

Mineral Production in 2020 and Exploration in 2021



Atlantic Mining NS, Inc. Gold Mine, Middle Musquodobit, Halifax County.

Report ME 2022-001

Mineral Management Division



Natural Resources and Renewables

Halifax, Nova Scotia

April 2022

Note

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Nova Scotia Department of Natural Resources and Renewables

Honourable Tory Rushton
Minister

Karen M. Gatien
Deputy Minister

Message from the Director of Mineral Management

This Mineral Production and Exploration Report highlights recent activities of the exploration and mining industry in Nova Scotia. The report includes the 2021 exploration statistics and the mineral production information for 2020. The report also includes a summary of reclamation activities completed within the year and reclamation security amounts from operating mines. The information was developed in cooperation with industry, and the data was provided by each of the companies surveyed. I would like to thank Nova Scotia's exploration and mining industry for its cooperation in the preparation of this report.

As a part of the highly competitive, global environment for mineral investment dollars, Nova Scotia is attuned to the challenges faced by the mining industry. The Mineral Management Division of the Nova Scotia Department of Natural Resources and Renewables is positioning the province to compete successfully for investment dollars within this global context by providing clear and effective laws and policies that support sustainable mineral resource development.

The mineral industry in Nova Scotia maintained a high level of exploration activity in 2021 that included progress in both grassroots exploration and advanced exploration projects. Exploration staking activity in the province decreased by 14 percent in terms of claims under license, but exploration expenditures increased, estimated at \$50.3 million.

The gold sector continues to lead the trend with the largest commodity value from mine production. Gold shipments increased by 20 percent in 2020 supported by the continued robust price of gold. As well, a number of gold companies continued to advance their gold exploration projects toward commercial production. The gypsum sector experienced a slight increase with output while the coal sector experienced a 50 percent reduction due to lower coal prices and challenging geological conditions. The salt producers experienced a slight decline in salt shipments and limestone producers seen an increased in shipments by 10 percent.

Employment levels at active mine sites exceeded 700 employees in 2020. Approximately 40 per cent of the employees in Nova Scotia's mineral industry work in the gold sector. Royalties collected in 2020 from producing mine sites totalled \$3.3 million.

If you are interested in building a better future through sustainable mineral resource development and would like additional information, I invite you to contact us at GMB@novascotia.ca.



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2021 Exploration Highlights

Mineral claim-staking activity in Nova Scotia was subdued with a 14 per cent decrease in 2021 relative to 2020, with the total number of claims under license decreasing to 35 886 from 41 798 in the previous year (Figure 1). Notably, with the proclamation of the new *Mineral Resources Act* in 2018, exploration licenses issued or renewed after December 18, 2018 are for two-year terms.

Field expenditures by the mineral exploration industry in 2021 are estimated at \$50.3 million, a level that is increased due to make-up of reduced work in 2020 attributed to the pandemic. Overall, this is consistent with expenditures of \$26.3 million in 2020, and \$37.9 million in 2019.

There were 203 companies and individuals holding exploration interests (licenses or options) in the province in 2021, including 2 major, 10 junior, and 61 private companies, as well as 130 individuals. In addition, several mineral lease holders carried out exploration and development work on their leased areas and exploration work for commodities that do not require staking (e.g., gypsum). Entities actively engaged in exploration during 2021 included 1 major, 8 junior and 24 private companies, as well as over 40 individuals.

Figure 2 shows the locations of exploration licenses and mineral leases within the province.

For an up-to-the-minute view of the number and distribution of mineral exploration licenses in the province, the reader is referred to <https://novaroc.novascotia.ca>, where the map button can be used to bring up a map showing the current mineral rights held throughout the province.

