



# WINDSOR-WEST HANTS MINING PROFILE



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## 1 Introduction

THE GYPSUM AND ANHYDRITE industries have long played a major role in the economy of Windsor-West Hants. Nova Scotia produces 80% of the total gypsum mined in Canada providing about 70% of the total demand of the United States.

Table 1 shows the types of mineral extraction which have taken place in Windsor-West Hants since confederation. More recently, gold and oil have been of interest to exploration companies in Windsor-West Hants.

**Table 1 – Historic Mineral Extraction in Windsor-West Hants**

<b>Ardoise</b>	Gold	1890-1906	7 oz
<b>Avondale</b>	Gypsum	1912-1922	238,373 tons
<b>McKay Settlement</b>	Gold	1904-1909	13 oz
	Gypsum	1948-1975	260,393 tons
<b>Wentworth</b>	Gypsum	1875-1975	55,285,122 tons
	Anhydrite	1961-1974	2,550,122 tons
<b>Cheverie</b>	Gypsum	1867-1967	1,093,314 tons
<b>Newport Station</b>	Gypsum	1912-1928	128,196 tons
<b>Windsor</b>	Limestone	1922-1946	82,311 tons
<b>Ferry Farm</b>	Limestone	1947-1948	14,260 tons
<b>Walton</b>	Gypsum	1967-1966	4,513,300 tons
	Barite	1941-1974	4,577,385 tons
	Copper	1962-1969	1,857 tons
	Lead	1962-1969	15,386 tons
	Zinc	1962-1969	3,576 tons
	Silver	1962-1969	3,475,757 oz

Source: Nova Scotia Dept. of Natural Resources.

## 2 Gypsum and Anhydrite

AS EARLY AS THE 1760s, gypsum was mined near Windsor from the first gypsum mines in North America. Knowing the demand for gypsum for use in plaster for house construction and for agricultural fertilizer, these early miners had already developed a trading route with the eastern United States. In the early 1800s, gypsum production was reported to be between 100,000 and 200,000 tonnes per year. The quarries in Hants County produced all the gypsum in Nova Scotia until 1856 when quarries were developed in Cape Breton. As the uses for

gypsum increased from agricultural uses and paint filler to the development of plaster of paris, cement retarder and wallboard or gyprock, the demand for gypsum increased dramatically. By 1939, the annual production of gypsum in Nova Scotia surpassed the one million tonne mark.

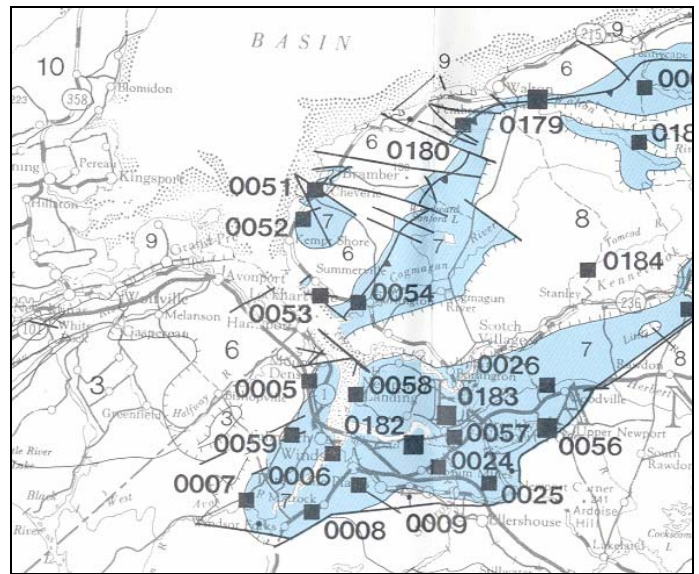


In 1826, all minerals rights in Nova Scotia were granted to the Duke of York. This was repealed in 1858, returning mineral rights to the ownership of the province. It was at this time, however, that the province divested itself of the rights to minerals used as building materials including limestone and gypsum. Thus, gypsum rights became the property of the land owner and to this day are governed differently than all other minerals in Nova Scotia.

