NOTICE OF INTENT

Department of Natural Resources
Office of Conservation

Class VI Injection Wells
(LAC 43:XVII.Chapter 6)

In accordance with the provisions of the Administrative Procedure Act, R.S. 49:950 et seq., and through the power delegated under the laws of the state of Louisiana, notice is hereby given that the Department of Natural Resources, Office of Conservation proposes to adopt Statewide Order No. 29-N-6 (LAC 43:XVII. Subpart 6, Chapter 6), to facilitate the permitting, siting, construction, operation, monitoring, and site closure of Class VI injection wells, which are used to injection carbon dioxide for the purposes of geologic sequestration.

The Department of Natural Resources, Office of Conservation proposes to adopt provisions governing the oversight of the Class VI carbon sequestration program within the Underground Injection Control (UIC) Program located within the Office of Conservation. Class VI wells are a federally-designated well class that inject carbon dioxide gas underground for long-term containment or sequestration, ultimately limiting net emissions for this greenhouse gas. The UIC Program is currently applying for primary enforcement authority from the United States Environmental Protection Agency (US EPA), modifying the UIC Program oversight to include Class VI well in addition to current oversight authority for Class I, II, III, IV, and V wells. Promulgation of Statewide Order 29-N-6 is required in order to obtain primary enforcement authority from the US EPA.

With the adoption of a new federal tax credit (IRS Section 45-Q), a large number of companies from oil and gas, utility, petrochemical, and other industries plan to construct and operate Class VI injection wells at new and existing sites in Louisiana to take advantage of 45-Q and mitigate carbon dioxide emissions. Currently, companies must submit Class VI permit applications to the US EPA. The promulgation of this proposed rule will enable the UIC Program to obtain primary enforcement authority from the US EPA so that permitting and compliance for Class VI wells will be incorporated into the UIC Program's current oversight authority for all other categories of injection wells.

Title 43

NATURAL RESOURCES

Part XVII. Office of Conservation—Injection and Mining

Subpart 6. Statewide Order No. 29-N-6

Chapter 6. Class VI Injection Wells

§601. Definitions

A. The following definitions apply to all regulations in this Chapter. Terms not defined in this Section for Class VI wells have the meaning given by R.S. (1950) Title 30, Section 1103.

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

Act—Part I, Chapter 1 of Title 30 of the Louisiana Revised Statutes.

Act 517—Act 517 of the 2009 Louisiana regular legislative session. See *Louisiana Geologic Sequestration of Carbon Dioxide Act*.

Application—the filing by a person on the Office of Conservation forms for an underground injection permit, including any additions, revisions or modifications to the forms.

Aquifer—a geological 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 Revie*w—the region surrounding the *geologic sequestration project* where USDWs may be endangered by the injection activity, and is delineated using computational modeling that accounts for the physical and chemical properties of all phases of the injected *carbon dioxide stream* and displaced fluids, and is based on available site characterization, monitoring, and operational data as set forth in §§615.B. and 615.C.

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

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

Carbon Dioxide Stream—the carbon dioxide that has been captured from an emission source (e.g., 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, Part 261.

Casing—a metallic or nonmetallic tubing or pipe of varying diameter and weight, lowered into a borehole during or after drilling in order to support the sides of the hole and thus prevent the walls form 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—the sudden and utter failure of overlying *strata* caused by removal of underlying materials.

Cementing—the operation whereby a cement slurry is pumped into a drilled hole and/or forced behind the casing.

Cesspool—a drywell that receives untreated sanitary waste containing human excreta, and which sometimes has an open bottom and/or perforated sides.

Commissioner—the Assistant Secretary of the Office of Conservation, Department of Natural Resources.

Confining Bed—a body of impermeable or distinctly less permeable material stratigraphically adjacent to one or more aquifers.

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

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

Corrective Action—the use of UIC program-approved methods to ensure that wells within the area of review do not serve as conduits for the movement of fluids into USDWs.

Disposal Well—a well used for the disposal of waste into a subsurface stratum.

Drilling Mud—heavy suspension used in drilling an injection well introduced down the drill pipe and through the drill bit.

Draft Permit— a document prepared under §611.C.1 indicating the commissioner'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 §§613.E.2 and 611.C are types of "draft permits." A denial of request for modification, revocation and reissuance, or termination, as discussed in §613.B.4 is not a draft permit.

Drywell—a well, other than an improved sinkhole or subsurface fluid distribution system, completed above the water table so that its bottom and sides are typically dry except when receiving fluids.

Effective Date—the date that the Louisiana State UIC Program is approved by the Environmental Protection Agency.

Emergency Permit—a UIC permit issued in accordance with §115 or §515.

Exempted Aquifer—an aquifer or its portion that meets the criteria of the definition of underground source of drinking water but which has been exempted according to the procedures set forth in §603.F.

Existing Injection Well or Project—an injection well or project other than a new injection well or project.

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

Facility or Activity—any facility or activity, including land or appurtenances thereto, that is subject to these regulations.

Fault—a surface or zone of rock fracture along which there has been displacement.

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

Fluid—any material or substance which flows or moves whether in a semisolid, liquid, sludge, gas or any other form or state.

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

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

Generator—any person, by site location, whose act or process produces hazardous waste identified or listed in the Louisiana Hazardous Waste Management Program; or any person or entity who generates or causes to be generated any fluid for well injection.

Geologic Storage—the long or short-term underground storage of carbon dioxide in subsurface geologic formations.

Geologic Storage Facility—See *Geologic Sequestration Site*.

Geologic Storage Site—See *Geologic Sequestration Site*.

Geologic Sequestration—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—an injection well or wells used to emplace a *carbon dioxide stream* 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 §603.F of this chapter. It includes the subsurface three-dimensional extent of the *carbon dioxide plume*, associated area of elevated pressure, and displaced fluids, as well as the surface area above that delineated region.

Geologic Sequestration Site—the underground reservoir, carbon dioxide injection wells, monitoring wells, underground equipment, and surface buildings and equipment utilized in the sequestration or storage operation, including pipelines owned or operated by the sequestration or storage operator used to transport the carbon dioxide from one or more capture facilities or sources to the sequestration or storage and injection site. The underground reservoir component of the sequestration or storage facility includes any necessary and reasonable aerial buffer and subsurface monitoring zones designated by the commissioner for the purpose of ensuring the safe and efficient operation of the storage facility for the storage of carbon dioxide and shall be chosen to protect against pollution, and escape, or migration of carbon dioxide.

Ground Water—water below the land surface in a zone of saturation.

Hazardous Waste—a hazardous waste as defined in the Louisiana Hazardous Waste Management Program.

Hazardous Waste Management (HWM) Facility—all contiguous land, and structures, other appurtenances, and improvements on the land, used for treating, storing or disposing of hazardous waste.

Improved Sinkhole—a naturally occurring karst depression or other natural crevice found in volcanic terrain and other geologic settings which have been modified by man for the purpose of directing and emplacing fluids into the subsurface.

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

Injection Interval—that part of the *injection zone* in which the well is screened or perforated or in which injected fluids are directly emplaced.

Injection Zone—a geological formation, 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 or wells associated with a geologic sequestration project.

Ionizing Radiation—any electromagnetic or particulate radiation capable of producing ions, directly or indirectly, in its passage through matter. It includes any or all of the following: alpha rays, beta rays, gamma rays, X-rays, neutrons, high-speed electrons, high-speed protons, and other atomic particles; but not sound or radio waves, or visible, infrared or ultraviolet light.

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

Louisiana Geologic Sequestration of Carbon Dioxide Act—Act 517 of 2009 at Chapter 11 of Title 30 of the Louisiana Revised Statutes of 1950,

Major Facility—any Class I or IV hazardous waste injection well facility or activity.

Manifest—the shipping document originated and signed by the generator which contains the information required by the Hazardous Waste Management Program.

New Injection Well—a well which began injection after the Louisiana Underground Injection Control program is approved and the applicable (Office of Conservation) rules and regulations are promulgated.

Operator—the person recognized as being responsible to the Office of Conservation for the well, site, facility, or activity subject to regulatory authority under these rules and regulations. The *operator* can, but need not be, the *owner* of the well, site, facility, or activity.

Owner—the person that owns any well, site, facility, or activity subject to regulation under the UIC program. The *owner* can, but need not be, the *operator* of the well, site, facility, or activity.

Packer—a device lowered into a well to produce a fluid tight seal within the casing.

Permit—an authorization, license, or equivalent control document issued by the commissioner to implement the requirements of these regulations. Permit includes, but it is not limited to, area permits and emergency permits. Permit does not include UIC authorization by rule or any permit which has not yet been the subject of final agency action, such as a draft permit.

Person—any natural person, individual, association, corporation, partnership, limited liability company, or other entity, receiver, tutor, curator, executor, administrator, fiduciary, municipality, state or federal agency, or an agent or employee of the aforementioned thereof.

Plugging—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.

Plugging Record— a systematic listing of permanent or temporary abandonment of water, oil, gas, test, exploration and waste injection wells, and may contain a well log, description of amounts and types of plugging material used, the method employed for plugging, a description of formations which are sealed and a graphic log of the well showing formation location, formation thickness, and location of plugging structures.

Point of Injection—the last accessible sampling point prior to waste fluids being released into the subsurface environment through a Class V injection well. For example, the point of injection of a Class V

septic system might be the distribution box, the last accessible sampling point before the waste fluids drain into the underlying soils. For a dry well, it is likely to be the well bore itself.

Post-Injection Site Care—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 §633.

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

Pressure Front—the zone of elevated pressure in the subsurface created by injection where there is a pressure differential sufficient to cause the movement of injected fluids or formation fluids into a USDW.

Project—a group of wells in a single operation.

Public Water System—a system for the provision to the public of piped water for human consumption, if such system has at least 15 service connections or regularly serves at least 25 individuals. Such term includes:

a. any collection, treatment, storage, and distribution facilities under control of the operator of such system and used primarily in connection with such system; and

b. any collection or pretreatment storage facilities not under such control which are used primarily in connection with such system.

Radiation—any electromagnetic or ionizing radiation including gamma rays and X-rays, alpha and beta particles, high-speed electrons, neutrons, protons and other nuclear particles; but not sound waves. Unless specifically stated otherwise, these regulations apply only to ionizing radiation.

Radioactive Material—any material, whether solid, liquid, or gas, which emits radiation spontaneously.

Radioactive Waste—any waste which contains radioactive material for which no use or reuse is intended and which is to be discarded.

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

Sanitary Waste—liquid or solid wastes originating solely from humans and human activities, such as wastes collected from toilets, showers, wash basins, sinks used for cleaning domestic areas, sinks used for food preparation, clothes washing operations, and sinks or washing machines where food and beverage serving dishes, glasses, and utensils are cleaned. Sources of these wastes may include single or multiple residences, hotels and motels, restaurants, bunkhouses, schools, ranger stations, crew quarters, guard stations, campgrounds, picnic grounds, day-use recreation areas, other commercial facilities, and industrial facilities provided the waste is not mixed with industrial waste.

Schedule of Compliance—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 the act and these regulations.

Septic System—a well that is used to emplace sanitary waste below the surface and is typically comprised of a septic tank and subsurface fluid distribution system or disposal system.

Site—the land or water area where any facility or activity is physically located or conducted including adjacent land used in connection with the facility or activity.

Site Closure—the point or time, as determined by the UIC program following the requirements under §633, at which the owner or operator of a geologic sequestration site is released from *post-injection site care* responsibilities.

Skin Effect—the blockage or plugging of the well perforations or near wellbore formation face from solids in the waste stream that results in increased injection pressures and can be measured by accepted engineering test procedures.

