



August 25, 2015

Mr. Sam LaRue
Senior HSE Representative
Kerr-McGee Oil & Gas Onshore LP
1099 18th Street, Suite 1800
Denver, Colorado 80202

**Re: Sump Closure Summary Letter Report
Meguire 4N-16HZ (Meguire X 21-5J)
API: 05-123-20156
Facility ID: 331104
Legal: SWNW Sec 21-T2N-R65W
Remediation Project #8961**

Dear Mr. LaRue:

On behalf of Kerr-McGee Oil & Gas Onshore LP (Kerr-McGee), Tasman Geosciences, Inc. (Tasman) has prepared this Sump Closure Summary Letter Report (Report) to document sampling activities and the results of environmental testing at the above-referenced site. This Report is being submitted under the Form 27 Management Plan for Closure of Produced Water Vessels, which has been assigned Remediation #8961 by the COGCC. Tasman provided environmental services at the site that included collection of confirmation soil samples from the excavation and documentation of field activities, as described below.

Site Assessment Activities

The field activities described herein were performed with the purpose of assessing potential hydrocarbon impacts at the site related to the closure of the produced water sump on August 19, 2015. Soil sampling activities, laboratory analytical results, and conclusions are presented below. The general site layout and sample locations are provided in the attached site map (Attachment A).

The final extent of the excavation measured approximately 21 feet by 9 feet with an approximate depth of 5 feet below ground surface (bgs). No impacted material was removed from the site during closure activities. A liner was not present at the location, and groundwater was not encountered in the excavation.

Confirmation soil samples were collected from the base and sidewalls of the excavation area at approximately 5 feet and 4 feet bgs, respectively. Soil samples were field screened for volatile organic compound (VOC) concentrations using a photoionization detector (PID). The confirmation soil sample collected from the base of the excavation area was 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 United States

Environmental Protection Agency (USEPA) Method 8260C, TPH – diesel range and oil range organics (DRO and ORO) by USEPA Method 8015, electrical conductivity (EC), and pH. Soil analytical data is summarized in Table 1 and the laboratory analytical report is provided in Attachment B.

Results

Soil analytical results from the sample collected from the base of the final extent of the excavation area indicated that BTEX and TPH concentrations were below the applicable COGCC Table 910-1 standards. The remaining four soil samples collected from the sidewalls of the excavation area were not submitted for laboratory analysis as analytical data confirmed the absence of petroleum hydrocarbon impacts above regulatory standards.

Conclusions

Analytical results described herein confirm BTEX and TPH impacts are not present at concentrations above applicable regulatory standards in the former sump location. Consequently, no further site assessment or remedial activity is recommended at this time. Following site assessment activities, the produced water sump was removed and the excavation area was backfilled and contoured to match pre-existing site conditions.

Please contact me at (720) 409-8791 if you have any questions regarding this report or require additional information.

Sincerely,

A handwritten signature in blue ink that reads 'Christine Wasko'.

Christine Wasko
Project Scientist

Attachments:

Table 1 – Soil Sample Results Summary Table
Attachment A – Site Map
Attachment B – Laboratory Analytical Reports

Table

TABLE 1
MEGUIRE 4N-16HZ (MEGUIRE X 21-5J)
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)	EC (mmhos/cm)	pH (units)
COGCC standards for soil (mg/kg) ⁽¹⁾			0.17	85	100	175	500			4.0	6 - 9
B01@5'	8/19/2015	5	<0.002	<0.002	<0.002	<0.002	<0.200	<50	<200	0.138	8.90

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.

EC = Electrical conductivity

mmhos/cm = Millimhos per centimeters

bgs = Below ground surface.

