Utah Division of Oil, Gas and Mining
Guidance Document

April 2004

Permitting a Class II Injection Well

This document is intended for use by oil and gas operators or others in preparing an application for a Class II injection well. The rules (Utah Administrative Code R649-5), pertaining to the requirements for injecting fluids into reservoirs and the permitting of Class II injection wells should be used in conjunction with this guidance.

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Introduction

The UIC program for Class II wells in the State of Utah, for all lands not designated as “Indian Country”, is administered by the Utah Department of Natural Resources, Division of Oil, Gas, & Mining (“the Division”). All Class II wells located in “Indian Country” are administered by Region 8 of the Environmental Protection Agency. Indian Country is defined in 18 U.S.C. 1151, and applicable court decisions related to the Uintah and Quray Reservation.

When an application for a Class II injection well is received by the Division it is assigned a UIC number which is used for tracking purposes and as a permit number. A technical staff member is assigned to review the application and the submitted document is then evaluated to determine if sufficient information has been provided in order to proceed with the permitting process. A public notice will then be placed in the local newspaper to allow for a period of public comment on the proposed injection well. If no objections to the proposal are made within 15 days of the date of publication the permit process is allowed to proceed, administratively. If objections to the proposal are made to the Division a hearing date is set for the proposal and objections to be heard before the Utah Board of Oil, Gas, and Mining (“the Board”). The Board may approve, deny, or remand the proposal back to the Division for administrative approval. After the 15 day comment period and when the Division staff have determined that the proposed application meets the requirements for a Class II well, the Division will issue a “Conversion Approval “ letter which allows the operator to proceed with the necessary work to convert the well to injection. This letter may have certain conditions the operator must fulfill during the conversion process. At the completion of well conversion, a mechanical integrity test must be performed on the well. If mechanical integrity is demonstrated and all other conditions met, the Division can then issue a final “Injection Permit”.

The Division and its staff will make every effort to process each permit application in a timely and efficient manner. A complete application package, submitted by the operator, which contains all of the required information will assure that the process moves along as quickly as possible.

I. **Permitting Requirements for Class II Injection Wells**
Including Water Disposal and Enhanced Recovery Wells

The application for an injection well shall include at a minimum the following information:

1. A properly completed UIC Form 1.
2. A plat showing the location of the proposed injection well. This may be plotted on a topographic map or other suitable plat showing the legal description of the well. A one-half mile radius circle should be drawn around the proposed well. All abandoned and active wells *should* be clearly identified within the one-half mile radius including known water wells. Additionally, surface owners and operators of producing leases in the one-half mile radius should be clearly identified.
3. Copies of electrical, radioactive, and cement bond logs should be included with the application. Bond logs for wells within the one-half mile radius that penetrate the proposed injection interval should also be included. Copies of logs already on file with the Division may be referenced.
4. A description of the casing or proposed casing program for the injection well. Well bore diagrams showing the depth at which each string of casing is set, tops of cement, perforations, packer depth, and formation tops are recommended.
5. A statement as to the type of fluid to be used for injection, its source and an estimate of the amount of fluid to be injected on a daily basis. Also provide a standard laboratory analyses of a representative sample of fluid to be injected, the fluid in the formation into which the fluid is being injected, and a compatibility analyses of the fluids. Note that if this is a new well to be drilled, some information on the target formation may need to be submitted at a later date.
6. A statement as to the proposed average and maximum injection pressure. Provide fracture gradient information for the area of the proposed injection well. Include data from step-rate test and/or frac jobs if available. Include calculations showing at what maximum surface pressure the target injection zone will likely fracture.
7. Appropriate geological and hydrological data on the zone of injection and the confining beds, both above and below the injection zone. Include geologic name, lithologic description, thickness, depth, and lateral extent also information on geologic structure that may affect the conveyance and/or storage of injected fluids. Provide information as to location and depth of any known fresh water aquifers. Provide information on the base of moderately saline water (water of quality that is less than 10,000 mg/1 TDS). Include any available water quality data. Reference technical publications that describe water quality in the area of the proposed injection well where available.

