R644. Natural Resources, Oil, Gas and Mining; Carbon Sequestration.
R644-1 Carbon Sequestration Definitions.
R644-1-1. Definitions.

The following definitions apply to all rules in Title R644. Terms not defined in this section for Class VI wells have the meaning given by Section 40-6-2.

"Abandoned Well" means a well that has been permanently discontinued or that is in a state of disrepair such that it cannot be used for its intended purpose or for observation purposes.

"Activity" means any activity that is subject to Title R644.

"API" means the American Petroleum Institute.

"Application" means the filing of a Division of Oil, Gas and Mining form for a permit associated with the underground injection and storage of carbon dioxide, including any additions, revisions, or modifications to the forms.

"Application for Permit to Drill, Deepen or Plug Back" or "APD" means the Form 3 submission required under Section R649-8-4 with the division.

"Aquifer" means a geologic formation, group of formations, or part of a formation that is capable of yielding a significant amount of water to a well or spring.

"Area of Review" means the region surrounding the geologic sequestration project where USDWs may be endangered by the injection activity. The area of review is delineated using computational modeling that accounts for the physical and chemical properties of each phase of the injected carbon dioxide stream and displaced fluids, and is based on available site characterization, monitoring, and operational data as set forth in Section R644-8-2.

"ASTM" means the American Society for Testing and Materials

"Board" means the Utah Board of Oil, Gas and Mining.

"Carbon Dioxide" means naturally occurring, geologically sourced, or anthropogenically sourced carbon dioxide including its derivatives and any mixtures, combinations, and phases, whether liquid or gaseous, stripped, segregated, or divided from any other fluid stream thereof.

"Carbon Dioxide Plume" means the extent underground, in three dimensions, of an injected carbon dioxide stream.

"Carbon Dioxide Stream" means the carbon dioxide that has been captured from an emission source, such as a power plant, plus incidental associated substances derived from the source materials and the capture process, and any substances added to the stream to enable or improve the injection process. This meaning does not apply to any carbon dioxide stream meeting the definition of a hazardous waste under Title 40, Code of Federal Regulations (40 CFR), Part 261.

"Casing" means a metallic or nonmetallic tubing or pipe of varying diameter and weight, lowered into a borehole during or after drilling to support the sides of the hole and thus prevent the walls from caving; to prevent loss of drilling mud into porous ground; or to prevent water, gas, or other fluid from entering or leaving the hole.

"Catastrophic Collapse" means the sudden and utter failure of overlying strata caused by removal of underlying materials.

"Cementing" means the operation whereby a cement slurry is pumped into a drilled hole or forced behind the casing.

"Class VI Geophysical Test Well" means any hole drilled for the sole purpose of obtaining geological and geophysical information, including reservoir monitoring, of a Class VI project. Any Class VI geophysical test well intended to subsequently be permitted as a Class VI well or used for Class VI reservoir monitoring shall be constructed in accordance with the general drilling rules under Rule R644-9.

"Class VI Well" means a well not experimental in nature that is used for geologic sequestration of carbon dioxide beneath the lowermost formation containing a USDW; or wells used for geologic sequestration of carbon dioxide that have received an expansion to the areal extent of an existing Class II enhanced oil recovery or enhanced gas recovery aquifer exemption pursuant to Subsections R644-2-4(2) and (4).

"Confining Zone" means a geological formation, a group of formations, or part of a formation stratigraphically overlying an injection zone and that acts as a barrier to fluid movement above an injection zone.

"Contaminant" means any physical, chemical, biological, or radiological substance or matter in water.

"Corrective Action" means the use of division-approved methods to ensure that wells within the Area of Review do not serve as conduits for the movement of fluids into USDWs.

"CO2 Sequestration Facility" means the reservoir, Class VI wells, monitoring wells, underground equipment, surface facilities and equipment used, or proposed to be used, in a geologic sequestration project and storage operation.

"Director" means the executive and administrative head of the division.

"Division" means the Utah Division of Oil, Gas and Mining Underground Injection Control Program.

"Draft Permit" means a document prepared under Section R644-6-1 indicating the division's decision to issue or deny, modify, revoke and reissue, terminate, or reissue a permit. A notice of intent to terminate a permit and a notice of intent to deny a permit as discussed in Section R644-6-1 and Subsection R644-7-5(2) are types of draft permits. A denial of request for modification, revocation and reissuance, or termination, as discussed in Subsection R644-7-2(4), is not a draft permit.

"Drilling Mud" means a circulating fluid usually called mud, that is introduced in a drill hole to lubricate the action of the rotary bit, remove the drilling cuttings, and control formation pressures.

"Effective Date" means the date that the Utah Division of Oil, Gas and Mining is approved by the United States Environmental Protection Agency.

"Exempted Aquifer" means an aquifer or its portion that meets the criteria of the definition of USDWs, but has been exempted according to the procedures set forth in Subsections R644-2-4(2) and (4).

"Experimental Technology" means a technology that has not been proven feasible under the conditions in which it is being tested.

"Fault" means a fracture or zone of fractures along which there has been displacement.

"Flow Rate" means the volume per time unit given to the flow of gasses or other fluid substance that emerges from an orifice, pump, or turbine or passes along a conduit or channel.

"Fluid" means any material or substance that flows or moves, whether in a semisolid, liquid, sludge, gas, or any other form or state.

"Formation" means a body of consolidated or unconsolidated rock characterized by a degree of lithologic homogeneity which is prevailingly, but not necessarily, tabular and is mappable on the earth's surface or traceable in the subsurface.

"Formation Fluid" means fluid present in a formation under natural conditions as opposed to introduced fluids, such as drilling muds.

"Geologic Sequestration" means the long-term containment of a gaseous, liquid, or supercritical carbon dioxide stream in subsurface geologic formations. This term does not apply to carbon dioxide capture or transport.

"Geologic Sequestration Project" means an injection well or wells used to emplace a carbon dioxide stream beneath the lowermost formation containing a USDW; or a well or wells used for geologic sequestration of carbon dioxide that have received an expansion to the areal extent of an existing Class II enhanced oil recovery or enhanced gas recovery aquifer exemption pursuant to Subsections R644-2-4(2) and (4). It includes the subsurface three-dimensional extent of the carbon dioxide plume, the associated area of elevated pressure and displaced fluids, as well as the surface area above that delineated region.

"Groundwater" means water in a zone of saturation below the ground surface.

"Hazardous Waste" means a hazardous waste as defined by the Utah Division of Waste Management and Radiation Control in Section R315-261-3.

"H.B. 244" means House Bill 244 of the 2022 Utah General Legislative Session.

"Indian Lands" means "Indian Country" as defined in 18 U.S.C. 1151. That section defines Indian Country as:
(a) All lands within the limits of any Indian reservation under the jurisdiction of the United States government, notwithstanding the issuance of any patent, and including rights-of-way running through the reservation;
(b) All dependent Indian communities within the borders of the United States whether within the original or subsequent acquired territory thereof, and whether within or without the limits of a State; and
(c) All Indian allotments, the Indian titles to which have not been extinguished, including rights-of-way running through the same.

"Injection Well" means a well into which fluids are being injected other than fluids associated with active drilling operations.

"Injection Zone" means a geological formation, a group of formations, or part of a formation receiving fluids through a well. For Class VI projects, it must also be of sufficient areal extent, thickness, porosity, and permeability to receive carbon dioxide through a well associated with a geologic sequestration project.

"Lithology" means the description of rocks on the basis of their physical and chemical characteristics.

"NPDES" means the National Pollutant Discharge Elimination System.

"Operator" means the person recognized as being responsible to the Division of Oil, Gas and Mining for the well, site, facility, or activity subject to regulatory authority under Title R644. The operator can, but need not be, the owner of the well, site, facility, or activity.

"Owner" means the person who owns any well, site, facility, or activity subject to regulation under Title R644. The owner can, but need not be, the operator of the well, site, facility, or activity.

"Packer" means a device lowered into a well to produce a fluid-tight seal.

"Permit" means an authorization, license, or equivalent control document issued by the division to implement the requirements Title R644. Permit does not include draft permits.

"Person" means an individual, group of individuals, partnership, corporation, association, political subdivision or its units, public or private organization or entity of any character, or another agency.

"Plugging" means the act or process of stopping the flow of water, oil, or gas into or out of a formation through a borehole or well penetrating that formation.

"Post-closure" means that period after the board has issued a certificate of project completion.

"Post-Injection Site Care" means the appropriate monitoring and other actions, including corrective action, needed following cessation of geologic sequestration injection to ensure that USDWs are not endangered, as required under Rule R644-17.

"Pressure" means the total load or force per unit area acting on a surface.

"Pressure Front" means the zone of elevated pressure that is created by the injection of carbon dioxide into the subsurface. For the purposes of this rule, the pressure front of a carbon dioxide plume refers to a zone where there is a pressure differential sufficient to cause the movement of injected fluids or formation fluids into a USDW.

"Project" means a group of wells in a single operation.

"Project completion" means the point in time, as determined by the division, when the certificate of project completion is issued and the storage operator is released from any regulatory requirements associated with the CO2 Sequestration facility.

"RCRA" means the Solid Waste Disposal Act as amended by the Resource Conservation and Recovery Act of 1976 (P.L. 94-580 as amended by P.L. 95-609,42 U.S.C. 6901 et seq.).

"Reservoir" means a portion of any underground geologic stratum, formation, or aquifer, including oil and gas reservoirs, or other saline formations, and coal and coalbed methane seams, capable of being made suitable for injection or storage of fluids.

"Schedule of Compliance" means a schedule or remedial measures included in a permit, including an enforceable sequence of interim requirements, for example, actions, operations, or milestone events, leading to compliance with Title R644.

"SIC" means the 4-digit Standard Industrial Classification code that represents the economic activity of a company.

"Site" means the land or water area where any CO2 Sequestration facility or activity is physically located or conducted, including adjacent land used in connection with the CO2 Sequestration facility or activity.

"Site Closure" means the point or time, as determined by the division, when the owner or operator of a geologic sequestration site is released from post-injection site care responsibilities under Rule R644-17.

"State" means the state of Utah.

"Stratum" means a single sedimentary bed or layer, regardless of thickness, that consists of generally the same kind of rock material.

"Subsidence" means the lowering of the natural land surface in response to earth movements, lowering of fluid pressure, removal of underlying supporting material by mining or solution of solids, either artificially or from natural causes, compaction due to wetting oxidation of organic matter in soils, or added load on the land surface.

"Subsurface Fluid Distribution System" means an assemblage of perforated pipes, drain tiles, or other similar mechanisms intended to distribute fluids below the surface of the ground.

"Surface Casing" means the first string of casing to be installed in the well, excluding conductor casing.

"Third Party" means a party who is not within the corporate structure of the owner or operator.

"Total Dissolved Solids" means the total filterable residue as determined by use of the method specified in 40 C.F.R. Part 136 Table 1B.

"Transmissive Fault or Fracture" means a fault or fracture that has sufficient permeability and vertical extent to allow fluids to move between formations.

"Underground Injection" means the subsurface emplacement of fluids through an injection well.

"Underground Source of Drinking Water (USDW)" means an aquifer or its portion which supplies any public water system, or which 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 mg/L total dissolved solids, and is not an exempted aquifer.

"USEPA" means the United States Environmental Protection Agency.

"Well" means a bored, drilled, or driven shaft whose depth is greater than the largest surface dimension, or a dug hole whose depth is greater than the largest surface dimension.

"Well Injection" means the subsurface emplacement of fluids through an injection well.

"Well Plug" means a fluid-tight seal installed in a borehole or well to prevent movement of fluids.

"Well Stimulation" means the process used to clean the well bore, enlarge channels, and increase pore space in the interval to be injected, thus making it possible for fluids to move more readily into the formation, and includes surging, jetting, blasting, acidizing, or hydraulic fracturing.

"Workover" refers to any maintenance activity performed on a well that involves ceasing injection.

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R644. Natural Resources, Oil, Gas and Mining; Carbon Sequestration.
R644-2. General Rules.
R644-2-1. Scope of Rules.

(1) Applicability. Title R644 applies to any owner or operator of a proposed or existing CO2 Sequestration facility and associated Class VI wells in Utah. Title R644 does not apply to applications filed with the division proposing to use carbon dioxide for an enhanced oil or gas recovery project, rather such applications will be processed under Rule R649-5.

(2) The division, under the direction of the board, shall administer Title 40, Chapter 11, Geologic Carbon Storage and Title R644 promulgated thereunder for geologic sequestration of carbon dioxide.

(3) Title R644 only applies to geologic sequestration of carbon dioxide in underground reservoirs as defined in Section R644-1-1. The geologic sequestration of carbon dioxide is not permitted in solution-mined salt caverns under these provisions.

(4) Title R644 does not apply to Class I, Class III, or Class V wells. Conversion of these wells to a Class VI well is prohibited. The construction, operation or maintenance of any Class V geologic sequestration well for carbon dioxide injection is prohibited.

(5) An operator of an existing Class II well must obtain a CO2 Sequestration facility permit, and a permit for a Class VI well associated with the CO2 Sequestration facility, prior to injecting carbon dioxide for the primary purpose of long-term storage into a reservoir and must demonstrate that the well is constructed to the division's satisfaction and meets the standards set forth in Rule R644-9. Upon approval of a CO2 Sequestration facility permit and the associated Class VI well permit, an operator's Class II permit will expire.

R644-2-2. Prohibition of Unauthorized Injection and Injection Depth Waivers.

(1) Any underground injection of carbon dioxide, except as authorized by a permit or rule, is prohibited after the effective date of these Title R644. Construction or operation of any CO2 Sequestration facility and an associated Class VI well is prohibited until a permit under these Title R644 has been issued.

(2) Any underground injection that violates Title R644 is subject to enforcement action.

(3) Class VI wells cannot be authorized by rule to inject carbon dioxide. Class VI wells must be permitted by the operator with an associated CO2 Sequestration facility permit.

(4) Notwithstanding any other provision in this section, the division will not grant an operator a waiver as to the Class VI well injection depth requirements to inject the carbon dioxide stream below the lowermost formation containing a USDW.