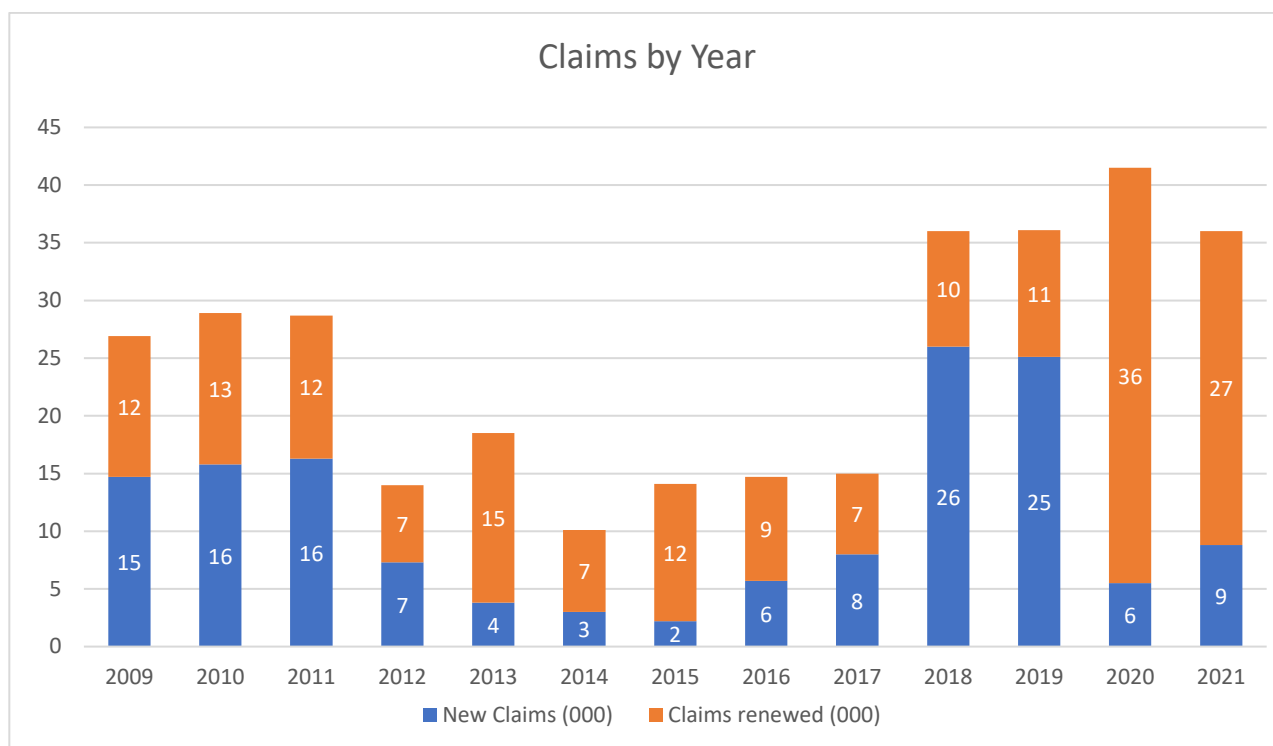


Figure 1. Number of claims under license by year, 2009 – 2021.

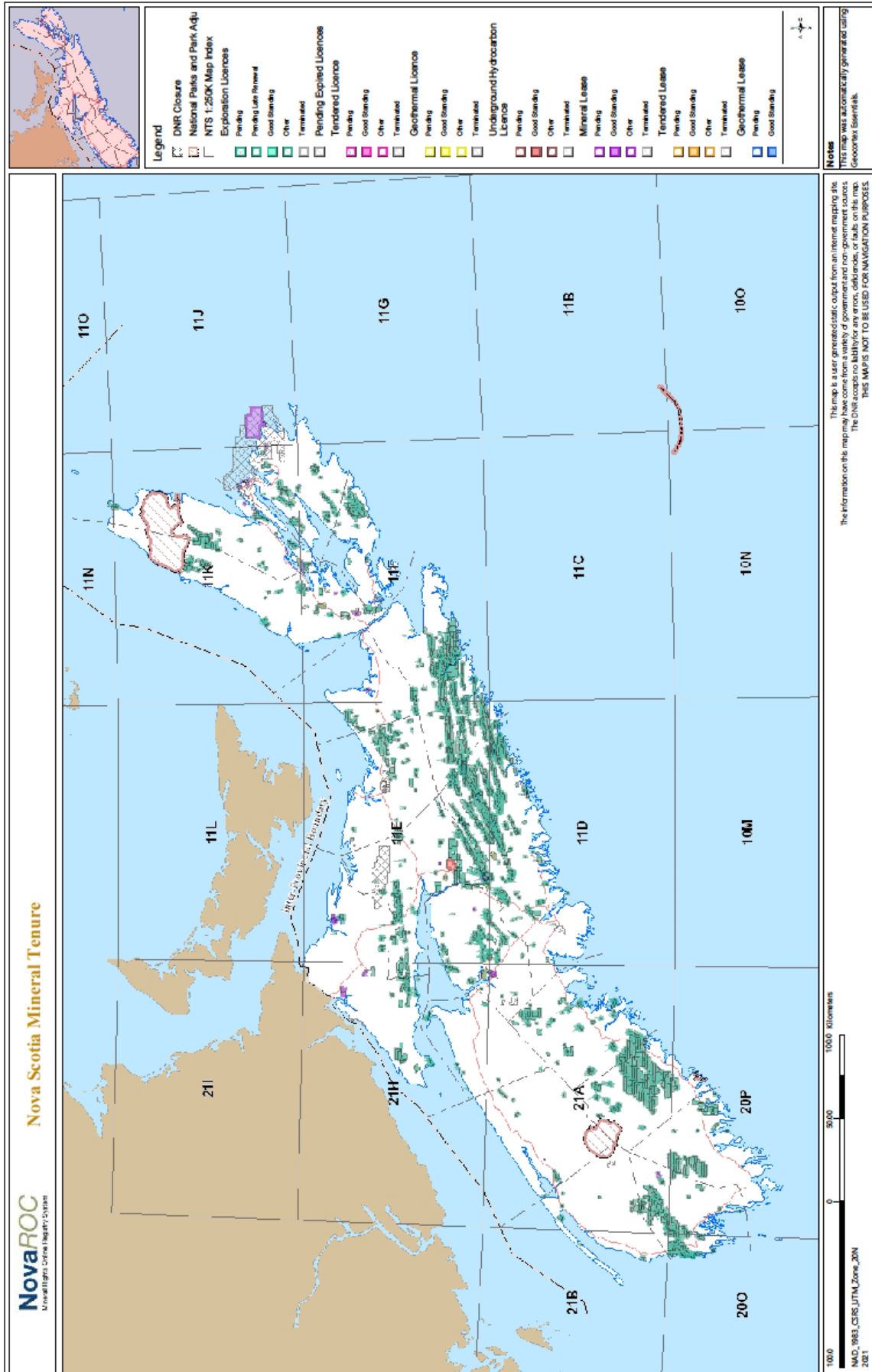


Figure 2. Mineral exploration activities in 2021.

