



March 10, 2015

Olsson Associates

Jason Davidson

4690 Table Mountain Drive

Golden

CO 80403

Project Name - Whiting Spill Response

Project Number - 013-2596

Attached are your analytical results for Whiting Spill Response received by Origins Laboratory, Inc. March 03, 2015. This project is associated with Origins project number X503024-01.

The analytical results in the following report were analyzed under the guidelines of EPA Methods. These methods are identified as follows; "SW" are defined in SW-846, "EPA" are defined in 40CFR part 136 and "SM" are defined in the most current revision of Standard Methods For the Examination of Water and Wastewater.

The analytical results apply specifically to the samples and analyses specified per the attached Chain of Custody. As such, this report shall not be reproduced except in full, without the written approval of Origin's laboratory.

Unless otherwise noted, the analytical results for all soil samples are reported on a wet weight basis. All analytical analyses were performed under NELAP guidelines unless noted by a data qualifier.

Any holding time exceedances, deviations from the method specifications or deviations from Origins Laboratory's Standard Operating Procedures are outlined in the case narrative.

Thank you for selecting Origins for your analytical needs. Please contact us with any questions concerning this report, or if we can help with anything at all.

Origins Laboratory, Inc.
303.433.1322
o-squad@oelabinc.com



1725 Elk Place, Denver, CO 80211 | Phone: 303.433.1322 | Fax: 303.265.9645

Olsson Associates

4690 Table Mountain Drive

Golden CO 80403

Jason Davidson

Project Number: 013-2596

Project: Whiting Spill Response

CROSS REFERENCE REPORT

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
Razor 27J-1	X503024-01	Soil	March 3, 2015 10:02	03/03/2015 16:36
Razor 27J-2	X503024-02	Soil	March 3, 2015 10:13	03/03/2015 16:36
Razor 27J-3	X503024-03	Soil	March 3, 2015 10:29	03/03/2015 16:36
Razor 27J-Reference	X503024-04	Soil	March 3, 2015 10:40	03/03/2015 16:36

Origins Laboratory, Inc.



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Olsson Associates
4690 Table Mountain Drive
Golden CO 80403

Jason Davidson
Project Number: 013-2596
Project: Whiting Spill Response

www.originslaboratory.com

xs03024

ORIGINS
LABORATORY, INC

Client: Olsson Associates
Address: 5285 Newwinney Blvd. Suite 100
Loveland, CO 80558
Telephone Number: 970-401-7733
Email Address: j.davidson@olssonassociates.com

Project Manager: Jason Davidson
Project Name: Whiting Spill Response
Project Number:
Samples Collected By: P. Koutelas

Sample ID Description	Date Sampled	Time Sampled	# of Containers	Preservative				Matrix		Analysis				Sample Instructions
				Unpreserved	HCl	HNO ₃	Other	Groundwater	Soil	Air Summa Canister #	Other	BTEX	VOC	
R4201 27J-1	3/13/15	10:02	3	X				X		X	X	X	X	1
R4201 27J-2		10:13	1	X				X		X	X	X	X	2
R4201 27J-3		10:21	1	X				X		X	X	X	X	3
R4201 27J-Return		10:40	1	X				X		X	X	X	X	4
														5
														6
														7
														8
														9
														10
Relinquished By: <i>[Signature]</i>	Date: 3/13/15	Time: 10:30		Received By: <i>[Signature]</i>	Date: 3/13/15	Time: 10:36		Turnaround Time: Same Day <input type="checkbox"/> 24 Hr <input type="checkbox"/> 48 Hr <input type="checkbox"/> Standard <input checked="" type="checkbox"/>						
Relinquished By: <i>[Signature]</i>	Date:	Time:		Received By:	Date:	Time:								

Date Results Needed

Temp Received: 5.7

Origins Laboratory, Inc.

