



Absaroka
Joel Mason
112 High St.

November 11, 2024

Buffalo WY 82834

Project Name - FEO Spicer Annex Confirmation Samples **Project Number - FEO.CO.0701.29**

Attached are your analytical results for FEO Spicer Annex Confirmation Samples received by Origins Laboratory October 15, 2024. This project is associated with Origins project number E410440-02.

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

Joel Mason
Project Number: FEO.CO.0701.29
Project: FEO Spicer Annex Confirmation Samples

CROSS REFERENCE REPORT

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
SS_S32_15_@6FT	E410440-02	Soil	October 14, 2024 10:40	10/15/2024 13:42

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E110440

page 1 of 1

Client: Absaroka Energy and Environmental Solutions
Address: 112 High St. Buffalo, WY 82834
Telephone Number: 307-262-8975
Email Address: joel.mason@absarokasolutions.com

Project Manager: Joel Mason
Project Name: FEO Spicer Annex Confirmation Samples
Project Number: FEO.CO.0701.29
Samples Collected By: joel.mason@absarokasolutions.com

Sample ID Description	Date Sampled	Time Sampled	# of Containers	Preservative			Matrix			Analysis Table 915.1 Parameters (Rush SAR EC, pH to quickest TAT)	Sample Instructions
				Unpreserved	HCl	HNO ₃	Other	Groundwater	Soil		
SS_S32_15_@5ft	10/14/2024	10:30	3	X						X	
SS_S32_15_@6ft	10/14/2024	10:40	3	X						X	
SS_S32_15_@7ft	10/14/2024	10:50	3	X						X	
SS_S32_16_@5ft	10/14/2024	11:00	3	X						X	
SS_S32_16_@6ft	10/14/2024	11:10	3	X						X	
SS_S32_16_@7ft	10/14/2024	11:20	3	X						X	
SS_S32_34_@7ft	10/14/2024	11:30	3	X						X	
SS_S32_34_@8ft	10/14/2024	11:40	3	X						X	
SS_S32_34_@9ft	10/14/2024	11:50	3	X						X	

Relinquished By: [Signature] Date: 10/15/24 Time: 8:42
Received By: [Signature] Date: 10/15/24 Time: 13:47
Turnaround Time: Some Day 24 Hr 48 Hr 72 Hr Standard

6 Date Results Needed

Origins Laboratory
Byron

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Project: FEO Spicer Annex Confirmation Samples

Origins Laboratory

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

Sample Receipt Checklist

Origins Work Order: E410440

Client: Absaroka

Client Project ID: Spicer Annex

Checklist Completed by: JAY KK

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

Date/time completed: 10/15/12

Airbill #: N/A

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

Cooler Number/Temperature: 116 °C / _____ °C / _____ °C (Describe)

Thermometer ID: 7004

Requirement Description	Yes	No	N/A	Comments (if any)
If samples require cooling, was the temperature between 0°C to ≤ 6°C ⁽¹⁾ ?	/			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 ⁽¹⁾ ?	/			
Was adequate sample volume provided ⁽¹⁾ ?	/			
Are short holding time analytes or samples with HTs due within 48 hours present ⁽¹⁾ ?		/		
Is a chain-of-custody (COC) present and filled out completely ⁽¹⁾ ?	/			
Does the COC agree with the number and type of sample bottles received ⁽¹⁾ ?	/			
Do the sample IDs on the bottle labels match the COC ⁽¹⁾ ?	/			
Is the COC properly relinquished by the client with date and time recorded ⁽¹⁾ ?	/			
For volatiles in water – is there headspace (> ¼ inch bubble) present? If yes, contact client and note in narrative.			/	
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)			/	
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) JAY Date/Time Reviewed 10/15/12

Origins Laboratory

J. Bynon

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SS S32 15 @6FT
10/14/2024 10:40:00AM

Analyte	Result	Min Detection Limit	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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Origins Laboratory
E410440-02 (Soil)

Boron (DTPA Sorbitol)

Boron	0.126		0.0996	mg/L	1	B4J1618	10/16/2024	10/17/2024	
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DRO/ORO by EPA 8015D

Diesel (C10-C28)	ND		25.0	mg/kg	1	B4J1701	10/17/2024	10/18/2024	Ua
Residual Range Organics (C28-C40)	ND		100	"	"	"	"	"	Ua

Surrogate: <i>o</i> -Terphenyl	74.5 %		50-150			"	"	"	
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GBTEX+TMBs by 8260D

