

April 23, 2024

**A.G. Wassenaar**

**Rachel Peterson**

**3211 South Zuni St**

**Englewood CO 80110**

**Project Name - Cowboys #1-25**

**Project Number - 173447**

Attached are your analytical results for Cowboys #1-25 received by Origins Laboratory, Inc. March 21, 2024. This project is associated with Origins project number Y403608-01.

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



A.G. Wassenaar  
3211 South Zuni St  
Englewood CO 80110

Rachel Peterson  
Project Number: 173447  
Project: Cowboys #1-25

CROSS REFERENCE REPORT

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
Cowboy - WH	Y403608-01	Soil	March 21, 2024 0:00	03/21/2024 16:17
Cowboy - E	Y403608-02	Soil	March 21, 2024 0:00	03/21/2024 16:17
Cowboy - S	Y403608-03	Soil	March 21, 2024 0:00	03/21/2024 16:17

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Rachel Peterson  
 Project Number: 173447  
 Project: Cowboys #1-25

Origins Laboratory

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

**Sample Receipt Checklist**

Origins Work Order: 403608

Client: AGW

Client Project ID: Cowboy 1-25

Checklist Completed by: EHS

Shipped Via: HO  
 (UPS, FedEx, Hand Delivered, Pick-up, etc.)

Date/time completed: 3/21/24

Airbill #: N/A

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

Cooler Number/Temperature: 118 °C / \_\_\_\_\_ °C / \_\_\_\_\_ °C / \_\_\_\_\_ °C

Thermometer ID: T004

Requirement Description	Yes	No	N/A	Comments (if any)
If samples require cooling, was the temperature between 0°C to ≤ 6°C <sup>(1)</sup> ?		/		SD
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 <sup>(1)</sup> ?	/			
Was adequate sample volume provided <sup>(1)</sup> ?	/			
Are short holding time analytes or samples with HTs due within 48 hours present <sup>(1)</sup> ?		/		
Is a chain-of-custody (COC) present and filled out completely <sup>(1)</sup> ?		/		no times
Does the COC agree with the number and type of sample bottles received <sup>(1)</sup> ?	/			
Do the sample IDs on the bottle labels match the COC <sup>(1)</sup> ?	/			
Is the COC properly relinquished by the client with date and time recorded <sup>(1)</sup> ?	/			
For volatiles in water – is there headspace (> 1/4 inch bubble) present? <b>if yes, contact client and note in narrative.</b>			/	
Are samples preserved that require preservation and was it checked <sup>(1)</sup> ? (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 HNO3, HCL, H2SO4) / (pH >10 for samples preserved with NaAsO2+NaOH, ZnAc+NaOH)			/	
Additional Comments (if any):				

<sup>(1)</sup>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: [Signature] (Project Manager)

Date/Time Reviewed: 3/25/24

Origins Laboratory, Inc.

[Signature]

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 Project: Cowboys #1-25

**Cowbov - WH**  
**3/21/2024 12:00:00AM**

Analyte	Result	Min Detection Limit	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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**Origins Laboratory, Inc.**  
**Y403608-01 (Soil)**

**Boron (DTPA Sorbitol)**

Boron	ND		1.01	mg/L	10	B4C2516	03/25/2024	03/29/2024	
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**DRO/ORO by EPA 8015D**

Diesel (C10-C28)	ND		25.0	mg/kg	1	B4C2201	03/22/2024	03/26/2024	U
Residual Range Organics (C28-C40)	ND		100	"	"	"	"	"	U

Surrogate: <i>o</i> -Terphenyl	98.2 %		50-150			"	"	"	
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**GBTEX+TMBs by 8260D**

1,2,4-Trimethylbenzene	ND		0.00200	mg/kg	1	B4C2160	03/21/2024	03/26/2024	U
1,3,5-Trimethylbenzene	ND		0.00200	"	"	"	"	"	U
Benzene	ND		0.00200	"	"	"	"	"	U
Ethylbenzene	ND		0.00200	"	"	"	"	"	U
Toluene	ND		0.00200	"	"	"	"	"	U
Xylenes, total	ND		0.00200	"	"	"	"	"	U
Gasoline Range Hydrocarbons	ND		0.200	"	"	"	"	"	U

Surrogate: 1,2-Dichloroethane-d4	108 %		70-130			"	"	"	
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**Cowbov - WH**  
**3/21/2024 12:00:00AM**

Analyte	Result	Min Detection Limit	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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**Origins Laboratory, Inc.**  
**Y403608-01 (Soil)**

**GBTEX+TMBs by 8260D**

Surrogate: Toluene-d8	102 %		70-130			B4C21 60	03/21/2024	03/26/2024	
Surrogate: 4-Bromofluorobenzene	97.4 %		70-130			"	"	"	

**Metals by Saturated Paste by EPA 6010**

Calcium	<b>2.85</b>		0.499	meq/L	10	[CALC]	03/25/2024	03/28/2024	
Magnesium	<b>1.29</b>		0.823	"	"	"	"	"	
Sodium	<b>0.441</b>		0.435	"	"	"	"	"	

