FLORIDA DEPARTMENT OF HEALTH

Florida Onsite Sewage Nitrogen Reduction Strategies Study

Task C.24

C-HS3 Monitoring Sample Event Report No. 4

Progress Report

June 2013

4423-001

HAZEN AND SAWYER
Environmental Engineers & Scientists

In association with

SCHOOL OF MINES 1874 COLORADO

AET
Applied Environmental Technology

OTIS ENVIRONMENTAL CONSULTANTS, LLC

Florida Onsite Sewage Nitrogen Reduction Strategies Study

TASK C.24
PROGRESS REPORT

C-HS3 Monitoring
Sample Event Report No. 4

Prepared for:

Florida Department of Health
Division of Disease Control and Health Protection
Bureau of Environmental Health
Onsite Sewage Programs
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June 2013

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C-HS3 Monitoring
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1.0 Background

Task C of the Florida Onsite Sewage Nitrogen Reduction Strategies Study includes monitoring at field sites in Florida to evaluate nitrogen reduction in soil and groundwater, to assess groundwater impacts from various onsite wastewater systems, and to provide data for parameter estimation, verification, and validation of models developed in Task D. The Task C.5 QAPP documents the objectives, monitoring framework, sample frequency and duration, and analytical methods to be used at the field sites. The Task C.23 instrumentation report for the C-HS3 OSTDS system and plume monitoring documents the test area design, number and location of monitoring points, and preliminary field parameters from monitoring points for this Polk County, Florida field site, and also includes preliminary sample collection and analyses.

2.0 Purpose

This sample event report documents data collected from the fourth C-HS3 monitoring and sampling event which was conducted May 20 through May 22, 2013. This monitoring event consisted of water use measurement from the household water meter, groundwater elevation measured within the standpipe piezometers, measurement of field parameters, and collection of groundwater samples and their analyses by a NELAC certified laboratory.

3.0 Materials and Methods

3.1 Project Site

The C-HS3 field site is located in Polk County, FL adjacent to Big Gum Lake in a rural area surrounded by commercial orange groves. The onsite sewage treatment and disposal system (OSTDS) for the residence consists of an old 750 gallon single compartment septic tank with most likely no outlet filter, and it is unknown whether an outlet tee is present. The septic tank is located adjacent to the soil treatment unit, which is a gravity fed standard bed drainfield, 10 ft by 20 ft in area.

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3.2 Monitoring and Sample Locations and Identification

A sampling grid for groundwater screening was developed downgradient of the soil treatment unit as depicted in Figure 1. A 6-foot by 5-foot grid spacing was staked. Transect lines A through U run east-west, roughly perpendicular to the groundwater flow direction and increase (higher letter identification) moving northward from the drainfield. Transect lines 0 through 7 run north-south, roughly parallel to the groundwater flow direction and increase moving from the east to west. Based on initial screening data, 22 monitoring locations were chosen within the grid for standpipe piezometer installation. Groundwater monitoring points were installed in June 2012. One type of monitoring point was installed using either hand or drilling methods: standpipe piezometers. Standpipe piezometers consist of either ¾-inch or 1-inch diameter PVC with a 1-foot or 5-foot screen (0.010-inch slots) and riser extending to the ground surface (refer to the Task C QAPP and Task C.23 C-HS3 Instrumentation Report for additional detail).

Each monitoring location was assigned a unique identification indicating grid location (self explanatory), and depth below ground surface (bottom of the drive point or well screen in feet). For example A03-15 is a standpipe piezometer sampler located on the grid at A03 at 15 feet below ground surface. A schematic of the C-HS3 monitoring network is shown in Figure 1. A complete list of all installed standpipe piezometers and sample identification is included in Appendix A. A total of 65 specific monitoring locations were sampled during this fourth C-HS3 sampling event.

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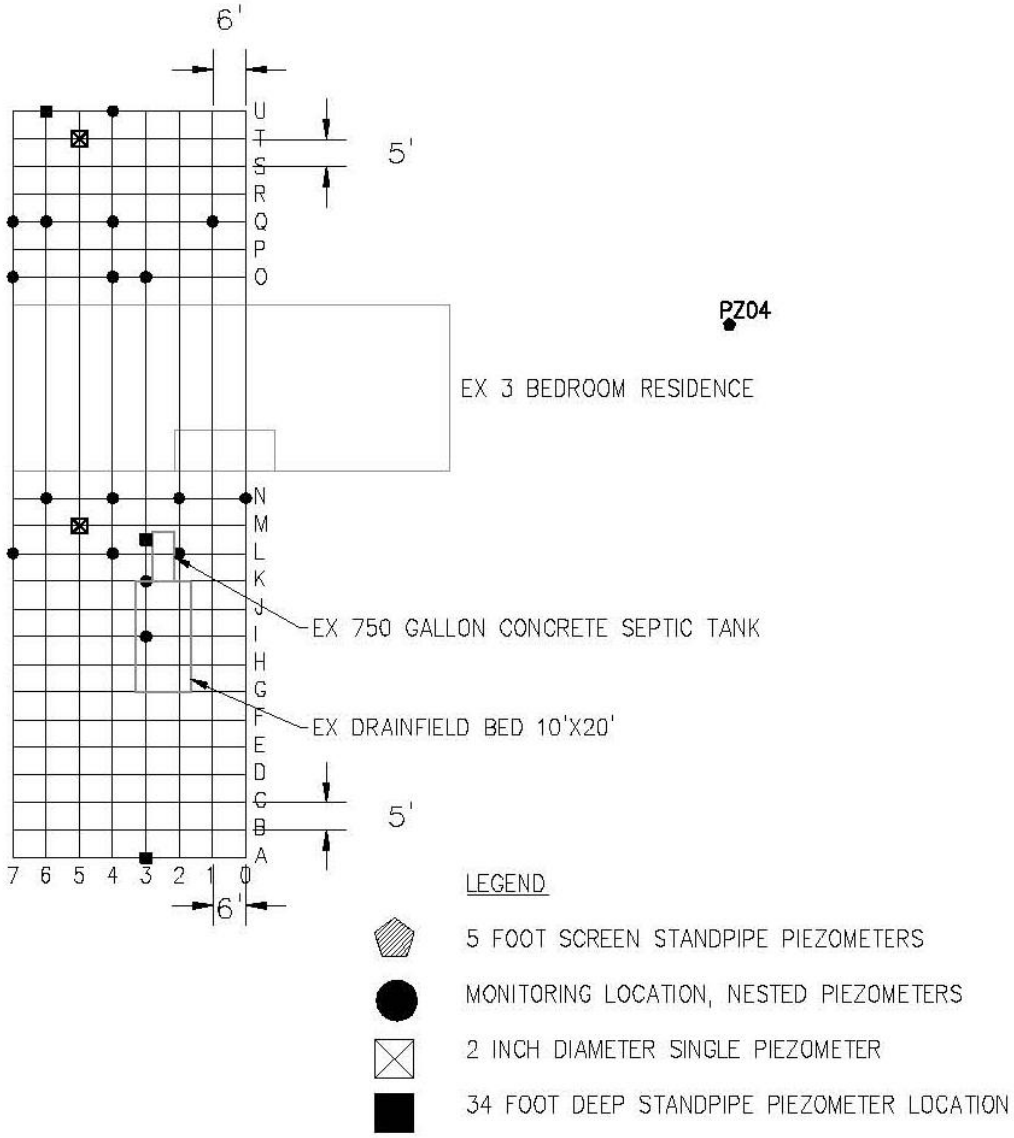

Figure 1
C-HS3 Monitoring Network

3.3 Operational Monitoring

A water meter for the house site was installed October 30, 2012. The water meter for the house site was read and recorded. A weather station (Ben Hill Griffin Elementary School in Frostproof, FL) is located approximately 17 miles from the site. Data from this weather station is available at the following website: http://fawn.ifas.ufl.edu/.

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3.4 Groundwater Elevation Measurements

Groundwater level measurements are used to determine hydraulic gradients and directions of flow. Groundwater levels were measured using a flat tape water level meter graduated in feet (measurement accuracy is 0.01 feet). The groundwater level within all the sampled standpipe piezometers was measured for this sampling event.

3.5 Water Quality Sample Collection and Analyses

Groundwater and septic tank effluent (STE) were collected May 20 through May 22, 2013 for water quality analysis. A sample was collected from the septic tank to represent the effluent delivered to the drainfield. A peristaltic pump was used to collect STE directly into the analysis-specific containers. Groundwater samples were obtained using a peristaltic pump, which was attached directly to dedicated standpipe piezometer tubing. Samples were collected after sufficient purging (the sample was clear and pH and conductivity readings had stabilized) had occurred. Field parameters were then recorded.

The analysis-specific containers were supplied by the analytical laboratory and contained appropriate preservatives. The analysis-specific containers were labeled, placed in coolers and transported on ice to the analytical laboratory. Each sample container was secured in packing material as appropriate to prevent damage and spills, and was recorded on chain-of-custody forms supplied by the laboratory. Chain of custody forms, provided in Appendix B, were used to document the transfer of samples from field personnel to the analytical laboratory.

In addition, field sample duplicates were collected immediately subsequent to the regular samples. The field duplicate samples taken include:

- C-HS3-STE
- C-HS3-PZ-03A-17
- C-HS3-PZ-02N-21
- C-HS3-04O-17
- C-HS3-06Q-15
- C-HS3-04U-14
- C-HS3-06U-14

Field parameters (pH, specific conductance, temperature (Temp), and dissolved oxygen (DO)) were measured using portable electronic probes with probe tips placed in an overflowing plastic beaker as groundwater was being pumped. All samples were analyzed by the laboratory for: total alkalinity, total Kjeldahl nitrogen (TKN-N), ammonia nitrogen (NH_3-N), nitrate/nitrite nitrogen (NO_X-N), and chloride (CL). At some of the locations, chemical oxygen demand (COD), total phosphorus (TP), anions, cations, total

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organic carbon (TOC), dissolved organic carbon (DOC), and sucralose were included. Additionally, for the STE sample, carbonaceous biological oxygen demand ($CBOD_5$), total solids (TS), total suspended solids (TSS), and fecal coliform (fecal) were included. All analyses were performed by an independent and fully certified analytical laboratory (Southern Analytical Laboratory and FDEP). Table 1 lists the analytical parameters, analytical methods, and detection limits for these analyses.

Table 1
Analytical Parameters, Method of Analysis, and Detection Limits

Analytical Parameter	Method of Analysis	Method Detection Limit (mg/L)
Total Alkalinity as $CaCO_3$	SM 2320B	2 mg/L
Chemical Oxygen Demand (COD)	EPA 410.4	10 mg/L
Carbonaceous BOD ($CBOD_5$)	SM 5210B	2 mg/L
Total Kjeldahl Nitrogen (TKN-N)	EPA 351.2	0.05 mg/L
Ammonia Nitrogen (NH_3-N)	EPA 350.1	0.005 mg/L
Nitrate/Nitrite Nitrogen (NO_X-N)	EPA 300.0	0.02 mg/L
Total Phosphorus	SM 4500P-E	0.01 mg/L
Dissolved Organic Carbon (DOC)	SM 5310B	0.5 mg/L
Total Organic Carbon (TOC)	SM 5310B	0.5 mg/L
Total Solids (TS)	EPA 160.3	0.01% by wt
Total Suspended Solids (TSS)	SM 2540D	1 mg/L
Fecal Coliform (fecal)	SM9222D	1 ct/100mL
Anions		
Fluoride	EPA 300.0	0.01 mg/L
Chloride	EPA 300.0	0.05 mg/L
Nitrate-N	EPA 300.0	0.01 mg/L
Nitrite-N	EPA 300.0	0.01 mg/L
Orthophosphate-P	EPA 300.0	0.01 mg/L
Sulfate	EPA 300.0	0.20 mg/L
Cations		
Boron	EPA 200.7	0.05 mg/L
Calcium	EPA 200.7	0.01 mg/L
Iron	EPA 200.7	0.02 mg/L
Magnesium	EPA 200.7	0.01 mg/L
Manganese	EPA 200.7	0.001 mg/L
Potassium	EPA 200.7	0.01 mg/L
Sodium	EPA 200.7	0.01 mg/L
Sucralose	EPA 8321B	0.01 µg/L

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4.0 Results

Once analytical results are obtained from the laboratory, the C-HS3 Data Summary Report No. 4 (Task C.25) will be prepared describing the results from this sampling event.

4.1 Operational Monitoring and Site Conditions

Table 2 summarizes the water meter readings and average daily water use for the residence at site C-HS3.

Table 2
Water Meter Readings and Water Usage for C-HS3

Residence	Date and Time Read	Meter Reading	Gallons/day
C-HS3 Residence	10/30/12 10:00	6,358.20	
	11/26/12 9:00	8,800.91	90.61
	2/25/13 9:00	15,980.66	78.90
	5/30/13 13:30	27,127.00	118.34

Daily recorded meteorological data is provided in Appendix C. Table 3 provides the daily averages leading up to and during the sample event.

