Salt Mining in New York:
The Ins and Outs of the Solution Mining Industry and Its Significance

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ABSTRACT

The salt mining industry has prospered in New York State since 1878 when commercial quantities of subsurface rock salt were inadvertently discovered at a well drilled for oil and gas. Both conventional hard rock mining (room and pillar) and solution mining (well injection) methods have been in use continuously for over one hundred years to recover the state's expansive subsurface salt deposits.

The salt industry is important because it provides an essential commodity, and employment either directly or indirectly for thousands of New Yorkers. In 1995, New York salt production ranked first in the United States in value at 185 million dollars and third in tonnage mined at 4.9 million short tons. Conventional mining accounted for 64 percent of salt mined in New York, with solution mining used to recover the remaining 36 percent. The two distinctly different mining methods are used in New York because of the need for unique end products. In 1996 production of salt by the solution mining method will in all likelihood surpass salt output by conventional means, primarily due to Retsof mine closure in September 1995.

INTRODUCTION

The salt mining industry has prospered in New York State since 1878 when commercial quantities of subsurface rock salt were inadvertently discovered at a well drilled for oil and gas. The mining of salt and its ultimate use virtually go unnoticed and unappreciated until an event occurs which triggers a response. The reflex mechanism could be as dramatic as a catastrophic event occurring at a mine or as relatively insignificant as a saltshaker running empty at the dinner table. Salt touches our lives every day in ways and in products beyond imagination.

The collapse of Akzo Nobel's Retsof mine in Livingston County, one of the world's largest underground rock salt mines, in March of 1994 literally sent shock waves throughout New York State. Because of this incident, the New York salt mining industry immediately became the focal point of numerous local, state and federal officials, industry experts worldwide, the international press, and both affected and unaffected citizens of the state. Even though the collapse occurred at a conventional underground salt mine, solution mines and operators "felt" the aftereffects and also attracted increased attention.
Most people outside the salt industry are not aware that salt is mined in New York by two very different methods. Although the two methods have been in use simultaneously for over one hundred years, conventional mining is the most widely known and understood. The “other” salt mining method, solution mining, produces the salt that we eat and use directly or indirectly in thousands of products. Solution-mined salt, unlike conventionally-mined salt, is much more than a seasonal-use product. Solution mining will account for over 50 percent of New York’s salt production in 1996.

THE SALT

It is estimated that 8,500 square miles of New York State are underlain by salt beds of potential commercial thickness (Kreidler, 1957). The location and net thickness of the state's expansive underground salt reserves are shown on Figure 1. The bedded salt deposits found in New York generally are limited in thickness but are laterally unrestricted, while salt dome deposits, typical of the Gulf of Mexico region, are localized but relatively unlimited in vertical thickness.

Figure 1. Location of New York State salt and mines.
Salt can be found within the upper Silurian Salina Group in either the Syracuse or Vernon formations, or both, depending upon the location in the state. The bedded salt of New York varies in thickness and number of beds, and is usually associated with other sedimentary rocks, such as shales, limestones, dolostone, gypsum and anhydrite. The salt strata dip to the south, ranging in depth from 500 feet at the northern edge of the occurrence to 4,000 feet at the New York/Pennsylvania border. Net aggregate thickness reaches over 500 feet in Chemung, Tioga, southern Tompkins and Schuyler and eastern Steuben counties (Sanford, 1996).

THE MINES

There are currently five active solution mining facilities and one active rock salt mine in New York. The relative locations of these mines, including three recently deactivated mines, to the state's salt reserves are also shown on Figure 1.

In 1995, the five operating solution mining facilities were: Akzo Nobel and Cargill, both in Schuyler County; Morton Salt in Wyoming County; and Dale and Wyoming Village also in Wyoming County, both operated by Texas Brine Corporation. The only underground rock salt mine operating for the entire 1995 calendar year was Cargill's Cayuga Salt mine in Tompkins County.

Akzo Nobel's Retsof underground rock salt mine in Livingston County ceased production in September 1995 due to mine collapse and flooding. AlliedSignal's Tully brine field in Onondaga County, begun in 1888 by the Solvay Process Company and once the largest solution salt mining field in the state, ceased operating in 1986. The final closure and plugging of over 150 wells within the Tully brine field were recently completed under the direction of the New York State Department of Environmental Conservation (NYSDEC) Division of Mineral Resources. International Salt's Lansing brine field in Tompkins County last produced brine in 1962 and was plugged in 1988 also under Mineral Resources direction.

