

POLLUTION CONTROL BOARD

NOTICE OF PROPOSED AMENDMENTS

- 1) Heading of the Part: Underground Injection Control Operating Requirements
- 2) Code Citation: 35 Ill. Adm. Code 730
- 3)

| <u>Section Numbers</u> : | <u>Proposed Action</u> : |
|--------------------------|--------------------------|
| 730.101 | Amend |
| 730.103 | Amend |
| 730.104 | Amend |
| 730.105 | Amend |
| 730.121 | Amend |
| 730.172 | Amend |
| 730.181 | New Section |
| 730.182 | New Section |
| 730.183 | New Section |
| 730.184 | New Section |
| 730.185 | New Section |
| 730.186 | New Section |
| 730.187 | New Section |
| 730.188 | New Section |
| 730.189 | New Section |
| 730.190 | New Section |
| 730.191 | New Section |
| 730.192 | New Section |
| 730.193 | New Section |
| 730.194 | New Section |
| 730.195 | New Section |
- 4) Statutory authority: 415 ILCS 5/7.2, 13 and 27
- 5) A complete description of the subjects and issues involved: The amendments to Part 730 are a single segment of the docket R11-14 rulemaking that also affects 35 Ill. Adm. Code 702, 704, and 705, each of which is covered by a separate notice in this issue of the Illinois Register. To save space, a more detailed description of the subjects and issues involved in the docket R11-14 rulemaking in this *Illinois Register* only in the answer to question 5 in the Notice of Adopted Amendments for 35 Ill. Adm. Code 730. A comprehensive description is contained in the Board's opinion and order of October 6, 2011, proposing amendments in docket R11-14, which opinion and order is available from the address below.

RECEIVED
CLERK'S OFFICE

DEC 16 2011

STATE OF ILLINOIS
Pollution Control Board

POLLUTION CONTROL BOARD

NOTICE OF PROPOSED AMENDMENTS

Specifically, the amendments to Part 730 implement the federal standards for Class VI carbon sequestration injection wells in Illinois.

Tables appear in the Board's opinion and order of October 6, 2011 in docket R11-14 that list numerous corrections and amendments that are not based on current federal amendments. The tables contain deviations from the literal text of the federal amendments underlying these amendments, as well as corrections and clarifications that the Board made in the base text involved. Persons interested in the details of those corrections and amendments should refer to the October 6, 2011 opinion and order in docket R11-14.

Section 13(c) of the Environmental Protection Act [415 ILCS 5/13(c)] provides that Section 5-35 of the Administrative Procedure Act [5 ILCS 100/5-35] does not apply to this rulemaking. Because this rulemaking is not subject to Section 5-35 of the APA, it is not subject to First Notice or to Second Notice review by the Joint Committee on Administrative Rules (JCAR).

- 6) Published studies or reports, and sources of underlying data, used to compose this rulemaking: None
- 7) Will these proposed amendments replace emergency amendments currently in effect? No
- 8) Does this rulemaking contain an automatic repeal date: No
- 9) Does this rulemaking contain incorporations by reference: No
- 11) Are there any other amendments pending on this Part? No
- 10) Statement of statewide policy objectives: These proposed amendments do not create or enlarge a State mandate, as defined in Section 3(b) of the State Mandates Act. [30 ILCS 805/3(b) (2008)].
- 12) Time, place and manner in which interested persons may comment on this proposed rulemaking: The Board will accept written public comment on this proposal for a period of 45 days after the date of this publication. Comments should reference docket R11-14 and be addressed to:

John T. Therriault, Assistant Clerk
Illinois Pollution Control Board

POLLUTION CONTROL BOARD

NOTICE OF PROPOSED AMENDMENTS

State of Illinois Center, Suite 11-500
100 W. Randolph St.
Chicago, IL 60601

Please direct inquiries to the following person and reference docket R11-14:

Michael J. McCambridge
Staff Attorney
Illinois Pollution Control Board
100 W. Randolph 11-500
Chicago, IL 60601

Phone: 312-814-6924
E-mail: mccambm@ipcb.state.il.us

Request copies of the Board's opinion and order at 312-814-3620, or download a copy from the Board's Website at <http://www.ipcb.state.il.us>.

- 13) Initial regulatory flexibility analysis:
- A) Types of small businesses, small municipalities, and not-for-profit corporations affected: This rulemaking may affect those small businesses, small municipalities, and not-for-profit corporations that own or operate an underground injection well.
 - B) Reporting, bookkeeping or other procedures required for compliance: The existing rules and proposed amendments require extensive reporting, bookkeeping and other procedures, including the preparation of manifests and annual reports, waste analyses and maintenance of operating records.
 - C) Types of professional skills necessary for compliance: Compliance with the existing rules and proposed amendments may require the services of an attorney, certified public accountant, chemist, and registered professional engineer.
- 14) Regulatory agenda on which this rulemaking was summarized: December 17, 2010; 34 Ill. Reg. 19623, 19687

The full text of the Proposed Amendments begins on the next page:

TITLE 35: ENVIRONMENTAL PROTECTION
SUBTITLE G: WASTE DISPOSAL
CHAPTER I: POLLUTION CONTROL BOARD
SUBCHAPTER d: UNDERGROUND INJECTION CONTROL AND
UNDERGROUND STORAGE TANK PROGRAMS

PART 730
UNDERGROUND INJECTION CONTROL OPERATING REQUIREMENTS

SUBPART A: GENERAL

Section
730.101 Applicability, Scope, and Effective Date
730.102 Laws Authorizing Regulations
730.103 Definitions
730.104 Criteria for Exempted Aquifers
730.105 Classification of Injection Wells
730.106 Area of Review
730.107 Corrective Action
730.108 Mechanical Integrity
730.109 Criteria for Establishing Permitting Priorities
730.110 Plugging and Abandoning Wells

SUBPART B: CRITERIA AND STANDARDS APPLICABLE
TO CLASS I NON-HAZARDOUS WASTE INJECTION WELLS

Section
730.111 Applicability
730.112 Construction Requirements
730.113 Operating, Monitoring, and Reporting Requirements
730.114 Information to be Considered by the Agency

SUBPART C: CRITERIA AND STANDARDS APPLICABLE
TO CLASS II INJECTION WELLS

Section
730.121 Adoption of Criteria and Standards Applicable to Class II Injection
Wells by the Illinois Department of Natural Resources, Office of Mines and
Minerals

SUBPART D: CRITERIA AND STANDARDS APPLICABLE
TO CLASS III INJECTION WELLS

Section
730.131 Applicability
730.132 Construction Requirements
730.133 Operating, Monitoring, and Reporting Requirements
730.134 Information to be Considered by the Agency

SUBPART F: CRITERIA AND STANDARDS APPLICABLE
TO CLASS V INJECTION WELLS

Section
730.151 Applicability
730.152 Inventory and Assessment (Repealed)

SUBPART G: CRITERIA AND STANDARDS APPLICABLE TO

RECEIVED
CLERK'S OFFICE
DEC 15 2011
STATE OF ILLINOIS
Pollution Control Board

CLASS I HAZARDOUS WASTE INJECTION WELLS

Section

730.161 Applicability and Definitions
730.162 Minimum Criteria for Siting
730.163 Area of Review
730.164 Corrective Action for Wells in the Area of Review
730.165 Construction Requirements
730.166 Logging, Sampling, and Testing Prior to New Well Operation
730.167 Operating Requirements
730.168 Testing and Monitoring Requirements
730.169 Reporting Requirements
730.170 Information to be Evaluated
730.171 Closure
730.172 Post-Closure Care
730.173 Financial Responsibility for Post-Closure Care

SUBPART H: CRITERIA AND STANDARDS APPLICABLE TO CLASS VI WELLS

Section

730.181 Applicability
730.182 Required Class VI Injection Well Permit Information
730.183 Minimum Criteria for Siting
730.184 Area of Review and Corrective Action
730.185 Financial Responsibility
730.186 Injection Well Construction Requirements
730.187 Logging, Sampling, and Testing Prior to Injection Well Operation
730.188 Injection Well Operating Requirements
730.189 Mechanical Integrity
730.190 Testing and Monitoring Requirements
730.191 Reporting Requirements
730.192 Injection Well Plugging
730.193 Post-Injection Site Care and Site Closure
730.194 Emergency and Remedial Response
730.195 Alternative Class VI Injection Well Depth ~~Waiver~~ Requirements

AUTHORITY: Implementing Sections 7.2, 13, and 22.4 and authorized by Section 27 of the Environmental Protection Act [415 ILCS 5/7.2, 13, 22.4, and 27].

SOURCE: Adopted in R81-32 at 6 Ill. Reg. 12479, effective March 3, 1984; amended in R82-19 at 7 Ill. Reg. 14426, effective March 3, 1984; recodified at 10 Ill. Reg. 14174; amended in R89-2 at 14 Ill. Reg. 3130, effective February 20, 1990; amended in R89-11 at 14 Ill. Reg. 11959, effective July 9, 1990; amended in R93-6 at 17 Ill. Reg. 15646, effective September 14, 1993; amended in R94-5 at 18 Ill. Reg. 18391, effective December 20, 1994; amended in R95-4 at 19 Ill. Reg. 10047, effective June 27, 1995; amended in R00-11/R01-1 at 24 Ill. Reg. 18680, effective December 7, 2000; amended in R06-16/R06-17/R06-18 at 31 Ill. Reg. 1281, effective December 20, 2006; amended ~~in R11-14~~ at 36 Ill. Reg. _____, effective _____.

SUBPART A: GENERAL

Section 730.101 Applicability, Scope, and Effective Date

a) This Part sets forth technical criteria and standards for the Underground Injection Control (UIC) Program. This Part must be read in conjunction with 35 Ill. Adm. Code 702, 704, and 705, which also apply to the UIC program. 35 Ill.

Adm. Code 702 and 704 prescribe the regulatory requirements for the UIC permit program. 35 Ill. Adm. Code 704 further outlines hazardous waste management requirements and sets forth the financial assurance requirements applicable to Class I hazardous waste injection wells and requirements applicable to certain types of Class V injection wells. 35 Ill. Adm. Code 705 describes the procedures ~~the Agency~~ the Agency must use for issuing UIC permits.

b) On and after February 1, 1984, any underground injection that is not authorized by rule or by permit is unlawful.

c) Electronic reporting. The filing of any document pursuant to any provision of this Part as an electronic document is subject to 35 Ill. Adm. Code 720.104.

BOARD NOTE: Subsection (c) of this Section is derived from 40 CFR 3 and 145.11(a)(33), ~~as added at 70 Fed. Reg. 59848 (Oct. 13, 2005)~~ (2010).

(Source: Amended at 36 Ill. Reg. _____, effective _____)

Section 730.103 Definitions

The following definitions apply to the underground injection control program.

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

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

"Administrator" means the Administrator of the U.S. Environmental Protection Agency or the Administrator's designee.

"Agency" means the Illinois Environmental Protection Agency.

"Application" means the Agency forms for applying for a permit, including any additions, revisions, or modifications to the forms. For RCRA, application also includes the information required by the Agency pursuant to 35 Ill. Adm. Code 703.182-703.188 and 703.200 (contents of Part B of the RCRA application).

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

"Area of review" means the area surrounding an "injection well" described according to the criteria set forth in Section 730.106 or, in the case of an area permit, the project area plus a circumscribing area the width of which is either 402 meters (one-quarter mile) or a number calculated according to the criteria set forth in Section 730.106.

"Casing" means a pipe or tubing of appropriate material, 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 from caving, to prevent loss of drilling mud into porous ground or to prevent water, gas, or other fluid from entering or leaving the hole.

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

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

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

"Confining bed" means a body of impermeable or distinctly less permeable material stratigraphically adjacent to one or more aquifers.

"Confining zone" means a geologic formation, group of formations, or part of a formation that is capable of limiting fluid movement above an injection zone.

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

"Conventional mine" means an open pit or underground excavation for the production of minerals.

"Date of approval by USEPA of the Illinois UIC program" means February 1, 1984.

"Director" means the Director of the Illinois Environmental Protection Agency or the Administrator's designee.

"Disposal well" means a well used for the disposal of waste into a subsurface stratum.

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

"Effective date of the UIC program" means February 1, 1984.

"Environmental Protection Act" means the Environmental Protection Act [415 ILCS 5].

"EPA" or "USEPA" means the United States Environmental Protection Agency.

"Exempted aquifer" means an "aquifer" or its portion that meets the criteria in the definition of "underground source of drinking water" but which has been exempted according to the procedures of 35 Ill. Adm. Code 704.123, 704.104, and 702.105.

"Existing injection well" means an "injection well" other than a "new injection well."

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

"Facility or activity" means any HWM facility, UIC injection well, or any other facility or activity (including land or appurtenances thereto) that is subject to regulation under the "State" RCRA or UIC program.

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

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

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

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

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

"Generator" means any person, by site location, whose act or process produces hazardous waste identified or listed in 35 Ill. Adm. Code 721.

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

"Hazardous waste" means a hazardous waste as defined in 35 Ill. Adm. Code 721.103.

"Hazardous waste management facility" or "HWM facility" means all contiguous land, and structures, other appurtenances and improvements on the land used for treating, storing, or disposing of hazardous waste. A facility may consist of several treatment, storage, or disposal operational units (for example, one or more landfills, surface impoundments, or combination of them).

"HWM facility" means Hazardous waste management facility.

"Illinois" means the State of Illinois.

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

"Injection well" means a well into which fluids are being injected.

"Injection zone" means a geologic formation, group of formations, or part of a formation receiving fluids through a well.

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

"Owner or operator" means the owner or operator of any facility or activity subject to regulation under RCRA, UIC, or the Environmental Protection Act.

"Packer" means a device lowered into a well that can be expanded to produce a fluid-tight seal.

"Permit" means an authorization, license, or equivalent control document issued by the Agency to implement the requirements of this Part and 35 Ill. Adm. Code 702 through 705. Permit does not include RCRA interim status (Subpart C of 35 Ill. Adm. Code 703), UIC authorization by rule (Subpart C of 35 Ill. Adm. Code 704), or any permit that has not yet been the subject of final Agency action, such as a draft permit or a proposed permit.

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

"Plugging record" means 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 that are sealed and a graphic log of the well showing formation location, formation thickness, and location of plugging structures.

"Point of injection," for a Class V injection well, means the last accessible sampling point prior to waste fluids being released into the subsurface environment through the 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.

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

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

"Radioactive Waste" means any waste that contains radioactive material in concentrations that exceed those listed in Table II, column 2 in appendix B to 10 CFR 20 (Water Effluent Concentrations), incorporated by reference in 35 Ill. Adm. Code 720.111.

"RCRA" means the Solid Waste Disposal Act, as amended by the Resource Conservation and Recovery Act of 1976 (42 USC 6901 et seq.).

"Sanitary waste" means 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.

"SDWA" means the Safe Drinking Water Act (42 USC 300(f) et seq.).

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

"Site" means 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.

"Sole or principal source aquifer" means an aquifer that has been designated by the Administrator pursuant to Section 1424(a) or (e) of SDWA (42 USC 300h-3(a) or (e)).

"State" means the State of Illinois.

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

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

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

"Surface casing" means the first string of well casing to be installed in the well.

"Total dissolved solids" or "TDS" means the total dissolved (filterable) solids, as determined by use of the method specified in 40 CFR 136.3 (Identification of Test Procedures; the method for filterable residue), incorporated by reference in 35 Ill. Adm. Code 720.111.

"UIC" means the Underground Injection Control program under Part C of the Safe Drinking Water Act (42 USC 300h through 300h-8), including the approved Illinois program.

"Underground injection" means a "well injection."

"Underground source of drinking water" or "USDW" means an aquifer or its portion of which the following is true:

It supplies any public water system; or

It contains a sufficient quantity of groundwater to supply a public water system; and

It currently supplies drinking water for human consumption; or

It contains less than 10,000 mg/l total dissolved solids; and

It is not an exempted "aquifer."

"USDW" means underground source of drinking water.

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

largest surface dimension; an improved sinkhole; or a subsurface fluid distribution system.

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

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

"Well plug" means a watertight and gastight seal installed in a borehole or well to prevent movement of fluids.

"Well stimulation" means 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 wastewater to move more readily into the formation, and includes surging, jetting, blasting, acidizing, and hydraulic fracturing.

BOARD NOTE: Derived from 40 CFR 146.3 (2005)-(2010).

(Source: Amended at 36 Ill. Reg. _____, effective _____)

Section 730.104 Criteria for Exempted Aquifers

An aquifer or a portion ~~thereof~~ of an aquifer that meets the criteria for an "underground source of drinking water" in Section 730.103 ~~may be determined by the Board pursuant to 35 Ill. Adm. Code 704.103, 704.123, and 702.105 to be~~ is an "exempted aquifer" for a Class I, Class III, or Class V injection well if ~~it~~ the Board determines pursuant to 35 Ill. Adm. Code 704.123 that the aquifer meets the criteria of either subsections (a) and (b) or (a) and (c) of this Section. For a Class VI injection well, the Board must determine that the well meets the criteria of subsection (d) of this Section.

- a) ~~It~~ The aquifer does not currently serve as a source of drinking water; and
- b) ~~It~~ The aquifer cannot now and will not in the future serve as a source of drinking water because one or more of the following is true of the aquifer:
 - 1) ~~It~~ The aquifer is mineral, hydrocarbon, or geothermal energy producing, or a permit applicant can demonstrate, as part of a permit application for a Class II or III injection well, that the aquifer contains minerals or hydrocarbons that are expected to be commercially producible considering their quantity and location;
 - 2) ~~It~~ The aquifer is situated at a depth or location that makes recovery of water for drinking water purposes economically or technologically impractical;
 - 3) ~~It~~ The aquifer is so contaminated that it would be economically or technologically impractical to render that water fit for human consumption; or
 - 4) ~~It~~ The aquifer is located over a Class III injection well mining area subject to subsidence or catastrophic collapse; or
- c) The total dissolved solids content of the groundwater in the aquifer is more than 3,000 and less than 10,000 mg/l, and the aquifer 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 is expanded for the exclusive purpose of Class VI injection for geologic sequestration pursuant to 35 Ill. Adm. Code 704.123(d) if the Agency determines that the aquifer meets the following criteria:

- 1) The aquifer does not currently serve as a source of drinking water;
- 2) The total dissolved solids content of the ground water in the aquifer is greater than 3,000 mg/l and less than 10,000 mg/l; and
- 3) The aquifer is not reasonably expected to supply a public water system.

BOARD NOTE: Derived from 40 CFR 146.4 (2010), as amended at 75 Fed. Reg. 77303 (Dec. 10, 2010).

(Source: Amended at 36 Ill. Reg. _____, effective _____)

Section 730.105 Classification of Injection Wells

Injection wells are classified as follows:

a) Class I injection wells. A Class I injection well is any of the following:

1) A Class I hazardous waste injection well that is used by a generator of hazardous waste or an owner or operator of a hazardous waste management facility to inject hazardous waste beneath the lowermost formation containing an underground source of drinking water within 402 meters (one-quarter mile) of the well bore.

2) An industrial or municipal disposal well that injects fluids beneath the lowermost formation containing an underground source of drinking water within 402 meters (one-quarter mile) of the well bore.

3) A radioactive waste disposal well that injects fluids below the lowermost formation containing an underground source of drinking water within 402 meters (one-quarter mile) of the well bore.

b) Class II injection wells. A Class II injection well is one that injects any of the following types of fluids:

1) Fluids that are brought to the surface in connection with conventional oil or natural gas production and which may be commingled with wastewaters from gas plants that are an integral part of production operations, unless those waters are classified as a hazardous waste at the time of injection;

2) Fluids that are used for enhanced recovery of oil or natural gas; and

3) Fluids that are used for storage of hydrocarbons that are liquid at standard temperature and pressure.

c) Class III injection wells. A Class III injection well is one that ~~that~~ injects fluid for extraction of minerals, including one used in any of the following activities:

1) Mining of sulfur by the Frasch process;

2) In situ production of uranium or other metals. This category includes only in situ production from ore bodies that have not been conventionally mined. Solution mining of conventional mines, such as stopes leaching, is included in Class V; or

3) Solution mining of salts or potash.

BOARD NOTE: Class III injection well would include a well used for the recovery of geothermal energy to produce electric power, but does not include a well used in heating or aquaculture that falls under Class V.

d) Class IV injection wells. A Class IV injection well is any of the following:

1) A well used by a generator of hazardous waste or of radioactive waste, by an owner or operator of a hazardous waste management facility, or by an owner or operator of a radioactive waste disposal site to dispose of hazardous waste or radioactive waste into a formation that contains an underground source of drinking water within 402 meters (one-quarter mile) of the well.

2) A well used by a generator of hazardous waste or of radioactive waste, by an owner or operator of a hazardous waste management facility, or by an owner or operator of a radioactive waste disposal site to dispose of hazardous waste or radioactive waste above a formation that contains an underground source of drinking water within 402 meters (one-quarter mile) of the well.

3) A well used by a generator of hazardous waste or an owner or operator of a hazardous waste management facility to dispose of hazardous waste that cannot be classified pursuant to subsection (a)(1), (d)(1), or (d)(2) of this Section (e.g., wells used to dispose of hazardous wastes into or above a formation that contains an aquifer that has been exempted pursuant to Section 730.104).

e) Class V injection wells. A Class V injection well is any not included in Class I, Class II, Class III, ~~or~~ Class IV, or Class VI. Specific types of Class V injection wells include the following:

1) Air conditioning return flow wells used to return the water used in a heat pump for heating or cooling to the supply aquifer;

2) Cesspools, including multiple dwelling, community, or regional cesspools, or other devices that receive wastes that have an open bottom and sometimes have perforated sides. The UIC requirements do not apply to single family residential cesspools or to non-residential cesspools that receive solely sanitary wastes and have the capacity to serve fewer than 20 persons a day;

3) Cooling water return flow wells used to inject water previously used for cooling;

4) Drainage wells used to drain surface fluid, primarily storm runoff, into a subsurface formation;

5) Dry wells used for the injection of wastes into a subsurface formation;

6) Recharge wells used to replenish the water in an aquifer;

- 7) Salt water intrusion barrier wells used to inject water into a fresh water aquifer to prevent the intrusion of salt water into the fresh water;
- 8) Sand backfill and other backfill wells used to inject a mixture of water and sand, mill tailings, or other solids into mined out portions of subsurface mines whether what is injected is a radioactive waste or not;
- 9) Septic system wells used to inject the waste or effluent from a multiple dwelling, business establishment, community, or regional business establishment septic tank. The UIC requirements do not apply to single family residential septic system wells, or to nonresidential septic system wells that are used solely for the disposal of sanitary waste and which have the capacity to serve fewer than 20 persons a day;
- 10) Subsidence control wells (not used for the purpose of oil or natural gas production) used to inject fluids into a non-oil or gas producing zone to reduce or eliminate subsidence associated with the overdraft of fresh water;
- 11) Radioactive waste disposal wells other than Class IV injection wells;
- 12) Injection wells associated with the recovery of geothermal energy for heating, aquaculture, or production of electric power;
- 13) Wells used for solution mining of conventional mines such as stopes leaching;
- 14) Wells used to inject spent brine into the same formation from which it was withdrawn after extraction of halogens or their salts; and
- 15) Injection wells used in experimental technologies.

f) Class VI injection wells. A Class VI injection well is any of the following:

- 1) An injection well that is not experimental in nature and ~~which~~that is used for geologic sequestration of carbon dioxide beneath the lowermost formation containing a USDW;
- 2) An injection well that is used for geologic sequestration of carbon dioxide and ~~which~~that has been granted a permit that includes alternative injection well depth requirements pursuant to Section 730.195; or
- 3) An injection well that is used for geologic sequestration of carbon dioxide and ~~which~~that has received an expansion to the areal extent of an existing Class II enhanced oil recovery or enhanced gas recovery aquifer exemption pursuant to Section 730.104 and 35 Ill. Adm. Code 704.123(d).

BOARD NOTE: Derived from 40 CFR 146.5 (2010), as amended at 75 Fed. Reg. 77303 (Dec. 10, 2010).

(Source: Amended at 36 Ill. Reg. _____, effective _____)

SUBPART C: CRITERIA AND STANDARDS APPLICABLE
TO CLASS II INJECTION WELLS

Section 730.121 Adoption of Criteria and Standards Applicable to Class II Injection Wells by the Illinois Department of Natural Resources, Office of Mines and Minerals

The criteria and standards for Class II injection wells will be adopted by the Illinois Department of Natural Resources, Office of Mines and Minerals pursuant to Section 1425 of the SDWA (42 USC 300h-4).

BOARD NOTE: This Section corresponds with subpart C of 40 CFR 146 (2010), as amended at 75 Fed. Reg. 77303 (Dec. 10, 2010).

(Source: Amended at 36 Ill. Reg. _____, effective _____)

SUBPART G: CRITERIA AND STANDARDS APPLICABLE TO CLASS I HAZARDOUS WASTE INJECTION WELLS

Section 730.172 Post-Closure Care

a) The owner or operator of a Class I hazardous waste injection well must prepare, maintain, and comply with a plan for post-closure care that meets the requirements of subsection (b) of this Section and is specified by permit condition. The obligation to implement the post-closure plan survives the termination of a permit or the cessation of injection activities. The requirement to maintain an approved plan is directly enforceable regardless of whether the requirement is a condition of the permit.

1) The owner or operator must submit the plan as a part of the permit application and, upon approval by the Agency, such plan must be a condition of any permit issued.

2) The owner or operator must submit any proposed significant revision to the plan as appropriate over the life of the well, but no later than the date of the closure report required pursuant to Section 730.171(c).

3) The plan must assure financial responsibility, as required in Section 730.173.

4) The plan must include the following information:

A) The pressure in the injection zone before injection began;

B) The anticipated pressure in the injection zone at the time of closure;

C) The predicted time until pressure in the injection zone decays to the point that the well's cone of influence no longer intersects the base of the lowermost USDW;

D) The predicted position of the waste front at closure;

E) The status of any cleanups required pursuant to Section 730.164; and

F) The estimated cost of proposed post-closure care.

5) At the request of the owner or operator, or on its own initiative, the Agency may modify the post-closure plan after submission of the closure report following the procedures in 35 Ill. Adm. Code 705.128.

b) The owner or operator must undertake each of the following activities:

1) It must continue and complete any cleanup action required pursuant to Section 730.164, if applicable;

2) It must continue to conduct any groundwater monitoring required under the permit until pressure in the injection zone decays to the point that the well's cone of influence no longer intersects the base of the lowermost USDW. The Agency must extend the period of post-closure monitoring if it determines in writing that the well may endanger a USDW;

3) It must submit a survey plat to the local zoning authority designated by permit condition. The plat must indicate the location of the well relative to permanently surveyed benchmarks. A copy of the plat must be submitted to USEPA, Region 5;

4) It must notify the Illinois Department of Natural Resources, Office of Mines and Minerals, the State Department of Public Health, and any unit of local government authorized to grant permits under the Water Well Construction Code [415 ILCS 30] in the area where the well is located as to the depth and location of the well and the confining zone; and

5) It must retain, for a period of three years following well closure, records reflecting the nature, composition, and volume of all injected fluids. Owners or operators must deliver the records to the Agency at the conclusion of the retention period.

c) Each owner of a Class I hazardous waste injection well, and the owner of the surface or subsurface property on or in which a Class I hazardous waste injection well is located, must record a notation on the deed to the facility property or on some other instrument that is normally examined during title search that will in perpetuity provide any potential purchaser of the property the following information:

1) The fact that land has been used to manage hazardous waste;

2) The names of the Illinois Department of Natural Resources, Office of Mines and Minerals and the local zoning authority with which the plat was filed, as well as the address of USEPA Region 5; and

3) The type and volume of waste injected, the injection interval or intervals into which it was injected, and the period over which injection occurred.

d) In addition to the requirements stated in this Section, each owner of a Class I hazardous waste injection well must comply with any other State or federal law or local ordinance that requires the reporting of any potential environmental or physical impairment of real property to subsequent or prospective owners.

