

State of Colorado  
Oil and Gas Conservation Commission

1120 Lincoln Street, Suite 801, Denver, Colorado 80203 (303) 894-2100 Fax 894-2109



FOR OGCC USE ONLY

**SITE INVESTIGATION AND REMEDIATION WORKPLAN**

This form shall be submitted to the Director for approval prior to the initiation of site investigation and remediation activities. Form 27 is intended to be used whenever possible. Additional documentation will be required when large volumes of soil and groundwater have been impacted or involve large facilities with multiple source areas. See Rule 910. Attach as many pages as needed to fully describe the proposed work.

OGCC Employee:

Spill  Complaint  
 Inspection  NOAV

Tracking No:

**CAUSE OF CONDITION BEING INVESTIGATED AND REMEDIATED**

Spill or Release  Plug & Abandon  Central Facility Closure  Site/Facility Closure  Other (describe): \_\_\_\_\_

**GENERAL INFORMATION**

<b>OGCC Operator Number:</b> 47120 <b>Name of Operator:</b> Kerr-McGee Oil and Gas Onshore, LP <b>Address:</b> 1099 18th Street, Suite 1800 <b>City:</b> Denver <b>State:</b> CO <b>Zip:</b> 80202		<b>Contact Name and Telephone</b> <b>Name:</b> Phillip Hamlin <b>No:</b> 970-336-3500 <b>Fax:</b> 970-336-3656	
<b>API/Facility No:</b> 330941 <b>Facility Name:</b> HSR-Ferme Farms <b>Well Name:</b> HSR-Ferme Farms <b>Location (QtrQtr, Sec, Twp, Rng, Meridian):</b> NENE S14 T3N R67W		<b>County:</b> Weld <b>Facility Number:</b> 63N67W14NENE <b>Well Number:</b> 1-14A <b>Latitude:</b> 40.23110 <b>Longitude:</b> -104.85189	

**TECHNICAL CONDITIONS**

Type of Waste Causing Impact (crude oil, condensate, produced water, etc.): Condensate and produced water

Site Conditions: Is location within a sensitive area (according to Rule 901e)?  Y  N If yes, attach evaluation.

Adjacent land use (cultivated, irrigated, dry land farming, industrial, residential, etc.): Crop land

Soil type, if not previously identified on Form 2A or Federal Surface Use Plan: Sand

Potential receptors (water wells within 1/4 mi, surface waters, etc.): The nearest surface water is located approximately 1320' west of the site.  
The nearest water well is located approximately 170' southwest of the release area.

Description of Impact (if previously provided, refer to that form or document):

Impacted Media (check):	Extent of Impact:	How Determined:
<input checked="" type="checkbox"/> Soils	30' (E-W) x 28' (N-S) x 6' bgs	Excavation, soil sampling, and laboratory analysis
<input type="checkbox"/> Vegetation		
<input checked="" type="checkbox"/> Groundwater	See attached data	Groundwater sampling and laboratory analysis
<input type="checkbox"/> Surface water		

**REMEDIATION WORKPLAN**

Describe initial action taken (if previously provided, refer to that form or document):

On September 23, 2015, historical impacts were discovered beneath the produced water sump during tank battery construction activities at the Ferme Farms 63N67W14NENE production facility. The facility was shut in, associated underground infrastructure removed, and excavation activities commenced. Groundwater was encountered in the excavation at approximately 6 feet below ground surface (bgs). An Initial Form 19 was submitted to the COGCC on September 24, 2015 (COGCC Document No. 400905110), and a Supplemental Form 19 was submitted on October 2, 2015 (COGCC Document No. 400908205). The COGCC has issued Spill Tracking number 443306 for this release.

Describe how source is to be removed:

On September 23, 2015, excavation activities commenced and approximately 210 cubic yards of impacted material were excavated; 20 cubic yards were transported to the Buffalo Ridge Landfill in Keenesburg, Colorado for disposal and 190 cubic yards were transported to the Kerr-McGee Land Treatment Facility in Weld County, Colorado. Excavation activities were guided in the field using a photoionization detector (PID) to measure volatile organic compound (VOC) concentrations in soil. Soil samples were collected from the sidewalls of the final extent of the excavation area at approximately 5 feet bgs. Soil samples were submitted to Origins Laboratory in Denver, Colorado for analysis of benzene, toluene, ethylbenzene, total xylenes (BTEX), total petroleum hydrocarbons (TPH) - gasoline range organics (GRO) by USEPA Method 8260, TPH - diesel range organics and oil range organics (DRO and ORO) by USEPA Method 8015, electrical conductivity (EC), and pH. Laboratory results indicated that constituent concentrations in the soil samples collected from the final lateral extent of the excavation area were below the applicable COGCC Table 910-1 standards. Soils were excavated into the phreatic zone to address potential hydrocarbon impacts that may have been present below the current groundwater table due to seasonal fluctuations. Groundwater was encountered in the excavation at approximately 6 feet bgs. Approximately 20 barrels of groundwater were removed via vacuum truck and transported to a licensed injection facility for disposal. A groundwater sample (GW01) was subsequently collected and submitted to Origins Laboratory for analysis of BTEX by USEPA Method 8260. Analytical results received on September 24, 2015, indicated that the benzene, toluene, and total xylenes concentrations in sample GW01 were above the applicable COGCC Table 910-1 groundwater standards. On September 28, 2015, approximately 240 additional barrels of groundwater were removed via vacuum truck and transported to a licensed injection facility for disposal. A second groundwater sample (GW02) was subsequently collected and submitted to Origins Laboratory for analysis of BTEX by USEPA Method 8260. Analytical results received on September 29, 2015, indicated that the benzene concentration in sample GW02 remained above the applicable COGCC Table 910-1 groundwater standard. Soil analytical results are summarized in Table 1 and groundwater analytical results are summarized in Table 2. Soil and excavation groundwater sample locations are illustrated on Figure 1 and laboratory analytical reports are included as Attachment A.

Describe how remediation of existing impacts is to be accomplished, including removal and disposal at an injection well or licensed facility, land treatment on site, removal of impacted groundwater, insitu bioremediation, burning of oily vegetation, etc.:

Impacted soil was excavated and transported to the Buffalo Ridge Landfill in Keenesburg, Colorado and the Kerr-McGee Land Treatment Facility in Weld County, Colorado. Prior to backfilling the excavation, 165 pounds of activated carbon were added to the groundwater table to mitigate remaining hydrocarbon impacts. Additional proposed groundwater remediation measures are described on the following page. The produced water sump was replaced during assessment and remediation activities.

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Tracking Number: Name of Operator: OGCC Operator No: Received Date: Well Name & No.: Facility Name & No.:

REMEDIATION WORKPLAN (CONT.)

OGCC Employee:

If groundwater has been impacted, describe proposed monitoring plan (# of wells or sample points, sampling schedule, analytical methods, etc.): Temporary groundwater monitoring and/or remediation wells will be installed at the site to further assess the extent of groundwater impacts. These wells will be sampled on a quarterly basis and submitted for laboratory analysis of BTEX until concentrations remain below COGCC groundwater standards for four consecutive quarters.

