



12065 Lebanon Rd.  
Mt. Juliet, TN 37122  
(615) 758-5858  
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Tax I.D. 62-0814289

Est. 1970

Robert Stockton  
Olsson Associates- Grand Junction, CO  
760 Horizon Drive, Ste 102  
Grand Junction, CO 81506

## Report Summary

Monday September 29, 2014

Report Number: L722683

Samples Received: 09/19/14

Client Project:

Description:

The analytical results in this report are based upon information supplied by you, the client, and are for your exclusive use. If you have any questions regarding this data package, please do not hesitate to call.

Entire Report Reviewed By:

Daphne Richards , ESC Representative

### Laboratory Certification Numbers

A2LA - 1461-01, AIHA - 100789, AL - 40660, CA - 01157CA, CT - PH-0197,  
FL - E87487, GA - 923, IN - C-TN-01, KY - 90010, KYUST - 0016,  
NC - ENV375/DW21704/BIO041, ND - R-140, NJ - TN002, NJ NELAP - TN002,  
SC - 84004, TN - 2006, VA - 460132, WV - 233, AZ - 0612,  
MN - 047-999-395, NY - 11742, WI - 998093910, NV - TN000032011-1,  
TX - T104704245-11-3, OK - 9915, PA - 68-02979, IA Lab #364, EPA - TN002

Accreditation is only applicable to the test methods specified on each scope of accreditation held by ESC Lab Sciences.

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# REPORT OF ANALYSIS

Robert Stockton  
Olsson Associates- Grand Junction,  
760 Horizon Drive, Ste 102  
Grand Junction, CO 81506

September 29, 2014

Date Received : September 19, 2014  
Description :  
Sample ID : POC PL 552  
Collected By : J. Surina  
Collection Date : 09/18/14 09:20

ESC Sample # : L722683-01

Site ID :

Project # :

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Chromium,Hexavalent	BDL	2.0	mg/kg	3060A/7196A	09/22/14	1
Chromium,Trivalent	7.9	2.0	mg/kg	Calc.	09/23/14	1
ORP	58.		mV	2580 B-2011	09/22/14	1
pH	8.6		su	9045D	09/24/14	1
Sodium Adsorption Ratio	1.1			Calc.	09/22/14	1
Specific Conductance	540		umhos/cm	9050AMod	09/25/14	1
Mercury	BDL	0.020	mg/kg	7471	09/22/14	1
Arsenic	5.0	2.0	mg/kg	6010B	09/22/14	1
Barium	200	0.50	mg/kg	6010B	09/22/14	1
Boron	16.	10.	mg/kg	6010B	09/22/14	1
Cadmium	BDL	0.50	mg/kg	6010B	09/22/14	1
Chromium	7.9	1.0	mg/kg	6010B	09/22/14	1
Copper	13.	2.0	mg/kg	6010B	09/22/14	1
Lead	13.	0.50	mg/kg	6010B	09/22/14	1
Nickel	14.	2.0	mg/kg	6010B	09/22/14	1
Selenium	2.1	2.0	mg/kg	6010B	09/22/14	1
Silver	BDL	1.0	mg/kg	6010B	09/25/14	1
Zinc	66.	5.0	mg/kg	6010B	09/22/14	1
Benzene	BDL	0.0025	mg/kg	8021	09/26/14	5
Toluene	BDL	0.025	mg/kg	8021	09/26/14	5
Ethylbenzene	BDL	0.0025	mg/kg	8021	09/26/14	5
Total Xylene	BDL	0.0075	mg/kg	8021	09/26/14	5
TPH (GC/FID) Low Fraction	BDL	0.50	mg/kg	8015	09/26/14	5
Surrogate Recovery-%						
a,a,a-Trifluorotoluene(FID)	97.1		% Rec.	8015	09/26/14	5
a,a,a-Trifluorotoluene(PID)	101.		% Rec.	8021	09/26/14	5
TPH (GC/FID) High Fraction	18.	4.0	mg/kg	3546/DRO	09/25/14	1
Surrogate recovery(%)						
o-Terphenyl	67.9		% Rec.	3546/DRO	09/25/14	1
Polynuclear Aromatic Hydrocarbons						
Anthracene	BDL	0.0060	mg/kg	8270C-SIM	09/24/14	1
Acenaphthene	BDL	0.0060	mg/kg	8270C-SIM	09/24/14	1
Acenaphthylene	BDL	0.0060	mg/kg	8270C-SIM	09/24/14	1
Benzo(a)anthracene	BDL	0.0060	mg/kg	8270C-SIM	09/24/14	1

