



July 11, 2019

Mr. Ryan Warner  
Magpie Operating, Inc.  
2707 South County Road 11  
Loveland, Colorado 80537

**State #1-36**  
**Production Pit Assessment Report**  
**40.714817 / -103.462663**  
**NE¼ NE¼ SEC.36 T9N R55W 6PM**  
**Logan County, Colorado**  
**Facility ID 116333**  
**Remediation # 6103**

Dear Mr. Warner,

Eagle Environmental Consulting, Inc. (EAGLE) is pleased to present the results from the Production Pit Assessment completed at the State #1-36 site (site).

## **1.0 SITE BACKGROUND**

On June 13, 2019, EAGLE completed surficial and subsurface assessment activities on behalf of Magpie Operating, Inc (Magpie) at the site in response to the closure of the production pits (3) onsite. Following backfill of the previous production pit locations, EAGLE collected six (6) soil samples from the former pit locations. Groundwater was not observed during assessment activities.

The following narrative details assessment activities completed at the site.

### **1.1 Site Description**

The State #1-36 site is located within the northeast quarter of the northeast quarter of Section 36, township 9 North, Range 55 West, of the 6<sup>th</sup> Prime Meridian, in Logan County, Colorado. The historical production pits associated with the site were located at latitude: 40.714817 and longitude: -103.462663. A topographic site location map is presented in Figure 1 and an aerial site location map is presented in Figure 2.

### **1.2 Site Geology**

The soil lithology observed at the site consists of dense, gravelly sand from the ground surface to approximately 0.75 feet below ground surface (bgs) underlain by loose, silty sand from approximately 0.75 feet bgs to 5 feet bgs. Groundwater was not observed during assessment activities.

## 2.0 SITE ASSESSMENT ACTIVITIES

On June 13, 2019, utilizing a hand auger, EAGLE collected soil samples adjacent to the former earthen-berm production pits at the site. Upon arrival, EAGLE observed the site had been decommissioned and no facilities were present. EAGLE collected soil samples to determine if adsorbed petroleum hydrocarbon impacts existed above Colorado Oil and Gas Conservation Commission (COGCC) Table 910-1 regulatory limits. Proposed assessment locations (3; one per previous production pit location) were based on historical Google Earth aerial photography and notes provided to EAGLE.

A portion of each soil sample was placed in a sealable plastic bag for volatile organic compound (VOC) headspace analysis utilizing a field-calibrated, photoionization detector (PID). Another portion of the soil sample was placed in a 2-ounce glass jar and packed in an iced cooler. A total of six (6) soil samples (SS-01@0-1', SS-01@4-5', SS-02@0-1', SS-02@4-5', SS-03@0-1', and SS-03@4-5') were submitted to Origins Laboratory, Inc. (Origins) under standard chain of custody procedures.

Soil samples SS-01@4-5', SS-02@4-5', and SS-03@4-5' were analyzed for benzene, toluene, ethylbenzene, total xylenes (BTEX), and total petroleum hydrocarbons – gasoline range organics (TPH-GRO) following EPA Method 8260D, and total petroleum hydrocarbons – diesel range organics (TPH-DRO) following EPA Method 8015D. Soil samples SS-01@0-1', SS-02@0-1', and SS-03@0-1' were analyzed for Sodium Adsorption Ratio (SAR) following United State Department of Agriculture (USDA) Method 20B, Specific Conductance (EC) following USDA Method 3, and pH following Environmental Protection Agency (EPA) Method 9045D. The soil samples were received with the required holding time for each laboratory analysis. Spatial location of each soil sample was recorded using a Trimble GeoXT 6000 series instrument. A site map presented soil sample locations is included in Figure 3.

### 2.1 Soil Analytical Results

Based on laboratory analytical results:

- Soil samples SS-01@4-5', SS-02@4-5', and SS-03@4-5' did not contain concentrations of BTEX, or total petroleum hydrocarbons (TPH) exceeding COGCC Table 910-1 regulatory limits.
- Soil samples SS-01@0-1', SS-02@0-1', and SS-03@0-1' had EC values below the applicable COGCC Table 910-1 regulatory limit.
- Soil sample SS-03@0-1' had a pH value within the applicable COGCC Table 910-1 regulatory limit range.
- Soil samples SS-01@0-1', SS-02@0-1', and SS-03@0-1' had SAR values (34.52, 32.75, and 20.71, respectively) exceeding the COGCC Table 910-1 regulatory limit of 12.
- Soil samples SS-01@0-1' and SS-02@0-1' had pH values (9.61 and 9.42, respectively) outside the COGCC Table 910-1 regulatory limit range of 6 to 9.

Soil analytical results are summarized in Table 1 and presented in Figure 3. The laboratory analytical report is included in Attachment A.

### 3.0 CONCLUSIONS

Based on the information presented in this report, EAGLE concludes the following:

- On June 13, 2019, EAGLE completed surficial and subsurface assessment activities adjacent to the former earthen-berm production pit locations at the site.
- Soil samples SS-01@4-5', SS-02@4-5', and SS-03@4-5' did not contain concentrations of BTEX, or TPH exceeding COGCC Table 910-1 regulatory limits.
- Soil samples SS-01@0-1', SS-02@0-1', and SS-03@0-1' had EC values below the applicable COGCC Table 910-1 regulatory limit.
- Soil sample SS-03@0-1' had a pH value within the applicable COGCC Table 910-1 regulatory limit range.
- Soil samples SS-01@0-1', SS-02@0-1', and SS-03@0-1' had SAR values exceeding the COGCC Table 910-1 regulatory limit of 12.
- Soil samples SS-01@0-1' and SS-02@0-1' had pH values outside the COGCC Table 910-1 regulatory limit range of 6 to 9.

