

SOLUTION SALT MINING IN NEW YORK, WITH EMPHASIS ON OPERATIONAL, REGULATORY AND PLUGGING INNOVATIONS IN THE TULLY VALLEY BRINE FIELD

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ABSTRACT

Five solution mining facilities in New York produce over two billion gallons of saturated brine, or over 1.7 million short tons of salt, per year. Operators of these facilities had drilled 287 wells by the end of 1995. They use the techniques of hydrofracturing, horizontal drilling, and roof padding to develop stable caverns. When caverns become depleted, operators plug the wells in accordance with modern standards and regulations. They had plugged 165 of the 287 drilled wells by the end of 1995. Solution mining has not caused damaging or catastrophic subsidence at any of the five facilities currently active in New York, even though three of the five fields have been in operation since the late 1800's.

Other solution salt miners drilled 264 additional solution mining wells in New York between 1878 and 1985. The Tully Valley brine field in Onondaga County, started by Solvay Process Company in 1888, was the site of 162 of these wells. Solvay Process Company and its successors used techniques such as "simulated horizontal drilling," wild brining, and uncontrolled air padding to create interconnected multi-well caverns with large, unsupported roof spans. Sinkholes and widespread subsidence resulted. No well plugging program was in place until ordered by the State in the late 1980's. The age and condition of the wells in Tully Valley necessitated an innovative approach to well plugging, from both the regulatory and operational perspectives.

Between 1989 and 1995, AlliedSignal Corporation, Solvay Process Company's ultimate successor, plugged 167 wells in Tully Valley. This total includes 158 of the solution mining wells drilled in the valley, along with a hundred-year-old exploratory well, seven coreholes, and a well drilled but never used for fluid disposal. Four solution mining wells and another old exploratory well could not be plugged either because they could not be located or could not be safely accessed. Plugging contractors, company engineers, and an on-site State inspector developed plugging methods in the field as downhole conditions varied from well to well.