



Kerr-McGee Oil & Gas Onshore LP  
1099 18<sup>th</sup> Street, Suite 1800  
Denver, Colorado 80202  
Phone: 720-929-6000

August 18, 2020

Mr. Alex Fischer  
Colorado Oil and Gas Conservation Commission  
1120 Lincoln Street, Suite 801  
Denver, Colorado 80203

**Re: Facility Summary and First Half 2020 Monitoring Report  
Aggregate Recycle Facility  
COGCC Facility ID #: 456644  
NESE Sec. 9-T2N-R66W  
Weld County, Colorado**

Dear Mr. Fischer:

On behalf of Kerr-McGee Oil & Gas Onshore LP (Kerr-McGee), Tasman Geosciences, Inc. (Tasman) has prepared this Facility Summary and First Half 2020 Monitoring Report (Report) to document facility operation updates and groundwater monitoring activities at the Kerr-McGee Aggregate Recycle Facility (ARF).

### **Facility Location and Summary**

The ARF is permitted as a Centralized E&P Waste Management Facility, and began operations in 2016 under Colorado Oil and Gas Conservation Commission (COGCC) Facility ID 456644. The purpose of this facility is to recycle and recondition used mud/fluids from drilling, completions, production, and workover activities for re-use in exploration and production (E&P) operations. If needed, the facility can be used for the production of fresh mud for workover and drilling activities. Waste manifests for material accepted at the ARF are tracked internally and are available upon request.

The ARF occupies approximately 5.43 acres in the northeast quarter of the southeast quarter of Section 9, Township 2 North, Range 66 West, as illustrated on Figure 1. The topography generally slopes gradually from the southeast to the northwest. Surrounding land use is cropland, rangeland, and rural residential. The nearest residence is located approximately 0.25 miles to the east, across County Road 31. Additional residences are located along County Road 31 to the northeast, and to the south along County Road 22.

A Use by Special Review (USR) permit was approved by Weld County in 2019 under Document No. 18-0069. In accordance with the approved USR, improvements were made to the facility entrance, roadway, Site drainage, septic system, and potable water supply. Documentation of these activities and the approved USR permit were previously transmitted to the COGCC via Form 4 Sundry Notification (COGCC Document No. 402248629).

### **ARF Operational Parameters**

This section provides a summary of the waste material accepted for beneficial reuse at the ARF during the First Half of 2020. The total volumes of liquid waste received, and recycled water produced at the ARF during the First Half of 2020 are presented below:

- 158,836.59 barrels of liquid waste were received from truck deliveries.
- 126,455 barrels of recycled water were produced for reuse in E&P operations.

A summary of the monthly volumes of liquid waste received and recycled water produced at the ARF during the First Half of 2020 is provided in Table 1.

### **Groundwater Monitoring Summary**

This section describes the groundwater monitoring activities that were performed to assess shallow aquifer conditions at the ARF. These monitoring activities are intended to satisfy the requirements outlined in COGCC Rule 908 for Centralized E&P Waste Management Facilities. Groundwater monitoring activities were initiated at the ARF in 2017 by a third-party environmental consultant. Historical groundwater monitoring data is provided in Tables 2 and 3.

The First Quarter 2020 monitoring event was conducted at the ARF on February 28, 2020, and the Second Quarter 2020 monitoring event was conducted on May 11, 2020. The groundwater gauging and sampling procedures for these events, along with the results of quarterly groundwater sampling, are described in the following sections.

#### Monitoring Well Gauging

The three (3) groundwater monitoring wells at the ARF (MW01 – MW03) were gauged for the presence and depth of groundwater and free-phase hydrocarbons (light non-aqueous phase liquid [LNAPL]) using an interface probe (IP). Fluid levels were measured on the north side of the well casing to the nearest 0.01-foot. Monitoring well total depths were also measured with the IP.

LNAPL was not detected in the 3 groundwater monitoring wells during the First and Second Quarter 2020 monitoring events. Measured depths to groundwater were converted to elevation in feet above mean sea level (ft. AMSL) by subtracting the measured depth to groundwater from the surveyed top-of-casing elevation at each location. Measured depths to water and the corresponding groundwater elevations are presented in Table 2. Monitoring well locations and the groundwater elevation contour maps for the First and Second Quarter 2020 monitoring events are illustrated on Figures 2 and 3, respectively.

### Groundwater Purging, Sample Collection, and Analysis

Prior to sample collection, a minimum of three casing volumes of groundwater (calculated by subtracting the measured depth to groundwater from the total depth of the well and multiplying the difference by the area of the well) were purged from each groundwater monitoring well using a new, disposable polyethylene bailer. Observations of groundwater color, odor, and turbidity were recorded after each casing volume was removed.

Subsequent to the completion of purging activities, groundwater samples were collected from each groundwater monitoring well. Monitoring wells were sampled using the dedicated bailer that was used to purge each specific well to limit the potential for cross-contamination between sampling points. Clean sample containers (40-milliliter [ml] volatile organic analysis [VOA] vials) supplied by the analytical laboratory were used to contain the groundwater samples for analysis.

VOA vials were overfilled and capped to reduce the potential for headspace and to prevent the loss of volatile analytes during transport to the laboratory. Subsequent to capping, VOA vials were inverted to confirm that no gas bubbles/void spaces were present within the sample container. Sample bottles were then labeled with the corresponding date, time of collection, and well identification information prior to placement into an ice-filled cooler, which maintained storage temperature at approximately 4 degrees Celsius (°C) for transportation to the laboratory.

The groundwater samples were packed using standard analytical laboratory protocols and transferred for analysis under chain-of-custody procedures to Origins Laboratory in Denver, CO (Origins). Groundwater samples were submitted for laboratory analysis of benzene, toluene, ethylbenzene, and total xylenes (BTEX) by United States Environmental Protection Agency (USEPA) Method 8260D.

### Groundwater Monitoring Results

Laboratory analytical results indicated that BTEX concentrations were below the laboratory reporting limits in all 3 monitoring wells during the First and Second Quarter 2020 monitoring events, and as such were in full compliance with the COGCC Table 910-1 standards. Groundwater analytical results are summarized in Table 3. The laboratory analytical data reports for the First and Second Quarter 2020 monitoring events are provided in Attachment A.

