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June 23, 2017

Mr. Steve Tafuni
Southwest District Office
Florida Department of Environmental Protection
13051 N. Telecom Parkway
Temple Terrace, FL 33637-0926

Re: **Review of Semi-Annual Sampling Results**
First Half 2017 Sampling Event
Hardee County Landfill
WACS Facility ID No. SWD/25/40612
Permit No. 38414-016-SO/01

Dear Mr. Tafuni:

On behalf of the Hardee County Solid Waste Department, Atkins presents this review of the results of the first half of 2017 sampling event for the facility referenced above. This document is designed to comply with the requirements of Appendix 3-Water Quality Monitoring Plan, included with the facility's operation permit, and was compiled in general accordance with the guidelines promulgated in Chapter 62-701.510(9)(a) of the Florida Administrative Code (FAC).

BACKGROUND

The Hardee County Solid Waste Disposal Facility is an active Class I landfill, which encompasses approximately 100 acres of land at 685 Airport Road in Hardee County, Florida. In November 2013, the County received a construction permit (38414-015-SC/01) for Phase II Section II Construction. Phase II Section II is located along the west side of the current waste placement area. Also in November 2013, the County received an operation permit associated with the Phase II Sections I & II operation. In 2014, the County completed construction of the waste cell for Phase II Section II. This required abandonment of two existing monitoring wells, abandonment of multiple piezometers, and installation of two new monitoring wells. According to the facility's operating permit (38414-016-SO/01), the water quality monitoring network is designed to monitor the groundwater in the surficial aquifer and the surface water.

The groundwater monitoring network includes eight monitoring wells, which are designated MW-1, MW-2, MW-4, MW-10R, MW-11, MW-12R, MW-13, and MW-14. The facility's permit designates MW-1 and MW-4 as background wells and the other wells as detection wells. Item 3 of Appendix 3-Water Quality Monitoring Plan lists the monitoring wells and piezometers applicable to the facility's current operation permit.

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There are two other monitoring wells, MW-6 and MW-7, which are designated by the permit as piezometers, along with 12 other piezometers. Please note that the following former piezometers have been abandoned and are no longer included in the operating permit: PZ-1, PZ-2, PZ-3, PZ-4, PZ-5, PZ-6, PZ-9, PZ-10, PZ-15, and PZ-16. The layout of the site is presented in **Figure 1**.

Item 4 of Appendix 3-Water Quality Monitoring Plan of the facility's operation permit specifies that groundwater samples shall be collected from the monitoring wells on a semi-annual basis. The groundwater samples are analyzed for the analytes listed on the 40 Code of Federal Regulations (CFR) Part 258, Appendix I, as well as for total ammonia, iron, chlorides, mercury, nitrate, sodium, and total dissolved solids (TDS). These analytes are also listed in Item 4 of Appendix 3 of the facility's operation permit.

Item 8 of Appendix 3-Water Quality Monitoring Plan of the facility's operation permit calls for the collection of a surface water sample from one location, which is designated SW-2. The surface water samples are normally collected during both semi-annual sampling events during the year if sufficient water is present.

The groundwater and surface water sampling points are illustrated in **Figure 1**.

FIRST HALF 2017 SAMPLING EVENT

The first half of 2017 sampling event was conducted on May 17 and 18, 2017. Groundwater samples were collected during this event. The groundwater samples were collected in general accordance with the Florida Department of Environmental Protection (FDEP) Standard Operating Procedure for Field Activities (SOP 001/01). Sample collection was performed by Atkins personnel, and analysis was performed by Flowers Chemical Laboratories, Inc. (FCL). FCL is a NELAC-certified laboratory. A FDEP Water Quality Monitoring Certification form for the sampling event is provided in **Attachment A**.

Sample Collection Methodology

Prior to sampling the monitoring wells, each well was purged with a peristaltic pump using the "low-flow" method. A minimum equivalent of one to three well volumes was purged from each well prior to sample collection. Temperature, pH, conductivity, dissolved oxygen (DO), and turbidity measurements were monitored and recorded throughout the purging process to ensure that representative water samples were collected. The groundwater samples were given identifiers which corresponded to the well of origin. Depth-to-groundwater measurements were made from the top-of-casing (TOC) at each monitoring well prior to initiating the purging process. Water level readings were also made at the piezometers listed in the permit. The water level measurements were subtracted from the TOC elevations to determine the elevation of the water table at each well and piezometer. The TOC elevations are referenced in feet above the National Geodetic Vertical Datum (NGVD). The groundwater sampling logs and field equipment calibration logs are provided in **Attachment B**.

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All of the samples were placed in laboratory-prepared containers, placed on ice, and transferred to FCL for analysis of the analytes listed in the applicable sections of the facility's operation permit.

FIRST HALF 2017 SAMPLING EVENT RESULTS

Groundwater Flow Pattern

Depth to groundwater measurements were collected at the eight monitoring wells and at 12 piezometers during this sampling event. The groundwater level elevation data from this event are presented in **Table 1**. The groundwater elevation data were plotted and contoured to generate the groundwater elevation contour map presented in **Figure 2**. Piezometers P-18 and P-21 were dry, and both appeared to be blocked or clogged at the bottom. The data indicated that the groundwater in the surficial aquifer beneath the landfill was flowing in a southerly direction at the time of this sampling event. The groundwater also appeared to be flowing to the southeast, toward a wetland area east of the landfill. The water table gradient measured approximately 0.0014 feet per foot beneath the site (as measured between well MW-1 and well MW-10R). Water level elevation measurements were also performed at two staff gauges located in ponds on the site (SG-1 and SG-2). However, the pond at SG-1 was dry, so no water level information could be collected there.

Sampling Results

A description of the detections in the groundwater is presented below.

Groundwater Analytical Results

There were numerous inorganic analytes detected, but no organic analytes detected, in the groundwater samples collected and analyzed during this sampling event. The inorganic analyte detections included all of those which are typically part of the analytical program except antimony, beryllium, cadmium, lead, mercury, selenium, silver, and thallium. At least one inorganic analyte was detected at every well in the monitoring network.

The concentrations of all of the analytes that were detected in the groundwater were compared to their respective Maximum Contaminant Levels (MCLs) or Secondary Drinking Water Standard (SDWS) in accordance with the Florida statutes. The MCLs and SDWSs for Drinking Water Standards, Monitoring, and Reporting are promulgated by Chapter 62-550 of the Florida Administrative Code (FAC). Not every parameter has an MCL or SDWS. There were four analytes detected at concentrations that did not comply with their standards – pH, iron, arsenic, and vanadium. Iron, pH, and TDS have SDWS criteria, while the criteria for arsenic is provided as an MCL in Chapter 62-550 FAC. A description of the detection patterns with these four analytes is described below.

- pH - The standard for pH is any value within the range of 6.5 to 8.5 Standard Units (SU). The pH values at seven of the eight wells were less than 6.5 SU, and the pH measured as low as 4.52 SU at well MW-11. The pH value at well MW-2 was within the standard

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range. The pH values at both of the background wells, MW-1 (with a pH of 4.90 SU) and MW-4 (with a pH of 5.48 SU), were lower than the standard range.

- Iron - The standard for iron is 0.3 milligrams per liter (mg/L). The iron concentrations in the samples collected at all of the wells exceeded the standard. The iron concentrations at both of the background wells (MW-1 and MW-4) were well above the standard. The iron concentrations ranged from 0.403 mg/L (at MW-12R) to 29.3 mg/L (at MW-10R).

- Arsenic – Monitoring at this site has been closely tracking arsenic concentrations in MW-4. The standard for arsenic is 0.01 mg/L. The arsenic concentrations in three wells (MW-1, MW-4, and MW-12R) exceeded the standard, with the highest arsenic concentration (of 0.0212 mg/L) at MW-12R. MW-1 and MW-4 are both background wells. For the past multiple sampling events, the arsenic concentration in MW-4 has slightly exceeded that standard, and that trend continued during this sampling event. The arsenic concentration in MW-4 during May 2017 was 0.015 mg/L, which compares closely with the two previous arsenic values (0.0142 mg/L and 0.0128 mg/L, respectively). Arsenic concentrations did not exceed the standard at MW-1 and MW-12R during the previous two years.

- Vanadium - The standard for vanadium is 0.049 mg/L. The vanadium concentration in one well (MW-1) exceeded the standard, with a concentration of 0.0892 mg/L. MW-1 is a background well. In the previous two years, the highest vanadium concentration at MW-1 was 0.0261 mg/L. The monitoring program will continue to track the vanadium concentration at MW-1.

A summary of the groundwater analytical results is presented in **Table 2**, and the laboratory analytical reports are provided in **Attachment C**.

Surface Water Analytical Results

Due to the lack of any nearby surface water, no surface water was available for sampling at sampling location SW-2. Due to the extended drought that has occurred over the past several months (prior to June 2017) in central Florida, no surface water was present within 50 feet of the SW-2 location. The upstream stormwater pond and the downstream drainage swale were both dry. Sampling of surface water will be attempted again during the Second Half 2017 sampling event.

SUMMARY AND CONLUSIONS

The results of the first half of 2017 sampling event at the Hardee County Solid Waste Disposal Facility were generally consistent with those of the recent sampling events, with numerous inorganic analyte detections in the groundwater.

