WYOMING
CLASS VI
UNDERGROUND INJECTION CONTROL
PROGRAM (1422) DESCRIPTION

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CLASS VI

UNDERGROUND INJECTION CONTROL

PROGRAM (1422) DESCRIPTION

Wyoming Department of Environmental Equality

Water Quality Division

Groundwater Section

I. INTRODUCTION

As mandated by the Safe Drinking Water Act of 1974 (as amended), the United States Environmental Protection Agency (EPA) has promulgated regulations establishing minimum requirements, technical criteria, and standards for State Underground Injection Control (UIC) programs to protect underground sources of drinking water (USDW). The State of Wyoming received UIC program primacy from the EPA in 1983 and has since operated under an EPA-approved UIC program. The Wyoming Department of Environmental Quality (WDEQ) Water Quality Division (WQD) currently has regulatory authority for the Class I and Class V injection wells, Class II wells are regulated by the Wyoming Oil and Gas Conservation Commission (WOGCC), and Class III wells are regulated by the WDEQ Land Quality Division (LQD).

On December 10, 2010 EPA finalized minimum federal requirements under the Safe Drinking Water Act (SDWA) for underground injection of Carbon Dioxide (CO_2) establishing a new class of injection wells, Class VI. The Class VI rule is based on UIC regulatory framework, with modifications to address the unique nature of CO_2 injection. The purpose of the Class VI rule is to ensure that the geologic storage of CO_2 is conducted in a manner that protects USDWs.

In order to gain primary enforcement responsibility for Class VI injection wells, Wyoming will demonstrate in this submittal that its UIC program is at least as stringent as the federal standards. The Wyoming Environmental Quality Act (WEQA, Chapter 11, Article 3, Sections 35-11-313 to 35-11-318) was amended and the Wyoming Water Quality Rules and Regulations (WQRR) were revised to include Class VI injection wells (Chapter 24).

This revised program description incorporates changes as required under federal regulations, and is only an addendum to the current Wyoming 1422 UIC primacy authority. Nothing in this document in any way affects the current administration of the Class II program under Section 1425 of the SDWA or the Class I, Class III, and Class V programs under Section 1422 of the SDWA. Jurisdiction of Class VI injection wells will be administered by the WDEQ WQD. This revision of the Wyoming 1422 UIC program is for the sole purpose of adding Class VI injection wells to the program.

II. OVERVIEW OF THE STATE UIC PROGRAM

WQD has been mandated the responsibility of protecting the quality of the State's water resources, including both surface and groundwater, to ensure that all existing and potential beneficial uses are met. The primary mechanisms used to meet this mandate are through the implementation and enforcement of surface and groundwater standards, construction standards for water and wastewater facilities, and permit programs for construction of facilities and discharges to Waters of the State.

Wyoming has primary enforcement authority under the SDWA for all Class I, Class II, Class III, Class IV and Class V wells outside Indian Lands (as defined in 42 United States Code (U.S.C.) § 300h-1), and has authority under Wyoming Statutes (W.S.) § 35-11-313 for Class VI wells. The lead agency for the Wyoming 1422 UIC Program is the WDEQ/WQD. The WQD administers the 1422 UIC program Class I and Class V injection wells, the WOGCC administers the 1425 UIC program Class II wells, and the WDEQ/LQD administers the 1422 UIC program Class III wells. Through memorandums of agreement with WOGCC and LQD, WQD is responsible for groundwater classifications as part of EPA aquifer exemption requests for Class II and Class III wells. The WOGCC administers the 1425 UIC program regulating Class II injection activities through a separate EPA program grant. Each state agency is responsible for administering the UIC injection wells under their jurisdiction, including reporting, permitting, monitoring, compliance, and enforcement actions.

Currently, there are no permitted Class I UIC injection wells for the purpose of CO_2 geologic storage, nor Class V injection wells permitted for experimental purposes. In addition, there are no Class VI injection wells permitted by the EPA within Wyoming. It is anticipated that within the first two (2) years after receiving primacy for the Class VI UIC program, that up to two (2) permit applications may be submitted to DEQ/WQD. Each permit application will be reviewed for compliance with applicable state statutes and regulations, permitting requirements, and for the adequacy of protection of USDWs. WQD anticipates that reviewing applications will require six (6) to nine (9) months following the date that a complete Class VI permit application is submitted. It is expected that interest in CO_2 injection permits will increase after Wyoming is granted primacy due to energy production, interest in CO_2 as a commodity, and in relation to the regulation of CO_2 emissions.

WDEQ/WQD will evaluate information about Class II carbon dioxide-enhanced recovery (ER) wells (e.g., carbon dioxide injection) and production data or information related to the other factors at Water Quality Rules and Regulations Chapter 24, Section 3(c)(i) and identify whether any projects are approaching risk thresholds. The agency will coordinate with the Wyoming Oil and Gas Conservation Commission as needed to obtain the data needed for this review.

If such increased risk is present, WDEQ/WQD will contact the owners or operators of these wells and inform them that they must apply for a Class VI permit. Agency staff will provide information about the state's Class VI regulation and about applying for a Class VI permit pursuant to W.S. § 35-11-313(c) and WQRR Chapter 24, Section 3(c). Permitting of these wells will be conducted as described below.

The primary focus of the UIC program under the SDWA is the protection of USDWs. The Federal definition of a USDW is an aquifer or any portion of an aquifer that supplies a public water system, or contains a sufficient quantity of groundwater to supply a public water system, and currently supplies drinking water for human consumption, or contains fewer than 10,000 milligrams per liter (mg/L) of total dissolved solids (TDS) and is not an exempted aquifer.

As described in state regulations, a USDW is defined as those aquifers or portions thereof that meet the definition at 40 Code of Federal Regulations (CFR) §144.3 as of November 15, 1984. In addition, injections for Class VI UIC facilities shall be limited to receivers that are classified as Class V (Hydrocarbon Commercial) or Class VI (Unsuitable for Use) as determined by the WQD pursuant to Chapter 8, WQRR (WQRR Chapter 24, Section 4).

Owners or operators of Class II ER wells may apply to expand the areal extent of Class II aquifer exemptions. Such requests must be submitted concurrently with Class VI permit applications, pursuant to WQRR Chapter 24, Section 5.

