

## SCS ENGINEERS

October 13, 2011  
File No. 09210021.03

Mr. John Morris, P.G.  
Florida Department of Environmental Protection  
Southwest District  
13051 N. Telecom Parkway  
Temple Terrace, Florida 33637-0926

Subject: Citrus County Central Landfill  
Quarterly and Annual Leachate Sampling – Third Quarter and Annual 2011  
Permit No. 21375-008-SO/01

Dear Mr. Morris:

SCS Engineers (SCS) is providing the Third Quarter and Annual Leachate monitoring results on behalf of the Citrus County Solid Waste Management Division (County) for the Central Landfill located in Citrus County, Florida (the site). This report provides copies of the final laboratory reports, field forms, and a CD containing an electronic copy of this report and the electronic data deliverable (EDD) in the “ADaPT” format provided by TestAmerica Laboratories Inc., (TestAmerica).

The leachate influent samples were analyzed in compliance with the permit for the annual parameters listed in Specific Condition Part E.9.a.1 of the permit. The leachate sludge sample was analyzed in compliance with the permit for the annual parameters listed in Specific Condition Part E.9.c. The leachate effluent sample was analyzed in compliance with the permit for the quarterly parameters listed in Specific Condition Part E.9.b.2 (quarterly and annual) of the permit. The resulting data from the quarterly and annual sampling event are included in Attachment 1 and Tables 1 through 6, Attachment 3.

A full list spike was utilized for methods 8260B and 8270C of the leachate influent samples and method 8260B of the leachate effluent sample. Due to the large number of spiked analytes, there is a high probability that one or more analytes recovered outside acceptance limits. The laboratory's Standard Operating Procedure (SOP) allows for 5 analytes to recover outside criteria. The laboratory control sample (LCS) and matrix spike associated with batch 112849 had 4 analytes outside control limits; therefore, the LCS and matrix spike met the laboratories SOP, and the results are considered valid and useable for reporting purposes. These results were qualified with J3.

The LCS for the leachate influent sample exceeded control limits for tin. This analyte was biased high in the LCS and was an “I” value in the sample. The sample was flagged with J3.

The matrix spike / matrix spike duplicate (MS/MSD) recoveries were outside control limits for method 8270C of the leachate sludge sample and leachate influent sample. The associated LCS recoveries met acceptance criteria; therefore, the results are considered valid and useable for reporting purposes. The samples were flagged with J3.

With the exception of arsenic, sodium, chloride, and total dissolved solids (TDS), the leachate effluent sample complied with the groundwater standards and minimum criteria referenced in Florida Administrative Code (FAC) Chapters 62-520.420 and 62-520.400, respectively. As per Specific Condition Part E.9.b, arsenic, sodium, chloride, and TDS are not required to meet the groundwater standards and minimum criteria at the discharge point; however, they must comply at monitoring well MW-6 (Table 3, Attachment 3).

The leachate influent data and leachate sludge sample data complied with the regulatory standards listed in 40 Code of Federal Regulations (CFR) Part 261.24.

Third Quarter and Annual 2011 leachate quality sampling, physical readings and measurements, and leachate quality analyses were performed by TestAmerica. Field work, sampling methodologies, data evaluation, and data Quality Assurance/Quality Control (QA/QC) were conducted in accordance with FAC Chapter 62-160 Standard Operating Procedures (DEP-SOP-001/01) and the TestAmerica quality manual. Laboratory analyses were performed in accordance with Chapter 62-160, FAC DEP-SOP-001/01. TestAmerica is certified by the Florida Department of Health Environmental Laboratory Certification Program (DoH ELCP).

TestAmerica mobilized to the site on July 20, 2010, to collect leachate samples following the FDEP SOPs as guidance for the collection of these samples. Copies of the laboratory report and field forms are presented in Attachment 1.

Monthly samples of the leachate effluent were analyzed for the parameters listed in Specific Condition Part E.9.b.2 (monthly) of the Permit. The monthly samples were collected by the site and analyzed by their contract laboratory. The analytical laboratory reports from the monthly sampling events for July, August, and September of 2011 are included in Attachment 2 and summarized on Table 2, Attachment 3.

If you have any questions regarding this report, please contact the undersigned at (813) 621-0080.

