



Environment
Canada

Environmental
Stewardship
Branch

Environnement
Canada

Directoin générale
de l'intendance
environnementale

Sulphur in Liquid Fuels

2005

Prepared by: **Jeffrey Guthrie**
 Oil, Gas and Energy Division
 Clean Air Directorate
 Environment Canada

and **Wesam Al-Sarraj**
 Co-op Student
 University of Ottawa

and **Maureen Froese**
 Co-op Student
 University of Waterloo

November 2006

Environment Canada

Sulphur in Liquid Fuels

2005

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:

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

Table of Contents

1.0 EXECUTIVE SUMMARY	1
2.0 INTRODUCTION	6
2.1 FUELS INFORMATION REGULATIONS, NO. 1	6
2.2 REGULATIONS AND OTHER MEASURES TO ADDRESS SULPHUR LEVELS IN FUELS	6
2.3 PERIOD COVERED	8
2.4 REPORTING PETROLEUM REFINERIES AND IMPORTING COMPANIES	8
2.5 COMPANY SPECIFIC SULPHUR LEVELS	11
3.0 VOLUMES OF LIQUID FUELS PRODUCED / IMPORTED	12
4.0 VOLUMES OF LIQUID FUELS PRODUCED / IMPORTED AND FUEL SULPHUR CONTENT	13
4.1 NATIONAL AND REGIONAL SUMMARIES	13

List of Graphs

1.1 Sulphur Levels in Gasoline by Region, 1995-2005.....	2
1.2 National Trend of Sulphur Content in Gasoline (1999-2005)	3
1.3 Sulphur Mass in Liquid Fuels by Region, 1995-2005.....	4
4.1 National Liquid Fuel Production / Imports in 2005	14
4.2 Tonnage of Sulphur in Liquid Fuels in 2005.....	15
4.3 Mass of Sulphur in Liquid Fuels Produced / Imported in 2005	19
4.4 Sulphur Mass in Liquid Fuels by Region, 1995-2005.....	20
4.5 Sulphur Levels in Motor/Aviation Gasoline by Region, 1995-2005.....	21
4.6 Sulphur Levels in Motor Gasoline by Refinery/Importer in 2005	22
4.7 Sulphur Levels in Low-Sulphur Diesel Fuel by Refinery / Importer in 2005	23
4.8 Sulphur Levels in Regular Diesel Fuel by Refinery / Importer in 2005.....	24
4.9 National Trend of Sulphur Content in Aviation Turbo Fuel, 1995-2005	25
4.10 National Trend of Sulphur Content in Motor/Aviation Gasoline, 1995-2005.....	25
4.11 National Trend of Sulphur Content in Kerosene / Stove Oil, 1995-2005	26
4.12 National Trend of Sulphur Content in Diesel Fuel (Total Pool), 1995-2005	26
4.13 National Trend of Sulphur Content in Light Fuel Oil, 1995-2005	27
4.14 National Trend of Sulphur Content in Heavy Fuel Oil, 1995-2005	27

List of Tables

1.1	Fuel Production / Imports and Sulphur Content, National Summary for 2005	5
2.1	Refineries, Blenders and Upgraders Reporting under the Respective Regulations.....	9
2.2	Importers Reporting under the Respective Regulations	10
3.1	Volume of Liquid Fuels Produced/Imported, Statistics Canada and Environment Canada Reporting	12
4.1	Fuel Production / Imports and Sulphur Content, National Summary for 2005	13
4.2A	Fuel Production / Imports, Atlantic Region Summary, 2005	16
4.2B	Fuel Production / Imports, Quebec Region Summary, 2005	16
4.2C	Fuel Production / Imports, Ontario Region Summary 2005.....	17
4.2D	Fuel Production / Imports, West Region Summary, 2005.....	17
4.2E	Regional and National Averages of the Density of Fuels Produced and Imported in 2005.....	18
A3.1.a	Volume Weighted Annual Sulphur Level in Motor Gasoline 1995-2005	37
A3.1.b	Volume Weighted Annual Sulphur Level in Motor Gasoline for 2005 (Reported by Quarters).....	38
A3.2.a	Volume Weighted Annual Sulphur Level in Low-Sulphur Diesel 1995-2005	39
A3.2.b	Volume Weighted Annual Sulphur Level in Low-Sulphur Diesel for 2005 (Reported by Quarters).....	40
A3.3.a	Volume Weighted Annual Sulphur Level in Regular Diesel 1995-2005	41
A3.3.b	Volume Weighted Annual Sulphur Level in Regular Diesel for 2005 (Reported by Quarters).....	42
A3.4.a	Volume Weighted Annual Sulphur Level in Light Fuel Oil 1995-2005	43
A3.4.b	Volume Weighted Annual Sulphur Level in Light Fuel Oil for 2005 (Reported by Quarters).....	44
A3.5.a	Volume Weighted Annual Sulphur Level in Heavy Fuel Oil 1995-2005	45
A3.5.b	Volume Weighted Annual Sulphur Level in Heavy Fuel Oil for 2005 (Reported by Quarters).....	46
A3.6.a	Volume Weighted Annual Sulphur Level in Aviation Gasoline (2002-2005)	47
A3.6.b	Volume Weighted Annual Sulphur Level in Aviation Gasoline for 2005 (Reported by Quarters).....	47
A3.7.a	Volume Weighted Annual Sulphur Level in Aviation Turbo (Jet) Fuel (2002-2005)	48
A3.7.b	Volume Weighted Annual Sulphur Level in Aviation Turbo (Jet) Fuel for 2005 (Reported by Quarters)	49

Appendices

Appendix 1:

Web-site References for *Fuels Information Regulation, No. 1* and other Fuels Regulations.....28

Appendix 2:

Sample Forms for Reporting Sulphur Content under the *Fuels Information Regulation, No. 1*,
Sulphur in Gasoline Regulations and *Sulphur in Diesel Fuel Regulations*.....30

Appendix 3:

Volume Weighted Annual Sulphur Levels by Refiner for 1995 to 2005

Appendix 4:

Canadian General Standards Board for Sulphur Content in Fuels

Appendix 5:

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

Appendix 6:
Comparison of Average Fuel Sulphur Content from the 2005 Liquid Fuels Report with
the Limits Set Forth By the Canadian General Standards Board and the Provincial Regulations .55

Appendix 7:
Summary of the Election Information as per *Sulphur in Gasoline Regulations*57

1.0 Executive Summary

This report summarizes the 2005 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*.

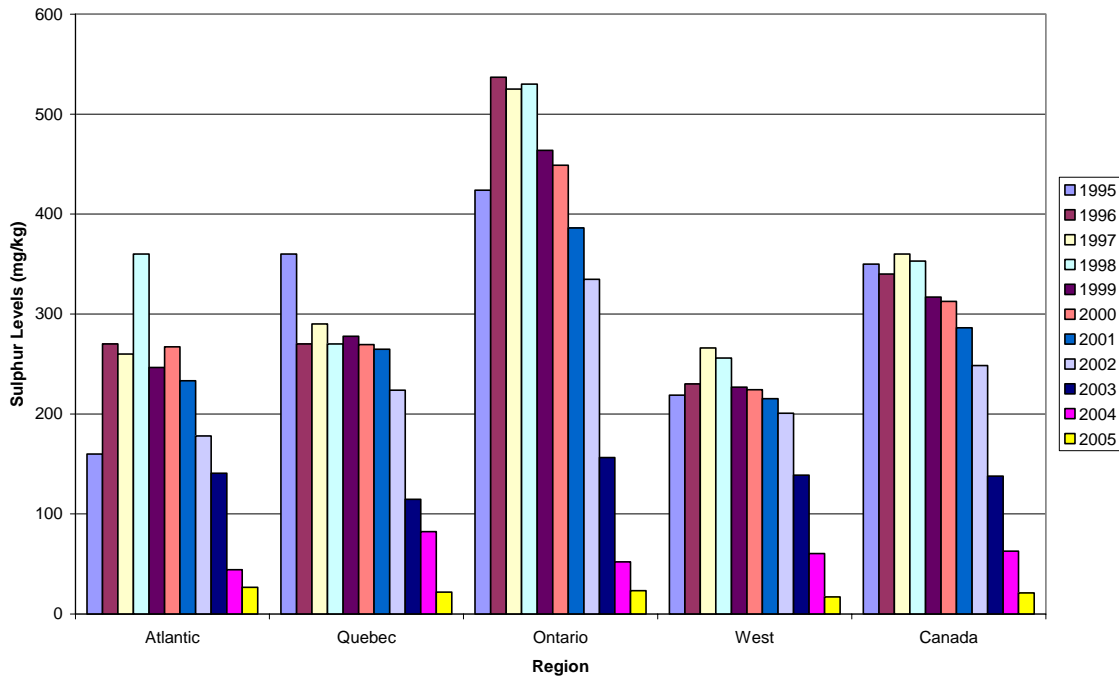
During 2005, there were various developments with respect to federal regulations on sulphur in fuels and other non-regulatory issues:

- Under the *Sulphur in Gasoline Regulations*, the average sulphur limit of 150 mg/kg for the 2½ year interim period beginning July 1, 2002, ended on December 31, 2004. The final 30 mg/kg average limit came into effect on January 1, 2005.
- *Amendments to the Sulphur in Diesel Fuel Regulations* with limits for sulphur in off-road, rail and marine diesel fuels were published in Part II of the *Canada Gazette* on October 19, 2005. The limits are:
 - 500 mg/kg for off-road, rail and marine diesel fuels in June 2007;
 - 15 mg/kg for off-road diesel fuel in June 2010; and
 - 15 mg/kg for rail and marine diesel fuels in June 2012.
- In August 2005, Environment Canada released a discussion paper on amendments¹ to the *Sulphur in Diesel Fuel Regulations* that would allow a sales transition period for on-road diesel fuel. The sales limit proposed would be aligned with the levels and timing requirements passed by the U.S. Environmental Protection Agency. The proposed limits and timing were:
 - 22 mg/kg for on-road diesel fuel from September 1, 2006 until October 15, 2006; and
 - 15 mg/kg for on-road diesel fuel after October 15, 2006.

¹ The proposed and final *Regulations Amending the Sulphur in Diesel Fuel Regulations* were subsequently published in the *Canada Gazette* Parts I and II on April 1, 2006 and June 23, 2006, respectively.

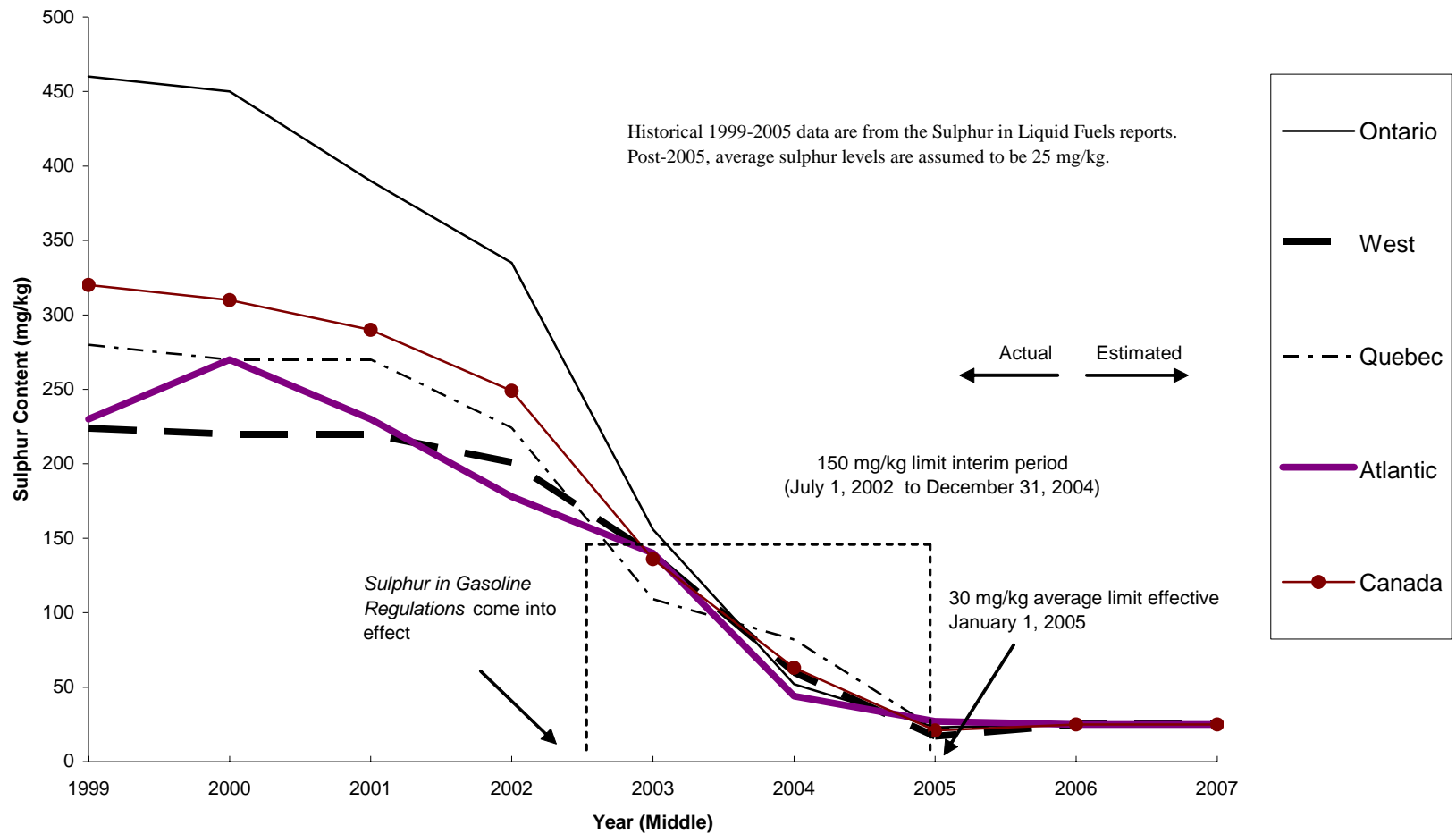
In 2005, the national average sulphur content in gasoline was determined to be **21 mg/kg**, which represents a decline of 66% with respect to 2004 levels (62 mg/kg). Graph 1.1 shows the trend for sulphur content in gasoline nationally and by region for the period 1995 to 2005.

