



June 06, 2019

Olsson Associates

Jason Davidson

1525 Raleigh St, Suite 400

Denver

CO 80204

Project Name - Grein #1 TB

Project Number - 019-0896

Attached are your analytical results for Grein #1 TB received by Origins Laboratory, Inc. May 31, 2019. This project is associated with Origins project number Y906015-01.

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

1525 Raleigh St, Suite 400

Denver CO 80204

Jason Davidson

Project Number: 019-0896

Project: Grein #1 TB

CROSS REFERENCE REPORT

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
SB1-06	Y906015-01	Soil	May 29, 2019 12:10	05/31/2019 15:40
SB2-06	Y906015-02	Soil	May 29, 2019 13:40	05/31/2019 15:40
SB3-08	Y906015-03	Soil	May 29, 2019 14:20	05/31/2019 15:40
SB5-06	Y906015-04	Soil	May 29, 2019 14:45	05/31/2019 15:40
SB8-06	Y906015-05	Soil	May 30, 2019 8:20	05/31/2019 15:40
SB10-06	Y906015-06	Soil	May 30, 2019 8:40	05/31/2019 15:40
SB11-06	Y906015-07	Soil	May 30, 2019 8:50	05/31/2019 15:40
SB12-05	Y906015-08	Soil	May 30, 2019 9:00	05/31/2019 15:40
SB13-06	Y906015-09	Soil	May 30, 2019 9:10	05/31/2019 15:40
SB14-09	Y906015-10	Soil	May 30, 2019 9:35	05/31/2019 15:40

Origins Laboratory, Inc.



The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Jen Pellegrini, Project Manager

Olsson Associates
1525 Raleigh St, Suite 400
Denver CO 80204

Jason Davidson
Project Number: 019-0896
Project: Grein #1 TB

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page 1 of 2

1906015

ORIGINS LABORATORY, INC

Client: Olsson Associates
Address: 1525 Raleigh St., Ste. 400
Telephone Number: 303-237-2072
Email Address: jidavidson@olsson.com

Project Manager: Jason Davidson
Project Name: Grein #1 TB
Project Number: 019-0896
Samples Collected By: jidavidson@olsson.com

Sample ID Description	Date Sampled	Time Sampled	# of Containers	Preservative					Matrix			Analysis	Sample Instructions
				Unpreserved	HCl	HNO ₃	Other	Groundwater	Soil	Air Summa #	Other		
SB1-09-06	5/29/19	1210	1	1					X			GRO(8260), DRO(8015)	1
SB1-12	5/31/19	1215											2
SB2-06		1340							X			GRO(8260), DRO(8015)	3
SB3-08		1420							X			GRO(8260), DRO(8015)	4
SB4-08		1430											5
SB5-06		1445							X			GRO(8260), DRO(8015)	6
SB6-08	5/31/19	1455											7
SB7-08		1600											8
													9
													10
Relinquished By: 	Date: 5/31/19	Time: 1540	Received By: 	Date: 5/31/19	Time: 1540	Turnaround Time: Same Day <input type="checkbox"/> 24 Hr <input type="checkbox"/> 48 Hr <input type="checkbox"/> 72 Hr <input checked="" type="checkbox"/> Standard <input type="checkbox"/>							
Relinquished By:	Date:	Time:	Received By:	Date:	Time:								

Make Baseline Standard

01 X

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Origins Laboratory, Inc.

Jefe Pellegrini

Jen Pellegrini, Project Manager

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Olsson Associates
1525 Raleigh St, Suite 400
Denver CO 80204

Jason Davidson
Project Number: 019-0896
Project: Grein #1 TB

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page 2 of 2

906015

ORIGINS LABORATORY, INC

Client: Olsson Associates

Address: 1525 Raleigh St., Ste. 400

Telephone Number: 303-237-2072



Email Address: j.davidson@olsson.com

Project Manager: Jason Davidson

Project Name: Grein #1 TB

Project Number: 019-0896

Samples Collected By: j.davidson@olsson.com

Sample ID Description	Date Sampled	Time Sampled	# of Containers	Preservative					Matrix				Analysis		Sample Instructions
				Unpreserved	HCl	HNO ₃	Other	Groundwater	Soil	Air Summa #	Other				
5808-06	5/20/19	0820	1	1					X				GRQ(8260), DRQ(8015)		1
5809-06	5/20/19	0830	1												2
5810-06	5/20/19	0840	1												3
5811-06	5/20/19	0850	1												4
5812-05	5/20/19	0900	1												5
5813-06	5/20/19	0910	1												6
5814-09	5/20/19	0905	1												7
															8
															9
															10
Relinquished By: 	Date: 5/31/19	Time: 1540							Received By: 	Date: 5/31/19	Time: 1540	Turnaround Time: Same Day <input type="checkbox"/> 24 Hr <input type="checkbox"/> 48 Hr <input type="checkbox"/> 72 Hr <input checked="" type="checkbox"/> Standard <input type="checkbox"/>			
Relinquished By:	Date:	Time:							Received By:	Date:	Time:				

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Origins Laboratory, Inc.

