

June 15, 2015

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

Attention: Scot Donato, EH&S/Regulatory Manager

Subject: Limited Subsurface Investigation
Mershon Production Battery Site
Weld County, Colorado
Project Number E14447.EC

Dear Mr. Donato,

As requested, A. G. Wassenaar, Inc. (AGW) conducted a limited subsurface investigation at the Mershon Production Battery Site in Weld County, Colorado. The site contains six oil and gas wellheads, seven condensate storage tanks, and one produced water storage tank. The tanks are positioned within two earthen containment berms. This letter summarizes the project activities and analytical results.

SCOPE OF WORK

This project was completed in accordance with the scope of work discussed with and approved by Great Western Operating Company, LLC (GWOC).

The purpose of the investigation was to further evaluate the extent of previously identified petroleum impacts in ground water at the site. The chemicals of concern for this project include benzene, toluene, ethylbenzene, and total xylenes (BTEX).

The investigation included the following general tasks:

- Health and Safety Plan Development
- Utility Locating and Potholing
- Permanent ground water monitoring well installation
- Ground Water Sampling
- Laboratory Analysis and Data Interpretation
- Report Preparation

BACKGROUND AND PREVIOUS ENVIRONMENTAL ACTIVITIES

AGW was present at the site on September 18, 2014, following the identification of visibly impacted soils beneath a produced water vessel which was being removed. AGW collected three soil samples for field evaluation and laboratory analysis from beneath the location of the former produced water vessel and from test pits east of the produced water vessel. The soil samples were submitted for laboratory analysis

of gasoline range organics (GRO) and diesel range organics (DRO). 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. The results of the September 18, 2014 soil sampling activities are depicted on Figure 1 in Attachment B.

GWOC notified the COGCC, as well as the surface owner and Weld County, of the release on September 26, 2014. On September 29, 2014, GWOC submitted a Form 19 Spill/Release Report. A supplemental Spill/Release Report was submitted on October 3, 2014, and a Form 27 Site Investigation and Remediation Workplan was submitted on October 7, 2014. COGCC approved the Form 27 on October 14, 2014, and work at this site will proceed under Remediation Project No. 8677. Copies of all COGCC forms and notifications are included in Attachment A.

In October 2014, approximately 200 cubic yards of soil exhibiting staining and odors were removed on various dates and disposed of at Waste Management's North Weld Landfill located in Ault, Colorado. The maximum depth of the excavation was approximately 14 feet deep. Ground water was encountered approximately 12-13 feet below ground surface (bgs). Following excavation, AGW collected four soil samples on October 3, 2014 from the excavation cavity walls. Due to the presence of ground water at the base of the excavation cavity, a soil sample was not collected from the base. AGW did collect one "grab" ground water sample, designated GW-Pit, from ground water which infiltrated the base of the excavation. Results from the October 3, 2014 soil and ground water sampling results are depicted on Figure 1 in Attachment B.

On October 20, 2014, approximately 150 cubic yards of additional soil were removed from the excavation. AGW collected a confirmation soil sample from the eastern wall of the expanded excavation and directed the excavation of additional test pits on the east and west sides of the DCP pipeline west of the excavation. "Grab" ground water samples, designated W-1 and W-2, were collected from two test pits south of the existing excavation. The October 20, 2014 soil and ground water sampling results are depicted on Figure 1 in Attachment B. To enhance remediation, approximately 250 pounds of an activated carbon and oxygen releasing remediation compound called COGAC (manufactured by Remington Technologies of Loveland, Colorado) were placed at the base of the excavation cavity prior to backfilling in October 2014.

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.

Utility Clearances

In accordance with Colorado law, AGW and the project drilling contractor contacted the Utility Notification Center of Colorado (UNCC) and associated utility companies to locate public subsurface utilities in the proposed boring areas prior to borehole advancement. Based on the utility locates, no subsurface utility conflicts were identified at the borehole locations.

Potholing Methods

Prior to advancement of two of the boreholes, MW-1 and MW-3, Dakota Drilling, Inc. (Dakota) of Denver, Colorado conducted hydro-excavation to a depth of 5 feet to ensure that no utilities were present in these locations. No conflicting pipelines or other buried utility lines were present within these two borehole locations.

Drilling and Soil Sampling Methods

On April 9, 2015, Dakota utilized a CME-55 truck-mounted drill rig to advance a total of four boreholes and assist with soil sample collection. The boreholes were designated MW-1 through MW-4.

To evaluate the previously identified impacted ground water in the former excavation, MW-1 was positioned as close as possible to the produced water tank, directly south of the earthen berm at the site. Based on regional topography and nearby surface water features, the estimated direction of ground water flow in the area is toward the south. Based on this information, borehole MW-2 was positioned southeast of the produced water tank and the earthen berm, borehole MW-3 was advanced southwest of the produced water tank and the earthen berm, and borehole MW-4 was advanced south of the produced water tank and the earthen berm. Figure 2 in Attachment B depicts the borehole locations.

To drill the boreholes, Dakota utilized 4-inch outside diameter solid-stem augers. During drilling, an AGW field geologist collected soil samples for field evaluation at approximate 5 foot intervals. The soil samples were collected from auger cuttings.

To control potential cross-contamination, Dakota used clean, decontaminated augers for each of the four boreholes. In addition, AGW cleaned the water level measuring tape prior to drilling and between uses with an Alconox® detergent and municipal water solution, followed by a municipal water rinse. The AGW field geologist also wore disposable nitrile gloves during sampling to help control potential cross-contamination.

Each borehole was advanced to a depth of 20 feet bgs to intersect the ground water table.

Soil Field Screening Methods

A portion of each borehole 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.

Soil Observations and Screening Results

Soils encountered during this project generally consisted of brown and gray silty sands from the surface to the base of each borehole. There were no suspect odors or staining observed in any of the soil samples. During this project, slightly elevated PID readings were detected in soils from the borehole for MW-1. Additional soil details and specific PID results are presented on the soil boring logs in Attachment C.

Monitoring Well Installation Methods

To allow for collection of ground water samples, Dakota constructed monitoring wells in each of the boreholes using 2-inch diameter, schedule 40 polyvinylchloride (PVC) piping. Each permanent well included a 10-foot section of machine slotted screen pipe (0.010-inch slots) with a bottom cap at the base of the borehole. Above each screened section, PVC riser pipe extended to approximately three feet above the ground surface. Commercial washed quartz sand (10/20) was then used to fill the space around each screened section to act as a filter pack. To control potential surface water infiltration, hydrated bentonite chips were used to fill the void around each riser pipe (above the screen and filter pack) to within approximately 12 inches of the top of the casing. Each permanent monitoring well pipe top was also sealed with a waterproof cap. To protect each monitoring well from potential surface damage, Dakota also installed steel protective covers set in concrete around each well. Well construction details are presented on the boring logs in Attachment C.