Graph 1.1: Sulphur Levels in Gasoline by Region, 1995 - 2005



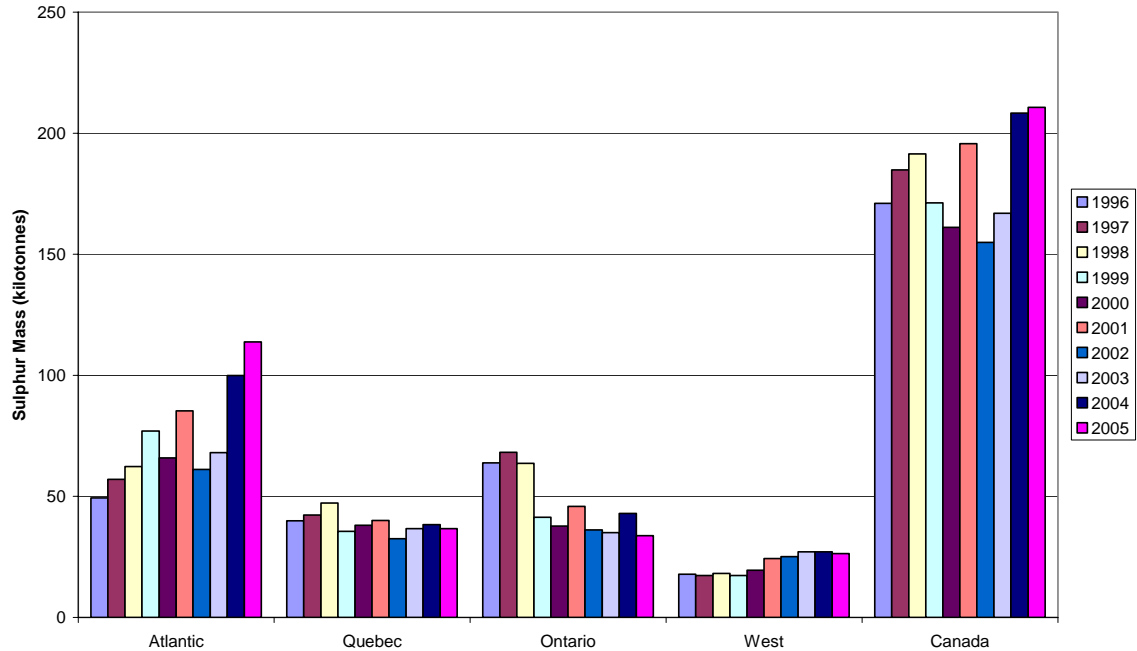
The lower sulphur levels in 2005 result from the *Sulphur in Gasoline Regulations*, which came into effect in 2002. The regulations set an average limit of 30 mg/kg commencing in 2005, with an interim limit of 150 mg/kg until then. Graph 1.2 shows the actual and projected trends in the levels of sulphur in gasoline from 1999 to 2007.

Graph 1.2: National Trend of Sulphur Content in Gasoline (1999-2007)



The reported mass of sulphur content in all liquid fuels nationally increased by **1.1%** in 2005 from 2004 values, as shown in Graph 1.3. In the Atlantic region, the reported mass of sulphur in all liquid fuels increased by 13.9% in 2005 from 2004 and 67.2% from 2003 to 2005. In Ontario and Quebec and the Western Provinces the decreases were 21%, 4% and 3% respectively from 2004 to 2005.

Graph 1.3: Sulphur Mass in Liquid Fuels by Region, 1996 - 2005



Fifty-four percent of the total mass of sulphur reported for Canada is attributed to the Atlantic Provinces. Eighty-three percent of the Atlantic Provinces' sulphur is from heavy fuel oil which increased by over 68% in volume from 2004 to 2005.

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 43.8% of all products, and accounted for 0.3% of the sulphur mass in liquid fuels. Heavy fuel oil constituted 10.6% by volume of the total liquid fuels and contained 77.4% of the total sulphur mass in Canada.

TABLE 1.1 :
Fuel Production / Imports and Sulphur Content
National Summary for 2005

Type of Fuel	Fuel Production / Imports		Sulphur Mass (tonnes)	Average Sulphur Content (mg/kg)	Distribution of Sulphur in Products (%)
	(m ³)	(% of total)			
Aviation Turbo Fuel	8,772,520	9.4	4,640	654	2.2
Motor Gasoline	40,977,305	43.8	618	21	0.3
Aviation Gasoline	104,134	0.1	3	43	0.0
Kerosene/Stove oil	1,066,100	1.1	387	441	0.2
Low-Sulphur Diesel Fuel	24,146,899	25.7	5,455	268	2.6
Diesel Fuel	2,775,574	3.0	5,169	2,177	2.5
Light Fuel Oil	3,453,589	3.7	4,691	1,594	2.2
Heavy Fuel Oil	9,944,545	10.6	163,119	16,444	77.4
Plant Consumption	1,406,943	1.5	8,474	6,260	4.0
Other ¹	861,189	0.9	18,071	20,750	8.6
TOTAL ²	93,508,796	100.0	210,628	2,304	100.0

Note:

1. The Type of Fuel category "Other" was reported under "Plant Consumption" in previous years reports.
2. Totals may not add up to due to rounding.

Note that the 2005 report has an additional category of fuel called "Other". The "Other" category is comprised of liquid fuels not captured under the fuels listed on Form 1 of the Fuels Information Regulations, No. 1. Fuels under "Other" for 2005 include intermediate fuel oils, bituminous emulsions (ORIMULSION[®]), asphalt, and unnamed fuels.

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 fuels² 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.

Fuel text of the *Fuels Information Regulations, No.1* and reporting forms are available at http://www.ec.gc.ca/cleanair-airpur/Fuel_Information_Regulations,_No._1-WS0FDA3887-1_En.htm

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

Sulphur in Diesel Fuel Regulations

The federal *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)³. 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.

² Throughout this document, the word "fuel(s)" applies only to those fuels which are in liquid form and petroleum-based.

³ 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.

Amendments to the federal *Sulphur in Diesel Fuel Regulations* were published in Part II of the *Canada Gazette* on October 19, 2005. The amendments introduce limits for sulphur in off-road, rail and marine diesel fuels aligned with the levels and timing of requirements passed by the U.S. Environmental Protection Agency in June 2004. The final sulphur limits are:

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

The amendments, along with the accompanying regulatory impact analysis statement are available at Environment Canada's Diesel Fuel website:

http://www.ec.gc.ca/cleanair-airpur/Diesel-WS94F5583C-1_En.htm

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.

Fuel text of the *Sulphur in Gasoline Regulations* and reporting forms are available at: http://www.ec.gc.ca/cleanair-airpur/Sulphur_in_Gasoline_Regulations-WSD7F604F8-1_En.htm

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. More information is available at:

http://www.ec.gc.ca/cleanair-airpur/Fuel_Oils-WSDC997DB6-1_En.htm

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/cleanair-airpur/caol/OGEB/library_e.htm

2.3 Period Covered

This report covers the period from January 1 to December 31, 2005. 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 offences 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 2005.

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

Company	Location	Prov	FIR⁴	Gasoline⁵	Diesel⁶
Chevron Canada Limited	Burnaby	BC	X	X	X
Consumers' Co-operative Refineries Limited	Regina	SK	X	X	X
Husky Oil Operations Ltd.	Prince George	BC	X	X	X
Imperial Oil	Dartmouth	NS	X	X	X
Imperial Oil	Edmonton	AB	X	X	X
Imperial Oil	Nanticoke	ON	X	X	X
Imperial Oil	Sarnia	ON	X	X	X
Imperial Oil Limited (Winnipeg Distribution Terminal)	Winnipeg	MB	X		X
Irving Oil Limited	Saint-John	NB	X	X	X
Newalta	North Vancouver	BC	X		X
North Atlantic Refining Limited	Come-by-Chance	NL	X	X	X
NOVA Chemicals Canada Limited	Corunna	ON	X		
Petro-Canada	Edmonton	AB	X	X	X
Petro-Canada	Montréal	QC	X	X	X
Petro-Canada	Oakville	ON	X	X	X
Petro-Canada	Port Moody	BC	X		X
Petro-Canada Lubricants	Mississauga	ON	X		X
Robbins Feed and Fuel	Allanburg	ON	X	X	
Shell Canada Products	Sarnia	ON	X	X	X
Shell Canada Products	Fort Saskatchewan	AB	X	X	X
Shell Canada Products	Montréal-Est	QC	X	X	X
Shell Canada Products	Burnaby	BC		X	
Suncor Energy Incorporated	Fort McMurray	AB	X		X
Suncor Energy Products Incorporated	Sarnia	ON	X	X	X
Ultramar Limitée	Lévis / St-Romuald	QC	X	X	X
Ultramar Limitée	Montréal-Est	QC	X	X	

⁴ FIR: *Fuels Information Regulations, No. 1*

⁵ Gasoline: *Sulphur in Gasoline Regulations*

⁶ Diesel: *Sulphur in Diesel Fuel Regulations*

The following petroleum importers reported, under the three regulations, information pertaining to *import* volume and fuel sulphur content for 2005:

Table 2.2
Importers Reporting under the under their respective Regulations

Company	Location	Prov.	FIR ⁷	Gasoline ⁸	Diesel ⁹
Air Canada	Westridge	BC	X		
Air Canada (Vopak)	Hamilton	ON	X		
BP Cherry Point	Vancouver	BC	X		
Canada Pacific Railway	Calgary	AB	X		X
Cervini Farms	Leamington	ON	X		
Coco Paving Inc.	Windsor	ON	X		X
Consumers' Co-operative Refineries Limited	Regina	SK	X		X
General Motors Canada	Ontario	ON		X	
Great Lakes Greenhouses Inc	Leamington	ON	X		
Imperial Oil	Burnaby	BC	X	X	X
Imperial Oil	Point Tupper	NS	X	X	
Kildair Services Ltée	Tracy	QC	X		
Mackenzie Petroleum Limited	Dawson City	YT	X		X
Marine Petrobulk Limited	North Vancouver	BC	X		
New Brunswick Power Corporation	Fredericton	NB	X		
Newalta	North Vancouver	BC	X		
Newfoundland & Labrador Hydro	St. John's	NL	X		
Nexfor Fraser Papers Incorporated	Edmundston	NB	X		
NOCO Energy Canada	Toronto	ON	X		
Norske Canada	Campbell River	BC	X		
Norske Canada	Crofton	BC	X		
North 60 Petro Ltd.	Whitehorse	YT	X	X	X
North Atlantic Refining Limited	Come-by-Chance	NL	X		
Nova Scotia Power	Halifax	NS	X		
Olco Petroleum Group	Beauport	QC	X	X	
Ontario Limited	Leamington	ON	X		
Parkland Refining Limited	Yukon Imports	YK	X		X
Perto-Canada	Montréal	QC	X	X	
Petro-Canada	Port Moody	BC	X	X	X
Pétroles Norcan	Montréal-Est	QC	X	X	
Pope and Talbot Limited	Nanaimo	BC	X		
Port Colborne Quarries Limited	Port Colborne	ON	X		
Shell Canada Products	Montréal-Est	QC	X	X	
Shell Canada Products	Burnaby	BC	X		X
Suncor Energy Products Incorporated	Sarnia	ON	X		X
Ultramar Limitée	Holyrood	NL	X	X	X
Ultramar Limitée	Lévis / St-Romuald	QC	X	X	X
Ultramar Limitée	Montréal-Est	QC	X	X	X

⁷ FIR: *Fuels Information Regulations, No. 1*

⁸ Gasoline: *Sulphur in Gasoline Regulations*

⁹ 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 2005 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 2005 (see Table 3.1).

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

Type of Fuel	Statistics Canada	Environment Canada
	(m ³)	(m ³)
Aviation Turbo Fuel	6,927,800	8,772,520
Motor/Aviation Gasoline	40,456,300	41,081,439
Kerosene/Stove oil	468,400	1,066,100
Low-Sulphur Diesel Fuel	0	24,146,899
Diesel Fuel	26,640,100	2,775,574
Light Fuel Oil	4,508,200	3,453,589
Heavy Fuel Oil	8,758,900	9,944,545
Plant Consumption	15,606,800	1,406,943
Other	5,557,300	861,189
TOTAL	108,923,800	93,508,796

Notes:

1. Statistics Canada data were compiled for the period Year 2005. Source: Statistics Canada, Catalogue no. 45-004-XIE Monthly, December 2005.
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 is listed as ‘Own Consumption’ in the Statistics Canada report. This covers the whole range of petroleum products listed in the Statistics Canada publication. Statistics Canada defined ‘Own Consumption’ as the amount of petroleum product produced or purchased and used in refinery operations. Environment Canada volumes reported under ‘plant consumption’ included combustible gas, natural gas, propane, butane, gasoline, diesel, light fuel oil, marine fuel (i.e., intermediate fuel oil IFO 30-460), heavy fuel oil, PFO, pitch and unnamed fuel. The Environment Canada quarterly report Form 1 does not list ‘Plant Consumption’ as a liquid fuel to report, although it has been historically reported by some companies.
6. Statistics Canada ‘Other Petroleum Products’ is defined as all other petroleum products such as wax and candels, unfinished products, etc.. The Fuels Information Regulations, No. 1 ‘Other’ reported included intermediate fuel oils, bituminous emulsions (ORIMULSION[®]), asphalt and unnamed fuels.
7. In the past Sulphur in Liquid Fuels annual reports, ‘Plant Consumption’ and ‘Other’ were combined under ‘Plant Consumption’.

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

4.1 National and Regional Summaries

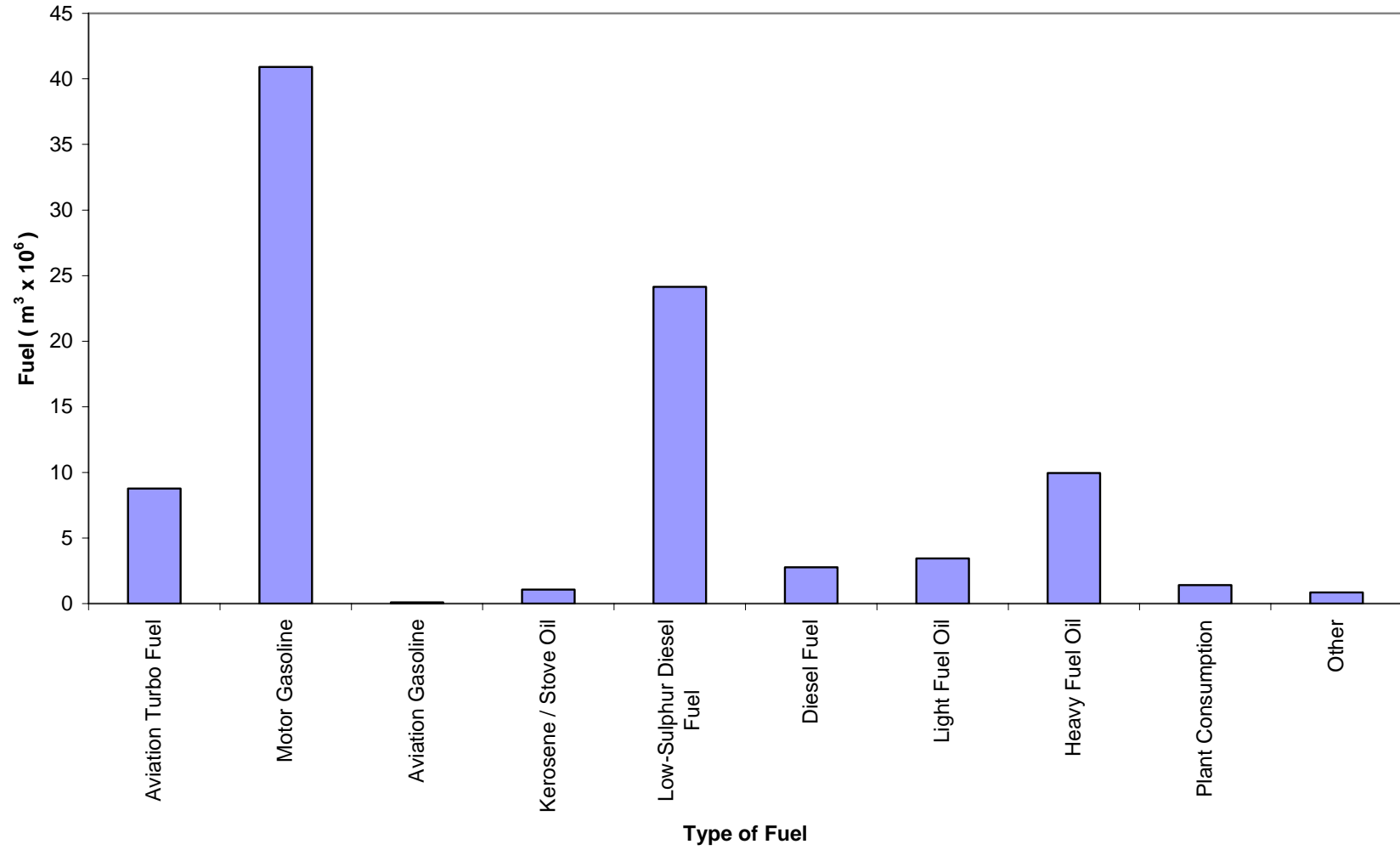
The following graphs and tables summarize the data compiled from reports submitted pursuant to the *Fuels Information Regulations No. 1* for 2005:

- 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

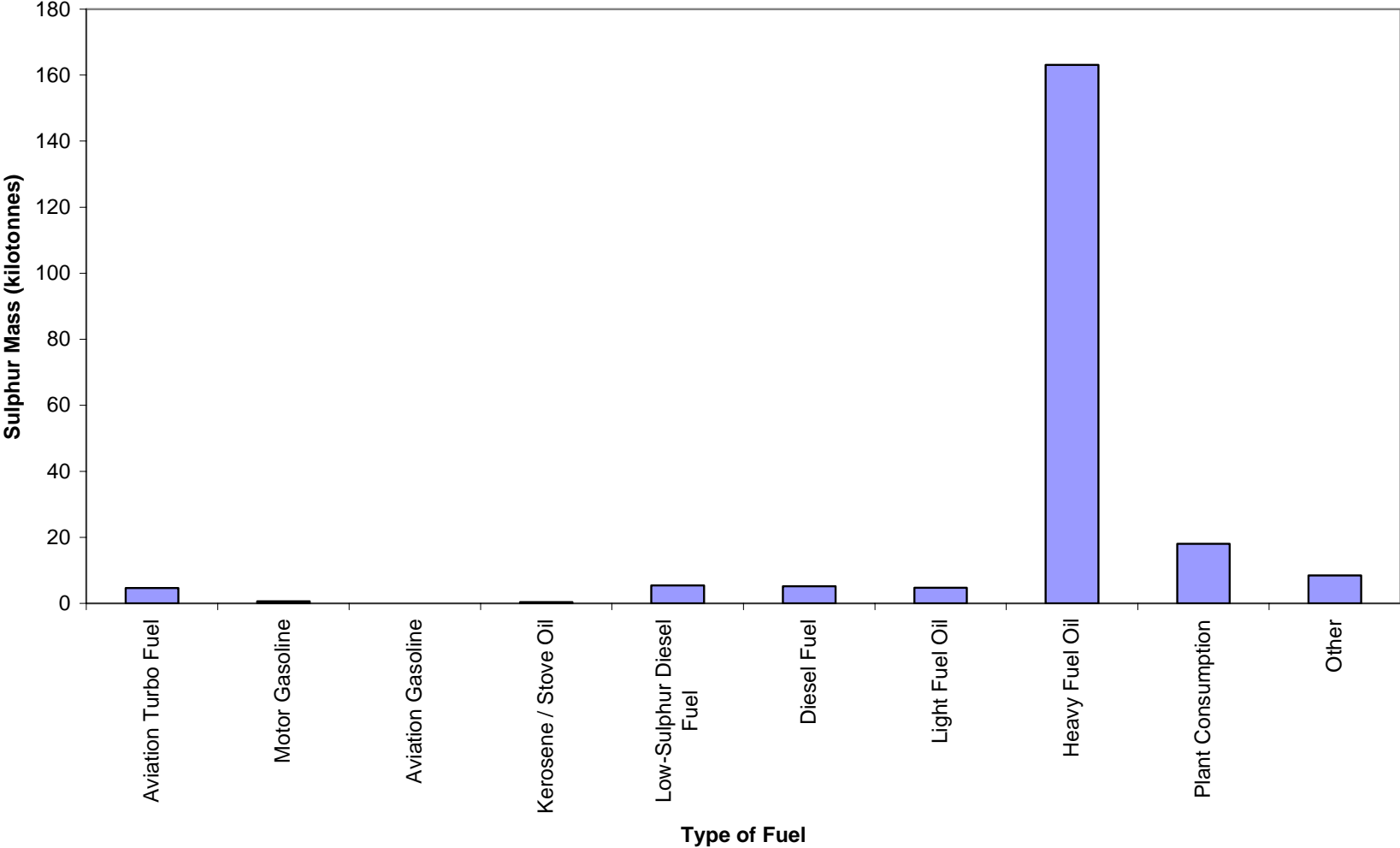
Type of Fuel	Fuel Production / Imports		Sulphur Mass (tonnes)	Average Sulphur Content (%wt.)	Distribution of Sulphur in Products (%)
	(m ³)	(% of total)			
Aviation Turbo Fuel	8,772,520	9.4	4,640	0.065	2.2
Motor Gasoline	40,977,305	43.8	618	0.002	0.3
Aviation Gasoline	104,134	0.1	3	0.004	0.0
Kerosene/Stove oil	1,066,100	1.1	387	0.044	0.2
Low-Sulphur Diesel Fuel	24,146,899	25.8	5,455	0.027	2.6
Diesel Fuel	2,775,574	3.0	5,169	0.218	2.5
Light Fuel Oil	3,453,589	3.7	4,691	0.159	2.2
Heavy Fuel Oil	9,944,545	10.6	163,119	1.644	77.4
Plant Consumption	1,406,943	1.5	8,474	0.626	4.0
Other	861,189	0.9	18,071	2.075	8.6
TOTAL	93,508,796	100.0	210,628	0.230	100.0

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

Graph 4.1: National Liquid Fuel Production / Imports in 2005



Graph 4.2: Tonnage of Sulphur in Liquid Fuels in 2005



**TABLE 4.2A:
Fuel Production/Imports and Sulphur Content, Atlantic Region Summary for
2005**

Atlantic Region				
Type of Fuel	Fuel Production / Imports (m³)	Sulphur Mass (tonnes)	Average Sulphur Content (%wt.)	Distribution of Sulphur in Products (%)
Aviation Turbo Fuel	516,257	596	0.144	0.5
Motor Gasoline	2,847,010	56	0.003	0.0
Aviation Gasoline	0	0	0.000	0.0
Kerosene/Stove oil	NA ¹	7	0.058	0.0
Low-Sulphur Diesel Fuel	1,570,914	469	0.035	0.4
Diesel Fuel	NA ¹	175	0.110	0.2
Light Fuel Oil	1,601,423	1,723	0.127	1.5
Heavy Fuel Oil	4,785,042	94,385	1.965	82.9
Plant Consumption ²	300,803	4,665	1.507	4.1
Other ³	NA ¹	11,711	2.128	10.3
TOTAL	12,372,087	113,786	0.920	100.0

Notes:

1. Volume not included to protect confidential data.
2. Plant Consumption in the Atlantic consists of marine fuels (i.e., intermediate fuel oil IFO 420), light/heavy fuel oil and pitch.
3. Other in the Atlantic consists of IFO-46 IFO 30-460, and import bituminous emulsion product (i.e., ORIMULSION®).

**TABLE 4.2B:
Fuel Production/Imports and Sulphur Content, Québec Region Summary for
2005**

Québec Region				
Type of Fuel	Fuel Production / Imports (m³)	Sulphur Mass (tonnes)	Average Sulphur Content (%wt.)	Distribution of Sulphur in Products (%)
Aviation Turbo Fuel	1,585,555	1,005	0.079	2.7
Motor Gasoline	13,706,112	210	0.002	0.6
Aviation Gasoline	NA ¹	0	0.000	0.0
Kerosene/Stove oil	1,029,771	341	0.040	0.9
Low-Sulphur Diesel Fuel	6,624,084	1,850	0.033	5.0
Diesel Fuel	NA ¹	388	0.273	1.1
Light Fuel Oil	NA ¹	1,614	0.232	4.4
Heavy Fuel Oil	2,746,678	29,046	1.074	79.1
Plant Consumption ²	NA ¹	534	0.143	1.5
Other ³	143,645	1,740	1.174	4.7
TOTAL	27,543,386	36,729	0.140	100.0

Notes:

1. Volume not included to protect confidential data
2. Plant consumption in Quebec consists of combustible gas, natural gas, propane, butane, gasoline, diesel, and heavy fuel oil.
3. Other in Quebec consists of asphalt and unnamed fuel.