Jefe Pellegrini

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Olsson Associates
1525 Raleigh St, Suite 400
Denver CO 80204

Jason Davidson
Project Number: 019-0896
Project: Grein #1 TB

Origins Laboratory

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

Sample Receipt Checklist

Origins Work Order: Y906015

Client: Olsson

Client Project ID: Grein #1 TB

Checklist Completed by: JG

Shipped Via: HD

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

Date/time completed: 6/3/2019

Airbill #: N/A

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

Cooler Number/Temperature: 1 / 4.8 °C / °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 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 checked="" type="checkbox"/>	<input 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) JP

Date/Time Reviewed 6/4/19

Origins Laboratory, Inc.

Jefe Pellegrini

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Olsson Associates
1525 Raleigh St, Suite 400
Denver CO 80204

Jason Davidson
Project Number: 019-0896
Project: Grein #1 TB

SB1-06

5/29/2019 12:10:00PM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Analyst	Prepared	Analyzed	Notes
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Origins Laboratory, Inc.
Y906015-01 (Soil)

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

Diesel (C10-C28)	570	50.0	mg/kg	1	B9F0305	JTD	06/03/2019	06/05/2019
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Surrogate: o-Terphenyl	82.9 %	50-150			"	"	"
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VOC by EPA 8260D

Gasoline Range Hydrocarbons	1060	50.0	mg/kg	250	B9F0311	KDK	06/03/2019	06/04/2019
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Surrogate: 1,2-Dichloroethane-d4	119 %	70-130			"	"	06/04/2019
Surrogate: Toluene-d8	105 %	70-130			"	"	"
Surrogate: 4-Bromofluorobenzene	97.3 %	70-130			"	"	"

Origins Laboratory, Inc.



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Olsson Associates
1525 Raleigh St, Suite 400
Denver CO 80204

Jason Davidson
Project Number: 019-0896
Project: Grein #1 TB

SB2-06

5/29/2019 1:40:00PM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Analyst	Prepared	Analyzed	Notes
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Origins Laboratory, Inc.
Y906015-02 (Soil)

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

Diesel (C10-C28)	190	50.0	mg/kg	1	B9F0305	JTD	06/03/2019	06/05/2019
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Surrogate: o-Terphenyl	77.9 %	50-150			"	"	"
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VOC by EPA 8260D

Gasoline Range Hydrocarbons	212	5.00	mg/kg	25	B9F0311	KDK	06/03/2019	06/04/2019
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Surrogate: 1,2-Dichloroethane-d4	114 %	70-130			"	"	"
Surrogate: Toluene-d8	116 %	70-130			"	"	"
Surrogate: 4-Bromofluorobenzene	89.7 %	70-130			"	"	"

Origins Laboratory, Inc.



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Olsson Associates
1525 Raleigh St, Suite 400
Denver CO 80204

Jason Davidson
Project Number: 019-0896
Project: Grein #1 TB

SB3-08

5/29/2019 2:20:00PM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Analyst	Prepared	Analyzed	Notes
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Origins Laboratory, Inc.
Y906015-03 (Soil)

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

Diesel (C10-C28)	ND	50.0	mg/kg	1	B9F0305	JTD	06/03/2019	06/05/2019	U
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Surrogate: o-Terphenyl	83.3 %	50-150			"	"	"		
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VOC by EPA 8260D

Gasoline Range Hydrocarbons	0.220	0.200	mg/kg	1	B9F0311	KDK	06/03/2019	06/04/2019	
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Surrogate: 1,2-Dichloroethane-d4	98.7 %	70-130			"	"	"		
Surrogate: Toluene-d8	94.6 %	70-130			"	"	"		
Surrogate: 4-Bromofluorobenzene	101 %	70-130			"	"	"		

Origins Laboratory, Inc.