R644-2-3. Prohibition of Movement of Fluid into Underground Sources of Drinking Water.

(1) Underground injection of carbon dioxide for geologic storage that causes or allows movement of fluid into an USDW is prohibited, unless the USDW is an exempted aquifer under Section R644-2-4.

(2) No CO2 Sequestration facility operator shall construct, operate, maintain, convert, plug, abandon, or conduct any injection activity in a manner that allows the movement of fluid containing any contaminant into an USDW, if the presence of that contaminant may endanger an USDW or may adversely affect the health of persons. The operator must show that the objectives of this section are fulfilled.

(3) Notwithstanding any other provision of this section, the division or the board may take emergency action upon receipt of information that a contaminant is present in or likely to enter a public water system or USDW may present an imminent and substantial endangerment to the health of persons.

R644-2-4. Identification of Underground Sources of Drinking Water and Exempted Aquifers.

(1) The division may identify, by narrative description, illustrations, maps, or other means, and shall protect as a USDW, each aquifer or parts of an aquifer that meet the definition of an USDW, except where there is an applicable aquifer exemption under Subsections (2) and (4), or 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 under Subsection (4). Other than approved aquifer exemption expansions that meet the criteria set forth in Subsection (3), new aquifer exemptions may not be issued for Class VI wells. Even if an aquifer has not been specifically identified by the division, it is a USDW if it meets the definition.

(2) After notice and opportunity for a public hearing the division may identify, by narrative description, illustrations, maps, or other means, and describe in geographic or geometric terms, such as vertical and lateral limits and gradient, which are clear and definite, any aquifer or parts of an aquifer that the division proposes to designate as exempted aquifers if they meet the following criteria:

(a) The aquifer does not currently serve as an USDW; and

(b) The aquifer cannot now and will not in the future serve as an USDW because:

(i) It is mineral, hydrocarbon or geothermal energy producing or can be demonstrated by an operator as part of a permit application for a Class II or Class III operation to contain minerals or hydrocarbons that, considering their quantity and location, are expected to be commercially producible;

(ii) It is situated at a depth or location that makes recovery of water for drinking water purposes economically or technologically impractical;

(iii) It is so contaminated that it would be economically or technologically impractical to render ground water fit for human consumption; or

(iv) It is located over a Class III well mining area subject to subsidence or catastrophic collapse; or

(c) The total dissolved solids content of the groundwater is more than 3,000 and less than 10,000 mg/l and it is not reasonably expected to supply a public water system.

(d) Interested parties desiring to have an aquifer exempted from classification as a USDW, shall submit to the division an application that includes sufficient data to justify the proposal. The division shall consider the application and if appropriate, will advise the applicant to submit a request to the board for an aquifer exemption.

(e) The areal extent of an aquifer exemption for a Class II enhanced oil recovery or enhanced gas recovery well may be expanded for the exclusive purpose of Class VI injection for geologic sequestration under Subsection (4) if it meets the following criteria:

(i) It does not currently serve as a USDW; and

(ii) The total dissolved solids content of the groundwater is more than 3,000 mg/L and less than 10,000 mg/L; and

(iii) It is not reasonably expected to supply a public water system.

(3) No designation of an exempted aquifer submitted as part of the UIC program shall be final until approved by the USEPA. No designation of an expansion to the areal extent of a Class II enhanced oil recovery or enhanced gas recovery aquifer exemption for the exclusive purpose of Class VI injection for geologic sequestration of carbon shall be final until approved by the USEPA as a substantial revision of the state's UIC program in accordance with 40 CFR 145.32.

(4) Expansion to the Areal Extent of Existing Class II Aquifer Exemptions for a Class VI Well. The operator of a Class II enhanced oil recovery or enhanced gas recovery well may request that the division approve an expansion to the areal extent of an aquifer exemption already in place for a Class II enhanced oil recovery or enhanced gas recovery well for the exclusive purpose of Class VI injection for geologic sequestration. Such requests are treated as a substantial program revision to the division's UIC program and will not be final until approved by USEPA.

(a) The 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 or geometric terms, or both, such as vertical and lateral limits and gradient, that are clear and definite, any aquifer or parts of an aquifer that are requested to be designated as exempted under Subsection (3).

(b) In evaluating a request to expand the areal extent of an aquifer exemption of a Class II enhanced oil recovery or enhanced gas recovery well for Class VI injection, the division must determine that the request meets the criteria for exemptions. In making the determination, the division shall consider:

(i) Current and potential future use of the USDWs to be exempted as drinking water resources;

(ii) The predicted extent of the injected carbon dioxide plume, and any mobilized fluids that may result in degradation of water quality, over the lifetime of the project, as informed by computational modeling performed pursuant to Section R644-8-2, to ensure that the proposed injection operation will not at any time endanger USDWs, including non-exempted portions of the injection formation; and

(iii) Whether the areal extent of the expanded aquifer exemption is of sufficient size to account for any possible revisions to the computational model during reevaluation of the area of review pursuant to Subsection R644-8-3(2).

R644-2-5. Transitioning from Class II to Class VI.

(1) An operator seeking to convert an existing Class II well to a Class VI well, for the primary purpose of long-term storage must obtain a CO2 Sequestration facility permit, and a permit for a Class VI well associated with the CO2 Sequestration facility, prior to injecting carbon dioxide. An operator seeking to convert an existing Class II well should consider the criteria specified in Subsection R644-2-5(2) before submitting a CO2 Sequestration facility permit application.

(2) The division shall determine when there is an increased risk to USDWs compared to Class II operations and a Class VI permit is required and must consider the following:

(a) Increase in reservoir pressure within each injection zone;

(b) Increase in carbon dioxide injection rates;

(c) Decrease in reservoir production rates;

(d) Distance between the injection zones and USDWs;

(e) Suitability of the Class II enhanced oil or gas recovery area of review delineation;

(f) Quality of any abandoned well plugs within the area of review;

(g) The operator's plan for recovery of carbon dioxide at the cessation of injection;

(h) The source and properties of injected carbon dioxide; and

(i) Any additional site-specific factors as determined by the division.

R644-2-6. Additional Requirements.

(1) Any item submitted for informational purposes, shall bear the division assigned API number of any Class VI carbon dioxide sequestration well associated with the submittal.

(2) Any item submitted comprising geoscientific work, must be prepared, sealed, signed, and dated by a licensed Professional Geoscientist (P.G.) authorized to practice by and in good standing with the Utah Division of Professional Licensing.

(3) Any item submitted comprising the practice of engineering, must be prepared, sealed, signed, and dated by a licensed Professional Engineer (P.E.) authorized to practice by and in good standing with the Utah Division of Professional Licensing.

(4) The division may prescribe additional requirements for a CO2 Sequestration facility and associated Class VI wells to protect USDWs and the health, safety, and welfare of the public.

R644-2-7. Confidentiality of Information.

(1) All information received on or with a permit application shall be made available to the public for inspection and copying except where nondisclosure for a confidentiality claim is requested in writing at the time of submittal, pursuant to Section 63G-2-309, and such information is determined by the division to constitute trade secrets or confidential information pursuant to Subsection 63G-2-305(1) or (2) or both. A confidentiality claim request shall include a copy of the permit application, that has redacted the identified confidential information, that will be made available for public inspection and copying.

(2) Any such nondisclosure may not apply to information that is necessary for use by authorized officers or employees of state or federal government in carrying out their responsibilities under these or applicable federal or state law.

(3) If no claim of nondisclosure is made at the time of submission, the director may make the information available to the public without further notice.

(4) Claims of confidentiality for the following information shall be denied:

(a) the name and address of any permit applicant or permittee; and

(b) information that deals with the existence, absence, or level of contaminants in drinking water.

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R644. Natural Resources, Oil, Gas and Mining; Carbon Sequestration.
R644-3. Permit Requirements, Application Signatories.
R644-3-1. General Permitting.

(1) Application for a permit under this section:

(a) Any person who is required to have a permit shall complete, sign, and submit a permit application to the division.

(b) When the owner and operator are different, it is the operator's duty to obtain a permit.

(c) The division may not begin processing a permit until the applicant has fully complied with the application requirements for that permit and the division reviews the application for completeness.

(d) The application must be complete before the permit is issued. An application for a permit is complete when the division receives an application form and any supplemental information that are completed to the division's satisfaction. 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 CO2 Sequestration facility or activity.

(2) The division cannot issue a permit on an area basis for a Class VI well or permit.

(3) Permit applications, reports, or information submitted to the division must comply with the following signature and certification requirements:

(a) Any permit application must be signed as follows:

(i) For a corporation by a principal executive officer of at least the level of vice president;

(ii) For a partnership or sole proprietorship by a general partner or the proprietor, respectively;

(iii) For a Limited Liability Company (LLC) by an authorized member or representative; or

(iv) For a municipality, state, federal, or other public agency by either a principal executive officer or ranking elected official.

(b) Reports required by permits and other information requested by the division must be signed by a person described in Subsection (a), or by an authorized representative of that person. A person is an authorized representative only if:

(i) The authorization is made in writing by a person described in Subsection (a);

(ii) The authorization specifies either an individual or a position having responsibility for the overall operation of the regulated CO2 Sequestration facility or activity, such as the position of plant manager, operator of a well or well field, superintendent, or position of equivalent responsibility. An authorized representative may thus be either a named individual or any individual occupying a named position; and

(iii) The written authorization is submitted to the division.

(c) If an authorization under Subsection (b) is no longer accurate because a different individual or position has responsibility for the overall operation of the CO2 Sequestration facility, a new authorization pursuant to Subsection (b) must be submitted to the division prior to or together with any reports, information, or applications to be signed by an authorized representative.

(d) Any person signing the application shall make the following certification statement: "I certify under penalty of law that this document and each attachment was prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. The information submitted is, to the best of my knowledge and belief, true, accurate, and complete. 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."

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R644. Natural Resources, Oil, Gas and Mining; Carbon Sequestration.
R644-4. Application Content.
R644-4-1. Information Required.

Information required under this rule shall be submitted with a permit application to construct a CO2 Sequestration facility and associated Class VI wells or convert an existing well for Class VI service. For information already on file, the division may accept the required information by reference provided they are current, readily available, and sufficiently identified to be retrieved.

R644-4-2. CO2 Sequestration Facility Application Requirements.

(1) The following is required with each permit application:

(a) The nonrefundable application fee;

(b) The owner and operator's name, address, telephone number, and email address;

(c) The physical address of the CO2 Sequestration facility;

(d) Ownership status, and status as federal, state, private, public, or other entity;

(e) A brief description of the nature of the business associated with the activity;

(f) The activity conducted by the operator that require a permit under Title R644;

(g) Up to four SIC Codes that best reflect the principal products or services provided by the CO2 Sequestration facility;

(h) A listing of each environmental permit, construction approval, or any other relevant permit received or applied for from the division or any other federal, state, or local regulatory agency relevant to the permit activity, which may include the following:

(i) The Utah Division of Waste Management and Radiation Control;

(ii) Any underground injection control program;

(iii) NPDES program under the Clean Water Act;

(iv) Prevention of Significant Deterioration program under the Clean Air Act;

(v) Nonattainment program under the Clean Air Act;

(vi) National Emission Standards for Hazardous Pollutants preconstruction approval under the Clean Air Act;

(vii) Dredge or fill permits under Section 404 of the Clean Water Act; and

(viii) Other relevant environmental permits including any state permit issued under the Utah Cultural Resource Inventory, the Utah Paleontological Inventory or the Utah Wild and Scenic Rivers Act;

(i) Acknowledgment as to whether the CO2 Sequestration facility is located on Indian lands or other lands under the jurisdiction or protection of the federal government, or whether the CO2 Sequestration facility is located on state water bottoms or other lands owned by or under the jurisdiction or protection of Utah;

(j) Documentation of financial responsibility or documentation of the method by which proof of financial responsibility will be provided as required in Section R644-5-3. Before making a final permit decision, official documentation of financial responsibility must be submitted to and approved by the division;

(k) The names and addresses of each owner of record of land within one-half mile of the CO2 Sequestration facility boundary.

R644-4-3. CO2 Sequestration Facility Application Contents.

(1) An application submitted to construct a CO2 Sequestration facility or the conversion of an existing Class II well shall contain the following geological and technical information for the area of review:

(a) Maps showing property boundaries of the CO2 Sequestration facility, location of each proposed Class VI well, and the applicable area of review for each well consistent with Section R644-8-2;

(b) Maps showing the section, township, and range of the area where the activity is located and any county, city, municipality, state, tribal boundaries, and roads;

(c) Maps showing each injection well, producing well, and abandoned well, plugged well or dry holes, deep stratigraphic boreholes, and Class VI geophysical test well;

(d) Maps showing any surface bodies of water such as lakes, rivers, streams, springs, and existing water wells;

(e) Maps showing surface and subsurface disturbance, such as mines, quarries, and cleanup sites;

(f) Maps showing structures intended for human occupancy;

(g) Only information of public record is required to be included on each map, however, the applicant is required to make a diligent search to locate each well not listed in the public record.

(h) Information on the geologic structure and hydrogeologic properties of the proposed sequestration site and overlying formations, to include:

(i) Regional geologic and topographic maps and cross-sections illustrating surface geology, geologic structure, and hydrology;

(ii) Detailed maps and cross-sections indicating the location, orientation, and properties of known or suspected faults and fractures that may transect the confining zone of each proposed injection zone in the area of review and a determination that they would not interfere with containment;

(iii) Maps and stratigraphic cross-sections showing the general vertical and lateral limits of each USDW, water wells and springs within the area of review, their position relative to each injection zone and the direction of water movement, if known;

(iv) In areas with limited subsurface well control or where the subsurface geology is in doubt and cannot be described adequately, the division may request the applicant to provide geophysical seismic data of the project area;

(i) Any other maps required by the division to evaluate the proposed project.

