5B

SEMIVOLATILE ORGANIC INSTRUMENT PERFORMANCE CHECK
DECAFLUOROTRIPHENYLPHOSPHINE (DFTPP)

Lab Name: ANALYTICAL RESOURCES INC Client: GEOENGINEERS

Instrument ID: NT8 Project: GAS WORKS PARK-PLAY AREA

DFTPP Injection Date: 01/13/15 DFTPP Injection Time: 1833

m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
51	10.0 - 80.0% of mass 198	18.6
68	Less than 2.0% of mass 69	0.0 (0.0)1
69	Mass 69 relative abundance	48.6
70	Less than 2.0% of mass 69	0.3 (0.7)1
127	10.0 - 80.0% of mass 198	48.3
197	Less than 2.0% of mass 198	0.0
198	Base Peak, 100% relative abundance	100.0
199	5.0 to 9.0% of mass 198	7.7
275	10.0 - 60.0% of mass 198	31.4
365	Greater than 1.0% of mass 198	3.71
441	0.0 - 24.0% of mass 442	9.0 (16.2)2
442	50.0 - 200.0% of mass 198	55.7
443	15.0 - 24.0% of mass 442	12.0 (21.6)2

1-Value is % mass 69 2-Value is % mass 442

THIS CHECK APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS, AND STANDARDS:

	CLIENT SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
01	ICV0113	ICV0113	01131519	01/13/15	1846
02	ZP06LCSS1	ZP06LCSS1	01131524	01/13/15	2053
03	ZP06LCSDS1	ZP06LCSDS1	01131525	01/13/15	2118
04	PAI-9-12.5-13.0	ZP16A	01131530	01/13/15	2325
05	PAI-9-12.5-13-DU	ZP16B	01131531	01/13/15	2350
06	PAI-10-9.5-10.0	ZP16C	01131532	01/14/15	0016
07	PAI-10-19.5-20.0	ZP16D	01131533	01/14/15	0041
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5B

SEMIVOLATILE ORGANIC INSTRUMENT PERFORMANCE CHECK
DECAFLUOROTRIPHENYLPHOSPHINE (DFTPP)

Lab Name: ANALYTICAL RESOURCES INC Client: GEOENGINEERS

Instrument ID: NT8 Project: GAS WORKS PARK-PLAY AREA

DFTPP Injection Date: 01/14/15 DFTPP Injection Time: 1044

m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
51	10.0 - 80.0% of mass 198	17.9
68	Less than 2.0% of mass 69	0.0 (0.0)1
69	Mass 69 relative abundance	51.9
70	Less than 2.0% of mass 69	0.4 (0.7)1
127	10.0 - 80.0% of mass 198	48.8
197	Less than 2.0% of mass 198	0.3
198	Base Peak, 100% relative abundance	100.0
199	5.0 to 9.0% of mass 198	7.6
275	10.0 - 60.0% of mass 198	31.3
365	Greater than 1.0% of mass 198	3.42
441	0.0 - 24.0% of mass 442	9.3 (15.9)2
442	50.0 - 200.0% of mass 198	58.5
443	15.0 - 24.0% of mass 442	11.7 (20.1)2

1-Value is % mass 69 2-Value is % mass 442

THIS CHECK APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS, AND STANDARDS:

	CLIENT SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
01	ICV0114	ICV0114	01141502	01/14/15	1057
02	ZP06MBS1	ZP06MBS1	01141503	01/14/15	1123
03	PAI-10-24.5-25.0	ZP16E	01141506	01/14/15	1238
04	PAI-9-12.5-13.0	ZP16A	01141507	01/14/15	1304
05	PAI-9-12.5-13-DU	ZP16B	01141508	01/14/15	1329
06	PAI-10-9.5-10.0	ZP16C	01141509	01/14/15	1354
07	PAI-10-19.5-20.0	ZP16D	01141510	01/14/15	1420
08	PAI-10-24.5-25.0	ZP16E	01141511	01/14/15	1445
09	PAI-9-12.5-13.0	ZP16A	01141512	01/14/15	1510
10	PAI-10-9.5-10.0	ZP16C	01141513	01/14/15	1535
11	PAI-10-19.5-20.0	ZP16D	01141514	01/14/15	1601
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FORM V SV

6B

SEMIVOLATILE 8270-D INITIAL CALIBRATION DATA

Lab Name: ANALYTICAL RESOURCES INC Client: GEOENGINEERS

ARI Job No: ZP15 Project: GAS WORKS PARK-PLAY AREA

Instrument ID: NT8 Calibration Date: 01/05/15

LAB FILE ID: RRF0.1=01051503 RRF0.5=01051504 RRF1 =01051505
RRF2.5=01051502 RRF5 =01051506 RRF10 =01051507

COMPOUND	RRF 0.1	RRF 0.5	RRF 1	RRF 2.5	RRF 5	RRF 10	___ RRF	%RSD /R^2
Naphthalene	1.287	1.037	1.113	1.164	1.171	1.130	1.150	7.2
2-Methylnaphthalene	0.696	0.647	0.656	0.676	0.688	0.677	0.673	2.8
1-methylnaphthalene	0.648	0.568	0.601	0.633	0.644	0.635	0.622	5.0
Biphenyl	1.613	1.336	1.461	1.458	1.497	1.427	1.465	6.2
2,6-Dimethylnaphthalene	1.126	0.951	1.049	1.067	1.127	1.098	1.070	6.2
Acenaphthylene	1.781	1.498	1.694	1.772	1.848	1.753	1.724	7.0
Acenaphthene	1.328	1.058	1.140	1.164	1.182	1.155	1.171	7.5
Dibenzofuran	1.794	1.531	1.643	1.636	1.687	1.578	1.645	5.6
1,6,7-Trimethylnaphthalene	1.087	0.974	1.024	1.062	1.129	1.096	1.062	5.2
Fluorene	1.478	1.160	1.297	1.320	1.398	1.346	1.333	8.0
Dibenzothiophene	1.146	1.001	1.029	1.071	1.053	1.020	1.053	4.9
Phenanthrene	1.202	1.023	1.069	1.073	1.102	1.062	1.088	5.6
Anthracene	1.134	0.976	1.061	1.091	1.123	1.086	1.078	5.2
Carbazole	1.020	0.888	0.942	0.986	1.014	0.999	0.975	5.2
1-Methylphenanthrene	0.961	0.774	0.829	0.878	0.898	0.905	0.874	7.4
Fluoranthene	1.538	1.197	1.268	1.293	1.317	1.283	1.316	8.8
Pyrene	1.314	1.129	1.223	1.236	1.274	1.211	1.231	5.1
Benzo(a)anthracene	1.328	1.077	1.193	1.226	1.248	1.237	1.218	6.8
Chrysene	1.289	1.088	1.165	1.181	1.186	1.183	1.182	5.4
Benzo(b)fluoranthene	1.240	1.022	1.046	1.142	1.188	1.158	1.133	7.4
Benzo(k)fluoranthene	1.300	1.045	1.104	1.189	1.210	1.223	1.178	7.7
Benzo(j)fluoranthene	1.335	1.032	1.084	1.162	1.166	1.180	1.160	8.9
Benzo(e)pyrene	1.219	1.047	1.073	1.118	1.136	1.134	1.121	5.3
Benzo(a)pyrene	1.215	0.964	1.069	1.099	1.174	1.172	1.116	8.2
Perylene	1.258	0.999	1.057	1.106	1.163	1.152	1.122	8.0
Indeno(1,2,3-cd)pyrene	1.192	1.112	1.178	1.260	1.329	1.373	1.241	7.9
Dibenzo(a,h)anthracene	0.945	0.909	0.970	1.014	1.138	1.170	1.024	10.4
Benzo(g,h,i)perylene	1.167	0.985	0.981	1.047	1.121	1.136	1.073	7.5
2-Methylnaphthalene-d10	0.784	0.640	0.682	0.694	0.721	0.720	0.707	6.8
Dibenzo(a,h)anthracene-d14	0.826	0.724	0.769	0.814	0.874	0.910	0.820	8.3

<- Outside QC limits: %RSD <20% or R^2 > 0.990

7B

SEMIVOLATILE 8270-D CONTINUING CALIBRATION CHECK

Lab Name: ANALYTICAL RESOURCES INC Client: GEOENGINEERS

ARI Job No: ZP15 Project: GAS WORKS PARK-PLAY AREA

Instrument ID: NT8 Cont. Calib. Date: 01/13/15

Init. Calib. Date: 01/05/15 Cont. Calib. Time: 1846

COMPOUND	CalAmt or ARF	CC Amt or RF	MIN RRF	CURVE TYPE	%D or Drift
Naphthalene	1.150	1.113	0.700	AVRG	-3.2
2-Methylnaphthalene	0.673	0.702	0.400	AVRG	4.3
Acenaphthylene	1.724	1.772	0.900	AVRG	2.8
Acenaphthene	1.171	1.177	0.900	AVRG	0.5
Dibenzofuran	1.645	1.576	0.800	AVRG	-4.2
Fluorene	1.333	1.339	0.900	AVRG	0.4
Phenanthrene	1.088	1.104	0.700	AVRG	1.5
Anthracene	1.078	1.115	0.700	AVRG	3.4
Fluoranthene	1.316	1.281	0.600	AVRG	-2.6
Pyrene	1.231	1.262	0.600	AVRG	2.5
Benzo(a)anthracene	1.218	1.209	0.800	AVRG	-0.7
Chrysene	1.182	1.148	0.700	AVRG	-2.9
Benzo(b)fluoranthene	1.133	1.166	0.700	AVRG	2.9
Benzo(k)fluoranthene	1.178	1.150	0.700	AVRG	-2.4
Benzo(j)fluoranthene	1.160	1.090	0.010	AVRG	-6.0
Benzo(a)pyrene	1.116	1.099	0.700	AVRG	-1.5
Indeno(1,2,3-cd)pyrene	1.241	1.348	0.500	AVRG	8.6
Dibenzo(a,h)anthracene	1.024	1.134	0.400	AVRG	10.7
Benzo(g,h,i)perylene	1.073	1.166	0.500	AVRG	8.7
1-methylnaphthalene	0.622	0.663	0.010	AVRG	6.6
Perylene	1.122	1.096	0.010	AVRG	-2.3
2-Methylnaphthalene-d10	0.707	0.711	0.010	AVRG	0.6
Dibenzo(a,h)anthracene-d14	0.820	0.959	0.010	AVRG	17.0
Fluoranthene-d10	1.185	1.179	0.010	AVRG	-0.5

<- Exceeds QC limit of 20% D
* RF less than minimum RF

FORM VII SV-1

7B

SEMIVOLATILE 8270-D CONTINUING CALIBRATION CHECK

Lab Name: ANALYTICAL RESOURCES INC Client: GEOENGINEERS

ARI Job No: ZP15 Project: GAS WORKS PARK-PLAY AREA

Instrument ID: NT8 Cont. Calib. Date: 01/14/15

Init. Calib. Date: 01/05/15 Cont. Calib. Time: 1057

COMPOUND	CalAmt or ARF	CC Amt or RF	MIN RRF	CURVE TYPE	%D or Drift
Naphthalene	1.150	1.077	0.700	AVRG	-6.3
2-Methylnaphthalene	0.673	0.697	0.400	AVRG	3.6
Acenaphthylene	1.724	1.820	0.900	AVRG	5.6
Acenaphthene	1.171	1.195	0.900	AVRG	2.0
Dibenzofuran	1.645	1.642	0.800	AVRG	-0.2
Fluorene	1.333	1.370	0.900	AVRG	2.8
Phenanthrene	1.088	1.086	0.700	AVRG	-0.2
Anthracene	1.078	1.099	0.700	AVRG	1.9
Fluoranthene	1.316	1.297	0.600	AVRG	-1.4
Pyrene	1.231	1.231	0.600	AVRG	0.0
Benzo(a)anthracene	1.218	1.210	0.800	AVRG	-0.6
Chrysene	1.182	1.141	0.700	AVRG	-3.5
Benzo(b)fluoranthene	1.133	1.174	0.700	AVRG	3.6
Benzo(k)fluoranthene	1.178	1.196	0.700	AVRG	1.5
Benzo(j)fluoranthene	1.160	1.131	0.010	AVRG	-2.5
Benzo(a)pyrene	1.116	1.106	0.700	AVRG	-0.9
Indeno(1,2,3-cd)pyrene	1.241	1.246	0.500	AVRG	0.4
Dibenzo(a,h)anthracene	1.024	1.045	0.400	AVRG	2.0
Benzo(g,h,i)perylene	1.073	1.077	0.500	AVRG	0.4
1-methylnaphthalene	0.622	0.675	0.010	AVRG	8.5
Perylene	1.122	1.108	0.010	AVRG	-1.2
2-Methylnaphthalene-d10	0.707	0.697	0.010	AVRG	-1.4
Dibenzo(a,h)anthracene-d14	0.820	0.893	0.010	AVRG	8.9
Fluoranthene-d10	1.185	1.194	0.010	AVRG	0.8

<- Exceeds QC limit of 20% D

* RF less than minimum RF

FORM VII SV-1

SEMIVOLATILE 8270-D CONTINUING CALIBRATION CHECK

Lab Name: ANALYTICAL RESOURCES INC Client: GEOENGINEERS

ARI Job No: ZP15 Project: GAS WORKS PARK-PLAY AREA

Instrument ID: NT8 Cont. Calib. Date: 01/15/15

Init. Calib. Date: 01/05/15 Cont. Calib. Time: 0956

COMPOUND	CalAmt or ARF	CC Amt or RF	MIN RRF	CURVE TYPE	%D or Drift
Naphthalene	1.150	1.107	0.700	AVRG	-3.7
2-Methylnaphthalene	0.673	0.686	0.400	AVRG	1.9
Acenaphthylene	1.724	1.794	0.900	AVRG	4.1
Acenaphthene	1.171	1.195	0.900	AVRG	2.0
Dibenzofuran	1.645	1.657	0.800	AVRG	0.7
Fluorene	1.333	1.358	0.900	AVRG	1.9
Phenanthrene	1.088	1.092	0.700	AVRG	0.4
Anthracene	1.078	1.077	0.700	AVRG	-0.1
Fluoranthene	1.316	1.318	0.600	AVRG	0.2
Pyrene	1.231	1.257	0.600	AVRG	2.1
Benzo(a)anthracene	1.218	1.211	0.800	AVRG	-0.6
Chrysene	1.182	1.158	0.700	AVRG	-2.0
Benzo(b)fluoranthene	1.133	1.153	0.700	AVRG	1.8
Benzo(k)fluoranthene	1.178	1.200	0.700	AVRG	1.9
Benzo(j)fluoranthene	1.160	1.191	0.010	AVRG	2.7
Benzo(a)pyrene	1.116	1.134	0.700	AVRG	1.6
Indeno(1,2,3-cd)pyrene	1.241	1.262	0.500	AVRG	1.7
Dibenzo(a,h)anthracene	1.024	1.076	0.400	AVRG	5.1
Benzo(g,h,i)perylene	1.073	1.074	0.500	AVRG	0.1
1-methylnaphthalene	0.622	0.658	0.010	AVRG	5.8
Perylene	1.122	1.151	0.010	AVRG	2.6
2-Methylnaphthalene-d10	0.707	0.705	0.010	AVRG	-0.3
Dibenzo(a,h)anthracene-d14	0.820	0.880	0.010	AVRG	7.3
Fluoranthene-d10	1.185	1.193	0.010	AVRG	0.7

<- Exceeds QC limit of 20% D
* RF less than minimum RF

7B

SEMIVOLATILE 8270-D CONTINUING CALIBRATION CHECK

Lab Name: ANALYTICAL RESOURCES INC Client: GEOENGINEERS

ARI Job No: ZP15 Project: GAS WORKS PARK-PLAY AREA

Instrument ID: NT8 Cont. Calib. Date: 01/16/15

Init. Calib. Date: 01/05/15 Cont. Calib. Time: 0856

COMPOUND	CalAmt or ARF	CC Amt or RF	MIN RRF	CURVE TYPE	%D or Drift
Naphthalene	1.150	1.118	0.700	AVRG	-2.8
2-Methylnaphthalene	0.673	0.693	0.400	AVRG	3.0
Acenaphthylene	1.724	1.748	0.900	AVRG	1.4
Acenaphthene	1.171	1.183	0.900	AVRG	1.0
Dibenzofuran	1.645	1.615	0.800	AVRG	-1.8
Fluorene	1.333	1.344	0.900	AVRG	0.8
Phenanthrene	1.088	1.099	0.700	AVRG	1.0
Anthracene	1.078	1.102	0.700	AVRG	2.2
Fluoranthene	1.316	1.349	0.600	AVRG	2.5
Pyrene	1.231	1.229	0.600	AVRG	-0.2
Benzo(a)anthracene	1.218	1.207	0.800	AVRG	-0.9
Chrysene	1.182	1.145	0.700	AVRG	-3.1
Benzo(b)fluoranthene	1.133	1.152	0.700	AVRG	1.7
Benzo(k)fluoranthene	1.178	1.185	0.700	AVRG	0.6
Benzo(j)fluoranthene	1.160	1.153	0.010	AVRG	-0.6
Benzo(a)pyrene	1.116	1.142	0.700	AVRG	2.3
Indeno(1,2,3-cd)pyrene	1.241	1.275	0.500	AVRG	2.7
Dibenzo(a,h)anthracene	1.024	1.042	0.400	AVRG	1.8
Benzo(g,h,i)perylene	1.073	1.099	0.500	AVRG	2.4
1-methylnaphthalene	0.622	0.650	0.010	AVRG	4.5
Perylene	1.122	1.144	0.010	AVRG	2.0
2-Methylnaphthalene-d10	0.707	0.705	0.010	AVRG	-0.3
Dibenzo(a,h)anthracene-d14	0.820	0.878	0.010	AVRG	7.1
Fluoranthene-d10	1.185	1.201	0.010	AVRG	1.4

<- Exceeds QC limit of 20% D
* RF less than minimum RF

FORM VII SV-1

8B

SEMIVOLATILE INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: ANALYTICAL RESOURCES INC Client: GEOENGINEERS

ARI Job No: ZP15 Project: GAS WORKS PARK-PLAY AREA

Ical Midpoint ID: 01051502 Ical Date: 01/05/15

Instrument ID: NT8 Cont. Cal Date: 01/13/15

		IS1(NPT) AREA #	RT #	IS2(ANT) AREA #	RT #	IS3(PHN) AREA #	RT #
	ICAL MIDPT	387555	4.71	258447	6.97	456948	8.98
	UPPER LIMIT	775110		516894		913896	
	LOWER LIMIT	193778		129224		228474	
	CCAL	393798	4.60	262932	6.86	448261	8.87
	UPPER LIMIT		5.10		7.36		9.37
	LOWER LIMIT		4.10		6.36		8.37
01	ZO53MBW1	419217	4.60	279466	6.86	476274	8.88
02	ZO53LCSW1	436630	4.60	287344	6.86	489369	8.88
03							
04							
05							
06							
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23							
24							
25							

IS1 = Naphthalene-d8
IS2 = Acenaphthene-d10
IS3 = Phenanthrene-d10

AREA UPPER LIMIT = +100% of internal standard area from Ical midpoint
AREA LOWER LIMIT = - 50% of internal standard area from Ical midpoint
RT UPPER LIMIT = + 0.50 minutes of internal standard RT from Cont. Cal
RT LOWER LIMIT = - 0.50 minutes of internal standard RT from Cont. Cal

* Values outside of QC limits.

FORM VIII SV-1

8B

SEMIVOLATILE INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: ANALYTICAL RESOURCES INC Client: GEOENGINEERS

ARI Job No: ZP15 Project: GAS WORKS PARK-PLAY AREA

Ical Midpoint ID: 01051502 Ical Date: 01/05/15

Instrument ID: NT8 Cont. Cal Date: 01/13/15

		IS4(CRY) AREA #	RT #	IS5(PRY) AREA #	RT #	AREA #	RT #
	ICAL MIDPT	492500	13.72	485582	17.52		
	UPPER LIMIT	985000		971164			
	LOWER LIMIT	246250		242791			
	CCAL	482100	13.53	484352	17.30		
	UPPER LIMIT		14.03		17.80		
	LOWER LIMIT		13.03		16.80		
01	ZO53MBW1	515142	13.54	531933	17.31		
02	ZO53LCSW1	549867	13.54	523541	17.31		
03							
04							
05							
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23							
24							
25							

IS4 = Chrysene-d12
IS5 = Perylene-d12

AREA UPPER LIMIT = +100% of internal standard area from Ical midpoint
AREA LOWER LIMIT = - 50% of internal standard area from Ical midpoint
RT UPPER LIMIT = + 0.50 minutes of internal standard RT from Cont. Cal
RT LOWER LIMIT = - 0.50 minutes of internal standard RT from Cont. Cal

* Values outside of QC limits.

FORM VIII SV-2

8B

SEMIVOLATILE INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: ANALYTICAL RESOURCES INC Client: GEOENGINEERS

ARI Job No: ZP15 Project: GAS WORKS PARK-PLAY AREA

Ical Midpoint ID: 01051502 Ical Date: 01/05/15

Instrument ID: NT8 Cont. Cal Date: 01/14/15

		IS1(NPT) AREA #	RT #	IS2(ANT) AREA #	RT #	IS3(PHN) AREA #	RT #
	ICAL MIDPT	387555	4.71	258447	6.97	456948	8.98
	UPPER LIMIT	775110		516894		913896	
	LOWER LIMIT	193778		129224		228474	
	CCAL	432716	4.59	285009	6.85	514676	8.85
	UPPER LIMIT		5.09		7.35		9.35
	LOWER LIMIT		4.09		6.35		8.35
01	ZO53LCSDW1	412151	4.58	272668	6.85	470766	8.85
02							
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19							
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22							
23							
24							
25							

IS1 = Naphthalene-d8
IS2 = Acenaphthene-d10
IS3 = Phenanthrene-d10

AREA UPPER LIMIT = +100% of internal standard area from Ical midpoint
AREA LOWER LIMIT = - 50% of internal standard area from Ical midpoint
RT UPPER LIMIT = + 0.50 minutes of internal standard RT from Cont. Cal
RT LOWER LIMIT = - 0.50 minutes of internal standard RT from Cont. Cal

* Values outside of QC limits.

FORM VIII SV-1

8B

SEMIVOLATILE INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: ANALYTICAL RESOURCES INC Client: GEOENGINEERS

ARI Job No: ZP15 Project: GAS WORKS PARK-PLAY AREA

Ical Midpoint ID: 01051502 Ical Date: 01/05/15

Instrument ID: NT8 Cont. Cal Date: 01/14/15

		IS4(CRY) AREA #	RT #	IS5(PRY) AREA #	RT #	AREA #	RT #
	ICAL MIDPT	492500	13.72	485582	17.52		
	UPPER LIMIT	985000		971164			
	LOWER LIMIT	246250		242791			
	CCAL	561143	13.51	529600	17.27		
	UPPER LIMIT		14.01		17.77		
	LOWER LIMIT		13.01		16.77		
01	ZO53LCSDW1	528600	13.51	439033	17.27		
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IS4 = Chrysene-d12
IS5 = Perylene-d12

AREA UPPER LIMIT = +100% of internal standard area from Ical midpoint
AREA LOWER LIMIT = - 50% of internal standard area from Ical midpoint
RT UPPER LIMIT = + 0.50 minutes of internal standard RT from Cont. Cal
RT LOWER LIMIT = - 0.50 minutes of internal standard RT from Cont. Cal

* Values outside of QC limits.

FORM VIII SV-2

8B

SEMIVOLATILE INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: ANALYTICAL RESOURCES INC | Client: GEOENGINEERS

ARI Job No: ZP15 | Project: GAS WORKS PARK-PLAY AREA

Ical Midpoint ID: 01051502 | Ical Date: 01/05/15

Instrument ID: NT8 | Cont. Cal Date: 01/15/15

		IS1(NPT) AREA #	RT #	IS2(ANT) AREA #	RT #	IS3(PHN) AREA #	RT #
	ICAL MIDPT	387555	4.71	258447	6.97	456948	8.98
	UPPER LIMIT	775110		516894		913896	
	LOWER LIMIT	193778		129224		228474	
	CCAL	363073	4.59	238241	6.84	432531	8.85
	UPPER LIMIT		5.09		7.34		9.35
	LOWER LIMIT		4.09		6.34		8.35
01	MW-36D-14121	609643	4.62	256822	6.85	452479	8.85
02	MW-36S-14121	476880	4.62	269147	6.85	461437	8.85
03	MW-36D-14121	632661	4.62	263212	6.85	466918	8.86
04	MW-36S-14121	485099	4.62	266619	6.85	467656	8.85
05	MW-36D-14121	354198	4.59	230542	6.85	405398	8.85
06	MW-36S-14121	361516	4.59	234780	6.85	409403	8.85
07	MW-36D-14121	381401	4.59	245833	6.85	424418	8.85
08	MW-36S-14121	342594	4.59	231149	6.84	397525	8.85
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IS1 = Naphthalene-d8
IS2 = Acenaphthene-d10
IS3 = Phenanthrene-d10

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* Values outside of QC limits.

FORM VIII SV-1

8B

SEMIVOLATILE INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: ANALYTICAL RESOURCES INC | Client: GEOENGINEERS

ARI Job No: ZP15 | Project: GAS WORKS PARK-PLAY AREA

Ical Midpoint ID: 01051502 | Ical Date: 01/05/15

Instrument ID: NT8 | Cont. Cal Date: 01/15/15

		IS4(CRY) AREA #	RT #	IS5(PRY) AREA #	RT #	AREA #	RT #
	ICAL MIDPT	492500	13.72	485582	17.52		
	UPPER LIMIT	985000		971164			
	LOWER LIMIT	246250		242791			
	CCAL	471355	13.51	427266	17.27		
	UPPER LIMIT		14.01		17.77		
	LOWER LIMIT		13.01		16.77		
01	MW-36D-14121	500346	13.50	432368	17.26		
02	MW-36S-14121	506793	13.50	453340	17.26		
03	MW-36D-14121	505814	13.50	435683	17.26		
04	MW-36S-14121	509705	13.50	455118	17.26		
05	MW-36D-14121	467282	13.50	392651	17.26		
06	MW-36S-14121	471825	13.51	400330	17.26		
07	MW-36D-14121	486664	13.50	430000	17.26		
08	MW-36S-14121	454831	13.51	388532	17.27		
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IS4 = Chrysene-d12
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RT LOWER LIMIT = - 0.50 minutes of internal standard RT from Cont. Cal

* Values outside of QC limits.

FORM VIII SV-2

8B

SEMIVOLATILE INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: ANALYTICAL RESOURCES INC Client: GEOENGINEERS

ARI Job No: ZP15 Project: GAS WORKS PARK-PLAY AREA

Ical Midpoint ID: 01051502 Ical Date: 01/05/15

Instrument ID: NT8 Cont. Cal Date: 01/16/15

		IS1(NPT) AREA #	RT #	IS2(ANT) AREA #	RT #	IS3(PHN) AREA #	RT #
	ICAL MIDPT	387555	4.71	258447	6.97	456948	8.98
	UPPER LIMIT	775110		516894		913896	
	LOWER LIMIT	193778		129224		228474	
	CCAL	353898	4.58	236153	6.84	418975	8.85
	UPPER LIMIT		5.08		7.34		9.35
	LOWER LIMIT		4.08		6.34		8.35
01	MW-36D-14121	364376	4.59	234794	6.84	416909	8.85
02	MW-36S-14121	358912	4.59	244607	6.84	427198	8.85
03	MW-36D-14121	389742	4.59	257118	6.84	447106	8.85
04	MW-36S-14121	380771	4.59	251175	6.84	432723	8.85
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* Values outside of QC limits.

FORM VIII SV-1

8B

SEMIVOLATILE INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: ANALYTICAL RESOURCES INC Client: GEOENGINEERS

ARI Job No: ZP15 Project: GAS WORKS PARK-PLAY AREA

Ical Midpoint ID: 01051502 Ical Date: 01/05/15

Instrument ID: NT8 Cont. Cal Date: 01/16/15

		IS4(CRY) AREA #	RT #	IS5(PRY) AREA #	RT #	AREA #	RT #
	ICAL MIDPT	492500	13.72	485582	17.52		
	UPPER LIMIT	985000		971164			
	LOWER LIMIT	246250		242791			
	CCAL	468221	13.51	421063	17.27		
	UPPER LIMIT		14.01		17.77		
	LOWER LIMIT		13.01		16.77		
01	MW-36D-14121	470542	13.51	417375	17.27		
02	MW-36S-14121	478681	13.51	430521	17.26		
03	MW-36D-14121	503540	13.50	453365	17.26		
04	MW-36S-14121	485546	13.50	423060	17.26		
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FORM VIII SV-2

8B

SEMIVOLATILE INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: ANALYTICAL RESOURCES INC Client: GEOENGINEERS

ARI Job No: ZP16 Project: GAS WORKS PARK-PLAY

Ical Midpoint ID: 01051502 Ical Date: 01/05/15

Instrument ID: NT8 Cont. Cal Date: 01/15/15

		IS1(NPT) AREA #	RT #	IS2(ANT) AREA #	RT #	IS3(PHN) AREA #	RT #
	ICAL MIDPT	387555	4.71	258447	6.97	456948	8.98
	UPPER LIMIT	775110		516894		913896	
	LOWER LIMIT	193778		129224		228474	
	CCAL	363073	4.59	238241	6.84	432531	8.85
	UPPER LIMIT		5.09		7.34		9.35
	LOWER LIMIT		4.09		6.34		8.35
01	RINSATE-1412	350465	4.58	236444	6.85	417746	8.85
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FORM VIII SV-1

8B

SEMIVOLATILE INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: ANALYTICAL RESOURCES INC | Client: GEOENGINEERS

ARI Job No: ZP16 | Project: GAS WORKS PARK-PLAY

Ical Midpoint ID: 01051502 | Ical Date: 01/05/15

Instrument ID: NT8 | Cont. Cal Date: 01/15/15

		IS4(CRY) AREA #	RT #	IS5(PRY) AREA #	RT #	AREA #	RT #
	ICAL MIDPT	492500	13.72	485582	17.52		
	UPPER LIMIT	985000		971164			
	LOWER LIMIT	246250		242791			
	CCAL	471355	13.51	427266	17.27		
	UPPER LIMIT		14.01		17.77		
	LOWER LIMIT		13.01		16.77		
01	RINSATE-1412	459533	13.51	357415	17.26		
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FORM VIII SV-2

8B

SEMIVOLATILE INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: ANALYTICAL RESOURCES INC Client: GEOENGINEERS

ARI Job No: ZP16 Project: GAS WORKS PARK-PLAY AREA

Ical Midpoint ID: 01051502 Ical Date: 01/05/15

Instrument ID: NT8 Cont. Cal Date: 01/13/15

		IS1(NPT) AREA #	RT #	IS2(ANT) AREA #	RT #	IS3(PHN) AREA #	RT #
	ICAL MIDPT	387555	4.71	258447	6.97	456948	8.98
	UPPER LIMIT	775110		516894		913896	
	LOWER LIMIT	193778		129224		228474	
	CCAL	393798	4.60	262932	6.86	448261	8.87
	UPPER LIMIT		5.10		7.36		9.37
	LOWER LIMIT		4.10		6.36		8.37
01	ZP06LCSS1	402831	4.59	270225	6.86	460514	8.87
02	ZP06LCSDS1	388827	4.60	262621	6.86	444839	8.87
03	PAI-9-12.5-1	450772	4.60	282878	6.86	485107	8.88
04	PAI-9-12.5-1	353150	4.60	239110	6.86	413806	8.88
05	PAI-10-9.5-1	462010	4.66	469313	6.88	610062	8.90
06	PAI-10-19.5-	477920	4.61	280009	6.87	467229	8.88
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IS1 = Naphthalene-d8
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FORM VIII SV-1

8B

SEMIVOLATILE INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: ANALYTICAL RESOURCES INC Client: GEOENGINEERS

ARI Job No: ZP16 Project: GAS WORKS PARK-PLAY AREA

Ical Midpoint ID: 01051502 Ical Date: 01/05/15

Instrument ID: NT8 Cont. Cal Date: 01/13/15

		IS4(CRY) AREA #	RT #	IS5(PRY) AREA #	RT #	AREA #	RT #
	ICAL MIDPT	492500	13.72	485582	17.52		
	UPPER LIMIT	985000		971164			
	LOWER LIMIT	246250		242791			
	CCAL	482100	13.53	484352	17.30		
	UPPER LIMIT		14.03		17.80		
	LOWER LIMIT		13.03		16.80		
01	ZP06LCSS1	501792	13.53	497942	17.30		
02	ZP06LCSDS1	492133	13.54	483539	17.30		
03	PAI-9-12.5-1	527377	13.54	560527	17.31		
04	PAI-9-12.5-1	449873	13.54	458038	17.30		
05	PAI-10-9.5-1	617103	13.56	671044	17.33		
06	PAI-10-19.5-	518884	13.54	526402	17.31		
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IS4 = Chrysene-d12
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FORM VIII SV-2

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SEMIVOLATILE INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: ANALYTICAL RESOURCES INC Client: GEOENGINEERS

ARI Job No: ZP16 Project: GAS WORKS PARK-PLAY AREA

Ical Midpoint ID: 01051502 Ical Date: 01/05/15

Instrument ID: NT8 Cont. Cal Date: 01/14/15

		IS1(NPT) AREA #	RT #	IS2(ANT) AREA #	RT #	IS3(PHN) AREA #	RT #
	ICAL MIDPT	387555	4.71	258447	6.97	456948	8.98
	UPPER LIMIT	775110		516894		913896	
	LOWER LIMIT	193778		129224		228474	
	CCAL	432716	4.59	285009	6.85	514676	8.85
	UPPER LIMIT		5.09		7.35		9.35
	LOWER LIMIT		4.09		6.35		8.35
01	ZP06MBS1	429175	4.59	282514	6.85	484040	8.86
02	PAI-10-24.5-	425344	4.60	288517	6.85	493565	8.86
03	PAI-9-12.5-1	418807	4.59	286732	6.85	486711	8.86
04	PAI-9-12.5-1	409742	4.59	273484	6.85	481890	8.86
05	PAI-10-9.5-1	407927	4.59	271738	6.85	468520	8.85
06	PAI-10-19.5-	417693	4.59	278419	6.85	483336	8.86
07	PAI-10-24.5-	434530	4.59	295410	6.85	522923	8.85
08	PAI-9-12.5-1	409778	4.59	275307	6.85	476785	8.85
09	PAI-10-9.5-1	373128	4.59	253870	6.84	440114	8.85
10	PAI-10-19.5-	367897	4.59	249778	6.85	441906	8.85
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SEMIVOLATILE INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: ANALYTICAL RESOURCES INC Client: GEOENGINEERS

ARI Job No: ZP16 Project: GAS WORKS PARK-PLAY AREA

Ical Midpoint ID: 01051502 Ical Date: 01/05/15

Instrument ID: NT8 Cont. Cal Date: 01/14/15

		IS4(CRY) AREA #	RT #	IS5(PRY) AREA #	RT #	AREA #	RT #
	ICAL MIDPT	492500	13.72	485582	17.52		
	UPPER LIMIT	985000		971164			
	LOWER LIMIT	246250		242791			
	CCAL	561143	13.51	529600	17.27		
	UPPER LIMIT		14.01		17.77		
	LOWER LIMIT		13.01		16.77		
01	ZP06MBS1	532275	13.51	460216	17.27		
02	PAI-10-24.5-	557200	13.51	527441	17.26		
03	PAI-9-12.5-1	530451	13.51	507774	17.27		
04	PAI-9-12.5-1	524181	13.51	485015	17.26		
05	PAI-10-9.5-1	533034	13.51	502085	17.27		
06	PAI-10-19.5-	551443	13.51	499876	17.27		
07	PAI-10-24.5-	577863	13.51	526858	17.27		
08	PAI-9-12.5-1	513337	13.51	481033	17.27		
09	PAI-10-9.5-1	510687	13.51	460447	17.27		
10	PAI-10-19.5-	490713	13.51	437587	17.26		
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IS4 = Chrysene-d12
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FORM VIII SV-2

Metals Analysis
Report and Summary QC Forms

ARI Job ID: ZP15, ZP16

Cover Page

INORGANIC ANALYSIS DATA PACKAGE

ANALYTICAL RESOURCES INCORPORATED

CLIENT: Geoengineers

PROJECT: Gas Works Park-Paly

SDG: ZP15

CLIENT ID	ARI ID	ARI LIMS ID	REPREP
MW-36D-141215	ZP15A	14-27518	
MW-36D-141215D	ZP15ADUP	14-27518	
MW-36D-141215S	ZP15ASPK	14-27518	
MW-36S-141215	ZP15B	14-27519	
PBW	ZP15MB1	14-27519	
LCSW	ZP15MB1SPK	14-27519	

Were ICP interelement corrections applied ?	Yes/No	YES
Were ICP background corrections applied ?	Yes/No	YES
If yes - were raw data generated before application of background corrections ?	Yes/No	NO

Comments: _____

THIS DATA PACKAGE HAS BEEN REVIEWED AND AUTHORIZED FOR RELEASE BY:

Signature: _____ Name: Jay Kuhn

Date: 12/30/14 Title: Inorganics Director

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
DISSOLVED METALS
Page 1 of 1

Sample ID: MW-36D-141215
SAMPLE

Lab Sample ID: ZP15A
LIMS ID: 14-27518
Matrix: Water
Data Release Authorized:
Reported: 12/30/14

QC Report No: ZP15-Geoengineers
Project: Gas Works Park-Play Area Investigat
0186-846-01 Task 1520
Date Sampled: 12/15/14
Date Received: 12/15/14

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	DL	LOQ	mg/L	Q
6010C	12/18/14	6010C	12/26/14	**7440-38-2**	**Arsenic**	0.02	0.2	**81.8**	
6010C	12/18/14	6010C	12/26/14	**7440-70-2**	**Calcium**	0.06	0.2	**3.2**	
6010C	12/18/14	6010C	12/26/14	**7439-89-6**	**Iron**	0.04	0.2	**1.6**	
6010C	12/18/14	6010C	12/26/14	**7439-95-4**	**Magnesium**	0.05	0.2	**2.2**	
6010C	12/18/14	6010C	12/26/14	**7439-96-5**	**Manganese**	0.0014	0.005	**0.038**	
6010C	12/18/14	6010C	12/26/14	**7440-09-7**	**Potassium**	0.3	2	**3**	
6010C	12/18/14	6010C	12/26/14	**7440-23-5**	**Sodium**	0.1	2	**979**	

U-Analyte undetected at given DL
J-Analyte detected between DL and LOQ
DL-Detection Limit

Results reported below the LOQ are for statistical purposes only and have not been evaluated by either an analyst or data reviewer.

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
DISSOLVED METALS
Page 1 of 1

Sample ID: MW-36S-141215
SAMPLE

Lab Sample ID: ZP15B
LIMS ID: 14-27519
Matrix: Water
Data Release Authorized:
Reported: 12/30/14

QC Report No: ZP15-Geoengineers
Project: Gas Works Park-Play Area Investigat
0186-846-01 Task 1520
Date Sampled: 12/15/14
Date Received: 12/15/14

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	DL	LOQ	mg/L	Q
6010C	12/18/14	6010C	12/26/14	**7440-38-2**	**Arsenic**	0.003	0.05	**0.07**	
6010C	12/18/14	6010C	12/26/14	**7440-70-2**	**Calcium**	0.011	0.05	**41.6**	
6010C	12/18/14	6010C	12/26/14	**7439-89-6**	**Iron**	0.008	0.05	**14.1**	
6010C	12/18/14	6010C	12/26/14	**7439-95-4**	**Magnesium**	0.010	0.05	**7.06**	
6010C	12/18/14	6010C	12/26/14	**7439-96-5**	**Manganese**	0.0003	0.001	**0.407**	
6010C	12/18/14	6010C	12/26/14	**7440-09-7**	**Potassium**	0.07	0.5	**2.7**	
6010C	12/18/14	6010C	12/26/14	**7440-23-5**	**Sodium**	0.01	0.5	**27.9**	

U-Analyte undetected at given DL
J-Analyte detected between DL and LOQ
DL-Detection Limit

Results reported below the LOQ are for statistical purposes only and have not been evaluated by either an analyst or data reviewer.

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
DISSOLVED METALS
Page 1 of 1

Sample ID: MW-36D-141215
MATRIX SPIKE

Lab Sample ID: ZP15A
LIMS ID: 14-27518
Matrix: Water
Data Release Authorized:
Reported: 12/30/14

QC Report No: ZP15-Geoengineers
Project: Gas Works Park-Play Area Investigat
0186-846-01 Task 1520
Date Sampled: 12/15/14
Date Received: 12/15/14

MATRIX SPIKE QUALITY CONTROL REPORT

Analyte	Analysis Method	Sample	Spike	Spike Added	% Recovery	Q
Arsenic	6010C	81.8	97.8	10.0	160%	H
Calcium	6010C	3.2	51.5	50.0	96.6%	
Iron	6010C	1.6	11.3	10.0	97.0%	
Magnesium	6010C	2.2	50.6	50.0	96.8%	
Manganese	6010C	0.038	2.45	2.50	96.5%	
Potassium	6010C	3	51	50.0	96.0%	
Sodium	6010C	979	1,050	50.0	142%	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%

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
DISSOLVED METALS
Page 1 of 1

Sample ID: MW-36D-141215
DUPLICATE

Lab Sample ID: ZP15A
LIMS ID: 14-27518
Matrix: Water
Data Release Authorized:
Reported: 12/30/14

QC Report No: ZP15-Geoengineers
Project: Gas Works Park-Play Area Investigat
0186-846-01 Task 1520
Date Sampled: 12/15/14
Date Received: 12/15/14

MATRIX DUPLICATE QUALITY CONTROL REPORT

Analyte	Analysis Method	Sample	Duplicate	RPD	Control Limit	Q
Arsenic	6010C	81.8	66.7	20.3%	+/- 20%	*
Calcium	6010C	3.2	3.3	3.1%	+/- 20%	
Iron	6010C	1.6	1.7	6.1%	+/- 20%	
Magnesium	6010C	2.2	2.2	0.0%	+/- 20%	
Manganese	6010C	0.038	0.040	5.1%	+/- 20%	
Potassium	6010C	3	3	0.0%	+/- 2	L
Sodium	6010C	979	1,010	3.1%	+/- 20%	

Reported in mg/L

*-Control Limit Not Met
L-RPD Invalid, Limit = Detection Limit

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
DISSOLVED METALS
Page 1 of 1

Sample ID: LAB CONTROL

Lab Sample ID: ZP15LCS
LIMS ID: 14-27519
Matrix: Water
Data Release Authorized:
Reported: 12/30/14

QC Report No: ZP15-Geoengineers
Project: Gas Works Park-Play Area Investigat
0186-846-01 Task 1520
Date Sampled: NA
Date Received: NA

BLANK SPIKE QUALITY CONTROL REPORT

Analyte	Analysis Method	Spike Found	Spike Added	% Recovery	Q
Arsenic	6010C	2.14	2.00	107%	
Calcium	6010C	9.81	10.0	98.1%	
Iron	6010C	2.01	2.00	100%	
Magnesium	6010C	10.1	10.0	101%	
Manganese	6010C	0.477	0.500	95.4%	
Potassium	6010C	10.0	10.0	100%	
Sodium	6010C	10.2	10.0	102%	

Reported in mg/L

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

FORM-VII

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
DISSOLVED METALS **Sample ID: METHOD BLANK**

Lab Sample ID: ZP15MB
LIMS ID: 14-27519
Matrix: Water
Data Release Authorized:
Reported: 12/30/14

QC Report No: ZP15-Geoengineers
Project: Gas Works Park-Play Area Investigat
0186-846-01 Task 1520
Date Sampled: NA
Date Received: NA

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	DL	LOQ	mg/L	Q
6010C	12/18/14	6010C	12/26/14	7440-38-2	Arsenic	0.003	0.05	0.05	U
6010C	12/18/14	6010C	12/26/14	7440-70-2	Calcium	0.011	0.05	0.05	U
6010C	12/18/14	6010C	12/26/14	7439-89-6	Iron	0.008	0.05	0.05	U
6010C	12/18/14	6010C	12/26/14	7439-95-4	Magnesium	0.010	0.05	0.05	U
6010C	12/18/14	6010C	12/26/14	7439-96-5	Manganese	0.0003	0.001	0.001	U
6010C	12/18/14	6010C	12/26/14	7440-09-7	Potassium	0.07	0.5	0.5	U
6010C	12/18/14	6010C	12/26/14	7440-23-5	Sodium	0.01	0.5	0.5	U

U-Analyte undetected at given DL
J-Analyte detected between DL and LOQ
DL-Detection Limit

Results reported below the LOQ are for statistical purposes only and have not been evaluated by either an analyst or data reviewer.

Calibration Verification

ANALYTICAL RESOURCES INCORPORATED

CLIENT: Geoengineers

PROJECT: Gas Works Park-Paly

UNITS: ug/L

SDG: ZP15

ANALYTE	EL	M	RUN	ICVTV	ICV	%R	CCVTV	CCV1	%R	CCV2	%R	CCV3	%R	CCV4	%R	CCV5	%R
Arsenic	AS	ICP	IP122671	2000.0	2047.58	**102.4**	2000.0	2054.14	**102.7**	2052.94	**102.6**	2056.18	**102.8**				
Calcium	CA	ICP	IP122671	2000.0	2002.75	**100.1**	2000.0	1989.73	**99.5**	1986.28	**99.3**	1978.80	**98.9**				
Iron	FE	ICP	IP122671	2000.0	2082.66	**104.1**	2000.0	2066.14	**103.3**	2035.73	**101.8**	2030.86	**101.5**				
Magnesium	MG	ICP	IP122671	2000.0	1999.58	**100.0**	2000.0	1997.19	**99.9**	1998.36	**99.9**	1984.39	**99.2**				
Manganese	MN	ICP	IP122671	1000.0	987.78	**98.8**	1000.0	976.10	**97.6**	966.38	**96.6**	968.38	**96.8**				
Potassium	K	ICP	IP122671	20000.0	20262.32	**101.3**	20000.0	20110.05	**100.6**	20059.90	**100.3**	20100.01	**100.5**				
Sodium	NA	ICP	IP122671	50000.0	51488.78	**103.0**	50000.0	50999.11	**102.0**	51142.82	**102.3**	50731.04	**101.5**				

Control Limits: Mercury 80-120; Other Metals 90-110

FORM II (1)

ZP15-00173

CRDL Standard

ANALYTICAL RESOURCES INCORPORATED

CLIENT: Geoengineers

PROJECT: Gas Works Park-Paly

UNITS: ug/L

SDG: ZP15

ANALYTE	EL	M	RUN	CRA/I TV	CR-1	%R	CR-2	%R	CR-3	%R	CR-4	%R	CR-5	%R	CR-6	%R
Arsenic	AS	ICP	IP122671	50.0	51.18	**102.4**										
Calcium	CA	ICP	IP122671	50.0	44.91	**89.8**										
Iron	FE	ICP	IP122671	50.0	51.08	**102.2**										
Magnesium	MG	ICP	IP122671	50.0	52.11	**104.2**										
Manganese	MN	ICP	IP122671	1.0	1.07	**107.0**										
Potassium	K	ICP	IP122671	500.0	522.16	**104.4**										
Sodium	NA	ICP	IP122671	500.0	461.73	**92.3**										

ZP15 - 0514 Tq

Control Limits: no control limits have been established by the EPA at this time.

