



Public Utilities

January 26, 2015

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County Internal Auditor

Michelle Leonhardt

County Attorney

Chip Fletcher

Public Utilities

PO Box 1110
Tampa, FL 33601-1110
Phone: (813) 272-5977
Fax: (813) 272-5589

Mr. John Morris, P.G.
Florida Department of Environmental Protection
Waste Permitting Section
13051 Telecom Parkway
Temple Terrace, FL 33637

RE: Southeast County Landfill
Laboratory Analytical Results
Initial Assessment Monitoring Plan
Report No. 52 – December 2014

Dear Mr. Morris:

The Hillsborough County Public Utilities Department (County) is pleased to provide the analytical results from the December 2014 sampling event conducted as part of the continuation of the Initial Assessment Monitoring Plan (IAMP). The IAMP was developed to address the potential impacts to groundwater from the sinkhole on the edge of Phase VI at the Southeast County Landfill (SCLF), which was discovered on December 14, 2010.

As part of the agreement between the County and Florida Department of Environmental Protection (Department) Southwest District Office, four (4) upper Floridan/Limestone aquifer monitoring wells, designated as TH-72, TH-76, TH-77, and TH-78 are sampled on a monthly schedule. Representative samples were collected from each of these four (4) monitoring wells on December 3-4, 2014 and analyzed for total dissolved solids (TDS), chloride, total ammonia, arsenic, iron, sodium, and five (5) field parameters. Each sample collected was analyzed by our contracted laboratory, Advanced Environmental Laboratories, Inc. The following paragraphs summarize the parameter specific results pertinent to the evaluation of potential water quality impacts from the sinkhole at the SCLF.

Mr. John Morris, P.G.

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pH

pH was observed within the Secondary Drinking Water Standard (SDWS) acceptable range of 6.5-8.5 pH units for each of the four (4) upper Floridan/Limestone aquifer monitoring wells. The pH values in UFA monitoring wells, TH-72, TH-76, TH-77, and TH-78 were recorded at 6.67, 7.34, 7.24, and 7.86 pH units, respectively and these values are consistent with the historical data set.

Turbidity

Turbidity values in upper Floridan/Limestone aquifer monitoring wells TH-72, TH-76, TH-77, and TH-78 were recorded at 1.3, 18.7, 0.5, and 0.5 Nephelometric Turbidity Units (NTUs). These values are consistent with the historical data set.

Conductivity

The conductivity values in TH-72, TH-76, TH-77, and TH-78 were recorded at 2,675, 517, 490, and 584 umhos/cm, respectively. Monitoring well TH-72 is the closest upper Floridan/Limestone aquifer monitoring well to the sinkhole, and it continues to exhibit groundwater impacts similar to those observed over the past year. Conductivity values in TH-76, TH-77, and TH-78 are relatively low and consistent with the other unaffected deep wells across the site.

Total Dissolved Solids (TDS)

The TDS in monitoring well TH-72 was observed at 1,300 mg/l, which continues to be above the SDWS of 500 mg/l. The remaining three (3) down gradient upper Floridan/Limestone aquifer monitoring wells, TH-76, TH-77, and TH-78 exhibited TDS values of 250, 270, and 290 mg/l, respectively, which are consistent with the water quality of the unaffected deep wells across the site. The values in all four (4) wells are consistent with the historical data set.

Chloride

Chloride was observed at 500 mg/l in monitoring well TH-72, which is above the SDWS of 250 mg/l. The elevated chloride value observed is likely attributable to the waste materials that fell into the sinkhole and the grout materials injected into the subsurface as part of the sinkhole stabilization and remediation. Chloride values in the down gradient upper Floridan/Limestone aquifer monitoring wells TH-76, TH-77, and TH-78 were observed at 8, 12, and 29 mg/l, which is consistent with the unaffected deep wells across the site.

Iron

The total iron concentration in one (1) of the four (4) upper Floridan/Limestone aquifer monitoring wells was observed above the SDWS of 0.3 mg/l. Monitoring well TH-72 exhibited iron at 0.58, mg/l. The remaining three upper Floridan/Limestone monitoring wells, TH-76, TH-77, and TH-78 exhibited iron at 0.21, 0.15, and 0.25 mg/l, respectively. The iron concentrations observed are consistent with the historical data set.

Sodium

Sodium was observed at a concentration of 160 mg/l in monitoring well TH-72, which is at the PDWS of 160 mg/l. The elevated sodium value is likely attributable to the waste in the sinkhole and/or the grouting materials, as previously discussed. Sodium values in down gradient monitoring wells TH-76, TH-77, and TH-78 were observed at 19, 16, and 31 mg/l, which is consistent with the unaffected deep wells across the site.

Groundwater Elevations and Direction of Flow

On December 4, 2014, the County collected groundwater and surface water elevation data at eleven (11) locations along the west side of Phases 1-6 at the site, including seven (7) surficial aquifer wells and four (4) upper Floridan (limestone) aquifer wells. No significant changes to the patterns of flow in the surficial aquifer were noted in the data set, and the flow diagram provided is consistent with the observations over the extensive period of record. The elevations observed within the wells closest to the sinkhole indicate that flow patterns continue to be affected in that area, which has not been unexpected. However, the overall direction of flow within the surficial aquifer remains toward the west/northwest.

A contour diagram of the upper Floridan / Limestone aquifer has been prepared for the west side of the landfill around the sinkhole, and it is provided with this submittal. This diagram was generated manually in AutoCad™ utilizing the four data points closest to the sinkhole. During this sampling event, the changes in elevations between TH-72 and TH-76 is - 0.06 ft., and TH-72 and TH-77 is + 0.15 ft. Elevation of newly installed monitor well TH-78 indicated an elevation of approximately 5 feet higher than those elevations recorded at TH-72, TH-76, and TH-77. This anomaly in the groundwater elevation indicates that TH-78 may be influenced by the surface water body in this area, or some other anomaly in the geologic formations that may be creating this potentiometric high. Based on the significant difference in elevations, the data from TH-78 was not utilized to prepare the UFA contour diagram. However, the County maintains the position that the configuration of the three down gradient deep monitoring wells has adequately addressed the potential for migration of the contamination observed in TH-72.

Conclusions

The water quality observed in the December 2014 IAMP sampling event indicates that the monitoring well TH-72, which is closest to the sinkhole, continues to exhibit impacts to water quality in the upper Floridan / Limestone aquifer. The impacts observed include elevated conductivity, TDS, chloride, iron, and sodium. The values have remained relatively stable, and do not appear to be migrating to any of the down gradient deep monitoring wells. The impacts to TH-72 were not unexpected in the immediate vicinity of the sinkhole, as the well is less than fifty feet away from the former surface expression, and likely even closer to the subsurface karst feature where significant amounts of waste and grout materials are likely present. Down gradient deep monitoring wells, TH-76 and TH-77, and TH-78 have consistently exhibit good water quality with no evidence of impact from the sinkhole. Conductivity values, pH, TDS, sodium and chloride are all very low and consistent with the historical data sets for the unaffected upper Floridan aquifer groundwater monitoring wells at the SCLF.

