

State of Colorado
Oil and Gas Conservation Commission

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FOR OGCC USE ONLY

REM 9840
Document 200440357

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: REM #9840

CAUSE OF CONDITION BEING INVESTIGATED AND REMEDIATED

☐ Spill or Release ☐ Plug & Abandon ☐ Central Facility Closure ☐ Site/Facility Closure ☒ Other (describe): Evaluation of Former Drilling Pit Area

OGCC Operator Number: 46685

Name of Operator: Kinder Morgan CO2 Co

Address: 17801 Hwy 491

City: Cortez

State: CO Zip: 81321

Contact Name and Telephone:

James Conway

No: 970-882-5505

Fax: 970-882-5521

API Number: 05-083-06596

County: Montezuma

Facility Name: N/A

Facility Number: N/A

Well Name: Hovenweep(HB-5)

Well Number: 5

Location: (QtrQtr, Sec, Twp, Rng, Meridian): SW 1/4, SE 1/4, Sec 30, T38N, R18W

Latitude: 37.518788 N Longitude: 108.873233 W

TECHNICAL CONDITIONS

Type of Waste Causing Impact (crude oil, condensate, produced water, etc): Potential for CO2 well drill cuttings exceeding COGCC Table 910-1 concentrations

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.): Dry land farming

Soil type, if not previously identified on Form 2A or Federal Surface Use Plan: Wetherill loam

Potential receptors (water wells within 1/4 mi, surface waters, etc.): No surface water, water wells, or residences identified within 1/2 mile of location.

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

Impacted Media (check):



Soils



Vegetation



Groundwater



Surface Water

Extent of Impact:

Not yet determined

How Determined:

See attached assessment scope

REMEDIALTION WORKPLAN

Describe initial action taken (if previously provided, refer to that form or document):

Kinder Morgan conducted a water well review and no water wells were found within a 1/2 mile of the location. Kinder Morgan has also prepared the attached scope of work for the assessment of the former drilling pit location.

Describe how source is to be removed:

Upon completion of assessment activities, Kinder Morgan will meet with COGCC to review assessment results and present a Remediation Work plan if subsurface conditions warrant.

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.:

Upon the completion of the assessment activities, Kinder Morgan will submit the results to the COGCC along with any remediation plans (as needed) for the consideration and approval of the COGCC.



REMEDIATION WORKPLAN (Cont.)

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

OGCC Employee:

If groundwater has been impacted, describe proposed monitoring plan (# of wells or sample points, sampling schedule, analytical methods, etc.):
There are no anticipated impacts to groundwater at this location. Please see Groundwater Evaluation section of the attached General Scope of Work.

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.

If a remediation plan is deemed necessary, Kinder Morgan will address any needed reclamation activities within the remediation plan. This would be completed after Kinder Morgan submits the soil assessment report to the COGCC.

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:

No soil samples are available at this time. Proposed soil boring locations are presented on the figure included within the attached General Scope of Work.

Final disposition of E&P waste (landtreated and disposed onsite, name of licensed disposal facility, recycling, reuse, etc.):

If offsite disposal of any material is deemed necessary, a properly licensed disposal facility will be used.

IMPLEMENTATION SCHEDULE

Date Site Investigation Began: 3Q 2016	Date Site Investigation Completed:	Date Remediation Plan Submitted: 9/15/16
Remediation Start Date:	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: James Conway

Signed:

Title: Operations Engineering & Regulatory Manager

Date: 9/15/16

OGCC Approved:

Title: Environmental Protection Specialist

Date: 9/22/16



General Scope of Work for Hovenweep (HB-5)

Kinder Morgan CO2 – McElmo Dome Units
API Number – 05-083-06596
Montezuma County, Colorado

General Well Location Information

Kinder Morgan's Hovenweep Well HB-5 was drilled in 2002. This well was drilled as a CO2 production well. A lined, earthen pit was constructed to hold the water-based drilling fluids for this well. Kinder Morgan's records indicate that the physical pit closure occurred in 2003.

The land use immediately surrounding the well location consists of rangeland. In addition, the land use within ½ mile of this well location includes non-irrigated farm land. There are no residences within ½ mile of this well location.

Groundwater Evaluation

Using the COGCC GIS Online mapping system and knowledge of the area, no groundwater wells were identified or located within ½ mile of this well location. An aerial photo from the COGCC mapping system is included with this work plan.