Sincerely,

Ken Guilbeault, LEP  
Project Manager  
**SCS ENGINEERS**

C. Ed Hilton, P.E.  
Vice President  
**SCS ENGINEERS**

KEG/CEH:ael

cc: Casey Stephens – Citrus County  
Solid Waste Administrator, FDEP - Tallahassee  
Attachments

DEP Form # 62-522.900(2)
Form Title <u>Ground Water Monitoring Report</u>
Effective Date _____
DEP Application No. _____

## Florida Department of Environmental Protection

Twin Towers Office Bldg. 2600 Blair Stone Road Tallahassee, Florida 32399-2400

# GROUND WATER MONITORING REPORT

## Rule 62-522.600(11)

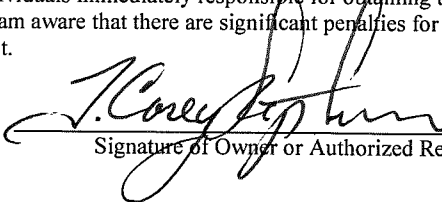
### PART I GENERAL INFORMATION

- (1) Facility Name Citrus County Central Landfill
- Address PO BOX 340
- City Lecanto Zip 34460
- Telephone Number (352) 527-7670
- (2) Facility WACS Number SWD/09/39859
- (3) DEP Permit Number 21375-008-SO/01
- (4) Authorized Representative Name Casey Stephens, Director of Solid Waste/Ken Guilbeault, SCS Engineers
- Address PO BOX 340
- City Lecanto Zip 34460
- Telephone Number (352) 527-7670
- (5) Type of Discharge Treated Class 1 Landfill Leachate
- (6) Method of Discharge Groundwater via Percolation

### 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 submitting false information, including the possibility of fine and imprisonment.

Date: October 10, 2011

  
Signature of Owner or Authorized Representative

### PART II QUALITY ASSURANCE REQUIREMENTS

Sample Organization      Comp QAP #      NA

Analytical Lab            Comp QAP # /HRS Certification #      NELAP Certifications E84282 and E81005

Lab Name                  TestAmerica Laboratories, Inc.

Address                    6712 Benjamin Road, Suite 100, Tampa, FL 33634

Phone Number            (813) 885-7427

ATTACHMENT 1  
LABORATORY ANALYTICAL RESULTS  
AND FIELD FORMS

ATTACHMENT 2

MONTHLY LEACAHATE QUALITY  
ANALYTICAL RESULTS FOR  
JULY, AUGUST, AND SEPTEMBER 2011

**S.A.C. ENVIRONMENTAL LABORATORY INC**  
**FLDOH CERTIFICATION #84492**  
**ANALYTICAL REPORT**

SOLID WASTE MANAGEMENT  
 PO BOX 340  
 LECANTO FL 34460

**Invoice Number** 11783

<b>Client</b>	CITRUS COUNTY UTILITIES	<b>Sample Number</b>	E111209	
<b>Project</b>	LANDFILL LEACHATE PLANT	<b>Date/Time Sampled</b>	7/6/11	1130 HRS
<b>Sample Description</b>	WWTP/EFF	<b>Date/Time Received</b>	7/6/11	1244 HRS

Method	Analytes	Units	Results	MDL	Analyst	Analysis Date/Time
SM5210-B	CBOD	mg/L	3.17	0.30 mg/L	SJL	7/7/11 0910 HRS
SM2540-D	TSS	mg/L	4.00	1.00 mg/L	SJL	7/8/11 0952 HRS
SM4500-NO3-E	NITRATE	mg/L	4.60	0.06 mg/L	SJL	7/7/11 0840 HRS

*Sally Ann Casillo*  
 \_\_\_\_\_  
 Laboratory Manager

*These results relate only to this sample.*

*For all results qualified with an I, the PQL is defined to be 4 times the MDL*

5376 S SUNCOAST BOULEVARD HOMOSASSA FL 34446 352.621.3513 FAX 352.621.3514

**S.A.C. ENVIRONMENTAL LABORATORY INC**  
**FLDOH CERTIFICATION #84492**  
**ANALYTICAL REPORT**

SOLID WASTE MANAGEMENT  
 PO BOX 340  
 LECANTO FL 34460

**Invoice Number** 11851

<b>Client</b>	CITRUS COUNTY UTILITIES	<b>Sample Number</b>	E111401
<b>Project</b>	LANDFILL LEACHATE PLANT	<b>Date/Time Sampled</b>	8/3/11 1000 HRS
<b>Sample Description</b>	WWTP/EFF	<b>Date/Time Received</b>	8/3/11 1122 HRS