Surveying Methods

To determine the relative ground surface and monitoring well casing elevations at the site, and to allow ground water flow direction and gradient calculations, AGW conducted an elevation survey of the subject area on April 9, 2015. The surveying was completed using standard methods with a tripod-mounted level and fiberglass measuring rod. A site-specific benchmark elevation of 100.00 feet was used for reference at the top of the well pipe at MW-1. The elevation survey results are considered accurate to 1/100th of a foot. As part of the surveying activities, AGW also recorded lateral distance measurements between monitoring wells using a GPS.

Well Development and Ground Water Measurements

Following monitoring well installation, the monitoring wells were developed to remove excess silt and sand sediment, maximize inflow of ground water into the wells, and to allow for representative sample collection. Monitoring well development was accomplished by agitating the ground water column in each well using a new dedicated plastic bailer attached to nylon cord. Following the removal of approximately three well volumes from each monitoring well, the extracted water was relatively clear.

During this project, AGW utilized a clean electronic water level indicator tape to measure the depth to ground water at all four monitoring wells. The water level indicator tape was cleaned prior to, and between each use, with a solution of Alconox® detergent and tap water, followed by a tap water rinse.

Ground Water Elevation Measurements

Following monitoring well development, ground water in the monitoring wells was allowed to stabilize before ground water measurements were collected on April 20, 2015 for ground water elevation calculations and gradient determination. Ground water depths ranged from approximately 10.48 to 11.97 feet bgs. Table 1 summarizes the ground water depth measurements and elevations.

**Table 1: Ground Water Measurements
Mershon Production Site
April 20, 2015**

Well Number	Ground Surface Elevation (ft.)*	Top of Casing (T.O.C.) Elevation (ft.)	Depth to Ground Water (T.O.C.) (ft.)	Ground Water Elevation (ft.)
MW-1	97.29	100.00	14.69	85.31
MW-2	96.08	98.73	13.45	85.28
MW-3	96.27	98.99	13.71	85.28
MW-4	96.27	98.97	13.75	85.22

* Elevations are in feet, based on a site datum of 100.00 feet. Benchmark is the top of well pipe casing MW-1

To evaluate the ground water measurements, AGW compared the measured data with surveyed elevations. Based on the results, ground water flow across the site is generally towards the south with a gradient of approximately 0.0085 feet per foot. Figure 2 in Attachment B illustrates the ground water elevations and estimated flow directions.

Ground Water Sampling Methods

Following monitoring well installation, AGW collected ground water samples from each of the four wells for analytical testing on April 9, 2015. Prior to collecting the samples, AGW measured the depth to ground water at each location.

To collect the samples, AGW utilized a new dedicated plastic bailer attached to nylon cord at each borehole. Each sample was transferred into three acid-preserved glass vials supplied by the laboratory for BTEX analysis. The filled sample containers were immediately sealed, labeled, and placed into a cooler with ice (a preservative). On the day of sample collection, AGW delivered the samples to Origins for analytical testing. During this project, AGW followed chain-of-custody procedures in general accordance with EPA guidelines. Origins analyzed all four ground water samples for BTEX using EPA Method 8260C.

Ground Water Analytical Results

Table 2, below, summarizes the ground water analytical results. A copy of the laboratory report is included in Attachment D. The results are also illustrated on Figure 3 in Attachment B.

**Table 2: Ground Water Analytical Results
Mershon Production Site
April 9, 2015**

Sample Number	Benzene	Toluene	Ethylbenzene	Total Xylenes
MW-1	0.118	0.0046	0.0139	0.0532
MW-2	ND	ND	ND	ND
MW-3	ND	ND	ND	ND

Sample Number	Benzene	Toluene	Ethylbenzene	Total Xylenes
MW-4	ND	ND	ND	ND
COGCC Table 910-1 Concentrations (mg/L)	0.005	1.0	0.70	10.0

All concentrations are in mg/L = Milligrams per liter, parts per million

ND = Not detected above laboratory detection limits

Analytes in **bold** exceed their respective COGCC Table 910-1 concentration

To evaluate the ground water analytical results, AGW consulted the Table 910-1 Concentration Levels provided within COGCC 900 Series Rules for Exploration and Production Waste Management. Based on the results, BTEX compounds were detected in sample MW-1. Benzene was detected at 0.118 mg/L, which is greater than its COGCC Table 910-1 concentration of 0.005 mg/L. All other analytes were present at concentrations less than their respective COGCC Table 910-1 concentrations. BTEX compounds were not detected in any of the other samples at concentrations greater than the laboratory detection limits.

DISCUSSION

On April 9, 2015, AGW conducted a limited subsurface investigation at the Mershon Production Site, in the vicinity of a release associated with a produced water tank. The investigation was conducted to further define the extent of contaminated ground water that had been previously identified in the excavation following the release.

To allow for collection of ground water for field evaluation and analytical testing, four permanent ground water wells were installed south, southeast, and southwest of the release location and former excavation.

Ground water samples were collected from each of the four monitoring wells on the day of installation, and analyzed for BTEX. Based on the ground water analytical results, BTEX compounds were not detected in any of the samples at concentrations greater than COGCC Table 910-1 regulatory concentrations, with the exception of benzene in the monitoring well nearest to the release, MW-1.

CONCLUSIONS

Impacted soils were removed in the vicinity of the former produced water vessel, except for inaccessible soils directly adjacent to underground gas lines, based on soil analytical results from samples collected in September and October 2014. To enhance remediation, approximately 250 pounds of COGAC were placed at the base of the excavation cavity prior to backfilling in October 2014. Impacted soils that could not be accessed should bioremediate in-situ given the limited volume remaining and the removal of other potential sources.

Based on ground water data from the monitoring wells installed at this site, impacted ground water is limited to the immediate vicinity of the operational produced water tank. Colorado Division of Water Resources well records indicate that there are no domestic water wells within ½ mile downgradient of the site. Additionally, based on the use of adjacent property in all directions (agricultural and industrial), it is

the opinion of AGW that the limited ground water impact does not present a significant threat to human health or the environment, and that monitored natural attenuation is the best remediation alternative for this site.

The monitoring wells at the site will be sampled for four consecutive quarters to monitor natural attenuation of impacted ground water.

