

## **ANALYTICAL TABLE**

**TABLE 1**  
**UPRR 43 PAN AM O#2**  
**SOIL SAMPLE RESULTS SUMMARY TABLE**  
**KERR-McGEE OIL AND GAS ONSHORE LP**

Sample ID	Date Sampled	Depth (feet bgs)	Benzene (mg/kg)	Toluene (mg/kg)	Ethylbenzene (mg/kg)	Total Xylenes (mg/kg)	TVPH - GRO (mg/kg)	TEPH - DRO (mg/kg)	TEPH - ORO (mg/kg)	pH (units)	EC (mmhos/cm)
COGCC standards for soil (mg/kg) <sup>(1)</sup>			0.17	85	100	175	500			6 - 9	4.0
B01 @ 5'	3/24/2015	5	<0.002	<0.002	<0.002	<0.002	<0.200	<50	<200	7.71	1.00
B02 @ 5'	3/24/2015	5	<0.002	<0.002	<0.002	<0.002	<0.200	<50	<200	8.43	0.436
E01 @ 4'	3/24/2015	4	<0.002	<0.002	<0.002	<0.002	1.13	<50	<200	8.11	0.542
E02 @ 4'	3/24/2015	4	<0.050	<0.050	0.050	0.184	<b>303</b>	<b>660</b>	<200	<b>9.57*</b>	0.223
W01 @ 4'	3/24/2015	4	<0.002	<0.002	<0.002	<0.002	<0.200	<50	<200	8.28	0.276
W02 @ 4'	3/24/2015	4	<0.002	<0.002	<0.002	<0.002	<0.200	<50	<200	8.11	0.604
N01 @ 4'	3/24/2015	4	<0.002	<0.002	<0.002	<0.002	<0.200	<50	<200	8.57	0.223
S01 @ 4'	3/24/2015	4	<0.002	<0.002	<0.002	<0.002	<0.200	<50	<200	8.49	0.620
S02 @ 4'	3/24/2015	4	<0.002	<0.002	<0.002	<0.002	<0.200	<50	<200	<b>9.04*</b>	0.429
W03 @ 4'	3/27/2015	4	<0.002	<0.002	<0.002	<0.002	<0.200	<50	<200	8.37	0.496
B03 @ 5'	3/27/2015	5	<0.002	<0.002	<0.002	<0.002	<0.200	<50	<200	<b>9.03*</b>	0.403
E03 @ 4'	3/27/2015	4	<0.002	<0.002	<0.002	<0.002	<0.200	<50	<200	8.19	0.519
E02-R @ 4'	3/27/2015	4	<0.050	<0.050	0.068	0.127	<b>112</b>	<b>1,000</b>	<b>340</b>	<b>9.14*</b>	0.235
E01-R @ 4'	3/27/2015	4	<0.002	<0.002	<0.002	<0.002	<0.200	<50	<200	8.53	0.292
E04 @ 4'	3/30/2015	4	<0.002	<0.002	<0.002	<0.002	<0.200	280	<200	8.49	1.56

**Notes:**

1. Standards for soil are taken from 2 CCR 404-1, Table 910-1, effective February 1, 2014.

COGCC = Colorado Oil and Gas Conservation Commission

(<) = Analytical result is less than the indicated laboratory reporting limit.

TVPH - GRO = Total volatile petroleum hydrocarbons - gasoline range organics

TEPH - DRO = Total extractable petroleum hydrocarbons - diesel range organics

TEPH - ORO = Total extractable petroleum hydrocarbons - oil range organics

mg/kg = Milligrams per kilogram.

bgs = Below ground surface.

EC = Electrical Conductivity

mmhos/cm = Millimhos per centimeter

\* = Below the designated root zone

**BOLD**=alytical result is in exceedance of COGCC Table 910-1 soil standards.

## **LABORATORY ANALYTICAL REPORTS**

March 25, 2015

Tasman Geosciences

Christine Wasko

6899 Pecos Street, Unit C

Denver

CO 80211

Project Name - KMG - UPRR 43 Pan Am O #2

Project Number - [none]

Attached are your analytical results for KMG - UPRR 43 Pan Am O #2 received by Origins Laboratory, Inc. March 24, 2015. This project is associated with Origins project number X503309-01.

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



Tasman Geosciences  
6899 Pecos Street, Unit C  
Denver CO 80211

Christine Wasko  
Project Number: [none]  
Project: KMG - UPRR 43 Pan Am O #2

**CROSS REFERENCE REPORT**

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
B01 @ 5'	X503309-01	Soil	March 24, 2015 14:40	03/24/2015 17:15
B02 @ 5'	X503309-02	Soil	March 24, 2015 14:48	03/24/2015 17:15
E01 @ 4'	X503309-03	Soil	March 24, 2015 14:45	03/24/2015 17:15
E02 @ 4'	X503309-04	Soil	March 24, 2015 14:50	03/24/2015 17:15
W01 @ 4'	X503309-05	Soil	March 24, 2015 15:15	03/24/2015 17:15
W02 @ 4'	X503309-06	Soil	March 24, 2015 15:20	03/24/2015 17:15
N01 @ 4'	X503309-07	Soil	March 24, 2015 15:30	03/24/2015 17:15
S01 @ 4'	X503309-08	Soil	March 24, 2015 15:46	03/24/2015 17:15
S02 @ 4'	X503309-09	Soil	March 24, 2015 15:50	03/24/2015 17:15

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.*

Tasman Geosciences  
6899 Pecos Street, Unit C  
Denver CO 80211

Christine Wasko  
Project Number: [none]  
Project: KMG - UPRR 43 Pan Am O #2

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**ORIGINS**  
LABORATORY, INC

**X503309**

Client: APC / TASMAN  
Project Manager: Christine Wasko  
Project Name: UPRR 43 Pan Am O #2  
Project Number:  
Telephone Number:  
Email Address: CWASKO@TASMAN-GEO.COM  
Samples Collected By: DON BAGGUS

Sample ID Description	Date Sampled	Time Sampled	# of Containers	Preservative				Matrix		Analysis		Sample Instructions
				Unpreserved	HCl	HNO <sub>3</sub>	Other	Groundwater	Soil	Air Summa Canister #	Other	
B0105'	3/24/15	1440	1	X				X		X	X	1
B0205'		1448	1	X				X		X	X	2
E0104'		1445	1	X				X		X	X	3
E0204'		1450	1	X				X		X	X	4
W0104'		1515	1	X				X		X	X	5
W0204'		1520	1	X				X		X	X	6
N0104'		1530	1	X				X		X	X	7
S0104'		1546	1	X				X		X	X	8
S0204'		1550	1	X				X		X	X	9
												10

  

Relinquished By:	Date:	Time:	Received By:	Date:	Time:	Turnaround Time:
APC	3/24/2015	1700	KAS	3.24.15	1715	Same Day <input checked="" type="checkbox"/> 24 Hr <input type="checkbox"/> 48 Hr <input type="checkbox"/> 72 Hr <input type="checkbox"/> Standard <input type="checkbox"/>

Date Results Needed

Temp Received: 5.7

Origins Laboratory, Inc.

*Jefe Pellegrini*

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Tasman Geosciences  
6899 Pecos Street, Unit C  
Denver CO 80211

Christine Wasko  
Project Number: [none]  
Project: KMG - UPRR 43 Pan Am O #2

Origins Laboratory

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

## Sample Receipt Checklist

Origins Work Order: X503309

Client: Tasman

Client Project ID: UPRR 43 Pan Am O #2

Checklist Completed by: Jeff Smith

Shipped Via: Pick Up

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

Date/time completed: 3/24/15

Airbill #: NA

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

Cooler Number/Temperature: 1 / 5.7 °C 1 / \_\_\_\_\_ °C 1 / \_\_\_\_\_ °C (Describe)

Thermometer ID: TDS3

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)

Date/Time Reviewed

Origins Laboratory, Inc.

