

December 5, 2016

Great Western Operating Company, LLC
1801 Broadway, Suite 500
Denver, Colorado 80202

Attention: Scot Donato, EH&S/Regulatory Manager

Subject: Excavation Soil Sampling and Remediation Activities
Haas #1
Weld County, Colorado
Project Number 160884.EC

Mr. Donato,

On October 4 and October 5, 2016, A. G. Wassenaar, Inc. (AGW) conducted post-excavation soil sampling and remediation activities at the Haas #1 facility in Weld County, Colorado. The site is located in the northeast ¼ of the southeast ¼ of Section 15, Township 6 North, Range 67 West; northwest of the intersection of Highway 392 and County Road 21 in Weld County, Colorado. Figure 1 in Attachment B depicts the location of the site. The site formerly contained one aboveground steel tank for condensate storage, one aboveground tank for produced water storage, and one earthen containment berm for the separator. This letter summarizes the project activities and analytical results.

BACKGROUND

In March 2016, Great Western Operating Company, LLC (GWOC) requested that AGW visit the site to collect soil samples following the excavation of approximately 250 cubic yards of visibly impacted soil in the vicinity of the former produced water storage vessel. On March 15, 2016, AGW collected soil samples from the walls and base of the excavation, and from the stockpiled soils. The soil samples were submitted for laboratory analysis of gasoline range organics (GRO), diesel range organics (DRO), for and benzene, toluene, ethylbenzene, and total xylenes (BTEX). The GRO and DRO values were added together to obtain the total petroleum hydrocarbon (TPH) concentration for comparison to the Colorado Oil and Gas Conservation Commission (COGCC) Table 910-1 TPH concentration. Based on the analytical results, impacted soils remained at the site.

GWOC notified the COGCC, Weld County, the Town of Windsor, and the surface owner of the historical release on March 22, 2016, and a Form 19 Spill/Release Report was submitted on March 24, 2016. A supplemental Spill/Release Report was submitted on April 1, 2016. Copies of all COGCC forms and notifications are included in Attachment A.

On May 3, 2016, AGW returned to the site to conduct drilling activities and complete additional soil and groundwater sampling to define the extent of impact in the vicinity of the release. The results of the May 3, 2016 investigation determined that groundwater had been impacted at the site, and that impacted soil remained at the site and additional excavation was needed.

To address the remaining impacted soils and groundwater at the site, on October 4 and October 5, 2016, the excavation was extended and 650 cubic yards of additional impacted soils were removed. An activated carbon remedial agent was incorporated into the soils and groundwater at the base of the excavation, and slotted PVC pipe was installed horizontally within the excavation to provide access to groundwater for possible future remediation efforts. Details of the project are included below.

METHODS AND RESULTS

Health and Safety Plan Development

AGW created a site specific Health and Safety Plan for activities conducted by AGW employees at the site. The plan called for level D (lowest threat level) protection based on the anticipated chemicals of concern and their potential concentrations. Additionally, trench safety practices and trench access were continually discussed between the track hoe operator and AGW throughout the project.

Excavation Methods and Utility Clearances

GWOC contracted M&M Excavation to supply and operate a track hoe excavator. In accordance with Colorado law, the project excavation contractor contacted the Utility Notification Center of Colorado (UNCC) and associated utility companies to locate public subsurface utilities in the proposed dig area. Based on the utility locates, no subsurface utility conflicts were identified at the excavation.

M&M Excavation removed approximately 650 cubic yards of visibly impacted soils from the site, which were disposed of offsite at a licensed facility. The excavation was approximately 30 feet wide in the east-west direction, 40 feet long in the north-south direction, and 12 feet deep. Groundwater was present at the base of the excavation.

Soil Sampling Soil Field Screening Methods and Results

Following excavation activities, on October 4, 2016, confirmation soil samples were collected from each of the four walls—north, south, east, and west—of the excavation, to verify that the impacted soils had been removed. No soil sample was collected from the base of the excavation.

A portion of each excavation wall soil sample was transferred into a sealable plastic bag for field evaluation and screening with a photoionization detector (PID). PID screening detects volatile organic compounds (VOCs) with an ionization potential of 10.6 electron volts (eV) or less, including many compounds found in petroleum. While the PID provides a semi-quantitative measurement, the instrument is a tool that provides more of a qualitative analysis of potential impacts from volatile hydrocarbons. Elevated soil moisture, humidity, and variations in contaminant composition, temperature, and soil type can affect the PID results. AGW accomplished the PID screening by inserting the PID probe into the individual sealed sample bags and recording the instrument response.

PID readings for samples collected from the north, west, and south walls were respectively 35.7 parts per million (ppm), 6.6 ppm, and 0.0 ppm. A slightly elevated PID reading of 584 ppm was detected at the east wall of the excavation.

Soil Sampling Methods and Results

During this project, AGW followed sampling procedures, equipment decontamination methods, and chain-of-custody procedures in general accordance with U. S. Environmental Protection Agency (EPA) guidelines.

On the day of collection, select soil samples were submitted to Origins Laboratory, Inc. (Origins) in Denver, Colorado for analysis. Origins analyzed the samples for BTEX, GRO, and DRO.

The October 4, 2016 soil sample results are included in Table 1, below and are depicted on Figure 2 in Attachment B. The laboratory analytical report is included in Attachment C.