Calibration Blanks

ANALYTICAL RESOURCES INCORPORATED

CLIENT: Geoengineers

PROJECT: Gas Works Park-Paly

UNITS: ug/L

SDG: ZP15

ANALYTE	EL	METH	RUN	CRDL	IDL	ICB	C	CCB1	C	CCB2	C	CCB3	C	CCB4	C	CCB5	C
Arsenic	AS	ICP	IP122671	10.0	50.0	50.0	U	50.0	U	50.0	U	50.0	U				
Calcium	CA	ICP	IP122671	5000.0	50.0	50.0	U	50.0	U	50.0	U	50.0	U				
Iron	FE	ICP	IP122671	100.0	50.0	50.0	U	50.0	U	50.0	U	50.0	U				
Magnesium	MG	ICP	IP122671	5000.0	50.0	50.0	U	50.0	U	50.0	U	50.0	U				
Manganese	MN	ICP	IP122671	15.0	1.0	1.0	U	1.0	U	1.0	U	1.0	U				
Potassium	K	ICP	IP122671	5000.0	500.0	500.0	U	500.0	U	500.0	U	500.0	U				
Sodium	NA	ICP	IP122671	5000.0	500.0	500.0	U	500.0	U	500.0	U	500.0	U				

ZP15 : 9SL7S

ICP Interference Check Sample

ANALYTICAL RESOURCES INCORPORATED

CLIENT: Geoengineers

ICS SOURCE: I.V.

PROJECT: Gas Works Park-Paly

RUNID: IP122671

SDG: ZP15

INSTRUMENT ID: OPTIMA ICP 2

UNITS: ug/L

ANALYTE	ICSA TV	ICSAB TV	ICSA1	ICSAB1	%R	ICSA2	ICSAB2	%R	ICSA3	ICSAB3	%R
Aluminum	200000	200000	201994.8	203508.1	**101.8**						
Antimony		1000	14.7	1068.8	**106.9**						
Arsenic		1000	25.4	1079.3	**107.9**						
Barium		1000	-0.4	1064.7	**106.5**						
Beryllium		1000	0.1	1027.6	**102.8**						
Boron			-3.8	-3.7							
Cadmium		1000	0.7	1049.5	**105.0**						
Calcium	100000	100000	103106.5	103136.0	**103.1**						
Chromium		1000	-1.4	1051.7	**105.2**						
Cobalt		1000	2.5	990.9	**99.1**						
Copper		1000	0.0	1073.4	**107.3**						
Iron	200000	200000	201409.4	202663.2	**101.3**						
Lead		1000	-12.5	1014.0	**101.4**						
Magnesium	100000	100000	104937.3	100979.2	**101.0**						
Manganese		1000	0.2	990.2	**99.0**						
Molybdenum			3.7	3.2							
Nickel		1000	0.6	1004.7	**100.5**						
Potassium			5.1	22.0							
Selenium		1000	37.1	1095.5	**109.6**						
Silicon			4.6	4.1							
Silver		1000	-1.0	1108.2	**110.8**						
Sodium			-41.4	-47.9							
Strontium			3.0	3.0							
Thallium		1000	2.1	978.9	**97.9**						
Tin			-20.1	-21.3							
Titanium			0.8	0.5							
Vanadium		1000	-1.3	1020.8	**102.1**						
Zinc		1000	2.7	1004.9	**100.5**						

ZP15 - 09176

IDLs and ICP Linear Ranges

ANALYTICAL RESOURCES INCORPORATED

CLIENT: Geoengineers

PROJECT: Gas Works Park-Paly

SDG: ZP15 UNITS: ug/L

ANALYTE	EL	METH	INSTRUMENT	WAVELENTH (nm)	GFA BACK-GROUND	CLP CRDL	RL	RL DATE	ICP LINEAR RANGE (ug/L)	ICP LR DATE
Arsenic	AS	ICP	OPTIMA ICP 2	197.20		10	50.0	4/1/2012	30000.0	6/10/2014
Calcium	CA	ICP	OPTIMA ICP 2	317.93		5000	50.0	4/1/2012	500000.0	6/10/2014
Iron	FE	ICP	OPTIMA ICP 2	259.94		100	50.0	4/1/2012	250000.0	6/10/2014
Magnesium	MG	ICP	OPTIMA ICP 2	279.08		5000	50.0	4/1/2012	500000.0	6/10/2014
Manganese	MN	ICP	OPTIMA ICP 2	257.61		15	1.0	4/1/2012	30000.0	6/10/2014
Potassium	K	ICP	OPTIMA ICP 2	766.49		5000	500.0	4/1/2012	500000.0	6/10/2014
Sodium	NA	ICP	OPTIMA ICP 2	589.00		5000	500.0	4/1/2012	5000000.0	6/10/2014

ICP Interelement Correction Factors

ANALYTICAL RESOURCES INCORPORATED

CLIENT: Geoengineers

PROJECT: Gas Works Park-Paly

IEC DATE: 10/27/2014

SDG: ZP15

INSTRUMENT ID: OPTIMA ICP 2

ANALYTE	WAVELENGTH	AL	AS	BA	BE	CA	CD	CO	CR	CU	FE
Aluminum	308.22	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Antimony	206.84	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	14.0198100	0.0000000	0.0000000
Arsenic	188.98	0.0000000	0.0000000	0.0000000	0.0000000	0.0764100	0.0000000	-1.0860250	1.6016350	0.0000000	0.0000000
Barium	233.53	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	-0.1911190	0.0000000	0.0000000	0.1532030
Beryllium	313.04	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0098370	0.0000000	0.0000000
Boron	249.67	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	2.1785010	0.0000000	0.0000000	0.0000000
Cadmium	228.80	0.0000000	5.7686950	0.0000000	0.0000000	0.0000000	0.0000000	0.1134910	0.0000000	0.0000000	0.0000000
Calcium	317.93	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Chromium	267.72	0.0000000	0.0000000	0.0000000	0.0000000	0.0105610	0.0000000	0.0000000	0.0000000	0.0000000	-0.0413720
Cobalt	228.62	0.0000000	0.0000000	0.0853470	0.0000000	0.0000000	0.0000000	0.0000000	-0.0421260	0.0000000	0.0000000
Copper	324.75	0.0000000	0.0000000	0.0000000	0.0000000	0.0021980	0.0000000	-0.1622490	-0.0152760	0.0000000	-0.0447290
Iron	273.96	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	-0.9508650	0.0000000	0.0000000
Lead	220.35	-0.2096680	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	-1.7516130	1.5325290	0.0499030
Magnesium	279.08	0.0000000	0.0000000	0.0000000	0.0000000	0.1119060	0.0000000	-1.6746270	-1.1710960	0.0000000	0.6610200
Manganese	257.61	0.0060150	0.0000000	0.0000000	0.0000000	0.0041750	0.0000000	0.0137770	0.0000000	0.0000000	-0.0046620
Molybdenum	202.03	0.0000000	0.0000000	0.0000000	0.0000000	0.0156160	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Nickel	231.60	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Potassium	766.49	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Selenium	196.03	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.5290750	0.0000000	0.0000000	0.0000000
Silicon	288.16	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	-3.5634780	0.0000000	-0.5863590	0.0000000	0.0000000
Silver	328.07	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Sodium	589.59	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Thallium	190.80	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	6.1573050	0.4310930	0.0000000	-0.1254120
Tin	189.93	0.0000000	0.0000000	0.0000000	0.0000000	-0.1475120	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Titanium	334.90	0.0000000	0.0000000	0.0000000	0.0000000	0.0797880	0.0000000	0.0000000	0.1965610	0.0000000	0.0000000
Vanadium	292.40	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	-3.7864850	0.0000000	0.0538250
Zinc	206.20	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000

ZP15_09178

ICP Interelement Correction Factors

ANALYTICAL RESOURCES INCORPORATED

CLIENT: Geoengineers

PROJECT: Gas Works Park-Paly

IEC DATE: 10/27/2014

SDG: ZP15

INSTRUMENT ID: OPTIMA ICP 2

ANALYTE	WAVELENGTH	MG	MN	MO	NI	PB	SB	TI	TL	V	ZN
Aluminum	308.22	0.0000000	0.0000000	15.2105350	0.0000000	0.0000000	0.0000000	1.9181250	0.0000000	14.9692830	0.0000000
Antimony	206.84	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	-0.6574750	0.0000000	-4.0497020	0.0000000
Arsenic	188.98	0.0000000	0.0000000	3.6569730	0.0000000	0.0000000	0.0000000	-26.2017890	0.0000000	0.0000000	0.0000000
Barium	233.53	0.0000000	0.0000000	0.0000000	0.1112510	0.0000000	0.0000000	0.0000000	0.0000000	0.2137080	0.0000000
Beryllium	313.04	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0122940	0.0000000	0.2849470	0.0000000
Boron	249.67	0.0000000	0.0000000	-1.1347080	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Cadmium	228.80	0.0000000	0.0000000	0.0000000	-0.9151470	0.0000000	0.0000000	0.0000000	0.0000000	0.0642140	0.0000000
Calcium	317.93	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Chromium	267.72	0.1073910	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.3457620	0.0000000
Cobalt	228.62	0.0000000	0.0000000	-0.1331780	0.1621790	0.0000000	0.0000000	1.7359160	0.0000000	0.0000000	0.0000000
Copper	324.75	0.0055170	0.0000000	0.3194440	0.0000000	0.0000000	0.0000000	0.1761040	0.0000000	0.0000000	0.0000000
Iron	273.96	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	7.5009230	0.0000000
Lead	220.35	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Magnesium	279.08	0.0000000	0.0000000	-5.2575470	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Manganese	257.61	0.0000000	0.0000000	0.0000000	0.0000000	-0.1944900	0.0000000	0.0000000	0.0000000	-0.0205160	0.0000000
Molybdenum	202.03	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Nickel	231.60	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	-0.5357680	0.0000000	0.4509940	0.0000000	0.0000000
Potassium	766.49	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Selenium	196.03	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.6217450	0.0000000
Silicon	288.16	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Silver	328.07	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	-0.2780320	0.0000000
Sodium	589.59	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	257.1408130	0.0000000	0.0000000	281.4212140
Thallium	190.80	0.0000000	0.0000000	-1.4387970	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	3.7649150	0.0000000
Tin	189.93	0.0000000	0.0000000	0.0000000	0.0000000	-0.0427690	-0.5371860	-0.2280960	0.0000000	0.0000000	0.0000000
Titanium	334.90	0.0000000	0.0000000	0.9643590	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Vanadium	292.40	0.0000000	-0.1516390	-0.4437580	0.0000000	0.0000000	0.0000000	0.5348410	0.0000000	0.0000000	0.0000000
Zinc	206.20	0.0000000	0.0000000	0.2610130	0.0000000	-0.0494060	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000

ZP15-S0179

Preparation Log

ANALYTICAL RESOURCES INCORPORATED

CLIENT: Geoengineers

PROJECT: Gas Works Park-Paly

SDG: ZP15

ANALYSIS METHOD: ICP

ARI PREP CODE: WMN

PREPDATE: 12/18/2014

CLIENT ID	ARI ID	MASS (g)	INITIAL VOLUME (mL)	FINAL VOLUME (mL)
MW-36D-141215	ZP15A	0.000	50.0	50.0
MW-36D-141215D	ZP15ADUP	0.000	50.0	50.0
MW-36D-141215S	ZP15ASPK	0.000	50.0	50.0
MW-36S-141215	ZP15B	0.000	50.0	50.0
PBW	ZP15MB1	0.000	50.0	50.0
LCSW	ZP15MB1SPK	0.000	50.0	50.0

Analysis Run Log

ANALYTICAL RESOURCES INCORPORATED

CLIENT: Geoengineers

PROJECT: Gas Works Park-Paly | INSTRUMENT ID: OPTIMA ICP 2 | START DATE: 12/26/2014

SDG: ZP15 | RUNID: IP122671 | METHOD: ICP | END DATE: 12/26/2014

CLIENT ID	ARI ID	DIL.	TIME	%R	AG	AL	AS	B	BA	BE	CA	CD	CO	CR	CU	FE	HG	K	MG	MN	MO	NA	NI	PB	SB	SE	SI	SN	TI	TL	U	V	ZN
S0	S0	1.00	09160				X				X					X		X	X	X		X											
S2	S2	1.00	09200																	X													
S3	S3	1.00	09220				X																										
S4	S4	1.00	09243																														
S5	S5	1.00	09264								X					X		X	X			X											
ICV	ICV	1.00	09292				X				X					X		X	X	X		X											
ICB	ICB	1.00	09351				X				X					X		X	X	X		X											
CRI	CRII	1.00	09392				X				X					X		X	X	X		X											
ICSA	ICSAI	1.00	09434				X				X					X		X	X	X		X											
ICSAB	ICSABI	1.00	09475				X				X					X		X	X	X		X											
CCV	CCV1	1.00	09532				X				X					X		X	X	X		X											
CCB	CCB1	1.00	09573				X				X					X		X	X	X		X											
ZZZZZZ	ZP16MB2	1.00	10014																														
PBW	ZP15MB1	1.00	10060				X				X					X		X	X	X		X											
ZZZZZZ	ZO83C	5.00	10101																														
ZZZZZZ	ZZZZZZ	5.00	10180																														
MW-36D-141215D	ZP15ADUP	5.00	10275				X				X					X		X	X	X		X											
MW-36D-141215	ZP15A	5.00	10364				X				X					X		X	X	X		X											
MW-36D-141215S	ZP15ASPK	5.00	10451				X				X					X		X	X	X		X											
ZZZZZZ	ZP49B	2.00	10570																														
ZZZZZZ	ZP16MB2SPK	1.00	11014																														
LCSW	ZP15MB1SPK	1.00	11054				X				X					X		X	X	X		X											
CCV	CCV2	1.00	11094				X				X					X		X	X	X		X											
CCB	CCB2	1.00	11135				X				X					X		X	X	X		X											
ZZZZZZ	ZO83MB1	1.00	11180																														
ZZZZZZ	ZP16VDUP	1.00	11222																														
ZZZZZZ	ZP16V	1.00	11263																														
ZZZZZZ	ZP16VSPK	1.00	11305																														
ZZZZZZ	ZO83ADUP	1.00	11345																														
ZZZZZZ	ZO83A	1.00	11390																														
ZZZZZZ	ZO83ASPK	1.00	11432																														
MW-36S-141215	ZP15B	1.00	11472				X				X					X		X	X	X		X											
ZZZZZZ	ZO83B	1.00	11514																														
ZZZZZZ	ZO83MB1SPK	1.00	11555																														
CCV	CCV3	1.00	11595				X				X					X		X	X	X		X											

FORM XIV

ZP15.90184

Analysis Run Log

ANALYTICAL RESOURCES INCORPORATED

CLIENT: Geoengineers

PROJECT: Gas Works Park-Paly | INSTRUMENT ID: OPTIMA ICP 2 | START DATE: 12/26/2014

SDG: ZP15 | RUNID: IP122671 | METHOD: ICP | END DATE: 12/26/2014

CLIENT ID	ARI ID	DIL.	TIME	%R	AG	AL	AS	B	BA	BE	CA	CD	CO	CR	CU	FE	HG	K	MG	MN	MO	NA	NI	PB	SB	SE	SI	SN	TI	TL	U	V	ZN
CCB	CCB3	1.00	12040				X				X					X		X	X	X		X											

ZP15.09182

Cover Page

INORGANIC ANALYSIS DATA PACKAGE

ANALYTICAL RESOURCES INCORPORATED

CLIENT: Geoengineers

PROJECT: Gas Works Park-Play

SDG: ZP16

CLIENT ID	ARI ID	ARI LIMS ID	REPREP
PAI-9-12.5-13.0	ZP16A	14-27409	
PAI-9-12.5-13.0D	ZP16ADUP	14-27409	
PAI-9-12.5-13.0S	ZP16ASPK	14-27409	
PAI-9-12.5-13-DUP	ZP16B	14-27410	
PBS	ZP16MB1	14-27410	
LCSS	ZP16MB1SPK	14-27410	
PAI-10-9.5-10.0	ZP16C	14-27411	
PAI-10-24.5-25.0	ZP16E	14-27413	
PAI-9-23-23.5	ZP16I	14-27417	
PBW	ZP16MB2	14-27430	
LCSW	ZP16MB2SPK	14-27430	
RINSATE-141211	ZP16V	14-27430	
RINSATE-141211D	ZP16VDUP	14-27430	
RINSATE-141211S	ZP16VSPK	14-27430	

Were ICP interelement corrections applied ?	Yes/No	YES
Were ICP background corrections applied ?	Yes/No	YES
If yes - were raw data generated before application of background corrections ?	Yes/No	NO

Comments: _____

THIS DATA PACKAGE HAS BEEN REVIEWED AND AUTHORIZED FOR RELEASE BY:

Signature: _____ Name: Jay Kuhn

Date: 12/30/14 Title: Inorganics Director

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS
Page 1 of 1

Sample ID: PAI-9-12.5-13.0
SAMPLE

Lab Sample ID: ZP16A
LIMS ID: 14-27409
Matrix: Soil
Data Release Authorized:
Reported: 12/30/14

QC Report No: ZP16-Geoengineers
Project: Gas Works Park-Play Area Investigat
0186-846-01 Task 1520
Date Sampled: 12/11/14
Date Received: 12/11/14

Percent Total Solids: 83.2%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	DL	LOQ	mg/kg	Q
3050B	12/23/14	6010C	12/26/14	**7440-38-2**	**Arsenic**	0.55	6	**478**	

U-Analyte undetected at given DL
J-Analyte detected between DL and LOQ
DL-Method Detection Limit

Results reported below the LOQ are for statistical purposes only and have not been evaluated by either an analyst or data reviewer.

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS

Sample ID: PAI-9-12.5-13-DUP
SAMPLE

Lab Sample ID: ZP16B
LIMS ID: 14-27410
Matrix: Soil
Data Release Authorized:
Reported: 12/30/14

QC Report No: ZP16-Geoengineers
Project: Gas Works Park-Play Area Investigat
0186-846-01 Task 1520
Date Sampled: 12/11/14
Date Received: 12/11/14

Percent Total Solids: 82.2%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	DL	LOQ	mg/kg	Q
3050B	12/23/14	6010C	12/26/14	**7440-38-2**	**Arsenic**	0.54	6	**463**	

U-Analyte undetected at given DL
J-Analyte detected between DL and LOQ
DL-Method Detection Limit

Results reported below the LOQ are for statistical purposes only and have not been evaluated by either an analyst or data reviewer.

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS

Sample ID: PAI-10-9.5-10.0
SAMPLE

Lab Sample ID: ZP16C
LIMS ID: 14-27411
Matrix: Soil
Data Release Authorized:
Reported: 12/30/14

QC Report No: ZP16-Geoengineers
Project: Gas Works Park-Play Area Investigat
0186-846-01 Task 1520
Date Sampled: 12/11/14
Date Received: 12/11/14

Percent Total Solids: 61.1%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	DL	LOQ	mg/kg	Q
3050B	12/23/14	6010C	12/29/14	**7440-38-2**	**Arsenic**	1.8	19.9	**19.3**	**J**

U-Analyte undetected at given DL
J-Analyte detected between DL and LOQ
DL-Method Detection Limit

Results reported below the LOQ are for statistical purposes only and have not been evaluated by either an analyst or data reviewer.

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS

Sample ID: PAI-10-24.5-25.0
SAMPLE

Lab Sample ID: ZP16E
LIMS ID: 14-27413
Matrix: Soil
Data Release Authorized:
Reported: 12/30/14

QC Report No: ZP16-Geoengineers
Project: Gas Works Park-Play Area Investigat
0186-846-01 Task 1520
Date Sampled: 12/11/14
Date Received: 12/11/14

Percent Total Solids: 58.4%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	DL	LOQ	mg/kg	Q
3050B	12/23/14	6010C	12/29/14	**7440-38-2**	**Arsenic**	1.8	20	**610**	

U-Analyte undetected at given DL
J-Analyte detected between DL and LOQ
DL-Method Detection Limit

Results reported below the LOQ are for statistical purposes only and have not been evaluated by either an analyst or data reviewer.

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS
Page 1 of 1

Sample ID: PAI-9-23-23.5
SAMPLE

Lab Sample ID: ZP16I
LIMS ID: 14-27417
Matrix: Soil
Data Release Authorized:
Reported: 12/30/14

QC Report No: ZP16-Geoengineers
Project: Gas Works Park-Play Area Investigat
0186-846-01 Task 1520
Date Sampled: 12/11/14
Date Received: 12/11/14

Percent Total Solids: 81.4%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	DL	LOQ	mg/kg	Q
3050B	12/23/14	6010C	12/26/14	**7440-38-2**	**Arsenic**	0.52	6	**60**	

U-Analyte undetected at given DL
J-Analyte detected between DL and LOQ
DL-Method Detection Limit

Results reported below the LOQ are for statistical purposes only and have not been evaluated by either an analyst or data reviewer.

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS

Sample ID: PAI-9-12.5-13.0
MATRIX SPIKE

Lab Sample ID: ZP16A
LIMS ID: 14-27409
Matrix: Soil
Data Release Authorized:
Reported: 12/30/14

QC Report No: ZP16-Geoengineers
Project: Gas Works Park-Play Area Investigat
0186-846-01 Task 1520
Date Sampled: 12/11/14
Date Received: 12/11/14

MATRIX SPIKE QUALITY CONTROL REPORT

Analyte	Analysis Method	Sample	Spike	Spike Added	% Recovery	Q
Arsenic	6010C	478	771	239	123%	

Reported in mg/kg-dry

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

Percent Recovery Limits: 75-125%

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS

Sample ID: PAI-9-12.5-13.0
DUPLICATE

Lab Sample ID: ZP16A
LIMS ID: 14-27409
Matrix: Soil
Data Release Authorized:
Reported: 12/30/14

QC Report No: ZP16-Geoengineers
Project: Gas Works Park-Play Area Investigat
0186-846-01 Task 1520
Date Sampled: 12/11/14
Date Received: 12/11/14

MATRIX DUPLICATE QUALITY CONTROL REPORT

Analyte	Analysis Method	Sample	Duplicate	RPD	Control Limit	Q
Arsenic	6010C	478	590	21.0%	+/- 20%	*

Reported in mg/kg-dry

*-Control Limit Not Met
L-RPD Invalid, Limit = Detection Limit

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS
Page 1 of 1

Sample ID: LAB CONTROL

Lab Sample ID: ZP16LCS
LIMS ID: 14-27410
Matrix: Soil
Data Release Authorized:
Reported: 12/30/14

QC Report No: ZP16-Geoengineers
Project: Gas Works Park-Play Area Investigat
0186-846-01 Task 1520
Date Sampled: NA
Date Received: NA

BLANK SPIKE QUALITY CONTROL REPORT

Analyte	Analysis Method	Spike Found	Spike Added	% Recovery	Q
Arsenic	6010C	213	200	106%	

Reported in mg/kg-dry

N-Control limit not met
NA-Not Applicable, Analyte Not Spiked
Control Limits: 80-120%

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS **Sample ID: METHOD BLANK**

Lab Sample ID: ZP16MB
LIMS ID: 14-27410
Matrix: Soil
Data Release Authorized:
Reported: 12/30/14

QC Report No: ZP16-Geoengineers
Project: Gas Works Park-Play Area Investigat
0186-846-01 Task 1520
Date Sampled: NA
Date Received: NA

Percent Total Solids: NA

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	DL	LOQ	mg/kg	Q
3050B	12/23/14	6010C	12/26/14	7440-38-2	Arsenic	0.46	5	5	U

U-Analyte undetected at given DL
J-Analyte detected between DL and LOQ
DL-Method Detection Limit

Results reported below the LOQ are for statistical purposes only and have not been evaluated by either an analyst or data reviewer.

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS

Sample ID: RINSATE-141211
SAMPLE

Lab Sample ID: ZP16V
LIMS ID: 14-27430
Matrix: Water
Data Release Authorized:
Reported: 12/30/14

QC Report No: ZP16-Geoengineers
Project: Gas Works Park-Play Area Investigat
0186-846-01 Task 1520
Date Sampled: 12/11/14
Date Received: 12/11/14

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	DL	LOQ	mg/L	Q
3010A	12/17/14	6010C	12/26/14	7440-38-2	Arsenic	0.003	0.05	0.05	U

U-Analyte undetected at given DL
J-Analyte detected between DL and LOQ
DL-Method Detection Limit

Results reported below the LOQ are for statistical purposes only and have not been evaluated by either an analyst or data reviewer.

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS

Sample ID: RINSATE-141211
MATRIX SPIKE

Lab Sample ID: ZP16V
LIMS ID: 14-27430
Matrix: Water
Data Release Authorized:
Reported: 12/30/14

QC Report No: ZP16-Geoengineers
Project: Gas Works Park-Play Area Investigat
0186-846-01 Task 1520
Date Sampled: 12/11/14
Date Received: 12/11/14

MATRIX SPIKE QUALITY CONTROL REPORT

Analyte	Analysis Method	Sample	Spike	Spike Added	% Recovery	Q
Arsenic	6010C	0.05 U	2.19	2.00	110%	

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%

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS
Page 1 of 1

Sample ID: RINSATE-141211
DUPLICATE

Lab Sample ID: ZP16V
LIMS ID: 14-27430
Matrix: Water
Data Release Authorized:
Reported: 12/30/14

QC Report No: ZP16-Geoengineers
Project: Gas Works Park-Play Area Investigat
0186-846-01 Task 1520
Date Sampled: 12/11/14
Date Received: 12/11/14

MATRIX DUPLICATE QUALITY CONTROL REPORT

Analyte	Analysis Method	Sample	Duplicate	RPD	Control Limit	Q
Arsenic	6010C	0.05 U	0.05 U	0.0%	+/- 0.05	L

Reported in mg/L

*-Control Limit Not Met
L-RPD Invalid, Limit = Detection Limit

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS
Page 1 of 1

Sample ID: LAB CONTROL

Lab Sample ID: ZP16LCS
LIMS ID: 14-27430
Matrix: Water
Data Release Authorized:
Reported: 12/30/14

QC Report No: ZP16-Geoengineers
Project: Gas Works Park-Play Area Investigat
0186-846-01 Task 1520
Date Sampled: NA
Date Received: NA

BLANK SPIKE QUALITY CONTROL REPORT

Analyte	Analysis Method	Spike Found	Spike Added	% Recovery	Q
Arsenic	6010C	2.20	2.00	110%	

Reported in mg/L

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

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS
Page 1 of 1

Sample ID: METHOD BLANK

Lab Sample ID: ZP16MB
LIMS ID: 14-27430
Matrix: Water
Data Release Authorized:
Reported: 12/30/14

QC Report No: ZP16-Geoengineers
Project: Gas Works Park-Play Area Investigat
0186-846-01 Task 1520
Date Sampled: NA
Date Received: NA

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	DL	LOQ	mg/L	Q
3010A	12/17/14	6010C	12/26/14	7440-38-2	Arsenic	0.003	0.05	0.05	U

U-Analyte undetected at given DL
J-Analyte detected between DL and LOQ
DL-Method Detection Limit

Results reported below the LOQ are for statistical purposes only and have not been evaluated by either an analyst or data reviewer.

Calibration Verification

ANALYTICAL RESOURCES INCORPORATED

CLIENT: Geoengineers

PROJECT: Gas Works Park-Play

UNITS: ug/L

SDG: ZP16

ANALYTE	EL	M	RUN	ICVTV	ICV	%R	CCVTV	CCV1	%R	CCV2	%R	CCV3	%R	CCV4	%R	CCV5	%R
Arsenic	AS	ICP	IP122671	2000.0	2047.58	**102.4**	2000.0	2054.14	**102.7**	2052.94	**102.6**	2056.18	**102.8**	2094.84	**104.7**	2097.45	**104.9**

Control Limits: Mercury 80-120; Other Metals 90-110

Calibration Verification

ANALYTICAL RESOURCES INCORPORATED

CLIENT: Geoengineers

PROJECT: Gas Works Park-Play

UNITS: ug/L

SDG: ZP16

ANALYTE	EL	M	RUN	ICVTV	ICV	%R	CCVTV	CCV1	%R	CCV2	%R	CCV3	%R	CCV4	%R	CCV5	%R
Arsenic	AS	ICP	IP122971	2000.0	2046.13	**102.3**	2000.0	2031.70	**101.6**	2021.54	**101.1**	2098.61	**104.9**	2122.52	**106.1**	2127.04	**106.4**

ZP15-05199

Control Limits: Mercury 80-120; Other Metals 90-110

Calibration Verification

ANALYTICAL RESOURCES INCORPORATED

CLIENT: Geoengineers

PROJECT: Gas Works Park-Play

SDG: ZP16

UNITS: ug/L

ANALYTE	EL	M	RUN	CCVTV	CCV6	%R	CCV7	%R	CCV8	%R	CCV9	%R	CCV10	%R	CCV11	%R
Arsenic	AS	ICP	IP122971	2000.0	2148.74	107.4										

Control Limits: Mercury 80-120; Other Metals 90-110

CRDL Standard

ANALYTICAL RESOURCES INCORPORATED

CLIENT: Geoengineers

PROJECT: Gas Works Park-Play

UNITS: ug/L

SDG: ZP16

ANALYTE	EL	M	RUN	CRA/I	TV	CR-1	%R	CR-2	%R	CR-3	%R	CR-4	%R	CR-5	%R	CR-6	%R
Arsenic	AS	ICP	IP122671		50.0	51.18	**102.4**										
Arsenic	AS	ICP	IP122971		50.0	50.05	**100.1**										

Control Limits: no control limits have been established by the EPA at this time.

Calibration Blanks

ANALYTICAL RESOURCES INCORPORATED

CLIENT: Geoengineers

PROJECT: Gas Works Park-Play

UNITS:ug/L

SDG: ZP16

ANALYTE	EL	METH	RUN	CRDL	IDL	ICB	C	CCB1	C	CCB2	C	CCB3	C	CCB4	C	CCB5	C
Arsenic	AS	ICP	IP122671	10.0	50.0	50.0	U	50.0	U	50.0	U	50.0	U	50.0	U	50.0	U

ZP15 : 95252

Calibration Blanks

ANALYTICAL RESOURCES INCORPORATED

CLIENT: Geoengineers

PROJECT: Gas Works Park-Play

UNITS: ug/L

SDG: ZP16

ANALYTE	EL	METH	RUN	CRDL	IDL	ICB	C	CCB1	C	CCB2	C	CCB3	C	CCB4	C	CCB5	C
Arsenic	AS	ICP	IP122971	10.0	50.0	50.0	U	50.0	U	50.0	U	50.0	U	50.0	U	50.0	U

ZP15 - 65203

Calibration Blanks

ANALYTICAL RESOURCES INCORPORATED

CLIENT: Geoengineers

PROJECT: Gas Works Park-Play

SDG: ZP16

UNITS: ug/L

ANALYTE	EL	METH	RUN	CRDL	IDL	CCB6	C	CCB7	C	CCB8	C	CCB9	C	CCB10	C	CCB11	C
Arsenic	AS	ICP	IP122971	10.0	50.0	50.0	U										

ZP16 : 002041

ICP Interference Check Sample

ANALYTICAL RESOURCES INCORPORATED

CLIENT: Geoengineers

PROJECT: Gas Works Park-Play

SDG: ZP16

ICS SOURCE: I.V.

RUNID: IP122671

INSTRUMENT ID: OPTIMA ICP 2

UNITS: ug/L

ANALYTE	ICSA TV	ICSAB TV	ICSA1	ICSAB1	%R	ICSA2	ICSAB2	%R	ICSA3	ICSAB3	%R
Aluminum	200000	200000	201994.8	203508.1	**101.8**						
Antimony		1000	14.7	1068.8	**106.9**						
Arsenic		1000	25.4	1079.3	**107.9**						
Barium		1000	-0.4	1064.7	**106.5**						
Beryllium		1000	0.1	1027.6	**102.8**						
Boron			-3.8	-3.7							
Cadmium		1000	0.7	1049.5	**105.0**						
Calcium	100000	100000	103106.5	103136.0	**103.1**						
Chromium		1000	-1.4	1051.7	**105.2**						
Cobalt		1000	2.5	990.9	**99.1**						
Copper		1000	0.0	1073.4	**107.3**						
Iron	200000	200000	201409.4	202663.2	**101.3**						
Lead		1000	-12.5	1014.0	**101.4**						
Magnesium	100000	100000	104937.3	100979.2	**101.0**						
Manganese		1000	0.2	990.2	**99.0**						
Molybdenum			3.7	3.2							
Nickel		1000	0.6	1004.7	**100.5**						
Potassium			5.1	22.0							
Selenium		1000	37.1	1095.5	**109.6**						
Silicon			4.6	4.1							
Silver		1000	-1.0	1108.2	**110.8**						
Sodium			-41.4	-47.9							
Strontium			3.0	3.0							
Thallium		1000	2.1	978.9	**97.9**						
Tin			-20.1	-21.3							
Titanium			0.8	0.5							
Vanadium		1000	-1.3	1020.8	**102.1**						
Zinc		1000	2.7	1004.9	**100.5**						

ZP16 : 092905

ICP Interference Check Sample

ANALYTICAL RESOURCES INCORPORATED

CLIENT: Geoengineers

PROJECT: Gas Works Park-Play

SDG: ZP16

ICS SOURCE: I.V.

RUNID: IP122971

INSTRUMENT ID: OPTIMA ICP 2

UNITS: ug/L

ANALYTE	ICSA TV	ICSAB TV	ICSA1	ICSAB1	%R	ICSA2	ICSAB2	%R	ICSA3	ICSAB3	%R
Aluminum	200000	200000	205572.8	211758.7	**105.9**						
Antimony		1000	16.6	1069.0	**106.9**						
Arsenic		1000	18.7	1067.1	**106.7**						
Barium		1000	-3.2	1025.0	**102.5**						
Beryllium		1000	0.1	1017.4	**101.7**						
Boron			-3.6	-4.4							
Cadmium		1000	0.9	1021.4	**102.1**						
Calcium	100000	100000	103567.3	103318.8	**103.3**						
Chromium		1000	-0.5	1033.1	**103.3**						
Cobalt		1000	2.1	970.3	**97.0**						
Copper		1000	0.1	1059.9	**106.0**						
Iron	200000	200000	202170.5	208089.7	**104.0**						
Lead		1000	-11.7	1012.0	**101.2**						
Magnesium	100000	100000	106670.6	105141.9	**105.1**						
Manganese		1000	0.0	968.3	**96.8**						
Molybdenum			3.2	2.9							
Nickel		1000	0.3	1006.1	**100.6**						
Potassium			-18.4	-26.3							
Selenium		1000	32.4	1083.4	**108.3**						
Silicon			1.3	3.0							
Silver		1000	-1.1	1115.0	**111.5**						
Sodium			-68.8	-72.5							
Strontium			3.0	3.0							
Thallium		1000	0.9	971.9	**97.2**						
Tin			-16.9	-20.3							
Titanium			1.3	1.9							
Vanadium		1000	-2.3	990.0	**99.0**						
Zinc		1000	3.5	990.4	**99.0**						

IDLs and ICP Linear Ranges

ANALYTICAL RESOURCES INCORPORATED

CLIENT: Geoengineers

PROJECT: Gas Works Park-Play

SDG: ZP16 UNITS: ug/L

ANALYTE	EL	METH	INSTRUMENT	WAVELENTH (nm)	GFA BACK-GROUND	CLP CRDL	RL	RL DATE	ICP LINEAR RANGE (ug/L)	ICP LR DATE
Arsenic	AS	ICP	OPTIMA ICP 2	197.20		10	50.0	4/1/2012	30000.0	6/10/2014

ICP Interelement Correction Factors

ANALYTICAL RESOURCES INCORPORATED

CLIENT: Geoengineers

PROJECT: Gas Works Park-Play

IEC DATE: 10/27/2014

SDG: ZP16

INSTRUMENT ID: OPTIMA ICP 2

ANALYTE	WAVELENGTH	AL	AS	BA	BE	CA	CD	CO	CR	CU	FE
Aluminum	308.22	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Antimony	206.84	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	14.0198100	0.0000000	0.0000000
Arsenic	188.98	0.0000000	0.0000000	0.0000000	0.0000000	0.0764100	0.0000000	-1.0860250	1.6016350	0.0000000	0.0000000
Barium	233.53	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	-0.1911190	0.0000000	0.0000000	0.1532030
Beryllium	313.04	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0098370	0.0000000	0.0000000
Boron	249.67	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	2.1785010	0.0000000	0.0000000	0.0000000
Cadmium	228.80	0.0000000	5.7686950	0.0000000	0.0000000	0.0000000	0.0000000	0.1134910	0.0000000	0.0000000	0.0000000
Calcium	317.93	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Chromium	267.72	0.0000000	0.0000000	0.0000000	0.0000000	0.0105610	0.0000000	0.0000000	0.0000000	0.0000000	-0.0413720
Cobalt	228.62	0.0000000	0.0000000	0.0853470	0.0000000	0.0000000	0.0000000	0.0000000	-0.0421260	0.0000000	0.0000000
Copper	324.75	0.0000000	0.0000000	0.0000000	0.0000000	0.0021980	0.0000000	-0.1622490	-0.0152760	0.0000000	-0.0447290
Iron	273.96	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	-0.9508650	0.0000000	0.0000000
Lead	220.35	-0.2096680	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	-1.7516130	1.5325290	0.0499030
Magnesium	279.08	0.0000000	0.0000000	0.0000000	0.0000000	0.1119060	0.0000000	-1.6746270	-1.1710960	0.0000000	0.6610200
Manganese	257.61	0.0060150	0.0000000	0.0000000	0.0000000	0.0041750	0.0000000	0.0137770	0.0000000	0.0000000	-0.0046620
Molybdenum	202.03	0.0000000	0.0000000	0.0000000	0.0000000	0.0156160	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Nickel	231.60	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Potassium	766.49	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Selenium	196.03	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.5290750	0.0000000	0.0000000	0.0000000
Silicon	288.16	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	-3.5634780	0.0000000	-0.5863590	0.0000000	0.0000000
Silver	328.07	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Sodium	589.59	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Thallium	190.80	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	6.1573050	0.4310930	0.0000000	-0.1254120
Tin	189.93	0.0000000	0.0000000	0.0000000	0.0000000	-0.1475120	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Titanium	334.90	0.0000000	0.0000000	0.0000000	0.0000000	0.0797880	0.0000000	0.0000000	0.1965610	0.0000000	0.0000000
Vanadium	292.40	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	-3.7864850	0.0000000	0.0538250
Zinc	206.20	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000

ZP1515 09298

ICP Interelement Correction Factors

ANALYTICAL RESOURCES INCORPORATED

CLIENT: Geoengineers

PROJECT: Gas Works Park-Play

IEC DATE: 10/27/2014

SDG: ZP16

INSTRUMENT ID: OPTIMA ICP 2

ANALYTE	WAVELENGTH	MG	MN	MO	NI	PB	SB	TI	TL	V	ZN
Aluminum	308.22	0.0000000	0.0000000	15.2105350	0.0000000	0.0000000	0.0000000	1.9181250	0.0000000	14.9692830	0.0000000
Antimony	206.84	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	-0.6574750	0.0000000	-4.0497020	0.0000000
Arsenic	188.98	0.0000000	0.0000000	3.6569730	0.0000000	0.0000000	0.0000000	-26.2017890	0.0000000	0.0000000	0.0000000
Barium	233.53	0.0000000	0.0000000	0.0000000	0.1112510	0.0000000	0.0000000	0.0000000	0.0000000	0.2137080	0.0000000
Beryllium	313.04	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0122940	0.0000000	0.2849470	0.0000000
Boron	249.67	0.0000000	0.0000000	-1.1347080	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Cadmium	228.80	0.0000000	0.0000000	0.0000000	-0.9151470	0.0000000	0.0000000	0.0000000	0.0000000	0.0642140	0.0000000
Calcium	317.93	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Chromium	267.72	0.1073910	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.3457620	0.0000000
Cobalt	228.62	0.0000000	0.0000000	-0.1331780	0.1621790	0.0000000	0.0000000	1.7359160	0.0000000	0.0000000	0.0000000
Copper	324.75	0.0055170	0.0000000	0.3194440	0.0000000	0.0000000	0.0000000	0.1761040	0.0000000	0.0000000	0.0000000
Iron	273.96	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	7.5009230	0.0000000
Lead	220.35	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Magnesium	279.08	0.0000000	0.0000000	-5.2575470	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Manganese	257.61	0.0000000	0.0000000	0.0000000	0.0000000	-0.1944900	0.0000000	0.0000000	0.0000000	-0.0205160	0.0000000
Molybdenum	202.03	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Nickel	231.60	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	-0.5357680	0.0000000	0.4509940	0.0000000	0.0000000
Potassium	766.49	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Selenium	196.03	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.6217450	0.0000000
Silicon	288.16	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Silver	328.07	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	-0.2780320	0.0000000
Sodium	589.59	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	257.1408130	0.0000000	0.0000000	281.4212140
Thallium	190.80	0.0000000	0.0000000	-1.4387970	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	3.7649150	0.0000000
Tin	189.93	0.0000000	0.0000000	0.0000000	0.0000000	-0.0427690	-0.5371860	-0.2280960	0.0000000	0.0000000	0.0000000
Titanium	334.90	0.0000000	0.0000000	0.9643590	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Vanadium	292.40	0.0000000	-0.1516390	-0.4437580	0.0000000	0.0000000	0.0000000	0.5348410	0.0000000	0.0000000	0.0000000
Zinc	206.20	0.0000000	0.0000000	0.2610130	0.0000000	-0.0494060	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000

ZP16 : 599299

Preparation Log

ANALYTICAL RESOURCES INCORPORATED

CLIENT: Geoengineers

PROJECT: Gas Works Park-Play

SDG: ZP16

ANALYSIS METHOD: ICP

ARI PREP CODE: TWC

PREPDATE: 12/17/2014

CLIENT ID	ARI ID	MASS (g)	INITIAL VOLUME (mL)	FINAL VOLUME (mL)
PBW	ZP16MB2	0.000	50.0	50.0
LCSW	ZP16MB2SPK	0.000	50.0	50.0
RINSATE-141211	ZP16V	0.000	50.0	50.0
RINSATE-141211D	ZP16VDUP	0.000	50.0	50.0
RINSATE-141211S	ZP16VSPK	0.000	50.0	50.0

Preparation Log

ANALYTICAL RESOURCES INCORPORATED

CLIENT: Geoengineers

PROJECT: Gas Works Park-Play

SDG: ZP16

ANALYSIS METHOD: ICP

ARI PREP CODE: SWC

PREPDATE: 12/23/2014

CLIENT ID	ARI ID	MASS (g)	INITIAL VOLUME (mL)	FINAL VOLUME (mL)
PAI-9-12.5-13.0	ZP16A	1.000	0.0	50.0
PAI-9-12.5-13.0D	ZP16ADUP	1.001	0.0	50.0
PAI-9-12.5-13.0S	ZP16ASPK	1.005	0.0	50.0
PAI-9-12.5-13-DUP	ZP16B	1.041	0.0	50.0
PAI-10-9.5-10.0	ZP16C	1.026	0.0	50.0
PAI-10-24.5-25.0	ZP16E	1.077	0.0	50.0
PAI-9-23-23.5	ZP16I	1.090	0.0	50.0
PBS	ZP16MB1	1.000	0.0	50.0
LCSS	ZP16MB1SPK	1.000	0.0	50.0

Analysis Run Log

ANALYTICAL RESOURCES INCORPORATED

CLIENT: Geoengineers

PROJECT: Gas Works Park-Play | INSTRUMENT ID: OPTIMA ICP 2 | START DATE: 12/26/2014

SDG: ZP16 | RUNID: IP122671 | METHOD: ICP | END DATE: 12/26/2014

CLIENT ID	ARI ID	DIL.	TIME	%R	AG	AL	AS	B	BA	BE	CA	CD	CO	CR	CU	FE	HG	K	MG	MN	MO	NA	NI	PB	SB	SE	SI	SN	TI	TL	U	V	ZN
S0	S0	1.00	09160				X																										
S2	S2	1.00	09200																														
S3	S3	1.00	09220				X																										
S4	S4	1.00	09243																														
S5	S5	1.00	09264																														
ICV	ICV	1.00	09292				X																										
ICB	ICB	1.00	09351				X																										
CRI	CRII	1.00	09392				X																										
ICSA	ICSAI	1.00	09434				X																										
ICSAB	ICSABI	1.00	09475				X																										
CCV	CCV1	1.00	09532				X																										
CCB	CCB1	1.00	09573				X																										
PBW	ZP16MB2	1.00	10014				X																										
ZZZZZZ	ZP15MB1	1.00	10060																														
ZZZZZZ	ZO83C	5.00	10101																														
ZZZZZZ	ZZZZZZ	5.00	10180																														
ZZZZZZ	ZP15ADUP	5.00	10275																														
ZZZZZZ	ZP15A	5.00	10364																														
ZZZZZZ	ZP15ASPK	5.00	10451																														
ZZZZZZ	ZP49B	2.00	10570																														
LCSW	ZP16MB2SPK	1.00	11014				X																										
ZZZZZZ	ZP15MB1SPK	1.00	11054																														
CCV	CCV2	1.00	11094				X																										
CCB	CCB2	1.00	11135				X																										
ZZZZZZ	ZO83MB1	1.00	11180																														
RINSATE-141211D	ZP16VDUP	1.00	11222				X																										
RINSATE-141211	ZP16V	1.00	11263				X																										
RINSATE-141211S	ZP16VSPK	1.00	11305				X																										
ZZZZZZ	ZO83ADUP	1.00	11345																														
ZZZZZZ	ZO83A	1.00	11390																														
ZZZZZZ	ZO83ASPK	1.00	11432																														
ZZZZZZ	ZP15B	1.00	11472																														
ZZZZZZ	ZO83B	1.00	11514																														
ZZZZZZ	ZO83MB1SPK	1.00	11555																														
CCV	CCV3	1.00	11595				X																										

FORM XIV

ZP15-99212

Analysis Run Log

ANALYTICAL RESOURCES INCORPORATED

CLIENT: Geoengineers

PROJECT: Gas Works Park-Play | INSTRUMENT ID: OPTIMA ICP 2 | START DATE: 12/26/2014