Table 3
Meteorological Data Daily Averages Measured
May 14 through May 22, 2013

Date	Temp Avg 60 cm (°F)	Temp Avg 2m (°F)	Temp Avg 10 m (°F)	Temp Soil Avg -10 cm (°F)	Dewpoint Avg 2m (°F)	Relative Humidity Avg 2m (%)	Rain Total 2m (in)	2m Rain max over 15min (in)	10m Wind avg (mph)	ET (in/d)
14-May-13	71.79	71.13	70.78	79.52	54.29	59	0	0	6.48	0.18
15-May-13	72.35	71.89	72.32	79.6	58.28	65	0	0	5.77	0.16
16-May-13	75.68	74.83	74.13	80.47	60.61	64	0	0	6.77	0.19
17-May-13	76.62	75.53	75.47	81.25	63.01	68	0	0	4.93	0.18
18-May-13	79.65	78.59	77.98	82.25	66.82	71	0	0	5.58	0.19
19-May-13	79.12	78.27	77.4	83.15	69.31	76	0	0	6.6	0.18
20-May-13	76.83	76.17	75.56	82.19	67.75	77	1.08	0.81	5.76	0.16
21-May-13	73.95	73.3	72.86	79.81	69.01	87	0.01	0.01	5.41	0.14
22-May-13	74.55	73.88	73.7	80.18	69.62	87	0.57	0.47	4.01	0.15

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4.2 Groundwater Levels

Water levels were measured at all standpipe piezometers sampled May 20 through May 22 for this sampling event as summarized in Table 4. Figures 2, 3, 4 and 5 illustrate the surficial groundwater contours as measured within the standpipe piezometers during Sample Event 1 (August 28, 2012), Sample Event 2 (November 26, 2012), Sample Event 3 (February 25, 2013), and Sample Event 4 on (May 20, 2013), respectively.

Table 4
Standpipe Piezometer Groundwater Levels May 20, 2013

Identification	Water Table El[1] (ft)	Identification	Water Table El[1] (ft)
PZ01	DRY	PZ-04N-17	92.56
PZ02	92.24	PZ-04N-21	92.60
PZ03	92.49	PZ-06N-15	92.57
PZ04	DRY	PZ-06N-17	92.55
PZ05	92.68	PZ-06N-21	92.56
PZ-03A-15	92.73	PZ-03O-15	92.49
PZ-03A-17	92.73	PZ-03O-17	92.48
PZ-03A-21	92.73	PZ-03O-21	92.49
PZ-03A-34	92.67	PZ-04O-15	92.48
PZ-03I-15	92.64	PZ-04O-17	92.50
PZ-03I-17	92.63	PZ-04O-21	92.53
PZ-03I-21	92.69	PZ-07O-15	92.47
PZ-03K-15	93.02	PZ-07O-17	92.33
PZ-03K-17	93.03	PZ-07O-20	92.49
PZ-03K-21	93.07	PZ-01Q-13	92.45
PZ-02L-15	92.58	PZ-01Q-15	92.46
PZ-02L-17	92.58	PZ-01Q-19	92.45
PZ-02L-21	92.60	PZ-04Q-13	92.45
PZ-04L-15	92.59	PZ-04Q-15	92.45
PZ-04L-17	92.60	PZ-04Q-19	92.46
PZ-04L-21	92.46	PZ-06Q-13	92.44
PZ-07L-15	92.58	PZ-06Q-15	92.45
PZ-07L-17	92.58	PZ-06Q-19	92.39
PZ-07L-21	92.59	PZ-07Q-13	92.47
PZ-03ML-15	92.59	PZ-07Q-15	92.45
PZ-03ML-17	92.64	PZ-07Q-19	92.48
PZ-03ML-21	92.66	PZ-04U-12	92.42
PZ-00N-15	92.58	PZ-04U-14	92.42
PZ-00N-17	92.59	PZ-04U-18	92.41
PZ-00N-21	92.58	PZ-06U-12	92.41
PZ-02N-15	92.58	PZ-06U-14	92.39
PZ-02N-17	92.58	PZ-06U-34	92.39
PZ-02N-21	92.60	Staff gauge	92.05
PZ-04N-15	92.56		

[1]Elevation above mean sea level based on NGVD 1929
[2]Most likely erroneous instrument reading

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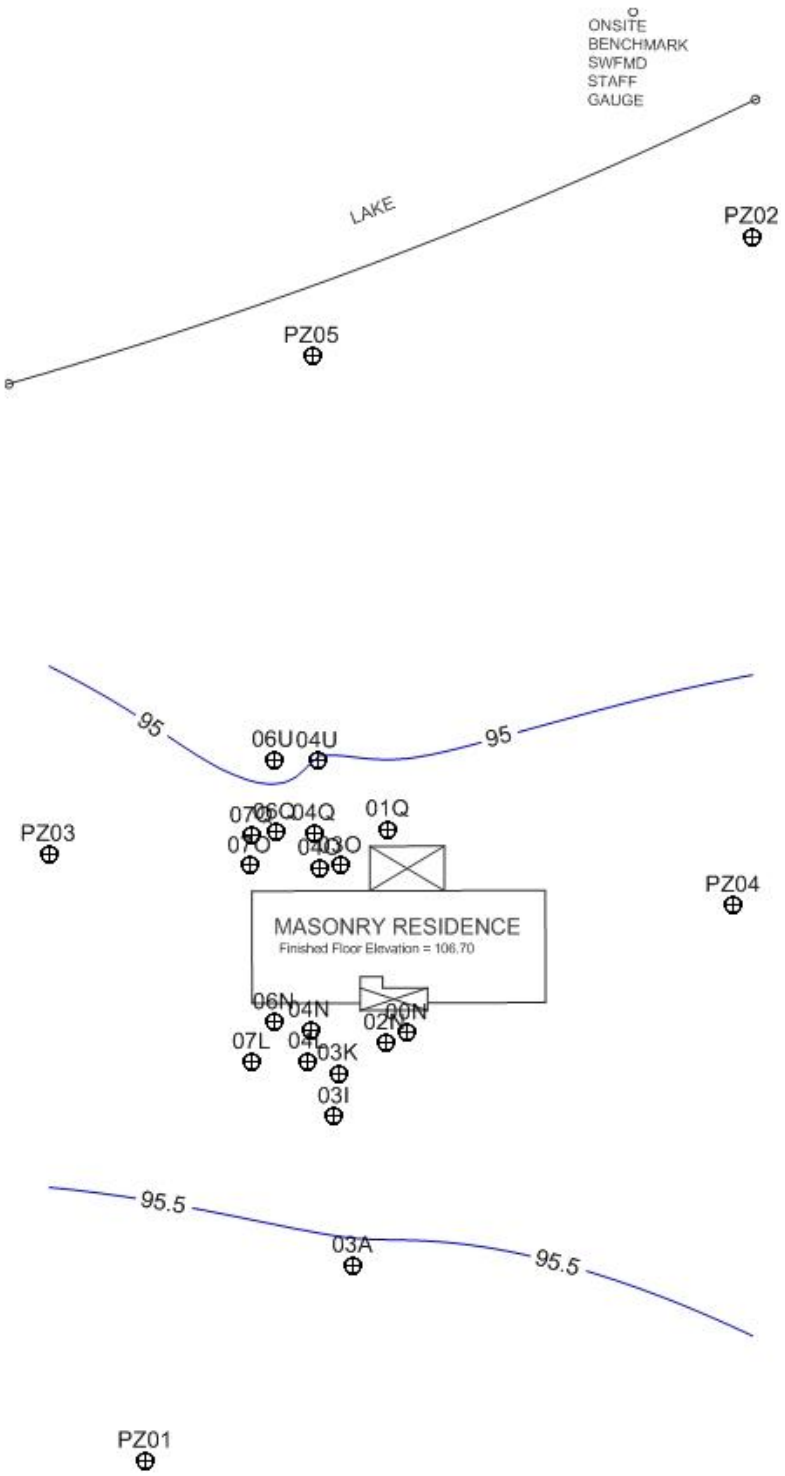

Figure 2
Surficial Groundwater Contours SE1, August 28, 2012

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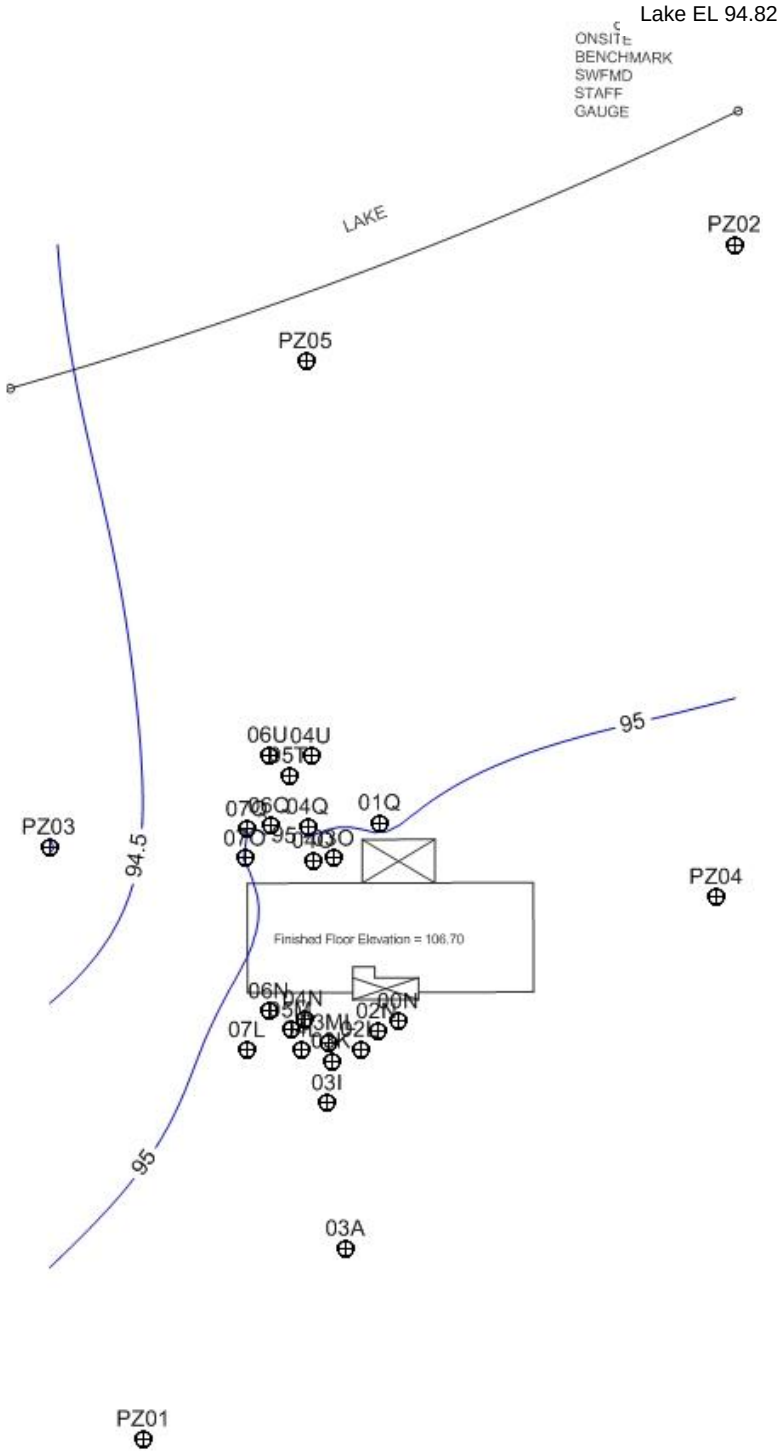