There were four analytes detected in the groundwater that did not comply with their regulatory standards: arsenic, pH, iron, and vanadium were detected in the groundwater at concentrations in excess of their regulatory criteria. It should be noted that the primary parameters that were not in

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compliance with their standards in the groundwater (pH and iron) were also not in compliance with their standards in both of the background monitoring wells. The exceedance for vanadium was only at the background monitoring well (MW-1). Two of the three arsenic exceedances occurred in the background monitoring wells (MW-1 and MW-4).

Based on these findings, the facility does not appear to be having a significant effect on groundwater quality. Atkins recommends that the analytical results in future sampling events be evaluated closely for any developing trends. If you have any questions regarding the information presented in this report, please call me at (813) 281-8377.

Sincerely,

Bradley J. Bayne

Bradley J. Bayne, PG
Senior Scientist
Florida PG No. 1733

CC: Ken Wheeler, Project Manager, Hardee County Solid Waste Management Department, 685 Airport Road, Wauchula, FL 33873 (1 copy)
Steve Strickland, Hardee County Solid Waste Management Department, 685 Airport Road, Wauchula, FL 33873 (1 copy)
File 100053538

TABLES

Table 1
Groundwater Elevation Data
Hardee County Landfill
First Half 2017

Well Identifier	Top-of-Casing Elevation (Ft-NGVD)	Ground Surface Elevation (Ft-NGVD)	Total Depth (Ft-TOC)	Well Diameter (Inches)	Depth to Groundwater (Ft below TOC)	Groundwater Elevation (Ft-NGVD)
Monitoring Wells						
MW-1	87.97	86.24	11.00	4	9.09	78.88
MW-2	85.86	83.75	10.50	4	9.91	75.95
MW-4	87.16	84.09	18.90	2	9.64	77.52
MW-10R	88.56	85.49	15.12	2	11.51	77.05
MW-11	88.11	85.17	13.90	2	11.23	76.88
MW-12R	89.00	85.71	23.25	2	11.90	77.10
MW-13	88.88	NM	23.00	2	11.73	77.15
MW-14	88.16	NM	23.00	2	10.81	77.35
Piezometers						
MW-6	88.25	85.06	NA	2	11.59	76.66
MW-7	87.88	84.98	NA	2	11.22	76.66
P-7	84.47	82.41	NA	2	8.70*	75.77
P-8	85.32	83.25	NA	2	9.73	75.59
P-11	88.69	86.16	NA	2	11.43	77.26
P-13	87.96	87.98	NA	2	10.99	76.97
P-14	87.31	84.05	NA	2	10.41	76.90
P-17	88.82	85.88	NA	2	9.45	79.37
P-18	88.74	84.37	NA	2	DRY**	ND
P-19	86.73	84.14	NA	2	6.49	80.24
P-20	87.6	84.68	NA	2	7.46	80.14
P-21	86.63	83.57	NA	2	DRY**	ND
P-22	87.04	84.09	NA	2	10.24	76.80
P-23	86.45	83.71	NA	2	10.44	76.01
Staff Gauges						
SG-1	80.51#	NA	NA	NA	DRY**	ND
SG-2	78.57#	NA	NA	NA	+0.2***	78.77

* = casing cut off # = lag bolt/zero elevation ** = dry, no data (ND)

*** = bottom of gauge in mud, elevation estimated

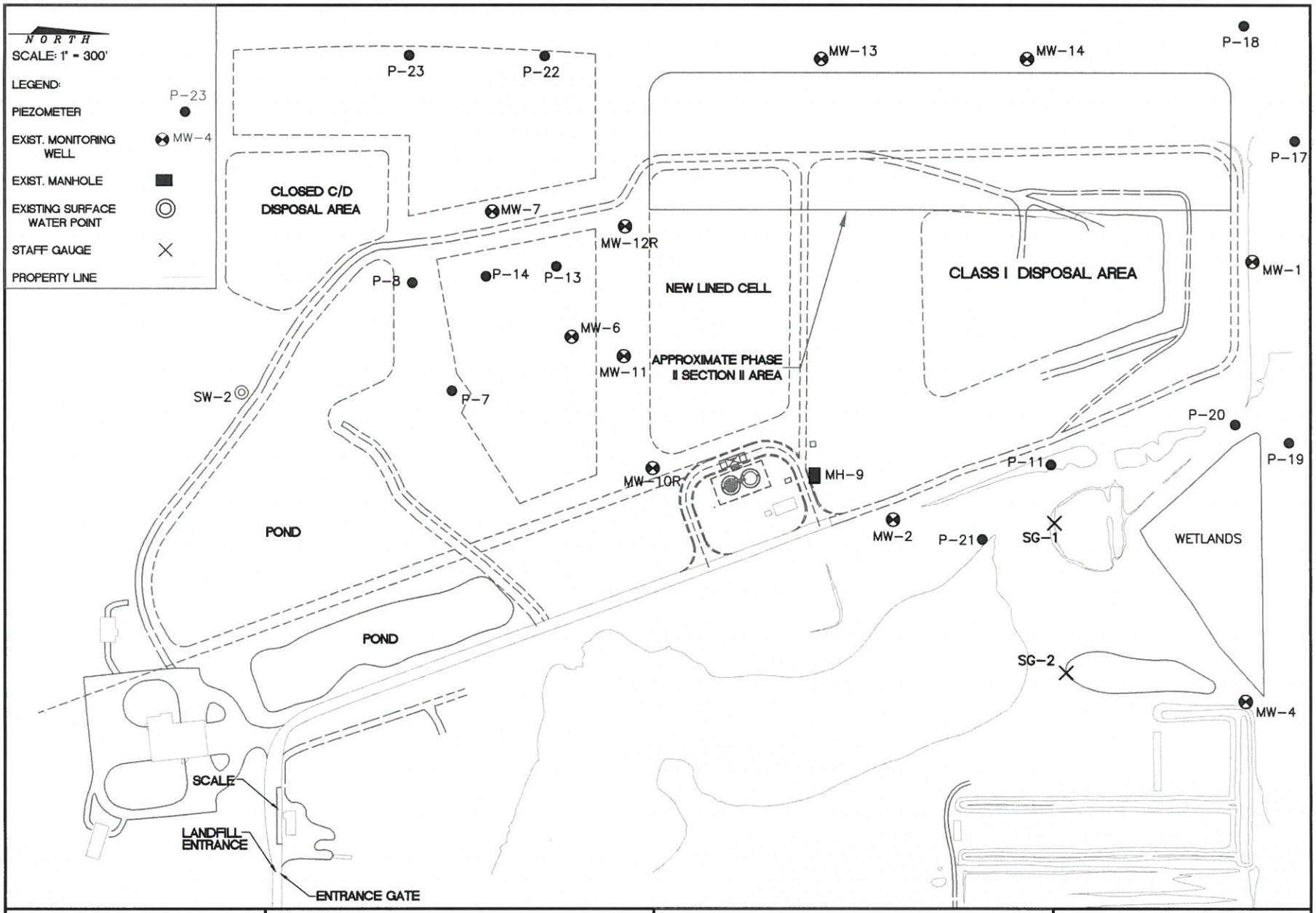
Table 2
Groundwater Analytical Summary
Hardee County Landfill
First Half 2017