MINING METHODS

Solution mining (well injection) and conventional underground mining (room and pillar) methods are in use today to recover the state’s subsurface salt deposits. Both methods have been in use in New York continuously for over one hundred years. Distinctly different salt mining techniques are used because of the need for unique end products. Additional information on why the salt industry requires two different extraction methods to obtain the same mineral is provided in Table 1.

Solution Mining - In solution mining, a liquid is pumped into the ground through a cased borehole to liquefy or dissolve a deposit, which then is pumped to the surface. Solution mining is typically initiated near the bottom of a selected water-soluble evaporite sequence. Subsequent vertical and lateral development of the mined cavern proceeds in stages, governed by local geologic conditions, engineering requirements, and environmental and safety considerations (Richner, 1992). “Solution mining may be used in massive, bedded or pocket-type deposits where . . . the mineral to be recovered is soluble in some type of medium. Minerals recovered (worldwide) with this method are salt, potash, sulfur, copper and uranium” (Morrison, 1973). In New York, salt is the only mineral mined by this technique. In 1969, Aughenbaugh and Pullen stated:
Solution mining has proven to be both an economical and efficient method of mining buried evaporite minerals. Solution mining has many desirable aspects that enhance its use. It overcomes problems of labor and safety of men working underground. The method involves the use of little equipment and is subject to minor maintenance. In addition, solution mining leaves the gangue material in place which eliminates problems of milling and tailings disposal.

In New York State, vacuum pan salt is synonymous with solution-mined salt processed at evaporating plants. "Vacuum pan salt is not mined but is a type of salt produced using mechanical evaporation technology. Although any of the three types of salt may be dissolved to make vacuum pan salt (i.e. rock salt, solar salt, and salt brine), virtually all domestic vacuum pan salt is obtained from solution mining underground salt formations" (Kostick, 1994).

Table 1. Why salt is mined by two different methods.

<table>
<thead>
<tr>
<th>Solution Mining (Brine)</th>
<th>Conventional Mining (Rock Salt)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Impurities in salt are more easily removed from brine and allow production of high-grade salt for food-grade products, chemical, and pharmaceutical manufacturing.</td>
<td>1. Per ton cost of mined rock salt is less than salt produced by energy intensive evaporation of solution mined brine.</td>
</tr>
<tr>
<td>2. Impurities associated with brine production are readily disposed of and returned to their underground origin when reinjected with fluids for additional brine production.</td>
<td>2. Rock salt, primarily used for ice and snow removal from roads, is easily stored and handled by highway service crews and equipment.</td>
</tr>
<tr>
<td>3. When brine undergoes recrystallization by evaporation and additional processing, it forms easily used &quot;uniform and pure&quot; table salt-sized grains to which people are accustomed.</td>
<td>3. Rock salt is more effective and efficient than solution mined salt for ice and snow control.</td>
</tr>
<tr>
<td>4. Brine is easily transported (two 60-mile long pipelines in New York).</td>
<td></td>
</tr>
<tr>
<td>5. Brine is a necessary raw material for chemical manufacturing processes (two plants in New York require brine).</td>
<td></td>
</tr>
</tbody>
</table>

Conventional Mining - All underground rock salt mines in the United States and Canada use the room and pillar method of mining. In room and pillar mining, salt is removed underground in a checkerboard pattern to leave solid salt pillars for roof support. Pillar height is limited by the thickness of the salt and the vertical section that can be economically mined. Salt is usually left unmined in the floor and roof to avoid mining non-salt beds that would contaminate the quality of mined salt. The pillar widths are controlled by the percentage of extraction permissible at the various depths and room widths (Kostick, 1994).
After the salt is dislodged from the ore body by mechanical and explosive means it is picked up and hauled to a combination crus her and feeder. The rock salt discharged from the crus her is conveyed to a series of below-ground crushing and screening stations. The salt is then ready to be hoisted to the surface as required (Morton International, undated).