### 4.0 RECOMMENDATIONS

Based on the information presented in this report, EAGLE recommends the following:

- Complete reclamation activities to below the root zone to address soil with elevated pH and SAR values.

EAGLE sincerely appreciates the opportunity to provide our services. If you have any questions or require further information, please contact us at (303) 433-0479.

Sincerely,

***EAGLE ENVIRONMENTAL CONSULTING, INC.***



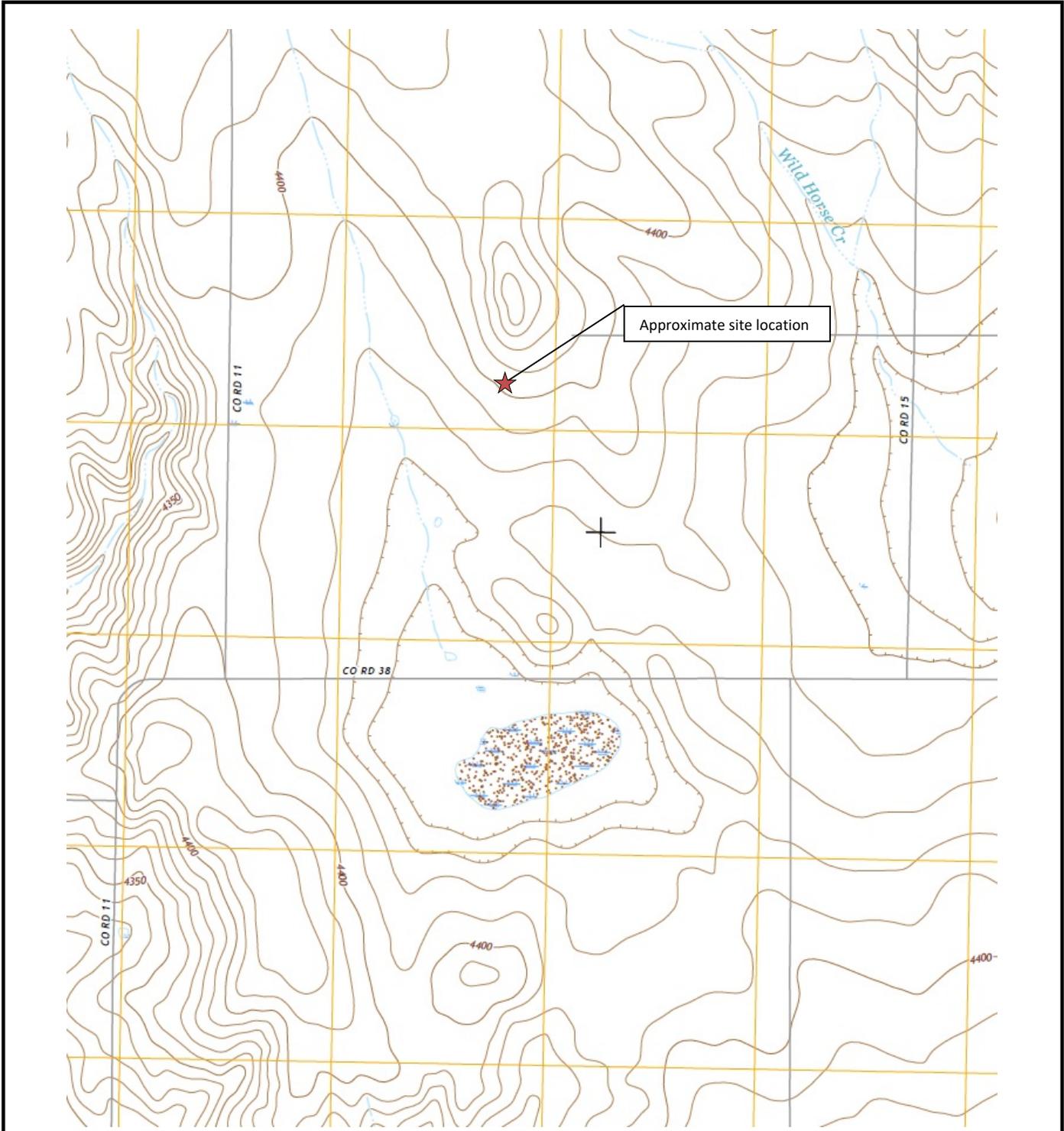
Andrew Newberry  
Project Geologist

## **FIGURES**

**Figure 1: Topographic Site Location Map**

**Figure 2: Aerial Site Location Map**

**Figure 3: Soil Analytical Map**



**Topographic Site Location Map**  
 State #1-36  
 Production Pit Assessment  
 40.714817 / -103.462663  
 NE¼ NE¼ SEC.36 T9N R55W 6PM  
 Logan County, Colorado  
 Facility ID 116333  
 Remediation # 6103



**EAGLE**  
 ENVIRONMENTAL  
 CONSULTING, INC.

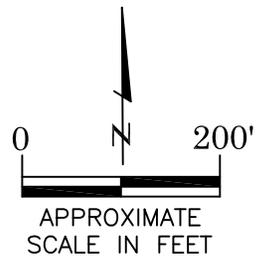
Source: USGS 7.5 Minute Topographic Map, Wild Horse Lake, CO Quadrangle 2016

**Figure 1**



**LEGEND**

-  APPROXIMATE DECOMMISSIONED STATE #1-36 FACILITY LOCATION
  
-  APPROXIMATE LOCATIONS OF PREVIOUS EARTHEN PRODUCTION PITS (3)  
(FACILITY ID 116333)



AERIAL SITE LOCATION MAP  
STATE #1-36  
PRODUCTION PIT ASSESSMENT  
40.714817 / -103.462663  
NE1/4 NE1/4 SEC.36 T9N R55W 6PM  
LOGAN COUNTY, COLORADO  
FACILITY 116333  
REMEDATION # 6103

