

State of Colorado Oil and Gas Conservation Commission

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FOR OGCC USE ONLY

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03/12/2015

UNDERGROUND INJECTION FORMATION PERMIT APPLICATION

Per Rule 325, this form shall be submitted with all required attachments.

A Form 31 – Intent shall be submitted and approved prior to completing an injection zone.

A Form 31 – Subsequent shall be submitted following collection of water samples and injectivity test (if performed) and must be approved prior to injection in any new injection facility.

NOTE: Per Rule 324B, an aquifer exemption is required for any injection formation with water quality less than 10,000 mg/L total dissolved solids (TDS). Contact the Commission for further requirements if the TDS as determined by water analysis for the injection zone is less than 10,000 mg/L.

Form 31 Type [] Intent [X] Subsequent UIC Facility ID 159979 UIC Facility ID Required for Subsequent Form 31

UIC FACILITY INFORMATION

Facility Name and Number: HORSETAIL 19N-1924M-R SWD County: WELD

Facility Location: SWSE / 19 / 10N / 57W / 6 Field Name and Number: WILDCAT 99999

Facility Type: [] Enhanced Recovery [X] Disposal [] Simultaneous Disposal

Single or Multiple Well Facility? [X] Single [] Multiple

Proposed Injection Program (Required):

INJECTION OF PRODUCED FLUID AND FLOWBACK WATERS INTO THE PROPOSED INJECTION WELL WILL OCCUR AT RATES AND PRESSURES BETWEEN THE MINIMUM AND MAXIMUM RATES & PRESSURES LISTED IN THE APPLICATION. THE FACILITY WILL CONSIST OF UPRIGHT WATER TANKS, A GUN BARREL, OIL TANKS, HORIZONTAL INJECTION PUMPS, FILTRATION, AUTOMATION, TRUCK BAYS AND THE NECESSARY CONTAINMENT. THE MAJORITY OF WATER WILL BE CONVEYED TO THE PROPOSED SWD SITE VIA EXISTING INTRAFIELD PIPELINES DEDICATED TO PRODUCED WATER, AND WATER WILL ALSO BE BROUGHT TO LOCATION VIA TRUCKING AND LOADED FROM TRUCK BAYS. INJECTION ACTIVITY WILL BE MONITORED THROUGH AUTOMATION EQUIPMENT, WITH 24-HOUR SURVEILLANCE. ALL INJECTED WATER WILL BE WATER FROM WHITING OIL AND GAS OPERATED WELLS IN WELD COUNTY, CO.

OPERATOR INFORMATION

OGCC Operator Number: 96155 Name of Operator: WHITING OIL & GAS CORPORATION Address: 1700 BROADWAY STE 2300 City: DENVER State: CO Zip: 80290

Contact Name and Telephone: Name: CHARLES OHLSON Phone: (303) 390-4905 Fax: (303) 390-4039 Email: charles.ohlson@whiting.com

INJECTED FLUID TYPE

All injected fluids must be Exempt E&P waste per RCRA Subpart C.

(Check all that apply.)

- [X] Produced Water [] Natural Gas [] CO2 [] Drilling Fluids [] Exempt Gas Plant Waste [] Used Workover Fluids [] Flowback Fluids

[] Other Fluids (describe):

Commercial Disposal Facility [] Yes [X] No Commercial UIC Bond Surety ID:

Commercial Facility Description: Describe the physical region of the facility, the details of the operations, and the type of fluids to be injected.

PROPOSED INJECTION FORMATIONS

FORMATION (Name): AMAZON Porosity: 9 %
Formation TDS: 34450 mg/L Frac Gradient: 0.62 psi/ft Permeability: 10 mD
Proposed Stimulation Program: Acid Frac Treatment None

FORMATION (Name): BLAINE Porosity: 7 %
Formation TDS: 18770 mg/L Frac Gradient: 0.62 psi/ft Permeability: _____ mD
Proposed Stimulation Program: Acid Frac Treatment None

FORMATION (Name): ENTRADA Porosity: 6 %
Formation TDS: 13992 mg/L Frac Gradient: 0.62 psi/ft Permeability: 25 mD
Proposed Stimulation Program: Acid Frac Treatment None

FORMATION (Name): LOWER SATANKA Porosity: 17 %
Formation TDS: 18770 mg/L Frac Gradient: 0.62 psi/ft Permeability: _____ mD
Proposed Stimulation Program: Acid Frac Treatment None

FORMATION (Name): LYKINS Porosity: 12 %
Formation TDS: 13992 mg/L Frac Gradient: 0.62 psi/ft Permeability: _____ mD
Proposed Stimulation Program: Acid Frac Treatment None