Analyte		Monitoring Well:	MW-1	MW-2	MW-4	MW-10R	MW-11	MW-12R	MW-13	MW-14
		Sample Date:	5/17/2017	5/17/2017	5/17/2017	5/18/2017	5/18/2017	5/17/2017	5/17/2017	5/17/2017
	Standard[1]	Units								
Field Measurements										
Groundwater Elevation		ft	78.88	75.95	77.52	77.05	76.88	77.10	77.15	77.35
Temperature		deg. C	25.37	24.19	23.01	25.98	24.35	26.24	25.79	24.77
pH	6.5-8.5	STD	**4.90**	6.66	**5.48**	**5.63**	**4.52**	**6.11**	**4.53**	**4.78**
Conductivity		uS/cm	128	537	202	359	141	454	108	220
Dissolved Oxygen (DO)		mg/l	1.80	0.80	1.74	1.18	1.05	1.75	0.78	1.23
Turbidity		NTU	18.90	8.26	3.97	3.47	19.1	6.95	10.60	4.11
Inorganics (Appendix I parameters only)										
Nitrate (as N)	10	mg/l	0.0279	0.0109 I	0.189	0.0100 U	0.0411	0.0376	0.0133 I	0.0100 U
TDS	500	mg/l	196	358	204	206	128	326	98.0	172
Chloride	250	mg/l	23.3	27.6	11.3	35.9	15.8	13.7	5.82 I	11.5
Antimony	0.006	mg/l	0.00200 U	0.00200 U	0.00200 U	0.00200 U	0.00200 U	0.00200 U	0.00200 U	0.00200 U
Arsenic	0.01	mg/l	**0.0104**	0.0028	**0.015**	0.003	0.0024	**0.0212**	0.00100 U	0.00100 U
Barium	2	mg/l	0.0153	0.0161	0.0069	0.0154	0.0143	0.00200 U	0.00200 U	0.0089
Beryllium	0.004	mg/l	0.000500 U	0.000500 U	0.000500 U	0.000500 U	0.000500 U	0.000500 U	0.000500 U	0.000500 U
Cadmium	0.005	mg/l	0.000200 U	0.000200 U	0.000200 U	0.000200 U	0.000200 U	0.000200 U	0.000200 U	0.000200 U
Chromium	0.1	mg/l	0.0207	0.00100 U	0.00610	0.00100 U	0.00100 U	0.00100 U	0.00100 U	0.00100 U
Cobalt	0.14	mg/l	0.00140 I	0.00100 U	0.00100 U	0.00100 U	0.00100 U	0.00100 U	0.00100 U	0.00100 U
Copper	1	mg/l	0.0273	0.00100 U	0.00100 U	0.00100 U	0.00100 U	0.00100 U	0.00100 U	0.00100 U
Lead	0.015	mg/l	0.00100 U	0.00100 U	0.00100 U	0.00100 U	0.00100 U	0.00100 U	0.00100 U	0.00100 U
Mercury	0.002	mg/l	0.0000200 U	0.0000200 U	0.0000200 U	0.0000200 U	0.0000200 U	0.0000200 U	0.0000200 U	0.0000200 U
Nickel	0.1	mg/l	0.0116	0.00190 I	0.00120 I	0.00100 U	0.00100 U	0.00100 U	0.00100 U	0.00100 U
Selenium	0.05	mg/l	0.00200 U	0.00200 U	0.00200 U	0.00200 U	0.00200 U	0.00200 U	0.00200 U	0.00200 U
Silver	0.1	mg/l	0.000500 U	0.000500 U	0.000500 U	0.000500 U	0.000500 U	0.000500 U	0.000500 U	0.000500 U
Thallium	0.002	mg/l	0.00100 U	0.00100 U	0.00100 U	0.00100 U	0.00100 U	0.00100 U	0.00100 U	0.00100 U
Vanadium	0.049	mg/l	**0.0892**	0.0023	0.0193	0.0021	0.006	0.0023	0.00100 U	0.00260
Zinc	5	mg/l	0.0142 I	0.0100 U	0.0100 U	0.0142 I	0.0481	0.0274	0.0100 U	0.0100 U
Ammonia (as N)	2.8	mg/l	0.0827	0.191	0.216	0.271	0.0621	0.141	0.0100 U	0.48
Iron	0.3	mg/l	**27.9**	**5.82**	**6.64**	**29.3**	**3.76**	**0.403**	**1.92**	**6.75**
Sodium	160	mg/l	9.92	13.5	5.89	18.1	8.08	8.53	4.46	9.22
Organics										
1,1,1,2-Tetrachloroethane		ug/l	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U
1,1,1-Trichloroethane	200	ug/l	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U
1,1,2,2-Tetrachloroethane		ug/l	0.100 U	0.100 U	0.100 U	0.100 U	0.100 U	0.100 U	0.100 U	0.100 U
1,1,2-Trichloroethane	5	ug/l	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U
1,1-Dichloroethane		ug/l	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U
1,1-Dichloroethene	7	ug/l	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U
1,2-Dichloroethane	3	ug/l	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U
1,2-Dichloropropane	5	ug/l	0.200 U	0.200 U	0.200 U	0.200 U	0.200 U	0.200 U	0.200 U	0.200 U
2-Butanone (MEK)		ug/l	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U
2-Hexanone		ug/l	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U
Acetone	6300	ug/l	5.00 U	5.00 U	5.00 U	5.00 U	5.00 U	5.00 U	5.00 U	5.00 U
Acrylonitrile		ug/l	0.300 U	0.300 U	0.300 U	0.300 U	0.300 U	0.300 U	0.300 U	0.300 U
Benzene	1	ug/l	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U
Bromochloromethane		ug/l	0.100 U	0.100 U	0.100 U	0.100 U	0.100 U	0.100 U	0.100 U	0.100 U
Bromodichloromethane		ug/l	0.100 U	0.100 U	0.100 U	0.100 U	0.100 U	0.100 U	0.100 U	0.100 U
Bromoform		ug/l	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U
Bromomethane		ug/l	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U
Carbon Disulfide		ug/l	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U
Carbon Tetrachloride	3	ug/l	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U
Chlorobenzene		ug/l	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U
Chloroethane		ug/l	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U
Chloroform		ug/l	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U
Chloromethane		ug/l	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U
Dibromochloromethane		ug/l	0.400 U	0.400 U	0.400 U	0.400 U	0.400 U	0.400 U	0.400 U	0.400 U
Dibromomethane		ug/l	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U
Ethylbenzene	700	ug/l	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U
Methyl Iodide		ug/l	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U
Methyl isobutyl ketone		ug/l	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U
Methylene chloride		ug/l	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U
Para-dichlorobenzene	75	ug/l	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U
Styrene	100	ug/l	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U
Tetrachloroethene	3	ug/l	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U
Toluene	1000	ug/l	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U
Trichloroethene	3	ug/l	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U
Trichlorofluoromethane		ug/l	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U
Vinyl Acetate		ug/l	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U	10.00 U
Vinyl chloride	1	ug/l	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U
Xylenes	10000	ug/l	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U
cis-1,2-Dichloroethene	70	ug/l	0.200 U	0.200 U	0.200 U	0.200 U	0.200 U	0.200 U	0.200 U	0.200 U
cis-1,3-Dichloropropene		ug/l	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U
o-Dichlorobenzene	600	ug/l	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U
trans-1,2-Dichloroethene	100	ug/l	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U
trans-1,3,-Dichloropropene		ug/l	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U
trans-1,4-Dichloro-2-butene		ug/l	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U
1,2,3 - Trichloropropane		ug/l	0.0200 U	0.0200 U	0.0200 U	0.0200 U	0.0200 U	0.0200 U	0.0200 U	0.0200 U
1,2 - Dibromoethane (EDB)		ug/l	0.0100 U	0.0100 U	0.0100 U	0.0100 U	0.0100 U	0.0100 U	0.0100 U	0.0100 U
1,2 - dibromo-3-chloropropane		ug/l	0.0200 U	0.0200 U	0.0200 U	0.0200 U	0.0200 U	0.0200 U	0.0200 U	0.0200 U

[1] - Maximum Contaminant Level (MCL) or Secondary Drinking Water Standard (SDWS), as established in Chapter 62-550. Analyte concentrations shown with shading represent an exceedance of the MCL or SDWS.

U = Compound was analyzed but not detected; I = Reported value is between the laboratory method detection limit and the laboratory practical quantitation limit

FIGURES



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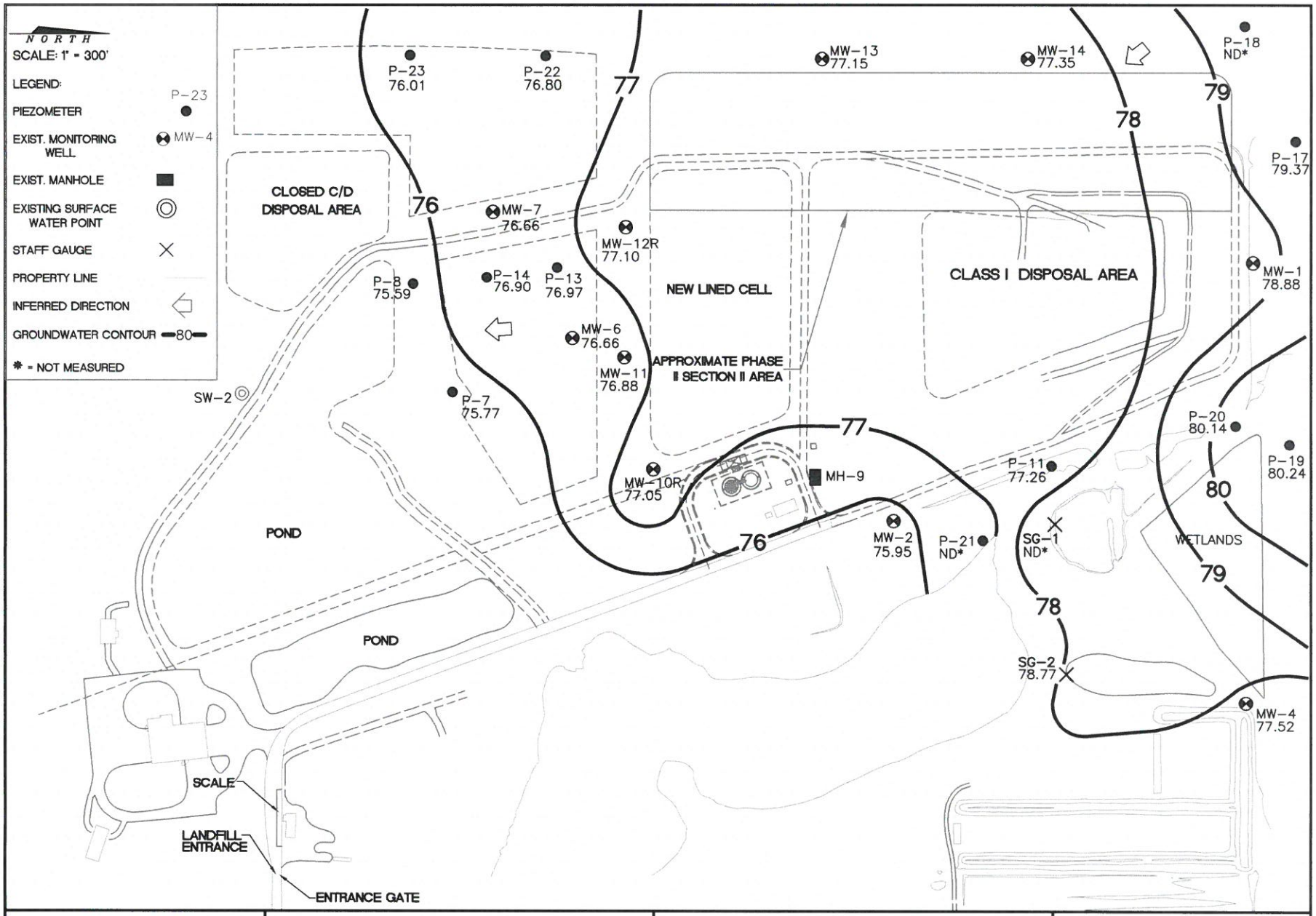
F:\COMMON\BRAD BAYNE\Hardee County Landfill\December 2015\FIG-1_MONITORING POINTS-12.15.dwg Jan 11, 2016 - 8:08am



