

**SUBCHAPTER E: STANDARDS FOR CLASS III WELLS**

**§§331.81 - 331.87**

**Effective December 11, 2014**

**§331.81. Applicability.**

This subchapter establishes criteria and standards that apply to all Class III wells.

Adopted April 2, 1997

Effective April 28, 1997

**§331.82. Construction Requirements.**

(a) Casing and cementing. All new Class III wells, baseline wells, and monitor wells associated with the mining operations shall be cased, cemented from the bottom of the casing to the surface, and capped to prevent the migration of fluids which may cause the pollution of underground sources of drinking water (USDWs) and maintained in that condition throughout the life of the well. In addition, existing wells in areas where there is the potential for contamination and other harmful or foreign matter to enter groundwater through an open well, shall also be cemented to the surface and capped. The casing and cement used in the construction of each well shall be designed for the life expectancy of the well. In determining and specifying casing and cementing requirements, the following factors shall be considered:

- (1) depth to the injection zone;
- (2) injection pressure, external pressure, internal pressure, axial loading, etc.;
- (3) hole size;
- (4) size and grade of all casing strings (wall thickness, diameter, nominal weight, length, joint specification, and construction material);
- (5) corrosiveness of injected fluids and formation fluids;
- (6) lithology of injection and confining zones; and
- (7) type and grade of cement.

(b) Alterations to construction plans. Any proposed changes or alterations to construction plans after permit issuance shall be submitted to the executive director and written approval obtained before incorporating such changes.

(c) Logs and tests. Appropriate logs and other tests shall be conducted during the drilling and construction of all new Class III wells and after an existing well has been repaired. A descriptive report interpreting the results of those logs and tests shall be prepared by a knowledgeable log analyst and submitted to the executive director. The logs and tests appropriate to each type of Class III well shall be determined based on the intended function, depth, construction, and other characteristics of the well, availability of similar data in the area of the drilling site, and the need for additional information that may arise from time to time as the construction of the well progresses.

(1) During the drilling and construction of Class III wells, appropriate deviation checks shall be conducted on holes, where pilot holes and reaming are used, at sufficiently frequent intervals to assure that vertical avenues for fluid migration in the form of diverging holes are not created during drilling.

(2) Mechanical integrity, as described in §331.43 of this title (relating to Mechanical Integrity Standards), shall be demonstrated both following construction of the well, and prior to production or injection. For Class III uranium solution mining wells, a pressure test shall also be conducted each time a tool that could affect mechanical integrity is placed into the well.

(A) Except as provided by subparagraph (B) of this paragraph, the following tests shall be used to evaluate the mechanical integrity of the injection well:

(i) to test for significant leaks under §331.43(a)(1) of this title, monitoring of annulus pressure, or pressure test with liquid or gas, or radioactive tracer survey. For Class III uranium solution mining wells only, a single point resistivity survey in conjunction with a pressure test can be used to detect any leaks in the casing, tubing, or packer; and

(ii) to test for significant fluid movement under §331.43(a)(2) of this title, temperature log, noise log, radioactive tracer survey, cement bond log, oxygen activation log. For Class III uranium solution mining wells only, cement records that demonstrate the absence of significant fluid movement can be used where other tests are not suitable. For Class III wells where the cement records are used to demonstrate the absence of significant fluid movement, the monitoring program prescribed by §331.84 of this title (relating to Monitoring Requirements) shall be designed to verify the absence of significant fluid movement.

(B) The executive director may allow the use of a test to demonstrate mechanical integrity other than those listed in subparagraph (A) of this paragraph with the written approval of the administrator of the United States Environmental Protection Agency (EPA) or his authorized representative. To obtain approval, the executive director shall submit a written request to the EPA administrator,

which shall set forth the proposed test and all technical data supporting its use. The EPA administrator shall approve the request if it will reliably demonstrate the mechanical integrity of wells for which its use is proposed. Any alternate method approved by the EPA administrator shall be published in the Federal Register and may be used unless its use is restricted at the time of approval by the EPA administrator.