*Jeff 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.

Tasman Geosciences  
6899 Pecos Street, Unit C  
Denver CO 80211

Christine Wasko  
Project Number: [none]  
Project: KMG - UPRR 43 Pan Am O #2

**B01 @ 5'**  
**3/24/2015 2:40:00PM**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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**Origins Laboratory, Inc.**  
**X503309-01 (Soil)**

**DRO/RRO by EPA8015C**

Diesel (C10-C28)	ND	50	mg/kg	1	5C24015	03/24/2015	03/25/2015
Residual Range Organics (C28-C36)	ND	200	"	"	"	"	"

Surrogate: o-Terphenyl	84.4 %	59-131			"	"	"
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**GBTEX by EPA 8260C**

Gasoline Range Hydrocarbons	ND	0.200	mg/kg	1	5C24016	03/24/2015	03/25/2015
Benzene	ND	0.002	"	"	"	"	"
Toluene	ND	0.002	"	"	"	"	"
Ethylbenzene	ND	0.002	"	"	"	"	"
Xylenes, total	ND	0.002	"	"	"	"	"

Surrogate: 1,2-Dichloroethane-d4	111 %	70-130			"	"	"
Surrogate: Toluene-d8	96.8 %	70-130			"	"	"
Surrogate: 4-Bromofluorobenzene	99.5 %	70-130			"	"	"

**pH in Soil by EPA 9045D**

pH	7.71		pH Units	1	5C24010	03/24/2015	03/24/2015
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**Specific Conductance by Modified 9050A**

Specific Conductance (EC)	1.00		mmhos/cm	"	5C24011	"	03/24/2015
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Origins Laboratory, Inc.



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Tasman Geosciences  
6899 Pecos Street, Unit C  
Denver CO 80211

Christine Wasko  
Project Number: [none]  
Project: KMG - UPRR 43 Pan Am O #2

**B02 @ 5'**  
**3/24/2015 2:48:00PM**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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**Origins Laboratory, Inc.**  
**X503309-02 (Soil)**

**DRO/RRO by EPA8015C**

Diesel (C10-C28)	ND	50	mg/kg	1	5C24015	03/24/2015	03/25/2015
Residual Range Organics (C28-C36)	ND	200	"	"	"	"	"

<i>Surrogate: o-Terphenyl</i>	81.1 %	59-131			"	"	"
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**GBTEX by EPA 8260C**

Gasoline Range Hydrocarbons	ND	0.200	mg/kg	1	5C24016	03/24/2015	03/25/2015
Benzene	ND	0.002	"	"	"	"	"
Toluene	ND	0.002	"	"	"	"	"
Ethylbenzene	ND	0.002	"	"	"	"	"
Xylenes, total	ND	0.002	"	"	"	"	"

<i>Surrogate: 1,2-Dichloroethane-d4</i>	109 %	70-130			"	"	"
<i>Surrogate: Toluene-d8</i>	96.6 %	70-130			"	"	"
<i>Surrogate: 4-Bromofluorobenzene</i>	102 %	70-130			"	"	"

**pH in Soil by EPA 9045D**

pH	8.43		pH Units	1	5C24010	03/24/2015	03/24/2015
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**Specific Conductance by Modified 9050A**

Specific Conductance (EC)	0.436		mmhos/cm	"	5C24011	"	03/24/2015
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Origins Laboratory, Inc.



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Tasman Geosciences  
6899 Pecos Street, Unit C  
Denver CO 80211

Christine Wasko  
Project Number: [none]  
Project: KMG - UPRR 43 Pan Am O #2

E01 @ 4'  
3/24/2015 2:45:00PM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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**Origins Laboratory, Inc.**  
**X503309-03 (Soil)**

**DRO/RRO by EPA8015C**

Diesel (C10-C28)	ND	50	mg/kg	1	5C24015	03/24/2015	03/25/2015
Residual Range Organics (C28-C36)	ND	200	"	"	"	"	"

Surrogate: o-Terphenyl	88.5 %	59-131			"	"	"
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**GBTEX by EPA 8260C**

Gasoline Range Hydrocarbons	1.13	0.200	mg/kg	1	5C24016	03/24/2015	03/25/2015
Benzene	ND	0.002	"	"	"	"	"
Toluene	ND	0.002	"	"	"	"	"
Ethylbenzene	ND	0.002	"	"	"	"	"
Xylenes, total	ND	0.002	"	"	"	"	"

Surrogate: 1,2-Dichloroethane-d4	114 %	70-130			"	"	"
Surrogate: Toluene-d8	96.7 %	70-130			"	"	"
Surrogate: 4-Bromofluorobenzene	104 %	70-130			"	"	"

**pH in Soil by EPA 9045D**

pH	8.11		pH Units	1	5C24010	03/24/2015	03/24/2015
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**Specific Conductance by Modified 9050A**

Specific Conductance (EC)	0.542		mmhos/cm	"	5C24011	"	03/24/2015
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Origins Laboratory, Inc.



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Tasman Geosciences  
6899 Pecos Street, Unit C  
Denver CO 80211

Christine Wasko  
Project Number: [none]  
Project: KMG - UPRR 43 Pan Am O #2

E02 @ 4'  
3/24/2015 2:50:00PM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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**Origins Laboratory, Inc.**  
**X503309-04 (Soil)**

**DRO/RRO by EPA8015C**

Diesel (C10-C28)	660	50	mg/kg	1	5C24015	03/24/2015	03/25/2015
Residual Range Organics (C28-C36)	ND	200	"	"	"	"	"

Surrogate: o-Terphenyl	86.1 %	59-131			"	"	"
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**GBTEX by EPA 8260C**

Gasoline Range Hydrocarbons	303	5.00	mg/kg	25	5C24016	03/24/2015	03/25/2015
Benzene	ND	0.050	"	"	"	"	"
Toluene	ND	0.050	"	"	"	"	"
Ethylbenzene	0.050	0.050	"	"	"	"	"
Xylenes, total	0.184	0.050	"	"	"	"	"

Surrogate: 1,2-Dichloroethane-d4	102 %	70-130			"	"	"
Surrogate: Toluene-d8	100 %	70-130			"	"	"
Surrogate: 4-Bromofluorobenzene	107 %	70-130			"	"	"

**pH in Soil by EPA 9045D**

pH	9.57		pH Units	1	5C24010	03/24/2015	03/24/2015
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**Specific Conductance by Modified 9050A**

Specific Conductance (EC)	0.223		mmhos/cm	"	5C24011	"	03/24/2015
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Origins Laboratory, Inc.



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Tasman Geosciences  
6899 Pecos Street, Unit C  
Denver CO 80211

Christine Wasko  
Project Number: [none]  
Project: KMG - UPRR 43 Pan Am O #2

W01 @ 4'  
3/24/2015 3:15:00PM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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**Origins Laboratory, Inc.**  
**X503309-05 (Soil)**

**DRO/RRO by EPA8015C**

Diesel (C10-C28)	ND	50	mg/kg	1	5C24015	03/24/2015	03/25/2015
Residual Range Organics (C28-C36)	ND	200	"	"	"	"	"

Surrogate: o-Terphenyl	86.8 %	59-131			"	"	"
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**GBTEX by EPA 8260C**

Gasoline Range Hydrocarbons	ND	0.200	mg/kg	1	5C24016	03/24/2015	03/25/2015
Benzene	ND	0.002	"	"	"	"	"
Toluene	ND	0.002	"	"	"	"	"
Ethylbenzene	ND	0.002	"	"	"	"	"
Xylenes, total	ND	0.002	"	"	"	"	"

Surrogate: 1,2-Dichloroethane-d4	109 %	70-130			"	"	"
Surrogate: Toluene-d8	97.7 %	70-130			"	"	"
Surrogate: 4-Bromofluorobenzene	98.9 %	70-130			"	"	"

**pH in Soil by EPA 9045D**

pH	8.28		pH Units	1	5C24010	03/24/2015	03/24/2015
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**Specific Conductance by Modified 9050A**

Specific Conductance (EC)	0.276		mmhos/cm	"	5C24011	"	03/24/2015
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Origins Laboratory, Inc.