DATE:	05/29/19
FIG. NO.	2
DRAWN BY:	amn



**EAGLE**  
ENVIRONMENTAL  
CONSULTING, INC.  
4101 INCA STREET, DENVER, CO 80211  
Ph: 303-433-0479 • F: 303-325-5449

SS-01@0-1'	SS-01@4-5'
06/13/19	06/13/19
0-1'	4-5'
B = NA	B = <0.0500
T = NA	T = <0.0500
E = NA	E = <0.0500
X = NA	X = <0.0500
G = NA	G = <5.00
D = NA	D = <50.0
EC = 0.873	EC = NA
SAR= <b>34.52</b>	SAR= NA
pH = <b>9.61</b>	pH = NA

SS-01  
PIT #1 (40.716375 / -103.461063)

SS-02  
PIT #2 (40.716230 / -103.461172)

SS-03  
PIT #3 (40.716054 / -103.461320)

SS-02@0-1'	SS-02@4-5'
06/13/19	06/13/19
0-1'	4-5'
B = NA	B = <0.0500
T = NA	T = <0.0500
E = NA	E = <0.0500
X = NA	X = <0.0500
G = NA	G = <5.00
D = NA	D = <50.0
EC = 0.793	EC = NA
SAR= <b>32.75</b>	SAR= NA
pH = <b>9.42</b>	pH = NA

SS-03@0-1'	SS-03@4-5'
06/13/19	06/13/19
0-1'	4-5'
B = NA	B = <0.0500
T = NA	T = <0.0500
E = NA	E = <0.0500
X = NA	X = <0.0500
G = NA	G = <5.00
D = NA	D = <50.0
EC = 0.349	EC = NA
SAR= <b>20.71</b>	SAR= NA
pH = 8.92	pH = NA

NOTE: ALL FACILITIES HAVE BEEN REMOVED. ASSESSMENT LOCATIONS BASED ON HISTORICAL AERIAL PHOTOGRAPHY (GOOGLE EARTH) & NOTES PROVIDED TO EAGLE ENVIRONMENTAL CONSULTING, INC.

**LEGEND**

- HISTORICAL EARTHEN PRODUCTION PIT LOCATIONS
- PIT #1 (40.716375 / -103.461063)
- PIT #2 (40.716230 / -103.461172)
- PIT #3 (40.716054 / -103.461320)
- APPROXIMATE SOIL SAMPLE LOCATIONS

**PARAMETERS**

SOIL SAMPLE LOCATION
DATE
DEPTH (FEET)
B = BENZENE (mg/kg)
T = TOLUENE (mg/kg)
E = ETHYLBENZENE (mg/kg)
X = TOTAL XYLENES (mg/kg)
G = TPH-GRO (mg/kg)
D = TPH-DRO (mg/kg)
EC = SPECIFIC CONDUCTANCE (mmhos/cm)
SAR= SODIUM ADSORPTION RATIO
pH = pH (PH UNITS)

mg/kg = MILLIGRAMS PER KILOGRAM

mmhos/cm = MILLIMHOS PER CENTIMETER

TPH-GRO = TOTAL PETROLEUM HYDROCARBONS - GASOLINE RANGE ORGANICS

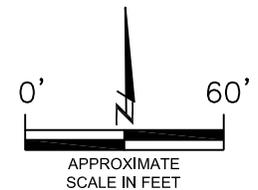
TPH-DRO = TOTAL PETROLEUM HYDROCARBONS - DIESEL RANGE ORGANICS

NA = NOT ANALYZED

NOTE: VALUES PRESENTED WITH A LESS THAN SYMBOL (<) DID NOT CONTAIN CONCENTRATIONS AT OR ABOVE LABORATORY DETECTION LIMITS

VALUES PRESENTED IN **BOLD** TYPEFACE CONTAIN CONCENTRATIONS EXCEEDING COGCC TABLE 910-1 REGULATORY LIMITS FOR THAT COMPOUND

COGCC - COLORADO OIL AND GAS CONSERVATION COMMISSION



SOIL ANALYTICAL MAP  
STATE #1-36  
PRODUCTION PIT ASSESSMENT  
40.714817 / -103.462663  
NE1/4 NE1/4 SEC.36 T9N R55W 6PM  
LOGAN COUNTY, COLORADO  
FACILITY ID 116333  
REMEDATION # 6103

DATE:  
07/08/19

DRAWN BY:  
amn

FIG. NO. 3



**EAGLE ENVIRONMENTAL CONSULTING, INC.**  
4101 INCA STREET, DENVER, CO 80211  
Ph: 303-433-0479 • F: 303-325-5449

## **TABLES**

**Table 1: Soil Analytical Results Summary**

**TABLE 1**  
**SOIL ANALYTICAL RESULTS SUMMARY**  
**STATE #1-36**  
**PRODUCTION PIT ASSESSMENT**  
**40.714817 / -103.462663**  
**NE1/4 NE1/4 SEC.36 T9N R55W 6PM**  
**LOGAN COUNTY, COLORADO**  
**FACILITY ID 116333**  
**REMEDIATION # 6103**