Figure 3
Surficial Groundwater Contours SE2, November 26, 2013

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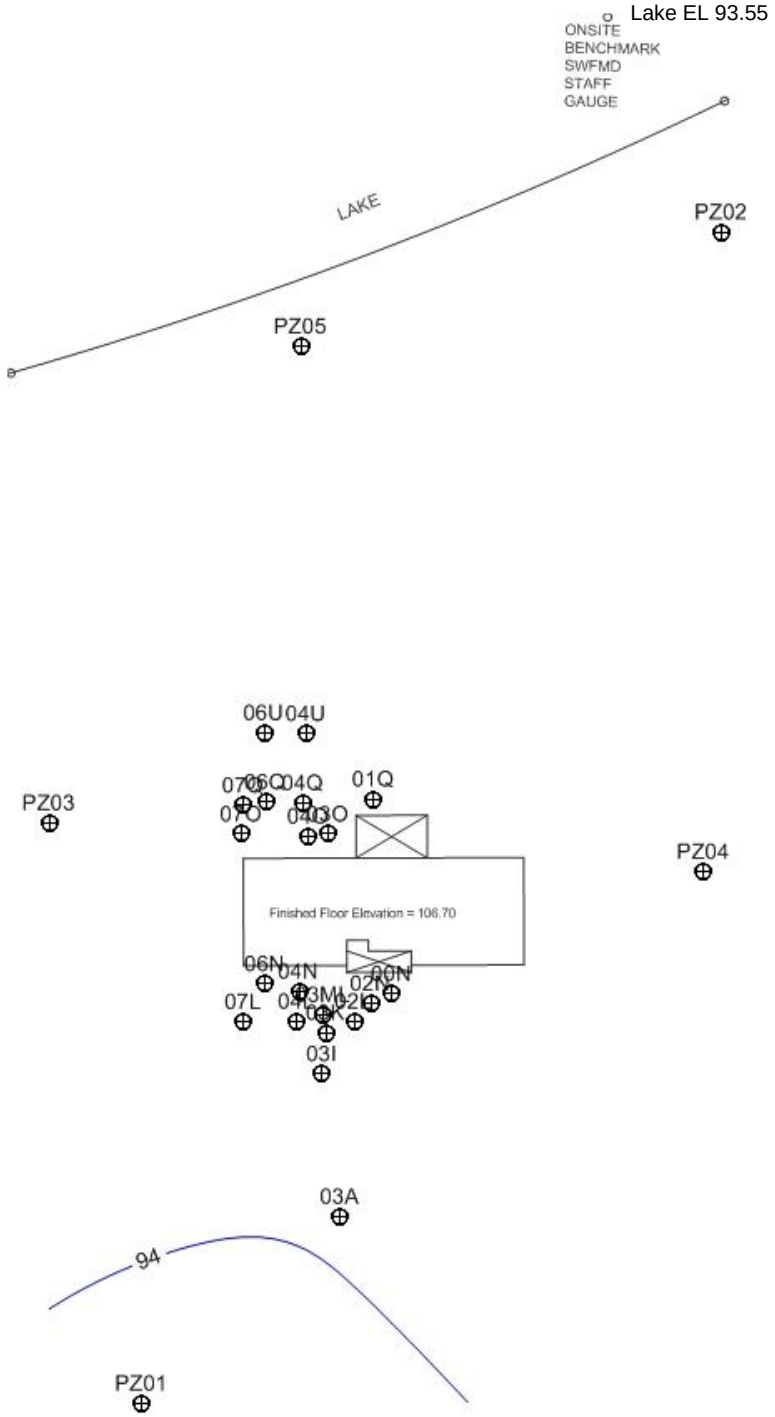

Figure 4
Surficial Groundwater Contours SE3, February 25, 2013

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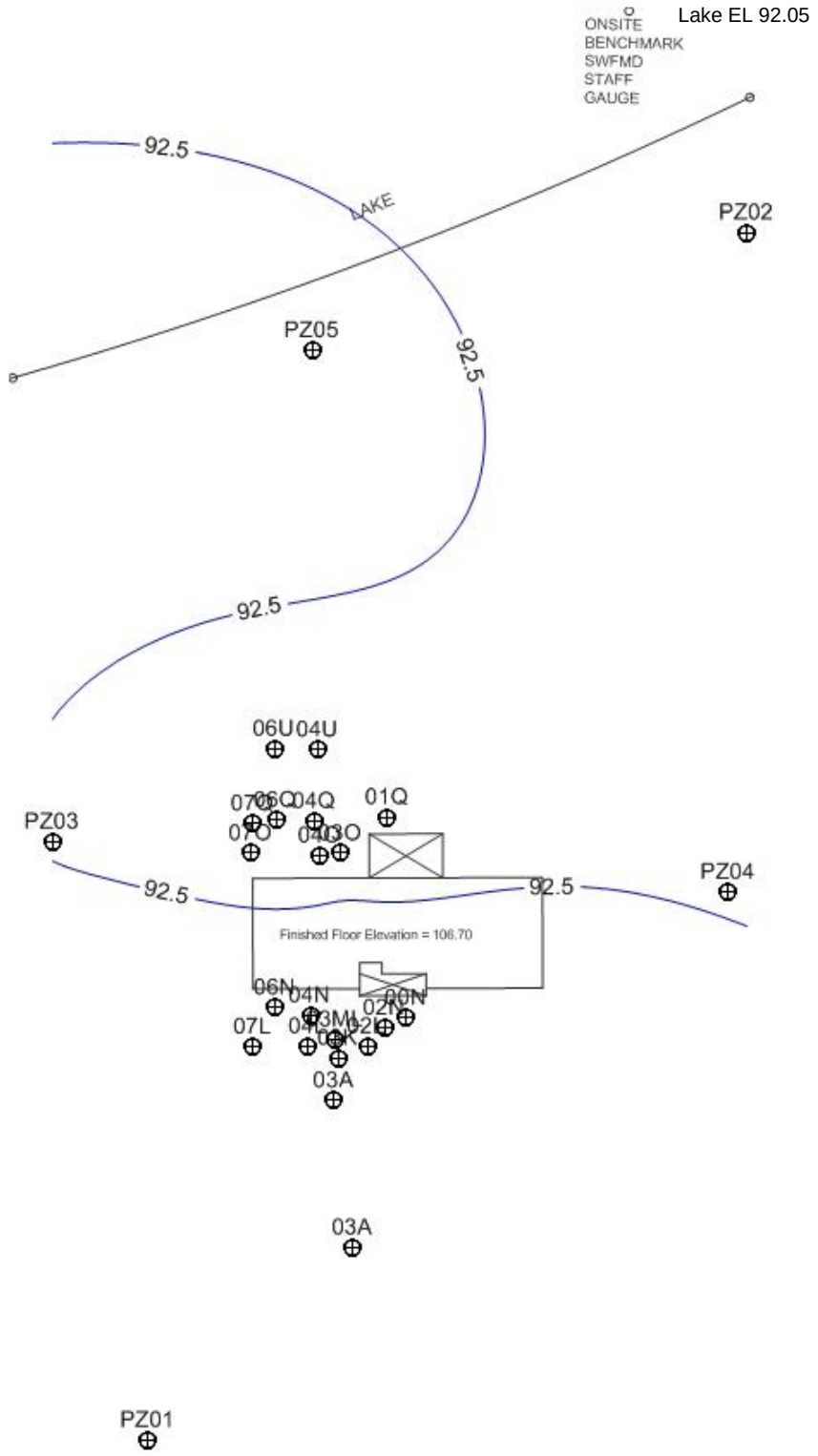

Figure 5
Surficial Groundwater Contours SE4, May 20, 2013

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4.3 Water Quality

Field parameters were measured prior to sample collection and are listed in Appendix D. Once analytical results are obtained from the laboratory, C-HS3 Data Summary Report No. 4 (Task C25) will be prepared describing the results from this sampling event.

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Appendix A: C-HS3 Sample Identification

Table 3

Site C-HS3 Sample Identification

	Identification	Type of Monitoring Point	Top Elevation[1] (feet)	Bottom Elevation[1] (feet)
1	C-HS3-STE	Wastewater	N/A	N/A
2	PZ01	1" Standpipe Piezometer, 5' screen	108.53	92.73
3	PZ02	1" Standpipe Piezometer, 5' screen	98.08	91.80
4	PZ03	1" Standpipe Piezometer, 5' screen	102.84	92.04
5	PZ04	1" Standpipe Piezometer, 5' screen	104.35	92.45
6	PZ05	1" Standpipe Piezometer, 5' screen	98.68	91.08
7	PZ-03A-15	1" Standpipe Piezometer, 5' screen	106.84	91.84
8	PZ-03A-17	3/4" Standpipe Piezometer, 1' screen	106.75	89.75
9	PZ-03A-21	3/4" Standpipe Piezometer, 1' screen	106.84	85.84
10	PZ-03A-34	2" Standpipe Piezometer, 5' screen	107.12	73.12
11	PZ-03I-15	1" Standpipe Piezometer, 5' screen	106.46	91.46
12	PZ-03I-17	3/4" Standpipe Piezometer, 1' screen	106.35	89.35
13	PZ-03I-21	3/4" Standpipe Piezometer, 1' screen	106.44	85.44
14	PZ-03K-15	1" Standpipe Piezometer, 5' screen	106.12	91.12
15	PZ-03K-17	3/4" Standpipe Piezometer, 1' screen	106.11	89.11
16	PZ-03K-21	3/4" Standpipe Piezometer, 1' screen	106.13	85.13
17	PZ-02L-15	1" Standpipe Piezometer, 5' screen	106.02	91.02
18	PZ-02L-17	3/4" Standpipe Piezometer, 1' screen	105.90	88.90
19	PZ-02L-21	3/4" Standpipe Piezometer, 1' screen	105.95	84.95
20	PZ-04L-15	1" Standpipe Piezometer, 5' screen	105.86	90.86
21	PZ-04L-17	3/4" Standpipe Piezometer, 1' screen	105.84	88.84
22	PZ-04L-21	3/4" Standpipe Piezometer, 1' screen	105.78	84.78
23	PZ-07L-15	1" Standpipe Piezometer, 5' screen	105.97	90.97
24	PZ-07L-17	3/4" Standpipe Piezometer, 1' screen	105.93	88.93
25	PZ-07L-21	3/4" Standpipe Piezometer, 1' screen	105.98	84.98
26	PZ-03ML-15	1" Standpipe Piezometer, 5' screen	106.00	91.00
27	PZ-03ML-17	3/4" Standpipe Piezometer, 1' screen	106.03	89.03
28	PZ-03ML-21	3/4" Standpipe Piezometer, 1' screen	105.93	84.93
29	PZ-05M-25	2" Standpipe Piezometer, 5' screen	106.01	81.01
30	PZ-00N-15	1" Standpipe Piezometer, 5' screen	105.78	90.78
31	PZ-00N-17	3/4" Standpipe Piezometer, 1' screen	105.74	88.74

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Table 3
Site C-HS3 Sample Identification

	Identification	Type of Monitoring Point	Top Elevation[1] (feet)	Bottom Elevation[1] (feet)
32	PZ-00N-21	3/4" Standpipe Piezometer, 1' screen	105.72	84.72
33	PZ-02N-15	1" Standpipe Piezometer, 5' screen	105.90	90.90
34	PZ-02N-17	3/4" Standpipe Piezometer, 1' screen	105.87	88.87
35	PZ-02N-21	3/4" Standpipe Piezometer, 1' screen	105.86	84.86
36	PZ-04N-15	1" Standpipe Piezometer, 5' screen	105.60	90.60
37	PZ-04N-17	3/4" Standpipe Piezometer, 1' screen	105.61	88.61
38	PZ-04N-21	3/4" Standpipe Piezometer, 1' screen	105.64	84.64
39	PZ-06N-15	1" Standpipe Piezometer, 5' screen	105.73	90.73
40	PZ-06N-17	3/4" Standpipe Piezometer, 1' screen	105.70	88.70
41	PZ-06N-21	3/4" Standpipe Piezometer, 1' screen	105.80	84.80
42	PZ-03O-15	1" Standpipe Piezometer, 5' screen	104.59	89.59
43	PZ-03O-17	3/4" Standpipe Piezometer, 1' screen	104.54	87.54
44	PZ-03O-21	3/4" Standpipe Piezometer, 1' screen	104.58	83.58
45	PZ-04O-15	1" Standpipe Piezometer, 5' screen	104.10	89.10
46	PZ-04O-17	3/4" Standpipe Piezometer, 1' screen	104.09	87.09
47	PZ-04O-21	3/4" Standpipe Piezometer, 1' screen	104.11	83.11
48	PZ-07O-15	1" Standpipe Piezometer, 5' screen	103.83	88.83
49	PZ-07O-17	3/4" Standpipe Piezometer, 1' screen	103.75	86.75
50	PZ-07O-20	3/4" Standpipe Piezometer, 1' screen	103.91	83.91
51	PZ-01Q-13	1" Standpipe Piezometer, 5' screen	104.19	91.19
52	PZ-01Q-15	3/4" Standpipe Piezometer, 1' screen	104.18	89.18
53	PZ-01Q-19	3/4" Standpipe Piezometer, 1' screen	104.24	85.24
54	PZ-04Q-13	1" Standpipe Piezometer, 5' screen	103.58	90.58
55	PZ-04Q-15	3/4" Standpipe Piezometer, 1' screen	103.54	88.54
56	PZ-04Q-19	3/4" Standpipe Piezometer, 1' screen	103.60	84.60
57	PZ-06Q-13	1" Standpipe Piezometer, 5' screen	103.66	90.66
58	PZ-06Q-15	3/4" Standpipe Piezometer, 1' screen	103.66	88.66
59	PZ-06Q-19	3/4" Standpipe Piezometer, 1' screen	103.71	84.71
60	PZ-07Q-13	1" Standpipe Piezometer, 5' screen	103.56	90.56
61	PZ-07Q-15	3/4" Standpipe Piezometer, 1' screen	103.64	88.64
62	PZ-07Q-19	3/4" Standpipe Piezometer, 1' screen	103.62	84.62
63	PZ-05T-25	2" Standpipe Piezometer, 5' screen	102.73	77.73
64	PZ-04U-12	1" Standpipe Piezometer, 5' screen	102.61	90.61
65	PZ-04U-14	3/4" Standpipe Piezometer, 1' screen	102.64	88.64

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Table 3
Site C-HS3 Sample Identification

	Identification	Type of Monitoring Point	Top Elevation[1] (feet)	Bottom Elevation[1] (feet)
66	PZ-04U-18	3/4" Standpipe Piezometer, 1' screen	102.61	84.61
67	PZ-06U-12	1" Standpipe Piezometer, 5' screen	102.07	90.07
68	PZ-06U-14	3/4" Standpipe Piezometer, 1' screen	101.96	87.96
69	PZ-06U-34	3/4" Standpipe Piezometer, 1' screen	101.94	67.94

[1]Elevation above mean sea level based on NGVD 1929

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Appendix B: Chain of Custody Forms

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SOUTHERN ANALYTICAL LABORATORIES, INC.

