FLORIDA DEPARTMENT OF HEALTH

Florida Onsite Sewage Nitrogen Reduction Strategies Study

Task C.24

C-HS2 Monitoring Sample Event Report No. 2

Progress Report

December 2011

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-HS2 Monitoring
Sample Event Report No. 2

Prepared for:

Florida Department of Health
Division of Environmental Health
Bureau of Onsite Sewage Programs
4042 Bald Cypress Way Bin #A-08
Tallahassee, FL 32399-1713

FDOH Contract CORCL

December 2011

Prepared by:

HAZEN AND SAWYER
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In Association With:

SCHOOL OF MINES
1874
COLORADO

C-HS2 Monitoring
Sample Event Report No. 2

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 C-HS2 Instrumentation report documents the field site layout, number and location of monitoring points, and preliminary field parameters from monitoring points for this field site located in the Wekiva Study area in Seminole County, Florida and preliminary sample collection and analyses.

2.0 Purpose

This sample event report documents data collected from the second C-HS2 monitoring and sampling event conducted November 30, 2011 and December 1, 2011. This monitoring event consisted of measurement of household water meters, 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-HS2 field site is located in Seminole County, FL in a neighborhood less than a mile from the Little Wekiva River. The onsite sewage treatment and disposal system (OSTDS) for the residence consists of a 1,050 gallon fiberglass baffled septic tank located adjacent to the drainfield mound and has a gravity fed standard bed mounded drainfield.

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3.2 Monitoring and Sample Locations and Identification

A sampling grid for groundwater screening was developed downgradient of the OSTDS as depicted in Figure 1. A 10-foot by 40-foot grid was staked then locations surveyed (x, y, and z). Transect lines A through D were located perpendicular to the groundwater flow direction (southwest) and increase (higher letter identification) moving southward from the mound. Transect lines 0 through 15 were located parallel to the groundwater flow direction and increase moving from southeast to northwest. Groundwater monitoring points were installed in June and July 2011. One type of monitoring point was installed using either hand or drilling methods: standpipe piezometers. Standpipe piezometers consist of either ¾-inch or 2-inch diameter PVC with a 1-foot, 2-foot, or 4-foot screen (0.010-inch slots) and riser extending to the ground surface (refer to the Task C QAPP and Task C.23 C-HS2 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 A09-7 is a standpipe piezometer sampler located on the grid at A09 at 7-feet below ground surface. A schematic of the C-HS2 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 63 specific monitoring locations were sampled during this second C-HS2 sampling event.

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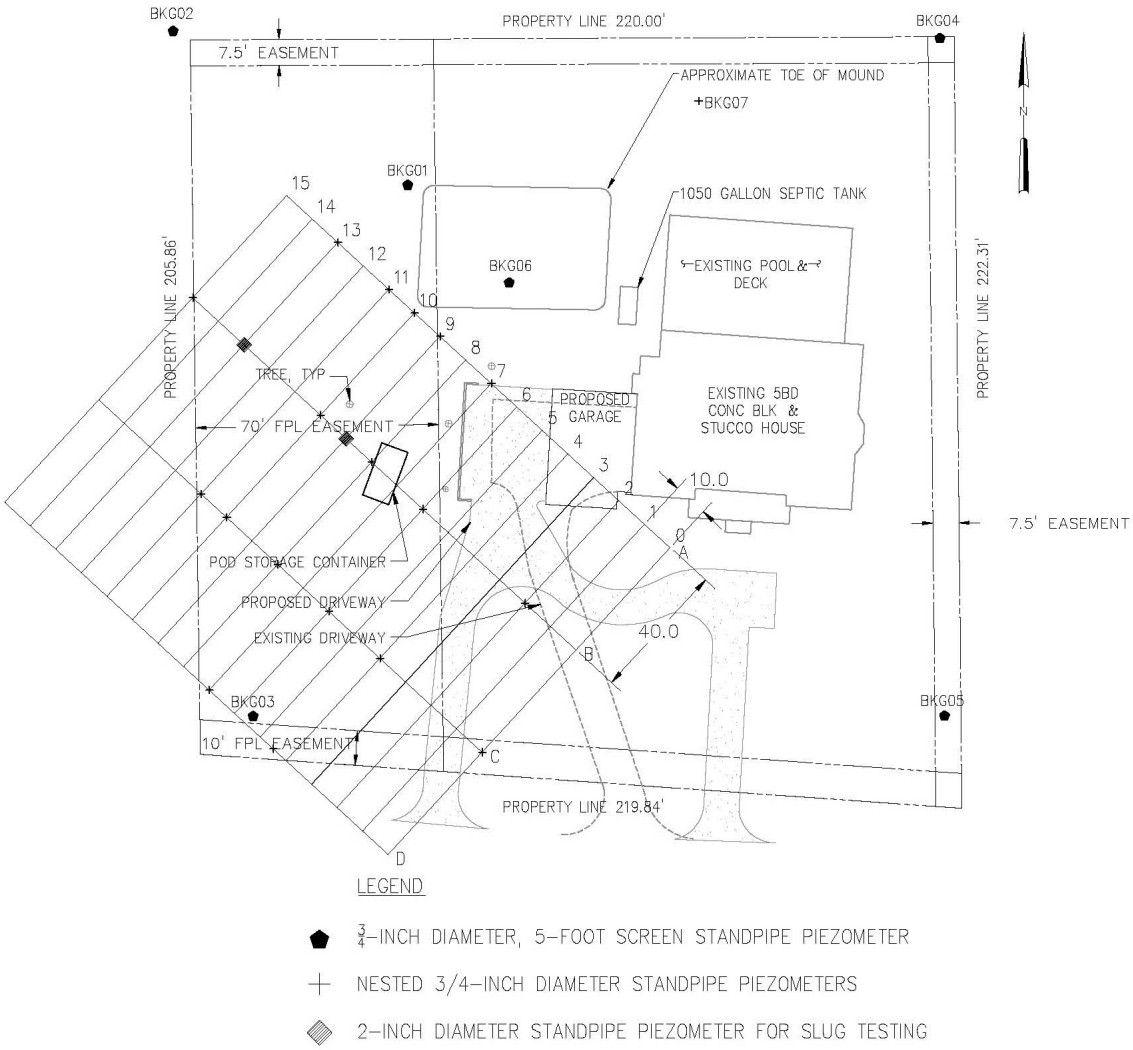

Figure 1
C-HS2 Monitoring Network

3.3 Operational Monitoring

The water meter for the house site was read and recorded. The residence has a garden with irrigation thus the actual wastewater flow can only be estimated. A weather station (Sheffield in the Crossings, Longwood, FL) is located approximately 5 miles from the site. Data from this weather station is available at the following website: http://www.wunderground.com.

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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 62 standpipe piezometers was measured for this sampling event.

3.5 Water Quality Sample Collection and Analyses

Groundwater and septic tank effluent (STE) were collected November 30, 2011 and December 1, 2011 for water quality analysis. A sample was collected from the septic tank outlet filter 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-HS2-STE
- C-HS2-A09-7
- C-HS2-B08-5
- C-HS2-C00-7
- C-HS2-C08-5
- C-HS2-D07-6

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). Additionally, at some of the locations with elevated nitrogen in previous preliminary sampling, anions, cations, total organic carbon (TOC) and dissolved organic carbon (DOC) were included.

