

**TRANSMITTAL SHEET FOR  
NOTICE OF INTENDED ACTION**

Control 335 Department or Agency Environmental Management  
Rule No. 335-6-8-18  
Rule Title: Class VI Well Construction Requirements

X New          Amend          Repeal          Adopt by Reference

Would the absence of the proposed rule significantly harm or endanger the public health, welfare, or safety?         YES        

Is there a reasonable relationship between the state's police power and the protection of the public health, safety, or welfare?         YES        

Is there another, less restrictive method of regulation available that could adequately protect the public?         NO        

Does the proposed rule have the effect of directly or indirectly increasing the costs of any goods or services involved and, if so, to what degree?         NO        

Is the increase in cost, if any, more harmful to the public than the harm that might result from the absence of the proposed rule?         N/A        

Are all facets of the rulemaking process designed solely for the purpose of, and so they have, as their primary effect, the protection of the public?         YES        

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Does the proposed rule have an economic impact?         NO        

If the proposed rule has an economic impact, the proposed rule is required to be accompanied by a fiscal note prepared in accordance with subsection (f) of section 41-22-23, Code of Alabama 1975.

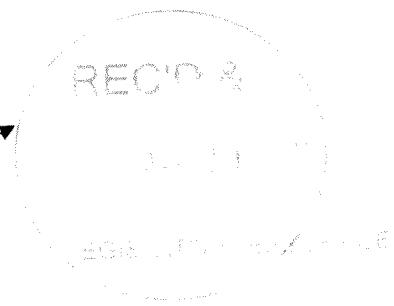
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Certification of Authorized Official

I certify that the attached proposed rule has been proposed in full compliance with the requirements of Chapter 22, Title 41, Code of Alabama 1975, and that it conforms to all applicable filing requirements of the Administrative Procedure Division of the Legislative Reference Service.

Signature of certifying officer Maelys Elliott

Date May 20, 2011

Date Filed



APA-2  
11/96

**ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT  
WATER DIVISION**

**NOTICE OF INTENDED ACTION**

**AGENCY NAME:** Alabama Department of Environmental Management

<b>Rule NO.</b>	<b>Title</b>
335-6-8-.01	Purpose
335-6-8-.02	Definitions
335-6-8-.05	Prohibited Actions
335-6-8-.07	Permit Issuance Procedures
335-6-8-.08	Public Notice Requirements
335-6-8-.10	Class V Well Permit Application Requirements
335-6-8-.12	Class V Well Permit Requirements
335-6-8-.13	Class VI Well Applicability and General Requirements
335-6-8-.14	Class VI Well Permit Application and Application Review Requirements
335-6-8-.15	Class VI Well Minimum Criteria for Siting
335-6-8-.16	Class VI Well Area of Review and Area of Review Corrective Action
335-6-8-.17	Class VI Well Financial Responsibility Requirements
335-6-8-.18	Class VI Well Construction Requirements
335-6-8-.19	Class VI Well Logging, Sampling and Testing Requirements Prior to Injection Well Operation
335-6-8-.20	Class VI Well Operating Requirements
335-6-8-.21	Class VI Well Mechanical Integrity Requirements
335-6-8-.22	Class VI Well Testing and Monitoring Requirements
335-6-8-.23	Class VI Well Reporting Requirements
335-6-8-.24	Class VI Well Plugging Requirements
335-6-8-.25	Class VI Well Post-Injection Site Care and Site Closure Requirements
335-6-8-.26	Class VI Well Emergency and Remedial Response Requirements
335-6-8-.27	Class VI Well Permit Requirements
335-6-8-.28	Technical Submittals and Other Reports to the Department
335-6-8-.29	Coordination with EPA
335-6-8-.30	Confidentiality

**INTENDED ACTION:** Revise Division 6 of the ADEM Administrative Code with the addition or amendment of Rules 335-6-8-.01 (Purpose), 335-6-8-.02 (Definitions), 335-6-8-.05 (Prohibited Actions), 335-6-8-.07 (Permit Issuance Procedures), 335-6-8-.08