(j) Data on the depth, areal extent, thickness, mineralogy, porosity, permeability, and capillary pressure of each injection zone and confining zone; including facies changes based on field data which may include geologic cores, outcrop data, seismic surveys, well logs, names, and lithologic descriptions;

(k) Geomechanical information on fractures, stress, ductility, rock strength, and in situ fluid pressures within the each confining zone;

(l) Information on the region's seismic history including the presence and depth of seismic sources and a determination that potential seismicity would not interfere with containment;

(m) A tabulation of each well within the area of review that penetrates each injection zone or confining zone. Such data must include a description of each well's type, construction, date drilled, location, depth, record of plugging or completion, and any additional information the division may require;

(n) Baseline geochemical data from subsurface formations and fluids, including each USDW in the area of review;

(o) Proposed operating data for each Class VI well:

(i) average and maximum daily rate and volume of the carbon dioxide stream;

(ii) total anticipated volume and mass of the carbon dioxide stream;

(iii) average and maximum injection pressure;

(iv) sources of the carbon dioxide stream;

(v) analysis of the chemical and physical characteristics of the carbon dioxide stream;

(p) Proposed pre-operational formation testing program for each Class VI well to obtain an analysis of the chemical and physical characteristics of each injection zone and confining zone and that meets the requirements listed in Section R644-9-2;

(q) Proposed stimulation program for each Class VI well, a description of stimulation fluids to be used, and a determination that stimulation will not interfere with containment;

(r) Proposed injection operation procedures for each Class VI well;

(s) Schematics or other appropriate drawings of the surface, such as wellhead and related appurtenances, and subsurface construction details of each Class VI well;

(t) Injection well construction procedures for each Class VI well that meet the requirements of Section R644-9-1;

(u) Proposed area of review and corrective action plan for each Class VI well that meets the requirements under Sections R644-8-2 and R644-8-3;

(v) Demonstration, satisfactory to the division, that the applicant has met the financial responsibility requirements under Section R644-5-3;

(w) Proposed testing and monitoring plan for each Class VI well required by Rule R644-13;

(x) Proposed injection well plugging plan for each Class VI well required by Rule R644-16;

(y) Proposed post-injection site care and site closure plan for each Class VI well required by Section R644-17-1;

(z) At the division's discretion, a demonstration of an alternative post-injection site care timeframe required by Subsection R644-17-1(3);

(aa) Proposed emergency and remedial response plan required, such as contingency plans for well failures or breaches, by Rule R644-12;

(bb) A list of contacts, submitted to the division for those states and tribes identified to be within the area of review based on information provided in Subsection (1)(a); and

(cc) Any additional information required by the division to evaluate the proposed project.

(2) An application submitted to construct a CO2 Sequestration facility shall also demonstrate that the applicant has obtained written consent of at least 70% of the reservoir's pore space owners within the CO2 Sequestration Facility.

(3) The division shall notify in writing any state or tribe within the area of review based on information provided by the applicant in Subsections (1)(a) and (1)(bb).

(4) Applications shall include a completed APD for each Class VI well, Class VI Geophysical Test Well and monitoring well. The following information shall be included for a completed APD:

(a) The name, address, telephone number, and electronic contact information of the operator;

(b) Proper identification of any relevant leases, including identification of whether the leases are state, federal, Indian, or fee;

(c) A plat or map prepared by a licensed surveyor or engineer that accurately provides:

(i) the proposed well's surface and terminus location as perpendicular distances from Public Land Survey System (PLSS) section lines;

(ii) the PLSS quarter-section or lot, section, township, range, and principal meridian where the proposed well is to be located;

(iii) bearings and distances of any pertinent PLSS section lines;

(iv) bearing and distance from the proposed well's surface to the proposed well's terminus location; and

(v) latitude and longitude coordinates of the proposed well's surface and terminus location, with any provided bearings, distances, and coordinates conforming to a coordinate reference system having datum, north reference, and measurement units acceptable to the division;

(d) A copy of the Division of Water Rights approval, or the identifying number of approval, for use of water at the drilling site;

(e) A drilling program containing the following information:

(i) The estimated tops of important geologic markers;

(ii) The estimated depths at which the top and the bottom of anticipated water, oil, gas, or other mineral-bearing formations are expected to be encountered, and the plans for protecting such resources;

(iii) The minimum specifications for pressure control equipment to be used and a schematic diagram thereof showing sizes, pressure ratings or API series, proposed testing procedures and testing frequency;

(iv) Any supplementary information more completely describing the drilling equipment and casing program;

(v) The type and characteristics of the proposed circulating medium to be employed in drilling, the quantities and types of mud and weighting material to be maintained, and the monitoring equipment to be used on the mud system;

(vi) The anticipated type and amount of testing, logging, and coring;

(vii) The expected bottom hole pressure and any anticipated abnormal pressures or temperatures or potential hazards, such as hydrogen sulfide, that are expected to be encountered, along with contingency plans for mitigating such identified hazards;

(viii) Any other relevant or unique information that would assist the division's assessment and consideration of the application; and

(f) An APD will not be approved until an onsite predrill evaluation is performed by the division as outlined in Section R649-3-18.

KEY: oil and gas law
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R644. Natural Resources, Oil, Gas and Mining; Carbon Sequestration.
R644-5. Legal Permit Conditions.
R644-5-1. Applicability.

This rule sets forth legal conditions for a CO2 Sequestration facility permit and any associated Class VI well permits. A permit for a Class VI well shall meet the applicable requirements in this rule and Rules R644-8 through R644-16. Any condition applicable to a permit shall be explicitly incorporated. If incorporated by reference, a specific citation to this rule must be given in the permit.

R644-5-2. Signatories.

Reports required by permits and other information requested by the division shall be signed by the person described in Section R644-3-1.

R644-5-3. Financial Responsibility.

(1) The operator must demonstrate and maintain financial responsibility as determined by the division that meets the following conditions:

(a) The financial responsibility instruments used must be from the following list of qualifying instruments:

(i) Surety Bonds in a form prescribed by the division;

(ii) Cash Accounts in a form prescribed by the division;

(iii) Negotiable Certificates of Deposit in a form prescribed by the division;

(iv) Letter of Credit in a form prescribed by the division; or

(v) Any other instruments of financial assurance satisfactory to the division.

(b) The qualifying financial responsibility instruments must be sufficient to cover the cost of:

(i) Corrective action that meets the requirements of Section R644-8-3;

(ii) Injection well plugging that meets the requirements of Rule R644-16;

(iii) Post-injection site care and site closure that meets the requirements of Rule R644-17; and

(iv) Emergency and remedial response that meets the requirements of Rule R644-12.

(c) The qualifying financial responsibility instruments must be sufficient to address endangerment of underground sources of drinking water.

(d) The qualifying financial responsibility instruments must comprise protective conditions of coverage. Protective conditions of coverage must include at a minimum cancellation, renewal, and continuation provisions; specifications on when the provider becomes liable following a notice of cancellation if there is a failure to renew with a new qualifying financial responsibility instrument; and requirements for the provider to meet a minimum rating, minimum capitalization, and ability to pass the bond rating when applicable.

(i) Cancellation. An operator must provide that their financial mechanism may not cancel, terminate, or fail to renew except for failure to pay such financial instrument. If there is a failure to pay the financial instrument, the financial institution may elect to cancel, terminate, or fail to renew the instrument by sending notice by certified mail to the operator and the division. The cancellation must not be final for 120 days after receipt of cancellation notice. The operator must provide an alternate qualifying financial responsibility demonstration within 60 days of notice of cancellation, and if an alternate financial responsibility demonstration is not acceptable or possible, any funds from the instrument being canceled must be released to the division within 60 days of notification by the division.

(ii) Renewal. The operator shall renew all qualifying financial responsibility instruments, if an instrument expires, for the entire term of the geologic sequestration project. The instrument must be automatically renewed as long as the operator has the option of renewal at the face amount of the expiring instrument. The automatic renewal must, at a minimum, provide the operator with the option of renewal at the face amount of the expiring financial instrument.

(iii) Cancellation, termination, or failure to renew may not occur, and the financial instrument will remain in full force and effect, in the event that on or before the date of expiration:

(A) The division deems the CO2 Sequestration facility abandoned;

(B) The permit is terminated or revoked or a new permit is denied;

(C) Closure is ordered by the division, board, or a United States district court or other court of competent jurisdiction;

(D) The operator is named as debtor in a voluntary or involuntary proceeding under U.S. Bankruptcy Act, Title 11 U.S.C.; or

(E) The amount due is paid.

(e) The qualifying financial responsibility instruments must be approved by the division.

(i) The division shall consider and approve the qualifying financial responsibility demonstration for all the phases of the geologic sequestration project prior to issuing a CO2 Sequestration facility permit and any associated Class VI well permits.

(ii) The operator shall provide any updated information related to its qualifying financial responsibility instruments on an annual basis and, if there are any changes, the division must evaluate, within a reasonable time, the qualifying financial responsibility demonstration to confirm that the instruments used remain adequate for use. The operator shall maintain financial responsibility requirements regardless of the status of the division's review of the financial responsibility demonstration.

(iii) The division may disapprove the use of a financial instrument if it determines that it is not sufficient to meet the requirements of this section.

(f) Upon the division's approval, the operator may demonstrate financial responsibility by using one or multiple qualifying financial instruments for specific phases of the geologic sequestration project. If the operator combines more than one instrument for a specific geologic sequestration phase, such as well plugging, the combination must be limited to instruments that are not based on financial strength or performance. In this case, it is the combination of mechanisms, rather than the single mechanism, which must provide financial responsibility for an amount at least equal to the current cost estimate.

(g) When using a third-party instrument to demonstrate financial responsibility, the operator shall provide proof that the third-party providers either have passed financial strength requirements based on credit ratings; or have met a minimum rating, minimum capitalization, and ability to pass the bond rating when applicable.

(h) If the operator uses a surety bond to satisfy its financial responsibility requirements, the operator shall be the principal on the bond and each surety bond shall be executed by the operator and a surety company licensed to do business in Utah that is listed in "A.M. Best's Key Rating Guide" at a rating of A- or better. All surety companies will also be listed in the current issue of the U.S. Department of the Treasury Circular 570.

(2) The requirement to maintain division-approved qualifying financial responsibility and resources is directly enforceable regardless of whether the requirement is a condition of the permit.

(a) The operator shall maintain qualifying financial responsibility and resources until the board issues a certificate of project completion subsequent to the division approving site closure.

(b) The operator may be released from a financial instrument before approved site closure in the following circumstances:

(i) The operator has completed the phase of the geologic sequestration project for which the financial instrument was required and has fulfilled all its financial obligations as determined by the division, including obtaining financial responsibility for the next phase of the geologic sequestration project, if required;

(ii) The operator has submitted a replacement financial instrument and received written approval from the division accepting the new financial instrument and releasing the operator from the previous financial instrument.

(3) The operator shall have a detailed written estimate, in current dollars, of the cost of performing corrective action on wells in the area of review, plugging the injection well, post-injection site care and site closure, and emergency and remedial response.

(a) The cost estimate must be performed for each phase separately and must be based on the costs to the division of hiring a third party to perform the required activities. A third party is a party who is not within the corporate structure of the operator;

(b) During the active life of the geologic sequestration project, the operator shall adjust the cost estimate for inflation within 60 days prior to the anniversary date of the establishment of the financial instruments used to comply with this section and provide this adjustment to the division. The operator shall also provide to the division written updates of adjustments to the cost estimate within 60 days of any amendments to the area of review and corrective action plan, the injection well plugging plan, the post-injection site care and site closure plan, and the emergency and remedial response plan;

(c) Any decrease or increase to the initial cost estimate is subject to the division's approval. During the active life of the geologic sequestration project, the operator shall revise the cost estimate no later than 60 days after the division has approved the request to modify the area of review and corrective action plan, the injection well plugging plan, the post-injection site care and site closure plan, and the emergency and remedial response plan, if the change in the plan increases the cost. If the change to the plans decreases the cost, any withdrawal of funds is subject to the division's approval. Any decrease to the value of the financial responsibility instruments must first be approved by the division. The revised cost estimate must be adjusted for inflation as specified in Subsection (3)(b); and

(d) When the current cost estimate increases to an amount greater than the face amount of a financial instrument currently in use, the operator, within 60 days after the increase, shall either cause the face amount to be increased to an amount at least equal to the current cost estimate and submit evidence of such increase to the division, or obtain other qualifying financial responsibility instruments to cover the increase. When the current cost estimate decreases, the face amount of the financial assurance instruments may be reduced to the amount of the current cost estimate only after the operator has received written approval from the division.

(4) The operator must notify the division by certified mail of adverse financial conditions such as bankruptcy that may affect its obligations, such as the ability to carry out injection well plugging, post-injection site care, and site closure.

(a) If the operator or the third-party provider of a qualifying financial responsibility instrument is named as the debtor in a bankruptcy proceeding, the operator must notify the division by certified mail of the commencement of a voluntary or involuntary proceeding under U.S. Bankruptcy Act, Title 11 U.S.C., naming the operator as debtor, within 10 days after commencement of the proceeding;

(b) A guarantor of a corporate guarantee must make such a notification to the division if they are named as debtor, as required under the terms of the corporate guarantee; and

(c) An operator who fulfills the financial responsibility requirements by obtaining an approved instrument of financial assurance will be deemed to be without the required financial assurance in the event of bankruptcy of the trustee or issuing institution, or a suspension or revocation of the authority of the trustee institution to act as trustee of the institution issuing the financial assurance instrument. The operator must establish other financial assurance within 60 days after such an event.

(5) The operator shall provide an adjustment of the cost estimate to the division within 60 days of notification by the division, if the division determines during the annual evaluation of the qualifying financial responsibility instruments that the most recent demonstration is no longer adequate to cover the cost of corrective action, injection well plugging, post-injection site care and site closure, and emergency and remedial response. An operator may request the use of pay-in-periods for cash-based accounts adjustments. Pay-in periods will only be allowed upon division approval.

R644-5-4. Duty to Comply.