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All analyses were performed by an independent and fully certified analytical laboratory (Southern Analytical Laboratory). 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	Laboratory Detection Limit (mg/L)
Total Alkalinity as $CaCO_3$	SM 2320B	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
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, the C-HS2 Data Summary Report No. 2 (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-HS2.

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Table 2
Water Meter Readings and Water Usage for C-HS2

Residence	Date and Time Read	Meter Reading	Gallons/day
C-HS2 Residence	7/13/2011 14:45	5302677.9	
	7/20/2011 17:50	5304207.8	215
	7/26/2011 15:19	5305257.9	178
	10/27/2011 15:19	5327920.4	244
	11/30/2011 8:00	5355610.4	822[1]

[1]Homeowner refilled swimming pool between readings.

Monthly 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 November 23, 2011 – December 2, 2011

Date	Temperature (°F)			Humidity (%)	Wind (mph)	Rain Total (inches)
	High	Avg	Low	Avg	Avg	Sum
11/23/2011	79	71	63	83	4	0
11/24/2011	75	65	55	72	4	0
11/25/2011	77	64	53	77	2	0
11/26/2011	78	67	57	79	2	0
11/27/2011	80	68	60	77	3	0
11/28/2011	82	67	59	84	5	0.08
11/29/2011	68	59	51	78	3	0
11/30/2011	63	55	46	76	2	0
12/1/2011	69	54	41	79	4	0
12/2/2011	73	60	51	77	4	0

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4.2 Groundwater Levels

Water levels were measured at all standpipe piezometers on November 30, 2011 for this sampling event as summarized in Table 4. Figure 2 illustrates the surficial groundwater contours as measured within the standpipe piezometers on July 27, 2011 during the first

sample event. Figure 3 illustrates the surficial groundwater contours as measured within the standpipe piezometers on November 30, 2011. As depicted, the groundwater elevations have been found to fluctuate due to periods of dry weather and/or heavy precipitation; however, the general flow-path does not change.

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Table 4
Standpipe Piezometer Groundwater Levels
Measured on November 30, 2011

Identification	Water Table Elevation (feet)	Identification	Water Table Elevation (feet)
C-HS2-BKG01	92.36	C-HS2-B10-10	92.81
C-HS2-BKG02	92.20	C-HS2-B15-5	91.99
C-HS2-BKG03	91.30	C-HS2-B15-7	92.01
C-HS2-BKG04	93.67	C-HS2-B15-10	91.98
C-HS2-BKG05	92.23	C-HS2-C00-5	91.67
C-HS2-BKG06	92.53	C-HS2-C00-7	91.65
C-HS2-A07-6	92.31	C-HS2-C00-10	91.66
C-HS2-A07-8	92.34	C-HS2-C04-5	91.62
C-HS2-A07-11	92.30	C-HS2-C04-7	91.64
C-HS2-A09-7	92.33	C-HS2-C04-10	91.64
C-HS2-A09-9	92.32	C-HS2-C06-5	91.65
C-HS2-A09-12	92.32	C-HS2-C06-7	91.65
C-HS2-A10-7	92.35	C-HS2-C06-10	91.66
C-HS2-A10-9	92.34	C-HS2-C08-5	91.66
C-HS2-A10-12	92.32	C-HS2-C08-7	91.72
C-HS2-A11-5	92.28	C-HS2-C08-10	91.67
C-HS2-A11-7	92.26	C-HS2-C10-6	91.69
C-HS2-A11-10	92.28	C-HS2-C10-8	91.70
C-HS2-A13-5	92.30	C-HS2-C10-11	91.71
C-HS2-A13-7	92.31	C-HS2-C11-5	91.70
C-HS2-A13-10	92.31	C-HS2-C11-7	91.70
C-HS2-B02-6	91.95	C-HS2-C11-10	91.70
C-HS2-B02-8	91.95	C-HS2-D04-5	91.38
C-HS2-B02-11	91.95	C-HS2-D04-7	91.41
C-HS2-B06-6	91.98	C-HS2-D04-10	91.42
C-HS2-B06-8	92.05	C-HS2-D07-6	91.39
C-HS2-B06-11	92.03	C-HS2-D07-8	91.39
C-HS2-B08-5	91.96	C-HS2-D07-11	91.43
C-HS2-B08-7	91.99	C-HS2-BKG07-5	93.12
C-HS2-B08-10	92.01	C-HS2-BKG07-7	93.12
C-HS2-B10-5	92.07	C-HS2-BKG07-10	93.11
C-HS2-B10-7	92.08		

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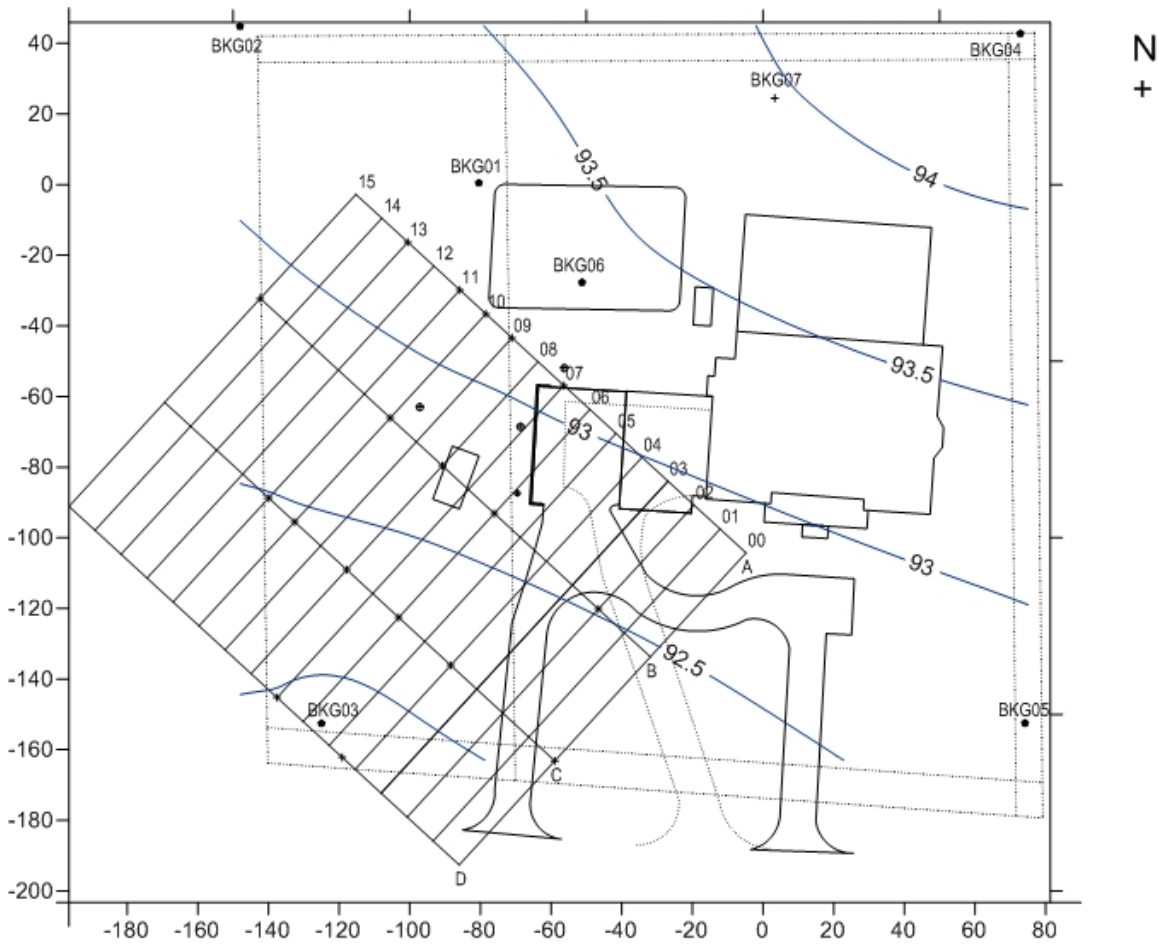