2020 Production Highlights

There were thirteen producing mines in Nova Scotia in 2020 (Figure 3), which operated under the authority of the *Mineral Resources Act*. In addition, six operations were under care and maintenance, awaiting improved market conditions to restart production.

In 2020, the market value of the province’s mineral production was \$340 million. This is the largest annual market value of mineral production within the province and represents an increase from the previous record high of \$327 million in 2018. The year’s increase was largely the result of a favorable gold price and renewed growth in the gypsum sector.

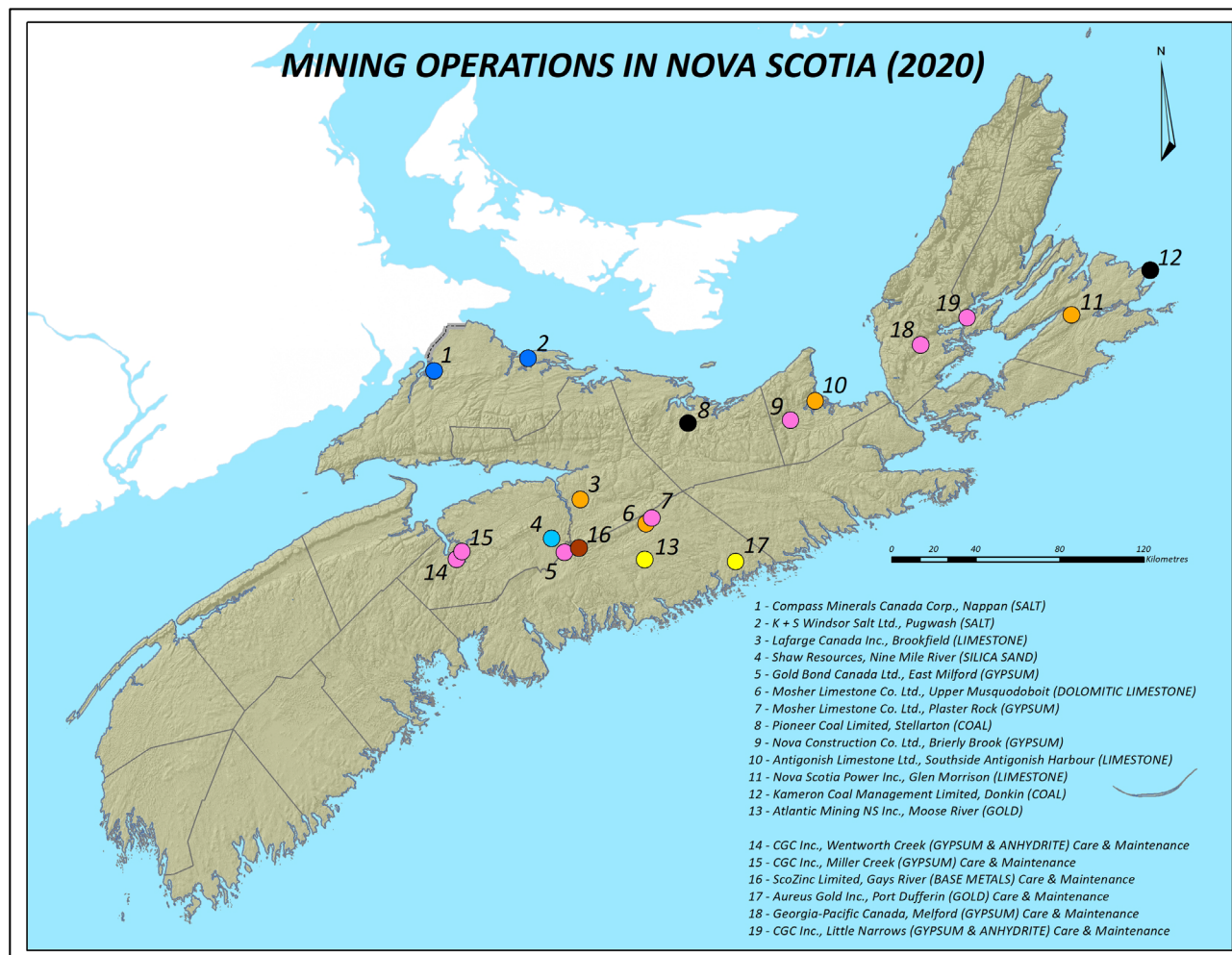


Figure 3. Active and care and maintenance mine sites.

Table 1. Nova Scotia mineral production in 2020*.

