

Progress Report
Solution Mining Research Institute Project
Contract No. 30852-2

The University of Texas
Austin, Texas

June 1, 1972

Analysis of Mixing of Fresh Water and Brine

Mechanism of Solution and Cavity Control -
Annulus or Intermediate Injection

Cavity Shape Calculation for a Midpoint Injection, Bottom
Production Field Well Cavity Development

Mathematical Review - Problems Relating to Salt Solution

Incremental Height Step	Average Radius (feet)		
	Initial	Actual	Final Calculated
1	762	1,225	1,321
2	736	1,237	1,288
3	693	1,243	1,241
4	672	1,240	1,206
5	906	1,327	1,380
6	1,083	1,325	1,355
7	1,075	1,218	1,276
8	1,112	1,118	1,232
9	1,068	1,070	1,167
10	1,096	1,097	1,146
11	1,015	1,016	1,016
12	850	850	850
13	693	693	693
14	553	553	553

The actual final average radius figures correspond to those measured by the sonar survey of October 26, 1971. At that time the following data was found:

Roof elevation	-	3880 ft
Tailpipe setting	-	3940 ft
Tubing setting	-	4006 ft
Bottom of hole	-	4040 ft

Summary

A mathematical model which employs salt removal rates corresponding to the variation in saturation of brine in a cavity, and applied over finite, incremental heights within the cavity has been used to calculate the progression of cavity shape and total volume of salt removal. The

results obtained are in good agreement with actual measured shape and volumes of salt produced. A prediction is made of the shape to be expected after another year's operation if no change is made in pipe positioning and if the rate of injection remains relatively the same.