

Regulatory Citation(s):

78.83b. Casing and cementing – lost circulation.

(a) If cement used to permanently cement the surface or coal protective casing is not circulated to the surface despite pumping a volume of cement equal to or greater than 120% of the calculated annular space, the operator shall determine the top of the cement, notify the Department, and meet one of the following requirements as approved by the Department.

Question:

In cases where cement returns are not realized for the surface casing, what criteria should be used to determine if drilling can continue or if the operator must plug and skid? Is there a cemented interval length/percentage benchmark that, if not achieved, would classify the cement job as a “catastrophic failure?” What is the appropriate course of action when cement returns are not achieved in terms of additional cementing?

Response:

Once the top of cement is determined, the operator must contact the Department and operations must not proceed until Department approval is granted. To aid the Department in determining an appropriate requirement in Section 78.83b(a), the operator must submit a copy of the well log used to determine top of cement indicating the location of the cement in terms of feet below the ground surface. This may be submitted either in paper or electronically.

If notification takes place on a weekend or after hours, there may be some delay in operations at the well site. It is recommended that operators establish a pre-approved course of action in areas of operation where lost-circulation problems are expected and effective methods for countering these problems have been developed. This course of action should be summarized in the casing and cementing plan, and will help avoid any unnecessary down time on weekends or after normal business hours.

Once information regarding the top of cement is received, the Department inspector or District Office will apply their discretion to decide if the cement sheath is sufficient for long term well integrity. This decision will be based on planned wellbore depths, expected subsurface conditions beyond the surface casing seat – including characteristics of any hydrocarbon-bearing zones likely to be encountered, characteristics of the formation(s) over the portion of the tophole section that is not isolated behind cement, the necessary support for any BOP apparatus that will be mounted on the surface casing string, and other considerations. Additionally, groundwater must be protected through the isolation of freshwater bearing zones from produced fluids or surface infiltration.

To prevent the infiltration of surface liquids, some type of surface seal/wellhead apparatus must be put in place at a minimum. A cement top job is not necessarily the recommended practice for establishing a surface seal, as in the event of casing corrosion/deterioration over the uncemented interval, a direct conduit for produced fluids to enter the zone of fresh groundwater may develop and the ability to vent the annular space or attempt repairs will be limited. Additionally, groundwater may enter the wellbore through corroded sections of casing resulting in additional pressure at the casing seat in circumstances where producing back pressures associated with gas are already causing pressure at the surface casing seat.

One of the options in Section 78.83b.(a)(1)-(5) or some other approved action under Section 78.75 must always be implemented when cement surface returns are not observed.