Economic Impact of the Mineral Industry in Nova Scotia

- 2012 Update -

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Nova Scotia Department of Natural Resources

Open File Report ME 2013-003

October 2013

NOVA SCOTIA

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- 2012 Update -

Prepared by:

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under contract
for the
Nova Scotia Department of Natural Resources

Date Submitted:
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Nova Scotia Department of Natural Resources
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1.0 Introduction

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Mineral Industry Overview

- The industry plays a major role in the Nova Scotia economy

- The economic impact of the industry stems from various activities, including:
  - Mineral exploration
  - Mine development
  - Mineral production
  - Secondary processing
  - Provision of goods and services to the industry
  - Mine site rehabilitation

How was the analysis undertaken?

- Interviews were conducted with industry participants to collect expenditure data and to collect information for the initial baseline study done in 2006.
- Mineral production data was primarily sourced from the Nova Scotia Department of Natural Resources and Natural Resources Canada.
- Statistics Canada and Natural Resources Canada data were used to analyze the secondary mineral processing industry.
- The Nova Scotia Department of Finance's Economic Impact Model was used to assess the spin-off impacts attributable to the industry for a baseline study.
- Impact ratios have been used to update the study to 2012.

2.0 Economic Impact Results

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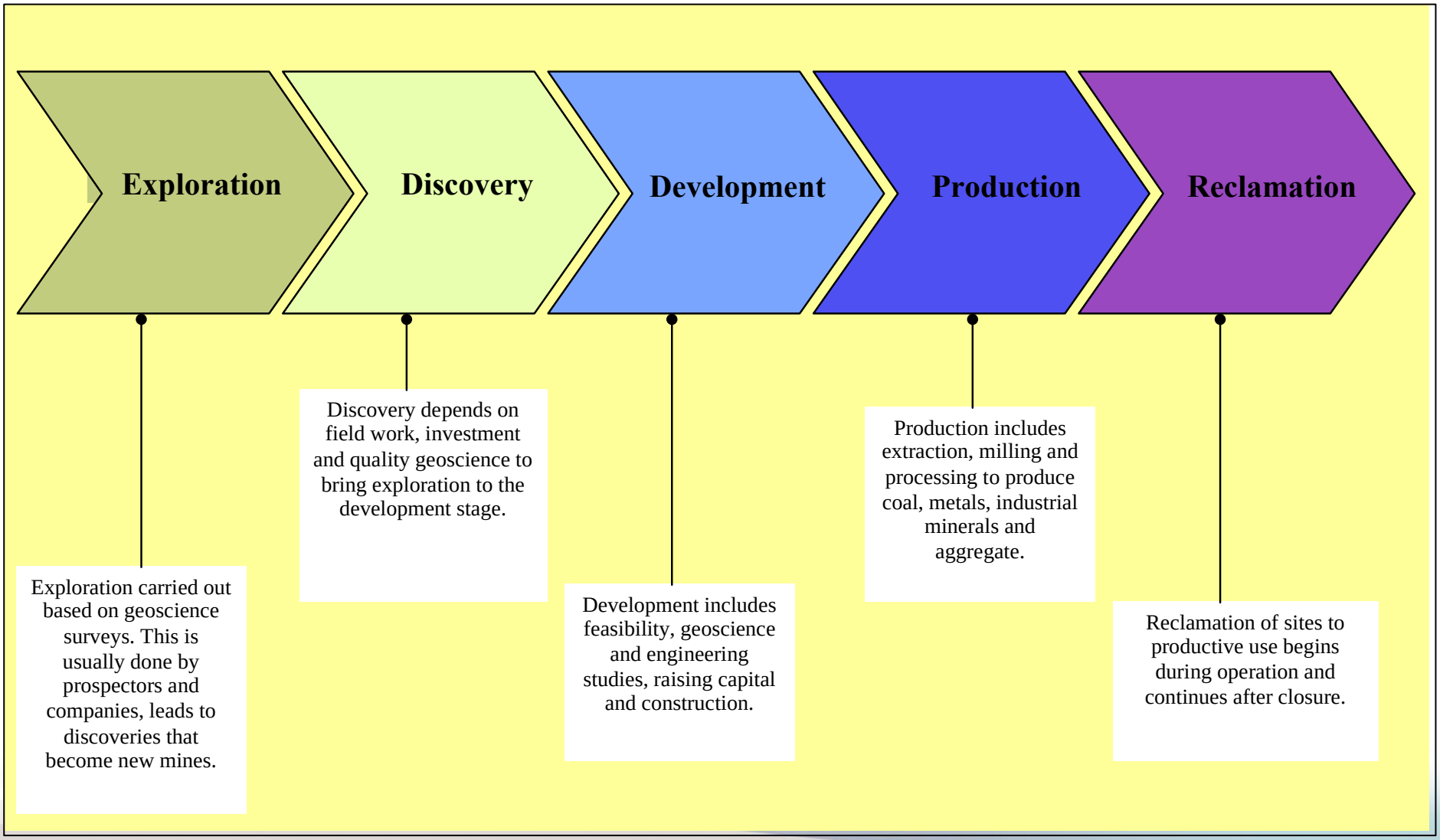
The direct economic impact of the industry stems from various activities



What are economic impacts?

- Primary direct economic impacts are those attributable to the individual mine operators, exploration companies or secondary processors. They are the expenditures they make on various goods (fuel, electricity, etc.) and services (accounting, legal, etc.) including wages and salaries.

- Both capital and operating expenses have been included.

- The spin-off or multiplier effect includes both indirect and induced impacts; these result to businesses that supply goods and services to the mining industry. Also they result from consumers spending the income they earn from both the direct and indirect stages.

- Impacts are reported both in terms of person-years (py's) of employment and gross domestic product (GDP).

Total Economic Impact Associated
including primary and processing activity

- Employment (py's)
  - Direct - 2,721
  - Spin-off - 2,763
  - Total - 5,484
- GDP ($Millions)
  - Direct - $243.5
  - Spin-off - $176.2
  - Total - $419.7

7.

Impacts associated with mining activity

8.

9.

Primary Extraction

- Employment (py's)
  - Direct - 1,467
  - Spin-off - 1,476
  - Total - 2,943
- GDP ($Millions)
  - Direct - $139.2
  - Spin-off - $94.9
  - Total - $234.1

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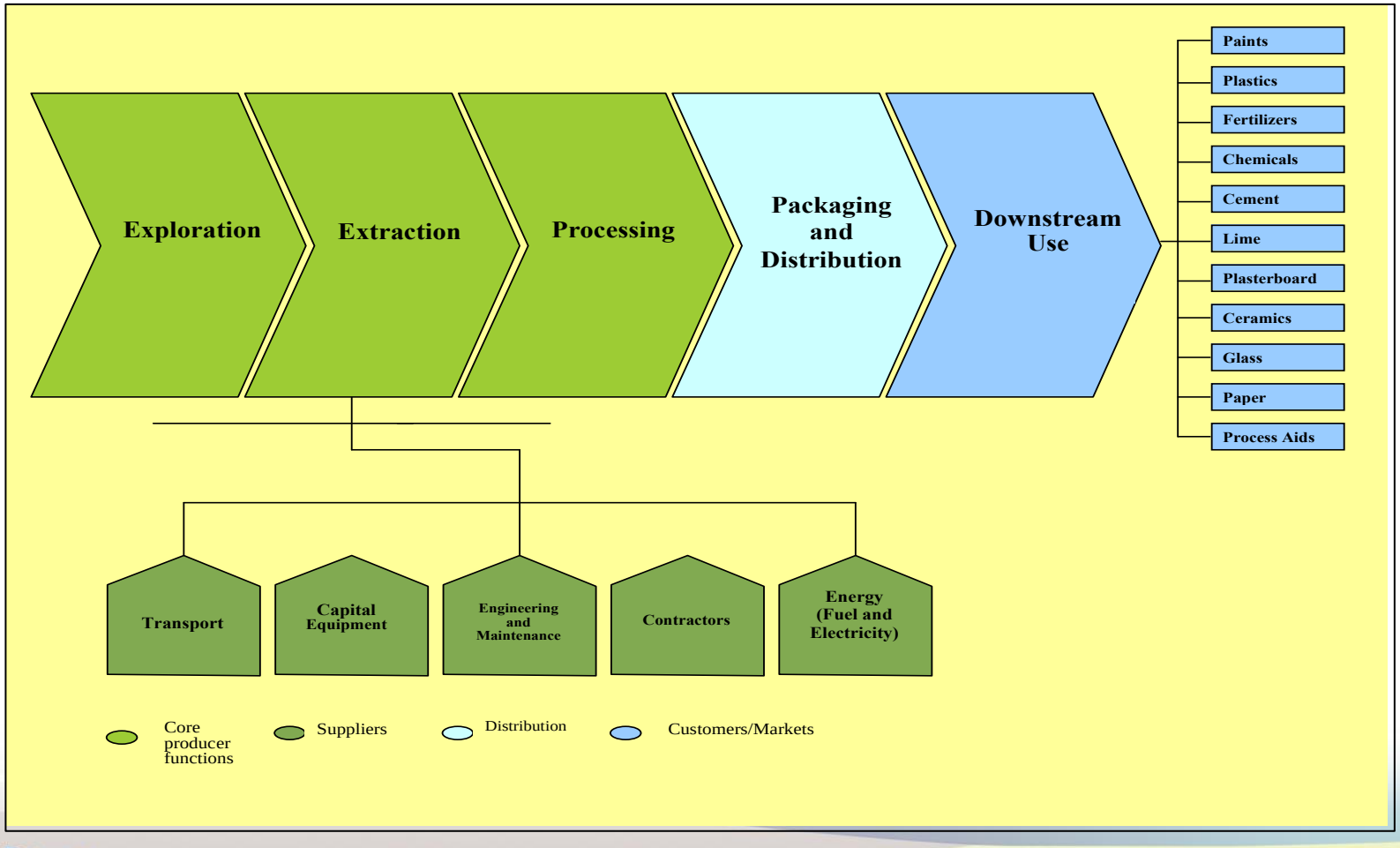
In this analysis we have included all aspects of the industry shown below except for downstream uses.

