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GOVERNOR

State of Louisiana
DEPARTMENT OF NATURAL RESOURCES
OFFICE OF CONSERVATION

ROBERT D. HARPER
SECRETARY
JAMES H. WELSH
COMMISSIONER OF CONSERVATION

INJECTION AND MINING DIVISION

INTRA-OFFICE GUIDANCE STATEMENT

GUIDANCE NO.: IMD-GS-01 **EFFECTIVE DATE:** February 15, 2001

AMENDMENT NO.: 3 **AMENDMENT EFFECTIVE DATE:** September 1, 2010

PRECEDING GUIDANCE: This document supersedes all previous policies issued before the effective date of this Amendment No. 3 regarding standards for surface casing variances, except as noted herein.

SUBJECT: Single String Casing Completion Requirements for Class II Saltwater Disposal Wells and Enhanced Recovery Injection Wells Completed With Tubing and Packer.

PURPOSE: This guidance establishes standards to apply when considering applications for a variance to the surface casing requirements of LAC 43:XIX.415.B.1.

BACKGROUND:

Statewide Order No. 29-B (LAC 43:XIX.415.B.1) requires a Class II saltwater disposal or enhanced recovery injection well's surface casing be set through the base of the geologic formation containing the deepest underground source of drinking water (USDW) and the casing be cemented back to the surface. A second casing string is then set through the injection or disposal zone and cemented above the zone.

On a case-by-case basis, consideration may be given to an application to convert a well where the surface casing does not extend through the base of the lowermost USDW. Similarly, consideration may be given to a well completed with only a single casing set across the geologic formation containing the lowermost USDW and the disposal or injection zone. In either scenario, the applicant must document cement isolation above the disposal or injection zone.

The applicant must propose a method of well construction and a method of monitoring the well's mechanical integrity that meets or exceeds the requirements put forth in this document if this office is to consider granting a variance to the surface casing requirements.

Injection and Mining Division

Post Office Box 94275 • Baton Rouge, Louisiana 70804-9275 • 617 North 3rd Street • 8th Floor • Baton Rouge, Louisiana 70802
Phone (225) 342-5515 • Fax (225) 342-3094 • www.dnr.state.la.us/conservation
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REVISED GUIDANCE:**I. General Requirements**

A. This guidance applies to all applicants seeking a surface casing variance:

1. to convert a well to Class II saltwater disposal or Class II enhanced recovery injection; or
2. to change the disposal or injection zone in an existing permitted Class II saltwater disposal well or an existing permitted Class II enhanced recovery injection well that was approved for a surface casing variance before the effective date of this Guidance No. IMD-GS-01, Amendment No. 3.

B. The applicant must request a variance to the surface casing requirements. Such request must be in writing as part of the permit application. The application must contain sufficient detail on how the applicant proposes to comply fully with this guidance. It is the responsibility of the applicant to demonstrate that the requested variance will not endanger a USDW.

C. Submitting an application under this guidance does not guarantee this office's approval of the application. This office will consider each application on its own merits given the applicant's ability to comply with those portions of Statewide Order No. 29-B applicable to the particular type of well and the requirements of this guidance.

II. Criteria For Approval

A. Construction Requirements Evidenced by the Applicant

1. At least 100 feet of net clay (shale) exists between the top of the injection or disposal zone and the base of the geologic formation containing the deepest USDW. The electric log of the well for which the variance is sought or the electric log of the closest well will be used to determine compliance with the 100-foot net shale criteria.

2. Isolate the top of the injection or disposal zone with a sufficient interval of cement set across the confining shale formation located immediately above the injection or disposal zone. A cement bond log must verify the presence of cement isolation. **Appendix A of this document shows the minimum interval of bonded casing required to demonstrate cement isolation.**

B. Mechanical Integrity Test Requirements:

1. If the Zone of Endangering Influence (ZEI) is less than the borehole radius, the well's operator-of-record will do:

a. an annual fluid level measurement to document that the ZEI is less than the borehole radius; and

b. an annual mechanical integrity pressure test of the well's tubing-casing annulus witnessed by an agent of the Office of Conservation.