FORMATION (Name): LYONS Porosity: 11 %
Formation TDS: 18770 mg/L Frac Gradient: 0.62 psi/ft Permeability: 658 mD
Proposed Stimulation Program: Acid Frac Treatment None

ANTICIPATED FACILITY OPERATIONS CONDITIONS

Under normal operating conditions, estimated TOTAL fluid injection rates and pressures for this facility:

FOR WATER: Daily Injection Rate Range From 7200 to 15840 bbls/day
Surface Injection Pressure Range From 51 to 1350 psi
FOR GAS: Daily Injection Rate Range From _____ to _____ mcf/day
Surface Injection Pressure Range From _____ to _____ psi

Estimated Initial Injection Date: 12/15/2015

AREA OF REVIEW OIL and GAS WELL EVALUATION SUMMARY

Review all existing wells within 1/2 mile for injection formation isolation.

Area Review Date: 7/30/2015

Total number of Oil & Gas Wells within Area of Review:

ABANDONED WELLS (All wells that have been plugged: PA and DA status))

Total within Area of Review
Number To Be Re-Plugged

ACTIVE WELLS (All wells that have not been plugged: AC, DG, DM, IJ, PR, SU, SI, TA, WO, XX, UN status)

Total within Area of Review
Number Requiring Casing Repair
Number To Be Plugged

Operator's Area of Review Contact Email: Bob Koehler-COGCC

No Wells within 2,640'

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

Print Name: CHARLES OHLSON Signed: _____

Title: ENG TEAM LEAD Date: 3/9/2015 12:00:00 AM

COGCC Approved:  Date: 12/02/2015

Form 31 - Intent Expiration Date: 06/02/2016

Per Rule 325.o, a 90 day extension of the Expiration Date may be requested via a Sundry Notice, Form 4 submitted prior to Form 31- Intent expiration

Order Number: _____ UIC FACILITY ID: 159979

CONDITIONS OF APPROVAL, IF ANY:

COA Type	Description
	Operator is required to perform additional Mechanical Integrity Tests ("MITs") at five (5) year intervals from the first test date reported here. If the downhole well configuration is changed at any time an MIT must be performed before the well is returned to injection.
	Operator is required to file a Sundry Notice notifying COGCC of the initial injection date within 30 days of the commencement of injection.
	Initial maximum daily injection rate limited to 10,000 bbls/day. After a minimum of 20 operating days Operator may request increase above that. Request will be evaluated based on existing daily injection rate and lack of seismic activity within 2.5 miles of the injection well.
	Operator is required to install a seismometer at a location to be determined by the operator and COGCC from which seismic activity in the vicinity of the injection well can be monitored. The operator will be responsible for maintenance of the seismometer. Data gathered by the seismometer will be made available to one or more third parties (such as the USGS, CU-Boulder, CSM, or CSU) for analysis.
	Injected water analysis to include TDS, major cations, and major anions is required 1-year after initial injection and from then on at 5-year intervals. Water analyses should be submitted via Sundry Notice and in Electronic Data Deliverable (EDD) Format.

Attachment Check List

<u>Att Doc Num</u>	<u>Name</u>
1772981	Area of Review-Workup
1772982	LIST OF O&G/WATER WELLS 1/2-MILE
1772983	ANALYSIS OF INJECTION WATER
1772984	INJECTION PROGRAM
1772985	NOTICE TO SURFACE & MINERAL OWNERS
1772986	REMEDIAL PROGRAM
2494575	FORM 31 SUBMITTED
2494581	CERTIFIED MAIL RECEIPT(S)
2494606	WELL LOCATION PLAT
2494607	MAP OF MIN. OWNERS 1/4 MILE
2494608	SURFACE AGRMT/SURETY
2494611	LIST OF MIN. OWNERS 1/4 MILE
2494616	LIST OF O&G/WATER WELLS1/2-MILE
2494617	CONST. LAYOUT DRAWINGS
2494618	ANALYSIS OF INJECTION ZONE WATER
400877541	OFFSET WELL EVALUATION
400942081	PROOF OF PUBLICATION
400942838	HYDROLOGY EVALUATION
400943001	MAXIMUM SURFACE INJECTION PRESSURE DETERMINATION
400945685	SEISMIC EVALUATION
400945799	MAXIMUM INJECTION VOLUME CALCULATION

Total Attach: 21 Files

General Comments

<u>User Group</u>	<u>Comment</u>	<u>Comment Date</u>
UIC	Original (March 9, 2015-submitted) filing was updated: submitted = June 17, 2015, received = June 22, 2015.	11/24/2015 4:30:00 PM

Total: 1 comment(s)