Method	Analytes	Units	Results	MDL	Analyst	Analysis Date/Time
SM5210-B	CBOD	mg/L	2.43	0.30 mg/L	SJL	8/4/11 0946 HRS
SM2540-D	TSS	mg/L	4.50	1.00 mg/L	SJL	8/5/11 0940 HRS
SM4500-NO3-E	NITRATE	mg/L	3.84	0.06 mg/L	SJL	8/3/11 1300 HRS

*Sally Ann Carrillo*  
 Laboratory Manager

These results relate only to this sample.

For all results qualified with an I, the PQL is defined to be 4 times the MDL

5376 S SUNCOAST BOULEVARD HOMOSASSA FL 34446 352.621.3513 FAX 352.621.3514

**S.A.C. ENVIRONMENTAL LABORATORY INC  
FLDOH CERTIFICATION #84492  
ANALYTICAL REPORT**

SOLID WASTE MANAGEMENT  
PO BOX 340  
LECANTO FL 34460

**Invoice Number** 11907

<b>Client</b>	CITRUS COUNTY UTILITIES	<b>Sample Number</b>	E111636
<b>Project</b>	LANDFILL LEACHATE PLANT	<b>Date/Time Sampled</b>	9/8/11 0950 HRS
<b>Sample Description</b>	WWTP/EFF	<b>Date/Time Received</b>	9/8/11 1039 HRS

Method	Analytes	Units	Results	MDL	Analyst	Analysis Date/Time
SM5210-B	CBOD	mg/L	6.72	0.30 mg/L	SJL	9/8/11 1210 HRS
SM2540-D	TSS	mg/L	8.50	1.00 mg/L	SJL	9/12/11 0920 HRS
SM4500-NO3-E	NITRATE	mg/L	4.09	0.06 mg/L	SJL	9/8/11 1330 HRS

*Suey Ann Casillo*  
Laboratory Manager

*These results relate only to this sample.*

*For all results qualified with an I, the PQL is defined to be 4 times the MDL*

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5376 S SUNCOAST BOULEVARD HOMOSASSA FL 34446 352.621.3513 FAX 352.621.3514