BDL - Below Detection Limit  
Det. Limit - Practical Quantitation Limit(PQL)  
L722683-01 (PH) - 8.6@21.4c



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September 29, 2014

Date Received : September 19, 2014  
Description :

Sample ID : POC PL 552

Collected By : J. Surina  
Collection Date : 09/18/14 09:20

ESC Sample # : L722683-01

Site ID :

Project # :

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Benzo(a)pyrene	BDL	0.0060	mg/kg	8270C-SIM	09/24/14	1
Benzo(b)fluoranthene	BDL	0.0060	mg/kg	8270C-SIM	09/24/14	1
Benzo(g,h,i)perylene	BDL	0.0060	mg/kg	8270C-SIM	09/24/14	1
Benzo(k)fluoranthene	BDL	0.0060	mg/kg	8270C-SIM	09/24/14	1
Chrysene	BDL	0.0060	mg/kg	8270C-SIM	09/24/14	1
Dibenz(a,h)anthracene	BDL	0.0060	mg/kg	8270C-SIM	09/24/14	1
Fluoranthene	BDL	0.0060	mg/kg	8270C-SIM	09/24/14	1
Fluorene	BDL	0.0060	mg/kg	8270C-SIM	09/24/14	1
Indeno(1,2,3-cd)pyrene	BDL	0.0060	mg/kg	8270C-SIM	09/24/14	1
Naphthalene	BDL	0.020	mg/kg	8270C-SIM	09/24/14	1
Phenanthrene	BDL	0.0060	mg/kg	8270C-SIM	09/24/14	1
Pyrene	BDL	0.0060	mg/kg	8270C-SIM	09/24/14	1
1-Methylnaphthalene	BDL	0.020	mg/kg	8270C-SIM	09/24/14	1
2-Methylnaphthalene	BDL	0.020	mg/kg	8270C-SIM	09/24/14	1
2-Chloronaphthalene	BDL	0.020	mg/kg	8270C-SIM	09/24/14	1
Surrogate Recovery						
p-Terphenyl-d14	66.7		% Rec.	8270C-SIM	09/24/14	1
Nitrobenzene-d5	77.4		% Rec.	8270C-SIM	09/24/14	1
2-Fluorobiphenyl	71.7		% Rec.	8270C-SIM	09/24/14	1

BDL - Below Detection Limit

Det. Limit - Practical Quantitation Limit(PQL)

Note:

The reported analytical results relate only to the sample submitted.

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Reported: 09/29/14 17:33 Printed: 09/29/14 17:33  
L722683-01 (PH) - 8.6@21.4c

Attachment A  
List of Analytes with QC Qualifiers

Sample Number	Work Group	Sample Type	Analyte	Run ID	Qualifier
L722683-01	WG744268	SAMP	Boron	R2991953	J6
	WG744268	SAMP	Lead	R2991953	O1

Attachment B  
Explanation of QC Qualifier Codes

Qualifier	Meaning
J6	The sample matrix interfered with the ability to make any accurate determination; spike value is low
O1	(ESC) The analyte failed the method required serial dilution test and/or subsequent post-spike criteria. These failures indicate matrix interference.

Qualifier Report Information

ESC utilizes sample and result qualifiers as set forth by the EPA Contract Laboratory Program and as required by most certifying bodies including NELAC. In addition to the EPA qualifiers adopted by ESC, we have implemented ESC qualifiers to provide more information pertaining to our analytical results. Each qualifier is designated in the qualifier explanation as either EPA or ESC. Data qualifiers are intended to provide the ESC client with more detailed information concerning the potential bias of reported data. Because of the wide range of constituents and variety of matrices incorporated by most EPA methods, it is common for some compounds to fall outside of established ranges. These exceptions are evaluated and all reported data is valid and useable "unless qualified as 'R' (Rejected)."

Definitions

- Accuracy - The relationship of the observed value of a known sample to the true value of a known sample. Represented by percent recovery and relevant to samples such as: control samples, matrix spike recoveries, surrogate recoveries, etc.
- Precision - The agreement between a set of samples or between duplicate samples. Relates to how close together the results are and is represented by Relative Percent Difference.
- Surrogate - Organic compounds that are similar in chemical composition, extraction, and chromatography to analytes of interest. The surrogates are used to determine the probable response of the group of analytes that are chemically related to the surrogate compound. Surrogates are added to the sample and carried through all stages of preparation and analyses.
- TIC - Tentatively Identified Compound: Compounds detected in samples that are not target compounds, internal standards, system monitoring compounds, or surrogates.

Summary of Remarks For Samples Printed  
09/29/14 at 17:33:37

TSR Signing Reports: 288  
R5 - Desired TAT

Log all PAHs as PAHSIM.