Describe reclamation plan. Discuss existing and new grade recontouring; method and testing of compaction alleviation; and reseeding program, including location of new seed, seed mix and noxious weed prevention. Attach diagram or drawing. Use additional sheet for description if required. The excavation has been backfilled with clean soil and graded to match the adjacent topography. Kerr-McGee's tank battery remains at the site. Reclamation activities at the site will be compliant with COGCC regulations.

Attach samples and analytical results taken to verify remediation of impacts. Show locations of samples on an onsite schematic or drawing. Is further site investigation required? [X] Y [ ] N If yes, describe: Data indicate that impacted soil has been delineated and removed from the site. Temporary monitoring/remediation wells will be installed to further assess groundwater impacts. Soil and groundwater analytical results are summarized in Tables 1 and 2, respectively. The analytical laboratory reports are included as Attachment A.

Final disposition of E&P waste (land treated and disposed onsite, name of licensed disposal facility, recycling, reuse, etc.): Impacted soil was transported to the Buffalo Ridge Landfill in Keenesburg, Colorado and the Kerr-McGee Land Treatment Facility in Weld County, Colorado for disposal. Impacted groundwater was transported to a licensed injection facility for disposal.

IMPLEMENTATION SCHEDULE

Date Site Investigation Began: 9/23/2015 Date Site Investigation Completed: Remediation Plan Submitted: Remediation Start Date: 9/23/2015 Anticipated Completion Date: 1/23/2017 Actual Completion Date:

I hereby certify that the statements made in this form are, to the best of my knowledge, true, correct, and complete.

Print Name: Phillip Hamlin

Signed: [Signature] Title: Senior HSE Representative Date: 1/29/2016

OGCC Approved: Title: Date:

**FIGURE**



DATE: December 2, 2015

DESIGNED BY: D. Wade

DRAWN BY: D. Wade



**Kerr-McGee Oil and Gas Onshore, LP**  
**HSR Ferme Farms 63N67W14NENE**  
 NENE, Section 14, Township 3 North, Range 67 West  
 Weld County, Colorado

Sample Location  
Map

FIGURE  
1

# **TABLES**

**TABLE 1**  
**HSR FERME FARMS 63N67W14NENE**  
**SOIL SAMPLE RESULTS SUMMARY TABLE**  
**KERR-McGEE OIL AND GAS ONSHORE LP**

Sample ID	Date	Depth (ft. 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)	EC (mmhos/cm)	pH (units)
<b>COGCC standards for soil (mg/kg) <sup>(1)</sup></b>			<b>0.17</b>	<b>85</b>	<b>100</b>	<b>175</b>	<b>500</b>			<b>4 or 2x BG</b>	<b>6-9</b>
S01@5'	09/23/15	5.0	<0.050	9.47	4.12	74.8	<b>491</b>	<b>470</b>	<200	0.0312	7.67
E01@5'	09/23/15	5.0	<0.050	0.108	<0.050	0.250	<5.00	<50	<200	0.0344	7.56
N02@5'	09/25/15	5.0	<0.002	<0.002	<0.002	<0.002	<0.200	<50	<200	0.0114	8.51
W02@5'	09/25/15	5.0	<0.002	<0.002	<0.002	0.005	<0.200	<50	<200	0.0436	8.18
S02@5'	09/28/15	5.0	<0.002	<0.002	<0.002	<0.002	<0.200	<50	<200	0.0167	8.25

**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

EC = Electrical conductivity

BG = Background

mmhos/cm = Millimhos per centimeter

mg/kg = Milligrams per kilogram.

ft. bgs = Feet below ground surface.

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

**TABLE 2**  
**HSR FERME FARMS 63N67W14NENE**  
**GROUNDWATER RESULTS SUMMARY TABLE**  
**KERR-McGEE OIL AND GAS ONSHORE LP**

Sample ID	Date	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	Total Xylenes (µg/L)	Depth To Water (ft. bgs)
<b>COGCC Standards for groundwater (µg/L) <sup>(1)</sup></b>		<b>5</b>	<b>560</b>	<b>700</b>	<b>1,400</b>	
GW01	09/23/15	<b>55.2</b>	<b>627</b>	29.7	<b>1,400</b>	~6
GW02	09/28/15	<b>36.8</b>	462	57.8	1,040	~6

**Notes:**

1. Standards for groundwater 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.

µg/L = Micrograms per liter.

ft. bgs = Feet below ground surface.

**BOLD** = Analytical result is in exceedance of COGCC Table 910-1 groundwater standards.

**ATTACHMENT A**  
**LABORATORY ANALYTICAL DATA**

September 24, 2015

Tasman Geosciences

Christine Wasko

6899 Pecos Street, Unit C

Denver

CO 80211

**Project Name - KMG - Ferme Farms 1-14**

**Project Number - [none]**

Attached are your analytical results for KMG - Ferme Farms 1-14 received by Origins Laboratory, Inc. September 23, 2015. This project is associated with Origins project number X509308-01.

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 - Ferme Farms 1-14

CROSS REFERENCE REPORT

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
S01 @ 5'	X509308-01	Soil	September 23, 2015 10:26	09/23/2015 16:30
E01 @ 5'	X509308-02	Soil	September 23, 2015 10:28	09/23/2015 16:30
GW01	X509308-03	Water	September 23, 2015 10:40	09/23/2015 16:30

Origins Laboratory, Inc.



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Tasman Geosciences  
 6899 Pecos Street, Unit C  
 Denver CO 80211

Christine Wasko  
 Project Number: [none]  
 Project: KMG - Ferme Farms 1-14

Origins Laboratory

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

**Sample Receipt Checklist**

Origins Work Order: X509308

Client: Tasman

Client Project ID: Ferme Farms 1-14

Checklist Completed by: Jeff Smith

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

Date/time completed: 9/23/15

Airbill #: N/A

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

Cooler Number/Temperature: 1 / 3.1 °C 1 / \_\_\_\_\_ °C 1 / \_\_\_\_\_ °C 1 / \_\_\_\_\_ °C (Describe)

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> ?	X			
Is there ice present (document if blue ice is used)	X			
Are custody seals present on cooler? (if so, document in comments if they are signed and dated, broken or intact)		X		
Are custody seals present on each sample container? (if so, document in comments if they are signed and dated, broken or intact)		X		
Were all samples received intact <sup>(1)</sup> ?	X			
Was adequate sample volume provided <sup>(1)</sup> ?	X			
Are short holding time analytes or samples with HTs due within 48 hours present <sup>(1)</sup> ?	X			PH
Is a chain-of-custody (COC) present and filled out completely <sup>(1)</sup> ?	X			
Does the COC agree with the number and type of sample bottles received <sup>(1)</sup> ?	X			
Do the sample IDs on the bottle labels match the COC <sup>(1)</sup> ?	X			
Is the COC properly relinquished by the client with date and time recorded <sup>(1)</sup> ?	X			
For volatiles in water – is there headspace (> ¼ inch bubble) present? If yes, contact client and note in narrative.		X		
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 HNO3, HCL, H2SO4) / (pH >10 for samples preserved with NaAsO2+NaOH, ZnAc+NaOH)	X			HCL
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 in the additional comments (above) and the case narrative.