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HARDEE COUNTY LANDFILL

WATER TABLE ELEVATION CONTOUR MAP FIRST HALF 2017

FIGURE 2

\\fustpa1000.wsatkins.com\tampa\env\COMMON\BRAD BAYNE\Hardee County Landfill\June 2017\FIG-1_MONITORING POINTS-First HALF 2017-05.25.dwg May 25, 2017 - 5:04pm

ATTACHMENT A

Ground Water Monitoring Report Form

Florida Department of Environmental Protection

Bob Martinez Center
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

DEP Form #: 62-701.900(31), F.A.C
Form Title: Water Quality Monitoring Certification
Effective Date: January 6, 2010
Incorporated in Rule 62-701.510(9), F.A.C.

WATER QUALITY MONITORING CERTIFICATION

PART I GENERAL INFORMATION

(1) Facility Name Hardee County Solid Waste Disposal Facility

Address 685 Airport Road

City Wauchula, FL Zip 33873 County Hardee

Telephone Number (863) 773-5089

(2) WACS Facility ID SWD-25-40612

(3) DEP Permit Number 38414-016-SO-01

(4) Authorized Representative's Name Bradley J. Bayne, P.G. Title Senior Geologist

Address Atkins North Amercia, 4030 West Boy Scout Boulevard, Suite 700

City Tampa, FL Zip 33607 County Hillsborough

Telephone Number (813) 281-8377

Email address (if available) bradley.bayne@atkinsglobal.com

CERTIFICATION

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submission of false information including the possibility of fine and imprisonment.

June 16, 2017 (Date)

Bradley J. Bayne (Owner or Authorized Representative's Signature)

PART II QUALITY ASSURANCE REQUIREMENTS

Sampling Organization Atkins North America (see above information)

Analytical Lab NELAC / HRS Certification # NELAC # E83018

Lab Name Flowers Chemical Laboratories, Inc.

Address 481 Newburyport Avenue, Altamonte Springs, FL 32715

Phone Number (407) 339-5984

Email address (if available) june@flowerslabs.com (June Flowers)

ATTACHMENT B

Groundwater Sampling Logs and Field Equipment Calibration Logs

Form FD 9000-24

GROUNDWATER SAMPLING LOG

SITE NAME: Hardee County Landfill	SITE LOCATION: 685 Airport Road, Wauchula
WELL NO: MW-1	SAMPLE ID: MW-1	DATE: 5/17/17

PURGING DATA

WELL DIAMETER (inches): 4	TUBING DIAMETER (inches): 1/4	WELL SCREEN INTERVAL DEPTH: feet to feet	STATIC DEPTH TO WATER (feet): 9.09	PURGE PUMP TYPE OR BAILER: Peristaltic

WELL VOLUME PURGE: 1 WELL VOLUME = (TOTAL WELL DEPTH – STATIC DEPTH TO WATER) X WELL CAPACITY
(only fill out if applicable)
= (12.70 feet – 9.09 feet) X 0.65 gallons/foot = 2.34 gallons

EQUIPMENT VOLUME PURGE: 1 EQUIPMENT VOL. = PUMP VOLUME + (TUBING CAPACITY X TUBING LENGTH) + FLOW CELL VOLUME
(only fill out if applicable)
= gallons + (gallons/foot X feet) + gallons = gallons

INITIAL PUMP OR TUBING DEPTH IN WELL (feet): 11	FINAL PUMP OR TUBING DEPTH IN WELL (feet): 12.5	PURGING INITIATED AT: 10:40	PURGING ENDED AT: 11:25	TOTAL VOLUME PURGED (gallons): 3.75

TIME	VOLUME PURGED (gallons)	CUMUL. VOLUME PURGED (gallons)	PURGE RATE (gpm)	DEPTH TO WATER (feet)	pH (standard units)	TEMP. (°C)	COND. (circle units) µmhos/cm or µS/cm	DISSOLVED OXYGEN (circle units) mg/L or % saturation	TURBIDITY (NTUs)	COLOR (describe)	ODOR (describe)
11:10	3.0	3.0	0.1	12.01	4.88	25.33	126	2.94	51.8	Brown	None
11:15	0.25	3.25	0.05	12.40	4.90	25.35	128	2.05	26.2	↓	↓
11:20	0.25	3.50	0.05	12.41	4.90	25.36	130	1.92	19.41	Clear	↓
11:25	0.25	3.75	0.05	12.40	4.90	25.37	128	1.80	18.90	↓	↓
		Well purged dry after 3.5 gallons									
		Well allowed to recharge, then sampled									

WELL CAPACITY (Gallons Per Foot): **0.75"** = 0.02; **1"** = 0.04; **1.25"** = 0.06; **2"** = 0.16; **3"** = 0.37; **4"** = 0.65; **5"** = 1.02; **6"** = 1.47; **12"** = 5.88
TUBING INSIDE DIA. CAPACITY (Gal./Ft.): **1/8"** = 0.0006; **3/16"** = 0.0014; **1/4"** = 0.0026; **5/16"** = 0.004; **3/8"** = 0.006; **1/2"** = 0.010; **5/8"** = 0.016

PURGING EQUIPMENT CODES: **B** = Bailer; **BP** = Bladder Pump; **ESP** = Electric Submersible Pump; **PP** = Peristaltic Pump; **O** = Other (Specify)

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION: Brad Bayne / Atkins	SAMPLER(S) SIGNATURE(S): [signature]	SAMPLING INITIATED AT: 11:25	SAMPLING ENDED AT: 12:00
PUMP OR TUBING DEPTH IN WELL (feet): 12.5	TUBING MATERIAL CODE: 5 + HDPE	FIELD-FILTERED: Y (N) Filtration Equipment Type:	FILTER SIZE: ____ µm
FIELD DECONTAMINATION: PUMP Y (N)	TUBING Y (N) (replaced)	DUPLICATE: Y (N)	

SAMPLE CONTAINER SPECIFICATION				SAMPLE PRESERVATION			INTENDED ANALYSIS AND/OR METHOD	SAMPLING EQUIPMENT CODE	SAMPLE PUMP FLOW RATE (mL per minute)
SAMPLE ID CODE	# CONTAINERS	MATERIAL CODE	VOLUME	PRESERVATIVE USED	TOTAL VOL ADDED IN FIELD (mL)	FINAL pH			
			See Chain of Custody						

REMARKS:
Well purged dry after 3.5 gallons, recharged and sampled

MATERIAL CODES: **AG** = Amber Glass; **CG** = Clear Glass; **PE** = Polyethylene; **PP** = Polypropylene; **S** = Silicone; **T** = Teflon; **O** = Other (Specify)

SAMPLING EQUIPMENT CODES: **APP** = After Peristaltic Pump; **B** = Bailer; **BP** = Bladder Pump; **ESP** = Electric Submersible Pump; **RFPP** = Reverse Flow Peristaltic Pump; **SM** = Straw Method (Tubing Gravity Drain); **O** = Other (Specify)

NOTES: 1. The above do not constitute all of the information required by Chapter 62-160, F.A.C.
2. STABILIZATION CRITERIA FOR RANGE OF VARIATION OF LAST THREE CONSECUTIVE READINGS (SEE FS 2212, SECTION 3)
pH: ± 0.2 units **Temperature:** ± 0.2 °C **Specific Conductance:** ± 5% **Dissolved Oxygen:** all readings ≤ 20% saturation (see Table FS 2200-2); optionally, ± 0.2 mg/L or ± 10% (whichever is greater) **Turbidity:** all readings ≤ 20 NTU; optionally ± 5 NTU or ± 10% (whichever is greater)

Revision Date: February 12, 2009

Form FD 9000-24

GROUNDWATER SAMPLING LOG

SITE NAME: Hardee County Landfill		SITE LOCATION: 685 Airport Road, Wauchula	
WELL NO: MW-2	SAMPLE ID: MW-2		DATE: 5/17/17

PURGING DATA

WELL DIAMETER (inches): 4	TUBING DIAMETER (inches): 1/4	WELL SCREEN INTERVAL DEPTH: feet to feet	STATIC DEPTH TO WATER (feet): 9.91	PURGE PUMP TYPE OR BAILER: Peristaltic

WELL VOLUME PURGE: 1 WELL VOLUME = (TOTAL WELL DEPTH – STATIC DEPTH TO WATER) X WELL CAPACITY
(only fill out if applicable)
= (12.70 feet – 9.91 feet) X 0.65 gallons/foot = 1.81 gallons

EQUIPMENT VOLUME PURGE: 1 EQUIPMENT VOL. = PUMP VOLUME + (TUBING CAPACITY X TUBING LENGTH) + FLOW CELL VOLUME
(only fill out if applicable)
= gallons + (gallons/foot X feet) + gallons = gallons

