



Absaroka  
Max Dahlgren  
112 High St.

January 09, 2025

Buffalo WY 82834

**Project Name - KMG - Herman UPRR 31-31 1  
Wellhead**

**Project Number - [none]**

Attached are your analytical results for KMG - Herman UPRR 31-31 1 Wellhead received by Origins Laboratory January 08, 2025. This project is associated with Origins project number E5A0099-01.

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

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112 High St.  
Buffalo

WY 82834

Max Dahlgren  
Project Number: [none]  
Project: KMG - Herman UPRR 31-31 1 Wellhead

## CROSS REFERENCE REPORT

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
WC01@3"	E5A0099-01	Soil	January 8, 2025 14:50	01/08/2025 17:21
BG01@3"	E5A0099-02	Soil	January 8, 2025 14:55	01/08/2025 17:21
BG02@3"	E5A0099-03	Soil	January 8, 2025 15:00	01/08/2025 17:21
BG03@3"	E5A0099-04	Soil	January 8, 2025 15:05	01/08/2025 17:21
BG04@3"	E5A0099-05	Soil	January 8, 2025 15:10	01/08/2025 17:21

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Jen Pellegrini For Jordan A. Bynon, Project Manager

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## Sample Receipt Checklist

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

Origins Work Order: E SA 0099

Client: Absaroka

Client Project ID: Herman

Checklist Completed by: EHJ

Shipped Via: NO

Date/time completed: 1/18/12

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

Airbill #: N/A

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

Cooler Number/Temperature: 1/12/12 °C (Describe)

Thermometer ID: 4007

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"/>	<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 <sup>(1)</sup> ?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Was adequate sample volume provided <sup>(1)</sup> ?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Are short holding time analytes or samples with HTs due within 48 hours present <sup>(1)</sup> ?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Is a chain-of-custody (COC) present and filled out completely <sup>(1)</sup> ?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Does the COC agree with the number and type of sample bottles received <sup>(1)</sup> ?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Do the sample IDs on the bottle labels match the COC <sup>(1)</sup> ?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Is the COC properly relinquished by the client with date and time recorded <sup>(1)</sup> ?	<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 <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 HNO <sub>3</sub> , HCL, H <sub>2</sub> SO <sub>4</sub> ) / (pH >10 for samples preserved with NaAsO <sub>2</sub> +NaOH, ZnAc+NaOH)	<input type="checkbox"/>	<input type="checkbox"/>	<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 in the additional comments (above) and the case narrative.

Reviewed by (Project Manager) EHJ

Date/Time Reviewed 1/18/12

Origins Laboratory

*Jen Pellegrini*

Jen Pellegrini For Jordan A. Bynon, Project Manager

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WY 82834

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Project Number: [none]  
Project: KMG - Herman UPRR 31-31 1 Wellhead

WC01@3"

1/8/2025 2:50:00PM

Analyte	Result	Min Detection Limit	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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## Origins Laboratory

### E5A0099-01 (Soil)

### DRO/ORO by EPA 8015D

Diesel (C10-C28)	ND	25.0	mg/kg	1	B5A0801	01/08/2025	01/08/2025	U
Residual Range Organics (C28-C40)	ND	100	"	"	"	"	"	U

Surrogate: o-Terphenyl 79.9 % 50-150 " " "

### GBTEX+TMBs by 8260D

1,2,4-Trimethylbenzene	0.0525	0.00200	mg/kg	1	B5A0813	01/08/2025	01/08/2025	
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	1.53	0.200	"	"	"	"	"	

Surrogate: 1,2-Dichloroethane-d4 107 % 70-130 " " "  
Surrogate: Toluene-d8 103 % 70-130 " " "  
Surrogate: 4-Bromofluorobenzene 102 % 70-130 " " "

### Table 915 metals by EPA 6020B

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WC01@3"

1/8/2025 2:50:00PM

Analyte	Result	Min Detection Limit	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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## Origins Laboratory

E5A0099-01 (Soil)

### Table 915 metals by EPA 6020B

Arsenic	5.32	0.274	mg/kg	10	B5A0818	01/08/2025	01/09/2025
Barium	101	9.44	"	"	"	"	"
Cadmium	0.380	0.0944	"	"	"	"	"
Copper	12.4	9.44	"	"	"	"	"
Lead	12.1	0.944	"	"	"	"	"
Nickel	12.4	0.944	"	"	"	"	"
Selenium	0.299	0.245	"	"	"	"	"
Silver	0.0982	0.0944	"	"	"	"	"
Zinc	60.5	34.9	"	"	"	"	"