Recommendations

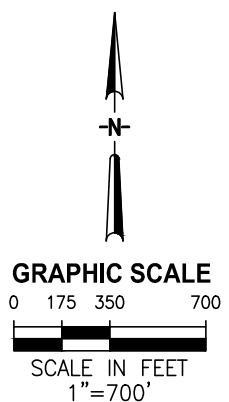
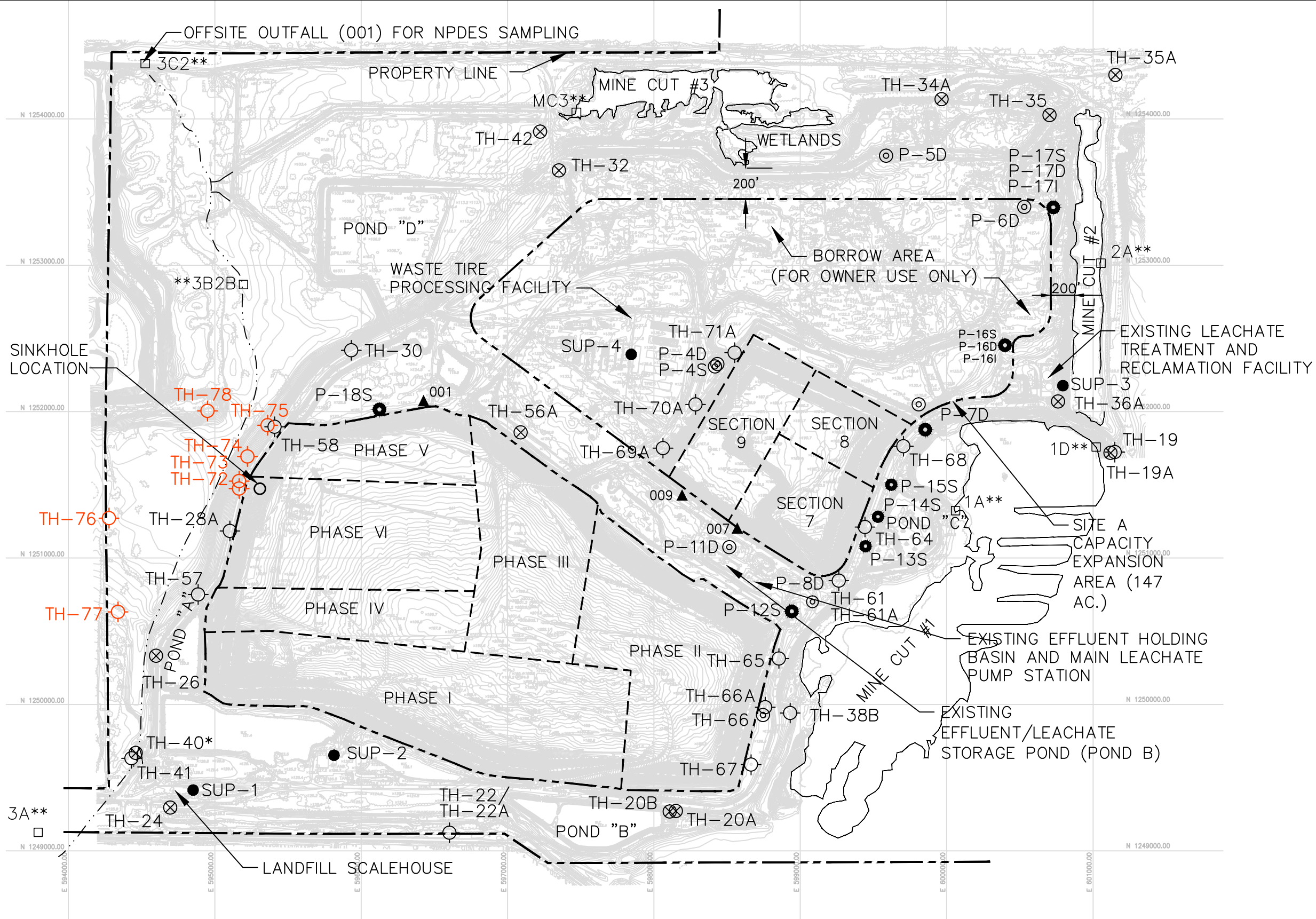
The County continues to move forward with implementation of the IAMP, which includes the monthly sampling of the four upper Floridan / Limestone aquifer groundwater monitoring wells, TH-72, TH-76, TH-77, and TH-78, and quarterly sampling of the three surficial aquifer wells, TH-73, TH-74, and TH-75. The County will continue to evaluate any water quality changes in both the surficial and upper Floridan aquifer wells, and present the findings in the monthly IAMP reports. However, it should be noted the IAMP has now been conducted for four years, and the consistency of the data set supports closure of this monitoring plan. A new plan designed to provide long term protectiveness addressing the sinkhole, should be included in the semi-annual sampling required by the Landfill Operations Permit No. 35435-022-SO/01. It is anticipated that an application for modification of that permit, which is currently being prepared for submittal in early 2015, will include this proposed approach. If you have any specific concerns with this concept, please provide your feedback as soon as possible, so we can incorporate any suggestions into our strategy moving forward.

Enclosed for your review please find a site location map depicting the location of the monitoring wells sampled, the water quality data summary table for this sampling event, a groundwater elevation data table, groundwater contour and flow diagrams for the surficial and upper Floridan / Limestone aquifers, the historical data summary tables for the wells sampled this month, and the complete analytical data report from our contracted laboratory, Advanced Environmental Laboratories, Inc. Should you have any questions or require any additional information please feel free to call me at (813) 663-3221.

Respectfully submitted,

David S. Adams, P.G.
Environmental Manager
Public Utilities Department

xc: John Lyons, Director, Public Works Department
Kim Byer, Director, Solid Waste Division, Public Works
Larry Ruiz, Landfill Manager, Solid Waste Division, Public Works
Jeff Greenwell, GMIII, Environmental Services, Public Utilities
Richard Tedder, FDEP Tallahassee
Clark Moore, FDEP Tallahassee
Steve Morgan, FDEP, Southwest District
Andy Schipfer, EPC
Ernest Ely, WMI
Brian Miller, DOH
Rich Siemering, HDR
Bob Curtis, HDR
Joe O'Neill, CDS



- LEGEND**
- 001 ▲ LEACHATE SAMPLING LOCATION
 - P-1S ⊙ SHALLOW PIEZOMETER
 - P-1D ⊙ DEEP PIEZOMETER
 - SUP-1 ● SUPPLY WELL
 - TH-32 ⊗ INACTIVE MONITORING WELL LOCATION AND DESIGNATION
 - P-8D ● PIEZOMETER TO MONITOR HYDRAULIC DIVIDE
 - 1D □ SURFACE WATER MONITORING SITE LOCATION
 - TH-22A ⊙ MONITORING SITE LOCATION MONITOR WELL
 - * FLORIDAN AQUIFER
 - 1A** STAFF GAUGE
 - TH-73 ⊙ MONITORING WELL SAMPLED AS PART OF IAMP

NOTES:
1. TOPOGRAPHICAL INFORMATION COMPLIED FROM EXISTING CONDITIONS SURVEY PERFORM BY PICKETT & ASSOCIATES DATED JAN 2013.



SHEET TITLE

**IAMP WELL LOCATIONS
SOUTHEAST COUNTY LANDFILL
HILLSBOROUGH COUNTY, FLORIDA**

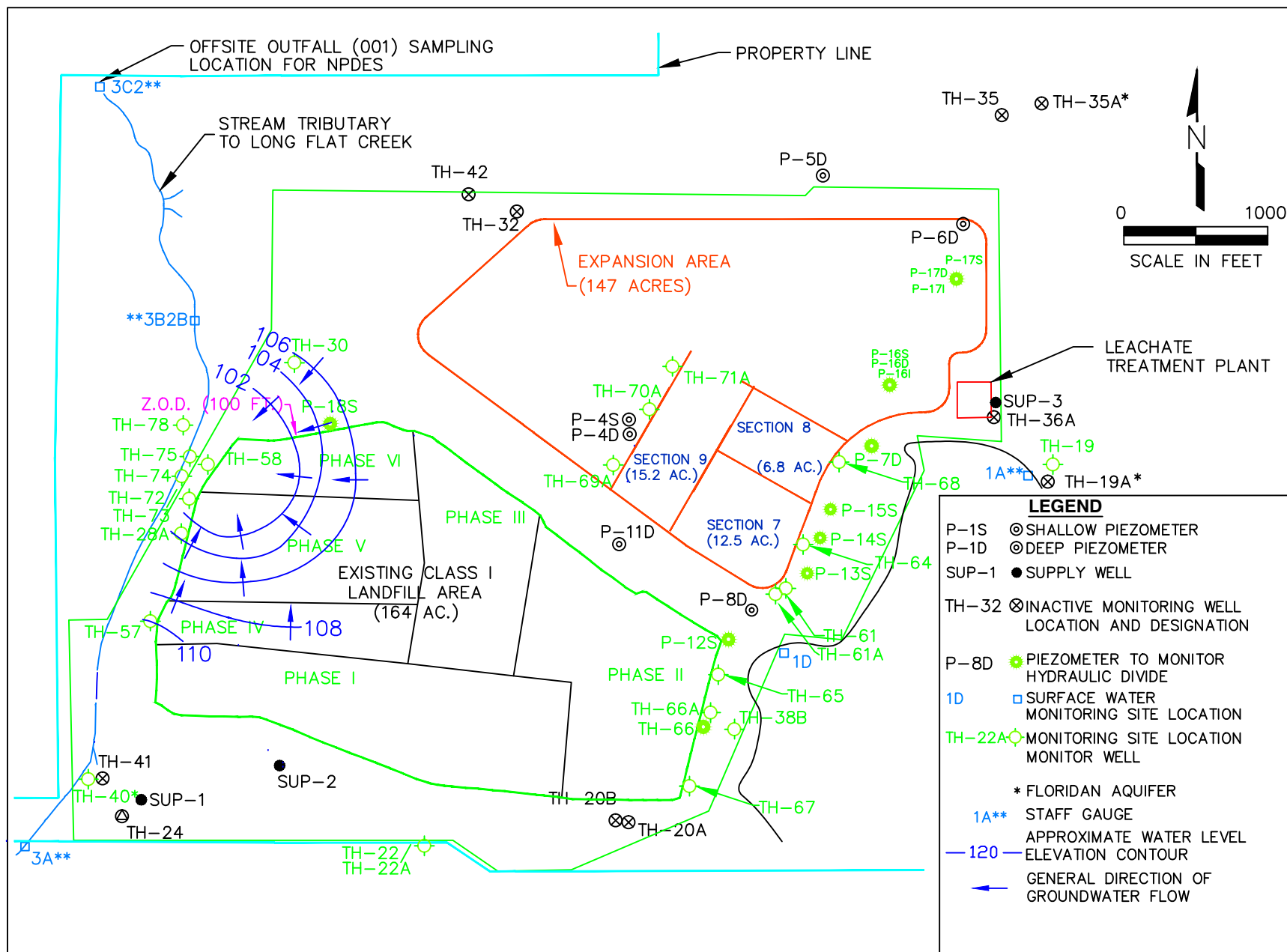
PROJECT NUMBER	REFERENCE SHEET
SCALE	DRAWING NAME
DATE JULY, 2014	EXHIBIT NUMBER 1