Jeff Smith  
 Reviewed by (Project Manager)

9/23/15  
 Date/Time Reviewed

Origins Laboratory, Inc.



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 6899 Pecos Street, Unit C  
 Denver CO 80211

Christine Wasko  
 Project Number: [none]  
 Project: KMG - Ferme Farms 1-14

**S01 @ 5'**  
**9/23/2015 10:26:00AM**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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**Origins Laboratory, Inc.**  
**X509308-01 (Soil)**

**DRO/RRO by EPA8015C**

Diesel (C10-C28)	470	50	mg/kg	1	5123008	09/23/2015	09/23/2015	
Residual Range Organics (C28-C36)	ND	200	"	"	"	"	"	

Surrogate: *o*-Terphenyl 74.8 % 59-131 " " "

**GBTEX by EPA 8260C**

Gasoline Range Hydrocarbons	491	5.00	mg/kg	25	5123007	09/23/2015	09/24/2015	
Benzene	ND	0.050	"	"	"	"	"	
Toluene	9.47	0.050	"	"	"	"	"	
Ethylbenzene	4.12	0.050	"	"	"	"	"	
Xylenes, total	74.8	0.498	"	250	"	"	09/24/2015	

Surrogate: 1,2-Dichloroethane-d4 104 % 70-130 " " 09/24/2015  
 Surrogate: Toluene-d8 110 % 70-130 " " "  
 Surrogate: 4-Bromofluorobenzene 116 % 70-130 " " "

**pH in Soil by EPA 9045D**

pH	7.67		pH Units	1	5123014	09/23/2015	09/23/2015	
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**Specific Conductance by Modified 9050A**

Specific Conductance (EC)	0.0312		mmhos/cm	"	5123015	"	"	
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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 - Ferme Farms 1-14

**E01 @ 5'**  
**9/23/2015 10:28:00AM**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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**Origins Laboratory, Inc.**  
**X509308-02 (Soil)**

**DRO/RRO by EPA8015C**

Diesel (C10-C28)	ND	50	mg/kg	1	5123008	09/23/2015	09/23/2015	
Residual Range Organics (C28-C36)	ND	200	"	"	"	"	"	

*Surrogate: o-Terphenyl* 69.5 % 59-131 " " "

**GBTEX by EPA 8260C**

Gasoline Range Hydrocarbons	ND	5.00	mg/kg	25	5123007	09/23/2015	09/24/2015	
Benzene	ND	0.050	"	"	"	"	"	
Toluene	<b>0.108</b>	0.050	"	"	"	"	"	
Ethylbenzene	ND	0.050	"	"	"	"	"	
Xylenes, total	<b>0.250</b>	0.050	"	"	"	"	"	

*Surrogate: 1,2-Dichloroethane-d4* 98.5 % 70-130 " " "  
*Surrogate: Toluene-d8* 95.8 % 70-130 " " "  
*Surrogate: 4-Bromofluorobenzene* 101 % 70-130 " " "

**pH in Soil by EPA 9045D**

pH	7.56		pH Units	1	5123014	09/23/2015	09/23/2015	
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**Specific Conductance by Modified 9050A**

Specific Conductance (EC)	<b>0.0344</b>		mmhos/cm	"	5123015	"	"	
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Origins Laboratory, Inc.



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 6899 Pecos Street, Unit C  
 Denver CO 80211

Christine Wasko  
 Project Number: [none]  
 Project: KMG - Ferme Farms 1-14

**GW01**  
**9/23/2015 10:40:00AM**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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**Origins Laboratory, Inc.**  
**X509308-03 (Water)**

**BTEX by EPA 8260C**

Benzene	55.2	1.0	ug/L	1	5123010	09/23/2015	09/23/2015	
Toluene	627	10.0	"	10	"	"	09/23/2015	
Ethylbenzene	29.7	1.0	"	1	"	"	09/23/2015	
Xylenes, total	1400	10.0	"	10	"	"	09/23/2015	
Surrogate: 1,2-Dichloroethane-d4	103 %	84-121			"	"	09/23/2015	
Surrogate: Toluene-d8	107 %	85-115			"	"	"	
Surrogate: 4-Bromofluorobenzene	99.2 %	84-114			"	"	"	

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 Denver CO 80211

Christine Wasko  
 Project Number: [none]  
 Project: KMG - Ferme Farms 1-14

**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 5123007 - EPA 5030 (soil)**

**Blank (5123007-BLK1)**

Prepared: 09/23/2015 Analyzed: 09/23/2015

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	64.5		ug/kg	62.5		103	70-130			
Surrogate: Toluene-d8	59.8		"	62.5		95.6	70-130			
Surrogate: 4-Bromofluorobenzene	60.7		"	62.5		97.1	70-130			

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Christine Wasko  
 Project Number: [none]  
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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 5123007 - EPA 5030 (soil)**

**LCS (5123007-BS1)**

Prepared: 09/23/2015 Analyzed: 09/23/2015

Benzene	0.098	0.002	mg/kg	0.100		97.8	77.1-124			
Toluene	0.097	0.002	"	0.100		96.7	74.5-128			
Ethylbenzene	0.108	0.002	"	0.100		108	66.4-127			
m,p-Xylene	0.210	0.004	"	0.200		105	76.6-124			
o-Xylene	0.108	0.002	"	0.100		108	76.6-124			
Surrogate: 1,2-Dichloroethane-d4	64.5		ug/kg	62.5		103	70-130			
Surrogate: Toluene-d8	60.2		"	62.5		96.4	70-130			
Surrogate: 4-Bromofluorobenzene	63.6		"	62.5		102	70-130			

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Christine Wasko  
 Project Number: [none]  
 Project: KMG - Ferme Farms 1-14

**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 5123007 - EPA 5030 (soil)

Matrix Spike (5123007-MS1)	Source: X509303-01			Prepared: 09/23/2015 Analyzed: 09/23/2015						
Benzene	0.109	0.002	mg/kg	0.100	ND	109	71.8-126			
Toluene	0.108	0.002	"	0.100	ND	108	65.1-130			
Ethylbenzene	0.113	0.002	"	0.100	ND	113	62.2-130			
m,p-Xylene	0.230	0.004	"	0.200	ND	115	46.5-137			
o-Xylene	0.115	0.002	"	0.100	ND	115	54.2-134			
Surrogate: 1,2-Dichloroethane-d4	66.6		ug/kg	62.5		107	70-130			
Surrogate: Toluene-d8	61.2		"	62.5		97.9	70-130			
Surrogate: 4-Bromofluorobenzene	64.6		"	62.5		103	70-130			

Origins Laboratory, Inc.



