**R644. Natural Resources, Oil, Gas and Mining; Carbon Sequestration.**

**R644-17. Closure and Post-Closure.**

**R644-17-1. Post-Injection Site Care and Site Closure.**

(1) The operator of a CO2 Sequestration facility and its associated Class VI wells shall prepare, maintain, and comply with a plan for post-injection site care and site closure that meets the requirements of Subsection (1)(b) and is acceptable to the division. The requirement to maintain and implement an approved plan is directly enforceable regardless of whether the requirement is a condition of the permit.

(a) The operator shall submit the post-injection site care and site closure plan as a part of the permit application.

(b) The post-injection site care and site closure plan shall include the following information:

(i) The pressure differential between pre-injection and predicted post-injection pressures in each injection zone;

(ii) The predicted position of the carbon dioxide plume and associated pressure front at site closure as demonstrated in the area of review evaluation required under Subsection R644-8-2(3)(a);

(iii) A description of post-injection monitoring location, methods, and proposed frequency;

(iv) A proposed schedule for submitting post-injection site care monitoring results to the division and to the USEPA pursuant to Subsection R644-15-1(4)(d);

(v) The duration of the post-injection site care timeframe and, if approved by the division, the demonstration of the alternative post-injection site care timeframe that ensures non-endangerment of USDWs; and

(vi) An affidavit to the division stating whether appropriate surface use agreements containing reclamation standards have been established with the surface landowners of the CO2 Sequestration facility. If no surface use agreement exist, the division shall establish minimum CO2 Sequestration facility reclamation requirements for the site closure plan.

(c) Upon cessation of injection, the operator of a CO2 Sequestration facility shall either submit an amended post-injection site care and site closure plan or demonstrate to the division through monitoring data and modeling results that no amendment to the plan is needed. Any amendments to the post-injection site care and site closure plan shall be approved by the division, be incorporated into the permit, and are subject to the permit modification requirements in Rule R644-7, as appropriate.

(d) At any time during the life of the geologic sequestration project, the operator may modify and resubmit the post-injection site care and site closure plan for the division's approval within 30 days of such change.

(2) The operator shall monitor the site following the cessation of injection to show the position of the carbon dioxide plume and pressure front and demonstrate that USDWs are not being endangered.

(a) Following the cessation of injection, the operator shall continue to conduct monitoring as specified in the division-approved post-injection site care and site closure plan for at least 50 years or for the duration of the alternative timeframe approved by the division pursuant to requirements in Subsection (3), unless the operator makes a demonstration under Subsection (2)(b). The monitoring shall continue until the geologic sequestration project is essentially stable and no longer poses an endangerment to USDWs and the demonstration under Subsection (2)(b) is submitted and approved by the division.

(b) If the operator can demonstrate to the satisfaction of the division before 50 years or prior to the end of the approved alternative timeframe based on monitoring and other site-specific data, that the geologic sequestration project no longer poses an endangerment to USDWs, the division may approve an amendment to the post-injection site care and site closure plan to reduce the frequency of monitoring or may authorize site closure before the end of the 50-year period or prior to the end of the approved alternative timeframe, where the operator has substantial evidence that the geologic sequestration project no longer poses a risk of endangerment to USDWs.

(c) Prior to authorization for site closure, the operator must submit to the division for review and approval a demonstration, based on monitoring and other site-specific data, that no additional monitoring is needed to ensure that the geologic sequestration project does not pose an endangerment to USDWs.

(d) If the demonstration in Subsection (2)(b) cannot be made, additional monitoring shall be conducted to ensure the geologic sequestration project does not pose an endangerment to USDWs at the end of the 50-year period or at the end of the approved alternative timeframe, or if the division does not approve the demonstration, the operator must submit to the division a plan to continue post-injection site care until a demonstration can be made and approved by the division.

(3) Demonstration of Alternative Post-Injection Site Care Timeframe. The division may approve, in consultation with the USEPA, an alternative post-injection site care time frame other than the 50-year default, if an operator can demonstrate during the permitting process that an alternative post-injection site care timeframe is appropriate and ensures non-endangerment of USDWs. The demonstration shall be based on significant, site-specific data and information including all data and information collected pursuant to Rules R644-4 and R644-8, and must contain substantial evidence that the geologic sequestration project will no longer pose a risk of endangerment to USDWs at the end of the alternative post-injection site care timeframe.