Jefe Pellegrini

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Olsson Associates
4690 Table Mountain Drive
Golden CO 80403

Jason Davidson
Project Number: 013-2596
Project: Whiting Spill Response

Origins Laboratory

F-012207-01-R1
Effective Date: 01/09/12

Sample Receipt Checklist

Origins Work Order: **XS03024**

Client: Olsson Associates
Client Project ID: Whiting Spill Response

Checklist Completed by: gux

Shipped Via: H/D
(UPS, FedEx, Hand Delivered, Pick-up, etc.)

Date/time completed: 3/3/15 @ 1740

Airbill #: N/A

Matrix(s) Received: (Check all that apply): ☒ Soil/Solid ☐ Water ☐ Other: _____

Cooler Number/Temperature: 1 / 5.7 °C _____ °C _____ °C (Describe)

Thermometer ID: T003

Requirement Description	Yes	No	N/A	Comments (if any)
If samples require cooling, was the temperature between 0°C to ≤ 6°C ⁽¹⁾ ?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Is there ice present (document if blue ice is used)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Are custody seals present on cooler? (if so, document in comments if they are signed and dated, broken or intact)	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Are custody seals present on each sample container? (if so, document in comments if they are signed and dated, broken or intact)	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Were all samples received intact ⁽¹⁾ ?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Was adequate sample volume provided ⁽¹⁾ ?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Are short holding time analytes or samples with HTs due within 48 hours present ⁽¹⁾ ?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Is a chain-of-custody (COC) present and filled out completely ⁽¹⁾ ?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	pH
Does the COC agree with the number and type of sample bottles received ⁽¹⁾ ?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Do the sample IDs on the bottle labels match the COC ⁽¹⁾ ?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Is the COC properly relinquished by the client with date and time recorded ⁽¹⁾ ?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
For volatiles in water – is there headspace (> ¼ inch bubble) present? If yes, contact client and note in narrative.	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Are samples preserved that require preservation and was it checked ⁽¹⁾ ? (note ID of confirmation instrument used in comments) / (preservation is not confirmed for subcontracted analyses in order to insure sample integrity)/(pH < 2 for samples preserved with HNO ₃ , HCL, H ₂ SO ₄) / (pH > 10 for samples preserved with NaAsO ₂ +NaOH, ZnAc+NaOH)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Additional Comments (if any):				

⁽¹⁾If NO, then contact the client before proceeding with analysis and note date/time and person contacted as well as the corrective action to in the additional comments (above) and the case narrative.

Jason Davidson
Reviewed by (Project Manager)

3/4/15
Date/Time Reviewed

Origins Laboratory, Inc.

Jefe Pellegrini

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Olsson Associates
4690 Table Mountain Drive
Golden CO 80403

Jason Davidson
Project Number: 013-2596
Project: Whiting Spill Response

Razor 27J-1
3/3/2015 10:02:00AM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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Origins Laboratory, Inc.
X503024-01 (Soil)

Diesel Range Organics (DRO/TEPH) by EPA 8015C

Diesel (C10-C28)	ND	50.0	mg/kg	1	5C04007	03/04/2015	03/04/2015
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Surrogate: o-Terphenyl	77.2 %	59-131			"	"	"
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GBTEX + Napthalene by 8260C

Gasoline Range Hydrocarbons	ND	0.200	mg/kg	1	5C04006	03/04/2015	03/04/2015
Benzene	ND	0.002	"	"	"	"	"
Toluene	ND	0.002	"	"	"	"	"
Ethylbenzene	ND	0.002	"	"	"	"	"
Xylenes, total	ND	0.002	"	"	"	"	"
Naphthalene	ND	0.007	"	"	"	"	"

Surrogate: 1,2-Dichloroethane-d4	101 %	70-130			"	"	"
Surrogate: Toluene-d8	100 %	70-130			"	"	"
Surrogate: 4-Bromofluorobenzene	95.5 %	70-130			"	"	"

pH in Soil by EPA 9045D

pH	8.47		pH Units	1	5C04004	03/04/2015	03/04/2015
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SAR Metals by SW846 3050B/6010C

Calcium	56100	33.2	mg/kg dry	1	1462142	03/06/2015	03/06/2015
Magnesium	5570	39.8	"	"	"	"	"

Origins Laboratory, Inc.