INITIAL PUMP OR TUBING DEPTH IN WELL (feet): 12	FINAL PUMP OR TUBING DEPTH IN WELL (feet): 12	PURGING INITIATED AT: 9:40	PURGING ENDED AT: 10:20	TOTAL VOLUME PURGED (gallons): 4.0

TIME	VOLUME PURGED (gallons)	CUMUL. VOLUME PURGED (gallons)	PURGE RATE (gpm)	DEPTH TO WATER (feet)	pH (standard units)	TEMP. (°C)	COND. (circle units) µmhos/cm or µS/cm	DISSOLVED OXYGEN (circle units) mg/L or % saturation	TURBIDITY (NTUs)	COLOR (describe)	ODOR (describe)
10:00	2.0	2.0	0.1	10.71	6.68	24.19	537	1.22	16.9	Clear	None
10:05	0.5	2.5	0.1	10.70	6.66	24.17	538	0.97	16.8	↓	↓
10:10	0.5	3.0	0.1	10.70	6.66	24.19	537	0.87	13.6	↓	↓
10:15	0.5	3.5	0.1	10.71	6.66	24.20	537	0.83	9.70	↓	↓
10:20	0.5	4.0	0.1	10.71	6.66	24.19	537	0.80	8.26	↓	↓

WELL CAPACITY (Gallons Per Foot): **0.75"** = 0.02; **1"** = 0.04; **1.25"** = 0.06; **2"** = 0.16; **3"** = 0.37; **4"** = 0.65; **5"** = 1.02; **6"** = 1.47; **12"** = 5.88
TUBING INSIDE DIA. CAPACITY (Gal./Ft.): **1/8"** = 0.0006; **3/16"** = 0.0014; **1/4"** = 0.0026; **5/16"** = 0.004; **3/8"** = 0.006; **1/2"** = 0.010; **5/8"** = 0.016

PURGING EQUIPMENT CODES: **B** = Bailer; **BP** = Bladder Pump; **ESP** = Electric Submersible Pump; **PP** = Peristaltic Pump; **O** = Other (Specify)

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION: Brad Bayne / Atkins	SAMPLER(S) SIGNATURE(S): [signature]	SAMPLING INITIATED AT: 10:20	SAMPLING ENDED AT: 10:30
PUMP OR TUBING DEPTH IN WELL (feet): 12	TUBING MATERIAL CODE: 5+HDPE	FIELD-FILTERED: Y (N) Filtration Equipment Type:	FILTER SIZE: ____ µm
FIELD DECONTAMINATION: PUMP Y (N)	TUBING Y (N) (replaced)	DUPLICATE: Y (N)	

SAMPLE CONTAINER SPECIFICATION				SAMPLE PRESERVATION			INTENDED ANALYSIS AND/OR METHOD	SAMPLING EQUIPMENT CODE	SAMPLE PUMP FLOW RATE (mL per minute)
SAMPLE ID CODE	# CONTAINERS	MATERIAL CODE	VOLUME	PRESERVATIVE USED	TOTAL VOL ADDED IN FIELD (mL)	FINAL pH			
			See	Chain	of	Custody			

REMARKS:

MATERIAL CODES: **AG** = Amber Glass; **CG** = Clear Glass; **PE** = Polyethylene; **PP** = Polypropylene; **S** = Silicone; **T** = Teflon; **O** = Other (Specify)

SAMPLING EQUIPMENT CODES: **APP** = After Peristaltic Pump; **B** = Bailer; **BP** = Bladder Pump; **ESP** = Electric Submersible Pump; **RFPP** = Reverse Flow Peristaltic Pump; **SM** = Straw Method (Tubing Gravity Drain); **O** = Other (Specify)

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

2. STABILIZATION CRITERIA FOR RANGE OF VARIATION OF LAST THREE CONSECUTIVE READINGS (SEE FS 2212, SECTION 3)

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

Revision Date: February 12, 2009

Form FD 9000-24

GROUNDWATER SAMPLING LOG

SITE NAME: Hardee County Landfill		SITE LOCATION: 685 Airport Road, Wauchula	
WELL NO: MW-4	SAMPLE ID: MW-4		DATE: 5/17/17

PURGING DATA

WELL DIAMETER (inches): 2	TUBING DIAMETER (inches): 1/4	WELL SCREEN INTERVAL DEPTH: feet to feet	STATIC DEPTH TO WATER (feet): 9.64	PURGE PUMP TYPE OR BAILER: Peristaltic

WELL VOLUME PURGE: 1 WELL VOLUME = (TOTAL WELL DEPTH – STATIC DEPTH TO WATER) X WELL CAPACITY
(only fill out if applicable)
= (21.60 feet – 9.64 feet) X 0.16 gallons/foot = 1.91 gallons

EQUIPMENT VOLUME PURGE: 1 EQUIPMENT VOL. = PUMP VOLUME + (TUBING CAPACITY X TUBING LENGTH) + FLOW CELL VOLUME
(only fill out if applicable)
= gallons + (gallons/foot X feet) + gallons = gallons

INITIAL PUMP OR TUBING DEPTH IN WELL (feet): 12	FINAL PUMP OR TUBING DEPTH IN WELL (feet): 12	PURGING INITIATED AT: 8:45	PURGING ENDED AT: 9:20	TOTAL VOLUME PURGED (gallons): 3.5

TIME	VOLUME PURGED (gallons)	CUMUL. VOLUME PURGED (gallons)	PURGE RATE (gpm)	DEPTH TO WATER (feet)	pH (standard units)	TEMP. (°C)	COND. (circle units) µmhos/cm or µS/cm	DISSOLVED OXYGEN (circle units) mg/L or % saturation	TURBIDITY (NTUs)	COLOR (describe)	ODOR (describe)
9:05	2.0	2.0	0.1	10.69	5.52	22.88	209	2.29	2.59	Brown	None
9:10	0.5	2.5	0.1	10.70	5.49	22.91	204	2.24	2.39	↓	↓
9:15	0.5	3.0	0.1	10.70	5.48	22.97	202	1.89	2.30	Clear	↓
9:20	0.5	3.5	0.1	10.70	5.48	23.01	202	1.74	3.97	↓	↓

WELL CAPACITY (Gallons Per Foot): **0.75"** = 0.02; **1"** = 0.04; **1.25"** = 0.06; **2"** = 0.16; **3"** = 0.37; **4"** = 0.65; **5"** = 1.02; **6"** = 1.47; **12"** = 5.88
TUBING INSIDE DIA. CAPACITY (Gal./Ft.): **1/8"** = 0.0006; **3/16"** = 0.0014; **1/4"** = 0.0026; **5/16"** = 0.004; **3/8"** = 0.006; **1/2"** = 0.010; **5/8"** = 0.016

PURGING EQUIPMENT CODES: **B** = Bailer; **BP** = Bladder Pump; **ESP** = Electric Submersible Pump; **PP** = Peristaltic Pump; **O** = Other (Specify)

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION: Brad Bayne / Atkins	SAMPLER(S) SIGNATURE(S): [signature]	SAMPLING INITIATED AT: 9:20	SAMPLING ENDED AT: 9:30
PUMP OR TUBING DEPTH IN WELL (feet): 12	TUBING MATERIAL CODE: S + HDPE	FIELD-FILTERED: Y (N) Filtration Equipment Type:	FILTER SIZE: ____ µm
FIELD DECONTAMINATION: PUMP Y (N)	TUBING Y (N) (replaced)	DUPLICATE: Y (N)	

SAMPLE CONTAINER SPECIFICATION				SAMPLE PRESERVATION			INTENDED ANALYSIS AND/OR METHOD	SAMPLING EQUIPMENT CODE	SAMPLE PUMP FLOW RATE (mL per minute)
SAMPLE ID CODE	# CONTAINERS	MATERIAL CODE	VOLUME	PRESERVATIVE USED	TOTAL VOL ADDED IN FIELD (mL)	FINAL pH			
			See Chain of Custody						

REMARKS:

MATERIAL CODES: **AG** = Amber Glass; **CG** = Clear Glass; **PE** = Polyethylene; **PP** = Polypropylene; **S** = Silicone; **T** = Teflon; **O** = Other (Specify)

SAMPLING EQUIPMENT CODES: **APP** = After Peristaltic Pump; **B** = Bailer; **BP** = Bladder Pump; **ESP** = Electric Submersible Pump; **RFPP** = Reverse Flow Peristaltic Pump; **SM** = Straw Method (Tubing Gravity Drain); **O** = Other (Specify)

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

2. STABILIZATION CRITERIA FOR RANGE OF VARIATION OF LAST THREE CONSECUTIVE READINGS (SEE FS 2212, SECTION 3)

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

Revision Date: February 12, 2009

Form FD 9000-24

GROUNDWATER SAMPLING LOG

SITE NAME: Hardee County Landfill	SITE LOCATION: 685 Airport Road, Wauchula	
WELL NO: MW-10R	SAMPLE ID: MW-10R	DATE: 5/18/17

PURGING DATA

WELL DIAMETER (inches): 2	TUBING DIAMETER (inches): 1/4	WELL SCREEN INTERVAL DEPTH: feet to feet	STATIC DEPTH TO WATER (feet): 11.51	PURGE PUMP TYPE OR BAILER: Peristaltic

