

Solution Mining Research Institute Spring 2010 Technical Conference
Grand Junction, Colorado, USA, 25–28 April 2010

HISTORICAL REVIEW OF EARLY SALT MANUFACTURING FROM NATURAL SALINES IN NEW YORK STATE: IMPLICATIONS FOR PRESENT-DAY CHALLENGES

William M. Goodman
David J. Gnage
Peter H. Smith
RESPEC, Rochester, New York, USA

Abstract

From the inception of the New York salt manufacturing industry in the 1790s until the 1920s, naturally occurring salines provided feedstock for inland manufactories. The most successful saline-based manufactories were located on the Onondaga Salt Springs Reservation because of the high strength of the brines, the shallow depth and productivity of the saline aquifer, and their position on the canal-based transportation system to major markets completed by 1825. Salt producers were also moderately successful at Montezuma in Cayuga County, and some commercial salt production also occurred at Galen in Wayne County. The last two manufacturing districts faded by the mid-1800s, but Onondaga Salt Springs solar salt operations continued for decades after the discovery of bedded rock salt in western New York (1865) and the advent of both manufactured brine salt production (1878) and mechanical rock salt mining (1885) in the state.

The saline springs that provided the feedstock for the early manufactories are localized discharge points for a regionally extensive, shallow subsurface, saline groundwater system beneath the Lake Ontario Plain. Two types of saline waters are present. The springs at Onondaga, Montezuma, and Galen owe their salinity to dissolution of bedded salts of the Silurian Salina Group beneath, and south of, the Onondaga Escarpment. Springs issuing from Silurian Medina Group and Ordovician Queenston Formation strata contain mixtures of more highly evolved basinal brine and meteoric water. Some salt production occurred from the “Medina brines,” but after opening of the Erie Canal, the red-tinted, bitter-tasting product from those manufactories could not compete with the readily available and affordable salt of superior quality produced from the Salina brines.

Most of the Lake Ontario Plain is underlain by low-permeability glacial and bedrock formations (aquitards), but salt production at the Onondaga and Montezuma manufactories relied upon shallow subsurface, high-strength brines drawn from permeable, Quaternary valley-fill or channel sand and gravel deposits that are hydrologically connected to the salt beds in the Salina Group. Other buried valleys beneath the southern portion of the Lake Ontario Plain farther west in New York may also contain highly saline aquifer systems consisting of unconsolidated sediments at their northern limits and leached Salina Group bedrock strata at their southern limits.

The hydrogeology of the saline Lake Ontario Province may be of interest to parties involved either in regulating and operating hydrocarbon storage facilities or in hydrocarbon exploration activities in the Marcellus Shale of New York State and adjacent areas. In light of the dearth of deep bedrock disposal zones for saline fluids in New York, potentially transmissive zones in the southern bedrock portions of the saline aquifer systems on the Lake Ontario Plain warrant further characterization.

Key Words: Montezuma, Onondaga, salines, salt manufacturing history, Salina Group, New York

©2022 – Solution Mining Institute

Full Paper is Available in the SMRI Library(www.solutionmining.org)