



February 21, 2017

Olsson Associates

Jason Davidson

4690 Table Mountain Drive

Golden

CO 80403

Project Name - Postle Drill Pad

Project Number - [none]

Attached are your analytical results for Postle Drill Pad received by Origins Laboratory, Inc. February 13, 2017. This project is associated with Origins project number X702246-01.

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: [none]

Project: Postle Drill Pad

CROSS REFERENCE REPORT

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
Postle-01	X702246-01	Soil	February 13, 2017 15:15	02/13/2017 17:40
Postle-02	X702246-02	Soil	February 13, 2017 15:35	02/13/2017 17:40
Postle-03	X702246-03	Soil	February 13, 2017 15:45	02/13/2017 17:40
Postle-04	X702246-04	Soil	February 13, 2017 15:50	02/13/2017 17:40

Origins Laboratory, Inc.



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Jen Pellegrini For Noelle Doyle Mathis, President

Olsson Associates
4690 Table Mountain Drive
Golden CO 80403

Jason Davidson
Project Number: [none]
Project: Postle Drill Pad

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ORIGINS
LABORATORY, INC

X702246

Client: Olsson Associates
Address: 4690 Table Mountain Drive Suite 200
Telephone Number: 303-374-3118
Email Address: jdavidson@olssonassociates.com

Project Manager: Jason Davidson
Project Name: Postle Drill Pad
Project Number: 710115
Samples Collected By: 710115

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	8260	8260	8260		
POSTLE-01	2/13/17	1515	2	✓					✓			✓	✓	✓	1	Standard
POSTLE-02	2/13/17	1535	2	✓					✓			✓	✓	✓	2	
POSTLE-03	2/13/17	1545	2	✓					✓			✓	✓	✓	3	
POSTLE-04	2/13/17	1550	2	✓					✓			✓	✓	✓	4	
															5	Standard
															6	
															7	
															8	
															9	Standard
															10	
Relinquished By: <u>HAL</u>	Date: <u>2/13/17</u>	Time: <u>1740</u>	Received By: <u>[Signature]</u>	Date: <u>2/13/17</u>	Time: <u>1740</u>	Turnaround Time: Same Day <input type="checkbox"/> 24 Hr <input type="checkbox"/> 48 Hr <input type="checkbox"/> 72 Hr <input checked="" type="checkbox"/> Standard										
Relinquished By:	Date:	Time:	Received By:	Date:	Time:											

Date Results Needed

Temp Received: 49°C

Origins Laboratory, Inc.

Jefe Pellegrini

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Olsson Associates
4690 Table Mountain Drive
Golden CO 80403

Jason Davidson
Project Number: [none]
Project: Postle Drill Pad

Origins Laboratory

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

Sample Receipt Checklist

Origins Work Order: X702246

Client: Olsson Associates

Client Project ID: Postle Drill Pad

Checklist Completed by: Don Lee

Shipped Via: NO

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

Date/time completed: 2-13-17 1523

Airbill #: NA

Matrix(s) Received: (Check all that apply): / Soil/Solid Water Other: (Describe)

Cooler Number/Temperature: 1 / 4.9 °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⁾ ?	/			
Is there ice present (document if blue ice is used)	/			
Are custody seals present on cooler? (if so, document in comments if they are signed and dated, broken or intact)		/		
Are custody seals present on each sample container? (if so, document in comments if they are signed and dated, broken or intact)		/		
Were all samples received intact ⁽¹⁾ ?	/			
Was adequate sample volume provided ⁽¹⁾ ?	/			
Are short holding time analytes or samples with HTs due within 48 hours present ⁽¹⁾ ?		/		
Is a chain-of-custody (COC) present and filled out completely ⁽¹⁾ ?	/			
Does the COC agree with the number and type of sample bottles received ⁽¹⁾ ?	/			
Do the sample IDs on the bottle labels match the COC ⁽¹⁾ ?	/			
Is the COC properly relinquished by the client with date and time recorded ⁽¹⁾ ?	/			
For volatiles in water – is there headspace (> ¼ inch bubble) present? If yes, contact client and note in narrative.			/	
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)		/		
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.

[Signature]
Reviewed by (Project Manager)

2/14/17
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: [none]
Project: Postle Drill Pad

Postle-01
2/13/2017 3:15:00PM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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Origins Laboratory, Inc.
X702246-01 (Soil)

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

Diesel (C10-C28)	8790	50.0	mg/kg	1	B7B1405	02/14/2017	02/14/2017
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Surrogate: o-Terphenyl	86.6 %	59-131			"	"	"
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GBTEX by EPA 8260C

Gasoline Range Hydrocarbons	494	5.00	mg/kg	25	B7B2001	02/20/2017	02/20/2017
Benzene	ND	0.050	"	"	"	"	U
Toluene	0.222	0.050	"	"	"	"	"
Ethylbenzene	0.534	0.050	"	"	"	"	"
Xylenes, total	3.47	0.050	"	"	"	"	"

Surrogate: 1,2-Dichloroethane-d4	103 %	70-130			"	"	"
Surrogate: Toluene-d8	102 %	70-130			"	"	"
Surrogate: 4-Bromofluorobenzene	98.8 %	70-130			"	"	"

Origins Laboratory, Inc.