Commodity	Production (Tonnes**)	Market Value***	Percentage of Total Market Value
Coal	356 068	\$ 19,907,000	5.8%
Gold (ounces)	112 266	\$ 213,169,000	62.6%
Gypsum	2 495 063	\$ 28,419,000	8.3%
Limestone	484 443	\$ 5,641,000	1.7%
Salt	819 490	\$ 72,602,000	21.3%
Silica Sand	14 562	\$ 969,000	0.3%
Total Mineral Production		\$ 340,707,000	100.0%

* Note that construction aggregates data are not included in Table 1

** Tonnes shipped, except gold (ounces)

*** Market value of shipped products

Salt

Two operating salt mines in Nova Scotia produced 819 490 tonnes of salt during 2020. There were 165 334 tonnes (-16.8%) less salt produced than in 2019. Salt accounted for \$72.6 million (21.3%) of the total value of Nova Scotia’s mineral production (Figure 4; Table 1). Since 1980, production has averaged roughly one million tonnes per year. A portion of annual production levels is directly related to the severity of winter weather in the region and fluctuating demands for the de-icing of roads.

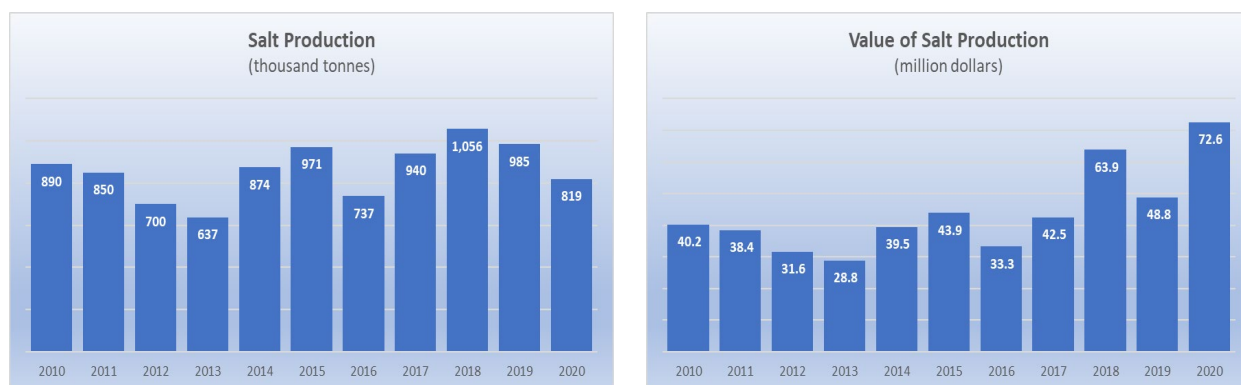


Figure 4. Salt production and market value of shipped salt and salt products.

Pugwash, Cumberland County

The Pugwash underground salt mine has been in continuous production since 1959. It is operated by K+S Windsor Salt Ltd. Salt is extracted by room-and-pillar mining. It is undercut, drilled and blasted, then transported by trucks and conveyor belts to the production shaft, where it is hoisted to surface.

The mine produced 780 148 tonnes of finished product in the form of bulk and packaged salt during 2020 and shipped 703 801 tonnes. Finished rock salt was distributed throughout eastern Canada via ships and trucks. Most of the finished product was sold in Atlantic Canada for de-icing roads.

Nappan, Cumberland County

The solution salt mine in Nappan has been in operation since 1947. It is operated by Compass Minerals Canada Corp. Wells are drilled into the salt formations, and water is used to create caverns and dissolve the salt, creating a brine solution. The brine is brought to the surface and sent through a processing plant, which evaporates the water and produces high-purity salt.

In 2020, the plant shipped 115 689 tonnes of salt. About half of the salt produced is for use in the food processing industry and for domestic consumption as table salt. The plant also produces and packages salt for other purposes, such as water conditioning, agriculture, and de-icing. Salt is shipped in bulk and packaged form to markets in eastern Canada, northeastern United States, and the Caribbean.



Figure 5. Nappan Solution Mine, Cumberland County.

Gold

There was one gold mine in production in 2020, located in Halifax County. The Touquoy project is an open pit mine at Moose River Gold Mines.

A total of 112 266 ounces of gold was shipped in 2020, representing \$213.2 million (62.6%) of the total value of Nova Scotia’s mineral production (Figure 6; Table 1).

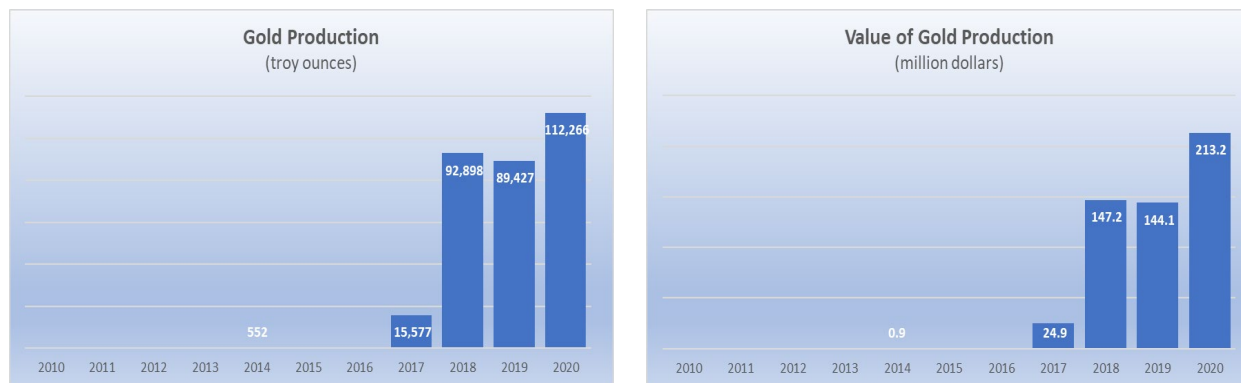


Figure 6. Gold production in Nova Scotia.

