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Sulphur in Liquid Fuels

2003

Prepared by: Elizabeth Escorihuela
Fuels Division
Oil, Gas and Energy Branch
Air Pollution Prevention Directorate
Environment Canada

and Hung Nguyen
Joel Daigneault
Co-op Students
Waterloo University

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Environment Canada

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Notice

The information contained in this report is compiled from data submitted by the producers and importers of liquid fuels in Canada pursuant to the requirements of the Federal *Fuels Information Regulations, No. 1*. Submissions have been verified for reasonableness but are subject to potential errors made at the source.

Any comments concerning the content of this report should be directed to:

Fuels Division
Oil, Gas, and Energy Branch
Environmental Protection Service
Environment Canada
Place Vincent Massey, 20th Floor
Gatineau, Quebec
K1A 0H3
Fax: (819) 953-8903

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1.0 Executive Summary

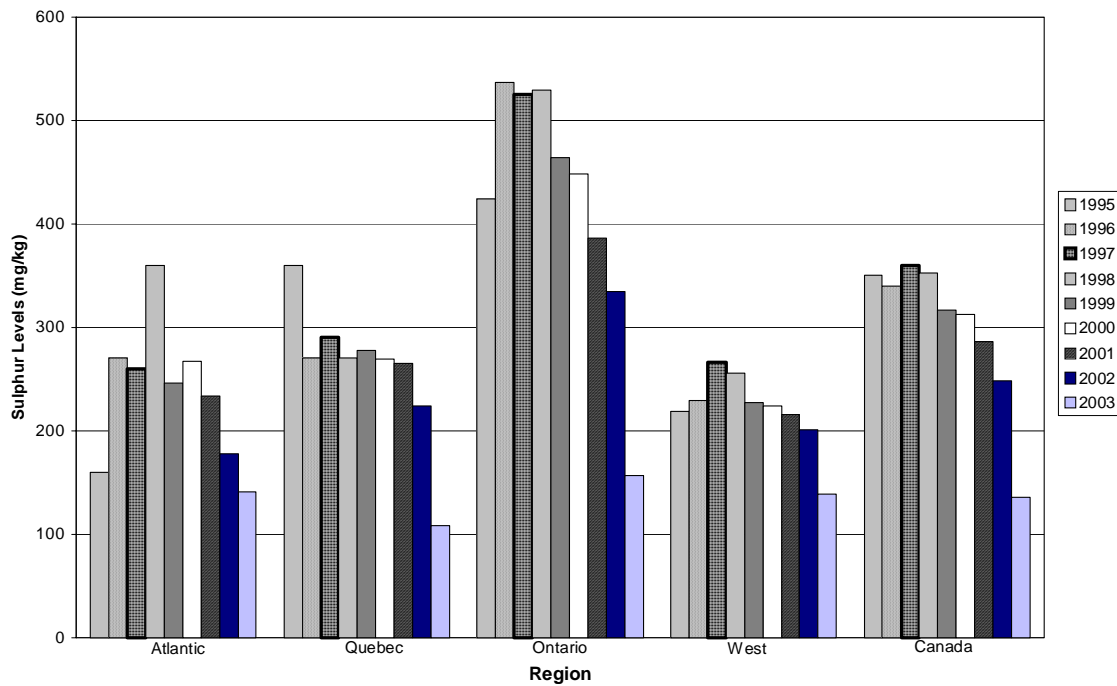
This report summarizes the 2003 data on the sulphur content in liquid fuels originating from crude oils, coal or bituminous sand. The information contained here was provided to Environment Canada by producers and importers of liquid fuels pursuant to the federal *Fuels Information Regulations, No.1* of the *Canadian Environmental Protection Act, 1999*.

During 2003, there were various developments with respect to federal regulations on sulphur in fuels and other non-regulatory issues:

- The *Sulphur in Diesel Fuels Regulations* came into force on January 1, 2003. These regulations revoke and replace the federal *Diesel Fuel Regulations* which had a maximum limit of 0.05% by weight (500 mg/kg) for on-road diesel fuel. The new regulations continue the 500 mg/kg limit until mid-2006, at which time a 15 mg/kg limit comes into effect for on-road diesel fuel.
- Consultation on regulations to introduce limits for sulphur in non-road diesel fuel commenced in August 2003 with the release of a Discussion document entitled “*Reducing the level of sulphur in Canadian diesel fuel – A Discussion Paper on designing a Canadian Regulation to align with the new U.S. Standard*”. Following review and consideration of comments received, proposed amendments to the *Sulphur in Diesel Fuel Regulations* were published in Part I of the *Canada Gazette* on October 2, 2004. The proposed amendments introduce limits for sulphur in off-road, rail and marine diesel fuels aligned with the levels and timing requirements passed by the U.S. Environmental Protection Agency in June 2004 as follows:
 - Initial limit of 500 mg/kg for off-road, rail and marine diesel fuels in June 2007;
 - Final limit of 15 mg/kg for off-road diesel fuel in June 2010; and
 - Final limit of 15 mg/kg for rail and marine diesel fuels in June 2012.
- Public consultations on measures to reduce the level of sulphur in both light and heavy fuel oils were launched in spring 2003 with the release of the Discussion Paper entitled “*Setting Canadian Standards for Light and Heavy Fuel Oils*” and a multistakeholder workshop held in Halifax. Environment Canada received written comments on the issues set out in the Discussion Paper and is currently assessing the path forward for the development of the appropriate measures to reduce sulphur in Canadian fuel oils.
- Environment Canada jointly with *Friends of Earth* produced a “*Low Sulphur Fuels Procurement Guide*” (June 2003) that is aimed at encouraging federal, provincial and municipal governments and other organizations to take leadership by procuring low sulphur fuels. The guide consists of an overview of the environmental and health impacts of sulphur in fuels; a description of the benefits of using low sulphur fuels; an overview of regulations and standards for sulphur content in fuels and case studies of the successful implementation of procurement initiatives.

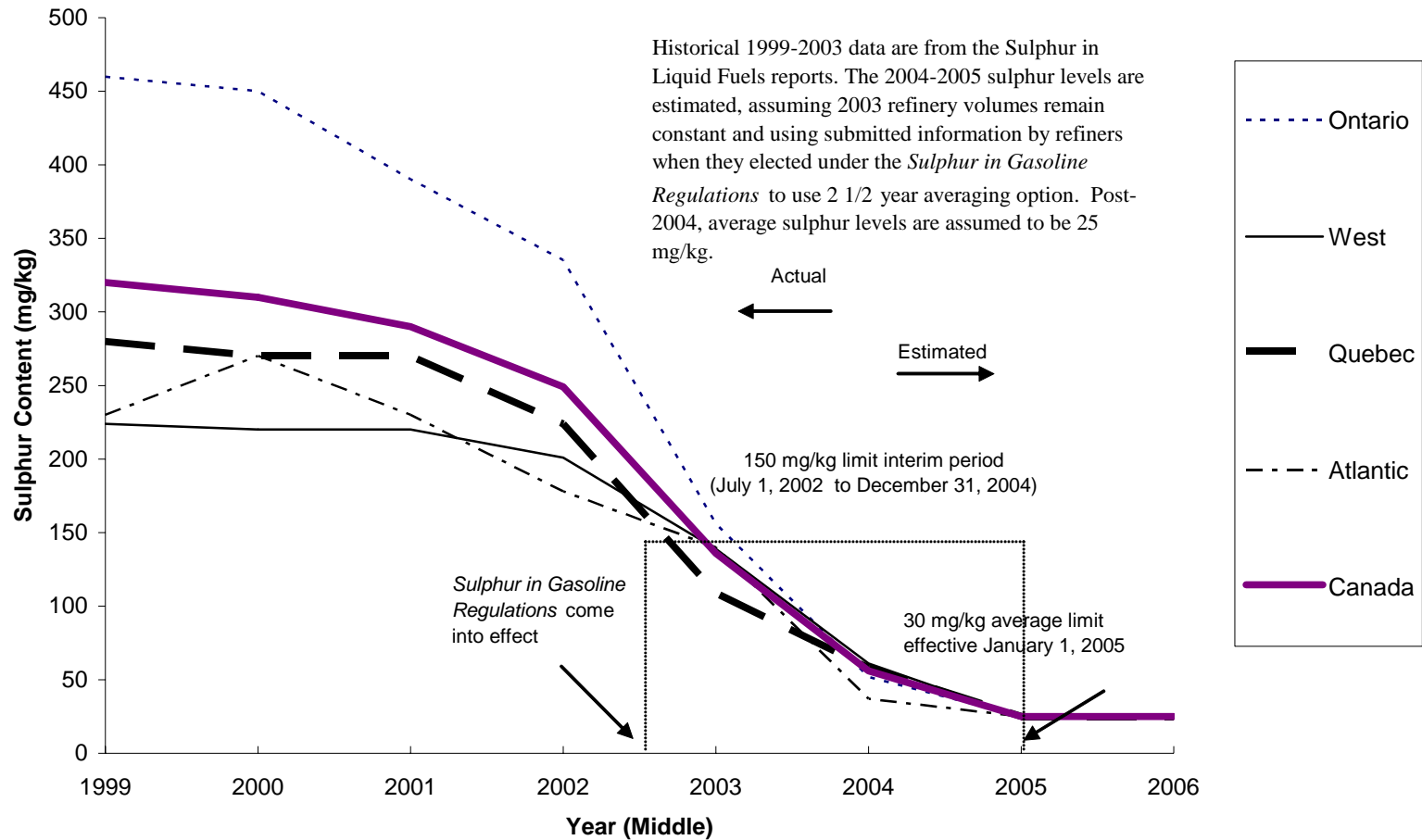
In 2003, the national average sulphur content in gasoline was determined to be **136 mg/kg**, which represents a decline of 54.6% with respect to 2002 levels (248 mg/kg). Graph 1.1 shows the trend for sulphur content in gasoline nationally and by region for the period 1995 to 2003.

Graph 1.1: Sulphur Levels in Gasoline by Region, 1995-2003



The lower sulphur levels in 2003 result from the *Sulphur in Gasoline Regulations*, which came into effect in 2002. The regulations set an average limit of 30 mg/kg commencing in 2005, with an interim limit of 150 mg/kg until then. Graph 1.2 shows the actual and projected trends in the levels of sulphur in gasoline from 1999 to 2006.

Graph 1.2: National Trend of Sulphur Content in Gasoline (1999-2006)



In contrast to the decline in the level of sulphur in gasoline, the reported mass of sulphur content in all liquid fuels nationally increased by **7.7%** in 2003 from 2002 values, as shown in Graph 1.3. In the Atlantic region, the reported mass of sulphur in all liquid fuels increased by 11.5% for 2003. In Quebec and the Western provinces the increases were 15.6% and 8% respectively. The increases are mainly due to a 12.4% increase in the volume of heavy fuel oil (HFO) produced / imported into Canada

Graph 1.3 : Sulphur Mass in Liquid Fuels by Region, 1996-2003

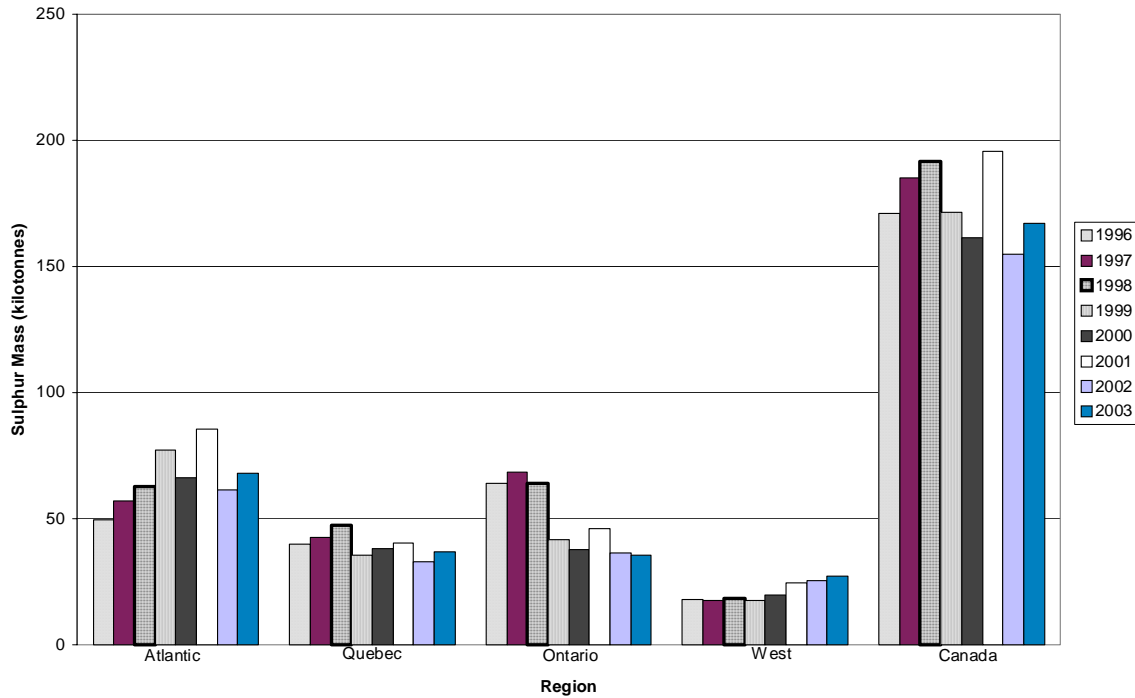


Table 1.1 shows the national summary of data compiled from **Form 1, “Report on Sulphur Content”**, of the *Fuels Information Regulations, No. 1*, which petroleum refineries and importing companies are required to submit to Environment Canada under those regulations.

The largest reported volume of liquid fuel produced in, or imported into Canada was gasoline which constituted 46.0% of all products, and accounted for 2.3% of the sulphur mass in liquid fuels. Heavy fuel oil constituted 8.7% by volume of the total liquid fuels and contained 70.8% of the total sulphur mass in Canada. The Atlantic provinces, Quebec and Ontario accounted for 83.6% of the total mass of sulphur present in fuels. Forty-one (41%) percent of the total sulphur mass was attributed to the Atlantic provinces with heavy fuel oil totaling over 84.5% of this sulphur mass.

The volume of fuel for plant consumption is 47.7% greater than from the 2002 Sulphur in Liquid Fuels report. This increase results from including liquefied refinery gas, marine bunker fuels (i.e., intermediate fuel oil IFO 420), asphalt and bituminous emulsion product (i.e., ORIMULSION®) in the 2003 figures. In previous years these were not included.

TABLE 1.1 :
Fuel Production / Imports and Sulphur Content
National Summary for 2003

Type of Fuel	Fuel Production / Imports		Sulphur Mass (tonnes)	Average Sulphur Content (%wt.)	Distribution of Sulphur in Products (%)
	(m ³)	(% of total)			
Aviation Turbo Fuel	5,977,594	6.7	3,167	0.065	1.9
Motor Gasoline	41,265,189	46.3	3,785	0.014	2.3
Aviation Gasoline	118,707	0.1	3	0.003	0.0
Kerosene/Stove oil	1,120,158	1.3	404	0.044	0.2
Low-Sulphur Diesel Fuel	22,788,561	25.6	6,192	0.032	3.7
Diesel Fuel	3,325,323	3.7	7,017	0.247	4.2
Light Fuel Oil	4,862,519	5.5	6,177	0.148	3.7
Heavy Fuel Oil	7,756,571	8.7	118,541	1.541	70.8
Plant Consumption	1,835,668	2.1	22,097	1.212	13.2
TOTAL	89,050,290	100.0	167,381	0.196	100.0

Note: Totals may not add up to due to rounding.

2.0 Introduction

2.1 *Fuels Information Regulations, No. 1*

The *Fuels Information Regulations, No.1* (see Appendix 2) were adopted in 1978 to provide Environment Canada with information regarding liquid fuel composition, particularly concerning sulphur dioxide (SO₂) emissions from combustion. These Regulations require annual reporting on sulphur levels in fuels and one-time reporting of non-lead fuel additive content (additional reporting is required when there are changes). They apply to all fuels¹ in liquid form that originate from crude oils, coal or bituminous sands.

The Regulations require all producers and importers handling more than 400 cubic meters (m³) of fuels intended for consumption in Canada within a calendar year to report the volume of fuels produced or imported, the fuel density and the fuel sulphur content for each quarter of the calendar year (see Appendix 2). Environment Canada uses the reported values to estimate the mass of sulphur in Canadian fuels. The types of liquid fuel to be reported can be found in Appendix 2. The Regulations also require all producers and importers who supply more than 400 m³ of a fuel to report all the additives other than lead or lead compounds in fuels.

