RD82
.8C214
Sept. '92

This document was produced by scanning the original publication.

Ce document est le produit d'une numérisation par balayage de la publication originale.

MINERAL POLICY SECTOR

SECTEUR DE LA POLITIQUE MINÉRALE

MINERAL INDUSTRY QUARTERLY REPORT

SEPTEMBER 1992

LIBRARY / BIBLIOTHÈQUE
OCT 22 1992

Energy, Mines and Resources Canada
Énergie, Mines et Ressources Canada

Canada

THE ENERGY OF OUR RESOURCES - THE POWER OF OUR IDEAS

L'ÉNERGIE DE NOS RESSOURCES - NOTRE FORCE CRÉATRICE

MINERAL POLICY SECTOR

SECTEUR DE LA POLITIQUE MINÉRALE

MINERAL INDUSTRY QUARTERLY REPORT

SEPTEMBER 1992

Energy, Mines and Resources Canada
Énergie, Mines et Ressources Canada

Canada

THE ENERGY OF OUR RESOURCES - THE POWER OF OUR IDEAS

L'ÉNERGIE DE NOS RESSOURCES - NOTRE FORCE CRÉATRICE

ISSN 1188-9004

The year 1992 marks the 150th Anniversary of the Geological Survey of Canada. The Mineral Policy Sector is pleased to recognize one of Canada's oldest scientific agencies and its distinguished record of public service.

© Minister of Supply and Services Canada 1992

PREFACE

This publication is prepared by the Mineral Policy Sector of Energy, Mines and Resources Canada. Data appearing in this publication are compiled from many sources using the best information available to us. This report is intended to provide the reader with a digest of general information on the status of the mineral industry in Canada. It should not be considered an authority for exact quotation or an expression of the official views of the Government of Canada.

Your comments on the format and contents of this report are welcome. Specific comments can be directed to:

Rob Dunn
Mineral and Metal Statistics Division
Mineral Policy Sector
460 O'Connor Street
Energy, Mines and Resources Canada
Ottawa, Ontario
K1A 0E4

Telephone: (613) 996-6384
Facsimile: (613) 992-5565

INTRODUCTION

The difficulties encountered in 1991 by the Canadian economy as a whole are mirrored in the performance of the mineral industry. During the past year, the mineral industry experienced drops both in its level of production and in the prices it received for its products. The impact of these declines on the mining industry is illustrated by the number of recent mine openings and closures summarized in the article "Actual and Expected Mine Openings, Re-Openings, Expansions, Suspensions and Closures in 1992." Nevertheless, despite these declines, the Canadian mineral industry continues to be a significant and positive force in the Canadian economy. The article entitled "The Mineral Industry in the Canadian Economy - 1991" summarizes the position of the mineral industry in 1991.

This issue also presents an article entitled "Coal - 1991," which highlights the growth of the domestic demand for coal since the mid-seventies.

Although much of the glamour of the mineral industry often tends to focus on metallic minerals such as gold, silver and copper and, more recently, on diamonds, nonmetallic and structural minerals play important roles in the Canadian mineral industry. This issue features articles on five of the most important nonmetallic minerals (asbestos, graphite, potash, salt and sulphur), which collectively accounted for more than 75% of the $2.25 billion value of the Canadian nonmetallic mineral production in 1991. Also included in this issue is an article that briefly profiles the construction materials industry (cement, gypsum, dimensional stone and mineral aggregates) in 1991.

TABLE OF CONTENTS

	Page
NOTES	
Mineral Policy Sector Notes	1
Mineral Industry Information Available from MPS	2
Environmental Updates	3
REVIEWS	
The Mineral Industry in the Canadian Economy - 1991	7
Actual and Expected Canadian Mine Openings, Re-Openings, Expansions, Suspensions and Closures in 1992 (as of July 1, 1992)	16
Coal - 1991	23
Industrial Minerals in 1991:	26
Asbestos	26
Graphite	28
Potash	30
Salt	36
Sulphur	36
Construction Materials	38
STATISTICAL TABLES	
1. Canada, Production of Leading Minerals	42
2. Metal Prices, 1992	43
3. Canada, Real Gross Domestic Product at Factor Cost by Industry, in 1986 Prices, Quarterly	44
4. Canada, Real Gross Domestic Product at Factor Cost by Industries Involved in Mineral Manufacturing, in 1986 Prices, Quarterly	45
5. Canada, Principal Statistics of the Mineral Industry, 1990	46
6. Canada, Principal Statistics of the Mineral Industry, 1989	47
7. Canada, Principal Statistics of the Mineral Industry by Region, 1990	48

		Page
8.	Canada, Principal Statistics of the Mineral Industry by Region, 1989	48
9.	Canada, Principal Statistics of the Mineral Industry, 1983-90	49
10.	Canada, Employment, Salaries and Wages in the Mineral Industry, 1983-90	50
11.	Canada, Principal Statistics of the Mineral Manufacturing Industries, 1989	51
12.	Canada, Principal Statistics of the Mineral Manufacturing Industries by Region, 1989	53
13.	Canada, Principal Statistics of the Mineral Manufacturing Industries 1908-89	54
14.	Canada, Employment, Salaries and Wages in the Mineral Manufacturing Industries, 1983-89	55
15.	Canada, Consumption of Fuel and Electricity in the Mineral Industry, 1990	56
16.	Canada, Cost of Fuel and Electricity Used in the Mining Industry, 1983-90	57
17.	Canada, Mineral Products Industries, Selling Price Indexes, 1985-91	58
18.	Canada, Selling Price Indexes of Mineral Raw Materials, 1985-91	59

NOTES

Mineral Policy Sector Notes

STAFF APPOINTMENTS

Ron Sully, Assistant Deputy Minister of the Mineral Policy Sector (MPS), Energy, Mines and Resources Canada, is pleased to announce the appointment of Neil Swan to the position of Director General, Mineral Strategy Branch, MPS, effective June 2, 1992.

Dr. Swan replaces Gordon Peeling who has accepted the position of Director General, Mineral and Metal Commodities Branch. Mr. Peeling will be responsible for the development and implementation of policies and programs to promote the economic development, production, utilization and market position of mineral and metal commodities.

Dr. Swan will be responsible for coordinating the development and implementation of federal mineral policies in accordance with federal economic and other objectives, and for advising on the strategies to be employed to attain the Government's domestic and international goals for minerals and metals. Dr. Swan was formerly the Senior Research Director at the Economic Council of Canada.

UPCOMING EVENTS

The 1992 Mineral Outlook Conference, "Mineral Outlook '92," will be held at The Westin Hotel in Ottawa on **Wednesday, November 18, 1992**. This one-day conference, jointly sponsored by Energy, Mines and Resources Canada and The Mining Association of Canada, will present issues of current interest to the industry.

Further details on this conference can be obtained by contacting Lyne Lagacé, MPS's Conference Coordinator, at (613) 996-7788.

NEW DESIGN ELEMENT

To better identify its products and services, the Mineral Policy Sector (MPS) has developed a new design element. Readers may have noticed the appearance of the design on the cover of the June 1992 issue of this report which was, in fact, the initial use of the symbol. The same element again graces the cover of the current issue of the *Mineral Industry Quarterly Report* and it will, in the future, be incorporated on all publications, reports and displays prepared by MPS. The new symbol is intended to reflect the importance of the Canadian mineral and metal industry as a supplier of commodities to the world and, at the same time, to portray MPS's important role in various international activities, including trade and the environment. The inner sphere represents the earth's core, the ultimate source of all mineral resources.

Mineral Industry Information Available from MPS

THE CANADIAN MINERALS YEARBOOK, 1991

Each year, the Mineral Policy Sector completes a comprehensive review of developments in the mineral and metal industry and publishes the results as the *Canadian Minerals Yearbook*. The Yearbook series forms a continuing record from year to year, with the current edition reporting on the activities of the industry during 1991.

The leading chapter of the Yearbook provides a general review of the Canadian economy and the performance of the mineral industry during the year. Separate chapters address the regional and international scenes; labour and employment; mine reserves, developments and promising deposits; mineral exploration; and mine openings and closures.

The commodity chapters form the major part of this publication. The subject matter spans all stages of industry activity from geoscience and exploration, through mining and processing, to markets, prices, trade, production, consumption, and recycling. They also provide an outlook of the industry's future.

The statistical summary at the end of the Yearbook contains over 90 tables which provide statistical data on production, trade, consumption, prices, employment, mining and exploration, transportation, investment, research and development, and other pertinent statistics of the mineral industry.

The 1991 edition of the Yearbook was published by the Mineral Policy Sector of Energy, Mines and Resources Canada in August 1992. It can be purchased from the Canada Communication Group–Publishing (telephone: (819) 956-4802) and associated bookstores.

WORLD MINERAL NOTES

The International Mineral Relations Division of MPS collects and disseminates information on world mineral activities that may be of interest from a Canadian perspective. *World Mineral Notes*, which is published on a quarterly basis, provides a useful review of this information. Copies may be obtained by contacting the MPS Publications Distribution Office.

ELECTRONIC DISTRIBUTION OF PUBLICATIONS

MPS is currently investigating the electronic distribution of this and other sector publications. If you have access to a link on the Internet and would, at some future date, prefer to receive this publication electronically, please send a message advising of your interest to: bmccutch@emr.ca.

If you have an account on another network (such as Compuserve), you may still be able to receive mail from the Internet. Contact your representative to obtain information on how to send a message to Internet users. You may also wish to enquire about the charges you will incur for receiving publications (such as the charge per kilobyte).

Please remember that we have not yet established a system to distribute

information electronically. However, your interest will be recorded and will be used in making future publication decisions.

MINERAL INDUSTRY INFORMATION CONTACT POINT

In order to provide our clients with timely access to information describing the mineral industry, MPS has established a contact point through which requests for specific statistical information on the mineral industry can be channelled. Once a request has been received, it will be immediately directed to the appropriate officer for response. This contact point is:

Despo Makris
Mineral and Metal Statistics Division
Mineral Policy Sector
Energy, Mines and Resources Canada
460 O'Connor Street
Ottawa, Ontario
K1A 0E4

Telephone: (613) 992-6522
Facsimile: (613) 992-5565

MPS PUBLICATIONS DISTRIBUTION OFFICE

The Mineral Policy Sector of EMR publishes a number of information products including regular and special publications, posters, and other material. These can be obtained from:

Publications Distribution Office
Mineral Policy Sector
Energy, Mines and Resources Canada
460 O'Connor Street
Ottawa, Ontario
K1A 0E4

Telephone: (613) 992-1108

Environmental Updates

As a regular feature in the *Mineral Industry Quarterly Report*, the Resource Management Division, MPS, proposes to include a synopsis of developments in environmental protection and regulation of interest to the mineral industry.

We need some advice. Do you, the reader, think that such a feature would be useful? What sort of emphasis would you like to see? Can you provide suggestions for an interesting (and translatable) title for this feature? Could/would you contribute items to the page? Please communicate your ideas/opinions to Sally Hamilton (telephone: (613) 995-9065 or facsimile: (613) 992-5244).

To get the ball rolling, here are some environmental items of interest to the mineral industry noted by MPS in recent months.

- On June 23, 1992, the Senate completed Third Reading of Bill C-13, the *Canadian Environmental Assessment Act* (CEAA). The CEAA received Royal Assent on the same day, but it will not be proclaimed until early in 1993. A number of regulations spelling out the circumstances under which the CEAA applies must be drafted and approved before the Act can come into force. Meanwhile, the Environmental Assessment Review Process Guidelines Order still applies.

- On July 8, 1992, the Government of Ontario released the draft Environmental Bill of Rights and a paper outlining the considerations that went into the draft. Interested parties have until mid-October to provide comments.

- The British Columbia Ministry of Environment, Lands and Parks is proposing four new pieces of legislation covering: environmental assessment; environmental protection; the protection of fish, wildlife and their habitats; and water management. Two discussion papers, *New Approaches to Environmental Protection in British Columbia - A Legislation Discussion Paper,* and *New Directions in Environmental Protection: Five-Year Action Plan (1992-1997*), were released in late April to open the consultation phase. The legislation discussion paper covers several topics of particular interest to the mineral industry such as: equivalency with federal legislation, zero pollution objectives, polluter-pay principle, toxics use reduction legislation, best available control technology, taxes and emissions or effluent charges, transferable emissions rights, etc.

- In June 1992, the Environmental Protection Service of Environment Canada released the *Report on Regulatory Initiatives in Conservation and Protection*. The report includes the title of the statute, a description of the proposal, the process schedule and a list of people that may be contacted regarding various aspects of the initiative. Contact Muriel Menard at (819) 997-2047 or Jeanne Courtemanche at (819) 953-1171 for more information.

- The *Federal Regulatory Plan 1992* is available from:

  Treasury Board Distribution Centre
  Ottawa, Ontario
  K1A OR5

  Telephone: (613) 995-2855

  The Plan provides a synopsis of the Government's anticipated regulatory activity for the year. In some cases, regulations will be streamlined, simplified or eliminated. In others, new regulations will be developed. Included in each entry is the name, address and telephone number of a contact person.

REVIEWS

TABLE 1. ECONOMIC DIMENSIONS OF THE MINERALS AND METALS SECTOR, 1991p

Economic Indicator	STAGE I Mining and Concentrating	II Smelting and Refining	III Semi-Fabricating	IV Metal Fabricating	Stages I + II	Stages I + II + III	Stages I + II + III + IV
OUTPUT							
Value of shipments (billions of 1991 dollars)	14.5	12.9	12.7	14.5	27.4	40.1	54.6
Gross Domestic Product (billions of 1986 dollars)	7.1	5.1	4.6	5.1	12.2	16.8	21.9
Percent share of total GDP	1.4	1.0	0.9	1.0	2.4	3.4	4.4
EMPLOYMENT							
Employment	71 800	66 600	79 300	112 300	138 300	218 000	330 000
Percent share of total employment	0.6	0.5	0.6	0.9	1.1	1.8	2.7
INVESTMENT							
Investment (capital and repair) ($ billion)	3.7	3.9	1.2	0.4	7.6	8.7	9.1
Percent share of total investment	2.3	2.4	0.7	0.2	4.6	5.3	5.6
New investment (capital only) ($ billion)	1.9	2.3	0.5	0.2	4.2	4.7	4.9
Percent share of total new investment	1.5	1.8	0.4	0.2	3.3	3.7	3.9
EXTERNAL TRADE							
Exports ($ billion)	8.7	8.2	4.7	1.9	17.0	21.7	23.6
Percent share of total domestic exports	6.3	6.0	3.4	1.4	12.3	15.7	17.1
Imports ($ billion)	2.6	2.8	5.1	2.3	5.4	10.5	12.8
Percent share of total imports	1.9	2.1	3.8	1.7	4.0	7.8	9.5
Balance of trade ($ billion)	6.2	5.4	–0.4	–0.4	11.6	11.2	10.8

Sources: Mineral and Metal Statistics Division, Mineral Policy Sector, EMR Canada; Statistics Canada.
p Preliminary, June 24, 1992.
Notes: Components may not add due to rounding. All dollar figures are in current dollars, except Gross Domestic Product, which is the GDP by industry at factor cost at 1986 prices. Data include coal and uranium, but exclude petroleum and natural gas and their products.
Stage I includes crude mineral ores and concentrates.
Stage II includes ferrous and nonferrous smelting and refining.
Stage III includes metal semi-fabricated products, wire and wire products, and nonmetallic mineral products.
Stage IV includes fabricated metal products, except wire and wire products, which are in Stage III.

REVIEWS

The Mineral Industry in the Canadian Economy - 1991

A.B. Siminowski
Telephone: (613) 943-8096

Jane Currie
Telephone: (613) 992-5798

This article summarizes the mineral industry's performance in 1991 and highlights its importance within the context of the Canadian economy. Table 1 (Economic Dimensions) on page 6 provides an economic snapshot of the mineral industry in 1991. The data in the table and in the charts accompanying this article include coal, but exclude petroleum and natural gas, and are presented in terms of four stages of processing activity within the mineral industry. It should be noted that activities associated with recycling are an important and integral part of mineral industry operations. The four stages are defined as follows:

- Stage I - Primary Mineral Production (mining and concentrating);
- Stage II - Metal Production (smelting and refining);
- Stage III - Minerals and Metals-Based Semi-Fabricating Industries; and
- Stage IV - Metal Fabricating Industries.

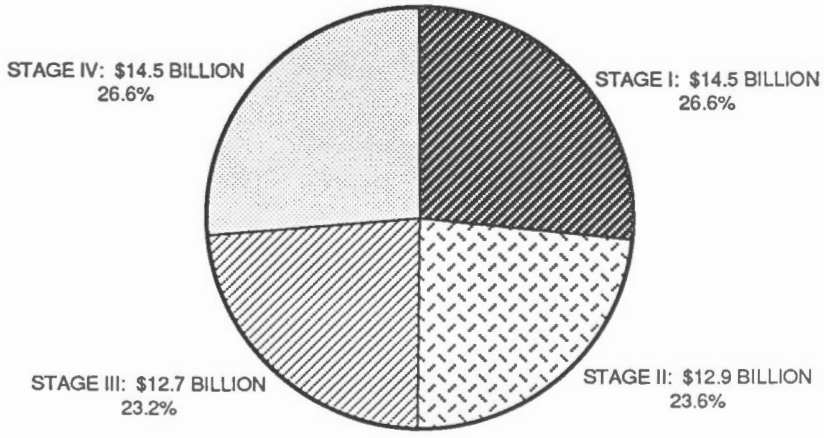
The following sections, which discuss industry output, employment, investment and trade, illustrate the overall importance of the industry to the economy, as well as the relative significance of each of the four stages of activity. The 1991 data are preliminary, while the 1990 figures incorporate revisions to the data originally presented in last year's corresponding article.

OUTPUT

The value of shipments by the mineral industry totalled $54.6 billion in 1991 compared with $61.4 billion in 1990, with each of the four stages accounting for about one quarter of the total. The 11.1% decline from the 1990 level reflected a general weakening in the Canadian economy during 1991, particularly in the goods-producing industries. Commodity prices were on a general downward trend throughout 1991.

Figure 1

VALUE OF SHIPMENTS - 1991
MINERAL INDUSTRY - $54.6 BILLION



By year-end, the Raw Materials Price Index for nonferrous metals, as reported by Statistics Canada, had fallen by 16.1% from its December 1990 level. In addition, the Raw Materials Price Index for ferrous materials fell by 4.5%, and for nonmetallic minerals by 3.3%.

Similarly, the Industrial Product Price Index for primary metal products continued the downward slide that had begun in the last quarter of 1990. By December 1991, after 15 consecutive monthly declines, the primary metal products index was 8.2% below its December 1990 level, falling to its lowest point since April 1987. On the other hand, the Industrial Product Price Indexes for fabricated metal products and for nonmetallic mineral products remained relatively constant over the course of the year. Nevertheless, the total value of shipments was lower in each of the four stages of the mineral industry.

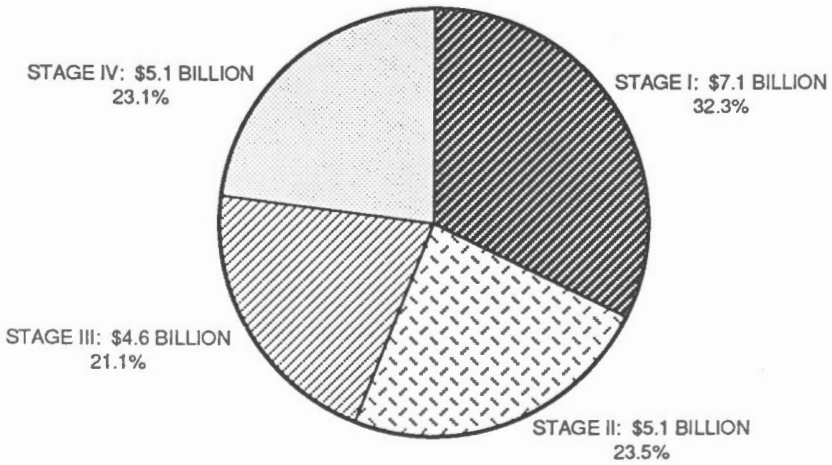
It should be noted that the "value of shipments" measure for each stage of activity is gross, not net. Therefore, since the output of one stage is the input for the next stage, there is an element of double counting in terms of value added. Gross Domestic Product (GDP) is another useful measure of output and eliminates the double counting inherent in the "value of shipments" measure.[1] In terms of GDP by industry at factor cost (measured on the basis of 1986 prices), Statistics Canada reported that the mineral and metal industry contributed $21.9 billion to the Canadian economy in 1991.[2] This level of output, however, represented a decline of 5.5% from the 1990 level of $23.2 billion, resulting from significant reductions in output from the semi-fabricating and fabricating stages of the industry (-11.4% and -13.8% respectively).

