



January 14, 2020

Olsson Associates

Trent Watne

1525 Raleigh St, Suite 400

Denver

CO 80204

Project Name - Great Western 26-31, 32, 51, 42

Project Number - 019-2466

Attached are your analytical results for Great Western 26-31, 32, 51, 42 received by Origins Laboratory, Inc. January 03, 2020. This project is associated with Origins project number Y001035-01.

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
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Olsson Associates

1525 Raleigh St, Suite 400

Denver CO 80204

Trent Watne

Project Number: 019-2466

Project: Great Western 26-31, 32, 51, 42

CROSS REFERENCE REPORT

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
Base-4	Y001035-01	Soil	January 3, 2020 9:18	01/03/2020 13:31
SWE-3	Y001035-02	Soil	January 3, 2020 9:15	01/03/2020 13:31

Origins Laboratory, Inc.



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Jen Pellegrini, Project Manager

Olsson Associates

1525 Raleigh St, Suite 400

Denver CO 80204

Trent Watne

Project Number: 019-2466

Project: Great Western 26-31, 32, 51, 42

Origins Laboratory

F-012207-01-R1

Effective Date: 01/09/12

Sample Receipt Checklist

Origins Work Order: Y001035

Client: Olsson

Client Project ID: Great Western 26-31, 32, 51, 42

Checklist Completed by: JG

Shipped Via: HD

(UPS, FedEx, Hand Delivered, Pick-up, etc.)

Date/time completed: 1/3/2020

Airbill #: N/A

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

(Describe)

Cooler Number/Temperature: 1/4.7 °C / _____ °C / _____ °C / _____ °C

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 type="checkbox"/>	<input checked="" 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"/>	
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.

Reviewed by (Project Manager)

Date/Time Reviewed 1/3/20

Origins Laboratory, Inc.

Jen Pellegrini

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Jen Pellegrini, Project Manager

Olsson Associates
1525 Raleigh St, Suite 400
Denver CO 80204

Trent Watne
Project Number: 019-2466
Project: Great Western 26-31, 32, 51, 42

Base-4

1/3/2020 9:18:00AM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Analyst	Prepared	Analyzed	Notes
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Origins Laboratory, Inc. Y001035-01 (Soil)

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

Diesel (C10-C28)	ND	50.0	mg/kg	1	B0A0305	TEM	01/03/2020	01/03/2020	U
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Surrogate: o-Terphenyl	73.6 %	50-150			"	"	"		
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GBTEX + Naphthalene by EPA 8260D

Gasoline Range Hydrocarbons	ND	5.00	mg/kg	25	B0A0304	KDK	01/03/2020	01/03/2020	U
Benzene	ND	0.050	"	"	"	KDK	"	"	U
Toluene	ND	0.050	"	"	"	KDK	"	"	U
Ethylbenzene	ND	0.050	"	"	"	KDK	"	"	U
Xylenes, total	ND	0.050	"	"	"	KDK	"	"	U
Naphthalene	ND	0.200	"	"	"	KDK	"	"	U

Surrogate: 1,2-Dichloroethane-d4	102 %	70-130			"	"	"		
Surrogate: Toluene-d8	100 %	70-130			"	"	"		
Surrogate: 4-Bromofluorobenzene	112 %	70-130			"	"	"		

Metals (Saturated Paste Prep)

Calcium	4.02	me/L	1	[none]		01/06/2020	01/08/2020
Magnesium	3.10	"	"	"		"	"
Sodium	3.82	"	"	"		"	"

pH in Soil by EPA 9045D

Origins Laboratory, Inc.