2.2 *Regulations and other Measures to Address Sulphur Levels in Fuels*

Sulphur in Diesel Fuel Regulations

The federal *Sulphur in Diesel Fuel Regulations* which were in effect from January 1, 1998 to December 31, 2002, required all on-road diesel fuel to have a sulphur level not exceeding 0.05% by weight (500 mg/kg)². Those regulations were revoked and replaced on January 1, 2003 by the *Sulphur in Diesel Fuel Regulations* (see Appendix 2) which were passed on July 31, 2002. The *Sulphur in Diesel Fuel Regulations* continue the 500 mg/kg limit until June 1, 2006, at which time a 15 mg/kg limit comes into effect for on-road diesel fuel. The Canadian requirements for sulphur content in on-road diesel fuel align with those in the U.S. EPA's *Final Rule on Heavy-Duty Engine and Vehicle Standards and Highway Diesel Fuel Sulfur Control Requirements*, published January 18, 2001. Note that there is no volume threshold for reporting under these regulations.

Proposed amendments to the federal *Sulphur in Diesel Fuel Regulations* were published in Part I of the *Canada Gazette* on October 2, 2004. The proposed amendments introduce limits for sulphur in off-road, rail and marine diesel fuels aligned with the levels and

¹ Throughout this document, the word “fuel(s)” applies only to those fuels which are in liquid form and petroleum-based.

² From October 1, 1994 to December 31, 1997, a non-regulatory program was in place under which petroleum marketers agreed to make available only diesel fuel with a sulphur content not exceeding 0.05% by weight at all service stations, truck stops and on-road cardlocks and keylocks in Canada – approximately 50% of the on-road diesel fuel pool.

timing of requirements passed by the U.S. Environmental Protection Agency in June 2004. The proposed sulphur limits are:

- Initial limit of 500 mg/kg for off-road, rail and marine diesel fuels in June 2007;
- Final limit of 15 mg/kg for off-road diesel fuel in June 2010; and
- Final limit of 15 mg/kg for rail and marine diesel fuels in June 2012.

The proposed amendments, along with the accompanying regulatory impact analysis statement are available at Environment Canada's Diesel Fuel website: http://www.ec.gc.ca/energ/fuels/fuel_home_e.html#diesel.

Sulphur in Gasoline Regulations

On June 23, 1999, the federal government passed regulations limiting the amount of sulphur in gasoline. The *Sulphur in Gasoline Regulations* limit the sulphur content in gasoline to an average of 30 mg/kg with a maximum of 80 mg/kg starting January 1, 2005. An interim period beginning July 1, 2002, limits the average sulphur content of gasoline to 150 mg/kg over a 2½ year period.

Amendments to the regulations were published in Part II of the *Canada Gazette* on September 25, 2003. The amendments include the use of a recently-developed method that provides more accurate measurement of sulphur at low levels and the reporting of the sulphur limits in milligrams per kilogram (mg/kg) rather than in percent by weight.

Canadian General Standards Board

The Canadian General Standards Board (CGSB) has commercial standards for fuels, some of which have been adopted by provinces in regulations. The standards for sulphur in fuels vary considerable between fuels (see Appendix 4). CGSB standards are revised periodically to reflect developments in product, usage and manufacturing technology.

Setting Canadian Standards for Fuel Oils used in stationary sources

In the Notice of Intent on Cleaner Vehicles, Engines and Fuels, published in the *Canada Gazette* on February 2001, Environment Canada proposed the development of measures to reduce the level of sulphur in both light and heavy fuel oils used in stationary sources, with the view to matching the requirements set by the European Union (i.e., 1% wt. for heavy fuel oil and 0.1% wt. for light fuel oil to be fully implemented by 2008). To this end, Environment Canada released a Discussion Paper in April 2003 and conducted a multistakeholder workshop in May 2003. Also, complementary measures to regulations, such as economic instruments have been examined. Recent work by the National Round Table on the Economy and the Environment (NRTEE) involved studying the environmental and economic implications of using fiscal instruments to reduce sulphur levels in light and heavy fuel oil.

Environment Canada has received written comments on the issues presented in the Fuel Oils Discussion Paper and is currently assessing the path forward.

Low Sulphur Procurement Guide

Environment Canada and Friends of Earth have jointly produced a “*Low Sulphur Fuels Procurement Guide*” (June 2003) that is aimed at encouraging governments and other organizations to take leadership by procuring low sulphur fuels where possible. It provides a checklist of suggested low sulphur fuels procurement practices, contracting recommendations, suggestions for estimating emissions reductions, cases studies and links to key sources of information. This guide is available at http://www.ec.gc.ca/energ/ecology/ecol_home_e.htm.

2.3 Period Covered

This report covers the period from January 1 to December 31, 2003. Under the *Fuels Information Regulations No. 1*, petroleum refineries and importing companies are required to submit information for each quarter of the calendar year to Environment Canada on or before January 31 of the following year. Under the *Sulphur in Diesel Fuel Regulations*, quarterly reports are also required on the level of sulphur in diesel fuel with sulphur concentrations exceeding 500 mg/kg and equal or less than 500 mg/kg. The *Sulphur in Gasoline Regulations* require annual reporting on the level of sulphur in gasoline.

Failure to submit the data on time, incomplete data or unsigned forms are offenses under the *Canadian Environmental Protection Act, 1999*.

2.4 Reporting Petroleum Refineries and Importing Companies

Table 2.1 lists the petroleum refineries, blenders, and upgrading plants that reported, under the three regulations, information pertaining to *production* volume and fuel sulphur content for 2003.

**Table 2.1
Refineries, Blenders and Upgraders Reporting under the respective Regulations**

Company	Location	Prov.	FIR³	Gasoline⁴	Diesel⁵
Chevron Canada Limited	Burnaby	BC	x	x	x
Consumers' Co-operative Refineries Ltd.	Regina	SK	x	x	x
Husky Oil Operations	Prince George	BC	x	x	x
Imperial Oil Limited (Dartmouth Refnr.)	Dartmouth	NS	x	x	x
Imperial Oil Limited (Sarnia Refinery)	Sarnia	ON	x	x	x
Imperial Oil Limited (Nanticoke Refinery)	Nanticoke	ON	x	x	x
Imperial Oil Limited (Strathcona Refinery)	Edmonton	AB	x	x	x
Irving Oil Limited	Saint John	NB	x	x	x
North Atlantic Refining Limited	Come-By-Chance	NF	x	x	x
NOVA Chemicals Canada Limited (Corunna Plant)	Sarnia	ON	x	-	x
Parkland Refining Ltd. (Bowden Refinery)	Bowden	AB	x	-	-
Petro-Canada Lubricants (Lubricants Centre)	Mississauga	ON	x	-	x
Petro-Canada Products Ltd. (Montréal Refinery)	Montréal	QC	x	x	x
Petro-Canada Products Limited (Edmonton Refinery)	Edmonton	AB	x	x	x
Petro-Canada Products Limited (Oakville Refinery)	Oakville	ON	x	x	-
Robbins Feed and Fuel Limited (Blender)	Thorold	ON	x	x	-
Shell Canada Ltd. (Montréal-East Refinery)	Montréal-Est	QC	x	x	-
Shell Canada Products (Sherwood Marketing Terminal) Gasoline-Like Blendstock	Calgary	AB	-	x	-
Shell Canada Products Ltd. (Sarnia Manufacturing Centre)	Corunna	ON	x	x	x
Shell Canada Products Ltd. (Scotford Refinery)	Fort Saskatchewan	AB	x	x	x
Suncor Energy Inc. (Oil Sands)	Fort McMurray	AB	x	-	x
Suncor Energy Inc. (Sarnia Refinery)	Sarnia	ON	x	x	x
Syncrude Canada Inc. (Mildred Lake Facility)	Fort McMurray	AB	x	-	-
Ultramar Canada Inc. (Montreal East Terminal)	Montreal East	QC	x	x	x
Ultramar Canada Inc. (St. Romuald - Jean-Gaulin Refinery)	St- Romuald	QC	x	x	x

The following petroleum importers reported, under the three regulations, information pertaining to *import* volume and fuel sulphur content for 2003:

³ FIR: *Fuels Information Regulations No. 1*

⁴ Gasoline: *Sulphur in Gasoline Regulations*

⁵ Diesel: *Sulphur in Diesel Fuel Regulations*

Table 2.2
Importers Reporting under the under their respective Regulations

Company	Location	Prov	FIR⁶	Gasoline⁷	Diesel⁸
Air Canada	Westridge / Shellburn	BC	x	-	-
Air Canada	Quebec City	QC	x	-	-
BP Cherry Point	Vancouver	BC	x	-	-
CAMI Automotive Inc.	Ingersoll	ON	-	x	-
Compaq Papiers (La compagnie de papiers Stadacona)	Quebec	QC	x	-	-
Daigle Oil Ltd.	Edmundston	NB	x	-	x
Emera Fuels Inc.	Darmouth	NS	x	-	-
Ford Motor Company of Canada	St. Thomas & Windsor	ON	x	x	-
General Motors of Canada Limited	Ontario	ON	-	x	x
Honda of Canada	Alliston	ON	-	x	-
Imperial Oil Limited (Burrard Terminal)	Burnaby	BC	x	x	x
Kildair Services Ltd.	Tracy	QC	x	-	-
Mackenzie Petroleum Ltd.	Dawson City	YT	x	-	x
Marine Petrobulk Limited	N. Vancouver	BC	x	-	x
Neste Petroleum	Montréal-Est	QC	x	-	-
Neste Petroleum	Beauport	QC	x	x	-
New Brunswick Power Corporation	Fredericton	NB	x	-	-
Newfoundland and Labrador Hydro	St. John's	NF	x	-	-
Nexfor Fraser Papers	Edmundston	NB	x	-	-
Norske Canada (Elf Falls Division)	Campbell River	BC	x	-	-
Northern Transportation Company Ltd.	Iqaluit	NU	x	-	x
North 60 Petro Ltd.	Whitehorse	YT	x	-	-
North Atlantic Refinery	Come-by-chance	NS	x	-	-
Nova Scotia Power Inc.	Halifax	NS	x	-	-
Olco Petroleum Group Inc.	Hamilton	ON	x	-	-
Parkland Refining Limited	Bowden	AB	x	-	x
Petro-Canada (Oakville Refinery)	Oakville	ON	x	x	-
Petro-Canada Products (Burrard Terminal)	Port Moody	BC	x	x	x
Petro-Canada Products Limited	Montréal	QC	x	x	-
Pétroles Norcan Inc.	Montréal	QC	x	x	-
Pope and Talbot Limited (Harmac Pulp Operations)	Nanaimo	BC	x	-	-
Port Colborne Quarries Limited	Port Colborne	ON	x	-	-
Shell Canada Products	Montreal-East	QC	x	x	-
Suncor Energy Inc	Sarnia	ON	x	x	x
Ultramar Canada Inc.	Halifax	ON	x	-	x
Ultramar Canada Inc.	Holyrood	NF	x	x	x
Ultramar Canada Inc. (Mtrl. East, Term)	Montreal East	QC	x	x	-
Ultramar Canada Inc.(St-Romuald, Rfr.)	St-Romuald	QC	x	x	-
United Refining Company	Warren	PA	x	-	x
Western Pulp Inc.	Port Alice	BC	X	-	-

⁶ FIR: *Fuels Information Regulations No. 1*

⁷ Gasoline: *Sulphur in Gasoline Regulations*

⁸ Diesel: *Sulphur in Diesel Fuel Regulations*

2.5 Company Specific Sulphur Levels

Appendix 3 presents data on the annual volume-weighted sulphur content (in mg/kg) for gasoline, diesel fuel and fuel oil during the period of 1995 to 2003 for each Canadian refinery and importer.

3.0 Volumes of Liquid Fuels Produced / Imported

In order to verify the accuracy, the reported volumes of produced fuels were compared to Statistics Canada figures for 2003 (see Table 3.1).

With the exception of kerosene/stove oil, diesel fuel and heavy fuel oil, there appears to be reasonable agreement between the two sets of data. These may result from the given differences in approaches noted below.

TABLE 3.1:		
Volumes of Liquid Fuels Produced / Imported for Sale in Canada		
Reported to Statistics Canada⁽¹⁾ and Environment Canada for 2003		
Type of Fuel	Statistics Canada	Environment Canada
	(m³)	(m³)
Aviation Turbo Fuel	6,055,149	5,977,594
Motor/Aviation Gasoline	40,803,092	41,383,896
Kerosene/Stove oil	422,462	1,120,158
Low-Sulphur Diesel Fuel	-	22,788,561
Diesel Fuel	24,212,517	3,325,323
Light Fuel Oil	5,262,373	4,862,519
Heavy Fuel Oil	9,570,093	7,756,571
Plant Consumption	2,117,693	1,835,668
TOTAL	88,443,379	89,050,290

Notes:

1. Statistics Canada data were compiled for the period Year 2003. Source: Statistics Canada, Catalogue no. 45-004-XIB Monthly, December 2003.
2. According to Statistics Canada, approximately 75-80% of refinery-produced kerosene and stove oil are later transferred to diesel and light fuel oils.
3. Statistics Canada does not distinguish between low-sulphur and regular diesel grades.
4. Volumes reported to Environment Canada mostly reflect production at the various refineries while Statistics Canada considers opening and closing inventories and inter-product transfers.
5. Plant consumption fuel is almost all heavy fuel oil, but in some instances includes liquefied petroleum gas, light fuel oil and diesel. Environment Canada is including the "plant consumption" volumes of marine bunker fuel (i.e., intermediate fuel oil IFO 420), asphalt and bituminous emulsion product (i.e., ORIMULSION[®]) in the 2003 figures (Marine bunker fuel and bituminous emulsions are not included in the Statistics Canada inventory).

4.0 Volumes of Liquid Fuels Produced / Imported and Fuel Sulphur Content

4.1 National and Regional Summaries

The following graphs and tables summarize the data compiled from reports submitted pursuant to the *Fuels Information Regulations No. 1* for 2003:

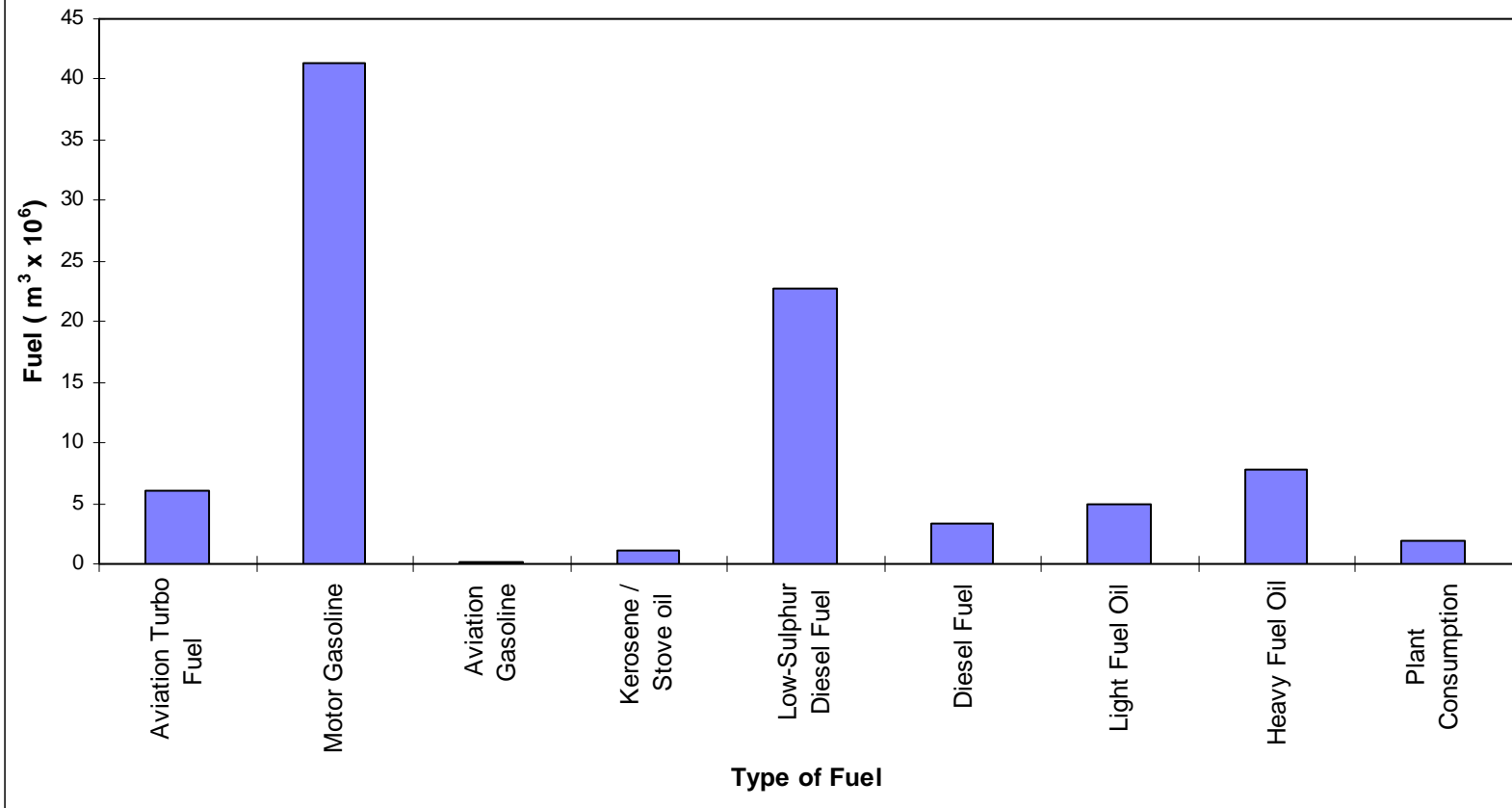
- National Data for Liquid Fuels: Table 4.1, Graphs 4.1 and 4.2
- Regional Data for Liquid Fuels: Tables 4.2A-E, Graphs 4.3 and 4.4
- Regional Data for Motor/Aviation Gasoline: Graph 4.5
- Refinery Data for Motor Gasoline: Graph 4.6
- Refinery Data for Diesel Fuel: Graphs 4.7 and 4.8
- Historical Trends (National): Graphs 4.9 to 4.14