These decreases reflected the overall weakness of the Canadian manufacturing sector in 1991. In contrast, the GDP in Stage I (mining) fell only slightly by 0.1%, while Stage II (smelting and refining) rose by 2.5%. Overall, the mineral industry accounted for 4.4% of total industry GDP in 1991, averaging 4.7% over the past several years. The mining sector (Stage I) has generally represented about 30% of mineral industry GDP.

Figure 2

GDP AT FACTOR COST - 1991 (IN 1986 DOLLARS)

MINERAL INDUSTRY - $21.9 BILLION



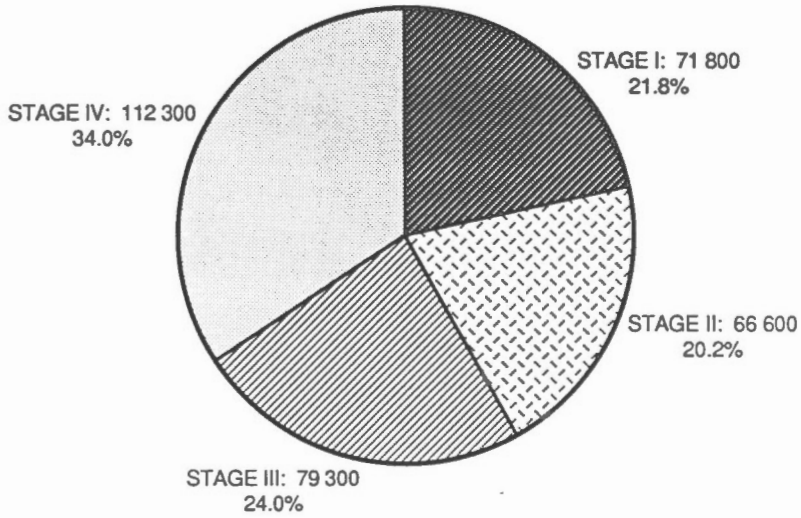
EMPLOYMENT

Preliminary estimates of employment in the mineral industry in 1991 totalled 330 000 (including all four stages), accounting for 2.7% of total national employment. Mineral industry employment was down by 12.7% from the 1990 level of 378 000. All stages of the industry experienced a decline, particularly the semi-fabricating and fabricating mineral industries. The total number of employees in Stage I (metal mining, nonmetal mining, quarrying and coal mining) was 72 000, down by 4.2% from 75 000 in 1990. Employment in Stage II (smelting and refining) was 67 000, down by 5.7% from 71 000 in 1990. Employment in Stages III and IV (semi-fabricating and fabricating mineral industries) fell by 17.5% to 192 000 in 1991 from 232 000 in 1990.

Figure 3

EMPLOYMENT - 1991

MINERAL INDUSTRY - 330 000



INVESTMENT

Preliminary estimates by Statistics Canada (based on its annual survey of public and private investment) indicated that capital investment by the mineral industry on construction, machinery and equipment totalled $4.9 billion in 1991 compared to $6.2 billion in 1990. This 20.5% decrease from the 1990 level reflected lower capital expenditures in all stages of the industry. Capital spending in the mining sector was down by 23.2% ($1.9 billion versus $2.5 billion in 1990). Overall, capital spending by the mineral industry in 1991 represented 3.9% of total capital spending in the economy.

Repair expenditures were $4.2 billion, down from $4.7 billion in 1990. Including these outlays for repairs, the combined spending for capital investment and repair was $9.1 billion, compared to $10.9 billion in 1990. This level of spending by the mineral industry in 1991 represented 5.6% of the total capital and repair expenditures by all sectors of the Canadian economy.

Figure 4

CAPITAL EXPENDITURES - 1991

MINERAL INDUSTRY - $4.9 BILLION

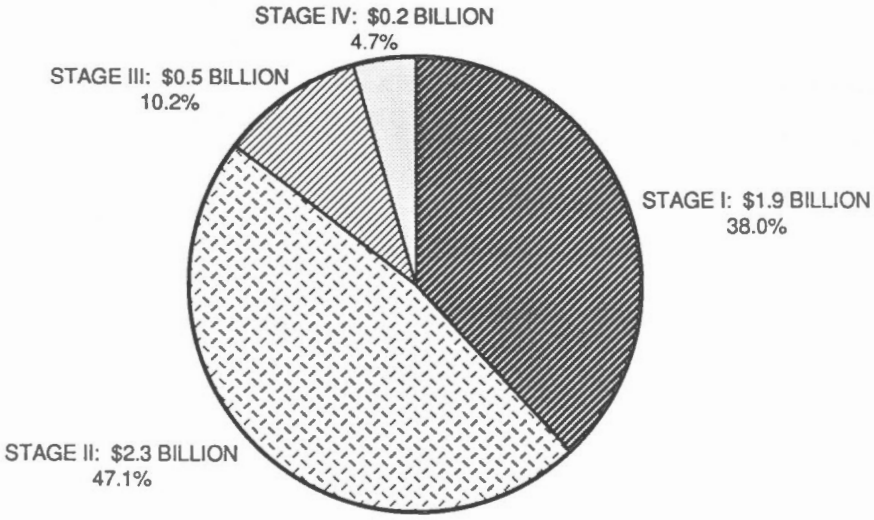
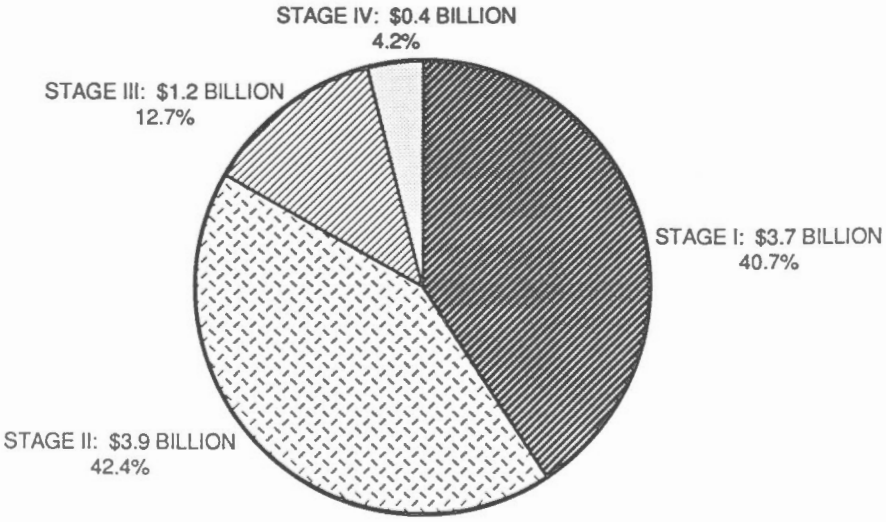


Figure 5

CAPITAL AND REPAIR EXPENDITURES - 1991

MINERAL INDUSTRY - $9.1 BILLION



TRADE

Mineral and mineral product exports in 1991 were about $23.6 billion, representing all four stages of the industry.[3] This included crude minerals, smelted and refined products, semi-fabricated and fabricated forms, as well as waste and scrap for recycling. Stages I and II, the mining and metallurgical extraction industries, account for almost three quarters of this total. Although mineral exports were down from the 1990 level of $24.9 billion, the industry continued to maintain a significant share of total Canadian exports, accounting for 17.1% of the total in 1991, compared to 17.6% in 1990.[4]

The United States continued to be Canada's major minerals export market. In 1991, mineral exports valued at $13.1 billion went to the United States, representing 55.7% of such exports (including coal, but excluding petroleum and natural gas), while 12.4% went to the European Community and 11.3% went to Japan.

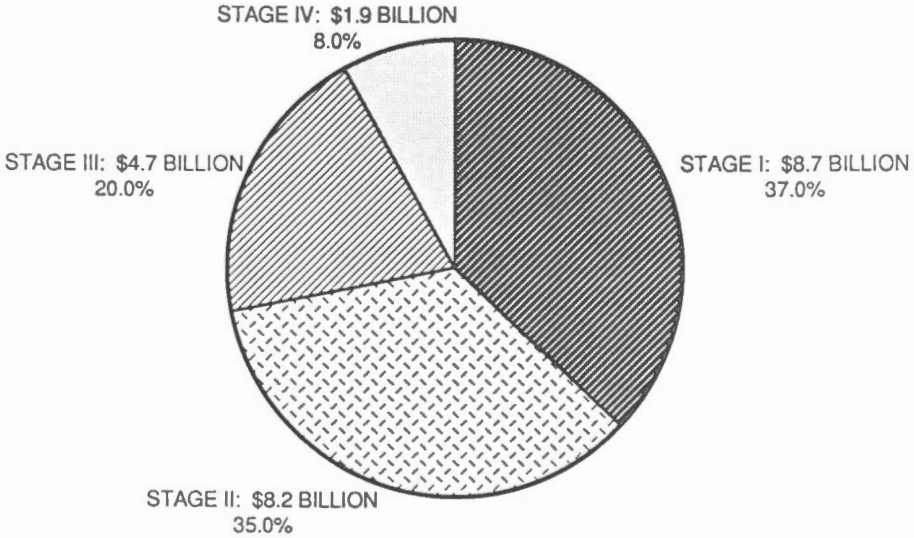
Mineral and mineral product imports were $12.8 billion in 1991, down from the previous year's level of $13.8 billion. About 68.7% ($8.8 billion) of the imports in 1991 came from the United States, with 11.7% from the European Community and 3.4% from Japan.

Overall, the Canadian mineral industry contributed a trade surplus of about $10.8 billion to Canada's merchandise balance of trade.

Figure 6

EXPORTS - 1991

MINERAL INDUSTRY - $23.6 BILLION



CONCLUSION

By way of summary, the figures at the end of this article (Figures 7 through 12) provide an historical overview of the mineral industry's performance over the past six years in terms of shipments, GDP, investment, employment and exports. Canada's mineral industry has traditionally been a source of strength to the overall economy, having accounted for an average of 4.7% of GDP over the past several years, more than 3% of national employment, and about 18% of Canadian exports. In addition, expenditures by the mineral industry on capital investment and repair have represented major spending within the Canadian economy. Despite the economic slowdown in 1991, the mineral industry was able to maintain its position as a major contributor to the Canadian economy.

REFERENCES

[1] Gross Domestic Product by industry at factor cost is a measure of total economic output. It is a value-added concept in that it measures only the net output of an industry, i.e., the value produced at a given stage of production after subtracting the cost of intermediate goods and services. This value added is attributable to the costs of the factors of production (land, labour and capital) that are used in producing the output. GDP by industry at factor cost equals the sum of the values added, i.e., the contributions made by each sector of the economy. To convert "GDP by industry at factor cost" to "GDP at market prices" (simply referred to as GDP), one must add an additional component to the GDP at factor cost, namely, indirect taxes net of subsidies.

[2] In 1990, Statistics Canada converted its constant price GDP series to a new base year using 1986 prices. The previous base year had been 1981. This change continued the policy of updating the time base from time to time in order to reflect more recent price structures. Constant price GDP estimates provide the necessary data to measure real economic growth from one period to another. By using the prices from a particular base year (e.g., 1986 prices), the effect due to year-to-year price changes is removed.

[3] As of January 1, 1988, Canadian external trade statistics have been classified and reported by Statistics Canada according to a new international commodity coding system referred to as the "H.S." or "Harmonized System" (Harmonized Commodity Description and Coding System). Total exports and imports for the years 1988 to 1990, as referred to in this article, are based on data as reported according to H.S. chapter summaries, i.e., those classes or commodity chapters that represent the mineral and metal product groups. The breakout by stage is based on a preliminary approximation by the Mineral and Metal Statistics Division of EMR Canada. A computer system to disaggregate the data by stage of processing is currently being developed by EMR and is expected to be available later this year. Due to the implementation of the new H.S. coding system, as well as other changes in data collection and reporting procedures at Statistics Canada, the year-to-year historical data may not be directly comparable.

[4] The mineral industry's share of Canadian exports is based on "domestic exports," i.e., total Canadian exports less re-exports. Re-exports are exports of goods of foreign origin which have not been materially transformed in Canada.

The material in this article supplements and updates the information contained in an earlier article, "The Canadian Mineral

Industry - 1991 In Review," which focused on Canada's mineral production and trade, and which appeared in the June 1992 issue of the Mineral Industry Quarterly Report. Information contained in this review was current as of July 1992.

Figure 7

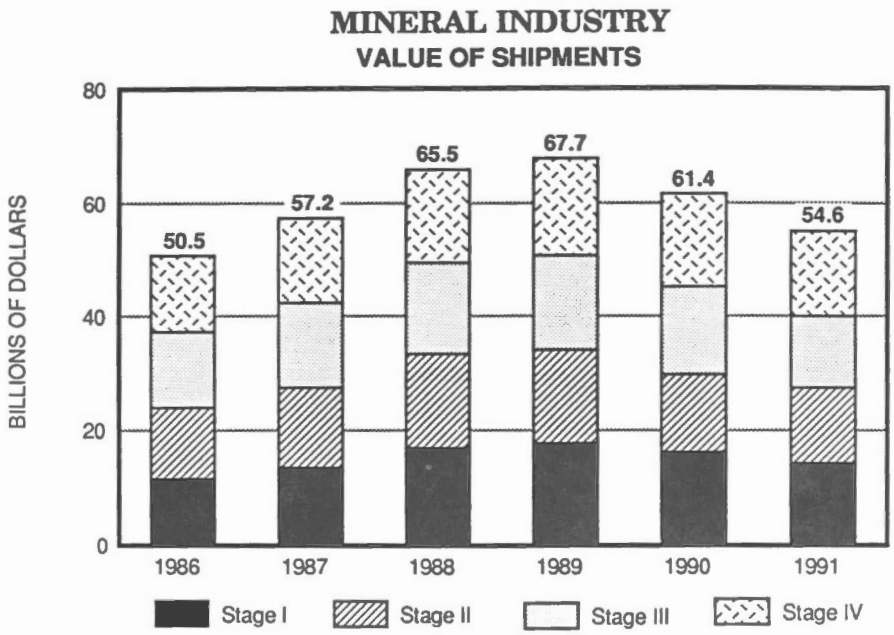


Figure 8

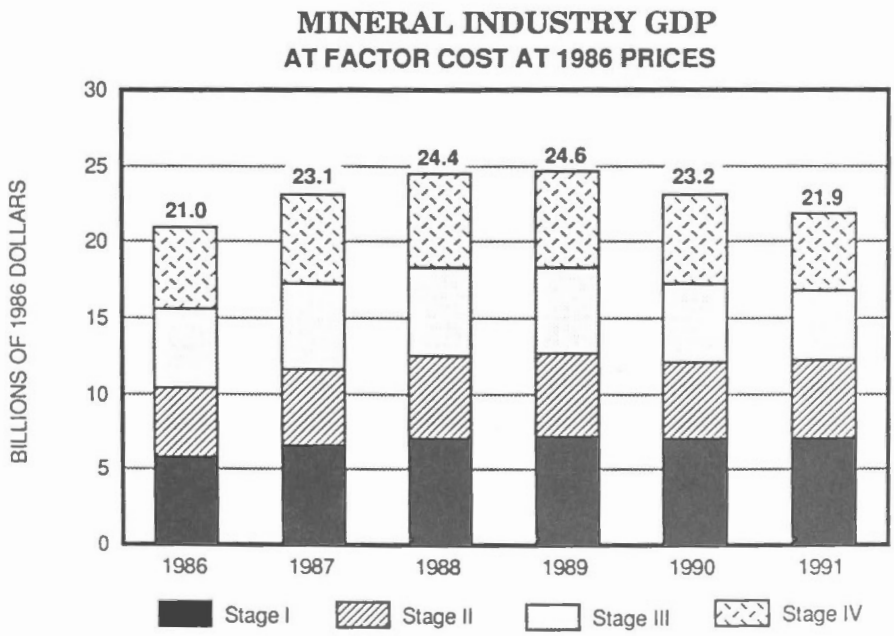


Figure 9

MINERAL INDUSTRY EMPLOYMENT

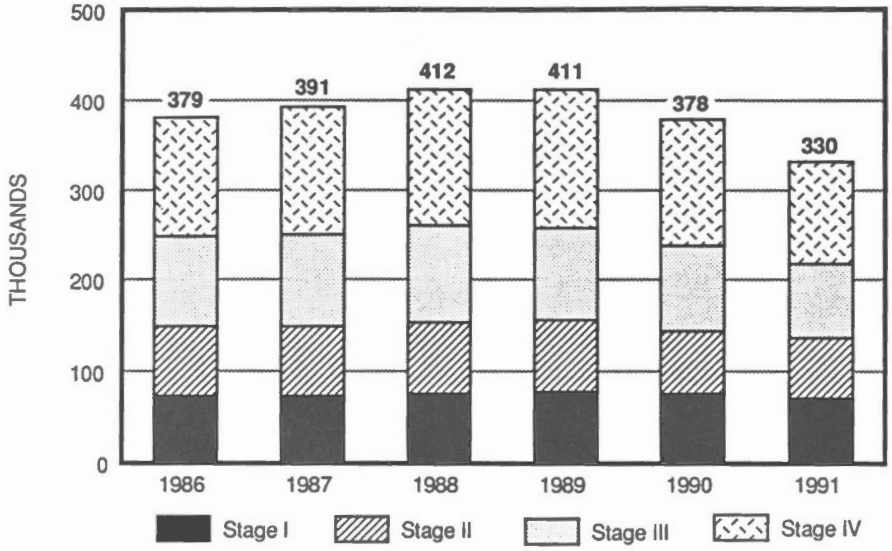


Figure 10

CAPITAL EXPENDITURES

MINERAL INDUSTRY

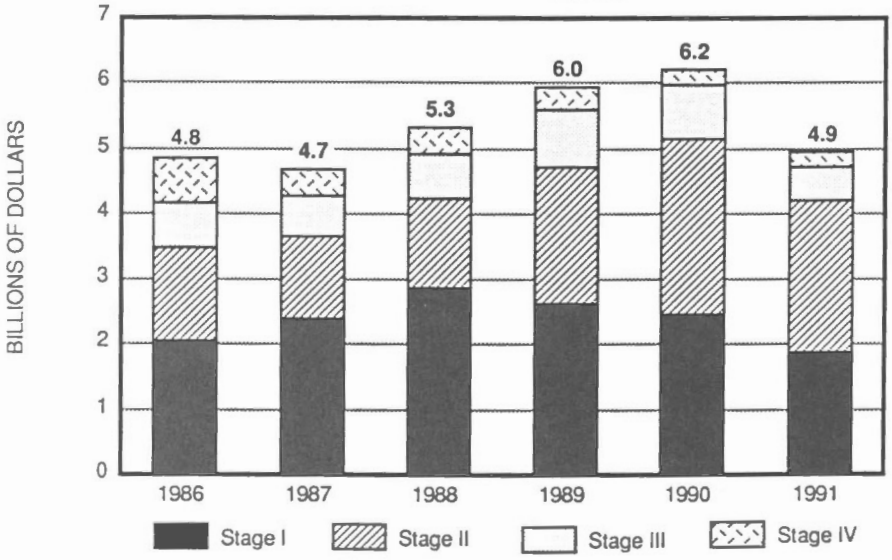


Figure 11

CAPITAL AND REPAIR EXPENDITURES

MINERAL INDUSTRY

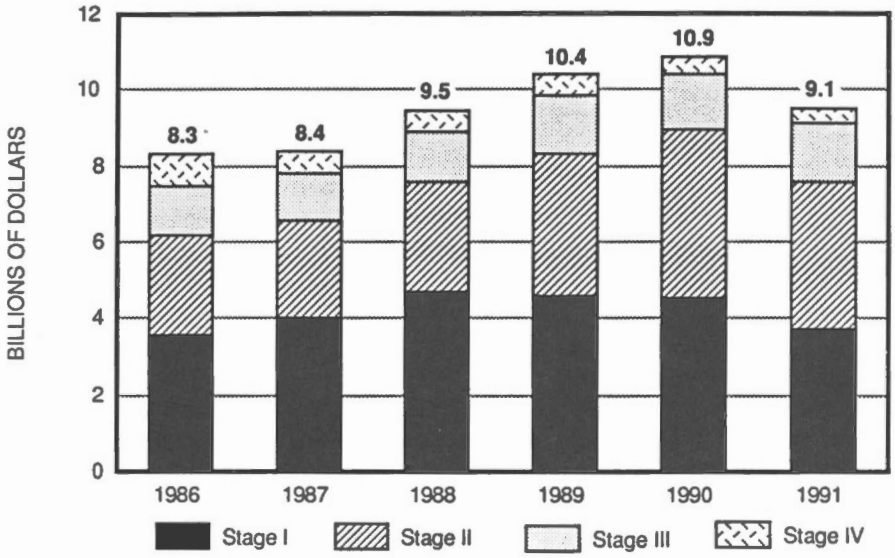
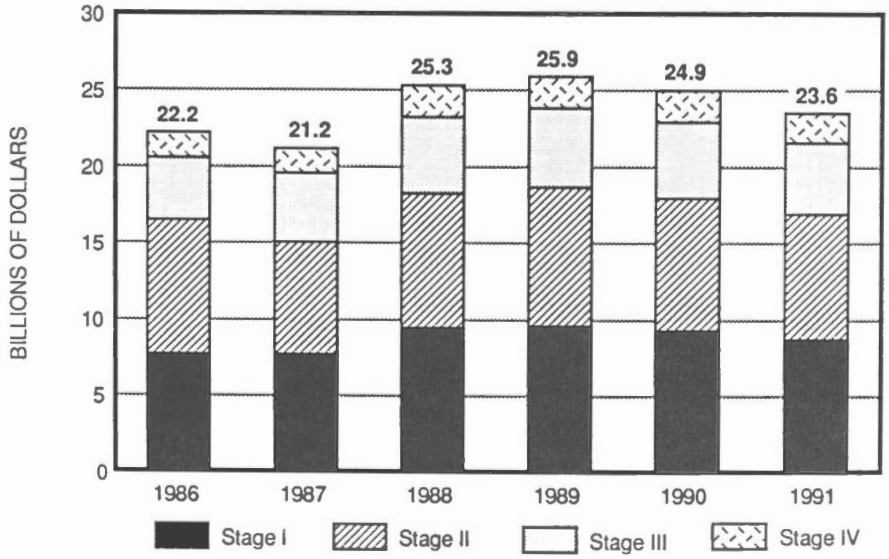


Figure 12

MINERAL INDUSTRY EXPORTS



Actual and Expected Canadian Mine Openings, Re-Openings, Expansions, Suspensions and Closures in 1992

Lo-Sun Jen
Telephone: (613) 992-0658

Mine opening and closure activities and plans in the first half of 1992 continued to show a battered Canadian mining sector (Table 1). Prior to July 1, fourteen mines (four gold, six base-metal, two coal, one asbestos and one uranium) closed or suspended operations; another seven (four gold, two silver base-metal, and one base-metal) are scheduled to shut down before year-end 1992. No new mines came on stream in the first half of the year, although one asbestos operation re-opened. This scenario, however, is expected to improve in the second half of 1992 when four new mines (one gold, two base-metal and one limestone) are scheduled to come on stream. In addition, two gold mines are expected to re-open. For 1992 as a whole, it is expected that there will be seven mine openings (four new and three re-opened) and twenty closures (six suspensions and fourteen permanent shut-downs).