WELL VOLUME PURGE: 1 WELL VOLUME = (TOTAL WELL DEPTH – STATIC DEPTH TO WATER) X WELL CAPACITY
(only fill out if applicable)
= (23.08 feet – 11.51 feet) X 0.16 gallons/foot = 1.85 gallons

EQUIPMENT VOLUME PURGE: 1 EQUIPMENT VOL. = PUMP VOLUME + (TUBING CAPACITY X TUBING LENGTH) + FLOW CELL VOLUME
(only fill out if applicable)
= gallons + (gallons/foot X feet) + gallons = gallons

INITIAL PUMP OR TUBING DEPTH IN WELL (feet): 14	FINAL PUMP OR TUBING DEPTH IN WELL (feet): 14	PURGING INITIATED AT: 9:35	PURGING ENDED AT: 10:20	TOTAL VOLUME PURGED (gallons): 4.5

TIME	VOLUME PURGED (gallons)	CUMUL. VOLUME PURGED (gallons)	PURGE RATE (gpm)	DEPTH TO WATER (feet)	pH (standard units)	TEMP. (°C)	COND. (circle units) µmhos/cm or µS/cm	DISSOLVED OXYGEN (circle units) mg/L or % saturation	TURBIDITY (NTUs)	COLOR (describe)	ODOR (describe)
10:05	3.0	3.0	0.1	12.61	5.65	25.96	358	1.49	20.2	Clear	None
10:10	0.5	3.5	0.1	12.62	5.63	25.95	359	1.28	7.31	↓	↓
10:15	0.5	4.0	0.1	12.62	5.63	25.96	359	1.22	4.43	↓	↓
10:20	0.5	4.5	0.1	12.62	5.63	25.98	359	1.18	3.47	↓	↓

WELL CAPACITY (Gallons Per Foot): **0.75"** = 0.02; **1"** = 0.04; **1.25"** = 0.06; **2"** = 0.16; **3"** = 0.37; **4"** = 0.65; **5"** = 1.02; **6"** = 1.47; **12"** = 5.88
TUBING INSIDE DIA. CAPACITY (Gal./Ft.): **1/8"** = 0.0006; **3/16"** = 0.0014; **1/4"** = 0.0026; **5/16"** = 0.004; **3/8"** = 0.006; **1/2"** = 0.010; **5/8"** = 0.016

PURGING EQUIPMENT CODES: **B** = Bailer; **BP** = Bladder Pump; **ESP** = Electric Submersible Pump; **PP** = Peristaltic Pump; **O** = Other (Specify)

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION: Brad Bayne / Atkins	SAMPLER(S) SIGNATURE(S): [signature]	SAMPLING INITIATED AT: 10:20	SAMPLING ENDED AT: 10:30
PUMP OR TUBING DEPTH IN WELL (feet): 14	TUBING MATERIAL CODE: 5+ HDPE	FIELD-FILTERED: Y (N) Filtration Equipment Type:	FILTER SIZE: ____ µm

FIELD DECONTAMINATION: PUMP Y (N) TUBING Y (N) (replaced) DUPLICATE: Y (N)

SAMPLE CONTAINER SPECIFICATION				SAMPLE PRESERVATION			INTENDED ANALYSIS AND/OR METHOD	SAMPLING EQUIPMENT CODE	SAMPLE PUMP FLOW RATE (mL per minute)
SAMPLE ID CODE	# CONTAINERS	MATERIAL CODE	VOLUME	PRESERVATIVE USED	TOTAL VOL ADDED IN FIELD (mL)	FINAL pH			
			See	Chain	of	Custody			

REMARKS:

MATERIAL CODES: **AG** = Amber Glass; **CG** = Clear Glass; **PE** = Polyethylene; **PP** = Polypropylene; **S** = Silicone; **T** = Teflon; **O** = Other (Specify)

SAMPLING EQUIPMENT CODES: **APP** = After Peristaltic Pump; **B** = Bailer; **BP** = Bladder Pump; **ESP** = Electric Submersible Pump; **RFPP** = Reverse Flow Peristaltic Pump; **SM** = Straw Method (Tubing Gravity Drain); **O** = Other (Specify)

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

2. STABILIZATION CRITERIA FOR RANGE OF VARIATION OF LAST THREE CONSECUTIVE READINGS (SEE FS 2212, SECTION 3)

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

Revision Date: February 12, 2009

Form FD 9000-24

GROUNDWATER SAMPLING LOG

SITE NAME: Hardee County Landfill		SITE LOCATION: 685 Airport Road, Wauchula	
WELL NO: MW-11	SAMPLE ID: MW-11		DATE: 5/18/17

PURGING DATA

WELL DIAMETER (inches): 2	TUBING DIAMETER (inches): 1/4	WELL SCREEN INTERVAL DEPTH: feet to feet	STATIC DEPTH TO WATER (feet): 11.23	PURGE PUMP TYPE OR BAILER: Peristaltic

WELL VOLUME PURGE: 1 WELL VOLUME = (TOTAL WELL DEPTH – STATIC DEPTH TO WATER) X WELL CAPACITY
(only fill out if applicable)
= (13.90 feet – 11.23 feet) X 0.16 gallons/foot = 0.43 gallons

EQUIPMENT VOLUME PURGE: 1 EQUIPMENT VOL. = PUMP VOLUME + (TUBING CAPACITY X TUBING LENGTH) + FLOW CELL VOLUME
(only fill out if applicable)
= gallons + (gallons/foot X feet) + gallons = gallons

INITIAL PUMP OR TUBING DEPTH IN WELL (feet): 13	FINAL PUMP OR TUBING DEPTH IN WELL (feet): 13	PURGING INITIATED AT: 8:40	PURGING ENDED AT: 9:15	TOTAL VOLUME PURGED (gallons): 3.5

TIME	VOLUME PURGED (gallons)	CUMUL. VOLUME PURGED (gallons)	PURGE RATE (gpm)	DEPTH TO WATER (feet)	pH (standard units)	TEMP. (°C)	COND. (circle units) µmhos/cm or µS/cm	DISSOLVED OXYGEN (circle units) mg/L or % saturation	TURBIDITY (NTUs)	COLOR (describe)	ODOR (describe)
9:00	2.0	2.0	0.1	11.63	4.57	24.35	141	1.65	50.1	Clear	None
9:05	0.5	2.5	0.1	11.64	4.54	24.34	141	1.19	31.2	↓	↓
9:10	0.5	3.0	0.1	11.64	4.54	24.35	141	1.09	22.6	↓	↓
9:15	0.5	3.5	0.1	11.64	4.52	24.35	141	1.05	19.1	↓	↓

WELL CAPACITY (Gallons Per Foot): **0.75"** = 0.02; **1"** = 0.04; **1.25"** = 0.06; **2"** = 0.16; **3"** = 0.37; **4"** = 0.65; **5"** = 1.02; **6"** = 1.47; **12"** = 5.88
TUBING INSIDE DIA. CAPACITY (Gal./Ft.): **1/8"** = 0.0006; **3/16"** = 0.0014; **1/4"** = 0.0026; **5/16"** = 0.004; **3/8"** = 0.006; **1/2"** = 0.010; **5/8"** = 0.016

PURGING EQUIPMENT CODES: **B** = Bailer; **BP** = Bladder Pump; **ESP** = Electric Submersible Pump; **PP** = Peristaltic Pump; **O** = Other (Specify)

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION: Brad Bayne / Atkins	SAMPLER(S) SIGNATURE(S): [signature]	SAMPLING INITIATED AT: 9:15	SAMPLING ENDED AT: 9:25
PUMP OR TUBING DEPTH IN WELL (feet): 13	TUBING MATERIAL CODE: S+HDPE	FIELD-FILTERED: Y (N) Filtration Equipment Type:	FILTER SIZE: ____ µm
FIELD DECONTAMINATION: PUMP Y (N)	TUBING Y (N) (replaced)	DUPLICATE: Y (N)	

SAMPLE CONTAINER SPECIFICATION				SAMPLE PRESERVATION			INTENDED ANALYSIS AND/OR METHOD	SAMPLING EQUIPMENT CODE	SAMPLE PUMP FLOW RATE (mL per minute)
SAMPLE ID CODE	# CONTAINERS	MATERIAL CODE	VOLUME	PRESERVATIVE USED	TOTAL VOL ADDED IN FIELD (mL)	FINAL pH			
			See Chain of Custody						

REMARKS:

MATERIAL CODES: **AG** = Amber Glass; **CG** = Clear Glass; **PE** = Polyethylene; **PP** = Polypropylene; **S** = Silicone; **T** = Teflon; **O** = Other (Specify)

SAMPLING EQUIPMENT CODES: **APP** = After Peristaltic Pump; **B** = Bailer; **BP** = Bladder Pump; **ESP** = Electric Submersible Pump; **RFPP** = Reverse Flow Peristaltic Pump; **SM** = Straw Method (Tubing Gravity Drain); **O** = Other (Specify)

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

2. STABILIZATION CRITERIA FOR RANGE OF VARIATION OF LAST THREE CONSECUTIVE READINGS (SEE FS 2212, SECTION 3)

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

Revision Date: February 12, 2009

Form FD 9000-24

GROUNDWATER SAMPLING LOG

SITE NAME: Hardee County Landfill		SITE LOCATION: 685 Airport Road, Wauchula	
WELL NO: MW-12R	SAMPLE ID: MW-12R		DATE: 5/17/17