Touquoy, Halifax County

The Touquoy Mine is operated by Atlantic Mining NS Inc., a wholly owned subsidiary of St. Barbara Limited. St. Barbara acquired Atlantic Mining NS in 2019, through the acquisition of its parent company, Atlantic Gold Corporation. The company is mining a relatively low-grade disseminated gold deposit by open pit methods. Gold shipments were 112 266 ounces for the year.

In 2020, 4.06 million tonnes of ore were mined from the Touquoy pit, using a bench mining method of drilling, blasting, and loading broken ore with hydraulic excavators into haulage trucks for transport to the mill. For the year, 2.78 million tonnes of ore were processed, yielding 109 160 ounces of gold.

The company is also developing projects at Fifteen Mile Stream, Beaver Dam and Cochrane Hill.



Figure 7. Touquoy Gold Mine, Halifax County.

Gypsum

During 2020, gypsum production of 2.49 million tonnes accounted for \$28.4 million (8.3%) of the total value of Nova Scotia’s mineral production (Figure 8; Table 1). This represented an increase in gypsum production of 246 159 tonnes from 2019. There were three gypsum mines of varying scale in production in 2020. These operations include a large gypsum quarry at East Milford, Halifax County, a quarry at Brierly Brook, Antigonish County and a small quarry at Dean Settlement, Halifax County. The Brierly Brook Quarry produces gypsum used for both the cement industry and for the manufacturing of wallboard. The Dean Settlement gypsum is processed into an agricultural product and marketed locally, while the bulk of the East Milford production is shipped for manufacturing wallboard. No anhydrite was produced in 2020.

Gypsum production has been relatively steady at around 2 million tonnes a year since 2010, and volumes remain significantly lower than the peak production of 8.6 million tonnes in 2005. The financial crisis of 2007–08 resulted in a reduced demand for new home construction in the United States. This significant decline in demand, combined with competition from synthetic gypsum (derived from pollution control equipment at coal-fired electric generating plants), resulted in an unprecedented decline in demand for natural gypsum. While housing starts in the United States have increased, natural gypsum demand has not matched this upward trend in recent years, the prospect of increased demand for natural gypsum is positive. The gradual phasing out of coal-fired power plants will result in a reduction in the availability of synthetic gypsum in the marketplace. This trend has already begun to occur, with some wallboard plants having switched to natural gypsum due to a lack of locally available synthetic gypsum.

Several gypsum and anhydrite mines, including the Wentworth Creek, Miller Creek and Little Narrows operations, remained on care and maintenance status while waiting for improved market conditions to restart.

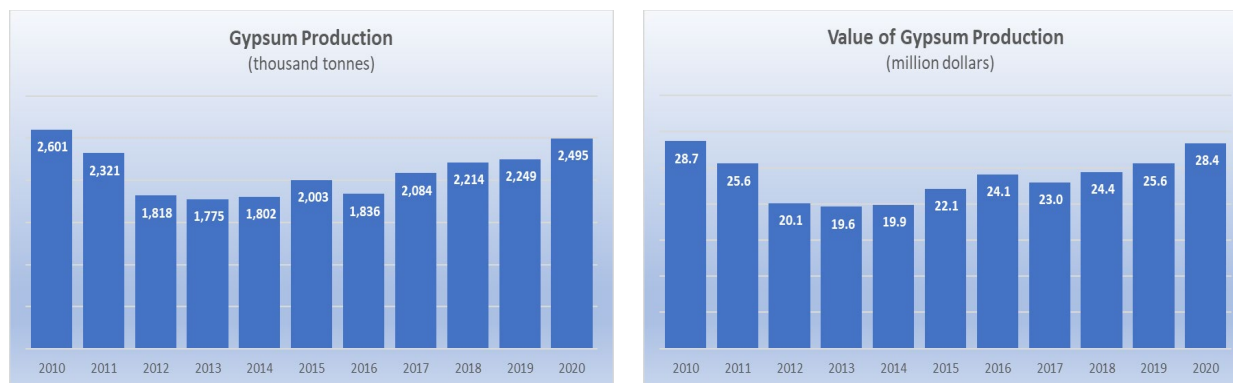


Figure 8. Gypsum production in Nova Scotia.

East Milford, Halifax County

Gold Bond Canada, Ltd. operates a gypsum quarry in East Milford, Halifax County. In 2020, the mine produced 2.42 million tonnes of gypsum and has produced more than 140 million tonnes since it began continuous operation in 1954.

