

The natural brine salt industry in the Saginaw Bay area operated in connection with the lumber mills. At one time more than 100 lumber mills used waste wood as fuel to evaporate brine to manufacture salt. Unfortunately, as the lumber mills closed, so did the salt blocks. By 1895, with the passing of the lumber industry, the number of Saginaw Bay area salt companies began to decline. The last salt produced from natural brine in Michigan was made in 1943 in Saginaw.

Natural brine has had other uses. Found throughout Michigan at varying depths, some natural brine is still used for ice and dust control on the roadways. Brines from Mt. Clemens, Lansing, and Ypsilanti were once used for “therapeutic mineral baths” in spas.

Rock salt was first found in Michigan by drilling in 1865 in Alpena. An unsuccessful attempt was made to market the rock salt. In Detroit, rock salt is mined underground from a 20 foot thick bed 1,040 feet beneath the city. The Detroit Salt Company produces rock salt for road maintenance.

In 1881 “solution mining” for salt was introduced in Manistee by Charles Rietz. He created an artificial brine by pumping fresh water down one well, into the salt beds, dissolving the salt, and bringing the brine back to the surface through a second well near the first. The brine was then converted to salt by evaporation. Eventually solution mining was used to produce salt in Algonac, Ludington, Manistee, Marine City, St. Clair, Whitehall, and Wyandotte.


Today several companies operate brine processing operations in the state. These include: Cargill Inc.; Dart Oil and Gas Corp.; The Dow Chemical Co.; IMC Potash Hersey, Inc.; Martin Marietta Magnesia Specialties, Inc.; Michigan Chloride Sales Inc.; Michigan Mineral Resources LLC.; and Morton International, Inc. The Detroit Salt Company is the only operating salt mine in the state.

The status of salt has decreased from earlier times, but is interwoven with the history and development of our great state. We hope this has given you some insight into the history, uses, and importance of salt, a Michigan resource.



Mine shaft of the Detroit Salt Company

MI DEQ - Geological Survey Division
525 W. Allegan Street, Lansing, MI 48909-7756
<http://www.michigan.gov/deq>

 Department of Environmental Quality
Russell J. Harding, Director
Environmental Assistance Center 1-800-622-9278

State of Michigan
John Engler, Governor

Printed by authority of part 601 Geological Survey, 1994 PA 451 as amended			
Total number of copies printed:	1000	Total costs:	\$ 570.00
		Cost per copy:	\$ 057

The Michigan Department of Environmental Quality (MDEQ) will not discriminate against any individual or group on the basis of race, sex, religion, age, national origin, color, marital status, disability or political beliefs. Questions or concerns should be directed to the MDEQ Office of Personnel Services, P.O. Box 30473, Lansing, MI 48909.

Salt: a Michigan Resource



Physical Properties

Salt is a naturally occurring mineral that crystallizes into perfect cubes. The mineral name for salt is halite. Halite breaks (or cleaves) into small cubes. Salt is transparent to translucent with colors including; white, gray, blue, purple, pink, or yellow.

Geology

The southern peninsula of Michigan is made of sedimentary rocks that form the Michigan Basin. In a basin, rather than being flat, the sedimentary layers slope toward the center. Various kinds of sedimentary rocks are found in the Michigan Basin; sandstone, shale, coal, limestone, dolomite, salt and anhydrite. Thick, remarkably pure, salt beds were deposited some 350 to 400 million years ago. The maximum recorded thickness of one of the salt beds is over 2,000 feet. Around the edges of the basin some of the original salt deposits have dissolved away over time. In some places they were not deposited.

Halite is one of a sequence of minerals precipitated when seawater evaporates. The sequence starts with the mineral calcite. If evaporation continues, gypsum or anhydrite will form. When 90 percent of the water has evaporated, halite forms. Finally, if more water is removed, potassium and magnesium salts precipitate. When a column of normal seawater 1,000 feet deep is evaporated, it will produce 13.7 feet of halite.

