

State of Colorado Oil and Gas Conservation Commission

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



FOR OGCC USE ONLY

SITE INVESTIGATION AND REMEDIATION WORKPLAN

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

OGCC Employee:

Spill, Complaint, Inspection, NOAV

Tracking No:

CAUSE OF CONDITION BEING INVESTIGATED AND REMEDIATED

Spill or Release, Plug & Abandon, Central Facility Closure, Site/Facility Closure, Other (describe)

GENERAL INFORMATION

OGCC Operator Number, Name of Operator, Address, City, State, Zip, Contact Name and Telephone, Name, No, Fax, API/Facility No, Spill/Release ID, County, Well, Facility Name, Facility Number, Well Name, Well Number, Location, Latitude, Longitude

TECHNICAL CONDITIONS

Type of Waste Causing Impact, Site Conditions, Adjacent land use, Soil type, Potential receptors, Description of Impact, Impacted Media (check), Extent of Impact, How Determined

REMEDIATION WORKPLAN

Describe initial action taken, Describe how source is to be removed, Describe how remediation of existing impacts is to be accomplished

FORM  
27  
Rev 6/99

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

**REMEDIATION WORKPLAN (CONT.)**

OGCC Employee: \_\_\_\_\_

If groundwater has been impacted, describe proposed monitoring plan (# of wells or sample points, sampling schedule, analytical methods, etc.):  
Groundwater monitoring wells will be installed at the site to fully define the extent and magnitude of the dissolved-phase groundwater impact. The monitoring wells will be surveyed to determine the groundwater flow direction. Quarterly groundwater monitoring activities will be conducted and samples will be submitted for laboratory analysis of BTEX.

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 dumplines adjacent to the historical petroleum hydrocarbon impacts will be replaced and the site will be restored to pre-release grade.

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?  Y  N If yes, describe:  
After installing the monitoring wells and establishing points of compliance, groundwater monitoring will be conducted.

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

**IMPLEMENTATION SCHEDULE**

Date Site Investigation Began: 8/31/2016 Date Site Investigation Completed: Active Remediation Plan Submitted: \_\_\_\_\_  
Remediation Start Date: 9/1/2016 Anticipated Completion Date: TBD Actual Completion Date: \_\_\_\_\_

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

Print Name: Phillip Hamlin

Signed: \_\_\_\_\_ Title: Senior HSE Representative Date: 11/30/16

OGCC Approved: \_\_\_\_\_ Title: \_\_\_\_\_ Date: \_\_\_\_\_

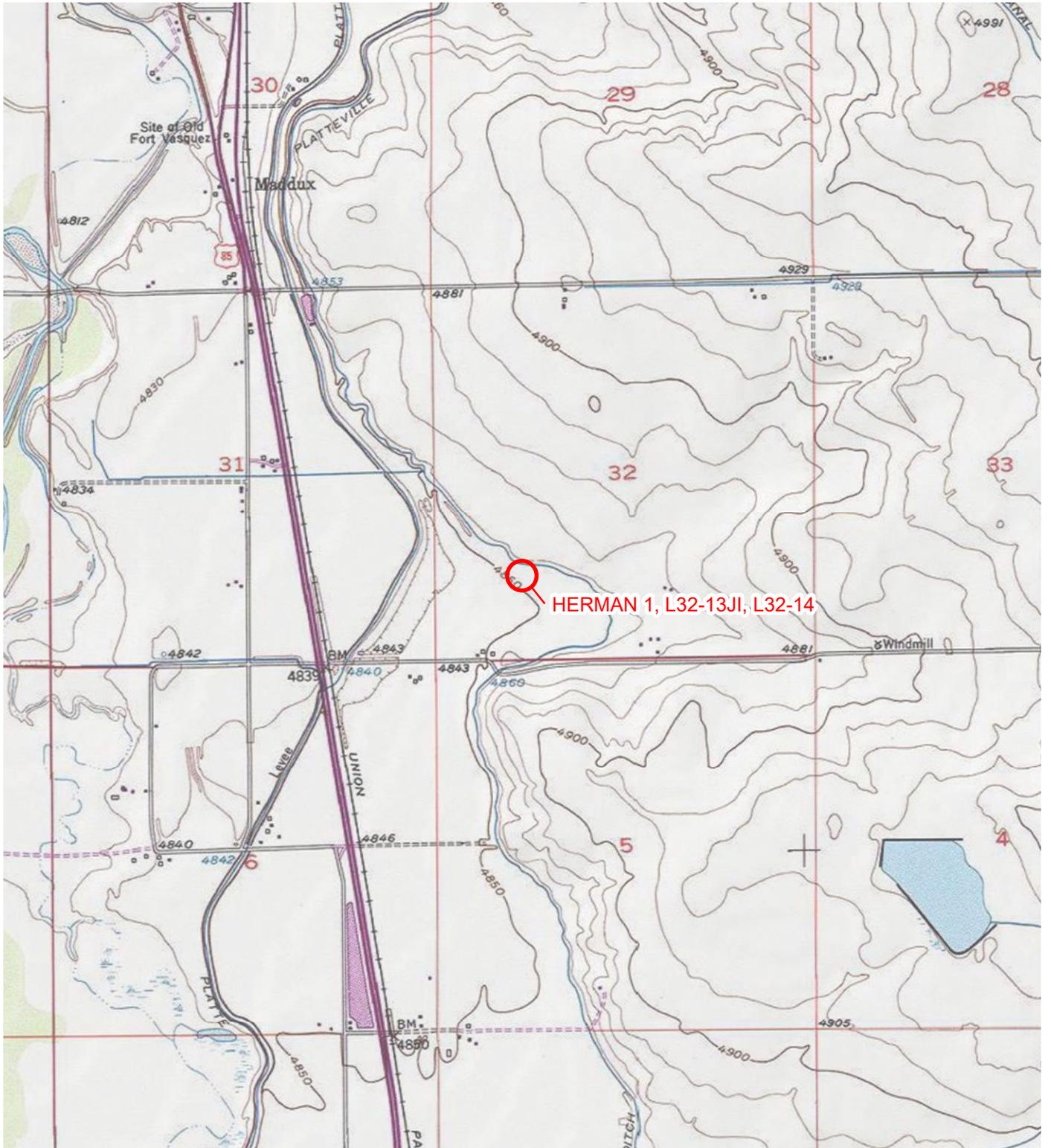
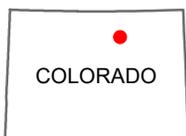
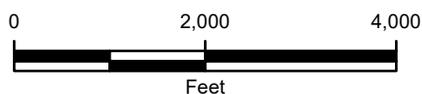