SDG: ZP16 | RUNID: IP122671 | METHOD: ICP | END DATE: 12/26/2014

CLIENT ID	ARI ID	DIL.	TIME	%R	AG	AL	AS	B	BA	BE	CA	CD	CO	CR	CU	FE	HG	K	MG	MN	MO	NA	NI	PB	SB	SE	SI	SN	TI	TL	U	V	ZN
CCB	CCB3	1.00	12040				X																										
PBS	ZP16MB1	2.00	12081																														
ZZZZZZ	ZP58F	1.00	12121																														
PAI-9-12.5-13-DUP	ZP16B	2.00	12163				X																										
PAI-10-9.5-10.0	ZP16C	2.00	12203																														
PAI-10-24.5-25.0	ZP16E	2.00	12250																														
PAI-9-23-23.5	ZP16I	2.00	12292				X																										
PAI-9-12.5-13.0D	ZP16ADUP	2.00	12332				X																										
PAI-9-12.5-13.0	ZP16A	2.00	12372				X																										
PAI-9-12.5-13.0S	ZP16ASPK	2.00	12412				X																										
LCSS	ZP16MB1SPK	2.00	12452				X																										
CCV	CCV4	1.00	12492				X																										
CCB	CCB4	1.00	12533				X																										
PBS	ZP16MB1	2.00	12574				X																										
ZZZZZZ	ZP58MB1	1.00	13020																														
ZZZZZZ	ZP58E	1.00	13061																														
ZZZZZZ	ZP58ADUP	1.00	13103																														
ZZZZZZ	ZP58A	1.00	13144																														
ZZZZZZ	ZP58ASPK	1.00	13260																														
ZZZZZZ	ZP58B	1.00	13300																														
ZZZZZZ	ZP58C	1.00	13341																														
ZZZZZZ	ZP58MB2SPK	1.00	13383																														
ZZZZZZ	ZP58MB1SPK	1.00	13423																														
CCV	CCV5	1.00	13463				X																										
CCB	CCB5	1.00	13503				X																										

ZP1513.09213

Analysis Run Log

ANALYTICAL RESOURCES INCORPORATED

CLIENT: Geoengineers

PROJECT: Gas Works Park-Play INSTRUMENT ID: OPTIMA ICP 2 START DATE: 12/29/2014

SDG: ZP16 RUNID: IP122971 METHOD: ICP END DATE: 12/29/2014

CLIENT ID	ARI ID	DIL.	TIME	%R	AG	AL	AS	B	BA	BE	CA	CD	CO	CR	CU	FE	HG	K	MG	MN	MO	NA	NI	PB	SB	SE	SI	SN	TI	TL	U	V	ZN
S0	S0	1.00	09561				X																										
S2	S2	1.00	10003																														
S3	S3	1.00	10023				X																										
S4	S4	1.00	10050																														
S5	S5	1.00	10072																														
ICV	ICV	1.00	10225				X																										
ICB	ICB	1.00	10270				X																										
CRI	CRII	1.00	10311				X																										
ICSA	ICSAI	1.00	10353				X																										
ICSAB	ICSABI	1.00	10394				X																										
CCV	CCV1	1.00	10452				X																										
CCB	CCB1	1.00	10493				X																										
ZZZZZZ	DICHECK	1.00	10534																														
ZZZZZZ	ZQ14MB2	1.00	10580																														
ZZZZZZ	ZQ14EDUP	1.00	11021																														
ZZZZZZ	ZQ14E	1.00	11063																														
ZZZZZZ	ZQ14ESPK	1.00	11104																														
ZZZZZZ	ZP65B	2.00	11144																														
ZZZZZZ	ZP65H	2.00	11191																														
ZZZZZZ	ZQ14B	2.00	11235																														
ZZZZZZ	ZQ14C	2.00	11275																														
ZZZZZZ	ZQ14MB2SPK	1.00	11315																														
CCV	CCV2	1.00	11355				X																										
CCB	CCB2	1.00	11395				X																										
ZZZZZZ	ZQ14MB1	2.00	11441																														
ZZZZZZ	ZQ14ADUP	2.00	11482																														
ZZZZZZ	ZQ14A	2.00	11523																														
ZZZZZZ	ZQ14ASPK	2.00	11563																														
ZZZZZZ	ZQ14D	2.00	12003																														
ZZZZZZ	ZP11A	2.00	12043																														
ZZZZZZ	ZP11B	2.00	12090																														
ZZZZZZ	ZP11C	2.00	12130																														
ZZZZZZ	ZP11D	2.00	12170																														
ZZZZZZ	ZQ14MB1SPK	2.00	12213																														
CCV	CCV3	1.00	12253				X																										

FORM XIV

Analysis Run Log

ANALYTICAL RESOURCES INCORPORATED

CLIENT: Geoengineers

PROJECT: Gas Works Park-Play | INSTRUMENT ID: OPTIMA ICP 2 | START DATE: 12/29/2014

SDG: ZP16 | RUNID: IP122971 | METHOD: ICP | END DATE: 12/29/2014

CLIENT ID	ARI ID	DIL.	TIME	%R	AG	AL	AS	B	BA	BE	CA	CD	CO	CR	CU	FE	HG	K	MG	MN	MO	NA	NI	PB	SB	SE	SI	SN	TI	TL	U	V	ZN
CCB	CCB3	1.00	12293				X																										
ZZZZZZ	ZP06MB1	2.00	12335																														
ZZZZZZ	ZP06ADUP	2.00	12383																														
ZZZZZZ	ZP06A	2.00	12425																														
ZZZZZZ	ZP06ASPK	2.00	12471																														
ZZZZZZ	ZP11E	2.00	12513																														
ZZZZZZ	ZP11F	2.00	12555																														
ZZZZZZ	ZP11G	2.00	12595																														
ZZZZZZ	ZP11H	2.00	13040																														
ZZZZZZ	ZP11I	2.00	13080																														
ZZZZZZ	ZP06MB1SPK	2.00	13120																														
CCV	CCV4	1.00	13160				X																										
CCB	CCB4	1.00	13201				X																										
ZZZZZZ	ZP06MB1	2.00	13242																														
ZZZZZZ	ZP35MB1	2.00	13284																														
ZZZZZZ	ZP11J	2.00	13325																														
ZZZZZZ	ZP35C	2.00	13365																														
ZZZZZZ	ZP35ADUP	2.00	13405																														
ZZZZZZ	ZP35A	2.00	13453																														
ZZZZZZ	ZP35ASPK	2.00	13501																														
ZZZZZZ	ZP11A	5.00	13544																														
ZZZZZZ	ZP11D	5.00	13585																														
ZZZZZZ	ZP35MB1SPK	2.00	14031																														
CCV	CCV5	1.00	14071				X																										
CCB	CCB5	1.00	14111				X																										
ZZZZZZ	ZP06ADUP	5.00	14153																														
ZZZZZZ	ZP06A	5.00	14195																														
ZZZZZZ	ZP06ASPK	5.00	14240																														
ZZZZZZ	ZP11H	5.00	14282																														
ZZZZZZ	ZP35ADUP	5.00	14322																														
ZZZZZZ	ZP35A	5.00	14365																														
ZZZZZZ	ZP35ASPK	5.00	14412																														
PAI-10-9.5-10.0	ZP16C	5.00	14454				X																										
PAI-10-24.5-25.0	ZP16E	5.00	14500				X																										
CCV	CCV6	1.00	14542				X																										

FORM XIV

Analysis Run Log

ANALYTICAL RESOURCES INCORPORATED

CLIENT: Geoengineers

PROJECT: Gas Works Park-Play | INSTRUMENT ID: OPTIMA ICP 2 | START DATE: 12/29/2014

SDG: ZP16 | RUNID: IP122971 | METHOD: ICP | END DATE: 12/29/2014

CLIENT ID	ARI ID	DIL.	TIME	%R	AG	AL	AS	B	BA	BE	CA	CD	CO	CR	CU	FE	HG	K	MG	MN	MO	NA	NI	PB	SB	SE	SI	SN	TI	TL	U	V	ZN
CCB	CCB6	1.00	14582				X																										

ZP15:90215

General Chemistry Analysis
Report and Summary QC Forms

ARI Job ID: ZP15, ZP16

SAMPLE RESULTS-CONVENTIONALS
ZP15-Geoengineers

ANALYTICAL RESOURCES INCORPORATED

Matrix: Groundwater
Data Release Authorized:
Reported: 01/23/15

Project: Gas Works Park-Play Area Inv
Event: 0186-846-01 Task 1520
Date Sampled: 12/15/14
Date Received: 12/15/14

Client ID: MW-36D-141215
ARI ID: 14-27518 ZP15A

Analyte	Date Batch	Method	Units	RL	Sample
Alkalinity	12/17/14 121714#1	SM 2320	mg/L CaCO3	1.0	1,000
Carbonate	12/17/14	SM 2320	mg/L CaCO3	1.0	112
Bicarbonate	12/17/14	SM 2320	mg/L CaCO3	1.0	893
Hydroxide	12/17/14	SM 2320	mg/L CaCO3	1.0	< 1.0 U
Total Dissolved Solids	12/18/14 121814#1	SM2540C	mg/L	20.0	2,940
Ferrous Iron	12/15/14 121514#1	SM3500 FeD	mg/L	0.040	0.220
N-Nitrate	12/17/14 121714#1	EPA 300.0	mg-N/L	0.5	< 0.5 U
Chloride	12/16/14 121614#1	SM4500-CLE	mg/L	100	497
Sulfate	12/17/14 121714#1	EPA 300.0	mg/L	50.0	604
Sulfide	12/17/14 121714#1	SM4500-S2D	mg/L	10.0	141
Total Organic Carbon	12/19/14 121914#1	SM5310B	mg/L	1.50	7.09
Dissolved Organic Carbon	12/19/14 121914#1	SM5310B	mg/L	1.50	6.85

RL Analytical reporting limit
U Undetected at reported detection limit

SAMPLE RESULTS-CONVENTIONALS
ZP15-Geoengineers

ANALYTICAL RESOURCES INCORPORATED

Matrix: Groundwater
Data Release Authorized:
Reported: 01/23/15

Project: Gas Works Park-Play Area Inv
Event: 0186-846-01 Task 1520
Date Sampled: 12/15/14
Date Received: 12/15/14

Client ID: MW-36S-141215
ARI ID: 14-27519 ZP15B

Analyte	Date Batch	Method	Units	RL	Sample
Alkalinity	12/17/14 121714#1	SM 2320	mg/L CaCO3	1.0	166
Carbonate	12/17/14	SM 2320	mg/L CaCO3	1.0	< 1.0 U
Bicarbonate	12/17/14	SM 2320	mg/L CaCO3	1.0	166
Hydroxide	12/17/14	SM 2320	mg/L CaCO3	1.0	< 1.0 U
Total Dissolved Solids	12/18/14 121814#1	SM2540C	mg/L	5.0	288
Ferrous Iron	12/15/14 121514#1	SM3500 FeD	mg/L	0.800	13.1
N-Nitrate	12/17/14 121714#1	EPA 300.0	mg-N/L	0.1	< 0.1 U
Chloride	12/16/14 121614#1	SM4500-CLE	mg/L	1.0	5.4
Sulfate	12/17/14 121714#1	EPA 300.0	mg/L	1.0	29.2
Sulfide	12/17/14 121714#1	SM4500-S2D	mg/L	0.050	0.512
Total Organic Carbon	12/19/14 121914#1	SM5310B	mg/L	1.50	10.5
Dissolved Organic Carbon	12/19/14 121914#1	SM5310B	mg/L	1.50	8.32

RL Analytical reporting limit
U Undetected at reported detection limit

MS/MSD RESULTS-CONVENTIONALS
ZP15-Geoengineers

ANALYTICAL RESOURCES INCORPORATED

Matrix: Groundwater
Data Release Authorized:
Reported: 01/23/15

Project: Gas Works Park-Play Area Inv
Event: 0186-846-01 Task 1520
Date Sampled: 12/15/14
Date Received: 12/15/14

Analyte	Method	Date	Units	Sample	Spike	Spike Added	Recovery
ARI ID: ZP15A Client ID: MW-36D-141215							
Ferrous Iron	SM3500 FeD	12/15/14	mg/L	0.220	0.539	0.400	79.8%
Total Organic Carbon	SM5310B	12/19/14	mg/L	7.09	26.5	20.0	97.0%
Dissolved Organic Carbon	SM5310B	12/19/14	mg/L	6.85	27.2	20.0	101.8%

REPLICATE RESULTS-CONVENTIONALS
ZP15-Geoengineers

ANALYTICAL RESOURCES INCORPORATED

Matrix: Groundwater
Data Release Authorized:
Reported: 01/23/15

Project: Gas Works Park-Play Area Inv
Event: 0186-846-01 Task 1520
Date Sampled: 12/15/14
Date Received: 12/15/14

Analyte	Method	Date	Units	Sample	Replicate(s)	RPD/RSD
ARI ID: ZP15A Client ID: MW-36D-141215						
Ferrous Iron	SM3500 FeD	12/15/14	mg/L	0.220	0.200	9.5%
Total Organic Carbon	SM5310B	12/19/14	mg/L	7.09	6.63	6.7%
Dissolved Organic Carbo	SM5310B	12/19/14	mg/L	6.85	6.79	0.9%

LAB CONTROL RESULTS-CONVENTIONALS
ZP15-Geoengineers

ANALYTICAL RESOURCES INCORPORATED

Matrix: Groundwater
Data Release Authorized:
Reported: 01/23/15

Project: Gas Works Park-Play Area Inv
Event: 0186-846-01 Task 1520
Date Sampled: NA
Date Received: NA

Analyte/Method	QC ID	Date	Units	LCS	Spike Added	Recovery
Total Dissolved Solids SM2540C	ICVL	12/18/14	mg/L	488	500	97.6%
Ferrous Iron SM3500 FeD	ICVL	12/15/14	mg/L	0.493	0.500	98.6%
Sulfide SM4500-S2D	ICVL	12/17/14	mg/L	0.521	0.501	104.0%

METHOD BLANK RESULTS-CONVENTIONALS
ZP15-Geoengineers

ANALYTICAL RESOURCES INCORPORATED

Matrix: Groundwater
Data Release Authorized:
Reported: 01/23/15

Project: Gas Works Park-Play Area Inv
Event: 0186-846-01 Task 1520
Date Sampled: NA
Date Received: NA

Analyte	Method	Date	Units	Blank	ID
Total Dissolved Solids	SM2540C	12/18/14	mg/L	< 5.0 U	
Ferrous Iron	SM3500 FeD	12/15/14	mg/L	< 0.040 U	
N-Nitrate	EPA 300.0	12/17/14	mg-N/L	< 0.1 U	
Chloride	SM4500-CLE	12/16/14	mg/L	< 1.0 U	FB
Sulfate	EPA 300.0	12/17/14	mg/L	< 0.1 U	
Sulfide	SM4500-S2D	12/17/14	mg/L	< 0.050 U	
Total Organic Carbon	SM5310B	12/19/14	mg/L	< 1.50 U	
Dissolved Organic Carbon	SM5310B	12/19/14	mg/L	< 1.50 U	
		12/19/14		1.70	FB

FB Filtration Blank

STANDARD REFERENCE RESULTS-CONVENTIONALS
ZP15-Geoengineers

ANALYTICAL RESOURCES INCORPORATED

Matrix: Groundwater
Data Release Authorized:
Reported: 01/23/15

Project: Gas Works Park-Play Area Inv
Event: 0186-846-01 Task 1520
Date Sampled: NA
Date Received: NA

Analyte/SRM ID	Method	Date	Units	SRM	True Value	Recovery
Alkalinity ERA #P114506	SM 2320	12/17/14	mg/L CaCO3	58.5	61.7	94.8%
N-Nitrate ERA #320614	EPA 300.0	12/17/14	mg-N/L	2.8	3.0	93.3%
Chloride ERA #290313	SM4500-CLE	12/16/14	mg/L	4.9	5.0	98.0%
Sulfate ERA 131013	EPA 300.0	12/17/14	mg/L	3.0	3.0	100.0%
Total Organic Carbon ERA #0408-13-02	SM5310B	12/19/14	mg/L	21.1	20.0	105.5%
Dissolved Organic Carbon ERA #0408-13-02	SM5310B	12/19/14	mg/L	21.1	20.0	105.5%

SAMPLE RESULTS-CONVENTIONALS
ZP16-Geoengineers

ANALYTICAL RESOURCES INCORPORATED

Matrix: Soil
Data Release Authorized:
Reported: 01/05/15

Project: Gas Works Park-Play Area Inv
Event: 0186-846-01 Task 1520
Date Sampled: 12/11/14
Date Received: 12/11/14

Client ID: PAI-10-31.5-32.0
ARI ID: 14-27414 ZP16F

Analyte	Date	Method	Units	RL	Sample
Preserved Total Solids	12/16/14 121614#1	SM2540G	Percent	0.01	90.01
Sulfide	12/22/14 122214#1	SM4500-S2D	mg/kg	1.10	10.8

RL Analytical reporting limit
U Undetected at reported detection limit

SAMPLE RESULTS-CONVENTIONALS
ZP16-Geoengineers

ANALYTICAL RESOURCES INCORPORATED

Matrix: Soil
Data Release Authorized:
Reported: 01/05/15

Project: Gas Works Park-Play Area Inv
Event: 0186-846-01 Task 1520
Date Sampled: 12/11/14
Date Received: 12/11/14

Client ID: PAI-11-12.0-12.5
ARI ID: 14-27415 ZP16G

Analyte	Date	Method	Units	RL	Sample
Preserved Total Solids	12/16/14 121614#1	SM2540G	Percent	0.01	68.07
Sulfide	12/22/14 122214#1	SM4500-S2D	mg/kg	291	752

RL Analytical reporting limit
U Undetected at reported detection limit

SAMPLE RESULTS-CONVENTIONALS
ZP16-Geoengineers

ANALYTICAL RESOURCES INCORPORATED

Matrix: Soil
Data Release Authorized:
Reported: 01/05/15

Project: Gas Works Park-Play Area Inv
Event: 0186-846-01 Task 1520
Date Sampled: 12/11/14
Date Received: 12/11/14

Client ID: PAI-11-22-22.5
ARI ID: 14-27416 ZP16H

Analyte	Date	Method	Units	RL	Sample
Preserved Total Solids	12/16/14 121614#1	SM2540G	Percent	0.01	83.03
Sulfide	12/22/14 122214#1	SM4500-S2D	mg/kg	234	851

RL Analytical reporting limit
U Undetected at reported detection limit

REPLICATE RESULTS-CONVENTIONALS
ZP16-Geoengineers

ANALYTICAL RESOURCES INCORPORATED

Matrix: Soil
Data Release Authorized:
Reported: 01/05/15

Project: Gas Works Park-Play Area Inv
Event: 0186-846-01 Task 1520
Date Sampled: 12/11/14
Date Received: 12/11/14

Analyte	Date	Units	Sample	Replicate(s)	RPD/RSD
ARI ID: ZP16F Client ID: PAI-10-31.5-32.0					
Preserved Total Solids	12/16/14	Percent	90.01	88.13	2.1%

LAB CONTROL RESULTS-CONVENTIONALS
ZP16-Geoengineers

ANALYTICAL RESOURCES INCORPORATED

Matrix: Soil
Data Release Authorized:
Reported: 01/05/15

Project: Gas Works Park-Play Area Inv
Event: 0186-846-01 Task 1520
Date Sampled: NA
Date Received: NA

Analyte/Method	QC ID	Date	Units	LCS	Spike Added	Recovery
Sulfide SM4500-S2D	PREP	12/22/14	mg/kg	7.13	6.95	102.6%

METHOD BLANK RESULTS-CONVENTIONALS
ZP16-Geoengineers

ANALYTICAL RESOURCES INCORPORATED

Matrix: Soil
Data Release Authorized:
Reported: 01/05/15

Project: Gas Works Park-Play Area Inv
Event: 0186-846-01 Task 1520
Date Sampled: NA
Date Received: NA

Analyte	Date	Units	Blank	QC ID
Preserved Total Solids	12/16/14	Percent	< 0.01 U	ICB
Sulfide	12/22/14	mg/kg	< 1.00 U	PREP

Total Solids

ARI Job ID: ZP15, ZP16

Volatiles Total Solids-voats
Data By: Pat Basilio
Created: 12/29/14

Worklist: 6260
Analyst: PAB
Comments:

Oven ID:_____

Balance ID:_____

Samples In: Date:_____ Time:_____ Temp:_____ Analyst:_____

Samples Out: Date:_____ Time:_____ Temp:_____ Analyst:_____

	ARI ID	Tare Wt (g)	Wet Wt (g)	Dry Wt (g)		% Solids
1.	ZP16A 14-27409				$	89.30
2.	ZP16B 14-27410				$	89.60
3.	ZP16C 14-27411				$	57.30
4.	ZP16D 14-27412				$	78.60
5.	ZP16E 14-27413				$	69.60

* - VOA TS Copied From BETX TS
% - VOA TS Copied From Metals TS
$ - VOA TS Copied From Extraction TS
$D - VOA TS Copied From Extraction TS/Decanted

Extractions Total Solids-extts
Data By: Susan D. Dunnihoo
Created: 12/18/14

Worklist: 2600
Analyst: SDRD
Comments:

Oven ID:_____

Balance ID:_____

Samples In: Date:_____ Time:_____ Temp:_____ Analyst:_____

Samples Out: Date:_____ Time:_____ Temp:_____ Analyst:_____

	ARI ID / CLIENT ID	Tare Wt (g)	Wet Wt (g)	Dry Wt (g)	% TS	Dcnt	5g	10g	12.5g
1.	ZP16A 14-27409 PAI-9-12.5-13.0	1.19	10.99	9.94	89.3	No	5.60	11.20	14.00
2.	ZP16B 14-27410 PAI-9-12.5-13-DUP	1.19	10.80	9.80	89.6	No	5.58	11.16	13.95
3.	ZP16C 14-27411 PAI-10-9.5-10.0	1.19	10.49	6.52	57.3	No	8.73	17.45	21.82
4.	ZP16D 14-27412 PAI-10-19.5-20.0	1.19	9.27	7.54	78.6	No	6.36	12.72	15.90
5.	ZP16E 14-27413 PAI-10-24.5-25.0	1.18	10.68	7.79	69.6	No	7.18	14.37	17.96

Extractions Total Solids-extts
Data By: Susan D. Dunnihoo
Created: 12/18/14

Worklist: 2600
Analyst: SDRD
Comments:

Oven ID: 015

Balance ID: B334705934

Samples In: Date: 12/18/14 Time: 14:50 Temp: 105 Analyst: TH

Samples Out: Date: 12/19/14 Time: 0800 Temp: 103 Analyst: SC

	ARI ID / CLIENT ID	Tare Wt (g)	Wet Wt (g)	Dry Wt (g)	% TS	Dcnt	5g	10g	12.5g
1.	ZP16A 14-27409 PAI-9-12.5-13.0	1.19	10.99	9.94		No			
2.	ZP16B 14-27410 PAI-9-12.5-13-DUP	1.19	10.80	9.80		No			
3.	ZP16C 14-27411 PAI-10-9.5-10.0	1.19	10.49	6.52		No			
4.	ZP16D 14-27412 PAI-10-19.5-20.0	1.19	9.27	7.54		No			
5.	ZP16E 14-27413 PAI-10-24.5-25.0	1.18	10.68	7.79		No			

Solids Data Entry Report Checked by: _____ Date: 12/23/14
Date: 12/23/14 Data Analyst: DM

Solids Determination performed on 12/22/14 by DM

JOB	SAMPLE	CLIENTID	TAREWEIGHT	SAMPDISH	DRYWEIGHT	SOLIDS
ZP16	A	PAI-9-12.5-13.0	1.019	10.177	8.635	83.16
ZP16	B	PAI-9-12.5-13-DUP	1.010	10.041	8.435	82.22
ZP16	C	PAI-10-9.5-10.0	1.002	10.597	6.866	61.12
ZP16	E	PAI-10-24.5-25.0	0.979	10.129	6.318	58.35
ZP16	I	PAI-9-23-23.5	1.012	10.142	8.446	81.42

Analytical Resources, Incorporated
Analytical Chemists and Consultants

Total Solids Bench Sheet

Laboratory Section: Metals

Oven Identification: 07 Balance ID: 068755

Samples in Oven: Date: 12-22-14 Time: 1340 Temp: 105°C Analyst: DM

Removed from Oven: Date: 12-23-14 Time: 0635 Temp: 104°C Analyst: DM

ARI Sample ID		Tare Weight (g)	Tare + Sample Wet (g)	Tare + Sample Dry (g)	Date & Time Last Weight	Final Weighting >12 hrs[1]
ZP14	A	0.974	10.557	9.361	—	✓
"	B	1.029	10.390	9.864	—	✓
"	C	1.043	10.690	10.025	—	✓
"	D	1.049	10.727	10.038	—	✓
ZP96	A	1.011	5.918	1.884	—	✓
ZP35	A	1.042	10.426	6.380	—	✓
"	C	1.013	10.786	9.721	—	✓
ZP16	A	1.019	10.177	8.635	—	✓
"	B	1.010	10.041	8.436	—	✓
"	C	1.002	10.597	6.866	—	✓
"	E	0.979	10.129	6.318	—	✓
"	I	1.012	10.142	8.446	—	✓
ZP06	A	0.997	10.545	7.063	—	✓
ZP11	A	1.049	10.848	7.924	—	✓
"	B	0.989	10.831	7.615	—	✓
"	C	1.019	10.500	8.671	—	✓
"	D	1.022	10.407	6.775	—	✓
"	E	0.981	10.717	8.184	—	✓
"	F	1.068	10.351	9.475	—	✓
"	G	1.052	10.299	9.191	—	✓
"	H	1.012	10.218	8.563	—	✓
"	I	1.058	10.241	9.220	—	✓
"	J	1.022	10.533	9.534	—	✓

1) Place a check mark in this column if samples have dried > 12 but < 24 hours. When samples have been at 104°C < 12 hours, constant weight must be verified as described in SOP 10023S. Use a 2nd bench sheet for additional weightings.

Subcontracted Results
Sulfur Analyzed by Horizon Labs

ARI Job ID: ZP15, ZP16

General Offices: P.O. Box 995 Price, Utah 84501 435-637-4343
Laboratory: 545 East 100 North Price, Utah 84501

Submitted to:
Analytical Resources Inc.
Mark Harris
4611 S. 134th Place
Suite 100
Tukwila, WA 98168-3240

December 31, 2014

Date Sampled: 12/11-12/2014
Date Received: 12/18/2014

Sampled By: ARI
Identification By: ARI

Analysis Report #: See Below

Sample Identification:

See Below

CERTIFICATE OF ANALYSIS

Analysis #	ARI ID	Sulfur (Acid Insoluble)
90188	14-27452 ZO83M	0.37
90189	14-27453 ZO83N	0.63
90190	14-27454 ZO83O	1.31
90191	14-27455 ZO83P	0.28
90192	14-27456 ZO83Q	0.03
90193	14-27418 ZP16J	0.04
90194	14-27419 ZP16K	0.56
90195	14-27420 ZP16L	0.12

Respectfully Submitted,
HORIZON LABORATORIES

Laboratory Manager

ZP15 : 00238

Name	Analysis Date		
Blank	12/29/2014 14:06		
	Sample Mass	Operator	Sulfur Concentration
	1.0000 g	Francesca	0.00%
	1.0000 g	Francesca	0.00%
Name	Analysis Date		
3.25 std	12/29/2014 14:21		
	Sample Mass	Operator	Sulfur Concentration
	0.2036 g	Francesca	3.12%
	0.2049 g	Francesca	3.24%
	0.2598 g	Francesca	3.26%
Name	Analysis Date		
90188	12/29/2014 14:25		
	Sample Mass	Operator	Sulfur Concentration
	0.1170 g	Francesca	0.37%
Name	Analysis Date		
90189	12/29/2014 14:27		
	Sample Mass	Operator	Sulfur Concentration
	0.1197 g	Francesca	0.63%
Name	Analysis Date		
90190	12/29/2014 14:29		
	Sample Mass	Operator	Sulfur Concentration
	0.1228 g	Francesca	1.31%
Name	Analysis Date		
90191	12/29/2014 14:32		
	Sample Mass	Operator	Sulfur Concentration
	0.1084 g	Francesca	0.27%
Name	Analysis Date		
90192	12/29/2014 14:34		
	Sample Mass	Operator	Sulfur Concentration
	0.1442 g	Francesca	0.03%
Name	Analysis Date		
90193	12/29/2014 14:40		
	Sample Mass	Operator	Sulfur Concentration
	0.1820 g	Francesca	0.04%
Name	Analysis Date		
90194	12/29/2014 14:42		
	Sample Mass	Operator	Sulfur Concentration
	0.1086 g	Francesca	0.56%
Name	Analysis Date		
90195	12/29/2014 14:44		
	Sample Mass	Operator	Sulfur Concentration
	0.1644 g	Francesca	0.12%
Name	Analysis Date		
90191	12/29/2014 14:46		
	Sample Mass	Operator	Sulfur Concentration
	0.1097 g	Francesca	0.29%
Name	Analysis Date		
STD BL-4a	12/29/2014 14:48		
	Sample Mass	Operator	Sulfur Concentration
	0.1592 g	Francesca	0.21%

Sample I.D.	Pan Weight	Pan & Sample Wt.	Pan & Dry Sample Wt.	Air Dry Loss (Moisture) %
90188	224.7	289.9	279.8	15.49
90189	227.3	290.9	273.2	27.83
90190	222.2	291.9	279.5	17.79
90191	225	335.7	312.4	21.04
90192	220.8	360.1	345.4	10.55
90193	222.2	445.6	417.7	12.49
90194	222.9	354.9	313.1	31.67
90195	223.6	403.4	352.5	28.31

Subcontracted Results
Metals (Sub) Analyzed by Applied Speciation & Consulting

ARI Job ID: ZP15, ZP16

APPLIED SPECIATION AND CONSULTING, LLC

18804 Northcreek Parkway Bothell, WA, 98011
Tel: (425) 483-3300 Fax: (425) 483-9818
www.appliedspeciation.com

January 15, 2015

Cheronne Oreiro
Analytical Resources Inc.
4611 S. 134th Place Suite 100
Tukwila, WA 98168
(206) 695-6200

Re: SDG A141217S1 (Gas Works Park – Play Area Investigation)

Ms. Oreiro,

Attached is the report associated with six (6) aqueous samples submitted for arsenite, arsenate, monomethylarsonic acid, and dimethylarsinic acid quantitation on December 17, 2014. The samples were received on the day of submittal in a sealed cooler at 0.3°C. Arsenite, arsenate, monomethylarsonic acid, and dimethylarsinic acid quantitation was performed via ion chromatography inductively coupled plasma collision reaction cell mass spectrometry (IC-ICP-CRC-MS). Any issues associated with the analyses are addressed in the following report.

If you have any questions, please feel free to contact me at your convenience.

Sincerely,

Ben Wozniak

Ben Wozniak
Project Manager
Applied Speciation and Consulting, LLC

Applied Speciation and Consulting, LLC

Report Prepared for:

Cheronne Oreiro
Analytical Resources Inc.
4611 S. 134th Place Suite 100
Tukwila, WA 98168

January 15, 2015

1. Sample Reception

Six (6) aqueous samples were submitted for arsenite, arsenate, monomethylarsonic acid, and dimethylarsinic acid quantitation on December 17, 2014. The samples were received on the day of submittal in a sealed cooler at 0.3°C, as indicated on the attached chain of custody (COC) forms.

The samples were received in a laminar flow clean hood, void of trace metals contamination and ultra-violet radiation, and assigned discrete sample identifiers. All samples were then stored in a secure, monitored refrigerator (maintained at a temperature of 4°C) until the analyses could occur.

It should be noted that one aqueous sample, identified as PAI-10GW, was included in the sample shipment but was not originally listed on any of the COC forms submitted with the samples. The client was contacted and submitted a new COC for this sample. Both the original COCs and this additional COC have been included in this report.

2. Sample Preparation

All sample preparation is performed in laminar flow clean hoods known to be free from trace metals contamination. All applied water for dilutions and sample preservatives are also monitored for contamination to account for any biases associated with the sample results.

Arsenic Speciation Analysis by IC-ICP-CRC-MS Each sample submitted in an evacuated vial containing an EDTA preservative (provided by Applied Speciation and Consulting) was analyzed as received, without further chemical preservation.

3. Sample Analysis

All sample analysis is preceded by a minimum of a five-point calibration curve spanning the entire concentration range of interest. All calibration curves, associated with each species of interest, are standardized by linear regression resulting in a response factor. All sample results are **instrument blank corrected** to account for any operational biases.

Prior to sample analysis, all calibration curves are verified using second source standards which are identified as initial calibration verification standards (ICV).

Ongoing instrument performance is identified by the analysis of continuing calibration verification standards (CCV) and continuing calibration blanks (CCB) at a minimum interval of every ten analytical runs.

Arsenic Speciation Analysis by IC-ICP-CRC-MS All samples for arsenite, arsenate, monomethylarsonic acid, and dimethylarsinic acid quantitation were analyzed by ion chromatography inductively coupled plasma collision reaction cell mass spectrometry (IC-ICP-CRC-MS) on December 17-18, 2014. Aliquots of each sample are injected onto an anion exchange column and are mobilized by an alkaline (pH > 7) gradient. The eluting arsenic species are then introduced into a radio frequency (RF) plasma where energy-transfer processes cause desolvation, atomization, and ionization. The ions are extracted from the plasma through a differentially-pumped vacuum interface and travel through a pressurized chamber (CRC) containing a specific collision gas. Polyatomic interferences, due to their inherently larger size, collide more frequently with the collision gas and therefore may be separated from the analyte of interest via kinetic energy discrimination (KED). A solid-state detector detects ions transmitted through the mass analyzer on the basis of their mass-to-charge ratio (m/z), and the resulting current is processed by a data handling system.

Retention times for each eluting species are compared to known standards for species identification.

4. Analytical Issues

No significant analytical issues were encountered during the requested analyses. All quality control parameters associated with these samples were within acceptance limits.

It should be noted that several additional arsenic-containing species were detected in the submitted samples during the speciation analyses. While the identities of these species could not be confirmed at this time, the estimated concentration of arsenic associated with each detected species has been provided for each sample in the attached results table. Applied Speciation and Consulting may be able to pursue identification of these additional species upon client request.

The estimated method detection limits (eMDLs) for arsenite, arsenate, and dimethylarsinic acid are generated from replicate analyses of the lowest standard in the calibration curve. Not all arsenic species are present in preparation blanks; therefore, eMDL calculations based on preparation blanks may be artificially biased low for individual arsenic species.

The eMDL for monomethylarsonic acid is calculated using the average eMDL of the species present in the calibration curve (*i.e.*, arsenite, arsenate, and dimethylarsinic acid). The ICP-CRC-MS determinative method exhibits a species-independent response, which is confirmed by the analysis of ICV standards for each species. Monomethylarsonic acid is not included

in the calibration standards, CCV standards, and matrix spikes due to impurities which would bias the results for other arsenic species.

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

Sincerely,

Ben Wozniak

Ben Wozniak
Project Manager
Applied Speciation and Consulting, LLC

Arsenic Speciation Results for ARI
SDG: A141217S1
Contact: Cheronne Oreiro

Report Date: January 15, 2015
Report Generated by: Ben Wozniak
Applied Speciation and Consulting, LLC

Sample Results

ARI Sample ID	Date Sampled	Dilution	As(III)	As(V)	MMAs	DMAs	Unk 8.4*	Unk 9.2*	Unk 10.2*	Unk 13.1*
14-27440-ZO83A	12/12/14	50	28.9	1.74	< 0.21 U	< 0.23 U	14.2	2.94	52.5	7.60
14-27441-ZO83B	12/12/14	500	702	141	< 2.1 U	< 2.3 U	144	7.9 J	120	19.4
14-27442-ZO83C	12/12/14	25000	42900	1200	< 110 U	< 120 U	1100	620	10500	680
14-27173-ZO53A	12/11/14	1000	482	15.4 J	< 4.2 U	< 4.6 U	102	128	2240	8.2 J
14-27518-ZP15A	12/15/14	50000	39700	790 J	< 210 U	< 230 U	3920	1210	19400	18700
14-27519-ZP15B	12/15/14	100	37.7	6.41	< 0.42 U	< 0.46 U	< 0.42 U	< 0.42 U	< 0.42 U	1.65 J

All results reflect the applied dilution and are reported in µg/L

U = Sample concentration is less than the estimated Method Detection Limit (eMDL)

J = Sample concentration is between the eMDL and the Reporting Limit (RL)

* Unknown arsenical species; please see narrative

Arsenic Speciation Results for ARI
SDG: A141217S1
Contact: Cheronne Oreiro

Report Date: January 15, 2015
Report Generated by: Ben Wozniak
Applied Speciation and Consulting, LLC

Quality Control Summary - Preparation Blanks

Analyte	Units	PBW1	PBW2	PBW3	PBW4	Mean	StdDev	eMDL* at 1x	RL at 1x	eMDL* at 50x	RL at 50x
As(III)	µg/L	0.000	0.000	0.000	0.000	0.000	0.000	0.003	0.020	0.13	1.0
As(V)	µg/L	0.000	0.000	0.000	0.000	0.000	0.000	0.005	0.020	0.27	1.0
MMAs	µg/L	0.000	0.000	0.000	0.000	0.000	0.000	0.004	0.020	0.21	1.0
DMAs	µg/L	0.000	0.000	0.000	0.000	0.000	0.000	0.005	0.021	0.23	1.0

eMDL = Estimated Method Detection Limit; RL = Reporting Limit
*Please see narrative regarding eMDL calculations

Quality Control Summary - Certified Reference Materials

Analyte	Units	CRM	True Value	Result	Recovery
As(III)	µg/L	ICV	5.000	5.079	101.6
As(V)	µg/L	ICV	5.000	4.736	94.7
MMAs	µg/L	ICV	4.610	4.680	101.5
DMAs	µg/L	ICV	3.625	3.682	101.6

Arsenic Speciation Results for ARI
SDG: A141217S1
Contact: Cheronne Oreiro

Report Date: January 15, 2015
Report Generated by: Ben Wozniak
Applied Speciation and Consulting, LLC

Quality Control Summary - Matrix Duplicate

Analyte	Units	Sample ID	Rep 1	Rep 2	Mean	RPD
As(III)	µg/L	14-27519-ZP15B	37.72	37.36	37.54	1.0
As(V)	µg/L	14-27519-ZP15B	6.41	6.24	6.33	2.8
MMAs	µg/L	14-27519-ZP15B	< 0.42 U	< 0.42 U	NC	NC
DMAs	µg/L	14-27519-ZP15B	< 0.46 U	< 0.46 U	NC	NC

NC = Value was not calculated due to one or more concentrations below the eMDL

Quality Control Summary - Matrix Spike/ Matrix Spike Duplicate

Analyte	Units	Sample ID	MS Spike Conc	MS Result	MS Recovery	MSD Spike Conc	MSD Result	MSD Recovery	RPD
As(III)	µg/L	14-27519-ZP15B	100.0	139.5	102.0	100.0	138.2	100.7	0.9
As(V)	µg/L	14-27519-ZP15B	100.0	105.3	99.0	100.0	103.9	97.6	1.3
DMAs	µg/L	14-27519-ZP15B	104.9	106.9	101.9	104.9	105.3	100.4	1.5

APPLIED SPECIATION AND CONSULTING, LLC

18804 Northcreek Parkway Bothell, WA, 98011
Tel: (425) 483-3300 Fax: (425) 483-9818
www.appliedspeciation.com

January 20, 2015

Cheronne Oreiro
Analytical Resources Inc.
4611 S. 134th Place Suite 100
Tukwila, WA 98168
(206) 695-6200

Re: SDG A141217S2 (Gas Works Park – Play Area Investigation)

Ms. Oreiro,

Attached is the report associated with eight (8) soil core samples submitted for arsenic sequential extraction on December 17, 2014. The samples were received on the day of submittal in a sealed cooler at 0.3°C. Any issues associated with the analyses are addressed in the following report.

If you have any questions, please feel free to contact me at your convenience.

Sincerely,

Ben Wozniak

Ben Wozniak
Project Manager
Applied Speciation and Consulting, LLC

Applied Speciation and Consulting, LLC

Report Prepared for:

Cheronne Oreiro
Analytical Resources Inc.
4611 S. 134th Place Suite 100
Tukwila, WA 98168

January 20, 2015

1. Sample Reception

Eight (8) soil core samples were submitted for arsenic sequential extraction on December 17, 2014. The samples were received on the day of submittal in a sealed cooler at 0.3°C, as indicated on the attached chain of custody (COC) forms.

All samples were received in a laminar flow clean hood, void of trace metals contamination and ultra-violet radiation. Immediately upon reception all samples were designated discrete sample identifiers and then stored in a secure, monitored freezer (maintained at a temperature of ≤ -10°C) until sample preparation could be performed.

2. Sample Preparation

All applied water for dilutions and sample reagents are monitored for contamination to account for any biases associated with the sample results.

Arsenic Sequential Extraction (Wenzel et al.) A sequential extraction method, based on Wenzel *et al.*, was employed for correlation between arsenic and different substrate properties. In accordance with the client's request, all handling of the submitted soil core samples and preparation of the first four extracts (*i.e.*, all extracts except the HNO_3 / H_2O_2 extraction) was performed in a glove box maintained under anoxic conditions.

A known mass of each soil sample was transferred to polypropylene vial and an aliquot of 0.05 M $(NH_4)_2SO_4$ was added to each vial. Each vial was capped and shaken on an inverting shaker for 4 hours at room temperature at 30 RPM.

The samples were removed from the shaker and centrifuged for 20 minutes at 3000RPM. After the supernatant was decanted into a separate vial for trace metals analysis, an aliquot of reagent water was added to each vial. The vials were shaken vigorously and centrifuged for 20 minutes at 3000RPM. The reagent water rinse was decanted and discarded.

An aliquot of 0.05 M $NH_4H_2PO_4$ was added to each vial. Each vial was capped and shaken on an inverting shaker for 16 hours at room temperature at 30 RPM.

The samples were removed from the shaker and centrifuged for 20 minutes at 3000RPM. After the supernatant was decanted into a separate vial for trace metals analysis, an aliquot of reagent water was added to each vial. The vials were shaken vigorously and centrifuged for 20 minutes at 3000RPM. The reagent water rinse was decanted and discarded.

All sample vials were wrapped in aluminum foil to prevent photo-oxidation and then an aliquot of 0.2M ammonium oxalate buffer (pH=3.25) was added to each vial. Each vial was capped and shaken on an inverting shaker for 4 hours at room temperature at 30 RPM.

The samples were removed from the shaker and centrifuged for 20 minutes at 3000RPM. After the supernatant was decanted into a separate vial for trace metals analysis, an aliquot of 0.2M ammonium oxalate buffer was added to each vial. The vials were shaken vigorously and centrifuged for 20 minutes at 3000RPM. The supernatant was decanted and discarded.

An aliquot of 0.2M ammonium oxalate buffer with 0.1M ascorbic acid was added to each vial. The vials were then placed in a hotblock digestion apparatus at 96°C for 30 minutes.

The samples were removed from the shaker and centrifuged for 20 minutes at 3000RPM. After the supernatant was decanted into a separate vial for trace metals analysis, an aliquot of 0.2M ammonium oxalate buffer with 0.1M ascorbic acid was added to each vial. The vials were shaken vigorously and centrifuged for 20 minutes at 3000RPM. The supernatant was decanted and discarded.

The residual solid pellets remaining in the vials were then digested via with aliquots of concentrated HNO_3 and H_2O_2 (in accordance with EPA Method 3050B).

In accordance with the client's request, all extracts were analyzed for iron in addition to arsenic.

3. Sample Analysis

All sample analysis is preceded by a minimum of a five-point calibration curve spanning the entire concentration range of interest. All calibration curves, associated with each species of interest, are standardized by linear regression resulting in a response factor. All sample results are **instrument blank corrected** to account for any operational biases associated with the analytical platform.

Prior to sample analysis, all calibration curves are verified using second source standards which are identified as initial calibration verification standards (ICV).

Ongoing instrument performance is identified by the analysis of continuing calibration verification standards (CCV) and continuing calibration blanks (CCB) at a minimum interval of every ten analytical runs.

Arsenic and Iron Quantitation by ICP-QQQ-MS All sample fractions for arsenic and iron quantitation were analyzed by inductively coupled plasma triple quadrupole mass

spectrometry (ICP-QQQ-MS). An aliquot of each sample extract is introduced into a radio frequency (RF) plasma where energy-transfer processes cause desolvation, atomization, and ionization. The ions are extracted from the plasma through a differentially-pumped vacuum interface and travel through an initial quadrupole (Q1), which filters the target masses prior to their entrance into a second chamber. The second chamber contains specific reactive gasses or collision gasses that preferentially react either with interfering ions of the same target mass to charge ratios (m/z) or with the target analyte, producing an entirely different mass to charge ratio (m/z) which can then be differentiated from the initial interferences. The ions then exit the collision/reaction chamber into the mass analyzer (Q2). A solid-state detector detects ions transmitted through the mass analyzer, on the basis of their mass-to-charge ratio (m/z), and the resulting current is processed by a data handling system.

Total Solids Analysis A known mass of each sample was placed into a pre-weighed pan, and the combined mass of the sample and pan was recorded. All samples were then placed into a convection oven maintained at a temperature of 60°C. After drying for a minimum of twelve (12) hours, all samples were briefly cooled and reweighed. The total solids percentage of each sample was calculated by dividing the weight of the dried sample by the weight of the original sample.

4. Analytical Discussion

No significant issues were encountered with the requested analyses. All quality control parameters associated with the samples were within acceptance limits.

If you have any questions or concerns regarding this report, please feel free to contact me.