INDUSTRY REGULATION

The manufacture of salt from the Syracuse salt springs was first regulated and taxed by New York State in 1797. In later years, the state fixed the price of salt derived from the springs and imposed a penalty on violators. Stevens (undated) of the Onondaga County Public Library states:

The Onondaga Salt Springs Reservation was created primarily to prevent the growth of a private salt monopoly and to serve as a revenue producing public works. Overseeing the Reservation was the Salt Springs Superintendent. He and his subordinates, nearly 60 State officials at the peak of the industry, were charged with collecting revenues, distributing brine and erecting wells, pipeline, pumphouses and reservoirs. The chicanery of some pioneer manufacturers, who attempted to sell wet or impure salt, forced the State to assume a regulatory role as well. Laws were created that forced producers to dry their salt for two weeks before packing, and no barrel was allowed to leave the Reservation without being inspected by the State.

State control of salt produced from the Syracuse springs continued until 1908 when the state sold the Salt Reservation lands and pumping equipment (Werner, 1917). Even though the salt manufacturers of today are more conscientious than the early-day manufacturers, perform self-inspections and use a number of mechanical quality control measures, both process equipment and finished product undergo rigorous inspections by major customers, the Institute of Baking, the State Department of Agriculture and Markets, and the federal Food and Drug Administration. In addition, the State Department of Health certifies individual company laboratory testing facilities (Border, 1996).

State environmental regulation of salt produced by solution mining was virtually nonexistent until 1966 and 1972 when the Legislature amended Article 23 of the Environmental Conservation Law and the Department of Environmental Conservation (DEC) updated the oil and gas well regulations in 6NYCRR Parts 550-555 to include solution mining by wells. The Division of Mineral Resources within the DEC currently regulates solution salt mining well drilling, plugging, and operational activities in the state, in conjunction with the federal Underground Injection Control (UIC) program. The Division also regulates underground rock salt mining and the need to clarify the state’s regulatory role of this salt mining method was focused by the Akzo Nobel mine collapse.

In 1981, the state imposed higher drilling fees on oil, gas and solution mining wells which allowed the Division of Mineral Resources to add staff and increase oversight of solution mining operations, although staffing cuts over the past seven years have partially negated the 1981 additions. Field inspections in 1984 revealed significant problems with over 150 century-old solution mining wells at AlliedSignal's Tully brine field located approximately 15 miles south of Syracuse, New York. Thus the early emphasis of the state regulatory program was on enforcement and remediation efforts at this single facility.
Brine production ceased at the Tully field in 1988. Between 1988 and 1995 AlliedSignal plugged 167 Tully wells. This total includes 158 solution mining wells, a hundred-year-old exploratory well, seven coreholes, and a well drilled, but never used, for fluid disposal. During 1995, AlliedSignal also drained and decommissioned a 20-mile-long, century-old pipeline that once conveyed brine from the Tully well field to the soda ash plant in Solvay, New York. Both the well plugging and pipeline closure actions were initiated by the DEC Division of Mineral Resources.

Since 1993 the focus of New York's solution mining regulatory program has been redirected at maintaining an appropriate level of oversight and involvement with active solution mining operations. Division accomplishments have included comprehensive field inspections at each of the state's five active facilities, development of a shut-in well program tailored to the unique needs of the industry, and enhanced annual reporting.

The environmental risks of underground cavern creation—catastrophic ground collapse, surface subsidence and degradation of groundwater quality and quantity—are the same for solution salt mining as for conventional rock salt mining. An effort is currently underway to eliminate regulatory duplication of the federally administered UIC program in areas where the state's program is merely equivalent and not superior, and to strengthen aspects of the state program that are not completely addressed under UIC. The UIC's primary mission is downhole protection of aquifers while the Division of Mineral Resource's role is more comprehensive and extends to prevention of both subsurface and surface impacts. Ensuring stability of solution-mined caverns is at the heart of the state's current regulatory reassessment phase. Therefore, it is important that the regulatory program be implemented by technical staff with the understanding and expertise to balance the industry's needs with the public's right to environmental protection.

