

The Ups and Downs of Post-Closure Subsidence Monitoring at the Tully Valley Brine Field, New York

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ABSTRACT

The Solvay Process Company's solution mining operations in Tully Valley, located approximately 18 miles south of Syracuse, New York, commenced in 1888, flourished for one hundred years and resulted in the drilling of 167 wells. Allied Chemical Company and its successor, AlliedSignal, continued operations started by The Solvay Process Company and produced more than one billion gallons of brine annually for the half-century ending in 1986. In 1988, all of the abandoned wells were ordered plugged at the direction of the New York State Department of Environmental Conservation's ("NYSDEC") Division of Mineral Resources.

A formal subsidence monitoring program for the brine field was instituted by Allied Chemical Company in 1959 and continued until 1991. A post-closure subsidence monitoring program, required by the State in conjunction with the well plugging agreement, started in 1993. Results to date have been both unexpected and interesting. Questions persist as to the validity and value of the post-closure monitoring data, requiring a retrospective analysis of the short and long-term objectives and methods of post-closure subsidence monitoring at the Tully Valley brine field.

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INTRODUCTION

Near Syracuse, New York, The Solvay Process Company began using brine as a raw material in its soda ash manufacturing plant in 1884 (Luther, 1896). The company drilled a series of exploratory wells south of Syracuse, ultimately discovering rock salt in Tully Valley in 1888 at a depth of 1,216 feet (Luther, 1896; Phalen, 1923). Thus began the hundred-year operational history of New York's largest solution mining field, with respect to both number of wells drilled and volume of salt withdrawn. Brine produced at Tully Valley was transported to the soda ash plant near Syracuse via a 20-mile long gravity pipeline.

During the century-long life of the field, 1.4 billion cubic feet of salt--enough to fill the Syracuse University Carrier Dome 35 times--were removed. Most activity in Tully Valley took place prior to the implementation in 1973 of legislative amendments that gave the New York State jurisdiction over solution mining wells. Upon abandonment of the Tully Valley brine field in 1988, none of the wells had been