**PAH by EPA 8270E**

1-Methylnaphthalene	ND		0.002	mg/kg	1	B4C2222	03/22/2024	03/27/2024	U
2-Methylnaphthalene	ND		0.002	"	"	"	"	"	U
Acenaphthene	ND		0.020	"	"	"	"	"	U
Anthracene	ND		0.020	"	"	"	"	"	U
Benzo (a) anthracene	ND		0.005	"	"	"	"	"	U
Benzo (a) pyrene	ND		0.020	"	"	"	"	"	U
Benzo (b) fluoranthene	ND		0.020	"	"	"	"	"	U
Benzo (k) fluoranthene	ND		0.020	"	"	"	"	"	U
Chrysene	ND		0.020	"	"	"	"	"	U
Dibenz (a,h) anthracene	ND		0.020	"	"	"	"	"	U
Fluoranthene	ND		0.020	"	"	"	"	"	U

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**Cowbov - WH**  
**3/21/2024 12:00:00AM**

Analyte	Result	Min Detection Limit	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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**Origins Laboratory, Inc.**  
**Y403608-01 (Soil)**

**PAH by EPA 8270E**

Fluorene	ND		0.020	mg/kg	1	B4C2222	03/22/2024	03/27/2024	U
Indeno (1,2,3-cd) pyrene	ND		0.020	"	"	"	"	"	U
Naphthalene	ND		0.002	"	"	"	"	"	U
Pyrene	ND		0.020	"	"	"	"	"	U

Surrogate: Fluorene-d10	99.7 %		60-130			"	"	"	
Surrogate: Anthracene-d10	93.5 %		60-130			"	"	"	
Surrogate: Pyrene-d10	107 %		60-130			"	"	"	
Surrogate: Benzo (a) pyrene-d12	101 %		60-130			"	"	"	

**pH in Soil by 9045D**

pH	8.11			pH Units	1	B4C2520	03/25/2024	03/26/2024	
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**SAR by 20B Saturated Paste**

SAR	0.307		0.0100	SAR	1	B4C2506	03/25/2024	03/28/2024	
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**Specific Conductance Mod. 9050A**

Specific Conductance (EC)	0.628		0.00500	mmhos/cm	1	B4C2520	03/25/2024	03/26/2024	
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**Table 915 metals by EPA 6020B**

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**Cowbov - WH**  
**3/21/2024 12:00:00AM**

Analyte	Result	Min Detection Limit	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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**Origins Laboratory, Inc.**  
**Y403608-01 (Soil)**

**Table 915 metals by EPA 6020B**

Arsenic	3.86		0.273	mg/kg	10	B4C2229	03/22/2024	03/28/2024	
Barium	141		9.42	"	"	"	"	"	
Cadmium	ND		0.0942	"	"	"	"	"	
Copper	10.7		9.42	"	"	"	"	"	
Lead	12.0		0.942	"	"	"	"	"	
Nickel	11.6		0.942	"	"	"	"	"	
Selenium	ND		0.245	"	"	"	"	"	
Silver	ND		0.0942	"	"	"	"	"	
Zinc	51.8		34.9	"	"	"	"	"	

**Total Metals by 7196A**

Chromium, Hexavalent	ND	0.488	1	mg/Kg	2	L744977	03/21/2024	04/18/2024	
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 Project Number: 173447  
 Project: Cowboys #1-25

**Cowbov - E**

**3/21/2024 12:00:00AM**

Analyte	Result	Min Detection Limit	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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**Origins Laboratory, Inc.**  
**Y403608-02 (Soil)**

**Boron (DTPA Sorbitol)**

Boron	ND		1.01	mg/L	10	B4C2516	03/25/2024	03/29/2024	
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**DRO/ORO by EPA 8015D**

Diesel (C10-C28)	ND		25.0	mg/kg	1	B4C2201	03/22/2024	03/26/2024	U
Residual Range Organics (C28-C40)	ND		100	"	"	"	"	"	U

Surrogate: <i>o</i> -Terphenyl	94.9 %		50-150			"	"	"	
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**GBTEX+TMBs by 8260D**

1,2,4-Trimethylbenzene	ND		0.00200	mg/kg	1	B4C2160	03/21/2024	03/26/2024	U
1,3,5-Trimethylbenzene	ND		0.00200	"	"	"	"	"	U
Benzene	ND		0.00200	"	"	"	"	"	U
Ethylbenzene	ND		0.00200	"	"	"	"	"	U
Toluene	ND		0.00200	"	"	"	"	"	U
Xylenes, total	ND		0.00200	"	"	"	"	"	U
Gasoline Range Hydrocarbons	ND		0.200	"	"	"	"	"	U

Surrogate: 1,2-Dichloroethane-d4	107 %		70-130			"	"	"	
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**Cowbov - E**

**3/21/2024 12:00:00AM**

Analyte	Result	Min Detection Limit	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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**Origins Laboratory, Inc.**  
**Y403608-02 (Soil)**

**GBTEX+TMBs by 8260D**

Surrogate: Toluene-d8	100 %		70-130			B4C21 60	03/21/2024	03/26/2024	
Surrogate: 4-Bromofluorobenzene	98.4 %		70-130			"	"	"	

**Metals by Saturated Paste by EPA 6010**

Calcium	2.53		0.499	meq/L	10	[CALC]	03/25/2024	03/28/2024	
Magnesium	1.17		0.823	"	"	"	"	"	
Sodium	0.466		0.435	"	"	"	"	"	