(3) Additional logs and tests may be required by the executive director when appropriate.

(d) Construction and testing supervision. All phases of well construction and testing shall be supervised by a person who is knowledgeable and experienced in practical drilling engineering and who is familiar with the special conditions and requirements of injection well construction.

(e) Injection zone characteristics - water bearing formation. Where the injection zone is a water bearing formation, the following information concerning the injection zone shall be determined or calculated:

- (1) fluid pressure;
- (2) temperature;
- (3) fracture pressure;
- (4) other physical and chemical characteristics of the injection zone;
- (5) physical and chemical characteristics of the formation fluids;
- (6) compatibility of injected fluids with formation fluids; and

(7) pre-mining groundwater quality, established in a range table as required under §305.49(a)(10) of this title (relating to Additional Contents of Application for an Injection Well Permit), for a Class III injection well permit authorizing *in situ* mining of uranium.

(f) Injection zone characteristics - non-water bearing formations. Where the injection formation is not a water bearing formation, the fracture pressure shall be determined or calculated.

(g) Monitor well location. Where injection is into a formation which contains water with less than 10,000 milligrams per liter of total dissolved solids, monitoring wells shall be completed into the injection zone and into any USDW above the injection zone which could be affected by the mining operation. These wells shall be located to

detect any excursion of injection fluids, production fluids, process by-products, or formation fluids outside the mining area or zone. If the operation may be affected by subsidence or catastrophic collapse, the monitoring wells shall be located so that they will not be physically affected. Designated monitoring wells shall be installed at least 100 feet inside any permit area boundary, unless excepted by written authorization from the executive director.

(h) Subsidence or catastrophic collapse. Where the injection wells penetrate a USDW in an area subject to subsidence or catastrophic collapse an adequate number of monitor wells shall be completed into the USDW to detect any movement of injected fluids, process by-products or formation fluids into the USDW. The monitor wells shall be located outside the physical influence of the subsidence or catastrophic collapse.

(i) Monitor well criteria. In determining the number, location, construction, and frequency of monitoring of the monitor wells the following criteria shall be considered:

(1) the population relying on the USDW affected or potentially affected by the injection operation;

(2) the proximity of the injection operation to points of withdrawal of drinking water;

(3) the local geology and hydrology;

(4) the operating pressures and whether a negative pressure gradient is being maintained;

(5) the chemistry and volume of the injected fluid, the formation water, and the process by-products; and

(6) the injection well density.

Adopted November 19, 2014

Effective December 11, 2014

### **§331.83. Operating Requirements.**

(a) Injection pressure at the wellhead shall not exceed a maximum, as specified in the permit or commission order, which shall be calculated so as to assure that the pressure in the injection zone during injection does not:

(1) initiate new fractures or propagate existing fractures in the injection zone;

(2) initiate fractures in the confining zone; or

(3) cause the migration of injection or formation fluids into USDWs.

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

Adopted April 2, 1997

Effective April 28, 1997

**§331.84. Monitoring Requirements.**

(a) Injection fluid shall be analyzed for physical and chemical characteristics with sufficient frequency to yield representative data on its characteristics. Whenever the injection fluid is modified to the extent that the analysis is incorrect or incomplete, a new analysis shall be submitted to the executive director.

(b) The injection pressure, the injection volume, and the production volume shall be recorded.

(c) Fluid level when required by permit and the parameters chosen to measure water quality in monitor wells completed in the injection zone shall be monitored twice a month. For a given calendar month, the second sample shall be collected 15 days after the first sample is collected.

(d) Specified wells within 1/4 mile of the injection site shall be monitored at least once every three months to detect any migration from the injection zone into fresh water.

