



Absaroka

Max Dahlgren

112 High St.

Buffalo

WY

82834

February 03, 2025

**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.

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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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Jordan A. Bynon, Project Manager

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Absaroka
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WY 82834

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

ORIGINS

65A0094

Page 1 of 1

Sample ID	Date Sampled	Time Sampled	# of Containers	Matrix Preservative	Analysis			Comments
					Full 915	pH, SAR, EC	915 Metals	
W01 @ 5"	11/8/25	14:50	5	UV	X			
6.00 @ 5"		14:52	2		X	X	X	
6.00 @ 5"		15:00	2		X	X	X	
6.00 @ 5"		15:05	2		X	X	X	
6.00 @ 5"		15:10	2		X	X	X	

Client: OXY / Absaroka
Address: _____
Telephone Number: 970-481-6909
Email Address: oxy.care@absarokasolutions.com
Project Manager: Max Dahlgren
Project Name: Herman UPRR 31-31 1 Wellhead
Project Number: _____
Collected By: SJE
Invoice/Billing Info: On file - Oxy
SW Source/Notes: _____
WWE Waste/Notes: _____

Temp Received: 29 Received On Ice? ☒ Yes ☐ No

Standard

48 Hr 72

DAY

X SAME 24

Turnaround Time

Origins Laboratory

J. Bynon

Jordan A. Bynon, Project Manager

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

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F-012207-01-R1

Effective Date: 01/09/12

Sample Receipt Checklist

Origins Work Order: E SA 0099

Client: Absaroka

Client Project ID: Herman

Checklist Completed by: SHD

Shipped Via: NO
(UPS, FedEx, Hand Delivered, Pick-up, etc.)

Date/time completed: 1/8/12

Airbill #: N/A

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

Cooler Number/Temperature: 129 °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 ⁽¹⁾ ?	<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 ⁽¹⁾ ?	<input checked="" type="checkbox"/>			
Was adequate sample volume provided ⁽¹⁾ ?	<input checked="" type="checkbox"/>			
Are short holding time analytes or samples with HTs due within 48 hours present ⁽¹⁾ ?		<input checked="" type="checkbox"/>		
Is a chain-of-custody (COC) present and filled out completely ⁽¹⁾ ?	<input checked="" type="checkbox"/>			
Does the COC agree with the number and type of sample bottles received ⁽¹⁾ ?	<input checked="" type="checkbox"/>			
Do the sample IDs on the bottle labels match the COC ⁽¹⁾ ?	<input checked="" type="checkbox"/>			
Is the COC properly relinquished by the client with date and time recorded ⁽¹⁾ ?	<input checked="" type="checkbox"/>			
For volatiles in water - is there headspace (> 1/4 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 ⁽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 checked="" 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) SHD

Date/Time Reviewed 1/8/12

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Jordan A. Bynon, Project Manager



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Max Dahlgren

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)

Boron (DTPA Sorbitol)

Boron	1.89	0.0986	mg/L	1	B5A0915	01/09/2025	01/10/2025
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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	"	"	"
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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	"	"	"

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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)

GBTEX+TMBs by 8260D

Surrogate: 4-Bromofluorobenzene 102 % 70-130 B5A08 13 01/08/2025 01/08/2025

Metals by Saturated Paste by EPA 6010

Calcium	4.92	0.499	meq/L	10	[CALC]	01/09/2025	01/10/2025
Magnesium	3.16	0.823	"	"	"	"	"
Sodium	11.1	0.435	"	"	"	"	"