Southeast County Landfill
Laboratory Analytical Data
Upper Floridan Aquifer Groundwater Monitoring Wells
December 3-4, 2014

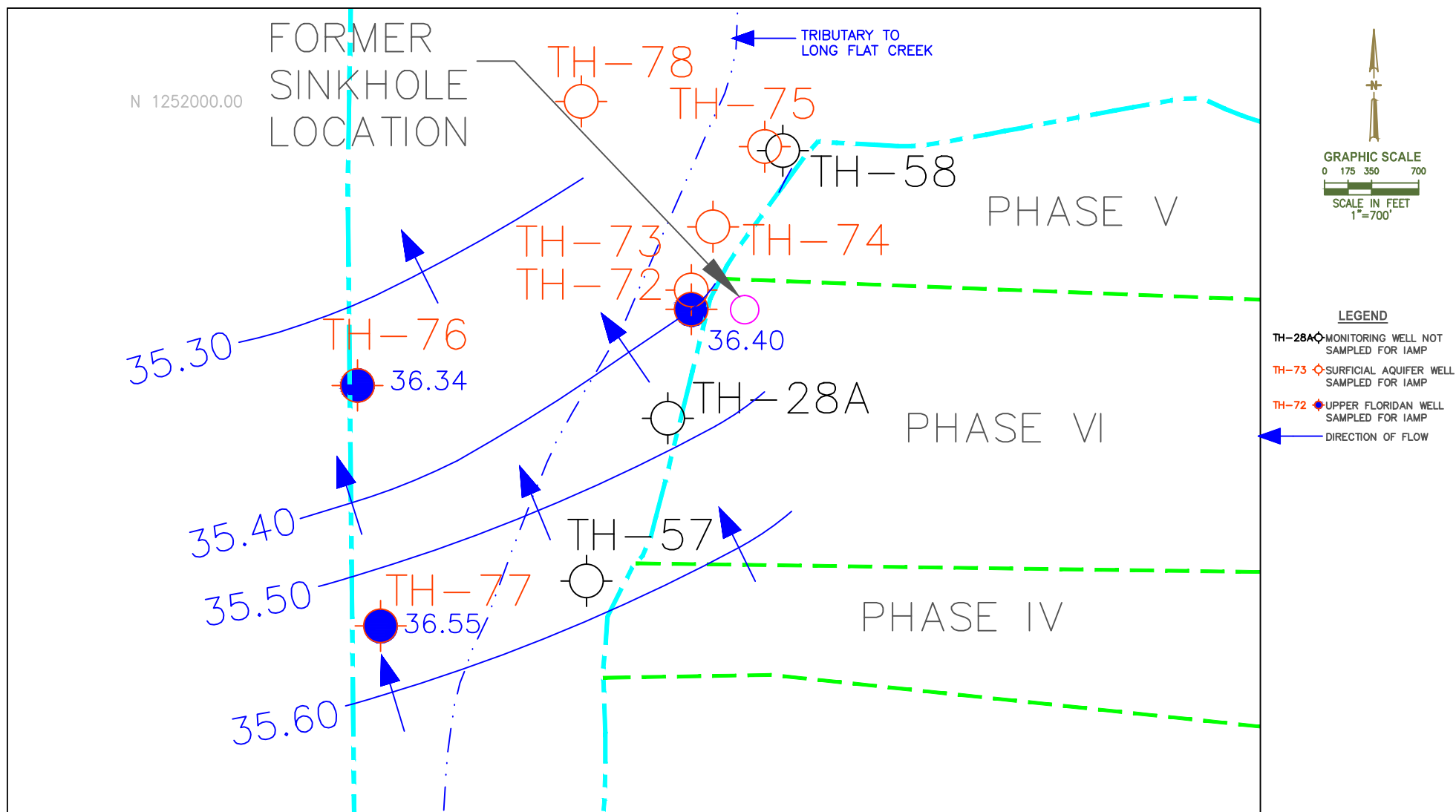
GENERAL	Upper Floridan Wells				MCL STANDARD
PARAMETERS	TH-72	TH-76	TH-77	TH-78	
conductivity (umhos/cm) (field)	2,675	517	490	584	NS
dissolved oxygen (mg/l) (field)	0.34	0.27	0.46	0.49	NS
pH (field)	6.67	7.34	7.24	7.86	(6.5 - 8.5)**
temperature (°C) (field)	23.47	22.82	23.43	23.30	NS
turbidity (NTU) (field)	1.3	18.7	0.5	0.5	NS
total dissolved solids (mg/l)	1,300	250	270	290	500**
chloride (mg/l)	500	8	12	29	250**
ammonia nitrogen (mg/l as N)	18	0.34	0.38	0.31	NS
METALS (mg/l)					MCL STANDARD
arsenic	0.0016 u	0.0016 u	0.0016 u	0.0016 u	0.01*
iron	0.58	0.21	0.15	0.25	0.3**
sodium	160	19	16	31	160*
Note: Ref. Groundwater Guidance Concentrations, FDEP 2012					
MCL = Maximum Contaminant Level					
NTU = Nephelometric Turbidity Units					
NS = No Standard					
i = reported value is between the laboratory method detection limit and practical quantitation limit.					
u = parameter was analyzed but not detected.					
* = Primary Drinking Water Standard					
** = Secondary Drinking Water Standard					
1,300					
ug/l = micrograms per liter					
mg/l = milligrams per liter					

Southeast County Landfill Groundwater Elevations December 3, 2014

Measuring Point I.D.	T.O.C. Elevations (NGVD)	W.L. B.T.O.C.	W.L. (NGVD)	Time
TH-28A	131.10	27.64	103.46	10:14 AM
TH-30	128.88	23.52	105.36	10:05 AM
TH-57	128.36	18.41	109.95	9:51 AM
TH-58	127.88	27.22	100.66	10:08 AM
TH-72*	130.96	94.56	36.40	10:10 AM
TH-73	131.07	30.33	100.74	10:12 AM
TH-74	109.08	8.80	100.28	9:57 AM
TH-75	106.92	7.31	99.61	10:00 AM
TH-76*	111.21	74.87	36.34	10:29 AM
TH-77*	119.88	83.33	36.55	10:25 AM
TH-78*	120.75	79.04	41.71	10:36 AM
NGVD = National Geodetic Vertical Datum				
T.O.C. = Top of Casing				
B.T.O.C. = Below Top of Casing				
* = Floridan Well				
W.L. = Water Level				



Southeast County Landfill
Groundwater Elevation Contour Diagram – December 3, 2014



DECEMBER 2014
 UPPER FLORIDAN / LIMESTONE AQUIFER CONTOUR DIAGRAM
 IN THE VICINITY OF THE FORMER SINKHOLE
 SOUTHEAST COUNTY LANDFILL
 HILLSBOROUGH COUNTY, FLORIDA

Hillsborough County Southeast Landfill
Laboratory Analytical Results from IAMP Groundwater Monitoring
TH-72