Figure 2
Surficial Groundwater Contours July 27, 2011

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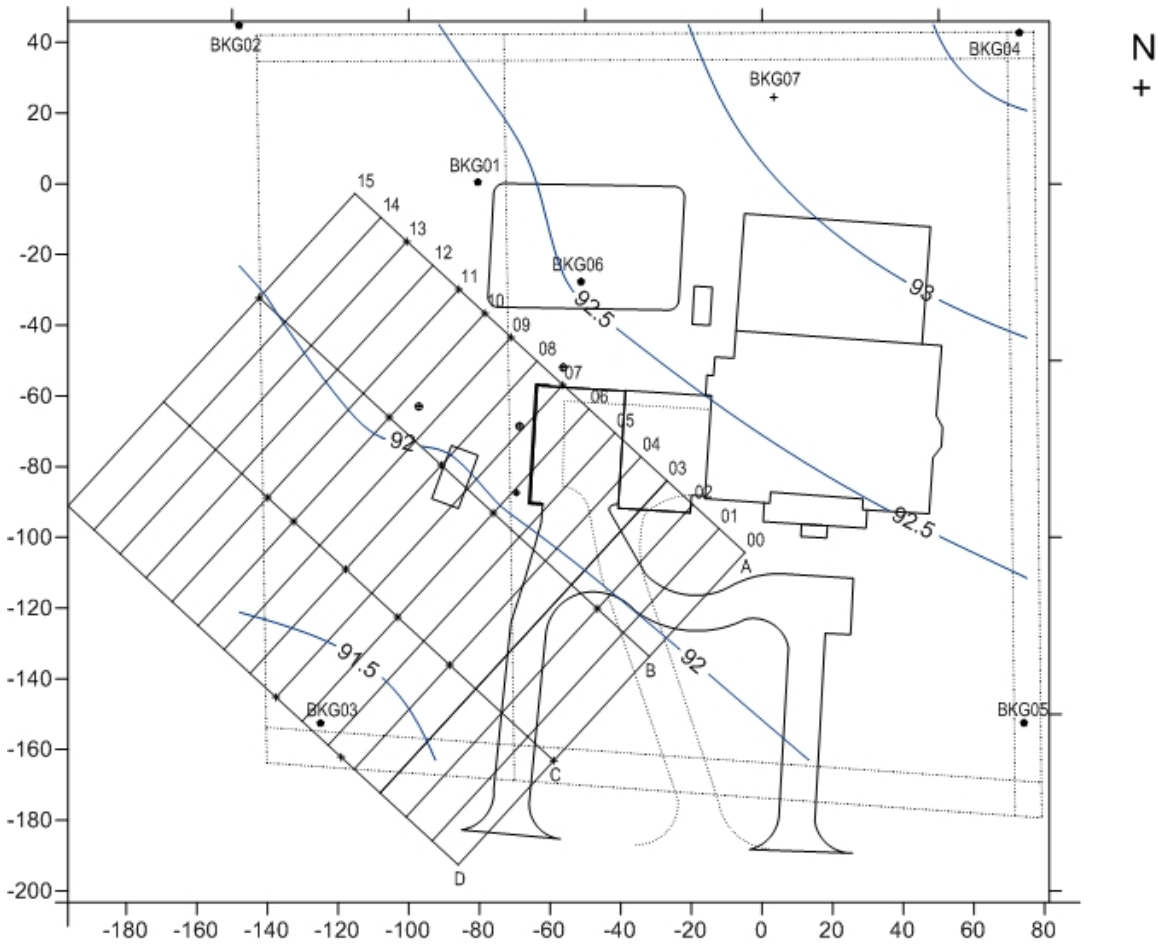

Figure 3
Surficial Groundwater Contours November 30, 2011

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-HS2 Data Summary Report No. 2 (Task C25) will be prepared describing the results from this sampling event.

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Appendix A: C-HS2 Sample Identification

Table A.1
C-HS2 Sample Identification

	Sample ID	Type of Monitoring Point	Surface Elevation (ft)	Bottom Elevation (ft)
1	STE	Waste Water	N/A	N/A
2	C-HS2-SW-6 inch	Storm sewer catch basin southwest of home	N/A	N/A
3	C-HS2-SW-M	Storm sewer catch basin southwest of home	N/A	N/A
4	C-HS2-BKG01-7	3/4" Standpipe Piezometer, 5' screen	96.11	88.93
5	C-HS2-BKG02-6	3/4" Standpipe Piezometer, 5' screen	94.48	88.20
6	C-HS2-BKG03-7	3/4" Standpipe Piezometer, 5' screen	93.52	86.56
7	C-HS2-BKG04-7	3/4" Standpipe Piezometer, 5' screen	96.00	88.94
8	C-HS2-BKG05-8	3/4" Standpipe Piezometer, 5' screen	95.21	87.26
9	C-HS2-BKG06-12	3/4" Standpipe Piezometer, 5' screen	99.55	87.93
10	C-HS2-A07-6	3/4" Standpipe Piezometer, 2' screen	97.33	91.67
11	C-HS2-A07-8	3/4" Standpipe Piezometer, 1' screen	97.34	89.69
12	C-HS2-A07-11	3/4" Standpipe Piezometer, 1' screen	97.33	86.78
13	C-HS2-A09-7	3/4" Standpipe Piezometer, 2' screen	98.23	91.34
14	C-HS2-A09-9	3/4" Standpipe Piezometer, 1' screen	98.22	89.01
15	C-HS2-A09-12	3/4" Standpipe Piezometer, 1' screen	98.22	86.47
16	C-HS2-A10-7	3/4" Standpipe Piezometer, 2' screen	97.63	90.76
17	C-HS2-A10-9	3/4" Standpipe Piezometer, 1' screen	97.65	88.84
18	C-HS2-A10-12	3/4" Standpipe Piezometer, 1' screen	97.65	85.65
19	C-HS2-A11-5	3/4" Standpipe Piezometer, 2' screen	96.45	91.46
20	C-HS2-A11-7	3/4" Standpipe Piezometer, 1' screen	96.45	89.63
21	C-HS2-A11-10	3/4" Standpipe Piezometer, 1' screen	96.45	86.59
22	C-HS2-A13-5	3/4" Standpipe Piezometer, 2' screen	95.76	90.77
23	C-HS2-A13-7	3/4" Standpipe Piezometer, 1' screen	95.76	88.78
24	C-HS2-A13-10	3/4" Standpipe Piezometer, 1' screen	95.77	86.03
25	C-HS2-B02-6	3/4" Standpipe Piezometer, 2' screen	95.85	90.29
26	C-HS2-B02-8	3/4" Standpipe Piezometer, 1' screen	95.85	88.06
27	C-HS2-B02-11	3/4" Standpipe Piezometer, 1' screen	95.85	85.12
28	C-HS2-B06-6	3/4" Standpipe Piezometer, 2' screen	95.85	90.17