**PAH by EPA 8270E**

1-Methylnaphthalene	ND		0.002	mg/kg	1	B4C2222	03/22/2024	03/27/2024	U
2-Methylnaphthalene	ND		0.002	"	"	"	"	"	U
Acenaphthene	ND		0.020	"	"	"	"	"	U
Anthracene	ND		0.020	"	"	"	"	"	U
Benzo (a) anthracene	ND		0.005	"	"	"	"	"	U
Benzo (a) pyrene	ND		0.020	"	"	"	"	"	U
Benzo (b) fluoranthene	ND		0.020	"	"	"	"	"	U
Benzo (k) fluoranthene	ND		0.020	"	"	"	"	"	U
Chrysene	ND		0.020	"	"	"	"	"	U
Dibenz (a,h) anthracene	ND		0.020	"	"	"	"	"	U
Fluoranthene	ND		0.020	"	"	"	"	"	U

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 Project: Cowboys #1-25

**Cowbov - E**

**3/21/2024 12:00:00AM**

Analyte	Result	Min Detection Limit	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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**Origins Laboratory, Inc.**  
**Y403608-02 (Soil)**

**PAH by EPA 8270E**

Fluorene	ND		0.020	mg/kg	1	B4C2222	03/22/2024	03/27/2024	U
Indeno (1,2,3-cd) pyrene	ND		0.020	"	"	"	"	"	U
Naphthalene	ND		0.002	"	"	"	"	"	U
Pyrene	ND		0.020	"	"	"	"	"	U

Surrogate: Fluorene-d10	99.7 %		60-130			"	"	"	
Surrogate: Anthracene-d10	93.7 %		60-130			"	"	"	
Surrogate: Pyrene-d10	98.3 %		60-130			"	"	"	
Surrogate: Benzo (a) pyrene-d12	101 %		60-130			"	"	"	

**pH in Soil by 9045D**

pH	7.92			pH Units	1	B4C2520	03/25/2024	03/26/2024	
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**SAR by 20B Saturated Paste**

SAR	0.343		0.0100	SAR	1	B4C2506	03/25/2024	03/28/2024	
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**Specific Conductance Mod. 9050A**

Specific Conductance (EC)	0.466		0.00500	mmhos/cm	1	B4C2520	03/25/2024	03/26/2024	
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**Table 915 metals by EPA 6020B**

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 Project: Cowboys #1-25

**Cowbov - E**

**3/21/2024 12:00:00AM**

Analyte	Result	Min Detection Limit	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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**Origins Laboratory, Inc.**  
**Y403608-02 (Soil)**

**Table 915 metals by EPA 6020B**

Arsenic	3.78		0.265	mg/kg	10	B4C2229	03/22/2024	03/28/2024	
Barium	134		9.14	"	"	"	"	"	
Cadmium	ND		0.0914	"	"	"	"	"	
Copper	10.5		9.14	"	"	"	"	"	
Lead	11.7		0.914	"	"	"	"	"	
Nickel	11.5		0.914	"	"	"	"	"	
Selenium	ND		0.238	"	"	"	"	"	
Silver	ND		0.0914	"	"	"	"	"	
Zinc	49.0		33.8	"	"	"	"	"	

**Total Metals by 7196A**

Chromium, Hexavalent	ND	0.488	1	mg/Kg	2	L744978	03/21/2024	04/18/2024	
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**Cowbov - S**

**3/21/2024 12:00:00AM**

Analyte	Result	Min Detection Limit	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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**Origins Laboratory, Inc.**  
**Y403608-03 (Soil)**

**Boron (DTPA Sorbitol)**

Boron	ND		0.985	mg/L	10	B4C2516	03/25/2024	03/29/2024	
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**DRO/ORO by EPA 8015D**

Diesel (C10-C28)	ND		25.0	mg/kg	1	B4C2201	03/22/2024	03/26/2024	U
Residual Range Organics (C28-C40)	ND		100	"	"	"	"	"	U

Surrogate: <i>o</i> -Terphenyl	91.1 %		50-150			"	"	"	
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**GBTEX+TMBs by 8260D**

1,2,4-Trimethylbenzene	ND		0.00200	mg/kg	1	B4C2160	03/21/2024	03/26/2024	U
1,3,5-Trimethylbenzene	ND		0.00200	"	"	"	"	"	U
Benzene	<b>0.00240</b>		0.00200	"	"	"	"	"	
Ethylbenzene	ND		0.00200	"	"	"	"	"	U
Toluene	<b>0.00216</b>		0.00200	"	"	"	"	"	
Xylenes, total	ND		0.00200	"	"	"	"	"	U
Gasoline Range Hydrocarbons	ND		0.200	"	"	"	"	"	U

Surrogate: 1,2-Dichloroethane-d4	107 %		70-130			"	"	"	
Surrogate: Toluene-d8	100 %		70-130			"	"	"	

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 Project: Cowboys #1-25

**Cowbov - S**

**3/21/2024 12:00:00AM**

Analyte	Result	Min Detection Limit	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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**Origins Laboratory, Inc.**  
**Y403608-03 (Soil)**

**GBTEX+TMBs by 8260D**

Surrogate: 4-Bromofluorobenzene	98.6 %	70-130				B4C21 60	03/21/2024	03/26/2024	
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**Metals by Saturated Paste by EPA 6010**