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BG01@3"

1/8/2025 2:55:00PM

Analyte	Result	Min Detection Limit	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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## Origins Laboratory

E5A0099-02 (Soil)

### Table 915 metals by EPA 6020B

Arsenic	4.15	0.283	mg/kg	10	B5A0818	01/08/2025	01/09/2025	
Barium	266	9.75	"	"	"	"	"	
Cadmium	0.235	0.0975	"	"	"	"	"	
Copper	18.7	9.75	"	"	"	"	"	
Lead	40.0	0.975	"	"	"	"	"	
Nickel	10.5	0.975	"	"	"	"	"	
Selenium	0.265	0.254	"	"	"	"	"	
Silver	ND	0.0975	"	"	"	"	"	U
Zinc	50.3	36.1	"	"	"	"	"	

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Project: KMG - Herman UPRR 31-31 1 Wellhead

BG02@3"

1/8/2025 3:00:00PM

Analyte	Result	Min Detection Limit	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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## Origins Laboratory

E5A0099-03 (Soil)

### Table 915 metals by EPA 6020B

Arsenic	4.57	0.266	mg/kg	10	B5A0818	01/08/2025	01/09/2025	
Barium	114	9.16	"	"	"	"	"	
Cadmium	0.300	0.0916	"	"	"	"	"	
Copper	13.4	9.16	"	"	"	"	"	
Lead	17.8	0.916	"	"	"	"	"	
Nickel	10.5	0.916	"	"	"	"	"	
Selenium	0.407	0.238	"	"	"	"	"	
Silver	ND	0.0916	"	"	"	"	"	U
Zinc	61.3	33.9	"	"	"	"	"	

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BG03@3"

1/8/2025 3:05:00PM

Analyte	Result	Min Detection Limit	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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## Origins Laboratory

E5A0099-04 (Soil)

### Table 915 metals by EPA 6020B

Arsenic	5.01	0.281	mg/kg	10	B5A0818	01/08/2025	01/09/2025
Barium	81.4	9.68	"	"	"	"	"
Cadmium	0.467	0.0968	"	"	"	"	"
Copper	18.1	9.68	"	"	"	"	"
Lead	17.0	0.968	"	"	"	"	"
Nickel	12.3	0.968	"	"	"	"	"
Selenium	0.733	0.252	"	"	"	"	"
Silver	0.178	0.0968	"	"	"	"	"
Zinc	77.4	35.8	"	"	"	"	"

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BG04@3"

1/8/2025 3:10:00PM

Analyte	Result	Min Detection Limit	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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Origins Laboratory

E5A0099-05 (Soil)

## Table 915 metals by EPA 6020B

Arsenic	2.32	0.283	mg/kg	10	B5A0818	01/08/2025	01/09/2025	
Barium	57.2	9.77	"	"	"	"	"	
Cadmium	0.295	0.0977	"	"	"	"	"	
Copper	ND	9.77	"	"	"	"	"	U
Lead	10.4	0.977	"	"	"	"	"	
Nickel	6.11	0.977	"	"	"	"	"	
Selenium	1.14	0.254	"	"	"	"	"	
Silver	0.107	0.0977	"	"	"	"	"	
Zinc	41.0	36.2	"	"	"	"	"	

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**Extractable Petroleum Hydrocarbons by 8015D - 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 B5A0801 - EPA 3550B**

**Blank (B5A0801-BLK1)**

Prepared: 01/08/2025 Analyzed: 01/08/2025

Diesel (C10-C28)	ND	25.0	mg/kg							U
Residual Range Organics (C28-C40)	ND	100	"							U
Surrogate: o-Terphenyl	22		"	24.9		90.2	50-150			

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## Extractable Petroleum Hydrocarbons by 8015D - 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 B5A0801 - EPA 3550B

#### LCS (B5A0801-BS1)

Prepared: 01/08/2025 Analyzed: 01/08/2025

Diesel (C10-C28)	839	50.0	mg/kg	1000		83.9	70-130			
Residual Range Organics (C28-C40)	857	200	"	1000		85.7	70-130			
Surrogate: o-Terphenyl	48		"	49.8		97.4	50-150			

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**Extractable Petroleum Hydrocarbons by 8015D - 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 B5A0801 - EPA 3550B**