If such requests are received, the agency will evaluate the application to determine that the area of the proposed expansion is sufficiently large to contain the carbon dioxide plume and pressure front and was determined in a manner that is consistent with the area of review (AoR) modeling required under WQRR Chapter 24, Section 8 and whether the request meets the criteria at 40 CFR § 146.4.

Following this evaluation and a determination that the proposed expansion of the areal extent of the aquifer exemption meets the requirements at 40 CFR §§ 144.7(d) and 146.4, the agency will forward the request to the EPA regional office. No designation of an expansion of the areal extent of a Class II ER aquifer exemption for geologic sequestration (GS) injection will be final unless approved by the US EPA Administrator as a revision. Other than EPA approved aquifer exemption expansions that meet the criteria set forth in WQRR Chapter 24, Section 5, new aquifer exemptions shall not be issued for Class VI injection wells. Even if an aquifer has not been specifically identified by the WQD Administrator, it is a USDW if it meets the definition in WQRR Chapter 24, Section 2.

The state's regulation, at WQRR Chapter 24, Section 10, includes provisions for owners or operators of Class VI wells seeking to inject into non-USDWs that lie above or between USDWs to apply for and receive injection depth waivers.

Owners or operators must apply for an injection depth waiver at the time they submit their Class VI permit application. The waiver application must include all of the information at WQRR Chapter 24, Section 10(a).

WQD will evaluate this information to ensure that USDW protection, site-specific drinking water resource issues, and the use and impact of GS technologies on all USDWs are considered and documented as part of the decision to grant a waiver. WQD will also evaluate all of the information at WQRR Chapter 24, Section 10(a)(i) through (vii).

If WQD determines, based on this review, that approval of the proposed injection depth waiver would allow injection that is protective of USDWs, the agency will:

- Consult with the Public Water System Supervision (PWSS) Programs of all states, territories and tribes having jurisdiction within the AoR of the proposed well to inform them of the pending waiver application pursuant to the requirements at WQRR Chapter 24, Section 10(b)(ii). Any written or verbal responses to this consultation will be documented and made a part of the administrative record for the Class VI permit application.

- Notify the public that a waiver application has been submitted, pursuant to the procedures at WQRR Chapter 24, Section 10(c) and evaluate and respond to all public comments.

- Forward all relevant information, including the results of an evaluation of the information described above, documentation of consultation with the PWSS Director, and public input on the proposed waiver to the EPA Regional Administrator. The state will not issue a Class VI permit to inject into non-USDWs above or between USDWs unless the EPA Regional Administrator approves an injection depth waiver, per 40 CFR § 146.95(d).

Following approval of an injection depth waiver, WQD would include additional conditions in the Class VI permit to ensure the protection of USDWs above and below the injection zone pursuant to the requirements at WQRR Chapter 24, Section 10(f).

WQRR Chapter 24, Section 19 requires owners or operators of Class VI wells to demonstrate and maintain financial resources to perform all required corrective action, plug the injection well, conduct post-injection site care and site closure, and perform any needed emergency and remedial response.

Agency staff with financial expertise will review the cost estimates provided by applicants to verify that they are sufficient to cover these activities and evaluate the financial instruments the applicant proposes to use to verify that they qualify and are appropriate.

W.S.§ 35-11-313 and WQRR Chapter 24 require that all operators must apply for a permit for the purpose of injection and geologic storage of CO_2. As part of the Class VI application for permit, the operator must submit all required information according to WQRR Chapter 24, including: UIC Class VI Permit application (Section 5), demonstration of suitable geology (Section 7), area of review delineation and corrective action plan (Section 8), injection well construction and operation specifications (Section 9 and Section 12), documentation of logs, samples and required testing (Section 11), demonstration of mechanical integrity (Section 13), a testing and monitoring plan (Section 14), an injection well-plugging plan (Section 16), a post-injection site care and closure plan (Section 17), an emergency and remedial response plan (Section 18), and a demonstration of financial responsibility (Section 19). Permit applications will be reviewed by WQD and will issue permits in accordance with WQRR Chapter 24, Section 4. Injection may not commence until well construction is complete, mechanical integrity has been demonstrated, and approval has been granted by the WQD Administrator.

Permittees must allow the WQD Administrator or their authorized representative access to regulated facilities or where records are kept for the purpose of inspection and/or compliance

monitoring, including to review and copy reports and records required by the permit, collect fluid samples for analysis, measure and record water levels, and perform any other functions authorized by law or regulation. Inspections of permitted facilities by WQD staff will be conducted on an annual basis, or more frequently as necessary to witness well construction, mechanical integrity testing, well work-overs, and/or well-plugging. Compliance monitoring includes the review of records and reports submitted in accordance with requirements of WQRR Chapter 24, Section 15.

The WQD Administrator will give written notification to all surface owners, mineral claimants, mineral owners, lessees and other owners of record of subsurface interests within 1-mile of the proposed geologic sequestration suite boundary; Tribes within the area of review of the Class VI project based on information provided in WQRR Chapter 24, Section 5(b)(vii)(A); and those entities listed in WQRR Chapter 24, Section 20(c)(i).

Wyoming encourages citizens to be involved in the permitting process through the public comment process and public hearings. All permit applications, once deemed complete and a draft permit is prepared, will be provided a 60-day public notice period. Public notice of a requested hearing will be provided thirty (30) days prior to the hearing.

The WQD Administrator may revoke and reissue, or terminate a permit due to non-compliance with the terms and conditions of the permit, failure to disclose fully all relevant facts, or misrepresenting relevant facts, or a determination that the activity endangers human health or the environment and can only be regulated by permit modification or termination. Non-compliance with permit conditions is a violation of regulations and is grounds for enforcement action, permit termination, revocation or modification.

III. AGENCY ORGANIZATION AND STRUCTURE

A. General Responsibilities

WDEQ/WQD has the statutory and regulatory authority to regulate Class VI Injection well activities under WEQA §35-11-313 to 318 and WQRR Chapter 24, respectively.

The WDEQ/WQD has the following responsibilities specific to their associated statutory authority:

1. Administer the rules and regulations as they pertain to subsurface injections.

2. Perform technical evaluations of injection well applications and prepare draft permits.

3. Issue, deny, modify, or terminate permits.

4. Witness, at the discretion of the permitting agency, any aspect of construction, testing, operation, and closure of injection well activities.

5. Perform on-site inspections of permit requirements.

6. Review operation reports for permit or rule compliance.

7. Maintain a database of injection well information including quantity and quality of injected material, well construction, local geology, and the pertinent water resources that could be impacted.

