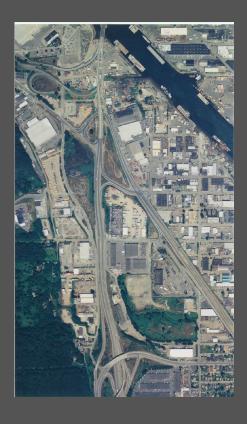
# April 2013 Interim Site-Wide Groundwater Monitoring Results



### Prepared for

City of Seattle South Park Property Development, LLC

September 2013

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# **April 2013 Interim Site-wide Groundwater Monitoring Results**

#### **Prepared for**

City of Seattle South Park Property Development, LLC

#### Prepared by





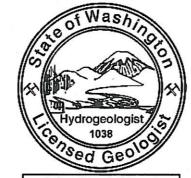


September 2013

#### South Park Landfill April 2013 Interim Site-Wide Groundwater Monitoring Results

#### CERTIFICATION

This document has been prepared for the City of Seattle under the direction of:



John Jacob Strunk

Name: John Strunk, LHG

Date: September 18, 2013

#### **AUTHOR RECOGNITION**

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#### **List of Abbreviations/Acronyms**

Acronym/

**Abbreviation Definition** 

AO Agreed Order No. 6706

ARI Analytical Resources, Inc.

CAP Cleanup Action Plan
CKD Cement kiln dust
DCE Dichloroethene

DNAPL Dense non-aqueous phase liquid

DO Dissolved oxygen

Ecology Washington State Department of Ecology

KIP Kenyon Industrial Park

Landfill South Park Landfill

LDPE Low density polyethylene

LFG Landfill gas

MTCA Model Toxics Control Act

NAPL Non-aqueous phase liquid

ORP Oxidation reduction potential

PVC Polyvinyl chloride
Redox Reduction-oxidation

RI/FS Remedial Investigation/Feasibility Study
SPPD South Park Property Development, LLC
SRDS South Recycling and Disposal Station

TCE Trichloroethylene

USEPA U.S. Environmental Protection Agency

#### 1.0 Introduction

This report provides the results of the April 2013 groundwater monitoring activities for the Interim Site-wide Groundwater Monitoring Program at the South Park Landfill (Landfill). The groundwater monitoring was conducted in accordance with the Interim Site-wide Groundwater Monitoring Plan (Floyd|Snider 2012a), which provides groundwater monitoring prior to the completion and submittal of the Cleanup Action Plan (CAP) and development of a Long-term Site-wide Groundwater Monitoring Plan. The Interim Site-wide Groundwater Monitoring Program supplements the Draft South Park Landfill Remedial Investigation/Feasibility Study (RI/FS; Floyd|Snider 2012b), which is currently being reviewed by the Washington State Department of Ecology (Ecology).

This report includes a brief description of the Landfill; a summary of the sampling methods and procedures; and an update of groundwater flow directions; and presents the analytical results. The April 2013 sampling event discussed in this report is the first groundwater quality monitoring event conducted as described in the Interim Site-wide Groundwater Monitoring Plan (Floyd|Snider 2012a).

#### 1.1 SITE DESCRIPTION

The Landfill is a former municipal solid waste landfill located in the South Park neighborhood of Seattle, Washington. The Landfill is located in the Duwamish Valley, between State Routes 509 and 99, and received solid wastes from the 1930s until it was closed in 1966 under King County's Title 10 provisions for solid waste regulation. Soil, groundwater, surface water, and landfill gas (LFG) monitoring began at the Landfill in the late 1980s and has continued through the present day. The Landfill is composed of several parcels, including the approximately 20-acre South Park Property Development, LLC (SPPD), the South Recycling and Disposal Station (SRDS), the Kenyon Industrial Park (KIP), and several other smaller parcels. The SPPD parcel will be developed in 2013 as part of an interim action (Farallon 2013).

In February 2007, the Landfill was added to Washington State's Hazardous Sites List and a RI/FS was conducted under Model Toxics Control Act (MTCA) Agreed Order No. 6706 (Agreed Order) with Ecology. The RI/FS determined the nature and extent of contamination associated with the Landfill and evaluated potential remedial alternatives.

#### 1.1.1 Monitoring Well Network

The monitoring wells included in the Interim Site-wide Groundwater Monitoring Program are illustrated on Figure 1.2. In addition to the proposed point of compliance (POC) wells (MW-08, MW-10, MW-18, MW-24, MW-25, MW-26, MW-27, MW-32, and MW-33), the monitoring well network also includes monitoring wells used to assess upgradient groundwater conditions (KMW-05, KMW-08, MW-12, MW-14, and MW-29); a monitoring well used to assess groundwater conditions along the northern edge of KIP (KMW-03A); and downgradient monitoring wells used to assess groundwater conditions adjacent to the former Glitsa American, Inc. (Glitsa) property (MW-30 and MW-31). KMW-08 was sampled as a supplement to KMW-05 in assessing upgradient groundwater conditions because the groundwater in KMW-05 was dark brown in color, which may be indicative of the aqueous interaction of highly alkaline cement kiln dust (CKD) and organic rich soil. Several additional wells (MW-06, KMW-01A, KMW-02B, KMW-04, KMW-06, and KMW-07) and surface water monitoring locations (SG-1S and SG-2N)

were included in the monitoring network to measure groundwater and surface water levels for determining representative groundwater flow directions and gradients at the Landfill.

As discussed in the draft RI/FS (refer to Section 5.5 of that document), the monitoring wells are primarily completed in one of three groundwater zones of interest (Perched Zone, A-Zone, or B-Zone), all of which are part of the Shallow Aquifer. The Perched Zone is a thin discontinuous layer of groundwater that exists above the Silt Overbank Deposit, which can often be in contact with solid waste and is thus conceptually equivalent to leachate in those locations. The A-Zone is immediately below the Silt Overbank Deposit and is the critical zone where leachate (and perched water) can enter the groundwater system and move off-site. The B-Zone represents the base of the Shallow Aquifer, overlying finer-grained estuarine deposits, and is where dense non-aqueous phase liquids (DNAPLs) would accumulate, if present. The completion zone for each well included in the monitoring well network is shown on Figure 1.1. Well construction logs are presented in Appendix A of the Interim Site-wide Groundwater Monitoring Plan.

#### 2.0 Groundwater Level Monitoring

Water levels were measured in the monitoring wells and surface water monitoring locations at the Landfill in order to provide an indication of groundwater elevations, gradients, and flow directions for the April 2013 sampling event. Figure 1.1 provides the monitoring well and surface water monitoring locations.

#### 2.1 MEASUREMENT PROCEDURE

Groundwater level measurements were conducted between April 1 and April 4, 2013, concurrent with groundwater sampling. Water level measurements were collected prior to the purging of the well for the collection of the groundwater samples. Groundwater levels were measured to a precision of 0.01 foot using an electric water level indicator. All groundwater level measurements were made relative to the surveyed top of the polyvinyl chloride (PVC) casing. Readings were recorded on a field form along with the measurement date and time (refer to Appendix A).

Due to the discoloration of the groundwater in KMW-05, an interface probe was used to confirm that no non-aqueous phase liquid (NAPL) was present within the well. There was no presence of NAPL detected in the well and there was no noticeable odor. There were no indications of potential NAPL in any of the other monitoring wells.

Surface water levels were measured at two locations (SG-1S and SG-2N) in the West Ditch (refer to Figure 1.1). SG-1S is a permanent staff gage installed at the southern end of the West Ditch, while SG-2N is a surveyed measuring point from the top of a 2-inch diameter PVC pipe set in concrete associated with a culvert at the northern end of the West Ditch. Due to the absence of the Silt Overbank Deposit in the northern portion of the West Ditch (refer to Section 5.5.4 of the RI/FS), surface water in the vicinity of SG-2N is expected to be in hydraulic continuity with groundwater in the A-Zone of the Shallow Aquifer. Therefore, the surface water elevation at SG-2N is considered an expression of the groundwater elevation. However, the Silt Overbank Deposit is present in the vicinity of SG-1S, likely acting as an aquitard between the West Ditch and the underlying A-Zone of the Shallow Aquifer.

#### 2.2 GROUNDWATER LEVELS AND FLOW DIRECTIONS

A shallow groundwater elevation and flow direction map for April 2013 is presented on Figure 2.1. Groundwater elevations at the two surface water locations and 23 monitoring wells with screens completed primarily in the A-Zone of the Shallow Aquifer were used for the contouring. The groundwater elevations were interpolated using triangulation with linear interpolation to produce the contours.

The interpolated groundwater elevations were then used in a "raindrop" analysis, where virtual particles are placed on the map and their flow path is predicted based on the interpolated water table surface, to produce the inferred groundwater flow path lines depicted on Figure 2.1. As shown on Figure 2.1, the groundwater flow direction in the vicinity of the Landfill is generally inferred to be to the northeast toward the Duwamish River.

#### 3.0 Groundwater Quality Monitoring

Groundwater samples were collected between April 1 and April 4, 2013, from the 17 monitoring wells (including KMW-08) according to low-flow sampling procedures as described in the Interim Site-wide Groundwater Monitoring Plan (Floyd|Snider 2012a).

#### 3.1 PROCEDURE

The wells were purged and sampled using either a dedicated bladder pump or a peristaltic pump with dedicated low density polyethylene (LDPE) and silicon tubing.

The wells were purged at a flow rate of less than 500 milliliters per minute until the field parameters stabilized or more than three casing volumes was purged from the well. The monitored field parameters included temperature, pH, conductivity, dissolved oxygen (DO), and oxidation reduction potential (ORP), which were recorded at 5-minute intervals using a calibrated multi-parameter probe and flow-through cell. Stabilization was defined as three successive readings where DO varied by less than 10 percent and ORP varied by less than 10 millivolts (mV). Additional stability criteria included 0.5 degrees Celsius (°C) for temperature, 10 percent for conductivity, and 0.1 units for pH. Flow rate and depth to water were also measured during well purging. In addition, prior to sampling, a turbidity measurement was collected to evaluate the quality of dissolved/total metal analytical results. All field measurements were documented on the respective Groundwater Sampling Records for each well, which are provided in Appendix A. Purge water was placed in 55-gallon drums on-site, which were removed for off-site disposal on April 22, 2013.

Groundwater samples were collected from the discharge tubing in advance of the flow-through cell. All dissolved metal samples (iron and manganese) were field filtered using disposable 0.45 micrometer filters. Samples were placed in containers provided by the laboratory, stored in coolers with ice, and delivered to Analytical Resources, Inc. (ARI) laboratory under industry-standard chain-of-custody procedures at the end of each sampling day. Groundwater samples were analyzed for the following parameters based on the Interim Site-wide Groundwater Monitoring Plan:

- cis-1,2–Dichloroethene (DCE), trichloroethylene (TCE), and benzene by U.S. Environmental Protection Agency (USEPA) Method 8260C
- Vinyl chloride by USEPA Method 8260C SIM
- Dissolved iron and manganese by USEPA Method 6010B
- Total iron and manganese by USEPA Method 6010B

Benzene was only analyzed in MW-25 and the upgradient monitoring wells (KMW-05 and KMW-08) based on historical detections of benzene in MW-25 and KMW-05.

In addition, the groundwater samples were also analyzed for several parameters not included in the Interim Site-wide Groundwater Monitoring Plan, including geochemical indicator parameters, the sulfide-sulfate reduction-oxidation (redox) couple, and nitrogen redox couples:

- Major cations, including sodium, potassium, calcium, and magnesium, by USEPA Method 6010B
- Major anions, including alkalinity, carbonate, and bicarbonate, by SM 2320B

- Major anions, including chloride, sulfate, nitrate, and nitrite by USEPA Method 300.0
- Ammonia by USEPA 350.1M and sulfide by USEPA Method 376.2

Quality control/quality assurance measures included two field duplicates, one rinse blank, and six trip blanks (one submitted with each cooler) submitted with the groundwater samples. The field duplicates were collected from MW-25 (identified as MW-60 in the laboratory report) and from KMW-08 (identified as MW-61 in the laboratory report), with the highest concentrations reported for MW-25 and KMW-08 on Figures 3.1, 3.2, and 3.3. The rinse blank is identified as MW-80 in the laboratory report. The chain-of-custodies and laboratory reports for the April 2013 sampling event are provided in Appendix B.

#### 3.2 ANALYTICAL RESULTS

The results of the April 2013 sampling event were received from ARI on April 18, 2013 (Appendix B). Table 3.1 provides a summary of the analytical results and field parameters. Cleanup levels have not yet been established for this site, but are expected to be based on either drinking water use (MCTA Method B) or on protection of surface water quality. Table 1 lists both potential cleanup levels for the convenience of the reader.

A Level I data validation of the analytical results was performed by Floyd|Snider and the data validation report is included as Appendix C. Results of the data validation indicated that all analytical results were acceptable as reported by the laboratory.

The analytical results are spatially illustrated on Figures 3.1, 3.2, and 3.3. An analysis of major cations (sodium, potassium, calcium, and magnesium) and anions (chloride, sulfate, carbonate, and bicarbonate) is also shown on the trilinear plots in Figures 3.4 and 3.5.

#### 4.0 References

- Farallon Consulting, LLC (Farallon). 2013. *Interim Action Work Plan South Park Landfill Site, Seattle, Washington*. Prepared for the South Park Property Development, LLC. 22 February.
- Floyd|Snider. 2012a. Southpark Landfill Interim Site-wide Groundwater Monitoring Plan.

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- U.S. Environmental Protection Agency (USEPA). 1998. Technical Protocol for Evaluating Natural Attenuation of Chlorinated Solvents in Ground Water, EPA 600-R-98-128. September.
- Washington State Department of Ecology (Ecology). 2007. *Model Toxics Control Act (MTCA)*. Chapter 173-340 Washington Administrative Code. 12 October.

# **April 2013 Interim Site-wide Groundwater Monitoring Results**

**Table** 

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Table 3.1 April 2013 Groundwater Sample Analytical Results

	Location	KMW-03A	KMW-05	KMW	V-08	MW-08	MW-10	MW-12	MW-14	MW-18	MW-24
	X-coord <sup>1</sup>	1270170.48	1269861.86	1269692.89	1269692.89	1271368.12	1270569.12	1269783.23	1269963.2	1271077.67	1271162.48
	Y-coord <sup>1</sup>	197585.09	197427.44	197356.14	197356.14	196837.87	197647.09	196963.92	196398.73	196350.26	197102.37
		SPL-GW-	SPL-GW-	SPL-GW-KMW08-					SPL-GW-	SPL-GW-MW18-	
	Sample ID	KMW03A-040313	KMW05-040313	040413	040413	040213	040213	040313	MW14-040313	040313	040213
	Sample Date	04/03/2013	04/03/2013	04/04/2013	04/04/2013	04/02/2013	04/02/2013	04/03/2013	04/03/2013	04/03/2013	04/02/2013
Analyte	Units										
Conventionals by USEPA	300.0, 350.1M,	376.2, and SM 232	0								
Chloride	mg/L	12.9	158	9.5	9.4	189	15.8	17.4	13.1	16.3	33.2
Sulfate	mg/L	0.4	1,150	27.9	27.6	3.8	56.3	17.8	2.3	76.5	0.3
Sulfide	mg/L	0.05 U	30.6	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U
N-ammonia	mg-N/L	3.04	74.3	0.22	0.235	2.96	3.74	0.692	0.236	2.27	3.52
N-nitrate	mg-N/L	0.1 U	5 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
N-nitrite	mg-N/L	0.1 U	5 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
Alkalinity	mg/L CaCO <sub>3</sub>	368	7,510	154	158	375	276	153	261	430	420
Bicarbonate	mg/L CaCO <sub>3</sub>	368	1 U	154	158	375	276	153	261	430	420
Carbonate	mg/L CaCO <sub>3</sub>	1 U	2,640	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Hydroxide	mg/L CaCO₃	1 U	4,860	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Metals by SW6010C											
Calcium, dissolved	mg/L	84.3	9.8	40.3	40.3	46	44.3	30.8	50.6	70.8	73.4
Iron, dissolved	mg/L	10.4	5	0.07	0.07	19.1	19.2	7.97	4.29	59.5	26
Iron, total	mg/L	10.2	5.7	0.15	0.15	19	18.4	11.3	4.8	59.6	29.5
Magnesium, dissolved	mg/L	27.1	0.5 U	8.89	8.89	47.8	28.2	16.4	30.5	62.2	33
Manganese, dissolved	mg/L	0.048	0.01 U	0.24	0.242	1.19	1.1	0.742	0.576	1.57	1.64
Manganese, total	mg/L	0.05	0.01 U	0.241	0.241	1.17	1.05	0.769	0.587	1.57	1.79
Potassium, dissolved	mg/L	15.5	4,160	22.9	22.8	16.9	9.2	4	4.9	16.6	12.3
Sodium, dissolved	mg/L	24.5	1,520	22.7	22.3	157	59.4	20.8	16.3	33.8	58.7
VOCs by SW8260C						,					
Benzene	μg/L		8.2	0.2 U	0.2 U						
cis-1,2-Dichloroethene	μg/L	0.2 U	4 U	0.2 U	0.2 U	0.2 U	1.8	3.1	0.2 U	0.2 U	0.2 U
Trichloroethene	μg/L	0.2 U	4 U	0.2 U	0.2 U	0.2 U	0.2 U	0.37	0.2 U	0.2 U	0.2 U
VOCs by SW8260C-SIM		T									
Vinyl chloride	μg/L	0.3	0.4 U	0.02 U	0.02 U	0.063	1.2	0.1	0.02 U	0.072	0.032
Field Parameters	"	0.70	0.00	1 005	1	0.00	1 4 70	0.05	0.00	0.05	0.70
Dissolved oxygen	mg/L	0.72	0.60	0.95		2.23	1.70	2.05	2.39	2.95	2.70
ORP	mV	-227.6	-560.4	110.4		-98.5	-109.3	-14.0	-50.2	-103.5	-86.6
pH	pH	7.68	13.11	6.66		6.82	6.80	6.68	6.70	6.60	6.68
Specific conductance	μS/cm	823.0	31,561.0	398.0		1,331.0	715.0	435.6	597.7	1,172.0	913.0

		Proposed	d CUL (Potential S	cenarios)
			Protection of	Upgradient or
Monitored Analytes	Units	Drinking Water	Surface Water	Background
Benzene	μg/L	5	51	
cis-1,2-Dichloroethene	μg/L	16	900	
Trichloroethene	μg/L	4.9	30	
Vinyl chloride	μg/L	0.29	2.40	
Iron	mg/L	-		18
Manganese	mg/L			2.0

#### Notes:

- -- Not analyzed for.
- 1 Coordinates are in Washington State Plane North NAD 83 feet.

#### Abbreviations:

CaCO<sub>3</sub> Calcium carbonate

CUL Cleanup level

μg/L Micrograms per liter

 $\mu S/cm$  Microsiemens per centimeter

mg/L Milligrams per liter

mg-N/L Milligrams per liter as nitrogen

mV Millivolt

NAD 83 North American Datum of 1983

ORP Oxidation reduction potential VOC Volatile organic compound

#### Qualifier:

U Analyte was not detected at given reporting limit.

FLOYDISNIDER South Park Landfill

Table 3.1 **April 2013 Groundwater Sample Analytical Results** 

	Location	MW	<i>I</i> -25	MW-26	MW-27	MW-29	MW-30	MW-31	MW-32	MW-33
	X-coord <sup>1</sup>	1270572.18	1270572.18	1271163.2	1271347.6	1270272.103	1270826.64	1270825.71	1270622.16	1270751.02
	Y-coord <sup>1</sup>	197667.54	197667.54	197122.51	196835.03	196033.286	197655.77	197660.37	197416.52	197257.91
		SPL-GW-MW25-	SPL-GW-MW60-	SPL-GW-MW26-	SPL-GW-MW27-	SPL-GW-MW29-	SPL-GW-MW30-	SPL-GW-MW31-	SPL-GW-MW32-	SPL-GW-MW33-
	Sample ID	040113	040113	040213	040213	040313	040213	040213	040113	040113
	Sample Date	04/01/2013	04/01/2013	04/02/2013	04/02/2013	04/03/2013	04/02/2013	04/02/2013	04/01/2013	04/01/2013
Analyte	Units									
Conventionals by USEPA	<del>,                                      </del>									
Chloride	mg/L	6.1	6.2	11.1	11.8	17.8	37.3	12.5	33.8	88.6
Sulfate	mg/L	4	4.5	12.1	6.2	282	19.4	0.1	12.8	1.4
Sulfide	mg/L	0.05 U								
N-ammonia	mg-N/L	2.11	2.1	0.18	1.59	0.754	0.299	2.19	9.35	14.7
N-nitrate	mg-N/L	0.1 U								
N-nitrite	mg-N/L	0.1 U								
Alkalinity	mg/L CaCO <sub>3</sub>	134	136	33.7	104	259	171	171	672	661
Bicarbonate	mg/L CaCO <sub>3</sub>	134	136	33.7	104	259	171	171	672	661
Carbonate	mg/L CaCO <sub>3</sub>	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Hydroxide	mg/L CaCO <sub>3</sub>	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Metals by SW6010C										
Calcium, dissolved	mg/L	19.5	19.7	8.92	16.2	147	65.1	24.5	68.3	37.1
Iron, dissolved	mg/L	6.7	6.68	5.58	12.5	15.8	2.21	11.9	23.8	18.4
Iron, total	mg/L	7.25	7.28	8.26	21.6	16.6	2.3	18.3	22.9	18.4
Magnesium, dissolved	mg/L	5.2	5.23	3.27	4.36	35.5	12.3	7.06	44.1	22.1
Manganese, dissolved	mg/L	0.525	0.528	0.129	0.395	1.31	0.079	0.442	2.31	1.84
Manganese, total	mg/L	0.536	0.53	0.136	0.417	1.36	0.08	0.505	2.2	1.83
Potassium, dissolved	mg/L	2.8	2.8	2.9	3.3	10.8	3.9	4.2	14.9	9.6
Sodium, dissolved	mg/L	33.8	33.7	9.5	30.3	21.4	14.3	40.3	162	265
VOCs by SW8260C										
Benzene	μg/L	0.43	0.4							
cis-1,2-Dichloroethene	μg/L	0.72	0.8	0.33	0.4	0.2 U	0.64	5.2	1.5	0.2 U
Trichloroethene	μg/L	0.2 U	0.2 U	0.31	0.2 U	0.2 U	0.6	0.2 U	0.2 U	0.2 U
VOCs by SW8260C-SIM			T	T			T	· -		
Vinyl chloride	μg/L	1.4	1.4	0.02 U	0.25	0.02 U	0.12	4.7	0.28	1.1
Field Parameters	T n T	4.00	I	4.70	4.00	0.00	1.00	1 000	1 44	0.50
Dissolved oxygen	mg/L	1.20		1.72	1.98	2.33	1.28	2.06	1.11	2.53
ORP	mV	-58.2		-13.3	-86.9	-28.7	6.0	-50.2	-97.7	-101.4
pH	pH	6.78		6.32	6.75	6.53	6.53	6.56	6.76	6.75
Specific conductance	μS/cm	288.8		148.7	280.7	1156.0	488.5	386.7	1339.0	1526.0

		Propose	d CUL (Potential Sce	narios)
			Protection of	Upgradient or
Monitored Analytes	Units	Drinking Water	Surface Water	Background
Benzene	μg/L	5	51	
cis-1,2-Dichloroethene	μg/L	16	900	
Trichloroethene	μg/L	4.9	30	
Vinyl chloride	μg/L	0.29	2.40	
Iron	mg/L		-	18
Manganese	mg/L			2.0

#### Notes:

- -- Not analyzed for.
- 1 Coordinates are in Washington State Plane North NAD 83 feet.

#### Abbreviations:

CaCO<sub>3</sub> Calcium carbonate

CUL Cleanup level

μg/L Micrograms per liter mg/L Milligrams per liter

μS/cm Microsiemens per centimeter

mg-N/L Milligrams per liter as nitrogen

mV Millivolt

NAD 83 North American Datum of 1983

ORP Oxidation reduction potential

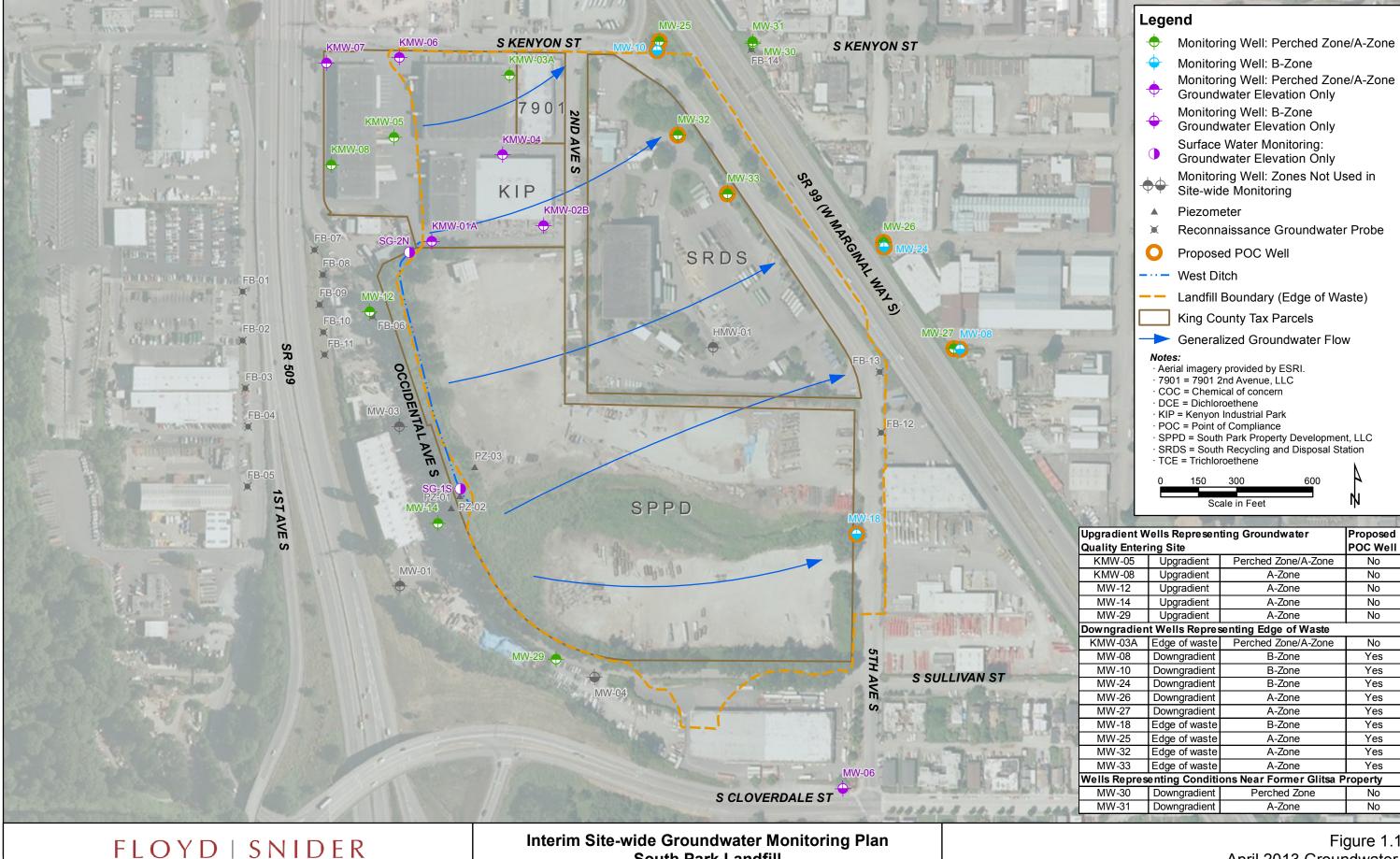
VOC Volatile organic compound

#### Qualifier:

U Analyte was not detected at given reporting limit.

# **April 2013 Interim Site-wide Groundwater Monitoring Results**

**Figures** 

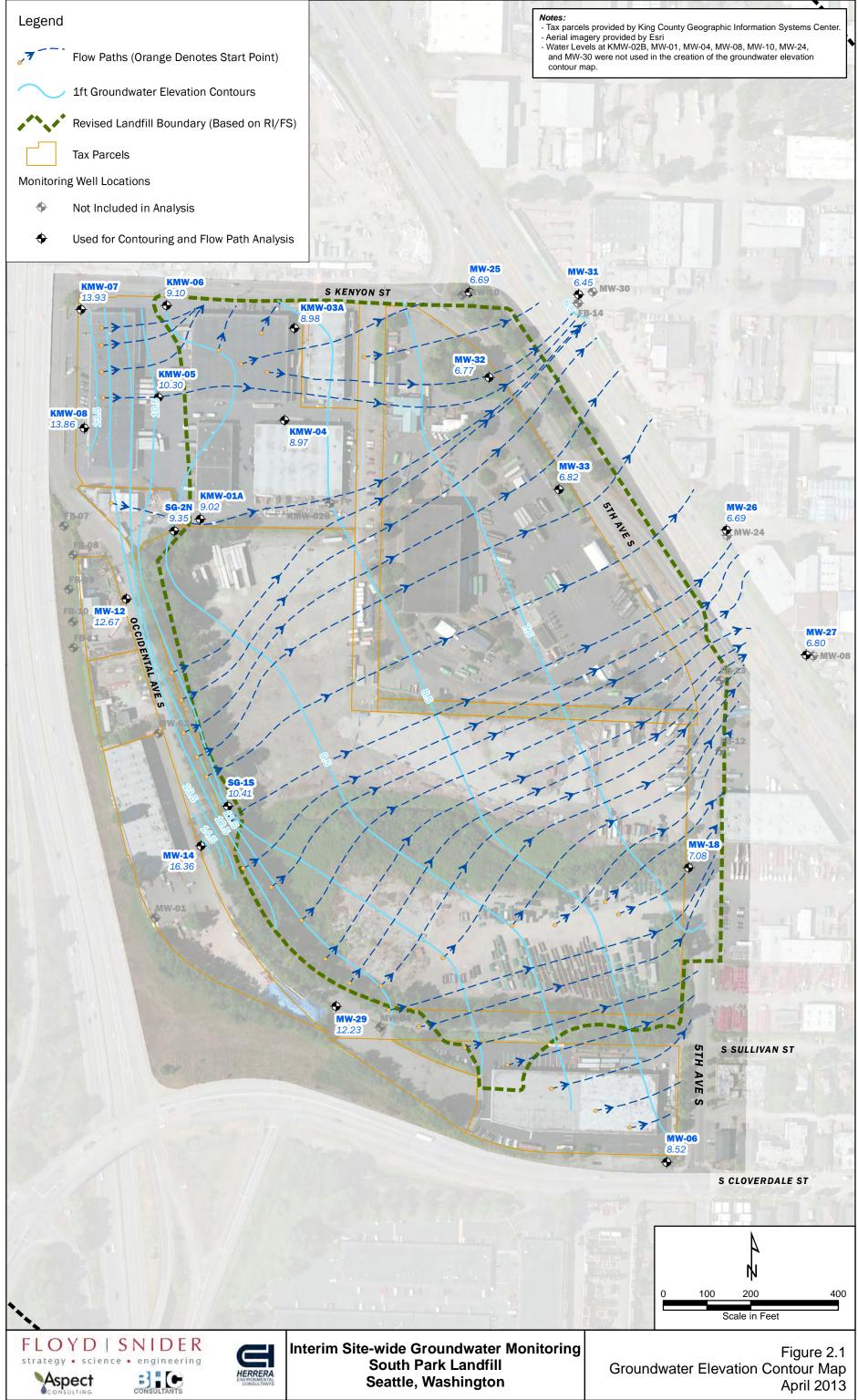


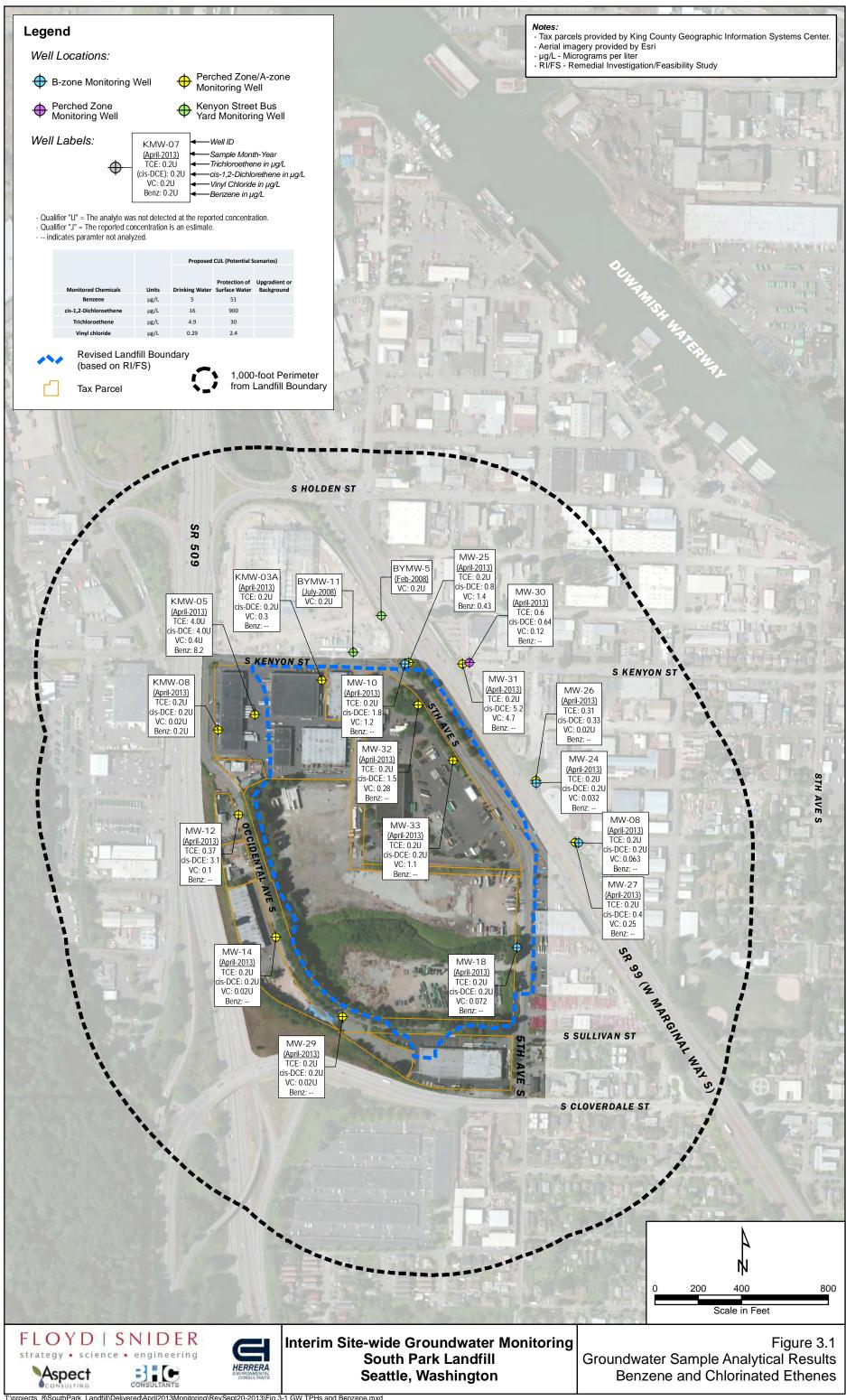
Seattle, Washington

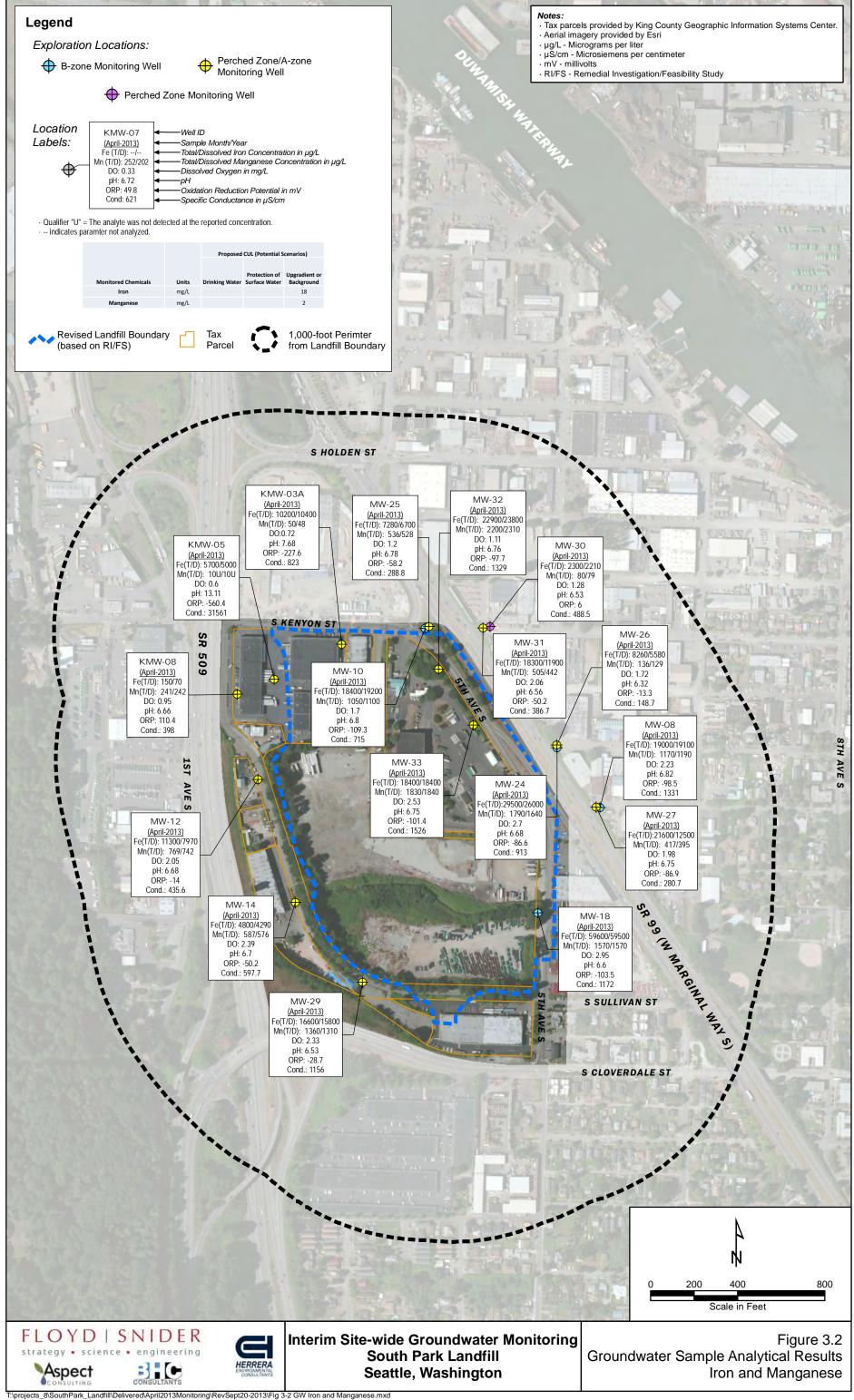
L\GIS\Projects\COS-SPARK\MXD\Figure 1 (Groundwater Monitoring Locations)\Version2.mxd 9/19/2013

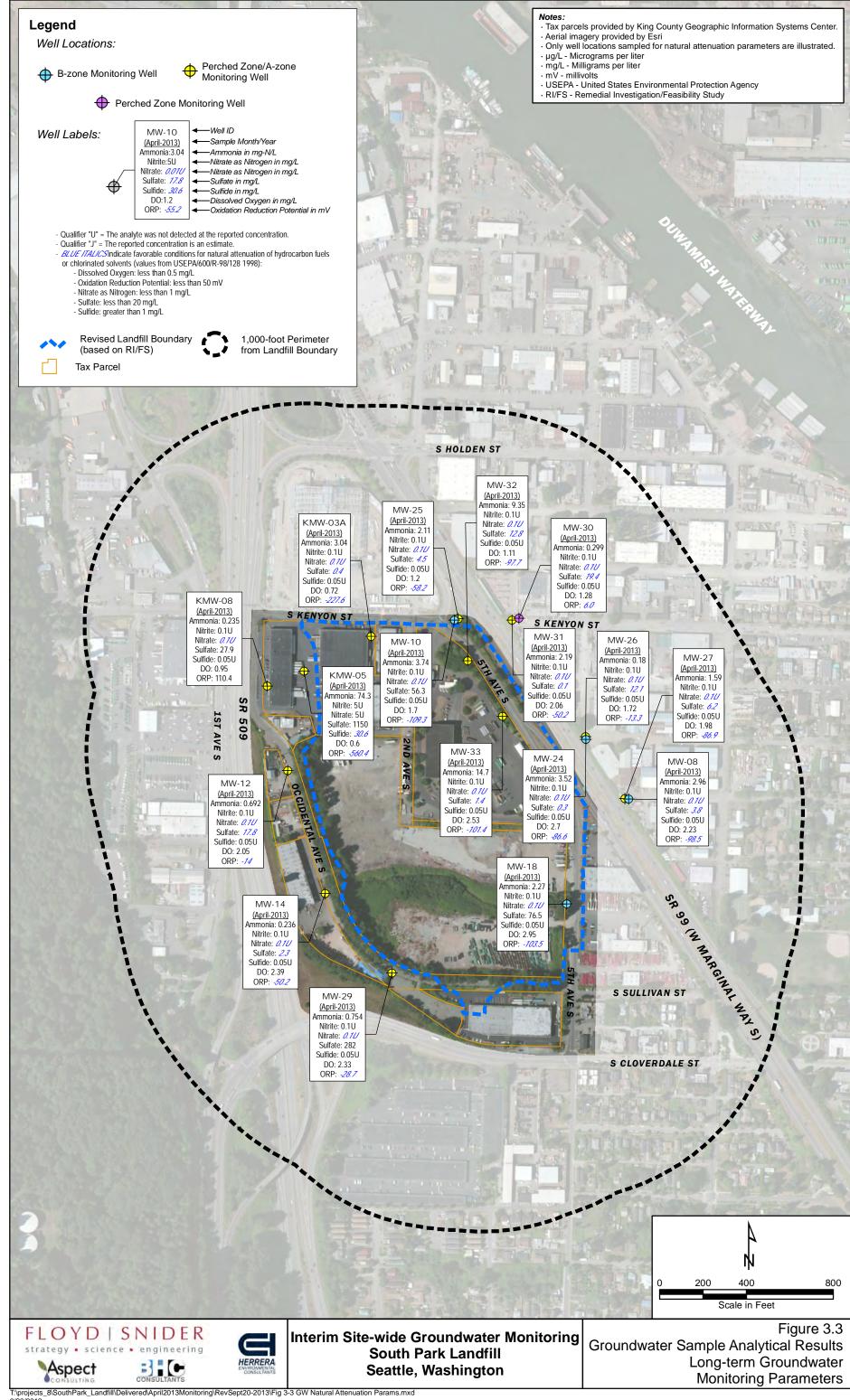
strategy • science • engineering

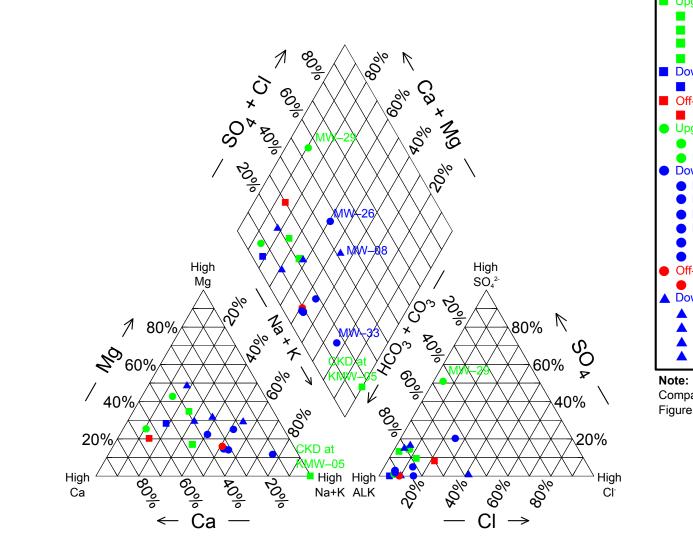
Figure 1.1 April 2013 Groundwater **Monitoring Locations** 











#### Legend

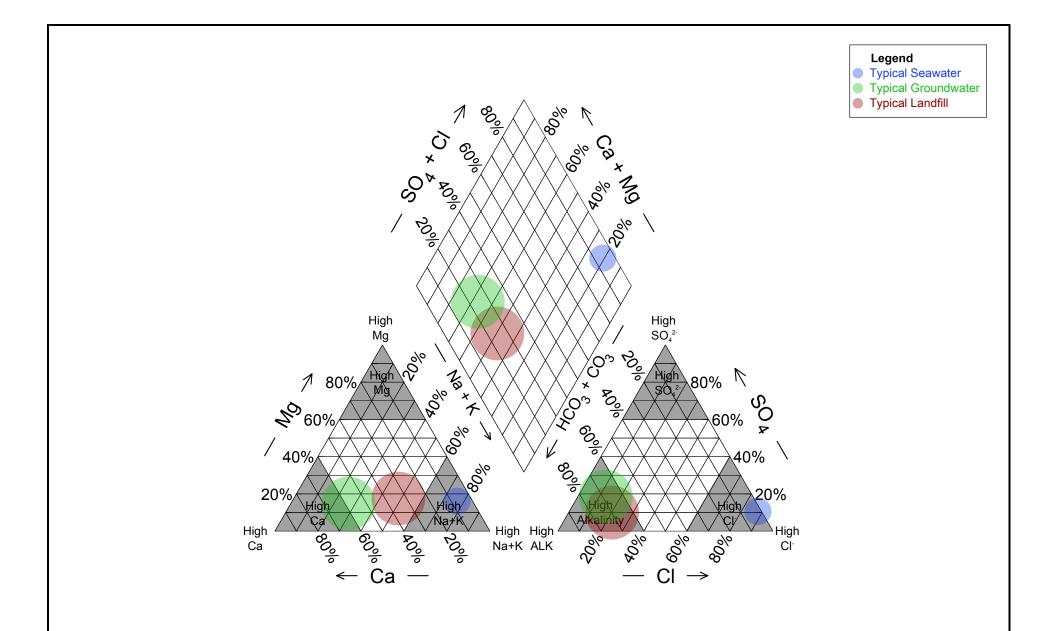
- Upgradient Perched and Perched/Shallow
  - KMW-05
- KMW-08
- KMW-08Dup
- MW-12
- Downgradient Perched and Perched/Shallow
  - KMW-03A
- Off-site Perched and Perched/Shallow
- MW-30
- Upgradient Shallow
  - MW–14
  - MW–29
- Downgradient Shallow
  - MW-25
  - MW-25Dup
  - MW–26
  - MW–27
  - MW-32
  - MW-33
- Off-site Shallow
  - MW–31
- Downgradient Deep
  - ▲ MW-08
  - ▲ MW-10
  - ▲ MW-18
  - ▲ MW-24

Companion information is provided on Figure 3.5.





