

ULTIMATE STRESS IN THE SALT ENVELOPE OF A SEALED LIQUID-FILLED SOLUTION CAVERN

prepared by
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1.0 PROPOSAL SUMMARY

1.1 Background

Serata Geomechanics, Inc. (SGI) is pleased to submit to SMRI this research proposal for the continuation of our previous work in the SMRI project entitled "Ultimate Stress in the Salt Envelope of a Sealed Liquid-Filled Solution Cavern." Phase I of that project analyzed cavern equilibrium and plug stability criteria for an idealized case, identifying the basic mechanisms of cavern deformation. Material property parameters for rock salt, caprock, brine water, and plug cement were calibrated, and the finite element model of the idealized cavern was validated against (1) closure data from laboratory physical models of the cavern; (2) a finite element cavern simulation by Ghaboussi, et al.; and (3) shut-in pressure build-up field data from 5 actual caverns located in Gulf Coast salt domes.