TABLE 4.1 :
Fuel Production / Imports and Sulphur Content
National Summary for 2003

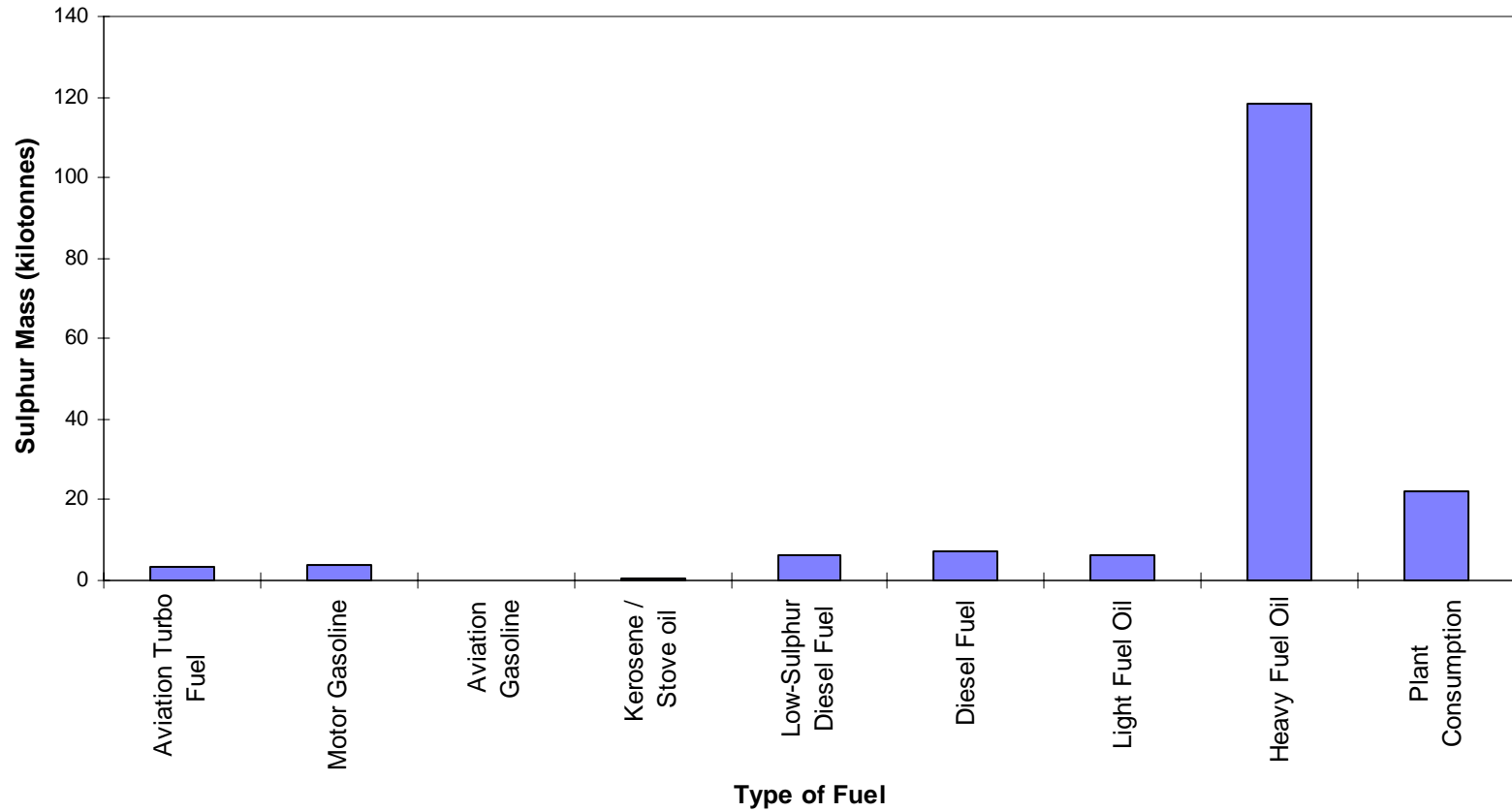
Type of Fuel	Fuel Production / Imports		Sulphur Mass (tonnes)	Average Sulphur Content (%wt.)	Distribution of Sulphur in Products (%)
	(m ³)	(% of total)			
Aviation Turbo Fuel	5,977,594	6.7	3,167	0.065	1.9
Motor Gasoline	41,265,189	46.3	3,785	0.014	2.3
Aviation Gasoline	118,707	0.1	3	0.003	0.0
Kerosene/Stove oil	1,120,158	1.3	404	0.044	0.2
Low-Sulphur Diesel Fuel	22,788,561	25.6	6,192	0.032	3.7
Diesel Fuel	3,325,323	3.7	7,017	0.247	4.2
Light Fuel Oil	4,862,519	5.5	6,177	0.148	3.7
Heavy Fuel Oil	7,756,571	8.7	118,541	1.541	70.8
Plant Consumption	1,835,668	2.1	22,097	1.212	13.2
TOTAL	89,050,290	100.0	167,381	0.196	100.0

Note: Totals may not add up to due to rounding.

Graph 4.1: National Liquid Fuel Production / Imports in 2003



Graph 4.2: Tonnage of Sulphur in Liquid Fuels in 2003



**TABLE 4.2A:
Fuel Production/Imports and Sulphur Content, Atlantic Region Summary for 2003**

Atlantic Region				
Type of Fuel	Fuel Production/Imports (m³)	Sulphur Mass (tonnes)	Average Sulphur Content (%wt.)	Distribution of Sulphur in Products (%)
Aviation Turbo Fuel	524,025	504	0.120	0.7
Motor Gasoline	2,896,245	299	0.014	0.4
Aviation Gasoline	0	0	0.000	0.0
Kerosene/Stove oil	98,333	24	0.030	0.0
Low-Sulphur Diesel Fuel	1,877,753	638	0.041	0.9
Diesel Fuel	N/A ¹	174	0.096	0.3
Light Fuel Oil	1,598,435	1,485	0.110	2.2
Heavy Fuel Oil	3,055,743	57,417	1.864	84.5
Plant Consumption ³	539,273	7,380	1.413	10.9
TOTAL	10,589,807²	67,920	0.633	100.0

Notes:

1. Volume not included to protect confidential data
2. Total volume excludes the volume not included, as per note 1
3. Plant consumption in the Atlantic consists mostly of marine fuels (i.e., intermediate fuel oil IFO 420), light/heavy fuel oil, asphalt and import bituminous emulsion product (i.e., ORIMULSION®).

**TABLE 4.2B:
Fuel Production/Imports and Sulphur Content, Quebec Region Summary for 2003**

Quebec Region				
Type of Fuel	Fuel Production/Imports (m³)	Sulphur Mass (tonnes)	Average Sulphur Content (%wt.)	Distribution of Sulphur in Products (%)
Aviation Turbo Fuel	1,577,478	1,091	0.085	3.0
Motor Gasoline	11,507,742	912	0.011	2.5
Aviation Gasoline	N/A ¹	0	0.001	0.0
Kerosene/Stove oil	949,958	357	0.046	1.0
Low-Sulphur Diesel Fuel	N/A ¹	2,007	0.040	5.5
Diesel Fuel	N/A ¹	275	0.212	0.8
Light Fuel Oil	1,572,365	2,520	0.187	6.9
Heavy Fuel Oil	2,153,956	23,384	1.136	63.8
Plant Consumption ³	459,061	6,121	1.352	16.7
TOTAL	18,220,560²	36,666	0.161	100.0

Notes:

1. Volume not included to protect confidential data
2. Total volume excludes the volume not included, as per note 1
3. Plant consumption in Quebec consists mostly of liquefied petroleum gas, heavy fuel oil, asphalt and diesel.

**TABLE 4.2C:
Fuel Production/Imports and Sulphur Content, Ontario Region Summary for 2003**

Ontario Region				
Type of Fuel	Fuel Production/Imports (m ³)	Sulphur Mass (tonnes)	Average Sulphur Content (%wt.)	Distribution of Sulphur in Products (%)
Aviation Turbo Fuel	1,190,930	721	0.074	2.0
Motor Gasoline	13,043,368	1,177	0.016	3.3
Aviation Gasoline	0	0	0.000	0.0
Kerosene/Stove oil	N/A ¹	21	0.040	0.1
Low-Sulphur Diesel Fuel	4,518,523	1,269	0.033	3.6
Diesel Fuel	N/A ¹	2,805	0.318	7.9
Light Fuel Oil	1,649,379	2,158	0.151	6.1
Heavy Fuel Oil	1,329,916	18,690	1.428	52.8
Plant Consumption ³	499,308	8,550	1.677	24.2
TOTAL	22,231,423 ²	35,392	0.161	100.0

Notes:

1. Volume not included to protect confidential data
2. Total volume excludes the volume not included, as per note 1
3. Plant consumption in the Ontario consists mostly of liquefied petroleum gas and heavy fuel oil.

**TABLE 4.2D:
Fuel Production/Imports and Sulphur Content, West Region Summary for 2003**

West Region				
Type of Fuel	Fuel Production/Imports (m ³)	Sulphur Mass (tonnes)	Average Sulphur Content (%wt.)	Distribution of Sulphur in Products (%)
Aviation Turbo Fuel	2,685,161	851	0.039	3.1
Motor Gasoline	13,817,834	1,397	0.014	5.1
Aviation Gasoline	N/A ¹	3	0.005	0.0
Kerosene/Stove oil	8,051	2	0.026	0.0
Low-Sulphur Diesel Fuel	10,393,738	2,278	0.026	8.3
Diesel Fuel	1,926,408	3,763	0.228	13.7
Light Fuel Oil	N/A ¹	15	0.040	0.1
Heavy Fuel Oil	1,216,955	19,050	1.571	69.5
Plant Consumption ³	338,027	46	0.016	0.2
TOTAL	30,386,174 ²	27,400	0.096	100.0

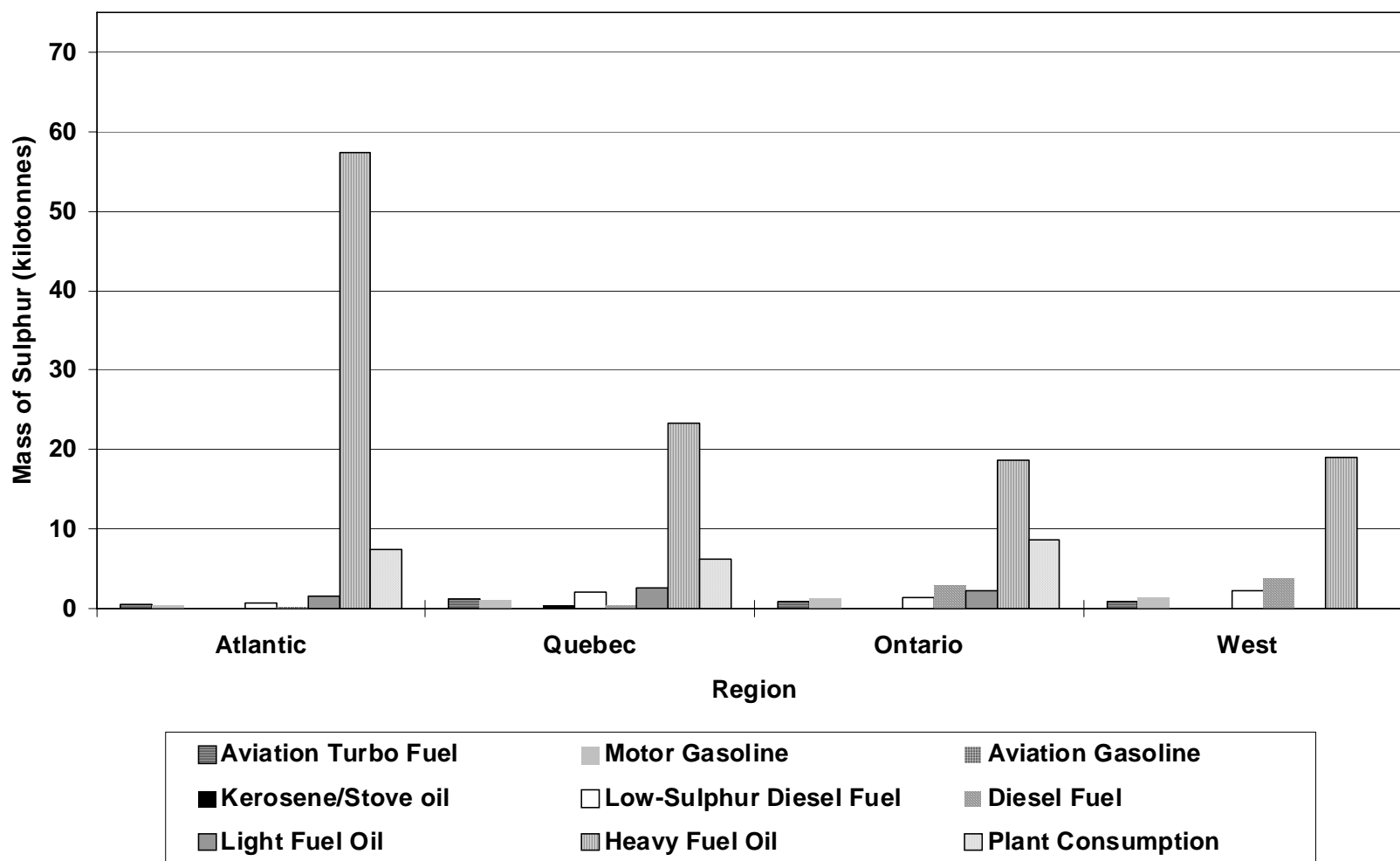
Notes:

1. Volume not included to protect confidential data
2. Total volume excludes the volume not included, as per note 1
3. Plant consumption in the West consists mostly of liquefied petroleum gas, light fuel oil, grade AA diesel.