### **Conclusions**

Based on the groundwater analytical data presented herein, BTEX concentrations in the 3 monitoring wells were in full compliance with COGCC standards. Quarterly groundwater monitoring for BTEX will be continued, with the next sampling events scheduled for completion in August and November 2020.

The ARF will continue to receive liquid and solid waste material for from Kerr-McGee's various exploration and production waste streams for treatment. The total waste volumes will continue to be tracked and reported to the COGCC on a semi-annual basis. Semi-Annual Facility Summary and Monitoring Reports will be prepared for this location, with the next report scheduled for submittal in January 2020.

Please contact me at (970) 515-1353 if you have any questions regarding this report or require additional information.

Sincerely,

Kerr-McGee Oil & Gas Onshore LP

Taylor Rowley  
Senior HSE Representative

**Attachments:**

Figure 1 – Site Location Map

Figure 2 – Groundwater Elevation Contour Map (02/28/2020)

Figure 3 – Groundwater Elevation Contour Map (05/11/2020)

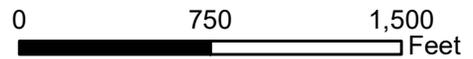
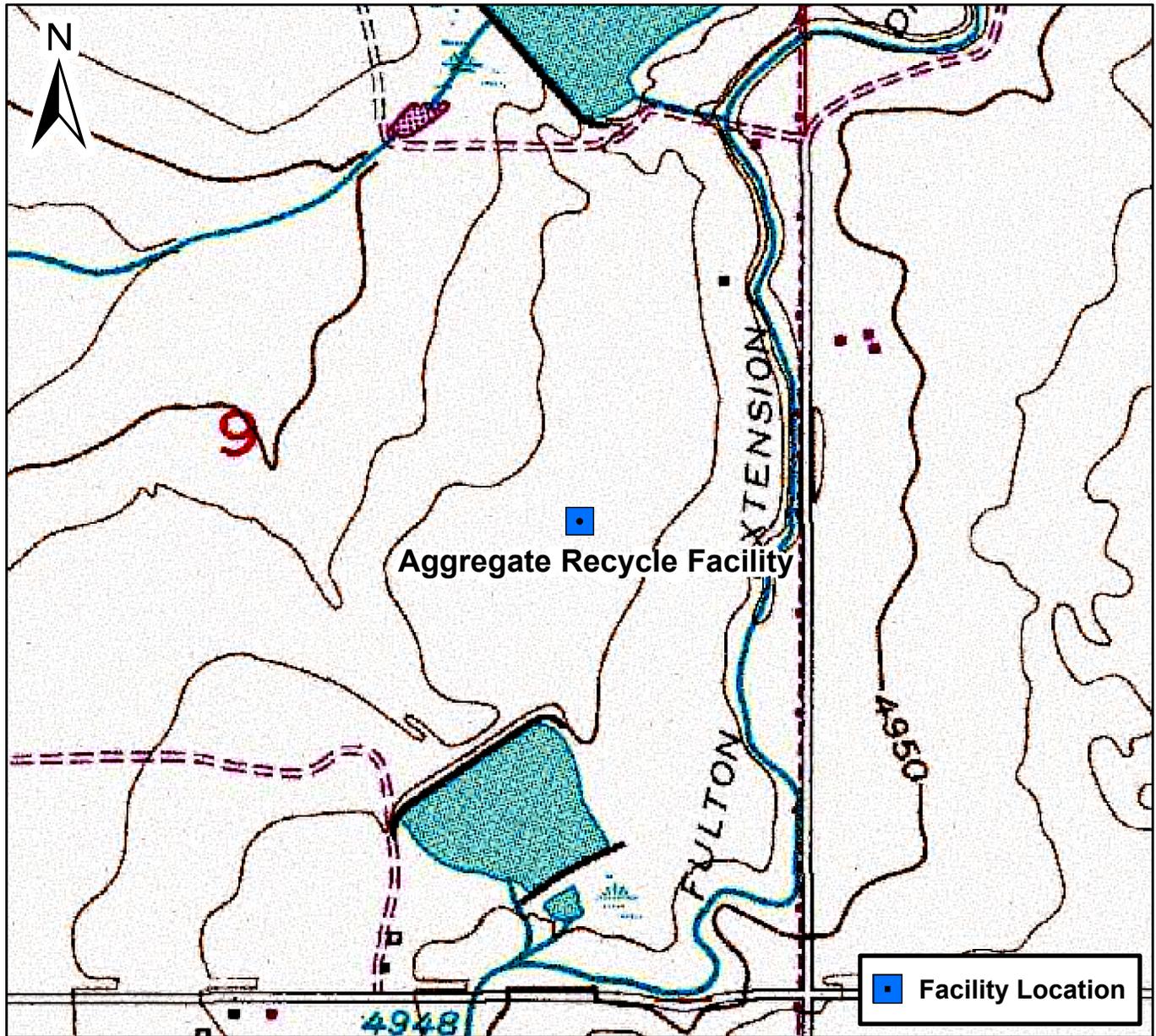
Table 1 – First Half 2020 Operational Parameters Summary Table