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Jen Pellegrini, Project Manager

Olsson Associates
1525 Raleigh St, Suite 400
Denver CO 80204

Jason Davidson
Project Number: 019-0896
Project: Grein #1 TB

SB5-06

5/29/2019 2:45:00PM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Analyst	Prepared	Analyzed	Notes
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Origins Laboratory, Inc.
Y906015-04 (Soil)

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

Diesel (C10-C28)	ND	50.0	mg/kg	1	B9F0305	JTD	06/03/2019	06/05/2019	U
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Surrogate: o-Terphenyl	78.1 %	50-150			"	"	"		
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VOC by EPA 8260D

Gasoline Range Hydrocarbons	ND	5.00	mg/kg	25	B9F0311	KDK	06/03/2019	06/04/2019	U
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Surrogate: 1,2-Dichloroethane-d4	93.4 %	70-130			"	"	"		
Surrogate: Toluene-d8	97.6 %	70-130			"	"	"		
Surrogate: 4-Bromofluorobenzene	101 %	70-130			"	"	"		

Origins Laboratory, Inc.



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Jen Pellegrini, Project Manager

Olsson Associates
1525 Raleigh St, Suite 400
Denver CO 80204

Jason Davidson
Project Number: 019-0896
Project: Grein #1 TB

SB8-06

5/30/2019 8:20:00AM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Analyst	Prepared	Analyzed	Notes
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Origins Laboratory, Inc.
Y906015-05 (Soil)

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

Diesel (C10-C28)	76.9	50.0	mg/kg	1	B9F0305	JTD	06/03/2019	06/05/2019
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Surrogate: o-Terphenyl	85.1 %	50-150			"	"	"
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VOC by EPA 8260D

Gasoline Range Hydrocarbons	68.3	5.00	mg/kg	25	B9F0311	KDK	06/03/2019	06/04/2019
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Surrogate: 1,2-Dichloroethane-d4	94.6 %	70-130			"	"	"
Surrogate: Toluene-d8	97.5 %	70-130			"	"	"
Surrogate: 4-Bromofluorobenzene	99.8 %	70-130			"	"	"

Origins Laboratory, Inc.



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Jen Pellegrini, Project Manager

Olsson Associates
1525 Raleigh St, Suite 400
Denver CO 80204

Jason Davidson
Project Number: 019-0896
Project: Grein #1 TB

SB10-06

5/30/2019 8:40:00AM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Analyst	Prepared	Analyzed	Notes
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Origins Laboratory, Inc. Y906015-06 (Soil)

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

Diesel (C10-C28)	ND	50.0	mg/kg	1	B9F0305	JTD	06/03/2019	06/05/2019	U
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Surrogate: o-Terphenyl	80.5 %	50-150			"	"	"		
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VOC by EPA 8260D

Gasoline Range Hydrocarbons	13.1	5.00	mg/kg	25	B9F0311	KDK	06/03/2019	06/04/2019	
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Surrogate: 1,2-Dichloroethane-d4	107 %	70-130			"	"	"		
Surrogate: Toluene-d8	121 %	70-130			"	"	"		
Surrogate: 4-Bromofluorobenzene	96.2 %	70-130			"	"	"		

Origins Laboratory, Inc.



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Jen Pellegrini, Project Manager

Olsson Associates
1525 Raleigh St, Suite 400
Denver CO 80204

Jason Davidson
Project Number: 019-0896
Project: Grein #1 TB

SB11-06

5/30/2019 8:50:00AM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Analyst	Prepared	Analyzed	Notes
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Origins Laboratory, Inc.
Y906015-07 (Soil)

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

Diesel (C10-C28)	ND	50.0	mg/kg	1	B9F0305	JTD	06/03/2019	06/05/2019	U
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Surrogate: o-Terphenyl	77.9 %	50-150			"	"	"
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VOC by EPA 8260D

Gasoline Range Hydrocarbons	0.290	0.200	mg/kg	1	B9F0311	KDK	06/03/2019	06/04/2019
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Surrogate: 1,2-Dichloroethane-d4	120 %	70-130			"	"	"
Surrogate: Toluene-d8	129 %	70-130			"	"	"
Surrogate: 4-Bromofluorobenzene	104 %	70-130			"	"	"

Origins Laboratory, Inc.



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Jen Pellegrini, Project Manager

Olsson Associates
1525 Raleigh St, Suite 400
Denver CO 80204

Jason Davidson
Project Number: 019-0896
Project: Grein #1 TB

SB12-05

5/30/2019 9:00:00AM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Analyst	Prepared	Analyzed	Notes
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Origins Laboratory, Inc.
Y906015-08 (Soil)

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

Diesel (C10-C28)	168	50.0	mg/kg	1	B9F0305	JTD	06/03/2019	06/05/2019
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Surrogate: o-Terphenyl	80.7 %	50-150			"	"	"
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VOC by EPA 8260D

Gasoline Range Hydrocarbons	140	5.00	mg/kg	25	B9F0311	KDK	06/03/2019	06/04/2019
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Surrogate: 1,2-Dichloroethane-d4	109 %	70-130			"	"	"
Surrogate: Toluene-d8	118 %	70-130			"	"	"
Surrogate: 4-Bromofluorobenzene	106 %	70-130			"	"	"

Origins Laboratory, Inc.