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

Attachment A



B01 @ 5'
B <0.002 mg/kg
TPH <200 mg/kg

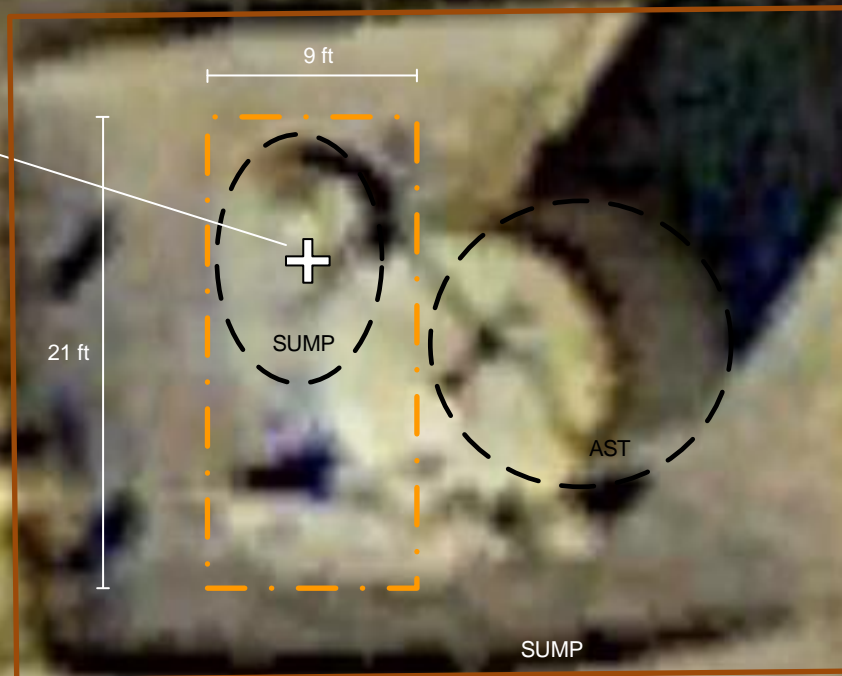
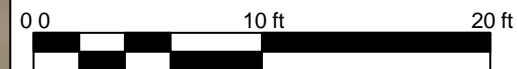


Image Source:
Google Earth 2015

B – Benzene
TPH – Total Petroleum Hydrocarbons
mg/kg – Milligrams Per Kilogram



DRAWN BY: BRN

DATE: 8/25/2015

Facility Diagram
Kerr-McGee Oil and Gas Onshore, LP
Meguire 4N-16HZ (Meguire X 21-5J)
SWNW S21 T2N R65W
Weld County, CO



TASMAN
GEOSCIENCES
6899 Pecos St., Unit C
Denver, CO 80221

LEGEND

- Approximate Excavation Extent
- Former Infrastructure
- Berm
- Approximate Soil Sample Location

FIGURE 1
SITE MAP

Attachment B

August 20, 2015

Tasman Geosciences

Christine Wasko

6899 Pecos Street, Unit C

Denver

CO 80211

Project Name - KMG - Mequire X 21-5J**Project Number - [none]**

Attached are your analytical results for KMG - Mequire X 21-5J received by Origins Laboratory, Inc. August 19, 2015. This project is associated with Origins project number X508231-05.

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 - Mequire X 21-5J

CROSS REFERENCE REPORT

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
B01 @ 5	X508231-05	Soil	August 19, 2015 15:15	08/19/2015 16:38

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 - Mequire X 21-5J

www.originslaboratory.com

page 1 of 1

ORIGINS
LABORATORY, INC

X508231

Client: Tasman Geosciences
Address: 6899 Pecos St. Unit C, Denver, CO
Telephone Number: 912 730 2807
Email Address: (wasko@tasman-geo.com)

Project Manager: Christine Wasko
Project Name: Mequire X 21-5J
Project Number:
Samples Collected By: Elliot Blum-Hertzog

Sample ID Description	Date Sampled	Time Sampled	# of Containers	Preservative				Matrix			Analysis	Sample Instructions
				Unpreserved	HCl	HNO ₃	Other	Groundwater	Soil	Air Summa Canister #		
N0104	8/14/15	15:05	2	x				x				1
S0104	8/14/15	15:08	2	y				y				2
E0104	8/14/15	15:07	2	y				x				3
W0104	8/14/15	15:10	2	y				y				4
B0105	8/14/15	15:15	2	x				x				5
												6
												7
												8
												9
												10

Handwritten notes in table:
- Sample 1: Hold
- Sample 5: BTEX (800)
- Sample 6: TPH-D10/100 (800)
- Sample 7: pH EC
- Sample 8: Please run sample for SHR + EC-2408