8. A review of the mechanical condition of each well in the one-half mile area of review that penetrated the proposed injection zone. Include depths at which the casing strings are set, cement tops, and depths of plugs in abandoned wells. Include information on condition of the wells, plug back depths, and zones of production. Wellbore diagrams for each well showing the above information is recommended. Also include the location and depth of any water source wells in the one-half mile area of review.
9. A list of all owners, operators, and surface owners within the one-half mile radius. Submit an affidavit certifying that a copy of the application has been made available to each of the above.

II. Permitting Requirements for Injection of Fluids into Reservoirs

For projects intended to increase ultimate recovery of hydrocarbons, approval will be granted only by order of the Board of Oil, Gas, and Mining after proper notice and hearing. A petition for approval to inject any medium into a reservoir shall contain at a minimum the following information:

1. The name and address of the operator of the project.
2. A plat showing the area involved and identifying all wells in the project area and within a one-half mile radius of the project.
3. A full description of the operation.
4. A description of the pools from which the wells are producing.
5. The name, description, and depth of the pool or pools to be affected.
6. A copy of the log of a representative well completed in the pool.
7. A statement as to the type of fluid to be used for injection, its source and estimated amounts to be injected daily.
8. A list of all operators, owners, and surface owners within a one-half mile radius of the proposed project.
9. An affidavit certifying that said operators, owners, and surface owners within a one-half mile radius of the project have been provided a copy of the petition.
10. Any additional information the Board may determine is necessary to adequately review the petition.
11. Complete applications for injection wells located within the project may be submitted for Board approval with the request for authorization of the recovery project. Information that is submitted as part of the engineering and geologic report for the project may be referenced.

III. Exempting an Aquifer from Classification as an Underground Source of Drinking Water (USDW)

A USDW is defined as a fresh water aquifer or a portion thereof that supplies drinking water for human consumption or contains less than 10,000 mg/1 total dissolved solids.

If an aquifer into which fluids will be injected is determined to be a USDW and an operator desires to have the formation (aquifer) exempted from classification as a USDW, the operator shall submit an application for an aquifer exemption to the Division which includes sufficient data and information to justify the proposal. Data should include documentation that the formation contains hydrocarbon, or is not now or is not likely to be a source of water for consumption. If the information provided is sufficient to justify an aquifer exemption, the Division will advise the operator to submit a Request for Agency Action to the Board for an aquifer exemption.

After notice and hearing and subject to EPA approval, the Board may authorize the exemption of an aquifer from classification as a USDW based on the following findings:

1. The aquifer does not currently serve as a source of drinking water, and 2 or 3 below is true.

2. The aquifer cannot now and will not in the future serve as a source of drinking water because of any of the following:

a. The aquifer is mineral, hydrocarbon, or geothermal producing.

b. The aquifer is located at a depth that makes recovery of water economically or technologically impractical.

c. The aquifer is contaminated to the extent it is not practical to treat for consumption.

d. The aquifer is located above a Class III well mining area subject to subsidence.

3. The total dissolved solids content of the water is more than 3000 mg/1 and less that 10,000 mg/1, and is not reasonably expected to be used as a source of fresh or potable water.