(1) The operator must comply with each condition of a permit. Any permit noncompliance constitutes a violation of Title R644 and is grounds for enforcement action allowed under Title 40, Chapter 11, Part 3, Board authority -- Rulemaking authority, or permit termination, revocation and reissuance, or modification; or for denial of a permit renewal application if the division determines that such noncompliance endangers USDWs.

(2) In an enforcement action, the operator may not use as a defense the reasoning that compliance could only be achieved by halting or reducing the permitted activity.

(3) The operator shall take every reasonable step to minimize or correct any adverse impact on the environment such as the contamination of USDW resulting from noncompliance with the permit.

(4) The operator shall maintain and properly operate any systems of treatment and control that are used at their facilities to achieve compliance within the conditions of their permit. Proper operation and maintenance includes effective performance, adequate funding, adequate operation staffing and training, and adequate laboratory process controls, including appropriate quality assurance procedures. This provision requires the operation of back-up or auxiliary facilities or similar systems only when necessary to achieve compliance with the conditions of the permit.

(5) The operator shall allow the director, or an authorized representative, upon the presentation of credentials and other documents as may be required by law, to:

(a) Enter upon the operator's premises where a regulated CO2 Sequestration facility or activity is located or conducted, or where records must be kept under the conditions of the permit;

(b) Have access to and copy, at reasonable times, any records that must be kept under the conditions of the permit;

(c) Inspect at reasonable times any facilities, equipment including monitoring and control equipment, practices, or operations regulated or required under the permit; and

(d) Sample or monitor at reasonable times, for the purposes of assuring permit compliance or as otherwise authorized by the Safe Drinking Water Act, any substances or parameters at any location.

(6) Compliance with a permit during its term constitutes compliance, for purposes of enforcement, with Part C of the Safe Drinking Water Act.

(7) The issuance of a permit does not authorize any injury to persons or property or invasion of other private rights, or any infringement of state or local law or regulations.

R644-5-5. Property Rights.

(1) The issuance of a permit does not convey any property rights of any sort, or any exclusive privilege or servitude.

(2) An operator shall file a record of the permit for the CO2 Sequestration facility and a description of the impacted land with the recorder's office in each county where the CO2 Sequestration facility is located.

R644-5-6. Notification Requirements.

(1) Planned Changes: The operator shall give notice to the division as soon as possible of any planned physical alterations or additions to the permitted CO2 Sequestration facility.

(2) Notice of Well Completion: An injection well may not commence injection until construction is complete, a notice of completion has been submitted to the division, the division has inspected or otherwise reviewed the injection well and finds it is in compliance with the conditions of the permit, and the division has given approval to begin injection.

(3) Anticipated Noncompliance: The operator shall give advance notice to the division of any planned changes in the permitted CO2 Sequestration facility or activity that may result in noncompliance with permit requirements.

(4) Transfers: A permit is not transferable to any person except after notice to the division and approval by the board. The division may require modification or revocation and reissuance of the permit to change the name of the owner or operator and incorporate such other requirements as may be necessary under the Safe Drinking Water Act and Section R644-7-5.

(5) Compliance Schedules: Report of compliance or noncompliance with, or any progress reports on, interim and final requirements contained in any compliance schedule in this rule shall be submitted to the division no later than 14 days following each compliance schedule date.

(6) The operator shall notify the division at such times as the permit requires before conversion or abandonment of the well or before closure of the project.

(7) Other Noncompliance: The operator shall report any instance of noncompliance not reported under Subsection (5) and Subsection R644-15-1(1)(d) when quarterly reports are submitted. The reports shall contain the information listed in Subsection R644-15-1(d)(i).

(8) Other Information: Where the operator becomes aware that they failed to submit any relevant facts in a permit application, or submitted incorrect information in a permit application or in any report to the division, they shall promptly submit such facts or information.

R644-5-7. Duration of Permits.

(1) A CO2 Sequestration facility permit, and any Class VI well permits associated with the CO2 Sequestration facility, shall be issued for the operating life of the CO2 Sequestration facility and the post-injection site care period. The division shall review each issued CO2 Sequestration facility and Class VI well permit at least once every five years to determine whether it should be modified, revoked, and reissued, terminated, or a minor modification made.

(2) If the operator wishes to continue an activity regulated by a permit after the expiration date of the permit, the operator must apply for and obtain a new permit.

R644-5-8. Schedules of Compliance.

(1) The permit may, when appropriate, specify a schedule of compliance leading to compliance with the Title R644.

(a) Time for Compliance. Any schedules of compliance under this section shall require compliance as soon as possible but not later than three years after the effective date of the permit.

(b) Interim Dates. Except as provided in Subsection (1)(b)(ii), if a permit establishes a schedule of compliance that exceeds one year from the date of permit issuance, the schedule shall set forth interim requirements and the dates for their achievement.

(i) The time between interim dates may not exceed one year.

(ii) If the time necessary for completion of any interim requirements is more than one year and is not readily divisible into stages for completion, the permit shall specify interim dates for submission of reports of progress toward completion of the interim requirements and indicate a projected completion date.

(c) Reporting. The permit shall be written to require that progress reports be submitted no later than 30 days following each interim date and the final date of compliance.

R644-5-9. Additional Conditions.

The division shall impose on a case-by-case basis such additional conditions as are necessary to protect USDWs .

R644-5-10. Duty to Establish and Maintain Mechanical Integrity of a Class VI Well.

The operator of a Class VI well shall establish mechanical integrity prior to commencing injection and on a schedule determined by this rule or the division. Thereafter, the operator of a Class VI well must maintain mechanical integrity as defined in Rule R644-14. The Class VI well operator shall immediately give notice to the division and cease injection into the well when it is determined the injection well is lacking mechanical integrity. The well shall be shut-in until mechanical integrity is restored, pursuant to Rule R644-14, and the operator receives written approval from the division to resume injection.

R644-5-11. Establishing Permit Conditions.

In addition to conditions required in each permit, the division shall establish conditions in permits as required on a case-by-case basis, to provide for and assure compliance with each applicable requirements of the Safe Drinking Water Act and Title R644.

R644-5-12. New Permits, Modified or Revoked and Reissued Permits.

New permits, and to the extent allowed under Rule R644-7 modified or revoked and reissued permits, shall incorporate each of the applicable requirements referenced in this section. An applicable requirement is a state statutory or regulatory requirement that takes effect prior to final administrative disposition of the permit. An applicable requirement is also any requirement that takes effect prior to the modification or revocation and reissuance of a permit, to the extent allowed in Rule R644-7.

R644-5-13. Incorporation.

All permit conditions shall be incorporated either expressly or by reference. If incorporated by reference, a specific citation to the applicable regulations or requirements must be given in the permit.

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Authorizing, and Implemented or Interpreted Law: 40-11-3

R644. Natural Resources, Oil, Gas and Mining; Carbon Sequestration.
R644-6 Permitting Process.
R644-6-1. Draft Permits.

(1) Draft Permits:

(a) Once the division has determined an application for a CO2 Sequestration facility is complete, they shall prepare a draft permit for the CO2 Sequestration facility and each of the Class VI wells included in the CO2 Sequestration facility application, or deny the application.

(b) The draft permit shall contain the following information:

(i) Each condition under Rule R644-5 and Rules R644-8 through R644-16;

(ii) Each compliance schedule under Subsection R644-5-8(1); and

(iii) All monitoring requirements listed under Rule R644-13.

(c) Each draft permit prepared under this section shall be accompanied by a statement of basis pursuant to Section R644-6-2 and shall be publicly noticed in accordance with Section R644-6-3 and made available for public comment pursuant to Section R644-6-4.

R644-6-2. Statement of Basis.

(1) A statement of basis shall be prepared for every draft permit. The statement of basis shall briefly set forth the principal facts and the significant factual, legal, methodological and policy questions considered in preparing the draft permit. The division shall send this statement of basis to the applicant and, on request, to any other person.

(2) The statement of basis shall include, when applicable:

(a) A brief description of the type of CO2 Sequestration facility or activity that is the subject of the draft permit;

(b) The quantity and quality of the carbon dioxide, and other constituents, proposed to be injected and stored;

(c) A brief summary of the basis for the draft permit conditions including references to applicable statutory or regulatory provisions;

(d) Reasons why any requested variances or alternatives to required standards do or do not appear justified;

(e) A description of the procedures for reaching a final decision on the draft permit including:

(i) The beginning and ending dates of the comment period under Section R644-6-4 and where comments will be received;

(ii) Details of the public hearing required under Section R644-6-5; and

(iii) Any other procedures by which the public may participate in the final decision;

(f) Name and telephone number of a person to contact for information.

(3) All persons identified in Subsections R644-6-3(3)(a)(i) through (3)(a)(iv), shall be mailed or emailed a copy of the statement of basis, the draft permit, and a notice that the permit application will be available online.

R644-6-3. Public Notice of Permit Actions and Public Comment Period.

(1) Public Notice:

(a) The division shall give public notice that the following actions have occurred:

(i) A draft permit has been prepared

(ii) A public hearing has been scheduled.

(b) No public notice is required when a request for permit modification, revocation and reissuance, or termination is denied. Written notice of that denial shall be given to the requester and to the operator.

(c) Public notices may describe more than one permit or permit action.

(2) Timing:

(a) Public notice of the preparation of a draft permit required under Subsection (1) shall allow 30 days for public comment.

(b) Public notice of a public hearing shall be given 30 days before the hearing. Public notice of the hearing may be given at the same time as public notice of the draft permit and the two notices may be combined.

(c) An applicant shall comply with the notice requirements under Subsection 40-11-7(4) for the public hearing.

(3) Methods. Public notice of activities described in Subsection (1) shall be given by the following methods:

(a) By emailing or by mailing a copy of a notice to the following persons:

(i) The applicant;

(ii) Any other agency that the division knows has issued or is required to issue a RCRA, UIC, PSD, or other permit under the Clean Air Act, NPDES, 404, or sludge management permit for the same CO2 Sequestration facility or activity, including EPA;

(iii) Federal and state agencies with jurisdiction over the Advisory Council on Historic Preservation, the Utah State Historic Preservation Office, the Utah Department of Environmental Quality, the Department of Natural Resources, and other appropriate government authorities, including any unit of local government having jurisdiction over the area where the CO2 Sequestration facility is proposed to be located, any affected states or Indian Tribes; and

(iv) Persons on a Class VI well mailing list developed by:

(A) Including those who request in writing to be on the list;

(B) Soliciting persons for "area lists" means from participants in past permit proceedings in that area; and

(C) Notifying the public of the opportunity to be put on the mailing list through periodic publication in the public press and in such publications as regional and state funded newsletters, environmental bulletins, or state law journals. The division may update the mailing list from time to time by requesting written indication of continued interest from those listed. The division may delete from the list the name of any person who fails to respond to such a request.

(v) Any person otherwise entitled to receive notice under this section may waive their right to receive notice

(b) Publication of a notice in a daily or weekly newspaper within the area affected by the facility or activity;

(c) In a manner constituting legal notice to the public under state law; and

(d) Any other method reasonably calculated to give actual notice of the action in question to the persons potentially affected by it, including press releases or any other form or medium to elicit public participation.

(4) Contents:

(a) All Public Notices. Public notices issued under this section shall contain the following information:

(i) Name and address of the division;

(ii) Name and address of the owner or operator and, if different, of the CO2 Sequestration facility or activity regulated by the permit;

(iii) A brief description of the business conducted at the CO2 Sequestration facility or activity described in the permit application or the draft permit;

(iv) Name, address, and telephone number of a person from whom interested persons may obtain copies of the draft permit, the statement of basis, the application, and further information concerning the application;

(v) A brief description of the comment procedures required under Section R644-6-4 and the time and place of any hearing that will be held, and other procedures by which the public may participate in the final permit decision; and

(vi) Any additional information considered necessary or proper.

(b) Public Notices for Hearings. In addition to the general public notice described in Subsection (4)(a), the public notice of a hearing under Section R644-6-5 shall contain the following information:

(i) Reference to the date of previous public notices relating to the permit;

(ii) Date, time, and place of the hearing; and

(iii) A brief description of the nature and purpose of the hearing, including the applicable rules and procedures.

R644-6-4. Public Comments and Requests for Public Hearings.

During the public comment period provided under Section R644-6-3, any interested person may submit written comments on the draft permit. Each comment shall be considered in making the final decision and shall be answered as provided in Section R644-6-7.

R644-6-5. Public Hearings.

(1) The board shall hold a public hearing before authorizing the division to issue a permit. The public hearing held under this section will be initiated by the division and conducted by the board in accordance with Title 63G, Chapter 4, Administrative Procedures Act.

(a) The public hearing may include all draft permits associated with the CO2 Sequestration facility.

(2) Any person may submit oral or written statements and data concerning the draft permit. Reasonable limits may be set upon the time allowed for oral statements, and the submission of statements in writing may be required. The public comment period shall automatically be extended to the close of any public hearing.

(3) A recording of the hearing shall be made available to the public.

R644-6-6. Permit Issuance and Effective Date.

(1) After closure of the public comment period and after the conclusion of the public hearing on the draft permit under Section R644-6-5, the board shall issue a final permit decision within 45 days. The board shall notify the applicant and each person who has submitted written comments or requested notice of the final permit decision. This notice shall include reference to the procedure for appealing a decision on a CO2 Sequestration facility permit and any associated UIC Class VI well permits under Section 63G-4-302. For the purposes of this section, a final permit decision means a final decision to issue, deny, modify, revoke and reissue, or terminate a permit.

(2) A final permit decision shall become effective on the date of issuance.

(3) Upon a final permit decision by the board to grant the permit, the division shall be authorized to issue the permit.

(4) A permit to construct a CO2 Sequestration facility, and permits to construct each of the associated Class VI wells, shall be valid for a period of five years and if not begun in that time, the permit shall be null and void. The permittee may request an extension of this five-year requirement; however, the division shall approve the request for extenuating circumstances only.

R644-6-7. Response to Comments.

(1) At the time that any final permit is issued the division shall issue a response to comments. This response shall:

(a) Specify which provisions; if any, of the draft permit have been changed in the final permit decision, and the reasons for the change; and

(b) Briefly describe and respond to all significant comments on the draft permit or the permit application raised during the public comment period, or during any hearing.