**2.1 LOCAL CONTEXT**

West Hants has significant gypsum and anhydrite resources as shown in Figure 1. In 1991, a major study was completed by the Department of Natural Resources on the gypsum and anhydrite deposits throughout Nova Scotia which analyzed the available information and reported on the development potential of every known deposit.<sup>1</sup> Table 2 shows the potential for development of the gypsum deposits in West Hants.

**Figure 1 – Gypsum Deposits in West Hants**



Source: Nova Scotia Dept. of Natural Resources. Map 91-1, Gypsum and Anhydrite Resources in Nova Scotia. Compiled by G. C. Adams.

**Table 2 – Gypsum Potential in Windsor-West Hants**

Area	Potential	Reason
Avondale	Poor	immediate vicinity used for agriculture
Cheverie	Little	Cultural development and thin hydration
Falmouth	Rock hound	Residential; Agricultural
Gypsum Mines	Poor	Mined out but some potential for stone carvers
Kempt Shore	Possible	Small quarry for local market
Lwr Burlington	Investigation	Exact locations are not known
Mantua	Little	Hwy 14 divides deposit
Martock	Rock hound	Cultural development
McKay Section	Excellent	Areas with over 52m depth of gypsum
Millers Creek	Good	Gypsum is of low purity
Mount Denson	Possible	Anhydrite rich; roadways are a barrier to development
Pembroke	Poor	Large deposits overlain by 30+m of clastic infill
St Croix	Possible	Anhydrite rich; depends on market
Summerville	Possible	Potential for a small quarry
Three Mile Plains	Poor	Residential development
Up Falmouth	Poor	Agricultural development
Wentworth Creek	Excellent	Estimated high gypsum reserves plus over 150 million tonnes of anhydrite estimated
Windsor	Poor	Little/No economic interest
Woodville	Investigation	Small scale production

Source: Gypsum and Anhydrite Resources in Nova Scotia. Compiled by G. C. Adams.

<sup>1</sup> Adams, G. C. **Gypsum and anhydrite resources in Nova Scotia.** Halifax: Nova Scotia Dept. of Natural Resources, 1991.

### 2.1.1 Gypsum Production

Table 3 shows the production of gypsum in West Hants from 1991 to 2000. Until 1997, there were two gypsum producers in West Hants. Domtar or Georgia Pacific (Canada) operated a quarry in McKay Section which between 1948 and 1990 had produced over 400,000 tonnes of gypsum. The first calcining mill was built in this area in 1891 and remained in operation for over one hundred years.

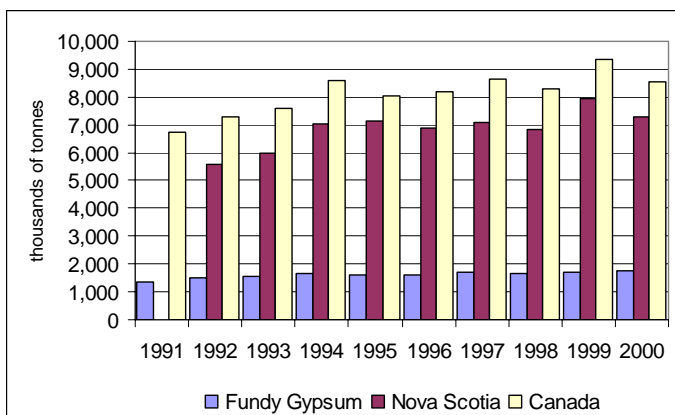
Since 1997, Fundy Gypsum, with quarries in Wentworth Creek and Millers Creek, has produced close to one quarter of the gypsum produced in Nova Scotia and a fifth of the gypsum quarried in Canada. In 2000, Fundy Gypsum built a new crushing facility at a cost of over \$20 million. It will enable Fundy Gypsum to increase production as well as provide custom products.