LIMITATIONS

This report summarizes AGW's findings associated with a limited subsurface investigation at the Mershon Production Site in Weld County, Colorado. Although AGW completes thorough studies, no warranty is made of its accuracy, completeness, and timeliness based on information obtained from third party sources. Findings are a reflection of, and within, the scope-of-work and limitations of the work performed.

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.



Rachel A. Peterson, P.G.
Project Manager

RAP/dd

Attachments

ATTACHMENT A

COGCC FORMS 19 AND 27



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:

400695452

Date Received:

09/28/2014

Spill report taken by:

ALLISON, RICK

Spill/Release Point ID:

439123

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: GREAT WESTERN OPERATING COMPANY LLC	Operator No: 10110	Phone Numbers
Address: 1801 BROADWAY #500		Phone: (303) 398-0537
City: DENVER State: CO Zip: 80202		Mobile: (303) 398-0537
Contact Person: Scot Donato		Email: sdonato@gwogco.com

INITIAL SPILL/RELEASE REPORT

Initial Spill/Release Report Doc# 400695452

Initial Report Date: 09/25/2014 Date of Discovery: 09/25/2014 Spill Type: Historical Release

Spill/Release Point Location:

Location of Spill/Release: QTRQTR SWSE SEC 26 TWP 6N RNG 67W MERIDIAN 6

Latitude: 40.452920 Longitude: -104.857360

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

Reference Location:

Facility Type: PARTIALLY-BURIED VESSEL Facility/Location ID No 333241

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: historical release: unknown quantity of produced water released

Land Use:

Current Land Use: OTHER Other(Specify): vacant and industrial

Weather Condition: clear, sunny

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):

A fiberglass produced water vessel was being removed and potential impacts were observed in soils beneath the removed vessel. Limited excavation and stockpiling of visibly impacted were conducted.

List Agencies and Other Parties Notified:

OTHER NOTIFICATIONS

<u>Date</u>	<u>Agency/Party</u>	<u>Contact</u>	<u>Phone</u>	<u>Response</u>
9/25/2014	Weld County	Tom Parko	970-353-6100	N/A
9/25/2014	Surface Owner	Broe Group	-	
			-	

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: 09/28/2014 Email: petersonr@agwassenaar.com

Attachment Check List

<u>Att Doc Num</u>	<u>Name</u>
2614945	EMAIL 24 HOUR NOTIFICATION
400695452	SPILL/RELEASE REPORT(INITIAL)
400695856	TOPOGRAPHIC MAP
400697277	FORM 19 SUBMITTED

Total Attach: 4 Files

General Comments

<u>User Group</u>	<u>Comment</u>	<u>Comment Date</u>
Environmental	Operator's 24 notification is attached.	9/29/2014 8:49:33 AM

Total: 1 comment(s)

Rachel Peterson

From: Scot Donato <sdonato@gwogco.com>
Sent: Friday, September 26, 2014 11:26 AM
To: rick.allison@state.co.us; rrudisill@weldgov.com; jmcdonald@weldgov.com;
tparko@co.weld.co.us
Cc: Rachel Peterson, PG (petersonr@agwassenaar.com)
Subject: Release notification

This email serves as notification of a release at Great Western Operating Company's Mershon facility, COGCC location 333241. The release volume is unknown.

A produced water vessel was being removed and potential impacts were observed in soils beneath the removed vessel on September 18, 2014. Laboratory analytical results received on September 25, 2014 confirmed the release. The site is located in Weld County, in the SWSE Section 26, Township 6N, Range 67W, 6th p.m.

Broe group-surface owner has also been notified.



Scot A. Donato
EH&S/Regulatory Manager
Great Western Operating Company, LLC
1801 Broadway, Suite 500
Denver, CO 80202
Office: 303-398-0302
Fax: 866-742-1784
sdonato@gwogco.com

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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:

400701233

Date Received:

10/03/2014

Spill report taken by:

ALLISON, RICK

Spill/Release Point ID:

439123

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: GREAT WESTERN OPERATING COMPANY LLC	Operator No: 10110	Phone Numbers
Address: 1801 BROADWAY #500		Phone: (303) 398-0537
City: DENVER State: CO Zip: 80202		Mobile: (303) 398-0537
Contact Person: Scot Donato		Email: sdonato@gwogco.com

INITIAL SPILL/RELEASE REPORT

Initial Spill/Release Report Doc# 400695452

Initial Report Date: 09/25/2014 Date of Discovery: 09/25/2014 Spill Type: Historical Release

Spill/Release Point Location:

Location of Spill/Release: QTRQTR SWSE SEC 26 TWP 6N RNG 67W MERIDIAN 6

Latitude: 40.452920 Longitude: -104.857360

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

Reference Location:

Facility Type: PARTIALLY-BURIED VESSEL Facility/Location ID No 333241

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: historical release: unknown quantity of produced water released

Land Use:

Current Land Use: OTHER Other(Specify): vacant and industrial

Weather Condition: clear, sunny

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):

A fiberglass produced water vessel was being removed and potential impacts were observed in soils beneath the removed vessel. Limited excavation and stockpiling of visibly impacted were conducted.

List Agencies and Other Parties Notified:

OTHER NOTIFICATIONS

Date	Agency/Party	Contact	Phone	Response
9/25/2014	Weld County	Tom Parko	970-353-6100	N/A
9/25/2014	Surface Owner	Broe Group	-	
			-	

SPILL/RELEASE DETAIL REPORTS

#1 Supplemental Report Date: 10/03/2014

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: Historical release: unknown quantity of produced water released

Was spill/release completely contained within berms or secondary containment? NO Was an Emergency Pit constructed? NO

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) Soil Groundwater Surface Water Dry Drainage Feature

Surface Area Impacted: Length of Impact (feet): _____ Width of Impact (feet): _____

Depth of Impact (feet BGS): _____ Depth of Impact (inches BGS): _____

How was extent determined?

Extent will be determined during further excavation and sampling.

Soil/Geology Description:

Poorly sorted clays, silts, and coarse sands.

Depth to Groundwater (feet BGS) 14 Number Water Wells within 1/2 mile radius: 18

If less than 1 mile, distance in feet to nearest

Water Well	_____	None <input checked="" type="checkbox"/>	Surface Water	_____	None <input checked="" type="checkbox"/>
Wetlands	_____	None <input checked="" type="checkbox"/>	Springs	_____	None <input checked="" type="checkbox"/>
Livestock	_____	None <input checked="" type="checkbox"/>	Occupied Building	_____	None <input checked="" type="checkbox"/>

Additional Spill Details Not Provided Above:

A produced water vessel was being removed and potential impacts were observed in soils beneath the removed vessel on September 18, 2014. Laboratory analytical results received on September 25, 2014 confirmed the release. Additional soil excavation and sampling was conducted on October 3, 2014 to further determine the extent of impact. Additional laboratory results will be submitted to COGCC when available.