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Olsson Associates
1525 Raleigh St, Suite 400
Denver CO 80204

Jason Davidson
Project Number: 019-0896
Project: Grein #1 TB

SB13-06

5/30/2019 9:10:00AM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Analyst	Prepared	Analyzed	Notes
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Origins Laboratory, Inc.
Y906015-09 (Soil)

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

Diesel (C10-C28)	1150	50.0	mg/kg	1	B9F0305	JTD	06/03/2019	06/05/2019
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Surrogate: o-Terphenyl	85.3 %	50-150			"	"	"
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VOC by EPA 8260D

Gasoline Range Hydrocarbons	1510	50.0	mg/kg	250	B9F0311	KDK	06/03/2019	06/04/2019
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Surrogate: 1,2-Dichloroethane-d4	119 %	70-130			"	"	06/04/2019
Surrogate: Toluene-d8	84.4 %	70-130			"	"	"
Surrogate: 4-Bromofluorobenzene	123 %	70-130			"	"	"

Origins Laboratory, Inc.



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Jen Pellegrini, Project Manager

Olsson Associates
1525 Raleigh St, Suite 400
Denver CO 80204

Jason Davidson
Project Number: 019-0896
Project: Grein #1 TB

SB14-09

5/30/2019 9:35:00AM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Analyst	Prepared	Analyzed	Notes
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Origins Laboratory, Inc.
Y906015-10 (Soil)

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

Diesel (C10-C28)	ND	50.0	mg/kg	1	B9F0305	JTD	06/03/2019	06/05/2019	U
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Surrogate: o-Terphenyl	84.9 %	50-150			"	"	"
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VOC by EPA 8260D

Gasoline Range Hydrocarbons	1.41	0.200	mg/kg	1	B9F0311	KDK	06/03/2019	06/04/2019
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Surrogate: 1,2-Dichloroethane-d4	117 %	70-130			"	"	"
Surrogate: Toluene-d8	125 %	70-130			"	"	"
Surrogate: 4-Bromofluorobenzene	106 %	70-130			"	"	"

Origins Laboratory, Inc.



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Jen Pellegrini, Project Manager

Olsson Associates
1525 Raleigh St, Suite 400
Denver CO 80204

Jason Davidson
Project Number: 019-0896
Project: Grein #1 TB

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 B9F0305 - EPA 3580

Blank (B9F0305-BLK1)

Prepared: 06/03/2019 Analyzed: 06/03/2019

Diesel (C10-C28)	ND	50.0	mg/kg							U
Surrogate: o-Terphenyl	40		"	50.0		80.4	50-150			

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Denver CO 80204

Jason Davidson
Project Number: 019-0896
Project: Grein #1 TB

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 B9F0305 - EPA 3580

Blank (B9F0305-BLK2)

Prepared: 06/03/2019 Analyzed: 06/03/2019

Diesel (C10-C28)	ND	50.0	mg/kg							U
Surrogate: o-Terphenyl	46		"	50.0		91.9	50-150			

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Jen Pellegrini, Project Manager

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Jason Davidson
Project Number: 019-0896
Project: Grein #1 TB

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 B9F0305 - EPA 3580

Blank (B9F0305-BLK3)

Prepared: 06/03/2019 Analyzed: 06/03/2019

Diesel (C10-C28)	ND	50.0	mg/kg							U
Surrogate: o-Terphenyl	43		"	50.0		85.2	50-150			

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Project: Grein #1 TB

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 B9F0305 - EPA 3580

LCS (B9F0305-BS1)

Prepared: 06/03/2019 Analyzed: 06/03/2019

Diesel (C10-C28)	955	50.0	mg/kg	1000		95.5	70-130			
Surrogate: o-Terphenyl	49		"	50.0		98.6	50-150			

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Project: Grein #1 TB

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 B9F0305 - EPA 3580

LCS (B9F0305-BS2)

Prepared: 06/03/2019 Analyzed: 06/03/2019

Diesel (C10-C28)	961	50.0	mg/kg	1000		96.1	70-130			
Surrogate: o-Terphenyl	44		"	50.0		88.5	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 B9F0305 - EPA 3580

LCS (B9F0305-BS3)

Prepared: 06/03/2019 Analyzed: 06/03/2019

Diesel (C10-C28)	927	50.0	mg/kg	1000		92.7	70-130			
Surrogate: o-Terphenyl	50		"	50.0		101	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 B9F0305 - EPA 3580