BOARD NOTE: The Responsible Property Transfer Act of 1988 [765 ILCS 90] (RPTA) formerly required the disclosure and recordation of any environmental impairment of real property in Illinois. The General Assembly repealed that statute in P.A. 92-299, Section 5, effective August 9, 2001. Section 10 of that repeal provided for continued maintenance of documents prepared and recorded under RPTA prior to its repeal.

BOARD NOTE: Derived from 40 CFR 146.72 (2005)-(2010), as amended at 75 Fed. Reg. 77303 (Dec. 10, 2010).

(Source: Amended at 36 Ill. Reg. _____, effective _____)

SUBPART H: CRITERIA AND STANDARDS APPLICABLE TO CLASS VI WELLS

Section 730.181 Applicability

a) This Subpart H establishes criteria and standards for Class VI carbon dioxide geologic sequestration injection wells.

b) This Subpart H applies to any injection well that is used to inject carbon dioxide specifically for the purpose of geologic sequestration.

c) This Subpart H also applies to the owner or operator of a permit- or rule-authorized Class I, Class II~~7~~ or Class V experimental carbon dioxide injection well that seeks to apply for a Class VI geologic sequestration permit for its well. An owner or operator that seeks to convert an existing Class I, Class II~~7~~ or Class V experimental injection well to a Class VI geologic sequestration ~~well~~well must demonstrate to the Agency that the well was engineered and constructed to meet the requirements of Section 146.86(a) and to ensure protection of USDWs, in lieu of requirements at Sections 146.86(b) and 146.87(a). By December 10, 2011, the owner or operator of either a Class I injection well that was previously permitted for the purpose of geologic sequestration or a Class V experimental technology injection well that is no longer being used for experimental purposes and ~~which~~that will continue injection of carbon dioxide for the purpose of geologic sequestration must apply for a Class VI permit. A converted well must still meet all other requirements of this Part.

d) Definitions. The following definitions apply to this Subpart H. To the extent that these definitions conflict with those that appear in 35 Ill. Adm. Code 702.110 or Section 730.103, the definitions of this Section govern for Class VI wells:

"Area of review" means the region surrounding the geologic sequestration project where a USDW 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 displaced fluids, and is based on available site characterization, monitoring~~7~~ and operational data, as set forth in Section 730.184.

"Carbon dioxide plume" means the sub-surface three-dimensional extent underground of an injected carbon dioxide stream.

"Carbon dioxide stream" means 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 Subpart H does not apply to any carbon dioxide stream that meets the definition of a hazardous waste in 35 Ill. Adm. Code 721.103.

"Confining zone" means a geologic formation, a group of formations~~7~~ or a part of a formation that stratigraphically overlies an injection zone and ~~which~~that acts as barrier to fluid movement. For a Class VI injection well that is operating under a permit that includes alternative injection well depth requirements,

"confining zone" means a geologic formation, a group of formations⁷ or a part of a formation that stratigraphically overlies and underlies the injection zone.

"Corrective action" means the use of Agency-approved methods to ensure that wells within an area of review do not serve as conduits for the movement of fluids into a USDW.

"Geologic sequestration" means the long-term containment of a gaseous, liquid⁷ or supercritical carbon dioxide stream in subsurface geologic formations. This term does not apply to carbon dioxide capture or transport.

"Geologic sequestration project" means any of the following three types of injection wells:

An injection well or wells that are used to emplace a carbon dioxide stream beneath the lowermost formation containing a USDW;

An injection well or wells that are used for geologic sequestration of carbon dioxide and ~~which~~that have been granted a permit that includes alternative injection well depth requirements pursuant to requirements at Section 730.195; or

An injection well or wells that are used for geologic sequestration of carbon dioxide and ~~which~~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 Section 730.104 and 35 Ill. Adm. Code 704.123(d).

A geologic sequestration project includes the subsurface three-dimensional extent of the carbon dioxide plume, the associated area of elevated pressure, and displaced fluids, as well as the surface area above that delineated region.

"Injection zone" means a geologic formation, a group of formations⁷ or a part of a formation that is of sufficient areal extent, thickness, porosity⁷ and permeability to receive carbon dioxide through a well or wells associated with a geologic sequestration project.

"Post-injection site care" means appropriate monitoring and other actions (including corrective action) needed following cessation of injection to ensure that no USDW is endangered, as required under Section 730.193.

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

"Site closure" means the point or time, as determined by the Agency pursuant to Section 730.193, at which the owner or operator of a geologic sequestration site is released from post-injection site care responsibilities.

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

BOARD NOTE: This Section corresponds with 40 CFR 146.81, as added at 75 Fed. Reg. 77303 (Dec. 10, 2010).

(Source: Added at 36 Ill. Reg. _____, effective _____)

Section 730.182 Required Class VI Injection Well Permit Information

This Section sets forth the information that the Agency must consider when authorizing a Class VI injection well. For a converted Class I, Class II₇ or Class V experimental injection well, certain maps, cross-sections₇ and tabulations of wells within the area of review and other data may be included in the application by reference provided they are current, readily available to the Agency₇ and sufficiently identified as to be retrieved. In cases where USEPA issues the permit, all the information in this Section must be submitted to the USEPA, Region 5.

a) Prior to the issuance of a permit for the construction of a new Class VI injection well or the conversion of an existing Class I, Class II₇ or Class V injection well to a Class VI injection well, the owner or operator must submit, pursuant to Section 730.191(e), and the Agency must consider₇ the following:

1) The information required by 35 Ill. Adm. Code 702.123(a) through (f);

2) A map showing the injection well for which a permit is sought and the applicable area of review consistent with Section 730.184. Within the area of review, the map must show the number or name and location of all injection wells, producing wells, abandoned wells, plugged wells₇ or dry holes; deep stratigraphic boreholes; Agency- or USEPA-approved subsurface cleanup sites; surface bodies of water, springs, mines (surface and subsurface), quarries₇ and water wells; and other pertinent surface features, including structures intended for human occupancy, state boundaries₇ and roads. The map should also show faults, if known or suspected. Only information of public record is required to be included on this map;

3) Information on the geologic structure and hydrogeologic properties of the proposed storage site and overlying formations, including the following documents and information:

A) Maps and cross sections of the area of review;

B) The location, orientation₇ and properties of known or suspected faults and fractures that may transect the confining zones in the area of review and a determination that the faults and fractures would not interfere with containment;

C) Data on the depth, areal extent, thickness, mineralogy, porosity, permeability₇ and capillary pressure of the injection and confining zones; including geology and facies changes based on field data, which may include geologic cores, outcrop data, seismic surveys, well logs₇ and names and lithologic descriptions;

D) Geomechanical information on fractures, stress, ductility, rock strength₇ and in situ fluid pressures within the confining zones;

E) Information on the seismic history that includes the presence and depth of seismic sources and a determination that the seismicity would not interfere with containment; and

F) Geologic and topographic maps and cross sections that illustrate regional geology, hydrogeology₇ and the geologic structure of the local area₇.

- 4) A tabulation of all wells within the area of review ~~which~~that penetrate the injection or confining zones. ~~Such~~This data must include a description of each well's type, construction, date drilled, location, depth, applicable records of plugging and completion, and any additional information that the Agency may require to evaluate the request for a permit;
- 5) Maps and stratigraphic cross sections indicating the general vertical and lateral limits of all USDWs, water wells, and springs within the area of review, their positions relative to the injection zones, and the direction of water movement, where known;
- 6) Baseline geochemical data on subsurface formations that includes all USDWs in the area of review;
- 7) Proposed operating data for the proposed geologic sequestration site that includes the following items of information:
 - A) The average and maximum daily rate and volume or mass, and the total anticipated volume or mass of the carbon dioxide stream;
 - B) The average and maximum injection pressures;
 - C) The sources of the carbon dioxide stream; and
 - D) An analysis of the chemical and physical characteristics of the carbon dioxide stream;
- 8) A proposed program for pre-operational formation testing that fulfills the requirements of Section 730.187 to obtain an analysis of the chemical and physical characteristics of the injection zones and confining zones;
- 9) A proposed stimulation program, a description of stimulation fluids to be used, and a determination that stimulation will not interfere with containment;
- 10) A proposed procedure to outline steps necessary to conduct injection operation;
- 11) Schematics or other appropriate drawings of the surface and subsurface construction details of the well;
- 12) Injection well construction procedures that fulfill the requirements of Section 730.186;
- 13) A proposed area of review and corrective action plan that fulfills the requirements of Section 730.184;
- 14) A demonstration ~~which~~that is sufficient to support an Agency determination that the applicant has met the financial responsibility requirements under Section 730.185;
- 15) A proposed testing and monitoring plan, as required by Section 730.190;
- 16) A proposed injection well plugging plan, as required by Section 730.192(b);
- 17) A proposed post-injection site care and site closure plan, as required by Section 730.193(a);

18) At the Agency's discretion, a demonstration of an alternative post-injection site care timeframe, as required, ~~as~~ by Section 730.193(c);

19) A proposed emergency and remedial response plan, as required by Section 730.194(a);

20) A list of contacts, submitted to the Agency, for those states identified to be within the area of review of the Class VI project based on information provided pursuant to subsection (a)(2) of this Section; and

21) Any other information requested by the Agency that would support an Agency determination whether to issue the requested permit.

b) Pursuant to this Section, and as required by 40 CFR 145.23(f)(13), the Agency must notify any states that the Agency determines are within the area of review of the Class VI project based on information submitted pursuant to subsections (a)(2) and (a)(20) of this Section of the permit application in writing.

c) Prior to granting a permit for the operation of a Class VI injection well, the Agency must consider the following information:

1) The final area of review based on modeling, ~~using~~ using data obtained during the logging and testing of the well and the formation required by subsections (c)(2), (c)(3), (c)(4), (c)(6), (c)(7), ~~and~~ and (c)(10) of this Section;

2) Any relevant updates to the information on the geologic structure and hydrogeologic properties of the proposed storage site and overlying formations, submitted pursuant to subsection (a)(3) of this Section, based on data obtained during the logging and testing of the well and the formation required by subsections (c)(3), (c)(4), (c)(6), (c)(7), ~~and~~ and (c)(10) of this Section;

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

4) The results of the formation testing program required by subsection (a)(8) of this Section;

5) Final injection well construction procedures that fulfill the requirements of Section 730.186;

6) The status of any corrective action on wells in the area of review;

7) All available logging and testing program data on the well required by Section 730.187;

8) A demonstration of mechanical integrity pursuant to Section 730.189;

9) Any updates to the proposed area of review and corrective action plan, the testing and monitoring plan, the injection well plugging plan, the post-injection site care and site closure plan, or the emergency and remedial response plan that the applicant has submitted pursuant to subsection (a) of this Section ~~which that~~ are necessary to address new information collected during logging and testing of the well and the formation, as required by this Section,

and any updates to the alternative post-injection site care timeframe demonstration submitted pursuant to subsection (a) of this Section, that are necessary to address new information collected during the logging and testing of the well and the formation as required by this Section; and

10) Any other information requested by the Agency.

d) An owner or operator that seeks a permit ~~which~~that includes alternative injection well depth requirements to the generally applicable requirement to inject below the lowermost USDW must also refer to Section 730.195 and submit a supplemental report, as required at Section 730.195(a). The supplemental report is not part of the permit application.

BOARD NOTE: This Section corresponds with 40 CFR 146.82, as added at 75 Fed. Reg. 77303 (Dec. 10, 2010).

(Source: Added at 36 Ill. Reg. _____, effective _____)

Section 730.183 Minimum Criteria for Siting

a) The owner or operator of a Class VI injection well must sufficiently demonstrate to support an Agency determination that the wells will be sited in areas with a suitable geologic system. The owner or operator must sufficiently demonstrate that the geologic system comprises both of the following elements:

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

2) Confining zones 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 zones.

b) The Agency may require the owner or operator of a Class VI injection well to identify and characterize additional zones that will impede vertical fluid movement; that are free of faults and fractures ~~which~~that may interfere with containment; that allow for pressure dissipation; and that provide additional opportunities for monitoring, mitigation, and remediation.

BOARD NOTE: This Section corresponds with 40 CFR 146.83, as added at 75 Fed. Reg. 77303 (Dec. 10, 2010).

(Source: Added at 36 Ill. Reg. _____, effective _____)

Section 730.184 Area of Review and Corrective Action

a) The area of review is the region surrounding the geologic sequestration project ~~where~~when injection activity may endanger a USDW. 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 ~~which~~that is based on available site characterization, monitoring, and operational data.

b) The owner or operator of a Class VI injection well must prepare, maintain, and comply with a plan to delineate the area of review for a proposed geologic sequestration project; must periodically reevaluate the delineation; and must

perform corrective action that meets the requirements of this Section and ~~which~~that is sufficient to support an Agency determination that the corrective action is acceptable. 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 to the Agency, the owner or operator must submit an area of review and corrective action plan that includes the following information:

1) The method that the owner or operator will use for delineating the area of review ~~which~~that meets the requirements of subsection (c) of this Section, including the model that the owner or operator will use, assumptions that the owner or operator will make, and the site characterization data on which the owner or operator will base the model;

2) A description of each of the following:

A) The minimum fixed frequency, not to exceed five years, at which the owner or operator proposes to reevaluate the area of review;

B) 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 pursuant to subsection (b)(2)(A) of this Section~~;~~

C) How monitoring and operational data (e.g., injection rate, pressure, etc.) will be used to inform an area of review reevaluation; and

D) How the owner or operator will conduct corrective action to meet the requirements of subsection (d) of this Section, including the following information:

i) What corrective action the owner or operator will perform prior to injection;

ii) What, if any, portions of the area of review the owner or operator will address with corrective action on a phased basis and how that phasing will be determined;

iii) How the owner or operator will adjust corrective action if there are changes in the area of review; and

iv) How the owner or operator will guarantee site access for future corrective action.

c) The owner or operator of a Class VI injection well must perform the following actions to delineate the area of review and identify all wells that require corrective action:

1) The owner or operator must 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 determined by the Agency. The model must fulfill the following requirements:

A) The model must be based on detailed geologic data collected to characterize the injection zones, confining zones and any additional zones; and anticipated operating data, including injection pressures, rates, and total volumes over the proposed life of the geologic sequestration project;

B) The model must take into account any geologic heterogeneities, other discontinuities, data quality, and their possible impact on model predictions; and

C) The model must consider potential migration through faults, fractures, and artificial penetrations.

2) Using methods approved by the Agency, the owner or operator must identify all penetrations, including active and abandoned wells and underground mines, in the area of review that may penetrate the confining ~~zone(s)~~. Provide zones and must provide a description of each well's type, construction, date drilled, location, depth, record of plugging and/ or completion, and any additional information the Agency may require; and

3) The owner or operator must 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.

d) The owner or operator of a Class VI injection well 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.

e) 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, the owner or operator of a Class VI injection well must fulfill each of the following requirements:

1) The owner or operator must reevaluate the area of review in the same manner specified in subsection (c)(1) of this Section;

2) The owner or operator must identify all wells in the reevaluated area of review that require corrective action in the same manner specified in subsection (c) of this Section;

3) The owner or operator must perform corrective action on wells requiring corrective action in the reevaluated area of review in the same manner specified in subsection (d) of this Section; and

4) The owner or operator must submit an amended area of review and corrective action plan or demonstrate through monitoring data and modeling results sufficiently to support an Agency finding 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 Agency, must be incorporated into the permit, and are subject to the permit modification requirements set forth in 35 Ill. Adm. Code 704.262 or 704.264, as appropriate.

f) The emergency and remedial response plan (as required by Section 730.194) and the demonstration of financial responsibility (as described by Section 730.185) must account for the area of review delineated as specified in

subsection (c)(1) of this Section or the most recently evaluated area of review delineated pursuant to subsection (e) of this Section, regardless of whether ~~or~~ ~~not~~ corrective action in the area of review is phased.

g) The owner or operator must retain all modeling inputs and data used to support area of review reevaluations under subsection (e) of this Section for 10 years.

BOARD NOTE: This Section corresponds with 40 CFR 146.84, as added at 75 Fed. Reg. 77303 (Dec. 10, 2010).

(Source: Added at 36 Ill. Reg. _____, effective _____)

Section 730.185 Financial Responsibility

a) The owner or operator of an injection well to which this Subpart H applies must demonstrate and maintain financial responsibility that the Agency has determined fulfills the following conditions:

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

- A) A trust fund~~+~~i
- B) A surety bond~~+~~i
- C) A letter of credit~~+~~i
- D) Insurance~~+~~i
- E) Self insurance (i.e., the financial test and corporate guarantee)~~+~~i
- F) An escrow account~~+~~i
- G) Any other instruments that the Agency determines are satisfactory.

2) The qualifying instruments must be sufficient to cover the following costs:

- A) The costs of corrective action (that meets the requirements of Section 730.184);
 - B) The costs of injection well plugging (that meets the requirements of Section 730.192);
 - C) The costs of post-injection site care and site closure (that meets the requirements of Section 730.193); and
 - D) The costs of emergency and remedial response (that meets the requirements of Section 730.194).
- 3) The financial responsibility instruments must be sufficient to address endangerment of underground sources of drinking water.
- 4) The qualifying financial responsibility instruments must comprise protective conditions of coverage.

A) 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 have the ability to pass the bond rating when applicable.

i) Cancellation. For purposes of this Subpart H, the owner or operator must provide that its financial mechanism may not cancel, terminate, or fail to renew, except for failure to pay ~~such~~the 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 Agency. The cancellation must not be final for 120 days after receipt of cancellation notice by the owner or operator and the Agency. The owner or operator must provide an alternative financial responsibility demonstration within 60 days ~~of~~after 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~~after notification by the Agency.

ii) Renewal. For purposes of this Subpart H, an owner or operator 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 an 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 any of the following occurs on or before the date of expiration: the Agency deems the facility abandoned; or the permit is revoked or a new permit is denied; closure is ordered by the Agency or a court of competent jurisdiction; the owner or operator is named as debtor in a voluntary or involuntary bankruptcy proceeding under Title 11 of the United States Code; or the amount due on the instrument is fully paid.

B) This subsection (a)(4)(B) would correspond with 40 CFR 706.85(a)(4)(ii) if such existed. USEPA codified a paragraph (a)(4)(i) without a paragraph (a)(4)(ii). Illinois codification requirements do not allow codification of a subsection level unless multiple subsections exist at that level. This statement maintains structural consistency with the corresponding federal rules.

5) The qualifying financial responsibility instruments must be approved by the Agency.

A) The Agency must consider and approve the financial responsibility demonstration for all the phases of the geologic sequestration project prior to ~~issue~~issuing a Class VI injection well permit (Section 730.182).

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

C) The Agency must disapprove the use of a financial instrument if the Agency determines that it is not sufficient to meet the requirements of this Section.

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

A) 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 (i.e., self insurance or performance bond), for example trust funds, surety bonds guaranteeing payment into a trust fund, letters of credit, escrow account, and insurance. In this case, it is the combination of mechanisms, rather than the single mechanism, that must provide financial responsibility for an amount at least equal to the current cost estimate.

B) When using a third-party instrument to demonstrate financial responsibility, the owner or operator must provide a proof that the third-party provider fulfills either of the following:

i) The provider must have passed financial strength requirements of subsection (b)(6)(E) of this Section based on credit ratings; or

ii) The provider must have met a minimum rating, minimum capitalization, and have the ability to pass the bond rating set forth in subsection (b)(6)(E) of this Section, when applicable.

C) An owner or operator using certain types of third-party instruments must establish a standby trust fund to enable the Agency to be party to the financial responsibility agreement without the Agency being the beneficiary of any funds. The standby trust fund must be used along with other financial responsibility instruments (e.g., surety bonds, letters of credit, or escrow accounts) to provide a location to place funds if needed.

D) An owner or operator may deposit money to an escrow account to cover financial responsibility requirements. This account must segregate funds sufficient to cover estimated costs for Class VI (geologic sequestration) financial responsibility from other accounts and uses.

E) An owner or operator or its guarantor may use self insurance to demonstrate financial responsibility for geologic sequestration projects if the owner or operator or its guarantor fulfill the following requirements:

i) The owner or operator or its guarantor must meet a tangible net worth of an amount approved by the Agency;

ii) The owner or operator or its guarantor must have a net working capital and tangible net worth each at least six times the sum of the current well plugging, post -injection site care, and site closure cost;

iii) The owner or operator or its guarantor must have assets located in the United States amounting to at least 90 percent of total assets or at least six times the sum of the current well plugging, post -injection site care, and site closure cost;

iv) The owner or operator or its guarantor must submit a report of its bond rating and financial information annually; and

v) The owner or operator or its guarantor must either have a bond rating test of AAA, AA, A, or BBB, as issued by Standard & Poor's, or Aaa, Aa, A, or Baa, as issued by Moody's, or meet all of the following five financial ratio thresholds: a ratio of total liabilities to net worth less than 2.0; a ratio of current assets to current liabilities greater than 1.5; a ratio of the sum of net income plus depreciation, depletion, and amortization to total liabilities greater than 0.1; a ratio of current assets minus current liabilities to total assets greater than -0.1; and a net profit (revenues minus expenses) greater than 0.

F) An owner or operator that is not able to meet the corporate financial test criteria of subsection (a)(6)(E) of this Section may arrange a corporate guarantee by demonstrating that its corporate parent meets the financial test requirements on its behalf. The corporate parent's demonstration that it meets the financial test requirement is insufficient if it has not also guaranteed to fulfill the obligations for the owner or operator.

G) An owner or operator may obtain an insurance policy to cover the estimated costs of geologic sequestration activities that require financial responsibility. This insurance policy must be obtained from a third party provider.

b) The requirement to maintain adequate financial responsibility and resources is directly enforceable regardless of whether the requirement is a condition of the permit.

1) The owner or operator must maintain financial responsibility and resources until both of the following events have occurred:

A) The Agency has received and approved the completed post-injection site care and site closure plan; and

B) The Agency has approved site closure.

2) The owner or operator may be released from a financial instrument in the following circumstances:

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

B) The owner or operator has submitted a replacement financial instrument, and the owner or operator has received written approval from the Agency that accepts the new financial instrument and ~~which~~ that releases the owner or operator from the previous financial assurance instrument.

c) 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 wells, post-injection site care, site closure, and emergency and remedial response.

1) The cost estimate must be performed for each phase separately, and the cost estimate must be based on the costs to the Agency of hiring a third party

to perform the required activities. A third party is a party who is not within the corporate structure of the owner or operator.

2) During the active life of the geologic sequestration project, the owner or operator must adjust the cost estimate for inflation within 60 days prior to the anniversary date of the establishment of the financial instruments used to comply with subsection (a) of this Section, and the owner or operator must provide this adjustment to the Agency. The owner or operator must also provide to the Agency written updates of adjustments to the cost estimate within 60 days after any amendments to the area of review and corrective action plan (Section 730.184), the injection well plugging plan (Section 730.192), the post-injection site care and site closure plan (Section 730.193), and the emergency and remedial response plan (Section 730.194).

3) The Agency 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 any of the following events has occurred: the Agency has approved the request to modify the area of review and corrective action plan (Section 730.184), the Agency has approved the injection well plugging plan (Section 730.192), the Agency has approved the post-injection site care and site closure plan (Section 730.193), or the Agency has approved the emergency and response plan (Section 730.194), if the change in the plan increases the cost. If the change to the plan decreases the cost, any withdrawal of funds must be approved by the Agency. Any decrease to the value of the financial assurance instrument must first be approved by the Agency. The revised cost estimate must be adjusted for inflation as specified at subsection (c)(2) of this Section.

4) Within 60 days after an increase in the current cost estimate to an amount greater than the face amount of a financial instrument currently in use, the owner or operator 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 that~~ increase to the Agency, or obtain other financial responsibility instruments to cover the increase. Whenever the current cost estimate decreases, the owner or operator may reduce the face amount of the financial assurance instrument to the amount of the current cost estimate only in accordance with a written approval from the Agency.

d) The owner or operator must notify the Agency 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.

1) 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 Agency of the proceeding by certified mail within 10 days after commencement of a voluntary or involuntary proceeding under Title 11 of the United States Code that names the owner or operator as debtor.

2) The guarantor of a corporate guarantee must make the notification to the Agency required by this subsection (d) ~~(2) of this Section~~ if the guarantor is named as debtor, as required under the terms of the corporate guarantee.

3) An owner or operator who fulfills the requirements of subsection (a) of this Section by obtaining a trust fund, surety bond, letter of credit, escrow account, or insurance policy 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 pertinent financial assurance instrument. The owner or operator must establish other financial assurance within 60 days after such an event.

e) The owner or operator must provide an adjustment of the cost estimate to the Agency within 60 days after notification of an Agency determination during the annual evaluation of the qualifying financial responsibility instruments that the most recent demonstration is no longer adequate to cover the cost of corrective action (as required by Section 730.184), injection well plugging (as required by Section 730.192), post-injection site care and site closure (as required by Section 730.193), and emergency and remedial response (as required by Section 730.194).

f) The Agency must approve the use and length of pay-in-periods for trust funds or escrow accounts.

BOARD NOTE: This Section corresponds with 40 CFR 146.85, as added at 75 Fed. Reg. 77303 (Dec. 10, 2010).

(Source: Added at 36 Ill. Reg. _____, effective _____)

Section 730.186 Injection Well Construction Requirements

a) General. The owner or operator must ensure that its Class VI injection wells are constructed and completed to fulfill the following requirements:

1) The well construction and completion must prevent the movement of fluids into or between USDWs or into any unauthorized zone;

2) The well construction and completion must permit the use of appropriate testing devices and workover tools; and

3) The well construction and completion must permit continuous monitoring of the annulus space between the injection tubing and long-string casing.

b) Casing and cementing of Class VI injection wells.

1) The casing, cement, and other materials used in the construction of each Class VI injection well must have sufficient structural strength and be designed to last for the life of the geologic sequestration project. All well materials must be compatible with fluids with which the materials may be expected to come into contact, and the owner or operator must submit sufficient documentation to the Agency to support a determination that the casing, cement, and other materials meet or exceed standards developed for ~~such~~ these materials by the American Petroleum Institute, ASTM International, or a comparable industry standards organization. The casing and cementing program must be designed to prevent the movement of fluids into or between USDWs. In order to allow the Agency to determine and specify casing and cementing requirements, the owner or operator must provide the following information to the Agency:

A) The depth to the injection zones;

B) The injection pressure, external pressure, internal pressure, and axial loading;

C) The hole size;

D) The size and grade of all casing strings (the wall thickness, external diameter, nominal weight, length, joint specification, and construction material);

E) The corrosiveness of the carbon dioxide stream and formation fluids;

F) The down-hole temperatures;

G) The lithology of the injection and confining zones;

H) The type or grade of cement and cement additives; and

I) The quantity, chemical composition, and temperature of the carbon dioxide stream.