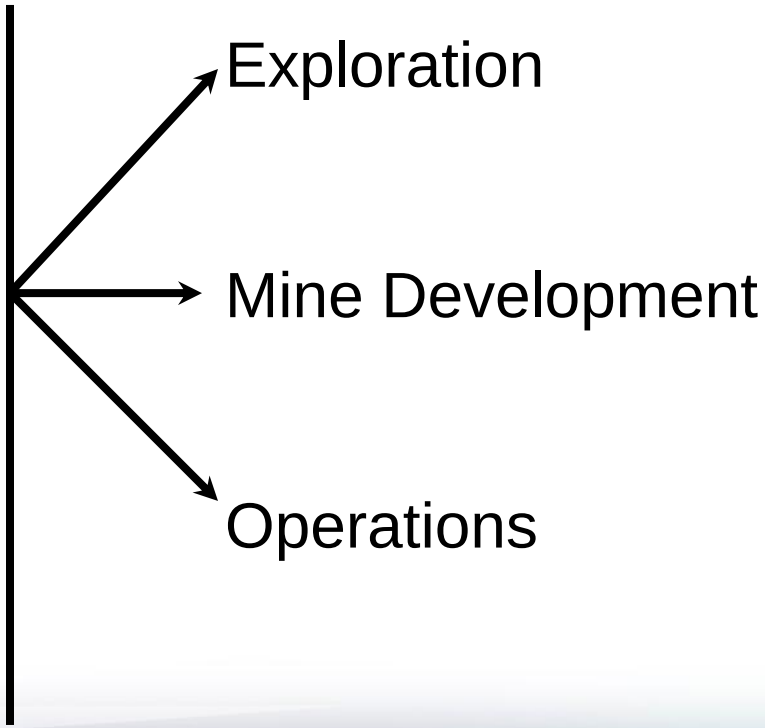


Services and goods supplied by the Nova Scotia economy to the mineral industry. These account for a significant share of the indirect economic impacts.

Services/goods to Industry

- Transportation
- Manufacturing
- Construction Services
- Business Services
- Wholesale and retail
- Government Services
- Financial Services
- Insurance Services
- Legal Services
- Communications
- Utilities
- Laboratory and testing services
- Accommodation/food services
- Technical Services
    - Engineering Design
    - Environmental Design
- Occupational Health and Safety
- Heavy Equipment Sales

Mineral Industry Activities



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Indirect economic impacts (continued)

- The preceding breakdown is not exhaustive, but rather illustrative.
- All phases of mineral production make use of these varied goods and services.
- Many are provided in their entirety by Nova Scotian firms.
- Transportation services are provided by trucking firms, rail lines and cargo vessels.
- Many of the specialized services come from engineering and other technical service companies, these are provided by highly qualified professionals.

Impacts associated with the processing of minerals into products:

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Processing

- Employment (py's)
  - Direct - 1,254
  - Spin-off - 1,287
  - Total - 2,541

- GDP ($Millions)
  - Direct - $104.3
  - Spin-off - $81.3
  - Total - $185.6

A wide variety of processed mineral products are manufactured in Nova Scotia

- Clay products
- Portland cement
- Ready mix concrete
- Bricks and mortar
- Agricultural lime
- Agricultural gypsum
- Building stone and slate
- Salt products

11.

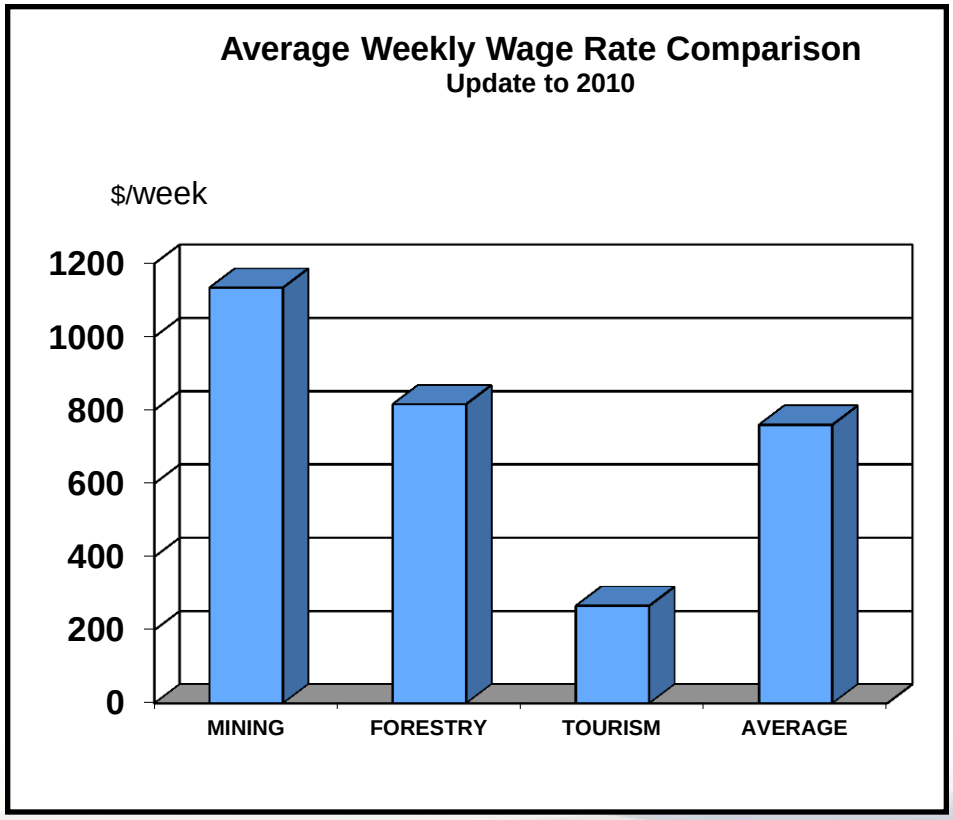
12.

Mining operations play an important role in the rural economy

- At current production levels about 1,467 persons are employed on a fulltime basis. The majority of these jobs are located in rural areas.
- It is estimated that the industry has a total payroll of about $88 million, including wages and benefits.

13.

The mining industry in Nova Scotia ranks “number one” in terms of average weekly wages paid among the various resource sectors



- Average wage in primary mining sector is over $1,100 per week.
- This is more than 40% higher than the average of all economic sectors.

3.0 Exploration

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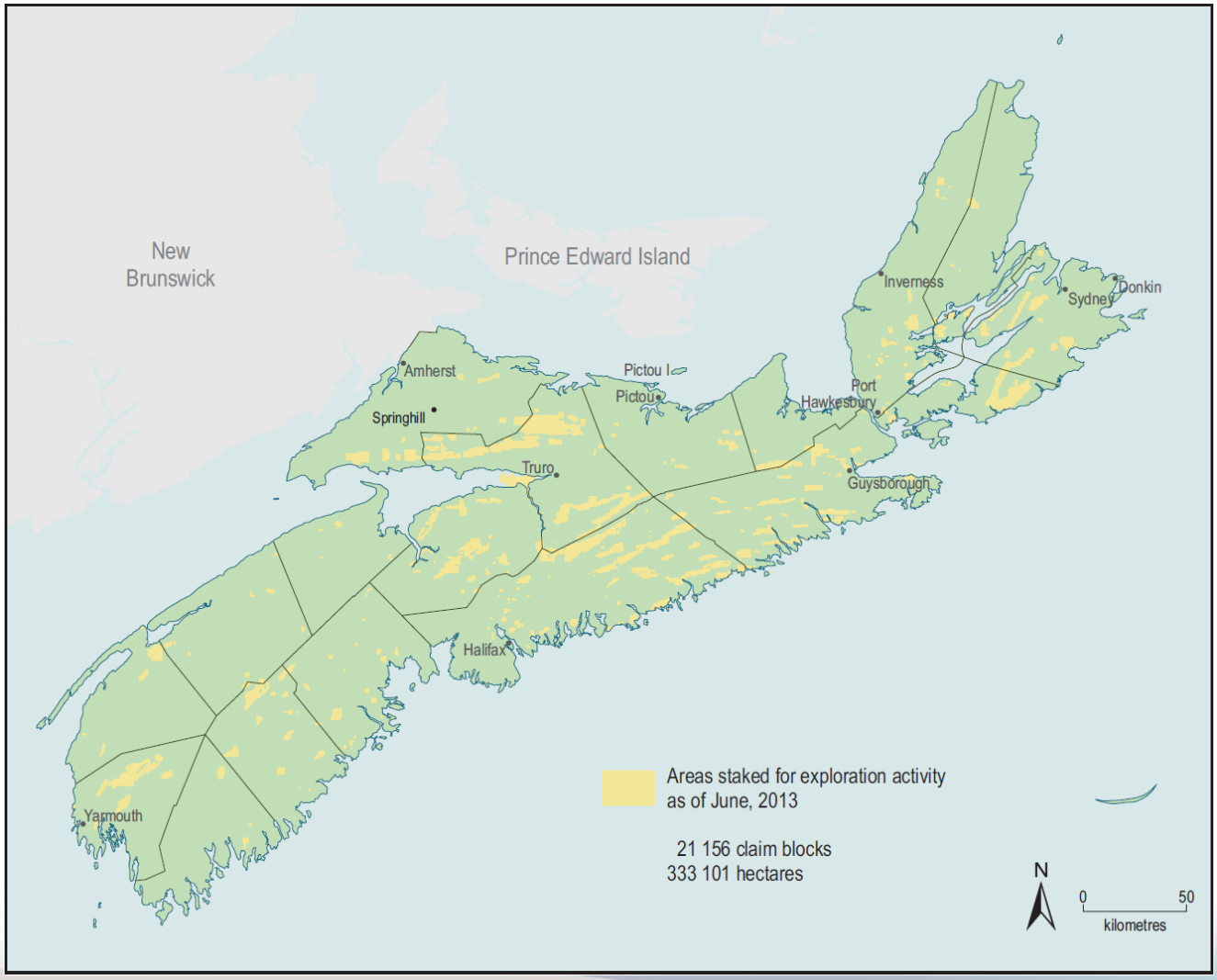
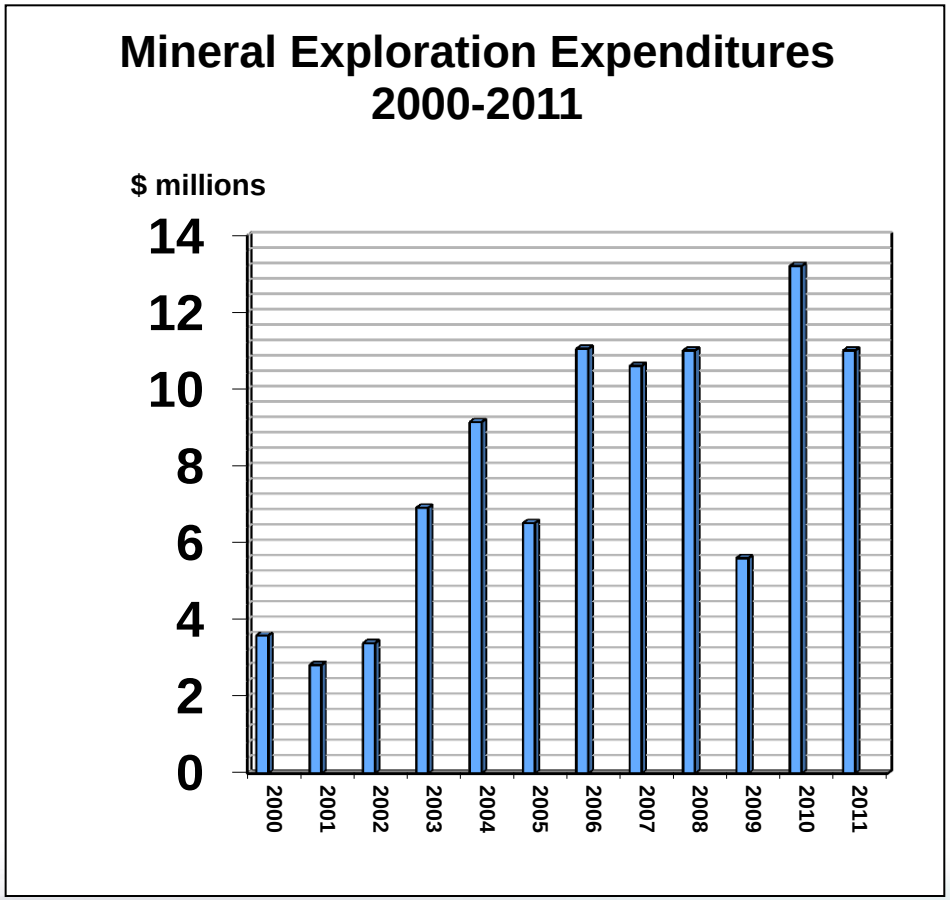
Exploration Staking Map

