FLORIDA DEPARTMENT OF HEALTH

Florida Onsite Sewage Nitrogen Reduction Strategies Study

Task C.21

GCREC Mound Monitoring Sample Event Report No. 2

Progress Report

April 2011

4423-001

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In association with

SCHOOL OF MINES 1874 COLORADO

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Florida Onsite Sewage Nitrogen Reduction Strategies Study

TASK C.21
PROGRESS REPORT

GCREC Mound Monitoring Sample Event Report No. 2

Prepared for:

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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 existing mound system at the Gulf Coast Research and Education Center (GCREC) is being monitored to serve as a bridge between the controlled GCREC pilot-scale testing conducted within the same type of soils and the uncontrolled monitoring at home sites in different soils throughout the state. The Task C.5 QAPP documents the objectives, monitoring framework, sample frequency and duration, and analytical methods to be used at the GCREC existing mound system site. The Task C.20 Instrumentation of GCREC Mound System and Plume Progress Reports No. 1 and 2 document the test area design, number and location of monitoring points, and preliminary sample collection and analyses.

2.0 Purpose

This sample event report documents data collected from the second GCREC mound monitoring and sampling event conducted March 29, 2011 through April 1, 2011 and April 4, 2011. This monitoring event consisted of measurement of flowrates dosed to the system, 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 GCREC mound is located at the University of Florida Gulf Coast Research and Education Center (GCREC) in southeast Hillsborough County, Florida. The facility is situated on 475 acres of land that were donated by Hillsborough County government. At the GCREC, wastewater from the research offices and onsite dormitories flow to an existing OSTDS. Lab waste from Facility laboratories is not directed to the OSTDS. This

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existing OSTDS consists of a pressure dosed mound system designed for 2,850 gallons per day. Two septic tanks (2,500 and 1,250 gallons) provide primary treatment followed by a dosing tank (3,000 gallons). The mound drainfield has 4,351 ft^2 of infiltrative area (design hydraulic loading rate of 0.65 gpd/ft^2) with each half of the drainfield receiving alternating doses. As part of this project, two flow meters were installed to monitor the actual daily flow to the drainfield.

3.2 Monitoring and Sampling Locations and Identification

A schematic of the GCREC mound monitoring network is shown in Figure 1. A 25-ft by 25-ft sampling grid was staked down gradient of the mound then locations surveyed (x, y, and z). Transect lines AA through R are parallel to the southern edge of the mound and increase (higher letter identification) moving southward from the mound. Transect lines 1 through 15 (from east to west) are perpendicular to the southern edge of the mound. Two types of monitoring points were installed: drive point samplers and standpipe piezometers (refer to the Task C QAPP and Task C.20 Progress Reports #1 and #2 for additional detail). Each groundwater monitoring location has been assigned a unique identification indicating the type of monitoring point (DP = drive point, PZ = standpipe piezometer), grid location (self explanatory), and depth below ground surface (bottom of the drive point or well screen in feet). For example DP-AA9-14 is a drive point sampler located on the grid at AA9 (see Figure 1) at approximately 14 ft below ground surface. Approximately 145 subsurface monitoring locations have been installed at the site to date.

A total of 146 specific monitoring locations were sampled during this GCREC mound sampling event. For reference, a complete listing of the GCREC mound sample locations is presented in Appendix A.

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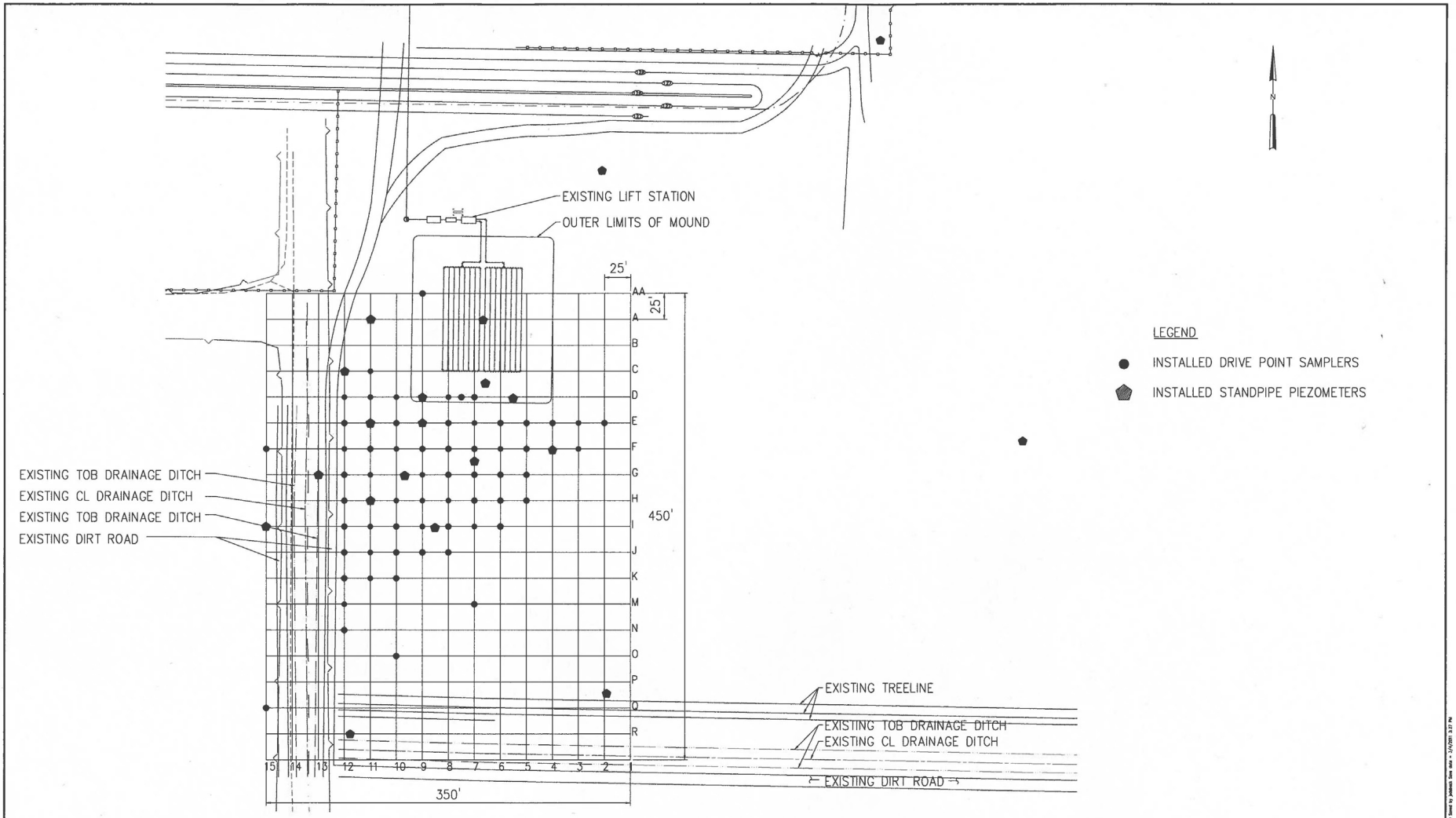

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FLORIDA DEPARTMENT OF HEALTH
FLORIDA ONSITE SEWAGE NITROGEN REDUCTION STRATIGIES STUDY

FIGURE 1
MONITORING PLAN

THE SCALE BAR SHOWN BELOW MEASURES ONE INCH LONG ON THE ORIGINAL DRAWING.

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3.3 Operational Monitoring and Site Conditions

Wastewater flow to the mound system is measured via two (2") flow meters located on the dose lines to the mound which were installed in December, 2009. The PNRS II test facility programmable logic controller (PLC) records flow data from these meters. The meters are also manually read on a regular basis. A weather station is located at the GCREC with weather conditions recorded every minute and stored on a private website.

3.4 Groundwater Level Monitoring

Groundwater levels were measured using a flat tape water level meter graduated in feet (measurement accuracy is 0.01 ft). The groundwater level within all 24 standpipe piezometers was measured on March 31, 2011 for this sampling event. Due to the rainfall event in the afternoon of March 31, 2011, the groundwater levels in the standpipe piezometers were measured again on April 1, 2011.

3.5 Water Quality Sample Collection and Analyses

Groundwater and effluent water quality samples for the GCREC mound Sample Event No. 2 were collected on March 29, 2011 through April 1, 2011 and April 4, 2011. A sample was collected from the existing lift station (see Figure 1) which supplies STE to the GCREC mound. STE from the lift station tank was collected directly into the analysis-specific containers supplied by the analytical laboratory using a peristaltic pump.

Groundwater samples were collected using a peristaltic pump attached to either the drivepoint or standpipe piezometer dedicated tubing and directing the sample into the analysis-specific containers after purging (the sample was clear and pH and conductivity readings had stabilized) had occurred. The analysis-specific containers were supplied by the analytical laboratory and contained the 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.

Equipment blank, field blank, and field sample duplicates were taken. The equipment blank was collected by pumping deionized water provided by the laboratory through the cleaned pump tubing. These samples were then analyzed for the same parameters as the GW samples. One field blank was collected by filling sample containers with

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deionized water that had been transported from the laboratory into the field along with other sample containers. A second field blank was collected by filling sample containers with the tap water used for rinsing. The field sample duplicates were collected immediately subsequent to the regular samples. The field duplicate samples taken were:

- PZ 04-BKG-9
- PZ 24-BKG-26
- DP-AA09-27
- DP-D07-5
- DP-E03-10
- DP-E12-15
- DP-F09-5
- DP-F11-11
- DP-F15-20
- DP-G12-18
- DP-H12-5
- DP-K12-5
- DP-O10-24
- STE- Pump Tank

Field parameters were measured using portable electronic probes with probe tips placed in a flow-cell device as groundwater was being pumped. Field parameters include pH, specific conductance, temperature (Temp), and dissolved oxygen (DO). The STE and groundwater samples were analyzed by the laboratory for: total alkalinity, total Kjeldahl nitrogen (TKN-N), ammonia nitrogen (NH_3-N), and nitrate/nitrite nitrogen (NO_X-N). Additionally, at some of the locations chemical oxygen demand (COD), total phosphorus (TP), dissolved organic carbon (DOC), total organic carbon (TOC), cations and anions were included. Table 1 lists the analytical parameters, analytical methods, and detection limits for these analyses. Once analytical results are obtained from the laboratory, GCREC Mound Data Summary Report No. 2 (Task C22) will be prepared describing the results from this sampling event.

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

Analytical Parameter	Method of Analysis	Laboratory Detection Limit (mg/L)
Total Alkalinity as $CaCO_3$	SM 2320B	2 mg/L
Chemical Oxygen Demand (COD)	EPA 410.4	10 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
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

4.0 Results

Once analytical results are obtained from the laboratory, GCREC Mound Data Summary Report No. 2 (Task C22) will be prepared describing the results from this sampling event.