1,2,4-Trimethylbenzene	ND		0.00200	mg/kg	1	B4J1850	10/18/2024	10/22/2024	Ua
1,3,5-Trimethylbenzene	ND		0.00200	"	"	"	"	"	Ua
Benzene	ND		0.00200	"	"	"	"	"	Ua
Ethylbenzene	ND		0.00200	"	"	"	"	"	Ua
Toluene	ND		0.00200	"	"	"	"	"	Ua
Xylenes, total	ND		0.00200	"	"	"	"	"	Ua
Gasoline Range Hydrocarbons	ND		0.200	"	"	"	"	"	Ua

Surrogate: 1,2-Dichloroethane-d4	87.1 %		70-130			"	"	"	
Surrogate: Toluene-d8	99.5 %		70-130			"	"	"	

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Analyte	Result	Min Detection Limit	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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Origins Laboratory
E410440-02 (Soil)

GBTEX+TMBs by 8260D

Surrogate: 4-Bromofluorobenzene	106 %	70-130	B4J18 50	10/18/2024	10/22/2024
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Metals by Saturated Paste by EPA 6010

Calcium	ND	0.499	meq/L	10	[CALC]	10/16/2024	10/18/2024
Magnesium	ND	0.823	"	"	"	"	"
Sodium	3.97	0.435	"	"	"	"	"

PAH by EPA 8270E extracted via 3580A

1-Methylnaphthalene	ND	0.002	mg/kg	1	B4J2141	10/21/2024	10/23/2024	Ua
2-Methylnaphthalene	ND	0.002	"	"	"	"	"	Ua
Acenaphthene	ND	0.020	"	"	"	"	"	Ua
Anthracene	ND	0.020	"	"	"	"	"	Ua
Benzo (a) anthracene	ND	0.005	"	"	"	"	"	Ua
Benzo (a) pyrene	ND	0.020	"	"	"	"	"	Ua
Benzo (b) fluoranthene	ND	0.020	"	"	"	"	"	Ua
Benzo (k) fluoranthene	ND	0.020	"	"	"	"	"	Ua
Chrysene	ND	0.020	"	"	"	"	"	Ua
Dibenz (a,h) anthracene	ND	0.020	"	"	"	"	"	Ua
Fluoranthene	ND	0.020	"	"	"	"	"	Ua
Fluorene	ND	0.020	"	"	"	"	"	Ua

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Analyte	Result	Min Detection Limit	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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Origins Laboratory
E410440-02 (Soil)

PAH by EPA 8270E extracted via 3580A

Indeno (1,2,3-cd) pyrene	ND		0.020	mg/kg	1	B4J2141	10/21/2024	10/23/2024	Ua
Naphthalene	ND		0.002	"	"	"	"	"	Ua
Pyrene	ND		0.020	"	"	"	"	"	Ua

Surrogate: Fluorene-d10	96.5 %		60-130			"	"	"	
Surrogate: Anthracene-d10	97.8 %		60-130			"	"	"	
Surrogate: Pyrene-d10	104 %		60-130			"	"	"	
Surrogate: Benzo (a) pyrene-d12	104 %		60-130			"	"	"	

pH in Soil by 9045D

pH	8.56			pH Units	1	B4J1619	10/16/2024	10/18/2024	
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SAR by 20B Saturated Paste

SAR	6.20		0.0100	SAR	1	B4J1609	10/16/2024	10/18/2024	
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Specific Conductance Mod. 9050A

Specific Conductance (EC)	0.496		0.00500	mmhos/cm	1	B4J1619	10/16/2024	10/18/2024	
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Table 915 metals by EPA 6020B

Arsenic	0.670		0.288	mg/kg	10	B4J1642	10/16/2024	10/17/2024	
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Analyte	Result	Min Detection Limit	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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Origins Laboratory
E410440-02 (Soil)

Table 915 metals by EPA 6020B

Barium	182		9.95	mg/kg	10	B4J1642	10/16/2024	10/17/2024	
Cadmium	0.137		0.0995	"	"	"	"	"	
Copper	24.4		9.95	"	"	"	"	"	
Lead	9.34		0.995	"	"	"	"	"	
Nickel	32.8		0.995	"	"	"	"	"	
Selenium	ND		0.259	"	"	"	"	"	
Silver	ND		0.0995	"	"	"	"	"	
Zinc	92.1		36.8	"	"	"	"	"	