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Tasman Geosciences  
6899 Pecos Street, Unit C  
Denver CO 80211

Christine Wasko  
Project Number: [none]  
Project: KMG - UPRR 43 Pan Am O #2

W02 @ 4'  
3/24/2015 3:20:00PM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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Origins Laboratory, Inc.  
X503309-06 (Soil)

## DRO/RRO by EPA8015C

Diesel (C10-C28)	ND	50	mg/kg	1	5C24015	03/24/2015	03/25/2015
Residual Range Organics (C28-C36)	ND	200	"	"	"	"	"

Surrogate: o-Terphenyl 80.6 % 59-131 " " "

## GBTEX by EPA 8260C

Gasoline Range Hydrocarbons	ND	0.200	mg/kg	1	5C24016	03/24/2015	03/25/2015
Benzene	ND	0.002	"	"	"	"	"
Toluene	ND	0.002	"	"	"	"	"
Ethylbenzene	ND	0.002	"	"	"	"	"
Xylenes, total	ND	0.002	"	"	"	"	"

Surrogate: 1,2-Dichloroethane-d4 111 % 70-130 " " "  
Surrogate: Toluene-d8 97.7 % 70-130 " " "  
Surrogate: 4-Bromofluorobenzene 101 % 70-130 " " "

## pH in Soil by EPA 9045D

pH	8.11		pH Units	1	5C24010	03/24/2015	03/24/2015
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## Specific Conductance by Modified 9050A

Specific Conductance (EC)	0.604		mmhos/cm	"	5C24011	"	03/24/2015
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Origins Laboratory, Inc.



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Tasman Geosciences  
6899 Pecos Street, Unit C  
Denver CO 80211

Christine Wasko  
Project Number: [none]  
Project: KMG - UPRR 43 Pan Am O #2

N01 @ 4'  
3/24/2015 3:30:00PM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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**Origins Laboratory, Inc.**  
**X503309-07 (Soil)**

**DRO/RRO by EPA8015C**

Diesel (C10-C28)	ND	50	mg/kg	1	5C24015	03/24/2015	03/25/2015
Residual Range Organics (C28-C36)	ND	200	"	"	"	"	"

Surrogate: o-Terphenyl	77.4 %	59-131			"	"	"
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**GBTEX by EPA 8260C**

Gasoline Range Hydrocarbons	ND	0.200	mg/kg	1	5C24016	03/24/2015	03/25/2015
Benzene	ND	0.002	"	"	"	"	"
Toluene	ND	0.002	"	"	"	"	"
Ethylbenzene	ND	0.002	"	"	"	"	"
Xylenes, total	ND	0.002	"	"	"	"	"

Surrogate: 1,2-Dichloroethane-d4	106 %	70-130			"	"	"
Surrogate: Toluene-d8	99.4 %	70-130			"	"	"
Surrogate: 4-Bromofluorobenzene	102 %	70-130			"	"	"

**pH in Soil by EPA 9045D**

pH	8.57		pH Units	1	5C24010	03/24/2015	03/24/2015
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**Specific Conductance by Modified 9050A**

Specific Conductance (EC)	0.223		mmhos/cm	"	5C24011	"	03/24/2015
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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.

Tasman Geosciences  
6899 Pecos Street, Unit C  
Denver CO 80211

Christine Wasko  
Project Number: [none]  
Project: KMG - UPRR 43 Pan Am O #2

**S01 @ 4'**  
**3/24/2015 3:46:00PM**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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**Origins Laboratory, Inc.**  
**X503309-08 (Soil)**

**DRO/RRO by EPA8015C**

Diesel (C10-C28)	ND	50	mg/kg	1	5C24015	03/24/2015	03/25/2015
Residual Range Organics (C28-C36)	ND	200	"	"	"	"	"

<i>Surrogate: o-Terphenyl</i>	81.7 %	59-131			"	"	"
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**GBTEX by EPA 8260C**

Gasoline Range Hydrocarbons	ND	0.200	mg/kg	1	5C24016	03/24/2015	03/25/2015
Benzene	ND	0.002	"	"	"	"	"
Toluene	ND	0.002	"	"	"	"	"
Ethylbenzene	ND	0.002	"	"	"	"	"
Xylenes, total	ND	0.002	"	"	"	"	"

<i>Surrogate: 1,2-Dichloroethane-d4</i>	125 %	70-130			"	"	"
<i>Surrogate: Toluene-d8</i>	95.6 %	70-130			"	"	"
<i>Surrogate: 4-Bromofluorobenzene</i>	101 %	70-130			"	"	"

**pH in Soil by EPA 9045D**

pH	8.49		pH Units	1	5C24010	03/24/2015	03/24/2015
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**Specific Conductance by Modified 9050A**

Specific Conductance (EC)	0.620		mmhos/cm	"	5C24011	"	03/24/2015
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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.*

Tasman Geosciences  
6899 Pecos Street, Unit C  
Denver CO 80211

Christine Wasko  
Project Number: [none]  
Project: KMG - UPRR 43 Pan Am O #2

**S02 @ 4'**  
**3/24/2015 3:50:00PM**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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**Origins Laboratory, Inc.**  
**X503309-09 (Soil)**

**DRO/RRO by EPA8015C**

Diesel (C10-C28)	ND	50	mg/kg	1	5C24015	03/24/2015	03/25/2015
Residual Range Organics (C28-C36)	ND	200	"	"	"	"	"

Surrogate: o-Terphenyl	83.3 %	59-131			"	"	"
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**GBTEX by EPA 8260C**

Gasoline Range Hydrocarbons	ND	0.200	mg/kg	1	5C24016	03/24/2015	03/25/2015
Benzene	ND	0.002	"	"	"	"	"
Toluene	ND	0.002	"	"	"	"	"
Ethylbenzene	ND	0.002	"	"	"	"	"
Xylenes, total	ND	0.002	"	"	"	"	"

Surrogate: 1,2-Dichloroethane-d4	119 %	70-130			"	"	"
Surrogate: Toluene-d8	95.7 %	70-130			"	"	"
Surrogate: 4-Bromofluorobenzene	101 %	70-130			"	"	"

**pH in Soil by EPA 9045D**

pH	9.04		pH Units	1	5C24010	03/24/2015	03/24/2015
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**Specific Conductance by Modified 9050A**

Specific Conductance (EC)	0.429		mmhos/cm	"	5C24011	"	03/24/2015
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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.



Tasman Geosciences  
6899 Pecos Street, Unit C  
Denver CO 80211

Christine Wasko  
Project Number: [none]  
Project: KMG - UPRR 43 Pan Am O #2

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

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
<b>Batch 5C24016 - EPA 5030 (soil)</b>										
<b>Blank (5C24016-BLK1)</b>					Prepared: 03/24/2015 Analyzed: 03/24/2015					
Gasoline Range Hydrocarbons	ND	0.200	mg/kg							
Benzene	ND	0.002	"							
Toluene	ND	0.002	"							
Ethylbenzene	ND	0.002	"							
Xylenes, total	ND	0.002	"							
Surrogate: 1,2-Dichloroethane-d4	65.8		ug/kg	62.5		105	70-130			
Surrogate: Toluene-d8	61.7		"	62.5		98.8	70-130			
Surrogate: 4-Bromofluorobenzene	62.1		"	62.5		99.3	70-130			

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.