Sample: L722683-01 Account: OLSSONCO Received: 09/19/14 09:00 Due Date: 09/26/14 00:00 RPT Date: 09/29/14 17:33



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Analyte	Result	Laboratory Blank		Limit	Batch	Date Analyzed
		Units	% Rec			
Mercury	< .02	mg/kg			WG744146	09/22/14 11:29
Chromium, Hexavalent	< 2	mg/kg			WG744201	09/22/14 15:21
Arsenic	< 2	mg/kg			WG744268	09/22/14 22:05
Barium	< .5	mg/kg			WG744268	09/22/14 22:05
Boron	< 10	mg/kg			WG744268	09/22/14 22:05
Cadmium	< .5	mg/kg			WG744268	09/22/14 22:05
Chromium	< 1	mg/kg			WG744268	09/22/14 22:05
Copper	< 2	mg/kg			WG744268	09/22/14 22:05
Lead	< .5	mg/kg			WG744268	09/22/14 22:05
Nickel	< 2	mg/kg			WG744268	09/22/14 22:05
Selenium	< 2	mg/kg			WG744268	09/22/14 22:05
Zinc	< 5	mg/kg			WG744268	09/22/14 22:05
Silver	< 1	mg/kg			WG744469	09/25/14 02:08
1-Methylnaphthalene	< .02	mg/kg			WG744400	09/24/14 11:52
2-Chloronaphthalene	< .02	mg/kg			WG744400	09/24/14 11:52
2-Methylnaphthalene	< .02	mg/kg			WG744400	09/24/14 11:52
Acenaphthene	< .006	mg/kg			WG744400	09/24/14 11:52
Acenaphthylene	< .006	mg/kg			WG744400	09/24/14 11:52
Anthracene	< .006	mg/kg			WG744400	09/24/14 11:52
Benzo(a)anthracene	< .006	mg/kg			WG744400	09/24/14 11:52
Benzo(a)pyrene	< .006	mg/kg			WG744400	09/24/14 11:52
Benzo(b)fluoranthene	< .006	mg/kg			WG744400	09/24/14 11:52
Benzo(g,h,i)perylene	< .006	mg/kg			WG744400	09/24/14 11:52
Benzo(k)fluoranthene	< .006	mg/kg			WG744400	09/24/14 11:52
Chrysene	< .006	mg/kg			WG744400	09/24/14 11:52
Dibenz(a,h)anthracene	< .006	mg/kg			WG744400	09/24/14 11:52
Fluoranthene	< .006	mg/kg			WG744400	09/24/14 11:52
Fluorene	< .006	mg/kg			WG744400	09/24/14 11:52
Indeno(1,2,3-cd)pyrene	< .006	mg/kg			WG744400	09/24/14 11:52
Naphthalene	< .02	mg/kg			WG744400	09/24/14 11:52
Phenanthrene	< .006	mg/kg			WG744400	09/24/14 11:52
Pyrene	< .006	mg/kg			WG744400	09/24/14 11:52
2-Fluorobiphenyl		% Rec.	74.20	38.2-135	WG744400	09/24/14 11:52
Nitrobenzene-d5		% Rec.	70.80	28.4-151	WG744400	09/24/14 11:52
p-Terphenyl-d14		% Rec.	72.40	34.2-141	WG744400	09/24/14 11:52
Specific Conductance	1.20	umhos/cm			WG744834	09/25/14 14:45
TPH (GC/FID) High Fraction	< 4	mg/kg			WG744609	09/25/14 15:56
o-Terphenyl		% Rec.	85.20	50-150	WG744609	09/25/14 15:56
Benzene	< .0005	mg/kg			WG745049	09/26/14 07:41
Ethylbenzene	< .0005	mg/kg			WG745049	09/26/14 07:41
Toluene	< .005	mg/kg			WG745049	09/26/14 07:41
TPH (GC/FID) Low Fraction	< .1	mg/kg			WG745049	09/26/14 07:41
Total Xylene	< .0015	mg/kg			WG745049	09/26/14 07:41
a,a,a-Trifluorotoluene(FID)		% Rec.	98.40	59-128	WG745049	09/26/14 07:41
a,a,a-Trifluorotoluene(PID)		% Rec.	103.0	54-144	WG745049	09/26/14 07:41

\* Performance of this Analyte is outside of established criteria.

For additional information, please see Attachment A 'List of Analytes with QC Qualifiers.'