(2) The response to comments shall be available to the public.

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R644. Natural Resources, Oil, Gas and Mining; Carbon Sequestration.
R644-7. Permit Modification, Revocation and Reissuance, Termination, Transfer or Renewal.
R644-7-1. Permit Actions.

(1) The permit may be modified, revoked, and reissued, or terminated for cause. The filing of a request by the operator for a permit modification, revocation and reissuance, or termination, or a notification of planned changes or anticipated noncompliance, does not stay any permit condition.

(2) The operator shall furnish to the division, within 30 days, any information that the division may request to determine whether cause exists for modifying, revoking, and reissuing, or terminating a permit, or to determine compliance with the permit. The operator shall also furnish to the division, upon request, copies of records required to be kept by the permit.

(3) The division may, upon their own initiative or at the request of any interested person, review any permit to determine if cause exists to modify, revoke and reissue, or terminate the permit for the reasons specified in Sections R644-7-2 through R644-7-4.

(4) Any request shall be in writing and contain facts or reasons supporting the request. If the division decides the request is not justified, they shall send the person making the request a brief written response giving a reason for the decision. Denials of requests for modification, revocation and reissuance, or termination are not subject to public notice, comment, or hearings.

(5) If the division decides to modify or revoke and reissue a permit under Sections R644-7-2 through R644-7-4, they shall prepare a draft permit under Section R644-6-1 incorporating the proposed changes. When a permit is modified, the entire permit is reopened and is subject to revision. The division may request additional information and, in the case of a modified permit, may require the submission of an updated permit application. In the case of revoked and reissued permits, the division shall require, if necessary, the submission of a new application.

(6) In a permit modification under this section, only those conditions to be modified shall be reopened when a new draft permit is prepared. Any other aspect of the existing permit shall remain in effect for the duration of the unmodified permit. When a permit is revoked and reissued under this section, the entire permit is reopened just as if the permit had expired and was being reissued. During any revocation and reissuance proceeding the permittee shall comply with each condition of the existing permit until a new final permit is reissued.

R644-7-2. Modification or Revocation and Reissuance of Permits.

(1) The following are causes for modification and may be causes for revocation and reissuance of permits.

(a) Alterations. There are material and substantial alterations or additions to the permitted CO2 Sequestration facility or activity that occurred after permit issuance which justify the application of permit conditions that are different or absent in the existing permit.

(b) Information. The division has received information pertinent to the permit that would have justified the application of different permit conditions at the time of issuance.

(c) New Regulations.

(i) The standards or regulations on which the permit was based have been changed by promulgation of amended standards or regulations or by judicial decision after the permit was issued. Permits for storage facilities may be modified during their terms when:

(A) The permit condition requested to be modified was based on a promulgated regulation or guideline;

(B) There has been a revision, withdrawal, or modification of that portion of the regulation or guideline on which the permit condition was based; and

(C) An operator requests modification within 90 days.

(ii) When standards or regulations on which the permit was based have been changed by withdrawal of standards or regulations or by promulgation of amended standards or regulations which impose less stringent requirements on the permitted activity or CO2 Sequestration facility and the operator requests to have permit conditions based on the withdrawn or revised standards or regulations deleted from their permit.

(iii) For judicial decisions, a court of competent jurisdiction has remanded and stayed Division of Oil, Gas and Mining regulations or guidelines and any appeals have been exhausted, if the remand and stay concern that portion of the regulations or guidelines on which the permit condition was based and a request is filed by the operator to have permit conditions based on the remanded or stayed standards or regulations deleted from their permit.

(d) Compliance Schedules. The division determines good cause exists for modification of a compliance schedule, such as an act of God, strike, flood, or materials shortage or other events over which the operator has little or no control and for which there is no reasonable available remedy.

(e) Additional Modification of CO2 Sequestration Facility Permit. For Class VI wells, whenever the division determines that permit changes are necessary based on:

(i) Area of review reevaluations under Subsection R644-8-2(2);

(ii) Any amendments to the testing and monitoring plan under Subsection R644-13-1(1)(j);

(iii) Any amendments to the injection well plugging plan under Subsection R644-16-1(3);

(iv) Any amendments to the post-injection site care and site closure plan under Subsection R644-17-1(1)(c);

(v) Any amendments to the emergency and remedial response plan under Subsection R644-12-1(4); or

(vi) A review of monitoring and testing results conducted in accordance with permit requirements.

(2) The following are causes to modify or, alternatively, revoke and reissue a permit:

(a) Cause exists for termination under Section R644-7-4, and the division determines that modification or revocation and reissuance is appropriate;

(b) The division has received notification of a proposed transfer of the permit and the transfer is determined not to be a minor modification, under Subsection R644-7-3(1)(d). A permit may be modified to reflect a transfer after the effective date but will not be revoked and reissued after the effective date except upon the request of the new operator; or

(c) A determination that the contents being injected are a hazardous waste as defined in Section R644-1-1 either because the definition has been revised, or because a previous determination has been changed; or

(d) To incorporate such other requirements as may be necessary under the Safe Drinking Water Act.

(3) CO2 Sequestration Facility Siting. Suitability of an existing CO2 Sequestration facility location will not be considered at the time of permit modification or revocation and reissuance unless new information or standards indicate that continued operations at the site pose a threat to the health or safety of persons or the environment which was unknown at the time of permit issuance. A change of injection site or CO2 Sequestration facility location may require modification or revocation and issuance as determined to be appropriate by the division.

(4) If a permit modification satisfies the criteria of this section, a draft permit must be prepared, and other applicable procedures must be followed.

R644-7-3. Minor Modifications of Permits.

(1) Upon the consent of the operator, the division may modify a permit to make the corrections or allowances for changes in the permitted activity listed in this section without issuing a draft permit and providing for public comment. Minor modifications may only:

(a) Correct typographical errors;

(b) Require more frequent monitoring or reporting by the operator;

(c) Change an interim compliance date in a schedule of compliance, provided the new date is not more than 120 days after the date specified in the existing permit and does not interfere with attainment of the final compliance date requirement;

(d) Allow for a change in ownership or operational control of a CO2 Sequestration facility where the division determines that no other change in the permit is necessary, provided that a written agreement containing a specific date for transfer of permit responsibility, coverage, and liability between the current and new operator has been submitted to the division as per Section R644-7-5;

(e) Change quantities or concentrations of fluids injected that are within the capacity of the CO2 Sequestration facility as permitted and, in the judgment of the division, would not interfere with the operation of the CO2 Sequestration facility or its ability to meet conditions prescribed in the permit, and would not change its classification;

(f) Change construction requirements or plans approved by the division provided that any such alteration shall comply with the requirements of this section and Rule R644-9. No such changes may be physically incorporated into construction of the well prior to approval; or

(g) Amend a Class VI well testing and monitoring plan, plugging plan, post-injection site care and site closure plan, or emergency and remedial response plan where the modifications merely clarify or correct the plan, as determined by the division.

R644-7-4. Termination of Permits.

(1) The division may terminate a permit during its term, or deny a permit renewal application after notice and a hearing for the following causes:

(a) Noncompliance by the operator with any condition of the permit;

(b) The permittee's failure in the application or during the permit issuance process to disclose fully all relevant facts, or the permittee's misrepresentation of any relevant facts at any time; or

(c) A determination that the permitted activity endangers the health or safety of persons or the environment, that activity cannot be regulated to acceptable levels by permit modification and can only be regulated to acceptable levels by permit termination.

(2) If the division decides to terminate a permit, they shall issue a notice of intent to terminate. A notice of intent to terminate is a type of draft permit that follows the same procedures as any draft permit prepared under Section R644-6-1.

(3) The division may alternatively decide to modify or revoke and reissue a permit for the causes in Subsection (1) and Subsection R644-7-2(2)(a).

R644-7-5. Transfer of Permits.

(1) A permit may be transferred to a new operator upon approval by the board.

(2) The current operator shall file a request for agency action with the board at least 60 days before the proposed transfer date in accordance with Title R641. The request shall include an application for transfer that shall contain the following:

(a) Name and address of the transferee;

(b) Date of proposed transfer; and

(c) A written agreement between the existing and new operator containing a specific date for transfer of permit responsibility, coverage, and liability between them. The agreement should also demonstrate to the satisfaction of the board that the financial responsibility requirements of Section R644-5-3 will be met by the new operator prior to the proposed transfer date.

(3) The permit transfer is effective on the date specified in the agreement mentioned in Subsection (2)(c), unless the division intends to modify or revoke and reissue the permit under Subsection R644-7-2(2)(b). If a decision to modify or revoke and reissue is made, the board must notify the existing and proposed operators before the effective date in the agreement.

(4) If the application for transfer contains an unsatisfactory written agreement, as described in Subsection (2)(c), no transfer will be approved by the board. Responsibility for compliance with the terms and conditions of the permit and liability for any violation will remain with the existing operator.

(5) If a person attempting to acquire a permit causes or allows operation of the CO2 Sequestration facility before approval by the board, it shall be considered a violation of this rule for operating without a permit or other authorization.

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R644. Natural Resources, Oil, Gas and Mining; Carbon Sequestration.
R644-8. Siting Criteria, Area of Review, and Corrective Action.
R644-8-1. Minimum Criteria for Siting for a Class VI Well.

(1) Operators of a Class VI well must demonstrate to the satisfaction of the division that the well will be sited in areas with a suitable geologic system. The demonstration must show that the geologic system comprises:

(a) An injection zone of sufficient areal extent, thickness, porosity, and permeability to receive the total anticipated volume of the carbon dioxide stream;

(b) A confining zone free of transmissive faults or fractures and of sufficient areal extent and integrity to contain the injected carbon dioxide stream and displaced formation fluids and allow injection at proposed maximum pressures and volumes without initiating or propagating fractures in the confining zone.

(i) The division may require an operator of a Class VI well to identify and characterize additional zones that will impede vertical fluid movement, are free of faults and fractures that may interfere with containment, allow for pressure dissipation, and provide additional opportunities for monitoring, mitigation, and remediation.

R644-8-2. Area of Review.

(1) The area of review is the region surrounding the geologic sequestration project where USDWs may be endangered by the injection activity. The area of review is delineated using computational modeling that accounts for the physical and chemical properties of each phase of the injected carbon dioxide stream and is based on available site characterization, monitoring, and operational data.

(2) The operator of a Class VI well must prepare, maintain, and comply with a plan to delineate the area of review for the proposed geologic sequestration project, periodically reevaluate the delineation, and perform corrective action that meets the requirements of this section 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. As a part of the permit application, the operator must submit an area of review and corrective action plan that includes the following information:

(a) The method for delineating the area of review that meets the requirements of Subsection (3), including the model to be used, assumptions that will be made, and the site characterization data that the model will be based;

(b) A description of:

(i) The minimum fixed frequency, not to exceed five years, that the operator proposes to reevaluate the area of review;

(ii) The monitoring and operational conditions that would warrant a reevaluation of the area of review prior to the next scheduled reevaluation as determined by the minimum fixed frequency established in Subsection (2)(b)(i).

(iii) How monitoring and operational data, such as injection rate and pressure, will be used to inform an area of review reevaluation; and

(iv) How corrective action will be conducted to meet the requirements of Subsection R644-8-3(1), including what corrective action will be performed prior to injection and what, if any, portions of the area of review the operator proposes to have corrective action addressed on a phased basis and how the phasing will be determined, how corrective action will be adjusted if there are changes in the area of review, and how site access will be guaranteed for future corrective action.

(3) An operator of a Class VI well must perform the following actions to delineate the area of review and identify each well that requires corrective action:

(a) Predict, using existing site characterization, monitoring and operational data, and computational modeling, the projected lateral and vertical migration of the carbon dioxide plume and formation fluids in the subsurface from the commencement of injection activities until the plume movement ceases, until pressure differentials sufficient to cause the

movement of injected fluids or formation fluids into a USDW are no longer present, or until the end of a fixed time period as determined by the division. The model must:

(i) Be based on detailed geologic data collected to characterize each injection zone, confining zone and any additional zones; and anticipated operating data, including injection pressures, rates, and total volumes over the proposed life of the geologic sequestration project;

(ii) Take into account any geologic heterogeneities, other discontinuities, and data quality, and their possible impact on model predictions; and

(iii) Consider potential migration through faults, fractures, and artificial penetrations.

(b) Using methods approved by the division, the operator shall at a minimum, identify each artificial penetration, including active wells, inactive wells, shut-in wells, abandoned wells and underground mines, in the area of review that penetrate each confining and injection zone. Provide a description of each well's type, construction, date drilled, location, depth, record of plugging, record of completion, and any additional information the division may require; and

(c) Determine which abandoned wells in the area of review have, or have not, been plugged in a manner that prevents the movement of carbon dioxide or other fluids that may endanger USDWs, including the use of materials compatible with the carbon dioxide stream.

R644-8-3. Corrective Action.

(1) An operator of a Class VI well must perform corrective action on each well in the area of review that is determined to need corrective action, using methods designed to prevent the movement of fluid into or between USDWs, including use of materials compatible with the carbon dioxide stream, where appropriate.

(2) At the minimum fixed frequency, not to exceed five years, as specified in the area of review and corrective action plan, or when monitoring and operational conditions warrant, an operator must:

(a) Reevaluate the area of review in the same manner specified in Subsection R644-8-2(3)(a);

(b) Identify each well in the reevaluated area of review that requires corrective action in the same manner specified in Subsection R644-8-2(3);

(c) Perform corrective action on each well requiring corrective action in the reevaluated area of review in the same manner specified in this section; and

(d) Submit an amended area of review and corrective action plan or demonstrate to the division through monitoring data and modeling results that no amendment to the area of review and corrective action plan is needed. Any amendment to the area of review and corrective action plan must be approved by the division, must be incorporated into the permit, and is subject to the permit modification requirements listed in Rule R644-7, as appropriate.