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

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

4) The circulation of cement may be accomplished by staging. The Agency must approve an alternative method of cementing when it determines that the cement cannot be recirculated to the surface, provided the owner or operator can demonstrate, by using logs, that the cement does not allow fluid movement behind the well bore.

5) The 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 must be verified that it uses technology capable of evaluating cement quality radially and ~~which~~that identifies the location of channels to ensure that USDWs are not endangered.

c) Tubing and packer.

1) The tubing and packer materials used in the construction of a Class VI injection well must be compatible with fluids with which the materials may be expected to come into contact, and the owner or operator must submit sufficient documentation to the Agency to support a determination that the tubing and packer meet or exceed standards developed for ~~such~~these materials by the American Petroleum Institute, ASTM International, or a comparable industry standards organization.

2) The owner or operator of a Class VI injection well must inject fluids through tubing with a packer set at a depth opposite a cemented interval at the location approved by the Agency.

3) In order for the Agency to determine and specify requirements for tubing and packer, the owner or operator must submit the following information to the Agency:

A) The depth of setting;

- B) The characteristics of the carbon dioxide stream (the chemical content, corrosiveness, temperature~~7~~ and density) and formation fluids;
- C) The maximum proposed injection pressure;
- D) The maximum proposed annular pressure;
- E) The proposed injection rate (intermittent or continuous) and the volume or mass of the carbon dioxide stream;
- F) The size of the tubing and casing; and
- G) The tubing tensile, burst~~7~~ and collapse strengths.

BOARD NOTE: This Section corresponds with 40 CFR 146.86, as added at 75 Fed. Reg. 77303 (Dec. 10, 2010).

(Source: Added at 36 Ill. Reg. _____, effective _____)

Section 730.187 Logging, Sampling~~7~~ and Testing Prior to Injection Well Operation

a) During the drilling and construction of a Class VI injection well, the owner or operator must run appropriate logs, surveys~~7~~ and tests to determine or verify the depth, thickness, porosity, permeability~~7~~ and lithology of all relevant geologic formations and the salinity of any formation fluids in those formations, to ensure conformance with the injection well construction requirements under Section 730.186 and to establish accurate baseline data against which future measurements may be compared. The owner or operator must submit to the Agency a descriptive report prepared by a knowledgeable log analyst that includes an interpretation of the results of ~~such~~the logs and tests. At a minimum, ~~such~~the logs and tests must include the following information items:

1) Deviation checks made during drilling on all holes constructed by drilling a pilot hole that is enlarged by reaming or another method. ~~Such~~These 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;

2) Before and upon installation of the surface casing, the following:

A) The resistivity, spontaneous potential~~7~~ and caliper logs before the casing is installed; and

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

3) Before and upon installation of the long string casing, the following:

A) The resistivity, spontaneous potential, porosity, caliper, gamma ray, fracture finder logs~~7~~ and any other logs the Agency requires for the given geology before the casing is installed; and

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

4) A series of tests designed to demonstrate the internal and external mechanical integrity of injection wells, which may include the following:

A) A pressure test with liquid or gas;

B) A tracer survey, such as oxygen-activation logging;

C) A temperature or noise log; and

D) A casing inspection log; and

5) Any alternative methods that provide equivalent or better information and ~~which~~that are required by or approved of by the Agency.

b) The owner or operator must take whole cores or sidewall cores of the injection zone and confining system and formation fluid samples from all injection zones, and the owner or operator must submit a detailed report prepared by a log analyst to the Agency that includes the following information: well log analyses (including well logs), core analyses~~r~~ and formation fluid sample information. The Agency must accept information on cores from nearby wells if the Agency determines that the owner or operator has demonstrated that core retrieval is not possible and ~~such~~the cores are representative of conditions at the well. The Agency must require the owner or operator to core other formations in the borehole if the Agency determines that coring those other formations is necessary for evaluation of the well project.

c) The owner or operator must record the fluid temperature, pH, conductivity, reservoir pressure~~r~~ and static fluid level of each injection zone.

d) At a minimum, the owner or operator must determine or calculate the following information concerning the injection and confining zones:

1) The fracture pressure;

2) Other physical and chemical characteristics of the injection and confining zones; and

3) The physical and chemical characteristics of the formation fluids in each injection zone.

e) Upon completion, but prior to operation, the owner or operator must conduct the following tests to verify hydrogeologic characteristics of each injection zone:

1) A pressure fall-off test and a pump test; or

2) A pressure fall-off test and injectivity tests.

f) The owner or operator must provide the Agency with the opportunity to witness all logging and testing by this Subpart H. The owner or operator must submit a schedule of ~~such~~these activities to the Agency no later than 30 days prior to conducting the first test, and the owner or operator must submit any changes to the schedule to the Agency no later than 30 days prior to the next scheduled test.

BOARD NOTE: This Section corresponds with 40 CFR 146.87, as added at 75 Fed. Reg. 77303 (Dec. 10, 2010).

(Source: Added at 36 Ill. Reg. _____, effective _____)

Section 730.188 Injection Well Operating Requirements

a) Except during injection well stimulation, the owner or operator must ensure that injection pressure does not exceed 90 percent of the fracture pressure of the injection zones, so as to ensure that the injection does not initiate new fractures or propagate existing fractures in the injection zones. In no case may injection pressure initiate fractures in the confining zones or cause the movement of injection or formation fluids that endangers a USDW. Pursuant to the requirements of Section 730.182(a)(9), all stimulation programs must be approved by the Agency as part of the permit application and incorporated into the permit.

b) Injection between the outermost casing that protects any USDW and the well bore is prohibited.

c) The owner or operator must fill the annulus between the tubing and the long string casing with a non-corrosive fluid approved by the Agency. The owner or operator must maintain on the annulus a pressure that exceeds the operating injection pressure, unless the Agency determines that such a requirement might harm the integrity of the well or endanger any USDW.

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

e) The owner or operator must install and use the equipment indicated in subsection (e)(1) of this Section and the appropriate of subsection (e)(2) or (e)(3) of this Section:

1) Continuous recording devices that monitor each of the following parameters:

A) The carbon dioxide injection pressure;

B) The rate, volume or mass, and temperature of the carbon dioxide stream;

C) The pressure on the annulus between the tubing and the long string casing; and

D) The annulus fluid volume.

2) For onshore wells, alarms and automatic surface shut-off systems or, at the discretion of the Agency, down-hole shut-off systems (e.g., automatic shut-off valves, check valves, etc.) or other mechanical devices that provide equivalent protection.

3) For wells located offshore but within State territorial waters, 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.

f) If a shutdown is triggered (down-hole or at the surface), or if a loss of mechanical integrity is discovered, the owner or operator must immediately investigate and identify the cause of the shutoff as expeditiously as possible. If, upon ~~such~~that investigation, or if monitoring required under subsection (e) of this Section otherwise indicates that the well may be lacking mechanical integrity, the well appears to be lacking mechanical integrity, the owner or operator must undertake each of the following actions:

- 1) The owner or operator must immediately cease injection;
- 2) The owner or operator must 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;
- 3) The owner or operator must notify the Agency of the event within 24 hours;
- 4) The owner or operator must restore and demonstrate the mechanical integrity of the well to the satisfaction of the Agency prior to resuming injection; and
- 5) The owner or operator must notify the Agency when injection can be expected to resume.

BOARD NOTE: This Section corresponds with 40 CFR 146.88, as added at 75 Fed. Reg. 77303 (Dec. 10, 2010).

(Source: Added at 36 Ill. Reg. _____, effective _____)

Section 730.189 Mechanical Integrity

a) A Class VI injection well has mechanical integrity if both of the following conditions exist:

- 1) There is no significant leak in the casing, tubing~~r~~ or packer; and
- 2) There is no significant fluid movement into a USDW through channels adjacent to the injection well bore.

b) To evaluate the absence of significant leaks under subsection (a)(1) of this Section, the owner or operator must, following an initial annulus pressure test, continuously monitor each of the following parameters:

- 1) The injection pressure, rate~~r~~ and injected volumes;
- 2) The pressure on the annulus between the tubing and the long-string casing; and
- 3) The annulus fluid volume, as specified in Section 730.188 (e);

c) At least once per year, the owner or operator must use one of the following methods to determine the absence of significant fluid movement under subsection (a)(2) of this Section:

- 1) An approved tracer survey, such as an oxygen-activation log; or
- 2) A temperature or noise log.

d) If required by the Agency, at a frequency specified in the testing and monitoring plan required by Section 730.190, the owner or operator must run a casing inspection log to determine the presence or absence of corrosion in the long-string casing.

e) The Agency must require any requested alternative test that the Agency has determined is necessary to evaluate mechanical integrity under subsections (a)(1) or (a)(2) of this Section after obtaining the written approval of USEPA.

BOARD NOTE: Corresponding 40 CFR 146.89(e) provides that the Agency must submit a written request to USEPA setting forth the proposed test and all technical data supporting its use to obtain approval for a new mechanical integrity test. USEPA stated that it will approve the request if USEPA determines that the proposed test will reliably demonstrate the mechanical integrity of wells for which its use was proposed. USEPA stated that it will publish any alternative method that USEPA has approved in the Federal Register, and the Agency must approve use of the published method if the Agency has determined that the method is appropriate to evaluate mechanical integrity, unless USEPA restricts its use at the time of approval by USEPA.

f) In conducting and evaluating the tests enumerated in this Section or others that the Agency has required by permit, the owner or operator and the Agency must apply methods and standards generally accepted in the industry. When the owner or operator reports the results of mechanical integrity tests to the Agency, the owner or operator must include a description of the tests and the methods used. In making its evaluation, the Agency must review monitoring and other test data submitted since the previous evaluation.

g) The Agency must require additional or alternative tests if the Agency determines that the results presented by the owner or operator pursuant to subsections (a) through (d) of this Section are not satisfactory to demonstrate that there is no significant leak in the casing, tubing, or packer or that there is no significant movement of fluid into a USDW resulting from the injection activity, as ~~such are~~ required by subsections (a)(1) and (a)(2) of this Section.

BOARD NOTE: This Section corresponds with 40 CFR 146.89, as added at 75 Fed. Reg. 77303 (Dec. 10, 2010).

(Source: Added at 36 Ill. Reg. _____, effective _____)

Section 730.190 Testing and Monitoring Requirements

The owner or operator of a Class VI injection well must prepare, maintain, and comply with a testing and monitoring plan ~~which~~that will verify that the geologic sequestration project is operating as permitted, and that the project is not endangering USDWs. The requirement to maintain and implement an approved testing and monitoring plan is directly enforceable, regardless of whether the requirement is a condition of the permit. The owner or operator must submit the testing and monitoring plan to the Agency with the permit application, and the owner or operator must include a description of how it will meet the requirements of this Section, including accessing sites for all necessary monitoring and testing during the life of the project. Testing and monitoring associated with geologic sequestration projects must, at a minimum, include the following parameters and devices:

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

b) Installation and use~~r~~ of continuous recording devices to monitor injection pressure, rate~~r~~ and volume, except during well workovers, as ~~such are~~ defined in Section 730.188(d); the pressure on the annulus between the tubing and the long ~~string~~ casing; and the annulus fluid volume added;

c) Corrosion monitoring of the well materials for loss of mass, thickness, cracking, pitting~~r~~ and other signs of corrosion, which must be performed on a quarterly basis to ensure that the well components fulfill the Agency-approved minimum standards for material strength and performance, as provided in Section 730.186(b), by performing one of the following tests:

1) Analyzing coupons of the well construction materials placed in contact with the carbon dioxide stream;

2) Routing the carbon dioxide stream through a loop constructed with the material used in the well and inspecting the materials in the loop; or

3) Using an alternative method approved by the Agency;

d) Periodic monitoring of the ~~ground water~~groundwater quality and geochemical changes above the confining zones that may be a result of carbon dioxide movement through the confining zones or additional identified zones, including the following information:

1) 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~~r~~ and other factors; and

2) The monitoring frequency and spatial distribution of monitoring wells based on baseline geochemical data that has been collected pursuant to Section 730.182(a)(6) and on any modeling results in the area of review evaluation required by Section 730.184(c).

e) The annual demonstration of external mechanical integrity required by Section 730.189(c) at least once per year until the injection well is plugged; and, if required by the Agency, a casing inspection log undertaken pursuant to Section 730.189(d), at a frequency established in the testing and monitoring plan;

f) A pressure fall-off test at least once every five years, unless the Agency has required more frequent testing based on site-specific information;

g) Testing and monitoring to track the extent of the carbon dioxide plume and the presence or absence of elevated pressure (i.e., the pressure front) by using the following types of methods:

1) Direct methods in the injection zones; and

2) Indirect methods (e.g., seismic, electrical, gravity~~r~~ or electromagnetic surveys or down-hole carbon dioxide detection tools), unless the Agency has determined, based on site-specific geology, that ~~such~~these methods are not appropriate;

h) The Agency must require surface air monitoring or soil gas monitoring if the Agency determines that ~~such~~this monitoring is needed to detect movement of carbon dioxide that could endanger a USDW.

1) The design of Class VI injection well surface air or soil gas monitoring must be based on potential risks to USDWs within the area of review;

2) The monitoring frequency and spatial distribution of surface air monitoring 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 or compliance with the prohibition against movement of fluid into a USDW set forth in 35 Ill. Adm. Code 704.122;

3) If the Agency requires surface air or soil gas monitoring, the Agency has determined that monitoring undertaken to comply with subpart RR of 40 CFR 98 accomplishes the goals of subsections (h)(1) and (h)(2) of this Section, and the owner or operator fulfills the carbon dioxide release reporting requirements set forth in Section 730.191(c)(5), the Agency must approve the use of monitoring undertaken to comply with subpart RR of 40 CFR 98. After approval by the Agency, compliance with subpart RR of 40 CFR 98 pursuant to this subsection (h)(3) is deemed a condition of the Class VI injection well permit;

i) Any additional monitoring that the Agency has determined is necessary to support, upgrade, and improve the computational modeling of the area of review evaluation that is required by Section 730.184(c) and to determine compliance with the prohibition against movement of fluid into a USDW set forth in 35 Ill. Adm. Code 704.122;

j) The owner or operator must periodically review the testing and monitoring plan to incorporate monitoring data collected under this Subpart H, operational data collected pursuant to Section 730.188, and the most recent area of review reevaluation performed pursuant to Section 730.184(e). The owner or operator must review the testing and monitoring plan at least once in every five-year period. Based on this review, the owner or operator must submit an amended testing and monitoring plan or demonstrate to the Agency that no amendment to the testing and monitoring plan is needed. Any amendments to the testing and monitoring plan must be approved by the Agency, must be incorporated into the permit, and are subject to the permit modification requirements set forth in 35 Ill. Adm. Code 704.261 or 704.264, as appropriate. The owner or operator must submit amended plans or demonstrations to the Agency as follows:

1) Within one year after an area of review reevaluation;

2) 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 Agency; or

3) When required by the Agency.

k) A quality assurance and surveillance plan for all testing and monitoring requirements.

BOARD NOTE: This Section corresponds with 40 CFR 146.90, as added at 75 Fed. Reg. 77303 (Dec. 10, 2010).

(Source: Added at 36 Ill. Reg. _____, effective _____)

Section 730.191 Reporting Requirements

The owner or operator of a Class VI injection well must, at a minimum, provide the following reports to the Agency for each permitted Class VI injection well, as specified in subsection (e) of this Section:

a) Semi-annual reports containing the following information:

- 1) A description of any deviations in the physical, chemical and other relevant characteristics of the carbon dioxide stream from the proposed operating data submitted to the Agency pursuant to Sections 730.182(a)(7) and (c)(3) and 730.186(b)(1) and (c)(3);
- 2) The monthly average, maximum and minimum values for injection pressure, flow rate and volume, and annular pressure;
- 3) A description of any event that exceeds operating parameters for the annulus pressure or injection pressure specified in the permit;
- 4) A description of any event that triggers a shut-off device required pursuant to Section 730.188(e) and the response undertaken by the owner or operator;
- 5) The monthly volume or mass of the carbon dioxide stream injected over the reporting period and the volume injected cumulatively over the life of the project;
- 6) The monthly annulus fluid volume added; and
- 7) The results of the monitoring required by Section 730.190.

b) Report the results within 30 days after completion of any of the following:

- 1) Any results of periodic tests of mechanical integrity;
- 2) Any well workover; and
- 3) Results of any other test of the injection well that the owner or operator has conducted as required by the Agency.

c) Report any of the following events within 24 hours after the event:

- 1) The owner or operator has discovered any evidence that the injected carbon dioxide stream or associated pressure front may cause an endangerment to a USDW;
- 2) The owner or operator has discovered any noncompliance with a permit condition, or malfunction of the injection system, which may cause fluid migration into or between USDWs;
- 3) The owner or operator has discovered any triggering of a shut-off system (i.e., down-hole or at the surface);
- 4) The owner or operator has discovered any failure to maintain mechanical integrity; or

5) The owner or operator has discovered any release of carbon dioxide to the atmosphere or biosphere through surface air or soil gas monitoring or other monitoring technologies that the Agency has required pursuant to Section 730.190(h).

d) An owner or operator must notify the Agency in writing 30 days in advance of any of the following:

1) Any planned well workover;

2) Any planned stimulation activities, other than stimulation for formation testing conducted pursuant to Section 730.182; and

3) Any other planned test of the injection well conducted by the owner or operator.

e) In corresponding 40 CFR 146.91(e), USEPA has stated that owners or operators must submit all required reports, submittals, and notifications under this Subpart H to USEPA in an electronic format approved by USEPA.

f) The owner or operator must retain records as follows:

1) The owner or operator must retain all data collected pursuant to Section 730.182 for Class VI permit applications throughout the life of the geologic sequestration project and for 10 years following site closure.

2) The owner or operator must retain data on the nature and composition of all injected fluids collected pursuant to Section 730.190(a) until 10 years after site closure. The Agency may require the owner or operator to deliver the records to the Agency at the conclusion of the retention period.

3) The owner or operator must retain monitoring data collected pursuant to Section 730.190(b) through (i) for 10 years after it is collected.

4) The owner or operator must retain well plugging reports, ~~post-injection~~ 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 ~~Sections~~ Section 730.193(f) and (h) for 10 years following site closure.

5) The Agency may require the owner or operator to retain any records required by this Subpart H for a period that is longer than 10 years after site closure. Any Agency requirement that the owner or operator retain records for a longer period must be made in writing, the writing must recite a definite longer period, and the Agency must state the reasons for the determination to require the longer period. An owner or operator may appeal any Agency determination made pursuant to this subsection (f)(5) to the Board pursuant to ~~section~~ Section 40 of the Act [415 ILCS 5/40].

BOARD NOTE: This Section corresponds with 40 CFR 146.91, as added at 75 Fed. Reg. 77303 (Dec. 10, 2010).

(Source: Added at 36 Ill. Reg. _____, effective _____)

Section 730.192 Injection Well Plugging

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

b) Well plugging plan. The owner or operator of a Class VI injection well must prepare, maintain, and comply with a well plugging plan that is acceptable to the Agency. The requirement to maintain and implement an approved well plugging plan is directly enforceable regardless of whether the requirement is a condition of the permit. The owner or operator must submit the well plugging plan as part of the permit application, and the well plugging plan must include the following information:

- 1) Appropriate tests or measures for determining bottomhole reservoir pressure;
- 2) Appropriate testing methods to ensure external mechanical integrity, as specified in Section 730.189;
- 3) The type and number of plugs to be used;
- 4) The placement of each plug, including the elevation of the top and bottom of each plug;
- 5) The type, grade, and quantity of material to be used in plugging. The material must be compatible with the carbon dioxide stream; and
- 6) The method of placement of the plugs.

c) Notice of intent to plug. The owner or operator must notify the Agency in writing, and USEPA electronically pursuant to Section 730.191(e), at least 60 days before beginning the plugging of a well. The owner or operator must also provide the revised well plugging plan at the time of this notice if any changes have been made to the original well plugging plan. The Agency must allow for a shorter notice period if the Agency determines that the shorter notice period is adequate to complete Agency review of the well plugging plan or that well plugging must occur more promptly. The Agency must approve any amendments to the injection well plugging plan and incorporate the amendments into the permit, and the incorporation of the amendments into the permit is subject to the permit modification requirements set forth in 35 Ill. Adm. Code 704.262 or 704.264, as appropriate.

d) Plugging report. Within 60 days after plugging, the owner or operator must submit a plugging report to the Agency, and electronically to USEPA pursuant to Section 730.191(e). The plugging report must be certified as accurate by the owner or operator and by the person who performed the plugging operation (if other than the owner or operator). The owner or operator must retain the well plugging report for 10 years following site closure.

BOARD NOTE: This Section corresponds with 40 CFR 146.92, as added at 75 Fed. Reg. 77303 (Dec. 10, 2010).

(Source: Added at 36 Ill. Reg. _____, effective _____)

Section 730.193 Post-Injection Site Care and Site Closure

a) The owner or operator of a Class VI injection well must prepare, maintain, and comply with a plan for post-injection site care and site closure that the

Agency has determined meets the requirements of subsection (a)(2) of this Section. The requirement to maintain and implement an approved plan is directly enforceable, regardless of whether the requirement is a condition of the permit.

1) The owner or operator must submit the post-injection site care and site closure plan to the Agency as a part of the permit application.

2) The post-injection site care and site closure plan must include the following information:

A) The pressure differential between pre-injection and predicted post-injection pressures in the injection zones;

B) The predicted position of the carbon dioxide plume and associated pressure front at site closure, as demonstrated in the area of review evaluation required by Section 730.184(c)(1);

C) A description of the proposed post-injection monitoring location, methods, and frequency;

D) A proposed schedule for submitting post-injection site care monitoring results to the Agency pursuant to Section 730.191(e); and

E) The duration of the post-injection site care timeframe and, if approved by the Agency, the demonstration of the alternative post-injection site care timeframe that ensures non-endangerment of USDWs.

3) Upon cessation of injection, the owner or operator of a Class VI injection well must either submit an amended post-injection site care and site closure plan or demonstrate to the Agency through monitoring data and modeling results that no amendment to the plan is needed. The Agency must approve any amendments to the post-injection site care and site closure plan and incorporate the amendments into the permit, and the incorporation of the amendments into the permit is subject to the permit modification requirements set forth in 35 Ill. Adm. Code 704.262 or 704.264, as appropriate.

4) 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 Agency approval. The owner or operator must resubmit the plan to the Agency within 30 days after making any modification.

b) The owner or operator must monitor the site following the cessation of injection to show the position of the carbon dioxide plume and pressure front and demonstrate that no USDW is being endangered.

1) Following the cessation of injection, the owner or operator must continue to conduct monitoring as specified in the Agency-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 Agency pursuant to requirements in subsection (c) of this Section, unless he/she makes a demonstration under subsection (b)(2) of this Section. The monitoring must continue until the geologic sequestration project no longer poses an endangerment to USDWs and the demonstration under subsection (b)(2) of this Section is submitted and approved by the Agency.

2) If the Agency determines, based on monitoring and other site-specific data, that the geologic sequestration project no longer poses an endangerment to

any USDW before 50 years or prior to the end of the approved alternative timeframe, the Agency must either approve an amendment to the post-injection site care and site closure plan to reduce the frequency of monitoring or authorize site closure before the end of the 50-year period or prior to the end of the approved alternative timeframe.

3) Prior to authorization for site closure, the owner or operator must submit to the Agency 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 any USDW.

4) If the owner or operator cannot make the demonstration required by subsection (b)(3) of this Section (i.e., the Agency has determined that additional monitoring is needed to ensure that the geologic sequestration project does not pose an endangerment to any USDW or the Agency has not approved the demonstration) at the end of the 50-year period or at the end of the approved alternative timeframe, the owner or operator must submit to the Agency a plan to continue post-injection site care until the owner or operator has made a demonstration that the Agency can approve.

c) Demonstration of alternative post-injection site care timeframe. If the Agency determines in consultation with USEPA during the permitting process that an alternative post-injection site care timeframe other than the 50-year default is appropriate and ensures non-endangerment of any USDW, the Agency must approve the alternative post-injection site care timeframe. The Agency must base its determination on significant, site-specific data and information, including all data and information collected pursuant to Sections 730.182 and 730.183, and the Agency must determine based on substantial evidence that the geologic sequestration project will no longer pose a risk of endangerment to any USDW at the end of the alternative post-injection site care timeframe.

1) A demonstration of an alternative post-injection site care timeframe must include consideration and documentation of the following:

A) The results of computational modeling performed pursuant to delineation of the area of review, as required by Section 730.184;

B) The predicted timeframe for pressure decline within the injection zone and any other zones, such that formation fluids may not be forced into any USDW, or the timeframe for pressure decline to pre-injection pressures;

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

D) 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;

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

F) The results of laboratory analyses, research studies, or field or site-specific studies to verify the information required in subsections (c)(1)(D) and (c)(1)(E) of this Section;

G) A characterization of the confining zones, including a demonstration that each confining zone is free of transmissive faults, fractures, and micro-

fractures and is of appropriate thickness, permeability, and integrity to impede fluid movement (e.g., carbon dioxide, formation fluids, etc.);

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

I) A description of the well construction and an assessment of the quality of plugs of all abandoned wells within the area of review;

J) The distance between the injection zone and the nearest USDWs above and below the injection zone; and

K) Any additional site-specific factors required by the Agency.

2) Information submitted to support the demonstration required by subsection (c)(1) of this Section must meet the following criteria:

A) All analyses and tests performed to support the demonstration must be accurate and reproducible, and they must have been performed in accordance with the established quality assurance standards;

B) Estimation techniques must be appropriate, and USEPA-certified test protocols must have been used ~~where~~when available;

C) 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;

D) Predictive models must be calibrated using existing information (e.g., at Class I, Class II, or Class V experimental technology injection well sites) ~~where~~when sufficient data are available;

E) Reasonably conservative values and modeling assumptions must be used and disclosed to the Agency whenever values are estimated on the basis of known historical information instead of site-specific measurements;

F) The owner or operator must perform an analysis 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;

G) An approved quality assurance and quality control plan must address all aspects of the demonstration; and,

H) Any additional criteria required by the Agency.

d) Notice of intent for site closure. The owner or operator must notify the Agency in writing at least 120 days before site closure. At the time of this notice, 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 Agency may allow for a shorter notice period. The Agency must allow for a shorter notice period if the Agency determines that the shorter notice period is

adequate to complete Agency review of the post-injection site care and site closure plan or that well closure must occur more promptly.

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

f) The owner or operator must submit a site closure report to the Agency within 90 days after site closure, which must thereafter be retained at a location designated by the Agency for at least 10 years. The report must include the following records and documentation:

1) Documentation of the injection and monitoring well plugging as required by Section 730.192 and subsection (e) of this Section. The owner or operator must provide a copy of a survey plat that the owner or operator has submitted to the local zoning authority designated by the Agency. 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 USEPA Region 5;

2) Documentation of appropriate notification and information to all State and local authorities that have authority over drilling activities within the area of review, to enable those State and local authorities to impose appropriate conditions on subsequent drilling activities that may penetrate the injection and confining zones; and

BOARD NOTE: The Illinois Department of Natural Resources, Office of Mines and Minerals, Oil and Gas Division and the Illinois Department of Public Health each have some role in regulating well drilling, depending on the type of well. Other State agencies may also have a role. Further, units of local government and agencies of a sister state may regulate well drilling if a portion of the area of review lies within their jurisdiction. The owner or operator must assure that all applicable regulatory entities receive the required notification and information.