PAH by SW8270

1-Methylnaphthalene	ND	0.00297	0.00600	mg/kg	1	BIA0364	01/10/2025	01/13/2025
2-Methylnaphthalene	ND	0.00743	0.0150	"	"	"	"	"
Acenaphthene	ND	0.0412	0.0833	"	"	"	"	"
Anthracene	ND	0.0412	0.0833	"	"	"	"	"
Benzo (a) anthracene	ND	0.00545	0.0110	"	"	"	"	"
Benzo (a) pyrene	ND	0.0412	0.0833	"	"	"	"	"
Benzo (b) fluoranthene	ND	0.0412	0.0833	"	"	"	"	"
Benzo (k) fluoranthene	ND	0.0412	0.0833	"	"	"	"	"
Chrysene	ND	0.0412	0.0833	"	"	"	"	"
Dibenz (a,h) anthracene	ND	0.0412	0.0833	"	"	"	"	"
Fluoranthene	ND	0.0412	0.0833	"	"	"	"	"
Fluorene	ND	0.0412	0.0833	"	"	"	"	"

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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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Enthalpy Analytical

E5A0099-01 (Soil)

PAH by SW8270

Indeno (1,2,3-cd) pyrene	ND	0.0412	0.0833	mg/kg	1	BIA0364	01/10/2025	01/13/2025
Naphthalene	ND	0.00188	0.00380	"	"	"	"	"
Pyrene	ND	0.0412	0.0833	"	"	"	"	"

Surrogate: 2,4,6-Tribromophenol (Surr)	24.6 %	15-96	"	"	"
Surrogate: 2-Fluorobiphenyl (Surr)	20.8 %	19-105	"	"	"
Surrogate: 2-Fluorophenol (Surr)	23.9 %	12-95	"	"	"
Surrogate: Nitrobenzene-d5 (Surr)	32.2 %	21-100	"	"	"
Surrogate: Phenol-d5 (Surr)	33.4 %	13-100	"	"	"
Surrogate: p-Terphenyl-d14 (Surr)	28.8 %	25-125	"	"	"

pH in Soil by 9045D

pH	8.29	pH Units	1	B5A0918	01/09/2025	01/10/2025
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SAR by 20B Saturated Paste

SAR	5.54	0.0100	SAR	1	B5A0911	01/09/2025	01/10/2025
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Specific Conductance Mod. 9050A

Specific Conductance (EC)	2.00	0.00500	mmhos/cm	1	B5A0918	01/09/2025	01/10/2025
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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)

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	"	"	"	"	"

Total Metals by SW7199

Chromium, Hexavalent	0.23	0.20	0.20	mg/kg	1	BIA0749	01/21/2025	01/25/2025
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Project Number: [none]

Project: KMG - Herman UPRR 31-31 1 Wellhead

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)

Boron (DTPA Sorbitol)

Boron	0.661	0.0999	mg/L	1	B5A0915	01/09/2025	01/10/2025
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Metals by Saturated Paste by EPA 6010

Calcium	5.10	0.499	meq/L	10	[CALC]	01/09/2025	01/10/2025
Magnesium	1.46	0.823	"	"	"	"	"
Sodium	1.28	0.435	"	"	"	"	"

pH in Soil by 9045D

pH	6.94		pH Units	1	B5A0918	01/09/2025	01/10/2025
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SAR by 20B Saturated Paste

SAR	0.710	0.0100	SAR	1	B5A0911	01/09/2025	01/10/2025
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Specific Conductance Mod. 9050A

Specific Conductance (EC)	0.782	0.00500	mmhos/cm	1	B5A0918	01/09/2025	01/10/2025
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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	"	"	"	"	"

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Project Number: [none]

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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

Lead	40.0	0.975	mg/kg	10	B5A0818	01/08/2025	01/09/2025
Nickel	10.5	0.975	"	"	"	"	"
Selenium	0.265	0.254	"	"	"	"	"
Silver	ND	0.0975	"	"	"	"	"
Zinc	50.3	36.1	"	"	"	"	"

Total Metals by SW7199

Chromium, Hexavalent	ND	0.20	0.20	mg/kg	1	BIA0749	01/21/2025	01/25/2025
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Jordan A. Bynon, Project Manager



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Max Dahlgren

Project Number: [none]

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)

Boron (DTPA Sorbitol)