Date	Depth to Water (feet)	Water Table Elevation (NGVD)	conductivity (umhos/cm) (field)	dissolved oxygen (mg/l) (field)	pH (field)	temperature (°C) (field)	turbidity (NTU) (field)	total dissolved solids (mg/l)	chloride (mg/l)	ammonia nitrogen (mg/l as N)	arsenic (mg/l)	iron (mg/l)	sodium (mg/l)
01/27/2011	115.69	15.27	551	0.39	7.43	22.88	3.2	320	32	0.22	0.004 u	0.52	32
02/03/2011	112.18	18.78	565	1.09	7.38	22.95	9.9	300	32	0.21	0.004 u	0.62	27
02/10/2011	109.80	21.16	514	1.58	7.34	22.65	3.2	340	31	0.28	0.004 u	0.54	31
02/14/2011	108.18	22.78	483	1.15	7.36	22.7	3.5	320	32	0.24	0.0013 u	0.58	32
02/24/2011	111.71	19.25	513	0.19	7.34	22.85	1	350	32	0.22	0.004 u	0.53	31
03/03/2011	111.88	19.08	579	0.77	7.35	22.8	0.8	330	31	0.23	0.004 u	0.43	32
03/10/2011	113.65	17.31	551	1.26	7.41	22.73	0.9	320	30	0.18	0.004 u	0.35	31
03/17/2011	112.85	18.11	388	1.05	7.34	22.9	0.9	330	30	0.31	0.004 u	0.25	31
03/24/2011	114.33	16.63	1192	1.5	7.58	23.1	1.5	1,100	350	9	0.004 u	0.64	130
04/01/2011	115.70	15.26	928	0.16	7.41	22.8	3.6	520	110	2	0.004 u	0.24	59
04/08/2011	112.10	18.86	810	0.92	7.35	23.13	6.1	420	87	1.9	0.004 u	0.22	51
05/05/2011	116.21	14.75	609	0.71	7.67	23.01	6.6	320	33	0.3	0.004 u	0.27	37
06/08/2011	119.19	11.77	607	0.71	7.65	23.35	4.51	340	32	0.57	0.004 u	0.2	34
07/07/2011	113.30	17.66	606	0.72	7.4	23.25	3.94	150	64	2.1	0.004 u	7.9	27
08/04/2011	103.31	27.65	564	0.33	7.29	23.18	0.4	360	33	0.21	0.004 u	0.18 i	34
09/08/2011	97.99	32.97	536	1.11	7.29	23.2	0.6	340	34	0.41	0.004 u	0.18 i	36
10/04/2011	99.45	31.51	471	1.69	7.31	23.13	1.1	290	31	0.3	0.004 u	0.14 i	34
11/03/2011	103.37	27.59	550	1.8	7.28	23.04	1.51	290	32	0.29	0.004 u	0.15 i	34
12/08/2011	106.80	24.16	528	1.92	7.31	22.9	0.73	320	29	0.32	0.004 u	0.13 i	33
01/05/2012	113.08	17.88	535	0.2	7.23	22.74	0.44	330	32	0.29	0.004 u	0.097 i	31
02/10/2012	113.86	17.10	511	0.94	7.3	22.89	1.39	310	28	0.28	0.004 u	0.13 i	30
03/07/2012	121.00	9.96	575	0.27	7.15	23.23	0.5	310	25	0.22	0.004 u	0.11 i	31
04/05/2012	124.96	6.00	522	1.09	7.08	23.18	0.65	280	28	0.41	0.004 u	0.11 i	29
05/03/2012	126.55	4.41	746	1.6	6.9	23.46	0.81	380	72	2.3	0.004 u	0.54	49
06/07/2012	120.46	10.50	641	0.72	7.07	23.4	0.26	370	46	1	0.004 u	0.23	37
07/05/2012	104.95	26.01	900	0.23	6.54	23.52	0.4	650	190	2.9 j3	0.004 u	0.39	70
08/03/2012	98.26	32.70	843	0.69	6.77	23.6	2.23	730	210	3	0.004 u	0.48	78
09/06/2012	91.18	39.66	2,357	0.2	6.51	23.62	1.05	1,300	570	12	0.004 u	1.1	170
10/04/2012	90.19	40.77	1,654	0.6	6.43	23.22	0.46	1,500	650	25	0.004 u	1.9	210
11/07/2012	99.29	31.67	2,488	0.76	6.58	23.03	0.74	1,400	540	15	0.004 u	1.4	180
12/05/2012	101.82	29.14	2,416	0.23	6.49	23.18	0.45	1,300	540	13	0.004 u	1.3	180 j3
01/03/2013	100.65	30.31	2,430	1.1	6.44	23.09	0.42	1,400	500	15	0.004 u	1.3	170 j3
02/07/2013	105.58	25.38	2,206	0.6	6.5	23.1	0.22	1,100	470	13	0.004 u	1.1	160
03/07/2013	110.00	20.96	1,234	0.3	6.61	22.85	0.41	770	290	11	0.004 u	1.1	110
04/04/2013	111.35	19.61	1,252	0.33	6.74	23.15	9.9	870	260	10	0.004 u	1	100
05/02/2013	109.56	21.40	1,615	0.18	6.83	23.16	0.45	810	300	8.6	0.004 u	0.87	110
06/04/2013	109.62	21.34	1,440	0.31	7.13	23.3	0.27	850	290	8.4	0.004 u	0.82	120
07/03/2013	98.72	32.24	1,450	0.18	7.03	23.5	0.41	820	280	8.8	0.004 u	0.79	120
08/02/2013	ND	ND	1,256	0.46	6.88	23.43	0.2	800	290	6.8	0.004 u	0.72	120
09/05/2013	87.92	43.04	1,001	0.61	6.98	23.45	1.17	760	290	7.6	0.004 u	0.71	110
10/02/2013	87.39	43.57	1,566	0.32	6.86	23.53	12.6	1,000	350	7.4 j3	0.004 u	0.79	120
11/06/2013	97.90	33.06	2,145	0.16	6.69	23.36	0.8	1,200	450	12	0.004 u	0.64	170
12/05/2013	98.50	32.46	2,615	0.39	6.74	23.45	0.58	1,200	580	16	0.004 u	0.65	200
01/03/2014	99.02	31.94	2,220	0.84	6.83	22.88	1.64	1,200	580	25	0.004 u	0.67	230 j3
02/06/2014	99.50	31.46	2,452	0.13	6.69	23.13	2.07	1,300	580	23 j3	0.004 u	0.71	210
03/04/2014	97.91	33.05	2,173	0.24	6.67	23.4	1.33	1,500	580	22	0.004 u	0.74	220
04/03/2014	96.22	34.74	1,992	0.22	6.74	23.35	1.33	1,400	590	27	0.0013 u	0.71	220
05/06/2014	100.22	30.74	2,247	0.46	6.81	23.5	1.22	1,400	590	24	0.004 u	0.64	230
06/03/2014	102.58	28.38	2,771	0.34	6.45	23.46	0.96	1,400	570	27	0.004 u	0.73	220
07/03/2014	97.64	33.32	2,388	0.29	6.86	23.54	1.34	1,300	570	24	0.004 u	0.72	220
08/12/2014	90.40	40.56	2,375	0.28	6.87	23.55	0.81	1,300	540	23	0.004 u	0.62	200 j3
09/05/2014	90.75	40.21	3,156	0.46	6.74	23.61	1.96	1,400	510	20	0.004 u	0.65	210
10/07/2014	88.72	42.24	2,300	0.18	6.78	23.59	0.79	1,300	530	23	0.004 u	0.61	200
11/04/2014	95.50	35.46	2,511	0.46	6.64	23.46	1.83	1,400	460	20	0.0016 u	0.68	200

New survey data beginning with 10/4/2012.

u = parameter was analyzed but not detected

i = reported value is between the laboratory method detection limit and the laboratory practical quantitation limit.

j3 = estimated value; value may not be accurate. Spike recovery or RPD outside of criteria.

ND = No Data - water levels collected during quarterly ADR.

1,100 EXCEEDS STANDARD

Hillsborough County Southeast Landfill
Laboratory Analytical Results from IAMP Groundwater Monitoring
TH-76

Date	Depth to Water (feet)	Water Table Elevation (NGVD)	conductivity (umhos/cm) (field)	dissolved oxygen (mg/l) (field)	pH (field)	temperature (°C) (field)	turbidity (NTU) (field)	total dissolved solids (mg/l)	chloride (mg/l)	ammonia nitrogen (mg/l as N)	arsenic (mg/l)	iron (mg/l)	sodium (mg/l)
05/02/2013	89.83	21.38	450	0.22	7.63	22.81	36.9	220	13	0.4	0.004 u	1.1	20
06/04/2013	89.91	21.30	401	0.27	7.86	22.9	16.2	240	13	0.4	0.004 u	0.66	22
07/03/2013	79.04	32.17	398	0.19	8	23	28.6	210	12	0.34	0.004 u	0.99	22
08/02/2013	ND	ND	343	0.22	7.57	23.02	42.2	230	13	0.26	0.004 u	1.6	21
09/05/2013	68.22	42.99	278	0.21	7.74	22.97	46	240	12	0.32	0.004 u	1.5	20
10/02/2013	67.69	43.46	399	0.22	7.61	22.99	61.9	120	13	0.38	0.004 u	1.7	20
11/06/2013	78.19	33.02	446	0.64	7.54	22.84	29	260	13	0.36	0.004 u	1.1	20
12/05/2013	78.80	32.41	478	0.48	7.45	22.9	19.2	240	12	0.35	0.004 u	0.96	20
01/03/2014	79.38	31.83	398	0.58	7.67	22.35	19.4	190	12	0.23 j3	0.004 u	1.1	20
02/06/2014	79.87	31.34	446	0.14	7.54	22.57	18.1	230	12	0.45	0.004 u	0.96	20
03/04/2014	78.20	33.01	434	0.18	7.36	22.7	26.2	230	12	0.33	0.004 u	0.69	20
04/03/2014	76.54	34.67	441	0.18	7.46	22.82	24.7	210	12	0.6	0.0013 u	0.34	19
05/06/2014	80.52	30.69	427	0.24	7.56	22.85	12.7	220	12	0.38	0.004 u	0.65	21
06/03/2014	82.85	28.36	423	0.3	7.47	22.82	16.8	240	12	0.47	0.004 u	0.64	20
07/03/2014	77.98	33.23	421	0.3	7.46	22.83	19.5	230	12	0.49	0.004 u	0.2	20
08/13/2014	70.72	40.49	445	0.25	7.37	22.81	17	240	12	0.5	0.004 u	0.7	20
09/05/2014	71.05	40.16	596	0.2	7.28	22.92	19	240	12	0.72	0.004 u	0.61	20
10/07/2014	69.03	42.18	432	0.34	7.37	22.89	17.9	260	12	0.78	0.004 u	0.77	19
11/04/2014	75.84	35.37	502	0.27	7.19	22.9	16.4	280	11	0.37	0.0016 u	0.27	21

u = parameter was analyzed but not detected
j3 = estimated value; value may not be accurate. Spike recovery or RPD outside of criteria.
ND = No Data - water levels collected during quarterly ADR.