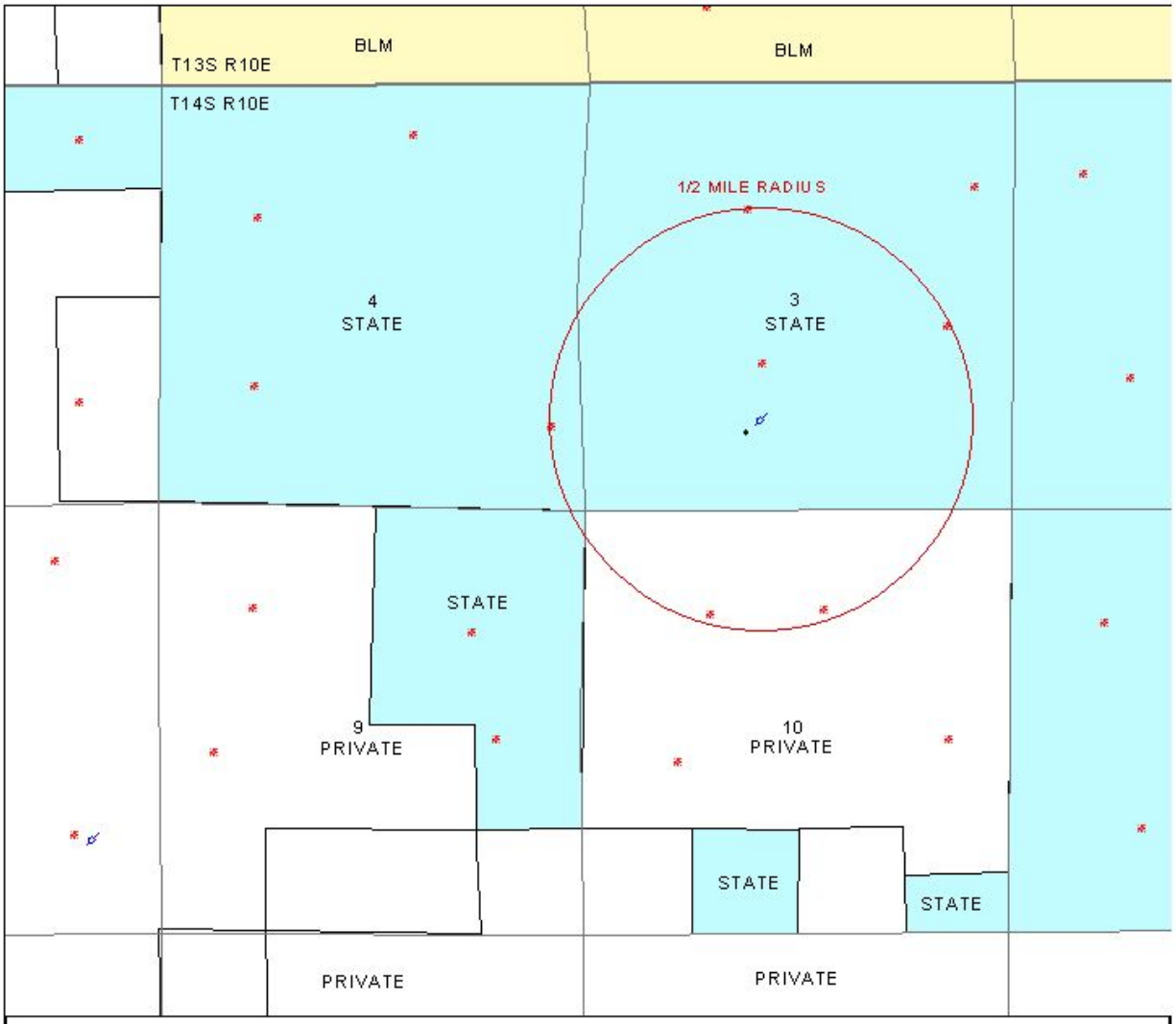
APPLICABLE RULES

- **R649-5-1. Requirements For Injection Of Fluids Into Reservoirs.**
- **R649-5-2. Requirements For Class II Injection Wells Including Water Disposal, Storage And Enhanced Recovery Wells.**
- **R649-5-3. Noticing and Approval Of Injection Wells.**
- **R649-5-4. Aquifer Exemption.**
- **R649-5-5. Testing And Monitoring Of Injection Wells.**
- **R649-5-6. Duration Of Approval For Injection Wells.**
- **R649-5-7. Unit or Cooperative Development Or Operation.**
- **KEY**
- **Date of Enactment or Last Substantive Amendment**
- **Notice of Continuation**
- **Authorizing, Implemented, or Interpreted Law**

FORMS

- **R649-8-18. UIC Form 1, Application for Injection Well.**
- **R649-8-19. UIC Form 2 (part 1), Monthly Report of Enhanced Recovery Project.**
- **R649-8-19. UIC Form 2 (part 2), Monthly Report of Enhanced Recovery Project.**
- **R649-8-20. UIC Form 3, Monthly Injection Report.**
- **R649-8-21. UIC Form 4, Annual Fluid Injection Report.**
- **R649-8-22. UIC Form 5, Transfer of Authority to Inject.**

Following are an Example Map showing land ownership and wells within one-half mile radius and a Wellbore Diagram.