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Golden CO 80403

Jason Davidson
Project Number: 013-2596
Project: Whiting Spill Response

Razor 27J-1
3/3/2015 10:02:00AM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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GEL Laboratories, LLC
X503024-01 (Soil)

SAR Metals by SW846 3050B/6010C

Sodium	844	33.2	mg/kg dry	1	1462142	03/06/2015	03/06/2015
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Sodium Adsorption Ratio

Sodium Adsorption Ratio	0.910		none	1	1462712		03/10/2015
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Specific Conductance by Modified 9050A

Specific Conductance (EC)	0.187		mmhos/cm	1	5C04005	03/04/2015	03/04/2015
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Origins Laboratory, Inc.



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Golden CO 80403

Jason Davidson
Project Number: 013-2596
Project: Whiting Spill Response

Razor 27J-2
3/3/2015 10:13:00AM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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Origins Laboratory, Inc.
X503024-02 (Soil)

Diesel Range Organics (DRO/TEPH) by EPA 8015C

Diesel (C10-C28)	ND	50.0	mg/kg	1	5C04007	03/04/2015	03/04/2015
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Surrogate: o-Terphenyl	75.7 %	59-131			"	"	"
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GBTEX + Napthalene by 8260C

Gasoline Range Hydrocarbons	ND	0.200	mg/kg	1	5C04006	03/04/2015	03/04/2015
Benzene	ND	0.002	"	"	"	"	"
Toluene	ND	0.002	"	"	"	"	"
Ethylbenzene	ND	0.002	"	"	"	"	"
Xylenes, total	ND	0.002	"	"	"	"	"
Naphthalene	ND	0.007	"	"	"	"	"

Surrogate: 1,2-Dichloroethane-d4	105 %	70-130			"	"	"
Surrogate: Toluene-d8	105 %	70-130			"	"	"
Surrogate: 4-Bromofluorobenzene	96.7 %	70-130			"	"	"

pH in Soil by EPA 9045D

pH	8.62		pH Units	1	5C04004	03/04/2015	03/04/2015
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SAR Metals by SW846 3050B/6010C

Calcium	56200	31.5	mg/kg dry	1	1462142	03/06/2015	03/06/2015
Magnesium	5620	37.9	"	"	"	"	"

Origins Laboratory, Inc.



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Olsson Associates
4690 Table Mountain Drive
Golden CO 80403

Jason Davidson
Project Number: 013-2596
Project: Whiting Spill Response

Razor 27J-2
3/3/2015 10:13:00AM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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GEL Laboratories, LLC
X503024-02 (Soil)

SAR Metals by SW846 3050B/6010C

Sodium	798	31.5	mg/kg dry	1	1462142	03/06/2015	03/06/2015
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Sodium Adsorption Ratio

Sodium Adsorption Ratio	0.859		none	1	1462712		03/10/2015
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Specific Conductance by Modified 9050A

Specific Conductance (EC)	0.176		mmhos/cm	1	5C04005	03/04/2015	03/04/2015
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Golden CO 80403

Jason Davidson
Project Number: 013-2596
Project: Whiting Spill Response

Razor 27J-3
3/3/2015 10:29:00AM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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Origins Laboratory, Inc.
X503024-03 (Soil)

Diesel Range Organics (DRO/TEPH) by EPA 8015C

Diesel (C10-C28)	ND	50.0	mg/kg	1	5C04007	03/04/2015	03/04/2015
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Surrogate: o-Terphenyl	86.0 %	59-131			"	"	"
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GBTEX + Napthalene by 8260C

Gasoline Range Hydrocarbons	ND	0.200	mg/kg	1	5C04006	03/04/2015	03/04/2015
Benzene	ND	0.002	"	"	"	"	"
Toluene	ND	0.002	"	"	"	"	"
Ethylbenzene	ND	0.002	"	"	"	"	"
Xylenes, total	ND	0.002	"	"	"	"	"
Naphthalene	ND	0.007	"	"	"	"	"

Surrogate: 1,2-Dichloroethane-d4	99.6 %	70-130			"	"	"
Surrogate: Toluene-d8	112 %	70-130			"	"	"
Surrogate: 4-Bromofluorobenzene	94.9 %	70-130			"	"	"

pH in Soil by EPA 9045D

pH	9.07		pH Units	1	5C04004	03/04/2015	03/04/2015
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SAR Metals by SW846 3050B/6010C

Calcium	45200	29.9	mg/kg dry	1	1462142	03/06/2015	03/06/2015
Magnesium	5640	35.8	"	"	"	"	"

Origins Laboratory, Inc.