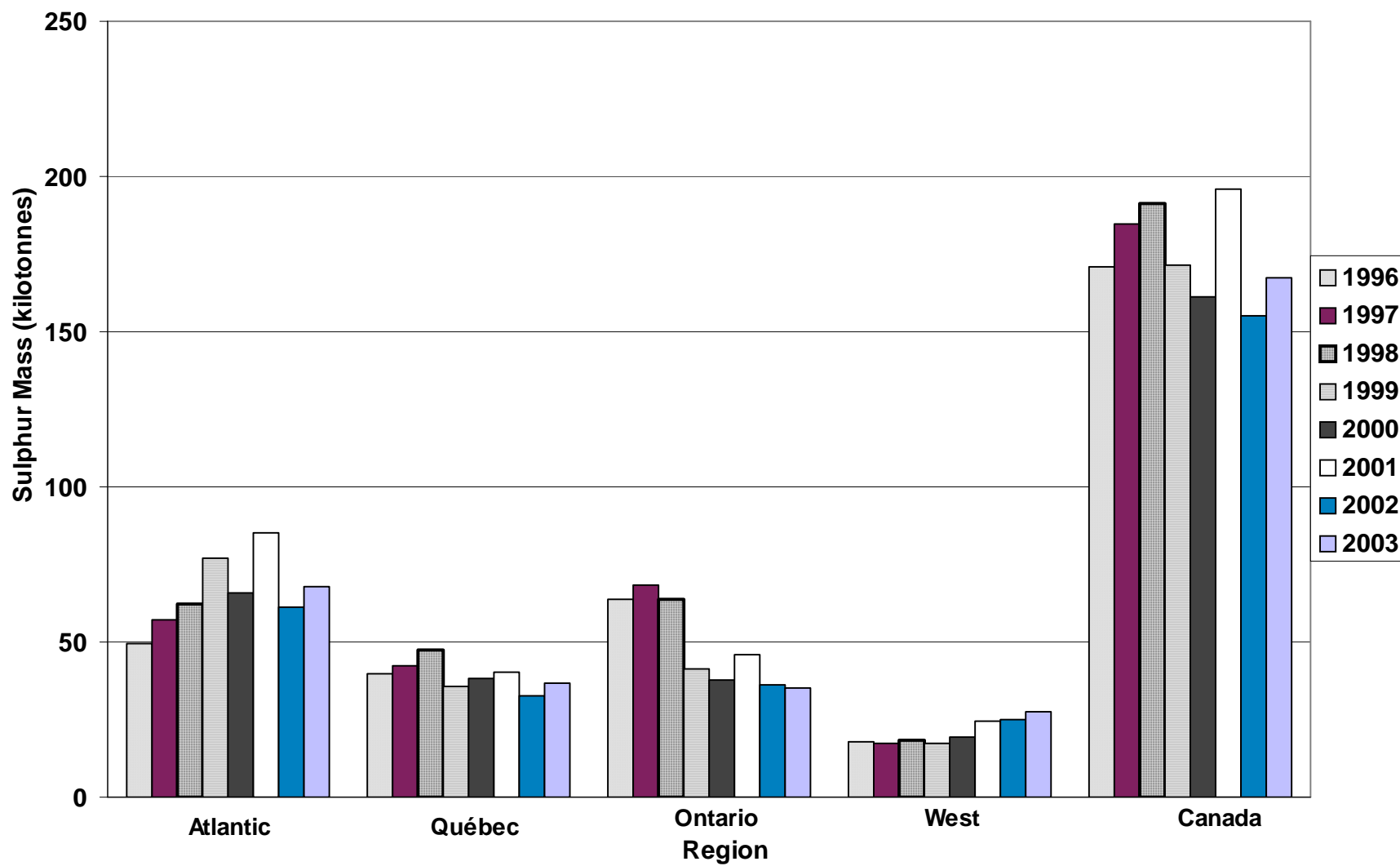
TABLE 4.2E:
Regional and National Volume Weighted Averages of the Density of Fuels Produced
And Imported in 2003 (in kg/m³)

	Atlantic	Quebec	Ontario	West	Canada
Aviation Turbo Fuel	800.7	812.1	807.0	812.9	810.4
Motor Gasoline	735.4	727.4	729.2	727.1	728.5
Aviation Gasoline	-	706.3	-	700.8	703.1
Kerosene/Stove Oil	821.6	804.4	829.6	822.2	807.4
Low-Sulphur Diesel Fuel	838.1	836.6	843.5	849.8	844.1
Diesel Fuel	843.1	855.5	852.2	857.5	854.9
Light Fuel Oil	844.5	856.7	863.3	844.0	854.8
Heavy Fuel Oil	1006.2	966.6	983.3	995.3	989.6
Plant Consumption	965.9	990.9	1020.1	805.7	957.4

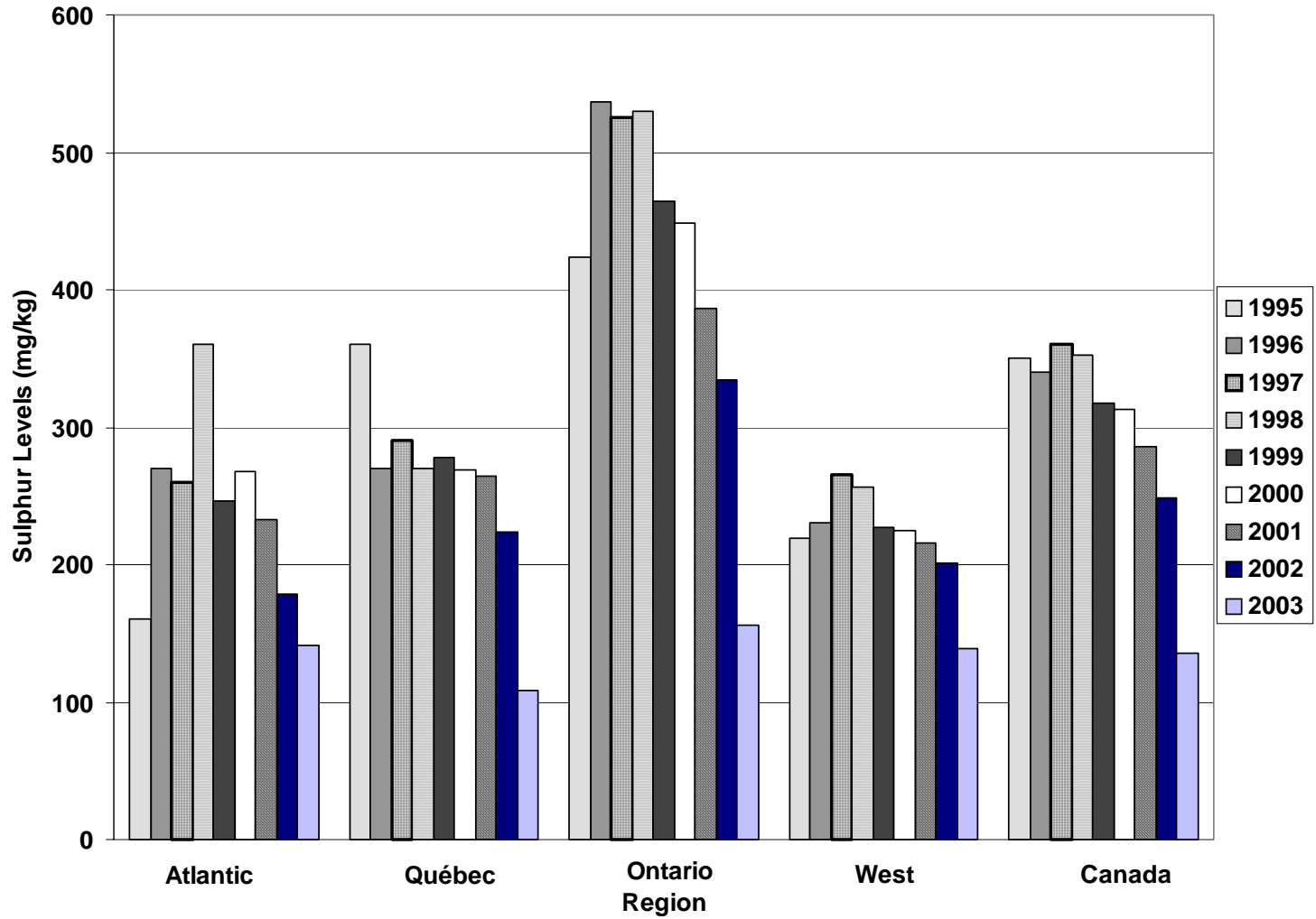
Gaph 4.3 : Mass of Sulphur in Liquid Fuels Produced or Imported in 2003



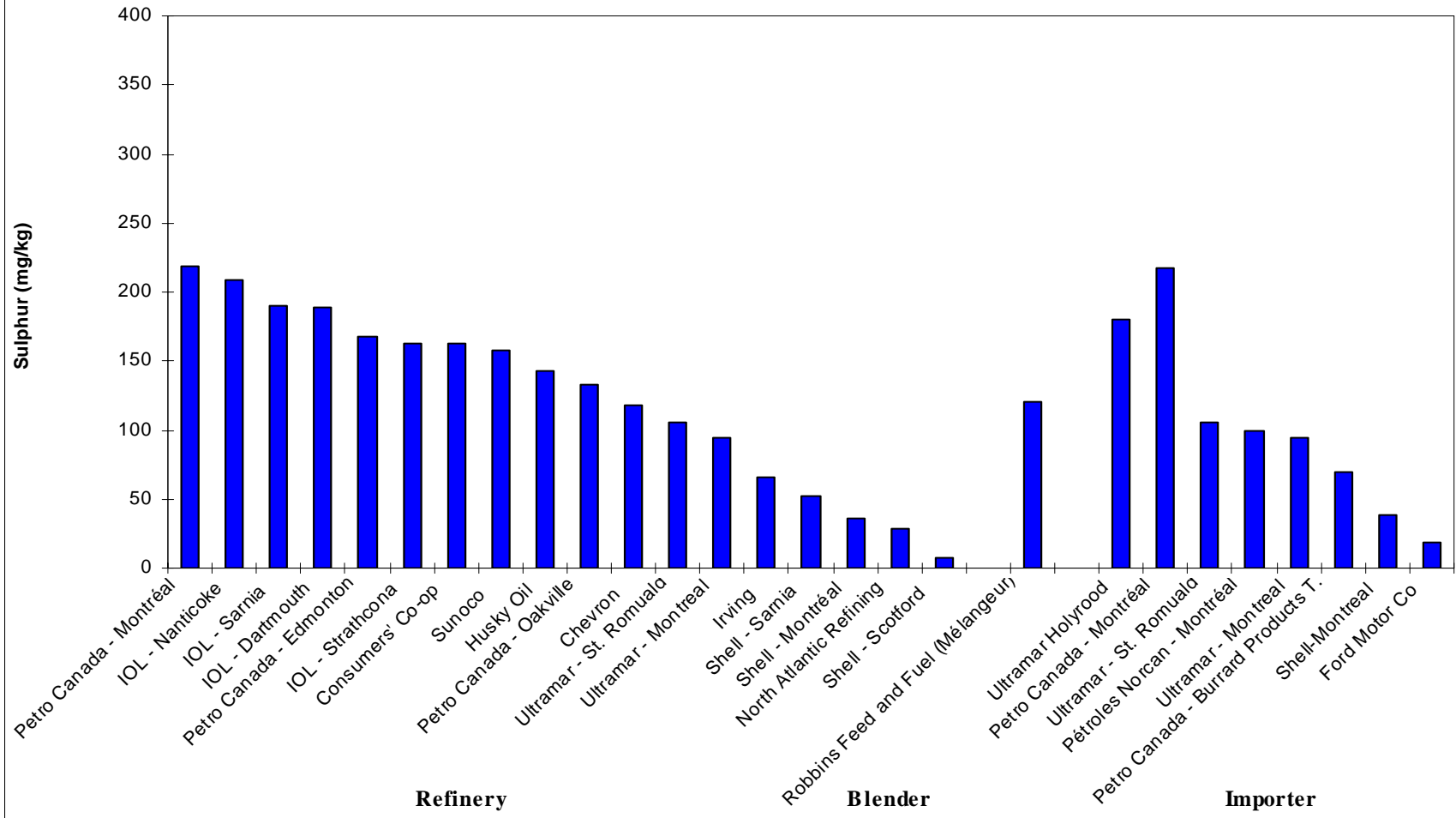
Graph 4.4 : Sulphur Mass in Liquid Fuels by Region, 1996-2003



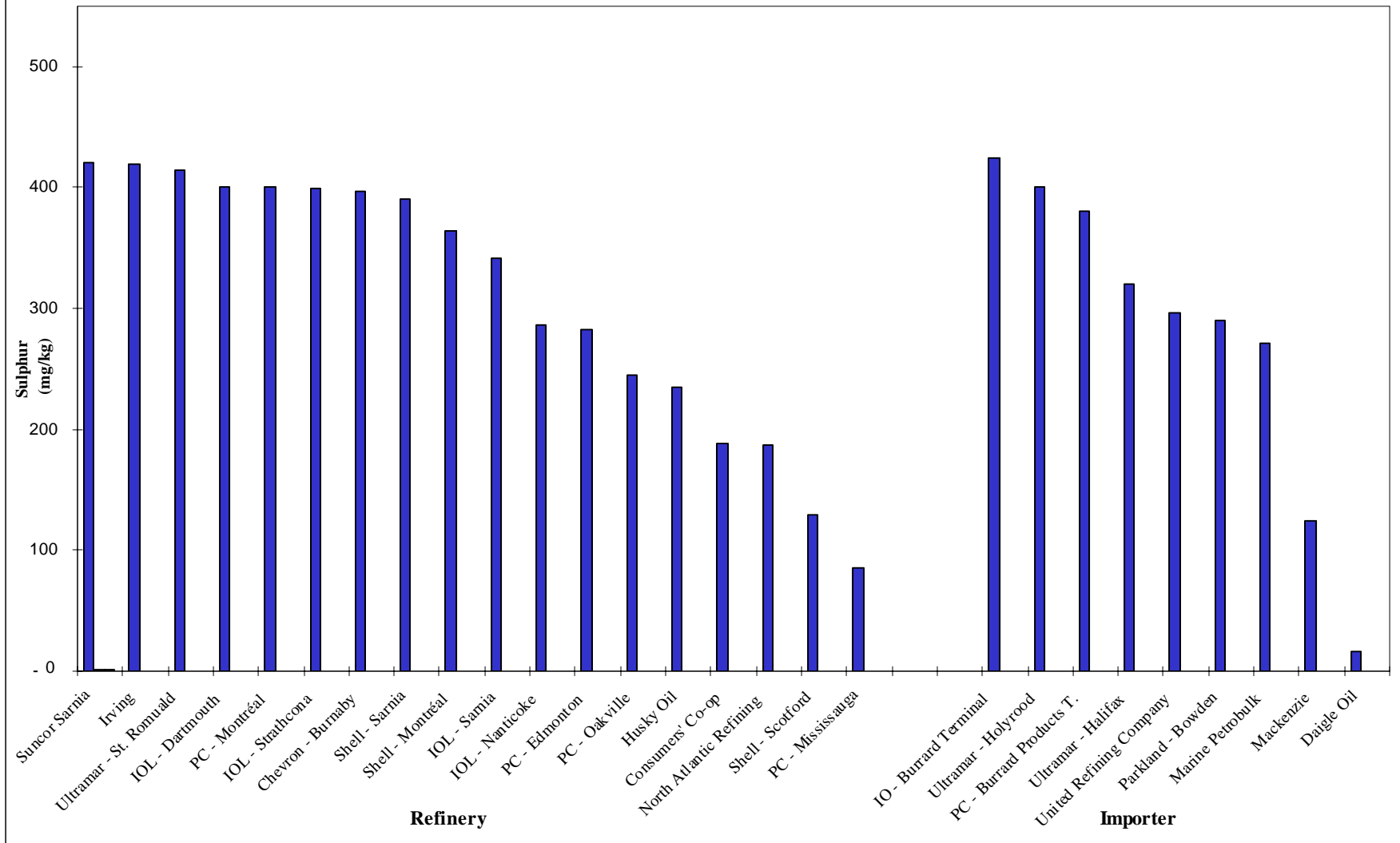
Graphic 4.5 : Sulphur Levels in Motor/Aviation Gasoline by Region, 1995-2003