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Table A.1
C-HS2 Sample Identification

	Sample ID	Type of Monitoring Point	Surface Elevation (ft)	Bottom Elevation (ft)
29	C-HS2-B06-8	3/4" Standpipe Piezometer, 1' screen	95.85	88.03
30	C-HS2-B06-11	3/4" Standpipe Piezometer, 1' screen	95.84	85.08
31	C-HS2-B08-5	3/4" Standpipe Piezometer, 2' screen	95.38	90.41
32	C-HS2-B08-7	3/4" Standpipe Piezometer, 1' screen	95.40	88.62
33	C-HS2-B08-10	3/4" Standpipe Piezometer, 1' screen	95.42	85.52
34	C-HS2-B09-15	2" Standpipe Piezometer, 5' screen	95.37	80.20
35	C-HS2-B10-5	3/4" Standpipe Piezometer, 2' screen	95.40	90.42
36	C-HS2-B10-7	3/4" Standpipe Piezometer, 1' screen	95.40	88.60
37	C-HS2-B10-10	3/4" Standpipe Piezometer, 1' screen	95.40	85.55
38	C-HS2-B13-15	2" Standpipe Piezometer, 5' screen	95.34	80.12
39	C-HS2-B15-5	3/4" Standpipe Piezometer, 2' screen	95.28	90.43
40	C-HS2-B15-7	3/4" Standpipe Piezometer, 1' screen	95.28	88.78
41	C-HS2-B15-10	3/4" Standpipe Piezometer, 1' screen	95.26	85.60
42	C-HS2-C00-5	3/4" Standpipe Piezometer, 2' screen	94.50	89.81
43	C-HS2-C00-7	3/4" Standpipe Piezometer, 1' screen	94.50	87.69
44	C-HS2-C00-10	3/4" Standpipe Piezometer, 1' screen	94.51	84.66
45	C-HS2-C04-5	3/4" Standpipe Piezometer, 2' screen	94.61	89.91
46	C-HS2-C04-7	3/4" Standpipe Piezometer, 1' screen	94.60	87.79
47	C-HS2-C04-10	3/4" Standpipe Piezometer, 1' screen	94.61	84.76
48	C-HS2-C06-5	3/4" Standpipe Piezometer, 2' screen	94.53	89.55
49	C-HS2-C06-7	3/4" Standpipe Piezometer, 1' screen	94.53	87.74
50	C-HS2-C06-10	3/4" Standpipe Piezometer, 1' screen	94.53	84.68
51	C-HS2-C08-5	3/4" Standpipe Piezometer, 2' screen	95.18	90.21
52	C-HS2-C08-7	3/4" Standpipe Piezometer, 1' screen	95.25	88.47
53	C-HS2-C08-10	3/4" Standpipe Piezometer, 1' screen	95.20	85.33
54	C-HS2-C10-6	3/4" Standpipe Piezometer, 2' screen	95.77	90.12
55	C-HS2-C10-8	3/4" Standpipe Piezometer, 1' screen	95.78	88.00
56	C-HS2-C10-12	3/4" Standpipe Piezometer, 1' screen	95.78	84.01
57	C-HS2-C11-5	3/4" Standpipe Piezometer, 2' screen	95.30	90.63
58	C-HS2-C11-7	3/4" Standpipe Piezometer, 1' screen	95.30	88.51
59	C-HS2-C11-10	3/4" Standpipe Piezometer, 1' screen	95.31	85.46

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Table A.1
C-HS2 Sample Identification

	Sample ID	Type of Monitoring Point	Surface Elevation (ft)	Bottom Elevation (ft)
60	C-HS2-D04-5	3/4" Standpipe Piezometer, 2' screen	93.98	89.09
61	C-HS2-D04-7	3/4" Standpipe Piezometer, 1' screen	93.98	87.14
62	C-HS2-D04-10	3/4" Standpipe Piezometer, 1' screen	94.00	84.31
63	C-HS2-D07-6	3/4" Standpipe Piezometer, 2' screen	95.41	89.43
64	C-HS2-D07-8	3/4" Standpipe Piezometer, 1' screen	95.39	87.53
65	C-HS2-D07-11	3/4" Standpipe Piezometer, 1' screen	95.43	84.59
66	C-HS2-BKG07-5	3/4" Standpipe Piezometer, 2' screen	96.01	91.36
67	C-HS2-BKG07-7	3/4" Standpipe Piezometer, 1' screen	96.01	89.43
68	C-HS2-BKG07-10	3/4" Standpipe Piezometer, 1' screen	96.01	86.40

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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. 1111095

Client Name: Hazen and Sawyer

Contact / Phone:

Project Name / Location: Seminole County C-HS2

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

	Sample Description	Date	Time	Matrix	Composite	Grab	1LP, Cool Total Alkalinity, Chloride	250mL P, H_2SO_4 TKN, NH_3, NO_x	1LP, Cool Total Alkalinity, Cl, F, NO_3, OP, SO_4	250mL P, H_2SO_4 TKN, NH_3, NO_x	40mLaV, HCl TOC	250mLaG, Cool DOC	250mL P, HNO_3 B, Ca, Fe, Mg, Mn, K, Na	Field Conductivity	Field DO	Field pH	Field Temperature				
01	C-HS2-STE	120111	1035	GW		X	1	1						906	0.94	7.4	21.3				
02	C-HS2-STE-DUP	120111	1040	GW		X	1	1						906	0.94	7.4	21.3				
03	C-HS2-SW-6 inch	120111	0815	GW		X	1	1						304.0	5.62	6.5	21.1				
04	C-HS2-SW-M	120111	0805	GW		X	1	1						344.8	6.42	7.1	19.8				
05	C-HS2-BKG01-7	120111	0915	GW		X	1	1						266.8	0.32	5.6	22.3				
06	C-HS2-BKG02-6	120111	0930	GW		X	1	1						417.7	0.11	7.3	21.1				
07	C-HS2-BKG03-7	120111	1025	GW		X	1	1						345.6	0.10	5.9	22.6				
08	C-HS2-BKG04-7	120111	1010	GW		X	1	1						268.2	0.05	5.3	21.4				
09	C-HS2-BGK06-12	120111	0900	GW		X	1	1						401.9	0.79	6.4	22.9				
10	C-HS2-BKG07-5	120111	0940	GW		X			1	1	2	1	1	191.6	0.06	5.7	22.2				
11	C-HS2-BKG07-7	120111	0950	GW		X	1	1						199.2	0.03	5.9	21.8				
12	C-HS2-BKG07-10	120111	1000	GW		X	1	1						178.8	0.01	5.2	22.3				

Containers Prepared/ Relinquished:	Date/Time: 11/29/11 915	Received:	Date/Time: 1500 11/29/11
Relinquished:	Date/Time: 1335 120111	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:

1111095

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. 1111095

Client Name: Hazen and Sawyer

Contact / Phone:

Project Name / Location: Seminole County C-HS2

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

	Sample Description	Date	Time	Matrix	Composite	Grab	1LP, Cool Total Alkalinity, Chloride	250mL P, H_2SO_4 TKN, NH_3, NO_x	1LP, Cool Total Alkalinity, Cl, F, NO_3, OP, SO_4	250mL P, H_2SO_4 TKN, NH_3, NO_x	40mLaV, HCl TOC	250mLaG, Cool DOC	250mL P, HNO_3 B, Ca, Fe, Mg, Mn, K, Na	Field Conductivity	Field DO	Field pH	Field Temperature
13	C-HS2-A07-6	120111	0730	GW		X			1	1	2	1	1	263.1	5.52	6.3	19.9
14	C-HS2-A07-8	120111	0740	GW		X	1	1						69.5	0.20	6.3	22.9
15	C-HS2-A07-11	120111	0750	GW		X	1	1						167.2	0.19	5.8	23.1
16	C-HS2-A09-7	120111	0700	GW		X	1	1						389.6	0.57	6.4	22.1
17	C-HS2-A09-7-Dup	120111	0705	GW		X	1	1						389.6	0.57	6.4	22.1
18	C-HS2-A09-9	120111	0715	GW		X	1	1						254.1	0.74	6.5	22.6
19	C-HS2-A09-12	120111	0720	GW		X	1	1						135.2	0.71	6.2	22.7
20	C-HS2-A10-7	DRY	DRY	GW		X	1	1						—	—	—	—
21	C-HS2-A10-9	113011	1515	GW		X	1	1						622	0.58	6.6	22.7
22	C-HS2-A10-12	113011	1525	GW		X	1	1						145.4	0.52	6.3	23.1
23	C-HS2-A11-5	DRY	DRY	GW		X	1	1						—	—	—	—
24	C-HS2-A11-7	113011	1455	GW		X	1	1						357.4	0.28	6.0	23.2

Relinquished:	Date/Time:	Received:	Date/Time:
Containers Prepared/ Relinquished: 9/13	Date/Time: 930 11/28/11	Received:	Date/Time: 1500 112811
Relinquished:	Date/Time: 1235 120111	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:

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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. 1111095

Client Name: Hazen and Sawyer

Contact / Phone:

Project Name / Location: Seminole County C-HS2

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

	Sample Description	Date	Time	Matrix	Composite	Grab	1LP, Cool Total Alkalinity, Chloride	250mL P, H_2SO_4 TKN, NH_3, NO_x	1LP, Cool Total Alkalinity, Cl, F, NO_3, OP, SO_4	250mL P, H_2SO_4 TKN, NH_3, NO_x	40mLaV, HCl TOC	250mLaG, Cool DOC	250mL P, HNO_3 B, Ca, Fe, Mg, Mn, K, Na	Field Conductivity	Field DO	Field pH	Field Temperature				
25	C-HS2-A11-10	113011	1505	GW		X	1	1						134.6	0.08	6.2	23.6				
26	C-HS2-A13-5	113011	1435	GW		X	1	1						304.8	0.05	5.8	22.6				
27	C-HS2-A13-7	113011	1445	GW		X	1	1						170.3	0.11	5.5	22.9				
28	C-HS2-A13-10	113011	1450	GW		X	1	1						131.4	0.07	4.8	23.2				
29	C-HS2-B02-6	113011	1200	GW		X	1	1						385.4	0.11	5.8	22.6				
30	C-HS2-B02-8	113011	1210	GW		X	1	1						611	0.10	6.7	22.7				
31	C-HS2-B02-11	113011	1215	GW		X	1	1						200.4	0.23	6.6	23.1				
32	C-HS2-B06-6	113011	1230	GW		X	1	1						631	0.42	5.6	23.3				
33	C-HS2-B06-8	113011	1240	GW		X	1	1						174.8	0.36	5.7	23.6				
34	C-HS2-B06-11	113011	1250	GW		X	1	1						156.6	0.30	4.6	23.6				
35	C-HS2-B08-5	113011	1310	GW		X			1	1	2	1	1	445.2	0.19	6.0	22.2				
36	C-HS2-B08-5-Dup	113011	1315	GW		X			1	1	2	1	1	445.2	0.19	6.0	22.2				

Containers Prepared/ Relinquished:	Date/Time:	Received:	Date/Time:
HH	1055 11-29-11		1129 11 1500
	1335 120111		

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:

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SOUTHERN ANALYTICAL LABORATORIES, INC.

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

SAL Project No. 1111095

Client Name: Hazen and Sawyer

Contact / Phone:

Project Name / Location: Seminole County C-HS2

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

	Sample Description	Date	Time	Matrix	Composite	Grab	1LP, Cool Total Alkalinity, Chloride	250mL P, H_2SO_4 TKN, NH_3, NO_x	1LP, Cool Total Alkalinity, Cl, F, NO_3, OP, SO_4	250mL P, H_2SO_4 TKN, NH_3, NO_x	40mLaV, HCl TOC	250mLaG, Cool DOC	250mL P, HNO_3 B, Ca, Fe, Mg, Mn, K, Na	Field Conductivity	Field DO	Field pH	Field Temperature				
37	C-HS2-B08-7	113011	1320	GW		X	1	1						281.6	0.08	6.1	22.6				
38	C-HS2-B08-10	113011	1330	GW		X	1	1						139.9	0.19	6.2	22.6				
39	C-HS2-B10-5	113011	1340	GW		X	1	1						722	0.05	6.4	22.8				
40	C-HS2-B10-7	113011	1350	GW		X	1	1						205.1	0.80	6.6	23.0				
41	C-HS2-B10-10	113011	1355	GW		X	1	1						137.4	0.14	5.9	23.0				
42	C-HS2-B15-5	113011	1405	GW		X	1	1						132.0	0.08	4.7	22.7				
43	C-HS2-B15-7	113011	1415	GW		X	1	1						149.4	0.07	4.8	23.1				
44	C-HS2-B15-10	113011	1425	GW		X	1	1						126.0	0.16	4.6	23.4				
45	C-HS2-C00-5	113011	1130	GW		X	1	1						319.7	0.03	6.0	24.7				
46	C-HS2-C00-7	113011	1140	GW		X	1	1						433.7	0.02	5.5	24.8				
47	C-HS2-C00-7-Dup	113011	1145	GW		X	1	1						433.7	0.02	5.5	24.8				
48	C-HS2-C00-10	113011	1150	GW		X	1	1						171.9	0.02	5.3	24.9				

Relinquished:	Date/Time:	Received:	Date/Time:
Containers Prepared/ Relinquished: HH	1010 11-29-11		1500 11-29-11
	1335 120111		

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:

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SOUTHERN ANALYTICAL LABORATORIES, INC.

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

SAL Project No. 1111095

Client Name: Hazen and Sawyer

Contact / Phone:

Project Name / Location: Seminole County C-HS2

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

	Sample Description	Date	Time	Matrix	Composite	Grab	1LP, Cool Total Alkalinity, Chloride	250mL P, H_2SO_4 TKN, NH_3, NO_x	1LP, Cool Total Alkalinity, Cl, F, NO_3, OP, SO_4	250mL P, H_2SO_4 TKN, NH_3, NO_x	40mLaV, HCl TOC	250mLaG, Cool DOC	250mL P, HNO_3 B, Ca, Fe, Mg, Mn, K, Na	Field Conductivity	Field DO	Field pH	Field Temperature				
49	C-HS2-C04-5	113011	1100	GW		X	1	1						338.6	0.05	5.8	22.7				
50	C-HS2-C04-7	113011	1110	GW		X	1	1						161.6	0.03	5.5	23.0				
51	C-HS2-C04-10	113011	1120	GW		X	1	1						139.8	0.03	5.5	23.0				
52	C-HS2-C06-5	113011	1030	GW		X			1	1	2	1	1	577	0.13	5.7	21.6				
53	C-HS2-C06-7	113011	1040	GW		X	1	1						361.3	0.26	6.0	21.8				
54	C-HS2-C06-10	113011	1050	GW		X	1	1						130.3	0.25	5.3	22.6				
55	C-HS2-C08-5	113011	1000	GW		X	1	1						353.0	0.67	5.9	21.6				
56	C-HS2-C08-5-Dup	113011	1005	GW		X	1	1						353.0	0.67	5.9	21.6				
57	C-HS2-C08-7	113011	1010	GW		X	1	1						255.0	0.40	6.3	22.1				
58	C-HS2-C08-10	113011	1020	GW		X	1	1						134.1	0.33	6.0	22.4				
59	C-HS2-C10-6	113011	0935	GW		X			1	1	2	1	1	209.6	0.11	5.7	22.8				
60	C-HS2-C10-8	113011	0945	GW		X	1	1						159.7	0.12	5.1	23.1				