CORRECTIVE ACTIONS

#1 Supplemental Report Date: 10/03/2014

Cause of Spill (Check all that apply) Human Error Equipment Failure Historical-Unknown
 Other (specify) _____

Describe Incident & Root Cause (include specific equipment and point of failure)

A produced water vessel was being removed and potential impacts were observed in soils beneath the removed vessel on September 18, 2014. The incident was a result of a historical release of unknown origins.

Describe measures taken to prevent the problem(s) from reoccurring:

Volume of Soil Excavated (cubic yards): 200

Disposition of Excavated Soil (attach documentation) Offsite Disposal Onsite Treatment
 Other (specify) _____

Volume of Impacted Ground Water Removed (bbls): _____

Volume of Impacted Surface Water Removed (bbls): _____

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: _____

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: 10/03/2014 Email: petersonr@agwassenaar.com

Attachment Check List

Att Doc Num	Name
400701233	FORM 19 SUBMITTED
400701249	TOPOGRAPHIC MAP

Total Attach: 2 Files

General Comments

User Group	Comment	Comment Date

Total: 0 comment(s)

State of Colorado
Oil and Gas Conservation Commission



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

FOR OGCC USE ONLY
Received 10/7/2014
Project No. 8677
OGCC Employee:
x Spill Complaint
Inspection NOAV
Tracking No: 400695452

SITE INVESTIGATION AND REMEDIATION WORKPLAN

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

CAUSE OF CONDITION BEING INVESTIGATED AND REMEDIATED

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

OGCC Operator Number: <u>10110</u>	Contact Name and Telephone: <u>Scot Donato, EH&S/Regulatory Manager</u>
Name of Operator: <u>Great Western Operating Company, LLC</u>	No: <u>303-398-0537</u>
Address: <u>1801 Broadway, Suite 500</u>	Fax: <u>866-742-1784</u>
City: <u>Denver</u> State: <u>CO</u> Zip: <u>80202</u>	

API Number: _____	County: <u>Weld</u>
Facility Name: <u>Mershon</u>	Facility Number: <u>333241</u>
Well Name: _____	Well Number: _____
Location: (QtrQtr, Sec, Twp, Rng, Meridian): <u>SWSE 26 6N 67W 6</u> Latitude: <u>40.45292</u> Longitude: <u>-104.85736</u>	

TECHNICAL CONDITIONS

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

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

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

Soil type, if not previously identified on Form 2A or Federal Surface Use Plan: Nunn Clay Loam, 0 to 1 percent slopes

Potential receptors (water wells within 1/4 mi, surface waters, etc.): None, see Form 19 submitted 09/28/2014

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

Impacted Media (check):	Extent of Impact:	How Determined:
<input checked="" type="checkbox"/> Soils	<u>To be determined during further excavation and sampling</u>	_____
<input type="checkbox"/> Vegetation	_____	_____
<input type="checkbox"/> Groundwater	_____	_____
<input type="checkbox"/> Surface Water	_____	_____

REMEDIATION WORKPLAN

Describe initial action taken (if previously provided, refer to that form or document):
Limited excavation and stockpiling of visibly impacted soils on September 18, 2014. Collected initial soil samples for laboratory analysis. September 25, 2014 lab results confirmed release. Approximately 250 cubic yards of additional impacted soils were excavated and sent for disposal at Waste Management's North Weld County facility on October 3, 2014.

Describe how source is to be removed:
Initial soil excavation based on staining, odors, and final laboratory analytical results has been completed at location of former produced water vessel.

Describe how remediation of existing impacts is to be accomplished, including removal and disposal at an injection well or licensed facility, land treatment on site, removal of impacted groundwater, insitu bioremediation, burning of oily vegetation, etc.:
Source removal will be conducted through impacted soil removal. Confirmation soil samples will be collected and analyzed for GRO/DRO/pH/EC. Removed soils will be disposed of properly at an approved offsite disposal facility.

REMEDIATION WORKPLAN (Cont.)

State of Colorado Oil and Gas Conservation Commission 1120 Lincoln Street, Suite 801, Denver, Colorado 80203 (303)894-2100 Fax:(303)894-2109



Tracking Number: 4006954542 Name of Operator: Great Western Operating Co. OGCC Operator No: 10110 Received Date: 10/7/2014 Well Name & No: Facility Name & No: Mershon

[Empty box for monitoring plan details]

If groundwater has been impacted, describe proposed monitoring plan (# of wells or sample points, sampling schedule, analytical methods, etc.): The vertical extent of soil impact will be determined during soil excavation activities in order to ensure that impacted soils are not in contact with ground water. If ground water is not encountered during further excavation, ground water investigation and remediation will not be conducted. If ground water is encountered during excavation activities, a grab ground water sample will be collected.

Describe reclamation plan. Discuss existing and new grade recontouring; method and testing of compaction alleviation; and reseeding program, including location of new seed, seed mix and noxious weed prevention. Attach diagram or drawing. Use additional sheet for description if required. The site will be reclaimed in accordance with the 1000 series rules.

Attach samples and analytical results taken to verify remediation of impacts. Show locations of samples on an onsite schematic or drawing.

Is further site investigation required? [X] Y [] N If yes, describe: Further definition of site impacts will be completed during additional site investigation activities.

Final disposition of E&P waste (landtreated and disposed onsite, name of licensed disposal facility, recycling, reuse, etc.): Impacted soils will be disposed of at a licensed disposal facility.

