



## Salt of the Earth

Grab your hard hats and prepare to go underground as I share my fascinating experience in the Ojibway Mine, operated by The Canadian Salt Company, where they mine 2.3 million tonnes of halite, also known as rock salt, per year from beneath the Detroit River in the southwest corner of the City of Windsor! This is Canada's most southerly underground mine which operates touching the international boundary, under a river and within sight of 70 office towers.



Before voyaging underground I had to be well equipped. I was outfitted with coveralls, gloves, safety goggles, a hard hat and a headlamp. The main entrance to the mine, known as the headframe, is where I caught the "elevator" or shaft down—deep down! The Ojibway Mine extracts salt from the Earth 295 metres below the surface. The halite samples found in your PDACMM kit were collected from this location far underground.

Stepping out into the salt mine was like discovering an entirely new world. Many of the tunnels were dark and cavernous, lit only by truck lights or a few bulbs along the sides. When illuminated I realized I was completely surrounded by rock salt—the floor, ceiling and walls were glistening white. The glittering tunnels of salt were about 6.5 metres high and about 12 metres wide. This gigantic salt mine has 800 kilometres of roads underground!



There are several steps to mining salt at the Ojibway Mine. First miners use a giant chainsaw to cut deep 4-metre slots into the top and bottom of the face. The face, made entirely of salt, is the end of a tunnel where mining takes place. Small holes about 4 metres deep are drilled into the face in a grid-like pattern. The holes are then packed with explosives and are set off. Each blast of the face creates 600 tonnes of broken salt! After the chunks of salt are removed, huge rooms separated by pillars of salt are created. This method requires that about half of the salt be left behind as pillars of support. This is known as a room-and-pillar method of mining. The blasted salt is removed by a fleet of load-haul-dump machines, which move it to crushing machines. The crushed salt is conveyed by a belt to a shaft where it is loaded into 12-tonne skips that carry the salt to the surface.

Not a pinch of this salt goes on your dinner table! This mined material is sold as rock salt which is used primarily for de-icing roads.

### **Where does your table salt come from?**

Salt used in household and food products is mined using a very different method. Fresh water is injected through a pipe into shafts that end in the salt beds deep underground. Salty water, called brine, is made as the salt dissolves into the water. The brine is pumped back to the surface so that all the water can be evaporated in order to recrystallize the salt.

### **Ontario's ancient salty sea**

It's hard to believe that Ontario was once in the tropics, but approximately 415 to 420 million years ago the process of plate tectonics had moved Ontario near the equator. A huge continental sea covered the region. This sea became isolated from the ocean and because of the hot, dry climate the seawater started to rapidly evaporate. The amount of salt in the water increased so much that solid salt began to form. This whole process was repeated several times resulting in the accumulation of several layers of rock salt. There are four distinct layers of salt that exist underground in Ontario. The total combined thickness of these units exceeds 215 metres!

### **Pass the salt**

Salt is more than just the white, granular seasoning that enhances the flavour of so many foods. Salt is one of the most widely used minerals on Earth. It's a natural preservative that inhibits the growth of bacteria, and is an essential element in our diet. It helps regulate our blood pressure and volume, facilitates the transmission of nerve impulses, and plays a vital role in heart and muscle contractions. We use salt to clear our roadways and stabilize our roadbeds and to maintain the conditioning systems that soften hard water. We make textiles and chemicals with it. Everything from aspirin to bars of soap to leather shoes! In a single year, Canadians can use more than ten million tonnes of salt. In fact, it's estimated there are more than 14,000 uses for this marvellous compound!

## **Create your own salt crystals**

### **Materials**

200 grams of table salt  
1 piece of string 15 cm long  
1 paper clip or metal washer  
1 sheet of aluminum foil, 30 cm x 30 cm  
1 large plastic cup

Hot tap water  
1 plastic spoon  
1 roll of masking tape  
1 marker  
1 magnifying glass

### **Instructions**

1. Fill the plastic cup about half full with hot tap water.
2. Begin stirring in spoonfuls of table salt until you can dissolve no more (usually about 6 to 8 spoons).
3. Use a piece of masking tape and the marking pen to label the cup "halite".
4. Tie the paper clip or washer to the end of the string.
5. Wet the string and rub some table salt on it.
6. Take a piece of aluminum foil and poke a small hole in the middle.
7. Thread the free end of the salted string through the hole in the foil and then cover the cup with the foil.
8. Pull up on the string so that the paper clip or washer is just touching the bottom of the cup.
9. Secure the free end of the string to the top of the cup with a piece of tape.
10. Place the cup in a safe location away from direct sunlight or heat. Visible crystals should start to develop on the string in about a week.
11. Use the magnifying glass to see the size of the crystals after one week, but your crystals will continue to grow for two or three weeks.