Sole or Principal Source Aquifer—an aquifer which is the sole or principal drinking water source for an area and which, if contaminated, would create a significant hazard to public health.

State—the state of Louisiana.

Stratum (plural *Strata*)—a single sedimentary bed or layer, regardless of thickness, that consists of generally the same kind of rock material.

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

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

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

Total Dissolved Solids—the total dissolved filterable solids as determined by use of the method specified in the 14th edition, pp. 91-92, of *Standard Methods for the Examination of Water and Waste Water*.

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

UIC—the Louisiana State Underground Injection Control Program.

Underground Injection—a well injection.

Underground Source of Drinking Water (USDW)—an aquifer or its portion:

a. which supplies any public water system; or

b. which contains a sufficient quantity of ground water to supply a public water system; and

i. currently supplies drinking water for human consumption; or

ii. contains fewer than 10,000 mg/1 total dissolved solids; and which is not an exempted aquifer.

USDW—Underground Source of Drinking Water.

USEPA—the United States Environmental Protection Agency.

Well—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; or, an improved sinkhole; or, a subsurface fluid distribution system.

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

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

Well monitoring—the measurement by on-site instruments or laboratory methods, of the quality of water in a well.

Well Stimulation—several processes 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, but may not be limited to:

a. surging;

b. jetting;

c. blasting;

d. acidizing; or

e. hydraulic fracturing.

Workover—to perform one or more of a variety of remedial operations on an injection well, such as cleaning, perforation, change tubing, deepening, squeezing, plugging back, etc.

AUTHORITY NOTE: Promulgated in accordance with R.S. 30:4 et seq., 30:22 et seq., and 30:1101 et seq.
HISTORICAL NOTE: Promulgated by the Department of Natural Resources, Injection and Mining Division, LR 46: Department of Natural Resources – Office of Conservation.

§603. General Provisions

A. Applicability. These rules and regulations apply to all owners and operators of proposed and existing Class VI injection wells and projects in the state of Louisiana.

1. The commissioner shall administer the provisions of Act 517 and these regulations promulgated thereunder for geologic sequestration of carbon dioxide.

2. The provisions of this Chapter only apply to geologic sequestration of carbon dioxide in underground reservoirs as defined in §601 above. The geologic sequestration of carbon dioxide is not permitted in solution-mined salt caverns under these provisions.

3. This provisions of this Chapter also apply to owners or operators of permit- or rule-authorized Class I, Class II, or Class V experimental carbon dioxide injection projects who seek to apply for a Class VI geologic sequestration permit for their well or wells. Owners or operators seeking to convert existing Class I, Class II, or Class V experimental wells to Class VI geologic sequestration wells must demonstrate to the commissioner that the wells were engineered and constructed to meet the requirements at §617.A.1 and ensure protection of USDWs, in lieu of requirements at §§617.A.2 and 617.B.1 By December 10, 2011, owners or operators of either Class I wells previously permitted for the purpose of geologic sequestration or Class V experimental technology wells no longer being used for experimental purposes that will continue injection of carbon dioxide for the purpose of GS must apply for a Class VI permit. A converted well must still meet all other requirements under this Chapter.

B. Prohibition of Unauthorized Injection. Any underground injection, except as authorized by a permit or rule, is prohibited after the effective date of these regulations. Construction or operation of any well required to have a permit under these regulations is prohibited until the permit has been issued.

1. Any underground injection that violates any rule of this Chapter is subject to enforcement action.

C. Classification of Injection Wells

1. Class VI. Wells not experimental in nature that are 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 the appropriate parts of §603.F.

a. During initial Class VI program development, the commissioner shall not expand the areal extent of an existing Class II enhanced oil recovery or enhanced gas recovery aquifer exemption for Class VI injection wells, and the USEPA shall not approve a program that applies for aquifer exemption expansions of Class II to Class VI exemptions as part of the program description. All Class II to Class VI aquifer exemption expansions previously issued by USEPA must be incorporated into the Class VI program descriptions pursuant to requirements at 40 CFR 145.23(f)(9).

2. Prohibition of Non-Experimental Class V Wells for Geologic Sequestration. The construction, operation or maintenance of any non-experimental Class V geologic sequestration well is prohibited.

D. Prohibition of Movement of Fluid into Underground Sources of Drinking Water

1. No authorization by permit or rule shall allow the movement of fluid containing any contaminant into underground sources of drinking water, if the presence of that contaminant may cause a violation of any primary drinking water regulation under 40 CFR part 141 or of the Louisiana Drinking Water Regulations, Chapter VIII of the State Sanitary Code or may otherwise adversely affect the health of persons. The applicant for a permit shall have the burden of showing that the requirements of this Section are met.

2. For Class VI wells, if any water quality monitoring of a USDW indicates the movement of any contaminant into the USDW, except as authorized under §603.F, the commissioner shall prescribe such additional requirements for construction, corrective action, operation, monitoring, or reporting (including closure of the injection well) as are necessary to prevent such movement. In the case of wells authorized by permit, these additional requirements shall be imposed by modifying the permit in accordance with §613.C, or the permit may be terminated under §613.E if cause exists, or appropriate enforcement action may be taken if the permit has been violated. In the case of wells authorized by rule, see §603.E.1.

3. If at any time the commissioner learns that a Class VI well may cause a violation of the Louisiana Drinking Water Regulations, Chapter XII of the State Sanitary Code or may be otherwise adversely affecting the health of persons, he shall:

a. require the injector to obtain a permit;

b. order the injector to take such actions (including, where required, closure of the injection well) as may be necessary to prevent the violation or adverse effect; or

c. take enforcement action.

4. Notwithstanding any other provision of this Section, the commissioner may take emergency action upon receipt of information that a contaminant which is present in or likely to enter a public water system or underground source of drinking water may present an imminent and substantial endangerment to the health or safety of persons.

E. Authorization of Underground Injection by Rule

1. Class VI wells cannot be authorized by rule to inject carbon dioxide. Owners or operators of Class VI wells must obtain a permit.

a. Any authorization by rule for an existing Class II enhanced recovery or hydrocarbon storage well shall expire upon the effective date of a Class VI permit issued pursuant to §603.G., or well plug and abandonment according to an approved plug and abandonment plan, or upon well conversion.

F. Identification of Underground Sources of Drinking Water and Exempted Aquifers

1. The commissioner may identify (by narrative description, illustrations, maps, or other means) and shall protect as an underground source of drinking water, all aquifers or parts of aquifers which meet the definition of an underground source of drinking water, except where there is an applicable aquifer exemption under §§603.F.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 §603.F.4. Other than approved aquifer exemption expansions that meet the criteria set forth in §603.F.2.d, new aquifer exemptions shall not be issued for Class VI injection wells. Even if an aquifer has not been specifically identified by the commissioner, it is an underground source of drinking water if it meets the definition.

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

a. the aquifer does not currently serve as a source of drinking water; and

b. the aquifer cannot now and will not in the future serve as a source of drinking water because:

i. it is mineral, hydrocarbon or geothermal energy producing or can be demonstrated by a permit applicant as part of a permit application for a 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 which 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 that 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 ground water is more than 3,000 and less than 10,000 mg/1 and it is not reasonably expected to supply a public water system.

d. 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 §103.F.4 if it meets the following criteria:

i. it does not currently serve as a source of drinking water; and

ii. the total dissolved solids content of the ground water 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 state's 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 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 Class VI Wells. Operators of Class II enhanced oil recovery or enhanced gas recovery wells may request that the

commissioner 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 state'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 and/or geometric terms (such as vertical and lateral limits and gradient) that are clear and definite, all aquifers or parts thereof that are requested to be designated as exempted using the criteria in §603.F.2.d.

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 the purpose of Class VI injection, the commissioner must determine that the request meets the criteria for exemptions. In making the determination, the commissioner 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, in order 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.

G Transitioning from Class II to Class VI

1. Operators of wells used to inject carbon dioxide for the primary purpose of long-term storage into an oil or gas reservoir must apply for and obtain a Class VI geologic sequestration permit when there is an increased risk to USDWs compared to Class II operations. The factors specified in §603.G.2 below must be considered in determining if there is an increased risk to USDWs.

2 The commissioner shall determine when there is an increased risk to USDWs compared to Class II operations and when a Class VI permit is required. The commissioner must consider the following in order to make this determination:

a. increase in reservoir pressure within the injection zone(s);

b. increase in carbon dioxide injection rates;

c. decrease in reservoir production rates;

d. distance between the injection zone(s) and USDWs;

e. suitability of the Class II enhanced oil or gas recovery area of review delineation;

f. quality of abandoned well plugs within the area of review;

g. the owner's or 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 commissioner.

H. Additional Requirements.

1. All tests, reports, logs, surveys, plans, applications, or other submittals whether required by these rules and regulations or submitted for informational purposes are required to bear the Louisiana Office of Conservation serial number of any Class VI carbon dioxide sequestration well associated with the submittal.

2. All applications, reports, plans, requests, maps, cross-sections, drawings, opinions, recommendations, calculations, evaluations, or other submittals including or comprising geoscientific work as defined by La. R.S. 37:711.1 et seq. must be prepared, sealed, signed, and dated by a licensed Professional Geoscientist (P.G.) authorized to practice by and in good standing with the Louisiana Board of Professional Geoscientists.

3. All applications, reports, plans, requests, specifications, details, calculations, drawings, opinions, recommendations, evaluations or other submittals including or comprising the practice of engineering as defined by La. R.S. 37:681 et seq. must be prepared, sealed, signed, and dated by a licensed Professional Engineer (P.E.) authorized to practice by and in good standing with the Louisiana Professional Engineering and Land Surveying Board.

4. The commissioner may prescribe additional requirements for Class VI wells or projects in order to protect USDWs and the health, safety, and welfare of the public.

I. Confidentiality of Information. Information obtained by any rule, regulations, order, or permit term or condition adopted or issued hereunder, or by any investigation authorized thereby, shall be available to the public, unless nondisclosure is requested in writing and such information is determined by the commissioner to require confidentiality to protect trade secrets, processes, operations, style of work, apparatus, statistical data, income, profits, losses, or in order to protect any plan, process, tool, mechanism, or compound; provided that such nondisclosure shall not apply to information that is necessary for use by duly authorized officers or employees of state or federal government in carrying out their responsibilities under these regulations or applicable federal or state law. If no claim is made at the time of submission, the commissioner may make the information available to the public without further notice. Claims of confidentiality for the following information shall be denied:

1. the name and address of any permit applicant or permittee; and

2. information which deals with the existence, absence, or level of contaminants in drinking water or zones other than the approved injection zone.

AUTHORITY NOTE: Promulgated in accordance with R.S. 30:4 et seq., 30:22 et seq., and 30:1101 et seq.
HISTORICAL NOTE: Promulgated by the Department of Natural Resources, Injection and Mining Division, LR 46: Department of Natural Resources – Office of Conservation.

§605. Permit Requirements, Application, Signatories

A. Applicability. The rules and regulations of this Section apply to all Class VI injection wells or project applications required to be filed with the Department of Natural Resources (Office of Conservation) for authorization under R.S. 1950 Title 30.

B. The commissioner cannot issue a permit on an area basis for a Class VI well or permit.

C. Application Required

1. Permit Application. New applicants, permittees, and any person required to have a permit shall complete, sign, and submit an application to the commissioner as described in this Section.

a. the applicant shall submit one signed paper version of the application and an exact duplicate of the application in an electronic format approved by the commissioner. The commissioner may request additional paper copies of the application—either in its entirety or in part—as needed.

b. the electronic version of the application shall contain the following certification statement:

> This document is an electronic version of the application titled *(Insert Document Title)* dated *(Insert Application Date)*. This electronic version is an exact duplicate of the paper copy submitted in *(Insert the Number of Volumes Comprising the Full Application)* to the Louisiana Office of Conservation.

c. The applicant shall submit the application identified in §605.C.1 above to the USEPA in an electronic format approved by the USEPA.