(e) All Class III wells may be monitored on a field or project basis rather than on an individual well basis by manifold monitoring. Manifold monitoring may be used in cases of facilities consisting of more than one injection well operating with a common manifold. Separate monitoring systems for each well are not required, provided the owner/operator demonstrates that manifold monitoring is comparable to individual well monitoring.

(f) Quarterly monitoring of wells required by §331.82(h) of this title (relating to Construction Requirements).

Adopted February 11, 2009

Effective March 12, 2009

**§331.85. Reporting Requirements.**

(a) Annual report. The permittee shall submit annually, by January 31st, a report including:

(1) an updated map of the area of review showing locations of newly constructed or newly discovered wells that penetrate the production zone within the area of review, not included in the technical report accompanying the permit application or in later reports; and

(2) a tabulation of data as required by §331.122(2)(B) of this title (relating to Class III Wells) for wells within the area of review that penetrate the production zone;

(3) For Class III uranium mining permits:

(A) an update of the cost estimate for well closure and groundwater restoration;

(B) an updated mine map;

(C) an updated mining schedule;

(D) an inventory of all injection, production, baseline, and monitor wells; and

(E) a document, signed by the owner or operator, or his or her designated representative, that the inventory of wells required in subparagraph (D) of this paragraph is true and correct to the best of his or her knowledge.

(b) Except for routine monitoring required in §331.84(d) of this title (relating to Monitoring Requirements), results of required monitoring shall be maintained on site and reported to the executive director upon request or as specified in the permit.

(c) Results of mechanical integrity and any other periodic test required by the executive director shall be reported upon request or as specified in the permit.

(d) Monitoring may be reported on a project or field basis rather than on an individual well basis where manifold monitoring is used.

(e) Routine monitoring data required in §331.84(c) and (d) of this title shall be reported at least quarterly to the executive director on a form provided by the executive director and in accordance with the form completion instructions. These reports must be postmarked no later than the tenth day of the following reporting period.

(f) In the event an excursion is verified in a designated monitor well, the permittee shall submit a written remedial action report at least every month to include for each well affected:

(1) an explanation of required and other actions since the verifying analysis was taken. The explanation should include the date on which actions were initiated and completed;

(2) a description of actions to be taken during the following report period;

(3) sample analysis results for control parameters;

(4) permittee's efforts to define the extent and probable cause of the presence of mining solutions in a designated monitor well.

(g) The first report required by subsection (f) of this section shall include a groundwater analysis in the manner required by §331.106(2) of this title (relating to Remedial Action for Excursion). A copy of all reports shall be mailed to the executive director, postmarked within two days of the end of each report period. The first report period shall begin with the day the presence of mining solution in a designated Monitor Well is verified. The permittee shall continue to make remedial action reports until clean-up is accomplished.

(h) Copies of all data required under this section shall be maintained at the permitted facility such that these documents are available for inspection at all times by the executive director.

Adopted February 11, 2009

Effective March 12, 2009

**§331.86. Closure.**

(a) Mine facilities. Within 120 days after acknowledgment of completion of mining activities, or if final restoration of the mine area aquifers is required, upon completion of final restoration, the permittee shall accomplish closure of the mining facilities in accordance with approved plugging and abandonment plans submitted as part of the supplementary technical report. An extension of time limit past 120 days must be approved in writing by the executive director.

(b) Acknowledgment of closure. When closure has been accomplished, the permittee shall notify the executive director. The executive director will conduct a final inspection of the site to certify that closure has been accomplished in accordance with the permit terms. If closure is certified by the executive director, he shall issue written acknowledgment and permit cancellation procedures will be initiated.

Adopted February 11, 2009

Effective March 12, 2009

**§331.87. Methods of Measurement.**

Determination of a physical or chemical parameter in groundwater may be by chemical analysis of a sample or by field measurement by an instrument. Any field measurement of a groundwater parameter using instrumentation must be done using methods and instruments that yield a measurement that is at least equivalent in quality and sensitivity as a measurement determined by chemical analysis.

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Effective March 12, 2009