**Table 3 – Production of Gypsum, 1991-2000**

	Georgia Pacific (Canada)	Fundy Gypsum	Total	% of NS	% of Canada
1991	N/A	1,356,444	N/A	N/A	N/A
1992	9,246	1,492,020	1,501,266	26.9	20.6
1993	7,330	1,548,300	1,555,630	26.1	20.6
1994	9,391	1,645,425	1,654,816	23.5	19.3
1995	9,874	1,627,998	1,637,872	23.0	20.3
1996	8,264	1,607,001	1,615,265	23.4	19.7
1997	0	1,699,772	1,699,772	24.0	19.7
1998	0	1,668,708	1,668,708	24.4	20.1
1999	0	1,685,000	1,685,000	21.3	18.0
2000	0	1,735,000	1,735,000	23.9	20.3

Source: Nova Scotia Dept. of Natural Resources; Natural Resources Canada, Minerals and Metals Sector.

**Figure 2 – Production of Gypsum, 1991-2000**



Source: Nova Scotia Dept. of Natural Resources; Natural Resources Canada, Minerals and Metals Sector.

### 2.1.2 Anhydrite Production

Fundy Gypsum is also a major producer of anhydrite, a bluish-grey mineral associated with gypsum which can be used for agricultural soil neutralizer. The demand for

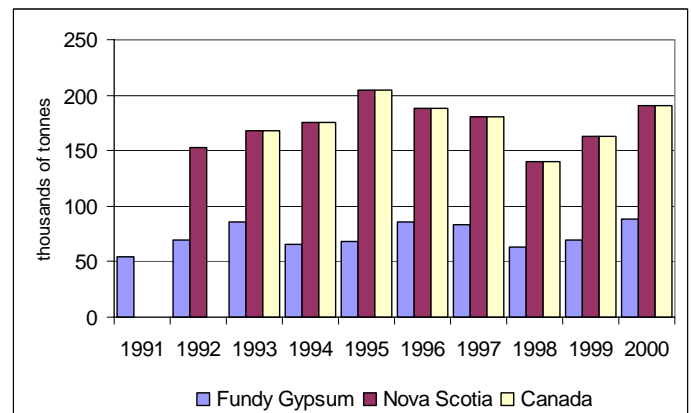
anhydrite has never been as high as for gypsum, therefore many of the older closed mines still have significant anhydrite deposits. Only two companies in Canada currently mine anhydrite: Fundy Gypsum and Little Narrows Gypsum in Little Narrows, Cape Breton.

**Table 4 – Production of Anhydrite 1991-2000**

	Fundy Gypsum	% of NS	% of Canada
1991	53,807	N/A	N/A
1992	69,298	45.4	N/A
1993	86,040	51.2	51.2
1994	65,950	37.7	37.7
1995	68,127	33.3	33.3
1996	86,000	45.7	45.7
1997	83,431	46.3	46.3
1998	63,049	45.1	45.1
1999	69,844	42.8	42.8
2000	89,000	46.6	46.6

Source: Nova Scotia Dept. of Natural Resources; Natural Resources Canada, Minerals and Metals Sector.

**Figure 3 – Production of Anhydrite, 1991-2000**



Source: Nova Scotia Dept. of Natural Resources; Natural Resources Canada, Minerals and Metals Sector.

### 2.1.3 Employment

Since the closure of the McKay Section quarry in 1997 over 160 people have been employed annually directly by Fundy Gypsum. This accounted for about 2 percent of the total employment in Windsor-West Hants in 1996. In addition, there are many local businesses which rely on the business provided by Fundy Gypsum. A prime example is The Windsor & Hantsport Railway Company. Just over 20 people are employed year-round by the short line railway which takes the gypsum from the quarry to be loaded on to ships in Hantsport.

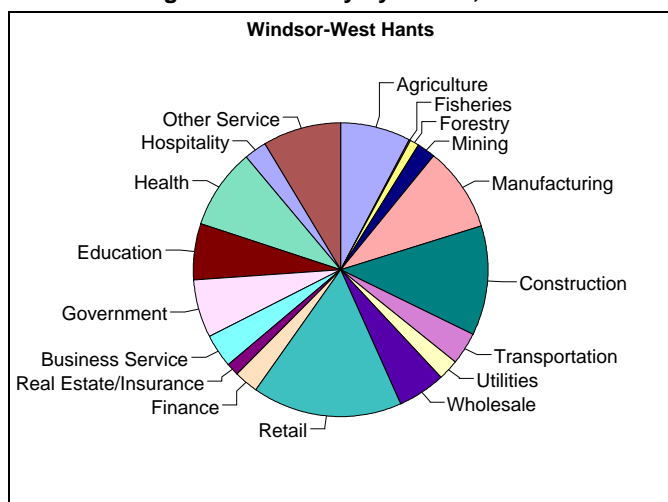
**Table 5 – Gypsum/Anhydrite Quarry Employment, 1991-2000**