(Public Notice), 335-6-8-.10 (Class V Well Permit Application Requirements), 335-6-8-.12 (Permit Issuance Procedures), 335-6-8-.13 (Class VI Well Applicability and General Requirements), 335-6-8-.14 ( Class VI Well Permit Application and Application Review Requirements), 335-6-8-.15 (Class VI Well Minimum Criteria for Siting), 335-6-8-.16 (Area of Review and Area of Review Corrective Action), 335-6-8-.17 (Class VI Well Financial Responsibility Requirements), 335-6-8-.18 (Class VI Well Construction Requirements), 335-6-8-.19 (Class VI Well Logging, Sampling and Testing Requirements Prior to Injection Well Operation), 335-6-8-.20 (Class VI Well Operating Requirements), 335-6-8-.21 (Class VI Well Mechanical Integrity Requirements), 335-6-8-.22 (Class VI Well Testing and Monitoring Requirements), 335-6-8-.23 (Class VI Well Reporting Requirements), 335-6-8-.24 (Class VI Well Plugging Plan), 335-6-8-.25 (Post-Injection Site Care and Site Closure Requirements), 335-6-8-.26 (Class VI Well Emergency and Remedial Response Requirements), 335-6-8-.27 (Class VI Well Permit Requirements), 335-6-8-.28 (Technical Submittals and Other Reports to the Department), 335-6-8-.29 (Coordination with EPA), and 335-6-8-.30 (Confidentiality).

**SUBSTANCE OF PROPOSED ACTION:**

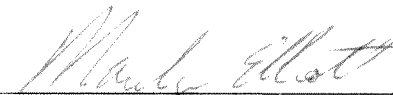
Revisions to the Division 6 Code are being proposed to include requirements for Class VI injection wells, for geologic sequestration of carbon dioxide. The proposed additions and amendments are consistent with the federal regulations for Class VI wells published in the Federal Register on December 10, 2010.

**TIME, PLACE, MANNER OF PRESENTING VIEWS:**

Comments may be submitted in writing or orally at a public hearing to be held 1:00 p.m., July 11, 2011, in the ADEM Hearing Room, 1400 Coliseum Blvd., Montgomery, Alabama 36110.

**FINAL DATE FOR COMMENT AND COMPLETION OF NOTICE:** July 11, 2011

**CONTACT PERSON AT AGENCY:** Sonja Massey (334) 271-7832



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Lance R. LeFleur  
Director

### **335-6-8-.18 Class VI Well Construction Requirements.**

(1) The owner or operator must demonstrate that all Class VI wells are constructed and completed to:

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

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

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

(2) Casing and Cementing of Class VI Wells.

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

1. Depth to the injection zone(s);

2. Injection pressure, external pressure, internal pressure, and axial loading;

3. Hole size;

4. Size and grade of all casing strings (wall thickness, external diameter, nominal weight, length, joint specification, and construction material);

5. Corrosiveness of the carbon dioxide stream and formation fluids;

6. Down-hole temperatures;

7. Lithology of injection and confining zone(s);

8. Type or grade of cement and cement additives; and

9. Quantity, chemical composition, and temperature of the carbon dioxide stream.

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

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

(d) Circulation of cement may be accomplished by staging. The Department may approve an alternative method of cementing in cases where 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.

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

(3) Tubing and packer.

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

(b) All owners or operators of Class VI wells must inject fluids through tubing with a packer set at a depth opposite a cemented interval at the location approved by the Department.

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

1. Depth of setting;
2. Characteristics of the carbon dioxide stream (chemical content, corrosiveness, temperature, and density) and formation fluids;
3. Maximum proposed injection pressure;
4. Maximum proposed annular pressure;
5. Proposed injection rate (intermittent or continuous) and volume and/or mass of the carbon dioxide stream;
6. Size of tubing and casing; and
7. Tubing tensile, burst, and collapse strengths.

**Author:** Sonja Massey.

**Statutory Authority:** Code of Alabama 1975, §§ 22-22-9, 22-22A-5, 22-22A-6, 22-22A-8.

**History:** XXXXXX, 2011.

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**History:** XXXXXX, 2011.