Among the new mines planned to open in 1992 are the Lindsley (Thayer Lindsley) copper-nickel mine and Monk gold mine in Ontario, the Grum zinc-lead-silver mine in the Yukon, and the Glen Morrison limestone quarry in Nova Scotia. Furthermore, the Hope Brook gold mine in southwest Newfoundland and the Rundle gold mine near Timmins, Ontario, are scheduled to re-open in late July and at year-end, respectively. The Baie Verte asbestos tailings wet process operation at Baie Verte, Newfoundland, re-opened in April of 1992.

On a regional basis, northwestern (Baie Verte area) and southwestern regions of the Island of Newfoundland stand to benefit the most, with two mine openings and no closures in 1992. By contrast, southern and northwestern British Columbia will be most hard hit with seven mine closures and no offsetting openings. While three mines in northern Ontario will be opened, these will not be sufficient to offset the negative impact of five mine closures in the province over the year. The most notable closure to date is that of the Denison mine at Elliot Lake, North America's largest underground uranium mine, which was permanently closed in March after 35 years of operation. Denison was the largest employer among the five mines that have so far closed in Ontario during the year.

In southwestern Nova Scotia, East Kemptville, the only producing tin mine in North America, closed on January 3, 1992. Although the Glen Morrison mine, a significant high-quality sulphur-absorbent limestone operation near Sydney, is scheduled to open in September, it is not likely that it can quickly offset the negative impact of the closure of East Kemptville. The Abitibi-Temiscamingue region of Quebec continues to suffer from mine closures. In the first quarter of 1992, the region lost two important mines, the Mobrun copper-zinc mine and the Lac Shortt gold mine; the Camflo gold mine will close in October. The Snow Lake area of northern Manitoba has suffered from the closure of the Spruce Point copper-zinc mine in March. While preparing for the closure of the giant Faro open-pit and underground mine operations in central Yukon by year-end, Curragh Resources

Inc. is bringing in the nearby Grum zinc-lead-silver deposit to replace it. In conjunction with the nearby Vangorda mine, Grum could offset the impact of closure of the Faro operations without incurring significant production or employment losses.

While most mine suspensions were the result of low metal prices, most permanent closures were due to the depletion of ore reserves.

Most of the important mine expansion projects that were started in the 1989-90 period will be completed by the end of 1992. These include mine production and mill capacity expansion projects at the Joe Mann and Bousquet No. 2 gold mines (including the Est-Malartic mill that processes ore from Bousquet) in Quebec, and at the Kerr (formerly Kerr Addison) gold mine in Ontario. Expansion at the Birchtree nickel-copper mine at Thompson, Manitoba, will continue. Plans to double coal production to 500 000 metric tonnes (t) per year at the Quinsam coal mine at Campbell River, British Columbia, originally scheduled for 1991, have been rescheduled for 1992. In 1992, mine closures (including suspensions) are again expected to exceed mine openings (including re-openings), continuing a trend that started in 1990. While new and re-opened Canadian mines added nearly 26 000 t of daily production capacity and some 870 jobs in 1992, mine suspensions and closures reduced Canadian ore production capacity by some 107 000 t per day and eliminated over 5100 jobs, for net overall losses of 81 000 t of daily capacity and some 4200 jobs for the year. These net losses are, or will be, the result of the closure of several large mines, including the Denison uranium mine in Ontario, the Bell copper and Equity Silver silver-gold-copper mines in British Columbia, and the Faro open-pit zinc-lead-silver operations in the Yukon, as well as the suspension of operations at the Balmer coal mine in British Columbia.

Note: Information in this article was current as of July 1, 1992.

TABLE 1. CANADIAN MINE OPENINGS, RE-OPENINGS, EXPANSIONS, SUSPENSIONS, AND CLOSURES IN 1992 (as of July 1, 1992)

Project	Location	Province	Capacity (tonnes/day)	Employment[1]	Date of Opening, Re-Opening, Expansion, Closure or Suspension	Mine Type	Main Commodities	Companies	Remarks
NEW OPERATIONS									
Precious Metals									
Monk	Wawa	Ont.	450	40	End of July	U/G	Gold	Monk Gold and Resource Limited	Monk and custom ores will be processed at the Surluga mill which is leased by Monk from Cidatel Gold Mines Ltd.
Base Metals									
Lindsley	Sudbury	Ont.	500	65	August	U/G	Copper, nickel	Falconbridge Limited	Ore to be milled at company's Strathcona mill.
Grum	Faro	Y.T.	14 900	400•	Year-end	O/P	Zinc, lead, silver	Curragh Resources Inc.	Ore to be milled at the Faro mill. Mine life is expected to be about 8 years. Existing crews at the Faro mine operation will be employed at Grum.
Other Minerals									
Glen Morrison	Sydney	N.S.	1 000	30	September	Quarry	Limestone	AquaGold Resources	The project will supply quality sulphur-absorbent limestone to cut SO_2 emissions from the Nova Scotia Power Corporation's Point Aconi plant. Reserves are estimated to be 25 Mt medium to high-grade limestone. Mine life is estimated to be at least 25 years.
RE-OPENINGS									
Precious Metals									
Rundle	Timmins	Ont.	450	15	December	U/G	Gold	Rundle Gold Mines Inc.	The property was brought into production in th early 40s but was closed because of a massive forest fire in 1948 that destroyed the surface plant and all the equipment. The mine will employ 80-100 full-time workers. Previously established ore reserves are 551 000 short tons (st) grading 0.204 ounces (oz) per st gold. More recent drilling indicates that this reserve figure will be revised upward significantly.

Hope Brook	Couteau Bay	Nfld.	3 150	240	End of July	O/P	Gold	Royal Oak Mines Inc.	The mine was purchased from BP Canada Inc. on April 30, 1992. Ore reserves were re-calculated and are now reported to be 7.4 million st grading 0.116 oz/st gold. There is a further mineral resource of 3 million st grading 0.094 oz/st gold. The mine will be turned into a fly-in operation with supplies to be transported in by boat. Plans are to produce 50 000 oz of gold in 1992, at a cash cost of US$300/oz. Annual production will be about 120 000 oz of gold.
Other Minerals									
Baie Verte tailings wet processing operation	Baie Verte	Nfld.	6 000	76	April 9	Surface	Asbestos	Princeton Mining Corporation	The operation was most recently suspended in December 1991 due to low fibre recovery caused by frozen tailings. Teranov Mining Corporation, a wholly owned subsidiary of Princeton, is the operator.
EXPANSIONS									
Precious Metals									
Joe Mann	Chibougamau	Que.	1 630	240	1989-92	U/G	Gold	Campbell Resources	Mine expansion program, which began in 1989, continued in 1991. Gold production in 1991 increased to 87 500 oz compared to 72 700 oz in 1990. However, gold production for 1992 has now been revised downward to about 75 000 oz and may temporarily decline in the years 1993-95 pending completion of the new shaft.
Bousquet No. 2	Malartic	Que.	1 630	235	1991-92	U/G	Gold	LAC Minerals Ltd.	Commercial production began in October 1990. Gold production inreased from 67 163 oz in 1990 to the 169 500-oz level in 1991, and is planned to further increase to 200 000 oz in 1992. Ore is milled at Est-Malartic mill which, in September 1991, began a capacity expansion program (scheduled for completion in the third quarter of 1992) to accommodate increased ore production from Bousquet No. 2 mine.

TABLE 1 (cont'd)

Project	Location	Province	Capacity (tonnes/day)	Employment[1]	Date of Opening, Re-Opening, Expansion, Closure or Suspension	Mine Type	Main Commodities	Companies	Remarks
EXPANSIONS (cont'd)									
Precious Metals (cont'd)									
Kerr (formerly Kerr Addison)	Virginiatown	Ont.	2 000	166	1991-92	U/G	Gold	Deak Resources Corporation	Increased one of the three 1360 tonnes per day (t/d) gold circuits from 1800 t/d in 1990 to 2000 t/d in 1991. Company plans to further increase this capacity to 2700 t/d in 1992. As well, the company plans to convert another 1360 t/d circuit to treat base-metal ore or additional gold ore.
Base Metals									
Birchtree	Thompson	Man.	3 000•	85	1991-97	U/G	Nickel, copper	Inco Limited	Work to double production to 34 million pounds (lb) nickel annually by 1997 continues.
Other Minerals									
Quinsam	Campbell River	B.C.	700	75	1992	O/P & U/G	Coal	Consolidated Brinco Limited	Plans are to double production to 500 000 tonnes per year in 1992. Ten more employees may be needed. Original plan to achieve this expansion in 1991 did not materialize.
SUSPENSIONS									
Precious Metals									
Cheminis	Virginiatown	Ont.	350	20	March	U/G	Gold	Northfield Minerals Inc.	Mining operation suspended because of low gold price.
Magino	Wawa	Ont.	400	118	June 30	U/G	Gold	Muscocho Explorations and McNeilan Resources Inc.	Operation suspended due to declining gold price and a lack of working capital.
Base Metals									
Langmuir No. 1	Timmins	Ont.	450	45	February	U/G	Nickel	Timmins Nickel Inc.	Mine placed on care and maintenance due to poor recoveries and low nickel price.
Shebandowan	Thunder Bay	Ont.	2 540	360	May 15	U/G	Nickel, copper	Inco Limited	The company shut down this mine for at least three months due to weak prices for nickel and other metals.
Other Minerals									
Westray	Plymouth	N.S.	3 000	225	May 9	U/G	Coal	Curragh Resources Inc.	Mining suspended because of an underground explosion.

Balmer	Sparwood	B.C.	30 000	1 300	May 1	O/P	Coal	Westar Mining Ltd.	Mining operation suspended due to contract dispute between union and the company as well as financial difficulties.
CLOSURES									
Precious Metals									
Lac Shortt	Desmaraisville	Que.	1 150	156	March 18	U/G	Gold	Minnova Inc. and Kerr Addison Mines Inc.	Mine closed due to depletion of ore reserves. The surface complex will be kept open until mid-1993 to treat water from the tailings pond. This low-grade mine had produced continuously since 1983.
Premier Gold	Stewart	B.C.	2 000	100	June 30	O/P	Gold	Westmin Resources Limited, Pioneer Metals Corporation and Canacord Resources Inc.	The open-pit mine will close due to depletion of ore reserves. Closure will result in 98 employees being laid off. However, the mill will continue to mill some underground and custom ore.
Lawyers	Smithers	B.C.	500	140	August 5	U/G	Gold, silver	Cheni Gold Mines Inc.	Mine to close due to financial problems and to depletion of mineable ore reserves. The mine began production in 1988. The company is reviewing the possibility of mining and milling the nearby small Mets gold deposit owned by Golden Rule Resources Ltd. and Manson Creek Resources Ltd.
Samatosum	Adams Lake	B.C.	450	51	September	O/P & U/G	Silver, copper, lead, zinc, gold	Minnova Inc. and Rea Gold Corp.	Ore from the open pit was depleted in April 1992. Underground ore will be exhausted in September 1992. The mine started production in 1989.
Camflo	Val-d'Or	Que.	1 200	125	October	U/G	Gold	American Barrick Resources Corporation	Mine to close due to depletion of ore reserves. Mill may be kept open to process custom ores. The mine began production in 1965.
Equity Silver	Houston	B.C.	9 000	156	October	O/P	Silver, gold, copper	Placer Dome Inc.	Mine to close due to depletion of ore reserves but mill to continue custom milling. Production began in 1980.
Base Metals									
East Kemptville	Yarmouth	N.S.	9 000	220	January 3	O/P	Tin	Rio Algom Limited	Mine closed due to low tin price and short remaining mine life. Production began in 1985.
Mobrun	Rouyn	Que.	1 200	115	January 10	U/G	Copper, zinc	Audrey Resources Inc.	Mine closed due to depletion of current ore reserves. Company is seeking funds to develop the 1 100 lens. Production from open-pit began in July 1989 and from underground in October 1987.

TABLE 1 (cont'd)

Project	Location	Province	Capacity (tonnes/day)	Employment[1]	Date of Opening, Re-Opening, Expansion, Closure or Suspension	Mine Type	Main Commodities	Companies	Remarks
CLOSURES (cont'd)									
Base Metals (cont'd)									
Faro open-pit and underground	Faro	Yukon	11 800	400	End of 1992	O/P & U/G	Zinc, lead, silver	Curragh Resources Inc.	Ore reserves at both the open-pit and underground mines will be depleted by year-end. Production began in 1972.
Bell	Granisle	B.C.	16 000	260	June 12	O/P	Copper	Noranda Minerals Inc.	Mine closed due to depletion of ore reserves. Production began in 1972, was suspended in 1982 and the mine re-opened in 1985.
Spruce Point	Snow Lake	Man.	680	42	March	U/G	Copper, zinc	Hudson Bay Mining and Smelting Co. Limited	Mine closed due to depletion of ore reserves.
Other Minerals									
Cassiar (McDame)	Cassiar	B.C.	3 600	450	February 5	U/G	Asbestos	Princeton Mining Corp.	Mine closed under orders from B.C. Supreme Court as a result of company's financial problems. Princeton's wholly owned subsidiary, Cassiar Mining Corporation, which operated the mine, went into receivership on February 6, 1992.
Denison	Elliot Lake	Ont.	13 600	900	March 11	U/G	Uranium	Denison Mines Limited	Operation ceased due to termination of a long-term contract by Ontario Hydro. Because of low grade, low uranium prices and high production costs, the mine is no longer competitive. The mine was the largest underground uranium mine in North America. The mine began production in 1957.

Source: Energy, Mines and Resources Canada.
O/P Open-pit; U/G Underground.
• Estimated.
[1] Employment refers to workers on the company's payroll and to contract workers at an operation, or at an operation prior to its closure.

Coal - 1991

Lisa Shapiro
Telephone: (613) 992-1904

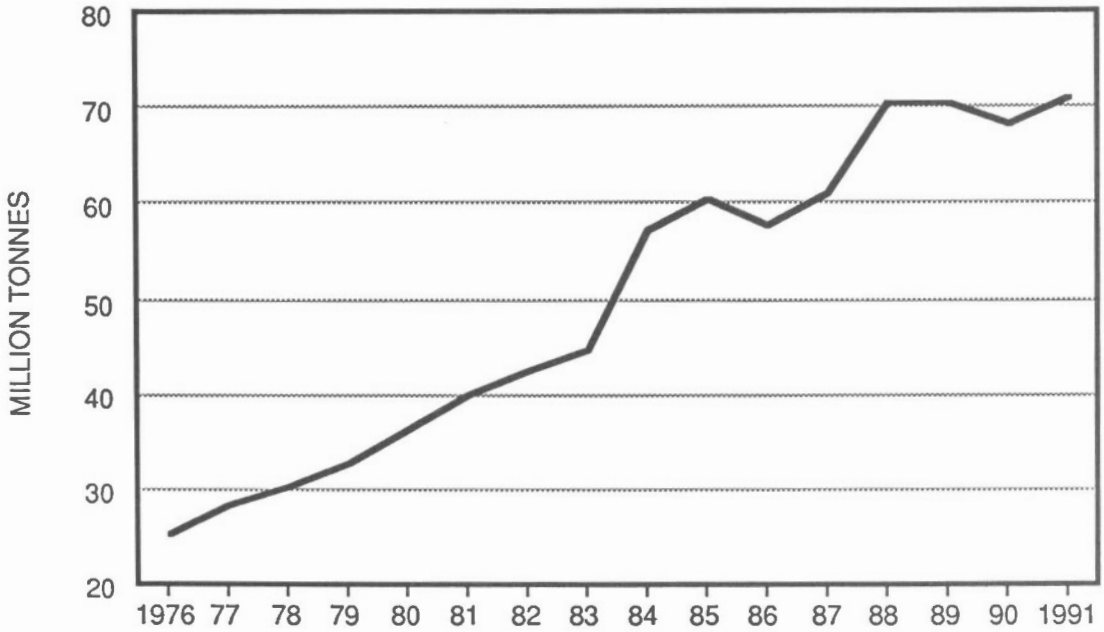
Coal is used mainly for the generation of electricity and the production of primary iron for making steel.

RECORD PRODUCTION

In 1991, Canada had a record coal production of 71.1 million tonnes (Mt). Figure 13 shows the increase in production that has occurred between 1976 and 1991. Most coal produced in Canada in 1991 was thermal (42 Mt), i.e., for power generation. Canada produces bituminous, sub-bituminous and lignite coal for power generation. The remaining 29 Mt was bituminous coal used for metallurgical purposes.

Figure 13

DOMESTIC COAL PRODUCTION, 1976-91



Source: Statistical Reviews of Coal in Canada, 1986 and 1991, Energy, Mines and Resources Canada.