8. Provide recommendations of compliance strategies and corrective action when violations occur.

9. Initiate and pursue appropriate enforcement action when the permit or rule requirements are violated.

10. Conduct public hearings or enforcement proceedings as required.

11. Respond to public inquiries and complaints regarding proposed or operating injection facilities.

12. Ensure that the regulated community and the public at large are informed about underground injection activities.

13. Maintain permit files including information on the geology and hydrology (e.g., depth, name, and quality of USDWs) in the vicinity of the injection wells along with other data submitted with the application.

14. Ensure that the permitted facility maintains financial assurance through the life of the permit and reclamation period.

B. Specific Responsibilities

The WDEQ/WQD has responsibility for the protection of groundwater resources and regulatory authority for Class I and Class V injection activities within the State. In addition to these responsibilities and upon EPA approval the WDEQ/WQD will administer all regulatory authority for Class VI injection well activities. The WDEQ/WQD is responsible for the following tasks and statutory obligations:

1. Administration of the Class I UIC Program.
2. Administration of Class V UIC Program.
3. Administration of Class VI UIC Program.

The mission of the WDEQ/WQD is to encourage responsible development, production, and utilization of natural resources while protecting, conserving, and enhancing Wyoming's water for the benefit of current and future generations.

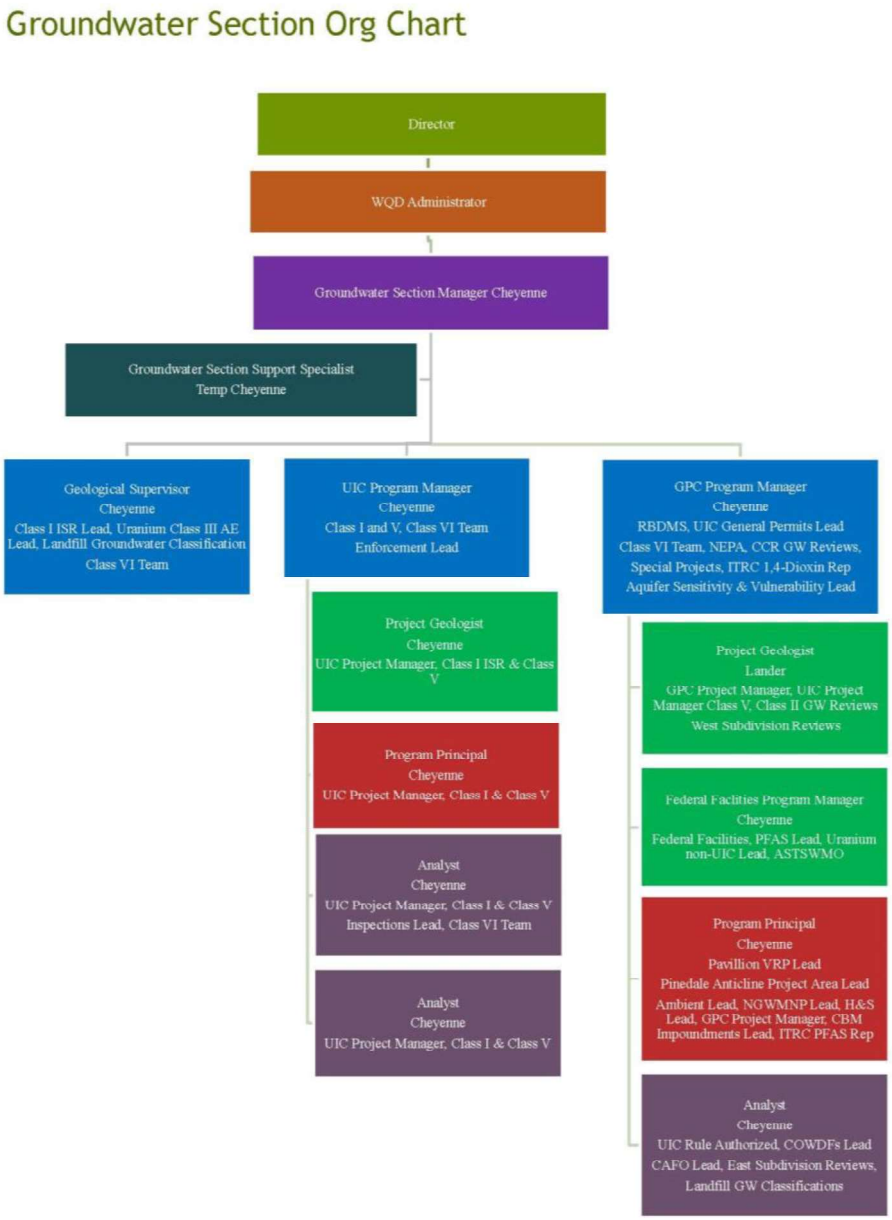
The Wyoming Class VI UIC program will be administered by the Groundwater Pollution Control (GPC) Supervisor with oversight from the Groundwater Section Manager. The GPC Supervisor will be a geologist or engineer able to perform all tasks associated with the administration of the program including, but not limited to permit evaluation, technical evaluation, on-site inspection, and compliance monitoring.

Staff in the Wyoming Class VI UIC program have both in-house expertise and access to contractor staff with skills in the technical and policy areas relevant to evaluating Class VI permit applications, issuing Class VI permits, and overseeing GS projects throughout their life span. The state plans to implement a "team" approach to permitting by dividing permit applications among staff with relevant areas of expertise. The table below identifies the sources of this expertise:

Expertise Area	In-House	Contractor
Site characterization, e.g., geologists, hydrogeologists, geochemists, and log analysts/experts to review site characterization data submitted during permitting and throughout the project duration.	✓	
Modeling, e.g., hydrogeologists and environmental/reservoir modelers to evaluate AoR delineation computational models during permitting and AoR reevaluations.		✓
Well construction and testing, e.g., well engineers, log analysts/experts, and geologists to review well construction information and operational reports on the performance of Class VI wells and review/evaluate testing and monitoring reports		✓
Finance experts to review financial responsibility information during permitting and annual evaluations of financial instruments.	✓	
Risk analysts to evaluate emergency and remedial response scenario probabilities and remediation cost estimates.		✓
Policy/regulatory experts on the UIC Program and the Class VI Rule to evaluate compliance with Class VI Rule requirements.	✓	
Enforcement/compliance, e.g., staff who can initiate and pursue appropriate enforcement actions when permit or rule requirements are violated.	✓	
Inspectors including well engineers or log analysts/experts to inspect wells or witness construction activities, workovers, and/or mechanical integrity tests.	✓	

Funding for the Class VI program will be from fees levied according to the provisions of WEQA §35-11-313, federal UIC grant and state permit and operating general funds. The fee amounts will be set by the WDEQ.