Sample Location (Latitude/Longitude)	Date	Approximate Depth (feet)	Benzene (mg/kg)	Toluene (mg/kg)	Ethylbenzene (mg/kg)	Total Xylenes (mg/kg)	TPH-GRO (mg/kg)	TPH-DRO (mg/kg)	Specific Conductance (mmhos/cm)	pH (pH units)	SAR
<b>COGCC Table 910-1 Regulatory Limits (mg/kg)</b>			<b>0.17</b>	<b>85</b>	<b>100</b>	<b>175</b>	<b>500</b>		<b>&lt;4</b>	<b>6 to 9</b>	<b>&lt;12</b>
SS-01 @ 0-1' (40.716375 / -103.461063)	06/13/19	0-1	NA	NA	NA	NA	NA	NA	0.873	<b>9.61</b>	<b>34.52</b>
SS-01 @ 4-5' (40.716375 / -103.461063)	06/13/19	4-5.0	<0.0500	<0.0500	<0.0500	<0.0500	<5.00	<50.0	NA	NA	NA
SS-02 @ 0-1' (40.716230 / -103.461172)	06/13/19	0-1	NA	NA	NA	NA	NA	NA	0.793	<b>9.42</b>	<b>32.75</b>
SS-02 @ 4-5' (40.716230 / -103.461172)	06/13/19	4-5.0	<0.0500	<0.0500	<0.0500	<0.0500	<5.00	<50.0	NA	NA	NA
SS-03 @ 0-1' (40.716054 / -103.461320)	06/13/19	0-1	NA	NA	NA	NA	NA	NA	0.349	8.92	<b>20.71</b>
SS-03 @ 4-5' (40.716054 / -103.461320)	06/13/19	4-5.0	<0.0500	<0.0500	<0.0500	<0.0500	<5.00	<50.0	NA	NA	NA

COGCC = Colorado Oil and Gas Conservation Commission

mg/kg = milligrams per kilogram

mmhos/cm = millimhos per centimeter

NA = Not Analyzed

TPH-GRO = Total Petroleum Hydrocarbons - Gasoline Range Organics

TPH-DRO = Total Petroleum Hydrocarbons - Diesel Range Organics

SAR = Sodium Adsorption Ratio

Note: Values presented with a less than symbol (<) indicate concentrations were not observed at or above the laboratory reporting limit.

Values presented in **bold** typeface exceed the COGCC Table 910-1 regulatory limits for that compound.



# **ATTACHMENT A**

## **Laboratory Analytical Report**



June 19, 2019

Eagle Environmental Consulting, Inc.

Martin C Eckert III

4101 Inca Street

Denver

CO 80211

**Project Name - Magpie - State #1-36**

**Project Number - [none]**

Attached are your analytical results for Magpie - State #1-36 received by Origins Laboratory, Inc. June 13, 2019. This project is associated with Origins project number Y906260-01.

The analytical results in the following report were analyzed under the guidelines of EPA Methods. These methods are identified as follows; "SW" are defined in SW-846, "EPA" are defined in 40CFR part 136 and "SM" are defined in the most current revision of Standard Methods For the Examination of Water and Wastewater.

The analytical results apply specifically to the samples and analyses specified per the attached Chain of Custody. As such, this report shall not be reproduced except in full, without the written approval of Origin's laboratory.

Unless otherwise noted, the analytical results for all soil samples are reported on a wet weight basis. All analytical analyses were performed under NELAP guidelines unless noted by a data qualifier.

Any holding time exceedances, deviations from the method specifications or deviations from Origins Laboratory's Standard Operating Procedures are outlined in the case narrative.

Thank you for selecting Origins for your analytical needs. Please contact us with any questions concerning this report, or if we can help with anything at all.

Origins Laboratory, Inc.  
303.433.1322  
o-squad@oelabinc.com



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

Eagle Environmental Consulting, Inc.  
4101 Inca Street  
Denver CO 80211

Martin C Eckert III  
Project Number: [none]  
Project: Magpie - State #1-36

CROSS REFERENCE REPORT

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
SS-01@0-1'	Y906260-01	Soil	June 13, 2019 12:00	06/13/2019 15:15
SS-01@4-5'	Y906260-02	Soil	June 13, 2019 12:10	06/13/2019 15:15
SS-02@0-1'	Y906260-03	Soil	June 13, 2019 12:12	06/13/2019 15:15
SS-02@4-5'	Y906260-04	Soil	June 13, 2019 12:17	06/13/2019 15:15
SS-03@0-1'	Y906260-05	Soil	June 13, 2019 12:20	06/13/2019 15:15
SS-03@4-5'	Y906260-06	Soil	June 13, 2019 12:30	06/13/2019 15:15

Origins Laboratory, Inc.



*The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.*



Eagle Environmental Consulting, Inc.  
 4101 Inca Street  
 Denver CO 80211

Martin C Eckert III  
 Project Number: [none]  
 Project: Magpie - State #1-36

Origins Laboratory

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

Sample Receipt Checklist

Origins Work Order: Y906260

Client: Eagle  
 Client Project ID: State 1-36

Checklist Completed by: JG  
 Date/time completed: 6/14/2019

Shipped Via: HD  
 (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 / 30 °C \_\_\_\_\_ / \_\_\_\_\_ °C \_\_\_\_\_ / \_\_\_\_\_ °C (Describe) \_\_\_\_\_ °C

Thermometer ID: T003

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 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 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) [Signature]

Date/Time Reviewed 6/17/19

Origins Laboratory, Inc.

Jefe Pellegrini

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Eagle Environmental Consulting, Inc.  
 4101 Inca Street  
 Denver CO 80211

Martin C Eckert III  
 Project Number: [none]  
 Project: Magpie - State #1-36

**SS-01@0-1'**

**6/13/2019 12:00:00PM**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Analyst	Prepared	Analyzed	Notes
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**AAL, Inc.**  
**Y906260-01 (Soil)**

**Metals (Saturated Paste Prep)**

Calcium	1.23		me/L	1	'[none]'		06/17/2019	06/19/2019	
Magnesium	0.55		"	"	"		"	"	
Sodium	32.57		"	"	"		"	"	

**pH in Soil by EPA 9045D**

pH	9.61		pH Units	1	B9F1405	OLAB	06/14/2019	06/14/2019	
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**SAR by 20B Saturated Paste**

SAR	34.52			1	'[none]'		06/17/2019	06/19/2019	
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**Specific Conductance by Modified 9050A**

Specific Conductance (EC)	0.873	0.00500	mmhos/cm	1	B9F1406	OLAB	06/14/2019	06/14/2019	
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Origins Laboratory, Inc.