Interim Site-wide Groundwater Monitoring South Park Landfill Seattle, Washington Figure 3.4 April 2013 Groundwater Monitoring Trilinear Plot of Major Cations and Anions







Interim Site-wide Groundwater Monitoring
South Park Landfill
Seattle, Washington

Figure 3.5 Trilinear Plot of Major Cations and Anions for Typical Waters

# **April 2013 Interim Site-wide Groundwater Monitoring Results**

# Appendix A Groundwater Sampling Field Forms



## Sample SPL-GW-KMW08-040413

	A2DLIIV					1,		/		
GROUN	DWATER	SAMPLING				WELL NUM	ABER: KY	<u>1W-08</u>		Page: of
Project Na Date: Sampled b		South 1		<u></u>		Project Num Starting We Casing Stic	ater Level (ft	1 <u>D0/ /</u> TOC) <u>:</u>	5.90	)
Measuring		ell:				Total Depth				
Screened ! Filter Pack						Casing Diar	meter (inche	es) <u>:</u>	<u> </u>	
		(ft Wate	er) x	/l ofv	)(anf) =	(L)(na	d)			
	umes: 3/4	"= 0.02 gpf 0.09 Lpf 2"	2" = 0.16 gp	f 4"	= 0.65 gpf	6" = 1.47	gpf		Sample Int	ake Depth (ft TOC):
PURGIN		JREMENTS								
Criteria:		Typical 0.1-0.5 Lpm	Stable	na	± 3%	± 10%	± 0.1	± 10 mV	± 10%	
Time	Cumul. Volume (gal or L)	Purge Rate (gpm or Lpm)	Water Level (ft)	Temp.	Specific Conductance (µS/cm)	Dissolved Oxygen (mg/L)	рН	ORP (m <u>v)</u>	Turbidity (NTU)	Comments
1022		0.35								Start
1027			5.92	13,6	388.2	0.94	6.66	1224	clear	
1032 1037 1042			5.92	13.6	383.0	0.90	6.66	117.8		
1037			5.92	13.6	398.6	0.88	6.66	115,2		
			5,90	1316		0.78	6.66	1114		
1047				13.5	398,0	0.95	6.66	110.4	0.41	Smple
	,									
,										
						_				
								_		
otal Gallon						Total Casing				_
nding Wate	_					Ending Total	Depth (ft 16	OC):		_ <del></del>
Time	Volume	Bottle Type	Quantity	Filtration	Preservation	Appear	ance	Field I	200-	Tiwe: (1/30) Remarks
1,,,,,				,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,		Color	Turbidity & Sediment	SPL-	GW-M	Remarks W61-040413
1050	40ml	VOA	3	W0	14EL, 2 no			Voc	8260	
	Jone	VOA	3	Ve	14ch, 2 no			Voc		oc-SIM (ve)
۷.	Sount	HOPE	) (	YES)	HN03			(Di55	well the	
5	00 ML	HDPF	1	No	HV03			total	nedals	FEIMA
. 4	ilame	02	7	NO	20			Anions (	CLNOZ	
	16	0.2	1	Po.	No			Alk		1000,000
	500 m	HOPE	- \	No	Ha So4 Znacotale			NH3	Amoria	70 11 1
ETHORS	Zanal 1.	Amor		No 1		. الم	1	2.1 60	4/11	NO HENSONE
arameters n	neasured w	oith (instrument m	A 1 1	–		Yellow Decon Equip	, —	Alconos	+D1	930
sposal of D		^		5140~	<del>)                                    </del>	_ 555., Equip		7.		V4. 673.5
oservations/				Duc	· · · · · ·					

GROU	NDWATER	SAMPLING	RECORD			WELL NUM	івея: 💢	MW-0.	5	Page: _/_ of _/_
Project / Date: _	4(3)	South	_	<u>_</u>		Project Nun Starting Wa	ter Level (ft	/ <i>D0/1</i> (TOC): S		abottomolivell More notes and
Sample	ng Point of W	311/41				Casing Stick				haranoles and
	d Interval (ft.					Casing Dian		es) <u>:</u>		
ilter Pa	ck Interval (ft.	TOC)	<del></del>							
-		(ft Wate							0	
asıng v		٠.	2" ≈ 0.16 gp = 0.62 Lpf		= 0.65 gpf 2.46 Lpf	6" = 1.47 6" = 5.56 L <sub>1</sub>	-		Sample Int	ake Depth (ft TOC):
PURGI		JREMENTS								
Criteri	a:	Typical 0.1-0.5 Lpm	Stable	na	± 3%	± 10%	± 0.1	± 10 mV	± 10%	
Time	Cumul. Volume	Purge Rate	Water	Тетр.	Specific Conductance	Dissolved Oxygen	pН	ORP	Turbidity	Comments
	(gal or L)	(gpm or Lpm)	(ft)	(°C)	(μS/cm)	(mg/L)		(miv)	(NTU)	
1447		0.3								Start
1452			5,65	15A	31023	0.5%	13.01	-344,2	cola	
1457	-	The state of the s		NACESCAMINATES 24	producer and the second of the	LENGTH VAND COME RECEIVE	Shirt was a second of the seco	A STATE OF THE PARTY OF THE PAR	- Art market Darriconso	pulled tubingue 2'
1\$60	d Service Control of the Control of	The second secon		With the same of t	وه المساور المساور المساور والمساور والمساور والمساور والمساور والمساور والمساور والمساور والمساور و					Starpano
150-	3	0.2			The same of the sa					pulled tubingup 2' Stop Pundo Ristort
1508			5.54	158	32843	0,58	13.10			
15/3			554	- 3	32624		13.0	-4909		
1518	1		5.54		32320		13,10	-5023		<u></u>
1523			5.54	+ + + + + + + + + + + + + + + + + + + +	32210	0,59	13/11	-511,9		
1528					31987			-6233	3	
1533	1				31800	0,56				
538		<del></del>		15.9		0,59	13,11	-549.3		
543	-			(5,9	<del></del>	010	13,11	-560.4		
SID	_			10/5	313624	U BEAL	1-2-61-1-			
						,	_			
stal Call	ons Purged: _		<del></del>			Total Casing	Volumes R	lemoved:		
itai Gali	olis Puiged					Total Casing	VOIDITIES TO	emovod.		
ding W	ater Level (ft	TOC):				Ending Total	Depth (ft T	OC):		
AMPLI	INVENTO					·	<u> </u>	- 1		
Time	Volume	Bottle Type	Quantity	Filtration	Preservation	Appear	1	Fiels &	AVE-	Remarks the
						Color	Turbidity & Sediment	SPL- 6	9-WM	61-0403/3/
550	40 ml	VOA	3	WO.	14EL, 2 no			VOC	8260	3c+ Benziery
	40m	VOA	3	Ve	14ch,200			Voc	826	oc-SIM (ve) V
	SpanL	HOPE		YES)	HN0-3			Diss	well My	tals Mark, Ea, My, FEL
	500 ML	HOPE	1	NO	HV03			total	many	FEMA V
	Small	0.5		No	NO	•		Anions	CL NO.	W/20 50/ V
		0.2		PO.	No			Alk	<del></del>	V
	500 ML	HOPE		No	H2504			N'H3	Amoria	
THO	S501144	HOPE		ho_1	ZN gretite			SILE	11	NO HENGOSEC
rameter	s measured w	vith (instrument n	nodel & seria	al number):	y S1	+ (yell	OLA) C	al @ 4	17/3	FOOK Product)
rging Ed	uipment:					Decon Equip	ment:			Suple
sposal of	Discharged !	Water:	<del></del>			_ <del></del>				
senzetin	ns/Comments	(otto	Jand :	Field	DUD/a	Harris	Labo	HE )	P.Sp.	GO MAN
		ils on Bay	v .(	10800	·/	7 5 14		-	<del>-1</del>	Met 2
1 . 1 . 1										· · · · · · · · · · · · · · · · · · ·



Sample number SPL-GW-KWWO3A-0403/3

		SAMPLING				WELL NUMBER: KMW-03A Page: Lo					
Sampled Measurin Screene	f by: ng Point of W d Interval (ft. '	TOC)	Parl			Project Number: 10016  Starting Water Level (ft TOC): 9,64  Casing Stickup (ft):  Total Depth (ft TOC):  Casing Diameter (inches):					
1	ck Interval (ft.										
Casing v	olumes: 3/4" 3/4"=	(ft Wate '= 0.02 gpf 0.09 Lpf 2'	2" = 0.16 gg	of 4"	= 0.65 gpf	6" = 1.47	6" = 1.47 gpf Sample Intake Depth (ft				
PURGI	NG MEASU	JREMENTS						_			
Criteri		Typlcal 0.1-0.5 Lpm	Stable	na	± 3%	± 10%	± 0.1	± 10 mV	± 10%		
Time	Cumul. Volume (gal or L)	Purge Rate (gpm or Lpm)	Water Level (ft)	Temp.	Specific Conductance (µS/cm)	Dissolved Oxygen (mg/L)	pН	ORP (mv)	Turbidity (NTU)	Comments	
1324		0,3	-				- Annual Control of the Control of t		, and the state of	Start	
3.2											
320	7	-		[4,1	826	0.88		-61.1	a fine		
133			9,65		820	0,83	7.00				
1339			9,65	H3.	820	070		-215.1			
1344	T		9.65		821	0.75		-222.8			
1349	<del>}</del>	\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \		14.1	823	0115	7.108	-227,16	1,65	SAMOLO	
Fotal Gallo	ons Purged:					Total Casing	Volumes R	lemoved:			
- 1: 1 <i>4/</i> -		·OC/+				C-41 T-1-1	D 15 # T	001			
	ater Level (ft 1				<del>_</del>	Ending Total	Depth (It I	OG):			
	Volume	Bottle Type	Quantity	Filtration	December						
Time				Filtration	Preservation	Appear Color	Turbloity & Sediment			Remarks	
400	40nh	VOA	3	No.	14er, 2 no			VOC	1260		
	90mr	VOA	3	Ve	14ch, 2 us			You	8260	oc-Sim (ve)	
	Sount	HDPE		YES!	HNO3			(Di555	well the	tals Markica, My, FEL	
		HOPE	1	No.	4403			total	Midds	FEIMA	
	Small	02	. 1	No	NO			Anions (	LI, NO3,	NO2, SOU	
	<u>  L</u>	0.20	1	NO.	NO			AIK	Amoria		
FTHO	500 ML	HOPE	-	No	20 geolide			CIRI	Amoria	ND Heitsmel	
arameters urging Equi	measured wi uipment: Discharged V	ith (instrument m Paraskultic to Vater:	who o	al number):	451 +Pr	o (vello) Decon Equip		cal:bra		3/13 AM	



# Sample SPL-6W-MU112-040313

	_	SAMPLING				WELL NUMBER: MW-12- Page: / of /						
Project No	ame:	South'	Parl			Project Nur	mber:	10011	6			
Date: <u>6</u>	12113	Sm/cm	_			Starting Wa	ater Level (fi	( TOC):	7.960			
ampieo i Measurino	g Point of W	9/11/ <i>C //</i>				Casing Stic	——-					
		гос)					meter (inche			<del></del>		
ilter Pacl	k Interval (ft.					(1)(00	——————————————————————————————————————					
		= 0.02 gpf							Sample Inte	ake Depth (ft TOC):		
aog		0.09 Lpf 2	-						- ample inte	ake Depth (it 100),		
URGIN		REMENTS										
Criteria		Typical 0.1-0.5 Lpm	Stable	ла	± 3%	± 10%	± 0.1	± 10 mV	± 10%			
Time	Cumui. Volume (gal or L)	Purge Rate (gpm or Lpm)	Water Level (ft)	Temp. (°C)	Specific Conductance (µS/cm)	Dissolved Oxygen (mg/L)	pH	ORP (ṁv)	Turbidity (NTU)	Comments		
1:53		<u> </u>				- Company of the State of the S	Contraction and the second	and the second s	THE PARTY OF THE PROPERTY OF	START		
11:58		6.0	7.99	12.6	423,2	3,43	6.68	740	Darage			
2:03			7.99	12.6				-66	clearing	<del></del>		
2:08		<del>                                     </del>	7,99		<del></del>			-65		<u> </u>		
2:13			1111	12,6	T							
2:18				1216	435 6		(0.68)			5 /		
2.10		<u> </u>	<del> </del>	1410	7000	2,00	10,000	17.()	02.0	Smote		
			<del> </del>				-		<del> </del>			
			<del> </del>	<del> </del> -	ļ <u></u>							
			-									
									<b></b>			
						_	_					
al Gallon	s Purged:					Total Casing	Volumes R	ewoneq.				
ai Gallori	.s , urgou					Total Casing	¥0101116311			<u> </u>		
ing Wat	er Level (ft T	OC):				Ending Total	Depth (ft To	OC):				
MPLE	INVENTO	RY										
ime	Volume	Bottle Type	Quantity	Filtration	Preservation	Appear	ance					
				İ		Color	Turbidity & Sediment		,	Remarks		
130	40 nL	VOA	3	No	1HEL, 2 no	Oronal	62.8	Voc	8260	) (.		
	40mm	VOA	3	Vo	14ch,200	-V1 - 772		1100		c-SIM (ve)		
1	Sconl	HOPE	1	XFS)	HN0-3	_		10:	due Chie			
	41	HOPE	1	No	HY03			+11				
+			<del></del>		200			10tal	Mades	FEIMA		
	Small	02	1	NO				<u> Mins</u>	L, NO3,	MO2,504		
7 "1	500 MU	FDPE)	1	NO!	NO 1			AK	(Amoria)	<del></del>		
	~> 00 IV\\\	HODE	1	No	2 n accture			SULEX	throng.	NO HELSON		
HODS				^				( )	1110	The Flexible		
_	500 Much			-Lawrence - N		/ .1	1 1	1 . 1	1. 1. 1. 1. 1. 1.	4/2/2		
meters r	500 Much	th (instrument m	. 41	_			ment:	Allon	Docated &	4/3/13 Am		
meters r	neasured wi	th (instrument m	bladd	a pum	とせから			Allon	of + F	4/3/13 Ans		
meters r ing Equi	neasured wi	th (instrument med cafed vater:	bladd un	002)fr	とせから	Decon Equip		Alran	ibraul (d)	4/3/13 Ans		



Sample SPL-GW-MW14-040313

GROUI	NDWATER	SAMPLING	RECORD			WELL NUMBER: MW-14 Page: 1 of /						
Sampled Measurin Screened	by: g Point of Wi I interval (ft.	roc)	_			Starting Wa Casing Stick Total Depth	Project Number: 10016 Starting Water Level (ft TOC): 5,49 Casing Stickup (ft): Total Depth (ft TOC): Casing Diameter (inches):					
Casing V	olumes: 3/4	(ft Wate = 0.02 gpf 0.09 Lpf 2"	2" = 0.16 gg	of 4"	= 0.65 gpf					ake Depth (fl TOC):		
PURGI		JREMENTS							_			
Criteria	1:	Typical 0.1-0.5 Lpm	Stable	na	± 3%	± 10%	± 0.1	± 10 mV	± 10%			
Time	Cumul. Volume (gal or L)	Purge Rate	Water Level (ft)	Temp.	Specific Conductance (µS/cm)	Dissolved Oxygen (mg/L)	ρΗ	ORP (mv)	Turbidity (NTU)	Comments		
1055	<u> </u>	0.35			1 1 10		1	C = 1		5tort pump		
1105			3.90	12.6	657	4.05 3.24	6.24	7-30	=56.2			
1110			3.95	12.5	20015		12100					
115		- constant	CONTRACTOR CONTRACTOR	125	598.F	configuration and the	anafarahbilan		5(a)			
1115			3.95			2,54	669	-52.1				
1120			3,95	12,5	598.2 597.7	2,40			9.57			
1125		· · · · · ·		1210	371:1	2133	6.70	3012	7.21	Smple		
							_					
·												
		· .										
Fotal Gallo	ns Purged:_					Total Casing	Volumes R	emoved:		_		
nding <b>W</b> a	iter Level (ft 1	OC):		<u></u>		Ending Total	Depth (ft To	DC):				
SAMPLE	INVENTO	RY										
Time	Volume	Bottle Type	Quantity	Filtration	Preservation	Appear	Turbidity & Sediment			Remarks		
1130	40ml	VOA	3	No	14EL,2 no			Voc	8260	3c V		
·	90mm	VOA	3	Vo	14ch,200			Voc		06-51m (ve) L		
	Sount	HDPE		YES!	HN03			Di55	duent the	tals min K, Ea, My, FE		
	500 ML	HOPE		NO	H403			total	judds			
	Small	02	1	No	No			ě	CI, NO3,	NO2,504		
	500 ML	HDPE)	\ \	NO.	NO Ha504			AK	Amoria			
ETHOU	SSON	HOPE		No_1	Zn acetite			20164		NO HEASONELL		
urging Eqi		ith (instrument n		ON-MO:		VS/→ Decon Equíp	c.a.	1 .	4/3/1 L+DI	13 AM		
•		:			WER VI	<u> </u>						



# Sample 5PL-GW-MW29-0403/3

GROU	NDWATER	SAMPLING I	RECORD			WELL NUMBER: WW-29 Page: of						
Droin at k	lame:	South?	Parl			Project Nun	nher	10011	6			
Date:	`	4/3/2				Starting Wa			6.9	3		
Sampled	by:	SMICM	_			Casing Stick			(6)	<del></del>		
	g Point of W					Total Depth (ft TOC):						
	l interval (ft.					Casing Diar	neter (inche	es) <u>:</u>	· ·			
	k Interval (ft.									<del></del>		
		(ft Wate							,			
Casing v		'= 0.02 gpf			= 0.65 gpf				Sample Int	ake Depth (ft TOC):		
		0.09 Lpf 2"	= 0.62 Lpf	<u>4" = 2</u>	2.46 Lpf	6" = 5.56 L	pf					
PURGI	NG MEASL	JREMENTS										
Criteria	ı	Typical 0.1-0.5 Lpm	Stable	na	± 3%	± 10%	± 0.1	± 10 mV	± 10%			
Time	Cumul.	Purge Rate	Water	Temp.	Specific	Dissolved	На	ORP	Turbidity	Comments		
	Volume (gaì or L)	(gpm or Lpm)	Level (ft)	(°C)	Conductance (µS/cm)	Oxygen (mg/L)		(mv)	(NTU)	}		
1000		0.35		1	Дологи	, (right)			(3.10)	Start		
1005	+		8.44	120	1167	1 001	6 46	270	CENE			
	<del> </del>	0-2		138		1.00			- Curre	Reduced flow rate		
1010	<del>  -</del>	<del>                                     </del>	8.27	13.9			6,30	9.1	<u> </u>			
1015	<u> </u>	<del>  _   _   _   _   _   _   _   _   _   _</del>	8.02	13,9	1153		6.52	-7.2				
1020			8.20	11.0	1154	2,02	0,53	-14.8				
1025			8,20	139	1158	2119	0.52	-22.3				
1030		V	8.14		11560	2,33	(0.53	-29 7	17.4-	Souple		
10			\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\	1 1 10	1100		103 - 7	5-11		3004		
		<del> </del>	<del> </del>	<u> </u>								
				<del> </del>								
,												
							_					
	_											
								_				
otal Gallo	ns Purged: _					Total Casing	Volumes R	lemoved:				
LA/c	ter Level (ft	TOC\-				Ending Total	Death /ft To	OC).				
						Zilding (otal	Deput (n. t.	00,				
	INVENTO											
Time	Volume	Bottle Type	Quantity	Filtration	Preservation	Appear				Remarks		
						Color	Turbidity & Sediment					
(635	40 ml	VOA	3	60	THEL, 2 no			Voc	8260	7 C		
	40mr	VOA	3	Vo	14ch, 2 no			Voc		oc-Sim (ve) L		
	Sount	HDPE	1	XFS)					diel M			
-					HN03			105		,		
	500 ML	HOPE		NO	HP03			Total	Middle	FEIMA		
	Small	02	1	140	No			Anims	CL, NO3	, NO2, SO4		
	1_	03		NO.	No			AK	-	V		
	500 ML	HOPE	\	No	H2504			NH3	(Amoria	1000		
ETHOD	S Son Much	HDVF		-ho-1	ZN acetate	1 .	<del></del>	Contract of the second	2/1/	NO HENSONIEL		
arameters	measured w	ith (instrument n	nodel & seri	al number):	451	lyclin	(ري	cal (	<u> 2 41:</u>	3/12 Atr		
urgina Ea	uipment:/	Porastall:	+ded:	wheel m	bina_	Decon Equip	oment:	Alcar	01 + D	\		
	· ·	Water:			,	. ,						
bservatior	s/Comments	:								<del></del>		

1 40	Spec			Sample number	SPL	一人 人	5-W-1	MWI	8-04	0312		
		SAMPLING				WELL NUM	IBER: M	. Page: _/ of				
Sampled Measurin Screened Filter Pad Casing V	Project Name:       Project Number:       J DOILG         Date:       4 3 13       Starting Water Level (ft TOC):        4 9           Sampled by:       Casing Stickup (ft):       Total Depth (ft TOC):       Casing Stickup (ft):         Measuring Point of Well:       Total Depth (ft TOC):       Casing Diameter (inches):         Screened Interval (ft. TOC)       Casing Diameter (inches):       Casing Diameter (inches):         Casing Volume       (ft Water) x       (Lpfv)(gpf) =       (L)(gal)         Casing volumes:       3/4"= 0.02 gpf       2" = 0.16 gpf       4" ≈ 0.65 gpf       6" = 1.47 gpf       Sample Intake Depth (ft TOC):         3/4"= 0.09 Lpf       2" = 0.62 Lpf       4" = 2.46 Lpf       6" = 5.56 Lpf											
PURGII		JREMENTS										
Typical         Stable         na         ± 3%         ± 10%         ± 0.1         ± 10 mV         ± 10%												
Time	Cumul. Volume (gal or L)	Purge Rate (gpm or Lpm)	Water Level (ft)	Temp.	Specific Conductance (µS/cm)	Dissolved Oxygen (mg/L)	рН	ORP (mv)	Turbidity (NTU)	Comments		
<u>0845</u>		0 0		100	1071	1,65	1 ~1		- CO111	There		
<u>0</u> 850		0.3	14.96	-	(124	135	6.54	5.2 -55,4				
<u>ර</u> දී කි			14,95		1148	1.48	6.50		-			
<u> </u>		<del>                                     </del>	17.7-	12.0	(159	199	0.57	~89°9				
0905 0910	1	<u> </u>		13,0	1165	2.27	0.58					
0915				13.0	11.00		6.39					
0920				13,1	1108			1013				
0925				13,1	1172	2,95			2.32			
_												
Ending Wa	ons Purged:ater Level (ft ]					Total Casing Ending Total				_		
Time	Volume	Bottle Type	Quantity	Filtration	Preservation	Appear	ance					
						Color	Turbidity & Sediment		_	lemarks		
0930	40 nl	VOA	3	No	14cm, 2 no			Voc	8260	c v		
	40mr	VOA	3	Ve	14ch, 2 us			VOC 82601-5/m (ve)				
	Sount	HDPE		(YES)	4403			Dissived Metals Mark, Ea, My, FE L				
	500 ML	HOPE		NO	HP03		· .	total rutals FEIMA L				
	Small	02	1	NO				Anions 1	C1, NO3,1	102,504 L		
	500 ML	D7 HDPE	- \ +	NO 1	NO Ha 504			AK	(Amoria)			
<b>METHOD</b>	S SON KALL	HOPE		νo	ZX geetine		,	الخاارك	- 1,7 - 03-p=1	ND Hendspiect		
		ith (instrument n			/	Decon Equip	oment:	alibra		15/13 Am		
	Discharged V	Q		uside								
	ns/Comments				mild wext	4	/	lock and	1.2			
1B-1	isind	L S:3+ C	poler)	(1) ed (	begining	of Day	(green					

	Spec			number	SPL-	GW-	MW I	0-09	10215	
		SAMPLING				WELL NUM	IBER: M	W-10		Page: of/_
Project N	lame:	South'	Park			Project Nun	nber:	10011	6	
Date: _	412/13		_			Starting Wa	iter Level (ft			8_
Sampled	бу:	SM/CW				Casing Stick	_			
	ig Foint of Wi i Interval (ft. 1	ell: TOC)				Total Depth Casing Diar		es):		-
	k Interval (ft.									
Casing V	olume	(ft Wate	er) x	(Lpfv	)(gpf) =	(L)(ga	l)			
Casing v		= 0.02 gpf			= 0.65 gpf				Sample Intak	e Depth (ft TOC):
or in Cil		0.09 Lpf          2" JREMENTS	= 0.62 Lpf	4" = 1	2.46 L.pf	6" = 5.56 L	pt			
Criteria		Typical	Stable		± 3%	± 10%	± 0.1	± 10 mV	± 10%	
	Cumul.	0.1-0.5 Lpm Purge Rate	Water	Tomp	Specific	Dissolved	H	ORP	<u> </u>	0
Time	Volume (gal or L)	(gpm or (pm)	Level	Temp.	Conductance	, , ,	pΗ	(mv)	Turbidity	Comments
1612		U,25	(ft)	(°C)	(µS/cm)	(mg/L)		(1117)	(NTU)	Start
1617		1	12.40	14.3	377.9	2,68	7.01	-51.1	Clear	STAT
1622		-	12.40		652.	1.67		-91.0	CITAL	
1627			12.74	14.3	700	1,51		-101,5		
1632		<del>                                     </del>	12.78	,	692	1,69	4.	-1065	<del></del>	
1637			12.80		715	170			2.62	Smole
1054		<del></del> -	100	1112	1 - 1 2	11.17	1 W/1 C/C/2	100		Super
			<del></del>						<del></del>	
							_			
,										
		<del></del> :								
ntal Gallo	ons Purged: _				<u> </u>	Total Casing	Volumes R	emoved:		
								_		-
	iter Level (ft					Ending Total	Depth (ft To	OC):		·
	INVENTO									
Time	Volume	Bottle Type	Quantity	Filtration	Preservation	Appear	ance Turbidity &	R	emarks	
	Jio .		7			Color	Sediment	1 - 1		
040	40nb	VOA	3	Mo	iter, 2 no	clear	2.62	UDC	_ 0000	c v
	40mr	VOA		VO	14ch, 2 no			Voc		C-SIM (UC)
	Sount	HDPE	<u> </u>	YES!	HN0-3				west Met	AS Ma, K, Ea, My, F
	500 ML	HOPE	$\rightarrow$	NO	HP03			(	pudals	FEIMA
	Small	02	. 1	NO	NO			Anims (	CL, NO3, A	102,504
1,		0.2		MO!	No			AIK	71	
ЕТНОП	SOMU SSOM	HOPE	1	No 1	27 geetine			SAIN	(Amoria)	NO Heatson
•		ith (instrument n	nodel & seris			Hello	,, 5	CAVE	3.4/2/1	3 Am
		orastalti				Decon Equip	)	Alana		> /10-
	, v	Water: Dr			401.11	Joseph Equip		411604	~~~ ~~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~	<b></b>
nneel of	Discharged 1	water " "								

Z-\Equipment/Field Forms\Groundwater Sampling Form-xisx

E A	-	
	cno	~+
	spe	
1 Acc	DNSULTI	NG
		,, 0

### Sample SPL-GW-WW27-040213

Measuring Poscreened Interpretation Filter Pack Interpretation Casing Volum Casing volum PURGING Criteria: Time	Point of Well terval (ft. Tonterval (ft. Tome mes: 3/4"= 0.	OC)  (ft Wate 0.02 gpf 09 Lpf 2"  REMENTS  Typical 0.1-0.5 Lpm  Purge Rate (gpm or(Lpm)  C ), 2	er) x 2" = 0.16 gp	\text{Lpfv}  if 4" = 4  na  \text{Temp.}  (*C)	)(gpf) = = 0.65 gpf 2.46 Lpf ± 3% Specific Conductance (μS/cm)	6" = 1.47 6" = 5.56 Ly ± 10% Dissolved Oxygen (mg/L)	tter Level (f kup (ft): (ft TOC): meter (inchi		7.96	ake Depth (ft TOC):	
Date: C Sampled by: Measuring Poscreened Interpretation Casing Volum Casing Volum PURGING  Criteria: Time  1510  1515  1535  1538  1538	Point of Well terval (ft. To nterval (ft. To me	(ft Wate OC) (ft Wate 0.02 gpf 09 Lpf 2" REMENTS Typical 0.1-0.5 Lpm Purge Rate (gpm or(Lpm)	er) x	(Lpfv 4" = 2 na Temp. (*C)	= 0.65 gpf 2.46 Lpf ± 3% Specific Conductance (μS/cm)	Casing Stic. Total Depth Casing Diar  (L)(ga 6" = 1.47 6" = 5.56 L)  ± 10%  Dissolved Oxygen (mg/L)	kup (ft):  (ft TOC): meter (inchi	± 10 mV	Sample Inta	ake Depth (ft TOC):	
Measuring Pi Screened Inti- Filter Pack In Casing Volum Casing volum PURGING Criteria: Time	Point of Well terval (ft. To nterval (ft. To me	(ft Wate OC) (ft Wate 0.02 gpf 09 Lpf 2" REMENTS Typical 0.1-0.5 Lpm Purge Rate (gpm or(Lpm)	er) x	(Lpfv 4" = 2 na Temp. (*C)	= 0.65 gpf 2.46 Lpf ± 3% Specific Conductance (μS/cm)	Total Depth Casing Diar  (L)(ga 6" = 1.47 6" = 5.56 L  ± 10% Dissolved Oxygen (mg/L)	(ft TOC): meter (inche	± 10 mV	± 10%	Comments	
Screened Interpretation of the Pack Interpretation of the Pack Interpretation of the Punch Interpretation of the P	terval (ft. To nterval (ft. To me	OC)  (ft Wate 0.02 gpf 09 Lpf 2"  REMENTS  Typical 0.1-0.5 Lpm  Purge Rate (gpm or(Lpm)  C ), 2	2r) x	(Lpfv 4" = 2 na Temp. (*C)	= 0.65 gpf 2.46 Lpf ± 3% Specific Conductance (μS/cm)	Casing Diar  (L)(ga 6" = 1.47 6" = 5.56 L  ± 10%  Dissolved Oxygen (mg/L)	gpt f	± 10 mV	± 10%	Comments	
Filter Pack In Casing Volum Casing Volum PURGING Criteria: Time 1510 1515 1530 1538 1538	me	(ft Wate 0.02 gpf 09 Lpf 2" REMENTS Typical 0.1-0.5 Lpm Purge Rate (gpm or(Lpm) (gpm or(Lpm)	2r) x	(Lpfv 4" = 2 na Temp. (*C)	= 0.65 gpf 2.46 Lpf ± 3% Specific Conductance (μS/cm)	(L)(ga 6" = 1.47 6" = 5.56 L ± 10% Dissolved Oxygen (mg/L)	gpf pf ± 0.1	± 10 mV	± 10%	Comments	
Casing Volum Casing volum PURGING Criteria: Time 1510 1515 1530 1535 1538	me	(ft Wate 0.02 gpf 09 Lpf 2" REMENTS Typical 0.1-0.5 Lpm Purge Rate (gpm or(Lpm) (gpm or(Lpm)	2" = 0.16 gp = 0.62 Lpf Stable Water Level (ft)	na Temp. (*C)	= 0.65 gpf 2.46 Lpf ± 3% Specific Conductance (μS/cm)	6" = 1.47 6" = 5.56 Ly ± 10% Dissolved Oxygen (mg/L)	gpf pf ± 0.1	ORP	± 10%	Comments	
Casing volum PURGING Criteria: Time    \$10   \$15   \$50   \$538   \$543	3/4"= 0.  i MEASUF  Cumul.  Volume	O.02 gpf O9 Lpf 2" REMENTS Typical O.1-0.5 Lpm Purge Rate (gpm of Lpm) C O , Q 9	2" = 0.16 gp = 0.62 Lpf Stable Water Level (ft)	na Temp. (*C)	= 0.65 gpf 2.46 Lpf ± 3% Specific Conductance (μS/cm)	6" = 1.47 6" = 5.56 Ly ± 10% Dissolved Oxygen (mg/L)	gpf pf ± 0.1	ORP	± 10%	Comments	
Criteria: Time  1510  1515  1525  1535  1538  1543	Cumul. Volume	Typical 0.1-0.5 Lpm Purge Rate (gpm or(Lpm)	Stable Water Level (ft)	na Temp. (*C)	± 3%  Specific  Conductance (μS/cm)	± 10%  Dissolved Oxygen (mg/L)	± 0.1	ORP	Turbidity		
Time   510   1515   1520   1525   1538   1543	Volume	O.1-0.5 Lpm Purge Rate (gpm or(Lpm)	Water Level (ft)	Temp. (°C)	Specific Conductance (µS/cm)	Dissolved Oxygen (mg/L)	Г	ORP	Turbidity		
1510 1515 1525 1525 1538 1538	Volume	(gpm or (pm) - 0,2 9 - 2.97-	Level (ft)	(°C)	Conductance (µS/cm)	Oxygen (mg/L)	рН		·		
1510 1515 1520 1525 1538 1538		7.97	(n) 7 9 7	13.3	(µS/cm)	(mg/L)	North State of State	(mv)	(NTU)		
1510 1515 1525 1536 1538 1543		7.97	7.97	13.3			V-1-American				
1515 1525 1525 1538 1538		7.97	7 M/4/1	13.3	11300		1	THE PRINCE SHOWING THE PARTY OF	al-duparitie-chair	5111 1	
1520 1525 1630 1538 1543			7 M/4/1	MA 1		2.34.	6x21	-9100	h sed -	Startpup	
1525 1538 1543			r 11 C2 7 18	THE CLEAN ASSET !	A JE AL	91-1/1	6.7044	-2011	1799	<del></del>	
1538 1543		7.96~	271.096	11 110 1 1.1. 1	13/17	V-X-/4X	10.9/	787/19	/		
1538 1543				·	13500	1/2/5/	6.80	-384	redbay	·	
1538 1543			7,95	10.8	204,3	2:34	0.77	-801			
!543			7,95	10,8	279,5	2.10	6.58	-760			
			<del>,,,,</del>	10.3	2709	2.07	6.72		clear		
コンドル				10.9	2807		10.75	-87.5	904		
				117.47	1-001	1 ( ()	999	100 (3/2)	707	<del></del>	
					ļ						
,											
			<u> </u>								
					L						
Total Gallons I	Purged:					Total Casing	Volumes F	Removed:			
Ending Water	Level (ft T	DC):	<del></del>			Ending Total	Depth (ft T	OC):			
SAMPLE IN	Volume		Quantity	Citantia a	Preservation		~~~				
Time   V	volume	Bottle Type	Quantity	Filtration	rreservation	<del></del> ,	Appearance Turbidity &		Remarks		
				]		Color	Sediment	<u>.                                    </u>			
1550 4	10 ml	VOA	3	W0	1HEL, 2 90	yellow	90.4	VOC	8260	7c -	
	one	VOA	3	Vo	14ch,2us		1	VIDO	8260	oc-SIM (ve)	
		HDPE	ì	XFS)	HN03				duel he		
		-								1 -	
		HOPE	-	No	HP03			,	Middle	FEIMA	
5	mali	0.2	\	140				Anions 1	CL, NO3,	NO2,504 L	
1 1 1	L	0.≥		NO.	No		V,	Alk		<u>ر</u>	
1/5	500 ML	HOPE		NO	H2504			NH3	Lamoria	1	
NETHODS:		HOPE			ZN getthe		- <del>\</del>	Sylex		NO HEARING	
arameters me	easured with	h (instrument m	nodel & seri	al number):	1/S1 P	1000 (V	ellows	)			
	t t	edicated 1		_		Decon Equip	.,	Alcon	0x + D	1	
				, ·	. 5	S Esperi		/ ,, , , , , ,		<u>,                                      </u>	
isposal of Dis	scharged W	ater: D(	Dun D	N 2140							



Sample SPL-GW-WW08-040213

			SAMPLING				WELL NUM	Page: of!					
Proje	ect N	ے ame:	South	Par	K		Project Number: 100/16 Starting Water Level (ft TOC): 7,0 8						
ID ata		9131.3	?				Starting Water Level (ft TOC): 7.0 x						
Samp	pied	оу:	SM/CM	h			Casing Stic						
		g Point of W					Total Depth						
Scree	ened	Interval (ft.	TOC)				Casing Diag	meter (inch	es):	<u> </u>			
Filter	Pac	k Interval (fi	. TOC)										
Casin	ıg Vo	olume	(ft Wai	ter) x	(Lpf	v)(gpf) =	(L)(ga	al)					
Casin	ıg vo	lumes: 3/4	″≈ 0.02 gpf	2'' = 0.16 g	pf 4*	' = 0.65 gpf	6" = 1.47 gpf Sample Intake Depth (ft TOC); 6" = 5.56 Lpf						
		3/4"=	0.09 Lpf2	" = 0.62 Lpf	4"_=	2.46 <u>L</u> pf							
PUR	GIN	IG MEAS	UREMENTS										
Cri	teria	:	Typical 0.1-0.5 Lpm	Stable	па	± 3%	± 10%	± 0.1	± 10 mV	± 10%			
Tim	ne	Cumul. Volume (gal or L)	Purge Rate (gpm or Lpm)	Level	Temp.	Specific Conductance (µS/cm)	Dissolved Oxygen (mg/L)	рН	ORP (mv)	Turbidity (NTU)	Comments		
141	2	1	0.35						**	- And Berger	Start		
142	_	† — ·	0.2	7,98	8 11.7	1678	8 5 1	bite	-506	CLEAR	<u> </u>		
<u> </u>			0,5			4,00	1.61						
142		ļ. ———	h.,	7,9	-	1445	185	68	<b>1900</b>				
143	0		<u> </u>	8.00		1373	2,10	10.62	-939				
143				18,00	11.7	1340	2.23	6.83	-96.5				
146				8,01	117	1331	2.23				Smpla		
- <del>'</del> -	-		<del></del> -	1.01	1 3113	1 - 1 - 1		- 37 <del>2</del> -	15 8 5	~~'``	2000		
			<del> </del>		<del></del>	<del> </del>					<del></del>		
				ļ		<u> </u>					<u> </u>		
1													
	_			<del> </del>	<del>                                      </del>	<del> </del>							
	$\rightarrow$		<del> </del> -	<del> </del>	-				<del> </del>				
						<u> </u>							
	_			<del>                                     </del>		1			<u> </u>				
	$\rightarrow$			<del> </del>		╃───			<del>  </del>				
			l	L		<u> </u>							
Total G	allor	ns Purged: _		_		•	Total Casing	Volumes F	Removed:				
									_				
Ending	Wat	er Level (ft *	TOC):			i	Ending Total	Depth (ft T	OC):				
SAMP	LE	INVENTO	RY						_				
Time	•	Volume	Bottle Type	Quantity	Filtration	Preservation	Appear				Remarks		
						(	Color	Turbidity & Sediment		_	TOTAL NO.		
144	51	40 ml	VOA	3	Nº 0	THEL, 2 no			Voc	8260	(		
1111	$\overline{}$		VOA	3	Vo								
		40mr		<del></del>	The state of the s	14ch, 2 us			Voc	0260	C-5/m (VE)		
	~	Sount	HDPE		AES)	HN0-3			(Di550	well fuel	als Markita, My, F		
	1	SOB ML	HOPE	1	No	4403		[	total	Midals	FEIMA		
$\neg$	1	Small	05		No	NO			1	C1, NO3,1			
1	+	1	03			No			£	-11-01311	102,504		
1	+	500 MU	HOPE	- : -	MO.	H2504			AK	(Amoria)			
AFTIA	One	500 WW	HOPE	· ·	No 1	>N sectife		-	Salla	(mone)	NO Hertson		
ALC: LA	_					_	14	7-1	-	1.1.1	,		
						<u>, ysi(</u>			Cal @		Ann		
		pment:	thatic and	bloda	purt +	Hobbin	Decon Equip	ment:	Alcon	+ + Til u	Jah-		
	Equi				1!	tub.							
urging			Nater: Day	hu m	KIL-								
urging			Water: <u>Pro</u>	unon	CI de								



Sample SPL-#GW-MW26-0402/3

GROU	NDWATER	SAMPLING	RECORD			WELL NUM	ABER: M	Page: / of /					
Date: _ Sampled Measurin	g Point of W	SM/CW				Project Number: 10016 Starting Water Level (ft TOC): 9,25 Casing Stickup (ft): Total Depth (ft TOC):							
	d Interval (ft. <sup>*</sup> ck Interval (ft	TOC)				Casing Diameter (inches):							
Casing V	olume	(ft Wate "= 0.02 gpf 0.09 Lpf 2"	er) x 2" = 0.16 gr	(Lpf\ of 4"	= 0.65 gpf	(L)(ga 6" = 1.47 6" = 5.56 L	gp <u>f</u>		Sample Int	ake Depth (ft TOC):			
PURGI	NG MEASI	JREMENTS											
Criteria		Typical 0.1-0.5 Lpm	Stable	na	± 3%	± 10%	± 0.1	± 10 mV	± 10%				
Time	Cumul. Volume (gal or L)	Purge Rate (gpm or Lpm)	Water Level (ft)	Temp. (°C)	Specific Conductance (µS/cm)	Dissolved Oxygen (mg/L)	рН	ORP (mv)	Turbidity (NTU)	Comments			
1255		0.3	0.36	1) 0	1, 22	O de	6 110		- Al .m	- Stort pump			
1360		ļ	9,25	1 .	177.5	<u></u>	6.42		OFFICE				
1305		<del> </del>	9.25		153.5	2,26	6.33			<u> </u>			
1310		<del> </del>	9,20	11.9	151.6	1,93		-19.8					
1320	]			11.9	50.0	1.84	652						
1325	T			1119	1495			-19.8					
13-10			<u>-</u>	(0.5)	148.7	1.72	6.32		59.7				
		<del></del>					ļ						
·			<u> </u>	<del> </del>			<u> </u>						
		<del> </del> -			<del> </del>					<u> </u>			
					-			_					
otal Gallo	ns Purged: _					Total Casing	Volumes F	Removed:		_			
nding Wa	ater Level (ft 1	ΓΟC):				Ending Total	Depth (ft T	OC):					
SAMPLE	INVENTO	RY											
Tìme	Volume	Bottle Type	Ouantity	Filtration	Preservation	Appear			Remarks				
						Color	Turbidity & Sediment						
1350	90ml	VOA	3	W0	14EL,2 no			YOC					
	40mr	VOA	3	XIVO	14ch, 2 us				VOC 8260C-SIM (VE)				
	SOUNL SOOML	HDPE		YES!	HN03			(V155	duel Me				
	Small	HOPE 05		NO	NO			total redus FEIMA					
	11	0.5	<u></u>	P 0.	NU			Alk	C1, NO3,	,NO2,504			
	500ML	39GH	\	No	H2504				(Amoria	, ,			
	5500 Kurl	HDPF		ho	3n quelite	1,		Silking		1 6 Headsonce			
	ŀ	ith (instrument n	nodel & seri	_	7 7	(ellau)	_Ca	11	2/13	AM I			
	uìpment: <u>///</u>		2160	MP 11	vbig	Decon Equip	pment:	Janor -	F111 250	<u></u>			
isposal of	Discharged \	Nater:	in 61 5	) <sub>k.</sub>	<u> </u>								
bservation	s/Comments	»:											



Sample SPL-GW-WW24-040213

		SAMPLING				WELL NUM	IBER: M	N-24		Page: of
Date: Sampled Measurin	by:g Point of We	SM/CW SM/CW Poll:					ater Level (fi kup (ft): (ft TOC <u>):</u>	100): TOC):		
		TOC)								
	olumes: 3/4"	(ft Wate = 0.02 gpf 0.09 Lpf 2"	2" = 0.16 gp	f 4"	≈ 0.65 gpf	6" = 1.47	gpt		Sample Inta	ake Depth (ft TOC):
PURGIN	IG MEASU	JREMENTS								
Criteria	:	Typical 0.1-0.5 Lpm	Stable	na	± 3%	± 10%	± 0.1	± 10 mV	± 10%	
Time	Cumul. Volume (gal or L)	Purge flate (gpm or Lpm)	Water Level (ft)	Temp.	Specific Conductance (µS/cm)	Dissolved Oxygen (mg/L)	рН	ORP (mv)	Turbidity (NTU)	Comments
1200			8,47			The second	C ( A	127.5		STAIRT
1210		0.3	8,49		950	2,05	6.6A		CLEAR	
12.15		1	8.49		940	2.17		-639		
1570		Ψ	8,49	11.9	919	284		-764		
1275	3	-  -	ļ	169	911	2.00		-82,2		
123C		\		[1,9	913	2.70	6.5	-86.6	39,1	5007
Total Gallo	ns Purged: _					Total Casing	Volumes H	lemoved:		_
ending Wa	ter Level (ft T	TOC):				Ending Total	Depth (ft T	OC):		
SAMPLE	INVENTO	RY								
Time	Volume	Bottle Type	Quantity	Filtration	Preservation	Appear Color	Turbidity & Sediment			Remarks
1235	40ml	VOA	3	No	14EL, 2 NO	Cles	39.1	Voc		
1.	40mm	VOA	3	Ve	14ch, 2 no		<u> </u>	Voc	8260	oc-51m (ve) 1
	SounL	HDPE	<u> </u>	YES)	HN03			(Di55	well the	
	500 ML	HOPE		NO	4403			total	models	FE,MA
	Small	02	1	NO	No	V		Anions (	C1. NO3	NO2,504 1
	11-	03	<u> </u>	NO.	No	<u> </u>	_	Alk	, ,	
V	500 ML	HOPE	1	No	Ha So4			< , Chie	(Amoria	NO HENSONE !
arameters		ith (instrument m		al number):	y51 (	yellow	cal	0.4/21		M HEAGINGE
		directed ble			A)IMP	Decon Equip	pment:	CA-AL -	-PIW	L 4
	Discharged V	Vater:	· · ·	~Side						