One explanation for the thick salt beds in Michigan is that evaporating conditions came about when high temperatures and low rain fall occurred over a then isolated shallow sea. The growth of reefs in the shallow fringes may have isolated the area from open sea currents. The rate of evaporation must have equaled or exceeded the rate of inflow of sea water. The concentration of dissolved minerals had to remain high enough to cause salt to form on a continuing basis to deposit the thick layers found today.

Not all sea water formed rock salt. Concentrated sea water also was trapped in rocks as natural brines. The concentration of salt and other minerals varies between areas and formations in the State.

History

Native Americans knew about the salt springs in the southern peninsula before European settlers arrived. Early settlers produced salt by evaporating the water from these weak, natural brines.

Most early Michigan settlers relied on salt imported from New York. Salt was very important, for table salt, preserving foods, curing meat, and tanning hides. Salt resources were so important to the State of Michigan that one of the Articles submitted with the Constitution provided that: "at least one section of land (about one square mile), including each spring, shall be granted to the State, to be used or disposed of as the Legislature may direct." The act of Congress admitting Michigan into the Union in 1837 gave authorities the right to select seventy-two sections as state salt lands.

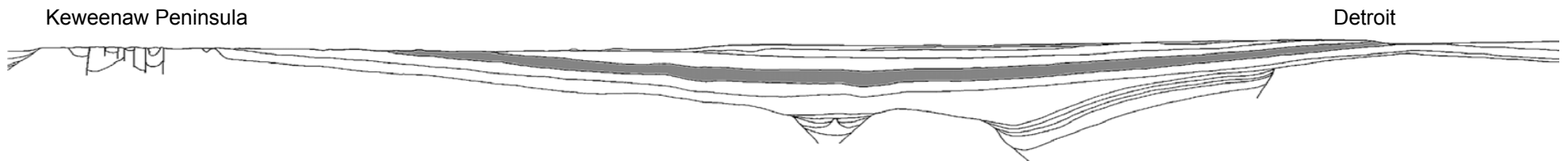
At its first meeting in 1837, the Legislature organized a State Geological Survey and appointed Dr. Douglass Houghton as the first State Geologist. During September of 1837, Houghton set out to investigate the state's salt springs. In June 1838, he began drilling a well in Midland County to produce natural brine to make salt. The well was located a half mile below the mouth of the Salt River, on the west bank of the Tittabawassee River. The well was abandoned when a boulder was struck at 139 feet that prevented deeper drilling.

A second well was begun in July 1838, three miles below Grand Rapids on the Grand River. This well was completed in 1841, at 661 feet. near the Bridge Street Bridge. Some salt was manufactured from this well during the 1840s. The well was later abandoned.

In 1859, the Michigan Legislature passed an Act to encourage the manufacture of salt. All producing salt properties were exempted from taxes. The Act further provided for a bounty of 10¢ per bushel for each bushel manufactured after the first 5,000 bushels.

The salt bounty helped revive the industry. In Grand Rapids, six wells were drilled, and a small amount of salt was produced. The quality of the brine was weak and contained other minerals. As a result, salt manufacturing in Grand Rapids was abandoned.

The natural brine salt industry flourished in the Saginaw area. The East Saginaw Salt Manufacturing Company drilled their first productive brine well on February 7, 1860. The well was 706 feet deep. The treatment and boiling of the brine, in what was known as a salt block, began in June. Soon, other companies began drilling and the industry progressed rapidly. Twenty-three companies were in operation in the Saginaw Valley, by 1862. The salt industry expanded to include Bay, Gratiot, Huron, Iosco, Isabella, and Macomb counties. From 1880 until 1892, Michigan ranked first in the United States in salt production.



A cross section diagram of Michigan from the Keweenaw Peninsula to southeast of Detroit. The salt bearing rocks are shown in gray; all formations contain brine.