3) Records reflecting the nature, composition~~r~~ and volume of the carbon dioxide stream.

g) 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 the following information to any potential purchaser of the property:

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

2) The name of the county with which the survey plat was filed, as well as the addresses of the Agency and USEPA Region 5; and

3) The volume of fluid injected, the injection zone or zones into which the fluid was injected, and the period over which injection occurred.

h) The owner or operator must retain records collected during the post-injection site care period for ~~10~~ at least 10 years following site closure. The owner or operator must deliver the records to the Agency at the conclusion of the retention period, and the records must thereafter be retained at a location designated by the Agency for that purpose.

BOARD NOTE: This Section corresponds with 40 CFR 146.93, as added at 75 Fed. Reg. 77303 (Dec. 10, 2010).

(Source: Added at 36 Ill. Reg. _____, effective _____)

Section 730.194 Emergency and Remedial Response

a) As part of the permit application, the owner or operator must provide the Agency 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 ~~which~~~~that~~ may cause an endangerment to a USDW during the construction, operation, and post-injection site care periods of the injection well. The requirement to maintain and implement an approved emergency and remedial response plan is directly enforceable regardless of whether the requirement is a condition of the permit.

b) 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 undertake the following actions:

- 1) The owner or operator must immediately cease injection;
- 2) The owner or operator must take all steps reasonably necessary to identify and characterize any release;
- 3) The owner or operator must notify the Agency within 24 hours after obtaining the evidence; and
- 4) The owner or operator must implement the emergency and remedial response plan approved by the Agency.

c) The Agency must allow the operator to resume injection prior to remediation if the Agency has determined that the injection operation will not endanger any USDW.

d) The owner or operator must periodically review the emergency and remedial response plan developed pursuant to subsection (a) of this Section. The owner or operator must review the emergency and remedial response plan at least once in every five year period. Based on this review, the owner or operator must submit an amended emergency and remedial response plan or demonstrate to the Agency that no amendment to the emergency and remedial response plan is needed. The Agency must approve any amendments to the emergency and remedial response plan and incorporate the amendments into the permit, and the incorporation of the amendments into the permit is subject to the permit modification requirements set forth in 35 Ill. Adm. Code 704.262 or 704.264, as appropriate. The owner or operator must submit any amended plans or demonstrations to the Agency as follows:

- 1) Within one year of an area of review reevaluation;
- 2) Following any significant changes to the facility, such as addition of injection or monitoring wells, on a schedule determined by the Agency; or
- 3) When required by the Agency.

BOARD NOTE: This Section corresponds with 40 CFR 146.94, as added at 75 Fed. Reg. 77303 (Dec. 10, 2010).

(Source: Added at 36 Ill. Reg. _____, effective _____)

Section 730.195 Alternative Class VI Injection Well Depth Requirements

This Section specifies the requirements for application of alternative injection well depth requirements for Class VI injection wells that meet certain criteria. This Section sets forth information that an owner or operator seeking application of alternative Class VI injection well depth requirements must submit to the Agency; the information that the Agency must consider when determining whether any well is suitable for application of alternative injection well depth requirements; the procedure for Agency-USEPA Region 5 communication and Agency determination whether a well is suitable for application of alternative injection well depth requirements; and the additional requirements that apply to an owner or operator of a Class VI injection well that has been granted a permit that includes alternative injection well depth requirements.

a) When seeking a permit that includes alternative injection well depth requirements to the requirement to inject below the lowermost USDW, the owner or operator must submit a supplemental report concurrent with the permit application. The supplemental report must include the following information:

1) The following demonstrations with regard to the injection zones:

A) Each is laterally continuous;

B) None is a USDW;

C) None is hydraulically connected to a USDW;

D) None outcrops;

E) Each has adequate injectivity, volume, and sufficient porosity to safely contain the injected carbon dioxide and formation fluids; and

F) Each has appropriate geochemistry.

2) A demonstration that each injection ~~zones~~zone is bounded by laterally continuous impermeable confining units above and below the injection zone that are adequate to prevent fluid movement and pressure buildup outside of the injection zone and that the confining units are free of transmissive faults and fractures. The report must further characterize the regional fracture properties and contain a demonstration that ~~such~~these fractures will not interfere with injection, serve as conduits, or endanger USDWs.

3) A demonstration, using computational modeling, that no fluid movement will endanger any USDW above or below the injection zone. This modeling should be conducted in conjunction with the area of review determination required by Section 730.184, and the modeling is subject to the area of review delineation and well identification requirements set forth in Section 730.184(c) and the periodic reevaluation requirements set forth in Section 730.184(e).

4) The following demonstrations with regard to well design and construction, in conjunction with the alternative injection well depth requirements:

A) Well design and construction will ensure isolation of the injectate in lieu of the prohibition against movement of fluids set forth in 730.186(a)(1); and

B) Well design and construction will meet the well construction requirements set forth in subsection (f) of this Section.

5) A description of how the owner or operator will tailor the monitoring and testing and any additional plans to the geologic sequestration project to ensure protection of USDWs above and below each injection zone if the Agency issues a permit that includes alternative injection well depth requirements.

6) Information on the location of all the public water supplies that will be affected, or which are reasonably likely to be affected, by the carbon sequestration project, and all public water supplies that distribute water drawn from any USDW in the area of review.

7) Any other information that the Agency determines is necessary to inform the USEPA Region 5's decision to issue a waiver, as required by subsection (b) of this Section.

b) To inform the USEPA Region 5's decision on whether to grant a waiver of the injection depth requirements pursuant to 40 CFR 146.95, which would allow the Agency to issue a permit that includes alternative injection well depth requirements, the Agency must submit the following documentation to USEPA Region 5:

1) An evaluation of the following information as it relates to siting, construction, and operation of a geologic sequestration project under a permit that includes alternative injection well depth requirements:

A) The integrity of the upper and lower confining units;

B) The suitability of the injection zones (e.g., lateral continuity, lack of transmissive faults and fractures, known current or planned artificial penetrations into the injection zones or formations below the injection zone, etc.);

C) The potential capacity of the geologic formations to sequester carbon dioxide, accounting for the availability of alternative injection sites;

D) All other site characterization data, the proposed emergency and remedial response plan, and a demonstration of financial responsibility;

E) An assessment of community needs, demands, and supply from drinking water resources;

F) An assessment of planned needs, and potential or future use of USDWs and non-USDWs in the area of review;

G) An assessment of planned or permitted water, hydrocarbon, or mineral resource exploitation potential of the proposed injection formations and other formations both above and below the injection zone to determine if there are any plans to drill through the formation to access resources in or beneath the proposed injection zones or formations;

H) The proposed plan for securing alternative water resources or treating USDW formation waters in the event of contamination related to the Class VI injection well activity; and,

I) Any other applicable considerations or information that the Agency determines is necessary to aid a determination by USEPA Region 5 to grant a waiver that would allow the Agency to issue a permit that includes alternative injection well depth requirements.

2) Consultation with the Agency's Division of Public Water ~~Supplies~~Supply and all agencies of a sister state that have public water system supervision authority over lands within the area of review of a well for which a waiver that would allow the Agency to issue a permit that includes alternative injection well depth requirements is sought.

3) Any written waiver-related information submitted by the Agency's Division of Public Water Supply and all agencies of a sister state that have public water system supervision authority to the Agency.

c) Pursuant to 35 Ill. Adm. Code 705.163 and concurrent with the Class VI injection well permit application notice process, the Agency must give public notice that the owner or operator has sought a permit that includes alternative injection well depth requirements. The notice must clearly state the following information:

1) The depth of the proposed injection zones;

2) The location of the injection wells;

3) The name and depth of each USDW within the area of review;

4) A map of the area of review;

5) The names of any public water supplies that will be affected, or which are reasonably likely to be affected, by the carbon sequestration project, and all public water supplies that distribute water drawn from any USDW in the area of review; and

6) The results of consultation with the Agency's Division of Public Water Supply and all agencies of a sister state that have public water system supervision authority, as required by subsection (b)(2) of this Section.

d) Following the public notice required by subsection (c) of this Section, the Agency must provide all information received through the waiver application process to USEPA Region 5. USEPA has stated in corresponding 40 CFR 146.95(d) that, based on this information, the USEPA Region 5 must provide written concurrence or non-concurrence regarding the Agency issuing a permit that includes alternative injection well depth requirements.

1) If USEPA Region 5 determines that additional information is required to support a decision, the Agency must provide that information. At ~~his or her~~its discretion, USEPA Region 5 may require that public notice of the new information be initiated.

2) The Agency must not issue a permit that includes alternative injection well depth requirements without having first received the written concurrence of USEPA Region 5.

e) USEPA has stated in corresponding 40 CFR 146.95(e) that if the Agency issues a permit that includes alternative injection well depth requirements, USEPA will post the following information on its Office of Water website within 30 days after permit issuance:

- 1) The depth of the proposed injection zones;
- 2) The location of the injection wells;
- 3) The name and depth of all USDWs within the area of review;
- 4) A map of the area of review;
- 5) The names of any public water supplies that will be affected, or which are reasonably likely to be affected, by the carbon sequestration project, and all public water supplies that distribute water drawn from any USDW in the area of review; and
- 6) The date of permit issuance.

f) Upon receipt of a permit that includes alternative injection well depth requirements for geologic sequestration, the owner or operator of the covered Class VI injection well must comply with the following requirements:

1) All requirements of Sections 730.184, 730.185, 730.187, 730.188, 730.189, 730.191, ~~730.192~~, 730.192 and 730.194;

2) All requirements of Section 730.186, with the following modified requirements:

A) The owner or operator must ensure that each Class VI injection well operating under the alternative injection well depth requirements is constructed and completed to prevent movement of fluids into any unauthorized zone that includes a USDW, in lieu of the requirements of Section 730.186(a)(1).

B) The casing and cementing program must be designed to prevent the movement of fluids into any unauthorized zone that includes a USDW, in lieu of the requirements of Section 730.186(b)(1).

C) The surface casing must extend through the base of the nearest USDW directly above the injection zone. The surface casing must be cemented to the surface. Alternatively, the Agency must require that the casing extend through another formation above the injection zone and below the nearest USDW above the injection zone if the Agency determines that doing so is necessary to prevent movement of fluids into a USDW.

3) All requirements of Section 730.190, with the following modified requirements:

A) The owner or operator must monitor the groundwater quality, geochemical changes, and pressure in the first USDWs immediately above and below each injection zone; and in any other formation that the Agency determines is necessary to detect potential movement of fluids into a USDW.

B) The owner or operator must conduct testing and monitoring to track the extent of the carbon dioxide plume and the presence or absence of elevated

pressure (i.e., the pressure front) by using direct methods to monitor for pressure changes in the injection zones. The owner or operator must use indirect methods (e.g., seismic, electrical, gravity~~7~~ or electromagnetic surveys or down-hole carbon dioxide detection tools) that the Agency determines are necessary based on site-specific geology.

4) All requirements of Section 730.193, with the following~~7~~ modified post-injection site care monitoring requirements:

A) The owner or operator must monitor the groundwater quality, geochemical changes~~7~~ and pressure in the first USDWs immediately above and below each injection zone; and in any other formation that the Agency determines is necessary to detect potential movement of fluids into a USDW.

B) The owner or operator must conduct testing and monitoring to track the extent of the carbon dioxide plume and the presence or absence of elevated pressure (i.e., the pressure front) by using direct methods in the injection zones. The owner or operator must use indirect methods (e.g., seismic, electrical, gravity~~7~~ or electromagnetic surveys or down-hole carbon dioxide detection tools) that the Agency determines ~~is~~are necessary to detect potential movement of fluids into a USDW;

5) Any additional requirements that the Agency determines are necessary to ensure protection of USDWs above and below the injection ~~zone(s)~~zones.

BOARD NOTE: This Section corresponds with 40 CFR 146.95, as added at 75 Fed. Reg. 77303 (Dec. 10, 2010). The corresponding federal rule calls the administrative permission to allow a well to inject at an alternative depth (i.e., above the lowermost USDW) a "waiver~~7~~". While the Board has retained the use of "waiver" with regard to USEPA review of alternative depth requirements, the Board has changed this to some variant of "permit that includes alternative injection well depth requirements~~7~~". While the Agency cannot "waive" standards embodied in Board regulations, ~~but~~ the Agency can issue a permit that applies alternative standards that are contained in the regulations. The Board believes that this rule includes standards sufficient to guide an Agency permit determination.

(Source: Added at 36 Ill. Reg. _____, effective _____)
~~ILLINOIS REGISTER~~

JCAR350730-1117264r01

~~POLLUTION CONTROL BOARD~~

~~NOTICE OF PROPOSED AMENDMENT~~

Document comparison done by DeltaView on Wednesday, December 14, 2011 11:47:04 AM

| Input: | |
|---------------|--|
| Document 1 | file://Y:/Input/35-730-Agency(issue44).doc |
| Document 2 | file://Y:/Input/35-730-JCAR(r01).doc |
| Rendering set | Standard |

| Legend: | |
|---------------------------|--|
| <u>Insertion</u> | |
| Deletion | |
| Moved from | |
| <u>Moved to</u> | |
| Style change | |
| Format change | |
| Moved deletion | |
| Inserted cell | |
| Deleted cell | |
| Moved cell | |
| Split/Merged cell | |
| Padding cell | |

| Statistics: | |
|----------------|-------|
| | Count |
| Insertions | 102 |
| Deletions | 237 |
| Moved from | 0 |
| Moved to | 0 |
| Style change | 0 |
| Format changed | 0 |
| Total changes | 339 |

EXEMPT

JCAR350730-1117264r01

1 TITLE 35: ENVIRONMENTAL PROTECTION
2 SUBTITLE G: WASTE DISPOSAL
3 CHAPTER I: POLLUTION CONTROL BOARD
4 SUBCHAPTER d: UNDERGROUND INJECTION CONTROL AND
5 UNDERGROUND STORAGE TANK PROGRAMS
6

7 PART 730
8 UNDERGROUND INJECTION CONTROL OPERATING REQUIREMENTS
9

10 SUBPART A: GENERAL
11

| | | |
|----|---------|---|
| 12 | Section | |
| 13 | 730.101 | Applicability, Scope, and Effective Date |
| 14 | 730.102 | Laws Authorizing Regulations |
| 15 | 730.103 | Definitions |
| 16 | 730.104 | Criteria for Exempted Aquifers |
| 17 | 730.105 | Classification of Injection Wells |
| 18 | 730.106 | Area of Review |
| 19 | 730.107 | Corrective Action |
| 20 | 730.108 | Mechanical Integrity |
| 21 | 730.109 | Criteria for Establishing Permitting Priorities |
| 22 | 730.110 | Plugging and Abandoning Wells |

23
24 SUBPART B: CRITERIA AND STANDARDS APPLICABLE
25 TO CLASS I NON-HAZARDOUS WASTE INJECTION WELLS
26

| | | |
|----|---------|---|
| 27 | Section | |
| 28 | 730.111 | Applicability |
| 29 | 730.112 | Construction Requirements |
| 30 | 730.113 | Operating, Monitoring, and Reporting Requirements |
| 31 | 730.114 | Information to be Considered by the Agency |

32
33 SUBPART C: CRITERIA AND STANDARDS APPLICABLE
34 TO CLASS II INJECTION WELLS
35

| | | |
|----|---------|--|
| 36 | Section | |
| 37 | 730.121 | Adoption of Criteria and Standards Applicable to Class II Injection Wells by the 38 Illinois Department of <u>Natural Resources, Office of Mines and Minerals</u> 39 |

40 SUBPART D: CRITERIA AND STANDARDS APPLICABLE
41 TO CLASS III INJECTION WELLS
42

43 Section

RE
CLEAN
DEC 16 1
STATE OF ILLINOIS
Pollution Control Board

- 44 730.131 Applicability
- 45 730.132 Construction Requirements
- 46 730.133 Operating, Monitoring, and Reporting Requirements
- 47 730.134 Information to be Considered by the Agency

48
49 SUBPART F: CRITERIA AND STANDARDS APPLICABLE
50 TO CLASS V INJECTION WELLS

- 51
- 52 Section
- 53 730.151 Applicability
- 54 730.152 Inventory and Assessment (Repealed)

55
56 SUBPART G: CRITERIA AND STANDARDS APPLICABLE TO
57 CLASS I HAZARDOUS WASTE INJECTION WELLS

- 58
- 59 Section
- 60 730.161 Applicability and Definitions
- 61 730.162 Minimum Criteria for Siting
- 62 730.163 Area of Review
- 63 730.164 Corrective Action for Wells in the Area of Review
- 64 730.165 Construction Requirements
- 65 730.166 Logging, Sampling, and Testing Prior to New Well Operation
- 66 730.167 Operating Requirements
- 67 730.168 Testing and Monitoring Requirements
- 68 730.169 Reporting Requirements
- 69 730.170 Information to be Evaluated
- 70 730.171 Closure
- 71 730.172 Post-Closure Care
- 72 730.173 Financial Responsibility for Post-Closure Care

73
74 SUBPART H: CRITERIA AND STANDARDS APPLICABLE TO CLASS VI WELLS

- 75
- 76 Section
- 77 730.181 Applicability
- 78 730.182 Required Class VI Injection Well Permit Information
- 79 730.183 Minimum Criteria for Siting
- 80 730.184 Area of Review and Corrective Action
- 81 730.185 Financial Responsibility
- 82 730.186 Injection Well Construction Requirements
- 83 730.187 Logging, Sampling and Testing Prior to Injection Well Operation
- 84 730.188 Injection Well Operating Requirements
- 85 730.189 Mechanical Integrity
- 86 730.190 Testing and Monitoring Requirements

87 730.191 Reporting Requirements
 88 730.192 Injection Well Plugging
 89 730.193 Post-Injection Site Care and Site Closure
 90 730.194 Emergency and Remedial Response
 91 730.195 Alternative Class VI Injection Well Depth Requirements

92
 93 AUTHORITY: Implementing Sections 7.2, 13, and 22.4 and authorized by Section 27 of the
 94 Environmental Protection Act [415 ILCS 5/7.2, 13, 22.4, and 27].
 95

96 SOURCE: Adopted in R81-32 at 6 Ill. Reg. 12479, effective March 3, 1984; amended in R82-19
 97 at 7 Ill. Reg. 14426, effective March 3, 1984; recodified at 10 Ill. Reg. 14174; amended in R89-2
 98 at 14 Ill. Reg. 3130, effective February 20, 1990; amended in R89-11 at 14 Ill. Reg. 11959,
 99 effective July 9, 1990; amended in R93-6 at 17 Ill. Reg. 15646, effective September 14, 1993;
 100 amended in R94-5 at 18 Ill. Reg. 18391, effective December 20, 1994; amended in R95-4 at 19
 101 Ill. Reg. 10047, effective June 27, 1995; amended in R00-11/R01-1 at 24 Ill. Reg. 18680,
 102 effective December 7, 2000; amended in R06-16/R06-17/R06-18 at 31 Ill. Reg. 1281, effective
 103 December 20, 2006; amended at 36 Ill. Reg. _____, effective _____.
 104

105 SUBPART A: GENERAL
 106

107 **Section 730.101 Applicability, Scope, and Effective Date**
 108

- 109 a) This Part sets forth technical criteria and standards for the Underground Injection
 110 Control (UIC) Program. This Part must be read in conjunction with 35 Ill. Adm.
 111 Code 702, 704, and 705, which also apply to the UIC program. 35 Ill. Adm. Code
 112 702 and 704 prescribe the regulatory requirements for the UIC permit program.
 113 35 Ill. Adm. Code 704 further outlines hazardous waste management
 114 requirements and sets forth the financial assurance requirements applicable to
 115 Class I hazardous waste injection wells and requirements applicable to certain
 116 types of Class V injection wells. 35 Ill. Adm. Code 705 describes the procedures
 117 the Agency must use for issuing UIC permits.
 118
 119 b) On and after February 1, 1984, any underground injection that is not authorized
 120 by rule or by permit is unlawful.
 121
 122 c) Electronic reporting. The filing of any document pursuant to any provision of this
 123 Part as an electronic document is subject to 35 Ill. Adm. Code 720.104.
 124

125 BOARD NOTE: Subsection (c) of this Section is derived from 40 CFR 3 and
 126 145.11(a)(33)(2010), as added at 70 Fed. Reg. 59848 (Oct. 13, 2005).
 127

128 (Source: Amended at 36 Ill. Reg. _____, effective _____)
 129

130 **Section 730.103 Definitions**

131
132 The following definitions apply to the underground injection control program.

133
134 "Abandoned well" means a well whose use has been permanently discontinued or
135 that is in a state of disrepair such that it cannot be used for its intended purpose or
136 for observation purposes.

137
138 "Act" means the Solid Waste Disposal Act, as amended by the Resource
139 Conservation and Recovery Act of 1976 (P.L. 94-580, as amended by P.L. 95-
140 609, 42 USC 6901).

141
142 "Administrator" means the Administrator of the U.S. Environmental Protection
143 Agency or the Administrator's designee.

144
145 "Agency" means the Illinois Environmental Protection Agency.

146
147 "Application" means the Agency forms for applying for a permit, including any
148 additions, revisions, or modifications to the forms. For RCRA, application also
149 includes the information required by the Agency pursuant to 35 Ill. Adm. Code
150 703.182-703.188 and 703.200 (contents of Part B of the RCRA application).

151
152 "Aquifer" means a geologic formation, group of formations or part of a formation
153 that is capable of yielding a significant amount of water to a well or spring.

154
155 "Area of review" means the area surrounding an "injection well" described
156 according to the criteria set forth in Section 730.106 or, in the case of an area
157 permit, the project area plus a circumscribing area the width of which is either
158 402 meters (one-quarter mile) or a number calculated according to the criteria set
159 forth in Section 730.106.

160
161 "Casing" means a pipe or tubing of appropriate material, of varying diameter and
162 weight, lowered into a borehole during or after drilling in order to support the
163 sides of the hole and thus prevent the walls from caving, to prevent loss of drilling
164 mud into porous ground or to prevent water, gas, or other fluid from entering or
165 leaving the hole.

166
167 "Catastrophic collapse" means the sudden and utter failure of overlying "strata"
168 caused by removal of underlying materials.

169
170 "Cementing" means the operation whereby a cement slurry is pumped into a
171 drilled hole or forced behind the casing.

172

173 "Cesspool" means a "drywell" that receives untreated sanitary waste containing
174 human excreta and which sometimes has an open bottom or perforated sides.
175
176 "Confining bed" means a body of impermeable or distinctly less permeable
177 material stratigraphically adjacent to one or more aquifers.
178
179 "Confining zone" means a geologic formation, group of formations, or part of a
180 formation that is capable of limiting fluid movement above an injection zone.
181
182 "Contaminant" means any physical, chemical, biological, or radiological
183 substance or matter in water.
184
185 "Conventional mine" means an open pit or underground excavation for the
186 production of minerals.
187
188 "Date of approval by USEPA of the Illinois UIC program" means February 1,
189 1984.
190
191 "Director" means the Director of the Illinois Environmental Protection Agency or
192 the Administrator's designee.
193
194 "Disposal well" means a well used for the disposal of waste into a subsurface
195 stratum.
196
197 "Drywell" means a well, other than an improved sinkhole or subsurface fluid
198 distribution system, that is completed above the water table so that its bottom and
199 sides are typically dry except when receiving fluids.
200
201 "Effective date of the UIC program" means February 1, 1984.
202
203 "Environmental Protection Act" means the Environmental Protection Act [415
204 ILCS 5].
205
206 "EPA" or "USEPA" means the United States Environmental Protection Agency.
207
208 "Exempted aquifer" means an "aquifer" or its portion that meets the criteria in the
209 definition of "underground source of drinking water" but which has been
210 exempted according to the procedures of 35 Ill. Adm. Code 704.123, 704.104, and
211 702.105.
212
213 "Existing injection well" means an "injection well" other than a "new injection
214 well."
215

216 "Experimental technology" means a technology that has not been proven feasible
217 under the conditions in which it is being tested.
218

219 "Facility or activity" means any HWM facility, UIC injection well, or any other
220 facility or activity (including land or appurtenances thereto) that is subject to
221 regulation under the "State" RCRA or UIC program.
222

223 "Fault" means a surface or zone of rock fracture along which there has been
224 displacement.
225

226 "Flow rate" means the volume per unit time of the flow of a gas or other fluid
227 substance that emerges from an orifice, pump or turbine or which passes along a
228 conduit or channel.
229

230 "Fluid" means material or substance that flows or moves, whether in a semisolid,
231 liquid sludge, gas, or any other form or state.
232

233 "Formation" means a body of rock characterized by a degree of lithologic
234 homogeneity that is prevailingly, but not necessarily, tabular and is mappable on
235 the earth's surface or traceable in the subsurface.
236

237 "Formation fluid" means fluid present in a formation under natural conditions as
238 opposed to introduced fluids, such as drilling mud.
239

240 "Generator" means any person, by site location, whose act or process produces
241 hazardous waste identified or listed in 35 Ill. Adm. Code 721.
242

243 "Groundwater" means water below the land surface in a zone of saturation.
244

245 "Hazardous waste" means a hazardous waste as defined in 35 Ill. Adm. Code
246 721.103.
247

248 "Hazardous waste management facility" or "HWM facility" means all contiguous
249 land, and structures, other appurtenances and improvements on the land used for
250 treating, storing, or disposing of hazardous waste. A facility may consist of
251 several treatment, storage, or disposal operational units (for example, one or more
252 landfills, surface impoundments, or combination of them).
253

254 "HWM facility" means Hazardous waste management facility.
255

256 "Illinois" means the State of Illinois.
257

258 "Improved sinkhole" means a naturally occurring karst depression or other natural

259 crevice that is found in volcanic terrain and other geologic settings that have been
 260 modified by man for the purpose of directing and emplacing fluids into the
 261 subsurface.

262
 263 "Injection well" means a well into which fluids are being injected.

264
 265 "Injection zone" means a geologic formation, group of formations, or part of a
 266 formation receiving fluids through a well.

267
 268 "Lithology" means the description of rocks on the basis of their physical and
 269 chemical characteristics.

270
 271 "Owner or operator" means the owner or operator of any facility or activity
 272 subject to regulation under RCRA, UIC, or the Environmental Protection Act.

273
 274 "Packer" means a device lowered into a well that can be expanded to produce a
 275 fluid-tight seal.

276
 277 "Permit" means an authorization, license, or equivalent control document issued
 278 by the Agency to implement the requirements of this Part and 35 Ill. Adm. Code
 279 702 through 705. Permit does not include RCRA interim status (Subpart C of 35
 280 Ill. Adm. Code 703), UIC authorization by rule (Subpart C of 35 Ill. Adm. Code
 281 704), or any permit that has not yet been the subject of final Agency action, such
 282 as a draft permit or a proposed permit.

283
 284 "Plugging" means the act or process of stopping the flow of water, oil, or gas into
 285 or out of a formation through a borehole or well penetrating that formation.