Table 2 – Groundwater Gauging Results Summary Table

Table 3 – Groundwater Sample Results Summary Table

Attachment A – Laboratory Analytical Reports

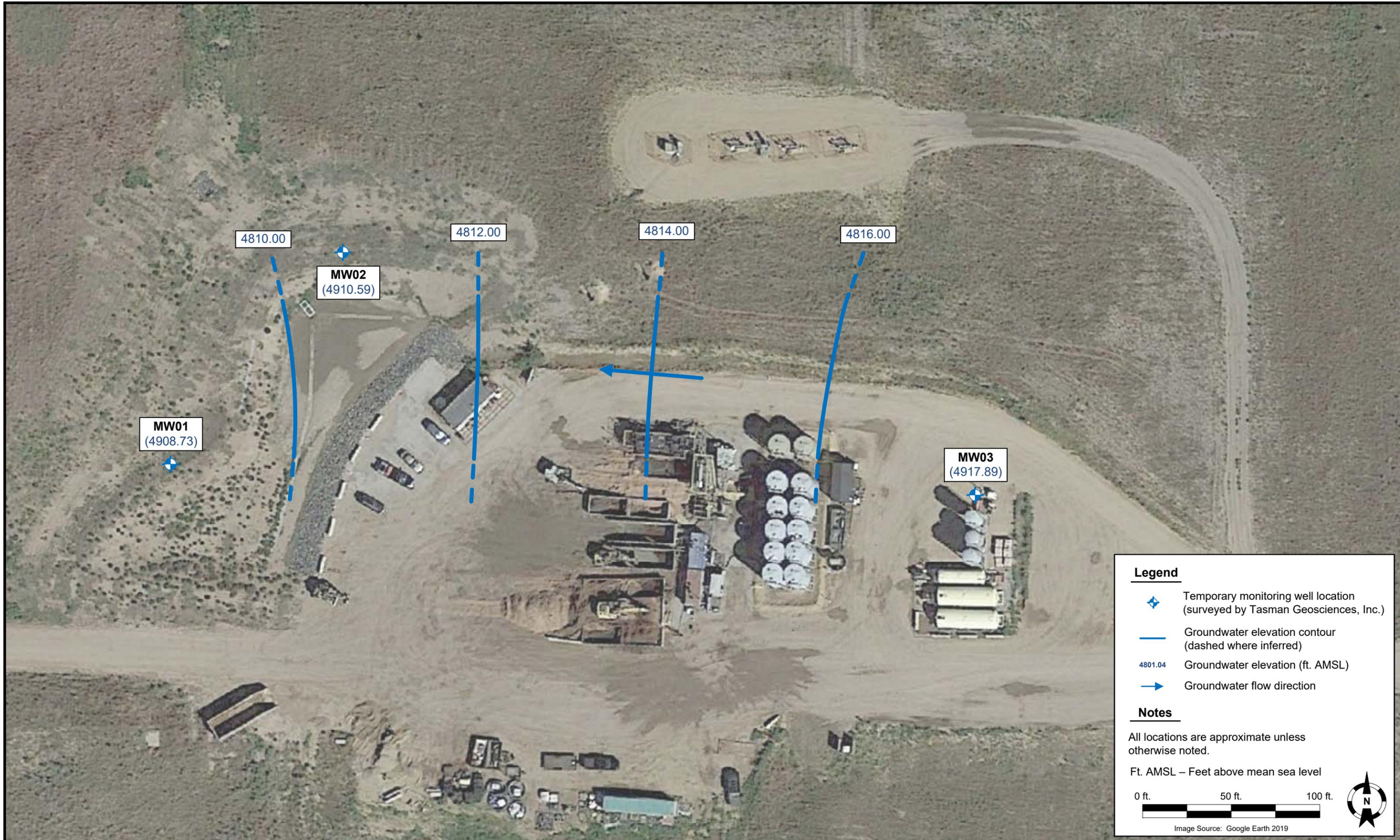
## **FIGURES**



### Figure 1

Site Location Map  
 Aggregate Recycle Facility  
 NESE Sec. 9-T2N-R66W  
 Weld County, Colorado





**Legend**

-  Temporary monitoring well location (surveyed by Tasman Geosciences, Inc.)
-  Groundwater elevation contour (dashed where inferred)
-  4801.04 Groundwater elevation (ft. AMSL)
-  Groundwater flow direction

**Notes**

All locations are approximate unless otherwise noted.

Ft. AMSL – Feet above mean sea level

0 ft.      50 ft.      100 ft.

Image Source: Google Earth 2019



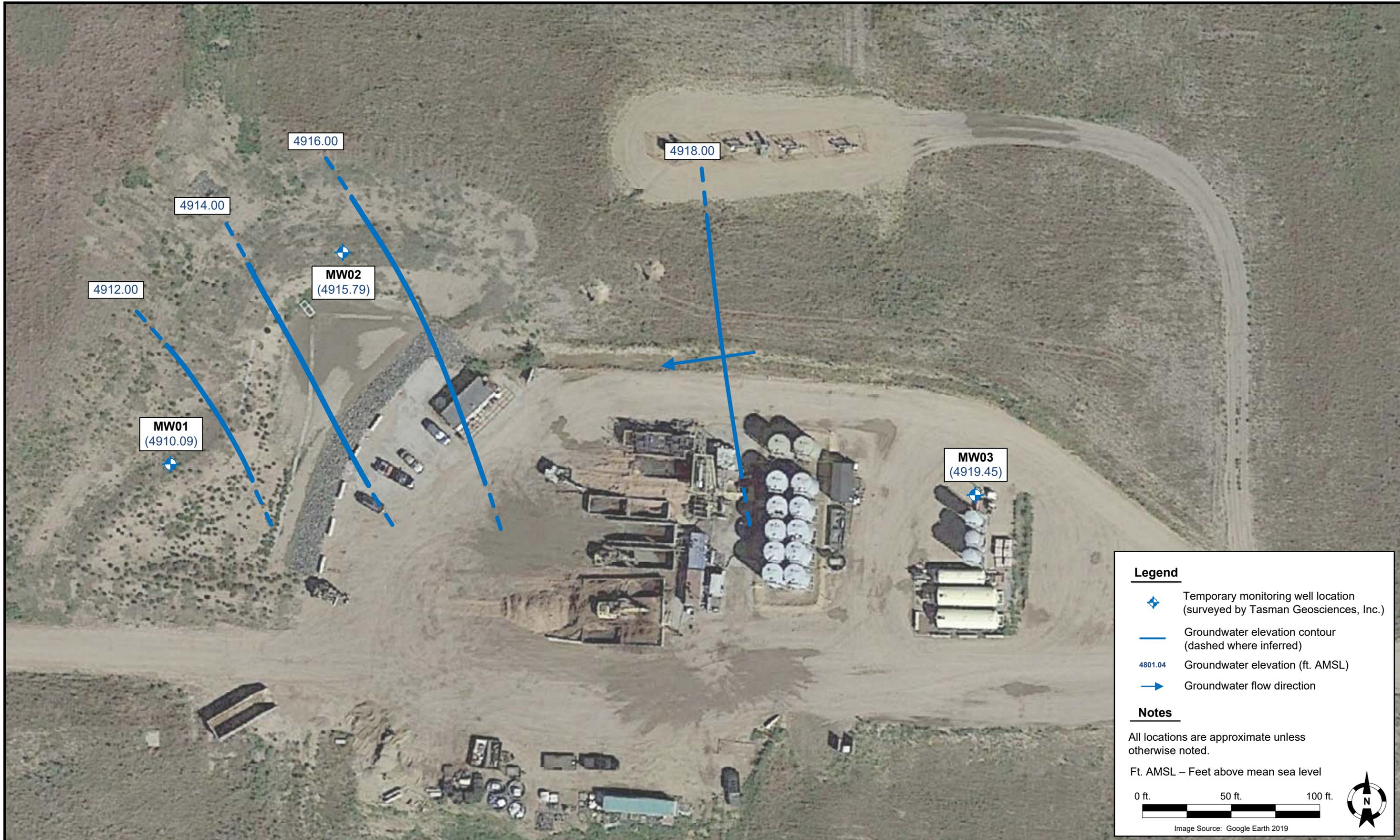
DATE:	March 4, 2020
DESIGNED BY:	E. Siegel
DRAWN BY:	L. Martin