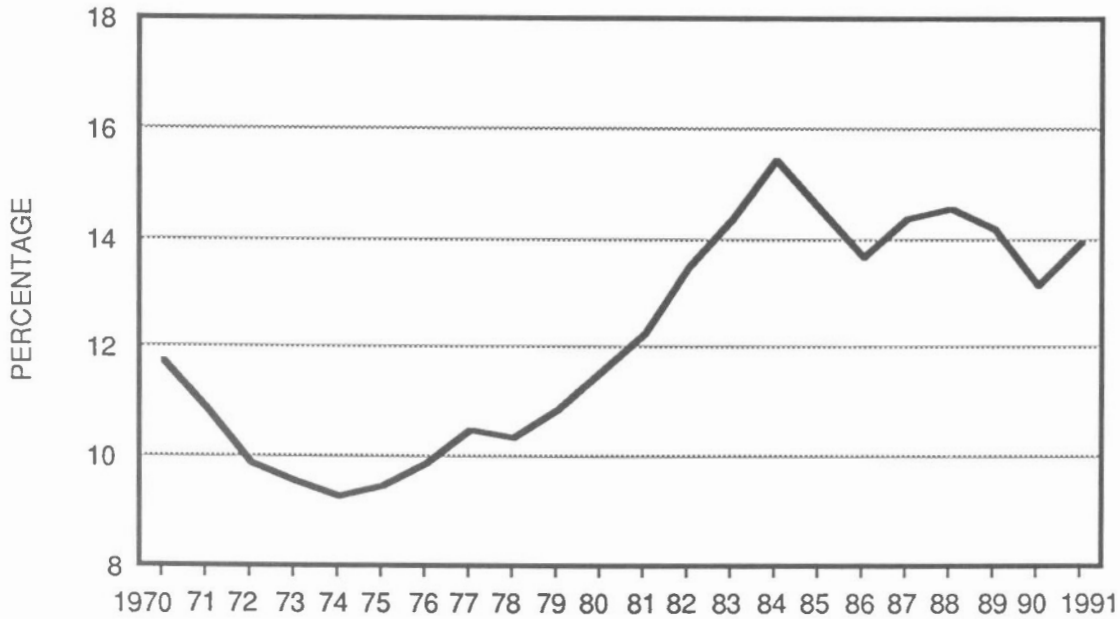
DOMESTIC CONSUMPTION

Canadian domestic coal consumption totalled 50 Mt in 1991. This consisted of 44 Mt for electricity generation, 5 Mt for steelmaking and 1 Mt for general industrial use, including cement manufacture. Canada's energy needs were met primarily by petroleum (37.1%) and natural gas (27.4%), with coal (14.0%), hydroelectricity (12.9%), nuclear-generated electricity (3.6%) and other sources (5.0%), primarily biomass, making up the remainder.

Coal accounted for 75% of Canada's primary energy in 1920 but dropped to less than 10% of primary energy demand by the early 1970s. It started recovering market share in the late 1970s, and this share has been hovering in the low-to-mid teens for the past ten years. Figure 14 shows this market share as a percentage of domestic demand for primary energy. Canadian consumption of thermal coal used for power generation is concentrated in coal-producing areas in Alberta and Saskatchewan where power plants are located near the mines, and in Ontario which has relatively easy access to U.S. coal.

Figure 14

DOMESTIC DEMAND FOR COAL
AS A PERCENTAGE OF DOMESTIC DEMAND FOR PRIMARY ENERGY



Source: Statistical Reviews of Coal in Canada, 1986 and 1991, Energy, Mines and Resources Canada.

EXPORTS AND IMPORTS

Canada exported a record 34.1 Mt (48% of production) in 1991, mostly metallurgical coal. Most exports were from the Western mountain mines to Pacific Rim countries. Japan and Korea alone accounted for 25.5 Mt. Exports to Europe, however, more than doubled to 4.4 Mt. Most of Canada's coal exports are metallurgical coals and, as a result, the volume of exports hinges on world steel production. Exports are expected to grow only modestly in the remainder of the decade as the steel industry's demand for metallurgical coal stabilizes. Central Canada, with no coal production, relies heavily on imports from the United States. Imports of 12.4 Mt in 1991 provided the metallurgical coal needed for Ontario's steel industry and approximately two-thirds of Ontario Hydro's thermal coal requirements.

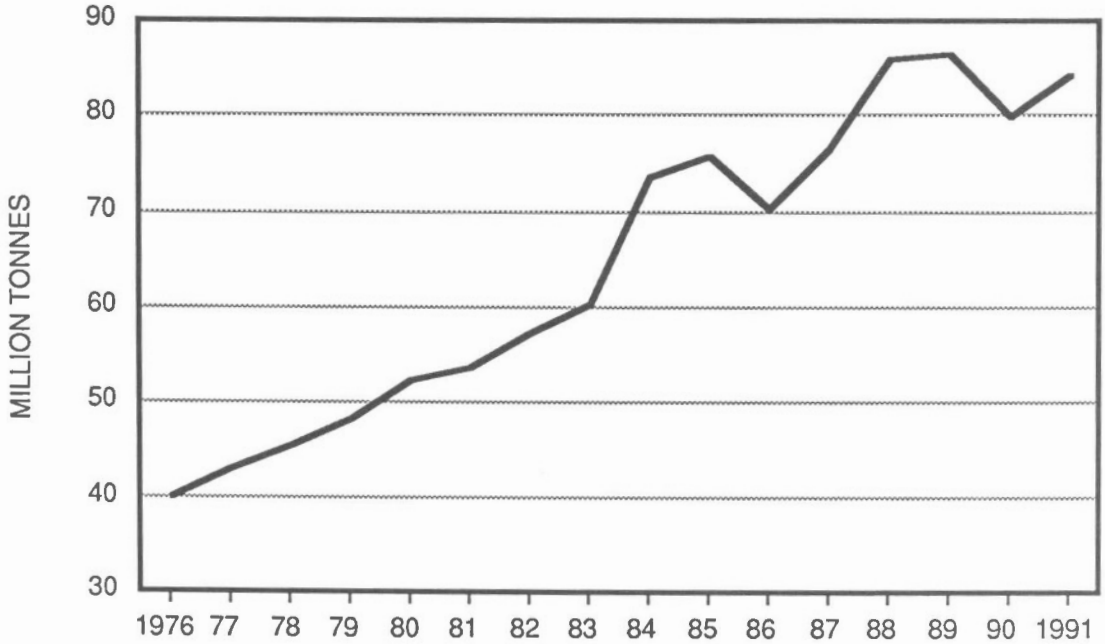
TOTAL DEMAND FOR COAL

As a result of increasing exports plus domestic demand, total demand for coal has increased from 40 Mt in 1976 to 84 Mt in 1991. Figure 15 shows total demand for coal over the past 15 years.

Further statistics on the Canadian coal industry are available in the Mineral Policy Sector publications entitled *Statistical Review of Coal in Canada - 1986* and *Statistical Review of Coal in Canada - 1991.* Copies may be obtained from the MPS Publications Distribution Office.

Figure 15

TOTAL COAL DEMAND, 1976-91



Note: Total coal demand = domestic consumption plus exports.
Source: Statistical Reviews of Coal in Canada, 1986 and 1991, Energy, Mines and Resources Canada.

Industrial Minerals in 1991

This edition of the *Mineral Industry Quarterly Report* contains a series of reports on a variety of Canadian industrial minerals. In the case of each mineral reviewed, information is provided on developments in Canada, the international scene, as well as the outlook for the commodity in question. The reports were prepared by staff of the Industrial Minerals Division of the Mineral Policy Sector. More detailed information regarding these and other industrial minerals are contained in the *Canadian Minerals Yearbook,* which is published by the Mineral Policy Sector.

Industrial minerals have a diversity of uses, markets, and mining and production methods. As a result, it is difficult to generalize about prospects for the sector. For example, some industrial minerals are finding new or expanded markets as a result of enhanced environmental concerns. By way of illustration, newsprint recycling is forecast as a growth area for talc, which is used as an absorbent in the de-inking process. Experimental work currently being carried out in Canada on the treatment of domestic and industrial effluents will likely lead to the development of new markets for peat. Finally, technologies for controlling sulphur dioxide emissions at major coal-fired power installations in Nova Scotia, New Brunswick, Ontario, and other locations represent potential markets for limestone.

Prospects for some industrial minerals are very much tied to general economic conditions; for example, construction materials will experience stronger demand in the post-recession economy and in the wake of growing recognition of the need for renewal of infrastructure, such as highways.

For certain major industrial minerals such as asbestos, potash, sulphur, and titanium dioxide, Canada is a leading world producer or exporter. Long-term prospects for these minerals are generally good.

The Industrial Minerals Division provides a range of services in support of Canada's industrial minerals sector. For more information, contact:

Industrial Minerals Division
Mineral and Metal Commodities Branch
Mineral Policy Sector
Energy, Mines and Resources Canada
460 O'Connor Street
Ottawa, Ontario
K1A 0E4

Telephone: (613) 992-5199
Facsimile: (613) 943-8450

ASBESTOS

Patrick Morel-à-l'Huissier
Telephone: (613) 992-3258

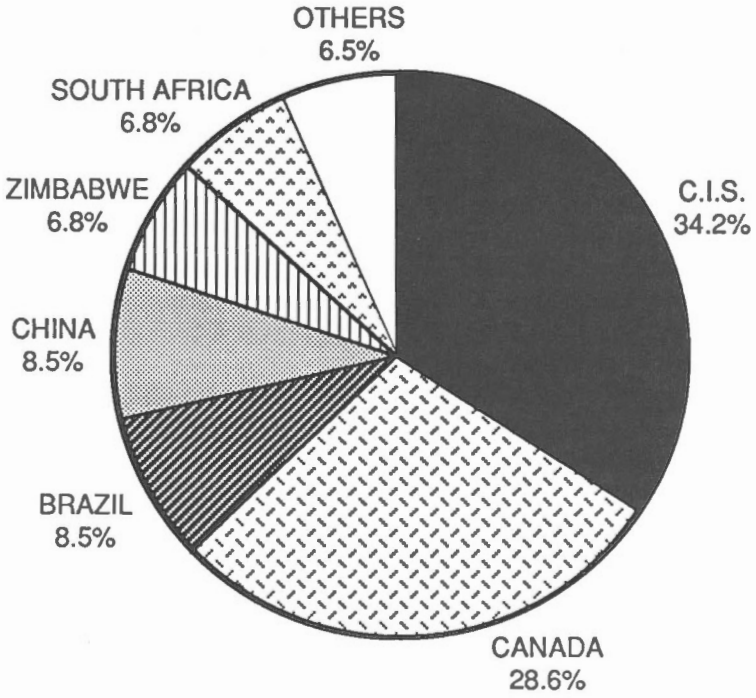
Wanda Hoskin
Telephone: (613) 995-8272

In 1991, Canadian asbestos mines operated at close to 100% of capacity and average prices increased by about 8%. Estimated total shipments in 1991 were 670 368 t valued at $274.5 million, compared with 1990 revised figures of 685 627 t valued at $272.1 million. The decrease in shipments reflects the closure of the Baie Verte mine and the strike which lasted two weeks at Cassiar's new mine. However, most of the losses due to the closure of the Baie Verte mine were offset by Cassiar's new underground McDame deposit, which was brought into

production in February 1991. Employment in asbestos mining and milling decreased following the closure of the Baie Verte mine.

Figure 16

ASBESTOS - WORLD PRODUCTION, 1991



Export volumes for 1991 are estimated to be about 632 000 t, only a 2.5% decrease from the previous year. The value of these exports is expected to decrease by about 8%. Exports in the January-to-September 1991 period totalled 474 289 t valued at $289.4 million, compared with 471 493 t valued at $302.4 million for the same period in the previous year.

The U.S. Bureau of Mines estimates 1991 Canadian asbestos imports into the United States at 36 822 t compared with 40 380 t in 1990. The 9% decrease represents a slowdown in the downward trend after the 1989 ban rule of the U.S. Environmental Protection Agency (EPA).

In May 1991, the ownership of JM Asbestos was transferred from Jeffrey Mine Holding to the Groupe Minier d'Asbestos-Estrie, a new holding company comprised of 15 senior managers.
JM Asbestos experienced a 16% increase in sales over 1990. The company plans to develop new reserves at the Jeffrey mine that will carry the operation until 1998 in a first phase and until 2005 in a second phase. To upgrade its intermediate-sized product, JM Asbestos is considering buying long fibres from Russia.

LAB Chrysotile enjoyed a very good year in 1991, the best since 1981. The company expects to increase its annual production capacity by 5%-10% within the next two years. Its Black Lake mine has 22 years of proven reserves. In February 1991, Baie Verte Mines (BVM) closed its open-pit operation one month earlier than expected due to equipment problems. This closure resulted in the permanent layoff of 390 people. Teranov Mining Corporation was the successful bidder for the Baie Verte Mines Reprocessing Inc. (BVMRI) wet-milling equipment and production began in July 1991. The operation currently employs 72 people. Due to problems with frozen tailings, the operation was temporarily shut down in December 1991. It is believed that this tailings reprocessing could extend asbestos operations for up to 20 years.

Cassiar's new McDame underground development experienced problems, both technical and financial, which forced Princeton Mining, which controls Cassiar Mining Corporation, to seek court protection under the *Companies' Creditors Arrangement Act*. Under the court order, Cassiar was granted 90 days from October 15, 1991, to complete the reorganization, after which time it would no longer be under court protection. Cassiar is currently seeking funds to start the wet process operation as the current underground reserves will only last up to the second half of 1992 if no further development takes place.

U.S. Appeals Court Overturns EPA's Controversial Asbestos Rule

On October 18, 1991, the U.S. Fifth Circuit Appeals Court of New Orleans rendered its judgement on the EPA asbestos ban rule and remanded the matter to the EPA for further consideration. In its judgement, the Court found that the EPA failed to muster enough evidence to support its rule and that the agency had not adequately considered the risks associated with the production and use of various substitutes. For Canadian producers, this judgement means a renewal of hope for the future as sales firmed up towards the end of the year.

One month prior to the EPA judgement, the U.S. Health Effects Institute released a study on *Asbestos in Public and Commercial Buildings*. This study was commissioned by the U.S. Congress in light of the vast amount of money spent on removing asbestos from buildings in the United States. The study found that asbestos in buildings in good repair does not pose a threat to occupants.

Markets

The overturn of the EPA's asbestos rule augurs well for the future of the industry. However, markets that have been lost due to the rule will not reappear overnight, and some of them may even be gone forever. In terms of market outlook, demand for asbestos cement building products is expected to continue in response to worldwide housing needs. Canadian production is expected to recover and increase.

GRAPHITE

Michel Boucher
Telephone: (613) 992-3074

In 1991, Canada's only commercial production of graphite came from Stratmin Inc. with a mine and concentrator at Lac-des-Îles, Quebec, and a concentrator at Notre-Dame-du-Laus, also in Quebec. The year was marked by a decline in exploration and development activity in both Ontario and Quebec. The

only company involved in major exploration work was Mart Mining & Exploration Ltd. of Labrador City, Labrador. Mart Mining completed a 600-m diamond drilling program in 1991 on its graphite deposit located 14 km south of Labrador City. The host rock is a micaceous quartz feldspar graphite schist with inclusions of garnet crystals and sulphides, dipping at 40° east and striking N 20°E. Five holes with a maximum hole depth of 154 m were drilled at an angle of 50° along a 600-m strike distance. The property's reserves are estimated at 6.0 million tonnes (Mt) grading 17.3% graphitic carbon. The company plans to continue with a diamond drilling program in 1992.

Cal Graphite Corporation of Lively, Ontario, holds a 100% interest in mining claims in the Township of Butt near Huntsville where crystalline flake graphite occurs in mafic gneiss and paragneiss. An open-pit mine and a processing plant with an initial milling capacity of 3000 tonnes per day (t/d) ore, which could be expanded to 5000 t/d ore, is currently producing 94%+ carbon graphite. Higher grade concentrates for specialty applications will be produced in 1993 by the company's refining facility at Huntsville.

No new developments were reported by Stewart Lake Resources Inc. of Oakville, Ontario, in 1991. The feasibility study on its Kirkham, Ontario, flake graphite project, completed in 1990, concluded that the project can be successfully developed and placed into production at an estimated cost of $9.8 million. Graphite ore would be mined by open-cast method in the beginning, moving eventually to an underground operation. Approximately 8000 tonnes per year (t/y) of graphite concentrate would be produced annually.

Victoria Graphite Inc. is seeking financing to start production on its 400 hectare (ha) property at Portland, halfway between Ottawa and Kingston. On the surface the ore extends about 1700 m by 75 m. Based on 25 trenches and 74 drill holes totalling 8000 m, the company reported possible ore reserves of 750 000 t averaging 7.0% with a cut-off grade of 3.0%. The mill has a design capacity of 300 t/d ore. For a good ore-to-waste ratio, the mine design is an open pit to 20 m, followed by an incline along the ore. Research indicated that the graphite would be suitable for the production of exfoliated graphite used in the manufacture of graphite foil.

North Coast Industries Ltd. of Vancouver, British Columbia, has had a share consolidation during the year and is now called "Consolidated North Coast Industries Ltd." The company is seeking financing to develop its flake graphite project in Bissett Creek, Ontario. North Coast is proposing an annual production of 17 000 t of marketable flake graphite.

In 1991, Stratmin Graphite Inc. completed the tune-up of its new mill at Lac-des-Îles, bringing it to its designed capacity of 950 t/d ore, or about 20 000 t/y graphite concentrates. With the leased mill at Notre-Dame-du-Laus, which has a rated capacity of 400 t/d ore, the combined capacity of Stratmin is 28 000 t/y of graphite concentrates. Stratmin is currently exporting its graphite concentrates to 14 countries in North America, South America, Europe, the Far East, and Asia. Due to depressed markets in 1991, the Notre-Dame-du-Laus mill was temporarily shut down in January 1991. From April to December 1991, the Lac-des-Îles mill operated on a reduced schedule of four days per week. Full production resumed early in 1992. Total production of concentrates by the company was 10 323 t in 1991.

Mazarin of Quebec City, Quebec, is seeking financing to develop its Fermont, Quebec, flake graphite deposit. A study on the feasibility of putting the property into production was prepared a couple years ago. The study proposed an open-pit mining operation for six months of the year, which would supply enough ore to feed a 400-t/d concentrator on a year-round basis for an annual production of 23 000 t of concentrate. A second feasibility study was prepared in early 1991 by Cambior Inc., which is a prospective partner in Mazarin. The total capital cost of the project estimated by Cambior is $30.6 million. Geological reserves are 8.1 Mt averaging 16.7% carbon. The 20-year mining reserves are 2.5 Mt grading 17.4% carbon after dilution; they are mineable by open pit with a waste/ore ratio of 1.0/1.0. The graphite is suitable for all major applications without chemical upgrading. The project is ready for construction and, according to the company, could be in production within 13 months.

In 1991, Graphicor Resources Inc. added primary milling capacity to its concentrator at Lac-des-Îles, Quebec. Starting in May, the facility was operated in various trial configurations designed to optimize both the grade and the recovery of flake graphite. However, mill results did not meet expectations and mining problems at the Diotte mine also developed. Consequently, mining operations were terminated in November with test milling of stockpiled ore continuing until closure in mid-December. The company is pursuing acquisition of the mining and environmental permits required to develop ore reserves at Lac Carmin, which is held in partnership with SOQUEM, and at Mousseau in the municipality of Ste. Veronique. Results of bulk tests to be performed on the ores from these two locations will be used to determine the cost of any further concentrator retrofit deemed necessary to ensure consistent production at design specifications. Given the reduced demand and sharply reduced prices for graphite, Graphicor will subject any decision to resume full operation to a complete review of all economic factors.

POTASH

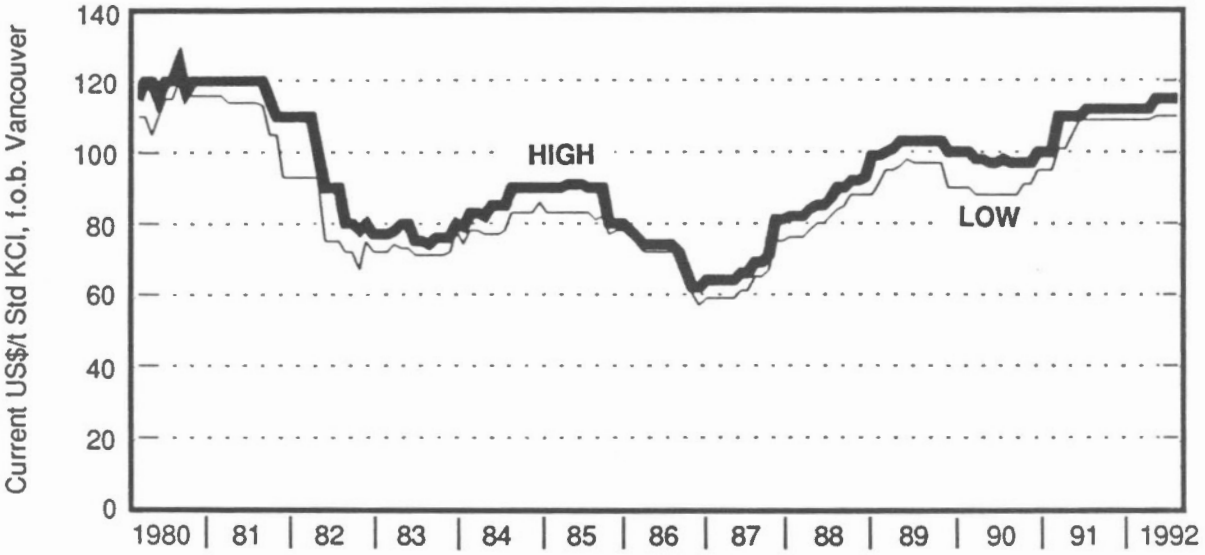
Michel Prud'homme
Telephone: (613) 992-3733

World production of potash in 1991 was estimated at 25.84 million tonnes (Mt) (in K_2O equivalent) compared to 27.4 Mt in 1990. The decline was mostly due to a reduction in potash output from the former German Democratic Republic (GDR) and from the former U.S.S.R. The reduction in world potash production was in response to lower demand, especially in Eastern Europe and Brazil. In the United States, potash fertilizer demand remained sluggish during most of the year, despite some significant sales during the fall.