Calcium	2.02	0.499	meq/L	10	[CALC]		03/25/2024	03/28/2024	
Magnesium	0.953	0.823	"	"	"	"	"	"	
Sodium	ND	0.435	"	"	"	"	"	"	

**PAH by EPA 8270E**

1-Methylnaphthalene	ND	0.002	mg/kg	1	B4C2222		03/22/2024	03/27/2024	U
2-Methylnaphthalene	ND	0.002	"	"	"	"	"	"	U
Acenaphthene	ND	0.020	"	"	"	"	"	"	U
Anthracene	ND	0.020	"	"	"	"	"	"	U
Benzo (a) anthracene	ND	0.005	"	"	"	"	"	"	U
Benzo (a) pyrene	ND	0.020	"	"	"	"	"	"	U
Benzo (b) fluoranthene	ND	0.020	"	"	"	"	"	"	U
Benzo (k) fluoranthene	ND	0.020	"	"	"	"	"	"	U
Chrysene	ND	0.020	"	"	"	"	"	"	U
Dibenz (a,h) anthracene	ND	0.020	"	"	"	"	"	"	U
Fluoranthene	ND	0.020	"	"	"	"	"	"	U
Fluorene	ND	0.020	"	"	"	"	"	"	U

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 Project: Cowboys #1-25

**Cowbov - S**

**3/21/2024 12:00:00AM**

Analyte	Result	Min Detection Limit	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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**Origins Laboratory, Inc.**  
**Y403608-03 (Soil)**

**PAH by EPA 8270E**

Indeno (1,2,3-cd) pyrene	ND		0.020	mg/kg	1	B4C2222	03/22/2024	03/27/2024	U
Naphthalene	ND		0.002	"	"	"	"	"	U
Pyrene	ND		0.020	"	"	"	"	"	U

Surrogate: Fluorene-d10	100 %		60-130			"	"	"	
Surrogate: Anthracene-d10	93.8 %		60-130			"	"	"	
Surrogate: Pyrene-d10	113 %		60-130			"	"	"	
Surrogate: Benzo (a) pyrene-d12	104 %		60-130			"	"	"	

**pH in Soil by 9045D**

pH	7.73			pH Units	1	B4C2520	03/25/2024	03/26/2024	
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**SAR by 20B Saturated Paste**

SAR	0.345		0.0100	SAR	1	B4C2506	03/25/2024	03/28/2024	
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**Specific Conductance Mod. 9050A**

Specific Conductance (EC)	0.440		0.00500	mmhos/cm	1	B4C2520	03/25/2024	03/26/2024	
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**Table 915 metals by EPA 6020B**

Arsenic	3.63		0.262	mg/kg	10	B4C2229	03/22/2024	03/28/2024	
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 3211 South Zuni St  
 Englewood CO 80110

Rachel Peterson  
 Project Number: 173447  
 Project: Cowboys #1-25

**Cowbov - S**

**3/21/2024 12:00:00AM**

Analyte	Result	Min Detection Limit	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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**Origins Laboratory, Inc.**  
**Y403608-03 (Soil)**

**Table 915 metals by EPA 6020B**

Barium	132		9.05	mg/kg	10	B4C2229	03/22/2024	03/28/2024	
Cadmium	ND		0.0905	"	"	"	"	"	
Copper	9.98		9.05	"	"	"	"	"	
Lead	11.8		0.905	"	"	"	"	"	
Nickel	11.1		0.905	"	"	"	"	"	
Selenium	ND		0.235	"	"	"	"	"	
Silver	ND		0.0905	"	"	"	"	"	
Zinc	48.1		33.5	"	"	"	"	"	

**Total Metals by 7196A**

Chromium, Hexavalent	ND	0.488	1	mg/Kg	2	L744978	03/21/2024	04/18/2024	
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 Project: Cowboys #1-25

**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 B4C2160 - EPA 5030 (soil)**

**Blank (B4C2160-BLK1)**

Prepared: 03/21/2024 Analyzed: 03/25/2024

1,2,4-Trimethylbenzene	ND	0.00200	mg/kg							U
1,3,5-Trimethylbenzene	ND	0.00200	"							U
Benzene	ND	0.00200	"							U
Ethylbenzene	ND	0.00200	"							U
Naphthalene	ND	0.00380	"							U
Toluene	ND	0.00200	"							U
Xylenes, total	ND	0.00200	"							U
Gasoline Range Hydrocarbons	ND	0.200	"							U
Surrogate: 1,2-Dichloroethane-d4	0.13		"	0.125	102		70-130			
Surrogate: Toluene-d8	0.13		"	0.125	101		70-130			
Surrogate: 4-Bromofluorobenzene	0.13		"	0.125	100		70-130			

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 Project: Cowboys #1-25

**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 B4C2160 - EPA 5030 (soil)

**LCS (B4C2160-BS1)**

Prepared: 03/21/2024 Analyzed: 03/25/2024

1,2,4-Trimethylbenzene	0.107	0.00200	mg/kg	0.100		107	70-130			
1,3,5-Trimethylbenzene	0.111	0.00200	"	0.100		111	70-130			
Benzene	0.110	0.00200	"	0.100		110	70-130			
Ethylbenzene	0.112	0.00200	"	0.100		112	70-130			
Naphthalene	0.108	0.00380	"	0.100		108	70-130			
Toluene	0.112	0.00200	"	0.100		112	70-130			
o-Xylene	0.104	0.00200	"	0.100		104	70-130			
m,p-Xylene	0.225	0.00400	"	0.200		112	70-130			
Surrogate: 1,2-Dichloroethane-d4	0.13		"	0.125		102	70-130			
Surrogate: Toluene-d8	0.13		"	0.125		103	70-130			
Surrogate: 4-Bromofluorobenzene	0.12		"	0.125		92.4	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 B4C2160 - EPA 5030 (soil)