4.1 Operational Monitoring and Site Conditions

Appendix C provides summary tables since the last sampling event of the recorded wastewater flow data for the GCREC mound pumps, between December 11, 2010 and April 4, 2011.

Monthly recorded meteorological data is given in Appendix D. Table 2 provides the recorded meteorological data daily averages leading up to and during the sample event dates of March 29, 2011 through April 1, 2011 and April 4, 2011. Prior to the period in

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Table 2, February and March had little rainfall, 2.06 inches total, with the only significant rainfall event of 1.46 inches occurring on March 10, 2011. A large rainfall event occurred on March, 28, 2011, which was the day before sampling commenced. A strong storm system moved through the area on March 31, 2011 with heavy rain and strong winds.

Table 2
Meteorological Data Daily Averages Measured March 26, 2011 – April, 4, 2011

Date	Temp Avg 60 cm (°F)	Temp Soil Avg -10 cm (°F)	Dew-point Avg 2m (°F)	Relative Humidity Avg 2m (%)	Rain Total 2m (in)	Wind Speed Avg 10m (mph)	Wind Speed Max 10m (mph)
03/26/11	69.49	71.53	59.89	76	0.00	4.77	18.97
03/27/11	73.02	71.73	62.09	74	0.00	7.26	24.07
03/28/11	67.36	71.14	64.41	91	1.82	9.42	28.10
03/29/11	70.74	70.23	64.36	83	0.00	5.99	15.47
03/30/11	73.54	71.81	67.05	83	0.51	11.20	29.67
03/31/11	67.68	69.88	64.39	90	2.95	11.14	44.13
04/01/11	67.29	69.33	55.71	71	0.01	6.36	17.83
04/02/11	67.08	69.22	54.35	69	0.00	4.77	14.57
04/03/11	70.09	69.75	58.16	71	0.00	7.87	21.63
04/04/11	75.19	71.37	65.41	76	0.02	9.41	22.20

4.2 Groundwater Levels

The piezometer designations listed in Table 3 correspond to the locations at which groundwater levels are measured. Figures 2 and 3 show the surficial groundwater contours on those two days.

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Table 3
Standpipe Piezometer Groundwater Level
Measured on March 31, 2011 and April 1, 2011

Fig 2 & 3 Identification	Location	Identification	Water Table Elevation (ft) March 31, 2011	Water Table Elevation (ft) April 1, 2011
1	Bkgd, North	PZ01-BKG-9	123.24	124.62
2	PQ1.75	PZ02-P02-9	119.78	120.37
3	H11	PZ03-H11-6	120.60	121.24
4	Bkgd, North	PZ04-BKG-9	122.08	123.68
5	Bkgd, East	PZ05-BKG-9	121.87	123.32
6	Bkgd, NW	PZ06-BKG-12	123.50	125.33
7	D5.5	PZ07-D05-7	121.10	122.63
8	FG7	PZ08-FG7-6	120.81	121.98
9	I8.5	PZ09-I08-5	120.53	121.39
10	CD6.5	PZ10-CD6-13	121.21	122.92
11	E9	PZ11-E09-10	120.85	121.91
12	F4	PZ13-F04-8	121.12	122.45
13	G13	PZ14-G13-7	119.99	120.28
14	A11	PZ15-A11-6	120.82	121.96
15	C12	PZ16-C12-28	120.53	121.36
16	I15	PZ17-I15-26	119.82	120.10
17	R12	PZ18-R12-26	119.82	119.99
18	G9.75	PZ19-G10-26	120.48	121.35
19	G9.75	PZ20-G10-15	120.49	121.37
20	E11	PZ21-E11-26	120.48	121.27
21	E11	PZ22-E11-15	120.47	121.28
22	D9	PZ23-D09-27	120.77	121.90
23	Bkgd, North	PZ24-BKG-26	121.81	123.35
24	AA9	PZ25-AA9-13	121.35	123.08

Note: PZ12 abandoned

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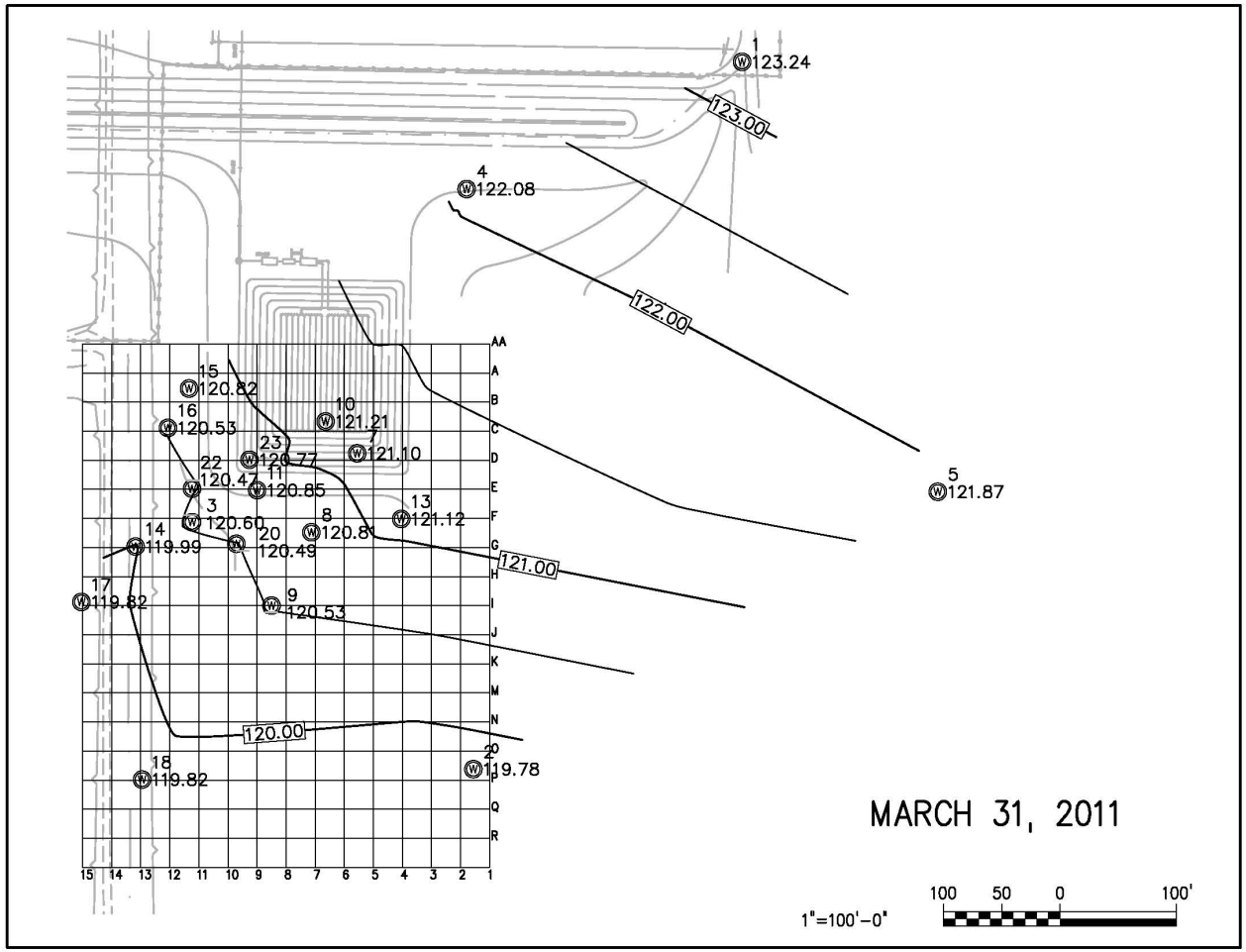

Figure 2
Surficial Groundwater Contours March 31, 2011

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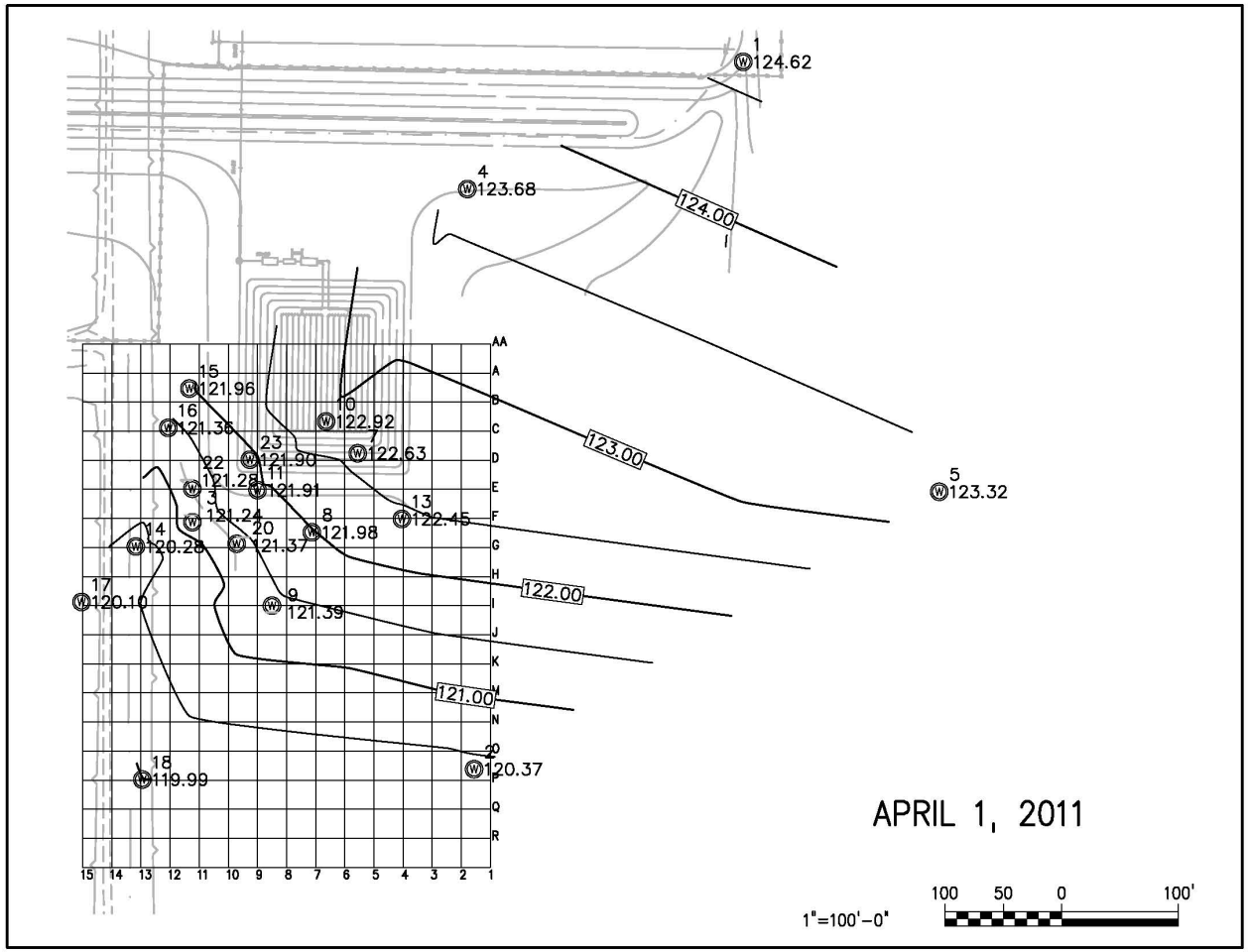

Figure 3
Surficial Groundwater Contours April 1, 2010

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4.3 Water Quality

Field parameters were measured prior to sample collection. Field parameter results are listed in Appendix E. Once analytical results are obtained from the laboratory, GCREC Mound Data Summary Report No. 2 (Task C22) will be prepared describing the results from this sampling event.