Matrix Spike (B9F0305-MS1)		Source: Y906002-01			Prepared: 06/03/2019 Analyzed: 06/03/2019					
Diesel (C10-C28)	889	50.0	mg/kg	1000	19.3	87.0	70-130			
Surrogate: o-Terphenyl	44		"	50.0		87.4	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 B9F0305 - EPA 3580

Matrix Spike (B9F0305-MS2)		Source: Y905472-04			Prepared: 06/03/2019 Analyzed: 06/03/2019					
Diesel (C10-C28)	860	50.0	mg/kg	1000	21.8	83.9	70-130			
Surrogate: o-Terphenyl	36		"	50.0		71.8	50-150			

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Extractable Petroleum Hydrocarbons by 8015D - Quality Control
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Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch B9F0305 - EPA 3580

Matrix Spike (B9F0305-MS3)		Source: Y906030-04			Prepared: 06/03/2019 Analyzed: 06/03/2019					
Diesel (C10-C28)	915	50.0	mg/kg	1000	18.7	89.6	70-130			
Surrogate: o-Terphenyl	47		"	50.0		93.3	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 B9F0305 - EPA 3580

Matrix Spike Dup (B9F0305-MSD1)		Source: Y906002-01			Prepared: 06/03/2019 Analyzed: 06/03/2019					
Diesel (C10-C28)	875	50.0	mg/kg	1000	19.3	85.6	70-130	1.58	35	
Surrogate: o-Terphenyl	44		"	50.0		88.7	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 B9F0305 - EPA 3580

Matrix Spike Dup (B9F0305-MSD2)		Source: Y905472-04			Prepared: 06/03/2019 Analyzed: 06/03/2019					
Diesel (C10-C28)	990	50.0	mg/kg	1000	21.8	96.8	70-130	14.0	35	
Surrogate: o-Terphenyl	48		"	50.0		96.4	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 B9F0305 - EPA 3580

Matrix Spike Dup (B9F0305-MSD3)			Source: Y906030-04		Prepared: 06/03/2019 Analyzed: 06/03/2019					
Diesel (C10-C28)	911	50.0	mg/kg	1000	18.7	89.3	70-130	0.371	35	
Surrogate: o-Terphenyl	47		"	50.0		94.4	50-150			

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Project: Grein #1 TB

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 B9F0311 - EPA 5030 (soil)

Blank (B9F0311-BLK1)

Prepared: 06/03/2019 Analyzed: 06/03/2019

1,1,1,2-Tetrachloroethane	ND	0.00200	mg/kg							U
1,1,1-Trichloroethane	ND	0.00200	"							U
1,1,2,2-Tetrachloroethane	ND	0.00200	"							U
1,1,2-Trichloroethane	ND	0.00200	"							U
1,1-Dichloroethane	ND	0.00200	"							U
1,1-Dichloroethene	ND	0.00200	"							U
1,1-Dichloropropene	ND	0.00200	"							U
1,2,3-Trichlorobenzene	ND	0.00500	"							U
1,2,3-Trichloropropane	ND	0.00500	"							U
1,2,4-Trichlorobenzene	ND	0.00500	"							U
1,2,4-Trimethylbenzene	ND	0.00200	"							U
1,2-Dibromo-3-chloropropane	ND	0.00500	"							U
1,2-Dibromoethane (EDB)	ND	0.00200	"							U
1,2-Dichlorobenzene	ND	0.00200	"							U
1,2-Dichloroethane	ND	0.00200	"							U
1,2-Dichloropropane	ND	0.00200	"							U
1,3,5-Trimethylbenzene	ND	0.00200	"							U
1,3-Dichlorobenzene	ND	0.00200	"							U
1,3-Dichloropropane	ND	0.00200	"							U
1,4-Dichlorobenzene	ND	0.00200	"							U
2,2-Dichloropropane	ND	0.00200	"							U
2-Butanone	ND	0.0100	"							U
2-Chlorotoluene	ND	0.00200	"							U
2-Hexanone	ND	0.0100	"							U
4-Chlorotoluene	ND	0.00200	"							U
4-Isopropyltoluene	ND	0.00200	"							U

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Jason Davidson
Project Number: 019-0896
Project: Grein #1 TB