The estimated costs for the first two (2) years of implementing the Wyoming Class VI UIC program will be approximately $200,000. These costs include a portion of the staff current salary, purchase of computer reservoir modeling software license, a computer to run the computer modeling simulations, computer reservoir modeling software training, updates to WDEQ's UIC database for CO_2 storage, and all other indirect costs associated with the administration of the program.



IV. STATE UIC PERMITTING PROCESS

The WDEQ/WQD is responsible for the technical evaluation of CO_2 injection well permit applications and drafting of permit provisions for Class VI wells.

A. Class VI Injection Wells Permitting

Wyoming's Class VI regulations apply to all Class VI wells used to inject carbon dioxide for geologic sequestration purposes, and all Class I, Class II, or Class V experimental/demonstration projects who seek to apply for a Class VI geologic sequestration permit. Each applicant will provide the information outlined in W.S. §35-11-313 (Geologic sequestration permit requirements), WQRR Chapter 24, and the permit application.

B. Required Information for Geologic Sequestration Facility permit

It is the operator's responsibility to make an application for and obtain a permit in accordance with the requirements of WQRR Chapter 24. Each application must be submitted with all supporting data. A complete application for a Class VI well shall include all information as identified in the attached application form and WQRR Chapter 24, Section 5.

C. Permit Review and Public Comment

Once a permit application is determined to be complete, a draft permit shall be prepared for issuance or denial, a fact sheet on the proposed operation shall be prepared, and provide public notice pursuant to WQRR Chapter 24, Section 20. An application is deemed complete when the WQD Administrator receives an application and any supplemental information necessary to determine compliance with these regulations, in accordance with WQRR Chapter 24, Section 4(b)(ii) and Section 5.

Public notice of the preparation of a draft permit shall allow at least sixty (60) days for public comment. Public notice of a public hearing shall be given at least thirty (30) days before the hearing.

During the public comment period, any interested person may submit written comments on the draft permit and may request a public hearing. Public notice of the hearing may be given at the same time as public notice of the draft permit and the two (2) notices may be combined. Requests for public hearings must be made in writing to the WQD Administrator and shall state the reasons for the request. All comments will be considered in making the final decision and will be addressed when a permit is issued or denied.

The WQD Administrator shall hold a hearing whenever the WQD Administrator finds, on the basis of requests, a significant degree of public interest in a draft permit. The WQD Administrator has the discretion to hold a hearing whenever such a hearing may clarify issues involved in a permit decision. The public comment period shall automatically extend to the close of any public hearing. The WQD Administrator may also extend the comment period by so stating at the public hearing.

D. Mechanical Integrity

To evaluate the absence of significant leaks, owners or operators must, following an initial annulus pressure test, continuously monitor injection pressure, rate, injected volumes, and pressure on the annulus between tubing and long string casing and annulus fluid volume as specified in WQRR Chapter 24, Section 12 (e) and (f);

At least once per year, the owner or operator must use one of the following methods to determine the absence of significant fluid movement under Chapter 24, Section 13(a)(ii):

(i) An approved tracer survey such as an oxygen-activation log; or

(ii) A temperature or noise log.

If required by the WQD Administrator, at a frequency specified in the testing and monitoring plan required in Section 14 of WQRR Chapter 24, the owner or operator must run a casing inspection log to determine the presence or absence of corrosion in the long-string casing.

The WQD Administrator may require any other test to evaluate mechanical integrity under Chapter 24, Section 13 (a)(i) or Section 13(a)(ii). Also, the WQD Administrator may allow the use of a test to demonstrate mechanical integrity other than those listed above, with the written approval of the US EPA Administrator. To obtain approval, the WQD Administrator must submit a written request to the US EPA Administrator that must set forth the proposed test and all technical data supporting its use.

E. Testing and Monitoring Requirements

The owner or operator of a Class VI well must prepare, maintain, and comply with a testing and monitoring plan to verify that the geologic sequestration project is operating as permitted and is not endangering USDWs. The testing and monitoring plan must be submitted with the permit application, for WQD Administrator approval, and must include a description of how the owner or operator will meet the requirements of this section, including accessing sites for all necessary monitoring and testing during the life of the project.

Testing and monitoring associated with geologic sequestration projects must include the information identified in WQRR Chapter 24, Section 14.

F. Plugging and Abandonment

The owner or operator must comply with the requirements identified in WQRR Chapter 24, Section 16.

G. Post-injection Site Care and Facility Closure

The owner or operator of a Class VI well must comply with the requirements identified at WQRR Chapter 24, Section17.

V. STATE COMPLIANCE MONITORING PROGRAM

All Class VI permits are required to have a provision that requires the permittee to allow the WQD Administrator, or an authorized representative of the WQD Administrator, upon the presentation of credentials, during normal working hours, to enter the premises where a regulated facility is located, or where records are kept under the conditions of this permit, and inspect the discharge and related facilities, review and copy reports and records required by the permit, collect fluid samples for analysis, measure and record water levels, and perform any other function authorized by law or regulation.

A. Plan Review

The WDEQ will verify that the storage facility construction, completion, operation, maintenance, and closure procedures are performed according to approved plans and specifications, and meet all permit or regulatory requirements. Verification of Class VI injection well activities is accomplished by reviewing appropriate plans and reports, performing on-site inspections, responding to complaints, and, where necessary, referring noncompliance to the enforcement

group and/or legal counsel for appropriate enforcement action. Review of plans and reports may include but are not restricted to:

1. Revisions to construction plans filed after permit issuance.

2. Well completion reports including results of required logging and other testing.

3. Results of injectivity and pump tests, mechanical integrity tests, and any other required tests.

4. Bottomhole pressure reports and updated evaluations of the effects of injection on the injection zone, including fluid volume, injection rate, and injection pressure data.

5. Workover plans and workover reports describing construction or maintenance.

6. Revisions to plugging plan and reports of completion of plugging, and other site closure activities.

7. Any other plans or test results connected with the proper construction, operation, and maintenance of the well and associated surface facilities.