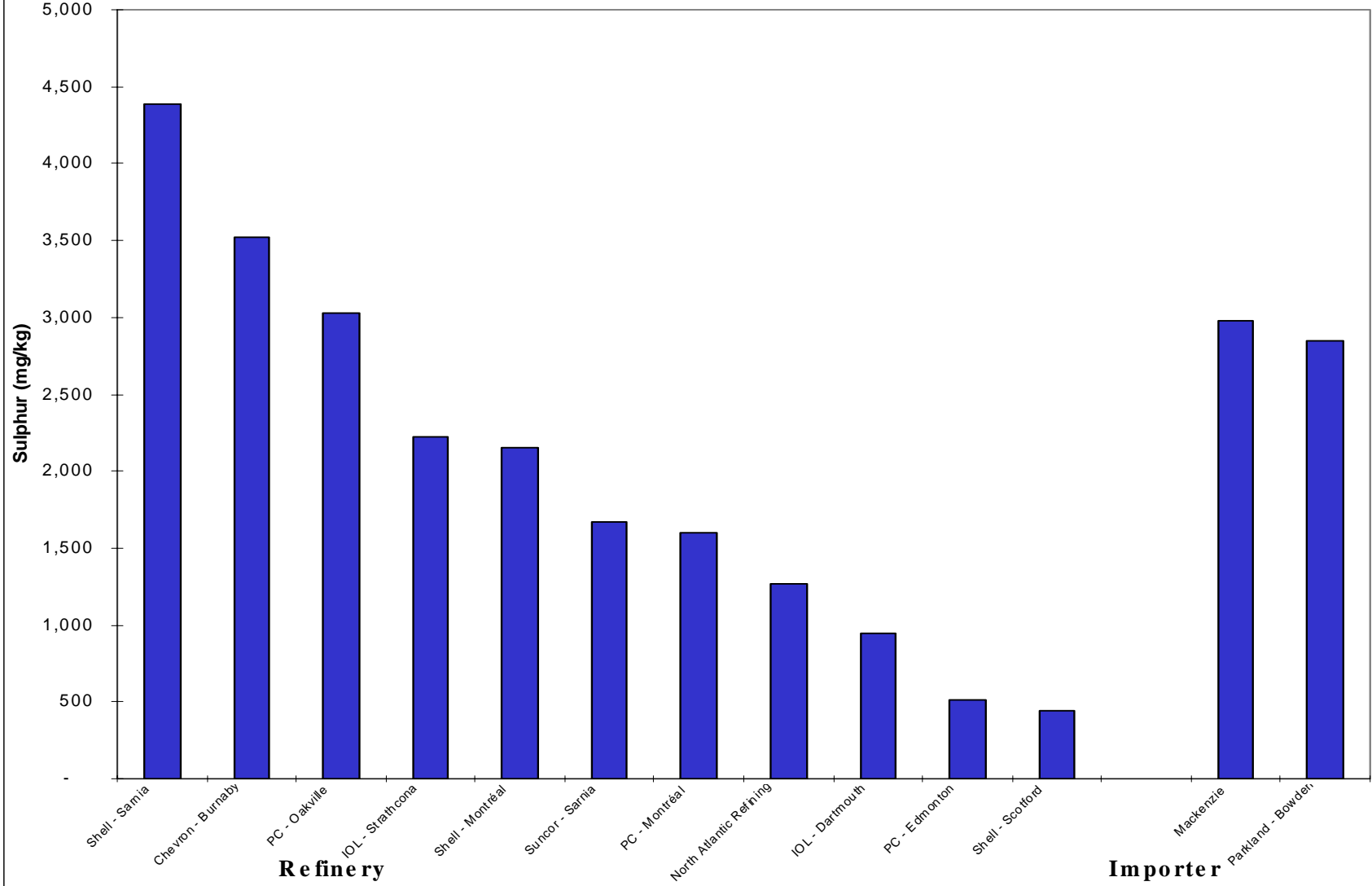
Graph 4.6: Sulphur Levels in Motor Gasoline by Refinery / Importer in 2003



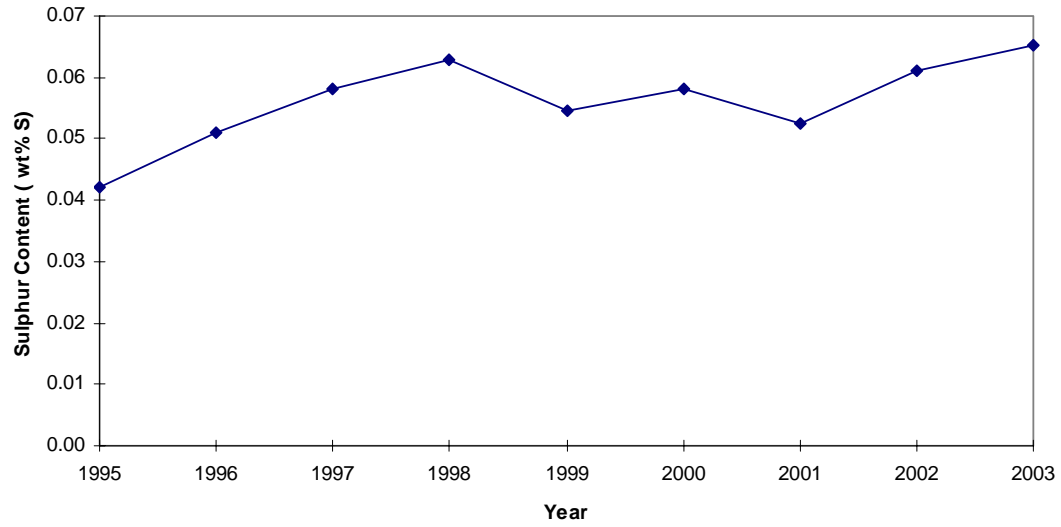
Graph 4.7: Sulphur Levels in Low Sulphur Diesel Fuel by Refinery / Importer in 2003



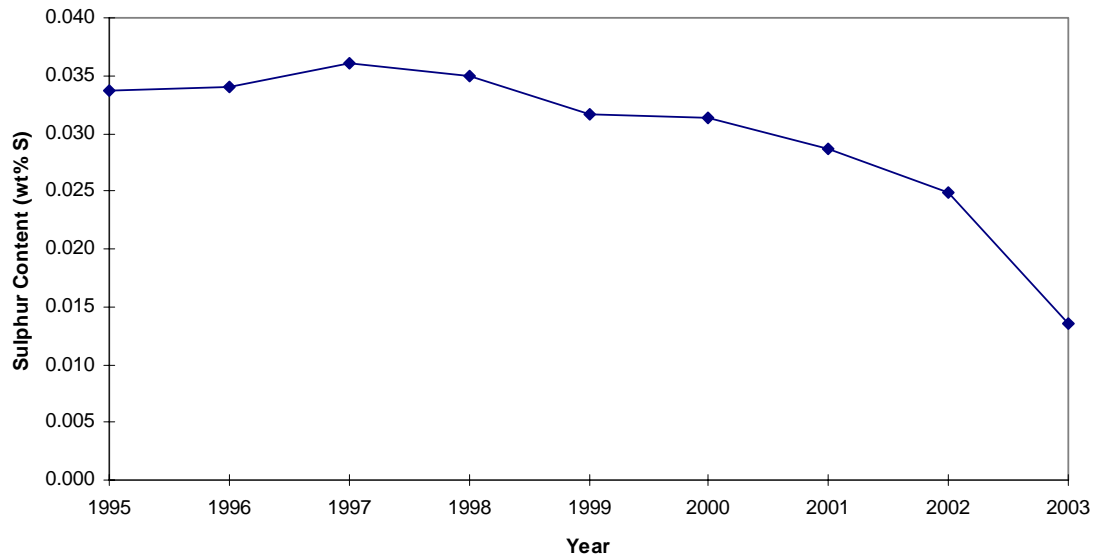
Graph 4.8: Sulphur Levels in Regular Diesel Fuel by Refinery / Importer in 2003



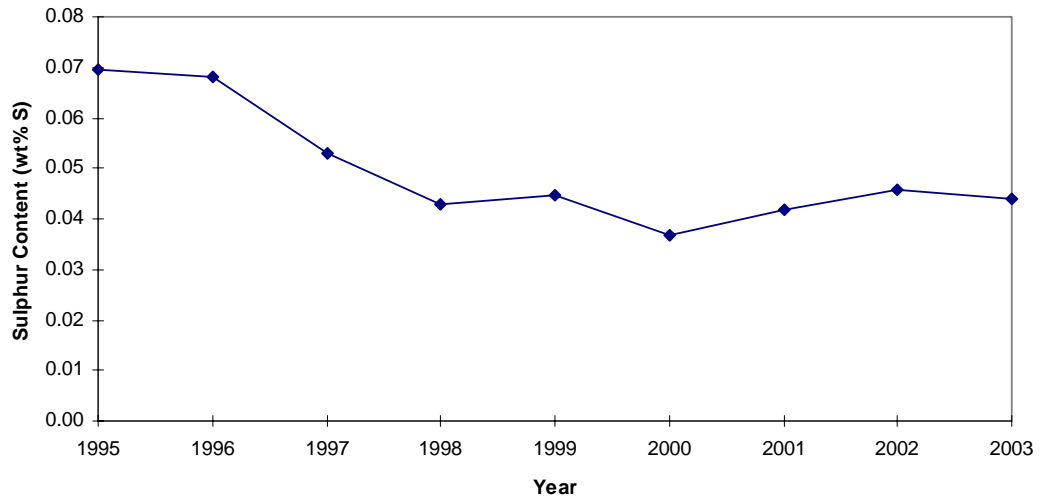
Graph 4.9 : 2003 National Trend of Sulphur Content in Aviation Turbo Fuel



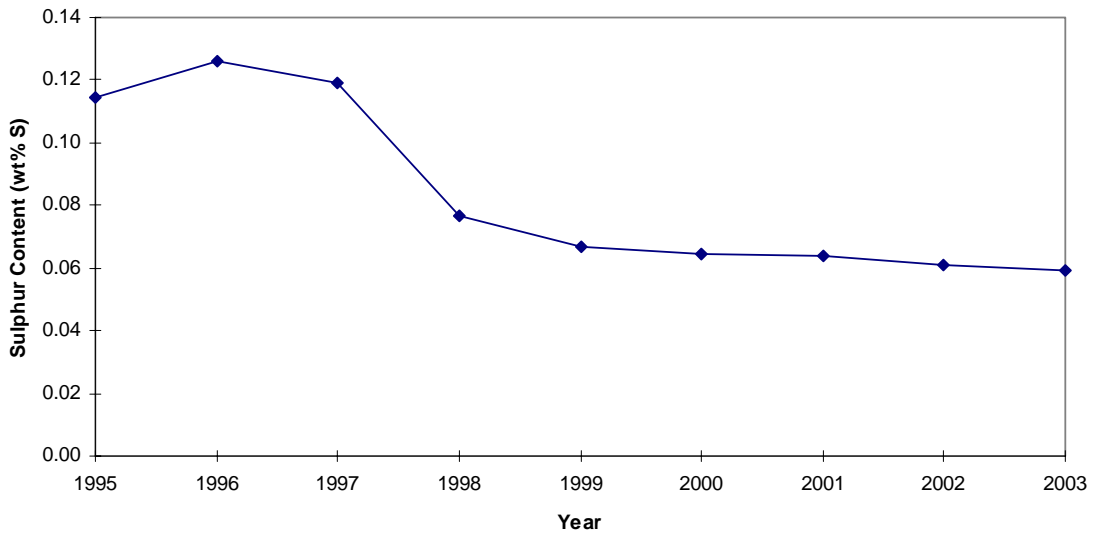
Graph 4.10: 2003 National Trend of Sulphur Content in Motor/Aviation Gasoline



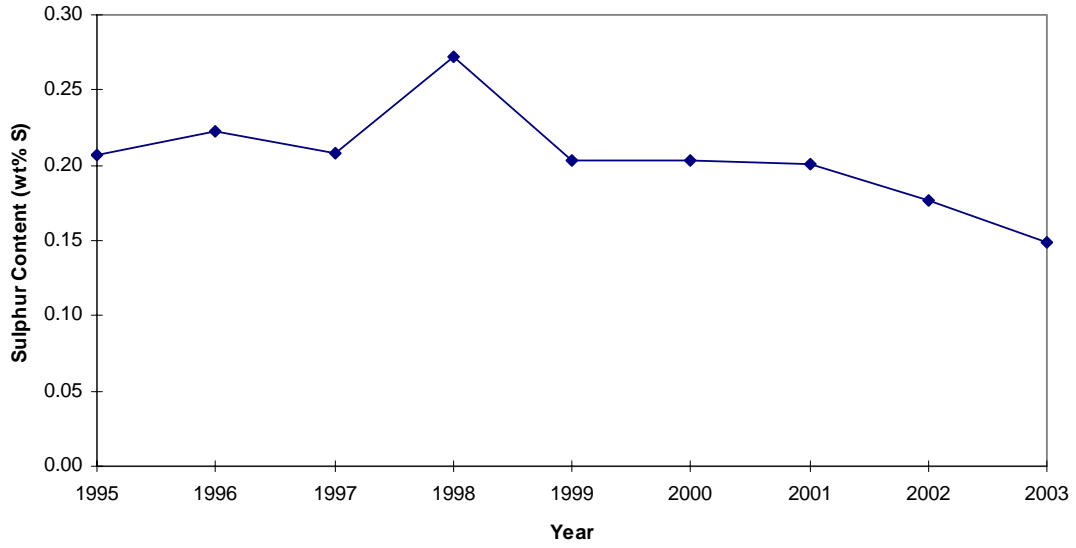
Graph 4.11 : 2003 National Trend of Sulphur Content in Kerosene/Stove Oil



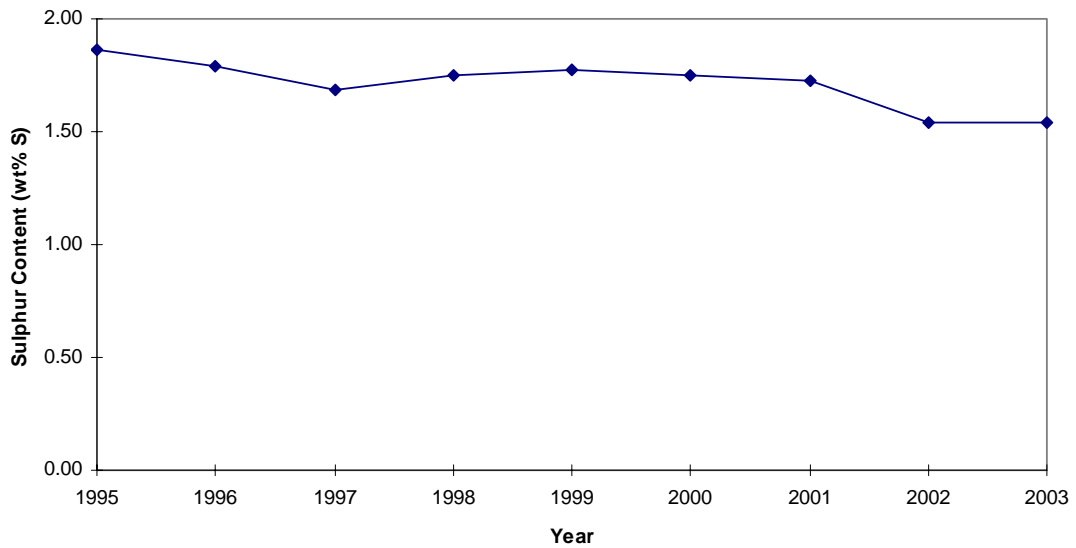
Graph 4.12 : 2003 National Trend of Sulphur Content in Diesel Fuel (Total Pool)



Graph 4.13 : 2003 National Trend of Sulphur Content in Light Fuel Oil



Graph 4.14 : 2003 National Trend of Sulphur Content in Heavy Fuel Oil



Appendix 1

**Web-site References for *Fuels Information Regulations*
No. 1 and other Fuels Regulations.**

Oil, Gas and Energy Branch –Home page
http://www.ec.gc.ca/energ/fuels/fuel_home_e.htm

Fuels Information Regulations, No. 1
http://www.ec.gc.ca/energ/fuels/regulations/fuelsreg_e.htm

Sulphur in Gasoline Regulations
http://www.ec.gc.ca/energ/fuels/regulations/sulreg_e.htm

Benzene in Gasoline Regulations
http://www.ec.gc.ca/energ/fuels/regulations/bzreg_e.htm

Contaminated Fuels Regulations
http://www.ec.gc.ca/energ/fuels/regulations/confuelreg_e.htm

Gasoline Regulations
http://www.ec.gc.ca/energ/fuels/regulations/gasreg_e.htm

Gasoline and Gasoline Blend Dispensing Flow Rate Regulations
http://www.ec.gc.ca/energ/fuels/regulations/gasblendreg_e.htm

Sulphur in Diesel Fuels Regulations
http://www.ec.gc.ca/energ/fuels/regulations/dieselreg_e.htm

Appendix 2

Sample Forms for Reporting Sulphur Content under the Regulations:

Fuel Information Regulations, No. 1
Sulphur in Gasoline Regulations
Sulphur in Diesel Fuel Regulations

(2003 Compliance promotion package)

Fuels Information Regulations, No. 1

NOTE: Information contained in this page is for compliance promotional purposes and has no legal status. For requirements under the regulations, refer to the actual regulations.