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Eagle Environmental Consulting, Inc.  
 4101 Inca Street  
 Denver CO 80211

Martin C Eckert III  
 Project Number: [none]  
 Project: Magpie - State #1-36

SS-01@4-5'

6/13/2019 12:10:00PM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Analyst	Prepared	Analyzed	Notes
---------	--------	-----------------	-------	----------	-------	---------	----------	----------	-------

**Origins Laboratory, Inc.**  
 Y906260-02 (Soil)

**BTEX/TVPH by EPA 8260D**

Benzene	ND	0.0500	mg/kg	25	B9F1401	KDK	06/14/2019	06/14/2019	U
Toluene	ND	0.0500	"	"	"	KDK	"	"	U
Ethylbenzene	ND	0.0500	"	"	"	KDK	"	"	U
Xylenes, total	ND	0.0500	"	"	"	KDK	"	"	U
Gasoline Range Hydrocarbons	ND	5.00	"	"	"	KDK	"	"	U

Surrogate: 1,2-Dichloroethane-d4	108 %	70-130			"	"	"	"	
Surrogate: Toluene-d8	103 %	70-130			"	"	"	"	
Surrogate: 4-Bromofluorobenzene	93.9 %	70-130			"	"	"	"	

**Diesel Range Organics (DRO/TEPH) by EPA 8015D**

Diesel (C10-C28)	ND	50.0	mg/kg	1	B9F1402	JTD	06/14/2019	06/15/2019	U
Surrogate: o-Terphenyl	90.8 %	50-150			"	"	"	"	

Origins Laboratory, Inc.



The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Eagle Environmental Consulting, Inc.  
 4101 Inca Street  
 Denver CO 80211

Martin C Eckert III  
 Project Number: [none]  
 Project: Magpie - State #1-36

**SS-02@0-1'**

**6/13/2019 12:12:00PM**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Analyst	Prepared	Analyzed	Notes
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**AAL, Inc.**  
**Y906260-03 (Soil)**

**Metals (Saturated Paste Prep)**

Calcium	1.61		me/L	1	'[none]'		06/17/2019	06/19/2019	
Magnesium	0.84		"	"	"		"	"	
Sodium	36.25		"	"	"		"	"	

**pH in Soil by EPA 9045D**

pH	9.42		pH Units	1	B9F1405	OLAB	06/14/2019	06/14/2019	
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**SAR by 20B Saturated Paste**

SAR	32.75			1	'[none]'		06/17/2019	06/19/2019	
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**Specific Conductance by Modified 9050A**

Specific Conductance (EC)	0.793	0.00503	mmhos/cm	1	B9F1406	OLAB	06/14/2019	06/14/2019	
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Origins Laboratory, Inc.



*The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.*

Eagle Environmental Consulting, Inc.  
 4101 Inca Street  
 Denver CO 80211

Martin C Eckert III  
 Project Number: [none]  
 Project: Magpie - State #1-36

SS-02@4-5'

6/13/2019 12:17:00PM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Analyst	Prepared	Analyzed	Notes
---------	--------	-----------------	-------	----------	-------	---------	----------	----------	-------

**Origins Laboratory, Inc.**  
 Y906260-04 (Soil)

**BTEX/TVPH by EPA 8260D**

Benzene	ND	0.0500	mg/kg	25	B9F1401	KDK	06/14/2019	06/14/2019	U
Toluene	ND	0.0500	"	"	"	KDK	"	"	U
Ethylbenzene	ND	0.0500	"	"	"	KDK	"	"	U
Xylenes, total	ND	0.0500	"	"	"	KDK	"	"	U
Gasoline Range Hydrocarbons	ND	5.00	"	"	"	KDK	"	"	U

Surrogate: 1,2-Dichloroethane-d4	109 %	70-130			"	"	"	"	
Surrogate: Toluene-d8	101 %	70-130			"	"	"	"	
Surrogate: 4-Bromofluorobenzene	92.8 %	70-130			"	"	"	"	

**Diesel Range Organics (DRO/TEPH) by EPA 8015D**

Diesel (C10-C28)	ND	50.0	mg/kg	1	B9F1402	JTD	06/14/2019	06/15/2019	U
Surrogate: o-Terphenyl	88.3 %	50-150			"	"	"	"	

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Eagle Environmental Consulting, Inc.  
4101 Inca Street  
Denver CO 80211

Martin C Eckert III  
Project Number: [none]  
Project: Magpie - State #1-36

**SS-03@0-1'**

**6/13/2019 12:20:00PM**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Analyst	Prepared	Analyzed	Notes
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**AAL, Inc.**  
**Y906260-05 (Soil)**

**Metals (Saturated Paste Prep)**

Calcium	4.09		me/L	1	'[none]'		06/17/2019	06/19/2019	
Magnesium	1.55		"	"	"		"	"	
Sodium	34.78		"	"	"		"	"	

**pH in Soil by EPA 9045D**

pH	8.92		pH Units	1	B9F1405	OLAB	06/14/2019	06/14/2019	
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**SAR by 20B Saturated Paste**

SAR	20.71			1	'[none]'		06/17/2019	06/19/2019	
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**Specific Conductance by Modified 9050A**

Specific Conductance (EC)	0.349	0.00500	mmhos/cm	1	B9F1406	OLAB	06/14/2019	06/14/2019	
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Eagle Environmental Consulting, Inc.  
 4101 Inca Street  
 Denver CO 80211