Matrix Spike (B4C2160-MS1)	Source: Y403647-01			Prepared: 03/21/2024 Analyzed: 03/25/2024						
1,2,4-Trimethylbenzene	0.109	0.00200	mg/kg	0.100	ND	109	70-130			
1,3,5-Trimethylbenzene	0.113	0.00200	"	0.100	ND	113	70-130			
Benzene	0.109	0.00200	"	0.100	ND	109	70-130			
Ethylbenzene	0.118	0.00200	"	0.100	ND	118	70-130			
Naphthalene	0.0960	0.00380	"	0.100	ND	96.0	70-130			
Toluene	0.112	0.00200	"	0.100	ND	112	70-130			
o-Xylene	0.109	0.00200	"	0.100	ND	109	70-130			
m,p-Xylene	0.233	0.00400	"	0.200	ND	117	70-130			
Surrogate: 1,2-Dichloroethane-d4	0.12		"	0.125		97.4	70-130			
Surrogate: Toluene-d8	0.13		"	0.125		104	70-130			
Surrogate: 4-Bromofluorobenzene	0.12		"	0.125		96.6	70-130			

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 Project: Cowboys #1-25

**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 B4C2160 - EPA 5030 (soil)

Matrix Spike Dup (B4C2160-MSD1)	Source: Y403647-01			Prepared: 03/21/2024 Analyzed: 03/25/2024						
1,2,4-Trimethylbenzene	0.105	0.00200	mg/kg	0.100	ND	105	70-130	3.72	20	
1,3,5-Trimethylbenzene	0.107	0.00200	"	0.100	ND	107	70-130	5.13	20	
Benzene	0.107	0.00200	"	0.100	ND	107	70-130	1.85	20	
Ethylbenzene	0.111	0.00200	"	0.100	ND	111	70-130	5.76	20	
Naphthalene	0.103	0.00380	"	0.100	ND	103	70-130	6.67	20	
Toluene	0.110	0.00200	"	0.100	ND	110	70-130	1.82	20	
o-Xylene	0.104	0.00200	"	0.100	ND	104	70-130	4.81	20	
m,p-Xylene	0.223	0.00400	"	0.200	ND	111	70-130	4.69	20	
Surrogate: 1,2-Dichloroethane-d4	0.13		"	0.125		101	70-130			
Surrogate: Toluene-d8	0.13		"	0.125		103	70-130			
Surrogate: 4-Bromofluorobenzene	0.12		"	0.125		95.1	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
<b>Batch B4C2201 - EPA 3550B</b>										
<b>Blank (B4C2201-BLK1)</b>										
					Prepared: 03/22/2024 Analyzed: 03/26/2024					
Diesel (C10-C28)	ND	25.0	mg/kg							U
Residual Range Organics (C28-C40)	ND	100	"							U
Surrogate: o-Terphenyl	23		"	24.9		92.1	50-150			

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 Project: Cowboys #1-25

**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 B4C2201 - EPA 3550B**

**LCS (B4C2201-BS1)**

Prepared: 03/22/2024 Analyzed: 03/26/2024

Diesel (C10-C28)	794	50.0	mg/kg	1000		79.4	70-130			
Residual Range Organics (C28-C40)	807	200	"	1000		80.7	70-130			
Surrogate: o-Terphenyl	47		"	49.8		95.3	50-150			

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 Project: Cowboys #1-25

**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 B4C2201 - EPA 3550B**

<b>Matrix Spike (B4C2201-MS1)</b>	<b>Source: Y403568-01</b>			Prepared: 03/22/2024 Analyzed: 03/26/2024						
Diesel (C10-C28)	773	50.0	mg/kg	1000	ND	77.3	70-130			
Residual Range Organics (C28-C40)	793	200	"	1000	ND	79.3	70-130			
Surrogate: o-Terphenyl	44		"	49.8		88.7	50-150			

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 Project: Cowboys #1-25

**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
<b>Batch B4C2201 - EPA 3550B</b>										
<b>Matrix Spike Dup (B4C2201-MSD1)</b>		<b>Source: Y403568-01</b>			Prepared: 03/22/2024 Analyzed: 03/26/2024					
Diesel (C10-C28)	754	50.0	mg/kg	1000	ND	75.4	70-130	2.51	35	
Residual Range Organics (C28-C40)	781	200	"	1000	ND	78.1	70-130	1.55	35	
Surrogate: o-Terphenyl	55		"	49.8		110	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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**Metals by EPA 6000/7000 Series Methods - 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 B4C2229 - EPA 3050B**

**Blank (B4C2229-BLK1)**

Prepared: 03/22/2024 Analyzed: 03/28/2024

Arsenic	ND	0.290	mg/kg							
Barium	ND	10.0	"							
Cadmium	ND	0.100	"							
Copper	ND	10.0	"							
Lead	ND	1.00	"							
Nickel	ND	1.00	"							
Selenium	ND	0.260	"							
Silver	ND	0.100	"							
Zinc	ND	37.0	"							