<b>o</b> co	NSULTIN	G		number	SPLIC	·			4001	>
ROUN	DWATER	SAMPLING	RECORD			WELL NUM	IBER: \coprod	12- <u>w</u> 1		Page: of
roiect Na	ame:	south?	Park	_		Project Nun	nber:	10011	6	
ate:	_912112		_					TOC):		2
		SM/CM				Casing Stick			<del></del>	
-	Point of We Interval (ft. T				<u>-</u> _	Total Depth		es):	<del></del>	
		TOC)						<u></u>		
asing Vo	lume	(ft Wate	er) x	(Lpfv	)(gp!) =	(L)(ga	·F)			
	lumes: 3/4"	= 0.02 gpf	2" = 0.16 gp	f 4"	= 0.65 apf	6" = 1.47	goţ		Sample Intake	Depth (fl TOC):
		0.09 Lpf 2*	= 0.62 Lpf	4" ==	2.46 Lpf	6" = 5.56 L	pf			
URGIN	G MEASU	Typical								<del></del>
Criteria		0.1-0.5 Lpm	Stable	na	± 3%	± 10%	± 0.1	± 10 mV	± 10%	<u>-</u>
Time	Cumul. Volume	Purge Rate	Water Level	Temp.	Specific Conductance	Dissolved Oxygen	ρН	ORP	Turbidity	Comments
	(gal or L)	(gpm or Lpm)	(ft)	(°C)	(µS/cm)	(mg/L)		(mv)	(NTU)	
1028		0.3	ļ ———			110				Sturt
1033			10.68	12.9	437	2.49	6.64	-0.2	Derane	
1034			10.69		397	1.85	6.59	-12.1		· · · · · · · · · · · · · · · · · · ·
1043			10.68	1219	387.1	1,89	6.57	-27.8		
1048				13,0	385.5	1.96	656	-36.0		
1053				12,9	385/10	2.01	6,56	42,3		
1058				13.0	38514	2.04	6,56	-46,5		
1103				1219	3867	2,00	6,56	-50,2	82,3	Suple
,, , ,										0.0
						<del></del>				
									<del></del>	
	D					Tatal Casina	Valumos	Pamouod:		
tai Galloi	ns Purged: _					Total Casing	volumes F	iemoved:		-
ding Wa	er Level (ft T	OC):				Ending Total	Depth (ft T	OC):		
AMPLE	INVENTO	RY								
Time	Volume	Bottle Type	Quantity	Filtration	Preservation	Appear			Re	emarks
[						Color	Turbidity & Sediment			ornarko
110	40ml	VOA	3	W.	Ther, 2 no			VOC	82600	c.
	40mr	VOA	3	No	14ch,2 no			Voc		-5/m (ve)
1	SoonL	HOPE	}	YES)	HN03			(Di55	wer Meto	LG NA, K, EA, MY, FE
	500 ML	HOPE		Vo	H403		-	total	Madd 5	FEIMA /
	Small	70	1	100	100			Anims 1	SI NO3 IL	
+	11-	0.2		NO	No			Alk	-1, -U3/A	1
V	500 ML	HOPE		No	H2504				(Amoria)	
ТНОД	550 much	HOPE		ho	ZM acctule			SULFI	1 1 1	ND HELLSPILL
	managurad w	ith (instrument n	nodel & seria	al number):	1151	vello	()	cal o	4/2/13 A	hr.
		dicated bla			<del></del>	7			<del></del>	

Z-\Equipment.Field Forms\Groundwater Sampling Form.xisx

Observations/Comments:

Temp.   Comul.   Volume   (gal or L)   (gpm or Lpm)   (ft)   (*C)   (μS/cm)   (4.5)	Casing Stic Total Depth Casing Dian  (L)(gs 6" = 1.47 6" = 5.56 L  ± 10%  Dissolved Oxygen (mg/L)	ater Level (ff: kup (ff): h (ff TOC): meter (inche  7 gpf pf  ± 0.1  pH	± 10 mV  ORP  (mv)	9.80	Comments  Stat put
pled by: SM / CM   Series   Se	Starting Walcasing Stior  Casing Dian  Casing Dian  (L)(ga 6" = 1.47 6" = 5.56 L  ± 10%  Dissolved Oxygen (mg/L)  O (1.97)  O (1.97)  O (1.97)  O (1.97)	ater Level (ff: kup (ff): h (ff TOC): meter (inche  7 gpf pf  ± 0.1  pH	± 10 mV  ORP  (mv)	Sample Int ± 10%  Turbidity (NTU)	cake Depth (ft TOC):
suring Point of Well: seened Interval (ft. TOC) r Pack Interval (ft. T	Total Depth Casing Dian  (L)(ga 6" = 1.47 6" = 5.56 L  ± 10%  Dissolved Oxygen (mg/L)  O 1.06  S 0.97  O 1.95  J 0.75	t(ft TOC): meter (inche) 7 gpf pf  ± 0.1 pH	± 10 mV ORP (mv)	Sample Int ± 10%  Turbidity (NTU)	Comments
rened Interval (ft. TOC) r Pack Interval (f	Casing Diam  (L)(ga 6" = 1.47 6" = 5.56 L  ± 10%  Dissolved Oxygen (mg/L)  O 0.95  O 0.97	t 0.1  pH  (0.47)	± 10 mV ORP (mv)	Sample Int ± 10%  Turbidity (NTU)	Comments
r Pack Interval (ft. TOC)  ring Volumeς 2	t 10%  c Dissolved Oxygen (mg/L)  1 (0)  1 (0)  2 (1)  3 (1)  4 (1)  5 (1)  6" = 5.56 L	1) 7 gpf pf ± 0.1 pH 0.47 (0.40) (0.5)	± 10 mV ORP (mv) 47 0	± 10% Turbidity (NTU)	Comments
ing Volumeς 2	6" = 1.47 6" = 5.56 L ± 10% Dissolved Oxygen (mg/L) O 1.05 O 0.95 O 0.95	* 0.1 pH 0.47 (0.40 (0.5)	± 10 mV ORP (mv) 470	± 10% Turbidity (NTU)	Comments
Topical   Temp.   Comul.   Volume   (gal or L)   (gpm or Lpm)   (ft)   (*C)   (μS/cm)   (μS/c	6" = 1.47 6" = 5.56 L ± 10% Dissolved Oxygen (mg/L) O 1.05 O 0.95 O 0.95	* 0.1 pH 0.47 (0.40 (0.5)	± 10 mV ORP (mv) 470	± 10% Turbidity (NTU)	Comments
3/4*= 0.09 Lpf 2" = 0.62 Lpf 4" = 2.46 Lpf  RGING MEASUREMENTS  Typical 0.1-0.5 Lpm Stable na ± 3%  Typical 0.1-0.5 Lpm Water Level (gal or L) (gpm or Lpm) (ft) (°C) (μS/cm)  (γC) (μS/cm)  (γC) (μS/cm)  (γC) (γC) (μS/cm)  (γC) (γC) (γC) (γC)  (γC) (γC) (γC)  (γC) (γC) (γC) (γC)  (γC) (γC) (γC)	± 10% Dissolved Oxygen (mg/L)  O 1,05 S 0,97 O 0,95 3 1,07	±0.1 pH 0.47 (0.40 (0.5)	± 10 mV ORP (mv) 470	± 10% Turbidity (NTU)	Comments
Typical   0.1-0.5 Lpm   Stable   na	Dissolved Oxygen (mg/L)  0 1,05 5 0,97 0 0,95 3 1,07	рН (0,47) (0,40) (0,5)	ORP (mv) 470	Turbidity (NTU)	
me Cumul. Volume (gal or L) (gpm or Lpm) (ht) (°C) Specific Conductal (µS/cm)  45	Dissolved Oxygen (mg/L)  0 1,05 5 0,97 0 0,95 3 1,07	рН (0,47) (0,40) (0,5)	ORP (mv) 470	Turbidity (NTU)	
Cumul.   Purge Rate   Water   Level   (°C)   Conductar (μS/cm)	0 1,05 5 0,97 0 1,05	0.47 (0.40 (0.51	(mv) 470	(NTU)	
Volume (gal or L) (gpm or Lpm) (ft) (°C) (μS/om)  (1/10  45  9,96   1/1 485,0  9,93   1/1 487,0  9,96   1/1 486,0  9,98   1/1 490,0	(mg/L) (m	(0,40) (0,51	470	(NTU)	Start pux
140 45 3 9,90 111 485,0 50 9,93 111 486,0 55 9,93 111 487,0 60 9,90 111 486,0 65 9,98 11,1 490,0	0 1,05 5 0,97 0 0,95 3 1,02	(0,40) (0,51		0(1-1-1)	Start pux
45 .3 9.96 11.1 485.0 50 9.93 11.1 486. 55 9.93 11.1 487. 50 9.96 11.1 486. 9.98 11.1 490.	S 0,97 0 0,95 3 1,07	(0,40) (0,51		OLF SIZ	
50 9,93 II.I 486, 55 9,93 II.I 487, 50 9,96 II.I 486, 05 9,98 II.I 490,	S 0,97 0 0,95 3 1,07	(0,40) (0,51		C ( ): -3/4	,
9,93 (L) 487, 00 9,90 (L) 486, 05 9,98 (L) 490,	0 <i>0,9</i> 5 3 1.07	10.51	265		
9,96 II.1 486, 05 9.98 II.1 490,	3 1.02		17,4-	<b>†</b>	
05 9.98 11,1 490,	9 1 1 1 1 1 1	6.51	12,3	<del> </del>	
		6,53	9,9		
989 11 1701	5/1/28	6.53	6,0	21.2	Samply
	) 11-0	DIVU	<u>Us )</u>		32000
		-	_		
		ļ	_		
Gallons Purged: 9 L	Total Casing	Volumes R	emoved:	73	_ <del>_</del>
	Ending Total	L Dooth /ft T	00%	·	
g Water Level (ft TOC):	Enong rotal	Deptin (it i	<del></del>		
PLE INVENTORY	Anno	10000			
ne Volume Bottle Type Quantity Filtration Preservation		Turbidity &			Remarks
	Color	Sediment			<del></del>
15 40ml VOA 3 WO THEW, 2 n	0		VOC	8261	
1 40mm VOA 3 De 1404,20	10		Voc		oc-SIM (ve)
SOUNL HOPE ) VES HNO3			Di55:	Well My	etals Mr. Kiza, My, FE
SOOML HOPE 1 NO HYO3			total	pedal	S FEIND 1
Small 05 100 NO			Anims (	1. NO3	
/ IL 03 1 PO. NO			AIK	7	7
500ml HDPE 1 NO HASOY	10			CAmoria	1
HOUS SOUTH HOPF 1 NO ISN acet			Do HALL	1 /	NO Headson
eters measured with (instrument model & serial number): 15 (	yellow	<u>Cal</u>	10 Carle	4/2	113 AM
g Equipment: parastaltic Dedicated Li	Decon Equi	pment:			
sal of Discharged Water: Drum on 5:4					
vations/Comments: Purque > 3 cuc vol	1.11.3				



SPL-6W-MW80-040213

GROUN	DWATER :	SAMPLING R	ECORD			WELL NUM	BER:/	nw-	80	Page:of
Project Na	me:515	uthfor	~			Project Num	ber: /	0016		
Date:	1/2/1	3				Starting Wat				
Developed	by:	3 3m	•			Casing Stick		. , o o <u>, </u>		—
		II:				Total Depth				_
		OC)				Casing Diam				
		гос)								
Casing Vol	lume	(ft Water	·) x	(Lpfv)	(gpf) =	(L)(gal	)			
	umes: 2" =	0.16 gpf 0.62 Lpf	4" = 0.65 gp	f 6'	' = 1.47 gpf				Sample Intake	Depth (ft TOC):
PURGIN		REMENTS	<u> </u>		0.00 201			_		
Time		Purge Rate	Water	Temp.	Specific	Dissolved	pН	Εh	Turbidity	Comments
	(gal or L)	(gpm or Lpm)	Level (ft)	(C or F)	Conductance (µS/cm)	Oxygen (mg/L)		ORP (mv)	(NTU)	
		95			(ролсті)	(IIIg/L)		(1114)	<u> </u>	
		K-	100	-	Bian	<i>i</i>				
		/ )	115	K	13100	/				
								_		
				$ \mathcal{M} $	D PON	2nto				
		-			Ü					
								<del> </del>		
		_								
		_								
		·								
Total Gallo	ns Purged:				_	Total Casing	Volumes	Removed:		
Endina Ma	to-Lovel (A.)	TOC).	•			Coding Total	Donth /ft	TOC):		
		ГОС):			<del></del>	Ending Total	Depth (it	100):	<del>_</del>	
	INVENTO				<u></u>					
Time	Volume	Bottle Type		Quantity	Filtration	Preservation	Appe	arance		Remarks
						250	Color	Turbidity & Sediment		
1130	40wh	DOA	C 7	3	No	ILICL			8260	C
	400	VOA		3	M	IHCL			42601	- Sim
1130	4000	VUA		_		Inch	/		1000	71.
метног	os									
	Equipment an	nd IDs:								
' '		DACACI	41:73	no. Ih	Dinh	Docca Ecui	inmont:			
Purging Ed		¥	WILLIG ( )	1 4/12/13	, - , , ,	Decon ∈qui	hueut _			
Disposal of	f Discharged	Water:			1 1 1		<u> </u>		<u> </u>	
Observation	ns/Comment	s: Rins	e Bla	W W	1100 <	voplee	d 1	1 (20	ter	
25	.1.		1 1 . 4	1	-	- 6 - 0		,		
1 5 6	017	6 6 5	1145 m =	·/~> · · ·						

GROUN	DWATER	SAMPLING	RECORD			WELL NUM	BER: M	$\Delta W-3$	2	Page: / of /
Project Na	ame;	South'	Park			Project Nun	nber:	10011	6	
Date:	4/1/18	_				Starting Wa	ter Level (f	t TOC): /(		
Sampled I	ру:	SM/CW				Casing Stic				
	Point of We					Total Depth				
	interval (ft. 1 cinterval (ft	TOC)				Casing Diar	meter (inche	es):	<del></del> -	
		(ft Wate		// ofv	\(ant\) =	(1.)(02	I)			
		= 0.02 gpf							Sample intake	Depth (ft TOC):
		0.09 Lpf 2,	-		2.46 Lpf					
URGIN	G MEASL	JREMENTS			104	-\0%	0.1	LORIV		-
Criteria:		Typical . 0.1-0.5 Lpm	Stable	Ona S	± 3%	± 10%	± 0.1	± 10 mV	± 10%	
Time	Cumul.	Purge Rate	Water	Temp.	Specific	Dissolved	pH	ORP	Turbidity	Comments
	Valume (gal or L)	(gpm or Lpm)	Level (ft)	(°C)	Conductance (µS/cm)	Oxygen (mg/L)	["	(mv)	(NTU)	Optimite 11/2
11:40		\			120,011	1				Stut
11195		0.25	10.34	12.8	1253	1,54	क्ता	-314	CLEAR	
11:50			10.34		1216	1,20	677		_	<del></del>
11:50			10.42		1262	1,23		-821	_	
1200		1	10,43		1290	1.61	6,70			
1205			10A2		1303	2.07	6.70			
			10.42		1319	2,45	_	· · · · · · · · · · · · · · · · · · ·		
<u> 1210  </u>			10.42		1323	2.72		-95,4	<del>-}-</del> -	
1215		<del> </del>	10.42		1323	281	0 1,	50.T	-	
1220			<del>+</del>	130	1329	3.01			-1	
1225			10,42	130	1254	3.0.	616	-97.7	200	
$\longrightarrow$		<del></del>	<del> </del>			<del> </del>				
		<u> </u>				1.11				
3,07						1.11				
										· · · · · · · · · · · · · · · · · · ·
$\longrightarrow$										···
										<u> </u>
tal Gallor	s Purged: _	♠ ∂.	50			Total Casing	Volumes F	Removed:		
dina Wat	er Level (ft 7	TOC):	)			Ending Total	Deoth (ft T	OCI:		
	INVENTO									
Time	Volume	Bottle Type	Quantity	Filtration	Preservation	Appear	ance			
						Colar	Turbidity &		Ren	marks
	110 1	JAA	3	<u>ا</u> ناه	الد. ٥		Sediment	100	801-	
	40nb	VOA	3	No 1	THEL, 2 no	yellow	-	<u>Voc</u>	\$260c	·
	40mr	VOA	<u>~</u>	W I W	14ch, 2 us			You	VA	Na, K, Ca, My, FE
<del></del>	Sound	HOPE		XFX	HN0-3			W1551	well Meta	15 mm
	500 ML	HOPE		NO	H403			total	pudal 5	FE, MAY
_	Small	02	- 1	NO				Anions (	21, NO3, N	7
-3//	اسا	0.3	1	NO.	No	V		AK	77	/ /
ETHON	500 ML	HOPE		No 1	Ha So4			SULILE	(Amoria) V	1 NO Heatsone
		ith (instrument r	nadal g serie			vellow	Ca	11 60	4/1/12	9:30 Ar
	_	ed cated	fa		7- (	Decon Equit	}	11	11 ( ) _	1.30 4
-1 F 1										

		SAMPLING						VM-3		Page: of
Project N	lame:	South	Parl	<u></u>		Project Nun	nber:	10011	6	
Date:	911115	Sm/cw				Starting Wa	ater Level (I	1 TOC):	10.50	
Measurin	ig Point of We	9/1/ / C //				Casing Stic		25	<u></u>	<del></del>
Screened	Interval (ft. 1	roc)				Casing Diar				
		TOC)							<del></del>	
		(ft Wate								
iCasing vi		= 0.02 gpf 0.09 Lpf 2"							Sample Inta	ake Depth (ft TOC):
PURGI		IREMENTS	<u> </u>			2				
Criteria		Typical	Stable	-0-5 na	±3%	± 10%	± 0.1	± 10 mV	± 10%	
	Cumul.	0.1-0.5 Lpm Purge Rate	Water	Temp.	Specific	Dissolved	pH	ORP		
Time	Volume (gal or L)		Level (ft)	(°C)	Conductance	Oxygen (mg/L)	pri	(mv)	Turbidity	Comments
245	- (ga: 61 L)	(gpin or Epin)	119	(0)	(µS/cm)	(ITIG/L)	- TOTAL EDWARD NAME	* ************************************	(NTU)	Sterin Bun
1350		0,3	10.53	14.7	1550	2,69	0.75	-909	clere	- Company
355	_	1	10,5		1550		675		7	<del></del>
1405			10.52		1549	3,09	-			
1410	1	1 1	16.53		1537			200		
1415	·	1/2	10,53		15210		6.75	101.4	6.59	
7 -		V	1	( '10-			1 1 1 1 1 1 1		- 1// - 1//	
14:50			,,,,,			253				
•										
			_ ,							
otal Gallo	ns Purged: _	~ 2	≤a			Total Casing	Volumes F	Removed: _		
ndina Wa	ter Level (ft T	OC):	2			Ending Total	Denth (ft T	OC).		
	INVENTO					<u> </u>	*			
Time	Volume	Bottle Type	Quantity	Filtration	Preservation	Appear	апсе			1
						Color	Turbidity &		f	Remarks
A:20	40 nL	VoA	3	No	14EL,2 NO	<del></del> _	Sediment	Upc	8260	
1	40mm	VOA	3	Vn	14ch, 2 us	7 5 11051 57 -		1100		c-SIM (ve
	SounL	HOPE	7	VES!	HNO3	,		(1):5a	241	Tale Na, K, Ea, M.
	500 ML	HOPE	1	VO	H403			+777	madels	<del>~~~</del>
	Small	07		NO	100	-		A: 24 6	CI, NO3,	FEIMA SAI
1/	11-	773	1	Pol	No	1 +		Alle	V1, ~ U3/	NO21 304
_ V	STOME	HOPE	\	No	H2504			NH3	(Amoria)	
-	S 500 KAL	HDPF		No 1	ZN acetive	/ 1.	<del></del>	Sultid	100	NO Heads
		th (instrument m	٠ 6	١ . ٢	.7	(xellow		(24/1		1:304-
ırging Equ	ipment: _	or: <talt.il< td=""><td>Bosco</td><td>Aic colal</td><td>trp 43</td><td>Decon Equip</td><td>iment:</td><td>Alcomo</td><td>1<u>arx</u></td><td>H 20</td></talt.il<>	Bosco	Aic colal	trp 43	Decon Equip	iment:	Alcomo	1 <u>arx</u>	H 20
sposal of	Discharged W	Vater: Pr	un a	12 - y	<u>ر</u>		0	. s. s.		
	- (Camana - t-	NOW	ni an	[ Level	, )	installe	A Las	liter;	Sal. Hal	albing in w

SA:	NSULTIN	G	-	Sample number	SPL-	JW-1	MW	35-	04011	.3
GROUN	IDWATER	SAMPLING F	RECORD	,		WELL NUM	IBER: W	W-25	-	Page: 1 of/
Date: Sampled to Measuring Screened	by: Point of We Interval (ft. T	SM/CM				Project Num Starting We Casing Stic Total Depth Casing Diar	ater Level (f kup (ft): (ft TOC):		6 13,40	
Casing Vo	lume lumes: 3/4":= 0	(ft Wate ≈ 0.02 gpf 2 0.09 Lpf 2*	r) x 2" = 0.16 gp	(Lpfv	≈ 0.65 gpf	6" = 1.47	gpf		Sample Inta	ake Depth (ft TOC):
PURGIN	G MEASU	Typical		-0.5	1070					
Criteria:	<u> </u>	0.1-0.5 Lpm	Stable	na	± 3%	± 10%	± 0.1	± 10 mV	± 10%	
Time	Cumul. Volume (gal or L)	Purge Rate (gpm of Lpm)	Water Level (ft)	Temp.	Specific Conductance (µS/cm)	Dissolved Oxygen (mg/L)	рН	ORP (m̂v)	Turbidity (NTU)	Comments
15:15		24/0	(3 40	1-5 (		3	(207	25-00-1	CLEAR	Start
15:25 15:30		0.150			502.3		6.97	-37.1	Chark	
15:35	L		13,40	14.0	350,0	2.78	6.78	-414	<del> </del>	
15:40			13.40	14.5	304.2	2.00	6.79	44,4		
15'45			13110	14.6	294.3		677	-422	<del></del>	
15:50				14,5	291.6		6.78	75	1-1-1	
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Tìme	Volume	Bottle Type	Quantity	Filtration	Preservation	Appear	апсе			
			[		ļ	Color	Turbiolity & Sediment			Remarks
1600	40ml	VoA	3	Wo	They 2 no			Voc	8260	oc (Berrowe) T
	40mr	VOA	3	Va	14ch, 2 us			Voc	8260	oc-SIM (ve) +
	SiranL	HDPE	] (	YES)	HN03			(Di55	due Che	tals ma K, Ea, My, FE+
4	500 ML	HOPE		NO	4403			total	Midds	FEIMA +
	Small	02	- 1	NO	No			Anions	CL, NO3,	NO2,504 +
	500 ML	HOPE	- 1	MO!	NO 1		,	AK	(Amoria	<del>,</del>
1ETHODS		HOPTOS		No	SN acetate			Sollin	e	ND Heatsmert
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bservations	s/Comments;	Collecte	d Fiel	Dug	D: SPL	-Gw	-mw	60-02	10113 (	7630)
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## **South Park Landfill**

# **April 2013 Interim Site-wide Groundwater Monitoring Results**

# **Appendix B Laboratory Analytical Results**

April 17, 2013

Stephen.Bentsen Floyd Snider 601 Union Street, Suite 600 Seattle, WA 98101-2341

RE: Project: South Park Landfill

ARI Job No: WJ94

Dear Stephen:

Please find enclosed analytical results and chain of custody documentation (COC) for the project referenced above. Analytical Resources, Incorporated (ARI) accepted four water samples and two trip blanks on April 1, 2013. The samples were in good condition with no discrepancies in paperwork.

The samples were analyzed for VOCs, SIM VOCs, Total and Dissolved Metals, Alkalinity, Nitrate, Nitrite, Chloride, Sulfate, Sulfide, as requested on the COC.

The total metals method blank contained manganese. All associated samples contained greater then ten times the concentration found in the method blank, therefore no further corrective action was taken.

No other analytical complications were noted for these analyses. Quality control results are included for your review.

A copy of the reports and all associated raw data will remain on file with ARI. If you have any questions or require additional information, please contact me at your convenience.

Sincerely,

ANALYTACAL RESOURCES, INC.

Kelly/Bottem

Client Services Manager kellyb@arilabs.com

206-695-6211

Enclosures

cc: eFile WJ94

KB/kb

Chain of Custody Record & Laboratory Analysis Request

ARI Assigned Number: 1377	Turn-around Standard	Turn-around Requested: Standard			Page:	-	of 1	NAME OF THE OWNER OWNER OF THE OWNER OWNE				Analytic Analytic	Analytical Resources, Incorporated Analytical Chemists and Consultants
ARI Client Company'Aspect Consulting	sulting	Phone: 2(	206.780.77	719	Date: 7	Date: 4 [1] 13	loe Present?	7 6				4611 Sou Tukwila,	4611 South 134th Place, Suite 100 Tukwila, WA 98168
Client Contact: John Strunk	2		ί.		No. of Coolers:	رخ	Cooler Temps:	6'9' A'1	6.7			206-695	206-695-6200 206-695-6201 (fax)
Client Project Name: South Dark I andfill	k I andfill						A	Analysis Requested	quested		i		Notes/Comments
					əuəl				00	'ә			*For 8260C please provide report for
Client Project #: 100116	Samplers:	Samplers: Seann	10,01	K	riteorolik	өр	Mg, Fe		ulfate, ite	tenoche:		9560C	only the analyses listed. Inowever prease rido dilutions and archive chromatographs for the full suite of analytes so
Sample ID	Date	Time	Matrix	No. Containers	VOC by 826 Cis-1,2 - did Trichloroeth *See Note	VOCs by 8	Dissolved 60108 Mn	Total Meta 80103 "Fe, Mn	Major Anio Chloride, S Nitrate, Nitr	Major Ani SM 2320B Bicarbonate	Ceneral C SM 4500 Ammonia,	Benzane (as part of	additional analytes may be analyzed later if requested.
SPL-6-4-MW32-040113 4/1/13	1/1/13	1230	Has	<i>خ(</i>	X	×	X	X	X	X	×		
SPL-GW-MM33-69013 4/1/13	3 4/1/13	1420	Hao	7	×	×	×	×	×	×	×		
SPL-6W- MW25-04013	1	1600		7	メ	メ	Х	メ	X	メ	X	X	
SPL-GW-MW60-040113	3	1630	7	7	メ	X	X	K	X	Х	X	X	
Trib Blank	41113			G	メ	X							
TripBlank	41,113		ب	๙	×	X							
	Marine de la Ano								111				
					1								
Comments/Special Instructions	Relinquished by	Ž		Received by:				Relinquished by:				Received by:	
	(Signature)	2		(Signature)			٦	(Signature)				(Signature)	
Notice of the state of the stat	Printed Name:	Seann Mccha	702X	Printed Name:	212	to	med 2	Printed Name:				Printed Name:	
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said services. The acceptance by the client of a proposal for services by ARI release ARI from any liability in excess thereof, not withstanding any provision to the contrary in any contract, purchase order or co-Limits of Llability: ARI will perform all requested services in accordance with appropriate methodology following ARI Standard Operating Procedures and the ARI Quality Assurance Program. This program meets standards for the industry. The total liability of ARI, its officers, agents, employees, or successors, arising out of or in connection with the requested services, shall not exceed the invoiced amount for signed agreement between ARI and the Cllent.

Date & Time

Date & Time:

Aigh

spectone, 143

Date & Time: L/L 1- 3

Sample Retention Policy: All samples submitted to ARI will be appropriately discarded no sooner than 90 days after receipt or 60 days after submission of hardcopy data, whichever is longer, unless alternate retention schedules have been established by work-order or contract.

wjou:oogoc



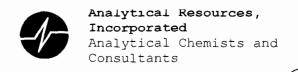
# Cooler Receipt Form

	Large → "lg"		
	Peabubbles → "pb"		
Small Air Bubbles Peabubbles LARGE Air Bubbles 2-4 mm > 4 mm	Small → "sm"		
By: JM Date: 4/2/13			
Samples Mw37 + Mw33 in cooler Samples Mw37 + Mw33 in cooler Samples Mw25 + Mw60 in Cooler	er with try Blank#	7.	
Additional Notes, Discrepancies, & Resolutions:	with Tris Blank #1	i	
Sample ID on Bottle Sample ID on COC	Sample ID on Bottle	Sample ID on COC	;
	er of discrepancies or concerns **		
Samples Logged by: Date		928	
Was Sample Split by ARI: YES Date/Time:	Equipment:	Split by:	
Date VOC Trip Blank was made at ARI		NA <u>J/L//</u>	1 ,
Was sufficient amount of sample sent in each bottle?		YES 3/15/	, NO
Were all VOC vials free of air bubbles?		NA CES	NO
Do any of the analyses (bottles) require preservation? (attach pre		NA ŒS	NO
Were all bottles used correct for the requested analyses?			NO
Did all bottle labels and tags agree with custody papers?		₩ <del>E</del> 8	NO
Did the number of containers listed on COC match with the numb		(YES)	NO
Were all bottle labels complete and legible?		YES	NO
Did all bottles arrive in good condition (unbroken)?		(FES)	NO
Were all bottles sealed in individual plastic bags?		YES	(NO)
Was sufficient ice used (if appropriate)?		NA VEST	(NO)
What kind of packing material was used? Bubble Wrap	1		
Was a temperature blank included in the cooler?		YES	
Log-In Phase:			<b>.</b>
<u></u>	and attach all shipping documents		
Cooler Accepted by:	Date: 4-1-7 Time:	1120	
If cooler temperature is out of compliance fill out form 00070F		Temp Gun ID#: 968	7153
Temperature of Cooler(s) (°C) (recommended 2.0-6.0 °C for chem	mistry) [[16 4.1]	6:7	
Were custody papers properly filled out (ink, signed, etc.)	, ,	KES	NO
Were custody papers included with the cooler?		(YES)	NO
Were intact, properly signed and dated custody seals attached to		YES Kro	(NO)
Preliminary Examination Phase:	# (-)   (1)     0	V/50	C.
Assigned ARI Job No:	Tracking No:		_(NA)
COC No(s):	Delivered by: Fed-Ex UPS Courie		
_	,		
ARI Client: A Spect	Project Name:	· Park Landfi	1

0016F 3/2/10 Cooler Receipt Form

Revision 014

EGGGG: HETH



# Cooler Temperature Compliance Form

Cooler#:		rature(°C):			
	Tempe	rature(°C): [(	6.3		
Sample ID		<b>Bottle Count</b>	Bottle Type		
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Samples	reamen				
46	ove te				
			<u> </u>		
		10.0			
Cooler#:	Tempe	rature(°C): Bottle Count			
Sample ID		Bottle Count	Bottle Type		
			<u> </u>		
· <del></del>					
Cooler#:		4(°C).			-
Sample ID	rempe	rature(°C): Bottle Count	Dottle Type		
Sample ID		Bottle Count	Bottle Type		
	······································				
			<del>                                     </del>		
	<del></del>		<del> </del>		
			_		
Cooler#:	Tempe	rature(°C):			
Sample ID	С	rature(°C): Bottle Count	Bottle Type		
					_
	11				
Completed by:	15	Date	4.1-13	Time: 1725	

00070F

Cooler Temperature Compliance Form

Version 000 3/3/09

WISH: DOOD!

### ): : - 6KXWK 3DUN / DQGIIIQ

Subject: FW: WJ94-South Park Landfill

From: "Jeremy M. Shaha" < jshaha@aspectconsulting.com>

**Date:** 4/2/2013 1:47 PM

To: Mark Harris <markh@arilabs.com>

CC: John Strunk <jstrunk@aspectconsulting.com>, Seann McClure

<smcclure@aspectconsulting.com>

Hi Mark,

A slight modification to the COC for the South Park Landfill project. We would also like to report benzene for the trip blank (Trip Blank #2) in the cooler with SPL-GW-MW25-040113 and SPL-GW-MW60-040113. Please see the attached COC.

Let us know if you have questions.

Thanks, Jeremy

Jeremy Shaha, LHG | Project Hydrogeologist | Direct: 206.780.7718 | Cell: 206.612.6420

Aspect Consulting LLC | 350 Madison Avenue N, Bainbridge Island, 98110 | www.aspectconsulting.com<a href="http://www.aspectconsulting.com/">www.aspectconsulting.com</a> Bainbridge Island - Seattle - Wenatchee - Yakima

This email is intended solely for the addressee(s) and may contain confidential or legally privileged information. If you are not the intended recipient, please immediately alert the sender by reply email and delete this message and any attachments without storing, copying, distributing, or using the contents.

----Original Message----

From: John Strunk

Sent: Tuesday, April 02, 2013 10:57 AM

To: Jeremy M. Shaha

Subject: FW: WJ94-South Park Landfill

Jeremy -

FYI....I contacted Seann regarding the temperature issue. Please check the COCs and make sure all analytes are accounted for.

Thanks -

John Strunk | Aspect Consulting, LLC | Senior Associate | Direct: 206.780.7719

RI UT94:0005 36

# Chain of Custody Record & Laboratory Analysis Request

ARI Assigned Number: Test Turn-around Requested:	Turn-around Standard	Requested:			Page:		5					Analytic	af Resource	Analytical Resources, Incorporated Analytical Chemists and Consultante
ARI Client Company, Aspect Consulting	suffing	Phone: 2(	206.780.7719	719	7:eyec	Date: 4-[1] 13	loe Present?	7				4611 So. Tukwila,	4611 South 134th Pi Tukwila, WA 98168	4611 South 134th Place, Suite 100 Tukwila, WA 98168
Clent Contact: John Strunk					Coolens:	رلم	Cooler Temps:	146,63	6.0			206-695	-6200 206-	206-695-6200 206-695-6201 (fax)
Client Project Name: South Park Landfill	Landfill						4	Analysis Requested	dinested				Notes	Notes/Comments
Client Project #: 100116	Samplers: Separat	Kane	PLCC/L	¥	echaritecnoti	0	94.8¢		98(6,	,elismoda		41.44	"For 8250C please only the analytes ndo dilutions and for the full suite o	For \$250C please provide report for only the analytes listed. However please do dilutions and auchive chromatograph for the full suffic of analytes to
Sample ID	Date	Time	Matrix	No. Containers	VOC by 8280 Cis.1,2 - did Trichioroeby See Note	Vinyl Chlond	Dissolved M 60108 Mn	Total Melata 60103 Fe, Mn	Major Anton Chiodde, Su Mitrale, Mitris	Major Anios SM 23208 Alkalinily, Ca Bicarbonate	Generial Ch 9M 4500 Ammonia, 5	enezne8 8 to heg sa)	edditional analys later if requested	additional analytes may be enalyzed later if requesited.
SPLEW-MW33-04013 4//13	4/1/13	1330	Och	13	×	メ	X	X	X	X	×			
SPL-G-WM33-69013 9/1/13	19/1/13	0641	Hao	12	×	×	×	×	×	×	×			
SPL-GW- MW75-04013		0091		13	メ	メ	メ	メ	メ	メ	メ	メ		
SPL-642-MW60-040113	ب	1630	-	12	メ	X	メ	Х	X	Х	X	X		
Trib Slark #4	41.113			C	メ	メ		,	-				>) 8 8	w/ 1816232
1 rio Blank#2	41,113		ب	۲	X	イ						X	Cooler	18/w 60
SMS	13					,							JMI54	12/13
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Comments/Special Instructions	Refinquished by	8		Received by:			Ī	Refinquished by:	¥.			Received by:		
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	Company:	Kactoo61	06JA3	Company: /	Aret			Company:				Company:		
	Deste Forme	3.30		Date & Time:	1-1-3	2	026	Date & Time:		·		Date & Time;		

meets standards for the industry. The total liability of ARI, its officers, agents, employees, or successors, arising out of or in connection with the requested services, shall not exceed the Invoiced amount for said services. The acceptance by the client of a proposal for services by ARI release ARI from any flability in excees thereof, not withstanding any provision to the contrary in any contract, purphase order or co-Limits of Liability: ARI will perform all requested services in accordance with appropriate methodology following ARI Standard Operating Procedures and the ARI Quality Assurance Program. This program signed agreement between ARI and the Client. Sample Retention Policy: All samples submitted to ARI will be appropriately discarded no sooner than 90 days after receipt or 60 days after submission of hardcopy data, whichever is longer, unless alternate retention schedules have been established by work-order or contract.

PRESERVATION VERIFICATION 04/02/13

1 of 1 Page

Analysis Requested: 04/02/13 Contact: Strunk, John Inquiry Number: NONE

Client: Aspect Consulting

Logged by: JM Sample Set Used: Yes-481 Validatable Package: No

Deliverables:

ARI Job No: WJ94

ANALYTICAL RESOURCES INCORPORATED

PC: Mark VTSR: 04/01/13

Project #: 100116 Project: South Park Landfill Sample Site: SDG No:

Analytical Protocol: In-house

LOGNUM ARI ID	CLIENT ID	CN >12	WAD >12	NH3	COD <2	F0G	MET 1	PHEN P	PHOS 7	TKN NO23	1023	TOC 8	S2   TP   >9   <	TPHD Fe2+ DMET DOC <2 <2 FLT FLT	+ DMET		PARAMETER	ADJUSTE TO	ADJUSTED LOT TO NUMBER	AMOUNT	DATE/BY
13-6927 <b>wJ94A</b>	SPL-GW-MW32-040113			4			43					-	),				- 5	215		NOH GN	4.2-17
13-6928 <b>wJ94B</b>	SPL-GW-MW33-040113			$\rightarrow$			TOT					i.sh	//						-		
13-6929 <b>WJ94C</b>	SPL-GW-MW25-040113			9			TOT	-				4	4								
13-6930 <b>WJ94D</b>	SPL-GW-MW60-040113			<u> </u>			EQ.				_		7						>		
13-6933 <b>wJ94G</b>	SPL-GW-MW32-040113						<b>A</b> s				,				Y						
13-6934 <b>wJ94</b> H	SPL-GW-MW33-040113						es de								Y						
13-6935 <b>WJ94I</b>	SPL-GW-MW25-040113						S S								Y						
13-6936 <b>w394J</b>	SPL-GW-MW60-040113						S S								×						
			-									25	o)	-3-1	Dre	Deri	S2 only preserved with 2note.	W.	S	0.40	
														$\supset$							

Checked By  $\sqrt{W}$  Date q

WISH: 00007

### Sample ID Cross Reference Report



ARI Job No: WJ94
Client: Aspect Consulting
Project Event: 100116

Project Name: South Park Landfill

	Sample ID	ARI Lab ID	ARI LIMS ID	Matrix	Sample Date/Time	VTSR
1.	SPL-GW-MW32-040113	WJ94A	13-6927	Water	04/01/13 12:30	04/01/13 17:20
2.	SPL-GW-MW33-040113	WJ94B	13-6928	Water	04/01/13 14:20	04/01/13 17:20
3.	SPL-GW-MW25-040113	WJ94C	13-6929	Water	04/01/13 16:00	04/01/13 17:20
4.	SPL-GW-MW60-040113	WJ94D	13-6930	Water	04/01/13 16:30	04/01/13 17:20
5.	Trip Blank 1	WJ94E	13-6931	Water	04/01/13	04/01/13 17:20
6.	Trip Blank 2	WJ94F	13-6932	Water	04/01/13	04/01/13 17:20
7.	SPL-GW-MW32-040113	WJ94G	13-6933	Water	04/01/13 12:30	04/01/13 17:20
8.	SPL-GW-MW33-040113	<b>W</b> J94H	13-6934	Water	04/01/13 14:20	04/01/13 17:20
9.	SPL-GW-MW25-040113	<b>W</b> J94I	13-6935	Water	04/01/13 16:00	04/01/13 17:20
10.	SPL-GW-MW60-040113	WJ94J	13-6936	Water	04/01/13 16:30	04/01/13 17:20

Printed 04/02/13 Page 1 of 1



Volatiles by Purge & Trap GC/MS-Method SW8260C Sam

Page 1 of 1 SAMPLE

Lab Sample ID: WJ94A LIMS ID: 13-6927

Matrix: Water

Data Release Authorized: 18

Instrument/Analyst: NT2/JZ

Date Analyzed: 04/06/13 03:25

Reported: 04/10/13

d: *JB* 

100116 Date Sampled: 04/01/13 Date Received: 04/01/13

> Sample Amount: 10.0 mL Purge Volume: 10.0 mL

QC Report No: WJ94-Aspect Consulting

Project: South Park Landfill

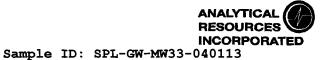
CAS Number	Analyte	LOQ	Result	Q
156-59-2	cis-1,2-Dichloroethene	0.20	1.5	_
79-01-6	Trichloroethene	0.20	< 0.20	U

Reported in µg/L (ppb)

### Volatile Surrogate Recovery

d4-1,2-Dichloroethane	104%
d8-Toluene	98.0%
Bromofluorobenzene	98.0%
d4-1,2-Dichlorobenzene	104%

FORM I 4194:00009



Volatiles by Purge & Trap GC/MS-Method SW8260C

Page 1 of 1 SAMPLE

Lab Sample ID: WJ94B LIMS ID: 13-6928 Matrix: Water

Data Release Authorized: Reported: 04/10/13

Instrument/Analyst: NT2/JZ Date Analyzed: 04/06/13 03:51 QC Report No: WJ94-Aspect Consulting

Project: South Park Landfill

100116

Date Sampled: 04/01/13 Date Received: 04/01/13

Sample Amount: 10.0 mL Purge Volume: 10.0 mL

CAS Number	Analyte	LOQ	Result	Q
156-59-2 79-01-6	cis-1,2-Dichloroethene Trichloroethene	0.20	< 0.20 < 0.20	•

Reported in µg/L (ppb)

### Volatile Surrogate Recovery

d4-1,2-Dichloroethane	99.2%
d8-Toluene	99.5%
Bromofluorobenzene	95.0%
d4-1,2-Dichlorobenzene	101%

FORM I WISH: BOOLB



Volatiles by Purge & Trap GC/MS-Method SW8260C

Page 1 of 1

Lab Sample ID: WJ94C LIMS ID: 13-6929

Matrix: Water

Data Release Authorized:/ Reported: 04/10/13

Instrument/Analyst: NT2/JZ Date Analyzed: 04/06/13 04:18 QC Report No: WJ94-Aspect Consulting

Project: South Park Landfill

100116

Date Sampled: 04/01/13 Date Received: 04/01/13

Sample Amount: 10.0 mL Purge Volume: 10.0 mL

CAS Number	Analyte	roð	Result	ð
<b>156-59-2</b> 79-01-6	cis-1,2-Dichloroethene Trichloroethene	<b>0.20</b>	<b>0.72</b> < 0.20	
71-43-2	Benzene	0.20	0.43	U

Reported in  $\mu g/L$  (ppb)

### Volatile Surrogate Recovery

d4-1,2-Dichloroethane	102%
d8-Toluene	101%
Bromofluorobenzene	98.0%
d4-1,2-Dichlorobenzene	109%



Volatiles by Purge & Trap GC/MS-Method SW8260C

Page 1 of 1 SAMPLE

Lab Sample ID: WJ94D LIMS ID: 13-6930

Matrix: Water

Data Release Authorized:

Reported: 04/10/13

Instrument/Analyst: NT2/JZ
Date Analyzed: 04/06/13 04:45

QC Report No: WJ94-Aspect Consulting

Project: South Park Landfill

100116

Date Sampled: 04/01/13 Date Received: 04/01/13

Sample Amount: 10.0 mL Purge Volume: 10.0 mL

CAS Number	Analyte	LOQ	Result	Q
156-59-2	cis-1,2-Dichloroethene	0.20	0.80	
79-01-6	Trichloroethene	0.20	< 0.20	U
71-43-2	Benzene	0.20	0.40	

Reported in µg/L (ppb)

### Volatile Surrogate Recovery

d4-1,2-Dichloroethane	99.3%
d8-Toluene	98.5%
Bromofluorobenzene	95.4%
d4-1,2-Dichlorobenzene	106%

FORM I 1154:00012



Volatiles by Purge & Trap GC/MS-Method SW8260C

Sample ID: Trip Blank 1 Page 1 of 1 SAMPLE

Lab Sample ID: WJ94E LIMS ID: 13-6931

Matrix: Water

Data Release Authorized: Reported: 04/10/13

Instrument/Analyst: NT2/JZ Date Analyzed: 04/08/13 20:41

QC Report No: WJ94-Aspect Consulting Project: South Park Landfill

100116

Date Sampled: 04/01/13 Date Received: 04/01/13

Sample Amount: 10.0 mL Purge Volume: 10.0 mL

CAS Number	Analyte	LOQ	Result	Q
156-59-2	cis-1,2-Dichloroethene	0.20	< 0.20	_
79-01-6	Trichloroethene	0.20	< 0.20	

Reported in µg/L (ppb)

### Volatile Surrogate Recovery

d4-1,2-Dichloroethane	103%
d8-Toluene	99.7%
Bromofluorobenzene	93.6%
d4-1,2-Dichlorobenzene	109%



Volatiles by Purge & Trap GC/MS-Method SW8260C

Page 1 of 1

Sample ID: Trip Blank 2

SAMPLE

Lab Sample ID: WJ94F LIMS ID: 13-6932

Matrix: Water

Data Release Authorized:

Instrument/Analyst: NT2/JZ

Date Analyzed: 04/06/13 02:58

Reported: 04/10/13

QC Report No: WJ94-Aspect Consulting Project: South Park Landfill 100116

Date Sampled: 04/01/13 Date Received: 04/01/13

Sample Amount: 10.0 mL Purge Volume: 10.0 mL

CAS Number	Analyte	LOQ	Result	Q
156-59-2 79-01-6	cis-1,2-Dichloroethene Trichloroethene	0.20	< 0.20	Ŭ
71-43-2	Benzene	0.20	< 0.20	Ü

Reported in µg/L (ppb)

### Volatile Surrogate Recovery

d4-1,2-Dichloroethane	102%
d8-Toluene	96.8%
Bromofluorobenzene	97.5%
d4-1,2-Dichlorobenzene	101%

WISH: 0001H FORM I



Volatiles by Purge & Trap GC/MS-Method SW8260C Sample ID: MB-040513A

Page 1 of 1 METHOD BLANK

Lab Sample ID: MB-040513A

LIMS ID: 13-6929 Matrix: Water

Data Release Authorized:

Reported: 04/10/13

Instrument/Analyst: NT2/JZ Date Analyzed: 04/05/13 22:58 QC Report No: WJ94-Aspect Consulting

Project: South Park Landfill

100116

Date Sampled: NA Date Received: NA

Sample Amount: 10.0 mL Purge Volume: 10.0 mL

CAS Number	Analyte	LOQ	Result	Q
156-59-2 79-01-6	cis-1,2-Dichloroethene Trichloroethene	0.20 0.20	< 0.20	U U
71-43-2	Benzene	0.20	< 0.20	U

Reported in µg/L (ppb)

### Volatile Surrogate Recovery

d4-1,2-Dichloroethane	96.5%
d8-Toluene	96.2%
Bromofluorobenzene	93.0%
d4-1,2-Dichlorobenzene	103%



Volatiles by Purge & Trap GC/MS-Method SW8260C

Sample ID: MB-040813A Page 1 of 1 METHOD BLANK

Lab Sample ID: MB-040813A

LIMS ID: 13-6931 Matrix: Water

Data Release Authorized:

Reported: 04/10/13

Instrument/Analyst: NT2/JZ Date Analyzed: 04/08/13 17:35 QC Report No: WJ94-Aspect Consulting

Project: South Park Landfill

100116

Date Sampled: NA Date Received: NA

Sample Amount: 10.0 mL Purge Volume: 10.0 mL

CAS Number	CAS Number Analyte		Result	Q
156-59-2 79-01-6	cis-1,2-Dichloroethene Trichloroethene	0.20	< 0.20 < 0.20	U

Reported in µg/L (ppb)

### Volatile Surrogate Recovery

d4-1,2-Dichloroethane	101%
d8-Toluene	97.7%
Bromofluorobenzene	95.2%
d4-1,2-Dichlorobenzene	103%

### ANALYTICAL RESOURCES INCORPORATED

### VOA SURROGATE RECOVERY SUMMARY

QC Report No: WJ94-Aspect Consulting Project: South Park Landfill Matrix: Water

100116

ARI ID	Client ID	PV	DCE	TOL	BFB	DCB	TOT OUT
WJ94A	SPL-GW-MW32-040113	10	104%	98.0%	98.0%	104%	0
WJ94B	SPL-GW-MW33-040113	10	99.2%	99.5%	95.0%	101%	Ō
MB-040513A	Method Blank	10	96.5%	96.2%	93.0%	103%	0
LCS-040513A	Lab Control	10	95.2%	97.3%	97.9%	102%	0
LCSD-040513A	Lab Control Dup	10	93.3%	96.5%	102%	100%	0
WJ94C	SPL-GW-MW25-040113	10	102%	101%	98.0%	109%	0
WJ94D	SPL-GW-MW60-040113	10	99.3%	98.5%	95.4%	106%	0
MB-040813A	Method Blank	10	101%	97.7%	95.2%	103%	0
LCS-040813A	Lab Control	10	103%	98.6%	104%	103%	0
LCSD-040813A	Lab Control Dup	10	104%	100%	101%	99.9%	0
WJ94E	Trip Blank 1	10	103%	99.7%	93.6%	109%	0
<b>W</b> J94F	Trip Blank 2	10	102%	96.8%	97.5%	101%	0
		LCS	/MB LIM	ITS		QC LIMI	rs
SW8260C							
(DCE) = d4-1,	2-Dichloroethane		(80-120)	)		(80-130	))
(TOL) = d8-To	luene		(80-120	)		(80-120	0)
(BFB) = Bromo	fluorobenzene		(80-120	)		(80-120	))
(DCB) = d4-1,	2-Dichlorobenzene		(80-120	)		(80-120	0)

Prep Method: SW5030B Log Number Range: 13-6927 to 13-6932

WJ94:00017

### **ANALYTICAL RESOURCES INCORPORATED**

### ORGANICS ANALYSIS DATA SHEET

Volatiles by Purge & Trap GC/MS-Method SW8260C Sample ID: LCS-040513A

Page 1 of 1 LAB CONTROL SAMPLE

Lab Sample ID: LCS-040513A

LIMS ID: 13-6929 Matrix: Water

Data Release Authorized:

Reported: 04/10/13

Instrument/Analyst LCS: NT2/JZ

LCSD: NT2/JZ

Date Analyzed LCS: 04/05/13 21:37

LCSD: 04/05/13 22:31

QC Report No: WJ94-Aspect Consulting

Project: South Park Landfill

100116

Date Sampled: NA Date Received: NA

Sample Amount LCS: 10.0 mL

LCSD: 10.0 mL Purge Volume LCS: 10.0 mL

LCSD: 10.0 mL

Analyte	LCS	Spike Added-LC	LCS S Recovery	LCSD	Spike Added-LCSI	LCSD Recovery	RPD
cis-1,2-Dichloroethene	9.72	10.0	97.2%	9.67	10.0	96.7%	0.5%
Trichloroethene	9.18	10.0	91.8%	9.18	10.0	91.8%	0.0%
Benzene	9.53	10.0	95.3%	9.55	10.0	95.5%	0.2%

Reported in µg/L (ppb)

RPD calculated using sample concentrations per SW846.