Table 1: Soil Analytical Results
Haas #1
October 4, 2016

Sample Number	Depth of Sample Collection (feet)	GRO	DRO	TPH (GRO+DRO)	BTEX
884-North	7	0.593	ND	0.593	BTE: ND X: 0.007
884-East	6	16.1	ND	16.1	B: 0.002 T: ND E: 0.039 X: 0.104
884-West	6	ND	75.8	75.8	ND
884-South	5	ND	ND	ND	ND
COGCC Table 910-1 Concentrations		500			B: 0.17 T: 85 E: 100 X: 175

All concentrations are in mg/kg = Milligrams per kilogram, parts per million (ppm)

GRO: Gasoline Range Organics

DRO: Diesel Range Organics

TPH: Total Petroleum Hydrocarbons

B: Benzene, T: Toluene, E: Ethylbenzene, X: Total Xylenes

ND = Not detected above laboratory detection limits

To evaluate the soil analytical results, AGW compared the identified concentrations to Table 910-1 Concentration Levels provided within COGCC 900 Series Rules for Exploration and Production Waste Management. Based on the results of the October 4, 2016 soil sampling activities, the extent of contamination has been defined and removed laterally. Soil samples collected from all four walls did not contain concentrations of BTEX or TPH greater than COGCC Table 910-1 concentrations.

Activated Carbon Remediation

Once impacted soils had been removed laterally, 1,150 pounds of granular COGAC™, an activated carbon remedial agent supplied by Remington Technologies, LLC, were incorporated into the soils and groundwater at the base of the excavation cavity.



Mixing COGAC™ in Track Hoe Bucket



Mixing COGAC™ into Excavation with Track Hoe

Remediation Pipe Installation

The COGAC™ was incorporated into the base of the excavation in order to treat groundwater impact at the Haas #1 site. In order to facilitate possible future remediation efforts and provide access to groundwater, slotted PVC pipe was installed horizontally in the base of the excavation prior to backfilling.



Infiltration Gallery - Northwest Looking Southeast



Infiltration Gallery - Northwest Looking Southeast

The excavation depth was approximately 12 feet. Groundwater was encountered at 9 feet below ground surface (bgs) during the May 2016 investigation, and at 12 feet bgs in October 2016. A 40-foot long, 3-foot-deep trench was advanced within the excavation, to a depth of 15 feet bgs.

Two 4-inch diameter, 20-foot long horizontal perforated PVC pipes connected to a non-perforated vertical PVC pipe were installed in the trench at the base of the excavation. The lateral portion of the gallery was placed in the trench, and surrounded by at least 6 inches of pea-gravel on all sides. The perforated, lateral portion of the gallery was wrapped in a permeable, woven geotextile to prevent the surrounding gravel pack from entering the perforations.

DISCUSSION AND CONCLUSIONS

In March and May 2016, A. G. Wassenaar, Inc. (AGW) conducted soil and groundwater sampling at the Haas #1 facility in Weld County, Colorado, following a release of produced water at the site. The results of the March and May 2016 investigations determined that soil and groundwater impact remained at the site.

To address the remaining impacted soils and groundwater at the site, on October 4 and October 5, 2016, the excavation at the Haas #1 facility was extended, and 650 cubic yards of additional impacted soils were removed. AGW conducted post-excavation soil sampling from each of the four walls of the excavation. Based on the analytical results, impacted soils have been removed laterally and to the depth of groundwater. 1,150 pounds of COGAC™ were incorporated into the soil and groundwater at the base of the excavation, and slotted PVC pipe was installed horizontally within the excavation to provide access to groundwater for possible future remediation efforts.

In order to monitor the effectiveness of the remediation activities, AGW recommends the installation of three monitoring at the site: one in the source area, and two downgradient. Once the monitoring wells have been installed, quarterly groundwater monitoring will take place until four consecutive sampling events have occurred in which BTEX and TPH are below their respective Table 910-1 values.

Thank you for your review of this report. If you have any questions or require further information, please call us at (303) 759-8373.

Sincerely,
A.G. Wassenaar, Inc.



Devin Hazelwood E.I.T.
Staff Environmental Engineer



Rachel A. Peterson, P.G.
Project Manager

DEH/RAP/dd

Attachments

ATTACHMENT A

COGCC SPILL REPORTS AND NOTIFICATIONS



State of Colorado Oil and Gas Conservation Commission

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



Document Number:

401015105

Date Received:

03/24/2016

Spill report taken by:

ALLISON, RICK

Spill/Release Point ID:

445284

SPILL/RELEASE REPORT (INITIAL)

This form is to be submitted by the party responsible for the oil and gas spill or release. Any spill or release which may impact waters of the State must be reported as soon as practicable; any spill over 20 bbls must be reported within 24 hours and all spills over five bbls must be reported within ten days. Submit a Site Investigation and Remediation Workplan (Form 27) when requested by the Director.

OPERATOR INFORMATION

Name of Operator: <u>GREAT WESTERN OPERATING COMPANY LLC</u>	Operator No: <u>10110</u>	Phone Numbers Phone: <u>(303) 398-0302</u> Mobile: <u>(303) 549-7739</u> Email: <u>sdonato@gwogco.com</u>
Address: <u>1801 BROADWAY #500</u>		
City: <u>DENVER</u>	State: <u>CO</u> Zip: <u>80202</u>	
Contact Person: <u>Scot Donato</u>		

INITIAL SPILL/RELEASE REPORT

Initial Spill/Release Report Doc# 401015105

Initial Report Date: 03/24/2016 Date of Discovery: 03/22/2016 Spill Type: Historical Release

Spill/Release Point Location:

Location of Spill/Release: QTRQTR NESE SEC 15 TWP 6N RNG 67W MERIDIAN 6

Latitude: 40.484493 Longitude: -104.872766

Municipality (if within municipal boundaries): Windsor County: WELD

Reference Location:

Facility Type: TANK BATTERY ☒ Facility/Location ID No 319611

☐ No Existing Facility or Location ID No.