1.1 EXCEEDS STANDARD

Hillsborough County Southeast Landfill
Laboratory Analytical Results from IAMP Groundwater Monitoring
TH-77

Date	Depth to Water (feet)	Water Table Elevation (NGVD)	conductivity (umhos/cm) (field)	dissolved oxygen (mg/l) (field)	pH (field)	temperature (°C) (field)	turbidity (NTU) (field)	total dissolved solids (mg/l)	chloride (mg/l)	ammonia nitrogen (mg/l as N)	arsenic (mg/l)	iron (mg/l)	sodium (mg/l)
05/02/2013	98.31	21.57	440	0.57	7.39	23.39	59.4	190	9.4	0.39	0.004 u	1.2	17
06/04/2013	98.38	21.50	384	0.56	7.86	23.59	35.4	230	8.9	0.42	0.004 u	0.89	18
07/03/2013	87.48	32.40	388	0.41	7.8	23.7	38.4	210	8.9	0.4	0.004 u	1.1	17
08/02/2013	ND	ND	334	0.47	7.44	23.66	42.9	230	9.2	0.36	0.004 u	1.1	18
09/05/2013	76.66	43.22	269	0.83	7.61	23.68	47.1	230	8.9	0.35	0.004 u	0.96	16
10/02/2013	76.14	43.72	383	0.69	7.5	23.59	52.7	240	9.1	0.39	0.004 u	1.3	17
11/06/2013	86.68	33.20	423	0.74	7.43	23.51	25.1	230	9.7	0.36 j3	0.004 u	0.68	17
12/05/2013	87.29	32.59	451	0.9	7.44	23.6	16.4	220	9	0.36	0.004 u	0.58	17
01/03/2014	87.87	32.01	371	0.85	7.65	23.18	16.5	160	9.1	0.39	0.004 u	0.63	17
02/06/2014	88.30	31.58	424	0.09	7.53	23.39	4.62	250	9.2	0.27	0.004 u	0.26	16
03/04/2014	86.70	33.18	418	0.36	7.34	23.38	1.12	230	9.3	0.32	0.004 u	0.21	16
04/03/2014	85.02	34.86	430	0.28	7.45	23.47	1.97	220	9.4	0.61	0.0013 u	0.18	15
05/06/2014	89.02	30.86	414	0.34	7.52	23.47	1.01	220	9.7	0.59	0.004 u	0.19	17
06/03/2014	91.34	28.54	464	0.27	7.47	23.49	0.88	230	9.7	0.75	0.004 u	0.19	17
07/03/2014	86.40	33.48	409	0.34	7.44	23.65	1.56	230	9.6	0.48	0.004 u	0.14 i	17
08/13/2014	79.19	40.69	436	0.36	7.39	23.76	0.61	260	9.5	0.49	0.004 u	0.16 i	16
09/05/2014	79.52	40.36	578	0.37	7.31	23.62	1.02	240	12	0.72	0.004 u	0.61	20
10/07/2014	77.55	42.33	416	0.22	7.36	23.64	0.71	240	9.3	1.4 j3	0.004 u	0.16 i	16
11/04/2014	84.27	35.61	469	0.27	7.26	23.66	1.28	280	10	0.38	0.0016 u	0.16	17

u = parameter was analyzed but not detected

i = reported value is between the laboratory method detection limit and the laboratory practical quantitation limit.

j3 = estimated value; value may not be accurate. Spike recovery or RPD outside of criteria.

ND = No Data - water levels collected during quarterly ADR.

1.2 EXCEEDS STANDARD

Hillsborough County Southeast Landfill
Laboratory Analytical Results from IAMP Groundwater Monitoring
TH-78

Date	Depth to Water (feet)	Water Table Elevation (NGVD)	conductivity (umhos/cm) (field)	dissolved oxygen (mg/l) (field)	pH (field)	temperature (°C) (field)	turbidity (NTU) (field)	total dissolved solids (mg/l)	chloride (mg/l)	ammonia nitrogen (mg/l as N)	arsenic (mg/l)	iron (mg/l)	sodium (mg/l)
07/02/2014	ND	ND	363	0.41	9.08	23.89	19.3	210	43	0.44	0.0019 i	1	38
08/12/2014	75.51	45.24	467	0.4	9.55	23.56	7.37	240	38	0.42 j3	0.004 u	0.48	34
09/05/2014	75.12	45.63	680	0.15	8.18	23.46	3.86	270	36	0.40	0.004 u	0.27	35
10/07/2014	73.49	47.26	508	0.30	8.39	23.35	1.12	270	34	0.44	0.004 u	0.23	34
11/04/2014	77.73	43.02	555	0.44	7.92	23.33	1.58	320	37	0.3	0.0016 u	0.27	34

u = parameter was analyzed but not detected
i = reported value is between the laboratory method detection limit and the laboratory practical quantitation limit.
j3 = estimated value; value may not be accurate. Spike recovery or RPD outside of criteria.
ND = No Data - survey data was not complete.

1 EXCEEDS STANDARD

December 18, 2014

David Adams
Hillsborough Co Public Utilities
332 North Falkenburg Rd
Tampa, FL 33619

RE: Workorder: T1416194 Southeast County Landfill-IAMP

Dear David Adams:

Enclosed are the analytical results for sample(s) received by the laboratory between Wednesday, December 03, 2014 and Thursday, December 04, 2014. Results reported herein conform to the most current NELAC standards, where applicable, unless otherwise narrated in the body of the report. The analytical results for the samples contained in this report were submitted for analysis as outlined by the Chain of Custody and results pertain only to these samples.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Heidi Brooks
HBrooks@AELLab.com

Enclosures

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SAMPLE SUMMARY

Workorder: T1416194 Southeast County Landfill-IAMP

Lab ID	Sample ID	Matrix	Date Collected	Date Received
T1416194001	Field Blank	Water	12/3/2014 10:35	12/3/2014 15:45
T1416194002	TH-78	Water	12/3/2014 11:40	12/3/2014 15:45
T1416194003	TH-77	Water	12/3/2014 12:47	12/3/2014 15:45
T1416194004	Duplicate	Water	12/4/2014 00:00	12/4/2014 14:00
T1416194005	TH-76	Water	12/4/2014 11:50	12/4/2014 14:00
T1416194006	TH-72	Water	12/4/2014 10:28	12/4/2014 14:00

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ANALYTICAL RESULTS

Workorder: T1416194 Southeast County Landfill-IAMP

Lab ID: **T1416194001**

Date Received: 12/03/14 15:45 Matrix: Water

Sample ID: **Field Blank**

Date Collected: 12/03/14 10:35

Sample Description:

Location:

Parameters	Results	Qual	Units	DF	Adjusted PQL	Adjusted MDL	Analyzed	Lab
METALS								
Analysis Desc: SW846 6010B			Preparation Method: SW-846 3010A					
Analysis, Water			Analytical Method: SW-846 6010					
Arsenic	1.6	U	ug/L	1	10	1.6	12/9/2014 16:34	T
Iron	21	U	ug/L	1	100	21	12/9/2014 16:34	T
Sodium	0.042	U	mg/L	1	0.20	0.042	12/9/2014 16:34	T
WET CHEMISTRY								
Analysis Desc: Ammonia, E350.1, Water			Analytical Method: EPA 350.1					
Ammonia (N)	0.02	U	mg/L	1	0.10	0.02	12/8/2014 14:24	T
Analysis Desc: Tot Dissolved Solids, SM2540C			Analytical Method: SM 2540 C					
Total Dissolved Solids	10	U	mg/L	1	10	10	12/9/2014 10:39	T
Analysis Desc: Chlorides, SM4500-Cl-E, Water			Analytical Method: SM 4500-Cl-E					
Chloride	1.1	U	mg/L	1	5.0	1.1	12/9/2014 17:39	T

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ANALYTICAL RESULTS

Workorder: T1416194 Southeast County Landfill-IAMP

Lab ID: **T1416194002**

Date Received: 12/03/14 15:45 Matrix: Water

Sample ID: **TH-78**

Date Collected: 12/03/14 11:40

Sample Description:

Location:

Parameters	Results	Qual	Units	DF	Adjusted PQL	Adjusted MDL	Analyzed	Lab
FIELD PARAMETERS								
Analysis Desc: Data entry of field measurements			Analytical Method: Field Measurements					
Conductivity	584		umhos/cm	1			12/3/2014 11:40	
Dissolved Oxygen	0.49		mg/L	1			12/3/2014 11:40	
Temperature	23.3		°C	1			12/3/2014 11:40	
Turbidity	0.5		NTU	1			12/3/2014 11:40	
pH	7.86		SU	1			12/3/2014 11:40	
METALS								
Analysis Desc: Chlorides, SM4500-Cl-E, Water			Analytical Method: SM 4500-Cl-E					
Chloride	29		mg/L	1	5.0	1.1	12/9/2014 17:39	T
Analysis Desc: SW846 6010B Analysis, Water			Preparation Method: SW-846 3010A Analytical Method: SW-846 6010					
Arsenic	1.6	U	ug/L	1	10	1.6	12/8/2014 16:07	T
Iron	250		ug/L	1	100	21	12/8/2014 16:07	T
Sodium	31		mg/L	1	0.20	0.042	12/8/2014 16:07	T
WET CHEMISTRY								
Analysis Desc: Ammonia, E350.1, Water			Analytical Method: EPA 350.1					
Ammonia (N)	0.31		mg/L	1	0.10	0.02	12/8/2014 14:24	T
Analysis Desc: Tot Dissolved Solids, SM2540C			Analytical Method: SM 2540 C					
Total Dissolved Solids	290		mg/L	1	10	10	12/9/2014 10:39	T

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ANALYTICAL RESULTS

Workorder: T1416194 Southeast County Landfill-IAMP

Lab ID: **T1416194003**

Date Received: 12/03/14 15:45 Matrix: Water

Sample ID: **TH-77**

Date Collected: 12/03/14 12:47

Sample Description:

Location:

Parameters	Results	Qual	Units	DF	Adjusted PQL	Adjusted MDL	Analyzed	Lab
FIELD PARAMETERS								
Analysis Desc: Data entry of field measurements			Analytical Method: Field Measurements					
Conductivity	490		umhos/cm	1			12/3/2014 12:47	
Dissolved Oxygen	0.46		mg/L	1			12/3/2014 12:47	
Temperature	23.43		°C	1			12/3/2014 12:47	
Turbidity	0.5		NTU	1			12/3/2014 12:47	
pH	7.24		SU	1			12/3/2014 12:47	
METALS								
Analysis Desc: SW846 6010B Analysis, Water			Preparation Method: SW-846 3010A Analytical Method: SW-846 6010					
Arsenic	1.6	U	ug/L	1	10	1.6	12/8/2014 16:12	T
Iron	150		ug/L	1	100	21	12/8/2014 16:12	T
Sodium	16		mg/L	1	0.20	0.042	12/8/2014 16:12	T
WET CHEMISTRY								
Analysis Desc: Ammonia, E350.1, Water			Analytical Method: EPA 350.1					
Ammonia (N)	0.38		mg/L	1	0.10	0.02	12/8/2014 14:24	T
Analysis Desc: Tot Dissolved Solids, SM2540C			Analytical Method: SM 2540 C					
Total Dissolved Solids	270		mg/L	1	10	10	12/9/2014 10:39	T
Analysis Desc: Chlorides, SM4500-Cl-E, Water			Analytical Method: SM 4500-Cl-E					
Chloride	12		mg/L	1	5.0	1.1	12/9/2014 17:39	T

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ANALYTICAL RESULTS

Workorder: T1416194 Southeast County Landfill-IAMP

Lab ID: **T1416194004**

Date Received: 12/04/14 14:00 Matrix: Water

Sample ID: **Duplicate**

Date Collected: 12/04/14 00:00

Sample Description:

Location:

Parameters	Results	Qual	Units	DF	Adjusted PQL	Adjusted MDL	Analyzed	Lab
METALS								
Analysis Desc: SW846 6010B			Preparation Method: SW-846 3010A					
Analysis, Water			Analytical Method: SW-846 6010					
Arsenic	1.6	U	ug/L	1	10	1.6	12/8/2014 16:18	T
Iron	220		ug/L	1	100	21	12/8/2014 16:18	T
Sodium	19		mg/L	1	0.20	0.042	12/8/2014 16:18	T
WET CHEMISTRY								
Analysis Desc: Ammonia, E350.1, Water			Analytical Method: EPA 350.1					
Ammonia (N)	0.32		mg/L	1	0.10	0.02	12/8/2014 14:24	T
Analysis Desc: Tot Dissolved Solids, SM2540C			Analytical Method: SM 2540 C					
Total Dissolved Solids	260		mg/L	1	10	10	12/10/2014 09:53	T
Analysis Desc: Chlorides, SM4500-Cl-E, Water			Analytical Method: SM 4500-Cl-E					
Chloride	8.2		mg/L	1	5.0	1.1	12/9/2014 17:39	T

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ANALYTICAL RESULTS

Workorder: T1416194 Southeast County Landfill-IAMP

Lab ID: **T1416194005**

Date Received: 12/04/14 14:00 Matrix: Water

Sample ID: **TH-76**

Date Collected: 12/04/14 11:50

Sample Description:

Location:

Parameters	Results	Qual	Units	DF	Adjusted PQL	Adjusted MDL	Analyzed	Lab
FIELD PARAMETERS								
Analysis Desc: Data entry of field measurements			Analytical Method: Field Measurements					
Conductivity	517		umhos/cm	1			12/4/2014 11:50	
Dissolved Oxygen	0.27		mg/L	1			12/4/2014 11:50	
Temperature	22.82		°C	1			12/4/2014 11:50	
Turbidity	18.7		NTU	1			12/4/2014 11:50	
pH	7.34		SU	1			12/4/2014 11:50	
METALS								
Analysis Desc: SW846 6010B Analysis, Water			Preparation Method: SW-846 3010A Analytical Method: SW-846 6010					
Arsenic	1.6	U	ug/L	1	10	1.6	12/8/2014 16:24	T
Iron	210		ug/L	1	100	21	12/8/2014 16:24	T
Sodium	19		mg/L	1	0.20	0.042	12/8/2014 16:24	T
WET CHEMISTRY								
Analysis Desc: Ammonia,E350.1,Water			Analytical Method: EPA 350.1					
Ammonia (N)	0.34		mg/L	1	0.10	0.02	12/8/2014 14:24	T
Analysis Desc: Tot Dissolved Solids,SM2540C			Analytical Method: SM 2540 C					
Total Dissolved Solids	250		mg/L	1	10	10	12/10/2014 09:53	T
Analysis Desc: Chlorides,SM4500-Cl-E,Water			Analytical Method: SM 4500-Cl-E					
Chloride	8.0		mg/L	1	5.0	1.1	12/9/2014 17:39	T

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ANALYTICAL RESULTS

Workorder: T1416194 Southeast County Landfill-IAMP

Lab ID: **T1416194006**

Date Received: 12/04/14 14:00 Matrix: Water

Sample ID: **TH-72**

Date Collected: 12/04/14 10:28

Sample Description:

Location:

Parameters	Results	Qual	Units	DF	Adjusted PQL	Adjusted MDL	Analyzed	Lab
FIELD PARAMETERS								
Analysis Desc: Data entry of field measurements			Analytical Method: Field Measurements					
Conductivity	2675		umhos/cm	1			12/4/2014 10:28	
Dissolved Oxygen	0.34		mg/L	1			12/4/2014 10:28	
Temperature	23.47		°C	1			12/4/2014 10:28	
Turbidity	1.3		NTU	1			12/4/2014 10:28	
pH	6.67		SU	1			12/4/2014 10:28	
METALS								
Analysis Desc: SW846 6010B Analysis, Water			Preparation Method: SW-846 3010A Analytical Method: SW-846 6010					
Arsenic	1.6	U	ug/L	1	10	1.6	12/8/2014 16:29	T
Iron	580		ug/L	1	100	21	12/8/2014 16:29	T
Sodium	160		mg/L	1	0.20	0.042	12/8/2014 16:29	T
WET CHEMISTRY								
Analysis Desc: Ammonia, E350.1, Water			Analytical Method: EPA 350.1					
Ammonia (N)	18		mg/L	10	1.00	0.25	12/8/2014 16:47	T
Analysis Desc: Tot Dissolved Solids, SM2540C			Analytical Method: SM 2540 C					
Total Dissolved Solids	1300		mg/L	1	10	10	12/10/2014 09:53	T
Analysis Desc: Chlorides, SM4500-Cl-E, Water			Analytical Method: SM 4500-Cl-E					
Chloride	500		mg/L	5	25	5.7	12/9/2014 17:39	T

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ANALYTICAL RESULTS QUALIFIERS

Workorder: T1416194 Southeast County Landfill-IAMP

PARAMETER QUALIFIERS

- U The compound was analyzed for but not detected.
- I The reported value is between the laboratory method detection limit and the laboratory practical quantitation limit.