Sincerely,

Ben Wozniak

Ben Wozniak
Project Manager
Applied Speciation and Consulting, LLC

Arsenic Sequential Extraction Results for ARI
SDG: A141217S2
Coniact: Cheronne Oreiro

Date: January 20, 2015
Report Generated by: Ben Wozniak
Applied Speciation and Consulting, LLC

Sample Results

14-27414-ZP16F

Fraction	Fraction Description	As	Fe
0.05 M $(NH_4)_2SO_4$	Non-specifically adsorbed arsenic	4.68	17.1
0.05 M $(NH_4)H_2PO_4$	Specifically-sorbed arsenic	1.60	159
0.2M $(NH_4)_2C_2O_4$	Amorphous Fe oxyhydroxide	1.11	1480
0.2M $(NH_4)_2C_2O_4$ + 0.1M Ascorbic acid	Crystalline Fe oxyhydroxide	0.493	715
HNO_3 / H_2O_2	Residual	3.71	6640

All analyte results are reported in µg/g on a dry weight (DW) basis
U = Sample concentration is less than the estimated Method Detection Limit (eMDL)
J = Sample concentration is between the eMDL and the Reporting Limit (RL)

Arsenic Sequential Extraction Results for ARI
SDG: A141217S2
Contact: Cheronne Oreiro

Date: January 20, 2015
Report Generated by: Ben Wozniak
Applied Speciation and Consulting, LLC

Sample Results

14-27415-ZP16G

Fraction	Fraction Description	As	Fe
0.05 M $(NH_4)_2SO_4$	Non-specifically adsorbed arsenic	0.556 J	208
0.05 M $(NH_4)H_2PO_4$	Specifically-sorbed arsenic	2.03	508
0.2M $(NH_4)_2C_2O_4$	Amorphous Fe oxyhydroxide	1.47	2430
0.2M $(NH_4)_2C_2O_4$ + 0.1M Ascorbic acid	Crystalline Fe oxyhydroxide	0.565 J	731
HNO_3 / H_2O_2	Residual	19.2	12700

All analyte results are reported in µg/g on a dry weight (DW) basis
U = Sample concentration is less than the estimated Method Detection Limit (eMDL)
J = Sample concentration is between the eMDL and the Reporting Limit (RL)

Arsenic Sequential Extraction Results for ARI
SDG: A141217S2
Contact: Cheronne Oreiro

Date: January 20, 2015
Report Generated by: Ben Wozniak
Applied Speciation and Consulting, LLC

Sample Results

14-27416-ZP16H

Fraction	Fraction Description	As	Fe
0.05 M $(NH_4)_2SO_4$	Non-specifically adsorbed arsenic	1.93	36.8
0.05 M $(NH_4)H_2PO_4$	Specifically-sorbed arsenic	3.75	392
0.2M $(NH_4)_2C_2O_4$	Amorphous Fe oxyhydroxide	0.790	1170
0.2M $(NH_4)_2C_2O_4$ + 0.1M Ascorbic acid	Crystalline Fe oxyhydroxide	0.845	834
HNO_3 / H_2O_2	Residual	35.4	13800

All analyte results are reported in µg/g on a dry weight (DW) basis
U = Sample concentration is less than the estimated Method Detection Limit (eMDL)
J = Sample concentration is between the eMDL and the Reporting Limit (RL)

Arsenic Sequential Extraction Results for ARI
SDG: A141217S2
Contact: Cheronne Oreiro

Date: January 20, 2015
Report Generated by: Ben Wozniak
Applied Speciation and Consulting, LLC

Sample Results

14-27447-ZO83H

Fraction	Fraction Description	As	Fe
0.05 M $(NH_4)_2SO_4$	Non-specifically adsorbed arsenic	18.5	35.0
0.05 M $(NH_4)H_2PO_4$	Specifically-sorbed arsenic	40.6	19.2 J
0.2M $(NH_4)_2C_2O_4$	Amorphous Fe oxyhydroxide	108	542
0.2M $(NH_4)_2C_2O_4$ + 0.1M Ascorbic acid	Crystalline Fe oxyhydroxide	26.8	1380
HNO_3 / H_2O_2	Residual	93.0	1630

All analyte results are reported in µg/g on a dry weight (DW) basis
U = Sample concentration is less than the estimated Method Detection Limit (eMDL)
J = Sample concentration is between the eMDL and the Reporting Limit (RL)

Arsenic Sequential Extraction Results for ARI
SDG: A141217S2
Contact: Cheronne Oreiro

Date: January 20, 2015
Report Generated by. Ben Wozniak
Applied Speciation and Consulting, LLC

Sample Results

14-27448-ZO83I

Fraction	Fraction Description	As	Fe
0.05 M $(NH_4)_2SO_4$	Non-specifically adsorbed arsenic	20.3	5.6 J
0.05 M $(NH_4)H_2PO_4$	Specifically-sorbed arsenic	908	32.6
0.2M $(NH_4)_2C_2O_4$	Amorphous Fe oxyhydroxide	4790	19200
0.2M $(NH_4)_2C_2O_4$ + 0.1M Ascorbic acid	Crystalline Fe oxyhydroxide	2620	4300
HNO_3 / H_2O_2	Residual	750	4870

All analyte results are reported in µg/g on a dry weight (DW) basis
U = Sample concentration is less than the estimated Method Detection Limit (eMDL)
.I = Sample concentration is between the eMDL and the Reporting Limit (RL)

Arsenic Sequential Extraction Results for ARI
SDG: A141217S2
Contact: Cheronne Oreiro

Date: January 20, 2015
Report Generated by: Ben Wozniak
Applied Speciation and Consulting, LLC

Sample Results

14-27449-ZO83J

Fraction	Fraction Description	As	Fe
0.05 M $(NH_4)_2SO_4$	Non-specifically adsorbed arsenic	354	55.1
0.05 M $(NH_4)H_2PO_4$	Specifically-sorbed arsenic	180	255
0.2M $(NH_4)_2C_2O_4$	Amorphous Fe oxyhydroxide	24.7	718
0.2M $(NH_4)_2C_2O_4$ + 0.1M Ascorbic acid	Crystalline Fe oxyhydroxide	78.5	532
HNO_3 / H_2O_2	Residual	9110	6120

All analyte results are reported in µg/g on a dry weight (DW) basis
U = Sample concentration is less than the estimated Method Detection Limit (eMDL)
J = Sample concentration is between the eMDL and the Reporting Limit (RL)

Arsenic Sequential Extraction Results for ARI
SDG: A141217S2
Contact: Cheronne Oreiro

Date: January 20, 2015
Report Generated by: Ben Wozniak
Applied Speciation and Consulting, LLC

Sample Results

14-27450-ZO83K

Fraction	Fraction Description	As	Fe
0.05 M $(NH_4)_2SO_4$	Non-specifically adsorbed arsenic	7.86	12.1 J
0.05 M $(NH_4)H_2PO_4$	Specifically-sorbed arsenic	8.07	180
0.2M $(NH_4)_2C_2O_4$	Amorphous Fe oxyhydroxide	3.10	799
0.2M $(NH_4)_2C_2O_4$ + 0.1M Ascorbic acid	Crystalline Fe oxyhydroxide	2.89	491
HNO_3 / H_2O_2	Residual	37.6	11900

All analyte results are reported in µg/g on a dry weight (DW) basis
U = Sample concentration is less than the estimated Method Detection Limit (eMDL)
J = Sample concentration is between the eMDL and the Reporting Limit (RL)

Arsenic Sequential Extraction Results for ARI
SDG. A141217S2
Contact: Cheronne Oreiro

Date: January 20, 2015
Report Generated by: Ben Wozniak
Applied Speciation and Consulting, LLC

Sample Results

14-27451-ZO83L

Fraction	Fraction Description	As	Fe
0.05 M $(NH_4)_2SO_4$	Non-specifically adsorbed arsenic	6.84	4.6 J
0.05 M $(NH_4)H_2PO_4$	Specifically-sorbed arsenic	0.832	338
0.2M $(NH_4)_2C_2O_4$	Amorphous Fe oxyhydroxide	0.721	1200
0.2M $(NH_4)_2C_2O_4$ + 0.1M Ascorbic acid	Crystalline Fe oxyhydroxide	0.578	715
HNO_3 / H_2O_2	Residual	3.23	5970

All analyte results are reported in µg/g on a dry weight (DW) basis
U = Sample concentration is less than the estimated Method Detection Limit (eMDL)
J = Sample concentration is between the eMDL and the Reporting Limit (RL)

Arsenic Sequential Extraction Results for ARI
SDG: A141217S2
Contact: Cheronne Oreiro

Date: January 20, 2015
Report Generated by: Ben Wozniak
Applied Speciation and Consulting, LLC

Quality Control Summary - Total Solids Results

Sample ID	Total Solids	Units
14-27414-ZP16F	91.4	%
14-27415-ZP16G	67.7	%
14-27416-ZP16H	82.4	%
14-27447-ZO83H	77.2	%
14-27448-ZO83I	57.6	%
14-27449-ZO83J	70.8	%
14-27450-ZO83K	90.3	%
14-27451-ZO83L	89.5	%

Arsenic Sequential Extraction Results for ARI
SDG: A141217S2
Contact: Cheronne Oreiro

Date: January 20, 2015
Report Generated by: Ben Wozniak
Applied Speciation and Consulting, LLC

Quality Control Summary - Preparation Blank Summary

Analyte	Units	Fraction	PB1	PB2	PB3	PB4	Mean	StdDev	eMDL*	RL
As	µg/g DW	0.05 M $(NH_4)_2SO_4$	0.028	0.042	0.033	0.025	0.032	0.007	0.022	0.40
As	µg/g DW	0.05 M $(NH_4)H_2PO_4$	0.054	0.032	0.017	0.028	0.033	0.015	0.046	0.40
As	µg/g DW	0.2M $(NH_4)_2C_2O_4$	0.039	0.031	0.049	0.083	0.051	0.023	0.069	0.40
As	µg/g DW	0.2M $(NH_4)_2C_2O_4$ + 0.1M Ascorbic acid	0.057	0.064	0.082	0.097	0.075	0.018	0.054	0.40
Fe	µg/g DW	HNO_3/H_2O_2	0.06	0.09	0.05	0.25	0.11	0.09	0.28	0.50
Fe	µg/g DW	0.05 M $(NH_4)_2SO_4$	0.9	0.7	-0.2	0.5	0.5	0.5	1.5	16
Fe	µg/g DW	0.05 M $(NH_4)H_2PO_4$	-0.14	-0.26	0.06	0.09	-0.06	0.17	0.50	16
Fe	µg/g DW	0.2M $(NH_4)_2C_2O_4$	1.6	1.8	2.8	2.9	2.3	0.7	2.0	16
Fe	µg/g DW	0.2M $(NH_4)_2C_2O_4$ + 0.1M Ascorbic acid	2.5	3.4	3.6	2.8	3.1	0.5	1.5	16
Fe	µg/g DW	HNO_3/H_2O_2	0.4	-0.2	-0.1	1.6	0.4	0.8	2.5	20

eMDL = Estimated Method Detection Limit; RL = Reporting Limit
*Please see narrative regarding eMDL calculations

Arsenic Sequential Extraction Results for ARI
SDG: A141217S2
Contact: Cheronne Oreiro

Date: January 20, 2015
Report Generated by: Ben Wozniak
Applied Speciation and Consulting, LLC

Quality Control Summary - Matrix Duplicate (MD)

Analyte	Units	Fraction	Sample ID	Rep 1	Rep 2	Mean	RPD
As	µg/g DW	0.05 M $(NH_4)_2SO_4$	14-27416-ZP16H	1.934	2.210	2.072	13.3
As	µg/g DW	0.05 M $(NH_4)H_2PO_4$	14-27416-ZP16H	3.749	3.744	3.746	0.1
As	µg/g DW	0.2M $(NH_4)_2C_2O_4$	14-27416-ZP16H	0.790	0.732	0.761	7.7
As	µg/g DW	0.2M $(NH_4)_2C_2O_4$ + 0.1M Ascorbic acid	14-27416-ZP16H	0.845	0.763	0.804	10.2
As	µg/g DW	HNO_3/H_2O_2	14-27416-ZP16H	35.38	41.84	38.61	16.7
Fe	µg/g DW	0.05 M $(NH_4)_2SO_4$	14-27416-ZP16H	36.8	42.3	39.6	13.8
Fe	µg/g DW	0.05 M $(NH_4)H_2PO_4$	14-27416-ZP16H	391.7	415.9	403.8	6.0
Fe	µg/g DW	0.2M $(NH_4)_2C_2O_4$	14-27416-ZP16H	1171	1480	1326	23.3
Fe	µg/g DW	0.2M $(NH_4)_2C_2O_4$ + 0.1M Ascorbic acid	14-27416-ZP16H	834.5	955.8	895.1	13.6
Fe	µg/g DW	HNO_3/H_2O_2	14-27416-ZP16H	13810	13900	13860	0.6
Total Solids	%	-	14-27416-ZP16H	82.40	84.64	83.52	2.7

NC = Value was not calculated due to one or more concentrations below the eMDL

SUBCONTRACTOR ANALYSIS REQUEST
CUSTODY TRANSFER 12/15/14

ANALYTICAL RESOURCES INCORPORATED

ARI Project: ZP16

Laboratory: Applied Speciation & Consulting
Lab Contact: Russell Gerads
Lab Address: 18804 Northcreek Parkway
Bothell, WA 98011
Phone: 425-483-3300
Fax: 425-483-9818

ARI Client: Geoengineers
Project ID: Gas Works Park-Play Area Investigat
ARI PM: Cheronne Oreiro
Phone: 206-695-6214
Fax: 206-695-6201
Email: subdata@arilabs.com

Analytical Protocol: In-house
Special Instructions:

Requested Turn Around:
Email Results (Y/N): Yes

Limits of Liability. *Subcontractor is expected to perform all requested services in accordance with appropriate methodology following Standard Operating Procedures that meet standards for the industry. The total liability of ARI, its officers, agents, employees, or sucessors, arising out of or in connection with the requested services, shall not exceed the negotiated amount for said services. The agreement by the Subcontractor to perform services requested by ARI releases ARI from any liability in excess thereof, not withstanding any provision to the contrary in any contract, purchase order or co-signed agreement between ARI and the Subcontractor.*

ARI ID	Client ID/ Add'l ID	Sampled	Matrix	Bottles	Analyses
14-27414-ZP16F	PAI-10-31.5-32.0	12/11/14 12:30	Soil	1	Metals (Sub)
Special Instructions: Sequential Extraction As,Fe					
14-27415-ZP16G	PAI-11-12.0-12.5	12/11/14 13:50	Soil	1	Metals (Sub)
Special Instructions: Sequential Extraction As,Fe					
14-27416-ZP16H	PAI-11-22-22.5	12/11/14 14:20	Soil	1	Metals (Sub)
Special Instructions: Sequential Extraction As,Fe					

Carrier		Airbill		Date	
Relinquished by		Company ARI		Date 12/17/14	Time 1330
Received by		Company ACS		Date 12/17/14	Time 13:34

Subcontractor Custody Form - **ZP16**
Page 1 of 1

@ 0.3°C

ZP15:00264

SUBCONTRACTOR ANALYSIS REQUEST
CUSTODY TRANSFER 12/15/14

ANALYTICAL RESOURCES INCORPORATED

ARI Project: Z083

Laboratory: Applied Speciation & Consulting
Lab Contact: Russell Gerads
Lab Address: 18804 Northcreek Parkway
Bothell, WA 98011
Phone: 425-483-3300
Fax: 425-483-9818

ARI Client: Geoengineers
Project ID: Gas Works Park-Play Area Investigat
ARI PM: Cheronne Oreirc
Phone: 206-695-6214
Fax: 206-695-6201
Email: subdata@arilabs.com

Analytical Protocol: In-house
Special Instructions:

Requested Turn Around:
Email Results (Y/N): email

Limits of Liability. *Subcontractor is expected to perform all requested services in accordance with appropriate methodology following Standard Operating Procedures that meet standards for the industry. The total liability of ARI, its officers, agents, employees, or sucessors, arising out of or in connection with the requested services, shall not exceed the negotiated amount for said services. The agreement by the Subcontractor to perform services requested by ARI releases ARI from any liability in excess thereof, not withstanding any provision to the contrary in any contract, purchase order or co-signed agreement between ARI and the Subcontractor.*

ARI ID	Client ID/ Add'l ID	Sampled	Matrix	Bottles	Analyses
14-27440-Z083A	PAI-11GW	12/12/14 10:00	Water	1	Metals (Sub)
Special Instructions: Speciated As 6800					
14-27441-Z083B	PAI-12GW	12/12/14 12:30	Water	1	Metals (Sub)
Special Instructions: Speciated As 6800					
14-27442-Z083C	PAI-2GW	12/12/14 14:00	Water	1	Metals (Sub)
Special Instructions: Speciated As 6800					
14-27447-Z083H	PAI-12-8.5-9.0	12/12/14 09:55	Soil	1	Metals (Sub)
Special Instructions: Sequential Extraction As, Fe					
14-27448-Z083I	PAI-12-13.5-14.0	12/12/14 10:15	Soil	1	Metals (Sub)
Special Instructions: Sequential Extraction As, Fe					
14-27449-Z083J	PAI-2-17.5-18.0	12/12/14 12:00	Soil	1	Metals (Sub)
Special Instructions: Sequential Extraction As, Fe					
14-27450-Z083K	PAI-2-19.0-19.5	12/12/14 11:50	Soil	1	Metals (Sub)
Special Instructions: Sequential Extraction As, Fe					

Sample not included on COC. 12/17/14
c PAI-10GW

Carrier	Airbill		Date
Relinquished by	Company ARI	Date 12/17/14	Time 1330
Received by	Company ACS	Date 12/17/14	Time 13:34 @ 0.3°

Subcontractor Custody Form - Z083
Page 1 of 12

ZP15:00265

SUBCONTRACTOR ANALYSIS REQUEST
CUSTODY TRANSFER 12/15/14

ANALYTICAL RESOURCES INCORPORATED

ARI Project: 2083

Laboratory: Applied Speciation & Consulting
Lab Contact: Russell Gerads

ARI Client: Geoengineers
Project ID: 0186-846-01 Task 1520

ARI Sample ID	Client Sample ID/ Add'l Sample ID	Sampled	Matrix	Bottles	Analyses
14-27451-Z083L	PAI-3-33.5-34.0	12/12/14 14:30	Soil	1	Metals (Sub)

Special Instructions: Sequential Extraction As, Fe

Carrier	Airbill		Date
Relinquished by	Company ARI	Date 12/17/14	Time 1330
Received by	Company ACS	Date 12/12/14	Time 13:54

@ 0.3°C

Subcontractor Custody Form - Z083
Page 2 of 2

ZP15:00266

SUBCONTRACTOR ANALYSIS REQUEST
CUSTODY TRANSFER 12/16/14

ANALYTICAL RESOURCES INCORPORATED

ARI Project: ZP15

Laboratory: Applied Speciation & Consulting
Lab Contact: Russell Gerads
Lab Address: 18804 Northcreek Parkway
Bothell, WA 98011
Phone: 425-483-3300
Fax: 425-483-9818

ARI Client: Geoengineers
Project ID: Gas Works Park-Paly Area Investiga
ARI PM: Cheronne Oreiro
Phone: 206-695-6214
Fax: 206-695-6201
Email: subdata@arilabs.com

Analytical Protocol: In-house
Special Instructions:

Requested Turn Around:
Email Results (Y/N): email

Limits of Liability. *Subcontractor is expected to perform all requested services in accordance with appropriate methodology following Standard Operating Procedures that meet standards for the industry. The total liability of ARI, its officers, agents, employees, or sucessors, arising out of or in connection with the requested services, shall not exceed the negotiated amount for said services. The agreement by the Subcontractor to perform services requested by ARI releases ARI from any liability in excess thereof, not withstanding any provision to the contrary in any contract, purchase order or co-signed agreement between ARI and the Subcontractor.*

ARI ID	Client ID/ Add'l ID	Sampled	Matrix	Bottles	Analyses
14-27518-ZP15A	MW-36D-141215	12/15/14 10:00	Water	1	Metals (Sub)
Special Instructions: Arsenic Speciation 6800					
14-27519-ZP15B	MW-36S-141215	12/15/14 11:30	Water	1	Metals (Sub)
Special Instructions: Arsenic Speciation 6800					

Carrier	Airbill		Date
Relinquished by	Company ARI	Date 12/17/14	Time 1330
Received by	Company ACS	Date 12/17/14	Time 13:34

@ 0.3°

ZP15:00267

Analytical Resources, Incorporated
Analytical Chemists and Consultants

January 23, 2015

Zanna Satterwhite
GeoEngineers, Inc.
Plaza 600 Building
600 Stewart Street, Suite 1700
Seattle, WA 98101

RE: Client Project: Gas Works Park-Play Area Investigation, 0186-846-01 Task 1520
ARI Job No.: ZP35

Dear Zanna:

Please find enclosed the Chain of Custody records (COCs), sample receipt documentation, and the final data package for samples from the project referenced above.

Sample receipt and details of these analyses are discussed in the Case Narrative.

An electronic copy of this package will remain on file with ARI. Should you have any questions or problems, please feel free to contact me at your convenience.

Sincerely,

ANALYTICAL RESOURCES, INC.

Cheronne Oreiro
Project Manager
(206) 695-6214
cheronneo@arilabs.com
www.arilabs.com

cc: eFile: ZP35

Enclosures

4611 South 134th Place, Suite 100 • Tukwila WA 98168 • **206-695-6200** • **206-695-6201** fax

Chain of Custody Documentation

ARI Job ID: ZP35

Chain of Custody Record & Laboratory Analysis Request

ARI Assigned Number:	Turn-around Requested:	Page: 1 of 2	
ARI Client Company: GeoEngineers	Phone: 206-239-3231	Date: 12/9/14	Ice Present?
Client Contact: Zanna Satterwhite		No. of Coolers:	Cooler Temps:
Client Project Name: Gas Works Park – Play Area Investigation			
Client Project #: 0186-846-01	Samplers: Robert Miyahira + Claudia DeLaVia		

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Analytical Chemists and Consultants
4611 South 134th Place, Suite 100
Tukwila, WA 98168
206-695-6200 206-695-6201 (fax)
www.arilabs.com

Sample ID	Date	Time	Matrix	No. Containers	Analysis Requested: HOLD								Notes/Comments
PAI-6-5.5-6.0	12/9	0910	Soil	6	X								
PAI-6-9.0-9.5	12/9	0905	Soil	6	X								
PAI-7-5.5-6.0	12/9	1000	Soil	6	X								
PAI-7-8.0-8.5	12/9	1010	Soil	6	X								
PAI-7-15.0-15.5	12/9	1100	Soil	6	X								
PAI-7-18.5-19.0	12/9	1110	Soil	6	X								
PAI-7-10.0-10.5	12/9	1040	Soil	6	X								
PAI-7-22.5-23.0	12/9	1145	Soil	6	X								
PAI-2-4.5-5.0	12/9	1300	Soil	~~6~~ 4	X								
PAI-2-12.5-13.0	12/9	1400	Soil	4	X								

Comments/Special Instructions	Relinquished by: (Signature)	Received by: (Signature)	Relinquished by: (Signature)	Received by: (Signature)
	Printed Name: Claudia DeLaVia	Printed Name: Rich Hudson	Printed Name:	Printed Name:
	Company: GeoEngineers	Company: ARI	Company:	Company:
	Date & Time: 12/10/14 1315	Date & Time: 12/10/14 1315	Date & Time:	Date & Time:

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 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-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.

Chain of Custody Record & Laboratory Analysis Request

ARI Assigned Number:	Turn-around Requested:	Page: 2 of 2	
ARI Client Company: GeoEngineers	Phone: 206-239-3231	Date: 12/9/14	Ice Present?
Client Contact: Zanna Satterwhite		No. of Coolers:	Cooler Temps:
Client Project Name: Gas Works Park			
Client Project #: 0186-846-01	Samplers: Robert Miyahira + Claudia DeLa Vina		

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Analytical Chemists and Consultants
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Tukwila, WA 98168
206-695-6200 206-695-6201 (fax)
www.arilabs.com

Sample ID	Date	Time	Matrix	No. Containers	Analysis Requested: HOLD								Notes/Comments
PAI-2-18.0-18.5	12/9	1440	Soil	4	X								
PAI-2-18.0-18.5-DUP	12/9	1440	Soil	4	X								
PAI-2-19.5-20.0	12/9	1450	Soil	4	X								
PAI-2-24.0-24.5	12/9	1510	Soil	4	X								
PAI-2-28.0-28.5	12/9	1540	Soil	5	X								
TRIP BLANK			Water	1	X								

Comments/Special Instructions	Relinquished by: (Signature)	Received by: (Signature)	Relinquished by: (Signature)	Received by: (Signature)
	Printed Name: Claudia DeLa Vina	Printed Name: Rod Hinkle	Printed Name:	Printed Name:
	Company: GeoEngineers	Company: ARI	Company:	Company:
	Date & Time: 12/10/14 1315	Date & Time: 12/10/14 1315	Date & Time:	Date & Time:

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 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-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.

ZP35:9999

Chain of Custody Record & Laboratory Analysis Request

ZP35 : 00007

DAS revision - 12-10-14

Chain of Custody Record & Laboratory Analysis Request

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Analytical Chemists and Consultants
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Tukwila, WA 98168
206-695-6200 206-695-6201 (fax)
www.arilabs.com

ARI Assigned Number:	Turn-around Requested: Standard
ARI Client Company: Geo Engineers	Phone: 206-730-3231
Client Contact: Dana Sato, PhD	
Client Project Name: Issaquah Park	
Client Project #: 0178-246-01 Task 1520	Samplers: Robert Miyahira + Claudia De La Vina
Page: 2 of 2	
Date: 12/9/14	Ice Present?
No. of Coolers:	Cooler Temps:

Analysis Requested

Sample ID	Date	Time	Matrix	No. Containers	HOLD	Arsenic EPA 200.8	PAHs by EPA 8270 SIM Chevlevel	BTEX by EPA 8260 Chevlevel					Notes/Comments
PAI-2-18.0-18.5	12/9	1440	Soil	4	X	O							XRF gun 7000 ppm
PAI-2-18.0-18.5-DUP	12/9	1440	Soil	4	X	O							X
PAI-2-19.5-20.0	12/9	1450	Soil	4	X								
PAI-2-24.0-24.5	12/9	1510	Soil	4	X								
PAI-2-28.0-28.5	12/9	1540	Soil	5	X	O							
TRIP BLANK			Water	1	X			O					

Comments/Special Instructions	Relinquished by:	Received by:	Relinquished by:	Received by:
	Signature:	Signature:	Signature:	Signature:
	Printed Name:	Printed Name:	Printed Name:	Printed Name:
	Company:	Company:	Company:	Company:
	Date & Time:	Date & Time:	Date & Time:	Date & Time:

Limits of Liability: ARI will perform 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 said services. The acceptance by the client of a proposal for services by ARI releases ARI from any liability in excess thereof, notwithstanding any provision to the contrary in any contract, purchase order or co-signed agreement between ARI and the client.

Sample Retention Policy: All samples submitted to ARI will be appropriately disposed of sixty (60) days after receipt of final report or sixty (60) days after submission of hardcopy data, whichever is longer, unless alternate retention schedules have been established in writing between ARI and the client.

Analytical Resources, Incorporated
Analytical Chemists and Consultants

Cooler Receipt Form

ARI Client: GeoEngineer

Project Name: Gas Works Park

COC No(s): _____ (NA)

Delivered by: Fed-Ex UPS Courier Hand Delivered Other: _____

Assigned ARI Job No: 7008

Tracking No: _____ (NA)

Preliminary Examination Phase:

Were intact, properly signed and dated custody seals attached to the outside of to cooler?	YES	(NO)
Were custody papers included with the cooler?	(YES)	NO
Were custody papers properly filled out (ink, signed, etc.)	(YES)	NO

Temperature of Cooler(s) (°C) (recommended 2.0-6.0 °C for chemistry) 4.0

Time: 1210

If cooler temperature is out of compliance fill out form 00070F

Temp Gun ID#: 90877952

Cooler Accepted by: _____ Date: 12/10/14 Time: 1315

Complete custody forms and attach all shipping documents

Log-In Phase:

Was a temperature blank included in the cooler?		YES	(NO)
What kind of packing material was used? ... Bubble Wrap Wet Ice (Gel Packs) Baggies (Foam Block) Paper Other: Box			
Was sufficient ice used (if appropriate)?	NA	(YES)	NO
Were all bottles sealed in individual plastic bags?		YES	(NO)
Did all bottles arrive in good condition (unbroken)?		(YES)	NO
Were all bottle labels complete and legible?		(YES)	NO
Did the number of containers listed on COC match with the number of containers received?		(YES)	NO
Did all bottle labels and tags agree with custody papers?		(YES)	NO
Were all bottles used correct for the requested analyses?		(YES)	NO
Do any of the analyses (bottles) require preservation? (attach preservation sheet, excluding VOCs)...	(NA)	YES	NO
Were all VOC vials free of air bubbles?	(NA)	YES	NO
Was sufficient amount of sample sent in each bottle?		(YES)	NO
Date VOC Trip Blank was made at ARI	NA	12/5/14	

Was Sample Split by ARI : (NA) YES Date/Time: _____ Equipment: _____ Split by: _____

Samples Logged by: AV Date: 12/12/14 Time: 1040

***** Notify Project Manager of discrepancies or concerns *****

Sample ID on Bottle	Sample ID on COC	Sample ID on Bottle	Sample ID on COC

Additional Notes, Discrepancies, & Resolutions:

By: Date:

Small Air Bubbles ~2mm	Peabubbles 2-4 mm	LARGE Air Bubbles > 4 mm
• • •	• • •	● ● ●

Small → "sm" (< 2 mm)

Peabubbles → "pb" (2 to < 4 mm)

Large → "lg" (4 to < 6 mm)

Headspace → "hs" (> 6 mm)

Chain of Custody Record & Laboratory Analysis Request

ARI Assigned Number:	Turn-around Requested:	Page: 1 of 2	
ARI Client Company: Geoengineers	Phone: 206-239-3231	Date: 12/11/14	Ice Present?
Client Contact: Zanna Satterwhite		No. of Coolers:	Cooler Temps:
Client Project Name: Gas Works Park - Play Area Investigation			
Client Project #: 0186-846-01	Samplers: Robert Mayhew & Claudia DeLaVia		

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Analytical Chemists and Consultants
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Tukwila, WA 98168
206-695-6200 206-695-6201 (fax)
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Sample ID	Date	Time	Matrix	No. Containers	Analysis Requested	Notes/Comments
PAI-9-3-3.5	12/11	0850	Soil	6		
PAI-9-9.5-10.0	12/11	0910	Soil	6		
PAI-9-11.5-12.0	12/11	0920	Soil	6		
PAI-9-12.5-13.0	12/11	0930	Soil	6		
PAI-9-12.5-13-DUP	12/11	0930	Soil	6		
PAI-9-17.5-18.0	12/11	0945	Soil	6		
RINSATE-141211	12/11	1010	Water	3		
PAI-10-9.5-10.0	12/11	1145	Soil	6		
PAI-10-14.5-15.0	12/11	1150	Soil	6		
PAI-10-19.5-20.0	12/11	1210	Soil	6		

Comments/Special Instructions	Relinquished by: (Signature)	Received by: (Signature)	Relinquished by: (Signature)	Received by: (Signature)
	Printed Name: Claudia DeLaVia	Printed Name: A. Volgardsen	Printed Name:	Printed Name:
	Company: Geoengineers	Company: ARI	Company:	Company:
	Date & Time: 12/11/14 1525	Date & Time: 12/11/14 1525	Date & Time:	Date & Time:

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 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-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.

Chain of Custody Record & Laboratory Analysis Request

ARI Assigned Number:	Turn-around Requested:	Page: 2 of 2	
ARI Client Company: Geo Engineers	Phone: 206-239-3231	Date: 12/11/14	Ice Present?
Client Contact: Zanna Satterwhite		No. of Coolers:	Cooler Temps:
Client Project Name: Gas Works Park - Play Area Investigation			
Client Project #: 0186-846-01	Samplers: Robert Miyahara Claudia DeLaVia		

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Analytical Chemists and Consultants
4611 South 134th Place, Suite 100
Tukwila, WA 98168
206-695-6200 206-695-6201 (fax)
www.arilabs.com

Sample ID	Date	Time	Matrix	No. Containers	Analysis Requested	Notes/Comments
PAI-10-24.5-25.0	12/11	1215	Soil	6		
PAI-10-29.5-30.0	12/11	1220	Soil	6		
PAI-10-31.5-32.0	12/11	1230	Soil	3		Dry ice core
PAI-11-12.0-12.5	12/11	1350	Soil	3		Black is bottom of core
PAI-11-18.5-19.0	12/11	1400	Soil	3		↓
PAI-11-28.0-28.5	12/11	1430	Soil	3		
PAI-11-22-22.5	12/11	1420	Soil	3		
TRIP BLANK			Water	2		

Comments/Special Instructions	Relinquished by: (Signature)	Received by: (Signature)	Relinquished by: (Signature)	Received by: (Signature)
	Printed Name: Claudia DeLa Via	Printed Name: A. Volgardsen	Printed Name:	Printed Name:
	Company: Geo Engineers	Company: ARI	Company:	Company:
	Date & Time: 12/11/14 1525	Date & Time: 12/11/14 1525	Date & Time:	Date & Time:

ZP35 : 90014

Subject: RE: Gas Works COCs
From: "Dan M. Baker" <dbaker@geoengineers.com>
Date: 12/13/2014 12:54 PM
To: "Zanna A. Satterwhite" <zsatterwhite@geoengineers.com>, Cheronne Oreiro <cheronneo@arilabs.com>
CC: Sample Login <sample-receiving@arilabs.com>

Cheronne and sample log-in folks,

Attached are the revised chain of custody forms.

Dan M. Baker
Hydrogeologist/Principal | GeoEngineers, Inc.
Phone: 206.239.3232
Fax: 206.728.2732
Mobile: 206.930.9180
Email: dbaker@geoengineers.com

From: Zanna A. Satterwhite
Sent: Saturday, December 13, 2014 11:58 AM
To: Cheronne Oreiro
Cc: Sample Login; Dan M. Baker
Subject: RE: Gas Works COCs

Cheronne,
We haven't forgotten the COCs for Gas Works. Dan is working on them.
Thank you
Zanna

From: Zanna A. Satterwhite
Sent: Friday, December 12, 2014 6:07 PM
To: 'Cheronne Oreiro'
Cc: Sample Login; Dan M. Baker
Subject: RE: Gas Works COCs

Okay, thanks. I'm ccing Dan.

From: Cheronne Oreiro [mailto:cheronneo@arilabs.com]
Sent: Friday, December 12, 2014 6:06 PM
To: Zanna A. Satterwhite
Cc: Sample Login
Subject: Gas Works COCs

Hi Zanna,

Please cc: sample-receiving@arilabs.com when you email the Gas Works COCs.
Thanks!

Chain of Custody Record & Laboratory Analysis Request

JAS Revisions 12-11-14

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Analytical Chemists and Consultants
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Tukwila, WA 98168
206-695-6200 206-695-6201 (fax)
www.arilabs.com

ARI Assigned Number: ZPV6	Turn-around Requested: standard	Page: 1 of 2		
ARI Client Company: GeoEngineers	Phone: 206-239-3251	Date: 12/11/14	Ice Present?	
Client Contact: Zanna Satterwhite		No. of Coolers:	Cooler Temps:	
Client Project Name: Gas Works Park - Play Area Investigation				
Client Project #: 0186-846-01 Task 1520	Samplers: Robert Mughas + Claudia DeLaVega			

Sample ID	Date	Time	Matrix	No. Containers	Hold	Metals 6010	PAHs 8270 (SIM)	BTEX 8260					Notes/Comments: XRF [illegible]
PAI-9-3-3.5	12/11	0850	Soil	6	X								X
PAI-9-9.5-10.0	12/11	0910	Soil	6	X								
PAI-9-11.5-12.0	12/11	0920	Soil	6	X								
PAI-9-12.5-13.0	12/11	0930	Soil	6		X	X	X					X
PAI-9-12.5-13-DUP	12/11	0930	Soil	6		X	X	X					X
PAI-9-17.5-18.0	12/11	0945	Soil	6	X								
RINSATE-141211	12/11	1010	Water	3		X	X						
PAI-10-9.5-10.0	12/11	1045	Soil	6		X	X	X					
PAI-10-14.5-15.0	12/11	1150	Soil	6	X								
PAI-10-19.5-20.0	12/11	1210	Soil	6			X	X					

Comments/Special Instructions:

Relinquished by:	Received by:	Relinquished by:	Received by:
Signature: [signature]	Signature: [signature]		
Printed Name: Claudia DeLaVega	Printed Name: [illegible]		
Company: GeoEngineers	Company: ARI		
Date & Time: 12/11/14 [illegible]	Date & Time: 12/11/14 1525		

Limits of Liability: ARI will perform all requested services in accordance with appropriate methodology [illegible] meets standards for the industry. [illegible] said services. The acceptance by the client [illegible] signed agreement between ARI and the Client. [illegible]

Sample Retention Policy: All samples [illegible]

JAS Lewis 12-11-14

Chain of Custody Record & Laboratory Analysis Request

Analytical Resources, Incorporated
Analytical Chemists and Consultants
4611 South 134th Place, Suite 100
Tukwila, WA 98168
206-695-6200 206-695-6201 (fax)
www.arilabs.com

ARI Assigned Number:	
Turn-around Requested:	Standard
ARI Client Company:	Geo Engineers
Phone:	206-239-3231
Client Contact:	Zanna Satterwhite
Client Project Name:	Geo Works Park Play Area Investigation
Client Project #:	0186-846-01 Task 1520
Samplers:	Robert Migdhart Claudia De La Via
Page:	2 of 2
Date:	12/11/14
Ice Present?	
No. of Coolers:	
Cooler Temps:	

Sample ID	Date	Time	Matrix	No. Containers	Hold	Arsenic 6010	PAHs EPA 8270SIM (low level)	BTEX EPA 8260 (low level)	Sequential Extraction (As, Fe)*	Acid Insoluble Sulfur ASTM E1915	Acid Volatile Sulfide SM4500-S2D		Notes/Comments XRF) 1000 [illegible] As
PAI-10-24.5-25.0	12/11	1215	Soil	6		X	X	X					
PAI-10-29.5-30.0	12/11	1220	Soil	6	X								
PAI-10-31.5-32.0	12/11	1230	Soil	3					X	X	X		
PAI-11-12.0-12.5	12/11	1350	Soil	3					X	X	X		Dry top core Black is bottom of core
PAI-11-18.5-19.0	12/11	1400	Soil	3	X								↓
PAI-11-28.0-28.5	12/11	1430	Soil	3	X								
PAI-11-22-22.5	12/11	1420	Soil	3					X	X	X		
TRIP BLANK			Water	2				X					
PAI-9-23-23.5	12/11		Soil	6		X	X						

Comments/Special Instructions:
* per 12-10-14 quote

	Relinquished by:	Received by:	Relinquished by:	Received by:
Signature	[signature]	[signature]		
Printed Name	Claudia De La Via	A. [illegible]		
Company	Geo Engineers	ARI		
Date & Time	12/11/14 1525	[illegible]		

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 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-signed agreement between ARI and the Client.

Analytical Resources, Incorporated
Analytical Chemists and Consultants

Cooler Receipt Form

ARI Client: GeoEngineers
Project Name: Gas Works Park - PAI
COC No(s): _____ (NA)
Delivered by: Fed-Ex UPS Courier Hand Delivered Other: _____
Assigned ARI Job No: ZP116
Tracking No: _____ NA

Preliminary Examination Phase:

Were intact, properly signed and dated custody seals attached to the outside of to cooler?	YES	(NO)
Were custody papers included with the cooler?	(YES)	NO
Were custody papers properly filled out (ink, signed, etc.)	(YES)	NO

Temperature of Cooler(s) (°C) (recommended 2.0-6.0 °C for chemistry): 6.0 -18 5.5 4.6
Time: 1623
If cooler temperature is out of compliance fill out form 00070F
Temp Gun ID#: 90377952

Cooler Accepted by: AV Date: 12/11/14 Time: 1525

Complete custody forms and attach all shipping documents

Log-In Phase:

Was a temperature blank included in the cooler?		YES	(NO)
What kind of packing material was used?	(Bubble Wrap) (Wet Ice) (Gel Packs) (Baggies) Foam Block Paper Other: DCX		
Was sufficient ice used (if appropriate)?	NA	(YES)	NO
Were all bottles sealed in individual plastic bags?		YES	(NO)
Did all bottles arrive in good condition (unbroken)?		(YES)	NO
Were all bottle labels complete and legible?		(YES)	NO
Did the number of containers listed on COC match with the number of containers received?		(YES)	NO
Did all bottle labels and tags agree with custody papers?		(YES)	NO
Were all bottles used correct for the requested analyses?		(YES)	NO
Do any of the analyses (bottles) require preservation? (attach preservation sheet, excluding VOCs)	(NA) AV	(YES)	NO
Were all VOC vials free of air bubbles?	NA	(YES)	NO
Was sufficient amount of sample sent in each bottle?		(YES)	NO
Date VOC Trip Blank was made at ARI	NA	12/10/14	

Was Sample Split by ARI: (NA) YES Date/Time: _____ Equipment: _____ Split by: _____

Samples Logged by: AV Date: 12/15/14 Time: 1455

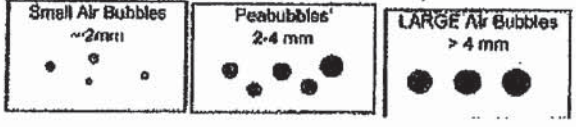
***** Notify Project Manager of discrepancies or concerns *****

Sample ID on Bottle	Sample ID on COC	Sample ID on Bottle	Sample ID on COC

Additional Notes, Discrepancies, & Resolutions:

PAI-11-22-22.5 both 8640z Jars have cracked bottoms. Sulfur Jar replaced, no volume lost.

By: AV Date: 12/15/14



Small → "sm" (< 2 mm)	
Peabubbles → "pb" (2 to < 4 mm)	
Large → "lg" (4 to < 6 mm)	
Headspace → "hs" (> 6 mm)	

Chain of Custody Record & Laboratory Analysis Request

ARI Assigned Number: 2083	Turn-around Requested:	Page: 1 of 1	
ARI Client Company: GeoEngineers	Phone: 206-239-3231	Date: 12/12/14	Ice Present?
Client Contact: Zanna Satterwhite		No. of Coolers:	Cooler Temps:
Client Project Name: Gas Works Park - Play Area Investigation			
Client Project #: 0186-846-01	Samplers: Robert + Claudia + Hannah		

Analytical Resources, Incorporated
Analytical Chemists and Consultants
4611 South 134th Place, Suite 100
Tukwila, WA 98168
206-695-6200 206-695-6201 (fax)
www.arilabs.com

Sample ID	Date	Time	Matrix	No. Containers	Analysis Requested: Hold	Notes/Comments
PAI-11GW	12/12	1000	Water	13+1	X	Ferrous Iron
PAI-12-8.5-9.0	12/12	0955	Soil	3		
PAI-12-13.5-14.0	12/12	1015	Soil	3		Long cores (bottom cap is black)
PAI-12-19.5-20.0	12/12	1040	Soil	1		
PAI-2-17.5-18.0	12/12	1150	Soil	3		
PAI-2-19.0-19.5	12/12	1200	Soil	3		
PAI-12GW	12/12	1230	Water	13+1		Ferrous Iron
PAI-2GW	12/12	1400	Water	13+1		Ferrous Iron
PAI-3-33.5-34.0	12/12	1430	Soil	3		
TRIP BLANK			Water	3		

Comments/Special Instructions	Relinquished by: (Signature)	Received by: (Signature)	Relinquished by: (Signature)	Received by: (Signature)
	Printed Name: Hannah McDonough	Printed Name: C. OREIRO	Printed Name:	Printed Name:
	Company: GeoEngineers	Company: ARI	Company:	Company:
	Date & Time: 12/12/14 @ 1645	Date & Time: 12/12/14 1645	Date & Time:	Date & Time:

ZP35 : 9005 91

Subject: RE: Gas Works COCs
From: "Dan M. Baker" <dbaker@geoengineers.com>
Date: 12/13/2014 12:54 PM
To: "Zanna A. Satterwhite" <zsatterwhite@geoengineers.com>, Cheronne Oreiro <cheronneo@arilabs.com>
CC: Sample Login <sample-receiving@arilabs.com>

Cheronne and sample log-in folks,

Attached are the revised chain of custody forms.

Dan M. Baker
Hydrogeologist/Principal | GeoEngineers, Inc.
Phone: 206.239.3232
Fax: 206.728.2732
Mobile: 206.930.9180
Email: dbaker@geoengineers.com

From: Zanna A. Satterwhite
Sent: Saturday, December 13, 2014 11:58 AM
To: Cheronne Oreiro
Cc: Sample Login; Dan M. Baker
Subject: RE: Gas Works COCs

Cheronne,
We haven't forgotten the COCs for Gas Works. Dan is working on them.
Thank you
Zanna

From: Zanna A. Satterwhite
Sent: Friday, December 12, 2014 6:07 PM
To: 'Cheronne Oreiro'
Cc: Sample Login; Dan M. Baker
Subject: RE: Gas Works COCs

Okay, thanks. I'm ccing Dan.

From: Cheronne Oreiro [mailto:cheronneo@arilabs.com]
Sent: Friday, December 12, 2014 6:06 PM
To: Zanna A. Satterwhite
Cc: Sample Login
Subject: Gas Works COCs

Hi Zanna,

Please cc: sample-receiving@arilabs.com when you email the Gas Works COCs.
Thanks!

ZAS revisions 12-12-14

Chain of Custody Record & Laboratory Analysis Request

Analytical Resources, Incorporated
Analytical Chemists and Consultants
4611 South 134th Place, Suite 100
Tukwila, WA 98168
206-695-6200 206-695-6201 (fax)
www.arilabs.com

ARI Assigned Number: ZP03 7083	Turn-around Requested: Standard
ARI Client Company: GeoEngineers	Phone: 206-239-3231
Client Contact: Zanna Satterwhite	
Client Project Name: Gas Works Park - Play Area Investigation	
Client Project #: 0186-846-01 Task 1520	Samplers: Robert + Claudette Hamrick
Page: 1 of 1	Date: 12/12/14
No. of Coolers:	Cooler Temps:

Analysis Requested (handwritten column headings, partly illegible): (1) As Spec. diss. EPA Modified 6800* ; (2) PAHs/[illegible] (lab filtered [illegible]) ; (3) Al – EPA 200.8 ; (4) BTEX 8260 LL ; (5) Sulfate, Sulfide, Alk, [illegible] TDS [illegible]* ; (6) [illegible] ASTM [illegible] ; (7) [illegible] SW6010-S2D ; (8) [illegible] Total (As, Pb)* ; (9) HOLD

Notes/Comments: XRF >1000 ppm As

Sample ID	Date	Time	Matrix	No. Containers	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9) HOLD	Notes/Comments
PAI-11GW	12/12	1000	Water	13+B	X	X	X	X	X					Ferrous Iron
PAI-12-8.5-9.0	12/12	0955	Soil	3						X	X	X		↑
PAI-12-13.5-14.0	12/12	1015	Soil	3						X	X	X		to be carried X
PAI-12-19.5-20.0	12/12	1040	Soil	1									X	(bottom capo block)
PAI-2-17.5-18.0	12/12	1150	Soil	3						X	X	X		↓ X
PAI-2-19.0-19.5	12/12	1200	Soil	3						X	X	X		X
PAI-12GW	12/12	1230	Water	13+1	X	X	X	X	X					Ferrous Iron
PAI-2GW	12/12	1400	Water	13+1	X	X	X	X	X					Ferrous Iron
PAI-3-33.5-34.0	12/12	1430	Soil	3						X	X	X		
Trip Blank			Water	3				X						

Comments/Special Instructions:
*As specified in quote dated 12-10-14.
Please analyze unfiltered volume for sulfate, alk., TDS, if available.

Relinquished by:	Received by:	Relinquished by:	Received by:
(Signature)	(Signature)	(Signature)	(Signature)
Printed Name:	Printed Name:	Printed Name:	Printed Name:
Company:	Company:	Company:	Company:
Date & Time:	Date & Time:	Date & Time:	Date & Time:

Limits of Liability: ARI will perform all requested services in accordance with [illegible] meets standards for the industry. The total liability of ARI [illegible] said services. The acceptance by the client of a proposal for services [illegible] signed agreement between ARI and the Client.

Sample Retention Policy: All samples submitted to ARI will be [illegible] discarded [illegible] 90 days [illegible] schedules have been established by work order or contract.