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Olsson Associates
4690 Table Mountain Drive
Golden CO 80403

Jason Davidson
Project Number: 013-2596
Project: Whiting Spill Response

Razor 27J-3
3/3/2015 10:29:00AM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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GEL Laboratories, LLC
X503024-03 (Soil)

SAR Metals by SW846 3050B/6010C

Sodium	736	29.9	mg/kg dry	1	1462142	03/06/2015	03/06/2015
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Sodium Adsorption Ratio

Sodium Adsorption Ratio	0.869		none	1	1462712		03/10/2015
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Specific Conductance by Modified 9050A

Specific Conductance (EC)	0.100		mmhos/cm	1	5C04005	03/04/2015	03/04/2015
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Origins Laboratory, Inc.



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Olsson Associates
4690 Table Mountain Drive
Golden CO 80403

Jason Davidson
Project Number: 013-2596
Project: Whiting Spill Response

Razor 27J-Reference
3/3/2015 10:40:00AM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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Origins Laboratory, Inc.
X503024-04 (Soil)

Diesel Range Organics (DRO/TEPH) by EPA 8015C

Diesel (C10-C28)	ND	50.0	mg/kg	1	5C04007	03/04/2015	03/04/2015
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Surrogate: o-Terphenyl	69.5 %	59-131			"	"	"
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GBTEX + Napthalene by 8260C

Gasoline Range Hydrocarbons	ND	0.200	mg/kg	1	5C04006	03/04/2015	03/04/2015
Benzene	ND	0.002	"	"	"	"	"
Toluene	ND	0.002	"	"	"	"	"
Ethylbenzene	ND	0.002	"	"	"	"	"
Xylenes, total	ND	0.002	"	"	"	"	"
Naphthalene	ND	0.007	"	"	"	"	"

Surrogate: 1,2-Dichloroethane-d4	97.8 %	70-130			"	"	"
Surrogate: Toluene-d8	105 %	70-130			"	"	"
Surrogate: 4-Bromofluorobenzene	101 %	70-130			"	"	"

pH in Soil by EPA 9045D

pH	8.65		pH Units	1	5C04004	03/04/2015	03/04/2015
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SAR Metals by SW846 3050B/6010C

Calcium	64700	33.4	mg/kg dry	1	1462142	03/06/2015	03/06/2015
Magnesium	5910	40.0	"	"	"	"	"

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Olsson Associates
4690 Table Mountain Drive
Golden CO 80403

Jason Davidson
Project Number: 013-2596
Project: Whiting Spill Response

Razor 27J-Reference
3/3/2015 10:40:00AM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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GEL Laboratories, LLC
X503024-04 (Soil)

SAR Metals by SW846 3050B/6010C

Sodium	833	33.4	mg/kg dry	1	1462142	03/06/2015	03/06/2015
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Sodium Adsorption Ratio

Sodium Adsorption Ratio	0.841		none	1	1462712		03/10/2015
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Specific Conductance by Modified 9050A

Specific Conductance (EC)	0.228		mmhos/cm	1	5C04005	03/04/2015	03/04/2015
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Olsson Associates
4690 Table Mountain Drive
Golden CO 80403

