FORM 27 Rev 3/16

State of Colorado
Oil and Gas Conservation Commission

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Report taken by: Jim Hughes

Site Investigation and Remediation Workplan (Supplemental Form)

This form shall be submitted to the Director for approval prior to the initiation of site investigation and remediation activities. However, this shall not preclude the Operator from taking immediate action to protect public health or safety, the environment, wildlife, or livestock.
This Form 27 describes site conditions as currently understood by the Operator; approval of this Form 27 by COGCC is based on the site conditions accurately described herein; any changes in site conditions identified during or subsequent to the performance of the approved workplan may necessitate additional investigation or remediation which shall be described on a supplemental Form 27.
This Form 27 is intended to provide basic information regarding the proposed site investigation and remediation actions, but the workplan may be more fully described in attached documentation.
Refer to Rules 340, 905, 906, 907, 908, 909, and 910

OPERATOR INFORMATON

Name of Operator: KINDER MORGAN CO2 CO LP Operator No: 46685
Address: 1001 LOUISIANA ST SUITE 1000
City: HOUSTON State: TX Zip: 77002
Contact Person: Michael Hannigan

Phone Numbers
Phone: (970) 882-5532
Mobile: (970) 403-9501
Email: michael_hannigan@kindermorgan.com

PROJECT, PURPOSE & SITE INFORMATION

PROJECT INFORMATION

Remediation Project #: 9837 Initial Form 27 Document #: 200440344

PURPOSE INFORMATION

- [ ] 901.e. Sensitive Area Determination
- [ ] 909.c.(1), Rule 905: Pit or PW vessel closure
- [x] 909.c.(2), Rule 906: Spill/Release Remediation
- [ ] 909.c.(3), Rule 907.e.: Land treatment of oily waste
- [ ] 909.c.(4), Rule 908.g.: Centralized E&P Waste Management Facility closure
- [ ] 909.c.(5), Rule 910.b.(4): Remediation of impacted ground water
- [ ] Rule 909.e.(2)A.: Notice completion of remediation in accordance with Rule 909.b.
- [ ] Rule 909.e.(2)B.: Closure of remediation project
- [ ] Rule 906.c.: Director request
- [x] Other Evaluation of former drilling pit area

SITE INFORMATION

N Multiple Facilites (in accordance with Rule 909.c.)

Facility Type: LOCATION Facility ID: 322131 API #: County Name: DOLORES
Facility Name: DOE CANYON-N40N17W 18NWNW Latitude: 37.731550 Longitude: -108.779470
** correct Lat/Long if needed: Latitude: Longitude:
QtrQtr: NWNW Sec: 18 Twp: 40N Range: 17W Meridian: N Sensitive Area? Yes

SITE CONDITIONS

General soil type - USCS Classifications: SM
Most Sensitive Adjacent Land Use: DRY LAND
Is domestic water well within 1/4 mile? No
Is surface water within 1/4 mile? No
Is groundwater less than 20 feet below ground surface? No

Other Potential Receptors within 1/4 mile

None.

SITE INVESTIGATION PLAN

TYPE OF WASTE:

- [x] **E&P Waste**
  - [ ] Produced Water
  - [ ] Oil
  - [ ] Condensate
  - [ ] Drilling Fluids
  - [x] Drill Cuttings
- [ ] **Other E&P Waste**
  - [ ] Workover Fluids
  - [ ] Tank Bottoms
  - [ ] Pigging Waste
  - [ ] Rig Wash
  - [ ] Spent Filters
  - [ ] Pit Bottoms
  - [ ] Other (as described by EPA) _____
- [ ] **Non-E&P Waste** _____

DESCRIPTION OF IMPACT

Impacted?	Impacted Media	Extent of Impact	How Determined
Yes	SOILS	TPH & EC > Table 910-1	Soil sample collection & laboratory analysis

INITIAL ACTION SUMMARY

Description of initial action or emergency response measures take to abate, investigate, and/or remediate impacts associated with E&P Waste.

Initial actions included conducting a review of water well databases to identify water wells within a 1/2 mile of the location and preparing a scope of work for the assessment of the former drilling pit.

PROPOSED SAMPLING PLAN

Proposed Soil Sampling

- [x] Will soil samples be collected as part of this investigation? (Number, type (grab/composite), analyses, and locations of samples):

After the remediation activities have been completed, soil samples will be collected from the same areas of the former drilling pit where EC & TPH concentrations exceeded Table 910-1 screening levels during site characterization soil sampling.