Total Metals 7196A

Hexavalent Chromium	ND	0.145	0.362	mg/kg dry	1	2689108	11/05/2024	11/06/2024	U
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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
Batch B4J1701 - EPA 3550B										
Blank (B4J1701-BLK1)										
					Prepared: 10/17/2024 Analyzed: 10/18/2024					
Diesel (C10-C28)	ND	25.0	mg/kg							Ua
Residual Range Organics (C28-C40)	ND	100	"							Ua
Surrogate: o-Terphenyl	21		"	24.9		84.9	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 B4J1701 - EPA 3550B

LCS (B4J1701-BS1)

Prepared: 10/17/2024 Analyzed: 10/18/2024

Diesel (C10-C28)	762	50.0	mg/kg	1000		76.2	70-130			
Residual Range Organics (C28-C40)	866	200	"	1000		86.6	70-130			
Surrogate: o-Terphenyl	39		"	49.8		78.6	50-150			

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Jordan A. Bynon, Project Manager

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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
Batch B4J1701 - EPA 3550B										
Matrix Spike (B4J1701-MS1)		Source: E410404-01			Prepared: 10/17/2024 Analyzed: 10/18/2024					
Diesel (C10-C28)	786	50.0	mg/kg	1000	ND	78.6	70-130			
Residual Range Organics (C28-C40)	902	200	"	1000	ND	90.2	70-130			
Surrogate: o-Terphenyl	45		"	49.8		91.4	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 B4J1701 - EPA 3550B

Matrix Spike Dup (B4J1701-MSD1)	Source: E410404-01			Prepared: 10/17/2024 Analyzed: 10/18/2024						
Diesel (C10-C28)	768	50.0	mg/kg	1000	ND	76.8	70-130	2.34	35	
Residual Range Organics (C28-C40)	894	200	"	1000	ND	89.4	70-130	0.890	35	
Surrogate: o-Terphenyl	44		"	49.8		88.5	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
Batch B4J1850 - EPA 5030 (soil)										
Blank (B4J1850-BLK1)										
					Prepared: 10/18/2024 Analyzed: 10/22/2024					
1,2,4-Trimethylbenzene	ND	0.00200	mg/kg							Ua
1,3,5-Trimethylbenzene	ND	0.00200	"							Ua
Benzene	ND	0.00200	"							Ua
Ethylbenzene	ND	0.00200	"							Ua
Naphthalene	ND	0.00380	"							Ua
Toluene	ND	0.00200	"							Ua
Xylenes, total	ND	0.00200	"							Ua
Gasoline Range Hydrocarbons	ND	0.200	"							Ua
Surrogate: 1,2-Dichloroethane-d4	0.10		"	0.125		80.9	70-130			
Surrogate: Toluene-d8	0.12		"	0.125		98.8	70-130			
Surrogate: 4-Bromofluorobenzene	0.13		"	0.125		105	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
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Batch B4J1850 - EPA 5030 (soil)

LCS (B4J1850-BS1)

Prepared: 10/18/2024 Analyzed: 10/22/2024

1,2,4-Trimethylbenzene	0.0856	0.00200	mg/kg	0.100		85.6	70-130			
1,3,5-Trimethylbenzene	0.0906	0.00200	"	0.100		90.6	70-130			
Benzene	0.0865	0.00200	"	0.100		86.5	70-130			
Ethylbenzene	0.0887	0.00200	"	0.100		88.7	70-130			
Naphthalene	0.0919	0.00380	"	0.100		91.9	70-130			
Toluene	0.0849	0.00200	"	0.100		84.9	70-130			
o-Xylene	0.0838	0.00200	"	0.100		83.8	70-130			
m,p-Xylene	0.171	0.00400	"	0.200		85.5	70-130			
Surrogate: 1,2-Dichloroethane-d4	0.13		"	0.125		107	70-130			
Surrogate: Toluene-d8	0.12		"	0.125		96.6	70-130			
Surrogate: 4-Bromofluorobenzene	0.12		"	0.125		97.8	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
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Batch B4J1850 - EPA 5030 (soil)