### Volatile Surrogate Recovery

	LCS	LCSD
d4-1,2-Dichloroethane	95.2%	93.3%
d8-Toluene	97.3%	96.5%
Bromofluorobenzene	97.9%	102%
d4-1,2-Dichlorobenzene	102%	100%

LITOU: COO16

### **ANALYTICAL RESOURCES** INCORPORATED

### ORGANICS ANALYSIS DATA SHEET

Volatiles by Purge & Trap GC/MS-Method SW8260C Sample ID: LCS-040813A

LAB CONTROL SAMPLE Page 1 of 1

Lab Sample ID: LCS-040813A

LIMS ID: 13-6931 Matrix: Water

Data Release Authorized:

Reported: 04/10/13

Instrument/Analyst LCS: NT2/JZ

LCSD: NT2/JZ

Date Analyzed LCS: 04/08/13 13:48

LCSD: 04/08/13 14:33

QC Report No: WJ94-Aspect Consulting

Project: South Park Landfill

100116

Date Sampled: NA Date Received: NA

Sample Amount LCS: 10.0 mL

LCSD: 10.0 mL
Purge Volume LCS: 10.0 mL
LCSD: 10.0 mL

Analyte	LCS	Spike Added-LCS	LCS Recovery	LCSD	Spike Added-LCSD	LCSD Recovery	RPD
cis-1,2-Dichloroethene	9.63	10.0	96.3%	9.54	10.0	95.4%	0.98
Trichloroethene	9.36	10.0	93.6%	9.56		95.6%	2.18

Reported in µg/L (ppb)

RPD calculated using sample concentrations per SW846.

### Volatile Surrogate Recovery

	LCS	LCSD
d4-1,2-Dichloroethane	103%	104%
d8-Toluene	98.6%	100%
Bromofluorobenzene	104%	101%
d4-1,2-Dichlorobenzene	103%	99.9%

FORM III UJ94 BOO19



Volatiles by Purge & Trap GC/MS-Method SW8260C-SIM Sample ID: SPL-GW-MW32-040113

Page 1 of 1 SAMPLE

Lab Sample ID: WJ94A QC Report No: WJ94-Aspect Consulting LIMS ID: 13-6927 Project: South Park Landfill

Matrix: Water 100116

Data Release Authorized: Date Sampled: 04/01/13 Reported: 04/04/13 Date Received: 04/01/13

Instrument/Analyst: NT7/LH Sample Amount: 10.0 mL Date Analyzed: 04/03/13 18:30 Purge Volume: 10.0 mL

CAS Number	Analyte	RL	Result Q	
75-01-4	Vinyl Chloride	0.020	0.28	

Reported in  $\mu g/L$  (ppb)

Volatile Surrogate Recovery

d4-1,2-Dichloroethane 119%

FORM I WJ94:00020



Data Release Authorized: \tag{W}

Matrix: Water

Reported: 04/04/13

Volatiles by Purge & Trap GC/MS-Method SW8260C-SIM Sample ID: SPL-GW-MW33-040113

Page 1 of 1 SAMPLE

Lab Sample ID: WJ94B QC Report No: WJ94-Aspect Consulting LIMS ID: 13-6928

Project: South Park Landfill

100116

Date Sampled: 04/01/13 Date Received: 04/01/13

Instrument/Analyst: NT7/LH Sample Amount: 10.0 mL Date Analyzed: 04/03/13 18:58 Purge Volume: 10.0 mL

CAS Number	Analyte	RL	Result	Q
75-01-4	Vinyl Chloride	0.020	1.1	

Reported in µg/L (ppb)

Volatile Surrogate Recovery

d4-1,2-Dichloroethane 119%

> FORM I 119H:00821



Volatiles by Purge & Trap GC/MS-Method SW8260C-SIM Sample ID: SPL-GW-MW25-040113

Page 1 of 1 SAMPLE

Lab Sample ID: WJ94C LIMS ID: 13-6929

Matrix: Water

Data Release Authorized: \( \mathcal{M} \)

Reported: 04/04/13

Instrument/Analyst: NT7/LH
Date Analyzed: 04/03/13 19:25

QC Report No: WJ94-Aspect Consulting Project: South Park Landfill

100116

Date Sampled: 04/01/13 Date Received: 04/01/13

Sample Amount: 10.0 mL Purge Volume: 10.0 mL

CAS Number Analyte		RL	Result (	Q
75-01-4	Vinyl Chloride	0.020	1.4	

Reported in µg/L (ppb)

Volatile Surrogate Recovery

d4-1,2-Dichloroethane 121%

FORM I WJ94:00022



Volatiles by Purge & Trap GC/MS-Method SW8260C-SIM Sample ID: SPL-GW-MW60-040113

SAMPLE Page 1 of 1

Lab Sample ID: WJ94D LIMS ID: 13-6930

Matrix: Water

Data Release Authorized: \times

Reported: 04/04/13

Instrument/Analyst: NT7/LH Date Analyzed: 04/03/13 19:53 QC Report No: WJ94-Aspect Consulting Project: South Park Landfill

100116

Date Sampled: 04/01/13 Date Received: 04/01/13

Sample Amount: 10.0 mL Purge Volume: 10.0 mL

CAS Number Analyte		RL	Result Q
75-01-4	Vinyl Chloride	0.020	1.4

Reported in µg/L (ppb)

Volatile Surrogate Recovery

d4-1,2-Dichloroethane 118%

> FORM I



Volatiles by Purge & Trap GC/MS-Method SW8260C-SIM Sample ID: Trip Blank 1

Page 1 of 1 SAMPLE

Lab Sample ID: WJ94E

LIMS ID: 13-6931

Matrix: Water

Data Release Authorized: ~~~

Reported: 04/04/13

Instrument/Analyst: NT7/LH Date Analyzed: 04/03/13 12:49 QC Report No: WJ94-Aspect Consulting

Project: South Park Landfill

100116

Date Sampled: 04/01/13 Date Received: 04/01/13

Sample Amount: 10.0 mL Purge Volume: 10.0 mL

CAS Number	Analyte	RL	Result	Q
75-01-4	Vinyl Chloride	0.020	< 0.020	U

Reported in µg/L (ppb)

Volatile Surrogate Recovery

d4-1,2-Dichloroethane 120%

> FORM I MISH: 0002H



Volatiles by Purge & Trap GC/MS-Method SW8260C-SIM Sample ID: Trip Blank 2 SAMPLE Page 1 of 1

Lab Sample ID: WJ94F LIMS ID: 13-6932

Matrix: Water

Data Release Authorized:

Reported: 04/04/13

Instrument/Analyst: NT7/LH Date Analyzed: 04/03/13 13:18 QC Report No: WJ94-Aspect Consulting Project: South Park Landfill

100116

Date Sampled: 04/01/13 Date Received: 04/01/13

Sample Amount: 10.0 mL Purge Volume: 10.0 mL

CAS Number	Analyte	RL	Result	Q
75-01-4	Vinyl Chloride	0.020	< 0.020	U

Reported in µg/L (ppb)

Volatile Surrogate Recovery

d4-1,2-Dichloroethane 126%

> FORM I ECOSC: HELL



### SW8260-SIM SURROGATE RECOVERY SUMMARY

QC Report No: WJ94-Aspect Consulting Project: South Park Landfill Matrix: Water

100116

Client ID	DCE	TOT OUT
MB-040313	114%	0
LCS-040313	112%	0
LCSD-040313	113%	0
SPL-GW-MW32-040113	119%	0
SPL-GW-MW33-040113	119%	0
SPL-GW-MW25-040113	121%	0
SPL-GW-MW60-040113	118%	0
Trip Blank 1	120%	0
Trip Blank 2	126%	0

LCS/MB LIMITS QC LIMITS

(DCE) = d4-1, 2-Dichloroethane(78-126)(80 - 129)

Prep Method: SW5030

Log Number Range: 13-6927 to 13-6932



Volatiles by Purge & Trap GC/MS-Method SW8260C-SIM Sample ID: LCS-040313

LAB CONTROL SAMPLE Page 1 of 1

Lab Sample ID: LCS-040313

LIMS ID: 13-6927

Matrix: Water Data Release Authorized:

Reported: 04/04/13

QC Report No: WJ94-Aspect Consulting Project: South Park Landfill

100116

Date Sampled: NA Date Received: NA

Sample Amount LCS: 10.0 mL LCSD: 10.0 mL

Purge Volume LCS: 10.0 mL

LCSD: 10.0 mL

LCSD: NT7/LH Date Analyzed LCS: 04/03/13 09:58

Instrument/Analyst LCS: NT7/LH

LCSD: 04/03/13 10:25

Analyte	LCS	Spike Added-LCS	LCS Recovery	LCSD	Spike Added-LCSD	LCSD Recovery	RPD
Vinyl Chloride	0.979	1.00	97.9%	0.931	1.00	93.1%	5.0%

Reported in µg/L (ppb)

RPD calculated using sample concentrations per SW846.

Volatile Surrogate Recovery

LCS LCSD d4-1,2-Dichloroethane 112% 113%

> FORM III WJ94:00027



Volatiles by Purge & Trap GC/MS-Method SW8260C-SIM Sample ID: MB-040313

Page 1 of 1

METHOD BLANK

Lab Sample ID: MB-040313

LIMS ID: 13-6927

Matrix: Water

Data Release Authorized: \www.

Reported: 04/04/13

QC Report No: WJ94-Aspect Consulting Project: South Park Landfill

100116

Date Sampled: NA

Date Received: NA

Instrument/Analyst: NT7/LH Date Analyzed: 04/03/13 10:53 Sample Amount: 10.0 mL Purge Volume: 10.0 mL

CAS Number RLResult Q Analyte 0.020 < 0.020 U 75-01-4 Vinyl Chloride

Reported in µg/L (ppb)

Volatile Surrogate Recovery

d4-1,2-Dichloroethane 114%

FORM I

WISH: 00028



TOTAL METALS

Page 1 of 1

Lab Sample ID: WJ94A

LIMS ID: 13-6927

Matrix: Water

Data Release Authorized:

Reported: 04/08/13

Sample ID: SPL-GW-MW32-040113

SAMPLE

QC Report No: WJ94-Aspect Consulting

Project: South Park Landfill

100116

Date Sampled: 04/01/13 Date Received: 04/01/13

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/L	Q
3010A	04/03/13	6010C	04/05/13	7439-89-6	Iron	0.05	22.9	
3010A	04/03/13	6010C	04/05/13	7439-96-5	Manganese	0.001	2.20	

U-Analyte undetected at given RL RL-Reporting Limit

W184:00029



TOTAL METALS

Page 1 of 1

Lab Sample ID: WJ94B

LIMS ID: 13-6928 Matrix: Water

Data Release Authorized Reported: 04/08/13

Sample ID: SPL-GW-MW33-040113

SAMPLE

QC Report No: WJ94-Aspect Consulting

Project: South Park Landfill

100116

Date Sampled: 04/01/13
Date Received: 04/01/13

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/L	Q
3010A	04/03/13	6010C	04/05/13	7439-89-6	Iron	0.05	18.4	
3010A	04/03/13	6010C	04/05/13	7439-96-5	Manganese	0.001	1.83	

U-Analyte undetected at given RL RL-Reporting Limit

WIOU: @@@OO



TOTAL METALS

Page 1 of 1

Lab Sample ID: WJ94C LIMS ID: 13-6929

Matrix: Water

Data Release Authorized:

Reported: 04/08/13

Sample ID: SPL-GW-MW25-040113

SAMPLE

QC Report No: WJ94-Aspect Consulting

Project: South Park Landfill

100116

Date Sampled: 04/01/13
Date Received: 04/01/13

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/L	Q
3010A	04/03/13	6010C	04/05/13	7439-89-6	Iron	0.05	7.25	
3010A	04/03/13	6010C	04/05/13	7439-96-5	Manganese	0.001	0.536	

U-Analyte undetected at given RL RL-Reporting Limit

11701 20021



TOTAL METALS

Page 1 of 1

Lab Sample ID: WJ94D LIMS ID: 13-6930

Matrix: Water

Data Release Authorized:

Reported: 04/08/13

Sample ID: SPL-GW-MW60-040113

SAMPLE

QC Report No: WJ94-Aspect Consulting

Project: South Park Landfill

100116

Date Sampled: 04/01/13
Date Received: 04/01/13

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/L	Q
3010A	04/03/13	6010C	04/05/13	7439-89-6	Iron	0.05	7.28	
3010A	04/03/13	6010C	04/05/13	7439-96-5	Manganese	0.001	0.530	

U-Analyte undetected at given RL RL-Reporting Limit

MISH: 00032



TOTAL METALS

Page 1 of 1

Lab Sample ID: WJ94A

LIMS ID: 13-6927 Matrix: Water

Data Release Authorized

Reported: 04/08/13

Sample ID: SPL-GW-MW32-040113

MATRIX SPIKE

QC Report No: WJ94-Aspect Consulting

Project: South Park Landfill

100116

Date Sampled: 04/01/13 Date Received: 04/01/13

### MATRIX SPIKE QUALITY CONTROL REPORT

	Analysis			Spike	8	
Analyte	Method	Sample	Spike	Added	Recovery	Q
Iron	6010C	22.9	25.1	2.00	110%	Н
Manganese	6010C	2.20	2.72	0.500	104%	H

Reported in mg/L

N-Control Limit Not Met

H-% Recovery Not Applicable, Sample Concentration Too High

NA-Not Applicable, Analyte Not Spiked

Percent Recovery Limits: 75-125%

FORM-V

LITOL: 20000



TOTAL METALS

Page 1 of 1

Lab Sample ID: WJ94A

LIMS ID: 13-6927 Matrix: Water

Data Release Authorized

Reported: 04/08/13

Sample ID: SPL-GW-MW32-040113

DUPLICATE

QC Report No: WJ94-Aspect Consulting Project: South Park Landfill

100116

Date Sampled: 04/01/13 Date Received: 04/01/13

## MATRIX DUPLICATE QUALITY CONTROL REPORT

	Analysis				Control		
Analyte	Method	Sample	Duplicate	RPD	Limit	Q	
Iron	6010C	22.9	23.5	2.6%	+/- 20%		
Manganese	6010C	2.20	2.26	2.7%	+/- 20%		

Reported in mg/L

\*-Control Limit Not Met

L-RPD Invalid, Limit = Detection Limit

M188 : M85 H



TOTAL METALS

Page 1 of 1

Lab Sample ID: WJ94LCS

LIMS ID: 13-6928

Matrix: Water

Data Release Authorized

Reported: 04/08/13

Sample ID: LAB CONTROL

QC Report No: WJ94-Aspect Consulting

Project: South Park Landfill

100116

Date Sampled: NA Date Received: NA

# BLANK SPIKE QUALITY CONTROL REPORT

Analyte	Analysis Method	Spike Found	Spike Added	% Recovery	Q
Iron	6010C	2.08	2.00	104%	
Manganese	6010C	0.506	0.500	101%	

Reported in mg/L

N-Control limit not met Control Limits: 80-120%

LITOU: DAAST



# INORGANICS ANALYSIS DATA SHEET TOTAL METALS

Page 1 of 1

Lab Sample ID: WJ94MB

LIMS ID: 13-6928

Matrix: Water

Data Release Authorized:

Reported: 04/08/13

Sample ID: METHOD BLANK

QC Report No: WJ94-Aspect Consulting

Project: South Park Landfill

100116

Date Sampled: NA Date Received: NA

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/L	Q
3010A	04/03/13	6010C	04/05/13	7439-89-6	Iron	0.05	0.05	U
3010A	04/03/13	6010C	04/05/13	7439-96-5	Manganese	0.001	0.001	

U-Analyte undetected at given RL RL-Reporting Limit



Page 1 of 1

Lab Sample ID: WJ94G

LIMS ID: 13-6933

Matrix: Water

Data Release Authorized:

Reported: 04/08/13

Sample ID: SPL-GW-MW32-040113

SAMPLE

QC Report No: WJ94-Aspect Consulting

Project: South Park Landfill

100116

Date Sampled: 04/01/13 Date Received: 04/01/13

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/L Q
6010C	04/03/13	6010C	04/05/13	7440-70-2	Calcium	0.05	68.3
6010C	04/03/13	6010C	04/05/13	7439-89-6	Iron	0.05	23.8
6010C	04/03/13	6010C	04/05/13	7439-95-4	Magnesium	0.05	44.1
6010C	04/03/13	6010C	04/05/13	7439-96-5	Manganese	0.001	2.31
6010C	04/03/13	6010C	04/05/13	7440-09-7	Potassium	0.5	14.9
6010C	04/03/13	6010C	04/05/13	7440-23-5	Sodium	0.5	162

U-Analyte undetected at given RL

RL-Reporting Limit

WJ94:00037



Page 1 of 1

Lab Sample ID: WJ94H

LIMS ID: 13-6934 Matrix: Water

Data Release Authorized:

Reported: 04/08/13

Sample ID: SPL-GW-MW33-040113

SAMPLE

QC Report No: WJ94-Aspect Consulting

Project: South Park Landfill

100116

Date Sampled: 04/01/13
Date Received: 04/01/13

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/L	Q
6010C	04/03/13	6010C	04/05/13	7440-70-2	Calcium	0.05	37.1	
6010C	04/03/13	6010C	04/05/13	7439-89-6	Iron	0.05	18.4	
6010C	04/03/13	6010C	04/05/13	7439-95-4	Magnesium	0.05	22.1	
6010C	04/03/13	6010C	04/05/13	7439-96-5	Manganese	0.001	1.84	
6010C	04/03/13	6010C	04/05/13	7440-09-7	Potassium	0.5	9.6	
6010C	04/03/13	6010C	04/05/13	7440-23-5	Sodium	0.5	265	

U-Analyte undetected at given RL RL-Reporting Limit

WISH: 00038



Page 1 of 1

Lab Sample ID: WJ94I

LIMS ID: 13-6935

Matrix: Water Data Release Authorized

Reported: 04/08/13

Sample ID: SPL-GW-MW25-040113

SAMPLE

QC Report No: WJ94-Aspect Consulting

Project: South Park Landfill

100116

Date Sampled: 04/01/13 Date Received: 04/01/13

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/L Q
6010C	04/03/13	6010C	04/05/13	7440-70-2	Calcium	0.05	19.5
6010C	04/03/13	6010C	04/05/13	7439-89-6	Iron	0.05	6.70
6010C	04/03/13	6010C	04/05/13	7439-95-4	Magnesium	0.05	5.20
6010C	04/03/13	6010C	04/05/13	7439-96-5	Manganese	0.001	0.525
6010C	04/03/13	6010C	04/05/13	7440-09-7	Potassium	0.5	2.8
6010C	04/03/13	6010C	04/05/13	7440-23-5	Sodium	0.5	33.8

U-Analyte undetected at given RL RL-Reporting Limit

Mien sosse



Page 1 of 1

Lab Sample ID: WJ94J

LIMS ID: 13-6936 Matrix: Water

Data Release Authorized

Reported: 04/08/13

Sample ID: SPL-GW-MW60-040113

SAMPLE

QC Report No: WJ94-Aspect Consulting

Project: South Park Landfill

100116

Date Sampled: 04/01/13 Date Received: 04/01/13

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/L	Q
6010C	04/03/13	6010C	04/05/13	7440-70-2	Calcium	0.05	19.7	
6010C	04/03/13	6010C	04/05/13	7439-89-6	Iron	0.05	6.68	
6010C	04/03/13	6010C	04/05/13	7439-95-4	Magnesium	0.05	5.23	
6010C	04/03/13	6010C	04/05/13	7439-96-5	Manganese	0.001	0.528	
6010C	04/03/13	6010C	04/05/13	7440-09-7	Potassium	0.5	2.8	
6010C	04/03/13	6010C	04/05/13	7440-23-5	Sodium	0.5	33.7	

U-Analyte undetected at given RL RL-Reporting Limit

MISH: GOOHO



DISSOLVED METALS

Page 1 of 1

Lab Sample ID: WJ94G

LIMS ID: 13-6933

Matrix: Water Data Release Authorized:

Reported: 04/08/13

Sample ID: SPL-GW-MW32-040113

MATRIX SPIKE

QC Report No: WJ94-Aspect Consulting

Project: South Park Landfill

100116

Date Sampled: 04/01/13 Date Received: 04/01/13

### MATRIX SPIKE QUALITY CONTROL REPORT

Analyte	Analysis Method	Sample	Spike	Spike Added	% Recovery	Q
	50107		5.5	10.0	71.00	
Calcium	6010C	68.3	75.4	10.0	71.0%	H
Iron	6010C	23.8	24.6	2.00	40.0%	H
Magnesium	6010C	44.1	52.1	10.0	80.0%	H
Manganese	6010C	2.31	2.70	0.500	78.0%	H
Potassium	6010C	14.9	24.6	10.0	97.0%	
Sodium	6010C	162	170	10.0	80.0%	H

Reported in mg/L

N-Control Limit Not Met

H-% Recovery Not Applicable, Sample Concentration Too High NA-Not Applicable, Analyte Not Spiked

Percent Recovery Limits: 75-125%

FORM-V

LION: DOOLL



Page 1 of 1

Lab Sample ID: WJ94G

LIMS ID: 13-6933

Matrix: Water

Data Release Authorized

Reported: 04/08/13

Sample ID: SPL-GW-MW32-040113

DUPLICATE

QC Report No: WJ94-Aspect Consulting

Project: South Park Landfill

100116

Date Sampled: 04/01/13 Date Received: 04/01/13

### MATRIX DUPLICATE QUALITY CONTROL REPORT

Analysis					Control		
Analyte	Method	Sample	Duplicate	RPD	Limit	Q	
Calcium	6010C	68.3	66.2	3.1%	+/- 20%		
Iron	6010C	23.8	23.2	2.6%	+/- 20%		
Magnesium	6010C	44.1	42.8	3.0%	+/- 20%		
Manganese	6010C	2.31	2.24	3.1%	+/- 20%		
Potassium	6010C	14.9	14.6	2.0%	+/- 20%		
Sodium	6010C	162	158	2.5%	+/- 20%		

Reported in mg/L

\*-Control Limit Not Met

L-RPD Invalid, Limit = Detection Limit

WJ94:00042



Page 1 of 1

Lab Sample ID: WJ94LCS

LIMS ID: 13-6934

Matrix: Water

Data Release Authorized Reported: 04/08/13

Sample ID: LAB CONTROL

QC Report No: WJ94-Aspect Consulting

Project: South Park Landfill

100116

Date Sampled: NA Date Received: NA

### BLANK SPIKE QUALITY CONTROL REPORT

	Analysis	Spike	Spike	8	
Analyte	Method	Found	Added	Recovery	Q
Calcium	6010C	10.1	10.0	101%	
Iron	6010C	2.06	2.00	103%	
Magnesium	6010C	10.5	10.0	105%	
Manganese	6010C	0.497	0.500	99.4%	
Potassium	6010C	10.2	10.0	102%	
Sodium	6010C	10.4	10.0	104%	

Reported in mg/L

N-Control limit not met Control Limits: 80-120%

LIJOH: BOBLO



Page 1 of 1

Lab Sample ID: WJ94MB

LIMS ID: 13-6934

Matrix: Water Data Release Authorized

Reported: 04/08/13

Sample ID: METHOD BLANK

QC Report No: WJ94-Aspect Consulting

Project: South Park Landfill

100116

Date Sampled: NA Date Received: NA

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/L	Q
6010C	04/03/13	6010C	04/05/13	7440-70-2	Calcium	0.05	0.05	Ū
6010C	04/03/13	6010C	04/05/13	7439-89-6	Iron	0.05	0.05	U
6010C	04/03/13	6010C	04/05/13	7439-95-4	Magnesium	0.05	0.05	U
6010C	04/03/13	6010C	04/05/13	7439-96-5	Manganese	0.001	0.001	U
6010C	04/03/13	6010C	04/05/13	7440-09-7	Potassium	0.5	0.5	U
6010C	04/03/13	6010C	04/05/13	7440-23-5	Sodium	0.5	0.5	U

U-Analyte undetected at given RL RL-Reporting Limit

HISOS: HELM

# SAMPLE RESULTS-CONVENTIONALS WJ94-Aspect Consulting



Matrix: Water

Data Release Authorized:

Reported: 04/10/13

Project: South Park Landfill
Event: 100116
Date Sampled: 04/01/13 Date Received: 04/01/13

Client ID: SPL-GW-MW32-040113 ARI ID: 13-6927 WJ94A

Analyte	Date Batch	Method _	Units	RL	Sample	
Alkalinity	04/08/13 040813#1	SM 2320	mg/L CaCO3	1.0	672	
Carbonate	04/08/13	SM 2320	mg/L CaCO3	1.0	< 1.0 U	
Bicarbonate	04/08/13	SM 2320	mg/L CaCO3	1.0	672	
Hydroxide	04/08/13	SM 2320	mg/L CaCO3	1.0	< 1.0 U	
Chloride	04/02/13 040213#1	EPA 300.0	mg/L	1.0	33.8	
N-Nitrate	04/02/13 040213#1	EPA 300.0	mg-N/L	0.1	< 0.1 U	
N-Nitrite	04/02/13 040213#1	EPA 300.0	mg-N/L	0.1	< 0.1 U	
N-Ammonia	04/04/13 040413#1	EPA 350.1M	mg-N/L	0.100	9.35	
Sulfate	04/02/13 040213#1	EPA 300.0	mg/L	0.5	12.8	
Sulfide	04/08/13 040813#1	EPA 376.2	mg/L	0.050	< 0.050 U	

RLAnalytical reporting limit

U Undetected at reported detection limit

Water Sample Report-WJ94

WISH: BOOKS

# SAMPLE RESULTS-CONVENTIONALS WJ94-Aspect Consulting



Matrix: Water

Data Release Authorized:

Reported: 04/10/13

Project: South Park Landfill

Event: 100116
Date Sampled: 04/01/13
Date Received: 04/01/13

Client ID: SPL-GW-MW33-040113 ARI ID: 13-6928 WJ94B

Analyte	Date Batch	Method	Units	RL	Sample	
Alkalinity	04/08/13 040813#1	SM 2320	mg/L CaCO3	1.0	661	
Carbonate	04/08/13	SM 2320	mg/L CaCO3	1.0	< 1.0 U	
Bicarbonate	04/08/13	SM 2320	mg/L CaCO3	1.0	661	
Hydroxide	04/08/13	SM 2320	mg/L CaCO3	1.0	< 1.0 U	
Chloride	04/02/13 040213#1	EPA 300.0	mg/L	2.0	88.6	
N-Nitrate	04/02/13 040213#1	EPA 300.0	mg-N/L	0.1	< 0.1 U	
N-Nitrite	04/02/13 040213#1	EPA 300.0	mg-N/L	0.1	< 0.1 U	
N-Ammonia	04/04/13 040413#1	EPA 350.1M	mg-N/L	0.200	14.7	
Sulfate	04/02/13 040213#1	EPA 300.0	mg/L	0.1	1.4	
Sulfide	04/08/13 040813#1	EPA 376.2	mg/L	0.050	< 0.050 U	

RL Analytical reporting limit

U Undetected at reported detection limit

Water Sample Report-WJ94

# SAMPLE RESULTS-CONVENTIONALS WJ94-Aspect Consulting



Matrix: Water

Data Release Authorized:

Reported: 04/10/13

Project: South Park Landfill Event: 100116 Date Sampled: 04/01/13 Date Received: 04/01/13

Client ID: SPL-GW-MW25-040113 ARI ID: 13-6929 WJ94C

Analyte	Date Batch	Method	Units	RL	Sample
Alkalinity	04/08/13 040813#1	SM 2320	mg/L CaCO3	1.0	134
Carbonate	04/08/13	SM 2320	mg/L CaCO3	1.0	< 1.0 U
Bicarbonate	04/08/13	SM 2320	mg/L CaCO3	1.0	134
Hydroxide	04/08/13	SM 2320	mg/L CaCO3	1.0	< 1.0 U
Chloride	04/02/13 040213#1	EPA 300.0	mg/L	0.2	6.1
N-Nitrate	04/02/13 040213#1	EPA 300.0	mg-N/L	0.1	< 0.1 U
N-Nitrite	04/02/13 040213#1	EPA 300.0	mg-N/L	0.1	< 0.1 U
N-Ammonia	04/04/13 040413#1	EPA 350.1M	mg-N/L	0.050	2.11
Sulfate	04/02/13 040213#1	EPA 300.0	mg/L	0.1	4.0
Sulfide	04/08/13 040813#1	EPA 376.2	mg/L	0.050	< 0.050 U

RL Analytical reporting limit

U Undetected at reported detection limit

Water Sample Report-WJ94

WIOU DOOL?

# SAMPLE RESULTS-CONVENTIONALS WJ94-Aspect Consulting



Matrix: Water

Data Release Authorized;

Reported: 04/10/13

Project: South Park Landfill

Event: 100116
Date Sampled: 04/01/13
Date Received: 04/01/13

Client ID: SPL-GW-MW60-040113 ARI ID: 13-6930 WJ94D

Analyte	Date Batch	Method	Units	RL	Sample
Alkalinity	04/08/13 040813#1	SM 2320	mg/L CaCO3	1.0	136
Carbonate	04/08/13	SM 2320	mg/L CaCO3	1.0	< 1.0 U
Bicarbonate	04/08/13	SM 2320	mg/L CaCO3	1.0	136
Hydroxide	04/08/13	SM 2320	mg/L CaCO3	1.0	< 1.0 U
Chloride	04/02/13 040213#1	EPA 300.0	mg/L	0.2	6.2
N-Nitrate	04/02/13 040213#1	EPA 300.0	mg-N/L	0.1	< 0.1 U
N-Nitrite	04/02/13 040213#1	EPA 300.0	mg-N/L	0.1	< 0.1 U
N-Ammonia	04/04/13 040413#1	EPA 350.1M	mg-N/L	0.050	2.10
Sulfate	04/02/13 040213#1	EPA 300.0	mg/L	0.1	4.5
Sulfide	04/08/13 040813#1	EPA 376.2	mg/L	0.050	< 0.050 U

RL Analytical reporting limit

U Undetected at reported detection limit

Water Sample Report-WJ94

WION: BOOKS

# MS/MSD RESULTS-CONVENTIONALS WJ94-Aspect Consulting



Matrix: Water

Data Release Authorized: Reported: 04/10/13

Project: South Park Landfill

Event: 100116 Date Sampled: 04/01/13 Date Received: 04/01/13

Analyte	Met	hod	Date	Units	Sample	Spike	Spike Added	Recovery
ARI ID: WJ94A	Client ID: S	PL-GW-1	1W32-04011	3				
Chloride	EPA	300.0	04/02/13	mg/L	33.8	50.9	20.0	85.5%
N-Nitrate	EPA	300.0	04/02/13	mg-N/L	< 0.1	1.9	2.0	95.0%
N-Nitrite	EPA	300.0	04/02/13	mg-N/L	< 0.1	1.9	2.0	95.0%
N-Ammonia	EPA	350.1M	04/04/13	mg-N/L	9.35	19.5	10.0	101.5%
Sulfate	EPA	300.0	04/02/13	mg/L	12.8	22.6	10.0	98.0%
Sulfide	EPA	376.2	04/08/13	mg/L	< 0.050	7.09	8.35	84.9%

Water MS/MSD Report-WJ94

Mien Goone

# REPLICATE RESULTS-CONVENTIONALS WJ94-Aspect Consulting



Matrix: Water Data Release Authorized: Reported: 04/10/13

Project: South Park Landfill Event: 100116 Date Sampled: 04/01/13 Date Received: 04/01/13

Analyte	Me	ethod	Date	Units	Sample	Replicate(s)	RPD/RSD
ARI ID: WJ94A	Client ID:	SPL-GW-M	W32-040113				
Alkalinity	SM	2320	04/08/13	mg/L CaCO3	672	657	2.3%
Carbonate	SM	2320	04/08/13	mg/L CaCO3	< 1.0	< 1.0	NA
Bicarbonate	SM	2320	04/08/13	mg/L CaCO3	672	657	2.3%
Hydroxide	SM	2320	04/08/13	mg/L CaCO3	< 1.0	< 1.0	NA
Chloride	EPA	0.00E	04/02/13	mg/L	33.8	33.5	0.9%
N-Nitrate	EPA	A 300.0	04/02/13	mg-N/L	< 0.1	< 0.1	NA
N-Nitrite	EPA	0.00E	04/02/13	mg-N/L	< 0.1	< 0.1	NA
N-Ammonia	EPA	A 350.1M	04/04/13	mg-N/L	9.35	9.31	0.4%
Sulfate	EPA	0.00E	04/02/13	mg/L	12.8	12.7	0.8%
Sulfide	EPA	A 376.2	04/08/13	mg/L	< 0.050	< 0.050	NA

Water Replicate Report-WJ94

W194:00050

# LAB CONTROL RESULTS-CONVENTIONALS WJ94-Aspect Consulting



Matrix: Water Data Release Authorized: Reported: 04/10/13

Project: South Park Landfill Event: 100116 Date Sampled: NA

Date Received: NA

Analyte/Method	QC ID	Date	Units	LCS	Spike Added	Recovery
Sulfide	ICVL	04/08/13	mg/L	0.499	0.501	99.6%
EPA 376.2	PREP	04/08/13		7.70	8.35	92.2%

Water Lab Control Report-WJ94

WJ94:00051

# METHOD BLANK RESULTS-CONVENTIONALS WJ94-Aspect Consulting



Matrix: Water

Data Release Authorized

Reported: 04/10/13

Project: South Park Landfill Event: 100116 Date Sampled: NA

Date Received: NA

Analyte	Method		Units	Blank ID
Chloride	EPA 300.0	04/02/13	mg/L	< 0.1 U
N-Nitrate	EPA 300.0	04/02/13	mq-N/L	< 0.1 U
N-Nitrite	EPA 300.0	04/02/13	mg-N/L	< 0.1 U
N-Ammonia	EPA 350.1M	04/04/13	mq-N/L	< 0.010 U FB
Sulfate	EPA 300.0	04/02/13	mg/L	< 0.1 U
Sulfide	EPA 376.2	04/08/13 04/08/13	mg/L	< 0.050 U < 0.050 U

Filtration Blank FB

# STANDARD REFERENCE RESULTS-CONVENTIONALS WJ94-Aspect Consulting



Matrix: Water

Data Release Authorized

Reported: 04/10/13

Project: South Park Landfill

Event: 100116 Date Sampled: NA Date Received: NA

Analyte/SRM ID	Method	Date	Units	SRM	True Value	Recovery
Alkalinity ERA #P114506	SM 2320	04/08/13	mg/L CaCO3	45.5	41.9	108.6%
Chloride ERA 210312	EPA 300.0	04/02/13	mg/L	3.0	3.0	100.0%
N-Nitrate EAR 230511	EPA 300.0	04/02/13	mg-N/L	3.0	3.0	100.0%
N-Nitrite ERA 490412	EPA 300.0	04/02/13	mg-N/L	3.0	3.0	100.0%
N-Ammonia ERA #15125	EPA 350.1M	04/04/13	mg-N/L	0.498	0.500	99.6%
Sulfate ERA 240312	EPA 300.0	04/02/13	mg/L	3.1	3.0	103.3%

Water Standard Reference Report-WJ94

WIOH: DOOES

April 17, 2013

Stephen.Bentsen Floyd Snider 601 Union Street, Suite 600 Seattle, WA 98101-2341

RE: Project: South Park Landfill

ARI Job No: WK09

Dear Stephen:

Please find enclosed analytical results and chain of custody documentation (COC) for the project referenced above. Analytical Resources, Incorporated (ARI) accepted eight water samples and two trip blanks on April 2, 2013. The samples were in good condition with no discrepancies in paperwork.

The samples were analyzed for VOCs, SIM VOCs, Total and Dissolved Metals, Alkalinity, Nitrate, Nitrite, Chloride, Sulfate, Sulfide, as requested on the COC.

No analytical complications were noted for these analyses. Quality control results are included for your review.

A copy of the reports and all associated raw data will remain on file with ARI. If you have any questions or require additional information, please contact me at your convenience.

Sincerely,

ANALYTICAL RESOURCES INC.

Kelly Bottem

Client Sérvices Manager

kellyb@arilabs.com

206-695-6211

**Enclosures** 

cc: eFile WK09

KB/kb

# Chain of Custody Record & Laboratory Analysis Request

	Chair of Gackey Hoose a marchan	-						'						
	ARI Assigned Number:	Turn-around Requested: Standard	Requested:			Page:	/	of					<mark>Analyti</mark> ca Analytica	Analytical Resources, Incorporated Analytical Chemists and Consultants
	ARI Client Company, Aspect Consulting	ulting	Phone: 2	206.780.77	19	Date: /	Date: 1/2/13	lce Present?	>				4611 Sou Tukwila,	4611 South 134th Place, Suite 100 Tukwila, WA 98168
	Client Contact: John Strunk		The second			No. of Coolers:	S	Cooler Temps:	3.6, (.1	و		•	206-695-	206-695-6200 206-695-6201 (fax)
-	Client Project Name: Carate Daniel Condition	II On of I						A	Analysis Requested	quested				Notes/Comments
	South Park	Landin		1		əue				,	,			*For 8260C please provide report for
·	Client Project #: 100116	Samplers:	Separ N	Samplers: Serve McClure		оере		e∃ 'f		,e)te		өру		only the analytes listed. However please rdo dilutions and archive chromatographs
				שמיכוני		ichle hyle	apņ	ξM ,		Sulfa	Car 3	ns '		for the full suite of analytes so
	Sample ID	Date	Time	Matrix	No. Containers	VOC by 8% Cis-1,2 - d Trichloroe *See Note	VOCs by	Mn Mn Total Met Total Met	6010B Fe, Mn	Major An Chloride, Vitrate, Vi	Major Ar SM 23206 Bicarbons	General SM 4500 Ammonia	o Mag ala)	later if requested.
•	5/7/9 BICOGO-ORMW-M9-7dS	5/12/4	1130	Hao	9	×	×							
•	SPL-GW-MW30-090213	1	1015	420	12	×	メ	X	X	X	X	×		
•	SPL-GW-MW31-040213		0111	Hao	12	X	メ	<b>×</b>	×	×	×	λ		
•	SPL-GW-MW39-040213		1235	Hzo	2/	×	×	×	メ	メ	×	×		
4	SPL-6W-MW26-04213		1350	Hao	C1	×	*	*	×	*	×	7		
•	SPL-G-V-MW08-040213		Shbl	420	C1	×	×	×	X	×	×	×		
•	SPL-GW-MW27-090313		1550	Hzo	12	×	¥	×	×	X	X	×		
•	SPL-64-MW10-040213		0691	H30	CI	አ	X	×	X	X	X	7		
	Trip Blank			Has	ત	¥	X							
	Arip Blank	~		400	4	X	>							
	Comments/Special Instructions	Relinquished by:			Received by:	مرهان معامل فالمتحدد والمتحدد		Œ	Relinquished by:	×		<u>a</u>	Received by:	
		(Signature)	X		(Signature)			3)	(Signature)			<u> </u>	(Signature)	
		Printed Name:		W.che	Printed Name:	צוסמג	Aso r	/ (	Printed Name:			<u>a</u>	Printed Name	
		Company:	1000		Company:			0	Company:			0	Company:	

said services. The acceptance by the client of a proposal for services by ARI release ARI from any flability in excess thereof, not withstanding any provision to the contrary in any contract, purchase order or co-Limits of Liability: ARI will perform all requested services in accordance with appropriate methodology following ARI Standard Operating Procedures and the ARI Quality Assurance Program. This program meets standards for the industry. The total liability of ARI, its officers, agents, employees, or successors, arising out of or In connection with the requested services, shall not exceed the Invoiced amount for signed agreement between ARI and the Client. Sample Retention Policy: All samples submitted to ARI will be appropriately discarded no sooner than 90 days after receipt or 60 days after submission of hardcopy data, whichever is longer, unless afternate retention schedules have been established by work-order or contract

# Sample ID Cross Reference Report



ARI Job No: WK09 Client: Aspect Consulting

Project Event: 100116

Project Name: South Park Landfill

	Sample ID	ARI Lab ID	ARI LIMS ID	Matrix	Sample Date/Time	VTSR
1.	SPL-GW-MW30-040213	WK09A	13-7009	Water	04/02/13 10:15	04/02/13 17:20
2.	SPL-GW-MW31-040213	WK09B	13-7010	Water	04/02/13 11:10	04/02/13 17:20
3.	SPL-GW-MW24-040213	WK09C	13-7011	Water	04/02/13 12:35	04/02/13 17:20
4.	SPL-GW-MW26-040213	WK09D	13-7012	Water	04/02/13 13:50	04/02/13 17:20
5.	SPL-GW-MW08-040213	WK09E	13-7013	Water	04/02/13 14:45	04/02/13 17:20
6.	SPL-GW-MW27-040213	WK09F	13-7014	Water	04/02/13 15:50	04/02/13 17:20
7.	SPL-GW-MW10-040213	WK09G	13-7015	Water	04/02/13 16:40	04/02/13 17:20
8.	SPL-GW-MW80-040213	WK09H	13-7016	Water	04/02/13 11:30	04/02/13 17:20
9.	Trip Blanks (1)	WK09I	13-7017	Water	04/02/13	04/02/13 17:20
10.	Trip Blanks (2)	WK09J	13-7018	Water	04/02/13	04/02/13 17:20
11.	SPL-GW-MW30-040213	WK09K	13-7019	Water	04/02/13 10:15	04/02/13 17:20
12.	SPL-GW-MW31-040213	WK09L	13-7020	Water	04/02/13 11:10	04/02/13 17:20
13.	SPL-GW-MW24-040213	WK09M	13-7021	Water	04/02/13 12:35	04/02/13 17:20
14.	SPL-GW-MW26-040213	WK09N	13-7022	Water	04/02/13 13:50	04/02/13 17:20
15.	SPL-GW-MW08-040213	WK090	13-7023	Water	04/02/13 14:45	04/02/13 17:20
16.	SPL-GW-MW27-040213	WK09P	13-7024	Water	04/02/13 15:50	04/02/13 17:20
17.	SPL-GW-MW10-040213	WK09Q	13-7025	Water	04/02/13 16:40	04/02/13 17:20

Printed 04/03/13 Page 1 of 1

MK68: 66663



# Cooler Receipt Form

ARI Client: ASpect		Project Name:	South	Park 1	landa	11
COC No(s):	(NA)	Delivered by: Fed		***********	Ned Other:	
Assigned ARI Job No:		Tracking No:		The same of the sa	_	
Preliminary Examination Phase:	<del> </del>	Tracking No			<del></del>	_(NA)
	adv cools attached to th	o outside of to ecolor	2	V	EC	
Were intact, properly signed and dated cust					ES	(N)
Were custody papers included with the coo				(Y	ES)	NO
Were custody papers properly filled out (ink		_		Q	ES	NO
Temperature of Cooler(s) (°C) (recommend	ed 2.0-6.0 °C for chemis	stry) <u>J. Lo</u>				<u>-</u> _
If cooler temperature is out of compliance fi	II out form 00070F	1 1			9087	<i>79</i> 52
Cooler Accepted by:	AV	Date: <u>4/2/13</u>	Time;	17.2C	)	
	lete custody forms an	d attach all shipping	documents			
Log-In Phase:						
Was a temperature blank included in the co	oler?				YES	(NO)
What kind of packing material was used?	Commence of the Property of th			ek Paner Ot	=	(NO
Was sufficient ice used (if appropriate)?	And the supplementary of the s	Andrew with		NA	(ES)	 NO
Were all bottles sealed in individual plastic				NA	YES	(O)
Did all bottles arrive in good condition (unbr					YES	NO NO
Were all bottle labels complete and legible?					(ES	NO
Did the number of containers listed on COC					(ES,	NO
Did all bottle labels and tags agree with cus					(ES)	NO
Were all bottles used correct for the reques					(ES	NO
Do any of the analyses (bottles) require pre				NA	(ES)	NO
Were all VOC vials free of air bubbles?				NA	YEŞ	(NO
Was sufficient amount of sample sent in ea				14/ (	(ES)	NO
Date VOC Trip Blank was made at ARI				NA 2	125/13(1)	
Was Sample Split by ARI: (NA) YES		Equipm			Split by:	
Was sample opine by Arti.	Date, Time.	Lquipis			Opiit by	
Samples Logged by:	Date:	4/3/13	Time:	1031		
** N	otify Project Manager o	of discrepancies or o	oncems **			
Sample ID on Bottle Sa	mple ID on COC	Sample ID on	Bottle	Sample	ID on COC	
Additional Notes, Discrepancies, & Reso			1 - 1010			
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TB(2) WI The Rest	0-1 Samples					
By: A Date: 4/3						
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	<b>*</b> * *	Large → "lg"				
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0016F 3/2/10 Cooler Receipt Form

Revision 014

MKGG: GGGR

PRESERVATION VERIFICATION 04/03/13

1 of 2

Inquiry Number: NONE Analysis Requested: 04/03/13 Contact: Strunk, John

Client: Aspect Consulting

Logged by: AV
Sample Set Used: Yes-481
Validatable Package: No
Deliverables:

ARI Job No: WK09 PC: Mark ( ( ) VISR: 04/02/13

ANALYTICAL RESOURCES INCORPORATED

Project: South Park Landfill Project #: 100116 Sample Site:

SDG No:

Analytical Protocol: In-house

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CLIENT	-													
LOGNUM ARI ID	13-7009 <b>WK09A</b>	13-7010 WK09B	13-7011 WK09C	13-7012 WK09D	13-7013 WK09E	13-7014 WKO9F	13-7015 WK09G	13-7019 WK09K	13-7020 # <b>K09L</b>	13-7021	10-7022	13-7023	15 7024	7025

Sz only preserved with Enorgilar to adjust Ph.