110 BAYVIEW BOULEVARD, OLDSMAR, FL 34677 813-855-1844 fax 813-855-2218

SAL Project No. 1304716

Client Name: Hazen and Sawyer

Contact / Phone:

Project Name / Location: C-HS3/SE#4

Samplers: (Signature)

Matrix Codes:
DW-Drinking Water WW-Wastewater
SW-SurfaceWater SL-Sludge SO-Soil
GW-Groundwater SA-Saline Water O-Other
R-Reagent Water

PARAMETER / CONTAINER DESCRIPTION

SAL Use Only Sample No.	Sample Description	Date	Time	Matrix	Composite	Grab	500mLP, Cool Total Alkalinity, TSS, TS, CBOD, NOx, Cl	125mLP, H_2SO_4 TKN, NH_3, TP	125mLP, $Na_2S_2O_3$ FC-MF	500mLP, Cool Total Alkalinity, NOx, Cl	125mLP, H_2SO_4 COD, TKN, NH_3, TP	500mLP, Cool Total Alkalinity, NOx, Cl, F, OP, SO_4	40mLaV, HCl TOC	250mLaG, Cool DOC	250mLP, HNO_3 B, Ca, Fe, Mg, Mn, K, Na	250mLP, H_2SO_4 TKN, NH_3	pH	Temperature	Conductivity	DO	No. of Containers (Total per each location)
01	STE	5/20/13	1010	WW		X	1	1	2								7.09	23.4	1346	0.09	
02	STE-DUP		1015	WW		X	1	1	2								7.09	23.4	1346	0.09	
03	PZ-03A-15		0912	GW		X				1	1						6.80	25.8	38.5	7.14	
04	PZ-03A-17		0831	GW		X				1	1						6.43	26.2	87.4	6.33	
05	PZ-03A-17-DUP		0936	GW		X				1	1						6.43	26.2	87.4	6.33	
06	PZ-03A-21		0947	GW		X					1	1	2	1	1	5.86	[illegible]	26.5	240	4.20	
07	PZ-03A-34			GW		X				1	1										
08	PZ-03I-15			GW		X				1	1										
09	PZ-03I-17			GW		X				1						1					
10	PZ-03I-21			GW		X				1						1					
11	PZ-03K-15			GW		X					1	1	2	1	1						
12	PZ-03K-17			GW		X				1						1					

	Date/Time	Received	Date/Time
Containers Prepared/ Relinquished: Chambers	5-18-13 10:00	Received:	Date/Time: 5/20/13 0900
Relinquished:	Date/Time: 5/20/13 1500	Received:	Date/Time: 5-20-13 1500
Relinquished:	Date/Time:	Received:	Date/Time:
Relinquished:	Date/Time:	Received:	Date/Time:
Relinquished:	Date/Time:	Received:	Date/Time:

Seal intact?	Y N N/A
Samples intact upon arrival?	Y N N/A
Received on ice? Temp_____	Y N N/A
Proper preservatives indicated?	Y N N/A
Rec'd within holding time?	Y N N/A
Volatiles rec'd w/out headspace?	Y N N/A
Proper containers used?	Y N N/A

Chain of Custody.xls
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Chain of Custody

SOUTHERN ANALYTICAL LABORATORIES, INC.

110 BAYVIEW BOULEVARD, OLDSMAR, FL 34677 813-855-1844 fax 813-855-2218

SAL Project No. 1304718

Client Name: Hazen and Sawyer

Contact / Phone:

Project Name / Location: C-HS3 SE#4

Samplers: (Signature)

Matrix Codes: DW-Drinking Water WW-Wastewater SW-SurfaceWater SL-Sludge SO-Soil GW-Groundwater SA-Saline Water O-Other R-Reagent Water

PARAMETER / CONTAINER DESCRIPTION

SAL Use Only Sample No.	Sample Description	Date	Time	Matrix	Composite	Grab	500mLP, Cool Total Alkalinity, TSS, TS, CBOD, NOx, Cl	125mLP, H_2SO_4 TKN, NH_3, TP	125mLP, $Na_2S_2O_3$ FC-MF	500mLP, Cool Total Alkalinity, NOx, Cl	125mLP, H_2SO_4 COD, TKN, NH_3, TP	500mLP, Cool Total Alkalinity, NOx, Cl, F, OP, SO_4	40mLaV, HCl TOC	250mLaG, Cool DOC	250mLP, HNO_3 B, Ca, Fe, Mg, Mn, K, Na	250mLP, H_2SO_4 TKN, NH_3	pH	Temperature	Conductivity	DO	No. of Containers (Total per each location)
13	PZ-03K-21			GW		X				1						1					
14	PZ-02L-15			GW		X				1	1										
15	PZ-02L-17			GW		X				1						1					
16	PZ-02L-21			GW		X				1						1					
17	PZ-04L-15			GW		X					1	1	2	1	1						
18	PZ-04L-17			GW		X				1						1					
19	PZ-04L-21			GW		X				1						1					
20	PZ-07L-15			GW		X				1	1										
21	PZ-07L-17			GW		X				1						1					
22	PZ-07L-21			GW		X				1						1					
23	PZ-03ML-15	5/20/13	0911	GW		X					1	1	2	1	1		6.77	26.2	286	5.58	
24	PZ-03ML-17		0943	GW		X					1	1	2	1	1		6.46	26.5	57.4	5.88	

Containers Prepared/ Relinquished:	Date/Time: 1150 05-10-13	Received:	Date/Time: 5/20/13 0900
Relinquished:	Date/Time: 5/20/13 1500	Received:	Date/Time: 5-20-13 1500
Relinquished:	Date/Time:	Received:	Date/Time:
Relinquished:	Date/Time:	Received:	Date/Time:
Relinquished:	Date/Time:	Received:	Date/Time:

Seal intact?	Y N N/A
Samples intact upon arrival?	Y N N/A
Received on ice? Temp_____	Y N N/A
Proper preservatives indicated?	Y N N/A
Rec'd within holding time?	Y N N/A
Volatiles rec'd w/out headspace?	Y N N/A
Proper containers used?	Y N N/A

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Chain of Custody

SOUTHERN ANALYTICAL LABORATORIES, INC.

110 BAYVIEW BOULEVARD, OLDSMAR, FL 34677 813-855-1844 fax 813-855-2218

SAL Project No. 1304718

Client Name: Hazen and Sawyer

Contact / Phone:

Project Name / Location: C-HS3 SE#4

Samplers: (Signature)

Matrix Codes: DW-Drinking Water WW-Wastewater SW-SurfaceWater SL-Sludge SO-Soil GW-Groundwater SA-Saline Water O-Other R-Reagent Water

PARAMETER / CONTAINER DESCRIPTION

SAL Use Only Sample No.	Sample Description	Date	Time	Matrix	Composite	Grab	500mLP, Cool Total Alkalinity, TSS, TS, CBOD, NOx, Cl	125mLP, H_2SO_4 TKN, NH_3, COD	125mLP, H_2SO_4 TKN, NH_3, TP	500mLP, Cool Total Alkalinity, NOx, Cl	125mLP, H_2SO_4 COD, TKN, NH_3, TP	500mLP, Cool Total Alkalinity, NOx, Cl, F, OP, SO_4	40mLaV, HCl TOC	250mLaG, Cool DOC	250mLP, HNO_3 B, Ca, Fe, Mg, Mn, K, Na	250mLP, H_2SO_4 TKN, NH_3	pH	Temperature	Conductivity	DO	No. of Containers (Total per each location)
25	PZ-03ML-21	5/20/13	1016	GW		X					1	1	2	1	1		6.05	26.2	2071	1.92	
26	PZ00N-15			GW		X				1	1										
27	PZ-00N-17			GW		X				1						1					
28	PZ-00N-21			GW		X				1						1					
29	PZ-02N-15			GW		X		1		1											
30	PZ-02N-17			GW		X				1						1					
31	PZ-02N-21			GW		X				1						1					
32	PZ-02N-21-DUP			GW		X				1						1					
33	PZ-04N-15			GW		X				1	1		2	1							
34	PZ-04N-17			GW		X				1	1										
35	PZ-04N-21			GW		X				1						1					
36	PZ-06N-15			GW		X			1			1	2	1	1						

Containers Prepared/ Relinquished:	Date/Time: 5-10-13 1200	Received:	Date/Time: 5/20/13 0900
Relinquished:	Date/Time: 5/20/13 1500	Received:	Date/Time: 5-20-13 1500
Relinquished:	Date/Time:	Received:	Date/Time:
Relinquished:	Date/Time:	Received:	Date/Time:
Relinquished:	Date/Time:	Received:	Date/Time:

Seal intact?	Y	N	N/A
Samples intact upon arrival?	Y	N	N/A
Received on ice? Temp_____	Y	N	N/A
Proper preservatives indicated?	Y	N	N/A
Rec'd within holding time?	Y	N	N/A
Volatiles rec'd w/out headspace?	Y	N	N/A
Proper containers used?	Y	N	N/A

Chain of Custody.xls
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Chain of Custody

SOUTHERN ANALYTICAL LABORATORIES, INC.

11D BAYVIEW BOULEVARD, OLDSMAR, FL 34677 813-855-1844 fax 813-855-2218

SAL Project No. 1304718

Client Name: Hazen and Sawyer

Contact / Phone:

Project Name / Location: C-HS3 SE#4

Samplers: (Signature)

Matrix Codes:
DW-Drinking Water WW-Wastewater
SW-SurfaceWater SL-Sludge SO-Soil
GW-Groundwater SA-Saline Water O-Other
R-Reagent Water

PARAMETER / CONTAINER DESCRIPTION

SAL Use Only Sample No.	Sample Description	Date	Time	Matrix	Composite	Grab	500mLP, Cool Total Alkalinity, TSS, TS, CBOD, NOx, Cl	125mLP, H_2SO_4 TKN, NH_3, COD	125mLP, H_2SO_4 TKN, NH_3, TP	500mLP, Cool Total Alkalinity, NOx, Cl	125mLP, H_2SO_4 COD, TKN, NH_3, TP	500mLP, Cool Total Alkalinity, NOx, Cl, F, OP, SO_4	40mLaV, HCl TOC	250mLaG, Cool DOC	250mLP, HNO_3 B, Ca, Fe, Mg, Mn, K, Na	250mLP, H_2SO_4 TKN, NH_3	pH	Temperature	Conductivity	DO	No. of Containers (Total per each location)
61	PZ-07Q-19			GW		X				1						1					
62	PZ-04U-12	5/20/13	1130	GW		X				1	1						6.61	26.1	97.5	5.86	
63	PZ-04U-14		1145	GW		X				1						1	6.25	26.2	114.6	4.82	
64	PZ-04U-14-DUP		1150	GW		X				1						1	6.25	26.2	114.6	4.82	
65	PZ-04U-18		1200	GW		X				1						1	6.06	26.8	66.8	5.29	
66	PZ-06U-12		1122	GW		X			1	1			2	1			6.28	26.7	202.7	5.14	
67	PZ-06U-14		1147	GW		X			1			1	2	1	1		5.89	26.7	471	2.46	
68	PZ-06U-14-DUP		1152	GW		X			1			1	2	1	1		5.89	26.7	471	2.46	
69	PZ-06U-34		1215	GW		X				1						1	5.92	27.2	1164	0.85	
70	PZ01-BKG			GW		X				1	1										
71	PZ-02BKG			GW		X				1	1										
72	PZ-03BKG			GW		X				1	1										

Relinquished:	Date/Time:	Received:	Date/Time:
Containers Prepared/ Relinquished: J. Chambers	5-10-13 11:00		5/20/13 0900
Relinquished:	5/20/13 1500		5-20-13 1500
Relinquished:	Date/Time:	Received:	Date/Time:
Relinquished:	Date/Time:	Received:	Date/Time:
Relinquished:	Date/Time:	Received:	Date/Time:

Seal intact?	Y N N/A
Samples intact upon arrival?	Y N N/A
Received on ice? Temp_____	Y N N/A
Proper preservatives indicated?	Y N N/A
Rec'd within holding time?	Y N N/A
Volatiles rec'd w/out headspace?	Y N N/A
Proper containers used?	Y N N/A

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SOUTHERN ANALYTICAL LABORATORIES, INC.