Mining involves drilling, blasting, and loading the gypsum onto trucks. It is then crushed and screened to remove the fines, and transported by train from East Milford to Wrights Cove, Dartmouth. Crushed rock is loaded on ships for wallboard manufacturing by its parent company in the United States and for customers in Canada and the United States. The mine also sells products within Nova Scotia for agricultural use.

Brierly Brook, Antigonish County

The Brierly Brook gypsum quarry is owned by Nova Construction Co. Ltd. and shipped 76 536 tonnes of gypsum in 2020. The quarry operated consistently throughout 2020 after ending a period of care and maintenance in 2019.

Operations at Brierly Brook include drilling, blasting, and loading the gypsum onto trucks. The gypsum is then crushed, screened, and stockpiled for shipment. The mine supplies gypsum for the manufacturing of wallboard and cement in domestic markets.



Figure 9. Brierly Brook Gypsum Quarry, Antigonish County.

Dean Settlement, Halifax County

Mosher Limestone Company Limited operates a small gypsum quarry at Dean Settlement. The company did not carry out mining operations in 2020, as gypsum stockpiles provided sufficient material to meet market demands. The gypsum is crushed and ground to a fine product at the company's plant in Upper Musquodoboit. The ground gypsum is sold to agricultural markets in Nova Scotia and PEI. In 2020, there were 1 134 tonnes of gypsum products sold.

Coal

During 2020, coal production of 356 068 tonnes accounted for \$19.9 million (5.8%) of the total value of mineral production in Nova Scotia (Figure 10; Table 1). Production was from the surface mine in Stellarton, Pictou County and from the Donkin underground coal mine in Cape Breton County. The coal is used as a fuel for electrical power generation within the province and is also shipped from the Donkin Mine to export markets through the Port of Sydney.

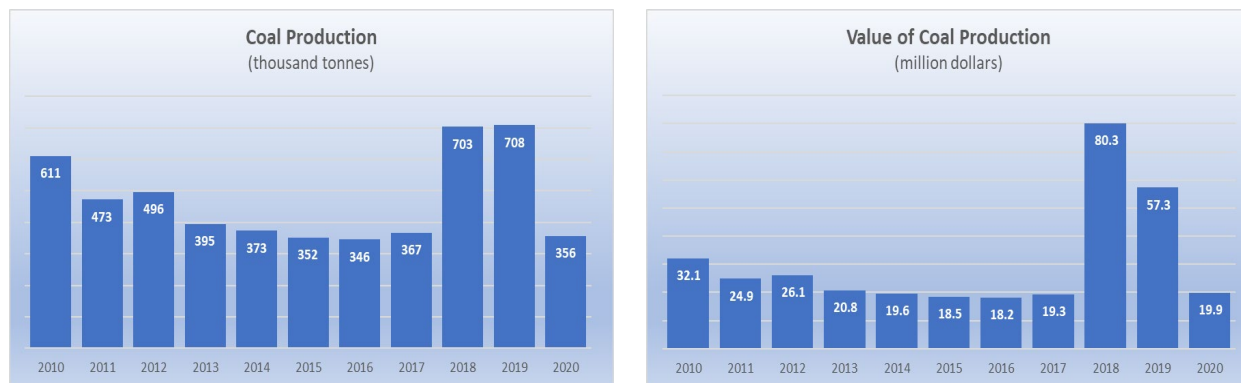


Figure 10. Coal production in Nova Scotia.

Stellarton, Pictou County

Pioneer Coal Limited has operated the Stellarton surface coal mine since 1996. In 2020, the operation produced 167 381 tonnes of coal from the Foord Seam, Cage Seam, Third Seam, and the Flemming/MacGregor Seams. The coal seams in Stellarton are relatively thick, with the Foord Seam averaging over 12 metres in thickness. Many of the coal seams were previously mined from underground workings, and therefore coal recovery is about 50 per cent of the original *in situ* reserves. Neither drilling nor blasting are conducted at this mine.

After overburden removal, excavators mine the coal and load it onto trucks for haulage to the crushing and sizing plant. Within the crushing/trans-shipment facility various coal qualities are blended and then shipped by truck to Nova Scotia Power’s generating station in Trenton.

Mining at Stellarton involves a series of open cuts, with overburden materials being placed into adjacent cuts as backfill or temporary stockpiles to allow for progressive reclamation. Once an area is backfilled and contoured, it is covered with a suitable growing material, limed, fertilized, seeded, and mulched.



Figure 11. Stellarton Coal Mine, Pictou County.

Donkin, Cape Breton County

The focus in 2020 at the Donkin underground mine, operated by Kameron Coal Management Limited, was to adjust its mining method in response to challenging ground conditions. The site made the switch from a room-and-pillar method to a longwall retreat method and successfully activated two longwall production sections before additional ground falls resulted in the mine being placed on a care and maintenance program in March 2020.

Shipments from the Donkin Mine in 2020 totaled 188 687 tonnes of clean coal, with the product being sold to both domestic and international markets.