**TABLE 4.2C:
Fuel Production/Imports and Sulphur Content, Ontario Region Summary for
2005**

Ontario Region				
Type of Fuel	Fuel Production / Imports (m³)	Sulphur Mass (tonnes)	Average Sulphur Content (%wt.)	Distribution of Sulphur in Products (%)
Aviation Turbo Fuel	1,291,044	917	0.088	2.7
Motor Gasoline	10,971,485	187	0.002	0.6
Aviation Gasoline	0	0	0.000	0.0
Kerosene/Stove oil	NA ¹	38	0.314	0.1
Low-Sulphur Diesel Fuel	4,575,144	1,309	0.034	3.9
Diesel Fuel	538,746	1,270	0.276	3.8
Light Fuel Oil	962,845	1,346	0.162	4.0
Heavy Fuel Oil	1,203,075	20,886	1.757	61.8
Plant Consumption ²	284,827	3,214	1.143	9.5
Other ³	NA ¹	4,614	2.826	13.7
TOTAL	20,001,131	33,782	0.175	100.0

Notes:

1. Volume not included to protect confidential data
2. Plant consumption in the Ontario consists of liquefied refinery fuel, PFO, and heavy fuel oil.
3. Other in Ontario consists of unnamed fuel.

**TABLE 4.2D:
Fuel Production/Imports and Sulphur Content, West Region Summary for 2005**

West Region				
Type of Fuel	Fuel Production / Imports (m³)	Sulphur Mass (tonnes)	Average Sulphur Content (%wt.)	Distribution of Sulphur in Products (%)
Aviation Turbo Fuel	5,379,664	2,122	0.049	8.1
Motor Gasoline	13,452,698	164	0.002	0.6
Aviation Gasoline	NA ¹	3	0.007	0.0
Kerosene/Stove oil	NA ¹	0	0.007	0.0
Low-Sulphur Diesel Fuel	11,204,860	1,827	0.019	6.9
Diesel Fuel	1,875,918	3,335	0.207	12.7
Light Fuel Oil	NA ¹	8	0.015	0.0
Heavy Fuel Oil	1,209,749	18,802	1.558	71.4
Plant Consumption ²	NA ¹	61	0.046	0.2
Other ³	NA ¹	6	0.080	0.0
TOTAL	33,592,192	26,330	0.083	100.0

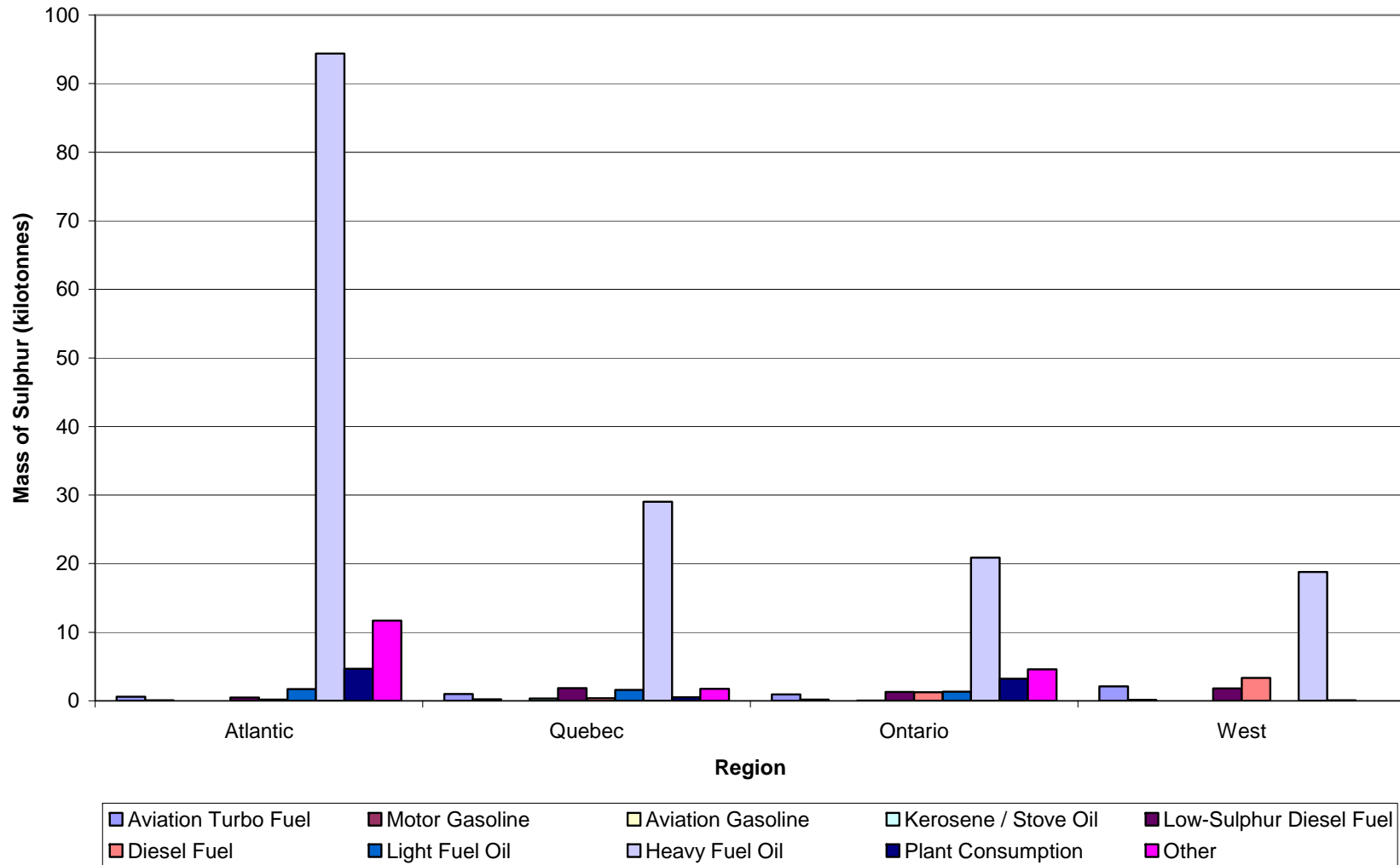
Notes:

1. Volume not included to protect confidential data
2. Plant consumption in the West consists of diesel fuel, light fuel oil, heavy fuel oil and unnamed fuel..
3. Other in the West consists of unnamed fuel.