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September 29, 2014

Analyte	Units	Result	Duplicate		RPD	Limit	Ref Samp	Batch
			Duplicate					
Mercury	mg/kg	0.0740	0.0403		59.0*	20	L722681-67	WG744146
ORP	mV	20.0	20.0		0.0	20	L722424-01	WG744131
Chromium,Hexavalent	mg/kg	0.0	0.0		0.0	20	L722683-01	WG744201
Chromium,Hexavalent	mg/kg	0.0	0.0		0.0	20	L722979-04	WG744201
pH	su	4.50	4.40		1.35*	1	L722451-01	WG744654
pH	su	8.60	8.60		0.580	1	L722979-04	WG744654
Specific Conductance	umhos/cm	2600	2600		0.772	20	L722434-01	WG744834
Specific Conductance	umhos/cm	2100	2100		0.957	20	L723447-02	WG744834

Analyte	Units	Laboratory Control Sample		% Rec	Limit	Batch
		Known Val	Result			
Mercury	mg/kg	12.4	9.34	75.0	71.6-128	WG744146
ORP	mV		110.	0.0*	90-20	WG744131
ORP	mV		110.	0.0*	90-20	WG744131
Chromium,Hexavalent	mg/kg	187	184.	98.4	80-120	WG744201
Arsenic	mg/kg	237	246.	104.	83.1-117	WG744268
Barium	mg/kg	252	250.	99.0	84.1-116	WG744268
Boron	mg/kg	118	108.	91.0	74-126	WG744268
Cadmium	mg/kg	191	199.	104.	83.2-117	WG744268
Chromium	mg/kg	128	129.	101.	81.3-118	WG744268
Copper	mg/kg	123	126.	102.	83.7-116	WG744268
Lead	mg/kg	103	106.	103.	83.1-117	WG744268
Nickel	mg/kg	118	118.	100.	82-118	WG744268
Selenium	mg/kg	110	115.	105.	78.7-122	WG744268
Zinc	mg/kg	183	182.	99.0	82-118	WG744268
pH	su	6.33	6.30	99.5	98.3-101.7	WG744654
Silver	mg/kg	47.3	49.3	104.	66.2-134	WG744469
1-Methylnaphthalene	mg/kg	.08	0.0537	67.2	48.9-127	WG744400
2-Chloronaphthalene	mg/kg	.08	0.0587	73.4	48.8-125	WG744400
2-Methylnaphthalene	mg/kg	.08	0.0541	67.6	45.7-131	WG744400
Acenaphthene	mg/kg	.08	0.0560	70.0	48.7-127	WG744400
Acenaphthylene	mg/kg	.08	0.0511	63.9	47.9-128	WG744400
Anthracene	mg/kg	.08	0.0523	65.4	51.3-136	WG744400
Benzo(a)anthracene	mg/kg	.08	0.0589	73.6	55-126	WG744400
Benzo(a)pyrene	mg/kg	.08	0.0525	65.7	51.9-127	WG744400
Benzo(b)fluoranthene	mg/kg	.08	0.0573	71.6	54-125	WG744400
Benzo(g,h,i)perylene	mg/kg	.08	0.0525	65.6	53.8-136	WG744400
Benzo(k)fluoranthene	mg/kg	.08	0.0590	73.7	53.9-132	WG744400

\* Performance of this Analyte is outside of established criteria.

For additional information, please see Attachment A 'List of Analytes with QC Qualifiers.'





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September 29, 2014

Analyte	Units	Laboratory Control Sample		% Rec	Limit	Batch
		Known Val	Result			
Chrysene	mg/kg	.08	0.0583	72.8	55.7-133	WG744400
Dibenz(a,h)anthracene	mg/kg	.08	0.0533	66.6	52.6-137	WG744400
Fluoranthene	mg/kg	.08	0.0674	84.2	54-132	WG744400
Fluorene	mg/kg	.08	0.0580	72.5	48.7-127	WG744400
Indeno(1,2,3-cd)pyrene	mg/kg	.08	0.0525	65.6	53.8-138	WG744400
Naphthalene	mg/kg	.08	0.0515	64.4	42-127	WG744400
Phenanthrene	mg/kg	.08	0.0535	66.9	49.6-126	WG744400
Pyrene	mg/kg	.08	0.0530	66.3	54-129	WG744400
2-Fluorobiphenyl				77.20	38.2-135	WG744400
Nitrobenzene-d5				83.50	28.4-151	WG744400
p-Terphenyl-d14				74.20	34.2-141	WG744400
Specific Conductance	umhos/cm	1040	1000	96.2	85-115	WG744834
TPH (GC/FID) High Fraction	mg/kg	60	46.7	77.8	50-150	WG744609
o-Terphenyl				85.50	50-150	WG744609
Benzene	mg/kg	.05	0.0500	100.	70-130	WG745049
Ethylbenzene	mg/kg	.05	0.0513	103.	70-130	WG745049
Toluene	mg/kg	.05	0.0511	102.	70-130	WG745049
Total Xylene	mg/kg	.15	0.155	103.	70-130	WG745049
a,a,a-Trifluorotoluene(PID)				102.0	54-144	WG745049
TPH (GC/FID) Low Fraction	mg/kg	5.5	4.77	86.7	63.5-137	WG745049
a,a,a-Trifluorotoluene(FID)				98.10	59-128	WG745049