Martin C Eckert III  
 Project Number: [none]  
 Project: Magpie - State #1-36

SS-03@4-5'

6/13/2019 12:30:00PM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Analyst	Prepared	Analyzed	Notes
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**Origins Laboratory, Inc.**  
 Y906260-06 (Soil)

**BTEX/TVPH by EPA 8260D**

Benzene	ND	0.0500	mg/kg	25	B9F1401	KDK	06/14/2019	06/14/2019	U
Toluene	ND	0.0500	"	"	"	KDK	"	"	U
Ethylbenzene	ND	0.0500	"	"	"	KDK	"	"	U
Xylenes, total	ND	0.0500	"	"	"	KDK	"	"	U
Gasoline Range Hydrocarbons	ND	5.00	"	"	"	KDK	"	"	U

Surrogate: 1,2-Dichloroethane-d4	108 %	70-130			"	"	"	"	
Surrogate: Toluene-d8	102 %	70-130			"	"	"	"	
Surrogate: 4-Bromofluorobenzene	94.3 %	70-130			"	"	"	"	

**Diesel Range Organics (DRO/TEPH) by EPA 8015D**

Diesel (C10-C28)	ND	50.0	mg/kg	1	B9F1402	JTD	06/14/2019	06/15/2019	U
Surrogate: o-Terphenyl	84.0 %	50-150			"	"	"	"	

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Martin C Eckert III  
 Project Number: [none]  
 Project: Magpie - State #1-36

**Volatile Organic Compounds by GC/MS SW846 8260D - Quality Control**  
**Origins Laboratory, Inc.**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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**Batch B9F1401 - EPA 5030 (soil)**

**Blank (B9F1401-BLK1)**

Prepared: 06/14/2019 Analyzed: 06/14/2019

Benzene	ND	0.00200	mg/kg							U
Toluene	ND	0.00200	"							U
Ethylbenzene	ND	0.00200	"							U
Xylenes, total	ND	0.00200	"							U
Gasoline Range Hydrocarbons	ND	0.200	"							U
<i>Surrogate: 1,2-Dichloroethane-d4</i>	<i>0.14</i>		<i>"</i>	<i>0.125</i>		<i>109</i>	<i>70-130</i>			
<i>Surrogate: Toluene-d8</i>	<i>0.12</i>		<i>"</i>	<i>0.125</i>		<i>98.4</i>	<i>70-130</i>			
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>0.12</i>		<i>"</i>	<i>0.125</i>		<i>95.8</i>	<i>70-130</i>			

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 Denver CO 80211

Martin C Eckert III  
 Project Number: [none]  
 Project: Magpie - State #1-36

**Volatile Organic Compounds by GC/MS SW846 8260D - Quality Control**  
**Origins Laboratory, Inc.**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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**Batch B9F1401 - EPA 5030 (soil)**

**Blank (B9F1401-BLK2)**

Prepared: 06/14/2019 Analyzed: 06/14/2019

Benzene	ND	0.00200	mg/kg							U
Toluene	ND	0.00200	"							U
Ethylbenzene	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		106	70-130			
Surrogate: Toluene-d8	0.12		"	0.125		94.4	70-130			
Surrogate: 4-Bromofluorobenzene	0.12		"	0.125		93.8	70-130			

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 Denver CO 80211

Martin C Eckert III  
 Project Number: [none]  
 Project: Magpie - State #1-36

**Volatile Organic Compounds by GC/MS SW846 8260D - Quality Control**  
**Origins Laboratory, Inc.**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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**Batch B9F1401 - EPA 5030 (soil)**

**LCS (B9F1401-BS1)**

Prepared: 06/14/2019 Analyzed: 06/14/2019

Benzene	0.103	0.00200	mg/kg	0.100		103	70-130			
Toluene	0.0985	0.00200	"	0.100		98.5	70-130			
Ethylbenzene	0.101	0.00200	"	0.100		101	70-130			
m,p-Xylene	0.203	0.00400	"	0.200		101	70-130			
o-Xylene	0.101	0.00200	"	0.100		101	70-130			
Surrogate: 1,2-Dichloroethane-d4	0.13		"	0.125		104	70-130			
Surrogate: Toluene-d8	0.12		"	0.125		97.7	70-130			
Surrogate: 4-Bromofluorobenzene	0.12		"	0.125		97.0	70-130			

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 Denver CO 80211

Martin C Eckert III  
 Project Number: [none]  
 Project: Magpie - State #1-36

**Volatile Organic Compounds by GC/MS SW846 8260D - Quality Control**  
**Origins Laboratory, Inc.**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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**Batch B9F1401 - EPA 5030 (soil)**

**LCS (B9F1401-BS2)**

Prepared: 06/14/2019 Analyzed: 06/14/2019

Benzene	0.0987	0.00200	mg/kg	0.100		98.7	70-130			
Toluene	0.0954	0.00200	"	0.100		95.4	70-130			
Ethylbenzene	0.0982	0.00200	"	0.100		98.2	70-130			
m,p-Xylene	0.199	0.00400	"	0.200		99.6	70-130			
o-Xylene	0.0992	0.00200	"	0.100		99.2	70-130			
Surrogate: 1,2-Dichloroethane-d4	0.13		"	0.125		103	70-130			
Surrogate: Toluene-d8	0.12		"	0.125		98.3	70-130			
Surrogate: 4-Bromofluorobenzene	0.12		"	0.125		95.3	70-130			

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 Denver CO 80211

Martin C Eckert III  
 Project Number: [none]  
 Project: Magpie - State #1-36

**Volatile Organic Compounds by GC/MS SW846 8260D - Quality Control**  
**Origins Laboratory, Inc.**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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**Batch B9F1401 - EPA 5030 (soil)**

