



1 1 1 West Second Street, Suite #400
P.O. Box 2775
Casper, WY 82602

Phone: 307-265-9199
Fax: 307-473-7138
E-mail: tylerv@gga-inc.com

WDEQ Rules And Regulations, Chapter 24 Class VI Injection Wells And Facilities Underground Injection Well Program Summary Of Permitting Requirements

Items not required in Class I or Class II permitting are highlighted in yellow.

- Section 1. Authority And Purpose**
- Section 2. Definitions**
- Section 3. Applicability**
- Section 4. Permits Required; Processing Of Permits; Requirements Applicable To All Permits**

Partial List Of Permit Requirements:

- Injections from Class VI wells shall be restricted to those receivers defined as Class V (Hydrocarbon Commercial) or Class VI groundwaters by the Department pursuant to Water Quality Rules and Regulations Chapter 8.
- A separate permit to construct is not required under Water Quality Rules and Regulations Chapter 3 for any Class VI facility.
- Permits may be issued for individual Class VI wells and shall not be issued on an area basis for multiple points of discharge operated by the same person.
- Sections of permit applications filed under this chapter that represent engineering and geologic work shall be sealed, signed, and dated by a licensed professional engineer and geologist, respectively, as required by W.S. § 33-29-601 and W.S. § 33-41-115.
- Within sixty (60) days of submission of the application, the Administrator shall make an initial determination of completeness. An application shall be determined complete when the Administrator receives an application and any supplemental information necessary to determine compliance with these regulations. The completeness of any application for a permit shall be judged independently of the status of any other permit application or permit for the same facility or activity.
- At the end of any 60-day review period where an application is determined complete, the Administrator shall prepare a draft permit for issuance or denial, prepare a fact sheet on the proposed operation, and provide public notice pursuant to Section 20 of this chapter.

Section 5. Permit Application

A complete application for a Class VI well shall include:

- A brief description of the nature of the business and the activities to be conducted that require the applicant to obtain a permit under this chapter.
- The name, address and telephone number of the operator, and the operator's ownership status and status as a Federal, State, private or other entity.
- Up to four SIC (Standard Industrial Classification) codes for products or services provided by the facility.
- Within the area of review, a listing and status of all permits or construction approvals associated with the geologic sequestration project received or applied for by the applicant.
- Within the area of review, a list of other relevant permits. This includes a statement as to whether or not the facility is within a state approved water quality management plan area, a state approved wellhead protection area or a state approved source water protection area.
- A map showing the injection well(s) for which a permit is sought and the applicable area of review, consistent with Section 8.
- A map delineating the area of review based upon modeling.
- A description of the general geology of the area to be affected by the injection of CO₂ including:
 - geochemistry
 - structure and faulting
 - fracturing and seals
 - stratigraphy and lithology
 - petrophysical attributes
 - reservoir properties of the proposed storage site and overlying formations
 - isopach maps
 - structural contour map
 - two (2) geologic cross-sections surface to total depth
 - location, orientation, and properties of known or suspected faults
 - seismic history
 - effectiveness of the injection and confining zone(s), including data on the depth, areal extent, thickness, mineralogy, porosity, vertical permeability, and capillary pressure of the injection and confining zone(s) within the area of review, and geologic changes based on field data that may include geologic cores, outcrop data, seismic surveys, well logs, and names and lithologic descriptions