Areas of current interest



Increasing prices for gold and other metals have been the prime motivator behind recent increases in exploration activity in the province

- Expenditures related to exploration have generally increased since a low in 2001.
- Exploration expenditures are important to specialized technical service providers, whose skills are required to evaluate feasibility. These account for one third of overall exploration expenditures.
- Much of the other expenditure related to exploration takes place in local communities.



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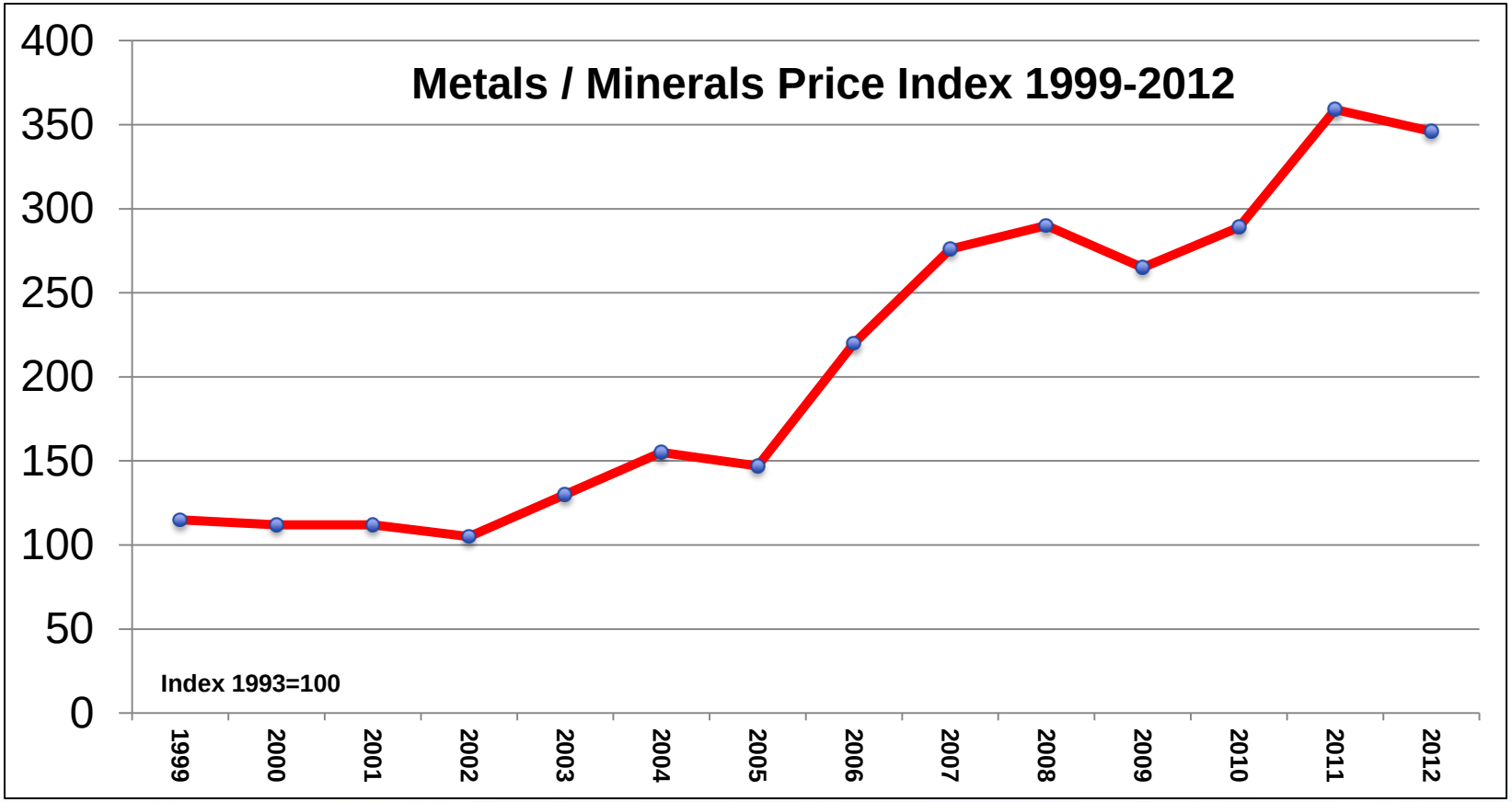
Rise in metal prices is credited with rise in exploration activity

Up 350% between 2001 and 2012



Source: BMO Financial Group Commodity Price

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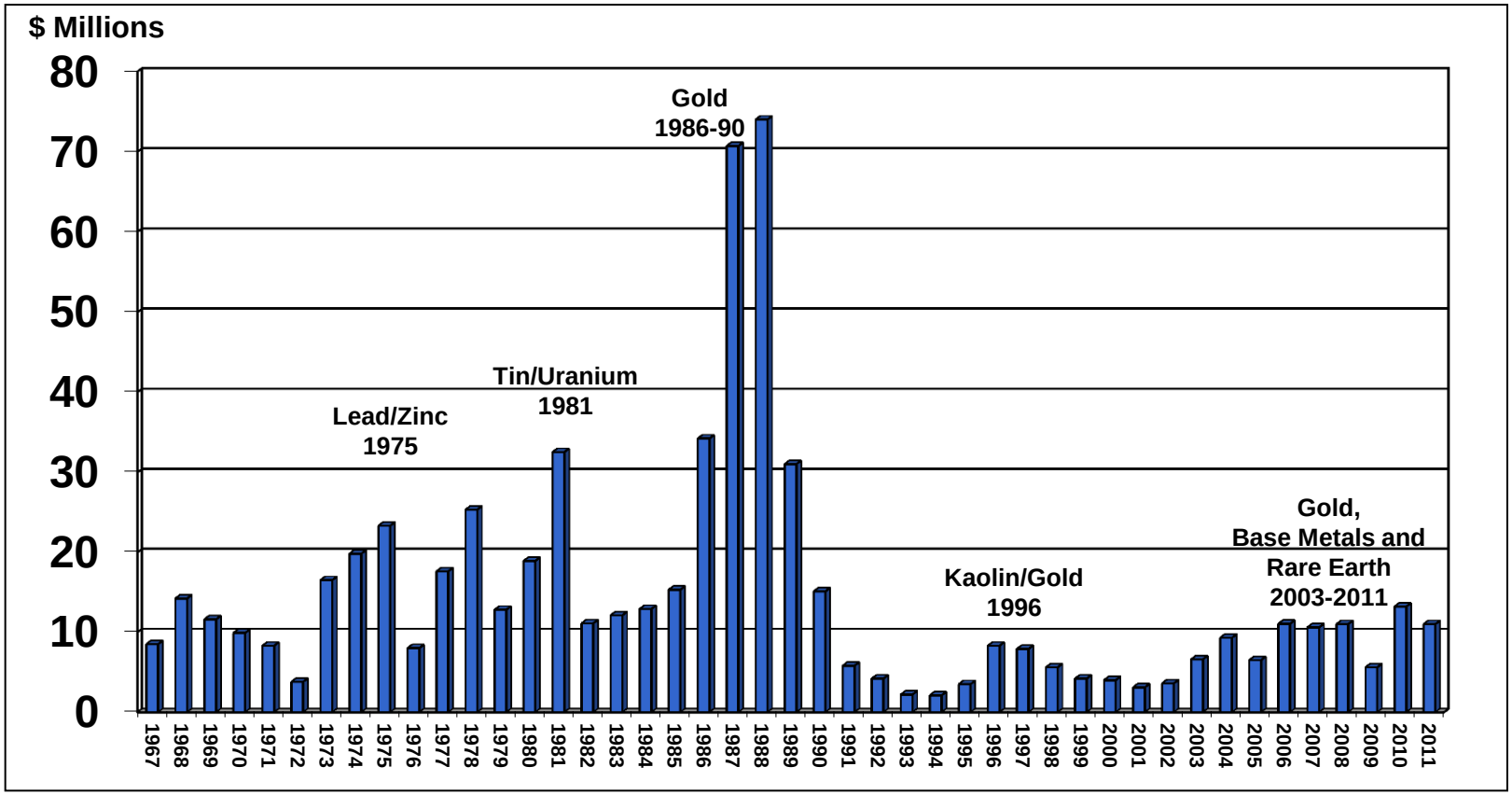
Exploration Expenditures