☐ Well API No. (Only if the reference facility is well) 05- -

Fluid(s) Spilled/Released (please answer Yes/No):

Was one (1) barrel or more spilled outside of berms or secondary containment? No

Secondary containment, including walls & floor regardless of construction material, must be sufficiently impervious to contain any discharge from primary containment until cleanup occurs.

Were Five (5) barrels or more spilled? No

Estimated Total Spill Volume: use same ranges as others for values

Estimated Oil Spill Volume(bbl): 0

Estimated Condensate Spill Volume(bbl): 0

Estimated Flow Back Fluid Spill Volume(bbl): 0

Estimated Produced Water Spill Volume(bbl): Unknown

Estimated Other E&P Waste Spill Volume(bbl): 0

Estimated Drilling Fluid Spill Volume(bbl): 0

Specify: _____

Land Use:

Current Land Use: NON-CROP LAND Other(Specify): undeveloped

Weather Condition: clear

Surface Owner: FEE Other(Specify): _____

Check if impacted or threatened by spill/Release (please answer Yes/No to all that apply):

Waters of the State ☐ Residence/Occupied Structure ☐ Livestock ☐ Public Byway ☐ Surface Water Supply Area ☐

As defined in COGCC 100-Series Rules

Describe what is known about the spill/release event (what happened -- including how it was stopped, contained, and recovered):

GWOC recently relocated the Haas #1 Tank Battery. As a result of that process, GWOC identified a historical release of produced water. impacted soils were noted and excavated. Soil samples collected from the walls and base of the excavation, and from the stockpile contained concentrations of TPH which exceed Table 910-1 concentrations.

List Agencies and Other Parties Notified:

OTHER NOTIFICATIONS

<u>Date</u>	<u>Agency/Party</u>	<u>Contact</u>	<u>Phone</u>	<u>Response</u>
3/22/2016	COGCC	Rick Allison	-	notified by email
3/22/2016	Weld County	Troy Swain	-	notified by email
3/24/2016	Town of Windsor	Joe Plummer	-	notified by email
3/22/2016	Surface Owner	Journey Homes	-	notified by email

OPERATOR COMMENTS:

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

Signed: _____ Print Name: Rachel Peterson

Title: Project Manager Date: 03/24/2016 Email: petersonr@agwassenaar.com

COA Type

Description

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Attachment Check List

Att Doc Num

Name

401015105	SPILL/RELEASE REPORT(INITIAL)
401015106	TOPOGRAPHIC MAP
401017637	FORM 19 SUBMITTED

Total Attach: 3 Files

General Comments

User Group

Comment

Comment Date

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Total: 0 comment(s)

State of Colorado Oil and Gas Conservation Commission

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



Document Number:

401019999

Date Received:

04/01/2016

Spill report taken by:

ALLISON, RICK

Spill/Release Point ID:

445284

SPILL/RELEASE REPORT (SUPPLEMENTAL)

This form is to be submitted by the party responsible for the oil and gas spill or release. Any spill or release which may impact waters of the State must be reported as soon as practicable; any spill over 20 bbls must be reported within 24 hours and all spills over five bbls must be reported within ten days. Submit a Site Investigation and Remediation Workplan (Form 27) when requested by the Director.

OPERATOR INFORMATION

Name of Operator: <u>GREAT WESTERN OPERATING COMPANY LLC</u>	Operator No: <u>10110</u>	Phone Numbers
Address: <u>1801 BROADWAY #500</u>		Phone: <u>(303) 398-0302</u>
City: <u>DENVER</u>	State: <u>CO</u>	Mobile: <u>(303) 549-7739</u>
Zip: <u>80202</u>		Email: <u>sdonato@gwogco.com</u>
Contact Person: <u>Scot Donato</u>		

INITIAL SPILL/RELEASE REPORT

Initial Spill/Release Report Doc# 401015105

Initial Report Date: 03/24/2016 Date of Discovery: 03/22/2016 Spill Type: Historical Release

Spill/Release Point Location:

Location of Spill/Release: QTRQTR NESE SEC 15 TWP 6N RNG 67W MERIDIAN 6Latitude: 40.484493 Longitude: -104.872766Municipality (if within municipal boundaries): Windsor County: WELD

Reference Location:

Facility Type: TANK BATTERY ☒ Facility/Location ID No 319611☐ No Existing Facility or Location ID No.☐ Well API No. (Only if the reference facility is well) 05- -

Fluid(s) Spilled/Released (please answer Yes/No):

Was one (1) barrel or more spilled outside of berms or secondary containment? No

Secondary containment, including walls & floor regardless of construction material, must be sufficiently impervious to contain any discharge from primary containment until cleanup occurs.

Were Five (5) barrels or more spilled? No

Estimated Total Spill Volume: use same ranges as others for values

Estimated Oil Spill Volume(bbl): 0Estimated Condensate Spill Volume(bbl): 0Estimated Flow Back Fluid Spill Volume(bbl): 0Estimated Produced Water Spill Volume(bbl): UnknownEstimated Other E&P Waste Spill Volume(bbl): 0Estimated Drilling Fluid Spill Volume(bbl): 0

Specify: _____

Land Use:

Current Land Use: NON-CROP LAND Other(Specify): undevelopedWeather Condition: clearSurface Owner: FEE Other(Specify): _____

Check if impacted or threatened by spill/Release (please answer Yes/No to all that apply):

Waters of the State ☐ Residence/Occupied Structure ☐ Livestock ☐ Public Byway ☐ Surface Water Supply Area ☐

As defined in COGCC 100-Series Rules

Describe what is known about the spill/release event (what happened -- including how it was stopped, contained, and recovered):

GWOC recently relocated the Haas #1 Tank Battery. As a result of that process, GWOC identified a historical release of produced water. impacted soils were noted and excavated. Soil samples collected from the walls and base of the excavation, and from the stockpile contained concentrations of TPH which exceed Table 910-1 concentrations.