Containers Prepared/ Relinquished:	Date/Time: 950 11/29/11	Received:	Date/Time: 1500 112911
Relinquished:	Date/Time: 1335 120111	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:

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SOUTHERN ANALYTICAL LABORATORIES, INC.

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

SAL Project No. 1111095

Client Name: Hazen and Sawyer

Contact / Phone:

Project Name / Location: Seminole County C-HS2

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

	Sample Description	Date	Time	Matrix	Composite	Grab	1LP, Cool Total Alkalinity, Chloride	250mL P, H_2SO_4 TKN, NH_3, NO_x	1LP, Cool Total Alkalinity, Cl, F, NO_3, OP, SO_4	250mL P, H_2SO_4 TKN, NH_3, NO_x	40mLaV, HCl TOC	250mLaG, Cool DOC	250mL P, HNO_3 B, Ca, Fe, Mg, Mn, K, Na	Field Conductivity	Field DO	Field pH	Field Temperature
61	C-HS2-C10-12	113011	0955	GW		X	1	1						130.3	0.66	4.7	24.0
62	C-HS2-C11-5	113011	0905	GW		X	1	1						133.4	0.71	5.3	21.8
63	C-HS2-C11-7	113011	0915	GW		X	1	1						234.5	0.66	5.3	22.4
64	C-HS2-C11-10	113011	0925	GW		X	1	1						132.8	0.22	5.2	22.7
65	C-HS2-D04-5	113011	0736	GW		X			1	1	2	1	1	656	0.08	5.7	23.2
66	C-HS2-D04-7	113011	0745	GW		X	1	1						379.1	0.07	5.9	23.3
67	C-HS2-D04-10	113011	0755	GW		X	1	1						168.9	0.47	5.8	23.1
68	C-HS2-D07-6	113011	0805	GW		X	1	1						541	0.23	6.2	22.4
69	C-HS2-D07-6-Dup	113011	0810	GW		X	1	1						541	0.23	6.2	22.4
70	C-HS2-D07-8	113011	0820	GW		X	1	1						336.8	0.41	6.0	22.9
71	C-HS2-D07-11	113011	0825	GW		X	1	1						130.3	0.54	5.9	23.3
72	FB-Tap	120111	1100	R		X	1	1						329.3	5.24	8.2	21.7

Relinquished:	Date/Time:	Received:	Date/Time:
Containers Prepared/ Relinquished: YB	Date/Time: 1000 11/29/11	Received:	Date/Time: 1500 112911
Relinquished:	Date/Time: 1335 120111	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:

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SOUTHERN ANALYTICAL LABORATORIES, INC.

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

SAL Project No. 1111095

Client Name: Hazen and Sawyer

Contact / Phone:

Project Name / Location: Seminole County C-HS2

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

	Sample Description	Date	Time	Matrix	Composite	Grab	1LP, Cool Total Alkalinity, Chloride	250mL P, H_2SO_4 TKN, NH_3, NO_x	1LP, Cool Total Alkalinity, Cl, F, NO_3, OP, SO_4	250mL P, H_2SO_4 TKN, NH_3, NO_x	40mLaV, HCl TOC	250mLaG, Cool DOC	250mL P, HNO_3 B, Ca, Fe, Mg, Mn, K, Na	Field Conductivity	Field DO	Field pH	Field Temperature				
73	FB-DI	120111	1110	R		X	1	1						2.8	8.47	8.0	16.2				
74	EB	113011	0730	R		X	1	1						3.9	5.23	7.7	13.2				

Containers Prepared/ Relinquished: 9B	Date/Time: 1000 11/29/11	Received:	Date/Time: 1500 112911
Relinquished:	Date/Time: 1335 120111	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:

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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. 1111095

Client Name: Hazen and Sawyer

Contact / Phone:

Project Name / Location: Seminole County C-HS2

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

	Sample Description	Date	Time	Matrix	Composite	Grab	1LP, Cool Total Alkalinity, Chloride	250mL P, H_2SO_4 TKN, NH_3, NO_x	1LP, Cool Total Alkalinity, Cl, F, NO_3, OP, SO_4	250mL P, H_2SO_4 TKN, NH_3, NO_x	40mLaV, HCl TOC	250mLaG, Cool DOC	250mL P, HNO_3 B, Ca, Fe, Mg, Mn, K, Na	Field Conductivity	Field DO	Field pH	Field Temperature				
25	C-HS2-A11-10	113011	1505	GW		X	1	1						134.6	0.08	6.2	23.6				
26	C-HS2-A13-5	113011	1435	GW		X	1	1						304.8	0.05	5.8	22.6				
27	C-HS2-A13-7	113011	1445	GW		X	1	1						170.3	0.11	5.5	22.9				
28	C-HS2-A13-10	113011	1450	GW		X	1	1						131.4	0.07	4.8	23.2				
29	C-HS2-B02-6	113011	1200	GW		X	1	1						385.4	0.11	5.8	22.6				
30	C-HS2-B02-8	113011	1210	GW		X	1	1						611	0.10	6.7	22.7				
31	C-HS2-B02-11	113011	1215	GW		X	1	1						200.4	0.23	6.6	23.1				
32	C-HS2-B06-6	113011	1230	GW		X	1	1						631	0.42	5.6	23.3				
33	C-HS2-B06-8	113011	1240	GW		X	1	1						174.8	0.36	5.7	23.6				
34	C-HS2-B06-11	113011	1250	GW		X	1	1						156.6	0.36	4.6	23.6				
35	C-HS2-B08-5	113011	1310	GW		X			1	1	2	1	1	445.2	0.19	6.0	22.2				
36	C-HS2-B08-5-Dup	113011	1315	GW		X			1	1	2	1	1	445.2	0.19	6.0	22.2				

Containers Prepared/ Relinquished:	Date/Time:	Received:	Date/Time:
HH	1055 11-29-11		1129 1500
	1335 120111		

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:

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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. 1111095

Client Name: Hazen and Sawyer

Contact / Phone:

Project Name / Location: Seminole County C-HS2

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

	Sample Description	Date	Time	Matrix	Composite	Grab	1LP, Cool Total Alkalinity, Chloride	250mL P, H_2SO_4 TKN, NH_3, NO_x	1LP, Cool Total Alkalinity, Cl, F, NO_3, OP, SO_4	250mL P, H_2SO_4 TKN, NH_3, NO_x	40mLaV, HCl TOC	250mLaG, Cool DOC	250mL P, HNO_3 B, Ca, Fe, Mg, Mn, K, Na	Field Conductivity	Field DO	Field pH	Field Temperature				
37	C-HS2-B08-7	113011	1320	GW		X	1	1						281.6	0.08	6.1	22.6				
38	C-HS2-B08-10	113011	1330	GW		X	1	1						139.9	0.19	6.2	22.8				
39	C-HS2-B10-5	113011	1340	GW		X	1	1						722	0.05	6.4	22.8				
40	C-HS2-B10-7	113011	1350	GW		X	1	1						205.1	0.80	6.6	23.0				
41	C-HS2-B10-10	113011	1355	GW		X	1	1						137.4	0.14	5.9	23.0				
42	C-HS2-B15-5	113011	1405	GW		X	1	1						132.0	0.08	4.7	22.7				
43	C-HS2-B15-7	113011	1415	GW		X	1	1						149.4	0.07	4.8	23.1				
44	C-HS2-B15-10	113011	1425	GW		X	1	1						126.0	0.16	4.6	23.4				
45	C-HS2-C00-5	113011	1130	GW		X	1	1						319.7	0.03	6.0	24.7				
46	C-HS2-C00-7	113011	1140	GW		X	1	1						433.7	0.02	5.5	24.8				
47	C-HS2-C00-7-Dup	113011	1145	GW		X	1	1						433.7	0.02	5.5	24.8				
48	C-HS2-C00-10	113011	1150	GW		X	1	1						171.9	0.02	5.3	24.9				

Containers Prepared/ Relinquished:	Date/Time:	Received:	Date/Time:
HH	1010 11-29-11		1500 11-29-11
Relinquished:	Date/Time: 1335 120111	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:

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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. 1111095

Client Name: Hazen and Sawyer

Contact / Phone:

Project Name / Location: Seminole County C-HS2

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

	Sample Description	Date	Time	Matrix	Composite	Grab	1LP, Cool Total Alkalinity, Chloride	250mL P, H_2SO_4 TKN, NH_3, NO_x	1LP, Cool Total Alkalinity, Cl, F, NO_3, OP, SO_4	250mL P, H_2SO_4 TKN, NH_3, NO_x	40mLaV, HCl TOC	250mLaG, Cool DOC	250mL P, HNO_3 B, Ca, Fe, Mg, Mn, K, Na	Field Conductivity	Field DO	Field pH	Field Temperature				
49	C-HS2-C04-5	113011	1100	GW		X	1	1						338.6	0.05	5.8	22.7				
50	C-HS2-C04-7	113011	1110	GW		X	1	1						161.6	0.03	5.5	23.0				
51	C-HS2-C04-10	113011	1120	GW		X	1	1						139.8	0.03	5.5	23.0				
52	C-HS2-C06-5	113011	1030	GW		X			1	1	2	1	1	577	0.13	5.7	21.6				
53	C-HS2-C06-7	113011	1040	GW		X	1	1						361.3	0.26	6.0	21.8				
54	C-HS2-C06-10	113011	1050	GW		X	1	1						130.3	0.25	5.3	22.6				
55	C-HS2-C08-5	113011	1000	GW		X	1	1						353.0	0.67	5.9	21.6				
56	C-HS2-C08-5-Dup	113011	1005	GW		X	1	1						353.0	0.67	5.9	21.6				
57	C-HS2-C08-7	113011	1010	GW		X	1	1						255.0	0.40	6.3	22.1				
58	C-HS2-C08-10	113011	1020	GW		X	1	1						134.1	0.33	6.0	22.4				
59	C-HS2-C10-6	113011	0935	GW		X			1	1	2	1	1	209.6	0.11	5.7	22.8				
60	C-HS2-C10-8	113011	0945	GW		X	1	1						159.7	0.12	5.1	23.1				

Relinquished:	Date/Time:	Received:	Date/Time:
Containers Prepared/ Relinquished: 9B	Date/Time: 950 11/29/11	Received:	Date/Time: 1500 112911
Relinquished:	Date/Time: 1335 120111	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:

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Chain of Custody.xls
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	Sample Description	Date	Time	Matrix	Composite	Grab	1LP, Cool Total Alkalinity, Chloride	250mL P, H_2SO_4 TKN, NH_3, NO_x	1LP, Cool Total Alkalinity, Cl, F, NO_3, OP, SO_4	250mL P, H_2SO_4 TKN, NH_3, NO_x	40mLaV, HCl TOC	250mLaG, Cool DOC	250mL P, HNO_3 B, Ca, Fe, Mg, Mn, K, Na	Field Conductivity	Field DO	Field pH	Field Temperature				
61	C-HS2-C10-12	113011	0955	GW		X	1	1						130.3	0.66	4.7	24.0				
62	C-HS2-C11-5	113011	0905	GW		X	1	1						133.4	0.71	5.3	21.8				
63	C-HS2-C11-7	113011	0915	GW		X	1	1						234.5	0.66	5.3	22.4				
64	C-HS2-C11-10	113011	0925	GW		X	1	1						132.8	0.22	5.2	22.7				
65	C-HS2-D04-5	113011	0736	GW		X			1	1	2	1	1	656	0.08	5.7	23.2				
66	C-HS2-D04-7	113011	0745	GW		X	1	1						379.1	0.07	5.9	23.3				
67	C-HS2-D04-10	113011	0755	GW		X	1	1						168.9	0.47	5.8	23.1				
68	C-HS2-D07-6	113011	0805	GW		X	1	1						541	0.23	6.2	22.4				
69	C-HS2-D07-6-Dup	113011	0810	GW		X	1	1						541	0.23	6.2	22.4				
70	C-HS2-D07-8	113011	0820	GW		X	1	1						336.8	0.41	6.0	22.9				
71	C-HS2-D07-11	113011	0825	GW		X	1	1						130.3	0.54	5.9	23.3				
72	FB-Tap	120111	1100	R		X	1	1						329.3	5.24	8.2	21.7				

Relinquished	Date/Time	Received	Date/Time
Containers Prepared/ Relinquished: YB	Date/Time: 1000 11/29/11	Received:	Date/Time: 1500 112911
Relinquished:	Date/Time: 1335 120111	Received:	Date/Time:
Relinquished:	Date/Time:	Received:	Date/Time:
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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:

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PARAMETER / CONTAINER DESCRIPTION

	Sample Description	Date	Time	Matrix	Composite	Grab	1LP, Cool Total Alkalinity, Chloride	250mL P, H_2SO_4 TKN, NH_3, NO_x	1LP, Cool Total Alkalinity, Cl, F, NO_3, OP, SO_4	250mL P, H_2SO_4 TKN, NH_3, NO_x	40mLaV, HCl TOC	250mLaG, Cool DOC	250mL P, HNO_3 B, Ca, Fe, Mg, Mn, K, Na	Field Conductivity	Field DO	Field pH	Field Temperature				
73	FB-DI	120111	1110	R		X	1	1						2.8	8.47	8.0	16.2				
74	EB	113011	0730	R		X	1	1						3.9	5.23	7.7	13.2				

Containers Prepared/ Relinquished: 9B	Date/Time: 1000 11/29/11	Received:	Date/Time: 1500 112911
Relinquished:	Date/Time: 1335 120111	Received:	Date/Time:
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Instructions / Remarks:

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Appendix C: Weather Station Data

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Table C.1
Monthly Recorded Meteorological Data
Sheffield in the Crossings, Longwood, FL