Canadian mine production rose from 7.0 Mt to 7.44 Mt K_2O, while mine shipments remained for the third consecutive year at the 7.0-7.3 Mt level. Mine-site inventories rose by about 300 000 t to 1.595 Mt K_2O at year-end. A production increase was registered both in Saskatchewan (accounting for 85% of Canada's potash output) and in New Brunswick (with a 15% share). On an annualized basis, the Canadian mines operated at 63% of capacity in 1991 (59% in 1990).

Figure 17

CANADIAN POTASH SPOT PRICES
1980-92 (JULY)



The average unit value of potash shipped by Canadian producers was estimated at C$131.06/t K_2O (f.o.b. mines) in 1991, compared to a readjusted value of C$131.38/t in 1990. The average unit value of exports, derived from export statistics on the basis of port of exit (e.g., Vancouver or Saint John), or a border crossing to the United States, was $125.02/t KCl in 1991 (based on exports for nine months) compared to $108.30/t in 1990. Profits in 1991 are expected to be slightly higher than in 1990 due to improved netback from offshore sales achieved by Canadian companies. However, since all sales are denominated in U.S. currency, returns on sales have been hampered by the increased value of the Canadian currency.

Saskatchewan

In September, the Government of Saskatchewan, through its Crown-owned corporations CIC Mineral Interests Corporation and CIC Mining Corporation, sold 7 301 133 special warrants of Potash Corporation of Saskatchewan Inc. (PCS) to investment dealers. Each special warrant, sold at C$18.75, consisted of one common share of PCS and one half purchase warrant for PCS common shares. This special issue allowed the Province to receive close to $137 million; ultimately, the Province will hold only 1.2% of PCS if all convertible bonds and purchase warrants are exercised.

Potash Corporation of Saskatchewan Inc. (PCS) operates four mines in Saskatchewan. Potash production from all of PCS's units, including tonnage from International Minerals & Chemical Corporation (Canada) Limited, was estimated at 4.0 Mt KCl, an 8% increase over 1990. In 1991, PCS continued to pursue its policy of strict inventory control with intermittent shut-downs at all of its operations throughout the year. In September, PCS sold its 3500-t/y potassium sulphate plant at Big Quill Lake (Saskatchewan) for $755 000 to Big Quill Resources Inc., a new company formed by former employees and based in Wynyard; the experimental plant came on stream in 1987 as a pilot project to experiment with the ion-exchange process to produce industrial-grade potassium sulphate. The new owners plan to invest $1.2 million to expand the capacity of the plant to 7000 t/y K_2SO_4 in 1992. At year-end, employment at PCS totalled 1236 jobs.

International Minerals & Chemical Corporation (Canada) Limited (IMCC) produced about 2.8 Mt KCl, of which over 500 000 t was for PCS's account at its K1 and K2 mines near Esterhazy. Employment at the mines was 916, of which 142 were additional employees dedicated to water inflow-related problems. During 1991, the K2 mine continued to experience water inflow problems. Chemical grouting with calcium chloride is ongoing; high-volume pumping of brine is carried out from three basins in the "B block" mining panel. In mid-1991, IMCC and Potash Corporation of Saskatchewan Inc. extended their five-year mining and processing agreement at Esterhazy. The renewed agreement gives PCS a 25% equity option to any new development (i.e., a new mine) if this option is pursued. During the summer of 1991, IMCC submitted a project for a new replacement mine near Esterhazy; the government's evaluations of the environmental impact study are expected early in 1992. The $400 million project involves the sinking of two shafts over a five-year period. A new 4.2-Mt/y KCl mine would be located 10 kilometres (km) northeast of the existing K2 mine; present milling facilities would be used as mined potash ore would be transported to the mills through a proposed 8-km underground pipeline using metal capsules propelled by compressed air. In 1991, seismic work was carried out around the three test holes drilled in 1990.

Potash Company of America (PCA), a division of Rio Algom Limited, extracts potash by solution from its old underground mine that flooded in 1987. In 1991, the mine produced about 240 000 t of KCl. During the year, an extended summer shut-down lasted from July through October.

Central Canada Potash (CCP), a division of Noranda Minerals Inc., produced 1.03 Mt KCl in 1991 at its underground mine at Viscount, east of Colonsay. Shipments were slightly higher for a second consecutive year, resulting in a small reduction of inventories. The operation shut down for four weeks in the summer starting July 12. Mining operations were carried out in Blocks II and III; development work is under way in Block IV.

Cominco Ltd. produced 1.03 Mt KCl in 1991 at the Vanscoy mine, a 5% reduction from the 1990 level. The operation ran on a seven-day-per-week schedule throughout the year except for a five-week maintenance shut-down in the summer and a one-week vacation period in December.

Kalium Canada, Ltd. operates a large solution mine at Belle-Plaine, west of Regina. During 1991, the company produced 1.69 Mt KCl, a 10% increase over

the previous year. Sales were slightly lower, resulting in a marginal rise in inventories. The plant operated at reduced rates in April and July and had a two-week maintenance shut-down in November. Some volume of salt waste has been dissolved and re-injected underground.

In March 1991, the Saskatchewan potash industry received close to $2.9 million from Western Economic Diversification, a federal agency, to conduct research on waste management practices and effective environmental protection technologies, advanced production methodologies and mining efficiency, and on transportation, handling and product quality. The funds, to be managed by the Saskatchewan Potash Producers Association, are part of a five-year $8 million program cost-shared by the producers and the federal and provincial governments.

In 1991, the Neptune Bulk Terminals, located west of the Second Narrow Bridge in the Vancouver area (British Columbia), announced an expansion plan that involves the construction of a new A-frame potash storage shed with a capacity of 100 000 t of product, the installation of a new reclaimer (3000 tonnes per hour (tph)), and a second railcar dumper; the Neptune potash-loading capacity will expand from 2.8 Mt/y to 4.3 Mt/y KCl. Construction started in May 1991 and will be completed by the end of 1992. The other potash terminal in the Vancouver area, Vancouver Wharves, has been planning to double its 155 000-t potash storage capacity and to install a second railcar dumper.

In August, CP Rail announced plans for a $3 million program to move potash from the Saskatoon-Lanigan area through a more direct route to U.S. markets. Potash exports to the United States are currently shipped eastward through Winnipeg to reach the Emerson (Manitoba) border-crossing point. With the acquisition of the U.S.-based Soo Line Railroad in 1990, CP Rail expects to achieve greater efficiency in routing potash southbound to U.S. Midwest markets through North Portal, Saskatchewan. Construction started in August for completion by early 1992.

During 1991, several trial shipments of potash were routed to the west coast via Burlington-Northern lines to U.S.-based terminals. Reports of better rates and delays in expansion at Vancouver-based terminals prompted Canadian potash suppliers to move some tonnages to Longview (Washington) and Portland (Oregon). Further trial shipments are expected in 1992.

New Brunswick

In January 1991, the New Brunswick government introduced a new policy concerning the acquisition of potash and related mineral rights in the province. The new "potash exploration policy" allows an individual or a company with a valid prospecting licence to apply for an exploration agreement to search for potash in an area of their choice on a "first-come, first-served" basis. An agreement to search is to cover a minimum of 10 000 contiguous hectares (ha), to a maximum of 20 000 contiguous ha. At the time of each annual renewal, the area of search could be reduced, but by not less than a minimum of 10 000 ha. Escalating work requirements ($63 000 per 10 000 ha in year one) are to apply similarly to other requirements imposed on mineral claims under the *Mining Act*. The term of the Exploration Agreement may be extended from year to year providing the holder meets certain terms and conditions. This new policy has been adopted to make potash more openly available for exploration.

In August 1991, the federal government announced its financial support to an agronomic research and education program to be conducted in Latin America in order to increase New Brunswick/ Canadian potash exports. The $320 000 program is to be directed by the Potash and Phosphate Institute of Canada over four years and is funded with the assistance of the Atlantic Canada Opportunities Agency, Western Economic Diversification and the Province of New Brunswick. Potash Company of America (PCA), a division of Rio Algom Limited, operates the Penobsquis underground mine (also referred as the Plumweseep mine) about 5 km east of Sussex, in Kings County. In 1991, production was about 670 000 t KCl, a 3% increase over 1990. The mine operated throughout the year at full capacity but closed for eight days in August for maintenance. During 1991, PCA did expansion work with the installation of a new compactor fines elevator bucket, a third crystallizer, an additional boiler and a new process control room. These new additions are part of PCA's $5.8 million program to increase productivity.

Denison-Potacan Potash Company (DPPC) produced 1.2 Mt of potash (KCl) in 1991, a 23% increase over 1990. DPPC has been mining potash since 1985 at the Cloverhill mine located 20 km southeast of Sussex, New Brunswick. Since 1990, the company has been returning slurried tailings underground using a hydraulic back-filling system; prior to 1990, a dry back-filling method was used but performed poorly, achieving only a maximum 60% filling rate. The new hydraulic system permits close to 92% of mill tailings to be returned underground, as recovery rates have reached over 120 000 t per month (t/m) since last year with the remainder being stored temporarily on the surface. Excess brine and rainfall runoffs from the surface tailings are disposed of through a 32-km pipeline in the Bay of Fundy. Alternative technologies, such as deep well injection, are currently under investigation through the Environmental Impact Assessment process. During 1991, the mine experienced a five-day maintenance closure in September. Early in 1991, Denison Mines Ltd. announced its intention to sell its 60% share in the Denison-Potacan Potash Company following the default of providing a principal repayment of $13.1 million to a consortium of 19 banks that funded the project. On April 11, Potash Company of Canada (Potacan), which already owns a 40% share in the operation, acquired Denison's interests for $15 million in cash with the assumption of $106 million in related liabilities. The net book value of Denison's share in DPPC was reported at close to $160 million. Potacan 's shareholders are Entreprise Minière et Chimique (EMC) of France and Kali und Salz AG of Germany, each with a 50% stake in Potacan. DPPC has been renamed Potacan Mining Co. (PMC).

Manitoba

Following the purchase of Canamax Resources Inc.'s 51% share of Manitoba Potash Corporation in 1989, Entreprise Minière et Chimique of France continued to study the feasibility of developing the potash deposit located near Russell at the Manitoba-Saskatchewan border. This reassessment will be carried out with reference to the world oversupply of potash, which is likely to continue until the end of this decade.

Prices

On average, potash prices in 1991 were higher than in 1990. Domestic prices were static, with a slight decline by year-end. The strengthening of the Canadian dollar during 1991 offset the benefits of the marginal increase obtained in North

American markets. In offshore markets, producers achieved an 8%-9% price increase, f.o.b. Vancouver, for most of the sales in Asian markets.

The re-emergence of China as a significant potash importer late in 1990 created some bullish expectations in the international marketplace. Entering 1991, contract prices for exports of potash from Vancouver were quoted at US$98-$101/t for standard grade in bulk shipments. During the first half 1991, Canpotex Limited of Canada and Sinochem of China reached a major agreement for a total 1991 tonnage of 950 000 t KCl at US$110.00/t, an increase of US$9.50/t over last year. In the May to December 1991 period, Vancouver prices for standard grade remained fairly stable at US$109-$111/t, as most other contracts for the year were settled with a view to consolidating the price increase achieved in the second quarter.

Early in 1991, hopes for higher prices in North American markets were not fully realized. The sluggish demand for potash in the United States remained persistent during the whole year despite good levels of movements that occurred in mid-April and in the fall. Prices at the beginning of 1991 were quoted at US$74/st for standard grade, f.o.b. Saskatchewan, for U.S. markets. A slight US$4/t increase was achieved in mid-March, consequent to the successful price increase achieved in offshore markets. Prices remained quoted at the US$79/st level for standard grade during the rest of the year. In early July and September, Canadian producers unsuccessfully sought small increases in the US$4-$5/st range, but encountered strong resistance from buyers. Potash continued to be available at lower prices, in the low US$70s, for the rest of the year. The last round of prices published by suppliers in late November 1991 indicated a slackening in prices entering 1992, at US$74/st, with provision for an increase by February 1992 to US$77/t.

Outlook

In the short term, world consumption of fertilizer potash is expected to decrease 3% in the fertilizer year 1991/92 as much reduced demand is to continue to prevail in the Commonwealth of Independent States (C.I.S.) and Eastern Europe. However, fertilizer consumption is projected to increase by 2% in developing countries. Potash fertilizer consumption is expected to remain stable in Latin America, Oceania, Africa and Asia, while some increases are anticipated in North America. Reduced levels of potash consumption are expected in Western Europe (-4%), the C.I.S. (-4%) and Eastern Europe (-30%), particularly in Czechoslovakia and Poland.

In North America, potash consumption is expected to increase as higher planted acreages for grain and corn are projected, following the reduced harvest of 1990/91 in wheat, corn and coarse grain. The 1991/92 Acreage Reduction Program for cereals has been set at 5%, compared to 7.5% in the previous year. Low agricultural prices and reduced farm incomes continue to trouble the agricultural sector in Canada and the United States. A 2% increase in the consumption of fertilizer nutrients is forecast.

For the period 1988-95, world potash consumption in fertilizers is forecast to grow at an annual rate of 0.5% to reach 29.6 Mt K_2O in 1995/96. The demand for industrial potash is forecast to increase by a total 3% to 1.09 Mt K_2O between 1988 and 1999. Total world demand for potash is forecast at 29.5 Mt K_2O by 1995 and at 31.7 Mt K_2O by the year 2000, taking into

account fertilizer and industrial potash products and supply distribution loss.

On the supply side, the future of world potash production is clouded by the restructuring, in-depth rationalization and increasing concerns about socio-economic and environmental questions facing the potash industries of the former U.S.S.R. and the former German Democratic Republic. Developing countries and established producers such as Israel and Jordan are contemplating additional expansions that will serve regional markets. These developments, if realized, will result in changes in trading patterns for established traders such as Canada, the C.I.S. and Germany.

SALT

Patrick Morel-à-l'Huissier
Telephone: (613) 992-3258

In 1991, Canadian salt production was estimated at 11.93 million tonnes (Mt) in comparison with 11.26 Mt in 1990, representing a 5.9% increase. The rise is mainly due to a return to normal production at The Canadian Salt Company Ltd. operations in Ontario, which were affected by a strike in 1990. Estimated Canadian shipments in 1991 of all types of salt are 11.59 Mt, a 3.5% rise over 1990 shipments of 11.19 Mt. About 60% of shipments were from Ontario compared with 55% in 1990. Salt producers ran at about 85% of capacity during 1990 and at 90% during 1991. The 1991 average unit value of salt shipments was estimated at $22.32/t, a 3.7% decrease over 1990.

Canadian rock salt prices increased 3%, varying between $48 and $85/t for de-icing rock salt in bulk shipment. Fine evaporated salt prices varied between $79 and $135/t, while water conditioning-grade salt was sold at $5-$9 per 40-kilogram bag.

Demand for salt in 1992 is expected to be firm in the de-icing sector due to the early cold winter of 1991/92. Sales in the chloralkali market will decrease modestly due to continued reduced demand for chlorine in the pulp and paper sector. Expected growth in sodium chlorate may lower requirements for chlorine. Further substitution of sodium carbonate for caustic soda is anticipated.

The Canadian Salt Company Ltd. continued development work at its underground mine in Pugwash, Nova Scotia; the 300-m level was brought to production in 1991.

At Mines Seleine, in Quebec, development work was completed at the 268-m level, which was brought to production in 1991.

In Ontario, Sifto Canada Inc. installed a new compactor at its Goderich evaporated salt plant in order to develop new markets.

In Saskatchewan, Sifto Canada Inc. closed its Unity fused salt plant mainly because of environmental concerns.

SULPHUR

Michel Prud'homme
Telephone: (613) 992-3733

In 1991, the world sulphur market was roughly in balance in spite of the removal of tonnage formerly produced in Kuwait and Iraq. World production of elemental sulphur declined 2.0 million tonnes (Mt) to 37.2 Mt, while international trade was estimated at 17.0 Mt, down 3.5% over last year. The world demand for sulphur in fertilizer decreased marginally in 1991, notably in Western Europe, North

America, Oceania, Eastern Europe and the former U.S.S.R.

Elemental Sulphur

In 1991, the production of elemental sulphur in Canada increased 4.3% to 6.19 Mt. Production from natural gas processing accounted for 87%, while the remainder was from oil sands plants (8.8%) and oil refineries (3.7%). Shipments of elemental sulphur were estimated at close to 7.1 Mt, a 2.5% increase from 1990. This increase resulted from a significant rise in Canada's exports to the United States, which are estimated at 1.65 Mt in 1991, an 18% increase over 1990. Offshore sales declined 2% to 4.75 Mt. Sulphur deliveries in Canada dropped to the 650 000-t/y level; the domestic market for fertilizers remained soft during the whole year as phosphatic fertilizer plants operated at a reduced level. While some addition to stocks occurred sporadically in the first half, net withdrawals in 1991 totalled close to 0.9 Mt, leaving about 2.6 Mt by year-end.

On the domestic scene, the most important event in 1991 was the formation of a new sulphur marketing organization, Prism Sulphur Corporation. The new consortium will be responsible for offshore exports of close to 90% of Canadian sulphur. It was officially formed in December 1991 after close to 18 months of legal and financial negotiations amongst the group's initial ten members. Prism includes 27 shareholders and started marketing Western Canadian sulphur outside of North America effective January 1, 1992.

Sulphuric Acid

In 1991, the demand for sulphuric acid in Canada declined from last year's level due to the depressed economic conditions that affected the pulp and paper sector. Exports to the United States remained strong. The production of sulphur products from smelters was estimated at 872 500 t, a 3% decrease from 1990. Sulphuric acid production fell 3.4% while the production of liquid sulphur dioxide from smelters rose 2%.

Prices

World sulphur prices declined dramatically in 1991 as a result of intense competition amongst Canadian suppliers, competition between Canada and offshore suppliers, and weak levels of sales during the first half of 1991. Canadian sulphur quotations, f.o.b. Vancouver, decreased from US$90-$93/t in January 1991 to the low US$60s by year-end.

The favourable netbacks achieved in the North American market led Canadian suppliers to increase their level of sulphur shipments into the lucrative Tampa market. At the beginning of 1991, price quotations for liquid sulphur from Alberta paralleled international trends and tended to increase from US$62-$64/t to US$68-$100/t. During the first half, prices remained in the US$62-$65/t range. In the second half, U.S. Frasch suppliers initiated three successive decreases in the Tampa prices in the magnitude of US$12-$15/long ton in order to remain competitive against Canadian volumes. Consequently, Alberta prices declined to US$20-$25/t at year-end.

Outlook

Following the destabilized pricing conditions that prevailed throughout 1991, the world sulphur market is set for another eventful year. The emergence of the new Canadian export consortium is expected to provide the much needed pricing stability sought by Canadian

suppliers. Moreover, the commissioning of the new Main Pass Frasch mine in offshore Louisiana (United States) should compensate for the indefinite closure of a few mines in Poland, Mexico and the United States.

The demand for sulphur in phosphate fertilizer in 1992 will continue to be affected by the uncertainties of the social and economic conditions that exist in the former Soviet Republics and in Central Europe. Entering 1992, several major fertilizer producers have refurnished their stocks of sulphur, giving signals for tough negotiations in the first half of 1992.

In 1992, Canadian sulphur production in Canada is projected to be maintained at close to 6.0 Mt, pending improvements in the economies of natural gas. No major expansions in sulphur output are foreseen in 1992, except the commissioning of Husky's heavy oil upgrader with a 70 000-t/y capacity. Technical problems were reported early in 1992 at the Obed gas field which could result in reduced sulphur production at Kaybob III. In British Columbia, gas-related developments, triggered by major gas discoveries over the last two years, could be postponed due to continuing weak prices for natural gas. Sulphur recovery in that province is forecast to decline in 1992 as a result of shut-ins of several sour gas wells. Sulphur production from smelters will likely decline marginally as reduced operating rates have been called for 1992 by several nickel producers in Ontario.

CONSTRUCTION MATERIALS

OliverVagt
Telephone: (613) 992-2667

Cement

In 1991, construction activity in Canada weakened as a result of a slowdown in the residential construction sector and continued weakness in other sectors. Total cement shipments were 9.4 Mt valued at $816.8 million, a decrease of 18% compared to 1990, based on preliminary figures.