286
 287 "Plugging record" means a systematic listing of permanent or temporary
 288 abandonment of water, oil, gas, test, exploration, and waste injection wells, and
 289 may contain a well log, description of amounts and types of plugging material
 290 used, the method employed for plugging, a description of formations that are
 291 sealed and a graphic log of the well showing formation location, formation
 292 thickness, and location of plugging structures.

293
 294 "Point of injection," for a Class V injection well, means the last accessible
 295 sampling point prior to waste fluids being released into the subsurface
 296 environment through the well. For example, the point of injection of a Class V
 297 septic system might be the distribution box— the last accessible sampling point
 298 before the waste fluids drain into the underlying soils. For a dry well, it is likely
 299 to be the well bore itself.

300
 301 "Pressure" means the total load or force per unit area acting on a surface.

302
303 "Project" means a group of wells in a single operation.
304
305 "Radioactive Waste" means any waste that contains radioactive material in
306 concentrations that exceed those listed in Table II, column 2 in appendix B to 10
307 CFR 20 (Water Effluent Concentrations), incorporated by reference in 35 Ill.
308 Adm. Code 720.111.
309
310 "RCRA" means the Solid Waste Disposal Act, as amended by the Resource
311 Conservation and Recovery Act of 1976 (42 USC 6901 et seq.).
312
313 "Sanitary waste" means liquid or solid wastes originating solely from humans and
314 human activities, such as wastes collected from toilets, showers, wash basins,
315 sinks used for cleaning domestic areas, sinks used for food preparation, clothes
316 washing operations, and sinks or washing machines where food and beverage
317 serving dishes, glasses, and utensils are cleaned. Sources of these wastes may
318 include single or multiple residences, hotels and motels, restaurants, bunkhouses,
319 schools, ranger stations, crew quarters, guard stations, campgrounds, picnic
320 grounds, day-use recreation areas, other commercial facilities, and industrial
321 facilities, provided the waste is not mixed with industrial waste.
322
323 "SDWA" means the Safe Drinking Water Act (42 USC 300(f) et seq.).
324
325 "Septic system" means a well that is used to emplace sanitary waste below the
326 surface and which is typically comprised of a septic tank and subsurface fluid
327 distribution system or disposal system.
328
329 "Site" means the land or water area where any facility or activity is physically
330 located or conducted, including adjacent land used in connection with the facility
331 or activity.
332
333 "Sole or principal source aquifer" means an aquifer that has been designated by
334 the Administrator pursuant to Section 1424(a) or (e) of SDWA (42 USC 300h-
335 3(a) or (e)).
336
337 "State" means the State of Illinois.
338
339 "Stratum" (plural strata) means a single sedimentary bed or layer, regardless of
340 thickness, that consists of generally the same kind of rock material.
341
342 "Subsidence" means the lowering of the natural land surface in response to: earth
343 movements; lowering of fluid pressure, removal of underlying supporting material
344 by mining or solution of solids, either artificially or from natural causes;

345 compaction due to wetting (hydrocompaction); oxidation of organic matter in
346 soils; or added load on the land surface.

347
348 "Subsurface fluid distribution system" means an assemblage of perforated pipes,
349 drain tiles, or other similar mechanisms intended to distribute fluids below the
350 surface of the ground.

351
352 "Surface casing" means the first string of well casing to be installed in the well.

353
354 "Total dissolved solids" or "TDS" means the total dissolved (filterable) solids, as
355 determined by use of the method specified in 40 CFR 136.3 (Identification of Test
356 Procedures; the method for filterable residue), incorporated by reference in 35 Ill.
357 Adm. Code 720.111.

358
359 "UIC" means the Underground Injection Control program under Part C of the
360 Safe Drinking Water Act (42 USC 300h through 300h-8), including the approved
361 Illinois program.

362
363 "Underground injection" means a "well injection."

364
365 "Underground source of drinking water" or "USDW" means an aquifer or its
366 portion of which the following is true:

367
368 It supplies any public water system; or

369
370 It contains a sufficient quantity of groundwater to supply a public water
371 system; and

372
373 It currently supplies drinking water for human consumption; or

374
375 It contains less than 10,000 mg/ℓ total dissolved solids; and

376
377 It is not an exempted "aquifer."

378
379 "USDW" means underground source of drinking water.

380
381 "Well" means a bored, drilled, or driven shaft whose depth is greater than the
382 largest surface dimension; a dug hole whose depth is greater than the largest
383 surface dimension; an improved sinkhole; or a subsurface fluid distribution
384 system.

385
386 "Well injection" means the subsurface emplacement of fluids through a well.

387

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

390
391 "Well plug" means a watertight and gastight seal installed in a borehole or well to
392 prevent movement of fluids.

393
394 "Well stimulation" means several processes used to clean the well bore, enlarge
395 channels, and increase pore space in the interval to be injected, thus making it
396 possible for wastewater to move more readily into the formation, and includes
397 surging, jetting, blasting, acidizing, and hydraulic fracturing.

398
399 BOARD NOTE: Derived from 40 CFR 146.3 ~~(2010)~~(2005).

400
401 (Source: Amended at 36 Ill. Reg. _____, effective _____)

402
403 **Section 730.104 Criteria for Exempted Aquifers**

404
405 An aquifer or a portion ~~of an aquifer~~ thereof that meets the criteria for an "underground source of
406 drinking water" in Section 730.103 ~~is may be determined by the Board pursuant to 35 Ill. Adm.~~
407 ~~Code 704.103, 704.123, and 702.105 to be an "exempted aquifer" for a Class I, Class III or Class~~
408 V injection well if the Board determines pursuant to 35 Ill. Adm. Code 704.123 that the aquifer it
409 meets the criteria of either subsections (a) and (b) or (a) and (c) of this Section. For a Class VI
410 injection well, the Board must determine that the well meets the criteria of subsection (d) of this
411 Section.

412
413 a) The aquifer ~~it~~ does not currently serve as a source of drinking water; and

414
415 b) The aquifer ~~it~~ cannot now and will not in the future serve as a source of drinking
416 water because one or more of the following is true of the aquifer:

417
418 1) The aquifer ~~it~~ is mineral, hydrocarbon, or geothermal energy producing, or
419 a permit applicant can demonstrate, as part of a permit application for a
420 Class II or III injection well, that the aquifer contains minerals or
421 hydrocarbons that are expected to be commercially producible considering
422 their quantity and location;

423
424 2) The aquifer ~~it~~ is situated at a depth or location that makes recovery of
425 water for drinking water purposes economically or technologically
426 impractical;

427
428 3) The aquifer ~~it~~ is so contaminated that it would be economically or
429 technologically impractical to render that water fit for human
430 consumption; or

- 431
432 4) The aquifer is located over a Class III injection well mining area subject
433 to subsidence or catastrophic collapse; or
434
435 c) The total dissolved solids content of the groundwater in the aquifer is more than
436 3,000 and less than 10,000 mg/ℓ, and the aquifer is not reasonably expected to
437 supply a public water system.
438
439 d) The areal extent of an aquifer exemption for a Class II enhanced oil recovery or
440 enhanced gas recovery well is expanded for the exclusive purpose of Class VI
441 injection for geologic sequestration pursuant to 35 Ill. Adm. Code 704.123(d) if
442 the Agency determines that the aquifer meets the following criteria:
443
444 1) The aquifer does not currently serve as a source of drinking water;
445
446 2) The total dissolved solids content of the ground water in the aquifer is
447 greater than 3,000 mg/ℓ and less than 10,000 mg/ℓ; and
448
449 3) The aquifer is not reasonably expected to supply a public water system.
450

451 BOARD NOTE: Derived from 40 CFR 146.4 (2010), as amended at 75 Fed. Reg. 77303
452 (Dec. 10, 2010).

453
454 (Source: Amended at 36 Ill. Reg. _____, effective _____)
455

456 **Section 730.105 Classification of Injection Wells**

457
458 Injection wells are classified as follows:

- 459 a) Class I injection wells. A Class I injection well is any of the following:
460
461 1) A Class I hazardous waste injection well that is used by a generator of
462 hazardous waste or an owner or operator of a hazardous waste
463 management facility to inject hazardous waste beneath the lowermost
464 formation containing an underground source of drinking water within 402
465 meters (one-quarter mile) of the well bore.
466
467 2) An industrial or municipal disposal well that injects fluids beneath the
468 lowermost formation containing an underground source of drinking water
469 within 402 meters (one-quarter mile) of the well bore.
470
471 3) A radioactive waste disposal well that injects fluids below the lowermost
472 formation containing an underground source of drinking water within 402
473

474 meters (one-quarter mile) of the well bore.
475

476 b) Class II injection wells. A Class II injection well is one that injects any of the
477 following types of fluids:
478

- 479 1) Fluids that are brought to the surface in connection with conventional oil
480 or natural gas production and which may be commingled with wastewaters
481 from gas plants that are an integral part of production operations, unless
482 those waters are classified as a hazardous waste at the time of injection;
483
- 484 2) Fluids that are used for enhanced recovery of oil or natural gas; and
485
- 486 3) Fluids that are used for storage of hydrocarbons that are liquid at standard
487 temperature and pressure.
488

489 c) Class III injection wells. A Class III injection well is one that injects fluid for
490 extraction of minerals, including one used in any of the following activities:
491

- 492 1) Mining of sulfur by the Frasch process;
493
- 494 2) In situ production of uranium or other metals. This category includes only
495 in situ production from ore bodies that have not been conventionally
496 mined. Solution mining of conventional mines, such as stopes leaching, is
497 included in Class V; or
498
- 499 3) Solution mining of salts or potash.
500

501 BOARD NOTE: Class III injection well would include a well used for the
502 recovery of geothermal energy to produce electric power, but does not include a
503 well used in heating or aquaculture that falls under Class V.
504

505 d) Class IV injection wells. A Class IV injection well is any of the following:
506

- 507 1) A well used by a generator of hazardous waste or of radioactive waste, by
508 an owner or operator of a hazardous waste management facility, or by an
509 owner or operator of a radioactive waste disposal site to dispose of
510 hazardous waste or radioactive waste into a formation that contains an
511 underground source of drinking water within 402 meters (one-quarter
512 mile) of the well.
513
- 514 2) A well used by a generator of hazardous waste or of radioactive waste, by
515 an owner or operator of a hazardous waste management facility, or by an
516 owner or operator of a radioactive waste disposal site to dispose of

- 517 hazardous waste or radioactive waste above a formation that contains an
 518 underground source of drinking water within 402 meters (one-quarter
 519 mile) of the well.
 520
- 521 3) A well used by a generator of hazardous waste or an owner or operator of
 522 a hazardous waste management facility to dispose of hazardous waste that
 523 cannot be classified pursuant to subsection (a)(1), (d)(1), or (d)(2) of this
 524 Section (e.g., wells used to dispose of hazardous wastes into or above a
 525 formation that contains an aquifer that has been exempted pursuant to
 526 Section 730.104).
 527
- 528 e) Class V injection wells. A Class V injection well is any not included in Class I,
 529 Class II, Class III, ~~or Class IV~~, or Class VI. Specific types of Class V injection
 530 wells include the following:
 531
- 532 1) Air conditioning return flow wells used to return the water used in a heat
 533 pump for heating or cooling to the supply aquifer;
 534
- 535 2) Cesspools, including multiple dwelling, community, or regional cesspools,
 536 or other devices that receive wastes that have an open bottom and
 537 sometimes have perforated sides. The UIC requirements do not apply to
 538 single family residential cesspools or to non-residential cesspools that
 539 receive solely sanitary wastes and have the capacity to serve fewer than 20
 540 persons a day;
 541
- 542 3) Cooling water return flow wells used to inject water previously used for
 543 cooling;
 544
- 545 4) Drainage wells used to drain surface fluid, primarily storm runoff, into a
 546 subsurface formation;
 547
- 548 5) Dry wells used for the injection of wastes into a subsurface formation;
 549
- 550 6) Recharge wells used to replenish the water in an aquifer;
 551
- 552 7) Salt water intrusion barrier wells used to inject water into a fresh water
 553 aquifer to prevent the intrusion of salt water into the fresh water;
 554
- 555 8) Sand backfill and other backfill wells used to inject a mixture of water and
 556 sand, mill tailings, or other solids into mined out portions of subsurface
 557 mines whether what is injected is a radioactive waste or not;
 558
- 559 9) Septic system wells used to inject the waste or effluent from a multiple

- 560 dwelling, business establishment, community, or regional business
561 establishment septic tank. The UIC requirements do not apply to single
562 family residential septic system wells, or to nonresidential septic system
563 wells that are used solely for the disposal of sanitary waste and which
564 have the capacity to serve fewer than 20 persons a day;
565
- 566 10) Subsidence control wells (not used for the purpose of oil or natural gas
567 production) used to inject fluids into a non-oil or gas producing zone to
568 reduce or eliminate subsidence associated with the overdraft of fresh
569 water;
570
- 571 11) Radioactive waste disposal wells other than Class IV injection wells;
572
- 573 12) Injection wells associated with the recovery of geothermal energy for
574 heating, aquaculture, or production of electric power;
575
- 576 13) Wells used for solution mining of conventional mines such as stopes
577 leaching;
578
- 579 14) Wells used to inject spent brine into the same formation from which it was
580 withdrawn after extraction of halogens or their salts; and
581
- 582 15) Injection wells used in experimental technologies.
583

584 f) Class VI injection wells. A Class VI injection well is any of the following:
585

- 586 1) An injection well that is not experimental in nature and that is used for
587 geologic sequestration of carbon dioxide beneath the lowermost formation
588 containing a USDW;
589
- 590 2) An injection well that is used for geologic sequestration of carbon dioxide
591 and that has been granted a permit that includes alternative injection well
592 depth requirements pursuant to Section 730.195; or
593
- 594 3) An injection well that is used for geologic sequestration of carbon dioxide
595 and that has received an expansion to the areal extent of an existing Class
596 II enhanced oil recovery or enhanced gas recovery aquifer exemption
597 pursuant to Section 730.104 and 35 Ill. Adm. Code 704.123(d).
598

599 BOARD NOTE: Derived from 40 CFR 146.5 (2010), as amended at 75 Fed. Reg. 77303
600 (Dec. 10, 2010).

601 (Source: Amended at 36 Ill. Reg. _____, effective _____)
602

SUBPART C: CRITERIA AND STANDARDS APPLICABLE
TO CLASS II INJECTION WELLS

**Section 730.121 Adoption of Criteria and Standards Applicable to Class II Injection Wells
by the Illinois Department of Natural Resources, Office of Mines and Minerals**

The criteria and standards for Class II injection wells will be adopted by the Illinois Department of Natural Resources, Office of Mines and Minerals pursuant to Section 1425 of the SDWA (42 USC 300h-4).

BOARD NOTE: This Section corresponds with subpart C of 40 CFR 146 (2010), as amended at 75 Fed. Reg. 77303 (Dec. 10, 2010).

(Source: Amended at 36 Ill. Reg. _____, effective _____)

SUBPART G: CRITERIA AND STANDARDS APPLICABLE TO
CLASS I HAZARDOUS WASTE INJECTION WELLS

Section 730.172 Post-Closure Care

a) The owner or operator of a Class I hazardous waste injection well must prepare, maintain, and comply with a plan for post-closure care that meets the requirements of subsection (b) of this Section and is specified by permit condition. The obligation to implement the post-closure plan survives the termination of a permit or the cessation of injection activities. The requirement to maintain an approved plan is directly enforceable regardless of whether the requirement is a condition of the permit.

1) The owner or operator must submit the plan as a part of the permit application and, upon approval by the Agency, such plan must be a condition of any permit issued.

2) The owner or operator must submit any proposed significant revision to the plan as appropriate over the life of the well, but no later than the date of the closure report required pursuant to Section 730.171(c).

3) The plan must assure financial responsibility, as required in Section 730.173.

4) The plan must include the following information:

A) The pressure in the injection zone before injection began;

- 646
647
648
649
650
651
652
653
654
655
656
657
658
659
660
661
662
663
664
665
666
667
668
669
670
671
672
673
674
675
676
677
678
679
680
681
682
683
684
685
686
687
688
- B) The anticipated pressure in the injection zone at the time of closure;
 - C) The predicted time until pressure in the injection zone decays to the point that the well's cone of influence no longer intersects the base of the lowermost USDW;
 - D) The predicted position of the waste front at closure;
 - E) The status of any cleanups required pursuant to Section 730.164; and
 - F) The estimated cost of proposed post-closure care.
- 5) At the request of the owner or operator, or on its own initiative, the Agency may modify the post-closure plan after submission of the closure report following the procedures in 35 Ill. Adm. Code 705.128.
- b) The owner or operator must undertake each of the following activities:
- 1) It must continue and complete any cleanup action required pursuant to Section 730.164, if applicable;
 - 2) It must continue to conduct any groundwater monitoring required under the permit until pressure in the injection zone decays to the point that the well's cone of influence no longer intersects the base of the lowermost USDW. The Agency must extend the period of post-closure monitoring if it determines in writing that the well may endanger a USDW;
 - 3) It must submit a survey plat to the local zoning authority designated by permit condition. The plat must indicate the location of the well relative to permanently surveyed benchmarks. A copy of the plat must be submitted to USEPA, Region 5;
 - 4) It must notify the Illinois Department of Natural Resources, Office of Mines and Minerals, the State Department of Public Health, and any unit of local government authorized to grant permits under the Water Well Construction Code [415 ILCS 30] in the area where the well is located as to the depth and location of the well and the confining zone; and
 - 5) It must retain, for a period of three years following well closure, records reflecting the nature, composition, and volume of all injected fluids.

689 Owners or operators must deliver the records to the Agency at the
690 conclusion of the retention period.

- 691
- 692 c) Each owner of a Class I hazardous waste injection well, and the owner of the
693 surface or subsurface property on or in which a Class I hazardous waste injection
694 well is located, must record a notation on the deed to the facility property or on
695 some other instrument that is normally examined during title search that will in
696 perpetuity provide any potential purchaser of the property the following
697 information:
- 698
- 699 1) The fact that land has been used to manage hazardous waste;
 - 700
 - 701 2) The names of the Illinois Department of Natural Resources, Office of
702 Mines and Minerals and the local zoning authority with which the plat was
703 filed, as well as the address of USEPA Region 5; and
 - 704
 - 705 3) The type and volume of waste injected, the injection interval or intervals
706 into which it was injected, and the period over which injection occurred.
 - 707
- 708 d) In addition to the requirements stated in this Section, each owner of a Class I
709 hazardous waste injection well must comply with any other State or federal law or
710 local ordinance that requires the reporting of any potential environmental or
711 physical impairment of real property to subsequent or prospective owners.

712

713 BOARD NOTE: The Responsible Property Transfer Act of 1988 [765 ILCS 90]
714 (RPTA) formerly required the disclosure and recordation of any environmental
715 impairment of real property in Illinois. The General Assembly repealed that
716 statute in P.A. 92-299, Section 5, effective August 9, 2001. Section 10 of that
717 repeal provided for continued maintenance of documents prepared and recorded
718 under RPTA prior to its repeal.

719

720 BOARD NOTE: Derived from 40 CFR 146.72 (2010), as amended at 75 Fed. Reg.
721 77303 (Dec. 10, 2010)(2005).

722

723 (Source: Amended at 36 Ill. Reg. _____, effective _____)

724

725 SUBPART H: CRITERIA AND STANDARDS APPLICABLE TO CLASS VI WELLS

726

727 Section 730.181 Applicability

- 728
- 729 a) This Subpart H establishes criteria and standards for Class VI carbon dioxide
730 geologic sequestration injection wells.
- 731

- 732 b) This Subpart H applies to any injection well that is used to inject carbon dioxide
733 specifically for the purpose of geologic sequestration.
734
- 735 c) This Subpart H also applies to the owner or operator of a permit- or rule-
736 authorized Class I, Class II or Class V experimental carbon dioxide injection well
737 that seeks to apply for a Class VI geologic sequestration permit for its well. An
738 owner or operator that seeks to convert an existing Class I, Class II or Class V
739 experimental injection well to a Class VI geologic sequestration well must
740 demonstrate to the Agency that the well was engineered and constructed to meet
741 the requirements of Section 146.86(a) and to ensure protection of USDWs, in lieu
742 of requirements at Sections 146.86(b) and 146.87(a). By December 10, 2011, the
743 owner or operator of either a Class I injection well that was previously permitted
744 for the purpose of geologic sequestration or a Class V experimental technology
745 injection well that is no longer being used for experimental purposes and that will
746 continue injection of carbon dioxide for the purpose of geologic sequestration
747 must apply for a Class VI permit. A converted well must still meet all other
748 requirements of this Part.
749
- 750 d) Definitions. The following definitions apply to this Subpart H. To the extent that
751 these definitions conflict with those that appear in 35 Ill. Adm. Code 702.110 or
752 Section 730.103, the definitions of this Section govern for Class VI wells:
753
- 754 "Area of review" means the region surrounding the geologic sequestration project
755 where a USDW may be endangered by the injection activity. The area of review
756 is delineated using computational modeling that accounts for the physical and
757 chemical properties of all phases of the injected carbon dioxide stream and
758 displaced fluids, and is based on available site characterization, monitoring and
759 operational data, as set forth in Section 730.184.
760
- 761 "Carbon dioxide plume" means the sub-surface three-dimensional extent
762 underground of an injected carbon dioxide stream.
763
- 764 "Carbon dioxide stream" means carbon dioxide that has been captured from an
765 emission source (e.g., a power plant), plus incidental associated substances
766 derived from the source materials and the capture process, and any substances
767 added to the stream to enable or improve the injection process. This Subpart H
768 does not apply to any carbon dioxide stream that meets the definition of a
769 hazardous waste in 35 Ill. Adm. Code 721.103.
770
- 771 "Confining zone" means a geologic formation, a group of formations or a part of a
772 formation that stratigraphically overlies an injection zone and that acts as barrier
773 to fluid movement. For a Class VI injection well that is operating under a permit
774 that includes alternative injection well depth requirements, "confining zone"

775 means a geologic formation, a group of formations or a part of a formation that
776 stratigraphically overlies and underlies the injection zone.
777

778 "Corrective action" means the use of Agency-approved methods to ensure that
779 wells within an area of review do not serve as conduits for the movement of fluids
780 into a USDW.
781

782 "Geologic sequestration" means the long-term containment of a gaseous, liquid or
783 supercritical carbon dioxide stream in subsurface geologic formations. This term
784 does not apply to carbon dioxide capture or transport.
785

786 "Geologic sequestration project" means any of the following three types of
787 injection wells:
788

789 An injection well or wells that are used to emplace a carbon dioxide
790 stream beneath the lowermost formation containing a USDW;
791

792 An injection well or wells that are used for geologic sequestration of
793 carbon dioxide and that have been granted a permit that includes
794 alternative injection well depth requirements pursuant to requirements at
795 Section 730.195; or
796

797 An injection well or wells that are used for geologic sequestration of
798 carbon dioxide and that have received an expansion to the areal extent of
799 an existing Class II enhanced oil recovery or enhanced gas recovery
800 aquifer exemption pursuant to Section 730.104 and 35 Ill. Adm. Code
801 704.123(d).
802

803 A geologic sequestration project includes the subsurface three-dimensional
804 extent of the carbon dioxide plume, the associated area of elevated pressure,
805 and displaced fluids, as well as the surface area above that delineated region.
806

807 "Injection zone" means a geologic formation, a group of formations or a part of a
808 formation that is of sufficient areal extent, thickness, porosity and permeability to
809 receive carbon dioxide through a well or wells associated with a geologic
810 sequestration project.
811

812 "Post-injection site care" means appropriate monitoring and other actions
813 (including corrective action) needed following cessation of injection to ensure that
814 no USDW is endangered, as required under Section 730.193.
815

816 "Pressure front" means the zone of elevated pressure that is created by the
817 injection of carbon dioxide into the subsurface. For the purposes of this Subpart

818 H, the pressure front of a carbon dioxide plume refers to a zone where there is a
819 pressure differential sufficient to cause the movement of injected fluids or
820 formation fluids into a USDW.

821
822 "Site closure" means the point or time, as determined by the Agency pursuant to
823 Section 730.193, at which the owner or operator of a geologic sequestration site is
824 released from post-injection site care responsibilities.

825
826 "Transmissive fault or fracture" means a fault or fracture that has sufficient
827 permeability and vertical extent to allow fluids to move between formations.

828
829 BOARD NOTE: This Section corresponds with 40 CFR 146.81, as added at 75 Fed.
830 Reg. 77303 (Dec. 10, 2010).

831
832 (Source: Added at 36 Ill. Reg. _____, effective _____)

833
834 **Section 730.182 Required Class VI Injection Well Permit Information**

835
836 This Section sets forth the information that the Agency must consider when authorizing a Class
837 VI injection well. For a converted Class I, Class II or Class V experimental injection well,
838 certain maps, cross-sections and tabulations of wells within the area of review and other data
839 may be included in the application by reference provided they are current, readily available to the
840 Agency and sufficiently identified as to be retrieved. In cases where USEPA issues the permit,
841 all the information in this Section must be submitted to the USEPA, Region 5.