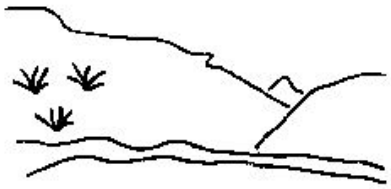
Legend

Wells
- GAS INJECTION
- GAS STORAGE
- LOCATION ABANDONED
- NEW LOCATION
- PLUGGED & ABANDONED
- PRODUCING GAS
- PRODUCING OIL
- SHUT-IN GAS
- SHUT-IN OIL
- TEMP. ABANDONED
- TEST WELL
- WATER INJECTION
- WATER SUPPLY
- WATER DISPOSAL

County Boundary

Field Status
- ABANDONED
- ACTIVE
- COMBINED
- INACTIVE
- PROPOSED
- STORAGE
- TERMINATED

Sections



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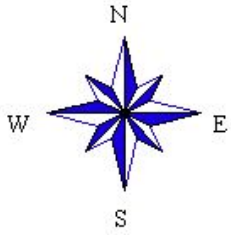


Wellbore Diagram

API Well No: 43-007-30361-00-00 **Permit No:** UIC-201.1 **Well Name/No:** HELPER ST SWD 1

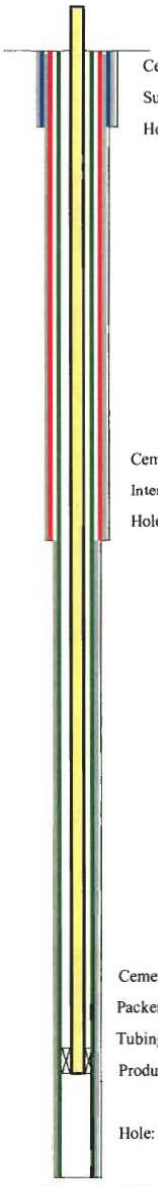
Company Name:

Location: Sec: 3 T: 14S R: 10E Spot: SESW

Coordinates: X: 518160 Y: 4386861

Field Name: HELPER

County Name: CARBON



Cement from 319 ft. to surface

Surface: 13.325 in. @ 319 ft.

Hole: 17.5 in. @ 319 ft.

Cement from 2811 ft. to 15 ft.

Intermediate: 8.625 in. @ 2811 ft.

Hole: 12.25 in. @ 2811 ft.

Cement from 6489 ft. to 2811 ft.

Packer: @ 5890 ft.

Tubing: 2.875 in. @ 5890 ft.

Production: 5.5 in. @ 6489 ft.

Hole: 7.875 in. @ 6489 ft.

TD: 6489 **TVD:** **PBTD:**

String Information

String	Bottom (ft sub)	Diameter (inches)	Weight (lb/ft)	Length (ft)
HOL1	319	17.5		
SURF	319	13.325	48	319
HOL2	2811	12.25		
I1	2811	8.625	24	2811
HOL3	6489	7.875		
PROD	6489	5.5	17	6489
T1	5890	2.875		
PKR	5890			

Cement Information

String	BOC (ft sub)	TOC (ft sub)	Class	Sacks
I1	2811	15	G	250
I1	2811	15	HC	750
PROD	6489	2811	UK	870
SURF	319	0	G	360

Perforation Information

Top (ft sub)	Bottom (ft sub)	Shts/Ft	No Shts	Dt Squeeze
5920	6320			

Formation Information

Formation	Depth
FRSD	2028
FRNCOL	2078
TNUNK	2246
NAVA	5870
KAYT	6155
WING	6256