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Christine Wasko  
 Project Number: [none]  
 Project: KMG - Ferme Farms 1-14

**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 5123007 - EPA 5030 (soil)

Matrix Spike Dup (5123007-MSD1)	Source: X509303-01			Prepared: 09/23/2015 Analyzed: 09/23/2015						
Benzene	0.106	0.002	mg/kg	0.100	ND	106	71.8-126	2.67	11.3	
Toluene	0.103	0.002	"	0.100	ND	103	65.1-130	4.28	15.4	
Ethylbenzene	0.106	0.002	"	0.100	ND	106	62.2-130	6.83	19.6	
m,p-Xylene	0.215	0.004	"	0.200	ND	107	46.5-137	6.77	19.2	
o-Xylene	0.109	0.002	"	0.100	ND	109	54.2-134	5.13	17.9	
Surrogate: 1,2-Dichloroethane-d4	68.2		ug/kg	62.5		109	70-130			
Surrogate: Toluene-d8	60.4		"	62.5		96.6	70-130			
Surrogate: 4-Bromofluorobenzene	65.3		"	62.5		105	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 - Ferme Farms 1-14

**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 5123010 - EPA 5030B (Water)**

**Blank (5123010-BLK1)**

Prepared: 09/23/2015 Analyzed: 09/23/2015

Benzene	ND	1.0	ug/L							
Toluene	ND	1.0	"							
Ethylbenzene	ND	1.0	"							
Xylenes, total	ND	1.0	"							
Surrogate: 1,2-Dichloroethane-d4	64		"	62.5		102	84-121			
Surrogate: Toluene-d8	63		"	62.5		101	85-115			
Surrogate: 4-Bromofluorobenzene	61		"	62.5		98.2	84-114			

Origins Laboratory, Inc.



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Tasman Geosciences  
 6899 Pecos Street, Unit C  
 Denver CO 80211

Christine Wasko  
 Project Number: [none]  
 Project: KMG - Ferme Farms 1-14

**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 5123010 - EPA 5030B (Water)**

**LCS (5123010-BS1)**

Prepared: 09/23/2015 Analyzed: 09/23/2015

Benzene	103	1.0	ug/L	100		103	75-126			
Toluene	103	1.0	"	100		103	78.7-126			
Ethylbenzene	103	1.0	"	100		103	80-130			
m,p-Xylene	209	2.0	"	200		104	77.2-133			
o-Xylene	105	1.0	"	100		105	77.9-126			
Surrogate: 1,2-Dichloroethane-d4	63		"	62.5		101	84-121			
Surrogate: Toluene-d8	62		"	62.5		98.7	85-115			
Surrogate: 4-Bromofluorobenzene	62		"	62.5		99.3	84-114			

Origins Laboratory, Inc.



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Tasman Geosciences  
 6899 Pecos Street, Unit C  
 Denver CO 80211

Christine Wasko  
 Project Number: [none]  
 Project: KMG - Ferme Farms 1-14

**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 5123010 - EPA 5030B (Water)**

<b>Matrix Spike (5123010-MS1)</b>	<b>Source: X509255-01</b>			<b>Prepared: 09/23/2015 Analyzed: 09/23/2015</b>						
Benzene	53.6	1.0	ug/L	50.0	ND	107	74-130			
Toluene	52.4	1.0	"	50.0	ND	105	73-131			
Ethylbenzene	54.5	1.0	"	50.0	ND	109	76-132			
m,p-Xylene	109	2.0	"	100	ND	109	69-139			
o-Xylene	53.2	1.0	"	50.0	ND	106	74-131			
Surrogate: 1,2-Dichloroethane-d4	63		"	62.5		101	84-121			
Surrogate: Toluene-d8	62		"	62.5		99.6	85-115			
Surrogate: 4-Bromofluorobenzene	62		"	62.5		98.9	84-114			

Origins Laboratory, Inc.



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Tasman Geosciences  
 6899 Pecos Street, Unit C  
 Denver CO 80211

Christine Wasko  
 Project Number: [none]  
 Project: KMG - Ferme Farms 1-14

**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 5123010 - EPA 5030B (Water)**

<b>Matrix Spike Dup (5123010-MSD1)</b>	<b>Source: X509255-01</b>			<b>Prepared: 09/23/2015 Analyzed: 09/23/2015</b>						
Benzene	52.2	1.0	ug/L	50.0	ND	104	74-130	2.53	20	
Toluene	51.6	1.0	"	50.0	ND	103	73-131	1.56	20	
Ethylbenzene	53.2	1.0	"	50.0	ND	106	76-132	2.51	20	
m,p-Xylene	106	2.0	"	100	ND	106	69-139	2.31	20	
o-Xylene	53.5	1.0	"	50.0	ND	107	74-131	0.506	20	
Surrogate: 1,2-Dichloroethane-d4	64		"	62.5		102	84-121			
Surrogate: Toluene-d8	63		"	62.5		100	85-115			
Surrogate: 4-Bromofluorobenzene	63		"	62.5		101	84-114			

Origins Laboratory, Inc.



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Tasman Geosciences  
 6899 Pecos Street, Unit C  
 Denver CO 80211

Christine Wasko  
 Project Number: [none]  
 Project: KMG - Ferme Farms 1-14

**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 5I23008 - EPA 3580**

**Blank (5I23008-BLK1)**

Prepared: 09/23/2015 Analyzed: 09/23/2015

Diesel (C10-C28)	ND	50	mg/kg							
Residual Range Organics (C28-C36)	ND	200	"							
Surrogate: o-Terphenyl	48		"	50.0		96.7	59-131			

**LCS (5I23008-BS1)**

Prepared: 09/23/2015 Analyzed: 09/23/2015

Diesel (C10-C28)	900	50	mg/kg	1000		90.1	64-121			
Residual Range Organics (C28-C36)	990	200	"	1000		99.0	58-124			
Surrogate: o-Terphenyl	52		"	50.0		103	59-131			

**Matrix Spike (5I23008-MS1)**

**Source: X509303-01**

Prepared: 09/23/2015 Analyzed: 09/23/2015

Diesel (C10-C28)	1000	50	mg/kg	1000	130	88.9	53-125			
Residual Range Organics (C28-C36)	790	200	"	1000	70	72.0	47-133			
Surrogate: o-Terphenyl	46		"	50.0		91.2	59-131			

**Matrix Spike Dup (5I23008-MSD1)**

**Source: X509303-01**

Prepared: 09/23/2015 Analyzed: 09/23/2015

Diesel (C10-C28)	1000	50	mg/kg	1000	130	91.7	53-125	2.72	20	
Residual Range Organics (C28-C36)	950	200	"	1000	70	87.7	47-133	18.0	20	
Surrogate: o-Terphenyl	49		"	50.0		97.3	59-131			

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 6899 Pecos Street, Unit C  
 Denver CO 80211

Christine Wasko  
 Project Number: [none]  
 Project: KMG - Ferme Farms 1-14

**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 5123014 - NO PREP</b>										
<b>Duplicate (5123014-DUP1)</b>		<b>Source: X509308-01</b>			Prepared: 09/23/2015 Analyzed: 09/23/2015					
pH	7.59		pH Units		7.67			1.05	25	
<b>Batch 5123015 - NO PREP</b>										
<b>Blank (5123015-BLK1)</b>		Prepared: 09/23/2015 Analyzed: 09/23/2015								
Specific Conductance (EC)	0.00390		mmhos/cm							
<b>Duplicate (5123015-DUP1)</b>		<b>Source: X509308-01</b>			Prepared: 09/23/2015 Analyzed: 09/23/2015					
Specific Conductance (EC)	0.0352		mmhos/cm		0.0312			12.0	25	

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Tasman Geosciences  
6899 Pecos Street, Unit C  
Denver CO 80211

Christine Wasko  
Project Number: [none]  
Project: KMG - Ferme Farms 1-14

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**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.*

September 27, 2015

Tasman Geosciences

Christine Wasko

6899 Pecos Street, Unit C

Denver CO 80211

Project Name - KMG - Ferme Farms 1-14

Project Number - [none]

Attached are your analytical results for KMG - Ferme Farms 1-14 received by Origins Laboratory, Inc. September 25, 2015. This project is associated with Origins project number X509343-01.