110 BAYVIEW BOULEVARD, OLDSMAR, FL 34677 813-855-1844 fax 813-855-2218

SAL Project No. 1304718

Client Name: Hazen and Sawyer

Contact / Phone:

Project Name / Location: C-HS3 SE#4

Samplers: (Signature)

Matrix Codes: DW-Drinking Water WW-Wastewater SW-SurfaceWater SL-Sludge SO-Soil GW-Groundwater SA-Saline Water O-Other R-Reagent Water

PARAMETER / CONTAINER DESCRIPTION

SAL Use Only Sample No.	Sample Description	Date	Time	Matrix	Composite	Grab	500mLP, Cool Total Alkalinity, TSS, TS, CBOD, NOx, Cl, F, OP, SO_4	125mLP, $Na_2S_2O_3$ FC-MF	125mLP, H_2SO_4 TKN, NH_3, TP	500mLP, Cool Total Alkalinity, NOx, Cl	125mLP, H_2SO_4 COD, TKN, NH_3, TP	500mLP, Cool Total Alkalinity, NOx, Cl, F, OP, SO_4	40mLaV, HCl TOC	250mLaG, Cool DOC	250mLP, HNO_3 B, Ca, Fe, Mg, Mn, K, Na	250mLP, H_2SO_4 TKN, NH_3	pH	Temperature	Conductivity	DO	No. of Containers (Total per each location)
73	PZ-04BKG			GW		X				1	1										
74	PZ-04BKG-DUP			GW		X				1	1										
75	PZ-05BKG			GW		X				1	1										
76	FB-DI	5/20/13	1055	R		X	1	2			1		2	1	1		7.34	28.0	168	7.88	
77	FB-TAP		1045	DW		X	1	2			1		2	1	1		6.50	25.7	328	3.05	
78	EB		1050	R		X	1	2			1		2	1	1		7.34	28.0	168	7.88	

Containers Prepared/ Relinquished:	Date/Time:	Received:	Date/Time:
J. Champlin	5-10-13 10:00		5/20/13 0900
Relinquished:	Date/Time: 5/20/13 1500	Received:	Date/Time: 5-20-13 1500
Relinquished:	Date/Time:	Received:	Date/Time:
Relinquished:	Date/Time:	Received:	Date/Time:
Relinquished:	Date/Time:	Received:	Date/Time:

Seal intact?	Y N N/A
Samples intact upon arrival?	Y N N/A
Received on ice? Temp_____	Y N N/A
Proper preservatives indicated?	Y N N/A
Rec'd within holding time?	Y N N/A
Volatiles rec'd w/out headspace?	Y N N/A
Proper containers used?	Y N N/A

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Chain of Custody

SOUTHERN ANALYTICAL LABORATORIES, INC.

110 BAYVIEW BOULEVARD, OLDSMAR, FL 34677 813-855-1844 fax 813-855-2218

SAL Project No. 1304718

Client Name: Hazen and Sawyer

Contact / Phone:

Project Name / Location: C-HS3 SE#4

Samplers: (Signature)

Matrix Codes: DW-Drinking Water WW-Wastewater SW-SurfaceWater SL-Sludge SO-Soil GW-Groundwater SA-Saline Water O-Other R-Reagent Water

PARAMETER / CONTAINER DESCRIPTION

SAL Use Only Sample No.	Sample Description	Date	Time	Matrix	Composite	Grab	500mLP, Cool Total Alkalinity, TSS, TS, CBOD, NOx, Cl	125mLP, H_2SO_4 TKN, NH_3, TP	125mLP, $Na_2S_2O_3$ FC-MF	500mLP, Cool Total Alkalinity, NOx, Cl	125mLP, H_2SO_4 COD, TKN, NH_3, TP	500mLP, Cool Total Alkalinity, NOx, Cl, F, OP, SO_4	40mLaV, HCl TOC	250mLaG, Cool DOC	250mLP, HNO_3 B, Ca, Fe, Mg, Mn, K, Na	250mLP, H_2SO_4 TKN, NH_3	pH	Temperature	Conductivity	DO	No. of Containers (Total per each location)
01	STE			WW		X	1	1	2												
02	STE-DUP			WW		X	1	1	2												
03	PZ-03A-15			GW		X				1	1										
04	PZ-03A-17			GW		X				1	1										
05	PZ-03A-17-DUP			GW		X				1	1										
06	PZ-03A-21			GW		X					1	1	2	1	1						
07	PZ-03A-34	5/21/13	1302	GW		X				1	1						4.47	26.6	181.6	1.38	
08	PZ-03I-15	5/21/13	1241	GW		X				1	1						5.79	27.6	44.3	5.26	
09	PZ-03I-17		1256	GW		X				1						1	5.66	27.3	48.6	6.15	
10	PZ-03I-21		1312	GW		X				1						1	4.89	27.4	172.7	3.78	
11	PZ-03K-15		1023	GW		X					1	1	2	1	1		6.75	26.3	170.6	5.41	
12	PZ-03K-17		1046	GW		X				1						1	6.18	26.7	45.8	5.98	

Relinquished	Date/Time	Received	Date/Time
Containers Prepared/ Relinquished: Chambers	5-10-13 10:00		5/20/13 0900
Relinquished:	5/20/13 1545	K Mudmeck	1545 5/21/13
Relinquished:			
Relinquished:			
Relinquished:			

Seal intact? Y N (N/A)

Samples intact upon arrival? (Y) N N/A

Received on ice? Temp_____ (Y) N N/A

Proper preservatives indicated? (Y) N N/A

Rec'd within holding time? (Y) N N/A

Volatiles rec'd w/out headspace? Y N (N/A)

Proper containers used? (Y) N N/A

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Chain of Custody

SOUTHERN ANALYTICAL LABORATORIES, INC.

110 BAYVIEW BOULEVARD, OLDSMAR, FL 34677 813-855-1844 fax 813-855-2218

SAL Project No. 1304718

Client Name: Hazen and Sawyer

Contact / Phone:

Project Name / Location: C-HS3 SE#4

Samplers: (Signature)

Matrix Codes:
DW-Drinking Water WW-Wastewater
SW-SurfaceWater SL-Sludge SO-Soil
GW-Groundwater SA-Saline Water O-Other
R-Reagent Water

PARAMETER / CONTAINER DESCRIPTION

SAL Use Only Sample No.	Sample Description	Date	Time	Matrix	Composite	Grab	500mLP, Cool Total Alkalinity, TSS, TS, CBOD, NOx, Cl	125mLP, H_2SO_4 TKN, NH_3, TP	125mLP, $Na_2S_2O_3$ FC-MF	500mLP, Cool Total Alkalinity, NOx, Cl	125mLP, H_2SO_4 COD, TKN, NH_3, TP	500mLP, Cool Total Alkalinity, NOx, Cl, F, OP, SO_4	40mLaV, HCl TOC	250mLaG, Cool DOC	250mLP, HNO_3 B, Ca, Fe, Mg, Mn, K, Na	250mLP, H_2SO_4 TKN, NH_3	pH	Temperature	Conductivity	DO	No. of Containers (Total per each location)
13	PZ-03K-21	5/21/13	1101	GW		X				1						1	5.86	26.2	178.7	3.03	
14	PZ-02L-15	5/21/13	1006	GW		X				1	1						6.30	26.2	62.3	5.47	
15	PZ-02L-17		1020	GW		X				1						1	6.86	26.0	75.1	5.44	
16	PZ-02L-21		1036	GW		X				1						1	5.14	26.2	194.5	2.72	
17	PZ-04L-15		1055	GW		X					1	1	2	1	1		6.63	26.4	247	5.56	
18	PZ-04L-17		1115	GW		X				1						1	6.00	26.2	49.6	6.13	
19	PZ-04L-21		1131	GW		X				1						1	5.97	26.4	205.3	2.69	
20	PZ-07L-15		1217	GW		X				1	1						6.12	27.6	54.1	5.89	
21	PZ-07L-17		1230	GW		X				1						1	6.04	26.5	49.6	5.69	
22	PZ-07L-21		1245	GW		X				1						1	5.12	26.9	124.9	2.37	
23	PZ-03ML-15			GW		X					1	1	2	1	1						
24	PZ-03ML-17			GW		X					1	1	2	1	1						

Relinquished:	Date/Time:	Received:	Date/Time:
Containers Prepared/ Relinquished:	1150 05-10-13		5/20/13 0900
Relinquished:	5/21/13 1545	K Mudrnesch	1545 5/21/13
Relinquished:			
Relinquished:			
Relinquished:			

Seal intact?	Y N N/A
Samples intact upon arrival?	Y N N/A
Received on ice? Temp_____	Y N N/A
Proper preservatives indicated?	Y N N/A
Rec'd within holding time?	Y N N/A
Volatiles rec'd w/out headspace?	Y N N/A
Proper containers used?	Y N N/A

SOUTHERN ANALYTICAL LABORATORIES, INC.

110 BAYVIEW BOULEVARD, OLDSMAR, FL 34677 813-855-1844 fax 813-855-2218

SAL Project No. 1304718

Client Name: Hazen and Sawyer

Contact / Phone:

Project Name / Location: C-HS3 SE#4

Samplers: (Signature)

Matrix Codes: DW-Drinking Water WW-Wastewater SW-SurfaceWater SL-Sludge SO-Soil GW-Groundwater SA-Saline Water O-Other R-Reagent Water

PARAMETER / CONTAINER DESCRIPTION

SAL Use Only Sample No.	Sample Description	Date	Time	Matrix	Composite	Grab	500mLP, Cool Total Alkalinity, TSS, TS, CBOD, NOx, Cl	125mLP, H_2SO_4 TKN, NH_3, COD	125mLP, H_2SO_4 TKN, NH_3, TP	500mLP, Cool Total Alkalinity, NOx, Cl	125mLP, H_2SO_4 COD, TKN, NH_3, TP	500mLP, Cool Total Alkalinity, NOx, Cl, F, OP, SO_4	40mLaV, HCl TOC	250mLaG, Cool DOC	250mLP, HNO_3 B, Ca, Fe, Mg, Mn, K, Na	250mLP, H_2SO_4 TKN, NH_3	pH	Temperature	Conductivity	DO	No. of Containers (Total per each location)
25	PZ-03ML-21			GW		X					1	1	2	1	1						
26	PZ00N-15	5/21/13	0917	GW		X				1	1						6.55	25.4	74.9	5.10	
27	PZ-00N-17		0933	GW		X				1						1	6.28	25.4	57.5	4.62	
28	PZ-00N-21		0949	GW		X				1						1	4.81	25.5	207.9	2.42	
29	PZ-02N-15		0926	GW		X		1		1							6.04	25.7	56.4	6.06	
30	PZ-02N-17		0942	GW		X				1						1	6.24	25.6	52.2	5.04	
31	PZ-02N-21		0956	GW		X				1						1	4.93	25.7	184.3	2.02	
32	PZ-02N-21-DUP		1001	GW		X				1						1	4.93	25.7	184.3	2.02	
33	PZ-04N-15		1119	GW		X				1	1		2	1			5.99	26.1	24.9	5.03	
34	PZ-04N-17		1139	GW		X				1	1						6.50	26.5	69.9	3.19	
35	PZ-04N-21		1155	GW		X				1						1	5.66	27.2	157.8	2.89	
36	PZ-06N-15		1149	GW		X			1			1	2	1	1		5.91	27.0	52.1	4.35	

Containers Prepared/ Relinquished:	Date/Time: 5-10-13 1200	Received:	Date/Time: 5/20/13 0900
Relinquished:	Date/Time: 5/21/13 1545	Received: K Nudmeck	Date/Time: 1545 5/21/13
Relinquished:	Date/Time:	Received:	Date/Time:
Relinquished:	Date/Time:	Received:	Date/Time:
Relinquished:	Date/Time:	Received:	Date/Time:

Seal intact?	Y N NA
Samples intact upon arrival?	Y N NA
Received on ice? Temp_____	Y N NA
Proper preservatives indicated?	Y N NA
Rec'd within holding time?	Y N NA
Volatiles rec'd w/out headspace?	Y N NA
Proper containers used?	Y N NA

SOUTHERN ANALYTICAL LABORATORIES, INC.

