20	
Thallium	92.4	0.100	0.500	ug/L	100.00	U	92.4	70-130	4.32	20	



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#### **General Chemistry Parameters - Quality Control**

Austra	Result	MDL	DOI	Units	Spike	Source	%Rec	%Rec Limits	RPD	RPD Limit	Qualifier
Analyte	Result	MDL	PQL	Units	Level	Result	%Rec	Limits	KPD	Limit	Quaimer
Batch 17D0124 - EPA 300.0											
Blank (17D0124-BLK1)					Prepared &	Analyzed:	04/17/17				
Chloride	0.0200	0.0200	0.500	mg/L							U
Fluoride	0.0100	0.0100	0.0500	mg/L							U
Sulfate	0.500	0.500	2.00	mg/L							U
LCS (17D0124-BS1)					Prepared &	Analyzed:	04/17/17				
Chloride	5.08	0.0200	0.500	mg/L	5.0000		102	90-110			
Fluoride	4.98	0.0100	0.0500	mg/L	5.0000		99.5	90-110			
Sulfate	5.04	0.500	2.00	mg/L	5.0000		101	90-110			
Matrix Spike (17D0124-MS1)		Sour	ce: L17D01	3-02	Prepared &	: Analyzed:	04/17/17				
Chloride	168	0.200	5.00	mg/L	50.000	119	98.5	90-110			
Fluoride	51.5	0.100	0.500	mg/L	50.000	0.237	103	90-110			
Sulfate	527	5.00	20.0	mg/L	50.000	485	83.7	90-110			J-
Matrix Spike Dup (17D0124-MSD1)		Sour	ce: L17D01	3-02	Prepared &	Analyzed:	04/17/17				
Chloride	167	0.200	5.00	mg/L	50.000	119	96.3	90-110	0.655	20	
Fluoride	51.4	0.100	0.500	mg/L	50.000	0.237	102	90-110	0.150	20	
Sulfate	525	5.00	20.0	mg/L	50.000	485	80.4	90-110	0.307	20	J-
Batch 17D0140 - SM 2540C											
Blank (17D0140-BLK1)					Prepared &	: Analyzed:	04/18/17				
Total Dissolved Solids	12.0	12.0	20.0	mg/L							U
LCS (17D0140-BS1)					Prepared &	Analyzed:	04/18/17				
Total Dissolved Solids	1020	12.0	20.0	mg/L	1000.0		102	80-120			



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#### **General Chemistry Parameters - Quality Control**

						_					
					Spike	Source		%Rec		RPD	
Analyte	Result	MDL	PQL	Units	Level	Result	%Rec	Limits	RPD	Limit	Qualifier

Batch 17D0140 - SM 2540C

Duplicate (17D0140-DUP1)		Sour	ce: L17D01	3-01	Prepared & Analyzed: 04/18/17			
Total Dissolved Solids	3090	24.0	40.0	mg/L	3110	0.709	10	J-

Tampa Electric Company, Laboratory Services

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Peggy Penner, Manager, Laboratory Services

Laboratory Services certifies that the test result in this report meet all requirements of the NELAC standards, unless indicated otherwise in the body of the report. Unless otherwise noted, all methods followed are per the most current published version of 40 CFR Part 136, Table B. Results reported on this report pertain to the above referenced sample only.

500 ml bottles (metals): 2 ml HNO3 to pH <2 QC Std: 5ml (NaThio)/500ml DI=10mg/L 1L bottles (rads): 5 ml HNO3 to pH <2 1) 1L plastic (PP) Purge End: 11:27 DEP FT 1600, Units: NTU FDEP FT 1200, Units: uMHOS DEP FT 1100 250 ml bottles (metal): 1 ml HNO3 to pH <2 ourge Start: 11:47 urging Information Inits: SU urge Meth eter ID: urge Start: urge Complete At urge Complete At urge End: urbidity Meter Calibration L17D013-01 L17D013-02 urge Meth: L17D013-02 L17D013-01 Ifite Info (QC Check) (EPA 377.1) nductivity Meter Calib. BBS-CCR-1 BBS-CCR-2 LIMS# LIMS# Well# 11:17 Ä A Loction Code BBS-CCR-1 BBS-CCR-2 250ml Cyan (3) 01073017 Diam/ Comp MPM08 TM07 MPM08 11:23 11:56 11:58 11:25 11:27 11:54 Time Time Big Bend 11:48 Gallons to Purge 0.12 11:18 Gallons to Purge 0.12 ESS (2) 500ml plastic (PP) Well Capacities (gallons/ ft): 2" = 0.16 4" = 0.65 1L inorg (1) Rate (ml/min Time Rate (ml/min Screen Interval (ft) Standard ID Buffer ID 018377B Screen Interval (ft) 11:33 12:05 580 730 0169180 720 ndard ID 016779A 017385C 017288D 016723 016722 500ml inorg (2) Date: Volume (gal) QC Result mg/ Volume (gal) Buffer Value 0218201Y Std Value 4.76 Std Value 1000 Depth (ft) Depth (ft) 52.10 10000 FE<sup>2</sup> mg/l 0.95 0.31 0.32 0.39 10 Pres ID L 013820 ☑ 25 (3) 250ml plastic (PP) ESS 03 250ml Inorg (3) 1L Mtls (1) 04/13/17 Total Vol. (gal) Total Vol. (gal) 1.33 013820 日 рн (SU) Рн 6.84 21.84 22.32 48.71 6.93 1.72 2.11 4.28 Cal 7.01 10.05 3.99 1.26 0.95 (#) Well Cal 1000 Time Stability Values = Stablility Values = 5.24 40 ml Vial (TOC): 0.5 ml H2SO4 to pH <2 1L bottles (diss. rads): filtered with 0.45um, 5 ml HNO3 to pH <2 250ml bottles (nuts): 1 ml H2SO4 to pH <2 Water Depth (ft) Water Depth (It) File Name: 0307301Y TEMP-C 23.70 23.95 Temp °C Depth to Water (ft) Titrator ID 55,49 8:14 8:14 8:14 Time 8:24 7.86 Depth to Water (n) 7.28 7.29 7.30 7.86 7.64 Time 7.15 ESS 3 H A checked box indicates ICV / CCV passed QC: (pH +/- 0.2) (Cond +/- 5%) (DO +/- 0.3mg/L) (Redox +/- 10mv) (4) 100ml coliform bottle ubing Inside Cond(uMHOS) 250mi Mtls (3) 4169.0 1543.0 COND-F Na Thio ID Water Column (ft) Water Column (ft) 53.00 6.92 6.94 pH (SU) 14.69 6.83 6.84 pH (SU) 1CV 4.79 9850 041317 Wells RAB 14.68 5 6.93 6.84 ē Diam. Capacities Gallons/ft]: 1/4" Well X Capacity (gal) 3 Well Capacity (gal) = DO 3 Pillow ID L Rads (1) DO Mg/L 23.89 Temp °C 0.08 23.96 23.95 Temp °C 23.82 23.89 23.70 8:30 23.95 0.16 0.16 Time 7:32 Time 7:33 Time ESS (5) 1L amber glass 500ml Sulfide (2) Turbidity(NTU) TURB-N-F 4.12 3.43 Cond (uMHOS) Weather: Cand (uMHOS) Starch Ind. ID =0.0026, 3/8" =0.006 52.70 1 Well Volume (gal) Volume (gal) 9813 4169 4169 4165 4166 4.77 2.35 CCV 7.08 CCV 1543 1514 1531 1543 2.35 (AG) 500ml Mtls (2) Redox (mv) DO (mg/L) REDOX -80.40 -137.70 PTLY CLOUDY & MILD Pres ID DO (mg/L) 0.0026 0.0026 13:45 0.10 0.05 13:20 Time 13:21 13:28 Time Time 0.04 odide ID Meter ID: MPM08 Barom. Pres 760 250 ml bottles (Cyan) 1g NAOH to pH >12 500 ml bottles(Sulfide) 2ml NAOH/Zinc Acet to pH >12 (6) 40ml VOA vial (CG) Zobell Sol ID: Redox Cal A checked box indicates that the sample Meter ID: DO Meter Cal Therm ID Sulfite (mg/L) Turbidity (NTU) MPM08 SO3-TR MPM08 22.84 (it) 3.08 3.46 5.30 (mgm) 3.43 2.52 23.3 4.12 017105A + + Temp\*C+/- 0.2 Cond % +/- 5 Purge Criteria Purge Criteria 00 % Sat. < 20 ph:+/-00 % Sat < 20 ond % +/ph:+/urb. NTU < 20 emp\*C+/- 0.2 LT. YELLOW \$COLOR-W 40mi Viai (6) MOTITAL (gall) 8:21 13:50 Color Pump Volume (pal) 13:47 Time 7:56 Time 0.2 0.2 0.2 51 RAB /TECO Initials 500 mi Nuts (2) Odor SODOR-W STABLE NONE NONE Total Time STABLE STABLE STABLE STABLE Temp °C vas verified to a pH of <2 STABLE STABLE STABLE STABLE Temp °C 21.8 22.1 1nduct( %) 21.6 22.0 Status Status 0.06 (gal) 0.06 Volume (gal) 11 Samples On Ice
Yes No Dedicated Tubing? Pump: Tubing: 1L Rads Diss. (1) Tubing: Pump: Equipment ID Level Meter. evel Meter. Reading mg/l 8.80 0.3 Reading my uipment ID Pres ID 11:17 Time 11:47 236.0 233.5 8.48 0.12 (ga) (gal) 0.12 "NGVD Sample Reciept
Time 13:42 Temp 1.2 Theo Value mg/l 8.794 Theo Value my Redox (mv) Eqpt. Table apt. Table LEVEL WLM08 WLM08 8.727 236.2 234.9 PE/S PE/S 6 No Yes No Yes PP PP

500 ml bottles (metals): 2 ml HNO3 to pH <2 Purge Start: 10:46 FDEP FT 1100 250 ml bottles (metal): 1 ml HNO3 to pH <2 IL bottles (rads): 5 ml HNO3 to pH <2 1) 1L plastic (PP) \_17D013-03 Purge End: 11:00 Jnits: SU ourge Complete At ourge Start: Purge Meth ourge Meth: H Meter Calibration urge End: urge Complete At DEP FT 1600, Units: NTU urbidity Meter Calibration onductivity Meter Calib. leter ID: DEP FT 1200, Units: uMHOS L17D013-03 Std: 5ml (NaThio)/500ml DI=10mg/L fite Info (QC Check) (EPA 377.1) BBS-CCR-3 LIMS# LIMS# Well # A Preservation Loction Code BBS-CCR-3 250ml Cyan (3) 0107301Y Diam/ Comp Diam/ Comp MPM08 MPM08 10:56 11:00 10:54 TM07 Time Time Big Bend 10:47 Gallons to Purge 0.12 Interval (ff) (2) 500ml plastic (PP) Rate (ml/min) 400 ESS Gallons to Purge Rate (ml/min) Well Capacities (gallons/ ft): 2" = 0.16 4" = 0.65 1L inorg (1) Screen Interval (ft) Standard ID Standard ID Time 11:11 Buffer ID 017385C 400 390 0169180 017288D 018377B 016779A 016722 016723 Date: 500ml inorg (2) Volume (gal) 0218201Y Volume (gal) Intake Depth (ft) Depth (ft) 18.23 Std Value Std Value 4.76 52.10 10000 0.21 0.85 1000 mg/l FEZ 10 0.00 ESS (3) 250ml plastic (PP) 250ml Inorg (3) 1L Mtls (1) Total Vol. (gal) Water Depth (ft) 04/13/17 File Name: Total Vol. (gal) 013820 🖸 pH (SU) 23.23 013820 48.71 6.49 Depth (it) 0.85 Depth (#) 1.06 Acceptability Range 4 28 5.24 4.28 Cal 1000 Time 10 Cal Stability Values = 7 Stablity Values = 250ml bottles (nuts): 1 ml H2SO4 to pH <2 1L bottles (diss. rads): filtered with 0.45um, 5 ml HNO3 to pH <2 40 ml Vial (TOC): 0.5 ml H2SO4 to pH <2 Water Depth (ft) 0307301Y Temp °C TEMP-C 24.27 Depth to Water (ft) Depth to Water (ft) 55.49 Time 8:24 8:14 7.61 7.61 8:14 8:14 7.62 7.13 n 11 ESS A checked box indicates ICV / CCV passed QC: (pH+/-0.2) (Cond+/-5%) (DO+/-0.3mg/L) (Redox+/-10mv) Preservation (4) 100ml coliform bottle Cond(uMHOS) COND-F 1585.0 250ml Mtls (3) 041317\_Wells\_RAB Water Column (ft) Column (ft) ng Inside Diam. Capacities Gallons/ft): 1/4" =0.0026 3/8" =0.006 Na Thio ID pH (SU) 53.00 pH (SU) 16.10 9850 6.46 6.48 4.79 6.49 ic/ Ēζ ίζV Well Capacity (gal) = Well Capacity (gal) DO 3 Pillow ID DO Mg/L DO 0.14 1L Rads (1) Temp °C 24.34 Temp °C 24.27 24.31 0.16 Time 7:33 7:32 8:30 Time Time ESS (5) 1L amber glass (AG) Turbidity(NTU)
TURB-N-F 500ml Sulfide (2) Cond (uMHOS) Weather: Cond (uMHOS) Starch Ind. ID 1 Weil Volume (gal) 1 Well Volume (gal) 52.70 9813 7.08 4.22 1622 1585 4.77 CCV 2.58 8 1585 1632 lodate/lodide ID Redox (mv) REDOX -114.30 500ml Mtls (2) DO (mg/L) DO (mg/L) PTLY CLOUDY & MILD Capacity (gaint.) Time 13:21 13:20 13:45 0.0026 Pres ID 0.13 0.11 0.14 13:28 Time 250ml Nuts (3) Zobell Sol ID: L 05A Meter ID: MPM08 250 ml bottles (Cyan) 1g NAOH to pH >12 Preservation
500 ml bottles(Sulfide) 2ml NAOH/Zinc Acet to pH >12 Sulfite (mg/L) SO3-TR Meter ID: (6) 40ml VOA vial (CG) Barom. Pres 760 DO Meter Cal Redox Cal A checked box indicates that the sample was verified to a pH of <2 Therm ID Turbidity (NTU) Turbidity (NTU) MPM08 MPM08 Length (it) 24.23 (II) 4.47 4.98 4.22 40ml Vial (6) Cond %+/- 5 DO % Sal. < 20 Purge Criteria ph:+/- 0.2 Temp\*C+/- 0.2 00 % Sat < 20 Purge Criteria ond %+/- 5 LT. YELLOW Turb. NTU < 20 emp\*C+/- 0.2 Pump Voiume (gal) urb. NTU < 20 ph:+/-SCOLOR-W Volume (gal) Initials 13:47 8:21 13:50 Color Time 7:56 Time 0.2 0.2 500 ml Nuts (2) 5 + RAB /TECO MODERATE \$0DOR-W STABLE Conduct.(%) Status STABLE STABLE STABLE Cell Volume (gal. \_\_ Temp °C 21.8 21.6 22.0 Temp °C Odor Status 22.1 (gal) 0.06 1L Rads Diss. (1) Samples On Ice Dedicated Tubing? Tubing: Equipment ID Tubing: Level Meter: Equipment ID Dedicated Pump: Level Meter: Reading mg/l Reading my Initials 0.3 233.5 236.0 Pres ID 10:45 1 Egpt Volume (gal) 0.12 (gal) 8.80 8.48 Time DE P NGVD Time 13:42 [5] Temp Total Containers Theo Value mg/l Theo Value my Eqpt. Table Eqpt. Table WLM08 Redox (mv) WLM08 LEVEL 8.727 8.794 234.9 236.2 PE/S 1.2 No Yes PE/S No Yes G PP

Sampler(s) /

Total Time

Purge Meth: 250 ml bottles (metal): 1 ml HNO3 to pH <2 500 ml bottles (metals): 2 ml HNO3 to pH <2 1L bottles (rads): 5 ml HNO3 to pH <2 1) 1L plastic (PP) \_17D013-04 Comments Purge Meth: Purge End: 9:57 Well # BBS-CCR-BW-1 DEP FT 1100 urge Complete At ourge End: 10:29 urge Start: urge Start: DEP FT 1600, Units: NTU urbidity Meter Calibration 17D013-05 urge Complete At irging Information eter ID: nits: SU anductivity Meter Calib. BS-CCR-BW-2 EP FT 1200, Units: uMHOS L17D013-05 L17D013-04 fite Info (QC Check) (EPA 377.1) Std: 5ml (NaThio)/500ml DI=10mg/L LIMS# LIMS# 10:16 9:34 1A Preservation BBS-CCR-BW-1 BBS-CCR-BW-2 Loction Code 250mi Cyan (3) 01073017 Diam/ Comp MPM08 MPM08 TM07 9:55 9:53 10:29 10:25 Time Time Big Bend 10:16 Gallons to Purge 0.32 9:35 Gallons to Purge ESS (2) 500ml plastic (PP) Well Capacities (gallons/ ft): 2" = 0.16 4" = 0.65 Rate (ml/min) 1L inorg (1) 500ml inorg (2) Rate (ml/min Screen Interval (ft) Standard ID Standard ID Time Screen interval (ft) 10:32 10:06 Buffer ID 2500 2500 2500 017385C 018377B 400 400 410 10 0169180 017288D 10 016779A 016722 016723 Date: QC Result mg/ Buffer Value 0218201Y Volume (gai) Volume (gal) Std Value Depth (ft) Depth (ft) 18.49 52.10 Std Value 10000 4.76 1000 0.21 2.01 1.32 6.06 0.22 ng/l FE, 10 4 0.12 ESS L 013820 回 250mt Inorg (3) (3) 250ml plastic (PP) 04/13/17 File Name: Total Vol. (gal) Total Vol. (gal) 013820 🖸 PH (SU) 6.50 6.67 23.84 Pres ID 7.38 8.70 Depth West 48.71 4.28 2.01 Depth Well 6.06 44.3 Acceptability Range 4.28 5.24 Cal 1000 2.44 Stability Values = Time Cal 10 Stability Values = 1L bottles (diss. rads): filtered with 0.45um, 5 ml HNO3 to pH <2 250ml bottles (nuts): 1 ml H2SO4 to pH <2 40 ml Vial (TOC): 0.5 ml H2SO4 to pH <2 Water Depth (ft) Water Depth (ft) 0307301Y 1L Mils (1) Temp °C TEMP-C 27.20 24.81 Titrator ID Depth to Water (ft) 31.69 31.68 30.71 55.49 8:14 Time 8:24 9.42 9.41 9.40 (ft) 8:14 8:14 9.24 Time ESS 11 Preservation ( A checked box indicates ICV / CCV passed QC: (pH +/- 0.2) (Cond +/- 5%) (DO +/- 0.3mg/L) (Redox +/- 10mv) (4) 100ml coliform bottle Tubing Inside Diam. Capacities Gallons/ft): 1/4" =0.0026 3/8" =0.006 Cond(uMHOS) 250ml Mtls (3) 041317\_Wells\_RAB Column (ft) COND-F 5005.0 1476.0 6.67 6.67 6.67 Na Thio ID Column (ft) pH (SU) 13.59 53.00 1CV 4.79 9850 6.50 6.67 14.60 6.50 6.50 ē ΙCV Well X Capacity (gal) Well
X Capacity (gal) = 3 DO 3 Pillow ID DO Mg/L DO 0.41 1L Rads (1) Temp °C 24.83 24.88 27.21 27.20 Temp °C 27.20 27.27 24.81 24.81 0.16 Time 7:33 7:32 1.32 8:30 Time 0.16 Time ESS (5) 1L amber glass (AG) Turbidity(NTU)
TURB-N-F 500ml Sulfide (2) Weather: Cond (uMHOS) Cond (uMHOS) Starch Ind. ID 1 Wes Volume (gal) 4.77 52.70 19.00 3.60 9813 1475 4989 5005 1475 Volume (gal) 4967 2.17 CCV 7.08 5005 1476 2.34 lodate/lodide ID 500ml Mtls (2) Redox (mv) REDOX 9.00 DO (mg/L) PTLY CLOUDY & MILD Tubing Capacity (gal/It.) 0.0026 Capacity (galfit) 42.00 DO (mg/L) 0.0026 Time 13:21 13:20 13:45 Pres ID 0.45 0.48 13:28 Time 0.41 Time 1.41 1.37 1.32 1.32 250mi Nuts (3) Redox Cal 250 ml bottles (Cyan) 1g NAOH to pH >12 L

A checked box indicates that the sample was verified to a pH of <2 Preservation
500 ml battles(Sulfide) 2ml NAOH/Zinc Acet to pH >12 Sulfite (mg/L) SO3-TR SSB (6) 40ml VOA vial (CG) Therm ID MPM08 Barom. Pres 760 Meter ID: DO Meter Cal Zobell Sol ID: Meter ID: Turbidity (NTU) Turbidity (NTU) MPM08 MPM08 (it) 14.70 12.70 24.64 (th) 3.81 19.00 19.00 5.48 3.60 100 017105A + + Purge Criteria ph:+/- 0.2 Temp\*C+/- 0.2 Cond % +/- 5 Temp\*C+/- 0.2 DO % Sat. < 20 00 % Sal. < 20 Purge Criteria LT. YELLOW urb, NTU < 20 ond %+/- 5 urb. NTU < 20 ph:+/- 0.2 40mi Vial (6) \$COLOR-W Volume (gal) CLEAR Initials Pump Volume (gal) 7:56 13:47 8:21 13:50 Color Time 0.2 Time 500 ml Nuts (2) RAB /TECO Initials Conduct.( %) \$ODOR-W STABLE STABLE STABLE STABLE STABLE STABLE STABLE STABLE NONE Temp °C 21.6 Temp °C Odor Status 21.8 Status 0.06 Volume (gal) 0.06 Volume (gal) 11 11 Samples On Ice 1L Rads Diss. (1) Dedicated Tubing? Tubing: Pump: Level Meter. Level Meter: Equipment ID Tubing? Dedicated Tubing: Pump: Equipment ID 236.0 233.5 Reading mg/l DO (mg/l) Pres ID Time 10:13 9:32 8.80 Volume (gal) 0.12 0.32 (gal) 0.3 3 NGVD 0 Temp Time 13:42 Theo Value mv 236.2 234.9 Theo Value mg/l Eqpt. Table WLM08 Redox (mv) Eqpt. Table WLM08 LEVEL 8.727 8.794 PE PE Containers PE/S No Yes 1.2 6 Yes 6

Sampler(s) I

Total Time

Total Miles

# GROUNDWATER WELL SAMPLING EQUIPMENT CALIBRATION

			Date:	04/13/17	Sampler(s): RAB	RAB		Initials	1		
pH Meter Calibration		Buffer ID	- Bullet Value	Cal	Time				CCV	Time	Pass/Fas
Meter ID:	MPM08	L 018377B	7	7.01	8:14				7.08	13:45	Pass
FDEP FT 1100			10	10.05	8:14			QC (pH +/-0.2)	(Cond +4-5%) (DC	pH +/+ 0.2) (Cond +/+ 5%) (DQ +/+ 0.3mgf.) (Redox =/+ 10mv)	d- formy
Units: SU		017385C		3,99	8:14	icγ	Tane		A checked box is	A checked box indicates ICV / CCV passed	ssed
	ICV Check	Į	7			7.03	817	Pass			
Conductivity Meter Calib.		Standard ID	Std Value	Cat	- Eurie	ıΩ	ausi	PassFail	V30	amti	Pass/Fail
Meter ID:	MPM08	0169180		1000	8:24						
FDEP FT 1200, Units: uMHOS	3.	- 1				9850	8:30	Pass	9813	13:28	Pass
Turbidity Meter Calibration		Standard ID	Sid Value	Acceptability Range	Range	100	Time	PassiFail	000	eth)	Pass/Fail
Meter ID:	TM07	016722		4.28	5.24	4.79	7:33	Pass	4.77	13:21	Pass
FDEP FT 1600, Units; NTU		016723	52.10	48.71	55.49	53,00	7:32	Pass	52.70	13:20	Pass
Suffite Info (QC Check) (EPA 377.1)	EPA 377 1)		QC Result mg/l	Time	Titrator (D	Ma Thid ID	DO 3 PiliwaliD	Starch (nd (D	Starch (nd ID) bolate/lodige (D)		
QC Std: 5ml (NaThio)/500ml Di=10mg/l	DI=10mg/L						L		L		
Redox Cal	Time	Temp C	Reading mv	Theo Value mv	Pass / Fall	DO Meter Cal	[]me	Temp°C	Reading mg/l	Theo Value mg/l	Pass / Fall
						FDEP FT (500					888
Meter ID:	8:21	21.6	236.0	236.2	Pass	Meter ID:	7:56	21.8	8.80	8.794	P355
MPM08	13:50	22.0	233.5	234.9	P355	MPM08	13:47	22.1	8.48	8.727	Pass
						Barom, Pres					
L 017105A						/60					
Therm ID	pН	Conduct %	DO mg/t	Redox my	613	Calibration	Ferrous Iron				
MPM08	0.2	5	0.3	10	0.2	Criterion	Comparator ID:		Reagent ID:	-	
CIO <sub>2</sub> DPD Check must read +/- 10% of the Calculated Std. Concentration, multiplied by 2.4	+/- 10% of the C	alculated Std, Conce	entration, multiplie	d by 2.4.		Glycene check shoul	Glycene check should read < 0.10 mg/l ClO <sub>2</sub> .	O <sub>2</sub> .			
						Initial Calibratio	Initial Calibration Verification ICV		Continuous Call	Continuous Calibration Vertication CCV	CV
Chioring Dioxide (mail)	Std. Conc	Std. Spike Volume	Cal Sample Volume (ml)	Calc. Std. Conc.	DPD Check (mall)	Glycene Check	Time	Pass/Fall	DPD Check (md/l)	Time	PassFall
Meter ID:		1.0	100								
			DPD ID:L		Glycene ID:		A checked		box indicates reagent expiration date has been verified	on date has been verif	ed.

#### DEP-SOP-001/01

#### FS 2200 Groundwater Sampling Form FD 9000-24

## **GROUNDWATER SAMPLING LOG**

WELL NO:   BBS-CR-1   SAMPLE ID:   L17D013-01   DATE:   4/13/17	FACILITY NAME:		Big B	end			SITE LOCATION:		Apollo	Beach, FL.	- 1		
DUBLIC   DUALETER (Inches)	WELL NO:	В				SAMPLE ID:	L171	0013-01		DATE:	4/13/17		
SAMPLED DEVOITING   PURSUR	A = 1 4 = 4 = 4												
THE   PURCE	WELL DIAMETER (inches	)	TUBING DIAMETER (inc	ches) 1/4	WELL SC DEPTH 12.3	REEN INTERV	AL (NGVD) 22.32 (feet)	STATIC DEF	PTH (feet): 7.64	PURGE PUMP T OR BAILER:	YPE PP		
Fight   Figh	WELL VOLUME PURG	E:								V			
Converged   Part   Pa	(only fillout it applicable)										t =	gallons	
INTIAL PUMPOR TUBING   DEPTH IN WELL (feet):   1.32	EQUIPMENT VOLI (only fillout if applic	JME PURGE: able)	1 EQ	UIPMENT VOL	= PUMP VOLU	ME + (TUBING						2.7.2	
DEPTH NWELL (Gest): 17.32				=(		gallons + (		ons/foot X		0.06			
TIME   VOLUME   PURGED   PURGE   PURGE   PURGE   PURGE   PURGED   PURGE   PUR	INITIAL PUMP OR DEPTH IN WELL (I	TUBING eet): 17.32		DEPTH IN W	ELL (feet): 1	7.32	INITIATED AT:	11:47	ENDED AT:	11:58	PURGED (galle	ns): 2.1	
11:54	TIME	PURGED	VOLUME PURGED	RATE	TO WATER	(standard		(µmhos/cm	OXYGEN (circle mg/l or			ODOR (describe)	
11:58 0.39 2.11 0.20 7.87 6.84 23.70 4169 0.08 4.12 LT.YELLOW N    11:58	11:54	1.33	1.33	0.19		6.84	23.89	4166	0.05	5.30	LT. YELLOW	NONE	
WELL CAPACITY (Gallons Per Foot): 0.75°=0.02; 1°=0.04; 1.25°=0.06; 2°=0.16; 3°=0.03; 4°=0.05; 5°=1.02; 6°=1.47; 12°=5.88  TUBING INSIDE DIA CAPACITY (Gall/Fil): 1/8°=0.00000000000000000000000000000000000	11:56	0.39	1.72	0.20	7.86	6.83	23.82	4165	0.10	3.46	LT. YELLOW	NONE	
TUBING INSIDE DIA. CAPACITY (Gal./FI.): 1/8" = 0.0006; 3/16" = 0.0014; 1/4" = 0.0026; S16" = 0.004; 3/16" = 0.0006; 1/2" = 0.010; S16" = 0.0	11:58	0.39	2.11	0.20	7.87	6.84	23.70	4169	0.08	4.12	LT. YELLOW	NONE	
SAMPLED BY (PRINT) / AFFILIATION: RAB   TECO   SAMPLE PUMP   FLOW RATE (mt. per minute)   FIELD DECONTAINER   SPECIFICATION   SPECIFICATION   SAMPLE OCODE   CONTAINERS   CODE   Volume   CODE   CONTAINERS   CODE   Volume   CODE   CONTAINERS   CODE   CODE   CODE   CONTAINERS   CODE   CODE													
SAMPLED BY (PRINT) / AFFILIATION: RAB   TECO   SAMPLE PUMP   FLOW RATE (mt. per minute)   FIELD DECONTAINER   SPECIFICATION   SPECIFICATION   SAMPLE OCODE   CONTAINERS   CODE   Volume   CODE   CONTAINERS   CODE   Volume   CODE   CONTAINERS   CODE   CODE   CODE   CONTAINERS   CODE   CODE				1									
TUBING INSIDE DIA. CAPACITY (Gal./FL): 1/8" = 0.0006; 3/16" = 0.0014; 1/4" = 0.0026; 5/16" = 0.004; 3/16" = 0.0006; 1/2" = 0.010; 5/16" = 0						-							
SAMPLED BY (PRINT) / AFFILIATION: RAB   TECO   SAMPLE PUMP   FLOW RATE (mt. per minute)   FIELD DECONTAINER   SPECIFICATION   SPECIFICATION   SAMPLE OCODE   CONTAINERS   CODE   Volume   CODE   CONTAINERS   CODE   Volume   CODE   CONTAINERS   CODE   CODE   CODE   CONTAINERS   CODE   CODE				-		-							
TUBING INSIDE DIA. CAPACITY (Gal./FL): 1/8" = 0.0006; 3/16" = 0.0014; 1/4" = 0.0026; 5/16" = 0.004; 3/16" = 0.0006; 1/2" = 0.010; 5/16" = 0			-			-						_	
SAMPLED BY (PRINT) / AFFILIATION: RAB   TECO   SAMPLE PUMP   FLOW RATE (mt. per minute)   FIELD DECONTAINER   SPECIFICATION   SPECIFICATION   SAMPLE OCODE   CONTAINERS   CODE   Volume   CODE   CONTAINERS   CODE   Volume   CODE   CONTAINERS   CODE   CODE   CODE   CONTAINERS   CODE   CODE						-			-		-		
PUMP OR TUBING DEPTH IN WELL (feet): 17.3 SAMPLE PUMP FLOW RATE (mL per minute): 727 TUBING MATERIAL CODE: PE/S  FIELD DECONTAMINATION: Y	TUBING INSIDE DIA.	CAPACITY (Gal./FI	ON:	3/16" = 0.0014	: 1/4" = 0.0026; SAMPLER(S) S	SAMPL IGNATURES:				110	SAMPLING SENDED AT: 1	2:05	
FIELD DECONTAMINATION: Y N FIELD-FILTERED: TYPE N FILTER SIZE: PM DUPLICATE: Y N M  SAMPLE CONTAINER SPECIFICATION  SAMPLE PRESERVATION  SAMPLE PRESERVATION  SAMPLE PRESERVATION  SAMPLE PRESERVATION  SAMPLE PRESERVATION  SAMPLE PRESERVATION  FINAL PH  MATERIAL CODE  VOLUME  WE DOWN METHOD  ANALYSIS AND/OR METHOD  CODE  ONE  CODE  WOLUME  WE DOWN METHOD  ANALYSIS AND/OR METHOD  ANALYSIS AND/OR METHOD  ANALYSIS AND/OR METHOD  ANALYSIS AND/OR METHOD  FINAL PH  ANALYSIS AND/OR METHOD  FINAL PH  ANALYSIS AND/OR METHOD  ANALYSIS AND/OR METHOD  FINAL PH  ANALYSIS AND/OR METHOD  ANALYSIS AND/OR METHOD  CODE  WE DOWN METHOD  ANALYSIS AND/OR METHOD  ANALYSIS AND/OR METHOD  ANALYSIS AND/OR METHOD  FINAL PH  ANALYSIS AND/OR METHOD  ANALYSIS AND/OR METHOD  ANALYSIS AND/OR METHOD  FINAL PH  ANALYSIS AND/OR METHOD  FINAL PH  ANALYSIS AND/OR METHOD	PUMP OR TUBING	15.		1,200				727	TUBING MATERIAL CODE	. PF	1706		
SAMPLE CONTAINER SPECIFICATION SAMPLE PRESERVATION SAMPLE PRESERVATION SAMPLEID CODE CONTAINERS CODE VOLUME PRESERVATIVE USED ADDED IN FIELD (mil) ph METHOD  @Ino-500 1 PE 500ml NONE NONE NONE N/A Inorganics PP  @Met-250 2 PE 250ml HNO3 1ml <2 Metals PP	The state of the s					de la				Part Track Street and			
SAMPLEID CODE CONTAINERS CODE VOLUME PRESERVATIVE USED ADDED IN FIELD (ml) (n) PH ADDED IN FIELD (ml) (ml) (ml) (ml) (ml) (ml) (ml) (ml)	( IEED BEGOIVIAN	SAMPLE CON	TAINER		Filtration Equipm	ment rype.		77-20	INTE	DISTRICT OF THE	1		
@Ino-500 1 PE 500ml NONE NONE N/A Inorganics PP  @Met-250 2 PE 250ml HNO3 1ml <2 Metals PP		SPECIFICA #		Limitum	PRESERVATIVE			FINAL	ANALYSI	S AND/OR	EQU	EQUIPMENT	
@Met-250 2 PE 250ml HNO3 1ml <2 Metals PP	SAMPLEID CODE	CONTAINERS	CODE	VOLUME	USED	ADDEDI	N FIELD (ml) (1)	pH	ME	HOD	-	ODE	
@Met-250 2 PE 250ml HNO3 1ml <2 Metals PP	OI 500		DE	5001	NONE		IONE	NVA	Inore	anice		DD	
	@ino-500	1	PE	Suumi	NONE		NOINE	N/A	morg	janics			
	@Met-250	2	PE	250ml	HNO3		1ml	<2	Me	etals		PP	
										-X			
			L. rover					-					
											1		
REMARKS:		N.A. S.L.A. S.	ET NUMBER	7									
(1) Sample bottles pre-preserved at laboratory prior to sample collection.							Confirmed A	000-					
MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = PolyethMene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)  SAMPLING/PURGING  APP = After Peristablic Pump; B = Balder, BP = Bladder Pump; ESP = Electric Submirsable Pump; PP = Peristablic Pump  ESP = Description: Code Code Code Code Code Code Code Code													

NOTES: 1. The above do not constitute all of the information requierd by Chapter 62-160, F.A.C.

<sup>2.</sup> STABILIZATION CRITERIA FOR RANGE OF VARIATION OF LAST THREE CONSECUTIVE READINGS (SEE FS 2212. SECTION 3)
pH: ± 0.2 units Temperature: ± 0.2 ℃ Specific Conductance: ±5% Dissolved Oxygen:all readings ≤ 20% saturation (see Table FS 2200-2); optionally, ± 0.2 mg/L or ±10% (whichever is greater) Turbidity:all readings ≤ 20 NTU; optionally ± 5 NTU or 10% (whichever is greater)

## **GROUNDWATER SAMPLING LOG**

SITE NAME:		Big Be	end			SITE LOCATION:	A 100 IS	Apollo	Beach, FL.		
WELL NO:	В	BS-CCR-2			SAMPLE ID	VIII II II II II I	0013-02		DATE:	4/13/17	
		THE REAL PROPERTY.				ING DATA					
WELL DIAMETER (inches	s)	TUBING DIAMETER (inc	thes) 1/4	WELL SCREEN IN DEPTH 11.84		21.84 (feet)	STATIC DEPTH TO WATER (fee	7.15	PURGE PUMP T OR BAILER:	YPE PP	
WELL VOLUME P	URGE:	1 WELL VO	LUME = (TOT.	AL WELL DEPTH -	STATIC DE	PTH TO WATER)	X WELL CA	PACITY			
Programme and the second		2 0020	= (	Termine contract	feet -		feet) x	TILL FLOWER	gallons/foo	t =	gallons
EQUIPMENT VOL (only fillout if applic	cable)	1 EQ		. = PUMP VOLUM				2227			0.12 gallons
INITIAL PUMP OR	TURING		EINAL PUMP	OR TUBING	gallons + (	0.0026 gall	-		1)+ 0.06	gallons =	ME
INITIAL PUMP OR DEPTH IN WELL (	feet): 16.8	4 COMOL.	FINAL PUMP DEPTH IN W	ELL (feet): 16	.84	PURGING INITIATED AT:		PURGING ENDED AT: DISSOLVED	11:27	PURGED (gal	lons): 1.58
TIME	VOLUME PURGED (GALLONS)	VOLUME PURGED (GALLONS)	PURGE RATE (GPM)	TO WATER (FEET)	pH (standard units)	TEMP. (°C)	COND. (µmhos/cm OR µS/cm)	OXYGEN (circle mg/lor % saturation)	TURBIDITY (NTUs)	COLOR (describe)	ODOR (describe)
11:23	0.95	0.95	0.16	7.28	6.92	23.89	1514	0.10	2.52	YELLOW	NONE
11:25	0.31	1.26	0.16	7.29	6.94	23.96	1531	0.08	3.08	YELLOW	NONE
11:27	0.32	1.58	0.16	7.30	6.93	23.95	1543	0.04	3.43	YELLOW	NONE
SAMPLED BY (PF	RINT) / AFFILIAT RAI	ION: B	3/16" = 0,0014	SAMPLER (S) SIGNAMPLE PUMP FLOW RATE (mL	ENATURES:	ING DATA	1/2" = 0.0 593	SAMPLING INITIATED AT: TUBING MATERIAL COD	11:27		11:33
FIELD DECONTAI	MINATION:	Y D N D		FIELD-FILTERED Filtration Equipme	nt Type.	N E FILT	ER SIZE:	μm	DUPLICATE:	Y D NE	2
	SAMPLE CO SPECIFIC			The same of the sa		ESERVATION	7 0107		NDED	SAMPLING	
SAMPLE ID CODE	#	MATERIAL CODE	VOLUME	PRESERVATIVE USED		TÁL VOL. N FIELD (ml) (1)	FINAL pH		IS AND/OR THOD	EQUIPMENT CODE	
@Ino-500	1	PE	500ml	NONE		ONE	N/A	Inorg	ganics	PP	
@Met-250	2	PE	250ml	HNO3		1ml	<2	Me	etals		PP
@Rad-1L	2	PE	11,	HNO3		5ml	<2	Radio	logicals		PP
REMARKS: (1) Sample bo	ottles pre-pre	served at lab	oratory pric	or to sample co	llection.						
MATERIAL CODE SAMPLING/PURGI			= Clear Glass taltic Pump; B	PE = Polyeth Baller; BP = Blad	4-7-4-7 Page 1	P = Polypropylene SP = Electric Subm				ecify)	

NOTES: 1. The above do not constitute all of the information requierd by Chapter 62-160, F.A.C.

<sup>2.</sup> STABILIZATION CRITERIA FOR RANGE OF VARIATION OF LAST THREE CONSECUTIVE READINGS (SEE FS 2212. SECTION 3) pH:  $\pm$  0.2 units Temperature:  $\pm$  0.2 °C Specific Conductance:  $\pm$  5% Dissolved Oxygen: all readings  $\pm$  20% saturation (see Table FS 2200-2); optionally,  $\pm$  0.2 mg/L or  $\pm$  10% (whichever is greater) Turbidity: all readings  $\pm$  20 NTU; optionally  $\pm$  5 NTU or 10% (whichever is greater)

## **GROUNDWATER SAMPLING LOG**

NAME:		Big B	end			LOCATION:		Apollo	Beach, FL.			
WELL NO:	В	BS-CCR-3	3		SAMPLE ID:	L170	0013-03		DATE:	4/13/17		
						NG DATA						
WELL DIAMETER (inches	)	TUBING DIAMETER (inc		WELL SCREEN IN DEPTH 13.23	feet to	23.23 (feet)	STATIC DEF TO WATER		PURGE PUMP T OR BAILER:	YPE PP		
WELL VOLUME PL (only fillout if application)	JRGE: able)		=(	AL WELL DEPTH -	feet -	ol other N	feet) x		gallons/fo	ot =	gallons	
EQUIPMENT VOLU (only fillout if application)	JME PURGE: able)	1 EQ	JIPMENT VOL	= PUMP VOLUM 0		0.0026 gallo		3TH) + FLOW CE 24.23 fe		gallons =	0.12 gallons	
INITIAL PUMP OR DEPTH IN WELL (f	TUBING eet): 18.23		FINAL PUMP DEPTH IN W	OR TUBING	.23	PURGING INITIATED AT:		PURGING ENDED AT:		TOTAL VOLUM PURGED (gallo	E	
TIME	VOLUME PURGED (GALLONS)	VOLUME PURGED (GALLONS)	PURGE RATE (GPM)	DEPTH TO WATER (FEET)	pH (standard units)	TEMP, (°C)	COND. (µmhos/cm OR µS/cm)	OXYGEN (circle@gl) or % saturation)	TURBIDITY (NTUs)	COLOR (describe)	ODOR (describe)	
10:54	0.85	0.85	0.11	7.62	6.48	24.31	1632	0.11	4.98	LT, YELLOW	MODERATE	
10:56	0.21	1.06	0.11	7.61	6.46	24.34	1622	0.13	4.47	LT, YELLOW	MODERATE	
11:00	0.41	1.47	0.10	7.61	6.49	24.27	1585	0.14	4.22	LT. YELLOW	MODERATE	
											1	
3	-										_	
SAMPLED BY (PR	INT)/AFFILIATIO		TECO			ING DATA			1:00	SAMPLING ENDED AT:	1:11	
PUMP OR TUBING DEPTH IN WELL (f	eet): 18.2		1.00	SAMPLE PUMP FLOW RATE (mL	ner minute):	Y	397	TUBING MATERIAL COD	E: PE	/S		
FIELD DECONTAM	O / Print No. 2	O N O		FIELD-FILTERED Filtration Equipme			ER SIZE:	μm	DUPLICATE:	Y N V	]	
The second	SAMPLE CON	TAINER		Filtration Equipme		ESERVATION	7.4 0.0	INTE	NDED		IPLING	
SAMPLE ID CODE	SPECIFICA # CONTAINERS	MATERIAL CODE	VOLUME	PRESERVATIVE USED	TO	TAL VOL. N FIELD (ml) (1)	FINAL pH	ANALYS	IS AND/OR THOD	EQUI	PMENT ODE	
@Ino-500	1	PE	500ml	NONE		IONE	N/A	Inor	ganics		PP	
Bine see			0001111									
@Met-250	2	PE	250ml	HNO3		1ml	<2	Me	etals		PP	
@Rad-1L	2	PE	1L	HNO3		5ml	<2	Radio	logicals		PP	
REMARKS	Waa aya 434	aniad at let			Mostina							
(1) Sample bo  MATERIAL CODE: SAMPLING/PURGIN EQUIPMENT CODE:	G: AG = Ambe	r Glass; CG	= Clear Glass		ylene; PF	P = Polypropylene				ecify)		

NOTES:

<sup>1.</sup> The above do not constitute all of the information requierd by Chapter 62-160, F.A.C.

<sup>2.</sup> STABILIZATION CRITERIA FOR RANGE OF VARIATION OF LAST THREE CONSECUTIVE READINGS (SEE FS 2212. SECTION 3)

pH; ± 0.2 units Temperature; ± 0.2 °C Specific Conductance: ± 5% Dissolved Oxygen: all readings ≤ 20% saturation (see Table FS 2200-2);

optionally, ± 0.2 mg/L or ± 10% (whichever is greater) Turbidity: all readings ≤ 20 NTU; optionally ± 5 NTU or 10% (whichever is greater)

# **GROUNDWATER SAMPLING LOG**

SITE NAME:		Big Be	end			SITE LOCATION:		Apollo	Beach, FL.			
WELL NO:	BBS	-CCR-BW			SAMPLE ID:	L171	D013-04		DATE:	4/13/17		
					PURGI	NG DATA	79.7-7			22/24/01		
WELL DIAMETER (inches	)	TUBING DIAMETER (inc		WELL SCREEN IN DEPTH 34.30	feet to		STATIC DEP TO WATER (		PURGE PUMP T OR BAILER:	ESP_		
WELL VOLUME PL (only fillout if application	JRGE: able)	1 WELL VO	LUME = (TOT/	AL WELL DEPTH -	STATIC DEP	TH TO WATER)	feet ) x	PACITY	gallons/foo	ot =	gallons	
EQUIPMENT VOLU	JME PURGE:	1 EQU	JIPMENT VOL	. = PUMP VOLUME		CAPACITY X		TH) + FLOW CE				
only fillout if applica	able)		=(	0	gallons + (	0.0026 gall			et)+ 0.06	gallons =	0.32 gallons	
INITIAL PUMP OR DEPTH IN WELL (f	TUBING eet): 39.30		FINAL PUMP DEPTH IN W	ELL (feet): 39.	30	PURGING INITIATED AT:	10:16	PURGING ENDED AT:	10:29	TOTAL VOLUM PURGED (gall	ME ons): 8.7	
TIME	VOLUME PURGED (GALLONS)	VOLUME PURGED (GALLONS)	PURGE RATE (GPM)	TO WATER (FEET)	pH (standard units)	TEMP. (°C)	COND. (µmhos/cm OR µS/cm)	DISSOLVED OXYGEN (circle mg/Ler % saturation)	TURBIDITY (NTUs)	COLOR (describe)	ODOR (describe)	
10:25	6.06	6.06	0.67	31.68	6.50	27.27	4967	0.48	5.48	CLEAR	NONE	
10:27	1.32	7.38	0.66	31.69	6.50	27.21	4989	0.45	3.81	CLEAR	NONE	
10:29	1.32	8.70	0.66	31.70	6.50	27.20	5005	0.41	3.60	CLEAR	NONE	
WELL CAPACITY (		0.75" = 0.02 1./Ft.): 1/8" = 0.00	and the same of th		0.0026:	5/16" = 0.004:	3/8" = 0.00		= 1.02; 6" = 1 010; 5/8	1.47; 12" = " = 0.016	= 5.88	
SAMPLED BY (PR	INT)/AFFILIATI		TECO	SAMPLER (S) SIG		ING DATA	`	SAMPLING INITIATED AT: 1(	0:29	SAMPLING ENDED AT:	0:32	
PUMP OR TUBINO DEPTH IN WELL (			1,200	SAMPLE PUMP FLOW RATE (mL	per minute):	2	2517	TUBING MATERIAL CODI	E: P	E		
FIELD DECONTAN	The research of the last	Y D N V		FIELD-FILTERED	: vП		ER SIZE:	μm	DUPLICATE:	Y D NE	2	
rices occontinu	SAMPLE CO	NTAINER		Filtration Equipme		ESERVATION		INTE	ENDED		MPLING	
SAMPLE ID CODE	# CONTAINERS	MATERIAL	VOLUME	PRESERVATIVE USED	то	TAL VOL. N FIELD (ml) (1)	FINAL pH		IS AND/OR THOD		JIPMENT CODE	
C) 500		DE.	500ml	NONE		IONE	N/A	Inon	ganics		ESP	
@Ino-500	1	PE	500111	NONE		ONL	N/A	110	garnoo			
@Met-250	2	PE	250ml	HNO3		1ml	<2	Me	etals		ESP	
@Rad-1L	2	PE	1L	HNO3		5ml	<2	Radio	ologicals		ESP	
										13.00		
REMARKS: (1) Sample bo	ottles pre-pre	served at lab	oratory pri	or to sample co	ollection.							
MATERIAL CODE	S: AG = Amb	er Glass; CC	G = Clear Glass	; PE = Polyeth	ylene; Pi	P = Polypropylen				ecify)		
SAMPLING/PURGII EQUIPMENT CODE	NG IS:	APP = After Peris RFPP = Reverse	staltic Pump; B Flow Peristaltic	= Bailer; BP = Blac Pump; SM = Straw	der Pump; E: Method (tubin	SP = Electric Sub- g Gravity Drain);	VT = Vacuum	Trap; O = Other (Sp	mp pecify)			

NOTES: 1. The above do not constitute all of the information requierd by Chapter 62-160, F.A.C.

<sup>2.</sup> STABILIZATION CRITERIA FOR RANGE OF VARIATION OF LAST THREE CONSECUTIVE READINGS (SEE FS 2212. SECTION 3) pH: ± 0.2 units Temperature: ± 0.2 °C Specific Conductance: ± 5% Dissolved Oxygen: all readings ≤ 20% saturation (see Table FS 2200-2); optionally, ± 0.2 mg/L or ± 10% (whichever is greater) Turbidity: all readings ≤ 20 NTU; optionally ± 5 NTU or 10% (whichever is greater)

# **GROUNDWATER SAMPLING LOG**

ITE AME: /ELL NO:	BBS	-CCR-BW										
		-OOIL DI	1-2		SAMPLE ID:	L170	013-05		DATE:	4/13/17		
						NG DATA						
VELL NAMETER (inches)		TUBING DIAMETER (inc	hes) 1/4	WELL SCREEN IN DEPTH 13.64	feet to	23.34 (feet)			PURGE PUMP T OR BAILER:	YPE PP		
VELL VOLUME PL	IRGE:	1 WELL VO	LUME = (TOTA	L WELL DEPTH-	STATIC DEP	TH TO WATER)	X WELL CA	PACITY				
		a finan	= (		feet -		feet ) x	*** FLOWER	qallons/foc	ot =	gallons	
QUIPMENT VOLU		1 EQI	JIPMENT VOL.	= PUMP VOLUME							0.10	
AND A COURSE SEE			=(	0		0.0026 gallo		24.64 fe	et)+ 0.06	gallons = TOTAL VOLUM	0.12 gallons	
NITIAL PUMP OR T EPTH IN WELL (fo	TUBING set): 18.49		FINAL PUMP DEPTH IN WE	ELL (feet): 18	49	PURGING INITIATED AT:	9:34	ENDED AT:	9:57	PURGED (gallo	ns): 2.4	
TIME	VOLUME PURGED (GALLONS)	VOLUME PURGED (GALLONS)	PURGE RATE (GPM)	TO WATER (FEET)	pH (standard units)	TEMP. (°C)	COND. (µmhos/cm OR µS/cm)	OXYGEN (circle mg/l or % saturation)	TURBIDITY (NTUs)	COLOR (describe)	ODOR (describe)	
9:53	2.01	2.01	0.11	9.40	6.67	24.83	1475	1.41	14.70	LT. YELLOW	NONE	
9:55	0.21	2,22	0.11	9.41	6.67	24.88	1475	1.37	12.70	LT. YELLOW	NONE	
9:57	0.22	2.44	0.11	9.42	6.67	24.81	1476	1.32	19.00	LT. YELLOW	NONE	
VELL CAPACITY (C									= 1.02; 6" = 1	1,47; 12" = " = 0,016	5.88	
UBING INSIDE DIA	Light of the		0006: 3/16":	= 0.0014; 1/4" =	SAMPL	5/16" = 0.004: ING DATA	3/8" = 0.00	SAMPLING INITIATED AT:	010; 910	SAMPLING ENDED AT:		
AMI CED DI (I II	RAE		TECO	1/1/	Recell	eff		INITIATED AT: 9	:57	ENDED AT:	0:06	
PUMP OR TUBING	eet): 18.5			SAMPLE PUMP FLOW RATE (mL		7	403	TUBING MATERIAL COD	E: PE	/S		
DEPTH IN WELL (F	Control of the Control	YOND		FIELD-FILTERED			ER SIZE:	μm	DUPLICATE:	Y NE		
FIELD DECONTAM	SAMPLE CON	the second second second		Filtration Equipme		ESERVATION		INT	NDED	1	MPLING	
	SPECIFICA	MATERIAL	1	PRESERVATIVE		TAL VOL.	FINAL	ANALYS	IS AND/OR THOD	EQU	EQUIPMENT	
SAMPLEID CODE	# CONTAINERS	CODE	VOLUME	USED	ADDEDII	N FIELD (ml) (11)	pH	ME	THOU		CODE	
@Ino-500	1	PE	500ml	NONE	٨	IONE	N/A	Inor	ganics		PP	
	12 , 12					6.77			Table 1		DD.	
@Met-250	2	PE	250ml	HNO3		1ml	<2		etals		PP PP	
@Rad-1L	2	PE	1L	HNO3	-	5ml	<2	Radio	logicals		FF	
	1 1							4		-		
DEMARKS												
REMARKS: (1) Sample bo	ttles pre-pre	served at lat	oratory pric	or to sample co								
				PE = Polyeth		P = Polypropylene	S = Silic	one: T = Teflor	: O= Other (Spe	a - March		

NOTES:

<sup>1.</sup> The above do not constitute all of the information requierd by Chapter 62-160, F.A.C.

<sup>2.</sup> STABILIZATION CRITERIA FOR RANGE OF VARIATION OF LAST THREE CONSECUTIVE READINGS (SEE FS 2212. SECTION 3)
pH: ± 0.2 units Temperature: ± 0.2 °C Specific Conductance: ± 5% DissolvedOxygen: all readings ≤ 20% saturation (see Table FS 2200-2);
optionally, ± 0.2 mg/L or ± 10% (whichever is greater) Turbidity: all readings ≤ 20 NTU; optionally ± 5 NTU or 10% (whichever is greater)



THE LEADER IN ENVIRONMENTAL TESTING

# **ANALYTICAL REPORT**

TestAmerica Laboratories, Inc.

TestAmerica Tampa 6712 Benjamin Road Suite 100 Tampa, FL 33634

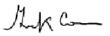
Tel: (813)885-7427

TestAmerica Job ID: 660-80222-1 Client Project/Site: L17D013

#### For:

Tampa Electric Company 5012 Causeway Boulevard Tampa, Florida 33619

Attn: Ms. Peggy Penner



Authorized for release by: 4/28/2017 12:33:58 PM

Keaton Conner, Project Mgmt. Assistant (813)885-7427

keaton.conner@testamericainc.com

.....LINKS .....

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The test results in this report meet all 2003 NELAC and 2009 TNI requirements for accredited parameters, exceptions are noted in this report. This report may not be reproduced except in full, and with written approval from the laboratory. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

Client: Tampa Electric Company Project/Site: L17D013 TestAmerica Job ID: 660-80222-1

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9

11

12

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# **Sample Summary**

Client: Tampa Electric Company Project/Site: L17D013

TestAmerica Job ID: 660-80222-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
660-80222-1	L17D013-01	Water	04/13/17 12:05	04/19/17 13:30
660-80222-2	L17D013-02	Water	04/13/17 11:33	04/19/17 13:30
660-80222-3	L17D013-03	Water	04/13/17 11:11	04/19/17 13:30
660-80222-4	L17D013-04	Water	04/13/17 10:32	04/19/17 13:30
660-80222-5	L17D013-05	Water	04/13/17 10:06	04/19/17 13:30

# **Definitions/Glossary**

Client: Tampa Electric Company

Project/Site: L17D013

TestAmerica Job ID: 660-80222-1

## **Qualifiers**

#### **Metals**

Qualifier	Qualifier Description
Ī	The reported value is between the laboratory method detection limit and the laboratory practical quantitation limit.
1.1	to Product that the account of the control of the bott and detacted

U Indicates that the compound was analyzed for but not detected.

## Glossary

QC

RER

RL RPD

TEF

TEQ

**Quality Control** 

Relative error ratio

Toxicity Equivalent Factor (Dioxin)

Toxicity Equivalent Quotient (Dioxin)

Reporting Limit or Requested Limit (Radiochemistry)

Relative Percent Difference, a measure of the relative difference between two points

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains no Free Liquid
DER	Duplicate error ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision level concentration
MDA	Minimum detectable activity
EDL	Estimated Detection Limit
MDC	Minimum detectable concentration
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit

TestAmerica Tampa

## **Case Narrative**

Client: Tampa Electric Company

Project/Site: L17D013

TestAmerica Job ID: 660-80222-1

Job ID: 660-80222-1

**Laboratory: TestAmerica Tampa** 

Narrative

Job Narrative 660-80222-1

#### Receipt

The samples were received on 4/19/2017 1:30 PM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 2.4° C.

#### Metals

No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

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# **Detection Summary**

Client: Tampa Electric Company

Project/Site: L17D013

TestAmerica Job ID: 660-80222-1

Client Sample ID: L17	7D013-01				Lab Sample ID: 660-80222-1
Analyte	Result Qualifier	PQL	MDL	Unit	Dil Fac D Method Prep Type
Lithium	0.010 I	0.050	0.0010	mg/L	1 200.7 Rev 4.4 Total/NA
Client Sample ID: L17	7D013-02				Lab Sample ID: 660-80222-2
Analyte	Result Qualifier	PQL	MDL	Unit	Dil Fac D Method Prep Type
Lithium	0.013 I	0.050	0.0010	mg/L	1 200.7 Rev 4.4 Total/NA
Client Sample ID: L17	7D013-03				Lab Sample ID: 660-80222-3
Analyte	Result Qualifier	PQL	MDL	Unit	Dil Fac D Method Prep Type
Lithium	0.0063 I	0.050	0.0010	mg/L	1 200.7 Rev 4.4 Total/NA
Client Sample ID: L17	7D013-04				Lab Sample ID: 660-80222-4
Analyte	Result Qualifier	PQL	MDL	Unit	Dil Fac D Method Prep Type
Lithium	0.012	0.050	0.0010	mg/L	1 200.7 Rev 4.4 Total/NA
Client Sample ID: L17	7D013-05				Lab Sample ID: 660-80222-5
Analyte	Result Qualifier	PQL	MDL	Unit	Dil Fac D Method Prep Type
Lithium	0.0034 I	0.050	0.0010	mg/L	1 200.7 Rev 4.4 Total/NA

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## **Client Sample Results**

Client: Tampa Electric Company

Project/Site: L17D013

TestAmerica Job ID: 660-80222-1

Client Sample ID: L17D013-01 Lab Sample ID: 660-80222-1 Date Collected: 04/13/17 12:05 **Matrix: Water** Date Received: 04/19/17 13:30

Method: 200.7 Rev 4.4 - Metals (ICP) Analyte Result Qualifier PQL **MDL** Unit D Prepared Analyzed Dil Fac 04/21/17 10:59 04/27/17 10:53 Lithium 0.010 I 0.050 0.0010 mg/L

Client Sample ID: L17D013-02 Lab Sample ID: 660-80222-2 Date Collected: 04/13/17 11:33 **Matrix: Water** Date Received: 04/19/17 13:30

Method: 200.7 Rev 4.4 - Metals (ICP) Analyte Result Qualifier PQL **MDL** Unit D Prepared Analyzed Dil Fac 0.050 04/21/17 10:59 04/27/17 11:07 Lithium 0.013 I 0.0010 mg/L

Client Sample ID: L17D013-03 Lab Sample ID: 660-80222-3 Date Collected: 04/13/17 11:11 **Matrix: Water** Date Received: 04/19/17 13:30

Method: 200.7 Rev 4.4 - Metals (ICP) Analyte Result Qualifier PQL MDL Unit Prepared Analyzed Dil Fac Lithium 0.0063 I 0.050 0.0010 mg/L 04/21/17 10:59 04/27/17 11:10

Client Sample ID: L17D013-04 Lab Sample ID: 660-80222-4 Date Collected: 04/13/17 10:32 **Matrix: Water** 

Date Received: 04/19/17 13:30

Method: 200.7 Rev 4.4 - Metals (ICP) Analyte Result Qualifier PQL **MDL** Unit D Prepared Analyzed Dil Fac 04/21/17 10:59 04/27/17 11:13 Lithium 0.050 0.0010 mg/L 0.012 I

Lab Sample ID: 660-80222-5 Client Sample ID: L17D013-05 Date Collected: 04/13/17 10:06 **Matrix: Water** 

Date Received: 04/19/17 13:30

Method: 200.7 Rev 4.4 - Metals (ICP) Analyte Result Qualifier **PQL MDL** Unit Prepared Analyzed 0.0010 mg/L 0.050 04/21/17 10:59 04/27/17 11:17 Lithium 0.0034 I

# QC Sample Results

Client: Tampa Electric Company TestAmerica Job ID: 660-80222-1

Project/Site: L17D013

Method: 200.7 Rev 4.4 - Metals (ICP)

Lab Sample ID: MB 400-350739/1-A Client Sample ID: Method Blank **Matrix: Water** Prep Type: Total/NA **Prep Batch: 350739** 

Analysis Batch: 351616 MB MB

Analyte Result Qualifier PQL **MDL** Unit Prepared Analyzed Dil Fac 0.050 04/21/17 10:59 04/27/17 10:01 Lithium 0.0010 U 0.0010 mg/L

Lab Sample ID: LCS 400-350739/2-A **Client Sample ID: Lab Control Sample Matrix: Water** Prep Type: Total/NA **Analysis Batch: 351616** Prep Batch: 350739 Spike LCS LCS %Rec. Added Limits Analyte Result Qualifier Unit D %Rec 85 - 115 Lithium 1.00 1.11 mg/L 111

Lab Sample ID: 400-136677-D-1-B MS **Client Sample ID: Matrix Spike Matrix: Water Prep Type: Total/NA** Analysis Batch: 351616 **Prep Batch: 350739** Sample Sample Spike MS MS %Rec. Result Qualifier Added Result Qualifier Limits Analyte Unit D %Rec Lithium 0.0021 I 1.00 1.08 mg/L 107 70 - 130

Lab Sample ID: 400-136677-D-1-C MSD **Client Sample ID: Matrix Spike Duplicate Matrix: Water** Prep Type: Total/NA Analysis Batch: 351616 **Prep Batch: 350739** Sample Sample Spike MSD MSD %Rec. **RPD** RPD

Analyte Result Qualifier Added Result Qualifier Unit %Rec Limits Limit Lithium 0.0021 I 1.00 1.06 106 70 - 130 mg/L

# **QC Association Summary**

Client: Tampa Electric Company

TestAmerica Job ID: 660-80222-1

Project/Site: L17D013

## **Metals**

## **Prep Batch: 350739**

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
660-80222-1	L17D013-01	Total/NA	Water	200.7	
660-80222-2	L17D013-02	Total/NA	Water	200.7	
660-80222-3	L17D013-03	Total/NA	Water	200.7	
660-80222-4	L17D013-04	Total/NA	Water	200.7	
660-80222-5	L17D013-05	Total/NA	Water	200.7	
MB 400-350739/1-A	Method Blank	Total/NA	Water	200.7	
LCS 400-350739/2-A	Lab Control Sample	Total/NA	Water	200.7	
400-136677-D-1-B MS	Matrix Spike	Total/NA	Water	200.7	
400-136677-D-1-C MSD	Matrix Spike Duplicate	Total/NA	Water	200.7	

## **Analysis Batch: 351616**

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
660-80222-1	L17D013-01	Total/NA	Water	200.7 Rev 4.4	350739
660-80222-2	L17D013-02	Total/NA	Water	200.7 Rev 4.4	350739
660-80222-3	L17D013-03	Total/NA	Water	200.7 Rev 4.4	350739
660-80222-4	L17D013-04	Total/NA	Water	200.7 Rev 4.4	350739
660-80222-5	L17D013-05	Total/NA	Water	200.7 Rev 4.4	350739
MB 400-350739/1-A	Method Blank	Total/NA	Water	200.7 Rev 4.4	350739
LCS 400-350739/2-A	Lab Control Sample	Total/NA	Water	200.7 Rev 4.4	350739
400-136677-D-1-B MS	Matrix Spike	Total/NA	Water	200.7 Rev 4.4	350739
400-136677-D-1-C MSD	Matrix Spike Duplicate	Total/NA	Water	200.7 Rev 4.4	350739

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Client: Tampa Electric Company

Project/Site: L17D013

Client Sample ID: L17D013-01

Date Collected: 04/13/17 12:05 Date Received: 04/19/17 13:30

Lab Sample ID: 660-80222-1

Matrix: Water

	Batch	Batch		Dil	Initial	Final	Batch	Prepared		
Prep Type	Type	Method	Run	Factor	Amount	Amount	Number	or Analyzed	Analyst	Lab
Total/NA	Prep	200.7			50 mL	50 mL	350739	04/21/17 10:59	DN1	TAL PEN
Total/NA	Analysis	200.7 Rev 4.4		1			351616	04/27/17 10:53	SEH	TAL PEN
	Instrumer	nt ID: 6500 ICP Duc	)							

Client Sample ID: L17D013-02 Lab Sample ID: 660-80222-2 **Matrix: Water** 

Date Collected: 04/13/17 11:33

Date Received: 04/19/17 13:30

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	200.7			50 mL	50 mL	350739	04/21/17 10:59	DN1	TAL PEN
Total/NA	Analysis	200.7 Rev 4.4		1			351616	04/27/17 11:07	SEH	TAL PEN
	Instrumer	nt ID: 6500 ICP Duo								

Client Sample ID: L17D013-03 Lab Sample ID: 660-80222-3 **Matrix: Water** 

Date Collected: 04/13/17 11:11

Date Received: 04/19/17 13:30

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	200.7			50 mL	50 mL	350739	04/21/17 10:59	DN1	TAL PEN
Total/NA	Analysis	200.7 Rev 4.4		1			351616	04/27/17 11:10	SEH	TAL PEN
	Instrumer	nt ID: 6500 ICP Duo								

Lab Sample ID: 660-80222-4 Client Sample ID: L17D013-04

Date Collected: 04/13/17 10:32

Date Received: 04/19/17 13:30

	Batch	Batch		Dil	Initial	Final	Batch	Prepared		
Prep Type	Type	Method	Run	Factor	Amount	Amount	Number	or Analyzed	Analyst	Lab
Total/NA	Prep	200.7			50 mL	50 mL	350739	04/21/17 10:59	DN1	TAL PEN
Total/NA	Analysis	200.7 Rev 4.4		1			351616	04/27/17 11:13	SEH	TAL PEN
	Instrumen	t ID: 6500 ICP Duo								

Client Sample ID: L17D013-05 Lab Sample ID: 660-80222-5 **Matrix: Water** 

Date Collected: 04/13/17 10:06

Date Received: 04/19/17 13:30

	Batch	Batch		Dil	Initial	Final	Batch	Prepared		
Prep Type	Туре	Method	Run	Factor	Amount	Amount	Number	or Analyzed	Analyst	Lab
Total/NA	Prep	200.7			50 mL	50 mL	350739	04/21/17 10:59	DN1	TAL PEN
Total/NA	Analysis	200.7 Rev 4.4		1			351616	04/27/17 11:17	SEH	TAL PEN
	Instrumen	it ID: 6500 ICP Duo								

**Laboratory References:** 

TAL PEN = TestAmerica Pensacola, 3355 McLemore Drive, Pensacola, FL 32514, TEL (850)474-1001

TestAmerica Tampa

**Matrix: Water** 

# **Accreditation/Certification Summary**

Client: Tampa Electric Company

Project/Site: L17D013

TestAmerica Job ID: 660-80222-1

## **Laboratory: TestAmerica Tampa**

The accreditations/certifications listed below are applicable to this report.

	Authority	Program	EPA Region	Identification Number	Expiration Date
l	Florida	NELAP	4	E84282	06-30-17

# Laboratory: TestAmerica Pensacola

The accreditations/certifications listed below are applicable to this report.

Authority	Program	EPA Region	Identification Number	<b>Expiration Date</b>
Florida	NELAP	4	E81010	06-30-17

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# **Method Summary**

Client: Tampa Electric Company

Project/Site: L17D013

TestAmerica Job ID: 660-80222-1

Method	Method Description	Protocol	Laboratory
200.7 Rev 4.4	Metals (ICP)	EPA	TAL PEN

#### **Protocol References:**

EPA = US Environmental Protection Agency

#### **Laboratory References:**

TAL PEN = TestAmerica Pensacola, 3355 McLemore Drive, Pensacola, FL 32514, TEL (850)474-1001

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#### SUBCONTRACT ORDER

## Tampa Electric Company, Laboratory Services L17D013

SENDING LABORATORY:			RECEIVING LAB	BORATORY:	
Tampa Electric Company, La 5012 Causeway Blvd Tampa, FL 33619 Phone: (813) 630-7490 Fax: (813) 630-7360 Project Manager: Peggy Pe	·		TestAmerica Labo 6712 Benjamin R Tampa, FL 33634 Phone :(813) 885 Fax: -		
Due Date: 04/28/17 1	16:00				
Analysis		Expires	4 11 11 11 11 11 11 11 11 11 11 11 11 11	Laboratory ID	Comments
Sample ID: L17D013-01 Sampled: 04/13/17 12:05	BBS-CCR-1		Water		
Lithium, Total EPA 6010  Containers Supplied: Poly HNO3 - 250mL (B)		10/10/17 12:05			
Sample ID: L17D013-02 Sampled: 04/13/17 11:33	BBS-CCR-2		Water		
Lithium, Total EPA 6010  Containers Supplied: Poly HNO3 - 250mL (B)		10/10/17 11:33			, Z
Sample ID: L17D013-03 Sampled: 04/13/17 11:11	BBS-CCR-3		Water		100: 660 8022:
Lithium, Total EPA 6010  Containers Supplied: Poly HNO3 - 250mL (B)		10/10/17 11:11			
Sample 1D; L17D013-04	BBS-CCR-BW1		Water		÷
Sampled: 04/13/17 10:32  Lithium, Total EPA 6010  Containers Supplied:		10/10/17 10:32			Chain of Custody
Sample ID: L17D013-05 Sampled: 04/13/17 10:06	BBS-CCR-BW2		Water		660-80222 C
Lithium, Total EPA 6010  Containers Supplied:		10/10/17 10:06			======================================

2.8/2.4w.09 - Port 4-19-1701330

Released By

Poly HNO3 - 250mL (B)

Date & Time

Received By

Date & Time

Page 3 of 3 4/28/2017

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N - None
O - Ashaooo
P - Na2O4S
Q - Na2So3
R - Na2So23
S - H2SO4
T - TSP Doterahydrate
U - Acetone
U - Acetone
W - MCAA
W - pH 4-5
Z - other (specify) TestAmerica Special Instructions/Note: loss and subsequence and the state of organized the connection of method, analyte & accreditation compliance upon our subcontract laboratories. This sample shipment is forwarded under chain-of-custody. If the laboratory of method, analyzed, the samples must be shipped back to the TestAmerica laboratories will be provided. Any changes to accreditation status should be brought to TestAmerica aboratories, inc. reservation Codes: A - HCL
B - NaOH
C - Zn Acetate
D - Nintc Acid
F - MeOH
G - Amchlor
H - Ascorbic Acid COC No: 660-95896.1 Page 1 of 1 360-80222-1 - Ice J - Di Water K - EDTA L - EDA Total Number of containers tate of Origin Analysis Requested Florida NELAP - Florida; NELAP - Texas keaton.conner@testamericainc.com Conner, Keaton E-Mail × × × 200.7/200.7 P\_TOT Lithium × Chain of Custody Record Perform MS/MSD (Yes or No) Field Filtered Sample (Yes or No) Water Water Water Preservation Code Water Water Matrix (C=comp, Sample G=grab) Type Eastern 11:33 Eastern 11:11 Eastern 10:32 Eastern 10:06 Eastern Sample Time 12:05 TAT Requested (days): Due Date Requested: 4/26/2017 Sample Date 4/13/17 4/13/17 4/13/17 4/13/17 4/13/17 Project #: 66004821 SSOW# Pione. #OM Client Information (Sub Contract Lab) Sample Identification - Client ID (Lab ID) Phone (813) 885-7427 Fax (813) 885-7049 850-474-1001(Tel) 850-478-2671(Fax) 6712 Benjamin Road Suite 100 restAmerica Laboratories, Inc. 17D013-02 (660-80222-2) .17D013-03 (660-80222-3) .17D013-04 (660-80222-4) 17D013-05 (660-80222-5) 17D013-01 (660-80222-1 3355 McLemore Drive, Tampa, FL 33634 Shipping/Receiving Project Name: L17D013 State, Zip. F.L., 32514 Pensacola

Sample Disposal ( A fee may be assessed if samples are retained longer than 1 month) Possible Hazard Identification

Months

Archive For

943

Unconfirmed			Return To Client	Disposal By Lab
Deliverable Requested: I, II, III, IV, Other (specify)	Primary Deliverable Rank: 2		Special Instructions/QC Requirements:	uirements:
Empty Kit Relinquished by:	Date:	Tu	Time:	Method of Sh
Relinquished by:	Date/1/7 /70C	1700 Company TPA	Received by	
Relinquished by	Date/Time.	Company	Received	
Relinquished by:	Date/Time	Company	Received by.	
On the day of the second No.			Total Tamasta International	Cution

TestAmerica Tampa

# **Login Sample Receipt Checklist**

Client: Tampa Electric Company

Job Number: 660-80222-1

Login Number: 80222 List Source: TestAmerica Tampa

List Number: 1

Creator: Moccia, Vanessa M

orcator. Mocola, Valicosa M		
Question	Answer	Comment
Radioactivity wasn't checked or is = background as measured by a survey meter.</td <td>N/A</td> <td></td>	N/A	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	N/A	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

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# **Login Sample Receipt Checklist**

Client: Tampa Electric Company

Job Number: 660-80222-1

List Number: 80222
List Number: 2
List Source: TestAmerica Pensacola
List Creation: 04/20/17 11:17 AM

Creator: Johnson, Jeremy N

oreator. Johnson, Jeremy N			
Question	Answer	Comment	
Radioactivity wasn't checked or is = background as measured by a survey meter.</td <td>N/A</td> <td></td>	N/A		
The cooler's custody seal, if present, is intact.	True		
Sample custody seals, if present, are intact.	N/A		
The cooler or samples do not appear to have been compromised or tampered with.	True		
Samples were received on ice.	True		
Cooler Temperature is acceptable.	True		
Cooler Temperature is recorded.	True	0.0°C IR2	
COC is present.	True		
COC is filled out in ink and legible.	True		
COC is filled out with all pertinent information.	True		
Is the Field Sampler's name present on COC?	True		
There are no discrepancies between the containers received and the COC.	True		
Samples are received within Holding Time (excluding tests with immediate HTs)	True		
Sample containers have legible labels.	True		
Containers are not broken or leaking.	True		
Sample collection date/times are provided.	True		
Appropriate sample containers are used.	True		
Sample bottles are completely filled.	True		
Sample Preservation Verified.	True		
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True		
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True		
Multiphasic samples are not present.	True		
Samples do not require splitting or compositing.	True		
Residual Chlorine Checked.	N/A		

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### DOH Certification #E84025 DEP COMPOAP # 870251

Report Date: May 1, 2017

TECO

5012 Causeway Blvd. Tampa, FL 33619

Attn: Peggy Penner

Field Custody:

Client

Client/Field ID:

L17D013-01

Sample Collection:

BBS-CCR-1 4-13-17/1205

Lab ID No:

17.4338

Lab Custody Date:

4-18-17/1100

Sample description:

Water

CERTIFICATE OF ANALYSIS

					Analysis		Detection	
Parameter	Units	Re	Results		Date	Method	Limit	
Combined Radium (Radium-226 + Radium 228)	pCi/l	35.8	±	1.7	Calc	Calc	0.7	
Radium-226	pCi/l	33.3	±	1.7	4-25-17/1157	EPA 903.0	0.4	
Radium-228 Alpha Standard: Th-230	pCi/l	2.5	±	0.6	4-26-17/1145	EPA Ra-05	0.7	

James W. Hayes Laboratory Manager

James W. Hages

Test results meet all requirements of the NELAC standards. Statement of estimated uncertainty available upon request. Test results refer only to sample(s) listed. Contact person: Jim Hayes (813) 229-2879.



### DOH Certification #E84025 DEP COMPOAP # 870251

Report Date: May 1, 2017

TECO

5012 Causeway Blvd. Tampa, FL 33619

Attn: Peggy Penner

Field Custody:

Client L17D013-02

Client/Field ID:

BBS-CCR-2

Sample Collection:

4-13-17/1133

Lab ID No:

17.4339

Lab Custody Date:

4-18-17/1100

Sample description:

Water

### CERTIFICATE OF ANALYSIS

					Analysis		Detection
Parameter	Units	Re	sul	ts	Date	Method	Limit
Combined Radium (Radium-226 + Radium 228)	pCi/l	14.2	±	1.1	Calc	Calc	0.7
Radium-226	pCi/l	13.8	±	1.1	4-25-17/1157	EPA 903.0	0.3
Radium-228 Alpha Standard: Th-230	pCi/l	0.4	±	0.5	5-1-17/1153	EPA Ra-05	0.7

James W. Hayes Laboratory Manager

James W. Hages

Test results meet all requirements of the NELAC standards. Statement of estimated uncertainty available upon request. Test results refer only to sample(s) listed. Contact person: Jim Hayes (813) 229-2879.



### DOH Certification #E84025 DEP COMPQAP # 870251

Report Date: May 1, 2017

TECO

5012 Causeway Blvd. Tampa, FL 33619

Attn: Peggy Penner

Field Custody:

Client

Client/Field ID:

L17D013-03

BBS-CCR-3

Sample Collection:

4-13-17/1111

Lab ID No:

17.4340

Lab Custody Date:

4-18-17/1100

Sample description:

Water

#### CERTIFICATE OF ANALYSIS

					Analysis		Detection	
Parameter	Units	Results			Date	Method	Limit	
Combined Radium (Radium-226 + Radium 228)	pCi/l	14.4	±	1.1	Calc	Calc	0.7	
Radium-226	pCi/l	13.3	±	1.1	4-25-17/1157	EPA 903.0	0.3	
Radium-228 Alpha Standard: Th-230	pCi/l	1.1	±	0.6	5-1-17/1153	EPA Ra-05	0.7	

James W. Hayes Laboratory Manager

James W. Hages

Test results meet all requirements of the NELAC standards. Statement of estimated uncertainty available upon request. Test results refer only to sample(s) listed. Contact person: Jim Hayes (813) 229-2879.



### DOH Certification #E84025 DEP COMPQAP # 870251

Report Date: May 1, 2017

TECO

5012 Causeway Blvd. Tampa, FL 33619

Attn: Peggy Penner

Field Custody:

Client

Client/Field ID:

L17D013-04

Sample Collection:

BBS-CCR-4 4-13-17/1032

Lab ID No:

17.4341

Lab Custody Date:

4-18-17/1100

Sample description:

Water

### CERTIFICATE OF ANALYSIS

					Analysis		Detection	
Parameter	Units	Re	esul	ts	Date	Method	Limit	
Combined Radium (Radium-226 + Radium 228)	pCi/l	39.7	±	1.9	Calc	Calc	0.8	
Radium-226	pCi/l	35.9	±	1.9	4-27-17/1048	EPA 903.0	0.3	
Radium-228 Alpha Standard: Th-230	pCi/l	3.8	±	0.7	5-1-17/1153	EPA Ra-05	0.8	

James W. Hayes Laboratory Manager

James W. Hages

Test results meet all requirements of the NELAC standards. Statement of estimated uncertainty available upon request. Test results refer only to sample(s) listed. Contact person: Jim Hayes (813) 229-2879.



### DOH Certification #E84025 DEP COMPQAP # 870251

Report Date: May 1, 2017

TECO

5012 Causeway Blvd. Tampa, FL 33619

Attn: Peggy Penner

Field Custody:

Client

Client/Field ID:

L17D013-05

Sample Collection:

BBS-CCR-BW2 4-13-17/1006

Lab ID No:

17.4342

Lab Custody Date:

4-18-17/1100

Sample description: Water

CERTIFICATE OF ANALYSIS

Parameter  Combined Radium (Radium-226 + Radium 228)	Units	Re	esul	ts	Analysis Date	Method	Detection Limit
(Radium-226 +	pCi/l	4.5	±	0.7	Calc	Calc	0.7
Radium-226	pCi/l	3.9	±	0.7	4-27-17/1048	EPA 903.0	0.4
Radium-228 Alpha Standard: Th-230	pCi/l	0.6	±	0.5	5-1-17/1153	EPA Ra-05	0.7

James W. Hayes Laboratory Manager

James W. Hages

Test results meet all requirements of the NELAC standards. Statement of estimated uncertainty available upon request. Test results refer only to sample(s) listed. Contact person: Jim Hayes (813) 229-2879.

#### SUBCONTRACT ORDER

### Tampa Electric Company, Laboratory Services L17D013

### SENDING LABORATORY:

Tampa Electric Company, Laboratory Services

5012 Causeway Blvd Tampa, FL 33619

Phone: (813) 630-7490 Fax: (813) 630-7360

Project Manager:

Peggy Penner

### RECEIVING LABORATORY:

**KNL Laboratory Services** 3202 N. Florida Ave. Tampa, FL 33603 Phone:(813) 229-2879

Fax: -

**Due Date:** 04/28/17 16:00

Analysis	Expires		Laboratory ID	Comments
Sample ID: L17D013-01 BBS-CCR-1 Sampled: 04/13/17 12:05		Water	17.4338	1 7
Radium 226 EPA 903.0	10/10/17 12:05		Level 2 Data requred	
Radium 226+228, Total	10/10/17 12:05		Level 2 Data requred	
Radium 228 Ra-05	10/10/17 12:05		Level 2 Data requred	
Containers Supplied: RAD Poly HNO3 - 1000mL (C)	RAD Poly HNO3 - 1000	0mL (D)		
Sample ID: L17D013-02 BBS-CCR-2 Sampled: 04/13/17 11:33	,	Water	17.4339	
Radium 226 EPA 903.0	10/10/17 11:33		Level 2 Data requred	
Radium 226+228, Total	10/10/17 11:33		Level 2 Data requred	
Radium 228 Ra-05	10/10/17 11:33		Level 2 Data requred	
Containers Supplied: RAD Poly HNO3 - 1000mL (C)	RAD Poly HNO3 - 1000	OmL (D)		
Sample ID: L17D013-03 BBS-CCR-3 Sampled: 04/13/17 11:11		Water	17.4340	<u> </u>
Radium 226+228, Total	10/10/17 11:11		Level 2 Data requred	
Radium 226 EPA 903.0	10/10/17 11:11		Level 2 Data requred	
Radium 228 Ra-05	10/10/17 11:11		Level 2 Data requred	in,
Containers Supplied:				
RAD Poly HNO3 - 1000mL (C)	RAD Poly HNO3 - 1000	0mL (D)		
Sample ID: L17D013-04 BBS-CCR-BV Sampled: 04/13/17 10:32	V1	Water	17.4341	
Radium 226 EPA 903.0	10/10/17 10:32		Level 2 Data requred	
Radium 226+228, Total	10/10/17 10:32		Level 2 Data requred	6
Radium 228 Ra-05	10/10/17 10:32		Level 2 Data requred	U L
Containers Supplied: RAD Poly HNO3 - 1000mL (C)	RAD Poly HNO3 - 1000	0mL (D)		

Date & Time

Date & Time Released By Date & Time Received By

### SUBCONTRACT ORDER

### Tampa Electric Company, Laboratory Services L17D013

Analysis	Expires	Laboratory ID Comments
Sample ID: L17D013-05 BBS-CCR Sampled: 04/13/17 10:06	-BW2 Water	17.4342
Radium 228 Ra-05	10/10/17 10:06	Level 2 Data requred
Radium 226 EPA 903.0	10/10/17 10:06	Level 2 Data requred
Radium 226+228, Total	10/10/17 10:06	Level 2 Data requred
Containers Supplied:		
RAD Poly HNO3 - 1000mL (C)	RAD Poly HNO3 - 1000mL (D)	

Received By

Date & Time

Released By Date & Time Date & Time Received By



QC Summary: Total Rac	dium Analysis	•	
Client Project #:L17	D013		
Analysis Completion Date:	41 251 17		4
Precision Data:  Sample Analysis (pCi/l)	Sample #:  Duplicate Analysis (pCi/l)  4-1	Range (pCi/l)	RPD (%)
Spike Data:  Sample Analysis (pCi/l)	Sample #:  Spike Added (pCi/l) Analyti	(7, 4250 cal Result (pCi/l)	
LCS Data:  Analytical Result (pCi/l)	True Value (pCi/l)	1.70	ecovery
Lab Blank:  Lab Blank	Analytical Result (pCi		lysis Date



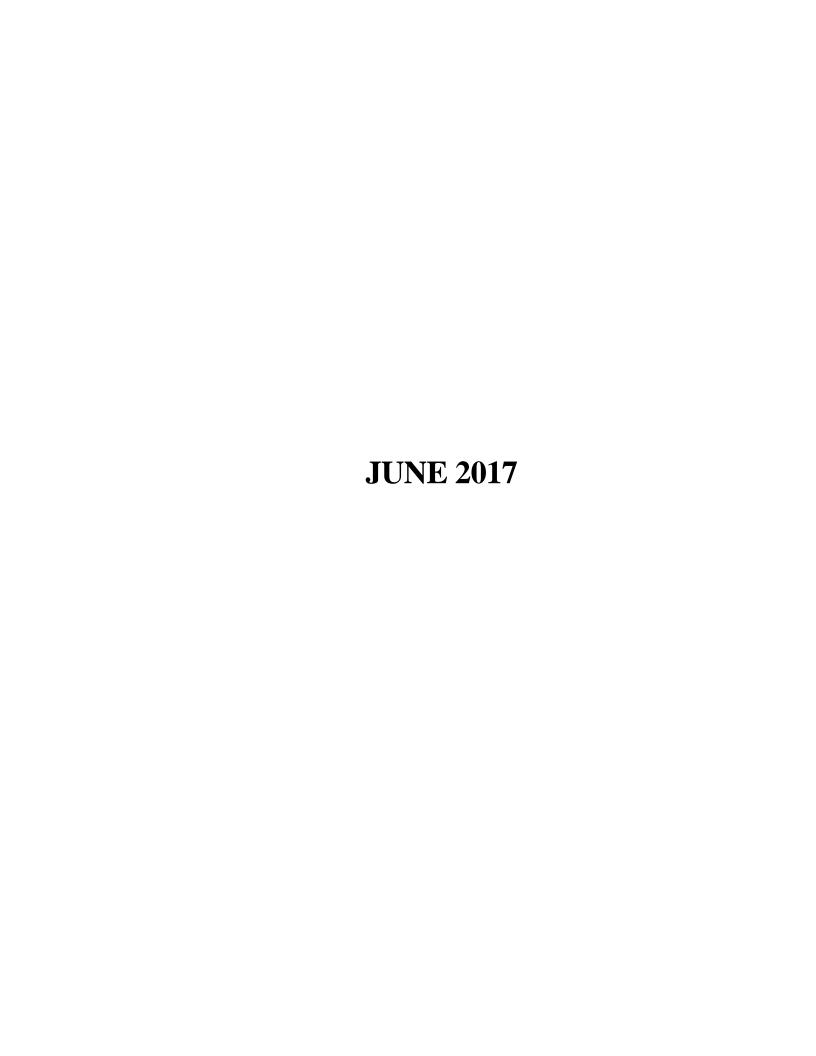
QC Summary: Total Rad	ium Analysis	
Client Project #:L17 D	0/3	
Analysis Completion Date: _	4127117	
Precision Data:	Sample #: _17.4	1342
Sample Analysis (pCi/l)  9.6	0.1	(pCi/l) RPD (%)
Spike Data:	Sample #:	4342
Sample Analysis (pCi/l)  3.9	Spike Added (pCi/l) Analytical Residue 4. S 9. 6	
LCS Data:		
Analytical Result (pCi/l)	True Value (pCi/l)	% Recovery
10.2		101%
Lab Blank:	Analytical Development (COM)	Analogia Davia
Lab Blank	Analytical Result (pCi/l)	Analysis Date  9 / 27 / / 7



QC Summary: Radium 2	28 Analysis		
Client Project #: LI7D	013		,
Analysis Completion Date:	4126117		. *
Precision Data:	Sample #:t	7.4251	
Sample Analysis (pCi/l)		ange (pCi/l)	RPD (%)
Spike Data:	Sample #:	7-4251	
Sample Analysis (pCi/l)	Spike Added (pCi/l) Analytical		Spike Rec (%)
LCS Data:	141		
Analytical Result (pCi/l)	True Value (pCi/l)	<u>% R</u>	ecovery
4.3	4.44		97%
Lab Blank:	Analytical Result (pCi/l)	Anal	lysis Date
Lab Blank	0.1 +1- 02	_4	1 261 17



QC Summary: Radium 2	228 Analysis	2	
Client Project #: L 17	0013		
Analysis Completion Date:	511117		2.4
Precision Data:	Sample #:/	7.4341	
Sample Analysis (pCi/l)	Duplicate Analysis (pCi/l) Ra	ange (pCi/l)	<u>RPD (%)</u>
8.8	8-8	0.0	0.0
Spike Data:	Sample #:(7	1-4341	
Sample Analysis (pCi/l)	Spike Added (pCi/l) Analytical	Result (pCi/l)	Spike Rec (%)
3.8	_3.95 _ 8.	8	127%
LCS Data:			
Analytical Result (pCi/l)	True Value (pCi/l)	% Re	covery
4.2	4.39		6%
Lab Blank:		4.4	
	Analytical Result (pCi/l)		rsis Date
Lab Blank	0.0 +1- 0.2	_ 5	1 1 17





5012 Causeway Blvd Tampa Fl. 33619 \* Ph (813)630-7490 \* Fax (813)630-7360 \* DOH #E54272

Big Bend Power Station Terry Eastley 13031 Wyandott Rd Apollo Beach, FL 33572 tleastley@tecoenergy.com

Work Order - L17F009

**Report Date:** 

07/17/17 11:04

### **Project - CCR Wells Economizer Ash Pond**

### **Case Narrative**

5 sample(s) were received on 06/28/17 15:12.