2. Time to Apply. Any person who performs or proposes an underground injection for which a permit is or will be required shall submit an application to the commissioner.

a. for new Class VI injection wells, a reasonable time before construction is expected to begin.

D. Who Applies. It is the duty of the owner of a facility or activity to submit an application for permit. When a facility is owned by one person and operated by another, it is the operator's duty to obtain a permit.

E. Signature Requirements. All permit applications shall be signed as follows.

1. Corporations. By a principal executive officer of at least the level of vice-president, or duly authorized representative of that person if the representative performs similar policy making functions for the corporation. A person is a duly authorized representative only if:

a. the authorization is made in writing by a principle executive officer of at least the level of vice-president;

b. the authorization specifies either an individual or position having responsibility for the overall operation of a sequestration well, such as the position of plant manager, superintendent, or position of equivalent responsibility. A duly authorized representative may thus be either a named individual or any individual occupying a named position; and

c. the written authorization is submitted to the Office of Conservation.

2. Limited Liability Company (LLC). By a member if the LLC is member-managed, by a manager if the LLC is manager-managed, or by a duly authorized representative only if:

a. the authorization is made in writing by an individual who would otherwise have signature authority as outlined in §605.E.2 above;

b. the authorization specifies either an individual or position having responsibility for the overall operation of a sequestration well, such as the position of plant manager, superintendent, or position of equivalent responsibility. A duly authorized representative may thus be either a named individual or any individual occupying a named position; and

c. the written authorization is submitted to the Office of Conservation.

3. Partnership or Sole Proprietorship. By a general partner or proprietor, respectively; or

4. Public Agency. By either a principal executive officer or a ranking elected official of a municipality, state, federal, or other public agency.

F. Signature Reauthorization. If an authorization under §605.E is no longer accurate because a different individual or position has responsibility for the overall operation of a sequestration well, a new authorization satisfying the signature requirements must be submitted to the Office of Conservation before or concurrent with any reports, information, or applications required to be signed by an authorized representative.

G. Certification. Any person signing a document under §605.E shall make the following certification on the application:

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

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§607. Application Content

A. The following minimum information required in §607 shall be submitted with a permit application to construct a new Class VI well or convert any existing well for Class VI service. The applicant shall also refer to the appropriate application form for any additional information that may be required. For information already on file with the office of conservation, the commissioner may accept the required information by reference provided they are current, readily available to the commissioner, and sufficiently identified to be retrieved.

B. Administrative information:

1. all required state application form(s);

2. the nonrefundable application fee(s) as per LAC 43:XIX.Chapter 7 or successor document;

3. the name and mailing address of the applicant and the physical address of the sequestration well facility;

4. the operator's name, address, telephone number, and email address;

5. ownership status, and status as federal, state, private, public, or other entity;

6. a brief description of the nature of the business associated with the activity;

7. the activity or activities conducted by the applicant which require the applicant to obtain a permit under these regulations;

8. up to four SIC Codes which best reflect the principal products or services provided by the facility;

9. a listing of all permits or construction approvals that the applicant has received or applied for under any of the following programs or which specifically affect the legal or technical ability of the applicant to undertake the activity or activities to be conducted by the applicant under the permit being sought:

a. the Louisiana Hazardous Waste Management;

b. this or any other Underground Injection Control Program;

c. NPDES Program under the Clean Water Act;

d. Prevention of Significant Deterioration (PSD) Program under the Clean Air Act;

e. Nonattainment Program under the Clean Air Act;

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

g. Ocean Dumping Permit under the Marine Protection Research and Sanctuaries Act;

h. dredge or fill permits under Section 404 of the Clean Water Act; and

i. other relevant environmental permits including, but not limited to any state permits issued under the Louisiana Coastal Resources Program, the Louisiana Surface Mining Program or the Louisiana Natural and Scenic Streams System;

10. acknowledgment as to whether the facility is located on Indian lands or other lands under the jurisdiction or protection of the federal government, or whether the facility is located on state water bottoms or other lands owned by or under the jurisdiction or protection of the state of Louisiana;

11. documentation of financial responsibility or documentation of the method by which proof of financial responsibility will be provided as required in §609.C. Before making a final permit decision, final (official) documentation of financial responsibility must be submitted to and approved by the Office of Conservation;

12. names and addresses of all property owners within the area of review of the Class VI well or project.

C. Application Contents: An application submitted to construct a new Class VI well or convert any existing well to Class VI shall contain the following geological and technical information:

1. Maps and Related Information

a. map(s) showing property boundaries of the facility, the location of the proposed Class VI well, and the applicable area of review consistent with §§615.B and 615.C. USGS topographic maps with a scale of 1:24,000 may be used. The map boundaries must extend at least two miles beyond the area of review and include as applicable:

i. the section, township and range of the area where the activity is located and any parish, city, municipality, state, and tribal boundaries.

ii. within the area of review, the map(s) must identify all injection wells, producing wells, abandoned wells, plugged wells or dry holes, deep stratigraphic boreholes, State- or USEPA-approved subsurface cleanup sites, surface bodies of water, springs, surface and subsurface mines, quarries, water wells, other pertinent surface features including structures intended for human occupancy, and roads.

iii. only information of public record is required to be included on the map(s), however, the applicant is required to make a diligent search to locate all wells not listed in the public record.

iv. for water wells on the facility property and adjacent property, submit a tabulation of well depth, water level, owner, chemical analysis, and other pertinent data. If these wells do not exist, submit this information for a minimum of three other wells in the area of review or a statement why this information was not included.

v. the protocol followed to identify, locate, and ascertain the condition of all wells within the area of review that penetrate the injection or confining zone.

b. information on the geologic structure and hydrogeologic properties of the proposed sequestration site and overlying formations, to include:

i. geologic and topographic maps and cross-sections illustrating regional geology, geologic structure, and hydrology.

ii. maps and cross-sections to a scale needed to detail the local geology, geologic structure, and hydrology. The maps and cross-sections must extend at least two miles beyond the area of review;

iii. the location, orientation, and properties of known or suspected faults and fractures that may transect the confining zone(s) in the area of review and a determination that they would not interfere with containment;

iv. maps and stratigraphic cross-sections showing the general vertical and lateral limits of all USDWs, water wells and springs within the area of review, their position relative to the injection zone(s) and the direction of water movement, if known.

v. in areas with limited subsurface well control or where the subsurface geology is in doubt and cannot be described adequately, the commissioner may request the applicant to provide geophysical seismic data of the project area.

c. any other maps required by the commissioner to evaluate the proposed project.

2. Application Technical Information

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

b. geomechanical information on fractures, stress, ductility, rock strength, and in situ fluid pressures within the confining zone(s);

c. information on the region's seismic history including the presence and depth of seismic sources and a determination that the seismicity would not interfere with containment; and

d. a tabulation of all wells within the area of review that penetrate the base of the USDW. Such data must include a description of each well's type, construction, date drilled, location, depth, record of plugging and/or completion, and any other information the commissioner may require;

e. baseline geochemical data on subsurface formations, including injection zones, confining zones and all USDWs in the area of review;

f. proposed operating data:

i. average and maximum daily rate and volume and/or mass and total anticipated volume and/or mass of the carbon dioxide stream;

ii. average and maximum injection pressure;

iii. source(s) of the carbon dioxide stream; and

iv. analysis of the chemical and physical characteristics of the carbon dioxide stream.

g. proposed pre-operational formation testing program to obtain an analysis of the chemical and physical characteristics of the injection zone(s) and confining zone(s) and that meets the requirements at §617.B;

h. proposed stimulation program, a description of stimulation fluids to be used and a determination that stimulation will not interfere with containment;

i. proposed injection operation procedures;

j. schematics or other appropriate drawings of the surface (wellhead and related appurtenances) and subsurface construction details of the well;

k. injection well construction procedures that meet the requirements of §617.A;

l. proposed area of review and corrective action plan that meets the requirements under §§615.B and 615.C;

m. demonstration, satisfactory to the commissioner, that the applicant has met the financial responsibility requirements under §609.C;

n. proposed testing and monitoring plan required by §625;

o. proposed injection well plugging plan required by §631;

p. proposed post-injection site care and site closure plan required by §633.A.3;

q. at the commissioner's discretion, a demonstration of an alternative post-injection site care timeframe required by §633.A.3;

r. proposed emergency and remedial response plan required (contingency plans for well failures or breaches) by §623;

s. a list of contacts, submitted to the commissioner for those states and tribes identified to be within the area of review based on information provided in §607.C.1.a.i; and

t any additional information required by the commissioner to evaluate the proposed project.

3. The commissioner shall notify in writing, any states or tribes within the area of review based on information provided by the applicant in §§607.C.1.a.i and 607.C.2.s.

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§609. Legal Permit Conditions

A. Applicability. The rules and regulations of this Section set forth legal conditions for Class VI well permits. Permits for owners or operators of Class VI injection wells shall include conditions meeting applicable requirements of §§609, 615, 617, 619, 621, 623, 625, 627, 629, and 631. All conditions applicable to all permits shall be incorporated into the permits either expressly or by reference. If incorporated by reference, a specific citation to these regulations must be given in the permit

B. Signatories. All reports required by permits and other information requested by the commissioner shall be signed as in applications by a person described in §605.D.

C. Financial Responsibility

1. The permit shall require the permittee to maintain financial responsibility and resources to close, plug, and abandon the underground injection wells and, where necessary, related surface facility, and for post-injection site care and site closure in a manner prescribed by the commissioner. Class VI well operators must also comply with §609.C.4. The permittee must show evidence of financial responsibility to the commissioner by the submission of:

a. a certificate of deposit issued in sole favor of the Office of Conservation in a form prescribed by the commissioner. A certificate of deposit may not be withdrawn, canceled, rolled over or amended in any manner without the approval of the commissioner;

b. a performance bond (surety bond) in sole favor of the Office of Conservation in a form prescribed by the commissioner;

c. a letter-of-credit in sole favor of the Office of Conservation in a form prescribed by the commissioner;

d. site-specific trust account, or

e. any other instrument of financial assurance acceptable to the commissioner.

2. The amount of funds available in the financial instrument shall be no less than the amount identified in the cost estimate of the closure plan and any required post-injection site care and site closure, and must be approved by the commissioner.

3. Any financial instrument filed in satisfaction of the financial responsibility requirements shall be issued by and drawn on a bank or other financial institution authorized under state or federal law to operate in the State of Louisiana.