Analyte	Units	Laboratory Control Sample Duplicate			Limit	RPD	Limit	Batch
		Result	Ref	%Rec				
ORP	mV	100.	110.	10000*	-20	9.52	20	WG744131
ORP	mV	100.	110.	10000*	-20	9.52	20	WG744131
Chromium, Hexavalent	mg/kg	184.	184.	98.0	80-120	0.0	20	WG744201
Arsenic	mg/kg	233.	246.	98.0	83.1-117	5.00	20	WG744268
Barium	mg/kg	235.	250.	93.0	84.1-116	6.00	20	WG744268
Boron	mg/kg	102.	108.	86.0	74-126	5.00	20	WG744268
Cadmium	mg/kg	189.	199.	99.0	83.2-117	5.00	20	WG744268
Chromium	mg/kg	122.	129.	96.0	81.3-118	5.00	20	WG744268
Copper	mg/kg	119.	126.	96.0	83.7-116	6.00	20	WG744268
Lead	mg/kg	99.0	106.	96.0	83.1-117	7.00	20	WG744268
Nickel	mg/kg	113.	118.	96.0	82-118	5.00	20	WG744268
Selenium	mg/kg	107.	115.	97.0	78.7-122	7.00	20	WG744268
Zinc	mg/kg	170.	182.	93.0	82-118	6.00	20	WG744268
pH	su	6.30	6.30	100.	98.3-101.7	0.0	20	WG744654
Silver	mg/kg	48.6	49.3	103.	66.2-134	1.00	20	WG744469
1-Methylnaphthalene	mg/kg	0.0543	0.0537	68.0	48.9-127	1.09	20	WG744400
2-Chloronaphthalene	mg/kg	0.0595	0.0587	74.0	48.8-125	1.39	20	WG744400
2-Methylnaphthalene	mg/kg	0.0546	0.0541	68.0	45.7-131	0.900	20	WG744400

\* Performance of this Analyte is outside of established criteria.

For additional information, please see Attachment A 'List of Analytes with QC Qualifiers.'



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September 29, 2014

Analyte	Units	Laboratory Control Sample Duplicate			Limit	RPD	Limit	Batch
		Result	Ref	%Rec				
Acenaphthene	mg/kg	0.0566	0.0560	71.0	48.7-127	1.11	20	WG744400
Acenaphthylene	mg/kg	0.0514	0.0511	64.0	47.9-128	0.680	20	WG744400
Anthracene	mg/kg	0.0519	0.0523	65.0	51.3-136	0.700	20	WG744400
Benzo(a)anthracene	mg/kg	0.0594	0.0589	74.0	55-126	0.790	20	WG744400
Benzo(a)pyrene	mg/kg	0.0531	0.0525	66.0	51.9-127	1.05	20	WG744400
Benzo(b)fluoranthene	mg/kg	0.0624	0.0573	78.0	54-125	8.48	20	WG744400
Benzo(g,h,i)perylene	mg/kg	0.0537	0.0525	67.0	53.8-136	2.26	20	WG744400
Benzo(k)fluoranthene	mg/kg	0.0549	0.0590	68.0	53.9-132	7.20	20	WG744400
Chrysene	mg/kg	0.0597	0.0583	75.0	55.7-133	2.41	20	WG744400
Dibenz(a,h)anthracene	mg/kg	0.0540	0.0533	67.0	52.6-137	1.30	20	WG744400
Fluoranthene	mg/kg	0.0680	0.0674	85.0	54-132	0.950	20	WG744400
Fluorene	mg/kg	0.0585	0.0580	73.0	48.7-127	0.870	20	WG744400
Indeno(1,2,3-cd)pyrene	mg/kg	0.0534	0.0525	67.0	53.8-138	1.84	20	WG744400
Naphthalene	mg/kg	0.0525	0.0515	66.0	42-127	1.88	20	WG744400
Phenanthrene	mg/kg	0.0539	0.0535	67.0	49.6-126	0.820	20	WG744400
Pyrene	mg/kg	0.0528	0.0530	66.0	54-129	0.330	20	WG744400
2-Fluorobiphenyl				77.30	38.2-135			WG744400
Nitrobenzene-d5				81.70	28.4-151			WG744400
p-Terphenyl-d14				74.00	34.2-141			WG744400
Specific Conductance	umhos/ 1000	1000		96.0	85-115	0.0	20	WG744834
TPH (GC/FID) High Fraction	mg/kg	48.2	46.7	80.0	50-150	3.29	20	WG744609
o-Terphenyl				89.10	50-150			WG744609
Benzene	mg/kg	0.0506	0.0500	101.	70-130	1.18	20	WG745049
Ethylbenzene	mg/kg	0.0516	0.0513	103.	70-130	0.460	20	WG745049
Toluene	mg/kg	0.0513	0.0511	102.	70-130	0.280	20	WG745049
Total Xylene	mg/kg	0.155	0.155	103.	70-130	0.0600	20	WG745049
a,a,a-Trifluorotoluene(PID)				102.0	54-144			WG745049
TPH (GC/FID) Low Fraction	mg/kg	4.76	4.77	87.0	63.5-137	0.120	20	WG745049
a,a,a-Trifluorotoluene(FID)				97.90	59-128			WG745049