Analytical Resources, Incorporated
Analytical Chemists and Consultants

Cooler Receipt Form

ARI Client: GeoEngineers
Project Name: GasWorks Park-PAI
COC No(s): _____ (NA)
Delivered by: Fed-Ex UPS Courier (Hand Delivered) Other: _____
Assigned ARI Job No: 7083
Tracking No: _____ (NA)

Preliminary Examination Phase:

Were intact, properly signed and dated custody seals attached to the outside of to cooler?	YES	(NO)
Were custody papers included with the cooler?	(YES)	NO
Were custody papers properly filled out (ink, signed, etc.)	(YES)	NO

Temperature of Cooler(s) (°C) (recommended 2.0-6.0 °C for chemistry): 10.2 9.1 11.3 ___
Time: 1045
If cooler temperature is out of compliance fill out form 00070F
Temp Gun ID#: 90287952

Cooler Accepted by: CO (N) Date: 12/12/14 Time: 1645

Complete custody forms and attach all shipping documents

Log-In Phase:

Was a temperature blank included in the cooler?		YES	(NO)
What kind of packing material was used? ... Bubble Wrap (Wet Ice) (Gel Packs) Baggies Foam Block Paper Other: BOX			
Was sufficient ice used (if appropriate)?	NA	YES	(NO)
Were all bottles sealed in individual plastic bags?		YES	(NO)
Did all bottles arrive in good condition (unbroken)?		(YES)	NO
Were all bottle labels complete and legible?		(YES)	NO
Did the number of containers listed on COC match with the number of containers received?		YES	(NO)
Did all bottle labels and tags agree with custody papers?		(YES)	NO
Were all bottles used correct for the requested analyses?		(YES)	NO
Do any of the analyses (bottles) require preservation? (attach preservation sheet, excluding VOCs)...	NA	(YES)	NO
Were all VOC vials free of air bubbles?	NA	(YES)	NO
Was sufficient amount of sample sent in each bottle?		(YES)	NO
Date VOC Trip Blank was made at ARI	NA	12/1/14	

Was Sample Split by ARI : (NA) YES Date/Time: _____ Equipment: _____ Split by: _____

Samples Logged by: AV Date: 12/15/14 Time: 1625

***** Notify Project Manager of discrepancies or concerns *****

Sample ID on Bottle	Sample ID on COC	Sample ID on Bottle	Sample ID on COC

Additional Notes, Discrepancies, & Resolutions:

PAI-12GW has 13 bottles PAI-11GW has 14 bottles FF Sulfides placed on hold for No unfiltered Conv volume on ~~GW~~ PAI-11GW except Sulfide
No unfiltered Conv volume for PAI-12GW 11GW+2GW

By: Date:

Small Air Bubbles ~2mm	Peabubbles 2-4 mm	LARGE Air Bubbles > 4 mm
• • •	• • • •	● ● ●

Small → "sm" (< 2 mm)	
Peabubbles → "pb" (2 to < 4 mm)	
Large → "lg" (4 to < 6 mm)	
Headspace → "hs" (> 6 mm)	

No unfiltered Conv volume for PAI-2GW except for Sulfide

Case Narrative, Data Qualifiers, Control Limits

ARI Job ID: ZP35

ANALYTICAL
RESOURCES
INCORPORATED

Case Narrative

Client: GeoEngineers, Inc.
Project: Gas Works Park-Play Area Investigation, 0186-846-01 Task 1520
ARI Job No.: ZP35

Sample Receipt

Five soil samples were removed from archive on December 16, 2014 and logged under ARI job ZP35. The samples were analyzed for BTEX, SIM PAHs, and arsenic, as requested. For details regarding sample receipt, please refer to the Cooler Receipt Form.

Volume for sample **PAI-2-18.0-18.5** was received in a core sleeve. BTEX volume was removed from the core first. Remaining volume was split between the extraction laboratory and the metals laboratory.

BETX by SW8260C

The samples were analyzed within the method recommended holding times.

Initial and continuing calibrations were within method requirements. Internal standard areas were within limits.

The surrogate percent recoveries were within control limits.

The method blank was clean at the reporting limit. The LCS and LCSD percent recoveries were within control limits.

PAHs by SW8270-SIM

The samples were extracted and analyzed within method recommended holding times.

Initial and continuing calibrations were within method requirements. Internal standard areas were within limits.

The surrogate percent recoveries were within control limits.

The method blank was clean at the reporting limit. The LCS percent recoveries were within control limits.

The matrix spike/matrix spike duplicate percent recoveries of Naphthalene were outside the control limits for sample **PAI-10-29.5-30.0**. The matrix spike duplicate percent recoveries of Fluroene and Phenanthrene were also outside the control limits. No corrective action is required for matrix QC.

Arsenic by SW6010C

The samples and associated laboratory QC were digested and analyzed within recommended holding times.

The method blank was clean at the reporting limit. The LCS percent recovery was within control limits.

The matrix spike percent recovery and the replicate RPD were within control limits.

Sample ID Cross Reference Report

ANALYTICAL RESOURCES INCORPORATED

ARI Job No: ZP35
Client: Geoengineers
Project Event: 0186-846-01 Task 1570
Project Name: Gas Works Park-Play Area Investigat

	Sample ID	ARI Lab ID	ARI LIMS ID	Matrix	Sample Date/Time	VTSR
1.	PAI-2-12.5-13.0	ZP35A	14-27575	Soil	12/09/14 14:00	12/12/14 16:45
2.	PAI-2-18.0-18.5	ZP35B	14-27576	Soil	12/09/14 14:40	12/12/14 16:45
3.	PAI-9-9.5-10.0	ZP35C	14-27577	Soil	12/11/14 09:10	12/12/14 16:45
4.	PAI-10-29.5-30.0	ZP35D	14-27578	Soil	12/11/14 12:20	12/12/14 16:45
5.	PAI-12-19.5-20.0	ZP35E	14-27579	Soil	12/12/14 10:40	12/12/14 16:45

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Analytical Chemists and Consultants

Data Reporting Qualifiers

Effective 12/31/13

Inorganic Data

U — Indicates that the target analyte was not detected at the reported concentration

* — Duplicate RPD is not within established control limits

B — Reported value is less than the CRDL but ≥ the Reporting Limit

N — Matrix Spike recovery not within established control limits

NA — Not Applicable, analyte not spiked

H — The natural concentration of the spiked element is so much greater than the concentration spiked that an accurate determination of spike recovery is not possible

L — Analyte concentration is ≤5 times the Reporting Limit and the replicate control limit defaults to ±1 RL instead of the normal 20% RPD

Organic Data

U — Indicates that the target analyte was not detected at the reported concentration

* — Flagged value is not within established control limits

B — Analyte detected in an associated Method Blank at a concentration greater than one-half of ARI's Reporting Limit or 5% of the regulatory limit or 5% of the analyte concentration in the sample.

J — Estimated concentration when the value is less than ARI's established reporting limits

D — The spiked compound was not detected due to sample extract dilution

E — Estimated concentration calculated for an analyte response above the valid instrument calibration range. A dilution is required to obtain an accurate quantification of the analyte.

Q Indicates a detected analyte with an initial or continuing calibration that does not meet established acceptance criteria (<20%RSD, <20%Drift or minimum RRF).

S Indicates an analyte response that has saturated the detector. The calculated concentration is not valid; a dilution is required to obtain valid quantification of the analyte

NA The flagged analyte was not analyzed for

NR Spiked compound recovery is not reported due to chromatographic interference

NS The flagged analyte was not spiked into the sample

M Estimated value for an analyte detected and confirmed by an analyst but with low spectral match parameters. This flag is used only for GC-MS analyses

N The analysis indicates the presence of an analyte for which there is presumptive evidence to make a "tentative identification"

Y The analyte is not detected at or above the reported concentration. The reporting limit is raised due to chromatographic interference. The Y flag is equivalent to the U flag with a raised reporting limit.

EMPC Estimated Maximum Possible Concentration (EMPC) defined in EPA Statement of Work DLM02.2 as a value "calculated for 2,3,7,8-substituted isomers for which the quantitation and /or confirmation ion(s) has signal to noise in excess of 2.5, but does not meet identification criteria" **(Dioxin/Furan analysis only)**

C The analyte was positively identified on only one of two chromatographic columns. Chromatographic interference prevented a positive identification on the second column

P The analyte was detected on both chromatographic columns but the quantified values differ by ≥40% RPD with no obvious chromatographic interference

X Analyte signal includes interference from polychlorinated diphenyl ethers. **(Dioxin/Furan analysis only)**

Z Analyte signal includes interference from the sample matrix or perfluorokerosene ions. **(Dioxin/Furan analysis only)**

Geotechnical Data

A	The total of all fines fractions. This flag is used to report total fines when only sieve analysis is requested and balances total grain size with sample weight.
F	Samples were frozen prior to particle size determination
SM	Sample matrix was not appropriate for the requested analysis. This normally refers to samples contaminated with an organic product that interferes with the sieving process and/or moisture content, porosity and saturation calculations
SS	Sample did not contain the proportion of "fines" required to perform the pipette portion of the grain size analysis
W	Weight of sample in some pipette aliquots was below the level required for accurate weighting

Analytical Method Information

Analyte	MDL	Reporting Limit	Surrogate %R	Duplicate RPD	Matrix Spike %R	Matrix Spike RPD	Blank Spike / LCS %R	Blank Spike / LCS RPD
8260C VOA Solid in Solid (EPA 8260C)								
Preservation: NaHSO4, MeOH, Cool <6°C								
Container: VOA Vial, Clear, 40 mL, Na2S2O3		**Amount Required:** 15 g				**Hold Time:** 14 days		
Dichlorodifluoromethane	0.207	1.00 ug/kg		30	67 - 142	30	67 - 142	30
Chloromethane	0.263	1.00 ug/kg		30	65 - 129	30	65 - 129	30
Vinyl Chloride	0.235	1.00 ug/kg		30	74 - 134	30	74 - 134	30
Bromomethane	0.187	1.00 ug/kg		30	40 - 172	30	40 - 172	30
Chloroethane	0.462	1.00 ug/kg		30	53 - 154	30	53 - 154	30
Trichlorofluoromethane	0.266	1.00 ug/kg		30	57 - 161	30	57 - 161	30
Acrolein	3.81	50.0 ug/kg		30	60 - 130	30	60 - 130	30
Acetone	0.482	5.00 ug/kg		30	48 - 132	30	48 - 132	30
1,1,2-Trichloro-1,2,2-Trifluoroethane	0.287	2.00 ug/kg		30	72 - 142	30	72 - 142	30
1,1-Dichloroethene	0.336	1.00 ug/kg		30	73 - 138	30	73 - 138	30
Bromoethane	0.440	2.00 ug/kg		30	74 - 132	30	74 - 132	30
Iodomethane	0.215	1.00 ug/kg		30	34 - 181	30	34 - 181	30
Methylene Chloride	0.635	2.00 ug/kg		30	61 - 128	30	61 - 128	30
Carbon Disulfide	0.559	1.00 ug/kg		30	72 - 146	30	72 - 146	30
Acrylonitrile	1.03	5.00 ug/kg		30	59 - 124	30	59 - 124	30
Methyl tert-butyl Ether	0.231	1.00 ug/kg		30	68 - 124	30	68 - 124	30
trans-1,2-Dichloroethene	0.266	1.00 ug/kg		30	73 - 131	30	73 - 131	30
Vinyl Acetate	0.381	5.00 ug/kg		30	54 - 138	30	54 - 138	30
1,1-Dichloroethane	0.203	1.00 ug/kg		30	65 - 139	30	65 - 139	30
2-Butanone	0.513	5.00 ug/kg		30	64 - 120	30	64 - 120	30
2,2-Dichloropropane	0.292	1.00 ug/kg		30	77 - 137	30	77 - 137	30
cis-1,2-Dichloroethene	0.240	1.00 ug/kg		30	75 - 124	30	75 - 124	30
Chloroform	0.234	1.00 ug/kg		30	75 - 126	30	75 - 126	30
Bromochloromethane	0.323	1.00 ug/kg		30	69 - 133	30	69 - 133	30
1,1,1-Trichloroethane	0.226	1.00 ug/kg		30	78 - 133	30	78 - 133	30
1,1-Dichloropropene	0.312	1.00 ug/kg		30	80 - 123	30	80 - 123	30
Carbon tetrachloride	0.213	1.00 ug/kg		30	76 - 136	30	76 - 136	30
1,2-Dichloroethane	0.191	1.00 ug/kg		30	77 - 120	30	77 - 120	30
Benzene	0.296	1.00 ug/kg		30	80 - 120	30	80 - 120	30
Trichloroethene	0.212	1.00 ug/kg		30	80 - 120	30	80 - 120	30
1,2-Dichloropropane	0.162	1.00 ug/kg		30	74 - 120	30	74 - 120	30
Bromodichloromethane	0.254	1.00 ug/kg		30	80 - 122	30	80 - 122	30
Dibromomethane	0.147	1.00 ug/kg		30	80 - 120	30	80 - 120	30
2-Chloroethyl vinyl ether	0.276	5.00 ug/kg		30	20 - 157	30	20 - 157	30
4-Methyl-2-Pentanone	0.420	5.00 ug/kg		30	70 - 124	30	70 - 124	30
cis-1,3-Dichloropropene	0.226	1.00 ug/kg		30	80 - 124	30	80 - 124	30
Toluene	0.151	1.00 ug/kg		30	78 - 120	30	78 - 120	30
trans-1,3-Dichloropropene	0.216	1.00 ug/kg		30	80 - 126	30	80 - 126	30
1,1,2-Trichloroethane	0.286	1.00 ug/kg		30	77 - 120	30	77 - 120	30
1,2-Dibromoethane	0.176	1.00 ug/kg		30	79 - 120	30	79 - 120	30
2-Hexanone	0.439	5.00 ug/kg		30	62 - 128	30	62 - 128	30
1,3-Dichloropropane	0.209	1.00 ug/kg		30	77 - 120	30	77 - 120	30
Tetrachloroethene	0.257	1.00 ug/kg		30	76 - 131	30	76 - 131	30
Dibromochloromethane	0.266	1.00 ug/kg		30	77 - 123	30	77 - 123	30
Chlorobenzene	0.219	1.00 ug/kg		30	80 - 120	30	80 - 120	30
1,1,1,2-Tetrachloroethane	0.233	1.00 ug/kg		30	80 - 120	30	80 - 120	30

Analytical Method Information

Analyte	MDL	Reporting Limit	Surrogate %R	Duplicate RPD	Matrix Spike %R	Matrix Spike RPD	Blank Spike / LCS %R	Blank Spike / LCS RPD
Ethylbenzene	0.202	1.00 ug/kg		30	80 - 120	30	80 - 120	30
m,p-Xylene	0.392	1.00 ug/kg		30	80 - 123	30	80 - 123	30
o-Xylene	0.224	1.00 ug/kg		30	80 - 120	30	80 - 120	30
Styrene	0.138	1.00 ug/kg		30	80 - 122	30	80 - 122	30
Bromoform	0.297	1.00 ug/kg		30	63 - 120	30	63 - 120	30
Isopropyl Benzene	0.233	1.00 ug/kg		30	77 - 127	30	77 - 127	30
1,1,2,2-Tetrachloroethane	0.253	1.00 ug/kg		30	71 - 120	30	71 - 120	30
1,2,3-Trichloropropane	0.517	2.00 ug/kg		30	75 - 120	30	75 - 120	30
trans-1,4-Dichloro 2-Butene	0.437	5.00 ug/kg		30	62 - 127	30	62 - 127	30
n-Propylbenzene	0.272	1.00 ug/kg		30	76 - 126	30	76 - 126	30
Bromobenzene	0.153	1.00 ug/kg		30	75 - 120	30	75 - 120	30
1,3,5-Trimethylbenzene	0.254	1.00 ug/kg		30	77 - 126	30	77 - 126	30
2-Chlorotoluene	0.300	1.00 ug/kg		30	76 - 120	30	76 - 120	30
4-Chlorotoluene	0.277	1.00 ug/kg		30	75 - 121	30	75 - 121	30
t-Butylbenzene	0.306	1.00 ug/kg		30	77 - 125	30	77 - 125	30
1,2,4-Trimethylbenzene	0.230	1.00 ug/kg		30	77 - 125	30	77 - 125	30
s-Butylbenzene	0.240	1.00 ug/kg		30	77 - 127	30	77 - 127	30
4-Isopropyl Toluene	0.236	1.00 ug/kg		30	78 - 131	30	78 - 131	30
1,3-Dichlorobenzene	0.227	1.00 ug/kg		30	76 - 120	30	76 - 120	30
1,4-Dichlorobenzene	0.232	1.00 ug/kg		30	75 - 120	30	75 - 120	30
n-Butylbenzene	0.262	1.00 ug/kg		30	75 - 134	30	75 - 134	30
1,2-Dichlorobenzene	0.293	1.00 ug/kg		30	77 - 120	30	77 - 120	30
1,2-Dibromo-3-Chloropropane	0.586	5.00 ug/kg		30	61 - 128	30	61 - 128	30
1,2,4-Trichlorobenzene	0.332	5.00 ug/kg		30	75 - 130	30	75 - 130	30
Hexachloro-1,3-Butadiene	0.410	5.00 ug/kg		30	72 - 135	30	72 - 135	30
Naphthalene	0.429	5.00 ug/kg		30	71 - 122	30	71 - 122	30
1,2,3-Trichlorobenzene	0.305	5.00 ug/kg		30	76 - 122	30	76 - 122	30
surr: 1,2-Dichloroethane-d4			80 - 149					
surr: 1,2-Dichlorobenzene-d4			80 - 120					
surr: Toluene-d8			77 - 120					
surr: 4-Bromofluorobenzene			80 - 120					
surr: Dibromofluoromethane			80 - 120					
Pentafluorobenzene								
Chlorobenzene-d5								
1,4-Difluorobenzene								
1,4-Dichlorobenzene-d4								

Analytical Resources, Inc.

1/22/2015

Analytical Method Information

Analyte	MDL	Reporting Limit	Surrogate %R	Duplicate RPD	Matrix Spike %R	Matrix Spike RPD	Blank Spike / LCS %R	Blank Spike / LCS RPD
8270D-SIM PAH (5 ug/kg) in Solid (EPA 8270D-SIM)								
Preservation: Cool <6°C								
Container: Glass WM, Clear, 8 oz		**Amount Required:** 150 g				**Hold Time:** 14 days		
Naphthalene	2.26	5.00 ug/kg		30	36 - 120	30	36 - 120	30
2-Methylnaphthalene	1.69	5.00 ug/kg		30	35 - 120	30	35 - 120	30
1-Methylnaphthalene	1.61	5.00 ug/kg		30	39 - 120	30	39 - 120	30
Biphenyl	1.44	5.00 ug/kg		30	30 - 160	30	30 - 160	30
2,6-Dimethylnaphthalene	0.750	5.00 ug/kg		30	30 - 160	30	30 - 160	30
Acenaphthylene	1.61	5.00 ug/kg		30	35 - 120	30	35 - 120	30
Acenaphthene	1.49	5.00 ug/kg		30	39 - 120	30	39 - 120	30
Dibenzofuran	1.41	5.00 ug/kg		30	38 - 120	30	38 - 120	30
2,3,5-Trimethylnaphthalene	0.419	5.00 ug/kg		30		30		30
Fluorene	1.47	5.00 ug/kg		30	41 - 120	30	41 - 120	30
Dibenzothiophene	0.425	5.00 ug/kg		30		30		30
Phenanthrene	1.58	5.00 ug/kg		30	46 - 120	30	46 - 120	30
Anthracene	1.78	5.00 ug/kg		30	36 - 120	30	36 - 120	30
Carbazole	0.189	5.00 ug/kg		30	30 - 160	30	30 - 160	30
1-Methylphenanthrene	0.700	5.00 ug/kg		30	30 - 160	30	30 - 160	30
Fluoranthene	1.87	5.00 ug/kg		30	46 - 120	30	46 - 120	30
Pyrene	2.26	5.00 ug/kg		30	49 - 120	30	49 - 120	30
Benzo(a)anthracene	2.22	5.00 ug/kg		30	42 - 120	30	42 - 120	30
Chrysene	1.92	5.00 ug/kg		30	48 - 120	30	48 - 120	30
Benzo(b)fluoranthene	2.11	5.00 ug/kg		30	35 - 127	30	35 - 127	30
Benzo(k)fluoranthene	2.28	5.00 ug/kg		30	37 - 129	30	37 - 129	30
Benzo(j)fluoranthene	1.75	5.00 ug/kg		30	40 - 120	30	40 - 120	30
Benzo(e)pyrene	0.647	5.00 ug/kg		30	30 - 160	30	30 - 160	30
Benzo(a)pyrene	2.38	5.00 ug/kg		30	36 - 120	30	36 - 120	30
Perylene	3.56	5.00 ug/kg		30	44 - 120	30	44 - 120	30
Indeno(1,2,3-cd)pyrene	3.01	5.00 ug/kg		30	40 - 120	30	40 - 120	30
Dibenzo(a,h)anthracene	2.56	5.00 ug/kg		30	38 - 120	30	38 - 120	30
Benzo(g,h,i)perylene	2.79	5.00 ug/kg		30	38 - 120	30	38 - 120	30
surr: 2-Methylnaphthalene-d10			32 - 120					
surr: Dibenzo[a,h]anthracene-d14			21 - 133					
surr: Fluoranthene-d10			36 - 134					
Naphthalene-d8								
Acenaphthene-d10								
Phenanthrene-d10								
Chrysene-d12								
Perylene-d12								

Analytical Method Information

Analyte	MDL	Reporting Limit	Surrogate %R	Duplicate RPD	Matrix Spike %R	Matrix Spike RPD	Blank Spike / LCS %R	Blank Spike / LCS RPD
Met 6010C in Solid (EPA 6010C)								
Preservation: Cool <6°C								
Container: Glass WM, Clear, 4 oz		**Amount Required:** 100 g				**Hold Time:** 180 days		
Aluminum	0.757	5.00 mg/kg		20	75 - 125	20	80 - 120	20
Antimony	0.628	5.00 mg/kg		20	75 - 125	20	80 - 120	20
Arsenic	0.333	5.00 mg/kg		20	75 - 125	20	80 - 120	20
Barium	0.133	0.300 mg/kg		20	75 - 125	20	80 - 120	20
Beryllium	0.0160	0.100 mg/kg		20	75 - 125	20	80 - 120	20
Boron	0.739	2.00 mg/kg		20	75 - 125	20	80 - 120	20
Cadmium	0.0180	0.200 mg/kg		20	75 - 125	20	80 - 120	20
Calcium	1.13	5.00 mg/kg		20	75 - 125	20	80 - 120	20
Chromium	0.124	0.500 mg/kg		20	75 - 125	20	80 - 120	20
Cobalt	0.0270	0.300 mg/kg		20	75 - 125	20	80 - 120	20
Copper	0.0920	0.200 mg/kg		20	75 - 125	20	80 - 120	20
Iron	0.750	5.00 mg/kg		20	75 - 125	20	80 - 120	20
Lead	0.155	2.00 mg/kg		20	75 - 125	20	80 - 120	20
Magnesium	0.961	5.00 mg/kg		20	75 - 125	20	80 - 120	20
Manganese	0.0280	0.100 mg/kg		20	75 - 125	20	80 - 120	20
Molybdenum	0.0790	0.500 mg/kg		20	75 - 125	20	80 - 120	20
Nickel	0.386	1.00 mg/kg		20	75 - 125	20	80 - 120	20
Potassium	6.57	50.0 mg/kg		20	75 - 125	20	80 - 120	20
Selenium	0.499	5.00 mg/kg		20	75 - 125	20	80 - 120	20
Silver	0.0430	0.300 mg/kg		20	75 - 125	20	80 - 120	20
Sodium	1.14	50.0 mg/kg		20	75 - 125	20	80 - 120	20
Sodium-1	114	5000 mg/kg		20	75 - 125	20	80 - 120	20
Strontium	0.00900	0.100 mg/kg		20	75 - 125	20	80 - 120	20
Thallium	0.310	5.00 mg/kg		20	75 - 125	20	80 - 120	20
Tin	0.141	1.00 mg/kg		20	75 - 125	20	80 - 120	20
Titanium	0.211	0.500 mg/kg		20	75 - 125	20	80 - 120	20
Vanadium	0.0270	0.300 mg/kg		20	75 - 125	20	80 - 120	20
Zinc	0.145	1.00 mg/kg		20	75 - 125	20	80 - 120	20

Volatile Analysis
Report and Summary QC Forms

ARI Job ID: ZP35

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS-Method SW8260C **Sample ID: PAI-2-18.0-18.5**
Page 1 of 1 **SAMPLE**

Lab Sample ID: ZP35B
LIMS ID: 14-27576
Matrix: Soil
Data Release Authorized: MW
Reported: 01/05/15

QC Report No: ZP35-Geoengineers
Project: Gas Works Park-Play Area Investigat
0186-846-01 Task 1570
Date Sampled: 12/09/14
Date Received: 12/12/14

Instrument/Analyst: NT5/PAB
Date Analyzed: 12/19/14 19:09

Sample Amount: 30.6 mg-dry-wt
Purge Volume: 5.0 mL
Moisture: 30.8%

CAS Number	Analyte	DL	LOQ	Result
71-43-2	**Benzene**	48	160	11,000
108-88-3	**Toluene**	25	160	7,100
100-41-4	**Ethylbenzene**	33	160	14,000
179601-23-1	**m,p-Xylene**	64	160	11,000
95-47-6	**o-Xylene**	37	160	6,400

Reported in µg/kg (ppb)

Volatile Surrogate Recovery

d4-1,2-Dichloroethane	93.0%
d8-Toluene	104%
Bromofluorobenzene	99.8%
d4-1,2-Dichlorobenzene	100%

Results corrected for soil moisture content per Section 11.10.5 of EPA Method 8000C.

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS-Method SW8260C **Sample ID: PAI-10-29.5-30.0**
Page 1 of 1 **SAMPLE**

Lab Sample ID: ZP35D
LIMS ID: 14-27578
Matrix: Soil
Data Release Authorized:
Reported: 01/05/15

QC Report No: ZP35-Geoengineers
Project: Gas Works Park-Play Area Investigat
0186-846-01 Task 1570
Date Sampled: 12/11/14
Date Received: 12/12/14

Instrument/Analyst: NT5/PAB
Date Analyzed: 12/19/14 19:34

Sample Amount: 81.1 mg-dry-wt
Purge Volume: 5.0 mL
Moisture: 7.8%

CAS Number	Analyte	DL	LOQ	Result
71-43-2	**Benzene**	18	62	670
108-88-3	**Toluene**	9.3	62	180
100-41-4	**Ethylbenzene**	12	62	260
179601-23-1	**m,p-Xylene**	24	62	380
95-47-6	**o-Xylene**	14	62	120

Reported in µg/kg (ppb)

Volatile Surrogate Recovery

d4-1,2-Dichloroethane	89.6%
d8-Toluene	105%
Bromofluorobenzene	98.8%
d4-1,2-Dichlorobenzene	97.9%

Results corrected for soil moisture content per Section 11.10.5 of EPA Method 8000C.

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS-Method SW8260C **Sample ID: PAI-12-19.5-20.0**
Page 1 of 1 **SAMPLE**

Lab Sample ID: ZP35E
LIMS ID: 14-27579
Matrix: Soil
Data Release Authorized:
Reported: 01/05/15

QC Report No: ZP35-Geoengineers
Project: Gas Works Park-Play Area Investigat
0186-846-01 Task 1570
Date Sampled: 12/12/14
Date Received: 12/12/14

Instrument/Analyst: NT5/PAB
Date Analyzed: 12/19/14 19:59

Sample Amount: 2.81 mg-dry-wt
Purge Volume: 5.0 mL
Moisture: 28.4%

CAS Number	Analyte	DL	LOQ	Result
71-43-2	**Benzene**	530	1800	2,000
108-88-3	**Toluene**	270	1800	1,900
100-41-4	**Ethylbenzene**	360	1800	2,700
179601-23-1	**m,p-Xylene**	700	1800	6,300
95-47-6	**o-Xylene**	400	1800	4,600

Reported in µg/kg (ppb)

Volatile Surrogate Recovery

d4-1,2-Dichloroethane	92.3%
d8-Toluene	103%
Bromofluorobenzene	98.6%
d4-1,2-Dichlorobenzene	99.6%

Results corrected for soil moisture content per Section 11.10.5 of EPA Method 8000C.

ANALYTICAL RESOURCES INCORPORATED

VOA SURROGATE RECOVERY SUMMARY

Matrix: Soil

QC Report No: ZP35-Geoengineers
Project: Gas Works Park-Play Area Investigat
0186-846-01 Task 1570

ARI ID	Client ID	Level	DCE	TOL	BFB	DCB	TOT OUT
MB-121914A	Method Blank	Med	95.3%	104%	97.2%	99.1%	0
LCS-121914A	Lab Control	Med	96.6%	107%	99.4%	99.2%	0
LCSD-121914A	Lab Control Dup	Med	99.7%	102%	101%	99.9%	0
ZP35B	PAI-2-18.0-18.5	Med	93.0%	104%	99.8%	100%	0
ZP35D	PAI-10-29.5-30.0	Med	89.6%	105%	98.8%	97.9%	0
ZP35E	PAI-12-19.5-20.0	Med	92.3%	103%	98.6%	99.6%	0

	LCS/MB LIMITS		QC LIMITS	
SW8260C	Low	Med	Low	Med
(DCE) = d4-1,2-Dichloroethane	80-149	80-124	80-149	80-124
(TOL) = d8-Toluene	77-120	80-120	77-120	80-120
(BFB) = Bromofluorobenzene	80-120	80-120	80-120	80-120
(DCB) = d4-1,2-Dichlorobenzene	80-120	80-120	80-120	80-120

Log Number Range: 14-27576 to 14-27579

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS-Method SW8260C **Sample ID: LCS-121914A**
Page 1 of 1 **LAB CONTROL SAMPLE**

Lab Sample ID: LCS-121914A
LIMS ID: 14-27576
Matrix: Soil
Data Release Authorized:
Reported: 01/05/15

QC Report No: ZP35-Geoengineers
Project: Gas Works Park-Play Area Investigat
0186-846-01 Task 1570
Date Sampled: NA
Date Received: NA

Instrument/Analyst LCS: NT5/PAB
LCSD: NT5/PAB
Date Analyzed LCS: 12/19/14 10:05
LCSD: 12/19/14 10:30

Sample Amount LCS: 100 mg-dry-wt
LCSD: 100 mg-dry-wt
Purge Volume LCS: 5.0 mL
LCSD: 5.0 mL
Moisture: NA

Analyte	LCS	Spike Added-LCS	LCS Recovery	LCSD	Spike Added-LCSD	LCSD Recovery	RPD
Benzene	2460	2500	98.4%	2390	2500	95.6%	2.9%
Toluene	2770	2500	111%	2590	2500	104%	6.7%
Ethylbenzene	2550	2500	102%	2500	2500	100%	2.0%
m,p-Xylene	5100	5000	102%	4950	5000	99.0%	3.0%
o-Xylene	2540	2500	102%	2460	2500	98.4%	3.2%

Reported in µg/kg (ppb)

RPD calculated using sample concentrations per SW846.

Volatile Surrogate Recovery

	LCS	LCSD
d4-1,2-Dichloroethane	96.6%	99.7%
d8-Toluene	107%	102%
Bromofluorobenzene	99.4%	101%
d4-1,2-Dichlorobenzene	99.2%	99.9%

4A
VOLATILE METHOD BLANK SUMMARY

Method Blank ID.

MB1219

Lab Name: ANALYTICAL RESOURCES INC

Client: GEOENGINEERS

ARI Job No: ZP35

Project: GAS WORKS PARK-PLAY ARE

Lab File ID: MB1219

Lab Sample ID: MB1219

Date Analyzed: 12/19/14

Time Analyzed: 1054

Instrument ID: NT5

Heated Purge: (Y/N) Y

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS and MSD:

	EPA SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	TIME ANALYZED
01	LCS1219	LCS1219	LCS1219	1005
02	LCS1219	LCS1219	LCS1219A	1030
03	PAI-2-18.0-1	ZP35B	ZP35B	1909
04	PAI-10-29.5-	ZP35D	ZP35D	1934
05	PAI-12-19.5-	ZP35E	ZP35E	1959
06				
07				
08				
09				
10				
11				
12				
13				
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15				
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28				
29				
30				

COMMENTS:

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS-Method SW8260C **Sample ID: MB-121914A**
 METHOD BLANK

Lab Sample ID: MB-121914A
LIMS ID: 14-27576
Matrix: Soil
Data Release Authorized:
Reported: 01/05/15

QC Report No: ZP35-Geoengineers
Project: Gas Works Park-Play Area Investigat
0186-846-01 Task 1570
Date Sampled: NA
Date Received: NA

Instrument/Analyst: NT5/PAB
Date Analyzed: 12/19/14 10:54

Sample Amount: 100 mg-dry-wt
Purge Volume: 5.0 mL
Moisture: NA

CAS Number	Analyte	DL	LOQ	Result
71-43-2	Benzene	15	50	< 50 U
108-88-3	Toluene	7.6	50	< 50 U
100-41-4	Ethylbenzene	10	50	< 50 U
179601-23-1	m,p-Xylene	20	50	< 50 U
95-47-6	o-Xylene	11	50	< 50 U

Reported in µg/kg (ppb)

Volatile Surrogate Recovery

d4-1,2-Dichloroethane	95.3%
d8-Toluene	104%
Bromofluorobenzene	97.2%
d4-1,2-Dichlorobenzene	99.1%

5A
VOLATILE ORGANIC INSTRUMENT PERFORMANCE CHECK
BROMOFLUOROBENZENE (BFB)

Lab Name: ANALYTICAL RESOURCES INC Contract: GEOENGINEERS

Lab Code: ARI Case No.: GAS WORKS PARK-PLAY AREA SDG No.: ZP35

Lab File ID: BFB1120X BFB Injection Date: 11/20/14

Instrument ID: NT5 BFB Injection Time: 1217

GC Column: RTXVMS ID: 0.18 (mm) Heated Purge: (Y/N) N

m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
50	15.0 - 40.0% of mass 95	18.5
75	30.0 - 60.0% of mass 95	46.4
95	Base Peak, 100% relative abundance	100.0
96	5.0 - 9.0% of mass 95	6.1
173	Less than 2.0% of mass 174	0.1 (0.2)1
174	50.0 - 100.0% of mass 95	77.3
175	5.0 - 9.0% of mass 174	5.9 (7.6)1
176	95.0 - 101.0% of mass 174	76.1 (98.5)1
177	5.0 - 9.0% of mass 176	5.2 (6.8)2

1-Value is % mass 174 2-Value is % mass 176

THIS CHECK APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS, AND STANDARDS:

	EPA SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
01	1	SCL0002-CAL1	0011120	11/20/14	1321
02	2	SCL0002-CAL2	0021120	11/20/14	1346
03	5	SCL0002-CAL3	0051120	11/20/14	1410
04	10	SCL0002-CAL4	0101120	11/20/14	1435
05	50	SCL0002-CAL5	0501120	11/20/14	1500
06	100	SCL0002-CAL6	1001120	11/20/14	1525
07	150	SCL0002-CAL7	1501120	11/20/14	1550
08	200	SCL0002-CAL8	2001120	11/20/14	1614
09	ICV1120	SCL0002-SCV1	ICV1120	11/20/14	1639
10					
11					
12					
13					
14					
15					
16					
17					
18					
19					
20					
21					
22					

5A
VOLATILE ORGANIC INSTRUMENT PERFORMANCE CHECK
BROMOFLUOROBENZENE (BFB)

Lab Name: ANALYTICAL RESOURCES INC Contract: GEOENGINEERS

Lab Code: ARI Case No.: GAS WORKS PARK-PLAY AREA SDG No.: ZP35

Lab File ID: BFB1219 BFB Injection Date: 12/19/14

Instrument ID: NT5 BFB Injection Time: 0854

GC Column: RTXVMS ID: 0.18 (mm) Heated Purge: (Y/N) N

m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE	
50	15.0 - 40.0% of mass 95	18.6	
75	30.0 - 60.0% of mass 95	46.2	
95	Base Peak, 100% relative abundance	100.0	
96	5.0 - 9.0% of mass 95	6.2	
173	Less than 2.0% of mass 174	0.4	(0.5)1
174	50.0 - 100.0% of mass 95	79.2	
175	5.0 - 9.0% of mass 174	6.0	(7.6)1
176	95.0 - 101.0% of mass 174	76.1	(96.1)1
177	5.0 - 9.0% of mass 176	5.9	(7.8)2

1-Value is % mass 174 2-Value is % mass 176

THIS CHECK APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS, AND STANDARDS:

	EPA SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
01	50	CC1219	CC1219	12/19/14	0928
02	LCS1219	LCS1219	LCS1219	12/19/14	1005
03	LCS1219	LCS1219	LCS1219A	12/19/14	1030
04	MB1219	MB1219	MB1219	12/19/14	1054
05	PAI-2-18.0-18.5	ZP35B	ZP35B	12/19/14	1909
06	PAI-10-29.5-30.0	ZP35D	ZP35D	12/19/14	1934
07	PAI-12-19.5-20.0	ZP35E	ZP35E	12/19/14	1959
08					
09					
10					
11					
12					
13					
14					
15					
16					
17					
18					
19					
20					
21					
22					

FORM 6
VOLATILE INITIAL CALIBRATION DATA

Lab Name: ANALYTICAL RESOURCES INC Client: GEOENGINEERS

ARI Job No: ZP35 Project: GAS WORKS PARK-PLAY AREA

Instrument ID: NT5 Calibration Date: 11/20/14

LAB FILE ID: RF1: 0011120 RF2: 0021120 RF5: 0051120
RF10: 0101120 RF50: 0501120

COMPOUND	RF1	RF2	RF5	RF10	RF50
Chloromethane	0.949	1.008	0.921	1.124	1.051
Vinyl Chloride	0.867	0.917	0.810	1.046	1.016
Bromomethane	0.494	0.469	0.373	0.467	0.349
Chloroethane	0.578	0.777	0.578	0.685	0.600
Trichlorofluoromethane	1.172	1.211	1.065	1.204	1.146
Acrolein	0.135	0.143	0.127	0.148	0.142
112Trichloro122Trifluoroetha	0.684	0.665	0.612	0.675	0.605
Acetone	0.269	0.238	0.176	0.199	0.180
1,1-Dichloroethene	0.651	0.636	0.590	0.682	0.601
Bromoethane	0.491	0.452	0.394	0.505	0.406
Iodomethane	0.165	0.143	0.148	0.267	0.384
Methylene Chloride		0.954	0.756	0.805	0.712
Acrylonitrile	0.255	0.288	0.282	0.305	0.302
Carbon Disulfide	2.309	2.143	1.980	2.280	1.989
Trans-1,2-Dichloroethene	0.747	0.804	0.745	0.804	0.778
Vinyl Acetate	0.363	0.366	0.366	0.362	0.364
1,1-Dichloroethane	1.416	1.460	1.412	1.505	1.466
2-Butanone	0.076	0.075	0.081	0.088	0.082
2,2-Dichloropropane	1.057	1.097	1.090	1.162	1.135
Cis-1,2-Dichloroethene	0.797	0.805	0.814	0.830	0.803
Chloroform	1.279	1.258	1.206	1.284	1.231
Bromochloromethane	0.319	0.372	0.366	0.356	0.350
1,1,1-Trichloroethane	1.148	1.152	1.134	1.201	1.162
1,1-Dichloropropene	0.419	0.427	0.429	0.433	0.415
Carbon Tetrachloride	0.392	0.401	0.378	0.407	0.394
1,2-Dichloroethane	0.339	0.393	0.377	0.392	0.364
Benzene	1.171	1.263	1.207	1.275	1.157
Trichloroethene	0.307	0.314	0.306	0.330	0.298
1,2-Dichloropropane	0.350	0.309	0.329	0.334	0.318
Bromodichloromethane	0.362	0.382	0.375	0.391	0.371
Dibromomethane	0.151	0.158	0.163	0.163	0.156
2-Chloroethyl Vinyl Ether	0.163	0.184	0.189	0.184	0.186
4-Methyl-2-Pentanone	0.110	0.140	0.130	0.139	0.142
Cis 1,3-dichloropropene	0.435	0.481	0.455	0.478	0.490
Toluene	0.795	0.958	0.793	0.811	0.897
Trans 1,3-Dichloropropene	0.382	0.385	0.388	0.417	0.440
2-Hexanone	0.180	0.187	0.193	0.208	0.201

FORM 6
VOLATILE INITIAL CALIBRATION DATA

Lab Name: ANALYTICAL RESOURCES INC Client: GEOENGINEERS

ARI Job No: ZP35 Project: GAS WORKS PARK-PLAY AREA

Instrument ID: NT5 Calibration Date: 11/20/14

LAB FILE ID: RF1: 0011120 RF2: 0021120 RF5: 0051120
RF10: 0101120 RF50: 0501120

COMPOUND	RF1	RF2	RF5	RF10	RF50
1,1,2-Trichloroethane	0.210	0.271	0.240	0.279	0.269
1,3-Dichloropropane	0.373	0.391	0.369	0.425	0.397
Tetrachloroethene	0.315	0.301	0.267	0.308	0.283
Chlorodibromomethane	0.205	0.234	0.219	0.253	0.245
1,2-Dibromoethane	0.216	0.253	0.246	0.258	0.254
Chlorobenzene	0.774	0.815	0.818	0.844	0.790
Ethyl Benzene	1.466	1.465	1.389	1.522	1.396
1,1,1,2-Tetrachloroethane	0.246	0.260	0.253	0.265	0.261
m,p-xylene	0.598	0.584	0.559	0.591	0.553
o-Xylene	0.566	0.540	0.534	0.552	0.532
Styrene	0.881	0.841	0.851	0.915	0.859
Bromoform	0.267	0.263	0.248	0.272	0.280
1,1,2,2-Tetrachloroethane	0.466	0.534	0.519	0.534	0.526
1,2,3-Trichloropropane	0.164	0.176	0.173	0.190	0.170
Trans-1,4-Dichloro 2-Butene	0.133	0.142	0.128	0.150	0.152
N-Propyl Benzene	3.163	3.265	3.103	3.166	2.974
Bromobenzene	0.592	0.621	0.599	0.608	0.576
Isopropyl Benzene	2.783	2.756	2.710	2.785	2.659
2-Chloro Toluene	1.916	1.893	1.744	1.842	1.746
4-Chloro Toluene	1.932	1.999	1.885	1.885	1.832
T-Butyl Benzene	2.049	2.022	1.994	2.055	1.930
1,3,5-Trimethyl Benzene	2.325	2.267	2.224	2.315	2.195
1,2,4-Trimethylbenzene	2.245	2.277	2.261	2.292	2.179
S-Butyl Benzene	3.059	3.086	2.987	3.069	2.905
4-Isopropyl Toluene	2.404	2.503	2.435	2.480	2.384
1,3-Dichlorobenzene	1.229	1.250	1.188	1.197	1.138
1,4-Dichlorobenzene	1.372	1.342	1.237	1.214	1.158
N-Butyl Benzene	2.406	2.262	2.301	2.316	2.177
1,2-Dichlorobenzene	1.254	1.162	1.117	1.140	1.076
1,2-Dibromo 3-Chloropropane	0.086	0.075	0.086	0.090	0.096
1,2,4-Trichlorobenzene	0.958	0.809	0.751	0.760	0.718
Hexachloro 1,3-Butadiene	0.413	0.414	0.387	0.408	0.376
Naphthalene	2.262	1.943	1.927	1.946	1.839
1,2,3-Trichlorobenzene	0.793	0.726	0.716	0.701	0.667
Dichlorodifluoromethane	0.557	0.510	0.610	0.833	0.781
Methyl tert butyl ether	1.960	1.988	2.006	2.102	2.122

FORM 6
VOLATILE INITIAL CALIBRATION DATA

Lab Name: ANALYTICAL RESOURCES INC Client: GEOENGINEERS

ARI Job No: ZP35 Project: GAS WORKS PARK-PLAY AREA

Instrument ID: NT5 Calibration Date: 11/20/14

LAB FILE ID: RF1: 0011120 RF2: 0021120 RF5: 0051120
RF10: 0101120 RF50: 0501120

COMPOUND	RF1	RF2	RF5	RF10	RF50
d4-1,2-Dichloroethane	0.726	0.738	0.728	0.735	0.750
d8-Toluene	1.240	1.408	1.252	1.247	1.338
4-Bromofluorobenzene	0.529	0.508	0.498	0.510	0.514
d4-1,2-Dichlorobenzene	0.954	0.952	0.940	0.933	0.951
Dibromofluoromethane	0.687	0.658	0.677	0.682	0.701

FORM 6
VOLATILE INITIAL CALIBRATION DATA

Lab Name: ANALYTICAL RESOURCES INC Client: GEOENGINEERS

ARI Job No: ZP35 Project: GAS WORKS PARK-PLAY AREA

Instrument ID: NT5 Calibration Date: 11/20/14

LAB FILE ID: RF100: 1001120 RF150: 1501120 RF200: 2001120

COMPOUND	RF100	RF150	RF200
Chloromethane	1.043	1.006	1.011
Vinyl Chloride	0.975	0.965	0.940
Bromomethane	0.307	0.306	0.298
Chloroethane	0.571	0.556	0.538
Trichlorofluoromethane	1.067	1.034	0.976
Acrolein	0.118	0.112	0.103
112Trichloro122Trifluoroetha	0.593	0.610	0.564
Acetone	0.146		
1,1-Dichloroethene	0.592	0.597	0.550
Bromoethane	0.366	0.361	0.336
Iodomethane	0.415	0.433	0.395
Methylene Chloride	0.552		
Acrylonitrile	0.303	0.282	0.278
Carbon Disulfide	1.956	2.007	1.852
Trans-1,2-Dichloroethene	0.723	0.567	0.539
Vinyl Acetate	0.379	0.365	0.360
1,1-Dichloroethane	1.469	1.419	1.405
2-Butanone	0.085	0.076	0.075
2,2-Dichloropropane	1.130	1.086	1.076
Cis-1,2-Dichloroethene	0.807	0.776	0.784
Chloroform	1.248	1.203	1.192
Bromochloromethane	0.356	0.334	0.334
1,1,1-Trichloroethane	1.188	1.138	1.123
1,1-Dichloropropene	0.429	0.406	0.433
Carbon Tetrachloride	0.398	0.381	0.398
1,2-Dichloroethane	0.377	0.354	0.372
Benzene	1.208	1.146	1.212
Trichloroethene	0.301	0.293	0.299
1,2-Dichloropropane	0.327	0.314	0.325
Bromodichloromethane	0.379	0.366	0.372
Dibromomethane	0.159	0.149	0.154
2-Chloroethyl Vinyl Ether	0.199	0.209	0.197
4-Methyl-2-Pentanone	0.133	0.137	0.140
Cis 1,3-dichloropropene	0.489	0.513	0.475
Toluene	0.817	0.868	0.839
Trans 1,3-Dichloropropene	0.429	0.449	0.456
2-Hexanone	0.213	0.206	0.209

FORM 6
VOLATILE INITIAL CALIBRATION DATA

Lab Name: ANALYTICAL RESOURCES INC Client: GEOENGINEERS

ARI Job No: ZP35 Project: GAS WORKS PARK-PLAY AREA

Instrument ID: NT5 Calibration Date: 11/20/14

LAB FILE ID: RF100: 1001120 RF150: 1501120 RF200: 2001120

COMPOUND	RF100	RF150	RF200
1,1,2-Trichloroethane	0.244	0.262	0.264
1,3-Dichloropropane	0.382	0.405	0.412
Tetrachloroethene	0.262	0.289	0.295
Chlorodibromomethane	0.244	0.256	0.262
1,2-Dibromoethane	0.238	0.255	0.261
Chlorobenzene	0.809	0.774	0.793
Ethyl Benzene	1.405	1.339	1.332
1,1,1,2-Tetrachloroethane	0.271	0.267	0.270
m,p-xylene	0.550	0.529	0.524
o-Xylene	0.546	0.530	0.537
Styrene	0.893	0.848	0.868
Bromoform	0.294	0.294	0.296
1,1,2,2-Tetrachloroethane	0.556	0.542	0.558
1,2,3-Trichloropropane	0.176	0.173	0.175
Trans-1,4-Dichloro 2-Butene	0.159	0.160	0.163
N-Propyl Benzene	2.939	2.795	2.767
Bromobenzene	0.589	0.579	0.595
Isopropyl Benzene	2.623	2.549	2.519
2-Chloro Toluene	1.758	1.727	1.735
4-Chloro Toluene	1.822	1.789	1.796
T-Butyl Benzene	1.940	1.870	1.882
1,3,5-Trimethyl Benzene	2.192	2.115	2.119
1,2,4-Trimethylbenzene	2.177	2.092	2.082
S-Butyl Benzene	2.859	2.737	2.696
4-Isopropyl Toluene	2.364	2.273	2.251
1,3-Dichlorobenzene	1.152	1.129	1.149
1,4-Dichlorobenzene	1.157	1.137	1.154
N-Butyl Benzene	2.168	2.086	2.064
1,2-Dichlorobenzene	1.086	1.067	1.095
1,2-Dibromo 3-Chloropropane	0.103	0.102	0.102
1,2,4-Trichlorobenzene	0.741	0.740	0.750
Hexachloro 1,3-Butadiene	0.384	0.384	0.392
Naphthalene	1.956	1.887	1.889
1,2,3-Trichlorobenzene	0.695	0.691	0.707
Dichlorodifluoromethane	0.760	0.743	0.719
Methyl tert butyl ether	2.137	1.776	1.540