Matrix Spike (B4J1850-MS1)	Source: E410440-01			Prepared: 10/18/2024 Analyzed: 10/22/2024						
1,2,4-Trimethylbenzene	0.0847	0.00200	mg/kg	0.100	ND	84.7	70-130			
1,3,5-Trimethylbenzene	0.0850	0.00200	"	0.100	ND	85.0	70-130			
Benzene	0.0785	0.00200	"	0.100	ND	78.5	70-130			
Ethylbenzene	0.0873	0.00200	"	0.100	ND	87.3	70-130			
Naphthalene	0.0658	0.00380	"	0.100	ND	65.8	70-130			QM-07
Toluene	0.0806	0.00200	"	0.100	ND	80.6	70-130			
o-Xylene	0.0849	0.00200	"	0.100	ND	84.9	70-130			
m,p-Xylene	0.171	0.00400	"	0.200	ND	85.7	70-130			
Surrogate: 1,2-Dichloroethane-d4	0.097		"	0.125		77.5	70-130			
Surrogate: Toluene-d8	0.13		"	0.125		102	70-130			
Surrogate: 4-Bromofluorobenzene	0.13		"	0.125		105	70-130			

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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 B4J1850 - EPA 5030 (soil)

Matrix Spike Dup (B4J1850-MSD1)	Source: E410440-01			Prepared: 10/18/2024 Analyzed: 10/22/2024						
1,2,4-Trimethylbenzene	0.0828	0.00200	mg/kg	0.100	ND	82.8	70-130	2.24	20	
1,3,5-Trimethylbenzene	0.0818	0.00200	"	0.100	ND	81.8	70-130	3.77	20	
Benzene	0.0782	0.00200	"	0.100	ND	78.2	70-130	0.383	20	
Ethylbenzene	0.0822	0.00200	"	0.100	ND	82.2	70-130	6.04	20	
Naphthalene	0.0805	0.00380	"	0.100	ND	80.5	70-130	20.0	20	
Toluene	0.0773	0.00200	"	0.100	ND	77.3	70-130	4.18	20	
o-Xylene	0.0826	0.00200	"	0.100	ND	82.6	70-130	2.72	20	
m,p-Xylene	0.164	0.00400	"	0.200	ND	82.2	70-130	4.12	20	
Surrogate: 1,2-Dichloroethane-d4	0.11		"	0.125		92.0	70-130			
Surrogate: Toluene-d8	0.12		"	0.125		93.6	70-130			
Surrogate: 4-Bromofluorobenzene	0.13		"	0.125		102	70-130			

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Joel Mason
 Project Number: FEO.CO.0701.29
 Project: FEO Spicer Annex Confirmation Samples

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 B4J1642 - EPA 3050B

Blank (B4J1642-BLK1)

Prepared: 10/16/2024 Analyzed: 10/17/2024

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 (B4J1642-BS1)

Prepared: 10/16/2024 Analyzed: 10/17/2024

Arsenic	4.90	0.290	mg/kg	5.00		98.0	80-120			
Barium	517	10.0	"	500		103	80-120			
Cadmium	5.19	0.100	"	5.00		104	80-120			
Copper	52.2	10.0	"	50.0		104	80-120			
Lead	5.07	1.00	"	5.00		101	80-120			
Nickel	5.26	1.00	"	5.00		105	80-120			
Selenium	5.04	0.260	"	5.00		101	80-120			
Silver	5.27	0.100	"	5.00		105	80-120			
Zinc	51.9	37.0	"	50.0		104	80-120			

Matrix Spike (B4J1642-MS1)

Source: E410440-01

Prepared: 10/16/2024 Analyzed: 10/17/2024

Origins Laboratory

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 112 High St.
 Buffalo WY 82834

Joel Mason
 Project Number: FEO.CO.0701.29
 Project: FEO Spicer Annex Confirmation Samples

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 B4J1642 - EPA 3050B

Matrix Spike (B4J1642-MS1)	Source: E410440-01			Prepared: 10/16/2024 Analyzed: 10/17/2024						
Arsenic	6.64	0.283	mg/kg	4.88	1.74	101	75-125			
Barium	760	9.75	"	488	177	119	75-125			
Cadmium	5.19	0.0975	"	4.88	0.122	104	75-125			
Copper	70.3	9.75	"	48.8	20.9	101	75-125			
Lead	13.3	0.975	"	4.88	8.78	92.5	75-125			
Nickel	28.0	0.975	"	4.88	23.1	100	75-125			
Selenium	4.97	0.254	"	4.88	0.121	99.5	75-125			
Silver	5.08	0.0975	"	4.88	0.0395	103	75-125			
Zinc	114	36.1	"	48.8	63.7	103	75-125			