Tasman Geosciences  
6899 Pecos Street, Unit C  
Denver CO 80211

Christine Wasko  
Project Number: [none]  
Project: KMG - UPRR 43 Pan Am O #2

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

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
<b>Batch 5C24016 - EPA 5030 (soil)</b>										
<b>LCS (5C24016-BS1)</b>					Prepared: 03/24/2015 Analyzed: 03/24/2015					
Benzene	0.107	0.002	mg/kg	0.100		107	77.1-124			
Toluene	0.105	0.002	"	0.100		105	74.5-128			
Ethylbenzene	0.105	0.002	"	0.100		105	66.4-127			
m,p-Xylene	0.212	0.004	"	0.200		106	76.6-124			
o-Xylene	0.106	0.002	"	0.100		106	76.6-124			
Surrogate: 1,2-Dichloroethane-d4	62.6		ug/kg	62.5		100	70-130			
Surrogate: Toluene-d8	61.5		"	62.5		98.4	70-130			
Surrogate: 4-Bromofluorobenzene	60.7		"	62.5		97.2	70-130			

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.

Tasman Geosciences  
6899 Pecos Street, Unit C  
Denver CO 80211

Christine Wasko  
Project Number: [none]  
Project: KMG - UPRR 43 Pan Am O #2

**Volatile Organic Compounds by GC/MS SW846 8260C - 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 5C24016 - EPA 5030 (soil)**

Matrix Spike (5C24016-MS1)		Source: X503308-01			Prepared: 03/24/2015 Analyzed: 03/24/2015					
Benzene	0.078	0.002	mg/kg	0.100	0.0007	77.1	71.8-126			
Toluene	0.095	0.002	"	0.100	ND	94.6	65.1-130			
Ethylbenzene	0.083	0.002	"	0.100	ND	83.0	62.2-130			
m,p-Xylene	0.166	0.004	"	0.200	ND	83.0	46.5-137			
o-Xylene	0.083	0.002	"	0.100	ND	83.1	54.2-134			
Surrogate: 1,2-Dichloroethane-d4	80.1		ug/kg	62.5		128	70-130			
Surrogate: Toluene-d8	66.9		"	62.5		107	70-130			
Surrogate: 4-Bromofluorobenzene	58.9		"	62.5		94.2	70-130			

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.

Tasman Geosciences  
6899 Pecos Street, Unit C  
Denver CO 80211

Christine Wasko  
Project Number: [none]  
Project: KMG - UPRR 43 Pan Am O #2

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

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
<b>Batch 5C24016 - EPA 5030 (soil)</b>										
<b>Matrix Spike Dup (5C24016-MSD1)</b>		<b>Source: X503308-01</b>			Prepared: 03/24/2015 Analyzed: 03/24/2015					
Benzene	0.021	0.002	mg/kg	0.100	0.0007	20.7	71.8-126	114	11.3	QM-07
Toluene	0.025	0.002	"	0.100	ND	24.8	65.1-130	117	15.4	QM-07
Ethylbenzene	0.018	0.002	"	0.100	ND	18.1	62.2-130	128	19.6	QM-07
m,p-Xylene	0.036	0.004	"	0.200	ND	18.1	46.5-137	128	19.2	QM-07
o-Xylene	0.018	0.002	"	0.100	ND	17.7	54.2-134	130	17.9	QM-07
Surrogate: 1,2-Dichloroethane-d4	80.2		ug/kg	62.5		128	70-130			
Surrogate: Toluene-d8	68.4		"	62.5		110	70-130			
Surrogate: 4-Bromofluorobenzene	58.0		"	62.5		92.8	70-130			

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.

Tasman Geosciences  
6899 Pecos Street, Unit C  
Denver CO 80211

Christine Wasko  
Project Number: [none]  
Project: KMG - UPRR 43 Pan Am O #2

**Volatile Organic Compounds by GC/MS SW846 8260C - 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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**Extractable Petroleum Hydrocarbons by 8015C - 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 5C24015 - EPA 3580**

**Blank (5C24015-BLK1)**

Prepared: 03/24/2015 Analyzed: 03/24/2015

Diesel (C10-C28)	ND	50	mg/kg							
Residual Range Organics (C28-C36)	ND	200	"							
Surrogate: o-Terphenyl	47		"	50.0		94.0	59-131			

**LCS (5C24015-BS1)**

Prepared: 03/24/2015 Analyzed: 03/25/2015

Diesel (C10-C28)	950	50	mg/kg	1000		94.5	64-121			
Residual Range Organics (C28-C36)	1000	200	"	1000		102	58-124			
Surrogate: o-Terphenyl	46		"	50.0		92.2	59-131			

**Matrix Spike (5C24015-MS1)**

**Source: X503307-01**

Prepared: 03/24/2015 Analyzed: 03/25/2015

Diesel (C10-C28)	970	50	mg/kg	1000	24	95.1	53-125			
Residual Range Organics (C28-C36)	1100	200	"	1000	21	104	47-133			
Surrogate: o-Terphenyl	46		"	50.0		91.4	59-131			

**Matrix Spike Dup (5C24015-MSD1)**

**Source: X503307-01**

Prepared: 03/24/2015 Analyzed: 03/25/2015

Diesel (C10-C28)	970	50	mg/kg	1000	24	94.2	53-125	0.906	20	
Residual Range Organics (C28-C36)	1000	200	"	1000	21	103	47-133	1.44	20	
Surrogate: o-Terphenyl	45		"	50.0		89.5	59-131			

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.

Tasman Geosciences  
6899 Pecos Street, Unit C  
Denver CO 80211

Christine Wasko  
Project Number: [none]  
Project: KMG - UPRR 43 Pan Am O #2

## Classical Chemistry Parameters - Quality Control Origins Laboratory, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
<b>Batch 5C24010 - NO PREP</b>										
<b>Duplicate (5C24010-DUP1)</b>	<b>Source: X503302-02</b>				Prepared: 03/24/2015 Analyzed: 03/24/2015					
pH	7.83		pH Units		7.90			0.890	25	
<b>Duplicate (5C24010-DUP2)</b>	<b>Source: X503306-01</b>				Prepared: 03/24/2015 Analyzed: 03/24/2015					
pH	8.44		pH Units		8.49			0.591	25	
<b>Batch 5C24011 - NO PREP</b>										
<b>Blank (5C24011-BLK1)</b>	Prepared: 03/24/2015 Analyzed: 03/24/2015									
Specific Conductance (EC)	0.00270		mmhos/cm							
<b>Blank (5C24011-BLK2)</b>	Prepared: 03/24/2015 Analyzed: 03/24/2015									
Specific Conductance (EC)	0.00240		mmhos/cm							
<b>Duplicate (5C24011-DUP1)</b>	<b>Source: X503302-02</b>				Prepared: 03/24/2015 Analyzed: 03/24/2015					
Specific Conductance (EC)	0.797		mmhos/cm		0.794			0.377	25	
<b>Duplicate (5C24011-DUP2)</b>	<b>Source: X503306-01</b>				Prepared: 03/24/2015 Analyzed: 03/24/2015					
Specific Conductance (EC)	0.691		mmhos/cm		0.685			0.872	25	

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.

Tasman Geosciences

6899 Pecos Street, Unit C

Denver CO 80211

Christine Wasko

Project Number: [none]

Project: KMG - UPRR 43 Pan Am O #2

### Notes and Definitions

QM-07 The spike recovery was outside acceptance limits for the MS and/or MSD. The batch was accepted based on acceptable LCS recovery.

ND Analyte NOT DETECTED at or above the reporting limit

RPD Relative Percent Difference

All soil results are reported at a wet weight basis.

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.*

Jen Pellegrini For Noelle Doyle Mathis, President

March 30, 2015

Tasman Geosciences

Christine Wasko

6899 Pecos Street, Unit C

Denver

CO 80211

**Project Name - KMG - UPRR 43 Pan Am O #2**

**Project Number - 88743945**

Attached are your analytical results for KMG - UPRR 43 Pan Am O #2 received by Origins Laboratory, Inc. March 27, 2015. This project is associated with Origins project number X503353-01.