Relinquished By: [Signature] Date: 08/19/15 Time: 16:00
Relinquished By: [Signature] Date: 8/19/15 Time: 16:00

Turnaround Time: Same Day ☒ 24 Hr ☐ 48 Hr ☐ 72 Hr ☐ Standard ☐ 24 ☐ 48 ☐ 72

Date Results Needed

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: [none]
Project: KMG - Mequire X 21-5J

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

X508231

Sample Receipt Checklist

Origins Work Order

X508230

Client: Tasman

Client Project ID: Mequire X 21-S3

Checklist Completed by: Jeff Smith

Shipped Via: H/D

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

Date/time completed: 8/15/15

Airbill #: N/A

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

Cooler Number/Temperature: 1 / 5.3 °C / °C / °C / °C

Thermometer ID: T003

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

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

Reviewed by (Project Manager)

Date/Time Reviewed 8/15/15

Origins Laboratory, Inc.

Jefi 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 - Mequire X 21-5J

B01 @ 5
8/19/2015 3:15:00PM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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Origins Laboratory, Inc.
X508231-05 (Soil)

DRO/RRO by EPA8015C

Diesel (C10-C28)	ND	50	mg/kg	1	5H19010	08/19/2015	08/19/2015
Residual Range Organics (C28-C36)	ND	200	"	"	"	"	"

Surrogate: o-Terphenyl 83.2 % 59-131 " " "

GBTEX by EPA 8260C

Gasoline Range Hydrocarbons	ND	0.200	mg/kg	1	5H19011	08/19/2015	08/19/2015
Benzene	ND	0.002	"	"	"	"	"
Toluene	ND	0.002	"	"	"	"	"
Ethylbenzene	ND	0.002	"	"	"	"	"
Xylenes, total	ND	0.002	"	"	"	"	"

Surrogate: 1,2-Dichloroethane-d4 104 % 70-130 " " "
Surrogate: Toluene-d8 100 % 70-130 " " "
Surrogate: 4-Bromofluorobenzene 102 % 70-130 " " "

pH in Soil by EPA 9045D

pH	8.90		pH Units	1	5H19012	08/19/2015	08/19/2015
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Specific Conductance by Modified 9050A

Specific Conductance (EC)	0.138		mmhos/cm	"	5H19013	08/19/2015	08/19/2015
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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 - Mequire X 21-5J

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
Batch 5H19011 - EPA 5030 (soil)										
Blank (5H19011-BLK1)					Prepared: 08/19/2015 Analyzed: 08/19/2015					
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	63.0		ug/kg	62.5		101	70-130			
Surrogate: Toluene-d8	62.4		"	62.5		99.8	70-130			
Surrogate: 4-Bromofluorobenzene	62.4		"	62.5		99.9	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 - Mequire X 21-5J

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
Batch 5H19011 - EPA 5030 (soil)										
LCS (5H19011-BS1)					Prepared: 08/19/2015 Analyzed: 08/19/2015					
Benzene	0.100	0.002	mg/kg	0.100		99.7	77.1-124			
Toluene	0.099	0.002	"	0.100		99.2	74.5-128			
Ethylbenzene	0.100	0.002	"	0.100		100	66.4-127			
m,p-Xylene	0.200	0.004	"	0.200		100	76.6-124			
o-Xylene	0.100	0.002	"	0.100		100	76.6-124			
Surrogate: 1,2-Dichloroethane-d4	59.0		ug/kg	62.5		94.4	70-130			
Surrogate: Toluene-d8	62.3		"	62.5		99.7	70-130			
Surrogate: 4-Bromofluorobenzene	62.4		"	62.5		99.8	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 - Mequire X 21-5J

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 5H19011 - EPA 5030 (soil)