<b>Matrix Spike (B9F1401-MS1)</b>	<b>Source: Y906247-03</b>			<b>Prepared: 06/14/2019 Analyzed: 06/14/2019</b>						
Benzene	0.102	0.00200	mg/kg	0.100	ND	102	70-130			
Toluene	0.0952	0.00200	"	0.100	ND	95.2	70-130			
Ethylbenzene	0.0999	0.00200	"	0.100	ND	99.9	70-130			
m,p-Xylene	0.201	0.00400	"	0.200	0.00550	97.7	70-130			
o-Xylene	0.0999	0.00200	"	0.100	ND	99.9	70-130			
Surrogate: 1,2-Dichloroethane-d4	0.13		"	0.125		104	70-130			
Surrogate: Toluene-d8	0.12		"	0.125		96.4	70-130			
Surrogate: 4-Bromofluorobenzene	0.12		"	0.125		95.1	70-130			

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Martin C Eckert III  
 Project Number: [none]  
 Project: Magpie - State #1-36

**Volatile Organic Compounds by GC/MS SW846 8260D - Quality Control**  
**Origins Laboratory, Inc.**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch B9F1401 - EPA 5030 (soil)

Matrix Spike (B9F1401-MS2)	Source: Y906247-04			Prepared: 06/14/2019 Analyzed: 06/14/2019						
Benzene	0.102	0.00200	mg/kg	0.100	ND	102	70-130			
Toluene	0.0984	0.00200	"	0.100	ND	98.4	70-130			
Ethylbenzene	0.101	0.00200	"	0.100	ND	101	70-130			
m,p-Xylene	0.200	0.00400	"	0.200	ND	99.9	70-130			
o-Xylene	0.100	0.00200	"	0.100	ND	100	70-130			
Surrogate: 1,2-Dichloroethane-d4	0.13		"	0.125		103	70-130			
Surrogate: Toluene-d8	0.12		"	0.125		97.6	70-130			
Surrogate: 4-Bromofluorobenzene	0.12		"	0.125		96.3	70-130			

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Martin C Eckert III  
 Project Number: [none]  
 Project: Magpie - State #1-36

**Volatile Organic Compounds by GC/MS SW846 8260D - Quality Control**  
**Origins Laboratory, Inc.**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch B9F1401 - EPA 5030 (soil)

Matrix Spike Dup (B9F1401-MSD1)	Source: Y906247-03			Prepared: 06/14/2019 Analyzed: 06/14/2019						
Benzene	0.0957	0.00200	mg/kg	0.100	ND	95.7	70-130	6.86	20	
Toluene	0.0916	0.00200	"	0.100	ND	91.6	70-130	3.79	20	
Ethylbenzene	0.0939	0.00200	"	0.100	ND	93.9	70-130	6.25	20	
m,p-Xylene	0.189	0.00400	"	0.200	0.00550	91.5	70-130	6.31	20	
o-Xylene	0.0952	0.00200	"	0.100	ND	95.2	70-130	4.82	20	
Surrogate: 1,2-Dichloroethane-d4	0.13		"	0.125		104	70-130			
Surrogate: Toluene-d8	0.12		"	0.125		96.6	70-130			
Surrogate: 4-Bromofluorobenzene	0.12		"	0.125		96.3	70-130			

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 Denver CO 80211

Martin C Eckert III  
 Project Number: [none]  
 Project: Magpie - State #1-36

**Volatile Organic Compounds by GC/MS SW846 8260D - Quality Control**  
**Origins Laboratory, Inc.**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch B9F1401 - EPA 5030 (soil)

Matrix Spike Dup (B9F1401-MSD2)	Source: Y906247-04			Prepared: 06/14/2019 Analyzed: 06/14/2019						
Benzene	0.0963	0.00200	mg/kg	0.100	ND	96.3	70-130	5.82	20	
Toluene	0.0924	0.00200	"	0.100	ND	92.4	70-130	6.27	20	
Ethylbenzene	0.0950	0.00200	"	0.100	ND	95.0	70-130	6.08	20	
m,p-Xylene	0.191	0.00400	"	0.200	ND	95.6	70-130	4.35	20	
o-Xylene	0.0964	0.00200	"	0.100	ND	96.4	70-130	4.19	20	
Surrogate: 1,2-Dichloroethane-d4	0.13		"	0.125		104	70-130			
Surrogate: Toluene-d8	0.12		"	0.125		97.8	70-130			
Surrogate: 4-Bromofluorobenzene	0.12		"	0.125		95.2	70-130			

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 Denver CO 80211

Martin C Eckert III  
 Project Number: [none]  
 Project: Magpie - State #1-36

**Volatile Organic Compounds by GC/MS SW846 8260D - Quality Control**  
**Origins Laboratory, Inc.**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
<b>Batch B9F1402 - EPA 3550B</b>										
<b>Blank (B9F1402-BLK1)</b>										
					Prepared: 06/14/2019 Analyzed: 06/14/2019					
Diesel (C10-C28)	ND	50.0	mg/kg							U
Surrogate: o-Terphenyl	38		"	50.0		75.9	50-150			

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Martin C Eckert III  
 Project Number: [none]  
 Project: Magpie - State #1-36

**Extractable Petroleum Hydrocarbons by 8015D - Quality Control**  
**Origins Laboratory, Inc.**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
<b>Batch B9F1402 - EPA 3550B</b>										
<b>Blank (B9F1402-BLK2)</b>					Prepared: 06/14/2019 Analyzed: 06/14/2019					
Diesel (C10-C28)	ND	50.0	mg/kg							U
Surrogate: o-Terphenyl	36		"	50.0		72.4	50-150			