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Olsson Associates
4690 Table Mountain Drive
Golden CO 80403

Jason Davidson
Project Number: [none]
Project: Postle Drill Pad

Postle-02
2/13/2017 3:35:00PM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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Origins Laboratory, Inc.
X702246-02 (Soil)

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

Diesel (C10-C28)	2910	50.0	mg/kg	1	B7B1405	02/14/2017	02/14/2017
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Surrogate: o-Terphenyl	97.0 %	59-131			"	"	"
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GBTEX by EPA 8260C

Gasoline Range Hydrocarbons	234	5.00	mg/kg	25	B7B2001	02/20/2017	02/20/2017	
Benzene	ND	0.050	"	"	"	"	"	U
Toluene	ND	0.050	"	"	"	"	"	U
Ethylbenzene	0.092	0.050	"	"	"	"	"	
Xylenes, total	0.420	0.050	"	"	"	"	"	

Surrogate: 1,2-Dichloroethane-d4	102 %	70-130			"	"	"
Surrogate: Toluene-d8	101 %	70-130			"	"	"
Surrogate: 4-Bromofluorobenzene	88.5 %	70-130			"	"	"

Origins Laboratory, Inc.



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Golden CO 80403

Jason Davidson
Project Number: [none]
Project: Postle Drill Pad

Postle-03
2/13/2017 3:45:00PM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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Origins Laboratory, Inc.
X702246-03 (Soil)

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

Diesel (C10-C28)	30200	500	mg/kg	10	B7B1405	02/14/2017	02/21/2017
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Surrogate: o-Terphenyl	149 %	59-131			"	"	" S-04
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GBTEX by EPA 8260C

Gasoline Range Hydrocarbons	2560	50.0	mg/kg	250	B7B2001	02/20/2017	02/21/2017
Benzene	0.058	0.050	"	25	"	"	02/20/2017
Toluene	2.26	0.050	"	"	"	"	"
Ethylbenzene	2.95	0.050	"	"	"	"	"
Xylenes, total	16.8	0.050	"	"	"	"	"

Surrogate: 1,2-Dichloroethane-d4	103 %	70-130			"	"	"
Surrogate: Toluene-d8	110 %	70-130			"	"	"
Surrogate: 4-Bromofluorobenzene	86.0 %	70-130			"	"	"

Origins Laboratory, Inc.



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Golden CO 80403

Jason Davidson
Project Number: [none]
Project: Postle Drill Pad

Postle-04
2/13/2017 3:50:00PM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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Origins Laboratory, Inc.
X702246-04 (Soil)

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

Diesel (C10-C28)	225	50.0	mg/kg	1	B7B1405	02/14/2017	02/21/2017
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Surrogate: o-Terphenyl	97.3 %	59-131			"	"	"
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GBTEX by EPA 8260C

Gasoline Range Hydrocarbons	79.8	5.00	mg/kg	25	B7B2001	02/20/2017	02/20/2017
Benzene	ND	0.050	"	"	"	"	U
Toluene	ND	0.050	"	"	"	"	U
Ethylbenzene	0.190	0.050	"	"	"	"	
Xylenes, total	ND	0.050	"	"	"	"	U

Surrogate: 1,2-Dichloroethane-d4	101 %	70-130			"	"	"
Surrogate: Toluene-d8	102 %	70-130			"	"	"
Surrogate: 4-Bromofluorobenzene	67.2 %	70-130			"	"	" S-04

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Golden CO 80403

Jason Davidson
Project Number: [none]
Project: Postle Drill Pad

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 B7B2001 - EPA 5030 (soil)										
Blank (B7B2001-BLK1)					Prepared: 02/20/2017 Analyzed: 02/20/2017					
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
Surrogate: 1,2-Dichloroethane-d4	62		ug/kg	62.5		99.1	70-130			
Surrogate: Toluene-d8	63		"	62.5		101	70-130			
Surrogate: 4-Bromofluorobenzene	61		"	62.5		97.3	70-130			

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Jason Davidson
Project Number: [none]
Project: Postle Drill Pad