Matrix Spike (5H19011-MS1)		Source: X508226-03			Prepared: 08/19/2015 Analyzed: 08/19/2015					
Benzene	0.107	0.002	mg/kg	0.100	ND	107	71.8-126			
Toluene	0.104	0.002	"	0.100	ND	104	65.1-130			
Ethylbenzene	0.107	0.002	"	0.100	ND	107	62.2-130			
m,p-Xylene	0.213	0.004	"	0.200	ND	107	46.5-137			
o-Xylene	0.106	0.002	"	0.100	ND	106	54.2-134			
Surrogate: 1,2-Dichloroethane-d4	61.7		ug/kg	62.5		98.7	70-130			
Surrogate: Toluene-d8	61.3		"	62.5		98.0	70-130			
Surrogate: 4-Bromofluorobenzene	62.9		"	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 - Mequire X 21-5J

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 5H19011 - EPA 5030 (soil)

Matrix Spike Dup (5H19011-MSD1)		Source: X508226-03			Prepared: 08/19/2015 Analyzed: 08/19/2015					
Benzene	0.105	0.002	mg/kg	0.100	ND	105	71.8-126	1.83	11.3	
Toluene	0.101	0.002	"	0.100	ND	101	65.1-130	2.60	15.4	
Ethylbenzene	0.103	0.002	"	0.100	ND	103	62.2-130	3.68	19.6	
m,p-Xylene	0.206	0.004	"	0.200	ND	103	46.5-137	3.18	19.2	
o-Xylene	0.103	0.002	"	0.100	ND	103	54.2-134	3.56	17.9	
Surrogate: 1,2-Dichloroethane-d4	62.8		ug/kg	62.5		100	70-130			
Surrogate: Toluene-d8	61.4		"	62.5		98.2	70-130			
Surrogate: 4-Bromofluorobenzene	63.1		"	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 - Mequire X 21-5J

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 5H19010 - EPA 3580

Blank (5H19010-BLK1)

Prepared: 08/19/2015 Analyzed: 08/19/2015

Diesel (C10-C28) ND 50 mg/kg

Residual Range Organics (C28-C36) ND 200 "

Surrogate: o-Terphenyl 51 " 50.0 102 59-131

LCS (5H19010-BS1)

Prepared: 08/19/2015 Analyzed: 08/19/2015

Diesel (C10-C28) 820 50 mg/kg 64-121

Residual Range Organics (C28-C36) 990 200 " 1000 98.9 58-124

Surrogate: o-Terphenyl 45 " 50.0 90.4 59-131

Matrix Spike (5H19010-MS1)

Source: X508226-03

Prepared: 08/19/2015 Analyzed: 08/19/2015

Diesel (C10-C28) 690 50 mg/kg 22 53-125

Residual Range Organics (C28-C36) 770 200 " 1000 ND 77.4 47-133

Surrogate: o-Terphenyl 39 " 50.0 78.9 59-131

Matrix Spike Dup (5H19010-MSD1)

Source: X508226-03

Prepared: 08/19/2015 Analyzed: 08/19/2015

Diesel (C10-C28) 710 50 mg/kg 22 53-125 1.75 20

Residual Range Organics (C28-C36) 790 200 " 1000 ND 78.8 47-133 1.83 20

Surrogate: o-Terphenyl 38 " 50.0 75.4 59-131

Origins Laboratory, Inc.



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Tasman Geosciences
6899 Pecos Street, Unit C
Denver CO 80211

Christine Wasko
Project Number: [none]
Project: KMG - Mequire X 21-5J

Classical Chemistry Parameters - Quality Control Origins Laboratory, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 5H19012 - NO PREP										
Duplicate (5H19012-DUP1)		Source: X508226-03			Prepared: 08/19/2015 Analyzed: 08/19/2015					
pH	8.79		pH Units		8.78			0.114	25	
Batch 5H19013 - NO PREP										
Blank (5H19013-BLK1)		Prepared: 08/19/2015 Analyzed: 08/19/2015								
Specific Conductance (EC)	0.00250		mmhos/cm							
Duplicate (5H19013-DUP1)		Source: X508226-03			Prepared: 08/19/2015 Analyzed: 08/19/2015					
Specific Conductance (EC)	0.255		mmhos/cm		0.270			5.71	25	

Origins Laboratory, Inc.



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Tasman Geosciences

6899 Pecos Street, Unit C

Denver CO 80211

Christine Wasko

Project Number: [none]

Project: KMG - Mequire X 21-5J

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.



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Jen Pellegrini For Noelle Doyle Mathis, President