4. Class VI well owners, operators, or applicants shall comply with these additional requirements of financial responsibility:

a. qualifying financial responsibility instruments must be sufficient to cover the cost of meeting the requirements of:

i. corrective action of §615.C;

ii. injection well plugging of §631;

iii. post-injection site care and site closure of §633; and

iv. emergency and remedial response of §623. The owner/operator shall maintain third party insurance at a sufficient level to respond to any emergency or to perform any remedial action that meets the requirements of §623.

b. financial responsibility instruments must be sufficient to address endangerment of underground sources of drinking water.

c. 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 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 owner or 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 owner or operator and the commissioner. The cancellation must not be final for 120 days after receipt of the cancellation notice. The owner or operator must provide an alternate 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 cancelled must be released within 60 days of notification by the commissioner.

ii. Renewal: owners or operators must renew all financial instruments, if an instrument expires, for the entire term of the geologic sequestration project. The instrument may be automatically renewed as long as the owner or operator has the option of renewal at the face amount of the expiring instrument. The automatic renewal of the instrument must, at a minimum, provide the holder 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 the commissioner deems the facility abandoned; or the permit is terminated or revoked or a new permit is denied; or closure is ordered by the commissioner or a court of competent jurisdiction; or the owner or operator is named as debtor in a voluntary or involuntary proceeding under Title 11 (Bankruptcy), U.S. Code; or the amount due is paid.

d. qualifying financial responsibility instruments must be approved by the commissioner.

i. the commissioner shall consider and approve the financial responsibility demonstration for all the phases of the geologic sequestration project before issuing any authorization to begin geologic sequestration of carbon dioxide in a Class VI well.

ii. the owner or operator must provide any updated information related to their financial responsibility instrument(s) annually and if there are any changes, the commissioner must evaluate the financial responsibility demonstration to confirm that the instrument(s) used remain adequate. The owner or operator must maintain financial responsibility requirements regardless of the status of the commissioner's review of the financial responsibility demonstration.

iii. the commissioner may disapprove the use of a financial instrument if he determines it is not sufficient to meet the financial responsibility requirements.

e. The owner or operator may demonstrate financial responsibility by using one or multiple qualifying financial instruments for specific phases of the geologic sequestration project.

i. In the event that the owner or operator combines more than one instrument for a specific geologic sequestration phase (e.g., well plugging), such combination must be limited to instruments that are not based on financial strength or performance, for example trust funds, certificates of deposit, surety bonds guaranteeing payment into a trust fund, and letters of credit. 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.f. the requirement to maintain adequate financial responsibility and resources is directly enforceable regardless of whether the requirement is a condition of the permit. The owner or operator must maintain financial responsibility and resources until:

i. the commissioner receives and approves the completed post-injection site care and site closure plan; and

ii. the commissioner approves site closure.

g. the owner or operator may be released from a financial instrument in the following circumstances:

i. the owner or 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

commissioner, including obtaining financial responsibility for the next phase of the geologic sequestration project, if required; or

ii. the owner or operator has submitted a replacement financial instrument and received written approval from the commissioner accepting the new financial instrument and releasing the owner or operator from the previous financial instrument.

h. the owner or operator must 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(s), post-injection site care and site closure, and emergency and remedial response.

i. the cost estimate must be performed for each phase separately and must be based on the costs to the Office of Conservation of contracting a third party to perform the required activities. A third party is a party who is not within the corporate structure of the owner or operator.

ii. during the active life of the geologic sequestration project, the owner or operator must adjust the cost estimate for inflation within 60 days before the anniversary date of the establishment of the financial instrument(s) and provide this adjustment to the commissioner. The owner or operator must also provide the commissioner 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.

iii. the commissioner must approve any decrease or increase to the initial cost estimate. During the active life of the geologic sequestration project, the owner or operator must revise the cost estimate no later than 60 days after the commissioner 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 response plan, if the change in the plan increases the cost. If the change to the plans decreases the cost, any withdrawal of funds must be approved by the commissioner. Any decrease to the value of the financial assurance instrument must first be approved by the commissioner. The revised cost estimate must be adjusted for inflation as specified at §609.C.4.h.ii. above.

iv. whenever the current cost estimate increases to an amount greater than the face amount of a financial instrument currently in use, the owner or operator, within 60 days after the increase, must 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 commissioner, or obtain other financial responsibility instruments to cover the increase. Whenever the current cost estimate decreases, the face amount of the financial assurance instrument may be reduced to the amount of the current cost estimate only after the owner or operator has received written approval from the commissioner.

i. the owner or operator must notify the commissioner by certified mail of adverse financial conditions such as bankruptcy that may affect the ability to carry out injection well plugging and post-injection site care and site closure.

i. in the event that the owner or operator or the third party provider of a financial responsibility instrument is going through a bankruptcy, the owner or operator must notify the commissioner by certified mail of the commencement of a voluntary or involuntary proceeding under Title 11 (Bankruptcy), U.S. Code, naming the owner or operator as debtor, within 10 days after commencement of the proceeding.

ii. an owner or 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 owner or operator must establish other financial assurance within 60 days after such an event.

j. the owner or operator must provide the commissioner with an adjustment of the cost estimate within 60 days of notification by the commissioner, if the commissioner determines during the annual evaluation of the qualifying financial responsibility instrument(s) 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.

k. the commissioner must approve the use and length of pay-in-periods for trust funds or escrow accounts.

5. The permit shall require the permittee to maintain financial responsibility as specified at §609.C.1 until:

a. the well has been plugged and abandoned in accordance with an approved plugging and abandonment plan pursuant to §631 and submitted a plugging and abandonment report pursuant to §631.A.5;

b. the well has been converted in compliance with the requirements of §609.L.7;or

c. the transferor of a permit has received notice from the commissioner that the owner or operator receiving transfer of the permit, the new permittee, has demonstrated financial responsibility for the well.D. Duty to Comply. The permittee must comply with all conditions of a permit. Any permit noncompliance constitutes a violation of the act and is grounds for enforcement action or permit termination, revocation and reissuance, or modification; or for denial of a permit renewal application if the commissioner determines that such noncompliance endangers underground sources of drinking water.

E. Duty to Reapply. If the permittee wishes to continue an activity regulated by a permit after the expiration date of this permit, the permittee must apply for and obtain a new permit.

F. Duty to Halt or Reduce Activity. It shall not be a defense for a permittee in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this permit.

G. Duty to Mitigate. The permittee shall take all reasonable steps to minimize or correct any adverse impact on the environment such as the contamination of underground sources of drinking water resulting from noncompliance with this permit.

H. Proper Operation and Maintenance. The permittee shall at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) which are installed or used by the permittee to achieve compliance with the conditions of his 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.

I. Inspection and Entry. Inspection and entry shall be allowed as prescribed in R.S. of 1950, Title 30, Section 4.

J. Compliance. Compliance with a permit during its term constitutes compliance, for purposes of enforcement, with the act and these regulations.

K. Property Rights. The issuance of a permit does not convey any property rights of any sort, or any exclusive privilege or servitude.

L. Notification Requirements

1. Planned Changes. The permittee shall give notice to the commissioner as soon as possible of any planned physical alterations or additions to the permitted facility.

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

3. Anticipated Noncompliance. The permittee shall give advance notice to the commissioner of any planned changes in the permitted facility or activity which may result in noncompliance with permit requirements.

4. Transfers. A permit is not transferable to any person except after notice to the commissioner. The commissioner may require modification or revocation and reissuance of the permit to change the name of the permittee and incorporate such other requirements as may be necessary under the Safe Drinking Water Act. (See §613.)

5. Compliance Schedules. Report of compliance or noncompliance with, or any progress reports on, interim and final requirements contained in any compliance schedule in these regulations shall be submitted to the commissioner no later than 14 days following each schedule date.

6. Twenty-Four Hour Reporting

a. The permittee shall report to the commissioner any noncompliance which may endanger health or the environment. Any information pertinent to the noncompliance shall be reported by telephone at (225) 342-5515 within 24 hours from the time the permittee becomes aware of the circumstances. A written submission shall also be provided within five days of the time the permittee 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 non-compliance.

b. The following additional information must be reported within the 24-hour period provided above:

i. any monitoring or other information which indicates that any contaminant may cause an endangerment to a USDW;

ii. any noncompliance with a permit condition or malfunction of the injection system which may cause fluid migration into or between USDWs.

7. The permittee shall notify the commissioner at such times as the permit requires before conversion or abandonment of the well or before closure of the project.

8. Other Noncompliance. The permittee shall report all instances of noncompliance not reported under §§609.L.5 and 609.L.6, at the time quarterly reports are submitted. The reports shall contain the information listed in §609.L.6.

9. Other Information. Where the permittee becomes aware that it failed to submit any relevant facts in a permit application, or submitted incorrect information in a permit application or in any report to the commissioner, it shall promptly submit such facts or information.

M. Duration of Permits

1. UIC permits for Class VI wells shall be issued for the operating life of the facility and the post-injection site care period. The commissioner shall review each issued 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. The term of a permit shall not be extended by modification beyond the maximum duration specified in this Section, except as provided in §609.M.4 below.

3. The commissioner may issue, for cause, any permit for a duration that is less than the full allowable term under this Section.

4. The conditions of an expired permit may continue in force until the effective date of a new permit if the permittee has submitted a timely and a complete application for a new permit, and the commissioner, through no fault of the permittee, does not issue a new permit with an effective date on or before the expiration date of the previous permit (e.g., when issuance is impracticable due to time or resource constraints).

a. Permits continued under this Section remain fully effective and enforceable.

b. When the permittee is not in compliance with the conditions of the expiring or expired permit, the commissioner may choose to do any or all of the following:

i. initiate enforcement action based upon the permit which has been continued;

ii. issue a notice of intent to deny the new permit. If the permit is denied, the owner or operator would then be required to cease the activities authorized by the continued permit or be subject to enforcement action for operating without a permit;

iii. issue a new permit under the requirements of these rules for issuing a new permit with appropriate conditions; or

iv. take other actions authorized by these regulations.

N. Schedules of Compliance. The permit may, when appropriate, specify a schedule of compliance leading to compliance with the act and these regulations.

1. 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.

2. Interim Dates. Except as provided in §609N.2.b, if a permit establishes a schedule of compliance which exceeds one year from the date of permit issuance, the schedule shall set forth interim requirements and the dates for their achievement.

a. The time between interim dates shall not exceed one year.

b. If the time necessary for completion of any interim requirements (such as the construction of a control facility) 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.

3. 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.

O. Additional Conditions. The commissioner shall impose on a case-by-case basis such additional conditions as are necessary to protect underground sources of drinking water.

P. Duty to Establish and Maintain Mechanical Integrity. The permittee of a Class VI injection well shall establish mechanical integrity prior to commencing injection and on a schedule determined by these rules or the commissioner. Thereafter, the owner or operator of Class VI injection wells must maintain mechanical integrity as defined in §627. The Class VI injection well owner or operator shall give notice to the commissioner when it is determined the injection well is lacking mechanical integrity. Upon receiving such notice, the operator shall immediately cease injection into the well. The well shall remain out of injection service until such time as well mechanical integrity is restored to the satisfaction of the commissioner. The owner or operator may resume injection upon written notification from the Director that the owner or operator has demonstrated mechanical integrity pursuant to §627.

Q. 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.

R. In addition to conditions required in all permits the commissioner shall establish conditions in permits as required on a case-by-case basis, to provide for and assure compliance with all applicable requirements of the SDWA and 40 CFR Parts 144, 145, 146 and 124.

S. New permits, and to the extent allowed under §613 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 §613.

T. 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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§611. Permitting Process

A. Applicability. This Section contains procedures for issuing all Class VI permits.

B. Application Submission and Review

1. Any person required to have a UIC permit shall submit an application to the Office of Conservation, UIC Section, as outlined in §605.

2. Check for completeness:

a. the commissioner shall not issue a permit before receiving an application form and any required supplemental information which are completed to his 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 facility or activity;

b. each application for a permit submitted for a new UIC injection well will be reviewed for completeness by the commissioner and the applicant will be notified of the commissioner's decision within 30 days of its receipt. Each application for a permit submitted for an existing injection well will be reviewed for completeness and the applicant will be notified of the commissioner's decision within 60 days of receipt. Upon completing the review, the commissioner shall notify the applicant in writing whether the application is complete.

3. Incomplete Applications

a. If the application is incomplete, the commissioner shall list in the notification in §611.B.2.b above, the information necessary to make the application complete. When the application is for an existing UIC injection well, the commissioner shall specify in the notice a date for submitting the necessary information. The commissioner shall notify the applicant that the application is complete upon receiving this information. The commissioner may request additional information from an applicant only when necessary to clarify, modify, or supplement previously submitted material. Requests for such additional information will not render an application incomplete.

b. If an applicant fails or refuses to correct deficiencies found in the application, the permit may be denied and, for existing wells, appropriate enforcement actions may be taken under the applicable statutory provision.