**Kerr-McGee Oil and Gas Onshore LP**  
**Aggregate Recycling Facility**  
 NESE Sec. 9-T2N-R66W  
 Weld County, Colorado

Groundwater Elevation Contour  
 Map (02/28/2020)

**FIGURE**  
 2



**Legend**

- Temporary monitoring well location (surveyed by Tasman Geosciences, Inc.)
- Groundwater elevation contour (dashed where inferred)
- 4801.04 Groundwater elevation (ft. AMSL)
- Groundwater flow direction

**Notes**

All locations are approximate unless otherwise noted.

Ft. AMSL – Feet above mean sea level

0 ft.      50 ft.      100 ft.

Image Source: Google Earth 2019



DATE:	May 14, 2020
DESIGNED BY:	E. Siegel
DRAWN BY:	L. Martin



**Kerr-McGee Oil and Gas Onshore LP**  
**Aggregate Recycling Facility**  
 NESE Sec. 9-T2N-R66W  
 Weld County, Colorado

Groundwater Elevation Contour  
 Map (05/11/2020)

**FIGURE**  
 3

## **TABLES**

**TABLE 1**  
**FIRST HALF 2020 OPERATIONAL PARAMETERS SUMMARY TABLE**  
**AGGREGATE RECYCLE FACILITY**  
**KERR-McGEE OIL & GAS ONSHORE LP**

<i>Date Range</i>	<i>Liquid Waste Received (barrels)</i>	<i>Recycled Water Produced (barrels)</i>
January 2020	55,755.78	45,835
February 2020	44,681.11	36,280
March 2020	35,137.6	28,090
April 2020	12,258.6	9,050
May 2020	5,969.5	3,750
June 2020	5,034	3,450
<b><i>First Half 2020 Total</i></b>	<b><i>158,836.59</i></b>	<b><i>126,455</i></b>
<b>Total Barrels Received / Produced To-Date (March 2016 - June 2020)</b>	<b><i>2,272,787.04</i></b>	<b><i>1,638,319</i></b>

**TABLE 2**  
**AGGREGATE RECYCLE FACILITY (ARF)**  
**GROUNDWATER GAUGING RESULTS SUMMARY TABLE**  
**KERR-McGEE OIL & GAS ONSHORE LP**

<b>Well ID</b>	<b>Date</b>	<b>Top of Casing Elevation (ft. AMSL)</b>	<b>Depth to Water (ft. BTOC)</b>	<b>Depth to Water (ft. BGS)</b>	<b>Groundwater Elevation (ft. AMSL)</b>
MW01	8/18/2017	4,925.03	14.33	12.12	4,910.70
	12/27/2017	4,925.03	15.94	13.73	4,909.09
	3/29/2018	4,925.03	15.25	13.04	4,909.78
	6/5/2018	4,925.03	15.95	13.74	4,909.08
	8/16/2018	4,925.03	14.50	12.29	4,910.53
	11/26/2018	4,925.03	14.30	12.09	4,910.73
	3/5/2019	4,925.03	15.80	13.59	4,909.23
	6/28/2019	4,925.03	14.90	12.69	4,910.13
	9/17/2019	4,925.03	14.40	12.19	4,910.63
	1/23/2020	4,923.64 <sup>(1)</sup>	14.45	12.24	4,909.19
	2/28/2020	4923.64	14.91	12.70	4,908.73
	5/11/2020	4923.64	13.55	11.34	4,910.09
	MW02	8/18/2017	4,924.11	11.00	11.19
12/27/2017		4,924.11	12.05	12.24	4,912.06
3/29/2018		4,924.11	11.50	11.69	4,912.61
6/5/2018		4,924.11	9.50	9.69	4,914.61
8/16/2018		4,924.11	9.46	9.65	4,914.65
11/27/2018		4,924.11	9.40	9.59	4,914.71
3/5/2019		4,924.11	9.10	9.29	4,915.01
6/28/2019		4,924.11	8.70	8.89	4,915.41
9/17/2019		4,924.11	11.80	11.99	4,912.31
1/23/2020		4,922.94 <sup>(1)</sup>	11.05	11.24	4,911.89
2/28/2020		4922.94	12.35	12.54	4,910.59
5/11/2020		4922.94	7.15	7.34	4,915.79
MW03		8/18/2017	4,929.48	8.53	6.68
	12/27/2017	4,929.48	8.05	6.20	4,921.43
	3/29/2018	4,929.48	9.16	7.31	4,920.32
	6/5/2018	4,929.48	9.50	7.65	4,919.98
	8/16/2018	4,929.48	14.50	12.65	4,914.98
	11/26/2018	4,929.48	14.30	12.45	4,915.18
	3/5/2019	4,929.48	15.80	13.95	4,913.68
	6/28/2019	4,929.48	14.90	13.05	4,914.58
	9/17/2019	4,929.48	10.00	8.15	4,919.48
	1/23/2020	4,926.93 <sup>(1)</sup>	9.20	7.35	4,917.73
	2/28/2020	4926.93	9.04	7.19	4,917.89
	5/11/2020	4926.93	7.48	5.63	4,919.45

**TABLE 2**  
**AGGREGATE RECYCLE FACILITY (ARF)**  
**GROUNDWATER GAUGING RESULTS SUMMARY TABLE**  
**KERR-McGEE OIL & GAS ONSHORE LP**

Well ID	Date	Top of Casing Elevation (ft. AMSL)	Depth to Water (ft. BTOC)	Depth to Water (ft. BGS)	Groundwater Elevation (ft. AMSL)
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**Notes:**

(1) Top of casing elevation re-surveyed by Tasman Geosciences, Inc.

ft. = Feet.