Matrix Spike (B5A0801-MS1)		Source: E5A0085-01			Prepared: 01/08/2025 Analyzed: 01/08/2025					
Diesel (C10-C28)	953	50.0	mg/kg	1000	ND	95.3	70-130			
Residual Range Organics (C28-C40)	1010	200	"	1000	ND	101	70-130			
Surrogate: o-Terphenyl	50		"	49.8		101	50-150			

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## Extractable Petroleum Hydrocarbons by 8015D - 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 B5A0801 - EPA 3550B

Matrix Spike Dup (B5A0801-MSD1)		Source: E5A0085-01			Prepared: 01/08/2025 Analyzed: 01/08/2025					
Diesel (C10-C28)	881	50.0	mg/kg	1000	ND	88.1	70-130	7.75	35	
Residual Range Organics (C28-C40)	918	200	"	1000	ND	91.8	70-130	9.71	35	
Surrogate: o-Terphenyl	49		"	49.8		97.6	50-150			

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## Extractable Petroleum Hydrocarbons by 8015D - Quality Control

### Origins Laboratory

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
<b>Batch B5A0813 - EPA 5030 (soil)</b>										
<b>Blank (B5A0813-BLK1)</b>					Prepared: 01/08/2025 Analyzed: 01/08/2025					
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		108	70-130			
Surrogate: Toluene-d8	0.13		"	0.125		102	70-130			
Surrogate: 4-Bromofluorobenzene	0.13		"	0.125		101	70-130			

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Absaroka  
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## Volatile Organic Compounds by GC/MS SW846 8260D - 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 B5A0813 - EPA 5030 (soil)

#### LCS (B5A0813-BS1)

Prepared: 01/08/2025 Analyzed: 01/08/2025

1,2,4-Trimethylbenzene	0.106	0.00200	mg/kg	0.100		106	70-130			
1,3,5-Trimethylbenzene	0.106	0.00200	"	0.100		106	70-130			
Benzene	0.102	0.00200	"	0.100		102	70-130			
Ethylbenzene	0.104	0.00200	"	0.100		104	70-130			
Naphthalene	0.103	0.00380	"	0.100		103	70-130			
Toluene	0.0992	0.00200	"	0.100		99.2	70-130			
o-Xylene	0.112	0.00200	"	0.100		112	70-130			
m,p-Xylene	0.208	0.00400	"	0.200		104	70-130			
Surrogate: 1,2-Dichloroethane-d4	0.13		"	0.125		104	70-130			
Surrogate: Toluene-d8	0.12		"	0.125		99.2	70-130			
Surrogate: 4-Bromofluorobenzene	0.13		"	0.125		103	70-130			

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## Volatile Organic Compounds by GC/MS SW846 8260D - Quality Control

### Origins Laboratory

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B5A0813 - EPA 5030 (soil)										
Matrix Spike (B5A0813-MS1)		Source: E5A0085-01			Prepared: 01/08/2025 Analyzed: 01/08/2025					
1,2,4-Trimethylbenzene	0.0879	0.00200	mg/kg	0.100	ND	87.9	70-130			
1,3,5-Trimethylbenzene	0.0900	0.00200	"	0.100	ND	90.0	70-130			
Benzene	0.0872	0.00200	"	0.100	ND	87.2	70-130			
Ethylbenzene	0.0917	0.00200	"	0.100	0.000740	91.0	70-130			
Naphthalene	0.0691	0.00380	"	0.100	ND	69.1	70-130			QM-07
Toluene	0.0858	0.00200	"	0.100	ND	85.8	70-130			
o-Xylene	0.0981	0.00200	"	0.100	ND	98.1	70-130			
m,p-Xylene	0.183	0.00400	"	0.200	0.00142	90.7	70-130			
Surrogate: 1,2-Dichloroethane-d4	0.13		"	0.125		108	70-130			
Surrogate: Toluene-d8	0.13		"	0.125		101	70-130			
Surrogate: 4-Bromofluorobenzene	0.13		"	0.125		106	70-130			

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## Volatile Organic Compounds by GC/MS SW846 8260D - Quality Control