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Appendix A: GCREC Mound Sample Identification

Table A.1
GCREC Mound Sample Identification

	Grid Location	Sample Identification	Notes	Bottom Elevation (ft)
1	Lift Station	STE PumpTank	Wastewater Sample	N/A
2	Bkgd, North	PZ01-BKG-9	1 1/4" Standpipe Piezometer, 4' screen	120.33
3	Bkgd, North	PZ04-BKG-9	1 1/4" Standpipe Piezometer, 4' screen	118.66
4	Bkgd, North	PZ24-BKG-26	2" Standpipe Piezometer, 5' screen	101.41
5	Bkgd, East	PZ05-BKG-9	1 1/4" Standpipe Piezometer, 4' screen	117.39
6	Bkgd, NW	PZ06-BKG-12	1 1/4" Standpipe Piezometer, 4' screen	118.10
7	AA9	DP-AA9-14	SST Drive Point	110.68
8	AA9	DP-AA9-22	SST Drive Point	103.08
9	AA9	DP-AA9-27	SST Drive Point	98.28
10	A6.5	PZ25-A6.5-10	3/4" Standpipe Piezometer, 3.5' screen	119.62
11	A11	PZ15-A11-6	3/4" Standpipe Piezometer, 5' screen	118.84
12	CD6.5	PZ10-CD6-13	3/4" Standpipe Piezometer, 5' screen	116.03
13	C11	DP-C11-8	SST Drive Point	116.18
14	C12	PZ16-C12-28	3/4" Standpipe Piezometer, 1' screen	94.75
15	D5.5	PZ07-D05-7	1 1/4" Standpipe Piezometer, 4' screen	118.89
16	D7	DP-D07-5	SST Drive Point	120.82
17	D7	DP-D07-7	SST Drive Point	118.86
18	D7	DP-D07-9	SST Drive Point	116.79
19	D7.5	DP-D7.5-14	SST Drive Point	111.24
20	D7.5	DP-D7.5-20	SST Drive Point	105.31
21	D7.5	DP-D7.5-26	SST Drive Point	99.24
22	D8	DP-D08-9	SST Drive Point	116.31
23	D9	DP-D09-6	SST Drive Point	118.35
24	D9	DP-D09-8	SST Drive Point	116.45
25	D9	DP-D09-15	SST Drive Point, taped to PZ riser	109.45
26	D9	DP-D09-21	SST Drive Point, taped to PZ riser	103.45
27	D9	DP-D09-27	SST Drive Point, taped to PZ riser	97.45
28	D9	PZ23-D09-27	2" Standpipe Piezometer, 5' screen	97.41
29	D10	DP-D10-8	SST Drive Point	116.31

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Table A.1
GCREC Mound Sample Identification

	Grid Location	Sample Identification	Notes	Bottom Elevation (ft)
30	D11	DP-D11-11	SST Drive Point	113.29
31	D12	DP-D12-11	SST Drive Point	112.46
32	E2	DP-E02-6	SST Drive Point	119.55
33	E2	DP-E02-8	SST Drive Point	117.55
34	E3	DP-E03-10	SST Drive Point	115.26
35	E4	DP-E04-6	SST Drive Point	119.71
36	E4	DP-E04-8	SST Drive Point	117.71
37	E5	DP-E05-6	SST Drive Point	118.58
38	E6	DP-E06-6	SST Drive Point	118.86
39	E6	DP-E06-8	SST Drive Point	116.86
40	E7	DP-E07-10	SST Drive Point	114.74
41	E8	DP-E08-6	SST Drive Point	118.41
42	E8	DP-E08-8	SST Drive Point	116.41
43	E9	PZ11-E09-10	3/4" Standpipe Piezometer, 5' screen	114.56
44	E10	DP-E10-6	SST Drive Point	118.21
45	E11	DP-E11-12	SST Drive Point	111.98
46	E11	PZ21-E11-26	2" Standpipe Piezometer, 5' screen	111.98
47	E11	PZ22-E11-15	3/4" Standpipe Piezometer, 10' screen	111.98
48	E12	DP-E12-10	SST Drive Point	113.22
49	E12	DP-E12-15	SST Drive Point	107.75
50	E12	DP-E12-22	SST Drive Point	101.65
51	E12	DP-E12-28	SST Drive Point	95.80
52	F3	DP-F03-8	SST Drive Point	116.44
53	F4	PZ13-F04-8	3/4" Standpipe Piezometer, 5' screen	116.31
54	F4	DP-F04-17	SST Drive Point	108.06
55	F4	DP-F04-22	SST Drive Point	102.95
56	F4	DP-F04-32	SST Drive Point	92.85
57	F5	DP-F05-5	SST Drive Point	119.94
58	F5	DP-F05-31	SST Drive Point	93.89
59	F6	DP-F06-10	SST Drive Point	115.03
60	F7	DP-F07-6	SST Drive Point	118.25
61	FG7	PZ08-FG7-6	1 1/4" Standpipe Piezometer, 4' screen	118.25

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Table A.1
GCREC Mound Sample Identification

	Grid Location	Sample Identification	Notes	Bottom Elevation (ft)
62	F8	DP-F08-14	SST Drive Point	110.43
63	F8	DP-F08-20	SST Drive Point	103.96
64	F8	DP-F08-28	SST Drive Point	96.18
65	F9	DP-F09-5	SST Drive Point	118.98
66	F10	DP-F10-11	SST Drive Point	112.93
67	F11	DP-F11-11	SST Drive Point	112.68
68	F11	DP-F11-15	SST Drive Point	108.88
69	F11	DP-F11-18	SST Drive Point	105.73
70	F11	DP-F11-21	SST Drive Point	102.93
71	F11	DP-F11-24	SST Drive Point	99.88
72	F11	DP-F11-27	SST Drive Point	96.73
73	F12	DP-F12-10	SST Drive Point	112.77
74	F15	DP-F15-14	SST Drive Point	108.81
75	F15	DP-F15-20	SST Drive Point	102.84
76	F15	DP-F15-26	SST Drive Point	97.00
77	G5	DP-G05-6	SST Drive Point	118.51
78	G6	DP-G06-7	SST Drive Point	116.95
79	G7	DP-G07-13	SST Drive Point	111.63
80	G7	DP-G07-15	SST Drive Point	109.56
81	G7	DP-G07-17	SST Drive Point	106.76
82	G7	DP-G07-21	SST Drive Point	103.31
83	G7	DP-G07-24	SST Drive Point	100.51
84	G7	DP-G07-27	SST Drive Point	97.61
85	G8	DP-G08-5	SST Drive Point	119.54
86	G9	DP-G09-11	SST Drive Point	112.99
87	G9.75	PZ19-G10-26	2" Standpipe Piezometer, 5' screen	97.55
88	G9.75	PZ20-G10-15	3/4" Standpipe Piezometer, 10' screen	108.50
89	G11	DP-G11-8	SST Drive Point	115.27
90	G12	DP-G12-9	SST Drive Point	114.44
91	G12	DP-G12-15	SST Drive Point	108.37
92	G12	DP-G12-18	SST Drive Point	105.27
93	G12	DP-G12-21	SST Drive Point	102.32

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Table A.1
GCREC Mound Sample Identification

	Grid Location	Sample Identification	Notes	Bottom Elevation (ft)
94	G12	DP-G12-24	SST Drive Point	99.72
95	G12	DP-G12-27	SST Drive Point	96.37
96	G13	PZ14-G13-7	1 1/4" Standpipe Piezometer, 4' screen	115.11
97	H5	DP-H05-7	SST Drive Point	117.13
98	H6	DP-H06-7	SST Drive Point	117.33
99	H7	DP-H07-8	SST Drive Point	116.32
100	H8	DP-H08-10	SST Drive Point	113.84
101	H9	DP-H09-12	SST Drive Point	111.74
102	H10	DP-H10-11	SST Drive Point	112.68
103	H11	PZ03-H11-6	1 1/4" Standpipe Piezometer, 4' screen	121.47
104	H12	DP-H12-5	SST Drive Point	118.01
105	I6	DP-I06-14	SST Drive Point	110.24
106	I6	DP-I06-20	SST Drive Point	103.99
107	I6	DP-I06-26	SST Drive Point	97.94
108	I7	DP-I07-8	SST Drive Point	115.67
109	I8	DP-I08-5	SST Drive Point	118.56
110	I8.5	PZ09-I08-5	1 1/4" Standpipe Piezometer, 4' screen	118.93
111	I9	DP-I09-11	SST Drive Point	112.96
112	I10	DP-I10-6	SST Drive Point	117.72
113	I11	DP-I11-10	SST Drive Point	113.50
114	I12	DP-I12-6	SST Drive Point	117.54
115	I15	PZ17-I15-26	3/4" Standpipe Piezometer,1' screen	97.09
116	J8	DP-J08-6	SST Drive Point	118.02
117	J9	DP-J09-12	SST Drive Point	112.05
118	J9	DP-J09-14	SST Drive Point	109.61
119	J9	DP-J09-20	SST Drive Point	103.36
120	J9	DP-J09-26	SST Drive Point	97.11
121	J10	DP-J10-6	SST Drive Point	117.32
122	J11	DP-J11-12	SST Drive Point	111.99
123	J12	DP-J12-13	SST Drive Point	110.44
124	J12	DP-J12-15	SST Drive Point	108.26
125	J12	DP-J12-20	SST Drive Point	102.61

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Table A.1
GCREC Mound Sample Identification

