

# ORIGINS LABORATORY

Absaroka  
Joel Mason  
112 High St.

Buffalo WY 82834

February 11, 2025

**Project Name - Citation - McCormick 24-3 #6**

**Project Number - CIT.CO.1055**

Attached are your analytical results for Citation - McCormick 24-3 #6 received by Origins Laboratory January 31, 2025. This project is associated with Origins project number E5A0737-01.

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  
303.433.1322  
projectmanager@originslab.com



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



Absaroka  
112 High St.  
Buffalo WY 82834

Joel Mason  
Project Number: CIT.CO.1055  
Project: Citation - McCormick 24-3 #8

### CROSS REFERENCE REPORT

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
MC24-3#6_BG01@2'	E5A0737-01	Soil	January 29, 2025 16:45	01/31/2025 15:20
MC24-3#6_BG02@2'	E5A0737-02	Soil	January 29, 2025 16:55	01/31/2025 15:20

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ES00337

#	Sample ID	Date Sampled	Time Sampled	# of Containers	Matrix Preservative	Analysis				Comments
						Table 915 Boron	Table 918 PH, EC, SAR	Table 916 Metals		
1	MCA-96-000107	1/29/2025	16:45	3	UMP	X	X	X		
2	MCA-96-000207	1/29/2025	16:55	3	UMP	X	X	X		
3										
4										
5										
6										
7										
8										
9										
10										

Relinquished By: *[Signature]* Date: 1/16/25 Time: 12:00  
 Received By: *[Signature]* Date: 1/31/25 Time: 5:20  
 Turnaround Time:  48 Hr  72  SAME DAY  24

Temp Received: 44 Received On Ice?  Yes  No

Client: Citation/Absaroka  
 Address: \_\_\_\_\_  
 Project Manager: Joel Mason  
 Project Name: McCormick (24-3) #6  
 Key: W=Water  
 Telephone Number: 307-262-9975  
 Project Number: CIT.CO.1055  
 Collected By: Devin Zaidce  
 Email Address: joelmason@absarokasolutions.com  
 Invoiced Billing Info: On File - Absaroka Energy Solutions  
 SWS=Surface Water  
 WW=Waste Water

S=Sil Silica S=Silicon H=Hydrogen HC=Hydrochloric HNO3=Nitric H2SO4=Sulfuric NaOH=Sodium Hydroxide

Origins Laboratory  
*[Signature]*

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Project: Citation - McCormick 24-3 #8

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

**Sample Receipt Checklist**

Origins Work Order: ESA0937 Client: Absaroka  
 Checklist Completed by: ADJR Client Project ID: McGowan  
 Date/Time completed: 1/31/25 Shipped Via: HQ  
 Matrix(s) Received: (Check all that apply)  Soil/Solid  Water  Other: \_\_\_\_\_  
 Cooler Number/Temperature: 114.4°C (Describe)  
 Thermometer ID: 1007

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

Reviewed by (Project Manager) [Signature] Date/Time Reviewed 2/3/25

Origins Laboratory  
[Signature]

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**MC24-3#6 BG01@2'**  
**1/29/2025 4:45:00PM**

Analyte	Result	Min Detection Limit	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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**Origins Laboratory**  
**E5A0737-01 (Soil)**

**Boron (DTPA Sorbitol)**

Boron	0.145	0.100	mg/L	1	B5B0323	02/03/2025	02/04/2025	
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**Metals by Saturated Paste by EPA 6010**

Calcium	1.23	0.499	meq/L	10	[CALC]	02/03/2025	02/06/2025	
Magnesium	ND	0.823	"	"	"	"	"	
Sodium	ND	0.435	"	"	"	"	"	

**pH in Soil by 9045D**

pH	8.37		pH Units	1	B5B0331	02/03/2025	02/05/2025	
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**SAR by 20B Saturated Paste**

SAR	0.0687	0.0100	SAR	1	B5B0327	02/03/2025	02/06/2025	
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**Specific Conductance Mod. 9050A**

Specific Conductance (EC)	0.155	0.00500	mmhos/cm	1	B5B0331	02/03/2025	02/05/2025	
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**Table 915 metals by EPA 6020B**

Arsenic	2.65	0.278	mg/kg	10	B5B0531	02/05/2025	02/06/2025	
Barium	57.2	9.58	"	"	"	"	"	
Cadmium	ND	0.0958	"	"	"	"	"	

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**MC24-3#6 BG01@2'**  
**1/29/2025 4:45:00PM**