(3) The emergency and remedial response plan, required by Rule R644-12, and the demonstration of financial responsibility, as described Section R644-5-3, must account for the area of review delineated as specified in Subsection R644-8-2(3) or the most recently evaluated area of review delineated under Subsection R644-8-2(2)(b)(i), regardless of whether or not corrective action in the area of review is phased.

(4) All modeling inputs and data used to support the area of review reevaluations under Subsections R644-8-2(2)(b)(i) and R644-8-3(2) shall be retained for at least 10 years.

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R644. Natural Resources, Oil, Gas and Mining; Carbon Sequestration.
R644-9. Well Construction and Completion.
R644-9-1. Injection Well Approval and Construction Requirements.

(1) General. Each phase of Class VI well and Class VI Geophysical test well construction shall be supervised by a person knowledgeable and experienced in practical drilling engineering and familiar with the special conditions and requirements of injection well construction. Any materials and equipment used in the construction of the well and related appurtenances shall be designed and manufactured to meet or exceed the operating requirements of the specific project, including flow induced vibrations. Any well permitted as a Class VI Geophysical test well will need to meet the requirements of this rule before it can be permitted for use as a Class VI well. The operator must ensure that each well is constructed and completed to:

(a) Prevent the movement of fluids into or between USDWs or into any unauthorized zone;

(b) Allow the use of appropriate testing devices and workover tools; and

(c) Allow for continuous monitoring of the annulus space between the injection tubing and long string casing.

(2) Casing and Cementing of Class VI Wells

(a) Casing, cement, and other materials used in the construction of each Class VI well must have sufficient structural strength and be designed for the life of the geologic sequestration project. All well materials must be compatible with fluids that the materials may be expected to come into contact with and must meet or exceed standards developed for such materials by the American Petroleum Institute, ASTM International, or comparable standards acceptable to the division. The casing and cementing program must be designed to prevent the movement of fluids into or between USDWs. In order to allow the division to evaluate casing and cementing requirements, the operator must provide the following information:

(i) Depth to each injection zone;

(ii) Injection pressure, external pressure, internal pressure, and axial loading;

(iii) Hole size;

(iv) Size and grade of each casing string, including wall thickness, external diameter, nominal weight, length, joint specification, and construction material;

(v) Corrosiveness of the carbon dioxide stream and formation fluids;

(vi) Down-hole temperatures;

(vii) Lithology of each injection zone and confining zone;

(viii) Type or grade of cement and cement additives; and

(ix) Quantity, chemical composition, and temperature of the carbon dioxide stream.

(b) Surface casing must extend through the base of the lowermost USDW and be cemented to the surface through the use of a single or multiple strings of casing and cement.

(c) At least one long string casing, using a sufficient number of centralizers, must extend to the injection zone and must be cemented by circulating cement to the surface in one or more stages.

(d) Circulation of cement may be accomplished by staging. The division may approve an alternative method of cementing in cases where the cement cannot be recirculated to the surface, provided the operator can demonstrate by using logs that the cement does not allow fluid movement behind the wellbore. A copy of the cementing company's job summary or cementing tickets indicating returns to the surface shall be submitted as part of the pre-operating requirements.

(i) If cement returns are lost during cementing, the operator shall have the burden of demonstrating, using wireline logs, that sufficient cement isolation is present to prevent the movement of fluid behind the well casing.

(ii) If adequate cement isolation of the USDW or the injection zone within the casing-formation annulus cannot be demonstrated, remedial cementing shall be performed prior to proceeding with further well construction, completion, or conversion.

(3) Cement and cement additives must be compatible with the carbon dioxide stream and formation fluids and of sufficient quality and quantity to maintain integrity over the design life of the geologic sequestration project. The integrity and location of the cement shall be verified using technology capable of evaluating cement quality radially and identifying the location of channels to ensure that USDWs are not endangered.

(4) Tubing and Packer

(a) Tubing and packer materials used in the construction of each Class VI well must be compatible with fluids that the materials may be expected to come into contact with and must meet or exceed standards developed for such materials by the American Petroleum Institute, ASTM International, or comparable standards acceptable to the division.

(b) Injection into a Class VI well must be through tubing with a packer set within an interval of cemented casing, at a distance no more than 100' from the top of the approved injection interval, at a depth approved by the division. Any exception to the packer depth requirement must be approved by the division.

(c) In order for the division to determine and specify requirements for tubing and packer, the operator must submit the following information:

(i) Depth of setting;

(ii) Characteristics of the carbon dioxide stream, such as chemical content, corrosiveness, temperature, and density, and formation fluids;

(iii) Maximum proposed injection pressure;

(iv) Maximum proposed annular pressure;

(v) Proposed intermittent or continuous injection rate, volume, and mass of the carbon dioxide stream;

(vi) Size of tubing and casing;

(vii) Tubing tensile, burst, and collapse strengths; and

(viii) Tubing manufacturer roughness factor.

R644-9-2. Logging, Sampling, and Testing Prior to Injection Well Operation.

(1) During the drilling and construction of a Class VI well, appropriate logs, surveys, and tests must be run to determine or verify the depth, thickness, porosity, permeability, and lithology of, and the salinity of formation fluids in, each relevant geologic formation to ensure conformance with the injection well construction requirements of Rule R644-9 and to establish accurate baseline data against which future measurements may be compared. The well operator must submit to the division a descriptive report prepared by a knowledgeable log analyst that includes an interpretation of the results of such logs and tests. At a minimum, such logs and tests must include:

(a) Deviation checks during drilling when a wellbore is constructed by drilling a pilot hole that is enlarged by reaming or another method. Such checks must be at sufficiently frequent intervals to determine the location of the borehole and to ensure that diverging holes are not created during drilling, to prevent avenues for vertical fluid movement;

(b) Before and upon installation of the surface casing:

(i) Resistivity, spontaneous potential, and caliper logs before the casing is installed; and

(ii) A cement bond and variable density log to evaluate cement quality radially, and a temperature log after the casing is set and cemented;

(c) Before and upon installation of intermediate and long string casing:

(i) Gamma ray, resistivity, spontaneous potential, porosity, caliper, fracture finder logs, and any other logs the division requires for the given geology before the casing is installed; and

(ii) A cement bond and variable density log, and a temperature log after the casing is set and cemented;

(d) A series of tests designed to demonstrate the internal and external mechanical integrity of injection wells, that may include:

(i) A pressure test with liquid or gas;

(ii) A tracer-type survey to detect fluid movement behind casing, such as a radioactive tracer, oxygen-activation logging, or similar tool;

(iii) A temperature or noise log;

(iv) A casing inspection log;

(e) Any alternative methods that provide equivalent or better information and that are required and approved by the division.

(2) The operator must take whole cores or sidewall cores of each injection zone and confining system and formation fluid samples from each injection zone and must submit to the division a detailed report prepared by a log analyst that includes: well log analysis and associated well logs, core analysis, and formation fluid sample information. The division may accept information on cores from nearby wells if the operator can demonstrate that core retrieval is not possible and that such cores are representative of conditions at the well. The division may require the operator to core other formations in the borehole.

(3) The operator must record the fluid temperature, pH, conductivity, reservoir pressure, and static fluid level of each injection zone.

(4) At a minimum, the operator must determine or calculate the following information concerning each injection zone and confining zone:

(a) Fracture pressure;

(b) Other physical and chemical characteristics of each injection and confining zone; and

(c) Physical and chemical characteristics of the formation fluids in each injection zone.

(5) Upon completion, but before operating, the operator must conduct the following tests to verify hydrogeologic characteristics of each injection zone:

(a) A pressure fall-off test; and

(b) A pump test; or

(c) Injectivity tests.

(6) The operator must provide the division with the opportunity to witness all logging and testing described in this section. The operator must submit a schedule of such activities to the division 30 days prior to conducting each log and test.

(a) The operator must notify the division at least 48 hours before conducting any wireline logs, well tests, or reservoir tests.

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R644. Natural Resources, Oil, Gas and Mining; Carbon Sequestration.
R644-10. Pre-Operations -- Completion Report and Site Reassessment.
R644-10-1. Pre-Operating Requirements.

(1) The operator of the well shall submit the following information to the division. The division shall consider the information before granting final approval for the operation of a Class VI well:

(a) The final area of review based on modeling, using data obtained during logging and testing of the well and subsurface formations as required by Subsections (1)(b) through (1)(d), (1)(f), (1)(g), and (1)(j);

(b) Any relevant updates, based on data obtained during logging and testing of the well and subsurface formations, as required by Subsections (1)(c), (1)(d), (1)(f), (1)(g), and (1)(j) to the information on the geologic structure and hydrogeologic properties of the proposed storage site and overlying formations, submitted to satisfy the requirements of Subsection R644-4-3(1)(h);

(c) Information on the compatibility of the carbon dioxide stream with fluids in the injection zone and minerals in both the injection and the confining zone, based on the results of the formation testing program, and with the materials used to construct the well;

(d) The results of the formation testing program required at Subsection R644-4-3(1)(p);

(e) Final injection well construction procedures that meet the requirements of Section R644-9-1;

(f) The status of corrective action on wells in the area of review;

(g) Each available logging and testing program data on the well required by Section R644-9-2;

(h) A demonstration of mechanical integrity required by Section R644-14-1;

(i) Any updates to the proposed area of review and corrective action plan, testing and monitoring plan, injection well plugging plan, post-injection site care and site closure plan, or the emergency and remedial response plan submitted under Subsection R644-12-1(1) that are necessary to address new information collected during logging and testing of the well and the formation as required by this section, and any updates to the alternative post-injection site care timeframe demonstration

submitted under this section, that are necessary to address new information collected during the logging and testing of the well and the formation as required by Section R644-9-2; and

(j) Any additional information requested by the division.

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R644. Natural Resources, Oil, Gas and Mining; Carbon Sequestration.
R644-11. Operations.
R644-11-1. Injection Well Operating Requirements.

(1) Except during stimulation, the injection well shall be operated so that the injection-induced pressure in each injection zone does not exceed 90% of the fracture pressure of that injection zone so as to ensure that the injection does not initiate new fractures or propagate existing fractures in the injection zone. In no case may injection pressure initiate fractures in the confining zone or cause the movement of injection or formation fluids that endangers a USDW. Pursuant to requirements in Subsection R644-4-3(1)(q), each stimulation program must be approved by the division as part of the permit application and incorporated into the permit.

(2) Injection between the outermost casing protecting USDWs and the wellbore is prohibited.

(3) The operator must fill the annulus between the tubing and the long string casing with a non-corrosive fluid approved by the division. The operator must maintain on the annulus a pressure that exceeds the operating injection pressure, unless the division determines that such a requirement might harm the integrity of the well or endanger USDWs. A request to operate the well at a reduced annulus pressure must be in writing and approved by the division.

(4) Other than during periods of well workover maintenance approved by the division where the sealed tubing-casing annulus is disassembled for maintenance or corrective procedures, the operator must maintain mechanical integrity of the injection well at all times.

(5) Continuous recording devices shall be installed, used, and maintained in proper working order for each well.

(a) Continuous recording devices shall monitor:

(i) Surface injection and bottomhole pressure;

(ii) Flow rate, volume, mass, and temperature of the carbon dioxide stream;

(iii) Tubing-casing annulus pressure and annulus fluid volume; and

(iv) Any other data specified by the division.

(b) Continuous recordings shall consist of digital recordings. Instruments shall be weatherproof or housed in weatherproof enclosures when located in areas exposed to climatic conditions.

(6) Alarms and Automatic Shutdown Systems

(a) Alarms and automatic shut-off systems designed to actuate on exceedance of a predetermined monitored condition shall be installed and maintained in proper working order as follows:

(i) Alarms and automatic surface shut-off valves or, at the discretion of the division, down-hole shut-off systems, such as automatic shut-off, check valves, or other mechanical devices, that provide equivalent protection; and

(ii) Each alarm must be integrated with any automatic shut-off system. If a shut-off is triggered or a loss of mechanical integrity is discovered, the operator must immediately investigate and identify as expeditiously as possible the cause of the shut-off. If, upon such investigation, the well is lacking mechanical integrity, or if monitored well parameters indicate that the well may be lacking mechanical integrity, the operator must:

(iii) Immediately cease injection;

(iv) Take all steps reasonably necessary to determine whether there may have been a release of the injected carbon dioxide stream or formation fluids into any unauthorized zone;

(v) Notify the division within 24 hours;

(vi) Restore and demonstrate mechanical integrity to the satisfaction of the division prior to resuming injection; and

(vii) Notify the division when injection can be expected to resume.

(7) Wellhead Identification

(a) An identifying sign shall be placed at the wellhead of each injection well and shall include, at a minimum, the operator's name, well name and number, well API number, section-township-range, and any other information required by the division. The sign shall be of durable construction with all lettering kept in a legible condition.

(8) Well Workovers. No well remedial work, well maintenance or repair, well or injection formation stimulation, well plug and abandonment or temporary abandonment, any other test of the injection well conducted by the operator, or well work of any kind, shall be done without prior written authorization from the division. The operator shall submit a work permit request form through sundry notification to seek well workover authorization.

(9) Pressure gauges that show surface and downhole pressure on the injection tubing and surface pressure on the tubing-casing annulus shall be installed at each wellhead. Each gauge shall be properly calibrated, maintained in good working order, and readable upon inspection.

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R644. Natural Resources, Oil, Gas and Mining; Carbon Sequestration.
R644-12. Emergency Response.
R644-12-1. Emergency and Remedial Response.

(1) As part of the permit application, the operator must provide the division with an emergency and remedial response plan that describes actions the operator must take to address movement of the injection or formation fluids that may cause an endangerment to a USDW during construction, operation, and post-injection site care periods. The requirement to maintain and implement an approved plan is directly enforceable regardless of whether the requirement is a condition of the permit.

(2) If the operator obtains evidence that the injected carbon dioxide stream and associated pressure front may cause an endangerment to a USDW, the operator must:

(a) Immediately cease injection;

(b) Take all steps reasonably necessary to identify and characterize any release;

(c) Notify the division within 24 hours; and

(d) Implement the emergency and remedial response plan approved by the division.