	Grid Location	Sample Identification	Notes	Bottom Elevation (ft)
126	J12	DP-J12-27	SST Drive Point	96.36
127	K10	DP-K10-7	SST Drive Point	116.41
128	K11	DP-K11-13	SST Drive Point	110.43
129	K12	DP-K12-5	SST Drive Point	117.68
130	M7	DP-M07-15	SST Drive Point	108.98
131	M7	DP-M07-21	SST Drive Point	102.65
132	M7	DP-M07-27	SST Drive Point	96.95
133	M12	DP-M12-10	SST Drive Point	112.79
134	N12	DP-N12-14	SST Drive Point	108.40
135	N12	DP-N12-18	SST Drive Point	104.75
136	N12	DP-N12-21	SST Drive Point	101.73
137	N12	DP-N12-24	SST Drive Point	98.75
138	N12	DP-N12-27	SST Drive Point	95.63
139	O10	DP-O10-12	SST Drive Point	110.71
140	O10	DP-O10-18	SST Drive Point	104.56
141	O10	DP-O10-24	SST Drive Point	98.56
142	PQ1.75	PZ02-P02-9	1 1/4" Standpipe Piezometer, 4' screen	115.24
143	Q15	DP-Q15-15	SST Drive Point	108.20
144	Q15	DP-Q15-21	SST Drive Point	102.29
145	Q15	DP-Q15-26	SST Drive Point	96.40
146	R12	PZ18-R12-26	3/4" Standpipe Piezometer, 1' screen	96.56

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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. 1102588

Client Name: Hazan and Sawyer

Contact / Phone: Josephin Edeback-Hirst 813-630-4498

jedeback@hazanandsawyer.com

Project Name / Location: GCREC Mound Groundwater Analyses

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	250ml P, Cool Alkalinity	250 ml P, H_2SO_4 TKN, NH_3, NOx	40 ml aV, HCl TOC	250ml aG, Cool DOC	Field pH	Field DO	Field Cond	Field Temp	250ml P, HNO_3 B,Ca,Na,K,Mg,Mn,Fe No. of Containers (Total per each location)
01	PZ04-BKG-9	3/31/11	0844	GW		X	1**	1 *		1	5.4	3.84	78.2	21.7	1
02	PZ24-BKG-26	033111	~~0809~~ 0814	GW		X	1**	1 *	2	1					1
03	DP-AA9-14	3/30/11	0855	GW		X	1	1			5.0	0.99	699	23.0	
04	DP-AA9-22	3/30/11	0910	GW		X	1	1			5.3	0.77	286	23.8	
05	DP-AA9-27	3/30/11	0930	GW		X	1	1			5.2	0.82	288	23.9	
06	PZ15-A11-6	033011	1122	GW		X	1	1			5.2	2.52	100.0	24.8	
07	PZ10-CD6-13	033011	1400	GW		X	1	1			6.0	2.85	524	25.6	
08	DP-C11-8	033011	0830	GW		X	1	1			5.9	3.50	319	21.8	
09	PZ16-C12-28	033011	1148	GW		X	1	1			5.7	0.66	295.1	25.4	
10	PZ07-D05-7	033011	1347	GW		X	1	1			4.7	0.39	221.6	25.3	
11	DP-D07-7	3/30/11	1145	GW		X	1**	1 *	2	1	4.7	0.77	365	23.3	1
12	DP-D7.5-14	3/30/11	1110	GW		X	1	1			5.0	0.67	514	23.8	

Relinquished:	Date/Time:	Received:	Date/Time:
Containers Prepared/ Relinquished:	Date/Time: 1630 03-27-11	Received:	Date/Time: 0500 032911
Relinquished:	Date/Time: 1830 033011	Received:	Date/Time:
Relinquished:	Date/Time: 1430 3/31/11	Received:	Date/Time:
Relinquished:	Date/Time:	Received:	Date/Time:
Relinquished:	Date/Time:	Received:	Date/Time:

3-21

1,2

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

Instructions / Remarks

* COD, TP

** Cl, NO_x 300, OP, SO_4, F

1102588

SOUTHERN ANALYTICAL LABORATORIES, INC.

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

SAL Project No. 1102588

Client Name: Hazan and Sawyer

Contact / Phone: Josephin Edeback-Hirst 813-630-4498

jedeback@hazanandsawyer.com

Project Name / Location: GCREC Mound Groundwater Analyses

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	250ml P, Cool Alkalinity	250 ml P, H_2SO_4 TKN, NH_3, NOx	40 ml aV, HCl TOC	250ml aG, Cool DOC	Field pH	Field DO	Field Cond	Field Temp	250 ml P, HNO3 B, Ca, Fe, Mg, Mn, K, Fe No. of Containers (Total per each location)
13	DP-D7.5-20	3/30/11	1140	GW		X	1 **	1 *	2	1	5.3	1.26	296	25.0	1
14	DP-D7.5-26	3/30/11	1210	GW		X	1	1							
15	DP-D08-9	3/30/11	1025	GW		X	1 **	1 *		1	5.6	1.36	502	24.6	1
16	DP-D09-8	3/30/11	1005	GW		X	1	1			4.6	1.01	487	22.6	
17	DP-D09-15	3/30/11	1020	GW		X	1	1			5.4	1.16	470	23.3	
18	DP-D09-21	3/30/11	1035	GW		X	1	1			5.3	0.80	298	24.2	
19	DP-D09-27	3/30/11	1055	GW		X	1	1			6.0	0.76	309	24.5	
20	DP-D10-8	3/30/11	0940	GW		X	1	1			5.7	1.45	337	23.8	
21	DP-D11-11	033011	0800	GW		X	1	1			5.3	1.39	479	21.7	
22	DP-D12-11	032911	1345	GW		X	1	1			4.8	0.65	477	22.3	
23	DP-E02-8	032911	0845	GW		X	1	1			5.1	0.46	158.9	21.3	
24	DP-E03-10 (Has dupe was E02-6-D)	032911	0915	GW		X	1	1			5.3	2.21	211.3	21.3	

Relinquished	Date/Time	Received	Date/Time
Containers Prepared/ Relinquished:	Date/Time: 1638 03-27-11	Received:	Date/Time: 0800 032911
Relinquished: (22-24)	Date/Time: 1600 032911	Received:	Date/Time: 3/29/11 1600
Relinquished:	Date/Time: 1430 3/31/11	Received:	Date/Time:
Relinquished: shipped by J. Edeback via courier (24, 21-22 8, 3, 4, 5, 20)	Date/Time: 1545 4/1/11	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

Instructions / Remarks
* COD, TP

1102588

SOUTHERN ANALYTICAL LABORATORIES, INC.

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

SAL Project No. 1102597

Client Name: Hazan and Sawyer	Contact / Phone: Josephin Edeback-Hirst 813-630-4498
Project Name / Location: GCREC Mound Groundwater Analyses	jedeback@hazanandsawyer.com
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

SAL Use Only Sample No.	Sample Description	Date	Time	Matrix	Composite	Grab	250ml P, Cool Alkalinity	250 ml P, H_2SO_4 TKN, NH_3, NOx	40 ml aV, HCl TOC	250ml aG, Cool DOC	Field pH	Field DO	Field Cond	Field Temp	250 ml P, HNO3 B, Ca, Fe, K, Mg, Mn, Na No. of Containers (Total per each location)
01	DP-E04-6	032911	950	GW		X	1 **	1 *		1	4.7	3.49	90.6	22.3	1
02	DP-E05-6	032911	1090	GW		X	1	1			6.0	2.96	171.8	24.8	
03	DP-E06-8	032911	1155	GW		X	1	1			4.5	1.09	180.6	22.7	
04	DP-E07-10	032911	1125	GW		X	1	1			4.9	1.19	289.0	22.5	
05	DP-E08-8	032911	1230	GW		X	1	1			5.0	1.52	348	22.6	
06	PZ11-E09-10	033011	1255	GW		X	1	1			5.6	2.33	453.8	25.8	
07	DP-E10-6	032911	1240	GW		X	1	1			4.6	0.60	407	23.0	
08	PZ21-E11-26	033011	1104	GW		X	1	1			5.2	0.36	295.6	23.6	
09	PZ22-E11-15	033011	1030	GW		X	1	1			5.3	1.36	416.0	24.4	
10	DP-E12-10	032911	1330	GW		X	1 **	1 *	2	1	5.1	0.35	520	23.9	1
11	DP-E12-15	033011	0745	GW		X	1 **	1 *		1	5.0	0.60	460	21.9	1
12	DP-E12-22	033011	0820	GW		X	1 **	1 *	2	1	5.3	0.59	297	22.5	1

Containers Prepared/ Relinquished:	Date/Time: 1600 03-27-11	Received:	Date/Time: 0500 032911
Relinquished:	Date/Time: 1830 033011	Received:	Date/Time:
Relinquished:	Date/Time: ~~1430~~ ~~3/31/11~~ MW	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

Instructions / Remarks

* COD, TP

** Cl, F, SO_4, OP, NOx 300

1102597

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SOUTHERN ANALYTICAL LABORATORIES, INC.

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

SAL Project No. 1102597

Client Name: Hazan and Sawyer

Contact / Phone: Josephin Edeback-Hirst 813-630-4498

jedeback@hazanandsawyer.com

Project Name / Location: GCREC Mound Groundwater Analyses

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	250ml P, Cool Alkalinity	250 ml P, H_2SO_4 TKN, NH_3, NOx	40 ml aV, HCl TOC	250ml aG, Cool DOC	Field pH	Field DO	Field Cond	Field Temp	250 ml P, HNO3 B, Ca, Fe, K, Mg, Mn, Na No. of Containers (Total per each location)
13	DP-E12-28	033011	0845	GW		X	1 **	1 *		1	5.3	0.57	310	22.8	1
14	PZ13-F04-8	032911	0925	GW		X	1	1			5.6	2.40	125.5	21.4	2 1
15	DP-F04-17	032911	1025	GW		X	1	1			7.3	0.57	415.7	22.0	2 1
16	DP-F04-22	032911	1045	GW		X	1	1			6.0	0.72	314.1	22.8	2 1
17	DP-F05-5	3/30/11	1325	GW		X	1	1			5.8	7.36	173.3	27.7	
18	DP-F05-31	032911	1115	GW		X	1 **	1 *		1	7.3	1.70	187.1	24.1	4 1
19	DP-F06-10	032911	1140	GW		X	1	1			5.2	0.30	190.6	21.8	2 1
20	PZ08-FG7-6	033011	1006	GW		X	1	1			4.8	3.33	126.9	23.6	
21	DP-F08-14	032911	1215	GW		X	1	1			7.6	1.28	501	22.5	
22	DP-F08-20	032911	1230	GW		X	1 **	1 *		1	6.0	0.41	335.6	23.1	1
23	DP-F08-28	032911	1245	GW		X	1	1			6.3	0.37	323.9	23.4	
24	DP-F09-5	032911	1315	GW		X	1 **	1 *		1	6.6	1.15	191.1	24.8	1

Relinquished	Date/Time	Received	Date/Time
Containers Prepared/ Relinquished:	Date/Time: 1600 03-27-11	Received:	Date/Time: 0500 032911
Relinquished:	Date/Time: 1600 032911	Received:	Date/Time: 3/29/11 1600
Relinquished:	Date/Time: 1830 033011	Received:	Date/Time:
Relinquished:	Date/Time: ~~1480~~ 3/31/11	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