IMPLEMENTATION SCHEDULE

Date Site Investigation Began: 09/18/14 Date Site Investigation Completed: Date Remediation Plan Submitted: Remediation Start Date: 10/03/14 Anticipated Completion Date: Actual Completion Date:

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

Print Name: Scot A. Donato Signed: [Signature] Title: EH&S/Regulatory Manager Date: 10/07/14

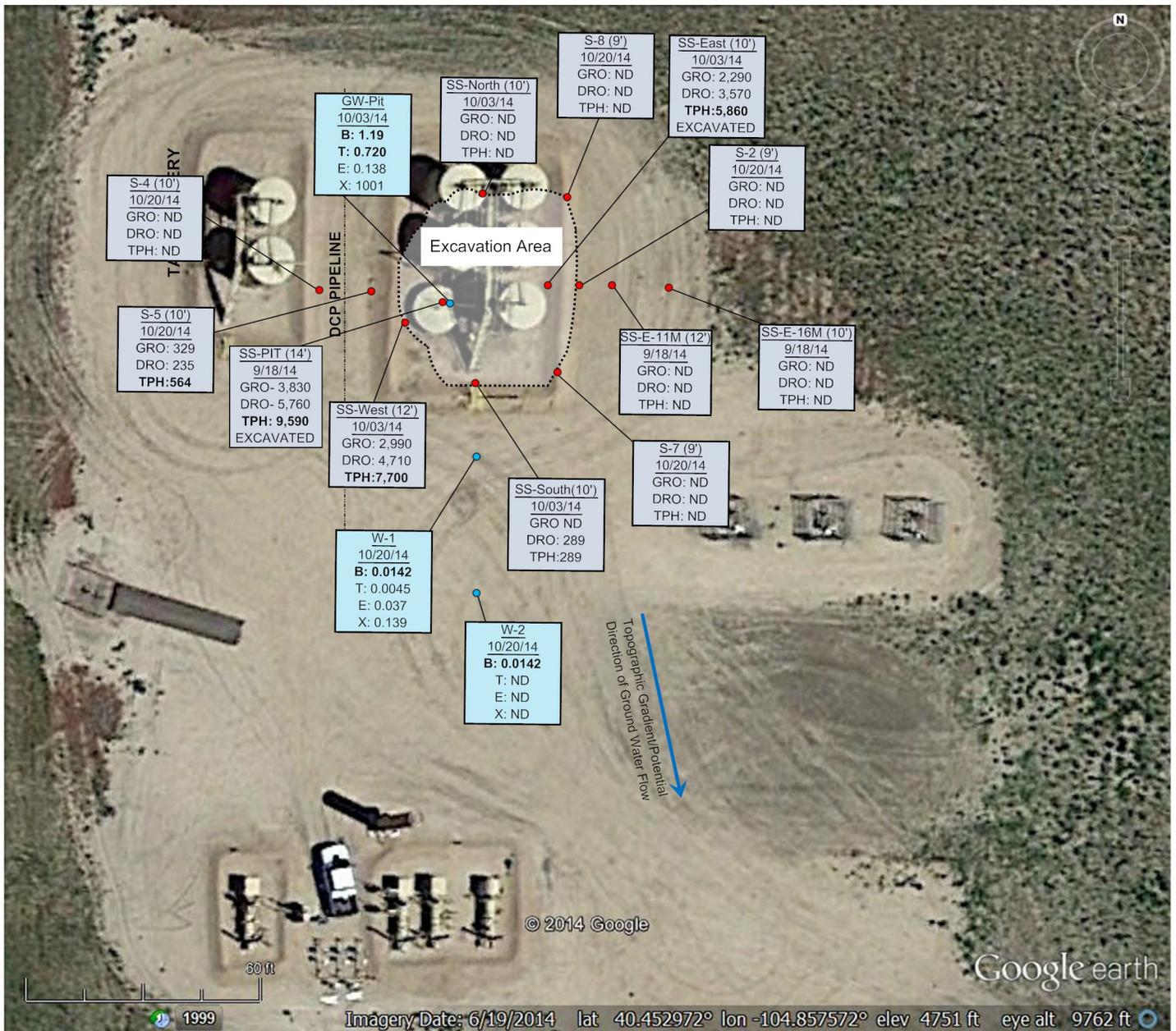
OGCC Approved: Title: Northeast EPS Date: 10/14/2014

Condition of Approval: Conduct the additional site investigation within 45 days of approval of this Form 27. Submit a summary of site assessment results and any proposed remedial actions within 90 days of approval of this Form 27.

ATTACHMENT B

DIAGRAMS





LEGEND

- Soil Sample Name (depth in feet)
date of collection
- Ground Water Sample
date of collection

GRO: Gasoline Range Organics
 DRO: Diesel Range Organics
 TPH: Total Petroleum Hydrocarbons (GRO + DRO)
 B: Benzene, T: Toluene, E: Ethylbenzene, X: Total Xylenes
 ND: Not detected above laboratory detection limits

pH and Specific Conductivity Results are not depicted; all pH and EC results were less than COGCC Table 910-1 concentrations
 Soil concentrations are in milligrams per kilogram (mg/kg)
 Ground water concentrations are in milligrams per liter (mg/L)
 Concentrations in **BOLD** exceed applicable COGCC Table 910-1 concentrations