INDUSTRY IMPORTANCE AND CURRENT PRODUCTION

"The industry and its basic product have been called unglamourous. But those who know the business disagree. What could be more exciting than the production and distribution of a mineral that is essential to all that man dreams of doing" (Dickinson, 1969)? Salt is valuable because it is an essential commodity for modern living. Salt and its derivatives are used in the manufacture of hundreds of items. The Solvay Process Company's "ALKALI TREE" (1916), included as Figure 2, demonstrates salt's importance as a basic building block for a myriad of items used by mankind daily. In Figure 2, note the position of rock salt (and brine) at the base of the "tree" and the many products that exist because of the founding role salt plays.

Production of salt by both solution and conventional mining methods in New York contributes to the State's economy. Figure 3 shows that:


- The state's five solution mining facilities and two operating rock salt mines in 1995 produced approximately 4.9 million short tons of salt with an estimated value of 185 million dollars (USGS, 1996).
Figure 2. Salt - A basic building block.
In 1995, solution mining accounted for 36 percent of salt mined in New York with conventional mining used to recover the remaining 64 percent. Table 2 lists the principal uses of salt mined at each solution mining facility and conventional mine in New York State.

Table 2. Principal uses of salt mined by operator.

<table>
<thead>
<tr>
<th>Operator</th>
<th>County</th>
<th>Mining Method</th>
<th>Principal Uses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alco Nobel</td>
<td>Livingston</td>
<td>Conventional</td>
<td>Road deicing, agricultural</td>
</tr>
<tr>
<td>Cargill</td>
<td>Tompkins</td>
<td>Conventional</td>
<td>Road deicing</td>
</tr>
<tr>
<td>Alco Nobel</td>
<td>Schuyler</td>
<td>Solution</td>
<td>Table salt, pharmaceutical and chemical manufacturing</td>
</tr>
<tr>
<td>Cargill</td>
<td>Schuyler</td>
<td>Solution</td>
<td>Water conditioning, agricultural</td>
</tr>
<tr>
<td>Morton</td>
<td>Wyoming</td>
<td>Solution</td>
<td>Table salt, water conditioning, chemical manufacturing, agricultural</td>
</tr>
<tr>
<td>Texas Brine</td>
<td>Wyoming</td>
<td>Solution</td>
<td>Caustic and chlorine manufacturing</td>
</tr>
<tr>
<td>Texas Brine</td>
<td>Wyoming</td>
<td>Solution</td>
<td>Caustic and chlorine manufacturing</td>
</tr>
</tbody>
</table>

The Akzo Nobel, Cargill and Morton solution mining well fields supply brine to on-site evaporating plants which each employ 200 to 300 people. All food-grade salt produced in New York, including common table salt, is extracted through solution mining and processed and packaged at these evaporating plants. In 1983, Dickinson of the Salt Institute stated:
There is really no satisfactory substitute for many of its uses in food processing. The iodization of salt more than 55 years ago was a major contributor to goiter prevention. Salt is used as a seasoning for everything from pretzels to caviar. There is a variety of food grade products in addition to regular table salt, and these include “Kosher” salt, smoked salt, pretzel salt, popcorn salt, flour salt and pickling or canning salt. Human beings need both sodium and chloride in their daily diet.

“In addition to home seasoning, salt is used in food service, water conditioning, agriculture, highway ice control and industry. Few would guess that salt is involved with products as diverse as aspirin, automobiles, bar soap, ballpoint pens, writing paper, cotton shirts, wool sweaters, leather shoes and even synthetic leather apparel” (Morton International, undated). Morton International’s publication entitled “Salt, Today and Yesterday” states it has been estimated that salt has 14,000 specific industrial applications, some of which are included in List 1.

List 1. Industrial applications of salt.