FORM 6
VOLATILE INITIAL CALIBRATION DATA

Lab Name: ANALYTICAL RESOURCES INC Client: GEOENGINEERS

ARI Job No: ZP35 Project: GAS WORKS PARK-PLAY AREA

Instrument ID: NT5 Calibration Date: 11/20/14

LAB FILE ID: RF100: 1001120 RF150: 1501120 RF200: 2001120

COMPOUND	RF100	RF150	RF200
d4-1,2-Dichloroethane	0.746	0.711	0.700
d8-Toluene	1.248	1.311	1.195
4-Bromofluorobenzene	0.515	0.516	0.518
d4-1,2-Dichlorobenzene	0.944	0.946	0.937
Dibromofluoromethane	0.713	0.691	0.686

FORM 6
VOLATILE INITIAL CALIBRATION DATA

Lab Name: ANALYTICAL RESOURCES INC Client: GEOENGINEERS

ARI Job No: ZP35 Project: GAS WORKS PARK-PLAY AREA

Instrument ID: NT5 Calibration Date: 11/20/14

COMPOUND	CURVE TYPE	AVE RF	%RSD OR R^2
Chloromethane	AVRG	1.014	6.2
Vinyl Chloride	AVRG	0.942	8.2
Bromomethane	LINR		0.9975
Chloroethane	AVRG	0.610	13.2
Trichlorofluoromethane	AVRG	1.109	7.8
Acrolein	AVRG	0.128	12.6
112Trichloro122Trifluoroetha	AVRG	0.626	6.9
Acetone	2ORDR		0.9994
1,1-Dichloroethene	AVRG	0.612	6.8
Bromoethane	AVRG	0.414	15.1
Iodomethane	LINR		0.9962
Methylene Chloride	AVRG	0.756	19.3
Acrylonitrile	AVRG	0.287	5.8
Carbon Disulfide	AVRG	2.064	7.9
Trans-1,2-Dichloroethene	AVRG	0.714	14.5
Vinyl Acetate	AVRG	0.366	1.6
1,1-Dichloroethane	AVRG	1.444	2.5
2-Butanone	AVRG	0.080	6.4
2,2-Dichloropropane	AVRG	1.104	3.2
Cis-1,2-Dichloroethene	AVRG	0.802	2.1
Chloroform	AVRG	1.238	2.9
Bromochloromethane	AVRG	0.348	5.2
1,1,1-Trichloroethane	AVRG	1.156	2.3
1,1-Dichloropropene	AVRG	0.424	2.3
Carbon Tetrachloride	AVRG	0.394	2.5
1,2-Dichloroethane	AVRG	0.371	5.0
Benzene	AVRG	1.205	3.9
Trichloroethene	AVRG	0.306	3.8
1,2-Dichloropropane	AVRG	0.326	3.9
Bromodichloromethane	AVRG	0.375	2.4
Dibromomethane	AVRG	0.157	3.3
2-Chloroethyl Vinyl Ether	AVRG	0.189	7.2
4-Methyl-2-Pentanone	AVRG	0.134	7.8
Cis 1,3-dichloropropene	AVRG	0.477	4.9
Toluene	AVRG	0.847	6.8
Trans 1,3-Dichloropropene	AVRG	0.418	7.1
2-Hexanone	AVRG	0.200	5.8

<- Indicates value outside QC limits:
(%RSD < 20% or R^2 > 0.990)

FORM 6
VOLATILE INITIAL CALIBRATION DATA

Lab Name: ANALYTICAL RESOURCES INC Client: GEOENGINEERS

ARI Job No: ZP35 Project: GAS WORKS PARK-PLAY AREA

Instrument ID: NT5 Calibration Date: 11/20/14

COMPOUND	CURVE TYPE	AVE RF	%RSD OR R^2
1,1,2-Trichloroethane	AVRG	0.255	8.8
1,3-Dichloropropane	AVRG	0.394	4.9
Tetrachloroethene	AVRG	0.290	6.5
Chlorodibromomethane	AVRG	0.240	8.1
1,2-Dibromoethane	AVRG	0.248	5.8
Chlorobenzene	AVRG	0.802	3.0
Ethyl Benzene	AVRG	1.414	4.6
1,1,1,2-Tetrachloroethane	AVRG	0.262	3.4
m,p-xylene	AVRG	0.561	4.9
o-Xylene	AVRG	0.542	2.2
Styrene	AVRG	0.869	2.9
Bromoform	AVRG	0.277	6.2
1,1,2,2-Tetrachloroethane	AVRG	0.529	5.4
1,2,3-Trichloropropane	AVRG	0.175	4.2
Trans-1,4-Dichloro 2-Butene	AVRG	0.148	8.6
N-Propyl Benzene	AVRG	3.022	6.0
Bromobenzene	AVRG	0.595	2.5
Isopropyl Benzene	AVRG	2.673	3.9
2-Chloro Toluene	AVRG	1.795	4.3
4-Chloro Toluene	AVRG	1.868	3.9
T-Butyl Benzene	AVRG	1.968	3.7
1,3,5-Trimethyl Benzene	AVRG	2.219	3.6
1,2,4-Trimethylbenzene	AVRG	2.201	3.7
S-Butyl Benzene	AVRG	2.925	5.2
4-Isopropyl Toluene	AVRG	2.387	3.8
1,3-Dichlorobenzene	AVRG	1.179	3.8
1,4-Dichlorobenzene	AVRG	1.221	7.4
N-Butyl Benzene	AVRG	2.223	5.3
1,2-Dichlorobenzene	AVRG	1.125	5.5
1,2-Dibromo 3-Chloropropane	AVRG	0.092	10.9
1,2,4-Trichlorobenzene	AVRG	0.778	9.9
Hexachloro 1,3-Butadiene	AVRG	0.395	3.7
Naphthalene	AVRG	1.956	6.6
1,2,3-Trichlorobenzene	AVRG	0.712	5.2
Dichlorodifluoromethane	AVRG	0.689	16.8
Methyl tert butyl ether	AVRG	1.954	10.4

<- Indicates value outside QC limits:
(%RSD < 20% or R^2 > 0.990)

FORM 6
VOLATILE INITIAL CALIBRATION DATA

Lab Name: ANALYTICAL RESOURCES INC Client: GEOENGINEERS

ARI Job No: ZP35 Project: GAS WORKS PARK-PLAY AREA

Instrument ID: NT5 Calibration Date: 11/20/14

COMPOUND	CURVE TYPE	AVE RF	%RSD OR R^2
d4-1,2-Dichloroethane	AVRG	0.729	2.3
d8-Toluene	AVRG	1.280	5.3
4-Bromofluorobenzene	AVRG	0.513	1.8
d4-1,2-Dichlorobenzene	AVRG	0.945	0.8
Dibromofluoromethane	AVRG	0.687	2.4

<- Indicates value outside QC limits:
(%RSD < 20% or R^2 > 0.990)

7A
VOLATILE CONTINUING CALIBRATION CHECK

Lab Name: ANALYTICAL RESOURCES INC Client: GEOENGINEERS

ARI Job No: ZP35 Project: GAS WORKS PARK-PLAY AREA

Instrument ID: NT5 Cont. Calib. Date: 11/20/14

Init. Calib. Date: 11/20/14 Cont. Calib. Time: 1410

COMPOUND	CalAmt or ARF	CC Amt or RF	MIN RRF	CURVE TYPE	%D or Drift	
Chloromethane	1.014	1.0512	0.100	AVRG	3.7	
Vinyl Chloride	0.942	1.0155	0.010	AVRG	7.8	
Bromomethane	50.000	6.138	0.010	LINR	-87.7	<-
Chloroethane	0.610	0.6000	0.010	AVRG	-1.6	
Trichlorofluoromethane	1.109	1.1456	0.010	AVRG	3.3	
Acrolein	0.128	0.1416	0.010	AVRG	10.6	
112Trichloro122Trifluoroetha	0.626	0.6054	0.010	AVRG	-3.3	
Acetone	250.00	17.629	0.010	2ORDR	-92.9	<-
1,1-Dichloroethene	0.612	0.6008	0.010	AVRG	-1.8	
Bromoethane	0.414	0.4056	0.010	AVRG	-2.0	
Iodomethane	50.000	1.810	0.010	LINR	-96.4	<-
Methylene Chloride	0.756	0.7124	0.010	AVRG	-5.8	
Acrylonitrile	0.287	0.3016	0.010	AVRG	5.1	
Carbon Disulfide	2.064	1.9888	0.010	AVRG	-3.6	
Trans-1,2-Dichloroethene	0.713	0.7784	0.010	AVRG	9.2	
Vinyl Acetate	0.366	0.3643	0.010	AVRG	-0.5	
1,1-Dichloroethane	1.444	1.4664	0.100	AVRG	1.6	
2-Butanone	0.080	0.0820	0.010	AVRG	2.5	
2,2-Dichloropropane	1.104	1.1350	0.010	AVRG	2.8	
Cis-1,2-Dichloroethene	0.802	0.8030	0.010	AVRG	0.1	
Chloroform	1.238	1.2306	0.010	AVRG	-0.6	
Bromochloromethane	0.348	0.3501	0.010	AVRG	0.6	
1,1,1-Trichloroethane	1.156	1.1625	0.010	AVRG	0.6	
1,1-Dichloropropene	0.424	0.4152	0.010	AVRG	-2.1	
Carbon Tetrachloride	0.394	0.3937	0.010	AVRG	-0.1	
1,2-Dichloroethane	0.371	0.3644	0.010	AVRG	-1.8	
Benzene	1.205	1.1573	0.010	AVRG	-4.0	
Trichloroethene	0.306	0.2980	0.010	AVRG	-2.6	
1,2-Dichloropropane	0.326	0.3182	0.010	AVRG	-2.4	
Bromodichloromethane	0.375	0.3715	0.010	AVRG	-0.9	
Dibromomethane	0.157	0.1562	0.010	AVRG	-0.5	
2-Chloroethyl Vinyl Ether	0.189	0.1856	0.010	AVRG	-1.8	
4-Methyl-2-Pentanone	0.134	0.1418	0.010	AVRG	5.8	
Cis 1,3-dichloropropene	0.477	0.4896	0.010	AVRG	2.6	
Toluene	0.847	0.8968	0.010	AVRG	5.9	
Trans 1,3-Dichloropropene	0.418	0.4396	0.010	AVRG	5.2	
2-Hexanone	0.200	0.2008	0.010	AVRG	0.4	

<- Exceeds QC limit of 20% D
* RF less than minimum RF

7A
VOLATILE CONTINUING CALIBRATION CHECK

Lab Name: ANALYTICAL RESOURCES INC Client: GEOENGINEERS

ARI Job No: ZP35 Project: GAS WORKS PARK-PLAY AREA

Instrument ID: NT5 Cont. Calib. Date: 11/20/14

Init. Calib. Date: 11/20/14 Cont. Calib. Time: 1410

COMPOUND	CalAmt or ARF	CC Amt or RF	MIN RRF	CURVE TYPE	%D or Drift
1,1,2-Trichloroethane	0.255	0.2686	0.010	AVRG	5.3
1,3-Dichloropropane	0.394	0.3967	0.010	AVRG	0.7
Tetrachloroethene	0.290	0.2831	0.010	AVRG	-2.4
Chlorodibromomethane	0.240	0.2449	0.010	AVRG	2.0
1,2-Dibromoethane	0.248	0.2544	0.010	AVRG	2.6
Chlorobenzene	0.802	0.7901	0.300	AVRG	-1.5
Ethyl Benzene	1.414	1.3961	0.010	AVRG	-1.3
1,1,1,2-Tetrachloroethane	0.262	0.2612	0.010	AVRG	-0.3
m,p-xylene	0.561	0.5531	0.010	AVRG	-1.4
o-Xylene	0.542	0.5318	0.010	AVRG	-1.9
Styrene	0.870	0.8595	0.010	AVRG	-1.2
Bromoform	0.277	0.2803	0.100	AVRG	1.2
1,1,2,2-Tetrachloroethane	0.529	0.5260	0.300	AVRG	-0.6
1,2,3-Trichloropropane	0.175	0.1703	0.010	AVRG	-2.7
Trans-1,4-Dichloro 2-Butene	0.148	0.1522	0.010	AVRG	2.8
N-Propyl Benzene	3.022	2.9739	0.010	AVRG	-1.6
Bromobenzene	0.595	0.5758	0.010	AVRG	-3.2
Isopropyl Benzene	2.673	2.6587	0.010	AVRG	-0.5
2-Chloro Toluene	1.795	1.7460	0.010	AVRG	-2.7
4-Chloro Toluene	1.868	1.8323	0.010	AVRG	-1.9
T-Butyl Benzene	1.968	1.9304	0.010	AVRG	-1.9
1,3,5-Trimethyl Benzene	2.219	2.1952	0.010	AVRG	-1.1
1,2,4-Trimethylbenzene	2.201	2.1787	0.010	AVRG	-1.0
S-Butyl Benzene	2.925	2.9052	0.010	AVRG	-0.7
4-Isopropyl Toluene	2.387	2.3838	0.010	AVRG	-0.1
1,3-Dichlorobenzene	1.179	1.1379	0.010	AVRG	-3.5
1,4-Dichlorobenzene	1.221	1.1579	0.010	AVRG	-5.2
N-Butyl Benzene	2.222	2.1774	0.010	AVRG	-2.0
1,2-Dichlorobenzene	1.125	1.0764	0.010	AVRG	-4.3
1,2-Dibromo 3-Chloropropane	0.092	0.0965	0.010	AVRG	4.9
1,2,4-Trichlorobenzene	0.778	0.7183	0.010	AVRG	-7.7
Hexachloro 1,3-Butadiene	0.395	0.3761	0.010	AVRG	-4.8
Naphthalene	1.956	1.8389	0.010	AVRG	-6.0
1,2,3-Trichlorobenzene	0.712	0.6667	0.010	AVRG	-6.4
Dichlorodifluoromethane	0.689	0.7813	0.010	AVRG	13.4
Methyl tert butyl ether	1.954	2.1226	0.010	AVRG	8.6

<- Exceeds QC limit of 20% D
* RF less than minimum RF

FORM VII VOA

7A
VOLATILE CONTINUING CALIBRATION CHECK

Lab Name: ANALYTICAL RESOURCES INC Client: GEOENGINEERS

ARI Job No: ZP35 Project: GAS WORKS PARK-PLAY AREA

Instrument ID: NT5 Cont. Calib. Date: 11/20/14

Init. Calib. Date: 11/20/14 Cont. Calib. Time: 1410

COMPOUND	CalAmt or ARF	CC Amt or RF	MIN RRF	CURVE TYPE	%D or Drift
d4-1,2-Dichloroethane	0.729	0.7497	0.010	AVRG	2.8
d8-Toluene	1.280	1.3384	0.010	AVRG	4.6
4-Bromofluorobenzene	0.514	0.5144	0.010	AVRG	0.1
d4-1,2-Dichlorobenzene	0.945	0.9515	0.010	AVRG	0.7
Dibromofluoromethane	0.687	0.7009	0.010	AVRG	2.0

<- Exceeds QC limit of 20% D
* RF less than minimum RF

FORM VII VOA

7A
VOLATILE CONTINUING CALIBRATION CHECK

Lab Name: ANALYTICAL RESOURCES INC Client: GEOENGINEERS

ARI Job No: ZP35 Project: GAS WORKS PARK-PLAY AREA

Instrument ID: NT5 Cont. Calib. Date: 12/19/14

Init. Calib. Date: 11/20/14 Cont. Calib. Time: 0928

COMPOUND	CalAmt or ARF	CC Amt or RF	MIN RRF	CURVE TYPE	%D or Drift	
Chloromethane	1.014	0.7222	0.100	AVRG	-28.8	<-
Vinyl Chloride	0.942	0.7454	0.010	AVRG	-20.9	<-
Bromomethane	50.000	31.949	0.010	LINR	-36.1	<-
Chloroethane	0.610	0.4814	0.010	AVRG	-21.1	<-
Trichlorofluoromethane	1.109	1.0807	0.010	AVRG	-2.6	
Acrolein	0.128	0.1084	0.010	AVRG	-15.3	
112Trichloro122Trifluoroetha	0.626	0.6233	0.010	AVRG	-0.4	
Acetone	250.00	234.81	0.010	2ORDR	-6.1	
1,1-Dichloroethene	0.612	0.5675	0.010	AVRG	-7.3	
Bromoethane	0.414	0.3999	0.010	AVRG	-3.4	
Iodomethane	50.000	36.813	0.010	LINR	-26.4	<-
Methylene Chloride	0.756	0.6431	0.010	AVRG	-14.9	
Acrylonitrile	0.287	0.2406	0.010	AVRG	-16.2	
Carbon Disulfide	2.064	1.9389	0.010	AVRG	-6.1	
Trans-1,2-Dichloroethene	0.713	0.7065	0.010	AVRG	-0.9	
Vinyl Acetate	0.366	0.3364	0.010	AVRG	-8.1	
1,1-Dichloroethane	1.444	1.3832	0.100	AVRG	-4.2	
2-Butanone	0.080	0.0737	0.010	AVRG	-7.9	
2,2-Dichloropropane	1.104	1.1863	0.010	AVRG	7.4	
Cis-1,2-Dichloroethene	0.802	0.7568	0.010	AVRG	-5.6	
Chloroform	1.238	1.2474	0.010	AVRG	0.8	
Bromochloromethane	0.348	0.3486	0.010	AVRG	0.2	
1,1,1-Trichloroethane	1.156	1.2281	0.010	AVRG	6.2	
1,1-Dichloropropene	0.424	0.4561	0.010	AVRG	7.6	
Carbon Tetrachloride	0.394	0.4757	0.010	AVRG	20.7	<-
1,2-Dichloroethane	0.371	0.4192	0.010	AVRG	13.0	
Benzene	1.205	1.2426	0.010	AVRG	3.1	
Trichloroethene	0.306	0.3193	0.010	AVRG	4.3	
1,2-Dichloropropane	0.326	0.3200	0.010	AVRG	-1.8	
Bromodichloromethane	0.375	0.4167	0.010	AVRG	11.1	
Dibromomethane	0.157	0.1651	0.010	AVRG	5.2	
2-Chloroethyl Vinyl Ether	0.189	0.1472	0.010	AVRG	-22.1	<-
4-Methyl-2-Pentanone	0.134	0.1377	0.010	AVRG	2.8	
Cis 1,3-dichloropropene	0.477	0.5065	0.010	AVRG	6.2	
Toluene	0.847	0.8280	0.010	AVRG	-2.2	
Trans 1,3-Dichloropropene	0.418	0.4842	0.010	AVRG	15.8	
2-Hexanone	0.200	0.1913	0.010	AVRG	-4.4	

<- Exceeds QC limit of 20% D
* RF less than minimum RF

FORM VII VOA

7A
VOLATILE CONTINUING CALIBRATION CHECK

Lab Name: ANALYTICAL RESOURCES INC Client: GEOENGINEERS

ARI Job No: ZP35 Project: GAS WORKS PARK-PLAY AREA

Instrument ID: NT5 Cont. Calib. Date: 12/19/14

Init. Calib. Date: 11/20/14 Cont. Calib. Time: 0928

COMPOUND	CalAmt or ARF	CC Amt or RF	MIN RRF	CURVE TYPE	%D or Drift	
1,1,2-Trichloroethane	0.255	0.2801	0.010	AVRG	9.8	
1,3-Dichloropropane	0.394	0.4097	0.010	AVRG	4.0	
Tetrachloroethene	0.290	0.2997	0.010	AVRG	3.3	
Chlorodibromomethane	0.240	0.2766	0.010	AVRG	15.2	
1,2-Dibromoethane	0.248	0.2819	0.010	AVRG	13.7	
Chlorobenzene	0.802	0.8354	0.300	AVRG	4.2	
Ethyl Benzene	1.414	1.4608	0.010	AVRG	3.3	
1,1,1,2-Tetrachloroethane	0.262	0.2954	0.010	AVRG	12.7	
m,p-xylene	0.561	0.5756	0.010	AVRG	2.6	
o-Xylene	0.542	0.5576	0.010	AVRG	2.9	
Styrene	0.870	0.9084	0.010	AVRG	4.4	
Bromoform	0.277	0.3060	0.100	AVRG	10.5	
1,1,2,2-Tetrachloroethane	0.529	0.5281	0.300	AVRG	-0.2	
1,2,3-Trichloropropane	0.175	0.1796	0.010	AVRG	2.6	
Trans-1,4-Dichloro 2-Butene	0.148	0.1506	0.010	AVRG	1.8	
N-Propyl Benzene	3.022	3.0621	0.010	AVRG	1.3	
Bromobenzene	0.595	0.6177	0.010	AVRG	3.8	
Isopropyl Benzene	2.673	2.7599	0.010	AVRG	3.2	
2-Chloro Toluene	1.795	1.8351	0.010	AVRG	2.2	
4-Chloro Toluene	1.868	1.9102	0.010	AVRG	2.2	
T-Butyl Benzene	1.968	2.0498	0.010	AVRG	4.2	
1,3,5-Trimethyl Benzene	2.219	2.3068	0.010	AVRG	4.0	
1,2,4-Trimethylbenzene	2.201	2.2826	0.010	AVRG	3.7	
S-Butyl Benzene	2.925	3.0088	0.010	AVRG	2.9	
4-Isopropyl Toluene	2.387	2.4932	0.010	AVRG	4.4	
1,3-Dichlorobenzene	1.179	1.2271	0.010	AVRG	4.1	
1,4-Dichlorobenzene	1.221	1.2345	0.010	AVRG	1.1	
N-Butyl Benzene	2.222	2.2529	0.010	AVRG	1.4	
1,2-Dichlorobenzene	1.125	1.1291	0.010	AVRG	0.4	
1,2-Dibromo 3-Chloropropane	0.092	0.0963	0.010	AVRG	4.7	
1,2,4-Trichlorobenzene	0.778	0.7634	0.010	AVRG	-1.9	
Hexachloro 1,3-Butadiene	0.395	0.4025	0.010	AVRG	1.9	
Naphthalene	1.956	1.8658	0.010	AVRG	-4.6	
1,2,3-Trichlorobenzene	0.712	0.6929	0.010	AVRG	-2.7	
Dichlorodifluoromethane	0.689	0.3525	0.010	AVRG	-48.8	<-
Methyl tert butyl ether	1.954	2.0252	0.010	AVRG	3.6	

<- Exceeds QC limit of 20% D
* RF less than minimum RF

FORM VII VOA

7A
VOLATILE CONTINUING CALIBRATION CHECK

Lab Name: ANALYTICAL RESOURCES INC Client: GEOENGINEERS

ARI Job No: ZP35 Project: GAS WORKS PARK-PLAY AREA

Instrument ID: NT5 Cont. Calib. Date: 12/19/14

Init. Calib. Date: 11/20/14 Cont. Calib. Time: 0928

COMPOUND	CalAmt or ARF	CC Amt or RF	MIN RRF	CURVE TYPE	%D or Drift
d4-1,2-Dichloroethane	0.729	0.7189	0.010	AVRG	-1.4
d8-Toluene	1.280	1.2160	0.010	AVRG	-5.0
4-Bromofluorobenzene	0.514	0.5141	0.010	AVRG	0.0
d4-1,2-Dichlorobenzene	0.945	0.9645	0.010	AVRG	2.1
Dibromofluoromethane	0.687	0.6533	0.010	AVRG	-4.9

<- Exceeds QC limit of 20% D
* RF less than minimum RF

FORM VII VOA

8A
VOLATILE INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: ANALYTICAL RESOURCES INC Client: GEOENGINEERS

ARI Job No: ZP35 Project: GAS WORKS PARK-PLAY AREA

Ical Midpoint ID: 0101120 Ical Date: 11/20/14

Instrument ID: NT5 Project Run Date: 11/20/14

		IS1(PFB) AREA #	IS1(PFB) RT #	IS2(DFB) AREA #	IS2(DFB) RT #	IS3(CLB) AREA #	IS3(CLB) RT #
	ICAL MIDPT	278101	5.12	699590	5.56	830842	8.00
	UPPER LIMIT	556202	5.62	1399180	6.06	1661684	8.50
	LOWER LIMIT	139050	4.62	349795	5.06	415421	7.50
	Sample ID						
01	ICV1120	274481	5.11	695211	5.55	823689	8.00
02							
03							
04							
05							
06							
07							
08							
09							
10							
11							
12							
13							
14							
15							
16							
17							
18							
19							
20							
21							
22							

IS1 (PFB) = Pentafluorobenzene
IS2 (DFB) = 1,4-Difluorobenzene
IS3 (CLB) = d5-Chlorobenzene

AREA UPPER LIMIT = +100% of internal standard area from Ical midpoint
AREA LOWER LIMIT = - 50% of internal standard area from Ical midpoint
RT UPPER LIMIT = + 0.50 minutes of internal standard RT from Ical midpoint
RT LOWER LIMIT = - 0.50 minutes of internal standard RT from Ical midpoint

* Values outside of QC limits.

8A
VOLATILE INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: ANALYTICAL RESOURCES INC | Client: GEOENGINEERS

ARI Job No: ZP35 | Project: GAS WORKS PARK-PLAY AREA

Ical Midpoint ID: 0101120 | Ical Date: 11/20/14

Instrument ID: NT5 | Project Run Date: 11/20/14

		IS4 (DCB) AREA #	RT #	AREA #	RT #	AREA #	RT #
	ICAL MIDPT	450241	10.09				
	UPPER LIMIT	900482	10.59				
	LOWER LIMIT	225120	9.59				
	Sample ID						
01	ICV1120	439864	10.10				
02							
03							
04							
05							
06							
07							
08							
09							
10							
11							
12							
13							
14							
15							
16							
17							
18							
19							
20							
21							
22							

IS4 (DCB) = d4-1,4-Dichlorobenzene

AREA UPPER LIMIT = +100% of internal standard area from Ical midpoint
AREA LOWER LIMIT = - 50% of internal standard area from Ical midpoint
RT UPPER LIMIT = + 0.50 minutes of internal standard RT from Ical midpoint
RT LOWER LIMIT = - 0.50 minutes of internal standard RT from Ical midpoint

* Values outside of QC limits.

8A
VOLATILE INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: ANALYTICAL RESOURCES INC Client: GEOENGINEERS

ARI Job No: ZP35 Project: GAS WORKS PARK-PLAY AREA

Ical Midpoint ID: 0101120 Ical Date: 11/20/14

Instrument ID: NT5 Project Run Date: 12/19/14

		IS1(PFB) AREA #	IS1(PFB) RT #	IS2(DFB) AREA #	IS2(DFB) RT #	IS3(CLB) AREA #	IS3(CLB) RT #
	ICAL MIDPT	278101	5.12	699590	5.56	830842	8.00
	UPPER LIMIT	556202	5.62	1399180	6.06	1661684	8.50
	LOWER LIMIT	139050	4.62	349795	5.06	415421	7.50
	Sample ID						
01	LCS1219	337612	5.11	779608	5.55	966808	8.00
02	LCS1219	342947	5.11	793503	5.55	968460	8.00
03	MB1219	325612	5.12	761187	5.56	910835	8.00
04	PAI-2-18.0-1	348239	5.11	795333	5.55	975408	8.00
05	PAI-10-29.5-	357025	5.11	802587	5.55	978386	8.00
06	PAI-12-19.5-	338685	5.11	773757	5.55	927662	8.00
07							
08							
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14							
15							
16							
17							
18							
19							
20							
21							
22							

IS1 (PFB) = Pentafluorobenzene
IS2 (DFB) = 1,4-Difluorobenzene
IS3 (CLB) = d5-Chlorobenzene

AREA UPPER LIMIT = +100% of internal standard area from Ical midpoint
AREA LOWER LIMIT = - 50% of internal standard area from Ical midpoint
RT UPPER LIMIT = + 0.50 minutes of internal standard RT from Ical midpoint
RT LOWER LIMIT = - 0.50 minutes of internal standard RT from Ical midpoint

* Values outside of QC limits.

8A
VOLATILE INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: ANALYTICAL RESOURCES INC Client: GEOENGINEERS

ARI Job No: ZP35 Project: GAS WORKS PARK-PLAY AREA

Ical Midpoint ID: 0101120 Ical Date: 11/20/14

Instrument ID: NT5 Project Run Date: 12/19/14

		IS4(DCB) AREA #	RT #	AREA #	RT #	AREA #	RT #
	ICAL MIDPT	450241	10.09				
	UPPER LIMIT	900482	10.59				
	LOWER LIMIT	225120	9.59				
	Sample ID						
01	LCS1219	520111	10.09				
02	LCS1219	529836	10.09				
03	MB1219	484034	10.09				
04	PAI-2-18.0-1	533394	10.10				
05	PAI-10-29.5-	526713	10.10				
06	PAI-12-19.5-	498437	10.09				
07							
08							
09							
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13							
14							
15							
16							
17							
18							
19							
20							
21							
22							

IS4 (DCB) = d4-1,4-Dichlorobenzene

AREA UPPER LIMIT = +100% of internal standard area from Ical midpoint
AREA LOWER LIMIT = - 50% of internal standard area from Ical midpoint
RT UPPER LIMIT = + 0.50 minutes of internal standard RT from Ical midpoint
RT LOWER LIMIT = - 0.50 minutes of internal standard RT from Ical midpoint

* Values outside of QC limits.

SIM PAH Analysis
Report and Summary QC Forms

ARI Job ID: ZP35

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PNAs by SIM SW8270D-SIM GC/MS
Extraction Method: SW3546
Page 1 of 1

Sample ID: PAI-2-18.0-18.5
SAMPLE

Lab Sample ID: ZP35B
LIMS ID: 14-27576
Matrix: Soil
Data Release Authorized:
Reported: 01/21/15

QC Report No: ZP35-Geoengineers
Project: Gas Works Park-Play Area Investigat
0186-846-01 Task 1570
Date Sampled: 12/09/14
Date Received: 12/12/14

Date Extracted: 12/23/14
Date Analyzed: 01/19/15 22:43
Instrument/Analyst: NT8/JZ
GPC Cleanup: No

Sample Amount: 10.4 g-dry-wt
Final Extract Volume: 0.50 mL
Dilution Factor: 10.0
Percent Moisture: 30.8 %

CAS Number	Analyte	DL	LOQ	Result
91-20-3	Naphthalene	22	48	64,000 ES
208-96-8	Acenaphthylene	15	48	3,600
83-32-9	Acenaphthene	14	48	9,600 E
86-73-7	Fluorene	14	48	8,300 E
85-01-8	Phenanthrene	15	48	13,000 ES
120-12-7	Anthracene	17	48	5,900 E
206-44-0	Fluoranthene	18	48	8,200 E
129-00-0	Pyrene	22	48	7,000 E
56-55-3	Benzo(a)anthracene	21	48	2,100
218-01-9	Chrysene	18	48	2,200
205-99-2	Benzo(b)fluoranthene	20	48	840
207-08-9	Benzo(k)fluoranthene	22	48	530
50-32-8	Benzo(a)pyrene	23	48	850
193-39-5	Indeno(1,2,3-cd)pyrene	29	48	360
53-70-3	Dibenz(a,h)anthracene	25	48	110
191-24-2	Benzo(g,h,i)perylene	27	48	430
TOTBFA	Total Benzofluoranthenes	22	48	1,900

Reported in µg/kg (ppb)

SIM Semivolatile Surrogate Recovery

d10-Fluoranthene	40.0%
d10-2-Methylnaphthalene	56.7%
d14-Dibenzo(a,h)anthracen	D

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PNAs by SIM SW8270D-SIM GC/MS
Extraction Method: SW3546
Page 1 of 1

Sample ID: PAI-2-18.0-18.5
DILUTION

Lab Sample ID: ZP35B
LIMS ID: 14-27576
Matrix: Soil
Data Release Authorized:
Reported: 01/21/15

QC Report No: ZP35-Geoengineers
Project: Gas Works Park-Play Area Investigat
0186-846-01 Task 1570
Date Sampled: 12/09/14
Date Received: 12/12/14

Date Extracted: 12/23/14
Date Analyzed: 01/20/15 11:35
Instrument/Analyst: NT8/JZ
GPC Cleanup: No

Sample Amount: 10.4 g-dry-wt
Final Extract Volume: 0.50 mL
Dilution Factor: 1000
Percent Moisture: 30.8 %

CAS Number	Analyte	DL	LOQ	Result
91-20-3	**Naphthalene**	**2200**	**4,800**	**620,000 E**
208-96-8	**Acenaphthylene**	**1500**	**4,800**	**4,200 J**
83-32-9	**Acenaphthene**	**1400**	**4,800**	**14,000**
86-73-7	**Fluorene**	**1400**	**4,800**	**11,000**
85-01-8	**Phenanthrene**	**1500**	**4,800**	**28,000**
120-12-7	**Anthracene**	**1700**	**4,800**	**7,500**
206-44-0	**Fluoranthene**	**1800**	**4,800**	**12,000**
129-00-0	**Pyrene**	**2200**	**4,800**	**9,600**
56-55-3	**Benzo(a)anthracene**	**2100**	**4,800**	**2,400 J**
218-01-9	Chrysene	1800	4,800	< 4,800 U
205-99-2	Benzo(b)fluoranthene	2000	4,800	< 4,800 U
207-08-9	Benzo(k)fluoranthene	2200	4,800	< 4,800 U
50-32-8	Benzo(a)pyrene	2300	4,800	< 4,800 U
193-39-5	Indeno(1,2,3-cd)pyrene	2900	4,800	< 4,800 U
53-70-3	Dibenz(a,h)anthracene	2500	4,800	< 4,800 U
191-24-2	Benzo(g,h,i)perylene	2700	4,800	< 4,800 U
TOTBFA	Total Benzofluoranthenes	2200	4,800	< 4,800 U

Reported in µg/kg (ppb)

SIM Semivolatile Surrogate Recovery

d10-Fluoranthene	D
d10-2-Methylnaphthalene	D
d14-Dibenzo(a,h)anthracen	D

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PNAs by SIM SW8270D-SIM GC/MS
Extraction Method: SW3546
Page 1 of 1

Sample ID: PAI-2-18.0-18.5
DILUTION2

Lab Sample ID: ZP35B
LIMS ID: 14-27576
Matrix: Soil
Data Release Authorized:
Reported: 01/21/15

QC Report No: ZP35-Geoengineers
Project: Gas Works Park-Play Area Investigat
0186-846-01 Task 1570
Date Sampled: 12/09/14
Date Received: 12/12/14

Date Extracted: 12/23/14
Date Analyzed: 01/20/15 16:54
Instrument/Analyst: NT8/JZ
GPC Cleanup: No

Sample Amount: 10.4 g-dry-wt
Final Extract Volume: 0.50 mL
Dilution Factor: 2000
Percent Moisture: 30.8 %

CAS Number	Analyte	DL	LOQ	Result
91-20-3	**Naphthalene**	**4400**	**9,600**	**640,000**
208-96-8	Acenaphthylene	3100	9,600	< 9,600 U
83-32-9	**Acenaphthene**	**2900**	**9,600**	**14,000**
86-73-7	**Fluorene**	**2800**	**9,600**	**11,000**
85-01-8	**Phenanthrene**	**3000**	**9,600**	**29,000**
120-12-7	**Anthracene**	**3400**	**9,600**	**6,900 J**
206-44-0	**Fluoranthene**	**3600**	**9,600**	**12,000**
129-00-0	**Pyrene**	**4400**	**9,600**	**8,800 J**
56-55-3	Benzo(a)anthracene	4300	9,600	< 9,600 U
218-01-9	Chrysene	3700	9,600	< 9,600 U
205-99-2	Benzo(b)fluoranthene	4100	9,600	< 9,600 U
207-08-9	Benzo(k)fluoranthene	4400	9,600	< 9,600 U
50-32-8	Benzo(a)pyrene	4600	9,600	< 9,600 U
193-39-5	Indeno(1,2,3-cd)pyrene	5800	9,600	< 9,600 U
53-70-3	Dibenz(a,h)anthracene	4900	9,600	< 9,600 U
191-24-2	Benzo(g,h,i)perylene	5400	9,600	< 9,600 U
TOTBFA	Total Benzofluoranthenes	4400	9,600	< 9,600 U

Reported in µg/kg (ppb)

SIM Semivolatile Surrogate Recovery

d10-Fluoranthene	D
d10-2-Methylnaphthalene	D
d14-Dibenzo(a,h)anthracen	D

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PNAs by SIM SW8270D-SIM GC/MS
Extraction Method: SW3546
Page 1 of 1

Sample ID: PAI-10-29.5-30.0
SAMPLE

Lab Sample ID: ZP35D
LIMS ID: 14-27578
Matrix: Soil
Data Release Authorized:
Reported: 01/21/15

QC Report No: ZP35-Geoengineers
Project: Gas Works Park-Play Area Investigat
0186-846-01 Task 1570
Date Sampled: 12/11/14
Date Received: 12/12/14

Date Extracted: 12/23/14
Date Analyzed: 01/19/15 23:08
Instrument/Analyst: NT8/JZ
GPC Cleanup: No

Sample Amount: 10.1 g-dry-wt
Final Extract Volume: 0.50 mL
Dilution Factor: 1.00
Percent Moisture: 7.8 %

CAS Number	Analyte	DL	LOQ	Result
91-20-3	Naphthalene	2.2	4.9	3,300 ES
208-96-8	Acenaphthylene	1.6	4.9	67
83-32-9	Acenaphthene	1.5	4.9	91
86-73-7	Fluorene	1.4	4.9	89
85-01-8	Phenanthrene	1.6	4.9	330
120-12-7	Anthracene	1.8	4.9	84
206-44-0	Fluoranthene	1.8	4.9	310
129-00-0	Pyrene	2.2	4.9	300
56-55-3	Benzo(a)anthracene	2.2	4.9	120
218-01-9	Chrysene	1.9	4.9	140
205-99-2	Benzo(b)fluoranthene	2.1	4.9	110
207-08-9	Benzo(k)fluoranthene	2.2	4.9	59
50-32-8	Benzo(a)pyrene	2.3	4.9	130
193-39-5	Indeno(1,2,3-cd)pyrene	3.0	4.9	110
53-70-3	Dibenz(a,h)anthracene	2.5	4.9	22
191-24-2	Benzo(g,h,i)perylene	2.8	4.9	150
TOTBFA	Total Benzofluoranthenes	2.2	4.9	220

Reported in µg/kg (ppb)

SIM Semivolatile Surrogate Recovery

d10-Fluoranthene	62.0%
d10-2-Methylnaphthalene	42.3%
d14-Dibenzo(a,h)anthracen	66.0%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PNAs by SIM SW8270D-SIM GC/MS
Extraction Method: SW3546
Page 1 of 1

Sample ID: PAI-10-29.5-30.0
DILUTION

Lab Sample ID: ZP35D
LIMS ID: 14-27578
Matrix: Soil
Data Release Authorized:
Reported: 01/21/15

QC Report No: ZP35-Geoengineers
Project: Gas Works Park-Play Area Investigat
0186-846-01 Task 1570
Date Sampled: 12/11/14
Date Received: 12/12/14

Date Extracted: 12/23/14
Date Analyzed: 01/20/15 12:00
Instrument/Analyst: NT8/JZ
GPC Cleanup: No

Sample Amount: 10.1 g-dry-wt
Final Extract Volume: 0.50 mL
Dilution Factor: 30.0
Percent Moisture: 7.8 %

CAS Number	Analyte	DL	LOQ	Result
91-20-3	**Naphthalene**	**67**	**150**	**7,600**
208-96-8	Acenaphthylene	48	150	< 150 U
83-32-9	**Acenaphthene**	**44**	**150**	**87 J**
86-73-7	Fluorene	43	150	< 150 U
85-01-8	**Phenanthrene**	**47**	**150**	**310**
120-12-7	**Anthracene**	**53**	**150**	**83 J**
206-44-0	**Fluoranthene**	**55**	**150**	**310**
129-00-0	**Pyrene**	**67**	**150**	**270**
56-55-3	**Benzo(a)anthracene**	**66**	**150**	**110 J**
218-01-9	**Chrysene**	**57**	**150**	**120 J**
205-99-2	**Benzo(b)fluoranthene**	**62**	**150**	**100 J**
207-08-9	Benzo(k)fluoranthene	67	150	< 150 U
50-32-8	**Benzo(a)pyrene**	**70**	**150**	**120 J**
193-39-5	**Indeno(1,2,3-cd)pyrene**	**89**	**150**	**98 J**
53-70-3	Dibenz(a,h)anthracene	76	150	< 150 U
191-24-2	**Benzo(g,h,i)perylene**	**83**	**150**	**150 J**
TOTBFA	**Total Benzofluoranthenes**	**67**	**150**	**220**

Reported in µg/kg (ppb)

SIM Semivolatile Surrogate Recovery

d10-Fluoranthene	D
d10-2-Methylnaphthalene	D
d14-Dibenzo(a,h)anthracen	D

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PNAs by SIM SW8270D-SIM GC/MS
Extraction Method: SW3546
Page 1 of 1

Sample ID: PAI-12-19.5-20.0
SAMPLE

Lab Sample ID: ZP35E
LIMS ID: 14-27579
Matrix: Soil
Data Release Authorized:
Reported: 01/21/15

QC Report No: ZP35-Geoengineers
Project: Gas Works Park-Play Area Investigat
0186-846-01 Task 1570
Date Sampled: 12/12/14
Date Received: 12/12/14

Date Extracted: 12/23/14
Date Analyzed: 01/20/15 00:23
Instrument/Analyst: NT8/JZ
GPC Cleanup: No

Sample Amount: 0.74 g-dry-wt
Final Extract Volume: 0.50 mL
Dilution Factor: 10.0
Percent Moisture: 28.4 %

CAS Number	Analyte	DL	LOQ	Result
91-20-3	Naphthalene	310	680	340,000 ES
208-96-8	Acenaphthylene	220	680	13,000
83-32-9	Acenaphthene	200	680	6,900
86-73-7	Fluorene	200	680	31,000
85-01-8	Phenanthrene	210	680	90,000 E
120-12-7	Anthracene	240	680	27,000
206-44-0	Fluoranthene	250	680	48,000
129-00-0	Pyrene	310	680	52,000
56-55-3	Benzo(a)anthracene	300	680	17,000
218-01-9	Chrysene	260	680	20,000
205-99-2	Benzo(b)fluoranthene	290	680	9,400
207-08-9	Benzo(k)fluoranthene	310	680	5,400
50-32-8	Benzo(a)pyrene	320	680	16,000
193-39-5	Indeno(1,2,3-cd)pyrene	410	680	7,400
53-70-3	Dibenz(a,h)anthracene	350	680	2,000
191-24-2	Benzo(g,h,i)perylene	380	680	10,000
TOTBFA	Total Benzofluoranthenes	310	680	21,000

Reported in µg/kg (ppb)

SIM Semivolatile Surrogate Recovery

d10-Fluoranthene	63.3%
d10-2-Methylnaphthalene	63.3%
d14-Dibenzo(a,h)anthracen	63.3%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PNAs by SIM SW8270D-SIM GC/MS
Extraction Method: SW3546
Page 1 of 1

Sample ID: PAI-12-19.5-20.0
DILUTION

Lab Sample ID: ZP35E
LIMS ID: 14-27579
Matrix: Soil
Data Release Authorized:
Reported: 01/21/15

QC Report No: ZP35-Geoengineers
Project: Gas Works Park-Play Area Investigat
0186-846-01 Task 1570
Date Sampled: 12/12/14
Date Received: 12/12/14

Date Extracted: 12/23/14
Date Analyzed: 01/20/15 12:26
Instrument/Analyst: NT8/JZ
GPC Cleanup: No

Sample Amount: 0.74 g-dry-wt
Final Extract Volume: 0.50 mL
Dilution Factor: 300
Percent Moisture: 28.4 %

CAS Number	Analyte	DL	LOQ	Result	
91-20-3	**Naphthalene**	**9200**	**20,000**	**700,000**	
208-96-8	**Acenaphthylene**	**6500**	**20,000**	**14,000**	**J**
83-32-9	Acenaphthene	6000	20,000	< 20,000	U
86-73-7	**Fluorene**	**6000**	**20,000**	**32,000**	
85-01-8	**Phenanthrene**	**6400**	**20,000**	**110,000**	
120-12-7	**Anthracene**	**7200**	**20,000**	**29,000**	
206-44-0	**Fluoranthene**	**7600**	**20,000**	**52,000**	
129-00-0	**Pyrene**	**9200**	**20,000**	**57,000**	
56-55-3	**Benzo(a)anthracene**	**9000**	**20,000**	**16,000**	**J**
218-01-9	**Chrysene**	**7800**	**20,000**	**19,000**	**J**
205-99-2	**Benzo(b)fluoranthene**	**8600**	**20,000**	**9,700**	**J**
207-08-9	Benzo(k)fluoranthene	9200	20,000	< 20,000	U
50-32-8	**Benzo(a)pyrene**	**9600**	**20,000**	**16,000**	**J**
193-39-5	Indeno(1,2,3-cd)pyrene	12000	20,000	< 20,000	U
53-70-3	Dibenz(a,h)anthracene	10000	20,000	< 20,000	U
191-24-2	**Benzo(g,h,i)perylene**	**11000**	**20,000**	**11,000**	**J**
TOTBFA	**Total Benzofluoranthenes**	**9200**	**20,000**	**22,000**	

Reported in µg/kg (ppb)

SIM Semivolatile Surrogate Recovery

d10-Fluoranthene	D
d10-2-Methylnaphthalene	D
d14-Dibenzo(a,h)anthracen	D

ANALYTICAL RESOURCES INCORPORATED

SIM SW8270 SURROGATE RECOVERY SUMMARY

Matrix: Soil

QC Report No: ZP35-Geoengineers
Project: Gas Works Park-Play Area Investigat
0186-846-01 Task 1570

Client ID	FLN	MNP	DBA	TOT OUT
PAI-2-18.0-18.5	40.0%	56.7%	D D	0
PAI-2-18.0-18.5 DL	D D	D D	D D	0
PAI-2-18.0-18.5 DL2	D D	D D	D D	0
MB-122314	73.3%	55.3%	82.7%	0
LCS-122314	71.3%	52.0%	80.3%	0
PAI-10-29.5-30.0	62.0%	42.3%	66.0%	0
PAI-10-29.5-30.0 DL	D D	D D	D D	0
PAI-10-29.5-30.0 MS	77.3%	51.7%	78.7%	0
PAI-10-29.5-30.0 MSD	76.3%	50.7%	78.7%	0
PAI-12-19.5-20.0	63.3%	63.3%	63.3%	0
PAI-12-19.5-20.0 DL	D D	D D	D D	0

	LCS/MB LIMITS	QC LIMITS
(FLN) = d10-Fluoranthene	(36-134)	(36-134)
(MNP) = d10-2-Methylnaphthalene	(32-120)	(32-120)
(DBA) = d14-Dibenzo(a,h)anthracene	(21-133)	(21-133)

Prep Method: SW3546
Log Number Range: 14-27576 to 14-27579

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PNAs by SW8270D-SIM GC/MS

Sample ID: PAI-10-29.5-30.0
MATRIX SPIKE

Lab Sample ID: ZP35D
LIMS ID: 14-27578
Matrix: Soil
Data Release Authorized:
Reported: 01/21/15

QC Report No: ZP35-Geoengineers
Project: Gas Works Park-Play Area Investigat
Event: 0186-846-01 Task 1570
Date Sampled: 12/11/14
Date Received: 12/12/14

Date Extracted MS/MSD: 12/23/14

Sample Amount MS: 10.19 g-dry-wt
MSD: 10.19 g-dry-wt
Final Extract Volume MS: 0.50 mL
MSD: 0.50 mL
Dilution Factor MS: 1.00
MSD: 1.00

Date Analyzed MS: 01/19/15 23:33
MSD: 01/19/15 23:58
Instrument/Analyst MS: NT8/JZ
MSD: NT8/JZ

Analyte	Sample	MS	Spike Added-MS	MS Recovery	MSD	Spike Added-MSD	MSD Recovery	RPD
Naphthalene	3300 ES	4940 ES	147	NA	4770 ES	147	NA	3.5%
Acenaphthylene	67	170	147	70.1%	201	147	91.2%	16.7%
Acenaphthene	91	190	147	67.3%	250	147	108%	27.3%
Fluorene	89	198	147	74.1%	330	147	164%	50.0%
Phenanthrene	330	423	147	63.3%	678 E	147	237%	46.3%
Anthracene	84	188	147	70.7%	246	147	110%	26.7%
Fluoranthene	310	433	147	83.7%	474	147	112%	9.0%
Pyrene	300	417	147	79.6%	444	147	98.0%	6.3%
Benzo(a)anthracene	120	239	147	81.0%	242	147	83.0%	1.2%
Chrysene	140	255	147	78.2%	260	147	81.6%	1.9%
Benzo(b)fluoranthene	110	230	147	81.6%	233	147	83.7%	1.3%
Benzo(k)fluoranthene	59	174	147	78.2%	174	147	78.2%	0.0%
Benzo(a)pyrene	130	254	147	84.4%	255	147	85.0%	0.4%
Indeno(1,2,3-cd)pyrene	110	234	147	84.4%	233	147	83.7%	0.4%
Dibenz(a,h)anthracene	22	137	147	78.2%	136	147	77.6%	0.7%
Benzo(g,h,i)perylene	150	283	147	90.5%	279	147	87.8%	1.4%
Total Benzofluoranthenes	220	557	442	76.2%	559	442	76.7%	0.4%

Reported in µg/kg (ppb)

NA-No recovery due to high concentration (> 4X) of analyte in original sample, calculated negative recovery, or undetected spike.
RPD calculated using sample concentrations per SW846.