There were no issues noted with the sample(s) associated with this workorder unless noted below.

Lithiium was subcontracted to TestAmerica Labs. The report is attached.

Rad 226/228 was subcontracted to KNL Laboratories, the report is attached.

#### **EPA 300.0**

The recovery of the matrix spike and spike duplicate for Sulfate was above the control limits due to matrix interference. The parent sample is flagged with a J qualifier.

#### **EPA 6010**

The recovery of the matrixspike and/or spike duplicate for Calcium and Boron could not be accurately determined due to the amount of target analyte in the sample matrix. The parent sample is flagged with a J qualifier.



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### **Sample Information**

Client: Big Bend Power Station

Lab Sample ID: L17F009-01 Sampled By: Robert Barthelette

Sample Description: BBS-CCR-1 Date and Time Collected: 6/28/17 12:45
Sample Collection Method: Grab Date of Sample Receipt: 6/28/17 15:12

### **Laboratory Results**

					Qualifier		Test		Analysis
Parameter	Result	Units	MDL	PQL	Code	Dil	Method	Analyst	Date & Time
	,	Tampa Elec	tric Compa	ny, Labo	ratory Se	rvices			
<b>General Chemistry Parameters</b>									
Chloride	720	mg/L	2.00	50.0		100	EPA 300.0	RFL	6/29/17 17:33
Specific Conductance	4060	umhos/cm	100	100		1	FDEP SOP FT 1200	RAB	6/28/17 12:45
Dissolved Oxygen	0.270	mg/L	0.100	0.100		1	FDEP SOP FT 1500	RAB	6/28/17 12:45
Fluoride	0.208	mg/L	0.0100	0.0500		1	EPA 300.0	RFL	6/29/17 17:23
pH	6.78	pH Units	1.00	1.00		1	FDEP SOP FT 1100	RAB	6/28/17 12:45
REDOX Potential	-80.6	mV	-999	-999		1	SM 2580B	RAB	6/28/17 12:45
Total Dissolved Solids	3140	mg/L	24.0	40.0		2	SM 2540C	TMH	7/3/17 13:19
Sulfate	1120	mg/L	50.0	200		100	EPA 300.0	RFL	7/10/17 13:29
Turbidity	3.63	NTU	0.100	0.100		1	FDEP SOP FT 1600	RAB	6/28/17 12:45
<b>Total Mercury by SW846 Metho</b>	d 7470/7471								
Mercury	0.0500	ug/L	0.0500	0.200	U	1	EPA 7470A	RLC	7/5/17 14:04
<b>Total Recoverable Metals by 200</b>	Series								
Antimony	0.600	ug/L	0.600	2.00	U	1	EPA 200.8	RLC	6/29/17 14:49
Arsenic	9.76	ug/L	0.320	2.00		1	EPA 200.8	RLC	6/29/17 14:49
Cadmium	0.100	ug/L	0.100	0.500	U	1	EPA 200.8	RLC	6/29/17 14:49
Cobalt	0.484	ug/L	0.0400	2.00	I	1	EPA 200.8	RLC	6/29/17 14:49
Lead	8.00E-5	mg/L	8.00E-5	0.00200	U	1	EPA 200.8	RLC	6/29/17 14:49
Selenium	0.756	ug/L	0.200	2.00	I	1	EPA 200.8	RLC	6/29/17 14:49
Thallium	0.100	ug/L	0.100	0.500	U	1	EPA 200.8	RLC	6/29/17 14:49
Total Recoverable Metals by SW	846 Method	6010B							
Barium	0.113	mg/L	0.000500	0.0200		1	EPA 6010B	RLC	6/30/17 8:46
Beryllium	0.200	ug/L	0.200	2.00	U	1	EPA 6010B	RLC	6/30/17 8:46
Boron	16.5	mg/L	0.0100	0.0500		1	EPA 6010B	RLC	6/30/17 8:46
Calcium	569	mg/L	0.0300	1.00		1	EPA 6010B	RLC	6/29/17 13:49
Chromium	1.93	ug/L	1.60	12.0	I	1	EPA 6010B	RLC	6/30/17 8:46
Molybdenum	96.5	ug/L	1.00	20.0	V	1	EPA 6010B	RLC	6/30/17 12:58



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### **Sample Information**

Client: Big Bend Power Station

Lab Sample ID: L17F009-02 Sampled By: Robert Barthelette

Sample Description: BBS-CCR-2 Date and Time Collected: 6/28/17 11:27

Sample Collection Method: Grab Date of Sample Receipt: 6/28/17 15:12

### **Laboratory Results**

					Qualifier		Test		Analysis
Parameter	Result	Units	MDL	PQL	Code	Dil	Method	Analyst	Date & Time
		Tampa Elec	tric Compa	ny, Labo	ratory Se	rvices			
<b>General Chemistry Parameters</b>									
Chloride	105	mg/L	0.200	5.00		10	EPA 300.0	RFL	6/29/17 17:53
Specific Conductance	1480	umhos/cm	100	100		1	FDEP SOP FT 1200	RAB	6/28/17 11:27
Dissolved Oxygen	0.240	mg/L	0.100	0.100		1	FDEP SOP FT 1500	RAB	6/28/17 11:27
Fluoride	0.214	mg/L	0.0100	0.0500		1	EPA 300.0	RFL	6/29/17 17:43
pH	6.87	pH Units	1.00	1.00		1	FDEP SOP FT 1100	RAB	6/28/17 11:27
REDOX Potential	-131	mV	-999	-999		1	SM 2580B	RAB	6/28/17 11:27
Total Dissolved Solids	1080	mg/L	12.0	20.0		1	SM 2540C	TMH	7/3/17 13:19
Sulfate	415	mg/L	5.00	20.0	J-	10	EPA 300.0	RFL	7/10/17 13:39
Turbidity	4.71	NTU	0.100	0.100		1	FDEP SOP FT 1600	RAB	6/28/17 11:27
<b>Total Mercury by SW846 Metho</b>	d 7470/7471								
Mercury	0.0500	ug/L	0.0500	0.200	U	1	EPA 7470A	RLC	7/5/17 14:08
<b>Total Recoverable Metals by 200</b>	<u>Series</u>								
Antimony	0.600	ug/L	0.600	2.00	U	1	EPA 200.8	RLC	6/29/17 14:53
Arsenic	1.01	ug/L	0.320	2.00	I	1	EPA 200.8	RLC	6/29/17 14:53
Cadmium	0.100	ug/L	0.100	0.500	U	1	EPA 200.8	RLC	6/29/17 14:53
Cobalt	0.0875	ug/L	0.0400	2.00	I	1	EPA 200.8	RLC	6/29/17 14:53
Lead	0.000144	mg/L	8.00E-5	0.00200	I	1	EPA 200.8	RLC	6/29/17 14:53
Selenium	0.200	ug/L	0.200	2.00	U	1	EPA 200.8	RLC	6/29/17 14:53
Thallium	0.100	ug/L	0.100	0.500	U	1	EPA 200.8	RLC	6/29/17 14:53
Total Recoverable Metals by SW	846 Method	6010B							
Barium	0.0546	mg/L	0.000500	0.0200		1	EPA 6010B	RLC	6/30/17 8:49
Beryllium	0.200	ug/L	0.200	2.00	U	1	EPA 6010B	RLC	6/30/17 8:49
Boron	3.20	mg/L	0.0100	0.0500		1	EPA 6010B	RLC	6/30/17 8:49
Calcium	173	mg/L	0.0300	1.00		1	EPA 6010B	RLC	6/29/17 13:51
Chromium	1.96	ug/L	1.60	12.0	I	1	EPA 6010B	RLC	6/30/17 8:49
Molybdenum	9.59	ug/L	1.00	20.0	I,V	1	EPA 6010B	RLC	6/30/17 13:00



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### **Sample Information**

Client: Big Bend Power Station

Lab Sample ID: L17F009-03 Sampled By: Robert Barthelette

Sample Description: BBS-CCR-3 Date and Time Collected: 6/28/17 11:00
Sample Collection Method: Grab Date of Sample Receipt: 6/28/17 15:12

### **Laboratory Results**

					Qualifier		Test		Analysis
Parameter	Result	Units	MDL	PQL	Code	Dil	Method	Analyst	Date & Time
		Tampa Elec	tric Compa	ny, Labo	ratory Se	rvices			
<b>General Chemistry Parameters</b>	<u>s</u>								
Chloride	168	mg/L	0.200	5.00		10	EPA 300.0	RFL	6/29/17 18:54
Specific Conductance	1760	umhos/cm	100	100		1	FDEP SOP FT 1200	RAB	6/28/17 11:00
Dissolved Oxygen	0.280	mg/L	0.100	0.100		1	FDEP SOP FT 1500	RAB	6/28/17 11:00
Fluoride	0.338	mg/L	0.0100	0.0500		1	EPA 300.0	RFL	6/29/17 18:24
pH	6.38	pH Units	1.00	1.00		1	FDEP SOP FT 1100	RAB	6/28/17 11:00
REDOX Potential	-125	mV	-999	-999		1	SM 2580B	RAB	6/28/17 11:00
Total Dissolved Solids	1280	mg/L	12.0	20.0		1	SM 2540C	TMH	7/3/17 13:19
Sulfate	493	mg/L	5.00	20.0		10	EPA 300.0	RFL	7/10/17 14:09
Turbidity	0.940	NTU	0.100	0.100		1	FDEP SOP FT 1600	RAB	6/28/17 11:00
<b>Total Mercury by SW846 Meth</b>	nod 7470/7471								
Mercury	0.0500	ug/L	0.0500	0.200	U	1	EPA 7470A	RLC	7/5/17 14:11
Total Recoverable Metals by 20	00 Series								
Antimony	0.600	ug/L	0.600	2.00	U	1	EPA 200.8	RLC	6/29/17 14:57
Arsenic	0.525	ug/L	0.320	2.00	I	1	EPA 200.8	RLC	6/29/17 14:57
Cadmium	0.100	ug/L	0.100	0.500	U	1	EPA 200.8	RLC	6/29/17 14:57
Cobalt	0.119	ug/L	0.0400	2.00	I	1	EPA 200.8	RLC	6/29/17 14:57
Lead	8.00E-5	mg/L	8.00E-5	0.00200	U	1	EPA 200.8	RLC	6/29/17 14:57
Selenium	0.200	ug/L	0.200	2.00	U	1	EPA 200.8	RLC	6/29/17 14:57
Thallium	0.100	ug/L	0.100	0.500	U	1	EPA 200.8	RLC	6/29/17 14:57
<b>Total Recoverable Metals by S</b>	W846 Method	6010B							
Barium	0.0618	mg/L	0.000500	0.0200		1	EPA 6010B	RLC	6/30/17 8:51
Beryllium	0.200	ug/L	0.200	2.00	U	1	EPA 6010B	RLC	6/30/17 8:51
Boron	0.184	mg/L	0.0100	0.0500		1	EPA 6010B	RLC	6/30/17 8:51
Calcium	192	mg/L	0.0300	1.00		1	EPA 6010B	RLC	6/29/17 13:54
Chromium	3.12	ug/L	1.60	12.0	I	1	EPA 6010B	RLC	6/30/17 8:51
Molybdenum	11.9	ug/L	1.00	20.0	I,V	1	EPA 6010B	RLC	6/30/17 13:03



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### **Sample Information**

Client: Big Bend Power Station

Lab Sample ID: L17F009-04 Sampled By: Robert Barthelette

Sample Description: BBS-CCR-BW1 Date and Time Collected: 6/28/17 10:28
Sample Collection Method: Grab Date of Sample Receipt: 6/28/17 15:12

### **Laboratory Results**

					Qualifier		Test		Analysis
Parameter	Result	Units	MDL	PQL	Code	Dil	Method	Analyst	Date & Time
	, .	Tampa Elec	tric Compa	ny, Labo	ratory Se	rvices			
<b>General Chemistry Parameter</b>	<u>·s</u>								
Chloride	995	mg/L	2.00	50.0		100	EPA 300.0	RFL	6/29/17 19:14
Specific Conductance	5010	umhos/cm	100	100		1	FDEP SOP FT 1200	RAB	6/28/17 10:28
Dissolved Oxygen	0.420	mg/L	0.100	0.100		1	FDEP SOP FT 1500	RAB	6/28/17 10:28
Fluoride	0.298	mg/L	0.0100	0.0500		1	EPA 300.0	RFL	6/29/17 19:04
pH	6.47	pH Units	1.00	1.00		1	FDEP SOP FT 1100	RAB	6/28/17 10:28
REDOX Potential	-11.4	mV	-999	-999		1	SM 2580B	RAB	6/28/17 10:28
Total Dissolved Solids	4430	mg/L	48.0	80.0		4	SM 2540C	TMH	7/3/17 13:19
Sulfate	1510	mg/L	50.0	200		100	EPA 300.0	RFL	7/10/17 14:19
Turbidity	0.690	NTU	0.100	0.100		1	FDEP SOP FT 1600	RAB	6/28/17 10:28
<b>Total Mercury by SW846 Met</b>	hod 7470/7471								
Mercury	0.0500	ug/L	0.0500	0.200	U	1	EPA 7470A	RLC	7/5/17 14:22
<b>Total Recoverable Metals by 2</b>	00 Series								
Antimony	0.600	ug/L	0.600	2.00	U	1	EPA 200.8	RLC	6/29/17 15:00
Arsenic	7.68	ug/L	0.320	2.00		1	EPA 200.8	RLC	6/29/17 15:00
Cadmium	0.124	ug/L	0.100	0.500	I	1	EPA 200.8	RLC	6/29/17 15:00
Cobalt	1.71	ug/L	0.0400	2.00	I	1	EPA 200.8	RLC	6/29/17 15:00
Lead	8.00E-5	mg/L	8.00E-5	0.00200	U	1	EPA 200.8	RLC	6/29/17 15:00
Selenium	1.81	ug/L	0.200	2.00	I	1	EPA 200.8	RLC	6/29/17 15:00
Thallium	0.100	ug/L	0.100	0.500	U	1	EPA 200.8	RLC	6/29/17 15:00
<b>Total Recoverable Metals by S</b>	SW846 Method	6010B							
Barium	0.0554	mg/L	0.000500	0.0200		1	EPA 6010B	RLC	6/30/17 8:54
Beryllium	0.200	ug/L	0.200	2.00	U	1	EPA 6010B	RLC	6/30/17 8:54
Boron	51.7	mg/L	0.0100	0.0500		1	EPA 6010B	RLC	6/30/17 8:54
Calcium	781	mg/L	0.0300	1.00		1	EPA 6010B	RLC	6/29/17 13:56
Chromium	2.29	ug/L	1.60	12.0	I	1	EPA 6010B	RLC	6/30/17 8:54
Molybdenum	16.3	ug/L	1.00	20.0	I,V	1	EPA 6010B	RLC	6/30/17 13:06



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### **Sample Information**

Client: Big Bend Power Station

Lab Sample ID: L17F009-05 Sampled By: Robert Barthelette

Sample Description: BBS-CCR-BW2 Date and Time Collected: 6/28/17 10:02
Sample Collection Method: Grab Date of Sample Receipt: 6/28/17 15:12

### **Laboratory Results**

#### Sample Qualifier:

					Qualifier		Test		Analysis
Parameter	Result	Units	MDL	PQL	Code	Dil	Method	Analyst	Date & Time
	ŗ	Tampa Elec	tric Compa	ny, Labo	ratory Se	rvices			
<b>General Chemistry Parameters</b>									
Chloride	135	mg/L	0.200	5.00		10	EPA 300.0	RFL	6/29/17 19:34
Specific Conductance	1540	umhos/cm	100	100		1	FDEP SOP FT 1200	RAB	6/28/17 10:02
Dissolved Oxygen	0.190	mg/L	0.100	0.100		1	FDEP SOP FT 1500	RAB	6/28/17 10:02
Fluoride	0.559	mg/L	0.0100	0.0500		1	EPA 300.0	RFL	6/29/17 19:24
pH	6.64	pH Units	1.00	1.00		1	FDEP SOP FT 1100	RAB	6/28/17 10:02
REDOX Potential	-82.4	mV	-999	-999		1	SM 2580B	RAB	6/28/17 10:02
Total Dissolved Solids	1170	mg/L	12.0	20.0		1	SM 2540C	TMH	7/3/17 13:19
Sulfate	402	mg/L	5.00	20.0		10	EPA 300.0	RFL	7/10/17 14:29
Turbidity	6.09	NTU	0.100	0.100		1	FDEP SOP FT 1600	RAB	6/28/17 10:02
Total Mercury by SW846 Method	17470/7471								
Mercury	0.0500	ug/L	0.0500	0.200	U	1	EPA 7470A	RLC	7/5/17 14:25
<b>Total Recoverable Metals by 200</b>	<u>Series</u>								
Antimony	0.600	ug/L	0.600	2.00	U	1	EPA 200.8	RLC	6/29/17 15:04
Arsenic	1.68	ug/L	0.320	2.00	I	1	EPA 200.8	RLC	6/29/17 15:04
Cadmium	0.100	ug/L	0.100	0.500	U	1	EPA 200.8	RLC	6/29/17 15:04
Cobalt	0.0959	ug/L	0.0400	2.00	I	1	EPA 200.8	RLC	6/29/17 15:04
Lead	8.00E-5	mg/L	8.00E-5	0.00200	U	1	EPA 200.8	RLC	6/29/17 15:04
Selenium	0.386	ug/L	0.200	2.00	I	1	EPA 200.8	RLC	6/29/17 15:04
Thallium	0.100	ug/L	0.100	0.500	U	1	EPA 200.8	RLC	6/29/17 15:04
Total Recoverable Metals by SW	846 Method	6010B							
Barium	0.0488	mg/L	0.000500	0.0200		1	EPA 6010B	RLC	6/30/17 8:56
Beryllium	0.200	ug/L	0.200	2.00	U	1	EPA 6010B	RLC	6/30/17 8:56
Boron	4.54	mg/L	0.0100	0.0500	J-	1	EPA 6010B	RLC	6/30/17 8:56
Calcium	290	mg/L	0.0300	1.00	J-	1	EPA 6010B	RLC	6/29/17 13:59
Chromium	1.68	ug/L	1.60	12.0	I	1	EPA 6010B	RLC	6/30/17 8:56
Molybdenum	10.2	ug/L	1.00	20.0	I,V	1	EPA 6010B	RLC	6/30/17 13:08

### **Comments**

- U Indicates that the compound was analyzed for but not detected.
- J- The reported value is an estimated value, see the case narrative for specifics.
- I Estimated value
- V Analyte detected in the method blank

Laboratory Services certifies that the test result in this report meet all requirements of the NELAC standards, unless indicated otherwise in the body of the report. Unless otherwise noted, all methods followed are per the most current published version of 40 CFR Part 136, Table B. Results reported on this report pertain to the above referenced sample only.



5012 Causeway Blvd Tampa Fl. 33619 \* Ph (813)630-7490 \* Fax (813)630-7360 \* DOH #E54272

**Subcontract Laboratories:** 



5012 Causeway Blvd Tampa Fl. 33619 \* Ph (813)630-7490 \* Fax (813)630-7360 \* DOH #E54272

### Total Recoverable Metals by SW846 Method 6010B - Quality Control

					0.7	-		0/P		DDD	
Analyte	Result	MDL	PQL	Units	Spike Level	Source Result	%Rec	%Rec Limits	RPD	RPD Limit	Qualifier
Batch 17F0185 - EPA 6010B											
Blank (17F0185-BLK1)					Prepared: (	06/29/17 Ar	nalyzed: 06	5/30/17			
Barium	0.000500	0.000500	0.0200	mg/L							U
Beryllium	0.200	0.200	2.00	ug/L							U
Boron	0.0100	0.0100	0.0500	mg/L							U
Calcium	0.0300	0.0300	1.00	mg/L							U
Chromium	1.60	1.60	12.0	ug/L							U
LCS (17F0185-BS1)					Prepared: (	06/29/17 Ar	nalyzed: 06	6/30/17			
Barium	0.997	0.000500	0.0200	mg/L	1.0000		99.7	80-120			
Beryllium	1030	0.200	2.00	ug/L	1000.0		103	80-120			
Boron	1.05	0.0100	0.0500	mg/L	1.0000		105	80-120			
Chromium	996	1.60	12.0	ug/L	1000.0		99.6	80-120			
Matrix Spike (17F0185-MS1)		Sourc	e: L17F00	9-05	Prepared: (	06/29/17 Ar	nalyzed: 06	6/30/17			
Barium	1.01	0.000500	0.0200	mg/L	1.0000	0.0488	96.2	75-125			
Beryllium	994	0.200	2.00	ug/L	1000.0	U	99.4	75-125			
Boron	5.44	0.0100	0.0500	mg/L	1.0000	4.54	90.6	75-125			
Chromium	977	1.60	12.0	ug/L	1000.0	1.68	97.5	75-125			
Matrix Spike Dup (17F0185-MSD1)		Sourc	e: L17F00	9-05	Prepared: (	06/29/17 Ar	nalyzed: 06	6/30/17			
Barium	0.983	0.000500	0.0200	mg/L	1.0000	0.0488	93.4	75-125	2.84	20	
Beryllium	982	0.200	2.00	ug/L	1000.0	U	98.2	75-125	1.28	20	
Boron	5.23	0.0100	0.0500	mg/L	1.0000	4.54	69.7	75-125	3.93	20	J-
Chromium	960	1.60	12.0	ug/L	1000.0	1.68	95.8	75-125	1.77	20	
Batch 17F0216 - EPA 6010B											
Blank (17F0216-BLK1)					Prepared &	z Analyzed:	06/30/17				
Molybdenum	1.12	1.00	20.0	ug/L	1						I



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### Total Recoverable Metals by SW846 Method 6010B - Quality Control

Analyte	Result	MDL	PQL	Units	Spike Level	Source Result	%Rec	%Rec Limits	RPD	RPD Limit	Qualifier
Batch 17F0216 - EPA 6010B											
LCS (17F0216-BS1)					Prepared &	Analyzed:	06/30/17				
Molybdenum	1020	1.00	20.0	ug/L	1000.0		102	80-120			V
Matrix Spike (17F0216-MS1)		Sour	ce: L17F08	1-01RE1	Prepared &	Analyzed:	06/30/17				
Molybdenum	1080	1.00	20.0	ug/L	1000.0	71.6	101	75-125			V
Matrix Spike Dup (17F0216-MSD1)		Sour	ce: L17F08	1-01RE1	Prepared &	Analyzed:	06/30/17				
Molybdenum	1080	1.00	20.0	ug/L	1000.0	71.6	101	75-125	0.0171	20	V



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### Total Mercury by SW846 Method 7470/7471 - Quality Control

Analyte	Result	MDL	PQL	Units	Spike Level	Source Result	%Rec	%Rec Limits	RPD	RPD Limit	Qualifier
Batch 17G0011 - EPA 7470A											
Blank (17G0011-BLK1)					Prepared &	Analyzed:	07/05/17				
Mercury	0.0500	0.0500	0.200	ug/L							U
LCS (17G0011-BS1)					Prepared &	Analyzed:	07/05/17				
Mercury	1.02	0.0500	0.200	ug/L	1.0000		102	80-120			
Matrix Spike (17G0011-MS1)		Sourc	e: L17F00	9-03	Prepared &	Analyzed:	07/05/17				
Mercury	0.956	0.0500	0.200	ug/L	1.0000	U	95.6	75-125			
Matrix Spike Dup (17G0011-MSD1)		Sourc	e: L17F00	9-03	Prepared &	Analyzed:	07/05/17				
Mercury	0.993	0.0500	0.200	ug/L	1.0000	U	99.3	75-125	3.83	20	



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### **Total Recoverable Metals by 200 Series - Quality Control**

Aucher	D 1	MDI	DO.	11.7	Spike	Source	0/P	%Rec	DPD	RPD	01.0
Analyte	Result	MDL	PQL	Units	Level	Result	%Rec	Limits	RPD	Limit	Qualifier
Batch 17F0201 - EPA 200.8											
Blank (17F0201-BLK1)					Prepared &	Analyzed:	06/29/17				
Antimony	0.600	0.600	2.00	ug/L							U
Arsenic	0.320	0.320	2.00	ug/L							U
Cadmium	0.100	0.100	0.500	ug/L							U
Cobalt	0.0400	0.0400	2.00	ug/L							U
Lead	8.00E-5	8.00E-5	0.00200	mg/L							U
Selenium	0.200	0.200	2.00	ug/L							U
Thallium	0.100	0.100	0.500	ug/L							U
LCS (17F0201-BS1)					Prepared &	Analyzed:	06/29/17				
Antimony	101	0.600	2.00	ug/L	100.00		101	85-115			
Arsenic	105	0.320	2.00	ug/L	100.00		105	85-115			
Cadmium	107	0.100	0.500	ug/L	100.00		107	85-115			
Cobalt	107	0.0400	2.00	ug/L	100.00		107	85-115			
Lead	0.105	8.00E-5	0.00200	mg/L	0.10000		105	85-115			
Selenium	107	0.200	2.00	ug/L	100.00		107	85-115			
Thallium	103	0.100	0.500	ug/L	100.00		103	85-115			
Matrix Spike (17F0201-MS1)		Sour	ce: L17F009	9-01	Prepared &	Analyzed:	06/29/17				
Antimony	101	0.600	2.00	ug/L	100.00	U	101	70-130			
Arsenic	102	0.320	2.00	ug/L	100.00	9.76	92.0	70-130			
Cadmium	84.4	0.100	0.500	ug/L	100.00	U	84.4	70-130			
Cobalt	90.3	0.0400	2.00	ug/L	100.00	0.484	89.8	70-130			
Lead	0.0858	8.00E-5	0.00200	mg/L	0.10000	U	85.8	70-130			
Selenium	88.0	0.200	2.00	ug/L	100.00	0.756	87.3	70-130			
Thallium	88.5	0.100	0.500	ug/L	100.00	U	88.5	70-130			
Matrix Spike Dup (17F0201-MSD1)		Sour	ce: L17F009	9-01	Prepared &	Analyzed:	06/29/17				
Antimony	101	0.600	2.00	ug/L	100.00	U	101	70-130	0.0197	20	
Arsenic	102	0.320	2.00	ug/L	100.00	9.76	92.5	70-130	0.487	20	
Cadmium	81.2	0.100	0.500	ug/L	100.00	U	81.2	70-130	3.86	20	
Cobalt	90.3	0.0400	2.00	ug/L	100.00	0.484	89.8	70-130	0.0252	20	
Lead	0.0877	8.00E-5	0.00200	mg/L	0.10000	U	87.7	70-130	2.16	20	
Selenium	90.1	0.200	2.00	ug/L	100.00	0.756	89.4	70-130	2.37	20	
Thallium	89.8	0.100	0.500	ug/L	100.00	U	89.8	70-130	1.47	20	



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### **General Chemistry Parameters - Quality Control**

		) (D)	POL	TT 1.	Spike	Source	0/7	%Rec	DDD	RPD	0 1:0
Analyte	Result	MDL	PQL	Units	Level	Result	%Rec	Limits	RPD	Limit	Qualifier
Batch 17F0214 - EPA 300.0											
Blank (17F0214-BLK1)					Prepared &	Analyzed:	06/29/17				
Chloride	0.0200	0.0200	0.500	mg/L							U
Fluoride	0.0100	0.0100	0.0500	mg/L							U
LCS (17F0214-BS1)					Prepared &	Analyzed:	06/29/17				
Chloride	4.90	0.0200	0.500	mg/L	5.0000		97.9	90-110			
Fluoride	4.90	0.0100	0.0500	mg/L	5.0000		98.1	90-110			
Matrix Spike (17F0214-MS1)		Sour	ce: L17F00	9-02	Prepared &	Analyzed:	06/29/17				
Chloride	155	0.200	5.00	mg/L	50.000	105	99.9	90-110			
Fluoride	54.1	0.100	0.500	mg/L	50.000	0.214	108	90-110			
Matrix Spike Dup (17F0214-MSD1)		Sour	ce: L17F00	9-02	Prepared &	Analyzed:	06/29/17				
Chloride	155	0.200	5.00	mg/L	50.000	105	98.5	90-110	0.457	20	
Fluoride	54.0	0.100	0.500	mg/L	50.000	0.214	108	90-110	0.168	20	
Batch 17G0002 - SM 2540C											
Blank (17G0002-BLK1)					Prepared &	Analyzed:	07/03/17				
Total Dissolved Solids	12.0	12.0	20.0	mg/L	-						U
LCS (17G0002-BS1)					Prepared &	Analyzed:	07/03/17				
Total Dissolved Solids	999	12.0	20.0	mg/L	1000.0		99.9	80-120			
Duplicate (17G0002-DUP1)		Sour	ce: L17F00	9-01	Prepared &	Analyzed:	07/03/17				
Total Dissolved Solids	3110	24.0	40.0	mg/L		3140			1.15	10	



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### **General Chemistry Parameters - Quality Control**

					Spike	Source		%Rec		RPD	
Analyte	Result	MDL	PQL	Units	Level	Result	%Rec	Limits	RPD	Limit	Qualifier
Batch 17G0008 - EPA 300.0											
Blank (17G0008-BLK1)					Prepared &	Analyzed:	07/03/17				
Sulfate	0.500	0.500	2.00	mg/L							U
LCS (17G0008-BS1)					Prepared &	Analyzed:	07/03/17				
Sulfate	4.94	0.500	2.00	mg/L	5.0000		98.7	90-110			
Batch 17G0042 - EPA 300.0											
Blank (17G0042-BLK1)					Prepared &	Analyzed:	07/10/17				
Sulfate	0.500	0.500	2.00	mg/L							U
LCS (17G0042-BS1)					Prepared &	Analyzed:	07/10/17				
Sulfate	4.68	0.500	2.00	mg/L	5.0000		93.7	90-110			
Matrix Spike (17G0042-MS1)		Sour	ce: L17F00	9-02RE1	Prepared &	Analyzed:	07/10/17				
Sulfate	476	5.00	20.0	mg/L	50.000	415	122	90-110			J-
Matrix Spike Dup (17G0042-MSD1)		Sour	ce: L17F00	9-02RE1	Prepared &	Analyzed:	07/10/17				
Sulfate	493	5.00	20.0	mg/L	50.000	415	155	90-110	3.44	20	J-

Tampa Electric Company, Laboratory Services

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Peggy Penner, Manager, Laboratory Services

Laboratory Services certifies that the test result in this report meet all requirements of the NELAC standards, unless indicated otherwise in the body of the report. Unless otherwise noted, all methods followed are per the most current published version of 40 CFR Part 136, Table B. Results reported on this report pertain to the above referenced sample only.

Site:	Big Be		Date:	06/28/17	File Name:		_Wells_RAB	Weather:		udy & Hot	Color	Odor		IGVD
LIMS#	Loction Code	Time	FE <sup>2</sup>	pH (SU)	Temp °C	Cond(uMHOS)	DO Mg/L	Turbidity(NTU) TURB-N-F	Redox (mv)	Sulfite (mg/L) SO3-TR	SCOLOR-W	SODOR-W	Time	LEVEL
	DD0 00D 4	40.45	mg/l	PH	TEMP-C	COND-F	0.27	3.63	-80.60	303-IK	LT. YELLOW	NONE	12:27	
L17F009-01	BBS-CCR-1	12:45		6.78	25.54 25.12	4063.00 1485.00	0.24	4.71	-131.30		YELLOW	MILD	11:09	
L17F009-02	BBS-CCR-2	11:27				3 14 545 1	-	A COMPANY OF THE PARTY OF THE P		252-141 - (2)	40ml Vial (6)	500 mi Nuts (2)	1L Rads Diss. (1)	Total Container
LIMS#	250ml Cyan (3)	1L Inorg (1)	500ml inorg (2)		1L Mtls (1)	250ml Mtls (3)	1L Rads (1)	500ml Sulfide (2)	500ml Mtls (2)	250ml Nuts (3)	40mi Viai (6)	Out mi Nois (2)	TE Raus Diss. (1)	
2111 000 01			1			☑ 2 ☑ 2	= -		0	6			i i	10
	]		1						_	_			Samples On Ice	Sample Reciept
) 1L plastic (PP)		(2) 500ml plastic	-	(3) 250ml plastic		(4) 100ml coliform i	bottle	(5) 1L amber glass (	AG)	(6) 40ml VOA vial	(CG)		Yes No	Time 15:12
SS	0107301Y	ESS	0218201Y	ESS	0307031Y	ESS		ESS		ESS				Temp 2.0
	Preservation			Pres ID		Preservation			Pres ID		Preservation		Pres ID	Temp 2.0
bottles (rads): 5 ml H	NO3 to pH <2			L 012553 🗹		its): 1 ml H2SO4 to p			L L		ide) 2ml NAOH/Zinc			
00 ml bottles (metals):	2 ml HNO3 to pH <2			L D		: 0.5 ml H2SO4 to ph			L L		n) 1g NAOH to pH >			_
50 ml bottles (metal): 1	ml HNO3 to pH <2			L 012553 ☑	1L bottles (diss. r	ads): filtered with 0.4	5um, 5 ml HNO3 to pH	<2	L L	A checked box inc	dicates that the sam			
H Meter Calibration		Buffer ID	Buffer Value	Cal	Time	ICV	Time	CCV	Time	Redox Cal	Time	Temp °C	Reading mv	Theo Value m
eter ID:	MPM08	L 019075A	7	7.01	8:51			7.10	14:58	Meter ID:	9:00	20.1	236.9	237.5
DEP FT 1100		L 018611B	10	10.04	8:51		ond +/- 5%) (DO +/- 0.3		v)	MPM08	15:09	21.2	233.1	236.2
nits: SU		L 018737A	4	3.99	8:51	A checked box inc	dicates ICV / CCV passe			Zobell Sol ID:				
onductivity Meter Ca	lib.	Standard ID	Std Value	Cal	Time	ICV	Time	CCV	Time	L 019150A		7		
leter ID:	MPM08	L 017987C	1000	1000	9:04					DO Meter Cal	Time	Temp °C	Reading mg/l	Theo Value m
DEP FT 1200, Units: u	MHOS	L 018416B	10000			9792	9:09	9830	14:48	Meter ID:	8:42	21.7	8.84	8.812
urbidity Meter Calibra	ation	Standard ID	Std Value	Acceptab	ility Range	ICV	Time	CCV	Time	MPM08	15:19	20.9	9.06	8.932
leter ID:	TM07	L 106722	4.76	4.28	5.24	4.83	8:50		1	Barom. Pres				
DEP FT 1600, Units: N	ITU	L 106723	52.10	48.71	55.49			52.20	14:49	760				
ulfite Info (QC Check	(EPA 377.1)		QC Result mg/l	Time	Titrator ID	Na Thio ID	DO 3 Pillow ID	Starch Ind. ID	lodate/lodide ID	Therm ID	pH	Conduct.( %)	DO (mg/l)	Redox (mv)
C Std: 5ml (NaThio)/5	00ml DI=10mg/L					L	L	L	L	MPM08	0.2	5	0.3	10
urging Information		Well Capacities	s (gallons/ ft): 2"	" = 0.16 4" =0.65		Tubing Inside Dia	m. Capacities Gallons/f	ft): 1/4" =0.0026, 3/8" =	=0.006					
Well #	Diam/ Comp	Screen Interval (ft)	Intake Depth (ft)	Well Depth (ft)	- Depth to Water (R)	= Water Column (#)	X Capacity (gal) =	1 Well Volume (gal)	( Tubing Capacity (galff.)	X Tubing Length )	+ Volume + (gal)	Celf Volume (gal)	1 Egpt. Volume (gal)	
BBS-CCR-1	2	10	17.32	22.32	7.41	14.91	0.16	2.39	0.0026	23.3	0	0.06	0.12	
Purge Meth:	Time	Rate (ml/min)	Volume (gal)	Total Vol. (gal)	Water Depth (ft)	pH (SU)	Temp °C	Cond (uMHOS)	DO (mg/L)	Turbidity (NTU)	Purge Criteria	Status	Equipment ID	Egpt. Table
1A	12:34	550	0.87	0.87	7.58	6.78	25.48	4063	0.38	6.42	ph:+/- 0.2	STABLE	Level Meter:	WLM08
urge Start:	12:36	550	0.29	1.16	7.57	6.77	25.51	4063	0.28	4.58	Temp°C+/- 0.2	STABLE	Pump:	PP
12:28	12:38	550	0.29	1.45	7.57	6.78	25.54	4063	0.27	3.63	Cond % +/- 5	STABLE	Tubing:	PE/S
	12.00	330	0.23	1.40	7.01	0.10	20.01	1			DO % Sat. < 20	STABLE	Dedicated	✓ Yes
urge End: 12:38		1									Turb. NTU < 20	STABLE	Tubing?	□ No
urge Complete A	12.20	Gallons to P	ume 0.12	Stability	Values =	6.78	25.54	4063	0.27	3.63				
		Screen	Intake	Well Depth (ft)	Depth to - Water (ff)	100.00	Well Capacity (gal) =	1 Well Volume (gal)	Tubing	Tubing Length )	Pump + Volume + (gal)	Cell Volume = (gal)	1 Eqpt. Volume (gal)	
Well#	Diam/ Comp	Interval (ft)	Depth (ft)	21.84	6.97	14.87	0.16	2.38	0.0026	22.84	0	0.06	0.12	
BBS-CCR-2	2	10	16.84					Cond (uMHOS)	DO (mg/L)	Turbidity (NTU)	Purge Criteria	Status	Equipment ID	Eqpt. Tabl
urge Meth:	Time	Rate (ml/min)	Volume (gal)	Total Vol. (gal)	Water Depth (it)		Temp °C		1.4.7	7.90	ph:+/- 0.2	STABLE	Level Meter:	WLM08
	11:15	680	1.08	1.08	7.11	6.91	25.15	1478	0.23	5.74	0.0	STABLE	Pump:	PP
1A	11:17	700	0.37	1.45	7.11	6.87	25.07	1493	0.26		Temp*C+/- U.2 Cond % +/- 5	STABLE	Tubing:	PE/S
urge Start:		700	0.37	1.82	7.10	6.87	25.12	1485	0.24	4.71	DO % Sat. < 20		Dedicated	✓ Yes
	11:19											STABLE	Dedicated	
urge Start:	11:19										Trush AITH - OA	CTADLE	Tubine?	No.
urge Start: 11:09		Gallons to F			Values =	6.87	25.12	1485	0.24	4.71	Turb. NTU < 20	STABLE	Tubing?	□ No

Sampler(s) / Initials RAB /TECO Initials 062817 Wells RAB Big Bend 06/28/17 File Name: Weather: Ptly Cloudy & Hot Date: Site: NGVD FE<sup>2</sup> Turbidity(NTU) Redox (mv) Sulfite (mg/L) Color LIMS# Loction Code Time pH (SU) Temp °C Cond(uMHOS) DO Mg/L \$ODOR-W Time LEVEL TEMP-C COND-F DO TURB-N-F REDOX SO3-TR SCOLOR-W mg/l PH MODERATE 10:36 6.38 26.15 1755.00 0.28 0.94 -124.70 YELLOW L17F009-03 BBS-CCR-3 11:00 250ml Nuts (3) 40ml Vial (6) 500 ml Nuts (2) | 1L Rads Diss. (1) **Total Containers** 1L Mtls (1) 250ml Mtls (3) 1L Rads (1) 500ml Sulfide (2) 500ml Mtls (2) LIMS# 250ml Cyan (3) 1L Inorg (1) 500ml Inorg (2) 250ml Inorg (3) 17F009-03 1 Samples On Ice Sample Reciept (3) 250ml plastic (PP) (4) 100ml coliform bottle (5) 1L amber glass (AG) (6) 40ml VOA vial (CG) (2) 500ml plastic (PP) (1) 1L plastic (PP) Yes No Time 15:12 ESS ESS 0107301Y 0218201Y ESS 0307031Y ESS ESS Pres ID Temp 2 Pres ID Preservation Pres ID Preservation Preservation 012553 ☑ 500 ml bottles(Sulfide) 2ml NAOH/Zinc Acet. to pH >12 1L bottles (rads): 5 ml HNO3 to pH <2 250ml bottles (nuts): 1 ml H2SO4 to pH <2 250 ml bottles (Cyan) 1g NAOH to pH >12 40 ml Vial (TOC): 0.5 ml H2SO4 to pH <2 500 ml bottles (metals): 2 ml HNO3 to pH <2 A checked box indicates that the sample was verified to a pH of <2 L 012553 V 1L bottles (diss, rads); filtered with 0.45um, 5 ml HNO3 to pH <2 250 ml bottles (metal): 1 ml HNO3 to pH <2 Temp °C Theo Value my Reading my ICV CCV Time Redox Cal Time Buffer ID Buffer Value Cal Time pH Meter Calibration 20.1 236.9 237.5 019075A 7.10 14:58 Meter ID: 9:00 8:51 MPM08 7 7 Meter ID: 236.2 MPM08 21.2 233.1 018611B QC: (pH +/- 0.2) (Cond +/- 5%) (DO +/- 0.3mg/L) (Redox +/- 10mv) 15:09 FDEP FT 1100 10 10 8:51 Zobell Sol ID: 018737A 8:51 A checked box indicates ICV / CCV passed 4 4 Units: SU L 50A CCV Time Conductivity Meter Calib. Standard ID Std Value Cal Time ICV Time Temp °C Theo Value mg/l DO Meter Cal Time Reading mg/l Meter ID: MPM08 017987C 1000 1000 9:04 018416B 9830 14:48 Meter ID: 8:42 21.7 8.84 8.812 9792 9-09 10000 FDEP FT 1200, Units: uMHOS MPM08 15:19 20.9 9.06 8.932 ICV Time CCV Time Standard ID Std Value Acceptability Range **Turbidity Meter Calibration** 106722 4.28 5.24 4.83 8:50 Barom, Pres 4.76 Meter ID: TM07 106723 48.71 55.49 52.20 14:49 760 FDEP FT 1600, Units: NTU 52.10 Conduct.(%) DO (mg/l) Redox (mv) Therm ID pH Sulfite Info (QC Check) (EPA 377.1) QC Result mg/l Time Titrator ID Na Thio ID DO 3 Pillow ID Starch Ind. ID odate/lodide ID MPM08 0.2 5 0.3 10 QC Std: 5ml (NaThio)/500ml DI=10mg/L Tubing Inside Diam. Capacities Gallons/ft): 1/4" =0.0026 3/8" =0.006 Well Capacities (gallons/ ft): 2" = 0.16 4" =0.65 Purging Information Pump Volume 1 Egpt. Well
X Capacity (gal) = Tubing Length Cell Tubing Capacity (gal/ft.) Depth to Volume (gal) Volume (gal) Screen Intake Water (ft) Volume (gal) Depth (ft) (mail: Interval (ft) Depth (ft) Well# Diam/ Comp 0.06 0.12 BBS-CCR-3 18.23 23.23 6.64 16.59 0.16 2.65 0.0026 24.23 0 2 10 Eqpt. Table Equipment ID Temp °C Cond (uMHOS) DO (mg/L) Turbidity (NTU) Purge Criteria Status Purge Meth: Rate (ml/min) Volume (gal) Total Vol. (gal) Water Depth (ft) pH (SU) Time 1.00 ph:+/-0.2 STABLE Level Meter: WLM08 6.40 26.43 1781 0.20 300 0.48 0.48 7.00 10:43 1A PP Temp°C+/- 0.2 STABLE 0.27 Pump: 0.64 7.01 6.39 26.23 1770 0.85 Purge Start: 10:45 300 0.16 PE/S Cond % +/- 5 STABLE Tubing: 26.21 1764 0.30 1.39 7.02 6.38 10:37 10:47 300 0.16 0.80 1 STABLE Dedicated Yes 6.38 26.15 1755 0.28 0.94 DO % Sat. < 20 0.96 7.04 10:49 300 0.16 Purge End: STABLE Tubing? No Turb. NTU < 20 10:49 10:39 Gallons to Purge 0.12 26.15 1755 0.28 0.94 Purge Complete At Stablility Values = 6.38 Cell Volume (gal) \_\_\_ 1 Eqpt. Well
X Capacity (gal) = Pump + Volume (gal) + 1 Well Tubing Water Volume Intake Screen Depth (1) Water (ft) Capacity (gal/ft.) Volume (gal) Column (gai) Well# Diam/ Comp Interval (ft) Depth (ft) (ft) Eqpt. Table Temp °C Cond (uMHOS) DO (mg/L) Turbidity (NTU) Purge Criteria Status Equipment ID Volume (qai) Total Vol. (gal) Water Depth (ft) pH (SU) Purge Meth: Rate (ml/min) Time WLM08 ph:+/- 0.2 Level Meter. Temp°C+/- 0.2 PP Pump: Purge Start: PE/S Tubing: ond % +/-V DO % Sat. < 20 Dedicated Yes Purge End: 4 No Turb. NTU < 20 Tubing? Purge Complete At Gallons to Purge 0.00 Stablity Values = Comments:

Total Miles

Total Time

LIMS#	Big Be	Time	Date:	06/28/17	Temp °C	Cond(uMHOS)	Wells_RAB	Weather: Turbidity(NTU)	Redox (mv)	udy & Hot Sulfite (mg/L)	Color	Odor		IGVD
LIMS#	Loction Code	Time		pH (SU)	TEMP-C	COND-F	DO Mg/L	TURB-N-F	REDOX	SO3-TR	\$COLOR-W	\$ODOR-W	Time	LEVEL
L17F009-04	BBS-CCR-BW-1	10:28	mg/l	6.47	27.72	5010.00	0.42	0.69	-11.40	300 III	CLEAR	NONE	10:09	
L17F009-04	BBS-CCR-BW-1	10:20	1	6.64	26.69	1538.00	0.19	6.09	-82.40		LT. YELLOW	NONE	9:40	
							1L Rads (1)	500ml Sulfide (2)	500ml Mtls (2)	250ml Nuts (3)	40ml Vial (6)	500 ml Nuts (2)	1L Rads Diss. (1)	Total Container
LIMS#	250ml Cyan (3)	1L Inorg (1)	500ml Inorg (2)	250ml Inorg (3)	1L Mtls (1)	250ml Mtis (3)	1L Rads (1)	South Suite (2)	Outri Mus (2)	250mi Nois (5)	- 40tta viai (0)	300 mii (4013 (2)		
L17F009-04	6		1			2 2	2 2	la la						10
L17F009-05	Н			(0) 050 1 1 6		(4) 100ml coliform b		(5) 1L amber glass (		(6) 40ml VOA vial (		_	Samples On Ice	Sample Reciept
1) 1L plastic (PP)	04070041/	(2) 500ml plastic		(3) 250ml plastic ESS	0307031Y	ESS	oottie	ESS (5) IL amber glass (	(AG)	ESS	(00)		Yes No	Time 15:12
ESS	0107301Y	ESS	0218201Y		03070311			E33	D 1D	E33	Preservation		Pres ID	Temp 2
	Preservation			Pres ID		Preservation			Pres ID	Too at harder & As	de) 2ml NAOH/Zinc	Acet to oU >12	L D	remp 2
IL bottles (rads): 5 ml				L 012553 🖸		ts): 1 ml H2SO4 to p				_				
	): 2 ml HNO3 to pH <2			L O		0.5 ml H2SO4 to pH			L		n) 1g NAOH to pH >		-	-
	1 ml HNO3 to pH <2			L 012553 🗹			5um, 5 ml HNO3 to pH		-		dicates that the sam	Temp °C		Theo Value my
pH Meter Calibration		Buffer ID	Buffer Value	Cal	Time	icv	Time	CCV	Time	Redox Cal	Time 0-00		Reading mv	237.5
Meter ID:	MPM08	L 019075A	7	7	8:51	1		7.10	14:58	Meter ID:	9:00	20.1	236.9	237.5
FDEP FT 1100		L 018611B	10	10	8:51		ond +/- 5%) (DO +/- 0.3		v)	MPM08	15:09	21.2	233.1	230.2
Jnits: SU		L 018737A	4	4	8:51		licates ICV / CCV passe			Zobell Sol ID:				
Conductivity Meter C		Standard ID	Std Value	Cal	Time	ICV	Time	ccv	Time	L 019150A		Temp °C	Distinguish	Theo Value mo
Meter ID:	MPM08	L 017987C	1000	1000	9:04			0000	44.40	DO Meter Cal	Time		Reading mg/l	8.812
FDEP FT 1200, Units:	uMHOS	L 018416B	10000			9792	9:09	9830	14:48	Meter ID:	8:42	21.7	8.84	
Turbidity Meter Calib		Standard ID	Std Value		lity Range	ICV	Time	CCV	Time	MPM08	15:19	20.9	9.06	8.932
Meter ID:	TM07	L 106722	4.76	4.28	5.24	4.83	8:50			Barom. Pres		-		-
FDEP FT 1600, Units:	NTU	L 106723	52.10	48.71	55.49			52.20	14:49	760				
Sulfite Info (QC Ched	ck) (EPA 377.1)		QC Result mg/l	Time	Titrator ID	Na Thio ID	DO 3 Pillow ID	Starch ind. ID	lodate/lodide ID	Therm ID	pH	Conduct.(%)	DO (mg/l)	Redox (mv)
QC Std: 5ml (NaThio)	/500ml DI=10mg/L					L	L	Ц	L	MPM08	0.2	5	0.3	10
Purging Information		Well Capacities	s (gallons/ ft): 2'	" = 0.16 4" =0.65	7	Tubing Inside Diar	n. Capacities Gallons/f		0.006					1
Well#	Diam/ Comp	Screen Interval (ft)	Intake Depth (ft)	Well Depth (ft)	Depth to Water (ft)	= Water Column (ft)	X Capacity (gal) =	1 Well Volume (gal)	( Capacity X (gal/It.)	Length )	+ Volume + (gai)	Celi Volume (gal) =	1 Eqpt Volume (gal)	
BBS-CCR-BW-1	2	10	39.3	44.3	29.92	14.38	0.16	2.30	0.0026	100	0	0.06	0.32	
Duran Math	Time	Rate (ml/min)	Volume (gai)	Total Vol. (gal)	Water Depth (ft)	pH (SU)	Temp °C	Cond (uMHOS)	DO (mg/L)	Turbidity (NTU)	Purge Criteria	Status	Equipment ID	Eqpt. Table
Pulge Melli.	10:21	2200	4.65	4.65	31.10	6.48	27.70	4954	0.39	1.88	ph:+/- 0.2	STABLE	Level Meter.	WLM08
1A		2200	1.16	5.81	31.10	6.48	27.70	4972	0.45	1.08	Temp <sup>c</sup> C+/- 0.2	STABLE	Pump:	ESP
1A	10:23	2200								0.69	Cond % +/- 5	STABLE	Tubing:	PE
Purge Start:	10:23	2200	1.16	6.97	31.10	6.47	27.72	5010	0.42	0.09		OTTOCK		☐ Yes
1A Purge Start: 10:13				6.97	31.10	6.47	27.72	5010	0.42	0.69	DO % Sat.< 20	STABLE	Dedicated	- 100
1A Purge Start: 10:13				6.97	31.10	6.47	27.72	5010	0.42	0.69	DO % Sat. < 20 Turb. NTU < 20		Tubing?	☑ No
1A Purge Start: 10:13 Purge End: 10:25	10:25		1.16			6.47	27.72	5010	0.42	0.69		STABLE		- 100
1A Purge Start: 10:13 Purge End: 10:25 Purge Complete	10:25 At 10:14	2200 Gallons to F	1.16 Purge 0.32	Stability	Values =	6.47 = Water Column				0.69		STABLE	Tubing?	- 100
1A Purge Start: 10:13 Purge End: 10:25 Purge Complete Well #	10:25 At 10:14  Diam/ Comp	2200 Gallons to F Screen	1.16 Purge 0.32 Intake Depth (ft)	Stability Well Depth (#)	Values =  Depth to Water (ff)	6.47 = Water Column (ft)	27.72 Well X Capacity (gal) =	5010 1 Well Volume (gal)	0.42 ( Tubing Capacity (galfit.)	0.69	Turb. NTU < 20  Pump + Volume +	STABLE STABLE	Tubing?	- 100
1A Purge Start: 10:13 Purge End: 10:25 Purge Complete Well # BBS-CCR-BW-2	10:25  At 10:14  Diam/ Comp	Screen Interval (ft)	1.16 Purge 0.32 Intake Depth (ft) 18.49	Stability Well Depth (t) 23.84	Values =  Depth to Water (ft)  8.53	6.47 = Water Column (ft) 15.31	27.72  Well  X Capacity (gal) = 0.16	5010 1 Well Volume (gall) 2.45	0.42 ( Tubing Capacity (gulfit.) 0.0026	0.69 Tubing Length (tt) 24.64	Pump + Volume + (gal)	STABLE STABLE  Cell Volume (gal)  0.06	Tubing?  1 Expt Volume (gal)  0.12	☑ No
1A Purge Start: 10:13 Purge End: 10:25 Purge Complete  Well # BBS-CCR-BW-2 Purge Meth:	10:25  At 10:14  Diam/ Comp 2 2  Time	Gallons to F Screen Interval (ft) 10 Rate (ml/min)	1.16 Purge 0.32 Intake Depth (ft) 18.49 Volume (gal)	Stability Well Depth (it) 23.84 Total Vol. (gal)	Values =  Depth to Water (ft)  8.53  Water Depth (ft)	6.47 = Water Column (ft) 15.31 pH (SU)	27.72  Well (gal) = 0.16  Temp °C	5010  1 Well Volume (gall)  2.45  Cond (uMHOS)	0.42  ( Tubing Capacity (gulff.)  0.0026  DO (mg/L)	0.69 Tubing Length (t) 24.64 Turbidity (NTU)	Pump + Volume + (gall)  0  Purge Criteria	STABLE  STABLE  Cell Volume (gal)  0.06  Status	Tubing?  1 Eqt. Volume (gal)  0.12  Equipment ID	No No
1A Purge Start: 10:13 Purge End: 10:25 Purge Complete  Well # BBS-CCR-BW-2 Purge Meth: 1A	10:25  At 10:14  Diam/ Comp 2 2  Time 9:49	Screen Interval (II) 10 Rate (ml/min) 570	1.16 Purge 0.32 Intake Depth (ft) 18.49 Volume (gal) 1.36	Stability Well Depth (it) 23.84 Total Vol. (gal) 1.36	Values =  Depth to Water (ft)  8.53  Water Depth (ft)	6.47  = Water Column (R) 15.31 pH (SU) 6.64	27.72  Well (gal) = 0.16  Temp °C 26.67	5010  1 Well Volume (gal)  2.45  Cond (uMHOS)  1537	0.42  ( Tubing Capacity (guille)  0.0026  DO (mg/L)  0.18	0.69 Tubing Length ) 24.64 Turbidity (NTU) 11.20	Turb, NTU < 20  Pump  Volume +  (gall)  0  Purge Criteria ph: +/- 0.2	STABLE  STABLE  Cell Volume (gal)  0.06  Status  STABLE	Tubing?  1 Eqpt. Volume (gal)  0.12  Equipment ID Level Meter:	No No Eqpt. Table WLM08
1A Purge Start: 10:13 Purge End: 10:25 Purge Complete  Well # BBS-CCR-BW-2 Purge Meth: 1A Purge Start:	10:25  At 10:14  Diam/ Comp 2 2  Time 9:49 9:51	Screen Interval (II) 10 Rate (ml/min) 570	1.16 Purge 0.32 Intake Depth (ft) 18.49 Volume (gal) 1.36 0.29	Stability Well Depth (#) 23.84 Total Vol. (gal) 1.36 1.65	Values =  Depth to Water (ft)  8.53  Water Depth (ft)  8.78  8.77	6.47  = Water Column (ft)  15.31 pH (SU) 6.64 6.64	27.72  Well (gal) = 0.16  Temp °C 26.67 26.66	5010  1 Well Volume (gal)  2.45  Cond (uMHOS)  1537  1538	0.42  ( Tribing Capacity (galfit) 0.0026  DO (mg/L) 0.18 0.18	0.69 Tubing Length ) 24.64 Turbidity (NTU) 11.20 12.20	Pump + Volume + (gail)  0  Purge Criteria ph:+/- 0.2  TempfC+/- 0.2	Cell Volume (gal) 0.06 Status STABLE	1 Equt. Volume (gal) 0.12 Equipment ID Level Meter: Pump:	No No Eqpt. Table WLM08
1A Purge Start: 10:13 Purge End: 10:25 Purge Complete  Well # BBS-CCR-BW-2 Purge Meth: 1A Purge Start: 9:40	10:25  At 10:14  Diam/ Comp 2 2  Time 9:49	Screen Interval (II) 10 Rate (ml/min) 570	1.16 Purge 0.32 Intake Depth (ft) 18.49 Volume (gal) 1.36	Stability Well Depth (it) 23.84 Total Vol. (gal) 1.36	Values =  Depth to Water (ft)  8.53  Water Depth (ft)	6.47  = Water Column (R) 15.31 pH (SU) 6.64	27.72  Well (gal) = 0.16  Temp °C 26.67	5010  1 Well Volume (gal)  2.45  Cond (uMHOS)  1537	0.42  ( Tubing Capacity (guille)  0.0026  DO (mg/L)  0.18	0.69 Tubing Length ) 24.64 Turbidity (NTU) 11.20	Pump + Volume + (gail)  0  Purge Criteria pht:+/- 0.2  Temp*C+/- 0.2  Cond % +/- 5	Cell Volume (gal)  0.06 Status STABLE STABLE STABLE	Tubing?  1 Eapt. Volume (gal)  0.12 Equipment ID Level Meter. Pump: Tubing:	Eqpt. Tabl WLM08 PP PE/S
1A Purge Start: 10:13 Purge End: 10:25 Purge Complete  Well # BBS-CCR-BW-2 Purge Meth: 1A Purge Start:	10:25  At 10:14  Diam/ Comp 2 2  Time 9:49 9:51	Screen Interval (II) 10 Rate (ml/min) 570	1.16 Purge 0.32 Intake Depth (ft) 18.49 Volume (gal) 1.36 0.29	Stability Well Depth (#) 23.84 Total Vol. (gal) 1.36 1.65	Values =  Depth to Water (ft)  8.53  Water Depth (ft)  8.78  8.77	6.47  = Water Column (ft)  15.31 pH (SU) 6.64 6.64	27.72  Well (gal) = 0.16  Temp °C 26.67 26.66	5010  1 Well Volume (gal)  2.45  Cond (uMHOS)  1537  1538	0.42  ( Tribing Capacity (galfit) 0.0026  DO (mg/L) 0.18 0.18	0.69 Tubing Length ) 24.64 Turbidity (NTU) 11.20 12.20	Pump + Volume + (gail)  0  Purge Criteria ph:+/- 0.2  TempfC+/- 0.2	Cell Volume (gal) 0.06 Status STABLE	1 Equt. Volume (gal) 0.12 Equipment ID Level Meter: Pump:	No No Eqpt. Table WLM08

Total Time

Total Miles

### GROUNDWATER WELL SAMPLING EQUIPMENT CALIBRATION

			Date:	06/28/17	Sampler(s):	RAB		Initials	1845			
pH Meter Calibration		Buffer ID	Buffer Value	Caf	Time				CCV	Time	Pass/Fail	
Meter ID:	MPM08	L 019075A	<b>2</b> 7	7.01	8:51				7.10	14:58	Pass	
FDEP FT 1100		L 018611B	<b>Y</b> 10	10.04	8:51			QC (pH +/- 0.2	) (Cand +/- 5%) (DC	0.3mg/L) (Redox:	=/- 10mv)	
Units: SU		L 018737A	2 4	3.99	8:51	ICV	Tane	Pass/Fail	A checked box i	ndicates ICV / CCV pa	essed	1
	ICV Check	L 0183771	2 7			7.03	857	Pass				
Conductivity Meter Calib.		Standard (0)	Std Value	Cal	Time	ICV	Time	Pass/Fail	CCV	Time	Pass/Fail	
Meter ID:	MPM08	L 017987C	1000	1000	9:04							
FDEP FT 1200, Units: uMHC	)S	L 018416B	10000			9792	9:09	Pass	9830	14:48	Pass	
Turbidity Meter Calibration		Standard ID	Std Value	Acceptabilit	y Range	CCV	Time	Pass/Fail	GCV	Time	Pass/Fail	8
Meter ID:	TM07	L 106722	4.76	4.28	5.24	4.83	8:50	Pass				
FDEP FT 1600, Units: NTU		L 106723	52.10	48.71	55.49				52.20	14:49	Pass	
Sulfite Info (QC Check) (	EPA 377.1)		QC Result mg/	Time	Titrator ID	Na Thio ID	DO 3 Pillow ID	Starch Ind. iD	lodate/lodide ID			
QC Std: 5ml (NaThio)/500ml						L	L	L	L			
Redox Cal	Time	Temp C	Reading my	Theo Value my	Pass / Fall	DO Meter Cal	Time	Femp °C	Reading mg/l	Theo Value mg/l	Pass / Fall	
						FDEP FT 1500						
Meter ID:	9:00	20,1	236.9	237.5	Pass	Meter ID:	8:42	21.7	8.84	8.812	Pass	
MPM08	15:09	21.2	233,1	236.2	Pass	MPM08	15:19	20.9	9.06	8.932	Pass	8
Zobell Sol ID:						Barom, Pres						4
L 019150A 🔀						760						1
Therm ID	pН	Conduct %	DO mg/l	Redox mv	CL2	Calibration	Ferrous Iron			<b></b> ,		
MPM08	0.2	5	0.3	10	0.2	Criterion	Comparator ID:		Reagent ID:	[-		4
CIO <sub>2</sub> DPD Check must read	+/- 10% of the	Calculated Std. Co	ncentration, multiple	ied by 2.4.		Glycene check shou	ld read < 0.10 mg/l C	IO <sub>2</sub> ,				
						Initial Calibrati	on Verification ICV		Continuous Cal	ibration Verification C	cv	Method 10
	Std. Conc.	Std. Spike Volu	ime Cal Sample	Calc. Std. Conc.	DPD Check				DPD Check			*Equivalent to
Chlorine Dioxide (mg/l)	(mg/li)	(ml)	Votume (mi)	(mg/l)	(mg/l)	Glycene Check	Time	Pass/Fall	{mg/l}	Time	PassiFail	Standard Met
Meter ID:		1.0	100						-			4500 CIO <sub>2</sub> D.
			:" DPD ID: L	100	Glycene ID:	cene ID: L : A checked box indicates reagent expiration date has been verified.					ied.	

COMMENTS:

CL2 Std. ID: L

#### DEP-SOP-001/01

#### FS 2200 Groundwater Sampling Form FD 9000-24

### **GROUNDWATER SAMPLING LOG**

FACILITY NAME:		Big Be	end			SITE LOCATION: Apollo Beach, FL.							
WELL NO:	В	BS-CCR-1			SAMPLE ID:	L171	-009-01		DATE: <b>6/28/17</b>				
					PURGI	NG DATA			1				
WELL DIAMETER (inches	s)	TUBING DIAMETER (inc	hes) 1/4	WELL SCR DEPTH 12.32	EEN INTERV		STATIC DEF		PURGE PUMP TO	YPE PP			
WELL VOLUME PURG	E:			LL DEPTH - STATIC D		\ /	<del></del>	, , , , , , , , , , , , , , , , , , , ,	1				
(only fillout if applicable	)		= (		feet -		feet) x		gallons/foot	: =	gallons		
EQUIPMENT VOL		1 EQL	JIPMENT VOL	= PUMP VOLUM	E + (TUBING	CAPACITY X 1	TUBING LENG	STH ) + FLOW CE	LL VOLUME				
(orny miour ii appiio	asio)		=(	0	gallons + (	0.0026 gallo	ons/foot X	23.3 feet ) +	0.06	gallons =	0.12 gallons		
INITIAL PUMP OR DEPTH IN WELL (	TUBING feet): 17.32		FINAL PUMP DEPTH IN W	ELL (feet): 17	.32	PURGING INITIATED AT:	12:28	PURGING ENDED AT:	12:38	TOTAL VOLUM PURGED (gallo	ME ons): 1.4		
TIME	VOLUME PURGED (GALLONS)	CUMUL. VOLUME PURGED (GALLONS)	PURGE RATE (GPM)	DEPTH TO WATER	pH (standard units)	TEMP. (°C)	COND. (µmhos/cm OR µS/cm)	DISSOLVED OXYGEN (circle mg/l or	TURBIDITY (NTUs)	COLOR (describe)	ODOR (describe)		
12:34	0.87	0.87	0.15	(FEET) 7.58	6.78	25.48	4063	% saturation)	6.42	LT. YELLOW	NONE		
12:36	0.29	1.16	0.15	7.57	6.77	25.51	4063	0.28	4.58	LT. YELLOW	NONE		
12:38	0.29	1.45	0.15	7.57	6.78	25.54	4063	0.27	3.63	LT. YELLOW	NONE		
.2.00	0.20		01.10		00	20.0		0.2.	0.00				
WELL CAPACITY (G	allons Per Foot): (	<b>0.75"</b> = 0.02;	1" = 0.04;	<b>1.25"</b> = 0.06; <b>2"</b> =	0.16; 3" =	0.37; <b>4"</b> = 0.	65; <b>5</b> " =	1.02; 6" = 1.47;	<b>12"</b> = 5.88				
TUBING INSIDE DIA.	CAPACITY (Gal./Ft	.): <b>1/8"</b> = 0.00006;	<b>3/16"</b> = 0.0014	1/4" = 0.0026;	5/16" = 0.004;		1/2" = 0.0	010; 5/8" = 0	0.016				
SAMPLED BY (PR	INT) / AFFILIATIO	ON:		SAMPLER (S) SIG		ING DATA	<u> </u>						
	RAE		TECO		SAMPLING INITIATED AT:				SAMPLING 12:38 ENDED AT: 12:45				
PUMP OR TUBING DEPTH IN WELL (	e feet): 17.3	}		SAMPLE PUMP FLOW RATE (ml	AMPLE PUMP FLOW RATE (mL per minute): 550				: PE	E/S			
FIELD DECONTAN	MINATION: Y	□ N <b>✓</b>		FIELD-FILTERED Filtration Equipme	): ent Type□	N 🔽 FILT	ER SIZE:	μm	DUPLICATE:	Y N			
	SAMPLE CON SPECIFICA				SAMPLE PRE	SERVATION		INTE	NDED	SAI	MPLING		
044DI E ID 00DE	#	MATERIAL	VOLUME	PRESERVATIVE					S AND/OR THOD	R EQUIPMENT CODE			
SAMPLE ID CODE	CONTAINERS	CODE		USED	ADDED IN	N FIELD (ml) (1)	pН						
01 500		DE	500 1	NONE		ONE	N1/A		:		DD.		
@Ino-500	1	PE	500ml	NONE	IN	ONE	N/A	inorg	janics		PP		
@Met-250	2	PE	250ml	HNO3		1ml	<2	Me	tals		PP		
@Rad-1L	2	PE	1L	HNO3		5ml	<2	Radiol	ogicals		PP		
REMARKS:	1	ı	1	1	1		ı	1		1			
(1) Sample bo	ttles pre-pres	erved at lab	oratory pric	or to sample co	ollection.								
MATERIAL CODES			Clear Glass;	PE = Polyethylene;	•			*	ner (Specify)				
SAMPLING/PURGIN	NG A	APP = After Perist	altic Pump; B	= Bailer; BP = Blac	der Pump; ES	P = Electric Subm	nirsable Pump;	PP = Peristaltic Pum	np ecify)				

NOTES:

optionally,  $\pm$  0.2 mg/L or  $\pm$  10% (whichever is greater) **Turbidity:** all readings  $\leq$  20 NTU; optionally  $\pm$  5 NTU or 10% (whichever is greater)

<sup>1.</sup> The above do not constitute all of the information requierd by Chapter 62-160, F.A.C.

<sup>2.</sup> STABILIZATION CRITERIA FOR RANGE OF VARIATION OF LAST THREE CONSECUTIVE READINGS (SEE FS 2212. SECTION 3)

pH: ± 0.2 units Temperature: ± 0.2 °C Specific Conductance: ± 5% Dissolved Oxygen: all readings ≤ 20% saturation (see Table FS 2200-2);

### **GROUNDWATER SAMPLING LOG**

SITE NAME:		Big Be	end			SITE LOCATION: Apollo Beach, FL.						
WELL NO:	В	BS-CCR-2	<u> </u>		SAMPLE ID:	L17F	009-02		DATE:	6/28/17		
					PURGI	NG DATA						
WELL DIAMETER (inches	3)	TUBING DIAMETER (inc	hes) 1/4	WELL SCREEN IN DEPTH 11.84		21.84 (feet)	STATIC DEPTH TO WATER (fee		PURGE PUMP TY OR BAILER:	<sup>/PE</sup> PP		
WELL VOLUME PI	JRGE:	,		AL WELL DEPTH -					ON BY HELL H			
(only fillout if application	able)		= (		feet -		feet) x		gallons/foot	=	gallons	
EQUIPMENT VOLU		1 EQI	JIPMENT VOL	. = PUMP VOLUMI	E + (TUBING	CAPACITY X T	UBING LENG	STH ) + FLOW CEL	L VOLUME			
(orny miout ii applioi	abio)		=(	0	gallons + (	0.0026 galle	ons/foot X	22.84 feet	)+ 0.06	gallons =	0.12 gallons	
INITIAL PUMP OR DEPTH IN WELL (f	TUBING <sup>(eet):</sup> 16.84		FINAL PUMP DEPTH IN W	, , 10	.84	PURGING INITIATED AT:	11:09	PURGING ENDED AT:	11:19	TOTAL VOLUM PURGED (gall	ME ons): 1.82	
TIME	VOLUME PURGED (GALLONS)	CUMUL. VOLUME PURGED (GALLONS)	PURGE RATE (GPM)	DEPTH TO WATER (FEET)	pH (standard units)	TEMP. (°C)	COND. (µmhos/cm OR µS/cm)	DISSOLVED OXYGEN (circle(mg/l) or % saturation)	TURBIDITY (NTUs)	COLOR (describe)	ODOR (describe)	
11:15	1.08	1.08	0.18	7.11	6.91	25.15	1478	0.23	7.90	YELLOW	MILD	
11:17	0.37	1.45	0.19	7.11	6.87	25.07	1493	0.26	5.74	YELLOW	MILD	
11:19	0.37	1.82	0.19	7.10	6.87	25.12	1485	0.24	4.71	YELLOW	MILD	
WELL CAPACITY (Ga FUBING INSIDE DIA.	,			<b>1.25</b> " = 0.06; <b>2</b> " = <b>1/4</b> " = 0.0026;	0.16; <b>3"</b> = <b>5/16"</b> = 0.004;	0.37; <b>4"</b> = 0.6 <b>3/8"</b> = 0.006;	55; 5" = 1/2" = 0.0		<b>12"</b> = 5.88			
		, , , , , , , , , , , , , , , , , , , ,			_	ING DATA		,				
SAMPLED BY (PR	,			SAMPLER (S) SIG	SNATURES:			SAMPLING INITIATED AT:		SAMPLING ENDED AT:		
PUMP OR TUBING	RAE	3	TECO	CAMDLE DUMD				TUBING	11:19		11:27	
DEPTH IN WELL (f	eet): 16.8	}		SAMPLE PUMP FLOW RATE (mL		(	93	MATERIAL CODE	: PE	/S		
FIELD DECONTAM	MINATION:	/ 🗌 N 🗹		FIELD-FILTERED Filtration Equipme	: nt Type	N FILTE	ER SIZE:	μm	DUPLICATE:	Y N	7	
	SAMPLE CON SPECIFICA				SAMPLE PRE	SERVATION			NDED		MPLING	
SAMPLE ID CODE	# CONTAINERS	MATERIAL CODE	VOLUME	PRESERVATIVE USED					S AND/OR HOD	EQUIPMENT CODE		
005E	, , , , , , , , , , , , , , , , , , , ,				יוו טבטבויי		P					
@Ino-500	1	PE	500ml	NONE	N	ONE	N/A	Inorg	anics		PP	
<u></u>	·							319				
@Met-250	2	PE	250ml	HNO3		1ml	<2	Me	tals		PP	
@Rad-1L	2	PE	1L	HNO3		5ml	<2		ogicals	İ	PP	
			1						<u> </u>	İ		
										İ		
REMARKS:							•			•		
(1) Sample bo	ttles pre-pres	erved at lab	oratory pric	r to sample co	llection.							
MATERIAL CODES			= Clear Glass		•	= Polypropylene	•			cify)		
SAMPLING/PURGIN EQUIPMENT CODE	1G / S: F	APP = Atter Perist RFPP = Reverse f	aitic Pump; <b>B</b> Flow Peristaltic I	= ʁaɪler; <b>BP</b> = Blad Pump: <b>SM</b> = Straw	aer Pump; ES Method (tubina	oP = Electric Subm or Gravity Drain):   \	irsable Pump; <b>/T</b> = Vacuum	PP = Peristaltic Pum Frap; O = Other (Spe	ip ecify)			

NOTES: 1. The above do not constitute all of the information requierd by Chapter 62-160, F.A.C.

 $optionally, \pm 0.2 \ mg/L \ or \pm 10\% \ (whichever is \ greater) \ Turbidity: \ all \ readings \leq 20 \ NTU; \ optionally \pm 5 \ NTU \ or \ 10\% \ (whichever is \ greater)$ 

<sup>2.</sup> STABILIZATION CRITERIA FOR RANGE OF VARIATION OF LAST THREE CONSECUTIVE READINGS (SEE FS 2212. SECTION 3)

pH: ± 0.2 units Temperature: ± 0.2 °C Specific Conductance: ± 5% Dissolved Oxygen: all readings ≤ 20% saturation (see Table FS 2200-2);

### **GROUNDWATER SAMPLING LOG**

	SITE NAME:		Big Be	end			SITE LOCATION:		Apollo	Beach, FL.			
DISSUED   DIS	WELL NO:	В	BS-CCR-3	3		SAMPLE ID:	L17F	-009-03	-	DATE:	6/28/17		
DIAMETER (Inches)   DIAMETER (Inches)   DIAMETER (Inches)   1/4   DEPTH 13.23   Sett   23.23 (Med   10 WILL CAPACITY   PP						PURGI	NG DATA			•			
WELL CAMPACITY (COMMINIST PURSOE)   STATE	WELL DIAMETER (inches	s)	TUBING DIAMETER (inc	hes) 1/4			23 23 (feet)	STATIC DEF	PTH (feet): 6.64		YPE PP		
Complement volume purgen:   Equipment vol. = Pulmy vol.und   Full (Light Care Actiff X Tulling)   Care Care X Tulling Care Actiff X Tulling Care Actiff X Tulling Care Care X Tulling Care X Tulling Care X Tulling Care Care X Tulling Care X	WELL VOLUME P	URGE:	1 WELL VO						, , , , , , , , , , , , , , , , , , , ,				
Company   Comp	(only fillout if applic	able)		= (		feet -		feet) x		gallons/foo	ıt =	gallons	
10   10   10   10   10   10   10   10			1 EQI	JIPMENT VOL	. = PUMP VOLUM	IE + (TUBING	CAPACITY X T	UBING LENG	GTH) + FLOW CEI	LL VOLUME			
DEPTH IN WELL (6et): 18,23	. ,			=(	0	gallons + (	0.0026 gallo	ons/foot X	24.23 fee	et)+ 0.06	gallons =	0.12 gallons	
Time	INITIAL PUMP OR DEPTH IN WELL (1		3	FINAL PUMP DEPTH IN W		3.23	PURGING INITIATED AT:	10:37	PURGING ENDED AT:	10:49	TOTAL VOLUI PURGED (gall	ME ons): 0.96	
10:43	TIME	PURGED	VOLUME PURGED	RATE	TO WATER	(standard		COND. (µmhos/cm	DISSOLVED OXYGEN (circle mg/l or	TURBIDITY	COLOR	ODOR	
10.45	10:43		,			· '	26.42		1	1.00	VELLOW	MODERATE	
10:47													
10:49													
WELL CAPACITY (Solone-Per Fool): 0.178 * − 0.002: 1* − 0.001. 1.28* − 0.006. 2* − 0.001. 114* − 0.0000. 2* − 0.001. 114* − 0.0000. 2* − 0.001. 114* − 0.0000. 2* − 0.001. 114* − 0.0000. 2* − 0.001. 114* − 0.0000. 2* − 0.001. 114* − 0.0000. 2* − 0.001. 114* − 0.0000. 2* − 0.001. 2*	_												
TUBING INSIDE DIA. CAPACITY (Gal/R): 1/8" = 0.00016;    1/8" = 0.0016;    1/8" = 0.0016;    1/8" = 0.0106;    1/8" =	10.49	0.10	0.90	0.00	7.04	0.30	20.13	1733	0.20	0.34	TELLOW	WODERATE	
TUBING INSIDE DIA. CAPACITY (Gal/R): 1/8" = 0.00016;    1/8" = 0.0016;    1/8" = 0.0016;    1/8" = 0.0106;    1/8" =													
TUBING INSIDE DIA. CAPACITY (Gal/FL): 1/8" = 0.00016;													
TUBING INSIDE DIA. CAPACITY (Gal/FL): 1/8" = 0.00016;													
TUBING INSIDE DIA. CAPACITY (Gal/R): 1/8" = 0.00016;    1/8" = 0.0016;    1/8" = 0.0016;    1/8" = 0.0106;    1/8" =													
TUBING INSIDE DIA. CAPACITY (Gal/FL): 1/8" = 0.00016;													
SAMPLED BY (PRINT) / AFFILIATION: RAB TECO PUMP OR TUBING DEPTH IN WELL (feet): 18.2  SAMPLE PUMP FLOW RATE (mL. per minute): SAMPLE PUMP FLOW RATE (mL. per minute): SAMPLE PUMP FLOW RATE (mL. per minute): SAMPLE PUMP FLOW RATE (mL. per minute): SAMPLE PUMP FLOW RATE (mL. per minute): SAMPLE PUMP FLOW RATE (mL. per minute): SAMPLE PUMP FLOW RATE (mL. per minute): SAMPLE PUMP FLOW RATE (mL. per minute): SAMPLE PUMP FLOW RATE (mL. per minute): SAMPLE PUMP FLOW RATE (mL. per minute): SAMPLE PUMP FLOW RATE (mL. per minute): SAMPLE PUMP FLOW RATE (mL. per minute): SAMPLE PLOW RATE (mL. per minute): SAMPLE PUMP FLOW RATE (mL. per minute): SAMPLE PUMP FLOW RATE (mL. per minute): SAMPLE PUMP FLOW RATE (mL. per minute): SAMPLE PLOW RATE (mL. per minu	,	,										<b>!</b>	
RAB TECO  PUMP OR TUBING DEPTH IN WELL (feet): 18.2  SAMPLE PLOW RATE (mL per minute): 300 MATERIAL CODE: PE/S  FIELD DECONTAMINATION: Y N SAMPLE PUMP FIELD DECONTAMINATION: Y N SAMPLE PUMP SPECIFICATION SAMPLE OR SAMPLE PRESERVATION SAMPLE PRESERVATION SAMPLE PRESERVATION SAMPLE PRESERVATION SAMPLE DCODE CONTAINERS CODE  VOLUME PRESERVATIVE TOTAL VOL. PH NAL METHOD  WISED ADDED IN FIELD (ml) (1) PH  WHATERIAL CODE: PE/S  FINAL PRESERVATION ADDED IN FINAL PH NAL YES ANDIOR EQUIPMENT CODE  WHATERIAL CODE: PE/S  SAMPLE PRESERVATION INTENDED ANALYSIS ANDIOR EQUIPMENT CODE  SAMPLING EQUIPMENT CODE  SAMPLING FINAL PH NAL YES ANDIOR EQUIPMENT CODE  WHETHOD  WHETHOD  PP  WHETHOD  WHETHOD  PP  WHETHOD  REMARKS:  (1) Sample bottles pre-preserved at laboratory prior to sample collection.  WATERIAL CODES: AG = Amber Glass; PE = Polyetrylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)  MATERIAL CODES: AG = Amber Glass; PE = Polyetrylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)	TUBING INSIDE DIA.	CAPACITY (Gal./F	t.): <b>1/8</b> " = 0.00006;	<b>3/16</b> " = 0.0014;	1/4" = 0.0026;	-			)10; <b>5/8</b> " = 0	J.016			
RAB TECO  PUMP OR TUBING DEPTH IN WELL (feet): 18.2  SAMPLE PLOW RATE (mL per minute): 300 MATERIAL CODE: PE/S  FIELD DECONTAMINATION: Y N SAMPLE PUMP FIELD DECONTAMINATION: Y N SAMPLE PUMP SPECIFICATION SAMPLE OR SAMPLE PRESERVATION SAMPLE PRESERVATION SAMPLE PRESERVATION SAMPLE PRESERVATION SAMPLE DCODE CONTAINERS CODE  VOLUME PRESERVATIVE TOTAL VOL. PH NAL METHOD  WISED ADDED IN FIELD (ml) (1) PH  WHATERIAL CODE: PE/S  FINAL PRESERVATION ADDED IN FINAL PH NAL YES ANDIOR EQUIPMENT CODE  WHATERIAL CODE: PE/S  SAMPLE PRESERVATION INTENDED ANALYSIS ANDIOR EQUIPMENT CODE  SAMPLING EQUIPMENT CODE  SAMPLING FINAL PH NAL YES ANDIOR EQUIPMENT CODE  WHETHOD  WHETHOD  PP  WHETHOD  WHETHOD  PP  WHETHOD  REMARKS:  (1) Sample bottles pre-preserved at laboratory prior to sample collection.  WATERIAL CODES: AG = Amber Glass; PE = Polyetrylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)  MATERIAL CODES: AG = Amber Glass; PE = Polyetrylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)	SAMPLED BY (PR	INT) / AFFILIATI	ON:		SAMPLER (S) SI	GNATURES:			SAMPLING INITIATED AT:		SAMPLING ENDED AT:		
FIELD PECONTAMINATION: Y			3	TECO					10:49 11:00				
SAMPLE CONTAINER SPECIFICATION SAMPLE ID CODE SAMPLING SAMPLE PRESERVATION SAMPLE ID CODE SAMPLE ID CODE SAMPLING SAMPLE PRESERVATION SAMPLING FINAL PH SAMPLE ID CODE SAMPLING SAMPLING FINAL PH SAMPLE PRESERVATION SAMPLING FINAL PH SAMPLE PRESERVATION SAMPLING FINAL PH SAMPLE PRESERVATION SAMPLE PRESERVATION SAMPLE PRESERVATION SAMPLE PRESERVATION SAMPLE SAMPLE SAMPLE SAMPLE SAMPLE SAMPLE SAMPLE SAMPLE SAMPLE SAMPLE SAMPLE SAMPLE SAMPLING SAMPLING SAMPLE PRESERVATION SAMPLE PRESERVATION SAMPLE CODE SAMPLE PRESERVATION SAMPLE SAMPLE PRESERVATION SAMPLE SAMPLE SAMPLE SAMPLE SAMPLE SAMPLE SAMPLE SAMPLE SAMPLE SAMPLE SAMPLE SAMPLE SAMPLE SAMPLE SAMPLE SAMPLE SAMPLE SAMPLE	DEPTH IN WELL (	eet): 18.2	2		FLOW RATE (ml	L per minute):	;	300		: PE	/S		
SAMPLE   S	FIELD DECONTAN	MINATION:	y 🔲 N 🗹		FIELD-FILTERED Filtration Equipme	D: ent Type.	N 🔽 FILTI	ER SIZE:	μm	DUPLICATE:	Y N	~	
# MATERIAL CODE						SAMPLE PRE	SERVATION						
@Ino-500 1 PE 500ml NONE NONE NONE N/A Inorganics PP  @Met-250 2 PE 250ml HNO3 1ml <2 Metals PP  @Rad-1L 2 PE 1L HNO3 5ml <2 Radiologicals PP  REMARKS:  (1) Sample bottles pre-preserved at laboratory prior to sample collection.  MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)  SAMPLING/PURGING APP = After Peristaltic Pump; B = Baller; BP = Bladder Pump; ESP = Electric Submirsable Pump; PP = Peristaltic Pump	SAMPLE ID CODE	#	MATERIAL	VOLUME									
@Met-250 2 PE 250ml HNO3 1ml <2 Metals PP  @Rad-1L 2 PE 1L HNO3 5ml <2 Radiologicals PP  REMARKS:  (1) Sample bottles pre-preserved at laboratory prior to sample collection.  MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)  SAMPLING/PURGING APP = After Peristaltic Pump; B = Baller; BP = Bladder Pump; ESP = Electric Submirsable Pump; PP = Peristaltic Pump	O/ WIT EE ID CODE	CONTINUENC	OODE		COLD	ADDED III	T FIELD (IIII) (1)	pri					
@Met-250 2 PE 250ml HNO3 1ml <2 Metals PP  @Rad-1L 2 PE 1L HNO3 5ml <2 Radiologicals PP  REMARKS:  (1) Sample bottles pre-preserved at laboratory prior to sample collection.  MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)  SAMPLING/PURGING APP = After Peristaltic Pump; B = Baller; BP = Bladder Pump; ESP = Electric Submirsable Pump; PP = Peristaltic Pump	@lno-500	1	PE	500ml	NONE	N	ONE	N/A	Inoro	nanics		PP	
@Rad-1L 2 PE 1L HNO3 5ml <2 Radiologicals PP  REMARKS:  (1) Sample bottles pre-preserved at laboratory prior to sample collection.  MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)  SAMPLING/PURGING APP = After Peristaltic Pump; B = Bailer; BP = Bladder Pump; ESP = Electric Submirsable Pump; PP = Peristaltic Pump	<u>@</u> 110 000			0001111	HOHE		ONE	14//	morg	jarnoo			
@Rad-1L 2 PE 1L HNO3 5ml <2 Radiologicals PP  REMARKS:  (1) Sample bottles pre-preserved at laboratory prior to sample collection.  MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)  SAMPLING/PURGING APP = After Peristaltic Pump; B = Bailer; BP = Bladder Pump; ESP = Electric Submirsable Pump; PP = Peristaltic Pump													
@Rad-1L 2 PE 1L HNO3 5ml <2 Radiologicals PP  REMARKS:  (1) Sample bottles pre-preserved at laboratory prior to sample collection.  MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)  SAMPLING/PURGING APP = After Peristaltic Pump; B = Bailer; BP = Bladder Pump; ESP = Electric Submirsable Pump; PP = Peristaltic Pump	@Met-250	2	PE	250ml	HNO3		1ml	<2	Me	tals		PP	
(1) Sample bottles pre-preserved at laboratory prior to sample collection.  MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)  SAMPLING/PURGING APP = After Peristaltic Pump; B = Bailer; BP = Bladder Pump; ESP = Electric Submirsable Pump; PP = Peristaltic Pump		2					5ml	<2				PP	
(1) Sample bottles pre-preserved at laboratory prior to sample collection.  MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)  SAMPLING/PURGING APP = After Peristaltic Pump; B = Bailer; BP = Bladder Pump; ESP = Electric Submirsable Pump; PP = Peristaltic Pump	_												
(1) Sample bottles pre-preserved at laboratory prior to sample collection.  MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)  SAMPLING/PURGING APP = After Peristaltic Pump; B = Bailer; BP = Bladder Pump; ESP = Electric Submirsable Pump; PP = Peristaltic Pump													
(1) Sample bottles pre-preserved at laboratory prior to sample collection.  MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)  SAMPLING/PURGING APP = After Peristaltic Pump; B = Bailer; BP = Bladder Pump; ESP = Electric Submirsable Pump; PP = Peristaltic Pump													
(1) Sample bottles pre-preserved at laboratory prior to sample collection.  MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)  SAMPLING/PURGING APP = After Peristaltic Pump; B = Bailer; BP = Bladder Pump; ESP = Electric Submirsable Pump; PP = Peristaltic Pump													
(1) Sample bottles pre-preserved at laboratory prior to sample collection.  MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)  SAMPLING/PURGING APP = After Peristaltic Pump; B = Bailer; BP = Bladder Pump; ESP = Electric Submirsable Pump; PP = Peristaltic Pump													
(1) Sample bottles pre-preserved at laboratory prior to sample collection.  MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)  SAMPLING/PURGING APP = After Peristaltic Pump; B = Bailer; BP = Bladder Pump; ESP = Electric Submirsable Pump; PP = Peristaltic Pump													
MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)  SAMPLING/PURGING  APP = After Peristaltic Pump; B = Bailer; BP = Bladder Pump; ESP = Electric Submirsable Pump; PP = Peristaltic Pump	REMARKS:												
SAMPLING/PURGING APP = After Peristaltic Pump; B = Bailer; BP = Bladder Pump; ESP = Electric Submirsable Pump; PP = Peristaltic Pump	· / -				•					- 0:: ::			
	SAMPLING/PURGIN	IG	APP = After Perist	altic Pump; B	= Bailer; <b>BP</b> = Blad	dder Pump; ES	P = Electric Subm	irsable Pump;	PP = Peristaltic Pum	np	спу)		

NOTES: 1. The above do not constitute all of the information requierd by Chapter 62-160, F.A.C.