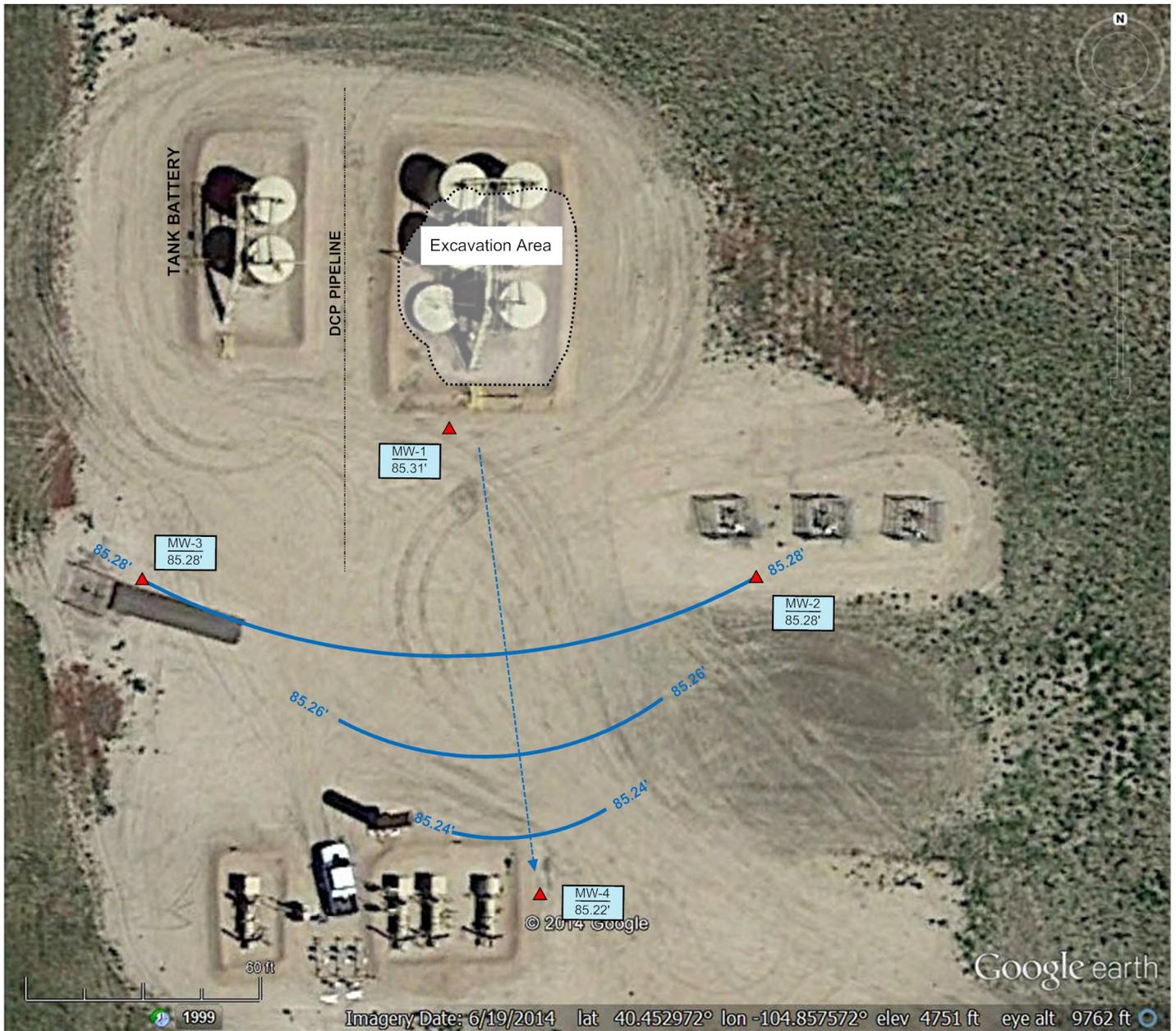


Approximate Scale: 1" = 40'

A. G. WASSENAAR | **INC.**

GEOTECHNICAL • ENVIRONMENTAL
CONSULTANTS

September and October 2014
 Soil and Ground Water Analytical Results
 Mershon Production Site, Weld County, Colorado
 September and October 2014
 AGW Project Number: E14447.EC
 Figure 1



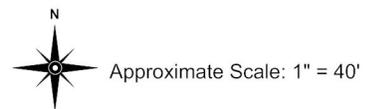
A.G. WASSENAAR | **INC.**
 GEOTECHNICAL • ENVIRONMENTAL
 CONSULTANTS

April 2015
 Ground Water Elevations and Flow Direction
 Mershon Production Site, Weld County, Colorado
 AGW Project Number: E14447.EC
 Figure 2

LEGEND

▲ Ground Water Monitoring Well Location
 Relative Ground Water Elevation in feet (')

➤ Direction of Ground Water Flow



LEGEND

▲ Ground Water Monitoring Well Location
Analytical Results

B: Benzene, T: Toluene, E: Ethylbenzene, X: Total Xylenes
ND: Not detected above laboratory detection limits

Ground water concentrations are in milligrams per liter (mg/L)
Concentrations in **BOLD** exceed applicable COGCC Table 910-1 concentrations

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

April 2015
Ground Water Analytical Results
Mershon Production Site, Weld County, Colorado
AGW Project Number: E14447.EC
Figure 3

ATTACHMENT C

BOREHOLE LOGS



A.G. Wassenaar

Geotechnical and Environmental Consultants

2180 South Ivanhoe Street, Suite 5
Denver, Colorado 80222-5710

303-759-8373 Fax 303-759-4874

www.agwassenaar.com

Inc.

Location Diagram

see Figures 2-3 in Attachment B

Water Level Observations

WL (while drilling) ____11'____

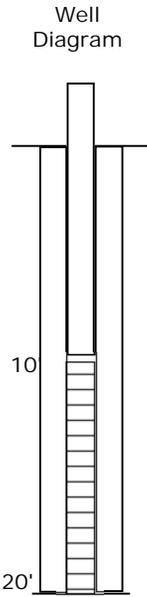
WL (while sampling) ____10.48'____

WL (after ____ hrs) _____

Geologist: R. Peterson Drill Date: 04/09/15
 Driller: Dan Start Time: 915 AM
 Helper: Jose End Time: 945 AM
 Auger Type: 4" Solid Stem Boring Number: MW-2

Project Number E14447.E2

Sample No.	Depth or Elevation (feet)		Sampling Method	Split Spoon Blows				Length Recovered In Inches	PID Reading	Strata Change	Sample Description
	From	To		6"	6"	6"	6"				
				← 2 feet →							
1	0	5	AU					0		Brown silty clay, slightly moist	
2	5	10	AU					0		Brown silty clay, slightly moist	
3	10	15	AU					0		Light brown silty sand with clay, wet	
										End of boring: 20'	
										10' of screen, 10' riser pipe	



A.G. Wassenaar

Geotechnical and Environmental Consultants

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Inc.

Location Diagram

see Figures 2-3 in Attachment B

Water Level Observations

WL (while drilling) ____11'____

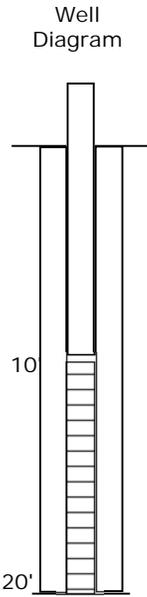
WL (while sampling) ____10.61'____

WL (after ____ hrs) _____

Geologist: R. Peterson Drill Date: 04/09/15
 Driller: Dan Start Time: 945 AM
 Helper: Jose End Time: 1015 AM
 Auger Type: 4" Solid Stem Boring Number: MW-4

Project Number E14447.E2

Sample No.	Depth or Elevation (feet)		Sampling Method	Split Spoon Blows				Length Recovered In Inches	PID Reading	Strata Change	Sample Description
	From	To		6"	6"	6"	6"				
				← 2 feet →							
1	0	5	AU					0		Brown/gray sand and silty clay, slightly damp	
2	5	10	AU					0		Brown/gray sand and silty clay, very damp	
3	10	15	AU					0		Light brown silty sand, wet	
										End of boring: 20'	
										10' of screen, 10' riser pipe	



ATTACHMENT D

LABORATORY ANALYTICAL REPORT



April 16, 2015

A.G. Wassenaar

Rachel Peterson

2180 South Ivanhoe Street - Suite 5

Denver

CO 80222

Project Name - Mershon

Project Number - E14447.EC

Attached are your analytical results for Mershon received by Origins Laboratory, Inc. April 09, 2015. This project is associated with Origins project number X504133-01.