4. If the commissioner decides that a site visit is necessary for any reason in conjunction with the processing of an application, he shall notify the applicant, state the reason for the visit, and a date shall be scheduled.

C. Draft Permits

1. Once an application is complete, the commissioner shall prepare a draft permit or deny the application.

2. The applicant may appeal the decision to deny the application in a letter to the commissioner who may then call a public hearing through §611.G.1.

3. If the commissioner prepares a draft permit, it shall contain the following information where appropriate:

a. all conditions under §§609, 615, 617, 619, 621, 623, 625, 627, 629, and 631;

b. all compliance schedules under §609.N; and

c. all monitoring requirements under applicable Paragraphs in §625.

4. All draft permits prepared under this Section may be accompanied by a fact sheet pursuant to §611.D, and shall be publicly noticed in accordance with §611.E, and made available for public comment pursuant to §611.F.

D. Fact Sheet

1. A fact sheet shall be prepared for every draft permit for all major UIC facilities or activities and for every draft permit which the commissioner finds is the subject of wide-spread public interest or raises major issues. The fact sheet shall briefly set forth the principal facts and the significant factual, legal, methodological and policy questions considered in preparing the draft permits. The commissioner shall send this fact sheet to the applicant and, on request, to any other person.

2. The fact sheet shall include, when applicable:

a. a brief description of the type of facility or activity which is the subject of the draft permit;

b. the type and quantity of wastes, fluids, or pollutants which are proposed to be or are being injected;

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 §611.F and the address where comments will be received;

ii. procedures for requesting a hearing and the nature of that hearing; 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 §§611.E.3.a.i, ii, iii, and iv shall be mailed or emailed a copy of the fact sheet, the draft permit, and a notice that the permit application will be available online.

E. Public Notice of Permit Actions and Public Comment Period

1. Scope

a. The commissioner shall give public notice (including a notice of intent to deny a permit application) that the following actions have occurred:

i. a draft permit has been prepared under §611.C; and

ii. a hearing has been scheduled under §611.G.

b. No public notice is required when a request for permit modification, revocation and reissuance, or termination is denied under §613. Written notice of that denial shall be given to the requester and to the permittee.

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 §611.E.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).

3. Methods. Public notice of activities described in §611.E.1.a shall be given by the following methods:

a. by electronic mailing (emailing) or by mailing a copy of a notice to the following persons (any person otherwise entitled to receive notice under this Section may waive his rights to receive notice for any classes and categories of permits):

i. the applicant;

ii. any other agency which the commissioner knows has issued or is required to issue a permit for the same facility or activity (including EPA);

iii. federal and state agencies with jurisdiction over fish, shellfish, and wildlife resources and over coastal zone management plans, the Advisory Council on Historic Preservation, the State Archeological Survey and Antiquities Commission, the Director of the Public Water Supply Supervision program in the State, the Department of Natural Resource, and other appropriate government authorities, including any

unit of local government having jurisdiction over the area where the facility is proposed to be located, any affected states or Indian Tribes; and

iv. persons on a UIC mailing list developed by:

(a).including those who request in writing to be on the list;

(b). soliciting persons for "area lists" 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 commissioner may update the mailing list from time to time by requesting written indication of continued interest from those listed. The commissioner may delete from the list the name of any person who fails to respond to such a request.)

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 of the Office of Conservation processing the permit action for which notice is being given;

ii. name and address of the permittee or permit applicant and, if different, of the facility or activity regulated by the permit;

iii. a brief description of the business conducted at the 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 fact sheet, the application, and further information concerning the application;

v. a brief description of the comment procedures required by §611.F and the time and place of any hearing that will be held, including a brief statement of procedures to request a hearing (unless a hearing has already been scheduled) 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 §611.E.4.a, the public notice of a hearing under §611.G 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.

F. Public Comments and Requests for Public Hearings. During the public comment period provided under §611.G, any interested person may submit written comments on the draft permit and may request a public hearing, if no hearing has already been scheduled. A request for a public hearing shall be in writing and shall state the nature of the issues proposed to be raised in the hearing. All comments shall be considered in making the final decision and shall be answered as provided in §611.H.

G. Public Hearings

1. The commissioner shall hold a public hearing whenever he finds, on the basis of requests, a significant degree of public interest in (a) draft permit(s). The commissioner also may hold a public hearing at his discretion, whenever, for instance, such a hearing might clarify one or more issues involved in the permit decision. Public notice of the hearing shall be given as specified in §611.G.

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 under §611.G shall automatically be extended to the close of any public hearing under this Section. The hearing officer may also extend the comment period by so stating at the hearing.

3. A tape recording or written transcript of the hearing shall be made available to the public.

H. Response to Comments

1. At the time that any final permit is issued the commissioner 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.

I. Permit Issuance and Effective Date

1. After closure of the public comment period, including any public hearing, under §611.G on a draft permit, the commissioner shall issue a final permit decision within 30 days. The commissioner 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 UIC permit under La. Title 30 R.S. §30:15. 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. Approval or the granting of a permit to construct a Class VI well shall be valid for a period of one year and if not begun in that time, the permit shall be null and void. The permittee may request an extension of this one-year requirement; however, the commissioner shall approve the request for extenuating circumstances only.

AUTHORITY NOTE: Promulgated in accordance with R.S. 30:4 et seq., 30:22 et seq., and 30:1101 et seq.
HISTORICAL NOTE: Promulgated by the Department of Natural Resources, Injection and Mining Division, LR 46: Department of Natural Resources – Office of Conservation.

§613 Permit Modification, Revocation and Reissuance, Termination, Transfer or Renewal

A. Applicability. The rules of this Section set forth the standards and requirements for applications and actions concerning modification, revocation and reissuance, termination, transfer and renewal of permits.

B. Permit Actions

1. The permit may be modified, revoked and reissued, or terminated for cause. The filing of a request by the permittee 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 permittee shall furnish to the commissioner, within 30 days, any information which the commissioner may request to determine whether cause exists for modifying, revoking and reissuing, or terminating a permit, or to determine compliance with the permit. The permittee shall also furnish to the commissioner, upon request, copies of records required to be kept by the permit.

3. The commissioner may, upon his 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 §§613.C, D, and E. All requests shall be in writing and shall contain facts or reasons supporting the request.

4. If the commissioner decides the request is not justified, he 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 commissioner decides to modify or revoke and reissue a permit under §§613.C, D, and E, he shall prepare a draft permit under §611.C incorporating the proposed changes. When a permit is modified, the entire permit is reopened and is subject to revision. The commissioner 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 commissioner 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. All other aspects 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 all conditions of the existing permit until a new final permit is reissued.

C. 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 facility or activity which occurred after permit issuance which justify the application of permit conditions that are different or absent in the existing permit.

b. Information. The commissioner 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 Class VI wells 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). a permittee requests modification within 90 days after *Louisiana Register* notice of the action on which the request is based.

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 facility and the permittee requests to have permit conditions based on the withdrawn or revised standards or regulations deleted from his permit.

iii. For judicial decisions, a court of competent jurisdiction has remanded and stayed Office of Conservation regulations or guidelines and all 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 permittee to have permit conditions based on the remanded or stayed standards or regulations deleted from his permit.

d. Compliance Schedules. The commissioner 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 permittee has little or no control and for which there is no reasonable available remedy.

e. Additional Modification of Class VI Permits. For Class VI wells, whenever the commissioner determines that permit changes are necessary based on:

i. area of review reevaluations under §615.C.2;

ii. any amendments to the testing and monitoring plan under §625.A.10;

iii. any amendments to the injection well plugging plan under §631.A.3;

iv. any amendments to the post-injection site care and site closure plan under §633.A.1.c;

v. any amendments to the emergency and remedial response plan under §625.A.4; or

vi. a review of monitoring and testing results conducted in accordance with permit requirements.

2. Causes for modification or revocation and reissuance. The following are causes to modify or, alternatively, revoke and reissue a permit:

a. cause exists for termination under §613.E, and the commissioner determines that modification or revocation and reissuance is appropriate;

b. the commissioner has received notification of a proposed transfer of the permit and the transfer is determined not to be a minor modification (see §613.D.4). A permit may be modified to reflect a transfer after the effective date (§613.F.2.b) but will not be revoked and reissued after the effective date except upon the request of the new permittee; or

c. a determination that the waste being injected is a hazardous waste as defined in §601 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. Facility Siting. Suitability of an existing 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 facility location may require modification or revocation and issuance as determined to be appropriate by the commissioner.

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

D. Minor Modifications of Permits. Upon the consent of the permittee, the commissioner 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:

1. correct typographical errors;

2. require more frequent monitoring or reporting by the permittee;

3. 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;

4. allow for a change in ownership or operational control of a facility where the commissioner 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 permittees has been submitted to the commissioner (see §613.F);

5. change quantities or types of fluids injected which are within the capacity of the facility as permitted and, in the judgment of the commissioner, would not interfere with the operation of the facility or its ability to meet conditions prescribed in the permit, and would not change its classification;

6. change construction requirements or plans approved by the commissioner provided that any such alteration shall comply with the requirements of this Section and §617. No such changes may be physically incorporated into construction of the well prior to approval; or

7. amend a Class VI injection 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 commissioner.

E. Termination of Permits

1. The commissioner may terminate a permit during its term for the following causes:

a. noncompliance by the permittee 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 which activity cannot be regulated to acceptable levels by permit modification and can only be regulated to acceptable levels by permit termination.

2. If the commissioner decides to terminate a permit, he shall issue a notice of intent to terminate. A notice of intent to terminate is a type of draft permit which follows the same procedures as any draft permit prepared under §611.C.

3. The commissioner may alternatively decide to modify or revoke and reissue a permit for the causes in §613.E.1 (see §613.C.2.a).

F. Transfers of Permits

1. A permit may be transferred to a new owner or operator upon approval by the commissioner.

2. The current permittee shall submit an application for transfer at least 30 days before the proposed transfer date. The application 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 permittees containing a specific date for transfer of permit responsibility, coverage and liability between them. The agreement should also demonstrate to the satisfaction of the commissioner that the financial responsibility requirements of §609.C will be met by the new permittee.

3. If the commissioner does not notify the existing permittee and the proposed new permittee of his intent to modify or revoke and reissue the permit under §613.C.2.b the transfer is effective on the date specified in the agreement mentioned in §613.F.2.c.

4. If no agreement described in §613.F.2.c is provided, responsibility for compliance with the terms and conditions of the permit and liability for any violation will shift from the existing permittee to the new permittee on the date the transfer is approved.

5. If a person attempting to acquire a permit causes or allows operation of the facility before approval by the commissioner, it shall be considered a violation of these rules for operating without a permit or other authorization.

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HISTORICAL NOTE: Promulgated by the Department of Natural Resources, Injection and Mining Division, LR 46: Department of Natural Resources – Office of Conservation.

§615. Siting Criteria, AOR, and Corrective Action

A. Minimum Criteria for Siting. Applicants, owners, or operators of Class VI wells must demonstrate to the satisfaction of the commissioner that the wells will be sited in areas with a suitable geologic system. The demonstration must show that the geologic system comprises:

1. an injection zone of sufficient areal extent, thickness, porosity, and permeability to receive the total anticipated volume of the carbon dioxide stream;

2. confining zone(s) 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(s).

a. The commissioner may require owners or operators of Class VI wells 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.

B. Area of Review (AOR)

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 all phases of the injected carbon dioxide stream and is based on available site characterization, monitoring, and operational data.