Limestone

In 2020, limestone production of 484 443 tonnes from four mines accounted for \$5.6 million (1.7%) of the total value of Nova Scotia’s mineral production (Fig. 12; Table 1). Most of the limestone produced (326 300 tonnes) was used as a feedstock or raw material for Portland cement production. There were also 119 161 tonnes of limestone used for management of combustion gas emissions at a coal-fired power station. The remainder of the limestone production (38 982 tonnes) was sold for agricultural soil amendments, the manufacture of pulp and paper products, and for some miscellaneous uses.



Figure 12. Limestone production in Nova Scotia.

Brookfield, Colchester County

Lafarge Canada Inc. has operated a limestone quarry and a cement manufacturing plant in Pleasant Valley, 5 km west of Brookfield, Colchester County, since 1965.

In 2020, the Brookfield Quarry produced 326 300 tonnes of crushed limestone. Mining limestone involves removing the till and cap rock overburden, followed by drilling, blasting, and loading the rock onto trucks for haulage to a crushing plant. All of the limestone from Brookfield is used to manufacture Portland cement products.

Glen Morrison, Cape Breton County

Production from the limestone quarry at Glen Morrison, Cape Breton County, began in 1993. The quarry is owned by Nova Scotia Power Incorporated, and contractor Northern Contracting Limited operated the quarry in 2020. Limestone is mined by first removing the overburden, followed by drilling and blasting the limestone, and hauling it by front-end loader to the primary crusher. The limestone is further crushed and processed at an on-site crushing and screening facility.

Most of the 119 161 tonnes of limestone produced in 2020 was shipped to Nova Scotia Power’s fluidized-bed, coal and pet-coke fired generating station in Point Aconi, where it is used to reduce stack emissions. A small volume of fine limestone was sold to local customers.



Figure 13. Glen Morrison Limestone Quarry, Cape Breton County.

Upper Musquodoboit, Halifax County

Mosher Limestone Company Limited operates several quarries near Upper Musquodoboit. The company processed and sold 24 601 tonnes of limestone for the year in 2020. In 2020, the majority of this material was produced from the quarries with the remainder being sourced from stockpiles.

Agricultural grade dolomite and limestone is produced at the company's grinding plant in Upper Musquodoboit. The product is sold throughout the Atlantic provinces in bagged or bulk form. The company produces both ground and pelletized limestone.

Southside Antigonish Harbour, Antigonish County

Antigonish Limestone Ltd. operates a small quarry at Southside Antigonish Harbour. In 2020, all of the limestone produced was obtained from existing stockpiles. Limestone is crushed and sorted into three different sizes, each having its own application and markets. The company also operates a cage mill to produce a finely ground product for the agricultural market. In 2020, 14 156 tonnes of product were sold, with the majority of the limestone being used in the agricultural industry.

Silica Sand

All of the silica sand produced in Nova Scotia comes from the West Indian Road Silica Pit at Nine Mile River, Hants County. During 2020, silica sand shipments of 14 562 tonnes accounted for \$969 000 (0.3%) of the total value of Nova Scotia’s mineral production (Fig. 14; Table 1).

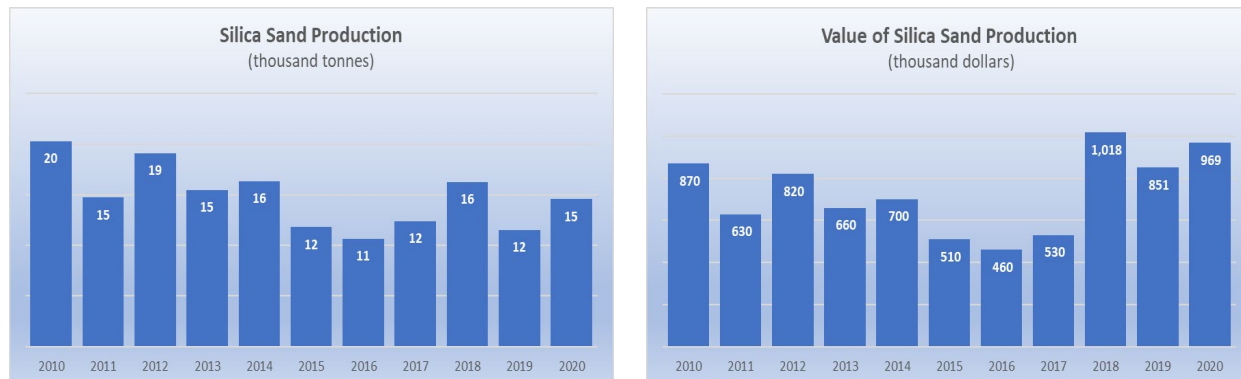


Figure 14. Silica sand production in Nova Scotia.

Nine Mile River, Hants County

Shaw Resources, a member of The Shaw Group Limited, produces silica sand from a deposit located on the West Indian Road in Nine Mile River. Sand is excavated from the pit and either stockpiled or trucked to the company’s wash plant. The sand is then washed and screened into several products that are sold and shipped throughout the Atlantic provinces and Quebec.

In 2020, 14 562 tonnes of silica sand were processed and shipped. As well, the sand pit was operational during the year to supply the wash plant and replenish the stockpile. Once replenished, sand can be drawn from the stockpile for the next several years.