110 BAYVIEW BOULEVARD, OLDSMAR, FL 34677 813-855-1844 fax 813-855-2218

SAL Project No. 1304718

Client Name: Hazen and Sawyer

Contact / Phone:

Project Name / Location: C-HS3 SE#4

Samplers: (Signature)

Matrix Codes: DW-Drinking Water WW-Wastewater SW-SurfaceWater SL-Sludge SO-Soil GW-Groundwater SA-Saline Water O-Other R-Reagent Water

PARAMETER / CONTAINER DESCRIPTION

SAL Use Only Sample No.	Sample Description	Date	Time	Matrix	Composite	Grab	500mLP, Cool Total Alkalinity, TSS, TS, CBOD, NOx, Cl	125mLP, H_2SO_4 TKN, NH_3, COD	125mLP, H_2SO_4 TKN, NH_3, TP	500mLP, Cool Total Alkalinity, NOx, Cl	125mLP, H_2SO_4 COD, TKN, NH_3, TP	500mLP, Cool Total Alkalinity, NOx, Cl, F, OP, SO_4	40mLaV, HCl TOC	250mLaG, Cool DOC	250mLP, HNO_3 B, Ca, Fe, Mg, Mn, K, Na	250mLP, H_2SO_4 TKN, NH_3	pH	Temperature	Conductivity	DO	No. of Containers (Total per each location)
37	PZ-06N-17	5/21/13	1209	GW		X				1						1	5.85	27.2	169.1	5.21	
38	PZ-06N-21		1225	GW		X				1						1	4.76	26.8	94.8	4.04	
39	PZ-03O-15			GW		X				1						1					
40	PZ-03O-17			GW		X				1						1					
41	PZ-03O-21			GW		X				1						1					
42	PZ-04O-15			GW		X					1	1	2	1	1						
43	PZ-04O-17			GW		X		1		1											
44	PZ-04O-17-DUP			GW		X				1	1										
45	PZ-04O-21			GW		X				1	1										
46	PZ-07O-15			GW		X						1	2	1	1						
47	PZ-07O-17			GW		X				1						1					
48	PZ-07O-20			GW		X				1						1					

Containers Prepared/ Relinquished:	Date/Time: 5-10-13 11:10	Received:	Date/Time: 5/20/13 0900
Relinquished:	Date/Time: 5/21/13 1545	Received:	Date/Time: 5/21/13 1545
Relinquished:	Date/Time:	Received:	Date/Time:
Relinquished:	Date/Time:	Received:	Date/Time:
Relinquished:	Date/Time:	Received:	Date/Time:

Seal intact?	Y N N/A
Samples intact upon arrival?	Y N N/A
Received on ice? Temp_____	Y N N/A
Proper preservatives indicated?	Y N N/A
Rec'd within holding time?	Y N N/A
Volatiles rec'd w/out headspace?	Y N N/A
Proper containers used?	Y N N/A

Chain of Custody.xls
Rev.Date 11/18/01

Chain of Custody

SOUTHERN ANALYTICAL LABORATORIES, INC.

110 BAYVIEW BOULEVARD, OLDSMAR, FL 34677 813-855-1844 fax 813-855-2218

SAL Project No. 1304718

Client Name: Hazen and Sawyer

Contact / Phone:

Project Name / Location: C-HS3 SE#4

Samplers: (Signature)

Matrix Codes: DW-Drinking Water WW-Wastewater SW-SurfaceWater SL-Sludge SO-Soil GW-Groundwater SA-Saline Water O-Other R-Reagent Water

PARAMETER / CONTAINER DESCRIPTION

SAL Use Only Sample No.	Sample Description	Date	Time	Matrix	Composite	Grab	500mLP, Cool Total Alkalinity, TSS, TS, CBOD, NOx, Cl	125mLP, H_2SO_4 TKN, NH_3, COD	125mLP, H_2SO_4 TKN, NH_3, TP	500mLP, Cool Total Alkalinity, NOx, Cl	125mLP, H_2SO_4 COD, TKN, NH_3, TP	500mLP, Cool Total Alkalinity, NOx, Cl, F, OP, SO_4	40mLaV, HCl TOC	250mLaG, Cool DOC	250mLP, HNO_3 B, Ca, Fe, Mg, Mn, K, Na	250mLP, H_2SO_4 TKN, NH_3	pH	Temperature	Conductivity	DO	No. of Containers (Total per each location)
37	PZ-06N-17			GW		X				1						1					
38	PZ-06N-21			GW		X				1						1					
39	PZ-03O-15	5/22/13	1118	GW		X				1						1	6.57	25	91.9	5.66	
40	PZ-03O-17		1132	GW		X				1						1	6.34	25.2	63	3.54	
41	PZ-03O-21		1146	GW		X				1						1	5.06	26.2	256	1.57	
42	PZ-04O-15		1112	GW		X					1	1	2	1	1		6.35	25.1	98.3	4.46	
43	PZ-04O-17		1130	GW		X		1		1							6.42	25.3	81	1.21	
44	PZ-04O-17-DUP		1135	GW		X				1	1						6.42	25.3	81	1.21	
45	PZ-04O-21		1147	GW		X				1	1						5.77	26.4	276	1.76	
46	PZ-07O-15		0839	GW		X						1	2	1	1		6.35	25.6	298	4.25	
47	PZ-07O-17		0956	GW		X				1						1	6.38	25.5	1127	2.24	
48	PZ-07O-20		1014	GW		X				1						1	6.04	25.9	88.6	0.59	

Containers Prepared/ Relinquished:	Date/Time:	Received:	Date/Time:
J. Chambers	5-10-13 11:10		5/20/13 0900
Relinquished:	Date/Time: 5/22/13 1500	Received: K Mudmark	Date/Time: 5/22/13 1500
Relinquished:	Date/Time:	Received:	Date/Time:
Relinquished:	Date/Time:	Received:	Date/Time:
Relinquished:	Date/Time:	Received:	Date/Time:

Seal intact? Y N N/A

Samples intact upon arrival? Y N N/A

Received on ice? Temp_____ Y N N/A

Proper preservatives indicated? Y N N/A

Rec'd within holding time? Y N N/A

Volatiles rec'd w/out headspace? Y N N/A

Proper containers used? Y N N/A

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Chain of Custody

SOUTHERN ANALYTICAL LABORATORIES, INC.

110 BAYVIEW BOULEVARD, OLDSMAR, FL 34677 813-855-1844 fax 813-855-2218

SAL Project No. 1304718

Client Name: Hazen and Sawyer

Contact / Phone:

Project Name / Location: C-HS3 SE44

Samplers: (Signature)

Matrix Codes:
DW-Drinking Water WW-Wastewater
SW-SurfaceWater SL-Sludge SO-Soil
GW-Groundwater SA-Saline Water O-Other
R-Reagent Water

PARAMETER / CONTAINER DESCRIPTION

SAL Use Only Sample No.	Sample Description	Date	Time	Matrix	Composite	Grab	500mLP, Cool Total Alkalinity, TSS, TS, CBOD, NOx, Cl	125mLP, H_2SO_4 TKN, NH_3, COD	125mLP, H_2SO_4 TKN, NH_3, TP	500mLP, Cool Total Alkalinity, NOx, Cl	125mLP, H_2SO_4 COD, TKN, NH_3, TP	500mLP, Cool Total Alkalinity, NOx, Cl, F, OP, SO_4	40mLaV, HCl TOC	250mLaG, Cool DOC	250mLP, HNO_3 B, Ca, Fe, Mg, Mn, K, Na	250mLP, H_2SO_4 TKN, NH_3	pH	Temperature	Conductivity	DO	No. of Containers (Total per each location)
49	PZ-01Q-13	5/22/13	1203	GW		X				1	1						6.51	25.7	75.8	4.67	
50	PZ-01Q-15		1230	GW		X				1	1						4.49	26.0	77.7	3.05	
51	PZ-01Q-19		1217	GW		X				1						1	6.09	25.5	99.7	5.56	
52	PZ-04Q-13		1033	GW		X		1		1							6.50	26.4	95.1	4.37	
53	PZ-04Q-15		1100	GW		X				1	1		2	1			6.67	25.5	74.8	3.58	
54	PZ-04Q-19		1045	GW		X				1						1	6.16	25.8	94.3	3.70	
55	PZ-06Q-13		1027	GW		X				1	1						6.48	26.3	445	4.90	
56	PZ-06Q-15		1042	GW		X		1		1							6.06	25.4	599	3.42	
57	PZ-06Q-15-DUP		1047	GW		X		1		1							6.06	25.4	599	3.42	
58	PZ-06Q-19		1057	GW		X				1	1						6.20	25.4	84.8	0.30	
59	PZ-07Q-13		0936	GW		X					1	1	2	1	1		6.49	25.9	76.4	4.56	
60	PZ-07Q-15		0956	GW		X				1						1	6.31	25.5	75.3	1.87	

Containers Prepared/ Relinquished:	Date/Time: 1110 05-10-13	Received:	Date/Time: 5/20/13 0900
Relinquished:	Date/Time: 5/22/13 1500	Received: K Mdmard	Date/Time: 5/22/13 1500
Relinquished:	Date/Time:	Received:	Date/Time:
Relinquished:	Date/Time:	Received:	Date/Time:
Relinquished:	Date/Time:	Received:	Date/Time:

Seal intact?	Y N (N/A)
Samples intact upon arrival?	(Y) N N/A
Received on ice? Temp_____	(Y) N N/A
Proper preservatives indicated?	(Y) N N/A
Rec'd within holding time?	(Y) N N/A
Volatiles rec'd w/out headspace?	Y N (N/A)
Proper containers used?	(Y) N N/A

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Chain of Custody

SOUTHERN ANALYTICAL LABORATORIES, INC.

110 BAYVIEW BOULEVARD, OLDSMAR, FL 34677 813-855-1844 fax 813-855-2218

SAL Project No. 1304718

Client Name: Hazen and Sawyer

Contact / Phone:

Project Name / Location: C-HS3 SE#4

Samplers: (Signature)

Matrix Codes: DW-Drinking Water WW-Wastewater SW-SurfaceWater SL-Sludge SO-Soil GW-Groundwater SA-Saline Water O-Other R-Reagent Water

PARAMETER / CONTAINER DESCRIPTION

SAL Use Only Sample No.	Sample Description	Date	Time	Matrix	Composite	Grab	500mLP, Cool Total Alkalinity, TSS, TS, CBOD, NOx, Cl	125mLP, H_2SO_4 TKN, NH_3, COD	125mLP, H_2SO_4 TKN, NH_3, TP	500mLP, Cool Total Alkalinity, NOx, Cl	125mLP, H_2SO_4 COD, TKN, NH_3, TP	500mLP, Cool Total Alkalinity, NOx, Cl, F, OP, SO_4	40mLaV, HCl TOC	250mLaG, Cool DOC	250mLP, HNO_3 B, Ca, Fe, Mg, Mn, K, Na	250mLP, H_2SO_4 TKN, NH_3	pH	Temperature	Conductivity	DO	No. of Containers (Total per each location)
61	PZ-07Q-19	5/22/13	1010	GW		X				1						1	5.59	25.6	148	3.54	
62	PZ-04U-12			GW		X				1	1										
63	PZ-04U-14			GW		X				1						1					
64	PZ-04U-14-DUP			GW		X				1						1					
65	PZ-04U-18			GW		X				1						1					
66	PZ-06U-12			GW		X			1	1			2	1							
67	PZ-06U-14			GW		X			1			1	2	1	1						
68	PZ-06U-14-DUP			GW		X			1			1	2	1	1						
69	PZ-06U-34			GW		X				1						1					
70	PZ01-BKG			GW		X				1	1										
71	PZ-02BKG	5/22/13	1248	GW		X				1	1						4.72	29.1	195.1	5.37	
72	PZ-03BKG		1200	GW		X				1	1						6.72	26.1	37.9	4.58	

Relinquished:	Date/Time:	Received:	Date/Time:
Containers Prepared/ Relinquished: J. Chambers	5/20/13 11:00		5/20/13 0900
Relinquished:	5/22/13 1500	K Nordmeuk	5/22/13 1500
Relinquished:	Date/Time:	Received:	Date/Time:
Relinquished:	Date/Time:	Received:	Date/Time:
Relinquished:	Date/Time:	Received:	Date/Time:

Seal intact?	Y N (N/A)
Samples intact upon arrival?	(Y) N N/A
Received on ice? Temp_____	(Y) N N/A
Proper preservatives indicated?	(Y) N N/A
Rec'd within holding time?	(Y) N N/A
Volatiles rec'd w/out headspace?	Y N (N/A)
Proper containers used?	(Y) N N/A

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Chain of Custody

SOUTHERN ANALYTICAL LABORATORIES, INC.