ATTACHMENT 3

TABLES

**Table 1. Summary of Leachate Effluent Quality Analytical Results  
Citrus County Central Landfill**

Parameter	Standard	MCL	Units	Leachate Effluent														
				10/15/2008	1/27/2009	4/20/2009	7/21/2009	9/9/2009	10/14/2009	1/26/2010	5/12/2010	7/27/2010	9/9/2010	10/27/2010	1/19/2011	4/28/2011	5/25/2011	7/20/2011
<b>Volatile Organics</b>								Resample					Resample				Resample	
Acetone	GCTL	6300	ug/L	---	---	---	21	---	---	---	---	40	151	---	---	---	---	9.9 U J3
Benzene	PDWS	1	ug/L	0.5 U	1 U	0.5 U	0.5 U	---	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Carbon Tetrachloride	PDWS	3	ug/L	---	---	---	1 U	---	---	---	---	1.2	0.45 I	---	---	---	---	0.42 U
Chlorobromomethane	GCTL	91	ug/L	---	---	---	0.58 U	0.58 U	---	---	---	5.7	0.58 U	---	---	---	---	0.58 U
Chloromethane	GCTL	2.7	ug/L	---	---	---	1 U	---	---	---	---	2.4 I	1.0 U	---	---	---	---	1.0 U
Dibromomethane	GCTL	70	ug/L	---	---	---	0.41 U	---	---	---	---	5.8	0.41 U	---	---	---	---	0.41 U
Ethylbenzene	SDWS	30	ug/L	0.5 U	1 U	0.5 U	0.44 U	---	0.44 U	0.44 U	0.44 U	0.44 U	0.44 U	0.44 U	0.44 U	0.44 U	0.44 U	0.44 U
Ethylene Dibromide	PDWS	0.02	ug/L	0.0061 U	0.0064 U	0.0064 U	0.5 U	---	0.0061 U	0.0098 U	0.0096 U	0.010 U	---	0.010 U	0.0097 U	0.011 U	---	0.010 U
Toluene	SDWS	40	ug/L	0.5 U	1 U	0.5 U	0.51 U	---	0.51 U	0.51 U	0.51 U	0.51 U	0.51 U	0.51 U	0.51 U	0.51 U	0.51 U	0.51 U
Vinyl chloride	PDWS	1	ug/L	0.53 U	1.1 U	0.53 U	0.5 U	---	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.50 U
Xylenes, Total	SDWS	20	ug/L	1 U	2.1 I	1 U	0.5 U	---	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.50 U	0.50 U
<b>Trihalomethanes</b>																		
Bromodichloromethane	See Total THMs		ug/L	---	14	---	410	0.35 U	---	13	---	870	170	0.35 U	0.35 U	---	---	30
Bromoform	See Total THMs		ug/L	---	2.9	---	71	0.58 U	---	7	---	190	36	0.58 U	0.58 U	---	---	8.5
Chloroform	See Total THMs		ug/L	---	11	---	370	0.90 U	---	8.3	---	900	110	0.90 U	0.9 U	---	---	25
Dibromochloromethane	See Total THMs		ug/L	---	6.9	---	280	0.58 U	---	9.7	---	670	110	0.34 U	0.34 U	---	---	19
Total THMs	Permit	100	ug/L	---	34.8	---	1131	Not Detected	---	38	---	2630	426	Not Detected	Not Detected	---	---	82.5
<b>Metals</b>																		
Antimony	PDWS	0.006	mg/L	---	---	---	---	---	---	---	---	0.0031 I	---	---	---	---	---	0.0092 U
Arsenic	PDWS	0.01	mg/L	---	---	---	0.0091 I	---	---	---	---	0.025	0.02	0.034	0.012	36	---	0.046
Barium	PDWS	2	mg/L	---	---	---	0.058	---	---	---	---	0.081	---	---	---	---	---	0.011
Cobalt	GCTL	0.14	mg/L	---	---	---	0.011	---	---	---	---	0.019	---	---	---	---	---	0.022
Chromium	PDWS	0.1	mg/L	---	---	---	0.0058 I	---	---	---	---	0.0066	---	---	---	---	---	0.0063
Copper	SDWS	1	mg/L	---	---	---	0.014	---	---	---	---	0.024	---	---	---	---	---	0.0027
Lead	PDWS	0.015	mg/L	---	---	---	0.002 U	---	---	---	---	0.0031	---	---	---	---	---	0.00020 U
Nickel	PDWS	0.1	mg/L	---	---	---	0.046	---	---	---	---	0.071	---	---	---	---	---	0.077
Iron	SDWS	0.3	mg/L	---	---	---	0.068 I	---	---	---	---	0.058 I	---	---	---	---	---	0.076 I
Zinc	SDWS	5	mg/L	---	---	---	0.020 I	---	---	---	---	0.031	---	---	---	---	---	0.03
<b>General Chemistry</b>																		
Ammonia, Total	GCTL	2.8	mg/L	0.094	1.1	0.19	0.16	---	0.010 U	0.086	0.17	0.09	---	0.013 I	0.01	10	0.7	0.3
Chloride	SDWS	250	mg/L	940	1300	1500	710	---	910	1000	1200	1300	---	1000	750	960	---	1200
Cyanide	PDWS	0.2	mg/L	---	---	---	0.014	---	---	---	---	---	---	---	---	---	---	---
Sodium	PDWS	160	mg/L	570	800	820	430	---	570	580	750	830	---	670	400	630	---	800
TDS	SDWS	500	mg/L	2400	2800	3000	1800	---	2000	2200	2900	1500	---	2500	1600	2400	---	2800
TOC	NS	NS	mg/L	---	---	---	---	---	---	---	---	---	---	140	---	---	---	---
<b>General Field Parameters</b>																		
Conductivity	NS	NS	umhos/cm	3929	4907	4820	3462	2786	3772	3475	4752	4617	4167	4358	3176	3780	4701	3963
Dissolved Oxygen	NS	NS	mg/L	2.96	0.93	2.78	1.34	0.72	7.01	0.75	1.22	1.42	1.36	6.01	8.38	0.14	1.81	
pH	SDWS	6.5-8.5	pH Units	7.87	7.79	7.68	7.49	7.94	7.83	7.27	7.52	7.37	7.69	8.1	7.52	8.13	7.81	7.65
Oxygen Reduction Potential	NS	NS	mV	---	---	---	---	---	---	228	25.8	350.7	-1.8	164.3	40.2	197.6	216.7	109.4
Temperature, Water	NS	NS	deg C	26.55	17.35	24.83	31.5	27.9	27.9	17.1	27.2	28.5	29.4	26.2	---	27.3	27.5	29.1
Turbidity	NS	NS	NTU	1.07	1.65	5	---	6.67	4.73	1.84	7.94	3.4	2.71	4.55	---	10.8	7.04	2.69