842
843 a) Prior to the issuance of a permit for the construction of a new Class VI injection
844 well or the conversion of an existing Class I, Class II or Class V injection well to
845 a Class VI injection well, the owner or operator must submit, pursuant to Section
846 730.191(e), and the Agency must consider, the following:

847
848 1) The information required by 35 Ill. Adm. Code 702.123(a) through (f);

849
850 2) A map showing the injection well for which a permit is sought and the
851 applicable area of review consistent with Section 730.184. Within the
852 area of review, the map must show the number or name and location of all
853 injection wells, producing wells, abandoned wells, plugged wells or dry
854 holes; deep stratigraphic boreholes; Agency- or USEPA-approved
855 subsurface cleanup sites; surface bodies of water, springs, mines (surface
856 and subsurface), quarries and water wells; and other pertinent surface
857 features, including structures intended for human occupancy, state
858 boundaries and roads. The map should also show faults, if known or
859 suspected. Only information of public record is required to be included on
860 this map;

- 861
 862
 863
 864
 865
 866
 867
 868
 869
 870
 871
 872
 873
 874
 875
 876
 877
 878
 879
 880
 881
 882
 883
 884
 885
 886
 887
 888
 889
 890
 891
 892
 893
 894
 895
 896
 897
 898
 899
 900
 901
 902
 903
- 3) Information on the geologic structure and hydrogeologic properties of the proposed storage site and overlying formations, including the following documents and information:
 - A) Maps and cross sections of the area of review;
 - B) The location, orientation and properties of known or suspected faults and fractures that may transect the confining zones in the area of review and a determination that the faults and fractures would not interfere with containment;
 - C) Data on the depth, areal extent, thickness, mineralogy, porosity, permeability and capillary pressure of the injection and confining zones; including geology and facies changes based on field data, which may include geologic cores, outcrop data, seismic surveys, well logs and names and lithologic descriptions;
 - D) Geomechanical information on fractures, stress, ductility, rock strength and in situ fluid pressures within the confining zones;
 - E) Information on the seismic history that includes the presence and depth of seismic sources and a determination that the seismicity would not interfere with containment; and
 - F) Geologic and topographic maps and cross sections that illustrate regional geology, hydrogeology and the geologic structure of the local area;
 - 4) A tabulation of all wells within the area of review that penetrate the injection or confining zones. This data must include a description of each well's type, construction, date drilled, location, depth, applicable records of plugging and completion, and any additional information that the Agency may require to evaluate the request for a permit;
 - 5) Maps and stratigraphic cross sections indicating the general vertical and lateral limits of all USDWs, water wells and springs within the area of review, their positions relative to the injection zones, and the direction of water movement, where known;
 - 6) Baseline geochemical data on subsurface formations that includes all USDWs in the area of review;

- 904
905
906
907
908
909
910
911
912
913
914
915
916
917
918
919
920
921
922
923
924
925
926
927
928
929
930
931
932
933
934
935
936
937
938
939
940
941
942
943
944
945
- 7) Proposed operating data for the proposed geologic sequestration site that includes that following items of information:
 - A) The average and maximum daily rate and volume or mass and the total anticipated volume or mass of the carbon dioxide stream;
 - B) The average and maximum injection pressures;
 - C) The sources of the carbon dioxide stream; and
 - D) An analysis of the chemical and physical characteristics of the carbon dioxide stream;
 - 8) A proposed program for pre-operational formation testing that fulfills the requirements of Section 730.187 to obtain an analysis of the chemical and physical characteristics of the injection zones and confining zones;
 - 9) A proposed stimulation program, a description of stimulation fluids to be used, and a determination that stimulation will not interfere with containment;
 - 10) A proposed procedure to outline steps necessary to conduct injection operation;
 - 11) Schematics or other appropriate drawings of the surface and subsurface construction details of the well;
 - 12) Injection well construction procedures that fulfill the requirements of Section 730.186;
 - 13) A proposed area of review and corrective action plan that fulfills the requirements of Section 730.184;
 - 14) A demonstration that is sufficient to support an Agency determination that the applicant has met the financial responsibility requirements under Section 730.185;
 - 15) A proposed testing and monitoring plan, as required by Section 730.190;
 - 16) A proposed injection well plugging plan, as required by Section 730.192(b);

- 946 17) A proposed post-injection site care and site closure plan, as required by
 947 Section 730.193(a);
 948
- 949 18) At the Agency's discretion, a demonstration of an alternative post-
 950 injection site care timeframe, as required by Section 730.193(c);
 951
- 952 19) A proposed emergency and remedial response plan, as required by Section
 953 730.194(a);
 954
- 955 20) A list of contacts, submitted to the Agency, for those states identified to be
 956 within the area of review of the Class VI project based on information
 957 provided pursuant to subsection (a)(2) of this Section; and
 958
- 959 21) Any other information requested by the Agency that would support an
 960 Agency determination whether to issue the requested permit.
 961
- 962 b) Pursuant to this Section, and as required by 40 CFR 145.23(f)(13), the Agency
 963 must notify any states that the Agency determines are within the area of review of
 964 the Class VI project based on information submitted pursuant to subsections (a)(2)
 965 and (a)(20) of this Section of the permit application in writing.
 966
- 967 c) Prior to granting a permit for the operation of a Class VI injection well, the
 968 Agency must consider the following information:
 969
- 970 1) The final area of review based on modeling using data obtained during the
 971 logging and testing of the well and the formation required by subsections
 972 (c)(2), (c)(3), (c)(4), (c)(6), (c)(7) and (c)(10) of this Section;
 973
- 974 2) Any relevant updates to the information on the geologic structure and
 975 hydrogeologic properties of the proposed storage site and overlying
 976 formations, submitted pursuant to subsection (a)(3) of this Section, based
 977 on data obtained during the logging and testing of the well and the
 978 formation required by subsections (c)(3), (c)(4), (c)(6), (c)(7) and (c)(10)
 979 of this Section;
 980
- 981 3) Information on the compatibility of the carbon dioxide stream with fluids
 982 in the injection zones and minerals in both the injection and the confining
 983 zones, based on the results of the formation testing program, and with the
 984 materials used to construct the well;
 985
- 986 4) The results of the formation testing program required by subsection (a)(8)
 987 of this Section;
 988

- 989 5) Final injection well construction procedures that fulfill the requirements of
990 Section 730.186;
991
992 6) The status of any corrective action on wells in the area of review;
993
994 7) All available logging and testing program data on the well required by
995 Section 730.187;
996
997 8) A demonstration of mechanical integrity pursuant to Section 730.189;
998
999 9) Any updates to the proposed area of review and corrective action plan, the
1000 testing and monitoring plan, the injection well plugging plan, the post-
1001 injection site care and site closure plan, or the emergency and remedial
1002 response plan that the applicant has submitted pursuant to subsection (a)
1003 of this Section that are necessary to address new information collected
1004 during logging and testing of the well and the formation, as required by
1005 this Section, and any updates to the alternative post-injection site care
1006 timeframe demonstration submitted pursuant to subsection (a) of this
1007 Section, that are necessary to address new information collected during the
1008 logging and testing of the well and the formation as required by this
1009 Section; and
1010
1011 10) Any other information requested by the Agency.
1012
1013 d) An owner or operator that seeks a permit that includes alternative injection well
1014 depth requirements to the generally applicable requirement to inject below the
1015 lowermost USDW must also refer to Section 730.195 and submit a supplemental
1016 report, as required at Section 730.195(a). The supplemental report is not part of
1017 the permit application.
1018

1019 BOARD NOTE: This Section corresponds with 40 CFR 146.82, as added at 75 Fed. Reg. 77303
1020 (Dec. 10, 2010).

1021
1022 (Source: Added at 36 Ill. Reg. _____, effective _____)
1023

1024 **Section 730.183 Minimum Criteria for Siting**
1025

- 1026 a) The owner or operator of a Class VI injection well must sufficiently demonstrate
1027 to support an Agency determination that the wells will be sited in areas with a
1028 suitable geologic system. The owner or operator must sufficiently demonstrate
1029 that the geologic system comprises both of the following elements:
1030

- 1031 1) An injection zone of sufficient areal extent, thickness, porosity and
1032 permeability to receive the total anticipated volume of the carbon dioxide
1033 stream; and
1034
1035 2) Confining zones free of transmissive faults or fractures and of sufficient
1036 areal extent and integrity to contain the injected carbon dioxide stream and
1037 displaced formation fluids and allow injection at proposed maximum
1038 pressures and volumes without initiating or propagating fractures in the
1039 confining zones.
1040
1041 b) The Agency may require the owner or operator of a Class VI injection well to
1042 identify and characterize additional zones that will impede vertical fluid
1043 movement; that are free of faults and fractures that may interfere with
1044 containment; that allow for pressure dissipation; and that provide additional
1045 opportunities for monitoring, mitigation and remediation.
1046

1047 BOARD NOTE: This Section corresponds with 40 CFR 146.83, as added at 75 Fed.
1048 Reg. 77303 (Dec. 10, 2010).

1049
1050 (Source: Added at 36 Ill. Reg. _____, effective _____)

1051
1052 **Section 730.184 Area of Review and Corrective Action**

- 1053
1054 a) The area of review is the region surrounding the geologic sequestration project
1055 when injection activity may endanger a USDW. The area of review is delineated
1056 using computational modeling that accounts for the physical and chemical
1057 properties of all phases of the injected carbon dioxide stream and that is based on
1058 available site characterization, monitoring and operational data.
1059
1060 b) The owner or operator of a Class VI injection well must prepare, maintain and
1061 comply with a plan to delineate the area of review for a proposed geologic
1062 sequestration project; must periodically reevaluate the delineation; and must
1063 perform corrective action that meets the requirements of this Section and that is
1064 sufficient to support an Agency determination that the corrective action is
1065 acceptable. The requirement to maintain and implement an approved plan is
1066 directly enforceable regardless of whether the requirement is a condition of the
1067 permit. As a part of the permit application to the Agency, the owner or operator
1068 must submit an area of review and corrective action plan that includes the
1069 following information:
1070
1071 1) The method that the owner or operator will use for delineating the area of
1072 review that meets the requirements of subsection (c) of this Section,
1073 including the model that the owner or operator will use, assumptions that

1074 the owner or operator will make, and the site characterization data on
1075 which the owner or operator will base the model;

1076
1077 2) A description of each of the following:

1078
1079 A) The minimum fixed frequency, not to exceed five years, at which
1080 the owner or operator proposes to reevaluate the area of review;

1081
1082 B) The monitoring and operational conditions that would warrant a
1083 reevaluation of the area of review prior to the next scheduled
1084 reevaluation as determined by the minimum fixed frequency
1085 established pursuant to subsection (b)(2)(A) of this Section;

1086
1087 C) How monitoring and operational data (e.g., injection rate, pressure,
1088 etc.) will be used to inform an area of review reevaluation; and

1089
1090 D) How the owner or operator will conduct corrective action to meet
1091 the requirements of subsection (d) of this Section, including the
1092 following information:

1093
1094 i) What corrective action the owner or operator will perform
1095 prior to injection;

1096
1097 ii) What, if any, portions of the area of review the owner or
1098 operator will address with corrective action on a phased
1099 basis and how that phasing will be determined;

1100
1101 iii) How the owner or operator will adjust corrective action if
1102 there are changes in the area of review; and

1103
1104 iv) How the owner or operator will guarantee site access for
1105 future corrective action.

1106
1107 c) The owner or operator of a Class VI injection well must perform the following
1108 actions to delineate the area of review and identify all wells that require corrective
1109 action:

1110
1111 1) The owner or operator must predict, using existing site characterization,
1112 monitoring and operational data, and computational modeling, the
1113 projected lateral and vertical migration of the carbon dioxide plume and
1114 formation fluids in the subsurface from the commencement of injection
1115 activities until the plume movement ceases, until pressure differentials
1116 sufficient to cause the movement of injected fluids or formation fluids into

1117 a USDW are no longer present, or until the end of a fixed time period
 1118 determined by the Agency. The model must fulfill the following
 1119 requirements:

1121 A) The model must be based on detailed geologic data collected to
 1122 characterize the injection zones, confining zones and any
 1123 additional zones; and anticipated operating data, including
 1124 injection pressures, rates and total volumes over the proposed life
 1125 of the geologic sequestration project;

1127 B) The model must take into account any geologic heterogeneities,
 1128 other discontinuities, data quality and their possible impact on
 1129 model predictions; and

1131 C) The model must consider potential migration through faults,
 1132 fractures and artificial penetrations.

1134 2) Using methods approved by the Agency, the owner or operator must
 1135 identify all penetrations, including active and abandoned wells and
 1136 underground mines, in the area of review that may penetrate the confining
 1137 zones and must provide a description of each well's type, construction,
 1138 date drilled, location, depth, record of plugging and/or completion, and
 1139 any additional information the Agency may require; and

1141 3) The owner or operator must determine which abandoned wells in the area
 1142 of review have been plugged in a manner that prevents the movement of
 1143 carbon dioxide or other fluids that may endanger USDWs, including use
 1144 of materials compatible with the carbon dioxide stream.

1146 d) The owner or operator of a Class VI injection well must perform corrective action
 1147 on all wells in the area of review that are determined to need corrective action,
 1148 using methods designed to prevent the movement of fluid into or between
 1149 USDWs, including use of materials compatible with the carbon dioxide stream,
 1150 where appropriate.

1152 e) At the minimum fixed frequency, not to exceed five years, as specified in the area
 1153 of review and corrective action plan, or when monitoring and operational
 1154 conditions warrant, the owner or operator of a Class VI injection well must fulfill
 1155 each of the following requirements:

1157 1) The owner or operator must reevaluate the area of review in the same
 1158 manner specified in subsection (c)(1) of this Section;

1159

- 1160 2) The owner or operator must identify all wells in the reevaluated area of
1161 review that require corrective action in the same manner specified in
1162 subsection (c) of this Section;
- 1163
- 1164 3) The owner or operator must perform corrective action on wells requiring
1165 corrective action in the reevaluated area of review in the same manner
1166 specified in subsection (d) of this Section; and
- 1167
- 1168 4) The owner or operator must submit an amended area of review and
1169 corrective action plan or demonstrate through monitoring data and
1170 modeling results sufficiently to support an Agency finding that no
1171 amendment to the area of review and corrective action plan is needed.
1172 Any amendments to the area of review and corrective action plan must be
1173 approved by the Agency, must be incorporated into the permit, and are
1174 subject to the permit modification requirements set forth in 35 Ill. Adm.
1175 Code 704.262 or 704.264, as appropriate.
- 1176
- 1177 f) The emergency and remedial response plan (as required by Section 730.194) and
1178 the demonstration of financial responsibility (as described by Section 730.185)
1179 must account for the area of review delineated as specified in subsection (c)(1) of
1180 this Section or the most recently evaluated area of review delineated pursuant to
1181 subsection (e) of this Section, regardless of whether corrective action in the area
1182 of review is phased.
- 1183
- 1184 g) The owner or operator must retain all modeling inputs and data used to support
1185 area of review reevaluations under subsection (e) of this Section for 10 years.
- 1186

1187 BOARD NOTE: This Section corresponds with 40 CFR 146.84, as added at 75 Fed.
1188 Reg. 77303 (Dec. 10, 2010).

1189
1190 (Source: Added at 36 Ill. Reg. _____, effective _____)

1191
1192 **Section 730.185 Financial Responsibility**

- 1193
- 1194 a) The owner or operator of an injection well to which this Subpart H applies must
1195 demonstrate and maintain financial responsibility that the Agency has determined
1196 fulfills the following conditions:
- 1197
- 1198 1) The financial responsibility instruments used must be from the following
1199 list of qualifying instruments:
- 1200
- 1201 A) A trust fund;
- 1202

- 1203 B) A surety bond;
1204
1205 C) A letter of credit;
1206
1207 D) Insurance;
1208
1209 E) Self insurance (i.e., the financial test and corporate guarantee);
1210
1211 F) An escrow account;
1212
1213 G) Any other instruments that the Agency determines are satisfactory.
1214
1215 2) The qualifying instruments must be sufficient to cover the following costs:
1216
1217 A) The costs of corrective action (that meets the requirements of
1218 Section 730.184);
1219
1220 B) The costs of injection well plugging (that meets the requirements
1221 of Section 730.192);
1222
1223 C) The costs of post-injection site care and site closure (that meets the
1224 requirements of Section 730.193); and
1225
1226 D) The costs of emergency and remedial response (that meets the
1227 requirements of Section 730.194).
1228
1229 3) The financial responsibility instruments must be sufficient to address
1230 endangerment of underground sources of drinking water.
1231
1232 4) The qualifying financial responsibility instruments must comprise
1233 protective conditions of coverage.
1234
1235 A) Protective conditions of coverage must include, at a minimum,
1236 cancellation, renewal and continuation provisions; specifications
1237 on when the provider becomes liable following a notice of
1238 cancellation if there is a failure to renew with a new qualifying
1239 financial instrument, and requirements for the provider to meet a
1240 minimum rating, minimum capitalization, and have the ability to
1241 pass the bond rating when applicable.
1242
1243 i) Cancellation. For purposes of this Subpart H, the owner or
1244 operator must provide that its financial mechanism may not
1245 cancel, terminate or fail to renew, except for failure to pay

1246 the financial instrument. If there is a failure to pay the
 1247 financial instrument, the financial institution may elect to
 1248 cancel, terminate or fail to renew the instrument by sending
 1249 notice by certified mail to the owner or operator and the
 1250 Agency. The cancellation must not be final for 120 days
 1251 after receipt of cancellation notice by the owner or operator
 1252 and the Agency. The owner or operator must provide an
 1253 alternative financial responsibility demonstration within 60
 1254 days after notice of cancellation, and if an alternate
 1255 financial responsibility demonstration is not acceptable (or
 1256 possible), any funds from the instrument being cancelled
 1257 must be released within 60 days after notification by the
 1258 Agency.

1260 ii) Renewal. For purposes of this Subpart H, an owner or
 1261 operator must renew all financial instruments, if an
 1262 instrument expires, for the entire term of the geologic
 1263 sequestration project. The instrument may be automatically
 1264 renewed, as long as the owner or operator has the option of
 1265 renewal at the face amount of the expiring instrument. The
 1266 automatic renewal of an instrument must, at a minimum,
 1267 provide the holder with the option of renewal at the face
 1268 amount of the expiring financial instrument.

1270 iii) Cancellation, termination or failure to renew may not occur
 1271 and the financial instrument will remain in full force and
 1272 effect in the event that any of the following occurs on or
 1273 before the date of expiration: the Agency deems the
 1274 facility abandoned; or the permit is revoked or a new
 1275 permit is denied; closure is ordered by the Agency or a
 1276 court of competent jurisdiction; the owner or operator is
 1277 named as debtor in a voluntary or involuntary bankruptcy
 1278 proceeding under Title 11 of the United States Code; or the
 1279 amount due on the instrument is fully paid.

1281 B) This subsection (a)(4)(B) would correspond with 40 CFR
 1282 706.85(a)(4)(ii) if such existed. USEPA codified a paragraph
 1283 (a)(4)(i) without a paragraph (a)(4)(ii). Illinois codification
 1284 requirements do not allow codification of a subsection level unless
 1285 multiple subsections exist at that level. This statement maintains
 1286 structural consistency with the corresponding federal rules.
 1287

- 1288
1289
1290
1291
1292
1293
1294
1295
1296
1297
1298
1299
1300
1301
1302
1303
1304
1305
1306
1307
1308
1309
1310
1311
1312
1313
1314
1315
1316
1317
1318
1319
1320
1321
1322
1323
1324
1325
1326
1327
1328
1329
1330
- 5) The qualifying financial responsibility instruments must be approved by the Agency.
 - A) The Agency must consider and approve the financial responsibility demonstration for all the phases of the geologic sequestration project prior to issuing a Class VI injection well permit (Section 730.182).
 - B) The owner or operator must provide any updated information related to their financial responsibility instruments on an annual basis and if there are any changes, the Agency must evaluate, within a reasonable time, the financial responsibility demonstration to confirm that the instruments used remain adequate for use. The owner or operator must maintain financial responsibility requirements regardless of the status of the Agency's review of the financial responsibility demonstration.
 - C) The Agency must disapprove the use of a financial instrument if the Agency determines that it is not sufficient to meet the requirements of this Section.

 - 6) The owner or operator may demonstrate financial responsibility by using one or multiple qualifying financial instruments for specific phases of the geologic sequestration project.
 - A) 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 (i.e., self insurance or performance bond), for example trust funds, surety bonds guaranteeing payment into a trust fund, letters of credit, escrow account and insurance. In this case, it is the combination of mechanisms, rather than the single mechanism, that must provide financial responsibility for an amount at least equal to the current cost estimate.
 - B) When using a third-party instrument to demonstrate financial responsibility, the owner or operator must provide a proof that the third-party provider fulfills either of the following:
 - i) The provider must have passed financial strength requirements of subsection (b)(6)(E) of this Section based on credit ratings; or

- 1331
 1332
 1333
 1334
 1335
 1336
 1337
 1338
 1339
 1340
 1341
 1342
 1343
 1344
 1345
 1346
 1347
 1348
 1349
 1350
 1351
 1352
 1353
 1354
 1355
 1356
 1357
 1358
 1359
 1360
 1361
 1362
 1363
 1364
 1365
 1366
 1367
 1368
 1369
 1370
 1371
 1372
- ii) The provider must have met a minimum rating, minimum capitalization, and have the ability to pass the bond rating set forth in subsection (b)(6)(E) of this Section, when applicable.

 - C) An owner or operator using certain types of third-party instruments must establish a standby trust fund to enable the Agency to be party to the financial responsibility agreement without the Agency being the beneficiary of any funds. The standby trust fund must be used along with other financial responsibility instruments (e.g., surety bonds, letters of credit, or escrow accounts) to provide a location to place funds if needed.

 - D) An owner or operator may deposit money to an escrow account to cover financial responsibility requirements. This account must segregate funds sufficient to cover estimated costs for Class VI (geologic sequestration) financial responsibility from other accounts and uses.

 - E) An owner or operator or its guarantor may use self insurance to demonstrate financial responsibility for geologic sequestration projects if the owner or operator or its guarantor fulfill the following requirements:
 - i) The owner or operator or its guarantor must meet a tangible net worth of an amount approved by the Agency;

 - ii) The owner or operator or its guarantor must have a net working capital and tangible net worth each at least six times the sum of the current well plugging, post-injection site care and site closure cost;

 - iii) The owner or operator or its guarantor must have assets located in the United States amounting to at least 90 percent of total assets or at least six times the sum of the current well plugging, post-injection site care and site closure cost;

 - iv) The owner or operator or its guarantor must submit a report of its bond rating and financial information annually; and

1373 v) The owner or operator or its guarantor must either have a
1374 bond rating test of AAA, AA, A, or BBB, as issued by
1375 Standard & Poor's, or Aaa, Aa, A, or Baa, as issued by
1376 Moody's, or meet all of the following five financial ratio
1377 thresholds: a ratio of total liabilities to net worth less than
1378 2.0; a ratio of current assets to current liabilities greater
1379 than 1.5; a ratio of the sum of net income plus depreciation,
1380 depletion and amortization to total liabilities greater than
1381 0.1; a ratio of current assets minus current liabilities to total
1382 assets greater than -0.1; and a net profit (revenues minus
1383 expenses) greater than 0.

1384
1385 F) An owner or operator that is not able to meet the corporate
1386 financial test criteria of subsection (a)(6)(E) of this Section may
1387 arrange a corporate guarantee by demonstrating that its corporate
1388 parent meets the financial test requirements on its behalf. The
1389 corporate parent's demonstration that it meets the financial test
1390 requirement is insufficient if it has not also guaranteed to fulfill the
1391 obligations for the owner or operator.

1392
1393 G) An owner or operator may obtain an insurance policy to cover the
1394 estimated costs of geologic sequestration activities that require
1395 financial responsibility. This insurance policy must be obtained
1396 from a third-party provider.

1397
1398 b) The requirement to maintain adequate financial responsibility and resources is
1399 directly enforceable regardless of whether the requirement is a condition of the
1400 permit.

1401
1402 1) The owner or operator must maintain financial responsibility and
1403 resources until both of the following events have occurred:

1404
1405 A) The Agency has received and approved the completed post-
1406 injection site care and site closure plan; and

1407
1408 B) The Agency has approved site closure.

1409
1410 2) The owner or operator may be released from a financial instrument in the
1411 following circumstances:

1412
1413 A) The owner or operator has completed the phase of the geologic
1414 sequestration project for which the financial instrument was
1415 required, and the owner or operator has fulfilled all of its financial

1416 obligations, as determined by the Agency, including obtaining
1417 financial responsibility for the next phase of the geologic
1418 sequestration project, if required; or

1420 B) The owner or operator has submitted a replacement financial
1421 instrument, and the owner or operator has received written
1422 approval from the Agency that accepts the new financial
1423 instrument and that releases the owner or operator from the
1424 previous financial assurance instrument.

1426 c) The owner or operator must have a detailed written estimate, in current dollars, of
1427 the cost of performing corrective action on wells in the area of review, plugging
1428 the injection wells, post-injection site care, site closure and emergency and
1429 remedial response.

1430
1431 1) The cost estimate must be performed for each phase separately, and the
1432 cost estimate must be based on the costs to the Agency of hiring a third-
1433 party to perform the required activities. A third-party is a party who is not
1434 within the corporate structure of the owner or operator.

1435
1436 2) During the active life of the geologic sequestration project, the owner or
1437 operator must adjust the cost estimate for inflation within 60 days prior to
1438 the anniversary date of the establishment of the financial instruments used
1439 to comply with subsection (a) of this Section, and the owner or operator
1440 must provide this adjustment to the Agency. The owner or operator must
1441 also provide to the Agency written updates of adjustments to the cost
1442 estimate within 60 days after any amendments to the area of review and
1443 corrective action plan (Section 730.184), the injection well plugging plan
1444 (Section 730.192), the post-injection site care and site closure plan
1445 (Section 730.193), and the emergency and remedial response plan (Section
1446 730.194).

1447
1448 3) The Agency must approve any decrease or increase to the initial cost
1449 estimate. During the active life of the geologic sequestration project, the
1450 owner or operator must revise the cost estimate no later than 60 days after
1451 any of the following events has occurred: the Agency has approved the
1452 request to modify the area of review and corrective action plan (Section
1453 730.184), the Agency has approved the injection well plugging plan
1454 (Section 730.192), the Agency has approved the post-injection site care
1455 and site closure plan (Section 730.193), or the Agency has approved the
1456 emergency and response plan (Section 730.194), if the change in the plan
1457 increases the cost. If the change to the plan decreases the cost, any
1458 withdrawal of funds must be approved by the Agency. Any decrease to

- 1459 the value of the financial assurance instrument must first be approved by
 1460 the Agency. The revised cost estimate must be adjusted for inflation as
 1461 specified at subsection (c)(2) of this Section.
 1462
- 1463 4) Within 60 days after an increase in the current cost estimate to an amount
 1464 greater than the face amount of a financial instrument currently in use, the
 1465 owner or operator must either cause the face amount to be increased to an
 1466 amount at least equal to the current cost estimate and submit evidence of
 1467 that increase to the Agency, or obtain other financial responsibility
 1468 instruments to cover the increase. Whenever the current cost estimate
 1469 decreases, the owner or operator may reduce the face amount of the
 1470 financial assurance instrument to the amount of the current cost estimate
 1471 only in accordance with a written approval from the Agency.
 1472
- 1473 d) The owner or operator must notify the Agency by certified mail of adverse
 1474 financial conditions, such as bankruptcy, that may affect the ability to carry out
 1475 injection well plugging and post-injection site care and site closure.
 1476
- 1477 1) In the event that the owner or operator or the third-party provider of a
 1478 financial responsibility instrument is going through a bankruptcy, the
 1479 owner or operator must notify the Agency of the proceeding by certified
 1480 mail within 10 days after commencement of a voluntary or involuntary
 1481 proceeding under Title 11 of the United States Code that names the owner
 1482 or operator as debtor.
 1483
- 1484 2) The guarantor of a corporate guarantee must make the notification to the
 1485 Agency required by this subsection (d) if the guarantor is named as debtor,
 1486 as required under the terms of the corporate guarantee.
 1487
- 1488 3) An owner or operator who fulfills the requirements of subsection (a) of
 1489 this Section by obtaining a trust fund, surety bond, letter of credit, escrow
 1490 account or insurance policy will be deemed to be without the required
 1491 financial assurance in the event of bankruptcy of the trustee or issuing
 1492 institution or a suspension or revocation of the authority of the trustee
 1493 institution to act as trustee of the institution issuing the pertinent financial
 1494 assurance instrument. The owner or operator must establish other
 1495 financial assurance within 60 days after such an event.
 1496
- 1497 e) The owner or operator must provide an adjustment of the cost estimate to the
 1498 Agency within 60 days after notification of an Agency determination during the
 1499 annual evaluation of the qualifying financial responsibility instruments that the
 1500 most recent demonstration is no longer adequate to cover the cost of corrective
 1501 action (as required by Section 730.184), injection well plugging (as required by

1502 Section 730.192), post-injection site care and site closure (as required by Section
1503 730.193), and emergency and remedial response (as required by Section 730.194).

- 1504
1505 f) The Agency must approve the use and length of pay-in-periods for trust funds or
1506 escrow accounts.

1507
1508 BOARD NOTE: This Section corresponds with 40 CFR 146.85, as added at 75 Fed.
1509 Reg. 77303 (Dec. 10, 2010).