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: E14447.EC

Project: Mershon

CROSS REFERENCE REPORT

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
MW-1	X504133-01	Water	April 9, 2015 12:20	04/09/2015 13:44
MW-2	X504133-02	Water	April 9, 2015 12:15	04/09/2015 13:44
MW-3	X504133-03	Water	April 9, 2015 12:20	04/09/2015 13:44
MW-4	X504133-04	Water	April 9, 2015 12:15	04/09/2015 13:44

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.

A.G. Wassenaar
 2180 South Ivanhoe Street - Suite 5
 Denver CO 80222

Rachel Peterson
 Project Number: E14447.EC
 Project: Mershon

Origins Laboratory

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

Sample Receipt Checklist

Origins Work Order: **XS04133**

Client: A.G. Wassenaar

Client Project ID: Mershon

Checklist Completed by: Jen Pellegrini

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

Date/time completed: 4/9/15

Airbill #: N/A

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

Cooler Number/Temperature: 1 / 8.9 °C _____ / _____ °C _____ / _____ °C (Describe)

Thermometer ID: 1003

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"/>		<u>sampled same day</u>
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"/>		
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"/>			<u>HCL</u>
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.

Jen Pellegrini
 Reviewed by (Project Manager)

4/15/15
 Date/Time Reviewed

Origins Laboratory, Inc.



The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

A.G. Wassenaar
2180 South Ivanhoe Street - Suite 5
Denver CO 80222

Rachel Peterson
Project Number: E14447.EC
Project: Mershon

MW-1

4/9/2015 12:20:00PM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
---------	--------	-----------------	-------	----------	-------	----------	----------	-------

Origins Laboratory, Inc.
X504133-01 (Water)

BTEX by EPA 8260C

Benzene	118	1.0	ug/L	1	5D15005	04/15/2015	04/16/2015	
Toluene	4.6	1.0	"	"	"	"	"	
Ethylbenzene	13.9	1.0	"	"	"	"	"	
Xylenes, total	53.2	1.0	"	"	"	"	"	
Surrogate: 1,2-Dichloroethane-d4	104 %	87.3-113			"	"	"	
Surrogate: Toluene-d8	103 %	90.9-108			"	"	"	
Surrogate: 4-Bromofluorobenzene	92.6 %	88.6-111			"	"	"	

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.

A.G. Wassenaar
 2180 South Ivanhoe Street - Suite 5
 Denver CO 80222

Rachel Peterson
 Project Number: E14447.EC
 Project: Mershon

MW-2
4/9/2015 12:15:00PM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
---------	--------	-----------------	-------	----------	-------	----------	----------	-------

Origins Laboratory, Inc.
X504133-02 (Water)

BTEX by EPA 8260C

Benzene	ND	1.0	ug/L	1	5D15005	04/15/2015	04/16/2015	
Toluene	ND	1.0	"	"	"	"	"	
Ethylbenzene	ND	1.0	"	"	"	"	"	
Xylenes, total	ND	1.0	"	"	"	"	"	
Surrogate: 1,2-Dichloroethane-d4	103 %	87.3-113			"	"	"	
Surrogate: Toluene-d8	102 %	90.9-108			"	"	"	
Surrogate: 4-Bromofluorobenzene	92.2 %	88.6-111			"	"	"	

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.

A.G. Wassenaar
 2180 South Ivanhoe Street - Suite 5
 Denver CO 80222

Rachel Peterson
 Project Number: E14447.EC
 Project: Mershon

MW-3
4/9/2015 12:20:00PM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
---------	--------	-----------------	-------	----------	-------	----------	----------	-------

Origins Laboratory, Inc.
X504133-03 (Water)

BTEX by EPA 8260C

Benzene	ND	1.0	ug/L	1	5D15005	04/15/2015	04/16/2015	
Toluene	ND	1.0	"	"	"	"	"	
Ethylbenzene	ND	1.0	"	"	"	"	"	
Xylenes, total	ND	1.0	"	"	"	"	"	
<i>Surrogate: 1,2-Dichloroethane-d4</i>	103 %	87.3-113			"	"	"	
<i>Surrogate: Toluene-d8</i>	102 %	90.9-108			"	"	"	
<i>Surrogate: 4-Bromofluorobenzene</i>	92.5 %	88.6-111			"	"	"	

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.

A.G. Wassenaar
2180 South Ivanhoe Street - Suite 5
Denver CO 80222

Rachel Peterson
Project Number: E14447.EC
Project: Mershon

MW-4

4/9/2015 12:15:00PM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
---------	--------	-----------------	-------	----------	-------	----------	----------	-------

Origins Laboratory, Inc.
X504133-04 (Water)

BTEX by EPA 8260C

Benzene	ND	1.0	ug/L	1	5D15005	04/15/2015	04/16/2015	
Toluene	ND	1.0	"	"	"	"	"	
Ethylbenzene	ND	1.0	"	"	"	"	"	
Xylenes, total	ND	1.0	"	"	"	"	"	
Surrogate: 1,2-Dichloroethane-d4	103 %	87.3-113			"	"	"	
Surrogate: Toluene-d8	100 %	90.9-108			"	"	"	
Surrogate: 4-Bromofluorobenzene	91.5 %	88.6-111			"	"	"	

Origins Laboratory, Inc.



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A.G. Wassenaar
 2180 South Ivanhoe Street - Suite 5
 Denver CO 80222

Rachel Peterson
 Project Number: E14447.EC
 Project: Mershon

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 5D15005 - EPA 5030B (Water)

Blank (5D15005-BLK1)

Prepared: 04/15/2015 Analyzed: 04/15/2015

Benzene	ND	1.0	ug/L							
Toluene	ND	1.0	"							
Ethylbenzene	ND	1.0	"							
Xylenes, total	ND	1.0	"							
Surrogate: 1,2-Dichloroethane-d4	64		"	62.5	102		87.3-113			
Surrogate: Toluene-d8	64		"	62.5	102		90.9-108			
Surrogate: 4-Bromofluorobenzene	57		"	62.5	91.5		88.6-111			

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A.G. Wassenaar
 2180 South Ivanhoe Street - Suite 5
 Denver CO 80222

Rachel Peterson
 Project Number: E14447.EC
 Project: Mershon

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 5D15005 - EPA 5030B (Water)

Blank (5D15005-BLK2)

Prepared: 04/15/2015 Analyzed: 04/15/2015

Benzene	ND	1.0	ug/L							
Toluene	ND	1.0	"							
Ethylbenzene	ND	1.0	"							
Xylenes, total	ND	1.0	"							
Surrogate: 1,2-Dichloroethane-d4	65		"	62.5	104		87.3-113			
Surrogate: Toluene-d8	63		"	62.5	101		90.9-108			
Surrogate: 4-Bromofluorobenzene	57		"	62.5	90.9		88.6-111			

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.