Boron	0.896	0.100	mg/L	1	B5A0915	01/09/2025	01/10/2025
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Metals by Saturated Paste by EPA 6010

Calcium	4.50	0.499	meq/L	10	[CALC]	01/09/2025	01/10/2025
Magnesium	1.23	0.823	"	"	"	"	"
Sodium	ND	0.435	"	"	"	"	"

pH in Soil by 9045D

pH	7.04		pH Units	1	B5A0918	01/09/2025	01/10/2025
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SAR by 20B Saturated Paste

SAR	0.199	0.0100	SAR	1	B5A0911	01/09/2025	01/10/2025
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Specific Conductance Mod. 9050A

Specific Conductance (EC)	0.902	0.00500	mmhos/cm	1	B5A0918	01/09/2025	01/10/2025
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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	"	"	"	"	"

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Project Number: [none]

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

Lead	17.8	0.916	mg/kg	10	B5A0818	01/08/2025	01/09/2025
Nickel	10.5	0.916	"	"	"	"	"
Selenium	0.407	0.238	"	"	"	"	"
Silver	ND	0.0916	"	"	"	"	"
Zinc	61.3	33.9	"	"	"	"	"

Total Metals by SW7199

Chromium, Hexavalent	ND	0.20	0.20	mg/kg	1	BIA0749	01/21/2025	01/25/2025
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Project Number: [none]

Project: KMG - Herman UPRR 31-31 1 Wellhead

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)

Boron (DTPA Sorbitol)

Boron	9.22	0.100	mg/L	1	B5A0915	01/09/2025	01/10/2025
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Metals by Saturated Paste by EPA 6010

Calcium	12.6	0.499	meq/L	10	[CALC]	01/09/2025	01/10/2025
Magnesium	46.0	0.823	"	"	"	"	"
Sodium	101	4.35	"	100	"	"	01/15/2025

pH in Soil by 9045D

pH	7.90		pH Units	1	B5A0918	01/09/2025	01/10/2025
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SAR by 20B Saturated Paste

SAR	18.7	0.0100	SAR	1	B5A0911	01/09/2025	01/15/2025
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Specific Conductance Mod. 9050A

Specific Conductance (EC)	12.4	0.00500	mmhos/cm	1	B5A0918	01/09/2025	01/10/2025
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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	"	"	"	"	"

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Project Number: [none]

Project: KMG - Herman UPRR 31-31 1 Wellhead

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

Lead	17.0	0.968	mg/kg	10	B5A0818	01/08/2025	01/09/2025
Nickel	12.3	0.968	"	"	"	"	"
Selenium	0.733	0.252	"	"	"	"	"
Silver	0.178	0.0968	"	"	"	"	"
Zinc	77.4	35.8	"	"	"	"	"

Total Metals by SW7196

Chromium, Hexavalent	0.33	0.20	0.20	mg/kg	1	BIA1140	01/30/2025	01/31/2025
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Max Dahlgren

Project Number: [none]

Project: KMG - Herman UPRR 31-31 1 Wellhead

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)

Boron (DTPA Sorbitol)

Boron	9.06	0.0990	mg/L	1	B5A0915	01/09/2025	01/10/2025
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Metals by Saturated Paste by EPA 6010

Calcium	8.98	0.499	meq/L	10	[CALC]	01/09/2025	01/10/2025
Magnesium	38.8	0.823	"	"	"	"	"
Sodium	78.5	0.435	"	"	"	"	"

pH in Soil by 9045D

pH	8.11		pH Units	1	B5A0918	01/09/2025	01/10/2025
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SAR by 20B Saturated Paste

SAR	16.1	0.0100	SAR	1	B5A0911	01/09/2025	01/10/2025
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Specific Conductance Mod. 9050A

Specific Conductance (EC)	7.72	0.00500	mmhos/cm	1	B5A0918	01/09/2025	01/10/2025
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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	"	"	"	"	"