1510
1511 (Source: Added at 36 Ill. Reg. _____, effective _____)

1512
1513 **Section 730.186 Injection Well Construction Requirements**

- 1514
1515 a) General. The owner or operator must ensure that its Class VI injection wells are
1516 constructed and completed to fulfill the following requirements:

- 1517
1518 1) The well construction and completion must prevent the movement of
1519 fluids into or between USDWs or into any unauthorized zone;
1520
1521 2) The well construction and completion must permit the use of appropriate
1522 testing devices and workover tools; and
1523
1524 3) The well construction and completion must permit continuous monitoring
1525 of the annulus space between the injection tubing and long-string casing.

- 1526
1527 b) Casing and cementing of Class VI injection wells.

- 1528
1529 1) The casing, cement and other materials used in the construction of each
1530 Class VI injection well must have sufficient structural strength and be
1531 designed to last for the life of the geologic sequestration project. All well
1532 materials must be compatible with fluids with which the materials may be
1533 expected to come into contact, and the owner or operator must submit
1534 sufficient documentation to the Agency to support a determination that the
1535 casing, cement and other materials meet or exceed standards developed for
1536 these materials by the American Petroleum Institute, ASTM International,
1537 or a comparable industry standards organization. The casing and
1538 cementing program must be designed to prevent the movement of fluids
1539 into or between USDWs. In order to allow the Agency to determine and
1540 specify casing and cementing requirements, the owner or operator must
1541 provide the following information to the Agency:

- 1542
1543 A) The depth to the injection zones;
1544

- 1545 B) The injection pressure, external pressure, internal pressure and
1546 axial loading;
1547
1548 C) The hole size;
1549
1550 D) The size and grade of all casing strings (the wall thickness,
1551 external diameter, nominal weight, length, joint specification, and
1552 construction material);
1553
1554 E) The corrosiveness of the carbon dioxide stream and formation
1555 fluids;
1556
1557 F) The down-hole temperatures;
1558
1559 G) The lithology of the injection and confining zones;
1560
1561 H) The type or grade of cement and cement additives; and
1562
1563 I) The quantity, chemical composition and temperature of the carbon
1564 dioxide stream.
1565
1566 2) The surface casing must extend through the base of the lowermost USDW
1567 and be cemented to the surface through the use of a single or multiple
1568 strings of casing and cement.
1569
1570 3) At least one long-string casing, using a sufficient number of centralizers,
1571 must extend to the injection zone and must be cemented by circulating
1572 cement to the surface in one or more stages.
1573
1574 4) The circulation of cement may be accomplished by staging. The Agency
1575 must approve an alternative method of cementing when it determines that
1576 the cement cannot be recirculated to the surface, provided the owner or
1577 operator can demonstrate, by using logs, that the cement does not allow
1578 fluid movement behind the well bore.
1579
1580 5) The cement and cement additives must be compatible with the carbon
1581 dioxide stream and formation fluids and of sufficient quality and quantity
1582 to maintain integrity over the design life of the geologic sequestration
1583 project. The integrity and location of the cement must be verified that it
1584 uses technology capable of evaluating cement quality radially and that
1585 identifies the location of channels to ensure that USDWs are not
1586 endangered.
1587

- 1588 c) Tubing and packer.
1589
1590 1) The tubing and packer materials used in the construction of a Class VI
1591 injection well must be compatible with fluids with which the materials
1592 may be expected to come into contact, and the owner or operator must
1593 submit sufficient documentation to the Agency to support a determination
1594 that the tubing and packer meet or exceed standards developed for these
1595 materials by the American Petroleum Institute, ASTM International, or a
1596 comparable industry standards organization.
1597
1598 2) The owner or operator of a Class VI injection well must inject fluids
1599 through tubing with a packer set at a depth opposite a cemented interval at
1600 the location approved by the Agency.
1601
1602 3) In order for the Agency to determine and specify requirements for tubing
1603 and packer, the owner or operator must submit the following information
1604 to the Agency:
1605
1606 A) The depth of setting;
1607
1608 B) The characteristics of the carbon dioxide stream (the chemical
1609 content, corrosiveness, temperature and density) and formation
1610 fluids;
1611
1612 C) The maximum proposed injection pressure;
1613
1614 D) The maximum proposed annular pressure;
1615
1616 E) The proposed injection rate (intermittent or continuous) and the
1617 volume or mass of the carbon dioxide stream;
1618
1619 F) The size of the tubing and casing; and
1620
1621 G) The tubing tensile, burst and collapse strengths.
1622

1623 BOARD NOTE: This Section corresponds with 40 CFR 146.86, as added at 75 Fed.
1624 Reg. 77303 (Dec. 10, 2010).

1625
1626 (Source: Added at 36 Ill. Reg. _____, effective _____)
1627

1628 **Section 730.187 Logging, Sampling and Testing Prior to Injection Well Operation**
1629

1630
1631
1632
1633
1634
1635
1636
1637
1638
1639
1640
1641
1642
1643
1644
1645
1646
1647
1648
1649
1650
1651
1652
1653
1654
1655
1656
1657
1658
1659
1660
1661
1662
1663
1664
1665
1666
1667
1668
1669
1670
1671
1672

- a) During the drilling and construction of a Class VI injection well, the owner or operator must run appropriate logs, surveys and tests to determine or verify the depth, thickness, porosity, permeability and lithology of all relevant geologic formations and the salinity of any formation fluids in those formations, to ensure conformance with the injection well construction requirements under Section 730.186 and to establish accurate baseline data against which future measurements may be compared. The owner or operator must submit to the Agency a descriptive report prepared by a knowledgeable log analyst that includes an interpretation of the results of the logs and tests. At a minimum, the logs and tests must include the following information items:
- 1) Deviation checks made during drilling on all holes constructed by drilling a pilot hole that is enlarged by reaming or another method. These 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;
 - 2) Before and upon installation of the surface casing, the following:
 - A) The resistivity, spontaneous potential and caliper logs before the casing is installed; and
 - B) A cement bond and variable density log, to evaluate cement quality radially, and a temperature log after the casing is set and cemented;
 - 3) Before and upon installation of the long-string casing, the following:
 - A) The resistivity, spontaneous potential, porosity, caliper, gamma ray, fracture finder logs and any other logs the Agency requires for the given geology before the casing is installed; and
 - B) A cement bond and variable density log and a temperature log, after the casing is set and cemented;
 - 4) A series of tests designed to demonstrate the internal and external mechanical integrity of injection wells, which may include the following:
 - A) A pressure test with liquid or gas;
 - B) A tracer survey, such as oxygen-activation logging;
 - C) A temperature or noise log; and

- 1673 D) A casing inspection log; and
 1674
 1675 5) Any alternative methods that provide equivalent or better information and
 1676 that are required by or approved of by the Agency.
 1677
 1678 b) The owner or operator must take whole cores or sidewall cores of the injection
 1679 zone and confining system and formation fluid samples from all injection zones,
 1680 and the owner or operator must submit a detailed report prepared by a log analyst
 1681 to the Agency that includes the following information: well log analyses
 1682 (including well logs), core analyses and formation fluid sample information. The
 1683 Agency must accept information on cores from nearby wells if the Agency
 1684 determines that the owner or operator has demonstrated that core retrieval is not
 1685 possible and the cores are representative of conditions at the well. The Agency
 1686 must require the owner or operator to core other formations in the borehole if the
 1687 Agency determines that coring those other formations is necessary for evaluation
 1688 of the well project.
 1689
 1690 c) The owner or operator must record the fluid temperature, pH, conductivity,
 1691 reservoir pressure and static fluid level of each injection zone.
 1692
 1693 d) At a minimum, the owner or operator must determine or calculate the following
 1694 information concerning the injection and confining zones:
 1695
 1696 1) The fracture pressure;
 1697
 1698 2) Other physical and chemical characteristics of the injection and confining
 1699 zones; and
 1700
 1701 3) The physical and chemical characteristics of the formation fluids in each
 1702 injection zone.
 1703
 1704 e) Upon completion, but prior to operation, the owner or operator must conduct the
 1705 following tests to verify hydrogeologic characteristics of each injection zone:
 1706
 1707 1) A pressure fall-off test and a pump test; or
 1708
 1709 2) A pressure fall-off test and injectivity tests.
 1710
 1711 f) The owner or operator must provide the Agency with the opportunity to witness
 1712 all logging and testing by this Subpart H. The owner or operator must submit a
 1713 schedule of these activities to the Agency no later than 30 days prior to
 1714 conducting the first test, and the owner or operator must submit any changes to
 1715 the schedule to the Agency no later than 30 days prior to the next scheduled test.

1716
 1717 BOARD NOTE: This Section corresponds with 40 CFR 146.87, as added at 75 Fed.
 1718 Reg. 77303 (Dec. 10, 2010).

1719
 1720 (Source: Added at 36 Ill. Reg. _____, effective _____)
 1721

1722 **Section 730.188 Injection Well Operating Requirements**
 1723

- 1724 a) Except during injection well stimulation, the owner or operator must ensure that
 1725 injection pressure does not exceed 90 percent of the fracture pressure of the
 1726 injection zones, so as to ensure that the injection does not initiate new fractures or
 1727 propagate existing fractures in the injection zones. In no case may injection
 1728 pressure initiate fractures in the confining zones or cause the movement of
 1729 injection or formation fluids that endangers a USDW. Pursuant to the
 1730 requirements of Section 730.182(a)(9), all stimulation programs must be approved
 1731 by the Agency as part of the permit application and incorporated into the permit.
 1732
- 1733 b) Injection between the outermost casing that protects any USDW and the well bore
 1734 is prohibited.
 1735
- 1736 c) The owner or operator must fill the annulus between the tubing and the long-
 1737 string casing with a non-corrosive fluid approved by the Agency. The owner or
 1738 operator must maintain on the annulus a pressure that exceeds the operating
 1739 injection pressure, unless the Agency determines that such a requirement might
 1740 harm the integrity of the well or endanger any USDW.
 1741
- 1742 d) Other than during periods of well workover (maintenance) approved by the
 1743 Agency in which the sealed tubing-casing annulus is disassembled for
 1744 maintenance or corrective procedures, the owner or operator must maintain
 1745 mechanical integrity of the injection well at all times.
 1746
- 1747 e) The owner or operator must install and use the equipment indicated in subsection
 1748 (e)(1) of this Section and the appropriate of subsection (e)(2) or (e)(3) of this
 1749 Section:
 1750
- 1751 1) Continuous recording devices that monitor each of the following
 1752 parameters:
 1753
- 1754 A) The carbon dioxide injection pressure;
 1755
- 1756 B) The rate, volume or mass, and temperature of the carbon dioxide
 1757 stream;
 1758

- 1759 C) The pressure on the annulus between the tubing and the long-string
 1760 casing; and
 1761
- 1762 D) The annulus fluid volume.
 1763
- 1764 2) For onshore wells, alarms and automatic surface shut-off systems or, at the
 1765 discretion of the Agency, down-hole shut-off systems (e.g., automatic
 1766 shut-off valves, check valves, etc.) or other mechanical devices that
 1767 provide equivalent protection.
 1768
- 1769 3) For wells located offshore but within State territorial waters, alarms and
 1770 automatic down-hole shut-off systems designed to alert the operator and
 1771 shut-in the well when operating parameters, such as annulus pressure,
 1772 injection rate or other parameters, diverge beyond permitted ranges or
 1773 gradients specified in the permit.
 1774
- 1775 f) If a shutdown is triggered (down-hole or at the surface), or if a loss of mechanical
 1776 integrity is discovered, the owner or operator must immediately investigate and
 1777 identify the cause of the shutoff as expeditiously as possible. If, upon that
 1778 investigation, or if monitoring required under subsection (e) of this Section
 1779 otherwise indicates that the well may be lacking mechanical integrity, the well
 1780 appears to be lacking mechanical integrity, the owner or operator must undertake
 1781 each of the following actions:
 1782
- 1783 1) The owner or operator must immediately cease injection;
 1784
- 1785 2) The owner or operator must take all steps reasonably necessary to
 1786 determine whether there may have been a release of the injected carbon
 1787 dioxide stream or formation fluids into any unauthorized zone;
 1788
- 1789 3) The owner or operator must notify the Agency of the event within 24
 1790 hours;
 1791
- 1792 4) The owner or operator must restore and demonstrate the mechanical
 1793 integrity of the well to the satisfaction of the Agency prior to resuming
 1794 injection; and
 1795
- 1796 5) The owner or operator must notify the Agency when injection can be
 1797 expected to resume.
 1798

1799 BOARD NOTE: This Section corresponds with 40 CFR 146.88, as added at 75 Fed.
 1800 Reg. 77303 (Dec. 10, 2010).
 1801

(Source: Added at 36 Ill. Reg. _____, effective _____)

Section 730.189 Mechanical Integrity

- a) A Class VI injection well has mechanical integrity if both of the following conditions exist:
 - 1) There is no significant leak in the casing, tubing or packer; and
 - 2) There is no significant fluid movement into a USDW through channels adjacent to the injection well bore.

- b) To evaluate the absence of significant leaks under subsection (a)(1) of this Section, the owner or operator must, following an initial annulus pressure test, continuously monitor each of the following parameters:
 - 1) The injection pressure, rate and injected volumes;
 - 2) The pressure on the annulus between the tubing and the long-string casing; and
 - 3) The annulus fluid volume, as specified in Section 730.188(e);

- c) At least once per year, the owner or operator must use one of the following methods to determine the absence of significant fluid movement under subsection (a)(2) of this Section:
 - 1) An approved tracer survey, such as an oxygen-activation log; or
 - 2) A temperature or noise log.

- d) If required by the Agency, at a frequency specified in the testing and monitoring plan required by Section 730.190, the owner or operator must run a casing inspection log to determine the presence or absence of corrosion in the long-string casing.

- e) The Agency must require any requested alternative test that the Agency has determined is necessary to evaluate mechanical integrity under subsections (a)(1) or (a)(2) of this Section after obtaining the written approval of USEPA.

BOARD NOTE: Corresponding 40 CFR 146.89(e) provides that the Agency must submit a written request to USEPA setting forth the proposed test and all technical data supporting its use to obtain approval for a new mechanical integrity

1845 test. USEPA stated that it will approve the request if USEPA determines that the
 1846 proposed test will reliably demonstrate the mechanical integrity of wells for
 1847 which its use was proposed. USEPA stated that it will publish any alternative
 1848 method that USEPA has approved in the Federal Register, and the Agency must
 1849 approve use of the published method if the Agency has determined that the
 1850 method is appropriate to evaluate mechanical integrity, unless USEPA restricts its
 1851 use at the time of approval by USEPA.

1852
 1853 f) In conducting and evaluating the tests enumerated in this Section or others that
 1854 the Agency has required by permit, the owner or operator and the Agency must
 1855 apply methods and standards generally accepted in the industry. When the owner
 1856 or operator reports the results of mechanical integrity tests to the Agency, the
 1857 owner or operator must include a description of the tests and the methods used. In
 1858 making its evaluation, the Agency must review monitoring and other test data
 1859 submitted since the previous evaluation.

1860
 1861 g) The Agency must require additional or alternative tests if the Agency determines
 1862 that the results presented by the owner or operator pursuant to subsections (a)
 1863 through (d) of this Section are not satisfactory to demonstrate that there is no
 1864 significant leak in the casing, tubing, or packer or that there is no significant
 1865 movement of fluid into a USDW resulting from the injection activity, as required
 1866 by subsections (a)(1) and (a)(2) of this Section.

1867
 1868 BOARD NOTE: This Section corresponds with 40 CFR 146.89, as added at 75 Fed.
 1869 Reg. 77303 (Dec. 10, 2010).

1870
 1871 (Source: Added at 36 Ill. Reg. _____, effective _____)

1872
 1873 **Section 730.190 Testing and Monitoring Requirements**

1874
 1875 The owner or operator of a Class VI injection well must prepare, maintain and comply with a
 1876 testing and monitoring plan that will verify that the geologic sequestration project is operating as
 1877 permitted, and that the project is not endangering USDWs. The requirement to maintain and
 1878 implement an approved testing and monitoring plan is directly enforceable, regardless of whether
 1879 the requirement is a condition of the permit. The owner or operator must submit the testing and
 1880 monitoring plan to the Agency with the permit application, and the owner or operator must
 1881 include a description of how it will meet the requirements of this Section, including accessing
 1882 sites for all necessary monitoring and testing during the life of the project. Testing and
 1883 monitoring associated with geologic sequestration projects must, at a minimum, include the
 1884 following parameters and devices:

1885
 1886 a) Analyses of the carbon dioxide stream with sufficient frequency to yield data
 1887 representative of the chemical and physical characteristics of the stream;

- 1888
 1889
 1890
 1891
 1892
 1893
 1894
 1895
 1896
 1897
 1898
 1899
 1900
 1901
 1902
 1903
 1904
 1905
 1906
 1907
 1908
 1909
 1910
 1911
 1912
 1913
 1914
 1915
 1916
 1917
 1918
 1919
 1920
 1921
 1922
 1923
 1924
 1925
 1926
 1927
 1928
 1929
 1930
- b) Installation and use of continuous recording devices to monitor injection pressure, rate and volume, except during well workovers, as defined in Section 730.188(d); the pressure on the annulus between the tubing and the long-string casing; and the annulus fluid volume added;
 - c) 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 fulfill the Agency-approved minimum standards for material strength and performance, as provided in Section 730.186(b), by performing one of the following tests:
 - 1) Analyzing coupons of the well construction materials placed in contact with the carbon dioxide stream;
 - 2) Routing the carbon dioxide stream through a loop constructed with the material used in the well and inspecting the materials in the loop; or
 - 3) Using an alternative method approved by the Agency;
 - d) Periodic monitoring of the groundwater quality and geochemical changes above the confining zones that may be a result of carbon dioxide movement through the confining zones or additional identified zones, including the following information:
 - 1) 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
 - 2) The monitoring frequency and spatial distribution of monitoring wells based on baseline geochemical data that has been collected pursuant to Section 730.182(a)(6) and on any modeling results in the area of review evaluation required by Section 730.184(c).
 - e) The annual demonstration of external mechanical integrity required by Section 730.189(c) at least once per year until the injection well is plugged; and, if required by the Agency, a casing inspection log undertaken pursuant to Section 730.189(d), at a frequency established in the testing and monitoring plan;
 - f) A pressure fall-off test at least once every five years, unless the Agency has required more frequent testing based on site-specific information;

- 1931 g) Testing and monitoring to track the extent of the carbon dioxide plume and the
 1932 presence or absence of elevated pressure (i.e., the pressure front) by using the
 1933 following types of methods:
 1934
- 1935 1) Direct methods in the injection zones; and
 - 1936
 - 1937 2) Indirect methods (e.g., seismic, electrical, gravity or electromagnetic
 1938 surveys or down-hole carbon dioxide detection tools), unless the Agency
 1939 has determined, based on site-specific geology, that these methods are not
 1940 appropriate;
 - 1941
- 1942 h) The Agency must require surface air monitoring or soil gas monitoring if the
 1943 Agency determines that this monitoring is needed to detect movement of carbon
 1944 dioxide that could endanger a USDW.
 1945
- 1946 1) The design of Class VI injection well surface air or soil gas monitoring
 1947 must be based on potential risks to USDWs within the area of review;
 - 1948
 - 1949 2) The monitoring frequency and spatial distribution of surface air
 1950 monitoring or soil gas monitoring must be decided using baseline data,
 1951 and the monitoring plan must describe how the proposed monitoring will
 1952 yield useful information on the area of review delineation or compliance
 1953 with the prohibition against movement of fluid into a USDW set forth in
 1954 35 Ill. Adm. Code 704.122;
 - 1955
 - 1956 3) If the Agency requires surface air or soil gas monitoring, the Agency has
 1957 determined that monitoring undertaken to comply with subpart RR of 40
 1958 CFR 98 accomplishes the goals of subsections (h)(1) and (h)(2) of this
 1959 Section, and the owner or operator fulfills the carbon dioxide release
 1960 reporting requirements set forth in Section 730.191(c)(5), the Agency
 1961 must approve the use of monitoring undertaken to comply with subpart
 1962 RR of 40 CFR 98. After approval by the Agency, compliance with
 1963 subpart RR of 40 CFR 98 pursuant to this subsection (h)(3) is deemed a
 1964 condition of the Class VI injection well permit;
 - 1965
- 1966 i) Any additional monitoring that the Agency has determined is necessary to
 1967 support, upgrade and improve the computational modeling of the area of review
 1968 evaluation that is required by Section 730.184(c) and to determine compliance
 1969 with the prohibition against movement of fluid into a USDW set forth in 35 Ill.
 1970 Adm. Code 704.122;
 1971
- 1972 j) The owner or operator must periodically review the testing and monitoring plan to
 1973 incorporate monitoring data collected under this Subpart H, operational data

1974 collected pursuant to Section 730.188, and the most recent area of review
1975 reevaluation performed pursuant to Section 730.184(e). The owner or operator
1976 must review the testing and monitoring plan at least once in every five-year
1977 period. Based on this review, the owner or operator must submit an amended
1978 testing and monitoring plan or demonstrate to the Agency that no amendment to
1979 the testing and monitoring plan is needed. Any amendments to the testing and
1980 monitoring plan must be approved by the Agency, must be incorporated into the
1981 permit and are subject to the permit modification requirements set forth in 35 Ill.
1982 Adm. Code 704.261 or 704.264, as appropriate. The owner or operator must
1983 submit amended plans or demonstrations to the Agency as follows:

- 1984
- 1985 1) Within one year after an area of review reevaluation;
- 1986
- 1987 2) Following any significant changes to the facility, such as addition of
1988 monitoring wells or newly permitted injection wells within the area of
1989 review, on a schedule determined by the Agency; or
- 1990
- 1991 3) When required by the Agency.

- 1992
- 1993 k) A quality assurance and surveillance plan for all testing and monitoring
1994 requirements.
- 1995

1996 BOARD NOTE: This Section corresponds with 40 CFR 146.90, as added at 75 Fed. Reg. 77303
1997 (Dec. 10, 2010).

1998

1999 (Source: Added at 36 Ill. Reg. _____, effective _____)

2000

2001 **Section 730.191 Reporting Requirements**

2002

2003 The owner or operator of a Class VI injection well must, at a minimum, provide the following
2004 reports to the Agency for each permitted Class VI injection well, as specified in subsection (e) of
2005 this Section:

- 2006
- 2007 a) Semi-annual reports containing the following information:
- 2008
- 2009 1) A description of any deviations in the physical, chemical and other
2010 relevant characteristics of the carbon dioxide stream from the proposed
2011 operating data submitted to the Agency pursuant to Sections 730.182(a)(7)
2012 and (c)(3) and 730.186(b)(1) and (c)(3);
- 2013
- 2014 2) The monthly average, maximum and minimum values for injection
2015 pressure, flow rate and volume, and annular pressure;
- 2016

- 2017
2018
2019
2020
2021
2022
2023
2024
2025
2026
2027
2028
2029
2030
2031
2032
2033
2034
2035
2036
2037
2038
2039
2040
2041
2042
2043
2044
2045
2046
2047
2048
2049
2050
2051
2052
2053
2054
2055
2056
2057
2058
- 3) A description of any event that exceeds operating parameters for the annulus pressure or injection pressure specified in the permit;
 - 4) A description of any event that triggers a shut-off device required pursuant to Section 730.188(e) and the response undertaken by the owner or operator;
 - 5) The monthly volume or mass of the carbon dioxide stream injected over the reporting period and the volume injected cumulatively over the life of the project;
 - 6) The monthly annulus fluid volume added; and
 - 7) The results of the monitoring required by Section 730.190.
- b) Report the results within 30 days after completion of any of the following:
- 1) Any results of periodic tests of mechanical integrity;
 - 2) Any well workover; and
 - 3) Results of any other test of the injection well that the owner or operator has conducted as required by the Agency.
- c) Report any of the following events within 24 hours after the event:
- 1) The owner or operator has discovered any evidence that the injected carbon dioxide stream or associated pressure front may cause an endangerment to a USDW;
 - 2) The owner or operator has discovered any noncompliance with a permit condition, or malfunction of the injection system, which may cause fluid migration into or between USDWs;
 - 3) The owner or operator has discovered any triggering of a shut-off system (i.e., down-hole or at the surface);
 - 4) The owner or operator has discovered any failure to maintain mechanical integrity; or
 - 5) The owner or operator has discovered any release of carbon dioxide to the atmosphere or biosphere through surface air or soil gas monitoring or

2059 other monitoring technologies that the Agency has required pursuant to
2060 Section 730.190(h).

2061
2062 d) An owner or operator must notify the Agency in writing 30 days in advance of
2063 any of the following:

2064
2065 1) Any planned well workover;

2066
2067 2) Any planned stimulation activities, other than stimulation for formation
2068 testing conducted pursuant to Section 730.182; and

2069
2070 3) Any other planned test of the injection well conducted by the owner or
2071 operator.

2072
2073 e) In corresponding 40 CFR 146.91(e), USEPA has stated that owners or operators
2074 must submit all required reports, submittals and notifications under this Subpart H
2075 to USEPA in an electronic format approved by USEPA.

2076
2077 f) The owner or operator must retain records as follows:

2078
2079 1) The owner or operator must retain all data collected pursuant to Section
2080 730.182 for Class VI permit applications throughout the life of the
2081 geologic sequestration project and for 10 years following site closure.

2082
2083 2) The owner or operator must retain data on the nature and composition of
2084 all injected fluids collected pursuant to Section 730.190(a) until 10 years
2085 after site closure. The Agency may require the owner or operator to
2086 deliver the records to the Agency at the conclusion of the retention period.

2087
2088 3) The owner or operator must retain monitoring data collected pursuant to
2089 Section 730.190(b) through (i) for 10 years after it is collected.

2090
2091 4) The owner or operator must retain well plugging reports, post-injection
2092 site care data, including, if appropriate, data and information used to
2093 develop the demonstration of the alternative post-injection site care
2094 timeframe, and the site closure report collected pursuant to requirements at
2095 Section 730.193(f) and (h) for 10 years following site closure.

2096
2097 5) The Agency may require the owner or operator to retain any records
2098 required by this Subpart H for a period that is longer than 10 years after
2099 site closure. Any Agency requirement that the owner or operator retain
2100 records for a longer period must be made in writing, the writing must
2101 recite a definite longer period, and the Agency must state the reasons for

2102 the determination to require the longer period. An owner or operator may
2103 appeal any Agency determination made pursuant to this subsection (f)(5)
2104 to the Board pursuant to Section 40 of the Act [415 ILCS 5/40].
2105

2106 BOARD NOTE: This Section corresponds with 40 CFR 146.91, as added at 75 Fed. Reg. 77303
2107 (Dec. 10, 2010).

2108
2109 (Source: Added at 36 Ill. Reg. _____, effective _____)
2110

2111 **Section 730.192 Injection Well Plugging**

- 2112
- 2113 a) Prior to the well plugging, the owner or operator must flush each Class VI
2114 injection well with a buffer fluid, determine bottomhole reservoir pressure and
2115 perform a final external mechanical integrity test.
2116
 - 2117 b) Well plugging plan. The owner or operator of a Class VI injection well must
2118 prepare, maintain and comply with a well plugging plan that is acceptable to the
2119 Agency. The requirement to maintain and implement an approved well plugging
2120 plan is directly enforceable regardless of whether the requirement is a condition of
2121 the permit. The owner or operator must submit the well plugging plan as part of
2122 the permit application, and the well plugging plan must include the following
2123 information:
2124
 - 2125 1) Appropriate tests or measures for determining bottomhole reservoir
2126 pressure;
 - 2127
 - 2128 2) Appropriate testing methods to ensure external mechanical integrity, as
2129 specified in Section 730.189;
 - 2130
 - 2131 3) The type and number of plugs to be used;
 - 2132
 - 2133 4) The placement of each plug, including the elevation of the top and bottom
2134 of each plug;
 - 2135
 - 2136 5) The type, grade and quantity of material to be used in plugging. The
2137 material must be compatible with the carbon dioxide stream; and
2138
 - 2139 6) The method of placement of the plugs.
 - 2140
 - 2141 c) Notice of intent to plug. The owner or operator must notify the Agency in
2142 writing, and USEPA electronically pursuant to Section 730.191(e), at least 60
2143 days before beginning the plugging of a well. The owner or operator must also
2144 provide the revised well plugging plan at the time of this notice if any changes

2145 have been made to the original well plugging plan. The Agency must allow for a
 2146 shorter notice period if the Agency determines that the shorter notice period is
 2147 adequate to complete Agency review of the well plugging plan or that well
 2148 plugging must occur more promptly. The Agency must approve any amendments
 2149 to the injection well plugging plan and incorporate the amendments into the
 2150 permit, and the incorporation of the amendments into the permit is subject to the
 2151 permit modification requirements set forth in 35 Ill. Adm. Code 704.262 or
 2152 704.264, as appropriate.