	Nova Scotia	Georgia Pacific Canada	Fundy Gypsum	% of NS
1991	N/A	N/A	155	N/A
1992	469	16	180	38.4

	Nova Scotia	Georgia Pacific Canada	Fundy Gypsum	% of NS
1993	502	16	170	33.9
1994	500	4	170	34.8
1995	513	16	175	37.2
1996	508	16	170	36.6
1997	474	0	170	35.9
1998	468	0	166	35.5
1999	491	0	166	33.8
2000	501	0	201	40.1

Source: Nova Scotia Dept. of Natural Resources.

Figure 4 – Industry by Sector, 1996



Source: Statistics Canada, 1996

### 2.1.4 Value of Production

Based on the total value of gypsum and anhydrite in the province, the value of the gypsum and anhydrite produced in West Hants can be estimated. Since 1991 the value of West Hants gypsum has ranged from \$15.2 million to a high of \$18.2 million. Over the same period, the value per tonne of gypsum has increased from a low of \$9.51 in 1996 to a high of \$10.50 in 1998, 1999 and 2000.

Table 6 – Value of Gypsum, 1992-2000

	NS Gypsum Value	Value per Tonne	West Hants Value (est.)	% of NS
1992	\$56,919,000	\$10.18	\$15,193,419	26.7
1993	\$60,000,000	\$10.05	\$15,558,719	25.9
1994	\$70,000,000	\$9.94	\$16,361,457	23.4
1995	\$68,000,000	\$9.54	\$15,533,615	22.8
1996	\$65,554,000	\$9.51	\$15,280,722	23.3
1997	\$72,655,000	\$10.25	\$17,422,640	24.0
1998	\$71,703,000	\$10.50	\$17,521,450	24.4
1999	\$83,204,000	\$10.50	\$17,692,925	21.3
2000	\$76,340,000	\$10.50	\$18,218,693	23.9

Source: Nova Scotia Dept. of Natural Resources.

Table 7 – Value of Anhydrite, 1992-2000

	NS Anhydrite Value	Value per Tonne	West Hants Value (est.)	% of NS
1992	\$1,781,000	\$11.66	\$807,874	45.4
1993	\$1,980,000	\$11.77	\$1,012,837	51.2
1994	\$2,011,000	\$11.49	\$757,860	37.7
1995	\$2,332,000	\$11.41	\$777,642	33.3
1996	\$2,193,000	\$11.66	\$1,003,181	45.7
1997	\$2,148,000	\$11.93	\$995,057	46.3
1998	\$1,733,000	\$12.40	\$781,573	45.1
1999	\$2,018,000	\$12.36	\$863,106	42.8
2000	\$2,200,000	\$11.52	\$1,025,131	46.6

Source: Nova Scotia Dept. of Natural Resources.

## 2.2 NATIONAL AND INTERNATIONAL CONTEXT

The Nova Scotian gypsum industry has a significant impact in both the national and international marketplaces. Most Nova Scotia gypsum is exported to the United States. About 80 percent of the gypsum imported by the United States is from Canada.

Table 8 – Nova Scotia Gypsum for Export, 1992-2000

	Nova Scotia (tonnes)	% of Canada	Nova Scotia (value)	% of Canada
1992	5,502,562	75.4%	\$47,251,000	65.8%
1993	5,835,915	77.2%	\$56,295,000	67.8%
1994	6,815,077	79.4%	\$67,603,000	70.0%

	Nova Scotia (tonnes)	% of Canada	Nova Scotia (value)	% of Canada
1995	6,656,754	82.6%	\$66,645,000	75.4%
1996	6,578,674	80.2%	\$67,668,000	79.2%
1997	6,851,977	79.4%	\$74,108,000	77.8%
1998	6,545,537	78.8%	\$72,857,000	77.2%
1999	7,483,604	80.1%	\$78,945,000	74.0%
2000	6,876,446	80.4%	\$75,746,000	79.0%

Source: Nova Scotia Dept. of Natural Resources; Natural Resources Canada, Minerals and Metals Sector.