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Absaroka

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82834

Max Dahlgren

Project Number: [none]

Project: KMG - Herman UPRR 31-31 1 Wellhead

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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E5A0099-05 (Soil)

Table 915 metals by EPA 6020B

Lead	10.4	0.977	mg/kg	10	B5A0818	01/08/2025	01/09/2025
Nickel	6.11	0.977	"	"	"	"	"
Selenium	1.14	0.254	"	"	"	"	"
Silver	0.107	0.0977	"	"	"	"	"
Zinc	41.0	36.2	"	"	"	"	"

Total Metals by SW7196

Chromium, Hexavalent	ND	0.20	0.20	mg/kg	1	BIA1140	01/30/2025	01/31/2025
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Project Number: [none]

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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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Project Number: [none]

Project: KMG - Herman UPRR 31-31 1 Wellhead

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
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
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Batch B5A0813 - EPA 5030 (soil)

Blank (B5A0813-BLK1)

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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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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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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Project Number: [none]

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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)

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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Project Number: [none]

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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)

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			

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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
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 (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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Project Number: [none]

Project: KMG - Herman UPRR 31-31 1 Wellhead

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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Project Number: [none]

Project: KMG - Herman UPRR 31-31 1 Wellhead

Classical Chemistry Parameters - 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 B5A0911 - Saturated Paste Metals

Blank (B5A0911-BLK1)

Prepared: 01/09/2025 Analyzed: 01/10/2025

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 (B5A0911-DUP1)

Source: E5A0098-07

Prepared: 01/09/2025 Analyzed: 01/10/2025

SAR	ND	0.0100	SAR	ND	200
Calcium PPM	30.0	10.0	mg/L	34.4	50
Magnesium PPM	12.9	10.0	"	14.4	50
Sodium PPM	98.7	10.0	"	110	50

Batch B5A0915 - DTPA Sorbitol Preparation

Blank (B5A0915-BLK1)

Prepared: 01/09/2025 Analyzed: 01/10/2025

Boron	ND	0.100	mg/L
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Duplicate (B5A0915-DUP1)

Source: E5A0098-09

Prepared: 01/09/2025 Analyzed: 01/10/2025

Boron	0.215	0.0999	mg/L	0.205	4.54	50
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Project Number: [none]

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Saturated Paste - 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 B5A0918 - Saturated Paste pH/EC

Blank (B5A0918-BLK1)

Prepared: 01/09/2025 Analyzed: 01/10/2025

Specific Conductance (EC) ND 0.00500 mmhos/cm

Duplicate (B5A0918-DUP1)

Source: E5A0098-07

Prepared: 01/09/2025 Analyzed: 01/10/2025

pH	8.15		pH Units	8.18		0.367	25
Specific Conductance (EC)	0.913	0.00500	mmhos/cm	0.965		5.56	25

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Project Number: [none]

Project: KMG - Herman UPRR 31-31 1 Wellhead

PAH by SW8270 - Quality Control
Enthalpy Analytical

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch BIA0364 - SW3550C/EPA600-MS

Blank (BIA0364-BLK1)