7=Pass F=Fail

Date #313 Checked By +



Volatiles by Purge & Trap GC/MS-Method SW8260C-SIM Sample ID: SPL-GW-MW30-040213

Page 1 of 1 SAMPLE

Lab Sample ID: WK09A LIMS ID: 13-7009

Matrix: Water

Data Release Authorized:

Reported: 04/11/13

Instrument/Analyst: NT7/PAB Date Analyzed: 04/04/13 16:36 QC Report No: WK09-Aspect Consulting Project: South Park Landfill

100116

Date Sampled: 04/02/13 Date Received: 04/02/13

Sample Amount: 10.0 mL Purge Volume: 10.0 mL

CAS Number	Analyte	RL	Result Q	
75-01-4	Vinyl Chloride	0.020	0.12	

Reported in µg/L (ppb)

Volatile Surrogate Recovery

d4-1,2-Dichloroethane 119%

> FORM I UK09: 0000S



Volatiles by Purge & Trap GC/MS-Method SW8260C-SIM Sample ID: SPL-GW-MW31-040213

Page 1 of 1 \_\_\_\_\_ SAMPLE

Lab Sample ID: WK09B LIMS ID: 13-7010

Matrix: Water Data Release Authorized:

Instrument/Analyst: NT7/PAB
Date Analyzed: 04/04/13 17:04

Reported: 04/11/13

18

QC Report No: WK09-Aspect Consulting Project: South Park Landfill

100116

Date Sampled: 04/02/13 Date Received: 04/02/13

Sample Amount: 10.0 mL Purge Volume: 10.0 mL

CAS Number	Analyte	RL	Result Q
75-01-4	Vinyl Chloride	0.020	4.7

Reported in µg/L (ppb)

Volatile Surrogate Recovery

d4-1,2-Dichloroethane 127%

FORM I

WK09:00007



Volatiles by Purge & Trap GC/MS-Method SW8260C-SIM Sample ID: SPL-GW-MW24-040213

Page 1 of 1 SAMPLE

Lab Sample ID: WK09C LIMS ID: 13-7011

Matrix: Water

Reported: 04/11/13

Data Release Authorized:

Instrument/Analyst: NT7/PAB Date Analyzed: 04/04/13 17:31 QC Report No: WK09-Aspect Consulting

Project: South Park Landfill

100116

Date Sampled: 04/02/13 Date Received: 04/02/13

Sample Amount: 10.0 mL Purge Volume: 10.0 mL

CAS Number	Analyte	RL	Result	Q
75-01-4	Vinyl Chloride	0.020	0.032	

Reported in µg/L (ppb)

Volatile Surrogate Recovery

d4-1,2-Dichloroethane 122%



Volatiles by Purge & Trap GC/MS-Method SW8260C-SIM Sample ID: SPL-GW-MW26-040213

Page 1 of 1 SAMPLE

Lab Sample ID: WK09D LIMS ID: 13-7012

Matrix: Water

Data Release Authorized:

Instrument/Analyst: NT7/PAB

Date Analyzed: 04/04/13 17:59

Reported: 04/11/13

R

QC Report No: WK09-Aspect Consulting

Project: South Park Landfill

100116

Date Sampled: 04/02/13 Date Received: 04/02/13

Sample Amount: 10.0 mL Purge Volume: 10.0 mL

CAS Number	Analyte	RL	Result	Q
75-01-4	Vinyl Chloride	0.020	< 0.020	U

Reported in µg/L (ppb)

Volatile Surrogate Recovery

d4-1,2-Dichloroethane 121%

FORM I WK09:00009



Volātiles by Purge & Trap GC/MS-Method SW8260C-SIM Sample ID: SPL-GW-MW08-040213

Page 1 of 1 SAMPLE

Lab Sample ID: WK09E LIMS ID: 13-7013

Matrix: Water

Data Release Authorized: //

Instrument/Analyst: NT7/PAB

Date Analyzed: 04/04/13 18:26

Reported: 04/11/13

: *K* 

Project: South Park Landfill 100116 Date Sampled: 04/02/13

QC Report No: WK09-Aspect Consulting

Date Received: 04/02/13

Sample Amount: 10.0 mL
Purge Volume: 10.0 mL

CAS Number	Analyte	RL	Result	Q
75-01-4	Vinul Chlorido	0.020	0 063	

Reported in µg/L (ppb)

Volatile Surrogate Recovery

d4-1,2-Dichloroethane 120%

FORM I

HKOS: OOO10



Volatiles by Purge & Trap GC/MS-Method SW8260C-SIM Sample ID: SPL-GW-MW27-040213

Page 1 of 1 SAMPLE

Lab Sample ID: WK09F

LIMS ID: 13-7014 Matrix: Water

Data Release Authorized:

Reported: 04/11/13

Instrument/Analyst: NT7/PAB
Date Analyzed: 04/04/13 18:54

QC Report No: WK09-Aspect Consulting Project: South Park Landfill

100116

Date Sampled: 04/02/13 Date Received: 04/02/13

Sample Amount: 10.0 mL Purge Volume: 10.0 mL

CAS Number	Analyte	RL	Result Q
75-01-4	Vinyl Chloride	0.020	0.25

Reported in µg/L (ppb)

Volatile Surrogate Recovery

d4-1,2-Dichloroethane 123%

FORM I

WK09:00011

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET

Volatiles by Purge & Trap GC/MS-Method SW8260C-SIM Sample ID: SPL-GW-MW10-040213

Page 1 of 1

Lab Sample ID: WK09G LIMS ID: 13-7015

Matrix: Water

Data Release Authorized:

Reported: 04/11/13

Instrument/Analyst: NT7/PAB
Date Analyzed: 04/04/13 19:22

QC Report No: WK09-Aspect Consulting

Project: South Park Landfill

100116

Date Sampled: 04/02/13 Date Received: 04/02/13

Sample Amount: 10.0 mL Purge Volume: 10.0 mL

CAS Number	Analyte	RL	Result Q
75-01-4	Vinyl Chloride	0.020	1.2

Reported in µg/L (ppb)

Volatile Surrogate Recovery

d4-1,2-Dichloroethane 119%

FORM I

WK09:00012



Volatiles by Purge & Trap GC/MS-Method SW8260C-SIM Sample ID: SPL-GW-MW80-040213

Page 1 of 1 SAMPLE

Lab Sample ID: WK09H LIMS ID: 13-7016

Matrix: Water

Data Release Authorized:

Reported: 04/11/13

QC Report No: WK09-Aspect Consulting Project: South Park Landfill 100116

Date Sampled: 04/02/13 Date Received: 04/02/13

Instrument/Analyst: NT7/PAB Sample Amount: 10.0 mL Date Analyzed: 04/04/13 19:49 Purge Volume: 10.0 mL

CAS Number	Analyte	RL	Result	Q
75-01-4	Vinyl Chloride	0.020	< 0.020	U

Reported in µg/L (ppb)

Volatile Surrogate Recovery

d4-1,2-Dichloroethane 120%

FORM I WK09:00013



Volatiles by Purge & Trap GC/MS-Method SW8260C-SIM Sample ID: Trip Blanks (1)

SAMPLE Page 1\_of 1

Lab Sample ID: WK09I LIMS ID: 13-7017

Matrix: Water

Data Release Authorized: 2

Reported: 04/11/13

Instrument/Analyst: NT7/PAB Date Analyzed: 04/04/13 11:04 QC Report No: WK09-Aspect Consulting

Project: South Park Landfill

100116

Date Sampled: 04/02/13 Date Received: 04/02/13

Sample Amount: 10.0 mL Purge Volume: 10.0 mL

CAS Number	Analyte	RL	Result	Q
75-01-4	Vinyl Chloride	0.020	< 0.020	U

Reported in µg/L (ppb)

Volatile Surrogate Recovery

d4-1,2-Dichloroethane 115%

FORM I

LIMBO BBB1



Volatiles by Purge & Trap GC/MS-Method SW8260C-SIM Sample ID: Trip Blanks (2)

Page 1 of 1 SAMPLE

Lab Sample ID: WK09J LIMS ID: 13-7018

Matrix: Water

Data Release Authorized:

Instrument/Analyst: NT7/PAB Date Analyzed: 04/04/13 11:32

Reported: 04/11/13

QC Report No: WK09-Aspect Consulting Project: South Park Landfill

100116

Date Sampled: 04/02/13 Date Received: 04/02/13

Sample Amount: 10.0 mL Purge Volume: 10.0 mL

CAS Number	Analyte	RL	Result	Q
75-01-4	Vinyl Chloride	0.020	< 0.020	U

Reported in µg/L (ppb)

Volatile Surrogate Recovery

d4-1,2-Dichloroethane 118%

FORM I

WK09:00015



Volatiles by Purge & Trap GC/MS-Method SW8260C-SIM Sample ID: MB-040413

Page 1 of 1 METHOD BLANK

Lab Sample ID: MB-040413

LIMS ID: 13-7009 Matrix: Water

Data Release Authorized:

Reported: 04/11/13

Instrument/Analyst: NT7/PAB
Date Analyzed: 04/04/13 10:25

QC Report No: WK09-Aspect Consulting

Project: South Park Landfill

100116

Date Sampled: NA Date Received: NA

Sample Amount: 10.0 mL Purge Volume: 10.0 mL

CAS Number	Analyte	RL	Result	Q
75-01-4	Vinyl Chloride	0.020	< 0.020	U

Reported in µg/L (ppb)

Volatile Surrogate Recovery

d4-1,2-Dichloroethane 118%

FORM I

WK08:00016



# SW8260-SIM SURROGATE RECOVERY SUMMARY

Matrix: Water

QC Report No: WK09-Aspect Consulting Project: South Park Landfill

100116

Client ID	DCE	TOT OUT
	_	
MB-040413	118%	0
LCS-040413	113%	0
LCSD-040413	115%	0
SPL-GW-MW30-040213	119%	0
SPL-GW-MW31-040213	127%	0
SPL-GW-MW24-040213	122%	0
SPL-GW-MW26-040213	121%	0
SPL-GW-MW08-040213	120%	0
SPL-GW-MW27-040213	123%	0
SPL-GW-MW10-040213	119%	0
SPL-GW-MW80-040213	120%	0
Trip Blanks (1)	115%	0
Trip Blanks (2)	118%	0

LCS/MB	T.TMTTC	OC LIMITS
	TITMITIO	OC DIMITIO

(DCE) = d4-1, 2-Dichloroethane

(78-126)

(80 - 129)

Prep Method: SW5030

Log Number Range: 13-7009 to 13-7018

**ANALYTICAL RESOURCES** INCORPORATED

#### ORGANICS ANALYSIS DATA SHEET

Volatiles by Purge & Trap GC/MS-Method SW8260C-SIM Sample ID: LCS-040413

LAB CONTROL SAMPLE Page 1 of 1

Lab Sample ID: LCS-040413

LIMS ID: 13-7009 Matrix: Water

Data Release Authorized: Reported: 04/11/13

Instrument/Analyst LCS: NT7/PAB

LCSD: NT7/PAB

Date Analyzed LCS: 04/04/13 09:29

LCSD: 04/04/13 09:57

QC Report No: WK09-Aspect Consulting

Project: South Park Landfill

100116

Date Sampled: NA Date Received: NA

Sample Amount LCS: 10.0 mL

LCSD: 10.0 mL

Purge Volume LCS: 10.0 mL

LCSD: 10.0 mL

Analyte	LCS	Spike Added-LCS	LCS Recovery	LCSD	Spike Added-LCSD	LCSD Recovery	RPD
Vinyl Chloride	0.962	1.00	96.2%	1.00	1.00	100%	3.9%

Reported in µg/L (ppb)

RPD calculated using sample concentrations per SW846.

Volatile Surrogate Recovery

LCS LCSD d4-1,2-Dichloroethane 113% 115%

> FORM III LIKOO: OOM18

# ANALYTICAL RESOURCES INCORPORATED

# ORGANICS ANALYSIS DATA SHEET

Matrix: Water

Volatiles by Purge & Trap GC/MS-Method SW8260C Sample ID: SPL-GW-MW30-040213

Page 1 of 1 SAMPLE

Lab Sample ID: WK09A QC Report No: WK09-Aspect Consulting LIMS ID: 13-7009 Project: South Park Landfill

100116

Data Release Authorized: Date Sampled: 04/02/13 Reported: 04/10/13 Date Received: 04/02/13

Instrument/Analyst: NT3/PAB Sample Amount: 10.0 mL Date Analyzed: 04/05/13 15:14 Purge Volume: 10.0 mL

CAS Number	Analyte	LOQ	Result Q
156-59-2	cis-1,2-Dichloroethene	0.20	0.64
79-01-6	Trichloroethene	0.20	0.60

Reported in µg/L (ppb)

# Volatile Surrogate Recovery

d4-1,2-Dichloroethane	102%
d8-Toluene	101%
Bromofluorobenzene	101%
d4-1,2-Dichlorobenzene	102%

FORM I WK09:00019



Volatiles by Purge & Trap GC/MS-Method SW8260C

Page 1 of 1\_\_\_

Sample ID: SPL-GW-MW31-040213

SAMPLE

Lab Sample ID: WK09B LIMS ID: 13-7010

Matrix: Water

Data Release Authorized: \www.

Instrument/Analyst: NT3/PAB

Date Analyzed: 04/05/13 15:41

Reported: 04/10/13

QC Report No: WK09-Aspect Consulting Project: South Park Landfill

100116

Date Sampled: 04/02/13 Date Received: 04/02/13

Sample Amount: 10.0 mL Purge Volume: 10.0 mL

CAS Number	Analyte	LOQ	Result	Q
156-59-2	cis-1,2-Dichloroethene	0.20	5.2	
79-01-6	Trichloroethene	0.20	< 0.20	U

Reported in  $\mu g/L$  (ppb)

# Volatile Surrogate Recovery

d4-1,2-Dichloroethane	104%
d8-Toluene	101%
Bromofluorobenzene	99.2%
d4-1,2-Dichlorobenzene	103%

FORM I WKOS: 00020



Volatiles by Purge & Trap GC/MS-Method SW8260C

Page 1 of 1

Sample ID: SPL-GW-MW24-040213

SAMPLE

Lab Sample ID: WK09C QC Report No: WK09-Aspect Consulting

LIMS ID: 13-7011 Project: South Park Landfill Matrix: Water

100116

Data Release Authorized: Www Date Sampled: 04/02/13 Reported: 04/10/13 Date Received: 04/02/13

Instrument/Analyst: NT3/PAB Sample Amount: 10.0 mL Date Analyzed: 04/05/13 16:07 Purge Volume: 10.0 mL

CAS Number	Analyte	LOQ	Result	Q
156-59-2 79-01-6	cis-1,2-Dichloroethene Trichloroethene	0.20	< 0.20 < 0.20	•

Reported in µg/L (ppb)

#### Volatile Surrogate Recovery

d4-1,2-Dichloroethane	100%
d8-Toluene	101%
Bromofluorobenzene	104%
d4-1,2-Dichlorobenzene	101%

WWWO OOD21 FORM I



Volatiles by Purge & Trap GC/MS-Method SW8260C

Page 1 of 1

Sample ID: SPL-GW-MW26-040213

SAMPLE

Lab Sample ID: WK09D LIMS ID: 13-7012

Matrix: Water

Data Release Authorized: WW

Reported: 04/10/13

Project: South Park Landfill 100116

Date Sampled: 04/02/13 Date Received: 04/02/13

QC Report No: WK09-Aspect Consulting

Instrument/Analyst: NT3/PAB
Date Analyzed: 04/05/13 16:34

Sample Amount: 10.0 mL Purge Volume: 10.0 mL

CAS Number	Analyte	LOQ	Result	Q
156-59-2	cis-1,2-Dichloroethene	0.20	0.33	
79-01-6	Trichloroethene	0.20	0.31	

Reported in µg/L (ppb)

# Volatile Surrogate Recovery

d4-1,2-Dichloroethane	104%
d8-Toluene	99.3%
Bromofluorobenzene	101%
d4-1,2-Dichlorobenzene	104%

WK88: 66655

FORM I



Instrument/Analyst: NT3/PAB

Date Analyzed: 04/05/13 17:01

Volatiles by Purge & Trap GC/MS-Method SW8260C

Page 1 of 1

Sample ID: SPL-GW-MW08-040213

SAMPLE

Lab Sample ID: WK09E

LIMS ID: 13-7013

Matrix: Water
Data Release Authorized: \( \)

Reported: 04/10/13

QC Report No: WK09-Aspect Consulting Project: South Park Landfill

100116

Date Sampled: 04/02/13 Date Received: 04/02/13

Sample Amount: 10.0 mL Purge Volume: 10.0 mL

CAS Number	Analyte	LOQ	Result	Q
156-59-2	cis-1,2-Dichloroethene	0.20	< 0.20	U
79-01-6	Trichloroethene	0.20	< 0.20	U

Reported in µg/L (ppb)

#### Volatile Surrogate Recovery

d4-1,2-Dichloroethane	104%
d8-Toluene	99.0%
Bromofluorobenzene	101%
d4-1,2-Dichlorobenzene	103%

FORM I UK09:00023



Volatiles by Purge & Trap GC/MS-Method SW8260C

Page 1 of 1

Sample ID: SPL-GW-MW27-040213

SAMPLE

Lab Sample ID: WK09F LIMS ID: 13-7014

Matrix: Water

Data Release Authorized: \\

Reported: 04/10/13

QC Report No: WK09-Aspect Consulting

Project: South Park Landfill

100116

Date Sampled: 04/02/13 Date Received: 04/02/13

Instrument/Analyst: NT3/PAB Sample Amount: 10.0 mL Date Analyzed: 04/05/13 17:28 Purge Volume: 10.0 mL

CAS Number	Analyte	LOQ	Result	Q
156-59-2	cis-1,2-Dichloroethene	0.20	0.40	
79-01-6	Trichloroethene	0.20	< 0.20	U

Reported in µg/L (ppb)

#### Volatile Surrogate Recovery

d4-1,2-Dichloroethane	98.9%
d8-Toluene	102%
Bromofluorobenzene	96.6%
d4-1,2-Dichlorobenzene	101%

FORM I UK 09: 00024



Matrix: Water

Volatiles by Purge & Trap GC/MS-Method SW8260C Sample ID: SPL-GW-MW10-040213

Page 1 of 1 SAMPLE

Lab Sample ID: WK09G QC Report No: WK09-Aspect Consulting LIMS ID: 13-7015 Project: South Park Landfill

100116

Data Release Authorized: WW Date Sampled: 04/02/13 Reported: 04/10/13 Date Received: 04/02/13

Instrument/Analyst: NT3/PAB Sample Amount: 10.0 mL Date Analyzed: 04/05/13 17:54 Purge Volume: 10.0 mL

CAS Number	Analyte	LOQ	Result Q	
156-59-2	cis-1,2-Dichloroethene	0.20	1.8	
79-01-6	Trichloroethene	0.20	< 0.20 U	

Reported in µg/L (ppb)

# Volatile Surrogate Recovery

d4-1,2-Dichloroethane	103%
d8-Toluene	99.1%
Bromofluorobenzene	101%
d4-1,2-Dichlorobenzene	100%

FORM I UK09:00025



Sample ID: SPL-GW-MW80-040213 Volatiles by Purge & Trap GC/MS-Method SW8260C

Page 1 of 1 SAMPLE

Lab Sample ID: WK09H QC Report No: WK09-Aspect Consulting

LIMS ID: 13-7016 Project: South Park Landfill Matrix: Water

100116

Data Release Authorized: \text{NW} Date Sampled: 04/02/13 Reported: 04/10/13 Date Received: 04/02/13

Instrument/Analyst: NT3/PAB Sample Amount: 10.0 mL Date Analyzed: 04/05/13 18:21 Purge Volume: 10.0 mL

CAS Number	Analyte	LOQ	Result	Q
156-59-2	cis-1,2-Dichloroethene	0.20	< 0.20	•
79-01-6	Trichloroethene	0.20	< 0.20	

Reported in µg/L (ppb)

# Volatile Surrogate Recovery

d4-1,2-Dichloroethane	103%
d8-Toluene	102%
Bromofluorobenzene	99.0%
d4-1,2-Dichlorobenzene	103%

MK08: 6665E FORM I



Volatiles by Purge & Trap GC/MS-Method SW8260C

Page 1 of 1

Sample ID: Trip Blanks (1)

SAMPLE

Lab Sample ID: WK09I

LIMS ID: 13-7017

Matrix: Water

Data Release Authorized: \\

Instrument/Analyst: NT3/PAB

Date Analyzed: 04/05/13 18:48

Reported: 04/10/13

QC Report No: WK09-Aspect Consulting

Project: South Park Landfill

100116

Date Sampled: 04/02/13 Date Received: 04/02/13

Sample Amount: 10.0 mL Purge Volume: 10.0 mL

CAS Number	Analyte	LOQ	Result	Q
156-59-2	cis-1,2-Dichloroethene	0.20	< 0.20	U
79-01-6	Trichloroethene	0.20	< 0.20	U

Reported in µg/L (ppb)

# Volatile Surrogate Recovery

d4-1,2-Dichloroethane	100%
d8-Toluene	104%
Bromofluorobenzene	99.6%
d4-1,2-Dichlorobenzene	103%

WK09:00027

FORM I



Matrix: Water

Volatiles by Purge & Trap GC/MS-Method SW8260C

Page 1 of 1 SAMPLE

Lab Sample ID: WK09J QC Report No: WK09-Aspect Consulting LIMS ID: 13-7018 Project: South Park Landfill

100116

Data Release Authorized: WW Date Sampled: 04/02/13 Reported: 04/10/13 Date Received: 04/02/13

Instrument/Analyst: NT3/PAB Sample Amount: 10.0 mL Date Analyzed: 04/05/13 19:15 Purge Volume: 10.0 mL

CAS Number	Analyte	LOQ	Result	Q
156-59-2	cis-1,2-Dichloroethene	0.20	< 0.20	U
79-01-6	Trichloroethene	0.20	< 0.20	U

Reported in µg/L (ppb)

# Volatile Surrogate Recovery

d4-1,2-Dichloroethane	102%
d8-Toluene	99.5%
Bromofluorobenzene	102%
d4-1,2-Dichlorobenzene	104%

FORM I UK09:00028



Volatiles by Purge & Trap GC/MS-Method SW8260C

Page 1 of 1

Sample ID: MB-040513A METHOD BLANK

Lab Sample ID: MB-040513A

LIMS ID: 13-7009

Matrix: Water

Data Release Authorized:  $\sim$ 

Reported: 04/10/13

Instrument/Analyst: NT3/PAB Date Analyzed: 04/05/13 11:33 QC Report No: WK09-Aspect Consulting

Project: South Park Landfill

100116

Date Sampled: NA Date Received: NA

Sample Amount: 10.0 mL Purge Volume: 10.0 mL

CAS Number	Analyte	LOQ	Result	Q
156-59-2	cis-1,2-Dichloroethene	0.20	< 0.20	U
79-01-6	Trichloroethene	0.20	< 0.20	U

Reported in µg/L (ppb)

# Volatile Surrogate Recovery

d4-1,2-Dichloroethane	93.8%
d8-Toluene	100%
Bromofluorobenzene	102%
d4-1,2-Dichlorobenzene	101%

# VOA SURROGATE RECOVERY SUMMARY



QC Report No: WK09-Aspect Consulting Project: South Park Landfill Matrix: Water

100116

ARI ID	Client ID	PV	DCE	TOL	BFB	DCB	TOT OUT
MB-040513A	Method Blank	10	93.8%	100%	102%	101%	0
LCS-040513A	Lab Control	10	92.0%	99.9%	103%	100%	0
LCSD-040513A	Lab Control Dup	10	90.5%	102%	104%	97.5%	0
WK09A	SPL-GW-MW30-040213	10	102%	101%	101%	102%	0
WK09B	SPL-GW-MW31-040213	10	104%	101%	99.2%	103%	0
WK09C	SPL-GW-MW24-040213	10	100%	101%	104%	101%	0
WK09D	SPL-GW-MW26-040213	10	104%	99.3%	101%	104%	0
WK09E	SPL-GW-MW08-040213	10	104%	99.0%	101%	103%	0
WK09F	SPL-GW-MW27-040213	10	98.9%	102%	96.6%	101%	0
WK09G	SPL-GW-MW10-040213	10	103%	99.1%	101%	100%	0
WK09H	SPL-GW-MW80-040213	10	103%	102%	99.0%	103%	0
WK09I	Trip Blanks (1)	10	100%	104%	99.6%	103%	0
WK09J	Trip Blanks (2)	10	102%	99.5%	102%	104%	0
		LCS	/MB LIM	ITS		QC LIMI	rs
SW8260C							
(DCE) = d4-1,	2-Dichloroethane		(80-120)	)		(80-130	))
(TOL) = d8-To			(80-120)			(80-120	•
(BFB) = Bromo	fluorobenzene		(80-120	)	(80-120)		
(DCB) = d4-1,	2-Dichlorobenzene		(80-120)	)		(80-120	

Prep Method: SW5030B

Log Number Range: 13-7009 to 13-7018

MK68: 66636

# **ANALYTICAL RESOURCES INCORPORATED**

#### ORGANICS ANALYSIS DATA SHEET

Volatiles by Purge & Trap GC/MS-Method SW8260C

Page 1 of 1 LAB CONTROL SAMPLE

Lab Sample ID: LCS-040513A QC Report No: WK09-Aspect Consulting

LIMS ID: 13-7009 Project: South Park Landfill Matrix: Water

100116

Sample ID: LCS-040513A

Data Release Authorized: \textit{\textit{WW}} Date Sampled: NA

Reported: 04/10/13 Date Received: NA

Instrument/Analyst LCS: NT3/PAB Sample Amount LCS: 10.0 mL

LCSD: 10.0 mL LCSD: NT3/PAB Date Analyzed LCS: 04/05/13 10:41 Purge Volume LCS: 10.0 mL

LCSD: 04/05/13 11:07 LCSD: 10.0 mL

Analyte	LCS	Spike Added-LCS	LCS Recovery	LCSD	Spike Added-LCSD	LCSD Recovery	RPD
cis-1,2-Dichloroethene	9.19	10.0	91.9%	8.72	10.0	87.2%	5.2%
Trichloroethene	9.34	10.0	93.4%	9.74		97.4%	4.2%

Reported in µg/L (ppb)

RPD calculated using sample concentrations per SW846.

# Volatile Surrogate Recovery

	LCS	LCSD
d4-1,2-Dichloroethane	92.0%	90.5%
d8-Toluene	99.9%	102%
Bromofluorobenzene	103%	104%
d4-1,2-Dichlorobenzene	100%	97.5%

FORM III LIVOS: DOOS!



Matrix: Water

Data Release Authorized

Reported: 04/10/13

Project: South Park Landfill

Event: 100116
Date Sampled: 04/02/13
Date Received: 04/02/13

Client ID: SPL-GW-MW30-040213 ARI ID: 13-7009 WK09A

Analyte	Date Batch	Method	Units	RL	Sample
Alkalinity	04/08/13 040813#1	SM 2320	mg/L CaCO3	1.0	171
Carbonate	04/08/13	SM 2320	mg/L CaCO3	1.0	< 1.0 U
Bicarbonate	04/08/13	SM 2320	mg/L CaCO3	1.0	171
Hydroxide	04/08/13	SM 2320	mg/L CaCO3	1.0	< 1.0 U
Chloride	04/03/13 040313#1	EPA 300.0	mg/L	1.0	37.3
N-Nitrate	04/02/13 040213#1	EPA 300.0	mg-N/L	0.1	< 0.1 U
N-Nitrite	04/02/13 040213#1	EPA 300.0	mg-N/L	0.1	< 0.1 U
N-Ammonia	04/05/13 040513#1	EPA 350.1M	mg-N/L	0.010	0.299
Sulfate	04/03/13 040313#1	EPA 300.0	mg/L	0.5	19.4
Sulfide	04/08/13 040813#1	EPA 376.2	mg/L	0.050	< 0.050 U

RL Analytical reporting limit

U Undetected at reported detection limit

Water Sample Report-WK09

TING6 : 00055



Matrix: Water

Data Release Authorized /

Reported: 04/10/13

Project: South Park Landfill

Event: 100116
Date Sampled: 04/02/13
Date Received: 04/02/13

Client ID: SPL-GW-MW31-040213 ARI ID: 13-7010 WK09B

Analyte	Date Batch	Method	Units	RL	Sample
Alkalinity	04/08/13 040813#1	SM 2320	mg/L CaCO3	1.0	171
Carbonate	04/08/13	SM 2320	mg/L CaCO3	1.0	< 1.0 U
Bicarbonate	04/08/13	SM 2320	mg/L CaCO3	1.0	171
Hydroxide	04/08/13	SM 2320	mg/L CaCO3	1.0	< 1.0 U
Chloride	04/03/13 040313#1	EPA 300.0	mg/L	0.5	12.5
N-Nitrate	04/02/13 040213#1	EPA 300.0	mg-N/L	0.1	< 0.1 U
N-Nitrite	04/02/13 040213#1	EPA 300.0	mg-N/L	0.1	< 0.1 U
N-Ammonia	04/05/13 040513#1	EPA 350.1M	mg-N/L	0.050	2.19
Sulfate	04/02/13 040213#1	EPA 300.0	mg/L	0.1	0.1
Sulfide	04/08/13 040813#1	EPA 376.2	mg/L	0.050	< 0.050 U

RL Analytical reporting limit

U Undetected at reported detection limit

Water Sample Report-WK09

MKO8: 00035



Matrix: Water

Matrix: Water
Data Release Authorized

Reported: 04/10/13

Project: South Park Landfill

Event: 100116

Date Sampled: 04/02/13 Date Received: 04/02/13

Client ID: SPL-GW-MW24-040213 ARI ID: 13-7011 WK09C

Analyte	Date Batch	Method	Units	RL	Sample
Alkalinity	04/08/13 040813#1	SM 2320	mg/L CaCO3	1.0	420
Carbonate	04/08/13	SM 2320	mg/L CaCO3	1.0	< 1.0 U
Bicarbonate	04/08/13	SM 2320	mg/L CaCO3	1.0	420
Hydroxide	04/08/13	SM 2320	mg/L CaCO3	1.0	< 1.0 U
Chloride	04/03/13 040313#1	EPA 300.0	mg/L	1.0	33.2
N-Nitrate	04/02/13 040213#1	EPA 300.0	mg-N/L	0.1	< 0.1 U
N-Nitrite	04/02/13 040213#1	EPA 300.0	mg-N/L	0.1	< 0.1 U
N-Ammonia	04/05/13 040513#1	EPA 350.1M	mg-N/L	0.050	3.52
Sulfate	04/02/13 040213#1	EPA 300.0	mg/L	0.1	0.3
Sulfide	04/08/13 040813#1	EPA 376.2	mg/L	0.050	< 0.050 U

Analytical reporting limit RL

Undetected at reported detection limit Ū

Water Sample Report-WK09

MK66: 68631



Matrix: Water

Data Release Authorized:

Reported: 04/10/13

Project: South Park Landfill

Event: 100116
Date Sampled: 04/02/13
Date Received: 04/02/13

Client ID: SPL-GW-MW26-040213 ARI ID: 13-7012 WK09D

Analyte	Date Batch	Method	Units	RL	Sample
Alkalinity	04/08/13 040813#1	SM 2320	mg/L CaCO3	1.0	33.7
Carbonate	04/08/13	SM 2320	mg/L CaCO3	1.0	< 1.0 U
Bicarbonate	04/08/13	SM 2320	mg/L CaCO3	1.0	33.7
Hydroxide	04/08/13	SM 2320	mg/L CaCO3	1.0	< 1.0 U
Chloride	04/03/13 040313#1	EPA 300.0	mg/L	0.5	11.1
N-Nitrate	04/02/13 040213#1	EPA 300.0	mg-N/L	0.1	< 0.1 U
N-Nitrite	04/02/13 040213#1	EPA 300.0	mg-N/L	0.1	< 0.1 U
N-Ammonia	04/05/13 040513#1	EPA 350.1M	mg-N/L	0.010	0.180
Sulfate	04/03/13 040313#1	EPA 300.0	mg/L	0.5	12.1
Sulfide	04/08/13 040813#1	EPA 376.2	mg/L	0.050	< 0.050 U

RL Analytical reporting limit

U Undetected at reported detection limit

Water Sample Report-WK09

MKOG: 6003E



Matrix: Water

Data Release Authorized

Reported: 04/10/13

Project: South Park Landfill Event: 100116 Date Sampled: 04/02/13 Date Received: 04/02/13

Client ID: SPL-GW-MW08-040213 ARI ID: 13-7013 WK09E

Analyte	Date Batch	Method	Units	RL	Sample
Alkalinity	04/08/13 040813#1	SM 2320	mg/L CaCO3	1.0	375
Carbonate	04/08/13	SM 2320	mg/L CaCO3	1.0	< 1.0 U
Bicarbonate	04/08/13	SM 2320	mg/L CaCO3	1.0	375
Hydroxide	04/08/13	SM 2320	mg/L CaCO3	1.0	< 1.0 U
Chloride	04/03/13 040313#1	EPA 300.0	mg/L	5.0	189
N-Nitrate	04/02/13 040213#1	EPA 300.0	mg-N/L	0.1	< 0.1 U
N-Nitrite	04/02/13 040213#1	EPA 300.0	mg-N/L	0.1	< 0.1 U
N-Ammonia	04/05/13 040513#1	EPA 350.1M	mg-N/L	0.050	2.96
Sulfate	04/02/13 040213#1	EPA 300.0	mg/L	0.1	3.8
Sulfide	04/08/13 040813#1	EPA 376.2	mg/L	0.050	< 0.050 U

RLAnalytical reporting limit

U Undetected at reported detection limit

Water Sample Report-WK09

LIMBO DESCRIPTION



Matrix: Water

Data Release Authorized:

Reported: 04/10/13

Project: South Park Landfill

Event: 100116 Date Sampled: 04/02/13 Date Received: 04/02/13

Client ID: SPL-GW-MW27-040213 ARI ID: 13-7014 WK09F

Analyte	Date Batch			RL	Sample
Alkalinity	04/08/13 040813#1	SM 2320	mg/L CaCO3	1.0	104
Carbonate	04/08/13	SM 2320	mg/L CaCO3	1.0	< 1.0 U
Bicarbonate	04/08/13	SM 2320	mg/L CaCO3	1.0	104
Hydroxide	04/08/13	SM 2320	mg/L CaCO3	1.0	< 1.0 U
Chloride	04/03/13 040313#1	EPA 300.0	mg/L	0.5	11.8
N-Nitrate	04/02/13 040213#1	EPA 300.0	mg-N/L	0.1	< 0.1 U
N-Nitrite	04/02/13 040213#1	EPA 300.0	mg-N/L	0.1	< 0.1 U
N-Ammonia	04/05/13 040513#1	EPA 350.1M	mg-N/L	0.020	1.59
Sulfate	04/03/13 040313#1	EPA 300.0	mg/L	0.2	6.2
Sulfide	04/08/13 040813#1	EPA 376.2	mg/L	0.050	< 0.050 U

RLAnalytical reporting limit

U Undetected at reported detection limit

Water Sample Report-WK09

WK09:00037



Matrix: Water

Data Release Authorized

Reported: 04/10/13

Project: South Park Landfill

Event: 100116
Date Sampled: 04/02/13 Date Received: 04/02/13

Client ID: SPL-GW-MW10-040213 ARI ID: 13-7015 WK09G

Analyte	Date Batch	Method	Units	RL	Sample
Alkalinity	04/08/13 040813#1	SM 2320	mg/L CaCO3	1.0	276
Carbonate	04/08/13	SM 2320	mg/L CaCO3	1.0	< 1.0 U
Bicarbonate	04/08/13	SM 2320	mg/L CaCO3	1.0	276
Hydroxide	04/08/13	SM 2320	mg/L CaCO3	1.0	< 1.0 U
Chloride	04/03/13 040313#1	EPA 300.0	mg/L	0.5	15.8
N-Nitrate	04/02/13 040213#1	EPA 300.0	mg-N/L	0.1	< 0.1 U
N-Nitrite	04/02/13 040213#1	EPA 300.0	mg-N/L	0.1	< 0.1 U
N-Ammonia	04/05/13 040513#1	EPA 350.1M	mg-N/L	0.050	3.74
Sulfate	04/03/13 040313#1	EPA 300.0	mg/L	2.0	56.3
Sulfide	04/08/13 040813#1	EPA 376.2	mg/L	0.050	< 0.050 U

RLAnalytical reporting limit

U Undetected at reported detection limit

WK09: 80028

# METHOD BLANK RESULTS-CONVENTIONALS WK09-Aspect Consulting



Matrix: Water

Data Release Authorized: Reported: 04/10/13

Project: South Park Landfill Event: 100116 Date Sampled: NA Date Received: NA

Analyte	Method	Date	Units	Blank ID
Chloride	EPA 300.0	04/03/13	mg/L	< 0.1 U
N-Nitrate	EPA 300.0	04/02/13	mg-N/L	< 0.1 U
N-Nitrite	EPA 300.0	04/02/13	mg-N/L	< 0.1 U
N-Ammonia	EPA 350.1M	04/05/13	mg-N/L	< 0.010 U FB
Sulfate	EPA 300.0	04/02/13 04/03/13	mg/L	< 0.1 U < 0.1 U
Sulfide	EPA 376.2	04/08/13 04/08/13	mg/L	< 0.050 U < 0.050 U

FBFiltration Blank

Water Method Blank Report-WK09

WW00 : 00000

# LAB CONTROL RESULTS-CONVENTIONALS WK09-Aspect Consulting



Matrix: Water

Data Release Authorized: Reported: 04/10/13

Project: South Park Landfill Event: 100116 Date Sampled: NA

Date Received: NA

Analyte/Method	QC ID	Date	Units	LCS	Spike Added	Recovery
Sulfide	ICVL	04/08/13	mg/L	0.499	0.501	99.6%
EPA 376.2	PREP	04/08/13		7.70	8.35	92.2%

# STANDARD REFERENCE RESULTS-CONVENTIONALS WK09-Aspect Consulting



Matrix: Water

Data Release Authorized Reported: 04/10/13

Project: South Park Landfill

Event: 100116 Date Sampled: NA

Date Received: NA

Analyte/SRM ID	Method	Date	Units	SRM	True Value	Recovery
Alkalinity ERA #P114506	SM 2320	04/08/13 04/08/13	mg/L CaCO3	40.7 45.5	41.9 41.9	97.1% 108.6%
Chloride ERA 210312	EPA 300.0	04/03/13	mg/L	3.0	3.0	100.0%
N-Nitrate EAR 230511	EPA 300.0	04/02/13	mg-N/L	3.0	3.0	100.0%
N-Nitrite ERA 490412	EPA 300.0	04/02/13	mg-N/L	3.0	3.0	100.0%
N-Ammonia ERA #15125	EPA 350.1M	04/05/13	mg-N/L	0.506	0.500	101.2%
Sulfate ERA 240312	EPA 300.0	04/02/13 04/03/13	mg/L	3.1 3.1	3.0 3.0	103.3% 103.3%



Matrix: Water

Data Release Authorized: Reported: 04/10/13

Project: South Park Landfill
Event: 100116
Date Sampled: 04/02/13
Date Received: 04/02/13

Analyte	Meth	nod Date	Units	Sample	Replicate(s)	RPD/RSD
ARI ID: WK09A	Client ID: SP	PL-GW-MW30-04021	3			
N-Ammonia	EPA 3	350.1M 04/05/13	mg-N/L	0.299	0.319	6.5%
Sulfide	EPA 3	376.2 04/08/13	mg/L	< 0.050	< 0.050	NA
ARI ID: WK09D	Client ID: SP	PL-GW-MW26-04021	3			
Alkalinity	SM 23	320 04/08/13	mg/L CaCO	3 33.7	33.4	0.9%
Carbonate	SM 23	320 04/08/13	mg/L CaCO	3 < 1.0	< 1.0	NA
Bicarbonate	SM 23	320 04/08/13	mg/L CaCO	3 33.7	33.4	0.9%
Hydroxide	SM 23	320 04/08/13	mg/L CaCO	3 < 1.0	< 1.0	NA

Water Replicate Report-WK09

MK68: 66645



Matrix: Water

Data Release Authorizeds Reported: 04/10/13

Project: South Park Landfill

Event: 100116 Date Sampled: 04/02/13 Date Received: 04/02/13

Analyte	Method	Date	Units	Sample	Spike	Spike Added	Recovery
ARI ID: WK09A	Client ID: SPL-GW	/-MW30-04021	.3				
N-Ammonia	EPA 350.1	M 04/05/13	mg-N/L	0.299	0.791	0.500	98.4%
Sulfide	EPA 376.2	04/08/13	mg/L	< 0.050	0.220	0.250	88.0%

Water MS/MSD Report-WK09

MKOO: GOONS



TOTAL METALS

Page 1 of 1

Lab Sample ID: WK09A

LIMS ID: 13-7009

Matrix: Water

Data Release Authorized Reported: 04/09/13

Sample ID: SPL-GW-MW30-040213

SAMPLE

QC Report No: WK09-Aspect Consulting

Project: South Park Landfill

100116

Date Sampled: 04/02/13 Date Received: 04/02/13

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/L	Q
3010A	04/04/13	6010C	04/08/13	7439-89-6	Iron	0.05	2.30	
3010A	04/04/13	6010C	04/08/13	7439-96-5	Manganese	0.001	0.080	

U-Analyte undetected at given RL RL-Reporting Limit

WKGG: GGGHH



TOTAL METALS

Page 1 of 1

Lab Sample ID: WK09A

Data Release Authorized Reported: 04/09/13

LIMS ID: 13-7009 Matrix: Water

DUPLICATE

Sample ID: SPL-GW-MW30-040213

QC Report No: WK09-Aspect Consulting Project: South Park Landfill

100116

Date Sampled: 04/02/13 Date Received: 04/02/13

# MATRIX DUPLICATE QUALITY CONTROL REPORT

Analyte	Analysis Method	Sample	Duplicate	RPD	Control Limit	Q
Iron Manganese	6010C 6010C	2.30 0.080	2.25 0.079	2.2%	+/- 20% +/- 20%	

Reported in mg/L

\*-Control Limit Not Met

L-RPD Invalid, Limit = Detection Limit



TOTAL METALS

Page 1 of 1

Lab Sample ID: WK09A

LIMS ID: 13-7009

Matrix: Water

Data Release Authorized Reported: 04/09/13

MATRIX SPIKE

Sample ID: SPL-GW-MW30-040213

QC Report No: WK09-Aspect Consulting

Project: South Park Landfill

100116

Date Sampled: 04/02/13 Date Received: 04/02/13

# MATRIX SPIKE QUALITY CONTROL REPORT

	Analysis			Spike	8	
Analyte	Method	Sample	Spike	Added	Recovery	Q
Iron	6010C	2.30	4.40	2.00	105%	
Manganese	6010C	0.080	0.580	0.500	100%	

Reported in mg/L

N-Control Limit Not Met H-% Recovery Not Applicable, Sample Concentration Too High NA-Not Applicable, Analyte Not Spiked

Percent Recovery Limits: 75-125%



TOTAL METALS

Page 1 of 1

Lab Sample ID: WK09B

LIMS ID: 13-7010

Matrix: Water

Data Release Authorized

Reported: 04/09/13

Sample ID: SPL-GW-MW31-040213

SAMPLE

QC Report No: WK09-Aspect Consulting

Project: South Park Landfill

100116

Date Sampled: 04/02/13 Date Received: 04/02/13

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/L	Q
3010A	04/04/13	6010C	04/08/13	7439-89-6	Iron	0.05	18.3	
3010A	04/04/13	6010C	04/08/13	7439-96-5	Manganese	0.001	0.505	

U-Analyte undetected at given RL RL-Reporting Limit

WKDO DODIT



TOTAL METALS

Page 1 of 1

Lab Sample ID: WK09C LIMS ID: 13-7011

Matrix: Water

Data Release Authorized

Reported: 04/09/13

Sample ID: SPL-GW-MW24-040213

SAMPLE

QC Report No: WK09-Aspect Consulting

Project: South Park Landfill

100116

Date Sampled: 04/02/13
Date Received: 04/02/13

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/L Q
3010A	04/04/13	6010C	04/08/13	7439-89-6	Iron	0.05	29.5
3010A	04/04/13	6010C	04/08/13	7439-96-5	Manganese	0.001	1.79