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 Denver CO 80211

Martin C Eckert III  
 Project Number: [none]  
 Project: Magpie - State #1-36

**Extractable Petroleum Hydrocarbons by 8015D - Quality Control**  
**Origins Laboratory, Inc.**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
<b>Batch B9F1402 - EPA 3550B</b>										
<b>LCS (B9F1402-BS1)</b>					Prepared: 06/14/2019 Analyzed: 06/14/2019					
Diesel (C10-C28)	989	50.0	mg/kg	1000		98.9	70-130			
Surrogate: o-Terphenyl	48		"	50.0		96.6	50-150			

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 Denver CO 80211

Martin C Eckert III  
 Project Number: [none]  
 Project: Magpie - State #1-36

**Extractable Petroleum Hydrocarbons by 8015D - Quality Control**  
**Origins Laboratory, Inc.**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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**Batch B9F1402 - EPA 3550B**

**LCS (B9F1402-BS2)**

Prepared: 06/14/2019 Analyzed: 06/14/2019

Diesel (C10-C28)	953	50.0	mg/kg	1000		95.3	70-130			
Surrogate: o-Terphenyl	39		"	50.0		78.2	50-150			

Origins Laboratory, Inc.



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Martin C Eckert III  
 Project Number: [none]  
 Project: Magpie - State #1-36

**Extractable Petroleum Hydrocarbons by 8015D - Quality Control**  
**Origins Laboratory, Inc.**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
<b>Batch B9F1402 - EPA 3550B</b>										
<b>Matrix Spike (B9F1402-MS1)</b>		<b>Source: Y906247-03</b>			Prepared: 06/14/2019 Analyzed: 06/14/2019					
Diesel (C10-C28)	966	50.0	mg/kg	1000	ND	96.6	70-130			
Surrogate: o-Terphenyl	48		"	50.0		95.9	50-150			

Origins Laboratory, Inc.



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Martin C Eckert III  
 Project Number: [none]  
 Project: Magpie - State #1-36

**Extractable Petroleum Hydrocarbons by 8015D - Quality Control**  
**Origins Laboratory, Inc.**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
<b>Batch B9F1402 - EPA 3550B</b>										
<b>Matrix Spike (B9F1402-MS2)</b>		<b>Source: Y906247-04</b>			Prepared: 06/14/2019 Analyzed: 06/14/2019					
Diesel (C10-C28)	904	50.0	mg/kg	1000	ND	90.4	70-130			
Surrogate: o-Terphenyl	44		"	50.0		88.4	50-150			

Origins Laboratory, Inc.



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Eagle Environmental Consulting, Inc.  
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Martin C Eckert III  
 Project Number: [none]  
 Project: Magpie - State #1-36

**Extractable Petroleum Hydrocarbons by 8015D - Quality Control**  
**Origins Laboratory, Inc.**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
<b>Batch B9F1402 - EPA 3550B</b>										
<b>Matrix Spike Dup (B9F1402-MSD1)</b>		<b>Source: Y906247-03</b>			Prepared: 06/14/2019 Analyzed: 06/14/2019					
Diesel (C10-C28)	923	50.0	mg/kg	1000	ND	92.3	70-130	4.48	35	
Surrogate: o-Terphenyl	45		"	50.0		90.0	50-150			

Origins Laboratory, Inc.



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 Denver CO 80211

Martin C Eckert III  
 Project Number: [none]  
 Project: Magpie - State #1-36

**Extractable Petroleum Hydrocarbons by 8015D - Quality Control**  
**Origins Laboratory, Inc.**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
<b>Batch B9F1402 - EPA 3550B</b>										
<b>Matrix Spike Dup (B9F1402-MSD2)</b>		<b>Source: Y906247-04</b>								Prepared: 06/14/2019 Analyzed: 06/14/2019
Diesel (C10-C28)	952	50.0	mg/kg	1000	ND	95.2	70-130	5.19	35	
Surrogate: o-Terphenyl	46		"	50.0		92.7	50-150			

Origins Laboratory, Inc.



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Eagle Environmental Consulting, Inc.  
 4101 Inca Street  
 Denver CO 80211

Martin C Eckert III  
 Project Number: [none]  
 Project: Magpie - State #1-36

**Extractable Petroleum Hydrocarbons by 8015D - Quality Control**  
**Origins Laboratory, Inc.**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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**Classical Chemistry Parameters - Quality Control**  
**Origins Laboratory, Inc.**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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**Batch B9F1405 - NO PREP**

**Duplicate (B9F1405-DUP1)**

**Source: Y906252-12**

Prepared: 06/14/2019 Analyzed: 06/14/2019

pH	7.49		pH Units		7.49			0.00	25	
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**Batch B9F1406 - NO PREP**

**Blank (B9F1406-BLK1)**

Prepared: 06/14/2019 Analyzed: 06/14/2019

Specific Conductance (EC)	0.00300	0.00500	mmhos/cm							
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**Duplicate (B9F1406-DUP1)**

**Source: Y906252-12**

Prepared: 06/14/2019 Analyzed: 06/14/2019

Specific Conductance (EC)	0.180	0.00500	mmhos/cm		0.180			0.0555	25	
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Origins Laboratory, Inc.



*The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.*

Eagle Environmental Consulting, Inc.  
4101 Inca Street  
Denver CO 80211

Martin C Eckert III  
Project Number: [none]  
Project: Magpie - State #1-36

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**Notes and Definitions**

U Sample is Non-Detect.

ND Analyte NOT DETECTED at or above the reporting limit

RPD Relative Percent Difference

All soil results are reported at a wet weight basis.

Origins Laboratory, Inc.



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Jen Pellegrini For Noelle Doyle Mathis, President