Jason Davidson
Project Number: 013-2596
Project: Whiting Spill Response

Volatile Organic Compounds by GC/MS SW846 8260C - Quality Control
Origins Laboratory, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 5C04006 - EPA 5030 (soil)										
Blank (5C04006-BLK1)					Prepared: 03/04/2015 Analyzed: 03/04/2015					
Gasoline Range Hydrocarbons	ND	0.200	mg/kg							
Benzene	ND	0.002	"							
Toluene	ND	0.002	"							
Ethylbenzene	ND	0.002	"							
Xylenes, total	ND	0.002	"							
Naphthalene	ND	0.007	"							
Surrogate: 1,2-Dichloroethane-d4	60		ug/kg	62.5		96.2	70-130			
Surrogate: Toluene-d8	70		"	62.5		113	70-130			
Surrogate: 4-Bromofluorobenzene	60		"	62.5		96.0	70-130			

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Golden CO 80403

Jason Davidson
Project Number: 013-2596
Project: Whiting Spill Response

Volatile Organic Compounds by GC/MS SW846 8260C - Quality Control
Origins Laboratory, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 5C04006 - EPA 5030 (soil)										
LCS (5C04006-BS1)					Prepared: 03/04/2015 Analyzed: 03/04/2015					
Benzene	0.099	0.002	mg/kg	0.100		99.4	70-130			
Toluene	0.106	0.002	"	0.100		106	70-130			
Ethylbenzene	0.102	0.002	"	0.100		102	70-130			
m,p-Xylene	0.208	0.004	"	0.200		104	70-130			
o-Xylene	0.107	0.002	"	0.100		107	70-130			
Naphthalene	0.114	0.007	"	0.100		114	70-130			
Surrogate: 1,2-Dichloroethane-d4	59		ug/kg	62.5		93.6	70-130			
Surrogate: Toluene-d8	62		"	62.5		99.6	70-130			
Surrogate: 4-Bromofluorobenzene	63		"	62.5		102	70-130			

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Project Number: 013-2596
Project: Whiting Spill Response

Volatile Organic Compounds by GC/MS SW846 8260C - Quality Control
Origins Laboratory, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch 5C04006 - EPA 5030 (soil)

Matrix Spike (5C04006-MS1)		Source: X503024-02			Prepared: 03/04/2015 Analyzed: 03/04/2015					
Benzene	0.085	0.002	mg/kg	0.100	ND	85.1	70-130			
Toluene	0.079	0.002	"	0.100	ND	78.7	70-130			
Ethylbenzene	0.083	0.002	"	0.100	ND	82.7	70-130			
m,p-Xylene	0.169	0.004	"	0.200	ND	84.7	70-130			
o-Xylene	0.082	0.002	"	0.100	ND	81.6	70-130			
Naphthalene	0.087	0.007	"	0.100	0.002	84.3	70-130			
Surrogate: 1,2-Dichloroethane-d4	63		ug/kg	62.5		101	70-130			
Surrogate: Toluene-d8	62		"	62.5		99.8	70-130			
Surrogate: 4-Bromofluorobenzene	66		"	62.5		105	70-130			

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Jason Davidson
Project Number: 013-2596
Project: Whiting Spill Response

Volatile Organic Compounds by GC/MS SW846 8260C - Quality Control
Origins Laboratory, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 5C04006 - EPA 5030 (soil)										
Matrix Spike Dup (5C04006-MSD1)		Source: X503024-02			Prepared: 03/04/2015 Analyzed: 03/04/2015					
Benzene	0.094	0.002	mg/kg	0.100	ND	93.9	70-130	9.85	20	
Toluene	0.096	0.002	"	0.100	ND	96.2	70-130	20.0	20	
Ethylbenzene	0.090	0.002	"	0.100	ND	89.6	70-130	8.01	20	
m,p-Xylene	0.182	0.004	"	0.200	ND	91.0	70-130	7.22	20	
o-Xylene	0.092	0.002	"	0.100	ND	91.7	70-130	11.7	20	
Naphthalene	0.082	0.007	"	0.100	0.002	80.2	70-130	4.83	20	
Surrogate: 1,2-Dichloroethane-d4	62		ug/kg	62.5		99.2	70-130			
Surrogate: Toluene-d8	65		"	62.5		104	70-130			
Surrogate: 4-Bromofluorobenzene	67		"	62.5		107	70-130			

Origins Laboratory, Inc.