**LCS (B4C2229-BS1)**

Prepared: 03/22/2024 Analyzed: 03/28/2024

Arsenic	4.67	0.290	mg/kg	5.00		93.5	80-120			
Barium	477	10.0	"	500		95.3	80-120			
Cadmium	4.62	0.100	"	5.00		92.5	80-120			
Copper	47.8	10.0	"	50.0		95.6	80-120			
Lead	4.41	1.00	"	5.00		88.2	80-120			
Nickel	4.46	1.00	"	5.00		89.1	80-120			
Selenium	10.7	0.260	"	9.50		113	80-120			
Silver	4.47	0.100	"	5.00		89.4	80-120			
Zinc	48.0	37.0	"	50.0		96.0	80-120			

**Matrix Spike (B4C2229-MS1)**

Source: Y403608-01

Prepared: 03/22/2024 Analyzed: 03/28/2024

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 Project: Cowboys #1-25

**Metals by EPA 6000/7000 Series Methods - 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 B4C2229 - EPA 3050B**

<b>Matrix Spike (B4C2229-MS1)</b>		<b>Source: Y403608-01</b>			Prepared: 03/22/2024 Analyzed: 03/28/2024					
Arsenic	9.19	0.280	mg/kg	4.83	3.86	110	75-125			
Barium	614	9.67	"	483	141	98.0	75-125			
Cadmium	4.67	0.0967	"	4.83	ND	96.7	75-125			
Copper	58.4	9.67	"	48.3	10.7	98.8	75-125			
Lead	17.2	0.967	"	4.83	12.0	107	75-125			
Nickel	16.8	0.967	"	4.83	11.6	108	75-125			
Selenium	10.0	0.251	"	9.18	ND	109	75-125			
Silver	4.16	0.0967	"	4.83	ND	86.2	75-125			
Zinc	102	35.8	"	48.3	51.8	103	75-125			

<b>Matrix Spike Dup (B4C2229-MSD1)</b>		<b>Source: Y403608-01</b>			Prepared: 03/22/2024 Analyzed: 03/28/2024					
Arsenic	8.47	0.264	mg/kg	4.55	3.86	102	75-125	8.06	20	
Barium	589	9.09	"	455	141	98.6	75-125	4.15	20	
Cadmium	4.53	0.0909	"	4.55	ND	99.7	75-125	3.02	20	
Copper	54.4	9.09	"	45.5	10.7	96.3	75-125	7.09	20	
Lead	16.6	0.909	"	4.55	12.0	100	75-125	3.60	20	
Nickel	16.3	0.909	"	4.55	11.6	103	75-125	3.26	20	
Selenium	9.41	0.236	"	8.64	ND	109	75-125	6.14	20	
Silver	3.95	0.0909	"	4.55	ND	87.0	75-125	5.19	20	
Zinc	98.3	33.6	"	45.5	51.8	102	75-125	3.54	20	

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 Project: Cowboys #1-25

**EPA 8270E (SW846) - Semivolatile Organic Compounds - 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 B4C2222 - EPA 3580**

**Blank (B4C2222-BLK1)**

Prepared: 03/22/2024 Analyzed: 03/27/2024

1-Methylnaphthalene	ND	0.002	mg/kg							U
2-Methylnaphthalene	ND	0.002	"							U
Acenaphthene	ND	0.020	"							U
Anthracene	ND	0.020	"							U
Benzo (a) anthracene	ND	0.005	"							U
Benzo (a) pyrene	ND	0.020	"							U
Benzo (b) fluoranthene	ND	0.020	"							U
Benzo (g,h,i) perylene	ND	0.020	"							U
Benzo (k) fluoranthene	ND	0.020	"							U
Chrysene	ND	0.020	"							U
Dibenz (a,h) anthracene	ND	0.020	"							U
Fluoranthene	ND	0.020	"							U
Fluorene	ND	0.020	"							U
Indeno (1,2,3-cd) pyrene	ND	0.020	"							U
Naphthalene	ND	0.002	"							U
Phenanthrene	ND	0.020	"							U
Pyrene	ND	0.020	"							U
Surrogate: Fluorene-d10	200		ug/kg	200		100	60-130			
Surrogate: Anthracene-d10	190		"	200		94.2	60-130			
Surrogate: Pyrene-d10	200		"	200		98.4	60-130			
Surrogate: Benzo (a) pyrene-d12	190		"	200		96.5	60-130			

**LCS (B4C2222-BS1)**

Prepared: 03/22/2024 Analyzed: 03/27/2024

1-Methylnaphthalene	0.190	0.002	mg/kg	0.200		95.1	70-130			
2-Methylnaphthalene	0.191	0.002	"	0.200		95.3	70-130			
Acenaphthene	0.198	0.020	"	0.200		98.8	70-130			
Anthracene	0.184	0.020	"	0.200		91.8	70-130			

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Rachel Peterson  
 Project Number: 173447  
 Project: Cowboys #1-25

**EPA 8270E (SW846) - Semivolatile Organic Compounds - 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 B4C2222 - EPA 3580**