Matrix Spike Dup (B4J1642-MSD1)	Source: E410440-01			Prepared: 10/16/2024 Analyzed: 10/17/2024						
Arsenic	6.26	0.269	mg/kg	4.64	1.74	97.5	75-125	5.88	20	
Barium	694	9.28	"	464	177	111	75-125	9.07	20	
Cadmium	5.00	0.0928	"	4.64	0.122	105	75-125	3.77	20	
Copper	68.8	9.28	"	46.4	20.9	103	75-125	2.11	20	
Lead	13.9	0.928	"	4.64	8.78	110	75-125	4.42	20	
Nickel	29.4	0.928	"	4.64	23.1	136	75-125	4.85	20	QM-07
Selenium	4.64	0.241	"	4.64	0.121	97.4	75-125	6.88	20	
Silver	4.96	0.0928	"	4.64	0.0395	106	75-125	2.43	20	
Zinc	112	34.3	"	46.4	63.7	105	75-125	1.56	20	

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Joel Mason
 Project Number: FEO.CO.0701.29
 Project: FEO Spicer Annex Confirmation Samples

EPA 8270E (SW846) - Semivolatile Organic Compounds - 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 B4J2141 - EPA 3580

Blank (B4J2141-BLK1)

Prepared: 10/21/2024 Analyzed: 10/23/2024

1-Methylnaphthalene	ND	0.002	mg/kg							Ua
2-Methylnaphthalene	ND	0.002	"							Ua
Acenaphthene	ND	0.020	"							Ua
Anthracene	ND	0.020	"							Ua
Benzo (a) anthracene	ND	0.005	"							Ua
Benzo (a) pyrene	ND	0.020	"							Ua
Benzo (b) fluoranthene	ND	0.020	"							Ua
Benzo (g,h,i) perylene	ND	0.020	"							Ua
Benzo (k) fluoranthene	ND	0.020	"							Ua
Chrysene	ND	0.020	"							Ua
Dibenz (a,h) anthracene	ND	0.020	"							Ua
Fluoranthene	ND	0.020	"							Ua
Fluorene	ND	0.020	"							Ua
Indeno (1,2,3-cd) pyrene	ND	0.020	"							Ua
Naphthalene	ND	0.002	"							Ua
Phenanthrene	ND	0.020	"							Ua
Pyrene	ND	0.020	"							Ua

Surrogate: Fluorene-d10	190		ug/kg	200		94.5	60-130
Surrogate: Anthracene-d10	200		"	200		99.7	60-130
Surrogate: Pyrene-d10	220		"	200		109	60-130
Surrogate: Benzo (a) pyrene-d12	210		"	200		106	60-130

LCS (B4J2141-BS1)

Prepared: 10/21/2024 Analyzed: 10/23/2024

1-Methylnaphthalene	0.190	0.002	mg/kg	0.200		95.2	70-130
2-Methylnaphthalene	0.191	0.002	"	0.200		95.3	70-130
Acenaphthene	0.188	0.020	"	0.200		94.2	70-130
Anthracene	0.197	0.020	"	0.200		98.4	70-130

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Project: FEO Spicer Annex Confirmation Samples

EPA 8270E (SW846) - Semivolatile Organic Compounds - 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 B4J2141 - EPA 3580

LCS (B4J2141-BS1)

Prepared: 10/21/2024 Analyzed: 10/23/2024

Benzo (a) anthracene	0.194	0.005	mg/kg	0.200		96.9	70-130			
Benzo (a) pyrene	0.200	0.020	"	0.200		100	70-130			
Benzo (b) fluoranthene	0.189	0.020	"	0.200		94.4	70-130			
Benzo (g,h,i) perylene	0.189	0.020	"	0.200		94.4	70-130			
Benzo (k) fluoranthene	0.201	0.020	"	0.200		101	70-130			
Chrysene	0.188	0.020	"	0.200		94.1	70-130			
Dibenz (a,h) anthracene	0.186	0.020	"	0.200		93.1	70-130			
Fluoranthene	0.155	0.020	"	0.200		77.5	70-130			
Fluorene	0.178	0.020	"	0.200		88.8	70-130			
Indeno (1,2,3-cd) pyrene	0.222	0.020	"	0.200		111	70-130			
Naphthalene	0.193	0.002	"	0.200		96.3	70-130			
Phenanthrene	0.194	0.020	"	0.200		97.1	70-130			
Pyrene	0.221	0.020	"	0.200		110	70-130			
Surrogate: Fluorene-d10	190		ug/kg	200		94.4	60-130			
Surrogate: Anthracene-d10	200		"	200		99.4	60-130			
Surrogate: Pyrene-d10	230		"	200		116	60-130			
Surrogate: Benzo (a) pyrene-d12	220		"	200		108	60-130			