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





Tasman Geosciences

6899 Pecos Street, Unit C

Denver CO 80211

Christine Wasko

Project Number: 88743945

Project: KMG - UPRR 43 Pan Am O #2

## CROSS REFERENCE REPORT

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
W03 @ 4	X503353-01	Soil	March 27, 2015 9:30	03/27/2015 12:30
B03 @ 5	X503353-02	Soil	March 27, 2015 9:35	03/27/2015 12:30
E03 @ 4	X503353-03	Soil	March 27, 2015 9:40	03/27/2015 12:30
E02-R @ 4	X503353-04	Soil	March 27, 2015 9:55	03/27/2015 12:30
E01-R @ 4	X503353-05	Soil	March 27, 2015 10:00	03/27/2015 12:30

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.*

Tasman Geosciences  
6899 Pecos Street, Unit C  
Denver CO 80211

Christine Wasko  
Project Number: 88743945  
Project: KMG - UPRR 43 Pan Am O #2

www.originslaboratory.com

X503353

page 1 of 1

**ORIGINS**  
LABORATORY, INC

Client: APL / TASMAN  
Address: \_\_\_\_\_  
Project Manager: CHRISTINE WASKO  
Project Name: UPRR 43 Pan Am O #2  
Project Number: \_\_\_\_\_  
Samples Collected By: DON BAGGINS  
Telephone Number: \_\_\_\_\_  
Email Address: CWASKO@TASMAN-GEO.COM

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

Sample ID Description	Date Sampled	Time Sampled	# of Containers	Preservative				Matrix			Analysis	Sample Instructions	
				Unpreserved	HCl	HNO <sub>3</sub>	Other	Groundwater	Soil	Air Summa Canister #			
W0304	3/27/15	0930	1	X					X			X	1
B0305		0935	1	X					X			X	2
E0304		0940	1	X					X			X	3
E02-RE4		0955	1	X					X			X	4
E01-RE4		1000	1	X					X			X	5
													6
													7
													8
													9
													10

  

Relinquished By:	Date:	Time:	Received By:	Date:	Time:	Turnaround Time:
<u>TRAVIS</u>	3/27/15	1230	<u>[Signature]</u>	3/27/15	1230	Same Day <input checked="" type="checkbox"/> 24 Hr <input type="checkbox"/> 48 Hr <input type="checkbox"/> 72 Hr <input type="checkbox"/> Standard <input type="checkbox"/>

Date Results Needed

Temp Received-

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.

Tasman Geosciences  
6899 Pecos Street, Unit C  
Denver CO 80211

Christine Wasko  
Project Number: 88743945  
Project: KMG - UPRR 43 Pan Am O #2

Origins Laboratory

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

## Sample Receipt Checklist

Origins Work Order: XS05353

Client: Tasman

Client Project ID: UPRR43 Pan Am O #2

Checklist Completed by: Jeff Smith

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

Date/time completed: 3/27/12

Airbill #: NA

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

Cooler Number/Temperature: 1 / 15.9 °C 1 °C 1 °C (Describe) 1 °C

Thermometer ID: TK03

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.

[Signature]  
Reviewed By (Project Manager)

3/27/12  
Date/Time Reviewed

Origins Laboratory, Inc.

[Signature]

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.

Tasman Geosciences  
6899 Pecos Street, Unit C  
Denver CO 80211

Christine Wasko  
Project Number: 88743945  
Project: KMG - UPRR 43 Pan Am O #2

W03 @ 4  
3/27/2015 9:30:00AM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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**Origins Laboratory, Inc.**  
**X503353-01 (Soil)**

**DRO/RRO by EPA8015C**

Diesel (C10-C28)	ND	50	mg/kg	1	5C27006	03/27/2015	03/27/2015
Residual Range Organics (C28-C36)	ND	200	"	"	"	"	"

Surrogate: o-Terphenyl 87.8 % 59-131 " " "

**GBTEX by EPA 8260C**

Gasoline Range Hydrocarbons	ND	0.200	mg/kg	1	5C27008	03/27/2015	03/27/2015
Benzene	ND	0.002	"	"	"	"	"
Toluene	ND	0.002	"	"	"	"	"
Ethylbenzene	ND	0.002	"	"	"	"	"
Xylenes, total	ND	0.002	"	"	"	"	"

Surrogate: 1,2-Dichloroethane-d4 126 % 70-130 " " "  
Surrogate: Toluene-d8 94.4 % 70-130 " " "  
Surrogate: 4-Bromofluorobenzene 98.8 % 70-130 " " "

**pH in Soil by EPA 9045D**

pH	8.37		pH Units	1	5C27011	03/27/2015	03/27/2015
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**Specific Conductance by Modified 9050A**

Specific Conductance (EC)	0.496		mmhos/cm	"	5C27012	03/27/2015	03/27/2015
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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.

Tasman Geosciences  
6899 Pecos Street, Unit C  
Denver CO 80211

Christine Wasko  
Project Number: 88743945  
Project: KMG - UPRR 43 Pan Am O #2

**B03 @ 5**  
**3/27/2015 9:35:00AM**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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**Origins Laboratory, Inc.**  
**X503353-02 (Soil)**

**DRO/RRO by EPA8015C**

Diesel (C10-C28)	ND	50	mg/kg	1	5C27006	03/27/2015	03/27/2015
Residual Range Organics (C28-C36)	ND	200	"	"	"	"	"

Surrogate: o-Terphenyl 94.8 % 59-131 " " "

**GBTEX by EPA 8260C**

Gasoline Range Hydrocarbons	ND	0.200	mg/kg	1	5C27008	03/27/2015	03/27/2015
Benzene	ND	0.002	"	"	"	"	"
Toluene	ND	0.002	"	"	"	"	"
Ethylbenzene	ND	0.002	"	"	"	"	"
Xylenes, total	ND	0.002	"	"	"	"	"

Surrogate: 1,2-Dichloroethane-d4 114 % 70-130 " " "  
Surrogate: Toluene-d8 96.3 % 70-130 " " "  
Surrogate: 4-Bromofluorobenzene 102 % 70-130 " " "

**pH in Soil by EPA 9045D**

pH	9.03		pH Units	1	5C27011	03/27/2015	03/27/2015
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**Specific Conductance by Modified 9050A**

Specific Conductance (EC)	0.403		mmhos/cm	"	5C27012	03/27/2015	03/27/2015
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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.

Tasman Geosciences  
6899 Pecos Street, Unit C  
Denver CO 80211

Christine Wasko  
Project Number: 88743945  
Project: KMG - UPRR 43 Pan Am O #2

E03 @ 4  
3/27/2015 9:40:00AM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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**Origins Laboratory, Inc.**  
**X503353-03 (Soil)**

**DRO/RRO by EPA8015C**

Diesel (C10-C28)	ND	50	mg/kg	1	5C27006	03/27/2015	03/27/2015
Residual Range Organics (C28-C36)	ND	200	"	"	"	"	"

Surrogate: o-Terphenyl	92.9 %	59-131			"	"	"
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**GBTEX by EPA 8260C**

Gasoline Range Hydrocarbons	ND	0.200	mg/kg	1	5C27008	03/27/2015	03/27/2015
Benzene	ND	0.002	"	"	"	"	"
Toluene	ND	0.002	"	"	"	"	"
Ethylbenzene	ND	0.002	"	"	"	"	"
Xylenes, total	ND	0.002	"	"	"	"	"

Surrogate: 1,2-Dichloroethane-d4	126 %	70-130			"	"	"
Surrogate: Toluene-d8	95.0 %	70-130			"	"	"
Surrogate: 4-Bromofluorobenzene	102 %	70-130			"	"	"

**pH in Soil by EPA 9045D**

pH	8.19		pH Units	1	5C27011	03/27/2015	03/27/2015
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**Specific Conductance by Modified 9050A**

Specific Conductance (EC)	0.519		mmhos/cm	"	5C27012	03/27/2015	03/27/2015
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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.