Table 9 shows the importance of the West Hants gypsum industry in the world market. Since 1993, West Hants has mined almost two percent of the total amount of gypsum and anhydrite produced in the world

**Table 9 – Gypsum and Anhydrite Production, 1993-2000**

	West Hants	% of World	Canada	% of World	World
1993	1,641,670	1.6	7,563,369	7.4	102,663,369
1994	1,720,766	1.7	8,587,303	8.5	101,067,303
1995	1,705,999	1.7	8,054,741	8.2	98,184,741
1996	1,701,265	1.7	8,201,774	8.2	99,611,774
1997	1,783,203	1.7	8,627,772	8.3	104,127,772
1998	1,731,757	1.6	8,306,534	7.7	107,206,534
1999	1,754,844	1.6	9,345,342	8.7	106,875,342
2000	1,824,000	1.7	8,548,139	7.9	108,698,139

Source: Nova Scotia Dept. of Natural Resources; Natural Resources Canada, Minerals and Metals Sector.

### 3 Other Resources

#### 3.1 GOLD

In 2000 and 2001, True Metallic Inc. conducted a drilling program for gold in the Castle Frederick area. As of the time of this report evaluation of the data was still in progress.

#### 3.2 OIL AND GAS

In 2001, NorthStar Energy, a subsidiary of Devon Energy, was investigating the potential for oil and gas deposits in the Cheverie Mountain area. As with gold, the results of these tests are still being analyzed.

## 4 Mining and Land Use Planning

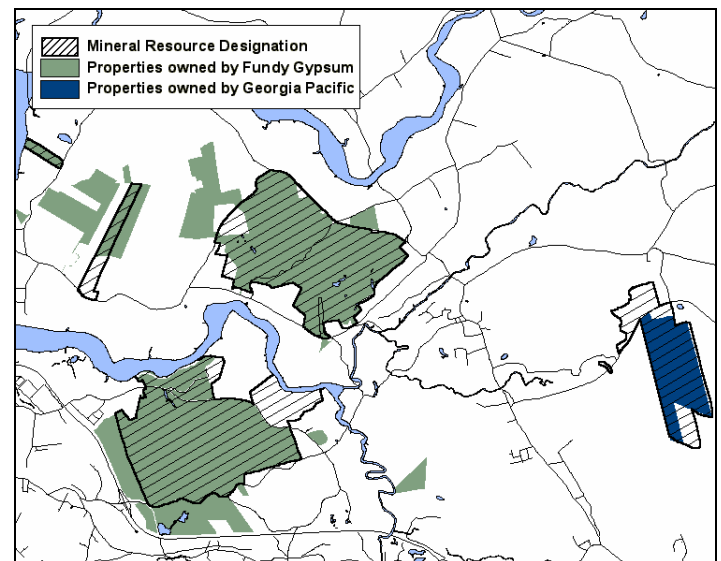
#### 4.1 CURRENT ZONING

West Hants is divided into different areas for zoning purposes. In all there are four Municipal Planning Strategies and Land Use By-laws, one each for Upper Falmouth, Falmouth and Area One as well as one for both Areas Two and Three. The documents for Falmouth, Upper Falmouth and Areas Two and Three do not

specifically mention mining uses in any zone. The Area One Strategy and By-law, however, establish both a Mineral Resource designation and a Mineral Resource zone. Area One covers the area of the existing Fundy Gypsum operations as well as the now closed Georgia Pacific site at McKay Section.