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 - Ferme Farms 1-14

CROSS REFERENCE REPORT

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
N02 @ 5'	X509343-01	Soil	September 25, 2015 13:42	09/25/2015 17:30
W02 @ 5'	X509343-02	Soil	September 25, 2015 13:40	09/25/2015 17:30

Origins Laboratory, Inc.



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Noelle Doyle Mathis, President



Tasman Geosciences  
 6899 Pecos Street, Unit C  
 Denver CO 80211

Christine Wasko  
 Project Number: [none]  
 Project: KMG - Ferme Farms 1-14

Origins Laboratory

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

**Sample Receipt Checklist**

Origins Work Order: X509343 Client: Tasman  
 Client Project ID: Ferme Farms 1-14  
 Checklist Completed by: Jeff Smith Shipped Via: Pick Up  
 (UPS, FedEx, Hand Delivered, Pick-up, etc.)  
 Date/time completed: 9/25/13 Airbill #: NA  
 Matrix(s) Received: (Check all that apply):  Soil/Solid  Water  Other: \_\_\_\_\_  
 Cooler Number/Temperature: 1 / 4.0 °C 1 °C 1 °C 1 °C (Describe)  
 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> ?	X			
Is there ice present (document if blue ice is used)	X			
Are custody seals present on cooler? (if so, document in comments if they are signed and dated, broken or intact)		✓		
Are custody seals present on each sample container? (if so, document in comments if they are signed and dated, broken or intact)		✓		
Were all samples received intact <sup>(1)</sup> ?	✓			
Was adequate sample volume provided <sup>(1)</sup> ?	✓			
Are short holding time analytes or samples with HTs due within 48 hours present <sup>(1)</sup> ?	X			PH
Is a chain-of-custody (COC) present and filled out completely <sup>(1)</sup> ?	✓			
Does the COC agree with the number and type of sample bottles received <sup>(1)</sup> ?	✓			
Do the sample IDs on the bottle labels match the COC <sup>(1)</sup> ?	✓			
Is the COC properly relinquished by the client with date and time recorded <sup>(1)</sup> ?	X			
For volatiles in water – is there headspace (> ¼ inch bubble) present? If yes, contact client and note in narrative.			X	
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 HNO3, HCL, H2SO4) / (pH >10 for samples preserved with NaAsO2+NaOH, ZnAc+NaOH)			✓	
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.

Jess Smith Reviewed by (Project Manager) 9/25/13 Date/Time Reviewed

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 - Ferme Farms 1-14

N02 @ 5'  
 9/25/2015 1:42:00PM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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Origins Laboratory, Inc.  
 X509343-01 (Soil)

**DRO/RRO by EPA8015C**

Diesel (C10-C28)	ND	50	mg/kg	1	5125012	09/25/2015	09/25/2015	
Residual Range Organics (C28-C36)	ND	200	"	"	"	"	"	

*Surrogate: o-Terphenyl* 84.2 % 59-131 " " "

**GBTEX by EPA 8260C**

Gasoline Range Hydrocarbons	ND	0.200	mg/kg	1	5125013	09/25/2015	09/26/2015	
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* 96.9 % 70-130 " " "  
*Surrogate: 4-Bromofluorobenzene* 102 % 70-130 " " "

**pH in Soil by EPA 9045D**

pH	8.51		pH Units	1	5125014	09/25/2015	09/25/2015	
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**Specific Conductance by Modified 9050A**

Specific Conductance (EC)	0.0114		mmhos/cm	"	5125015	09/25/2015	09/25/2015	
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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 - Ferme Farms 1-14

W02 @ 5'  
 9/25/2015 1:40:00PM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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Origins Laboratory, Inc.  
 X509343-02 (Soil)

**DRO/RRO by EPA8015C**

Diesel (C10-C28)	ND	50	mg/kg	1	5125012	09/25/2015	09/25/2015	
Residual Range Organics (C28-C36)	ND	200	"	"	"	"	"	
<i>Surrogate: o-Terphenyl</i>	78.6 %	59-131			"	"	"	

**GBTEX by EPA 8260C**

Gasoline Range Hydrocarbons	ND	0.200	mg/kg	1	5125013	09/25/2015	09/26/2015	
Benzene	ND	0.002	"	"	"	"	"	
Toluene	ND	0.002	"	"	"	"	"	
Ethylbenzene	ND	0.002	"	"	"	"	"	
Xylenes, total	0.005	0.002	"	"	"	"	"	
<i>Surrogate: 1,2-Dichloroethane-d4</i>	105 %	70-130			"	"	"	
<i>Surrogate: Toluene-d8</i>	97.4 %	70-130			"	"	"	
<i>Surrogate: 4-Bromofluorobenzene</i>	101 %	70-130			"	"	"	

**pH in Soil by EPA 9045D**

pH	8.18		pH Units	1	5125014	09/25/2015	09/25/2015	
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**Specific Conductance by Modified 9050A**

Specific Conductance (EC)	0.0436		mmhos/cm	"	5125015	09/25/2015	09/25/2015	
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Tasman Geosciences  
 6899 Pecos Street, Unit C  
 Denver CO 80211

Christine Wasko  
 Project Number: [none]  
 Project: KMG - Ferme Farms 1-14

**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 5125013 - EPA 5030 (soil)

**Blank (5125013-BLK1)**

Prepared: 09/25/2015 Analyzed: 09/25/2015

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	"							
<i>Surrogate: 1,2-Dichloroethane-d4</i>	<i>66.2</i>		<i>ug/kg</i>	<i>62.5</i>		<i>106</i>	<i>70-130</i>			
<i>Surrogate: Toluene-d8</i>	<i>58.6</i>		<i>"</i>	<i>62.5</i>		<i>93.7</i>	<i>70-130</i>			
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>63.7</i>		<i>"</i>	<i>62.5</i>		<i>102</i>	<i>70-130</i>			

Origins Laboratory, Inc.