PURGING DATA

WELL DIAMETER (inches): 2	TUBING DIAMETER (inches): 1/4	WELL SCREEN INTERVAL DEPTH: feet to feet	STATIC DEPTH TO WATER (feet): 11.90	PURGE PUMP TYPE OR BAILER: Peristaltic

WELL VOLUME PURGE: 1 WELL VOLUME = (TOTAL WELL DEPTH – STATIC DEPTH TO WATER) X WELL CAPACITY
(only fill out if applicable)
= (23.04 feet – 11.90 feet) X 0.16 gallons/foot = 1.78 gallons

EQUIPMENT VOLUME PURGE: 1 EQUIPMENT VOL. = PUMP VOLUME + (TUBING CAPACITY X TUBING LENGTH) + FLOW CELL VOLUME
(only fill out if applicable)
= gallons + (gallons/foot X feet) + gallons = gallons

INITIAL PUMP OR TUBING DEPTH IN WELL (feet): 15	FINAL PUMP OR TUBING DEPTH IN WELL (feet): 16	PURGING INITIATED AT: 14:35	PURGING ENDED AT: 15:20	TOTAL VOLUME PURGED (gallons): 4.5

TIME	VOLUME PURGED (gallons)	CUMUL. VOLUME PURGED (gallons)	PURGE RATE (gpm)	DEPTH TO WATER (feet)	pH (standard units)	TEMP. (°C)	COND. (circle units) µmhos/cm or µS/cm	DISSOLVED OXYGEN (circle units) mg/L or % saturation	TURBIDITY (NTUs)	COLOR (describe)	ODOR (describe)
15:05	3.0	3.0	0.1	14.44	6.08	26.79	455	3.16	22.6	Clear	None
15:10	0.5	3.5	0.1	14.43	6.11	26.49	455	3.01	16.5	↓	↓
15:15	0.5	4.0	0.1	14.44	6.13	26.23	454	2.31	9.30	↓	↓
15:20	0.5	4.5	0.1	14.44	6.11	26.24	454	1.75	6.95	↓	↓

WELL CAPACITY (Gallons Per Foot): **0.75"** = 0.02; **1"** = 0.04; **1.25"** = 0.06; **2"** = 0.16; **3"** = 0.37; **4"** = 0.65; **5"** = 1.02; **6"** = 1.47; **12"** = 5.88
TUBING INSIDE DIA. CAPACITY (Gal./Ft.): **1/8"** = 0.0006; **3/16"** = 0.0014; **1/4"** = 0.0026; **5/16"** = 0.004; **3/8"** = 0.006; **1/2"** = 0.010; **5/8"** = 0.016

PURGING EQUIPMENT CODES: **B** = Bailer; **BP** = Bladder Pump; **ESP** = Electric Submersible Pump; **PP** = Peristaltic Pump; **O** = Other (Specify)

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION: Brad Bayne/Atkins	SAMPLER(S) SIGNATURE(S): [signature]	SAMPLING INITIATED AT: 15:20	SAMPLING ENDED AT: 15:30
PUMP OR TUBING DEPTH IN WELL (feet): 16	TUBING MATERIAL CODE: 5+HDPE	FIELD-FILTERED: Y (N) Filtration Equipment Type:	FILTER SIZE: ____ µm
FIELD DECONTAMINATION: PUMP Y (N)	TUBING Y (N) (replaced)	DUPLICATE: Y (N)	

SAMPLE CONTAINER SPECIFICATION				SAMPLE PRESERVATION			INTENDED ANALYSIS AND/OR METHOD	SAMPLING EQUIPMENT CODE	SAMPLE PUMP FLOW RATE (mL per minute)
SAMPLE ID CODE	# CONTAINERS	MATERIAL CODE	VOLUME	PRESERVATIVE USED	TOTAL VOL ADDED IN FIELD (mL)	FINAL pH			
			See Chain of Custody						

REMARKS:

MATERIAL CODES: **AG** = Amber Glass; **CG** = Clear Glass; **PE** = Polyethylene; **PP** = Polypropylene; **S** = Silicone; **T** = Teflon; **O** = Other (Specify)

SAMPLING EQUIPMENT CODES: **APP** = After Peristaltic Pump; **B** = Bailer; **BP** = Bladder Pump; **ESP** = Electric Submersible Pump; **RFPP** = Reverse Flow Peristaltic Pump; **SM** = Straw Method (Tubing Gravity Drain); **O** = Other (Specify)

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

2. STABILIZATION CRITERIA FOR RANGE OF VARIATION OF LAST THREE CONSECUTIVE READINGS (SEE FS 2212, SECTION 3)

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

Revision Date: February 12, 2009

Form FD 9000-24

GROUNDWATER SAMPLING LOG

SITE NAME: Hardee County Landfill	SITE LOCATION: 685 Airport Road, Wauchula
WELL NO: MW-13	SAMPLE ID: MW-13	DATE: 5/17/17

PURGING DATA

WELL DIAMETER (inches): 2	TUBING DIAMETER (inches): 1/4	WELL SCREEN INTERVAL DEPTH: feet to feet	STATIC DEPTH TO WATER (feet): 11.73	PURGE PUMP TYPE OR BAILER: Peristaltic

WELL VOLUME PURGE: 1 WELL VOLUME = (TOTAL WELL DEPTH – STATIC DEPTH TO WATER) X WELL CAPACITY
(only fill out if applicable)
= (20.79 feet – 11.73 feet) X 0.16 gallons/foot = 1.45 gallons

EQUIPMENT VOLUME PURGE: 1 EQUIPMENT VOL. = PUMP VOLUME + (TUBING CAPACITY X TUBING LENGTH) + FLOW CELL VOLUME
(only fill out if applicable)
= gallons + (gallons/foot X feet) + gallons = gallons

INITIAL PUMP OR TUBING DEPTH IN WELL (feet): 14	FINAL PUMP OR TUBING DEPTH IN WELL (feet): 14	PURGING INITIATED AT: 13:05	PURGING ENDED AT: 13:45	TOTAL VOLUME PURGED (gallons): 4.0

TIME	VOLUME PURGED (gallons)	CUMUL. VOLUME PURGED (gallons)	PURGE RATE (gpm)	DEPTH TO WATER (feet)	pH (standard units)	TEMP. (°C)	COND. (circle units) µmhos/cm or µS/cm	DISSOLVED OXYGEN (circle units) mg/L or % saturation	TURBIDITY (NTUs)	COLOR (describe)	ODOR (describe)
13:35	3.0	3.0	0.1	12.04	4.72	26.49	110	1.02	7.52	Clear	None
13:40	0.5	3.5	0.1	12.06	4.62	25.88	110	0.85	12.4	↓	↓
13:45	0.5	4.0	0.1	12.05	4.53	25.79	108	0.78	10.6	↓	↓

WELL CAPACITY (Gallons Per Foot): **0.75"** = 0.02; **1"** = 0.04; **1.25"** = 0.06; **2"** = 0.16; **3"** = 0.37; **4"** = 0.65; **5"** = 1.02; **6"** = 1.47; **12"** = 5.88
TUBING INSIDE DIA. CAPACITY (Gal./Ft.): **1/8"** = 0.0006; **3/16"** = 0.0014; **1/4"** = 0.0026; **5/16"** = 0.004; **3/8"** = 0.006; **1/2"** = 0.010; **5/8"** = 0.016

PURGING EQUIPMENT CODES: **B** = Bailer; **BP** = Bladder Pump; **ESP** = Electric Submersible Pump; **PP** = Peristaltic Pump; **O** = Other (Specify)

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION: Brad Bayne / Atkins	SAMPLER(S) SIGNATURE(S): [signature]	SAMPLING INITIATED AT: 13:45	SAMPLING ENDED AT: 13:55
PUMP OR TUBING DEPTH IN WELL (feet): 14	TUBING MATERIAL CODE: S + HDPE	FIELD-FILTERED: Y (N) Filtration Equipment Type:	FILTER SIZE: ____ µm
FIELD DECONTAMINATION: PUMP Y (N)	TUBING Y (N) (replaced)	DUPLICATE: Y (N)	

SAMPLE CONTAINER SPECIFICATION				SAMPLE PRESERVATION			INTENDED ANALYSIS AND/OR METHOD	SAMPLING EQUIPMENT CODE	SAMPLE PUMP FLOW RATE (mL per minute)
SAMPLE ID CODE	# CONTAINERS	MATERIAL CODE	VOLUME	PRESERVATIVE USED	TOTAL VOL ADDED IN FIELD (mL)	FINAL pH			
			See Chain of Custody						

REMARKS:

MATERIAL CODES: **AG** = Amber Glass; **CG** = Clear Glass; **PE** = Polyethylene; **PP** = Polypropylene; **S** = Silicone; **T** = Teflon; **O** = Other (Specify)

SAMPLING EQUIPMENT CODES: **APP** = After Peristaltic Pump; **B** = Bailer; **BP** = Bladder Pump; **ESP** = Electric Submersible Pump; **RFPP** = Reverse Flow Peristaltic Pump; **SM** = Straw Method (Tubing Gravity Drain); **O** = Other (Specify)