The *Fuels Information Regulations, No. 1*, require every person who produces or imports **more than 400 cubic metres** (i.e., 400,000 L or 87,988 Imp. gallons) of aviation turbo fuel, gasoline, kerosene, diesel fuel or fuel oils per year to submit to Environment Canada the following information as outlined in Form 1 and Form 2 described below:

Form 1: Report on Sulphur Content of Liquid Fuels.

The Report on Sulphur Content of Liquid Fuels for each quarter of the calendar year is due on or before January 31st of each year following the year of production or import. (a form is attached for your convenience),

Form 2: Report on Fuel Additives (other than lead or lead compounds) in Petroleum Fuels.

The Report on Fuel Additives in Petroleum Fuels is due within sixty days of selling the fuel. This information does not have to be reported annually once the initial report is made, but any changes in the information regarding additives must be reported within 60 days of any change. (a form is attached for your convenience).

REPORT ON SULPHUR CONTENT OF LIQUID FUELS (Form 1)

QUARTER: _____ YEAR: _____

This report should be submitted:

- a) by January 31st for each quarter separately of the preceding calendar year, except in respect of diesel fuel as per notice below.
- b) by every person who during the calendar year has produced or imported over 400 cubic meters of petroleum fuels for use in Canada. (No minimum for diesel fuel)
- c) for the purpose of informing the Minister of Environment
- d) to:
 Manager, Emergencies and Enforcement Division
 Environment Canada – Ontario Region
 Environmental Protection Branch
 4905 Dufferin Street, Second floor
 Downsview, Ontario, M3H 5T4

Notice: 30 days after the last day of each quarter if this form includes information scheduled under subsection 4(1) of the Diesel Fuel Regulations (applies only in respect of the first quarter in 2003 as the Diesel Fuel Regulations are revoked and replaced by the Sulphur in Diesel Fuel Regulations on January 1st, 2003).

This form is provided for your convenience. Please refer to the Canadian Environmental Protection Act, Fuels Information Regulation No. 1, Diesel Fuel Regulations, for information on compliance with the requirements for reporting on sulphur content of liquid fuels.

FUELS PRODUCED OR IMPORTED FOR USE OR SALE IN CANADA

COMPANY							
FACILITY NAME:							
FACILITY ADDRESS:							
	TYPE OF LIQUID FUEL	VOLUME (m ³)		DENSITY (kg/m ³) or API	SULPHUR CONTENT (WEIGHT %)		
		PRODUCED	IMPORTED		Highest	Lowest	Volume weighted average
1	AVIATION TURBO FUEL 1.1 Jet A 1.2 Jet B						
2	GASOLINE 2.1 Regular 2.2 Mid-Grade 2.3 Premium 2.4 Aviation						
3	KEROSENE AND STOVE OIL						
4	DIESEL FUEL (by type)						
5	NUMBER 2 - LIGHT FUEL OIL						
6	HEAVY FUEL OIL 6.1 NUMBER 4 6.2 NUMBER 5 6.3 NUMBER 6						
7	Other: specify (including Plant Consumption and Synthetic Crude used as a fuel)						
AUTHORIZED COMPANY OFFICIAL: (PLEASE PRINT)		TITLE:		SIGNATURE			
TELEPHONE NUMBER:		FAX NUMBER:		DATE:			

SULPHUR IN DIESEL FUEL REGULATIONS

SCHEDULE 1
(Paragraph 5(1)(b))

QUARTERLY REPORT OF SULPHUR CONCENTRATION IN DIESEL FUEL

1. Calendar quarter _____

2. Year _____

3. Name of producer or importer

4. Name of the facility in Canada producing diesel fuel or the province of import

5. Street address (and mailing address if different) of the facility in Canada producing diesel fuel or of the importer's place of business in Canada

6. Volume of diesel fuel, in m³

(a) Diesel fuel with a concentration of sulphur that was less than or equal to 500 mg/kg until May 31, 2006 or that was less than or equal to 15 mg/kg after May 31, 2006

(i) Produced at the facility _____

(ii) Imported into the province _____

(b) Diesel fuel with a concentration of sulphur that exceeded 500 mg/kg until May 31, 2006 or exceeds 15 mg/kg after May 31, 2006

(i) Produced at the facility _____

(ii) Imported into the province _____

7. (1) Sulphur concentration (mg/kg, or percent by weight if the units are identified), reported separately for diesel fuel produced and diesel fuel imported

(a) Diesel fuel with a concentration of sulphur that was equal to or less than 500 mg/kg until May 31, 2006 or that was equal to or less than 15 mg/kg after May 31, 2006

(i) Highest _____

(ii) Lowest _____

(iii) Volume-weighted average _____

(b) Diesel fuel with a concentration of sulphur that exceeded 500 mg/kg until May 31, 2006 or exceeded 15 mg/kg after May 31, 2006

(i) Highest _____

(ii) Lowest _____

(iii) Volume-weighted average _____

(2) Method used (for reporting purposes) to measure sulphur concentration

8. Authorized official

Name _____

Title _____

Signature and date _____

Telephone number (____) _____

Fax number (____) _____

ADDRESSES OF ENVIRONMENT CANADA'S REGIONAL OFFICES

Newfoundland, Nova Scotia, New Brunswick and Prince Edward Island

Director
Environmental Protection – Atlantic Region
Environment Canada
45 Alderney Drive
16th floor, Queen Square
Dartmouth, Nova Scotia B2Y 2N6

Quebec

Director
Environmental Protection – Quebec Region
Environment Canada
105 rue McGill, 4th Floor
Montreal, Quebec H2Y 2E7

Ontario

Manager, Emergencies and Enforcement Division
Environment Canada – Ontario Region
Environmental Protection Branch
4905 Dufferin Street, Second floor
Downsview, Ontario, M3H 5T4

Manitoba, Saskatchewan, Alberta, NWT and Nunavut

Director
Environmental Protection – Prairies & Northern Region
Environment Canada
Twin Atria #2, 2nd floor
4999 - 98th Avenue
Edmonton Alberta T6B 2X3

British Columbia and Yukon

Manager, Emergencies and Enforcement Division
Environmental Protection – Pacific & Yukon Region
Environment Canada
224 West Esplanade
North Vancouver, British Columbia V7M 3H7

Appendix 3

Volume Weighted Annual Sulphur Levels by Refiner for 1995 to 2003

Table A3.1a: Volume-Weighted Annual Sulphur Level in Motor Gasoline 1995 – 2003⁹

			Sulphur Levels (mg/kg)								
	Name	City	1995	1996	1997	1998	1999	2000	2001	2002	2003
Refiners	Chevron	Burnaby	215	273	294	246	199	174	171	213	118
	Consumer's Co-op	Regina	97	179	103	148	187	242	197	178	163
	Husky Oil	Prince George	183	261	225	282	170	248	239	242	143
	Imperial Oil	Dartmouth	365	419	374	491	329	382	356	265	188
	Imperial Oil	Sarnia	728	787	712	792	694	693	596	432	190
	Imperial Oil	Nanticoke	340	506	530	529	450	456	376	366	208
	Imperial Oil	Strathcona	239	243	346	297	272	252	302	268	165
	Irving Oil Limited	Saint-John	71	35	43	129	96	85	48	50	67
	North Atlantic Refining Ltd.	Come-by-Chance	38	75	118	76	55	47	49	58	29
	Parkland	Bowden	0	1	1	4	4	8	4	-	-
	Petro-Canada	Montreal	472	356	387	316	367	292	320	275	218
	Petro-Canada	Oakville	528	489	519	514	523	479	396	305	132
	Petro-Canada	Edmonton	360	380	394	377	311	311	250	202	167
	Shell	Montreal	392	319	333	312	269	318	280	231	38
	Shell	Sarnia	553	579	582	567	453	466	462	399	52
	Shell	Scotford	50	50	50	50	50	50	49	50	7
	Suncor	Sarnia	368	276	298	301	209	192	180	196	157
	Ultramar	Montreal	-	-	-	-	-	-	-	155	90
Ultramar	St-Romuald	219	174	186	171	173	218	212	188	104	
Robbins Feed & Fuel (Blnd)	Thorold	-	-	-	137	271	239	307	222	120	
Importers	BP Cherry Point	Blaine	-	-	-	70	103	105	110	100	-
	Delta Western Fuel (Totem Oil)	Whitehorse	-	-	-	610	73	236	-	-	-
	Ford Motor Company	Ontario	-	-	-	-	-	28	22	28	18
	Husky Oil	Prince George	-	-	-	80	-	-	-	-	-
	Imperial Oil	Burnaby	-	-	-	210	-	-	63	63	-
	Imperial Oil	Montreal	-	-	-	-	340	-	-	-	-
	Mackenzie Petroleum	Dawson City	-	-	-	170	301	280	234	234	-
	Murphy Oil USA	Superior	-	-	-	540	430	-	-	-	-
	Neste Petroleum	Beauport	-	-	-	-	-	-	386	400	-
	Neste Petroleum	Montreal	-	-	-	-	-	-	361	222	-
	Northern Transportation	Iqaluit	-	-	-	100	310	107	743	43	-
	Olco Petroleum Group	Quebec	-	-	-	457	511	299	-	-	-
	Olco Petroleum Group	Hamilton	-	-	-	410	540	394	317	307	-
	PaceSetter Enterprises	Whitehorse	-	-	-	-	246	220	-	-	-
	Parkland	Bowden	-	-	-	110	18	18	82	265	-
	Petro-Canada	Montreal	-	-	-	340	360	-	420	315	230
	Petro-Canada	Oakville	-	-	-	610	520	490	368	-	-
	Petro-Canada	Port Moody	-	-	-	210	321	-	-	-	70
	Petroles Norcan	Montreal	-	-	-	470	560	273	243	196	100
	Robbins Feed & Fuel	Thorold	-	-	-	140	270	-	-	-	120
Shell	Montreal	392	313	333	312	269	318	280	231	36	
TransCanada Energy	Calgary	-	-	-	100	500	-	-	-	-	

⁹ For the years 1995 to 2000, sulphur levels for motor gasoline were averaged with levels for aviation gasoline. Post-2000, the values are for sulphur in motor gasoline only.

**Table A3.1a: Volume-Weighted Annual Sulphur Level in Motor Gasoline 1995 – 2003
(cont'd)**

	Name	City	Sulphur Levels (mg/kg)								
			1995	1996	1997	1998	1999	2000	2001	2002	2003
Importer	Ultramar	Holyrood	-	-	-	-	-	-	-	-	180
	Ultramar	Montreal								170	90
	Ultramar	St-Romuald	-	-	-	120	300	270	262	140	104
National Average			345	340	360	350	320	310	290	246	121

**Table A3.1b: Volume-Weighted Annual Sulphur Level in Motor Gasoline for 2003
(Reported by quarters)**

	Name	City	Sulphur levels (mg/kg)				
			2003				
			Q1	Q2	Q3	Q4	Annual
Refiners	Chevron	Burnaby	130	145	60	130	118
	Consumer's Co-op	Regina	170	160	190	130	163
	Husky	Prince George	190	190	90	90	143
	Imperial Oil	Dartmouth	270	310	70	120	188
	Imperial Oil - Sarnia	Sarnia	210	240	220	80	190
	Imperial Oil	Nanticoke	210	340	270	60	208
	Imperial Oil	Strathcona	190	215	230	20	165
	Irving	Saint-John	70	70	60	70	67
	North Atlantic	Come-by-Chance	60	0	20	20	29
	Petro-Canada*	Montreal	*	*	*	*	218*
	Petro-Canada	Oakville	120	150	150	120	132
	Petro-Canada	Edmonton	170	180	140	170	167
	Shell	Montreal	20	40	60	30	38
	Shell	Sarnia	80	40	50	40	52
	Shell	Scotford	2	6	8	12	7
	Sunoco	Sarnia	180	230	180	36	157
	Ultramar	Montreal	100	150	70	90	90
Ultramar	St.Romuald	70	140	130	90	104	
Robbins Feed & Fuel	Thorold	120	120	100	130	120	
Importers	Ford Motor Company	Ontario	20	20	10	20	18
	Petro-Canada	Port Moody	120	116	30	24	70
	Petro-Canada *	Montreal	*	*	*	*	230*
	Pétroles Norcan	Montreal	0	36	88	91	100
	Shell	Montreal	20	40	60	30	36
	Ultramar	Montreal	100	150	70	86	90
	Ultramar	Holyrood	180	0	0	0	180
	Ultramar	St.Romuald	70	140	130	90	104
National Average			144	180	143	80	121

* Only the annual average was reported.

Table A3.2a: Volume-Weighted Annual Sulphur Level in Low-Sulphur Diesel 1995-2003

	Name	City	Sulphur Levels (mg/kg)								
			1995	1996	1997	1998	1999	2000	2001	2002	2003
Refiners	Chevron	Burnaby	350	390	380	400	400	400	389	490	400
	Consumer's Co-op	Regina	200	270	250	230	220	190	211	211	190
	Husky Oil	Prince George	140	200	200	210	190	190	188	165	240
	Imperial Oil	Dartmouth	340	360	390	400	330	370	402	397	400
	Imperial Oil	Sarnia	-	-	420	290	410	350	349	371	340
	Imperial Oil	Nanticoke	-	-	160	290	280	310	356	322	285
	Imperial Oil	Strathcona	290	400	410	380	430	400	420	409	400
	Irving Oil Limited	Saint-John	400	400	440	450	440	430	433	432	420
	North Atlantic Refining Ltd.	Come-by-Chance	-	-	490	130	330	260	148	163	190
	Petro-Canada	Montreal	340	420	330	400	400	430	451	422	400
	Petro-Canada	Oakville	-	-	170	320	300	300	278	222	245
	Petro-Canada	Edmonton	190	220	210	230	240	280	283	256	280
	Petro-Canada Lubricants	Mississauga	10	20	20	20	20	20	20	20	85
	Shell	Montreal	390	370	210	280	360	350	378	344	365
	Shell	Sarnia	330	340	360	360	370	390	392	400	390
	Shell	Scotford	50	80	100	210	140	150	196	129	130
	Suncor	Fort McMurray	70	90	140	160	200	250	225	225	220
	Sunncor	Sarnia	340	300	370	460	450	440	437	425	420
	Ultramar	St-Romuald	450	380	400	410	430	420	420	424	412
Robbins Feed & Fuel (Blender)	Thorold	-	-	-	-	-	410	-	-	-	
Importers	BP Cherry Point	Blaine	-	-	-	380	380	360	339	400	-
	Daigle Oil	Edmundston	-	-	-	-	-	500	500	-	16
	Delta Western Fuel (Totem Oil)	Whitehorse	-	-	-	160	400	430	-	-	-
	Husky Oil	Prince George	-	-	-	380	-	-	-	-	-
	Imperial Oil	Burnaby	-	-	-	230	-	360	345	-	425
	Mackenzie Petroleum	Dawson City	-	-	-	300	400	450	400	398	385
	Marine Petrobulk	Vancouver	-	-	-	-	-	-	-	200	270
	Murphy Oil USA	Superior	-	-	-	270	270	-	-	-	-
	Northern Transportation	Iqaluit	-	-	-	20	210	270	271	255	-
	Olco Petroleum Group	Beauport	-	-	-	400	310	-	-	-	-
	Olco Petroleum Group	Montreal	-	-	-	-	310	-	-	-	-
	Parkland	Bowden	-	-	-	400	500	480	500	448	445
	Petro-Canada	Montreal	-	-	-	390	400	400	473	500	-
	Petro-Canada	Oakville	-	-	-	310	-	-	-	-	-
	Petro-Canada	Port Moody	-	-	-	-	-	360	251	-	375
	Petroles Norcan	Montreal	-	-	-	450	450	-	-	-	-
	Robbins Feed & Fuel	Thorold	-	-	-	-	-	-	289	-	-
	Sunoco	Sarnia	-	-	-	-	-	-	430	-	-
	Ultramar	Montreal	-	-	-	-	-	-	-	440	-
	Ultramar	St-Romuald	-	-	-	410	430	410	412	-	-
	Ultramar	Halifax	-	-	-	-	-	-	-	-	320
	Ultramar	Holyrood	-	-	-	-	-	-	-	-	400
United Refining Co.	Warren	-	-	-	-	-	-	282	286	300	
National Average			210	260	270	310	320	330	340	324	317

**Table A3.2b: Volume-Weighted Annual Sulphur Level in Low-Sulphur Diesel for 2003
(Reported by quarters)**

	Name	City	Sulphur Levels (mg/kg)				
			2003				
			Q1	Q2	Q3	Q4	Annual
Refiners	Chevron	Burnaby	360	490	380	340	400
	Consumer's Co-op	Regina	250	210	170	130	190
	Husky	Prince George	100	300	300	300	240
	Imperial Oil	Dartmouth	390	390	410	410	400
	Imperial Oil	Sarnia	340	400	370	250	340
	Imperial Oil	Nanticoke	220	340	310	290	285
	Imperial Oil	Strathcona	420	410	380	390	400
	Irving	Saint John	440	430	440	380	420
	North Atlantic	Come-by-Chance	110	230	240	130	190
	Petro-Canada *	Montreal	*	*	*	*	400*
	Petro-Canada	Oakville	270	240	210	270	245
	Petro-Canada	Edmonton	220	340	360	220	280
	Petro-Canada	Mississauga	110	50	0	0	85
	Shell	Montreal	360	390	350	370	365
	Shell	Sarnia	380	380	400	410	390
	Shell	Scotford	120	150	125	130	130
	Suncor	Fort McMurray	227	192	237	238	220
Suncor	Sarnia	420	400	440	420	420	
Ultramar	St.Romuald	420	440	420	370	412	
Importers	Daigle Oil Limited	Edmunston-	-	-	-	16	16
	Imperial Oil	Burrard	0	410	480	360	425
	Mackenzie Petroleum Ltd.	Dawson City	-	488	809	300	385
	Marine Petrobulk	Vancouver	200	200	300	300	270
	Parkland	Bowden	0	0	500	290	445
	Petro-Canada	Port Moody	0	375	0	0	375
	Ultramar	Halifax	320	400	-	-	320
	Ultramar	Holyrood	400	400	-	-	400
United Refining Company	Warren	300	0	0	0	300	
	National Average		299	348	331	284	317

* Only the annual average was reported.