 $optionally, \pm 0.2 \ mg/L \ or \ \pm 10\% \ (whichever is \ greater) \ Turbidity: \ all \ readings \leq 20 \ NTU; \ optionally \ \pm 5 \ NTU \ or \ 10\% \ (whichever is \ greater)$ 

<sup>2.</sup> STABILIZATION CRITERIA FOR RANGE OF VARIATION OF LAST THREE CONSECUTIVE READINGS (SEE FS 2212. SECTION 3)

pH: ± 0.2 units Temperature: ± 0.2 °C Specific Conductance: ± 5% Dissolved Oxygen: all readings ≤ 20% saturation (see Table FS 2200-2);

#### **GROUNDWATER SAMPLING LOG**

		Big Be	JIIU			LOCATION:		Apollo	Beach, FL.			
WELL NO:	BBS	CCR-BW	<i>I</i> -1		SAMPLE ID:	L17I	-009-04	DATE: <b>6/28/17</b>				
						NG DATA	•		•			
WELL DIAMETER (inches	;)	TUBING DIAMETER (inc	thes) 1/4	WELL SCREEN IN DEPTH 34.30		44.30 (feet	STATIC DEF	PTH (feet): 29.92	PURGE PUMP T' OR BAILER:	YPE ESP		
WELL VOLUME PU		1 WELL VO	LUME = (TOT	AL WELL DEPTH -	STATIC DEP	TH TO WATER)	X WELL CA	APACITY				
	,		= (		feet -		feet ) x		gallons/foo	ot =	gallons	
EQUIPMENT VOLU (only fillout if application	JME PURGE: able)	1 EQU	JIPMENT VOL		`			STH) + FLOW CE	0.00			
INITIAL PUMP OR	TUBING		=( FINAL PUMP	OR TUBING	gallons + (	0.0026 galle		DUDGING	et)+ 0.06	gallons = TOTAL VOLUM	0.32 gallons	
DEPTH IN WELL (f	<sup>(eet):</sup> 39.30	COMOL.	DEPTH IN W		.30	INITIATED AT:	10:13	ENDED AT:	10:25		ons): 6.97	
TIME	VOLUME PURGED (GALLONS)	VOLUME PURGED (GALLONS)	PURGE RATE (GPM)	TO WATER (FEET)	pH (standard units)	TEMP. (°C)	COND. (µmhos/cm OR µS/cm)	OXYGEN (circle(mg/l) or % saturation)	TURBIDITY (NTUs)	COLOR (describe)	ODOR (describe)	
10:21	4.65	4.65	0.58	31.10	6.48	27.70	4954	0.39	1.88	CLEAR	NONE	
10:23	1.16	5.81	0.58	31.10	6.48	27.70	4972	0.45	1.08	CLEAR	NONE	
10:25	1.16	6.97	0.58	31.10	6.47	27.72	5010	0.42	0.69	CLEAR	NONE	
WELL CAPACITY (C	,	<b>0.75"</b> = 0.02;							1.02; 6" = 1		= 5.88	
TUBING INSIDE DIA	A. CAPACITY (Gai	./Ft.): <b>1/8</b> " = 0.00	)006; <b>3/16</b> " :	= 0.0014; <b>1/4"</b> =	_	5/16" = 0.004; ING DATA	<b>3/8"</b> = 0.00	6; <b>1/2"</b> = 0.0	10; 5/8	" = 0.016		
SAMPLED BY (PR	•			SAMPLER (S) SIG	SNATURES:			SAMPLING INITIATED AT:		SAMPLING ENDED AT:		
PLIMP OR TUBING	RAB	}	TECO						:25	1	0:28	
PUMP OR TUBING DEPTH IN WELL (f				SAMPLE PUMP FLOW RATE (mL			200	TUBING MATERIAL CODE	: Pi		_	
FIELD DECONTAN	SAMPLE CON	Y N V		FIELD-FILTERED Filtration Equipme	nt Type.	N 🗹 FILT	ER SIZE:	μm	DUPLICATE:	Y N	4	
	SPECIFICA	TION	Т	SAMPLE PRESERVATION				ANALYSIS AND/OR EQU			MPLING JIPMENT	
SAMPLE ID CODE	# CONTAINERS	MATERIAL CODE	VOLUME	PRESERVATIVE USED		TAL VOL. N FIELD (ml) <sub>(1)</sub>	FINAL pH	METHOD			CODE	
@Ino-500	1	PE	500ml	NONE	N	ONE	N/A	Inorg	anics	l l	ESP	
011 1 050			050 1			41			4.1.			
@Met-250	2	PE	250ml	HNO3		1ml 5ml	<2		tals		ESP ESP	
@Rad-1L	2	PE	1L	HNO3		5ml	<2	Raului	ogicals		<u> </u>	
REMARKS:				to oo:!-								
(1) Sample bo			oratory pric = Clear Glass			• = Polypropylene	e; <b>S</b> = Silice	one; <b>T</b> = Teflon:	O= Other (Spe	ecify)		
SAMPLING/PURGIN	IG A	APP = After Perist	taltic Pump; B	= Bailer; <b>BP</b> = Blad	der Pump; ES	SP = Electric Subm	irsable Pump;	PP = Peristaltic Pun Trap; 0 = Other (Spe	ıp			

1. The above do not constitute all of the information requierd by Chapter 62-160, F.A.C.

NOTES:

<sup>2.</sup> STABILIZATION CRITERIA FOR RANGE OF VARIATION OF LAST THREE CONSECUTIVE READINGS (SEE FS 2212. SECTION 3)

pH: ± 0.2 units Temperature: ± 0.2 °C Specific Conductance: ± 5% Dissolved Oxygen: all readings ≤ 20% saturation (see Table FS 2200-2); optionally, ± 0.2 mg/L or ± 10% (whichever is greater) Turbidity: all readings ≤ 20 NTU; optionally ± 5 NTU or 10% (whichever is greater)

### **GROUNDWATER SAMPLING LOG**

NAME:		Big Be	end			LOCATION:		Apollo l	Beach, FL.		
WELL NO:	BBS	S-CCR-BW		SAMPLE ID:	L171	-009-05	DATE: <b>6/28/17</b>				
				_		NG DATA					
WELL DIAMETER (inches	s)	TUBING DIAMETER (inc	hes) 1/4	WELL SCREEN I DEPTH 13.64		23.34 (feet)	STATIC DEF	PTH (feet): 8.53	PURGE PUMP T' OR BAILER:	YPE PP	
WELL VOLUME P		1 WELL VO	LUME = (TOT	AL WELL DEPTH	- STATIC DEF	TH TO WATER)	X WELL CA	APACITY			
	,		= (		feet -		feet) x		gallons/foo	t =	gallons
EQUIPMENT VOL (only fillout if applic	UME PURGE: :able)	1 EQI	JIPMENT VOL	= PUMP VOLUM	IE + (TUBING			STH ) + FLOW CE			
INITIAL PUMP OR	TUDING		=(	OR TUBING	gallons + (	0.0026 galle	ons/foot X	24.64 fee		TOTAL VOLUM	0.12 gallons
DEPTH IN WELL (	feet): 18.49	OMIL.	DEPTH IN W	ELL (feet): 18	3.49	PURGING INITIATED AT:	9:40	ENDED AT:	9:53	PURGED (gallo	ons): 1.94
TIME	VOLUME PURGED (GALLONS)	VOLUME PURGED (GALLONS)	PURGE RATE (GPM)	DEPTH TO WATER (FEET)	pH (standard units)	TEMP. (°C)	COND. (µmhos/cm OR µS/cm)		TURBIDITY (NTUs)	COLOR (describe)	ODOR (describe)
9:49	1.36	1.36	0.15	8.78	6.64	26.67	1537	0.18	11.20	LT. YELLOW	NONE
9:51	0.29	1.65	0.15	8.77	6.64	26.66	1538	0.18	12.20	LT. YELLOW	NONE
9:53	0.29	1.94	0.15	8.78	6.64	26.69	1538	0.19	6.09	LT. YELLOW	NONE
WELL CAPACITY (	- /	<b>0.75</b> " = 0.02;							: 1.02; <b>6"</b> = 1		5.88
TUBING INSIDE DIA	A. CAPACITY (Gai	./Ft.): 1/8" = 0.00	0006; <b>3/16</b> **	= 0.0014; <b>1/4"</b> =	SAMPL	5/16" = 0.004; ING DATA	<b>3/8"</b> = 0.00	6; <b>1/2"</b> = 0.0	110; 5/8	" = 0.016	
SAMPLED BY (PR	,			SAMPLER (S) SI	GNATURES:			SAMPLING INITIATED AT:		SAMPLING ENDED AT:	
PUMP OR TURING	RAE	3	TECO					9: TUBING	53	1	0:02
PUMP OR TUBING DEPTH IN WELL (1				SAMPLE PUMP FLOW RATE (mI FIELD-FILTERED			557 ER SIZE:	MATERIAL CODE			
FIELD DECONTAI	MINATION: SAMPLE CON	Y N V		Filtration Equipme	ent Type.	N 🗹	LIT OIZE.	μ	DUPLICATE:	Y N N	1
	SPECIFICA	TION		DDECED (ATIVE	SAMPLE PRE		T FINIAL		NDED S AND/OR	SAMPLING EQUIPMENT	
SAMPLE ID CODE	# CONTAINERS	MATERIAL CODE	VOLUME	PRESERVATIVE USED		TAL VOL. N FIELD (ml) <sub>(1)</sub>	FINAL pH	METHOD		CODE	
@Ino-500	1	PE	500ml	NONE	N	ONE	N/A	Inorg	janics		PP
014 / 050		25	050 1	10100		41			4.1.		DD.
@Met-250	2	PE	250ml	HNO3		1ml 5ml	<2		tals		PP PP
@Rad-1L	2	PE	1L	HNO3		5ml	<2	Radioi	ogicals		PP
REMARKS:	ttlaa nra nr-	oniod at lat	orotom: ====================================	orto comunic -	ollo oti o =						
(1) Sample bo			oratory pric = Clear Glass	•		e = Polypropylene	e; <b>S</b> = Silic	one; <b>T</b> = Teflon;	O= Other (Spe	cify)	
SAMPLING/PURGIN EQUIPMENT CODE	NG A	APP = After Perist	altic Pump; B	= Bailer; BP = Blad	dder Pump; ES	SP = Electric Subm	irsable Pump;	PP = Peristaltic Pum Frap; O = Other (Spe	np	1/	

NOTES: 1. The above do not constitute all of the information requierd by Chapter 62-160, F.A.C.

<sup>2.</sup> STABILIZATION CRITERIA FOR RANGE OF VARIATION OF LAST THREE CONSECUTIVE READINGS (SEE FS 2212. SECTION 3)

pH: ± 0.2 units Temperature: ± 0.2 °C Specific Conductance: ± 5% Dissolved Oxygen: all readings ≤ 20% saturation (see Table FS 2200-2); optionally, ± 0.2 mg/L or ± 10% (whichever is greater) Turbidity: all readings ≤ 20 NTU; optionally ± 5 NTU or 10% (whichever is greater)



THE LEADER IN ENVIRONMENTAL TESTING

## **ANALYTICAL REPORT**

TestAmerica Laboratories, Inc.

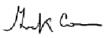
TestAmerica Tampa 6712 Benjamin Road Suite 100 Tampa, FL 33634 Tel: (813)885-7427

TestAmerica Job ID: 660-81511-1 Client Project/Site: L17F009

### For:

Tampa Electric Company 5012 Causeway Boulevard Tampa, Florida 33619

Attn: Ms. Peggy Penner



Authorized for release by: 7/5/2017 1:02:55 PM

Keaton Conner, Project Manager I (813)885-7427

keaton.conner@testamericainc.com

LINKS .....

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**Have a Question?** 



Visit us at: www.testamericainc.com

The test results in this report meet all 2003 NELAC and 2009 TNI requirements for accredited parameters, exceptions are noted in this report. This report may not be reproduced except in full, and with written approval from the laboratory. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

Client: Tampa Electric Company Project/Site: L17F009 TestAmerica Job ID: 660-81511-1

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# **Sample Summary**

Client: Tampa Electric Company Project/Site: L17F009

TestAmerica Job ID: 660-81511-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
660-81511-1	L17F009-01	Water	06/28/17 12:45	06/29/17 12:40
660-81511-2	L17F009-02	Water	06/28/17 11:27	06/29/17 12:40
660-81511-3	L17F009-03	Water	06/28/17 11:00	06/29/17 12:40
660-81511-4	L17F009-04	Water	06/28/17 10:28	06/29/17 12:40
660-81511-5	L17F009-05	Water	06/28/17 10:02	06/29/17 12:40

# **Definitions/Glossary**

Client: Tampa Electric Company

Project/Site: L17F009

TestAmerica Job ID: 660-81511-1

### **Qualifiers**

### **Metals**

Qualifier	Qualifier Description
I	The reported value is between the laboratory method detection limit and the laboratory practical quantitation limit.

U Indicates that the compound was analyzed for but not detected.

Practical Quantitation Limit

Relative Error Ratio (Radiochemistry)

Toxicity Equivalent Factor (Dioxin)
Toxicity Equivalent Quotient (Dioxin)

Reporting Limit or Requested Limit (Radiochemistry)

Relative Percent Difference, a measure of the relative difference between two points

**Quality Control** 

### **Glossary**

**PQL** 

QC

RL

**RER** 

RPD TEF

TEQ

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)

TestAmerica Tampa

7/5/2017

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### **Case Narrative**

Client: Tampa Electric Company

Project/Site: L17F009

TestAmerica Job ID: 660-81511-1

Job ID: 660-81511-1

**Laboratory: TestAmerica Tampa** 

Narrative

Job Narrative 660-81511-1

#### Receipt

The samples were received on 6/29/2017 12:40 PM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was  $2.4^{\circ}$  C.

#### Metals

No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

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# **Detection Summary**

Client: Tampa Electric Company

Project/Site: L17F009

Lithium

TestAmerica Job ID: 660-81511-1

200.7 Rev 4.4

Client Sample ID:	L17F009-01					Lab Sa	mple ID: 66	80-81511-1
Analyte	Result	Qualifier	PQL	MDL	Unit	Dil Fac D	Method	Prep Type
Lithium	0.013	Ī	0.050	0.0010	mg/L		200.7 Rev 4.4	Total/NA
Client Sample ID:	L17F009-02					Lab Sa	mple ID: 66	60-81511-2
Analyte	Result	Qualifier	PQL	MDL	Unit	Dil Fac D	Method	Prep Type
Lithium	0.014	Ī	0.050	0.0010	mg/L		200.7 Rev 4.4	Total/NA
Client Sample ID:	L17F009-03					Lab Sa	mple ID: 66	60-81511-3
Analyte	Result	Qualifier	PQL	MDL	Unit	Dil Fac D	Method	Prep Type
Lithium	0.0093	I	0.050	0.0010	mg/L		200.7 Rev 4.4	Total/NA
Client Sample ID:	L17F009-04					Lab Sa	mple ID: 66	60-81511-4
Analyte	Result	Qualifier	PQL	MDL	Unit	Dil Fac D	Method	Prep Type
Lithium	0.015	I	0.050	0.0010	mg/L		200.7 Rev 4.4	Total/NA
Client Sample ID:	L17F009-05					Lab Sa	mple ID: 66	60-81511-5
Analyte	Result	Qualifier	PQL	MDL	Unit	Dil Fac D	Method	Prep Type

0.050

0.0010 mg/L

0.0052 I

5

0

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Total/NA

### **Client Sample Results**

Client: Tampa Electric Company

Project/Site: L17F009

Analyte

Lithium

Client Sample ID: L17F009-05

TestAmerica Job ID: 660-81511-1

Client Sample ID: L17F009-01 Lab Sample ID: 660-81511-1 Date Collected: 06/28/17 12:45 **Matrix: Water** Date Received: 06/29/17 12:40 Method: 200.7 Rev 4.4 - Metals (ICP) Analyte Result Qualifier PQL **MDL** Unit D Prepared Analyzed Dil Fac 07/02/17 10:47 07/03/17 13:10 Lithium 0.013 I 0.050 0.0010 mg/L Client Sample ID: L17F009-02 Lab Sample ID: 660-81511-2 Date Collected: 06/28/17 11:27 **Matrix: Water** Date Received: 06/29/17 12:40 Method: 200.7 Rev 4.4 - Metals (ICP) Analyte Result Qualifier PQL **MDL** Unit D Prepared Analyzed Dil Fac 0.050 0.0010 mg/L 07/02/17 10:47 07/03/17 13:24 Lithium 0.014 I Client Sample ID: L17F009-03 Lab Sample ID: 660-81511-3 Date Collected: 06/28/17 11:00 **Matrix: Water** Date Received: 06/29/17 12:40 Method: 200.7 Rev 4.4 - Metals (ICP) Analyte Result Qualifier PQL MDL Unit Prepared Analyzed Dil Fac 0.0010 mg/L Lithium 0.0093 I 0.050 07/02/17 10:47 07/03/17 13:27 Client Sample ID: L17F009-04 Lab Sample ID: 660-81511-4 Date Collected: 06/28/17 10:28 **Matrix: Water** Date Received: 06/29/17 12:40 Method: 200.7 Rev 4.4 - Metals (ICP)

Date Collected: 06/28/17 10:02							Matrix:	Water
Date Received: 06/29/17 12:40								
Method: 200.7 Rev 4.4 - Metals	(ICP)							
Analyte	Result Qualifier	PQL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Lithium	0.0052 I	0.050	0.0010	mg/L		07/02/17 10:47	07/03/17 13:34	1

PQL

0.050

**MDL** Unit

0.0010 mg/L

Prepared

07/02/17 10:47 07/03/17 13:30

Lab Sample ID: 660-81511-5

Analyzed

Dil Fac

Result Qualifier

0.015 I

### QC Sample Results

Client: Tampa Electric Company

Project/Site: L17F009

TestAmerica Job ID: 660-81511-1

Method: 200.7 Rev 4.4 - Metals (ICP)

Lab Sample ID: MB 400-359159/1-A Client Sample ID: Method Blank **Matrix: Water** Prep Type: Total/NA Analysis Batch: 359305 **Prep Batch: 359159** 

MB MB

Analyte Result Qualifier PQL **MDL** Unit Prepared Analyzed Dil Fac 0.050 07/02/17 10:47 07/03/17 12:41 Lithium 0.0010 U 0.0010 mg/L

Lab Sample ID: LCS 400-359159/2-A **Client Sample ID: Lab Control Sample Matrix: Water** Prep Type: Total/NA **Analysis Batch: 359305 Prep Batch: 359159** Spike LCS LCS %Rec. Added Limits Analyte Result Qualifier Unit D %Rec 85 - 115 Lithium 1.00 1.06 mg/L 106

Lab Sample ID: 400-139832-A-1-B MS **Client Sample ID: Matrix Spike Matrix: Water Prep Type: Total/NA** Analysis Batch: 359305 **Prep Batch: 359159** Sample Sample Spike MS MS %Rec. Result Qualifier Added Result Qualifier Limits Analyte Unit D %Rec Lithium 0.047 I 1.00 1.13 mg/L 108 70 - 130

Lab Sample ID: 400-139832-A-1-C MSD **Client Sample ID: Matrix Spike Duplicate Matrix: Water** Prep Type: Total/NA Analysis Batch: 359305 **Prep Batch: 359159** 

Sample Sample Spike MSD MSD %Rec. **RPD** Analyte Result Qualifier Added Result Qualifier Unit %Rec Limits RPD Limit Lithium 0.047 I 1.00 1.18 113 70 - 130 mg/L

# **QC Association Summary**

Client: Tampa Electric Company Project/Site: L17F009 TestAmerica Job ID: 660-81511-1

### **Metals**

### **Prep Batch: 359159**

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
660-81511-1	L17F009-01	Total/NA	Water	200.7	_
660-81511-2	L17F009-02	Total/NA	Water	200.7	
660-81511-3	L17F009-03	Total/NA	Water	200.7	
660-81511-4	L17F009-04	Total/NA	Water	200.7	
660-81511-5	L17F009-05	Total/NA	Water	200.7	
MB 400-359159/1-A	Method Blank	Total/NA	Water	200.7	
LCS 400-359159/2-A	Lab Control Sample	Total/NA	Water	200.7	
400-139832-A-1-B MS	Matrix Spike	Total/NA	Water	200.7	
400-139832-A-1-C MSD	Matrix Spike Duplicate	Total/NA	Water	200.7	

### **Analysis Batch: 359305**

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
660-81511-1	L17F009-01	Total/NA	Water	200.7 Rev 4.4	359159
660-81511-2	L17F009-02	Total/NA	Water	200.7 Rev 4.4	359159
660-81511-3	L17F009-03	Total/NA	Water	200.7 Rev 4.4	359159
660-81511-4	L17F009-04	Total/NA	Water	200.7 Rev 4.4	359159
660-81511-5	L17F009-05	Total/NA	Water	200.7 Rev 4.4	359159
MB 400-359159/1-A	Method Blank	Total/NA	Water	200.7 Rev 4.4	359159
LCS 400-359159/2-A	Lab Control Sample	Total/NA	Water	200.7 Rev 4.4	359159
400-139832-A-1-B MS	Matrix Spike	Total/NA	Water	200.7 Rev 4.4	359159
400-139832-A-1-C MSD	Matrix Spike Duplicate	Total/NA	Water	200.7 Rev 4.4	359159

Client: Tampa Electric Company

Project/Site: L17F009

Lab Sample ID: 660-81511-1 Client Sample ID: L17F009-01 Date Collected: 06/28/17 12:45

Matrix: Water

Date Received: 06/29/17 12:40

	Batch	Batch		Dil	Initial	Final	Batch	Prepared		
Prep Type	Type	Method	Run	Factor	Amount	Amount	Number	or Analyzed	Analyst	Lab
Total/NA	Prep	200.7			50 mL	50 mL	359159	07/02/17 10:47	DN1	TAL PEN
Total/NA	Analysis	200.7 Rev 4.4		1			359305	07/03/17 13:10	GESP	TAL PEN
	Instrument	ID: 6500 ICP Duo								

Client Sample ID: L17F009-02 Lab Sample ID: 660-81511-2

Date Collected: 06/28/17 11:27 **Matrix: Water** 

Date Received: 06/29/17 12:40

	Batch	Batch		Dil	Initial	Final	Batch	Prepared		
Prep Type	Type	Method	Run	Factor	Amount	Amount	Number	or Analyzed	Analyst	Lab
Total/NA	Prep	200.7			50 mL	50 mL	359159	07/02/17 10:47	DN1	TAL PEN
Total/NA	Analysis	200.7 Rev 4.4		1			359305	07/03/17 13:24	GESP	TAL PEN
	Instrumer	it ID: 6500 ICP Duc	)							

Client Sample ID: L17F009-03 Lab Sample ID: 660-81511-3

Date Collected: 06/28/17 11:00 **Matrix: Water** 

Date Received: 06/29/17 12:40

	Batch	Batch		Dil	Initial	Final	Batch	Prepared		
Prep Type	Type	Method	Run	Factor	Amount	Amount	Number	or Analyzed	Analyst	Lab
Total/NA	Prep	200.7			50 mL	50 mL	359159	07/02/17 10:47	DN1	TAL PEN
Total/NA	Analysis	200.7 Rev 4.4		1			359305	07/03/17 13:27	GESP	TAL PEN
	Instrumer	nt ID: 6500 ICP Duo								

Client Sample ID: L17F009-04 Lab Sample ID: 660-81511-4

Date Collected: 06/28/17 10:28 **Matrix: Water** 

Date Received: 06/29/17 12:40

	Batch	Batch		Dil	Initial	Final	Batch	Prepared		
Prep Type	Type	Method	Run	Factor	Amount	Amount	Number	or Analyzed	Analyst	Lab
Total/NA	Prep	200.7			50 mL	50 mL	359159	07/02/17 10:47	DN1	TAL PEN
Total/NA	Analysis	200.7 Rev 4.4		1			359305	07/03/17 13:30	GESP	TAL PEN
	Instrumen	t ID: 6500 ICP Duo								

Client Sample ID: L17F009-05 Lab Sample ID: 660-81511-5

Date Collected: 06/28/17 10:02 **Matrix: Water** Date Received: 06/29/17 12:40

	Batch	Batch		Dil	Initial	Final	Batch	Prepared		
Prep Type	Type	Method	Run	Factor	Amount	Amount	Number	or Analyzed	Analyst	Lab
Total/NA	Prep	200.7			50 mL	50 mL	359159	07/02/17 10:47	DN1	TAL PEN
Total/NA	Analysis	200.7 Rev 4.4		1			359305	07/03/17 13:34	GESP	TAL PEN
	Instrumen	it ID: 6500 ICP Duo								

**Laboratory References:** 

TAL PEN = TestAmerica Pensacola, 3355 McLemore Drive, Pensacola, FL 32514, TEL (850)474-1001

# **Accreditation/Certification Summary**

Client: Tampa Electric Company

Project/Site: L17F009

TestAmerica Job ID: 660-81511-1

### **Laboratory: TestAmerica Tampa**

The accreditations/certifications listed below are applicable to this report.

	Authority	Program	EPA Region	Identification Number	Expiration Date
l	Florida	NELAP	4	E84282	06-30-18

## Laboratory: TestAmerica Pensacola

The accreditations/certifications listed below are applicable to this report.

Authority	Program	<b>EPA Region</b>	Identification Number	<b>Expiration Date</b>
Florida	NELAP	4	E81010	06-30-18

TestAmerica Tampa

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# **Method Summary**

Client: Tampa Electric Company

Project/Site: L17F009

TestAmerica Job ID: 660-81511-1

Method	Method Description	Protocol	Laboratory
200.7 Rev 4.4	Metals (ICP)	EPA	TAL PEN

**Protocol References:** 

EPA = US Environmental Protection Agency

**Laboratory References:** 

TAL PEN = TestAmerica Pensacola, 3355 McLemore Drive, Pensacola, FL 32514, TEL (850)474-1001

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#### **SENDING LABORATORY:**

Tampa Electric Company, Laboratory Services

5012 Causeway Blvd Tampa, FL 33619 Phone: (813) 630-7490 Fax: (813) 630-7360

Project Manager:

Peggy Penner

### RECEIVING LABORATORY:

TestAmerica Laboratories, Inc. - Tampa

6712 Benjamin Rd., Suite 100

Tampa, FL 33634 Phone: (813) 885-7427

Fax: -

07/13/17 16:00 Due Date:

Analysis		Expires			Laborato	ory ID	Con	ments
Sample ID: L17F009-01	BBS-CCR-1		Water	-			•	la
Sampled: 06/28/17 12:45			<del></del>		· 		.1	
Lithium, Total EPA 6010		12/25/17 12:45						8151
Containers Supplied;								
Poly HNO3 - 250mL (A)								Chain
Sample ID: L17F009-02	BBS-CCR-2		Water	-			,	9
Sampled: 06/28/17 11:27							`	Custod
Lithium, Total EPA 6010		12/25/17 11:27						8
Containers Supplied:								
Poly HNO3 - 250mL(A)								
Sample ID: L17F009-03	BBS-CCR-3		Water		-	_		-
Sampled: 06/28/17 11:00				:			`	_
Lithium, Total EPA 6010		12/25/17 11:00						ထု ငြ
Containers Supplied:								8151 8151
Poly HNO3 - 250mL (A)								_ = 2 8
Sample ID: L17F009-04	BBS-CCR-BW1		Water		-		3	<del></del>
Sampled: 06/28/17 10:28							-	
Lithìum, Total EPA 6010		12/25/17 10:28						
Containers Supplied:								
Poly HNO3 - 250mL (A)	-							
Sample ID: L17F009-05	BBS-CCR-BW2		Water	11111		-	-	
Sampled: 06/28/17 10:02				'		-	-	
Lithium, Total EPA 6010		12/25/17 10:02						
Containers Supplied:								
Poly HNO3 - 250mL(A)								

Released By

Date & Time

Received By

Page 3 of 3

7/5/2017

12 13 14



TestAmerica Chain of Custody Record Tampa, FL 33634 Phone (813) 885-7427 Fax (813) 885-7049 TestAmerica Tampa 6712 Benjamin Road Suite 100

	Sampler			Lab PM	A.		Camer Tracking No(s):		No	
Client Information (Sub Contract Lab)				Con	Conner, Keaton			-099	660-97633.1	
Client Contact Shipping/Receiving	Phone			keato keato	n conner(	E-Mail keaton conner@testamericainc.com	State of Origin: Florida	Page	Page 1 of 1	
Company: TestAmerica Laboratories, Inc.					Accreditation NELAP - F	Accreditations Required (See note) NELAP - Florida; NELAP - Texas		# qof	Job # 660-81511-1	
Address: 3355 McLemore Drive,	Due Date Requested: 7/7/2017	- De				Analysis	Analysis Requested	Pres	b	5.
Crly. Pensacola State, Zip.	TAT Requested (days):	ıys):						- BOOH	A - HCL B - NaOH C - Zn Acetate D - Nitrio Acid	N - Hexane N - None O - AsNaO2 P - Na2O4S
rt., 25317 Phore Phore 474-1001(Tel) 850-478-2671(Fax)	# 0d				(1			A - 0		R - Na25203 S - H2504
	WO#.				- 22					U - Acetone V - MCAA
Project Name. L17F009	Project # 66004821				N 10 se				K-EDTA L-EDA	W - pH 4-5 Z - other (specify)
Site:	SSOW#:				N) as			other:	Ľ.	
Sample Identification - Client ID (Lab ID)	Sample Date	Sample	Sample Type (C=comp, G=grab)	Matrix (W-water, S-solid, O-waste/oll, BT-Tissue, A-Ale)	Field Filtered S Perform MS/MS T_9_T.005/T.005			Total Number o	Special Ins	Special Instructions/Note:
	X	X	Preserva	Preservation Code:	X			×	$\left  \right $	V
L17F009-01 (660-81511-1)	6/28/17	12:45 Eastern		Water	×			+		
L17F009-02 (660-81511-2)	6/28/17	11.27 Eastern		Water	×			-		
L17F009-03 (660-81511-3)	6/28/17	11:00 Eastern		Water	×			÷		
L17F009-04 (660-81511-4)	6/28/17	10:28 Eastern		Water	×			٠		
L17F009-05 (660-81511-5)	6/28/17	10:02 Eastern		Water	×			1		
Note: Since laboratory accreditations are subject to change, TestAmenica Laboratores, Inc. places the ownership of method, analyte & accreditation out subcontract laboratories. This sample shipment is forwarded under chain-of-custody. If the laboratory or other instructions will be provided. Any changes to accreditation status should be brought to TestAmerica laboratories, inc. attention immediately. If all requested accreditations are current to date, return the signed Chain of Custody attesting to said complicance to TestAmerica Laboratories, inc.	Laboratories, Inc. places the ysis/tests/matrix being analyzi e current to date, return the si	ownership of med, the sample gned Chain of	ethod, analyte s must be shipp Custody attestir	& accreditation ed back to the ig to said comp	compliance u festAmerica icance to Te	upon out subcontract laboratorie laboratory or other instructions stAmerica Laboratories, Inc	s. This sample shipment i	is forwarded under chain-o	of-custody. If the	laboratory does not. ght to TestAmerica
Possible Hazard Identification					Samp	Sample Disposal ( A fee may be assessed if samples are retained longer than 1 month)	be assessed if sam	ples are retained los	nger than 1 r	nonth)
Unconfirmed Deliverable Requested: I, II, III, IV, Other (specify)	Primary Deliverable Rank:		2		Specie	Special Instructions/QC Requirements:	Disposal By Lab ements:	Archive For	or	Months
Empty Kit Relinquished by:		Date:			Time:	(	Method of Shipment	hipment.		
	Date/Time: 91	1	700	Company	PAR.	Received		Date/Time	1824	Сотрапу
Relinquished by:	DateTime			Company	Re	Received by:		Date/Time		Company
Reinquished by:	Date/Time:			Сотрапу	R	Received by:		Date/Time:		Company
Custody Seals Intact: Custody Seal No.					ŭ	Cooler Temperature(s) *Cond Or	and Ower Remarks:			

# **Login Sample Receipt Checklist**

Client: Tampa Electric Company

Job Number: 660-81511-1

Login Number: 81511 List Source: TestAmerica Tampa

List Number: 1

Creator: Moccia, Vanessa M

Cieator. Moccia, variessa M		
Question	Answer	Comment
Radioactivity wasn't checked or is = background as measured by a survey meter.</td <td>N/A</td> <td></td>	N/A	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	N/A	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

7/5/2017

TestAmerica Tampa

# **Login Sample Receipt Checklist**

Client: Tampa Electric Company

Job Number: 660-81511-1

List Number: 81511 List Source: TestAmerica Pensacola
List Number: 2 List Creation: 06/30/17 10:50 AM

Creator: Edwards, Robin S

Creator: Edwards, Robin 5		
Question	Answer	Comment
Radioactivity wasn't checked or is = background as measured by a survey meter.</td <td>N/A</td> <td></td>	N/A	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	0.6°C IR-2
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	N/A	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

TestAmerica Tampa

7/5/2017



Report Date: July 11, 2017

TECO

5012 Causeway Blvd. Tampa, FL 33619

Attn: Peggy Penner

Field Custody:

Client

Client/Field ID:

L17F009-05

BBS-CCR-BW2

Sample Collection:

6-28-17/1002

Lab ID No:

17.7747

Lab Custody Date:

6-29-17/1450

Sample description:

Water

#### CERTIFICATE OF ANALYSIS

/					Analysis		Detection	
Parameter	Units	Re	esul	ts	Date	Method	Limit	
Combined Radium (Radium-226 + Radium 228)	pCi/l	4.8	±	0.7	Calc	Calc	0.7	
Radium-226	pCi/l	4.4	±	0.7	7-5-17/1227	EPA 903.0	0.3	
Radium-228 Alpha Standard: Th-230	pCi/l	0.4	±	0.5	7-11-17/0952	EPA Ra-05	0.7	

James W. Hayes

ames W. Hages

Laboratory Manager

Test results meet all requirements of the NELAC standards. Statement of estimated uncertainty available upon request. Test results refer only to sample(s) listed. Contact person: Jim Hayes (813) 229-2879.



Report Date: July 11, 2017

TECO

5012 Causeway Blvd. Tampa, FL 33619

Attn: Peggy Penner

Field Custody:

Client

Client/Field ID:

L17F009-04

BBS-CCR-BW1

Sample Collection:

6-28-17/1028

Lab ID No:

17.7746

Lab Custody Date:

6-29-17/1450

Sample description:

Water

CERTIFICATE OF ANALYSIS

					Analysis		Detection
Parameter	Units	Re	sul	ts	Date	Method	Limit
Combined Radium (Radium-226 + Radium 228)	pCi/l	37.8	±	1.7	Calc	Calc	0.7
Radium-226	pCi/l	34.4	±	1.7	7-5-17/1227	EPA 903.0	0.4
Radium-228 Alpha Standard: Th-230	pCi/l	3.4	±	0.6	7-11-17/0952	EPA Ra-05	0.7

ames W. Hages

James W. Hayes Laboratory Manager

Test results meet all requirements of the NELAC standards. Statement of estimated uncertainty available upon request. Test results refer only to sample(s) listed. Contact person: Jim Hayes (813) 229-2879.



Report Date: July 11, 2017

TECO

5012 Causeway Blvd. Tampa, FL 33619

Alpha Standard: Th-230

Attn: Peggy Penner

Field Custody:

Client

Client/Field ID:

L17F009-03

BBS-CCR-3

Sample Collection:

6-28-17/1100

Lab ID No:

17.7745

Lab Custody Date:

6-29-17/1450

Sample description:

Water

CERTIFICATE OF ANALYSIS

				Analysis		Detection	
Units	Re	sul	ts	Date	Method	Limit	
pCi/l	17.7	±	1.2	Calc	Calc	0.7	
pCi/l	15.9	±	1.2	7-5-17/1227	EPA 903.0	0.4	
pCi/l	1.8	±	0.6	7-11-17/0952	EPA Ra-05	0.7	
	pCi/l	pCi/l 17.7	pCi/l 17.7 ± pCi/l 15.9 ±	<pre>Units Results  pCi/l 17.7 ± 1.2  pCi/l 15.9 ± 1.2</pre>	pCi/l 17.7 ± 1.2 Calc pCi/l 15.9 ± 1.2 7-5-17/1227	Units         Results         Date         Method           pCi/l         17.7 ± 1.2         Calc         Calc           pCi/l         15.9 ± 1.2         7-5-17/1227         EPA 903.0	Units         Results         Date         Method         Limit           pCi/l         17.7 ± 1.2         Calc         Calc         0.7           pCi/l         15.9 ± 1.2         7-5-17/1227         EPA 903.0         0.4

ames W. Hages

James W. Hayes Laboratory Manager

Test results meet all requirements of the NELAC standards. Statement of estimated uncertainty available upon request. Test results refer only to sample(s) listed. Contact person: Jim Hayes (813) 229-2879.



Report Date: July 11, 2017

TECO

5012 Causeway Blvd. Tampa, FL 33619

Attn: Peggy Penner

Field Custody:

Client

Client/Field ID:

L17F009-02

BBS-CCR-2

Sample Collection:

6-28-17/1127

Lab ID No:

17.7744

Lab Custody Date:

6-29-17/1450

Sample description:

Water

CERTIFICATE OF ANALYSIS

				Detection			
Parameter	Units	Re	sul		Analysis Date	Method	Limit
Combined Radium (Radium-226 + Radium 228)	pCi/l	14.7	±	1.1	Calc	Calc	0.7
Radium-226	pCi/l	13.7	±	1.1	7-5-17/1227	EPA 903.0	0.4
Radium-228 Alpha Standard: Th-230	pCi/l	1.0	±	0.5	7-11-17/0952	EPA Ra-05	0.7

ames W. Hages

James W. Hayes Laboratory Manager

Test results meet all requirements of the NELAC standards. Statement of estimated uncertainty available upon request. Test results refer only to sample(s) listed. Contact person: Jim Hayes (813) 229-2879.



Report Date: July 11, 2017

TECO

5012 Causeway Blvd. Tampa, FL 33619

Attn: Peggy Penner

Field Custody: Client/Field ID: Client L17F009-01

BBS-CCR-1

Sample Collection:

6-28-17/1245

Lab ID No:

17.7743

Lab Custody Date:

6-29-17/1450

Sample description: Water

CERTIFICATE OF ANALYSIS

					Analysis		Detection		
Parameter	Units	Re	sul	ts	Date	Method	Limit	_	
Combined Radium (Radium-226 + Radium 228)	pCi/l	41.4	±	1.9	Calc	Calc	0.7		
Radium-226	pCi/l	39.7	±	1.9	7-5-17/1227	EPA 903.0	0.4		
Radium-228 Alpha Standard: Th-230	pCi/l	1.7	±	0.6	7-11-17/0952	EPA Ra-05	0.7		

James W. Hayes

Laboratory Manager

Test results meet all requirements of the NELAC standards. Statement of estimated uncertainty available upon request. Test results refer only to sample(s) listed. Contact person: Jim Hayes (813) 229-2879.

### SUBCONTRACT ORDER

# Tampa Electric Company, Laboratory Services L17F009

### SENDING LABORATORY:

Tampa Electric Company, Laboratory Services

5012 Causeway Blvd Tampa, FL 33619

Phone: (813) 630-7490 Fax: (813) 630-7360

Project Manager:

ger: Peggy Penner

### RECEIVING LABORATORY:

KNL Laboratory Services

3202 N. Florida Ave.

Tampa, FL 33603

Phone:(813) 229-2879

Fax: -

Due Date: 07/13/17 16:00

Analysis	Expires		Laboratory ID Comments	
Sample ID: L17F009-01 BBS-CCR-1 Sampled: 06/28/17 12:45		Water	17.7743	
Radium 226 EPA 903.0	12/25/17 12:45		Level 2 Data requred	
Radium 226+228, Total	12/25/17 12:45		Level 2 Data requred	
Radium 228 Ra-05	12/25/17 12:45		Level 2 Data requred	
Containers Supplied:				
RAD Poly HNO3 - 1000mL (C)	RAD Poly HNO3 - 1000	mL(D)		
Sample ID: L17F009-02 BBS-CCR-2 Sampled: 06/28/17 11:27		Water	17.7744	
Radium 226 EPA 903.0	12/25/17 11:27		Level 2 Data requred	
Radium 226+228, Total	12/25/17 11:27		Level 2 Data requred	
Radium 228 Ra-05	12/25/17 11:27		Level 2 Data requred	
Containers Supplied: RAD Poly HNO3 - 1000mL (C)	RAD Poly HNO3 - 1000	)mL (D)		
Sample ID: L17F009-03 BBS-CCR-3		Water	17 22 1	
Sampled: 06/28/17 11:00			17.7745	
Radium 226+228, Total	12/25/17 11:00		Level 2 Data requred	
Radium 226 EPA 903.0	12/25/17 11:00		Level 2 Data requred	
Radium 228 Ra-05	12/25/17 11:00		Level 2 Data requred	
Containers Supplied:				
RAD Poly HNO3 - 1000mL (C)	RAD Poly HNO3 - 1000			
Sample ID: L17F009-04 BBS-CCR-BV Sampled: 06/28/17 10:28	V1	Water	17.7746	
Sampled: 06/28/17 10:28  Radium 226 EPA 903.0	12/25/17 10:28		Level 2 Data requred	
Radium 226+228, Total	12/25/17 10:28		Level 2 Data requred	
Radium 228 Ra-05	12/25/17 10:28		Level 2 Data requred	
Containers Supplied:	n.n.n.l. 19102 100	0 - I (D)		
RAD Poly HNO3 - 1000mL (C)	RAD Poly HNO3 - 100	UmL (D)		

Released By Date & Time

Received By

6/29/17 1450 Date & Time

Released By Date & Time

Received By

Date & Time

## SUBCONTRACT ORDER

# Tampa Electric Company, Laboratory Services L17F009

Analysis	Expires		Laboratory ID Comments
Sample ID: L17F009-05 BBS-CCR- Sampled: 06/28/17 10:02	BW2	Water	17.7747
Radium 228 Ra-05	12/25/17 10:02		Level 2 Data requred
Radium 226 EPA 903.0	12/25/17 10:02		Level 2 Data requred
Radium 226+228, Total	12/25/17 10:02		Level 2 Data requred
Containers Supplied: RAD Poly HNO3 - 1000mL (C)	RAD Poly HNO3 - 1000mL (l	D)	

Released By Date

Date & Time

Received By

Date & Time

Released By Date & Time Received By Date & Time



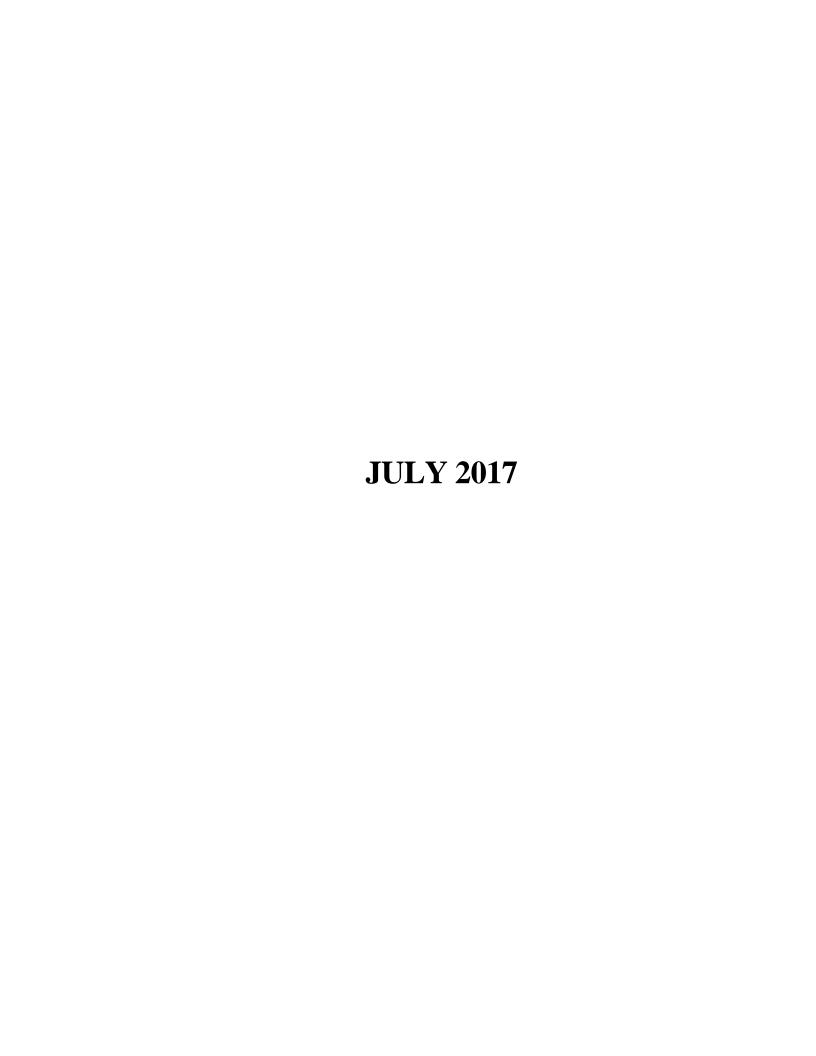
# **FL DOH Certification # E84025**

QC Summary: Radium 2	28 Analysis	
Client Project #:L17F	009	
Analysis Completion Date:	71 11 17	
Precision Data:	Sample #: _ 17.	.7746
Sample Analysis (pCi/l)		(pCi/l) RPD (%)
Spike Data:	Sample #:	7746
Sample Analysis (pCi/l)	Spike Added (pCi/l) Analytical Res	ult (pCi/l) Spike Rec (%)
3.4	3.85 6.9	9 91%
LCS Data:		
Analytical Result (pCi/l)	True Value (pCi/l)	% Recovery
4.4	4.28	103 %
Lab Blank:		
	Analytical Result (pCi/l)	Analysis Date
Lab Blank	0.3 +1	7 1 11 1 17



# FL DOH Certification # E84025

QC Summary: Total Rad	lium Analysis	
Client Project # : L17F	009	
Analysis Completion Date:	715117	_3
Precision Data:	Sample #:	7744
Sample Analysis (pCi/l)	Duplicate Analysis (pCi/l) Range	e (pCi/l) RPD (%)
_18.7	_17.6	1.1 6.04
Spike Data:	Sample #: _17.	7744
Sample Analysis (pCi/l)	Spike Added (pCi/l) Analytical Res	sult (pCi/l) Spike Rec (%)
13.7	4.5 17.4	877
LCS Data:	,	
Analytical Result (pCi/l)	True Value (pCi/l)	% Recovery
10.8	_10-1	1078
Lab Blank:		
A. S. e. a. v.	Analytical Result (pCi/l)	Analysis Date
Lab Blank	0.2 +/- 0,1	715117





5012 Causeway Blvd Tampa Fl. 33619 \* Ph (813)630-7490 \* Fax (813)630-7360 \* DOH #E54272

Big Bend Power Station Terry Eastley 13031 Wyandott Rd Apollo Beach, FL 33572 tleastley@tecoenergy.com

Work Order - L17G024

**Report Date:** 

08/22/17 15:12

# **Project - CCR Wells Economizer Ash Pond**

### **Case Narrative**

5 sample(s) were received on 07/20/17 13:30.

There were no issues noted with the sample(s) associated with this workorder unless noted below.

#### SM2540C TDS

When reviewing the data, it was noticed that sample BBS-CCR-1 results was 1/2 of the expected range. In addition, the water quality comparison was outside of expected ranges. The sample was reanalyzed past the EPA recommended hold time. The result was within the expected historical and water quality comparison ranges. The re-analysis is reported with a Q qualifier.

A constant weight could not be acheived after three consectutive weighing and drying cycles for sample CCR-BW-1. The sample(s) are flagged with a J qualifier.

#### **EPA 300.0**

The recovery of the matrix spike and/or spike duplicate for Chloride and Fluoride were outside the control limits due to matrix interference. The parent sample is flagged with a J qualifier.

The CCV for Fluoride was above the control limits. Review of historical data showed that all results were comparable to historical values, therefore the results were reported. The samples are flagged with a J qualifier.

#### **EPA 200.7**

The recovery of the matrix spike and spike duplicate for Calcium could not be accurately determined due to the amount of target analyte in the sample matrix . The parent sample is flagged with a J qualifier.



5012 Causeway Blvd Tampa Fl. 33619 \* Ph (813)630-7490 \* Fax (813)630-7360 \* DOH #E54272

### **Sample Information**

Client: Big Bend Power Station

Lab Sample ID: L17G024-01 Sampled By: Robert Barthelette

Sample Description: BBS-CCR-1 Date and Time Collected: 7/20/17 12:25
Sample Collection Method: Grab Date of Sample Receipt: 7/20/17 13:30

### **Laboratory Results**

D	D 14	TT '4	MDI	DOL	Qualifier	D.I	Test		Analysis
Parameter	Result	Units	MDL	PQL	Code	Dil	Method	Analyst	Date & Time
	7	Tampa Elec	tric Compa	ny, Labo	ratory Sei	vices			
<b>General Chemistry Parameters</b>									
Chloride	694	mg/L	2.00	50.0	J-,V	100	EPA 300.0	RFL	8/14/17 16:32
Specific Conductance	3960	umhos/cm	100	100		1	FDEP SOP FT 1200	RAB	7/20/17 12:25
Dissolved Oxygen	0.100	mg/L	0.100	0.100		1	FDEP SOP FT 1500	RAB	7/20/17 12:25
Fluoride	0.157	mg/L	0.0100	0.0500	J-,V	1	EPA 300.0	RFL	8/14/17 16:22
pН	6.81	pH Units	1.00	1.00		1	FDEP SOP FT 1100	RAB	7/20/17 12:25
REDOX Potential	-122	mV	-999	-999		1	SM 2580B	RAB	7/20/17 12:25
Total Dissolved Solids	3400	mg/L	12.0	20.0	Q	1	SM 2540C	RFL	8/18/17 15:25
Sulfate	1390	mg/L	50.0	200		100	EPA 300.0	RFL	8/9/17 22:43
Turbidity	1.58	NTU	0.100	0.100		1	FDEP SOP FT 1600	RAB	7/20/17 12:25
Total Mercury by SW846 Metho	d 7470/7471								
Mercury	0.0500	ug/L	0.0500	0.200	U	1	EPA 7470A	RLC	7/26/17 14:46
<b>Total Recoverable Metals by 200</b>	Series								
Antimony	3.00	ug/L	3.00	10.0	U	5	EPA 200.8	RLC	8/3/17 8:08
Arsenic	10.3	ug/L	1.60	10.0		5	EPA 200.8	RLC	8/3/17 8:08
Cadmium	0.500	ug/L	0.500	2.50	U	5	EPA 200.8	RLC	8/3/17 8:08
Cobalt	0.495	ug/L	0.200	10.0	I	5	EPA 200.8	RLC	8/3/17 8:08
Lead	0.000400	mg/L	0.000400	0.0100	U	5	EPA 200.8	RLC	8/3/17 8:08
Selenium	2.25	ug/L	1.00	10.0	I	5	EPA 200.8	RLC	8/3/17 8:08
Thallium	0.500	ug/L	0.500	2.50	U	5	EPA 200.8	RLC	8/3/17 8:08
<b>Total Recoverable Metals by SW</b>	846 Method	6010B							
Barium	0.112	mg/L	0.000500	0.0200		1	EPA 6010B	MCR	7/27/17 12:53
Beryllium	0.200	ug/L	0.200	2.00	U	1	EPA 6010B	MCR	7/27/17 12:53
Boron	16.0	mg/L	0.0100	0.0500		1	EPA 6010B	MCR	7/27/17 12:53
Calcium	576	mg/L	0.0300	1.00	V	1	EPA 6010B	MCR	7/31/17 11:24
Chromium	1.62	ug/L	1.60	12.0	I	1	EPA 6010B	MCR	7/27/17 12:53
Molybdenum	99.6	ug/L	1.00	20.0		1	EPA 6010B	MCR	7/28/17 14:54



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### **Sample Information**

Client: Big Bend Power Station

Lab Sample ID: L17G024-02 Sampled By: Robert Barthelette

Sample Description: BBS-CCR-2 Date and Time Collected: 7/20/17 12:56
Sample Collection Method: Grab Date of Sample Receipt: 7/20/17 13:30

### **Laboratory Results**

					Qualifier		Test		Analysis
Parameter	Result	Units	MDL	PQL	Code	Dil	Method	Analyst	Date & Time
	7	Tampa Elec	tric Compa	ny, Labo	ratory Se	rvices			
<b>General Chemistry Parameters</b>									
Chloride	114	mg/L	0.200	5.00	V	10	EPA 300.0	RFL	8/14/17 17:13
Specific Conductance	1630	umhos/cm	100	100		1	FDEP SOP FT 1200	RAB	7/20/17 12:56
Dissolved Oxygen	0.100	mg/L	0.100	0.100	U	1	FDEP SOP FT 1500	RAB	7/20/17 12:56
Fluoride	0.166	mg/L	0.0100	0.0500	J-,V	1	EPA 300.0	RFL	8/14/17 16:43
pH	6.97	pH Units	1.00	1.00		1	FDEP SOP FT 1100	RAB	7/20/17 12:56
REDOX Potential	-154	mV	-999	-999		1	SM 2580B	RAB	7/20/17 12:56
Total Dissolved Solids	1140	mg/L	24.0	40.0		2	SM 2540C	RFL	7/24/17 17:30
Sulfate	481	mg/L	5.00	20.0		10	EPA 300.0	RFL	8/9/17 23:03
Turbidity	4.56	NTU	0.100	0.100		1	FDEP SOP FT 1600	RAB	7/20/17 12:56
Total Mercury by SW846 Meth	od 7470/7471								
Mercury	0.0500	ug/L	0.0500	0.200	U	1	EPA 7470A	RLC	7/26/17 14:49
<b>Total Recoverable Metals by 20</b>	0 Series								
Antimony	0.600	ug/L	0.600	2.00	U	1	EPA 200.8	RLC	7/31/17 9:49
Arsenic	0.974	ug/L	0.320	2.00	I	1	EPA 200.8	RLC	7/31/17 9:49
Cadmium	0.100	ug/L	0.100	0.500	U	1	EPA 200.8	RLC	7/31/17 9:49
Cobalt	0.0857	ug/L	0.0400	2.00	I	1	EPA 200.8	RLC	7/31/17 9:49
Lead	0.000127	mg/L	8.00E-5	0.00200	I	1	EPA 200.8	RLC	7/31/17 9:49
Selenium	0.474	ug/L	0.200	2.00	I	1	EPA 200.8	RLC	7/31/17 9:49
Thallium	0.100	ug/L	0.100	0.500	U	1	EPA 200.8	RLC	7/31/17 9:49
<b>Total Recoverable Metals by SV</b>	W846 Method	6010B							
Barium	0.0546	mg/L	0.000500	0.0200		1	EPA 6010B	MCR	7/27/17 12:56
Beryllium	0.423	ug/L	0.200	2.00	I,V	1	EPA 6010B	MCR	7/27/17 12:56
Boron	4.94	mg/L	0.0100	0.0500		1	EPA 6010B	MCR	7/27/17 12:56
Calcium	178	mg/L	0.0300	1.00	V	1	EPA 6010B	MCR	7/31/17 11:26
Chromium	3.11	ug/L	1.60	12.0	I	1	EPA 6010B	MCR	7/27/17 12:56
Molybdenum	9.88	ug/L	1.00	20.0	I	1	EPA 6010B	MCR	7/28/17 14:57



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### **Sample Information**

Client: Big Bend Power Station

Lab Sample ID: L17G024-03 Sampled By: Robert Barthelette

Sample Description: BBS-CCR-3 Date and Time Collected: 7/20/17 11:56
Sample Collection Method: Grab Date of Sample Receipt: 7/20/17 13:30

### **Laboratory Results**

					Qualifier		Test		Analysis
Parameter	Result	Units	MDL	PQL	Code	Dil	Method	Analyst	Date & Time
	7	Tampa Elec	tric Compa	ny, Labo	ratory Se	rvices			
<b>General Chemistry Parameter</b>	<u>rs</u>								
Chloride	158	mg/L	0.200	5.00	V	10	EPA 300.0	RFL	8/14/17 17:33
Specific Conductance	1750	umhos/cm	100	100		1	FDEP SOP FT 1200	RAB	7/20/17 11:56
Dissolved Oxygen	0.170	mg/L	0.100	0.100		1	FDEP SOP FT 1500	RAB	7/20/17 11:56
Fluoride	0.230	mg/L	0.0100	0.0500	J-,V	1	EPA 300.0	RFL	8/14/17 17:23
pH	6.36	pH Units	1.00	1.00		1	FDEP SOP FT 1100	RAB	7/20/17 11:56
REDOX Potential	-122	mV	-999	-999		1	SM 2580B	RAB	7/20/17 11:56
Total Dissolved Solids	1310	mg/L	24.0	40.0		2	SM 2540C	RFL	7/24/17 17:30
Sulfate	506	mg/L	5.00	20.0		10	EPA 300.0	RFL	8/9/17 23:24
Turbidity	0.510	NTU	0.100	0.100		1	FDEP SOP FT 1600	RAB	7/20/17 11:56
<b>Total Mercury by SW846 Met</b>	thod 7470/7471								
Mercury	0.0500	ug/L	0.0500	0.200	U	1	EPA 7470A	RLC	7/26/17 14:53
<b>Total Recoverable Metals by 2</b>	200 Series								
Antimony	3.00	ug/L	3.00	10.0	U	5	EPA 200.8	RLC	8/3/17 8:11
Arsenic	1.60	ug/L	1.60	10.0	U	5	EPA 200.8	RLC	8/3/17 8:11
Cadmium	0.500	ug/L	0.500	2.50	U	5	EPA 200.8	RLC	8/3/17 8:11
Cobalt	0.200	ug/L	0.200	10.0	U	5	EPA 200.8	RLC	8/3/17 8:11
Lead	0.000400	mg/L	0.000400	0.0100	U	5	EPA 200.8	RLC	8/3/17 8:11
Selenium	1.00	ug/L	1.00	10.0	U	5	EPA 200.8	RLC	8/3/17 8:11
Thallium	0.500	ug/L	0.500	2.50	U	5	EPA 200.8	RLC	8/3/17 8:11
<b>Total Recoverable Metals by S</b>	SW846 Method	6010B							
Barium	0.0634	mg/L	0.000500	0.0200		1	EPA 6010B	MCR	7/27/17 12:59
Beryllium	0.356	ug/L	0.200	2.00	I,V	1	EPA 6010B	MCR	7/27/17 12:59
Boron	0.211	mg/L	0.0100	0.0500		1	EPA 6010B	MCR	7/27/17 12:59
Calcium	205	mg/L	0.0300	1.00	J-,V	1	EPA 6010B	MCR	7/31/17 11:29
Chromium	3.43	ug/L	1.60	12.0	I	1	EPA 6010B	MCR	7/27/17 12:59
Molybdenum	10.6	ug/L	1.00	20.0	I	1	EPA 6010B	MCR	7/28/17 14:59



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### **Sample Information**

Client: Big Bend Power Station

Lab Sample ID: L17G024-04 Sampled By: Robert Barthelette

Sample Description: BBS-CCR-BW1 Date and Time Collected: 7/20/17 11:01
Sample Collection Method: Grab Date of Sample Receipt: 7/20/17 13:30

### **Laboratory Results**

					Qualifier		Test		Analysis
Parameter	Result	Units	MDL	PQL	Code	Dil	Method	Analyst	Date & Time
	7	Tampa Elec	tric Compa	ny, Labo	ratory Ser	vices			
<b>General Chemistry Paramete</b>	<u>rs</u>								
Chloride	915	mg/L	4.00	100	V	200	EPA 300.0	RFL	8/14/17 17:53
Specific Conductance	4960	umhos/cm	100	100		1	FDEP SOP FT 1200	RAB	7/20/17 11:01
Dissolved Oxygen	0.600	mg/L	0.100	0.100		1	FDEP SOP FT 1500	RAB	7/20/17 11:01
Fluoride	0.255	mg/L	0.0100	0.0500	J-,V	1	EPA 300.0	RFL	8/14/17 17:43
pH	6.49	pH Units	1.00	1.00		1	FDEP SOP FT 1100	RAB	7/20/17 11:01
REDOX Potential	-23.0	mV	-999	-999		1	SM 2580B	RAB	7/20/17 11:01
Total Dissolved Solids	4160	mg/L	48.0	80.0	J-	4	SM 2540C	RFL	7/24/17 17:30
Sulfate	1470	mg/L	100	400		200	EPA 300.0	RFL	8/14/17 17:53
Turbidity	2.38	NTU	0.100	0.100		1	FDEP SOP FT 1600	RAB	7/20/17 11:01
<b>Total Mercury by SW846 Met</b>	thod 7470/7471								
Mercury	0.0500	ug/L	0.0500	0.200	U	1	EPA 7470A	RLC	7/26/17 14:56
<b>Total Recoverable Metals by 2</b>	200 Series								
Antimony	6.00	ug/L	6.00	20.0	U	10	EPA 200.8	RLC	7/31/17 10:06
Arsenic	8.48	ug/L	3.20	20.0	I	10	EPA 200.8	RLC	7/31/17 10:06
Cadmium	1.00	ug/L	1.00	5.00	U	10	EPA 200.8	RLC	7/31/17 10:06
Cobalt	1.97	ug/L	0.400	20.0	I	10	EPA 200.8	RLC	7/31/17 10:06
Lead	0.000800	mg/L	0.000800	0.0200	U	10	EPA 200.8	RLC	7/31/17 10:06
Selenium	2.00	ug/L	2.00	20.0	U	10	EPA 200.8	RLC	7/31/17 10:06
Thallium	1.00	ug/L	1.00	5.00	U	10	EPA 200.8	RLC	7/31/17 10:06
<b>Total Recoverable Metals by S</b>	SW846 Method	6010B							
Barium	0.0517	mg/L	0.000500	0.0200		1	EPA 6010B	MCR	7/27/17 13:01
Beryllium	0.200	ug/L	0.200	2.00	U	1	EPA 6010B	MCR	7/27/17 13:01
Boron	47.0	mg/L	0.0100	0.0500		1	EPA 6010B	MCR	7/27/17 13:01
Calcium	744	mg/L	0.0300	1.00	V	1	EPA 6010B	MCR	7/31/17 11:31
Chromium	2.16	ug/L	1.60	12.0	I	1	EPA 6010B	MCR	7/27/17 13:01
Molybdenum	13.6	ug/L	1.00	20.0	I	1	EPA 6010B	MCR	7/28/17 15:02



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### **Sample Information**

Client: Big Bend Power Station

Lab Sample ID: L17G024-05 Sampled By: Robert Barthelette

Sample Description: BBS-CCR-BW2 Date and Time Collected: 7/20/17 10:29
Sample Collection Method: Grab Date of Sample Receipt: 7/20/17 13:30

### **Laboratory Results**

	ъ. т.	<b>T</b> I. <b>1</b> .	MDI	DOI.	Qualifier	ъ.,	Test		Analysis
Parameter	Result	Units	MDL	PQL	Code	Dil	Method	Analyst	Date & Time
	Т	Tampa Elec	tric Compa	ny, Labo	ratory Sei	rvices			
<b>General Chemistry Parameters</b>									
Chloride	123	mg/L	0.200	5.00	V	10	EPA 300.0	RFL	8/14/17 18:13
Specific Conductance	1540	umhos/cm	100	100		1	FDEP SOP FT 1200	RAB	7/20/17 10:29
Dissolved Oxygen	0.330	mg/L	0.100	0.100		1	FDEP SOP FT 1500	RAB	7/20/17 10:29
Fluoride	0.319	mg/L	0.0100	0.0500	J-,V	1	EPA 300.0	RFL	8/14/17 18:03
pH	6.66	pH Units	1.00	1.00		1	FDEP SOP FT 1100	RAB	7/20/17 10:29
REDOX Potential	-94.0	mV	-999	-999		1	SM 2580B	RAB	7/20/17 10:29
Total Dissolved Solids	1200	mg/L	24.0	40.0		2	SM 2540C	RFL	7/24/17 17:30
Sulfate	41.7	mg/L	5.00	20.0		10	EPA 300.0	RFL	8/10/17 0:24
Turbidity	5.27	NTU	0.100	0.100		1	FDEP SOP FT 1600	RAB	7/20/17 10:29
<b>Total Mercury by SW846 Metho</b>	od 7470/7471								
Mercury	0.0500	ug/L	0.0500	0.200	U	1	EPA 7470A	RLC	7/26/17 14:59
<b>Total Recoverable Metals by 20</b>	0 Series								
Antimony	6.00	ug/L	6.00	20.0	U	10	EPA 200.8	RLC	7/31/17 10:09
Arsenic	3.20	ug/L	3.20	20.0	U	10	EPA 200.8	RLC	7/31/17 10:09
Cadmium	1.00	ug/L	1.00	5.00	U	10	EPA 200.8	RLC	7/31/17 10:09
Cobalt	0.400	ug/L	0.400	20.0	U	10	EPA 200.8	RLC	7/31/17 10:09
Lead	0.000800	mg/L	0.000800	0.0200	U	10	EPA 200.8	RLC	7/31/17 10:09
Selenium	2.00	ug/L	2.00	20.0	U	10	EPA 200.8	RLC	7/31/17 10:09
Thallium	1.00	ug/L	1.00	5.00	U	10	EPA 200.8	RLC	7/31/17 10:09
<b>Total Recoverable Metals by SV</b>	V846 Method	6010B							
Barium	0.0477	mg/L	0.000500	0.0200		1	EPA 6010B	MCR	7/27/17 13:04
Beryllium	0.220	ug/L	0.200	2.00	I,V	1	EPA 6010B	MCR	7/27/17 13:04
Boron	4.57	mg/L	0.0100	0.0500		1	EPA 6010B	MCR	7/27/17 13:04
Calcium	278	mg/L	0.0300	1.00	V	1	EPA 6010B	MCR	7/31/17 11:34
Chromium	2.26	ug/L	1.60	12.0	I	1	EPA 6010B	MCR	7/27/17 13:04
Molybdenum	8.90	ug/L	1.00	20.0	I	1	EPA 6010B	MCR	7/28/17 15:04



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#### **Comments**

- U Indicates that the compound was analyzed for but not detected.
- Q Sample held beyond the accepted holding time.
- J- The reported value is an estimated value, see the case narrative for specifics.
- I Estimated value
- V Analyte detected in the method blank

#### **Subcontract Laboratories:**



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### Total Recoverable Metals by SW846 Method 6010B - Quality Control

arce	ke	Spike	Spike S	Source		%Rec		RPD	
sult		Level	•	Result	%Rec	Limits	RPD	Limit	Qualifier
17 Anal	ed: 07/	Prepared: 0	repared: 07/2	7/25/17 A	nalyzed: 0	7/27/17			
									U
									I
									U
									I
									U
17 Anal	ed: 07/	Prepared: 0	repared: 07/2	7/25/17 A	nalyzed: 0	7/27/17			
	00	1.0000	1.0000		96.3	80-120			
	).0	1000.0	1000.0		96.2	80-120			V
	00	1.0000	1.0000		99.1	80-120			
	).0	1000.0	1000.0		96.3	80-120			
17 Anal	ed: 07/	Prepared: 0	repared: 07/2	7/25/17 A	nalyzed: 0	7/27/17			
634	00	1.0000	1.0000	0.0634	95.0	75-125			
356	).0	1000.0	1000.0	0.356	95.7	75-125			V
211	00	1.0000	1.0000	0.211	100	75-125			
43	).0	1000.0	1000.0	3.43	95.5	75-125			
17 Anal	ed: 07/	Prepared: 0	repared: 07/2	7/25/17 A	nalyzed: 0	7/27/17			
634	00	1.0000	1.0000	0.0634	92.2	75-125	2.83	20	
356	).0	1000.0	1000.0	0.356	93.7	75-125	2.10	20	V
211	00	1.0000	1.0000	0.211	96.6	75-125	3.09	20	
43	).0	1000.0	1000.0	3.43	93.2	75-125	2.36	20	
17 Anal	ed: 07/	Prepared: 0	repared: 07/2	7/27/17 A	nalyzed: 0	07/28/17			
					<u> </u>				U
17 Anal	ed: 07/2	Prepared: 0	repared: 07/2	7/27/17 A	analyzed: 0	07/28/17			



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### Total Recoverable Metals by SW846 Method 6010B - Quality Control

					Spike	Source		%Rec		RPD	
Analyte	Result	MDL	PQL	Units	Level	Result	%Rec	Limits	RPD	Limit	Qualifier
Batch 17G0232 - EPA 6010B											
LCS (17G0232-BS1)					Prepared: (	)7/27/17 Aı	nalyzed: 07	//28/17			
Molybdenum	920	1.00	20.0	ug/L	1000.0		92.0	80-120			
Matrix Spike (17G0232-MS1)		Sour	ce: L17G02	24-01	Prepared: (	)7/27/17 Aı	nalyzed: 07	7/28/17			
Molybdenum	943	1.00	20.0	ug/L	1000.0	99.6	84.3	75-125			
Matrix Spike Dup (17G0232-MSD1)		Sour	ce: L17G02	24-01	Prepared: (	)7/27/17 Aı	nalyzed: 07	7/28/17			
Molybdenum	957	1.00	20.0	ug/L	1000.0	99.6	85.8	75-125	1.54	20	



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### Total Mercury by SW846 Method 7470/7471 - Quality Control

Analyte	Result	MDL	PQL	Units	Spike Level	Source Result	%Rec	%Rec Limits	RPD	RPD Limit	Qualifier
Batch 17G0170 - EPA 7470A											
Blank (17G0170-BLK1)					Prepared &	Analyzed:	07/26/17				
Mercury	0.0500	0.0500	0.200	ug/L							U
LCS (17G0170-BS1)					Prepared &	Analyzed:	07/26/17				
Mercury	0.995	0.0500	0.200	ug/L	1.0000		99.5	80-120			
Matrix Spike (17G0170-MS1)		Sour	e: L17G02	24-04	Prepared &	Analyzed:	07/26/17				
Mercury	1.00	0.0500	0.200	ug/L	1.0000	U	100	75-125			
Matrix Spike Dup (17G0170-MSD1)		Sour	e: L17G02	24-04	Prepared &	Analyzed:	07/26/17				
Mercury	1.00	0.0500	0.200	ug/L	1.0000	U	100	75-125	0.390	20	



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### **Total Recoverable Metals by 200 Series - Quality Control**

Analyte	Result	MDL	PQL	Units	Spike Level	Source Result	%Rec	%Rec Limits	RPD	RPD Limit	Qualifier
Batch 17G0141 - EPA 200.8											
Blank (17G0141-BLK1)					Prepared: 0	07/20/17 Ar	nalyzed: 07	7/31/17			
Antimony	0.600	0.600	2.00	ug/L	<u> </u>						U
Arsenic	0.320	0.320	2.00	ug/L							U
Cadmium	0.100	0.100	0.500	ug/L							U
Cobalt	0.0400	0.0400	2.00	ug/L							U
Lead	8.00E-5	8.00E-5	0.00200	mg/L							U
Selenium	0.200	0.200	2.00	ug/L							U
Thallium	0.100	0.100	0.500	ug/L							U
LCS (17G0141-BS1)		Prepared: 07/20/17 Analyzed: 07/31/17									
Antimony	106	0.600	2.00	ug/L	100.00		106	85-115			
Arsenic	99.9	0.320	2.00	ug/L	100.00		99.9	85-115			
Cadmium	104	0.100	0.500	ug/L	100.00		104	85-115			
Cobalt	94.5	0.0400	2.00	ug/L	100.00		94.5	85-115			
Lead	0.103	8.00E-5	0.00200	mg/L	0.10000		103	85-115			
Selenium	105	0.200	2.00	ug/L	100.00		105	85-115			
Thallium	108	0.100	0.500	ug/L	100.00		108	85-115			
Matrix Spike (17G0141-MS1)		Source: L17G013-03				Prepared: 07/20/17 Analyzed: 08/03/17					
Antimony	117	3.00	10.0	ug/L	100.00	14.5	102	70-130			
Arsenic	108	1.60	10.0	ug/L	100.00	2.89	105	70-130			
Cadmium	97.8	0.500	2.50	ug/L	100.00	0.746	97.1	70-130			
Cobalt	99.1	0.200	10.0	ug/L	100.00	3.49	95.6	70-130			
Lead	0.0943	0.000400	0.0100	mg/L	0.10000	U	94.3	70-130			
Selenium	278	1.00	10.0	ug/L	100.00	173	105	70-130			
Thallium	97.4	0.500	2.50	ug/L	100.00	1.93	95.5	70-130			
Matrix Spike (17G0141-MS2)		Source: L17G024-01			Prepared: 07/20/17 Analyzed: 08/03/17						
Antimony	107	3.00	10.0	ug/L	100.00	U	107	70-130			
Arsenic	119	1.60	10.0	ug/L	100.00	10.3	108	70-130			
Cadmium	97.1	0.500	2.50	ug/L	100.00	U	97.1	70-130			
Cobalt	96.3	0.200	10.0	ug/L	100.00	0.495	95.8	70-130			
Lead	0.0932	0.000400	0.0100	mg/L	0.10000	U	93.2	70-130			
Selenium	113	1.00	10.0	ug/L	100.00	2.25	111	70-130			
Thallium	95.3	0.500	2.50	ug/L	100.00	U	95.3	70-130			



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### **Total Recoverable Metals by 200 Series - Quality Control**

Analyte	Result	MDL	PQL	Units	Spike Level	Source Result	%Rec	%Rec Limits	RPD	RPD Limit	Qualifier
Batch 17G0141 - EPA 200.8											
Matrix Spike Dup (17G0141-MSD1)		Source: L17G013-03			Prepared: 0	7/20/17 Ar	nalyzed: 08				
Antimony	119	3.00	10.0	ug/L	100.00	14.5	105	70-130	1.83	20	
Arsenic	114	1.60	10.0	ug/L	100.00	2.89	111	70-130	5.95	20	
Cadmium	103	0.500	2.50	ug/L	100.00	0.746	102	70-130	5.13	20	
Cobalt	99.8	0.200	10.0	ug/L	100.00	3.49	96.3	70-130	0.700	20	
Lead	0.0982	0.000400	0.0100	mg/L	0.10000	U	98.2	70-130	4.13	20	
Selenium	300	1.00	10.0	ug/L	100.00	173	126	70-130	7.42	20	
Thallium	102	0.500	2.50	ug/L	100.00	1.93	100	70-130	4.83	20	
Matrix Spike Dup (17G0141-MSD2)		Source: L17G024-01			Prepared: 07/20/17 Analyzed: 08/03/17						
Antimony	106	3.00	10.0	ug/L	100.00	U	106	70-130	0.540	20	
Arsenic	119	1.60	10.0	ug/L	100.00	10.3	109	70-130	0.633	20	
Cadmium	95.1	0.500	2.50	ug/L	100.00	U	95.1	70-130	2.04	20	
Cobalt	94.5	0.200	10.0	ug/L	100.00	0.495	94.0	70-130	1.87	20	
Lead	0.0915	0.000400	0.0100	mg/L	0.10000	U	91.5	70-130	1.87	20	
Selenium	107	1.00	10.0	ug/L	100.00	2.25	104	70-130	6.18	20	
Thallium	94.4	0.500	2.50	ug/L	100.00	U	94.4	70-130	0.965	20	



# **Tampa Electric Laboratory Services**

5012 Causeway Blvd Tampa Fl. 33619 \* Ph (813)630-7490 \* Fax (813)630-7360 \* DOH #E54272

### **General Chemistry Parameters - Quality Control**

					Spike	Source		%Rec		RPD	
Analyte	Result	MDL	PQL	Units	Level	Result	%Rec	Limits	RPD	Limit	Qualifier
Batch 17G0187 - SM 2540C											
Blank (17G0187-BLK1)					Prepared &	Analyzed:	07/24/17				
Total Dissolved Solids	12.0	12.0	20.0	mg/L							U
LCS (17G0187-BS1)					Prepared &	Analyzed:	07/24/17				
Total Dissolved Solids	1000	12.0	20.0	mg/L	1000.0		100	80-120			
Duplicate (17G0187-DUP1)		Sour	ce: L17G0(	03-01	Prepared &	Analyzed:	07/24/17				
Total Dissolved Solids	193	12.0	20.0	mg/L		187			3.16	10	
Duplicate (17G0187-DUP2)		Sour	ce: L17G01	13-03	Prepared &	Analyzed:	07/24/17				
Total Dissolved Solids	721	12.0	20.0	mg/L		724			0.415	10	
Batch 17H0076 - EPA 300.0											
Blank (17H0076-BLK1)					Prepared &	Analyzed:	08/09/17				
Sulfate	0.500	0.500	2.00	mg/L	-						U
LCS (17H0076-BS1)					Prepared &	Analyzed:	08/09/17				
Sulfate	4.58	0.500	2.00	mg/L	5.0000		91.6	90-110			
Matrix Spike (17H0076-MS1)		Sour	ce: L17G0(	03-01	Prepared &	z Analyzed:	08/09/17				
Sulfate	33.9	0.500	2.00	mg/L	5.0000	28.5	107	90-110			
Matrix Spike (17H0076-MS2)		Sour	ce: L17G01	10-01	Prepared &	Analyzed:	08/09/17				
Sulfate	6.81	0.500	2.00	mg/L	5.0000	2.16	93.0	90-110			
Matrix Spike Dup (17H0076-MSD1)		Sour	ce: L17G0(	03-01	Prepared &	z Analyzed:	08/09/17				
Sulfate	35.7	0.500	2.00	mg/L	5.0000	28.5	143	90-110	5.12	20	J-



# **Tampa Electric Laboratory Services**

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### **General Chemistry Parameters - Quality Control**

					Spike	Source		%Rec		RPD	
Analyte	Result	MDL	PQL	Units	Level	Result	%Rec	Limits	RPD	Limit	Qualifier
Batch 17H0076 - EPA 300.0											
Matrix Spike Dup (17H0076-MSD2)		Sour	ce: L17G01	0-01	Prepared &	Analyzed:	08/09/17				
Sulfate	6.99	0.500	2.00	mg/L	5.0000	2.16	96.7	90-110	2.69	20	
Batch 17H0125 - EPA 300.0											
Blank (17H0125-BLK1)					Prepared &	Analyzed:	08/14/17				
Chloride	0.631	0.0200	0.500	mg/L							
Fluoride	0.0688	0.0100	0.0500	mg/L							
Sulfate	0.500	0.500	2.00	mg/L							U
LCS (17H0125-BS1)					Prepared &	Analyzed:	08/14/17				
Chloride	4.67	0.0200	0.500	mg/L	5.0000		93.5	90-110			V
Fluoride	4.93	0.0100	0.0500	mg/L	5.0000		98.6	90-110			V
Sulfate	4.83	0.500	2.00	mg/L	5.0000		96.5	90-110			
Matrix Spike (17H0125-MS1)		Sour	ce: L17G01	5-01	Prepared &	Analyzed:	08/14/17				
Chloride	339	0.200	5.00	mg/L	50.000	296	86.1	90-110			J-,V
Fluoride	59.6	0.100	0.500	mg/L	50.000	0.918	117	90-110			J-,V
Sulfate	483	5.00	20.0	mg/L	50.000	440	84.9	90-110			J-
Matrix Spike Dup (17H0125-MSD1)		Sour	ce: L17G01	5-01	Prepared &	Analyzed:	08/14/17				
Chloride	343	0.200	5.00	mg/L	50.000	296	93.3	90-110	1.05	20	V
Fluoride	60.7	0.100	0.500	mg/L	50.000	0.918	120	90-110	1.82	20	J-,V
Sulfate	486	5.00	20.0	mg/L	50.000	440	92.7	90-110	0.812	20	

Tampa Electric Company, Laboratory Services

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Peggy Penner, Manager, Laboratory Services

Laboratory Services certifies that the test result in this report meet all requirements of the NELAC standards, unless indicated otherwise in the body of the report. Unless otherwise noted, all methods followed are per the most current published version of 40 CFR Part 136, Table B. Results reported on this report pertain to the above referenced sample only.