Matrix Spike (B4J2141-MS1)

Source: E410404-01

Prepared: 10/21/2024 Analyzed: 10/23/2024

1-Methylnaphthalene	0.227	0.002	mg/kg	0.200	ND	114	70-130			
2-Methylnaphthalene	0.227	0.002	"	0.200	ND	113	70-130			
Acenaphthene	0.223	0.020	"	0.200	ND	111	70-130			
Anthracene	0.229	0.020	"	0.200	ND	114	70-130			
Benzo (a) anthracene	0.231	0.005	"	0.200	ND	116	70-130			
Benzo (a) pyrene	0.232	0.020	"	0.200	0.002	115	70-130			
Benzo (b) fluoranthene	0.223	0.020	"	0.200	ND	112	70-130			
Benzo (g,h,i) perylene	0.213	0.020	"	0.200	0.0003	107	70-130			

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Joel Mason
Project Number: FEO.CO.0701.29
Project: FEO Spicer Annex Confirmation Samples

EPA 8270E (SW846) - Semivolatile Organic Compounds - 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 B4J2141 - EPA 3580

Matrix Spike (B4J2141-MS1)	Source: E410404-01			Prepared: 10/21/2024 Analyzed: 10/23/2024						
Benzo (k) fluoranthene	0.233	0.020	mg/kg	0.200	ND	116	70-130			
Chrysene	0.222	0.020	"	0.200	0.0004	111	70-130			
Dibenz (a,h) anthracene	0.229	0.020	"	0.200	ND	114	70-130			
Fluoranthene	0.224	0.020	"	0.200	ND	112	70-130			
Fluorene	0.222	0.020	"	0.200	0.001	110	70-130			
Indeno (1,2,3-cd) pyrene	0.219	0.020	"	0.200	ND	110	70-130			
Naphthalene	0.226	0.002	"	0.200	ND	113	70-130			
Phenanthrene	0.226	0.020	"	0.200	ND	113	70-130			
Pyrene	0.223	0.020	"	0.200	0.0006	111	70-130			
Surrogate: Fluorene-d10	200		ug/kg	200		98.7	60-130			
Surrogate: Anthracene-d10	200		"	200		98.9	60-130			
Surrogate: Pyrene-d10	200		"	200		99.5	60-130			
Surrogate: Benzo (a) pyrene-d12	200		"	200		101	60-130			

Matrix Spike Dup (B4J2141-MSD1)	Source: E410404-01			Prepared: 10/21/2024 Analyzed: 10/23/2024						
1-Methylnaphthalene	0.219	0.002	mg/kg	0.200	ND	109	70-130	3.86	20	
2-Methylnaphthalene	0.218	0.002	"	0.200	ND	109	70-130	3.86	20	
Acenaphthene	0.214	0.020	"	0.200	ND	107	70-130	3.74	20	
Anthracene	0.220	0.020	"	0.200	ND	110	70-130	3.78	20	
Benzo (a) anthracene	0.216	0.005	"	0.200	ND	108	70-130	6.59	20	
Benzo (a) pyrene	0.218	0.020	"	0.200	0.002	108	70-130	5.93	20	
Benzo (b) fluoranthene	0.223	0.020	"	0.200	ND	112	70-130	0.155	20	
Benzo (g,h,i) perylene	0.211	0.020	"	0.200	0.0003	105	70-130	1.34	20	
Benzo (k) fluoranthene	0.234	0.020	"	0.200	ND	117	70-130	0.437	20	
Chrysene	0.210	0.020	"	0.200	0.0004	105	70-130	5.73	20	
Dibenz (a,h) anthracene	0.221	0.020	"	0.200	ND	110	70-130	3.70	20	
Fluoranthene	0.216	0.020	"	0.200	ND	108	70-130	3.34	20	

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Project: FEO Spicer Annex Confirmation Samples

EPA 8270E (SW846) - Semivolatile Organic Compounds - 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 B4J2141 - EPA 3580