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Trent Watne
Project Number: 019-2466
Project: Great Western 26-31, 32, 51, 42

Base-4

1/3/2020 9:18:00AM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Analyst	Prepared	Analyzed	Notes
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Origins Laboratory, Inc.
Y001035-01 (Soil)

pH in Soil by EPA 9045D

pH	7.70	pH Units	1	B0A0307	OLAB	01/03/2020	01/03/2020
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SAR by 20B Saturated Paste

SAR	2.02		1	[none]		01/06/2020	01/08/2020
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Specific Conductance by Modified 9050A

Specific Conductance (EC)	0.116	0.00500	mmhos/cm	1	B0A0308	KDK	01/03/2020	01/03/2020
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Project Number: 019-2466
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SWE-3

1/3/2020 9:15:00AM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Analyst	Prepared	Analyzed	Notes
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Origins Laboratory, Inc. Y001035-02 (Soil)

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

Diesel (C10-C28)	ND	50.0	mg/kg	1	B0A0305	TEM	01/03/2020	01/03/2020	U
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Surrogate: o-Terphenyl	80.1 %	50-150			"	"	"		
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GBTEX + Naphthalene by EPA 8260D

Gasoline Range Hydrocarbons	ND	5.00	mg/kg	25	B0A0304	KDK	01/03/2020	01/03/2020	U
Benzene	ND	0.050	"	"	"	KDK	"	"	U
Toluene	ND	0.050	"	"	"	KDK	"	"	U
Ethylbenzene	ND	0.050	"	"	"	KDK	"	"	U
Xylenes, total	ND	0.050	"	"	"	KDK	"	"	U
Naphthalene	ND	0.200	"	"	"	KDK	"	"	U

Surrogate: 1,2-Dichloroethane-d4	100 %	70-130			"	"	"		
Surrogate: Toluene-d8	102 %	70-130			"	"	"		
Surrogate: 4-Bromofluorobenzene	111 %	70-130			"	"	"		

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Trent Watne
Project Number: 019-2466
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Volatile Organic Compounds by GC/MS SW846 8260D - Quality Control
Origins Laboratory, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B0A0304 - EPA 5030 (soil)										
Blank (B0A0304-BLK1)					Prepared: 01/03/2020 Analyzed: 01/03/2020					
Gasoline Range Hydrocarbons	ND	0.200	mg/kg							U
Benzene	ND	0.002	"							U
Toluene	ND	0.002	"							U
Ethylbenzene	ND	0.002	"							U
Xylenes, total	ND	0.002	"							U
Naphthalene	ND	0.008	"							U
Surrogate: 1,2-Dichloroethane-d4	0.13		"	0.125		105	70-130			
Surrogate: Toluene-d8	0.12		"	0.125		98.0	70-130			
Surrogate: 4-Bromofluorobenzene	0.14		"	0.125		111	70-130			

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Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B0A0304 - EPA 5030 (soil)										
LCS (B0A0304-BS1)					Prepared: 01/03/2020 Analyzed: 01/03/2020					
Benzene	0.115	0.002	mg/kg	0.100		115	70-130			
Toluene	0.120	0.002	"	0.100		120	70-130			
Ethylbenzene	0.118	0.002	"	0.100		118	70-130			
m,p-Xylene	0.238	0.004	"	0.200		119	70-130			
o-Xylene	0.116	0.002	"	0.100		116	70-130			
Naphthalene	0.107	0.008	"	0.100		107	70-130			
Surrogate: 1,2-Dichloroethane-d4	0.12		"	0.125		94.3	70-130			
Surrogate: Toluene-d8	0.12		"	0.125		96.5	70-130			
Surrogate: 4-Bromofluorobenzene	0.14		"	0.125		116	70-130			

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Volatile Organic Compounds by GC/MS SW846 8260D - 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 B0A0304 - EPA 5030 (soil)

Matrix Spike (B0A0304-MS1)		Source: Y001031-01			Prepared: 01/03/2020 Analyzed: 01/03/2020					
Benzene	0.112	0.002	mg/kg	0.100	ND	112	70-130			
Toluene	0.124	0.002	"	0.100	ND	124	70-130			
Ethylbenzene	0.103	0.002	"	0.100	ND	103	70-130			
m,p-Xylene	0.206	0.004	"	0.200	ND	103	70-130			
o-Xylene	0.103	0.002	"	0.100	ND	103	70-130			
Naphthalene	0.124	0.008	"	0.100	0.018	106	70-130			
Surrogate: 1,2-Dichloroethane-d4	0.12		"	0.125		97.4	70-130			
Surrogate: Toluene-d8	0.14		"	0.125		109	70-130			
Surrogate: 4-Bromofluorobenzene	0.13		"	0.125		105	70-130			