Eqpt. Table Theo Value mg/l Total Containers Theo Value mv Eqpt. Table Redox (mv) WLM08 WLM08 PE/S 8.846 PE/S 236.2 8.880 Yes Yes LEVEL Firme 13:30 dd. dd 10 Sample Reciept Temp 1.3 10 RAB /TECO Initials Total Miles 1L Rads Diss. (1) Samples On Ice Reading mg/l Reading mv S. Level Meter DO (mg/l) Squipment ID Level Meter Equipment ID Pres ID 236.0 8.86 9.00 (gal) 0.12 0.12 Dedicated 0.3 Dedicated 1 Egpt. Volume (gal) Time Tubing: Tubing? A checked box indicates that the sample was verified to a pH of <2 Tubing: **Tubing?** Pump: Pump: Yes 11 500 ml Nuts (2) STABLE STABLE STABLE STABLE Conduct (%) STABLE STABLE STABLE STABLE Total Time STABLE SODOR-W NONE Temp "C Temp °C 500 ml bottles(Sulfide) 2ml NAOH/Zinc Acet. to pH >12 Volume (gal) 21.5 21.5 Status 90.0 Status MILD 21.2 90.0 Volume (gal) S 250 ml bottles (Cyan) 1g NAOH to pH >12 + Sampler(s) / Initials Temp<sup>2</sup>C+/- 0.2 Cond % +/- 5 DO % Sat.< 20 Turb. NTU < 20 LT. YELLOW 0.2 0.2 Cond % +/- 5 00 % Sat. < 20 urb. NTU < 20 ph:+/- 0.2 emp°C+/- 0.2 \$COLOR-W 40ml Vial (6) <sup>2</sup>urge Criteria Purge Criteria CLEAR 13:40 13:33 9:10 Color Time 8:24 Time 0.2 표 Pump Volume (gal) Volume (gal) -/+:yd (6) 40ml VOA vial (CG) + + 019150A 250ml Nuts (3) Turbidity (NTU) Sulfite (mg/L) Turbidity (NTU) MPM08 MPM08 DO Meter Cal MPM08 2.52 4.56 4.56 Zobell Sol ID: 5.99 1.58 22.84 4.04 SO3-TR 1.62 1.58 Length (#) 760 23.3 Barom. Pres Tubing Length (ft) Therm ID Redox Cal Meter ID: CLOUDY & HOT Meter ID: × LT. YELLOW Redox (mv) Iodate/Iodide ID DO (mg/L) Pres ID 13:12 DO (mg/L) 0.0026 REDOX Capacity (galff.) 0.0026 90.0 0.04 0.05 Time 13:30 13:20 0.11 0.10 0.10 0.10 0.05 -122 Time -154 Time =0,006 (5) 1L amber glass (AG) ESS QC: (pH +/- 0.2) (Cond +/- 5%) (DO +/- 0.3mg/L) (Redox +/- 10mv) 500ml Sulfide (2) Turbidity(NTU) Starch Ind. ID. Tubing Inside Diam. Capacities Gallons/ft): 1/4" =0.0026, 3/8" Cond (uMHOS) Cond (uMHOS TURB-N-F 1629 9686 52.10 1 Well Volume (gal) 3962 3965 3965 3962 2.68 1569 1628 1629 7.00 2.63 1 Well Volume (gall) 1.6 200 SCS 1L bottles (diss. rads): filtered with 0.45um, 5 ml HNO3 to pH <2 A checked box indicates ICV / CCV passed DO 3 Pillow ID Well Capacity (gal) = 1L Rads (1) Temp °C Temp °C 25.82 25.74 25.74 25.80 25.71 25.74 072017 Wells RAB DO Mg/L 90:6 0.16 25.81 25.81 0.16 8:13 Well Capacity (gal) Time Time 8 0.1 0.1 2 250ml battles (nuts): 1 ml H2SO4 to pH <2 40 ml Vial (TOC): 0.5 ml H2SO4 to pH <2 (4) 100ml coliform bottle × Cond(uMHOS) 250ml Mtls (3) Na Thio ID 16.46 pH (SU) COND-F 1CV 53.00 16.78 pH (SU) 3965 1629 9715 6.82 6.98 Water Column (ft) 6.81 6.97 6.97 6.97 6.81 6.81 S ≥ Water Column (ft) ESS 11 II Water Depth (ft) File Name: 0307031Y 1L MUs (1) Temp °C Titrator ID TEMP-C Water Depth Stability Values =
Well Depth to
Depth Water
(ft) (ft) Depth to Water (fit) 5.18 5.18 5.19 8:45 Acceptability Range 48.71 55.49 6.03 5.06 25.8 8:45 6.03 Stablility Values = 8:45 9:00 5.86 6.02 Time Time (3) 250ml plastic (PP) 250ml Inorg (3) Total Vol. (gal) 07/20/17 Total Vol. (gal) Pres ID 22.32 pH (SU) 011664 011664 Cal 7.02 10.02 1000 1.62 21.84 1.43 1.72 Well Depth 1.33 1.91 2.01 4.01 6.8 G Time PH ESS 12:31 Gallons to Purge 0.12 500ml Inorg (2) Well Capacities (gallons/ft): 2" 12:06 Gallons to Purge 0.12 QC Result mg/l 0218201Y Volume (gal) Volume (gal) Buffer Value Intake Depth (ft) Intake Depth (ft) Std Value 52.10 17.32 16.84 Std Value 1000 10000 1.33 0.29 1.43 0.29 0.29 0.29 FE2 Ng/ 9 Date: (2) 500ml plastic (PP) 018611D 017987D 018416C 016723 018737A 1L Inorg (1) Standard ID Screen Interval (ft) Standard ID Screen Interval (ff) Rate (ml/min 12:25 Rate (ml/m Time 540 550 10 560 550 550 10 **Big Bend** ESS Loction Code 500 ml bottles (metals): 2 ml HNO3 to pH <2 BBS-CCR-2 250ml Cyan (3) 250 ml bottles (metal): 1 ml HNO3 to pH <2 BBS-CCR-1 0107301Y Diam/ Comp Diam/ Comp MPM08 MPM08 12:16 12:18 12:40 12:42 12:44 TM07 12:14 QC Std: 5ml (NaThio)/500ml DI=10mg/L ulfite Info (QC Check) (EPA 377.1) Time Time 1L bottles (rads): 5 ml HNO3 to pH <2 DEP FT 1200, Units: uMHOS **Turbidity Meter Calibration** DEP FT 1600, Units: NTU Conductivity Meter Calib urge Complete At urge Complete At L17G024-01 A L17G024-02 A urging Information L17G024-01 A L17G024-02 A BBS-CCR-2 BBS-CCR-1 FIMS# 1) 1L plastic (PP) pH Meter Calibr 12:18 12:30 12:44 Well # 12:05 #SWI7 Well # Comments: DEP FT 1100 Purge Meth. Purge Meth 1A urge Start: 1A urge Start: urge End: urge End: Aeter ID: Inits: SU Aeter ID: leter ID: Site:

Total Containers Theo Value mg/l Eqpt. Table Eqpt. Table Theo Value my Redox (mv) WLM08 WLM08 PE/S 8.846 8.880 PE/S 236.2 236.2 Yes LEVEL Time 13:30 В Yes 10 Sample Reciept Тетр 1.3 Total Miles RAB /TECO Initials MAD 1L Rads Diss. (1) Samples On Ice Reading mg/l 2 Reading mv evel Meter. DO (mg/l) Equipment ID Equipment ID Level Meter Pres ID 236.0 237.5 0.32 0.12 Dedicated 8.86 9.00 0.3 Dedicated Volume (pal) Volume (gal) Time A checked box indicates that the sample was verified to a pH of <2 Tubing: Tubing? Tubing? Tubing: Pump: Pump: Yes Cell Volume (gal = 500 ml Nuts (2) Conduct.(%) Total Time STABLE STABLE STABLE STABLE STABLE \$ODOR-W Temp °C 500 ml bottles(Sulfide) 2ml NAOH/Zinc Acet to pH >12 Temp °C 21.5 Status MILD 21.5 21.2 Status 21.3 90.0 90.0 Volume (gal) 2 250 ml bottles (Cyan) 1g NAOH to pH >12 40ml Vial (6) urb. NTU < 20 2 00 % Sat. < 20 Sampler(s) / 3 1+ % puo 00 % Sal. < 20 urb. NTU < 20 ph:+/- 0.2 emp\*C+/- 0.2 emp°C+/- 0.2 \$COLOR-W ph:+/- 0.2 YELLOW Purge Criteria Purge Criteria Pump Pump (gal) + ( 9:10 13:33 13:40 Time Time 8:24 Color PH 0.2 -/+ % puo Pump Volumo (gal) (6) 40ml VOA vial (CG) 250ml Nuts (3) Turbidity (NTU) Turbidity (NTU) Sulfite (mg/L) Therm ID MPM08 MPM08 MPM08 DO Meter Cal SO3-TR 24.23 Zobell Sol ID: Barom. Pres 760 0.69 0.73 0.51 0.51 Tubing Length 100 Redox Cal Tubing Length (ft) Meter ID: CLOUDY & HOT Meter ID: 50A × 500ml Mtls (2) Redox (mv) DO (mg/L) 0.0026 Pres ID 13:20 Time 13:12 DO (mg/L) 0.0026 13:30 0.16 REDOX 0.16 -123 0.17 0.17 Capacity (galfit.) Time Time Tubing Capacity (galfft.) \_ Tubing Inside Diam, Capacities Gallons/Ht); 1/4" =0.0026 3/8" =0.006 (5) 1L amber glass (AG) QC; (pH +/- 0.2) (Cond +/- 5%) (DO +/- 0.3mg/L) (Redox +/- 10mv) 500ml Sulfide (2) Turbidity(NTU) Starch Ind. ID Cond (uMHOS) Cond (uMHOS) Weather: ccv 52.10 TURB-N-F 1749 9896 1762 1753 1749 2.88 1 Well Volume (gal) 2.95 1 Well Volume (gal) 7.00 0.5 CCV SS ESS 1L bottles (diss. rads); filtered with 0.45um, 5 ml HNO3 to pH <2 A checked box indicates ICV / CCV passed DO 3 Pillow ID 072017 Wells RAB 1L Rads (1) X Capacity (gal) = Temp °C Temp °C 26.80 26.73 26.73 DO Mg/L 26.84 0.16 0.16 90:6 Time 8:13 Time Тіте X Capacity (gal) 0.2 8 (4) 100ml coliform bottle 250ml bottles (nuts): 1 ml H2SO4 to pH <2 40 ml Vial (TOC): 0.5 ml H2SO4 to pH <2 250ml Mtls (3) Cond(uMHOS) Na Thio ID COND-F 18.00 pH (SU) 53.00 18,46 pH (SU) 9715 6.36 1749 6.40 6.36 6.36 Water Column (#) Water Column (ft) ≥ 2 ICV 11 Water Depth (ft) Water Depth (ft) 1L Mils (1) 0307031Y Temp °C Tritrator ID 07/20/17 File Name: Depth to Water (ff) TEMP-C Depth to Water (ft) 55.49 5.19 26.7 Тте 8:45 8:45 8:45 9:00 5.20 4.77. 5.21 Time Stablility Values = Stablity Values = Acceptability Range (3) 250ml plastic (PP) Total Vol. (gal) 250ml Inorg (3) Fotal Vol. (gal) Pres ID 011664 pH (SU) 011664 48.71 23.23 2.69 1000 3.05 6.4 Time Well Depth 19 Cal 10 Cal Well Depth 표 4 ESS Gallons to Purge 0.32 1L Inorg (1) 500ml Inorg (2) Well Capacities (gallons/ft): 2" 11:10 Gallons to Purge 0.12 Volume (gal) QC Result mg/l (2) 500ml plastic (PP) ESS 0218201Y Volume (gal) Buffer Value Intake Depth (ft) Intake Depth (ft) Std Value 52.10 10000 Std Value 18.23 1000 2.69 0.18 0.18 14 10 лgm Л FE2 Date: 018611D 018416C 017987D 016723 Buffer ID 019075D 018737A Standard ID Standard ID Screen Interval (ff) Rate (ml/min) Screen Interval (ft) Rate (ml/min) Time 11:56 350 340 340 10 10 Big Bend Loction Code 500 ml bottles (metals); 2 ml HNO3 to pH <2 BBS-CCR-3 250ml Cyan (3) 250 ml bottles (metal): 1 ml HNO3 to pH <2 Diam/ Comp. Diam/ Comp 0107301Y MPM08 MPM08 11:41 11:39 11:43 TM07 Sulfite Info (QC Check) (EPA 377.1) QC Std: 5ml (NaThio)/500ml DI=10mg/L Time 1L bottles (rads): 5 ml HNO3 to pH <2 Time :DEP FT 1200, Units: uMHOS **Turbidity Meter Calibration** DEP FT 1600, Units: NTU Conductivity Meter Calib urge Complete At urge Complete At pH Meter Calibration urging Information L17G024-03 A BBS-CCR-3 17G024-03 A 1) 1L plastic (PP) TIMS# #SWI7 11:43 11:09 Well # Comments: :DEP FT 1100 Jurge Meth. Well # Purge Meth 14 urge Start: Jurge Start: Jurge End: urge End: Juits: SU Neter ID: Meter ID: Meter ID:

L17G024-04 A BBS-CCR-BW-1 L17G024-05 A BBS-CCR-BWZ L17G024-04 A 250ml Cyan (3) L17G024-05 A (1) 1 L plastic (PP) ESS 0107301Y	Loction Code I Ime	FE <sup>2</sup>	(ns) Hd	Temp °C	Cond(uMHOS) DO Mg/L	DO Mg/L	Turbidity(NTU)	Redox (mv)	Suffite (mg/L)	Color	Odor	Z	NGVD
4 4		μgμ	H	TEMP-C	COND-F	00	TURB-N-F	REDOX	SO3-TR	\$COLOR-W	\$ODOR-W	Time	LEVEL
4	3-BW-1 11:01		6.5	27.9	4961	9.0	2.4	-23		CLEAR	NONE		
	R-BW2 10:29		6.7	27.2	1539	0.3	5.3	-94		CLEAR	NONE		
	ran (3) 1L Inorg (1)	500ml Inorg (2)	250ml Inorg (3)	1L Mtls (1)	250ml Mtls (3)	1L Rads (1)	500ml Sulfide (2)	500ml Mile (2)	250ml Nuts (3)	40ml Vial (6)	500 ml Nuts (2)	1L Rads Diss. (1)	Total Containers
		,			2	2							10
		1	Ĺ		2	2							
	(2) 500ml plastic (PP)		(3) 250ml plastic (PP)	(94)	(4) 100ml coliform bottle	Te	(5) 1L amber glass (AG)	AG)	(6) 40ml VOA vial (CG)	(90)		Samples On Ice	Sample Reciept
The state of the s	T	8201Y		307031Y	ESS		ESS		ESS			Yes No	Time 13:30
Preservation			Pres ID		Preservation			Dres ID		Preservation		Dres ID	Temp 1.3
1L bottles (rads): 5 ml HNO3 to pH <2	100		L 011664	250ml bottles (nut	250ml bottles (nuts): 1 ml H2SO4 to pH <2	42		7	500 ml bottles(Sulfi	500 ml bottles(Sulfide) 2ml NAOH/Zinc Acet to pH >12	toet to pH > 12	7	
500 ml bottles (metals): 2 ml HNO3 to pH <2	pH<2		1	40 ml Vial (TOC):	40 ml Vial (TOC): 0.5 ml H2SO4 to pH <2	2		1	250 ml bottles (Cya	250 ml bottles (Cyan) 1g NAOH to pH >12	12	7	
250 ml botlles (metal): 1 ml HNO3 to pH <2	oH<2		L 011664	1L bottles (diss. ra	ds): filtered with 0.45u	1L bottles (diss. rads): filtered with 0.45um, 5 ml HNO3 to pH <2	2	٦	A checked box inc	A checked box indicates that the sample was verified to a pH of <2	ple was verified to	sapHof <2	
pH Meter Calibration	Buffer ID	Buffer Value	3	Time	ICV	Time	ccv	Time	Redox Cal	Time	Temp °C	Reading mv	Theo Value mv
Meter ID: MPM08	ı	_	7	8:45			7.00	13:30	Meter ID:	9:10	21.5	236.0	236.2
FDEP FT 1100	L 018611D	10	10	8:45	QC: (pH +/- 0.2) (Con	QC: (pH +1- 0.2) (Cond +1- 5%) (DO +1- 0.3mg/L) (Redox +1- 10mv)	g/L) (Redox +/- 10mv		MPM08	13:33	21.3	237.5	236.2
Units: SU	L 018737A		4	8:45	A checked box indic	A checked box indicates ICV / CCV passed	1		Zobell Sol ID:				
Conductivity Meter Calib.	Standard ID	Std Value	Cal	Time	ICV	Time	ccv	Time	L 019150A				
Meter ID: MPM08	US L 017987D	1000	1000	9:00					DO Meter Cal	Time	D <sub>o</sub> dwa1	Reading mg/l	Theo Value mg/l
FDEP FT 1200, Units: uMHOS	L 018416C	10000			9715	9:06	9686	13:20	Meter ID:	8:24	21.5	8.86	8.846
Turbidity Meter Calibration	Standard ID	Std Value	Acceptability Range	lity Range	ICA	Time	ccv	Time	MPM08	13:40	21.2	9.00	8.880
Meter ID: TM07	7	_	48.71	55.49	53.00	8:13	52.10	13:12	Barom. Pres				
1600, Units; NTU	1	0							760		1		
Sulfite Info (QC Check) (EPA 377.1)	1)	QC Result mg/l	Time	Titrator ID	Na Thio ID	DO 3 Pillow ID	Starch Ind. ID	Iodate/lodide ID	Therm ID	Hd	Conduct.(%)	(Ingm) OO	Redox (mv)
QC Std: 5ml (NaThio)/500ml DI=10mg/L	3/L				1	Τ.	1	1	MPM08	0.2	5	0.3	10
Purging Information	Well Capaciti	Well Capacities (gallons/ft): 2" = 0.16 4" =0.65	= 0.16 4" =0.65		Tubing Inside Diam.	Tubing Inside Diam. Capacities Gallons/ft); 1/4" =0.0026 3/8" =0.006	: 1/4" =0.0026 3/8" =:	9000					
Well # Diam/ Comp	Screen Somp Interval (ft)	Intake Depth (ft)	Well Depth (ft)	Depth to Water (ft)	= Water X Column (f)	X Capacty (gal) =	1 Well Volume (gal)	( Capacity ) (galfit.)	X Tubing X Langth )	+ Volume + (gal)	Colume Volume = (gal)	1 Eqpt Volume (gal)	
BW-1		-	44.3	28.89	15.41	0.16	2.47	0.0026	100	0	90'0	0.32	
Purge Meth: Time	e Rate (ml/min)	>	Total Vol. (gal)	Water Depth (#)		Temp °C	Cond (uMHOS)	DO (mg/L)	Turbidity (NTU)	Purge Criteria	Status	Equipment ID	Eqpt. Table
1A 10:53		-	4.65	29.81		27.84	4959	09'0	9.53	ph:+/- 0.2	STABLE	Level Meter:	WLM08
Purge Start: 10:55	55 1600	0.85	5.50	29.82	6.49	27.86	4953	69'0	3.46	Temp°C+/- 0.2	STABLE	Pump:	ESP
10:42 10:57	1600	0.85	6.35	29.80	6,49	27.89	4961	09'0	2.38	Cond % +/- 5	STABLE	Tubing:	PE
Purge End:										DO % Sat. < 20	STABLE	Dedicated	Yes
10:57										Turb. NTU < 20	STABLE	Tubing?	
Purge Complete At	10:43 Gallons to Purge 0.32	Purge 0.32		Stability Values =	6.49	27.89	4961	09'0	2.38				
Well# Diam/ Como	Screen (ft)	Intake Deoth (ft)		Depth to Water (ff)	= Water X Column (ft)	Capaci	1 Well Volume (gal)	100	X Length )	Pump + Volume + (gal)	Cell Volume (gal)	1 Eqpt. Volume (pal)	
3W2		-	23.84	7.45	16.39	0.16	2.62	0.0026	24.64	0	90'0	0.12	
Purge Meth: Time	e Rate (mVmin)	>	Total Vol. (gal)	Wal	(NS) Hd	Temp °C	Cond (uMHOS)	DO (mg/L)	Turbidity (NTU)	Purge Criteria	Status	Equipment ID	Eqpt. Table
		_	5.90		6.65	27.19	1542	0.50	6.32	ph:+/- 0.2	STABLE	Level Meter:	WLM08
Purge Start: 10:21		0.38	6.28	7.89	6.65	27.22	1540	0.40	4.65	Temp5C+/- 0.2	STABLE	Pump:	dd
9:48 10:23		0.38	99.9	7.88	99'9	27.20	1539	0.33	5.27	Cond % +/- 5	STABLE	Tubing:	PE/S
										DO % Sat < 20	STABLE	Dedicated	Yes
10:23										Turb. NTU < 20	STABLE	Tubing?	
Purge Complete At	9:49 Gallons to Purge 0.12	Purge 0.12		Stability Values =	99'9	27.20	1539	0.33	5.27				

# GROUNDWATER WELL SAMPLING EQUIPMENT CALIBRATION

	Buffer ID	Buffer Value	is.	Time			h	200	Тіте	Pass/Fail	
-	019075D 🖼	1 1	7.02	8:45				7.00	13:30	Pass	
f	018611D S	10	10.02	8:45			QC (pH +/- 0.2) (	Cond ++ 5%) (DO	QC (pH +/: 0.2) (Cond +/- 5%) (DO +/- 0.3mg/t.) (Redox +/- 10ff(v)	=/- 10mv)	
f	018737A 😤	4	4.01	8:45	20	Тіте	Pass/Fail	A checked box inc	PassiFail A checked box Indicates ICV / CCV passed	assed	
ICV Check L	018377J	7			7.01	8:53	Pass				
	Standard ID	Std Value	ন্ত	Time	λOI	Time	Fass/Fail	A00	Time	Pass/Fail	
MPM08	017987D 🥺	1000	1000	9:00							
	018416C 38	10000			9715	9:06	Pass	9686	13:20	288	
	Standard ID	Std Value	Acceptability Range	Range	200	Time	PassiFail	700	Time	Pass/Fail	
TM07	016723	8 52.10	48.71	55.49	53.00	8;13	Pass	52.10	13:12	Pass	
7	D	3									
Sulfite Info (QC Check) (EPA 377.1)		QC Result mg/l	Time	Titrator ID	Na Thio ID	DO 3 Pillow ID	Starch Ind. ID Indate/Ibdide ID	lodate/lodide ID			
QC Std; 5ml (NaThio)/500ml Di=10mg/L					٦	1	1	[]			
Time	C femb C	Reading my	Theo Value mv	Pass / Fall	DO Meter Cal	Time	D, dwei	Reading mg/l	Theo Value mgf	Pass/Fall	
					FDEP FT 1500						
9:10	21.54	236.0	236.2	Pass	Meter ID:	8:24	21.49	8.86	8.846	Pass	
13:33	21.33	237.5	236.2	Pass	MPM08	13:40	21.22	00'6	8.880	Pass	
		-			Barom, Pres						
					760						
長	Conduct %	1) pm 00	Redox mv	CL2	Calibration	Ferrous Iron					
0.2	2	0.3	10	0.2	Criterion	Comparator ID:		Reagent ID:	-5		
of the C	CIO2 DPD Check must read +/- 10% of the Calculated Std. Concentration, multiplied by 2.4	entration, multiplie	d by 2.4.		Glycene check shou	Glycene check should read < 0.10 mg/l ClO <sub>2</sub>	.²c				
					Initial Calibrati	Initial Calibration Verification ICV		Confinuous Calib	Continuous Calibration Verification CCV	2.	Method 10126*
Std. Conc. (mg/l)	Std. Spike Volume Cal Sample (ml) Volume (ml)	Cal Sample Volume (ml)	Calc. Std. Conc. (mg/l)	DPD Check (mg/l)	Glycene Check	Тіте	PassiFall	DPD Check (mg/l)	Time	Pass/Fall	*Equivalent to Standard Methods,
	1.0	100									4500 CIO <sub>2</sub> D.
		I -UI UGU		Choope ID.	14.3	Acho	strainer year beginning	of research evaluation	helifian neat set atth neitrings transact setrolles and hedged a	Pag	

COMMENTS: CL2 Std. ID: L

### DEP-SOP-001/01

### FS 2200 Groundwater Sampling Form FD 9000-24

### **GROUNDWATER SAMPLING LOG**

FACILITY NAME:		Big Be	end			SITE LOCATION:		Apollo	Beach, FL.		
WELL NO:	В	BS-CCR-1			SAMPLE ID	L17G	024-01 A		DATE:	7/20/17	
						NG DATA					
WELL DIAMETER (inche:	5)	TUBING DIAMETER (inc		WELL SCRE DEPTH 12.32	feet to	22.32 (feet)	STATIC DEF	PTH (feet): 5.86	PURGE PUMP T OR BAILER:	YPE PP	
WELL VOLUME PURG (only fillout if applicable		1 WELL VOLU	ME = (TOTAL WE	LL DEPTH - STATIC DE	PTH TO WATE	R) X WELL CAPAC					
		71.640	= (	. = PUMP VOLUME	feet -	CABACITY V	feet) x	THAT ELONICE	gallons/foo	t =	gallons
EQUIPMENT VOL (only fillout if applic	ume Purge: able)	1 EQL	JIPMENT VOL						0.00		0.12
	m miles		=(	0	gallons + (	0.0026 galk		23.3 feet)		gallons =	0.12 gallons
INITIAL PUMP OR DEPTH IN WELL (	feet); 17.32		FINAL PUMP DEPTH IN W	111	.32	INITIATED AT:	12:05	PURGING ENDED AT:	12:18	PURGED (gallo	ons): 1.9
TIME	VOLUME PURGED (GALLONS)	VOLUME PURGED (GALLONS)	PURGE RATE (GPM)	DEPTH TO WATER (FEET)	pH (standard units)	TEMP. (°C)	COND. (µmhos/cm OR µS/cm)	OXYGEN (circle mg/l) r % saturation)	TURBIDITY (NTUs)	COLOR (describe)	ODOR (describe)
12:14	1.33	1.33	0.15	6.03	6.82	25.82	3962	0.11	5.99	CLEAR	NONE
12:16	0.29	1.62	0.15	6.03	6.81	25.80	3965	0.10	1.62	CLEAR	NONE
12:18	0.29	1.91	0.15	6.02	6,81	25.81	3965	0.10	1.58	CLEAR	NONE
WELL CAPACITY (G TUBING INSIDE DIA SAMPLED BY (PF	CAPACITY (Gal/F RINT) / AFFILIATI RAI	ON:	1" = 0.04; 3/16" = 0.0014; TECO		SAMPL SAMPL SNATURES;	0.37; 4" = 0 3; 3/8" = 0.006 LING DATA	1/2" = 0.0			SAMPLING 8 ENDED AT: 1	2:25
PUMP OR TUBING DEPTH IN WELL (	feet): 17.3	3		FLOW RATE (mL	per minute)		553	MATERIAL CODE	PE	E/S	
FIELD DECONTAI	MINATION:			FIELD-FILTERED Filtration Equipme	nt Type	N FILT	TER SIZE:	μm	DUPLICATE:	Y D N E	1
	SAMPLE CO					ESERVATION			NDED		MPLING
SAMPLE ID CODE	CONTAINERS	MATERIAL CODE	VOLUME	PRESERVATIVE USED		TAL VOL. IN FIELD (ml) (1)	FINAL pH		IS AND/OR THOD		DIPMENT
@Ino-500	1	PE	500ml	NONE	- 1	NONE	N/A	Inorg	ganics		PP
@Met-250	2	PE	250ml	HNO3		1ml	<2	Me	etals		PP
@Rad-1L	2	PE	1L	НИОЗ		5ml	<2	Radio	logicals		PP
									100		
REMARKS:											
	ottles pre-pre	served at lab	oratory price	or to sample co		lypropylene; S	= Silicone;	T = Teflon; O= O	ther (Specify)		

<sup>1.</sup> The above do not constitute all of the information requierd by Chapter 62-160, F.A.C.

<sup>2.</sup> STABILIZATION CRITERIA FOR RANGE OF VARIATION OF LAST THREE CONSECUTIVE READINGS (SEE FS 2212. SECTION 3) pH: ± 0.2 units Temperature: ± 0.2 °C Specific Conductance: ± 5% Dissolved Oxygen: all readings ≤ 20% saturation (see Table FS 2200-2); optionally, ± 0.2 mg/L or ± 10% (whichever is greater) Turbidity: all readings ≤ 20 NTU; optionally ± 5 NTU or 10% (whichever is greater)

### DEP-SOP-001/01

### FS 2200 Groundwater Sampling Form FD 9000-24

### **GROUNDWATER SAMPLING LOG**

SITE NAME:		Big Be	end			SITE LOCATION:		Apollo	Beach, FL.		
WELL NO:	В	BS-CCR-2			SAMPLE ID:	L17G	024-02 A		DATE:	7/20/17	
						NG DATA					
WELL DIAMETER (inches	)	TUBING DIAMETER (inc	thes) 1/4	DEPTH 11.84		21.84 (feet)	STATIC DEPTH TO WATER (fee		PURGE PUMP T OR BAILER;	PP PP	
WELL VOLUME PL	JRGE:	1 WELL VO	LUME = (TOT	AL WELL DEPTH -	STATIC DE	PTH TO WATER	X WELL CA	PACITY			
	11.1	0.00	= (	= PUMP VOLUM	feet -	CARACITY V	feet) x	THA + ELOWICE	gallons/foo	1 =	gallons
EQUIPMENT VOLU (only fillout if applica		1 EQ		_						sollens b	0.12 gallon
INITIAL PUMP OR	TURING	-	=(	O OR TUBING	gallons + (	0.0026 gai PURGING INITIATED AT:	ons/foot X		t)+ 0.06	gallons = TOTAL VOLUM	E
DEPTH IN WELL (fo	eet): 16.8	4 CUMUL	DEPTH IN W		.84	INITIATED AT:		PURGING ENDED AT: DISSOLVED	12:44	PURGED (gallo	ns): 2.0
TIME	VOLUME PURGED (GALLONS)	VOLUME PURGED (GALLONS)	PURGE RATE (GPM)	TO WATER (FEET)	pH (standard units)	TEMP. (°C)	COND. (µmhos/cm OR µS/cm)	OXYGEN (circle(mg/l) or % saturation)	TURBIDITY (NTUs)	COLOR (describe)	ODOR (describe)
12:40	1.43	1.43	0.14	5.18	6.98	25.74	1569	0.06	2.52	LT. YELLOW	MILD
12:42	0.29	1.72	0.15	5.18	6.97	25.71	1628	0.04	4.04	LT. YELLOW	MILD
12:44	0.29	2.01	0.15	5,19	6.97	25.74	1629	0.05	4.56	LT. YELLOW	MILD
WELL CAPACITY (Ga	lions Per Foot):	0.75" = 0.02;	1" = 0.04;	1.25" = 0.06; 2" =	0.16; 3"=	0.37; 4"=0	65; 5" =	1.02; 6" = 1.47;	12" = 5.88		
TUBING INSIDE DIA.	CAPACITY (Gat./	(t): 1/8" = 0.00006	3/16" = 0.0014	1/4" = 0.0026;	5/16" = 0.004	ING DATA	1/2" = 0.0	010; 5/8" =	0.016		
SAMPLED BY (PR	INT) / AFFILIAT	ION:		SAMPLER (S) SIG	SNATURES:	A		SAMPLING INITIATED AT:	1.04	SAMPLING ENDED AT:	7.24
01 11 10 00 TH 10 11 10	RA	В	TECO		celety	94		TUBING	12:44	4	12:5
PUMP OR TUBING DEPTH IN WELL (F	eet): 16.	8		SAMPLE PUMP FLOW RATE (ml			547	MATERIAL COD	E: PE	The Victoria of	
FIELD DECONTAN		Y D N Ø		FIELD-FILTERED Filtration Equipme	nt Type.	N 🗹 FILT	ER SIZE:	μm	DUPLICATE:	Y D N Z	
	SAMPLE CO SPECIFIC					ESERVATION	0.0167		ENDED IS AND/OR		IPMENT
SAMPLE ID CODE	# CONTAINERS	MATERIAL CODE	VOLUME	PRESERVATIVE USED		TAL VOL. IN FIELD (ml) (1)	FINAL pH		THOD		ODE
@Ino-500	1	PE	500ml	NONE	1	NONE	N/A	Inor	ganics		PP
2			464.01			1ml		M	etals		PP
@Met-250	2	PE	250ml	HNO3		5ml	<2		logicals	+	PP
@Rad-1L	2	PE	1L	HNO3		Jilli .	~2	Ivadic	nogicala		
				7= -1							
								-			
REMARKS: (1) Sample bo	ttlee nre nre	sooned at lat	opraton, nel	or to cample of	Maction						
MATERIAL CODES			3 = Clear Glass	- TAIL - A - A - A - A - A - A - A - A - A -		P = Polypropylen	e: S = Silic	one; T = Teflor	n; O= Other (Sp	ecify)	
SAMPLING/PURGIN				= Bailer; BP = Blac Pump; SM = Straw							

<sup>1.</sup> The above do not constitute all of the information requierd by Chapter 62-160, F.A.C.

<sup>2.</sup> STABILIZATION CRITERIA FOR RANGE OF VARIATION OF LAST THREE CONSECUTIVE READINGS (SEE FS 2212, SECTION 3) pH:  $\pm$  0.2 units Temperature:  $\pm$  0.2 °C Specific Conductance:  $\pm$  5% Dissolved Oxygen: all readings  $\leq$  20% saturation (see Table FS 2200-2); optionally,  $\pm$  0.2 mg/L or  $\pm$  10% (whichever is greater) Turbidity: all readings  $\leq$  20 NTU; optionally  $\pm$  5 NTU or 10% (whichever is greater)

### DEP-SOP-001/01 FS 2200 Groundwater Sampling Form FD 9000-24

### **GROUNDWATER SAMPLING LOG**

SITE NAME:		Big Be	end			SITE LOCATION:		Apollo	Beach, FL.		
WELL NO;	В	BS-CCR-3			SAMPLE ID:	L17G	024-03 A		DATE:	7/20/17	
					PURGI	NG DATA					
WELL DIAMETER (inches	)	TUBING DIAMETER (inc	thes) 1/4	WELL SCREEN II DEPTH 13.23	feet to	23.23 (feet)			PURGE PUMP TO OR BAILER:	PP PP	
WELL VOLUME Pt (only fillout if applica	JRGE: able)	1 WELL VO	LUME = (TOT/	AL WELL DEPTH -	STATIC DEF	PTH TO WATER	X WELL CA	PACITY	gallons/foo	ot =	gallons
EQUIPMENT VOLU (only fillout if application)	JME PURGE: able)	1 EQ		. = PUMP VOLUM	E + (TUBING	CAPACITY X		24.23 fe		gallons =	0.12 gallons
INITIAL PUMP OR DEPTH IN WELL (f	TUBING eet): 18.23	1	FINAL PUMP DEPTH IN W	OR TUBING	.23	PURGING INITIATED AT:		PURGING ENDED AT:		TOTAL VOLUMI PURGED (gallor	E ns): 3.0
TIME	VOLUME PURGED (GALLONS)	CUMUL. VOLUME PURGED (GALLONS)	PURGE RATE (GPM)	DEPTH TO WATER (FEET)	pH (standard units)	TEMP.	COND. (µmhos/cm OR µS/cm)	OXYGEN (circle mg/l or % saturation)	TURBIDITY (NTUs)	COLOR (describe)	ODOR (describe)
11:39	2.69	2.69	0.09	5.19	6.40	26.84	1762	0.16	0.69	YELLOW	MILD
11:41	0.18	2.87	0.09	5.20	6.36	26.80	1753	0.16	0.73	YELLOW	MILD
11:43	0.18	3.05	0.09	5.21	6.36	26.73	1749	0.17	0.51	YELLOW	MILD
WELL CAPACITY (G:	llons Per Foot):	0.75" = 0.02:	1" = 0.04;	1.25" = 0.06; 2" =	0.16; 3"=	0.37; 4" = 0	65; 5"=	1.02; 6" = 1.47	12" = 5.88		
TUBING INSIDE DIA.		t): 1/8" = 0.00006;	3/16" = 0.0014	1/4" = 0.0026;	5/16"= 0.004	ING DATA	1/2" = 0.0	010; 5/8" =	0.016		
SAMPLED BY (PR	INT) / AFFILIATI RAE		TECO	SAMPLER (S) SI		_		SAMPLING INITIATED AT: 1	1:43	SAMPLING ENDED AT: 11	1:56
PUMP OR TUBING DEPTH IN WELL (	(eet): 18.2	,		SAMPLE PUMP FLOW RATE (ml	per minule):		343	TUBING MATERIAL COD	E: PE	/S	
FIELD DECONTAN	5 (1) (1) (1) (1) (1)	YONV		FIELD-FILTERED Filtration Equipme		N FILT	ER SIZE:	μm	DUPLICATE:	YDNE	
	SAMPLE CON SPECIFICA					ESERVATION			ENDED		PLING
SAMPLE ID CODE	# CONTAINERS	MATERIAL CODE	VOLUME	PRESERVATIVE USED		TAL VOL. N FIELD (ml) (1)	FINAL pH		SIS AND/OR THOD		PMENT ODE
@Ino-500	1	PE	500ml	NONE	1	NONE	N/A	Inor	ganics		PP .
@Met-250	2	PE	250ml	HNO3		1ml	<2		etals	_	PP
@Rad-1L	2	PE	1L	HNO3		5ml	<2	Radio	ologicals		PP
							1				
REMARKS: (1) Sample bo	ttles pre-pre	served at lat	oratory pric	or to sample c	ollection.		70-000				
MATERIAL CODE	0.0		3 = Clear Glass	The state of the s		P = Polypropylen	e; S = Silic	one; T = Teflo	n; O= Other (Spa	ecify)	
SAMPLING/PURGIF			staltic Pump; B	= Bailer, BP = Bla Pump: SM = Straw	dder Pump; E	SP = Electric Subr	nirsable Pump; VT = Vacuum	PP = Peristaltic Po	imp pecify)		

<sup>1.</sup> The above do not constitute all of the information requierd by Chapter 62-160, F.A.C.

<sup>2.</sup> STABILIZATION CRITERIA FOR RANGE OF VARIATION OF LAST THREE CONSECUTIVE READINGS (SEE FS 2212. SECTION 3) pH: ± 0.2 units Temperature: ± 0.2 °C Specific Conductance: ± 5% Dissolved Oxygen: all readings ≤ 20% saturation (see Table FS 2200-2); optionally, ± 0.2 mg/L or ± 10% (whichever is greater) Turbidity: all readings ≤ 20 NTU; optionally ± 5 NTU or 10% (whichever is greater)

### DEP-SOP-001/01

### FS 2200 Groundwater Sampling Form FD 9000-24

### **GROUNDWATER SAMPLING LOG**

SITE NAME:		Big Be	end			SITE LOCATION:		Apollo	Beach, FL.		
WELL NO:	BBS	S-CCR-BW			SAMPLE ID:	L17G	024-04 A		DATE:	7/20/17	
				T. Detect I	PURGI	NG DATA				THE VIE	
WELL DIAMETER (inches	)	TUBING DIAMETER (inc	thes) 1/4	WELL SCREEN I DEPTH 34.30		44.30 (feet	STATIC DEP	TH (feet): 28.89	PURGE PUMP T OR BAILER:	ESP	
WELL VOLUME P	JRGE:	The second second		AL WELL DEPTH		TH TO WATER	) X WELL CA	PACITY			
(only fillout if applic	able)		= (	Or and place little	feet -		feet) x		gallons/for	ot =	gallons
EQUIPMENT VOLI	JME PURGE: able)	1 EQL	JIPMENT VOL	. = PUMP VOLUM	E + (TUBING	CAPACITY X	TUBING LENG	TH) + FLOW CE			710
			=(	0		0.0026 gall	lons/foot X	A	et)+ 0.06	gallons =	0.32 gallons
INITIAL PUMP OR DEPTH IN WELL (I	TUBING eet): 39.30		FINAL PUMP DEPTH IN W	ELL (feet): 39	0.30	PURGING INITIATED AT:	10:42		10:57		ons): 6.3
TIME	VOLUME PURGED (GALLONS)	VOLUME PURGED (GALLONS)	PURGE RATE (GPM)	TO WATER (FEET)	pH (standard units)	TEMP. (°C)	COND. (µmhos/cm OR µS/cm)	OXYGEN (circle mg/l er % saturation)	TURBIDITY (NTUs)	COLOR (describe)	ODOR (describe)
10:53	4.65	4.65	0.42	29.81	6.49	27.84	4959	0.60	9.53	CLEAR	NONE
10:55	0.85	5.50	0.43	29.82	6.49	27.86	4953	0.69	3.46	CLEAR	NONE
10:57	0.85	6.35	0.43	29.80	6.49	27.89	4961	0.60	2.38	CLEAR	NONE
							1				
								F T			-
SAMPLED BY (PR	INT) / AFFILIATI RAE		TECO	SAMPLER (S) S		ING DATA	1	SAMPLING INITIATED AT:	0:57	SAMPLING ENDED AT:	11:01
PUMP OR TUBING DEPTH IN WELL (	eet): 39.3	3		SAMPLE PUMP FLOW RATE (m	L per minute):	y 1	600	TUBING MATERIAL CODE	E: P	E	
FIELD DECONTAN	ALLEGE A COLUMN	YUNV		FIELD-FILTEREI Filtration Equipm		N FILT	TER SIZE:	μm	DUPLICATE:	Y D N	2
	SAMPLE CON			r mranorr Equipm	SAMPLE PRE	SERVATION			ENDED		MPLING
SAMPLE ID CODE	# CONTAINERS	MATERIAL CODE	VOLUME	PRESERVATIVE USED		AL VOL. I FIELD (ml) (t)	FINAL pH		IS AND/OR THOD		JIPMENT CODE
		h te					17.4				
@Ino-500	1	PE	500ml	NONE	N	ONE	N/A	Inorg	ganics		ESP
@Met-250	2	PE	250ml	HNO3		1ml	<2	Me	etals		ESP
@Rad-1L	2	PE	1L	HNO3	_	5ml	<2		logicals		ESP
WINDS IE			1.0	7111,00			1				
			+	-	-						
REMARKS:	and a second	Tourist Service	lange of the	Control control	nederion)						
(1) Sample bo			oratory pric = Clear Glass	7.02 - 0.00		= Polypropylen	ne; S = Silic	one: T = Teflor	n; O= Other (Sp	ecify)	
MATERIAL CODE SAMPLING/PURGII EQUIPMENT CODE					and the last of th			PP = Peristaltic Pur Trap; O = Other (Sp			

<sup>1.</sup> The above do not constitute all of the information requierd by Chapter 62-160, F.A.C.

<sup>2.</sup> STABILIZATION CRITERIA FOR RANGE OF VARIATION OF LAST THREE CONSECUTIVE READINGS (SEE FS 2212, SECTION 3) pH:  $\pm$  0.2 units Temperature:  $\pm$  0.2 °C Specific Conductance:  $\pm$  5% Dissolved Oxygen: all readings  $\leq$  20% saturation (see Table FS 2200-2); optionally,  $\pm$  0.2 mg/L or  $\pm$  10% (whichever is greater) Turbidity: all readings  $\leq$  20 NTU; optionally  $\pm$  5 NTU or 10% (whichever is greater)

### DEP-SOP-001/01 FS 2200 Groundwater Sampling

### Form FD 9000-24

### **GROUNDWATER SAMPLING LOG**

ITE IAME:		Big Be	end			SITE LOCATION:		Apollo	Beach, FL.		
VELL NO:	BBS	S-CCR-BW			SAMPLE ID:	L17G	024-05 A	THE PARTY.	DATE:	7/20/17	
	- 71	= -===		L. I TIL	PURGII	NG DATA					
VELL DIAMETER (inche	5)	TUBING DIAMETER (inc	thes) 1/4	WELL SCREEN DEPTH 13.64		23.34 (feet)	STATIC DEP TO WATER (	TH feet): 7.45	PURGE PUMP T OR BAILER:	PP PP	
VELL VOLUME Ponly fillout if applic		1 WELL VO	LUME = (TOTA	AL WELL DEPTH	- STATIC DEP	TH TO WATER	) X WELL CA	PACITY	gallons/foo	ot =	gallons
QUIPMENT VOL	UME PURGE:	1 EQL		= PUMP VOLUM		CAPACITY X		TH) + FLOW CE			
only fillout if applic	able)		=(	0	gallons + (	0.0026 gall	lons/foot X	24.64 fee	et)+ 0.06	gallons=	0.12 gallons
NITIAL PUMP OR DEPTH IN WELL (	TUBING feet): 18.49		FINAL PUMP DEPTH IN W	ELL (feet): 1:	8.49	PURGING INITIATED AT:	9:48	PURGING ENDED AT:	10:23	TOTAL VOLUM PURGED (gallo	ME pns); 6.6
TIME	VOLUME PURGED (GALLONS)	VOLUME PURGED (GALLONS)	PURGE RATE (GPM)	TO WATER (FEET)	pH (standard units)	TEMP. (°C)	COND. (µmhos/cm OR µS/cm)	OXYGEN (circle(mg/Ler % saturation)	TURBIDITY (NTUs)	COLOR (describe)	ODOR (describe)
10:19	5.90	5.90	0.19	7.87	6.65	27.19	1542	0.50	6.32	CLEAR	NONE
10:21	0.38	6.28	0.19	7.89	6.65	27.22	1540	0.40	4.65	CLEAR	NONE
10:23	0.38	6.66	0.19	7.88	6.66	27.20	1539	0.33	5.27	CLEAR	NONE
	Gallons Per Foot): A. CAPACITY (Gal RINT) / AFFILIATIO	ON:		= 0.0014; 1/4" SAMPLER (S) S	= 0.0026; SAMPL	0.16; 3" = 0 5/16" = 0.004; ING DATA	3/8" = 0.00	SAMPLING	= 1.02; 6" = 5/8 010; 5/8	"= 0.016 SAMPLING ENDED AT:	0:29
PUMP OR TUBIN	(feet): 18.5	5		SAMPLE PUMP FLOW RATE (n	nL per minute):		720	TUBING MATERIAL CODE	: PE	/S	
FIELD DECONTA	67 7 7	YONV		FIELD-FILTERE Filtration Equipm	D: Tyde	N FILT	TER SIZE:	μm	DUPLICATE:	Y D N	2
	SAMPLE CON SPECIFICA				SAMPLE PRE	SERVATION	4 - 1		NDED		MPLING
SAMPLE ID CODE	1000	MATERIAL	VOLUME	PRESERVATIVE		AL VOL. I FIELD (ml) m	FINAL pH		IS AND/OR THOD		CODE
@Ino-500	1	PE	500ml	NONE	N	ONE	N/A	Inorg	ganics		PP
@Met-250	2	PE	250ml	HNO3		1ml	<2	Me	etals		PP
@Rad-1L	2	PE	1L	HNO3		5ml	<2	Radio	logicals		PP
	-										
REMARKS: (1) Sample be	ottles pre-pres	served at lab	oratory pric	or to sample	collection.						
							ne: S = Silic	one: T = Teflor	c O= Other (Sp	0.1711/	

<sup>1.</sup> The above do not constitute all of the information requierd by Chapter 62-160, F.A.C.

<sup>2.</sup> STABILIZATION CRITERIA FOR RANGE OF VARIATION OF LAST THREE CONSECUTIVE READINGS (SEE FS 2212, SECTION 3)
pH: ± 0.2 units Temperature: ± 0.2 °C Specific Conductance: ± 5% Dissolved Oxygen: all readings ≤ 20% saturation (see Table FS 2200-2);
optionally, ± 0.2 mg/L or ± 10% (whichever is greater)



THE LEADER IN ENVIRONMENTAL TESTING

# **ANALYTICAL REPORT**

TestAmerica Laboratories, Inc.

TestAmerica Tampa 6712 Benjamin Road Suite 100 Tampa, FL 33634

Tel: (813)885-7427

TestAmerica Job ID: 660-81885-1 Client Project/Site: L17G024

### For:

Tampa Electric Company 5012 Causeway Boulevard Tampa, Florida 33619

Attn: Ms. Peggy Penner



Authorized for release by: 7/28/2017 7:53:53 AM

Keaton Conner, Project Manager I (813)885-7427

keaton.conner@testamericainc.com

.....LINKS .....

Review your project results through

Total Access

**Have a Question?** 



Visit us at: www.testamericainc.com

The test results in this report meet all 2003 NELAC and 2009 TNI requirements for accredited parameters, exceptions are noted in this report. This report may not be reproduced except in full, and with written approval from the laboratory. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

Client: Tampa Electric Company Project/Site: L17G024 TestAmerica Job ID: 660-81885-1

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# **Sample Summary**

Client: Tampa Electric Company Project/Site: L17G024

TestAmerica Job ID: 660-81885-1

Lab Sample ID	Client Sample ID	Matrix	Collected Received
660-81885-1	L17G024-01	Water	07/20/17 12:25 07/21/17 07:55
660-81885-2	L17G024-02	Water	07/20/17 12:56 07/21/17 07:55
660-81885-3	L17G024-03	Water	07/20/17 11:56 07/21/17 07:55
660-81885-4	L17G024-04	Water	07/20/17 11:01 07/21/17 07:55
660-81885-5	L17G024-05	Water	07/20/17 10:29 07/21/17 07:55

### **Definitions/Glossary**

Client: Tampa Electric Company

Project/Site: L17G024

TestAmerica Job ID: 660-81885-1

### **Qualifiers**

### **Metals**

Qualifier	Qualifier Description
I	The reported value is between the laboratory method detection limit and the laboratory practical quantitation limit.
J3	Estimated value; value may not be accurate. Spike recovery or RPD outside of criteria.
U	Indicates that the compound was analyzed for but not detected.

### Glossary

RL

RPD

TEF TEQ

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)

Reporting Limit or Requested Limit (Radiochemistry)

Toxicity Equivalent Factor (Dioxin)

Toxicity Equivalent Quotient (Dioxin)

Relative Percent Difference, a measure of the relative difference between two points

TestAmerica Tampa

### **Case Narrative**

Client: Tampa Electric Company

Project/Site: L17G024

TestAmerica Job ID: 660-81885-1

Job ID: 660-81885-1

**Laboratory: TestAmerica Tampa** 

Narrative

Job Narrative 660-81885-1

### Receipt

The samples were received on 7/21/2017 7:55 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 3.4° C.

### Metals

Method 200.7 Rev 4.4: Spike compounds were inadvertently omitted during the extraction process for the matrix spike(MS); therefore, matrix spike recoveries are unavailable for preparation batch 400-361570 and analytical batch 400-361867. Since the spike compound was omitted, the RPD calculations will not pass criteria. The associated laboratory control sample (LCS) met acceptance criteria. The post-digestion spike (PDS) recoveries also met acceptance criteria.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

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### **Detection Summary**

Client: Tampa Electric Company

Project/Site: L17G024

TestAmerica Job ID: 660-81885-1

Client Sample ID:	L17G024-01					Lab Sa	mple ID: 66	0-81885-1		
Analyte	Result	Qualifier	PQL	MDL	Unit	Dil Fac D	Method	Prep Type		
Lithium	0.014	I J3	0.050	0.0010	mg/L		200.7 Rev 4.4	Total/NA		
Client Sample ID: L17G024-02							Lab Sample ID: 660-81885-2			
Analyte	Result	Qualifier	PQL	MDL	Unit	Dil Fac D	Method	Prep Type		
Lithium	0.016	Ī	0.050	0.0010	mg/L		200.7 Rev 4.4	Total/NA		
Client Sample ID:	L17G024-03					Lab Sa	mple ID: 66	0-81885-3		
Analyte	Result	Qualifier	PQL	MDL	Unit	Dil Fac D	Method	Prep Type		
Lithium	0.010	I	0.050	0.0010	mg/L		200.7 Rev 4.4	Total/NA		
Client Sample ID:	L17G024-04					Lab Sa	mple ID: 66	0-81885-4		
Analyte	Result	Qualifier	PQL	MDL	Unit	Dil Fac D	Method	Prep Type		
Lithium	0.017	Ī	0.050	0.0010	mg/L		200.7 Rev 4.4	Total/NA		
Client Sample ID:	L17G024-05					Lab Sa	mple ID: 66	60-81885-5		
Analyte	Result	Qualifier	PQL	MDL	Unit	Dil Fac D	Method	Prep Type		
Lithium	0.0059	Ī -	0.050	0.0010	mg/L		200.7 Rev 4.4	Total/NA		

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### Client Sample Results

Client: Tampa Electric Company

Project/Site: L17G024

TestAmerica Job ID: 660-81885-1

**Matrix: Water** 

**Matrix: Water** 

Client Sample ID: L17G024-01 Lab Sample ID: 660-81885-1 Date Collected: 07/20/17 12:25 **Matrix: Water** 

Date Received: 07/21/17 07:55

Method: 200.7 Rev 4.4 - Metals (ICP) Analyte Result Qualifier PQL **MDL** Unit D Prepared Analyzed Dil Fac 07/25/17 09:29 07/26/17 13:50 Lithium 0.014 I J3 0.050 0.0010 mg/L

Client Sample ID: L17G024-02 Lab Sample ID: 660-81885-2

Date Collected: 07/20/17 12:56

Date Received: 07/21/17 07:55

Method: 200.7 Rev 4.4 - Metals (ICP) Analyte Result Qualifier PQL **MDL** Unit D Prepared Analyzed Dil Fac 0.050 07/25/17 09:29 07/26/17 14:08 Lithium 0.016 I 0.0010 mg/L

Client Sample ID: L17G024-03 Lab Sample ID: 660-81885-3

Date Collected: 07/20/17 11:56 Date Received: 07/21/17 07:55

Method: 200.7 Rev 4.4 - Metals (ICP)

Analyte Result Qualifier PQL MDL Unit Prepared Analyzed Dil Fac 0.0010 mg/L Lithium 0.010 I 0.050 07/25/17 09:29 07/26/17 14:11

Client Sample ID: L17G024-04 Lab Sample ID: 660-81885-4 **Matrix: Water** 

Date Collected: 07/20/17 11:01 Date Received: 07/21/17 07:55

Method: 200.7 Rev 4.4 - Metals (ICP) Analyte Result Qualifier PQL **MDL** Unit D Prepared Analyzed Dil Fac 07/25/17 09:29 07/26/17 14:15 Lithium 0.050 0.0010 mg/L 0.017 I

Client Sample ID: L17G024-05 Lab Sample ID: 660-81885-5 **Matrix: Water** 

Date Collected: 07/20/17 10:29 Date Received: 07/21/17 07:55

Lithium

Method: 200.7 Rev 4.4 - Metals (ICP) Analyte Result Qualifier **PQL MDL** Unit Prepared Analyzed 0.0010 mg/L 0.050 07/25/17 09:29 07/26/17 14:18

0.0059 I

7/28/2017

### QC Sample Results

Client: Tampa Electric Company TestAmerica Job ID: 660-81885-1

Project/Site: L17G024

Lithium

Lithium

Method: 200.7 Rev 4.4 - Metals (ICP)

Lab Sample ID: MB 400-361570/1-A Client Sample ID: Method Blank **Matrix: Water** Prep Type: Total/NA

**Analysis Batch: 361867** MB MB

0.014 I J3

Analyte Result Qualifier PQL **MDL** Unit Prepared Analyzed Dil Fac 0.050 07/25/17 09:29 07/26/17 13:04 Lithium 0.0010 U 0.0010 mg/L

Lab Sample ID: LCS 400-361570/2-A **Client Sample ID: Lab Control Sample Matrix: Water** Prep Type: Total/NA **Analysis Batch: 361867 Prep Batch: 361570** Spike LCS LCS %Rec. Added Limits Analyte Result Qualifier Unit D %Rec

1.04

0.0147 I J3

mg/L

mg/L

Lab Sample ID: 660-81885-1 MS Client Sample ID: L17G024-01 **Matrix: Water Prep Type: Total/NA Analysis Batch: 361867 Prep Batch: 361570** Sample Sample Spike MS MS %Rec. Result Qualifier Added Result Qualifier Limits Analyte Unit D %Rec

1.00

1.00

Lab Sample ID: 660-81885-1 MSD Client Sample ID: L17G024-01 **Matrix: Water** Prep Type: Total/NA **Analysis Batch: 361867 Prep Batch: 361570** 

Sample Sample Spike MSD MSD %Rec. **RPD** Analyte Result Qualifier Added Result Qualifier Unit %Rec Limits RPD Limit Lithium 0.014 I J3 1.00 1.16 J3 mg/L 115 70 - 130 195 20

**Prep Batch: 361570** 

85 - 115

70 - 130

104

0.1

### **QC Association Summary**

Client: Tampa Electric Company

TestAmerica Job ID: 660-81885-1

Project/Site: L17G024

### **Metals**

### **Prep Batch: 361570**

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
660-81885-1	L17G024-01	Total/NA	Water	200.7	_
660-81885-2	L17G024-02	Total/NA	Water	200.7	
660-81885-3	L17G024-03	Total/NA	Water	200.7	
660-81885-4	L17G024-04	Total/NA	Water	200.7	
660-81885-5	L17G024-05	Total/NA	Water	200.7	
MB 400-361570/1-A	Method Blank	Total/NA	Water	200.7	
LCS 400-361570/2-A	Lab Control Sample	Total/NA	Water	200.7	
660-81885-1 MS	L17G024-01	Total/NA	Water	200.7	
660-81885-1 MSD	L17G024-01	Total/NA	Water	200.7	

### **Analysis Batch: 361867**

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
660-81885-1	L17G024-01	Total/NA	Water	200.7 Rev 4.4	361570
660-81885-2	L17G024-02	Total/NA	Water	200.7 Rev 4.4	361570
660-81885-3	L17G024-03	Total/NA	Water	200.7 Rev 4.4	361570
660-81885-4	L17G024-04	Total/NA	Water	200.7 Rev 4.4	361570
660-81885-5	L17G024-05	Total/NA	Water	200.7 Rev 4.4	361570
MB 400-361570/1-A	Method Blank	Total/NA	Water	200.7 Rev 4.4	361570
LCS 400-361570/2-A	Lab Control Sample	Total/NA	Water	200.7 Rev 4.4	361570
660-81885-1 MS	L17G024-01	Total/NA	Water	200.7 Rev 4.4	361570
660-81885-1 MSD	L17G024-01	Total/NA	Water	200.7 Rev 4.4	361570

04005.4

TestAmerica Tampa

7/28/2017

Client: Tampa Electric Company Project/Site: L17G024

Client Sample ID: L17G024-01 Lab Sample ID: 660-81885-1

Date Collected: 07/20/17 12:25 Matrix: Water

Date Received: 07/21/17 07:55

	Batch	Batch		Dil	Initial	Final	Batch	Prepared		
Prep Type	Type	Method	Run	Factor	Amount	Amount	Number	or Analyzed	Analyst	Lab
Total/NA	Prep	200.7			50 mL	50 mL	361570	07/25/17 09:29	KWN	TAL PEN
Total/NA	Analysis	200.7 Rev 4.4		1			361867	07/26/17 13:50	GESP	TAL PEN
	Instrumen	it ID: 6500 ICP Duo								

Lab Sample ID: 660-81885-2 Client Sample ID: L17G024-02

Date Collected: 07/20/17 12:56

Date Received: 07/21/17 07:55

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	200.7			50 mL	50 mL	361570	07/25/17 09:29	KWN	TAL PEN
Total/NA	Analysis	200.7 Rev 4.4		1			361867	07/26/17 14:08	GESP	TAL PEN
	Instrumer	nt ID: 6500 ICP Duc	)							

Client Sample ID: L17G024-03 Lab Sample ID: 660-81885-3 **Matrix: Water** 

Date Collected: 07/20/17 11:56

Date Received: 07/21/17 07:55

_	Batch	Batch		Dil	Initial	Final	Batch	Prepared		
Prep Type	Type	Method	Run	Factor	Amount	Amount	Number	or Analyzed	Analyst	Lab
Total/NA	Prep	200.7			50 mL	50 mL	361570	07/25/17 09:29	KWN	TAL PEN
Total/NA	Analysis	200.7 Rev 4.4		1			361867	07/26/17 14:11	GESP	TAL PEN
	Instrumer	nt ID: 6500 ICP Duo								

Client Sample ID: L17G024-04 Lab Sample ID: 660-81885-4

Date Collected: 07/20/17 11:01

Date Received: 07/21/17 07:55

	Batch	Batch		Dil	Initial	Final	Batch	Prepared		
Prep Type	Type	Method	Run	Factor	Amount	Amount	Number	or Analyzed	Analyst	Lab
Total/NA	Prep	200.7			50 mL	50 mL	361570	07/25/17 09:29	KWN	TAL PEN
Total/NA	Analysis	200.7 Rev 4.4		1			361867	07/26/17 14:15	GESP	TAL PEN
	Instrumen	it ID: 6500 ICP Duo								

Client Sample ID: L17G024-05 Lab Sample ID: 660-81885-5

Date Collected: 07/20/17 10:29

Date Received: 07/21/17 07:55

	Batch	Batch		Dil	Initial	Final	Batch	Prepared		
Prep Type	Type	Method	Run	Factor	Amount	Amount	Number	or Analyzed	Analyst	Lab
Total/NA	Prep	200.7			50 mL	50 mL	361570	07/25/17 09:29	KWN	TAL PEN
Total/NA	Analysis	200.7 Rev 4.4		1			361867	07/26/17 14:18	GESP	TAL PEN
	Instrumen	it ID: 6500 ICP Duo								

**Laboratory References:** 

TAL PEN = TestAmerica Pensacola, 3355 McLemore Drive, Pensacola, FL 32514, TEL (850)474-1001

TestAmerica Tampa

Page 10 of 16

**Matrix: Water** 

**Matrix: Water** 

### **Accreditation/Certification Summary**

Client: Tampa Electric Company

Project/Site: L17G024

TestAmerica Job ID: 660-81885-1

### **Laboratory: TestAmerica Tampa**

The accreditations/certifications listed below are applicable to this report.

ſ	Authority	Program	EPA Region	Identification Number	Expiration Date
	Florida	NELAP	4	E84282	06-30-18

### Laboratory: TestAmerica Pensacola

The accreditations/certifications listed below are applicable to this report.

Authority	Program	<b>EPA Region</b>	Identification Number	<b>Expiration Date</b>
Florida	NELAP	4	E81010	06-30-18

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### **Method Summary**

Client: Tampa Electric Company

Project/Site: L17G024

TestAmerica Job ID: 660-81885-1

Method	Method Description	Protocol	Laboratory
200.7 Rev 4.4	Metals (ICP)	EPA	TAL PEN

**Protocol References:** 

EPA = US Environmental Protection Agency

**Laboratory References:** 

TAL PEN = TestAmerica Pensacola, 3355 McLemore Drive, Pensacola, FL 32514, TEL (850)474-1001

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### SUBCONTRACT ORDER

mpany, Laboratory Services	
RECEIVING LABORATORY:	***************************************
TestAmerica Laboratories, Inc Tampa 6712 Benjamin Rd., Suite 100 Tampa, FL 33634 Phone :(813) 885-7427 Fax: -	· MANAGEMENTA
Laboratory ID Comments	
Water	
3	
Water	
5	
Water	•
- : <del>- : - : - : - : - : - : - : - : - :</del>	
· · · · · · · · · · · · · · · · · · ·	
Water	
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Listo	
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98	
5	RECEIVING LABORATORY: TestAmerica Laboratories, Inc Tampa 6712 Benjamin Rd., Suite 100 Tampa, FL 33634 Phone: (813) 885-7427 Fax: -  Laboratory ID Comments  Water  Water  Water  Water

Received By

3,2/3,4 cu-09 1t lall 7-21-1700755

Released By

Date & Time

Received By

Date & Time

# Chain of Custody Record

6712 Benjamin Road Suite 100 TestAmerica Tampa

Client Information (Sub Contract Lab)				Conne	Conner, Keaton	ton		(e)oxi filiropii iailiao	ang No(s)	660-98130.1	0.1
Client Contact Shipping/Receiving	Phone			E-Mail: keato	n.conn	E-Mail: keaton.conner@testamericainc.com	cainc.com	State of Origin Florida	in	Page: Page 1 of 1	-
Company TestAmerica Laboratories, Inc.					Accredita	Accreditations Required (See note); NELAP - Florida; NELAP - Texas	See note): LAP - Texas			Job # 660-81885-1	
Address: 3355 McLemore Drive,	Due Date Requested: 7/28/2017	:pa					Analysis	Analysis Requested		Preservation Codes	on Codes:
City. Pensacola State, Zip.	TAT Requested (days):	ıys):								B - NaOH C - Zn Acetate D - Nitric Acid	
FL, 32514	9									E - NaHSO4 F - MeOH	
Phone 850-474-1001(Tel) 850-478-2671(Fax)	PO#.				(0					G - Amenior H - Ascorbic Acid	S - H2SO4 T - TSP Dodecahydrate
Email	WO#,									_	
Project Name: L17G024	Project # 66004821					muiri				rtainer	W - pH 4-5 Z - other (specify)
Site:	SSOW#.					IT 10.				of cor	
Sample Identification - Client ID (Lab ID)	Sample Date	Sample	Sample Type (C=comp,	(W-water, Sesolid, O-wasteroll,	Field Filtered Perform MS/M	r_q_7.00 <u>s\7.00</u>				otal Number	Gnorial Inetructions Mate
	X	X	4 0	Preservation Code:							
17G024-01 (660-81885-1)	71/20/17	12.25 Fastern		Water		×				-	
.17G024-02 (660-81885-2)	7/20/17	12:56 Eastern		Water		×				+	
17G024-03 (660-81885-3)	71/20/17	11.56 Eastern		Water		×				+	
17G024-04 (660-81885-4)	7/20/17	11:01 Eastern		Water		×				+	
_17G024-05 (660-81885-5)	7/20/17	10:29 Eastern		Water		×				+	
					Ц						

Archive For Special Instructions/QC Requirements. Primary Deliverable Rank: 2 Unconfirmed Deliverable Requested: I, II, III, IV, Other (specify) Possible Hazard Identification Empty Kit Relinquished by: indivision by

Cooler Temperature(s) "C and Other Remarks A 13

eceived by

Company

ate/Time:

7/28/2017

elinquished by

Custody Seals Intact. Custody Seal No

### **Login Sample Receipt Checklist**

Client: Tampa Electric Company

Job Number: 660-81885-1

Login Number: 81885 List Source: TestAmerica Tampa

List Number: 1

Creator: Moccia, Vanessa M

Cieator. Woccia, Variessa W		
Question	Answer	Comment
Radioactivity wasn't checked or is = background as measured by a survey meter.</td <td>N/A</td> <td></td>	N/A	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
s the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <a href="mailto:smaller">&lt;6mm (1/4").</a>	N/A	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

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### **Login Sample Receipt Checklist**

Client: Tampa Electric Company

Job Number: 660-81885-1

Login Number: 81885
List Source: TestAmerica Pensacola
List Number: 2
List Creation: 07/22/17 12:00 PM

Creator: Johnson, Jeremy N

Radioactivity wasn't checked or is = background as measured by a survey meter.  The cooler's custody seal, if present, is intact.  Sample custody seals, if present, are intact.  True  Sample custody seals, if present, are intact.  The cooler or samples do not appear to have been compromised or tampered with.  Samples were received on ice.  Cooler Temperature is acceptable.  Cooler Temperature is recorded.  COC is present.  COC is present.  COC is filled out in ink and legible.  COC is filled out with all pertinent information.  Is the Field Sampler's name present on COC?  There are no discrepancies between the containers received and the COC.  Samples are received within Holding Time (excluding tests with immediate HTs)  Sample containers have legible labels.  Containers are not broken or leaking.  Sample collection date/times are provided.  Appropriate sample containers are used.  Sample Preservation Verified.  True  Sample Preservation Verified.  There is sufficient vol. for all requested analyses, incl. any requested  MS/MSDs  Containers requiring zero headspace have no headspace or bubble is  Samples do not require splitting or compositing.  True  True  True  Samples do not require splitting or compositing.  True  True  True  True  True  True</th <th>Creator: Johnson, Jeremy N</th> <th></th> <th></th>	Creator: Johnson, Jeremy N		
meter. The cooler's custody seal, if present, is intact.  Sample custody seals, if present, are intact.  The cooler or samples do not appear to have been compromised or tampered with.  Samples were received on ice.  Cooler Temperature is acceptable.  Cooler Temperature is recorded.  True  COC is present.  COC is filled out in ink and legible.  COC is filled out with all pertinent information.  Is the Field Sampler's name present on COC?  There are no discrepancies between the containers received and the COC.  Samples are received within Holding Time (excluding tests with immediate HTs)  Sample containers have legible labels.  Containers are not broken or leaking.  Sample collection date/times are provided.  Appropriate sample containers are used.  Sample bottles are completely filled.  Sample Preservation Verified.  True  There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs  Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").  Multiphasic samples are not present.  True	Question	Answer	Comment
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MS/MSDs  Containers requiring zero headspace have no headspace or bubble is <a href="https://www.nc.align.com/"></a>	Sample Preservation Verified.	True	
<6mm (1/4").  Multiphasic samples are not present.  True		True	
and the second process of the second process		N/A	
Samples do not require splitting or compositing	Multiphasic samples are not present.	True	
camples do not require splitting or compositing.	Samples do not require splitting or compositing.	True	
Residual Chlorine Checked. N/A	Residual Chlorine Checked.	N/A	
	<6mm (1/4"). Multiphasic samples are not present. Samples do not require splitting or compositing.	True True	

TestAmerica Tampa

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5012 Causeway Blvd. Tampa, FL 33619

TECO

### DOH Certification #E84025

Report Date: August 2, 2017

Field Custody:

Client

Client/Field ID:

L17G024-01

Sample Collection:

7-20-17/1225

Lab ID No:

17.8608

Lab Custody Date:

7-21-17/0925

Sample description:

W

CERTIFICATE OF ANALYSIS

					Analysis		Detection	
Parameter	Units	Re	sul	ts	Date	Method	Limit	_
Combined Radium (Radium-226 + Radium 228)	pCi/l	34.7	±	1.8	Calc	Calc	0.7	
Radium-226	pCi/l	33.1	±	1.8	7-31-17/1406	EPA 903.0	0.4	
Radium-228	pCi/l	1.6	±	0.6	8-1-17/1103	EPA Ra-05	0.7	

James W. Hayes Laboratory Manager

ames W. Hages



5012 Causeway Blvd. Tampa, FL 33619

TECO

### DOH Certification #E84025

Report Date: August 2, 2017

Field Custody:

Client

Client/Field ID:

L17G024-02

Sample Collection:

7-20-17/1256

Lab ID No:

17.8609

Lab Custody Date:

7-21-17/0925

Sample description:

### CERTIFICATE OF ANALYSIS

					Analysis		Detection	
Parameter	Units	Re	sul	ts	Date	Method	Limit	
Combined Radium (Radium-226 + Radium 228)	pCi/l	14.4	±	1.1	Calc	Calc	0.8	
Radium-226	pCi/l	13.6	±	1.1	7-31-17/1406	EPA 903.0	0.4	
Radium-228	pCi/l	0.8	±	0.5	8-1-17/1103	EPA Ra-05	0.8	

James W. Hayes

ames W. Hages

Laboratory Manager



### DOH Certification #E84025

Report Date: August 3, 2017

TECO 5012 Causeway Blvd. Tampa, FL 33619 Field Custody: Client
Client/Field ID: L17G024-03
Sample Collection: 7-20-17/1156
Lab ID No: 17.8610

Lab Custody Date: 7-21-17/0925

Sample description: w

CERTIFICATE OF ANALYSIS

					Analysis		Detection
Parameter	Units	Re	sult	ts	Date	Method	Limit
Combined Radium (Radium-226 + Radium 228)	pCi/l	20.3	±	1.3	Calc	Calc	0.8
Radium-226	pCi/l	18.6	±	1.3	7-31-17/1406	EPA 903.0	0.4
Radium-228	pCi/l	1.7	±	0.6	8-2-17/1145	EPA Ra-05	0.8

James W. Hayes Laboratory Manager

amus W. Hages



### DOH Certification #E84025

Report Date: August 3, 2017

TECO 5012 Causeway Blvd. Tampa, FL 33619 Field Custody:

Client

Client/Field ID: Sample Collection: L17G024-04 7-20-17/1101

Lab ID No:

17.8611

Lab Custody Date:

7-21-17/0925

Sample description:

W

CERTIFICATE OF ANALYSIS

Parameter	Units	Re	sul		Analysis Date	Method	Detection Limit
Combined Radium (Radium-226 + Radium 228)	pCi/l	37.2	±	1.8	Calc	Calc	0.7
Radium-226	pCi/l	33.8	±	1.8	8-1-17/1154	EPA 903.0	0.4
Radium-228	pCi/l	3.4	±	0.7	8-2-17/1145	EPA Ra-05	0.7

James W. Hayes Laboratory Manager

amus W. Hages



### DOH Certification #E84025

Report Date: August 3, 2017

TECO 5012 Causeway Blvd. Tampa, FL 33619 Field Custody:

Client

Client/Field ID: Sample Collection: L17G024-05 7-20-17/1029

Lab ID No:

17.8612

Lab Custody Date:

7-21-17/0925

Sample description:

W

CERTIFICATE OF ANALYSIS

					Analysis		Detection	
Parameter	Units	Re	esul	ts	Date	Method	Limit	
Combined Radium (Radium-226 + Radium 228)	pCi/l	4.4	±	0.6	Calc	Calc	0.8	
Radium-226	pCi/l	3.9	±	0.6	8-1-17/1154	EPA 903.0	0.5	
Radium-228	pCi/l	0.5	±	0.5	8-2-17/1145	EPA Ra-05	0.8	

James W. Hayes Laboratory Manager

ames W. Hages

### SUBCONTRACT ORDER

### Tampa Electric Company, Laboratory Services

### L17G024

### SENDING LABORATORY:

Tampa Electric Company, Laboratory Services

5012 Causeway Blvd Tampa, FL 33619

Phone: (813) 630-7490 Fax: (813) 630-7360

Project Manager:

Analysis

nager: Peggy Penner

RECEIVING LABORATORY:

KNL Laboratory Services 3202 N. Florida Ave.

Tampa, FL 33603

Phone: (813) 229-2879

Laboratory ID

Comments

Fax: -

Due Date: 08/03/17 16:00

Expires

Sample ID: L17G024-01 BBS-CCR-1 Sampled: 07/20/17 12:25	Water	17.8608
Radium 226 EPA 903.0	01/16/18 12:25	Level 2 Data requred
Radium 226+228, Total	01/16/18 12:25	Level 2 Data requred
Radium 228 Ra-05	01/16/18 12:25	Level 2 Data requred
Containers Supplied:		
RAD Poly HNO3 - 1000mL (C)	RAD Poly HNO3 - 1000mL (D)	
Sample ID: L17G024-02 BBS-CCR-2 Sampled: 07/20/17 12:56	Water	17.8609
Radium 226 EPA 903.0	01/16/18 12:56	Level 2 Data requred
Radium 226+228, Total	01/16/18 12:56	Level 2 Data requred
Radium 228 Ra-05	01/16/18 12:56	Level 2 Data requred
Containers Supplied:		
RAD Poly HNO3 - 1000mL (C)	RAD Poly HNO3 - 1000mL (D)	
Sample ID: L17G024-03 BBS-CCR-3 Sampled: 07/20/17 11:56	Water	17.8610
Radium 226+228, Total	01/16/18 11:56	Level 2 Data requred
Radium 226 EPA 903.0	01/16/18 11:56	Level 2 Data requred
Radium 228 Ra-05	01/16/18 11:56	Level 2 Data requred
Containers Supplied:		
RAD Poly HNO3 - 1000mL (C)	RAD Poly HNO3 - 1000mL (D)	
Sample ID: L17G024-04 BBS-CCR-BW Sampled: 07/20/17 11:01	V1 Water	17.8611
Radium 226 EPA 903.0	01/16/18 11:01	Level 2 Data requred
Radium 226+228, Total	01/16/18 11:01	Level 2 Data requred
Radium 228 Ra-05	01/16/18 11:01	Level 2 Data requred
Containers Supplied:		

Pageelly 7-21-17 0925

RAD Poly HNO3 - 1000mL (C)

k Time Received By

RAD Poly HNO3 - 1000mL (D)

Date & Time

Released By Date & Time Received By Date & Time

### SUBCONTRACT ORDER

# Tampa Electric Company, Laboratory Services L17G024

Analysis	Expires	Laboratory ID Comments
Sample ID: L17G024-05 BBS-CCR- Sampled: 07/20/17 10:29	BW2 Water	178612
Radium 228 Ra-05	01/16/18 10:29	Level 2 Data requred
Radium 226 EPA 903.0	01/16/18 10:29	Level 2 Data requred
Radium 226+228, Total	01/16/18 10:29	Level 2 Data requred
Containers Supplied:		
RAD Poly HNO3 - 1000mL (C)	RAD Poly HNO3 - 1000mL (D)	

ABully 7-21-17 0925

Date & Time Re

CT-21-17@ C925

Received By Date & Time

Released By Date & Time Received By Date & Time



# FL DOH Certification # E84025

QC Summary: Total Rad	ium Analysis		
Client Project #: 176	024		
Analysis Completion Date:	811117		<b>7</b> =
Precision Data:  Sample Analysis (pCi/l)  38.6	Sample #:  Duplicate Analysis (pCi/l)  38. /	17.8611  Range (pCi/l)	RPD (%)
Spike Data:  Sample Analysis (pCi/l)  33.8	Spike Added (pCi/l) Analyt	17.86 / / ical Result (pCi/l)	
LCS Data:			
Analytical Result (pCi/l)	True Value (pCi/l)	% R	ecovery
9.5	_10.1		94%
Lab Blank:	7.0.7.12.12.12.12		
T.I.Di. i	Analytical Result (pC		lysis Date
Lab Blank	_0.2 +/0.1	<u> </u>	1 1 1 17



# FL DOH Certification # E84025

QC Summary: Total Ra	dium Analysis	
Client Project #:	6024	
Analysis Completion Date:	71 311 17	× .
Precision Data:	Sample #: _17	,8609
Sample Analysis (pCi/l)	Duplicate Analysis (pCi/l) Ran	ge (pCi/l) RPD (%)
19.1	18.6	0.5 2.65 %
Spike Data:	Sample #: _17.	8609
Sample Analysis (pCi/l)	Spike Added (pCi/l) Analytical R	esult (pCi/l) Spike Rec (%)
13.4	4.5 18.1	
LCS Data:	,	
Analytical Result (pCi/l)	True Value (pCi/l)	% Recovery
10.6	_10.1	105%
Lab Blank:		
	Analytical Result (pCi/l)	Analysis Date
Lab Blank	0,6+1-0,2	7/31/17



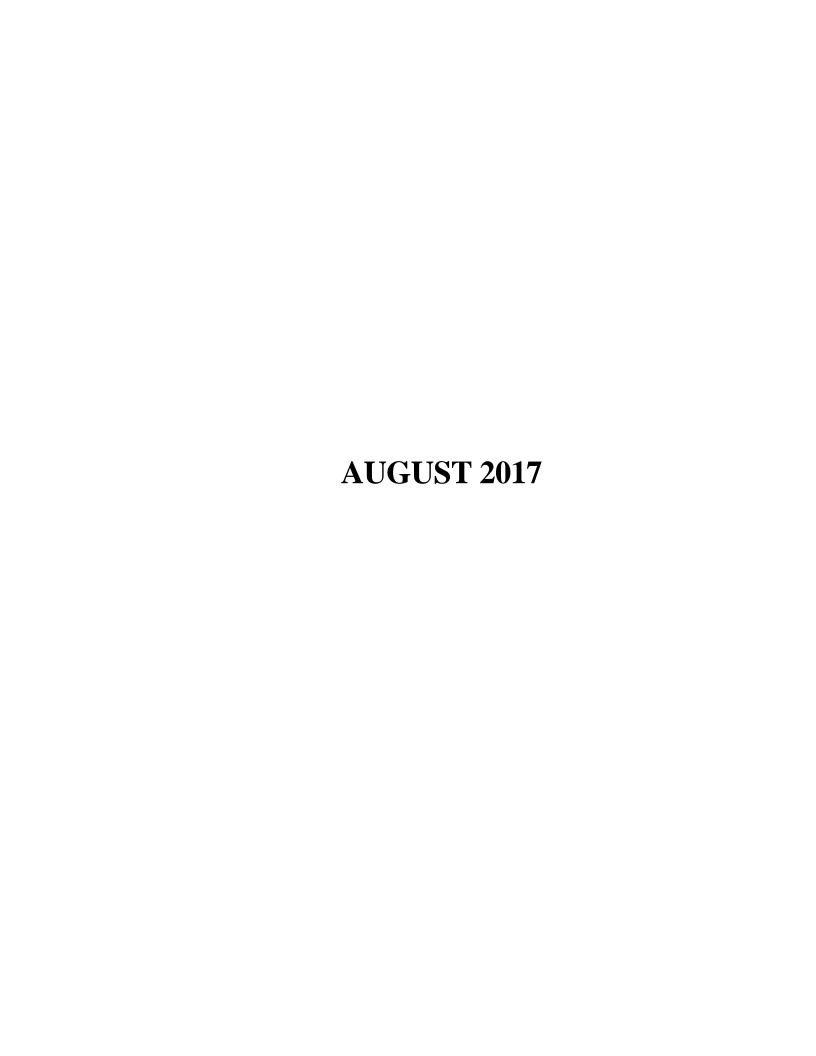
# FL DOH Certification # E84025

QC Summary: Radium 2	228 Analysis	
Client Project # : L176	024	
Analysis Completion Date:	812117	4
		+**
Precision Data:	Sample #:	8650
Sample Analysis (pCi/l)	Duplicate Analysis (pCi/l) Range	(pCi/l) RPD (%)
4-8	4.7 0.	1 _2.1%
Spike Data:	Sample #:/7.	8720
Sample Analysis (pCi/l)	Spike Added (pCi/l) Analytical Resu	ult (pCi/l) Spike Rec (%)
0.2	3.85 4.7	
LCS Data:		
Analytical Result (pCi/l)	True Value (pCi/l)	% Recovery
4.1	4.28	96%
Lab Blank:		
2.022.8	Analytical Result (pCi/l)	Analysis Date
Lab Blank	<u> 0. / +/- 0.3</u>	812117



# FL DOH Certification # E84025

QC Summary: Radium 2			
Client Project #: 417	6024		
Analysis Completion Date:	81 1117		
Precision Data:	Sample #:	17,8608	_
Sample Analysis (pCi/l)	Duplicate Analysis (pCi/l)	Range (pCi/l)	<u>RPD (%)</u>
5.9	6.0	0.1	1.77
Spike Data:	Sample #:	17.8608	
Sample Analysis (pCi/l)	Spike Added (pCi/l) Analy	tical Result (pCi/l)	Spike Rec (%)
1.6	3.85	5.9	112%
LCS Data:			
Analytical Result (pCi/l)	True Value (pCi/l)	<u>%</u> ]	Recovery
4.(	4.28	-	962
Lab Blank:			
	Analytical Result (po		alysis Date
Lab Blank	0.2+1-0.	3_8	1 1 17





5012 Causeway Blvd Tampa Fl. 33619 \* Ph (813)630-7490 \* Fax (813)630-7360 \* DOH #E54272

Big Bend Power Station
Terry Eastley
13031 Wyandott Rd
Apollo Beach, FL 33572
tleastley@tecoenergy.com

Work Order - L17H005

**Report Date:** 

09/01/17 15:20

### **Project - CCR Wells Economizer Ash Pond**

### **Case Narrative**

5 sample(s) were received on 08/16/17 13:43.

There were no issues noted with the sample(s) associated with this workorder unless noted below.

#### **SM 2540C**

A constant weight could not be acheived after three consectutive weighing and drying cycles for samples BBS-CCR-1 and BBS-CCR-BW2. The sample(s) are flagged with a J qualifier.

#### **EPA 200.7**

The recovery of the matrix spike and spike duplicate for Boron and Calcuim could not be accurately determined due to the amount of target analyte in the sample matrix. The parent sample is flagged with a J qualifier.