AMSL = Above mean sea level.

BTOC = Below top of casing.

BGS = Below ground surface.

Blue = Denotes data collected by Quandry Consultants, LLC.

**TABLE 3**  
**AGGREGATE RECYCLE FACILITY (ARF)**  
**GROUNDWATER SAMPLE RESULTS SUMMARY TABLE**  
**KERR-McGEE OIL AND GAS ONSHORE LP**

Well ID	Date	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	Total Xylenes (µg/L)	Depth To Water (ft. BGS)
<b>COGCC Table 910-1 standards for groundwater (µg/L)<sup>(1)</sup></b>		<b>5</b>	<b>560</b>	<b>700</b>	<b>1400</b>	
MW01	8/18/2017	<1.00	<1.00	<1.00	<1.00	12.12
	12/27/2017	<1.00	<1.00	<1.00	<1.00	13.73
	3/29/2018	<1.00	<1.00	<1.00	<1.00	13.04
	6/5/2018	<1.00	<1.00	<1.00	<1.00	13.74
	8/16/2018	<1.00	<1.00	<1.00	<1.00	12.29
	11/27/2018	<1.00	<1.00	<1.00	<1.00	12.09
	3/5/2019	<1.00	<1.00	<1.00	<1.00	13.59
	6/28/2019	<1.00	<1.00	<1.00	<1.00	12.69
	9/17/2019	<1.00	<1.00	<1.00	<1.00	12.19
	1/23/2020	<1.00	<1.00	<1.00	<1.00	12.24
	2/28/2020	<1.00	<1.00	<1.00	<1.00	12.70
	5/11/2020	<1.00	<1.00	<1.00	<1.00	11.34
	MW02	8/18/2017	<1.00	<1.00	<1.00	<1.00
12/27/2017		<1.00	<1.00	<1.00	<1.00	12.24
3/29/2018		<1.00	<1.00	<1.00	<1.00	11.69
6/5/2018		<1.00	<1.00	<1.00	<1.00	9.69
8/16/2018		<1.00	<1.00	<1.00	<1.00	9.65
11/27/2018		<1.00	<1.00	<1.00	<1.00	9.59
3/5/2019		<1.00	<1.00	<1.00	<1.00	9.29
6/28/2019		<1.00	<1.00	<1.00	<1.00	8.89
9/17/2019		<1.00	<1.00	<1.00	<1.00	11.99
1/23/2020		<1.00	<1.00	<1.00	<1.00	11.24
2/28/2020		<1.00	<1.00	<1.00	<1.00	12.54
5/11/2020		<1.00	<1.00	<1.00	<1.00	7.34

**TABLE 3**  
**AGGREGATE RECYCLE FACILITY (ARF)**  
**GROUNDWATER SAMPLE RESULTS SUMMARY TABLE**  
**KERR-McGEE OIL AND GAS ONSHORE LP**

Well ID	Date	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	Total Xylenes (µg/L)	Depth To Water (ft. BGS)
<b>COGCC Table 910-1 standards for groundwater (µg/L)<sup>(1)</sup></b>		<b>5</b>	<b>560</b>	<b>700</b>	<b>1400</b>	
MW03	8/18/2017	<1.00	<1.00	<1.00	<1.00	6.68
	12/27/2017	<1.00	<1.00	<1.00	<1.00	6.20
	3/29/2018	<1.00	<1.00	<1.00	<1.00	7.31
	6/5/2018	<1.00	<1.00	<1.00	<1.00	7.65
	8/16/2018	<1.00	<1.00	<1.00	<1.00	12.65
	11/27/2018	<1.00	<1.00	<1.00	<1.00	12.45
	3/5/2019	<1.00	<1.00	<1.00	<1.00	13.95
	6/28/2019	<1.00	<1.00	<1.00	<1.00	13.05
	9/17/2019	<1.00	<1.00	<1.00	<1.00	8.15
	1/23/2020	<1.00	<1.00	<1.00	<1.00	7.35
	2/28/2020	<1.00	<1.00	<1.00	<1.00	7.19
	5/11/2020	<1.00	<1.00	<1.00	<1.00	5.63

**Notes:**

(1) Standards for groundwater are taken from 2 CCR 404-1, Table 910-1, effective May 1, 2018

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

Blue = Denotes data collected by Quandry Consultants, LLC

**ATTACHMENT A**  
**LABORATORY ANALYTICAL REPORTS**



March 06, 2020

Tasman Geosciences

Bob Cornez

6855 West 119th Avenue

Broomfield CO 80020

Project Name - KMG - ARF

Project Number - 43103361

Attached are your analytical results for KMG - ARF received by Origins Laboratory, Inc. February 28, 2020. This project is associated with Origins project number Y003011-01.

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  
6855 West 119th Avenue  
Broomfield CO 80020

Bob Cornez  
Project Number: 43103361  
Project: KMG - ARF

CROSS REFERENCE REPORT

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
MW01-022820	Y003011-01	Water	February 28, 2020 12:45	02/28/2020 19:09
MW02-022820	Y003011-02	Water	February 28, 2020 12:30	02/28/2020 19:09
MW03-022820	Y003011-03	Water	February 28, 2020 12:15	02/28/2020 19:09

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, Project Manager

Tasman Geosciences  
 6855 West 119th Avenue  
 Broomfield CO 80020

Bob Cornez  
 Project Number: 43103361  
 Project: KMG - ARF

www.originslaboratory.com

page 1 of 1

**ORIGINS**  
 LABORATORY, INC

YESSEN

Client: APC/Tasman  
 Address: 6855 W 119th Ave  
 Project Manager: Robert Cornez  
 Project Name: ARF  
 Project Number: 43103361  
 Telephone Number: 970-927-0393  
 Email Address: rcornez@tasman-geo.com  
 Samples Collected By: rcornez@tasman-geo.com

