

FOSSIL FUELS

Fossil Fuels

Oil, Natural Gas, Oil Shale, Coal

Many people think of fossil fuels as the gasoline we use to power our vehicles or the furnace oil we use to heat our homes, but fossil fuels are also used for petroleum by-products in plastics, cosmetics, and medicines.

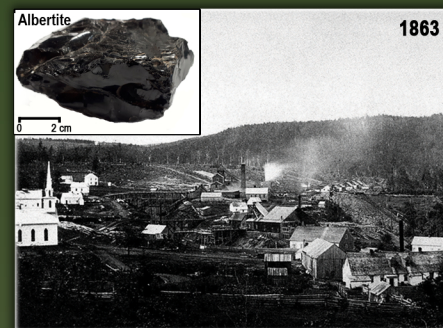
How Do Fossil Fuels Form?

Fossil fuels form in the subsurface as organic matter made up of the remnants of simple algae or bacteria and more complex plants, like ferns and trees, decomposes. The process begins as life forms are deeply buried in the sediments of river beds, swamps, lakes, and oceans. Over several million years, the decomposing life forms change into two types of organic matter — kerogen and coal. The types of fossil fuels produced depend on the type of original organic matter and the degree of heating the organic matter experiences during burial. For example, oil shales are rocks that contain abundant kerogen and have experienced modest elevations in temperature. As temperature increases, kerogen breaks down and expels crude oil, and, eventually, natural gas. Coal forms in swamps and remains solid through a considerable range of temperatures and depths.

In rare cases, crude oil expelled from kerogen migrates into cracks in rocks and forms veins of solid residue called bitumen. Found in southeastern New Brunswick at Albert Mines, black glassy bitumen there is called Albertite. In New Brunswick, coal, oil, and natural gas are associated with two rock formations that were deposited during the Carboniferous Period (c. 300 – 360 Ma). Seams of coal form part of the Minto Formation in young (Pennsylvanian) rocks of the central platform of New Brunswick, around Grand Lake and near Canaan and Coal Branch along Hwy 126. Oil and natural gas are associated with older (Mississippian) rocks of the Albert Formation in Westmorland and Albert counties, and subsurface in Kings County, around Sussex and Penobsquis.



McCully Field Natural Gas Plant



Albertite Mining Facility at Albert Mines

Interesting Facts:

- The first reported shipment of coal from Canada left Grand Lake, New Brunswick for Boston, Massachusetts in 1639.
- During the late 1800s, albertite-derived kerosene replaced whale oil used in lamps.
- A petroleum borehole drilled in 1859 at Saint-Joseph, New Brunswick was one of the world's first oil wells.
- Until a temporary closure in 1991, the Stoney Creek Field near Moncton, New Brunswick was the second-oldest producer of oil and natural gas in Canada.

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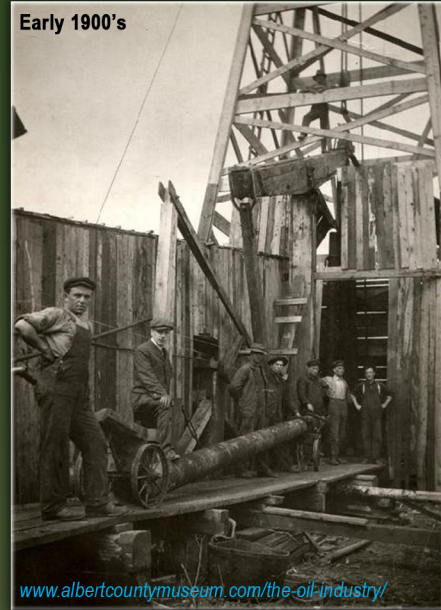
New Brunswick's Fossil Fuels - Then and Now

In the 1600s around Grand Lake, coal was mined from open pits and shipments were sent to Boston. These activities were the first commercial coal mining operations in North America. Large scale operations commenced in the mid-1800s and by the time the mines closed in 2010, some 37 million tonnes had been extracted (the last few decades, the coal was only mined to fuel the generating plant at Grand Lake).

North America's first petroleum operation was located around Albert Mines where oil shale and albertite were mined from the Albert Formation for use as kerosene or lamp oil. From the 1840s until the 1890s, approximately 155,000 tonnes of Albertite was extracted. The last oil shale/albertite mine, which was located at Rosevale, closed in 1925.

Liquid oil and natural gas were first located in New Brunswick, around 1859, by exploration drilling in the Albert Formation near Dover, Westmorland County, and, until 1904, over 90 exploration wells were drilled around the Petitcodiac estuary near Weldon, Dover, and Memramcook. About 10,000 barrels of oil were extracted. The Stoney Creek oil and natural gas field was discovered in 1903, and extraction commenced in 1909 with a brief period of no production during the 1990s. To date, this field has produced about 800,000 barrels of oil and 30 billion cubic feet (Bcf) of gas.

Fossil fuel exploration continued fitfully in New Brunswick during the 20th century until a natural gas field was discovered at McCully, near Sussex, in 2000. Also located in sandstone of the Albert Formation, and situated over 2 km below the surface, this field has so far produced about 60 Bcf of natural gas, all of which was fed into the Maritimes and Northeast pipeline for distribution to New Brunswick and Nova Scotia and the states of Maine, New Hampshire, and Massachusetts.



Early 1900's
Cable tool drill rig at the Stoney Creek Field



1970's
Coal extraction near Minto