- Notes
1. PDWS = Primary Drinking Water Standard (62-550 F.A.C.).
  2. SDWS = Secondary Drinking Water Standard (62-550 F.A.C.).
  3. GCTL = Groundwater Clean-up Target Level (62-777 F.A.C.).
  4. THMs = Trihalomethanes
  5. NS = No numeric standard has been set for this analyte.
  6. --- = Parameter not analyzed.
  7. mg/L: milligrams per liter.
  8. ug/L: micrograms per liter.
  9. NTU: nephelometric turbidity units.
  10. Yellow Shaded values indicate parameter concentrations exceeded primary, secondary Drinking Water Standards or groundwater cleanup target levels.
  11. I = Analyte detected below quantitation limits.
  12. U = Analyte concentration was below the laboratory detection limit (value shown).
  13. J3 = Estimated value; value may not be accurate. Spike recovery or RPD outside of criteria.

**Table 2. Twelve Month Summary of Leachate Effluent Monthly Analytical Results  
Citrus County Central Landfill**

Parameter	Standard	MCL	Units												
				10/5/2010	11/2/2010	12/8/2010	1/5/2011	2/2/2011	3/9/2011	4/14/2011	5/10/2011	6/16/2011	7/6/2011	8/3/2011	9/8/2011
CBOD	Permit	20	mg/L	2.35	2.07	1.72	3.11	6.44	17.13	4.42	3.74	2.5	3.17	2.43	6.72
TSS	Permit	20	mg/L	1.5	1.0 U	2	<1	3	15.5	7.5	2.5	3.5	4	4.5	8.5
Nitrate	Permit	10	mg/L	1.87	1.55	5.95	0.12	2.48	0.42	0.28	0.24	0.94	4.6	3.84	4.09

Notes

1. mg/l: milligrams per liter.
2. ug/l: micrograms per liter.
3. Yellow Shaded values indicate parameter concentrations exceeded Permit MCL levels.
4. I = Analyte detected below quantitation limits.
5. U = Analyte concentration was below the laboratory detection limit (value shown).

**Table 3. 2010 and 2011 Summary of Monitoring Well MW-6  
for Arsenic, Sodium, Chloride, and TDS Citrus County Central Landfill**

Parameter	Standard	MCL	Units	MW-6			
				1/26/2010	7/27/2010	1/19/2011	7/20/2011
Arsenic	PDWS	10	mg/L	1.3 U	1.3 U	1.3 U	1.3 U
Sodium	PDWS	160	mg/L	120	100	100	90
Chloride	SDWS	250	mg/L	220	220	220	13
TDS	SDWS	500	mg/L	400	400	380	370

Notes

1. PDWS = Primary Drinking Water Standard (62-550 F.A.C.).
2. SDWS = Secondary Drinking Water Standard (62-550 F.A.C.).
3. mg/l: milligrams per liter.
4. ug/l: micrograms per liter.
5. Yellow Shaded values indicate parameter concentrations exceeded primary or secondary Drinking Water Standards.
6. **I** = Analyte detected below quantitation limits.
7. **U** = Analyte concentration was below the laboratory detection limit (value shown).