1967-2011 with Major Commodity Targets



Note: Adjusted for 2005 dollars

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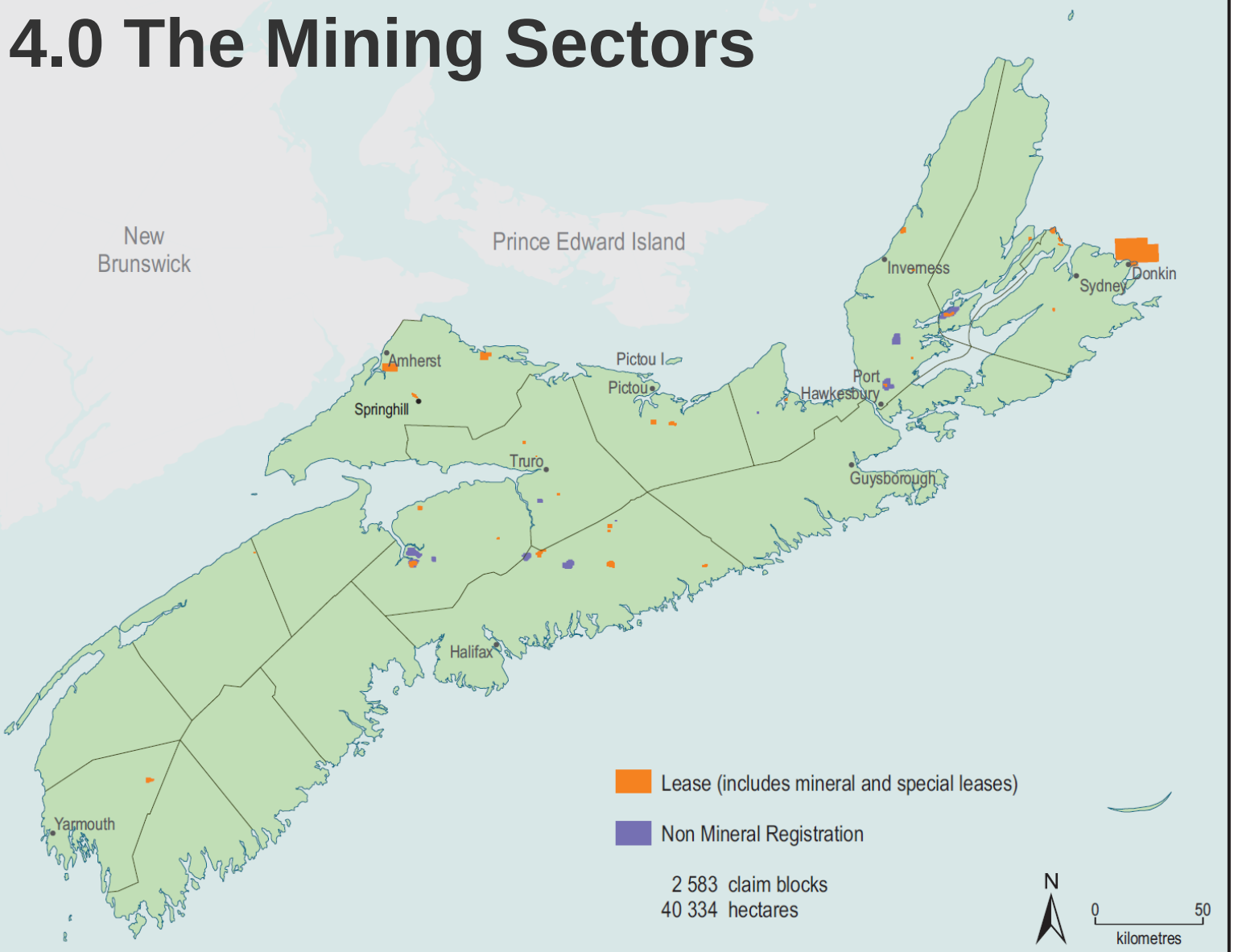
4.0 The Mining Sectors



Mining Operations in Nova Scotia - 2012

Sifto Canada Corp.
Nappan - salt

Canadian Salt Company Ltd.
Pugwash - salt

Antigonish Limestone Ltd.
Southside Antigonish Harbour - limestone

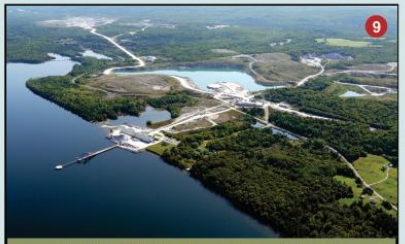
N

50 km

Pioneer Coal Limited
Point Aconi - coal

Nova Scotia Power Incorporated
Glen Morrison - limestone

Lafarge Canada Inc.
Pleasant Valley (Brookfield) - limestone



CGC Little Narrows Plant
Little Narrows - gypsum, anhydrite

Pioneer Coal Limited
Stellarton - coal

Shaw Resources
Nine Mile River - silica sand

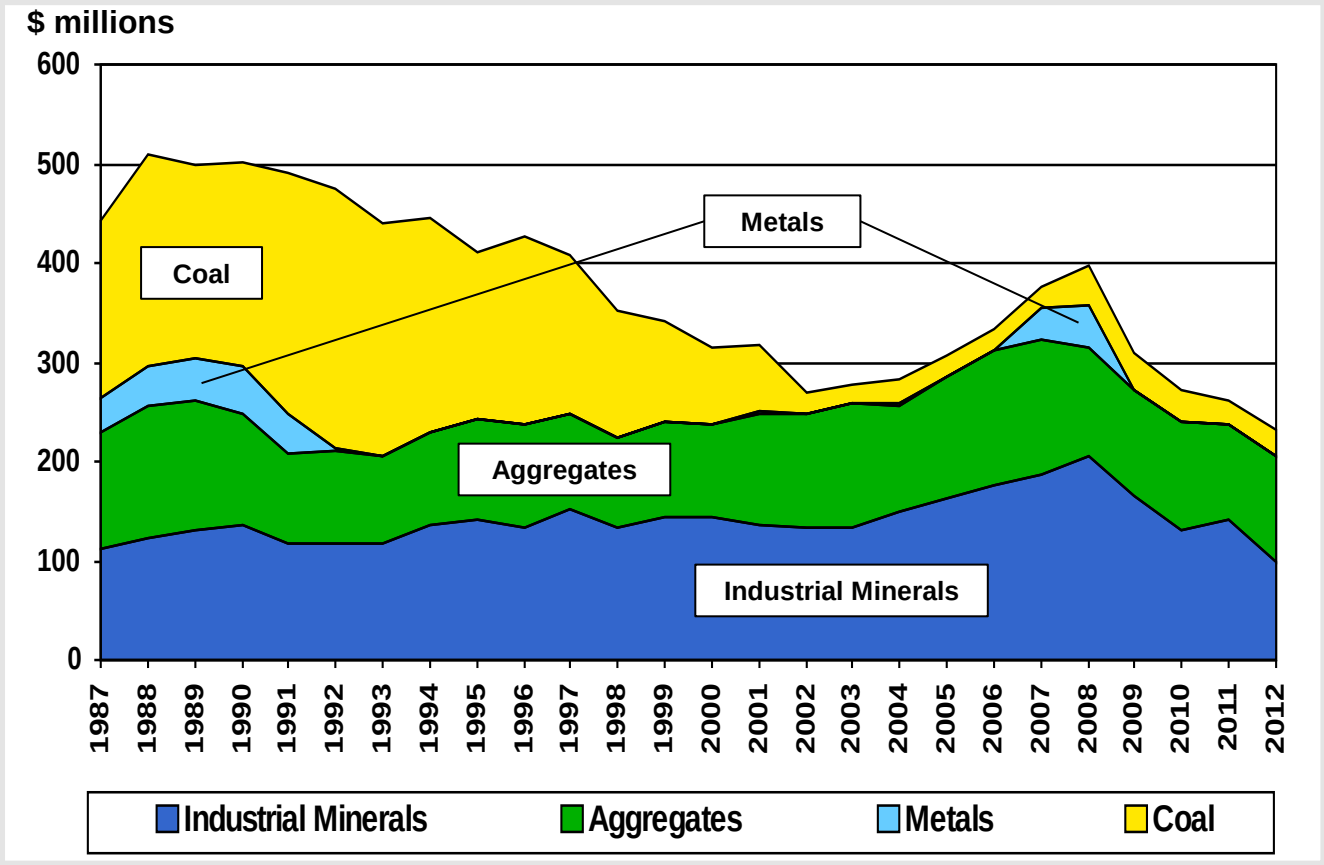
National Gypsum (Canada) Ltd.
East Milford - gypsum

Mosher Limestone Co. Ltd.
Upper Musquodoboit - dolomitic limestone

2012 Value of Primary Production
by Commodity
($,000)

Aggregates	$105,818	42.8%
Salt	$72,000	29.1%
Coal	$28,050	11.3%
Gypsum	$26,299	10.6%
Limestone	$4,000	1.6%
Anhydrite	$1,000	0.4%
Other (includes: clay, barite, silica sand, dimension stone and limestone for cement)	$10,000	4.0%
Total Mineral Production	$247,167	100%

Value of Production 1987-2012 shows steady performance of industrial minerals and aggregates



- Value of production fell from about $400 million in 2009 to $247 million in 2012.
- Drop in gypsum production and the suspension of metal production accounted for decline.
- Over the period 1995-2012 the value of salt and aggregate production has been relatively steady.

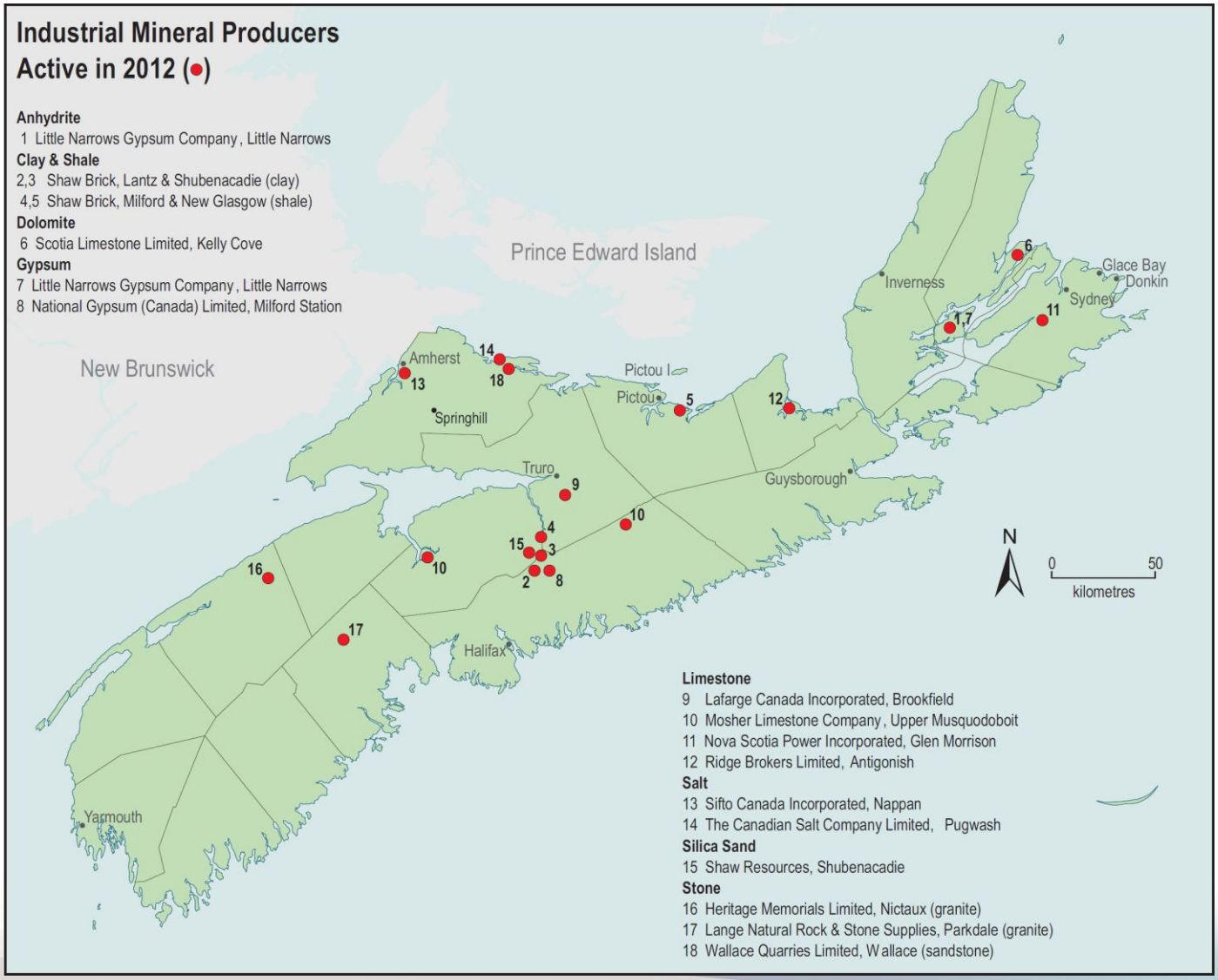
The Department of Natural Resources collects revenues related to both exploration and mineral production activity