2. The owner or 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 these regulations and is acceptable to the commissioner. 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 owner or 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 §615.B.3, including the model to be used, assumptions that will be made, and the site characterization data on which the model will be based;

b. a description of:

i. the minimum fixed frequency—not to exceed five years—at which the owner or 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 §615.B.2.b.i.

iii. how monitoring and operational data (e.g., 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 §615.C, 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. Area of Review Boundary Delineation. Owners or operators of Class VI wells must perform the following actions to delineate the area of review and identify all wells that require 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 commissioner. The model must:

i. be based on detailed geologic data collected to characterize the injection zone(s), confining zone(s) 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, 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 commissioner, the owner or operator shall at a minimum, identify all penetrations, including active and abandoned wells and underground mines, in the area of review that penetrate the confining and injection zone(s). (See §603.H.4.) Provide a description of each well's type, construction, date drilled, location, depth, record of plugging and/or completion, and any additional information the commissioner may require; and

c. determine which abandoned wells in the area of review have been plugged in a manner that prevents the movement of carbon dioxide or other fluids that may endanger USDWs, including use of materials compatible with the carbon dioxide stream.

C. Corrective Action

1. Owners or operators of Class VI wells must perform corrective action on all wells in the area of review that are 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, owners or operators must:

a. reevaluate the area of review in the same manner specified in §615.B.3.a;

b. identify all wells in the reevaluated area of review that require corrective action in the same manner specified in §615.B.3;

c. perform corrective action on wells requiring corrective action in the reevaluated area of review in the same manner specified in §615.C.1; and

d. submit an amended area of review and corrective action plan or demonstrate to the commissioner through monitoring data and modeling results that no amendment to the area of review and corrective action plan is needed. Any amendments to the area of review and corrective action plan must be approved by the commissioner, must be incorporated into the permit, and are subject to the permit modification requirements at §613, as appropriate.

3. The emergency and remedial response plan (as required by §623) and the demonstration of financial responsibility (as described by §609.C must account for the area of review delineated as specified in §615.B.3.a or the most recently evaluated area of review delineated under §615.C.2, regardless of whether or not corrective action in the area of review is phased.

4. All modeling inputs and data used to support area of review reevaluations under §615.C.2 shall be retained for at least 10 years.

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§617. Well Construction and Completion

A. Injection Well Construction Requirements

1. General. All phases of Class VI well construction shall be supervised by a person knowledgeable and experienced in practical drilling engineering and is familiar with the special conditions and

requirements of injection well construction. All materials and equipment used in the construction of the well and related appurtenances shall be designed and manufactured to exceed the operating requirements of the specific project, including flow induced vibrations. The owner or operator must ensure that all wells are constructed and completed to:

a. prevent the movement of fluids into or between USDWs or into any unauthorized zones;

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 and cement or 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 and must meet or exceed standards developed for such materials by the American Petroleum Institute, ASTM International, or comparable standards acceptable to the commissioner. The casing and cementing program must be designed to prevent the movement of fluids into or between USDWs. In order to allow the commissioner to evaluate casing and cementing requirements, the owner or operator must provide the following information:

i. depth to the injection zone(s);

ii. injection pressure, external pressure, internal pressure, and axial loading;

iii. hole size;

iv. size and grade of all casing strings (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 injection and confining zone(s);

viii. type or grade of cement and cement additives including slurry weight (lb/gal) and yield (cu. ft./sack); and

ix. quantity, chemical composition, and temperature of the carbon dioxide stream.

b. The surface casing of any Class VI well must extend into a confining bed—such as a shale—below the base of the deepest formation containing a USDW. The casing shall be cemented with a sufficient volume of cement to circulate cement from the casing shoe to the surface. The commissioner will not grant an exception or variance to the surface casing setting depth.

c. At least one long string casing, using a sufficient number of centralizers, shall be utilized in the well. If the casing is to be perforated for injection, then the approved casing shall extend through the base of the injection zone. If an approved alternate construction method is used, such as the setting of a screen, the casing shall be set to the top of the injection interval. Regardless of the construction method utilized, the casings shall be cemented by circulating cement from the casing shoe to the surface in one or more stages.

d. Circulation of cement may be accomplished by staging. Circulated to the surface shall mean that actual cement returns to the surface were observed during the primary cementing operation. 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. The commissioner may approve an alternative method of cementing in cases where the cement cannot be circulated to the surface. If cement returns are lost during cementing, the owner or operator shall have the burden of showing—using wireline logs—that sufficient cement isolation is present to prevent the movement of fluid behind the well casing.

ii. Remedial cementing shall be done before proceeding with further well construction, completion, or conversion if adequate cement isolation of the USDW or the injection zone within the casing-formation annulus cannot be demonstrated.

e. 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.

3. Casing and Casing Seat Tests. The owner or operator shall monitor and record the tests using a surface readout pressure gauge and a chart or a digital recorder. All instruments shall be calibrated properly and in good working order. If there is a failure of the required tests, the owner or operator shall take necessary corrective action to obtain a passing test.

a. Casing. After cementing each casing, but before drilling out the respective casing shoe, all casings shall be hydrostatically pressure tested to verify casing integrity and the absence of leaks. For surface casing, the stabilized test pressure applied at the surface shall be a minimum of 500 pounds per square inch gauge (PSIG). The stabilized test pressure applied at the surface for all other casings shall be a minimum of 1,000 PSIG. All casing test pressures shall be maintained for one hour after stabilization. Allowable pressure loss is limited to five percent of the test pressure over the stabilized test duration.

i. Casing test pressures shall never exceed the rated burst or collapse pressures of the respective casings.

b. Casing Seat. The casing seat and cement of any intermediate and injection casings shall be hydrostatically pressure tested after drilling out the casing shoe. At least 10 feet of formation below the respective casing shoes shall be drilled before the test. The test pressure applied at the surface shall be a minimum of 1,000 PSIG. The test pressure shall be maintained for one hour after pressure stabilization. Allowable pressure loss is limited to five percent of the test pressure over the stabilized test duration.

i. Casing seat test pressures shall never exceed the known or calculated fracture gradient of the appropriate subsurface formation.

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 and must meet or exceed standards developed for such materials by the American Petroleum Institute, ASTM International, or comparable standards acceptable to the commissioner.

b. Injection into a Class VI well must be through tubing with a packer set at a depth opposite an interval of cemented casing at a location approved by the commissioner.

c. In order for the commissioner to determine and specify requirements for tubing and packer, the owner or operator must submit the following information:

i. depth of setting;

ii. characteristics of the carbon dioxide stream (chemical content, corrosiveness, temperature, and density) and formation fluids;

iii. maximum proposed injection pressure;

iv. maximum proposed annular pressure;

v. proposed injection rate (intermittent or continuous) and volume and/or mass of the carbon dioxide stream;

vi. size of tubing and casing; and

vii. tubing tensile, burst, and collapse strengths.

B. 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 all relevant geologic formations to ensure conformance with the injection well construction requirements of §617 and to establish accurate baseline data against which future measurements may be compared. The well operator must submit to the commissioner 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 of all boreholes constructed by drilling a pilot hole, which 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 vertical avenues for fluid movement in the form of diverging holes are not created during drilling;

b. before and upon installation of the surface casing:

i. resistivity, gamma-ray, 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. resistivity, gamma-ray, spontaneous potential, porosity, caliper, fracture finder logs, and any other logs the commissioner 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, which 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 or 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 by and approved by the commissioner.

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

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

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

a. fracture pressure;

b. other physical and chemical characteristics of the injection and confining zone(s); and

c. physical and chemical characteristics of the formation fluids in the injection zone(s).

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

a. a pressure fall-off test; and,

b. a pump test; or

c. injectivity tests.

6. The owner or operator must notify the Office of Conservation at least 72 hours before conducting any wireline logs, well tests, or reservoir tests.

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§619. Pre-Operations—Completion Report and Site Reassessment

A. Pre-Operating Requirements. The owner or operator of the well shall submit the following information to the commissioner. The commissioner shall consider the information before granting final approval for the operation of a Class VI well:

1. the final area of review based on modeling, using data obtained during logging and testing of the well and subsurface formations as required by §619.A.2, 3, 4, 6, 7, and 10;

2. any relevant updates—based on data obtained during logging and testing of the well and subsurface formations as required by §619.A.3, 4, 6, 7, and 10—to the information on the geologic structure and hydrogeologic properties of the proposed storage site and overlying formations, submitted to satisfy the requirements of §607.C.1.b;

3. information on the compatibility of the carbon dioxide stream:

a. with fluids in the injection zone(s);

b. with minerals in both the injection and the confining zone(s), based on the results of the formation testing program; and

c. with the materials used to construct the well;

4. the results of the formation testing program required at §607.C.2.g;

5. final injection well construction procedures that meet the requirements of §617.A;

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

7. all available logging and testing program data on the well required by §617.B;

8. a demonstration of mechanical integrity pursuant to §627;

9. 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 §623, that are necessary to address new information collected during logging and testing of the well and the formation as required by§617.B, and any updates to the alternative post-injection site care timeframe demonstration submitted under §633, that are necessary to address new information collected during the logging and testing of the well and the formation as required by; and

10. Any additional information requested by the commissioner.

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§621. Operations

A. Injection Well Operating Requirements

1. Injection Pressure. Except during stimulation, the injection well shall be operated so that the injection-induced pressure in the injection zone(s) does not exceed 90 percent of the fracture pressure of the injection zone(s). This shall 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(s) or cause the movement of injection or formation fluids that endangers a USDW. Pursuant to requirements at §607.C.2.h, all stimulation programs must be approved by the commissioner 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 owner or operator must fill the annulus between the tubing and the long string casing with a non-corrosive fluid approved by the commissioner or a fluid containing a corrosion inhibitor approved by the commissioner.

4. Annulus Pressure. The owner or operator shall maintain a tubing-casing annulus pressure that exceeds the operating injection pressure, unless the commissioner determines that such requirement might harm the integrity of the well or endanger a USDW. A request to operate the well at a reduced annulus pressure must be in writing and approved by the commissioner.

5. The owner or operator must maintain mechanical integrity of the injection well at all times, except when doing well workovers, well maintenance, or well remedial work approved by the commissioner.

6. 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 or bottom-hole pressure;

ii. flow rate, volume and/or mass, and temperature of the carbon dioxide stream;

iii. tubing-casing annulus pressure and annulus fluid volume;

iv. any other data specified by the commissioner.

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.

7. Alarms and Automatic Shutdown Systems

a. Alarms and automatic shutdown systems designed to actuate on exceedance of a predetermined monitored condition shall be installed and maintained in proper working order as follows:

i. for onshore wells, alarms and automatic surface shut-off valves or—at the discretion of the commissioner—down-hole shut-off systems (e.g., automatic shut-off, check valves) or, other mechanical devices that provide equivalent protection; and

ii. for offshore wells, alarms and automatic down-hole shut-off systems designed to alert the operator and shut-in the well when operating parameters such as annulus pressure, injection rate, or other parameters diverge beyond permitted ranges or gradients specified in the permit.

iii. all alarms must be integrated with any automatic shutdown system.

b. If a shutdown (i.e., down-hole or at the surface) is triggered or a loss of mechanical integrity is discovered, the owner or operator must immediately investigate and identify as expeditiously as possible the cause of the shutoff. 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 owner or operator must:

i. immediately cease injection;

ii. 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;

iii. notify the commissioner within 24 hours;

iv. restore and demonstrate mechanical integrity to the satisfaction of the commissioner prior to resuming injection; and

v. notify the commissioner when injection can be expected to resume.

c. All emergency shutdown systems shall be fail-safe. The operator shall function-test all critical systems of control and safety at least once every six months. This includes testing of alarms, test tripping of emergency shutdown valves ensuring their closure times are within design specifications, and ensuring the integrity of all electrical, pneumatic, and hydraulic circuits. Test dates and results shall be documented and be available for inspection by an agent of the Office of Conservation.