(3) The division may allow the operator to resume injection prior to remediation if the operator demonstrates that the injection operation will not endanger USDWs.

(4) The operator shall review the emergency and remedial response plan developed under Subsection (1) at least once every five years. Based on this review, the operator shall submit an amended emergency and remedial response plan or demonstrate to the division that no amendment to the emergency and remedial response plan is needed. Any amendments to the emergency and remedial response plan must be approved by the division, must be incorporated into the permit, and are subject to the permit modification requirements Rule R644-7, as appropriate. Amended plans or demonstrations shall be submitted to the division as follows:

(a) Within one year of an area of review reevaluation;

(b) Following any significant changes to the CO2 Sequestration facility, such as addition of injection or monitoring wells, on a schedule determined by the division; or

(c) When required by the division.

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R644. Natural Resources, Oil, Gas and Mining; Carbon Sequestration.
R644-13. Testing and Monitoring.
R644-13-1. Testing and Monitoring Requirements.

(1) The operator of a Class VI well shall 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 requirement to maintain and implement an approved plan is directly enforceable regardless of whether the requirement is a condition of the permit. The testing and monitoring plan shall be included with the permit application and shall include a description of how the operator will meet these requirements, including accessing sites for any necessary monitoring and testing during the life of the project. Testing and monitoring associated with geologic sequestration projects shall include, at a minimum:

(a) analysis of the carbon dioxide stream with sufficient frequency to yield data representative of its chemical and physical characteristics;

(b) installation and use of continuous recording devices to monitor injection pressure, rate, and volume; the pressure on the tubing-casing annulus; and the annulus fluid volume added. Continuous monitoring is not required during well workovers;

(c) corrosion monitoring of the well materials for loss of mass, thickness, cracking, pitting, and other signs of corrosion, that shall be performed on a quarterly basis to ensure that the well components meet the minimum standards for material strength and performance set forth in Subsection R644-9-1(5), by:

(i) analyzing coupons of the well construction materials placed in contact with the carbon dioxide stream;

(ii) routing the carbon dioxide stream through a loop constructed with the material used in the well and inspecting the materials in the loop; or

(iii) using an alternative method approved by the division;

(d) periodic monitoring of the groundwater quality and geochemical changes above each confining zone that may be a result of carbon dioxide movement through the confining zone or additional identified zones including:

(i) the location and number of monitoring wells based on specific information about the geologic sequestration project, including injection rate and volume, geology, the presence of artificial penetrations, and other factors; and

(ii) the monitoring frequency and spatial distribution of monitoring wells based on baseline geochemical data that has been collected under Subsection R644-4-3(1)(n) and on any modeling results in the area of review evaluation required by Subsection R644-8-2(3).

(e) a demonstration of mechanical integrity pursuant to Subsection R644-14-1(3) at least once every 12 months until the injection well is permanently plugged and abandoned and, if required by the division, a casing inspection log pursuant to Subsection R644-14-1(4) at a frequency established in the testing and monitoring plan;

(f) a pressure fall-off test at least once every five years unless more frequent testing is required by the division based on site-specific information;

(g) testing and monitoring to track the extent of the carbon dioxide plume and the presence or absence of elevated pressure, by using:

(i) direct methods in each injection zone; and

(ii) indirect methods, such as seismic, electrical, gravity, or electromagnetic surveys or down-hole carbon dioxide detection tools, unless the division determines that such methods are not appropriate, based on site-specific geology;

(h) the division may require surface air monitoring and soil gas monitoring to detect movement of carbon dioxide that could endanger a USDW;

(i) design of Class VI surface air monitoring and soil gas monitoring shall be based on potential risks to USDWs within the area of review;

(ii) the monitoring frequency and spatial distribution of surface air monitoring and soil gas monitoring shall be decided using baseline data, and the monitoring plan shall describe how the proposed monitoring will yield useful information on the area of review delineation and compliance with standards under Section R644-2-3;

(iii) if an operator demonstrates that monitoring employed under 40 CFR 98.440 to 98.449 accomplishes the goals of Subsections (h)(i) and (h)(ii), and meets the requirements pursuant to Subsection R644-15-1(b)(iv), a regulatory agency that requires surface air or soil, or both, gas monitoring shall approve the use of monitoring employed under 40 CFR 98.440 to 98.449. Compliance with 40 CFR 98.440 to 98.449 pursuant to this provision is considered a condition of the CO2 Sequestration facility and Class VI permits;

(i) any additional monitoring, as required by the division, necessary to support, upgrade, and improve computational modeling of the area of review evaluation required under Subsection R644-8-2(3)(a) and as necessary to demonstrate that there is no movement of fluid containing any contaminant into USDWs in exceedance of any primary drinking water regulation under 40 CFR 144.12;

(j) the operator shall periodically review the testing and monitoring plan to incorporate monitoring data collected under this rule, operational data collected under Rule R644-11, and the most recent area of review reevaluation performed under Subsection R644-8-3(2). In no case shall the operator review the testing and monitoring plan less often than once every five years. Based on this review, the operator shall submit an amended testing and monitoring plan or demonstrate to the division that no amendment to the testing and monitoring plan is needed. Any amendments to the testing and monitoring plan shall be approved by the division, shall be incorporated into the permit, and are subject to the permit modification requirements in Rule R644-7, as appropriate. Amended plans or demonstrations shall be submitted to the division as follows:

(k) within 12 months of an area of review reevaluation;

(i) following any significant changes to the CO2 Sequestration facility, such as the addition of monitoring wells or newly permitted injection wells within the area of review, on a schedule determined by the division; or

(ii) when required by the division.

(l) a quality assurance and surveillance plan for each testing and monitoring requirement.

R644-13-2. Monitoring and Records.

(1) Samples and measurements taken for monitoring shall be representative of the monitored activity.

(2) The operator shall retain records of all monitoring information, including the following:

(a) Calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation, copies of all reports required by this permit, and records of all data used to complete the application for this permit, for a period of at least three years from the date of the sample, measurement, report, or application. This period may be extended by request of the division at any time; and

(b) The nature and composition of each injected fluid until three years after the completion of any plugging and abandonment procedures specified under Rule R644-16. The division may require the operator to deliver the records to the division at the conclusion of the retention period.

(3) Records of monitoring information shall include:

(a) The date, exact place, and time of sampling or measurements;

(b) The individual who performed the sampling or measurements;

(c) The date analyses were performed;

(d) The individual who performed the analyses;

(e) The analytical techniques or methods used; and

(f) The results of such analyses.

(4) Operators of Class VI wells shall retain records as specified in Subsections R644-8-3(4), R644-15-1(4), R644-16-1(5), R644-17-1(6), and R644-17-1(7).

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R644. Natural Resources, Oil, Gas and Mining; Carbon Sequestration.
R644-14. Mechanical Integrity.
R644-14-1. Mechanical Integrity.

(1) A Class VI well has mechanical integrity if:

(a) there is no significant leak in the casing, tubing, or packer; and

(b) there is no significant fluid movement into a USDW through channels adjacent to the injection wellbore.

(2) To evaluate the absence of significant leaks, the operator shall:

(a) perform an annulus pressure test:

(i) after initial well construction or conversion as part of the pre-operating requirements;

(ii) at least once every 12 months to a pressure equal to the maximum authorized injection pressure or to 1,000 psi, whichever is greater.

(b) continuously monitor injection pressure, rate, injected volumes; pressure on the annulus between tubing and long-string casing; and annulus fluid volume as specified in Subsection R644-11-1(5).

(3) At least once every 12 months, the operator shall use one of the following methods to determine the absence of significant fluid movement:

(a) an approved tracer-type survey such as a radioactive tracer, oxygen-activation log, or similar tool; or

(b) a temperature or noise log.

(4) If required by the division, the operator shall run a casing inspection log at a frequency specified in the testing and monitoring plan at Rule R644-13 to determine the presence or absence of corrosion in the long-string casing.

(5) The division may require additional tests to evaluate mechanical integrity of the well.

(a) The division may allow the use of a test to demonstrate mechanical integrity other than those listed in Subsections (1) through (5) with written approval of the USEPA. To obtain approval for the use of a new mechanical integrity test, the operator shall submit a written request to the division with details of the proposed test and all technical data supporting its use, and the division will submit a written request to the USEPA.

(6) In conducting and evaluating the tests enumerated in this section or others to be allowed by the division, the operator and the division shall apply methods and standards generally accepted in the industry. When the operator reports the results of mechanical integrity tests to the division, a description of the tests and methods used shall be included. In making the evaluation, the division shall review monitoring and other test data submitted since the previous evaluation. The division may require additional or alternative tests if the mechanical integrity test results presented are not satisfactory to the division to demonstrate that there is no significant leak in the casing, tubing, or packer, or to demonstrate that there is no significant movement of fluid into a USDW resulting from the injection activity.

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R644. Natural Resources, Oil, Gas and Mining; Carbon Sequestration.
R644-15. Reporting.
R644-15-1. Reporting Requirements.

(1) The operator shall provide, at a minimum, the following reports to the division, for each Class VI well located within the permitted CO2 Sequestration facility:

(a) semi-annual reports containing:

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

(ii) monthly average, maximum, and minimum values for injection pressure, flow rate and volume, and annular pressure;

(iii) a description of any event that exceeds operating parameters for annulus pressure or injection pressure specified in the permit;

(iv) a description of any event that triggers a shut-off device required by Subsection R644-11-1(6) and the response taken;

(v) the monthly volume and mass of the carbon dioxide stream injected over the reporting period and the volume injected cumulatively over the life of the project;

(vi) monthly annulus fluid volume added;

(vii) the results of monitoring prescribed under Rule R644-13; and

(viii) the raw operating data from the continuous recording devices prescribed by Subsection R644-11-1(5) submitted in digital format;

(b) report, within 30 days, the results of:

(i) periodic tests of mechanical integrity;

(ii) any well workover; and

(iii) any other test of the injection well conducted by the operator if required by the division;

(c) report, within 24 hours:

(i) any evidence that the injected carbon dioxide stream or associated pressure front may cause an endangerment to a USDW; any noncompliance with a permit condition, or malfunction of the injection system, that may cause fluid migration into or between USDWs;

(ii) any triggering of a shut-off system, such as down-hole or at the surface;

(iii) any failure to maintain mechanical integrity; or

(iv) any release of carbon dioxide to the atmosphere or biosphere pursuant to compliance with the requirement at Subsection R644-13-1(h) for surface air monitoring and soil gas monitoring or other monitoring technologies, if required by the division.

(d) noncompliance Reporting:

(i) the operator shall report to the division, within 24 hours, any noncompliance that may endanger health or the environment. The report shall include any pertinent information regarding the noncompliance and steps taken to resolve the incident. The following additional information shall be included:

(A) any monitoring or other information that indicates that any contaminant 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.

(ii) when the operator becomes aware of additional relevant information regarding the noncompliance, they shall promptly submit such facts and information.

(iii) a written submission shall also be provided within five days of the time the operator becomes aware of the circumstances and shall contain a description of the noncompliance and its cause; the period of noncompliance, including exact dates and times, and if the noncompliance has not been corrected, the anticipated time it is expected to continue; and steps taken or planned to reduce, eliminate, and prevent reoccurrence of the noncompliance.

(2) The operator must notify the division in writing 30 days in advance of doing any well workover, formation testing, or planned stimulation activities as required in Subsection R644-11-1(8).

(3) The operator shall submit all required reports, submittals, and notifications under Title R644 to the USEPA in an electronic format approved by that agency.

(4) Records shall be retained by the operator as follows:

(a) data collected for CO2 Sequestration facility permit applications in Rules R644-4 and R644-10 shall be retained throughout the life of the geologic sequestration project and at least 10 years following site closure.

(b) data on the nature and composition of each injected fluid collected under Subsection R644-13-1(1)(a) shall be retained at least 10 years after site closure. The division may require the operator to deliver the records to the division at the conclusion of the retention period.

(c) monitoring data collected under Subsections R644-13-1(1)(b) and (1)(i) shall be retained at least 10 years after it is collected.

(d) well plugging reports, post-injection site care data, including, if appropriate, data and information used to develop the demonstration of the alternative post-injection site care timeframe, and the site closure report collected pursuant to requirements at Subsections R644-17-1(5) and (7) shall be retained at least 10 years following site closure.

(e) the division may require the owner or operator to retain any records required under this rule for longer than 10 years after site closure.

R644-15-2. Recordkeeping.

An operator of a Class VI well shall retain their records as specified in Subsections R644-8-3(4) and R644-17-1(5), R644-17-1(6), and R644-17-1(8).

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R644. Natural Resources, Oil, Gas and Mining; Carbon Sequestration.
R644-16. Well Plugging and Abandonment.
R644-16-1. Well Plugging and Abandonment.

(1) A CO2 Sequestration facility permit shall include an acceptable plugging plan for each Class VI well that meets the requirements set forth in this section and in Section R649-3-24 as appropriate, and shall be incorporated into the permit as a permit condition.

(2) Prior to well plugging, the operator must flush each Class VI well with a buffer fluid, determine bottomhole reservoir pressure, and perform a final external mechanical integrity test.

(3) Well Plugging Plan. The operator of a Class VI well shall prepare, maintain, and comply with a plan 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. The well plugging plan shall be submitted as part of the permit application and shall include the following minimum information:

(a) appropriate tests or measures for determining bottomhole reservoir pressure;

(b) appropriate testing methods to ensure external mechanical integrity as specified in Rule R644-14;

(c) the type and number of plugs to be used;

(d) the placement of each plug, including the elevation of the top and bottom of each plug;

(e) the type, grade, yield, and quantity of material, such as cement, to be used in plugging. The material must be compatible with the carbon dioxide stream;

(f) the method of placement of the plugs;

(g) pre-closure and proposed post-closure well schematics;

(h) that each plug shall be appropriately tagged and tested for seal and stability;

(i) that the well casings shall be cut at least five feet below ground surface.

(j) that upon successful completion of well closure, a steel plate shall be welded across all casings and inscribed with the well name, location, API number, date plugged and abandoned, operator name; and

(k) any additional information that the division may require.