Instructions / Remarks
* COD, TP
** Cl, F, OP, NOX 300, SO4

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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. 1102612

Client Name: Hazan and Sawyer

Contact / Phone: Josephin Edeback-Hirst 813-630-4498

jedeback@hazanandsawyer.com

Project Name / Location: GCREC Mound Groundwater Analyses

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	250ml P, Cool Alkalinity	250 ml P, H_2SO_4 TKN, NH_3, NOx	40 ml aV, HCl TOC	250ml aG, Cool DOC	Field pH	Field DO	Field Cond	Field Temp	250 ml P, HNO3 Ca, Fe, Na, K, Mn, Mg, B No. of Containers (Total per each location)
01	DP-F10-11	033011	0745	GW		X	1	1			4.7	0.80	475.9	21.3	
02	DP-F11-11	033011	0800	GW		X	1	1			5.3	0.90	412.7	21.4	
03	DP-F11-15	033011	0820	GW		X	1	1			5.1	0.28	453.3	21.8	
04	DP-F11-18	033011	0840	GW		X	1	1			5.4	1.18	433.9	22.2	
05	DP-F11-21	033011	0900	GW		X	1	1			5.2	0.43	318.4	22.5	
06	DP-F11-24	033011	0930	GW		X	1	1			5.1	0.30	301.1	22.8	
07	DP-F11-27	033011	0950	GW		X	1	1			5.3	0.39	307.5	23.2	
JMH 08	DP-F12-10	3/31/11	0850	GW		X	1	1			5.0	0.90	427	24.5	
JMH 09	DP-F15-14	3/31/11	0922	GW		X	1	1			5.2	0.53	512	24.7	
JMH 10	DP-F15-20	3/31/11	0937	GW		X	1	1			5.4	0.78	383	22.3	
JMH 11	DP-F15-26	3/31/11	1000	GW		X	1	1			5.2	0.78	306	22.5	
12	DP-G05-6	3/30/11	1340	GW		X	1 **	1 *		1	6.1	2.49	151.9	24.2	1

Containers Prepared/ Relinquished:	Date/Time: 1700 03-27-11	Received:	Date/Time: 0500 032911
1-7, 12, 13-16, 19-22 Relinquished:	Date/Time: 1830 033011	Received:	Date/Time:
Relinquished:	Date/Time: 1430 3/31/11	Received:	Date/Time:
8-11, 16-18, 23-24 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

Instructions / Remarks

* COD, TP

** F, Cl, SO_4, OP, NOx 300

1102612

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

Chain of Custody

SOUTHERN ANALYTICAL LABORATORIES, INC.

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

SAL Project No. 1102612

Client Name: Hazan and Sawyer

Contact / Phone: Josephin Edeback-Hirst 813-630-4498

jedeback@hazanandsawyer.com

Project Name / Location: GCREC Mound Groundwater Analyses

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	250ml P, Cool Alkalinity	250 ml P, H_2SO_4 TKN, NH_3, NOx	40 ml aV, HCl TOC	250ml aG, Cool DOC	Field pH	Field DO	Field Cond	Field Temp	250 ml P, HNO_3 Ca, Fe, K, Na, Mn, Mg, B No. of Containers (Total per each location)
	13	DP-G07-13	3/30/11	1505	GW		X	1	1			5.8	2.19	232	25.2	
	14	DP-G07-15	3/30/11	1530	GW		X	1	1			5.2	1.20	272	23.4	
	15	DP-G07-17	3/30/11	1550	GW		X	1	1			5.3	1.52	317	23.7	
JMH	16	DP-G07-21	3/31/11	0755	GW		X	1	1			5.6	0.57	326	22.2	
JMH	17	DP-G07-24	3/31/11	0815	GW		X	1	1			5.7	0.94	271	22.3	
JMH	18	DP-G07-27	3/31/11	0835	GW		X	1	1			5.2	0.95	303	22.3	
	19	DP-G08-5	3/30/11	1515	GW		X	1	1			5.6	7.64	157.8	26.1	
	20	DP-G09-11	3/30/11	1545	GW		X	1**	1*		1	5.4	2.08	285	24.0	1
	21	PZ19-G10-26	033011	0945	GW		X	1	1			5.1	1.07	302.1	23.1	
	22	PZ20-G10-15	033011	0901	GW		X	1	1			5.6	1.97	356.1	22.2	
JMH	23	DP-G11-8	3/31/11	0805	GW		X	1	1			5.1	1.38	295	21.2	
JMH	24	DP-G12-9	3-31-11	0830	GW		X	1	1			4.7	2.62	341	21.4	

Relinquished:	Date/Time:	Received:	Date/Time:
Containers Prepared/ Relinquished:	Date/Time: 1700 03-27-11	Received:	Date/Time: 032911 0500
Relinquished:	Date/Time: 1830 033011	Received:	Date/Time:
Relinquished:	Date/Time: 1430 3/31/11	Received:	Date/Time:
Relinquished:	Date/Time:	Received:	Date/Time:
Relinquished:	Date/Time:	Received:	Date/Time:

1-7, 12-15, 19-22, 8-11, 16-18, 23, 24

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

Instructions / Remarks

*COD, TP

**Cl, F, SO_4, OP, NOx 300

1102612

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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. 1102625

Client Name: Hazan and Sawyer

Contact / Phone: Josephin Edeback-Hirst 813-630-4498

jedeback@hazanandsawyer.com

Project Name / Location: GCREC Mound Groundwater Analyses

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	250ml P, Cool Alkalinity	250 ml P, H_2SO_4 TKN, NH_3, NOx	40 ml aV, HCl TOC	250ml aG, Cool DOC	Field pH	Field DO	Field Cond	Field Temp	No. of Containers (Total per each location)
JMH	01	DP-G12-15	3/31/11	0845	GW		X	1	1			5.6	0.96	487	21.8	
JMH	02	DP-G12-18	3/31/11	855	GW		X	1	1			5.2	1.40	494	22.2	
JMH	03	DP-G12-21	3/31/11	915	GW		X	1	1			5.4	0.50	385	22.7	
JMH	04	DP-G12-24	3/31/11	9:30	GW		X	1	1			5.4	0.82	324	22.7	
JMH	05	DP-G12-27	3/31/11	950	GW		X	1	1			5.4	0.43	311	22.9	
	06	PZ14-G13-7	03/30/11	1505	GW		X	1	1			5.8	4.04	246.1	24.5	
												5.8 SA	4.04 SA	246.1 SA	24.5 SA	
	07	DP-H06-7	4/1/11	0755	GW		X	1	1			6.2	2.97	189	22.7	
JMH	08	DP-H~~06~~08-10	3/31/11	1100	GW		X	1	1			6.2	5.83	204.5	22.2	
JMH	09	DP-H~~06~~10-11	3/31/11	1010	GW		X	1	1			5.6	0.94	188.5	21.9	
JMH	10	DP-H12-5	3/31/11	~~1035~~ 900	GW		X	1	1			5.3	1.44	212.3	20.9	
	11	DP-I06-14	4/1/11	0758	GW		X	1	1			5.0	1.03	358	21.4	
	12	DP-I06-20	4/1/11	085	GW		X	1	1							

Relinquished:	Date/Time:	Received:	Date/Time:
Containers Prepared/ Relinquished:	1430 03-26-11		0500 032911
Relinquished:	1830 033011	Received:	Date/Time:
Relinquished:	1430 3/31/11	Received:	Date/Time:
Relinquished:	Date/Time:	Received:	Date/Time:
Relinquished:	Date/Time:	Received:	Date/Time:

6

1-5, 8-10, 15, 17

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

Instructions / Remarks

1102625

SOUTHERN ANALYTICAL LABORATORIES, INC.

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

SAL Project No. 1102625

Client Name: Hazan and Sawyer	Contact / Phone: Josephin Edeback-Hirst 813-630-4498
Project Name / Location: GCREC Mound Groundwater Analyses	jedeback@hazanandsawyer.com
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	250ml P, Cool Alkalinity	250 ml P, H_2SO_4 TKN, NH_3, NOx	40 ml aV, HCl TOC	250ml aG, Cool DOC	Field pH	Field DO	Field Cond	Field Temp	250 ml P, HNO3 B, Ca, Na, K, Fe, Mn, Mg No. of Containers (Total per each location)
13	DP-I06-26	4/1/11	0830	GW		X	1	1			4.9	1.13	305	21.6	
14	DP-I07-8	↓	0725	GW		X	1	1			5.8	2.23	170.7	19.4	
JMH 15	DP-I09-11	3/31/11	1035	GW		X	1	1			5.1	0.77	180.6	21.5	
16	DP-I11-10	4/1/11	0920	GW		X	1	1			5.7	0.90	166.8	21.4	
17	PZ17-I15-26	3/31/11	1035	GW		X	1	1			4.8	2.46	307.1	23.1	
18	DP-J08-6	4/1/11	0825	GW		X	1	1			6.0	2.70	140.3	19.7	
19	DP-J09-12		0850	GW		X	1	1			4.8	0.81	167.0	21.1	
20	DP-J09-14		0910	GW		X	1	1			4.8	0.73	226	21.4	
21	DP-J09-20		0930	GW		X	1	1			4.4	0.66	365	22.1	
22	DP-J09-26		0950	GW		X	1	1			5.0	0.73	297	22.5	
23	DP-J10-6		1105	GW		X	1	1			5.9	3.48	186.6	24.0	
24	DP-J11-12	↓	1140	GW		X	1**	1*		1	4.4	1.02	196.7	23.7	1

Containers Prepared/ Relinquished:	Date/Time: 1430 03-26-11	Received:	Date/Time: 0500 03-29-11
Relinquished:	Date/Time: 1430 3/31/11	Received:	Date/Time:
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

Instructions / Remarks

* COD, TP

** Cl, F, SO_4, OP, NOx 300

1102625

SOUTHERN ANALYTICAL LABORATORIES, INC.