U-Analyte undetected at given RL RL-Reporting Limit

MKOS: OOOHS



TOTAL METALS

Page 1 of 1

Lab Sample ID: WK09D

LIMS ID: 13-7012

Matrix: Water

Data Release Authorized

Reported: 04/09/13

Sample ID: SPL-GW-MW26-040213

SAMPLE

QC Report No: WK09-Aspect Consulting

Project: South Park Landfill

100116

Date Sampled: 04/02/13 Date Received: 04/02/13

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/L	Q
3010A	04/04/13	6010C	04/08/13	7439-89-6	Iron	0.05	8.26	
3010A	04/04/13	6010C	04/08/13	7439-96-5	Manganese	0.001	0.136	

U-Analyte undetected at given RL RL-Reporting Limit



TOTAL METALS

Page 1 of 1

Lab Sample ID: WK09E LIMS ID: 13-7013

Matrix: Water

Data Release Authorized Reported: 04/09/13

Sample ID: SPL-GW-MW08-040213

SAMPLE

QC Report No: WK09-Aspect Consulting Project: South Park Landfill

100116

Date Sampled: 04/02/13 Date Received: 04/02/13

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/L	Q
3010A 3010A	04/04/13	6010C 6010C	04/08/13 04/08/13	7439-89-6 7439-96-5	Iron Manganese	0.05 0.001	19.0 1.17	

U-Analyte undetected at given RL RL-Reporting Limit

WK09:00050



TOTAL METALS

Page 1 of 1

Lab Sample ID: WK09F

LIMS ID: 13-7014

Matrix: Water
Data Release Authorized

Reported: 04/09/13

Sample ID: SPL-GW-MW27-040213

SAMPLE

QC Report No: WK09-Aspect Consulting

Project: South Park Landfill

100116

Date Sampled: 04/02/13 Date Received: 04/02/13

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/L	Q
3010A	04/04/13	6010C	04/08/13	7439-89-6	Iron	0.05	21.6	
3010A	04/04/13	6010C	04/08/13	7439-96-5	Manganese	0.001	0.417	

U-Analyte undetected at given RL RL-Reporting Limit

WK09:00051



TOTAL METALS

Page 1 of 1

Lab Sample ID: WK09G

LIMS ID: 13-7015

Matrix: Water

Data Release Authorized: Reported: 04/09/13

Sample ID: SPL-GW-MW10-040213

SAMPLE

QC Report No: WK09-Aspect Consulting

Project: South Park Landfill

100116

Date Sampled: 04/02/13 Date Received: 04/02/13

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/L	Q
3010A	04/04/13	6010C	04/08/13	7439-89-6	Iron	0.05	18.4	
3010A	04/04/13	6010C	04/08/13	7439-96-5	Manganese	0.001	1.05	

U-Analyte undetected at given RL RL-Reporting Limit



Page 1 of 1

Lab Sample ID: WK09K

LIMS ID: 13-7019

Matrix: Water

Data Release Authorized Reported: 04/09/13

Sample ID: SPL-GW-MW30-040213

SAMPLE

QC Report No: WK09-Aspect Consulting Project: South Park Landfill

100116

Date Sampled: 04/02/13 Date Received: 04/02/13

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/L	Q
6010C	04/04/13	6010C	04/08/13	7440-70-2	Calcium	0.05	65.1	
6010C	04/04/13	6010C	04/08/13	7439-89-6	Iron	0.05	2.21	
6010C	04/04/13	6010C	04/08/13	7439-95-4	Magnesium	0.05	12.3	
6010C	04/04/13	6010C	04/08/13	7439-96-5	Manganese	0.001	0.079	
6010C	04/04/13	6010C	04/08/13	7440-09-7	Potassium	0.5	3.9	
6010C	04/04/13	6010C	04/08/13	7440-23-5	Sodium	0.5	14.3	

U-Analyte undetected at given RL RL-Reporting Limit

ukas baass



DISSOLVED METALS

Page 1 of 1

Lab Sample ID: WK09K

LIMS ID: 13-7019

Matrix: Water

Data Release Authorized

Reported: 04/09/13

Sample ID: SPL-GW-MW30-040213

DUPLICATE

QC Report No: WK09-Aspect Consulting

Project: South Park Landfill

100116

Date Sampled: 04/02/13 Date Received: 04/02/13

# MATRIX DUPLICATE QUALITY CONTROL REPORT

	Analysis				Control	
Analyte	Method	Sample	Duplicate	RPD	Limit	Q
Calcium	6010C	65.1	65.4	0.5%	+/- 20%	
Iron	6010C	2.21	2.21	0.0%	+/- 20%	
Magnesium	6010C	12.3	12.3	0.0%	+/- 20%	
Manganese	6010C	0.079	0.079	0.0%	+/- 20%	
Potassium	6010C	3.9	3.9	0.0%	+/- 20%	
Sodium	6010C	14.3	14.4	0.7%	+/- 20%	

Reported in mg/L

\*-Control Limit Not Met

L-RPD Invalid, Limit = Detection Limit

W00:0005U



Page 1 of 1

Lab Sample ID: WK09K

LIMS ID: 13-7019

Matrix: Water

Data Release Authoriz Reported: 04/09/13

Sample ID: SPL-GW-MW30-040213

MATRIX SPIKE

QC Report No: WK09-Aspect Consulting

Project: South Park Landfill

100116

Date Sampled: 04/02/13 Date Received: 04/02/13

# MATRIX SPIKE QUALITY CONTROL REPORT

	Analysis			Spike	*	
Analyte	Method	Sample	Spike	Added	Recovery	Q
Calcium	6010C	65.1	75.6	10.0	105%	Н
Iron	6010C	2.21	4.35	2.00	107%	
Magnesium	6010C	12.3	23.4	10.0	111%	
Manganese	6010C	0.079	0.586	0.500	101%	
Potassium	6010C	3.9	14.4	10.0	105%	
Sodium	6010C	14.3	25.0	10.0	107%	

Reported in mg/L

N-Control Limit Not Met

H-% Recovery Not Applicable, Sample Concentration Too High

NA-Not Applicable, Analyte Not Spiked

Percent Recovery Limits: 75-125%

MV29:2005



Page 1 of 1

Lab Sample ID: WK09L

LIMS ID: 13-7020

Matrix: Water

Data Release Authorized:

Reported: 04/09/13

Sample ID: SPL-GW-MW31-040213

SAMPLE

QC Report No: WK09-Aspect Consulting

Project: South Park Landfill

100116

Date Sampled: 04/02/13 Date Received: 04/02/13

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/L	Q
6010C	04/04/13	6010C	04/08/13	7440-70-2	Calcium	0.05	24.5	
6010C	04/04/13	6010C	04/08/13	7439-89-6	Iron	0.05	11.9	
6010C	04/04/13	6010C	04/08/13	7439-95-4	Magnesium	0.05	7.06	
6010C	04/04/13	6010C	04/08/13	7439-96-5	Manganese	0.001	0.442	
6010C	04/04/13	6010C	04/08/13	7440-09-7	Potassium	0.5	4.2	
6010C	04/04/13	6010C	04/08/13	7440-23-5	Sodium	0.5	40.3	

U-Analyte undetected at given RL RL-Reporting Limit

WOO DODES



DISSOLVED METALS

Page 1 of 1

Lab Sample ID: WK09M

LIMS ID: 13-7021

Matrix: Water

Data Release Authorized

Reported: 04/09/13

Sample ID: SPL-GW-MW24-040213

SAMPLE

QC Report No: WK09-Aspect Consulting

Project: South Park Landfill

100116

Date Sampled: 04/02/13 Date Received: 04/02/13

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/L	Q
6010C	04/04/13	6010C	04/08/13	7440-70-2	Calcium	0.05	73.4	
6010C	04/04/13	6010C	04/08/13	7439-89-6	Iron	0.05	26.0	
6010C	04/04/13	6010C	04/08/13	7439-95-4	Magnesium	0.05	33.0	
6010C	04/04/13	6010C	04/08/13	7439-96-5	Manganese	0.001	1.64	
6010C	04/04/13	6010C	04/08/13	7440-09-7	Potassium	0.5	12.3	
6010C	04/04/13	6010C	04/08/13	7440-23-5	Sodium	0.5	58.7	

U-Analyte undetected at given RL RL-Reporting Limit



DISSOLVED METALS

Page 1 of 1

Lab Sample ID: WK09N

LIMS ID: 13-7022

Matrix: Water

Data Release Authorized Reported: 04/09/13

Sample ID: SPL-GW-MW26-040213

SAMPLE

QC Report No: WK09-Aspect Consulting

Project: South Park Landfill

100116

Date Sampled: 04/02/13 Date Received: 04/02/13

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/L (	Q
6010C	04/04/13	6010C	04/08/13	7440-70-2	Calcium	0.05	8.92	
6010C	04/04/13	6010C	04/08/13	7439-89-6	Iron	0.05	5.58	
6010C	04/04/13	6010C	04/08/13	7439-95-4	Magnesium	0.05	3.27	
6010C	04/04/13	6010C	04/08/13	7439~96-5	Manganese	0.001	0.129	
6010C	04/04/13	6010C	04/08/13	7440-09-7	Potassium	0.5	2.9	
6010C	04/04/13	6010C	04/08/13	7440-23-5	Sodium	0.5	9.5	

U-Analyte undetected at given RL RL-Reporting Limit

WK09:00058



Page 1 of 1

Lab Sample ID: WK090

LIMS ID: 13-7023

Matrix: Water

Data Release Authorized

Reported: 04/09/13

Sample ID: SPL-GW-MW08-040213

SAMPLE

QC Report No: WK09-Aspect Consulting

Project: South Park Landfill

100116

Date Sampled: 04/02/13 Date Received: 04/02/13

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/L Q
6010C	04/04/13	6010C	04/08/13	7440-70-2	Calcium	0.05	46.0
6010C	04/04/13	6010C	04/08/13	7439-89-6	Iron	0.05	19.1
6010C	04/04/13	6010C	04/08/13	7439-95-4	Magnesium	0.05	47.8
6010C	04/04/13	6010C	04/08/13	7439-96-5	Manganese	0.001	1.19
6010C	04/04/13	6010C	04/08/13	7440-09-7	Potassium	0.5	16.9
6010C	04/04/13	6010C	04/08/13	7440-23-5	Sodium	0.5	157

U-Analyte undetected at given RL RL-Reporting Limit

WKOS POSE



Page 1 of 1

Lab Sample ID: WK09P

LIMS ID: 13-7024

Matrix: Water

Data Release Authorized Reported: 04/09/13

Sample ID: SPL-GW-MW27-040213

SAMPLE

QC Report No: WK09-Aspect Consulting

Project: South Park Landfill

100116

Date Sampled: 04/02/13 Date Received: 04/02/13

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/L	Q
6010C	04/04/13	6010C	04/08/13	7440-70-2	Calcium	0.05	16.2	
6010C	04/04/13	6010C	04/08/13	7439-89-6	Iron	0.05	12.5	
6010C	04/04/13	6010C	04/08/13	7439-95-4	Magnesium	0.05	4.36	
6010C	04/04/13	6010C	04/08/13	7439-96-5	Manganese	0.001	0.395	
6010C	04/04/13	6010C	04/08/13	7440-09-7	Potassium	0.5	3.3	
6010C	04/04/13	6010C	04/08/13	7440-23-5	Sodium	0.5	30.3	

U-Analyte undetected at given RL RL-Reporting Limit

WK09:00060



Page 1 of 1

Lab Sample ID: WK09Q

LIMS ID: 13-7025

Matrix: Water

Data Release Authorized

Reported: 04/09/13

Sample ID: SPL-GW-MW10-040213

SAMPLE

QC Report No: WK09-Aspect Consulting

Project: South Park Landfill

100116

Date Sampled: 04/02/13 Date Received: 04/02/13

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/L C
6010C	04/04/13	6010C	04/08/13	7440-70-2	Calcium	0.05	44.3
6010C	04/04/13	6010C	04/08/13	7439-89-6	Iron	0.05	19.2
6010C	04/04/13	6010C	04/08/13	7439-95-4	Magnesium	0.05	28.2
6010C	04/04/13	6010C	04/08/13	7439-96-5	Manganese	0.001	1.10
6010C	04/04/13	6010C	04/08/13	7440-09-7	Potassium	0.5	9.2
6010C	04/04/13	6010C	04/08/13	7440-23-5	Sodium	0.5	59.4

U-Analyte undetected at given RL RL-Reporting Limit



TOTAL METALS

Page 1 of 1

Lab Sample ID: WK09MB

LIMS ID: 13-7010

Matrix: Water

Data Release Authorized

Reported: 04/09/13

Sample ID: METHOD BLANK

QC Report No: WK09-Aspect Consulting

Project: South Park Landfill

100116

Date Sampled: NA Date Received: NA

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/L	Q
3010A	04/04/13	6010C	04/08/13	7439-89-6	Iron	0.05	0.05	U
3010A	04/04/13	6010C	04/08/13	7439-96-5	Manganese	0.001	0.001	U

U-Analyte undetected at given RL RL-Reporting Limit



# INORGANICS ANALYSIS DATA SHEET TOTAL METALS

TOTAL METALS

Page 1 of 1

Lab Sample ID: WK09LCS

LIMS ID: 13-7010 Matrix: Water

Data Release Authorized:

Reported: 04/09/13

Sample ID: LAB CONTROL

QC Report No: WK09-Aspect Consulting

Project: South Park Landfill

100116

Date Sampled: NA Date Received: NA

# BLANK SPIKE QUALITY CONTROL REPORT

Analyte	Analysis Method	Spike Found	Spike Added	% Recovery	Q
Iron	6010C	2.10	2.00	105%	
Manganese	6010C	0.495	0.500	99.0%	

Reported in mg/L

N-Control limit not met Control Limits: 80-120%

WK09:00063



Page 1 of 1

Lab Sample ID: WK09MB

LIMS ID: 13-7020

Matrix: Water

Data Release Authorized

Reported: 04/09/13

Sample ID: METHOD BLANK

QC Report No: WK09-Aspect Consulting

Project: South Park Landfill 100116

Date Sampled: NA Date Received: NA

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/L	Q
6010C	04/04/13	6010C	04/08/13	7440-70-2	Calcium	0.05	0.05	U
6010C	04/04/13	6010C	04/08/13	7439-89-6	Iron	0.05	0.05	U
6010C	04/04/13	6010C	04/08/13	7439-95-4	Magnesium	0.05	0.05	U
6010C	04/04/13	6010C	04/08/13	7439-96-5	Manganese	0.001	0.001	U
6010C	04/04/13	6010C	04/08/13	7440-09-7	Potassium	0.5	0.5	U
6010C	04/04/13	6010C	04/08/13	7440-23-5	Sodium	0.5	0.5	U

U-Analyte undetected at given RL

RL-Reporting Limit

WK08: 000EH



Page 1 of 1

Lab Sample ID: WK09LCS

LIMS ID: 13-7020 Matrix: Water

Data Release Authorized:

Reported: 04/09/13

Sample ID: LAB CONTROL

QC Report No: WK09-Aspect Consulting

Project: South Park Landfill

100116

Date Sampled: NA Date Received: NA

# BLANK SPIKE QUALITY CONTROL REPORT

	Analysis	Spike	Spike	%	
Analyte	Method	Found	Added	Recovery	<u>Q</u>
Calcium	6010C	10.1	10.0	101%	
Iron	6010C	2.10	2.00	105%	
Magnesium	6010C	10.7	10.0	107%	
Manganese	6010C	0.502	0.500	100%	
Potassium	6010C	10.2	10.0	102%	
Sodium	6010C	10.2	10.0	102%	

Reported in mg/L

N-Control limit not met Control Limits: 80-120%

FORM-VII

WK09 GOGE

April 17, 2013

Stephen.Bentsen Floyd Snider 601 Union Street, Suite 600 Seattle, WA 98101-2341

RE: Project: South Park Landfill

ARI Job No: WK27

Dear Stephen:

Please find enclosed analytical results and chain of custody documentation (COC) for the project referenced above. Analytical Resources, Incorporated (ARI) accepted six water samples and two trip blanks on April 4, 2013. The samples were in good condition with no discrepancies in paperwork.

The samples were analyzed for VOCs, SIM VOCs, Total and Dissolved Metals, Alkalinity, Nitrate, Nitrite, Chloride, Sulfate, Sulfide, as requested on the COC.

No analytical complications were noted for these analyses. Quality control results are included for your review.

A copy of the reports and all associated raw data will remain on file with ARI. If you have any questions or require additional information, please contact me at your convenience.

Sincerely,

ANALYTICAL RESOURCES, INC.

Kelly Bottem

Client Services Manager kellyb@arilabs.com

206-695-6211

**Enclosures** 

cc: eFile WK27

KB/kb

# Chain of Custody Record & Laboratory Analysis Request

Toolers:    Content   Cont	Sullting   Phone: 206.780.7719   Date:   Landfill   Samplers:   Sullting   Phone: 206.780.7719   Date:   Landfill   Samplers:   Samplers	ARI Assigned Number: $\omega$ $\mu$	Turn-around Requested: Standard	Requested:			Page:	_	to of					Analytic	Analytical Resources, Incorporated
Coolege:	Cocines:   Time   Martix   Mactive   Cocines:   Time   Martix   Mactive   Cocines:   Time   Martix   Mactive   Cocines:   Time   Martix   Mactive   Cocines:   Time   Martix   Mactive   Cocines:   Time   Martix   Mactive   Cocines:   Time   Martix   Mactive   Cocines:   Time   Martix   Mactive   Cocines:   Time   Martix   Mactive   Cocines:   Time   Martix   Time   Martix   Time   Martix   Time	ARI Client Company's spect Cons	sulting		780.7		Date:	14/13		× a				4611 So Tukwila,	uth 134th Place, Suite 100 WA 98168
Samplers   Samplers	Samplers;   Samp	Client Contact: John Strunk					No. of Coolers:	7	1	4.1	3, 4			206-695	-6200 206-695-6201 (fax)
13   13   13   14   15   15   15   15   15   15   15	1   1   2   2   2   2   2   2   2   2	Client Project Name: South Park	landfill							Analysis R	ednested				Notes/Comments
Harry   Matrix   No Containment   Matrix   No Containment   Harry	1170   1170	Client Project #:100116	Samplers:	ann Mc	clure		hloroethene	et		a pλ	lfate, et	arbonate,		209C	*For 8260C please provide report for only the analytes listed. However please rdo dilutions and archive chromatograph for the full surile of analytes so
4/3/13  4/3/19  4/3/20  12  2  2  2  2  2  2  2  2  2  2  2  2	4/3/13 H20 2 X X X X X X X X X X X X X X X X X X	. Sample ID	Date	Тіте	Matrix		Cis-1,2 - dio Trichloroeth	Vinyl Chloric	6010B Ma, K, Ca,	80108	Chloride, Si Nitrate, Nitri	SM 2320B Alkalinity, C	2 <b>W</b> 4200		additional analytes may be analyzed later if requested.
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	18-1	4/3/13		Mao	2	X	X	X	X	X	X	1		P
10:35	10:35	78-2				2	7	X	X	X	X	X	X	χ	(rp81~K
10:35	$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	SDL-GW-MW18-040213		9:30		10	X	$\lambda$	X	X	X	メ	*	:	
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	SPL-GW-MW29-040213		10:35		12	X	+	X	X	X	X	X		
1330	1330	SA-6W-HW14-040313		1130		12	X	X	ィ	×	イ	メ	イ		4
1460   12	1400   12	SPL-GW- MW12-040313		1230		12	X	X	X	X	Х	1	1		
		SPL-6W-KMW034 240313		1400		12	X	X	X	X	X	X	X		
Relinquished by:   Received by:   Campany:	Reinquished by: (Signature) Printed Name:  S. & M. M. C. M. C. M. L. & L. M. Company:  Date & Time:  4 14 13 9:00 M.  Date & Time:  Date & Time:  A 20 00 M.  Date & Time:  A 20 00 M.  Date & Time:  A 20 00 M.  Date & Time:  A 20 00 M.  Date & Time:  A 20 00 M.  Date & Time:  A 20 00 M.  Date & Time:  A 20 00 M.  Date & Time:  A 20 00 M.  Date & Time:  A 20 00 M.	SP-6W-KHW05-040313	<u> </u>	1550	$\geq$	12	X	X	X	1	X	X	X	X	
Relinquished by:   Recoked by:   Recoked by:   Relinquished by:   Re	Relinquished by:   Signature   Received by:   (Signature   Signature   Structure   Structure   Structure   Structure   Printed Name:   Structure   Structure   Printed Name:   Printed Name:   Structure   Printed Name:   Print														
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Printed Name:  ONN MICLIANE Company:  Decit Consolition Date & Time:  14/3 9:00 Mary Date & Time:  1-1-2-2-3-3-3-3-3-3-3-3-3-3-3-3-3-3-3-3-	ANN MICLINE Company:  A CAT Company:  A CAT  A CAT  A CAT  A CAT  Company:	Comments/Special Instructions	Relinquished by: (Signature)	25/20	\	Received by: (Signature)	(		1	Refinquished t Signature)	: <b>x</b> c			Received by: (Signature)	
10 cot Consolition Date & Time: 11-11-12 Act Date & Time:	pect Consolpin Date & Time: 11-11-13 900 Date & Time:		Printed Name: $S_{\mathcal{L} \not N V}$	JV/V	ر کرو اگر	E \ `	7/2/	\$ 5.00 pt	3	Printed Name:				Printed Name	
Date & Time:      - t  \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \	Date & Time: [ / - L/_ vz		Company:	My Con	Sultion	Company:	ARK			Company:				Company:	
			Date & Time?	1/2 9	Son Am	Date & Time:	1.4.7	1		Date & Time:				Date & Time:	

meets standards for the industry. The total liability of ARI, its officers, agents, employees, or successors, arising out of or in connection with the requested services, shall not exceed amount for said services. The acceptance by the client of a proposal for services by ARI release ARI from any liability in excess thereof, not withstanding any provision to the contrary in any contract, purchase order or co-Limits of Liability: ARI will perform all requested services in accordance with appropriate methodology following ARI Standard Operating Procedures and the ARI Quality Assurance Program. This program signed agreement between ARI and the Client. Sample Retention Policy: All samples submitted to ARI will be appropriately discarded no sooner than 90 days after receipt or 60 days after submission of hardcopy data, whichever is longer, unless atternate retention schedules have been established by work-order or contract.



# Cooler Receipt Form

ARI Client:	Project Name: <u> </u>	th Park	Lund	et l
COC No(s):NA	Delivered by: Fed-Ex UPS Co		•	
Assigned ARI Job No: Wh77	Tracking No:			NA.
Preliminary Examination Phase:	·		-	
Were intact, properly signed and dated custody seals attact	ched to the outside of to cooler?		YES	<b>(</b> (3)
Were custody papers included with the cooler?		•	(Es	NO NO
Were custody papers properly filled out (ink, signed, etc.)			(ES)	NO
Temperature of Cooler(s) (°C) (recommended 2.0-6.0 °C f	•			140
If cooler temperature is out of compliance fill out form 0007		Toma Cua II	D#: 708	77967
T	· J		-	
Cooler Accepted by:	Date: VILL-13 Tir			
	forms and attach all shipping document	s		
Log-In Phase:				
Was a temperature blank included in the cooler?			YES	(NO)
What kind of packing material was used? Bubble	e Wrap Wet Ice Gel Packs Baggies Foa	m Blook Paper	Other:	
Was sufficient ice used (if appropriate)?		NA	YES	NO
Were all bottles sealed in individual plastic bags?	,		YES	<b>(MO)</b>
Did all bottles arrive in good condition (unbroken)?			VES	NO
Were all bottle labels complete and legible?	,		(FES)	NO
Did the number of containers listed on COC match with the	e number of containers received?	•	(ES)	NO
Did all bottle labels and tags agree with custody papers? .			(PE)s	NO
Were all bottles used correct for the requested analyses?			CYES	NO
Do any of the analyses (bottles) require preservation? (atta	ach preservation sheet, excluding VOCs)	. NA	O'ES	NO
Were all VOC vials free of air bubbles?		NA	(ES	NO
Was sufficient amount of sample sent in each bottle?			<b>VES</b>	/ NO
Date VOC Trip Blank was made at ARI		NA	3/21/	13
Was Sample Split by ARI: (NA) YES Date/Time	e:		Split by:	
) IM	0/11/10			
Samples Logged by:	Date:Time	:		
** Notify Project M	fanager of discrepancies or concerns **	•		
Sample ID on Bottle Sample ID on CC	DC Sample ID on Bottle	Samp	ole ID on CO	c
	·	·		
Additional Notes, Discrepancies, & Resolutions:		i ii		
Samples mwi8, mwz, mwi4+	Mwiz Were in cool	or with	113-1	
Samples KMW03A + KMW05	Were in Cooler w.	H1 713	- 2.	
By: Date: 4/4//3	TB-1 + TB-	•		bad for
Small Air Bobbles Peabubbles LARGE Air Bubbl		nalyse		. 1
-2mm 2-4 mm > 4 mm	Peabubbles → "pb"	NA W	1m 1/1	y logo
	Large → "lg"	101 27 O	1111 10	· - '
Волите продолжения в постанования в применя в применя в постанования в постанова	Hendennes → "he?"			

0016F 3/2/10 Cooler Receipt Form

Revision 014

# Sample ID Cross Reference Report



ARI Job No: WK27 Client: Aspect Consulting Project Event: 100116

Project Name: South Park Landfill

	Sample ID	ARI Lab ID	ARI LIMS ID	Matrix	Sample Date/Time	VTSR
1.	SPL-GW-MW18-040313	WK27A	13-7128	Water	04/03/13 09:30	04/04/13 09:00
2.	SPL-GW-MW29-040313	WK27B	13-7129	Water	04/03/13 10:35	04/04/13 09:00
3.	SPL-GW-MW14-040313	WK27C	13-7130	Water	04/03/13 11:30	04/04/13 09:00
4.	SPL-GW-MW12-040313	WK27D	13-7131	Water	04/03/13 12:30	04/04/13 09:00
5.	SPL-GW-KMW03A-040313	WK27E	13-7132	Water	04/03/13 14:00	04/04/13 09:00
6.	SPL-GW-KMW05-040313	WK27F	13-7133	Water	04/03/13 15:50	04/04/13 09:00
7.	TB-1	WK27G	13-7134	Water	04/03/13	04/04/13 09:00
8.	TB-2	WK27H	13-7135	Water	04/03/13	04/04/13 09:00
9.	SPL-GW-MW18-040313	WK27I	13-7136	Water	04/03/13 09:30	04/04/13 09:00
10.	SPL-GW-MW29-040313	WK27J	13-7137	Water	04/03/13 10:35	04/04/13 09:00
11.	SPL-GW-MW14-040313	WK27K	13-7138	Water	04/03/13 11:30	04/04/13 09:00
12.	SPL-GW-MW12-040313	WK27L	13-7139	Water	04/03/13 12:30	04/04/13 09:00
13.	SPL-GW-KMW03A-040313	WK27M	13-7140	Water	04/03/13 14:00	04/04/13 09:00
14.	SPL-GW-KMW05-040313	WK27N	13-7141	Water	04/03/13 15:50	04/04/13 09:00

Printed 04/04/13 Page 1 of 1

WYD7 MOOGI

PRESERVATION VERIFICATION 04/04/13

Page

Inquiry Number: NONE Analysis Requested: 04/04/13 Contact: Strunk, John

Client: Aspect Consulting

Logged by: JM Sample Set Used: Yes-481

Validatable Package: No

Deliverables:

ANALYTICAL (RESOURCES (NINCORPORATED

ARI Job No: WK27

PC: Kelly VTSR: 04/04/13

Project: South Park Landfill Project #: 100116 Sample Site:

SDG No:

Analytical Protocol: In-house

LOGNUM ARI ID	CLIENT ID	CN >12	WAD >12	NH3	COD	F0G <2	MET <2	PHEN <2	PHOS <2	TKN NO23		10C	S2 TP > 9	TPHD Fe2+	2+ DM	DMET DOC FLT FLT	PARAMETER	ADJUSTED LOT TO NUMBI	) LOT NUMBER	AMOUNT	T D DATE/BY
13-7128 WK27A	SPL-GW-MW18-040313			0			<b>P</b>						T								
13-7129 <b>WK27B</b>	SPL-GW-MW29-040313			_			<b>E</b>						11	_							
13-7130 WK27C	SPL-GW-MW14-040313			4			S L						77								
13-7131 WK27D	SPL-GW-MW12-040313			d			Q .						1								
13-7132 <b>WK27E</b>	SPL-GW-KMW03A-040313			<u>م</u>			P.						11-					- ~-			
13-7133 WK27F	SPL-GW-KMW05-040313			1			缸						14								0KQ+)
13-7136 WK27I	SPL-GW-MW18-040313						Sc.								7						
13-7137 <b>WK27J</b>	SPL-GW-MW29-040313						<u>sa</u>								7					,	!
13-7138 <b>wr27r</b>	SPL-GW-MW14-040313						2								74						
13-7139 WK27L	SPL-GW-MW12-040313						S.								>-			100			
13-7140 WK27M	SPL-GW-KMW03A-040313						Se								7						
**************************************	SPL-GW-KMW05-040313						\$\overline{T}_{\				_	_			*	<u>.</u>		4	rshedu	7	MO 81.4.4 - HUT SHOW 67
<b>0000</b> 5								P"	Sg.	3	P= Pass , F= fa,	9				Š	Sa only preserved with	Jang 12	12 S		5, th

Checked By  $\mathcal{M}$  Date  $\mathcal{U}[\mathcal{U}]$ 

PRESERVATION VERIFICATION 04/04/13

1 of 1 Page Inquiry Number: NONE Analysis Requested: 04/04/13 Contact: Strunk, John

Client: Aspect Consulting

Logged by: JM Sample Set Used: Yes-481

Validatable Package: No

Deliverables:

PC: Kelly VTSR: 04/04/13

ARI Job No: WK27

ANALYTICAL (C)
RESOURCES (INCORPORATED

Project #: 100116 Project: South Park Landfill

Sample Site: SDG No:

Analytical Protocol: In-house

LOGNUM ARI ID	CLIENT ID	CN >12	WAD >12	NH3 <2	COD <2	F0G <	MET <2	PHEN F	PHOS <	TKN N(	NO23 T	TOC S:	\$2 TP	TPHD Fe2+	+ DME	DMET DOC FLT FLT	PARAMETER	ADJUSTED TO	D LOT NUMBER	AMOUNT R ADDED	DED	DATE/BY
13-7128 WK27A	SPL-GW-MW18-040313			5			<b>P</b>					E-b-	<i>)</i> /				1	712		7 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	2	2-4-2
13-7129 WK27B	SPL-GW-MW29-040313			Δ			5					g-4-	11									
13-7130 <b>WK27c</b>	SPL-GW-MW14-040313			4			P <sub>T</sub>					17	- 11									
13-7131 WK27D	SPL-GW-MW12-040313			Q.			2	-				1-	Ì,									
13-7132 <b>WK27E</b>	SPI-GW-KMW03A-040313			9			50					L	11-					S				
13-7133 WK27F	SPL-GW-KMW05-040313			17			ĬĮ.					1.1							<b>\</b>			
13-7136 WK27I	SPL-GW-MW18-040313						S								*							
13-7137 WK27J	SPL-GW-MW29-040313						Š)								×			A				
13-7138 <b>w</b> K27K	SPL-GW-MW14-040313					`	<u>a</u>								<b>&gt;</b> →							
13-7139 WK27L	SPL-GW-MW12-040313						SE_								7			, 1880 cm da aca				
3-7140 WK27M	SPL-GW-KMW03A-040313						S								×							
** 3-7141 WK27N	SPI-GW-KMW05-040313						Ø								7							
0000S							,	P. Pa	Lag	wo (F= fail	Li'	(a)				S	Sa only preserved with Enorge.	Pres	\$ 5 K	10 de 1	3	44

Checked By  $\mathcal{J}^{\mathcal{M}}$  Date  $\dot{\mathcal{L}}(\dot{\mathcal{L}})$ 

# ANALYTICAL RESOURCES INCORPORATED

# ORGANICS ANALYSIS DATA SHEET

Volatiles by Purge & Trap GC/MS-Method SW8260C Sample ID: SPL-GW-MW18-040313

Page 1 of 1 SAMPLE

Lab Sample ID: WK27A LIMS ID: 13-7128

Matrix: Water

Data Release Authorized:

Instrument/Analyst: NT3/PAB

Date Analyzed: 04/06/13 06:44

Reported: 04/10/13

QC Report No: WK27-Aspect Consulting Project: South Park Landfill

100116

Date Sampled: 04/03/13 Date Received: 04/04/13

Sample Amount: 10.0 mL Purge Volume: 10.0 mL

CAS Number	Analyte	LOQ	Result	Q
156-59-2 79-01-6	cis-1,2-Dichloroethene Trichloroethene	0.20	< 0.20	U

Reported in µg/L (ppb)

# Volatile Surrogate Recovery

d4-1,2-Dichloroethane	104%
d8-Toluene	102%
Bromofluorobenzene	99.3%
d4-1,2-Dichlorobenzene	105%

FORM I WK27:00007



Volatiles by Purge & Trap GC/MS-Method SW8260C Sample ID: SPL-GW-MW29-040313

Page 1 of 1 SAMPLE

Lab Sample ID: WK27B LIMS ID: 13-7129

Matrix: Water

Data Release Authorized: WW

Reported: 04/10/13

Instrument/Analyst: NT3/PAB
Date Analyzed: 04/06/13 07:10

QC Report No: WK27-Aspect Consulting Project: South Park Landfill

100116

Date Sampled: 04/03/13 Date Received: 04/04/13

Sample Amount: 10.0 mL Purge Volume: 10.0 mL

CAS Number	Analyte	LOQ	Result	Q
156-59-2	cis-1,2-Dichloroethene	0.20	< 0.20	U
79-01-6	Trichloroethene	0.20	< 0.20	U

Reported in µg/L (ppb)

# Volatile Surrogate Recovery

d4-1,2-Dichloroethane	104%
d8-Toluene	102%
Bromofluorobenzene	102%
d4-1,2-Dichlorobenzene	106%

FORM I WK27:00008



Volatiles by Purge & Trap GC/MS-Method SW8260C

Page 1 of 1

Sample ID: SPL-GW-MW14-040313

SAMPLE

Lab Sample ID: WK27C LIMS ID: 13-7130

Matrix: Water

Data Release Authorized:

Instrument/Analyst: NT3/PAB

Date Analyzed: 04/06/13 07:37

Reported: 04/10/13

QC Report No: WK27-Aspect Consulting Project: South Park Landfill

100116

Date Sampled: 04/03/13 Date Received: 04/04/13

Sample Amount: 10.0 mL Purge Volume: 10.0 mL

CAS Number	Analyte	LOQ	Result	Q
156-59-2	cis-1,2-Dichloroethene	0.20	< 0.20	-
79-01-6	Trichloroethene	0.20	< 0.20	

Reported in µg/L (ppb)

d4-1,2-Dichloroethane	102%
d8-Toluene	104%
Bromofluorobenzene	100%
d4-1,2-Dichlorobenzene	103%



Volatiles by Purge & Trap GC/MS-Method SW8260C Sam

Page 1 of 1

Sample ID: SPL-GW-MW12-040313

SAMPLE

Lab Sample TD: WK27D LIMS ID: 13-7131

Matrix: Water

Data Release Authorized:

Reported: 04/10/13

Instrument/Analyst: NT3/PAB
Date Analyzed: 04/06/13 08:03

QC Report No: WK27-Aspect Consulting

Project: South Park Landfill

100116

Date Sampled: 04/03/13 Date Received: 04/04/13

Sample Amount: 10.0 mL Purge Volume: 10.0 mL

CAS Number	Analyte	TOŌ	Result Q
156-59-2	cis-1,2-Dichloroethene	0.20	3.1
79-01-6	Trichloroethene	0.20	0.37

Reported in µg/L (ppb)

d4-1,2-Dichloroethane	108%
d8-Toluene	99.0%
Bromofluorobenzene	99.2%
d4-1,2-Dichlorobenzene	106%

Volatiles by Purge & Trap GC/MS-Method SW8260C Sample ID: SPL-GW-KMW03A-040313

Page 1 of 1 SAMPLE

Lab Sample ID: WK27E LIMS ID: 13-7132

Matrix: Water

Data Release Authorized:

Reported: 04/10/13

Instrument/Analyst: NT3/PAB
Date Analyzed: 04/06/13 08:30

QC Report No: WK27-Aspect Consulting Project: South Park Landfill

100116

Date Sampled: 04/03/13 Date Received: 04/04/13

Sample Amount: 10.0 mL Purge Volume: 10.0 mL

CAS Number	Analyte	LOQ	Result	Ω
156-59-2 79-01-6	cis-1,2-Dichloroethene Trichloroethene	0.20	< 0.20	_

Reported in µg/L (ppb)

d4-1,2-Dichloroethane	103%
d8-Toluene	102%
Bromofluorobenzene	99.3%
d4-1,2-Dichlorobenzene	105%

# **ANALYTICAL** RESOURCES **INCORPORATED**

# ORGANICS ANALYSIS DATA SHEET

Volatiles by Purge & Trap GC/MS-Method SW8260C Sample ID: SPL-GW-KMW05-040313

SAMPLE Page 1 of 1

Lab Sample ID: WK27F LIMS ID: 13-7133

Matrix: Water

Data Release Authorized: Www

Reported: 04/10/13

Instrument/Analyst: NT3/PAB Date Analyzed: 04/06/13 09:50 QC Report No: WK27-Aspect Consulting

Project: South Park Landfill

100116

Date Sampled: 04/03/13 Date Received: 04/04/13

Sample Amount: 0.500 mL Purge Volume: 10.0 mL

CAS Number	Analyte	LOQ	Result	Q
156-59-2 79-01-6	cis-1,2-Dichloroethene Trichloroethene	4.0 4.0	< 4.0 < 4.0	U U
71-43-2	Benzene	4.0	8.2	

FORM I

Reported in µg/L (ppb)

# Volatile Surrogate Recovery

d4-1,2-Dichloroethane	102%
d8-Toluene	103%
Bromofluorobenzene	104%
d4-1,2-Dichlorobenzene	102%

W27:00012



Volatiles by Purge & Trap GC/MS-Method SW8260C Sample ID: TB-1

Page 1 of 1

Lab Sample ID: WK27G LIMS ID: 13-7134

Matrix: Water

Data Release Authorized:

Reported: 04/10/13

Instrument/Analyst: NT3/PAB Date Analyzed: 04/06/13 08:57 SAMPLE

QC Report No: WK27-Aspect Consulting

Project: South Park Landfill

100116

Date Sampled: 04/03/13 Date Received: 04/04/13

Sample Amount: 10.0 mL Purge Volume: 10.0 mL

CAS Number	Analyte	LOQ	Result	Q
156-59-2	cis-1,2-Dichloroethene	0.20	< 0.20	-
79-01-6	Trichloroethene	0.20	< 0.20	Ţ

Reported in µg/L (ppb)

d4-1,2-Dichloroethane	109%
d8-Toluene	101%
Bromofluorobenzene	99.4%
d4-1,2-Dichlorobenzene	105%



Matrix: Water

Volatiles by Purge & Trap GC/MS-Method SW8260C Sample ID: TB-2

Page 1 of 1 SAMPLE

Lab Sample ID: WK27H QC Report No: WK27-Aspect Consulting LIMS ID: 13-7135 Project: South Park Landfill

100116

Data Release Authorized: Date Sampled: 04/03/13 Reported: 04/10/13 Date Received: 04/04/13

Instrument/Analyst: NT3/PAB Sample Amount: 10.0 mL Date Analyzed: 04/06/13 09:24 Purge Volume: 10.0 mL

CAS Number	Analyte	LOQ	Result	Q
156-59-2 79-01-6 71-43-2	cis-1,2-Dichloroethene Trichloroethene Benzene	0.20 0.20 0.20	< 0.20 < 0.20 < 0.20	U

Reported in µg/L (ppb)

# Volatile Surrogate Recovery

d4-1,2-Dichloroethane	109%
d8-Toluene	103%
Bromofluorobenzene	99.7%
d4-1,2-Dichlorobenzene	105%

FORM I WK27:00014



Volatiles by Purge & Trap GC/MS-Method SW8260C

Sample ID: MB-040513A METHOD BLANK Page 1 of 1

QC Report No: WK27-Aspect Consulting

100116

Date Sampled: NA

Date Received: NA

Project: South Park Landfill

Lab Sample ID: MB-040513A

LIMS ID: 13-7133 Matrix: Water

Reported: 04/10/13

Data Release Authorized: WW

Sample Amount: 10.0 mL Instrument/Analyst: NT3/PAB Purge Volume: 10.0 mL Date Analyzed: 04/06/13 00:56

CAS Number	Analyte	LOQ	Result	Q
156-59-2 79-01-6	cis-1,2-Dichloroethene Trichloroethene	0.20 0.20	< 0.20 < 0.20	U
71-43-2	Benzene	0.20	< 0.20	U

Reported in  $\mu g/L$  (ppb)

# Volatile Surrogate Recovery

d4-1,2-Dichloroethane	100%
d8-Toluene	102%
Bromofluorobenzene	102%
d4-1,2-Dichlorobenzene	105%

WK27:00015 FORM I

# **RESOURCES** INCORPORATED

# VOA SURROGATE RECOVERY SUMMARY

QC Report No: WK27-Aspect Consulting Project: South Park Landfill Matrix: Water

(80-120)

100116

ARI ID	Client ID	PV	DCE	TOL	BFB	DCB	TOT OUT
WK27A	SPL-GW-MW18-040313	10	104%	102%	99.3%	105%	0
WK27B	SPL-GW-MW29-040313	10	104%	102%	102%	106%	0
WK27C	SPL-GW-MW14-040313	10	102%	104%	100%	103%	0
WK27D	SPL-GW-MW12-040313	10	108%	99.0%	99.2%	106%	0
WK27E	SPL-GW-KMW03A-040313	10	103%	102%	99.3%	105%	0
MB-040513A	Method Blank	10	100%	102%	102%	105%	0
LCS-040513A	Lab Control	10	91.5%	102%	106%	101%	0
LCSD-040513A	Lab Control Dup	10	100%	104%	105%	103%	0
WK27F	SPL-GW-KMW05-040313	10	102%	103%	104%	102%	0
WK27G	TB-1	10	109%	101%	99.4%	105%	0
WK27H	TB-2	10	109%	103%	99.7%	105%	0
		LCS/MB LIMITS			QC LIMI	rs	
SW8260C			•			_	
(DCE) = d4-1, 2-Dichloroethane		(80-120)		(80-130)			
(TOL) = d8-Tc		(80-120)		)	(80-120)		
,,	,,		(80-120	•		(80-120	- •

Prep Method: SW5030B

(DCB) = d4-1, 2-Dichlorobenzene

Log Number Range: 13-7128 to 13-7135

(80-120)

WK27:00016

# ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET

Volatiles by Purge & Trap GC/MS-Method SW8260C

Page 1 of 1

Sample ID: LCS-040513A

LAB CONTROL SAMPLE

Lab Sample ID: LCS-040513A

LIMS ID: 13-7133

Matrix: Water

Data Release Authorized:

Reported: 04/10/13

QC Report No: WK27-Aspect Consulting

Project: South Park Landfill

100116

Date Sampled: NA Date Received: NA

Instrument/Analyst LCS: NT3/PAB

LCSD: NT3/PAB

Date Analyzed LCS: 04/06/13 00:02

LCSD: 04/06/13 00:29

Sample Amount LCS: 10.0 mL

LCSD: 10.0 mL

Purge Volume LCS: 10.0 mL

LCSD: 10.0 mL

Analyte	LCS	Spike Added-LCS	LCS Recovery	LCSD	Spike Added-LCSD	LCSD Recovery	RPD
cis-1,2-Dichloroethene	8.90	10.0	89.0%	9.62	10.0	96.2%	7.8%
Trichloroethene	10.2	10.0	102%	10.1	10.0	101%	1.0%
Benzene	9.83	10.0	98.3%	9.92	10.0	99.2%	0.9%

Reported in µg/L (ppb)

RPD calculated using sample concentrations per SW846.