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

2. STABILIZATION CRITERIA FOR RANGE OF VARIATION OF LAST THREE CONSECUTIVE READINGS (SEE FS 2212, SECTION 3)

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

Revision Date: February 12, 2009

Form FD 9000-24

GROUNDWATER SAMPLING LOG

SITE NAME: Hardee County Landfill		SITE LOCATION: 685 Airport Road, Wauchula	
WELL NO: MW-14	SAMPLE ID: MW-14		DATE: 5/17/17

PURGING DATA

WELL DIAMETER (inches): 2	TUBING DIAMETER (inches): 1/4	WELL SCREEN INTERVAL DEPTH: feet to feet	STATIC DEPTH TO WATER (feet): 10.81	PURGE PUMP TYPE OR BAILER: Peristaltic

WELL VOLUME PURGE: 1 WELL VOLUME = (TOTAL WELL DEPTH – STATIC DEPTH TO WATER) X WELL CAPACITY
(only fill out if applicable)
= (20.35 feet – 10.81 feet) X 0.16 gallons/foot = 1.53 gallons

EQUIPMENT VOLUME PURGE: 1 EQUIPMENT VOL. = PUMP VOLUME + (TUBING CAPACITY X TUBING LENGTH) + FLOW CELL VOLUME
(only fill out if applicable)
= gallons + (gallons/foot X feet) + gallons = gallons

INITIAL PUMP OR TUBING DEPTH IN WELL (feet): 13	FINAL PUMP OR TUBING DEPTH IN WELL (feet): 13	PURGING INITIATED AT: 12:00	PURGING ENDED AT: 12:40	TOTAL VOLUME PURGED (gallons): 4.0

TIME	VOLUME PURGED (gallons)	CUMUL. VOLUME PURGED (gallons)	PURGE RATE (gpm)	DEPTH TO WATER (feet)	pH (standard units)	TEMP. (°C)	COND. (circle units) µmhos/cm or µS/cm	DISSOLVED OXYGEN (circle units) mg/L or % saturation	TURBIDITY (NTUs)	COLOR (describe)	ODOR (describe)
12:30	3.0	3.0	0.1	11.15	4.87	24.71	220	1.61	7.79	Clear	None
12:35	0.5	3.5	0.1	11.16	4.82	24.75	220	1.40	2.70	↓	↓
12:40	0.5	4.0	0.1	11.15	4.78	24.77	220	1.23	4.11	↓	↓

WELL CAPACITY (Gallons Per Foot): **0.75"** = 0.02; **1"** = 0.04; **1.25"** = 0.06; **2"** = 0.16; **3"** = 0.37; **4"** = 0.65; **5"** = 1.02; **6"** = 1.47; **12"** = 5.88
TUBING INSIDE DIA. CAPACITY (Gal./Ft.): **1/8"** = 0.0006; **3/16"** = 0.0014; **1/4"** = 0.0026; **5/16"** = 0.004; **3/8"** = 0.006; **1/2"** = 0.010; **5/8"** = 0.016

PURGING EQUIPMENT CODES: **B** = Bailer; **BP** = Bladder Pump; **ESP** = Electric Submersible Pump; **PP** = Peristaltic Pump; **O** = Other (Specify)

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION: Brad Bayne / Atkins	SAMPLER(S) SIGNATURE(S): [signature]	SAMPLING INITIATED AT: 12:40	SAMPLING ENDED AT: 12:50
PUMP OR TUBING DEPTH IN WELL (feet):	TUBING MATERIAL CODE: S + HDPE	FIELD-FILTERED: Y (N) Filtration Equipment Type:	FILTER SIZE: ____ µm
FIELD DECONTAMINATION: PUMP Y (N)	TUBING Y (N) (replaced)	DUPLICATE: Y (N)	

SAMPLE CONTAINER SPECIFICATION				SAMPLE PRESERVATION			INTENDED ANALYSIS AND/OR METHOD	SAMPLING EQUIPMENT CODE	SAMPLE PUMP FLOW RATE (mL per minute)
SAMPLE ID CODE	# CONTAINERS	MATERIAL CODE	VOLUME	PRESERVATIVE USED	TOTAL VOL ADDED IN FIELD (mL)	FINAL pH			
			See	Chain	of	Custody			

REMARKS:

MATERIAL CODES: **AG** = Amber Glass; **CG** = Clear Glass; **PE** = Polyethylene; **PP** = Polypropylene; **S** = Silicone; **T** = Teflon; **O** = Other (Specify)

SAMPLING EQUIPMENT CODES: **APP** = After Peristaltic Pump; **B** = Bailer; **BP** = Bladder Pump; **ESP** = Electric Submersible Pump; **RFPP** = Reverse Flow Peristaltic Pump; **SM** = Straw Method (Tubing Gravity Drain); **O** = Other (Specify)

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

2. STABILIZATION CRITERIA FOR RANGE OF VARIATION OF LAST THREE CONSECUTIVE READINGS (SEE FS 2212, SECTION 3)

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

Revision Date: February 12, 2009

Field Instrument Calibration Records

INSTRUMENT (MAKE/MODEL#) YSI 556 **INSTRUMENT #** 03H1215AA

PARAMETER: *[check only one]* Rented from Peterson Environmental

☐ TEMPERATURE ☒ CONDUCTIVITY ☐ SALINITY ☐ pH ☐ ORP

☐ TURBIDITY ☐ RESIDUAL CL ☐ DO ☐ OTHER _____

STANDARDS: *[Specify the type(s) of standards used for calibration, the origin of the standards, the standard values, and the date the standards were prepared or purchased]*

Standard A 1,000 µS (provided by Peterson Environmental)

Standard B _____

Standard C _____

DATE (yy/mm/dd)	TIME (hr:min)	STD (A, B, C)	STD VALUE	INSTRUMENT RESPONSE	% DEV	CALIBRATED (YES, NO)	TYPE (INIT, CONT)	SAMPLER INITIALS
5/17/17	8:31	A	1,000	999	<1%	Yes	Init.	BB
5/18/17	8:35	A	1,000	999	<1%	Yes	Init.	BB

Field Instrument Calibration Records

INSTRUMENT (MAKE/MODEL#) YSI 556 **INSTRUMENT #** 03H1215AA

PARAMETER: *[check only one]* Provided by Peterson Environmental

☐ TEMPERATURE ☐ CONDUCTIVITY ☐ SALINITY ☐ pH ☐ ORP

☐ TURBIDITY ☐ RESIDUAL CL ☒ DO ☐ OTHER _____

STANDARDS: *[Specify the type(s) of standards used for calibration, the origin of the standards, the standard values, and the date the standards were prepared or purchased]*

Standard A 100 % (8.56 mg/L) provided by

Standard B _____ Peterson Environmental

Standard C _____

DATE (yy/mm/dd)	TIME (hr:min)	STD (A, B, C)	STD VALUE	INSTRUMENT RESPONSE	% DEV	CALIBRATED (YES, NO)	TYPE (INIT, CONT)	SAMPLER INITIALS
5/17/17	8:33	A	8.56	8.54	<1%	Yes	Init.	BB
5/18/17	8:36	A	8.56	8.56	0%	Yes	Init.	BB

Field Instrument Calibration Records

INSTRUMENT (MAKE/MODEL#) YSI 556 **INSTRUMENT #** 03H1215AA

PARAMETER: *[check only one]* Rented from Peterson Environmental

☐ TEMPERATURE ☐ CONDUCTIVITY ☐ SALINITY ☒ pH ☐ ORP

☐ TURBIDITY ☐ RESIDUAL CL ☐ DO ☐ OTHER _____

STANDARDS: *[Specify the type(s) of standards used for calibration, the origin of the standards, the standard values, and the date the standards were prepared or purchased]*

Standard A 4.01 provided by Peterson Environmental

Standard B 7.00

Standard C _____

DATE (yy/mm/dd)	TIME (hr:min)	STD (A, B, C)	STD VALUE	INSTRUMENT RESPONSE	% DEV	CALIBRATED (YES, NO)	TYPE (INIT, CONT)	SAMPLER INITIALS
5/17/17	8:34	A	4.01	4.01	0%	Yes	Init.	BB
5/17/17	8:35	B	7.00	7.00	0%	Yes	Init.	BB
5/18/17	8:37	A	4.01	4.01	0%	Yes	Init.	BB
5/18/17	8:38	B	7.00	7.00	0%	Yes	Init.	BB

Field Instrument Calibration Records

INSTRUMENT (MAKE/MODEL#) Hach 2100 Q **INSTRUMENT #** _____

PARAMETER: *[check only one]* Provided by Peterson Environmental

☐ TEMPERATURE ☐ CONDUCTIVITY ☐ SALINITY ☐ pH ☐ ORP

☒ TURBIDITY ☐ RESIDUAL CL ☐ DO ☐ OTHER _____

STANDARDS: *[Specify the type(s) of standards used for calibration, the origin of the standards, the standard values, and the date the standards were prepared or purchased]*

Standard A 10 NTU provided by Peterson Environmental

Standard B 20 NTU

Standard C _____

DATE (yy/mm/dd)	TIME (hr:min)	STD (A, B, C)	STD VALUE	INSTRUMENT RESPONSE	% DEV	CALIBRATED (YES, NO)	TYPE (INIT, CONT)	SAMPLER INITIALS
5/17/17	8:38	A	10	10.2	<1%	Yes	Init.	BB
5/17/17	8:39	B	20	20	0%	Yes	Init.	BB
5/18/17	8:38	A	10	10.1	<1%	Yes	Init.	BB
5/18/17	8:39	B	20	20	0%	Yes	Init.	BB