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

SAL Project No. 1102630

Client Name: Hazan and Sawyer

Contact / Phone: Josephin Edeback-Hirst 813-630-4498

jedeback@hazanandsawyer.com

Project Name / Location: GCREC Mound Groundwater Analyses

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	250ml P, Cool Alkalinity	250 ml P, H_2SO_4 TKN, NH_3, NOx	40 ml aV, HCl TOC	250ml aG, Cool DOC	Field pH	Field DO	Field Cond	Field Temp	250 ml P, HNO_3 B, Fe, Ca, Mg, K, Mn, Na No. of Containers (Total per each location)
01	DP-J12-13	4/01/11	1150	GW		X	1	1			4.9	1.54	238	22.9	
02	DP-J12-15		1200	GW		X	1	1			5.1	1.13	281	23.3	
03	DP-J12-20		1250	GW		X	1**	1*		1	5.6	1.20	354	23.4	1
04	DP-J12-27		1311	GW		X	1	1			5.1	0.92	303	23.6	
05	DP-K10-7	04/01/11	1125	GW		X	1	1			6.0	3.79	163.8	24.2	
06	DP-K11-13		1030	GW		X	1	1			4.9	1.84	168.3	22.1	
07	DP-K12-5		1005	GW		X	1**	1*		1	5.6	1.40	59.3	22.3	1
08	DP-M07-15		1410	GW		X	1	1			5.2	0.71	267	23.0	
09	DP-M07-21		1415	GW		X	1	1			4.9	0.88	362	24.0	
10	DP-M07-27		1420	GW		X	1	1			5.2	1.08	293	23.8	
11	DP-M12-10		1210	GW		X	1	1			5.7	1.83	161.6	24.0	
12	DP-M12-14		1240	GW		X	1	1			4.8	0.91	178.6	22.9	

Relinquished:	Date/Time:	Received:	Date/Time:
Containers Prepared/ Relinquished:	Date/Time: 1530 03-22-11	Received:	Date/Time: 0500 032911
Relinquished:	Date/Time:	Received:	Date/Time:
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

Instructions / Remarks

* COD, TP

** Cl, F, SO_4, OP, NOx 300

1102630

SOUTHERN ANALYTICAL LABORATORIES, INC.

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

SAL Project No. 1102630

Client Name: Hazan and Sawyer	Contact / Phone: Josephin Edeback-Hirst 813-630-4498
Project Name / Location: GCREC Mound Groundwater Analyses	jedeback@hazanandsawyer.com
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	250ml P, Cool Alkalinity	250 ml P, H_2SO_4 TKN, NH_3, NOx	40 ml aV, HCl TOC	250ml aG, Cool DOC	Field pH	Field DO	Field Cond	Field Temp	No. of Containers (Total per each location)
	13	DP-N12-18	4/1/11	1300	GW		X	1	1			5.1	1.11	250	23.2	
	14	DP-N12-21	4/1/11	1320	GW		X	1	1			5.2	1.04	279	23.3	
~~SMH~~	15	DP-N12-24	~~3/31/11~~	~~1035~~ 1340	GW		X	1	1			5.2	0.78	348	24.1	
	16	DP-N12-27		1355	GW		X	1	1			5.1	0.68	342	23.9	
~~SH SMH~~	17	DP-O10-12	~~3/31/11~~	~~1035~~ 1330	GW		X	1	1			4.3	1.13	1859	22.9	
	18	DP-O10-18		1350	GW		X	1	1			5.3	1.04	294	23.5	
	19	DP-O10-24		1400	GW		X	1	1			5.1	0.95	361	24.2	
	20	DP-Q15-15	4/4/11	0915	GW		X	1	1			4.8	0.61	285	22.7	
	21	DP-Q15-21	4/4/11	0940	GW		X	1	1			5.2	0.73	319	23.5	
	22	DP-Q15-26	4/4/11	1010	GW		X	1	1			5.2	1.33	333	23.2	
SH	23	PZ18-R12-26	3/31/11	1103	GW		X	1	1			5.0	0.89	328.1	23.4	
	24	PZ02-P02-9	033011	1535	GW		X	1	1			4.7	5.63	73.6	24.4	

Containers Prepared/ Relinquished:	Date/Time: 1530 03-27-11	Received:	Date/Time: 0500 032911
Relinquished:	Date/Time: 1830 033011	Received:	Date/Time:
Relinquished:	Date/Time: 1430 3/31/11	Received:	Date/Time:
Relinquished: courier	Date/Time: 1315 4/4/11	Received:	Date/Time:
Relinquished:	Date/Time:	Received:	Date/Time:

24

23

20, 21, 22

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

Instructions / Remarks

1102630

SOUTHERN ANALYTICAL LABORATORIES, INC.

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

SAL Project No. 1102633

Client Name: Hazan and Sawyer

Contact / Phone: Josephin Edeback-Hirst 813-630-4498

jedeback@hazanandsawyer.com

Project Name / Location: GCREC Mound Groundwater Analyses

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	250ml P, Cool Alkalinity	250 ml P, H_2SO_4 TKN, NH_3, NOx	40 ml aV, HCl TOC	250ml aG, Cool DOC	Field pH	Field DO	Field Cond	Field Temp	No. of Containers (Total per each location)
01	PZ01-BKG-9	3/31/11	0930	GW		X	1	1			4.6	6.78	146.8	22.8	
02	PZ05-BKG-9	3/31/11	1014	GW		X	1	1			5.1	4.38	98.8	21.8	
03	PZ06-BKG-12	3/31/11	1003	GW		X	1	1			4.7	5.41	59.4	23.1	
04	DP-D07-5	3/30/11	1120	GW		X	1	1			6.0	4.86	326	24.1	
05	PZ23-D09-27	033011	1306	GW		X	1	1			5.4	0.18	306.2	24.4	
06	DP-E02-6	032911	0835	GW		X	1	1			5.5	2.41	985	21.3	2
07	DP-E11-12	032911	1300	GW		X	1	1			5.1	0.99	441	23.0	
08	PZ09-I08-5	033011	1438	GW		X	1	1			5.2	6.03	94.2	21.9	
09	DP-D07-9	3/30/11	1205	GW		X	1	1			4.5	0.97	392	24.0	
10	DP-D09-6	3/30/11	0950	GW		X	1	1			4.5	2.05	456	22.6	
11	DP-E04-8	032911	1015	GW		X	1	1			4.9	1.43	171.1	22.0	
12	DP-E06-6	032911	1100	GW		X	1	1			4.4	1.89	162.8	22.8	

	Date/Time	Received	Date/Time
Containers Prepared/ Relinquished:	Date/Time: 1515 03-27-11	Received:	Date/Time: 0500 032911
Relinquished:	Date/Time: 1600 032911	Received:	Date/Time: 3/29/11 1600
Relinquished:	Date/Time: 1830 033011	Received:	Date/Time:
Relinquished:	Date/Time: 1430 3/31/11	Received:	Date/Time:
Relinquished:	Date/Time:	Received:	Date/Time:

6, 7, 11, 12
13-15, 24
4, 5, 8-10,
16, 20
1-3, 19, 21

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

Instructions / Remarks

1102633

SOUTHERN ANALYTICAL LABORATORIES, INC.

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

SAL Project No. 1102633

Client Name: Hazan and Sawyer

Contact / Phone: Josephin Edeback-Hirst 813-630-4498

jedeback@hazanandsawyer.com

Project Name / Location: GCREC Mound Groundwater Analyses

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	250ml P, Cool Alkalinity	250 ml P, H_2SO_4 TKN, NH_3, NOx	40 ml aV, HCl TOC	250ml aG, Cool DOC	Field pH	Field DO	Field Cond	Field Temp	No. of Containers (Total per each location)
	13	DP-E08-6	03291	1200	GW		X	1	1			5.0	1.83	326	22.4	
	14	DP-F03-8	032911	1000	GW		X	1	1			6.2	1.22	145.6	21.7	2
	15	~~DP-F07-6~~ 032911	0329	Ory	GW		X	1	1			Ory	—	—	—	—
	16	DP-G06-7	3/30/11	1445	GW		X	1	1			6.2	2.36	184	28.9	
	17	DP-H05-7	4/4/11	1040	GW		X	1	1			6.3	6.73	136.7	25.6	
	18	DP-H07-8	04/01/11	0730	GW		X	1	1			5.1	1.57	151.3	20.2	
JMH	19	DP-H09-12	3/31/11	1025	GW		X	1	1			5.7	3.40	249	21.9	
	20	PZ03-H11-6	033011	1214	GW		X	1	1			4.8	3.68	138.4	25.9	
JMH	21	DP-I08-5	3/31/11	1105	GW		X	1	1			6.5	4.69	191.5	23.0	
	22	DP-I10-6	04/01/11	0855	GW		X	1	1			6.2	5.10	173.4	20.2	
	23	DP-I12-6	04/01/11	0940	GW		X	1	1			5.6	1.87	127.6	21.9	
	24	DP-F04-32	032911	1100	GW		X	1	1			6.9	1.04	345.6	23.1	

Containers Prepared/ Relinquished:	Date/Time: 1515 03-27-11	Received:	Date/Time: 0500 032911
13-15, 24 Relinquished:	Date/Time: 1600 032911	Received:	Date/Time: 3/29/11 1600
16,20 Relinquished:	Date/Time: 1830 033011	Received:	Date/Time:
19,21 Relinquished: Courier	Date/Time: 1430 3/31/11	Received:	Date/Time:
17 Relinquished: Courier	Date/Time: 1315 4/4/11	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

Instructions / Remarks

DP-F07-6 switch with water tank
1210 032911
Ph 7.5
DO 7.55
CON 427
Temp 22.8
1102633

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

Chain of Custody

SOUTHERN ANALYTICAL LABORATORIES, INC.

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

SAL Project No. 1102635

Client Name: Hazan and Sawyer

Contact / Phone: Josephin Edeback-Hirst 813-630-4498

jedeback@hazanandsawyer.com

Project Name / Location: GCREC Mound Groundwater Analyses

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	250ml P, Cool Alkalinity	250 ml P, H_2SO_4 TKN, NH_3, NOx	40 ml aV, HCl TOC	250ml aG, Cool DOC	Field pH	Field DO	Field Cond	Field Temp	250ml P, HNO_3 B, Ca, Fe, K, Na, Mn, Mg ~~No. of Containers (Total per each location)~~
01	STE-EX Pump Tank ***	4/4/11	1140	GW		X	* 1	** 1			6.8	0.30	830	26.4	1
02	Field Blank-DI	4/4/11	0900	GW		X	1	1			6.1	8.55	1.19	21.5	
03	Field Blank-Tap	4/4/11	1030	GW		X	1	1			7.7	8.13	432	23.6	
04	Equipment Rinsate	4/4/11	1050	GW		X	1	1			6.0	7.90	1.38	27.5	
05	PZ04-BKG-9-D	3/31/11	0844	GW		X	1	1		1	5.4	3.84	78.2	21.7	
06	PZ24-BKG-26-D	033111	0819	GW		X	1	1	2	1	5.0	0.50	270.9	23.1	
07	DP-AA9-27-D	033011	0933 ~~0855~~ PDA	GW		X	1	1			~~5.0~~ 5.2	0.80 ~~0.99~~	288 ~~699~~	~~23.0~~ 23.9 PDA	
08	DP-D07-5-D	3/30/11	1115	GW		X	1	1			6.0	4.86	324	24.1	
09	~~DP-E02-6-D~~ DP-E03-10-D SH	032911	0920	GW		X	1	1			5.3	2.21	211.3	21.3	
10	DP-E12-15-D	033011	0755 SH	GW		X	1	1			5.0	0.60	460	21.9	
11	DP-F09-5-D	032911	1330	GW		X	1	1			6.6	1.15	141.1	24.8	
12	DP-F11-~~15~~ 11-D (Dup was switched from DP-F11-15-D to DP-F11-11-D)	033011	0805	GW		X	1	1			5.3	0.90	412.7	21.4	

Relinquished:	Date/Time:	Received:	Date/Time:
Containers Prepared/ Relinquished:	1630 03-27-11		0500 032911
Relinquished:	1600 03-29-11	Received:	3/29/11 1600
Relinquished:	1830 03-30-11	Received:	Date/Time:
Relinquished:	1430 3/31/11	Received:	Date/Time:
Relinquished: courier	1315 4/4/11	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

Instructions / Remarks

* 1LP,C = Alk, CBOD, TS, TSS, Cl, F, OP, SO_4, NOx 300

** – TP

*** – 125 mlP, sterile, $Na_2S_2O_3$ m-Coliblue 24

1102635

9,11
7,8,10,12
5,6,13,15
19
02,03
04,01

SOUTHERN ANALYTICAL LABORATORIES, INC.