List Agencies and Other Parties Notified:

OTHER NOTIFICATIONS

Date	Agency/Party	Contact	Phone	Response
3/22/2016	COGCC	Rick Allison	-	notified by email
3/22/2016	Weld County	Troy Swain	-	notified by email
3/24/2016	Town of Windsor	Joe Plummer	-	notified by email
3/22/2016	Surface Owner	Journey Homes	-	notified by email

SPILL/RELEASE DETAIL REPORTS

#1	Supplemental Report Date: 04/01/2016		
FLUIDS	BBL's SPILLED	BBL's RECOVERED	Unknown
OIL	0	0	<input type="checkbox"/>
CONDENSATE	0	0	<input type="checkbox"/>
PRODUCED WATER			<input checked="" type="checkbox"/>
DRILLING FLUID	0	0	<input type="checkbox"/>
FLOW BACK FLUID	0	0	<input type="checkbox"/>
OTHER E&P WASTE	0	0	<input type="checkbox"/>
specify: _____			
Was spill/release completely contained within berms or secondary containment? <u>NO</u> Was an Emergency Pit constructed? <u>NO</u>			
Secondary containment, including walls & floor regardless of construction material , must be sufficiently impervious to contain any discharge from primary containment until cleanup occurs.			
A Form 15 Pit Report shall be submitted within 30 calendar days after the construction of an emergency pit			
Impacted Media (Check all that apply) <input checked="" type="checkbox"/> Soil <input type="checkbox"/> Groundwater <input type="checkbox"/> Surface Water <input type="checkbox"/> Dry Drainage Feature			
Surface Area Impacted: Length of Impact (feet): 0		Width of Impact (feet): 0	
Depth of Impact (feet BGS): 0		Depth of Impact (inches BGS): _____	
How was extent determined?			
Extent has not been fully determined yet, but will be during additional excavation and/or drilling activities. The site is currently inaccessible due to significant snowfall and mud conditions.			
Soil/Geology Description:			
Kim Loam, 1 to 3 percent slopes			
Depth to Groundwater (feet BGS) 0		Number Water Wells within 1/2 mile radius: 7	
If less than 1 mile, distance in feet to nearest		Water Well 190 None <input type="checkbox"/>	Surface Water 200 None <input type="checkbox"/>
		Wetlands 0 None <input type="checkbox"/>	Springs 0 None <input type="checkbox"/>
		Livestock 0 None <input type="checkbox"/>	Occupied Building 1600 None <input type="checkbox"/>
Additional Spill Details Not Provided Above:			

REQUEST FOR CLOSURE

Spill/Release Reports should be closed when impacts have been remediated or when further investigation and corrective actions will take place under an approved Form 27.

Basis for Closure: ☐ Corrective Actions Completed (documentation attached)

☐ Work proceeding under an approved Form 27

Form 27 Remediation Project No: _____

OPERATOR COMMENTS:

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

Signed: _____ Print Name: Rachel Peterson

Title: Project Manager Date: 04/01/2016 Email: petersonr@agwassenaar.com

<u>COA Type</u>	<u>Description</u>
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Attachment Check List

<u>Att Doc Num</u>	<u>Name</u>
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401019999	SPILL/RELEASE REPORT(SUPPLEMENTAL)
401032781	FORM 19 SUBMITTED

Total Attach: 2 Files

General Comments

<u>User Group</u>	<u>Comment</u>	<u>Comment Date</u>
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Environmental	Operator is requested to verify the location of the water well identified to be 190 feet from the reported release point. If the water well is incorrectly located based on DWR historical records, then submit a revised Spill/Release Detail Report with a corrected distance to the nearest water well. If the water well is verified to be mapped correctly or is found to be located within 1/8 mile of the release, then include the water well location on site diagrams with future reports.	4/6/2016 9:44:53 AM
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Total: 1 comment(s)

Rachel Peterson

From: Rachel Peterson
Sent: Tuesday, March 22, 2016 10:43 AM
To: rick.allison@state.co.us; tswain@weldgov.com
Cc: Donato Scot; David Slawkowski; rscheid@gwogco.com; Hettinger Mike
Subject: spill notification

This email serves as notification of a historical release at the Haas #1 site (API [05-123-11564](#)) operated by Great Western Operating Company (Operator #10110). Soil analytical results received this morning confirmed that concentrations of TPH greater than the COGCC Table 910-1 concentration are present in soils at this site. A spill report will also be submitted for this historical release. The site is located in Weld County, in the NESE Section 15, Township 6N, Range 67W, 6th p.m.

Sincerely,
Rachel Peterson

Rachel Peterson, P.G.
A. G. Wassenaar, Inc.
303.759.8373
fax 303.759.4874
petersonr@agwassenaar.com

Information contained herein may be subject to failure or corruption during transmission. Final stamped and signed documents govern. Use of this data is solely at the user's risk. By accessing the data contained in these files the user agrees to indemnify, hold harmless and defend A. G. Wassenaar, Inc. and its employees, officers, and agents from any and all claims arising from the use of the data.