Analyte	Units	Matrix Spike			% Rec	Limit	Ref Samp	Batch
		MS Res	Ref Res	TV				
Mercury	mg/kg	0.542	0.0403	.5	100.	80-120	L722681-67	WG744146
Chromium,Hexavalent	mg/kg	19.5	0.0	20	98.0	75-125	L722683-01	WG744201
Arsenic	mg/kg	97.9	5.02	100	93.0	75-125	L722683-01	WG744268
Barium	mg/kg	297.	200.	100	97.0	75-125	L722683-01	WG744268
Boron	mg/kg	84.0	15.8	100	68.0*	75-125	L722683-01	WG744268
Cadmium	mg/kg	90.7	0.455	100	90.0	75-125	L722683-01	WG744268
Chromium	mg/kg	104.	7.87	100	96.0	75-125	L722683-01	WG744268
Copper	mg/kg	109.	12.9	100	96.0	75-125	L722683-01	WG744268
Lead	mg/kg	103.	13.1	100	90.0	75-125	L722683-01	WG744268
Nickel	mg/kg	104.	13.8	100	90.0	75-125	L722683-01	WG744268
Selenium	mg/kg	96.1	2.12	100	94.0	75-125	L722683-01	WG744268
Zinc	mg/kg	159.	65.7	100	93.0	75-125	L722683-01	WG744268
Silver	mg/kg	106.	-0.273	100	110.	75-125	L722683-01	WG744469

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Analyte	Units	MS Res	Matrix Spike		% Rec	Limit	Ref Samp	Batch
			Ref Res	TV				
1-Methylnaphthalene	mg/kg	0.0530	0.0	.08	66.0	41.8-133	L722556-17	WG744400
2-Chloronaphthalene	mg/kg	0.0560	0.0	.08	70.0	42.4-129	L722556-17	WG744400
2-Methylnaphthalene	mg/kg	0.0525	0.0	.08	66.0	37.5-137	L722556-17	WG744400
Acenaphthene	mg/kg	0.0513	0.0	.08	64.0	39.4-132	L722556-17	WG744400
Acenaphthylene	mg/kg	0.0501	0.0	.08	63.0	41.3-132	L722556-17	WG744400
Anthracene	mg/kg	0.0455	0.0	.08	57.0	36.7-144	L722556-17	WG744400
Benzo(a)anthracene	mg/kg	0.0460	0.0	.08	58.0	28-144	L722556-17	WG744400
Benzo(a)pyrene	mg/kg	0.0443	0.0	.08	55.0	23.8-147	L722556-17	WG744400
Benzo(b)fluoranthene	mg/kg	0.0409	0.0	.08	51.0	18.2-147	L722556-17	WG744400
Benzo(g,h,i)perylene	mg/kg	0.0416	0.0	.08	52.0	9.2-155	L722556-17	WG744400
Benzo(k)fluoranthene	mg/kg	0.0472	0.0	.08	59.0	26.5-143	L722556-17	WG744400
Chrysene	mg/kg	0.0494	0.0	.08	62.0	27.4-150	L722556-17	WG744400
Dibenz(a,h)anthracene	mg/kg	0.0437	0.0	.08	55.0	13.8-150	L722556-17	WG744400
Fluoranthene	mg/kg	0.0489	0.0	.08	61.0	23.2-158	L722556-17	WG744400
Fluorene	mg/kg	0.0513	0.0	.08	64.0	30.8-139	L722556-17	WG744400
Indeno(1,2,3-cd)pyrene	mg/kg	0.0409	0.0	.08	51.0	10.7-155	L722556-17	WG744400
Naphthalene	mg/kg	0.0534	0.0	.08	67.0	34.9-133	L722556-17	WG744400
Phenanthrene	mg/kg	0.0436	0.0	.08	54.0	20.2-150	L722556-17	WG744400
Pyrene	mg/kg	0.0384	0.0	.08	48.0	22.6-151	L722556-17	WG744400
2-Fluorobiphenyl					82.70	38.2-135		WG744400
Nitrobenzene-d5					89.10	28.4-151		WG744400
p-Terphenyl-d14					76.10	34.2-141		WG744400
TPH (GC/FID) High Fraction	mg/kg	59.3	17.8	60	69.0	50-150	L722683-01	WG744609
o-Terphenyl					70.30	50-150		WG744609
Benzene	mg/kg	0.244	0.000787	.05	97.0	49.7-127	L723327-01	WG745049
Ethylbenzene	mg/kg	0.244	0.000846	.05	97.0	40.8-141	L723327-01	WG745049
Toluene	mg/kg	0.244	0.00132	.05	97.0	49.8-132	L723327-01	WG745049
Total Xylene	mg/kg	0.734	0.00300	.15	98.0	41.2-140	L723327-01	WG745049
a,a,a-Trifluorotoluene(PID)					101.0	54-144		WG745049
TPH (GC/FID) Low Fraction	mg/kg	16.1	0.231	5.5	58.0	28.5-138	L723447-01	WG745049
a,a,a-Trifluorotoluene(FID)					96.60	59-128		WG745049