A.G. Wassenaar
 2180 South Ivanhoe Street - Suite 5
 Denver CO 80222

Rachel Peterson
 Project Number: E14447.EC
 Project: Mershon

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 5D15005 - EPA 5030B (Water)

LCS (5D15005-BS1)

Prepared: 04/15/2015 Analyzed: 04/15/2015

Benzene	42.6	1.0	ug/L	50.0		85.1	75-126			
Toluene	44.2	1.0	"	50.0		88.4	78.7-126			
Ethylbenzene	45.3	1.0	"	50.0		90.6	80-130			
m,p-Xylene	90.3	2.0	"	100		90.3	77.2-133			
o-Xylene	46.7	1.0	"	50.0		93.5	77.9-126			
Surrogate: 1,2-Dichloroethane-d4	61		"	62.5		97.1	87.3-113			
Surrogate: Toluene-d8	63		"	62.5		101	90.9-108			
Surrogate: 4-Bromofluorobenzene	59		"	62.5		93.8	88.6-111			

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.

A.G. Wassenaar
 2180 South Ivanhoe Street - Suite 5
 Denver CO 80222

Rachel Peterson
 Project Number: E14447.EC
 Project: Mershon

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 5D15005 - EPA 5030B (Water)

LCS (5D15005-BS2)

Prepared: 04/15/2015 Analyzed: 04/15/2015

Benzene	52.4	1.0	ug/L	50.0		105	75-126			
Toluene	56.1	1.0	"	50.0		112	78.7-126			
Ethylbenzene	58.8	1.0	"	50.0		118	80-130			
m,p-Xylene	116	2.0	"	100		116	77.2-133			
o-Xylene	57.2	1.0	"	50.0		114	77.9-126			
Surrogate: 1,2-Dichloroethane-d4	60		"	62.5		96.1	87.3-113			
Surrogate: Toluene-d8	63		"	62.5		101	90.9-108			
Surrogate: 4-Bromofluorobenzene	57		"	62.5		91.9	88.6-111			

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.

A.G. Wassenaar
 2180 South Ivanhoe Street - Suite 5
 Denver CO 80222

Rachel Peterson
 Project Number: E14447.EC
 Project: Mershon

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 5D15005 - EPA 5030B (Water)

Matrix Spike (5D15005-MS1)	Source: X504129-01			Prepared: 04/15/2015 Analyzed: 04/15/2015						
Benzene	49.6	1.0	ug/L	50.0	ND	99.1	74-130			
Toluene	52.1	1.0	"	50.0	ND	104	73-131			
Ethylbenzene	55.2	1.0	"	50.0	ND	110	76-132			
m,p-Xylene	108	2.0	"	100	ND	108	69-139			
o-Xylene	52.5	1.0	"	50.0	ND	105	74-131			
Surrogate: 1,2-Dichloroethane-d4	60		"	62.5		95.2	87.3-113			
Surrogate: Toluene-d8	63		"	62.5		101	90.9-108			
Surrogate: 4-Bromofluorobenzene	58		"	62.5		93.4	88.6-111			

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.

A.G. Wassenaar
 2180 South Ivanhoe Street - Suite 5
 Denver CO 80222

Rachel Peterson
 Project Number: E14447.EC
 Project: Mershon

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 5D15005 - EPA 5030B (Water)

Matrix Spike (5D15005-MS2)	Source: X504129-02			Prepared: 04/15/2015 Analyzed: 04/16/2015						
Benzene	39.8	1.0	ug/L	50.0	ND	79.6	74-130			
Toluene	41.5	1.0	"	50.0	ND	82.9	73-131			
Ethylbenzene	42.3	1.0	"	50.0	ND	84.6	76-132			
m,p-Xylene	84.6	2.0	"	100	ND	84.6	69-139			
o-Xylene	42.1	1.0	"	50.0	ND	84.2	74-131			
Surrogate: 1,2-Dichloroethane-d4	60		"	62.5		96.2	87.3-113			
Surrogate: Toluene-d8	63		"	62.5		101	90.9-108			
Surrogate: 4-Bromofluorobenzene	57		"	62.5		92.0	88.6-111			

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 Denver CO 80222

Rachel Peterson
 Project Number: E14447.EC
 Project: Mershon

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 5D15005 - EPA 5030B (Water)

Matrix Spike Dup (5D15005-MSD1)	Source: X504129-01			Prepared: 04/15/2015 Analyzed: 04/15/2015						
Benzene	48.1	1.0	ug/L	50.0	ND	96.2	74-130	2.93	20	
Toluene	49.4	1.0	"	50.0	ND	98.7	73-131	5.34	20	
Ethylbenzene	50.7	1.0	"	50.0	ND	101	76-132	8.40	20	
m,p-Xylene	102	2.0	"	100	ND	102	69-139	5.88	20	
o-Xylene	51.4	1.0	"	50.0	ND	103	74-131	2.14	20	
Surrogate: 1,2-Dichloroethane-d4	59		"	62.5		95.0	87.3-113			
Surrogate: Toluene-d8	63		"	62.5		100	90.9-108			
Surrogate: 4-Bromofluorobenzene	58		"	62.5		93.3	88.6-111			

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

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch 5D15005 - EPA 5030B (Water)

Matrix Spike Dup (5D15005-MSD2)	Source: X504129-02			Prepared: 04/15/2015 Analyzed: 04/15/2015						
Benzene	44.5	1.0	ug/L	50.0	ND	89.0	74-130	11.2	20	
Toluene	47.5	1.0	"	50.0	ND	94.9	73-131	13.5	20	
Ethylbenzene	49.8	1.0	"	50.0	ND	99.5	76-132	16.1	20	
m,p-Xylene	98.9	2.0	"	100	ND	98.9	69-139	15.6	20	
o-Xylene	48.9	1.0	"	50.0	ND	97.8	74-131	14.9	20	
Surrogate: 1,2-Dichloroethane-d4	60		"	62.5		96.6	87.3-113			
Surrogate: Toluene-d8	63		"	62.5		102	90.9-108			
Surrogate: 4-Bromofluorobenzene	57		"	62.5		91.9	88.6-111			

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Rachel Peterson

Project Number: E14447.EC

Project: Mershon

Notes and Definitions

ND Analyte NOT DETECTED at or above the reporting limit

RPD Relative Percent Difference

All soil results are reported at a wet weight basis.

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Jen Pellegrini For Noelle Doyle Mathis, President