**LCS (B4C2222-BS1)**

Prepared: 03/22/2024 Analyzed: 03/27/2024

Benzo (a) anthracene	0.188	0.005	mg/kg	0.200		94.0	70-130			
Benzo (a) pyrene	0.184	0.020	"	0.200		92.0	70-130			
Benzo (b) fluoranthene	0.199	0.020	"	0.200		99.4	70-130			
Benzo (g,h,i) perylene	0.202	0.020	"	0.200		101	70-130			
Benzo (k) fluoranthene	0.190	0.020	"	0.200		95.2	70-130			
Chrysene	0.181	0.020	"	0.200		90.7	70-130			
Dibenz (a,h) anthracene	0.196	0.020	"	0.200		98.0	70-130			
Fluoranthene	0.179	0.020	"	0.200		89.3	70-130			
Fluorene	0.195	0.020	"	0.200		97.6	70-130			
Indeno (1,2,3-cd) pyrene	0.196	0.020	"	0.200		98.2	70-130			
Naphthalene	0.199	0.002	"	0.200		99.5	70-130			
Phenanthrene	0.182	0.020	"	0.200		91.2	70-130			
Pyrene	0.203	0.020	"	0.200		101	70-130			
Surrogate: Fluorene-d10	200		ug/kg	200		100	60-130			
Surrogate: Anthracene-d10	190		"	200		94.9	60-130			
Surrogate: Pyrene-d10	210		"	200		105	60-130			
Surrogate: Benzo (a) pyrene-d12	200		"	200		101	60-130			

**Matrix Spike (B4C2222-MS1)**

**Source: Y403528-01**

Prepared: 03/22/2024 Analyzed: 03/27/2024

1-Methylnaphthalene	0.252	0.002	mg/kg	0.200	0.060	95.9	70-130			
2-Methylnaphthalene	0.232	0.002	"	0.200	0.030	101	70-130			
Acenaphthene	0.211	0.020	"	0.200	0.022	94.4	70-130			
Anthracene	0.192	0.020	"	0.200	0.002	94.9	70-130			
Benzo (a) anthracene	0.174	0.005	"	0.200	0.001	86.4	70-130			
Benzo (a) pyrene	0.195	0.020	"	0.200	0.003	96.2	70-130			
Benzo (b) fluoranthene	0.212	0.020	"	0.200	0.0003	106	70-130			
Benzo (g,h,i) perylene	0.197	0.020	"	0.200	0.0008	98.2	70-130			

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Rachel Peterson  
 Project Number: 173447  
 Project: Cowboys #1-25

**EPA 8270E (SW846) - Semivolatile Organic Compounds - 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 B4C2222 - EPA 3580**

<b>Matrix Spike (B4C2222-MS1)</b>		<b>Source: Y403528-01</b>			Prepared: 03/22/2024 Analyzed: 03/27/2024					
Benzo (k) fluoranthene	0.193	0.020	mg/kg	0.200	0.002	95.9	70-130			
Chrysene	0.184	0.020	"	0.200	0.005	89.2	70-130			
Dibenz (a,h) anthracene	0.207	0.020	"	0.200	ND	104	70-130			
Fluoranthene	0.158	0.020	"	0.200	0.001	78.5	70-130			
Fluorene	0.217	0.020	"	0.200	0.032	92.5	70-130			
Indeno (1,2,3-cd) pyrene	0.193	0.020	"	0.200	ND	96.5	70-130			
Naphthalene	0.202	0.002	"	0.200	0.004	99.0	70-130			
Phenanthrene	0.201	0.020	"	0.200	0.023	88.8	70-130			
Pyrene	0.257	0.020	"	0.200	0.004	127	70-130			
Surrogate: Fluorene-d10	200		ug/kg	200		101	60-130			
Surrogate: Anthracene-d10	190		"	200		95.1	60-130			
Surrogate: Pyrene-d10	270		"	200		135	60-130			S-04
Surrogate: Benzo (a) pyrene-d12	210		"	200		103	60-130			

<b>Matrix Spike Dup (B4C2222-MSD1)</b>		<b>Source: Y403528-01</b>			Prepared: 03/22/2024 Analyzed: 03/27/2024					
1-Methylnaphthalene	0.272	0.002	mg/kg	0.200	0.060	106	70-130	7.59	20	
2-Methylnaphthalene	0.264	0.002	"	0.200	0.030	117	70-130	12.9	20	
Acenaphthene	0.223	0.020	"	0.200	0.022	100	70-130	5.36	20	
Anthracene	0.193	0.020	"	0.200	0.002	95.6	70-130	0.714	20	
Benzo (a) anthracene	0.182	0.005	"	0.200	0.001	90.6	70-130	4.72	20	
Benzo (a) pyrene	0.198	0.020	"	0.200	0.003	97.4	70-130	1.19	20	
Benzo (b) fluoranthene	0.206	0.020	"	0.200	0.0003	103	70-130	3.05	20	
Benzo (g,h,i) perylene	0.195	0.020	"	0.200	0.0008	97.0	70-130	1.23	20	
Benzo (k) fluoranthene	0.178	0.020	"	0.200	0.002	88.1	70-130	8.41	20	
Chrysene	0.185	0.020	"	0.200	0.005	90.0	70-130	0.779	20	
Dibenz (a,h) anthracene	0.207	0.020	"	0.200	ND	103	70-130	0.119	20	
Fluoranthene	0.162	0.020	"	0.200	0.001	80.5	70-130	2.60	20	