5012 Causeway Blvd Tampa Fl. 33619 \* Ph (813)630-7490 \* Fax (813)630-7360 \* DOH #E54272

### **Sample Information**

Client: Big Bend Power Station

Lab Sample ID: L17H005-01 Sampled By: Robert Barthelette

Sample Description: BBS-CCR-1 Date and Time Collected: 8/16/17 11:24
Sample Collection Method: Grab Date of Sample Receipt: 8/16/17 13:43

### **Laboratory Results**

Davamatau	Result	Units	MDL	DOL	Qualifier Code	Dil	Test Method	Amalwat	Analysis Date & Time
Parameter				PQL			Metnoa	Analyst	Date & Time
	]	Tampa Elec	tric Compa	ıny, Labo	ratory Se	rvices			
<b>General Chemistry Parameters</b>									
Chloride	710	mg/L	2.00	50.0		100	EPA 300.0	RFL	8/24/17 16:41
Specific Conductance	4110	umhos/cm	100	100		1	FDEP SOP FT 1200	RAB	8/16/17 11:24
Dissolved Oxygen	0.280	mg/L	0.100	0.100		1	FDEP SOP FT 1500	RAB	8/16/17 11:24
Fluoride	0.200	mg/L	0.0100	0.0500		1	EPA 300.0	RFL	8/24/17 16:31
pH	6.82	pH Units	1.00	1.00		1	FDEP SOP FT 1100	RAB	8/16/17 11:24
REDOX Potential	-109	mV	-999	-999		1	SM 2580B	RAB	8/16/17 11:24
Total Dissolved Solids	2960	mg/L	24.0	40.0	J-	2	SM 2540C	NLT	8/18/17 15:35
Sulfate	1240	mg/L	50.0	200		100	EPA 300.0	RFL	8/24/17 16:41
Turbidity	1.88	NTU	0.100	0.100		1	FDEP SOP FT 1600	RAB	8/16/17 11:24
Total Mercury by SW846 Metho	d 7470/7471								
Mercury	0.0500	ug/L	0.0500	0.200	U	1	EPA 7470A	MCR	8/18/17 10:22
<b>Total Recoverable Metals by 200</b>	Series								
Antimony	0.600	ug/L	0.600	2.00	U	1	EPA 200.8	MCR	8/18/17 12:03
Arsenic	9.33	ug/L	0.320	2.00		1	EPA 200.8	MCR	8/18/17 12:03
Cadmium	0.100	ug/L	0.100	0.500	U	1	EPA 200.8	MCR	8/18/17 12:03
Cobalt	0.473	ug/L	0.0400	2.00	I	1	EPA 200.8	MCR	8/18/17 12:03
Lead	8.00E-5	mg/L	8.00E-5	0.00200	U	1	EPA 200.8	MCR	8/18/17 12:03
Selenium	0.918	ug/L	0.200	2.00	I	1	EPA 200.8	MCR	8/18/17 12:03
Thallium	0.100	ug/L	0.100	0.500	U	1	EPA 200.8	MCR	8/18/17 12:03
<b>Total Recoverable Metals by SW</b>	846 Method	6010B							
Barium	0.122	mg/L	0.000500	0.0200		1	EPA 6010B	RLC	8/18/17 9:46
Beryllium	0.200	ug/L	0.200	2.00	U	1	EPA 6010B	RLC	8/18/17 9:46
Boron	17.0	mg/L	0.0100	0.0500		1	EPA 6010B	RLC	8/18/17 9:46
Calcium	572	mg/L	0.0300	1.00		1	EPA 6010B	RLC	8/18/17 8:29
Chromium	1.60	ug/L	1.60	12.0	U	1	EPA 6010B	RLC	8/18/17 9:46
Molybdenum	86.4	ug/L	1.00	20.0		1	EPA 6010B	RLC	8/18/17 9:46



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### **Sample Information**

Client: Big Bend Power Station

Lab Sample ID: L17H005-02 Sampled By: Robert Barthelette

Sample Description: BBS-CCR-2 Date and Time Collected: 8/16/17 10:55 Sample Collection Method: Date of Sample Receipt: 8/16/17 13:43 Grab

### **Laboratory Results**

Parameter	Result	Units	MDL	PQL	Qualifier Code	Dil	Test Method	Analyst	Analysis Date & Time
r ar ameter							Method	Allalyst	Date & Time
	7	ampa Elec	tric Compa	ıny, Labo	ratory Sei	rvices			
<b>General Chemistry Parameters</b>									
Chloride	113	mg/L	0.200	5.00		10	EPA 300.0	RFL	8/24/17 17:01
Specific Conductance	1560	umhos/cm	100	100		1	FDEP SOP FT 1200	RAB	8/16/17 10:55
Dissolved Oxygen	0.250	mg/L	0.100	0.100		1	FDEP SOP FT 1500	RAB	8/16/17 10:55
Fluoride	0.155	mg/L	0.0100	0.0500		1	EPA 300.0	RFL	8/24/17 16:51
pН	6.92	pH Units	1.00	1.00		1	FDEP SOP FT 1100	RAB	8/16/17 10:55
REDOX Potential	-233	mV	-999	-999		1	SM 2580B	RAB	8/16/17 10:55
Total Dissolved Solids	1080	mg/L	24.0	40.0		2	SM 2540C	NLT	8/18/17 15:35
Sulfate	459	mg/L	5.00	20.0		10	EPA 300.0	RFL	8/24/17 17:01
Turbidity	3.22	NTU	0.100	0.100		1	FDEP SOP FT 1600	RAB	8/16/17 10:55
<b>Total Mercury by SW846 Metho</b>	od 7470/7471								
Mercury	0.0500	ug/L	0.0500	0.200	U	1	EPA 7470A	MCR	8/18/17 10:25
<b>Total Recoverable Metals by 20</b>	0 Series								
Antimony	1.20	ug/L	1.20	4.00	U	2	EPA 200.8	MCR	8/18/17 12:38
Arsenic	1.02	ug/L	0.640	4.00	I	2	EPA 200.8	MCR	8/18/17 12:38
Cadmium	0.200	ug/L	0.200	1.00	U	2	EPA 200.8	MCR	8/18/17 12:38
Cobalt	0.150	ug/L	0.0800	4.00	I	2	EPA 200.8	MCR	8/18/17 12:38
Lead	0.000244	mg/L	0.000160	0.00400	I	2	EPA 200.8	MCR	8/18/17 12:38
Selenium	0.662	ug/L	0.400	4.00	I	2	EPA 200.8	MCR	8/18/17 12:38
Thallium	0.200	ug/L	0.200	1.00	U	2	EPA 200.8	MCR	8/18/17 12:38
<b>Total Recoverable Metals by SV</b>	V846 Method	6010B							
Barium	0.0568	mg/L	0.000500	0.0200		1	EPA 6010B	RLC	8/18/17 9:48
Beryllium	0.200	ug/L	0.200	2.00	U	1	EPA 6010B	RLC	8/18/17 9:48
Boron	4.32	mg/L	0.0100	0.0500		1	EPA 6010B	RLC	8/18/17 9:48
Calcium	171	mg/L	0.0300	1.00		1	EPA 6010B	RLC	8/18/17 8:32
Chromium	1.60	ug/L	1.60	12.0	U	1	EPA 6010B	RLC	8/18/17 9:48
Molybdenum	3.02	ug/L	1.00	20.0	I	1	EPA 6010B	RLC	8/18/17 9:48



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### **Sample Information**

Client: Big Bend Power Station

Lab Sample ID: L17H005-03 Sampled By: Robert Barthelette

Sample Description: BBS-CCR-3 Date and Time Collected: 8/16/17 10:27
Sample Collection Method: Grab Date of Sample Receipt: 8/16/17 13:43

### **Laboratory Results**

D	D 14	<b>T</b> T *4	MDI	DOL	Qualifier	D.I	Test	. 1	Analysis
Parameter	Result	Units	MDL	PQL	Code	Dil	Method	Analyst	Date & Time
	ŗ	Гатра Elec	tric Compa	ny, Labo	ratory Se	rvices			
<b>General Chemistry Parameters</b>									
Chloride	156	mg/L	0.200	5.00		10	EPA 300.0	RFL	8/24/17 17:22
Specific Conductance	1790	umhos/cm	100	100		1	FDEP SOP FT 1200	RAB	8/16/17 10:27
Dissolved Oxygen	0.290	mg/L	0.100	0.100		1	FDEP SOP FT 1500	RAB	8/16/17 10:27
Fluoride	0.338	mg/L	0.0100	0.0500		1	EPA 300.0	RFL	8/24/17 17:11
pH	6.42	pH Units	1.00	1.00		1	FDEP SOP FT 1100	RAB	8/16/17 10:27
REDOX Potential	-206	mV	-999	-999		1	SM 2580B	RAB	8/16/17 10:27
Total Dissolved Solids	1290	mg/L	24.0	40.0		2	SM 2540C	NLT	8/18/17 15:35
Sulfate	484	mg/L	5.00	20.0		10	EPA 300.0	RFL	8/24/17 17:22
Turbidity	0.470	NTU	0.100	0.100		1	FDEP SOP FT 1600	RAB	8/16/17 10:27
<b>Total Mercury by SW846 Metho</b>	d 7470/7471								
Mercury	0.0500	ug/L	0.0500	0.200	U	1	EPA 7470A	MCR	8/18/17 10:29
<b>Total Recoverable Metals by 200</b>	Series_								
Antimony	0.600	ug/L	0.600	2.00	U	1	EPA 200.8	MCR	8/18/17 12:09
Arsenic	0.536	ug/L	0.320	2.00	I	1	EPA 200.8	MCR	8/18/17 12:09
Cadmium	0.100	ug/L	0.100	0.500	U	1	EPA 200.8	MCR	8/18/17 12:09
Cobalt	0.123	ug/L	0.0400	2.00	I	1	EPA 200.8	MCR	8/18/17 12:09
Lead	8.00E-5	mg/L	8.00E-5	0.00200	U	1	EPA 200.8	MCR	8/18/17 12:09
Selenium	0.200	ug/L	0.200	2.00	U	1	EPA 200.8	MCR	8/18/17 12:09
Thallium	0.100	ug/L	0.100	0.500	U	1	EPA 200.8	MCR	8/18/17 12:09
<b>Total Recoverable Metals by SW</b>	/846 Method	6010B							
Barium	0.0598	mg/L	0.000500	0.0200		1	EPA 6010B	RLC	8/18/17 9:52
Beryllium	0.200	ug/L	0.200	2.00	U	1	EPA 6010B	RLC	8/18/17 9:52
Boron	0.266	mg/L	0.0100	0.0500		1	EPA 6010B	RLC	8/18/17 9:52
Calcium	187	mg/L	0.0300	1.00		1	EPA 6010B	RLC	8/18/17 8:34
Chromium	2.02	ug/L	1.60	12.0	I	1	EPA 6010B	RLC	8/18/17 9:52
Molybdenum	3.14	ug/L	1.00	20.0	I	1	EPA 6010B	RLC	8/18/17 9:52



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### **Sample Information**

Client: Big Bend Power Station

Lab Sample ID: L17H005-04 Sampled By: Robert Barthelette

Sample Description: BBS-CCR-BW1 Date and Time Collected: 8/16/17 9:52
Sample Collection Method: Grab Date of Sample Receipt: 8/16/17 13:43

### **Laboratory Results**

D	D14	TI:4-	MDL		Qualifier Code	Dil	Test	A I4	Analysis
Parameter	Result	Units		PQL			Method	Analyst	Date & Time
	7	Tampa Elec	tric Compa	ıny, Labo	ratory Sei	rvices			
<b>General Chemistry Parameters</b>									
Chloride	793	mg/L	4.00	100		200	EPA 300.0	RFL	8/24/17 18:02
Specific Conductance	5000	umhos/cm	100	100		1	FDEP SOP FT 1200	RAB	8/16/17 9:52
Dissolved Oxygen	0.450	mg/L	0.100	0.100		1	FDEP SOP FT 1500	RAB	8/16/17 9:52
Fluoride	0.0100	mg/L	0.0100	0.0500	U	1	EPA 300.0	RFL	8/24/17 17:32
pH	6.52	pH Units	1.00	1.00		1	FDEP SOP FT 1100	RAB	8/16/17 9:52
REDOX Potential	3.60	mV	-999	-999		1	SM 2580B	RAB	8/16/17 9:52
Total Dissolved Solids	4340	mg/L	48.0	80.0		4	SM 2540C	NLT	8/18/17 15:35
Sulfate	1320	mg/L	100	400		200	EPA 300.0	RFL	8/24/17 18:02
Turbidity	6.03	NTU	0.100	0.100		1	FDEP SOP FT 1600	RAB	8/16/17 9:52
<b>Total Mercury by SW846 Metho</b>	d 7470/7471								
Mercury	0.0500	ug/L	0.0500	0.200	U	1	EPA 7470A	MCR	8/18/17 10:32
<b>Total Recoverable Metals by 200</b>	Series								
Antimony	0.600	ug/L	0.600	2.00	U	1	EPA 200.8	MCR	8/18/17 12:12
Arsenic	6.60	ug/L	0.320	2.00		1	EPA 200.8	MCR	8/18/17 12:12
Cadmium	0.100	ug/L	0.100	0.500	U	1	EPA 200.8	MCR	8/18/17 12:12
Cobalt	1.66	ug/L	0.0400	2.00	I	1	EPA 200.8	MCR	8/18/17 12:12
Lead	0.000291	mg/L	8.00E-5	0.00200	I	1	EPA 200.8	MCR	8/18/17 12:12
Selenium	1.76	ug/L	0.200	2.00	I	1	EPA 200.8	MCR	8/18/17 12:12
Thallium	0.100	ug/L	0.100	0.500	U	1	EPA 200.8	MCR	8/18/17 12:12
<b>Total Recoverable Metals by SW</b>	846 Method	6010B							
Barium	0.0556	mg/L	0.000500	0.0200		1	EPA 6010B	RLC	8/18/17 9:54
Beryllium	0.200	ug/L	0.200	2.00	U	1	EPA 6010B	RLC	8/18/17 9:54
Boron	48.0	mg/L	0.0100	0.0500	J-	1	EPA 6010B	RLC	8/18/17 9:54
Calcium	743	mg/L	0.0300	1.00	J-	1	EPA 6010B	RLC	8/18/17 8:36
Chromium	2.48	ug/L	1.60	12.0	I	1	EPA 6010B	RLC	8/18/17 9:54
Molybdenum	1.43	ug/L	1.00	20.0	I	1	EPA 6010B	RLC	8/18/17 9:54



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### **Sample Information**

Client: Big Bend Power Station

Lab Sample ID: L17H005-05 Sampled By: Robert Barthelette

Sample Description: BBS-CCR-BW2 Date and Time Collected: 8/16/17 9:18
Sample Collection Method: Grab Date of Sample Receipt: 8/16/17 13:43

### **Laboratory Results**

#### Sample Qualifier:

					Qualifier		Test		Analysis
Parameter	Result	Units	MDL	PQL	Code	Dil	Method	Analyst	Date & Time
	7	Гатра Elec	tric Compa	ny, Labo	ratory Se	rvices			
<b>General Chemistry Parameters</b>									
Chloride	117	mg/L	0.200	5.00		10	EPA 300.0	RFL	8/24/17 18:23
Specific Conductance	1580	umhos/cm	100	100		1	FDEP SOP FT 1200	RAB	8/16/17 9:18
Dissolved Oxygen	0.430	mg/L	0.100	0.100		1	FDEP SOP FT 1500	RAB	8/16/17 9:18
Fluoride	0.352	mg/L	0.0100	0.0500		1	EPA 300.0	RFL	8/24/17 18:13
pH	6.68	pH Units	1.00	1.00		1	FDEP SOP FT 1100	RAB	8/16/17 9:18
REDOX Potential	-53.3	mV	-999	-999		1	SM 2580B	RAB	8/16/17 9:18
Total Dissolved Solids	1180	mg/L	24.0	40.0	J-	2	SM 2540C	NLT	8/18/17 15:35
Sulfate	462	mg/L	5.00	20.0		10	EPA 300.0	RFL	8/24/17 18:23
Turbidity	3.66	NTU	0.100	0.100		1	FDEP SOP FT 1600	RAB	8/16/17 9:18
<b>Total Mercury by SW846 Method</b>	d 7470/7471								
Mercury	0.0500	ug/L	0.0500	0.200	U	1	EPA 7470A	MCR	8/18/17 10:36
<b>Total Recoverable Metals by 200</b>	Series								
Antimony	0.600	ug/L	0.600	2.00	U	1	EPA 200.8	MCR	8/18/17 12:20
Arsenic	1.80	ug/L	0.320	2.00	I	1	EPA 200.8	MCR	8/18/17 12:20
Cadmium	0.100	ug/L	0.100	0.500	U	1	EPA 200.8	MCR	8/18/17 12:20
Cobalt	0.110	ug/L	0.0400	2.00	I	1	EPA 200.8	MCR	8/18/17 12:20
Lead	0.000101	mg/L	8.00E-5	0.00200	I	1	EPA 200.8	MCR	8/18/17 12:20
Selenium	0.420	ug/L	0.200	2.00	I	1	EPA 200.8	MCR	8/18/17 12:20
Thallium	0.100	ug/L	0.100	0.500	U	1	EPA 200.8	MCR	8/18/17 12:20
Total Recoverable Metals by SW	846 Method	6010B							
Barium	0.0499	mg/L	0.000500	0.0200		1	EPA 6010B	RLC	8/18/17 10:03
Beryllium	0.200	ug/L	0.200	2.00	U	1	EPA 6010B	RLC	8/18/17 10:03
Boron	4.39	mg/L	0.0100	0.0500		1	EPA 6010B	RLC	8/18/17 10:03
Calcium	287	mg/L	0.0300	1.00		1	EPA 6010B	RLC	8/18/17 8:43
Chromium	1.60	ug/L	1.60	12.0	U	1	EPA 6010B	RLC	8/18/17 10:03
Molybdenum	4.08	ug/L	1.00	20.0	I	1	EPA 6010B	RLC	8/18/17 10:03

### **Comments**

#### **Subcontract Laboratories:**

Laboratory Services certifies that the test result in this report meet all requirements of the NELAC standards, unless indicated otherwise in the body of the report. Unless otherwise noted, all methods followed are per the most current published version of 40 CFR Part 136, Table B. Results reported on this report pertain to the above referenced sample only.

U Indicates that the compound was analyzed for but not detected.

J- The reported value is an estimated value, see the case narrative for specifics.

I Estimated value



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### Total Recoverable Metals by SW846 Method 6010B - Quality Control

Batch 17H0161 - EPA 6010B   Blank (17H0161 - BLK1)						Spike	Source		%Rec		RPD	
Prepared:	Analyte	Result	MDL	PQL	Units	Level	Result	%Rec	Limits	RPD	Limit	Qualifier
Sarium	Batch 17H0161 - EPA 6010B											
Part   Part	Blank (17H0161-BLK1)					Prepared: (	08/17/17 Ar	nalyzed: 08	3/18/17			
Series   Continue	Barium	0.000500	0.000500	0.0200	mg/L							U
Calcium	Beryllium	0.200	0.200	2.00	ug/L							U
Chromium         1.60         1.60         12.0         ug/L	Boron	0.0100	0.0100	0.0500	mg/L							U
Molybdenum   1.00   1.00   2.00   1	Calcium	0.0300	0.0300	1.00	mg/L							U
Prepared: 08/17/17   Analyzed: 08/18/17   Analyzed: 08/18/18	Chromium	1.60	1.60	12.0	ug/L							U
Sarium   1.01   0.000500   0.0200   mg/L   1.0000   101   80-120	Molybdenum	1.00	1.00	20.0	ug/L							U
Beryllium 1010 0.200 2.00 ug/L 1000.0 101 80-120 Boron 1.02 0.0100 0.0500 mg/L 1.0000 102 80-120 Chromium 1010 1.60 12.0 ug/L 1000.0 101 80-120 Molybdenum 991 1.00 20.0 ug/L 1000.0 99.1 80-120  Matrix Spike (17H0161-MS1) Source: L17H005-0 Prepared: 08/17/17 Analyzed: 08/18/17  Beryllium 973 0.200 0.200 mg/L 1.000 0.556 99.1 75-125 Boron 51.0 0.0100 0.0500 mg/L 1.0000 0.0556 99.1 75-125 Chromium 972 1.60 12.0 ug/L 1000.0 U 97.3 75-125 Molybdenum 973 0.200 0.0500 mg/L 1.0000 0.48.0 297 75-125 Molybdenum 972 1.60 12.0 ug/L 1000.0 1.43 102 75-125 Molybdenum 1020 1.00 20.0 ug/L 1000.0 1.43 102 75-125  Matrix Spike (17H0161-MS2) Prepared: 08/17/17 Analyzed: 08/18/17  Barium 1.02 0.000500 0.0200 mg/L 1.0000 0.0457 101 75-125 Beryllium 1010 0.200 2.00 ug/L 1000.0 U 101 75-125 Boron 1.15 0.0100 0.0500 mg/L 1.0000 0.0474 110 75-125 Boron 1.15 0.0100 0.0500 mg/L 1.0000 0.0474 110 75-125 Chromium 1010 1.60 12.0 ug/L 1000.0 U 101 75-125 Chromium 1010 1.60 12.0 ug/L 1000.0 U 101 75-125	LCS (17H0161-BS1)					Prepared: (	08/17/17 Ar	alyzed: 08	3/18/17			
Boron         1.02         0.0100         0.0500         mg/L         1.0000         102         80-120           Chromium         1010         1.60         12.0         ug/L         1000.0         101         80-120           Molybdenum         991         1.00         20.0         ug/L         1000.0         99.1         80-120           Matrix Spike (17H0161-MS1)         Source: L17H005-04         Prepared: 08/17/17 Analyzed: 08/18/17           Barium         1.05         0.000500         0.200         mg/L         1.0000         0.0556         99.1         75-125           Beryllium         973         0.200         2.00         ug/L         10000         U         97.3         75-125           Boron         51.0         0.0100         0.0500         mg/L         1.0000         48.0         297         75-125         J-           Chromium         972         1.60         12.0         ug/L         1000.0         2.48         97.0         75-125         J-           Matrix Spike (17H0161-MS2)         Source: L17H025-01         Prepared: 08/17/17 Analyzed: 08/18/17         N-125         N-125           Barium         1.02         0.000500         0.0200 <t< td=""><td>Barium</td><td>1.01</td><td>0.000500</td><td>0.0200</td><td>mg/L</td><td>1.0000</td><td></td><td>101</td><td>80-120</td><td></td><td></td><td></td></t<>	Barium	1.01	0.000500	0.0200	mg/L	1.0000		101	80-120			
Chromium	Beryllium	1010	0.200	2.00	ug/L	1000.0		101	80-120			
Matrix Spike (17H0161-MS1)   Source: L17H005-04   Prepared: 08/17/17   Analyzed: 08/18/17	Boron	1.02	0.0100	0.0500	mg/L	1.0000		102	80-120			
Matrix Spike (17H0161-MS1)   Source: L17H005-04   Prepared: 08/17/17   Analyzed: 08/18/17	Chromium	1010	1.60	12.0	ug/L	1000.0		101	80-120			
Barium 1.05 0.000500 0.0200 mg/L 1.0000 0.0556 99.1 75-125 Beryllium 973 0.200 2.00 ug/L 1000.0 U 97.3 75-125 Boron 51.0 0.0100 0.0500 mg/L 1.0000 48.0 297 75-125  Molybdenum 1020 1.00 20.0 ug/L 1000.0 1.43 102 75-125  Matrix Spike (17H0161-MS2) Source: L17H025-01 Prepared: 08/17/17 Analyzed: 08/18/17  Barium 1.02 0.000500 0.0200 mg/L 1.0000 0.00457 101 75-125  Beryllium 1010 0.200 2.00 ug/L 1000.0 U 101 75-125  Boron 1.15 0.0100 0.0500 mg/L 1.0000 0.0474 110 75-125  Chromium 1010 1.60 12.0 ug/L 1000.0 U 101 75-125	Molybdenum	991	1.00	20.0	ug/L	1000.0		99.1	80-120			
Beryllium   973   0.200   2.00   ug/L   1000.0   U   97.3   75-125   Boron   51.0   0.0100   0.0500   mg/L   1.0000   48.0   297   75-125   J-Chromium   972   1.60   12.0   ug/L   1000.0   2.48   97.0   75-125   Molybdenum   1020   1.00   20.0   ug/L   1000.0   1.43   102   75-125   Matrix Spike (17H0161-MS2)   Source: L17H025-01   Prepared: 08/17/17   Analyzed: 08/18/17	Matrix Spike (17H0161-MS1)		Source	e: L17H00	05-04	Prepared: (	08/17/17 Ar	alyzed: 08	3/18/17			
Source   S	Barium	1.05	0.000500	0.0200	mg/L	1.0000	0.0556	99.1	75-125			
Chromium 972 1.60 12.0 ug/L 1000.0 2.48 97.0 75-125 Molybdenum 1020 1.00 20.0 ug/L 1000.0 1.43 102 75-125  Matrix Spike (17H0161-MS2) Source: L17H025-01 Prepared: 08/17/17 Analyzed: 08/18/17  Barium 1.02 0.000500 0.0200 mg/L 1.0000 0.00457 101 75-125  Beryllium 1010 0.200 2.00 ug/L 1000.0 U 101 75-125  Boron 1.15 0.0100 0.0500 mg/L 1.0000 0.0474 110 75-125  Chromium 1010 1.60 12.0 ug/L 1000.0 U 101 75-125	Beryllium	973	0.200	2.00	ug/L	1000.0	U	97.3	75-125			
Molybdenum         1020         1.00         20.0         ug/L         1000.0         1.43         102         75-125           Matrix Spike (17H0161-MS2)         Source: L17H025-01         Prepared: 08/17/17 Analyzed: 08/18/17           Barium         1.02         0.000500         0.0200         mg/L         1.0000         0.0457         101         75-125           Beryllium         1010         0.200         2.00         ug/L         1000.0         U         101         75-125           Boron         1.15         0.0100         0.0500         mg/L         1.0000         0.0474         110         75-125           Chromium         1010         1.60         12.0         ug/L         1000.0         U         101         75-125	Boron	51.0	0.0100	0.0500	mg/L	1.0000	48.0	297	75-125			J-
Matrix Spike (17H0161-MS2)         Source: L17H025-01         Prepared: 08/17/17 Analyzed: 08/18/17           Barium         1.02         0.000500         0.0200         mg/L         1.0000         0.00457         101         75-125           Beryllium         1010         0.200         2.00         ug/L         1000.0         U         101         75-125           Boron         1.15         0.0100         0.0500         mg/L         1.0000         0.0474         110         75-125           Chromium         1010         1.60         12.0         ug/L         1000.0         U         101         75-125	Chromium	972	1.60	12.0	ug/L	1000.0	2.48	97.0	75-125			
Barium 1.02 0.000500 0.0200 mg/L 1.0000 0.00457 101 75-125 Beryllium 1010 0.200 2.00 ug/L 1000.0 U 101 75-125 Boron 1.15 0.0100 0.0500 mg/L 1.0000 0.0474 110 75-125 Chromium 1010 1.60 12.0 ug/L 1000.0 U 101 75-125	Molybdenum	1020	1.00	20.0	ug/L	1000.0	1.43	102	75-125			
Beryllium         1010         0.200         2.00         ug/L         1000.0         U         101         75-125           Boron         1.15         0.0100         0.0500         mg/L         1.0000         0.0474         110         75-125           Chromium         1010         1.60         12.0         ug/L         1000.0         U         101         75-125	Matrix Spike (17H0161-MS2)		Sourc	e: L17H02	25-01	Prepared: (	08/17/17 Ar	alyzed: 08	3/18/17			
Boron 1.15 0.0100 0.0500 mg/L 1.0000 0.0474 110 75-125 Chromium 1010 1.60 12.0 ug/L 1000.0 U 101 75-125	Barium	1.02	0.000500	0.0200	mg/L	1.0000	0.00457	101	75-125			
Chromium 1010 1.60 12.0 ug/L 1000.0 U 101 75-125	Beryllium	1010	0.200	2.00	ug/L	1000.0	U	101	75-125			
Ç .	Boron	1.15	0.0100	0.0500	mg/L	1.0000	0.0474	110	75-125			
Molybdenum 1000 1.00 20.0 ug/L 1000.0 2.21 100 75-125	Chromium	1010	1.60	12.0	ug/L	1000.0	U	101	75-125			
	Molybdenum	1000	1.00	20.0	ug/L	1000.0	2.21	100	75-125			



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### Total Recoverable Metals by SW846 Method 6010B - Quality Control

Analyte	Result	MDL	PQL	Units	Spike Level	Source Result	%Rec	%Rec Limits	RPD	RPD Limit	Qualifier
Batch 17H0161 - EPA 6010B											
Matrix Spike Dup (17H0161-MSD1)		Sourc	e: L17H00	05-04	Prepared: (	08/17/17 Ar	nalyzed: 08	3/18/17			
Barium	1.05	0.000500	0.0200	mg/L	1.0000	0.0556	99.7	75-125	0.598	20	
Beryllium	972	0.200	2.00	ug/L	1000.0	U	97.2	75-125	0.0458	20	
Boron	50.5	0.0100	0.0500	mg/L	1.0000	48.0	249	75-125	0.961	20	J-
Chromium	980	1.60	12.0	ug/L	1000.0	2.48	97.7	75-125	0.792	20	
Molybdenum	1030	1.00	20.0	ug/L	1000.0	1.43	102	75-125	0.636	20	
Matrix Spike Dup (17H0161-MSD2)		Sourc	e: L17H02	25-01	Prepared: (	08/17/17 Ar	nalyzed: 08	3/18/17			
Barium	1.05	0.000500	0.0200	mg/L	1.0000	0.00457	104	75-125	2.79	20	
Beryllium	1030	0.200	2.00	ug/L	1000.0	U	103	75-125	2.06	20	
Boron	1.14	0.0100	0.0500	mg/L	1.0000	0.0474	109	75-125	1.08	20	
Chromium	1030	1.60	12.0	ug/L	1000.0	U	103	75-125	2.24	20	
Molybdenum	1020	1.00	20.0	ug/L	1000.0	2.21	102	75-125	2.00	20	



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### Total Mercury by SW846 Method 7470/7471 - Quality Control

					C 11	C		%Rec		DDD	
Analyte	Result	MDL	PQL	Units	Spike Level	Source Result	%Rec	Limits	RPD	RPD Limit	Qualifier
· mary te	resur		. 42		20,01	resur	701100	2,111110		2,,,,,,	Quantities.
Batch 17H0163 - EPA 7470A											
Blank (17H0163-BLK1)					Prepared: 0	08/17/17 Aı	nalyzed: 08	/18/17			
Mercury	0.0500	0.0500	0.200	ug/L							U
LCS (17H0163-BS1)					Prepared: 0	08/17/17 A1	nalyzed: 08	/18/17			
Mercury	0.893	0.0500	0.200	ug/L	1.0000		89.3	80-120			
Matrix Spike (17H0163-MS1)		Sourc	ce: L17H00	05-05	Prepared: 0	08/17/17 A1	nalyzed: 08	/18/17			
Mercury	0.966	0.0500	0.200	ug/L	1.0000	U	96.6	75-125			
Matrix Spike Dup (17H0163-MSD1)		Sourc	ce: L17H00	05-05	Prepared: 0	8/17/17 Aı	nalyzed: 08	/18/17			
Mercury	0.976	0.0500	0.200	ug/L	1.0000	U	97.6	75-125	1.08	20	



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### **Total Recoverable Metals by 200 Series - Quality Control**

					Spike	Source		%Rec		RPD	
Analyte	Result	MDL	PQL	Units	Level	Result	%Rec	Limits	RPD	Limit	Qualifier
Batch 17H0157 - EPA 200.8											
Blank (17H0157-BLK1)					Prepared: (	08/16/17 An	alyzed: 08	/18/17			
Antimony	0.600	0.600	2.00	ug/L							U
Arsenic	0.320	0.320	2.00	ug/L							U
Cadmium	0.100	0.100	0.500	ug/L							U
Cobalt	0.0400	0.0400	2.00	ug/L							U
Lead	8.00E-5	8.00E-5	0.00200	mg/L							U
Selenium	0.200	0.200	2.00	ug/L							U
Thallium	0.100	0.100	0.500	ug/L							U
LCS (17H0157-BS1)					Prepared: (	08/16/17 An	alyzed: 08	/18/17			
Antimony	104	0.600	2.00	ug/L	100.00		104	85-115			
Arsenic	103	0.320	2.00	ug/L	100.00		103	85-115			
Cadmium	102	0.100	0.500	ug/L	100.00		102	85-115			
Cobalt	95.8	0.0400	2.00	ug/L	100.00		95.8	85-115			
Lead	0.0977	8.00E-5	0.00200	mg/L	0.10000		97.7	85-115			
Selenium	107	0.200	2.00	ug/L	100.00		107	85-115			
Thallium	100	0.100	0.500	ug/L	100.00		100	85-115			
Matrix Spike (17H0157-MS1)		Sour	ce: L17H02	7-01	Prepared: (	08/16/17 An	alyzed: 08	/18/17			
Antimony	107	0.600	2.00	ug/L	100.00	0.827	106	70-130			
Arsenic	96.5	0.320	2.00	ug/L	100.00	1.14	95.4	70-130			
Cadmium	87.0	0.100	0.500	ug/L	100.00	0.154	86.8	70-130			
Cobalt	91.7	0.0400	2.00	ug/L	100.00	0.223	91.5	70-130			
Lead	0.0890	8.00E-5	0.00200	mg/L	0.10000	0.000269	88.7	70-130			
Selenium	93.8	0.200	2.00	ug/L	100.00	0.208	93.6	70-130			
Thallium	94.3	0.100	0.500	ug/L	100.00	0.203	94.1	70-130			
Matrix Spike (17H0157-MS2)		Sour	ce: L17H00	5-01	Prepared: (	08/16/17 An	alyzed: 08	/18/17			
Antimony	95.9	0.600	2.00	ug/L	100.00	U	95.9	70-130			
Arsenic	91.9	0.320	2.00	ug/L	100.00	9.33	82.6	70-130			
Cadmium	73.5	0.100	0.500	ug/L	100.00	U	73.5	70-130			
Cobalt	77.4	0.0400	2.00	ug/L	100.00	0.473	76.9	70-130			
Lead	0.0769	8.00E-5	0.00200	mg/L	0.10000	U	76.9	70-130			
Selenium	80.7	0.200	2.00	ug/L	100.00	0.918	79.8	70-130			
Thallium	82.4	0.100	0.500	ug/L	100.00	U	82.4	70-130			



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### **Total Recoverable Metals by 200 Series - Quality Control**

Analyte	Result	MDL	PQL	Units	Spike Level	Source Result	%Rec	%Rec Limits	RPD	RPD Limit	Qualifier
Batch 17H0157 - EPA 200.8											
Matrix Spike Dup (17H0157-MSD1)		Sourc	ce: L17H02	7-01	Prepared: 0	08/16/17 Ana	alyzed: 08	/18/17			
Antimony	104	0.600	2.00	ug/L	100.00	0.827	103	70-130	3.02	20	
Arsenic	95.8	0.320	2.00	ug/L	100.00	1.14	94.7	70-130	0.752	20	
Cadmium	84.3	0.100	0.500	ug/L	100.00	0.154	84.1	70-130	3.14	20	
Cobalt	87.2	0.0400	2.00	ug/L	100.00	0.223	86.9	70-130	5.08	20	
Lead	0.0859	8.00E-5	0.00200	mg/L	0.10000	0.000269	85.6	70-130	3.53	20	
Selenium	93.6	0.200	2.00	ug/L	100.00	0.208	93.4	70-130	0.244	20	
Thallium	90.4	0.100	0.500	ug/L	100.00	0.203	90.2	70-130	4.23	20	
Matrix Spike Dup (17H0157-MSD2)		Source	ce: L17H00	15-01	Prepared: 0	08/16/17 Ana	alyzed: 08	/18/17			
Antimony	100	0.600	2.00	ug/L	100.00	U	100	70-130	4.65	20	
Arsenic	98.7	0.320	2.00	ug/L	100.00	9.33	89.4	70-130	7.10	20	
Cadmium	76.0	0.100	0.500	ug/L	100.00	U	76.0	70-130	3.33	20	
Cobalt	79.7	0.0400	2.00	ug/L	100.00	0.473	79.2	70-130	2.88	20	
Lead	0.0794	8.00E-5	0.00200	mg/L	0.10000	U	79.4	70-130	3.21	20	
Selenium	86.2	0.200	2.00	ug/L	100.00	0.918	85.3	70-130	6.63	20	
Thallium	86.1	0.100	0.500	ug/L	100.00	U	86.1	70-130	4.43	20	



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### **General Chemistry Parameters - Quality Control**

Analyte	Result	MDL	PQL	Units	Spike Level	Source Result	%Rec	%Rec Limits	RPD	RPD Limit	Qualifier
Batch 17H0172 - SM 2540C											
Blank (17H0172-BLK1)					Prepared &	Analyzed:	08/18/17				
Total Dissolved Solids	12.0	12.0	20.0	mg/L							U
LCS (17H0172-BS1)					Prepared &	Analyzed:	08/18/17				
Total Dissolved Solids	1000	12.0	20.0	mg/L	1000.0		100	80-120			
Duplicate (17H0172-DUP1)		Sour	ce: L17H00	05-01	Prepared &	Analyzed:	08/18/17				
Total Dissolved Solids	2970	24.0	40.0	mg/L		2960			0.270	10	J-
Batch 17H0209 - EPA 300.0											
Blank (17H0209-BLK1)					Prepared &	Analyzed:	08/24/17				
Chloride	0.0200	0.0200	0.500	mg/L							U
Fluoride	0.0100	0.0100	0.0500	mg/L							U
Sulfate	0.500	0.500	2.00	mg/L							U
LCS (17H0209-BS1)					Prepared & Analyzed: 08/24/17						
Chloride	4.68	0.0200	0.500	mg/L	5.0000		93.7	90-110			
Fluoride	4.65	0.0100	0.0500	mg/L	5.0000		93.0	90-110			
Sulfate	4.91	0.500	2.00	mg/L	5.0000		98.2	90-110			
Matrix Spike (17H0209-MS1)		Sour	ce: L17H01	2-01	Prepared &	Analyzed:	08/24/17				
Chloride	14.6	0.0200	0.500	mg/L	5.0000	9.91	93.9	90-110			
Fluoride	5.53	0.0100	0.0500	mg/L	5.0000	0.364	103	90-110			
Sulfate	36.6	0.500	2.00	mg/L	5.0000	32.1	90.6	90-110			
Matrix Spike (17H0209-MS2)		Sour	ce: L17H02	22-01	Prepared &	Analyzed:	08/24/17				
Chloride	2820	2.00	50.0	mg/L	500.00	2370	91.3	90-110			
Fluoride	510	1.00	5.00	mg/L	500.00	2.66	101	90-110			
Sulfate	2000	50.0	200	mg/L	500.00	1460	108	90-110			



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### **General Chemistry Parameters - Quality Control**

Analyte	Result	MDL	PQL	Units	Spike Level	Source Result	%Rec	%Rec Limits	RPD	RPD Limit	Qualifier
Batch 17H0209 - EPA 300.0											
Matrix Spike Dup (17H0209-MSD1)		Sour	ce: L17H01	2-01	Prepared &	Analyzed:	08/24/17				
Chloride	14.8	0.0200	0.500	mg/L	5.0000	9.91	97.4	90-110	1.21	20	
Fluoride	5.65	0.0100	0.0500	mg/L	5.0000	0.364	106	90-110	2.19	20	
Sulfate	36.8	0.500	2.00	mg/L	5.0000	32.1	93.3	90-110	0.380	20	
Matrix Spike Dup (17H0209-MSD2)		Sour	ce: L17H02	22-01	Prepared & Analyzed: 08/24/17						
Chloride	2850	2.00	50.0	mg/L	500.00	2370	97.1	90-110	1.02	20	
Fluoride	524	1.00	5.00	mg/L	500.00	2.66	104	90-110	2.75	20	
Sulfate	2020	50.0	200	mg/L	500.00	1460	111	90-110	0.694	20	J-

Tampa Electric Company, Laboratory Services

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Peggy Penner, Manager, Laboratory Services

Laboratory Services certifies that the test result in this report meet all requirements of the NELAC standards, unless indicated otherwise in the body of the report. Unless otherwise noted, all methods followed are per the most current published version of 40 CFR Part 136, Table B. Results reported on this report pertain to the above referenced sample only.

Eqpt. Table Theo Value mg/ Total Containers Theo Value mv Eqpt. Table Redox (mv) WLM08 WLM08 PE/S SE (S) S Yes 236.2 8.915 8.727 Time 13:43 S LEVEL ВР 10 Ы 19 Sample Reciept Temp 0.8 Total Miles Samples On Ice Yes No Pres ID 1L Rads Diss. (1) Reading mg/l Reading mv quipment ID Level Meter DO (mg/l) Equipment ID evel Meter RAB /TECO Initials 0.12 236.5 8.89 (gal) 0.12 Dedicated 8.78 Dedicated Volume (gal) 0.3 Tubing? Tubing? 4 checked box indicates that the sample was verified to a pH of <2 Pump: Tubing: Tubing: Pump: 11 500 ml Nuts (2) STABLE Conduct.( %) STABLE STABLE STABLE STABLE STABLE STABLE STABLE Total Time STABLE STABLE SODOR-W Temp °C 500 ml bottles(Sulfide) 2ml NAOH/Zinc Acet, to pH >12 Temp °C Volume (pal) MILD MILD 21.0 90.0 21.3 21.8 90.0 22.1 Cell Volume (gal) 40 250 ml bottles (Cyan) 1g NAOH to pH > 12 DO % Sat. < 20 Turb. NTU < 20 LT. YELLOW 0.2 LT. YELLOW 40ml Vial (6) 0.2 5 00 % Sat. < 20 rurb. NTU < 20 20nd % +/- 5 Temp<sup>2</sup>C+/- 0.2 ph:+f- 0,2 SCOLOR-W Purge Criteria 13:00 13:22 8:15 Time 7:53 PH 0.2 Cond % +/-Time Pump Volume (pal) Color Volume (gal) ph:+/-(6) 40ml VOA vial (CG) + + 019150A 250ml Nuts (3) (urbidity (NTU) Turbidity (NTU) Sulfite (mg/L) MPM08 MPM08 MPM08 DO Meter Cal SO3-TR Zobell Sol ID: 7.41 2.72 1.88 22.84 3.92 3.22 3.22 1.88 2.84 23.3 Barrom, Pres 760 Partly Cloudy & Hot Length (%) Tubing Length Redox Cal Therm ID Meter ID: Meter ID: ESS × Redox (mv) 500ml Mtls (2) lodate/lodide ID DO (mg/L) -109.30 -233.30 0.0026 Pres ID Time 13:15 0.0026 DO (mg/L) 0.25 REDOX 12:57 12:59 Capacity (galff.) 0.30 0.29 0.28 0.28 0.30 0.27 0.25 Time Time (5) 1L amber glass (AG) QC: (pH +/- 0.2) (Cond +/- 5%) (DO +/- 0.3mg/L) (Redox +/- 10mv) 500ml Sulfide (2) Tubing Inside Diam. Capacities Gallons/ft): 1/4" =0.0026, 3/8" Turbidity(NTU) Starch Ind. ID Cond (uMHOS) Cand (uMHOS) 1566 1565 TURB-N-F 9865 1 Well Volume (gal) 4109 4113 4110 4110 1564 1565 0.00 4.78 1.88 2.45 1 Well Volume (gal) 2.45 3.22 CCV 7.04 SSS ESS 1L bottles (diss. rads): filtered with 0.45um, 5 ml HNO3 to pH <2 A checked box indicates ICV / CCV passed DO 3 Pillow ID 1L Rads (1) Temp °C C dwe1 26.43 25.80 25.80 Well Capacity (gall) = 26.34 26.41 26.43 25.80 0.16 25.81 DO Mg/L Well Capacity (gall) 0.16 0.28 Time 7:44 8:11 8:21 Time 8 7 7 250ml bottles (nuts): 1 ml H2SO4 to pH <2 (4) 100ml coliform bottle 40 ml Vial (TOC): 0.5 ml H2SO4 to pH <2 × Cond(uMHOS) 250ml Mtls (3) Na Thio ID COND-F 53.50 15.29 pH (SU) pH (SU) 6.93 1565 9869 6.82 6.82 15.31 6.92 6.83 6.92 6.82 7.05 2 Water Column (fi) Water Column (fi) ≥ S 2 11 Water Depth (ft) Water Depth (ft) File Name: 0307301Y 1L Mtls (1) Titrator ID Depth to Water (ff) Temp °C TEMP-C Stability Values =

Well Depth to
Depth Water
(ft) (ft) 25.80 55.49 7.03 7.23 7.21 6.62 6.63 8:07 5.24 6.62 8:07 8:17 7.20 6.53 Stability Values = 8:07 Time (3) 250ml plastic (PP) Total Vol. (gal) Total Vol. (gal) 500ml Inorg (2) 250ml Inorg (3) 08/16/17 pH (SU) 48.71 21.84 Pres ID 012551 012551 10.04 4.00 1000 4.28 22.32 1.96 1.10 6.92 7.01 1.62 1.37 1.64 Well Oepth (ft) 2.30 Time S H Cal ESS Gallons to Purge 0.12 (gallons/ft): 2" 11:06 Gallons to Purge 0.12 0218201Y QC Result mg Volume (gal) Volume (gal) Infake Depth (ft) Intake Depth (ft) 16.84 10000 52.10 17.32 Std Value 1000 Std Value 4.76 1.62 0.34 1.10 0.34 0.27 0.27 FE2 l/gm 10 Date: (2) 500ml plastic (PP) 018416C Well Capacities 018611D 106723 016722 1L Inorg (1) 019075D 018737D 019355A Standard ID Screen Interval (ft) Standard ID Rate (ml/min) Screen Interval (ft) Rate (ml/min) Buffer ID 10:55 11:24 520 650 520 Time 650 520 10 9 ESS Big Bend 10:34 Loction Code BBS-CCR-1 BBS-CCR-2 500 ml bottles (metals): 2 ml HNO3 to pH <2 250ml Cyan (3) 50 ml bottles (metal): 1 ml HNO3 to pH <2 0107301Y Diam/ Comp Diam/ Comp MPM08 MPM08 11:14 11:16 10:41 10:43 10:45 **TM07** QC Std: 5ml (NaThio)/500ml DI=10mg/L 11:18 ulfite Info (QC Check) (EPA 377.1) Time Time IL bottles (rads): 5 ml HNO3 to pH <2 :DEP FT 1200, Units: uMHOS DEP FT 1600, Units: NTU onductivity Meter Calib urbidity Meter Calibration Purge Complete At urge Complete At H Meter Calibration L17H005-01 A L17H005-02 A L17H005-01 A L17H005-02 A urging Information BBS-CCR-2 BBS-CCR-1 ) 1L plastic (PP) 10:45 FIMS# 11:05 11:18 10:33 TIMS# DEP FT 1100 Well # Well # Jurge Meth Comments: urge Meth 14 urge Start: 1A Jurge End: urge End: Juits: SU leter ID: leter ID: Aeter ID:

Sampler(s) /

1.1 Rads (1)   500ml Sulfide (2)	Table of the second	Turbidity(NTU)	Redox (mv) Sulfite (mg/L)	Color	Odor	NG	NGVD
10.277   10.277   1.0 Mist (1)   250mm funcaç (2)   1.1 Mist (1)   250mm funcaç (2)   1.1 Mist (1)   250mm funcaç (2)   1.1 Mist (1)   250mm funcaç (2)   1.1 Mist (1)   250mm funcaç (2)   2.5 mm funcaç (		TURB-N-F	REDOX SO3-TR	\$COLOR-W	soboR-w	Time	LEVEL
Committee   Comm		0.47	-206.30	YELLOW	MILD		
Colore place (PP)	to Deale and	+	+	And the Manual And And And And And And And And And And	CO and Made (C)	11 Bode Dies (1)	Total Containers
Col   Store   Part   Col   S	IL Kads (1)	-	South Mis (2) Zouth Nuis (3)		200 Mil Nuis (2)	IL RAds Diss. (1)	Total Collidates
Common planter (PP)							2
ESS   O218201Y   ESS   O307301Y   ESS		11 amberolass (AG)	(6) 40ml VOA vial (CG)	al (CG)		Samples On ice	Sample Recient
Preservation   Prese ID   Preservation   Preserva		SS	ESS				Time 13:43
L   012851   150m   boltete (nuts); 1 mi 1/2504 to pH <2   1 min 1/2504 to pH <2   1 min 1/2504 to pH <2   1 min 1/2504 to pH <2   1 min 1/2504 to pH <2   1 min 1/2504 to pH <2   1 min 1/2504 to pH <2   1 min 1/2504 to pH <2   1 min 1/2504 to pH <2   1 min 1/2504 to pH <2   2 min 1/2504 to pH <2   2 min 1/2504 to pH <2   2 min 1/2504 to pH <2   2 min 1/2504 to pH <2   2 min 1/2504 to pH <2   2 min 1/2504 to pH <2   2 min 1/2504 to pH <2   2 min 1/2504 to pH <2   2 min 1/2504 to pH <2   2 min 1/2504 to pH <2   2 min 1/2504 to pH <2   2 min 1/2504 to pH <2   2 min 1/2504 to pH <2   2 min 1/2504 to pH <2   2 min 1/2504 to pH <2   2 min 1/2504 to pH <2   2 min 1/2504 to pH <2   2 min 1/2504 to pH <2   2 min 1/2504 to pH <2   2 min 1/2504 to pH <2   2 min 1/2504 to pH <2   2 min 1/2504 to pH <2   2 min 1/2504 to pH <2   2 min 1/2504 to pH <2   2 min 1/2504 to pH <2   2 min 1/2504 to pH <2   2 min 1/2504 to pH <2   2 min 1/2504 to pH <2   2 min 1/2504 to pH <2   2 min 1/2504 to pH <2   2 min 1/2504 to pH <2   2 min 1/2504 to pH <2   2 min 1/2504 to pH <2   2 min 1/2504 to pH <2   2 min 1/2504 to pH <2   2 min 1/2504 to pH <2   2 min 1/2504 to pH <2   2 min 1/2504 to pH <2   2 min 1/2504 to pH <2   2 min 1/2504 to pH <2   2 min 1/2504 to pH <2   2 min 1/2504 to pH <2   2 min 1/2504 to pH <2   2 min 1/2504 to pH <2   2 min 1/2504 to pH <2   2 min 1/2504 to pH <2   2 min 1/2504 to pH <2   2 min 1/2504 to pH <2   2 min 1/2504 to pH <2   2 min 1/2504 to pH <2   2 min 1/2504 to pH <2   2 min 1/2504 to pH <2   2 min 1/2504 to pH <2   2 min 1/2504 to pH <2   2 min 1/2504 to pH <2   2 min 1/2504 to pH <2   2 min 1/2504 to pH <2   2 min 1/2504 to pH <2   2 min 1/2504 to pH <2   2 min 1/2504 to pH <2   2 min 1/2504 to pH <2   2 min 1/2504 to pH <2   2 min 1/2504 to pH <2   2 min 1/2504 to pH <2   2 min 1/2504 to pH <2   2 min 1/2504 to pH <2   2 min 1/2504 to pH <2   2 min 1/2504 to pH <2   2 min 1/2504 to pH <2   2 min 1/2504 to pH <2   2 min 1/2504 to pH <2   2 min 1/2504 to pH <2   2 min 1/2504 to pH <2   2 min 1/2504 to p			Pres ID	Preservation		Ol sa	Temp 0.8 C
Buffer   Buffer Value   Cal	2SO4 to pH <2		Г	500 ml bottles/Sulfide) 2ml NAOH/Zinc Acet, to pH > 12	Acet. to pH >12	1	
Buffer Value   Cal   Time   CV   Time   CV	SO4 to pH <2		250 ml bottles (0	250 ml bottles (Cyan) 1g NAOH to pH >12	12	7	
Buffer   D   Buffer Value   Cai	d with 0.45um, 5 ml HNO3 to pH <2	7	A checked box	A checked box indicates that the sample was verified to a pH of <2	ple was verified to	a pH of <2	
MPMOR   L   01951D   T   T   T   T   T   T   T   T   T	CV	ccv	Time Redox Cal	Time	Temp °C	Reading mv	Theo Value my
Lange   10   10   10   10   10   10   10   1		7.04		8:15	21.3	236.5	236.2
Lange   Lang	+1- 0.2) (Cond +1- 5%) (DO +1- 0.3mg/L	L) (Redox +/- 10mv)		13:22	21.8	235.3	236.2
Sandard ID   Star Value   Cal   Time   ICV   Time   CCV	d box indicates ICV / CCV passed		Zobell Sol ID:				
Conditions   Conditions   Cold   Conditions   Cold   Conditions   Cold   Conditions   Cold    CV Time	. ADD	Time L 50A					
L   10672   10000   1CV   1me   10672   52.10   48.71   55.49   53.50   7.44   0.00   0.00     L   10672   52.10   48.71   55.49   53.50   7.44   0.00   0.00     L   10672   4.28   5.24   1me   0.00   1me   0.00   0.			DO Meter Cal	Time	C duna1	Reading mg/l	Theo Value mg/l
Significant ID   Sid Value   Acceptability Range   ICV   Time   CCV		9865	12:57 Meter ID:	7:53	21.0	8.89	8.915
L   106723   52.10   48.71   55.49   53.50   7.44   0.00     L   016722   4.76   4.28   5.24   4.78   4.78   4.78   4.78     L   016722   4.76   4.28   5.24   4.78   4.78   4.78   4.78     L   0.0   0.0   0.0   0.0   0.0		CCV	Time MPM08	13:00	22.1	8.78	8.727
L   016722   4.76   4.28   5.24		0.00	Barom, Pres				
Compact   Comp		4.78	12:59 760				
New   Capacities (gallonst ft); 2" = 0.16 4" = 0.65		1	lodate/lodide ID Therm ID	Hd	Conduct.( %)	DO (mg/l)	Redox (mv)
Neal Capacities (gallons/ti): 2" = 0.16 4" = 0.65   Tubing Inside Diam. Capacities Callons/ti): 114" = 0.0026 310" = 0.0026 310" = 0.0026 310" = 0.0026 310" = 0.0026 310" = 0.0026 310" = 0.0026 310" = 0.0026 310" = 0.0026 310"   Neal of the column of t	- 1		L MPM08	0.2	2	0.3	10
Screen   Intake   Water   Capum   Ca	nside Diam. Capacities Gallons/ft); 1/4	=0.0026 3/8"					
Time		1 Well Volume (gal)	Tubing X Tubing Capachy X Length (t)	+ Pump + (gal) + (	Cell Volume (gal) =	1 Egpt. Volume (gal)	
Time   Rate (mul/min)   Volume (gan)   Total Vol. (gan)   Water Depth (m)   pH (SU)   Temp °C   Cond (uMHOS)     10:09   300   0.63   0.63   6.39   6.42   26.88   1811     10:11   310   0.16   0.79   6.40   6.42   26.88   1801     10:13   300   0.16   0.95   6.42   6.42   26.86   1788     10:13   300   0.16   0.95   6.42   6.42   26.86   1788     10:13   Screen   Inlake   Well   Water Depth (m)   Water Depth (m)   Temp °C   Cond (uMHOS)		2.75	0.0026 24.23	0	90.0	0.12	
10:09   300   0.63   0.63   6.39   6.42   26.83   1811     10:11   310   0.16   0.79   6.40   6.42   26.88   1801     10:13   300   0.16   0.95   6.42   6.42   26.86   1788     10:13   300   0.16   0.95   6.42   26.86   1788     10:13   Screen   Inlake   Well   Water Depth (a)   (ft)   (ft)   (ft)   (ft)   (ft)   (ft)   (ft)     Time   Rate (ml/min)   Volume (gal)   Total Vol. (gal)   Water Depth (a)   pH (SU)   Temp °C   Cond (uARHOS)		Cond (uMHOS)	DO (mg/L) Turbidity (NTU)	J) Purge Criteria	Status	Equipment ID	Eqpt. Table
10:11 310 0.16 0.79 6.40 6.42 26.88 1801  10:13 300 0.16 0.95 6.42 6.42 26.86 1788  10:03 Gallons to Purge 0.12 Stability Values = 6.42 26.86 1788  Screen Intake Depth (2) (4) (4) (4) (4) (4) (4) (4) (4) (4) (4		1811			STABLE	Level Meter:	WLM08
10:13   300   0.16   0.95   6.42   6.42   26.86   1788   1788   1788   10:03   Gallons to Purge   0.12   Stability Values = 6.42   26.86   1788   1		1801	0.37 0.76	Temp*C+/- 0.2	STABLE	Pump:	PP
10:03 Gallons to Purge 0.12 Stability Values = 6.42 26.86 1788  Screen Intake Depth (2) (4) Maser Depth (2) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1		1788	0.29 0.47	Cond % +/- 5	STABLE	Tubing:	PE/S
10:03   Gallons to Purge   0.12   Stability Values = 6.42   26.86   1788				DO % Sat. < 20	STABLE	Dedicated	(Yes)
10:03 Gallons to Purge   0.12   Stability Values = 6.42   26.86   1788   1788				Turb, NTU < 20	STABLE	Tubing?	No
Screen Interval (11) Depth (12) Water Depth (12) Time Rate (ml/min) Volume (gal) Total Vol. (gal) Water Depth (12) Temp °C Cond (uAH-OS)		1788	0.29 0.47				
h; Time Rate (ml/min) Volume (gal) Total Vol. (gal) Water Depth (th) pH (SU), Temp °C Cond (uMHOS)	X Capacity (gal)	1 West Volume (gal)	Tubing Tubing Capacity X Length (galft.)	Pump + (gal) + (	Cett Volume (gal =	1 Eqpt. Volume (pal)	
The Rate (mirmin) Volume (gai) 10tal Vol. (gai) Water Deptin (ft) pri (su) temp C. Corto (ukrtus)			1			Contraction of	Cant Table
Purge Start:		Cond (uMHOS)	DO (mg/L) 1 urbidity (N1U)	oh:+/- 0.2	Status	Equipment ID	WI MOR
Purpe End:				1.3		Pump:	PP
Purge End:				5		Tubing	PE/S
Purge End:		Ī		Cond % +/L		Tubility.	5 %
				Turk MTH 200		Dedicated	res
Cat carella C				Iuro. NIO < 20		) Bulan I	ON
piete At							
Comments:							

L17H005-04 A BBS-CCF L17H005-05 A BBS-CCF L17H005-04 A L17H005-05 A L1		Time	FE <sup>2</sup>	(NS) Hd	Temp °C	Cond(uMHOS)	DO Mg/L	Turbidity(NTU)	Redox (mv)	Sulfite (mg/L)	Color	Odor	Odor N(	NGVD
7H005-04 A 7H005-05 A LIMS # H005-04 A H005-05 A			l/gm	Н	TEMP-C	COND-F	8	TURB-N-F	REDOX	SO3-TR	\$COLOR-W	SODOR-W	Time	LEVEL
7H005-05 A LIMS # H005-04 A H005-05 A plastic (PP)	BBS-CCR-BW-1	9:52		6.52	28.08	4995	0.45	6.03	3.60		CLEAR	NONE		#VALUE!
LIMS # H005-04 A H005-05 A Pre	BBS-CCR-BW-2	9:18		6.68	27.69	1585	0.43	3.66	-53.50		CLEAR	NONE		#VALUE!
H005-04 A H005-05 A plastic (PP)	250ml Cyan (3)	1L Inorg (1)	500ml Inorg (2)	250ml Inorg (3)	1L MUs (1)	250ml Müs (3)	1L Rads (1)	500ml Sulfide (2)	500ml Mtls (2)	250ml Nuts (3)	40ml Vial (6)	500 ml Nuts (2)	1L Rads Diss. (1)	Total Containers
H005-05 A IIII						2	2							10
. plastic (PP)			1	211		2	2		100					
Pres	2	(2) 500ml plastic (PP)		(3) 250ml plastic (PP)		(4) 100ml coliform bottle	e	(5) 1L amber glass (AG)	(9)	(6) 40ml VOA vial (CG)	(50)		-	Sample Reciept
Preserva	0107301Y E	ESS	8201Y	ESS	307301Y	ESS		ESS		ESS			(Yes) No	Time 13:43
	ation			Dres ID	1	Preservation			Pres ID		Preservation		Pres ID	Temp 0.8 C
1L bottles (rads): 5 ml HNO3 to pH <2	3H 2		_		250ml bottles (nuts)	250ml bottles (nuts): 1 ml H2SO4 to pH <2	2		L	500 ml bottles(Sulfix	500 ml bottles(Sulfide) 2ml NAOH/Zinc Acet to pH >12	cet to pH >12	7	
500 ml bottles (metals): 2 ml HNO3 to pH <2	03 to pH <2		-		49 ml Vial (TOC): 0	49 ml Vial (TOC): 0.5 ml H2SO4 to pH <2			1	250 ml bottles (Cyal	250 ml bottles (Cyan) 1g NAOH to pH >12	2	L	
250 ml bottles (metal): 1 ml HNO3 to pH <2	13 to pH <2			L 012551 V	1L bottles (diss. rad	is); filtered with 0.45u	1L bottles (diss. rads): filtered with 0.45um, 5 ml HNO3 to pH <2			A checked box ind	A checked box indicates that the sample was verified to a pH of <2	ole was verified to	a pH of <2	
pH Meter Calibration		Buffer ID	Buffer Value	S	Time	ICV	Time	CCV	Time	Redox Cal	Тіте	Temp °C	Reading mv	Theo Value mv
	MPM08	019075D	7	7	8:07	7.05	8:11	7.04	13:15	Meter ID:	8:15	21.3	236.5	236.2
1100	1	018611D	10	10		3C: (pH +/- 0.2) (Con	QC: (pH +/- 0.2) (Cond +/- 5%) (DO +/- 0.3mg/L) (Redox +/- 10mv)	I/L) (Redox +/- 10mv)		MPM08	13:22	21.8	235.3	236.2
Units: SU	1	018737D	4	4		checked box indica	A checked box indicates ICV / CCV passed			Zobell Sol ID:				
Conductivity Meter Calib.		Standard ID	Std Value	Cal		ICV	Time	ccv	Time	L 019150A				
	MPM08	L 019355A	1000	1000	8:17					DO Meter Cal	Time	D, dwa_	Reading mg/l	Theo Value mg/l
1200, Units: uMHOS	_	018416C	10000			9869	8:21	9865	12:57	Meter ID:	7:53	21.0	8.89	8.915
Turbidity Meter Calibration		Standard ID	Std Value	Acceptability Range	ity Range	ICA	Time	ADD	Time	MPM08	13:00	22.1	8.78	8.727
	TM07	L 106723	52.10	48.71	55.49	53.50	7:44			Barom. Pres				
FDEP FT 1600, Units: NTU	_	016722	4.76	4.28	5.24			4.78	12:59	760				
Sulfite Info (QC Check) (EPA 377.1)	377.1)		QC Result mg/l	Time	Titrator ID	Na Thio ID	DO 3 Pillow ID	Starch Ind. ID	lodate/lodide ID	Therm ID	Hd	Conduct.( %)	DO (mg/l)	Redox (mv)
QC Std: 5ml (NaThio)/500ml DI=10mg/L	-10mg/L		0		1		7	П	1	MPM08	0.2	5	0.3	10
Purging Information		Well Capacities	(gallons/ft): 2"	Well Capacities (gallons/ ft): 2" = 0.16 4" =0.65	į.	Tubing Inside Diam.	Tubing Inside Diam. Capacities Gallons/ft): 1/4"	1/4" =0.0026 3/8" =0.006	9000					
# HeAV	Diam/ Comp	Screen Interval (ft)	Intake Depth (ft)	West Depth (ft)	Depth to Water (ft)	= Water X (fi)	X Capacity (gal) =	1 Well Volume (gal)	( Capacity X (galfit.)	Tubing Langth (70)	Pump + Volume (gal)	Volume =	1 Egpt. Volume (gal)	
BW-1	2	10	39.3	44.3	28.74	15.56	0.16	2.49	0.0026	100	0	90'0	0.32	
Purge Meth:	9	Rate (ml/min)	Volume (gal)	(Jail)	Water Depth (ft)	(SU)	Temp °C	Cond (uMHOS)	DO (mg/L)	Turbidity (NTU)	Purge Criteria	Status	Equipment ID	Eqpt. Table
1A		1800	4.76	4.76	29.58	6.52	28.03	4920	0.55	7.98	ph:+f- 0.2	STABLE	Level Meter:	WLM08
Purge Start:	9:46	1800	0.95	5.71	29.57	6.52	28.04	4996	0.47	7.49	Temp²C+/- 0.2	STABLE	Pump:	ESP
9:34	9:48	1800	0.95	99'9	29.56	6.52	28.08	4995	0.45	6.03	Cond % +/- 5	STABLE	Tubing:	F
Purge End:											DO % Sat. < 20	STABLE	Dedicated	Yes
9:48											Turb. NTU < 20	STABLE	Tubing?	(N)
Purge Complete At	9:32	9:35 Gallons to Purge 0.32	urge 0.32	Stability \	Stability Values =	6.52	28.08	4995	0.45	6.03				)
	Diami Como	Screen (ff)	Intake	Well Depth (ft)	Depth to Water (ft)	= Water X Column X	Well Capacity (gal) =	1 Well Volume (gal)	( Capacity X (galfit.)	Tubing )	Pump + Volume + (spl)	Volume (gal)	1 Eget Volume (gal)	
3W-2	2	10	18.49	23.84	7.33	16.51	0.16	2.64	0.0026	24.64	0	90'0	0.12	
Purae Meth:	Time	Rate (ml/min)	Volume (gal)	Total Vol. (qal)	Water Depth (ft)	pH (SU)	⊃, du⊐L	Cond (wMHOS)	DO (mg/L)	Turbidity (NTU)	Purge Criteria	Status	Equipment ID	Eqpt. Table
14	9:02	460	0.85	0.85	7.53	6.66	27.81	1587	0.44	5.18	ph:+f- 0.2	STABLE	Level Meter:	WLM08
Purge Start:	9:07	450	0.24	1.09	7.53	6.67	27.74	1587	0.42	4.74	Temp5.46, 0.2	STABLE	Pump:	РР
8:58	9:10	450	0.36	1.45	7.54	6.68	27.69	1585	0.43	3.66	Cond % +/- 5	STABLE	Tubing:	PE/S
Puros End-											DO % Sat < 20	STABLE	Dedicated	(Yes)
9:10											Turb. NTU < 20	STABLE	Tubing?	No No
Purge Complete At	8:59	8:59 Gallons to Purge	urge 0.12		Stability Values =	89'9	27.69	1585	0.43	3.66				
Comments:														



THE LEADER IN ENVIRONMENTAL TESTING

# **ANALYTICAL REPORT**

TestAmerica Laboratories, Inc.

TestAmerica Tampa 6712 Benjamin Road Suite 100 Tampa, FL 33634

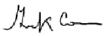
Tel: (813)885-7427

TestAmerica Job ID: 660-82456-1 Client Project/Site: L17H005

### For:

Tampa Electric Company 5012 Causeway Boulevard Tampa, Florida 33619

Attn: Ms. Peggy Penner



Authorized for release by: 8/29/2017 9:14:38 AM

Keaton Conner, Project Manager I (813)885-7427

keaton.conner@testamericainc.com

.....LINKS .....

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The test results in this report meet all 2003 NELAC and 2009 TNI requirements for accredited parameters, exceptions are noted in this report. This report may not be reproduced except in full, and with written approval from the laboratory. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

Client: Tampa Electric Company Project/Site: L17H005 TestAmerica Job ID: 660-82456-1

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# **Sample Summary**

Client: Tampa Electric Company Project/Site: L17H005

TestAmerica Job ID: 660-82456-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
660-82456-1	L17H005-01	Water	08/16/17 11:24	08/22/17 12:15
660-82456-2	L17H005-02	Water	08/16/17 10:55	08/22/17 12:15
660-82456-3	L17H005-03	Water	08/16/17 10:27	08/22/17 12:15
660-82456-4	L17H005-04	Water	08/16/17 09:52	08/22/17 12:15
660-82456-5	L17H005-05	Water	08/16/17 09:18	08/22/17 12:15

# **Definitions/Glossary**

Client: Tampa Electric Company

Project/Site: L17H005

TestAmerica Job ID: 660-82456-1

### **Qualifiers**

### **Metals**

Qualifier	Qualifier Description
I	The reported value is between the laboratory method detection limit and the laboratory practical quantitation limit.
V	Indicates that the analyte was detected at or above the method detection limit in both the sample and the associated method blank and the

### Glossary

PQL

QC RER

RL RPD

TEF

**TEQ** 

Practical Quantitation Limit

Relative Error Ratio (Radiochemistry)

Toxicity Equivalent Factor (Dioxin)

Toxicity Equivalent Quotient (Dioxin)

Reporting Limit or Requested Limit (Radiochemistry)

Relative Percent Difference, a measure of the relative difference between two points

**Quality Control** 

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)

TestAmerica Tampa

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### **Case Narrative**

Client: Tampa Electric Company

Project/Site: L17H005

TestAmerica Job ID: 660-82456-1

Job ID: 660-82456-1

**Laboratory: TestAmerica Tampa** 

**Narrative** 

Job Narrative 660-82456-1

#### Receipt

The samples were received on 8/22/2017 12:15 PM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 1.6° C.

#### Metals

Method 200.7 Rev 4.4: The method blank for preparation batch 400-365468 and analytical batch 400-365789 contained Lithium above the method detection limit. This target analyte concentration was less than the reporting limit (RL); therefore, re-extraction and/or re-analysis of samples was not performed.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

### **Detection Summary**

Client: Tampa Electric Company

Project/Site: L17H005

TestAmerica Job ID: 660-82456-1

Client Sample ID:	L17H005-01					Lab Sa	mple ID: 66	60-82456-1
Analyte	Result	Qualifier	PQL	MDL	Unit	Dil Fac D	Method	Prep Type
Lithium	0.013	Ī	0.050	0.0010	mg/L		200.7 Rev 4.4	Total/NA
Client Sample ID:	L17H005-02					Lab Sa	mple ID: 66	0-82456-2
Analyte	Result	Qualifier	PQL	MDL	Unit	Dil Fac D	Method	Prep Type
Lithium	0.016	I	0.050	0.0010	mg/L		200.7 Rev 4.4	Total/NA
Client Sample ID:	L17H005-03					Lab Sa	mple ID: 66	0-82456-3
Analyte	Result	Qualifier	PQL	MDL	Unit	Dil Fac D	Method	Prep Type
Lithium	0.011	I	0.050	0.0010	mg/L	1	200.7 Rev 4.4	Total/NA
Client Sample ID:	L17H005-04					Lab Sa	mple ID: 66	0-82456-4
Analyte	Result	Qualifier	PQL	MDL	Unit	Dil Fac D	Method	Prep Type
Lithium	0.017	I	0.050	0.0010	mg/L		200.7 Rev 4.4	Total/NA
Client Sample ID:	L17H005-05					Lab Sa	mple ID: 66	0-82456-5
Analyte	Result	Qualifier	PQL	MDL	Unit	Dil Fac D	Method	Prep Type
Lithium	0.0062	IV	0.050	0.0010	mg/L		200.7 Rev 4.4	Total/NA

### **Client Sample Results**

Client: Tampa Electric Company

Method: 200.7 Rev 4.4 - Metals (ICP)

Analyte

Lithium

Project/Site: L17H005

TestAmerica Job ID: 660-82456-1

Client Sample ID: L17H005-01 Lab Sample ID: 660-82456-1 Date Collected: 08/16/17 11:24 **Matrix: Water** Date Received: 08/22/17 12:15 Method: 200.7 Rev 4.4 - Metals (ICP) Analyte Result Qualifier PQL **MDL** Unit D Prepared Analyzed Dil Fac 08/24/17 10:11 08/25/17 16:21 Lithium 0.013 I 0.050 0.0010 mg/L Client Sample ID: L17H005-02 Lab Sample ID: 660-82456-2 Date Collected: 08/16/17 10:55 **Matrix: Water** Date Received: 08/22/17 12:15 Method: 200.7 Rev 4.4 - Metals (ICP) Analyte Result Qualifier PQL **MDL** Unit Prepared Analyzed Dil Fac 0.050 0.0010 mg/L 08/24/17 10:11 08/25/17 16:48 Lithium 0.016 I Client Sample ID: L17H005-03 Lab Sample ID: 660-82456-3 Date Collected: 08/16/17 10:27 **Matrix: Water** Date Received: 08/22/17 12:15 Method: 200.7 Rev 4.4 - Metals (ICP) Analyte Result Qualifier PQL MDL Unit Prepared Analyzed Dil Fac 0.0010 mg/L Lithium 0.011 I 0.050 08/24/17 10:11 08/25/17 16:52 Client Sample ID: L17H005-04 Lab Sample ID: 660-82456-4 Date Collected: 08/16/17 09:52 **Matrix: Water** Date Received: 08/22/17 12:15

Client Sample ID: L17H005-05 Lab Sample ID: 660-82456-5 Date Collected: 08/16/17 09:18 **Matrix: Water** Date Received: 08/22/17 12:15

PQL

0.050

**MDL** Unit

0.0010 mg/L

Prepared

08/24/17 10:11 08/25/17 16:55

Analyzed

Result Qualifier

0.017 I

Method: 200.7 Rev 4.4 - Metals (IC	P)								
Analyte	Result	Qualifier	PQL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Lithium	0.0062	IV	0.050	0.0010	mg/L		08/24/17 10:11	08/25/17 16:59	1

Dil Fac

### QC Sample Results

Client: Tampa Electric Company TestAmerica Job ID: 660-82456-1

Project/Site: L17H005

Method: 200.7 Rev 4.4 - Metals (ICP)

Lab Sample ID: MB 400-365468/1-A Client Sample ID: Method Blank **Matrix: Water** Prep Type: Total/NA **Analysis Batch: 365789 Prep Batch: 365468** 

MB MB

0.013 I

Analyte Result Qualifier PQL **MDL** Unit Prepared Analyzed Dil Fac 0.050 08/24/17 10:11 08/25/17 15:58 Lithium 0.0010 mg/L 0.00100 I

Lab Sample ID: LCS 400-365468/2-A **Client Sample ID: Lab Control Sample Matrix: Water** Prep Type: Total/NA **Analysis Batch: 365789 Prep Batch: 365468** Spike LCS LCS %Rec. Added Limits Analyte Result Qualifier Unit D %Rec 85 - 115 Lithium 1.00 1.04 mg/L 104

Lab Sample ID: 660-82456-1 MS Client Sample ID: L17H005-01 **Matrix: Water Prep Type: Total/NA Analysis Batch: 365789 Prep Batch: 365468** Sample Sample Spike MS MS %Rec. Result Qualifier Added Analyte Result Qualifier Limits Unit D %Rec

1.00

Lab Sample ID: 660-82456-1 MSD Client Sample ID: L17H005-01 **Matrix: Water** Prep Type: Total/NA **Prep Batch: 365468** 

1.20

mg/L

118

70 - 130

**Analysis Batch: 365789** 

Lithium

Sample Sample Spike MSD MSD %Rec. **RPD** Analyte Result Qualifier Added Result Qualifier Unit %Rec Limits RPD Limit Lithium 0.013 Ī 1.00 1.17 116 70 - 130 2 mg/L

8/29/2017

### **QC Association Summary**

Client: Tampa Electric Company Project/Site: L17H005 TestAmerica Job ID: 660-82456-1

### **Metals**

### **Prep Batch: 365468**

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
660-82456-1	L17H005-01	Total/NA	Water	200.7	
660-82456-2	L17H005-02	Total/NA	Water	200.7	
660-82456-3	L17H005-03	Total/NA	Water	200.7	
660-82456-4	L17H005-04	Total/NA	Water	200.7	
660-82456-5	L17H005-05	Total/NA	Water	200.7	
MB 400-365468/1-A	Method Blank	Total/NA	Water	200.7	
LCS 400-365468/2-A	Lab Control Sample	Total/NA	Water	200.7	
660-82456-1 MS	L17H005-01	Total/NA	Water	200.7	
660-82456-1 MSD	L17H005-01	Total/NA	Water	200.7	

### **Analysis Batch: 365789**

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
660-82456-1	L17H005-01	Total/NA	Water	200.7 Rev 4.4	365468
660-82456-2	L17H005-02	Total/NA	Water	200.7 Rev 4.4	365468
660-82456-3	L17H005-03	Total/NA	Water	200.7 Rev 4.4	365468
660-82456-4	L17H005-04	Total/NA	Water	200.7 Rev 4.4	365468
660-82456-5	L17H005-05	Total/NA	Water	200.7 Rev 4.4	365468
MB 400-365468/1-A	Method Blank	Total/NA	Water	200.7 Rev 4.4	365468
LCS 400-365468/2-A	Lab Control Sample	Total/NA	Water	200.7 Rev 4.4	365468
660-82456-1 MS	L17H005-01	Total/NA	Water	200.7 Rev 4.4	365468
660-82456-1 MSD	L17H005-01	Total/NA	Water	200.7 Rev 4.4	365468

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Client: Tampa Electric Company

Project/Site: L17H005

Client Sample ID: L17H005-01 Lab Sam
Date Collected: 08/16/17 11:24

Lab Sample ID: 660-82456-1

Matrix: Water

Date Received: 08/22/17 12:15

	Batch	Batch		Dil	Initial	Final	Batch	Prepared		
Prep Type	Туре	Method	Run	Factor	Amount	Amount	Number	or Analyzed	Analyst	Lab
Total/NA	Prep	200.7			50 mL	50 mL	365468	08/24/17 10:11	KWN	TAL PEN
Total/NA	Analysis	200.7 Rev 4.4		1			365789	08/25/17 16:21	SEH	TAL PEN
	Instrument	ID: 6500 ICP Duo								

Lab Sample ID: 660-82456-2

Date Collected: 08/16/17 10:55

Client Sample ID: L17H005-02

Matrix: Water

Date Received: 08/22/17 12:15

	Batch	Batch		Dil	Initial	Final	Batch	Prepared		
Prep Type	Type	Method	Run	Factor	Amount	Amount	Number	or Analyzed	Analyst	Lab
Total/NA	Prep	200.7			50 mL	50 mL	365468	08/24/17 10:11	KWN	TAL PEN
Total/NA	Analysis	200.7 Rev 4.4		1			365789	08/25/17 16:48	SEH	TAL PEN
	Instrumen	it ID: 6500 ICP Duo	)							

Client Sample ID: L17H005-03 Lab Sample ID: 660-82456-3

Date Collected: 08/16/17 10:27 Matrix: Water

Date Received: 08/22/17 12:15

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	200.7			50 mL	50 mL	365468	08/24/17 10:11	KWN	TAL PEN
Total/NA	Analysis	200.7 Rev 4.4		1			365789	08/25/17 16:52	SEH	TAL PEN
	Instrumer	nt ID: 6500 ICP Duo								

Client Sample ID: L17H005-04 Lab Sample ID: 660-82456-4

Date Collected: 08/16/17 09:52

Instrument ID: 6500 ICP Duo

Date Received: 08/22/17 12:15

Matrix: Water

Batch Batch Dil Initial Final Batch Prepared **Prep Type** Type Method Factor **Amount** Number or Analyzed Run Amount Analyst Lab Total/NA Prep 200.7 50 mL 50 mL 365468 08/24/17 10:11 KWN TAL PEN Total/NA Analysis 200.7 Rev 4.4 365789 08/25/17 16:55 SEH TAL PEN 1

Client Sample ID: L17H005-05 Lab Sample ID: 660-82456-5

Date Collected: 08/16/17 09:18

Date Received: 08/22/17 12:15

Matrix: Water

	Batch	Batch		Dil	Initial	Final	Batch	Prepared		
Prep Type	Type	Method	Run	Factor	Amount	Amount	Number	or Analyzed	Analyst	Lab
Total/NA	Prep	200.7			50 mL	50 mL	365468	08/24/17 10:11	KWN	TAL PEN
Total/NA	Analysis	200.7 Rev 4.4		1			365789	08/25/17 16:59	SEH	TAL PEN
	Instrumen	t ID: 6500 ICP Duo								

Laboratory References:

TAL PEN = TestAmerica Pensacola, 3355 McLemore Drive, Pensacola, FL 32514, TEL (850)474-1001

TestAmerica Tampa

### **Accreditation/Certification Summary**

Client: Tampa Electric Company

Project/Site: L17H005

TestAmerica Job ID: 660-82456-1

### **Laboratory: TestAmerica Tampa**

The accreditations/certifications listed below are applicable to this report.

Authority	Program	EPA Region	Identification Number	Expiration Date
Florida	NELAP	4	E84282	06-30-18

### Laboratory: TestAmerica Pensacola

The accreditations/certifications listed below are applicable to this report.

Authority	Program	<b>EPA Region</b>	<b>Identification Number</b>	<b>Expiration Date</b>
Florida	NELAP	4	E81010	06-30-18

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### **Method Summary**

Client: Tampa Electric Company

Project/Site: L17H005

TestAmerica Job ID: 660-82456-1

Method	Method Description	Protocol	Laboratory
200.7 Rev 4.4	Metals (ICP)	EPA	TAL PEN

#### **Protocol References:**

EPA = US Environmental Protection Agency

#### **Laboratory References:**

TAL PEN = TestAmerica Pensacola, 3355 McLemore Drive, Pensacola, FL 32514, TEL (850)474-1001

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## Tampa Electric Company, Laboratory Services

### L17H005

### **SENDING LABORATORY:**

Tampa Electric Company, Laboratory Services

5012 Causeway Blvd Tampa, FL 33619 Phone: (813) 630-7490

Fax: (813) 630-7360

Project Manager:

Peggy Penner

### RECEIVING LABORATORY:

TestAmerica Laboratories, Inc. - Tampa

6712 Benjamin Rd., Suite 100

Tampa, FL 33634

Phone:(813) 885-7427

Fax: -

08/30/17 16:00 Due Date:

Duc Date. 03/30/1/	10.00				
Analysis		Expires		Laboratory ID	Comments
Sample ID: L17H005-01	BBS-CCR-1	- <del>-</del> -	Water	-	
Sampled: 08/16/17 11:24					
Lithium, Total EPA 6010	<u> </u>	02/12/18 11:24			
Containers Supplied:					
Poly HNO3 - 250mL (A)					
Sample ID: L17H005-02	BBS-CCR-2		Water		
Sampled: 08/16/17 10:55					
Lithium, Total EPA 6010		02/12/18 10:55			
Containers Supplied:					-
Poly HNO3 - 250mL (A)					
Sample ID: L17H005-03	BBS-CCR-3		Water		1.111
Sampled: 08/16/17 10:27					
Lithium, Total EPA 6010		02/12/18 10:27			
Containers Supplied:					
Poly HNO3 - 250mL (A)					
Sample ID: L17H005-04	BBS-CCR-BW1		Water		
Sampled: 08/16/17 09:52					
Lithium, Total EPA 6010		02/12/18 09:52			
Containers Supplied:					
Poly HNO3 - 250mL (A)					
Sample ID: L17H005-05	BBS-CCR-BW2		Water		
Sampled: 08/16/17 09:18			E: K:122352222		
Lithium, Total EPA 6010		02/12/18 09:18			82456
Containers Supplied:					

2004 8-16-17 1400 Date & Time

660-82456 Chain of Custody

8-22-17@12(S

Released By

Poly HNO3 - 250mL (A)

Date & Time

Received By

Page 3 of 3

Page 13 of 17

8/29/2017

TestAmerica Chain of Custody Record Phone (813) 885-7427 Fax (813) 885-7049 6712 Benjamin Road Suite 100 TestAmerica Tampa

T - TSP Dodecahydral U - Acetone Special Instructions/Note: Since aboratory accreditations are subject to change, TestAmerica Laboratories, Inc. places the ownership of method, analyte & accreditation compliance upon out subcontract laboratories. This sample shipped the changes to careditation in the State of Origin listed above for analysis/fasts/matrix being analyzed, the samples must be shipped back to the TestAmerica laboratory or other instructions will be provided. Any changes to accreditation status should be brought to TestAmerica Laboratories, inc. Z - other (specify) N - None O - AsNaO2 P - Na2O4S Q - Na2SO3 R - Na2S2O3 S - H2SO4 V-MCAA W-pH 4-5 Months Ompany 4 Preservation Codes: G - Amchlor H - Ascorbic Acid COC No: 660-98916.1 A - HCL B - NaOH C - Zn Acetate D - Nitric Acid E - NaHSO4 F - MeOH 660-82456-1 Page 1 of 1 J - DI Water K - EDTA 上出 938 1 - Ice L-EDA -Total Number of containers 8/23/17 ate/Time ethod of Shipment State of Origin Florida Analysis Requested Cooler Temperature(s) °C and Other Remarks. Special Instructions/QC Requirements NELAP - Florida, NELAP - Texas E-Mail: keaton.conner@testamericainc.com sceived by eceived by: × × × × × 200.7/200.7 P\_TOT Lithium Conner, Keaton Time Perform MS/MSD (Yes or No) 44 Field Filtered Sample (Yes or No) G=grab) BT=Thssue, A=Alr Sesolid, O-waste/oil, Preservation Code Water Water Water Water Matrix Water Sompany 700174 (C=comp, Sample Type Primary Deliverable Rank: 2 Eastern 10:55 Eastern 10:27 Eastern 09,52 Eastern 09,18 Sample Time Date: 8/22/17 (AT Requested (days): Due Date Requested: 8/29/2017 Sample Date 8/16/17 8/16/17 8/16/17 8/16/17 8/16/17 Project #. 66004821 Jate/Time. Phone #OM Deliverable Requested: I, II, III, IV, Other (specify) Client Information (Sub Contract Lab) Custody Seal No. Sample Identification - Client ID (Lab ID) 850-474-1001(Tel) 850-478-2671(Fax) Possible Hazard Identification TestAmerica Laboratories, Inc. .17H005-04 (660-82456-4) 17H005-01 (660-82456-1) 17H005-02 (660-82456-2) L17H005-05 (660-82456-5) Empty Kit Relinquished by 17H005-03 (660-82456-3) Custody Seals Intact: A Yes A No 3355 McLemore Drive, Shipping/Receiving elinquished by: iquished by. Unconfirmed State, Zip FL, 32514 Pensacola L17C 8/29/2017

STORE REFRIGERATED (2° TO 8° C / 36° TO 47° F) IF THIS SHIPMENT IS DELAYED IN TRANSIT, stAmericc

ORIGIN ID:TPFA (813) 885-7427 (12100) CESTOPE (12100) CESTOPE (12100) CESTOPE (1300) CESTOPE (13

TO SAMPLE CONTRO

SHIP DATE: 22AUG17 ACTWGT: 60.95 LB CAD: 545549/CAFE3107 DIMS: 24x14x13 IN BILL RECIPIET

TEST AMERICA P. 3355 MC LEMORE

PENSACOLA FL 32 FZ 850) 474-1001 **IEPT: WORKSHARE SAMPLES** 

WED - 23 AUG 3:00P STANDARD OVERNIGHT

2 of 2

FL-US BFM

### **Login Sample Receipt Checklist**

Client: Tampa Electric Company

Job Number: 660-82456-1

Login Number: 82456 List Source: TestAmerica Tampa

List Number: 1

Creator: Edwards, Erricka

Question	Answor	Comment
******	Answer	Comment
Radioactivity wasn't checked or is = background as measured by a survey meter.</td <td>N/A</td> <td></td>	N/A	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
s the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <a href="mailto:smm">&lt;6mm</a> (1/4").	N/A	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

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### DOH Certification #E84025 DEP COMPQAP # 870251

Report Date: August 24, 2017

TECO

5012 Causeway Blvd. Tampa, FL 33619

Attn: Peggy Penner

Field Custody:

Client

Client/Field ID:

L17H005-01

BBS-CCR-1

Sample Collection:

08-16-17/1124

Lab ID No:

17.9669

Lab Custody Date:

8-17-17/1010

Sample description:

Water

#### CERTIFICATE OF ANALYSIS

					Analysis		Detection
Parameter	Units	Re	sul	ts	Date	Method	Limit
Combined Radium (Radium-226 + Radium 228)	pCi/l	33.4	±	1.7	Calc	Calc	0.7
Radium-226	pCi/1	32.0	±	1.7	8-22-17/1128	EPA 903.0	0.4
Radium-228	pCi/l	1.4	±	0.5	8-23-17/1218	EPA Ra-05	0.7

James W. Hayes Laboratory Manager

James W. Hages

Test results meet all requirements of the NELAC standards. Statement of estimated uncertainty available upon request. Test results refer only to sample(s) listed. Contact person: Jim Hayes (813) 229-2879.

Page 1 of 1



Report Date: August 24, 2017

TECO

5012 Causeway Blvd. Tampa, FL 33619

Attn: Peggy Penner

Field Custody:

Client Client/Field ID:

L17H005-02 BBS-CCR-2

Sample Collection:

08-16-17/1055

Lab ID No:

17.9670

Lab Custody Date:

8-17-17/1010

Sample description: Water

CERTIFICATE OF ANALYSIS

			Detection				
Parameter	Units Res		sul	ts	Date	Method	Limit
Combined Radium (Radium-225 + Radium 228)	pCi/l	12.1	+	0.9	Calc	Calc	0.7
Radium-226	pCi/l	11.7	±	0.9	8-22-17/1128	EPA 903.0	0.4
Radium-228	pCi/l	0.4	±	0.5	8-23-17/1218	EPA Ra-05	0.7

James W. Hayes Laboratory Manager

amis W. Hayes

Test results meet all requirements of the NELAC standards. Statement of estimated uncertainty available upon request. Test results refer only to sample(s) listed. Contact person: Jim Hayes (813) 229-2879.

Page 1 of 1



Report Date: August 24, 2017

TECO

5012 Causeway Blvd. Tampa, FL 33619

Attn: Peggy Penner

Field Custody:

Client

Client/Field ID:

L17H005-03

Sample Collection:

BBS-CCR-3 08-16-17/1027

Lab ID No:

17.9671

Lab Custody Date:

8-17-17/1010

Sample description:

Water

CERTIFICATE OF ANALYSIS

			Detection				
Parameter	Units Resul				Analysis Date	Method	Limit
Combined Radium (Radium-226 + Radium 228)	pCi/l	19.6	±	1.2	Calc	Calc	0.7
Radium-226	pCi/1	18.0	±	1.2	8-22-17/1128	EPA 903.0	0.4
Radium-228	pCi/1	1.6	±	0.5	8-23-17/1218	EPA Ra-05	0.7

James W. Hayes Laboratory Manager

ames W. Hages

Test results meet all requirements of the NELAC standards. Statement of estimated uncertainty available upon request. Test results refer only to sample(s) listed. Contact person: Jim Hayes (813) 229-2879.



Report Date: August 24, 2017

TECO

5012 Causeway Blvd.

Tampa, FL 33619

Attn: Peggy Penner

Field Custody: Client/Field ID: Client

L17H005-04

Sample Collection:

BBS-CCR-BW1 08-16-17/0952

Lab ID No:

17.9672

Lab Custody Date:

8-17-17/1010

Sample description: Water

CERTIFICATE OF ANALYSIS

			Detection				
Parameter	Units	sul	ts	Date	Method	Limit	
Combined Radium (Radium-226 + Radium 228)	pCi/l	30.1	±	1.4	Calc	Calc	0.7
Radium-226	pCi/l	26.9	±	1.4	8-22-17/1128	EPA 903.0	0.3
Radium-228	pCi/l	3.2	±	0.6	8-23-17/1218	EPA Ra-05	0.7

James W. Hayes Laboratory Manager

James W. Hages

Test results meet all requirements of the NELAC standards. Statement of estimated uncertainty available upon request. Test results refer only to sample(s) listed. Contact person: Jim Hayes (813) 229-2879.

#### SUBCONTRACT ORDER

### Tampa Electric Company, Laboratory Services L17H005

### SENDING LABORATORY:

Tampa Electric Company, Laboratory Services

5012 Causeway Blvd Tampa, FL 33619

Phone: (813) 630-7490 Fax: (813) 630-7360

Project Manager: Peggy Penner

RECEIVING LABORATORY:

KNL Laboratory Services 3202 N. Florida Ave. Tampa, FL 33603

Phone: (813) 229-2879

Fax: -

Due Date:

08/30/17 16:00

Analysis	Expires		Laboratory ID Comm	ients
Sample 1D: L17H005-01 BBS-CCR- Sampled: 08/16/17 11:24		Water	17.9669	
Radium 226 EPA 903.0	02/12/18 11:24		Level 2 Data requred	
Radium 226+228, Total	02/12/18 11:24		Level 2 Data requred	
Radium 228 Ra-05	02/12/18 11:24		Level 2 Data requred	
Containers Supplied: RAD Poly HNO3 - 1000mL (C)	RAD Poly HNO3 - 1000	ont (D)		
Sample ID: L17H005-02 BBS-CCR-2 Sampled: 08/16/17 10:55		Water	179670	
Radium 226 EPA 903.0	02/12/18 10:55		Level 2 Data requred	
Radium 226+228, Total	02/12/18 10:55		Level 2 Data requred	
Radium 228 Ra-05	02/12/18 10:55		Level 2 Data requred	
Containers Supplied:				
RAD Poly HNO3 - 1000mL (C)	RAD Poly HNO3 - 1000	OmL (D)		
Sample ID: L17H005-03 BBS-CCR-3 Sampled: 08/16/17 10:27		Water	17.9671	
Radium 226+228, Total	02/12/18 10:27		Level 2 Data requred	
Radium 226 EPA 903.0	02/12/18 10:27		Level 2 Data requred	
Radium 228 Ra-05	02/12/18 10:27		Level 2 Data requred	
Containers Supplied:				
RAD Poly HNO3 - 1000mL (C)	RAD Poly HNO3 - 1000	OmL (D)		
Sample ID: L17H005-04 BBS-CCR-I Sampled: 08/16/17 09:52	3W1	Water	17.9672	
Radium 226 EPA 903.0	02/12/18 09:52		Level 2 Data requred	
Radium 226+228, Total	02/12/18 09:52		Level 2 Data requred	
Radium 228 Ra-05	02/12/18 09:52		Level 2 Data requred	
Containers Supplied: RAD Poly HNO3 - 1000mL (C)	RAD Poly HNO3 - 1000	OmL (D)		

Released By Date & Time Rec

KNL DUJ

8/7/1 1010

Date & Time

Released By

Date & Time

Received By

Date & Time



Report Date: August 24, 2017

TECO

5012 Causeway Blvd. Tampa, FL 33619

Attn: Peggy Penner

Field Custody:

Client

Client/Field ID:

L17H005-05

Sample Collection:

BBS-CCR-BW2 08-16-17/0918

Lab ID No:

17.9673

Lab Custody Date:

8-17-17/1010

Sample description:

Water

#### CERTIFICATE OF ANALYSIS

		Analysis								
Parameter	Units	Re	esul	ts	Date	Method	Limit			
Combined Radium (Radium-226 + Radium 228)	pCi/l	4.9	±	0.6	Calc	Calc	0.7			
Radium-226	pCi/l	4.5	±	0.6	8-22-17/1128	EPA 903.0	0.3			
Radium-228 Alpha Standard: Th-230	pCi/l	0.4	±	0.5	8-23-17/1218	EPA Ra-05	0.7			

James W. Hayes Laboratory Manager

James W. Hages

Test results meet all requirements of the NELAC standards. Statement of estimated uncertainty available upon request. Test results refer only to sample(s) listed. Contact person: Jim Hayes (813) 229-2879.