Tasman Geosciences  
6899 Pecos Street, Unit C  
Denver CO 80211

Christine Wasko  
Project Number: 88743945  
Project: KMG - UPRR 43 Pan Am O #2

E02-R @ 4  
3/27/2015 9:55:00AM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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**Origins Laboratory, Inc.**  
**X503353-04 (Soil)**

**DRO/RRO by EPA8015C**

Diesel (C10-C28)	1000	50	mg/kg	1	5C27006	03/27/2015	03/27/2015
Residual Range Organics (C28-C36)	340	200	"	"	"	"	"

Surrogate: o-Terphenyl	103 %	59-131			"	"	"
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**GBTEX by EPA 8260C**

Gasoline Range Hydrocarbons	112	5.00	mg/kg	25	5C27008	03/27/2015	03/27/2015
Benzene	ND	0.050	"	"	"	"	"
Toluene	ND	0.050	"	"	"	"	"
Ethylbenzene	0.068	0.050	"	"	"	"	"
Xylenes, total	0.127	0.050	"	"	"	"	"

Surrogate: 1,2-Dichloroethane-d4	105 %	70-130			"	"	"
Surrogate: Toluene-d8	99.8 %	70-130			"	"	"
Surrogate: 4-Bromofluorobenzene	106 %	70-130			"	"	"

**pH in Soil by EPA 9045D**

pH	9.14		pH Units	1	5C27011	03/27/2015	03/27/2015
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**Specific Conductance by Modified 9050A**

Specific Conductance (EC)	0.235		mmhos/cm	"	5C27012	03/27/2015	03/27/2015
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Origins Laboratory, Inc.



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Tasman Geosciences  
6899 Pecos Street, Unit C  
Denver CO 80211

Christine Wasko  
Project Number: 88743945  
Project: KMG - UPRR 43 Pan Am O #2

E01-R @ 4

3/27/2015 10:00:00AM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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**Origins Laboratory, Inc.**  
**X503353-05 (Soil)**

**DRO/RRO by EPA8015C**

Diesel (C10-C28)	ND	50	mg/kg	1	5C27006	03/27/2015	03/27/2015
Residual Range Organics (C28-C36)	ND	200	"	"	"	"	"

Surrogate: o-Terphenyl 89.5 % 59-131 " " "

**GBTEX by EPA 8260C**

Gasoline Range Hydrocarbons	ND	0.200	mg/kg	1	5C27008	03/27/2015	03/27/2015
Benzene	ND	0.002	"	"	"	"	"
Toluene	ND	0.002	"	"	"	"	"
Ethylbenzene	ND	0.002	"	"	"	"	"
Xylenes, total	ND	0.002	"	"	"	"	"

Surrogate: 1,2-Dichloroethane-d4 111 % 70-130 " " "  
Surrogate: Toluene-d8 97.9 % 70-130 " " "  
Surrogate: 4-Bromofluorobenzene 101 % 70-130 " " "

**pH in Soil by EPA 9045D**

pH	8.53		pH Units	1	5C27011	03/27/2015	03/27/2015
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**Specific Conductance by Modified 9050A**

Specific Conductance (EC)	0.292		mmhos/cm	"	5C27012	03/27/2015	03/27/2015
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Origins Laboratory, Inc.



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Tasman Geosciences  
6899 Pecos Street, Unit C  
Denver CO 80211

Christine Wasko  
Project Number: 88743945  
Project: KMG - UPRR 43 Pan Am O #2

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

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
<b>Batch 5C27008 - EPA 5030 (soil)</b>										
<b>Blank (5C27008-BLK1)</b>					Prepared: 03/27/2015 Analyzed: 03/27/2015					
Gasoline Range Hydrocarbons	ND	0.200	mg/kg							
Benzene	ND	0.002	"							
Toluene	ND	0.002	"							
Ethylbenzene	ND	0.002	"							
Xylenes, total	ND	0.002	"							
Surrogate: 1,2-Dichloroethane-d4	69.8		ug/kg	62.5		112	70-130			
Surrogate: Toluene-d8	61.2		"	62.5		98.0	70-130			
Surrogate: 4-Bromofluorobenzene	62.7		"	62.5		100	70-130			

Origins Laboratory, Inc.



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Tasman Geosciences  
6899 Pecos Street, Unit C  
Denver CO 80211

Christine Wasko  
Project Number: 88743945  
Project: KMG - UPRR 43 Pan Am O #2

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

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
<b>Batch 5C27008 - EPA 5030 (soil)</b>										
<b>LCS (5C27008-BS1)</b>					Prepared: 03/27/2015 Analyzed: 03/27/2015					
Benzene	0.096	0.002	mg/kg	0.100		96.2	77.1-124			
Toluene	0.093	0.002	"	0.100		93.3	74.5-128			
Ethylbenzene	0.091	0.002	"	0.100		91.3	66.4-127			
m,p-Xylene	0.184	0.004	"	0.200		92.0	76.6-124			
o-Xylene	0.093	0.002	"	0.100		93.0	76.6-124			
Surrogate: 1,2-Dichloroethane-d4	64.8		ug/kg	62.5		104	70-130			
Surrogate: Toluene-d8	61.1		"	62.5		97.8	70-130			
Surrogate: 4-Bromofluorobenzene	61.8		"	62.5		98.9	70-130			

Origins Laboratory, Inc.



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Tasman Geosciences  
6899 Pecos Street, Unit C  
Denver CO 80211

Christine Wasko  
Project Number: 88743945  
Project: KMG - UPRR 43 Pan Am O #2

**Volatile Organic Compounds by GC/MS SW846 8260C - 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 5C27008 - EPA 5030 (soil)**

Matrix Spike (5C27008-MS1)		Source: X503342-01			Prepared: 03/27/2015 Analyzed: 03/27/2015					
Benzene	0.104	0.002	mg/kg	0.100	ND	104	71.8-126			
Toluene	0.102	0.002	"	0.100	ND	102	65.1-130			
Ethylbenzene	0.103	0.002	"	0.100	ND	103	62.2-130			
m,p-Xylene	0.206	0.004	"	0.200	ND	103	46.5-137			
o-Xylene	0.105	0.002	"	0.100	ND	105	54.2-134			
Surrogate: 1,2-Dichloroethane-d4	65.6		ug/kg	62.5		105	70-130			
Surrogate: Toluene-d8	62.3		"	62.5		99.7	70-130			
Surrogate: 4-Bromofluorobenzene	63.8		"	62.5		102	70-130			

Origins Laboratory, Inc.



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Tasman Geosciences  
6899 Pecos Street, Unit C  
Denver CO 80211

Christine Wasko  
Project Number: 88743945  
Project: KMG - UPRR 43 Pan Am O #2

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

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
<b>Batch 5C27008 - EPA 5030 (soil)</b>										
<b>Matrix Spike Dup (5C27008-MSD1)</b>		<b>Source: X503342-01</b>			Prepared: 03/27/2015 Analyzed: 03/27/2015					
Benzene	0.095	0.002	mg/kg	0.100	ND	95.3	71.8-126	9.21	11.3	
Toluene	0.090	0.002	"	0.100	ND	90.2	65.1-130	12.1	15.4	
Ethylbenzene	0.090	0.002	"	0.100	ND	89.8	62.2-130	13.4	19.6	
m,p-Xylene	0.180	0.004	"	0.200	ND	89.8	46.5-137	13.7	19.2	
o-Xylene	0.093	0.002	"	0.100	ND	92.6	54.2-134	12.3	17.9	
Surrogate: 1,2-Dichloroethane-d4	64.6		ug/kg	62.5		103	70-130			
Surrogate: Toluene-d8	61.8		"	62.5		98.9	70-130			
Surrogate: 4-Bromofluorobenzene	65.0		"	62.5		104	70-130			

Origins Laboratory, Inc.