Proposed Groundwater Sampling

- [ ] Will groundwater samples be collected as part of this investigation? (Number, analyses, and locations of samples):

Proposed Surface Water Sampling

- [ ] Will surface water samples be collected as part of this investigation? (Number, analyses, and locations of samples):

Additional Investigative Actions

- [ ] Additional alternative investigative actions described in attached Site Investigation Plan (summary):

SITE INVESTIGATION REPORT

SAMPLE SUMMARY

Soil

Number of soil samples collected: 24

Number of soil samples exceeeding 910-1: 13

Was the areal and vertical extent of soil contamination delineated? Yes

Approximate areal extent (square feet): 900

NA / ND

-- Highest concentration of TPH (mg/kg): 880

-- Highest concentration of SAR: 51.3

BTEX > 910-1: No

Vertical Extent > 910-1 (in feet): 18

Groundwater

Number of groundwater samples collected: 0

Was extent of groundwater contaminated delineated? Yes

Depth to groundwater (below ground surface, in feet): `

Number of groundwater monitoring wells installed:

Number of groundwater samples exceeding 910-1:

Highest concentration of Benzene (µg/l):

Highest concentration of Toluene (µg/l):

Highest concentration of Ethylbenzene (µg/l):

Highest concentration of Xylene (µg/l):

Highest concentration of Methane (mg/l):

Surface Water

0 Number of surface water samples collected

0 Number of surface water samples exceeding 910-1

If surface water is impacted, other agency notification may be required.

OTHER INVESTIGATION INFORMATION

☐ Were impacts to adjacent property or offsite impacts identified?

☐ Were background samples collected as part of this site investigation?

☐ Was investigation derived waste (IDW) generated as part of this investigation?

Volume of solid waste (cubic yards):

Volume of liquid waste (barrels):

☐ Is further site investigation required?

REMEDIAL ACTION PLAN

Does this Supplemental Form 27A include changes to a previously approved Remedial Action Plan? No

SOURCE REMOVAL SUMMARY

Describe how source is to be removed.

Waste remaining in place meets Table 910-1 screening levels and/or criteria described in COGCC 2008 Rulemaking Frequently Asked Questions (#32) related to depth of clean cover with the exception of EC in B6 & B7, pH in B6 and TPH in 1 soil sample collected from B3 (880 mg/kg).

REMEDIATION SUMMARY

Describe how remediation of existing impacts to soil and groundwater is to be accomplished (i.e. summarize remedial action plan). Provide a brief narrative description including: technical justification, schedule for implementation, estimated time to attain NFA status, plus plans and specifications for the selected remedial action technology.

Remediation of existing TPH impacts will be accomplished through natural biodegradation. The proposeded remediation schedule includes attainment of TPH concentrations less than Table 910-1 screening levels within 24 months which will be verified by soil sample collection and laboratory analysis. See attached technical data summary sheet. Remediation of EC & pH in soil less than 3' bgs in the areas surrounding B6 & B7 will be accomplished by surface application of a calcium soil amendment (gypsum). The proposed remediation schedule calls for soil amendment application during the months of June and July with attainment of EC & pH concentrations less than Table 910-1 screening levels in 18 to 24 months verified by soil sample collection and laboratory analysis.

Soil Remediation Summary

In Situ

- ____ Bioremediation (or enhanced bioremediation)
- ____ Chemical oxidation
- ____ Air sparge / Soil vapor extraction
- Yes Natural Attenuation
- Yes Other Surface application of calcium soil amendment (gypsum)

Ex Situ

- ____ Excavate and offsite disposal
  - If Yes: Estimated Volume (Cubic Yards) ____
  - Name of Licensed Disposal Facility or COGCC Facility ID # ____
- ____ Excavate and onsite remediation
  - ____ Land Treatment
  - ____ Bioremediation (or enhanced bioremediation)
  - ____ Chemical oxidation
  - ____ Other ____

Groundwater Remediation Summary

- ____ Bioremediation (or enhanced bioremediation)
- ____ Chemical oxidation
- ____ Air sparge / Soil vapor extraction
- ____ Natural Attenuation
- ____ Other ____

GROUNDWATER MONITORING

If groundwater has been impacted, describe proposed monitoring plan, including # of wells or sample points, monitoring schedule, analytical methods, points of compliance. Attach a groundwater monitoring location diagram.