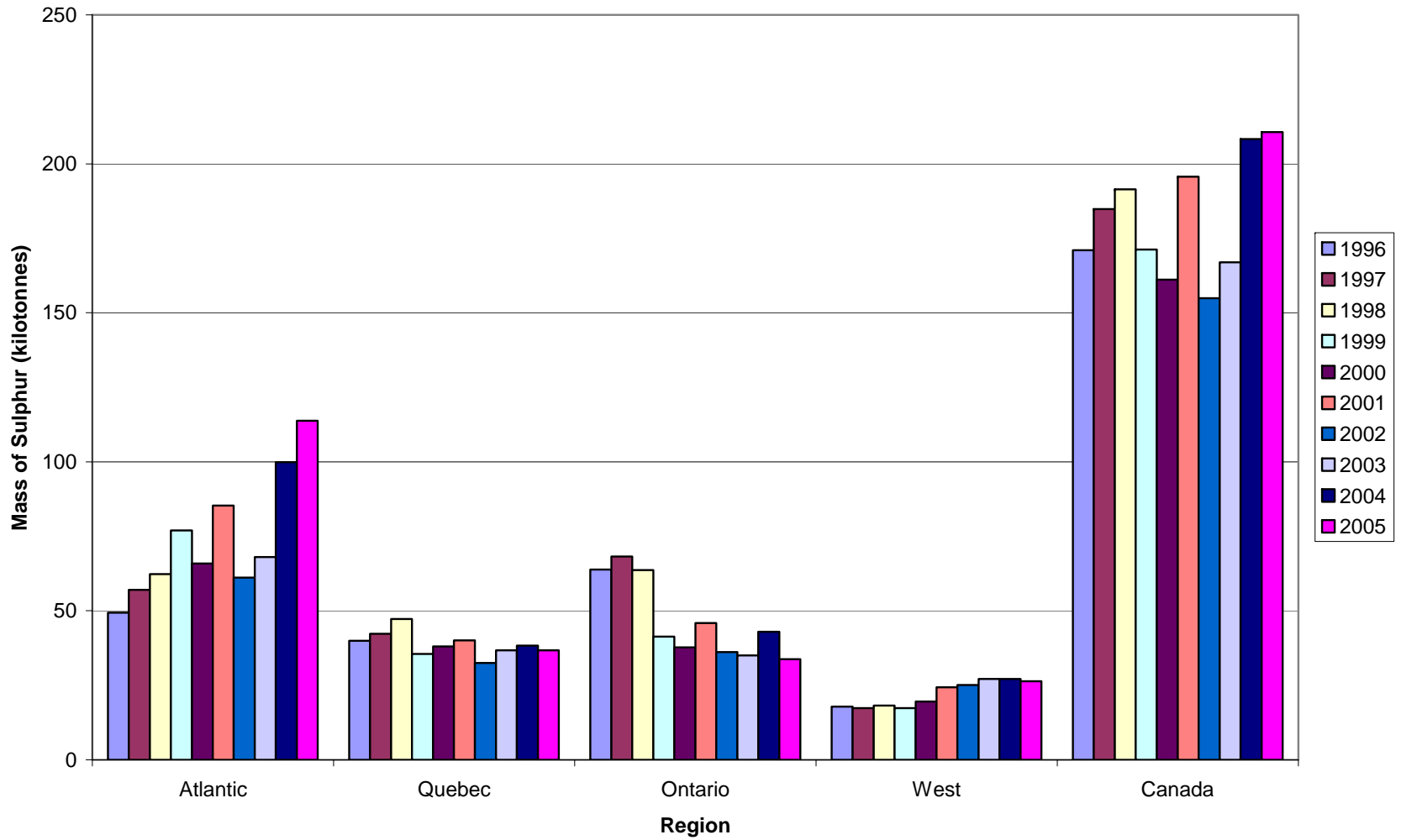
TABLE 4.2E:
Regional and National Volume Weighted Averages of the Density of Fuels
Produced And Imported in 2005 (kg/m3)

Type of Fuel	Atlantic	Quebec	Ontario	West	Canada
Aviation Turbo Fuel	803.3	808.8	810.5	811.3	810.2
Motor Gasoline	736.2	738.3	734.8	729.4	734.3
Aviation Gasoline	0.0	705.1	0.0	701.5	703.0
Kerosene/Stove oil	808.1	821.9	845.2	817.0	822.0
Low-Sulphur Diesel Fuel	842.3	834.4	842.9	849.8	843.7
Diesel Fuel	856.2	813.4	853.8	858.7	854.8
Light Fuel Oil	846.6	843.7	857.1	826.9	848.4
Heavy Fuel Oil	1002.7	980.2	988.2	998.4	994.2
Plant Consumption	1030.6	809.0	997.1	847.6	898.7
Other	998.7	1004.1	1019.5	802.0	1001.2

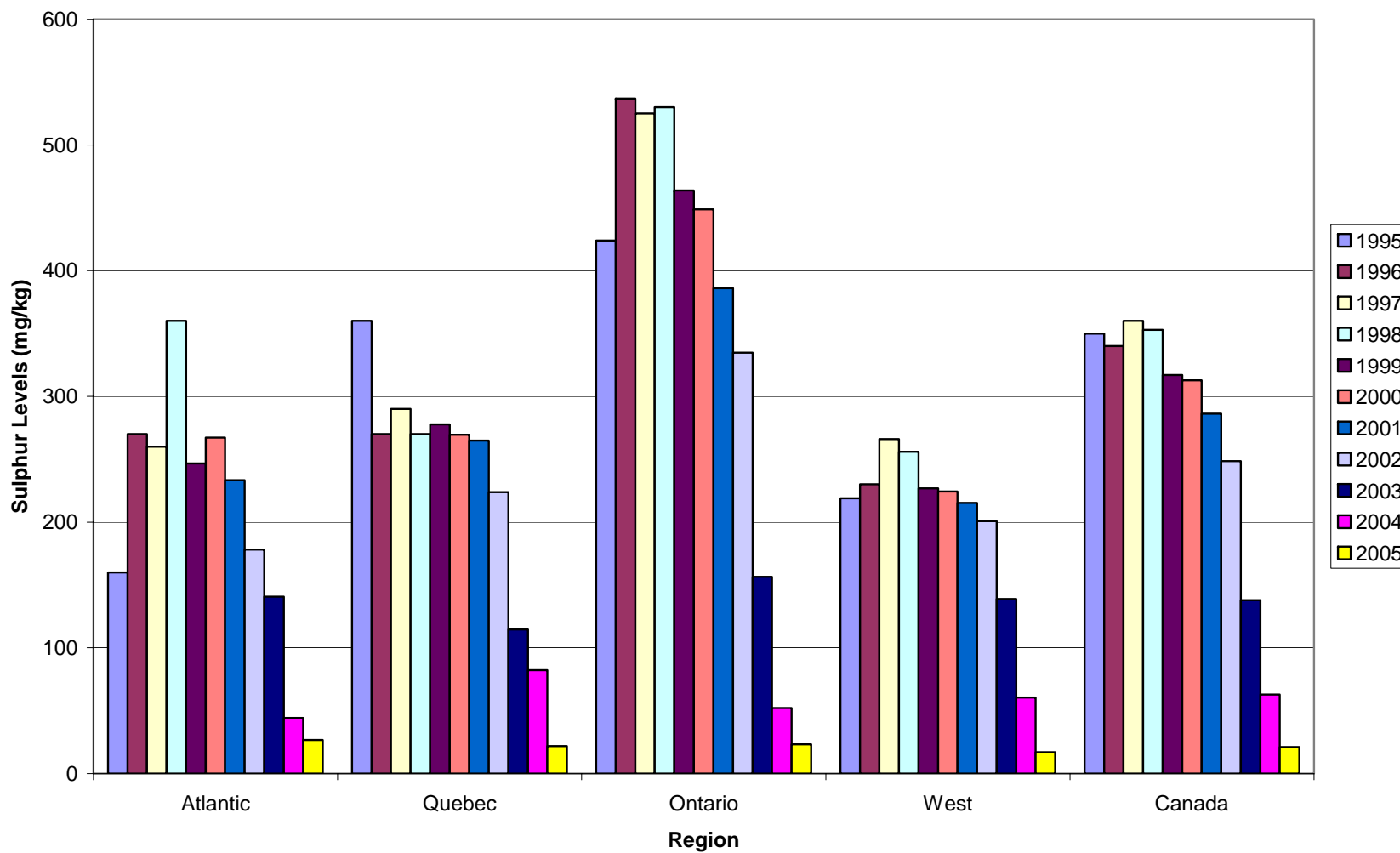
Graph 4.3: Mass of Sulphur in Liquid Fuels Produced or Imported in 2005



