

Vent gas source ID using geochemistry

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Summary

Gas vents commonly originate from downhole sources in poorly cemented wells. Gas source identification can help support well integrity and abandonment operations by targeting where isolations and interventions may be most effective to plug leaks that are typically behind casing(s).

Theory / Method / Workflow

Gas molecular and isotopic composition from mud gas profiles and produced gas samples collected are very helpful to interpret SCVF gas source(s). Public data including molecular gas compositions alone can also be helpful to narrow down gas source zones when isotopic data is not available. Non-hydrocarbon gases are also important determine gas source(s).

H₂S gas assessment can also be a key natural tracer to target gas source zones. The workflow we find most useful is to assess sour gas presence or absence using hand held electronic monitors, field gas stain tubes, and if any trace sour gas is observed then a sample is collected to verify H₂S concentration by lab sulfur chemoluminescence detection (SCD).

Results, Observations, Conclusions

Subsurface gas source zone(s) interpretations from geochemistry can then be ranked against Petrophysics (CBL, acoustic, logs), geology (producing zones maps, PPF, H₂S) and regulatory requirements (zonal isolations)

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