Period	Temp high (°F)	Temp avg (°F)	Temp low (°F)	Humidity high (%)	Humidity avg (%)	Humidity low (%)	Wind high (mph)	Wind avg (mph)	Rain max (in)	Rain total (in)
Jan-10	65	52	41	90	73	48	18	5	0.61	2.31
Feb-10	64	53	42	92	73	49	19	5	0.94	3.52
Mar-10	72	60	49	93	71	43	20	6	3.43	7.22
Apr-10	84	71	59	95	73	44	17	4	1.45	3.34
May-10	91	78	69	93	76	50	16	4	1.82	3.88
Jun-10	95	82	73	95	79	50	18	3	0.97	5.15
Jul-10	94	82	75	96	80	56	15	3	1.29	4.26
Aug-10	94	84	76	96	80	56	79	3	2.23	4.37
Sep-10	92	80	72	97	81	53	17	3	0.79	3.35
Oct-10	87	72	61	95	72	40	15	3	0.00	0.00
Nov-10	77	64	54	94	78	53	15	3	1.10	2.09
Dec-10	63	49	37	89	70	44	18	5	0.47	0.62
Jan-11	68	57	45	92	74	48	19	4	1.27	4.18
Feb-11	76	62	52	95	76	49	17	4	1.27	1.78
Mar-11	80	66	55	94	73	46	16	4	3.61	5.57
Apr-11	88	74	62	95	71	41	17	4	0.55	0.65
May-11	92	77	65	94	68	38	18	3	0.58	1.21
Jun-11	92	80	71	96	77	51	15	2	1.99	6.50
Jul-11	95	86	76	95	68	50	15	2	2.65	3.99
Aug-11	95	84	76	96	78	53	17	3	1.28	6.02
Sep-11	92	80	72	97	80	51	15	2	1.71	7.19
Oct-11	81	70	62	94	78	54	16	3	5.37	7.90
Nov-11	76	66	57	94	79	57	16	3	0.13	0.27

Source: www.wunderground.com

Appendix D: Field Parameter Analyses

Table D.1
Field Parameter Results
(November 30, 2011 and December 1, 2011)

	Sample Identification	Temperature (°C)	pH	Specific Conductance (µS)	Dissolved Oxygen (mg/L)
1	C-HS2-STE	21.3	7.4	906	0.9
2	C-HS2-STE-DUP	21.3	7.4	906	0.9
3	C-HS2-SW-6 inch	21.1	6.5	304	5.6
4	C-HS2-SW-M	19.8	7.1	345	6.4
5	C-HS2-BKG01	22.3	5.6	267	0.3
6	C-HS2-BKG02	21.1	7.3	418	0.1
7	C-HS2-BKG03	22.6	5.9	346	0.1
8	C-HS2-BKG04	21.4	5.3	268	0.1
9	C-HS2-BKG06	22.9	6.4	402	0.3
10	C-HS2-A07-6	19.9	6.3	263	5.5
11	C-HS2-A07-8	22.9	6.3	695	0.2
12	C-HS2-A07-11	23.1	5.8	167	0.2
13	C-HS2-A09-7	22.1	6.4	390	0.6
14	C-HS2-A09-7-DUP	22.1	6.4	390	0.6
15	C-HS2-A09-9	22.6	6.5	254	0.7
16	C-HS2-A09-12	22.7	6.2	135	0.7
	C-HS2-A10-7	Dry			
17	C-HS2-A10-9	22.7	6.6	622	0.6
18	C-HS2-A10-12	23.1	6.3	145	0.5
	C-HS2-A11-5	Dry			
19	C-HS2-A11-7	23.2	6.0	357	0.3
20	C-HS2-A11-10	23.6	6.2	135	0.1
21	C-HS2-A13-5	22.6	5.8	305	0.1
22	C-HS2-A13-7	22.9	5.5	170	0.1
23	C-HS2-A13-10	23.2	4.8	134	0.1
24	C-HS2-B02-6	22.6	5.8	385	0.1

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	Sample Identification	Temperature (°C)	pH	Specific Conductance (µS)	Dissolved Oxygen (mg/L)
25	C-HS2-B02-8	22.7	6.7	611	0.1
26	C-HS2-B02-11	23.1	6.6	200	0.2
27	C-HS2-B06-6	23.3	5.6	631	0.4
28	C-HS2-B06-8	23.6	5.7	175	0.4
29	C-HS2-B06-11	23.6	4.6	157	0.4
30	C-HS2-B08-5	22.2	6.0	445	0.2
31	C-HS2-B08-5-DUP	22.2	6.0	445	0.2
32	C-HS2-B08-7	22.6	6.1	282	0.1
33	C-HS2-B08-10	22.6	6.2	140	0.2
34	C-HS2-B10-5	22.8	6.4	722	0.1
35	C-HS2-B10-7	23.0	6.6	205	0.8
36	C-HS2-B10-10	23.0	5.9	137	0.7
37	C-HS2-B15-5	22.7	4.7	132	0.1
38	C-HS2-B15-7	23.1	4.8	149	0.1
39	C-HS2-B15-10	23.4	4.6	126	0.2
40	C-HS2-C00-5	24.7	6.0	320	0.1
41	C-HS2-C00-7	24.8	5.5	434	0.1
42	C-HS2-C00-7-DUP	24.8	5.5	434	0.1
43	C-HS2-C00-10	24.9	5.3	172	0.1
44	C-HS2-C04-5	22.7	5.8	339	0.1
45	C-HS2-C04-7	23.0	5.3	162	0.1
46	C-HS2-C04-10	23.0	5.5	140	0.1
47	C-HS2-C06-5	21.6	5.7	577	0.1
48	C-HS2-C06-7	21.8	6.0	361	0.3
49	C-HS2-C06-10	22.6	5.3	130	0.2
50	C-HS2-C08-5	21.6	5.9	353	0.7
51	C-HS2-C08-5-DUP	21.6	5.9	353	0.7
52	C-HS2-C08-7	22.1	6.3	255	0.4
53	C-HS2-C08-10	22.4	6.0	134	0.3
54	C-HS2-C10-6	22.8	5.7	210	0.1
55	C-HS2-C10-8	23.1	5.1	160	0.1
56	C-HS2-C10-11	24.0	4.7	130	0.7
57	C-HS2-C11-5	21.8	5.3	133	0.7

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	Sample Identification	Temperature (°C)	pH	Specific Conductance (µS)	Dissolved Oxygen (mg/L)
58	C-HS2-C11-7	22.4	5.3	234	0.7
59	C-HS2-C11-10	22.7	5.2	133	0.2
60	C-HS2-D04-5	23.2	5.7	656	0.1
61	C-HS2-D04-7	23.3	5.9	379	0.1
62	C-HS2-D04-10	23.1	5.8	169	0.5
63	C-HS2-D07-6	22.4	6.2	541	0.2
64	C-HS2-D07-6-DUP	22.4	6.2	541	0.2
65	C-HS2-D07-8	22.9	6.0	337	0.4
66	C-HS2-D07-11	23.3	5.9	130	0.5
67	C-HS2-BKG07-5	21.2	5.7	192	0.1
68	C-HS2-BKG07-7	21.8	5.9	199	0.1
69	C-HS2-BKG07-10	22.3	5.2	179	0.1
70	FB-TAP	21.7	8.2	329	5.2
71	FB-DI	16.2	8.0	3	8.5
72	EB	13.2	7.7	4	5.2

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