In 2012 total revenue collected was $2.5 million

Exploration	Number	Claims	Hectares	**Revenue**
New Licences	480	9,365	151,592	$92,462
Renewals	535	11,722	189,745	$197,812
Other Revenue				
Mineral Lease Rentals				$60,482
Royalties				$1,686,939
Taxes on non-mineral production				$415,194
Total Direct Revenue				$2,452,889

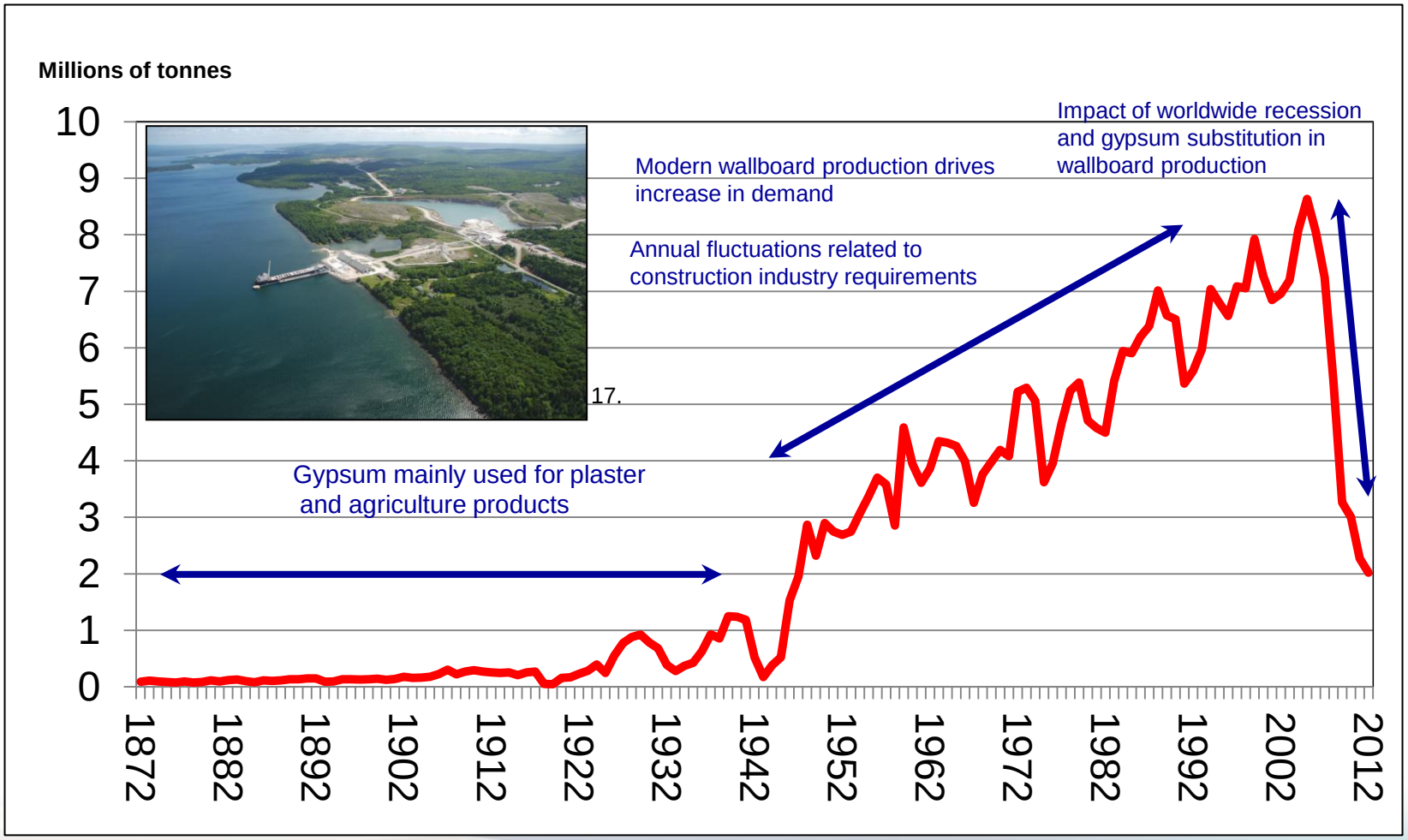
Industrial Mineral Production Locations

Widely dispersed, mostly associated with sedimentary geology



Gypsum Production 1872 – 2012

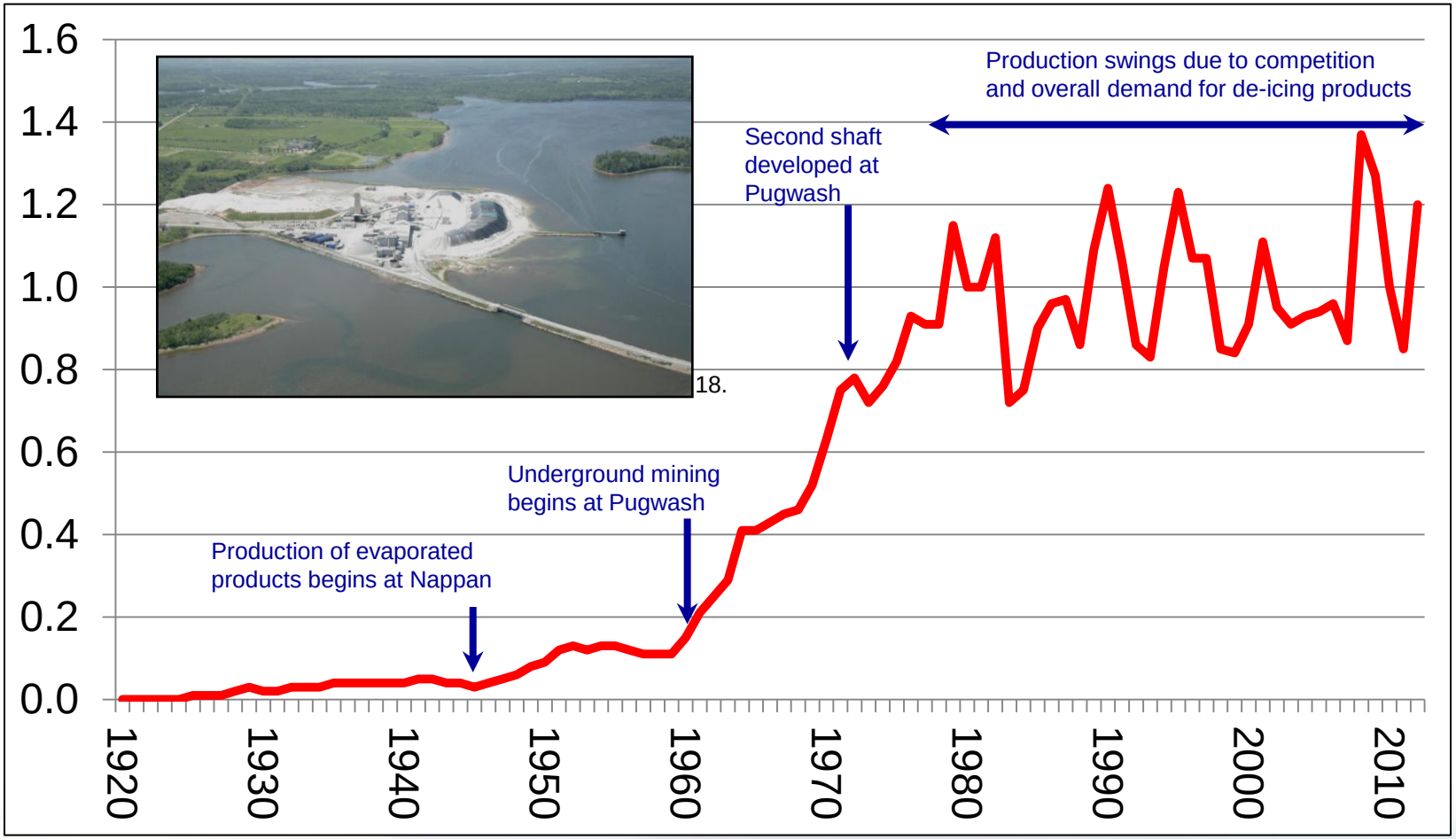
A mainstay of the industry with almost continuous growth- recent drop off in production.