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

SAL Project No. 1102635

Client Name: Hazan and Sawyer

Contact / Phone: Josephin Edeback-Hirst 813-630-4498

jedeback@hazanandsawyer.com

Project Name / Location: GCREC Mound Groundwater Analyses

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	250ml P, Cool Alkalinity	250 ml P, H_2SO_4 TKN, NH_3, NOx	40 ml aV, HCl TOC	250ml aG, Cool DOC	Field pH	Field DO	Field Cond	Field Temp	~~No. of Containers (Total per each location)~~
13	DP-F15-20-D	3/31/11	940	GW		X	1	1			5.4	0.78	383	22.3	
14	DP-G12-18-D	3/31/11	900	GW		X	1	1			5.2	1.40	494	22.2	
15	DP-H12-5-D	3/31/11	905	GW		X	1	1			5.6	0.94	188.5	21.9	
16	DP-K12-5-D	4/1/11	1010	GW		X	1	1			5.6	1.40	59.3	22.3	
17	DP-O10-24-D	4/1/11	1402	GW		X	1	1			5.1	0.95	361	24.2	
18	STE-D	4/4/11	1150	GW		X	1	1			6.8	0.30	830	26.4	
19	PZ-25	3/31/11	1125	GW		X	1	1			6.0	5.65	770	22.0	

	Date/Time	Received	Date/Time
Containers Prepared/ Relinquished:	1650 03-27-11	Received:	0500 032911
5,6,13-15,19 Relinquished: ~~Courier~~	1430 3/31/11	Received:	
18 Relinquished: Courier		Received:	
Relinquished:		Received:	
Relinquished:		Received:	

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

Instructions / Remarks

1102635

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

Chain of Custody

Appendix C: GCREC Mound Wastewater Flow Data

Table C.1
GCREC Mound Metered Wastewater Flow Data (Manually Read)

Date Range	Flow Meter Totalized Pump 1 to GCREC Mound (avg. gpd)	Flow Meter Totalized Pump 2 to GCREC Mound (avg. gpd)	Total Recorded Flow (avg. gpd)
12/27/10 – 4/6/11	1,150	1,337	2,486

Table C.2
Summary of Daily Wastewater Flows (PLC Recorded)

	Date Range	Average Recorded Flow (gpd)	Std. Dev.	MIN (gpd)	MAX (gpd)
Pump 1 to Mound	12/11/10 – 4/4/11	1,054	519	146	3,216
Pump 2 to Mound		1,282	551	293	2,653
Sum of Both Pumps		2336	997	584	4,640

Table C.3
PLC Recorded Daily Wastewater Flows
(12/11/10 – 4/4/11)

Day Since Start-Up	Date	Pump 1 to GCREC Mound	Pump 2 to GCREC Mound	Sum Pump 1 and 2
208	12/11/2010	146	443	589
209	12/12/2010	299	449	748
210	12/13/2010	848	1270	2118
211	12/14/2010	923	797	1720
212	12/15/2010	767	1095	1862
213	12/16/2010	926	940	1866
214	12/17/2010	799	1126	1925
215	12/18/2010	307	448	755
216	12/19/2010	436	293	729
217	12/20/2010	759	939	1698
218	12/21/2010	765	921	1686
219	12/22/2010	959	1649	2608
220	12/23/2010	913	795	1708
221	12/24/2010	297	455	752
222	12/25/2010	148	440	588
223	12/26/2010	289	299	588
224	12/27/2010	598	612	1210
225	12/28/2010	599	608	1207
226	12/29/2010	450	762	1212

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Day Since Start-Up	Date	Pump 1 to GCREC Mound	Pump 2 to GCREC Mound	Sum Pump 1 and 2
227	12/30/2010	452	910	1362
228	12/31/2010	296	452	748
229	1/1/2011	288	296	584
230	1/2/2011	436	452	888
231	1/3/2011	1137	1575	2712
232	1/4/2011	1309	1367	2676
233	1/5/2011	1148	1530	2678
234	1/6/2011	1430	2043	3473
235	1/7/2011	1323	1539	2862
236	1/8/2011	452	445	897
237	1/9/2011	448	599	1047
238	1/10/2011	1307	1507	2814
239	1/11/2011	1360	2147	3507
240	1/12/2011	1387	2380	3767
241	1/13/2011	1391	2392	3783
242	1/14/2011	942	1623	2565
243	1/15/2011	292	774	1066
244	1/16/2011	445	610	1055
245	1/17/2011	596	462	1058
246	1/18/2011	2011	2221	4232
247	1/19/2011	1350	1541	2891
248	1/20/2011	951	1306	2257
249	1/21/2011	938	1284	2222
250	1/22/2011	449	609	1058
251	1/23/2011	448	930	1378
252	1/24/2011	1642	1912	3554
253	1/25/2011	1536	1920	3456
254	1/26/2011	1978	2021	3999
255	1/27/2011	1720	1703	3423
256	1/28/2011	1113	1242	2355
257	1/29/2011	597	702	1299
258	1/30/2011	446	621	1067
259	1/31/2011	2314	2326	4640
260	2/1/2011	945	1478	2423
261	2/2/2011	1094	1320	2414
262	2/3/2011	1376	1856	3232
263	2/4/2011	1752	1749	3501
264	2/5/2011	603	634	1237

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Day Since Start-Up	Date	Pump 1 to GCREC Mound	Pump 2 to GCREC Mound	Sum Pump 1 and 2
265	2/6/2011	589	773	1362
266	2/7/2011	1571	1924	3495
267	2/8/2011	1524	1893	3417
268	2/9/2011	1100	1825	2925
269	2/10/2011	1279	1658	2937
270	2/11/2011	1468	1652	3120
271	2/12/2011	592	917	1509
272	2/13/2011	751	772	1523
273	2/14/2011	1414	2213	3627
274	2/15/2011	1881	2653	4534
275	2/16/2011	2193	2106	4299
276	2/17/2011	781	1425	2206
277	2/18/2011	1242	1281	2523
278	2/19/2011	733	918	1651
279	2/20/2011	444	751	1195
280	2/21/2011	1617	1813	3430
281	2/22/2011	769	1758	2527
282	2/23/2011	1258	1626	2884
283	2/24/2011	1236	1411	2647
284	2/25/2011	1083	1598	2681
285	2/26/2011	586	909	1495
286	2/27/2011	902	928	1830
287	2/28/2011	1444	1629	3073
288	3/1/2011	1260	1554	2814
289	3/2/2011	1340	1685	3025
290	3/3/2011	1140	1620	2760
291	3/4/2011	1349	1606	2955
292	3/5/2011	747	920	1667
293	3/6/2011	764	924	1688
294	3/7/2011	1184	1591	2775
295	3/8/2011	1296	1429	2725
296	3/9/2011	1350	1570	2920
297	3/10/2011	1351	1599	2950
298	3/11/2011	1160	1449	2609
299	3/12/2011	789	935	1724
300	3/13/2011	943	918	1861
301	3/14/2011	1385	1766	3151
302	3/15/2011	1252	1457	2709

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Day Since Start-Up	Date	Pump 1 to GCREC Mound	Pump 2 to GCREC Mound	Sum Pump 1 and 2
303	3/16/2011	1318	1462	2780
304	3/17/2011	1343	1605	2948
305	3/18/2011	1398	1639	3037
306	3/19/2011	478	1237	1715
307	3/20/2011	765	772	1537
308	3/21/2011	1394	1463	2857
309	3/22/2011	1405	1430	2835
310	3/23/2011	1033	1944	2977
311	3/24/2011	1136	1593	2729
312	3/25/2011	1919	1679	3598
313	3/26/2011	712	772	1484
314	3/27/2011	727	1074	1801
315	3/28/2011	1828	1302	3130
316	3/29/2011	1474	1282	2756
317	3/30/2011	1391	1421	2812
318	3/31/2011	1245	1686	2931
319	4/1/2011	1676	1768	3444
320	4/2/2011	NR	NR	
321	4/3/2011	NR	NR	
322	4/4/2011	3216	462	3678

[1]NR = No reading

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Appendix D: GCREC Weather Station Data

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Table D.1
Monthly Recorded Meteorological Data

Period	60cm T avg (F)	60cm T min (F)	60cm T max (F)	Tsoil avg - 10cm (F)	Tsoil min(avg) -10cm (F)	Tsoil max(avg) -10cm (F)	2m DewPt avg (F)	RelHum avg 2m (pct)	2m Rain tot (in)	2m Rain max over 15min(in)	10m Wind avg (mph)	10m Wind max (mph)	WDir avg 10m (deg)	ET avg (in)
Jan-10	53.10	23.97	82.38	59.67	51.13	66.63	44.57	76	3.19	0.57	7.60	32.80	348	0.05
Feb-10	53.75	30.84	78.96	59.86	54.32	65.75	43.97	74	2.22	0.47	7.85	36.13	348	0.07
Mar-10	59.24	32.89	82.26	62.09	55.31	68.11	48.75	73	6.15	0.44	8.25	38.27	289	0.10
Apr-10	69.78	44.74	88.54	70.78	63.00	75.72	59.50	74	2.79	0.52	7.46	44.17	94	0.15
May-10	77.78	62.37	93.63	79.11	73.17	83.97	68.62	77	0.89	0.13	6.75	31.10	126	0.18
Jun-10	80.91	65.84	99.09	82.32	76.69	88.63	72.87	80	8.25	1.30	5.85	50.47	116	0.19
Jul-10	80.67	68.00	96.21	82.58	77.49	87.03	74.05	82	7.30	0.48	5.95	35.37	103	0.18
Aug-10	80.54	70.59	96.87	82.63	79.11	87.85	75.03	85	13.51	1.74	5.78	43.53	154	0.16
Sep-10	78.91	63.43	95.88	80.83	78.17	83.39	72.11	82	3.42	0.55	6.33	41.60	84	0.16
Oct-10	71.98	51.24	93.00	74.97	71.83	78.62	61.55	73	0.01	0.01	5.56	32.00	31	0.11
Nov-10	65.75	39.95	86.77	69.47	64.33	75.34	56.97	76	1.24	0.16	6.52	30.53	55	0.07
Dec-10	50.64	22.86	78.37	60.71	54.61	71.33	39.83	71	0.50	0.05	7.33	36.77	354	0.04
Jan-11	57.65	29.23	79.54	61.34	56.86	65.07	49.01	77	4.13	0.49	7.08	44.07	319	0.06
Feb-11	62.95	34.76	85.21	63.94	57.76	69.58	54.40	78	0.47	0.07	6.38	35.57	75	0.09
Mar-11	66.56	39.12	88.66	68.35	61.45	73.83	56.59	75	6.89	0.47	7.41	44.13	82	0.12