Figure 15. Nine Mile River Silica Quarry, Hants County.

2020 Reclamation Activity Update

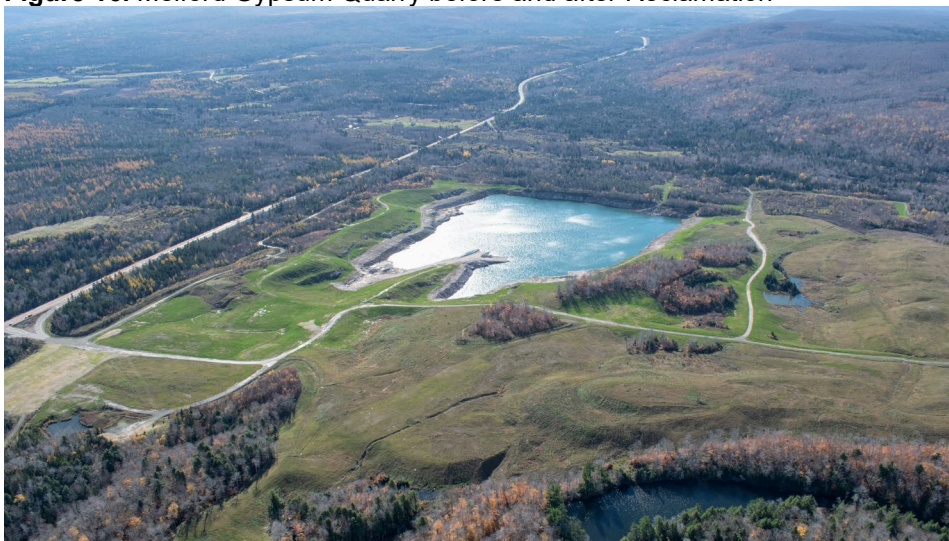
In 2020 several mine sites within the province completed reclamation activities to restore land that has been affected by mining activity. These activities consisted of both progressively reclaiming areas on active mine sites that are no longer required for future production, along with the final reclamation and closure of mine sites that are no longer producing.

In 2020 over 1 million square metres of land were reclaimed by mine operators in Nova Scotia. This reclamation includes items such as the re-sloping of steep gradients to maintain long-term stability and revegetation work. Mine operators also engaged in studying mining areas to determine future reclamation requirements and the dismantling of infrastructure.

As part of the updated *Mineral Resources Act*, Mine operators are required to submit updated reclamation plans every three years. The Mineral Management Division of the Department of Natural Resources reviewed and accepted three reclamation plans that were submitted in 2020.



Figure 16. Melford Gypsum Quarry before and after Reclamation



Reclamation Security Table for Operating Mines.

Reclamation securities for seven of the province's operating mines are listed in Table 2. The data is voluntarily reported by the companies and is current as of December 2021. The reclamation securities may be held by the Department of Natural Resources and Renewables or the Department of Environment and Climate Change, and are in the form of cash, letter of credit or surety bond, or combinations thereof. The reclamation cost estimate is either as estimated in each mine's reclamation plan, or as estimated by NRR and/or ECC. For tax and royalty data please refer to the Natural Resources Canada website at [Access ESTMA reports and data \(nrcan.gc.ca\)](https://www.nrcan.gc.ca)

Table 2. Reclamation security information for Nova Scotia mines.

Mine	Company	Status	Commodity	Reclamation Security Held	Reclamation Plan Cost Estimate and Date
Touquoy	Atlantic Mining NS Inc.	Producing	Gold	\$41,200,000	\$41,200,000 (2021)
Brookfield	Lafarge Canada Inc.	Producing	Limestone	\$285,000	\$3,100,000 (2018)
Stellarton	Pioneer Coal Limited	Producing	Coal	\$2,500,000	\$2,500,000 (2008)
Glen Morrison	Nova Scotia Power Incorporated	Producing	Limestone	\$750,000	\$750,000 (2015)
South Side Antigonish Harbour	Antigonish Limestone Ltd.	Producing	Limestone	\$230,000	\$230,000 (2019)
Nappan	Compass Minerals Canada Corp.	Producing	Salt	\$6,300,000	\$6,300,000 (2021)
Upper Musquodoboit	Mosher Limestone Company Limited	Producing	Limestone	\$20,000	\$20,000 (2009)
Pugwash	K+S Windsor Salt Ltd.	Producing	Salt	For information, please contact: K+S Windsor Salt Ltd. Head Office 755 boul. St-Jean Pointe Claire, Québec H9R 5M9 Phone: 1-514-630-0900	
Milford	Gold Bond Canada, Ltd. (formerly National Gypsum (Canada) Ltd.	Producing	Gypsum	For information, please contact: National Gypsum Company Head Office 2001 Rexford Road Charlotte, North Carolina, USA 28211 Phone: 1-704-365-7300 ng@nationalgypsum.com	
Nine Mile River	Shaw Resources	Producing	Silica Sand	For information, please contact: Corporate Secretary The Shaw Group Limited P.O. Box 60 Shubenacadie, N.S. B0N 2H0 Phone: 1-902-758-4727 lhawker@shawgrouppltd.com	

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