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PNAs by SIM SW8270D-SIM GC/MS
Extraction Method: SW3546
Page 1 of 1

Sample ID: PAI-10-29.5-30.0
MATRIX SPIKE

Lab Sample ID: ZP35D
LIMS ID: 14-27578
Matrix: Soil
Data Release Authorized:
Reported: 01/21/15

QC Report No: ZP35-Geoengineers
Project: Gas Works Park-Play Area Investigat
0186-846-01 Task 1570
Date Sampled: 12/11/14
Date Received: 12/12/14

Date Extracted: 12/23/14
Date Analyzed: 01/19/15 23:33
Instrument/Analyst: NT8/JZ
GPC Cleanup: No

Sample Amount: 10.2 g-dry-wt
Final Extract Volume: 0.50 mL
Dilution Factor: 1.00
Percent Moisture: 7.8 %

CAS Number	Analyte	DL	LOQ	Result
91-20-3	Naphthalene	2.2	4.9	---
208-96-8	Acenaphthylene	1.6	4.9	---
83-32-9	Acenaphthene	1.5	4.9	---
86-73-7	Fluorene	1.4	4.9	---
85-01-8	Phenanthrene	1.6	4.9	---
120-12-7	Anthracene	1.7	4.9	---
206-44-0	Fluoranthene	1.8	4.9	---
129-00-0	Pyrene	2.2	4.9	---
56-55-3	Benzo(a)anthracene	2.2	4.9	---
218-01-9	Chrysene	1.9	4.9	---
205-99-2	Benzo(b)fluoranthene	2.1	4.9	---
207-08-9	Benzo(k)fluoranthene	2.2	4.9	---
50-32-8	Benzo(a)pyrene	2.3	4.9	---
193-39-5	Indeno(1,2,3-cd)pyrene	3.0	4.9	---
53-70-3	Dibenz(a,h)anthracene	2.5	4.9	---
191-24-2	Benzo(g,h,i)perylene	2.7	4.9	---
TOTBFA	Total Benzofluoranthenes	2.2	4.9	---

Reported in µg/kg (ppb)

SIM Semivolatile Surrogate Recovery

d10-Fluoranthene	77.3%
d10-2-Methylnaphthalene	51.7%
d14-Dibenzo(a,h)anthracen	78.7%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PNAs by SIM SW8270D-SIM GC/MS
Extraction Method: SW3546

Sample ID: PAI-10-29.5-30.0
MATRIX SPIKE DUP

Lab Sample ID: ZP35D
LIMS ID: 14-27578
Matrix: Soil
Data Release Authorized:
Reported: 01/21/15

QC Report No: ZP35-Geoengineers
Project: Gas Works Park-Play Area Investigat
0186-846-01 Task 1570
Date Sampled: 12/11/14
Date Received: 12/12/14

Date Extracted: 12/23/14
Date Analyzed: 01/19/15 23:58
Instrument/Analyst: NT8/JZ
GPC Cleanup: No

Sample Amount: 10.2 g-dry-wt
Final Extract Volume: 0.50 mL
Dilution Factor: 1.00
Percent Moisture: 7.8 %

CAS Number	Analyte	DL	LOQ	Result
91-20-3	Naphthalene	2.2	4.9	---
208-96-8	Acenaphthylene	1.6	4.9	---
83-32-9	Acenaphthene	1.5	4.9	---
86-73-7	Fluorene	1.4	4.9	---
85-01-8	Phenanthrene	1.6	4.9	---
120-12-7	Anthracene	1.7	4.9	---
206-44-0	Fluoranthene	1.8	4.9	---
129-00-0	Pyrene	2.2	4.9	---
56-55-3	Benzo(a)anthracene	2.2	4.9	---
218-01-9	Chrysene	1.9	4.9	---
205-99-2	Benzo(b)fluoranthene	2.1	4.9	---
207-08-9	Benzo(k)fluoranthene	2.2	4.9	---
50-32-8	Benzo(a)pyrene	2.3	4.9	---
193-39-5	Indeno(1,2,3-cd)pyrene	3.0	4.9	---
53-70-3	Dibenz(a,h)anthracene	2.5	4.9	---
191-24-2	Benzo(g,h,i)perylene	2.7	4.9	---
TOTBFA	Total Benzofluoranthenes	2.2	4.9	---

Reported in µg/kg (ppb)

SIM Semivolatile Surrogate Recovery

d10-Fluoranthene	76.3%
d10-2-Methylnaphthalene	50.7%
d14-Dibenzo(a,h)anthracen	78.7%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PNAs by SW8270D-SIM GC/MS

Sample ID: LCS-122314
LAB CONTROL SAMPLE

Lab Sample ID: LCS-122314
LIMS ID: 14-27578
Matrix: Soil
Data Release Authorized:
Reported: 01/21/15

QC Report No: ZP35-Geoengineers
Project: Gas Works Park-Play Area Investigat
Event: 0186-846-01 Task 1570
Date Sampled: NA
Date Received: NA

Date Extracted: 12/23/14
Date Analyzed LCS: 01/19/15 22:18
Instrument/Analyst LCS: NT8/JZ

Sample Amount LCS: 10.00 g-dry-wt
Final Extract Volume LCS: 0.50 mL
Dilution Factor LCS: 1.00

Analyte	LCS	Spike Added	Recovery
Naphthalene	80.4	150	53.6%
Acenaphthylene	84.8	150	56.5%
Acenaphthene	79.2	150	52.8%
Fluorene	89.6	150	59.7%
Phenanthrene	96.2	150	64.1%
Anthracene	93.0	150	62.0%
Fluoranthene	105	150	70.0%
Pyrene	97.5	150	65.0%
Benzo(a)anthracene	104	150	69.3%
Chrysene	101	150	67.3%
Benzo(b)fluoranthene	108	150	72.0%
Benzo(k)fluoranthene	102	150	68.0%
Benzo(a)pyrene	96.9	150	64.6%
Indeno(1,2,3-cd)pyrene	107	150	71.3%
Dibenz(a,h)anthracene	109	150	72.7%
Benzo(g,h,i)perylene	109	150	72.7%
Total Benzofluoranthenes	289	450	64.2%

Reported in µg/kg (ppb)

SIM Semivolatile Surrogate Recovery

d10-Fluoranthene	71.3%
d10-2-Methylnaphthalene	52.0%
d14-Dibenzo(a,h)anthracene	80.3%

4B

SEMIVOLATILE METHOD BLANK SUMMARY

BLANK NO.

ZP35MBS1

Lab Name: ANALYTICAL RESOURCES INC

Client: GEOENGINEERS

ARI Job No: ZP35

Project: GAS WORKS PARK-PLAY

Lab File ID: 01191530

Date Extracted: 12/23/14

Instrument ID: NT8

Date Analyzed: 01/19/15

Matrix: SOLID

Time Analyzed: 2153

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS and MSD:

	CLIENT SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED
01	ZP35LCSS1	ZP35LCSS1	01191531	01/19/15
02	PAI-2-18.0-18.5	ZP35B	01191532	01/19/15
03	PAI-10-29.5-30.0	ZP35D	01191533	01/19/15
04	PAI-10-29.5-30.	ZP35DMS	01191534	01/19/15
05	PAI-10-29.5-30.	ZP35DMSD	01191535	01/19/15
06	PAI-12-19.5-20.0	ZP35E	01191536	01/20/15
07	PAI-2-18.0-18.5	ZP35B	01201506	01/20/15
08	PAI-10-29.5-30.0	ZP35D	01201507	01/20/15
09	PAI-12-19.5-20.0	ZP35E	01201508	01/20/15
10	PAI-2-18.0-18.5	ZP35B	01201514	01/20/15
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FORM IV SV

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PNAs by SIM SW8270D-SIM GC/MS
Extraction Method: SW3546
Page 1 of 1

Sample ID: MB-122314
METHOD BLANK

Lab Sample ID: MB-122314
LIMS ID: 14-27578
Matrix: Soil
Data Release Authorized:
Reported: 01/21/15

QC Report No: ZP35-Geoengineers
Project: Gas Works Park-Play Area Investigat
0186-846-01 Task 1570
Date Sampled: NA
Date Received: NA

Date Extracted: 12/23/14
Date Analyzed: 01/19/15 21:53
Instrument/Analyst: NT8/JZ
GPC Cleanup: No

Sample Amount: 10.0 g-dry-wt
Final Extract Volume: 0.50 mL
Dilution Factor: 1.00
Percent Moisture: NA

CAS Number	Analyte	DL	LOQ	Result
91-20-3	Naphthalene	2.3	5.0	< 5.0 U
208-96-8	Acenaphthylene	1.6	5.0	< 5.0 U
83-32-9	Acenaphthene	1.5	5.0	< 5.0 U
86-73-7	Fluorene	1.5	5.0	< 5.0 U
85-01-8	Phenanthrene	1.6	5.0	< 5.0 U
120-12-7	Anthracene	1.8	5.0	< 5.0 U
206-44-0	Fluoranthene	1.9	5.0	< 5.0 U
129-00-0	Pyrene	2.3	5.0	< 5.0 U
56-55-3	Benzo(a)anthracene	2.2	5.0	< 5.0 U
218-01-9	Chrysene	1.9	5.0	< 5.0 U
205-99-2	Benzo(b)fluoranthene	2.1	5.0	< 5.0 U
207-08-9	Benzo(k)fluoranthene	2.3	5.0	< 5.0 U
50-32-8	Benzo(a)pyrene	2.4	5.0	< 5.0 U
193-39-5	Indeno(1,2,3-cd)pyrene	3.0	5.0	< 5.0 U
53-70-3	Dibenz(a,h)anthracene	2.6	5.0	< 5.0 U
191-24-2	Benzo(g,h,i)perylene	2.8	5.0	< 5.0 U
TOTBFA	Total Benzofluoranthenes	2.3	5.0	< 5.0 U

Reported in µg/kg (ppb)

SIM Semivolatile Surrogate Recovery

d10-Fluoranthene	73.3%
d10-2-Methylnaphthalene	55.3%
d14-Dibenzo(a,h)anthracen	82.7%

5B

SEMIVOLATILE ORGANIC INSTRUMENT PERFORMANCE CHECK
DECAFLUOROTRIPHENYLPHOSPHINE (DFTPP)

Lab Name: ANALYTICAL RESOURCES INC Client: GEOENGINEERS

Instrument ID: NT8 Project: GAS WORKS PARK-PLAY

DFTPP Injection Date: 01/05/15 DFTPP Injection Time: 1510

m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
51	10.0 - 80.0% of mass 198	25.9
68	Less than 2.0% of mass 69	1.0 (1.9)1
69	Mass 69 relative abundance	50.7
70	Less than 2.0% of mass 69	0.3 (0.5)1
127	10.0 - 80.0% of mass 198	51.2
197	Less than 2.0% of mass 198	0.7
198	Base Peak, 100% relative abundance	100.0
199	5.0 to 9.0% of mass 198	7.7
275	10.0 - 60.0% of mass 198	31.2
365	Greater than 1.0% of mass 198	4.12
441	0.0 - 24.0% of mass 442	8.7 (14.6)2
442	50.0 - 200.0% of mass 198	59.9
443	15.0 - 24.0% of mass 442	12.1 (20.2)2

1-Value is % mass 69 2-Value is % mass 442

THIS CHECK APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS, AND STANDARDS:

	CLIENT SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
01	IC250105	SDA0002-CAL4	01051502	01/05/15	1523
02	IC010105	SDA0002-CAL1	01051503	01/05/15	1548
03	IC050105	SDA0002-CAL2	01051504	01/05/15	1614
04	IC10105	SDA0002-CAL3	01051505	01/05/15	1639
05	IC50105	SDA0002-CAL5	01051506	01/05/15	1704
06	IC100105	SDA0002-CAL6	01051507	01/05/15	1730
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5B

SEMIVOLATILE ORGANIC INSTRUMENT PERFORMANCE CHECK
DECAFLUOROTRIPHENYLPHOSPHINE (DFTPP)

Lab Name: ANALYTICAL RESOURCES INC Client: GEOENGINEERS

Instrument ID: NT8 Project: GAS WORKS PARK-PLAY

DFTPP Injection Date: 01/19/15 DFTPP Injection Time: 1844

m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
51	10.0 - 80.0% of mass 198	19.2
68	Less than 2.0% of mass 69	0.0 (0.0)1
69	Mass 69 relative abundance	52.8
70	Less than 2.0% of mass 69	0.3 (0.6)1
127	10.0 - 80.0% of mass 198	50.3
197	Less than 2.0% of mass 198	0.0
198	Base Peak, 100% relative abundance	100.0
199	5.0 to 9.0% of mass 198	7.5
275	10.0 - 60.0% of mass 198	31.8
365	Greater than 1.0% of mass 198	3.51
441	0.0 - 24.0% of mass 442	10.1 (16.6)2
442	50.0 - 200.0% of mass 198	61.0
443	15.0 - 24.0% of mass 442	13.1 (21.5)2

1-Value is % mass 69 2-Value is % mass 442

THIS CHECK APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS, AND STANDARDS:

	CLIENT SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
01	ICV0119A	ICV0119A	01191523	01/19/15	1857
02	ZP35MBS1	ZP35MBS1	01191530	01/19/15	2153
03	ZP35LCSS1	ZP35LCSS1	01191531	01/19/15	2218
04	PAI-2-18.0-18.5	ZP35B	01191532	01/19/15	2243
05	PAI-10-29.5-30.0	ZP35D	01191533	01/19/15	2308
06	PAI-10-29.5-30.	ZP35DMS	01191534	01/19/15	2333
07	PAI-10-29.5-30.	ZP35DMSD	01191535	01/19/15	2358
08	PAI-12-19.5-20.0	ZP35E	01191536	01/20/15	0023
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5B

SEMIVOLATILE ORGANIC INSTRUMENT PERFORMANCE CHECK
DECAFLUOROTRIPHENYLPHOSPHINE (DFTPP)

Lab Name: ANALYTICAL RESOURCES INC Client: GEOENGINEERS

Instrument ID: NT8 Project: GAS WORKS PARK-PLAY

DFTPP Injection Date: 01/20/15 DFTPP Injection Time: 0936

m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
51	10.0 - 80.0% of mass 198	18.9
68	Less than 2.0% of mass 69	0.0 (0.0)1
69	Mass 69 relative abundance	53.6
70	Less than 2.0% of mass 69	0.3 (0.7)1
127	10.0 - 80.0% of mass 198	49.4
197	Less than 2.0% of mass 198	0.0
198	Base Peak, 100% relative abundance	100.0
199	5.0 to 9.0% of mass 198	7.5
275	10.0 - 60.0% of mass 198	32.4
365	Greater than 1.0% of mass 198	3.75
441	0.0 - 24.0% of mass 442	9.7 (15.6)2
442	50.0 - 200.0% of mass 198	62.3
443	15.0 - 24.0% of mass 442	12.5 (20.1)2

1-Value is % mass 69 2-Value is % mass 442

THIS CHECK APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS, AND STANDARDS:

	CLIENT SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
01	ICV0120	ICV0120	01201502	01/20/15	0950
02	PAI-2-18.0-18.5	ZP35B	01201506	01/20/15	1135
03	PAI-10-29.5-30.0	ZP35D	01201507	01/20/15	1200
04	PAI-12-19.5-20.0	ZP35E	01201508	01/20/15	1226
05	PAI-2-18.0-18.5	ZP35B	01201514	01/20/15	1654
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FORM V SV

6B

SEMIVOLATILE 8270-D INITIAL CALIBRATION DATA

Lab Name: ANALYTICAL RESOURCES INC Client: GEOENGINEERS

ARI Job No: ZP35 Project: GAS WORKS PARK-PLAY

Instrument ID: NT8 Calibration Date: 01/05/15

LAB FILE ID: RRF0.1=01051503 RRF0.5=01051504 RRF1 =01051505
RRF2.5=01051502 RRF5 =01051506 RRF10 =01051507

COMPOUND	RRF 0.1	RRF 0.5	RRF 1	RRF 2.5	RRF 5	RRF 10	$\overline{RRF}$	%RSD /R^2
Naphthalene	1.287	1.037	1.113	1.164	1.171	1.130	1.150	7.2
2-Methylnaphthalene	0.696	0.647	0.656	0.676	0.688	0.677	0.673	2.8
1-methylnaphthalene	0.648	0.568	0.601	0.633	0.644	0.635	0.622	5.0
Biphenyl	1.613	1.336	1.461	1.458	1.497	1.427	1.465	6.2
2,6-Dimethylnaphthalene	1.126	0.951	1.049	1.067	1.127	1.098	1.070	6.2
Acenaphthylene	1.781	1.498	1.694	1.772	1.848	1.753	1.724	7.0
Acenaphthene	1.328	1.058	1.140	1.164	1.182	1.155	1.171	7.5
Dibenzofuran	1.794	1.531	1.643	1.636	1.687	1.578	1.645	5.6
1,6,7-Trimethylnaphthalene	1.087	0.974	1.024	1.062	1.129	1.096	1.062	5.2
Fluorene	1.478	1.160	1.297	1.320	1.398	1.346	1.333	8.0
Dibenzothiophene	1.146	1.001	1.029	1.071	1.053	1.020	1.053	4.9
Phenanthrene	1.202	1.023	1.069	1.073	1.102	1.062	1.088	5.6
Anthracene	1.134	0.976	1.061	1.091	1.123	1.086	1.078	5.2
Carbazole	1.020	0.888	0.942	0.986	1.014	0.999	0.975	5.2
1-Methylphenanthrene	0.961	0.774	0.829	0.878	0.898	0.905	0.874	7.4
Fluoranthene	1.538	1.197	1.268	1.293	1.317	1.283	1.316	8.8
Pyrene	1.314	1.129	1.223	1.236	1.274	1.211	1.231	5.1
Benzo(a)anthracene	1.328	1.077	1.193	1.226	1.248	1.237	1.218	6.8
Chrysene	1.289	1.088	1.165	1.181	1.186	1.183	1.182	5.4
Benzo(b)fluoranthene	1.240	1.022	1.046	1.142	1.188	1.158	1.133	7.4
Benzo(k)fluoranthene	1.300	1.045	1.104	1.189	1.210	1.223	1.178	7.7
Benzo(j)fluoranthene	1.335	1.032	1.084	1.162	1.166	1.180	1.160	8.9
Benzo(e)pyrene	1.219	1.047	1.073	1.118	1.136	1.134	1.121	5.3
Benzo(a)pyrene	1.215	0.964	1.069	1.099	1.174	1.172	1.116	8.2
Perylene	1.258	0.999	1.057	1.106	1.163	1.152	1.122	8.0
Indeno(1,2,3-cd)pyrene	1.192	1.112	1.178	1.260	1.329	1.373	1.241	7.9
Dibenzo(a,h)anthracene	0.945	0.909	0.970	1.014	1.138	1.170	1.024	10.4
Benzo(g,h,i)perylene	1.167	0.985	0.981	1.047	1.121	1.136	1.073	7.5
2-Methylnaphthalene-d10	0.784	0.640	0.682	0.694	0.721	0.720	0.707	6.8
Dibenzo(a,h)anthracene-d14	0.826	0.724	0.769	0.814	0.874	0.910	0.820	8.3

<- Outside QC limits: %RSD <20% or R^2 > 0.990

7B

SEMIVOLATILE 8270-D CONTINUING CALIBRATION CHECK

Lab Name: ANALYTICAL RESOURCES INC Client: GEOENGINEERS

ARI Job No: ZP35 Project: GAS WORKS PARK-PLAY

Instrument ID: NT8 Cont. Calib. Date: 01/19/15

Init. Calib. Date: 01/05/15 Cont. Calib. Time: 1857

COMPOUND	CalAmt or ARF	CC Amt or RF	MIN RRF	CURVE TYPE	%D or Drift
Naphthalene	1.150	1.050	0.700	AVRG	-8.7
2-Methylnaphthalene	0.673	0.705	0.400	AVRG	4.8
Acenaphthylene	1.724	1.827	0.900	AVRG	6.0
Acenaphthene	1.171	1.171	0.900	AVRG	0.0
Dibenzofuran	1.645	1.631	0.800	AVRG	-0.8
Fluorene	1.333	1.358	0.900	AVRG	1.9
Phenanthrene	1.088	1.081	0.700	AVRG	-0.6
Anthracene	1.078	1.098	0.700	AVRG	1.8
Fluoranthene	1.316	1.334	0.600	AVRG	1.4
Pyrene	1.231	1.133	0.600	AVRG	-8.0
Benzo(a)anthracene	1.218	1.164	0.800	AVRG	-4.4
Chrysene	1.182	1.116	0.700	AVRG	-5.6
Benzo(b)fluoranthene	1.133	1.151	0.700	AVRG	1.6
Benzo(k)fluoranthene	1.178	1.165	0.700	AVRG	-1.1
Benzo(j)fluoranthene	1.160	1.111	0.010	AVRG	-4.2
Benzo(a)pyrene	1.116	1.134	0.700	AVRG	1.6
Indeno(1,2,3-cd)pyrene	1.241	1.322	0.500	AVRG	6.5
Dibenzo(a,h)anthracene	1.024	1.106	0.400	AVRG	8.0
Benzo(g,h,i)perylene	1.073	1.133	0.500	AVRG	5.6
1-methylnaphthalene	0.622	0.653	0.010	AVRG	5.0
Perylene	1.122	1.113	0.010	AVRG	-0.8
2-Methylnaphthalene-d10	0.707	0.719	0.010	AVRG	1.7
Dibenzo(a,h)anthracene-d14	0.820	0.936	0.010	AVRG	14.1
Fluoranthene-d10	1.185	1.209	0.010	AVRG	2.0

<- Exceeds QC limit of 20% D

* RF less than minimum RF

FORM VII SV-1

7B

SEMIVOLATILE 8270-D CONTINUING CALIBRATION CHECK

Lab Name: ANALYTICAL RESOURCES INC Client: GEOENGINEERS

ARI Job No: ZP35 Project: GAS WORKS PARK-PLAY

Instrument ID: NT8 Cont. Calib. Date: 01/20/15

Init. Calib. Date: 01/05/15 Cont. Calib. Time: 0950

COMPOUND	CalAmt or ARF	CC Amt or RF	MIN RRF	CURVE TYPE	%D or Drift
Naphthalene	1.150	1.065	0.700	AVRG	-7.4
2-Methylnaphthalene	0.673	0.696	0.400	AVRG	3.4
Acenaphthylene	1.724	1.821	0.900	AVRG	5.6
Acenaphthene	1.171	1.194	0.900	AVRG	2.0
Dibenzofuran	1.645	1.625	0.800	AVRG	-1.2
Fluorene	1.333	1.392	0.900	AVRG	4.4
Phenanthrene	1.088	1.086	0.700	AVRG	-0.2
Anthracene	1.078	1.108	0.700	AVRG	2.8
Fluoranthene	1.316	1.336	0.600	AVRG	1.5
Pyrene	1.231	1.137	0.600	AVRG	-7.6
Benzo(a)anthracene	1.218	1.199	0.800	AVRG	-1.6
Chrysene	1.182	1.132	0.700	AVRG	-4.2
Benzo(b)fluoranthene	1.133	1.129	0.700	AVRG	-0.4
Benzo(k)fluoranthene	1.178	1.167	0.700	AVRG	-0.9
Benzo(j)fluoranthene	1.160	1.179	0.010	AVRG	1.6
Benzo(a)pyrene	1.116	1.120	0.700	AVRG	0.4
Indeno(1,2,3-cd)pyrene	1.241	1.216	0.500	AVRG	-2.0
Dibenzo(a,h)anthracene	1.024	1.059	0.400	AVRG	3.4
Benzo(g,h,i)perylene	1.073	1.081	0.500	AVRG	0.7
1-methylnaphthalene	0.622	0.656	0.010	AVRG	5.5
Perylene	1.122	1.124	0.010	AVRG	0.2
2-Methylnaphthalene-d10	0.707	0.697	0.010	AVRG	-1.4
Dibenzo(a,h)anthracene-d14	0.820	0.865	0.010	AVRG	5.5
Fluoranthene-d10	1.185	1.211	0.010	AVRG	2.2

<- Exceeds QC limit of 20% D

* RF less than minimum RF

FORM VII SV-1

8B

SEMIVOLATILE INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: ANALYTICAL RESOURCES INC Client: GEOENGINEERS

ARI Job No: ZP35 Project: GAS WORKS PARK-PLAY

Ical Midpoint ID: 01051502 Ical Date: 01/05/15

Instrument ID: NT8 Cont. Cal Date: 01/19/15

		IS1(NPT) AREA #	RT #	IS2(ANT) AREA #	RT #	IS3(PHN) AREA #	RT #
	ICAL MIDPT	387555	4.71	258447	6.97	456948	8.98
	UPPER LIMIT	775110		516894		913896	
	LOWER LIMIT	193778		129224		228474	
	CCAL	462048	4.55	296335	6.81	537194	8.82
	UPPER LIMIT		5.05		7.31		9.32
	LOWER LIMIT		4.05		6.31		8.32
01	ZP35MBS1	410219	4.55	273837	6.81	488450	8.82
02	ZP35LCSS1	436987	4.55	276604	6.81	495657	8.82
03	PAI-2-18.0-1	554754	4.58	336136	6.82	552321	8.83
04	PAI-10-29.5-	401613	4.56	261542	6.81	467211	8.82
05	PAI-10-29.5-	459388	4.56	269142	6.81	486475	8.82
06	PAI-10-29.5-	474262	4.57	279375	6.81	493770	8.82
07	PAI-12-19.5-	431703	4.56	284357	6.81	503149	8.82
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25							

IS1 = Naphthalene-d8
IS2 = Acenaphthene-d10
IS3 = Phenanthrene-d10

AREA UPPER LIMIT = +100% of internal standard area from Ical midpoint
AREA LOWER LIMIT = - 50% of internal standard area from Ical midpoint
RT UPPER LIMIT = + 0.50 minutes of internal standard RT from Cont. Cal
RT LOWER LIMIT = - 0.50 minutes of internal standard RT from Cont. Cal

* Values outside of QC limits.

FORM VIII SV-1

8B

SEMIVOLATILE INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: ANALYTICAL RESOURCES INC Client: GEOENGINEERS

ARI Job No: ZP35 Project: GAS WORKS PARK-PLAY

Ical Midpoint ID: 01051502 Ical Date: 01/05/15

Instrument ID: NT8 Cont. Cal Date: 01/19/15

		IS4(CRY) AREA #	RT #	IS5(PRY) AREA #	RT #	AREA #	RT #
	ICAL MIDPT	492500	13.72	485582	17.52		
	UPPER LIMIT	985000		971164			
	LOWER LIMIT	246250		242791			
	CCAL	652608	13.46	652482	17.20		
	UPPER LIMIT		13.96		17.70		
	LOWER LIMIT		12.96		16.70		
01	ZP35MBS1	602025	13.46	628969	17.21		
02	ZP35LCSS1	594239	13.45	600570	17.21		
03	PAI-2-18.0-1	658596	13.46	677235	17.21		
04	PAI-10-29.5-	554891	13.45	567695	17.21		
05	PAI-10-29.5-	576771	13.45	580697	17.21		
06	PAI-10-29.5-	590772	13.45	585604	17.21		
07	PAI-12-19.5-	606747	13.45	610228	17.21		
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IS4 = Chrysene-d12
IS5 = Perylene-d12

AREA UPPER LIMIT = +100% of internal standard area from Ical midpoint
AREA LOWER LIMIT = - 50% of internal standard area from Ical midpoint
RT UPPER LIMIT = + 0.50 minutes of internal standard RT from Cont. Cal
RT LOWER LIMIT = - 0.50 minutes of internal standard RT from Cont. Cal

* Values outside of QC limits.

FORM VIII SV-2

8B

SEMIVOLATILE INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: ANALYTICAL RESOURCES INC Client: GEOENGINEERS

ARI Job No: ZP35 Project: GAS WORKS PARK-PLAY

Ical Midpoint ID: 01051502 Ical Date: 01/05/15

Instrument ID: NT8 Cont. Cal Date: 01/20/15

		IS1(NPT) AREA #	RT #	IS2(ANT) AREA #	RT #	IS3(PHN) AREA #	RT #
	ICAL MIDPT	387555	4.71	258447	6.97	456948	8.98
	UPPER LIMIT	775110		516894		913896	
	LOWER LIMIT	193778		129224		228474	
	CCAL	389201	4.55	259938	6.81	477075	8.82
	UPPER LIMIT		5.05		7.31		9.32
	LOWER LIMIT		4.05		6.31		8.32
01	PAI-2-18.0-1	367872	4.55	239912	6.81	416451	8.82
02	PAI-10-29.5-	386963	4.55	252604	6.81	444303	8.82
03	PAI-12-19.5-	402737	4.56	258461	6.81	455206	8.82
04	PAI-2-18.0-1	334827	4.55	218873	6.81	390968	8.82
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IS1 = Naphthalene-d8
IS2 = Acenaphthene-d10
IS3 = Phenanthrene-d10

AREA UPPER LIMIT = +100% of internal standard area from Ical midpoint
AREA LOWER LIMIT = - 50% of internal standard area from Ical midpoint
RT UPPER LIMIT = + 0.50 minutes of internal standard RT from Cont. Cal
RT LOWER LIMIT = - 0.50 minutes of internal standard RT from Cont. Cal

* Values outside of QC limits.

FORM VIII SV-1

8B

SEMIVOLATILE INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: ANALYTICAL RESOURCES INC Client: GEOENGINEERS

ARI Job No: ZP35 Project: GAS WORKS PARK-PLAY

Ical Midpoint ID: 01051502 Ical Date: 01/05/15

Instrument ID: NT8 Cont. Cal Date: 01/20/15

		IS4(CRY) AREA #	RT #	IS5(PRY) AREA #	RT #	AREA #	RT #
	ICAL MIDPT	492500	13.72	485582	17.52		
	UPPER LIMIT	985000		971164			
	LOWER LIMIT	246250		242791			
	CCAL	577051	13.45	560055	17.20		
	UPPER LIMIT		13.95		17.70		
	LOWER LIMIT		12.95		16.70		
01	PAI-2-18.0-1	531889	13.45	558571	17.21		
02	PAI-10-29.5-	551919	13.45	567725	17.20		
03	PAI-12-19.5-	550147	13.45	552530	17.20		
04	PAI-2-18.0-1	491438	13.46	466538	17.21		
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25							

IS4 = Chrysene-d12
IS5 = Perylene-d12

AREA UPPER LIMIT = +100% of internal standard area from Ical midpoint
AREA LOWER LIMIT = - 50% of internal standard area from Ical midpoint
RT UPPER LIMIT = + 0.50 minutes of internal standard RT from Cont. Cal
RT LOWER LIMIT = - 0.50 minutes of internal standard RT from Cont. Cal

* Values outside of QC limits.

FORM VIII SV-2

Metals Analysis
Report and Summary QC Forms

ARI Job ID: ZP35

Cover Page

INORGANIC ANALYSIS DATA PACKAGE

ANALYTICAL RESOURCES INCORPORATED

CLIENT: Geoengineers

PROJECT: Gas Works Park-Play

SDG: ZP35

CLIENT ID	ARI ID	ARI LIMS ID	REPREP
PAI-2-12.5-13.0	ZP35A	14-27575	
PAI-2-12.5-13.0D	ZP35ADUP	14-27575	
PAI-2-12.5-13.0S	ZP35ASPK	14-27575	
PAI-9-9.5-10.0	ZP35C	14-27577	
PBS	ZP35MB1	14-27577	
LCSS	ZP35MB1SPK	14-27577	

Were ICP interelement corrections applied ?	Yes/No	YES
Were ICP background corrections applied ?	Yes/No	YES
If yes - were raw data generated before application of background corrections ?	Yes/No	NO

Comments: _____

THIS DATA PACKAGE HAS BEEN REVIEWED AND AUTHORIZED FOR RELEASE BY:

Signature: _____ Name: Jay Kuhn

Date: 12/30/14 Title: Inorganics Director

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS
Page 1 of 1

Sample ID: PAI-2-12.5-13.0
SAMPLE

Lab Sample ID: ZP35A
LIMS ID: 14-27575
Matrix: Soil
Data Release Authorized:
Reported: 12/30/14

QC Report No: ZP35-Geoengineers
Project: Gas Works Park-Play Area Investigat
0186-846-01 Task 1570
Date Sampled: 12/09/14
Date Received: 12/12/14

Percent Total Solids: 56.9%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	DL	LOQ	mg/kg	Q
3050B	12/23/14	6010C	12/29/14	**7440-38-2**	**Arsenic**	2.0	20	**80**	

U-Analyte undetected at given DL
J-Analyte detected between DL and LOQ
DL-Method Detection Limit

Results reported below the LOQ are for statistical purposes only and have not been evaluated by either an analyst or data reviewer.

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS
Page 1 of 1

Sample ID: PAI-9-9.5-10.0
SAMPLE

Lab Sample ID: ZP35C
LIMS ID: 14-27577
Matrix: Soil
Data Release Authorized:
Reported: 12/30/14

QC Report No: ZP35-Geoengineers
Project: Gas Works Park-Play Area Investigat
0186-846-01 Task 1570
Date Sampled: 12/11/14
Date Received: 12/12/14

Percent Total Solids: 89.1%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	DL	LOQ	mg/kg	Q
3050B	12/23/14	6010C	12/29/14	**7440-38-2**	**Arsenic**	0.48	5	**160**	

U-Analyte undetected at given DL
J-Analyte detected between DL and LOQ
DL-Method Detection Limit

Results reported below the LOQ are for statistical purposes only and have not been evaluated by either an analyst or data reviewer.

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS

Sample ID: PAI-2-12.5-13.0
MATRIX SPIKE

Lab Sample ID: ZP35A
LIMS ID: 14-27575
Matrix: Soil
Data Release Authorized:
Reported: 12/30/14

QC Report No: ZP35-Geoengineers
Project: Gas Works Park-Play Area Investigat
0186-846-01 Task 1570
Date Sampled: 12/09/14
Date Received: 12/12/14

MATRIX SPIKE QUALITY CONTROL REPORT

Analyte	Analysis Method	Sample	Spike	Spike Added	% Recovery	Q
Arsenic	6010C	80	430	343	102%	

Reported in mg/kg-dry

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

Percent Recovery Limits: 75-125%

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS
Page 1 of 1

Sample ID: PAI-2-12.5-13.0
DUPLICATE

Lab Sample ID: ZP35A
LIMS ID: 14-27575
Matrix: Soil
Data Release Authorized:
Reported: 12/30/14

QC Report No: ZP35-Geoengineers
Project: Gas Works Park-Play Area Investigat
0186-846-01 Task 1570
Date Sampled: 12/09/14
Date Received: 12/12/14

MATRIX DUPLICATE QUALITY CONTROL REPORT

Analyte	Analysis Method	Sample	Duplicate	RPD	Control Limit	Q
Arsenic	6010C	80	80	0.0%	+/- 20	L

Reported in mg/kg-dry

*-Control Limit Not Met
L-RPD Invalid, Limit = Detection Limit

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS
Page 1 of 1

Sample ID: LAB CONTROL

Lab Sample ID: ZP35LCS
LIMS ID: 14-27577
Matrix: Soil
Data Release Authorized:
Reported: 12/30/14

QC Report No: ZP35-Geoengineers
Project: Gas Works Park-Play Area Investigat
0186-846-01 Task 1570
Date Sampled: NA
Date Received: NA

BLANK SPIKE QUALITY CONTROL REPORT

Analyte	Analysis Method	Spike Found	Spike Added	% Recovery	Q
Arsenic	6010C	220	200	110%	

Reported in mg/kg-dry

N-Control limit not met
NA-Not Applicable, Analyte Not Spiked
Control Limits: 80-120%

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS **Sample ID: METHOD BLANK**

Lab Sample ID: ZP35MB
LIMS ID: 14-27577
Matrix: Soil
Data Release Authorized:
Reported: 12/30/14

QC Report No: ZP35-Geoengineers
Project: Gas Works Park-Play Area Investigat
0186-846-01 Task 1570
Date Sampled: NA
Date Received: NA

Percent Total Solids: NA

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	DL	LOQ	mg/kg	Q
3050B	12/23/14	6010C	12/29/14	7440-38-2	Arsenic	0.46	5	5	U

U-Analyte undetected at given DL
J-Analyte detected between DL and LOQ
DL-Method Detection Limit

Results reported below the LOQ are for statistical purposes only and have not been evaluated by either an analyst or data reviewer.

Calibration Verification

ANALYTICAL RESOURCES INCORPORATED

CLIENT: Geoengineers

PROJECT: Gas Works Park-Play

UNITS: ug/L

SDG: ZP35

ANALYTE	EL	M	RUN	ICVTV	ICV	%R	CCVTV	CCV1	%R	CCV2	%R	CCV3	%R	CCV4	%R	CCV5	%R
Arsenic	AS	ICP	IP122971	2000.0	2046.13	**102.3**	2000.0	2031.70	**101.6**	2021.54	**101.1**	2098.61	**104.9**	2122.52	**106.1**	2127.04	**106.4**

Control Limits: Mercury 80-120; Other Metals 90-110

FORM II (1)

ZP35 : 999993

Calibration Verification

ANALYTICAL RESOURCES INCORPORATED

CLIENT: Geoengineers

PROJECT: Gas Works Park-Play

UNITS: ug/L

SDG: ZP35

ANALYTE	EL	M	RUN	CCVTV	CCV6	%R	CCV7	%R	CCV8	%R	CCV9	%R	CCV10	%R	CCV11	%R
Arsenic	AS	ICP	IP122971	2000.0	2148.74	107.4										

Control Limits: Mercury 80-120; Other Metals 90-110

CRDL Standard

ANALYTICAL RESOURCES INCORPORATED

CLIENT: Geoengineers

PROJECT: Gas Works Park-Play

SDG: ZP35

UNITS: ug/L

ANALYTE	EL	M	RUN	CRA/I	TV	CR-1	%R	CR-2	%R	CR-3	%R	CR-4	%R	CR-5	%R	CR-6	%R
Arsenic	AS	ICP	IP122971		50.0	50.05	**100.1**										

Control Limits: no control limits have been established by the EPA at this time.

Calibration Blanks

ANALYTICAL RESOURCES INCORPORATED

CLIENT: Geoengineers

PROJECT: Gas Works Park-Play

SDG: ZP35

UNITS: ug/L

ANALYTE	EL	METH	RUN	CRDL	IDL	ICB	C	CCB1	C	CCB2	C	CCB3	C	CCB4	C	CCB5	C
Arsenic	AS	ICP	IP122971	10.0	50.0	50.0	U	50.0	U	50.0	U	50.0	U	50.0	U	50.0	U

ZP35 : 999995

Calibration Blanks

ANALYTICAL RESOURCES INCORPORATED

CLIENT: Geoengineers

PROJECT: Gas Works Park-Play

UNITS:ug/L

SDG: ZP35

ANALYTE	EL	METH	RUN	CRDL	IDL	CCB6	C	CCB7	C	CCB8	C	CCB9	C	CCB10	C	CCB11	C
Arsenic	AS	ICP	IP122971	10.0	50.0	50.0	U										

ICP Interference Check Sample

ANALYTICAL RESOURCES INCORPORATED

CLIENT: Geoengineers

ICS SOURCE: I.V.