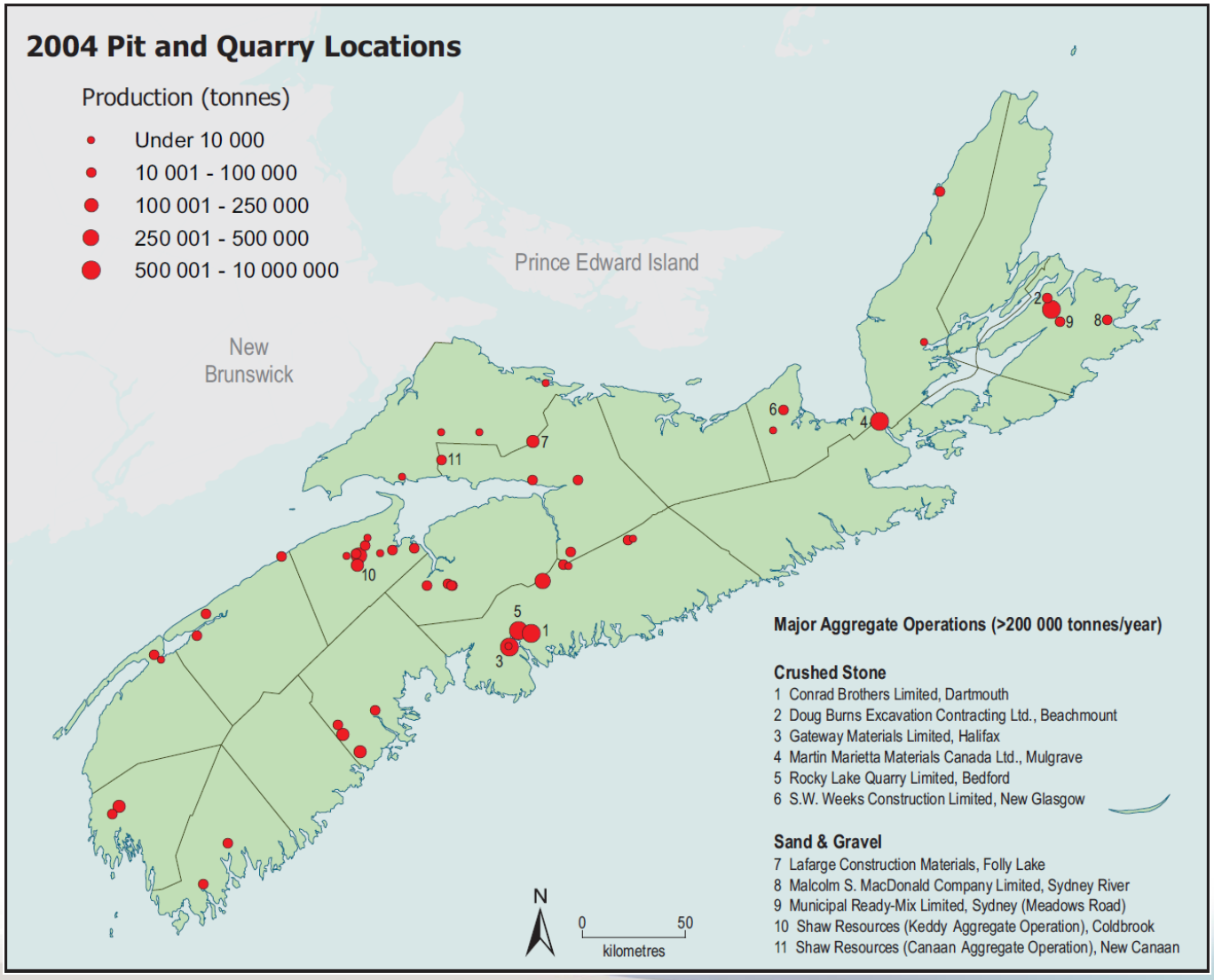
Salt Production 1920-2012

Has followed overall demand for de-icing products

Millions of tonnes



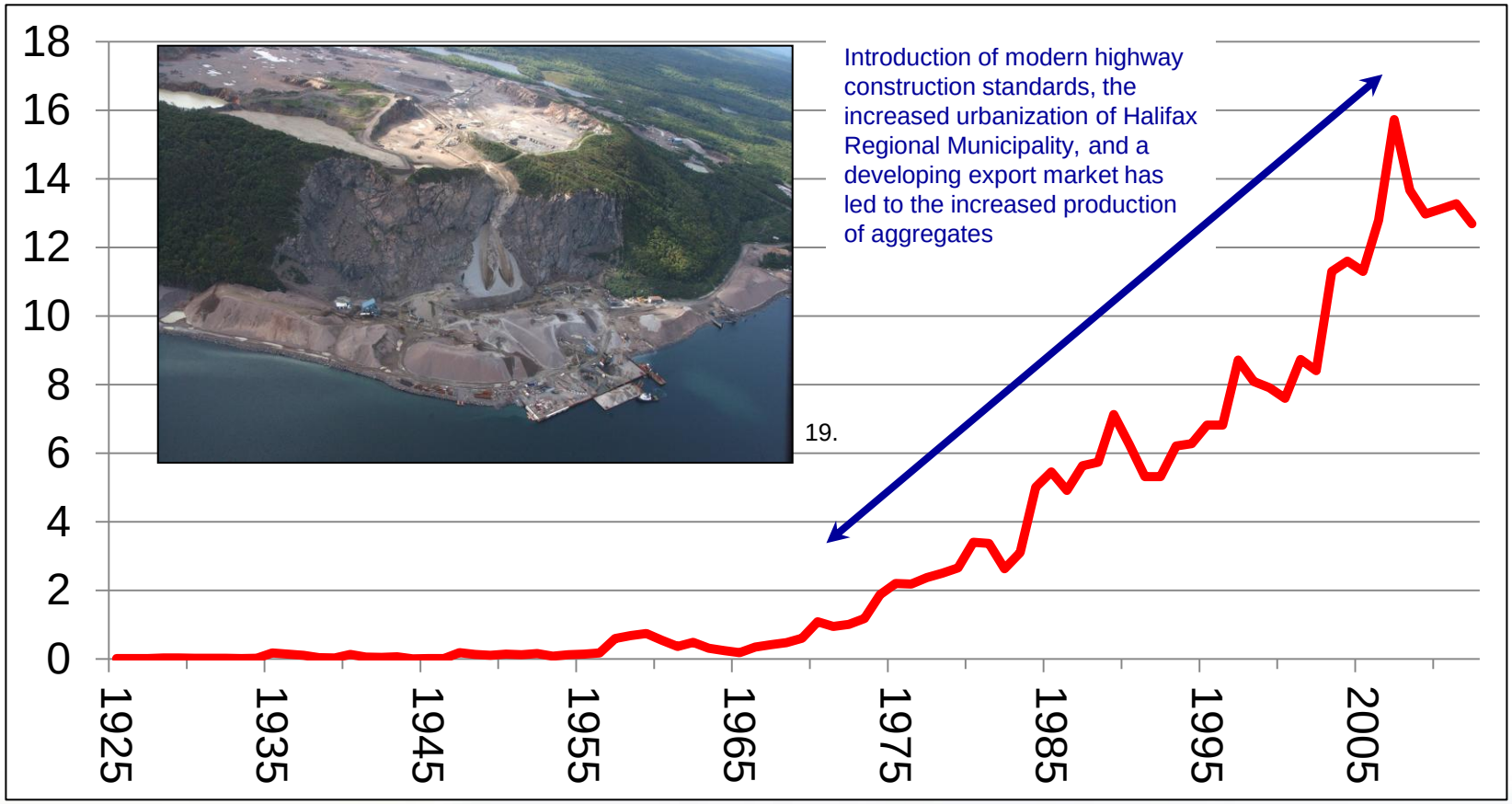
Aggregate Pit & Quarry Locations
Locations dictated by markets and geology



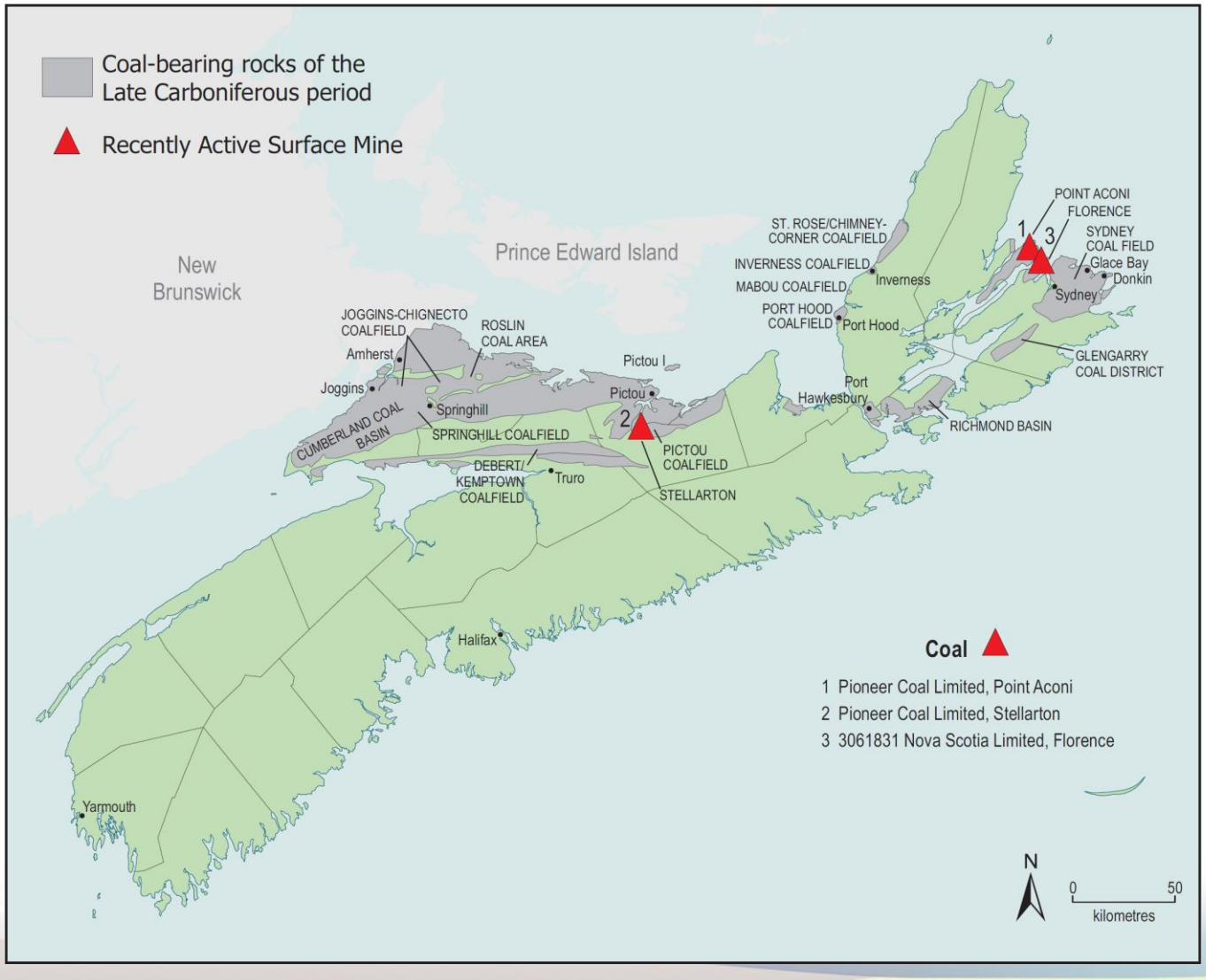
Construction Aggregate Production 1925 - 2012