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 B9F0311 - EPA 5030 (soil)										
Blank (B9F0311-BLK1)					Prepared: 06/03/2019 Analyzed: 06/03/2019					
4-Methyl-2-pentanone	ND	0.0100	mg/kg							U
Acetone	ND	0.0200	"							U
Benzene	ND	0.00200	"							U
Bromobenzene	ND	0.00200	"							U
Bromochloromethane	ND	0.00200	"							U
Bromodichloromethane	ND	0.00200	"							U
Bromoform	ND	0.00200	"							U
Bromomethane	ND	0.00200	"							U
Carbon disulfide	ND	0.00500	"							U
Carbon tetrachloride	ND	0.00200	"							U
Chlorobenzene	ND	0.00200	"							U
Chloroethane	ND	0.00500	"							U
Chloroform	ND	0.00200	"							U
Chloromethane	ND	0.00200	"							U
cis-1,2-Dichloroethene	ND	0.00200	"							U
cis-1,3-Dichloropropene	ND	0.00200	"							U
Dibromochloromethane	ND	0.00200	"							U
Dibromomethane	ND	0.00200	"							U
Ethylbenzene	ND	0.00200	"							U
Hexachlorobutadiene	ND	0.00500	"							U
Iodomethane	ND	0.0150	"							U
Isopropylbenzene	ND	0.00200	"							U
m,p-Xylene	ND	0.00400	"							U
Methyl tert-Butyl Ether	ND	0.00200	"							U
Methylene Chloride	ND	0.0200	"							U
Naphthalene	ND	0.0100	"							U

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Jason Davidson
Project Number: 019-0896
Project: Grein #1 TB

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 B9F0311 - EPA 5030 (soil)										
Blank (B9F0311-BLK1)					Prepared: 06/03/2019 Analyzed: 06/03/2019					
n-Butylbenzene	ND	0.00200	mg/kg							U
n-Propylbenzene	ND	0.00200	"							U
o-Xylene	ND	0.00200	"							U
sec-Butylbenzene	ND	0.00200	"							U
Styrene	ND	0.00200	"							U
tert-Butylbenzene	ND	0.00200	"							U
Tetrachloroethene	ND	0.00200	"							U
Toluene	ND	0.00200	"							U
trans-1,2-Dichloroethene	ND	0.00200	"							U
trans-1,3-Dichloropropene	ND	0.00200	"							U
Trichloroethene	ND	0.00200	"							U
Trichlorofluoromethane	ND	0.00300	"							U
Vinyl chloride	ND	0.00200	"							U
Surrogate: 1,2-Dichloroethane-d4	0.15		"	0.125		123	70-130			
Surrogate: 4-Bromofluorobenzene	0.13		"	0.125		106	70-130			

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Jason Davidson
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Project: Grein #1 TB

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 B9F0311 - EPA 5030 (soil)

Blank (B9F0311-BLK2)

Prepared: 06/03/2019 Analyzed: 06/03/2019

1,1,1,2-Tetrachloroethane	ND	0.00200	mg/kg							U
1,1,1-Trichloroethane	ND	0.00200	"							U
1,1,2,2-Tetrachloroethane	ND	0.00200	"							U
1,1,2-Trichloroethane	ND	0.00200	"							U
1,1-Dichloroethane	ND	0.00200	"							U
1,1-Dichloroethene	ND	0.00200	"							U
1,1-Dichloropropene	ND	0.00200	"							U
1,2,3-Trichlorobenzene	ND	0.00500	"							U
1,2,3-Trichloropropane	ND	0.00500	"							U
1,2,4-Trichlorobenzene	ND	0.00500	"							U
1,2,4-Trimethylbenzene	ND	0.00200	"							U
1,2-Dibromo-3-chloropropane	ND	0.00500	"							U
1,2-Dibromoethane (EDB)	ND	0.00200	"							U
1,2-Dichlorobenzene	ND	0.00200	"							U
1,2-Dichloroethane	ND	0.00200	"							U
1,2-Dichloropropane	ND	0.00200	"							U
1,3,5-Trimethylbenzene	ND	0.00200	"							U
1,3-Dichlorobenzene	ND	0.00200	"							U
1,3-Dichloropropane	ND	0.00200	"							U
1,4-Dichlorobenzene	ND	0.00200	"							U
2,2-Dichloropropane	ND	0.00200	"							U
2-Butanone	ND	0.0100	"							U
2-Chlorotoluene	ND	0.00200	"							U
2-Hexanone	ND	0.0100	"							U
4-Chlorotoluene	ND	0.00200	"							U
4-Isopropyltoluene	ND	0.00200	"							U