Analyte	Result	Min Detection Limit	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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**Origins Laboratory**  
**E5A0737-01 (Soil)**

**Table 915 metals by EPA 6020B**

Copper	ND		9.58	mg/kg	10	B5B0531	02/05/2025	02/06/2025	
Lead	<b>4.30</b>		0.958	"	"	"	"	"	
Nickel	<b>5.29</b>		0.958	"	"	"	"	"	
Selenium	ND		0.249	"	"	"	"	"	
Silver	ND		0.0958	"	"	"	"	"	
Zinc	ND		35.4	"	"	"	"	"	

**Total Metals 7196A**

Chromium, Hexavalent	ND	0.5	0.5	mg/Kg	1	A99757	01/29/2025	02/06/2025	
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**MC24-3#6 BG02@2'**  
**1/29/2025 4:55:00PM**

Analyte	Result	Min Detection Limit	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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**Origins Laboratory**  
**E5A0737-02 (Soil)**

**Boron (DTPA Sorbitol)**

Boron	0.147		0.100	mg/L	1	B5B0323	02/03/2025	02/04/2025	
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**Metals by Saturated Paste by EPA 6010**

Calcium	1.46		0.499	meq/L	10	[CALC]	02/03/2025	02/06/2025	
Magnesium	ND		0.823	"	"	"	"	"	
Sodium	ND		0.435	"	"	"	"	"	

**pH in Soil by 9045D**

pH	8.42			pH Units	1	B5B0331	02/03/2025	02/05/2025	
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**SAR by 20B Saturated Paste**

SAR	0.151		0.0100	SAR	1	B5B0327	02/03/2025	02/06/2025	
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**Specific Conductance Mod. 9050A**

Specific Conductance (EC)	0.207		0.00500	mmhos/cm	1	B5B0331	02/03/2025	02/05/2025	
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**Table 915 metals by EPA 6020B**

Arsenic	3.74		0.280	mg/kg	10	B5B0531	02/05/2025	02/06/2025	
Barium	125		9.67	"	"	"	"	"	
Cadmium	ND		0.0967	"	"	"	"	"	

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MC24-3#6 BG02@2'  
1/29/2025 4:55:00PM

Analyte	Result	Min Detection Limit	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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**Origins Laboratory**  
E5A0737-02 (Soil)

**Table 915 metals by EPA 6020B**

Copper	ND		9.67	mg/kg	10	B5B0531	02/05/2025	02/06/2025	
Lead	6.53		0.967	"	"	"	"	"	
Nickel	7.94		0.967	"	"	"	"	"	
Selenium	ND		0.251	"	"	"	"	"	
Silver	ND		0.0967	"	"	"	"	"	
Zinc	ND		35.8	"	"	"	"	"	

**Total Metals 7196A**

Chromium, Hexavalent	ND	0.5	0.5	mg/Kg	1	A99757	01/29/2025	02/06/2025	
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**Metals by EPA 6000/7000 Series Methods - Quality Control**  
**Origins Laboratory**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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**Batch B5B0531 - EPA 3050B**

**Blank (B5B0531-BLK1)**

Prepared: 02/05/2025 Analyzed: 02/06/2025

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 (B5B0531-BS1)**

Prepared: 02/05/2025 Analyzed: 02/06/2025

Arsenic	4.88	0.290	mg/kg	5.00		97.5	80-120			
Barium	549	10.0	"	500		110	80-120			
Cadmium	4.96	0.100	"	5.00		99.2	80-120			
Copper	52.2	10.0	"	50.0		104	80-120			
Lead	4.95	1.00	"	5.00		98.9	80-120			
Nickel	5.34	1.00	"	5.00		107	80-120			
Selenium	5.37	0.260	"	5.00		107	80-120			
Silver	5.47	0.100	"	5.00		109	80-120			
Zinc	52.9	37.0	"	50.0		106	80-120			

**Matrix Spike (B5B0531-MS1)**

Source: E5B0103-05

Prepared: 02/05/2025 Analyzed: 02/06/2025

Arsenic	8.43	0.279	mg/kg	4.81	3.22	108	75-125			
Barium	645	9.62	"	481	90.1	115	75-125			
Cadmium	5.19	0.0962	"	4.81	0.264	103	75-125			
Copper	67.8	9.62	"	48.1	11.8	116	75-125			
Lead	20.6	0.962	"	4.81	18.0	54.2	75-125			QM-07