St. Lawrence Cement, the largest cement producer in eastern Canada, reached an agreement in principle to establish an alliance with a major supplier of used and recycled waste industrial products. With extensive operations including southwestern Ontario and metropolitan Montreal, the fully integrated waste management company may provide a range of products from supplemental fuels to low-cost substitutes for some cement raw materials. These in turn could be used by the applicable cement producers in Ontario and Quebec.

St. Mary's Cement in Bowmanville, Ontario, and Tilbury Cement Limited in Delta, British Columbia, completed plant expansions.

Gypsum

Shipments of crude gypsum were 7 305 000 t valued at $74.3 million in 1991, compared to 7 977 685 t valued at $80.1 million in 1990. Output from Nova Scotia, mainly dependent on exports to the United States, was down about 10%, whereas Ontario production dropped about 30%.

Domtar Inc. completed its major underground mine development at the No. 3 mine at Caledonia, Ontario, and CGC Inc. continued development of new ore reserves at Hagersville, Ontario.

Eastern Gypsum Inc., of McAdam, New Brunswick, which operated a wallboard plant for only a few months, fell into receivership in February 1991.

Dimension Stone

Production of dimension stone, along with exports mainly of rough granite from Quebec, continued to be relatively strong in 1991. However, there was less emphasis on quarry development to support the manufacture of slabs, custom-cut panels and tiles as demand weakened in the domestic and export markets. In Ontario, Jarvis Resources plans to develop a marble property in the Sudbury area. Japan continued to be Canada's major customer for rough granite, whereas the United States remained the most important outlet for construction panels and tiles.

Mineral Aggregates

Total shipments of crushed stone and sand and gravel dropped about 20% to less than 290 Mt in 1991, the lowest level since 1982.

STATISTICAL TABLES

TABLE 1. CANADA, PRODUCTION OF LEADING MINERALS

		1991				1992				Percentage Changes		
		March	April	May	Total 5 Months	March	April	May	Total 5 Months	May 1992 / May 1991	May 1992 / April 1992	5 Months 1992 / 1991
		(000 tonnes except where noted)										
METALS												
Copper		69.3r	76.1r	64.4r	335.4	71.8r	69.1	64.8	332.9	0.6	–6.2	–0.7
Gold	kg	14 724.5r	15 176.0r	15 637.0r	71 108.3	13 457.7r	13 101.4	12 422.9	63 761.0	–20.6	–5.2	–10.3
Iron ore		1 323.3	2 907.9	3 143.6	10 390.3	1 074.1	3 093.2	3 111.8	9 905.2	–1.0	0.6	–4.7
Lead		14.4	8.4	11.5	61.1	19.7	22.0	25.8	111.6	124.2	17.3	82.7
Molybdenum	t	1 035.6	995.4	1 068.1	5 357.7	652.4	587.3	697.2	3 576.2	–34.7	18.7	–33.3
Nickel		17.8r	17.4r	21.2	90.8	20.0	19.8	19.3	92.8	–8.7	–2.3	2.3
Silver	t	113.3	110.4	111.3	547.4	97.9	98.0	101.8	485.1	–8.6	3.8	–11.4
Uranium[1]	t	590.3	557.0	860.4	3 091.3	556.3	563.4	778.8	3 033.2	–9.5	38.2	–1.9
Zinc		86.5r	54.4r	62.9r	339.4	97.5	91.4	109.0	441.1	73.3	19.2	30.0
NONMETALS												
Asbestos		43.9	53.1	57.7	254.8	45.7	60.0	51.0	249.1	–11.7	–15.0	–2.2
Clay products	$000	7 691.1	11 058.1	12 945.2r	39 900.4	5 749.4	10 264.8	12 471.3	37 980.4	–3.7	21.5	–4.8
Gypsum		476.8	546.4	612.0	2 775.2	485.4	583.0	742.6	3 006.1	21.3	27.4	8.3
Potash K_2O		676.4	761.9	761.9	3 348.5	693.8	776.9	665.4	3 289.9	–12.7	–14.4	–1.8
Cement		449.7	816.1	1 014.7	2 959.8	439.9	658.0	876.2	2 600.7	–13.6	33.2	–12.1
Lime		183.4	200.0	208.8	967.0	194.1	196.0	204.4	980.3	–2.1	4.3	1.4
Salt		526.4r	908.3r	960.6r	4 016.7	534.3	798.0	973.9	3 790.7	1.4	22.0	–5.6
FUELS												
Coal		6 244.0	5 832.9	5 974.7	28 876.9	6 307.8	..	..	..	..	..	..
Natural gas	million m^3	11 507.0r	10 885.0r	10 589.0r	55 717.0	12 151.0	..	..	..	..	..	..
Crude oil and equivalent	000 m^3	8 261.0r	7 492.0r	7 909.0r	39 775.0	8 690.0	..	..	..	..	..	..

Sources: Energy, Mines and Resources Canada; Statistics Canada.
.. Not available; r Revised.
[1] Tonnes uranium (1 tonne U = 1.2999 short tons U_3O_8).
Note: Percentage changes are calculated on the basis of actual production figures as opposed to the rounded figures as shown.

TABLE 2. METAL PRICES, 1992

	April	May	June
COPPER			
Electrolytic, U.S. producer f.o.b. refinery, cents (US)	103.338	103.525	107.702
Electrolytic, COMEX, 1st pos. plus 5¢, cents (US)	100.348	100.558	104.741
Electrolytic, LME Grade A settlement, cents (US)	100.486	100.541	104.294
LEAD			
U.S. producer, cents (US)	35.000	35.000	35.000
Montreal, cents (C)	39.500	39.500	39.500
LME cash, cents (US)	24.150	23.579	24.839
SILVER			
Handy & Harmon, cents per troy oz (US)	403.000	406.825	405.636
Handy & Harmon, cents per troy oz (C)	478.584	487.783	485.100
ZINC			
LME SHG cash, cents (US)	59.160	62.272	62.831
North American SHG, cents (US)	60.528	63.167	63.754
TIN			
New York, dealers, cents (US)	270.944	285.375	303.792
Metals Week, composite, cents (US)	386.827	402.702	431.670
GOLD			
London, p.m., US$ per troy oz	338.618	337.239	340.805
MERCURY			
New York, dealers, US$ per flask	153.182	182.500	. .
NICKEL			
New York, dealers, cathode, US$	3.405	3.352	3.248
LME cash, US$	3.366	3.323	3.262
ANTIMONY			
New York, dealers, cents (US)	78.364	79.500	78.455
PLATINUM[1]			
London PM fix, US$ per troy oz	347.580	358.655	369.116
CADMIUM			
New York, dealers, US$	1.000	0.965	0.759
ALUMINUM			
LME cash, cents (C)	70.941	71.071	69.192
LME cash, cents (US)	59.740	59.275	57.858
COBALT			
Shot/cathode/250 kg, US$	25.000	25.000	25.000
U.S. spot cathode, US$	26.438	26.250	24.600
TUNGSTEN			
U.S. spot ore, US$/MTU	57.320	56.218	55.116
MOLYBDENUM			
Metals Week dealer oxide, US$	2.121	2.183	2.265
URANIUM			
Nuexco, US$, U_3O_8	8.000	8.000	7.750

Sources: Metals Week; The Northern Miner.
Average U.S. Exchange Rate for April = 1.1875, May = 1.190, June = 1.1959.
. . Not available.
[1] As of January 1992 we replaced the Impala Producer price for platinum with the London PM Fix price.
Note: Prices are per pound unless otherwise stated.

TABLE 3. CANADA, REAL GROSS DOMESTIC PRODUCT AT FACTOR COST BY INDUSTRY, IN 1986 PRICES, QUARTERLY (SEASONALLY ADJUSTED AT ANNUAL RATES)

Industry Sector	1991 1st Quarter	1991 2nd Quarter	1991 3rd Quarter	1991 4th Quarter	1992 1st Quarter	% Change 1st Quarter 1992 / 4th Quarter 1991	% Change 1st Quarter 1992 / 1st Quarter 1991
			($ million)				
TOTAL ECONOMY	496 520.6	503 554.0	504 294.1	503 083.9	503 393.0	0.1	1.4
Business Sector							
Agriculture	11 552.5	11 418.5	11 420.5	11 508.2	11 509.6	0.0	-0.4
Fishing and trapping	882.0	882.0	881.2	839.8	827.6	-1.5	-6.2
Forestry	2 472.3	2 601.5	2 649.9	2 564.7	2 509.6	-2.1	1.5
Mines, quarries and oil wells	**20 009.0**	**19 849.8**	**19 789.5**	**19 808.9**	**19 735.2**	**-0.4**	**-1.4**
Mining industries	6 215.6	6 295.3	6 373.3	6 332.3	6 220.4	-1.8	0.1
Gold mines	1 647.0	1 661.0	1 620.2	1 544.2	1 528.4	-1.0	-7.2
Other metal mines	2 299.2	2 321.9	2 514.0	2 473.0	2 398.8	-3.0	4.3
Iron mines	466.5	489.3	449.7	474.1	461.6	-2.6	-1.1
Asbestos mines	84.4	94.9	102.1	104.9	90.4	-13.8	7.1
Nonmetal mines	593.9	565.4	546.4	553.6	562.4	1.6	-5.3
Salt mines	156.5	163.7	147.7	152.1	144.8	-4.8	-7.5
Coal mines	968.0	999.2	993.2	1 030.4	1 034.0	0.3	6.8
Crude petroleum and natural gas	11 726.7	11 750.3	11 699.9	11 920.7	12 084.0	1.4	3.0
Quarry and sand pit industries	767.9	737.1	747.1	717.9	663.2	-7.6	-13.6
Services related to mineral extraction	1 298.9	1 067.1	969.2	838.0	767.6	-8.4	-40.9
Manufacturing	83 649.3	85 082.7	85 816.0	84 413.1	83 894.0	-0.6	0.3
Construction industry	31 109.6	31 633.3	32 411.1	32 032.7	31 374.0	-2.1	0.8
Transportation and storage	21 508.7	21 998.7	21 907.7	21 610.3	21 836.5	1.0	1.5
Communications	18 984.1	19 266.3	19 235.3	19 545.8	19 610.4	0.3	3.5
Other utilities	16 118.1	16 207.7	16 408.5	16 482.9	16 494.8	0.1	2.3
Wholesale trade	24 979.2	26 522.8	27 138.8	27 150.0	27 269.2	0.4	9.2
Retail trade	29 029.3	29 626.7	29 354.6	29 325.4	29 578.4	0.9	1.9
Finance, insurance and real estate	82 079.4	84 179.3	84 323.9	85 464.4	87 076.0	1.9	6.1
Community, business and personal services	63 343.0	62 906.9	62 023.3	60 872.0	60 187.7	-1.1	-5.0
Non-Business Sector							
Government service industries	33 464.1	33 895.0	33 381.3	33 889.0	34 115.2	0.7	1.9
Community and personal services	53 076.9	53 217.3	53 330.5	53 435.3	53 304.8	-0.2	0.4
Other non-business industries and services	4 299.1	4 265.5	4 222.0	4 141.4	4 070.0	-1.7	-5.3

Source: Statistics Canada.
Note: Numbers may not add to totals due to rounding.

TABLE 4. CANADA, REAL GROSS DOMESTIC PRODUCT AT FACTOR COST BY INDUSTRIES INVOLVED IN MINERAL MANUFACTURING, IN 1986 PRICES, QUARTERLY (SEASONALLY ADJUSTED AT ANNUAL RATES)

Industry	1991 1st Quarter	1991 2nd Quarter	1991 3rd Quarter	1991 4th Quarter	1992 1st Quarter	% Change 1st Quarter 1992 / 4th Quarter 1991	% Change 1st Quarter 1992 / 1st Quarter 1991
			($ million)				
PRIMARY METAL INDUSTRIES	**6 382.4**	**6 650.6**	**7 031.4**	**6 973.4**	**6 685.9**	**-4.1**	**4.8**
Primary steel industries	2 389.6	2 524.2	2 800.9	2 765.4	2 622.0	-5.2	9.7
Steel, pipe and tube industries	438.3	448.3	461.9	473.9	366.0	-22.8	-16.5
Iron foundries	309.5	315.3	302.0	302.4	308.3	2.0	-0.4
Smelting and refining	2 440.4	2 511.5	2 579.9	2 563.9	2 488.0	-3.0	2.0
Aluminum rolling, casting and extruding	429.3	474.8	486.9	456.7	499.5	9.4	16.4
Copper rolling, casting and extruding	73.1	76.6	80.9	76.2	74.2	-2.6	1.5
Other metal rolling, casting, etc.	302.3	299.9	318.8	335.0	328.0	-2.1	8.5
FABRICATED METAL PRODUCTS INDUSTRIES	**5 719.6**	**5 694.8**	**5 668.3**	**5 396.2**	**5 280.6**	**-2.1**	**-7.7**
Power boiler and heat exchanger industry	270.4	291.3	274.1	259.8	297.2	14.4	9.9
Fabricated structural metal industry	1 026.4	998.0	983.9	940.5	899.4	-4.4	-12.4
Ornamental and architectural metal products industry	594.3	618.4	634.9	606.4	577.3	-4.8	-2.9
Stamped, pressed and coated metals	1 301.2	1 328.2	1 316.0	1 229.8	1 206.1	-1.9	-7.3
Wire and wire products industries	459.3	459.3	489.1	489.9	479.8	-2.1	4.5
Hardware, tool and cutlery industries	661.0	668.8	666.3	649.3	642.8	-1.0	-2.8
Heating equipment industry	141.0	145.6	154.4	153.0	146.1	-4.5	3.6
Machine shops industry	638.0	596.4	558.6	497.8	478.7	-3.8	-25.0
Other metal fabricating industries	627.9	588.9	591.1	569.7	553.2	-2.9	-11.9
NONMETALLIC MINERAL PRODUCTS INDUSTRIES	**2 468.1**	**2 578.7**	**2 583.5**	**2 475.0**	**2 302.0**	**-7.0**	**-6.7**
Clay products industry	83.7	106.5	117.2	107.9	93.6	-13.3	11.8
Cement industry	334.8	352.6	340.9	326.0	295.2	-9.4	-11.8
Concrete products industries	354.1	354.4	351.5	321.7	288.9	-10.2	-18.4
Ready-mix concrete industry	341.7	359.8	360.5	339.6	301.2	-11.3	-11.9
Glass and glass products industries	573.1	600.2	611.0	585.3	576.1	-1.6	0.5
Miscellaneous nonmetallic mineral products	780.7	805.2	802.4	794.5	747.0	-6.0	-4.3

Source: Statistics Canada.
Note: Numbers may not add to totals due to rounding.

TABLE 5. CANADA, PRINCIPAL STATISTICS OF THE MINERAL INDUSTRY,[1] 1990

		Mining Activity							Total Activity[2]		
		Production and Related Workers			Costs						
	Establishments	Employees	Person-Hours Paid	Wages	Fuel and Electricity	Materials and Supplies	Value of Production	Value Added	Employees	Salaries and Wages	Value Added
	(number)	(number)	(000)	($000)	($000)	($000)	($000)	($000)	(number)	($000)	($000)
METALS											
Nickel-copper-zinc	28	13 705	30 821	653 915	236 549	1 991 490	5 836 150	3 608 111	19 104	945 838	3 638 147
Gold	66	9 591	20 943	492 259	135 252	559 464	2 282 757	1 588 041	11 807	604 836	1 584 276
Uranium	5	3 066	6 370	161 643	54 056	125 160	735 694	556 478	3 702	198 024	556 969
Silver-lead-zinc	16	2 304	5 246	103 173	73 145	610 426	1 476 505	792 934	3 727	174 141	798 190
Iron	7	4 384	9 400	226 563	167 528	410 416	1 214 158	636 214	5 820	306 016	606 336
Miscellaneous metal mines[3]	5	845	1 838	36 498	15 284	59 421	168 803	94 098	1 088	48 681	94 554
Total	127	33 895	74 617	1 674 050	681 814	3 756 376	11 714 067	7 275 876	45 248	2 277 536	7 278 472
INDUSTRIALS											
Potash	11	2 810	6 249	111 612	101 372	137 292	968 512	729 848	3 822	162 523	732 506
Stone	123	2 270	5 165	80 360	37 522	118 233	476 858	321 104	2 951	108 954	326 558
Sand and gravel	132	1 696	3 972	58 040	28 182	86 885	365 266	250 199	2 425	85 128	259 954
Miscellaneous nonmetals[4]	34	1 804	3 956	63 789	29 642	61 567	332 826	241 616	2 468	92 392	240 712
Asbestos	4	2 080	4 752	77 772	35 802	53 618	293 731	204 311	2 699	107 764	204 902
Peat	48	1 386	3 063	28 299	5 606	27 713	118 414	85 095	1 740	39 437	85 231
Gypsum	10	656	1 515	18 853	7 105	20 292	88 575	61 178	786	23 948	61 029
Total	362	12 702	28 673	438 725	245 232	505 601	2 644 181	1 893 349	16 891	620 145	1 910 891
FUELS											
Oil, crude and natural gas	714	8 699	17 654	430 018	359 799	1 395 421	18 681 735	16 926 515	31 926	1 742 725	17 117 866
Coal	29	9 410	18 197	447 543	137 092	393 904	1 828 044	1 297 048	11 504	550 214	1 318 855
Total	743	18 109	35 851	877 561	496 891	1 789 325	20 509 779	18 223 563	43 430	2 292 939	18 436 721
Total minerals industry	1 232	64 706	139 141	2 990 336	1 423 937	6 051 302	34 868 027	27 392 788	105 569	5 190 620	27 626 084

Sources: Energy, Mines and Resources Canada; Statistics Canada.
[1] Cement manufacturing, lime manufacturing, clay and clay products (domestic clays) are included in the mineral manufacturing industry. [2] Total activity includes sales and head offices.
[3] Includes molybdenum. [4] Includes salt.
Note: Numbers may not add to totals due to rounding.

TABLE 6. CANADA, PRINCIPAL STATISTICS OF THE MINERAL INDUSTRY,[1] 1989

		Mining Activity							Total Activity[2]		
		Production and Related Workers			Costs						
	Establishments	Employees	Person-Hours Paid	Wages	Fuel and Electricity	Materials and Supplies	Value of Production	Value Added	Employees	Salaries and Wages	Value Added
	(number)	(number)	(000)	($000)	($000)	($000)	($000)	($000)	(number)	($000)	($000)
METALS											
Nickel-copper-zinc	27	14 374	31 561	644 216	228 734	1 914 018	6 617 321	4 474 570	19 837	920 213	4 515 629
Gold	70	10 130	22 117	469 884	120 501	530 195	2 079 569	1 428 873	12 631	588 283	1 425 910
Uranium	5	4 123	8 570	197 028	51 756	155 290	916 419	709 372	4 839	238 520	706 903
Silver-lead-zinc	15	3 105	7 127	138 782	59 653	709 046	1 749 389	980 690	4 487	208 358	989 947
Iron	7	4 786	10 421	220 108	177 860	416 147	1 351 098	757 091	6 303	298 824	741 271
Miscellaneous metal mines[3]	6	933	2 035	37 635	14 125	56 319	188 295	117 850	1 308	53 693	123 027
Total	130	37 451	81 830	1 707 653	652 629	3 781 017	12 902 092	8 468 446	49 405	2 307 891	8 502 686
INDUSTRIALS											
Potash	11	2 887	6 361	108 302	98 387	142 716	1 074 242	833 139	3 893	155 976	841 515
Stone	125	2 410	5 652	82 514	36 563	134 571	513 922	342 788	3 145	111 334	351 350
Sand and gravel	139	1 836	4 256	60 228	29 039	94 583	403 824	280 202	2 736	95 190	300 712
Miscellaneous nonmetals[4]	33	1 697	3 775	60 012	28 485	62 756	364 285	273 044	2 343	85 618	272 714
Asbestos	4	2 128	5 021	82 386	34 673	63 208	303 737	205 856	2 800	113 296	208 599
Peat	56	1 355	3 018	27 992	5 721	30 177	120 324	84 427	1 713	38 635	86 872
Gypsum	10	663	1 452	19 316	7 852	20 381	90 768	62 535	965	32 258	66 026
Total	378	12 976	29 534	440 750	240 720	548 391	2 871 102	2 081 991	17 595	632 308	2 127 787
FUELS											
Oil, crude and natural gas	725	9 111[r]	18 609[r]	422 756[r]	336 559	1 352 711	16 109 679	14 415 409	32 696[r]	1 772 335[r]	14 610 015
Coal	29	9 166[r]	18 582[r]	414 402[r]	119 660[r]	389 413[r]	1 672 583[r]	1 163 510[r]	11 279[r]	520 452[r]	1 199 706[r]
Total	754	18 277[r]	37 191[r]	837 158[r]	456 219[r]	1 742 124[r]	17 782 262[r]	15 578 919[r]	43 975[r]	2 292 787[r]	15 809 721[r]
Total minerals industry	1 262	68 704[r]	148 555[r]	2 985 561[r]	1 349 568[r]	6 071 532[r]	33 555 456[r]	26 129 356[r]	110 975[r]	5 232 986[r]	26 440 194[r]

Sources: Energy, Mines and Resources Canada; Statistics Canada.
[r] Revised.
[1] Cement manufacturing, lime manufacturing, clay and clay products (domestic clays) are included in the mineral manufacturing industry. [2] Total activity includes sales and head offices.
[3] Includes molybdenum. [4] Includes salt.
Note: Numbers may not add to totals due to rounding.