Table A3.3a: Volume-Weighted Annual Sulphur Level in Regular Diesel 1995-2003

			Sulphur Levels (mg/kg)									
	Name	City	1995	1996	1997	1998	1999	2000	2001	2002	2003	
Refiners	Chevron	Burnaby	1,680	2,670	4,140	3,750	4,050	3,110	3,290	3,648	3,518	
	Husky Oil	Prince George	570	580	-	-	-	-	-	-	-	
	Imperial Oil	Dartmouth	2,010	1,460	1,840	890	510	740	989	656	944	
	Imperial Oil	Sarnia	660	690	-	-	-	1,430	1,297	1,154	-	
	Imperial Oil	Nanticoke	3,480	3,880	4,300	-	-	-	-	-	-	
	Imperial Oil	Strathcona	1,820	2,100	1,980	2,100	2,140	2,170	2,495	2,253	2,218	
	Irving Oil Limited	Saint-John	1,820	1,840	1,750	2,150	1,700	1,690	-	-	-	
	North Atlantic Refining Ltd.	Come-by-Chance	2,320	1,270	1,100	4,220	-	1,100	485	-	1,273	
	Parkland	Bowden	5,650	5,680	4,620	4,730	3,880	4,820	3,781	-	-	
	Petro-Canada	Montreal	2,910	3,720	3,540	2,430	5,330	3,510	3,071	2,044	1,600	
	Petro-Canada	Oakville	3,570	3,500	3,810	3,720	3,160	2,990	2,839	3,216	3,026	
	Petro-Canada	Edmonton	-	-	-	-	-	-	-	-	-	512
	Shell	Montreal	2,060	2,230	1,900	3,020	2,470	2,110	2,431	2,050	2,153	
	Shell	Sarnia	4,050	4,040	4,200	4,090	3,720	3,780	3,676	3,658	4,389	
	Shell	Scotford	-	-	270	-	480	470	-	-	441	
	Suncor	Sarnia	1,290	1,620	2,370	2,650	2,010	2,300	2,291	1,958	1,667	
Ultramar	St-Romuald	800	760	860	-	-	-	-	-	-		
Importers	Daigle Oil	Edmundston	-	-	-	-	-	1,750	-	-	-	
	Mackenzie Petroleum	Dawson City	-	-	-	4,730	3,730	4,130	3,592	4,100	2,967	
	Marine Petrobulk	Vancouver	-	-	-	-	-	-	500	-	-	
	Murphy Oil USA	Superior	-	-	-	2,900	820	-	-	-	-	
	North 60 Petro	Whitehorse	-	-	-	-	-	2,710	-	-	-	
	Northern Transportation	Iqaluit	-	-	-	800	-	1,840	-	-	-	
	Parkland	Bowden	-	-	-	4,730	3,500	4,780	3,621	4,074	2,850	
	Petro-Canada	Oakville	-	-	-	3,700	2,510	3,030	2,812	-	-	
	Petro-Canada	Port Moody	-	-	-	-	490	-	-	-	-	
National Average			2,150	2,360	2,580	2,990	2,300	2,170	2,480	2,467	2,120	

**Table A3.3b: Volume-Weighted Annual Sulphur Level in Regular Diesel for 2003
(Reported by quarters)**

			Sulphur Levels (mg/kg)				
			2003				
	Name	City	Q1	Q2	Q3	Q4	Annual
Refiners	Chevron	Burnaby	3,240	3,920	3,410	3,580	3,518
	Imperial Oil	Dartmouth	740	1140	1,060	770	944
	Imperial Oil	Strathcona	1,550	3,060	2,570	1,600	2,218
	North Atlantic	Come-by-Chance	0	1,850	0	730	1,273
	PC – Montreal *	Montreal	*	*	*	*	1600 *
	Petro-Canada	Oakville	2,806	3,838	2,990	2,435	3,026
	Petro-Canada	Edmonton	750	0	0	440	512
	Shell	Montreal	1,430	2,220	3,220	1,310	2,153
	Shell	Sarnia	3,910	4,670	4,750	4,230	4,389
	Shell	Scotford	0	420	500	400	441
	Suncor	Sarnia	1,600	1,690	1,840	1,470	1,667
Importers	Mackenzie	Dawson	2,880	3,300	3,385	830	2,967
	Parkland	Bowden	N/A	N/A	3,350	2,490	2,850
National Average			2,046	3,103	2,748	1,929	2,120

* Only the annual average was reported.

Table A3.4a: Volume-Weighted Annual Sulphur Level in Light Fuel Oil 1995-2003

			Sulphur Levels (mg/kg)								
	Name	City	1995	1996	1997	1998	1999	2000	2001	2002	2003
Refiners	Husky Oil	Prince George	-	-	514	599	590	600	599	703	403
	Imperial Oil	Dartmouth	2,125	2,004	1,928	1,360	940	1,230	1,168	1,037	1,030
	Imperial Oil	Sarnia	1,668	1,803	1,417	2,260	1,830	1,690	2,277	2,047	1,414
	Imperial Oil	Nanticoke	2,950	3,189	3,327	1,791	2,000	1,950	1,269	-	2,770
	Irving Oil Limited	Saint-John	-	-	1,731	2,080	1,770	1,660	1,630	1,553	1,304
	North Atlantic	Come-By-Chance	-	-	-	-	-	-	-	1,282	860
	NOVA Chemicals	Sarnia	1,520	1,450	1,550	1,850	1,770	1,450	1,449	1,252	1,117
	Petro-Canada	Montreal	2,577	3,591	2,753	3,336	3,360	3,470	3,129	2,509	2,400
	Petro-Canada	Oakville	3,642	4,069	3,663	4,253	4,120	3,650	3,368	3,819	3,710
	Shell	Montreal	2,357	2,256	2,784	2,837	2,720	2,770	2,895	2,291	2,467
	Shell	Sarnia	3,000	-	-	-	-	-	-	-	-
	Suncor	Sarnia	1,591	1,758	2,144	2,578	2,190	2,960	1,810	2,376	1,653
Ultramar	St-Romuald	1,120	1,281	1,355	2,231	1,810	1,630	1,539	1,215	1,018	
Importers	Daigle Oil	Edmundston	-	-	-	-	-	3,000	3,000	3,000	3,000
	North 60 Petro	Whitehorse	-	-	-	1,000	1,000	1,000	2,700	-	-
	Olco Petroleum Group	Montreal	-	-	-	-	2,300	-	-	-	-
	Olco Petroleum Group	Beauport	-	-	-	-	2,300	-	-	-	-
	Petro-Canada	Oakville	-	-	-	3,880	3,880	-	3,440	3,600	-
	Petroles Norcan	Norcan Terminal	-	-	-	-	-	-	-	-	2,740
	Port Colborne Quarries	Port Colborne	-	-	-	-	-	-	-	-	1,028
	Statia Terminals Canada	Point Tupper	-	-	-	-	-	-	1,020	-	-
	Ultramar	St. Romuald	-	-	-	-	-	-	1,643	-	-
National Average			1,980	2,150	2,000	2,270	2,030	2,030	1,890	1,763	1,794

Table A3.4b: Volume-Weighted Annual Sulphur Level in Light Fuel Oil for 2003
(Reported by quarters)

		Sulphur Levels (mg/kg)					
		2003					
	Name	City	Q1	Q2	Q3	Q4	Annual
Refiners	Husky	Prince George	600	400	500	100	403
	Imperial Oil	Dartmouth	820	1,640	1,040	960	1,030
	Imperial Oil	Sarnia	1,280	1,720	1,470	1,450	1,414
	Imperial Oil	Nanticoke	0	2,770	0	0	2,770
	Irving	SaintJohn	1,410	1,300	1,480	1,100	1,304
	North Atlantic	Come-by-Chance	1,260	580	430	1,130	860
	NOVA Chemicals	Sarnia	1,110	1,180	1,190	1,000	1,117
	Petro-Canada *	Montreal *	*	*	*	*	2,400 *
	Petro-Canada	Oakville	3,910	4,710	3,240	3,250	3,710
	Shell	Montreal	2,600	2,200	3,200	2,200	2,467
	Suncor	Sarnia	1,770	1,800	1,870	1,400	1,653
Ultramar	St. Romuald	1,190	930	600	1,040	1,018	
Importer	Daigle Oil Limited	Edmundston	-	-	-	3,000	3,000
	Petroles Norcan	Norcan Terminal	0	0	0	2,740	2,740
	Port Colborne	Port Colborne	1,080	1,110	850	1,090	1,028
National Average			1,458	1443	1,225	1,397	1,794

* Only the annual average was reported.

Table A3.5a: Volume-Weighted Annual Sulphur Level in Heavy Fuel Oil 1995-2003

	Name	City	Sulphur Levels (mg/kg)								
			1995	1996	1997	1998	1999	2000	2001	2002	2003
Refiners	Chevron	Burnaby	14,663	17,832	15,153	15,107	17,880	-	-	-	-
	Consumer's Co-op	Regina	8,313	12,315	11,207	8,986	8,870	10,640	7,032	9,122	8,742
	Husky Oil	Prince George	26,300	16,636	13,800	19,549	20,340	17,200	14,818	16,976	21,185
	Imperial Oil	Dartmouth	14,698	13,590	12,664	15,820	13,540	14,130	14,959	12,553	13,778
	Imperial Oil	Sarnia	21,970	20,153	21,840	22,530	19,900	17,980	19,465	14,922	17,845
	Imperial Oil	Nanticoke	23,022	23,325	25,815	27,319	22,780	17,030	14,610	12,613	11,291
	Imperial Oil	Strathcona	15,302	15,080	15,493	13,697	12,660	12,930	13,864	13,598	14,378
	Irving Oil Limited	Saint-John	20,850	18,612	18,396	18,409	17,800	16,270	17,454	15,917	16,781
	North Atlantic Refining Ltd.	Come-by-Chance	17,876	22,302	28,323	26,460	28,070	28,410	26,267	-	-
	NOVA Chemicals	Sarnia	11,840	11,990	13,520	14,690	13,870	11,750	11,751	12,411	11,584
	Petro-Canada	Montreal	20,644	22,130	21,072	19,730	15,450	18,810	17,034	16,348	15,100
	Petro-Canada	Oakville	14,702	15,029	15,848	16,099	14,270	14,240	13,425	14,540	12,765
	Petro-Canada	Edmonton	23,009	26,568	25,890	23,736	22,160	24,500	22,128	21,219	19,600
	Shell	Montreal	17,723	19,447	18,230	17,679	15,960	14,210	15,828	12,890	13,287
	Shell	Sarnia	25,835	27,398	28,326	26,485	25,130	25,540	25,736	24,339	24,335
Suncor	Sarnia	17,317	18,351	20,169	20,539	17,220	20,240	18,239	19,480	18,561	
Ultramar	St-Romuald	8,324	10,070	11,361	11,440	11,100	10,990	10,165	9,790	10,012	
Importers	Compaq Papiers	Quebec	-	-	-	-	-	-	-	-	19,258
	Emera Fuels Inc.	Dartmouth	-	-	-	-	-	-	-	-	27,200
	Fraser Papers	Edmundston	-	-	-	-	4,280	3,980	4,214	4,379	1,590
	Kildair Services	Tracy	-	-	-	4,150	8,290	18,080	8,006	15,000	8,355
	Marine Petrobulk	North Vancouver	-	-	-	-	-	17,920	24,000	16,390	18,405
	Murphy Oil USA	Superior	-	-	-	45,710	18,230	-	-	-	-
	New Brunswick Power	Fredericton	-	-	-	27,360	27,820	27,800	27,269	25,194	25,540
	Newfoundland & Labrador Hydro	St. John's	-	-	-	19,960	19,940	20,970	20,600	20,186	20,603
	Norske Canada	Campbell River	-	-	-	-	-	-	10,237	9,400	-
	Norske Canada	Crofton	-	-	-	-	-	-	9,871	-	-
	North 60 Petro	Whitehorse	-	-	-	6,530	3,440	2,430	4,313	4,288	4,249
	North Atlantic Refining Ltd.	Come-by-Chance	-	-	-	-	-	-	-	25,491	20,495
	Nova Scotia Power	Halifax	-	-	-	27,030	25,990	26,810	28,102	19,728	17,868
	Pope and Talbot	Nanaimo	-	-	-	-	-	10,600	10,216	10,749	9,646
	Statia Terminals Canada	Point Tupper	-	-	-	-	-	-	8,268	-	-
	Vancouver General Hospital	North Vancouver	-	-	-	-	-	10,600	10,600	-	-
	Western Pulp	Port Alice	-	-	-	-	-	14,510	14,840	13,478	13,821
Western Pulp	Squamish	-	-	-	-	-	-	11,000	-	-	
National Average			16,761	17,300	17,250	17,220	17,710	17,400	17,280	15,366	15,428

**Table A3.5b: Volume-Weighted Annual Sulphur Level in Heavy Fuel Oil for 2003
(Reported by quarters)**

	Name	City	Sulphur Levels (mg/kg)				
			2003				
			Q1	Q2	Q3	Q4	Annual
Refiners	Co-op	Regina	9,189	10,526	9,282	6,530	8,742
	Husky	Prince George	17,318	21,843	23,274	23,608	21,185
	Imperial Oil	Dartmouth	11,239	15,911	14,887	13,375	13,778
	Imperial Oil	Sarnia	21,380	13,100	16,500	19,950	17,845
	Imperial Oil	Nanticoke	10,860	12,390	10,700	11,290	11,291
	Imperial Oil	Strathcona	14,060	14,610	14,550	14,260	14,378
	Irving	Saint-John	21,100	17,000	14,800	13,500	16,781
	NOVA Chemicals	Sarnia	11,270	11,860	12,140	10,800	11,584
	Petro-Canada *	Montreal *	*	*	*	*	15,100 *
	Petro-Canada	Oakville	14,000	13,000	11,600	12,400	12,765
	Petro-Canada	Edmonton	21,360	0	18,050	22,410	19,600
	Shell	Montreal	11,200	12,300	14,820	14,326	13,287
	Shell	Sarnia	23,600	23,910	24,026	24,912	24,335
	Sunocor	Sarnia	20,090	20,770	16,329	17,690	18,561
Ultramar	St. Romuald	10,250	10,350	10,250	9,220	10,012	
Importers	Compaq Papiers	Stadacona	-	19,700	-	19,100	19,258
	Emera Fuels Inc.	Darmouth	27,200	-	-	-	27,200
	Fraser Papers	Edmundston	2,240	722.4	1,682	1,716	1,590
	Kildair Services	Tracy	0	4,300	6,000	12,300	8,355
	Marine Petrobulk	Vancouver	16,400	18,200	18,500	20,000	18,405
	New Brunswick Power Corp.	Fredericton	25,400	27,700	24,800	22,600	25,540
	Nfld. & Labrador Hydro	St.John's	20,970	20,990	21,000	19,790	20,603
	North 60	Whitehorse	-	4,090	4,300	-	4,249
	North Atlantic Refining Ltd.	Come-by-Chance	16,500	22,400	24,700	22,600	20,495
	Nova Scotia Power	Halifax	17,500	21,200	18,000	15,500	17,868
	Pope and Talbot	Nanaimo	9500	10,400	-	9,100	9,646
	Western Pulp - Port Alice Operation	Port Alice	14,700	-	13,200	13,800	13,821
National average			16,737	15,374	15,184	14,396	15,428

* Only the annual average was reported.