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Tasman Geosciences  
6899 Pecos Street, Unit C  
Denver CO 80211

Christine Wasko  
Project Number: 88743945  
Project: KMG - UPRR 43 Pan Am O #2

## Volatile Organic Compounds by GC/MS SW846 8260C - 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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## Extractable Petroleum Hydrocarbons by 8015C - 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 5C27006 - EPA 3580

#### Blank (5C27006-BLK1)

Prepared: 03/27/2015 Analyzed: 03/27/2015

Diesel (C10-C28)	ND	50	mg/kg							
Residual Range Organics (C28-C36)	ND	200	"							
Surrogate: o-Terphenyl	54		"	50.0		109	59-131			

#### LCS (5C27006-BS1)

Prepared: 03/27/2015 Analyzed: 03/27/2015

Diesel (C10-C28)	1100	50	mg/kg	1000		110	64-121			
Residual Range Organics (C28-C36)	970	200	"	1000		96.6	58-124			
Surrogate: o-Terphenyl	51		"	50.0		102	59-131			

#### Matrix Spike (5C27006-MS1)

Source: X503342-01

Prepared: 03/27/2015 Analyzed: 03/27/2015

Diesel (C10-C28)	1100	50	mg/kg	1000	49	104	53-125			
Residual Range Organics (C28-C36)	940	200	"	1000	25	91.5	47-133			
Surrogate: o-Terphenyl	46		"	50.0		92.5	59-131			

#### Matrix Spike Dup (5C27006-MSD1)

Source: X503342-01

Prepared: 03/27/2015 Analyzed: 03/27/2015

Diesel (C10-C28)	1100	50	mg/kg	1000	49	103	53-125	1.29	20	
Residual Range Organics (C28-C36)	950	200	"	1000	25	92.4	47-133	0.886	20	
Surrogate: o-Terphenyl	47		"	50.0		94.4	59-131			

Origins Laboratory, Inc.



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Tasman Geosciences  
6899 Pecos Street, Unit C  
Denver CO 80211

Christine Wasko  
Project Number: 88743945  
Project: KMG - UPRR 43 Pan Am O #2

## Classical Chemistry Parameters - Quality Control Origins Laboratory, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
<b>Batch 5C27011 - NO PREP</b>										
<b>Duplicate (5C27011-DUP1)</b>		<b>Source: X503342-01</b>			Prepared: 03/27/2015 Analyzed: 03/27/2015					
pH	8.78		pH Units		8.76			0.228	25	
<b>Duplicate (5C27011-DUP2)</b>		<b>Source: X503353-01</b>			Prepared: 03/27/2015 Analyzed: 03/27/2015					
pH	8.40		pH Units		8.37			0.358	25	
<b>Batch 5C27012 - NO PREP</b>										
<b>Blank (5C27012-BLK1)</b>					Prepared: 03/27/2015 Analyzed: 03/27/2015					
Specific Conductance (EC)	0.00310		mmhos/cm							
<b>Blank (5C27012-BLK2)</b>					Prepared: 03/27/2015 Analyzed: 03/27/2015					
Specific Conductance (EC)	0.00310		mmhos/cm							
<b>Duplicate (5C27012-DUP1)</b>		<b>Source: X503342-01</b>			Prepared: 03/27/2015 Analyzed: 03/27/2015					
Specific Conductance (EC)	0.0735		mmhos/cm		0.0749			1.89	25	
<b>Duplicate (5C27012-DUP2)</b>		<b>Source: X503353-01</b>			Prepared: 03/27/2015 Analyzed: 03/27/2015					
Specific Conductance (EC)	0.493		mmhos/cm		0.496			0.607	25	

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.

Tasman Geosciences

6899 Pecos Street, Unit C

Denver CO 80211

Christine Wasko

Project Number: 88743945

Project: KMG - UPRR 43 Pan Am O #2

### Notes and Definitions

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.



*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.*

Jen Pellegrini For Noelle Doyle Mathis, President



March 31, 2015

Tasman Geosciences

Christine Wasko

6899 Pecos Street, Unit C

Denver

CO 80211

**Project Name - KMG - UPRR 43 Pan Am O #2**

**Project Number - 88743945**

Attached are your analytical results for KMG - UPRR 43 Pan Am O #2 received by Origins Laboratory, Inc. March 30, 2015. This project is associated with Origins project number X503379-01.

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



Tasman Geosciences

6899 Pecos Street, Unit C

Denver CO 80211

Christine Wasko

Project Number: 88743945

Project: KMG - UPRR 43 Pan Am O #2

## CROSS REFERENCE REPORT

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
E04 @ 4	X503379-01	Soil	March 30, 2015 15:35	03/30/2015 17:00

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.*

Page 3 of 12

Tasman Geosciences  
6899 Pecos Street, Unit C  
Denver CO 80211

Christine Wasko  
Project Number: 88743945  
Project: KMG - UPRR 43 Pan Am O #2

Origins Laboratory

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

## Sample Receipt Checklist

Origins Work Order: 503379

Client: LTE

Client Project ID: UPRR 43 Pan Am O #2

Checklist Completed by: Jeff Smith

Shipped Via: Pick Up

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

Date/time completed: 3/30/15

Airbill #: NA

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

Cooler Number/Temperature: 1 / 4.5 °C 1 / \_\_\_\_\_ °C 1 / \_\_\_\_\_ °C (Describe)

Thermometer ID: 7003

Requirement Description	Yes	No	N/A	Comments (if any)
If samples require cooling, was the temperature between 0°C to ≤ 6°C <sup>(1)</sup> ?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Is there ice present (document if blue ice is used)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Are custody seals present on cooler? (if so, document in comments if they are signed and dated, broken or intact)	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Are custody seals present on each sample container? (if so, document in comments if they are signed and dated, broken or intact)	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Were all samples received intact <sup>(1)</sup> ?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Was adequate sample volume provided <sup>(1)</sup> ?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Are short holding time analytes or samples with HTs due within 48 hours present <sup>(1)</sup> ?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<u>PH</u>
Is a chain-of-custody (COC) present and filled out completely <sup>(1)</sup> ?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Does the COC agree with the number and type of sample bottles received <sup>(1)</sup> ?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Do the sample IDs on the bottle labels match the COC <sup>(1)</sup> ?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Is the COC properly relinquished by the client with date and time recorded <sup>(1)</sup> ?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
For volatiles in water – is there headspace (> ¼ inch bubble) present? If yes, contact client and note in narrative.	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Are samples preserved that require preservation and was it checked <sup>(1)</sup> ? (note ID of confirmation instrument used in comments) / (preservation is not confirmed for subcontracted analyses in order to insure sample integrity)/(pH < 2 for samples preserved with HNO <sub>3</sub> , HCL, H <sub>2</sub> SO <sub>4</sub> ) / (pH > 10 for samples preserved with NaAsO <sub>2</sub> +NaOH, ZnAc+NaOH)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Additional Comments (if any):				

<sup>(1)</sup> If NO, then contact the client before proceeding with analysis and note date/time and person contacted as well as the corrective action to in the additional comments (above) and the case narrative.

Jeff Smith  
Reviewed by (Project Manager)

3/30/15  
Date/Time Reviewed

Origins Laboratory, Inc.

*Jeff 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.