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 B7B2001 - EPA 5030 (soil)										
LCS (B7B2001-BS1)					Prepared: 02/20/2017 Analyzed: 02/20/2017					
Benzene	0.095	0.002	mg/kg	0.100		95.0	77.1-124			
Toluene	0.094	0.002	"	0.100		94.0	74.5-128			
Ethylbenzene	0.097	0.002	"	0.100		97.5	66.4-127			
m,p-Xylene	0.194	0.004	"	0.200		96.9	76.6-124			
o-Xylene	0.093	0.002	"	0.100		93.2	76.6-124			
Surrogate: 1,2-Dichloroethane-d4	65		ug/kg	62.5		103	70-130			
Surrogate: Toluene-d8	64		"	62.5		102	70-130			
Surrogate: 4-Bromofluorobenzene	64		"	62.5		103	70-130			

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Jason Davidson
Project Number: [none]
Project: Postle Drill Pad

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 B7B2001 - EPA 5030 (soil)										
Matrix Spike (B7B2001-MS1)		Source: X702248-01			Prepared: 02/20/2017 Analyzed: 02/20/2017					
Benzene	0.110	0.002	mg/kg	0.100	ND	110	71.8-126			
Toluene	0.117	0.002	"	0.100	ND	117	65.1-130			
Ethylbenzene	0.137	0.002	"	0.100	ND	137	62.2-130			QM-07
m,p-Xylene	0.324	0.004	"	0.200	ND	162	46.5-137			QM-07
o-Xylene	0.156	0.002	"	0.100	ND	156	54.2-134			QM-07
Surrogate: 1,2-Dichloroethane-d4	61		ug/kg	62.5		98.3	70-130			
Surrogate: Toluene-d8	64		"	62.5		103	70-130			
Surrogate: 4-Bromofluorobenzene	61		"	62.5		98.2	70-130			

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Project Number: [none]
Project: Postle Drill Pad

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 B7B2001 - EPA 5030 (soil)

Matrix Spike Dup (B7B2001-MSD1)		Source: X702248-01			Prepared: 02/20/2017 Analyzed: 02/20/2017					
Benzene	0.110	0.002	mg/kg	0.100	ND	110	71.8-126	0.437	11.3	
Toluene	0.117	0.002	"	0.100	ND	117	65.1-130	0.496	15.4	
Ethylbenzene	0.096	0.002	"	0.100	ND	96.2	62.2-130	35.2	19.6	QR-03
m,p-Xylene	0.233	0.004	"	0.200	ND	116	46.5-137	32.9	19.2	QR-03
o-Xylene	0.111	0.002	"	0.100	ND	111	54.2-134	34.2	17.9	QR-03
Surrogate: 1,2-Dichloroethane-d4	62		ug/kg	62.5		100	70-130			
Surrogate: Toluene-d8	65		"	62.5		104	70-130			
Surrogate: 4-Bromofluorobenzene	45		"	62.5		71.6	70-130			

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Jason Davidson
Project Number: [none]
Project: Postle Drill Pad

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 8015C - 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 B7B1405 - EPA 3580

Blank (B7B1405-BLK1)

Prepared: 02/14/2017 Analyzed: 02/14/2017

Diesel (C10-C28)	ND	50.0	mg/kg							U
Surrogate: o-Terphenyl	57		"	50.0		113	59-131			

LCS (B7B1405-BS1)

Prepared: 02/14/2017 Analyzed: 02/14/2017

Diesel (C10-C28)	1020	50.0	mg/kg	1000		102	64-121			
Surrogate: o-Terphenyl	48		"	50.0		95.3	59-131			

Matrix Spike (B7B1405-MS1)

Source: X702230-01

Prepared: 02/14/2017 Analyzed: 02/14/2017

Diesel (C10-C28)	4240	50.0	mg/kg	1000	3620	62.3	53-125			
Surrogate: o-Terphenyl	52		"	50.0		104	59-131			

Matrix Spike Dup (B7B1405-MSD1)

Source: X702230-01

Prepared: 02/14/2017 Analyzed: 02/14/2017

Diesel (C10-C28)	3730	50.0	mg/kg	1000	3620	11.0	53-125	12.9	20	QM-4X
Surrogate: o-Terphenyl	54		"	50.0		109	59-131			

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Olsson Associates
4690 Table Mountain Drive
Golden CO 80403

Jason Davidson
Project Number: [none]
Project: Postle Drill Pad

Notes and Definitions

- U Sample is Non-Detect.
- S-04 The surrogate recovery for this sample is outside of established control limits due to a sample matrix effect.
- 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-4X The spike recovery was outside of QC acceptance limits for the MS and/or MSD due to analyte concentration at 4 times or greater the spike concentration. The QC batch was accepted based on LCS and/or LCSD recoveries within the acceptance limits.
- 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.

Origins Laboratory, Inc.



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