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**EPA 8270E (SW846) - Semivolatile Organic Compounds - 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 B4C2222 - EPA 3580

Matrix Spike Dup (B4C2222-MSD1)	Source: Y403528-01			Prepared: 03/22/2024 Analyzed: 03/27/2024						
Fluorene	0.221	0.020	mg/kg	0.200	0.032	94.7	70-130	2.02	20	
Indeno (1,2,3-cd) pyrene	0.162	0.020	"	0.200	ND	81.2	70-130	17.2	20	
Naphthalene	0.214	0.002	"	0.200	0.004	105	70-130	5.73	20	
Phenanthrene	0.212	0.020	"	0.200	0.023	94.5	70-130	5.51	20	
Pyrene	0.262	0.020	"	0.200	0.004	129	70-130	1.94	20	
Surrogate: Fluorene-d10	200		ug/kg	200		101	60-130			
Surrogate: Anthracene-d10	190		"	200		96.8	60-130			
Surrogate: Pyrene-d10	270		"	200		135	60-130			S-04
Surrogate: Benzo (a) pyrene-d12	210		"	200		104	60-130			

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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 B4C2506 - Saturated Paste Metals**

**Blank (B4C2506-BLK1)**

Prepared: 03/25/2024 Analyzed: 03/28/2024

SAR	ND	0.0100	SAR							
Calcium PPM	ND	10.0	mg/L							
Magnesium PPM	ND	10.0	"							
Sodium PPM	ND	10.0	"							

**Duplicate (B4C2506-DUP1)**

**Source: Y403580-01**

Prepared: 03/25/2024 Analyzed: 03/28/2024

SAR	ND	0.0100	SAR	2.89					200	
Calcium PPM	395	10.0	mg/L	426				7.48	50	
Magnesium PPM	72.5	10.0	"	80.8				10.8	50	
Sodium PPM	239	10.0	"	248				3.68	50	

**Batch B4C2516 - DTPA Sorbitol Preparation**

**Blank (B4C2516-BLK1)**

Prepared: 03/25/2024 Analyzed: 03/26/2024

Boron	ND	0.100	mg/L							
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**Duplicate (B4C2516-DUP1)**

**Source: Y403569-01**

Prepared: 03/25/2024 Analyzed: 03/26/2024

Boron	0.545	0.0995	mg/L	0.526				3.58	50	
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**Saturated Paste - Quality Control**  
**Origins Laboratory, Inc.**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
<b>Batch B4C2520 - Saturated Paste pH/EC</b>										
<b>Blank (B4C2520-BLK1)</b>					Prepared: 03/25/2024 Analyzed: 03/26/2024					
Specific Conductance (EC)	ND	0.00500	mmhos/cm							
<b>Duplicate (B4C2520-DUP1)</b>					<b>Source: Y403580-01</b> Prepared: 03/25/2024 Analyzed: 03/26/2024					
Specific Conductance (EC)	2.62	0.00500	mmhos/cm		2.67		2.15	25		
pH	7.92		pH Units		8.30		4.69	25		

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**Total Metals by 7196A - Quality Control**  
**Waypoint Analytical, LLC.**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
<b>Batch L744978 -</b>										
<b>DUP (L 81751-DUP)</b>		<b>Source: 81751</b>			Prepared: Analyzed: 04/18/2024					
Chromium, Hexavalent	ND	0.5	mg/Kg		<0.500		-	0	20	
<b>MS (L 81751-MS)</b>		<b>Source: 81751</b>			Prepared: Analyzed: 04/18/2024					
Chromium, Hexavalent	31.8	2.5	mg/Kg	38.9	< 0.244	82	75-125			
<b>LCS (LCS)</b>		Prepared: Analyzed: 04/18/2024								
Chromium, Hexavalent	6.7	0.5	mg/Kg	8		84	75-125			
<b>LRB (LRB)</b>		Prepared: Analyzed: 04/18/2024								
Chromium, Hexavalent	ND	0.5	mg/Kg				-			

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**Total Metals by 7196A - Quality Control**  
**Waypoint Analytical, LLC.**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
<b>Batch L744977 -</b>										
<b>DUP (L 97712-DUP)</b>		<b>Source: 97712</b>			Prepared: Analyzed: 04/18/2024					
Chromium, Hexavalent	ND	0.5	mg/Kg		<0.500		-	0.3	20	
<b>MS (L 97712-MS)</b>		<b>Source: 97712</b>			Prepared: Analyzed: 04/18/2024					
Chromium, Hexavalent	27	2.5	mg/Kg	39.9	< 0.244	68	75-125			*
<b>LCS (LCS)</b>		Prepared: Analyzed: 04/18/2024								
Chromium, Hexavalent	6.66	0.5	mg/Kg	8		83	75-125			
<b>LRB (LRB)</b>		Prepared: Analyzed: 04/18/2024								
Chromium, Hexavalent	ND	0.5	mg/Kg				-			

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### 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.

\* QC Failure

ND Analyte NOT DETECTED at or above the reporting limit

RPD Relative Percent Difference

All soil results are reported on a wet weight basis.

Calculated results may use J-flag data (instead of reported "ND") as part of calculation to provide a more accurate result.

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