Rachel Peterson

From: Rachel Peterson
Sent: Monday, March 28, 2016 9:49 AM
To: 'Scott Ballstadt'
Cc: Scot Donato
Subject: RE: spill notification

Scott,

Thanks for following up; we'll note that you are to be notified in the future. The attachment was probably just my email signature; there was no relevant attachment, just the email notification.

Sincerely,

Rachel

Rachel Peterson, P.G.

A. G. Wassenaar, Inc.

office 303.759.8373

cell 303.981.0292

fax 303.759.4874

Please note my new email address: petersonr@agwco.com

[LinkedIn](#)

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From: Scott Ballstadt [<mailto:sballstadt@windsorgov.com>]
Sent: Friday, March 25, 2016 3:12 PM
To: Rachel Peterson <petersonr@agwco.com>; Joe Plummer <jplummer@windsorgov.com>
Cc: Scot Donato <sdonato@gwogco.com>
Subject: RE: spill notification

Hi Rachel,

I am unable to open the document link in your below email. Can it be sent as an attachment?

Also, please note that Joe Plummer is no longer with the Town of Windsor. Please replace him with my information. Thanks.

Scott Ballstadt, AICP

Director

Town of Windsor | Planning

Dir: 970-674-2411 | www.windsorgov.com

Follow Us www.windsorgov.com/socialmedia

From: Rachel Peterson [<mailto:petersonr@agwco.com>]
Sent: Thursday, March 24, 2016 9:03 PM
To: Joe Plummer
Cc: Scot Donato
Subject: spill notification

This email serves as notification of a historical release at the Haas #1 site (API [05-123-11564](#)) operated by Great Western Operating Company (Operator #10110). Soil analytical results confirmed that concentrations of TPH greater than the COGCC Table 910-1 concentration are present in soils at this site. A spill report will also be submitted for this historical release. The site is located in Weld County, in the NESE Section 15, Township 6N, Range 67W, 6th p.m.

Sincerely,
Rachel Peterson

Rachel Peterson, P.G.
A. G. Wassenaar, Inc.
303.759.8373
fax 303.759.4874
petersonr@agwassenaar.com

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Rachel Peterson

From: Rachel Peterson
Sent: Thursday, March 24, 2016 9:39 PM
To: Scot Donato
Subject: Re: Historical Release Notification

Very good, thanks. Form 19 submitted this evening.
R

Rachel Peterson, P.G.
A. G. Wassenaar, Inc.
office 303.759.8373
cell 303.981.0292
fax 303.759.4874
Please note my new email address: petersonr@agwco.com
[LinkedIn](#)

Information contained herein may be subject to failure or corruption during transmission. Final stamped and signed documents govern. Use of this data is solely at the user's risk. By accessing the data contained in these files the user agrees to indemnify, hold harmless and defend A. G. Wassenaar, Inc. and its employees, officers, and agents from any and all claims arising from the use of the data.

From: Scot Donato <sdonato@gwogco.com>
Sent: Thursday, March 24, 2016 9:21 PM
To: Rachel Peterson
Subject: Fwd: Historical Release Notification

It was sent to David

Please excuse all Siri-spelling errors-Sent from my iPhone

Begin forwarded message:

From: Philip Hancock <phancock@gwogco.com>
Date: March 22, 2016 at 11:50:04 AM MDT
To: "linda@journeyhomes.com" <linda@journeyhomes.com>
Cc: "David Slawkowski (slawkawskid@agwco.com)" <slawkawskid@agwco.com>, Scot Donato <sdonato@gwogco.com>, Eric Creed <ecreed@gwogco.com>
Subject: Historical Release Notification

Hi Linda,

Thanks for taking my call a moment ago. As mentioned, we recently relocated our Haas #1 Tank Battery on the Village East Investments, LLC property in Windsor. As a result of that process, we identified a historical release of produced water. The Colorado Oil & Gas Conservation Commission (COGCC) requires operators to notify the landowner, County and the COGCC within 24 hours of identification of any spill. Let this email serve as such notification. We will report the release to the applicable agencies

and remediate it as required. Should you have any further questions, please contact our Regulatory Manager, Scot Donato, at 303-398-0302.

Thanks,



Philip Hancock

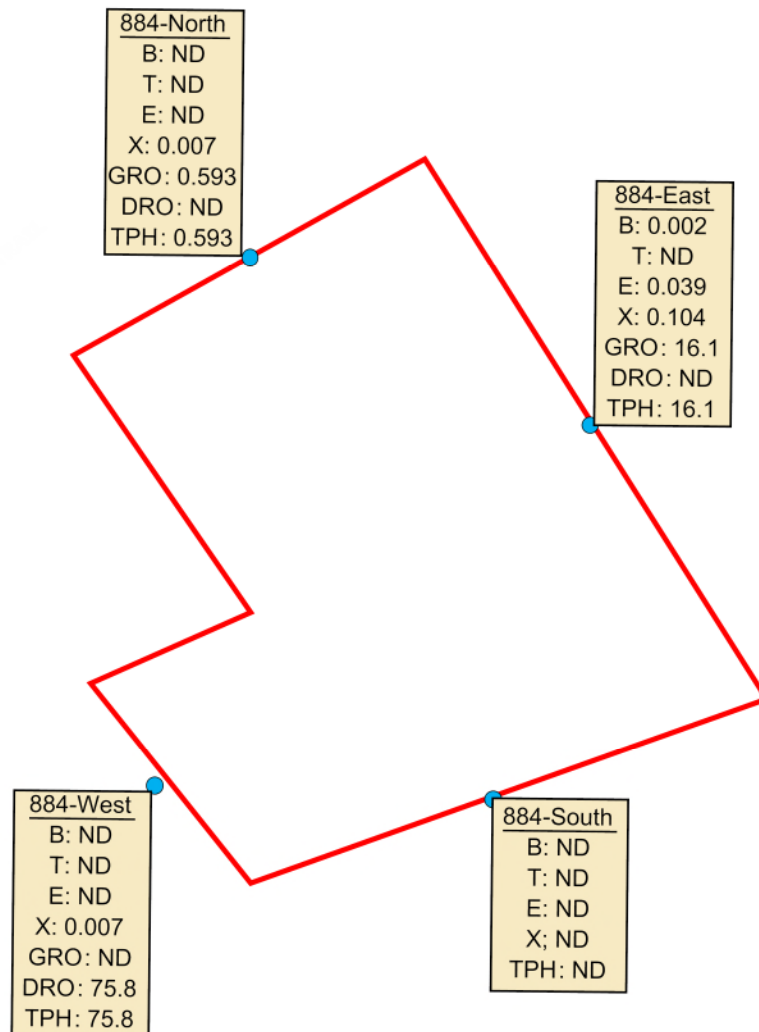
Sr. Surface Landman
Great Western Operating Company, LLC
2005 Howard Smith Ave. East
Windsor, CO 80550
Office: 970.460.1468
Cell: 318.401.4535
Fax: 866.742.1784
www.gwogco.com