Analyte	Units	MSD	Matrix Spike Duplicate		Limit	RPD	Limit	Ref Samp	Batch
			Ref	%Rec					
Mercury	mg/kg	0.509	0.542	93.7	80-120	6.00	20	L722681-67	WG744146
Chromium, Hexavalent	mg/kg	19.6	19.5	98.0	75-125	0.512	20	L722683-01	WG744201
Arsenic	mg/kg	93.3	97.9	88.3	75-125	5.00	20	L722683-01	WG744268
Barium	mg/kg	292.	297.	92.1	75-125	2.00	20	L722683-01	WG744268
Boron	mg/kg	81.3	84.0	65.4*	75-125	3.00	20	L722683-01	WG744268
Cadmium	mg/kg	86.5	90.7	86.0	75-125	5.00	20	L722683-01	WG744268
Chromium	mg/kg	98.8	104.	90.9	75-125	5.00	20	L722683-01	WG744268
Copper	mg/kg	104.	109.	91.5	75-125	4.00	20	L722683-01	WG744268
Lead	mg/kg	98.6	103.	85.5	75-125	5.00	20	L722683-01	WG744268
Nickel	mg/kg	99.1	104.	85.3	75-125	5.00	20	L722683-01	WG744268
Selenium	mg/kg	91.6	96.1	89.5	75-125	5.00	20	L722683-01	WG744268
Zinc	mg/kg	156.	159.	90.2	75-125	2.00	20	L722683-01	WG744268
Silver	mg/kg	105.	106.	105.	75-125	1.00	20	L722683-01	WG744469