Matrix Spike Dup (B4J2141-MSD1)	Source: E410404-01			Prepared: 10/21/2024 Analyzed: 10/23/2024						
Fluorene	0.212	0.020	mg/kg	0.200	0.001	106	70-130	4.33	20	
Indeno (1,2,3-cd) pyrene	0.217	0.020	"	0.200	ND	108	70-130	1.08	20	
Naphthalene	0.216	0.002	"	0.200	ND	108	70-130	4.75	20	
Phenanthrene	0.217	0.020	"	0.200	ND	109	70-130	3.81	20	
Pyrene	0.213	0.020	"	0.200	0.0006	106	70-130	4.73	20	
Surrogate: Fluorene-d10	200		ug/kg	200		99.0	60-130			
Surrogate: Anthracene-d10	200		"	200		99.0	60-130			
Surrogate: Pyrene-d10	200		"	200		99.0	60-130			
Surrogate: Benzo (a) pyrene-d12	210		"	200		104	60-130			

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 Project Number: FEO.CO.0701.29
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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 B4J1609 - Saturated Paste Metals

Blank (B4J1609-BLK1)

Prepared: 10/16/2024 Analyzed: 10/18/2024

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

Duplicate (B4J1609-DUP1)

Source: E410437-01

Prepared: 10/16/2024 Analyzed: 10/18/2024

SAR	ND	0.0100	SAR	0.732			200
Calcium PPM	3.82	10.0	mg/L	3.63		5.10	50
Magnesium PPM	1.96	10.0	"	1.38		34.7	50
Sodium PPM	6.40	10.0	"	6.46		0.933	50

Batch B4J1618 - DTPA Sorbitol Preparation

Blank (B4J1618-BLK1)

Prepared: 10/16/2024 Analyzed: 10/17/2024

Boron	ND	0.100	mg/L
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Duplicate (B4J1618-DUP1)

Source: E410433-01

Prepared: 10/16/2024 Analyzed: 10/17/2024

Boron	0.143	0.101	mg/L	0.136		5.06	50
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Project Number: FEO.CO.0701.29
Project: FEO Spicer Annex Confirmation Samples

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 B4J1619 - Saturated Paste pH/EC

Blank (B4J1619-BLK1)

Prepared: 10/16/2024 Analyzed: 10/18/2024

Specific Conductance (EC) ND 0.00500 mmhos/cm

Duplicate (B4J1619-DUP1)

Source: E410437-01

Prepared: 10/16/2024 Analyzed: 10/18/2024

Specific Conductance (EC)	0.106	0.00500	mmhos/cm	0.107	0.376	25
pH	7.92		pH Units	7.88	0.506	25

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 Project: FEO Spicer Annex Confirmation Samples

Total Metals 7196A - Quality Control
GEL Laboratories, LLC

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 2689108 - SW846 3060A										
BLANK (1205888911-BLK)					Prepared: 11/05/2024 Analyzed: 11/06/2024					
Hexavalent Chromium	ND	0.376	mg/kg				-			U
LCS (1205888912-BKS)					Prepared: 11/05/2024 Analyzed: 11/06/2024					
Hexavalent Chromium	3.95	0.397	mg/kg	3.97		99.3	80-120			
DUP (1205888913 D)					Source: 690226001 Prepared: 11/05/2024 Analyzed: 11/06/2024					
Hexavalent Chromium	ND	0.244	mg/kg dry		<0.0978		0-50	N/A	50	U
MS (1205888914 S)					Source: 690226001 Prepared: 11/05/2024 Analyzed: 11/06/2024					
Hexavalent Chromium	2.18	0.244	mg/kg dry	2.44	<0.0978	87.3	75-125			
DUP (1205888915 D)					Source: 690226002 Prepared: 11/05/2024 Analyzed: 11/06/2024					
Hexavalent Chromium	ND	0.312	mg/kg dry		<0.125		0-50	N/A	50	U
MS (1205888916 S)					Source: 690226002 Prepared: 11/05/2024 Analyzed: 11/06/2024					
Hexavalent Chromium	2.02	0.312	mg/kg dry	3.12	<0.125	64.6	75-125			
ILCS (1205888917-ILCS)					Prepared: 11/05/2024 Analyzed: 11/06/2024					
Hexavalent Chromium	7.53	0.364	mg/kg	7.33		103	80-120			

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Project: FEO Spicer Annex Confirmation Samples

Notes and Definitions

Ua Sample is Non-Detect.

U Result not detected above the detection limit

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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