The compliance monitoring program will be overseen by WDEQ WQD for all Class VI injection well activities. The objective of the monitoring program is to verify compliance with provisions of permits, rules, and any other additional permit conditions or stipulations. The objectives are achieved by:

1. Conducting inspections of storage facilities.

2. Reviewing self-reporting, monitoring, recordkeeping, and certain operating and maintenance activities.

3. Investigating unauthorized injection activities and unauthorized facilities.

4. Participation in appropriate water quality sampling programs.

5. Responding to citizen complaints.

B. Geologic storage facilities will be inspected on an annual basis.

Annual site inspections will be conducted to observe and document the condition of the injection site, facilities, and monitoring wells; and to review Class VI permit conditions and facility records to determine compliance with any plans or permit conditions. Additional site inspections may be conducted to verify or witness construction, operation, and maintenance procedures, or in response to a complaint or other indication that a problem may exist. Construction elements and testing that may be witnessed by the WDEQ, include:

1. Well pad and site construction.

2. All drilling and well completion operations.

3. Pressure testing of tubing and casing.

4. Formation pressure tests, injectivity tests, or pump tests.

5. Installation and maintenance of instrumentation.

6. Work required by any corrective action plan.

7. Well workovers.

8. Placement of monitoring wells or other equipment.

9. Any plugging procedures.

10. Mechanical Integrity testing.

Violations of any permit conditions noted during an inspection will be referred for enforcement action.

VI. WYOMING ENFORCEMENT PROCEDURES

Class VI enforcement actions will be initiated and processed as described below:

The State can address violations through:

1. Issuance of a Notice of Violation (NOV) or letter of violation (LOV) and work through conference and conciliation to abate the violation ;

2. Issuance of a Notice of Violation and an administrative order that is appealable to the Environmental Quality Council, in accordance with W.S. § 35-11-701;

3. Referral of the case to the Attorney General's office with a recommendation that a complaint be filed in district court; and/or

4. The issuance of emergency orders, in accordance with W.S. § 35-11-115.

The approach under item 1 or 2 allows the State to resolve the violations through conference and conciliation.

A violation of any category of major violations will not automatically dictate that the State seek a penalty. Each case will be evaluated on its own merit using the criteria below.

When a penalty is being sought through the court system, an analysis of the violation and penalty justification will be supplied to EPA.

In recommending a fine, the Department will give consideration to factors such as:

1. Classification of the receiving aquifer;

2. The environmental effect of the violation and the effect on the use of the resource;

3. The cooperativeness and previous record of the violator;

4. The economic benefit to the violator of non-compliance;

5. Degree of fault;

6. Costs incurred during reclamation; and

7. Mitigating circumstance.

The Attorney General will be notified of any appeals or requests for hearings before the Environmental Quality Council by phone and correspondence. The Attorney General will represent the Department at such hearings.

Any request for enforcement action by a complaint filed in District Court will be made by the Director of the Department to the Attorney General.

VII. REPORTS

The owner or operator is required to submit all required reports, submittals, and notifications under WQRR Chapter 24 to both the WDEQ and to EPA, in an electronic format acceptable to the EPA. Reports submitted to the WDEQ are uploaded to the WDEQ Underground Injection Control GEM database. The EPA has viewing authority of all reports submitted to the WDEQ through GEM.

A. Reporting Schedule

Reports are required to be submitted to the WDEQ within thirty (30) days following the end of the reporting period specified in the permit. At a minimum, the following reports are required:

1. Semi-Annual Reports which are required by the permit shall be submitted to the WQD Administrator within thirty (30) days following the end of the period covered in the report, and shall contain:

    a) Any changes to the physical, chemical and other relevant characteristics of the carbon dioxide stream from the proposed operating data;

    b) Monthly average, maximum and minimum values for injection pressure, flow rate and volume, and annular pressure;

    c) A description of any event that exceeds operating parameters for annulus pressure or injection pressure as specified in the permit;

    d) A description of any event that triggers a shutdown device required pursuant to WQRR Chapter 24, Section 12(g), and the response taken;

    e) The monthly volume of the carbon dioxide stream injected over the reporting period and project cumulatively;

    f) Monthly annulus fluid volume added; and

g) The results of monitoring prescribed under WQRR Chapter 24, Section 14.

2. Report Within thirty (30) days, results of:

   a) Periodic tests of mechanical integrity;

   b) Any other test of the injection well conducted by the permittee if required by the WQD Administrator; and

   c) Any well workover.

3. Report within 24-hours:

   a) Any evidence that the injected carbon dioxide stream or associated pressure front may cause an endangerment to a USDW;

   b) Any noncompliance with a permit condition, or malfunction of the injection system, that may cause fluid migration into or between USDWs;

   c) Any triggering of a shut-off system (i.e., down-hole or at the surface);

   d) Pursuant to compliance with the requirement at Section 14(b)(x) of WQRR Chapter 24 for surface air or soil gas monitoring or other monitoring technologies, if required by the WQD Administrator, any release of carbon dioxide to the atmosphere or biosphere.

4. In addition, owners must notify the WQD Administrator in writing thirty (30) days in advance of:

   a) Any planned well workover;

   b) Any planned stimulation activities, other than stimulation for formation testing conducted under WQRR Chapter 24 Section 5; and

   c) Any other planned test of the injection well conducted by the permittee.

B. Class VI UIC Program Reporting

Class VI UIC program annual reports will be submitted to the Regional Administrator by December 1. The report is for the period of October 1 through September 30 (federal fiscal year) and will consist of the following:

1. A well inventory consisting of the facility name and ID, location, well type, and well status.

2. A summary of the major program activities during the fiscal year as identified in the work plan.

VIII. FORMS

WATER QUALITY DIVISION

UNDERGROUND INJECTION CONTROL

PERMIT APPLICATION

CLASS VI WELL

Mail one (1) hard copy with original signatures and one (1) digital copy to:

Wyoming Dept. of Environmental Quality
Water Quality Division
ATTN: Groundwater Section Manager
200 West 17th Street, 2nd Floor
Cheyenne, WY 82002

Office Use Only

UIC Facility Number: _____

UIC Permit Number: _____

Date Received: _____

A complete application for a Class VI well shall include all information required under Wyoming Water Quality Rules and Regulations (WQRR), Chapter 24 and this application consisting of Part I and II.