A review of US Geological Survey data identifies the Dakota-Glen Canyon aquifer system as the major aquifer system in this area of Colorado (Ground Water Atlas of the United States; Arizona, Colorado, New Mexico Utah HA 730-C; US Geological Survey, 1995). The regional direction of flow of the Dakota-Glen Canyon aquifer system in this area is typically to the west and estimated depth of this regional aquifer is between 800-1,200 feet below ground surface. The Mancos Shale confining unit is located between the surface and the Dakota-Glen Canyon aquifer systems which should prohibit any downward migration of surface water into the Dakota-Glen Canyon aquifer system. The major recharge areas for the Dakota-Glen Canyon aquifer system lie well outside of the HB-5 location.

The COGCC GIS Online mapping system show 3 water well locations from 1.3 to 1.5 miles northeast of the HB-5 location. Two of the water well locations were not drilled after having their permits denied. The third water well location (Colorado Division of Water Resources Permit 205309) was drilled to a depth of 1,070 feet in 1997. This well location is listed as a "Dry Hole". For this reason, Kinder Morgan does not anticipate that any shallow groundwater would be located at the HB-5 location.

In addition, Kinder Morgan does not anticipate any hydrocarbon impact could migrate to groundwater from the former pits at this location since oil-based drilling mud was not used and the well was drilled

for production of CO₂. Kinder Morgan does not anticipate encountering any perched water within the former drilling pit, however, if perched water is encountered in the bottom of the hole a sample will be submitted for analysis of BTEX, TDS, Chlorides, and Sulfates per Table 910-1.

Site Assessment

This site assessment is intended to collect current data from the former drilling pit location including:

- Photographic documentation of current surface vegetation and current land use.
- Soil samples from 8 boring locations within the former pit area to gather the following data:
 - Thickness of the clean soil cap
 - Thickness of any drilling material left in the former drilling pit and soil samples to evaluate current concentrations of applicable constituents.
 - Document the presence or absence of any liner material.
 - Depth to native soil or bedrock below the former drilling pit.
- GPS coordinates of each soil boring location.
- Summary report

Soil Boring Program:

Eight soil borings will be advanced to native soil or bedrock below the former drilling pit location to assess the current soil conditions in the former drilling pit location. Borings may extend 2 feet below the bottom of the former drilling pit. A soil boring location map is also included as an attachment to this work plan. The soil boring program will be conducted as follows:

- All necessary utility notifications will be made prior to advancing soil borings.
- A hollow stem auger rig will be utilized to collect a continuous sample of each boring.
- Photograph each full diameter split spoon for inclusion in the assessment report.
- Field screen a sample of each 1 foot interval for total chloride concentration and note on a boring log. Jar the remainder of the sample for potential laboratory analysis per the Laboratory Analysis Plan below. The typical sample submittal for laboratory analysis for each boring will be as follows:
 - Highest chloride sample interval observed from the surface to 3 feet bgs.
 - Highest chloride concentration of the visually identified drilling waste. If no waste is visible, the highest observed chloride concentration from 3 feet bgs to the bottom of the boring.
 - The bottom boring sample.
 - Please note that groundwater is not anticipated to be encountered, however, perched water may be encountered in the bottom of the hole in select locations. If groundwater is encountered, a sample will be submitted for analysis of BTEX, TDS, Chlorides, and Sulfates per Table 910-1.
- Collect the GPS coordinates for each boring.
- Backfill each boring with removed material plus bentonite chips near the ground surface, as needed.

Laboratory Analysis Plan

Kinder Morgan proposes to submit each soil sample for analysis of all applicable constituents on COGCC Table 910-1 with the exception of PAHs (Acenaphthene, Anthracene, Benz(a)anthracene, Benzo(b)fluoranthene, Benzo(k)fluoranthene, Benzo(a)pyrene, Chrysene, Dibenzo(a,h)anthracene, Fluoranthene, Fluorene, Indeno(1,2,3,c,d)pyrene, Naphthalene, and Pyrene). The rationale for omitting the PAH analysis is based on the fact that Kinder Morgan did not use any oil based drilling fluids nor were any PAHs listed as chemical ingredients on any of the Safety Data Sheets of the drilling fluid additives.

Per COGCC Rule 910.b(3)C, Kinder Morgan is requesting the COGCC approve this proposed laboratory analysis plan.

Summary Report:

Upon completion of the site assessment activities, a summary report will be prepared and submitted to the COGCC accompanied by an updated Form 27. The summary report will contain all sampling information, including sampling data from the laboratory, field notes, and site photographs.

Kinder Morgan HB-5