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Project: Grein #1 TB

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 B9F0311 - EPA 5030 (soil)										
Blank (B9F0311-BLK2)					Prepared: 06/03/2019 Analyzed: 06/03/2019					
4-Methyl-2-pentanone	ND	0.0100	mg/kg							U
Acetone	ND	0.0200	"							U
Benzene	ND	0.00200	"							U
Bromobenzene	ND	0.00200	"							U
Bromochloromethane	ND	0.00200	"							U
Bromodichloromethane	ND	0.00200	"							U
Bromoform	ND	0.00200	"							U
Bromomethane	ND	0.00200	"							U
Carbon disulfide	ND	0.00500	"							U
Carbon tetrachloride	ND	0.00200	"							U
Chlorobenzene	ND	0.00200	"							U
Chloroethane	ND	0.00500	"							U
Chloroform	ND	0.00200	"							U
Chloromethane	ND	0.00200	"							U
cis-1,2-Dichloroethene	ND	0.00200	"							U
cis-1,3-Dichloropropene	ND	0.00200	"							U
Dibromochloromethane	ND	0.00200	"							U
Dibromomethane	ND	0.00200	"							U
Ethylbenzene	ND	0.00200	"							U
Hexachlorobutadiene	ND	0.00500	"							U
Iodomethane	ND	0.0150	"							U
Isopropylbenzene	ND	0.00200	"							U
m,p-Xylene	ND	0.00400	"							U
Methyl tert-Butyl Ether	ND	0.00200	"							U
Methylene Chloride	ND	0.0200	"							U
Naphthalene	ND	0.0100	"							U

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Jason Davidson
Project Number: 019-0896
Project: Grein #1 TB

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 B9F0311 - EPA 5030 (soil)										
Blank (B9F0311-BLK2)					Prepared: 06/03/2019 Analyzed: 06/03/2019					
n-Butylbenzene	ND	0.00200	mg/kg							U
n-Propylbenzene	ND	0.00200	"							U
o-Xylene	ND	0.00200	"							U
sec-Butylbenzene	ND	0.00200	"							U
Styrene	ND	0.00200	"							U
tert-Butylbenzene	ND	0.00200	"							U
Tetrachloroethene	ND	0.00200	"							U
Toluene	ND	0.00200	"							U
trans-1,2-Dichloroethene	ND	0.00200	"							U
trans-1,3-Dichloropropene	ND	0.00200	"							U
Trichloroethene	ND	0.00200	"							U
Trichlorofluoromethane	ND	0.00300	"							U
Vinyl chloride	ND	0.00200	"							U
Surrogate: 1,2-Dichloroethane-d4	0.12		"	0.125		99.0	70-130			
Surrogate: Toluene-d8	0.12		"	0.125		94.9	70-130			
Surrogate: 4-Bromofluorobenzene	0.13		"	0.125		100	70-130			

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Jason Davidson
Project Number: 019-0896
Project: Grein #1 TB

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 B9F0311 - EPA 5030 (soil)

LCS (B9F0311-BS1)

Prepared: 06/03/2019 Analyzed: 06/03/2019

1,1,1,2-Tetrachloroethane	0.0918	0.00200	mg/kg	0.100		91.8	70-130			
1,1,1-Trichloroethane	0.0786	0.00200	"	0.100		78.6	70-130			
1,1,2,2-Tetrachloroethane	0.0974	0.00200	"	0.100		97.4	70-130			
1,1,2-Trichloroethane	0.0986	0.00200	"	0.100		98.6	70-130			
1,1-Dichloroethane	0.0738	0.00200	"	0.100		73.8	70-130			
1,1-Dichloroethene	0.0479	0.00200	"	0.100		47.9	70-130			
1,1-Dichloropropene	0.0764	0.00200	"	0.100		76.4	70-130			
1,2,3-Trichlorobenzene	0.0880	0.00500	"	0.100		88.0	70-130			
1,2,3-Trichloropropane	0.0931	0.00500	"	0.100		93.1	70-130			
1,2,4-Trichlorobenzene	0.0879	0.00500	"	0.100		87.9	70-130			
1,2,4-Trimethylbenzene	0.0904	0.00200	"	0.100		90.4	70-130			
1,2-Dibromo-3-chloropropane	0.102	0.00500	"	0.100		102	70-130			
1,2-Dibromoethane (EDB)	0.100	0.00200	"	0.100		100	70-130			
1,2-Dichlorobenzene	0.0907	0.00200	"	0.100		90.7	70-130			
1,2-Dichloroethane	0.0858	0.00200	"	0.100		85.8	70-130			
1,2-Dichloropropane	0.0877	0.00200	"	0.100		87.7	70-130			
1,3,5-Trimethylbenzene	0.0879	0.00200	"	0.100		87.9	70-130			
1,3-Dichlorobenzene	0.0866	0.00200	"	0.100		86.6	70-130			
1,3-Dichloropropane	0.0963	0.00200	"	0.100		96.3	70-130			
1,4-Dichlorobenzene	0.0863	0.00200	"	0.100		86.3	70-130			
2,2-Dichloropropane	0.0785	0.00200	"	0.100		78.5	70-130			
2-Butanone	0.413	0.0100	"	0.500		82.5	70-130			
2-Chlorotoluene	0.0879	0.00200	"	0.100		87.9	70-130			
2-Hexanone	0.425	0.0100	"	0.500		85.1	70-130			
4-Chlorotoluene	0.0869	0.00200	"	0.100		86.9	70-130			
4-Isopropyltoluene	0.0916	0.00200	"	0.100		91.6	70-130			

Origins Laboratory, Inc.