All data used to complete the permit application shall be kept by the applicant for the life of the geologic sequestration project and for ten (10) years following site closure.

IX. FORMS AND GENERAL INFORMATION AND SIGNATORY AUTHORITY

CLASS VI WELL DEFINITION: (WQRR CHAPTER 24, SEC 2)

"Class VI well" means a well injecting a carbon dioxide stream for geologic sequestration, beneath the lowermost formation containing an Underground Source of Drinking Water (USDW); or a well used for geologic sequestration of carbon dioxide that has been granted a waiver of the injection depth requirements pursuant to requirements of WQRR Chapter 24, Section 10; or, a well used for geologic sequestration of carbon dioxide that has received an expansion to the areal extent of an existing Class II enhanced oil recovery or enhanced gas recovery aquifer exemption pursuant to WQRR Chapter 24, Section 5.

1. Facility name _____
(This is the facility name that will appear on the permit.)

2. Type of application submittal

☐ Initial (new facility)

☐ Initial (conversion from other well type)

☐ Major Modification (current permit number) _____

3. Facility/Operator Name_____

Responsible Corporate Officer_____ Title_____

Street Address _____

City_____ County _____State____

Zip Code _____ E-mail Address_____ Phone No._____

4. Operator's Ownership Status

☐ Private

☐ Public

☐ Federal Government

☐ State Government

☐ Other Entity (Specify) _____

5. Facility Address (if same as No. 3 enter SAA)

Street Address _____

City_____ County _____State____

Zip Code _____ Phone No._____

6. Consultant Company Name (if applicable)_____

Consultant Contact Name _____

Street Address _____

City _____State_____Zip Code _____

E-mail Address _____Telephone Number _____

7. Brief description of the business/activities to be conducted under this permit

8. Up to four SIC (Standard Industrial Classification) codes that best reflect the principal products or services provided by the facility

_____, _____, _____, _____

9. Major Permit modification. Describe major permit modification below. If necessary, contact the UIC Program staff to discuss if the modification is considered a major modification to the existing permit. If a new permit, skip and proceed to No. 9.

10. Well location(s). Complete the following table. Include an additional sheet if necessary.

Table 1 Injection Well Location(s)

Well Name	County	Latitude*	Longitude*	Township	Range	Section	Qtr/Qtr

**Provide latitude and longitude in decimal degree format to four significant figures, using the North American Datum 83 geodetic reference system.*
Note: Please note which, if any, sections include Indian Lands.

11. Injection Well Information (referenced below ground surface in feet)

Table 2 Injection Well Information

Well Name	Injection Zone Formation Name(s)	Injection Well Total Depth	Injection Zone Depths

12. Mineral right ownership for injection zone at the facility (within Area of Review)

- ☐ Applicant
- ☐ Surface Owner
- ☐ Federal Government
- ☐ State Government
- ☐ Indian Lands
- ☐ Other (Specify)

13. Surface ownership at facility location (within Area of Review)

- ☐ Applicant
- ☐ Private (Specify)
- ☐ Federal Government
- ☐ State Government
- ☐ Indian Lands (Contact USEPA Region 8)
- ☐ Other (Specify)

14. 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. Notice requirements shall at a minimum require:

a. The publishing of notice of the application in a newspaper of general circulation in each county of the proposed operation at weekly intervals for four (4) consecutive weeks; and

b. A copy of the notice shall also be mailed to all surface owners, mineral claimants, mineral owners, lessees and other owners of record of subsurface interests that are located within one (1) mile of the proposed boundary of the geologic sequestration site as defined by W.S. § 35-11-103(c)(xxi).

15. A list of contacts, submitted to the Administrator, for those Tribes identified to be within the area of review of the geologic sequestration project.

16. The Administrator may consider a request from owners and/or operators of permitted Class II injection well(s) that are seeking to convert their well(s) to a Class VI well and are seeking an expansion to the areal extent of an existing Class II enhanced oil recovery or enhanced gas recovery aquifer exemption for the exclusive purpose of Class VI injection for geologic sequestration if the existing aquifer exemption and the affected wells meet the conditions identified in WQRR Chapter 24, Section 5(c)(i)(A-C).

a. Such request will not be final until the Administrator submits the request as a revision to the applicable Federal UIC program under 40 CFR part 147 and EPA approves the request.

b. The owner or operator of a Class II enhanced oil recovery or enhanced gas

recovery well that requests an expansion of the areal extent of an existing aquifer exemption for the exclusive purpose of Class VI injection for geologic sequestration must define (by narrative description, illustrations, maps, or other means) and describe in geographic and/or geometric terms (such as vertical and lateral limits and gradient) that are clear and definite, all aquifers or parts thereof that are requested to be designated as exempted using the criteria identified in WQRR Chapter 24, Section 5(d)(i)(A-C).

17. Owners or operators seeking a waiver of the requirement to inject below the lowermost USDW must refer to WQRR Chapter 24, Section 10 and submit a supplemental report, as required in WQRR Chapter 24, Section 10(a). The supplemental report is not part of the permit application and may be submitted under separate cover once a determination is made that a waiver is warranted. Owners or operators seeking a waiver of the requirement to inject below the lowermost USDW must obtain a waiver prior to WDEQ issuing the permit.

18. Pursuant to WQRR, Chapter 8, Section 6(c)(ii), the discharge will not degrade or decrease the availability of mineral resources, including oil and gas. Therefore, prior to submitting an application to construct a UIC Class VI injection well, the WDEQ strongly encourages applicants to collaborate with nearby leasees and mineral ownership owners to demonstrate that the proposed injection activities to be permitted will present no damage to existing or future recovery of sub-surface minerals. Any permit challenge that is upheld by the WOGCC is grounds for the WDEQ to deny issuance of the Class VI UIC permit.

19. An applicant applying for a Class VI well permit must obtain public liability insurance to cover the geologic sequestration activities for which a permit is sought.

a. The public liability insurance shall be in addition to the financial assurance required in WQRR Chapter 24, Section 19.

b. A certificate shall be provided with the application or evidence that the applicant has satisfied other state or federal self-insurance requirements.

c. The minimum insurance coverage shall be five hundred thousand dollars ($500,000) for each occurrence of bodily injury or property damage, and one million dollars ($1,000,000) aggregate.

d. The public liability insurance shall include a rider requiring that the insurer notify the Administrator whenever substantive changes are made to the policy, including any termination or failure to renew.