PROJECT: Gas Works Park-Play

RUNID: IP122971

SDG: ZP35

INSTRUMENT ID: OPTIMA ICP 2

UNITS: ug/L

ANALYTE	ICSA TV	ICSAB TV	ICSA1	ICSAB1	%R	ICSA2	ICSAB2	%R	ICSA3	ICSAB3	%R
Aluminum	200000	200000	205572.8	211758.7	**105.9**						
Antimony		1000	16.6	1069.0	**106.9**						
Arsenic		1000	18.7	1067.1	**106.7**						
Barium		1000	-3.2	1025.0	**102.5**						
Beryllium		1000	0.1	1017.4	**101.7**						
Boron			-3.6	-4.4							
Cadmium		1000	0.9	1021.4	**102.1**						
Calcium	100000	100000	103567.3	103318.8	**103.3**						
Chromium		1000	-0.5	1033.1	**103.3**						
Cobalt		1000	2.1	970.3	**97.0**						
Copper		1000	0.1	1059.9	**106.0**						
Iron	200000	200000	202170.5	208089.7	**104.0**						
Lead		1000	-11.7	1012.0	**101.2**						
Magnesium	100000	100000	106670.6	105141.9	**105.1**						
Manganese		1000	0.0	968.3	**96.8**						
Molybdenum			3.2	2.9							
Nickel		1000	0.3	1006.1	**100.6**						
Potassium			-18.4	-26.3							
Selenium		1000	32.4	1083.4	**108.3**						
Silicon			1.3	3.0							
Silver		1000	-1.1	1115.0	**111.5**						
Sodium			-68.8	-72.5							
Strontium			3.0	3.0							
Thallium		1000	0.9	971.9	**97.2**						
Tin			-16.9	-20.3							
Titanium			1.3	1.9							
Vanadium		1000	-2.3	990.0	**99.0**						
Zinc		1000	3.5	990.4	**99.0**						

IDLs and ICP Linear Ranges

ANALYTICAL RESOURCES INCORPORATED

CLIENT: Geoengineers

PROJECT: Gas Works Park-Play

SDG: ZP35 UNITS: ug/L

ANALYTE	EL	METH	INSTRUMENT	WAVELENTH (nm)	GFA BACK-GROUND	CLP CRDL	RL	RL DATE	ICP LINEAR RANGE (ug/L)	ICP LR DATE
Arsenic	AS	ICP	OPTIMA ICP 2	197.20		10	50.0	4/1/2012	30000.0	6/10/2014

ICP Interelement Correction Factors

ANALYTICAL RESOURCES INCORPORATED

CLIENT: Geoengineers

PROJECT: Gas Works Park-Play

IEC DATE: 10/27/2014

SDG: ZP35

INSTRUMENT ID: OPTIMA ICP 2

ANALYTE	WAVELENGTH	AL	AS	BA	BE	CA	CD	CO	CR	CU	FE
Aluminum	308.22	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Antimony	206.84	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	14.0198100	0.0000000	0.0000000
Arsenic	188.98	0.0000000	0.0000000	0.0000000	0.0000000	0.0764100	0.0000000	-1.0860250	1.6016350	0.0000000	0.0000000
Barium	233.53	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	-0.1911190	0.0000000	0.0000000	0.1532030
Beryllium	313.04	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0098370	0.0000000	0.0000000
Boron	249.67	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	2.1785010	0.0000000	0.0000000	0.0000000
Cadmium	228.80	0.0000000	5.7686950	0.0000000	0.0000000	0.0000000	0.0000000	0.1134910	0.0000000	0.0000000	0.0000000
Calcium	317.93	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Chromium	267.72	0.0000000	0.0000000	0.0000000	0.0000000	0.0105610	0.0000000	0.0000000	0.0000000	0.0000000	-0.0413720
Cobalt	228.62	0.0000000	0.0000000	0.0853470	0.0000000	0.0000000	0.0000000	0.0000000	-0.0421260	0.0000000	0.0000000
Copper	324.75	0.0000000	0.0000000	0.0000000	0.0000000	0.0021980	0.0000000	-0.1622490	-0.0152760	0.0000000	-0.0447290
Iron	273.96	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	-0.9508650	0.0000000	0.0000000
Lead	220.35	-0.2096680	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	-1.7516130	1.5325290	0.0499030
Magnesium	279.08	0.0000000	0.0000000	0.0000000	0.0000000	0.1119060	0.0000000	-1.6746270	-1.1710960	0.0000000	0.6610200
Manganese	257.61	0.0060150	0.0000000	0.0000000	0.0000000	0.0041750	0.0000000	0.0137770	0.0000000	0.0000000	-0.0046620
Molybdenum	202.03	0.0000000	0.0000000	0.0000000	0.0000000	0.0156160	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Nickel	231.60	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Potassium	766.49	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Selenium	196.03	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.5290750	0.0000000	0.0000000	0.0000000
Silicon	288.16	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	-3.5634780	0.0000000	-0.5863590	0.0000000	0.0000000
Silver	328.07	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Sodium	589.59	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Thallium	190.80	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	6.1573050	0.4310930	0.0000000	-0.1254120
Tin	189.93	0.0000000	0.0000000	0.0000000	0.0000000	-0.1475120	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Titanium	334.90	0.0000000	0.0000000	0.0000000	0.0000000	0.0797880	0.0000000	0.0000000	0.1965610	0.0000000	0.0000000
Vanadium	292.40	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	-3.7864850	0.0000000	0.0538250
Zinc	206.20	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000

ZP35 : 551695

ICP Interelement Correction Factors

ANALYTICAL RESOURCES INCORPORATED

CLIENT: Geoengineers

PROJECT: Gas Works Park-Play

IEC DATE: 10/27/2014

SDG: ZP35

INSTRUMENT ID: OPTIMA ICP 2

ANALYTE	WAVELENGTH	MG	MN	MO	NI	PB	SB	TI	TL	V	ZN
Aluminum	308.22	0.0000000	0.0000000	15.2105350	0.0000000	0.0000000	0.0000000	1.9181250	0.0000000	14.9692830	0.0000000
Antimony	206.84	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	-0.6574750	0.0000000	-4.0497020	0.0000000
Arsenic	188.98	0.0000000	0.0000000	3.6569730	0.0000000	0.0000000	0.0000000	-26.2017890	0.0000000	0.0000000	0.0000000
Barium	233.53	0.0000000	0.0000000	0.0000000	0.1112510	0.0000000	0.0000000	0.0000000	0.0000000	0.2137080	0.0000000
Beryllium	313.04	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0122940	0.0000000	0.2849470	0.0000000
Boron	249.67	0.0000000	0.0000000	-1.1347080	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Cadmium	228.80	0.0000000	0.0000000	0.0000000	-0.9151470	0.0000000	0.0000000	0.0000000	0.0000000	0.0642140	0.0000000
Calcium	317.93	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Chromium	267.72	0.1073910	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.3457620	0.0000000
Cobalt	228.62	0.0000000	0.0000000	-0.1331780	0.1621790	0.0000000	0.0000000	1.7359160	0.0000000	0.0000000	0.0000000
Copper	324.75	0.0055170	0.0000000	0.3194440	0.0000000	0.0000000	0.0000000	0.1761040	0.0000000	0.0000000	0.0000000
Iron	273.96	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	7.5009230	0.0000000
Lead	220.35	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Magnesium	279.08	0.0000000	0.0000000	-5.2575470	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Manganese	257.61	0.0000000	0.0000000	0.0000000	0.0000000	-0.1944900	0.0000000	0.0000000	0.0000000	-0.0205160	0.0000000
Molybdenum	202.03	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Nickel	231.60	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	-0.5357680	0.0000000	0.4509940	0.0000000	0.0000000
Potassium	766.49	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Selenium	196.03	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.6217450	0.0000000
Silicon	288.16	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Silver	328.07	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	-0.2780320	0.0000000
Sodium	589.59	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	257.1408130	0.0000000	0.0000000	281.4212140
Thallium	190.80	0.0000000	0.0000000	-1.4387970	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	3.7649150	0.0000000
Tin	189.93	0.0000000	0.0000000	0.0000000	0.0000000	-0.0427690	-0.5371860	-0.2280960	0.0000000	0.0000000	0.0000000
Titanium	334.90	0.0000000	0.0000000	0.9643590	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Vanadium	292.40	0.0000000	-0.1516390	-0.4437580	0.0000000	0.0000000	0.0000000	0.5348410	0.0000000	0.0000000	0.0000000
Zinc	206.20	0.0000000	0.0000000	0.2610130	0.0000000	-0.0494060	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000

Preparation Log

ANALYTICAL RESOURCES INCORPORATED

CLIENT: Geoengineers

PROJECT: Gas Works Park-Play

SDG: ZP35

ANALYSIS METHOD: ICP

ARI PREP CODE: SWC

PREPDATE: 12/23/2014

CLIENT ID	ARI ID	MASS (g)	INITIAL VOLUME (mL)	FINAL VOLUME (mL)
PAI-2-12.5-13.0	ZP35A	1.026	0.0	50.0
PAI-2-12.5-13.0D	ZP35ADUP	1.027	0.0	50.0
PAI-2-12.5-13.0S	ZP35ASPK	1.024	0.0	50.0
PAI-9-9.5-10.0	ZP35C	1.079	0.0	50.0
PBS	ZP35MB1	1.000	0.0	50.0
LCSS	ZP35MB1SPK	1.000	0.0	50.0

Analysis Run Log

ANALYTICAL RESOURCES INCORPORATED

CLIENT: Geoengineers

PROJECT: Gas Works Park-Play | INSTRUMENT ID: OPTIMA ICP 2 | START DATE: 12/29/2014

SDG: ZP35 | RUNID: IP122971 | METHOD: ICP | END DATE: 12/29/2014

CLIENT ID	ARI ID	DIL.	TIME	%R	AG	AL	AS	B	BA	BE	CA	CD	CO	CR	CU	FE	HG	K	MG	MN	MO	NA	NI	PB	SB	SE	SI	SN	TI	TL	U	V	ZN
S0	S0	1.00	09561				X																										
S2	S2	1.00	10003																														
S3	S3	1.00	10023				X																										
S4	S4	1.00	10050																														
S5	S5	1.00	10072																														
ICV	ICV	1.00	10225				X																										
ICB	ICB	1.00	10270				X																										
CRI	CRII	1.00	10311				X																										
ICSA	ICSAI	1.00	10353				X																										
ICSAB	ICSABI	1.00	10394				X																										
CCV	CCV1	1.00	10452				X																										
CCB	CCB1	1.00	10493				X																										
ZZZZZZ	DICHECK	1.00	10534																														
ZZZZZZ	ZQ14MB2	1.00	10580																														
ZZZZZZ	ZQ14EDUP	1.00	11021																														
ZZZZZZ	ZQ14E	1.00	11063																														
ZZZZZZ	ZQ14ESPK	1.00	11104																														
ZZZZZZ	ZP65B	2.00	11144																														
ZZZZZZ	ZP65H	2.00	11191																														
ZZZZZZ	ZQ14B	2.00	11235																														
ZZZZZZ	ZQ14C	2.00	11275																														
ZZZZZZ	ZQ14MB2SPK	1.00	11315																														
CCV	CCV2	1.00	11355				X																										
CCB	CCB2	1.00	11395				X																										
ZZZZZZ	ZQ14MB1	2.00	11441																														
ZZZZZZ	ZQ14ADUP	2.00	11482																														
ZZZZZZ	ZQ14A	2.00	11523																														
ZZZZZZ	ZQ14ASPK	2.00	11563																														
ZZZZZZ	ZQ14D	2.00	12003																														
ZZZZZZ	ZP11A	2.00	12043																														
ZZZZZZ	ZP11B	2.00	12090																														
ZZZZZZ	ZP11C	2.00	12130																														
ZZZZZZ	ZP11D	2.00	12170																														
ZZZZZZ	ZQ14MB1SPK	2.00	12213																														
CCV	CCV3	1.00	12253				X																										

FORM XIV

ZP35 : 901453

Analysis Run Log

ANALYTICAL RESOURCES INCORPORATED

CLIENT: Geoengineers

PROJECT: Gas Works Park-Play | INSTRUMENT ID: OPTIMA ICP 2 | START DATE: 12/29/2014

SDG: ZP35 | RUNID: IP122971 | METHOD: ICP | END DATE: 12/29/2014

CLIENT ID	ARI ID	DIL.	TIME	%R	AG	AL	AS	B	BA	BE	CA	CD	CO	CR	CU	FE	HG	K	MG	MN	MO	NA	NI	PB	SB	SE	SI	SN	TI	TL	U	V	ZN
CCB	CCB3	1.00	12293				X																										
ZZZZZZ	ZP06MB1	2.00	12335																														
ZZZZZZ	ZP06ADUP	2.00	12383																														
ZZZZZZ	ZP06A	2.00	12425																														
ZZZZZZ	ZP06ASPK	2.00	12471																														
ZZZZZZ	ZP11E	2.00	12513																														
ZZZZZZ	ZP11F	2.00	12555																														
ZZZZZZ	ZP11G	2.00	12595																														
ZZZZZZ	ZP11H	2.00	13040																														
ZZZZZZ	ZP11I	2.00	13080																														
ZZZZZZ	ZP06MB1SPK	2.00	13120																														
CCV	CCV4	1.00	13160				X																										
CCB	CCB4	1.00	13201				X																										
ZZZZZZ	ZP06MB1	2.00	13242																														
PBS	ZP35MB1	2.00	13284				X																										
ZZZZZZ	ZP11J	2.00	13325																														
PAI-9-9.5-10.0	ZP35C	2.00	13365				X																										
PAI-2-12.5-13.0D	ZP35ADUP	2.00	13405																														
PAI-2-12.5-13.0	ZP35A	2.00	13453																														
PAI-2-12.5-13.0S	ZP35ASPK	2.00	13501																														
ZZZZZZ	ZP11A	5.00	13544																														
ZZZZZZ	ZP11D	5.00	13585																														
LCSS	ZP35MB1SPK	2.00	14031				X																										
CCV	CCV5	1.00	14071				X																										
CCB	CCB5	1.00	14111				X																										
ZZZZZZ	ZP06ADUP	5.00	14153																														
ZZZZZZ	ZP06A	5.00	14195																														
ZZZZZZ	ZP06ASPK	5.00	14240																														
ZZZZZZ	ZP11H	5.00	14282																														
PAI-2-12.5-13.0D	ZP35ADUP	5.00	14322				X																										
PAI-2-12.5-13.0	ZP35A	5.00	14365				X																										
PAI-2-12.5-13.0S	ZP35ASPK	5.00	14412				X																										
ZZZZZZ	ZP16C	5.00	14454																														
ZZZZZZ	ZP16E	5.00	14500																														
CCV	CCV6	1.00	14542				X																										

FORM XIV

ZP35 : 90191

Analysis Run Log

ANALYTICAL RESOURCES INCORPORATED

CLIENT: Geoengineers

PROJECT: Gas Works Park-Play | INSTRUMENT ID: OPTIMA ICP 2 | START DATE: 12/29/2014

SDG: ZP35 | RUNID: IP122971 | METHOD: ICP | END DATE: 12/29/2014

CLIENT ID	ARI ID	DIL.	TIME	%R	AG	AL	AS	B	BA	BE	CA	CD	CO	CR	CU	FE	HG	K	MG	MN	MO	NA	NI	PB	SB	SE	SI	SN	TI	TL	U	V	ZN
CCB	CCB6	1.00	14582				X																										

ZP35 : 901405

Total Solids

ARI Job ID: ZP35

Extractions Total Solids-extts
Data By: Susan D. Dunnihoo
Created: 12/18/14

Worklist: 2601
Analyst: SDRD
Comments:

Oven ID:_____

Balance ID:_____

Samples In: Date:_____ Time:_____ Temp:_____ Analyst:_____

Samples Out: Date:_____ Time:_____ Temp:_____ Analyst:_____

	ARI ID CLIENT ID	Tare Wt (g)	Wet Wt (g)	Dry Wt (g)	% TS	Dcnt	5g	10g	12.5g
1.	ZP35B 14-27576 PAI-2-18.0-18.5	1.18	9.08	6.65	69.2	No	7.23	14.45	18.06
2.	ZP35D 14-27578 PAI-10-29.5-30.0	1.20	10.49	9.77	92.2	No	5.42	10.85	13.56
3.	ZP35E 14-27579 PAI-12-19.5-20.0	1.19	9.88	7.41	71.6	No	6.98	13.97	17.46

Extractions Total Solids-extts
Data By: Susan D. Dunnihoo
Created: 12/18/14

Worklist: 2601
Analyst: SDRD
Comments:

Oven ID: 615

Balance ID: B33470 5934

Samples In: Date: 12/19/14 Time: 14:47 Temp: 102 Analyst: TH

Samples Out: Date: 12/21/14 Time: 14:35 Temp: 105 Analyst: TH

	ARI ID / CLIENT ID	Tare Wt (g)	Wet Wt (g)	Dry Wt (g)	% TS	Dcnt	5g	10g	12.5g
1.	ZP35B 14-27576 PAI-2-18.0-18.5	1.18	9.08	~~6.65~~ 6.65		No			
2.	ZP35D 14-27578 PAI-10-29.5-30.0	1.20	10.49	9.77		No			
3.	ZP35E 14-27579 PAI-12-19.5-20.0	1.19	9.88	7.41		No			

Solids Data Entry Report Checked by: CB Date: 12/23/14
Date: 12/23/14 Data Analyst: DM

Solids Determination performed on 12/22/14 by DM

JOB	SAMPLE	CLIENTID	TAREWEIGHT	SAMPDISH	DRYWEIGHT	SOLIDS
ZP35	A	PAI-2-12.5-13.0	1.042	10.426	6.380	56.88
ZP35	C	PAI-9-9.5-10.0	1.013	10.786	9.721	89.10

Analytical Resources, Incorporated
Analytical Chemists and Consultants

Total Solids Bench Sheet

Laboratory Section: Metals

Oven Identification: 07 Balance ID: 068755

Samples in Oven: Date: 12-22-19 Time: 1340 Temp: 105°C Analyst: DM

Removed from Oven: Date: 12-23-19 Time: 0635 Temp: 104°C Analyst: DM

ARI Sample ID		Tare Weight (g)	Tare + Sample Wet (g)	Tare + Sample Dry (g)	Date & Time Last Weight	Final Weighting >12 hrs[1]
ZP14	A	0.974	10.557	9.361	—	✓
"	B	1.029	10.390	9.864	—	✓
"	C	1.045	10.690	10.025	—	✓
"	D	1.049	10.727	10.038	—	✓
ZP96	A	1.011	5.918	1.884	—	✓
ZP35	A	1.042	10.426	6.380	—	✓
"	C	1.013	10.786	9.721	—	✓
ZP16	A	1.019	10.177	8.635	—	✓
"	B	1.010	10.041	8.436	—	✓
"	C	1.002	10.597	6.866	—	✓
"	E	0.979	10.129	6.318	—	✓
"	I	1.012	10.142	8.446	—	✓
ZP06	A	0.997	10.545	7.063	—	✓
ZP11	A	1.049	10.848	7.924	—	✓
"	B	0.989	10.831	7.615	—	✓
"	C	1.019	10.500	8.671	—	✓
"	D	1.022	10.407	6.775	—	✓
"	E	0.981	10.717	8.184	—	✓
"	F	1.068	10.351	9.475	—	✓
"	G	1.052	10.299	9.191	—	✓
"	H	1.012	10.218	8.563	—	✓
"	I	1.058	10.241	9.220	—	✓
"	J	1.022	10.533	9.534	—	✓

1) Place a check mark in this column if samples have dried > 12 but < 24 hours. When samples have been at 104°C < 12 hours, constant weight must be verified as described in SOP 10023S. Use a 2nd bench sheet for additional weightings.

Volatile Raw Data
Preparation Log

ARI Job ID: ZP35

Analytical Resources, Incorporated
Analytical Chemists and Consultants

VOA Method 5035 Extraction Bench Sheet

(8260C, 8260C-SIM, 8021B, NWTPH-Gx, AK-101, TPH-G, VPH, TCLP-ZHE)

ARI Project No.	Client ID	Prep/Extraction Date	MeOH Lot No.	Analyst
ZP35		12/19/14		

	Lab ID	Vial No.	Preservative			Method 5035 Sample Weight					Comments
			$NaHSO_3$	CH_3OH	Lot #	Vial Weight (g)	Tare (from vial) (g)	Sample Weight (g)	Extract Volume (mL)	MeOH Spilt Volume (µL)	
1	ZP35B	1		–	DJ279	31.07	28.587	2.563	5mL	100µL	
2	D	1		–	L	33.40	28.675	4.725	↓	↓	
3	↓			–				5.06	↓	5mL	
4											
5											
6											
7											
8											
9											
10											
11											
12											
13											
14											
15											
16											
17											
18											
19											
20											
21											
22											
23											
					Balance ID:						

ZP35 : 091112

Analytical Resources, Incorporated
Analytical Chemists and Consultants

January 16, 2015

Zanna Satterwhite
GeoEngineers, Inc.
Plaza 600 Building
600 Stewart Street, Suite 1700
Seattle, WA 98101

RE: Client Project: Gas Works Park-Play Area Investigation, 0186-846-01 Task 1520
ARI Job No.: ZR94

Dear Zanna:

Please find enclosed the Chain of Custody record (COC), sample receipt documentation, and the final data package for samples from the project referenced above.

Sample receipt and details of these analyses are discussed in the Case Narrative.

An electronic copy of this package will remain on file with ARI. Should you have any questions or problems, please feel free to contact me at your convenience.

Sincerely,

ANALYTICAL RESOURCES, INC.

Cheronne Oreiro
Project Manager
(206) 695-6214
cheronneo@arilabs.com
www.arilabs.com

cc: eFile: ZR94

Enclosures

4611 South 134th Place, Suite 100 • Tukwila WA 98168 • **206-695-6200** • **206-695-6201** fax

Chain of Custody Documentation

ARI Job ID: ZR94

Chain of Custody Record & Laboratory Analysis Request

ARI Assigned Number: 2P15	Turn-around Requested:	Page: , of	
ARI Client Company: GeoEngineers	Phone: 206-239-3231	Date: 12/15/14	Ice Present? Y
Client Contact: Zanna Satterwhite		No. of Coolers: 2	Cooler Temps: 5.2 5.6
Client Project Name: Geo Works Park - Play Area Investigation			
Client Project #: 0186-846-01	Samplers: Robert Miyahara / Claudia DeLaVa		

Analytical Resources, Incorporated
Analytical Chemists and Consultants
4611 South 134th Place, Suite 100
Tukwila, WA 98168
206-695-6200 206-695-6201 (fax)
www.arilabs.com

Sample ID	Date	Time	Matrix	No. Containers	Analysis Requested	Notes/Comments
TRIP BLANK	12/15	—	Water	2		
MW-36D-141215	12/15	1000	Water	14		Ferrous Iron
MW-365-141215	12/15	1130	Water	14		Ferrous Iron

Comments/Special Instructions	Relinquished by: (Signature)	Received by: (Signature)	Relinquished by: (Signature)	Received by: (Signature)
	Printed Name: Hannah McDonough	Printed Name: A. Volgardsen	Printed Name:	Printed Name:
	Company: GeoEngineers	Company: ARI	Company:	Company:
	Date & Time: 12/15/14 @ 1350	Date & Time: 12/15/14 1350	Date & Time:	Date & Time:

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 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-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.

Analytical Resources, Incorporated
Analytical Chemists and Consultants

Cooler Receipt Form

ARI Client: GeoEngineers
Project Name: Gas Works Park - PAI
COC No(s): _____ (NA)
Delivered by: Fed-Ex UPS Courier Hand Delivered Other: _____
Assigned ARI Job No: ZP15
Tracking No: _____ (NA)

Preliminary Examination Phase:

Were intact, properly signed and dated custody seals attached to the outside of to cooler?	YES	(NO)
Were custody papers included with the cooler?	(YES)	NO
Were custody papers properly filled out (ink, signed, etc.)	(YES)	NO

Temperature of Cooler(s) (°C) (recommended 2.0-6.0 °C for chemistry) 5.2 5.6 ___ ___
Time: 1350
If cooler temperature is out of compliance fill out form 00070F
Temp Gun ID#: 90277952

Cooler Accepted by: AV Date: 12/15/14 Time: 1350

Complete custody forms and attach all shipping documents

Log-In Phase:

Was a temperature blank included in the cooler?		YES	(NO)
What kind of packing material was used? ... Bubble Wrap (Wet Ice) Gel Packs (Baggies) Foam Block Paper Other:			
Was sufficient ice used (if appropriate)?	NA	(YES)	NO
Were all bottles sealed in individual plastic bags?		YES	(NO)
Did all bottles arrive in good condition (unbroken)?		(YES)	NO
Were all bottle labels complete and legible?		(YES)	NO
Did the number of containers listed on COC match with the number of containers received?		(YES)	NO
Did all bottle labels and tags agree with custody papers?		(YES)	NO
Were all bottles used correct for the requested analyses?		(YES)	NO
Do any of the analyses (bottles) require preservation? (attach preservation sheet, excluding VOCs)...	NA	(YES)	NO
Were all VOC vials free of air bubbles?	NA	YES	(NO)
Was sufficient amount of sample sent in each bottle?		(YES)	NO
Date VOC Trip Blank was made at ARI	NA	12/1/14	

Was Sample Split by ARI : (NA) YES Date/Time: _____ Equipment: _____ Split by: _____

Samples Logged by: AV Date: 12/16/14 Time: 1250

*** Notify Project Manager of discrepancies or concerns ***

Sample ID on Bottle	Sample ID on COC	Sample ID on Bottle	Sample ID on COC

Additional Notes, Discrepancies, & Resolutions:

~~TB1 = MW-36S-14~~ TB1 = MW36D-141215 TB2 = MW-36S-141215
TB2 = LG MW-36D-141215 = 2LG Placed FF Sulfides on hold.
all other conv requests are FF.

By: AV Date: 12/16/14

Small Air Bubbles ~2mm	Peabubbles 2-4 mm	LARGE Air Bubbles > 4 mm
• • •	• • •	● ● ●

Small → "sm" (< 2 mm)
Peabubbles → "pb" (2 to < 4 mm)
Large → "lg" (4 to < 6 mm)
Headspace → "hs" (> 6 mm)

TOC + DOC requested on COC, no bottles received.

PRESERVATION VERIFICATION 12/16/14
Page 1 of 1

ANALYTICAL RESOURCES INCORPORATED

ARI Job No: **ZP15**

Inquiry Number: NONE
Analysis Requested: 12/16/14
Contact: Satterwhite, Zanna
Client: Geoengineers
Logged by: AV
Sample Set Used: Yes-481
Validatable Package: Lv4
Deliverables:

PC: Cheronne
VTSR: 12/15/14

Project #: 0186-846-01 Task 1520
Project: Gas Works Park-Paly Area Investigat
Sample Site:
SDG No:
Analytical Protocol: In-house

LOGNUM ARI ID	CLIENT ID	CN >12	WAD >12	NH3 <2	COD <2	FOG <2	MET <2	PHEN <2	PHOS <2	TKN <2	NO23 <2	TOC <2	S2 >9	TPHD <2	Fe2+ <2	DMET FLT	DOC FLT	PARAMETER	ADJUSTED TO	LOT NUMBER	AMOUNT ADDED	DATE/BY
14-27518 **ZP15A**	MW-36D-141215						DIS pass					Fail	** Fail		*	Y	N					
14-27519 **ZP15B**	MW-36S-141215						DIS pass					Fail	Fail		*	Y	N					

*Lab to determine ferrous iron preservation

** Sulfide preserved with ZnOAC, lab to adjust pH.

Checked By AV Date 12/16/14

ZP91 - 99999

Case Narrative, Data Qualifiers, Control Limits

ARI Job ID: ZR94

ANALYTICAL
RESOURCES
INCORPORATED

Case Narrative

Client: GeoEngineers, Inc.
Project: Gas Works Park-Play Area Investigation, 0186-846-01 Task 1520
ARI Job Nos.: ZO41 & ZO68

Sample Receipt

The preserved metals volume for one water sample was removed from archive on January 8, 2015. The preserved volume was analyzed for TSS in duplicate, as requested. The TSS filters were retained and digested for metals. For details regarding sample receipt, please refer to the Cooler Receipt Form.

Metals by SW6010C (Filters)

The sample and associated laboratory QC were digested and analyzed within method recommended holding times.

Iron was present in the filter blank at a level that was greater than the reporting limit. No corrective action was taken.

The duplicate RPD of iron was outside the control limit for the filter sample **MW-36D-141215**. All relevant data have been flagged with a "*" qualifier on the Form VI. No further corrective action was taken.

TSS by SM2540D

The water sample was prepared and analyzed outside the method recommended holding time of seven days.

The method blank was clean at the reporting limit. The LCS percent recovery was within control limits.

The replicate RPD was within control limits.

Sample ID Cross Reference Report

ANALYTICAL RESOURCES INCORPORATED

ARI Job No: ZR94
Client: Geoengineers
Project Event: 0186-846-01
Project Name: Gas Works Park-Play Area Investigat

	Sample ID	ARI Lab ID	ARI LIMS ID	Matrix	Sample Date/Time	VTSR
1.	MW-36D-141215	ZR94A	15-234	Water	12/15/14 10:00	12/15/14 13:50
2.	MW-36D-141215	ZR94B	15-235	Filter	12/15/14 10:00	12/15/14 13:50

Analytical Method Information

Analyte	MDL	Reporting Limit	Surrogate %R	Duplicate RPD	Matrix Spike %R	Matrix Spike RPD	Blank Spike / LCS %R	Blank Spike / LCS RPD
Met 6010C in Solid (EPA 6010C)								
Preservation: Cool <6°C								
Container: Glass WM, Clear, 4 oz		**Amount Required:** 100 g				**Hold Time:** 180 days		
Aluminum	0.757	5.00 mg/kg		20	75 - 125	20	80 - 120	20
Antimony	0.628	5.00 mg/kg		20	75 - 125	20	80 - 120	20
Arsenic	0.333	5.00 mg/kg		20	75 - 125	20	80 - 120	20
Barium	0.133	0.300 mg/kg		20	75 - 125	20	80 - 120	20
Beryllium	0.0160	0.100 mg/kg		20	75 - 125	20	80 - 120	20
Boron	0.739	2.00 mg/kg		20	75 - 125	20	80 - 120	20
Cadmium	0.0180	0.200 mg/kg		20	75 - 125	20	80 - 120	20
Calcium	1.13	5.00 mg/kg		20	75 - 125	20	80 - 120	20
Chromium	0.124	0.500 mg/kg		20	75 - 125	20	80 - 120	20
Cobalt	0.0270	0.300 mg/kg		20	75 - 125	20	80 - 120	20
Copper	0.0920	0.200 mg/kg		20	75 - 125	20	80 - 120	20
Iron	0.750	5.00 mg/kg		20	75 - 125	20	80 - 120	20
Lead	0.155	2.00 mg/kg		20	75 - 125	20	80 - 120	20
Magnesium	0.961	5.00 mg/kg		20	75 - 125	20	80 - 120	20
Manganese	0.0280	0.100 mg/kg		20	75 - 125	20	80 - 120	20
Molybdenum	0.0790	0.500 mg/kg		20	75 - 125	20	80 - 120	20
Nickel	0.386	1.00 mg/kg		20	75 - 125	20	80 - 120	20
Potassium	6.57	50.0 mg/kg		20	75 - 125	20	80 - 120	20
Selenium	0.499	5.00 mg/kg		20	75 - 125	20	80 - 120	20
Silver	0.0430	0.300 mg/kg		20	75 - 125	20	80 - 120	20
Sodium	1.14	50.0 mg/kg		20	75 - 125	20	80 - 120	20
Sodium-1	114	5000 mg/kg		20	75 - 125	20	80 - 120	20
Strontium	0.00900	0.100 mg/kg		20	75 - 125	20	80 - 120	20
Thallium	0.310	5.00 mg/kg		20	75 - 125	20	80 - 120	20
Tin	0.141	1.00 mg/kg		20	75 - 125	20	80 - 120	20
Titanium	0.211	0.500 mg/kg		20	75 - 125	20	80 - 120	20
Vanadium	0.0270	0.300 mg/kg		20	75 - 125	20	80 - 120	20
Zinc	0.145	1.00 mg/kg		20	75 - 125	20	80 - 120	20

Analytical Method Information

Analyte	MDL	Reporting Limit	Surrogate %R	Duplicate RPD	Matrix Spike %R	Matrix Spike RPD	Blank Spike / LCS %R	Blank Spike / LCS RPD
Solids, Total Suspended SM 2540 D-97 in Water (SM 2540 D-97)								
Preservation: Cool <6°C								
Container: HDPE NM, 1000 mL		**Amount Required:** 1000 mL				**Hold Time:** 7 days		
Suspended Solids		1.00 mg/L		20				

Metals Analysis
Report and Summary QC Forms

ARI Job ID: ZR94

Cover Page

INORGANIC ANALYSIS DATA PACKAGE

ANALYTICAL RESOURCES INCORPORATED

CLIENT: Geoengineers

PROJECT: Gas Works Park-Play

SDG: ZR94

CLIENT ID	ARI ID	ARI LIMS ID	REPREP
MW-36D-141215	ZR94B	15-235	
MW-36D-141215D	ZR94BDUP	15-235	
PBS	ZR94MB1	15-235	

Were ICP interelement corrections applied ?	Yes/No	YES
Were ICP background corrections applied ?	Yes/No	YES
If yes - were raw data generated before application of background corrections ?	Yes/No	NO

Comments: _____

THIS DATA PACKAGE HAS BEEN REVIEWED AND AUTHORIZED FOR RELEASE BY:

Signature: _____ Name: Jay Kuhn

Date: 1/14/15 Title: Inorganics Director

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS
Page 1 of 1

Sample ID: MW-36D-141215
SAMPLE

Lab Sample ID: ZR94B
LIMS ID: 15-235
Matrix: Filter
Data Release Authorized:
Reported: 01/14/15

QC Report No: ZR94-Geoengineers
Project: Gas Works Park-Play Area Investigat
0186-846-01
Date Sampled: 12/15/14
Date Received: 12/15/14

Percent Total Solids: NA

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	µg/Sample	Q
6010C	01/12/15	6010C	01/13/15	**7440-38-2**	**Arsenic**	20	**7,500**	
6010C	01/12/15	6010C	01/13/15	**7439-89-6**	**Iron**	20	**50**	

U-Analyte undetected at given RL
RL-Reporting Limit

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS

Sample ID: MW-36D-141215
DUPLICATE

Lab Sample ID: ZR94B
LIMS ID: 15-235
Matrix: Filter
Data Release Authorized:
Reported: 01/14/15

QC Report No: ZR94-Geoengineers
Project: Gas Works Park-Play Area Investigat
0186-846-01
Date Sampled: 12/15/14
Date Received: 12/15/14

MATRIX DUPLICATE QUALITY CONTROL REPORT

Analyte	Analysis Method	Sample	Duplicate	RPD	Control Limit	Q
Arsenic	6010C	7,500	7,640	1.8%	+/- 20%	
Iron	6010C	50	130	88.9%	+/- 20	L*

Reported in µg/Sample

*-Control Limit Not Met
L-RPD Invalid, Limit = Detection Limit

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS
Page 1 of 1

Sample ID: METHOD BLANK

Lab Sample ID: ZR94MB
LIMS ID: 15-235
Matrix: Filter
Data Release Authorized:
Reported: 01/14/15

QC Report No: ZR94-Geoengineers
Project: Gas Works Park-Play Area Investigat
0186-846-01
Date Sampled: NA
Date Received: NA

Percent Total Solids: NA

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	µg/Sample	Q
6010C	01/12/15	6010C	01/13/15	7440-38-2	Arsenic	2	2	U
6010C	01/12/15	6010C	01/13/15	**7439-89-6**	**Iron**	2	**47**	

U-Analyte undetected at given RL
RL-Reporting Limit

Calibration Verification

ANALYTICAL RESOURCES INCORPORATED

CLIENT: Geoengineers

PROJECT: Gas Works Park-Play

SDG: ZR94

UNITS: ug/L

ANALYTE	EL	M	RUN	ICVTV	ICV	%R	CCVTV	CCV1	%R	CCV2	%R	CCV3	%R	CCV4	%R	CCV5	%R
Arsenic	AS	ICP	IP011371	2000.0	2033.26	**101.7**	2000.0	2007.09	**100.4**	2059.02	**103.0**	2070.00	**103.5**	2066.19	**103.3**	2088.81	**104.4**
Iron	FE	ICP	IP011371	2000.0	2042.80	**102.1**	2000.0	2047.96	**102.4**	2043.03	**102.2**	2060.58	**103.0**	2073.09	**103.7**	2077.70	**103.9**

Control Limits: Mercury 80-120; Other Metals 90-110

Calibration Verification

ANALYTICAL RESOURCES INCORPORATED

CLIENT: Geoengineers

PROJECT: Gas Works Park-Play

UNITS: ug/L

SDG: ZR94

ANALYTE	EL	M	RUN	CCVTV	CCV6	%R	CCV7	%R	CCV8	%R	CCV9	%R	CCV10	%R	CCV11	%R
Arsenic	AS	ICP	IP011371	2000.0	2087.44	**104.4**										
Iron	FE	ICP	IP011371	2000.0	2085.69	**104.3**										

Control Limits: Mercury 80-120; Other Metals 90-110

CRDL Standard

ANALYTICAL RESOURCES INCORPORATED

CLIENT: Geoengineers

PROJECT: Gas Works Park-Play

UNITS: ug/L

SDG: ZR94

ANALYTE	EL	M	RUN	CRA/I	TV	CR-1	%R	CR-2	%R	CR-3	%R	CR-4	%R	CR-5	%R	CR-6	%R
Arsenic	AS	ICP	IP011371		50.0	50.12	**100.2**	53.24	**106.5**								
Iron	FE	ICP	IP011371		50.0	52.49	**105.0**	53.14	**106.3**								

Control Limits: no control limits have been established by the EPA at this time.

Calibration Blanks

ANALYTICAL RESOURCES INCORPORATED

CLIENT: Geoengineers

PROJECT: Gas Works Park-Play

SDG: ZR94

UNITS: ug/L

ANALYTE	EL	METH	RUN	CRDL	IDL	ICB	C	CCB1	C	CCB2	C	CCB3	C	CCB4	C	CCB5	C
Arsenic	AS	ICP	IP011371	10.0	50.0	50.0	U	50.0	U	50.0	U	50.0	U	50.0	U	50.0	U
Iron	FE	ICP	IP011371	100.0	50.0	50.0	U	50.0	U	50.0	U	50.0	U	50.0	U	50.0	U

Calibration Blanks

ANALYTICAL RESOURCES INCORPORATED

CLIENT: Geoengineers

PROJECT: Gas Works Park-Play

SDG: ZR94

UNITS:ug/L

ANALYTE	EL	METH	RUN	CRDL	IDL	CCB6	C	CCB7	C	CCB8	C	CCB9	C	CCB10	C	CCB11	C
Arsenic	AS	ICP	IP011371	10.0	50.0	50.0	U										
Iron	FE	ICP	IP011371	100.0	50.0	50.0	U										

ZR94:00920

ICP Interference Check Sample

ANALYTICAL RESOURCES INCORPORATED

CLIENT: Geoengineers

ICS SOURCE: I.V.

PROJECT: Gas Works Park-Play

RUNID: IP011371

SDG: ZR94

INSTRUMENT ID: OPTIMA ICP 2

UNITS: ug/L

ANALYTE	ICSA TV	ICSAB TV	ICSA1	ICSAB1	%R	ICSA2	ICSAB2	%R	ICSA3	ICSAB3	%R
Aluminum	200000	200000	200194.3	200788.3	**100.4**	203582.5	204001.6	**102.0**			
Antimony		1000	15.2	1050.1	**105.0**	16.3	1089.0	**108.9**			
Arsenic		1000	22.7	1043.1	**104.3**	22.5	1078.8	**107.9**			
Barium		1000	-3.2	1026.6	**102.7**	-2.8	1056.8	**105.7**			
Beryllium		1000	0.1	1008.2	**100.8**	0.1	1015.6	**101.6**			
Boron			-6.6	-4.1		-6.2	-5.6				
Cadmium		1000	0.6	1053.2	**105.3**	1.1	1068.1	**106.8**			
Calcium	100000	100000	101014.4	100804.5	**100.8**	102372.0	102295.0	**102.3**			
Chromium		1000	-1.9	1041.6	**104.2**	-2.3	1068.2	**106.8**			
Cobalt		1000	2.1	990.9	**99.1**	2.0	1018.7	**101.9**			
Copper		1000	0.5	1089.0	**108.9**	0.5	1102.7	**110.3**			
Iron	200000	200000	196967.1	197129.7	**98.6**	198859.7	200589.4	**100.3**			
Lead		1000	-10.0	991.9	**99.2**	-9.3	1023.3	**102.3**			
Magnesium	100000	100000	103068.5	99639.1	**99.6**	105581.2	101480.2	**101.5**			
Manganese		1000	0.4	979.2	**97.9**	0.6	996.7	**99.7**			
Molybdenum			2.2	2.4		2.1	2.2				
Nickel		1000	1.1	984.5	**98.5**	0.1	1012.2	**101.2**			
Potassium			-12.6	-2.7		0.4	-1.4				
Selenium		1000	29.4	1064.2	**106.4**	37.4	1095.0	**109.5**			
Silicon			12.7	6.5		10.5	6.7				
Silver		1000	-0.8	1084.5	**108.5**	-0.8	1102.4	**110.2**			
Sodium			6.3	4.5		8.5	10.1				
Strontium			3.0	2.9		3.0	3.0				
Thallium		1000	-3.2	944.5	**94.5**	-0.8	974.2	**97.4**			
Tin			-20.3	-21.9		-21.1	-21.6				
Titanium			0.7	0.5		1.1	0.6				
Vanadium		1000	-3.6	1005.4	**100.5**	-3.3	1022.0	**102.2**			
Zinc		1000	3.0	971.0	**97.1**	3.2	994.2	**99.4**			

ZR94 : 990921

IDLs and ICP Linear Ranges

ANALYTICAL RESOURCES INCORPORATED

CLIENT: Geoengineers

PROJECT: Gas Works Park-Play

SDG: ZR94 UNITS: ug/L

ANALYTE	EL	METH	INSTRUMENT	WAVELENTH (nm)	GFA BACK-GROUND	CLP CRDL	RL	RL DATE	ICP LINEAR RANGE (ug/L)	ICP LR DATE
Arsenic	AS	ICP	OPTIMA ICP 2	197.20		10	50.0	4/1/2012	30000.0	6/10/2014
Iron	FE	ICP	OPTIMA ICP 2	259.94		100	50.0	4/1/2012	250000.0	6/10/2014

ICP Interelement Correction Factors

ANALYTICAL RESOURCES INCORPORATED

CLIENT: Geoengineers

PROJECT: Gas Works Park-Play

IEC DATE: 10/27/2014

SDG: ZR94

INSTRUMENT ID: OPTIMA ICP 2

ANALYTE	WAVELENGTH	AL	AS	BA	BE	CA	CD	CO	CR	CU	FE
Aluminum	308.22	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Antimony	206.84	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	14.0198100	0.0000000	0.0000000
Arsenic	188.98	0.0000000	0.0000000	0.0000000	0.0000000	0.0764100	0.0000000	-1.0860250	1.6016350	0.0000000	0.0000000
Barium	233.53	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	-0.1911190	0.0000000	0.0000000	0.1532030
Beryllium	313.04	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0098370	0.0000000	0.0000000
Boron	249.67	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	2.1785010	0.0000000	0.0000000	0.0000000
Cadmium	228.80	0.0000000	5.7686950	0.0000000	0.0000000	0.0000000	0.0000000	0.1134910	0.0000000	0.0000000	0.0000000
Calcium	317.93	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Chromium	267.72	0.0000000	0.0000000	0.0000000	0.0000000	0.0105610	0.0000000	0.0000000	0.0000000	0.0000000	-0.0413720
Cobalt	228.62	0.0000000	0.0000000	0.0853470	0.0000000	0.0000000	0.0000000	0.0000000	-0.0421260	0.0000000	0.0000000
Copper	324.75	0.0000000	0.0000000	0.0000000	0.0000000	0.0021980	0.0000000	-0.1622490	-0.0152760	0.0000000	-0.0447290
Iron	273.96	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	-0.9508650	0.0000000	0.0000000
Lead	220.35	-0.2096680	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	-1.7516130	1.5325290	0.0499030
Magnesium	279.08	0.0000000	0.0000000	0.0000000	0.0000000	0.1119060	0.0000000	-1.6746270	-1.1710960	0.0000000	0.6610200
Manganese	257.61	0.0060150	0.0000000	0.0000000	0.0000000	0.0041750	0.0000000	0.0137770	0.0000000	0.0000000	-0.0046620
Molybdenum	202.03	0.0000000	0.0000000	0.0000000	0.0000000	0.0156160	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Nickel	231.60	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Potassium	766.49	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Selenium	196.03	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.5290750	0.0000000	0.0000000	0.0000000
Silicon	288.16	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	-3.5634780	0.0000000	-0.5863590	0.0000000	0.0000000
Silver	328.07	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Sodium	589.59	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Thallium	190.80	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	6.1573050	0.4310930	0.0000000	-0.1254120
Tin	189.93	0.0000000	0.0000000	0.0000000	0.0000000	-0.1475120	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Titanium	334.90	0.0000000	0.0000000	0.0000000	0.0000000	0.0797880	0.0000000	0.0000000	0.1965610	0.0000000	0.0000000
Vanadium	292.40	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	-3.7864850	0.0000000	0.0538250
Zinc	206.20	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000

ZR94h : 00023

ICP Interelement Correction Factors

ANALYTICAL RESOURCES INCORPORATED

CLIENT: Geoengineers

PROJECT: Gas Works Park-Play

IEC DATE: 10/27/2014

SDG: ZR94

INSTRUMENT ID: OPTIMA ICP 2

ANALYTE	WAVELENGTH	MG	MN	MO	NI	PB	SB	TI	TL	V	ZN
Aluminum	308.22	0.0000000	0.0000000	15.2105350	0.0000000	0.0000000	0.0000000	1.9181250	0.0000000	14.9692830	0.0000000
Antimony	206.84	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	-0.6574750	0.0000000	-4.0497020	0.0000000
Arsenic	188.98	0.0000000	0.0000000	3.6569730	0.0000000	0.0000000	0.0000000	-26.2017890	0.0000000	0.0000000	0.0000000
Barium	233.53	0.0000000	0.0000000	0.0000000	0.1112510	0.0000000	0.0000000	0.0000000	0.0000000	0.2137080	0.0000000
Beryllium	313.04	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0122940	0.0000000	0.2849470	0.0000000
Boron	249.67	0.0000000	0.0000000	-1.1347080	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Cadmium	228.80	0.0000000	0.0000000	0.0000000	-0.9151470	0.0000000	0.0000000	0.0000000	0.0000000	0.0642140	0.0000000
Calcium	317.93	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Chromium	267.72	0.1073910	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.3457620	0.0000000
Cobalt	228.62	0.0000000	0.0000000	-0.1331780	0.1621790	0.0000000	0.0000000	1.7359160	0.0000000	0.0000000	0.0000000
Copper	324.75	0.0055170	0.0000000	0.3194440	0.0000000	0.0000000	0.0000000	0.1761040	0.0000000	0.0000000	0.0000000
Iron	273.96	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	7.5009230	0.0000000
Lead	220.35	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Magnesium	279.08	0.0000000	0.0000000	-5.2575470	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Manganese	257.61	0.0000000	0.0000000	0.0000000	0.0000000	-0.1944900	0.0000000	0.0000000	0.0000000	-0.0205160	0.0000000
Molybdenum	202.03	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Nickel	231.60	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	-0.5357680	0.0000000	0.4509940	0.0000000	0.0000000
Potassium	766.49	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Selenium	196.03	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.6217450	0.0000000
Silicon	288.16	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Silver	328.07	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	-0.2780320	0.0000000
Sodium	589.59	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	257.1408130	0.0000000	0.0000000	281.4212140
Thallium	190.80	0.0000000	0.0000000	-1.4387970	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	3.7649150	0.0000000
Tin	189.93	0.0000000	0.0000000	0.0000000	0.0000000	-0.0427690	-0.5371860	-0.2280960	0.0000000	0.0000000	0.0000000
Titanium	334.90	0.0000000	0.0000000	0.9643590	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Vanadium	292.40	0.0000000	-0.1516390	-0.4437580	0.0000000	0.0000000	0.0000000	0.5348410	0.0000000	0.0000000	0.0000000
Zinc	206.20	0.0000000	0.0000000	0.2610130	0.0000000	-0.0494060	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000

ZR94 : 66952

Preparation Log

ANALYTICAL RESOURCES INCORPORATED

CLIENT: Geoengineers

PROJECT: Gas Works Park-Play

SDG: ZR94

ANALYSIS METHOD: ICP

ARI PREP CODE: PHN

PREPDATE: 1/12/2015

CLIENT ID	ARI ID	MASS (g)	INITIAL VOLUME (mL)	FINAL VOLUME (mL)
MW-36D-141215	ZR94B	1.000	0.0	50.0
MW-36D-141215D	ZR94BDUP	1.000	0.0	50.0
PBS	ZR94MB1	1.000	0.0	50.0

Analysis Run Log

ANALYTICAL RESOURCES INCORPORATED

CLIENT: Geoengineers

PROJECT: Gas Works Park-Play | INSTRUMENT ID: OPTIMA ICP 2 | START DATE: 1/13/2015

SDG: ZR94 | RUNID: IP011371 | METHOD: ICP | END DATE: 1/13/2015

CLIENT ID	ARI ID	DIL.	TIME	%R	AG	AL	AS	B	BA	BE	CA	CD	CO	CR	CU	FE	HG	K	MG	MN	MO	NA	NI	PB	SB	SE	SI	SN	TI	TL	U	V	ZN
S0	S0	1.00	08431				X									X																	
S2	S2	1.00	08473																														
S3	S3	1.00	08493				X																										
S4	S4	1.00	08520																														
S5	S5	1.00	08541													X																	
ICV	ICV	1.00	09003				X									X																	
ICB	ICB	1.00	09043				X									X																	
CRI	CRII	1.00	09085				X									X																	
ICSA	ICSAI	1.00	09131				X									X																	
ICSAB	ICSABI	1.00	09172				X									X																	
CCV	CCV1	1.00	09224				X									X																	
CCB	CCB1	1.00	09265				X									X																	
ZZZZZZ	ZR74MB2	1.00	09310																														
ZZZZZZ	ZR74G-L	5.00	09352																														
ZZZZZZ	ZR74G	1.00	09393																														
ZZZZZZ	ZR74GDUP	1.00	09435																														
ZZZZZZ	ZR74GSPK	1.00	09481																														
ZZZZZZ	ZR74H	1.00	09522																														
ZZZZZZ	ZR74I	1.00	09564																														
ZZZZZZ	ZR74B	2.00	10005																														
ZZZZZZ	ZR74C	2.00	10050																														
ZZZZZZ	ZR74MB2SPK	1.00	10090																														
CCV	CCV2	1.00	10130				X									X																	
CCB	CCB2	1.00	10170				X									X																	
ZZZZZZ	ZR74MB1	2.00	10212																														
ZZZZZZ	ZR74A-L	10.00	10253																														
ZZZZZZ	ZR74A	2.00	10295																														
ZZZZZZ	ZR74ADUP	2.00	10340																														
ZZZZZZ	ZR74ASPK	2.00	10380																														
ZZZZZZ	ZR74D	2.00	10420																														
ZZZZZZ	ZR74E	2.00	10460																														
ZZZZZZ	ZR74F	2.00	10500																														
ZZZZZZ	ZR74MB1SPK	2.00	10541																														
CCV	CCV3	1.00	10581				X									X																	
CCB	CCB3	1.00	11021				X									X																	

FORM XIV

ZR94 : 960926