REMEDIATION PROGRESS UPDATE

PERIODIC REPORTING

Frequency: ☐ Quarterly ☐ Semi-Annually ☐ Annually ☐ Other _____

Report Type: ☐ Groundwater Monitoring ☐ Land Treatment Progress Report ☐ O&M Report

☐ Other _____

WASTE DISPOSAL INFORMATION

Was E&P waste generated as part of this remediation? _____

Describe beneficial use, if any, of E&P Waste derived from this remediation project:

Volume of E&P Waste (solid) in cubic yards _____

E&P waste (solid) description _____

COGCC Disposal Facility ID #, if applicable: _____

Non-COGCC Disposal Facility: _____

Volume of E&P Waste (liquid) in barrels _____

E&P waste (liquid) description _____

COGCC Disposal Facility ID #, if applicable: _____

Non-COGCC Disposal Facility: _____

REMEDIATION COMPLETION REPORT

REMEDIATION COMPLETION SUMMARY

Is this a Final Closure Request for this Remediation Project? No

Do all soils meet Table 910-1 standards? _____

Does the previous reply indicate consideration of background concentrations? _____

Are the only residual soil impacts pH, SAR, or EC at depths greater than 3 feet below ground surface? _____

Does Groundwater meet Table 910-1 standards? _____

Is additional groundwater monitoring to be conducted? _____

RECLAMATION PLAN

RECLAMATION PLANNING

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.

The DC-2 location is currently in interim reclamation status. The soil amendment application will likely cause disturbance to the existing vegetation in the areas of soil borings B3, B6 and B7. The entire area above and adjacent to the former drilling pit will be relaimed subsequent to the soil amendment application. Soil samples will be collected and analyzed for nutrient deficiencies and the presence of herbicides. If necessary, additional soil amendments will be applied prior to the area being re-seeded and periodic irrigation will take place in order to ensure sustained vegetation growth at the location. The proposed seed mix to be used at the location will be approved by the landowner. The location will continue to be included in Kinder Morgan's noxious weed prevention program.

Is the described reclamation complete? No

Does the reclamation described herein constitute interim or final reclamation of the Oil and Gas Location?

☐ Interim? ☐ Final?

Did the Surface Owner approve the seed mix? Yes

If NO, does the seed mix comply with local soil conservation district recommendations? Yes

IMPLEMENTATION SCHEDULE

PRIOR DATES

Date of Surface Owner notification/consultation, if required. _____

Actual Spill or Release date, if known. _____

SITE INVESTIGATION DATES

Date of Initial Actions described in Site Investigation Plan (start date). 05/02/2016

Date of commencement of Site Investigation. 11/04/2016

Date of completion of Site Investigation. 02/08/2017

REMEDIAL ACTION DATES

Date of commencement of Remediation. _____

Date of completion of Remediation. _____

SITE RECLAMATION DATES

Date of commencement of Reclamation. _____

Date of completion of Reclamation. _____

OPERATOR COMMENT

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

Signed:` Michael Hannigan Title: Senior EHS Engineer

Submit Date:` 05/11/2017 Email: michael_hannigan@kindermorgan.com

Based on the information provided herein, this Application for Site Investigation and Remediation Workplan complies with COGCC Rules and applicable orders and is hereby approved.

COGCC Approved: Jim Hughes Date: 05/23/2017

Remediation Project Number: 9837

COA Type	Description
	It is stated in the Remedial Summary Table, that the decay rate constant and half-life assumptions are based on literature findings. In order for the COGCC to approve remediation of existing TPH impacts through natural biodegradation, the Operator shall complete site specific bench scale testing demonstrating that natural biodegration will meet Table 910-1 constiuent levels in the time frame presented in the Remedial Summary Table.
	Operator shall notify COGCC SW EPS 72 hours prior to application of gypsum/soil amendments at 970-903-4072 or jimo.hughes@state.co.us. A remedial Progress Update shall be submitted on a semi-annual basis.
	It is stated in the February 8, 2017 Arcadis Report that, "Liner material was observed at 12 feet bgs and 13.7 feet bgs in borings 2 and 3, respectively, but was otherwise absent from the other borings." Liner material must be removed by Rule unless a variance is submitted by the Operator and granted by the Director of the COGCC.
	It is stated in the Remedial Action Plan that, "Remediation of existing TPH impacts will be accomplished through natural biodegradation. The proposeded remediation schedule includes attainment of TPH concentrations less than Table 910-1 screening levels within 24 months which will be verified by soil sample collection and laboratory analysis." This is not acceptable and the Operator shall propose and implement either an active in-situ remedial alternative to meet Table 910-1 concentrations or remove the TPH impacted material and replace with clean fill.

Attachment Check List

Upon approval, the approved Form 27 and all listed attachments will be indexed to the Remediation Project file. Only the approved Form 27 will also be indexed to the related Facilities.

Att Doc Num	Name
401272702	FORM 27-SUPPLEMENTAL-SUBMITTED
401280622	SITE INVESTIGATION REPORT
401280635	OTHER
401280674	OTHER
401280677	OTHER

Total Attach: 5 Files

General Comments

User Group	Comment	Comment Date
		Stamp Upon Approval

Total: 0 comment(s)