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Denver CO 80204

Jason Davidson
Project Number: 019-0896
Project: Grein #1 TB

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 B9F0311 - EPA 5030 (soil)										
LCS (B9F0311-BS1)					Prepared: 06/03/2019 Analyzed: 06/03/2019					
4-Methyl-2-pentanone	0.415	0.0100	mg/kg	0.500		83.0	70-130			
Acetone	0.368	0.0200	"	0.500		73.6	70-130			
Benzene	0.0772	0.00200	"	0.100		77.2	70-130			
Bromobenzene	0.0872	0.00200	"	0.100		87.2	70-130			
Bromochloromethane	0.0895	0.00200	"	0.100		89.5	70-130			
Bromodichloromethane	0.0886	0.00200	"	0.100		88.6	70-130			
Bromoform	0.0956	0.00200	"	0.100		95.6	70-130			
Bromomethane	0.00120	0.00200	"	0.100		1.20	70-130			U
Carbon disulfide	0.0325	0.00500	"	0.100		32.5	70-130			
Carbon tetrachloride	0.0769	0.00200	"	0.100		76.9	70-130			
Chlorobenzene	0.0849	0.00200	"	0.100		84.9	70-130			
Chloroethane	0.00172	0.00500	"	0.100		1.72	70-130			U
Chloroform	0.0826	0.00200	"	0.100		82.6	70-130			
Chloromethane	0.000620	0.00200	"	0.100		0.620	70-130			U
cis-1,2-Dichloroethene	0.0777	0.00200	"	0.100		77.7	70-130			
cis-1,3-Dichloropropene	0.0862	0.00200	"	0.100		86.2	70-130			
Dibromochloromethane	0.0895	0.00200	"	0.100		89.5	70-130			
Dibromomethane	0.0957	0.00200	"	0.100		95.7	70-130			
Ethylbenzene	0.0834	0.00200	"	0.100		83.4	70-130			
Hexachlorobutadiene	0.0959	0.00500	"	0.100		95.9	70-130			
Iodomethane	0.0591	0.0150	"	0.100		59.1	70-130			
Isopropylbenzene	0.0923	0.00200	"	0.100		92.3	70-130			
m,p-Xylene	0.173	0.00400	"	0.200		86.3	70-130			
Methyl tert-Butyl Ether	0.0844	0.00200	"	0.100		84.4	70-130			
Methylene Chloride	0.0657	0.0200	"	0.100		65.7	70-130			
Naphthalene	0.0934	0.0100	"	0.100		93.4	70-130			

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Jason Davidson
Project Number: 019-0896
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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 B9F0311 - EPA 5030 (soil)										
LCS (B9F0311-BS1)					Prepared: 06/03/2019 Analyzed: 06/03/2019					
n-Butylbenzene	0.0895	0.00200	mg/kg	0.100		89.5	70-130			
n-Propylbenzene	0.0867	0.00200	"	0.100		86.7	70-130			
o-Xylene	0.0901	0.00200	"	0.100		90.1	70-130			
sec-Butylbenzene	0.0894	0.00200	"	0.100		89.4	70-130			
Styrene	0.0960	0.00200	"	0.100		96.0	70-130			
tert-Butylbenzene	0.0909	0.00200	"	0.100		90.9	70-130			
Tetrachloroethene	0.0847	0.00200	"	0.100		84.7	70-130			
Toluene	0.0800	0.00200	"	0.100		80.0	70-130			
trans-1,2-Dichloroethene	0.0667	0.00200	"	0.100		66.7	70-130			
trans-1,3-Dichloropropene	0.0903	0.00200	"	0.100		90.3	70-130			
Trichloroethene	0.0825	0.00200	"	0.100		82.5	70-130			
Trichlorofluoromethane	ND	0.00300	"	0.100			70-130			U
Vinyl chloride	0.000780	0.00200	"	0.100		0.780	70-130			U
Surrogate: 1,2-Dichloroethane-d4	0.12		"	0.125		96.8	70-130			
Surrogate: Toluene-d8	0.12		"	0.125		94.8	70-130			
Surrogate: 4-Bromofluorobenzene	0.13		"	0.125		103	70-130			

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Jen Pellegrini, Project Manager

Olsson Associates

1525 Raleigh St, Suite 400

Denver CO 80204

Jason Davidson

Project Number: 019-0896

Project: Grein #1 TB

Notes and Definitions

U Sample is Non-Detect.

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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Jen Pellegrini, Project Manager