8. Wellhead Identification and Protection

a. A protective barrier shall be installed and maintained around the wellheads, piping, and above ground structures that may be vulnerable to physical or accidental damage by mobile equipment or trespassers.

b. 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 serial number, section-township-range, and any other information required by the commissioner. The sign shall be of durable construction with all lettering kept in a legible condition.

9. 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 permittee, or well work of any kind, shall be done without prior written authorization from the commissioner. The operator shall submit a work permit request form (Form UIC-17 or successor) to seek well work authorization.

10. Pressure gauges that show pressure on the injection tubing and tubing-casing annulus shall be installed at each wellhead. Gauges shall be designed to read in increments of 10 PSIG. All gauges shall be properly calibrated and be maintained in good working order. The pressure valves onto which the pressure gauges are affixed shall have one-half inch female fittings.

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§623. Emergency Response

A. Emergency and Remedial Response.

1. As part of the permit application, the owner or operator must provide the commissioner with an emergency and remedial response plan that describes actions the owner or 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 owner or operator obtains evidence that the injected carbon dioxide stream and associated pressure front may cause an endangerment to a USDW, the owner or operator must:

a. immediately cease injection;

b. take all steps reasonably necessary to identify and characterize any release;

c. notify the commissioner within 24 hours; and

d. Implement the emergency and remedial response plan approved by the commissioner.

3. The commissioner may allow the operator to resume injection prior to remediation if the owner or operator demonstrates that the injection operation will not endanger USDWs.

4. The owner or operator shall review the emergency and remedial response plan developed under §623.A.1 at least once every five years. Based on this review, the owner or operator shall submit an amended emergency and remedial response plan or demonstrate to the commissioner 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 commissioner, must be incorporated into the permit, and are subject to the permit modification requirements at §613, as appropriate. Amended plans or demonstrations shall be submitted to the commissioner as follows:

a. within one year of an area of review reevaluation;

b. following any significant changes to the facility, such as addition of injection or monitoring wells, on a schedule determined by the commissioner; or

c. when required by the commissioner.

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§625. Testing and Monitoring

A. Testing and Monitoring Requirements. The owner or operator of a Class VI well must prepare, maintain, and comply with a testing and monitoring plan to verify that the geologic sequestration project is operating as permitted and is not endangering USDWs. The 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 must be included with the permit application and must include a description of how the owner or operator will meet these requirements—including accessing sites for all necessary monitoring and testing during the life of the project. Testing and monitoring associated with geologic sequestration projects must include, at a minimum:

1. analysis of the carbon dioxide stream with sufficient frequency to yield data representative of its chemical and physical characteristics;

2. 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 as defined in §621.A.5;

3. corrosion monitoring of the well materials for loss of mass, thickness, cracking, pitting, and other signs of corrosion, which must be performed on a quarterly basis to ensure that the well components meet the minimum standards for material strength and performance set forth in §617.A.2, by:

a. analyzing coupons of the well construction materials placed in contact with the carbon dioxide stream; or

b. routing the carbon dioxide stream through a loop constructed with the material used in the well and inspecting the materials in the loop; or

c. using an alternative method approved by the commissioner;

4. periodic monitoring of the ground water quality and geochemical changes above the confining zone(s) that may be a result of carbon dioxide movement through the confining zone(s) or additional identified zones including:

a. 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

b. the monitoring frequency and spatial distribution of monitoring wells based on baseline geochemical data that has been collected under §607.C.2.e and on any modeling results in the area of review evaluation required by §615.B.3.

5. a demonstration of external mechanical integrity pursuant to §627.A.3 at least once every 12 months until the injection well is permanently plugged and abandoned; and, if required by the

commissioner, a casing inspection log pursuant to requirements at §627.A.4 at a frequency established in the testing and monitoring plan;

6. a pressure fall-off test at least once every five years unless more frequent testing is required by the commissioner based on site-specific information;

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

a. direct methods in the injection zone(s); and

b. indirect methods (e.g., seismic, electrical, gravity, or electromagnetic surveys and/or down-hole carbon dioxide detection tools), unless the commissioner determines that such methods are not appropriate, based on site-specific geology;

8. The commissioner may require surface air monitoring and/or soil gas monitoring to detect movement of carbon dioxide that could endanger a USDW.

a. Design of Class VI surface air and/or soil gas monitoring must be based on potential risks to USDWs within the area of review;

b. The monitoring frequency and spatial distribution of surface air monitoring and/or soil gas monitoring must be decided using baseline data, and the monitoring plan must describe how the proposed monitoring will yield useful information on the area of review delineation and/or compliance with standards under §603.D;

c. If an owner or operator demonstrates that monitoring employed under 40 CFR 98.440 to 98.449 accomplishes the goals of §§625.A.8.a. and b., and meets the requirements pursuant to §629.A.3.e, a regulatory agency that requires surface air/soil gas monitoring must 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 Class VI permit;

9. Any additional monitoring, as required by the commissioner, necessary to support, upgrade, and improve computational modeling of the area of review evaluation required under §615.B.3 and to determine compliance with standards under §619;

10. The owner or operator shall periodically review the testing and monitoring plan to incorporate monitoring data collected under §625, operational data collected under §621, and the most recent area of review reevaluation performed under §615.C.2. In no case shall the owner or operator review the testing and monitoring plan less often than once every five years. Based on this review, the owner or operator shall submit an amended testing and monitoring plan or demonstrate to the commissioner that no amendment to the testing and monitoring plan is needed. Any amendments to the testing and monitoring plan must be approved by the commissioner, must be incorporated into the permit, and are subject to the permit modification requirements at §613, as appropriate. Amended plans or demonstrations shall be submitted to the commissioner as follows:

a. within 12 months of an area of review reevaluation;

b. following any significant changes to the facility, such as addition of monitoring wells or newly permitted injection wells within the area of review, on a schedule determined by the commissioner; or

c. when required by the commissioner.

11. a quality assurance and surveillance plan for all testing and monitoring requirements.

B. Monitoring and records.

1. samples and measurements taken for the purpose of monitoring shall be representative of the monitored activity.

2. The permittee 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 3 years from the date of the sample, measurement, report, or application. This period may be extended by request of the commissioner at any time; and

b. the nature and composition of all injected fluids until three years after the completion of any plugging and abandonment procedures specified under §629 The commissioner may require the owner or operator to deliver the records to the commissioner 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(s) who performed the sampling or measurements;

c. the date(s) analyses were performed;

d. the individual(s) who performed the analyses;

e. the analytical techniques or methods used; and

f. the results of such analyses.

4. Owners or operators of Class VI wells shall retain records as specified in §§615.C.4, 629.A.6, 631.A.5, 633.A.6, and 633.A.8 of this chapter.

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§627. Mechanical Integrity

A. 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, owners or operators must:

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 witnessed by an agent of the Office of Conservation; and

iii. after performing any well remedial work that involves unseating the tubing or packer.

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 §621.A.6.

3. At least once every 12 months, 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 commissioner, run a casing inspection log at a frequency specified in the testing and monitoring plan at §625 to determine the presence or absence of corrosion in the long-string casing.

5. The commissioner may require other tests to evaluate well mechanical integrity.

a. The commissioner may allow the use of a test to demonstrate mechanical integrity other than those listed above with written approval of the USEPA. To obtain approval for the use of a new mechanical integrity test, the owner or operator must submit a written request to the commissioner with details of the proposed test and all technical data supporting its use, and the commissioner will submit a written request to the USEPA.

6. In conducting and evaluating the tests enumerated in this section to be allowed by the commissioner, the owner or operator and the commissioner must apply methods and standards generally accepted in the industry. When the owner or operator reports the results of mechanical integrity tests to the commissioner, a description of the test(s) and the method(s) used must be included. In making the evaluation, the commissioner must review monitoring and other test data submitted since the previous evaluation.

7. The commissioner may require additional or alternative tests if the mechanical integrity test results presented are not satisfactory to the commissioner 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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§629. Reporting

A. Reporting Requirements. The owner or operator must provide, at a minimum, the following reports to the commissioner—and the USEPA as specified in §629.A.5—for each permitted Class VI well:

1. Semi-annual reports containing:

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

b. monthly average, maximum, and minimum values for injection pressure, flow rate and volume, and annular pressure;

c. a description of any event that exceeds operating parameters for annulus pressure or injection pressure specified in the permit;

d. a description of any event which triggers a shut-off device required by §621 and the response taken;

e. the monthly volume and/or mass of the carbon dioxide stream injected over the reporting period and the volume injected cumulatively over the life of the project;

f. monthly annulus fluid volume added;

g. the results of monitoring prescribed under §625; and

h. the raw operating data from the continuous recording devices prescribed by §621.A.6 submitted in digital format.

2. Report, within 30 days or as specified by permit, the results of:

a. periodic tests of mechanical integrity;

b. any well workover; and

c. any other test of the injection well conducted by the permittee if required by the commissioner.

3. Report, within 24 hours:

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

b. any noncompliance with a permit condition, or malfunction of the injection system, which may cause fluid migration into or between USDWs;

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

d. any failure to maintain mechanical integrity; or

e. any release of carbon dioxide to the atmosphere or biosphere pursuant to compliance with the requirement at §625.A.8 for surface air/soil gas monitoring or other monitoring technologies, if required by the commissioner.

4. Owners or operators must notify the commissioner in writing in advance of doing any well work or formation testing as required in §621.A.9.

5. Regardless of whether the State of Louisiana has primary permit and enforcement authority (primacy) for Class VI wells, owners or operators of Class VI wells, or applicants for Class VI wells must submit all required submittals, reports, and notifications under §§605, 607, 615, 617, 619, 621, 623, 625, 627, 629, 631, and §633 to the USEPA in an electronic format approved by the USEPA.

6. Records shall be retained by the owner or operator as follows:

a. all data collected for Class VI permit applications in §§607 and 619 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 all injected fluids collected under §625.A.1 shall be retained at least 10 years after site closure. The commissioner may require the owner or operator to deliver the records to the commissioner at the conclusion of the retention period.

c. monitoring data collected under §§625.A.2 through 625.A.9 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 §§633.A.6 and 633.A.8 shall be retained at least 10 years following site closure.

e. The commissioner may require the owner or operator to retain any records required under these regulations for longer than 10 years after site closure.

B. Recordkeeping. Owners or operators of Class VI wells shall retain records as specified in §§615.C.4, 629.A.6, 631.A.5, 633.A.6, and 633.A.8.

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§631. Plugging and Abandonment

A. Well Plugging and Abandonment.

1. A Class VI permit shall include conditions that meet the requirements set forth in this subsection and shall be incorporated into the permit as a permit condition. For purposes of this subsection, temporary or intermittent cessation of injection operations is not abandonment.

2. Before well plugging, the owner or 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 owner or operator of a Class VI well must prepare, maintain, and comply with a plan acceptable to the commissioner. 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 must be submitted as part of the permit application, must be designed in a way that will prevent the movement of fluids into or between USDWs or outside the injection zone, and must 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 §627;

c. a description of the size and amount of casing, tubing, or any other well construction materials to be removed from the well before well closure;

d. that prior to the placement of plugs, the well shall be in a state of static equilibrium with the mud weight equalized top to bottom, either by circulating the mud in the well at least once or by a comparable method;

e. the type and number of plugs to be used;

f. the placement of each plug, including the elevation of the top and bottom of each plug;

g. 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;

h. the method of placement of the plugs;

i. pre-closure and proposed post-closure well schematics;

j. that each plug shall be appropriately tagged and tested for seal and stability;

k. that the well casings shall be cut at least five feet below ground surface for land-based wells, and at least 15 feet below the mud line for wells at a water location.

l. that upon successful completion of well closure of a land-based well, a one-half (½) inch steel plate shall be welded across all casings and inscribed with the well's state serial number and date plugged and abandoned, and

m. any addition information that the commissioner may require.