Prepared: 01/10/2025 Analyzed: 01/13/2025

1-Methylnaphthalene	ND	0.00600	mg/kg	-	-	-	-	-	-	-
2-Methylnaphthalene	ND	0.0150	"	-	-	-	-	-	-	-
Acenaphthene	ND	0.0833	"	-	-	-	-	-	-	-
Anthracene	ND	0.0833	"	-	-	-	-	-	-	-
Benzo (a) anthracene	ND	0.0110	"	-	-	-	-	-	-	-
Benzo (a) pyrene	ND	0.0833	"	-	-	-	-	-	-	-
Benzo (b) fluoranthene	ND	0.0833	"	-	-	-	-	-	-	-
Benzo (k) fluoranthene	ND	0.0833	"	-	-	-	-	-	-	-
Chrysene	ND	0.0833	"	-	-	-	-	-	-	-
Dibenz (a,h) anthracene	ND	0.0833	"	-	-	-	-	-	-	-
Fluoranthene	ND	0.0833	"	-	-	-	-	-	-	-
Fluorene	ND	0.0833	"	-	-	-	-	-	-	-
Indeno (1,2,3-cd) pyrene	ND	0.0833	"	-	-	-	-	-	-	-
Naphthalene	ND	0.00380	"	-	-	-	-	-	-	-
Pyrene	ND	0.0833	"	-	-	-	-	-	-	-
Surrogate: 2,4,6-Tribromophenol (Surr)	1.06	"	3.33	31.7	15-96					
Surrogate: 2-Fluorobiphenyl (Surr)	0.806	"	1.67	48.4	19-105					
Surrogate: 2-Fluorophenol (Surr)	1.59	"	3.33	47.6	12-95					
Surrogate: Nitrobenzene-d5 (Surr)	0.830	"	1.67	49.8	21-100					
Surrogate: Phenol-d5 (Surr)	1.64	"	3.33	49.3	13-100					
Surrogate: p-Terphenyl-d14 (Surr)	0.913	"	1.67	54.8	25-125					

LCS (BIA0364-BS1)

Prepared: 01/10/2025 Analyzed: 01/13/2025

1-Methylnaphthalene	ND	0.0833	mg/kg	-	-	-	-	-	-	-
2-Methylnaphthalene	ND	0.0833	"	-	-	-	-	-	-	-
Acenaphthene	0.704	0.0833	"	1.67	42.3	24-110				
Anthracene	0.707	0.0833	"	1.67	42.4	25-117				

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Max Dahlgren

Project Number: [none]

Project: KMG - Herman UPRR 31-31 1 Wellhead

PAH by SW8270 - Quality Control
Enthalpy Analytical

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch BIA0364 - SW3550C/EPA600-MS**LCS (BIA0364-BS1)**

Prepared: 01/10/2025 Analyzed: 01/13/2025

Benzo (a) anthracene	0.772	0.0833	mg/kg	1.67		46.3	25-127			
Benzo (a) pyrene	0.758	0.0833	"	1.67		45.5	18-127			
Benzo (b) fluoranthene	0.933	0.0833	"	1.67		56.0	20-132			
Benzo (k) fluoranthene	0.769	0.0833	"	1.67		46.1	14-136			
Chrysene	0.795	0.0833	"	1.67		47.7	21-141			
Dibenz (a,h) anthracene	0.663	0.0833	"	1.67		39.8	10-142			
Fluoranthene	0.822	0.0833	"	1.67		49.3	19-138			
Fluorene	0.695	0.0833	"	1.67		41.7	25-114			
Indeno (1,2,3-cd) pyrene	0.634	0.0833	"	1.67		38.1	10-136			
Naphthalene	0.714	0.0833	"	1.67		42.8	18-109			
Pyrene	0.814	0.0833	"	1.67		48.8	17-159			
Surrogate: 2,4,6-Tribromophenol (Surr)	1.16		"	3.33		34.9	15-96			
Surrogate: 2-Fluorobiphenyl (Surr)	0.639		"	1.67		38.4	19-105			
Surrogate: 2-Fluorophenol (Surr)	1.46		"	3.33		43.8	12-95			
Surrogate: Nitrobenzene-d5 (Surr)	0.717		"	1.67		43.0	21-100			
Surrogate: Phenol-d5 (Surr)	1.40		"	3.33		41.9	13-100			
Surrogate: p-Terphenyl-d14 (Surr)	0.728		"	1.67		43.7	25-125			