LAB QUALIFIERS

- T DOH Certification #E84589(AEL-T)(FL NELAC Certification)
- T^ Not Certified

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QUALITY CONTROL DATA

Workorder: T1416194 Southeast County Landfill-IAMP

QC Batch: DGM/1499 Analysis Method: SW-846 6010
QC Batch Method: SW-846 3010A Prepared: 12/05/2014 12:00
Associated Lab Samples: T1416194001

METHOD BLANK: 1625949

Parameter	Units	Blank Result	Reporting Limit Qualifiers
METALS			
Arsenic	ug/L	1.6	1.6 U
Iron	ug/L	21	21 U
Sodium	mg/L	0.042	0.042 U

LABORATORY CONTROL SAMPLE: 1625950

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits Qualifiers
METALS					
Arsenic	ug/L	400	390	97	80-120
Iron	ug/L	25000	27000	106	80-120
Sodium	mg/L	50	51	101	80-120

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1625951 1625952 Original: T1416104001

Parameter	Units	Original Result	Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limit	Max RPD	RPD	Qualifiers
METALS											
Arsenic	ug/L	-0.98	400	370	380	94	95	75-125	1	20	
Iron	ug/L	3.7	25000	27000	27000	104	104	75-125	0	20	
Sodium	mg/L	0.017	50	52	51	103	101	75-125	1	20	

QC Batch: DGM/1500 Analysis Method: SW-846 6010
QC Batch Method: SW-846 3010A Prepared: 12/05/2014 12:00
Associated Lab Samples: T1416194002, T1416194003, T1416194004, T1416194005, T1416194006

METHOD BLANK: 1625953

Parameter	Units	Blank Result	Reporting Limit Qualifiers
METALS			
Arsenic	ug/L	1.6	1.6 U

Report ID: 344451 - 4911909

AMENDED

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QUALITY CONTROL DATA

Workorder: T1416194 Southeast County Landfill-IAMP

METHOD BLANK: 1625953

Parameter	Units	Blank Result	Reporting Limit Qualifiers
Iron	ug/L	21	21 U
Sodium	mg/L	0.042	0.042 U

LABORATORY CONTROL SAMPLE: 1625954

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits Qualifiers
METALS					
Arsenic	ug/L	400	390	97	80-120
Iron	ug/L	25000	27000	106	80-120
Sodium	mg/L	50	52	103	80-120

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1625955 1625956 Original: T1416196001

Parameter	Units	Original Result	Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limit	Max RPD	Max RPD Qualifiers
METALS										
Arsenic	ug/L	-0.53	400	390	390	98	98	75-125	1	20
Iron	ug/L	8.7	25000	28000	28000	110	112	75-125	2	20
Sodium	mg/L	0.023	50	54	54	106	107	75-125	0	20

QC Batch: WCAI/7306

Analysis Method: EPA 350.1

QC Batch Method: EPA 350.1

Prepared:

Associated Lab Samples: T1416194001, T1416194002, T1416194003, T1416194004, T1416194005

METHOD BLANK: 1627214

Parameter	Units	Blank Result	Reporting Limit Qualifiers
WET CHEMISTRY			
Ammonia (N)	mg/L	0.02	0.02 U

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QUALITY CONTROL DATA

Workorder: T1416194 Southeast County Landfill-IAMP

LABORATORY CONTROL SAMPLE: 1627215

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
WET CHEMISTRY						
Ammonia (N)	mg/L	1	1.1	108	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1627216 1627217 Original: T1416193001

Parameter	Units	Original Result	Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limit	Max RPD	Max RPD	Qualifiers
WET CHEMISTRY											
Ammonia (N)	mg/L	8.6	1	9.5	9.6	93	97	90-110	0	10	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1627218 1627219 Original: T1416194001

Parameter	Units	Original Result	Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limit	Max RPD	Max RPD	Qualifiers
WET CHEMISTRY											
Ammonia (N)	mg/L	0	1	1.0	0.99	101	99	90-110	2	10	

QC Batch: WCAI/7307

Analysis Method: EPA 350.1

QC Batch Method: EPA 350.1

Prepared:

Associated Lab Samples: T1416194006

METHOD BLANK: 1627222

Parameter	Units	Blank Result	Reporting Limit	Qualifiers
WET CHEMISTRY				
Ammonia (N)	mg/L	0.02	0.02	U

LABORATORY CONTROL SAMPLE: 1627223

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
WET CHEMISTRY						
Ammonia (N)	mg/L	1	1.1	108	90-110	

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QUALITY CONTROL DATA

Workorder: T1416194 Southeast County Landfill-IAMP

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1627224 1627225 Original: T1416196001

Parameter	Units	Original Result	Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limit	Max RPD	RPD	Qualifiers
WET CHEMISTRY Ammonia (N)	mg/L	0.04	1	0.96	0.96	92	91	90-110	1	10	

QC Batch: WCAI/7339 Analysis Method: SM 2540 C
QC Batch Method: SM 2540 C Prepared:
Associated Lab Samples: T1416194001, T1416194002, T1416194003

METHOD BLANK: 1628194

Parameter	Units	Blank Result	Reporting Limit	Qualifiers
WET CHEMISTRY Total Dissolved Solids	mg/L	10	10	U

LABORATORY CONTROL SAMPLE: 1628195

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
WET CHEMISTRY Total Dissolved Solids	mg/L	660	640	97	75-125	

SAMPLE DUPLICATE: 1628196 Original: T1416180001

Parameter	Units	Original Result	DUP Result	RPD	Max RPD	Qualifiers
WET CHEMISTRY Total Dissolved Solids	mg/L	380	390	1	10	

QC Batch: WCAI/7362 Analysis Method: SM 2540 C
QC Batch Method: SM 2540 C Prepared:
Associated Lab Samples: T1416194004, T1416194005, T1416194006

CERTIFICATE OF ANALYSIS

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QUALITY CONTROL DATA

Workorder: T1416194 Southeast County Landfill-IAMP

METHOD BLANK: 1629481

Parameter	Units	Blank Result	Reporting Limit Qualifiers
WET CHEMISTRY			
Total Dissolved Solids	mg/L	10	10 U

LABORATORY CONTROL SAMPLE: 1629482

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits Qualifiers
WET CHEMISTRY					
Total Dissolved Solids	mg/L	660	660	100	75-125

SAMPLE DUPLICATE: 1629483

Original: T1416194004

Parameter	Units	Original Result	DUP Result	RPD	Max RPD Qualifiers
WET CHEMISTRY					
Total Dissolved Solids	mg/L	260	260	1	10
QC Batch:	WCAI/7386		Analysis Method:	SM 4500-CI-E	
QC Batch Method:	SM 4500-CI-E		Prepared:		
Associated Lab Samples:	T1416194001, T1416194002, T1416194003, T1416194004, T1416194005, T1416194006				

METHOD BLANK: 1630015

Parameter	Units	Blank Result	Reporting Limit Qualifiers
WET CHEMISTRY			
Chloride	mg/L	1.1	1.1 U

LABORATORY CONTROL SAMPLE: 1630016

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits Qualifiers
WET CHEMISTRY					
Chloride	mg/L	40	42	104	90-110

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QUALITY CONTROL DATA

Workorder: T1416194 Southeast County Landfill-IAMP

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1630017 1630018 Original: T1416194002

Parameter	Units	Original Result	Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limit	Max RPD	Max RPD	Qualifiers
WET CHEMISTRY Chloride	mg/L	29	40	70	73	103	109	90-110	3	10	

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Workorder: T1416194 Southeast County Landfill-IAMP

Lab ID	Sample ID	Prep Method	Prep Batch	Analysis Method	Analysis Batch
T1416194001	Field Blank	SW-846 3010A	DGMt/1499	SW-846 6010	ICPt/1280
T1416194002	TH-78	SW-846 3010A	DGMt/1500	SW-846 6010	ICPt/1281
T1416194003	TH-77	SW-846 3010A	DGMt/1500	SW-846 6010	ICPt/1281
T1416194004	Duplicate	SW-846 3010A	DGMt/1500	SW-846 6010	ICPt/1281
T1416194005	TH-76	SW-846 3010A	DGMt/1500	SW-846 6010	ICPt/1281
T1416194006	TH-72	SW-846 3010A	DGMt/1500	SW-846 6010	ICPt/1281
T1416194001	Field Blank			EPA 350.1	WCAI/7306
T1416194002	TH-78			EPA 350.1	WCAI/7306
T1416194003	TH-77			EPA 350.1	WCAI/7306
T1416194004	Duplicate			EPA 350.1	WCAI/7306
T1416194005	TH-76			EPA 350.1	WCAI/7306
T1416194006	TH-72			EPA 350.1	WCAI/7307
T1416194001	Field Blank			SM 2540 C	WCAI/7339
T1416194002	TH-78			SM 2540 C	WCAI/7339
T1416194003	TH-77			SM 2540 C	WCAI/7339
T1416194004	Duplicate			SM 2540 C	WCAI/7362
T1416194005	TH-76			SM 2540 C	WCAI/7362
T1416194006	TH-72			SM 2540 C	WCAI/7362
T1416194001	Field Blank			SM 4500-CI-E	WCAI/7386
T1416194002	TH-78			SM 4500-CI-E	WCAI/7386
T1416194003	TH-77			SM 4500-CI-E	WCAI/7386
T1416194004	Duplicate			SM 4500-CI-E	WCAI/7386
T1416194005	TH-76			SM 4500-CI-E	WCAI/7386
T1416194006	TH-72			SM 4500-CI-E	WCAI/7386
T1416194002	TH-78	Field Measurements	FLDt/	Field Measurements	FLDt/
T1416194003	TH-77	Field Measurements	FLDt/	Field Measurements	FLDt/

Report ID: 344451 - 4911909

AMENDED

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Workorder: T1416194 Southeast County Landfill-IAMP