- 2153
- 2154 d) Plugging report. Within 60 days after plugging, the owner or operator must
 2155 submit a plugging report to the Agency and electronically to USEPA pursuant to
 2156 Section 730.191(e). The plugging report must be certified as accurate by the
 2157 owner or operator and by the person who performed the plugging operation (if
 2158 other than the owner or operator). The owner or operator must retain the well
 2159 plugging report for 10 years following site closure.

2160

2161 BOARD NOTE: This Section corresponds with 40 CFR 146.92, as added at 75 Fed.
 2162 Reg. 77303 (Dec. 10, 2010).

2163

2164 (Source: Added at 36 Ill. Reg. _____, effective _____)

2165

2166 **Section 730.193 Post-Injection Site Care and Site Closure**

- 2167
- 2168 a) The owner or operator of a Class VI injection well must prepare, maintain and
 2169 comply with a plan for post-injection site care and site closure that the Agency
 2170 has determined meets the requirements of subsection (a)(2) of this Section. The
 2171 requirement to maintain and implement an approved plan is directly enforceable,
 2172 regardless of whether the requirement is a condition of the permit.
- 2173
- 2174 1) The owner or operator must submit the post-injection site care and site
 2175 closure plan to the Agency as a part of the permit application.
- 2176
- 2177 2) The post-injection site care and site closure plan must include the
 2178 following information:
- 2179
- 2180 A) The pressure differential between pre-injection and predicted post-
 2181 injection pressures in the injection zones;
- 2182
- 2183 B) The predicted position of the carbon dioxide plume and associated
 2184 pressure front at site closure, as demonstrated in the area of review
 2185 evaluation required by Section 730.184(c)(1);
- 2186

- 2187
2188
2189
2190
2191
2192
2193
2194
2195
2196
2197
2198
2199
2200
2201
2202
2203
2204
2205
2206
2207
2208
2209
2210
2211
2212
2213
2214
2215
2216
2217
2218
2219
2220
2221
2222
2223
2224
2225
2226
2227
2228
2229
- C) A description of the proposed post-injection monitoring location, methods and frequency;
 - D) A proposed schedule for submitting post-injection site care monitoring results to the Agency pursuant to Section 730.191(e); and
 - E) The duration of the post-injection site care timeframe and, if approved by the Agency, the demonstration of the alternative post-injection site care timeframe that ensures non-endangerment of USDWs.
- 3) Upon cessation of injection, the owner or operator of a Class VI injection well must either submit an amended post-injection site care and site closure plan or demonstrate to the Agency through monitoring data and modeling results that no amendment to the plan is needed. The Agency must approve any amendments to the post-injection site care and site closure plan and incorporate the amendments into the permit, and the incorporation of the amendments into the permit is subject to the permit modification requirements set forth in 35 Ill. Adm. Code 704.262 or 704.264, as appropriate.
- 4) 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 Agency approval. The owner or operator must resubmit the plan to the Agency within 30 days after making any modification.
- b) The owner or operator must monitor the site following the cessation of injection to show the position of the carbon dioxide plume and pressure front and demonstrate that no USDW is being endangered.
- 1) Following the cessation of injection, the owner or operator must continue to conduct monitoring as specified in the Agency-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 Agency pursuant to requirements in subsection (c) of this Section, unless he/she makes a demonstration under subsection (b)(2) of this Section. The monitoring must continue until the geologic sequestration project no longer poses an endangerment to USDWs and the demonstration under subsection (b)(2) of this Section is submitted and approved by the Agency.
 - 2) If the Agency determines, based on monitoring and other site-specific data, that the geologic sequestration project no longer poses an

2230 endangerment to any USDW before 50 years or prior to the end of the
 2231 approved alternative timeframe, the Agency must either approve an
 2232 amendment to the post-injection site care and site closure plan to reduce
 2233 the frequency of monitoring or authorize site closure before the end of the
 2234 50-year period or prior to the end of the approved alternative timeframe.

2235
 2236 3) Prior to authorization for site closure, the owner or operator must submit
 2237 to the Agency for review and approval a demonstration, based on
 2238 monitoring and other site-specific data, that no additional monitoring is
 2239 needed to ensure that the geologic sequestration project does not pose an
 2240 endangerment to any USDW.

2241
 2242 4) If the owner or operator cannot make the demonstration required by
 2243 subsection (b)(3) of this Section (i.e., the Agency has determined that
 2244 additional monitoring is needed to ensure that the geologic sequestration
 2245 project does not pose an endangerment to any USDW or the Agency has
 2246 not approved the demonstration) at the end of the 50-year period or at the
 2247 end of the approved alternative timeframe, the owner or operator must
 2248 submit to the Agency a plan to continue post-injection site care until the
 2249 owner or operator has made a demonstration that the Agency can approve.

2250
 2251 c) Demonstration of alternative post-injection site care timeframe. If the Agency
 2252 determines in consultation with USEPA during the permitting process that an
 2253 alternative post-injection site care timeframe other than the 50-year default is
 2254 appropriate and ensures non-endangerment of any USDW, the Agency must
 2255 approve the alternative post-injection site care timeframe. The Agency must base
 2256 its determination on significant, site-specific data and information, including all
 2257 data and information collected pursuant to Sections 730.182 and 730.183, and the
 2258 Agency must determine based on substantial evidence that the geologic
 2259 sequestration project will no longer pose a risk of endangerment to any USDW at
 2260 the end of the alternative post-injection site care timeframe.

2261
 2262 1) A demonstration of an alternative post-injection site care timeframe must
 2263 include consideration and documentation of the following:

2264
 2265 A) The results of computational modeling performed pursuant to
 2266 delineation of the area of review, as required by Section 730.184;

2267
 2268 B) The predicted timeframe for pressure decline within the injection
 2269 zone and any other zones, such that formation fluids may not be
 2270 forced into any USDW, or the timeframe for pressure decline to
 2271 pre-injection pressures;
 2272

- 2273
2274
2275
2276
2277
2278
2279
2280
2281
2282
2283
2284
2285
2286
2287
2288
2289
2290
2291
2292
2293
2294
2295
2296
2297
2298
2299
2300
2301
2302
2303
2304
2305
2306
2307
2308
2309
2310
2311
2312
2313
2314
- C) The predicted rate of carbon dioxide plume migration within the injection zone and the predicted timeframe for the cessation of migration;
 - D) 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;
 - E) The predicted rate of carbon dioxide trapping in the immobile capillary phase, dissolved phase and mineral phase;
 - F) The results of laboratory analyses, research studies or field or site-specific studies to verify the information required in subsections (c)(1)(D) and (c)(1)(E) of this Section;
 - G) A characterization of the confining zones, including a demonstration that each confining zone is free of transmissive faults, fractures and micro-fractures and is of appropriate thickness, permeability and integrity to impede fluid movement (e.g., carbon dioxide, formation fluids, etc.);
 - H) The presence of potential conduits for fluid movement, including planned injection wells and project monitoring wells associated with the proposed geologic sequestration project or any other projects in proximity to the predicted or modeled final extent of the carbon dioxide plume and area of elevated pressure;
 - I) A description of the well construction and an assessment of the quality of plugs of all abandoned wells within the area of review;
 - J) The distance between the injection zone and the nearest USDWs above and below the injection zone; and
 - K) Any additional site-specific factors required by the Agency.
- 2) Information submitted to support the demonstration required by subsection (c)(1) of this Section must meet the following criteria:
- A) All analyses and tests performed to support the demonstration must be accurate and reproducible, and they must have been performed in accordance with the established quality assurance standards;

- 2315 B) Estimation techniques must be appropriate, and USEPA-certified
2316 test protocols must have been used when available;
2317
- 2318 C) Predictive models must be appropriate and tailored to the site
2319 conditions, composition of the carbon dioxide stream, and injection
2320 and site conditions over the life of the geologic sequestration
2321 project;
2322
- 2323 D) Predictive models must be calibrated using existing information
2324 (e.g., at Class I, Class II or Class V experimental technology
2325 injection well sites) when sufficient data are available;
2326
- 2327 E) Reasonably conservative values and modeling assumptions must
2328 be used and disclosed to the Agency whenever values are
2329 estimated on the basis of known historical information instead of
2330 site-specific measurements;
2331
- 2332 F) The owner or operator must perform an analysis to identify and
2333 assess aspects of the alternative post-injection site care timeframe
2334 demonstration that contribute significantly to uncertainty. The
2335 owner or operator must conduct sensitivity analyses to determine
2336 the effect that significant uncertainty may contribute to the
2337 modeling demonstration;
2338
- 2339 G) An approved quality assurance and quality control plan must
2340 address all aspects of the demonstration; and,
2341
- 2342 H) Any additional criteria required by the Agency.
2343
- 2344 d) Notice of intent for site closure. The owner or operator must notify the Agency in
2345 writing at least 120 days before site closure. At the time of this notice, if any
2346 changes have been made to the original post-injection site care and site closure
2347 plan, the owner or operator must also provide the revised plan. The Agency may
2348 allow for a shorter notice period. The Agency must allow for a shorter notice
2349 period if the Agency determines that the shorter notice period is adequate to
2350 complete Agency review of the post-injection site care and site closure plan or
2351 that well closure must occur more promptly.
2352
- 2353 e) After the Agency has authorized site closure, the owner or operator must plug all
2354 monitoring wells in a manner that will not allow movement of injection or
2355 formation fluids that endangers a USDW.
2356

- 2357 f) The owner or operator must submit a site closure report to the Agency within 90
 2358 days after site closure, which must thereafter be retained at a location designated
 2359 by the Agency for at least 10 years. The report must include the following
 2360 records and documentation:
 2361
 2362 1) Documentation of the injection and monitoring well plugging as required
 2363 by Section 730.192 and subsection (e) of this Section. The owner or
 2364 operator must provide a copy of a survey plat that the owner or operator
 2365 has submitted to the local zoning authority designated by the Agency. The
 2366 plat must indicate the location of the injection well relative to permanently
 2367 surveyed benchmarks. The owner or operator must also submit a copy of
 2368 the plat to USEPA Region 5;
 2369
 2370 2) Documentation of appropriate notification and information to all State and
 2371 local authorities that have authority over drilling activities within the area
 2372 of review, to enable those State and local authorities to impose appropriate
 2373 conditions on subsequent drilling activities that may penetrate the
 2374 injection and confining zones; and
 2375
 2376 BOARD NOTE: The Illinois Department of Natural Resources, Office of
 2377 Mines and Minerals, Oil and Gas Division and the Illinois Department of
 2378 Public Health each have some role in regulating well drilling, depending
 2379 on the type of well. Other State agencies may also have a role. Further,
 2380 units of local government and agencies of a sister state may regulate well
 2381 drilling if a portion of the area of review lies within their jurisdiction. The
 2382 owner or operator must assure that all applicable regulatory entities
 2383 receive the required notification and information.
 2384
 2385 3) Records reflecting the nature, composition and volume of the carbon
 2386 dioxide stream.
 2387
 2388 g) Each owner or operator of a Class VI injection well must record a notation on the
 2389 deed to the facility property or any other document that is normally examined
 2390 during title search that will in perpetuity provide the following information to any
 2391 potential purchaser of the property:
 2392
 2393 1) The fact that land has been used to sequester carbon dioxide;
 2394
 2395 2) The name of the county with which the survey plat was filed, as well as
 2396 the addresses of the Agency and USEPA Region 5; and
 2397
 2398 3) The volume of fluid injected, the injection zone or zones into which the
 2399 fluid was injected, and the period over which injection occurred.

2400
2401 h) The owner or operator must retain records collected during the post-injection site
2402 care period for at least 10 years following site closure. The owner or operator
2403 must deliver the records to the Agency at the conclusion of the retention period,
2404 and the records must thereafter be retained at a location designated by the Agency
2405 for that purpose.
2406

2407 BOARD NOTE: This Section corresponds with 40 CFR 146.93, as added at 75 Fed.
2408 Reg. 77303 (Dec. 10, 2010).

2409
2410 (Source: Added at 36 Ill. Reg. _____, effective _____)
2411

2412 **Section 730.194 Emergency and Remedial Response**
2413

2414 a) As part of the permit application, the owner or operator must provide the Agency
2415 with an emergency and remedial response plan that describes actions the owner or
2416 operator must take to address movement of the injection or formation fluids that
2417 may cause an endangerment to a USDW during the construction, operation and
2418 post-injection site care periods of the injection well. The requirement to maintain
2419 and implement an approved emergency and remedial response plan is directly
2420 enforceable regardless of whether the requirement is a condition of the permit.
2421

2422 b) If the owner or operator obtains evidence that the injected carbon dioxide stream
2423 and associated pressure front may cause an endangerment to a USDW, the owner
2424 or operator must undertake the following actions:
2425

2426 1) The owner or operator must immediately cease injection;

2427
2428 2) The owner or operator must take all steps reasonably necessary to identify
2429 and characterize any release;

2430
2431 3) The owner or operator must notify the Agency within 24 hours after
2432 obtaining the evidence; and

2433
2434 4) The owner or operator must implement the emergency and remedial
2435 response plan approved by the Agency.
2436

2437 c) The Agency must allow the operator to resume injection prior to remediation if
2438 the Agency has determined that the injection operation will not endanger any
2439 USDW.
2440

2441 d) The owner or operator must periodically review the emergency and remedial
2442 response plan developed pursuant to subsection (a) of this Section. The owner or

operator must review the emergency and remedial response plan at least once in every five year period. Based on this review, the owner or operator must submit an amended emergency and remedial response plan or demonstrate to the Agency that no amendment to the emergency and remedial response plan is needed. The Agency must approve any amendments to the emergency and remedial response plan and incorporate the amendments into the permit, and the incorporation of the amendments into the permit is subject to the permit modification requirements set forth in 35 Ill. Adm. Code 704.262 or 704.264, as appropriate. The owner or operator must submit any amended plans or demonstrations to the Agency as follows:

- 1) Within one year of an area of review reevaluation;
- 2) Following any significant changes to the facility, such as addition of injection or monitoring wells, on a schedule determined by the Agency; or
- 3) When required by the Agency.

BOARD NOTE: This Section corresponds with 40 CFR 146.94, as added at 75 Fed. Reg. 77303 (Dec. 10, 2010).

(Source: Added at 36 Ill. Reg. _____, effective _____)

Section 730.195 Alternative Class VI Injection Well Depth Requirements

This Section specifies the requirements for application of alternative injection well depth requirements for Class VI injection wells that meet certain criteria. This Section sets forth information that an owner or operator seeking application of alternative Class VI injection well depth requirements must submit to the Agency; the information that the Agency must consider when determining whether any well is suitable for application of alternative injection well depth requirements; the procedure for Agency-USEPA Region 5 communication and Agency determination whether a well is suitable for application of alternative injection well depth requirements; and the additional requirements that apply to an owner or operator of a Class VI injection well that has been granted a permit that includes alternative injection well depth requirements.

- a) When seeking a permit that includes alternative injection well depth requirements to the requirement to inject below the lowermost USDW, the owner or operator must submit a supplemental report concurrent with the permit application. The supplemental report must include the following information:

- 1) The following demonstrations with regard to the injection zones:

- 2486 A) Each is laterally continuous;
 2487
 2488 B) None is a USDW;
 2489
 2490 C) None is hydraulically connected to a USDW;
 2491
 2492 D) None outcrops;
 2493
 2494 E) Each has adequate injectivity, volume and sufficient porosity to
 2495 safely contain the injected carbon dioxide and formation fluids;
 2496 and
 2497
 2498 F) Each has appropriate geochemistry.
 2499
 2500 2) A demonstration that each injection zone is bounded by laterally
 2501 continuous impermeable confining units above and below the injection
 2502 zone that are adequate to prevent fluid movement and pressure buildup
 2503 outside of the injection zone and that the confining units are free of
 2504 transmissive faults and fractures. The report must further characterize the
 2505 regional fracture properties and contain a demonstration that these
 2506 fractures will not interfere with injection, serve as conduits or endanger
 2507 USDWs.
 2508
 2509 3) A demonstration, using computational modeling, that no fluid movement
 2510 will endanger any USDW above or below the injection zone. This
 2511 modeling should be conducted in conjunction with the area of review
 2512 determination required by Section 730.184, and the modeling is subject to
 2513 the area of review delineation and well identification requirements set
 2514 forth in Section 730.184(c) and the periodic reevaluation requirements set
 2515 forth in Section 730.184(e).
 2516
 2517 4) The following demonstrations with regard to well design and construction,
 2518 in conjunction with the alternative injection well depth requirements:
 2519
 2520 A) Well design and construction will ensure isolation of the injectate
 2521 in lieu of the prohibition against movement of fluids set forth in
 2522 730.186(a)(1); and
 2523
 2524 B) Well design and construction will meet the well construction
 2525 requirements set forth in subsection (f) of this Section.
 2526
 2527 5) A description of how the owner or operator will tailor the monitoring and
 2528 testing and any additional plans to the geologic sequestration project to

2529 ensure protection of USDWs above and below each injection zone if the
2530 Agency issues a permit that includes alternative injection well depth
2531 requirements.

2532
2533 6) Information on the location of all the public water supplies that will be
2534 affected, or which are reasonably likely to be affected, by the carbon
2535 sequestration project, and all public water supplies that distribute water
2536 drawn from any USDW in the area of review.

2537
2538 7) Any other information that the Agency determines is necessary to inform
2539 the USEPA Region 5's decision to issue a waiver, as required by
2540 subsection (b) of this Section.

2541
2542 b) To inform the USEPA Region 5's decision on whether to grant a waiver of the
2543 injection depth requirements pursuant to 40 CFR 146.95, which would allow the
2544 Agency to issue a permit that includes alternative injection well depth
2545 requirements, the Agency must submit the following documentation to USEPA
2546 Region 5:

2547
2548 1) An evaluation of the following information as it relates to siting,
2549 construction and operation of a geologic sequestration project under a
2550 permit that includes alternative injection well depth requirements:

2551
2552 A) The integrity of the upper and lower confining units;

2553
2554 B) The suitability of the injection zones (e.g., lateral continuity, lack
2555 of transmissive faults and fractures, known current or planned
2556 artificial penetrations into the injection zones or formations below
2557 the injection zone, etc.);

2558
2559 C) The potential capacity of the geologic formations to sequester
2560 carbon dioxide, accounting for the availability of alternative
2561 injection sites;

2562
2563 D) All other site characterization data, the proposed emergency and
2564 remedial response plan and a demonstration of financial
2565 responsibility;

2566
2567 E) An assessment of community needs, demands and supply from
2568 drinking water resources;

2569
2570 F) An assessment of planned needs and potential or future use of
2571 USDWs and non-USDWs in the area of review;

- 2572
2573
2574
2575
2576
2577
2578
2579
2580
2581
2582
2583
2584
2585
2586
2587
2588
2589
2590
2591
2592
2593
2594
2595
2596
2597
2598
2599
2600
2601
2602
2603
2604
2605
2606
2607
2608
2609
2610
2611
2612
2613
- G) An assessment of planned or permitted water, hydrocarbon or mineral resource exploitation potential of the proposed injection formations and other formations both above and below the injection zone to determine if there are any plans to drill through the formation to access resources in or beneath the proposed injection zones or formations;
 - H) The proposed plan for securing alternative water resources or treating USDW formation waters in the event of contamination related to the Class VI injection well activity; and,
 - I) Any other applicable considerations or information that the Agency determines is necessary to aid a determination by USEPA Region 5 to grant a waiver that would allow the Agency to issue a permit that includes alternative injection well depth requirements.
- 2) Consultation with the Agency's Division of Public Water Supply and all agencies of a sister state that have public water system supervision authority over lands within the area of review of a well for which a waiver that would allow the Agency to issue a permit that includes alternative injection well depth requirements is sought.
- 3) Any written waiver-related information submitted by the Agency's Division of Public Water Supply and all agencies of a sister state that have public water system supervision authority to the Agency.
- c) Pursuant to 35 Ill. Adm. Code 705.163 and concurrent with the Class VI injection well permit application notice process, the Agency must give public notice that the owner or operator has sought a permit that includes alternative injection well depth requirements. The notice must clearly state the following information:
- 1) The depth of the proposed injection zones;
 - 2) The location of the injection wells;
 - 3) The name and depth of each USDW within the area of review;
 - 4) A map of the area of review;
 - 5) The names of any public water supplies that will be affected, or which are reasonably likely to be affected, by the carbon sequestration project, and

2614 all public water supplies that distribute water drawn from any USDW in
2615 the area of review; and

2616
2617 6) The results of consultation with the Agency's Division of Public Water
2618 Supply and all agencies of a sister state that have public water system
2619 supervision authority, as required by subsection (b)(2) of this Section.

2620
2621 d) Following the public notice required by subsection (c) of this Section, the Agency
2622 must provide all information received through the waiver application process to
2623 USEPA Region 5. USEPA has stated in corresponding 40 CFR 146.95(d) that,
2624 based on this information, the USEPA Region 5 must provide written concurrence
2625 or non-concurrence regarding the Agency issuing a permit that includes
2626 alternative injection well depth requirements.

2627
2628 1) If USEPA Region 5 determines that additional information is required to
2629 support a decision, the Agency must provide that information. At its
2630 discretion, USEPA Region 5 may require that public notice of the new
2631 information be initiated.

2632
2633 2) The Agency must not issue a permit that includes alternative injection well
2634 depth requirements without having first received the written concurrence
2635 of USEPA Region 5.

2636
2637 e) USEPA has stated in corresponding 40 CFR 146.95(e) that if the Agency issues a
2638 permit that includes alternative injection well depth requirements, USEPA will
2639 post the following information on its Office of Water website within 30 days after
2640 permit issuance:

2641
2642 1) The depth of the proposed injection zones;

2643
2644 2) The location of the injection wells;

2645
2646 3) The name and depth of all USDWs within the area of review;

2647
2648 4) A map of the area of review;

2649
2650 5) The names of any public water supplies that will be affected, or which are
2651 reasonably likely to be affected, by the carbon sequestration project, and
2652 all public water supplies that distribute water drawn from any USDW in
2653 the area of review; and

2654
2655 6) The date of permit issuance.

2656

- 2657 f) Upon receipt of a permit that includes alternative injection well depth
 2658 requirements for geologic sequestration, the owner or operator of the covered
 2659 Class VI injection well must comply with the following requirements:
 2660
- 2661 1) All requirements of Sections 730.184, 730.185, 730.187, 730.188,
 2662 730.189, 730.191, 730.192 and 730.194;
 2663
- 2664 2) All requirements of Section 730.186, with the following modified
 2665 requirements:
 2666
- 2667 A) The owner or operator must ensure that each Class VI injection
 2668 well operating under the alternative injection well depth
 2669 requirements is constructed and completed to prevent movement of
 2670 fluids into any unauthorized zone that includes a USDW, in lieu of
 2671 the requirements of Section 730.186(a)(1).
 2672
- 2673 B) The casing and cementing program must be designed to prevent
 2674 the movement of fluids into any unauthorized zone that includes a
 2675 USDW, in lieu of the requirements of Section 730.186(b)(1).
 2676
- 2677 C) The surface casing must extend through the base of the nearest
 2678 USDW directly above the injection zone. The surface casing must
 2679 be cemented to the surface. Alternatively, the Agency must
 2680 require that the casing extend through another formation above the
 2681 injection zone and below the nearest USDW above the injection
 2682 zone if the Agency determines that doing so is necessary to prevent
 2683 movement of fluids into a USDW.
 2684
- 2685 3) All requirements of Section 730.190, with the following modified
 2686 requirements:
 2687
- 2688 A) The owner or operator must monitor the groundwater quality,
 2689 geochemical changes and pressure in the first USDWs immediately
 2690 above and below each injection zone; and in any other formation
 2691 that the Agency determines is necessary to detect potential
 2692 movement of fluids into a USDW.
 2693
- 2694 B) The owner or operator must conduct testing and monitoring to
 2695 track the extent of the carbon dioxide plume and the presence or
 2696 absence of elevated pressure (i.e., the pressure front) by using
 2697 direct methods to monitor for pressure changes in the injection
 2698 zones. The owner or operator must use indirect methods (e.g.,
 2699 seismic, electrical, gravity or electromagnetic surveys or down-

2700 hole carbon dioxide detection tools) that the Agency determines
2701 are necessary based on site-specific geology.

2702
2703 4) All requirements of Section 730.193, with the following modified post-
2704 injection site care monitoring requirements:

2705
2706 A) The owner or operator must monitor the groundwater quality,
2707 geochemical changes and pressure in the first USDWs immediately
2708 above and below each injection zone; and in any other formation
2709 that the Agency determines is necessary to detect potential
2710 movement of fluids into a USDW.

2711
2712 B) The owner or operator must conduct testing and monitoring to
2713 track the extent of the carbon dioxide plume and the presence or
2714 absence of elevated pressure (i.e., the pressure front) by using
2715 direct methods in the injection zones. The owner or operator must
2716 use indirect methods (e.g., seismic, electrical, gravity or
2717 electromagnetic surveys or down-hole carbon dioxide detection
2718 tools) that the Agency determines are necessary to detect potential
2719 movement of fluids into a USDW;

2720
2721 5) Any additional requirements that the Agency determines are necessary to
2722 ensure protection of USDWs above and below the injection zones.

2723
2724 BOARD NOTE: This Section corresponds with 40 CFR 146.95, as added at 75 Fed. Reg. 77303
2725 (Dec. 10, 2010). The corresponding federal rule calls the administrative permission to allow a
2726 well to inject at an alternative depth (i.e., above the lowermost USDW) a "waiver". While the
2727 Board has retained the use of "waiver" with regard to USEPA review of alternative depth
2728 requirements, the Board has changed this to some variant of "permit that includes alternative
2729 injection well depth requirements". While the Agency cannot "waive" standards embodied in
2730 Board regulations, the Agency can issue a permit that applies alternative standards that are
2731 contained in the regulations. The Board believes that this rule includes standards sufficient to
2732 guide an Agency permit determination.

2733
2734 (Source: Added at 36 Ill. Reg. _____, effective _____)