### SUBCONTRACT ORDER

# Tampa Electric Company, Laboratory Services L17H005



Analysis	Expires		Laboratory ID Comments
Sample ID: L17H005-05 BBS-CCR Sampled: 08/16/17 09:18	-BW2	Water	17.9473
Radium 228 Ra-05	02/12/18 09:18		Level 2 Data requred
Radium 226 EPA 903.0	02/12/18 09:18		Level 2 Data requred
Radium 226+228, Total	02/12/18 09:18		Level 2 Data requred
Containers Supplied:			
RAD Poly HNO3 - 1000mL (C)	RAD Poly HNO3 - 1000mL	(D)	

Released By Date & Time Box Received By Date & Time

Released By Date & Time Received By Date & Time



# **FL DOH Certification # E84025**

QC Summary: Radium 22	28 Analysis	
Client Project # : L 17 1	+005	
Analysis Completion Date:	81 231 17	
Precision Data:	Sample #:	9672
Sample Analysis (pCi/l)	Duplicate Analysis (pCi/l) Range	(pCi/l) RPD (%)
8.0	8-0	2 _0.0
Spike Data:	Sample #:17.	9672
Sample Analysis (pCi/l)	Spike Added (pCi/l) Analytical Res	sult (pCi/l) Spike Rec (%)
3.2	3.81 8.0	126%
LCS Data:		
Analytical Result (pCi/l)	True Value (pCi/l)	% Recovery
4.3	4.23	102%
Lab Blank:	Analytical Result (pCi/l)	Analysis Date
r d Di. t		
Lab Blank	0.0 +1- 0.2	8123117



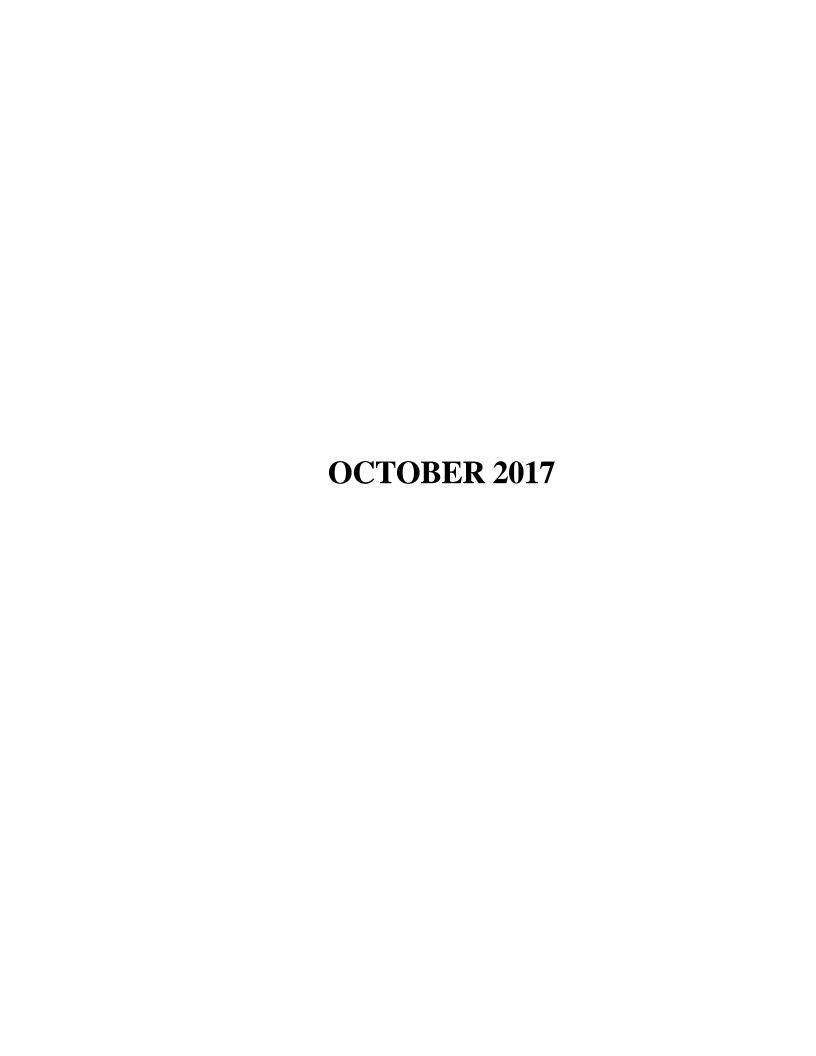
## **FL DOH Certification # E84025**

QC Summary: Total Ra	dium Analysis	-	
Client Project #: _ L 17	HOOS		
Analysis Completion Date	: 81 221 17		
Precision Data:	Sample #:	17,9670	
Sample Analysis (pCi/l)	Duplicate Analysis (pCi/l)	Range (pCi/l)	<u>RPD (%)</u>
22.8	20-8	2.0	9.20,
Spike Data:  Sample Analysis (pCi/l)  11.7	Sample #:  Spike Added (pCi/l) Analy  9.0		Spike Rec (%)
LCS Data:			
Analytical Result (pCi/l)	True Value (pCi/l)	<u>% R</u>	ecovery
10.5	10-1	_	104 %
Lab Blank:	Analytical Result (pt	Ci/l) Anal	ysis Date

Lab Blank

0.1 +1- 0.1

8122117





5012 Causeway Blvd Tampa Fl. 33619 \* Ph (813)630-7490 \* Fax (813)630-7360 \* DOH #E54272

Big Bend Power Station Terry Eastley 13031 Wyandott Rd Apollo Beach, FL 33572 tleastley@tecoenergy.com

Work Order -

L17J115

**Report Date:** 

11/13/17 10:59

### **Project - CCR Wells Economizer Ash Pond**

### **Case Narrative**

5 sample(s) were received on 10/13/17 14:18.

There were no issues noted with the sample(s) associated with this workorder unless noted below.

Lithium was subcontracted to Test America Labs. The report is attached.

Radiological analysis was subcontracted to KNL Labs. The report is attached.



5012 Causeway Blvd Tampa Fl. 33619 \* Ph (813)630-7490 \* Fax (813)630-7360 \* DOH #E54272

### **Sample Information**

Client: Big Bend Power Station

Lab Sample ID: L17J115-01 Sampled By: Robert Barthelette

Sample Description: BBS-CCR-1 Date and Time Collected: 10/13/17 11:50
Sample Collection Method: Grab Date of Sample Receipt: 10/13/17 14:18

### **Laboratory Results**

				Qualifier		Test	Analysis		
Parameter	Result	Units	MDL	PQL	Code	Dil	Method	Analyst	Date & Time
	,	Tampa Elec	tric Compa	ny, Labo	ratory Se	rvices			
<b>General Chemistry Parameters</b>									
Chloride	716	mg/L	2.00	50.0		100	EPA 300.0	TMH	10/24/17 18:51
Specific Conductance	4260	umhos/cm	100	100		1	FDEP SOP FT 1200	RAB	10/13/17 11:50
Dissolved Oxygen	0.240	mg/L	0.100	0.100		1	FDEP SOP FT 1500	RAB	10/13/17 11:50
Fluoride	0.201	mg/L	0.0100	0.0500		1	EPA 300.0	TMH	10/24/17 18:42
pH	6.83	pH Units	1.00	1.00		1	FDEP SOP FT 1100	RAB	10/13/17 11:50
REDOX Potential	-83.3	mV	-999	-999		1	SM 2580B	RAB	10/13/17 11:50
Total Dissolved Solids	3470	mg/L	24.0	40.0		2	SM 2540C	RFL	10/18/17 15:55
Sulfate	1230	mg/L	50.0	200		100	EPA 300.0	TMH	10/24/17 18:51
Turbidity	0.890	NTU	0.100	0.100		1	FDEP SOP FT 1600	RAB	10/13/17 11:50
Total Mercury by SW846 Method 7470/7471									
Mercury	0.0500	ug/L	0.0500	0.200	U	1	EPA 7470A	MCR	10/19/17 9:34
<b>Total Recoverable Metals by 200</b>	Series								
Antimony	0.600	ug/L	0.600	2.00	U	1	EPA 200.8	MCR	10/16/17 12:23
Arsenic	9.03	ug/L	0.320	2.00		1	EPA 200.8	MCR	10/16/17 12:23
Cadmium	0.100	ug/L	0.100	0.500	U	1	EPA 200.8	MCR	10/16/17 12:23
Cobalt	0.453	ug/L	0.0400	2.00	I	1	EPA 200.8	MCR	10/16/17 12:23
Lead	8.00E-5	mg/L	8.00E-5	0.00200	U	1	EPA 200.8	MCR	10/16/17 12:23
Selenium	0.990	ug/L	0.200	2.00	I	1	EPA 200.8	MCR	10/16/17 12:23
Thallium	0.100	ug/L	0.100	0.500	U	1	EPA 200.8	MCR	10/16/17 12:23
<b>Total Recoverable Metals by SW</b>	846 Method	6010B							
Barium	0.129	mg/L	0.000500	0.0200		1	EPA 6010B	RLC	10/16/17 16:44
Beryllium	0.200	ug/L	0.200	2.00	U	1	EPA 6010B	RLC	10/16/17 16:44
Boron	19.9	mg/L	0.0100	0.0500		1	EPA 6010B	RLC	10/16/17 16:44
Calcium	596	mg/L	0.0300	1.00		1	EPA 6010B	RLC	10/17/17 9:25
Chromium	1.60	ug/L	1.60	12.0	U	1	EPA 6010B	RLC	10/16/17 16:44
Molybdenum	82.5	ug/L	1.00	20.0		1	EPA 6010B	RLC	10/16/17 16:44



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### **Sample Information**

Client: Big Bend Power Station

Lab Sample ID: L17J115-02 Sampled By: Robert Barthelette

Sample Description: BBS-CCR-2 Date and Time Collected: 10/13/17 11:10

Sample Collection Method: Grab Date of Sample Receipt: 10/13/17 14:18

### **Laboratory Results**

Parameter	Result	Units	MDL	PQL	Qualifier Code	Dil	Test Method	Analyst	Analysis Date & Time
r at ameter							Method	Allalyst	Date & Time
	1	Tampa Elec	tric Compa	ny, Labo	ratory Se	rvices			
<b>General Chemistry Parameters</b>									
Chloride	70.9	mg/L	0.0200	0.500		1	EPA 300.0	TMH	10/24/17 19:10
Specific Conductance	1350	umhos/cm	100	100		1	FDEP SOP FT 1200	RAB	10/13/17 11:10
Dissolved Oxygen	0.200	mg/L	0.100	0.100		1	FDEP SOP FT 1500	RAB	10/13/17 11:10
Fluoride	0.182	mg/L	0.0100	0.0500		1	EPA 300.0	TMH	10/24/17 19:10
pH	6.87	pH Units	1.00	1.00		1	FDEP SOP FT 1100	RAB	10/13/17 11:10
REDOX Potential	-188	mV	-999	-999		1	SM 2580B	RAB	10/13/17 11:10
Total Dissolved Solids	1030	mg/L	24.0	40.0		2	SM 2540C	RFL	10/18/17 15:55
Sulfate	432	mg/L	5.00	20.0		10	EPA 300.0	TMH	10/24/17 19:10
Turbidity	3.03	NTU	0.100	0.100		1	FDEP SOP FT 1600	RAB	10/13/17 11:10
<b>Total Mercury by SW846 Metho</b>	od 7470/7471								
Mercury	0.0500	ug/L	0.0500	0.200	U	1	EPA 7470A	MCR	10/19/17 9:38
<b>Total Recoverable Metals by 20</b>	<u> 0 Series</u>								
Antimony	0.600	ug/L	0.600	2.00	U	1	EPA 200.8	MCR	10/16/17 12:27
Arsenic	1.14	ug/L	0.320	2.00	I	1	EPA 200.8	MCR	10/16/17 12:27
Cadmium	0.100	ug/L	0.100	0.500	U	1	EPA 200.8	MCR	10/16/17 12:27
Cobalt	0.115	ug/L	0.0400	2.00	I	1	EPA 200.8	MCR	10/16/17 12:27
Lead	0.000150	mg/L	8.00E-5	0.00200	I	1	EPA 200.8	MCR	10/16/17 12:27
Selenium	0.474	ug/L	0.200	2.00	I	1	EPA 200.8	MCR	10/16/17 12:27
Thallium	0.100	ug/L	0.100	0.500	U	1	EPA 200.8	MCR	10/16/17 12:27
<b>Total Recoverable Metals by SV</b>	V846 Method	6010B							
Barium	0.0533	mg/L	0.000500	0.0200		1	EPA 6010B	RLC	10/16/17 16:47
Beryllium	0.200	ug/L	0.200	2.00	U	1	EPA 6010B	RLC	10/16/17 16:47
Boron	0.888	mg/L	0.0100	0.0500		1	EPA 6010B	RLC	10/16/17 16:47
Calcium	169	mg/L	0.0300	1.00		1	EPA 6010B	RLC	10/17/17 9:28
Chromium	1.60	ug/L	1.60	12.0	U	1	EPA 6010B	RLC	10/16/17 16:47
Molybdenum	1.99	ug/L	1.00	20.0	I	1	EPA 6010B	RLC	10/16/17 16:47



5012 Causeway Blvd Tampa Fl. 33619 \* Ph (813)630-7490 \* Fax (813)630-7360 \* DOH #E54272

### **Sample Information**

Client: Big Bend Power Station

Lab Sample ID: L17J115-03 Sampled By: Robert Barthelette

Sample Description: BBS-CCR-3 Date and Time Collected: 10/13/17 10:42
Sample Collection Method: Grab Date of Sample Receipt: 10/13/17 14:18

### **Laboratory Results**

					Qualifier		Test		Analysis	
Parameter	Result	Units	MDL	PQL	Code	Dil	Method	Analyst	Date & Time	
	,	Tampa Elec	tric Compa	ny, Labo	ratory Se	rvices				
<b>General Chemistry Parameters</b>										
Chloride	153	mg/L	0.200	5.00		10	EPA 300.0	TMH	10/24/17 20:08	
Specific Conductance	1750	umhos/cm	100	100		1	FDEP SOP FT 1200	RAB	10/13/17 10:42	
Dissolved Oxygen	0.370	mg/L	0.100	0.100		1	FDEP SOP FT 1500	RAB	10/13/17 10:42	
Fluoride	0.333	mg/L	0.0100	0.0500		1	EPA 300.0	TMH	10/24/17 19:58	
pH	6.44	pH Units	1.00	1.00		1	FDEP SOP FT 1100	RAB	10/13/17 10:42	
REDOX Potential	-249	mV	-999	-999		1	SM 2580B	RAB	10/13/17 10:42	
Total Dissolved Solids	1310	mg/L	24.0	40.0		2	SM 2540C	RFL	10/18/17 15:55	
Sulfate	503	mg/L	5.00	20.0		10	EPA 300.0	TMH	10/24/17 20:08	
Turbidity	2.39	NTU	0.100	0.100		1	FDEP SOP FT 1600	RAB	10/13/17 10:42	
Total Mercury by SW846 Method 7470/7471										
Mercury	0.0500	ug/L	0.0500	0.200	U	1	EPA 7470A	MCR	10/19/17 9:41	
<b>Total Recoverable Metals by 200</b>	Series									
Antimony	0.600	ug/L	0.600	2.00	U	1	EPA 200.8	MCR	10/16/17 12:30	
Arsenic	0.665	ug/L	0.320	2.00	I	1	EPA 200.8	MCR	10/16/17 12:30	
Cadmium	0.100	ug/L	0.100	0.500	U	1	EPA 200.8	MCR	10/16/17 12:30	
Cobalt	0.155	ug/L	0.0400	2.00	I	1	EPA 200.8	MCR	10/16/17 12:30	
Lead	8.00E-5	mg/L	8.00E-5	0.00200	U	1	EPA 200.8	MCR	10/16/17 12:30	
Selenium	0.285	ug/L	0.200	2.00	I	1	EPA 200.8	MCR	10/16/17 12:30	
Thallium	0.100	ug/L	0.100	0.500	U	1	EPA 200.8	MCR	10/16/17 12:30	
Total Recoverable Metals by SW	846 Method	6010B								
Barium	0.0593	mg/L	0.000500	0.0200		1	EPA 6010B	RLC	10/16/17 16:50	
Beryllium	0.200	ug/L	0.200	2.00	U	1	EPA 6010B	RLC	10/16/17 16:50	
Boron	0.373	mg/L	0.0100	0.0500		1	EPA 6010B	RLC	10/16/17 16:50	
Calcium	190	mg/L	0.0300	1.00		1	EPA 6010B	RLC	10/17/17 9:30	
Chromium	1.60	ug/L	1.60	12.0	U	1	EPA 6010B	RLC	10/16/17 16:50	
Molybdenum	3.82	ug/L	1.00	20.0	I	1	EPA 6010B	RLC	10/16/17 16:50	



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### **Sample Information**

Client: Big Bend Power Station

Lab Sample ID: L17J115-04 Sampled By: Robert Barthelette

Sample Description: BBS-CCR-BW1 Date and Time Collected: 10/13/17 10:04
Sample Collection Method: Grab Date of Sample Receipt: 10/13/17 14:18

### **Laboratory Results**

D	D 1/	<b>T</b> I •	MDI	<b>DOI</b>	Qualifier	D.II	Test		Analysis
Parameter	Result	Units	MDL	PQL	Code	Dil	Method	Analyst	Date & Time
	Т	Tampa Elec	tric Compa	ny, Labo	ratory Se	rvices			
<b>General Chemistry Parameters</b>									
Chloride	809	mg/L	0.200	5.00		10	EPA 300.0	TMH	10/24/17 19:49
Specific Conductance	4570	umhos/cm	100	100		1	FDEP SOP FT 1200	RAB	10/13/17 10:04
Dissolved Oxygen	0.400	mg/L	0.100	0.100		1	FDEP SOP FT 1500	RAB	10/13/17 10:04
Fluoride	0.334	mg/L	0.0100	0.0500		1	EPA 300.0	TMH	10/24/17 19:49
pH	6.55	pH Units	1.00	1.00		1	FDEP SOP FT 1100	RAB	10/13/17 10:04
REDOX Potential	-18.4	mV	-999	-999		1	SM 2580B	RAB	10/13/17 10:04
Total Dissolved Solids	3890	mg/L	24.0	40.0		2	SM 2540C	RFL	10/18/17 15:55
Sulfate	217	mg/L	50.0	200		100	EPA 300.0	TMH	10/25/17 16:30
Turbidity	2.51	NTU	0.100	0.100		1	FDEP SOP FT 1600	RAB	10/13/17 10:04
<b>Total Mercury by SW846 Metho</b>	od 7470/7471								
Mercury	0.0500	ug/L	0.0500	0.200	U	1	EPA 7470A	MCR	10/19/17 9:45
<b>Total Recoverable Metals by 200</b>	0 Series								
Antimony	0.600	ug/L	0.600	2.00	U	1	EPA 200.8	MCR	10/16/17 12:34
Arsenic	9.06	ug/L	0.320	2.00		1	EPA 200.8	MCR	10/16/17 12:34
Cadmium	0.100	ug/L	0.100	0.500	U	1	EPA 200.8	MCR	10/16/17 12:34
Cobalt	1.86	ug/L	0.0400	2.00	I	1	EPA 200.8	MCR	10/16/17 12:34
Lead	0.000103	mg/L	8.00E-5	0.00200	I	1	EPA 200.8	MCR	10/16/17 12:34
Selenium	2.14	ug/L	0.200	2.00		1	EPA 200.8	MCR	10/16/17 12:34
Thallium	0.100	ug/L	0.100	0.500	U	1	EPA 200.8	MCR	10/16/17 12:34
<b>Total Recoverable Metals by SW</b>	V846 Method	6010B							
Barium	0.0558	mg/L	0.000500	0.0200		1	EPA 6010B	RLC	10/16/17 16:54
Beryllium	0.200	ug/L	0.200	2.00	U	1	EPA 6010B	RLC	10/16/17 16:54
Boron	44.2	mg/L	0.0100	0.0500		1	EPA 6010B	RLC	10/16/17 16:54
Calcium	691	mg/L	0.0300	1.00		1	EPA 6010B	RLC	10/17/17 9:32
Chromium	1.60	ug/L	1.60	12.0	U	1	EPA 6010B	RLC	10/16/17 16:54
Molybdenum	4.27	ug/L	1.00	20.0	I	1	EPA 6010B	RLC	10/16/17 16:54



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### **Sample Information**

Client: Big Bend Power Station

Lab Sample ID: L17J115-05 Sampled By: Robert Barthelette

Sample Description: BBS-CCR-BW2 Date and Time Collected: 10/13/17 9:40
Sample Collection Method: Grab Date of Sample Receipt: 10/13/17 14:18

### **Laboratory Results**

#### Sample Qualifier:

					Qualifier		Test		Analysis
Parameter	Result	Units	MDL	PQL	Code	Dil	Method	Analyst	Date & Time
	,	Tampa Elec	tric Compa	ny, Labo	ratory Se	rvices			
<b>General Chemistry Parameters</b>									
Chloride	84.9	mg/L	0.0200	0.500		1	EPA 300.0	TMH	10/24/17 20:17
Specific Conductance	1700	umhos/cm	100	100		1	FDEP SOP FT 1200	RAB	10/13/17 9:40
Dissolved Oxygen	0.280	mg/L	0.100	0.100		1	FDEP SOP FT 1500	RAB	10/13/17 9:40
Fluoride	0.513	mg/L	0.0100	0.0500		1	EPA 300.0	TMH	10/24/17 20:17
pH	6.70	pH Units	1.00	1.00		1	FDEP SOP FT 1100	RAB	10/13/17 9:40
REDOX Potential	-72.1	mV	-999	-999		1	SM 2580B	RAB	10/13/17 9:40
Total Dissolved Solids	1330	mg/L	24.0	40.0		2	SM 2540C	RFL	10/18/17 15:55
Sulfate	632	mg/L	5.00	20.0		10	EPA 300.0	TMH	10/24/17 20:27
Turbidity	3.96	NTU	0.100	0.100		1	FDEP SOP FT 1600	RAB	10/13/17 9:40
Total Mercury by SW846 Method	17470/7471								
Mercury	0.0500	ug/L	0.0500	0.200	U	1	EPA 7470A	MCR	10/19/17 9:48
<b>Total Recoverable Metals by 200</b>	Series								
Antimony	0.600	ug/L	0.600	2.00	U	1	EPA 200.8	MCR	10/16/17 12:38
Arsenic	2.01	ug/L	0.320	2.00		1	EPA 200.8	MCR	10/16/17 12:38
Cadmium	0.100	ug/L	0.100	0.500	U	1	EPA 200.8	MCR	10/16/17 12:38
Cobalt	0.129	ug/L	0.0400	2.00	I	1	EPA 200.8	MCR	10/16/17 12:38
Lead	8.00E-5	mg/L	8.00E-5	0.00200	U	1	EPA 200.8	MCR	10/16/17 12:38
Selenium	0.523	ug/L	0.200	2.00	I	1	EPA 200.8	MCR	10/16/17 12:38
Thallium	0.100	ug/L	0.100	0.500	U	1	EPA 200.8	MCR	10/16/17 12:38
<b>Total Recoverable Metals by SW</b>	846 Method	6010B							
Barium	0.0562	mg/L	0.000500	0.0200		1	EPA 6010B	RLC	10/16/17 16:57
Beryllium	0.254	ug/L	0.200	2.00	I	1	EPA 6010B	RLC	10/16/17 16:57
Boron	4.08	mg/L	0.0100	0.0500		1	EPA 6010B	RLC	10/16/17 16:57
Calcium	321	mg/L	0.0300	1.00		1	EPA 6010B	RLC	10/17/17 9:35
Chromium	1.60	ug/L	1.60	12.0	U	1	EPA 6010B	RLC	10/16/17 16:57
Molybdenum	2.51	ug/L	1.00	20.0	I	1	EPA 6010B	RLC	10/16/17 16:57

### **Comments**

#### **Subcontract Laboratories:**

Laboratory Services certifies that the test result in this report meet all requirements of the NELAC standards, unless indicated otherwise in the body of the report. Unless otherwise noted, all methods followed are per the most current published version of 40 CFR Part 136, Table B. Results reported on this report pertain to the above referenced sample only.

U Indicates that the compound was analyzed for but not detected.

J- The reported value is an estimated value, see the case narrative for specifics.

I Estimated value



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### Total Recoverable Metals by SW846 Method 6010B - Quality Control

Analyte	Result	MDL	PQL	Units	Spike Level	Source Result	%Rec	%Rec Limits	RPD	RPD Limit	Qualifier
·	Result	MIDE	1 4 5	Omis	Level	Result	/01000	Limio	МЪ	Limit	Quannici
Batch 17J0144 - EPA 6010B											
Blank (17J0144-BLK1)					Prepared &	Analyzed:	10/16/17				
Barium	0.000500	0.000500	0.0200	mg/L							U
Beryllium	0.200	0.200	2.00	ug/L							U
Boron	0.0100	0.0100	0.0500	mg/L							U
Calcium	0.0300	0.0300	1.00	mg/L							U
Chromium	1.60	1.60	12.0	ug/L							U
Molybdenum	1.00	1.00	20.0	ug/L							U
LCS (17J0144-BS1)					Prepared &	Analyzed:	10/16/17				
Barium	0.993	0.000500	0.0200	mg/L	1.0000		99.3	80-120			
Beryllium	959	0.200	2.00	ug/L	1000.0		95.9	80-120			
Boron	1.00	0.0100	0.0500	mg/L	1.0000		100	80-120			
Chromium	984	1.60	12.0	ug/L	1000.0		98.4	80-120			
Molybdenum	963	1.00	20.0	ug/L	1000.0		96.3	80-120			
Matrix Spike (17J0144-MS1)		Sourc	e: L17J013	3-01	Prepared &	Analyzed:	10/16/17				
Barium	1.05	0.000500	0.0200	mg/L	1.0000	0.0677	97.8	75-125			
Beryllium	949	0.200	2.00	ug/L	1000.0	U	94.9	75-125			
Boron	1.03	0.0100	0.0500	mg/L	1.0000	0.0247	101	75-125			
Chromium	965	1.60	12.0	ug/L	1000.0	U	96.5	75-125			
Molybdenum	973	1.00	20.0	ug/L	1000.0	9.51	96.4	75-125			
Matrix Spike (17J0144-MS2)		Sourc	e: L17J116	5-02	Prepared &	Analyzed:	10/16/17				
Barium	1.02	0.000500	0.0200	mg/L	1.0000	0.0420	97.7	75-125			
Beryllium	949	0.200	2.00	ug/L	1000.0	U	94.9	75-125			
Boron	1.09	0.0100	0.0500	mg/L	1.0000	0.0552	103	75-125			
Chromium	964	1.60	12.0	ug/L	1000.0	U	96.4	75-125			
Molybdenum	971	1.00	20.0	ug/L	1000.0	1.46	97.0	75-125			



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### Total Recoverable Metals by SW846 Method 6010B - Quality Control

Analyte	Result	MDL	PQL	Units	Spike Level	Source Result	%Rec	%Rec Limits	RPD	RPD Limit	Qualifier
Batch 17J0144 - EPA 6010B											
Matrix Spike Dup (17J0144-MSD1)		Sourc	e: L17J01	3-01	Prepared &	Analyzed:	10/16/17				
Barium	1.06	0.000500	0.0200	mg/L	1.0000	0.0677	99.3	75-125	1.40	20	
Beryllium	979	0.200	2.00	ug/L	1000.0	U	97.9	75-125	3.10	20	
Boron	1.05	0.0100	0.0500	mg/L	1.0000	0.0247	103	75-125	1.64	20	
Chromium	983	1.60	12.0	ug/L	1000.0	U	98.3	75-125	1.85	20	
Molybdenum	983	1.00	20.0	ug/L	1000.0	9.51	97.3	75-125	0.967	20	
Matrix Spike Dup (17J0144-MSD2)		Sourc	e: L17J110	5-02	Prepared &	Analyzed:	10/16/17				
Barium	1.03	0.000500	0.0200	mg/L	1.0000	0.0420	99.2	75-125	1.43	20	
Beryllium	957	0.200	2.00	ug/L	1000.0	U	95.7	75-125	0.889	20	
Boron	1.10	0.0100	0.0500	mg/L	1.0000	0.0552	105	75-125	1.53	20	
Chromium	983	1.60	12.0	ug/L	1000.0	U	98.3	75-125	1.94	20	
Molybdenum	995	1.00	20.0	ug/L	1000.0	1.46	99.4	75-125	2.44	20	



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### Total Mercury by SW846 Method 7470/7471 - Quality Control

					Spike	Source		%Rec		RPD	
Analyte	Result	MDL	PQL	Units	Level	Result	%Rec	Limits	RPD	Limit	Qualifier
Batch 17J0184 - EPA 7470A											
Blank (17J0184-BLK1)					Prepared: 1	0/18/17 Aı	nalyzed: 10	/19/17			
Mercury	0.0500	0.0500	0.200	ug/L							U
LCS (17J0184-BS1)					Prepared: 1	0/18/17 Aı	nalyzed: 10	/19/17			
Mercury	0.976	0.0500	0.200	ug/L	1.0000		97.6	80-120			
Matrix Spike (17J0184-MS1)		Sour	ce: L17J11:	5-02	Prepared: 1	0/18/17 Aı	nalyzed: 10	/19/17			
Mercury	0.790	0.0500	0.200	ug/L	1.0000	U	79.0	75-125			
Matrix Spike Dup (17J0184-MSD1)		Sour	ce: L17J11:	5-02	Prepared: 1	0/18/17 Aı	nalyzed: 10	/19/17			
Mercury	0.764	0.0500	0.200	ug/L	1.0000	U	76.4	75-125	3.26	20	



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### **Total Recoverable Metals by 200 Series - Quality Control**

Result   MDL   PQL   Units   Level   Result   %Rec   Limits   1	RPD Limit	
Prepared: 10/13/17   Analyzed: 10/16/17		Qualifier
Antimony 0.600 0.600 2.00 ug/L  Arsenic 0.320 0.320 2.00 ug/L  Cadmium 0.100 0.100 0.500 ug/L  Cobalt 0.0400 0.0400 2.00 ug/L  Lead 8.00E-5 8.00E-5 0.00200 mg/L  Selenium 0.100 0.100 0.500 ug/L  Thallium 0.100 0.100 0.500 ug/L  CCS (17J0116-BS1) Prepared: 10/13/17 Analyzed: 10/16/17  Antimony 96.0 0.600 2.00 ug/L  Arsenic 101 0.320 2.00 ug/L 100.00 96.0 85-115  Arsenic 101 0.320 2.00 ug/L 100.00 101 85-115  Cadmium 102 0.100 0.500 ug/L 100.00 98.6 85-115  Cobalt 98.6 0.0400 2.00 ug/L 100.00 98.6 85-115  Lead 0.0958 8.00E-5 0.00200 mg/L 0.1000 95.8 85-115  Selenium 108 0.200 2.00 ug/L 100.00 108 85-115  Selenium 95.9 0.100 0.500 ug/L 100.00 95.9 85-115		
Arsenic         0.320         0.320         2.00         ug/L           Cadmium         0.100         0.100         0.500         ug/L           Cobalt         0.0400         0.0400         2.00         ug/L           Lead         8.00E-5         8.00E-5         0.00200         mg/L           Selenium         0.200         0.200         2.00         ug/L           Thallium         0.100         0.100         0.500         ug/L           Antimony         96.0         0.600         2.00         ug/L         100.00         96.0         85-115           Arsenic         101         0.320         2.00         ug/L         100.00         101         85-115           Cadmium         102         0.100         0.500         ug/L         100.00         102         85-115           Cobalt         98.6         0.0400         2.00         ug/L         100.00         98.6         85-115           Lead         0.0958         8.00E-5         0.00200         mg/L         0.10000         95.8         85-115           Selenium         108         0.200         2.00         ug/L         100.00         95.9         85-115		
Cadmium         0.100         0.100         0.500         ug/L           Cobalt         0.0400         0.0400         2.00         ug/L           Lead         8.00E-5         8.00E-5         0.00200         mg/L           Selenium         0.200         0.200         2.00         ug/L           Thallium         0.100         0.500         ug/L           Prepared: 10/13/17 Analyzed: 10/16/17           Antimony         96.0         0.600         2.00         ug/L         100.00         96.0         85-115           Arsenic         101         0.320         2.00         ug/L         100.00         101         85-115           Cadmium         102         0.100         0.500         ug/L         100.00         98.6         85-115           Cobalt         98.6         0.0400         2.00         ug/L         100.00         98.6         85-115           Lead         0.0958         8.00E-5         0.00200         mg/L         0.10000         95.8         85-115           Selenium         108         0.200         2.00         ug/L         100.00         108         85-115           Thallium         95.9         0.100		U
Cobalt         0.0400         0.0400         2.00         ug/L           Lead         8.00E-5         8.00E-5         0.00200         mg/L           Selenium         0.200         0.200         2.00         ug/L           Thallium         0.100         0.100         0.500         ug/L           Prepared: 10/13/17 Analyzed: 10/16/17           Antimony         96.0         0.600         2.00         ug/L         100.00         96.0         85-115           Arsenic         101         0.320         2.00         ug/L         100.00         101         85-115           Cadmium         102         0.100         0.500         ug/L         100.00         98.6         85-115           Cobalt         98.6         0.0400         2.00         ug/L         100.00         98.6         85-115           Lead         0.0958         8.00E-5         0.00200         mg/L         0.10000         95.8         85-115           Selenium         108         0.200         2.00         ug/L         100.00         108         85-115           Thallium         95.9         0.100         0.500         ug/L         100.00         95.9         85-115 <td></td> <td>U</td>		U
Lead         8.00E-5         8.00E-5         0.00200         mg/L           Selenium         0.200         0.200         2.00         ug/L           Thallium         0.100         0.100         0.500         ug/L           Prepared: 10/13/17 Analyzed: 10/16/17           Antimony         96.0         0.600         2.00         ug/L         100.00         96.0         85-115           Arsenic         101         0.320         2.00         ug/L         100.00         101         85-115           Cadmium         102         0.100         0.500         ug/L         100.00         102         85-115           Cobalt         98.6         0.0400         2.00         ug/L         100.00         98.6         85-115           Lead         0.0958         8.00E-5         0.00200         mg/L         0.10000         95.8         85-115           Selenium         108         0.200         2.00         ug/L         100.00         108         85-115           Thallium         95.9         0.100         0.500         ug/L         100.00         95.9         85-115		U
Selenium         0.200         0.200         2.00         ug/L           Thallium         0.100         0.100         0.500         ug/L           Prepared: 10/13/17 Analyzed: 10/16/17           Antimony         96.0         0.600         2.00         ug/L         100.00         96.0         85-115           Arsenic         101         0.320         2.00         ug/L         100.00         101         85-115           Cadmium         102         0.100         0.500         ug/L         100.00         102         85-115           Cobalt         98.6         0.0400         2.00         ug/L         100.00         98.6         85-115           Lead         0.0958         8.00E-5         0.00200         mg/L         0.10000         95.8         85-115           Selenium         108         0.200         2.00         ug/L         100.00         108         85-115           Thallium         95.9         0.100         0.500         ug/L         100.00         95.9         85-115		U
Thallium         0.100         0.100         0.500         ug/L           Prepared: 10/13/17 Analyzed: 10/16/17           Antimony         96.0         0.600         2.00         ug/L         100.00         96.0         85-115           Arsenic         101         0.320         2.00         ug/L         100.00         101         85-115           Cadmium         102         0.100         0.500         ug/L         100.00         102         85-115           Cobalt         98.6         0.0400         2.00         ug/L         100.00         98.6         85-115           Lead         0.0958         8.00E-5         0.00200         mg/L         0.10000         95.8         85-115           Selenium         108         0.200         2.00         ug/L         100.00         108         85-115           Thallium         95.9         0.100         0.500         ug/L         100.00         95.9         85-115		U
LCS (17J0116-BS1)           Prepared: 10/13/17 Analyzed: 10/16/17           Antimony         96.0 0.600 2.00 ug/L 100.00         100.00 96.0 85-115           Arsenic         101 0.320 2.00 ug/L 100.00         101 85-115           Cadmium         102 0.100 0.500 ug/L 100.00         102 85-115           Cobalt         98.6 0.0400 2.00 ug/L 100.00         98.6 85-115           Lead         0.0958 8.00E-5 0.00200 mg/L 0.10000         95.8 85-115           Selenium         108 0.200 2.00 ug/L 100.00         108 85-115           Thallium         95.9 0.100 0.500 ug/L 100.00         95.9 85-115		U
Antimony         96.0         0.600         2.00         ug/L         100.00         96.0         85-115           Arsenic         101         0.320         2.00         ug/L         100.00         101         85-115           Cadmium         102         0.100         0.500         ug/L         100.00         102         85-115           Cobalt         98.6         0.0400         2.00         ug/L         100.00         98.6         85-115           Lead         0.0958         8.00E-5         0.00200         mg/L         0.10000         95.8         85-115           Selenium         108         0.200         2.00         ug/L         100.00         108         85-115           Thallium         95.9         0.100         0.500         ug/L         100.00         95.9         85-115		U
Arsenic         101         0.320         2.00         ug/L         100.00         101         85-115           Cadmium         102         0.100         0.500         ug/L         100.00         102         85-115           Cobalt         98.6         0.0400         2.00         ug/L         100.00         98.6         85-115           Lead         0.0958         8.00E-5         0.00200         mg/L         0.10000         95.8         85-115           Selenium         108         0.200         2.00         ug/L         100.00         108         85-115           Thallium         95.9         0.100         0.500         ug/L         100.00         95.9         85-115		
Cadmium         102         0.100         0.500         ug/L         100.00         102         85-115           Cobalt         98.6         0.0400         2.00         ug/L         100.00         98.6         85-115           Lead         0.0958         8.00E-5         0.00200         mg/L         0.10000         95.8         85-115           Selenium         108         0.200         2.00         ug/L         100.00         108         85-115           Thallium         95.9         0.100         0.500         ug/L         100.00         95.9         85-115		
Cobalt         98.6         0.0400         2.00         ug/L         100.00         98.6         85-115           Lead         0.0958         8.00E-5         0.00200         mg/L         0.10000         95.8         85-115           Selenium         108         0.200         2.00         ug/L         100.00         108         85-115           Thallium         95.9         0.100         0.500         ug/L         100.00         95.9         85-115		
Lead         0.0958         8.00E-5         0.00200         mg/L         0.10000         95.8         85-115           Selenium         108         0.200         2.00         ug/L         100.00         108         85-115           Thallium         95.9         0.100         0.500         ug/L         100.00         95.9         85-115		
Selenium         108         0.200         2.00         ug/L         100.00         108         85-115           Thallium         95.9         0.100         0.500         ug/L         100.00         95.9         85-115		
Thallium 95.9 0.100 0.500 ug/L 100.00 95.9 85-115		
<b>Matrix Spike (17J0116-MS1)</b> Source: L17J002-01 Prepared: 10/13/17 Analyzed: 10/16/17		
Antimony 103 3.00 10.0 ug/L 100.00 U 103 70-130		
Arsenic 96.3 1.60 10.0 ug/L 100.00 U 96.3 70-130		
Cadmium 99.5 0.500 2.50 ug/L 100.00 U 99.5 70-130		
Cobalt 96.2 0.200 10.0 ug/L 100.00 U 96.2 70-130		
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Selenium 98.1 1.00 10.0 ug/L 100.00 U 98.1 70-130		
Thallium 90.3 0.500 2.50 ug/L 100.00 U 90.3 70-130		
Matrix Spike (17J0116-MS2) Source: L17J115-01 Prepared: 10/13/17 Analyzed: 10/16/17		
Antimony 98.6 0.600 2.00 ug/L 100.00 U 98.6 70-130		
Arsenic 95.6 0.320 2.00 ug/L 100.00 9.03 86.6 70-130		
Cadmium 80.5 0.100 0.500 ug/L 100.00 U 80.5 70-130		
Cobalt 89.4 0.0400 2.00 ug/L 100.00 0.453 89.0 70-130		
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Selenium 81.0 0.200 2.00 ug/L 100.00 0.990 80.0 70-130		
Thallium 87.7 0.100 0.500 ug/L 100.00 U 87.7 70-130		



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### **Total Recoverable Metals by 200 Series - Quality Control**

Analyte	Result	MDL	PQL	Units	Spike Level	Source Result	%Rec	%Rec Limits	RPD	RPD Limit	Qualifier
Batch 17J0116 - EPA 200.8											
Matrix Spike Dup (17J0116-MSD1)		Sourc	ce: L17J002	2-01	Prepared: 1	0/13/17 Ar	nalyzed: 10	/16/17			
Antimony	100	3.00	10.0	ug/L	100.00	U	100	70-130	2.63	20	
Arsenic	98.4	1.60	10.0	ug/L	100.00	U	98.4	70-130	2.14	20	
Cadmium	103	0.500	2.50	ug/L	100.00	U	103	70-130	3.64	20	
Cobalt	101	0.200	10.0	ug/L	100.00	U	101	70-130	4.37	20	
Lead	0.0959	0.000400	0.0100	mg/L	0.10000	U	95.9	70-130	5.68	20	
Selenium	103	1.00	10.0	ug/L	100.00	U	103	70-130	4.36	20	
Thallium	95.3	0.500	2.50	ug/L	100.00	U	95.3	70-130	5.33	20	
Matrix Spike Dup (17J0116-MSD2)		Sourc	ce: L17J115	5-01	Prepared: 1	0/13/17 Ar	nalyzed: 10	/16/17			
Antimony	100	0.600	2.00	ug/L	100.00	U	100	70-130	1.91	20	<del></del>
Arsenic	96.8	0.320	2.00	ug/L	100.00	9.03	87.8	70-130	1.30	20	
Cadmium	80.2	0.100	0.500	ug/L	100.00	U	80.2	70-130	0.392	20	
Cobalt	91.4	0.0400	2.00	ug/L	100.00	0.453	90.9	70-130	2.19	20	
Lead	0.0830	8.00E-5	0.00200	mg/L	0.10000	U	83.0	70-130	0.740	20	
Selenium	83.1	0.200	2.00	ug/L	100.00	0.990	82.1	70-130	2.51	20	
Thallium	87.2	0.100	0.500	ug/L	100.00	U	87.2	70-130	0.629	20	



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### **General Chemistry Parameters - Quality Control**

	D. I	MDI	DOL	<b>T</b> T '	Spike	Source	0/ <b>D</b>	%Rec	DDD	RPD	0 1.0
Analyte	Result	MDL	PQL	Units	Level	Result	%Rec	Limits	RPD	Limit	Qualifier
Batch 17J0212 - SM 2540C											
Blank (17J0212-BLK1)					Prepared &	ն Analyzed:	10/18/17				
Total Dissolved Solids	12.0	12.0	20.0	mg/L							U
LCS (17J0212-BS1)					Prepared &	k Analyzed:	10/18/17				
Total Dissolved Solids	994	12.0	20.0	mg/L	1000.0		99.4	80-120			
Duplicate (17J0212-DUP1)		Sour	ce: L17J013	3-01	Prepared &	analyzed:	10/18/17				
Total Dissolved Solids	202	12.0	20.0	mg/L		201			0.496	10	
Duplicate (17J0212-DUP2)		Sour	ce: L17J01	4-01	Prepared &	k Analyzed:	10/18/17				
Total Dissolved Solids	3740	120	200	mg/L		3860			3.16	10	
Batch 17J0255 - EPA 300.0											
Blank (17J0255-BLK1)					Prepared &	k Analyzed:	10/24/17				
Chloride	0.0200	0.0200	0.500	mg/L							U
Fluoride	0.0100	0.0100	0.0500	mg/L							U
Sulfate	0.500	0.500	2.00	mg/L							U
LCS (17J0255-BS1)					Prepared &	k Analyzed:	10/24/17				
Chloride	4.96	0.0200	0.500	mg/L	5.0000		99.3	90-110			
Fluoride	5.00	0.0100	0.0500	mg/L	5.0000		100	90-110			
Sulfate	5.15	0.500	2.00	mg/L	5.0000		103	90-110			
Matrix Spike (17J0255-MS1)		Sour	ce: L17J013	3-04	Prepared &	k Analyzed:	10/24/17				
Chloride	2660	2.00	50.0	mg/L	500.00	2070	119	90-110			J-
Fluoride	560	1.00	5.00	mg/L	500.00	3.03	111	90-110			J-
Sulfate	3250	50.0	200	mg/L	500.00	2750	99.5	90-110			



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### **General Chemistry Parameters - Quality Control**

Analyta	Result	MDL	PQL	Units	Spike Level	Source Result	%Rec	%Rec Limits	RPD	RPD Limit	Qualifier
Analyte	Result	MDL	rQL	Units	Level	Result	70Rec	Limits	KrD	LIIIII	Quanner
Batch 17J0255 - EPA 300.0											
Matrix Spike (17J0255-MS2)		Sour	ce: L17J02	6-04	Prepared &	Analyzed:	10/24/17				
Chloride	74.7	0.0200	0.500	mg/L	5.0000	73.8	18.8	90-110			J-
Fluoride	5.44	0.0100	0.0500	mg/L	5.0000	0.395	101	90-110			
Sulfate	5.26	0.500	2.00	mg/L	5.0000	U	105	90-110			
Matrix Spike Dup (17J0255-MSD1)		Sour	ce: L17J013	3-04	Prepared &	Analyzed:	10/24/17				
Chloride	2630	2.00	50.0	mg/L	500.00	2070	112	90-110	1.25	20	J-
Fluoride	557	1.00	5.00	mg/L	500.00	3.03	111	90-110	0.528	20	J-
Sulfate	3210	50.0	200	mg/L	500.00	2750	92.6	90-110	1.08	20	
Matrix Spike Dup (17J0255-MSD2)		Sour	ce: L17J020	6-04	Prepared &	Analyzed:	10/24/17				
Chloride	74.7	0.0200	0.500	mg/L	5.0000	73.8	18.7	90-110	0.00695	20	J-
Fluoride	5.52	0.0100	0.0500	mg/L	5.0000	0.395	102	90-110	1.37	20	
Sulfate	5.30	0.500	2.00	mg/L	5.0000	U	106	90-110	0.661	20	
Batch 17J0272 - EPA 300.0											
Blank (17J0272-BLK1)					Prepared &	Analyzed:	10/25/17				
Sulfate	0.500	0.500	2.00	mg/L							U
LCS (17J0272-BS1)					Prepared &	Analyzed:	10/25/17				
Sulfate	5.06	0.500	2.00	mg/L	5.0000		101	90-110			
Matrix Spike (17J0272-MS1)		Sour	ce: L17J002	2-11	Prepared &	Analyzed:	10/25/17				
Sulfate	1320	5.00	20.0	mg/L	50.000		NR	90-110			J-
Matrix Spike Dup (17J0272-MSD1)		Sour	ce: L17J002	2-11	Prepared &	Analyzed:	10/25/17				
Sulfate	1390	5.00	20.0	mg/L	50.000		NR	90-110	5.13	20	J-

Tampa Electric Company, Laboratory Services

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Peggy Penner, Manager, Laboratory Services

Laboratory Services certifies that the test result in this report meet all requirements of the NELAC standards, unless indicated otherwise in the body of the report. Unless otherwise noted, all methods followed are per the most current published version of 40 CFR Part 136, Table B. Results reported on this report pertain to the above referenced sample only.

#### DEP-SOP-001/01

#### FS 2200 Groundwater Sampling Form FD 9000-24

### **GROUNDWATER SAMPLING LOG**

	FACILITY NAME:		Big Be	end			SITE LOCATION:		Apollo l	Beach, FL.			
DIRBOY_   DIRB	WELL NO:	В	BS-CCR-1			SAMPLE ID:	L17J	115-01 A		DATE:	10/13/17		
DAMPETER (LOUNDAY   1/44   Depth   12.32   Sent   2.23   Georgi   TOWNTERNEE   1.32   PRAILER   PP						PURGI	NG DATA						
WELL VOLUME   PROFILE   1	WELL DIAMETER (inches	s)	TUBING DIAMETER (inc	hes) 1/4				STATIC DEF	PTH (feet): 7.32	PURGE PUMP T'	YPE PP		
SAMPLED   CONTAINANTON   PRESENTING   PRESENTANCE   PRESENTING   PRESENTANCE   PRESENTAN	WELL VOLUME PURG	E:					,		( /	ļ.			
Company   Comp	(only fillout if applicable	)		= (		feet -		feet) x		gallons/foot	=	g	jallons
SAMPLED BY (PRINT)			1 EQL	JIPMENT VOL	= PUMP VOLUM	E + (TUBING	CAPACITY X 1	TUBING LENG	GTH) + FLOW CE	LL VOLUME			
DEPTH IN WELL (Serv.   17.32   DEPTH IN WELL (Serv.   17.32   NITATED AT:   11.172   PURCED (gallors):   1.5	()	/		=(	0	gallons + (	0.0026 gallo	ons/foot X	23.3 feet ) +	0.06	gallons =	0.12	gallons
TIME VOLUME VOLUME VOLUME VOLUME VOLUME VOLUME VOLUME VOLUMENT VO	INITIAL PUMP OR DEPTH IN WELL (1			FINAL PUMP DEPTH IN W	ELL (feet): 17	.32	PURGING INITIATED AT:	11:17	ENDED AT:	11:32	TOTAL VOLUI PURGED (gall	ME ons):	1.5
11:30	TIME	PURGED	VOLUME PURGED	RATE	TO WATER	(standard		(µmhos/cm	OXYGEN (circle mg/l or				
11:32	11:28	1.10	1.10	0.10	7.41	6.83	26.47	4268	0.20	1.86	Clear	N	one
WELL CAPACITY (Salons Per Foot): 0.75" - 0.02. 1" - 0.04. 1.25" - 0.06. 2" - 0.16. 3" - 0.37. 4" - 0.05. 5" + 1.02. 6" - 1.47. 12" - 5.80  VIUNINO NOBISED BA. CAPACITY (JOINT): 197" - 0.00000. 376" - 0.001. 197" - 0.0010. 58" - 0.010. 58"	11:30	0.21	1.31	0.11	7.40	6.83	26.53	4261	0.24	0.97	Clear	N	one
Name   Name	11:32	0.20	1.51	0.10	7.41	6.83	26.57	4258	0.24	0.89	Clear	N	one
Name   Name													
Name   Name													
Name   Name													
Name   Name													
Name   Name													
Name   Name													
Name   Name	WELL CARACITY (C			1, 004	10511 000 01	0.40			100 01 117	401 500			
SAMPLE D BY (PRINT) / AFFILIATION: RAB   TECO	,	,				<b>5/16"</b> = 0.004;	<b>3/8"</b> = 0.006;	1/2" = 0.0					
RAB   TECO	0.440, 50.07 (0.0		011		DAMBLED (O) OL		ING DATA	<b>L</b>	Т		T		
SAMPLE PINNE   PINNE   SAMPLE PINNE   SAMPLE PINNE   PINNE   SAMPLE PINNE   PINNE   SAMPLE PINNE   PINNE   PINNE   SAMPLE PINNE   PIN	SAMPLED BY (PR	,		TECO	SAMPLER (S) SI	GNATURES:			SAMPLING INITIATED AT:	11.32	SAMPLING ENDED AT: 1	1.50	
SAMPLE CONTAINER SPECIFICATION  SAMPLE ID CODE  ## MATERIAL CODE	PUMP OR TUBING DEPTH IN WELL (1	}		TEGO	SAMPLE PUMP FLOW RATE (ml	per minute):	;	383	TUBING MATERIAL CODE		I.	1.00	
SAMPLE CONTAINER SPECIFICATION  SAMPLE ID CODE  ## MATERIAL CODE ## MATERIAL CODE ## MATER	FIELD DECONTAN	MINATION: Y	′ □ N <b>▽</b>		FIELD-FILTERED	): ent Tybe	N ✓ FILT	ER SIZE:	μm	DUPLICATE:	Y 🔲 N 🔽	1	
## MATERIAL CODE  ## MATERIAL CODE  ## VOLUME							SERVATION		INTE	NDED	SA	MPLING	
### SAMPLE ID CODE		#	MATERIAL	VOLUME									
@Met-250 2 PE 250ml HNO3 1ml <2 Metals PP  @Rad-1L 2 PE 1L HNO3 5ml <2 Radiologicals PP  REMARKS:  (1) Sample bottles pre-preserved at laboratory prior to sample collection.  MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)	SAMPLE ID CODE	CONTAINERS	CODE	VOLOIVIL	USED	ADDED IN	N FIELD (ml) (1)	pH	· · ·				
@Met-250 2 PE 250ml HNO3 1ml <2 Metals PP  @Rad-1L 2 PE 1L HNO3 5ml <2 Radiologicals PP  REMARKS:  (1) Sample bottles pre-preserved at laboratory prior to sample collection.  MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)	Ol 500	4	DE	F00I	NONE	N	ONE	NI/A	lnore	vanias		DD	
@Rad-1L 2 PE 1L HNO3 5ml <2 Radiologicals PP    Radiologicals   PP	@110-500	'	PE	SOUTH	NONE	IN IN	ONE	IN/A	inorg	Janics		FF	
@Rad-1L 2 PE 1L HNO3 5ml <2 Radiologicals PP    Radiologicals   PP													
@Rad-1L 2 PE 1L HNO3 5ml <2 Radiologicals PP    Radiologicals   PP	@Met-250	2	PE	250ml	HNO3		1ml	<2	Me	tals		PP	
REMARKS:  (1) Sample bottles pre-preserved at laboratory prior to sample collection.  MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)													
(1) Sample bottles pre-preserved at laboratory prior to sample collection.  MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)													
(1) Sample bottles pre-preserved at laboratory prior to sample collection.  MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)													
(1) Sample bottles pre-preserved at laboratory prior to sample collection.  MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)													
(1) Sample bottles pre-preserved at laboratory prior to sample collection.  MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)													
(1) Sample bottles pre-preserved at laboratory prior to sample collection.  MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)													
(1) Sample bottles pre-preserved at laboratory prior to sample collection.  MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)													
MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O= Other (Specify)	REMARKS:							•	•		•		
	•						mranidan -: 2	- Ciliaar - :	T - Toflon: 0- 0"	nor (Chaoif à			
						•			, , , , , , , , , , , , , , , , , , , ,				

NOTES:

optionally,  $\pm$  0.2 mg/L or  $\pm$  10% (whichever is greater) **Turbidity**: all readings  $\leq$  20 NTU; optionally  $\pm$  5 NTU or 10% (whichever is greater)

<sup>1.</sup> The above do not constitute all of the information requierd by Chapter 62-160, F.A.C.

<sup>2.</sup> STABILIZATION CRITERIA FOR RANGE OF VARIATION OF LAST THREE CONSECUTIVE READINGS (SEE FS 2212. SECTION 3)

pH: ± 0.2 units Temperature: ± 0.2 °C Specific Conductance: ± 5% Dissolved Oxygen: all readings ≤ 20% saturation (see Table FS 2200-2);

### **GROUNDWATER SAMPLING LOG**

SITE NAME:		Big Be	end			SITE LOCATION:		Apollo I	Beach, FL.		
WELL NO:	В	BS-CCR-2	2		SAMPLE ID:	L17J1	15-02 A		DATE:	10/13/17	
					PURGI	NG DATA			•		
WELL DIAMETER (inches	s)	TUBING DIAMETER (inc	hes) 1/4	WELL SCREEN IN DEPTH 11.84		21.84 (feet)	STATIC DEPTH TO WATER (fe	d et): 6.88	PURGE PUMP T' OR BAILER:	YPE PP	
WELL VOLUME P	URGE:	,	, .,	AL WELL DEPTH -					1-		
(only fillout if applic	able)		= (		feet -		feet) x		gallons/foot	=	gallons
EQUIPMENT VOL		1 EQI	JIPMENT VOL	= PUMP VOLUM	E + (TUBING	CAPACITY X T	UBING LENG	GTH) + FLOW CE	LL VOLUME		
			=(	0	gallons + (		ons/foot X	22.84 feet	)+ 0.06	gallons =	0.12 gallons
INITIAL PUMP OR DEPTH IN WELL (1	TUBING feet): 16.84	1	FINAL PUMP DEPTH IN W	OR TUBING ELL (feet): 16	.84	PURGING INITIATED AT:	10:48	PURGING ENDED AT:	11:00	TOTAL VOLUI PURGED (gall	ME ons): 1.20
TIME	VOLUME PURGED (GALLONS)	CUMUL. VOLUME PURGED (GALLONS)	PURGE RATE (GPM)	DEPTH TO WATER (FEET)	pH (standard units)	TEMP. (°C)	COND. (µmhos/cm OR µS/cm)	DISSOLVED OXYGEN (circle(mg/l) or % saturation)	TURBIDITY (NTUs)	COLOR (describe)	ODOR (describe)
10:56	0.80	0.80	0.10	6.94	6.87	26.44	1348	0.19	3.18	Lt. Yellow	None
10:58	0.20	1.00	0.10	6.94	6.86	26.45	1350	0.16	2.80	Lt. Yellow	None
11:00	0.20	1.20	0.10	6.95	6.87	26.46	1350	0.20	3.03	Lt. Yellow	None
WELL CAPACITY (Ga	-ll D F4):	<b>0.75"</b> = 0.02:	1" = 0.04;	<b>1.25</b> " = 0.06; <b>2</b> " =	0.40: 0!! -	0.37; 4" = 0.6	65; <b>5</b> " =	1.02; <b>6"</b> = 1.47;	<b>12"</b> = 5.88		
TUBING INSIDE DIA.	,		3/16" = 0.0014;		5/16" = 0.004;		1/2" = 0.0				
SAMPLED BY (PR	INIT) / AEEII IATI	ON:		SAMPLER (S) SIG		ING DATA		SAMPLING		SAMPLING	
OAWI ELD DI (I IV	RAE		TECO	OAWII ELIY (O) OIC	JIVATOREO.			INITIATED AT:	11:00	ENDED AT:	11:10
PUMP OR TUBING DEPTH IN WELL (1	et): 16.8	3		SAMPLE PUMP FLOW RATE (mL	per minute):	3	380	TUBING MATERIAL CODE	: PE	/S	
FIELD DECONTAN	MINATION:	Y		FIELD-FILTERED Filtration Equipme	: nt Tyre	N ✓ FILTE	ER SIZE:	μm	DUPLICATE:	Y N	7
	SAMPLE CON			r iiti daon Equipino	SAMPLE PRE	ESERVATION		INTE	I NDED	SA	MPLING
	SPECIFICA #	MATERIAL	VOLUME	PRESERVATIVE	_	TAL VOL.	FINAL	ANALYSI	S AND/OR HOD	EQU	JIPMENT CODE
SAMPLE ID CODE	CONTAINERS	CODE	VOLUME	USED	ADDED IN	N FIELD (ml) (1)	pН				
@lna F00	4	PE	F00mal	NONE	N	ONE	NI/A	Inore	anico		PP
@Ino-500	1	PE	500ml	NONE	IN IN	ONE	N/A	inorg	janics		rr
@Met-250	2	PE	250ml	HNO3		1ml	<2	Me	tals		PP
@Rad-1L	2	PE	1L	HNO3		5ml	<2	Radiol	ogicals		PP
	-	-								-	
DELLASIO	<u> </u>	l								<u> </u>	
REMARKS: (1) Sample bo	ttles pre-pres	served at lah	oratory pric	or to sample co	llection						
MATERIAL CODE			= Clear Glass			• = Polypropylene	; <b>S</b> = Silic	one; <b>T</b> = Teflon;	O= Other (Spe	cify)	
SAMPLING/PURGIN EQUIPMENT CODE	NG A	APP = After Perist	altic Pump; B	= Bailer; <b>BP</b> = Blad	der Pump; ES	GP = Electric Subm	irsable Pump;	PP = Peristaltic Pum Trap; O = Other (Spe	np ecify)		
NOTES:				nformation requi				ap, <b>-</b> Outer (Ope			

1. The above do not constitute all of the information requierd by Chapter 62-160, F.A.C.

optionally,  $\pm$  0.2 mg/L or  $\pm$  10% (whichever is greater) Turbidity: all readings  $\leq$  20 NTU; optionally  $\pm$  5 NTU or 10% (whichever is greater)

<sup>2.</sup> STABILIZATION CRITERIA FOR RANGE OF VARIATION OF LAST THREE CONSECUTIVE READINGS (SEE FS 2212. SECTION 3) pH: ± 0.2 units Temperature: ± 0.2 °C Specific Conductance: ± 5% Dissolved Oxygen: all readings ≤ 20% saturation (see Table FS 2200-2);

### **GROUNDWATER SAMPLING LOG**

SITE NAME:		Big Be	end			SITE LOCATION:		Apollo l	Beach, FL.		
WELL NO:	В	BS-CCR-3	3		SAMPLE ID:	L17J	115-03 A		DATE:	10/13/17	
				_		NG DATA					
WELL DIAMETER (inches	s)	TUBING DIAMETER (inc	hes) 1/4	WELL SCREEN I DEPTH 13.23		23.23 (feet)	STATIC DEF		PURGE PUMP T' OR BAILER:	YPE PP	
WELL VOLUME P	URGE:	1 WELL VO	LUME = (TOT	AL WELL DEPTH	- STATIC DEP	TH TO WATER)	X WELL CA	APACITY	*		
(only illout if applic	abic)		= (		feet -		feet) x		gallons/foo	ot =	gallons
(only fillout if applic		1 EQU	JIPMENT VOL	= PUMP VOLUM	IE + (TUBING	CAPACITY X T	UBING LENG	STH) + FLOW CE	LL VOLUME		
			=(	0	gallons + (	0.0026 gallo	ons/foot X	24.23 fee	et)+ 0.06	gallons =	0.12 gallons
INITIAL PUMP OR DEPTH IN WELL (			FINAL PUMP DEPTH IN W		3.23	PURGING INITIATED AT:	10:13	PURGING ENDED AT:	10:26	TOTAL VOLUI PURGED (gall	ME ons): 0.63
TIME	VOLUME	CUMUL. VOLUME	PURGE	DEPTH TO	pH	TEMP.	COND.	DISSOLVED OXYGEN	TURBIDITY	COLOR	ODOR
TIME	PURGED (GALLONS)	PURGED (GALLONS)	RATE (GPM)	WATER (FEET)	(standard units)	(°C)	(μmhos/cm OR μS/cm)	(circle mg/l or % saturation)	(NTUs)	(describe)	(describe)
10:22	0.43	0.43	0.05	6.72	6.47	27.31	1785	0.36	1.59	Yellow	Mild
10:24	0.10	0.53	0.05	6.72	6.45	27.20	1763	0.50	1.13	Yellow	Mild
10:26	0.10	0.63	0.05	6.71	6.44	27.18	1747	0.37	2.39	Yellow	Mild
WELL CAPACITY (G	allons Per Foot):	<b>0.75"</b> = 0.02;	1" = 0.04;	1.25" = 0.06: 2" =	= 0.16; 3" =	0.37: <b>4"</b> = 0.0	35; <b>5</b> " =	1.02; <b>6"</b> = 1.47;	<b>12"</b> = 5.88		
TUBING INSIDE DIA.	,			1/4" = 0.0026;	<b>5/16"</b> = 0.004;	<b>3/8"</b> = 0.006;	1/2" = 0.0				
SAMPLED BY (PR	INT) / AFFILIATI	ON:		SAMPLER (S) SI		ING DATA		SAMPLING		SAMPLING	
	RAE		TECO	, ,				INITIATED AT: 10	:26	ENDED AT:	0:42
PUMP OR TUBINO DEPTH IN WELL (	Feet): 18.2	2		SAMPLE PUMP FLOW RATE (ml	L per minute):	,	187	TUBING MATERIAL CODE	: PE	/S	
FIELD DECONTAN	MINATION:	Y □ N ☑		FIELD-FILTERED	D: pot Type	N FILTI	ER SIZE:	μm	DUPLICATE:	Y 🔲 N 🖪	7
	SAMPLE CON SPECIFICA				SAMPLE PRE	SERVATION		INTE	NDED	SA	MPLING
0.44DI 5 ID 00D5	#	MATERIAL	VOLUME	PRESERVATIVE		AL VOL.	FINAL		S AND/OR THOD		JIPMENT CODE
SAMPLE ID CODE	CONTAINERS	CODE		USED	ADDED IN	I FIELD (ml) (1)	pН				
@Ino-500	1	PE	500ml	NONE	N	ONE	N/A	Inore	anics		PP
@110-300	'	F L	3001111	NONE	i iv	ONL	IN/A	morg	jariics		11
@Met-250	2	PE	250ml	HNO3		1ml	<2	Me	tals		PP
@Rad-1L	2	PE	1L	HNO3		5ml	<2		ogicals		PP
REMARKS: (1) Sample bo	ttlee pre pres	onyod at lah	orotory neig	or to comple a	ollootion						
MATERIAL CODE	- ' '		= Clear Glass			= Polypropylene	e; <b>S</b> = Silic	one; <b>T</b> = Teflon;	O= Other (Spe	ecify)	
SAMPLING/PURGIT	NG /	APP = After Perist	altic Pump; B	= Bailer; BP = Blad	dder Pump; ES	P = Electric Subm	irsable Pump;	PP = Peristaltic Pum	np		

NOTES: 1. The above do not constitute all of the information requierd by Chapter 62-160, F.A.C.

 $optionally, \pm 0.2 \ mg/L \ or \pm 10\% \ (whichever is \ greater) \ \ Turbidity: \ all \ readings \leq 20 \ NTU; \ optionally \pm 5 \ NTU \ or 10\% \ (whichever is \ greater)$ 

<sup>2.</sup> STABILIZATION CRITERIA FOR RANGE OF VARIATION OF LAST THREE CONSECUTIVE READINGS (SEE FS 2212. SECTION 3)

pH: ± 0.2 units Temperature: ± 0.2 °C Specific Conductance: ± 5% Dissolved Oxygen: all readings ≤ 20% saturation (see Table FS 2200-2);

#### **GROUNDWATER SAMPLING LOG**

PURGING DATA	SITE NAME:		Big Be	end			SITE LOCATION:		Apollo	Beach, FL.		
Vict.   DAMETER (incline)   DAMETER (incline)   1   Vict.	WELL NO:	BBS	S-CCR-BW	<i>I</i> -1		SAMPLE ID:	L17J	115-04 A		DATE:	10/13/17	
DAME:   Page   DAME:   DAME:   Page   DAME:							NG DATA					
WELL VOLUME   PURPORE	WELL DIAMETER (inche	s)		thes) 1/4			44.30 (feet)	STATIC DEF	PTH (feet): 29.60	PURGE PUMP TO	YPE ESP	
Complement volume Purce	WELL VOLUME P	PURGE:	1 WELL VO	LUME = (TOT	AL WELL DEPTH	- STATIC DEF				I		
Comparison   Com	(only fillout if applic	cable)		= (		feet -		feet) x		gallons/foo	ot =	gallons
NITIAL PUMP OR TUBING	EQUIPMENT VOL (only fillout if applic	.UME PURGE: cable)	1 EQI	JIPMENT VOL	= PUMP VOLUM	E + (TUBING	CAPACITY X 1	UBING LENG	STH) + FLOW CE	LL VOLUME		
DEPTH N WELL (Feet)   39,30				=(	0	gallons + (	0.0026 galle	ons/foot X		et)+ 0.06	gallons =	0.32 gallor
TIME VOLUME VOLUME PURGED PURGED (earlier) (earlier dearlier) (earlier	INITIAL PUMP OR DEPTH IN WELL (		)	FINAL PUMP DEPTH IN W	ELL (feet): 39	.30	PURGING INITIATED AT:	9:49	PURGING ENDED AT:	10:01	TOTAL VOLUM PURGED (gall	ME ons): 8.
9:59 1.37 6.86 0.69 30.42 6.55 27.81 4499 0.57 4.40 Clear None  10:01 1.37 8.23 0.69 30.41 6.55 27.86 4570 0.40 2.51 Clear None  WELL CAPACITY (Callons Per Foot) 8.75 = 0.02 1*= 0.04 1.25*= 0.08 2*= 0.16 3*= 0.07 4*= 0.05 5*= 1.02 6*= 1.47 12*= 5.88 1.08 12*= 0.000 3**= 0.000 12*= 0.000 3**= 0.000 12*= 0.00	TIME	PURGED	VOLUME PURGED	RATE	TO WATER	(standard		(µmhos/cm	OXYGEN (circle mg/l or			
10:01	9:57	5.49	5.49	0.69	30.43	6.55	27.81	4384	0.87	7.30	Clear	None
WELL CAPACITY (Galions Per Fool): 0.75° = 0.02; 1° = 0.04; 1.25° = 0.06; 2° = 0.16; 3° = 0.37; 4° = 0.85; 5° = 1.02; 6° = 1.47; 12° = 5.88  TUBINOR INSIDE DIA. CAPACITY (Galions, Per Fool): 0.75° = 0.02; 1° = 0.04; 1.25° = 0.06; 2° = 0.16; 3° = 0.37; 4° = 0.85; 5° = 1.02; 6° = 1.47; 12° = 5.88  TUBINOR INSIDE DIA. CAPACITY (Galions, Per Fool): 30° = 0.010; 30° = 0.0	9:59	1.37	6.86	0.69	30.42	6.55	27.81	4499	0.57	4.40	Clear	None
TUBING INSIDE DIA CAPACITY (Gal/FL): 18" = 0.00006: 346" = 0.0014: 14" = 0.0026: 516" = 0.003: 348" = 0.005: 12" = 0.010: 588" = 0.016   SAMPLED BY (PRINT) / AFFILIATION: RAB   TECO   RAB   TECO   RAB   TECO   SIGNATURES:   SAMPLENG   SAMPL	10:01	1.37	8.23	0.69	30.41	6.55	27.86	4570	0.40	2.51	Clear	None
TUBING INSIDE DIA CAPACITY (Gal./FL): 18* = 0.0006: 3/16* = 0.0014: 14* = 0.0026: 5/18* = 0.005: 3/18* = 0.005: 1/2* = 0.010: 5/8* = 0.016   SAMPLENG DATA												
TUBING INSIDE DIA CAPACITY (Gal./FL): 18* = 0.0006: 3/16* = 0.0014: 14* = 0.0026: 5/16* = 0.004: 3/16* = 0.0016: 5/16* = 0.												
TUBING INSIDE DIA CAPACITY (Gal./FL): 18* = 0.0006: 3/16* = 0.0014: 14* = 0.0026: 5/18* = 0.005: 3/18* = 0.005: 1/2* = 0.010: 5/8* = 0.016   SAMPLENG DATA												
TUBING INSIDE DIA CAPACITY (Gal./FL): 18* = 0.0006: 3/16* = 0.0014: 14* = 0.0026: 5/16* = 0.004: 3/16* = 0.0016: 5/16* = 0.											1	
TUBING INSIDE DIA CAPACITY (Gal./FL): 18* = 0.0006: 3/16* = 0.0014: 14* = 0.0026: 5/18* = 0.005: 3/18* = 0.005: 1/2* = 0.010: 5/8* = 0.016   SAMPLENG DATA												
TUBING INSIDE DIA CAPACITY (Gal/FL): 18" = 0.00006: 346" = 0.0014: 14" = 0.0026: 516" = 0.003: 348" = 0.005: 12" = 0.010: 588" = 0.016   SAMPLED BY (PRINT) / AFFILIATION: RAB   TECO   RAB   TECO   RAB   TECO   SIGNATURES:   SAMPLENG   SAMPL											-	
SAMPLING DATA   SAMPLING   SAMP		,						- 1				= 5.88
SAMPLED BY (PRINT) / AFFILIATION:         RAB         TECO         SAMPLER (S) SIGNATURES:         SAMPLING INITIATED AT:         SAMPLING INITIATED AT:         SAMPLING INITIATED AT:         SAMPLING INITIATED AT:         10:01         10:04         10	TUBING INSIDE DI	A. CAPACITY (Ga	l./Ft.): <b>1/8"</b> = 0.00	0006; 3/16"	= 0.0014; <b>1/4"</b> =				6; <b>1/2"</b> = 0.0	010; <b>5/8</b>	<u>" = 0.016</u>	
PUMP OR TUBING   DEPTH IN WELL (feet): 39.3   SAMPLE PUMP   FLOW RATE (mL per minute): 2600   MATERIAL CODE: PE	SAMPLED BY (PF	RINT) / AFFILIATI	ON:		SAMPLER (S) SIG			•			SAMPLING ENDED AT:	
FIELD FILTERED: V N FILTER SIZE: µm DUPLICATE: Y N N M SAMPLE CONTAINER  SAMPLE CONTAINER  SAMPLE CONTAINER  SAMPLE PRESERVATION  SAMPLE PRESERVATION  SAMPLE PRESERVATION  SAMPLE D CODE # CONTAINERS   MATERIAL CODE   VOLUME   VO			3	TECO					10	):01		0:04
SAMPLE CONTAINER  SAMPLE CONTAINER  SPECIFICATION  SAMPLE OCTOR   SAMPLE CONTAINER  SPECIFICATION  SAMPLE CONTAINERS  SAMPLE PRESERVATION  SAMPLE PRESERVATION  SAMPLE PRESERVATION  SAMPLE PRESERVATION  SAMPLE PRESERVATION  SAMPLING  FINAL  ADDED IN FIELD (ml) (1) PH  ANALYSIS ANDIOR  METHOD  SAMPLING  EQUIPMENT  CODE  SAMPLING  ANALYSIS ANDIOR  METHOD  SAMPLING  EQUIPMENT  CODE  SAMPLING  SAMPLING  FINAL  ANALYSIS ANDIOR  METHOD  SAMPLING  EQUIPMENT  CODE  SAMPLING  EQUIPMENT  CODE  SAMPLING  FINAL  APP = After Peristallic Pump: PP = Polypropylene; SP = Electric Submirsable Pump: PP = Peristallic Pump  RESERVATIVE  SAMPLING  FINAL  ANALYSIS ANDIOR  ANALYSIS AND	PUMP OR TUBING DEPTH IN WELL (	G (feet): 39.3	3		SAMPLE PUMP FLOW RATE (ml	per minute):	20	600	TUBING MATERIAL CODE	: Pl	E	
SAMPLE ID CODE # CONTAINERS CODE VOLUME PRESERVATIVE USED TOTAL VOL ADDED IN FIELD (ml) (1) FINAL PH ANALYSIS AND/OR METHOD CODE  @Ino-500	FIELD DECONTAI	MINATION:	Y 🔲 N 🔽		FIELD-FILTERED	ent Type.	N 🔽 FILT	ER SIZE:	μm	DUPLICATE:	Y 🔲 N 🕟	Z
SAMPLE ID CODE						SAMPLE PRE	SERVATION					
@Ino-500 1 PE 500ml NONE NONE NONE N/A Inorganics ESP  @Met-250 2 PE 250ml HNO3 1ml <2 Metals ESP  @Rad-1L 2 PE 1L HNO3 5ml <2 Radiologicals ESP  REMARKS: (1) Sample bottles pre-preserved at laboratory prior to sample collection.  MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)  SAMPLING/PURGING  APP = After Peristaltic Pump; B = Baller; BP = Bladder Pump; ESP = Electric Submirsable Pump; PP = Peristaltic Pump	SAMPLE ID CODE	# CONTAINERS		VOLUME								
@Met-250 2 PE 250ml HNO3 1ml <2 Metals ESP  @Rad-1L 2 PE 1L HNO3 5ml <2 Radiologicals ESP  REMARKS:  (1) Sample bottles pre-preserved at laboratory prior to sample collection.  MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)  SAMPLING/PURGING APP = After Peristaltic Pump; B = Bailer; BP = Bladder Pump; ESP = Electric Submirsable Pump; PP = Peristaltic Pump						7,0020	*** ***** (****) (1)					
@Rad-1L 2 PE 1L HN03 5ml <2 Radiologicals ESP  REMARKS: (1) Sample bottles pre-preserved at laboratory prior to sample collection.  MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)  SAMPLING/PURGING APP = After Peristaltic Pump; B = Bailer; BP = Bladder Pump; ESP = Electric Submirsable Pump; PP = Peristaltic Pump	@Ino-500	1	PE	500ml	NONE	N	ONE	N/A	Inorg	ganics		ESP
@Rad-1L 2 PE 1L HN03 5ml <2 Radiologicals ESP  REMARKS: (1) Sample bottles pre-preserved at laboratory prior to sample collection.  MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)  SAMPLING/PURGING APP = After Peristaltic Pump; B = Bailer; BP = Bladder Pump; ESP = Electric Submirsable Pump; PP = Peristaltic Pump												
@Rad-1L 2 PE 1L HN03 5ml <2 Radiologicals ESP  REMARKS: (1) Sample bottles pre-preserved at laboratory prior to sample collection.  MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)  SAMPLING/PURGING APP = After Peristaltic Pump; B = Bailer; BP = Bladder Pump; ESP = Electric Submirsable Pump; PP = Peristaltic Pump												
REMARKS:  (1) Sample bottles pre-preserved at laboratory prior to sample collection.  MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)  SAMPLING/PURGING APP = After Peristaltic Pump; B = Bailer; BP = Bladder Pump; ESP = Electric Submirsable Pump; PP = Peristaltic Pump	@Met-250	2	PE	250ml	HNO3		1ml	<2	Me	etals	<u> </u>	ESP
(1) Sample bottles pre-preserved at laboratory prior to sample collection.  MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)  SAMPLING/PURGING APP = After Peristaltic Pump; B = Bailer; BP = Bladder Pump; ESP = Electric Submirsable Pump; PP = Peristaltic Pump	@Rad-1L	2	PE	1L	HNO3		5ml	<2	Radiol	logicals		ESP
(1) Sample bottles pre-preserved at laboratory prior to sample collection.  MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)  SAMPLING/PURGING APP = After Peristaltic Pump; B = Bailer; BP = Bladder Pump; ESP = Electric Submirsable Pump; PP = Peristaltic Pump											-	
(1) Sample bottles pre-preserved at laboratory prior to sample collection.  MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)  SAMPLING/PURGING APP = After Peristaltic Pump; B = Bailer; BP = Bladder Pump; ESP = Electric Submirsable Pump; PP = Peristaltic Pump											1	
(1) Sample bottles pre-preserved at laboratory prior to sample collection.  MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)  SAMPLING/PURGING APP = After Peristaltic Pump; B = Bailer; BP = Bladder Pump; ESP = Electric Submirsable Pump; PP = Peristaltic Pump												
(1) Sample bottles pre-preserved at laboratory prior to sample collection.  MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)  SAMPLING/PURGING APP = After Peristaltic Pump; B = Bailer; BP = Bladder Pump; ESP = Electric Submirsable Pump; PP = Peristaltic Pump											+	
(1) Sample bottles pre-preserved at laboratory prior to sample collection.  MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)  SAMPLING/PURGING APP = After Peristaltic Pump; B = Bailer; BP = Bladder Pump; ESP = Electric Submirsable Pump; PP = Peristaltic Pump												
MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)  SAMPLING/PURGING APP = After Peristaltic Pump; B = Bailer; BP = Bladder Pump; ESP = Electric Submirsable Pump; PP = Peristaltic Pump						-114:		<u> </u>	1		1	
SAMPLING/PURGING APP = After Peristaltic Pump; B = Bailer; BP = Bladder Pump; ESP = Electric Submirsable Pump; PP = Peristaltic Pump					•		= Polypronylene	e: <b>S</b> = Silic	one: <b>T</b> = Teflon	: <b>0</b> = Other (Sne	ecify)	
		NG A	APP = After Perist	taltic Pump; B	= Bailer; BP = Blad	der Pump; ES	SP = Electric Subm	irsable Pump;	PP = Peristaltic Pun	np		

NOTES: 1. The above do not constitute all of the information requierd by Chapter 62-160, F.A.C.