Has followed a consistent upward trend

Millions of tonnes

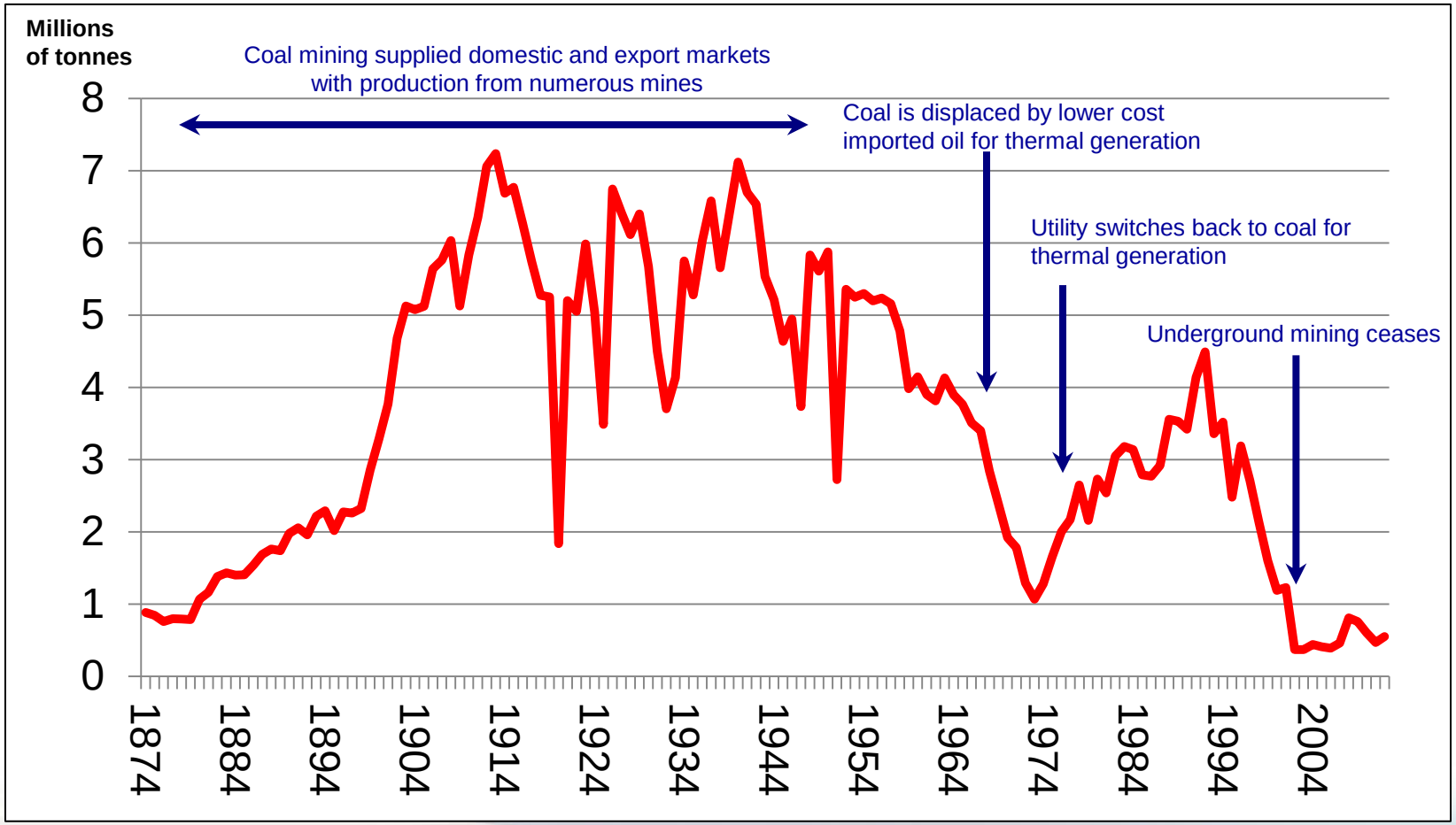


Coal resources are found in both Cape Breton and Northern Nova Scotia



Nova Scotia Coal Production 1874 - 2012

Coal industry has played a major role in the economy over this period. Production has varied due to changing market requirements and depletion of resources.



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Coal Comment

- Worldwide coal prices have more than doubled in the past number of years. Interest in coal projects has increased as a result.

- The development of new mines would reverse the recent trend of a declining contribution by the coal sector.

- Existing surface coal operations will produce in the range of 250,000 - 500,000 tonnes per year.

- Provincial thermal power generation consumes in the order of 2 million tonnes of coal per year, which is now mostly imported.

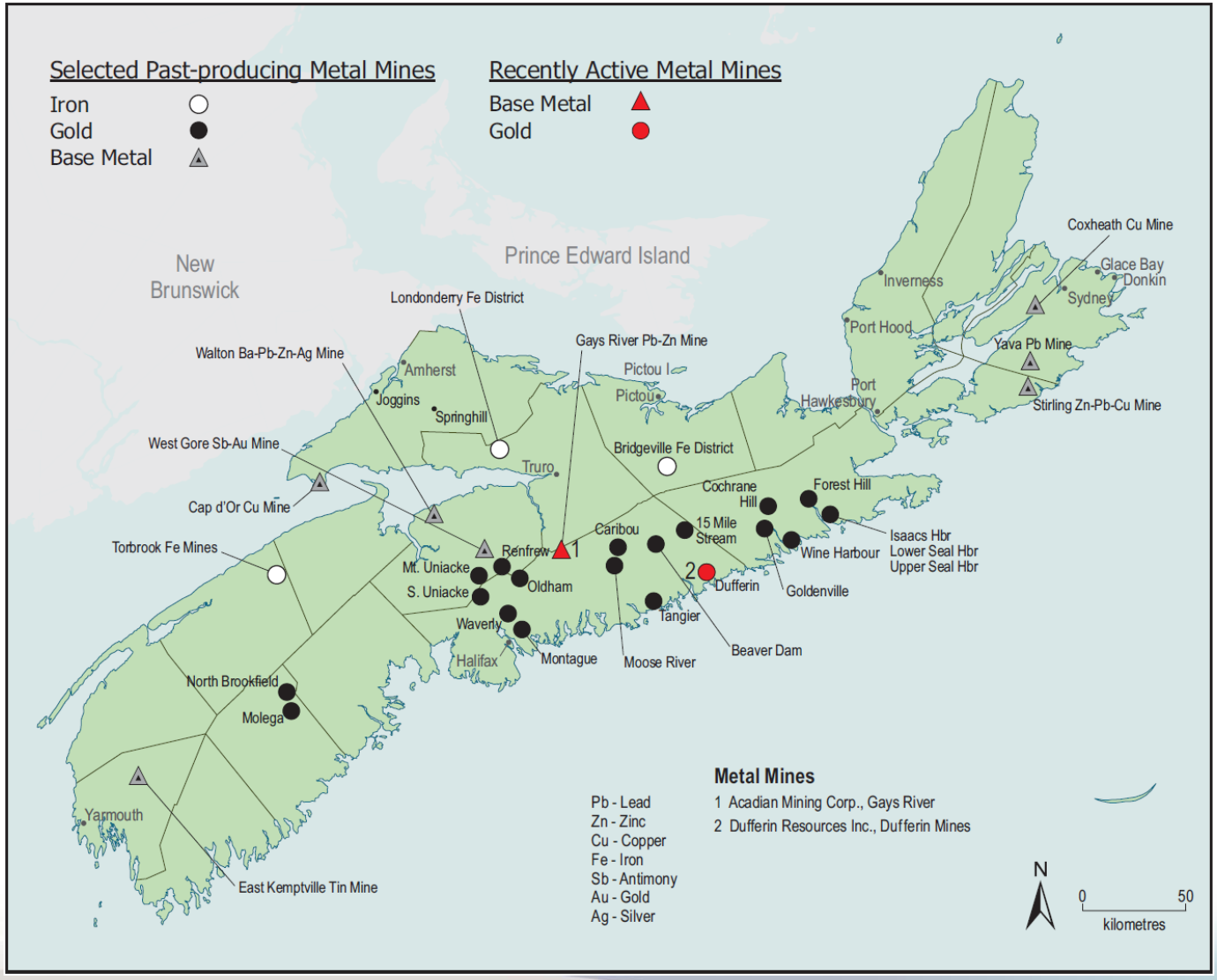
- Donkin Submarine Coal Resource Block - annual underground production potential of 3 to 4 million tonnes per year.

Donkin Project Summary

20.