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Noelle Doyle Mathis, President

Tasman Geosciences  
 6899 Pecos Street, Unit C  
 Denver CO 80211

Christine Wasko  
 Project Number: [none]  
 Project: KMG - Ferme Farms 1-14

**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 5125013 - EPA 5030 (soil)

LCS (5125013-BS1)

Prepared: 09/25/2015 Analyzed: 09/25/2015

Benzene	0.097	0.002	mg/kg	0.100		96.6	77.1-124			
Toluene	0.097	0.002	"	0.100		96.6	74.5-128			
Ethylbenzene	0.104	0.002	"	0.100		104	66.4-127			
m,p-Xylene	0.208	0.004	"	0.200		104	76.6-124			
o-Xylene	0.106	0.002	"	0.100		106	76.6-124			
<i>Surrogate: 1,2-Dichloroethane-d4</i>	<i>65.5</i>		<i>ug/kg</i>	<i>62.5</i>		<i>105</i>	<i>70-130</i>			
<i>Surrogate: Toluene-d8</i>	<i>59.0</i>		<i>"</i>	<i>62.5</i>		<i>94.4</i>	<i>70-130</i>			
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>62.7</i>		<i>"</i>	<i>62.5</i>		<i>100</i>	<i>70-130</i>			

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Tasman Geosciences  
 6899 Pecos Street, Unit C  
 Denver CO 80211

Christine Wasko  
 Project Number: [none]  
 Project: KMG - Ferme Farms 1-14

**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 5125013 - EPA 5030 (soil)

Matrix Spike (5125013-MS1)	Source: X509328-01			Prepared: 09/25/2015 Analyzed: 09/25/2015						
Benzene	0.100	0.002	mg/kg	0.100	ND	100	71.8-126			
Toluene	0.100	0.002	"	0.100	ND	99.7	65.1-130			
Ethylbenzene	0.109	0.002	"	0.100	ND	109	62.2-130			
m,p-Xylene	0.214	0.004	"	0.200	ND	107	46.5-137			
o-Xylene	0.108	0.002	"	0.100	ND	108	54.2-134			
Surrogate: 1,2-Dichloroethane-d4	66.1		ug/kg	62.5		106	70-130			
Surrogate: Toluene-d8	60.2		"	62.5		96.3	70-130			
Surrogate: 4-Bromofluorobenzene	63.4		"	62.5		101	70-130			

Origins Laboratory, Inc.



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Tasman Geosciences  
 6899 Pecos Street, Unit C  
 Denver CO 80211

Christine Wasko  
 Project Number: [none]  
 Project: KMG - Ferme Farms 1-14

**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 5125013 - EPA 5030 (soil)

Matrix Spike Dup (5125013-MSD1)	Source: X509328-01			Prepared: 09/25/2015 Analyzed: 09/25/2015						
Benzene	0.100	0.002	mg/kg	0.100	ND	99.8	71.8-126	0.679	11.3	
Toluene	0.098	0.002	"	0.100	ND	98.4	65.1-130	1.27	15.4	
Ethylbenzene	0.110	0.002	"	0.100	ND	110	62.2-130	0.110	19.6	
m,p-Xylene	0.216	0.004	"	0.200	ND	108	46.5-137	0.817	19.2	
o-Xylene	0.108	0.002	"	0.100	ND	108	54.2-134	0.704	17.9	
<i>Surrogate: 1,2-Dichloroethane-d4</i>	<i>66.6</i>		<i>ug/kg</i>	<i>62.5</i>		<i>107</i>	<i>70-130</i>			
<i>Surrogate: Toluene-d8</i>	<i>58.2</i>		<i>"</i>	<i>62.5</i>		<i>93.1</i>	<i>70-130</i>			
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>62.9</i>		<i>"</i>	<i>62.5</i>		<i>101</i>	<i>70-130</i>			

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 Denver CO 80211

Christine Wasko  
 Project Number: [none]  
 Project: KMG - Ferme Farms 1-14

**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 5125012 - EPA 3580**

**Blank (5125012-BLK1)**

Prepared: 09/25/2015 Analyzed: 09/25/2015

Diesel (C10-C28)	ND	50	mg/kg							
Residual Range Organics (C28-C36)	ND	200	"							
<i>Surrogate: o-Terphenyl</i>	38		"	50.0		75.9	59-131			

**LCS (5125012-BS1)**

Prepared: 09/25/2015 Analyzed: 09/25/2015

Diesel (C10-C28)	830	50	mg/kg	1000		83.3	64-121			
Residual Range Organics (C28-C36)	950	200	"	1000		94.8	58-124			
<i>Surrogate: o-Terphenyl</i>	47		"	50.0		93.2	59-131			

**Matrix Spike (5125012-MS1)**

Source: X509328-01

Prepared: 09/25/2015 Analyzed: 09/25/2015

Diesel (C10-C28)	870	50	mg/kg	1000	ND	87.2	53-125			
Residual Range Organics (C28-C36)	950	200	"	1000	16	93.1	47-133			
<i>Surrogate: o-Terphenyl</i>	44		"	50.0		88.9	59-131			

**Matrix Spike Dup (5125012-MSD1)**

Source: X509328-01

Prepared: 09/25/2015 Analyzed: 09/25/2015

Diesel (C10-C28)	860	50	mg/kg	1000	ND	85.6	53-125	1.91	20	
Residual Range Organics (C28-C36)	920	200	"	1000	16	90.8	47-133	2.54	20	
<i>Surrogate: o-Terphenyl</i>	44		"	50.0		88.7	59-131			

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Christine Wasko  
 Project Number: [none]  
 Project: KMG - Ferme Farms 1-14

**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 5125014 - NO PREP</b>										
<b>Duplicate (5125014-DUP1)</b>		<b>Source: X509328-01</b>			<b>Prepared: 09/25/2015 Analyzed: 09/25/2015</b>					
pH	6.26		pH Units		6.12			2.26	25	
<b>Batch 5125015 - NO PREP</b>										
<b>Blank (5125015-BLK1)</b>		<b>Prepared: 09/25/2015 Analyzed: 09/25/2015</b>								
Specific Conductance (EC)	0.00370		mmhos/cm							
<b>Duplicate (5125015-DUP1)</b>		<b>Source: X509328-01</b>			<b>Prepared: 09/25/2015 Analyzed: 09/25/2015</b>					
Specific Conductance (EC)	0.0548		mmhos/cm		0.0595			8.22	25	

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Denver CO 80211

Christine Wasko  
Project Number: [none]  
Project: KMG - Ferme Farms 1-14

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**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.

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---

Noelle Doyle Mathis, President

September 29, 2015

Tasman Geosciences

Christine Wasko

6899 Pecos Street, Unit C

Denver CO 80211

**Project Name - KMG - Ferme Farms 1-14**

**Project Number - [none]**

Attached are your analytical results for KMG - Ferme Farms 1-14 received by Origins Laboratory, Inc. September 28, 2015. This project is associated with Origins project number X509365-01.