**SALT - SODIUM CHLORIDE**

**DIRECT APPLICATIONS**

<table>
<thead>
<tr>
<th>Drug and Pharmaceutical</th>
<th>Household, Personal Care Products</th>
<th>Dyes, Paper, Plastics, Textiles</th>
<th>Metallurgy</th>
<th>Food Processing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Blood dialysis</td>
<td>Bowl, oven cleaners</td>
<td>Dye stuff manufacture</td>
<td>Aluminum foil etching</td>
<td>General seasoning</td>
</tr>
<tr>
<td>IV solutions, drug dispensers</td>
<td>Dry bleach</td>
<td>Dye carrier, diluent</td>
<td>Aluminum flux</td>
<td>Flavoring for salted snacks</td>
</tr>
<tr>
<td>Eye rinses</td>
<td>Facial lotion</td>
<td>Cotton, wool dyeing</td>
<td>Electrolytic machining</td>
<td>Preservative</td>
</tr>
<tr>
<td>Hormone, antibiotic manufacture</td>
<td>Laundry, dishwashing detergents</td>
<td>Pigment grinding</td>
<td>Electronic circuits</td>
<td>Processing aid</td>
</tr>
<tr>
<td>Surgical cauterizing</td>
<td>Shampoos, rinses, conditioners</td>
<td>Paper grinding</td>
<td>Solder flux</td>
<td>Shellfish shucking</td>
</tr>
<tr>
<td></td>
<td>Water softener compounds</td>
<td>Dry bleach</td>
<td>Steel descaling</td>
<td>Freezing/Refrigeration</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Plastics, develop porosity</td>
<td>Ore processing</td>
<td></td>
</tr>
</tbody>
</table>

**INDIRECT APPLICATIONS**

<table>
<thead>
<tr>
<th>Soda Ash</th>
<th>Sodium</th>
<th>Sodium Sulfate</th>
<th>Hydrogen</th>
<th>Hydrochloric Acid</th>
<th>Chlorine</th>
<th>Caustic Soda</th>
</tr>
</thead>
<tbody>
<tr>
<td>abrasives</td>
<td>bactericides</td>
<td>ceramics</td>
<td>alcohol</td>
<td>adhesives</td>
<td>bleaches</td>
<td>adhesives</td>
</tr>
<tr>
<td>adhesives</td>
<td>cosmetics</td>
<td>detergents</td>
<td>ammonia</td>
<td>ceramics</td>
<td>cleaners</td>
<td>batteries</td>
</tr>
<tr>
<td>ceramics</td>
<td>dyes</td>
<td>dyes</td>
<td>cooking fats</td>
<td>dyes</td>
<td>disinfectants</td>
<td>ceramics</td>
</tr>
<tr>
<td>cosmetics</td>
<td>heat transfer</td>
<td>explosives</td>
<td>hydrochloric acid</td>
<td>links</td>
<td>dyes</td>
<td></td>
</tr>
<tr>
<td>degreasers</td>
<td>ore refining</td>
<td>fertilizers</td>
<td>metallurgy</td>
<td>explosives</td>
<td>explosives</td>
<td>electronics</td>
</tr>
<tr>
<td>dyes</td>
<td>organic synthases</td>
<td>paper</td>
<td>petroleum</td>
<td>fertilizers</td>
<td>paper</td>
<td>plastics</td>
</tr>
<tr>
<td>explosives</td>
<td>paints</td>
<td>pharmaceuticals</td>
<td>products</td>
<td>rubber</td>
<td>plastic</td>
<td>rubber</td>
</tr>
<tr>
<td>fertilizers</td>
<td>photography</td>
<td>rubber</td>
<td>printing</td>
<td>synthetic fibers</td>
<td>rubber</td>
<td>rubber</td>
</tr>
<tr>
<td>insecticides</td>
<td>pulp bleaching</td>
<td>soap</td>
<td>textiles</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>paint removers</td>
<td>textile bleaching</td>
<td>textiles</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>textiles</td>
<td>water softeners</td>
<td></td>
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</tbody>
</table>

ADAPTED FROM MORTON INTERNATIONAL “SALT, TODAY AND YESTERDAY”
Two additional well fields in Wyoming county, operated by Texas Brine, supply brine to off-site chemical manufacturing plants, which employ over 250 people each. The chemical industry is the largest consumer of brine in the world. Approximately 93 percent of the brine production in the United States is for chemical uses (Kostick, 1994). In New York at Texas Brine’s two well fields and at the Akzo Nobel, Cargill and Morton solution mining facilities over one billion gallons of brine production, or over 50 percent of total solution mining production, is dedicated toward chemical manufacturing or the manufacture of chemical-grade salt. All five solution mining fields operate 24 hours per day, and rely on uninterrupted flow of brine from wells regulated by the Division of Mineral Resources.