Fax: 303.265.9645 | Phone: 303.433.1322 | Denver, CO 80211

Sample ID Description	Date Sampled	Time Sampled	# of Containers	Preservative				Matrix			Analysis	Sample Instructions		
				Unpreserved	HCl	HNO <sub>3</sub>	Other	Groundwater	Soil	Gr Summa #			Other	
M1001-022820	2/28/20	12:45	3	X				X					1	
M1002-022820	2/28/20	12:30	3	X				X					2	
M1003-022820	2/28/20	12:15	3	X				X					3	
													4	
													5	
													6	
													7	
													8	
													9	
													10	
Relinquished By: <i>[Signature]</i>	Date: 2/28/20	Time: 17:05	Received By: <i>[Signature]</i>	Date: 2/28/20	Time: 17:05	Turnaround Time: Same Day <input checked="" type="checkbox"/> 24 Hr <input type="checkbox"/> 48 Hr <input type="checkbox"/> 72 Hr <input type="checkbox"/> Standard <input checked="" type="checkbox"/>								
Relinquished By:	Date:	Time:	Received By:	Date:	Time:									

1725 Elk Place | 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  
 6855 West 119th Avenue  
 Broomfield CO 80020

Bob Cornez  
 Project Number: 43103361  
 Project: KMG - ARF

Origins Laboratory

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

**Sample Receipt Checklist**

Origins Work Order: 4003011

Client: Tasman

Client Project ID: KMG-ARF

Checklist Completed by: JP

Shipped Via: HD

Date/time completed: 3/2/20

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

Airbill #: NA

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

Cooler Number/Temperature: 1 / 2.6 c /      ° c /      ° c (Describe)

Thermometer ID: TCP3

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 type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
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? <b>If yes, contact client and note in narrative.</b>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input 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 HNO3, HCL, H2SO4) / (pH >10 for samples preserved with NaAsO2+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.

[Signature]  
 Reviewed by (Project Manager)

03-03-20  
 Date/Time Reviewed

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  
 6855 West 119th Avenue  
 Broomfield CO 80020

Bob Cornez  
 Project Number: 43103361  
 Project: KMG - ARF

**MW01-022820**

**2/28/2020 12:45:00PM**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Analyst	Prepared	Analyzed	Notes
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**Origins Laboratory, Inc.**  
**Y003011-01 (Water)**

**BTEX by EPA 8260D**

Benzene	ND	1.00	ug/L	1	B0C0205	ZZZ	03/02/2020	03/04/2020	U
Toluene	ND	1.00	"	"	"	ZZZ	"	"	U
Ethylbenzene	ND	1.00	"	"	"	ZZZ	"	"	U
Xylenes, total	ND	1.00	"	"	"	ZZZ	"	"	U

Surrogate: 1,2-Dichloroethane-d4	94.8 %	70-130			"	"	"	"	
Surrogate: Toluene-d8	103 %	70-130			"	"	"	"	
Surrogate: 4-Bromofluorobenzene	92.1 %	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  
 6855 West 119th Avenue  
 Broomfield CO 80020

Bob Cornez  
 Project Number: 43103361  
 Project: KMG - ARF

**MW02-022820**

**2/28/2020 12:30:00PM**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Analyst	Prepared	Analyzed	Notes
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**Origins Laboratory, Inc.**  
**Y003011-02 (Water)**

**BTEX by EPA 8260D**

Benzene	ND	1.00	ug/L	1	B0C0205	ZZZ	03/02/2020	03/04/2020	U
Toluene	ND	1.00	"	"	"	ZZZ	"	"	U
Ethylbenzene	ND	1.00	"	"	"	ZZZ	"	"	U
Xylenes, total	ND	1.00	"	"	"	ZZZ	"	"	U

Surrogate: 1,2-Dichloroethane-d4	95.9 %	70-130			"	"	"	"	
Surrogate: Toluene-d8	104 %	70-130			"	"	"	"	
Surrogate: 4-Bromofluorobenzene	90.8 %	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.*

Jen Pellegrini, Project Manager

Tasman Geosciences  
 6855 West 119th Avenue  
 Broomfield CO 80020

Bob Cornez  
 Project Number: 43103361  
 Project: KMG - ARF

MW03-022820

2/28/2020 12:15:00PM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Analyst	Prepared	Analyzed	Notes
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**Origins Laboratory, Inc.**  
 Y003011-03 (Water)

**BTEX by EPA 8260D**

Benzene	ND	1.00	ug/L	1	B0C0205	ZZZ	03/02/2020	03/04/2020	U
Toluene	ND	1.00	"	"	"	ZZZ	"	"	U
Ethylbenzene	ND	1.00	"	"	"	ZZZ	"	"	U
Xylenes, total	ND	1.00	"	"	"	ZZZ	"	"	U

Surrogate: 1,2-Dichloroethane-d4	91.9 %	70-130			"	"	"	"	
Surrogate: Toluene-d8	104 %	70-130			"	"	"	"	
Surrogate: 4-Bromofluorobenzene	89.7 %	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.

Jen Pellegrini, Project Manager

Tasman Geosciences  
 6855 West 119th Avenue  
 Broomfield CO 80020

Bob Cornez  
 Project Number: 43103361  
 Project: KMG - ARF

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

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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**Batch B0C0205 - EPA 5030B (Water)**

**Blank (B0C0205-BLK1)**

Prepared: 03/02/2020 Analyzed: 03/04/2020

Benzene	ND	1.00	ug/L							U
Toluene	ND	1.00	"							U
Ethylbenzene	ND	1.00	"							U
Xylenes, total	ND	1.00	"							U
Surrogate: 1,2-Dichloroethane-d4	56		"	62.5		89.8	70-130			
Surrogate: Toluene-d8	63		"	62.5		100	70-130			
Surrogate: 4-Bromofluorobenzene	59		"	62.5		94.4	70-130			

Origins Laboratory, Inc.



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Jen Pellegrini, Project Manager

Tasman Geosciences  
 6855 West 119th Avenue  
 Broomfield CO 80020

Bob Cornez  
 Project Number: 43103361  
 Project: KMG - ARF

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

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch B0C0205 - EPA 5030B (Water)

**LCS (B0C0205-BS1)**

Prepared: 03/02/2020 Analyzed: 03/04/2020

Benzene	47.8	1.00	ug/L	50.0		95.6	70-130			
Toluene	55.2	1.00	"	50.0		110	70-130			
Ethylbenzene	55.9	1.00	"	50.0		112	70-130			
m,p-Xylene	111	2.00	"	100		111	70-130			
o-Xylene	52.8	1.00	"	50.0		106	70-130			
Surrogate: 1,2-Dichloroethane-d4	51		"	62.5		81.3	70-130			
Surrogate: Toluene-d8	66		"	62.5		106	70-130			
Surrogate: 4-Bromofluorobenzene	54		"	62.5		86.9	70-130			

Origins Laboratory, Inc.