20. Sage grouse mitigation

Pursuant to the requirements of the Governor's Executive Order 2011-5 (SGEO), applicants for new UIC permits must determine if any part of the project falls within a Greater Sage-Grouse Core Area (SGCA) before applying. If any part of the project falls within an SGCA, the first point of contact for addressing sage-grouse issues is the Wyoming Game and Fish Department (WGFD). Please coordinate with the WGFD and obtain written confirmation of consistency with the Executive Order prior to applying for a UIC permit and submit this documentation as part of the application package. Note that the application shall be returned without processing until a letter confirming consistency with the Executive Order has been obtained. Additional information and maps of SGCAs are available at https://wgfd.wyo.gov/Habitat/Sage-Grouse-Management.

Check one of the following, as applicable to the project:

☐ Some part of my project does fall within an SGCA and I have contacted the WGFD for an SGEO review. A letter from the WGFD confirming consistency with the Executive Order is attached.

☐ My project does fall within an SGCA. I have contacted the WGFD for an SGEO review. It does not comply with the SGEO. I have valid and existing rights related to this permit. I have committed to the following recommendations that will minimize the impact on the sage grouse.

☐ No part of my project falls within an SGCA. There are no additional requirements.

21. Access for Inspections

Wyoming Statute (W.S.) § 35-11-303 (a) states: "the administrator of the water quality division at the direction of the director: (i) may conduct on-site compliance inspections of all facilities and work during or following the completion of any construction, installation or modification for which a permit is issued under W.S. § 35-11-301 (a)(ii)."

As part of its application, the applicant shall certify under penalty of perjury that the applicant has secured and shall maintain permission for WDEQ personnel and their invitees to access the permitted facility, including (i) permission to access the land where the facility is located, (ii) permission to collect resource data as defined by W.S § 6-3-414, and (iii) permission to enter and cross all properties necessary to access the facility if the facility cannot be directly accessed from a public road. A map of the access route(s) to the facility shall accompany the application.

> *I, _____, certify under penalty of perjury that applicant has secured and shall maintain permission for WDEQ personnel and their invitees to access the permitted facility, including (i) permission to access the land where the facility is located, (ii) permission to collect resource data as defined by Wyoming Statute § 6-3-414, and (iii) permission to enter and cross all properties necessary to access the facility if the facility cannot be directly accessed from a public road.*

CERTIFICATION OF THE OPERATOR OF THE FACILITY:

"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

Printed name of Applicant	Title
Signature of Applicant	Date signed

X. TECHNICAL INFORMATION

CERTIFICATION OF PROFESSIONAL GEOLOGIST:

The geologic interpretations, cross-sections, maps and hydrologic studies that are included in this application were all completed under the responsible charge or direct supervision of the licensee, who has reviewed this work and certifies that it is prepared according to the highest standards of Professional Geology.

Printed Name of Professional Geologist	**P.G. Number (SEAL)**
Signature of Professional Geologist	**Date Signed**

CERTIFICATION OF PROFESSIONAL ENGINEER:

The Engineering Designs, Plans, and Specifications that are included in this application were all completed under the responsible charge or direct supervision of the licensee who has reviewed this work and certifies that it is prepared according to the highest standards of Professional Engineering.

Printed Name of Professional Engineer	**P.E. Number (SEAL)**
Signature of Professional Engineer	**Date Signed**

A. AREA OF REVIEW

i. "Area of review" " means the subsurface three-dimensional extent of the carbon dioxide plume, associated pressure front, and displaced fluids, as well as the overlying formations and surface area above that delineated region. The area of review is based on available site characterization, monitoring, and operational data as set forth in WQRR Chapter 24, Section 8.

ii. 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 as identified in WQRR Chapter 24, Section 5(b)(v)(A - G).

iii. Within the area of review, a list of other relevant permits, whether federal or state, associated with the geologic sequestration project that the applicant has been required to obtain, such as construction 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.

iv. A map showing the injection well(s) for which a permit is sought and the applicable area of review, consistent with WQRR Chapter 24, Section 8 and:

(a) Within the area of review, the map must show the number, or name and location of all known injection wells, producing wells, abandoned wells, plugged wells or dry holes, deep stratigraphic boreholes, state or US Environmental Protection Agency (EPA) approved subsurface cleanup sites, public drinking water supply wellhead or source water protection areas, surface bodies of water, springs, mines (surface and subsurface), quarries, water wells and other pertinent surface features including structures intended for human occupancy, state, tribal, and territory boundaries, and roads.

(b) Only information of public record is required to be included on the map.

(c) The map should also show faults, if known or suspected.

v. A map delineating the area of review based upon modeling, using all available data including data available from any logging and testing of wells within and adjacent (within one (1) mile) to the area of review;

(a) A Class VI area of review shall never be less than the area of potentially affected groundwater.

(b) All areas of review shall be legally described by township, range, and section to the nearest ten (10) acres as described under the general land survey system.

vi. The permit application shall include a description of the general geology of the area to be affected by the injection of carbon dioxide including geochemistry, structure and faulting, fracturing and seals, and stratigraphy and lithology including petrophysical attributes. The description shall also include sufficient information on the geologic structure and reservoir

properties of the proposed storage site and overlying formations, including information as required in WQRR Chapter 24, Section 5(b)(ix)(A - F).

vii. A compilation of all wells and other drill holes within, and adjacent (within 1 mile) to the area of review. Such data must include a description of each well and drill hole type, construction, date drilled, location, depth, record of plugging and/or completion, and any additional information the Water Quality Division (WQD) Administrator may require.

(a) The location of all known wells within, and adjacent (within 1 mile) to the area of review that penetrate the confining or injection zone.

(b) Mapping with sufficient resolution in order to make a comprehensive effort to identify wells that are not in the public record using aerial photography, aerial survey, physical traverse, or other methods acceptable to the WQD Administrator.

(c) Perform corrective action as specified in WQRR Chapter 24, Section 8.

viii. 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.

B. Groundwater/Aquifer Characterization

i. 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 which may be affected by the proposed discharge. This must include information necessary for WQD to classify the receiver and any secondarily affected aquifers under WQRR, Chapter 8;

ii. Provide baseline geochemical data on subsurface formations, including all USDWs in the area of review. "USDW" or "Underground source of drinking water" means those aquifers or portions thereof meet the definition at 40 CFR § 144.3 as of November 15, 1984.