110 BAYVIEW BOULEVARD, OLDSMAR, FL 34677 813-855-1844 fax 813-855-2218

SAL Project No. 1304718

Client Name: Hazen and Sawyer

Contact / Phone:

Project Name / Location: C-HS3 SE#4

Samplers: (Signature)

Matrix Codes: DW-Drinking Water WW-Wastewater SW-SurfaceWater SL-Sludge SO-Soil GW-Groundwater SA-Saline Water O-Other R-Reagent Water

PARAMETER / CONTAINER DESCRIPTION

SAL Use Only Sample No.	Sample Description	Date	Time	Matrix	Composite	Grab	500mLP, Cool Total Alkalinity, TSS, TS, CBOD, NOx, Cl, F, OP, SO_4	125mLP, $Na_2S_2O_3$ FC-MF	125mLP, H_2SO_4 TKN, NH_3, TP	500mLP, Cool Total Alkalinity, NOx, Cl	125mLP, H_2SO_4 COD, TKN, NH_3, TP	500mLP, Cool Total Alkalinity, NOx, Cl, F, OP, SO_4	40mLaV, HCl TOC	250mLaG, Cool DOC	250mLP, HNO_3 B, Ca, Fe, Mg, Mn, K, Na	250mLP, H_2SO_4 TKN, NH_3	pH	Temperature	Conductivity	DO	No. of Containers (Total per each location)
73	PZ-04BKG			GW		X				1	1										
74	PZ-04BKG-DUP			GW		X				1	1										
75	PZ-05BKG	5/22/13	1221	GW		X				1	1						5.85	26.1	55.8	0.15	
76	FB-DI			R		X	1	2			1		2	1	1						
77	FB-TAP			DW		X	1	2			1		2	1	1						
78	EB			R		X	1	2			1		2	1	1						

Containers Prepared/ Relinquished:	Date/Time:	Received:	Date/Time:
J. Champeau	5-10-13 10:00	[signature]	5/20/13 0900
Relinquished: [signature]	Date/Time: 5/22/13 01500	Received: K Mudmark	Date/Time: 5/22/13 1500
Relinquished:	Date/Time:	Received:	Date/Time:
Relinquished:	Date/Time:	Received:	Date/Time:
Relinquished:	Date/Time:	Received:	Date/Time:

Seal intact? Y N (N/A)

Samples intact upon arrival? (Y) N N/A

Received on ice? Temp_____ (Y) N N/A

Proper preservatives indicated? (Y) N N/A

Rec'd within holding time? (Y) N N/A

Volatiles rec'd w/out headspace? Y N (N/A)

Proper containers used? (Y) N N/A

Chain of Custody.xls
Rev.Date 11/19/01

Chain of Custody

Appendix C: Weather Station Data

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Table C.1
Daily Recorded Meteorological Data
Frostproof, FL

Period	60cm T avg (F)	60cm T min (F)	60cm T max (F)	2m T avg (F)	2m T min (F)	2m T max (F)	10m T avg (F)	10m T min (F)	10m T max (F)	Tsoil avg - 10cm (F)	Tsoil min (avg) - 10cm (F)	Tsoil max (avg) - 10cm (F)	2m DewPt avg (F)	RelHum avg 2m (%)	2m Rain tot (in)	2m Rain max over 15min (in)	10m Wind avg (mph)	10m Wind min (mph)	10m Wind max (mph)	W Dir avg 10m (deg)
1-Mar-13	55.6	48.81	61.65	54.97	49.59	59.05	55.26	51.22	58.5	69.37	68.58	71.04	42.41	64	0	0	7.01	0.53	18.17	310
2-Mar-13	51.5	36.92	61.84	50.87	40.1	58.62	51.64	45.36	57.25	67.68	66.67	68.52	36.64	60	0	0	8.32	0.4	29.7	319
3-Mar-13	46.1	35.31	57.96	45.44	36.33	54.77	45.73	37.41	53.56	65.74	64.35	66.83	33.16	64	0	0	8.8	1.53	24.87	318
4-Mar-13	49.2	31.06	70.21	49.16	33.79	65.68	50.79	37.94	66.18	64.98	62.91	67.19	30.21	55	0	0	4.83	0.17	16.1	43
5-Mar-13	60	37.77	81.1	59.84	40.44	77.85	60.67	46.58	76.01	66.09	63.52	69.04	46.09	65	0	0	6.9	0.47	18.13	216
6-Mar-13	59.6	46.22	71.49	58.71	46.8	69.13	58.5	48	67.17	68	67.08	69.4	42.32	61	0	0	10.68	1.7	27.93	284
7-Mar-13	53.6	41.2	72.28	52.64	41.42	67.84	53.6	42.02	67.73	66.88	64.89	68.9	37.09	57	0	0	6.01	0.07	17.33	358
8-Mar-13	58.1	37.18	79.32	57.34	39.56	75.9	58.32	42.65	75.15	67.05	64.83	69.39	40.43	62	0	0	5	0.07	13.33	3
9-Mar-13	61.5	46.38	76.98	60.98	48.63	74.16	61.42	50.94	72.57	67.87	65.95	69.93	48.24	66	0	0	6.63	0.13	17.5	49
10-Mar-13	65	51.21	80.74	64.32	52.75	78.26	64.18	54.14	76.64	69.09	67.14	71.49	53.63	71	0	0	7.49	1.5	21.83	78
11-Mar-13	67.1	53.37	80.06	66.94	55	77.97	67.04	56.57	76.87	69.71	68.05	71.29	56.86	72	0	0	7.16	1.43	20.67	139
12-Mar-13	65	53.82	72.41	64.8	53.8	70.79	64.85	54.21	70.47	70.09	69.46	70.63	61.21	88	0.25	0.08	8.92	0.73	23.37	222
13-Mar-13	61.2	49.39	77.74	60.7	50.36	74.84	61.02	51.19	73.67	68.3	66.83	69.46	41.84	57	0	0	8.12	1.4	22.03	338
14-Mar-13	56.1	43.87	71.71	55.48	45.63	68.67	55.91	47.19	67.59	67.18	65.53	68.7	35.4	53	0	0	7.66	0.37	21.8	3
15-Mar-13	56.3	41.37	74.91	56.03	43.15	70.59	57.75	45.32	70.32	66.91	64.9	69.15	38.44	58	0	0	5.55	0.3	44.57	21
16-Mar-13	60.1	40.46	81.36	60.22	42.63	77.38	63.09	50.52	76.93	67.66	65.01	70.57	44.84	64	0	0	4.59	0.07	15	233
17-Mar-13	62.8	44.78	77.94	62.75	47.07	75.27	64.82	52.79	74.64	68.45	66.36	70.54	52.88	73	0	0	4.32	0	18.73	143
18-Mar-13	68.9	59.65	79.34	68.62	61.16	78.15	68.64	62.46	77.29	69.73	68.54	70.93	62.62	82	0.02	0.01	6.85	0	28.9	186
19-Mar-13	71.2	61.14	89.37	70.42	62.37	85.05	70.75	62.91	84.63	70.94	69.26	73.2	62.29	79	0	0	3.8	0	14.67	187
20-Mar-13	66.9	58.71	76.48	66.55	59.31	74.98	66.59	59.95	74.03	71.36	70.65	72.16	61.56	85	0	0	6	0	25.33	274
21-Mar-13	60.3	45.81	75.49	59.61	49.05	71.87	60.05	50.34	70.75	70.38	68.79	71.94	40.68	57	0.01	0.01	6.66	0.7	25.23	328
22-Mar-13	60.5	39.63	80.22	60.3	42.03	76.59	60.9	45.68	75.16	69.41	67.23	71.49	51.89	77	0.36	0.17	6.54	0.87	18.2	65
23-Mar-13	73.5	62.56	87.78	73.01	62.71	86.4	72.66	62.71	84.92	71.35	69.75	73.4	66.77	83	0	0	6.82	0.2	26.87	188
24-Mar-13	74.2	69.04	85.03	74.21	69.48	84.06	73.95	69.6	82.62	72.62	71.73	73.56	69.76	87	0.04	0.03	10.16	0.6	30.73	222
25-Mar-13	64.5	50.36	75.67	63.77	50.7	74.89	63.52	51.62	71.46	71.94	70.81	73.02	45.01	58	0	0	9.21	1.67	28.37	302
26-Mar-13	53.4	43.48	63.14	52.42	43.83	60.62	52.25	44.67	58.64	69.42	68.07	70.72	31.54	47	0	0	11	2.13	28.13	324
27-Mar-13	51.6	35.35	67.98	50.56	37.62	64.24	50.87	39.59	63.43	68.01	66.04	69.93	32.5	54	0	0	6.48	0.27	16	344
28-Mar-13	56.2	37.95	75.99	55.5	40.59	71.29	56.6	43.59	71.65	68.11	65.8	70.59	34.9	54	0	0	5.04	0.17	24.2	25
29-Mar-13	60.3	43.14	77.63	60.02	46.71	73.78	61.45	50.36	73.49	68.83	66.58	71.37	39.65	54	0	0	5.49	0.33	18.87	50
30-Mar-13	64	44.91	80.73	63.43	46.18	77.88	64.55	50.59	77.04	69.81	67.33	72.54	48.61	63	0	0	5.49	0.33	15.67	175
31-Mar-13	70.2	55.26	83.66	69.35	56.66	81.1	69.31	58.71	80.19	71.47	69.33	73.9	53.83	60	0	0	6.17	0.1	27.43	199

Table C.1 (cont'd)
Daily Recorded Meteorological Data
Frostproof, FL

Period	60cm T avg (F)	60cm T min (F)	60cm T max (F)	2m T avg (F)	2m T min (F)	2m T max (F)	10m T avg (F)	10m T min (F)	10m T max (F)	Tsoil avg - 10cm (F)	Tsoil min (avg) - 10cm (F)	Tsoil max (avg) - 10cm (F)	2m DewPt avg (F)	RelHum avg 2m (%)	2m Rain tot (in)	2m Rain max over 15min (in)	10m Wind avg (mph)	10m Wind min (mph)	10m Wind max (mph)	W Dir avg 10m (deg)
1-Apr-13	72.4	61.52	87.28	71.77	62.31	84.76	71.49	63.21	82.4	72.82	71.02	74.88	61.8	73	0	0	7.08	0.2	22.9	242
2-Apr-13	72.4	60.22	88.07	71.11	60.66	84.16	70.87	61.32	83.77	73.89	71.98	76.14	59.6	72	0	0	4.66	0.07	23.03	7
3-Apr-13	73.4	61.54	87.28	72.85	62.89	85.03	72.48	63.28	83.55	74.59	72.82	76.5	63.64	76	0.39	0.29	6.88	0.1	18.33	126
4-Apr-13	68	65.23	70.27	67.92	65.19	70.23	67.94	65.34	70.09	73.61	72.59	75.42	66.34	95	1.29	0.1	8.25	0	25.73	187
5-Apr-13	67.9	60.73	77.85	67.4	60.46	76.39	67.35	60.6	75.07	72.39	71.55	73.44	62.06	84	0.11	0.04	8.04	1.07	28.03	279
6-Apr-13	66.6	54.61	80.65	65.58	54.73	77.99	65.19	55.26	76.5	72.12	70.18	74.14	55.83	73	0	0	9	1.57	34.23	37
7-Apr-13	69.7	58.19	83.43	68.92	58.82	80.62	68.64	59.72	78.8	72.99	71.02	75.24	59.19	74	0	0	6.61	0.83	18.8	69
8-Apr-13	71.9	59.02	85.23	71.24	60.04	81.99	70.98	61.27	80.56	74.23	71.92	76.89	59.25	69	0	0	5.69	0.33	21.8	99
9-Apr-13	71.2	59.95	85.23	70.86	61.23	82.72	70.7	62.06	80.85	74.87	72.88	77.02	62.35	76	0	0	6.82	0.7	20.33	100
10-Apr-13	74.5	59.04	89.67	73.86	60.93	86.77	73.51	61.7	85.51	75.42	72.95	78.04	64.58	75	0	0	6.62	0.77	18.43	107
11-Apr-13	77.4	69.31	88.88	76.95	69.62	86.92	76.33	69.58	85.32	77.14	75.47	79.07	69.81	80	0.02	0.02	9.87	2.7	24.33	156
12-Apr-13	77.5	71.73	86.07	77.5	72.55	85.39	77	72.37	84.13	77.27	76.41	78.15	71.14	82	0	0	9.2	0	27.1	198
13-Apr-13	77.6	68.14	90.46	76.75	68.97	86.77	76.51	69.13	85.37	77.68	76.19	79.39	67.74	76	0	0	3.97	0	17	355
14-Apr-13	77.1	67.39	91.78	76.56	68.04	89.87	76.02	68.13	88.57	78.27	76.86	80.01	68.63	78	0.01	0.01	7.77	0.6	31.7	140
15-Apr-13	76.3	62.91	93.7	75.65	63.73	90	75.36	65.25	88.18	78.18	76.33	80.06	65.92	74	0	0	5.5	0	14.37	137
16-Apr-13	77.1	67.24	90.79	76.5	67.55	88.36	75.91	67.71	85.82	79.1	77.22	81.23	68.12	77	0	0	8.17	0.83	21.9	59
17-Apr-13	75	64.98	87.39	74.4	66.02	84.94	73.95	66.22	83.12	79.24	77.32	81.21	64.43	74	0	0	7.44	1.47	20.3	62
18-Apr-13	77.4	65.37	91.81	76.56	66.27	87.67	76.1	66.63	86.47	79.56	77.38	81.79	66.72	74	0	0	6.18	0.17	16	115
19-Apr-13	78.5	69.98	93.09	77.92	70.57	90.12	77.38	70.5	87.82	80.27	78.64	81.9	69.29	77	0	0	8.09	1.3	24.43	172
20-Apr-13	71.5	62.44	82.04	70.59	62.04	78.89	70.22	62.11	77.16	79.54	78.48	80.55	65.34	84	0	0	7.54	0.33	17.03	32
21-Apr-13	70.8	60.57	85.51	69.85	60.13	82.22	69.54	60.21	81.41	77.65	76.05	79.18	65.62	87	0.44	0.32	5.79	0.27	16	34
22-Apr-13	71.3	66.36	82.29	70.59	66.24	78.71	70.32	66.16	77.72	77.74	76.96	78.67	67.13	89	0.07	0.02	6.28	0.13	23.6	15
23-Apr-13	72.4	62.65	84.81	71.55	62.89	82.26	70.91	63.34	80.04	77.48	75.81	79.39	62.69	76	0	0	9.24	2.07	21.57	44
24-Apr-13	73.3	59.92	90.32	72.12	60.26	86.27	71.76	60.76	85.51	77.92	75.51	80.6	60.95	72	0	0	5.94	0.43	16.47	79
25-Apr-13	74.4	59.32	90.41	73.88	60.62	86.34	74.44	65.59	85.19	78.55	76.3	80.76	60.53	67	0	0	4.41	0	14.23	107
26-Apr-13	74.5	59.38	89.71	73.96	60.8	87.19	74.83	65.71	84.92	78.99	76.57	81.52	62.41	70	0	0	5.58	0.07	19.63	82
27-Apr-13	74.1	62.6	85.37	73.54	64.89	83.5	73.01	66.24	81.48	79.37	77.59	81.21	65.65	78	0	0	6.91	0.3	21.4	67
28-Apr-13	74.4	60.96	88.2	73.94	62.92	85.24	73.28	63.95	83.12	79.66	77.11	82.36	61.15	68	0	0	7.88	0.63	20.7	120
29-Apr-13	74.2	60.89	89.53	73.66	62.46	86.72	73.18	63.63	84.92	79.83	77.68	81.95	64.11	75	0	0	6.33	0.03	31	151
30-Apr-13	74.9	66.43	93.13	74.14	67.69	89.04	73.71	68.72	88.39	80.36	78.39	82.67	66.76	81	0.07	0.03	5.59	0	24.6	125