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Jen Pellegrini, Project Manager

Tasman Geosciences  
 6855 West 119th Avenue  
 Broomfield CO 80020

Bob Cornez  
 Project Number: 43103361  
 Project: KMG - ARF

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

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch B0C0205 - EPA 5030B (Water)

Matrix Spike (B0C0205-MS1)	Source: Y003002-01			Prepared: 03/02/2020 Analyzed: 03/04/2020						
Benzene	51.3	1.00	ug/L	50.0	ND	103	70-130			
Toluene	57.1	1.00	"	50.0	ND	114	70-130			
Ethylbenzene	58.6	1.00	"	50.0	0.080	117	70-130			
m,p-Xylene	117	2.00	"	100	0.210	117	70-130			
o-Xylene	55.2	1.00	"	50.0	ND	110	70-130			
Surrogate: 1,2-Dichloroethane-d4	51		"	62.5		81.9	70-130			
Surrogate: Toluene-d8	63		"	62.5		101	70-130			
Surrogate: 4-Bromofluorobenzene	55		"	62.5		87.9	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  
 6855 West 119th Avenue  
 Broomfield CO 80020

Bob Cornez  
 Project Number: 43103361  
 Project: KMG - ARF

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

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch B0C0205 - EPA 5030B (Water)

Matrix Spike Dup (B0C0205-MSD1)	Source: Y003002-01			Prepared: 03/02/2020 Analyzed: 03/04/2020						
Benzene	47.0	1.00	ug/L	50.0	ND	94.0	70-130	8.75	20	
Toluene	56.1	1.00	"	50.0	ND	112	70-130	1.71	20	
Ethylbenzene	55.5	1.00	"	50.0	0.080	111	70-130	5.52	20	
m,p-Xylene	110	2.00	"	100	0.210	110	70-130	5.68	20	
o-Xylene	52.4	1.00	"	50.0	ND	105	70-130	5.13	20	
Surrogate: 1,2-Dichloroethane-d4	51		"	62.5		81.0	70-130			
Surrogate: Toluene-d8	68		"	62.5		108	70-130			
Surrogate: 4-Bromofluorobenzene	54		"	62.5		86.5	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  
6855 West 119th Avenue  
Broomfield CO 80020

Bob Cornez  
Project Number: 43103361  
Project: KMG - ARF

---

**Notes and Definitions**

U Sample is Non-Detect.

ND Analyte NOT DETECTED at or above the reporting limit

RPD Relative Percent Difference

All soil results are reported at a wet weight basis.

Origins Laboratory, Inc.



*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, Project Manager

May 18, 2020

Tasman Geosciences

Bob Cornez

6855 West 119th Avenue

Broomfield CO 80020

**Project Name - KMG - ARF**

**Project Number - 43103361**

Attached are your analytical results for KMG - ARF received by Origins Laboratory, Inc. May 11, 2020. This project is associated with Origins project number Y005137-01.

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  
6855 West 119th Avenue  
Broomfield CO 80020

Bob Cornez  
Project Number: 43103361  
Project: KMG - ARF

CROSS REFERENCE REPORT

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
MW 01 - 051120	Y005137-01	Water	May 11, 2020 15:20	05/11/2020 16:45
MW 02 - 051120	Y005137-02	Water	May 11, 2020 15:15	05/11/2020 16:45
MW 03 - 051120	Y005137-03	Water	May 11, 2020 14:54	05/11/2020 16:45

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  
 6855 West 119th Avenue  
 Broomfield CO 80020

Bob Cornez  
 Project Number: 43103361  
 Project: KMG - ARF

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

**Sample Receipt Checklist**

Origins Work Order: Y005137 Client: Tasman  
 Client Project ID: ARF

Checklist Completed by: JR KDK Shipped Via: HD  
 Date/time completed: 05/12/2020 (UPS, FedEx, Hand Delivered, Pick-up, etc.)  
 Airbill #: N/A

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

Cooler Number/Temperature: 1 / 3.9 °C 1 °C 1 °C (Describe) \_\_\_\_\_ °C

Thermometer ID: T003

Requirement Description	Yes	No	N/A	Comments (if any)
If samples require cooling, was the temperature between 0°C to ≤ 6°C <sup>(1)</sup> ?	/			
Is there ice present (document if blue ice is used)	/			
Are custody seals present on cooler? (if so, document in comments if they are signed and dated, broken or intact)			/	
Are custody seals present on each sample container? (If so, document in comments if they are signed and dated, broken or intact)			/	
Were all samples received intact <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> ?			/	
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> ?	/			
For volatiles in water – is there headspace (> ¼ inch bubble) present? If yes, contact client and note in narrative.		/		
Are samples preserved that require preservation and was it checked <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)			/	
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) JM Date/Time Reviewed 5-13-20

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  
 6855 West 119th Avenue  
 Broomfield CO 80020

Bob Cornez  
 Project Number: 43103361  
 Project: KMG - ARF

MW 01 - 051120

5/11/2020 3:20:00PM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Analyst	Prepared	Analyzed	Notes
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**Origins Laboratory, Inc.**  
 Y005137-01 (Water)

**BTEX by EPA 8260D**

Benzene	ND	1.00	ug/L	1	B0E1202	KDK	05/12/2020	05/13/2020	U
Toluene	ND	1.00	"	"	"	KDK	"	"	U
Ethylbenzene	ND	1.00	"	"	"	KDK	"	"	U
Xylenes, total	ND	1.00	"	"	"	KDK	"	"	U

Surrogate: 1,2-Dichloroethane-d4	104 %	70-130			"	"	"	"	
Surrogate: Toluene-d8	99.2 %	70-130			"	"	"	"	
Surrogate: 4-Bromofluorobenzene	101 %	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  
 6855 West 119th Avenue  
 Broomfield CO 80020