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ATTACHMENT B

DIAGRAMS





October, 2016 excavation boundaries
 Sampling Location



Approximate Scale: 1" = 10'

B: Benzene
 T: Toluene
 E: Ethylbenzene
 X: Total Xylenes
 GRO: Gasoline Range Organics
 DRO: Diesel Range Organics
 TPH: Total Petroleum Hydrocarbons (GRO + DRO)

Concentrations in milligrams per kilogram (mg/kg)
 ND: Not detected above laboratory detection limits
 Concentrations in **BOLD** exceed COGCC Table 910-1

A.G. WASSENAAR | **INC.**
 GEOTECHNICAL • ENVIRONMENTAL
 CONSULTANTS

October 4, 2016 Soil Analytical Results
 Haas 1, Weld County, Colorado
 AGW Project Number: 160884.EC
 Figure 1

ATTACHMENT C

LABORATORY ANALYTICAL REPORTS



October 05, 2016

A.G. Wassenaar

Rachel Peterson

2180 South Ivanhoe Street - Suite 5

Denver

CO 80222

Project Name - HAAS #1

Project Number - 160884

Attached are your analytical results for HAAS #1 received by Origins Laboratory, Inc. October 04, 2016. This project is associated with Origins project number X610025-01.

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



A.G. Wassenaar

2180 South Ivanhoe Street - Suite 5

Denver CO 80222

Rachel Peterson

Project Number: 160884

Project: HAAS #1

CROSS REFERENCE REPORT

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
884-West	X610025-01	Soil	October 4, 2016 15:10	10/04/2016 16:50
884-South	X610025-02	Soil	October 4, 2016 15:15	10/04/2016 16:50
884-North	X610025-03	Soil	October 4, 2016 15:20	10/04/2016 16:50
884-East	X610025-04	Soil	October 4, 2016 15:25	10/04/2016 16:50

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Jen Pellegrini For Noelle Doyle Mathis, President

A.G. Wassenaar

2180 South Ivanhoe Street - Suite 5

Denver CO 80222

Rachel Peterson

Project Number: 160884

Project: HAAS #1

www.originslaboratory.com

X610025

ORIGINS
LABORATORY, INC

page 1 of 1

Client: A.G. Wassenaar, Inc.
Address: 2180 S. Ivanhoe St #5 Denver, CO 80222
Telephone Number: hazelwood@agwco.com
Email Address: peterson@agwco.com

Project Manager: Rachel Peterson
Project Name: Haas #1
Project Number: 160884
Samples Collected By: Devin Hazelwood

Sample ID Description	Date Sampled	Time Sampled	# of Containers	Preservative				Matrix			Analysis	Sample Instructions	
				Unpreserved	HCl	HNO ₃	Other	Groundwater	Soil	Air Summa Canister #			
884-West	10/4/16	15:10	2	X					X				1
884-South	10/4/16	15:15	2	X					X				2
884-North	10/4/16	15:20	2	X					X				3
884-East	10/4/16	15:25	2	X					X				4
													5
													6
													7
													8
													9
													10

Relinquished By:	Date:	Time:	Received By:	Date:	Time:	Turnaround Time:
J. Hazelwood	10/4/16	16:50	J. Peterson	10/4/16	16:50	Same Day <input type="checkbox"/> 24 Hr <input checked="" type="checkbox"/> 48 Hr <input type="checkbox"/> 72 Hr <input type="checkbox"/> Standard <input type="checkbox"/>

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

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Jen Pellegrini

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A.G. Wassenaar

2180 South Ivanhoe Street - Suite 5

Denver CO 80222

Rachel Peterson

Project Number: 160884

Project: HAAS #1

Origins Laboratory

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

Sample Receipt Checklist

Origins Work Order: X610025

Client: A.G. Wassenaar

Client Project ID: HAAS #1

Checklist Completed by: Jeff Smith

Shipped Via: HTD

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

Date/time completed: 10/14/12

Airbill #: 123

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

Cooler Number/Temperature: 1 / 15.4 °C 1 / _____ °C 1 / _____ °C (Describe)

Thermometer ID: T2003

Requirement Description	Yes	No	N/A	Comments (if any)
If samples require cooling, was the temperature between 0°C to ≤ 6°C ⁽¹⁾ ?	✓			
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 ⁽¹⁾ ?	✓			
Was adequate sample volume provided ⁽¹⁾ ?	<			
Are short holding time analytes or samples with HTs due within 48 hours present ⁽¹⁾ ?		✓		
Is a chain-of-custody (COC) present and filled out completely ⁽¹⁾ ?	✓			
Does the COC agree with the number and type of sample bottles received ⁽¹⁾ ?	<			
Do the sample IDs on the bottle labels match the COC ⁽¹⁾ ?	<			
Is the COC properly relinquished by the client with date and time recorded ⁽¹⁾ ?	<			
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 ⁽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)		<		
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) Jeff Smith

Date/Time Reviewed 10/14/12

Origins Laboratory, Inc.

