

Minerals in Alberta

Facts and Stats

Facts on minerals

Quick facts

- Buildings, eyeglasses, computers, automobiles, wind turbines, solar panels and hospital equipment are some of the many things that can be made with minerals.
- Alberta has one metal refinery/smelter located in Fort Saskatchewan, Alberta, that produces nickel and cobalt.
- In 2017, 696 troy ounces of gold were collected from gravel pits in Alberta worth \$1.13 million. The Edmonton river valley was dredged for gold in the late 1800s. Today recreational placer miners scour the North Saskatchewan river for flour gold along the river's edge.
- Mineral development in Alberta in 2017 was focused mainly on lithium potential. Lithium-ion batteries are used for energy storage in products like cell phones, implanted medical devices and electric cars.

The past

Archeological evidence suggests that in North America, minerals such as copper and silver were mined and traded by Indigenous peoples over 7,000 years ago, long before Europeans arrived in North America. Expeditions led by early explorers in Canada often included mineral exploration work. Coal and building stone were the first minerals mined in large quantities in Alberta.

The present

There are 21 industrial mineral operations active in Alberta including producers of limestone, salt, shale, and other building stone. Alberta also hosts placer mining for gold and mining operations for coal and ammonite shell. Salt in Alberta is recovered by solution mining. Water is pumped down wells to dissolve the salt and the resulting salt brine is pumped to the surface. Sand and gravel is mined for construction, fill and cement manufacturing. Some sand and gravel is washed for placer minerals, such as gold and platinum, before use.

The future

Alberta's transportation and utilities infrastructure, along with northern areas already opened up for oil and gas exploration, are favourable for mineral exploration and development. Potential exists for iron, diamonds, lead, zinc and copper in northern Alberta, lithium in southern, central and northwestern Alberta, and uranium in northeast and southern Alberta. Companies are also exploring for potash, rare earth elements, and gold.

The Alberta Geological Survey provides free web-based interactive maps which display geological and mineral resource data within the province. The Alberta Interactive Minerals Map can be found at:

aqs.aer.ca/data-maps-models/interactive-maps.

Alberta's minerals

Ammonite

Ammonites (below) are extinct members of the cephalopod class, which today includes nautilus, squid, octopus and cuttlefish. The coloured fossilized shell of the ammonite, of special significance to Indigenous peoples, generated interest among Alberta mineral collectors in the 1970s and an industry soon developed to produce ammonite shell jewelry.

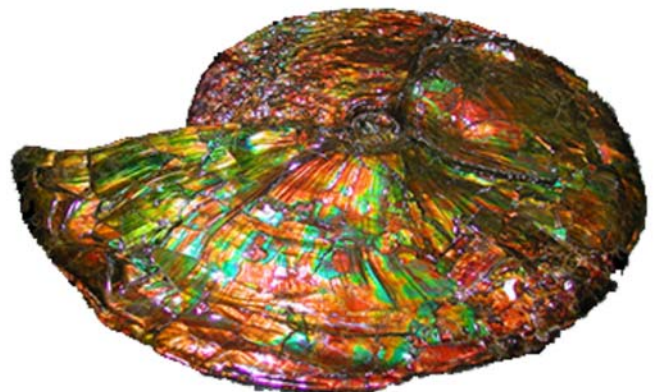


Photo courtesy of: Royal Tyrrell Museum

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Gold

Gold is an extremely malleable bright yellow metal that is extracted from ores and hardened by being combined in alloys with silver or copper. It is used in coins, jewelry and dentistry, and gold compounds are used in photography and medicine. In Alberta, gold is almost always found as tiny particles mixed with streambed deposits of sand and gravel; these deposits are called placers. Prospectors have been mining and searching for placer gold in the river systems of north-central Alberta since the mid-1800s.

Salt

A residue of ancient seas covering parts of Alberta at various times, salt is produced in significant quantities from four brining operations in northern and central Alberta. While salt is probably best known for table salt and road salt, most salt produced in Alberta is used for chemical production and in the pulp industry.

Building stone

Limestone

Limestone (calcium carbonate) is quarried at 10 operations across Alberta. It is used in a wide range of products, from cement to fertilizer. Other uses for limestone include use in oil sands operations, as an aggregate for road construction, and in landscaping.

Silica sand

Silica has many industrial uses including glass, paint filler, and plastics. High purity silica sand is in high demand for use in hydraulic fracturing. Athabasca Minerals, a mineral exploration company, is developing a major silica sand project north of Fort McMurray.

Sand and gravel and other aggregate

The last glaciers deposited much of Alberta's sand and gravel, which is mainly used in cement making and as construction aggregate for roads, buildings and other large structures. Gravels such as "Alberta rainbow rock" are also used for decorative purposes in landscaping, while clay and shale are used to make bricks and other ceramic products.

Mineral potential

Iron and vanadium

Iron is used to make steel. Vanadium is used to make steel less corrosive and is also used to make rechargeable batteries. An iron-vanadium project in northwest Alberta is being evaluated for its iron and steelmaking potential.

Diamonds

Diamonds are a hard, compact, and natural crystalline form of carbon, colourless when pure but sometimes coloured by traces of impurities. Diamonds are generally found in rock formations called kimberlites. In Alberta, 55 kimberlitic pipes have been discovered in three areas of northern Alberta: Mountain Lake, Buffalo Head Hills, and Birch Mountains. One of the world's hardest-known substances, diamonds are used for cutting tools and drill bits, and as decorative gemstones.

Lithium

In Alberta, lithium is found in wastewater generated during oil and gas production. Companies are evaluating the possibility of producing lithium compounds from the wastewater.

Uranium

Exploration for uranium has focused in northeast Alberta in the uranium-rich Athabasca Basin.

For additional information on Alberta's minerals:

<http://www.energy.alberta.ca/coal/920.asp>