4. Notice of Intent to Plug. The owner or operator must submit the Form UIC-17, or successor form, to the commissioner and receive written approval from the commissioner before beginning actual well plugging operations. The form must contain information on the procedures to be used in the field to plug and abandon the well.

5. Well Closure Report. The owner or operator shall submit a closure report to the commissioner within 30 days after well plug and abandonment. The report shall be certified as accurate by the owner or operator and by the person charged with overseeing the closure operation (if other than the owner or operator). The owner or operator shall retain the well closure report at least 10 years following site closure. The report shall contain the following information:

a. detailed procedures of the closure operation. Where actual closure differed from the approved plan, the report shall include a written statement specifying the differences between the previous plan and the actual closure;

b. all state regulatory reporting forms relating to the closure activity; and

c. any information pertinent to the closure activity including schematics, tests, or monitoring data.

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§633. Closure and Post-Closure

A. Post-Injection Site Care and Site Closure.

1. The owner or operator of a Class VI well must prepare, maintain, and comply with a plan for post-injection site care and site closure that meets the requirements of §633.A.1.b and is acceptable to the commissioner. 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 owner or operator must 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 must include the following information:

i. the pressure differential between pre-injection and predicted post-injection pressures in the injection zone(s);

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 §615.B.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 commissioner and to the USEPA pursuant to §629.A.5; and,

v. the duration of the post-injection site care timeframe and, if approved by the commissioner, the demonstration of the alternative post-injection site care timeframe that ensures non-endangerment of USDWs.

c. Upon cessation of injection, owners or operators of Class VI wells must either submit an amended post-injection site care and site closure plan or demonstrate to the commissioner 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 must be approved by the commissioner, be incorporated into the permit, and are subject to the permit modification requirements at §613, as appropriate.

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

2. The owner or 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 owner or operator shall continue to conduct monitoring as specified in the commissioner-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 commissioner pursuant to requirements in §633.A.3, unless the owner or operator makes a demonstration under §633.A.2.b. The monitoring must continue until the geologic sequestration project no longer poses an endangerment to USDWs and the demonstration under §633.A.2.b is submitted and approved by the commissioner.

b. If the owner or operator can demonstrate to the satisfaction of the commissioner 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 commissioner 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 owner or 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 owner or operator must submit to the commissioner 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 §633.A.2.c cannot be made (i.e., additional monitoring is needed to ensure that 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 commissioner does not approve the demonstration, the owner or operator must submit to the commissioner a plan to continue post-injection site care until a demonstration can be made and approved by the commissioner.

3. Demonstration of Alternative Post-Injection Site Care Timeframe. The commissioner may approve, in consultation with the USEPA, an alternative post-injection site care timeframe other than the 50-year default, if an owner or 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 must be based on significant, site-specific data and information including all data and information collected pursuant to §607 and §615, 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 must include consideration and documentation of:

i. the results of computational modeling performed pursuant to delineation of the area of review under §615.B and §615.C;

ii. the predicted timeframe for pressure decline within the injection zone, and any other zones, such that formation fluids may not be forced into any USDWs; and/or 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/or mineral phase;

vi. the results of laboratory analyses, research studies, and/or field or site-specific studies to verify the information required in clauses iv. and v. above;

vii. a characterization of the confining zone(s) including a demonstration that it is free of transmissive faults, fractures, and micro-fractures and of appropriate thickness, permeability, and integrity to impede fluid (e.g., carbon dioxide, formation fluids) movement;

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/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 all abandoned wells within the area of review;

x. the distance between the injection zone and the nearest USDW above the injection zone; and

xi. any additional site-specific factors required by the commissioner.

b. Information submitted to support the demonstration in §633.A.3.a must meet the following criteria:

i. all analyses and tests performed to support the demonstration must be accurate, reproducible, and performed in accordance with the established quality assurance standards;

ii. estimation techniques must 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 must be calibrated using existing information (e.g., at Class I, Class II, or Class V experimental technology well sites) where sufficient data are available;

v. reasonably conservative values and modeling assumptions must be used and disclosed to the commissioner whenever values are estimated on the basis of known, historical information instead of site-specific measurements;

vi. an analysis must be performed to identify and assess aspects of the alternative post-injection site care timeframe demonstration that contribute significantly to uncertainty. The owner or operator must 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 must address all aspects of the demonstration; and,

viii. any additional criteria required by the commissioner.

4. Notice of Intent for Site Closure. The owner or operator must notify the commissioner 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 owner or operator must also provide the revised plan. The commissioner may allow for a shorter notice period.

5. After the commissioner has authorized site closure, the owner or operator must plug all monitoring wells in a manner which will not allow movement of injection or formation fluids that endangers a USDW.

6. The owner or operator must submit a site closure report to the commissioner within 90 days after site closure, which must also be retained by the owner or operator for at least 10 years. The report must include:

a. documentation of appropriate injection and monitoring well plugging as specified in §631 and §633.A.5. The owner or operator must provide a copy of a survey plat which has been submitted to the local zoning authority designated by the commissioner. The plat must indicate the location of the injection well relative to permanently surveyed benchmarks. The owner or operator must also submit a copy of the plat to the USEPA as in §629.A.5;

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 the injection and confining zone(s); and

c. records reflecting the nature, composition, and volume of the carbon dioxide stream.

7. Each owner or operator of a Class VI injection well must record a notation on the deed to the 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/or Tribe with which the survey plat was filed, as well as the address of the USEPA Regional Office to which it was submitted; and

c. the volume of fluid injected, the injection zone or zones into which it was injected, and the period over which injection occurred.

8. The owner or operator must retain for at least 10 years following site closure, records collected during the post-injection site care period. The owner or operator must deliver the records to the commissioner at the conclusion of the retention period, and the records must thereafter be retained in a form and manner and at a location designated by the commissioner.

B. Certificate of Completion. The commissioner shall not issue a certificate of completion pursuant to R.S. 1109 unless the operator has sufficient financial surety with the Office of Conservation to adequately close the facility, plug all existing wells, and provide for post-injection site care and site closure.

AUTHORITY NOTE: Promulgated in accordance with R.S. 30:4 et seq., 30:22 et seq., and 30:1101 et seq.
HISTORICAL NOTE: Promulgated by the Department of Natural Resources, Injection and Mining Division, LR 46: Department of Natural Resources – Office of Conservation.

Richard P. Ieyoub
Commissioner

Family Impact Statement

In compliance with Act 1183 of the 1999 Regular Session of the Louisiana Legislature, the impact of this proposed rule on the family has been considered. This proposed rule has a positive impact on family functioning, stability, or autonomy as described in R.S. 49:972.

Poverty Impact Statement

The proposed Rule should not have any known or foreseeable impact on any child, individual or family as defined by R.S. 49:973.B. In particular, there should be no known or foreseeable effect on:

1. the effect on household income, assets, and financial security;
2. the effect on early childhood development and preschool through postsecondary education development;
3. the effect on employment and workforce development;
4. the effect on taxes and tax credits;
5. the effect on child and dependent care, housing, health care, nutrition, transportation, and utilities assistance.

Small Business Analysis

Pursuant to R.S. 49:965.6, methods for reduction of the impact on small business, as defined in the Regulatory Flexibility Act, have been considered when creating this proposed Rule.

This proposed Rule is not anticipated to have an adverse impact on small businesses; therefore, a Small Business Economic Impact Statement has not been prepared.

Provider Impact Statement

The proposed Rule should not have any known or foreseeable impact on providers as defined by HCR 170 of 2014 Regular Legislative Session. In particular, there should be no known or foreseeable effect on:

1. the effect on the staffing level requirements or qualifications required to provide the same level of service;
2. the total direct and indirect effect on the cost to the providers to provide the same level of service; or
3. the overall effect on the ability of the provider to provide the same level of service.

Public Comments

Interested persons may submit written comments to Stephen Lee, Director of the Injection and Mining Division, Office of Conservation, Louisiana Department of Natural Resources, P.O. Box 94275, Baton Rouge, LA 70804-9275, or by faxing comments to (225) 242-3441. Written comments will be accepted through the close of business, 5:00 p.m. on December 1, 2020. A public hearing is not currently scheduled, but if requested will be held on the morning of Tuesday, December 1, 2020.

Richard P. Ieyoub
Commissioner of Conservation

FISCAL AND ECONOMIC IMPACT STATEMENT FOR ADMINISTRATIVE RULES

I. ESTIMATED IMPLEMENTATION COSTS (SAVINGS) TO STATE OR LOCAL GOVERNMENTAL UNITS (Summary)

There will be an increase in expenditures to the Louisiana Department of Natural Resources (LDNR) as a result of the proposed rules required by Act 517 of 2009. The proposed rules govern Class VI wells for the sequestration of carbon dioxide in subsurface geologic formations, ultimately limiting emissions of this greenhouse gas. LDNR anticipates minimal costs to the program in FY 21 (which will be absorbed within their existing budget) because LDNR will not receive approval from the United States Environmental Protection Agency (USEPA) to issue permits for these types of wells until FY 22.

Expenditures will increase over FY 22 and FY 23 as the program is fully staffed and implemented and will require approximately $1.135 M for full implementation by FY 23. Funding for the program will come from the newly created Carbon Dioxide Geologic Storage Trust Fund (CDGSTF), federal grants, and State General Fund (Direct) (SGF). The largest impact to the SGF will be in FY 23, with an expected impact of approximately $500,000. Reliance on the SGF is minimal for FY 24 and beyond as the CDGSTF is expected to have accrued sufficient funds for program operations, in addition to federal grants.

There will be no impact to local governmental units.

II. ESTIMATED EFFECT ON REVENUE COLLECTIONS OF STATE OR LOCAL GOVERNMENTAL UNITS (Summary)

There will be an increase in revenue collections to LDNR beginning in FY 22 and increasing each subsequent fiscal year. LDNR will experience small increases to the Oil and Gas Regulatory Fund each fiscal year ($10,000 by FY 23) and significant increases to the new CDGSTF each fiscal year ($315,000 by FY 23). LDNR anticipates 4 to 6 sites by the end of FY 24 with estimated revenue to the CDGSTF between $1.6 M - $2.4 M. Future grant funding will increase each fiscal year and will be based on the Class VI well count.

There will be an impact to the SGF to the extent that Class VI wells are constructed under state property thereby creating leasing revenues. However, the number and location of the Class VI wells is speculative

and future revenues are indeterminable.

III. ESTIMATED COSTS AND/OR ECONOMIC BENEFITS TO DIRECTLY AFFECTED PERSONS, SMALL BUSINESSES, OR NON-GOVERNMENTAL GROUPS (Summary)

There will be positive economic benefits to individuals, businesses, and other non-governmental groups as a result of this program. Individuals who own surface rights in the area of Class VI sequestration projects will be able to negotiate leases for storage rights in the subsurface. Non-governmental groups in the industrial sector will benefit from increased construction as well as the federal tax credits received by the operator who is sequestering the carbon dioxide underground.

IV. ESTIMATED EFFECT ON COMPETITION AND EMPLOYMENT (Summary)

There will be a positive impact on employment in the industrial construction sector as there will be an increase in the availability of construction jobs in order to build pipeline infrastructure and injection sites for the Class VI wells. However, this is a new industry in the United States and therefore potential impacts, while positive, are indeterminable.