Table C.1 (cont'd)
Daily Recorded Meteorological Data
Frostproof, FL

Period	60cm T avg (F)	60cm T min (F)	60cm T max (F)	2m T avg (F)	2m T min (F)	2m T max (F)	10m T avg (F)	10m T min (F)	10m T max (F)	Tsoil avg - 10cm (F)	Tsoil min (avg) - 10cm (F)	Tsoil max (avg) - 10cm (F)	2m DewPt avg (F)	RelHum avg 2m (%)	2m Rain tot (in)	2m Rain max over 15min (in)	10m Wind avg (mph)	10m Wind min (mph)	10m Wind max (mph)	W Dir avg 10m (deg)
1-May-13	69.7	65.84	78.78	69.74	65.89	77.99	69.36	65.62	76.87	78.61	76.89	80.83	68.26	95	1.07	0.21	4.95	0.73	21.13	81
2-May-13	70.2	63.99	75.99	69.95	64.08	74.84	69.47	63.82	74.07	76.71	75.6	77.85	67.76	93	0.44	0.08	6.14	0.83	19.17	117
3-May-13	72.4	62.33	86.7	71.66	63.37	83.97	71.3	64.42	82	77.25	75.67	78.91	66.87	86	0.01	0.01	5.5	0.13	25.4	317
4-May-13	74	66.79	85.75	73.38	67.03	83.82	72.49	66.63	81.61	77.9	76.71	79.39	66.18	80	0	0	7.47	0.87	24.1	269
5-May-13	69.3	56.1	81.05	68.71	58.24	78.17	68.31	60.28	76.39	77.76	76.44	79.23	53.86	64	0	0	8.32	1.23	22.9	305
6-May-13	68.3	52.14	81.57	67.74	54.19	79.29	67.56	58.82	77.2	77.38	75.67	79.47	55.65	68	0	0	7.28	0.73	28.57	260
7-May-13	66.8	50.61	83.25	66.4	52.38	80.53	67.21	57.15	78.26	76.94	74.86	79.03	55.46	71	0	0	6.22	0.2	19.8	263
8-May-13	70.4	56.34	84.92	69.54	57.96	82.26	69.6	58.78	80.28	77.3	75.4	79.38	58.73	72	0	0	5.79	0.17	16.33	255
9-May-13	73	54.1	90	72.59	57.06	86.11	73.16	61.38	86.4	78.12	75.47	81.05	58.34	66	0.02	0.02	4.16	0.13	16.33	17
10-May-13	78.3	64.9	94.42	77.61	66	91.17	77.07	66.61	89.8	79.49	77.25	82.06	66.84	73	0	0	6.26	0.37	36.17	157
11-May-13	77.5	67.26	90.39	77.05	67.73	88.02	76.74	68.11	86.36	80.32	78.51	81.93	69.02	78	0	0	6.35	0.5	24.1	240
12-May-13	77.8	65.95	90.77	77.36	68.14	88.68	76.8	69.91	86.79	80.62	78.96	82.65	70	80	0.01	0.01	6.59	0.57	21.73	253
13-May-13	73.4	62.46	87.19	72.97	64.44	83.61	72.75	65.61	81.95	80.01	78.48	81.84	60.88	70	0	0	6.27	0.83	16.37	330
14-May-13	71.8	56.73	84.88	71.13	59.11	82.22	70.78	60.24	80.76	79.52	77	82.17	54.29	59	0	0	6.48	0.2	19.2	55
15-May-13	72.4	54.05	86.31	71.89	56.48	82.94	72.32	62.49	81.52	79.6	76.96	82.04	58.28	65	0	0	5.77	0.13	18.77	81
16-May-13	75.7	65.23	87.49	74.83	66.65	84.78	74.13	66.85	82.81	80.47	77.92	83.34	60.61	64	0	0	6.77	0.07	19.23	134
17-May-13	76.6	59.86	91.94	75.53	61.79	87.78	75.47	64.9	86.7	81.25	78.53	83.98	63.01	68	0	0	4.93	0.07	21.97	103
18-May-13	79.7	65.34	95.56	78.59	66.52	91.35	77.98	66.94	90.41	82.25	79.5	85.15	66.82	71	0	0	5.58	0.13	19.57	111
19-May-13	79.1	69.85	95.67	78.27	70.45	91.62	77.4	70.14	89.33	83.15	81.05	85.3	69.31	76	0	0	6.6	0.5	21.97	156
20-May-13	76.8	65.89	92.55	76.17	66.29	89.38	75.56	66.24	87.42	82.19	78.4	85.71	67.75	77	1.08	0.81	5.76	0	38.4	111
21-May-13	74	66.04	85.73	73.3	66.78	82.04	72.86	66.83	80.98	79.81	78.08	81.57	69.01	87	0.01	0.01	5.41	0.2	31.17	102
22-May-13	74.6	66.18	87.93	73.88	67.15	84.31	73.7	67.3	83.34	80.18	78.4	81.82	69.62	87	0.57	0.47	4.01	0	18.93	91
23-May-13	79.3	67.23	94.62	78.46	68.11	90.97	78.25	68.27	89.82	80.82	78.39	83.61	69.87	78	0	0	4.17	0	14.07	335
24-May-13	81.1	68.27	96.42	80.5	69.55	93.56	80.06	70.18	91.9	81.93	79.54	84.56	66.53	68	0	0	5.5	0.23	17.47	337
25-May-13	78	66.9	89.11	77.53	67.86	86.7	76.78	67.89	84.51	82.53	80.42	84.97	65.1	68	0	0	8.06	0.13	19.97	69
26-May-13	74	58.87	87.37	73.36	61.29	84.81	73.07	63.48	83.17	82.07	79.56	84.51	60.1	66	0	0	5.86	0.2	18.37	70
27-May-13	75.4	61.95	88.05	74.94	63.59	86.02	74.38	64.44	83.91	82.16	79.74	84.65	63.36	70	0	0	7.12	0.83	29.37	79
28-May-13	75.1	66.47	87.17	74.97	68.11	85.28	74.46	68.54	83.52	81.86	80.64	82.98	69.63	84	0.29	0.23	7.94	0.87	43.5	94
29-May-13	73.4	69.78	80.91	73.22	70.14	79.11	72.7	69.91	77.97	80.71	79.75	81.86	70.94	93	0.47	0.21	6.63	1.2	29.4	83
30-May-13	75.8	70.48	82.47	75.79	70.74	81.86	75.2	70.56	80.94	80.41	79.09	81.97	70.32	84	0.05	0.02	9.46	0.93	37.87	93
31-May-13	76.9	70.59	85.01	76.74	71.08	83.14	76.14	70.9	81.45	80.32	78.73	81.9	70.31	81	0.07	0.04	8.66	1.93	23.27	93

Appendix D: Field Parameter Analyses

Table D.1
Field Parameter Results
May 20 through May 22, 2013

Sample Identification	Temperature (°C)	pH	Specific Conductance (µS)	Dissolved Oxygen (mg/L)
STE Sample				
STE	23.4	7.09	1346	0.09
STE DUP	23.4	7.09	1346	0.09
Groundwater Samples				
PZ-03A-15	25.8	6.90	38.5	7.14
PZ-03A-17	26.2	6.43	87.4	6.33
PZ-03A-17-DUP	26.2	6.43	87.4	6.33
PZ-03A-21	26.5	5.86	240	4.20
PZ-03A-34	26.6	7.47	181.6	1.38
PZ-03I-15	27.6	5.79	44.3	5.20
PZ-03I-17	27.3	5.66	48.6	6.15
PZ-03I-21	27.4	4.89	172.7	3.78
PZ-03K-15	26.3	6.75	130.6	5.41
PZ-03K-17	26.7	6.18	45.8	5.98
PZ-03K-21	26.2	5.86	178.7	3.03
PZ-02L-15	26.2	6.30	62.3	5.47
PZ-02L-17	26.0	6.86	75.1	5.44
PZ-02L-21	26.2	5.14	194.5	2.72
PZ-04L-15	26.4	6.63	247	5.56
PZ-04L-17	26.2	6.00	49.6	6.13
PZ-04L-21	26.4	5.97	205.3	2.69
PZ-07L-15	57.6	6.12	54.1	2.89
PZ-07L-17	26.5	6.40	49.6	5.69
PZ-07L-21	26.9	5.12	121.9	2.37
PZ-03ML-15	26.2	6.77	286	5.38

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Table D.1
Field Parameter Results
May 20 through May 22, 2013

Sample Identification	Temperature (°C)	pH	Specific Conductance (µS)	Dissolved Oxygen (mg/L)
PZ-03ML-17	26.5	6.46	51.4	5.88
PZ-03ML-21	26.8	6.03	207.1	1.92
PZ-00N-15	25.4	6.55	74.9	5.10
PZ-00N-17	25.4	6.28	57.5	4.62
PZ-00N-21	25.5	4.81	207.9	2.42
PZ-02N-15	25.7	6.64	56.4	6.06
PZ-02N-17	25.6	6.29	52.2	5.04
PZ-02N-21	25.7	4.93	184.3	2.02
PZ-02N-21-DUP	25.7	4.93	184.3	2.02
PZ-04N-15	26.1	5.99	249	5.03
PZ-04N-17	26.5	6.50	69.9	3.19
PZ-04N-21	27.0	5.66	157.8	2.89
PZ-06N-15	27.0	5.91	521	4.35
PZ-06N-17	27.2	5.85	169.1	5.21
PZ-06N-21	26.8	4.76	94.8	4.04
PZ-03O-15	25.0	6.57	91.9	5.66
PZ-03O-17	25.2	6.34	63	3.54
PZ-03O-21	26.2	5.06	256	1.87
PZ-04O-15	25.1	6.35	25.1	4.46
PZ-04O-17	25.3	6.42	81	1.21
PZ-04O-17-DUP	25.3	6.42	81	1.21
PZ-04O-21	26.4	5.74	276	1.76
PZ-07O-15	25.6	6.35	298	4.25
PZ-07O-17	25.5	6.38	112.7	2.24
PZ-07O-20	25.9	6.04	88.6	0.59
PZ-01Q-13	25.7	6.51	75.8	4.67
PZ-01Q-15	26.0	4.99	77.7	3.05
PZ-01Q-19	25.5	6.09	49.7	5.55
PZ-04Q-13	26.4	6.50	95.1	4.37
PZ-04Q-15	25.5	6.67	74.8	3.58
PZ-04Q-19	25.8	6.16	94.3	3.40

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Table D.1
Field Parameter Results
May 20 through May 22, 2013

Sample Identification	Temperature (°C)	pH	Specific Conductance (µS)	Dissolved Oxygen (mg/L)
PZ-06Q-13	26.3	6.48	445	4.90
PZ-06Q-15	25.4	6.06	599	3.47
PZ-06Q-15-DUP	25.4	6.06	599	3.47
PZ-06Q-19	25.4	6.20	84.8	0.30
PZ-07Q-13	25.9	6.49	262	4.56
PZ-07Q-15	25.5	6.31	75.3	1.84
PZ-07Q-19	25.6	5.57	148	3.54
PZ-04U-12	26.1	6.61	97.5	5.86
PZ-04U-14	26.2	6.25	114.6	4.82
PZ-04U-14-DUP	26.2	6.25	114.6	4.82
PZ-04U-18	26.8	6.06	66.8	5.29
PZ-06U-12	26.7	6.28	202.7	5.14
PZ-06U-14	26.7	5.89	471	2.46
PZ-06U-14-DUP	26.7	5.89	471	2.46
PZ-06U-34	27.2	5.92	116.4	0.85
PZ-02BKG	29.1	4.72	195.1	5.37
PZ-03BKG	26.1	6.32	137.9	4.58
PZ-05BKG	26.7	5.85	55.9	0.15
FB-DI	28.0	7.34	1.7	7.88
FB-TAP	25.7	6.50	328	3.05
EB	28.0	7.34	1.7	7.88

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