IMAGE COURTESY OF ESRI/USGS

**LEGEND**

 SITE LOCATION



COLORADO

**FIGURE 1**  
**SITE LOCATION MAP**  
 HERMAN 1, L32-13JI, L32-14  
 SWSW SEC 32-T3N-R66W  
 WELD COUNTY, COLORADO  
 KERR-MCGEE OIL & GAS ONSHORE LP



GROUNDWATER SAMPLE ID  
 SAMPLE DATE  
 B: BENZENE CONCENTRATION  
 X: TOTAL XYLENE CONCENTRATION  
 RESULTS IN MICROGRAMS PER LITER  
**BOLD INDICATES RESULT EXCEEDS STANDARD**

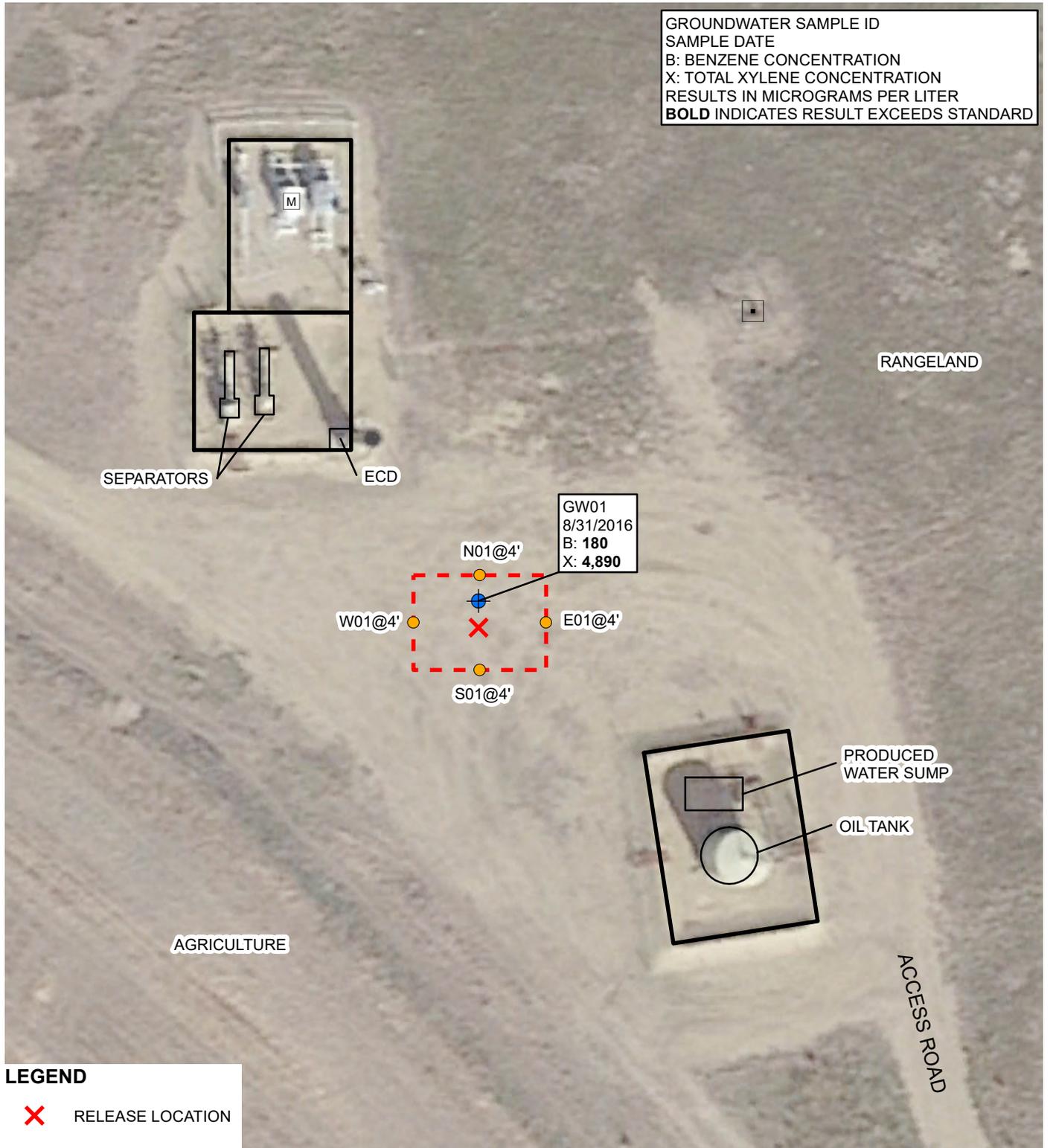


IMAGE COURTESY OF GOOGLE EARTH 2015

**LEGEND**

- X RELEASE LOCATION
- SOIL SAMPLE
- ⊕ GROUNDWATER SAMPLE
- WELLHEAD
- M METER HOUSE
- EXCAVATION EXTENT
- BERM

ECD: EMISSION CONTROL DEVICE

**FIGURE 2**  
 EXCAVATION SITE MAP  
 HERMAN 1, L32-13JI, L32-14  
 SWSW SEC 32-T3N-R66W  
 WELD COUNTY, COLORADO  
**KERR-MCGEE OIL & GAS ONSHORE LP**



**TABLE 1**  
**SOIL SAMPLE ANALYTICAL RESULTS**  
**HERMAN 1, L32-13JI, L32-14**  
**WELD COUNTY, COLORADO**  
**KERR-MCGEE OIL & GAS ONSHORE LP**

Soil Sample ID	Depth (bgs)	Date	Benzene (mg/kg)	Toluene (mg/kg)	Ethylbenzene (mg/kg)	Total Xylenes (mg/kg)	DRO (mg/kg)	GRO (mg/kg)	ORO (mg/kg)	pH (su)	Specific Conductance (mmhos/cm)
E01 @ 4'	4'	08/31/2016	<0.050	<0.050	<0.050	<0.050	<25.0	<5.00	<100	7.38	0.174
N01 @ 4'	4'	08/31/2016	<0.050	<0.050	<0.050	<0.050	<25.0	<5.00	<100	7.46	0.189
S01 @ 4'	4'	08/31/2016	<0.050	<0.050	<0.050	<0.050	<25.0	<5.00	<100	7.41	0.150