(4) Notice of Intent to Plug. The operator must notify the division in writing, at least 60 days before plugging a well. The division may allow for a shorter notice period. If any changes have been made to the original well plugging plan, the operator shall provide the revised plugging plan. Any amendments to the plugging plan shall be approved by the division and shall be incorporated into the permit, and are subject to the permit modification requirements.

(5) Well Closure Report. The operator shall submit a plugging report to the division within 30 days after well plug and abandonment. The report shall be certified as accurate by the operator and by the person charged with overseeing the plugging operation. The operator shall retain the well closure report at least 10 years following site closure.

(6) Abandonment of wells. The removal of injection equipment or failure to operate an injection well for one year constitutes abandonment of the well. An abandoned well shall be plugged in accordance with the plugging plan and its location shall be reclaimed.

(a) After a cessation of operations of two years, the operator shall plug and abandon the well in accordance with the plugging plan unless they receive approval for temporarily abandoned status described in Subsection (b).

(b) At the request of the operator and approval by the division, temporarily abandoned status may be granted for a period of up to five years. If, at the end of the five years, the well has not been returned to active status, the operator shall plug the well and reclaim its location in accordance with the plugging plan.

(c) Upon approval of temporarily abandoned status, the well's perforations shall be isolated and all mechanical integrity conditions shall be met as set forth in Rule R644-14.

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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.

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R644. Natural Resources; Oil, Gas and Mining; Carbon Sequestration.
R644-18. Administrative Penalties.
R644-18-1. General Information on Authority and Procedures.

(1) Objectives and Enforcement Authority. Pursuant to Section 40-11-24, Geologic Carbon Storage administrative penalties are assessed by the process described under Section 40-6-11 of the Utah Oil and Gas Conservation Act to deter violations and to ensure compliance with geologic carbon storage statutes and rules. The division shall have any enforcement rights or procedures allowed under Title 40, Chapter 11, Geologic Carbon Storage.

(2) How Assessments are Made. The division shall appoint an assessment officer to review each unabated notice of violation in accordance with the assessment procedures described in Rule R644-18 to determine whether an administrative penalty shall be assessed and the amount of the penalty.

(3) Compliance Conference. A person may request a compliance conference with an authorized representative of the division to review the compliance status of any condition or practice at any operation.

(a) A compliance conference may not change the required abatement period contained in a notice of violation.

(b) The division shall grant any request for a compliance conference received within the abatement period contained within a notice of violation.

(c) The division may accept or reject any good faith request to conduct a compliance conference received after the abatement period contained within a notice of violation.

R644-18-2. Provisions of State Enforcement.

(1) Notice of Violation.

(a) During any division inspection, including a record review, if the division determines that a violation exists that does not cause imminent danger or harm, the division may issue a notice of violation to the owner and operator fixing a reasonable time, not to exceed 90 calendar days, for the abatement of the violation and providing opportunity for a hearing before the division. Any hearing will follow the division's rules for informal adjudicative proceedings, as articulated in Section R649-10-3.

(b) A notice of violation shall be issued in writing, signed by an authorized representative of the division, and shall set forth with reasonable specificity:

(i) the nature of the violation;

(ii) the remedial action required, which may include interim required actions;

(iii) a reasonable time for abatement; and

(iv) a reasonable description of the portion of the carbon sequestration operation that it applies to.

(c) The division may extend the time set for abatement or for accomplishment of an interim step if the failure to meet the time previously set was not caused by lack of diligence on the part of the person. The total time for abatement under a notice of violation, including any extensions, may not exceed 90 calendar days from the date of issuance except as provided for in Subsection (e).

(d) The division will terminate a notice of violation by written notice to the owner or operator when the division determines that violations listed in the notice of violation have been abated. If any violations have been abated within the time for abatement provided in the notice of violation, then no administrative penalty shall be assessed. Termination of a notice of violation will not affect the right of the division to assess administrative penalties for those violations that the owner or operator failed to abate within the time for abatement provided in the notice of violation.

(e) Circumstances that may qualify a carbon sequestration operation for an abatement period of more than 90 days are:

(i) where climatic conditions preclude complete abatement within 90 days;

(ii) where due to climatic conditions, abatement within 90 days would clearly cause more harm than it would prevent;

(iii) where the operator's action to abate the violation within 90 days would violate safety standards; or

(iv) other circumstances beyond the control of the operator as deemed by the division.

(2) Division Enforcement Order.

(a) When a notice of violation has been issued and the operator fails to abate the violation within the abatement period, then the division shall issue a division enforcement order. A division enforcement order shall require the person to take each step the division deems necessary to abate the violations covered by the order in the most expeditious manner possible.

(b) A division enforcement order issued shall be in writing, signed by the authorized representative of the division who issued it, and shall set forth with reasonable specificity:

(i) the nature of the violation;

(ii) the remedial action or affirmative obligation required, including interim required actions, if appropriate;

(iii) the time established for abatement;

(iv) a reasonable description of the portion of the carbon sequestration operation to which it applies; and

(v) that the order shall remain in effect until the violation has been abated or until vacated, modified or terminated in writing by the division.

(c) Activities intended to protect public health, safety, and welfare and prevent resource detriment will continue during the period of any order unless otherwise provided.

(d) The division may modify, terminate, or vacate a division enforcement order or cessation order for good cause and may extend the time for abatement if the failure to abate within the time previously set was not caused by lack of diligence on the part of the person.

(e) The division will terminate a division enforcement order or cessation order by written notice to the person, when it is determined that the conditions, practices, or violations listed in the order have been abated. If the violations have been abated within the time for abatement provided in the division enforcement order, then no administrative penalty shall be assessed. Termination of a division enforcement order will not affect the right of the division to assess administrative penalties for those violations that the person failed to abate within the time for abatement provided in the notice of violation.

(3) Service of Notices of Violation, Division Enforcement Order and Administrative Penalties.

(a) Notices of violation, division enforcement orders, and proposed administrative penalties assessment shall be served on the person promptly after issuance by one of the following methods:

(i) personal service, in accordance with the Utah Rules of Civil Procedure, Rule 4. Service shall be effective on the date of personal service.

(ii) first posting a copy of the notice at the carbon sequestration operation location or offices of the place of violation, and thereafter by personally delivering or mailing a copy by certified mail to the person at the last address provided to the division.

Service shall be complete upon personal delivery or three days after the date of mailing.

(b) Service on the person shall be sufficient if service is made upon:

(i) an officer of a corporation;

(ii) the person designated by law for service of process, or the registered agent for the corporation; or

(iii) an owner, or partner of an entity other than a corporation.

(c) Proof of Service.

(i) Proof of personal service shall be made in accordance with the Utah Rules of Civil Procedure, Rule 4.

(ii) Proof of posting or personal delivery may be made by a signed written statement of the person effecting posting or personal delivery stating the date, time, and place of posting, and, if personal delivery, the person to whom the notice was delivered.

(4) Emergency Orders

(a) The division director may immediately issue an emergency order, including an order to cease and desist if appropriate, in accordance with Section 40-11-24 if, during any division inspection, it finds any violation, which creates an immediate threat to public health or welfare.

R644-18-3. Administrative Penalty Assessment.

(1) General. Any person who violated Title 40, Chapter 11, Geologic Carbon Storage, a division rule, board order, or permit may be subject to an administrative penalty.

(2) Maximum Administrative Penalty Amounts.

(a) An administrative penalty on any person may not exceed $5,000 per day for each day of a violation.

(b) If the board determines that a violation is a willful violation, the board may impose an administrative penalty on that person not to exceed $10,000 for each day of the violation.

(c) Administrative penalties assessed by the division or the board may not exceed $200,000 per violation per person.

(3) Days of Violation. The duration of a violation shall be calculated in days as follows:

(a) a reporting or other minor violation that presents low direct risk or threat of harm to public health, safety, and welfare, begins on the day that the report should have been made or other required action should have been taken, and continues until the report is filed or the required action is completed to the division's satisfaction.

(b) violations that present a possibility of distinct, identifiable actual or threatened adverse impact, or violations that present a significant probability of actual or threatened adverse impact, begin on the date the violation was discovered or should have been discovered through the exercise of reasonable care and continue until the appropriate corrective action is completed to the division's satisfaction.

(4) Penalty Calculation. The base penalty for each violation shall be calculated based on the division's penalty schedule. Each violation is initially assessed at the minor violation rate, but may be escalated to the major violation rate in accordance with Section R644-18-3.

(5) Issuance of Proposed Assessments.

(a) If a violation is not abated prior to the end of the abatement period specified for that violation, the division shall issue a proposed assessment to the person containing the penalty amount after the abatement period ends.

(i) Failure by the division to serve a proposed assessment within 30 days will not be grounds for dismissal of any part of such assessment unless the permittee or operator:

(A) proves actual prejudice as a result of the delay; and

(B) makes a timely objection to the delay.

(b) Upon abatement of the violation, or when the maximum penalty amount has been reached, the division will issue a final assessment to the person containing the final penalty amount.

(i) Failure by the division to serve a final proposed assessment within 30 days will not be grounds for dismissal of any part of such assessment unless the permittee or operator:

(A) proves actual prejudice as a result of the delay; and

(B) makes a timely objection to the delay.

(6) Violations Designated as Class 1.

(a) Violations that present a low direct risk or threat of harm to public health, safety and welfare, including:

(i) Section R644-5-3 financial responsibility violations;

(ii) Section R644-16-1 temporarily abandoned well violations;

(iii) Section R644-5-4 pollution and surface damage violations;

(iv) Section R644-17-1 site closure restoration violations;

(v) Section R644-15-1 reporting violations;

(vi) Section R644-5-6 inadequate notification violations;

(vii) Section R644-13-2 facility records for review violations; and

(viii) any other violation listed in Title R644 or Title 40, Chapter 11, Geologic Carbon Storage.

(7) Violations Designated as Class II.

(a) Violations that present a possibility of distinct, identifiable, actual or threatened adverse impacts to public health, safety, and welfare, including:

(i) Section R644-7-5 operations without a permit;

(ii) Section R644-11-1 workover without approval;

(iii) Section R644-15-1 not reporting an incident;

(iv) Sections R644-4-3 and R644-11-1 not adhering to the approved procedure or conditions on an APD or sundry notice;

(v) Section R644-5-4 violation of permit conditions;

(vi) Section R644-13-1 testing and monitoring violations;

(vii) Section R644-14-1 mechanical integrity violations;

(viii) Section R644-3-1 false reporting; and

(ix) any other violation listed in Title R644 or Title 40, Chapter 11, Geologic Carbon Storage that presents a possibility of distinct, identifiable, actual or threatened adverse impacts to public health, safety and welfare.

(8) Violations Designated as Class III.

(a) Violations that present a significant probability of actual or threatened adverse impact to public health, safety, and welfare, including:

(i) Section R644-9-1 drilling or spudding a Class VI well without approval;

(ii) Section R644-10-1 operating a Class VI well without approval;

(iii) Section R644-16-1 P&A without approval;

(iv) Section R644-5-6 injection without approval; and

(v) any other rule violation listed in Title R644 or Title 40, Chapter 11, Geologic Carbon Storage that presents a significant probability of actual or threatened adverse impact to public health, safety and welfare.

(9) Administrative Penalty Schedule.

(a) Penalty Schedule. The division's penalty schedule establishes a daily penalty based on the classification of the rule violation, Class I, II, or III as provided in Subsection (6), (7), and (8), and the degree of actual or threatened adverse impact resulting from the violation, minor or major as provided in Subsections (9)(b) and (10).

TABLE
v. Daily Penalty Schedule

Violation	Class I	Class II	Class III
Degree:			
Minor	$ 750	$ 1,500	$ 5,000
Major	$ 1,500	$ 5,000	$ 10,000

(b) Degree of actual or threatened adverse impact. A minor violation and associated penalty amount may be increased to a major violation and penalty amount based on the degree of actual or threatened adverse impact to public health, safety and welfare resulting from the violation. The division shall determine the degree of actual or threatened adverse impact to public health, safety, and welfare, based on the totality of circumstances in each case that may involve increasing a Class I violation to a Class II or Class III violation, or increasing a Class II violation to a Class III violation.

(10) Penalty Adjustments based on Aggravating and Mitigating Factors. The division shall consider aggravating and mitigating factors when determining whether a violation is minor or major. These factors shall include:

(a) Aggravating factors:

(i) The violation involved a substantial departure from the standards of ordinary care of a reasonable prudent person.

(ii) The violation was a willful violation.

(iii) The violation had a significant negative impact on human health or resource detriment.

(iv) The violator was nonresponsive to the division in correcting or responding to the violation.

(v) The violator benefited economically from the violation, in that case the amount of such benefit shall be taken into consideration.

(vi) The violator has a history of previous violations at the particular well or CO2 Sequestration facility.

(b) Mitigating factors:

(i) The violator self-reported the violation.

(ii) The violator demonstrated prompt, effective and prudent response to the violation, including assistance to any impacted parties.

(iii) The cause of the violation was outside of the violator's reasonable control and responsibility.

(iv) The violator made a good faith effort to comply with applicable requirements prior to the division learning of the violation.

(v) The violator has demonstrated a history of compliance with division rules, orders, and permits.

(vi) The violator has not been served with a notice of violation within the twenty-four-month period prior to the subject violation at issue.

(11) Repeat Violations. The division shall consider the history of previous violations at a particular well or CO2 Sequestration facility when determining an appropriate administrative penalty. If the person has three or more violations of the same minor violation in the twenty-four-month period immediately preceding the violation at issue, the minor violation shall escalate to a major violation.

(12) Unabated Violations. The division may request an emergency order from the board requiring well or CO2 Sequestration facility operations be suspended for any unabated violation where the maximum penalty amount has accrued. Operations may only resume upon abatement of the violation and payment of the penalty.

(13) Appeals. A notice of violation, division enforcement order, or administrative penalty assessment issued by the division may be appealed by filing a request for agency action with the division within 30 calendar days of the assessment following the procedures provided in Rule R649-10.

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