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**Metals by EPA 6000/7000 Series Methods - Quality Control**  
**Origins Laboratory**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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**Batch B5B0531 - EPA 3050B**

**Matrix Spike (B5B0531-MS1)**

**Source: E5B0103-05**

Prepared: 02/05/2025 Analyzed: 02/06/2025

Nickel	13.5	0.962	mg/kg	4.81	7.57	124	75-125			
Selenium	5.54	0.250	"	4.81	0.248	110	75-125			
Silver	5.49	0.0962	"	4.81	0.0788	113	75-125			
Zinc	104	35.6	"	48.1	48.0	116	75-125			

**Matrix Spike Dup (B5B0531-MSD1)**

**Source: E5B0103-05**

Prepared: 02/05/2025 Analyzed: 02/06/2025

Arsenic	8.22	0.282	mg/kg	4.86	3.22	103	75-125	2.48	20	
Barium	621	9.72	"	486	90.1	109	75-125	3.73	20	
Cadmium	5.15	0.0972	"	4.86	0.264	100	75-125	0.937	20	
Copper	60.4	9.72	"	48.6	11.8	100	75-125	11.4	20	
Lead	23.1	0.972	"	4.86	18.0	105	75-125	11.4	20	
Nickel	12.3	0.972	"	4.86	7.57	98.3	75-125	9.18	20	
Selenium	5.27	0.253	"	4.86	0.248	103	75-125	5.07	20	
Silver	5.33	0.0972	"	4.86	0.0788	108	75-125	2.97	20	
Zinc	96.7	36.0	"	48.6	48.0	100	75-125	7.00	20	

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**Classical Chemistry Parameters - Quality Control**  
**Origins Laboratory**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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**Batch B5B0323 - DTPA Sorbitol Preparation**

**Blank (B5B0323-BLK1)**

Prepared: 02/03/2025 Analyzed: 02/04/2025

Boron ND 0.100 mg/L

**Duplicate (B5B0323-DUP1)**

**Source: E5A0736-06**

Prepared: 02/03/2025 Analyzed: 02/04/2025

Boron 0.785 0.101 mg/L 0.769 2.07 50

**Batch B5B0327 - Saturated Paste Metals**

**Blank (B5B0327-BLK1)**

Prepared: 02/03/2025 Analyzed: 02/06/2025

Calcium PPM ND 10.0 mg/L

SAR ND 0.0100 SAR

Magnesium PPM ND 10.0 mg/L

Sodium PPM ND 10.0 "

**Duplicate (B5B0327-DUP1)**

**Source: E5A0735-25**

Prepared: 02/03/2025 Analyzed: 02/06/2025

SAR ND 0.0100 SAR 0.0808 200

Calcium PPM 11.6 10.0 mg/L 11.5 0.432 50

Magnesium PPM 3.34 10.0 " 3.65 8.87 50

Sodium PPM 0.780 10.0 " 1.23 44.8 50

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**Saturated Paste - Quality Control**  
**Origins Laboratory**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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**Batch B5B0331 - Saturated Paste pH/EC**

**Blank (B5B0331-BLK1)**

Prepared: 02/03/2025 Analyzed: 02/05/2025

Specific Conductance (EC) ND 0.00500 mmhos/cm

**Duplicate (B5B0331-DUP1)**

**Source: E5A0735-25**

Prepared: 02/03/2025 Analyzed: 02/05/2025

Specific Conductance (EC) 0.180 0.00500 mmhos/cm 0.187 3.60 25

pH 7.22 pH Units 7.19 0.416 25

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

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
<b>Batch A99757 -</b>										
<b>DUP (L 85202-DUP)</b>			<b>Source: 85202</b>			Prepared: Analyzed: 02/06/2025				
Chromium, Hexavalent	ND	0.5	mg/Kg		<0.500	-		0	20	
<b>MS (L 85202-MS)</b>			<b>Source: 85202</b>			Prepared: Analyzed: 02/06/2025				
Chromium, Hexavalent	6.28	0.5	mg/Kg	7.84	<0.244	80	75-125			
<b>LCS (LCS)</b>						Prepared: Analyzed: 02/06/2025				
Chromium, Hexavalent	6.74	0.5	mg/Kg	7.91		85	75-125			
<b>LRB (LRB)</b>						Prepared: Analyzed: 02/06/2025				
Chromium, Hexavalent	ND	0.5	mg/Kg							

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### Notes and Definitions

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 on a wet weight basis.

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