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Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B0A0304 - EPA 5030 (soil)										
Matrix Spike Dup (B0A0304-MSD1)		Source: Y001031-01			Prepared: 01/03/2020 Analyzed: 01/03/2020					
Benzene	0.093	0.002	mg/kg	0.100	ND	93.0	70-130	18.5	20	
Toluene	0.097	0.002	"	0.100	ND	96.7	70-130	24.4	20	QR-03
Ethylbenzene	0.091	0.002	"	0.100	ND	91.1	70-130	12.3	20	
m,p-Xylene	0.184	0.004	"	0.200	ND	91.8	70-130	11.6	20	
o-Xylene	0.088	0.002	"	0.100	ND	88.4	70-130	15.0	20	
Naphthalene	0.087	0.008	"	0.100	0.018	68.4	70-130	35.4	20	QM-07, QR-03
Surrogate: 1,2-Dichloroethane-d4	0.12		"	0.125		94.9	70-130			
Surrogate: Toluene-d8	0.13		"	0.125		101	70-130			
Surrogate: 4-Bromofluorobenzene	0.14		"	0.125		112	70-130			

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Volatile Organic Compounds by GC/MS SW846 8260D - 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 B0A0305 - EPA 3580

Blank (B0A0305-BLK1)

Prepared: 01/03/2020 Analyzed: 01/03/2020

Diesel (C10-C28)	ND	25.0	mg/kg							U
Surrogate: o-Terphenyl	18		"	25.0		70.7	50-150			

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Extractable Petroleum Hydrocarbons by 8015D - 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 B0A0305 - EPA 3580

LCS (B0A0305-BS1)

Prepared: 01/03/2020 Analyzed: 01/03/2020

Diesel (C10-C28)	1090	50.0	mg/kg	1000		109	70-130			
Surrogate: o-Terphenyl	52		"	50.0		104	50-150			

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Extractable Petroleum Hydrocarbons by 8015D - 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 B0A0305 - EPA 3580

Matrix Spike (B0A0305-MS1)		Source: Y001031-01			Prepared: 01/03/2020 Analyzed: 01/03/2020					
Diesel (C10-C28)	859	50.0	mg/kg	1000	ND	85.9	70-130			
Surrogate: o-Terphenyl	39		"	50.0		78.8	50-150			

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Extractable Petroleum Hydrocarbons by 8015D - 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 B0A0305 - EPA 3580

Matrix Spike Dup (B0A0305-MSD1)		Source: Y001031-01			Prepared: 01/03/2020 Analyzed: 01/03/2020					
Diesel (C10-C28)	864	50.0	mg/kg	1000	ND	86.4	70-130	0.567	35	
Surrogate: o-Terphenyl	45		"	50.0		89.0	50-150			

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Extractable Petroleum Hydrocarbons by 8015D - 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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Classical Chemistry Parameters - 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 B0A0307 - NO PREP

Duplicate (B0A0307-DUP1)		Source: Y001035-01			Prepared: 01/03/2020 Analyzed: 01/03/2020					
pH	7.72		pH Units		7.70			0.259	25	

Batch B0A0308 - NO PREP

Blank (B0A0308-BLK1)		Prepared: 01/03/2020 Analyzed: 01/03/2020								
Specific Conductance (EC)	0.00210	0.00500	mmhos/cm							
Duplicate (B0A0308-DUP1)		Source: Y001035-01			Prepared: 01/03/2020 Analyzed: 01/03/2020					
Specific Conductance (EC)	0.116	0.00500	mmhos/cm		0.116			0.431	25	

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Notes and Definitions

U Sample is Non-Detect.

QR-03 The RPD value for the sample duplicate or MS/MSD was outside of QC acceptance limits due to matrix interference. QC batch accepted based on LCS and/or LCSD recovery and/or RPD values.

QM-07 The spike recovery was outside acceptance limits for the MS and/or MSD. The batch was accepted based on acceptable LCS recovery.

ND Analyte NOT DETECTED at or above the reporting limit

RPD Relative Percent Difference

All soil results are reported at a wet weight basis.

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