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 - Ferme Farms 1-14

CROSS REFERENCE REPORT

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
S02 @ 5'	X509365-01	Soil	September 28, 2015 13:10	09/28/2015 16:15
GW02	X509365-02	Water	September 28, 2015 13:20	09/28/2015 16:15

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Jen Pellegrini For Noelle Doyle Mathis, President



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 Denver CO 80211

Christine Wasko  
 Project Number: [none]  
 Project: KMG - Ferme Farms 1-14

Origins Laboratory

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

**Sample Receipt Checklist**

Origins Work Order: XS09365 Client: Tasman  
 Client Project ID: Ferme Farms 1-14  
 Checklist Completed by: JFF Smith Shipped Via: Pick Up  
 Date/time completed: 9/25/15 (UPS, FedEx, Hand Delivered, Pick-up, etc.)  
 Airbill #: NA  
 Matrix(s) Received: (Check all that apply):  Soil/Solid  Water  Other: \_\_\_\_\_  
 Cooler Number/Temperature: 1 / 38 °C 1 °C 1 °C 1 °C (Describe)  
 Thermometer ID: 703

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>	X			
Is there ice present (document if blue ice is used)	X			
Are custody seals present on cooler? (if so, document in comments if they are signed and dated, broken or intact)		X		
Are custody seals present on each sample container? (if so, document in comments if they are signed and dated, broken or intact)		X		
Were all samples received intact <sup>(1)?</sup>	X			
Was adequate sample volume provided <sup>(1)?</sup>	X			
Are short holding time analytes or samples with HTs due within 48 hours present <sup>(1)?</sup>	X			PH
Is a chain-of-custody (COC) present and filled out completely <sup>(1)?</sup>	X			
Does the COC agree with the number and type of sample bottles received <sup>(1)?</sup>	X			
Do the sample IDs on the bottle labels match the COC <sup>(1)?</sup>	X			
Is the COC properly relinquished by the client with date and time recorded <sup>(1)?</sup>	X			
For volatiles in water – is there headspace (> ¼ inch bubble) present? If yes, contact client and note in narrative.		X		4/2/15 CB
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)	X			HCL
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.

JFF Smith 9/25/15  
 Reviewed by (Project Manager) Date/Time Reviewed

Origins Laboratory, Inc.



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 Denver CO 80211

Christine Wasko  
 Project Number: [none]  
 Project: KMG - Ferme Farms 1-14

**S02 @ 5'**  
**9/28/2015 1:10:00PM**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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**Origins Laboratory, Inc.**  
**X509365-01 (Soil)**

**DRO/RRO by EPA8015C**

Diesel (C10-C28)	ND	50	mg/kg	1	5128008	09/28/2015	09/28/2015	
Residual Range Organics (C28-C36)	ND	200	"	"	"	"	"	

*Surrogate: o-Terphenyl* 89.4 % 59-131 " " "

**GBTEX by EPA 8260C**

Gasoline Range Hydrocarbons	ND	0.200	mg/kg	1	5128007	09/28/2015	09/28/2015	
Benzene	ND	0.002	"	"	"	"	"	
Toluene	ND	0.002	"	"	"	"	"	
Ethylbenzene	ND	0.002	"	"	"	"	"	
Xylenes, total	ND	0.002	"	"	"	"	"	

*Surrogate: 1,2-Dichloroethane-d4* 99.1 % 70-130 " " "  
*Surrogate: Toluene-d8* 97.5 % 70-130 " " "  
*Surrogate: 4-Bromofluorobenzene* 104 % 70-130 " " "

**pH in Soil by EPA 9045D**

pH	8.25		pH Units	1	5128014	09/28/2015	09/28/2015	
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**Specific Conductance by Modified 9050A**

Specific Conductance (EC)	0.0167		mmhos/cm	"	5128015	09/28/2015	"	
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Denver CO 80211

Christine Wasko  
Project Number: [none]  
Project: KMG - Ferme Farms 1-14

**GW02**  
**9/28/2015 1:20:00PM**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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**Origins Laboratory, Inc.**  
**X509365-02 (Water)**

**BTEX by EPA 8260C**

Benzene	36.8	1.0	ug/L	1	5128011	09/28/2015	09/28/2015	
Toluene	462	10.0	"	10	"	"	09/28/2015	
Ethylbenzene	57.8	1.0	"	1	"	"	09/28/2015	
Xylenes, total	1040	10.0	"	10	"	"	09/28/2015	
Surrogate: 1,2-Dichloroethane-d4	97.2 %	84-121			"	"	09/28/2015	
Surrogate: Toluene-d8	107 %	85-115			"	"	"	
Surrogate: 4-Bromofluorobenzene	103 %	84-114			"	"	"	

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Christine Wasko  
 Project Number: [none]  
 Project: KMG - Ferme Farms 1-14

**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 5128007 - EPA 5030 (soil)**

**Blank (5128007-BLK1)**

Prepared: 09/28/2015 Analyzed: 09/28/2015

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	86.9		ug/kg	62.5		139	70-130			
Surrogate: Toluene-d8	58.4		"	62.5		93.4	70-130			
Surrogate: 4-Bromofluorobenzene	57.8		"	62.5		92.5	70-130			

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 Denver CO 80211

Christine Wasko  
 Project Number: [none]  
 Project: KMG - Ferme Farms 1-14

**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 5128007 - EPA 5030 (soil)**

**LCS (5128007-BS1)**

Prepared: 09/28/2015 Analyzed: 09/28/2015

Benzene	0.092	0.002	mg/kg	0.100		91.7	77.1-124			
Toluene	0.094	0.002	"	0.100		93.5	74.5-128			
Ethylbenzene	0.104	0.002	"	0.100		104	66.4-127			
m,p-Xylene	0.205	0.004	"	0.200		102	76.6-124			
o-Xylene	0.102	0.002	"	0.100		102	76.6-124			
Surrogate: 1,2-Dichloroethane-d4	58.6		ug/kg	62.5		93.7	70-130			
Surrogate: Toluene-d8	58.7		"	62.5		93.9	70-130			
Surrogate: 4-Bromofluorobenzene	60.9		"	62.5		97.4	70-130			

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Christine Wasko  
 Project Number: [none]  
 Project: KMG - Ferme Farms 1-14

**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 5128007 - EPA 5030 (soil)

Matrix Spike (5128007-MS1)	Source: X509337-01			Prepared: 09/28/2015 Analyzed: 09/28/2015						
Benzene	2.60	0.050	mg/kg	2.50	ND	104	71.8-126			
Toluene	2.93	0.050	"	2.50	0.384	102	65.1-130			
Ethylbenzene	10.3	0.050	"	2.50	8.55	69.2	62.2-130			
m,p-Xylene	22.2	0.100	"	5.00	40.5	NR	46.5-137			QM-02
o-Xylene	15.9	0.050	"	2.50	24.2	NR	54.2-134			QM-02
Surrogate: 1,2-Dichloroethane-d4	61.1		ug/kg	62.5		97.7	70-130			
Surrogate: Toluene-d8	60.8		"	62.5		97.3	70-130			
Surrogate: 4-Bromofluorobenzene	77.2		"	62.5		123	70-130			

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Christine Wasko  
 Project Number: [none]  
 Project: KMG - Ferme Farms 1-14