<sup>2.</sup> STABILIZATION CRITERIA FOR RANGE OF VARIATION OF LAST THREE CONSECUTIVE READINGS (SEE FS 2212. SECTION 3) pH: ± 0.2 units Temperature: ± 0.2 °C Specific Conductance: ± 5% Dissolved Oxygen: all readings ≤ 20% saturation (see Table FS 2200-2);

#### **GROUNDWATER SAMPLING LOG**

NAME:		Big Be	end			LOCATION:		Apollo	Beach, FL.			
WELL NO:	BBS	S-CCR-BW	<b>/-2</b>		SAMPLE ID:	L17J	115-05 A		DATE:	10/13/17		
		1		L		NG DATA	T					
WELL DIAMETER (inche	s)	TUBING DIAMETER (inc	thes) 1/4	WELL SCREEN II DEPTH 13.64		23.34 (feet)	STATIC DEF	PTH (feet): 7.38	PURGE PUMP T OR BAILER:	YPE PP		
WELL VOLUME P (only fillout if applic		1 WELL VO	LUME = (TOT	AL WELL DEPTH	STATIC DEF	PTH TO WATER)	X WELL CA	PACITY				
EQUIPMENT VOL	UME DUDGE.	4.50	= (	DUM DA VOLLINA	feet -	OADAOITY V	feet) x	TIL) . FLOW OF	gallons/foo	ot =	gallons	
(only fillout if applic	able)	1 EQI	JIPMENI VOL		,			TH) + FLOW CE			0.40	
INITIAL PUMP OR	TUBING		=( FINAL PUMP		gallons + (	1		24.64 fee		TOTAL VOLUM	0.12 gallons ⁄/E	
DEPTH IN WELL (	feet): 18.49	COMOL.	DEPTH IN W	ELL (feet): 18 DEPTH	.49	PURGING INITIATED AT:		ENDED AT:	9:32	PURGED (gallo	ons): 2.27	
TIME	VOLUME PURGED (GALLONS)	VOLUME PURGED (GALLONS)	PURGE RATE (GPM)	TO WATER (FEET)	pH (standard units)	TEMP. (°C)	COND. (µmhos/cm OR µS/cm)	OXYGEN (circle(mg/l) or % saturation)	TURBIDITY (NTUs)	COLOR (describe)	ODOR (describe)	
9:28	1.75	1.75	0.13	7.61	6.68	27.92	1706	0.39	4.98	Lt. Yellow	None	
9:30	0.26	2.01	0.13	7.62	6.69	27.95	1702	0.31	6.12	Lt. Yellow	None	
9:32	0.26	2.27	0.13	7.62	6.70	27.98	1699	0.28	3.96	Lt. Yellow	None	
										+		
WELL CAPACITY (	- ,	<b>0.75"</b> = 0.02;			06; <b>2"</b> = 0.0026;	0.16; <b>3</b> " = 0 <b>5/16</b> " = 0.004;	.37; <b>4</b> " <b>3/8</b> " = 0.00		: 1.02; <b>6"</b> = 1	1.47; <b>12</b> " =	= 5.88	
TOBING INSIDE DI	A. CAI ACITI (Cai		3/10 ·	- 0.0014, 1/4 -	_	ING DATA			110, <b>3/0</b>	- 0.010		
SAMPLED BY (PF	RINT) / AFFILIATI RAE		TECO	SAMPLER (S) SIG	GNATURES:			SAMPLING INITIATED AT: 9:	32	SAMPLING ENDED AT:	9:40	
PUMP OR TUBINO DEPTH IN WELL (				SAMPLE PUMP FLOW RATE (ml	ner minute):		503	TUBING MATERIAL CODE				
FIELD DECONTAIN		, Y		FIELD-FILTERED Filtration Equipme			ER SIZE:	μm	DUPLICATE:	Y □ N 🖸	<b>Z</b>	
	SAMPLE CON	ITAINER		i iiti ation Equipme		ESERVATION		INTE	NDED		MPLING	
	SPECIFICA	MATERIAL	VOLUME	PRESERVATIVE		TAL VOL.	FINAL				JIPMENT CODE	
SAMPLE ID CODE	# CONTAINERS	CODE	7 0201112	USED	ADDED II	N FIELD (ml) (1)	pН					
@Ino-500	1	PE	500ml	NONE	N	IONE	N/A	Inorc	anics	; PP		
<u>@iiio 000</u>			Coom	HOHE			1071	morg	jarnoo		• •	
@Met-250	2	PE	250ml	HNO3		1ml	<2	Me	tals	PP		
@Rad-1L	2	PE	1L	HNO3		5ml	<2	Radiol	ogicals		PP	
										<del>                                     </del>		
										1		
REMARKS:				1								
	ttles pre-pres	erved at lab	oratory pric	or to sample co	ollection.							
MATERIAL CODE			= Clear Glass		•	P = Polypropylene				ecify)		
SAMPLING/PURGII EQUIPMENT CODE	NG /	APP = After Perist RFPP = Reverse I	taitic Pump; <b>B</b> Flow Peristaltic l	= ʁaɪler; <b>BP</b> = Blad Pump; <b>SM</b> = Straw	ager Pump; <b>ES</b> Method (tubin)	SP = Electric Subm g Gravity Drain);	nrsable Pump; <b>VT</b> = Vacuum 1	PP = Peristaltic Pun rap; O = Other (Spe	np ecify)			

1. The above do not constitute all of the information requierd by Chapter 62-160, F.A.C.

NOTES:

<sup>2.</sup> STABILIZATION CRITERIA FOR RANGE OF VARIATION OF LAST THREE CONSECUTIVE READINGS (SEE FS 2212. SECTION 3)

pH: ± 0.2 units Temperature: ± 0.2 °C Specific Conductance: ± 5% Dissolved Oxygen: all readings ≤ 20% saturation (see Table FS 2200-2); optionally, ± 0.2 mg/L or ± 10% (whichever is greater) Turbidity: all readings ≤ 20 NTU; optionally ± 5 NTU or 10% (whichever is greater)

Sampler(s) / Big Bend 10/13/17 Initials RAB /TECO Initials File Name: 101317 Wells RAB Site: Date: Weather: Partly Cloudy & Warm Time Temp °C LIMS # **Loction Code** pH (SU) Cond(uMHOS) DO Mg/ Turbidity(NTU) Redox (mv) Sulfite (mg/L) Color NGVD mg/l PH TEMP-C COND-F DO TURB-N-F REDOX SO3-TR \$COLOR-W \$ODOR-W Time LEVEL BBS-CCR-1 L17J115-01 A 11:50 6.83 26.57 4258 0.24 0.89 -83.3 Clear None L17J115-02 A BBS-CCR-2 11:10 6.87 26.46 1350 0.20 3.03 -188.5 Lt. Yellow None LIMS # 250ml Cyan (3) 1L Inorg (1) 500ml Inorg (2) 250ml Inorg (3) 1L Mtls (1) 250ml Mtls (3) 1L Rads (1) 500ml Sulfide (2) 500ml Mtls (2) 250ml Nuts (3) 40ml Vial (6) 500 ml Nuts (2) 1L Rads Diss. (1) Total Containers ~ > L17J115-01 A 2 1 2 10 L17J115-02 A  $\overline{\mathbf{v}}$  $\overline{\mathbf{v}}$ 2 1) 1L plastic (PP) (3) 250ml plastic (PP) (2) 500ml plastic (PP) (4) 100ml coliform bottle (5) 1L amber glass (AG) (6) 40ml VOA vial (CG) Samples On Ice Sample Reciept Yes No SS 0107301Y ESS 0218201Y ESS 0307301Y ESS ESS ESS Time 14:18 emp 1.4 Preservation Pres ID Preservation Pres ID Preservation Pres ID IL bottles (rads): 5 ml HNO3 to pH <2 012558 250ml bottles (nuts): 1 ml H2SO4 to pH <2 500 ml bottles(Sulfide) 2ml NAOH/Zinc Acet. to pH >12 500 ml bottles (metals): 2 ml HNO3 to pH <2 40 ml Vial (TOC): 0.5 ml H2SO4 to pH <2 250 ml bottles (Cyan) 1g NAOH to pH >12 250 ml bottles (metal): 1 ml HNO3 to pH <2 012558 1L bottles (diss. rads): filtered with 0.45um, 5 ml HNO3 to pH <2 A checked box indicates that the sample was verified to a pH of <2 H Meter Calibration Buffer ID Buffer Value Cal Time ICV CCV Time Redox Cal Temp °C Theo Value mv Time Time Reading mv MPM08 1 019949D 236.2 7 7.01 7:02 7.03 7:06 7.11 14:29 Meter ID: 7:10 21.5 236.0 Aeter ID: 019074C 10 10.05 7:02 MPM08 14:33 21.1 233.5 236.2 DEP FT 1100 019303D 4.00 7:02 Inite: SII 4 Zobell Sol ID: Conductivity Meter Calib. Standard ID Std Value Cal Time ICV Time Time 019150B CCV MPM08 018805E 1000 1000 7:14 DO Meter Cal Time Temp °C Reading mg/l Theo Value mg/l Meter ID: FDEP FT 1200. Units: uMHOS 019100B 10000 9830 7:18 9791 14:01 Meter ID: 6:54 21.4 8.90 8.863 MPM08 14:42 20.8 8.97 8.950 ICV CCV **Furbidity Meter Calibration** Standard ID Std Value Acceptability Range Time Time TM07 019883 5.56 5.00 6.12 5.60 6:43 5.61 13:59 Meter ID: Barom, Pres FDEP FT 1600, Units: NTU 760 Sulfite Info (QC Check) (EPA 377.1) QC Result mg/ Time Titrator ID Na Thio ID DO 3 Pillow ID Starch Ind. ID lodate/lodide ID Therm ID pН Conduct.(%) DO (mg/l) Redox (mv) QC Std: 5ml (NaThio)/500ml DI=10mg/L MPM08 0.2 5 0.3 10 Well Capacities (gallons/ ft): 2" = 0.16 4" = 0.65 Tubing Inside Diam. Capacities Gallons/ft): 1/4" =0.0026, 3/8" =0.006 Purging Information Well Depth Depth to Water (ft) Well Capacity (gal) = Tubing Length Pump Volume Cell Volume 1 Eqpt. Volume Tubing Capacity (gal/ft.) Column Screen Intake Volume (gal) (gal) (gal) (gal) Well # Diam/ Comp Interval (ft) Depth (ft) BBS-CCR-1 2 10 17.32 22 32 7.32 15.00 0.16 2.40 0.0026 23.3 0 0.06 0.12 Volume (gal) Egpt. Table Time Rate (ml/mir Total Vol. (gal) Water Depth (ft) pH (SU) Temp °C Cond (uMHOS) DO (mg/L) Turbidity (NTU) urge Criteria quipment ID 0.2 ph:+/-1A 11:28 380 1.10 1.10 7.41 6.83 26.47 4268 0.20 1.86 **STABLE** Level Meter: WLM08 11:30 0.21 1.31 7.40 6.83 26.53 4261 0.24 0.97 emp°C+/- 0.2 **STABLE** Pump: PP 390 Purge Start: 11:17 11:32 380 0.20 1.51 7.41 6.83 26.57 4258 0.24 0.89 Cond % +/-5 STABLE Tubing: PE/S  $\checkmark$ Purge End: 00 % Sat. < 20 STABLE Dedicated Yes STABLE Tubing? 11:32 urb. NTU < 20 No urge Complete At 11:18 Gallons to Purge 0.12 Stablility Values = 6.83 26.57 4258 0.24 0.89 Well Well Water 1 Well Cell 1 Eqpt. Volume Tubing Capacity (gal/ft.) Pump Capacity (gal) = Depth (ft) Length (ft) Screen Intake Column (ft) Volume Volume Volume (ft) (gal) Diam/ Comp (gal) Interval (ft) Depth (ft) BBS-CCR-2 2 10 16.84 21.84 6.88 14.96 0.16 2.39 0.0026 22.84 Λ 0.06 0.12 Eapt. Table Time Rate (ml/min) Volume (gal) Total Vol. (gal) Water Depth (ft) pH (SU) Temp °C Cond (uMHOS) DO (mg/L) Turbidity (NTU) Purge Criteria Status Equipment ID 380 ph:+/-0.2 evel Meter: WLM08 1A 10:56 0.80 0.80 6.94 6.87 26.44 1348 0.19 3.18 **STABLE** 0.2 **STABLE** Pump: PP Purge Start: 10:58 380 0.20 1.00 6.94 6.86 26.45 1350 0.16 2.80 Cond % +/-5 11:00 **STABLE** Tubing: 10:48 380 0.20 1.20 6.95 6.87 26.46 1350 0.20 3.03 PE/S DO % Sat.< 20  $\checkmark$ **STABLE** Dedicated Yes Purge End: urb. NTU < 20 **STABLE** Tubing? 11.00 No urge Complete At 10:49 Gallons to Purge 0.12 Stablility Values = 6.87 26.46 1350 0.20 3.03 Comments:

**Total Time** 

**Total Miles** 

Site:	Big Be	end	l	Date:	10/13/17	File Name:	101317_	Wells_RAB	Weather:	Partly Clo	udy & Warm	Sampler(s) / Initials	RAB /TEC	O Initials	
LIMS#	Loction Code		Time	FE <sup>2</sup>	pH (SU)	Temp °C	Cond(uMHOS)	DO Mg/L	Turbidity(NTU)	Redox (mv)	Sulfite (mg/L)	Color	Odor	N	IGVD
				mg/l	PH	TEMP-C	COND-F	DO	TURB-N-F	REDOX	SO3-TR	\$COLOR-W	\$ODOR-W	Time	LEVEL
L17J115-03 A	BBS-CCR-3		10:42		6.44	27.18	1747	0.37	2.39	-249.3		Yellow	Mild		
	CCR-PZ-4														
LIMS#	250ml Cyan (3)	1L	L Inorg (1)	500ml Inorg (2)	250ml Inorg (3)	1L Mtls (1)	250ml Mtls (3)	1L Rads (1)	500ml Sulfide (2)	500ml Mtls (2)	250ml Nuts (3)	40ml Vial (6)	500 ml Nuts (2)	1L Rads Diss. (1)	Total Containers
L17J115-03 A				1			<b>☑</b> 2	☑ 2	a .	B		<u> </u>			5
							Y	>							3
(1) 1L plastic (PP)		(2) 5	500ml plastic	(PP)	(3) 250ml plastic	(PP)	(4) 100ml coliform b	ottle	(5) 1L amber glass (	(AG)	(6) 40ml VOA vial	(CG)		Samples On Ice	Sample Reciept
ESS	0107301Y	ESS	3	0218201Y	ESS	0307301Y	ESS		ESS		ESS			Yes No	Time 14:18
	Preservation				Pres ID		Preservation			Pres ID		Preservation		Pres ID	Temp 1.4 C
1L bottles (rads): 5 ml H	NO3 to pH <2				L 012558	250ml bottles (nu	ts): 1 ml H2SO4 to ph	l <2		L [	500 ml bottles(Sulf	ide) 2ml NAOH/Zinc	Acet. to pH >12	L	
500 ml bottles (metals):	2 ml HNO3 to pH <2					40 ml Vial (TOC):	0.5 ml H2SO4 to pH	<2			250 ml bottles (Cya	an) 1g NAOH to pH >	×12	L	
250 ml bottles (metal): 1	ml HNO3 to pH <2				L 012558	1L bottles (diss. ra	ads): filtered with 0.45	5um, 5 ml HNO3 to pH <2	2	L	A checked box in	dicates that the sam	nple was verified to	a pH of <2	
pH Meter Calibration		E	Buffer ID	Buffer Value	Cal	Time	ICV	Time	CCV	Time	Redox Cal	Time	Temp °C	Reading mv	Theo Value mv
Meter ID:	MPM08	L	019949D	7	7	7:02	7.03	7:06	7.11	14:29	Meter ID:	7:10	21.5	236.0	236.2
FDEP FT 1100		L	019074C	10	10	7:02	QC: (pH +/- 0.2) (Cc	ond +/- 5%) (DO +/- 0.3m	ıg/L) (Redox +/- 10m\	<i>'</i> )	MPM08	14:33	21.1	233.5	236.2
Units: SU		L	019303D	4	4	7:02	A checked box indi	cates ICV / CCV passed	1		Zobell Sol ID:				
Conductivity Meter Cal	lib.	St	tandard ID	Std Value	Cal	Time	ICV	Time	CCV	Time	L 50B				
Meter ID:	MPM08	L	018805E	1000	1000	7:14					DO Meter Cal	Time	Temp °C	Reading mg/l	Theo Value mg/l
FDEP FT 1200, Units: ul	MHOS	L	019100B	10000			9830	7:18	9791	14:01	Meter ID:	6:54	21.4	8.90	8.863
Turbidity Meter Calibra	ation	St	tandard ID	Std Value	Acceptabi	lity Range	ICV	Time	CCV	Time	MPM08	14:42	20.8	8.97	8.950
Meter ID:	TM07	L	019883	5.56	5.00	6.12	5.60	6:43	5.61	13:59	Barom. Pres				
FDEP FT 1600, Units: N	TU	L	0								760				
Sulfite Info (QC Check)	) (EPA 377.1)			QC Result mg/	I Time	Titrator ID	Na Thio ID	DO 3 Pillow ID	Starch Ind. ID	lodate/lodide ID	Therm ID	pН	Conduct.( %)	DO (mg/l)	Redox (mv)
QC Std: 5ml (NaThio)/50							L	L	L	L	MPM08	0.2	5	0.3	10
Purging Information		Wel	I Capacities	(gallons/ft): 2	" = 0.16 4" =0.65		Tubing Inside Diam	. Capacities Gallons/ft)	: 1/4" =0.0026 3/8" =6	0.006					
Well #	Diam/ Comp		Screen iterval (ft)	Intake Depth (ft)	Well Depth (ft)	Depth to Water (ft)	= Water Column (ft)	Well ( Capacity (gal) =	1 Well Volume (gal)	Tubing X Capacity (gal/ft.)	Tubing Length (ft)	Pump + Volume + (gal)	Cell Volume (gal)	1 Eqpt. Volume (gal)	
BBS-CCR-3	2		10	18.23	23.23	6.52	16.71	0.16	2.67	0.0026	24.23	0	0.06	0.12	
Purge Meth:	Time	Rat	te (ml/min)	Volume (gal)	Total Vol. (gal)	Water Depth (ft)	pH (SU)	Temp °C	Cond (uMHOS)	DO (mg/L)	Turbidity (NTU)	Purge Criteria	Status	Equipment ID	Eqpt. Table
1A	10:22		180	0.43	0.43	6.72	6.47	27.31	1785	0.36	1.59	ph:+/- 0.2	STABLE	Level Meter:	WLM08
Purge Start:	10:24		190	0.10	0.53	6.72	6.45	27.20	1763	0.50	1.13	Temp°C+/- 0.2	STABLE	Pump:	PP
10:13	10:26		190	0.10	0.63	6.71	6.44	27.18	1747	0.37	2.39	Cond % +/- 5	STABLE	Tubing:	PE/S
Purge End:												DO % Sat.< 20	STABLE	Dedicated	✓ Yes
10:26												Turb. NTU < 20	STABLE	Tubing?	□ No
Purge Complete A	t 10:16	Gal	llons to F	urge 0.12	Stablility	Values =	6.44	27.18	1747	0.37	2.39				
Well #	Diam/ Comp		Screen	Intake Depth (ft)	Well Depth (ft)	Depth to Water (ft)	= Water Column (ft)	Well ( Capacity (gal) =	1 Well Volume (gal)	Tubing X Capacity (gal/ft.)	Tubing Length (ft)	Pump + Volume (gal) +	Cell Volume (gal) =	1 Eqpt. Volume (gal)	
	2		10	14	18		18.00	0.16	2.88	0.0026	100	0	0.06	0.32	
Purge Meth:	Time	Ra	ite (ml/min)	Volume (gal)	Total Vol. (gal)	Water Depth (ft)	pH (SU)	Temp °C	Cond (uMHOS)	DO (mg/L)	Turbidity (NTU)	Purge Criteria	Status	Equipment ID	Egpt. Table
			, , ,,,,		(3)	. ( )	. , ,		,	,	, , ,	ph:+/- 0.2		Level Meter:	WLM08
		1										Temp°C+/- 0.2		Pump:	PP
Purge Start:								1	1			5	1	t - '	PE/S
Purge Start:												Cond % ±/		Tubing:	PE/3
												Cond % +/- DO % Sat.< 20		Tubing: Dedicated	☐ Yes
Purge Start:												Cond % +/-		t i	
	t	Gal	llons to F	Purge 0.32	Stablity <sup>1</sup>	/alues =						DO % Sat. < 20		Dedicated	☐ Yes

Sampler(s) / Initials

Site:	Big Be	nd	Date:	10/13/17	File Name:	101317_	Wells_RAB	Weather:	Partly Clou	ıdy & Warm	Initials	RAB /TEC	O Initials	
LIMS #	Loction Code	Time	FE <sup>2</sup>	pH (SU)	Temp °C	Cond(uMHOS)	DO Mg/L	Turbidity(NTU)	Redox (mv)	Sulfite (mg/L)	Color	Odor	N	IGVD
			mg/l	PH	TEMP-C	COND-F	DO	TURB-N-F	REDOX	SO3-TR	\$COLOR-W	\$ODOR-W	Time	LEVEL
L17J115-04 A	BBS-CCR-BW-1	10:04		6.6	27.9	4570	0.4	2.5	-18.4		Clear	None		
L17J115-05 A	BBS-CCR-BW-2	9:40		6.7	28.0	1699	0.3	4.0	-72.1		Lt. Yellow	None		
LIMS #	250ml Cyan (3)	1L Inorg (1)	500ml Inorg (2)	250ml Inorg (3)	1L Mtls (1)	250ml Mtls (3)	1L Rads (1)	500ml Sulfide (2)	500ml Mtls (2)	250ml Nuts (3)	40ml Vial (6)	500 ml Nuts (2)	1L Rads Diss. (1)	Total Containers
L17J115-04 A			1			<b>☑</b> 2	✓ 2				a a		п	40
L17J115-05 A			1			<b>⊻</b> 2	<b>☑</b> 2							10
(1) 1L plastic (PP)		(2) 500ml plastic	c (PP)	(3) 250ml plastic	(PP)	(4) 100ml coliform be	ottle	(5) 1L amber glass (	AG)	(6) 40ml VOA vial	(CG)		Samples On Ice	Sample Reciept
ESS	0107301Y	ESS	0218201Y	ESS	0307301Y	ESS		ESS		ESS		•	Yes No	Time 14:18
	Preservation			Pres ID		Preservation		-	Pres ID		Preservation		Pres ID	Temp 1.4
1L bottles (rads): 5 ml H	NO3 to pH <2			L 012558 🗹	250ml bottles (nu	s): 1 ml H2SO4 to pH	l <2		L 🗆	500 ml bottles(Sulfi	ide) 2ml NAOH/Zinc	Acet. to pH >12		
500 ml bottles (metals):	2 ml HNO3 to pH <2				40 ml Vial (TOC):	0.5 ml H2SO4 to pH	<2		L $\square$	250 ml bottles (Cya	n) 1g NAOH to pH >	12	_	
250 ml bottles (metal): 1	ml HNO3 to pH <2			L 012558 🗹	1L bottles (diss. ra	ads): filtered with 0.45	ium, 5 ml HNO3 to pH <2	2	L	A checked box inc	dicates that the sam	ple was verified to	a pH of <2	
pH Meter Calibration		Buffer ID	Buffer Value	Cal	Time	ICV	Time	CCV	Time	Redox Cal	Time	Temp °C	Reading mv	Theo Value mv
Meter ID:	MPM08	L 019949D	7	7	7:02	7.03	7:06	7.11	14:29	Meter ID:	7:10	21.5	236.0	236.2
FDEP FT 1100		L 019074C	10	10	7:02	QC: (pH +/- 0.2) (Co	nd +/- 5%) (DO +/- 0.3m	ng/L) (Redox +/- 10mv		MPM08	14:33	21.1	233.5	236.2
Units: SU		L 019303D	4	4	7:02		cates ICV / CCV passed			Zobell Sol ID:				
Conductivity Meter Ca	lib.	Standard ID	Std Value	Cal	Time	ICV	Time	CCV	Time	L 019150B				
Meter ID:	MPM08	L 018805E	1000	1000	7:14					DO Meter Cal	Time	Temp °C	Reading mg/l	Theo Value mg/l
FDEP FT 1200, Units: u	MHOS	L 019100B	10000			9830	7:18	9791	14:01	Meter ID:	6:54	21.4	8.90	8.863
Turbidity Meter Calibra	ation	Standard ID	Std Value	Acceptabi	ility Range	ICV	Time	CCV	Time	MPM08	14:42	20.8	8.97	8.950
Meter ID:	TM07	L 019883	5.56	5.00	6.12	5.60	6:43	5.61	13:59	Barom. Pres				
FDEP FT 1600, Units: N	ITU	L 0								760				
Sulfite Info (QC Check	) (EPA 377.1)		QC Result mg/l	Time	Titrator ID	Na Thio ID	DO 3 Pillow ID	Starch Ind. ID	lodate/lodide ID	Therm ID	pН	Conduct.( %)	DO (mg/l)	Redox (mv)
QC Std: 5ml (NaThio)/5						L	L	L	L	MPM08	0.2	5	0.3	10
Purging Information		Well Capacities	s (gallons/ ft): 2"	= 0.16 4" =0.65		Tubing Inside Diam	. Capacities Gallons/ft)	: 1/4" =0.0026 3/8" =0	0.006					
Well #	Diam/ Comp	Screen Interval (ft)	Intake Depth (ft)	Well Depth (ft)	Depth to Water (ft)	= Water Column (ft)	Well Capacity (gal) =	1 Well Volume (gal)	Tubing X Capacity (gal/ft.)	Tubing Length (ft)	Pump + Volume + (gal)	Cell Volume (gal) =	1 Eqpt. Volume (gal)	
BBS-CCR-BW-1	2	10	39.3	44.3	29.60	14.70	0.16	2.35	0.0026	100	0	0.06	0.32	
Purge Meth:	Time	Rate (ml/min)	Volume (gal)	Total Vol. (gal)	Water Depth (ft)	pH (SU)	Temp °C	Cond (uMHOS)	DO (mg/L)	Turbidity (NTU)	Purge Criteria	Status	Equipment ID	Eqpt. Table
1A	9:57	2600	5.49	5.49	30.43	6.55	27.81	4384	0.87	7.30	ph:+/- 0.2	STABLE	Level Meter:	WLM08
Purge Start:	9:59	2600	1.37	6.86	30.42	6.55	27.81	4499	0.57	4.40	Temp°C+/- 0.2	STABLE	Pump:	ESP
9:49	10:01	2600	1.37	8.23	30.41	6.55	27.86	4570	0.40	2.51	Cond % +/- 5	STABLE	Tubing:	PE
Purge End:											DO % Sat.< 20	STABLE	Dedicated	Yes
10:01											Turb. NTU < 20	STABLE	Tubing?	<b>☑</b> No
Purge Complete A	t 9:49	Gallons to F	ourge 0.32	Stability	Values =	6.55	27.86	4570	0.40	2.51				
Well #	Diam/ Comp	Screen Interval (ft)	Intake Depth (ft)	Well Depth (ft)	Depth to Water (ft)	= Water Column (ft) x	Well Capacity (gal) =	1 Well Volume (gal)	Tubing X Capacity (gal/ft.)	Tubing Length (ft)	Pump + Volume + (gal)	Cell Volume (gal) =	1 Eqpt. Volume (gal)	
BBS-CCR-BW-2	2	10	18.49	23.84	7.38	16.46	0.16	2.63	0.0026	24.64	0	0.06	0.12	
Purge Meth:	Time	Rate (ml/min)	Volume (gal)	Total Vol. (gal)	Water Depth (ft)	pH (SU)	Temp °C	Cond (uMHOS)	DO (mg/L)	Turbidity (NTU)	Purge Criteria	Status	Equipment ID	Eqpt. Table
1A	9:28	510	1.75	1.75	7.61	6.68	27.92	1706	0.39	4.98	ph:+/- 0.2	STABLE	Level Meter:	WLM08
Purge Start:	9:30	500	0.26	2.01	7.62	6.69	27.95	1702	0.31	6.12	0.2	STABLE	Pump:	PP
9:15	9:32	500	0.26	2.27	7.62	6.70	27.98	1699	0.28	3.96	Temp°C+/ Cond % +/- 5	STABLE	Tubing:	PE/S
Purge End:	0.02		0.20			5 5	200		0.20	0.00	DO % Sat.< 20	STABLE	Dedicated	✓ Yes
9:32											Turb. NTU < 20	STABLE	Tubing?	□ No
Purge Complete A	t 9:16	Gallons to F	urge 0.12	Stability	Values =	6.70	27.98	1699	0.28	3.96				
Comments:								1						
												Total Time	Total	Miles



THE LEADER IN ENVIRONMENTAL TESTING

# **ANALYTICAL REPORT**

TestAmerica Laboratories, Inc.

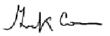
TestAmerica Tampa 6712 Benjamin Road Suite 100 Tampa, FL 33634 Tel: (813)885-7427

TestAmerica Job ID: 660-83441-1 Client Project/Site: L17J115

### For:

Tampa Electric Company 5012 Causeway Boulevard Tampa, Florida 33619

Attn: Ms. Peggy Penner



Authorized for release by: 10/23/2017 3:29:41 PM

Keaton Conner, Project Manager I (813)885-7427

keaton.conner@testamericainc.com

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The test results in this report meet all 2003 NELAC and 2009 TNI requirements for accredited parameters, exceptions are noted in this report. This report may not be reproduced except in full, and with written approval from the laboratory. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

Client: Tampa Electric Company Project/Site: L17J115 TestAmerica Job ID: 660-83441-1

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# **Sample Summary**

Client: Tampa Electric Company Project/Site: L17J115

TestAmerica Job ID: 660-83441-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
660-83441-1	L17J115-01	Water		
660-83441-2	L17J115-02	Water	10/13/17 11:10	10/17/17 09:10
660-83441-3	L17J115-03	Water	10/13/17 10:42	10/17/17 09:10
660-83441-4	L17J115-04	Water	10/13/17 10:04	10/17/17 09:10
660-83441-5	L17J115-05	Water	10/13/17 09:40	10/17/17 09:10

### **Definitions/Glossary**

Client: Tampa Electric Company

Project/Site: L17J115

TestAmerica Job ID: 660-83441-1

### **Qualifiers**

### **Metals**

Qualifier	Qualifier Description
Ī	The reported value is between the laboratory method detection limit and the laboratory practical quantitation limit.
V	Indicates that the analyte was detected at or above the method detection limit in both the sample and the associated method blank and the value of 10 times the blank value was equal to or greater than the associated sample value.

### Glossary

PQL

QC RER

RL RPD

TEF

TEQ

Practical Quantitation Limit

Relative Error Ratio (Radiochemistry)

Toxicity Equivalent Factor (Dioxin)

Toxicity Equivalent Quotient (Dioxin)

Reporting Limit or Requested Limit (Radiochemistry)

Relative Percent Difference, a measure of the relative difference between two points

**Quality Control** 

Abbreviation	These commonly used abbreviations may or may not be present in this report.
n	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)

TestAmerica Tampa

### **Case Narrative**

Client: Tampa Electric Company

Project/Site: L17J115

TestAmerica Job ID: 660-83441-1

Job ID: 660-83441-1

**Laboratory: TestAmerica Tampa** 

Narrative

### **CASE NARRATIVE**

**Client: Tampa Electric Company** 

Project: L17J115

Report Number: 660-83441-1

With the exceptions noted as flags or footnotes, standard analytical protocols were followed in the analysis of the samples and no problems were encountered or anomalies observed. In addition all laboratory quality control samples were within established control limits, with any exceptions noted below. Each sample was analyzed to achieve the lowest possible reporting limit within the constraints of the method. In the event of interference or analytes present at high concentrations, samples may be diluted. For diluted samples, the reporting limits are adjusted relative to the dilution required.

#### RECEIPT

The samples were received on 10/17/2017; the samples arrived in good condition, properly preserved and on ice. The temperature of the coolers at receipt was 2.6 C.

#### **TOTAL METALS (ICP)**

Samples L17J115-01 (660-83441-1), L17J115-02 (660-83441-2), L17J115-03 (660-83441-3), L17J115-04 (660-83441-4) and L17J115-05 (660-83441-5) were analyzed for total metals (ICP) in accordance with EPA Method 200.7. The samples were prepared on 10/19/2017 and analyzed on 10/20/2017.

The method blank for preparation batch 400-372467 and analytical batch 400-372725 contained Lithium above the method detection limit. This target analyte concentration was less than the reporting limit (RL); therefore, re-extraction and/or re-analysis of samples was not performed.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

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4 4

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14

## **Detection Summary**

Client: Tampa Electric Company

Project/Site: L17J115

TestAmerica Job ID: 660-83441-1

Client Sample ID: L17J115-01	Lab Sample ID: 660-83441-1								
Analyte	Result	Qualifier	PQL	MDL	Unit	Dil Fac D	Method	Prep Type	
Lithium	0.015	IV	0.050	0.0010	mg/L		200.7 Rev 4.4	Total/NA	
Client Sample ID: L17J115-02	Lab Sa	Lab Sample ID: 660-83441-2							
Analyte	Result	Qualifier	PQL	MDL	Unit	Dil Fac D	Method	Prep Type	
Lithium	0.016	IV	0.050	0.0010	mg/L		200.7 Rev 4.4	Total/NA	
Client Sample ID: L17J115-03	3					Lab Sample ID: 660-83441-3			
Analyte	Result	Qualifier	PQL	MDL	Unit	Dil Fac D	Method	Prep Type	
Lithium	0.011	IV	0.050	0.0010	mg/L		200.7 Rev 4.4	Total/NA	
Client Sample ID: L17J115-04	ı					Lab Sample ID: 660-83441-4			
Analyte	Result	Qualifier	PQL	MDL	Unit	Dil Fac D	Method	Prep Type	
Lithium	0.017	IV	0.050	0.0010	mg/L		200.7 Rev 4.4	Total/NA	
Client Sample ID: L17J115-05	5					Lab Sa	mple ID: 66	0-83441-5	
Analyte	Result	Qualifier	PQL	MDL	Unit	Dil Fac D	Method	Prep Type	
Lithium	0.0082	IV	0.050	0.0010	mg/L		200.7 Rev 4.4	Total/NA	

# **Client Sample Results**

Client: Tampa Electric Company

Project/Site: L17J115

TestAmerica Job ID: 660-83441-1

Client Sample ID: L17J115-01 Lab Sample ID: 660-83441-1 Date Collected: 10/13/17 11:50 **Matrix: Water** 

Date Received: 10/17/17 09:10

Method: 200.7 Rev 4.4 - Metals (ICP) Analyte Result Qualifier PQL **MDL** Unit D Prepared Analyzed Dil Fac 10/19/17 09:37 10/20/17 13:10 Lithium 0.015 I V 0.050 0.0010 mg/L

Client Sample ID: L17J115-02 Lab Sample ID: 660-83441-2

Date Collected: 10/13/17 11:10

Date Received: 10/17/17 09:10

Method: 200.7 Rev 4.4 - Metals (ICP) Analyte Result Qualifier PQL **MDL** Unit D **Prepared** 0.050 10/19/17 09:37 10/20/17 13:27 Lithium 0.016 IV 0.0010 mg/L

Client Sample ID: L17J115-03 Lab Sample ID: 660-83441-3

Date Collected: 10/13/17 10:42 Date Received: 10/17/17 09:10

Method: 200.7 Rev 4.4 - Metals (ICP)

Analyte Result Qualifier PQL MDL Unit Prepared Analyzed Dil Fac 0.0010 mg/L Lithium 0.011 IV 0.050 10/19/17 09:37 10/20/17 13:40

Client Sample ID: L17J115-04 Lab Sample ID: 660-83441-4 **Matrix: Water** 

Date Collected: 10/13/17 10:04 Date Received: 10/17/17 09:10

Method: 200.7 Rev 4.4 - Metals (ICP)

Analyte Result Qualifier PQL **MDL** Unit Prepared Analyzed Dil Fac <u>10/19/17 09:37</u> <u>10/20/17 13:43</u> Lithium 0.050 0.0010 mg/L 0.017 IV

Lab Sample ID: 660-83441-5 Client Sample ID: L17J115-05 **Matrix: Water** 

Date Collected: 10/13/17 09:40 Date Received: 10/17/17 09:10

Method: 200.7 Rev 4.4 - Metals (ICP)

Analyte Result Qualifier **PQL MDL** Unit Prepared Analyzed 0.0010 mg/L 0.050 10/19/17 09:37 10/20/17 13:47 Lithium 0.0082 IV

**Matrix: Water** 

**Matrix: Water** 

Dil Fac

Analyzed

# **QC Sample Results**

Client: Tampa Electric Company

TestAmerica Job ID: 660-83441-1

Project/Site: L17J115

Lithium

Method: 200.7 Rev 4.4 - Metals (ICP)

Lab Sample ID: MB 400-372467/1-A

Client Sample ID: Method Blank

Matrix: Water

Prep Type: Total/NA

Analysis Batch: 372725

MB MB

 Analyte
 Result
 Qualifier
 PQL
 MDL
 Unit
 D
 Prepared
 Analyzed
 Dil Fac

 Lithium
 0.00274
 I
 0.050
 0.0010
 mg/L
 10/19/17 09:37
 10/20/17 13:04
 1

Lab Sample ID: LCS 400-372467/2-A

Matrix: Water

Analysis Batch: 372725

Spike

Added

Added

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Prep Batch: 372467

%Rec.

Added

Result Qualifier Unit D %Rec Limits

1.05

mg/L

1.00

Lab Sample ID: 660-83441-1 MS Client Sample ID: L17J115-01 **Matrix: Water Prep Type: Total/NA Analysis Batch: 372725** Prep Batch: 372467 Sample Sample Spike MS MS %Rec. Result Qualifier Added Analyte Result Qualifier Limits Unit D %Rec Lithium 0.015 IV 1.00 1.16 mg/L 115 70 - 130

Lab Sample ID: 660-83441-1 MSD

Matrix: Water

Analysis Batch: 372725

Sample Sample Spike MSD MSD

Client Sample ID: L17J115-01

Prep Type: Total/NA

Prep Batch: 372467

RPD

Analyte Result Qualifier Added Result Qualifier Unit %Rec Limits RPD Limit Lithium 0.015 IV 1.00 1.18 117 70 - 130 mg/L

10/23/2017

Prep Batch: 372467

85 - 115

105

# **QC Association Summary**

Client: Tampa Electric Company

Project/Site: L17J115

TestAmerica Job ID: 660-83441-1

#### **Metals**

### **Prep Batch: 372467**

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
660-83441-1	L17J115-01	Total/NA	Water	200.7	
660-83441-2	L17J115-02	Total/NA	Water	200.7	
660-83441-3	L17J115-03	Total/NA	Water	200.7	
660-83441-4	L17J115-04	Total/NA	Water	200.7	
660-83441-5	L17J115-05	Total/NA	Water	200.7	
MB 400-372467/1-A	Method Blank	Total/NA	Water	200.7	
LCS 400-372467/2-A	Lab Control Sample	Total/NA	Water	200.7	
660-83441-1 MS	L17J115-01	Total/NA	Water	200.7	
660-83441-1 MSD	L17J115-01	Total/NA	Water	200.7	

#### **Analysis Batch: 372725**

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
660-83441-1	L17J115-01	Total/NA	Water	200.7 Rev 4.4	372467
660-83441-2	L17J115-02	Total/NA	Water	200.7 Rev 4.4	372467
660-83441-3	L17J115-03	Total/NA	Water	200.7 Rev 4.4	372467
660-83441-4	L17J115-04	Total/NA	Water	200.7 Rev 4.4	372467
660-83441-5	L17J115-05	Total/NA	Water	200.7 Rev 4.4	372467
MB 400-372467/1-A	Method Blank	Total/NA	Water	200.7 Rev 4.4	372467
LCS 400-372467/2-A	Lab Control Sample	Total/NA	Water	200.7 Rev 4.4	372467
660-83441-1 MS	L17J115-01	Total/NA	Water	200.7 Rev 4.4	372467
660-83441-1 MSD	L17J115-01	Total/NA	Water	200.7 Rev 4.4	372467

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Α

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0

9

9

10

4.0

**Matrix: Water** 

**Matrix: Water** 

**Matrix: Water** 

2

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Client: Tampa Electric Company

Project/Site: L17J115

Client Sample ID: L17J115-01 Lab Sample ID: 660-83441-1

Date Collected: 10/13/17 11:50 Matrix: Water

Date Received: 10/17/17 09:10

	Batch	Batch		Dil	Initial	Final	Batch	Prepared		
Prep Type	Туре	Method	Run	Factor	Amount	Amount	Number	or Analyzed	Analyst	Lab
Total/NA	Prep	200.7			50 mL	50 mL	372467	10/19/17 09:37	KWN	TAL PEN
Total/NA	Analysis	200.7 Rev 4.4		1			372725	10/20/17 13:10	GESP	TAL PEN
	Instrumer	it ID: 6500 ICP Duo								

Client Sample ID: L17J115-02 Lab Sample ID: 660-83441-2

Date Collected: 10/13/17 11:10 Date Received: 10/17/17 09:10

Batch Dil Initial Final Batch Batch Prepared **Prep Type** Туре Method Factor Amount Amount Number or Analyzed Run Analyst Lab 372467 10/19/17 09:37 KWN Total/NA Prep 200.7 50 mL 50 mL TAL PEN Total/NA Analysis 200.7 Rev 4.4 372725 10/20/17 13:27 GESP TAL PEN Instrument ID: 6500 ICP Duo

Client Sample ID: L17J115-03 Lab Sample ID: 660-83441-3

Date Collected: 10/13/17 10:42 Date Received: 10/17/17 09:10

Dil Initial Batch Batch Final Batch **Prepared Prep Type** Type Method Run **Factor** Amount Amount Number or Analyzed Analyst Lab 200.7 50 mL Total/NA Prep 50 mL 372467 10/19/17 09:37 KWN TAL PEN Total/NA Analysis 200.7 Rev 4.4 372725 10/20/17 13:40 GESP TAL PEN Instrument ID: 6500 ICP Duo

Client Sample ID: L17J115-04 Lab Sample ID: 660-83441-4

Date Collected: 10/13/17 10:04 Date Received: 10/17/17 09:10

Batch Batch Dil Initial Final Batch Prepared **Prep Type** Method Number or Analyzed Type Run **Factor Amount** Amount Analyst Lab Total/NA 200.7 50 mL 372467 10/19/17 09:37 KWN TAL PEN Prep 50 mL Total/NA Analysis 200.7 Rev 4.4 372725 10/20/17 13:43 GESP TAL PEN 1 Instrument ID: 6500 ICP Duo

Client Sample ID: L17J115-05 Lab Sample ID: 660-83441-5

Date Collected: 10/13/17 09:40 Matrix: Water Date Received: 10/17/17 09:10

	Batch	Batch		Dil	Initial	Final	Batch	Prepared		
Prep Type	Type	Method	Run	Factor	Amount	Amount	Number	or Analyzed	Analyst	Lab
Total/NA	Prep	200.7			50 mL	50 mL	372467	10/19/17 09:37	KWN	TAL PEN
Total/NA	Analysis	200.7 Rev 4.4		1			372725	10/20/17 13:47	GESP	TAL PEN
	Instrument	ID: 6500 ICP Duo								

#### Laboratory References:

TAL PEN = TestAmerica Pensacola, 3355 McLemore Drive, Pensacola, FL 32514, TEL (850)474-1001

TestAmerica Tampa

# **Accreditation/Certification Summary**

Client: Tampa Electric Company

Project/Site: L17J115

TestAmerica Job ID: 660-83441-1

# **Laboratory: TestAmerica Tampa**

The accreditations/certifications listed below are applicable to this report.

Authority	Program	EPA Region	Identification Number	Expiration Date
Florida	NELAP	4	E84282	06-30-18

# Laboratory: TestAmerica Pensacola

The accreditations/certifications listed below are applicable to this report.

Authority	Program	<b>EPA Region</b>	Identification Number	<b>Expiration Date</b>
Florida	NELAP	4	E81010	06-30-18

2

- 5

4

5

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112

# **Method Summary**

Client: Tampa Electric Company

Project/Site: L17J115

TestAmerica Job ID: 660-83441-1

Method	Method Description	Protocol	Laboratory
200.7 Rev 4.4	Metals (ICP)	EPA	TAL PEN

#### **Protocol References:**

EPA = US Environmental Protection Agency

#### **Laboratory References:**

TAL PEN = TestAmerica Pensacola, 3355 McLemore Drive, Pensacola, FL 32514, TEL (850)474-1001

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# Tampa Electric Company, Laboratory Services L17J115

#### **SENDING LABORATORY:**

Tampa Electric Company, Laboratory Services

5012 Causeway Blvd Tampa, FL 33619 Phone: (813) 630-7490

Fax: (813) 630-7360

Project Manager: Peggy Penner

**RECEIVING LABORATORY:** 

TestAmerica Laboratories, Inc. - Tampa

6712 Benjamin Rd., Suite 100

Tampa, FL 33634

Phone:(813) 885-7427

Fax: -

Due Date: 10/26/17 16:00

	Expires		Laboratory ID	Comments
BBS-CCR-1	-	Water		
	04/11/18 11:50			
BBS-CCR-2		Water		
	04/11/18 11:10			
BBS-CCR-3		Water		
	04/11/18 10:42			
BBS-CCR-BW1		Water		
	04/11/18 10:04			<del></del>
BBS-CCR-BW2		Water		
			1.00	
	04/11/18 09:40			
	BBS-CCR-3  BBS-CCR-BW1	BBS-CCR-2  BBS-CCR-2  04/11/18 11:10  BBS-CCR-3  04/11/18 10:42  BBS-CCR-BW1  04/11/18 10:04	BBS-CCR-2 Water  04/11/18 11:50  BBS-CCR-2 Water  04/11/18 11:10  Water  04/11/18 10:42  Water  04/11/18 10:04  Water	BBS-CCR-2 Water  04/11/18 11:50  BBS-CCR-2 Water  04/11/18 11:10  BBS-CCR-3 Water  04/11/18 10:42  BBS-CCR-BW1 Water  04/11/18 10:04



Loc: 660 83441 3.2/2.4 CU-09

660-83441 Chain of Custody

1980 1013-17 1450 Date & Time

Received By

10-17-17007/C

Released By

Date & Time

Received By

<b>TestAmerico</b>	THE LEADER IN ENVIRONMENTAL TESTING
Chain of Custody Record	

<b>TestAmerica Tampa</b> 6712 Benjamin Road Suite 100 Tampa, FL 33634 Phone (813) 885-7427 Fax (813) 885-7049	O	hain o	f Cust	Chain of Custody Record	cord			TestAmerica HILLEADIN IN CONNICONNICONNICONNICONNICONNICONN	Derical
Client Information (Sub Contract Lab)	Sampler			Lab PM. Conne	Lab PM. Conner, Keaton	Carrier Tracking No(s)	.:	COC No. 660-100268.1	
Client Contact Shipping/Receiving	Phone:			E-Mail keator	E-Mail keaton.conner@testamericainc.com	State of Origin.		Page: Page 1 of 1	
Company. TestAmerica Laboratories, Inc.				42	Accreditations Required (See note): NELAP - Florida; NELAP - Texas	note): P - Texas		Job # 660-83441-1	
Address: 3355 McLemore Drive.	Due Date Requested: 10/24/2017	÷				Analysis Requested		S	
City Pensacola State, Zp.	TAT Requested (days):	ys):						B - NaOH N - C - Zn Acetate O - D - Nitric Acid P - E - NaHSO4 O -	M - Hexane N - None O - AsNaO2 P - Na2O4S Q - Na2SO3
Phone Phone 850-474-1001(Tell) 850-478-2671(Fax)	# Od				- 10				Na2S2O3 H2SO4
	#OM				100		9.	I - foe J - Di Water	Acetone MCAA
Project Name. L17C	Project#, 66004821				( 10 sa)		19uietne	K-EDTA L-EDA	W - pH 4-5 Z - other (specify)
Site;	SSOW#				) as		00 10	Other:	
Sample Identification - Client ID (Lab ID)	Sample Date	Sample	Sample Type (C=comp, G=crab)	Matrix (Wewster, Sesald, Owasteloll, BT-Tissue, A-Ar)	benealija bleija Mi&M mrotheq F_q_7.005/17.005		19dmuM lstoT		Special Instructions Note:
		$\bigvee$	Preserva		X				
L17J115-01 (660-83441-1)	10/13/17	11:50 Eastern		Water	×		-		
L17J115-02 (660-83441-2)	10/13/17	11:10 Eastern		Water	×		-		
L17J115-03 (660-83441-3)	10/13/17	10:42 Eastern		Water	×		-		
L17J115-04 (660-83441-4)	10/13/17	10:04 Eastern		Water	×		-		
L17J115-05 (660-83441-5)	10/13/17	09:40 Eastern		Water	×			1	
Note: Since laboratory accreditations are subject to change, TestAmenca Laboratones, inc. places the ownership of method, analyte & accreditation compliance upon out subcontract laboratories currently maintain accreditation in the State of Origin listed above for analysis/lests/matrix being analyzed, the samples must be shipped back to the TestAmerca laboratory or other instructions will Laboratories, inc. attention immediately. If all requested accreditations are current to date, return the signed Chain of Custody attesting to said complicance to TestAmerica Laboratories, inc.	aboratones, Inc. places the sis/lests/matrix being analic current to date, return the	e ownership oyzed, the sam	of Custody at	yte & accreditati hipped back to t esting to said co	nership of method, analyte & accreditation compliance upon out subcontract laborate the samples must be shipped back to the TestAmerica laboratory or other instruction of Chain of Custody attesting to said complicance to TestAmerica Laboratories, Inc.	inership of method, analyte & accreditation compliance upon out subcontract laboratones. This sample shipment is forwarded under chain-of-custody. If the laboratory does not the samples must be shipped back to the TestAmerica laboratory or other instructions will be provided. Any changes to accreditation status should be brought to TestAmerica a	nent is forwarded changes to accr	This sample shipment is forwarded under chain-of-custody. If the laboratory does not be provided. Any changes to accreditation status should be brought to TestAmerica	the laboratory does not prought to TestAmerica
Possible Hazard Identification					Sample Disposal	Sample Disposal ( A fee may be assessed if samples are retained longer than 1 month)	oles are retai	retained longer than 1 m	onth)
Oncommisso Deliverable Requested: I, II, III, IV, Other (specify)	Primary Deliverable Rank:	able Rank	2		Special Instructions	Special Instructions/QC Requirements:	310	IIVE LOI	Months
Empty Kit Relinquished by:		Date:			Time:	Method of Shipment	pment.		
Relinquished by: Churche Cawas dy Relinquished by.	Date/Time:	1 6	001	Company Company	Received by:		Date/Time/19/19/19/19/19/19/19/19/19/19/19/19/19/	2 0833	Company
Relinquished by.	Date/Time:			Company	Received by		Date/Time:		Company
Custody Seals Intact. Custody Seal No.:					Cooler Temperatu	Cooler Temperature(s) °C and Other Remarks:			
									A100/00/00 -4V

stAmerica	LEADER IN ENVIRORMENTAL TESTING
	E
ody Record	

<b>TestAmerica Tampa</b> 6712 Benjamin Road Suite 100 Tampa, FL 33634 Phone (813) 885-7427 Fax (813) 885-7049	O	hain	of Cus	Chain of Custody Record	scord				TestAmerica
Client Information (Sub Contract Lab)	Sampler			Lab PM: Conne	Lab PM: Conner, Keaton		Carrier Tracking No(s):	COC No: 660-100268.1	
Client Contact: Shipping/Receiving	Phone.			E-Mail Keato	E-Mail: keaton.conner@testamericainc.com	mericainc.com	State of Origin: Florida	Page: Page 1 of 1	
Company: TestAmerica Laboratories, Inc.					Accreditations Requir	Accreditations Required (See note): NELAP - Florida; NELAP - Texas		Job #: 660-83441-1	
Address: 3355 McLemore Drive,	Due Date Requested: 10/24/2017	:pa				Analysis Re	Requested	Preservation Codes	1.7
City. Pensacola State.Zip.	TAT Requested (days):	3ys):						B - NaOH C - Zn Acetate C - Natric Acid D - Nitric Acid	M - Havane N - None O - AsNaO2 P - Na2O4S O - Na2SO3
Phone Phone 1850-474-1001(Tell : 850-478-2671(Fax)	#0d#				(			F - MeOH G - Amchlor	R - Na2S203 S - H2S04
	#OW							1 - Ice	U - Acetone V - MCAA
Project Name: L17C Site	Project # 66004821 SSOW#				(Yes of I			container	W - pH 4-5 Z - other (specify)
Sample Identification - Client ID (Lab ID)	Samole Date	Sample	Sample Type (C=comp,	Matrix (wwwater, Sesolid, Oewasteloil,	ing beselff bleif DZM\ZM mothe9 TOT_9_T.005\T.009			To redmuN isto	Special Instructions Motor
de la company de	$\bigvee$	X	Preserve	Preservation Code:	X				
L17J115-01 (860-83441-1)	10/13/17	11:50 Fastern		Water	×			F	
L17J115-02 (660-83441-2)	10/13/17	11:10 Fastern		Water	×				
L17J115-03 (660-83441-3)	10/13/17	10:42 Eastern		Water	×			-	
L17J115-04 (660-83441-4)	10/13/17	10:04 Eastern		Water	×			4	
L17J115-05 (660-83441-5)	10/13/17	09:40 Eastern		Water	×			-	
Note: Since laboratory accreditations are subject to change. TestAmerica Laboratories, inc. places the ownership of method, analyte & accreditation compliance upon out subcontract laboratories. This sample shipment accreditations are subject to analysis/ests/matrix being analyzed, the samples must be shipped back to the TestAmerica laboratory or other instructions will be provided. Any changes to accreditation status should be brought to TestAmerica Laboratories, inc. attention immediately. If all requested accreditations are current to date, return the signed Chain of Custody attesting to said complicance to TestAmerica Laboratories, inc.	aboratories, Inc. places to sis/lests/matrix being and current to date, return the	he ownership llyzed, the san e signed Chai	of method, and ples must be a n of Custody at	shipped back to testing to said of	ion compliance upor the TestAmenca lab omplicance to TestA	n out subcontract laborato oratory or other instruction merica Laboratories, Inc.	nes. This sample shipment is is will be provided. Any chan	This sample shipment is forwarded under chain-of-custody. If the laboratory does not be provided. Any changes to accreditation status should be brought to TestAmerica	dy. If the laboratory does not d be brought to TestAmerica
Possible Hazard Identification Unconfirmed					Sample Dis	Sample Disposal ( A fee may be assi	assessed if samples	Sample Disposal ( A fee may be assessed if samples are retained longer than 1 month)  Return To Client	1 month) Months
Deliverable Requested: I, III, IIV, Other (specify)	Primary Deliverabl	rable Rank;	.2		Special Instr	ructions/QC Requiren	nents:		
Empty Kit Relinquished by:		Date:			Time:	100	Method of Shipment	nt	
Relinquished by Charfu Cawas & Relinquished by.	Date/fime.	1 6	200	Company Company	Received by Received by	Die Die	Date/Time Date/Time	16/17 0873	Company
Relinquished by	Date/Time			Company	Received by	by:	Date/Time	me:	Company
Custody Seals Intact. Custody Seal No					Cooler Te	Cooler Temperature(s) "C and Other Remarks	r Remarks:		
									Var. 00.00.0016

# **Login Sample Receipt Checklist**

Client: Tampa Electric Company

Job Number: 660-83441-1

Login Number: 83441 List Source: TestAmerica Tampa

List Number: 1

Creator: Southers, Kristin B

Creator. Southers, Kristin B		
Question	Answer	Comment
Radioactivity wasn't checked or is = background as measured by a sumeter.</td <td>urvey N/A</td> <td></td>	urvey N/A	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the Co	OC. True	
Samples are received within Holding Time (excluding tests with immedi-HTs)	iate True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	N/A	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

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14

# **Login Sample Receipt Checklist**

Client: Tampa Electric Company

Job Number: 660-83441-1

List Number: 83441 List Source: TestAmerica Pensacola
List Number: 2 List Creation: 10/18/17 10:43 AM

Creator: Johnson, Jeremy N

Creator: Johnson, Jeremy N		
Question	Answer	Comment
Radioactivity wasn't checked or is = background as measured by a survey meter.</td <td>N/A</td> <td></td>	N/A	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	0.0°C IR7
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	N/A	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

10/23/2017



# DOH Certification #E84025 DEP COMPQAP # 870251

Report Date: October 31, 2017

TECO

5012 Causeway Blvd. Tampa, FL 33619

Attn: Peggy Penner

Field Custody:

Client

Client/Field ID:

L17J115-01 BBS-CCR-1

Sample Collection:

10-13-17/1150

Lab ID No:

17.12008

Lab Custody Date:

10-19-17/0925

Sample description:

Water

#### CERTIFICATE OF ANALYSIS

					Analysis		Detection
Parameter	Units	Re	sul	ts	Date	Method	Limit
Combined Radium (Radium-226 + Radium 228)	pCi/l	35.6	±	1.8	Calc	Calc	0.7
Radium-226	pCi/l	33.9	$\pm$	1.8	10-30-17/1307	EPA 903.0	0.4
Radium-228 Alpha Standard: Th-230	pCi/l	1.7	<u>±</u>	0.6	10-30-17/1233	EPA Ra-05	0.7

James W. Hayes Laboratory Manager

James W. Hages

Test results meet all requirements of the NELAC standards. Statement of estimated uncertainty available upon request. Test results refer only to sample(s) listed. Contact person: Jim Hayes (813) 229-2879.



# DOH Certification #E84025 DEP COMPQAP # 870251

Report Date: October 31, 2017

TECO

5012 Causeway Blvd. Tampa, FL 33619

Attn: Peggy Penner

Field Custody:

Client

Client/Field ID: L17J115-02

BBS-CCR-2

Sample Collection:

10-13-17/1110

Lab ID No:

17.12009

Lab Custody Date:

10-19-17/0925

Sample description: Water

CERTIFICATE OF ANALYSIS

					Analysis		Detection
Parameter	Units	Re	sul	ts	Date	Method	Limit
Combined Radium (Radium-226 + Radium 228)	pCi/l	13.5	±	1.1	Calc	Calc	0.8
Radium-226	pCi/l	13.0	±	1.1	10-30-17/1307	EPA 903.0	0.4
Radium-228 Alpha Standard: Th-230	pCi/l	0.5	±	0.5	10-30-17/1233	EPA Ra-05	0.8

James W. Hayes Laboratory Manager

James W. Hages

Test results meet all requirements of the NELAC standards. Statement of estimated uncertainty available upon request. Test results refer only to sample(s) listed. Contact person: Jim Hayes (813) 229-2879.



# DOH Certification #E84025 DEP COMPOAP # 870251

Report Date: October 31, 2017

TECO

5012 Causeway Blvd. Tampa, FL 33619

Attn: Peggy Penner

Field Custody:

Client

Client/Field ID:

L17J115-03

BBS-CCR-3

Sample Collection:

10-13-17/1042

Lab ID No:

17.12010

Lab Custody Date:

10-19-17/0925

Sample description:

Water

#### CERTIFICATE OF ANALYSIS

					Analysis		Detection
Parameter	Units	Re	sul	ts	Date	Method	Limit
Combined Radium (Radium-226 + Radium 228)	pCi/l	20.0	±	1.3	Calc	Calc	0.7
Radium-226	pCi/l	18.1	$\pm$	1.3	10-30-17/1307	EPA 903.0	0.3
Radium-228 Alpha Standard: Th-230	pCi/l	1.9	±	0.6	10-30-17/1233	EPA Ra-05	0.7

James W. Hayes Laboratory Manager

James W. Hages

Test results meet all requirements of the NELAC standards. Statement of estimated uncertainty available upon request. Test results refer only to sample(s) listed. Contact person: Jim Hayes (813) 229-2879.



# DOH Certification #E84025 DEP COMPOAP # 870251

Report Date: October 31, 2017

TECO

5012 Causeway Blvd. Tampa, FL 33619

Attn: Peggy Penner

Field Custody: Client/Field ID: Client

L17J115-04

Sample Collection:

BBS-CCR-BW1

10-13-17/1004 17.12011

Lab ID No: Lab Custody Date:

10-19-17/0925

Sample description:

Water

CERTIFICATE OF ANALYSIS

					Analysis		Detection
Parameter	Units	Re	sul	ts	Date	Method	Limit
Combined Radium (Radium-226 + Radium 228)	pCi/l	22.1	±	1.2	Calc	Calc	0.7
Radium-226	pCi/l	19.2	±	1.2	10-26-17/1133	EPA 903.0	0.4
Radium-228 Alpha Standard: Th-230	pCi/l	2.9	±	0.6	10-30-17/1233	EPA Ra-05	0.7

James W. Hayes Laboratory Manager

James W. Hayes

Test results meet all requirements of the NELAC standards. Statement of estimated uncertainty available upon request. Test results refer only to sample(s) listed. Contact person: Jim Hayes (813) 229-2879.



# DOH Certification #E84025 DEP COMPQAP # 870251

Report Date: October 31, 2017

TECO

5012 Causeway Blvd. Tampa, FL 33619

Attn: Peggy Penner

Field Custody:

Client

Client/Field ID:

L17J115-05

BBS-CCR-BW2

Sample Collection:

10-13-17/0904

Lab ID No:

17.12012

Lab Custody Date:

10-19-17/0925

Sample description:

Water

#### CERTIFICATE OF ANALYSIS

					Analysis		Detection
Parameter	Units	Re	esul	ts	Date	Method	Limit
Combined Radium (Radium-226 + Radium 228)	pCi/l	4.9	±	0.7	Calc	Calc	0.8
Radium-226	pCi/l	4.9	$\pm$	0.7	10-30-17/1307	EPA 903.0	0.6
Radium-228 Alpha Standard: Th-230	pCi/l	0.0	±	0.5	10-30-17/1233	EPA Ra-05	0.8

James W. Hayes Laboratory Manager

James W. Hages

Test results meet all requirements of the NELAC standards. Statement of estimated uncertainty available upon request. Test results refer only to sample(s) listed. Contact person: Jim Hayes (813) 229-2879.



# DOH Certification #E84025 DEP COMPOAP # 870251

Report Date: October 31, 2017

TECO

5012 Causeway Blvd. Tampa, FL 33619

Attn: Peggy Penner

Field Custody:

Client

Client/Field ID:

L17J116-01

B-4R

Sample Collection:

10-13-17/0858

Lab ID No:

17.12013

Lab Custody Date:

10-19-17/0925

Sample description:

Water

CERTIFICATE OF ANALYSIS

					Analysis		Detection	
Parameter	Units	Re	esul	ts	Date	Method	Limit	
Combined Radium (Radium-226 + Radium 228)	pCi/l	0.6	±	0.4	Calc	Calc	0.8	
Radium-226	pCi/l	0.6	$\pm$	0.3	10-30-17/1307	EPA 903.0	0.4	
Radium-228 Alpha Standard: Th-230	pCi/l	0.0	±	0.4	10-30-17/1233	EPA Ra-05	0.8	

James W. Hayes Laboratory Manager

James W. Hages

Test results meet all requirements of the NELAC standards. Statement of estimated uncertainty available upon request. Test results refer only to sample(s) listed. Contact person: Jim Hayes (813) 229-2879.



# DOH Certification #E84025 **DEP COMPOAP # 870251**

Report Date: October 31, 2017

TECO

5012 Causeway Blvd. Tampa, FL 33619

Attn: Peggy Penner

Field Custody:

Client

Client/Field ID:

L17J116-02

B - 39

Sample Collection:

10-13-17/1332

Lab ID No:

17.12014

Lab Custody Date:

10-19-17/0925

Sample description:

Water

#### CERTIFICATE OF ANALYSIS

					Analysis		Detection	
Parameter	Units	Re	esul	ts	Date	Method	Limit	_
Combined Radium (Radium-226 + Radium 228)	pCi/l	9.7	±	0.8	Calc	Calc	0.7	
Radium-226	pCi/l	8.9	$\pm$	0.8	10-30-17/1307	EPA 903.0	0.4	
Radium-228 Alpha Standard: Th-230	pCi/l	0.8	±	0.5	10-30-17/1233	EPA Ra-05	0.7	

James W. Hayes Laboratory Manager

James W. Hages

Test results meet all requirements of the NELAC standards. Statement of estimated uncertainty available upon request. Test results refer only to sample(s) listed. Contact person: Jim Hayes (813) 229-2879.

# Tampa Electric Company, Laboratory Services L17J115

#### SENDING LABORATORY:

#### RECEIVING LABORATORY:

Laboratory ID

Comments

Tampa Electric Company, Laboratory Services

**KNL Laboratory Services** 

5012 Causeway Blvd

3202 N. Florida Ave.

Tampa, FL 33619 Phone: (813) 630-7490 Tampa, FL 33603 Phone: (813) 229-2879

Fax: (813) 630-7360

Analysis

Fax: -

**Expires** 

Project Manager: Peggy Penner

10/26/17 16:00 Due Date:

Allalysis	Expires		Laboratory 1D	Comments
Sample ID: L17J115-01 BBS-CCR-1 Sampled: 10/13/17 11:50		Water	17. 12002	17-12008
Radium 228 Ra-05	04/11/18 11:50		Level 2 Data requred	
Radium 226 EPA 903.0	04/11/18 11:50		Level 2 Data requred	
Radium 226+228, Total	04/11/18 11:50		Level 2 Data requred	
Containers Supplied:				
RAD Poly HNO3 - 1000mL (C)	RAD Poly HNO3 - 1000r			
Sample ID: L17J115-02 BBS-CCR-2 Sampled: 10/13/17 11:10		Water	17.12.03	17.12009
Radium 226 EPA 903.0	04/11/18 11:10		Level 2 Data requred	
Radium 226+228, Total	04/11/18 11:10		Level 2 Data requred	
Radium 228 Ra-05	04/11/18 11:10		Level 2 Data requred	
Containers Supplied: RAD Poly HNO3 - 1000mL (C)	RAD Poly HNO3 - 1000	mL (D)		
Sample ID: L17J115-03 BBS-CCR-3 Sampled: 10/13/17 10:42		Water	17.12004	17/2010
Radium 226+228, Total	04/11/18 10:42		Level 2 Data requred	
Radium 226 EPA 903.0	04/11/18 10:42		Level 2 Data required	
Radium 228 Ra-05	04/11/18 10:42		Level 2 Data requred	il .
Containers Supplied: RAD Poly HNO3 - 1000mL (C)	RAD Poly HNO3 - 1000			
Sample ID: L17J115-04 BBS-CCR- Sampled: 10/13/17 10:04	BW1	Water	17.12005	17.12011
Radium 226 EPA 903.0	04/11/18 10:04		Level 2 Data requre	1
Radium 226+228, Total	04/11/18 10:04		Level 2 Data requre	i
Radium 228 Ra-05	04/11/18 10:04		Level 2 Data requre	d
Containers Supplied: RAD Poly HNO3 - 1000mL (C)	RAD Poly HNO3 - 1000	OmL (D)		

KNL IRI 10-19-17 C925

Date & Time Received By

Released By

Date & Time

Received By

# Tampa Electric Company, Laboratory Services L17J115

Analysis	Expires		Laboratory ID Comments		
Sample ID: L17J115-05 BBS-CCR Sampled: 10/13/17 09:40	-BW2 Wa	iter	<del>17. 1266</del> - 17.12012		
Radium 228 Ra-05	04/11/18 09:40		Level 2 Data requred		
Radium 226 EPA 903.0	04/11/18 09:40		Level 2 Data required		
Radium 226+228, Total	04/11/18 09:40		Level 2 Data required		
Containers Supplied:			1.00		
RAD Poly HNO3 - 1000mL (C)	RAD Poly HNO3 - 1000mL (D)				

Envloamm 10-19-19
Released By Date & Tirde

KIVL IRT

10-19 17 0925

Received By

# Tampa Electric Company, Laboratory Services L17J116

#### SENDING LABORATORY:

RAD Poly HNO3 - 1000mL (C)

Tampa Electric Company, Laboratory Services

5012 Causeway Blvd Tampa, FL 33619 Phone: (813) 630-7490

Fax: (813) 630-7360

Project Manager:

RECEIVING LABORATORY:

KNL Laboratory Services

3202 N. Florida Ave. Tampa, FL 33603

Phone: (813) 229-2879

Fax: -

Due Date:

10/27/17 16:00

Peggy Penner

Analysis	Expires		Laboratory ID	Comments
Sample ID: L17J116-01 B-4R Sampled: 10/13/17 08:58		Water _	17,12007	17. 12013
Radium 228 Ra-05	04/11/18 08:58		Level 2 Data requred	
Radium 226+228, Total	04/11/18 08:58		Level 2 Data requred	
Radium 226 EPA 903.0	04/11/18 08:58		Level 2 Data requred	
Containers Supplied:				
RAD Poly HNO3 - 1000mL (C)	RAD Poly HNO3 - 1000m	nL (D)		
Sample ID: L17J116-02 B-39 Sampled: 10/13/17 13:32		Water	17.12008	17.12014
Radium 228 Ra-05	04/11/18 13:32		Level 2 Data requred	
Radium 226+228, Total	04/11/18 13:32		Level 2 Data requred	
Radium 226 EPA 903.0	04/11/18 13:32		Level 2 Data requred	
Containers Supplied:				

RAD Poly HNO3 - 1000mL (D)

Enellann 1

Received By



# FL DOH Certification # E84025

adium Analysis		
T/15		
e: <u>101 30 1 17</u>		. , ,
Sample #:	17,12012	_
Duplicate Analysis (pCi/l)  8.3	Range (pCi/l)	RPD (%)
Sample #:	17.12012	_
		Spike Rec (%) 782
l l		
True Value (pCi/l)		Recovery
		llysis Date 2
	Sample #:  Duplicate Analysis (pCi/l)  8.3  Sample #:  Spike Added (pCi/l) Analyt  4.5  True Value (pCi/l)  10./  Analytical Result (pCi	Sample #: 17, 120/2  Duplicate Analysis (pCi/l) Range (pCi/l)  8.3 0-/  Sample #: 17, 120/2  Spike Added (pCi/l) Analytical Result (pCi/l)  4.5 8.4  True Value (pCi/l) % F  10-/  Analytical Result (pCi/l) Analytical Result (pCi/l)



# FL DOH Certification # E84025

QC Summary: Radium 2	28 Analysis	-	
Client Project #: 17J	115		
Analysis Completion Date:	101 30 1 17		
Precision Data:	Sample #:	17,12008	
Sample Analysis (pCi/l)	Duplicate Analysis (pCi/l)	Range (pCi/l)	<u>RPD (%)</u>
5.7	5.5	0.2	_3.6
Spike Data:	Sample #:	17.12008	
Sample Analysis (pCi/l)	Spike Added (pCi/l) Analyti	ical Result (pCi/l)	Spike Rec (%)
		5.7	100
LCS Data:			
Analytical Result (pCi/l)	True Value (pCi/l)	% R	ecovery
4.3	4.44		976
Lab Blank:			
	Analytical Result (pCi	<u>Ana</u>	lysis Date
Lab Blank	0.0 +1- 0.7		1/30/17

# APPENDIX B Geosyntec Data Validation Reports



180A Market Place Boulevard Knoxville, TN 37922 PH 865.330.0037 www.geosyntec.com

Final Review: JK Caprio 09/23/16

#### Memorandum

Date: 13 September 2016

To: Todd Kafka

From: Chris Pracheil

CC: J. Caprio

Subject: Stage 2A Data Validation – Level II Data Deliverable – Tampa

Electric Laboratory Services #L16F174 & L16G005, TestAmerica #660-74676-1 & 660-75265-1 and KNL Environmental Testing #

L16F174 & L16G005

SITE: Big Bend Power Station, Apollo Beach, Florida

#### INTRODUCTION

This report summarizes the findings of the Stage 2A data validation of 16 water samples, collected on 24 June 2016 and 27 July 2016 as part of the Big Bend Power Station coal combustion residuals (CCR) groundwater monitoring program plan. The lithium analyses were performed by TestAmerica Tampa, Tampa, Florida (TestAmerica). The radium analyses were performed by KNL Environmental Testing, Tampa, Florida (KNL). The rest of the analyses were performed by Tampa Electric Laboratory Services, Tampa, Florida (TELS). The samples were analyzed for the following:

- Metals by EPA Method 200.7, 200.8 and 6010B
- Mercury by EPA Method 7470A
- Radium-226 by EPA Method 903.0
- Radium-228 by EPA Method Ra-05
- Chloride, Fluoride and Sulfate by EPA Method 300.0
- Total Dissolved Solids by SM 2540C

#### **EXECUTIVE SUMMARY**

The samples were handled, prepared, and measured in the same manner under similar prescribed conditions.

Overall, based on this Stage 2A data validation covering the quality control (QC) parameters listed below, the data as qualified are usable for meeting project objectives. The qualified data should be used within the limitations of the qualifications.

The inorganic data were reviewed based on the following: CCR Groundwater Monitoring Program Plan, Big Bend Power Station, Apollo Beach, Florida, September 2016, USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review, August 2014 (OSWER 9355.0-131, EPA 540-R-013-001), as well as by the pertinent methods referenced by the data package and professional and technical judgment.

The following samples were analyzed and validated at a Stage 2A level in the data set:

Laboratory	Client ID
ID	
L16F174-01	PZ1 (6/24/2016)
L16F174-02	PZ2 (6/24/2016)
L16F174-03	PZ3 (6/24/2016)
L16F174-04	PZ4 (6/24/2016)
L16F174-05	PZ5 (6/24/2016)
L16F174-06	PZ6 (6/24/2016)
L16F174-07	MWB-35 (6/24/2016)
L16F174-08	MWB-36 (6/24/2016)

Laboratory	Client ID
ID	
L16G005-01	PZ1 (7/27/2016)
L16G005-02	PZ2 (7/27/2016)
L16G005-03	PZ3 (7/27/2016)
L16G005-04	PZ4 (7/27/2016)
L16G005-05	PZ5 (7/27/2016)
L16G005-06	PZ6 (7/27/2016)
L16G005-07	MWB-35 (7/27/2016)
L16G005-08	MWB-36 (7/27/2016)

Final Review: JK Caprio 09/23/16

The samples were received at TestAmerica Tampa outside the temperature criteria of  $4\pm2^{\circ}$ C; the samples were received at  $0.0^{\circ}$ C. Based on professional and technical judgment, no qualifications were applied to the data due to the temperatures outside the criteria. No sample preservation issues were noted by the laboratories.

#### 1.0 TOTAL METALS

The samples were analyzed for total metals per EPA Methods 200.7, 200.8 and 6010B.

The areas of data review are listed below. A leading check mark  $(\checkmark)$  indicates an area of review in which the data were acceptable. A preceding crossed circle  $(\otimes)$  signifies areas where issues were raised during the course of the validation review and should be considered to determine the impact on data quality and usability.

- ✓ Overall Assessment
- ✓ Holding Times
- ✓ Method Blank

L16F174 L16G005 Bigbend DVR.docx

- Matrix Spike/Matrix Spike Duplicate
- ✓ Laboratory Control Sample
- ✓ Serial Dilution
- ✓ Field Blank
- ✓ Equipment Blank
- ✓ Field Duplicate
- ✓ Sensitivity
- ✓ Electronic Data Deliverable Review

#### 1.1 Overall Assessment

The metals data reported in this package are considered to be usable for meeting project objectives. The results are considered valid; analytical completeness, defined as the ratio of the number of valid analytical results (valid analytical results include values qualified as estimated) to the total number of analytical results requested on samples submitted for analysis for the project, is 100%.

#### 1.2 Holding Times

The holding time for the metals analysis of waters is 180 days from sample collection to analysis. The holding time was met for the sample analyses.

#### 1.3 Method Blank

Method blanks were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). Seven method blanks were reported, three for the method 200.7 data (batches 16F0213, 312424, and 316923), two for the method 200.8 data (batches 16F0212 and 16H0004), and two for the method 6010B data (batches 16F0213 and 16H0014). Metals were not detected in the method blanks above the method detection limit (MDL).

#### 1.4 Matrix Spike/Matrix Spike Duplicate (MS/MSD)

MS/MSDs were analyzed at the proper frequency for the number and types of samples analyzed (one pair per batch of 20 samples). Two sample set specific MS/MSD pairs were reported for the 200.7, 200.8 and 6010B data, using samples PZ2(6/24/2016) and PZ1(7/27/2016), PZ1(6/24/2016) and MWB-36(7/27/2016), and PZ2(6/24/2016) and PZ2(7/27/2016), respectively. The recovery and relative percent difference (RPD) results were within the laboratory specified acceptance criteria, with the following exceptions.

The recoveries of cadmium and the recoveries of selenium were low and outside of the laboratory specified acceptance criteria in the MS/MSDs using samples PZ1(6/24/2016) and MWB-36(7/27/2016), respectively. Therefore, the non-detect result for cadmium in sample PZ1(6/24/2016) was UJ qualified as estimated less than the MDL, and the concentrations of selenium in sample MWB-36(7/27/2016) was J- qualified as estimated with a low bias.

Client Sample ID	Compound	Laboratory Result (µg/L)	Laboratory Flag	Validation Result (µg/L)	Validation Qualifier*	Reason Code**
PZ1 (6/24/2016)	Cadmium	0.10	J-,U	0.10	UJ	4
MWB-36 (7/27/2016)	Selenium	0.58	J-,I	0.58	J-	4

µg/L-micrograms per liter

One batch MS/MSD pair was also reported for the 200.7 data. Since these are batch QC, the results do not affect the samples in this data set and qualifications were not applied to the data.

#### 1.5 Laboratory Control Sample (LCS)

LCSs were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). Seven LCSs were reported, three for the 200.7 data, two for the 200.8 data and two for the 6010B data. The recovery results were within the laboratory specified acceptance criteria.

#### 1.6 <u>Serial Dilution</u>

Serial dilutions were not reported.

#### 1.7 Equipment Blank

Equipment blanks were not reported with the sample sets.

#### 1.8 Field Duplicate

Field duplicates were not reported with the sample sets.

J--laboratory flag indicating the MS/MSD recovery was low

U- laboratory flag indicating the compound was analyzed for but not detected

I-laboratory flag indicating an estimated concentration, less than the RL

<sup>\*</sup> Validation qualifiers are defined in Attachment 1 at the end of this report

<sup>\*\*</sup>Reason codes are defined in Attachment 2 at the end of this report

#### 1.9 Sensitivity

The samples were reported to the MDLs. No elevated non-detect results were reported. The MDLs met the limits listed in Table 4 of the CCR Groundwater Monitoring Plan.

#### **Electronic Data Deliverable Review** 1.10

The results and sample identifications (IDs) in the EDD were reviewed against the information provided by the associated level II report at a minimum of 20% as part of the data validation process. The non-detect results were reported at the MDL in the laboratory reports and reported as ND in the EDD. No other discrepancies were identified between the level II report and the EDD.

#### 2.0 **MERCURY**

The samples were analyzed for mercury per EPA Method 7470A.

The areas of data review are listed below. A leading check mark  $(\checkmark)$  indicates an area of review in which the data were acceptable. A preceding crossed circle ( $\otimes$ ) signifies areas where issues were raised during the course of the validation review and should be considered to determine the impact on data quality and usability.

- ✓ Overall Assessment
- ✓ Holding Times
- ✓ Method Blank
- ✓ Matrix Spike/Matrix Spike Duplicate
- ✓ Laboratory Control Sample
- ✓ Field Blank
- ✓ Equipment Blank
- ✓ Field Duplicate
- ✓ Sensitivity
- ✓ Electronic Data Deliverable Review

#### 2.1 **Overall Assessment**

The mercury data reported in this package are considered to be usable for meeting project objectives. The results are considered valid; analytical completeness, defined as the ratio of the number of valid analytical results (valid analytical results include values qualified as estimated) to the total number of analytical results requested on samples submitted for analysis for the project, is 100%.

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#### 2.2 Holding Times

The holding time for the mercury analysis of a water sample is 28 days from sample collection to analysis. The holding time was met for the sample analysis.

## 2.3 Method Blank

Method blanks were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). Two method blanks were reported (batches 16G0021 and 16H0035). Mercury was not detected in the method blanks above the MDL.

#### 2.4 Matrix Spike/Matrix Spike Duplicate

MS/MSD pairs were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). Two sample set specific MS/MSD pairs, using samples MWB-36(6/24/2016) and PZ1(7/27/2016), were reported. The recovery and RPD results were within the laboratory specified acceptance criteria.

#### 2.5 Laboratory Control Sample

LCSs were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). Two LCSs were reported. The recovery results were within the laboratory specified acceptance criteria.

#### 2.6 Equipment Blank

Equipment blanks were not reported with the sample sets.

#### 2.7 Field Duplicate

Field duplicates were not reported with the sample sets.

#### 2.8 Sensitivity

The samples were reported to the MDL. No elevated non-detect results were reported. The MDLs for mercury met the limits listed in Table 4 of the CCR Groundwater Monitoring Plan.

#### 2.9 Electronic Data Deliverable Review

The results and sample IDs in the EDD were reviewed against the information provided by the associated level II report at a minimum of 20% as part of the data validation process. The non-detect results were reported at the MDL in the laboratory reports and reported as ND in the EDD. No other discrepancies were identified between the level II report and the EDD.

#### 3.0 RADIUM-226 AND RADIUM-228

The samples were analyzed for radium 226 and radium 228 per EPA Methods 903.0 and RA-05, respectively.

The areas of data review are listed below. A leading check mark  $(\checkmark)$  indicates an area of review in which the data were acceptable. A preceding crossed circle  $(\otimes)$  signifies areas where issues were raised during the course of the validation review and should be considered to determine the impact on data quality and usability.

- ✓ Overall Assessment
- ✓ Holding Times
- ⊗ Method Blank
- ✓ Matrix Spike/Matrix Spike Duplicate
- ✓ Laboratory Control Sample
- ✓ Surrogates
- ✓ Field Blank
- ✓ Equipment Blank
- ✓ Field Duplicate
- ✓ Sensitivity
- ✓ Electronic Data Deliverable Review

#### 3.1 Overall Assessment

The radium-226 and radium-228 data reported in this package are considered to be usable for meeting project objectives. The results are considered valid; the analytical completeness, defined as the ratio of the number of valid analytical results (valid analytical results include values qualified as estimated) to the total number of analytical results requested on samples submitted for analysis for the project, is 100%.

#### 3.2 **Holding Times**

The holding times for radium-226 and radium-228 analysis of waters are 180 days from sample collection to analysis. The holding times were met for the sample analyses.

#### 3.3 Method Blank

Method blanks were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). Two method blanks were reported for radium-226 and radium-228 data (batches L16F174 and L16G005). Radium-228 was not detected in the method blanks above the minimum detectable concentration (MDC); however, radium-226 was detected above the MDC in the method blanks associated with batch L16G005. Therefore, the detections of radium-226 and combined radium (radium-226 + radium-228) with concentrations less than 10x the blank concentration were J qualified as estimated.

Client Sample ID	Compound	Laboratory Result (pCi/L)	Laboratory Flag	Validation Result (pCi/L)	Validation Qualifier	Reason Code
PZ6 (7/27/2016)	Radium-226	4.6	NA	4.6	J	3
PZ6 (7/27/2016)	Radium-226 + Radium-228	5.1	NA	5.1	J	3
MWB-35 (7/27/2016)	Radium-226	1.6	NA	1.6	J	3
MWB-35 (7/27/2016)	Radium-226 + Radium-228	1.9	NA	1.9	J	3
MWB-36 (7/27/2016)	Radium-226	3.2	NA	3.2	J	3
MWB-36 (7/27/2016)	Radium-226 + Radium-228	4.1	NA	4.1	J	3

pCi/L-picocuries per liter NA-not applicable

#### 3.4 <u>Matrix Spike/Matrix Spike Duplicate</u>

MS/MSD pairs were not reported.

#### 3.5 Laboratory Control Sample

LCSs were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). Two LCS were reported for radium-226 and radium-228. The recovery results were within the laboratory specified acceptance criteria.

#### 3.6 **Equipment Blank**

Equipment blanks were not reported with the sample sets.

#### 3.7 <u>Laboratory Duplicate</u>

Two laboratory duplicates for radium-226 and radium-228 were reported with the sample sets. The RPD results were within the laboratory specified acceptance criteria.

#### 3.8 Sensitivity

The samples were reported to the MDCs. The MDCs reported met the limits listed in Table 4 of the CCR Groundwater Monitoring Plan.

#### 3.9 <u>Electronic Data Deliverable Review</u>

The results and sample IDs in the EDD were reviewed against the information provided by the associated level II report at a minimum of 20% as part of the data validation process. The non-detect results were reported at the MDL in the laboratory reports and reported as ND in the EDD. No other discrepancies were identified between the level II report and the EDD.

#### 4.0 WET CHEMISTRY PARAMETERS

The samples were analyzed for chloride, fluoride and sulfate by EPA Method 300.0 and total dissolved solids by SM 2540C.

The areas of data review are listed below. A leading check mark ( $\checkmark$ ) indicates an area of review in which the data were acceptable. A preceding crossed circle ( $\otimes$ ) signifies areas where issues were raised during the course of the validation review and should be considered to determine any impact on data quality and usability.

- ✓ Overall Assessment
- ✓ Holding Times
- ✓ Method Blank
- ⊗ Matrix Spike/Matrix Spike Duplicate
- ✓ Laboratory Control Sample
- ✓ Laboratory Duplicate
- ✓ Equipment Blank
- ✓ Field Duplicate
- ✓ Sensitivity
- ✓ Electronic Data Deliverables Review

#### 4.1 Overall Assessment

The wet chemistry data reported in this package are considered to be usable for meeting project objectives. The results are considered to be valid; the analytical completeness, defined as the ratio of the number of valid analytical results (valid analytical results include values qualified as estimated) to the total number of analytical results requested on samples submitted for analysis, for the project is 100%.

#### 4.1.1 Analysis Anomaly

The narrative sections of laboratory reports L16F174 and L16G005 stated that constant weight could not be achieved during the total dissolved solids analysis of samples PZ1 (6/24/2016), PZ5 (6/24/2016), PZ6 (6/24/2016), and PZ2 (7/27/2016), respectively. Therefore, the concentrations of total dissolved solids in these samples were J qualified as estimated.

Client Sample ID	Compound	Laboratory Result (mg/L)	Laboratory Flag	Validation Result (µg/L)	Validation Qualifier	Reason Code
PZ1 (6/24/2016)	Total Dissolved Solids	3060	J-	3060	J	13
PZ2 (6/24/2016)	Total Dissolved Solids	1170	J-	1170	J	13
PZ5 (6/24/2016)	Total Dissolved Solids	5050	J-	5050	J	13
PZ6 (6/24/2016)	Total Dissolved Solids	1230	J-	1230	J	13
PZ2 (7/27/2016)	Total Dissolved Solids	1170	J-	1170	J	13

mg/L-milligrams per liter

J--laboratory flag indicating the result is estimated

#### 4.2 Holding Times

The holding times for chloride, fluoride and sulfate by EPA method 300.0 are 28 days from sample collection to analysis and the holding time for total dissolved solids by SM 2540C is 7 days. The holding times were met for the sample analyses.

#### 4.3 Method Blanks

Method blanks were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). Method blanks were reported for each analysis as appropriate. The wet chemistry parameters were not detected in the method blanks above the MDLs.

#### 4.4 Matrix Spike/Matrix Spike Duplicate

Sample set specific MS/MSD pairs were reported for chloride, fluoride, sulfate using samples PZ5 (6/24/2016), MWB-35 (6/24/2016) and PZ1 (7/27/2016). The recovery and RPD results were within the laboratory specified acceptance criteria, with the following exceptions.

The recoveries of chloride and sulfate were low and outside of the laboratory specified acceptance criteria in the MS/MSDs using samples PZ5 (6/24/2016) and PZ1 (7/27/2016). Therefore, the concentrations of chloride and sulfate in samples PZ5 (6/24/2016) and PZ1 (7/27/2016) were J-qualified as estimated with a low bias.

Client Sample ID	Compound	Laboratory Result	Laboratory Flag	Validation Result	Validation Qualifier	Reason Code
		(mg/L)		(µg/L)		
PZ1 (7/27/2016)	Chloride	742	J-	742	J-	4
PZ1 (7/27/2016)	Sulfate	1320	J-	1320	J-	4
PZ5 (6/24/2016)	Chloride	1140	J-	1140	J-	4
PZ5 (6/24/2016)	Sulfate	1440	J-	1440	J-	4

mg/L-milligrams per liter

J--laboratory flag indicating the MS/MSD recovery was low

#### 4.5 Laboratory Control Sample

LCSs were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). LCSs were reported for each analysis as appropriate. The recovery results were within the laboratory specified acceptance criteria.

#### 4.6 <u>Laboratory Duplicate</u>

Two batch laboratory duplicates were reported for the total dissolved solids analyses. Since this was batch QC there was no impact on the data.

#### 4.7 Equipment Blank

Equipment blanks were not reported with the sample sets.

#### 4.8 Field Duplicate

Field duplicates were not reported with the sample sets.

#### 4.9 **Sensitivity**

The samples were reported to the MDLs. The MDLs reported met the limits listed in Table 4 of the CCR Groundwater Monitoring Plan.

## **4.10** Electronic Data Deliverables Review

Results and sample IDs in the EDDs were reviewed against the information provided by the associated level II reports at a minimum of 20% as part of the data validation process. The non-detect results were reported at the MDL in the laboratory reports and reported as ND in the EDD. No other discrepancies were identified between the level II report and the EDD.

\* \* \* \* \*

# ATTACHMENT 1 DATA VALIDATION QUALIFIER DEFINITIONS AND INTERPRETATION KEY Assigned by Geosyntec's Data Validation Team

#### DATA QUALIFIER DEFINITIONS

- U The analyte was analyzed for, but was not detected above the reported sample quantitation limit.
- J The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.
- J+ The analyte was positively identified; however, the associated numerical value is likely to be higher than the concentration of the analyte in the sample due to positive bias of associated QC or calibration data or attributable to matrix interference.
- J- The analyte was positively identified; however, the associated numerical value is likely to be lower than the concentration of the analyte in the sample due to negative bias of associated QC or calibration data or attributable to matrix interference.
- UJ The analyte was not detected above the reported sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.
- R The sample results are rejected due to serious deficiencies in the ability to analyze the sample and meet quality control criteria. The presence or absence of the analyte cannot be verified.

## ATTACHMENT 2 DATA VALIDATION REASON CODES Assigned by Geosyntec's Data Validation Team

Valid Value	Description
1	Preservation requirement not met
2	Analysis holding time exceeded
3	Blank contamination (i.e., method, trip, equipment, etc.)
4	Matrix spike/matrix spike duplicate recovery or RPD outside limits
5	LCS or RPD recovery outside limits (LCS/LCSD)
6	Surrogate recovery outside limits
7	Field Duplicate RPD exceeded
8	Serial dilution percent difference exceeded
9	Calibration criteria not met
10	Linear range exceeded
11	Internal standard criteria not met
12	Lab duplicates RPD exceeded
13	Other

## Geosyntec consultants

180A Market Place Boulevard Knoxville, TN 37922 PH 865.330.0037 www.geosyntec.com

## Memorandum

Date: 24 October 2016

To: Todd Kafka

From: Chris Pracheil

CC: J. Caprio

Subject: Stage 2A Data Validation – Level II Data Deliverable – Tampa

Electric Laboratory Services #L16H075, TestAmerica #660-75848-1

and KNL Environmental Testing # L16H075

SITE: Big Bend Power Station, Apollo Beach, Florida

#### INTRODUCTION

This report summarizes the findings of the Stage 2A data validation of 5 water samples, collected on August 26, 2016 as part of the Big Bend Power Station coal combustion residuals (CCR) groundwater monitoring program plan. The lithium analyses were performed by TestAmerica Tampa, Tampa, Florida (TestAmerica). The radium analyses were performed by KNL Environmental Testing, Tampa, Florida (KNL). The rest of the analyses were performed by Tampa Electric Laboratory Services, Tampa, Florida (TELS). The samples were analyzed for the following:

- Metals by EPA Method 200.7, 200.8 and 6010B
- Mercury by EPA Method 7470A
- Radium-226 by EPA Method 903.0
- Radium-228 by EPA Method Ra-05
- Chloride, Fluoride and Sulfate by EPA Method 300.0
- Total Dissolved Solids by SM 2540C

#### **EXECUTIVE SUMMARY**

The samples were handled, prepared, and measured in the same manner under similar prescribed conditions.

Overall, based on this Stage 2A data validation covering the quality control (QC) parameters listed below, the data as qualified are usable for meeting project objectives. The qualified data should be used within the limitations of the qualifications.

L16H075 Bigbend DVR Final Review: JK Caprio 11/10/16

The inorganic data were reviewed based on the following: CCR Groundwater Monitoring Program Plan, Big Bend Power Station, Apollo Beach, Florida, September 2016, USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review, August 2014 (OSWER 9355.0-131, EPA 540-R-013-001), as well as by the pertinent methods referenced by the data package and professional and technical judgment.

The following samples were analyzed and validated at a Stage 2A level in the data set:

Laboratory ID	Client ID
L16H075-01	PZ1
L16H075-02	PZ2
L16H075-03	PZ3

Laboratory ID	Client ID
L16H075-05	PZ5
L16H075-06	PZ6

The samples were received at TestAmerica Tampa outside the temperature criteria of  $4\pm2^{\circ}$ C; the samples were received at  $1.0^{\circ}$ C. Based on professional and technical judgment, no qualifications were applied to the data due to the temperatures outside the criteria. No sample preservation issues were noted by the laboratories.

#### 1.0 TOTAL METALS

The samples were analyzed for total metals per EPA Methods 200.7, 200.8 and 6010B.

The areas of data review are listed below. A leading check mark  $(\checkmark)$  indicates an area of review in which the data were acceptable. A preceding crossed circle  $(\otimes)$  signifies areas where issues were raised during the course of the validation review and should be considered to determine the impact on data quality and usability.

- ✓ Overall Assessment
- ✓ Holding Times
- ✓ Method Blank
- ✓ Matrix Spike/Matrix Spike Duplicate
- ✓ Laboratory Control Sample
- ✓ Serial Dilution
- ✓ Field Blank
- ✓ Equipment Blank
- ✓ Field Duplicate
- ✓ Sensitivity
- ✓ Electronic Data Deliverable Review

#### 1.1 Overall Assessment

The metals data reported in this package are considered to be usable for meeting project objectives. The results are considered valid; analytical completeness, defined as the ratio of the number of valid analytical results (valid analytical results include values qualified as estimated) to the total number of analytical results requested on samples submitted for analysis for the project, is 100%.

#### 1.2 **Holding Times**

The holding time for the metals analysis of waters is 180 days from sample collection to analysis. The holding time was met for the sample analyses.

#### 1.3 Method Blank

Method blanks were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). Four method blanks were reported, one for the method 200.7 data (batch 321282), one for the method 200.8 data (batch 16H0242), and two for the method 6010B data (batches 16H0239 and 16H0254). Metals were not detected in the method blanks above the method detection limit (MDL), with the following exception.

Boron was detected at an estimated concentration in the method blank associated with batch 16H0254. Since boron was detected above the reporting limit (RL) in the associated samples, no qualifications were applied to the data.

#### 1.4 Matrix Spike/Matrix Spike Duplicate (MS/MSD)

MS/MSDs were analyzed at the proper frequency for the number and types of samples analyzed (one pair per batch of 20 samples). One sample set specific MS/MSD pair was reported for the 6010B data, using samples PZ6, and one sample set specific MS/MSD pair was reported for the 200.7 data, using samples PZ1. The recovery and relative percent difference (RPD) results were within the laboratory specified acceptance criteria.

Batch MS/MSD pairs were also reported for the 200.8 and 6010B data. Since these are batch QC, the results do not affect the samples in this data set and qualifications were not applied to the data.

#### 1.5 <u>Laboratory Control Sample (LCS)</u>

LCSs were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). Four LCSs were reported, one for the 200.7 data, one for the 200.8 data

and two for the 6010B data. The recovery results were within the laboratory specified acceptance criteria.

#### 1.6 Serial Dilution

Serial dilutions were not reported.

## 1.7 Field Duplicate

Field duplicates were not reported with the sample sets.

#### 1.8 Sensitivity

The samples were reported to the MDLs. No elevated non-detect results were reported. The MDLs met the limits listed in Table 4 of the CCR Groundwater Monitoring Plan.