Bob Cornez  
 Project Number: 43103361  
 Project: KMG - ARF

MW 02 - 051120

5/11/2020 3:15:00PM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Analyst	Prepared	Analyzed	Notes
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**Origins Laboratory, Inc.**  
 Y005137-02 (Water)

**BTEX by EPA 8260D**

Benzene	ND	1.00	ug/L	1	B0E1202	KDK	05/12/2020	05/13/2020	U
Toluene	ND	1.00	"	"	"	KDK	"	"	U
Ethylbenzene	ND	1.00	"	"	"	KDK	"	"	U
Xylenes, total	ND	1.00	"	"	"	KDK	"	"	U

Surrogate: 1,2-Dichloroethane-d4	102 %	70-130			"	"	"	"	
Surrogate: Toluene-d8	100 %	70-130			"	"	"	"	
Surrogate: 4-Bromofluorobenzene	101 %	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  
 6855 West 119th Avenue  
 Broomfield CO 80020

Bob Cornez  
 Project Number: 43103361  
 Project: KMG - ARF

MW 03 - 051120

5/11/2020 2:54:00PM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Analyst	Prepared	Analyzed	Notes
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**Origins Laboratory, Inc.**  
 Y005137-03 (Water)

**BTEX by EPA 8260D**

Benzene	ND	1.00	ug/L	1	B0E1202	KDK	05/12/2020	05/13/2020	U
Toluene	ND	1.00	"	"	"	KDK	"	"	U
Ethylbenzene	ND	1.00	"	"	"	KDK	"	"	U
Xylenes, total	ND	1.00	"	"	"	KDK	"	"	U

Surrogate: 1,2-Dichloroethane-d4	101 %	70-130			"	"	"	"	
Surrogate: Toluene-d8	99.3 %	70-130			"	"	"	"	
Surrogate: 4-Bromofluorobenzene	101 %	70-130			"	"	"	"	

Origins Laboratory, Inc.



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Tasman Geosciences  
 6855 West 119th Avenue  
 Broomfield CO 80020

Bob Cornez  
 Project Number: 43103361  
 Project: KMG - ARF

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

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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**Batch B0E1202 - EPA 5030B (Water)**

**Blank (B0E1202-BLK1)**

Prepared: 05/12/2020 Analyzed: 05/13/2020

Benzene	ND	1.00	ug/L							U
Toluene	ND	1.00	"							U
Ethylbenzene	ND	1.00	"							U
Xylenes, total	ND	1.00	"							U
Surrogate: 1,2-Dichloroethane-d4	63		"	62.5		100	70-130			
Surrogate: Toluene-d8	62		"	62.5		99.3	70-130			
Surrogate: 4-Bromofluorobenzene	63		"	62.5		101	70-130			

Origins Laboratory, Inc.



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Tasman Geosciences  
 6855 West 119th Avenue  
 Broomfield CO 80020

Bob Cornez  
 Project Number: 43103361  
 Project: KMG - ARF

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

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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**Batch B0E1202 - EPA 5030B (Water)**

**LCS (B0E1202-BS1)**

Prepared: 05/12/2020 Analyzed: 05/13/2020

Benzene	56.1	1.00	ug/L	50.0		112	70-130			
Toluene	54.6	1.00	"	50.0		109	70-130			
Ethylbenzene	56.7	1.00	"	50.0		113	70-130			
m,p-Xylene	106	2.00	"	100		106	70-130			
o-Xylene	50.7	1.00	"	50.0		101	70-130			
Surrogate: 1,2-Dichloroethane-d4	59		"	62.5		95.2	70-130			
Surrogate: Toluene-d8	63		"	62.5		100	70-130			
Surrogate: 4-Bromofluorobenzene	62		"	62.5		99.8	70-130			

Origins Laboratory, Inc.



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Tasman Geosciences  
 6855 West 119th Avenue  
 Broomfield CO 80020

Bob Cornez  
 Project Number: 43103361  
 Project: KMG - ARF

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

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch B0E1202 - EPA 5030B (Water)

Matrix Spike (B0E1202-MS1)	Source: Y005137-01			Prepared: 05/12/2020 Analyzed: 05/13/2020						
Benzene	54.0	1.00	ug/L	50.0	ND	108	70-130			
Toluene	51.8	1.00	"	50.0	ND	104	70-130			
Ethylbenzene	54.1	1.00	"	50.0	ND	108	70-130			
m,p-Xylene	101	2.00	"	100	0.240	101	70-130			
o-Xylene	48.6	1.00	"	50.0	ND	97.2	70-130			
Surrogate: 1,2-Dichloroethane-d4	62		"	62.5		98.8	70-130			
Surrogate: Toluene-d8	63		"	62.5		100	70-130			
Surrogate: 4-Bromofluorobenzene	63		"	62.5		101	70-130			

Origins Laboratory, Inc.



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Tasman Geosciences  
 6855 West 119th Avenue  
 Broomfield CO 80020

Bob Cornez  
 Project Number: 43103361  
 Project: KMG - ARF

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

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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**Batch B0E1202 - EPA 5030B (Water)**

Matrix Spike Dup (B0E1202-MSD1)	Source: Y005137-01			Prepared: 05/12/2020 Analyzed: 05/13/2020						
Benzene	50.8	1.00	ug/L	50.0	ND	102	70-130	6.11	20	
Toluene	49.4	1.00	"	50.0	ND	98.9	70-130	4.56	20	
Ethylbenzene	50.8	1.00	"	50.0	ND	102	70-130	6.25	20	
m,p-Xylene	95.2	2.00	"	100	0.240	94.9	70-130	5.91	20	
o-Xylene	45.7	1.00	"	50.0	ND	91.3	70-130	6.22	20	
Surrogate: 1,2-Dichloroethane-d4	62		"	62.5		98.9	70-130			
Surrogate: Toluene-d8	62		"	62.5		99.6	70-130			
Surrogate: 4-Bromofluorobenzene	63		"	62.5		100	70-130			

Origins Laboratory, Inc.



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Tasman Geosciences  
6855 West 119th Avenue  
Broomfield CO 80020

Bob Cornez  
Project Number: 43103361  
Project: KMG - ARF

---

**Notes and Definitions**

U Sample is Non-Detect.

ND Analyte NOT DETECTED at or above the reporting limit

RPD Relative Percent Difference

All soil results are reported at a wet weight basis.

Origins Laboratory, Inc.



*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.*