**Table 4. Summary of Leachate Influent Quality Analytical Results  
Citrus County Central Landfill**

Parameter	MCL	Units	Phase 2 Influent	Master Lift Influent
<b>Volatile Organics</b>				
Acetone	NS	ug/L	9.9 U J3	22 J3
Benzene	500	ug/L	13	3.7
Chlorobenzene	100000	ug/L	1.9	3.6
Cis-1,2-Dichloroethene	NS	ug/L	2.2	2.5
1,1-Dichloroethane	NS	ug/L	0.66 I	0.52 U
1,2-Dichloropropane	NS	ug/L	0.77 I	0.52 U
Ethylbenzene	NS	ug/L	9	100
Toluene	NS	ug/L	2.4	23
Vinyl chloride	200	ug/L	3.6	0.50 U
Xylenes, Total	NS	ug/L	9.6	82

**Notes**

1. NS = No numeric standard has been set for this analyte.
2. MCL = 40 Code of Federal Regulations (CFR) Part 261.24.
3. --- = Parameter not analyzed.
4. ug/l: micrograms per liter.
5. Yellow Shaded values indicate parameter concentrations exceeded 40 CFR Part 261.24.
6. I = Analyte detected below quantitation limits.
7. U = Analyte concentration was below the laboratory detection limit (value shown).
8. J3 = Estimated value; value may not be accurate. Spike recovery or RPD outside of criteria.

**Table 5. Summary of Composite Leachate Influent  
Quality Analytical Results, Citrus County Central Landfill**

Parameter	MCL	Units	Composite Leachate Influent
<b>Organics</b>			
1,3 Dichlorobenzene	NS	ug/L	6.2 I <b>J3</b>
1,4 Dichlorobenzene	7500	ug/L	6.1 I
<b>Metals</b>			
Arsenic	5	mg/L	0.06
Barium	100	mg/L	0.041
Chromium	5	mg/L	0.012
Cobalt	NS	mg/L	0.024
Copper	NS	mg/L	0.0016 I
Iron	NS	mg/L	18
Nickel	NS	mg/L	0.088
Selenium	1	mg/L	0.0013 I
Vanadium	NS	mg/L	0.0086 I
Tin	NS	mg/L	0.0018 I <b>J3</b>
<b>General Chemistry</b>			
Ammonia, Total	NS	mg/L	470
Bicarbonate Alkalinity as CaCO <sub>3</sub>	NS	mg/L	2400
Biochemical Oxygen Demand	NS	mg/L	64
Chemical Oxygen Demand	NS	mg/L	1200
Chloride	NS	mg/L	1200
Cyanide, Total	NS	mg/L	0.012
Sodium	NS	mg/L	0.76 <b>L</b>
TDS	NS	mg/L	3300
<b>General Field Parameters</b>			
Conductivity	NS	umhos/cm	3419
Dissolved Oxygen	NS	mg/L	0.46
pH	SDWS	pH Units	6.56
Oxygen Reduction Potential	NS	mV	-67.1
Temperature, Water	NS	deg C	33.6
Turbidity	NS	NTU	16

**Notes**

1. NS = No numeric standard has been set for this analyte.
2. MCL = 40 Code of Federal Regulations (CFR) Part 261.24.
3. mg/L = milligrams per liter.
4. ug/l: micrograms per liter.
5. Yellow Shaded values indicate parameter concentrations exceeded 40 CFR Part 261.24.
6. I = Analyte detected below quantitation limits.
7. U = Analyte concentration was below the laboratory detection limit (value shown).
8. J3 = Estimated value; value may not be accurate. Spike recovery or RPD outside of criterion.
9. L = Off-scale high. Actual value is known to be greater than the value given.

**Table 6. Summary of Leachate Sludge**

**Quality Analytical Results, Citrus County Central Landfill**

<b>Parameter</b>	<b>MCL</b>	<b>Units</b>	<b>Leachate Sludge</b>
Barium	100	mg/L	3.1
pH	NS	pH Units	5.3

**Notes**

1. NS = No numeric standard has been set for this analyte.
2. MCL = 40 Code of Federal Regulations (CFR) Part 261.24.
3. mg/L = milligrams per liter.
4. Yellow Shaded values indicate parameter concentrations exceeded 40 CFR Part 261.24.
5. **V** = Analyte was detected in the method blank.
6. **I** = Analyte detected below quantitation limits.

ATTACHMENT 4

COMPACT DISK CONTAINING  
REPORT IN PDF FORMAT AND  
ADaPT FILES