

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:

All the companies want to know if they can calculate the cement top with the cement displacement pressure to comply with 78.83b.(a)?

Displacement methodology proposed (summarized through discussions with operators):

- Pressure reading is acquired at the wellhead
- Must shut down prior to landing second wiper plug that isolates cement column from chaser water and let pressure stabilize
- Once cement is pumped, a positive pressure will exist at the wellhead
- Cement will be in annular space, and water will be inside surface casing when pressure reading is acquired
- Back pressure on cement head is measured once the column stabilizes – this is essentially a hydrostatic calculation that considers cement density
- Process takes about 5 to 10 minutes (similar to mud balance determination process)

Response:

The Department does not currently view this method as an acceptable means for determining the top of cement in the event of lost circulation. Although there are scenarios where the method could result in an accurate determination of the top of cement, there are also many situations in which the calculation would not be sufficient for achieving this end. The main issue arises as a consequence of multiple fluids occurring in the annular space that are of different densities, e.g., cement and a spacer or gel water. Under such conditions, there are many combinations of cement and the other fluids that could result in the same pressure reading (see chart below). This limits the ability of the operator to accurately estimate the column of cement in the annular space based solely on a pressure measurement.