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Olsson Associates
4690 Table Mountain Drive
Golden CO 80403

Jason Davidson
Project Number: 013-2596
Project: Whiting Spill Response

Volatile Organic Compounds by GC/MS SW846 8260C - Quality Control

Origins Laboratory, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Extractable Petroleum Hydrocarbons by 8015M - Quality Control

Origins Laboratory, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch 5C04007 - EPA 3580

Blank (5C04007-BLK1)

Prepared: 03/04/2015 Analyzed: 03/04/2015

Diesel (C10-C28) ND 50.0 mg/kg

Surrogate: o-Terphenyl 43 " 50.0 85.6 59-131

LCS (5C04007-BS1)

Prepared: 03/04/2015 Analyzed: 03/04/2015

Diesel (C10-C28) 954 50.0 mg/kg 1000 95.4 64-121

Surrogate: o-Terphenyl 50 " 50.0 99.6 59-131

Matrix Spike (5C04007-MS1)

Source: X503024-01

Prepared: 03/04/2015 Analyzed: 03/04/2015

Diesel (C10-C28) 803 50.0 mg/kg 1000 34.9 76.8 53-125

Surrogate: o-Terphenyl 37 " 50.0 73.7 59-131

Matrix Spike Dup (5C04007-MSD1)

Source: X503024-01

Prepared: 03/04/2015 Analyzed: 03/04/2015

Diesel (C10-C28) 935 50.0 mg/kg 1000 34.9 90.0 53-125 15.3 20

Surrogate: o-Terphenyl 42 " 50.0 84.4 59-131

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Classical Chemistry Parameters - Quality Control Origins Laboratory, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 5C04004 - NO PREP										
Duplicate (5C04004-DUP1)		Source: X503024-01			Prepared: 03/04/2015 Analyzed: 03/04/2015					
pH	8.53		pH Units		8.47			0.706	25	
Batch 5C04005 - NO PREP										
Blank (5C04005-BLK1)		Prepared: 03/04/2015 Analyzed: 03/04/2015								
Specific Conductance (EC)	0.00260		mmhos/cm							
Duplicate (5C04005-DUP1)		Source: X503024-01			Prepared: 03/04/2015 Analyzed: 03/04/2015					
Specific Conductance (EC)	0.188		mmhos/cm		0.187			0.427	25	

Origins Laboratory, Inc.



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Jason Davidson
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Project: Whiting Spill Response

SAR Metals by SW846 3050B/6010C - Quality Control
GEL Laboratories, LLC

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 1462142 - SW846 3050B										
BLANK (1203275872-BLK)					Prepared: 03/06/2015 Analyzed: 03/06/2015					
Sodium	ND	23.9	mg/kg				-			U
Magnesium	ND	28.7	"				-			U
Calcium	ND	23.9	"				-			U
LCS (1203275873-BKS)					Prepared: 03/06/2015 Analyzed: 03/06/2015					
Sodium	495	24.1	mg/kg	483		103	80-120			
Magnesium	482	29.0	"	483		99.9	80-120			
Calcium	492	24.1	"	483		102	80-120			
DUP (1203275874 D)					Source: X503024-01		Prepared: 03/06/2015 Analyzed: 03/06/2015			
Calcium	47100	33.2	mg/kg dry		56100		0-20	17.5	20	
Sodium	866	33.2	"		844		0-20	2.55	20	
Magnesium	5950	39.9	"		5570		0-20	6.63	20	
MS (1203275875 S)					Source: X503024-01		Prepared: 03/06/2015 Analyzed: 03/06/2015			
Sodium	1560	33.9	mg/kg dry	679	844	106	75-125			
Magnesium	8520	40.7	"	679	5570	434	75-125			
Calcium	49000	33.9	"	679	56100	0	75-125			

Origins Laboratory, Inc.



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Jason Davidson
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Project: Whiting Spill Response

Notes and Definitions

U Result not detected above the detection limit

ND Analyte NOT DETECTED at or above the reporting limit

RPD Relative Percent Difference

All soil results are reported at a wet weight basis.

Origins Laboratory, Inc.



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