



## Exploring Gypsum Underground

By Julia Taylor

*Each year, two university students and several high school students are hired for the summer months, to assist with the coordination of unit production. PDACMM benefits from these employees through a work-share program with the Ontario Ministry of Northern Development and Mines (MNDM), while providing valuable work experience in the fields of Earth Science, education, and customer service. I hope you enjoy this article by Julia Taylor, one of our 2004 summer students.*

I love my job! Last year I had no idea that there were any underground mines in Southern Ontario, let alone four. As a summer student working for **Mining Matters** and MNDM, I had the fantastic opportunity of going to the CGC Inc. gypsum mine and wallboard plant at Hagersville, Ontario for a tour. CGC Inc. is one of the many in-kind contributors who provide PDACMM with rock and mineral samples and other resources for their educational kits.



It turns out that gypsum has been mined in Ontario since 1923. Paris, Ontario was named after the gypsum beds found there, which were mined and manufactured into "Plaster of Paris". CGC Inc. started production at Hagersville in the early 1930's.

The gypsum bed that is mined by CGC Inc. at Hagersville was deposited approximately 420 million years ago. At that time, what is southern Ontario today was covered in a warm saltwater sea and was located just south of the equator. Gypsum forms as an evaporite. When the salty water evaporated, it precipitated its dissolved minerals as evaporites. The bed of gypsum mined at Hagersville likely formed in a coastal salina, which is a salt marsh or pond enclosed from the sea.

The bed of gypsum ranges in thickness from 0.8 to 1.2 metres and is about 30 metres below the surface. As well as one vertical access shaft (mine elevator), the mine is reached by a decline (ramp) that allows ore to be brought out on a continuous conveyor. The techniques they use to mine the gypsum are similar to those used in coal mining. A room and pillar mining method is used, so that pillars can act as roof supports. Since the mine is only 1.2 metres high at the working face, all the machines have to be specially adapted to work in that small space. To begin with, a series of small diameter holes is drilled three metres into the face area and filled with explosives. After the explosives have been blasted and the dust has

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settled, a special mucker comes in to gather up the broken rock. Instead of scooping up the gypsum, the mucker has gyrating arms on a low ramp that sweep the rock into its belly. Then, a small conveyor moves it back to a haulage vehicle, which in turn drives the rock over to the feeder-breaker/crusher. After the rock is crushed it moves on a six-kilometre-long conveyor to the surface where it is stockpiled for later use in the wallboard plant.

Originally mined and ground up for agricultural use as a soil conditioner, gypsum is now mainly used to make wallboard, plaster products, as a cement additive, and as chalkboard chalk. CGC Inc. uses a blend of naturally mined gypsum and synthetic gypsum to make over 30 different drywall products. These are distributed under the well known brand name Sheetrock. The products you buy at The Home Depot could have been gypsum in the ground just a few days before.

Why is gypsum used in wallboard? Gypsum is:

- A fire retardant (since gypsum is a hydrous mineral, a fire must boil the water within the wallboard before it can spread further, slowing the fire's rate of spread)
- Lightweight
- Relatively inexpensive

CGC Inc.'s commitment to the environment and stewardship is obvious through every step of the wallboard manufacturing process. The wallboard plant in Hagersville has been recycling waste gypsum board for more than 25 years. The paper used in the fabrication of new wallboard is 100% recycled. Synthetic gypsum is obtained from a process called flue gas desulphurization that uses scrubbers to reduce sulphide emissions from coal fired power plants. This process provides the environmental benefit of reducing acid rain, while eliminating the need to dispose of synthetic gypsum in landfills.

I really enjoyed my tour of the mine. I was impressed with the care CGC Inc. takes to protect the people and property above their mine, which is not something most northern Ontario mines need to worry about. Many thanks to CGC Inc. and everyone else who contributes to PDACMM, for making the teachers' kits and my job possible!