Conventionally mined rock salt from Cargill’s Cayuga mine in Tompkins County, which directly employs approximately 175 people, is primarily used for highway deicing and snow removal. Commerce and public transportation in the Northeast would literally freeze in a standstill without the benefits of salt during the winter months. “Traffic demands have been responsible for a large increase in salt use in the last two decades. The advent of the U.S. Interstate system, urban sprawl and our general mobile society have created the demand for June driving conditions in January throughout the snowbelt” (Dickinson, 1983).

HISTORICAL SOLUTION MINING PRODUCTION AND ACTIVITY

Many people are not aware of the important role that solution salt mining plays in New York’s overall production of salt. Graphical data detailing production and activity of the salt mining industry in New York since 1984 are presented in Figures 4 and 5. The 1984 calendar year is the first complete reporting year in Mineral Resources’ files for solution salt mining operators. Figure 4 represents total state salt production by solution and conventional methods for the 1984 through 1995 time period, and details the important contribution of solution mining wells by showing that:

- Since 1984, solution mining has accounted for at least 25 percent to a maximum of 41 percent of New York’s total annual salt production.

The significant drop in solution mining production from 1985 to 1986 is highlighted in Figure 4, when AlliedSignal ceased solution mining production at the Tully brine field, thereby removing approximately one million short tons of salt annually from solution mining and statewide industry totals. Since Tully shutdown, annual solution mining production has rebounded approximately 25 percent.

Figure 5 shows solution mining well activity in the state as reported to the Division of Mineral Resources for 1984 through 1995. The highlights of this graph are:

- The number of active solution mining wells has increased 35 percent since 1984.
- The number of active wells in 1994 and 1995 was greater than inactive wells for the first and second times respectively since 1984 (primarily due to plugging work at Tully).
Figure 4. New York State salt production (USGS, NYSOGS, NYSDEC, 1996).

Figure 5. Solution mining well activity (NYSDEC, 1996).

FUTURE OF SOLUTION MINING

In 1996 New York production of salt mined by the solution mining method will in all likelihood surpass salt output by conventional means, primarily due to the closure of Akzo Nobel's Retsof mine in September 1995. As previously mentioned, it is predicted that in 1996 over 50 percent of the state's salt production will come from brine fields. It is unknown how the recent announcement of Cargill's proposed acquisition of the salt production, processing and marketing assents of Akzo Nobel will ultimately affect the
New York salt industry. The tentative agreement does not include the abandoned Retsof mine or assets related to the canceled mine replacement project. Still more wild cards in the future of the New York salt industry are the planned construction of a major solution mining facility and evaporating plant just across the state border in Pennsylvania and a potential evaporating plant at the Avoca (New York) natural gas storage project discussed below.

In general, installation of newly drilled solution mining wells to further develop salt reserves at the state's five existing solution mining facilities is anticipated. This forecast is based on the operators' inescapable need to replace depleted wells, and several multi-well proposals currently undergoing review by the Division of Mineral Resources. The solution mining facility operators in New York use state-of-the-art mining techniques including horizontal drilling and oil padding to maximize total salt recovery at each well without endangering the environment.

There has been increasing interest in natural gas storage in salt caverns in New York, in both existing solution mined caverns and caverns to be created specifically for gas storage. Salt caverns provide high deliverability peak storage capacity which is of great interest to local distribution companies under Federal Energy Regulatory Commission Order 636. Furthermore, New York is uniquely positioned geographically at the gateway to major northeastern markets for natural gas. The Avoca natural gas storage facility in Steuben County, also permitted under Division of Mineral Resources regulatory authority, is under construction in virgin underground bedded salt at a depth of 3,500 feet. Brine generated from leaching of the caverns at the Avoca project was to be disposed of into deep injection wells, but poor injectivity has stalled the project. Alternative brine disposal methods or uses are being evaluated and an on-site evaporation plant is just one of the options under consideration. At the same time, in Schuyler County, New York State Electric and Gas is converting to natural gas storage an existing cavern originally solution-mined for the manufacture of food-grade salt.

Informal inquiries are occasionally received about the feasibility of using solution-mined salt caverns for disposal of various forms of waste. It is reasonable to anticipate that formal proposals to adapt solution mining technology for this purpose will someday be made in New York State. Division of Mineral Resources staff will use their understanding of solution mining operations to assist in the rigorous environmental review to which any such proposal would undoubtedly be subjected.
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