TABLE 7. CANADA, PRINCIPAL STATISTICS OF THE MINERAL INDUSTRY[1] BY REGION, 1990

		Mines, Quarries and Oil Wells Activity							Total Activity[2]		
		Production and Related Workers			Costs						
	Establishments	Employees	Person-Hours Paid	Wages	Fuel and Electricity	Materials and Supplies	Value of Production	Value Added	Employees	Salaries and Wages	Value Added
	(number)	(number)	(000)	($000)	($000)	($000)	($000)	($000)	(number)	($000)	($000)
Atlantic provinces[3]	84	8 351	16 532	309 664	150 992	661 745	1 793 866	981 125	10 738	416 926	960 302
Quebec[3]	183	10 777	23 497	462 174	214 085	780 391	2 437 732	1 443 258	14 751	651 791	1 463 206
Ontario	152	16 297	36 215	763 508	232 569	1 432 595	5 443 462	3 778 297	21 907	1 060 611	3 801 042
Prairie provinces	597	16 849	34 897	785 998	551 720	1 948 718	20 397 764	17 897 328	42 491	2 225 155	18 072 230
British Columbia[4]	180	10 095	22 435	526 293	216 949	954 158	3 478 401	2 307 295	12 577	654 998	2 335 877
Yukon and Northwest Territories[5]	36	2 337	5 568	142 698	57 624	273 694	1 316 805	985 487	3 105	181 141	993 426
Total	1 232	64 706	139 141	2 990 336	1 423 937	6 051 302	34 868 027	27 392 788	105 569	5 190 620	27 626 084

Sources: Energy, Mines and Resources Canada; Statistics Canada.
[1] Cement manufacturing, lime manufacturing, clay and clay products (domestic clays) are included in the mineral manufacturing industry. [2] Total activity includes sales and head offices.
[3] Includes eastern Canada offshore. [4] Includes western Canada offshore. [5] Includes Arctic Islands.
Note: Numbers may not add to totals due to rounding.

TABLE 8. CANADA, PRINCIPAL STATISTICS OF THE MINERAL INDUSTRY[1] BY REGION, 1989

		Mines, Quarries and Oil Wells Activity							Total Activity[2]		
		Production and Related Workers			Costs						
	Establishments	Employees	Person-Hours Paid	Wages	Fuel and Electricity	Materials and Supplies	Value of Production	Value Added	Employees	Salaries and Wages	Value Added
	(number)	(number)	(000)	($000)	($000)	($000)	($000)	($000)	(number)	($000)	($000)
Atlantic provinces[3]	87	8 775[r]	18 816[r]	313 919[r]	138 804	665 979	1 777 953[r]	973 166[r]	11 116	412 951	975 835[r]
Quebec[3]	191	11 055	24 356	455 928	200 889	741 327	2 255 701	1 313 484	15 196	643 051	1 353 497
Ontario	158	18 773[r]	41 401[r]	832 148[r]	250 902	1 466 418	6 096 815	4 374 495	25 030[r]	1 140 515[r]	4 411 358
Prairie provinces	613	17 319[r]	35 814[r]	749 291[r]	512 479	1 923 100[r]	18 579 464[r]	16 143 882[r]	43 460[r]	2 224 838[r]	16 312 132[r]
British Columbia[4]	178	10 560[r]	22 717[r]	506 588[r]	198 320[r]	972 434[r]	3 462 081[r]	2 291 328[r]	13 071[r]	639 850[r]	2 322 994[r]
Yukon and Northwest Territories[5]	35	2 222	5 451	127 687	48 173	302 270	1 383 443	1 032 999	3 102	171 782	1 064 380
Total	1 262	68 704[r]	148 555[r]	2 985 561[r]	1 349 568[r]	6 071 532[r]	33 555 456[r]	26 129 356[r]	110 975[r]	5 232 986[r]	26 440 194[r]

Sources: Energy, Mines and Resources Canada; Statistics Canada.
[r] Revised.
[1] Cement manufacturing, lime manufacturing, clay and clay products (domestic clays) are included in the mineral manufacturing industry. [2] Total activity includes sales and head offices.
[3] Includes eastern Canada offshore. [4] Includes western Canada offshore. [5] Includes Arctic Islands.
Note: Numbers may not add to totals due to rounding.

TABLE 9. CANADA, PRINCIPAL STATISTICS OF THE MINERAL INDUSTRY,[1] 1983-90

		Mines, Quarries and Oil Wells Activity							Total Activity[2]		
		Production and Related Workers			Costs						
	Establishments	Employees	Person-Hours Paid	Wages	Fuel and Electricity	Materials and Supplies	Value of Production	Value Added	Employees	Salaries and Wages	Value Added
	(number)	(number)	(000)	($000)	($000)	($000)	($000)	($000)	(number)	($000)	($000)
1983	1 407	66 629	131 406	1 963 773	1 022 417	3 756 625	32 771 401	27 992 357	113 831	3 687 911	28 012 167
1984	1 381	69 650	140 567	2 295 256	1 204 008	4 290 972	37 976 019	32 481 039	115 790	4 106 049	32 545 525
1985	1 385	66 945r	140 092r	2 347 084r	1 264 619	4 442 358	38 127 807	32 420 830	116 383r	4 421 553r	32 495 098
1986	1 507	64 360r	135 055r	2 378 524r	1 240 371	4 649 767	27 785 615	21 895 474	109 433r	4 445 569r	22 224 015
1987	1 276	64 370r	138 236r	2 444 934r	1 233 806	4 870 150	30 652 347	24 548 391	107 676r	4 449 357r	24 803 839
1988	1 340	67 360r	144 551r	2 749 351r	1 296 757	5 685 034	31 777 388	24 795 628	110 757r	4 876 209r	25 100 343
1989	1 262	68 704r	148 555r	2 985 561r	1 349 568r	6 071 532r	33 555 456r	26 129 356r	110 975r	5 232 986r	26 440 194r
1990	1 232	64 706	139 141	2 990 336	1 423 937	6 051 302	34 868 027	27 392 788	105 569	5 190 620	27 626 084

Sources: Energy, Mines and Resources Canada; Statistics Canada.
r Revised.
1 Cement manufacturing, lime manufacturing, clay and clay products (domestic clays) are included in the mineral manufacturing industry. 2 Total activity includes sales and head offices.

TABLE 10. CANADA, EMPLOYMENT, SALARIES AND WAGES IN THE MINERAL INDUSTRY,[1] 1983-90

	Unit	1983	1984	1985	1986	1987	1988	1989	1990
METALS									
Production and related workers	Number	37 270	39 181	36 618	34 941	34 329	36 140	37 451	33 895
Salaries and wages	$000	1 110 308	1 296 157	1 288 990	1 308 956	1 327 119	1 539 838	1 707 653	1 674 050
Annual average salary and wage	$	29 791	33 081	35 201	37 462	38 659	42 608	45 597	49 389
Administrative and office workers	Number	14 924	13 502	12 054	11 546	11 167	12 137	11 954	11 353
Salaries and wages	$000	533 517	518 644	487 398	489 402	489 609	561 205	600 238	603 486
Annual average salary and wage	$	35 749	38 412	40 435	42 387	43 844	46 239	50 212	53 157
Total metals									
Employees	Number	52 194	52 683	48 672	46 487	45 496	48 277	49 405	45 248
Salaries and wages	$000	1 643 825	1 814 801	1 776 388	1 798 358	1 816 728	2 101 043	2 307 891	2 277 536
Annual average salary and wage	$	31 495	34 448	36 497	38 685	39 932	43 521	46 714	50 335
INDUSTRIALS[2]									
Production and related workers	Number	12 768	13 008	12 535	12 376	12 989	12 969	12 976	12 702
Salaries and wages	$000	329 201	356 828	354 460	361 039	401 626	429 111	440 750	438 725
Annual average salary and wage	$	25 783	27 431	28 278	29 173	30 920	33 087	33 967	34 540
Administrative and office workers	Number	3 805	4 250	4 380	4 887	4 930	4 627	4 619	4 189
Salaries and wages	$000	115 378	138 012	148 090	169 237	183 979	189 650	191 558	181 420
Annual average salary and wage	$	30 323	32 473	33 811	34 630	37 318	40 988	41 472	43 309
Total industrials									
Employees	Number	16 573	17 258	16 915	17 263	17 919	17 596	17 595	16 891
Salaries and wages	$000	444 579	494 840	502 550	530 276	585 605	618 761	632 308	620 145
Annual average salary and wage	$	26 825	28 673	29 710	30 717	32 681	35 165	35 937	36 715
FUELS									
Production and related workers	Number	16 591	17 461	17 792r	17 043r	17 052r	18 251r	18 277r	18 109
Salaries and wages	$000	524 264	642 271	703 634r	708 529r	716 189r	780 402r	837 158r	877 561
Annual average salary and wage	$	31 599	36 783	39 548r	41 573r	42 000r	42 759r	45 804r	48 460
Administrative and office workers	Number	28 473	28 388	33 004r	28 640	27 209	26 633	25 698	25 321
Salaries and wages	$000	1 075 245	1 154 137	1 438 982r	1 408 406	1 330 835	1 376 003	1 455 629	1 415 378
Annual average salary and wage	$	37 764	40 656	43 600r	49 176	48 912	51 665	56 644	55 897
Total fuels									
Employees	Number	45 064	45 849	50 796r	45 683r	44 261r	44 884r	43 975r	43 430
Salaries and wages	$000	1 599 509	1 796 408	2 142 616r	2 116 935r	2 047 024r	2 156 405r	2 292 787r	2 292 939
Annual average salary and wage	$	35 494	39 181	42 181r	46 340r	46 249r	48 044r	52 138r	52 796
TOTAL MINERAL INDUSTRY									
Production and related workers	Number	66 629	69 650	66 945r	64 360r	64 370r	67 360r	68 704r	64 706
Salaries and wages	$000	1 963 773	2 295 256	2 347 084r	2 378 524r	2 444 934r	2 749 351r	2 985 561r	2 990 336
Annual average salary and wage	$	29 473	32 954	35 060r	36 957r	37 983r	40 816r	43 455r	46 214
Administrative and office workers	Number	47 202	46 140	49 438r	45 073	43 306	43 397	42 271	40 863
Salaries and wages	$000	1 724 140	1 810 793	2 074 470r	2 067 045	2 004 423	2 126 857	2 247 425	2 200 284
Annual average salary and wage	$	36 527	39 246	41 961r	45 860	46 285	49 009	53 167	53 845
Total mineral industry									
Employees	Number	113 831	115 790	116 383r	109 433r	107 676r	110 757r	110 975r	105 569
Salaries and wages	$000	3 687 913	4 106 049	4 421 554r	4 445 569r	4 449 357r	4 876 209r	5 232 986r	5 190 620
Annual average salary and wage	$	32 398	35 461	37 991r	40 624r	41 322r	44 026r	47 155r	49 168

Sources: Energy, Mines and Resources Canada; Statistics Canada.
r Revised.
1 Cement manufacturing, lime manufacturing, clay and clay products (domestic clays) are included in the mineral manufacturing industry. 2 Includes structural materials.
Note: Numbers may not add to totals due to rounding.

TABLE 11. CANADA, PRINCIPAL STATISTICS OF THE MINERAL MANUFACTURING INDUSTRIES, 1989

		Mineral Manufacturing Activity							Total Activity[1]		
		Production and Related Workers			Costs						
	Establishments	Employees	Person-Hours Paid	Wages	Fuel and Electricity	Materials and Supplies	Value of Shipments	Value Added	Employees	Salaries and Wages	Value Added
	(number)	(number)	(000)	($000)	($000)	($000)	($000)	($000)	(number)	($000)	($000)
PRIMARY METAL INDUSTRIES											
Primary steel	64	36 625	78 067	1 491 705	524 198	5 373 223	9 680 139	4 017 368	46 738	1 990 217	4 000 198
Smelting and refining	35	21 606	45 387	939 692	527 155	2 842 624	6 716 374	3 363 962	30 651	1 399 013	3 420 324
Wire and wire products industries[2]	325	11 927	25 119	325 754	38 745	1 051 054	1 865 837	787 747	15 077	441 958	828 479
Aluminum rolling, casting and extruding	76	4 928	10 930	170 640	32 179	1 718 537	2 305 069	537 770	6 285	230 649	532 692
Iron foundries	105	6 397	13 366	195 901	46 077	339 634	850 241	459 434	7 538	244 107	469 057
Metal rolling, casting and extruding n.e.s.	138	5 543	11 256	156 561	30 168	770 942	1 229 926	423 055	6 645	204 325	431 494
Steel pipe and tube	60	4 338	8 992	152 716	18 869	980 670	1 514 856	516 797	5 438	210 605	520 077
Copper and alloy rolling, casting and extruding	45	2 673	5 561	72 989	15 835	417 693	587 906	131 294	3 119	99 714	127 585
Total	848	94 037	198 678	3 505 958	1 233 226	13 494 377	24 750 348	10 237 427	121 491	4 820 588	10 329 906
NONMETALLIC MINERAL PRODUCTS INDUSTRIES											
Ready-mix concrete	654	10 720	23 395	328 801	65 385	1 202 262	2 052 130	785 174	12 377	392 292	795 858
Cement	22	2 122	4 617	89 789	153 630	189 852	955 916	610 300	3 350	145 743	627 698
Primary glass and glass containers	30	4 845	10 416	150 891	49 114	175 869	641 429	411 466	5 995	200 751	410 061
Glass products	166	5 604	11 591	157 442	18 071	319 485	716 665	381 815	6 669	197 039	414 089
Gypsum products	30	1 595	3 583	54 600	30 206	203 142	441 666	208 957	2 320	82 575	213 503
Mineral insulating products	49	2 396	5 326	78 284	37 444	184 657	466 254	243 429	3 620	133 545	368 047
Other concrete products	270	5 483	11 584	132 286	20 342	289 182	643 420	338 580	6 118	162 683	352 452
Structural concrete products	79	2 907	6 344	92 783	6 378	147 463	406 977	255 763	3 596	118 605	262 482
Clay products (domestic)	31	1 109	2 459	35 578	24 191	26 354	193 741	149 935	1 571	53 256	151 839
Other nonmetallic mineral products	175	2 972	6 369	76 311	11 605	122 538	325 159	191 681	3 377	93 418	194 579
Concrete pipe	45	1 425	3 057	43 511	5 729	97 396	248 308	146 806	1 791	59 902	148 318
Clay products (imported)	48	1 254	2 512	31 352	6 492	39 133	134 572	88 166	1 473	38 664	89 397
Refractory products	32	1 076	2 185	29 769	7 058	87 729	220 956	122 483	1 746	56 633	138 804
Abrasives	35	1 547	3 328	42 838	42 489	123 084	299 709	136 550	2 039	61 776	154 725
Lime	13	661	1 450	24 150	40 903	33 254	185 011	110 927	871	34 304	110 270
Asbestos products industry	9	303	646	6 549	827	12 492	26 061	11 033	404	9 801	11 759
Total	1 688	46 019	98 861	1 374 934	519 864	3 253 892	7 957 974	4 193 065	57 317	1 841 087	4 443 881

TABLE 11 (cont'd)

	Establishments	Mineral Manufacturing Activity: Production and Related Workers: Employees	Person-Hours Paid	Wages	Costs: Fuel and Electricity	Materials and Supplies	Value of Shipments	Value Added	Total Activity[1]: Employees	Salaries and Wages	Value Added
	(number)	(number)	(000)	($000)	($000)	($000)	($000)	($000)	(number)	($000)	($000)
FABRICATED METAL PRODUCTS INDUSTRIES											
Stamped and pressed metal products industries	1 027	31 391	66 270	805 115	84 401	3 071 888	5 198 307	2 035 781	36 707	1 003 554	2 089 144
Fabricated structural metal products industries	498	18 690	38 689	555 424	34 572	1 461 570	2 857 495	1 389 528	23 006	722 430	1 414 373
Hardware, tool and cutlery industry	895	22 964	48 065	608 299	30 958	743 912	1 936 707	1 162 871	25 626	707 493	1 200 754
Other metal fabricating industries	599	16 405	33 836	425 592	41 778	1 186 104	2 247 150	1 028 638	20 099	566 992	1 066 412
Ornamental and architectural metal products industries	834	19 111	39 986	443 132	27 891	1 233 492	2 257 224	990 386	22 591	574 073	1 011 314
Machine shop industry	1 544	23 774	49 298	601 487	31 436	622 807	1 532 432	881 732	24 639	636 035	886 078
Power boiler and heat exchanger industry	49	3 480	7 036	113 454	6 230	275 211	622 031	356 996	5 407	189 002	362 656
Heating equipment industry	155	5 650	11 640	129 760	6 475	321 697	637 090	313 906	7 076	176 390	320 174
Total	5 601	141 465	294 820	3 682 263	263 741	8 916 681	17 288 436	8 159 838	165 151	4 575 969	8 350 905
PETROLEUM AND COAL PRODUCTS INDUSTRIES											
Petroleum refining products	36	6 264	12 969	328 639	308 092	12 742 900	14 401 768	1 539 127	15 057	772 521	1 521 242
Other petroleum and coal products	88	856	1 796	24 728	11 099	170 453	269 589	91 056	1 135	35 439	101 802
Lubricating oils and greases	39	649	1 373/	21 849	5 556	207 637	287 308	71 719	1 029	36 717	85 617
Total	163	7 769	16 138	375 216	324 747	13 120 990	14 958 665	1 701 902	17 221	844 677	1 708 661
Total mineral manufacturing industries	8 300	289 290	608 497	8 938 371	2 341 578	38 785 940	64 955 423	24 292 232	361 180	12 082 321	24 833 353

Source: Statistics Canada, Catalogue No. 31-203.
n.e.s. Not elsewhere specified.
[1] Total activity includes sales and head offices. [2] Wire and wire products have been included in the primary metal industries group.
Note: Numbers may not add to totals due to rounding.