Matrix Spike (BIA0364-MS1)**Source: 25A0374-01**

Prepared: 01/10/2025 Analyzed: 01/13/2025

1-Methylnaphthalene	ND	0.0833	mg/kg		ND		0-200			
2-Methylnaphthalene	ND	0.0833	"		ND		70-130			
Acenaphthene	0.421	0.0833	"	1.67	ND	25.2	10-124			
Anthracene	0.418	0.0833	"	1.67	ND	25.1	10-143			
Benzo (a) anthracene	0.447	0.0833	"	1.67	ND	26.8	10-169			
Benzo (a) pyrene	0.474	0.0833	"	1.67	ND	28.4	10-149			
Benzo (b) fluoranthene	0.524	0.0833	"	1.67	ND	31.4	10-150			
Benzo (k) fluoranthene	0.472	0.0833	"	1.67	ND	28.3	10-211			

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82834

Max Dahlgren

Project Number: [none]

Project: KMG - Herman UPRR 31-31 1 Wellhead

PAH by SW8270 - Quality Control
Enthalpy Analytical

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch BIA0364 - SW3550C/EPA600-MS

Matrix Spike (BIA0364-MS1)			Source: 25A0374-01		Prepared: 01/10/2025 Analyzed: 01/13/2025					
Chrysene	0.463	0.0833	mg/kg	1.67	ND	27.8	10-172			
Dibenz (a,h) anthracene	0.432	0.0833	"	1.67	ND	26.0	10-128			
Fluoranthene	0.494	0.0833	"	1.67	ND	29.6	10-271			
Fluorene	0.423	0.0833	"	1.67	ND	25.4	10-124			
Indeno (1,2,3-cd) pyrene	0.392	0.0833	"	1.67	ND	23.5	10-127			
Naphthalene	0.411	0.0833	"	1.67	ND	24.7	10-118			
Pyrene	0.466	0.0833	"	1.67	ND	28.0	10-212			
Surrogate: 2,4,6-Tribromophenol (Surr)	0.775		"	3.33		23.3	15-96			
Surrogate: 2-Fluorobiphenyl (Surr)	0.373		"	1.67		22.4	19-105			
Surrogate: 2-Fluorophenol (Surr)	0.929		"	3.33		27.9	12-95			
Surrogate: Nitrobenzene-d5 (Surr)	0.472		"	1.67		28.3	21-100			
Surrogate: Phenol-d5 (Surr)	0.926		"	3.33		27.8	13-100			
Surrogate: p-Terphenyl-d14 (Surr)	0.424		"	1.67		25.4	25-125			

Matrix Spike Dup (BIA0364-MSD1)			Source: 25A0374-01		Prepared: 01/10/2025 Analyzed: 01/13/2025					
1-Methylnaphthalene	ND	0.0833	mg/kg		ND		0-200		20	
2-Methylnaphthalene	ND	0.0833	"		ND		70-130		20	
Acenaphthene	0.403	0.0833	"	1.64	ND	24.5	10-124	4.26	20	
Anthracene	0.407	0.0833	"	1.64	ND	24.8	10-143	2.53	20	
Benzo (a) anthracene	0.436	0.0833	"	1.64	ND	26.5	10-169	2.56	20	
Benzo (a) pyrene	0.445	0.0833	"	1.64	ND	27.0	10-149	6.41	20	
Benzo (b) fluoranthene	0.473	0.0833	"	1.64	ND	28.7	10-150	10.2	20	
Benzo (k) fluoranthene	0.438	0.0833	"	1.64	ND	26.6	10-211	7.44	20	
Chrysene	0.458	0.0833	"	1.64	ND	27.9	10-172	1.11	20	
Dibenz (a,h) anthracene	0.427	0.0833	"	1.64	ND	25.9	10-128	1.36	20	
Fluoranthene	0.441	0.0833	"	1.64	ND	26.8	10-271	11.1	20	
Fluorene	0.413	0.0833	"	1.64	ND	25.1	10-124	2.47	20	

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PAH by SW8270 - Quality Control
Enthalpy Analytical

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch BIA0364 - SW3550C/EPA600-MS

Matrix Spike Dup (BIA0364-MSD1)