Jefi Pellegrini

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A.G. Wassenaar

2180 South Ivanhoe Street - Suite 5

Denver CO 80222

Rachel Peterson

Project Number: 160884

Project: HAAS #1

884-West**10/4/2016 3:10:00PM**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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Origins Laboratory, Inc.
X610025-01 (Soil)**Diesel Range Organics (DRO/TEPH) by EPA 8015C**

Diesel (C10-C28)	75.8	50.0	mg/kg	1	B6J0404	10/04/2016	10/04/2016
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Surrogate: o-Terphenyl	86.4 %	59-131			"	"	"
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GBTEX by EPA 8260C

Gasoline Range Hydrocarbons	ND	0.200	mg/kg	1	B6J0403	10/04/2016	10/04/2016	U
Benzene	ND	0.002	"	"	"	"	"	U
Toluene	ND	0.002	"	"	"	"	"	U
Ethylbenzene	ND	0.002	"	"	"	"	"	U
Xylenes, total	ND	0.002	"	"	"	"	"	U

Surrogate: 1,2-Dichloroethane-d4	110 %	70-130			"	"	"
Surrogate: Toluene-d8	96.0 %	70-130			"	"	"
Surrogate: 4-Bromofluorobenzene	106 %	70-130			"	"	"

Origins Laboratory, Inc.



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A.G. Wassenaar

2180 South Ivanhoe Street - Suite 5

Denver CO 80222

Rachel Peterson

Project Number: 160884

Project: HAAS #1

884-South

10/4/2016 3:15:00PM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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Origins Laboratory, Inc.
X610025-02 (Soil)

Diesel Range Organics (DRO/TEPH) by EPA 8015C

Diesel (C10-C28)	ND	50.0	mg/kg	1	B6J0404	10/04/2016	10/04/2016	U
Surrogate: o-Terphenyl	77.5 %	59-131			"	"	"	

GBTEX by EPA 8260C

Gasoline Range Hydrocarbons	ND	0.200	mg/kg	1	B6J0403	10/04/2016	10/04/2016	U
Benzene	ND	0.002	"	"	"	"	"	U
Toluene	ND	0.002	"	"	"	"	"	U
Ethylbenzene	ND	0.002	"	"	"	"	"	U
Xylenes, total	ND	0.002	"	"	"	"	"	U
Surrogate: 1,2-Dichloroethane-d4	112 %	70-130			"	"	"	
Surrogate: Toluene-d8	95.0 %	70-130			"	"	"	
Surrogate: 4-Bromofluorobenzene	104 %	70-130			"	"	"	

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A.G. Wassenaar

2180 South Ivanhoe Street - Suite 5

Denver CO 80222

Rachel Peterson

Project Number: 160884

Project: HAAS #1

884-North

10/4/2016 3:20:00PM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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Origins Laboratory, Inc.
X610025-03 (Soil)

Diesel Range Organics (DRO/TEPH) by EPA 8015C

Diesel (C10-C28)	ND	50.0	mg/kg	1	B6J0404	10/04/2016	10/04/2016	U
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Surrogate: o-Terphenyl	67.5 %	59-131			"	"	10/04/2016	
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GBTEX by EPA 8260C

Gasoline Range Hydrocarbons	0.593	0.200	mg/kg	1	B6J0403	10/04/2016	10/04/2016	
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Benzene	ND	0.002	"	"	"	"	"	U
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Toluene	ND	0.002	"	"	"	"	"	U
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Ethylbenzene	ND	0.002	"	"	"	"	"	U
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Xylenes, total	0.007	0.002	"	"	"	"	"	
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Surrogate: 1,2-Dichloroethane-d4	107 %	70-130			"	"	"	
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Surrogate: Toluene-d8	98.5 %	70-130			"	"	"	
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Surrogate: 4-Bromofluorobenzene	104 %	70-130			"	"	"	
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Origins Laboratory, Inc.



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A.G. Wassenaar

2180 South Ivanhoe Street - Suite 5

Denver CO 80222

Rachel Peterson

Project Number: 160884

Project: HAAS #1

884-East

10/4/2016 3:25:00PM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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Origins Laboratory, Inc.
X610025-04 (Soil)

Diesel Range Organics (DRO/TEPH) by EPA 8015C

Diesel (C10-C28)	ND	50.0	mg/kg	1	B6J0404	10/04/2016	10/04/2016	U
Surrogate: o-Terphenyl	69.3 %	59-131			"	"	10/04/2016	

GBTEX by EPA 8260C

Gasoline Range Hydrocarbons	16.1	0.200	mg/kg	1	B6J0403	10/04/2016	10/04/2016	
Benzene	0.002	0.002	"	"	"	"	"	
Toluene	ND	0.002	"	"	"	"	"	U
Ethylbenzene	0.039	0.002	"	"	"	"	"	
Xylenes, total	0.104	0.002	"	"	"	"	"	
Surrogate: 1,2-Dichloroethane-d4	101 %	70-130			"	"	"	
Surrogate: Toluene-d8	109 %	70-130			"	"	"	
Surrogate: 4-Bromofluorobenzene	112 %	70-130			"	"	"	