(a) For all Class VI Underground Injection Control (UIC) wells, the proposed injection zone shall be situated such that injection takes place into a formation that is beneath the lowermost USDW or has been granted a waiver of the injection depth requirements in accordance with WQRR Chapter 24, Section 10 or an expansion of an aquifer exemption of an enhanced oil or gas operation.

1. Determination of USDWs:

a) For each aquifer from the ground surface to the Precambrian basement, including the target injection formation, Total Dissolved Solids concentrations, aquifer yield, and all supporting materials, including references, shall be presented to determine if each aquifer is a potential USDW.

2. Submit all available groundwater quality data for the formations determined to be aquifers in the region including, but not limited to data from:

a) Wyoming Oil and Gas Conservation Commission (WOGCC);

b) United States Geological Survey (USGS) produced water database: (http://energy.cr.usgs.gov/prov/prodwat)

c) USGS/ National Water Information System: (http://waterdata.usgs.gov)

d) Wyoming State Engineer's (WSEO) Office database: (http://seo.state.wy.us)

e) Wyoming Water Development Commission (WWDC) (http://wwdc.state.wy.us/)

f) Any additional available information.

C. Well Construction

For proposed new injection wells, and wells to be converted for injection, the applicant shall provide the following construction and operational details. Attach complete well diagrams for each well, including depth information, identified USDWs, confining zones, injection zones, tubing sizes, packers, perforated zones, casing sizes, cement types, and location of cement on each diagram. For existing production wells (being converted) provide hydrocarbon production history. The following tables shall be included in the permit application. Expand tables or provide additional tables as necessary. Provide a numbering scheme for all tables.

Table _____[Insert Injection Well Name]: General Information

Well Name	Planned Injection Start Date (mo/year)	Surface Elevation (feet)	Total Well Depth (feet)	Max Proposed Injection Rate (bbl/day)	Ave Proposed Injection Rate (bbl/day)	Proposed Well Life (years)

Table _____ [Insert Injection Well Name]: History (If applicable)

Well Name	API Number	Date Constructed	Date Production Began	Date Production Ended	Total Volume of fluids produced	Date Injection Began	Date Injection Ended	Total Volume Injected

Table_____ [Insert Injection Well Name]: Construction Details

	Conductor Casing	Surface Casing	Long String Casing	Liner (if applicable)	Tubing
Perforated Intervals (feet)					
Hole Diameter (inches)					
Grade					
Diameter (inches)					
Wall thickness					
Nominal Weight (pounds)					
Joint Specifications					
Construction Material					
Tensile, Burst, Collapse Strengths					
Type or Grade of Cement					
Top of Cement					
Packer Depth (feet)					
Packer Type					

D. Operational Data

i. Submit proposed Operational Data that shall include:

(a) Average and maximum daily rate and volume and/or mass and total anticipated volume and/or mass of the carbon dioxide stream;

(b) Average and maximum surface injection pressure;

(c) The source of the carbon dioxide stream; and

(d) An analysis of the chemical and physical characteristics of the carbon dioxide stream and any other substance(s) proposed for inclusion in the injectate stream;

(e) Anticipated duration of the proposed injection period(s);

ii. Submit information regarding the compatibility of the carbon dioxide stream with fluids in the injection zone and minerals in both the injection and the confining zone(s), based on the results of the formation testing program, and with the materials used to construct the well;

iii. Submit 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;

iv. Submit a 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 WQRR Chapter 24, Section 11;

v. Submit a 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 WQD Administrator as part of the permit application and incorporated into the permit;

vi. Submit a proposed procedure that outlines steps to conduct injection operation;

vii. Submit a wellbore schematic of the subsurface construction details and surface wellhead construction of the injection and monitoring wells.

viii. Submit an injection well design and construction procedures that meet the requirements of WQRR Chapter 24, Section 9;

ix. Submit a proposed area of review and corrective action plan that meets the requirements under WQRR Chapter 24, Section 8 and as prescribed in Section vi.c above;

x. Provide the status of corrective action on wells in the area of review;

xi. Provide all available logging and testing program data on the well(s) required by WQRR Chapter 24, Section 11;

xii. Submit a demonstration of mechanical integrity pursuant to WQRR Chapter 24, Section 13;

E. FINANCIAL ASSURANCE

i. Submit a demonstration, satisfactory to the WQD Administrator, that the applicant has met the financial responsibility requirements under WQRR Chapter 24, Section 19;

ii. The owner or operator must submit a detailed written estimate, at the time of permit application and updated annually in accordance with paragraph WQRR Chapter 24, Section 19(j)(iii), in current dollars, that includes the cost of performing corrective action on wells in the area of review that meets the requirements of WQRR Chapter 24, Section 8; plugging the injection well(s) that meets the requirements of WQRR Chapter 24, Section 16; post-injection site care and site closure~~,~~ that meets the requirements of WQRR Chapter 24, Section 17; monitoring activities that meets the requirements of WQRR Chapter 24, Section 14; and emergency and remedial response that meets the requirements of WQRR Chapter 24, Section 18.

F. TESTING AND MONITORING REQUIREMENTS

i. The owner or operator of a Class VI well must prepare, maintain, and comply with a testing and monitoring plan to verify that the geologic sequestration project is operating as permitted and is not endangering USDWs. The testing and monitoring plan must be submitted with the permit application, for Administrator approval, and must include a description of how the owner or operator will meet the requirements of WQRR Chapter 24, Section 14, including accessing sites for all necessary monitoring and testing during the life of the project

G. PLUGGING AND ABANDONMENT AND POST CLOSURE CARE

i. Submit proposed injection and monitoring well(s) plugging plan required by WQRR Chapter 24, Section 16(b); where the plan meets the requirements of Section 16(b), the Administrator shall incorporate it into the permit as a permit condition.

ii. The owner or oAerator of a Class VI well must prepare, maintain, update on the same schedule as the update to the area of review delineation, and comply with a plan for post-injection site care and site closure that meets the requirements of WQRR Chapter 24, Section 17(a)(ii) and is acceptable to the WQD Administrator.

H. EMERGENCY AND REMEDIAL RESPONSE PLAN

i. The owner or operator must provide the WQD Administrator with an emergency and remedial response plan that describes actions to be taken to address movement of the injectate or formation fluids that may cause an endangerment to a USDW or threaten human health, safety, or the environment during construction, operation, closure, and post-closure periods as required by WQRR Chapter 24, Section 18.