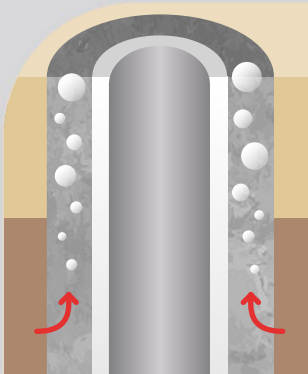
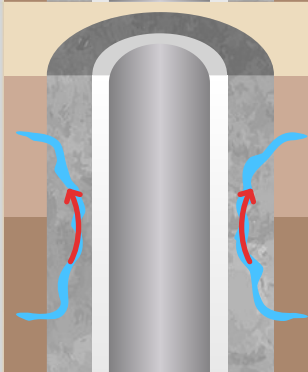


Common Well Cementing Problems, Causes, and Solutions



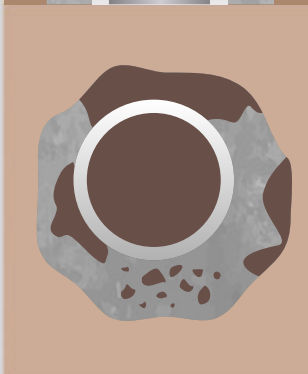
Gas Flow (After Placement)

- ⚠ Gas bubbling at the surface. Abnormal annular casing pressure. Surface casing vent flow (Canada). Gas indications on cement evaluation log.
- 🔍 Path for gas is created during cementing or after cement set. Mud channel or filter cakes. Cement shrinkage or dehydration.
- 💡 Improve mud removal. Evaluate CSGS and CGSP. Use low fluid loss, expanding agents, and self healing agents.



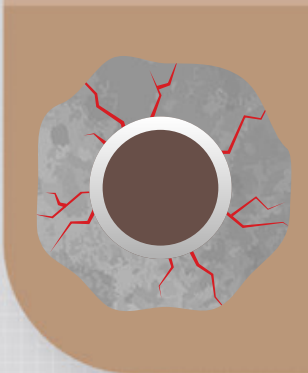
Zonal Communication

- ⚠ Communication between fracture stimulation treatments. Water or gas production from out of zone.
- 🔍 Poor mud removal. Cement failure. Percolation through cement. Casing corrosion.
- 💡 Improve mud removal. Use job evaluation.



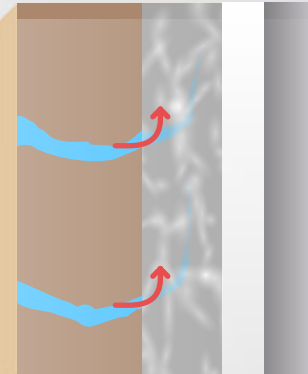
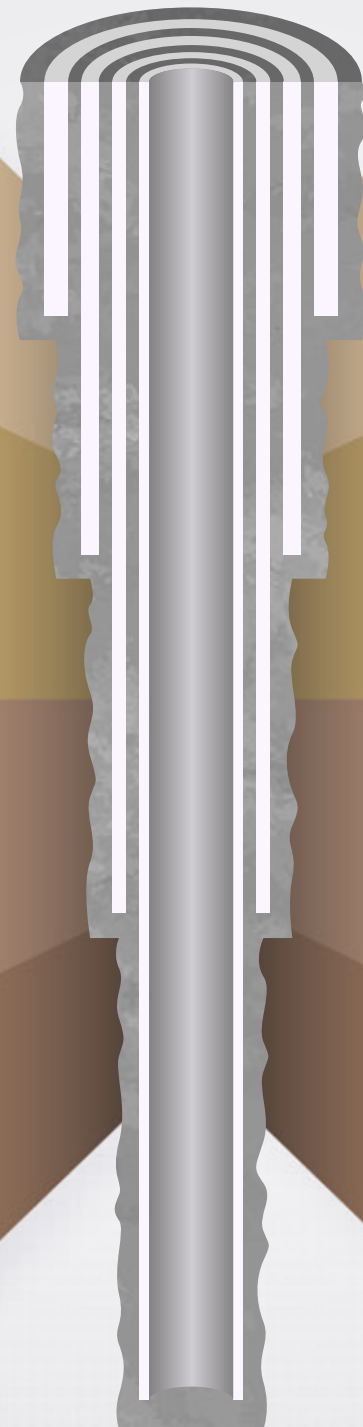
Poor Displacement Efficiency

- ⚠ Unsatisfactory cement bond logs. Gas flow.
- 🔍 Poor casing centralization. Poor job execution. Poor fluid properties (rheology, compatibility, etc.)
- 💡 Rotating or reciprocating pipes. Avoid contaminations.



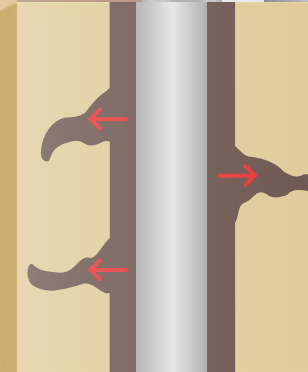
Cement Failure

- ⚠ Leakage pathway is present.
- 🔍 Excessive downhole temperature and pressure. Corrosive formation fluid.
- 💡 Consider flexible and self healing cements. Avoid contaminations.



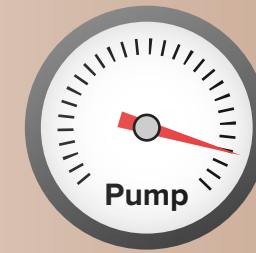
Fluid Influx (During Pumping)

- ⚠ Increase of returned outflow.
- 🔍 Underbalanced annular pressure due to too much water in pre-flush. Loss of circulation.
- 💡 Well Control must be designed. Proper spacer/slurry design. Use managed pressure cementing. Monitor returned outflow.



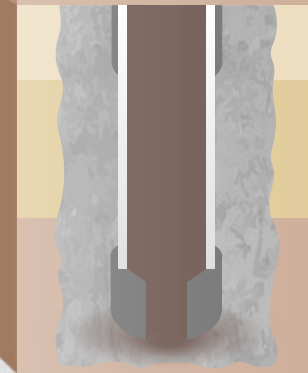
Lost Circulation

- ⚠ Excessive hook load. Loss of returns.
- 🔍 Fractured or highly permeable formations. Induced fractures.
- 💡 Design pump rates to minimize losses. Include LCM material in spacer/cement.



Poor Pumpability

- ⚠ Very high pump pressure.
- 🔍 Flow path blockage. Excessive casing stretch. Early cement setting.
- 💡 Ensure wellbore circulated clean. Plan sufficient rathole. Lab test cement at wellbore temperature and pressure.



Wet Shoe Track

- ⚠ Plug is not bumped. Pressure drops at end of cement displacement. Unable to pressure test casing.
- 🔍 Shoe track is too short. Cement plug not suitable for wellbore condition. Over retardation of cement slurry.
- 💡 Design slurry with accurate BHCT.