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2180 South Ivanhoe Street - Suite 5

Denver CO 80222

Rachel Peterson

Project Number: 160884

Project: HAAS #1

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 B6J0403 - EPA 5030 (soil)										
Blank (B6J0403-BLK1)					Prepared: 10/04/2016 Analyzed: 10/04/2016					
Gasoline Range Hydrocarbons	ND	0.200	mg/kg							U
Benzene	ND	0.002	"							U
Toluene	ND	0.002	"							U
Ethylbenzene	ND	0.002	"							U
Xylenes, total	ND	0.002	"							U
Surrogate: 1,2-Dichloroethane-d4	65		ug/kg	62.5		104	70-130			
Surrogate: Toluene-d8	61		"	62.5		97.3	70-130			
Surrogate: 4-Bromofluorobenzene	65		"	62.5		105	70-130			

Origins Laboratory, Inc.



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Denver CO 80222

Rachel Peterson

Project Number: 160884

Project: HAAS #1

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 B6J0403 - EPA 5030 (soil)

LCS (B6J0403-BS1)

Prepared: 10/04/2016 Analyzed: 10/04/2016

Benzene	0.115	0.002	mg/kg	0.100		115	77.1-124			
Toluene	0.110	0.002	"	0.100		110	74.5-128			
Ethylbenzene	0.106	0.002	"	0.100		106	66.4-127			
m,p-Xylene	0.208	0.004	"	0.200		104	76.6-124			
o-Xylene	0.105	0.002	"	0.100		105	76.6-124			
Surrogate: 1,2-Dichloroethane-d4	65		ug/kg	62.5		104	70-130			
Surrogate: Toluene-d8	65		"	62.5		104	70-130			
Surrogate: 4-Bromofluorobenzene	62		"	62.5		100	70-130			

Origins Laboratory, Inc.



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Jen Pellegrini For Noelle Doyle Mathis, President

A.G. Wassenaar

2180 South Ivanhoe Street - Suite 5

Denver CO 80222

Rachel Peterson

Project Number: 160884

Project: HAAS #1

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 B6J0403 - EPA 5030 (soil)

Matrix Spike (B6J0403-MS1)		Source: X609366-01			Prepared: 10/04/2016 Analyzed: 10/04/2016					
Benzene	0.085	0.002	mg/kg	0.100	ND	84.5	71.8-126			
Toluene	0.079	0.002	"	0.100	ND	79.4	65.1-130			
Ethylbenzene	0.077	0.002	"	0.100	ND	77.0	62.2-130			
m,p-Xylene	0.155	0.004	"	0.200	ND	77.6	46.5-137			
o-Xylene	0.077	0.002	"	0.100	ND	77.2	54.2-134			
Surrogate: 1,2-Dichloroethane-d4	66		ug/kg	62.5		106	70-130			
Surrogate: Toluene-d8	62		"	62.5		99.9	70-130			
Surrogate: 4-Bromofluorobenzene	65		"	62.5		104	70-130			

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Denver CO 80222

Rachel Peterson

Project Number: 160884

Project: HAAS #1

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 B6J0403 - EPA 5030 (soil)

Matrix Spike Dup (B6J0403-MSD1)		Source: X609366-01			Prepared: 10/04/2016 Analyzed: 10/04/2016					
Benzene	0.092	0.002	mg/kg	0.100	ND	92.2	71.8-126	8.69	11.3	
Toluene	0.088	0.002	"	0.100	ND	87.9	65.1-130	10.1	15.4	
Ethylbenzene	0.084	0.002	"	0.100	ND	83.8	62.2-130	8.43	19.6	
m,p-Xylene	0.169	0.004	"	0.200	ND	84.4	46.5-137	8.35	19.2	
o-Xylene	0.086	0.002	"	0.100	ND	86.1	54.2-134	11.0	17.9	
Surrogate: 1,2-Dichloroethane-d4	67		ug/kg	62.5		108	70-130			
Surrogate: Toluene-d8	64		"	62.5		103	70-130			
Surrogate: 4-Bromofluorobenzene	65		"	62.5		104	70-130			

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Denver CO 80222

Rachel Peterson

Project Number: 160884

Project: HAAS #1

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 B6J0404 - EPA 3580

Blank (B6J0404-BLK1)

Prepared: 10/04/2016 Analyzed: 10/04/2016

Diesel (C10-C28)	ND	50.0	mg/kg							U
Surrogate: o-Terphenyl	43		"	50.0		86.6	59-131			

LCS (B6J0404-BS1)

Prepared: 10/04/2016 Analyzed: 10/04/2016

Diesel (C10-C28)	919	50.0	mg/kg	1000		91.9	64-121			
Surrogate: o-Terphenyl	44		"	50.0		88.3	59-131			

LCS Dup (B6J0404-BSD1)

Prepared: 10/04/2016 Analyzed: 10/04/2016

Diesel (C10-C28)	922	50.0	mg/kg	1000		92.2	64-121	0.405	20	
Surrogate: o-Terphenyl	43		"	50.0		86.9	59-131			

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A.G. Wassenaar

2180 South Ivanhoe Street - Suite 5

Denver CO 80222

Rachel Peterson

Project Number: 160884

Project: HAAS #1

Notes and Definitions

U Sample is Non-Detect.

ND Analyte NOT DETECTED at or above the reporting limit

RPD Relative Percent Difference

All soil results are reported at a wet weight basis.

Origins Laboratory, Inc.



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