Source: 25A0374-01

Prepared: 01/10/2025 Analyzed: 01/13/2025

Indeno (1,2,3-cd) pyrene	0.397	0.0833	mg/kg	1.64	ND	24.1	10-127	1.24	20	
Naphthalene	0.406	0.0833	"	1.64	ND	24.7	10-118	1.20	20	
Pyrene	0.463	0.0833	"	1.64	ND	28.1	10-212	0.647	20	
Surrogate: 2,4,6-Tribromophenol (Surr)	0.729		"	3.29		22.2	15-96			
Surrogate: 2-Fluorobiphenyl (Surr)	0.360		"	1.64		21.9	19-105			
Surrogate: 2-Fluorophenol (Surr)	0.875		"	3.29		26.6	12-95			
Surrogate: Nitrobenzene-d5 (Surr)	0.436		"	1.64		26.5	21-100			
Surrogate: Phenol-d5 (Surr)	0.858		"	3.29		26.1	13-100			
Surrogate: p-Terphenyl-d14 (Surr)	0.403		"	1.64		24.5	25-125			S

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Project Number: [none]

Project: KMG - Herman UPRR 31-31 1 Wellhead

Total Metals by SW7196 - Quality Control
Enthalpy Analytical

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch BIA1140 - No Prep Wet Chem										
Blank (BIA1140-BLK1)					Prepared: 01/31/2025 Analyzed: 01/31/2025					
Chromium, Hexavalent	ND	0.005	mg/kg				-			
LCS (BIA1140-BS1)					Prepared: 01/31/2025 Analyzed: 01/31/2025					
Chromium, Hexavalent	0.05		mg/kg	0.0500		96.0	80-120			
LCS (BIA1140-BS2)					Prepared: 01/31/2025 Analyzed: 01/31/2025					
Chromium, Hexavalent	7.00	1.00	mg/kg	7.83		89.4	80-120			
Matrix Spike (BIA1140-MS1)					Source: 25A0380-01 Prepared: 01/31/2025 Analyzed: 01/31/2025					
Chromium, Hexavalent	1.68	0.20	mg/kg	1.95	ND	86.0	75-125			
Matrix Spike Dup (BIA1140-MSD1)					Source: 25A0380-01 Prepared: 01/31/2025 Analyzed: 01/31/2025					
Chromium, Hexavalent	1.60	0.20	mg/kg	1.96	ND	82.0	75-125	4.65	20	

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Project Number: [none]

Project: KMG - Herman UPRR 31-31 1 Wellhead

Total Metals by SW7199 - Quality Control
Enthalpy Analytical

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch BIA0749 - No Prep IC-WET										
Blank (BIA0749-BLK1)					Prepared: 01/21/2025 Analyzed: 01/25/2025					
Chromium, Hexavalent	ND	0.005	mg/kg				-			
LCS (BIA0749-BS1)					Prepared: 01/21/2025 Analyzed: 01/25/2025					
Chromium, Hexavalent	0.06	0.005	mg/kg	0.0500		113	80-120			
Matrix Spike (BIA0749-MS1)					Source: 25A0376-01 Prepared: 01/21/2025 Analyzed: 01/25/2025					
Chromium, Hexavalent	2.18	0.20	mg/kg	1.96	ND	111	75-125			
Matrix Spike Dup (BIA0749-MSD1)					Source: 25A0376-01 Prepared: 01/21/2025 Analyzed: 01/25/2025					
Chromium, Hexavalent	2.06	0.19	mg/kg	1.93	ND	107	75-125	5.74	20	

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Project Number: [none]

Project: KMG - Herman UPRR 31-31 1 Wellhead

Notes and Definitions

- U Sample is Non-Detect.
- S Surrogate recovery was outside acceptance criteria
- QM-07 The spike recovery was outside acceptance limits for the MS and/or MSD. The batch was accepted based on acceptable LCS recovery.
- M Matrix spike recovery is outside established acceptance limits
- L LCS recovery is outside of established acceptance limits
- 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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