Tasman Geosciences  
6899 Pecos Street, Unit C  
Denver CO 80211

Christine Wasko  
Project Number: 88743945  
Project: KMG - UPRR 43 Pan Am O #2

E04 @ 4  
3/30/2015 3:35:00PM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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**Origins Laboratory, Inc.**  
**X503379-01 (Soil)**

**DRO/RRO by EPA8015C**

Diesel (C10-C28)	280	50	mg/kg	1	5C30007	03/30/2015	03/30/2015
Residual Range Organics (C28-C36)	ND	200	"	"	"	"	"

Surrogate: o-Terphenyl	81.7 %	59-131			"	"	"
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**GBTEX by EPA 8260C**

Gasoline Range Hydrocarbons	ND	0.200	mg/kg	1	5C30010	03/30/2015	03/30/2015
Benzene	ND	0.002	"	"	"	"	"
Toluene	ND	0.002	"	"	"	"	"
Ethylbenzene	ND	0.002	"	"	"	"	"
Xylenes, total	ND	0.002	"	"	"	"	"

Surrogate: 1,2-Dichloroethane-d4	107 %	70-130			"	"	"
Surrogate: Toluene-d8	97.6 %	70-130			"	"	"
Surrogate: 4-Bromofluorobenzene	101 %	70-130			"	"	"

**pH in Soil by EPA 9045D**

pH	8.49		pH Units	1	5C30009	03/30/2015	03/30/2015
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**Specific Conductance by Modified 9050A**

Specific Conductance (EC)	1.56		mmhos/cm	"	5C30008	03/30/2015	03/30/2015
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Tasman Geosciences  
6899 Pecos Street, Unit C  
Denver CO 80211

Christine Wasko  
Project Number: 88743945  
Project: KMG - UPRR 43 Pan Am O #2

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

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
<b>Batch 5C30010 - EPA 5030 (soil)</b>										
<b>Blank (5C30010-BLK1)</b>					Prepared: 03/30/2015 Analyzed: 03/30/2015					
Gasoline Range Hydrocarbons	ND	0.200	mg/kg							
Benzene	ND	0.002	"							
Toluene	ND	0.002	"							
Ethylbenzene	ND	0.002	"							
Xylenes, total	ND	0.002	"							
Surrogate: 1,2-Dichloroethane-d4	71.8		ug/kg	62.5		115	70-130			
Surrogate: Toluene-d8	60.4		"	62.5		96.7	70-130			
Surrogate: 4-Bromofluorobenzene	63.6		"	62.5		102	70-130			

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**Origins Laboratory, Inc.**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
<b>Batch 5C30010 - EPA 5030 (soil)</b>										
<b>LCS (5C30010-BS1)</b>					Prepared: 03/30/2015 Analyzed: 03/30/2015					
Benzene	0.105	0.002	mg/kg	0.100		105	77.1-124			
Toluene	0.102	0.002	"	0.100		102	74.5-128			
Ethylbenzene	0.101	0.002	"	0.100		101	66.4-127			
m,p-Xylene	0.202	0.004	"	0.200		101	76.6-124			
o-Xylene	0.103	0.002	"	0.100		103	76.6-124			
Surrogate: 1,2-Dichloroethane-d4	66.0		ug/kg	62.5		106	70-130			
Surrogate: Toluene-d8	61.7		"	62.5		98.7	70-130			
Surrogate: 4-Bromofluorobenzene	62.5		"	62.5		100	70-130			

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**Volatile Organic Compounds by GC/MS SW846 8260C - 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 5C30010 - EPA 5030 (soil)**

Matrix Spike (5C30010-MS1)		Source: X503366-01			Prepared: 03/30/2015 Analyzed: 03/30/2015					
Benzene	0.110	0.002	mg/kg	0.100	0.003	107	71.8-126			
Toluene	0.118	0.002	"	0.100	0.016	102	65.1-130			
Ethylbenzene	0.117	0.002	"	0.100	0.018	98.6	62.2-130			
m,p-Xylene	0.255	0.004	"	0.200	0.057	99.0	46.5-137			
o-Xylene	0.128	0.002	"	0.100	0.027	101	54.2-134			
Surrogate: 1,2-Dichloroethane-d4	67.0		ug/kg	62.5		107	70-130			
Surrogate: Toluene-d8	61.0		"	62.5		97.6	70-130			
Surrogate: 4-Bromofluorobenzene	62.1		"	62.5		99.4	70-130			

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

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
<b>Batch 5C30010 - EPA 5030 (soil)</b>										
<b>Matrix Spike Dup (5C30010-MSD1)</b>		<b>Source: X503366-01</b>			Prepared: 03/30/2015 Analyzed: 03/30/2015					
Benzene	0.125	0.002	mg/kg	0.100	0.003	123	71.8-126	13.2	11.3	QR-02
Toluene	0.138	0.002	"	0.100	0.016	123	65.1-130	16.2	15.4	QR-02
Ethylbenzene	0.140	0.002	"	0.100	0.018	122	62.2-130	18.3	19.6	
m,p-Xylene	0.300	0.004	"	0.200	0.057	122	46.5-137	16.3	19.2	
o-Xylene	0.155	0.002	"	0.100	0.027	128	54.2-134	18.9	17.9	QR-02
Surrogate: 1,2-Dichloroethane-d4	66.6		ug/kg	62.5		107	70-130			
Surrogate: Toluene-d8	60.8		"	62.5		97.3	70-130			
Surrogate: 4-Bromofluorobenzene	63.2		"	62.5		101	70-130			

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## Volatile Organic Compounds by GC/MS SW846 8260C - 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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## Extractable Petroleum Hydrocarbons by 8015C - 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 5C30007 - EPA 3580

#### Blank (5C30007-BLK1)

Prepared: 03/30/2015 Analyzed: 03/30/2015

Diesel (C10-C28)	ND	50	mg/kg							
Residual Range Organics (C28-C36)	ND	200	"							
Surrogate: o-Terphenyl	45		"	50.0		90.1	59-131			

#### LCS (5C30007-BS1)

Prepared: 03/30/2015 Analyzed: 03/30/2015

Diesel (C10-C28)	920	50	mg/kg	1000		92.0	64-121			
Residual Range Organics (C28-C36)	630	200	"	1000		62.9	58-124			
Surrogate: o-Terphenyl	46		"	50.0		92.9	59-131			

#### Matrix Spike (5C30007-MS1)

Source: X503355-01

Prepared: 03/30/2015 Analyzed: 03/30/2015

Diesel (C10-C28)	1100	50	mg/kg	1000	160	90.4	53-125			
Residual Range Organics (C28-C36)	770	200	"	1000	ND	77.1	47-133			
Surrogate: o-Terphenyl	48		"	50.0		95.6	59-131			

#### Matrix Spike Dup (5C30007-MSD1)

Source: X503355-01

Prepared: 03/30/2015 Analyzed: 03/30/2015

Diesel (C10-C28)	1100	50	mg/kg	1000	160	90.5	53-125	0.104	20	
Residual Range Organics (C28-C36)	760	200	"	1000	ND	76.4	47-133	0.932	20	
Surrogate: o-Terphenyl	45		"	50.0		89.2	59-131			

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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
<b>Batch 5C30008 - NO PREP</b>										
<b>Blank (5C30008-BLK1)</b>					Prepared: 03/30/2015 Analyzed: 03/30/2015					
Specific Conductance (EC)	0.00310		mmhos/cm							
<b>Duplicate (5C30008-DUP1)</b>					<b>Source: X503081-01</b> Prepared: 03/30/2015 Analyzed: 03/30/2015					
Specific Conductance (EC)	0.154		mmhos/cm		0.156			1.42	25	
<b>Batch 5C30009 - NO PREP</b>										
<b>Duplicate (5C30009-DUP1)</b>					<b>Source: X503081-01</b> Prepared: 03/30/2015 Analyzed: 03/30/2015					
pH	8.46		pH Units		8.58			1.41	25	

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Tasman Geosciences

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Christine Wasko

Project Number: 88743945

Project: KMG - UPRR 43 Pan Am O #2

### Notes and Definitions

QR-02 The RPD result exceeded the QC control limits; however, both percent recoveries were acceptable. Sample results for the QC batch were accepted based on percent recoveries and completeness of QC data.

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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