W01 @ 4'	4'	08/31/2016	<0.050	<0.050	<0.050	<0.050	<25.0	<5.00	<100	7.93	0.211
<b>COGCC Allowable Levels</b>			<b>0.17</b>	<b>85</b>	<b>100</b>	<b>175</b>	<b>500*</b>	<b>500*</b>	<b>500*</b>	<b>6-9</b>	<b>4</b>

Notes: bgs - below ground surface

COGCC - Colorado Oil and Gas Conservation Commission

DRO - diesel range organics

GRO - gasoline range organics

mg/kg - milligrams per kilogram

mmhos/cm - millimhos per centimeter

NA - not analyzed/not available

ORO - oil range organics

su - standard units

\* - Standard applies to combined DRO-GRO-ORO

< - less than laboratory reporting limit

Bold indicates result exceeds allowable level



**TABLE 2**  
**GROUNDWATER ANALYTICAL AND FIELD RESULTS**  
**HERMAN 1, L32-13JI, L32-14**  
**WELD COUNTY, COLORADO**  
**KERR-MCGEE OIL & GAS ONSHORE LP**

<b>Well Name</b>	<b>Date</b>	<b>Benzene (µg/L)</b>	<b>Toluene (µg/L)</b>	<b>Ethylbenzene (µg/L)</b>	<b>Total Xylenes (µg/L)</b>	<b>Depth Water/ (Product Thickness) (ft bgs)</b>
GW01	08/31/2016	<b>180</b>	220	316	<b>4890</b>	6.00
<b>CGWQS</b>		<b>5</b>	<b>1000</b>	<b>700</b>	<b>1400</b>	

Notes: CGWQS - Colorado Groundwater Quality Standards  
 ft bgs - feet below ground surface  
 NA - not analyzed/not available  
 NM - not measured

µg/L - micrograms per liter  
 < - less than laboratory reporting limit  
 Bold indicates result exceeds allowable level  
 Excavation groundwater depth is approximate