#### 1.9 Electronic Data Deliverable Review

The results and sample identifications (IDs) in the EDD were reviewed against the information provided by the associated level II report at a minimum of 20% as part of the data validation process. No discrepancies were identified between the level II report and the EDD.

#### 2.0 MERCURY

The samples were analyzed for mercury per EPA Method 7470A.

The areas of data review are listed below. A leading check mark  $(\checkmark)$  indicates an area of review in which the data were acceptable. A preceding crossed circle  $(\otimes)$  signifies areas where issues were raised during the course of the validation review and should be considered to determine the impact on data quality and usability.

Final Review: JK Caprio 11/10/16

- ✓ Overall Assessment
- ✓ Holding Times
- ✓ Method Blank
- ✓ Matrix Spike/Matrix Spike Duplicate
- ✓ Laboratory Control Sample
- ✓ Field Blank
- ✓ Equipment Blank
- ✓ Field Duplicate
- ✓ Sensitivity

✓ Electronic Data Deliverable Review

#### 2.1 Overall Assessment

The mercury data reported in this package are considered to be usable for meeting project objectives. The results are considered valid; analytical completeness, defined as the ratio of the number of valid analytical results (valid analytical results include values qualified as estimated) to the total number of analytical results requested on samples submitted for analysis for the project, is 100%.

### 2.2 Holding Times

The holding time for the mercury analysis of a water sample is 28 days from sample collection to analysis. The holding times were met for the sample analyses.

## 2.3 Method Blank

Method blanks were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). One method blank was reported (batch 16H0256). Mercury was not detected in the method blank above the MDL.

#### 2.4 <u>Matrix Spike/Matrix Spike Duplicate</u>

MS/MSD pairs were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). One sample set specific MS/MSD pair, using sample PZ5, was reported. The recovery and RPD results were within the laboratory specified acceptance criteria.

## 2.5 <u>Laboratory Control Sample</u>

LCSs were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). One LCS was reported. The recovery results were within the laboratory specified acceptance criteria.

#### 2.6 Field Duplicate

Field duplicates were not reported with the sample sets.

#### 2.7 Sensitivity

The samples were reported to the MDL. No elevated non-detect results were reported. The MDL for mercury met the limits listed in Table 4 of the CCR Groundwater Monitoring Plan.

#### 2.8 Electronic Data Deliverable Review

The results and sample IDs in the EDD were reviewed against the information provided by the associated level II report at a minimum of 20% as part of the data validation process. No discrepancies were identified between the level II report and the EDD.

#### **3.0 RADIUM-226 AND RADIUM-228**

The samples were analyzed for radium 226 and radium 228 per EPA Methods 903.0 and RA-05, respectively.

The areas of data review are listed below. A leading check mark  $(\checkmark)$  indicates an area of review in which the data were acceptable. A preceding crossed circle  $(\otimes)$  signifies areas where issues were raised during the course of the validation review and should be considered to determine the impact on data quality and usability.

- ✓ Overall Assessment
- ✓ Holding Times
- ✓ Method Blank
- ✓ Matrix Spike/Matrix Spike Duplicate
- ✓ Laboratory Control Sample
- ✓ Surrogates
- ✓ Field Blank
- ✓ Equipment Blank
- ✓ Field Duplicate
- ✓ Sensitivity
- ✓ Electronic Data Deliverable Review

#### 3.1 Overall Assessment

The radium-226 and radium-228 data reported in this package are considered to be usable for meeting project objectives. The results are considered valid; the analytical completeness, defined as the ratio of the number of valid analytical results (valid analytical results include values

qualified as estimated) to the total number of analytical results requested on samples submitted for analysis for the project, is 100%.

#### 3.2 Holding Times

The holding times for radium-226 and radium-228 analysis of waters are 180 days from sample collection to analysis. The holding times were met for the sample analyses.

#### 3.3 Method Blank

Method blanks were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). Two method blanks were reported, one for the radium-226 data and one for the radium-228 data (both reported in batch L16H075). Radium-228 was not detected in the method blank above the minimum detectable concentration (MDC); however, radium-226 was detected above the MDC in the method blank associated with batch L16H075. Since, the detections of radium-226 and combined radium (radium-226 + radium-228) had concentrations greater than 10x the blank concentration no qualifications were applied to the data.

## 3.4 <u>Matrix Spike/Matrix Spike Duplicate</u>

MS/MSDs were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). One sample set specific MS/MSD pair, using sample PZ6, was reported for the radium-228 data. The MSD recovery of radium-228 was low and outside of laboratory specified acceptance criteria in the MS/MSD pair, using sample PZ6; therefore, the non-detect result of radium-228 in sample PZ6 was J qualified as estimated.

Client Sample ID	Compound	Laboratory Result (pCi/L)	Laboratory Flag	Validation Result (pCi/L)	Validation Qualifier*	Reason Code**
PZ6	Radium-228	0.7	U	0.7	UJ	4

pCi/L-picocuries per liter

A batch MS/MSD pair was reported for the radium-226 data. Since these are batch QC, the results do not affect the samples in this data set and qualifications were not applied to the data.

U- laboratory flag indicating the analytes was not detected above the MDL in the associated sample

<sup>\*</sup> Validation qualifiers are defined in Attachment 1 at the end of this report

<sup>\*\*</sup>Reason codes are defined in Attachment 2 at the end of this report

#### 3.5 <u>Laboratory Control Sample</u>

LCSs were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). Two LCS were reported for radium-226 and radium-228. The recovery results were within the laboratory specified acceptance criteria.

## 3.6 <u>Laboratory Duplicate</u>

A laboratory duplicate was not reported with the sample set.

## 3.7 <u>Sensitivity</u>

The samples were reported to the MDCs. The reported MDCs met the limits listed in Table 4 of the CCR Groundwater Monitoring Plan.

#### 3.8 Electronic Data Deliverable Review

The results and sample IDs in the EDD were reviewed against the information provided by the associated level II report at a minimum of 20% as part of the data validation process. No discrepancies were identified between the level II report and the EDD.

#### 4.0 WET CHEMISTRY PARAMETERS

The samples were analyzed for chloride, fluoride and sulfate by EPA Method 300.0 and total dissolved solids by SM 2540C.

The areas of data review are listed below. A leading check mark ( $\checkmark$ ) indicates an area of review in which the data were acceptable. A preceding crossed circle ( $\otimes$ ) signifies areas where issues were raised during the course of the validation review and should be considered to determine any impact on data quality and usability.

- ✓ Overall Assessment
- ✓ Holding Times
- ✓ Method Blank
- ✓ Matrix Spike/Matrix Spike Duplicate
- ✓ Laboratory Control Sample
- ✓ Laboratory Duplicate
- ✓ Equipment Blank
- ✓ Field Duplicate
- ✓ Sensitivity
- ✓ Electronic Data Deliverables Review

#### 4.1 Overall Assessment

The wet chemistry data reported in this package are considered to be usable for meeting project objectives. The results are considered to be valid; the analytical completeness, defined as the ratio of the number of valid analytical results (valid analytical results include values qualified as estimated) to the total number of analytical results requested on samples submitted for analysis, for the project is 100%.

#### **4.2** Holding Times

The holding times for chloride, fluoride and sulfate by EPA method 300.0 are 28 days from sample collection to analysis and the holding time for total dissolved solids by SM 2540C is 7 days. The holding times were met for the sample analyses.

#### 4.3 Method Blanks

Method blanks were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). Method blanks were reported for each analysis as appropriate. The wet chemistry parameters were not detected in the method blanks above the MDLs.

## 4.4 <u>Matrix Spike/Matrix Spike Duplicate</u>

Batch MS/MSD pairs were reported for the wet chemistry data. Since these are batch QC, the results do not affect the samples in this data set and qualifications were not applied to the data.

#### 4.5 <u>Laboratory Control Sample</u>

LCSs were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). LCSs were reported for each analysis as appropriate. The recovery results were within the laboratory specified acceptance criteria.

## 4.6 <u>Laboratory Duplicate</u>

One batch laboratory duplicate was reported for the total dissolved solids analyses. Since this was batch QC there was no impact on the data.

#### **4.7** Field Duplicate

Field duplicates were not reported with the sample sets.

#### 4.8 Sensitivity

The samples were reported to the MDLs. The MDLs reported met the limits listed in Table 4 of the CCR Groundwater Monitoring Plan.

#### 4.9 Electronic Data Deliverables Review

Results and sample IDs in the EDDs were reviewed against the information provided by the associated level II reports at a minimum of 20% as part of the data validation process. No discrepancies were identified between the level II report and the EDD.

\* \* \* \* \*

# ATTACHMENT 1 DATA VALIDATION QUALIFIER DEFINITIONS AND INTERPRETATION KEY Assigned by Geosyntec's Data Validation Team

#### DATA QUALIFIER DEFINITIONS

- U The analyte was analyzed for, but was not detected above the reported sample quantitation limit.
- J The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.
- J+ The analyte was positively identified; however, the associated numerical value is likely to be higher than the concentration of the analyte in the sample due to positive bias of associated QC or calibration data or attributable to matrix interference.
- J- The analyte was positively identified; however, the associated numerical value is likely to be lower than the concentration of the analyte in the sample due to negative bias of associated OC or calibration data or attributable to matrix interference.
- UJ The analyte was not detected above the reported sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.
- R The sample results are rejected due to serious deficiencies in the ability to analyze the sample and meet quality control criteria. The presence or absence of the analyte cannot be verified.

L16H075 Bigbend DVR Final Review: JK Caprio 11/10/16

## ATTACHMENT 2 DATA VALIDATION REASON CODES Assigned by Geosyntec's Data Validation Team

Valid Value	Description
1	Preservation requirement not met
2	Analysis holding time exceeded
3	Blank contamination (i.e., method, trip, equipment, etc.)
4	Matrix spike/matrix spike duplicate recovery or RPD outside limits
5	LCS or RPD recovery outside limits (LCS/LCSD)
6	Surrogate recovery outside limits
7	Field Duplicate RPD exceeded
8	Serial dilution percent difference exceeded
9	Calibration criteria not met
10	Linear range exceeded
11	Internal standard criteria not met
12	Lab duplicates RPD exceeded
13	Other

L16H075 Bigbend DVR Final Review: JK Caprio 11/10/16

## Geosyntec consultants

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Final Review: JK Caprio 1/17/17

## Memorandum

Date: 17 January 2017

To: Todd Kafka

From: Chris Pracheil

CC: J. Caprio

Subject: Stage 2A Data Validation – Level II Data Deliverable – Tampa

Electric Laboratory Services #L16J027 and #L16K034, TestAmerica #660-77026-1 and #660-77306-1 and KNL

Environmental Testing #L16J027 and #L16K034

SITE: Big Bend Power Station, Apollo Beach, Florida

#### INTRODUCTION

This report summarizes the findings of the Stage 2A data validation of 10 water samples, collected on October 28, 2016 and November 10, 2016 as part of the Big Bend Power Station coal combustion residuals (CCR) groundwater monitoring program plan. The lithium analyses were performed by TestAmerica Tampa, Tampa, Florida (TestAmerica). The radium analyses were performed by KNL Environmental Testing, Tampa, Florida (KNL). The rest of the analyses were performed by Tampa Electric Laboratory Services, Tampa, Florida (TELS). The samples were analyzed for the following:

- Metals by EPA Method 200.7, 200.8 and 6010B
- Mercury by EPA Method 7470A
- Radium-226 by EPA Method 903.0
- Radium-228 by EPA Method Ra-05
- Chloride, Fluoride and Sulfate by EPA Method 300.0
- Total Dissolved Solids by SM 2540C

#### **EXECUTIVE SUMMARY**

The samples were handled, prepared, and measured in the same manner under similar prescribed conditions.

Overall, based on this Stage 2A data validation covering the quality control (QC) parameters listed below, the data as qualified are usable for meeting project objectives. The qualified data should be used within the limitations of the qualifications.

The inorganic data were reviewed based on the following: CCR Groundwater Monitoring Program Plan, Big Bend Power Station, Apollo Beach, Florida, September 2016, USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review, August 2014 (OSWER 9355.0-131, EPA 540-R-013-001), as well as by the pertinent methods referenced by the data package and professional and technical judgment.

The following samples were analyzed and validated at a Stage 2A level in the data set:

Laboratory	Client ID
ID	
L16J027-01	BBS-CCR-1 (10/28/16)
L16J027-02	BBS-CCR-2 (10/28/16)
L16J027-03	BBS-CCR-3 (10/28/16)
L16J027-04	BBS-CCR-BW-1 (10/28/16)
L16J027-05	BBS-CCR-BW-2 (10/28/16)

Laboratory	Client ID
ID	
L16K034-01	BBS-CCR-1 (11/10/16)
L16K034-02	BBS-CCR-2 (11/10/16)
L16K034-03	BBS-CCR-3 (11/10/16)
L16K034-04	BBS-CCR-BW-1 (11/10/16)
L16K034-05	BBS-CCR-BW-2 (11/10/16)

The samples collected on 10/28/2016 were received at TestAmerica Tampa outside the temperature criteria of  $4\pm2^{\circ}$ C; the samples were received at  $0.4^{\circ}$ C. Based on professional and technical judgment, no qualifications were applied to the data due to the temperatures outside the criteria. No sample preservation issues were noted by the laboratories.

#### 1.0 TOTAL METALS

The samples were analyzed for total metals per EPA Methods 200.7, 200.8 and 6010B.

The areas of data review are listed below. A leading check mark  $(\checkmark)$  indicates an area of review in which the data were acceptable. A preceding crossed circle  $(\otimes)$  signifies areas where issues were raised during the course of the validation review and should be considered to determine the impact on data quality and usability.

- ✓ Overall Assessment
- ✓ Holding Times
- ✓ Method Blank
- ✓ Matrix Spike/Matrix Spike Duplicate
- ✓ Laboratory Control Sample
- ✓ Serial Dilution

- ✓ Field Blank
- ✓ Equipment Blank
- ✓ Field Duplicate
- ✓ Sensitivity
- ✓ Electronic Data Deliverable Review

#### 1.1 Overall Assessment

The metals data reported in this package are considered usable for meeting project objectives. The results are considered valid; analytical completeness, defined as the ratio of the number of valid analytical results (valid analytical results include values qualified as estimated) to the total number of analytical results requested on samples submitted for analysis for the project, is 100%.

## 1.2 Holding Times

The holding time for the metals analysis of waters is 180 days from sample collection to analysis. The holding time was met for the sample analyses.

## 1.3 Method Blank

Method blanks were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). Six method blanks were reported, two for the method 200.7 data (batches 329861 and 331677), two for the method 200.8 data (batches 16J0235 and 16K0095), and two for the method 6010B data (batches 16J0236 and 16K0104). Metals were not detected in the method blanks above the method detection limit (MDL), with the following exception.

Calcium was detected at an estimated concentration, greater than the MDL and less than the reporting limit (RL), in the method blank associated with batch 16J0236. Since calcium was detected above the RL in the associated samples, no qualifications were applied to the data.

#### 1.4 Matrix Spike/Matrix Spike Duplicate (MS/MSD)

MS/MSDs were analyzed at the proper frequency for the number and types of samples analyzed (one pair per batch of 20 samples). One sample set specific MS/MSD pair was reported for the Method 6010B data, using sample BBS-CCR-BW-2(10/28/16), and one sample set specific MS/MSD pair was reported for the Method 200.8 data, using sample BBS-CCR-1(10/28/16). The recovery and relative percent difference (RPD) results were within the laboratory specified acceptance criteria.

Batch MS/MSD pairs were also reported for Methods 200.7, 200.8 and 6010B data. Since these are batch QC, the results do not affect the samples in this data set and qualifications were not applied to the data.

## 1.5 <u>Laboratory Control Sample (LCS)</u>

LCSs were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). Six LCSs were reported, two for the Method 200.7 data, two for the Method 200.8 data and two for the Method 6010B data. The recovery results were within the laboratory specified acceptance criteria.

#### 1.6 <u>Serial Dilution</u>

Serial dilutions were not reported.

#### 1.7 Field Duplicate

Field duplicates were not reported with the sample sets.

#### 1.8 Sensitivity

The samples were reported to the MDLs. Elevated non-detect results were reported for sample BBS-CCR-BW-1 (10/28/16) due to the sample being analyzed at dilution. The MDLs met the limits listed in Table 4 of the CCR Groundwater Monitoring Plan.

#### 1.9 Electronic Data Deliverable Review

The results and sample identifications (IDs) in the EDD were reviewed against the information provided by the associated level II report at a minimum of 20% as part of the data validation process. No discrepancies were identified between the level II report and the EDD.

#### 2.0 MERCURY

The samples were analyzed for mercury per EPA Method 7470A.

The areas of data review are listed below. A leading check mark  $(\checkmark)$  indicates an area of review in which the data were acceptable. A preceding crossed circle  $(\otimes)$  signifies areas where issues were raised during the course of the validation review and should be considered to determine the impact on data quality and usability.

#### ✓ Overall Assessment

- ✓ Holding Times
- ✓ Method Blank
- ✓ Matrix Spike/Matrix Spike Duplicate
- ✓ Laboratory Control Sample
- ✓ Field Blank
- ✓ Equipment Blank
- ✓ Field Duplicate
- ✓ Sensitivity
- ✓ Electronic Data Deliverable Review

## 2.1 Overall Assessment

The mercury data reported in this package are considered to be usable for meeting project objectives. The results are considered valid; analytical completeness, defined as the ratio of the number of valid analytical results (valid analytical results include values qualified as estimated) to the total number of analytical results requested on samples submitted for analysis for the project, is 100%.

## 2.2 <u>Holding Times</u>

The holding time for the mercury analysis of a water sample is 28 days from sample collection to analysis. The holding times were met for the sample analyses.

#### 2.3 Method Blank

Method blanks were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). Two method blanks were reported (batches 16K0037 and 16K0106). Mercury was not detected in the method blanks above the MDL.

## 2.4 <u>Matrix Spike/Matrix Spike Duplicate</u>

MS/MSD pairs were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). One sample set specific MS/MSD pair, using sample BBS-CCR-1(11/10/16), was reported. The recovery and RPD results were within the laboratory specified acceptance criteria.

A batch MS/MSD pair was also reported for the mercury data. Since these are batch QC, the results do not affect the samples in this data set and qualifications were not applied to the data.

#### 2.5 <u>Laboratory Control Sample</u>

LCSs were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). Two LCSs were reported. The recovery results were within the laboratory specified acceptance criteria.

## 2.6 Field Duplicate

Field duplicates were not reported with the sample sets.

#### 2.7 Sensitivity

The samples were reported to the MDL. No elevated non-detect results were reported. The MDL for mercury met the limits listed in Table 4 of the CCR Groundwater Monitoring Plan.

#### 2.8 Electronic Data Deliverable Review

The results and sample IDs in the EDD were reviewed against the information provided by the associated level II report at a minimum of 20% as part of the data validation process. No discrepancies were identified between the level II report and the EDD.

#### **3.0 RADIUM-226 AND RADIUM-228**

The samples were analyzed for radium 226 and radium 228 per EPA Methods 903.0 and RA-05, respectively.

The areas of data review are listed below. A leading check mark  $(\checkmark)$  indicates an area of review in which the data were acceptable. A preceding crossed circle  $(\otimes)$  signifies areas where issues were raised during the course of the validation review and should be considered to determine the impact on data quality and usability.

- ✓ Overall Assessment
- ✓ Holding Times
- ⊗ Method Blank
- ✓ Matrix Spike/Matrix Spike Duplicate
- ✓ Laboratory Control Sample
- ✓ Surrogates
- ✓ Field Blank
- ✓ Equipment Blank
- ✓ Field Duplicate

- ✓ Sensitivity
- ✓ Electronic Data Deliverable Review

### 3.1 Overall Assessment

The radium-226 and radium-228 data reported in this package are considered usable for meeting project objectives. The results are considered valid; the analytical completeness, defined as the ratio of the number of valid analytical results (valid analytical results include values qualified as estimated) to the total number of analytical results requested on samples submitted for analysis for the project, is 100%.

#### 3.2 **Holding Times**

The holding times for radium-226 and radium-228 analysis of waters are 180 days from sample collection to analysis. The holding times were met for the sample analyses.

### 3.3 Method Blank

Method blanks were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). Four method blanks were reported, two for the radium-226 data and two for the radium-228 data. Radium-228 was detected in the method blank above the minimum detectable concentration (MDC) in batch L16K034 and radium-226 was detected above the MDC in the method blank associated with batches L16J027 and L16K034. Therefore, the detections of radium-228 with concentrations less than 10x the blank concentrations were J qualified as estimated. No qualifications were applied to the radium-226 and combined radium data (radium-226 + radium-228) since the concentrations were greater than 10x the blank concentration

Client Sample ID	Compound	Laboratory	Laboratory	Validation	Validation	Reason
		Result (pCi/L)	Flag	Result (pCi/L)	Qualifier*	Code**
BBS-CCR-1 (11/10/16)	Radium-228	2.3	NA	2.3	J	3
BBS-CCR-2 (11/10/16)	Radium-228	0.9	NA	0.9	J	3
BBS-CCR-3 (11/10/16)	Radium-228	1.9	NA	1.9	J	3
BBS-CCR-BW1 (11/10/16)	Radium-228	3.6	NA	3.6	J	3

pCi/L-picocuries per liter

NA-not applicable

<sup>\*</sup> Validation qualifiers are defined in Attachment 1 at the end of this report

<sup>\*\*</sup>Reason codes are defined in Attachment 2 at the end of this report

#### 3.4 Matrix Spike

MSs were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). One sample set specific MS, using sample BBS-CCR-BW1 (11/10/16), was reported for the radium-228 data. The recovery results were within the laboratory specified acceptance criteria.

Batch MSs were also reported for the radium-226 and radium-228 data. Since these are batch QC, the results do not affect the samples in this data set and qualifications were not applied to the data.

## 3.5 <u>Laboratory Control Sample</u>

LCSs were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). Two LCSs were reported for radium-226 and two for radium-228. The recovery results were within the laboratory specified acceptance criteria.

#### 3.6 Laboratory Duplicate

Laboratory duplicates were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). One sample set specific laboratory duplicate, using sample BBS-CCR-BW1 (11/10/16), was reported for the radium-228 data. The RPD result was within the validation specified acceptance criteria.

Batch laboratory duplicates were also reported for the radium-226 and radium-228 data. Since these are batch QC, the results do not affect the samples in this data set and qualifications were not applied to the data.

#### 3.7 Sensitivity

The samples were reported to the MDCs. The reported MDCs met the limits listed in Table 4 of the CCR Groundwater Monitoring Plan.

## 3.8 <u>Electronic Data Deliverable Review</u>

The results and sample IDs in the EDD were reviewed against the information provided by the associated level II report at a minimum of 20% as part of the data validation process. No discrepancies were identified between the level II report and the EDD.

#### 4.0 WET CHEMISTRY PARAMETERS

The samples were analyzed for chloride, fluoride and sulfate by EPA Method 300.0 and total dissolved solids by SM 2540C.

The areas of data review are listed below. A leading check mark  $(\checkmark)$  indicates an area of review in which the data were acceptable. A preceding crossed circle  $(\otimes)$  signifies areas where issues were raised during the course of the validation review and should be considered to determine any impact on data quality and usability.

- ✓ Overall Assessment
- ✓ Holding Times
- ✓ Method Blank
- ⊗ Matrix Spike/Matrix Spike Duplicate
- ✓ Laboratory Control Sample
- ✓ Laboratory Duplicate
- ✓ Equipment Blank
- ✓ Field Duplicate
- ✓ Sensitivity
- ✓ Electronic Data Deliverables Review

#### 4.1 Overall Assessment

The wet chemistry data reported in this package are considered usable for meeting project objectives. The results are considered to be valid; the analytical completeness, defined as the ratio of the number of valid analytical results (valid analytical results include values qualified as estimated) to the total number of analytical results requested on samples submitted for analysis, for the project is 100%.

## 4.2 <u>Holding Times</u>

The holding times for chloride, fluoride and sulfate by EPA method 300.0 are 28 days from sample collection to analysis and the holding time for total dissolved solids by SM 2540C is 7 days. The holding times were met for the sample analyses.

#### 4.3 Method Blanks

Method blanks were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). Method blanks were reported for each analysis as

appropriate. The wet chemistry parameters were not detected in the method blanks above the MDLs, with the following exceptions.

Chloride was detected at estimated concentrations, greater than the MDLs and less than the RLs, in the method blanks associated with batches 16K0007 and 16K0150. Since chloride was detected above the RL in the associated samples, no qualifications were applied to the data.

#### 4.4 Matrix Spike/Matrix Spike Duplicate

MS/MSD pairs were reported for the wet chemistry data. Sample set specific MS/MSD pairs were reported for chloride, fluoride and sulfate, using sample BBS-CCR-1 (10/28/16). The MS recoveries of chloride and sulfate were low and outside of laboratory specified acceptance criteria; therefore the concentrations of chloride and sulfate in sample BBS-CCR-1 (10/28/16) were J-qualified as estimated with a low bias.

Client Sample ID	Compound	Laboratory Result (mg/L)	Laboratory Flag	Validation Result (mg/L)	Validation Qualifier	Reason Code
BBS-CCR-1 (10/28/16)	Chloride	743	J-,V	743	J-	4
BBS-CCR-1 (10/28/16)	Sulfate	1230	J-	1230	J-	4

mg/L-milligrams per liter

Batch MS/MSD were also reported for the wet chemistry parameters. Since these are batch QC, the results do not affect the samples in this data set and qualifications were not applied to the data.

#### 4.5 <u>Laboratory Control Sample</u>

LCSs were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). LCSs were reported for each analysis as appropriate. The recovery results were within the laboratory specified acceptance criteria.

## 4.6 <u>Laboratory Duplicate</u>

Laboratory duplicates were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). Two sample set specific laboratory duplicates were reported for total dissolved solids using samples BBS-CCR-1 (10/28/16) and BBS-CCR-1 (11/10/16). The RPD results were within the laboratory specified acceptance criteria.

J- laboratory flag indicating the reported value is estimated

V-laboratory flag indication the analyte was detected in the method blank

Two batch laboratory duplicates were also reported for the total dissolved solids analyses. Since these were batch QC there was no impact on the data.

## **4.7** Field Duplicate

Field duplicates were not reported with the sample sets.

## 4.8 **Sensitivity**

The samples were reported to the MDLs. The MDLs reported met the limits listed in Table 4 of the CCR Groundwater Monitoring Plan.

## 4.9 <u>Electronic Data Deliverables Review</u>

Results and sample IDs in the EDDs were reviewed against the information provided by the associated level II reports at a minimum of 20% as part of the data validation process. No discrepancies were identified between the level II report and the EDD.

\* \* \* \* \*

# ATTACHMENT 1 DATA VALIDATION QUALIFIER DEFINITIONS AND INTERPRETATION KEY Assigned by Geosyntec's Data Validation Team

#### DATA QUALIFIER DEFINITIONS

- U The analyte was analyzed for, but was not detected above the reported sample quantitation limit.
- J The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.
- J+ The analyte was positively identified; however, the associated numerical value is likely to be higher than the concentration of the analyte in the sample due to positive bias of associated QC or calibration data or attributable to matrix interference.
- J- The analyte was positively identified; however, the associated numerical value is likely to be lower than the concentration of the analyte in the sample due to negative bias of associated QC or calibration data or attributable to matrix interference.
- UJ The analyte was not detected above the reported sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.
- R The sample results are rejected due to serious deficiencies in the ability to analyze the sample and meet quality control criteria. The presence or absence of the analyte cannot be verified.

Final Review: JK Caprio 1/17/17

## ATTACHMENT 2 DATA VALIDATION REASON CODES Assigned by Geosyntec's Data Validation Team

Valid Value	Description
1	Preservation requirement not met
2	Analysis holding time exceeded
3	Blank contamination (i.e., method, trip, equipment, etc.)
4	Matrix spike/matrix spike duplicate recovery or RPD outside limits
5	LCS or RPD recovery outside limits (LCS/LCSD)
6	Surrogate recovery outside limits
7	Field Duplicate RPD exceeded
8	Serial dilution percent difference exceeded
9	Calibration criteria not met
10	Linear range exceeded
11	Internal standard criteria not met
12	Lab duplicates RPD exceeded
13	Other



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## Memorandum

Date: 12 May 2017

To: Todd Kafka

From: Chris Pracheil

CC: J. Caprio

Subject: Stage 2A Data Validation – Level II Data Deliverable – Tampa

Electric Laboratory Services #L17A041 and #L17D013, TestAmerica #660-78617-1 and #660-80222-1 and KNL

Environmental Testing # L17A041 and # L17D013

SITE: Big Bend Power Station, Apollo Beach, Florida

#### INTRODUCTION

This report summarizes the findings of the Stage 2A data validation of 10 water samples, collected on January 26, 2017 and April 13, 2017 as part of the Big Bend Power Station coal combustion residuals (CCR) groundwater monitoring program plan. The lithium analyses were performed by TestAmerica Tampa, Tampa, Florida (TA). The radium analyses were performed by KNL Environmental Testing, Tampa, Florida (KNL). The rest of the analyses were performed by Tampa Electric Laboratory Services, Tampa, Florida (TELS). The samples were analyzed for the following:

- Metals by EPA Methods 200.7, 200.8 and 6010B
- Mercury by EPA Method 7470A
- Radium-226 by EPA Method 903.0
- Radium-228 by EPA Method Ra-05
- Chloride, Fluoride and Sulfate by EPA Method 300.0
- Total Dissolved Solids by Standard Method 2540C

#### **EXECUTIVE SUMMARY**

The samples were handled, prepared, and measured in the same manner under similar prescribed conditions.

Final Review: KDH 05/09/17

Overall, based on this Stage 2A data validation covering the quality control (QC) parameters listed below, the data as qualified are usable for meeting project objectives. The qualified data should be used within the limitations of the qualifications.

The inorganic data were reviewed based on the following: CCR Groundwater Monitoring Program Plan, Big Bend Power Station, Apollo Beach, Florida, September 2016, USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review, January 2017 (OLEM 9355.0-135, EPA 540-R-2017-001), as well as by the pertinent methods referenced by the data package and professional and technical judgment.

The following samples were analyzed and validated at a Stage 2A level in the data set:

Laboratory	Client ID
ID	
L17A041-01	BBS-CCR-1 (1/26/17)
L17A041-02	BBS-CCR-2 (1/26/17)
L17A041-03	BBS-CCR-3 (1/26/17)
L17A041-04	BBS-CCR-BW-1 (1/26/17))
L17A041-05	BBS-CCR-BW-2 (1/26/17)

Laboratory	Client ID
ID	
L17D013-01	BBS-CCR-1 (4/13/17)
L17D013-02	BBS-CCR-2 (4/13/17)
L17D013-03	BBS-CCR-3 (4/13/17)
L17D013-04	BBS-CCR-BW-1 (4/13/17)
L17D013-05	BBS-CCR-BW-2 (4/13/17)

Final Review: KDH 5/9/17

The samples collected on 1/26/2017 were received at TestAmerica Tampa outside the temperature criteria of  $4\pm2^{\circ}$ C; the samples were received at  $15.0^{\circ}$ C. Based on professional and technical judgment, no qualifications were applied to the data due to the temperatures outside the criteria. No sample preservation issues were noted by the laboratories.

It was noted that the chain of custody (COC) for TA report 660-78617 listed the sample collection date as 1/25/2017, instead of the correct sample collection date of 1/26/2017. Therefore, the samples have the incorrect sampling date listed in TA report 660-78617. This did not impact the data and no qualifications were applied to the data.

#### 1.0 TOTAL METALS

The samples were analyzed for total metals per EPA Methods 200.7, 200.8 and 6010B.

The areas of data review are listed below. A leading check mark  $(\checkmark)$  indicates an area of review in which the data were acceptable. A preceding crossed circle  $(\otimes)$  signifies areas where issues were raised during the course of the validation review and should be considered to determine the impact on data quality and usability.

- ✓ Overall Assessment
- ✓ Holding Times

- ✓ Matrix Spike/Matrix Spike Duplicate
- ✓ Laboratory Control Sample
- ✓ Serial Dilution
- ✓ Field Duplicate
- ✓ Sensitivity
- ✓ Electronic Data Deliverable Review

#### 1.1 Overall Assessment

The metals data reported in this package are considered usable for meeting project objectives. The results are considered valid; analytical completeness, defined as the ratio of the number of valid analytical results (valid analytical results include values qualified as estimated) to the total number of analytical results requested on samples submitted for analysis for the project, is 100%.

## 1.2 Holding Times

The holding time for the metals analysis of waters is 180 days from sample collection to analysis. The holding time was met for the sample analyses.

## 1.3 Method Blank

Method blanks were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). Six method blanks were reported (method 200.7 batches 340211 and 350739, method 200.8 batches 17A0263 and 17D0123, and method 6010B batches 17A0279 and 17D0115). Metals were not detected in the method blanks above the method detection limits (MDLs), with the following exceptions.

Cobalt was detected at an estimated concentration, greater than the MDL and less than the reporting limit (RL), in the method blank associated with batch 17D0123. Therefore, the estimated concentrations of cobalt in the associated samples were U qualified as not detected at the RL.

Client Sample ID	Compound	Laboratory Result (µg/L)	Laboratory Flag	Validation Result (µg/L)	Validation Qualifier*	Reason Code**
BBS-CCR-1 (4/13/17)	Cobalt	0.505	I,V	2.0	U	3
BBS-CCR-2 (4/13/17)	Cobalt	0.114	I,V	2.0	U	3
BBS-CCR-3 (4/13/17)	Cobalt	0.110	I,V	2.0	U	3
BBS-CCR-BW1 (4/13/17)	Cobalt	1.69	I,V	2.0	U	3
BBS-CCR-BW2 (4/13/17)	Cobalt	0.129	I,V	2.0	U	3

Final Review: KDH 5/9/17

µg/L-micrograms per liter

I- laboratory flag indicating the reported value is estimated, greater than MDL and less than RL

- V- Analyte detected in the method blank
- \* Validation qualifiers are defined in Attachment 1 at the end of this report
- \*\*Reason codes are defined in Attachment 2 at the end of this report

#### 1.4 Matrix Spike/Matrix Spike Duplicate (MS/MSD)

MS/MSDs were analyzed at the proper frequency for the number and types of samples analyzed (one pair per batch of 20 samples). Sample set specific MS/MSD pairs were reported for 6010B using sample BBS-CCR-1 (1/26/17) and 200.8 using samples BBS-CCR-1 (1/26/17) and BBS-CCR-BW-2 (4/13/17). The recovery and relative percent difference (RPD) results were within the laboratory specified acceptance criteria, with the following exception.

The recovery of boron in the MSD using sample BBS-CCR-1 (1/26/17) was high, outside the laboratory specified acceptance criteria. Since the boron concentration in sample BBS-CCR-1 (1/26/17) was greater than four times the spiked amount, no qualifications were applied to the boron data.

Batch MS/MSD pairs were also reported for Methods 200.7 and 6010B data. Since these are batch QC, the results do not affect the samples in this data set and qualifications were not applied to the data.

#### 1.5 **Laboratory Control Sample (LCS)**

LCSs were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). Six LCSs were reported. The recovery results were within the laboratory specified acceptance criteria.

#### 1.6 **Serial Dilution**

Serial dilutions were not reported.

#### 1.7 **Field Duplicate**

Field duplicates were not reported with the sample sets.

#### 1.8 Sensitivity

The samples were reported to the MDLs. Elevated non-detect results were reported for sample BBS-CCR-1(4/13/17) due to the sample being analyzed at dilution. The MDLs met the limits listed in Table 4 of the CCR Groundwater Monitoring Plan.

## 1.9 <u>Electronic Data Deliverable (EDD) Review</u>

The results and sample identifications (IDs) in the EDD were reviewed against the information provided by the associated level II reports at a minimum of 20% as part of the data validation process. No discrepancies were identified between the level II reports and the EDD.

#### 2.0 MERCURY

The samples were analyzed for mercury per EPA Method 7470A.

The areas of data review are listed below. A leading check mark  $(\checkmark)$  indicates an area of review in which the data were acceptable. A preceding crossed circle  $(\otimes)$  signifies areas where issues were raised during the course of the validation review and should be considered to determine the impact on data quality and usability.

- ✓ Overall Assessment
- ✓ Holding Times
- ✓ Method Blank
- ✓ Matrix Spike/Matrix Spike Duplicate
- ✓ Laboratory Control Sample
- ✓ Field Duplicate
- ✓ Sensitivity
- ✓ Electronic Data Deliverable Review

## 2.1 Overall Assessment

The mercury data reported in this package are considered to be usable for meeting project objectives. The results are considered valid; analytical completeness, defined as the ratio of the number of valid analytical results (valid analytical results include values qualified as estimated) to the total number of analytical results requested on samples submitted for analysis for the project, is 100%.

#### 2.2 Holding Times

The holding time for the mercury analysis of a water sample is 28 days from sample collection to analysis. The holding times were met for the sample analyses.

## 2.3 Method Blank

Method blanks were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). Two method blanks were reported (batches 17A0273 and 17D0122). Mercury was not detected in the method blanks above the MDL.

## 2.4 Matrix Spike/Matrix Spike Duplicate

MS/MSD pairs were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). Two sample set specific MS/MSD pairs, using samples BBS-CCR-2 (1/26/17) and BBS-CCR-1 (4/13/17), were reported. The recoveries and RPD results were within the laboratory specified acceptance criteria.

## 2.5 <u>Laboratory Control Sample</u>

LCSs were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). Two LCSs were reported. The recovery results were within the laboratory specified acceptance criteria.

#### 2.6 Field Duplicate

Field duplicates were not reported with the sample sets.

## 2.7 <u>Sensitivity</u>

The samples were reported to the MDL. No elevated non-detect results were reported. The MDL for mercury met the limit listed in Table 4 of the CCR Groundwater Monitoring Plan.

#### 2.8 Electronic Data Deliverable Review

The results and sample IDs in the EDD were reviewed against the information provided by the associated level II reports at a minimum of 20% as part of the data validation process. No discrepancies were identified between the level II reports and the EDD.

#### **3.0 RADIUM-226 AND RADIUM-228**

The samples were analyzed for radium 226 and radium 228 per EPA Methods 903.0 and RA-05, respectively.

The areas of data review are listed below. A leading check mark  $(\checkmark)$  indicates an area of review in which the data were acceptable. A preceding crossed circle  $(\otimes)$  signifies areas where issues were raised during the course of the validation review and should be considered to determine the impact on data quality and usability.

- ✓ Overall Assessment
- ✓ Holding Times
- ⊗ Method Blank
- ✓ Matrix Spike
- ✓ Laboratory Control Sample
- ✓ Laboratory Duplicate
- ✓ Sensitivity
- ✓ Electronic Data Deliverable Review

#### 3.1 Overall Assessment

The radium-226 and radium-228 data reported in this package are considered usable for meeting project objectives. The results are considered valid; the analytical completeness, defined as the ratio of the number of valid analytical results (valid analytical results include values qualified as estimated) to the total number of analytical results requested on samples submitted for analysis for the project, is 100%.

#### 3.2 Holding Times

The holding times for radium-226 and radium-228 analysis of waters are 180 days from sample collection to analysis. The holding times were met for the sample analyses.

#### 3.3 Method Blank

Method blanks were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). Six method blanks were reported (three for the radium-226 and three for the radium-228). The method blanks were within validation criteria with the following exceptions.

Radium-226 was detected at concentrations greater than 1.65 times the combined standard uncertainty (CSU) in batches L17A041 and L17D013. Therefore, the detections of radium-226 and combined radium data (radium-226 + radium-228) with concentrations less than 10 times the blank concentrations were J qualified as estimated.

Client Sample ID	Compound	Laboratory Result (pCi/L)	Laboratory Flag	Validation Result (pCi/L)	Validation Qualifier	Reason Code
BBS-CCR-2 (1/26/17)	Radium-226	3.7	NA	3.7	J	3
BBS-CCR-2 (1/26/17)	Radium-226 + Radium-228	4.8	NA	4.8	J	3

pCi/L-picocuries per liter NA-not applicable

#### 3.4 Matrix Spike

MSs were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). Two sample set specific MSs, using samples BBS-CCR-BW1 (1/26/17) and BBS-CCR-BW1 (4/13/17) for radium-228 and one sample set specific MS using sample BBS-CCR-BW2 (4/13/17) were reported for the radium-226 data. The recovery results were within the laboratory specified acceptance criteria.

Batch MSs were also reported for the radium-226 and radium-228 data. Since these are batch QC, the results do not affect the samples in this data set and qualifications were not applied to the data.

#### 3.5 <u>Laboratory Control Sample</u>

LCSs were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). Three LCSs were reported for radium-226 and three for radium-228. The recovery results were within the laboratory specified acceptance criteria.

#### 3.6 <u>Laboratory Duplicate</u>

Laboratory duplicates were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). Two sample set specific laboratory duplicates, using samples BBS-CCR-BW1 (1/26/17) and BBS-CCR-BW1 (4/13/17) for radium-228 and one sample set specific laboratory duplicate using sample BBS-CCR-BW2 (4/13/17) were reported for the radium-226 data.

Final Review: KDH 5/9/17

Batch laboratory duplicates were also reported for the radium-226 and radium-228 data. Since these are batch QC, the results do not affect the samples in this data set and qualifications were not applied to the data.

## 3.7 **Sensitivity**

The samples were reported to the MDCs. The reported MDCs met the limits listed in Table 4 of the CCR Groundwater Monitoring Plan.

#### 3.8 <u>Electronic Data Deliverable Review</u>

The results and sample IDs in the EDD were reviewed against the information provided by the associated level II reports at a minimum of 20% as part of the data validation process. No discrepancies were identified between the level II reports and the EDD.

#### 4.0 WET CHEMISTRY PARAMETERS

The samples were analyzed for chloride, fluoride and sulfate by EPA Method 300.0 and total dissolved solids by SM 2540C.

The areas of data review are listed below. A leading check mark ( $\checkmark$ ) indicates an area of review in which the data were acceptable. A preceding crossed circle ( $\otimes$ ) signifies areas where issues were raised during the course of the validation review and should be considered to determine any impact on data quality and usability.

- ⊗ Overall Assessment
- ✓ Holding Times
- ✓ Method Blank
- ⊗ Matrix Spike/Matrix Spike Duplicate
- ✓ Laboratory Control Sample
- ✓ Laboratory Duplicate
- ✓ Field Duplicate
- ✓ Sensitivity
- ✓ Electronic Data Deliverables Review

#### 4.1 Overall Assessment

The wet chemistry data reported in this package are considered usable for meeting project objectives. The results are considered to be valid; the analytical completeness, defined as the ratio of the number of valid analytical results (valid analytical results include values qualified as

estimated) to the total number of analytical results requested on samples submitted for analysis, for the project is 100%.

## 4.1.1 Assessment Anomalies

The case narratives for laboratory reports L17A041 and L17D013 noted that a constant weight could not be achieved after three consecutive weighing and drying cycles for the total dissolved solids analysis of samples BBS-CCR-1 (1/26/17) and BBS-CCR-BW-1 (1/26/17); and BBS-CCR-1 (4/13/17) and BBS-CCR-BW-1 (4/13/17). Therefore, the concentrations of total dissolved solids in these samples were J qualified as estimated.

Client Sample ID	Compound	Laboratory Result (mg/L)	Laboratory Flag	Validation Result (mg/L)	Validation Qualifier	Reason Code
BBS-CCR-1 (1/26/17)	Total Dissolved Solids	3670	J-	3670	J	13
BBS-CCR-BW1 (1/26/17)	Total Dissolved Solids	4510	J-	4510	J	13
BBS-CCR-1 (4/13/17)	Total Dissolved Solids	3110	J-	3110	J	13
BBS-CCR-BW1 (4/13/17)	Total Dissolved Solids	4060	J-	4060	J	13

mg/L-milligrams per liter

J-laboratory flag indicating the reported value is an estimated value

# **4.2** Holding Times

The holding times for chloride, fluoride and sulfate by EPA method 300.0 are 28 days from sample collection to analysis and the holding time for total dissolved solids by SM 2540C is 7 days from sample collection to analysis. The holding times were met for the sample analyses.

# 4.3 Method Blanks

Method blanks were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). Method blanks were reported for each analysis as appropriate. The wet chemistry parameters were not detected in the method blanks above the MDLs, with the following exceptions.

Chloride was detected at an estimated concentration, greater than the MDL and less than the RL, in the method blank associated with batch 17A0275. Since chloride was detected above the RL in the associated samples, no qualifications were applied to the data.

# 4.4 Matrix Spike/Matrix Spike Duplicate

MS/MSD pairs were reported for the wet chemistry data. Sample set specific MS/MSD pairs were reported for chloride, fluoride and sulfate using samples BBS-CCR-2 (1/26/17) and BBS-CCR-2 (4/13/17). The recoveries and RPD results were within the laboratory specified acceptance criteria, with the following exceptions.

The recoveries of chloride, fluoride and sulfate were high, outside laboratory specified acceptance criteria in the MS/MSD pair using sample BBS-CCR-2 (1/26/17) and the recoveries of sulfate were low and outside laboratory specified acceptance criteria in the MS/MSD pair using sample BBS-CCR-2 (4/13/17). Therefore the concentrations of chloride and fluoride in sample BBS-CCR-2 (1/26/17) were J+ qualified as estimated with a high bias. Since the concentrations of sulfate were more than four times the spike in samples BBS-CCR-2 (1/26/17) and BBS-CCR-2 (4/13/17), no qualifications were applied to the sulfate data.

Client Sample ID	Compound	Laboratory Result (mg/L)	Laboratory Flag	Validation Result (mg/L)	Validation Qualifier	Reason Code
BBS-CCR-2 (1/26/17)	Chloride	115	J-,V	115	J+	4
BBS-CCR-2 (1/26/17)	Fluoride	0.248	J-	0.248	J+	4

mg/L-milligrams per liter

# 4.5 <u>Laboratory Control Sample</u>

LCSs were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). LCSs were reported for each analysis as appropriate. The recovery results were within the laboratory specified acceptance criteria.

# 4.6 Laboratory Duplicate

Laboratory duplicates were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). Two sample set specific laboratory duplicates were reported for total dissolved solids using samples BBS-CCR-1 (1/26/17) and BBS-CCR-1 (4/13/17). The RPD results were within the laboratory specified acceptance criteria.

Final Review: KDH 5/9/17

# 4.7 Field Duplicate

Field duplicates were not reported with the sample sets.

J- laboratory flag indicating the reported value is estimated

V-laboratory flag indication the analyte was detected in the method blank

# 4.8 Sensitivity

The samples were reported to the MDLs. The MDLs reported met the limits listed in Table 4 of the CCR Groundwater Monitoring Plan.

# 4.9 Electronic Data Deliverables Review

The results and sample IDs in the EDD were reviewed against the information provided by the associated level II reports at a minimum of 20% as part of the data validation process. No discrepancies were identified between the level II reports and the EDD.

\* \* \* \* \*

Final Review: KDH 5/9/17

# ATTACHMENT 1 DATA VALIDATION QUALIFIER DEFINITIONS AND INTERPRETATION KEY Assigned by Geosyntec's Data Validation Team

#### DATA QUALIFIER DEFINITIONS

- U The analyte was analyzed for, but was not detected above the reported sample quantitation limit.
- J The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.
- J+ The analyte was positively identified; however, the associated numerical value is likely to be higher than the concentration of the analyte in the sample due to positive bias of associated QC or calibration data or attributable to matrix interference.
- J- The analyte was positively identified; however, the associated numerical value is likely to be lower than the concentration of the analyte in the sample due to negative bias of associated QC or calibration data or attributable to matrix interference.
- UJ The analyte was not detected above the reported sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.
- R The sample results are rejected due to serious deficiencies in the ability to analyze the sample and meet quality control criteria. The presence or absence of the analyte cannot be verified.

Final Review: KDH 5/9/17

# ATTACHMENT 2 DATA VALIDATION REASON CODES Assigned by Geosyntec's Data Validation Team

Valid Value	Description
1	Preservation requirement not met
2	Analysis holding time exceeded
3	Blank contamination (i.e., method, trip, equipment, etc.)
4	Matrix spike/matrix spike duplicate recovery or RPD outside limits
5	LCS or RPD recovery outside limits (LCS/LCSD)
6	Surrogate recovery outside limits
7	Field Duplicate RPD exceeded
8	Serial dilution percent difference exceeded
9	Calibration criteria not met
10	Linear range exceeded
11	Internal standard criteria not met
12	Lab duplicates RPD exceeded
13	Other

Final Review: KDH 5/9/17



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Final Review: JK Caprio 9/27/17

# Memorandum

Date: 25 August 2017

To: Todd Kafka

From: Chris Pracheil

CC: J. Caprio

Subject: Stage 2A Data Validation – Level II Data Deliverable – Tampa

Electric Laboratory Services #L17F009 and #L17G024, TestAmerica #660-81511-1 and #660-81885-1 and KNL

Environmental Testing # L17F009 and # L17G024

SITE: Big Bend Power Station, Apollo Beach, Florida

#### INTRODUCTION

This report summarizes the findings of the Stage 2A data validation of 10 water samples, collected on June 28, 2017 and July 20, 2017 as part of the Big Bend Power Station coal combustion residuals (CCR) groundwater monitoring program plan. The lithium analyses were performed by TestAmerica Tampa, Tampa, Florida (TA). The radium analyses were performed by KNL Environmental Testing, Tampa, Florida (KNL). The rest of the analyses were performed by Tampa Electric Laboratory Services, Tampa, Florida (TELS). The samples were analyzed for the following:

- Metals by EPA Methods 200.7, 200.8 and 6010B
- Mercury by EPA Method 7470A
- Radium-226 by EPA Method 903.0
- Radium-228 by EPA Method Ra-05
- Chloride, Fluoride and Sulfate by EPA Method 300.0
- Total Dissolved Solids by Standard Method 2540C

# **EXECUTIVE SUMMARY**

The samples were handled, prepared, and measured in the same manner under similar prescribed conditions.

Overall, based on this Stage 2A data validation covering the quality control (QC) parameters listed below, the data as qualified are usable for meeting project objectives. The qualified data should be used within the limitations of the qualifications.

The inorganic data were reviewed based on the following: CCR Groundwater Monitoring Program Plan, Big Bend Power Station, Apollo Beach, Florida, September 2016 (GWMP), USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review, January 2017 (OLEM 9355.0-135, EPA 540-R-2017-001), as well as by the pertinent methods referenced by the data package and professional and technical judgment.

The following samples were analyzed and validated at a Stage 2A level in the data set:

Laboratory	Client ID
ID	
L17F009-01	BBS-CCR-1 (6/28/17)
L17F009-02	BBS-CCR-2 (6/28/17)
L17F009-03	BBS-CCR-3 (6/28/17)
L17F009-04	BBS-CCR-BW-1 (6/28/17)
L17F009-05	BBS-CCR-BW-2 (6/28/17)

Laboratory	Client ID
ID	
L17G024-01	BBS-CCR-1 (7/20/17)
L17G024-02	BBS-CCR-2 (7/20/17)
L17G024-03	BBS-CCR-3 (7/20/17)
L17G024-04	BBS-CCR-BW-1 (7/20/17)
L17G024-05	BBS-CCR-BW-2 (7/20/17)

The samples were received at the laboratories at 1.3 °C, 2.0 °C, 2.4 °C and 3.4 °C within the criteria of 0-6 °C. No sample preservation or sample receipt issues were noted by the laboratories.

## 1.0 TOTAL METALS

The samples were analyzed for total metals per EPA Methods 200.7, 200.8 and 6010B.

The areas of data review are listed below. A leading check mark  $(\checkmark)$  indicates an area of review in which the data were acceptable. A preceding crossed circle  $(\otimes)$  signifies areas where issues were raised during the course of the validation review and should be considered to determine the impact on data quality and usability.

- ✓ Overall Assessment
- ✓ Holding Times
- ⊗ Method Blank
- ✓ Matrix Spike/Matrix Spike Duplicate
- ✓ Laboratory Control Sample
- ✓ Serial Dilution
- ✓ Field Duplicate
- ✓ Sensitivity

Electronic Data Deliverable Review

#### 1.1 **Overall Assessment**

The metals data reported in this package are considered usable for meeting project objectives. The results are considered valid; analytical completeness, defined as the ratio of the number of valid analytical results (valid analytical results include values qualified as estimated) to the total number of analytical results requested on samples submitted for analysis for the data set is 100%.

#### 1.2 **Holding Times**

The holding time for the metals analysis of waters is 180 days from sample collection to analysis. The holding time was met for the sample analyses.

#### 1.3 **Method Blank**

Method blanks were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). Eight method blanks were reported (method 200.7 batches 359159 and 361570, method 200.8 batches 17F0201 and 17G0141 and method 6010B batches 17F0185, 17F0216, 17G0203 and 17G0232). Metals were not detected in the method blanks above the method detection limits (MDLs), with the following exceptions.

Molybdenum in the method blank associated with batch 17F0216 and beryllium and calcium in the method blank associated with batch 17G0203 were detected at estimated concentrations, greater than the MDLs and less than the reporting limits (RLs). Therefore, the estimated concentrations of molybdenum and beryllium in the associated samples were U qualified as not detected at the RL. Since calcium was detected above the RL in the associated samples, no qualifications were applied to the calcium data.

Client Sample ID	Compound	Laboratory Result (µg/L)	Laboratory Flag	Validation Result (µg/L)	Validation Qualifier*	Reason Code**
BBS-CCR-2 (6/28/17)	Molybdenum	9.59	I,V	20.0	U	3
BBS-CCR-3 (6/28/17)	Molybdenum	11.9	I,V	20.0	U	3

Client Sample ID	Compound	Laboratory Result (µg/L)	Laboratory Flag	Validation Result (µg/L)	Validation Qualifier*	Reason Code**
BBS-CCR-BW1 (6/28/17)	Molybdenum	16.3	I,V	20.0	U	3
BBS-CCR-BW2 (6/28/17)	Molybdenum	10.2	I,V	20.0	U	3
BBS-CCR-2 (7/20/17)	Beryllium	0.423	I,V	2.00	U	3
BBS-CCR-3 (7/20/17)	Beryllium	0.356	I,V	2.00	U	3
BBS-CCR-BW2 (7/20/17)	Beryllium	0.220	I,V	2.00	U	3

μg/L-micrograms per liter

# 1.4 Matrix Spike/Matrix Spike Duplicate (MS/MSD)

MS/MSDs were analyzed at the proper frequency for the number and types of samples analyzed (one pair per batch of 20 samples). Sample set specific MS/MSD pairs were reported for method 6010B using samples BBS-CCR-BW-2 (6/28/17), BBS-CCR-1 (7/20/17) and BBS-CCR-3 (7/20/17); for method 200.7 using sample BBS-CCR-1 (7/20/17); and for method 200.8 using samples BBS-CCR-1 (6/28/17) and BBS-CCR-1 (7/20/17). The recovery and relative percent difference (RPD) results were within the laboratory specified acceptance criteria, with the following exceptions.

I- laboratory flag indicating the reported value is estimated, greater than MDL and less than RL

V- Analyte detected in the method blank

<sup>\*</sup> Validation qualifiers are defined in Attachment 1 at the end of this report

<sup>\*\*</sup>Reason codes are defined in Attachment 2 at the end of this report

The recovery of boron in the MSD using sample BBS-CCR-BW2 (6/28/17) was high, outside the laboratory specified acceptance criteria. Since the concentration of boron in sample BBS-CCR-BW2 (6/28/17) was greater than four times the spiked amount, no qualifications were applied to the boron data. Additionally, the laboratory narrative for report 660-81885-1 noted that the spiking compound was inadvertently omitted during the extraction process for the MS associated with batch 361570. Therefore, the MS recovery and RPD results for batch 361570 were not considered for this validation.

Batch MS/MSD pairs were also reported for Methods 200.7 and 6010B data. Since these are batch QC, the results do not affect the samples in this data set and qualifications were not applied to the data.

# 1.5 Laboratory Control Sample (LCS)

LCSs were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). Eight LCSs were reported; two for method 200.7, two for method 200.8 and four for method 6010B. The recovery results were within the laboratory specified acceptance criteria.

## 1.6 Serial Dilution

Serial dilutions were not reported.

#### 1.7 Field Duplicate

Field duplicates were not reported with the sample sets.

# 1.8 **Sensitivity**

The samples were reported to the MDLs. Elevated non-detect results were reported for samples BBS-CCR-1 (7/20/2017), BBS-CCR-3 (7/20/2017), BBS-CCR-BW1 (7/20/2017) and BBS-CCR-BW2 (7/20/2017) due to the dilutions analyzed. The MDLs met the limits listed in Table 4 of the CCR Groundwater Monitoring Plan.

# 1.9 Electronic Data Deliverable (EDD) Review

The results and sample identifications (IDs) in the EDD were reviewed against the information provided by the associated level II reports at a minimum of 20% as part of the data validation process. No discrepancies were identified between the level II reports and the EDD.

#### 2.0 MERCURY

The samples were analyzed for mercury per EPA Method 7470A.

The areas of data review are listed below. A leading check mark  $(\checkmark)$  indicates an area of review in which the data were acceptable. A preceding crossed circle  $(\otimes)$  signifies areas where issues were raised during the course of the validation review and should be considered to determine the impact on data quality and usability.

- ✓ Overall Assessment
- ✓ Holding Times
- ✓ Method Blank
- ✓ Matrix Spike/Matrix Spike Duplicate
- ✓ Laboratory Control Sample
- ✓ Field Duplicate
- ✓ Sensitivity
- ✓ Electronic Data Deliverable Review

# 2.1 Overall Assessment

The mercury data reported in this package are considered to be usable for meeting project objectives. The results are considered valid; analytical completeness, defined as the ratio of the number of valid analytical results (valid analytical results include values qualified as estimated) to the total number of analytical results requested on samples submitted for analysis for the data set is 100%.

# 2.2 Holding Times

The holding time for the mercury analysis of a water sample is 28 days from sample collection to analysis. The holding times were met for the sample analyses.

# 2.3 Method Blank

Method blanks were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). Two method blanks were reported (batches 17G0011 and 17G0170). Mercury was not detected in the method blanks above the MDL.

# 2.4 Matrix Spike/Matrix Spike Duplicate

MS/MSD pairs were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). Two sample set specific MS/MSD pairs, using samples BBS-CCR-3 (6/28/17) and BBS-CCR-BW1 (7/20/17), were reported. The recoveries and RPD results were within the laboratory specified acceptance criteria.

# 2.5 <u>Laboratory Control Sample</u>

LCSs were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). Two LCSs were reported. The recovery results were within the laboratory specified acceptance criteria.

# 2.6 Field Duplicate

Field duplicates were not reported with the sample sets.

# 2.7 <u>Sensitivity</u>

The samples were reported to the MDL. No elevated non-detect results were reported. The MDL for mercury met the limit listed in Table 4 of the CCR Groundwater Monitoring Plan.

# 2.8 Electronic Data Deliverable Review

The results and sample IDs in the EDD were reviewed against the information provided by the associated level II reports at a minimum of 20% as part of the data validation process. No discrepancies were identified between the level II reports and the EDD.

#### **3.0 RADIUM-226 AND RADIUM-228**

The samples were analyzed for radium 226 and radium 228 per EPA Methods 903.0 and RA-05, respectively.

The areas of data review are listed below. A leading check mark  $(\checkmark)$  indicates an area of review in which the data were acceptable. A preceding crossed circle  $(\otimes)$  signifies areas where issues were raised during the course of the validation review and should be considered to determine the impact on data quality and usability.

- ✓ Overall Assessment
- ✓ Holding Times

- ✓ Method Blank
- ✓ Matrix Spike
- ✓ Laboratory Control Sample
- ✓ Laboratory Duplicate
- ✓ Sensitivity
- ✓ Electronic Data Deliverable Review

## 3.1 Overall Assessment

The radium-226 and radium-228 data reported in this package are considered usable for meeting project objectives. The results are considered valid; the analytical completeness, defined as the ratio of the number of valid analytical results (valid analytical results include values qualified as estimated) to the total number of analytical results requested on samples submitted for analysis for the data set is 100%.

# 3.2 <u>Holding Times</u>

The holding times for radium-226 and radium-228 analysis of waters are 180 days from sample collection to analysis. The holding times were met for the sample analyses.

# 3.3 Method Blank

Method blanks were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). Six method blanks were reported (three for the radium-226 and three for the radium-228). The method blanks were within validation criteria with the following exceptions.

Radium-226 was detected at concentrations greater than 1.65 times the combined standard uncertainty (CSU) in batches L17F009 and L17G024. Since the detections of radium-226 and combined radium data (radium-226 + radium-228) were greater than 10 times the blank concentrations in the associated samples, no qualifications were applied to the data.

# 3.4 Matrix Spike

MSs were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). Two sample set specific MSs, using samples BBS-CCR-BW1 (6/28/17) and BBS-CCR-1 (7/20/17) for radium-228 and three sample set specific MSs, using samples BBS-CCR-2 (6/28/17), BBS-CCR-2 (7/20/17) and BBS-CCR-BW1 (7/2-/2017) were reported for the radium-226 data. The recovery results were within the laboratory specified acceptance criteria.

Batch MSs were also reported for the radium-226 and radium-228 data. Since these are batch QC, the results do not affect the samples in this data set and qualifications were not applied to the data.

# 3.5 Laboratory Control Sample

LCSs were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). Three LCSs were reported for radium-226 and three for radium-228. The recovery results were within the laboratory specified acceptance criteria.

# 3.6 <u>Laboratory Duplicate</u>

Laboratory duplicates were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). Two sample set specific laboratory duplicates, using samples BBS-CCR-BW1 (6/28/17) and BBS-CCR-1 (7/20/17) for radium-228 and three sample set specific laboratory duplicate using sample BBS-CCR-2 (6/28/17), BBS-CCR-2 (7/20/17) and BBS-CCR-BW1 (7/2-/2017) were reported for the radium-226 data.

Batch laboratory duplicates were also reported for the radium-226 and radium-228 data. Since these are batch QC, the results do not affect the samples in this data set and qualifications were not applied to the data.

# 3.7 Sensitivity

The samples were reported to the minimum detectable concentrations (MDCs). The reported MDCs met the limits listed in Table 4 of the CCR Groundwater Monitoring Plan.

# 3.8 Electronic Data Deliverable Review

The results and sample IDs in the EDD were reviewed against the information provided by the associated level II reports at a minimum of 20% as part of the data validation process. No discrepancies were identified between the level II reports and the EDD.

# 4.0 WET CHEMISTRY PARAMETERS

The samples were analyzed for chloride, fluoride and sulfate by EPA Method 300.0 and total dissolved solids by SM 2540C.

The areas of data review are listed below. A leading check mark  $(\checkmark)$  indicates an area of review in which the data were acceptable. A preceding crossed circle  $(\otimes)$  signifies areas where issues

were raised during the course of the validation review and should be considered to determine any impact on data quality and usability.

- ⊗ Overall Assessment
- **⊗** Holding Times
- ⊗ Method Blank
- ✓ Matrix Spike/Matrix Spike Duplicate
- ✓ Laboratory Control Sample
- ✓ Laboratory Duplicate
- ✓ Field Duplicate
- ✓ Sensitivity
- ✓ Electronic Data Deliverables Review

# 4.1 Overall Assessment

The wet chemistry data reported in this package are considered usable for meeting project objectives. The results are considered to be valid; the analytical completeness, defined as the ratio of the number of valid analytical results (valid analytical results include values qualified as estimated) to the total number of analytical results requested on samples submitted for analysis, for the data set 100%.

#### **4.1.1** Assessment Anomalies

The case narratives for laboratory report L17G024 noted that a constant weight could not be achieved after three consecutive weighing and drying cycles for the total dissolved solids analysis of sample BBS-CCR-BW-1 (7/20/17). Therefore, the concentration of total dissolved solids in this sample was J qualified as estimated.

Client Sample ID	Compound	Laboratory Result (mg/L)	Laboratory Flag	Validation Result (mg/L)	Validation Qualifier	Reason Code
BBS-CCR-BW-1 (7/20/17)	Total Dissolved	4160	J	4160	J	13
	Solids					

mg/L-milligrams per liter

J-laboratory flag indicating the reported value is an estimated value

# 4.2 **Holding Times**

The holding times for chloride, fluoride and sulfate by EPA method 300.0 are 28 days from sample collection to analysis and the holding time for total dissolved solids by SM 2540C is 7 days from

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sample collection to analysis. The holding times were met for the sample analyses, with the following exception.

The laboratory narrative for report L17G024 stated that the initial total dissolved solids result for sample BBS-CCR-1 (7/20/17) was below the expected result and the sample was reanalyzed outside of the method holding time. The reanalyzed total dissolved solids result was within the expected range and was reported. Since the reported total dissolved solids result for sample BBS-CCR-1 (7/20/17) was analyzed outside holding time the result was J qualified as estimated.

Client Sample ID	Compound	Laboratory Result (mg/L)	Laboratory Flag	Validation Result (mg/L)	Validation Qualifier	Reason Code
BBS-CCR-1 (7/20/17)	Total Dissolved Solids	3400	Q	3400	J	2

mg/L-milligrams per liter

Q-sample held beyond the method holding time

# 4.3 Method Blanks

Method blanks were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). Method blanks were reported for each analysis as appropriate. The wet chemistry parameters were not detected in the method blanks above the MDLs, with the following exceptions.

Chloride and fluoride were detected above the RL, in the method blank associated with batch 17H0125. Therefore, the concentrations of fluoride in the associated samples that were less than ten times the blank concentration were J+ qualified as estimated with a high bias. Since the concentrations of chloride in the associated samples were more than ten times the blank concentration, no qualifications were applied to the data.

Client Sample ID	Compound	Laboratory Result (mg/L)	Laboratory Flag	Validation Result (mg/L)	Validation Qualifier	Reason Code
BBS-CCR-1 (7/20/17)	Fluoride	0.157	J-, V	0.157	J	3
BBS-CCR-2 (7/20/17)	Fluoride	0.166	J-, V	0.166	J	3
BBS-CCR-3 (7/20/17)	Fluoride	0.230	J-, V	0.230	J	3
BBS-CCR-BW1 (7/20/17)	Fluoride	0.255	J-, V	0.255	J	3
BBS-CCR-BW1 (7/20/17)	Fluoride	0.319	J-, V	0.319	J	3

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mg/L-milligrams per liter

J-laboratory flag indicating the reported value is an estimated value

V-analyte detected in the method blank

# 4.4 <u>Matrix Spike/Matrix Spike Duplicate</u>

MS/MSD pairs were reported for the wet chemistry data. Sample set specific MS/MSD pairs were reported for chloride, fluoride and sulfate using sample BBS-CCR-2 (6/28/17). The recoveries and RPD results were within the laboratory specified acceptance criteria, with the following exceptions.

The recoveries of sulfate were high, outside laboratory specified acceptance criteria in the MS/MSD pair using sample BBS-CCR-2 (6/28/17). Since the concentration of sulfate in sample BBS-CCR-2 (6/28/17) was more than four times the spike amount, no qualifications were applied to the sulfate data.

Batch MS/MSD pairs were also reported for the chloride, fluoride and sulfate data. Since these are batch QC, the results do not affect the samples in this data set and qualifications were not applied to the data.

# 4.5 Laboratory Control Sample

LCSs were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). LCSs were reported for each analysis as appropriate. The recovery results were within the laboratory specified acceptance criteria.

# 4.6 <u>Laboratory Duplicate</u>

Laboratory duplicates were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). One sample set specific laboratory duplicate was reported for total dissolved solids using sample BBS-CCR-1 (6/28/17). The RPD results were within the laboratory specified acceptance criteria.

# 4.7 <u>Field Duplicate</u>

Field duplicates were not reported with the sample sets.

# 4.8 Sensitivity

The samples were reported to the MDLs. The MDLs reported met the limits listed in Table 4 of the CCR Groundwater Monitoring Plan.

#### 4.9 Electronic Data Deliverables Review

The results and sample IDs in the EDD were reviewed against the information provided by the associated level II reports at a minimum of 20% as part of the data validation process. No discrepancies were identified between the level II reports and the EDD.

\* \* \* \* \*

# ATTACHMENT 1 DATA VALIDATION QUALIFIER DEFINITIONS AND INTERPRETATION KEY Assigned by Geosyntec's Data Validation Team

#### DATA QUALIFIER DEFINITIONS

- U The analyte was analyzed for, but was not detected above the reported sample quantitation limit.
- J The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.
- J+ The analyte was positively identified; however, the associated numerical value is likely to be higher than the concentration of the analyte in the sample due to positive bias of associated QC or calibration data or attributable to matrix interference.
- J- The analyte was positively identified; however, the associated numerical value is likely to be lower than the concentration of the analyte in the sample due to negative bias of associated QC or calibration data or attributable to matrix interference.
- UJ The analyte was not detected above the reported sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.
- R The sample results are rejected due to serious deficiencies in the ability to analyze the sample and meet quality control criteria. The presence or absence of the analyte cannot be verified.

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# ATTACHMENT 2 DATA VALIDATION REASON CODES Assigned by Geosyntec's Data Validation Team

Valid Value	Description
1	Preservation requirement not met
2	Analysis holding time exceeded
3	Blank contamination (i.e., method, trip, equipment, etc.)
4	Matrix spike/matrix spike duplicate recovery or RPD outside limits
5	LCS or RPD recovery outside limits (LCS/LCSD)
6	Surrogate recovery outside limits
7	Field Duplicate RPD exceeded
8	Serial dilution percent difference exceeded
9	Calibration criteria not met
10	Linear range exceeded
11	Internal standard criteria not met
12	Lab duplicates RPD exceeded
13	Other



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Final Review: JK Caprio 2/1/17

# Memorandum

Date: 30 November 2017

To: Todd Kafka

From: Chris Pracheil

CC: J. Caprio

Subject: Stage 2A Data Validation – Level II Data Deliverable – Tampa

Electric Laboratory Services #L17H005 and L17J115, TestAmerica #660-82456-1 and #660-83441-1 and KNL Environmental Testing

**#L17H005 and L17J115** 

SITE: Big Bend Power Station, Apollo Beach, Florida

#### INTRODUCTION

This report summarizes the findings of the Stage 2A data validation of 10 water samples, collected on August 16, 2017 and October 13, 2017 as part of the Big Bend Power Station coal combustion residuals (CCR) groundwater monitoring program plan. The lithium analyses were performed by TestAmerica Tampa, Tampa, Florida (TA). The radium analyses were performed by KNL Environmental Testing, Tampa, Florida (KNL). The rest of the analyses were performed by Tampa Electric Laboratory Services, Tampa, Florida (TELS). The samples were analyzed for the following:

- Metals by EPA Methods 200.7, 200.8 and 6010B
- Mercury by EPA Method 7470A
- Radium-226 by EPA Method 903.0
- Radium-228 by EPA Method Ra-05
- Chloride, Fluoride and Sulfate by EPA Method 300.0
- Total Dissolved Solids by Standard Method 2540C

# **EXECUTIVE SUMMARY**

The samples were handled, prepared, and measured in the same manner under similar prescribed conditions.

Overall, based on this Stage 2A data validation covering the quality control (QC) parameters listed below, the data as qualified are usable for meeting project objectives. The qualified data should be used within the limitations of the qualifications.

The inorganic data were reviewed based on the following: CCR Groundwater Monitoring Program Plan, Big Bend Power Station, Apollo Beach, Florida, September 2016 (GWMP), USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review, January 2017 (OLEM 9355.0-135, EPA 540-R-2017-001), as well as by the pertinent methods referenced by the data package and professional and technical judgment.

The following samples were analyzed and validated at a Stage 2A level in the data set:

Laboratory	Client ID
ID	
L17H005-01	BBS-CCR-1 (8/16/17)
L17H005-02	BBS-CCR-2 (8/16/17)
L17H005-03	BBS-CCR-3 (8/16/17)
L17H005-04	BBS-CCR-BW-1 (8/16/17)
L17H005-05	BBS-CCR-BW-2 (8/16/17)

Laboratory	Client ID
ID	
L17J115-01	BBS-CCR-1 (10/13/17)
L17J115-02	BBS-CCR-2 (10/13/17)
L17J115-03	BBS-CCR-3 (10/13/17)
L17J115-04	BBS-CCR-BW-1 (10/13/17)
L17J115-05	BBS-CCR-BW-2 (10/13/17)

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The samples were received at the laboratories at 1.6°C and 2.6 °C within the criteria of 0-6°C. No sample preservation or sample receipt issues were noted by the laboratories.

## 1.0 TOTAL METALS

The samples were analyzed for total metals per EPA Methods 200.7, 200.8 and 6010B.

The areas of data review are listed below. A leading check mark  $(\checkmark)$  indicates an area of review in which the data were acceptable. A preceding crossed circle  $(\otimes)$  signifies areas where issues were raised during the course of the validation review and should be considered to determine the impact on data quality and usability.

- ✓ Overall Assessment
- ✓ Holding Times
- ⊗ Method Blank
- ✓ Matrix Spike/Matrix Spike Duplicate
- ✓ Laboratory Control Sample
- ✓ Serial Dilution
- ✓ Field Duplicate
- ✓ Sensitivity

✓ Electronic Data Deliverable Review

# 1.1 Overall Assessment

The metals data reported in this package are considered usable for meeting project objectives. The results are considered valid; analytical completeness, defined as the ratio of the number of valid analytical results (valid analytical results include values qualified as estimated) to the total number of analytical results requested on samples submitted for analysis for the data set is 100%.

# 1.2 <u>Holding Times</u>

The holding time for the metals analysis of waters is 180 days from sample collection to analysis. The holding time was met for the sample analyses.

# 1.3 Method Blank

Method blanks were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). Six method blanks were reported (method 200.7 batches 365468 and 372467, method 200.8 batches 17H0157 and 17J0116 and method 6010B batches 17H0161 and 17J0144). Metals were not detected in the method blanks above the method detection limits (MDLs), with the following exceptions.

Lithium was detected at an estimated concentration, greater than the MDL and less than the reporting limits (RL) in the method blanks associated with batches 365468 and 372467. Therefore, the estimated concentrations of lithium in the associated samples were U qualified as not detected at the RL.

Client Sample ID	Compound	Laboratory Result (µg/L)	Laboratory Flag	Validation Result (µg/L)	Validation Qualifier*	Reason Code**
BBS-CCR-1 (8/16/17)	Lithium	0.013	Ι	0.050	U	3
BBS-CCR-2 (8/16/17)	Lithium	0.016	Ι	0.050	U	3
BBS-CCR-3 (8/16/17)	Lithium	0.011	Ι	0.050	U	3
BBS-CCR-BW-1 (8/16/17)	Lithium	0.017	Ι	0.050	U	3
BBS-CCR-BW-2 (8/16/17)	Lithium	0.0062	I,V	0.050	U	3
BBS-CCR-1 (10/13/17)	Lithium	0.015	I,V	0.050	U	3
BBS-CCR-2 (10/13/17)	Lithium	0.016	I,V	0.050	U	3
BBS-CCR-3 (10/13/17)	Lithium	0.011	I,V	0.050	U	3
BBS-CCR-BW-1 (10/13/17)	Lithium	0.017	I,V	0.050	U	3
BBS-CCR-BW-2 (10/13/17)	Lithium	0.0082	I,V	0.050	U	3

μg/L-micrograms per liter

I- laboratory flag indicating the reported value is estimated, greater than MDL and less than RL

V- laboratory flag indicating analyte was detected in both the sample and the associated method blank and the value in the sample was less than 10 times the blank value

- \* Validation qualifiers are defined in Attachment 1 at the end of this report
- \*\*Reason codes are defined in Attachment 2 at the end of this report

# 1.4 <u>Matrix Spike/Matrix Spike Duplicate (MS/MSD)</u>

MS/MSDs were analyzed at the proper frequency for the number and types of samples analyzed (one pair per batch of 20 samples). Sample set specific MS/MSD pairs were reported for method 6010B using sample BBS-CCR-BW-1 (8/16/17); for method 200.7 using samples BBS-CCR-1 (8/16/17) and BBS-CCR-1 (10/13/17); and for method 200.8 using samples BBS-CCR-1 (8/16/17) and BBS-CCR-1 (10/13/17). The recovery and relative percent difference (RPD) results were within the laboratory specified acceptance criteria, with the following exceptions.

The recoveries of boron and calcium in the MS/MSD pair using sample BBS-CCR-BW-1 (8/16/17) were high, outside the laboratory specified acceptance criteria. Since the concentration of boron in sample BBS-CCR-BW-1 (8/16/17) was greater than four times the spiked amount, no qualification was applied to the boron data.

Batch MS/MSD pairs were also reported for Methods 200.8 and 6010B data. Since these are batch QC, the results do not affect the samples in this data set and qualifications were not applied to the data.

# 1.5 <u>Laboratory Control Sample (LCS)</u>

LCSs were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). Six LCSs were reported; two for method 200.7, two for method 200.8 and two for method 6010B. The recovery results were within the laboratory specified acceptance criteria.

Final Review: JK Caprio 12/1/17

#### 1.6 Serial Dilution

Serial dilutions were not reported.

# 1.7 Field Duplicate

Field duplicates were not reported with the sample sets.

# 1.8 Sensitivity

The samples were reported to the MDLs. Elevated non-detect results were reported for sample BBS-CCR-2 (8/16/17) due to the dilutions analyzed. The MDLs met the limits listed in Table 4 of the CCR Groundwater Monitoring Plan.

# 1.9 <u>Electronic Data Deliverable (EDD) Review</u>

The results and sample identifications (IDs) in the EDD were reviewed against the information provided by the associated level II reports at a minimum of 20% as part of the data validation process. No discrepancies were identified between the level II reports and the EDD.

#### 2.0 MERCURY

The samples were analyzed for mercury per EPA Method 7470A.

The areas of data review are listed below. A leading check mark  $(\checkmark)$  indicates an area of review in which the data were acceptable. A preceding crossed circle  $(\otimes)$  signifies areas where issues were raised during the course of the validation review and should be considered to determine the impact on data quality and usability.

- ✓ Overall Assessment
- ✓ Holding Times
- ✓ Method Blank
- ✓ Matrix Spike/Matrix Spike Duplicate
- ✓ Laboratory Control Sample
- ✓ Field Duplicate
- ✓ Sensitivity
- ✓ Electronic Data Deliverable Review

# 2.1 Overall Assessment

The mercury data reported in this package are considered usable for meeting project objectives. The results are considered valid; analytical completeness, defined as the ratio of the number of valid analytical results (valid analytical results include values qualified as estimated) to the total number of analytical results requested on samples submitted for analysis for the data set is 100%.

# 2.2 Holding Times

The holding time for the mercury analysis of a water sample is 28 days from sample collection to analysis. The holding times were met for the sample analyses.

# 2.3 Method Blank

Method blanks were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). Two method blanks were reported (batches 17H0163 and 17J0184). Mercury was not detected in the method blanks above the MDL.

# 2.4 Matrix Spike/Matrix Spike Duplicate

MS/MSD pairs were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). Two sample set specific MS/MSD pairs, using samples BBS-CCR-BW-2 (8/16/17) and BBS-CCR-2 (10/13/17), were reported. The recoveries and RPD results were within the laboratory specified acceptance criteria.

# 2.5 <u>Laboratory Control Sample</u>

LCSs were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). Two LCSs were reported. The recovery results were within the laboratory specified acceptance criteria.

# 2.6 Field Duplicate

Field duplicates were not reported with the sample sets.

# 2.7 <u>Sensitivity</u>

The samples were reported to the MDL. No elevated non-detect results were reported. The MDL for mercury met the limit listed in Table 4 of the CCR Groundwater Monitoring Plan.

# 2.8 Electronic Data Deliverable Review

The results and sample IDs in the EDD were reviewed against the information provided by the associated level II reports at a minimum of 20% as part of the data validation process. No discrepancies were identified between the level II reports and the EDD.

#### **3.0 RADIUM-226 AND RADIUM-228**

The samples were analyzed for radium 226 and radium 228 per EPA Methods 903.0 and RA-05, respectively.

The areas of data review are listed below. A leading check mark  $(\checkmark)$  indicates an area of review in which the data were acceptable. A preceding crossed circle  $(\otimes)$  signifies areas where issues were raised during the course of the validation review and should be considered to determine the impact on data quality and usability.

- ✓ Overall Assessment
- ✓ Holding Times
- ✓ Method Blank
- ✓ Matrix Spike
- ✓ Laboratory Control Sample
- ✓ Laboratory Duplicate
- ✓ Sensitivity
- ✓ Electronic Data Deliverable Review

# 3.1 Overall Assessment

The radium-226 and radium-228 data reported in this package are considered usable for meeting project objectives. The results are considered valid; the analytical completeness, defined as the ratio of the number of valid analytical results (valid analytical results include values qualified as estimated) to the total number of analytical results requested on samples submitted for analysis for the data set is 100%.

# 3.2 Holding Times

The holding times for radium-226 and radium-228 analysis of waters are 180 days from sample collection to analysis. The holding times were met for the sample analyses.

# 3.3 Method Blank

Method blanks were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). Four method blanks were reported (two for the radium-226 and two for the radium-228). The method blanks were within validation criteria with the following exceptions.

Radium-226 was detected at concentrations greater than 1.65 times the combined standard uncertainty (CSU) in batch L17J115. Since the detections of radium-226 and combined radium data (radium-226 + radium-228) were greater than 10 times the blank concentrations in the associated samples, no qualifications were applied to the data.

# 3.4 <u>Matrix Spike</u>

MSs were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). Two sample set specific MSs, using samples BBS-CCR-BW1 (8/16/17) and BBS-CCR-1 (10/13/17) were reported for radium-228 and two sample set specific MSs, using samples BBS-CCR-2 (8/16/17) and BBS-CCR-BW2 (10/13/2017) were reported for the radium-226 data. The recovery results were within the laboratory specified acceptance criteria.

# 3.5 <u>Laboratory Control Sample</u>

LCSs were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). Two LCSs were reported for radium-226 and two for radium-228. The recovery results were within the laboratory specified acceptance criteria.

# 3.6 Laboratory Duplicate

Laboratory duplicates were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). Two sample set specific laboratory duplicates, using samples BBS-CCR-BW1 (8/16/17) and BBS-CCR-1 (10/13/17) were reported for radium-228 and two sample set specific laboratory duplicates using samples BBS-CCR-2 (8/16/17) and BBS-CCR-BW2 (10/13/2017) were reported for the radium-226 data. The RPD results for the laboratory duplicates were within the laboratory acceptance criteria.

# 3.7 <u>Sensitivity</u>

The samples were reported to the minimum detectable concentrations (MDCs). The reported MDCs met the limits listed in Table 4 of the CCR Groundwater Monitoring Plan.

# 3.8 Electronic Data Deliverable Review

The results and sample IDs in the EDD were reviewed against the information provided by the associated level II reports at a minimum of 20% as part of the data validation process. No discrepancies were identified between the level II reports and the EDD.

#### 4.0 WET CHEMISTRY PARAMETERS

The samples were analyzed for chloride, fluoride and sulfate by EPA Method 300.0 and total dissolved solids by SM 2540C.

The areas of data review are listed below. A leading check mark ( $\checkmark$ ) indicates an area of review in which the data were acceptable. A preceding crossed circle ( $\otimes$ ) signifies areas where issues were raised during the course of the validation review and should be considered to determine any impact on data quality and usability.

- ⊗ Overall Assessment
- ✓ Holding Times
- ✓ Method Blank
- ✓ Matrix Spike/Matrix Spike Duplicate
- ✓ Laboratory Control Sample
- ✓ Laboratory Duplicate
- ✓ Field Duplicate
- ✓ Sensitivity
- ✓ Electronic Data Deliverables Review

# 4.1 Overall Assessment

The wet chemistry data reported in this package are considered usable for meeting project objectives. The results are considered to be valid; the analytical completeness, defined as the ratio of the number of valid analytical results (valid analytical results include values qualified as estimated) to the total number of analytical results requested on samples submitted for analysis, for the data set 100%.

#### 4.1.1 Analytical Anomalies

The case narratives for laboratory report L17H005 noted that a constant weight could not be achieved after three consecutive weighing and drying cycles for the total dissolved solids analysis of samples BBS-CCR-1 (8/16/17) and BBS-CCR-BW-2 (8/16/17). Therefore, the concentrations of total dissolved solids in these samples were J qualified as estimated.

Client Sample ID	Compound	Laboratory Result (mg/L)	Laboratory Flag	Validation Result (mg/L)	Validation Qualifier	Reason Code
BBS-CCR-1 (8/16/17)	Total Dissolved Solids	2960	J	2960	J	13
BBS-CCR-BW-2 (8/16/17)	Total Dissolved Solids	1180	J	1180	J	13

mg/L-milligrams per liter

J-laboratory flag indicating the reported value is an estimated value

# 4.2 **Holding Times**

The holding times for chloride, fluoride and sulfate by EPA method 300.0 are 28 days from sample collection to analysis and the holding time for total dissolved solids by SM 2540C is 7 days from sample collection to analysis. The holding times were met for the sample analyses.

# 4.3 <u>Method Blanks</u>

Method blanks were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). Method blanks were reported for each analysis as appropriate. The wet chemistry parameters were not detected in the method blanks above the MDLs.

# 4.4 Matrix Spike/Matrix Spike Duplicate

MS/MSD pairs were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). Batch MS/MSD pairs were reported for the chloride, fluoride and sulfate data. Since these are batch QC, the results do not affect the samples in this data set and qualifications were not applied to the data.

# 4.5 Laboratory Control Sample

LCSs were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). LCSs were reported for each analysis as appropriate. The recovery results were within the laboratory specified acceptance criteria.

#### 4.6 <u>Laboratory Duplicate</u>

Laboratory duplicates were reported for the total dissolved solids data. One sample set specific laboratory duplicate was reported for total dissolved solids using sample BBS-CCR-1 (8/16/17). The RPD results were within the laboratory specified acceptance criteria.

Batch laboratory duplicates were also reported for the total dissolved solids data. Since these are batch QC, the results do not affect the samples in this data set and qualifications were not applied to the data.

# 4.7 Field Duplicate

Field duplicates were not reported with the sample sets.

# 4.8 **Sensitivity**

The samples were reported to the MDLs. The MDLs reported met the limits listed in Table 4 of the CCR Groundwater Monitoring Plan.

# 4.9 Electronic Data Deliverables Review

The results and sample IDs in the EDD were reviewed against the information provided by the associated level II reports at a minimum of 20% as part of the data validation process. No discrepancies were identified between the level II reports and the EDD.

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# ATTACHMENT 1 DATA VALIDATION QUALIFIER DEFINITIONS AND INTERPRETATION KEY Assigned by Geosyntec's Data Validation Team

#### DATA QUALIFIER DEFINITIONS

- U The analyte was analyzed for, but was not detected above the reported sample quantitation limit.
- J The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.
- J+ The analyte was positively identified; however, the associated numerical value is likely to be higher than the concentration of the analyte in the sample due to positive bias of associated QC or calibration data or attributable to matrix interference.
- J- The analyte was positively identified; however, the associated numerical value is likely to be lower than the concentration of the analyte in the sample due to negative bias of associated OC or calibration data or attributable to matrix interference.
- UJ The analyte was not detected above the reported sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.
- R The sample results are rejected due to serious deficiencies in the ability to analyze the sample and meet quality control criteria. The presence or absence of the analyte cannot be verified.

# ATTACHMENT 2 DATA VALIDATION REASON CODES Assigned by Geosyntec's Data Validation Team

Valid Value	Description
1	Preservation requirement not met
2	Analysis holding time exceeded
3	Blank contamination (i.e., method, trip, equipment, etc.)
4	Matrix spike/matrix spike duplicate recovery or RPD outside limits
5	LCS or RPD recovery outside limits (LCS/LCSD)
6	Surrogate recovery outside limits
7	Field Duplicate RPD exceeded
8	Serial dilution percent difference exceeded
9	Calibration criteria not met
10	Linear range exceeded
11	Internal standard criteria not met
12	Lab duplicates RPD exceeded
13	Other