Table A3.6a: Volume-Weighted Annual Sulphur Level in Aviation Gasoline 2000 - 2003

	Name	City	Sulphur Levels (mg/kg)			
			2000	2001	2002	2003
Refiners	Shell	Montreal	-	14	50	10
	Imperial Oil	Strathcona	-	-	10	10
	Petro-Canada	Edmonton	-	352	229	206
Importers	Imperial Oil	Burnaby	-	30	0	-
	Imperial Oil	Strathcona	-	10	0	-
National Average			-	51	59	30

Note: Sulphur levels in aviation gasoline were averaged with motor gasoline levels for the years 1995 to 2000.
See Table A3.1a.

Table A3.6b: Volume-Weighted Annual Sulphur Level in Aviation Gasoline for 2003

(Reported by quarters)

	Name	City	Sulphur Levels (mg/kg)				
			2003				
			Q1	Q2	Q3	Q4	Annual
Refiners	Imperial Oil	Strathcona	10	10	10	10	10
	Petro Canada	Edmonton	200	160	200	390	206
	Shell	Montreal	10	10	10	10	10
National Average			23	31	36	73	41

Appendix 4

Canadian General Standards Board Standards for Sulphur Content in Fuels

**Appendix 4: Canadian General Standards Board
Standards for Sulphur Content in Fuels**

<u>Specification Number</u>	<u>Fuel Category</u>	<u>Maximum Sulphur Content</u> <u>(% mass)</u>
CAN/CGSB-3.5-99 CAN/CGSB-3.25-94	Gasoline Unleaded, Automotive Aviation	0.10 0.05
CAN/CGSB-3.23-2002 CAN/CGSB-3.22-2002	Aviation Turbo Fuel Kerosene Type (Jet A, A-1, F-34) Wide Cut Type (Jet b, F-40)	0.30 0.40
CAN/CGSB-3.3-99	Kerosene Type No. 1-K Type No. 2-K	0.04 0.30
CAN/CGSB 3.6-2000 CAN/CGSB-3.517-2000	Diesel Fuel Regular Sulphur - Type A Regular Sulphur - Type B Automotive Low Sulphur	0.30 0.50 0.05
CAN/CGSB-3.16-99	Mining Diesel Fuel Special Special - Low Sulphur	0.25 0.05
CAN/CGSB-3.2-99	Fuel Oil Type 0 Type 1 Type 2 Type 4 Type 5 Type 6	0.30 0.50 0.50 no limit no limit no limit
3-GP-11d (2002)	Fuel, Naval Distillate Type 11 Type 15	0.5 0.5
CAN/CGSB-3.27-M89	Naphtha Fuel Type 1 Type 2	5 mg/kg 500 mg/kg
3-GP-24d (2002)	Aviation Fuel High Flash Type	0.40
CAN/CGSB-3.18-2000	Diesel Fuel for Locomotive Type Medium Speed Diesel Engines	0.50

Appendix 5

Maximum Sulphur Content in Fuels Federal and Provincial Regulations and Municipal By-Laws

Maximum Sulphur Content in Fuels Federal and Provincial Regulations and Municipal By-Laws

Province	Act / Regulation / By-Law	Regulation Adoption	Maximum Sulphur Content (% mass)
Canada	<i>Canadian Environmental Protection Act 1999</i> Diesel Fuel Regulation (end 2002)	1999 (revoked 2002)	<u>Diesel</u> 0.05 (on-road)
	Sulphur in Diesel Fuel Regs (start 2003)	2002	<u>Diesel</u> 0.05 (on-road) 0.0015 (2006 – on-road)
	Sulphur in Gasoline Regulation	1999	<u>Gasoline</u> 0.015 avg/0.03cap (2002-04) ¹ 0.003 avg/0.008cap (2005) ¹
New Brunswick	<i>Clean Air Act</i> Air Quality Regulation	1983 (amended 1990 and 1998)	<u>Fuel Oil</u> Type No.1 - 0.5 Type No. 2 - 0.5 Type No. 4 - 1.5 Type No. 5 - 2.0 Type No. 6b - 3.0 Type No. 6c - 3.0
Newfoundland and Labrador	<i>Environmental Protection Act</i> Air Pollution Control Regulations	May 20, 2004	<u>Fuel Oil</u> Any fuel oil grade Type Nos. 4, 5 or 6: <ul style="list-style-type: none"> • Where Best Available Technology (BAT) is employed: <ul style="list-style-type: none"> - 3%, or - 2% on an annual basis. • Where BAT is not employed: <ul style="list-style-type: none"> - 2.2%, or - 2% on an annual basis.
Quebec	<i>Petroleum Products and Equipment Act</i> Petroleum Products Regulation	1991 (amended 1996, 1998 & 1999)	<u>Gasoline:</u> Grades 1, 2, 3, 4= 0.15% <u>Diesel</u> (Regular): <ul style="list-style-type: none"> - Type AA= 0.2% - Types A, B, C, D, E= 0.5% <u>Diesel</u> (Low-sulphur content): <ul style="list-style-type: none"> - Type AA, A, B, C, D, E= 0.05% <u>Fuel Oil:</u> <ul style="list-style-type: none"> - Type No. 00= 0.2% - Types Nos. 0,1,2= 0.5%
	<i>Environment Quality Act</i> Regulation Respecting the Quality of the Atmosphere	1981	<u>Fuel Oil</u> Light Oil (LFO)= 0.5% Intermediate Oil= 1.0% Heavy Oil (HFO)= 2.0%
	By-Law 90, Montreal Urban Community	1987	<u>Fuel Oil</u> LFO Type No. 2= 0.4% HFO Type No.6= 1.25 to 1.4%

¹ Have various options. See regulation for details.

Maximum Sulphur Content in Fuels Provincial Regulations and By-Laws

(Cont'd)

Province	Act / Regulation / By-Law	Regulation Adoption	Maximum Sulphur Content (% mass)
Ontario	<i>Environmental Protection Act</i> Regulation 361, Sulphur Content of Fuels (Effective in Metro Toronto only)	1970 (amended 1980, 1990 and 1999)	Fuel Oil Type No. 1 - 0.5 Type No. 2 - 0.5 Type No. 4 - 1.5 Type No. 5 - 1.5 Type No. 6b - 1.5 Type No. 6c - 1.5
	<i>Environmental Protection Act</i> Regulation 338, Boilers Regulation	1986 (amended 1999)	Fuel Oil All fuel oils - 1.0
British Columbia	<i>Waste Management Act</i> Sulphur Content of Fuel Regulation	1989	1.1
	<i>Waste Management Act</i> Cleaner Gasoline Regulation	1995 -Effective 1999 in Southwest B.C. -Effective 2000 for the rest of B.C.	Gasoline 0.015 ² 0.020 ²
Nova Scotia	<i>Environment Act</i> Air Quality Regulations.	PROPOSED <i>August 2004</i>	Fuel Oil HFO= 2.0% by mass

² Annual limit also can use the U.S. Complex Model to provide equivalent emission levels.

Appendix 6

Comparison of Average Sulphur Content from the 2003 Liquid Fuels Report with the Limits Set Forth by the Canadian General Standards Board and the Provincial Regulations

Appendix 6

Comparison of 2003 Reported Liquid Fuel Average Sulphur Levels and Standards Set Forth by the Canadian General Standards Board (CGSB) and the Provincial Regulations

1) Average Reported Sulphur Content (%) Versus the Standards Set Forth by the CGSB

Type of Fuel	Reported Average Sulphur Content (%)			CGSB (% mass)
	Low Value	National Average	High Value	
Aviation Turbo Fuel	0.039	0.065	0.120	0.30 - Jet A 0.40 - Jet B
Motor Gasoline	0.011	0.014	0.016	0.10 - Unleaded
Aviation Fuel	0.001	0.003	0.016	0.05
Kerosene/Stove Oil	0.026	0.044	0.046	0.04 - Type No. 1 -K 0.30 - Type No. 2 -K
Low Sulphur Diesel Fuel	0.026	0.032	0.041	0.05 - Automotive
Diesel Fuel	0.096	0.247	0.318	0.30 - Type A 0.50 - Type B
Light Fuel Oil	0.040	0.148	0.187	0.30 - Type No. 0 0.50 - Type No. 1 0.50 - Type No. 2
Heavy Fuel Oil	1.136	1.541	1.864	No Limits

2) Average reported sulphur content (%) for Heavy Fuel Oil versus the limits set forth by Provincial regulations

Region	Sulphur Content (%) in Heavy Fuel Oil (2003)	Provincial Regulations	
		Province	Sulphur Content Limit (%)
Atlantic	1.864	New Brunswick	<u>Heavy Fuel Oil</u> 1.5 - Type No. 4 2.0 - Type No. 5 3.0 - Type No. 6
		Newfoundland and Labrador	<u>Heavy Fuel Oil</u> Any fuel grade Type Nos. 4, 5 or 6: <ul style="list-style-type: none"> • Where Best Available Technology (BAT) is employed: <ul style="list-style-type: none"> - 3%, or - 2% on an annual basis. • Where BAT is not employed: <ul style="list-style-type: none"> - 2.2%, or - 2% on an annual basis.
		Nova Scotia (Proposed)	2.0 – All types
Quebec	1.136	Quebec	2.0 - All types 1.25 to 1.4 – HFO Type No.6 (Montreal)
Ontario	1.428	Ontario	1.0 - Boilers 1.5 - All Types (Toronto)
West	1.571	B.C.	1.1 - All Types

Appendix 7

Summary of the Election Information as per *Sulphur in Gasoline Regulations*

Appendix 7: Summary of the Election Information as per *Sulphur in Gasoline Regulations*

Election Information under Section 11(1) of the *Sulphur in Gasoline Regulations*

Company	Locations	Region	Type	Registration No.	No Election (flat limits)	1 Year Avgs.	2½ Year Avg.	Avg. Type Used [Note 1]	Estimate of Volume weighted average concentration of Sulphur (cumulative)			Estim.of Volume weighted average conc.of Sulphur (straight)		
									End of 2002	End of 2003	End of 2004	End of 2002	End of 2003	End of 2004
									Chevron	British Columbia	West	R	CHV-R1-BC-98	
Husky	Prince George, BC	West	R	HUS-R1-BC-98			Y	Cumulative	250	167	140	194	175	75
Petro-Can	Edmonton, AB	West	R	PCL-R4-AB-98			Y	Cumulative	220	168	150	220	175	90
Imperial	Strathcona, AB	West	R	IOL-R4-ON-98			Y	Cumulative	270	206	145	270	206	30
Shell	Scotford, AB	West	R	SHL-R3-AB-98			Y	Straight	50	50	50	50	50	50
Co-op	Regina, SK	West	R	CCR-R1-SK-98			Y	Cumulative	200	125	100	200	87.5	63
Imperial	Sarnia, ON	Ontario	R	IOL-R2-ON-98			Y	Cumulative	230	175	150	230	182	78
Shell	Sarnia, ON	Ontario	R	SHL-R2-ON-98			Y	Straight	530	177	50	530	80	30
Sunoco	Sarnia, ON	Ontario	R	SUN-R1-ON-98			Y	Cumulative	250	162	140	250	194.5	31
Imperial	Nanticoke, ON	Ontario	R	IOL-R3-ON-98			Y	Cumulative	295	228	150	295	221.5	6
Petro-Can	Oakville, ON	Ontario	R	PCL-R2-ON-98			Y	Cumulative	220	150	150	220	130	135
Petro-Can	Montreal, QC	Quebec	R	PCL-R1-QU-98			Y	Cumulative	230	230	140	230	230	30
Shell	Montreal, QC	Quebec	R	SHL-R1-QU-98			Y	Straight	350	230	150	350	170	30
Ultramar	Quebec, QC	Quebec	R	ULM-R1-QC-98			Y	Cumulative	200	108	145	200	170	93
Irving	St.John, NB	Atlantic	R	IRV-R1-NB-98		Y		Assumed [2]	48	48	48	48	48	48
Imperial	Dartmouth, NS	Atlantic	R	IOL-R1-NS-98			Y	Cumulative	270	200	150	270	127	30
North Atlantic	Come-by-Chance, NF	Atlantic	R	NAR-R1-NF-98	Y			Assumed [2]	49	49	49	49	49	49
Sunoco	Montreal, QC	Quebec	B	SUN-B6-QU-02			Y	Cumulative	300	222	145	300	183	30
Ultramar	Montreal, QC	Quebec	B	ULM-B1-QU-98			Y	Cumulative	200	115	140	200	95	110
Ultramar	Dartmouth, NF	Atlantic	B	ULM-B2-NF-98			Y	Cumulative	200	163	140	200	177	110
Petro-Can	British Columbia	West	I	PCL-I3-BC-98			Y	Cumulative	150	46	150	150	46	30
Petro-Can	Ontario	Ontario	I	PCL-I2-ON-98			Y	Cumulative	Note 3	Note 3	150	Note 3	Note 3	150
Neste	Ontario	Ontario	I	NES-I2-ON-98			Y	Straight	300	200	140	300	150	50

Appendix 7: Summary of the Election Information as per *Sulphur in Gasoline Regulations*

Election Information under Section 11(1) of the *Sulphur in Gasoline Regulations*

Company	Locations	Region	Type	Registration No.	No Election (flat limits)	1 Year Avgs.	2½ Year Avg.	Avg. Type Used [Note 1]	Estimate of Volume weighted average concentration of Sulphur (cumulative)			Estimate of Volume weighted average Concentration of Sulphur (annual)		
									End of 2002	End of 2003	End of 2004	End of 2002	End of 2003	End of 2004
Olco	Ontario	Ontario	I	OLC-I1-QU-98			Y	Straight	300	200	140	300	150	50
Olco	Ontario	Ontario	I	OLC-I2-ON-98			Y	Straight	300	0	0	300	0	0
Sunoco	Ontario	Ontario	I	SUN-I1-ON-98			Y	Cumulative	300	222	145	300	183	30
Petro-Can	Quebec	Quebec	I	PCL-I1-QU-98			Y	Cumulative	Note 3	Note 3	150	Note 3	Note 1	150
Neste	Quebec	Quebec	I	NES-I1-QU-98			Y	Straight	300	0	0	300	0	0
Sunoco	Quebec	Quebec	I	SUN-I2-QU-00			Y	Cumulative	300	222	145	300	183	30

Regional Averages (Note 4)

Year	Ontario	West	Quebec	Atlantic	Canada
1999	460	224	280	230	320
2000	450	220	270	270	310
2001	390	220	270	230	290
2002	335	201	224	178	249
2003	156	139	109	140	136
2004	52	61	58	37	56
2005	25	25	25	25	25

Notes

1. Companies either provided an average value for gasoline produced in each of the years 2002, 2003, and 2004 OR provided a running average for 2002, 2002-2003, and 2002-2004. The numbers in italics were computed by Environment Canada based on the assumption of annual volumes remaining constant between 2002-2004.

2. Sulphur levels for Irving and North Atlantic are based on 2001 levels.

3. The regulatees stated that while on a 30 month volume-weighted election has been made, it is their intention to combine all import batches with their refinery, in that province of import. Therefore unless their location of import changes, there will be no reported imports in those provinces. If such a change occurs the estimated number for the period in question is 0.0150 wt%.

4. Historical 1999-2003 data is from the Sulphur in Liquid Fuels reports. Regional volume-weighted averages for 2002-2004 assume 2001 refinery volumes remain constant.