TABLE 12. CANADA, PRINCIPAL STATISTICS OF THE MINERAL MANUFACTURING INDUSTRIES BY REGION, 1989

		Mineral Manufacturing Activity							Total Activity[1]		
		Production and Related Workers			Costs						
	Establishments	Employees	Person-Hours Paid	Wages	Fuel and Electricity	Materials and Supplies	Value of Shipments	Value Added	Employees	Salaries and Wages	Value Added
	(number)	(number)	(000)	($000)	($000)	($000)	($000)	($000)	(number)	($000)	($000)
PRIMARY METALS INDUSTRY											
Atlantic provinces	10	x	x	x	x	x	x	x	x	x	x
Quebec	136	20 130	42 142	795 098	491 563	3 636 330	7 375 258	3 285 174	28 379	1 195 164	3 271 040
Ontario	244	49 402	105 765	1 916 499	539 385	7 122 092	12 376 548	4 891 596	62 043	2 555 083	4 890 930
Prairie provinces	72	x	x	x	x	x	x	x	x	x	x
British Columbia	61	5 585	10 966	220 790	22 198	440 070	1 112 999	645 339	7 226	296 734	716 830
Yukon and Northwest Territories	–	–	–	–	–	–	–	–	–	–	–
Total Canada	523	82 110	173 558	3 180 204	1 194 481	12 443 323	22 884 511	9 449 680	106 414	4 378 630	9 501 427
NONMETALLIC MINERAL PRODUCTS INDUSTRY											
Atlantic provinces	128	2 169	4 527	53 843	20 492	121 760	301 947	162 390	2 595	69 680	162 605
Quebec	404	11 070	23 627	311 687	121 353	692 032	1 761 818	933 561	12 685	415 283	971 927
Ontario	628	23 865	51 745	731 914	283 593	1 744 323	4 252 530	2 246 482	29 645	982 916	2 441 712
Prairie provinces	343	5 376	11 648	158 324	53 752	391 407	937 625	489 374	6 888	214 497	501 023
British Columbia	185	3 539	7 315	119 166	40 674	304 370	704 054	361 238	4 504	158 711	366 614
Yukon and Northwest Territories	–	–	–	–	–	–	–	–	–	–	–
Total Canada	1 688	46 019	98 861	1 374 934	519 864	3 253 892	7 957 974	4 193 065	57 317	1 841 087	4 443 881
FABRICATED METAL PRODUCTS INDUSTRY[2]											
Atlantic provinces	204	3 426	7 181	85 944	5 537	196 126	366 793	168 572	4 201	112 172	182 012
Quebec	1 331	32 154	66 054	807 383	63 906	2 004 419	4 066 281	2 038 493	39 026	1 044 765	2 070 594
Ontario	3 062	93 244	195 621	2 448 749	187 188	6 124 769	11 557 804	5 252 383	107 811	3 020 443	5 390 923
Prairie provinces	746	14 863	31 046	378 771	26 978	941 793	1 796 493	835 037	17 619	475 376	848 902
British Columbia	583	9 705	20 038	287 170	18 877	700 628	1 366 902	653 100	11 571	365 171	686 953
Yukon and Northwest Territories	–	–	–	–	–	–	–	–	–	–	–
Total Canada	5 926	153 392	319 939	4 008 017	302 486	9 967 735	19 154 273	8 947 585	180 228	5 017 927	9 179 384
PETROLEUM AND COAL PRODUCTS INDUSTRY											
Atlantic provinces	11	x	x	x	x	x	x	x	x	x	x
Quebec	29	1 238	2 568	60 593	63 729	2 433 196	2 708 069	253 035	1 632	78 475	261 627
Ontario	57	3 654	7 554	180 642	151 188	4 932 371	5 635 043	597 333	8 789	455 715	598 924
Prairie provinces	49	x	x	x	x	x	x	x	x	x	x
British Columbia	16	638	1 200	31 915	18 626	1 219 939	1 455 859	239 437	917	49 052	242 440
Yukon and Northwest Territories	–	x	x	x	x	x	x	x	x	x	x
Total Canada	163	7 769	16 138	375 216	324 747	13 120 990	14 958 665	1 701 902	17 221	844 677	1 708 661
TOTAL MINERAL MANUFACTURING INDUSTRIES											
Atlantic provinces	353	x	x	x	x	x	x	x	x	x	x
Quebec	1 900	64 592	134 390	1 974 761	740 551	8 765 977	15 911 426	6 510 283	82 722	2 733 687	6 575 188
Ontario	3 991	170 165	360 684	5 277 804	1 161 354	19 923 555	33 821 925	12 987 794	208 288	7 014 157	13 322 489
Prairie provinces	1 210	x	x	x	x	x	x	x	x	x	x
British Columbia	845	19 467	39 519	659 041	100 375	2 665 007	4 639 814	1 899 114	24 218	869 668	2 012 837
Yukon and Northwest Territories	–	x	x	x	x	x	x	x	x	x	x
Total Canada	8 300	289 290	608 497	8 938 371	2 341 578	38 785 940	64 955 423	24 292 232	361 180	12 082 321	24 833 353

Source: Statistics Canada, Catalogue No. 31-203.
– Nil; x Confidential.
1 Total activity includes sales and head offices. 2 For reasons of confidentiality, SIC 305 (wire and wire products), normally included in Primary Metals is included in Fabricated Metal Products.

TABLE 13. CANADA, PRINCIPAL STATISTICS OF THE MINERAL MANUFACTURING INDUSTRIES,[1] 1980-89

		Mineral Manufacturing Activity							Total Activity[2]		
		Production and Related Workers			Costs						
	Establishments	Employees	Person-Hours Paid	Wages	Fuel and Electricity	Materials and Supplies	Value of Shipments	Value Added	Employees	Salaries and Wages	Value Added
	(number)	(number)	(000)	($000)	($000)	($000)	($000)	($000)	(number)	($000)	($000)
1980	7 229	270 529	565 988	4 991 451	1 411 101	28 394 177	43 895 507	14 758 224	366 120	7 262 688	15 160 467
1981	7 196	261 364	546 732	5 393 636	1 720 151	34 570 420	51 870 979	16 791 049	361 883	8 076 300	17 200 686
1982	5 687	229 518	475 378	5 333 201	1 728 740	34 241 605	50 045 037	14 497 245	321 785	8 126 238	14 823 990
1983	7 370	216 944	447 947	5 420 307	1 905 777	34 720 416	52 773 875	15 861 491	301 112	8 143 674	16 196 749
1984	7 511	223 816	470 367	5 948 626	2 125 032	37 738 117	57 207 764	17 980 271	304 309	8 719 151	18 265 131
1985	7 625	238 544	506 377	6 507 081	2 229 270	39 497 925	61 241 939	19 305 730	313 850	9 271 447	19 646 938
1986	7 841	248 039	524 184	6 829 899	2 096 145	31 806 478	54 521 641	19 788 464	319 950	9 563 918	20 124 687
1987	7 598	..	..	..	2 155 505	38 820 112	63 607 352	..	333 009	10 170 081	22 760 931
1988	8 309	277 965	586 697	8 187 400	2 268 400	35 436 700	62 739 600	22 871 500	350 917	11 191 000	25 725 700
1989	8 300	289 290	608 497	8 938 371	2 341 578	38 785 940	64 955 423	24 292 232	361 180	12 082 321	24 833 353

Source: Statistics Canada.
.. Not available.
[1] Includes the following industries: Primary Metals, Nonmetallic Mineral Products, Fabricated Metal Poducts, and Petroleum and Coal Products. [2] Total activity includes sales and head offices.

TABLE 14. CANADA, EMPLOYMENT, SALARIES AND WAGES IN THE MINERAL MANUFACTURING INDUSTRIES, 1983-89

	Unit	1983	1984	1985	1986	1987	1988	1989
PRIMARY METAL INDUSTRIES								
Production and related workers	Number	87 769	92 336	92 695	90 035	..	95 967	94 037
Salaries and wages	$000	2 445 267	2 818 413	2 940 777	2 924 986	..	3 387 100	3 505 958
Annual average salary and wage	$	27 860	30 523	31 725	32 487	..	35 294	37 283
Administrative and office workers	Number	31 076	30 826	29 467	28 738	..	27 861	27 454
Salaries and wages	$000	1 055 120	1 131 842	1 159 060	1 182 287	..	1 249 200	1 314 630
Annual average salary and wage	$	33 953	36 717	39 334	41 140	..	44 837	47 885
Total primary metal industries[1]								
Employees	Number	118 845	123 162	122 162	118 773	119 372	123 828	121 491
Salaries and wages	$000	3 500 387	3 950 387	4 099 837	4 107 273	4 244 950	4 636 300	4 820 588
Annual average salary and wage	$	29 453	32 074	33 561	34 581	35 561	37 441	39 679
NONMETALLIC MINERAL PRODUCTS INDUSTRIES								
Production and related workers	Number	34 097	36 155	38 763	42 011	..	45 974	46 019
Salaries and wages	$000	800 755	883 604	1 001 780	1 121 460	..	1 309 600	1 374 934
Annual average salary and wage	$	23 485	24 439	25 844	26 694	..	28 486	29 878
Administrative and office workers	Number	13 353	12 738	11 842	11 479	..	11 863	11 298
Salaries and wages	$000	391 901	394 620	397 131	406 427	..	464 600	466 153
Annual average salary and wage	$	29 349	30 980	33 536	35 406	..	39 164	41 260
Total nonmetallic mineral products								
Employees	Number	47 450	48 893	50 605	53 490	56 822	57 837	57 317
Salaries and wages	$000	1 192 656	1 278 224	1 398 911	1 527 887	1 668 869	1 774 200	1 841 087
Annual average salary and wage	$	25 135	26 143	27 644	28 564	29 370	30 676	32 121
FABRICATED METAL PRODUCTS INDUSTRIES								
Production and related workers	Number	87 661	88 787	100 650	109 634	..	129 187	141 465
Salaries and wages	$000	1 910 181	1 983 782	2 298 665	2 518 297	..	3 172 100	3 682 263
Annual average salary and wage	$	21 791	22 343	22 838	22 970	..	24 554	26 029
Administrative and officer workers	Number	28 239	26 203	23 694	22 987	..	24 455	23 686
Salaries and wages	$000	785 881	778 057	751 973	746 041	..	882 700	893 706
Annual average salary and wage	$	27 830	29 693	31 737	32 455	..	36 095	37 731
Total fabricated metal products industries								
Employees	Number	115 900	114 990	124 344	132 621	141 667	153 642	165 151
Salaries and wages	$000	2 696 062	2 761 839	3 050 638	3 264 338	3 547 954	4 054 800	4 575 969
Annual average salary and wage	$	23 262	24 018	24 534	24 614	25 044	26 391	27 708
PETROLEUM AND COAL PRODUCTS INDUSTRIES								
Production and related workers	Number	7 417	6 538	6 436	6 359	..	6 837	7 769
Salaries and wages	$000	264 104	262 827	265 859	265 156	..	318 600	375 216
Annual average salary and wage	$	35 608	40 200	41 308	41 698	..	46 599	48 297
Administrative and office workers	Number	11 500	10 726	10 303	8 707	..	8 773	9 452
Salaries and wages	$000	490 465	466 006	456 202	399 264	..	407 100	469 461
Annual average salary and wage	$	42 649	43 446	44 279	45 856	..	46 404	49 668
Total petroleum and coal products								
Employees	Number	18 917	17 264	16 739	15 066	15 148	15 610	17 221
Salaries and wages	$000	754 569	728 833	722 061	664 420	708 308	725 700	844 677
Annual average salary and wage	$	39 888	42 217	43 136	44 101	46 759	46 489	49 049
TOTAL MINERAL MANUFACTURING INDUSTRIES								
Production and related workers	Number	216 944	223 816	238 544	248 039	..	277 965	289 290
Salaries and wages	$000	5 420 307	5 948 626	6 507 081	6 829 899	..	8 187 400	8 938 371
Annual average salary and wage	$	24 985	26 578	27 278	27 536	..	29 455	30 898
Administrative and office workers	Number	84 168	80 493	75 306	71 911	..	72 952	71 890
Salaries and wages	$000	2 723 367	2 770 525	2 764 366	2 734 019	..	3 003 600	3 143 950
Annual average salary and wage	$	32 356	34 419	36 708	38 019	..	41 172	43 733
Total mineral manufacturing industries								
Employees	Number	301 112	304 309	313 850	319 950	333 009	350 917	361 180
Salaries and wages	$000	8 143 674	8 719 151	9 271 447	9 563 918	10 170 081	11 191 000	12 082 321
Annual average salary and wage	$	27 045	28 652	29 541	29 892	30 540	31 891	33 452

Source: Statistics Canada.
.. Not available.
[1] Wire and wire products have been included in the Primary Metal Industries group.

TABLE 15. CANADA, CONSUMPTION OF FUEL AND ELECTRICITY IN THE MINERAL INDUSTRY,[1] 1990

	Unit	Metals	Industrials[2]	Total
Coal	000 t	191	–	191
	$000	13 919	–	13 919
Gasoline	000 litres	24 219	20 454	44 673
	$000	10 369	9 521	19 890
Fuel oil, kerosene, diesel oil	000 litres	432 108	255 927	688 035
	$000	182 261	72 962	255 223
Liquefied petroleum gas	000 litres	118 602	14 465	133 067
	$000	23 389	3 247	26 636
Natural gas	000 m^3	172 526	652 165	824 691
	$000	18 768	43 669	62 437
Other fuels[3]	$000	22 105	1 681	23 786
Total value of fuels	$000	270 811	131 080	401 891
Electricity purchased	million kWh	13 097	2 842	15 939
	$000	411 002	114 151	525 153
Total value of fuels and electricity purchased in the nonfuel minerals industry	$000	681 813	245 231	927 044
Total value of fuels and electricity purchased in the fuel industry	$000	. .	. .	496 891
Total value of fuels and electricity purchased in the minerals industry, all reporting companies	$000	. .	. .	1 423 935

Sources: Energy, Mines and Resources Canada; Statistics Canada.
– Nil; . . Not available.
[1] Cement manufacturing, lime manufacturing, clay and clay products (domestic clays) are included in the mineral manufacturing industry. [2] Includes structural materials. [3] Includes wood, manufactured gas, steam purchased, and other miscellaneous fuels.
Note: Numbers may not add to totals due to rounding.

TABLE 16. CANADA, COST OF FUEL AND ELECTRICITY USED IN THE MINING INDUSTRY,[1] 1983-90

	Unit	1983	1984	1985	1986	1987	1988	1989	1990
METALS									
Fuel	$000	270 098	331 231	337 445	276 894	249 932	251 343	254 442	270 811
Electricity purchased	million kWh	9 659	11 672	11 504	12 066	12 128	13 264	13 396	13 097
	$000	238 458	272 932	281 373	320 828	345 068	368 369	398 188	411 002
Total cost of fuel and electricity	$000	508 556	604 163	618 818	597 722	595 000	619 712	652 630	681 813
INDUSTRIALS[2]									
Fuel	$000	157 872	169 486	165 665	153 442	137 873	139 126	127 612	131 080
Electricity purchased	million kWh	1 928	2 120	2 122	2 107	2 237	2 510	2 548	2 842
	$000	64 052	76 884	82 114	86 571	96 876	107 496	113 108	114 151
Total cost of fuel and electricity	$000	221 924	246 370	247 779	240 013	234 749	246 622	240 720	245 231
TOTAL NONFUEL MINERAL INDUSTRY									
Fuel	$000	427 970	500 717	503 110	430 336	387 805	390 469	382 054	401 891
Electricity purchased	million kWh	11 587	13 792	13 626	14 173	14 365	15 774	15 944	15 939
	$000	302 510	349 816	363 487	407 399	441 944	475 865	511 296	525 153
Total cost of fuel and electricity	$000	730 480	850 533	866 597	837 735	829 749	866 334	893 350	927 044
FUELS[3]									
Fuel	$000	68 800	89 237	101 049	73 426	67 103	68 654	. .	. .
Electricity purchased	million kWh	4 958	5 840	6 569	7 183	7 822	8 726	. .	. .
	$000	223 136	264 233	296 973	329 208	336 952	371 632	. .	. .
Total cost of fuel and electricity	$000	291 936	353 470	398 022	402 634	404 055	440 286	456 219r	496 891
TOTAL MINING INDUSTRY									
Fuel	$000	496 770	589 954	604 159	503 762	454 908	459 123	. .	. .
Electricity purchased	million kWh	16 545	19 632	20 195	21 356	22 187	24 501	. .	. .
	$000	525 646	614 049	660 460	736 607	778 896	847 497	. .	. .
Total cost of fuel and electricity	$000	1 022 416	1 204 003	1 264 619	1 240 369	1 233 804	1 306 620	1 349 569	1 423 935

Sources: Energy, Mines and Resources Canada; Statistics Canada.
. . Not available; r Revised.
1 Cement manufacturing, lime manufacturing, clay and clay products (domestic clays) are included in the mineral manufacturing industry. 2 Includes structural materials.
3 Breakdown not available for the fuel industries in 1989 and 1990.

TABLE 17. CANADA, MINERAL PRODUCTS INDUSTRIES, SELLING PRICE INDEXES, 1985-91

Base (1986=100)	1985	1986	1987	1988	1989	1990	1991p
IRON AND STEEL PRODUCTS INDUSTRIES							
Ferroalloy and steel foundry industries	98.7	100.0	100.7	106.3	116.1	108.6	108.2
Iron foundries	97.4	100.0	100.8	103.2	106.3	109.8	110.9
Primary steel industries	99.0	100.0	101.6	107.5	110.0	108.1	105.6
Steel pipe and tube industry	99.7	100.0	100.5	104.7	105.7	102.3	101.3
NONFERROUS PRIMARY METAL PRODUCTS INDUSTRIES							
Aluminum rolling, casting and extruding industry	97.2	100.0	104.4	123.2	117.2	100.5	91.6
Copper rolling, casting and extruding industry	97.0	100.0	111.5	146.5	161.1	154.4	138.9
Jewellery and precious metals industries	92.5	100.0	103.8	98.8	91.0	90.8	89.6
Other rolling casting and extruding industry	98.6	100.0	106.3	122.4	124.3	113.7	101.7
Nonferrous metal smelting and refining industries	96.3	100.0	111.6	148.2	141.4	117.0	99.0
NONMETALLIC MINERAL PRODUCTS INDUSTRIES							
Agricultural chemicals industries	102.5	100.0	94.4	98.3	98.8	95.1	97.6
Hydraulic cement industry	97.6	100.0	100.8	102.1	104.8	106.8	110.3
Clay products industry (from domestic clay)	93.7	100.0	107.7	110.8	117.3	122.7	122.0
Clay products industry (from imported clay)	94.9	100.0	105.2	112.3	118.0	123.4	124.6
Concrete products industries	94.7	100.0	104.8	113.0	116.2	118.3	119.9
Glass and glass products industries	96.1	100.0	104.5	110.2	111.1	110.7	109.8
Nonmetallic mineral insulating materials industry	99.2	100.0	104.5	109.6	114.1	114.5	114.2
Refined petroleum and coal products industries	124.5	100.0	95.0	88.2	89.5	100.9	97.7
FABRICATED METAL PRODUCTS INDUSTRIES							
Agricultural implement industry	97.7	100.0	101.8	104.3	106.7	109.0	109.9
Miscellaneous fabricated structural metal products	97.7	100.0	102.1	108.1	111.8	112.8	111.4
Hardware, tool and cutlery industries	96.6	100.0	103.9	109.2	113.7	117.4	120.0
Heating equipment industry	98.2	100.0	102.3	106.3	110.6	113.1	115.6
Other metal fabricating industries	96.4	100.0	102.2	107.5	112.8	115.4	117.8
Power boiler and heat exchanger industry	92.3	100.0	107.8	112.7	120.7	125.3	130.1
Stamped, pressed and coated metal products industries	96.1	100.0	102.3	105.1	105.6	104.7	103.9
Wire and wire products industries	99.2	100.0	101.4	106.9	111.5	112.7	112.7

Source: Statistics Canada, Catalogue No. 62-011.
p Preliminary.

TABLE 18. CANADA, SELLING PRICE INDEXES OF MINERAL RAW MATERIALS, 1985-91

Base (1986=100)	1985	1986	1987	1988	1989	1990	1991p
METALLIC MINERALS							
Copper concentrates	96.7	100.0	118.7	158.7	165.3	153.0	131.5
Iron ore	98.7	100.0	96.4	91.0	82.8	82.8	81.7
Lead concentrates	83.7	100.0	156.9	151.9	154.1	170.4	123.9
Nickel concentrates	114.0	100.0	111.1	263.3	251.6	166.0	149.9
Other base metals	98.0	100.0	107.0	130.6	119.4	96.0	80.3
Precious metals	89.2	100.0	114.5	103.9	87.8	85.4	78.0
Gold and alloys in primary form	88.8	100.0	114.2	103.9	87.8	85.9	78.8
Platinum	62.1	100.0	116.5	101.8	95.5	86.9	68.4
Silver	110.1	100.0	121.9	106.2	86.4	74.7	61.7
Radio-active concentrates	100.9	100.0	97.9	86.8	60.0	57.8	49.8
Zinc concentrates	103.3	100.0	106.2	138.8	184.8	165.7	121.9
NONMETALLIC MINERALS							
Asbestos fibres	100.3	100.0	100.1	100.9	107.2	108.9	111.0
Other crude minerals	98.7	100.0	100.4	106.0	105.7	104.6	104.7
Potash (muriate)	101.6	100.0	107.7	145.3	140.8	133.4	137.9
Quartz and silica sand	97.0	100.0	100.5	107.6	106.8	109.8	108.3
Sand and gravel	97.6	100.0	104.6	114.2	125.2	126.8	124.3
Stone	96.3	100.0	102.9	107.9	109.6	114.6	116.4
Building	97.4	100.0	103.5	106.5	111.4	117.2	119.5
Crushed	94.9	100.0	104.2	109.1	110.5	116.4	120.4
Other	97.4	100.0	103.5	106.5	111.4	117.2	119.5
Sulphur	93.4	100.0	81.4	65.8	65.9	57.6	53.0
MINERAL FUELS							
Coal (thermal)	100.2	100.0	100.7	89.7	90.0	90.7	94.6
Crude mineral oil	173.4	100.0	110.6	86.5	99.0	120.0	108.3
Natural gas	101.9	100.0	96.7	89.1	85.0	85.8	86.8

Source: Statistics Canada, Catalogue No. 62-011.
p Preliminary.