(a) A demonstration of an alternative post-injection site care timeframe shall include consideration and documentation of:

(i) The results of computational modeling performed pursuant to delineation of the area of review under Sections R644-8-2 and R644-8-3;

(ii) The predicted time frame for pressure decline within the injection zone, and any other zone, such that formation fluids may not be forced into any USDWs, and the timeframe for pressure decline to pre-injection pressures;

(iii) The predicted rate of carbon dioxide plume migration within the injection zone, and the predicted timeframe for the cessation of migration;

(iv) A description of the site-specific processes that will result in carbon dioxide trapping including immobilization by capillary trapping, dissolution, and mineralization at the site;

(v) The predicted rate of carbon dioxide trapping in the immobile capillary phase, dissolved phase, and mineral phase;

(vi) The results of laboratory analyses, research studies, and field or site-specific studies to verify the information required in Subsections (3)(a)(iv) and (3)(a)(v);

(vii) A characterization of each confining zone including a demonstration that it is free of transmissive faults, fractures, and micro-fractures and of appropriate thickness, permeability, and integrity to impede the movement of fluids, such as carbon dioxide or formation fluids;

(viii) The presence of potential conduits for fluid movement including planned injection wells and project monitoring wells associated with the proposed geologic sequestration project or any other projects in proximity to the predicted or modeled final extent of the carbon dioxide plume and area of elevated pressure;

(ix) A description of the well construction and an assessment of the quality of plugs of each abandoned well within the area of review;

(x) The distance between the uppermost injection zone and the nearest USDW above that injection zone; and

(xi) Any additional site-specific factors required by the division.

(b) Information submitted to support the demonstration in Subsection (3)(a) shall meet the following criteria:

(i) Each analysis and test performed to support the demonstration shall be accurate, reproducible, and performed in accordance with the established quality assurance standards;

(ii) Estimation techniques shall be appropriate and USEPA-certified test protocols must be used where available;

(iii) Predictive models must be appropriate and tailored to the site conditions, composition of the carbon dioxide stream and injection and site conditions over the life of the geologic sequestration project;

(iv) Predictive models shall be calibrated using existing information where sufficient data are available;

(v) Reasonably conservative values and modeling assumptions shall be used and disclosed to the division whenever values are estimated on the basis of known, historical information instead of site-specific measurements;

(vi) An analysis shall be performed to identify and assess aspects of the alternative post-injection site care timeframe demonstration that contribute significantly to uncertainty. The operator shall conduct sensitivity analyses to determine the effect that significant uncertainty may contribute to the modeling demonstration;

(vii) An approved quality assurance and quality control plan shall address each aspect of the demonstration; and

(viii) Any additional criteria required by the division.

(4) Notice of Intent for Site Closure. The operator must notify the division in writing at least 120 days before site closure. At this time, if any changes have been made to the original post-injection site care and site closure plan, the operator shall also provide the revised plan. The division may allow for a shorter notice period.

(5) After the division has authorized site closure, the operator shall plug each monitoring well in a manner that will not allow movement of injection or formation fluids that endangers a USDW. The operator shall submit a site closure report to the division within 90 days after site closure, that shall also be retained by the operator for at least 10 years. The report shall include:

(a) Documentation of appropriate injection and monitoring well plugging as specified in Rule R644-16 and Subsection (5). The operator shall provide a copy of a survey plat that has been submitted to the local zoning authority designated by the division. The plat shall indicate the location of the injection well relative to permanently surveyed benchmarks. The operator shall also submit a copy of the plat to the USEPA as specified in Subsection R644-15-1(3);

(b) Documentation of appropriate notification and information to such state, local, and Tribal authorities that have authority over drilling activities to enable such state, local, and Tribal authorities to impose appropriate conditions on subsequent drilling activities that may penetrate each injection and confining zone; and

(c) Records reflecting the nature, composition, and volume of the carbon dioxide stream.

(6) Each operator of a Class VI well shall record a notation on the deed to the CO2 Sequestration facility property or any other document that is normally examined during title search that will in perpetuity provide any potential purchaser of the property the following information:

(a) The fact that land has been used to sequester carbon dioxide;

(b) The name of the state agency, local authority, and Tribe where the survey plat was filed, as well as the address of the USEPA Regional Office that it was submitted; and

(c) The volume of fluid injected, each injection zone into which it was injected, and the period over which injection occurred.

(7) The operator shall retain records collected during the post-injection site care period for records collected during the post-injection site care period for at least 10 years following site closure. The operator shall deliver the records to the division at the conclusion of the retention period, and the records shall thereafter be retained in a form and manner and at a location designated by the division.

(8) The operator will only receive a certificate of project completion when it has met all requirements for site closure set forth herein, as described in Title 40, Chapter 11, Geologic Carbon Storage.

**KEY: oil and gas law**

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