# Volatile Surrogate Recovery

	LCS	LCSD
d4-1,2-Dichloroethane	91.5%	100%
d8-Toluene	102%	104%
Bromofluorobenzene	106%	105%
d4-1,2-Dichlorobenzene	101%	103%

FORM III

WK27:00017

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET

Volatiles by Purge & Trap GC/MS-Method SW8260C-SIM Sample ID: SPL-GW-MW18-040313

Page 1 of 1

Lab Sample ID: WK27A LIMS ID: 13-7128

Matrix: Water

Data Release Authorized:

Reported: 04/09/13

Instrument/Analyst: NT7/PAB
Date Analyzed: 04/08/13 20:09

QC Report No: WK27-Aspect Consulting Project: South Park Landfill

100116

Date Sampled: 04/03/13 Date Received: 04/04/13

Sample Amount: 10.0 mL Purge Volume: 10.0 mL

CAS Number Analyte RL Result Q
75-01-4 Vinyl Chloride 0.020 0.072

Reported in µg/L (ppb)

Volatile Surrogate Recovery

d4-1,2-Dichloroethane 122%



Volatiles by Purge & Trap GC/MS-Method SW8260C-SIM Sample ID: SPL-GW-MW29-040313

SAMPLE Page 1 of 1

Lab Sample ID: WK27B LIMS ID: 13-7129

Matrix: Water

Data Release Authorized: \times

Reported: 04/09/13

Instrument/Analyst: NT7/PAB Date Analyzed: 04/08/13 20:37 QC Report No: WK27-Aspect Consulting Project: South Park Landfill

100116

Date Sampled: 04/03/13 Date Received: 04/04/13

Sample Amount: 10.0 mL Purge Volume: 10.0 mL

CAS Number	Analyte	RL	Result	Q
75-01-4	Vinyl Chloride	0.020	< 0.020	U

Reported in µg/L (ppb)

Volatile Surrogate Recovery

d4-1,2-Dichloroethane 118%

> FORM I WK27:00019



Volatiles by Purge & Trap GC/MS-Method SW8260C-SIM Sample ID: SPL-GW-MW14-040313

SAMPLE Page 1 of 1

Lab Sample ID: WK27C LIMS ID: 13-7130

Matrix: Water

Data Release Authorized: \tag{W}

Reported: 04/09/13

Instrument/Analyst: NT7/PAB Date Analyzed: 04/08/13 21:05 QC Report No: WK27-Aspect Consulting

Project: South Park Landfill

100116

Date Sampled: 04/03/13 Date Received: 04/04/13

Sample Amount: 10.0 mL Purge Volume: 10.0 mL

CAS Number Analyte RLResult Q 75-01-4 Vinyl Chloride 0.020 < 0.020 U

Reported in µg/L (ppb)

Volatile Surrogate Recovery

d4-1,2-Dichloroethane 127%

> FORM I LW27: BBB28



Volatiles by Purge & Trap GC/MS-Method SW8260C-SIM Sample ID: SPL-GW-MW12-040313

Page 1 of 1 SAMPLE

Lab Sample ID: WK27D

LIMS ID: 13-7131

Matrix: Water

Data Release Authorized: WW Reported: 04/09/13

Instrument/Analyst: NT7/PAB Date Analyzed: 04/08/13 21:32 QC Report No: WK27-Aspect Consulting

Project: South Park Landfill

100116

Date Sampled: 04/03/13 Date Received: 04/04/13

Sample Amount: 10.0 mL Purge Volume: 10.0 mL

CAS Number	Analyte	RL	Result	Q
75-01-4	Vinyl Chloride	0.020	0.10	

Reported in µg/L (ppb)

Volatile Surrogate Recovery

d4-1,2-Dichloroethane 125%

FORM I

**ANALYTICAL RESOURCES** INCORPORATED

ORGANICS ANALYSIS DATA SHEET

Volatiles by Purge & Trap GC/MS-Method SW8260C-SIM Sample ID: SPL-GW-KMW03A-040313

Page 1 of 1

SAMPLE

Lab Sample ID: WK27E LIMS ID: 13-7132

Matrix: Water

Data Release Authorized:

Reported: 04/09/13

Instrument/Analyst: NT7/PAB Date Analyzed: 04/08/13 22:00 QC Report No: WK27-Aspect Consulting

Project: South Park Landfill

100116

Date Sampled: 04/03/13 Date Received: 04/04/13

Sample Amount: 10.0 mL Purge Volume: 10.0 mL

CAS Number Analyte RLResult Q 75-01-4 Vinyl Chloride 0.020 0.30

Reported in µg/L (ppb)

Volatile Surrogate Recovery

d4-1,2-Dichloroethane 121%

> FORM I WK27:00022



Volatiles by Purge & Trap GC/MS-Method SW8260C-SIM Sample ID: SPL-GW-KMW05-040313

Page 1 of 1 SAMPLE

Lab Sample ID: WK27F LIMS ID: 13-7133

Matrix: Water

Data Release Authorized: WW

Reported: 04/09/13

Instrument/Analyst: NT7/PAB
Date Analyzed: 04/08/13 22:27

QC Report No: WK27-Aspect Consulting

Project: South Park Landfill

100116

Date Sampled: 04/03/13 Date Received: 04/04/13

Sample Amount: 0.500 mL Purge Volume: 10.0 mL

CAS Number	Analyte	RL	Result	Q
75-01-4	Vinyl Chloride	0.40	< 0.40	U

Reported in µg/L (ppb)

Volatile Surrogate Recovery

d4-1,2-Dichloroethane 117%

FORM I UK27:00023



Volatiles by Purge & Trap GC/MS-Method SW8260C-SIM Sample ID: TB-1 Page 1 of 1 SAMPLE

Lab Sample ID: WK27G LIMS ID: 13-7134

Matrix: Water

Data Release Authorized:

Reported: 04/09/13

Instrument/Analyst: NT7/PAB
Date Analyzed: 04/08/13 22:55

QC Report No: WK27-Aspect Consulting

Project: South Park Landfill

100116

Date Sampled: 04/03/13 Date Received: 04/04/13

Sample Amount: 10.0 mL Purge Volume: 10.0 mL

CAS Number	Analyte	RL	Result	Q
75-01-4	Vinyl Chloride	0.020	< 0.020	U

Reported in µg/L (ppb)

Volatile Surrogate Recovery

d4-1,2-Dichloroethane 124%

FORM I WK27:00024



Volatiles by Purge & Trap GC/MS-Method SW8260C-SIM Sample ID: TB-2
Page 1 of 1 SAMPLE

Lab Sample ID: WK27H LIMS ID: 13-7135

Matrix: Water

Data Release Authorized: \tag{W}

Reported: 04/09/13

Instrument/Analyst: NT7/PAB
Date Analyzed: 04/08/13 23:23

QC Report No: WK27-Aspect Consulting

Project: South Park Landfill

100116

Date Sampled: 04/03/13 Date Received: 04/04/13

Sample Amount: 10.0 mL Purge Volume: 10.0 mL

CAS Number	Analyte	RL	Result	Q
75-01-4	Vinyl Chloride	0.020	< 0.020	U

Reported in µg/L (ppb)

Volatile Surrogate Recovery

d4-1,2-Dichloroethane 127%

FORM I UK27:00025



Volatiles by Purge & Trap GC/MS-Method SW8260C-SIM Sample ID: MB-040813

Page 1 of 1 METHOD BLANK

Lab Sample ID: MB-040813

LIMS ID: 13-7128 Matrix: Water

Data Release Authorized: \\

Reported: 04/09/13

Instrument/Analyst: NT7/PAB
Date Analyzed: 04/08/13 17:14

QC Report No: WK27-Aspect Consulting

Project: South Park Landfill

100116

Date Sampled: NA Date Received: NA

Sample Amount: 10.0 mL Purge Volume: 10.0 mL

 CAS Number
 Analyte
 RL
 Result
 Q

 75-01-4
 Vinyl Chloride
 0.020
 < 0.020</td>
 U

Reported in µg/L (ppb)

Volatile Surrogate Recovery

d4-1,2-Dichloroethane 116%

FORM I WK27:00026



#### SW8260-SIM SURROGATE RECOVERY SUMMARY

QC Report No: WK27-Aspect Consulting Project: South Park Landfill Matrix: Water

100116

Client ID	DCE	TOT OUT
MB-040813	116%	0
LCS-040813	112%	0
LCSD-040813	115%	0
SPL-GW-MW18-040313	122%	0
SPL-GW-MW29-040313	118%	0
SPL-GW-MW14-040313	127%	0
SPL-GW-MW12-040313	125%	0
SPL-GW-KMW03A-040313	121%	0
SPL-GW-KMW05-040313	117%	0
TB-1	124%	0
TB-2	127%	0

LCS/MB LIMITS QC LIMITS

(DCE) = d4-1, 2-Dichloroethane

(78-126)

(80-129)

Prep Method: SW5030

Log Number Range: 13-7128 to 13-7135



Volatiles by Purge & Trap GC/MS-Method SW8260C-SIM Sample ID: LCS-040813

LAB CONTROL SAMPLE Page 1 of 1

Lab Sample ID: LCS-040813

LIMS ID: 13-7128

Matrix: Water Data Release Authorized: ( )

Reported: 04/09/13

Instrument/Analyst LCS: NT7/PAB

LCSD: NT7/PAB

Date Analyzed LCS: 04/08/13 16:19

LCSD: 04/08/13 16:47

QC Report No: WK27-Aspect Consulting Project: South Park Landfill

100116

Date Sampled: NA Date Received: NA

Sample Amount LCS: 10.0 mL

LCSD: 10.0 mL Purge Volume LCS: 10.0 mL

LCSD: 10.0 mL

Analyte	LCS	Spike Added-LCS	LCS Recovery	LCSD	Spike Added-LCSD	LCSD Recovery	RPD
Vinyl Chloride	0.940	1.00	94.0%	0.906	1.00	90.6%	3.7%

Reported in µg/L (ppb)

RPD calculated using sample concentrations per SW846.

Volatile Surrogate Recovery

LCS LCSD d4-1,2-Dichloroethane 112% 115%

> FORM III LIK27 BOBSA



### INORGANICS ANALYSIS DATA SHEET TOTAL METALS

Page 1 of 1

Lab Sample ID: WK27A LIMS ID: 13-7128

Matrix: Water

Data Release Authorized: Reported: 04/12/13

Sample ID: SPL-GW-MW18-040313

SAMPLE

QC Report No: WK27-Aspect Consulting Project: South Park Landfill

100116

Date Sampled: 04/03/13 Date Received: 04/04/13

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/L Q
3010A	04/05/13	6010C	04/11/13	7439-89-6	Iron	0.05	59.6
3010A	04/05/13	6010C	04/11/13	7439-96-5	Manganese	0.001	1.57

U-Analyte undetected at given RL RL-Reporting Limit



TOTAL METALS Sample ID: SPL-GW-MW18-040313

Page 1 of 1 DUPLICATE

Lab Sample ID: WK27A

LIMS ID: 13-7128 Matrix: Water

Data Release Authorized

Reported: 04/12/13

QC Report No: WK27-Aspect Consulting Project: South Park Landfill

100116

Date Sampled: 04/03/13 Date Received: 04/04/13

#### MATRIX DUPLICATE QUALITY CONTROL REPORT

Analyte	Analysis Method	Sample	Duplicate	RPD	Control Limit	Q
Iron	6010C	59.6	59.8	0.3%	+/- 20%	
Manganese	6010C	1.57	1.57	0.0%	+/- 20%	

Reported in mg/L

\*-Control Limit Not Met

L-RPD Invalid, Limit = Detection Limit

FORM-VI



TOTAL METALS

Page 1 of 1

Lab Sample ID: WK27A

LIMS ID: 13-7128

Matrix: Water

Data Release Authorized

Reported: 04/12/13

Sample ID: SPL-GW-MW18-040313

MATRIX SPIKE

QC Report No: WK27-Aspect Consulting

Project: South Park Landfill

100116

Date Sampled: 04/03/13 Date Received: 04/04/13

#### MATRIX SPIKE QUALITY CONTROL REPORT

	Analysis			Spike	8	
Analyte	Method	Sample	Spike	Added	Recovery	Q
Iron	6010C	59.6	61.8	2.00	110%	Н
Manganese	6010C	1.57	2.07	0.500	100%	

Reported in mg/L

N-Control Limit Not Met

H-% Recovery Not Applicable, Sample Concentration Too High

NA-Not Applicable, Analyte Not Spiked

Percent Recovery Limits: 75-125%

FORM-V



TOTAL METALS

Page 1 of 1

Lab Sample ID: WK27B

LIMS ID: 13-7129

Matrix: Water

Data Release Authorized:

Reported: 04/12/13

Sample ID: SPL-GW-MW29-040313

SAMPLE

QC Report No: WK27-Aspect Consulting

Project: South Park Landfill

100116

Date Sampled: 04/03/13 Date Received: 04/04/13

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/L	Q
3010A	04/05/13	6010C	04/11/13	7439-89-6	Iron	0.05	16.6	
3010A	04/05/13	6010C	04/11/13	7439-96-5	Manganese	0.001	1.36	

U-Analyte undetected at given RL RL-Reporting Limit



TOTAL METALS

Page 1 of 1

Lab Sample ID: WK27C

LIMS ID: 13-7130

Matrix: Water Data Release Authorized:

Reported: 04/12/13

Sample ID: SPL-GW-MW14-040313

SAMPLE

QC Report No: WK27-Aspect Consulting

Project: South Park Landfill

100116

Date Sampled: 04/03/13 Date Received: 04/04/13

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/L	Q
3010A	04/05/13	6010C	04/11/13	7439-89-6	Iron	0.05	4.80	
3010A	04/05/13	6010C	04/11/13	7439-96-5	Manganese	0.001	0.587	

U-Analyte undetected at given RL RL-Reporting Limit



## INORGANICS ANALYSIS DATA SHEET TOTAL METALS

Page 1 of 1

Lab Sample ID: WK27D

LIMS ID: 13-7131 Matrix: Water

Data Release Authorized:

Reported: 04/12/13

Sample ID: SPL-GW-MW12-040313

SAMPLE

QC Report No: WK27-Aspect Consulting

Project: South Park Landfill

100116

Date Sampled: 04/03/13 Date Received: 04/04/13

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/L	Q
3010A	04/05/13	6010C	04/11/13	7439-89-6	Iron	0.05	11.3	
3010A	04/05/13	6010C	04/11/13	7439-96-5	Manganese	0.001	0.769	

U-Analyte undetected at given RL RL-Reporting Limit

MKS1: 6663H



TOTAL METALS

Page 1 of 1

Lab Sample ID: WK27E

LIMS ID: 13-7132 Matrix: Water

Data Release Authorized:

Reported: 04/12/13

Sample ID: SPL-GW-KMW03A-040313

SAMPLE

QC Report No: WK27-Aspect Consulting

Project: South Park Landfill

100116

Date Sampled: 04/03/13
Date Received: 04/04/13

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/L	Q
3010A	04/05/13	6010C	04/11/13	7439-89-6	Iron	0.05	10.2	
3010A	04/05/13	6010C	04/11/13	7439-96-5	Manganese	0.001	0.050	

U-Analyte undetected at given RL RL-Reporting Limit



TOTAL METALS

Page 1 of 1

Lab Sample ID: WK27F LIMS ID: 13-7133

Matrix: Water

Data Release Authorized:

Reported: 04/12/13

Sample ID: SPL-GW-KMW05-040313

SAMPLE

QC Report No: WK27-Aspect Consulting

Project: South Park Landfill

100116

Date Sampled: 04/03/13
Date Received: 04/04/13

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/L	Q
3010A	04/05/13	6010C	04/11/13	7439-89-6	Iron	0.5	5.7	
3010A	04/05/13	6010C	04/11/13	7439-96-5	Manganese	0.01	0.01	U

U-Analyte undetected at given RL RL-Reporting Limit



Page 1 of 1

Lab Sample ID: WK27I

LIMS ID: 13-7136

Matrix: Water

Data Release Authorized:

Reported: 04/12/13

Sample ID: SPL-GW-MW18-040313

SAMPLE

QC Report No: WK27-Aspect Consulting

Project: South Park Landfill

100116

Date Sampled: 04/03/13 Date Received: 04/04/13

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/L Ç
3010A	04/09/13	6010C	04/11/13	7440-70-2	Calcium	0.05	70.8
3010A	04/09/13	6010C	04/11/13	7439-89-6	Iron	0.05	59.5
3010A	04/09/13	6010C	04/11/13	7439-95-4	Magnesium	0.05	62.2
3010A	04/09/13	6010C	04/11/13	7439-96-5	Manganese	0.001	1.57
3010A	04/09/13	6010C	04/11/13	7440-09-7	Potassium	0.5	16.6
3010A	04/09/13	6010C	04/11/13	7440-23-5	Sodium	0.5	33.8

U-Analyte undetected at given RL RL-Reporting Limit

W27:80037



DISSOLVED METALS

Page 1 of 1

Lab Sample ID: WK27I LIMS ID: 13-7136

Matrix: Water

Data Release Authorized

Reported: 04/12/13

Sample ID: SPL-GW-MW18-040313

DUPLICATE

QC Report No: WK27-Aspect Consulting

Project: South Park Landfill

100116

Date Sampled: 04/03/13 Date Received: 04/04/13

#### MATRIX DUPLICATE QUALITY CONTROL REPORT

	Analysis				Control	
Analyte	Method	Sample	Duplicate	RPD	Limit	Q
Calcium	6010C	70.8	71.7	1.3%	+/- 20%	
Iron	6010C	59.5	60.2	1.2%	+/- 20%	
Magnesium	6010C	62.2	62.8	1.0%	+/- 20%	
Manganese	6010C	1.57	1.59	1.3%	+/- 20%	
Potassium	6010C	16.6	16.9	1.8%	+/- 20%	
Sodium	6010C	33.8	34.2	1.2%	+/- 20%	

Reported in mg/L

\*-Control Limit Not Met

L-RPD Invalid, Limit = Detection Limit

UK27 GDD38



DISSOLVED METALS

Page 1 of 1

Lab Sample ID: WK27I LIMS ID: 13-7136

Matrix: Water

Data Release Authorized:

Reported: 04/12/13

Sample ID: SPL-GW-MW18-040313

MATRIX SPIKE

QC Report No: WK27-Aspect Consulting

Project: South Park Landfill

100116

Date Sampled: 04/03/13 Date Received: 04/04/13

#### MATRIX SPIKE QUALITY CONTROL REPORT

	Analysis			Spike	*	
Analyte	Method	Sample	Spike	Added	Recovery	Q
Calcium	6010C	70.8	83.7	10.0	129%	Н
Iron	6010C	59.5	63.4	2.00	195%	Н
Magnesium	6010C	62.2	72.4	10.0	102%	Н
Manganese	6010C	1.57	2.12	0.500	110%	
Potassium	6010C	16.6	28.3	10.0	117%	
Sodium	6010C	33.8	45.7	10.0	119%	

Reported in mq/L

N-Control Limit Not Met

H-% Recovery Not Applicable, Sample Concentration Too High

NA-Not Applicable, Analyte Not Spiked

Percent Recovery Limits: 75-125%

WY27:00039



Page 1 of 1

Lab Sample ID: WK27J

LIMS ID: 13-7137 Matrix: Water

Data Release Authorized:

Reported: 04/12/13

Sample ID: SPL-GW-MW29-040313

SAMPLE

QC Report No: WK27-Aspect Consulting

Project: South Park Landfill

100116

Date Sampled: 04/03/13 Date Received: 04/04/13

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/L	Q
3010A	04/09/13	6010C	04/11/13	7440-70-2	Calcium	0.05	147	
3010A	04/09/13	6010C	04/11/13	7439-89-6	Iron	0.05	15.8	
3010A	04/09/13	6010C	04/11/13	7439-95-4	Magnesium	0.05	35.5	
3010A	04/09/13	6010C	04/11/13	7439-96-5	Manganese	0.001	1.31	
3010A	04/09/13	6010C	04/11/13	7440-09-7	Potassium	0.5	10.8	
3010A	04/09/13	6010C	04/11/13	7440-23-5	Sodium	0.5	21.4	

U-Analyte undetected at given RL RL-Reporting Limit



Page 1 of 1

Lab Sample ID: WK27K LIMS ID: 13-7138

Matrix: Water

Data Release Authorized:

Reported: 04/12/13

(M)

Sample ID: SPL-GW-MW14-040313

SAMPLE

QC Report No: WK27-Aspect Consulting

Project: South Park Landfill

100116

Date Sampled: 04/03/13 Date Received: 04/04/13

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/L	Q
3010A	04/09/13	6010C	04/11/13	7440-70-2	Calcium	0.05	50.6	
3010A	04/09/13	6010C	04/11/13	7439-89-6	Iron	0.05	4.29	
3010A	04/09/13	6010C	04/11/13	7439-95-4	Magnesium	0.05	30.5	
3010A	04/09/13	6010C	04/11/13	7439-96-5	Manganese	0.001	0.576	
3010A	04/09/13	6010C	04/11/13	7440-09-7	Potassium	0.5	4.9	
3010A	04/09/13	6010C	04/11/13	7440-23-5	Sodium	0.5	16.3	

U-Analyte undetected at given RL

RL-Reporting Limit

FORM-I



Page 1 of 1

Lab Sample ID: WK27L

LIMS ID: 13-7139

Matrix: Water

Data Release Authorized:

Reported: 04/12/13

Sample ID: SPL-GW-MW12-040313

SAMPLE

QC Report No: WK27-Aspect Consulting

Project: South Park Landfill

100116

Date Sampled: 04/03/13 Date Received: 04/04/13

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/L	Q
3010A	04/09/13	6010C	04/11/13	7440-70-2	Calcium	0.05	30.8	
3010A	04/09/13	6010C	04/11/13	7439-89-6	Iron	0.05	7.97	
3010A	04/09/13	6010C	04/11/13	7439-95-4	Magnesium	0.05	16.4	
3010A	04/09/13	6010C	04/11/13	7439-96-5	Manganese	0.001	0.742	
3010A	04/09/13	6010C	04/11/13	7440-09-7	Potassium	0.5	4.0	
3010A	04/09/13	6010C	04/11/13	7440-23-5	Sodium	0.5	20.8	

U-Analyte undetected at given RL

RL-Reporting Limit



Page 1 of 1

Lab Sample ID: WK27M

LIMS ID: 13-7140 Matrix: Water

Data Release Authorized

Reported: 04/12/13

Sample ID: SPL-GW-KMW03A-040313

SAMPLE

QC Report No: WK27-Aspect Consulting

Project: South Park Landfill

100116

Date Sampled: 04/03/13 Date Received: 04/04/13

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/L Q
3010A	04/09/13	6010C	04/11/13	7440-70-2	Calcium	0.05	84.3
3010A	04/09/13	6010C	04/11/13	7439-89-6	Iron	0.05	10.4
3010A	04/09/13	6010C	04/11/13	7439-95-4	Magnesium	0.05	27.1
3010A	04/09/13	6010C	04/11/13	7439-96-5	Manganese	0.001	0.048
3010A	04/09/13	6010C	04/11/13	7440-09-7	Potassium	0.5	15.5
3010A	04/09/13	6010C	04/11/13	7440-23-5	Sodium	0.5	24.5

U-Analyte undetected at given RL RL-Reporting Limit



Page 1 of 1

Lab Sample ID: WK27N

LIMS ID: 13-7141 Matrix: Water

Data Release Authorized:

Reported: 04/12/13

Sample ID: SPL-GW-KMW05-040313

SAMPLE

QC Report No: WK27-Aspect Consulting

Project: South Park Landfill

100116

Date Sampled: 04/03/13 Date Received: 04/04/13

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/L	Q
3010A	04/09/13	6010C	04/11/13	7440-70-2	Calcium	0.5	9.8	
3010A	04/09/13	6010C	04/11/13	7439-89-6	Iron	0.5	5.0	
3010A	04/09/13	6010C	04/11/13	7439-95-4	Magnesium	0.5	0.5	Ū
3010A	04/09/13	6010C	04/11/13	7439-96-5	Manganese	0.01	0.01	U
3010A	04/09/13	6010C	04/11/13	7440-09-7	Potassium	5	4,160	
3010A	04/09/13	6010C	04/11/13	7440-23-5	Sodium	5	1,520	

U-Analyte undetected at given RL RL-Reporting Limit



TOTAL METALS

Page 1 of 1

Lab Sample ID: WK27MB

LIMS ID: 13-7129

Matrix: Water

Data Release Authorized:

Reported: 04/12/13

Sample ID: METHOD BLANK

QC Report No: WK27-Aspect Consulting

Project: South Park Landfill

100116

Date Sampled: NA Date Received: NA

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/L	Q
3010A	04/05/13	6010C	04/11/13	7439-89-6	Iron	0.05	0.05	U
3010A	04/05/13	6010C	04/11/13	7439-96-5	Manganese	0.001	0.001	U

U-Analyte undetected at given RL RL-Reporting Limit



## INORGANICS ANALYSIS DATA SHEET TOTAL METALS

Page 1 of 1

Lab Sample ID: WK27LCS

LIMS ID: 13-7129

Matrix: Water

Data Release Authorized:

Reported: 04/12/13

Sample ID: LAB CONTROL

QC Report No: WK27-Aspect Consulting

Project: South Park Landfill

100116

Date Sampled: NA Date Received: NA

#### BLANK SPIKE QUALITY CONTROL REPORT

Analyte	Analysis Method	Spike Found	Spike Added	% Recovery	Q
Iron	6010C	1.94	2.00	97.0%	
Manganese	6010C	0.478	0.500	95.6%	

Reported in mg/L

N-Control limit not met Control Limits: 80-120%

FORM-VII

WK27 DDDUE



Page 1 of 1

Lab Sample ID: WK27MB

LIMS ID: 13-7137

Matrix: Water

Data Release Authorized

Reported: 04/12/13

Sample ID: METHOD BLANK

QC Report No: WK27-Aspect Consulting

Project: South Park Landfill

100116

Date Sampled: NA Date Received: NA

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/L	Q
3010A	04/09/13	6010C	04/11/13	7440-70-2	Calcium	0.05	0.05	U
3010A	04/09/13	6010C	04/11/13	7439-89-6	Iron	0.05	0.05	U
3010A	04/09/13	6010C	04/11/13	7439-95-4	Magnesium	0.05	0.05	U
3010A	04/09/13	6010C	04/11/13	7439-96-5	Manganese	0.001	0.001	U
3010A	04/09/13	6010C	04/11/13	7440-09-7	Potassium	0.5	0.5	U
3010A	04/09/13	6010C	04/11/13	7440-23-5	Sodium	0.5	0.5	U

U-Analyte undetected at given RL RL-Reporting Limit



Page 1 of 1

Lab Sample ID: WK27LCS

LIMS ID: 13-7137

Matrix: Water

Data Release Authorized:

Reported: 04/12/13

Sample ID: LAB CONTROL

QC Report No: WK27-Aspect Consulting

Project: South Park Landfill

100116

Date Sampled: NA Date Received: NA

### BLANK SPIKE QUALITY CONTROL REPORT

	Analysis	Spike	Spike	8		
Analyte	Method	Found	Added	Recovery	Q	
Calcium	6010C	10.2	10.0	102%		
Iron	6010C	2.01	2.00	100%		
Magnesium	6010C	10.9	10.0	109%		
Manganese	6010C	0.495	0.500	99.0%		
Potassium	6010C	10.4	10.0	104%		
Sodium	6010C	10.2	10.0	102%		

Reported in mg/L

N-Control limit not met Control Limits: 80-120%



Matrix: Water

Matrix: Water
Data Release Authorized:

Reported: 04/11/13

Project: South Park Landfill Event: 100116 Date Sampled: 04/03/13 Date Received: 04/04/13

Client ID: SPL-GW-MW18-040313 ARI ID: 13-7128 WK27A

Analyte	Date Batch	Method	Units	RL	Sample
Alkalinity	04/09/13 040913#1	SM 2320	mg/L CaCO3	1.0	430
Carbonate	04/09/13	SM 2320	mg/L CaCO3	1.0	< 1.0 U
Bicarbonate	04/09/13	SM 2320	mg/L CaCO3	1.0	430
Hydroxide	04/09/13	SM 2320	mg/L CaCO3	1.0	< 1.0 U
Chloride	04/05/13 040513#1	EPA 300.0	mg/L	0.5	16.3
N-Nitrate	04/04/13 040413#1	EPA 300.0	mg-N/L	0.1	< 0.1 U
N-Nitrite	04/04/13 040413#1	EPA 300.0	mg-N/L	0.1	< 0.1 U
N-Ammonia	04/05/13 040513#1	EPA 350.1M	mg-N/L	0.050	2.27
Sulfate	04/05/13 040513#1	EPA 300.0	mg/L	2.0	76.5
Sulfide	04/08/13 040813#1	EPA 376.2	mg/L	0.050	< 0.050 U

Analytical reporting limit RL

Undetected at reported detection limit U

Water Sample Report-WK27



Matrix: Water

Data Release Authorized

Reported: 04/11/13

Project: South Park Landfill Event: 100116 Date Sampled: 04/03/13 Date Received: 04/04/13

Client ID: SPL-GW-MW29-040313 ARI ID: 13-7129 WK27B

Analyte	Date Batch	Method	Units	RL	Sample
Alkalinity	04/09/13 040913#1	SM 2320	mg/L CaCO3	1.0	259
Carbonate	04/09/13	SM 2320	mg/L CaCO3	1.0	< 1.0 U
Bicarbonate	04/09/13	SM 2320	mg/L CaCO3	1.0	259
Hydroxide	04/09/13	SM 2320	mg/L CaCO3	1.0	< 1.0 U
Chloride	04/05/13 040513#1	EPA 300.0	mg/L	0.5	17.8
N-Nitrate	04/04/13 040413#1	EPA 300.0	mg-N/L	0.1	< 0.1 U
N-Nitrite	04/04/13 040413#1	EPA 300.0	mg-N/L	0.1	< 0.1 U
N-Ammonia	04/05/13 040513#1	EPA 350.1M	mg-N/L	0.010	0.754
Sulfate	04/05/13 040513#1	EPA 300.0	mg/L	10.0	282
Sulfide	04/08/13 040813#1	EPA 376.2	mg/L	0.050	< 0.050 U

RLAnalytical reporting limit

Undetected at reported detection limit

Water Sample Report-WK27



Matrix: Water

Data Release Authorized:

Reported: 04/11/13

Project: South Park Landfill Event: 100116 Date Sampled: 04/03/13 Date Received: 04/04/13

Client ID: SPL-GW-MW14-040313 ARI ID: 13-7130 WK27C

Analyte	Date Batch	Method	Units	RL	Sample
Alkalinity	04/09/13 040913#1	SM 2320	mg/L CaCO3	1.0	261
Carbonate	04/09/13	SM 2320	mg/L CaCO3	1.0	< 1.0 U
Bicarbonate	04/09/13	SM 2320	mg/L CaCO3	1.0	261
Hydroxide	04/09/13	SM 2320	mg/L CaCO3	1.0	< 1.0 U
Chloride	04/05/13 040513#1	EPA 300.0	mg/L	0.5	13.1
N-Nitrate	04/04/13 040413#1	EPA 300.0	mg-N/L	0.1	< 0.1 U
N-Nitrite	04/04/13 040413#1	EPA 300.0	mg-N/L	0.1	< 0.1 U
N-Ammonia	04/05/13 040513#1	EPA 350.1M	mg-N/L	0.010	0.236
Sulfate	04/04/13 040413#1	EPA 300.0	mg/L	0.1	2.3
Sulfide	04/08/13 040813#1	EPA 376.2	mg/L	0.050	< 0.050 U

RLAnalytical reporting limit

U Undetected at reported detection limit

Water Sample Report-WK27



Matrix: Water

Data Release Authorized

Reported: 04/11/13

Project: South Park Landfill

Event: 100116

Date Sampled: 04/03/13 Date Received: 04/04/13

Client ID: SPL-GW-MW12-040313 ARI ID: 13-7131 WK27D

Analyte	Date Batch	Method	Units	RL	Sample
Alkalinity	04/09/13 040913#1	SM 2320	mg/L CaCO3	1.0	153
Carbonate	04/09/13	SM 2320	mg/L CaCO3	1.0	< 1.0 U
Bicarbonate	04/09/13	SM 2320	mg/L CaCO3	1.0	153
Hydroxide	04/09/13	SM 2320	mg/L CaCO3	1.0	< 1.0 U
Chloride	04/05/13 040513#1	EPA 300.0	mg/L	0.5	17.4
N-Nitrate	04/04/13 040413#1	EPA 300.0	mg-N/L	0.1	< 0.1 U
N-Nitrite	04/04/13 040413#1	EPA 300.0	mg-N/L	0.1	< 0.1 U
N-Ammonia	04/05/13 040513#1	EPA 350.1M	mg-N/L	0.010	0.692
Sulfate	04/05/13 040513#1	EPA 300.0	mg/L	0.5	17.8
Sulfide	04/08/13 040813#1	EPA 376.2	mg/L	0.050	< 0.050 U

RL Analytical reporting limit

U Undetected at reported detection limit

Water Sample Report-WK27



Matrix: Water

Data Release Authorized

Reported: 04/11/13

Project: South Park Landfill
Event: 100116
Date Sampled: 04/03/13 Date Received: 04/04/13

Client ID: SPL-GW-KMW03A-040313 ARI ID: 13-7132 WK27E

Analyte	Date Batch	Method	Units	RL	Sample
Alkalinity	04/09/13 040913#1	SM 2320	mg/L CaCO3	1.0	368
Carbonate	04/09/13	SM 2320	mg/L CaCO3	1.0	< 1.0 U
Bicarbonate	04/09/13	SM 2320	mg/L CaCO3	1.0	368
Hydroxide	04/09/13	SM 2320	mg/L CaCO3	1.0	< 1.0 U
Chloride	04/05/13 040513#1	EPA 300.0	mg/L	0.5	12.9
N-Nitrate	04/04/13 040413#1	EPA 300.0	mg-N/L	0.1	< 0.1 U
N-Nitrite	04/04/13 040413#1	EPA 300.0	mg-N/L	0.1	< 0.1 U
N-Ammonia	04/05/13 040513#1	EPA 350.1M	mg-N/L	0.050	3.04
Sulfate	04/04/13 040413#1	EPA 300.0	mg/L	0.1	0.4
Sulfide	04/08/13 040813#1	EPA 376.2	mg/L	0.050	< 0.050 U

RLAnalytical reporting limit

Undetected at reported detection limit

Water Sample Report-WK27



Matrix: Water

Data Release Authorized Reported: 04/11/13

Project: South Park Landfill Event: 100116 Date Sampled: 04/03/13 Date Received: 04/04/13

Client ID: SPL-GW-KMW05-040313 ARI ID: 13-7133 WK27F

Analyte	Date Batch	Method	Units	RL	Sample
Alkalinity	04/09/13 040913#1	SM 2320	mg/L CaCO3	1.0	7,510
Carbonate	04/09/13	SM 2320	mg/L CaCO3	1.0	2,640
Bicarbonate	04/09/13	SM 2320	mg/L CaCO3	1.0	< 1.0 U
Hydroxide	04/09/13	SM 2320	mg/L CaCO3	1.0	4,860
Chloride	04/04/13 040413#1	EPA 300.0	mg/L	5.0	158
N-Nitrate	04/04/13 040413#1	EPA 300.0	mg-N/L	5.0	< 5.0 U
N-Nitrite	04/04/13 040413#1	EPA 300.0	mg-N/L	5.0	< 5.0 U
N-Ammonia	04/05/13 040513#1	EPA 350.1M	mg-N/L	2.00	74.3
Sulfate	04/05/13 040513#1	EPA 300.0	mg/L	50.0	1,150
Sulfide	04/08/13 040813#1	EPA 376.2	mg/L	2.52	30.6

RLAnalytical reporting limit

Undetected at reported detection limit

Water Sample Report-WK27

UK27:00054

# METHOD BLANK RESULTS-CONVENTIONALS WK27-Aspect Consulting



Matrix: Water

Data Release Authorized Reported: 04/11/13

Project: South Park Landfill Event: 100116 Date Sampled: NA

Date Received: NA

Analyte	Method	Date	Units	Blank ID
Chloride	EPA 300.0	04/04/13 04/05/13	mg/L	< 0.1 U < 0.1 U
N-Nitrate	EPA 300.0	04/04/13	mg-N/L	< 0.1 U
N-Nitrite	EPA 300.0	04/04/13	mg-N/L	< 0.1 U
N-Ammonia	EPA 350.1M	04/05/13	mg-N/L	< 0.010 U FB
Sulfate	EPA 300.0	04/04/13 04/05/13	mg/L	< 0.1 U < 0.1 U
Sulfide	EPA 376.2	04/08/13 04/08/13	mg/L	< 0.050 U < 0.050 U

FΒ Filtration Blank

Water Method Blank Report-WK27

WK27:00055

# LAB CONTROL RESULTS-CONVENTIONALS WK27-Aspect Consulting



Matrix: Water
Data Release Authorized:
Reported: 04/11/13

Project: South Park Landfill
Event: 100116
Date Sampled: NA

Date Received: NA

Analyte/Method	QC ID	Date	Units	LCS	Spike Added	Recovery
Sulfide	ICVL	04/08/13	mg/L	0.499	0.501	99.6%
EPA 376.2	PREP	04/08/13		7.70	8.35	92.2%

Water Lab Control Report-WK27

WK27:00056

# STANDARD REFERENCE RESULTS-CONVENTIONALS WK27-Aspect Consulting



Matrix: Water

Data Release Authorized

Reported: 04/11/13

Project: South Park Landfill

Event: 100116
Date Sampled: NA

Date Received: NA

True Analyte/SRM ID Units SRM Value Method Date Recovery Alkalinity SM 2320 04/09/13 mg/L CaCO3 45.2 41.9 107.9% ERA #P114506 Chloride EPA 300.0 04/04/13 3.0 mg/L 3.0 100.0% ERA 210312 04/05/13 3.0 3.0 100.0% N-Nitrate EPA 300.0 04/04/13 mg-N/L 3.0 3.0 100.0% EAR 230511 N-Nitrite EPA 300.0 04/04/13 mq-N/L3.0 3.0 100.0% ERA 490412 N-Ammonia EPA 350.1M 04/05/13 mg-N/L 0.506 0.500 101.2% ERA #15125 Sulfate EPA 300.0 04/04/13 mg/L 3.1 3.0 103.3% ERA 240312 04/05/13 3.1 3.0 103.3%

Water Standard Reference Report-WK27

# REPLICATE RESULTS-CONVENTIONALS WK27-Aspect Consulting



Matrix: Water

Data Release Authorized: Reported: 04/11/13

Project: South Park Landfill
Event: 100116
Date Sampled: 04/03/13
Date Received: 04/04/13

Analyte	М	ethod	Date	Units	Sample	Replicate(s)	RPD/RSD
ARI ID: WK27A	Client ID:	SPL-GW-1	W18-040313				
Alkalinity	SM	2320	04/09/13	mg/L CaCO3	430	430	0.0%
Carbonate	SM	2320	04/09/13	mg/L CaCO3	< 1.0	< 1.0	NA
Bicarbonate	SM	2320	04/09/13	mg/L CaCO3	430	430	0.0%
Hydroxide	SM	2320	04/09/13	mg/L CaCO3	< 1.0	< 1.0	NA
Chloride	EP	A 300.0	04/05/13	mg/L	16.3	16.4	0.6%
N-Nitrate	EP.	A 300.0	04/04/13	mg-N/L	< 0.1	< 0.1	NA
N-Nitrite	EP.	A 300.0	04/04/13	mg-N/L	< 0.1	< 0.1	NA
Sulfate	EP.	A 300.0	04/05/13	mg/L	76.5	75.9	0.8%

LIK27: ODOSE

# MS/MSD RESULTS-CONVENTIONALS WK27-Aspect Consulting



Matrix: Water

Data Release Authorized:

Reported: 04/11/13

Project: South Park Landfill

Event: 100116

Date Sampled: 04/03/13 Date Received: 04/04/13

Analyte	Method	Date	Units	Sample	Spike	Spike Added	Recovery
ARI ID: WK27A	Client ID: SPL-GW-	MW18-04031	.3				
Chloride	EPA 300.0	04/05/13	mg/L	16.3	34.8	20.0	92.5%
N-Nitrate	EPA 300.0	04/04/13	mg-N/L	< 0.1	1.9	2.0	95.0%
N-Nitrite	EPA 300.0	04/04/13	mg-N/L	< 0.1	2.0	2.0	100.0%
Sulfate	EPA 300.0	04/05/13	mg/L	76.5	173	100	96.5%

Water MS/MSD Report-WK27

WK27:00059

April 18, 2013

Stephen.Bentsen Floyd Snider 601 Union Street, Suite 600 Seattle, WA 98101-2341

RE: Project: South Park Landfill

**ARI Job No: WK40** 

Dear Stephen:

Please find enclosed analytical results and chain of custody documentation (COC) for the project referenced above. Analytical Resources, Incorporated (ARI) accepted two water samples and a trip blank on April 4, 2013. The samples were in good condition with no discrepancies in paperwork.

The samples were analyzed for VOCs, SIM VOCs, Total and Dissolved Metals, Alkalinity, Nitrate, Nitrite, Chloride, Sulfate, Sulfide, as requested on the COC.

No analytical complications were noted for these analyses. Quality control results are included for your review.

A copy of the reports and all associated raw data will remain on file with ARI. If you have any questions or require additional information, please contact me at your convenience.

Sincerely,

ANALYTICAL RESOURCES, INC.

Kelly Bottem

Client Services Manager kellyb@arilabs.com

206-695-6211

Enclosures

cc: eFile WK40

KB/kb

# Chain of Custody Record & Laboratory Analysis Request

Analytical Resources, Incorporated	4611 South 134th Place, Suite 100 Tukwila, WA 98168	206-695-6200 206-695-6201 (fax)	Notes/Comments	For By	additional analytes may be analyzed additional analyzed additional analyzed and 4500 Biocarbonia, 5 SM 4500 (as part of 8 Benzene (as part of 8 Gas part of	XX		X	- <del>γ</del>					Received by: (Signature)	Printed Name:	Company:	Data & Time
	7	8)	Analysis Requested	ilfate, te ns by	6010B  Major Anion Major Anion Wajor Anion Witzele, Nitri Witzele, Nitri Witzele, Nitri Wajor Anion	X		X X			3			Relinquished by: (Signature)	Printed Name:	Company:	Date & Time:
/ 10 /	4//3 Present?	Cooler Temps:	Ana	ie Ng. Fe	Vinyl Chlorid 6610B Na, K, Ca, I Mn Total Metal	イメメ		X	ア					HOP (Sign	Print	Com	Date
Page:	Date: 7/4//3	No. of Coolers:		hloroethene ylene	AOC PA 856	X	+	X	<sup>×</sup> メ					All h	OMNIGE L	4161	
	206.780.7719			McChre	Matrix No Containers	H30 13		Has 12	7					Received by: (Signature)	Printed N	5	1 2 Date & Time
Turn-around Requested: Standard	Phone:			irs. Slarr	te Time	1/2 1050		13 1130					-	On peu	Seant McClus	4 Spect Consulting	7 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
JLU6 Standar	ct Consulting	runk	th Park Land	Samplers:	Date	1-040413 4/4	ار	540413 4/4/13	y						Printed Name:		Date & Tin
ARI Assigned Number:	ARI Client Company Aspect Consulting	Client Contact: John Strunk	Client Project Name: South Park Landfill	Client Project #: 100116	Sample ID	SPL-GEN- KMW108-040413 4/4/12	147-C19-18	SPL-GW-MW61-040413	Try Blanc					Comments/Special Instructions			

meets standards for the industry. The total liability of ARI, its officers, agents, employees, or successors, arising out of or In connection with the requested services, shall not exceed the Involced amount for said services. The acceptance by the client of a proposal for services by ARI release ARI from any liability in excess thereof, not withstanding any provision to the contrary in any contract, purchase order or co-Limits of Liability: ARI will perform all requested services in accordance with appropriate methodology following ARI Standard Operating Procedures and the ARI Quality Assurance Program. This program signed agreement between ARI and the Client. Sample Retention Policy: All samples submitted to ARI will be appropriately discarded no sooner than 90 days after receipt or 60 days after submission of hardcopy data, whichever is longer, unless alternate retention schedules have been established by work-order or contract.