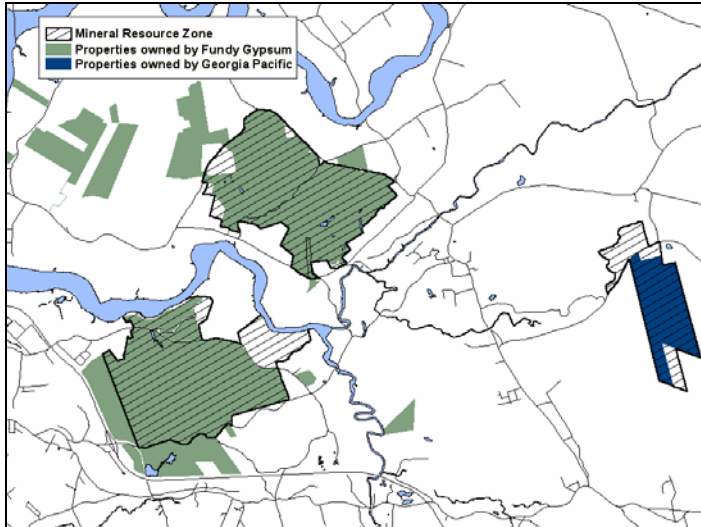
According to the Municipal Planning Strategy (MPS), mining is considered to be the primary activity in the Mineral Resource designation. The policies of the MPS allow for other uses in the designation and recognize the authority of the provincial government over mining matters. All land owned by gypsum companies and outside the growth centre, hamlets and village was designated Mineral Resource but only the active mines are zoned Mineral Resource. The MPS allows for rezoning to Mineral Resource subject to standard rezoning criteria and a review of land use conflicts and separation distance from other uses. The MPS also encourages the reclamation of closed mine sites and environmental assessments of new or expanded mines.

**Figure 5 – Mineral Resource Designation, Area One Generalized Future Land Use**



Source: Windsor-West Hants JPAC.

The Mineral Resource zone allows for a wide range of agricultural, forestry and mining uses as well as dwellings. The Land Use By-law requires a minimum separation distance of 500 feet between industrial activities and any other land use designation or existing residential, commercial or institutional buildings. There is no development permit required for development in the Mineral Resource zone unless a structure is involved.

**Figure 6 – Mineral Resource Zone,  
Area One Zoning**

Source: Windsor-West Hants JPAC.

#### 4.2 LIMITS TO LAND USE BY-LAWS

In Nova Scotia, mineral rights are owned by the Province and any company which wishes to mine for minerals must acquire the rights from the province. Gypsum, however, is not considered to be a mineral under provincial legislation. Therefore, a company may buy the rights to gypsum directly from the landowner. The granting of this right must be properly registered in the Registry of Deeds. The landowner does not give up their surface rights to the land but gives the company the right to explore for and extract gypsum on the property.

All mining operations in Nova Scotia, including gypsum, must be licensed by the Province through the departments of Natural Resources and Environment. The Department of Environment requires an environmental assessment for all new mining operations. Environmental assessments for expansions to existing operations are subject to the discretion of the Minister of Environment. Since permits and regulation of mining operations in Nova Scotia are the responsibility of the provincial government, Municipal Land Use By-laws cannot control the development of mining operations although they can regulate the location of buildings and outdoor storage.

#### 4.3 MINING PLANS AND LAND RECLAMATION

Since 1991, the Department of Natural Resources has required companies to submit mining plans for all new ventures as well as for alterations and additions to existing

mining operations. This includes gypsum operations. These plans are considered to be confidential due to the proprietary information which they may contain.

Mining plans are reviewed through a 'one-window' process which includes input from the provincial departments of Natural Resources, Environment and Labour. This process considers the acceptability of a mining operation with respect to provincial legislation and regulations. There is no consideration of municipal planning documents in this review. If any concerns are raised through this process the Department of Environment can order that the project must undergo an environmental assessment. The environmental assessment process is public and would include opportunities for input from the general public as well as the municipality.

The system for reclaiming mined land has improved greatly in the last ten years. All new developments are subject to a reclamation bond with the Department of Environment. The redevelopment of the land to a usable or acceptable condition is a process which involves the government, the company and the community.

If you have any questions or would like further information, please contact:

**Windsor-West Hants Planning Department**

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