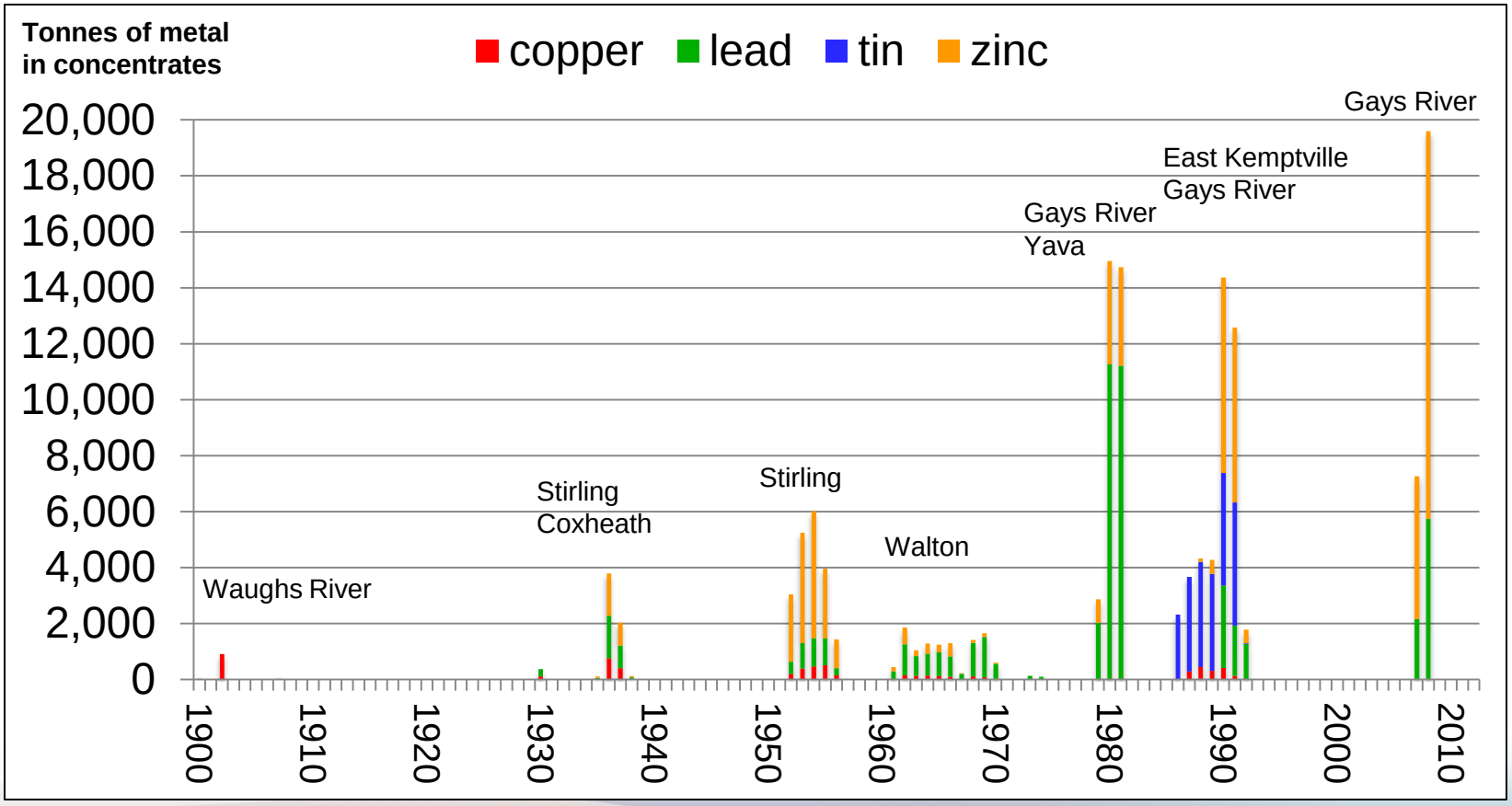
- Existing tunnels de-watered.
- Detailed feasibility study of existing mine infrastructure and coal resources completed.
- Comprehensive joint federal-provincial environmental assessment study completed.
- Potential to produce 3 – 4 million tonnes of coal per year with a value of several hundred million dollars for several decades.
- Approximately 200 people could be employed full time. Initial capital investment >$200 million expected if mine is constructed.
- Development partners being sought.

Past Metal Production Locations



Base metals have been produced intermittently as deposits are located, mined and depleted

Selected Base Metal Production 1900-2012



Base Metals Comment

- Base metals have been produced in the province for over a century.
- Metals produced in significant quantities include iron, copper, zinc, lead, tin and antimony. Other metals have also been recovered throughout the province.
- Increases in metal commodity prices have resulted in more metal mineral exploration and the start up of a lead-zinc mining operation in Halifax County. Although production has been suspended, a restart is expected in the next few years.

Scotia Mine Project

21.

- Production from the Scotia Mine has been suspended since 2009.
- Higher zinc and lead prices are needed to restart the mine and mill.
- The investment required to restart operations is estimated to be about $30 million.
- Using a combination of surface and proposed underground mining methods, the overall mine life is expected to be about eight years. Additional resource evaluations may extend the mine life by seven years.
- Prior to suspension in 2009 approximately 112 people were employed full time at the mine and mill.

Gold Mining

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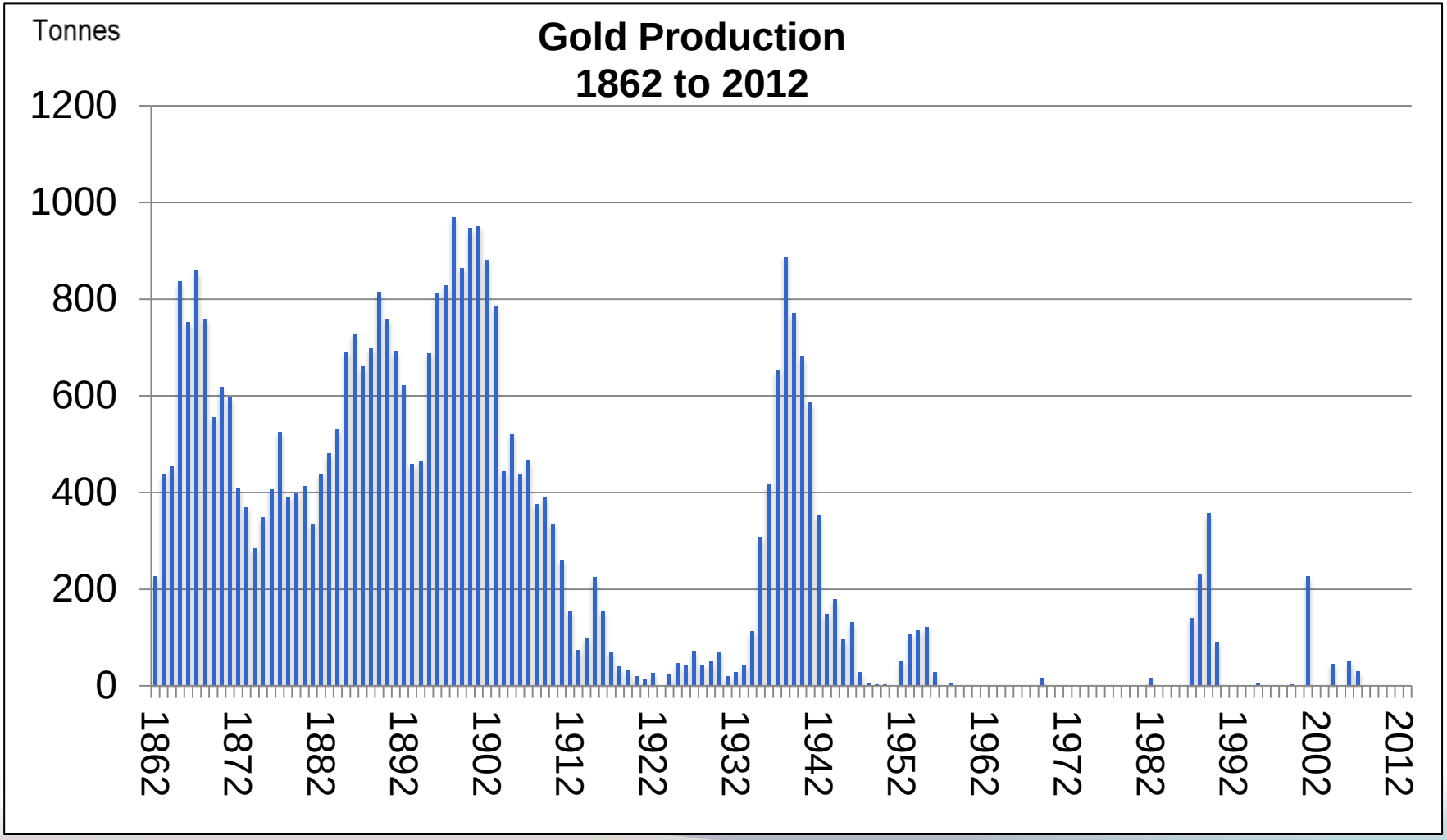
Nova Scotia has a long tradition of gold production



Moose River Gold Project

- A mineral lease was issued in August 2011.
- Project has been approved through the Environmental Assessment Process (Feb. 2008).
- The project incorporates a gold treatment plant with a 1.5 million tonne per annum throughput and a seven year mine life to produce approximately 90,000 ounces of gold per year.
- Project focused on lower grade, large tonnage mineralization.
- Capital investment of more than $140 million expected.
- It is anticipated 400 will be employed during a 12 month construction and development phase and a workforce of 170 persons will be required during the production phase.

5.0 Reclamation

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Economic Benefits Associated with Reclamation of Mines and Quarries

- In modern society, mines are developed with the intention that upon completion the site will be put to an alternative use.
- Many sites in North America are restored for innovative recreational purposes that provide many tangible and intangible benefits to communities.
- Developers are required to place a bond in Nova Scotia to ensure costs associated with reclamation are covered.
- Other common sequential land-uses include wildlife habitat, forestry, farming, residential and/or industrial developments.
- Maximum benefits are derived when communities participate in the development of reclamation plans that compliment community core values and needs.
- Numerous examples exist, both locally and in other jurisdictions, where the benefits of reclaimed mined lands are documented.

Reclamation of mine sites is required in Nova Scotia. This activity can create economic and commercial development opportunities.

29.

- Reclamation identified as an integral component of mining.
- The former Westville open pit coal operation now provides a land base suitable for recreational or light commercial use.
- 10 acres of parkland has been created and donated to the community.

Benefits of Recreational Activities

- Benefits of active recreation
  (require facilities)
  - Increased investment
  - Improved community health
  - Higher quality of life
  - Community revitalization
  - Local economic growth
  - Increased property values
  - Tourism opportunities

- Benefits of passive recreation
  (no facilities but can include parks/trails etc.)
  - Natural resource protection
  - Restored ecosystem services
  - Restored animal and plant habitat
  - Local economic development
  - Tourism opportunities

Examples of Mine Reclamation

30.

The Stellarton open pit coal operation has developed landforms for municipal recreation and infrastructure uses, such as the water tower and sports field shown below.

31.

Surface Coal Mine and Reclaimed Areas - Stellarton

From Strategy to Action

The vision

In 2020 and beyond

Nova Scotia is rich in natural resources, including biodiversity, forests, geological resources, and provincial parks.

Individuals and groups interested in our natural resources work with government to manage these resources wisely.

All Nova Scotians benefit from the natural health and wealth of the province.

Nova Scotia Department of Natural Resources (August 2011). From Strategy to Action, An Action Plan for the Path We Share, A Natural Resources Strategy for Nova Scotia, Nova Scotia Department of Natural Resources

Photograph Index:

1. Gypsum Quarry - National Gypsum (Canada) Limited (Milford, Halifax County) – World's largest known gypsum producer
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4. Clay brick products - Shaw Brick (Lantz, Halifax County)
5. Gypsum Quarry - National Gypsum (Canada) Limited (Milford, Halifax County)
6. Reproduced with permission from the Mining Association of Nova Scotia
7. Reproduced with permission from the Mining Association of Nova Scotia
8. Open pit mining - Pioneer Coal Limited (Stellarton, Pictou County)
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10. Reproduced with permission from the Mining Association of Nova Scotia
11. Locally processed mineral products (Nova Scotia Department of Natural Resources)
12. Municipal fire station constructed with locally produced building materials (Halifax Regional Municipality, Halifax County)
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16. Rock-core in provincial long-term storage facility - DNR Drill Core Library (Stellarton, Pictou County)

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18. Ship load-out and mine head-frame - The Canadian Salt Company Limited (Pugwash Harbour, Cumberland County)
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