# Cooler Receipt Form

ARI Client: ASSICT			Project Name: South	rack	Land	GH
COC No(s):		NA	Delivered by: Fed-Ex UPS Cour		ared) Othor:	
Assigned ARI Job No:	(1V-1)0	INA		Annual Control of the Parish	terior delication	
Preliminary Examination Phase:	WEOV		Tracking No:			—(NA)
-	tatad ayatady saa	ls attached t	to the outside of to socier?	,	YES	(N)
Were intact, properly signed and o				. ,	€8	(N)
Were custody papers included wit						NO
Were custody papers properly fille	_		1		JES)	NO
Temperature of Cooler(s) (°C) (re			emistry)	Temp Gun ID	#: 905-	7700
If cooler temperature is out of com			11/1/12	,		1 1952
Cooler Accepted by:				: <u>/3/</u> C	<del></del>	
Log In Phono:	Complete cus	stody forms	s and attach all shipping documents			
Log-In Phase:						
Was a temperature blank included					YES	$\mathbf{k}$
What kind of packing material w	ras used?	Bubble Wra	ap Wet Ice Gel Packs Baggies Foam	Block Paper C	)ther:	
Was sufficient ice used (if appropr				NA	YES	NO
Were all bottles sealed in individu	al plastic bags?				YES	(NO)
Did all bottles arrive in good cond	ition (unbroken)?				(Es)	NO
Were all bottle labels complete an	d legible?				YES)	NO
Did the number of containers liste	d on COC match	with the num	nber of containers received?		YES	NO
Did all bottle labels and tags agree	e with custody par	pers?			YES)	NO
Were all bottles used correct for the	ne requested anal	yses?			(ES	NO
Do any of the analyses (bottles) re	equire preservatio	n? (attach p	reservation sheet, excluding VOCs)	NA	YES	NO
Were all VOC vials free of air bub	bles?			NA	/Es	NO
Was sufficient amount of sample :	sent in each bottle	?			(E3)	NO
Date VOC Trip Blank was made a	t ARI			NA	4-1	1-13
Was Sample Split by ARI: NA	YES Da	te/Time:	Equipment:		Split by:	
Our also Larged buy	75	D-1	te:Time:	135	6	
Samples Logged by:	** Notify Pro		ger of discrepancies or concerns **			
Sample ID on Bottle	Sample ID	on COC	Sample ID on Bottle	Sampl	e ID on CO	С
Additional Notes, Discrepancie	a & Desalutions					
Additional Notes, Discrepancie	s, a Resolutions					
By: Da	te <sup>,</sup>					
Small Air Bubbles Peabubb	es' LARGE A	ir Bubbles	Small → "sm"			
-2mm 2-4 mm	>4	mm 	Peabubbles → "pb"		- M.A.	
Ligar 2 - A Collection Appropriate Anniel Constitution Collection	• • •	•	Large → "lg"			
The state of the s			Headspace → "hs"			

0016F 3/2/10 Cooler Receipt Form

Revision 014

WKTO: 00003

PRESERVATION VERIFICATION 04/04/13

1 of 1 Page Inquiry Number: NONE Analysis Requested: 04/04/13 Contact: Strunk, John

Client: Aspect Consulting

Logged by: TS Sample Set Used: Yes-481 Validatable Package: No

Deliverables:

ANALYTICAL RESOURCES INCORPORATED

PC: Kelly VTSR: 04/04/13

ARI Job No: WK40

Project #: 100116 Project: South Park Landfill

Sample Site: SDG No:

Analytical Protocol: In-house

0 /	CN V	MAD NH3 >12 <2	NH3 C	000 000 000	FOG M	MET PHEN E	N PHOS	$\longrightarrow$	TKN NO23	70C	\$2 >9	Fe2+	TPHD Fe2+ DMET DOC <2 <2 FLT FLT	PARAMETER	ADJUSTED LOT TO NUMBER		AMOUNT ADDED	DATE/BY
			<u></u>		<b>2</b> 0	DIS					كا		X	4	7/2	200	کے مرک	6-4-13
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Proposition of the stand

13 Date 4-4-13 Checked By

MKNO GOOON

# Sample ID Cross Reference Report



ARI Job No: WK40 Client: Aspect Consulting Project Event: 100116

Project Name: South Park Landfill

	Sample ID	ARI Lab ID	ARI LIMS ID	Matrix	Sample Date/Time	VTSR
1.	SPL-GW-KMW08-040413	WK40A	13-7162	Water	04/04/13 10:50	04/04/13 13:10
2.	SPL-GW-MW61-040413	WK40B	13-7163	Water	04/04/13 11:30	04/04/13 13:10
3.	SPL-GW-KMW08-040413	WK40C	13-7164	Water	04/04/13 10:50	04/04/13 13:10
4.	SPL-GW-MW61-040413	WK40D	13-7165	Water	04/04/13 11:30	04/04/13 13:10
5.	Trip Blanks	WK40E	13-7166	Water	04/04/13	04/04/13 13:10

Printed 04/04/13 Page 1 of 1

mkno: 00002



Volatiles by Purge & Trap GC/MS-Method SW8260C

Page 1 of 1

Sample ID: SPL-GW-KMW08-040413 SAMPLE

Lab Sample ID: WK40A LIMS ID: 13-7162

Matrix: Water

Data Release Authorized:

Instrument/Analyst: NT3/PAB Date Analyzed: 04/05/13 20:08

Reported: 04/10/13

QC Report No: WK40-Aspect Consulting Project: South Park Landfill

100116

Date Sampled: 04/04/13 Date Received: 04/04/13

Sample Amount: 10.0 mL Purge Volume: 10.0 mL

CAS Number	Analyte	LOQ	Result	Q
156-59-2 79-01-6	cis-1,2-Dichloroethene Trichloroethene	0.20	< 0.20	U
71-43-2	Benzene	0.20	< 0.20	Ü

Reported in µg/L (ppb)

### Volatile Surrogate Recovery

d4-1,2-Dichloroethane	102%
d8-Toluene	101%
Bromofluorobenzene	103%
d4-1,2-Dichlorobenzene	104%

LIVIO BODGE

FORM I

Volatiles by Purge & Trap GC/MS-Method SW8260C

Page 1 of 1

INCORPORATED
Sample ID: SPL-GW-MW61-040413

SAMPLE

ANALYTICAL RESOURCES

Lab Sample ID: WK40B LIMS ID: 13-7163

Matrix: Water

Data Release Authorized: WW

Reported: 04/10/13

100116
Date Sampled: 04/04/13
Date Received: 04/04/13

QC Report No: WK40-Aspect Consulting

Project: South Park Landfill

Instrument/Analyst: NT3/PAB
Date Analyzed: 04/05/13 20:35

Sample Amount: 10.0 mL Purge Volume: 10.0 mL

CAS Number	Analyte	LOQ	Result	Q
156-59-2 79-01-6 71-43-2	cis-1,2-Dichloroethene Trichloroethene Benzene	0.20 0.20 0.20	< 0.20 < 0.20 < 0.20	U U

FORM I

Reported in µg/L (ppb)

# Volatile Surrogate Recovery

d4-1,2-Dichloroethane	106%
d8-Toluene	100%
Bromofluorobenzene	100%
d4-1,2-Dichlorobenzene	106%

WK40:00007



Sample ID: Trip Blanks Volatiles by Purge & Trap GC/MS-Method SW8260C SAMPLE

Page 1 of 1

QC Report No: WK40-Aspect Consulting Lab Sample ID: WK40E LIMS ID: 13-7166 Project: South Park Landfill

Matrix: Water

Data Release Authorized:

Reported: 04/10/13

Instrument/Analyst: NT3/PAB Sample Amount: 10.0 mL Date Analyzed: 04/05/13 21:01 Purge Volume: 10.0 mL

CAS Number	Analyte	LOQ	Result	Q
156-59-2 79-01-6	cis-1,2-Dichloroethene Trichloroethene	0.20 0.20	< 0.20 < 0.20	U U
71-43-2	Benzene	0.20	< 0.20	U

100116

Date Sampled: 04/04/13

Date Received: 04/04/13

Reported in µg/L (ppb)

### Volatile Surrogate Recovery

d4-1,2-Dichloroethane	105%
d8-Toluene	101%
Bromofluorobenzene	98.8%
d4-1,2-Dichlorobenzene	103%

MKHO: 00008 FORM I



Volatiles by Purge & Trap GC/MS-Method SW8260C

Page 1 of 1

Sample ID: MB-040513A METHOD BLANK

Lab Sample ID: MB-040513A

LIMS ID: 13-7162

Matrix: Water Data Release Authorized:

Reported: 04/10/13

Instrument/Analyst: NT3/PAB Date Analyzed: 04/05/13 11:33 QC Report No: WK40-Aspect Consulting

Project: South Park Landfill

100116

Date Sampled: NA Date Received: NA

Sample Amount: 10.0 mL Purge Volume: 10.0 mL

CAS Number	Analyte	LOQ	Result	Q
156-59-2 79-01-6 71-43-2	cis-1,2-Dichloroethene Trichloroethene Benzene	0.20 0.20 0.20	< 0.20 < 0.20 < 0.20	U U

Reported in µg/L (ppb)

# Volatile Surrogate Recovery

d4-1,2-Dichloroethane	93.8%
d8-Toluene	100%
Bromofluorobenzene	102%
d4-1,2-Dichlorobenzene	101%

WK40:00009 FORM I

# VOA SURROGATE RECOVERY SUMMARY



Matrix: Water

QC Report No: WK40-Aspect Consulting Project: South Park Landfill

100116

ARI ID	Client ID	PV	DCE	TOL	BFB	DCB	TOT OUT
MB-040513A	Method Blank	10	93.8%	100%	102%	101%	0
LCS-040513A	Lab Control	10	92.0%	99.9%	103%	100%	0
LCSD-040513A	Lab Control Dup	10	90.5%	102%	104%	97.5%	0
WK40A	SPL-GW-KMW08-040413	10	102%	101%	103%	104%	0
WK40B	SPL-GW-MW61-040413	10	106%	100%	100%	106%	0
WK40E	Trip Blanks	10	105%	101%	98.8%	103%	0
		LCS	MB LIM	ITS		QC LIMI	rs
SW8260C							
(DCE) = d4-1, 2-Dichloroethane			(80-120)	)		(80-130	0)
(TOL) = d8-Toluene			(80-120)	)		(80-120	0)
(BFB) = Bromofluorobenzene		(80-120)			(80-120)		
(DCB) = d4-1, 2-Dichlorobenzene			(80-120)	)		(80-120	0)

Prep Method: SW5030B

Log Number Range: 13-7162 to 13-7166

MKH0:00010



Volatiles by Purge & Trap GC/MS-Method SW8260C Sample ID: LCS-040513A

LAB CONTROL SAMPLE Page 1 of 1

QC Report No: WK40-Aspect Consulting Lab Sample ID: LCS-040513A

LIMS ID: 13-7162 Matrix: Water

Data Release Authorized: MW

Instrument/Analyst LCS: NT3/PAB

Date Analyzed LCS: 04/05/13 10:41

Reported: 04/10/13

LCSD: NT3/PAB

LCSD: 04/05/13 11:07

Date Received: NA

Date Sampled: NA

Sample Amount LCS: 10.0 mL LCSD: 10.0 mL Purge Volume LCS: 10.0 mL LCSD: 10.0 mL

Project: South Park Landfill

100116

Analyte	LCS	Spike Added-LCS	LCS Recovery	LCSD	Spike Added-LCSD	LCSD Recovery	RPD
cis-1,2-Dichloroethene	9.19	10.0	91.9%	8.72	10.0	87.2%	5.2%
Trichloroethene	9.34	10.0	93.4%	9.74	10.0	97.4%	4.2%
Benzene	9.26	10.0	92.6%	9.59	10.0	95.9%	3.5%

Reported in µg/L (ppb)

RPD calculated using sample concentrations per SW846.

# Volatile Surrogate Recovery

	LCS	LCSD
d4-1,2-Dichloroethane	92.0%	90.5%
d8-Toluene	99.9%	102%
Bromofluorobenzene	103%	104%
d4-1,2-Dichlorobenzene	100%	97.5%

FORM III LIVUD DODI

**ANALYTICAL** RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET

Volatiles by Purge & Trap GC/MS-Method SW8260C-SIM Sample ID: SPL-GW-KMW08-040413

SAMPLE Page 1 of 1

Lab Sample ID: WK40A LIMS ID: 13-7162

Matrix: Water

Data Release Authorized:

Reported: 04/09/13

Instrument/Analyst: NT7/PAB Date Analyzed: 04/08/13 23:50 QC Report No: WK40-Aspect Consulting

Project: South Park Landfill 100116

Date Sampled: 04/04/13 Date Received: 04/04/13

Sample Amount: 10.0 mL Purge Volume: 10.0 mL

CAS Number	Analyte	RL	Result	Q
75-01-4	Vinyl Chloride	0.020	< 0.020	U

Reported in µg/L (ppb)

Volatile Surrogate Recovery

d4-1,2-Dichloroethane 120%

> FORM I WK40:00012

Matrix: Water

INCORPORATED Volatiles by Purge & Trap GC/MS-Method SW8260C-SIM Sample ID: SPL-GW-MW61-040413

Page 1 of 1 SAMPLE

Lab Sample ID: WK40B QC Report No: WK40-Aspect Consulting LIMS ID: 13-7163 Project: South Park Landfill

100116

**ANALYTICAL** RESOURCES

Data Release Authorized: WW Date Sampled: 04/04/13 Reported: 04/09/13 Date Received: 04/04/13

Instrument/Analyst: NT7/PAB Sample Amount: 10.0 mL Date Analyzed: 04/09/13 00:18 Purge Volume: 10.0 mL

> CAS Number RLAnalyte Result Q 75-01-4 Vinyl Chloride 0.020 < 0.020 U

> > Reported in µg/L (ppb)

Volatile Surrogate Recovery

d4-1,2-Dichloroethane 121%

> FORM I WHO: DOG! 3



Volatiles by Purge & Trap GC/MS-Method SW8260C-SIM Sample ID: Trip Blanks Page 1 of 1 SAMPLE

Lab Sample ID: WK40E LIMS ID: 13-7166

Matrix: Water

Data Release Authorized: WW

Reported: 04/09/13

Instrument/Analyst: NT7/PAB
Date Analyzed: 04/09/13 00:46

QC Report No: WK40-Aspect Consulting

Project: South Park Landfill

100116

Date Sampled: 04/04/13 Date Received: 04/04/13

Sample Amount: 10.0 mL Purge Volume: 10.0 mL

CAS Number	Analyte	RL	Result	Q
75-01-4	Vinyl Chloride	0.020	< 0.020	U

Reported in µg/L (ppb)

Volatile Surrogate Recovery

d4-1,2-Dichloroethane 129%

FORM I LIKUO: 00014



Volatiles by Purge & Trap GC/MS-Method SW8260C-SIM Sample ID: MB-040813

Page 1 of 1 METHOD BLANK

Lab Sample ID: MB-040813

LIMS ID: 13-7162 Matrix: Water

Data Release Authorized:

Reported: 04/09/13

Instrument/Analyst: NT7/PAB
Date Analyzed: 04/08/13 17:14

QC Report No: WK40-Aspect Consulting Project: South Park Landfill

100116

Date Sampled: NA Date Received: NA

Sample Amount: 10.0 mL Purge Volume: 10.0 mL

 CAS Number
 Analyte
 RL
 Result Q

 75-01-4
 Vinyl Chloride
 0.020
 < 0.020</td>
 U

Reported in µg/L (ppb)

Volatile Surrogate Recovery

d4-1,2-Dichloroethane 116%

FORM I WK40:00015



### SW8260-SIM SURROGATE RECOVERY SUMMARY

QC Report No: WK40-Aspect Consulting Project: South Park Landfill Matrix: Water

100116

Client ID	DCE	TOT OUT
MB-040813	116%	0
LCS-040813	112%	0
LCSD-040813	115%	0
SPL-GW-KMW08-040413	120%	0
SPL-GW-MW61-040413	121%	0
Trip Blanks	129%	0

LCS/MB LIMITS QC LIMITS

(DCE) = d4-1, 2-Dichloroethane (78-126)(80 - 129)

Prep Method: SW5030

Log Number Range: 13-7162 to 13-7166



Volatiles by Purge & Trap GC/MS-Method SW8260C-SIM Sample ID: LCS-040813

LAB CONTROL SAMPLE Page 1 of 1

Lab Sample ID: LCS-040813

LIMS ID: 13-7162

Matrix: Water

Data Release Authorized:

Reported: 04/09/13

Date Sampled: NA

Date Received: NA

Instrument/Analyst LCS: NT7/PAB

LCSD: NT7/PAB

Date Analyzed LCS: 04/08/13 16:19

LCSD: 04/08/13 16:47

Sample Amount LCS: 10.0 mL

LCSD: 10.0 mL Purge Volume LCS: 10.0 mL

QC Report No: WK40-Aspect Consulting

100116

Project: South Park Landfill

LCSD: 10.0 mL

Analyte	LCS	Spike Added-LCS	LCS Recovery	LCSD	Spike Added-LCSD	LCSD Recovery	RPD
Viny1 Chloride	0.940	1.00	94.0%	0.906	1.00	90.6%	3.7%

Reported in µg/L (ppb)

RPD calculated using sample concentrations per SW846.

Volatile Surrogate Recovery

LCS LCSD d4-1,2-Dichloroethane 112% 115%

> FORM III WK40:00017



# INORGANICS ANALYSIS DATA SHEET DISSOLVED METALS

Page 1 of 1

Lab Sample ID: WK40A

LIMS ID: 13-7162 Matrix: Water

Data Release Authorized:

Reported: 04/10/13

Sample ID: SPL-GW-KMW08-040413

SAMPLE

QC Report No: WK40-Aspect Consulting

Project: South Park Landfill

100116

Date Sampled: 04/04/13
Date Received: 04/04/13

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/L Q
6010C	04/05/13	6010C	04/09/13	7440-70-2	Calcium	0.05	40.3
6010C	04/05/13	6010C	04/09/13	7439-89-6	Iron	0.05	0.07
6010C	04/05/13	6010C	04/09/13	7439-95-4	Magnesium	0.05	8.89
6010C	04/05/13	6010C	04/09/13	7439-96-5	Manganese	0.001	0.240
6010C	04/05/13	6010C	04/09/13	7440-09-7	Potassium	0.5	22.9
6010C	04/05/13	6010C	04/09/13	7440-23-5	Sodium	0.5	22.7

U-Analyte undetected at given RL

RL-Reporting Limit

WK40:00018



# INORGANICS ANALYSIS DATA SHEET DISSOLVED METALS

Page 1 of 1

Lab Sample ID: WK40B

LIMS ID: 13-7163

Matrix: Water Data Release Authorized:

Reported: 04/10/13

Sample ID: SPL-GW-MW61-040413

SAMPLE

QC Report No: WK40-Aspect Consulting

Project: South Park Landfill

100116

Date Sampled: 04/04/13 Date Received: 04/04/13

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/L	Q
6010C	04/05/13	6010C	04/09/13	7440-70-2	Calcium	0.05	40.3	
6010C	04/05/13	6010C	04/09/13	7439-89-6	Iron	0.05	0.07	
6010C	04/05/13	6010C	04/09/13	7439-95-4	Magnesium	0.05	8.89	
6010C	04/05/13	6010C	04/09/13	7439-96-5	Manganese	0.001	0.242	
6010C	04/05/13	6010C	04/09/13	7440-09-7	Potassium	0.5	22.8	
6010C	04/05/13	6010C	04/09/13	7440-23-5	Sodium	0.5	22.3	

U-Analyte undetected at given RL RL-Reporting Limit

WK40:00019



TOTAL METALS

Page 1 of 1

Lab Sample ID: WK40C

LIMS ID: 13-7164

Matrix: Water

Data Release Authorize

Reported: 04/10/13

Sample ID: SPL-GW-KMW08-040413

SAMPLE

QC Report No: WK40-Aspect Consulting

Project: South Park Landfill

100116

Date Sampled: 04/04/13 Date Received: 04/04/13

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/L	Q
3010A	04/05/13	6010C	04/09/13	7439-89-6	Iron	0.05	0.15	
3010A	04/05/13	6010C	04/09/13	7439-96-5	Manganese	0.001	0.241	

U-Analyte undetected at given RL RL-Reporting Limit

LIKUO DODDA



TOTAL METALS

Page 1 of 1

Lab Sample ID: WK40D LIMS ID: 13-7165

Matrix: Water

Data Release Authorized

Reported: 04/10/13

Sample ID: SPL-GW-MW61-040413

SAMPLE

QC Report No: WK40-Aspect Consulting

Project: South Park Landfill

100116

Date Sampled: 04/04/13
Date Received: 04/04/13

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/L	Q
3010A	04/05/13	6010C	04/09/13	7439-89-6	Iron	0.05	0.15	
3010A	04/05/13	6010C	04/09/13	7439-96-5	Manganese	0.001	0.241	

U-Analyte undetected at given RL RL-Reporting Limit

WKAG . 6657



# INORGANICS ANALYSIS DATA SHEET DISSOLVED METALS

Page 1 of 1

Lab Sample ID: WK40MB

LIMS ID: 13-7162 Matrix: Water

Data Release Authorized

Reported: 04/10/13

Sample ID: METHOD BLANK

QC Report No: WK40-Aspect Consulting Project: South Park Landfill

100116

Date Sampled: NA Date Received: NA

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/L	Q
6010C	04/05/13	6010C	04/09/13	7440-70-2	Calcium	0.05	0.05	Ü
6010C	04/05/13	6010C	04/09/13	7439~89-6	Iron	0.05	0.05	U
6010C	04/05/13	6010C	04/09/13	7439~95-4	Magnesium	0.05	0.05	Ü
6010C	04/05/13	6010C	04/09/13	7439-96-5	Manganese	0.001	0.001	Ū
6010C	04/05/13	6010C	04/09/13	7440-09-7	Potassium	0.5	0.5	Ū
6010C	04/05/13	6010C	04/09/13	7440-23-5	Sodium	0.5	0.5	Ū

U-Analyte undetected at given RL

RL-Reporting Limit

WK40:00022



DISSOLVED METALS

Page 1 of 1

Lab Sample ID: WK40LCS

LIMS ID: 13-7162

Matrix: Water

Data Release Authorized Reported: 04/10/13

Sample ID: LAB CONTROL

QC Report No: WK40-Aspect Consulting

Project: South Park Landfill

100116

Date Sampled: NA Date Received: NA

# BLANK SPIKE QUALITY CONTROL REPORT

	Analysis	Spike	Spike	8	
Analyte	Method	Found	Added	Recovery	Q
Calcium	6010C	9.78	10.0	97.8%	
Iron	6010C	1.95	2.00	97.5%	
Magnesium	6010C	10.3	10.0	103%	
Manganese	6010C	0.481	0.500	96.2%	
Potassium	6010C	10.1	10.0	101%	
Sodium	6010C	9,8	10.0	98.0%	

Reported in mg/L

N-Control limit not met Control Limits: 80-120%

MK48:00053



TOTAL METALS

Page 1 of 1

Lab Sample ID: WK40MB

LIMS ID: 13-7164

Matrix: Water

Data Release Authorized

Reported: 04/10/13

Sample ID: METHOD BLANK

QC Report No: WK40-Aspect Consulting

Project: South Park Landfill

100116

Date Sampled: NA Date Received: NA

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/L	Q
3010A	04/05/13	6010C	04/09/13	7439-89-6	Iron	0.05	0.05	U
3010A	04/05/13	6010C	04/09/13	7439-96-5	Manganese	0.001	0.001	U

U-Analyte undetected at given RL RL-Reporting Limit

WHO BOOSH



TOTAL METALS

Page 1 of 1

Lab Sample ID: WK40LCS LIMS ID: 13-7164

Matrix: Water

Data Release Authorized Reported: 04/10/13

QC Report No: WK40-Aspect Consulting Project: South Park Landfill

100116

Sample ID: LAB CONTROL

Date Sampled: NA Date Received: NA

# BLANK SPIKE QUALITY CONTROL REPORT

Analyte	Analysis Method	Spike Found	Spike Added	% Recovery	Q
Iron	6010C	1.97	2.00	98.5%	
Manganese	6010C	0.482	0.500	96.4%	

Reported in mg/L

N-Control limit not met Control Limits: 80-120%

FORM-VII

WK40:00025

# SAMPLE RESULTS-CONVENTIONALS WK40-Aspect Consulting



Matrix: Water

Data Release Authorized

Reported: 04/11/13

Project: South Park Landfill

Event: 100116
Date Sampled: 04/04/13
Date Received: 04/04/13

Client ID: SPL-GW-KMW08-040413 ARI ID: 13-7162 WK40A

Analyte	Date Batch	Method	Units	RL	Sample
Alkalinity	04/09/13 040913#1	SM 2320	mg/L CaCO3	1.0	154
Carbonate	04/09/13	SM 2320	mg/L CaCO3	1.0	< 1.0 U
Bicarbonate	04/09/13	SM 2320	mg/L CaCO3	1.0	154
Hydroxide	04/09/13	SM 2320	mg/L CaCO3	1.0	< 1.0 U
Chloride	04/05/13 040513#1	EPA 300.0	mg/L	0.2	9.5
N-Nitrate	04/04/13 040413#1	EPA 300.0	mg-N/L	0.1	< 0.1 U
N-Nitrite	04/04/13 040413#1	EPA 300.0	mg-N/L	0.1	< 0.1 U
N-Ammonia	04/05/13 040513#1	EPA 350.1M	mg-N/L	0.010	0.220
Sulfate	04/05/13 040513#1	EPA 300.0	mg/L	1.0	27.9
Sulfide	04/08/13 040813#1	EPA 376.2	mg/L	0.050	< 0.050 U

RL Analytical reporting limit

U Undetected at reported detection limit

Water Sample Report-WK40

UK40:00026

# SAMPLE RESULTS-CONVENTIONALS WK40-Aspect Consulting



Matrix: Water

Data Release Authorized:

Reported: 04/11/13

Project: South Park Landfill Event: 100116 Date Sampled: 04/04/13 Date Received: 04/04/13

Client ID: SPL-GW-MW61-040413 ARI ID: 13-7163 WK40B

Analyte	te Batch Method		Units	RL	Sample
Alkalinity	04/09/13 040913#1	SM 2320	mg/L CaCO3	1.0	158
Carbonate	04/09/13	SM 2320	mg/L CaCO3	1.0	< 1.0 U
Bicarbonate	04/09/13	SM 2320	mg/L CaCO3	1.0	158
Hydroxide	04/09/13	SM 2320	mg/L CaCO3	1.0	< 1.0 U
Chloride	04/05/13 040513#1	EPA 300.0	mg/L	0.2	9.4
N-Nitrate	04/04/13 040413#1	EPA 300.0	mg-N/L	0.1	< 0.1 U
N-Nitrite	04/04/13 040413#1	EPA 300.0	mg-N/L	0.1	< 0.1 U
N-Ammonia	04/05/13 040513#1	EPA 350.1M	mg-N/L	0.010	0.235
Sulfate	04/05/13 040513#1	EPA 300.0	mg/L	1.0	27.6
Sulfide	04/08/13 040813#1	EPA 376.2	mg/L	0.050	< 0.050 U

RLAnalytical reporting limit

Undetected at reported detection limit Ū

Water Sample Report-WK40

# METHOD BLANK RESULTS-CONVENTIONALS WK40-Aspect Consulting



Matrix: Water

Data Release Authorized: Reported: 04/11/13

Project: South Park Landfill

Event: 100116 Date Sampled: NA Date Received: NA

Analyte	Method	Date	Units	Blank ID
Chloride	EPA 300.0	04/05/13	mg/L	< 0.1 U
N-Nitrate	EPA 300.0	04/04/13	mg-N/L	< 0.1 U
N-Nitrite	EPA 300.0	04/04/13	mg-N/L	< 0.1 U
N-Ammonia	EPA 350.1M	04/05/13	mg-N/L	< 0.010 U FB
Sulfate	EPA 300.0	04/05/13	mg/L	< 0.1 U
Sulfide	EPA 376.2	04/08/13 04/08/13	mg/L	< 0.050 U < 0.050 U

FBFiltration Blank

Water Method Blank Report-WK40

WKUO:00028

# LAB CONTROL RESULTS-CONVENTIONALS WK40-Aspect Consulting



Matrix: Water

Data Release Authorized Reported: 04/11/13

Project: South Park Landfill
Event: 100116
Date Sampled: NA

Date Received: NA

Analyte/Method	QC ID	Date	Units	LCS	Spike Added	Recovery
Sulfide	ICVL	04/08/13	mg/L	0.499	0.501	99.6%
EPA 376.2	PREP	04/08/13		7.70	8.35	92.2%

Water Lab Control Report-WK40

WKAS: 00050

# STANDARD REFERENCE RESULTS-CONVENTIONALS WK40-Aspect Consulting



Matrix: Water

Data Release Authorized

Reported: 04/11/13

Project: South Park Landfill Event: 100116 Date Sampled: NA

Date Received: NA

Analyte/SRM ID	Method	Date	Units	SRM	True Value	Recovery
Alkalinity ERA #P114506	SM 2320	04/09/13	mg/L CaCO3	45.2	41.9	107.9%
Chloride ERA 210312	EPA 300.0	04/05/13	mg/L	3.0	3.0	100.0%
N-Nitrate EAR 230511	EPA 300.0	04/04/13	mg-N/L	3.0	3.0	100.0%
N-Nitrite ERA 490412	EPA 300.0	04/04/13	mg-N/L	3.0	3.0	100.0%
N-Ammonia ERA #15125	EPA 350.1M	04/05/13	mg-N/L	0.506	0.500	101.2%
Sulfate ERA 240312	EPA 300.0	04/05/13	mg/L	3.1	3.0	103.3%

MKAO: 66630

# **South Park Landfill**

# **April 2013 Interim Site-wide Groundwater Monitoring Results**

# Appendix C Data Validation Results

# **April 2013 Groundwater Sampling Event South Park Landfill**

## **Data Validation Report**

## **Prepared for**

Seattle Public Utilities

## Prepared by

Floyd|Snider 601 Union Street Suite 600 Seattle, Washington 98101

**July 2013** 

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## **List of Appendices**

Appendix A Data Qualifier Definitions and Criteria Tables

## **List of Abbreviations and Acronyms**

Abbreviation/ Acronym	Definition
ARI	Analytical Resources, Inc. Laboratory
CLP	Contract Laboratory Program
LCS	Laboratory control sample
LCSD	Laboratory control sample duplicate
MS	Matrix spike

Abbreviation/

Acronym Definition

RPD Relative percent difference

QC Quality control

SDG Sample Delivery Group

USEPA U. S. Environmental Protection Agency

VOC Volatile organic compound

## 1.0 Project Narrative

#### 1.1 OVERVIEW OF DATA VALIDATION

This report summarizes the results of the Compliance Screening (Level I) performed on the groundwater and field quality control (QC) sample data for the South Park Landfill April 2013 Groundwater Monitoring Event. A complete list of samples is provided below.

### **Project Sample Index**

SDG (Batch)	Sample ID	Lab ID	8260C	8260C-SIM	6010B
WJ94	SPL-GW-MW32-040113	WJ94A/WJ94G	Х	Х	Х
WJ94	SPL-GW-MW33-040113	WJ94B/WG94H	Х	Х	Х
WJ94	SPL-GW-MW25-040113	WJ94C/WJ94I	Х	Х	Х
WJ94	SPL-GW-MW60-040113	WJ94D/WJ94J	Х	Х	Х
WJ94	TripBlank #1	WJ94E	Х	Х	
WJ94	TripBlank #2	WJ94F	Х	Х	
WK09	SPL-GW-MW30-040213	WK09A/WK09/K	Х	Х	Х
WK09	SPL-GW-MW31-040213	WK09B/WK09L	Х	Х	Х
WK09	SPL_GW-MW24-040213	WK09C/WK09M	Х	Х	Х
WK09	SPL-GW-MW26-040213	WK09D/WK09N	Х	Х	Х
WK09	SPL-GW-MW08-040213	WK09E/WK09O	Х	Х	Х
WK09	SPL-GW-MW27-040213	WK09F/WK09P	Х	Х	Х
WK09	SPL-GW-MW10-040213	WK09G/WK09Q	Х	Х	Х
WK09	SPL-GW-MW80-040213	WK09H	Х	Х	Х
WK09	TripBlank #1	WK09I	Х	Х	
WK09	TripBlank #2	WK09J	Х	Х	
WK27	SPL-GW-MW18-040313	WK27A/WK27I	Х	Х	Х
WK27	SPL-GW-MW29-040313	WK27B/WK27J	Х	Х	Х
WK27	SPL-GW-MW14-040313	WK27C/WK27K	Х	Х	Х
WK27	SPL-GW-MW12-040313	WK27D/WK27L	Х	Х	Х
WK27	SPL-GW-KMW03A-040313	WK27E/WK27M	Х	Х	Х
WK27	SPL-GW-KMW05-040313	WK27F/WK27N	Х	Х	Х
WK27	TripBlank #1	WK27G	Х	Х	
WK27	TripBlank #2	WK27H	Х	Х	
WK40	SPL-GW-KMW08-040413	WK40A/WK40C	Х	Х	Х
WK40	SPL-GW-MW61-040413	WK40B/WK40C	Х	Х	Х
WK40	TripBlank #1	WK40E	Х	Х	

The chemical analyses were performed by Analytical Resources, Inc. (ARI) located in Tukwila, Washington. Groundwater samples were collected between April 1 and April 4, 2013 and submitted to ARI for chemical analyses. The analytical methods include the following:

- Select volatile organic compounds (VOCs)—U.S. Environmental Protection Agency (USEPA) Method 8260C
- Vinyl chloride—USEPA Method 8260C-SIM
- Select metals—USEPA Method 6010B

The data were reviewed using guidance and QC criteria documented in the analytical methods, National Functional Guidelines for Inorganic Data Review (USEPA 1994 and 2004), National Functional Guidelines for Organic Data Review (USEPA 1999 and 2008), and the Sampling and Analysis Plan, Appendix D of the Remedial Investigation/Feasibility Study Work Plan for South Park Landfill Site (Farallon Consulting, LLC 2010).

Conventional parameters such as alkalinity, nitrate, nitrite, chloride, sulfate, and sulfide were also analyzed; however, they do not have data quality compliance requirements, and, therefore, the results were not included in this data validation report.

Floyd|Snider's goal in assigning data assessment qualifiers is to assist in proper data interpretation. If values are estimated (J or UJ), data may be used for site evaluation and risk assessment purposes, but reasons for data qualification should be taken into consideration when interpreting sample concentrations. If values are assigned an R, the data are to be rejected and should not be used for any site evaluation purposes. When compounds are analyzed at multiple dilutions, select results will be assigned a Do Not Report (DNR) qualification as a more appropriate result is reported from another dilution. If values have no data qualifier assigned, then the data meet the data quality objectives as stated in the documents and methods referenced above.

Data qualifier definitions, reasons, and validation criteria are included as Appendix A. As no data were qualified for this data set, the standard Qualified Data Summary Table was not populated, and has not been included as an attachment. Data validation worksheets (excel worksheets) will be kept on file at Floyd|Snider.

# 2.0 Data Validation Report Select VOCs by USEPA Method 8260C

This report documents the review of analytical data from the analyses of groundwater and field QC samples and the associated laboratory QC samples. Samples were analyzed by ARI. Compliance Screening (Level I) was performed on all analytical results by Chell Black as the primary data reviewer, and secondary review was performed by Jessi Massingale.

#### 2.1 DATA PACKAGE COMPLETENESS

The laboratory submitted all required deliverables. The laboratory followed adequate corrective action processes and all anomalies were discussed in the case narrative.

#### 2.2 TECHNICAL DATA VALIDATION

The QC requirements that were reviewed are listed below.

#### **QC** Requirements

Cooler temperature and preservation	Surrogate recoveries
Extraction and analysis holding times	Target analyte list
Blank contamination	Reporting limits and reported results
Laboratory control sample (LCS) and LCS duplicate (LCSD)	

#### Notes:

Appendix A presents data validation criteria tables for organic compound analysis. QC requirements that were met without exception are not discussed below. QC requirements that required further evaluation and had exceptions to the validation criteria are discussed below.

#### 2.2.1 Cooler Temperature and Preservation

For Sample Delivery Group (SDG) WJ94 the laboratory noted that the sample cooler temperatures (11.3°C and 6.3°C) were outside of the laboratory standard of 4±2°C. Samples were delivered to the laboratory the same day they were collected from the field. Only 60 minutes elapsed between when the final sample was collected and the cooler was delivered to the laboratory, leaving insufficient time for the cooler temperature to drop within the standard range. It is with professional judgment that no sample results be qualified based on cooler temperature, as the samples were delivered with minimal holding time.

#### 2.3 OVERALL ASSESSMENT

As was determined by this evaluation, the laboratory followed the specified analytical method. Accuracy was acceptable, as demonstrated by the sample surrogate, LCS, and LCSD percent recovery values. Precision was acceptable, as demonstrated by the LCS/LCSD relative percent difference (RPD).

All data, as reported by the laboratory, are acceptable for use.

<sup>1</sup> Quality control results are discussed below, but no data were qualified.

# 3.0 Data Validation Report Vinyl Chloride by USEPA Method 8260C-SIM

This report documents the review of analytical data from the analyses of groundwater and field QC samples and the associated laboratory QC samples. Samples were analyzed by ARI. Compliance Screening (Level I) was performed on all analytical results by Chell Black as the primary data reviewer, and secondary review was performed by Jessi Massingale.

#### 3.1 DATA PACKAGE COMPLETENESS

The laboratory submitted all required deliverables. The laboratory followed adequate corrective action processes and all anomalies were discussed in the case narrative.

#### 3.2 TECHNICAL DATA VALIDATION

The QC requirements that were reviewed are listed below.

#### **QC** Requirements

Cooler temperature and preservation	Surrogate recoveries
Extraction and analysis holding times	Target analyte list
Blank contamination	Reporting limits and reported results
LCS and LCSD	

#### Notes:

Appendix A presents data validation criteria tables for organic compound analysis. QC requirements that were met without exception are not discussed below. QC requirements that required further evaluation and had exceptions to the validation criteria are discussed below.

#### 3.2.1 Cooler Temperature and Preservation

For SDG WJ94 the laboratory noted that the sample cooler temperatures (11.3°C and 6.3°C) were outside of the laboratory standard of 4±2°C. Samples were delivered to the laboratory the same day they were collected from the field. Only 60 minutes elapsed between when the final sample was collected and the cooler was delivered to the laboratory, leaving insufficient time for the cooler temperature to drop within the standard range. It is with professional judgment that no sample results be qualified based on cooler temperature, as the samples were delivered with minimal holding time.

#### 3.3 OVERALL ASSESSMENT

As was determined by this evaluation, the laboratory followed the specified analytical method. Accuracy was acceptable, as demonstrated by the sample surrogate, LCS, and LCSD percent recovery values. Precision was acceptable, as demonstrated by the LCS/LCSD RPD.

All data, as reported by the laboratory, are acceptable for use.

<sup>1</sup> Quality control results are discussed below, but no data were qualified.

# 4.0 Data Validation Report Select Metals by USEPA Method 6010B

This report documents the review of analytical data from the analyses of groundwater and field QC samples and the associated laboratory QC samples. Samples were analyzed by ARI. Compliance Screening (Level I) was performed on all analytical results by Chell Black as the primary data reviewer, and secondary review was performed by Jessi Massingale.

#### 4.1 DATA PACKAGE COMPLETENESS

The laboratory submitted all required deliverables. The laboratory followed adequate corrective action processes and all anomalies were discussed in the case narrative.

#### 4.2 TECHNICAL DATA VALIDATION

The QC requirements that were reviewed are listed below.

#### **QC Requirements**

Cooler temperature and preservation	<sup>1</sup> Lab Sample and Lab Sample Duplicate
Extraction and analysis holding times	Target analyte list
Blank contamination	Reporting limits and reported results
<sup>1</sup> Matrix Spike (MS)	

#### Notes:

Appendix A presents data validation criteria tables for organic compound analysis. QC requirements that were met without exception are not discussed below. QC requirements that required further evaluation and had exceptions to the validation criteria are discussed below.

#### 4.2.1 Cooler Temperature and Preservation

For SDG WJ94 the laboratory noted that the sample cooler temperatures (11.3°C and 6.3°C) were outside of the laboratory standard of  $4\pm2$ °C. Samples were delivered to the laboratory the same day they were collected from the field. Only 60 minutes elapsed between when the final sample was collected and the cooler was delivered to the laboratory, leaving insufficient time for the cooler temperature to drop within the standard range. It is with professional judgment that no sample results be qualified based on cooler temperature, as the samples were delivered with minimal holding time.

#### 4.2.2 Matrix Spike

For the analysis of total metals in SDG WJ94, the laboratory noted that the MS for iron and manganese may not be applicable, as the original concentrations in the sample exceeded the spike concentration by a factor of four (4x) or greater. Recoveries were still within control limits. Consistent with USEPA Contract Laboratory Program (CLP) guidance, it is with professional judgment that no total metal results be qualified based on this MS recovery information.

<sup>1</sup> Quality control results are discussed below, but no data were qualified.

For the analysis of dissolved metals in SDG WJ94, the laboratory noted that the MS for calcium, iron, magnesium, manganese, and sodium may not be applicable, as the original concentrations in the sample exceeded the spike concentration by a factor of four (4x) or greater. Magnesium, manganese, and sodium had recoveries that were still within control limits. Calcium was spiked at 10 milligrams per liter (mg/L) with an original concentration of 68.3 mg/L, and iron was spiked at 2 mg/L with an original concentration of 23.8 mg/L. Per USEPA guidelines spike recovery limits do not apply when a sample concentration exceeds the spike concentration by a factor of four (4x) or greater. In such an event, the results shall be reported unqualified even if the percent recovery does not meet the acceptance criteria. Consistent with USEPA CLP guidance, it is with professional judgment that no dissolved metal results be qualified based on this MS recovery information.

For the analysis of dissolved metals in SDG WK04, the laboratory noted that the MS recovery for calcium may not be applicable, as the original concentration in the sample exceeded the spike concentration by a factor of four (4x) or greater. The recovery was still within control limits. Consistent with USEPA CLP guidance, it is with professional judgment that no dissolved calcium results be qualified based on this MS recovery information.

For the analysis of total metals in SDG WK27A, the laboratory noted that the MS recovery for iron may not be applicable, as the original concentration in the sample exceeded the spike concentration by a factor of four (4x) or greater. The recovery was still within control limits. Consistent with USEPA CLP guidance, it is with professional judgment that no total iron results be qualified based on this MS recovery information.

For the analysis of dissolved metals in SDG WK27A, the laboratory noted that the MS recoveries for calcium, iron, and magnesium may not be applicable, as the original concentrations in the sample exceeded the spike concentration by a factor of four (4x) or greater. The magnesium recovery was still within control limits. Calcium was spiked at 10 mg/L with an original concentration of 70.8 mg/L, and iron was spiked at 2 mg/L with an original concentration of 59.5 mg/L. Per USEPA guidelines, spike recovery limits do not apply when a sample concentration exceeds the spike concentration by a factor of four (4x) or greater. In such an event, the results shall be reported unqualified even if the percent recovery does not meet the acceptance criteria. Consistent with USEPA CLP guidance, it is with professional judgment that no dissolved metal results be qualified based on this MS recovery information.

#### 4.2.3 Lab Sample and Lab Sample Duplicate

For the analysis of total and dissolved metals in SDG WK40, no sample/sample duplicate was run, as there were only two samples in the sample delivery group. It is with professional judgment that no results be qualified based on missing duplicate analysis, as all other sample delivery groups for this event demonstrated adequate precision for this laboratory for this method.

#### 4.3 OVERALL ASSESSMENT

As was determined by this evaluation, the laboratory followed the specified analytical method. Accuracy was acceptable, as demonstrated by MS percent recovery values. Precision was acceptable, as demonstrated by the sample/sample duplicate RPDs as discussed above.

All data, as reported by the laboratory, are acceptable for use.

## 5.0 References

- Farallon Consulting, LLC. 2010. Sampling and Analysis Plan, Appendix D of the Remedial Investigation/Feasibility Study Work Plan for South Park Landfill Site.
- U.S. Environmental Protection Agency (USEPA). 2004, 1994. *National Functional Guidelines for Inorganic Data Review*.

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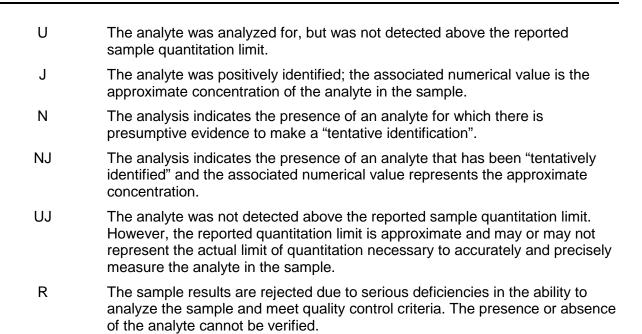
# April 2013 Groundwater Sampling Event South Park Landfill

## **Data Validation Report**

# Appendix A Data Qualifier Definitions and Criteria Tables

## DATA VALIDATION QUALIFIER CODES National Functional Guidelines

The following definitions provide brief explanations of the qualifiers assigned to results in the data review process.



The following is a Floyd|Snider qualifier that may also be assigned during the data review process:

DNR Do not report; a more appropriate result is reported from another analysis or dilution.

# Floyd|Snider Validation Guidelines for Metals Analysis by ICP-MS (Based on Inorganic NFG 1994 & 2004)

Validation QC Element	Acceptance Criteria	Action
Cooler Temperature and Preservation	Cooler temperature: 4°C ±2° Waters: Nitric Acid to pH < 2 For Dissolved Metals: 0.45um filter & preserve after filtration	Floyd Snider Professional Judgment—no qualification based on cooler temperature outliers J/UJ if pH preservation requirements are not met
Holding Time	180 days from date sampled Frozen tissues—HT extended to 2 years	J/UJ if holding time exceeded
Tune	Prior to ICAL monitoring compounds analyzed 5 times wih Std Dev. < 5% mass calibration <0.1 amu from True Value Resolution < 0.9 AMU @ 10% peak height or <0.75 amu @ 5% peak height	Use Professional Judgment to evaluate tune J/UJ if tune criteria not met
Initial Calibration	Blank + minimum 1 standard If more than 1 standard, r>0.995	J/UJ if r<0.995 (for multi point cal)
Initial Calibration Verification (ICV)	Independent source analyzed immediately after calibration %R within ±10% of true value	J/UJ if %R 75–89% J if %R = 111-125% R if %R > 125% R if %R < 75%
Continuing Calibration Verification (CCV)	Every ten samples, immediately following ICV/ICB and at end of run ±10% of true value	J/UJ if %R = 75–89% J if %R 111-125% R if %R > 125% R if %R < 75%
Initial and Continuing Calibration Blanks (ICB/CCB)	After each ICV and CCV every ten samples and end of run   blank   < IDL (MDL)	Action level is 5x absolute value of blank conc. For (+)blanks, U results < action level For (-) blanks, J/UJ results < action level

Validation QC Element	Acceptance Criteria	Action
Reporting Limit Standard (CRI)	2x RL analyzed beginning of run Not required for Al, Ba, Ca, Fe, Mg, Na, K %R = 70%-130% (50%-150% Co,Mn, Zn)	R, < 2x RL if %R < 50% (< 30% Co,Mn, Zn) J < 2x RL, UJ if %R 50-69% (30%-49% Co,Mn, Zn) J < 2x RL if %R 130%-180% (150%-200% Co,Mn, Zn) R < 2x RL if %R > 180% (200% Co, Mn, Zn)
Interference Check Samples (ICSA/ICSAB)	Required by SW 6020, but not 200.8 ICSAB %R 80% - 120% for all spiked elements   ICSA   < IDL (MDL) for all unspiked elements	For samples with AI, Ca, Fe, or Mg > ICS levels R if %R < 50% J if %R >120% J/UJ if %R = 50% to 79% Use Professional Judgment for ICSA to determine if bias is present
Method Blank	One per matrix per batch (batch not to exceed 20 samples) blank < MDL	Action level is 5x blank concentration U results < action level
Laboratory Control Sample (LCS)	One per matrix per batch Blank Spike: %R within 80%-120%	R if %R < 50% J/UJ if %R = 50-79% J if %R >120%
	CRM: Result within manufacturer's certified acceptance range or project guidelines	J/UJ if < LCL, J if > UCL
Matrix Spike/ Matrix Spike Duplicate (MS/MSD)	One per matrix per batch 75-125% for samples where results do not exceed 4x spike level	J if %R>125% J/UJ if %R <75% J/R if %R<30% or J/UJ if Post Spike %R 75%-125% Qualify all samples in batch
Post-digestion Spike	If Matrix Spike is outside 75-125%, Spike parent sample at 2x the sample conc.	No qualifiers assigned based on this element
Laboratory Duplicate (or MS/MSD)	One per matrix per batch RPD < 20% for samples > 5x RL Diff < RL for samples > RL and < 5 x RL (Diff < 2x RL for solids)	J/UJ if RPD > 20% or diff > RL All samples in batch
Serial Dilution	5x dilution one per matrix %D < 10% for original sample values > 50x MDL	J/UJ if %D >10% All samples in batch

Validation QC Element	Acceptance Criteria	Action		
Internal Standards	Every sample SW6020: 60%-125% of cal blank IS 200.8: 30%-120% of cal blank IS	J /UJ all analytes associated with IS outlier		
Field Blank	Blank < MDL	Action level is 5x blank conc. U sample values < AL in associated field samples only		
Field Duplicate	For results > 5x RL: Water: RPD < 35% Solid: RPD < 50% For results < 5 x RL: Water: Diff < RL Solid: Diff < 2x RL	J/UJ in parent samples only		
Linear Range	Sample concentrations must fall within range	J values over range		

# Floyd|Snider Validation Guidelines for Metals Analysis by ICP-MS (Based on Inorganic NFG 1994 & 2004)

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Cooler Temperature and Preservation	Cooler temperature: 4°C ±2° Waters: Nitric Acid to pH < 2 For Dissolved Metals: 0.45um filter & preserve after filtration	Floyd Snider Professional Judgment—no qualification based on cooler temperature outliers J/UJ if pH preservation requirements are not met
Holding Time	180 days from date sampled Frozen tissues—HT extended to 2 years	J/UJ if holding time exceeded
Tune	Prior to ICAL monitoring compounds analyzed 5 times wih Std Dev. < 5% mass calibration <0.1 amu from True Value Resolution < 0.9 AMU @ 10% peak height or <0.75 amu @ 5% peak height	Use Professional Judgment to evaluate tune J/UJ if tune criteria not met
Initial Calibration	Blank + minimum 1 standard If more than 1 standard, r>0.995	J/UJ if r<0.995 (for multi point cal)
Initial Calibration Verification (ICV)	Independent source analyzed immediately after calibration %R within ±10% of true value	J/UJ if %R 75–89% J if %R = 111-125% R if %R > 125% R if %R < 75%
Continuing Calibration Verification (CCV)	Every ten samples, immediately following ICV/ICB and at end of run ±10% of true value	J/UJ if %R = 75–89% J if %R 111-125% R if %R > 125% R if %R < 75%
Initial and Continuing Calibration Blanks (ICB/CCB)	After each ICV and CCV every ten samples and end of run   blank   < IDL (MDL)	Action level is 5x absolute value of blank conc. For (+)blanks, U results < action level For (-) blanks, J/UJ results < action level

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Reporting Limit Standard (CRI)	2x RL analyzed beginning of run Not required for Al, Ba, Ca, Fe, Mg, Na, K %R = 70%-130% (50%-150% Co,Mn, Zn)	R, < 2x RL if %R < 50% (< 30% Co,Mn, Zn) J < 2x RL, UJ if %R 50-69% (30%-49% Co,Mn, Zn) J < 2x RL if %R 130%-180% (150%-200% Co,Mn, Zn) R < 2x RL if %R > 180% (200% Co, Mn, Zn)
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