- geomechanical information on fractures, stress, ductility, rock strength, and in situ fluid pressures within the confining zone
 - geologic and topographic maps and cross-sections illustrating regional geology, hydrogeology, and the geologic structure of the local area
 - a compilation of all wells and other drill holes within, and adjacent (within one (1) mile) to the area of review (including wells that are not in the public record) using aerial photography, aerial survey, physical traverse, or other methods
- Applicants shall perform corrective action as specified in Section 8 of this chapter.
 - Maps and stratigraphic cross-sections indicating the general vertical and lateral limits of all USDWs, the location of water wells and springs within the area of review, their positions relative to the injection zone(s), and the direction of water movement, where known.
 - A characterization of the injection zone and aquifers above and below the injection zone that may be affected, including applicable pressure and fluid chemistry data to describe the projected effects of injection activities, and background water quality data that will facilitate the classification of any groundwaters that may be affected by the proposed discharge.
 - Baseline geochemical data on subsurface formations, including all USDWs within the area of review.
 - Proposed operating data: Average and maximum daily rate and volume and/or mass and total anticipated volume and/or mass of the CO₂ stream; average and maximum surface injection pressure; the source of the CO₂ stream; and an analysis of the chemical and physical characteristics of the CO₂ stream and any other substance(s) proposed for inclusion in the injectate stream; and anticipated duration of the proposed injection period(s).
 - The compatibility of the CO₂ stream with fluids in the injection zone and minerals in both the injection and the confining zone(s) and with the materials used to construct the well.
 - An assessment of the impact to fluid resources, on subsurface structures and the surface of lands that may reasonably be expected to be impacted, and the measures required to mitigate such impacts.
 - Proposed formation testing program to obtain an analysis of the chemical and physical characteristics of the injection zone and confining zone and that meets the requirements of Section 11 of this chapter.
 - Proposed stimulation program, a description of stimulation fluids to be used, and a determination that stimulation will not compromise containment. All stimulation programs must be approved by the Administrator as part of the permit application and incorporated into the permit.

- Proposed procedure that outlines steps to conduct injection operation.
- A wellbore schematic of the subsurface construction details and surface wellhead construction of the injection and monitoring wells.
- Injection well design and construction procedures that meet the requirements of Section 9.
- Proposed **area of review and corrective action plan** that meets the requirements under Section 8.
- The status of corrective action on wells within the area of review.
- All available logging and testing program data on the well(s) required by Section 11.
- A demonstration of mechanical integrity pursuant to Section 13.
- A demonstration that the applicant has met the financial responsibility under Section 19.
- Proposed testing and monitoring plan required by Section 14.
- Proposed injection and monitoring well(s) plugging plan required by Section 16(b).
- Proposed **post-injection site care plan** required by Section 17(a).
- Proposed **emergency and remedial response plan** required by Section 18.
- A site and facilities description, including a description of the proposed geologic sequestration facilities.
- Documentation sufficient to demonstrate that the applicant has all legal rights, including but not limited to the right to surface use, necessary to sequester CO₂ and associated constituents.
- Proof of notice to surface owners, mineral claimants, mineral owners, lessees, and other owners of record of subsurface interests as to the contents of such notice.
- A list of contacts, submitted to the Administrator, for those Tribes identified to be within the area of review.

Section 6. Prohibitions.

Section 7. Minimum Criteria For Siting Class VI Wells.

Section 8. Area Of Review Delineation And Corrective Action.

The area of review is based on computational modeling that accounts for the physical and chemical properties of all phases of the injected CO₂ stream. The owner or operator will re-evaluate the area of review at least every two (2) years.

Section 9. Construction And Operation Standards For Class VI Wells.

Section 10. Class VI Injection Depth Waiver Requirements.

The owner and/or operator seeking a waiver of the requirement to inject below the lowermost USDW shall submit a supplemental report, complete with simulation, concurrent with the permit application.

Section 11. Logging, Sampling, And Testing Prior To Injection Well Operation.

The owner or operator must take whole cores or sidewall cores of the injection zone and confining system, and formation fluid samples from the injection zone(s).

Section 12. Injection Well Operating Requirements.

Section 13. Mechanical Integrity.

Section 14. Testing And Monitoring Requirements.

Section 15. Reporting Requirements.

Section 16. Injection Well Plugging.

Section 17. Post Injection Site Care And Site Closure.

Section 18. Emergency And Remedial Response.

Section 19. Financial Responsibility.

The cost estimate shall be based upon a multi-disciplinary analytical framework such as Monte Carlo or other commonly accepted stochastic modeling tools.

Section 20. Public Participation, Public Notice And Public Hearing Requirements.