**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 5128007 - EPA 5030 (soil)

Matrix Spike Dup (5128007-MSD1)	Source: X509337-01			Prepared: 09/28/2015 Analyzed: 09/28/2015						
Benzene	2.30	0.050	mg/kg	2.50	ND	91.9	71.8-126	12.4	11.3	QR-02
Toluene	2.57	0.050	"	2.50	0.384	87.3	65.1-130	13.3	15.4	
Ethylbenzene	9.54	0.050	"	2.50	8.55	39.7	62.2-130	7.44	19.6	QM-02
m,p-Xylene	20.0	0.100	"	5.00	40.5	NR	46.5-137	10.3	19.2	QM-02
o-Xylene	14.7	0.050	"	2.50	24.2	NR	54.2-134	7.86	17.9	QM-02
Surrogate: 1,2-Dichloroethane-d4	60.8		ug/kg	62.5		97.2	70-130			
Surrogate: Toluene-d8	59.4		"	62.5		95.1	70-130			
Surrogate: 4-Bromofluorobenzene	76.4		"	62.5		122	70-130			

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Christine Wasko  
 Project Number: [none]  
 Project: KMG - Ferme Farms 1-14

**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 5128011 - EPA 5030B (Water)**

**Blank (5128011-BLK1)**

Prepared: 09/28/2015 Analyzed: 09/28/2015

Benzene	ND	1.0	ug/L							
Toluene	ND	1.0	"							
Ethylbenzene	ND	1.0	"							
Xylenes, total	ND	1.0	"							
Surrogate: 1,2-Dichloroethane-d4	61		"	62.5	97.5		84-121			
Surrogate: Toluene-d8	61		"	62.5	98.2		85-115			
Surrogate: 4-Bromofluorobenzene	65		"	62.5	104		84-114			

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 6899 Pecos Street, Unit C  
 Denver CO 80211

Christine Wasko  
 Project Number: [none]  
 Project: KMG - Ferme Farms 1-14

**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 5128011 - EPA 5030B (Water)**

**LCS (5128011-BS1)**

Prepared: 09/28/2015 Analyzed: 09/28/2015

Benzene	48.5	1.0	ug/L	50.0		97.1	75-126			
Toluene	46.7	1.0	"	50.0		93.4	78.7-126			
Ethylbenzene	46.4	1.0	"	50.0		92.8	80-130			
m,p-Xylene	93.4	2.0	"	100		93.4	77.2-133			
o-Xylene	47.8	1.0	"	50.0		95.7	77.9-126			
Surrogate: 1,2-Dichloroethane-d4	57		"	62.5		90.5	84-121			
Surrogate: Toluene-d8	62		"	62.5		99.4	85-115			
Surrogate: 4-Bromofluorobenzene	66		"	62.5		105	84-114			

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 Denver CO 80211

Christine Wasko  
 Project Number: [none]  
 Project: KMG - Ferme Farms 1-14

**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 5128011 - EPA 5030B (Water)**

<b>Matrix Spike (5128011-MS1)</b>	<b>Source: X509333-01</b>			<b>Prepared: 09/28/2015 Analyzed: 09/28/2015</b>						
Benzene	53.3	1.0	ug/L	50.0	ND	107	74-130			
Toluene	50.7	1.0	"	50.0	ND	101	73-131			
Ethylbenzene	49.6	1.0	"	50.0	ND	99.1	76-132			
m,p-Xylene	101	2.0	"	100	ND	101	69-139			
o-Xylene	55.1	1.0	"	50.0	ND	110	74-131			
Surrogate: 1,2-Dichloroethane-d4	56		"	62.5		90.0	84-121			
Surrogate: Toluene-d8	62		"	62.5		99.4	85-115			
Surrogate: 4-Bromofluorobenzene	66		"	62.5		105	84-114			

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 6899 Pecos Street, Unit C  
 Denver CO 80211

Christine Wasko  
 Project Number: [none]  
 Project: KMG - Ferme Farms 1-14

**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 5128011 - EPA 5030B (Water)**

Matrix Spike Dup (5128011-MSD1)	Source: X509333-01			Prepared: 09/28/2015 Analyzed: 09/28/2015						
Benzene	58.2	1.0	ug/L	50.0	ND	116	74-130	8.78	20	
Toluene	55.2	1.0	"	50.0	ND	110	73-131	8.63	20	
Ethylbenzene	54.7	1.0	"	50.0	ND	109	76-132	9.93	20	
m,p-Xylene	111	2.0	"	100	ND	111	69-139	9.24	20	
o-Xylene	59.3	1.0	"	50.0	ND	119	74-131	7.40	20	
Surrogate: 1,2-Dichloroethane-d4	61		"	62.5		97.3	84-121			
Surrogate: Toluene-d8	62		"	62.5		99.5	85-115			
Surrogate: 4-Bromofluorobenzene	67		"	62.5		108	84-114			

Origins Laboratory, Inc.



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Tasman Geosciences  
 6899 Pecos Street, Unit C  
 Denver CO 80211

Christine Wasko  
 Project Number: [none]  
 Project: KMG - Ferme Farms 1-14

**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 5128008 - EPA 3580**

**Blank (5128008-BLK1)**

Prepared: 09/28/2015 Analyzed: 09/28/2015

Diesel (C10-C28)	ND	50	mg/kg							
Residual Range Organics (C28-C36)	ND	200	"							
Surrogate: o-Terphenyl	49		"	50.0		98.3	59-131			

**LCS (5128008-BS1)**

Prepared: 09/28/2015 Analyzed: 09/28/2015

Diesel (C10-C28)	940	50	mg/kg	1000		93.5	64-121			
Residual Range Organics (C28-C36)	920	200	"	1000		92.3	58-124			
Surrogate: o-Terphenyl	48		"	50.0		95.4	59-131			

**LCS Dup (5128008-BSD1)**

Prepared: 09/28/2015 Analyzed: 09/28/2015

Diesel (C10-C28)	850	50	mg/kg	1000		84.6	64-121	9.99	20	
Residual Range Organics (C28-C36)	930	200	"	1000		92.9	58-124	0.743	20	
Surrogate: o-Terphenyl	44		"	50.0		88.7	59-131			

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Tasman Geosciences  
 6899 Pecos Street, Unit C  
 Denver CO 80211

Christine Wasko  
 Project Number: [none]  
 Project: KMG - Ferme Farms 1-14

**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 5128014 - NO PREP</b>										
<b>Duplicate (5128014-DUP1)</b>		<b>Source: X509365-01</b>			Prepared: 09/28/2015 Analyzed: 09/28/2015					
pH	8.28		pH Units		8.25			0.363	25	
<b>Batch 5128015 - NO PREP</b>										
<b>Blank (5128015-BLK1)</b>		Prepared: 09/28/2015 Analyzed: 09/28/2015								
Specific Conductance (EC)	0.00320		mmhos/cm							
<b>Duplicate (5128015-DUP1)</b>		<b>Source: X509365-01</b>			Prepared: 09/28/2015 Analyzed: 09/28/2015					
Specific Conductance (EC)	0.0171		mmhos/cm		0.0167			2.37	25	

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6899 Pecos Street, Unit C  
Denver CO 80211

Christine Wasko  
Project Number: [none]  
Project: KMG - Ferme Farms 1-14

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### 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.
- QM-02 The RPD and/or percent recovery for this QC spike sample cannot be accurately calculated due to the high concentration of analyte inherent in the sample.
- 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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