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Appendix E: Field Parameter Analyses

Table E.1
Field Parameter Results
(March 29-April 4, 2011)

	Sample Identification	Temperature (°C)	pH	Specific Conductance (µS)	Dissolved Oxygen (mg/L)
1	STE-EX Pump Tank	26.4	6.8	830.0	0.30
2	PZ01-BKG-9	22.8	4.6	146.8	6.78
3	PZ02-P02-9	24.4	4.7	73.6	4.63
4	PZ03-H11-6	25.9	4.8	138.4	3.68
5	PZ04-BKG-9	21.7	5.4	78.2	3.84
6	PZ05-BKG-9	21.8	5.1	98.8	4.38
7	PZ06-BKG-12	23.1	4.7	59.4	5.41
8	PZ07-D05-7	25.3	4.7	221.6	0.39
9	PZ08-FG7-6	23.6	4.8	126.9	3.33
10	PZ09-I08-5	21.9	5.2	94.2	6.03
11	PZ10-CD6-13	25.6	6.0	524.0	2.85
12	PZ11-E09-10	25.8	5.6	453.8	2.33
13	PZ13-F04-8	21.4	5.6	125.5	2.48
14	PZ14-G13-7	24.5	5.8	246.1	1.04
15	PZ15-A11-6	24.8	5.2	100.0	2.52
16	PZ16-C12-28	25.4	5.7	295.1	0.66
17	PZ17-I15-26	23.1	4.8	307.1	2.46
18	PZ18-R12-26	23.4	5.0	328.1	0.89
19	PZ19-G10-26	23.1	5.1	302.1	1.07
20	PZ20-G10-15	22.2	5.6	356.1	1.97
21	PZ21-E11-26	23.6	5.2	295.6	0.36
22	PZ22-E11-15	24.4	5.3	416.0	1.36
23	PZ23-D09-27	24.4	5.4	306.2	0.18
24	PZ24-BKG-26	23.1	5.0	271.0	0.50
25	PZ25-A6.5-10	22.0	6.0	770.0	5.65

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	Sample Identification	Temperature (°C)	pH	Specific Conductance (µS)	Dissolved Oxygen (mg/L)
26	DP-AA9-14	23	5.0	699	0.99
27	DP-AA9-22	23.8	5.3	286	0.77
28	DP-AA9-27	23.9	5.2	288	0.82
29	DP-C11-8	21.8	5.9	319	3.50
30	DP-D07-5	24.1	6	326	4.86
31	DP-D07-5-D	24.1	6	326	4.86
32	DP-D07-7	23.3	4.7	365	0.77
33	DP-D07-9	24	4.5	392	4.50
34	DP-D08-9	24.6	5.6	502	1.36
35	DP-D09-15	23.3	5.4	470	1.16
36	DP-D09-21	24.2	5.3	298	0.80
37	DP-D09-27	24.5	6.0	309	0.76
38	DP-D09-6	22.6	4.5	456	4.50
39	DP-D09-8	22.6	4.6	487	1.01
40	DP-D10-8	23.8	5.7	337	1.45
41	DP-D11-11	21.7	5.3	479	1.39
42	DP-D12-11	22.3	4.8	477	0.65
43	DP-D7.5-14	23.8	5.0	514	0.67
44	DP-D7.5-20	25	5.3	296	1.26
45	DP-D7.5-26	25	5.3	292	1.47
46	DP-E02-6	21.3	5.5	98.5	2.41
47	DP-E02-8	21.3	5.1	158.9	0.46
48	DP-E03-10	21.3	5.3	211.3	2.21
49	DP-E04-6	22.3	4.7	90.6	3.49
50	DP-E04-8	22	4.9	171.1	1.43
51	DP-E05-6	24.8	6.0	171.8	2.96
52	DP-E06-6	22.8	4.4	162.8	1.89
53	DP-E06-8	22.7	4.5	180.6	10.90
54	DP-E07-10	22.5	4.9	289	1.19
55	DP-E08-6	22.4	5.0	326	1.83
56	DP-E08-8	22.6	5.0	348	1.52
57	DP-E10-6	23	4.6	407	0.60
58	DP-E11-12	23	5.1	441	0.99

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	Sample Identification	Temperature (°C)	pH	Specific Conductance (µS)	Dissolved Oxygen (mg/L)
59	DP-E12-10	23.9	5.1	520	0.35
60	DP-E12-15	21.9	5.0	460	0.60
61	DP-E12-22	22.5	5.3	297	0.59
62	DP-E12-28	22.8	5.3	310	0.57
63	DP-F03-8	21.7	6.2	145.6	1.22
64	DP-F04-17	22	7.3	415.7	0.57
65	DP-F04-22	22.8	6.0	314.1	0.72
66	DP-F04-32	23.1	6.9	345.6	1.04
67	DP-F05-31	24.1	7.3	187.1	1.70
68	DP-F05-5	27.7	5.8	173.3	7.36
69	DP-F06-10	21.8	5.2	190.6	0.30
70	DP-F08-14	22.5	7.6	501	1.28
71	DP-F08-20	23.1	6.0	335.6	0.41
72	DP-F08-28	23.4	6.3	323.9	0.37
73	DP-F09-5	24.8	6.6	191.1	1.15
74	DP-F10-11	21.3	4.7	475.9	0.80
75	DP-F11-11	21.4	5.3	412.7	0.90
76	DP-F11-15	21.8	5.1	453.3	0.28
77	DP-F11-18	22.2	5.4	433.9	1.18
78	DP-F11-21	22.5	5.2	318.4	0.43
79	DP-F11-24	22.8	5.1	301.1	0.30
80	DP-F11-27	23.2	5.3	307.5	0.39
81	DP-F12-10	21.5	5.0	427	0.90
82	DP-F15-14	21.7	5.2	512	0.53
83	DP-F15-20	22.3	5.4	383	0.78
84	DP-F15-26	22.5	5.2	306	0.78
85	DP-G05-6	26.2	6.1	151.9	2.49
86	DP-G06-7	28.9	6.2	184	2.36
87	DP-G07-13	25.2	5.8	232	2.19
88	DP-G07-15	23.4	5.2	272	1.20
89	DP-G07-17	23.7	5.3	317	1.52
90	DP-G07-21	22.2	5.6	326	0.57
91	DP-G07-24	22.3	5.7	271	0.94

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	Sample Identification	Temperature (°C)	pH	Specific Conductance (µS)	Dissolved Oxygen (mg/L)
92	DP-G07-27	22.3	5.2	303	0.95
93	DP-G08-5	26.1	5.6	157.8	7.64
94	DP-G09-11	24	5.4	285	2.08
95	DP-G11-8	21.2	5.1	295	1.38
96	DP-G12-15	21.8	5.5	487	0.96
97	DP-G12-18	22.2	5.2	494	1.40
98	DP-G12-21	22.7	5.4	385	0.50
99	DP-G12-24	22.7	5.4	324	0.82
100	DP-G12-27	22.9	5.4	311	0.43
101	DP-G12-9	21.4	4.7	341	2.62
102	DP-H05-7	25.6	6.3	136.7	6.73
103	DP-H06-7	19.8	6.0	152.4	4.04
104	DP-H07-8	20.2	5.1	151.3	1.57
105	DP-H08-10	22.7	6.2	189	2.97
106	DP-H09-12	21.9	5.7	249	3.40
107	DP-H10-11	22.2	6.2	204.5	5.83
108	DP-H12-5	21.9	5.6	188.5	0.94
109	DP-I06-14	20.9	5.3	212.3	1.44
110	DP-I06-20	21.4	5.0	358	1.03
111	DP-I06-26	21.6	4.9	305	1.13
112	DP-I07-8	19.4	5.8	170.7	2.23
113	DP-I08-5	23	6.5	191.5	4.69
114	DP-I09-11	21.5	5.1	180.6	0.77
115	DP-I10-6	20.2	6.2	173.4	5.10
116	DP-I11-10	21.4	5.7	166.8	0.90
117	DP-I12-6	21.9	5.6	127.6	1.87
118	DP-J08-6	19.7	6.0	140.3	2.70
119	DP-J09-12	21.1	4.8	167	0.81
120	DP-J09-14	21.4	4.8	226	0.73
121	DP-J09-20	22.1	4.4	365	0.66
122	DP-J09-26	22.5	5.0	297	0.73
123	DP-J10-6	24	5.9	186.6	3.48
124	DP-J11-12	23.7	4.4	196.7	1.02

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	Sample Identification	Temperature (°C)	pH	Specific Conductance (µS)	Dissolved Oxygen (mg/L)
125	DP-J12-13	22.9	4.9	238	1.54
126	DP-J12-15	23.3	5.1	281	1.13
127	DP-J12-20	23.4	5.6	354	1.20
128	DP-J12-27	23.6	5.1	303	0.92
129	DP-K10-7	24.2	6.0	163.8	3.79
130	DP-K11-13	22.1	4.9	168.3	1.84
131	DP-K12-5	22.3	5.6	59.3	1.40
132	DP-M07-15	23	5.2	267	0.71
133	DP-M07-21	24	4.9	362	0.88
134	DP-M07-27	23.8	5.2	293	1.08
135	DP-M12-10	24	5.7	161.6	1.83
136	DP-N12-14	22.9	4.8	178.6	0.91
137	DP-N12-18	23.2	5.1	250	1.11
138	DP-N12-21	23.3	5.2	279	1.04
139	DP-N12-24	24.1	5.2	348	0.78
140	DP-N12-27	23.9	5.1	342	0.68
141	DP-O10-12	22.9	4.3	185.9	1.13
142	DP-O10-18	23.5	5.3	294	1.04
143	DP-O10-24	24.2	5.1	361	0.95
144	DP-Q15-15	22.7	4.8	285	0.61
145	DP-Q15-21	23.5	5.2	319	0.73
146	DP-Q15-26	23.2	5.2	333	1.33
147	Equipment Rinsate	27.5	6.0	1.38	7.90
148	Field Blank DI	21.5	6.1	1.19	8.55
149	Field Blank Tap	23.6	7.7	432	8.13

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