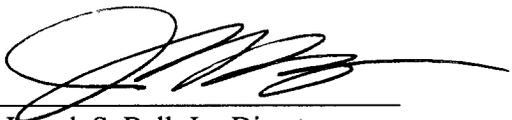
2. If the Zone of Endangering Influence (ZEI) is greater than the borehole radius, the well's operator-of-record will do:

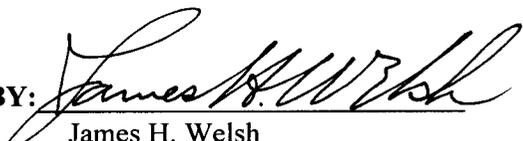
a. an annual mechanical integrity pressure test of the well's tubing-casing annulus witnessed by an agent of the Office of Conservation; and

b. an annual radioactive tracer survey, temperature log, or similar log capable of detecting fluid movement between the well casing and borehole.

III. Exceptions

An operator-of-record of a Class II saltwater disposal or Class II enhanced recovery injection well with a surface casing variance granted under previous policies may continue operating the well under the conditions stipulated in the well's Permit-to-Inject, except as described in Section I.A.2. of this document. In some instances, the office may require operators with a surface casing variance granted under previous policies to conform to the criteria contained in this document if the office deems it necessary to protect the USDW.

APPROVED BY: 
Joseph S. Ball, Jr., Director
Injection & Mining Division

APPROVED BY: 
James H. Welsh
Commissioner of Conservation

**APPENDIX A
CEMENT BOND LOG INTERPRETATION GUIDE
FOR SINGLE CASING STRING / SURFACE CASING VARIANCE
WELL COMPLETIONS**

Casing Size Outer Diameter (inches)	Casing Weight (lb/ft)	Travel Time μ - sec	Free Pipe Signal	Class H – 3000 PSI Cement		Interval for Isolation Across Shale or Clay for Single String Well Completions
				100% cmt	60% bond	
4-1/2	9.5	254	81 mv	0.2 mv	2.3 mv	10 feet
	11.6			0.6 mv	4.6 mv	
	13.5			1.0 mv	7.0 mv	
5	15.0	258	76 mv	0.9 mv	5.5 mv	10 feet
	18.0			2.2 mv	10.0 mv	
	21.0			3.6 mv	15.0 mv	
5-1/2	15.5	269	72 mv	0.7 mv	4.8 mv	12 feet
	17.0			1.0 mv	5.0 mv	
	20.0			2.1 mv	9.0 mv	
	23.0			3.5 mv	13.0 mv	
7	23.0	289	62 mv	1.0 mv	5.5 mv	22 feet
	26.0			1.7 mv	7.5 mv	
	29.0			2.4 mv	9.3 mv	
	32.0			3.3 mv	13.0 mv	
	35.0			4.0 mv	14.0 mv	
	38.0			5.0 mv	15.0 mv	
40.0	6.0 mv	17.0 mv				
7-5/8	26.4	302	59 mv	1.1 mv	5.5 mv	24 feet
	29.7			1.8 mv	7.5 mv	
	33.7			2.6 mv	10.0 mv	
	39.0			3.5 mv	13.0 mv	
9-5/8	40.0	332	51 mv	1.8 mv	6.8 mv	30 feet
	43.5			2.2 mv	8.5 mv	
	47.0			2.7 mv	9.0 mv	
	53.5			4.0 mv	12.0 mv	
10-3/4	40.5	352	48 mv	1.2 mv	5.1 mv	36 feet
	45.5			1.8 mv	6.5 mv	
	48.0			2.1 mv	7.6 mv	
	51.0			2.5 mv	8.0 mv	
	54.0			2.7 mv	8.4 mv	
55.5	2.8 mv	8.8 mv				