### Origins Laboratory

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B5A0813 - EPA 5030 (soil)										
Matrix Spike Dup (B5A0813-MSD1)			Source: E5A0085-01		Prepared: 01/08/2025 Analyzed: 01/08/2025					
1,2,4-Trimethylbenzene	0.0873	0.00200	mg/kg	0.100	ND	87.3	70-130	0.685	20	
1,3,5-Trimethylbenzene	0.0889	0.00200	"	0.100	ND	88.9	70-130	1.21	20	
Benzene	0.0879	0.00200	"	0.100	ND	87.9	70-130	0.822	20	
Ethylbenzene	0.0921	0.00200	"	0.100	0.000740	91.4	70-130	0.435	20	
Naphthalene	0.0643	0.00380	"	0.100	ND	64.3	70-130	7.13	20	QM-07
Toluene	0.0850	0.00200	"	0.100	ND	85.0	70-130	0.961	20	
o-Xylene	0.0967	0.00200	"	0.100	ND	96.7	70-130	1.50	20	
m,p-Xylene	0.183	0.00400	"	0.200	0.00142	90.7	70-130	0.0328	20	
Surrogate: 1,2-Dichloroethane-d4	0.14		"	0.125		110	70-130			
Surrogate: Toluene-d8	0.12		"	0.125		99.4	70-130			
Surrogate: 4-Bromofluorobenzene	0.13		"	0.125		108	70-130			

Origins Laboratory



Jen Pellegrini For Jordan A. Bynon, Project Manager

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Absaroka  
112 High St.  
Buffalo

WY 82834

Max Dahlgren  
Project Number: [none]  
Project: KMG - Herman UPRR 31-31 1 Wellhead

## Volatile Organic Compounds by GC/MS SW846 8260D - Quality Control

### Origins Laboratory

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

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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#### Batch B5A0818 - EPA 3050B

#### Blank (B5A0818-BLK1)

Prepared: 01/08/2025 Analyzed: 01/09/2025

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

#### LCS (B5A0818-BS1)

Prepared: 01/08/2025 Analyzed: 01/09/2025

Arsenic	5.31	0.290	mg/kg	5.00		106	80-120
Barium	550	10.0	"	500		110	80-120
Cadmium	5.50	0.100	"	5.00		110	80-120
Copper	56.5	10.0	"	50.0		113	80-120
Lead	5.34	1.00	"	5.00		107	80-120
Nickel	5.56	1.00	"	5.00		111	80-120
Selenium	5.46	0.260	"	5.00		109	80-120
Silver	5.46	0.100	"	5.00		109	80-120
Zinc	54.7	37.0	"	50.0		109	80-120

#### Matrix Spike (B5A0818-MS1)

Source: E5A0099-03

Prepared: 01/08/2025 Analyzed: 01/09/2025

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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 B5A0818 - EPA 3050B

Matrix Spike (B5A0818-MS1)		Source: E5A0099-03			Prepared: 01/08/2025 Analyzed: 01/09/2025					
Arsenic	9.71	0.282	mg/kg	4.87	4.57	106	75-125			
Barium	641	9.74	"	487	114	108	75-125			
Cadmium	5.47	0.0974	"	4.87	0.300	106	75-125			
Copper	69.6	9.74	"	48.7	13.4	116	75-125			
Lead	23.3	0.974	"	4.87	17.8	113	75-125			
Nickel	16.0	0.974	"	4.87	10.5	113	75-125			
Selenium	5.35	0.253	"	4.87	0.407	102	75-125			
Silver	5.17	0.0974	"	4.87	0.0715	105	75-125			
Zinc	114	36.0	"	48.7	61.3	108	75-125			
Matrix Spike Dup (B5A0818-MSD1)		Source: E5A0099-03			Prepared: 01/08/2025 Analyzed: 01/09/2025					
Arsenic	10.4	0.279	mg/kg	4.81	4.57	121	75-125	6.84	20	
Barium	673	9.63	"	481	114	116	75-125	4.85	20	
Cadmium	5.71	0.0963	"	4.81	0.300	112	75-125	4.25	20	
Copper	72.6	9.63	"	48.1	13.4	123	75-125	4.18	20	
Lead	24.4	0.963	"	4.81	17.8	138	75-125	4.69	20	QM-07
Nickel	17.1	0.963	"	4.81	10.5	137	75-125	6.64	20	QM-07
Selenium	5.64	0.250	"	4.81	0.407	109	75-125	5.15	20	
Silver	5.35	0.0963	"	4.81	0.0715	110	75-125	3.41	20	
Zinc	119	35.6	"	48.1	61.3	120	75-125	4.77	20	

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Max Dahlgren

Project Number: [none]

Project: KMG - Herman UPRR 31-31 1 Wellhead

## Notes and Definitions

U Sample is Non-Detect.

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.

Origins Laboratory



Jen Pellegrini For Jordan A. Bynon, Project Manager

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