Lab ID	Sample ID	Prep Method	Prep Batch	Analysis Method	Analysis Batch
T1416194005	TH-76	Field Measurements	FLDt/	Field Measurements	FLDt/
T1416194006	TH-72	Field Measurements	FLDt/	Field Measurements	FLDt/

CERTIFICATE OF ANALYSIS

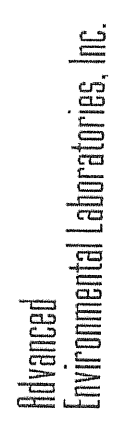
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FOR DRINKING WATER USE (When PWS Information not otherwise supplied)

PWS ID: _____

Contact Person: _____ Phone: _____

Supplier of Water: _____

Site-Address: _____

SITE NAME: SELF IAMP		SITE LOCATION:	
WELL NO: FIELD BLANK	SAMPLE ID: FIELD BLANK	DATE: 12-3-14	

WELL DIAMETER (inches):	TUBING DIAMETER (inches):	WELL SCREEN INTERVAL DEPTH:	STATIC DEPTH TO WATER (feet):	PURGE PUMP TYPE OR BAILER:
N/A	N/A	feet to feet	N/A	N/A
WELL VOLUME PURGE: 1 WELL VOLUME = (TOTAL WELL DEPTH - STATIC DEPTH TO WATER) X WELL CAPACITY (only fill out if applicable)				
$= (\quad \text{feet} - \quad \text{feet}) \times \quad \text{gallons/foot} = \quad \text{gallons}$				
EQUIPMENT VOLUME PURGE: 1 EQUIPMENT VOL. = PUMP VOLUME + (TUBING CAPACITY X TUBING LENGTH) + FLOW CELL VOLUME (only fill out if applicable)				
$= \quad \text{gallons} + (\quad \text{gallons/foot} \times \quad \text{feet}) + \quad \text{gallons} = \quad \text{gallons}$				
INITIAL PUMP OR TUBING DEPTH IN WELL (feet):	FINAL PUMP OR TUBING DEPTH IN WELL (feet):	PURGING INITIATED AT:	PURGING ENDED AT:	TOTAL VOLUME PURGED (gallons):
N/A	N/A	N/A	N/A	N/A

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)
FIELD BLANK											

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)

[illegible]

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:** $\pm 5\%$ **Dissolved Oxygen:** all readings $\leq 20\%$ saturation (see Table FS 2200-2); optionally, ± 0.2 mg/L or $\pm 10\%$ (whichever is greater) **Turbidity:** all readings ≤ 20 NTU; optionally ± 5 NTU or $\pm 10\%$ (whichever is greater)

Revision Date: February 2009

Form FD 9000-24

SITE NAME: SELF IAMP		SITE LOCATION:	
WELL NO: TH-78	SAMPLE ID: TH-78	DATE: 12-3-14	

PURGING DATA

WELL DIAMETER (inches):	2	TUBING DIAMETER (inches):	3/8	WELL SCREEN INTERVAL DEPTH	163.14 feet to 178.14 feet	STATIC DEPTH TO WATER (feet):	79.04	PURGE PUMP TYPE OR BAILER:	BP
----------------------------	---	------------------------------	-----	-------------------------------	----------------------------	----------------------------------	-------	-------------------------------	----

WELL VOLUME PURGE: 1 WELL VOLUME = (TOTAL WELL DEPTH - STATIC DEPTH TO WATER) X WELL CAPACITY

$$= (178.14 \text{ feet} - 79.04 \text{ feet}) \times .16 \text{ gallons/foot} = 15.86 \text{ gallons}$$

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): 177.14	FINAL PUMP OR TUBING DEPTH IN WELL (feet): 177.14	PURGING INITIATED AT: 10:44	PURGING ENDED AT: 11:40	TOTAL VOLUME PURGED (gallons): 28.0
--	--	--------------------------------	----------------------------	--

[illegible]

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

[illegible]

SEE COC FOR ANALYSIS

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:** $\pm 5\%$ **Dissolved Oxygen:** all readings $\leq 20\%$ saturation (see Table FS 2200-2); optionally, ± 0.2 mg/L or $\pm 10\%$ (whichever is greater) **Turbidity:** all readings ≤ 20 NTU; optionally ± 5 NTU or $\pm 10\%$ (whichever is greater)

Revision Date: February 2009

PURGING DATA

SAMPLING DATA

SEE C.O.C. FOR SAMPLE ANALYSIS

DBP= Dedicated bladder pump

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:** $\pm 5\%$ **Dissolved Oxygen:** all readings $\leq 20\%$ saturation (see Table FS 2200-2); optionally, ± 0.2 mg/L or $\pm 10\%$ (whichever is greater) **Turbidity:** all readings ≤ 20 NTU; optionally $+5$ NTU or $+10\%$ (whichever is greater)

Revision Date: February 1, 2004

Form FD 9000-24

PURGING DATA

SAMPLING DATA

SEE COC FOR ANALYSIS

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

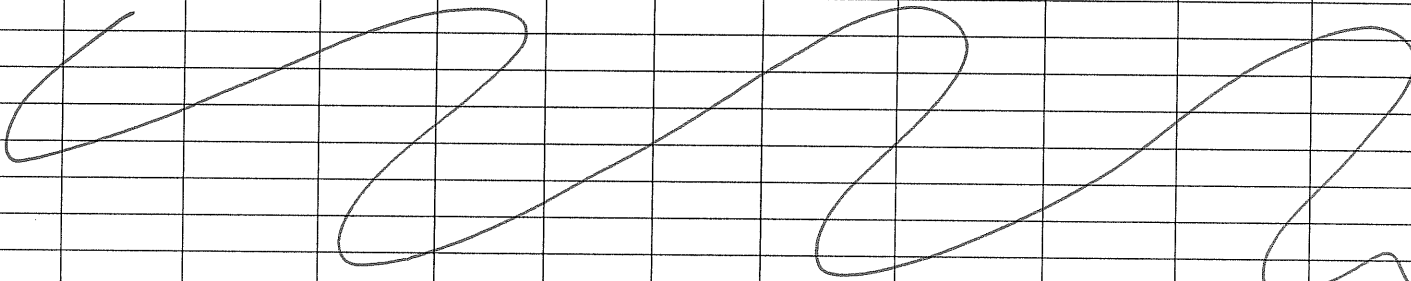
2. STABILIZATION CRITERIA FOR RANGE OF VARIATION OF LAST THREE CONSECUTIVE READINGS (SEE FS 2212, SECTION 3)

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

Revision Date: February 2009

SITE NAME: Southeast County Landfill IAMP		SITE LOCATION: Lithia, Florida	
WELL NO: TH-76		SAMPLE ID: TH-76	
		DATE: 12-4-14	

WELL DIAMETER (inches): 2	TUBING DIAMETER (inches): 0.5	WELL SCREEN INTERVAL DEPTH: 163.35 feet to 178.35 feet	STATIC DEPTH TO WATER (feet): 74.65	PURGE PUMP TYPE OR BAILER: DBP
WELL VOLUME PURGE: 1 WELL VOLUME = (TOTAL WELL DEPTH - STATIC DEPTH TO WATER) X WELL CAPACITY (only fill out if applicable)				
= (178.35 feet - 74.65 feet) X .16 gallons/foot = 16.60 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): 177.35			FINAL PUMP OR TUBING DEPTH IN WELL (feet): 177.35			PURGING INITIATED AT: 10:58		PURGING ENDED AT: 11:50		TOTAL VOLUME PURGED (gallons): 26.0	
TIME	VOLUME PURGED (gallons)	CUMUL. VOLUME PURGED (gallons)	PURGE RATE (gpm)	DEPTH TO WATER (feet)	pH (standard units)	TEMP. (°C)	COND. µS/cm	DISSOLVED OXYGEN mg/L	TURBIDITY (NTUs)	COLOR (describe)	ODOR (describe)
11:32	17.0	17.0	.50	74.65	7.37	22.77	515	.51	19.6	light cloudy	none
11:41	4.5	21.5	.50	74.65	7.35	22.79	516	.34	17.5	↓	↓
11:50	4.5	26.0	.50	74.65	7.34	22.82	517	.27	18.7	↓	↓
											

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)

[illegible]

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:** $\pm 5\%$ **Dissolved Oxygen:** all readings $\leq 20\%$ saturation (see Table FS 2200-2); optionally, ± 0.2 mg/L or $\pm 10\%$ (whichever is greater) **Turbidity:** all readings ≤ 20 NTU; optionally ± 5 NTU or $\pm 10\%$ (whichever is greater)

Revision Date: February 2009

PURGING DATA

SAMPLING DATA

SEE C.O.C. FOR SAMPLE ANALYSIS

DBP =Dedicated Bladder Pump

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: $\pm 5\%$ Dissolved Oxygen: all readings $\leq 20\%$ saturation (see Table FS 2200-2); optionally, ± 0.2 mg/L or $\pm 10\%$ (whichever is greater) Turbidity: all readings ≤ 20 NTU; optionally ± 5 NTU or $\pm 10\%$ (whichever is greater)

Revision Date: February 2009