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Analyte	Units	MSD	Matrix Spike Duplicate		Limit	RPD	Limit	Ref Samp	Batch
			Ref	%Rec					
1-Methylnaphthalene	mg/kg	0.0554	0.0530	69.3	41.8-133	4.45	20.9	L722556-17	WG744400
2-Chloronaphthalene	mg/kg	0.0587	0.0560	73.4	42.4-129	4.82	20	L722556-17	WG744400
2-Methylnaphthalene	mg/kg	0.0549	0.0525	68.6	37.5-137	4.51	20.4	L722556-17	WG744400
Acenaphthene	mg/kg	0.0542	0.0513	67.7	39.4-132	5.54	20	L722556-17	WG744400
Acenaphthylene	mg/kg	0.0516	0.0501	64.5	41.3-132	2.88	20	L722556-17	WG744400
Anthracene	mg/kg	0.0480	0.0455	60.0	36.7-144	5.48	20.7	L722556-17	WG744400
Benzo(a)anthracene	mg/kg	0.0455	0.0460	56.8	28-144	1.20	24.7	L722556-17	WG744400
Benzo(a)pyrene	mg/kg	0.0434	0.0443	54.2	23.8-147	2.01	25.3	L722556-17	WG744400
Benzo(b)fluoranthene	mg/kg	0.0423	0.0409	52.8	18.2-147	3.19	29.5	L722556-17	WG744400
Benzo(g,h,i)perylene	mg/kg	0.0411	0.0416	51.3	9.2-155	1.32	29.2	L722556-17	WG744400
Benzo(k)fluoranthene	mg/kg	0.0444	0.0472	55.5	26.5-143	6.14	26.1	L722556-17	WG744400
Chrysene	mg/kg	0.0489	0.0494	61.2	27.4-150	0.910	25.7	L722556-17	WG744400
Dibenz(a,h)anthracene	mg/kg	0.0419	0.0437	52.4	13.8-150	4.15	25.8	L722556-17	WG744400
Fluoranthene	mg/kg	0.0516	0.0489	64.6	23.2-158	5.45	26	L722556-17	WG744400
Fluorene	mg/kg	0.0540	0.0513	67.5	30.8-139	5.23	20	L722556-17	WG744400
Indeno(1,2,3-cd)pyrene	mg/kg	0.0396	0.0409	49.5	10.7-155	3.24	26.9	L722556-17	WG744400
Naphthalene	mg/kg	0.0547	0.0534	68.4	34.9-133	2.38	20.4	L722556-17	WG744400
Phenanthrene	mg/kg	0.0467	0.0436	58.4	20.2-150	6.88	24.6	L722556-17	WG744400
Pyrene	mg/kg	0.0405	0.0384	50.6	22.6-151	5.22	25.1	L722556-17	WG744400
2-Fluorobiphenyl				84.10	38.2-135				WG744400
Nitrobenzene-d5				95.60	28.4-151				WG744400
p-Terphenyl-d14				77.30	34.2-141				WG744400
TPH (GC/FID) High Fraction	mg/kg	58.3	59.3	67.6	50-150	1.61	20	L722683-01	WG744609
o-Terphenyl				74.00	50-150				WG744609
Benzene	mg/kg	0.247	0.244	98.4	49.7-127	1.27	23.5	L723327-01	WG745049
Ethylbenzene	mg/kg	0.245	0.244	97.6	40.8-141	0.490	23.8	L723327-01	WG745049
Toluene	mg/kg	0.246	0.244	97.9	49.8-132	0.920	23.5	L723327-01	WG745049
Total Xylene	mg/kg	0.739	0.734	98.1	41.2-140	0.630	23.7	L723327-01	WG745049
a,a,a-Trifluorotoluene(PID)				101.0	54-144				WG745049
TPH (GC/FID) Low Fraction	mg/kg	16.0	16.1	57.4	28.5-138	0.840	23.6	L723447-01	WG745049
a,a,a-Trifluorotoluene(FID)				97.10	59-128				WG745049

Post Spike

Serial Dilution

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Serial Dilution

Batch number /Run number / Sample number cross reference

WG744146: R2991746: L722683-01  
WG744131: R2991830: L722683-01  
WG744122: R2991843: L722683-01  
WG744201: R2991855: L722683-01  
WG744268: R2991953: L722683-01  
WG744654: R2992483: L722683-01  
WG744469: R2992728: L722683-01  
WG744400: R2992737 R2993114: L722683-01  
WG744834: R2992941: L722683-01  
WG744609: R2993011: L722683-01  
WG745049: R2993156: L722683-01

\* \* Calculations are performed prior to rounding of reported values.

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The data package includes a summary of the analytic results of the quality control samples required by the SW-846 or CWA methods. The quality control samples include a method blank, a laboratory control sample, and the matrix spike/matrix spike duplicate analysis. If a target parameter is outside the method limits, every sample that is effected is flagged with the appropriate qualifier in Appendix B of the analytic report.

Method Blank - an aliquot of reagent water carried through the entire analytic process. The method blank results indicate if any possible contamination exposure during the sample handling, digestion or extraction process, and analysis. Concentrations of target analytes above the reporting limit in the method blank are qualified with the "B" qualifier.

Laboratory Control Sample - is a sample of known concentration that is carried through the digestion/extraction and analysis process. The percent recovery, expressed as a percentage of the theoretical concentration, has statistical control limits indicating that the analytic process is "in control". If a target analyte is outside the control limits for the laboratory control sample or any other control sample, the parameter is flagged with a "J4" qualifier for all effected samples.

Matrix Spike and Matrix Spike Duplicate - is two aliquots of an environmental sample that is spiked with known concentrations of target analytes. The percent recovery of the target analytes also has statistical control limits. If any recoveries that are outside the method control limits, the sample that was selected for matrix spike/matrix spike duplicate analysis is flagged with either a "J5" or a "J6". The relative percent difference (%RPD) between the matrix spike and the matrix spike duplicate recoveries is all calculated. If the RPD is above the method limit, the effected samples are flagged with a "J3" qualifier.