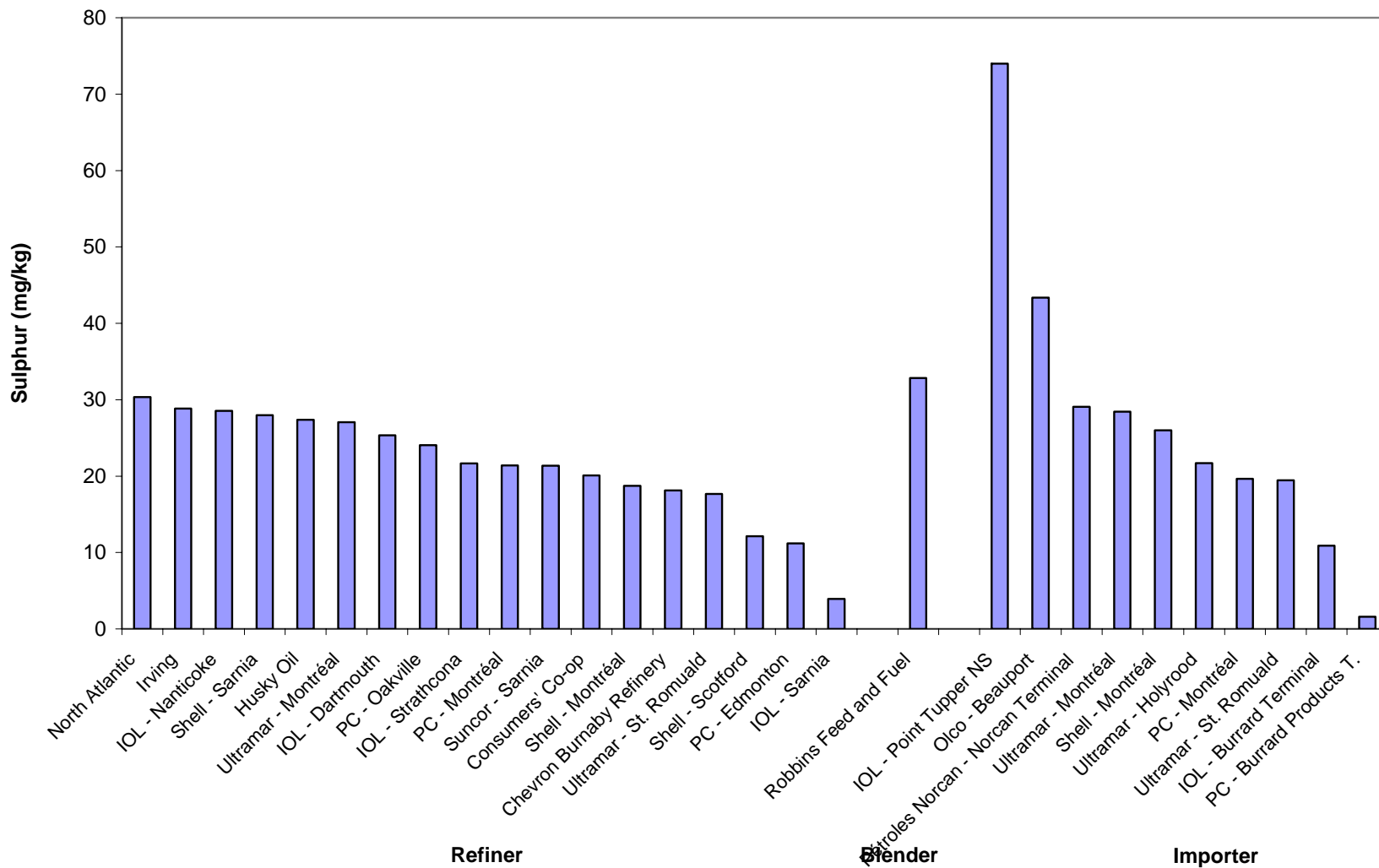
Graph 4.4 : Sulphur Mass in Liquid Fuels by Region, 1996 - 2005



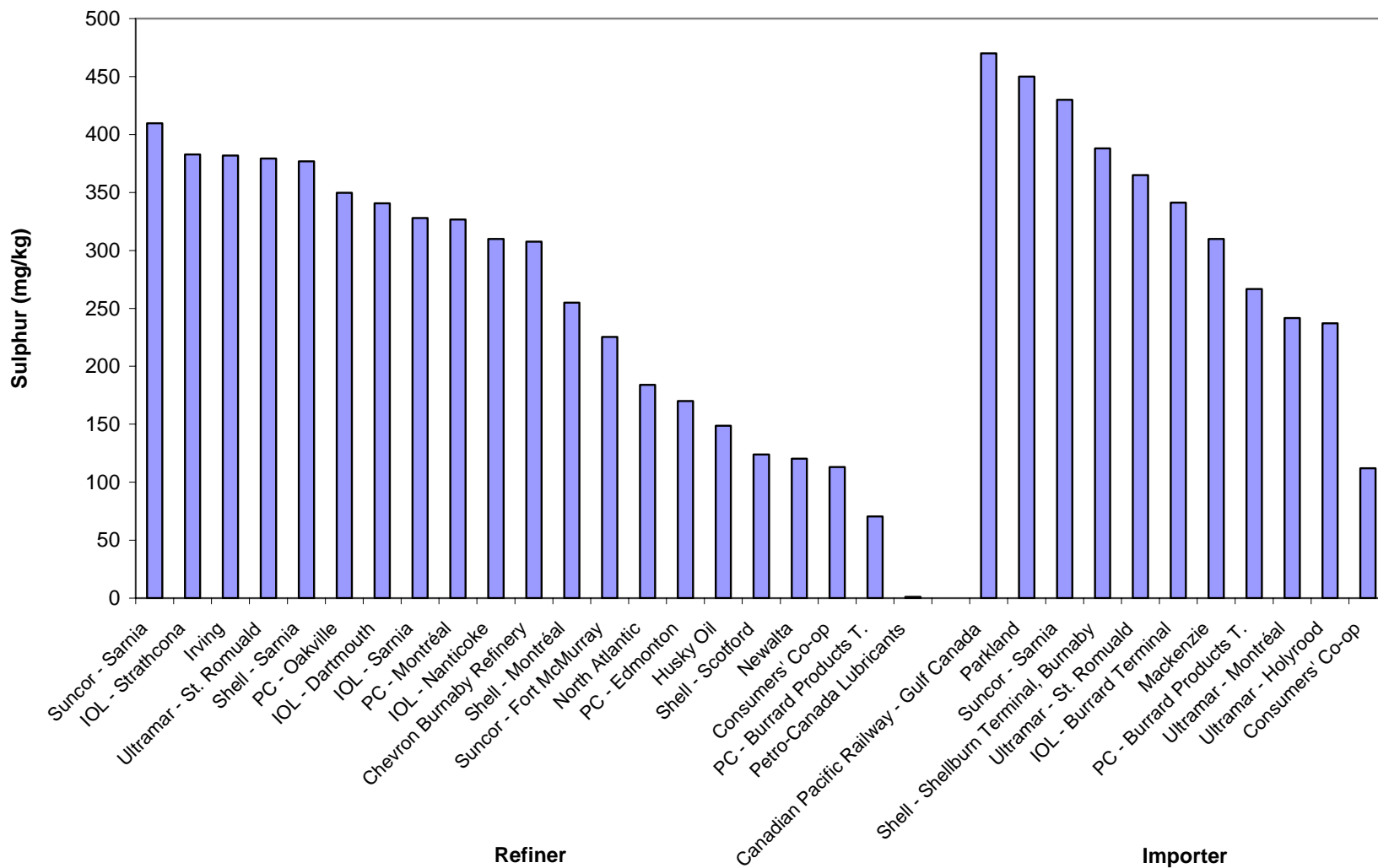
Graph 4.5 : Sulphur Levels in Motor/Aviation Gasoline by Region, 1995 - 2005



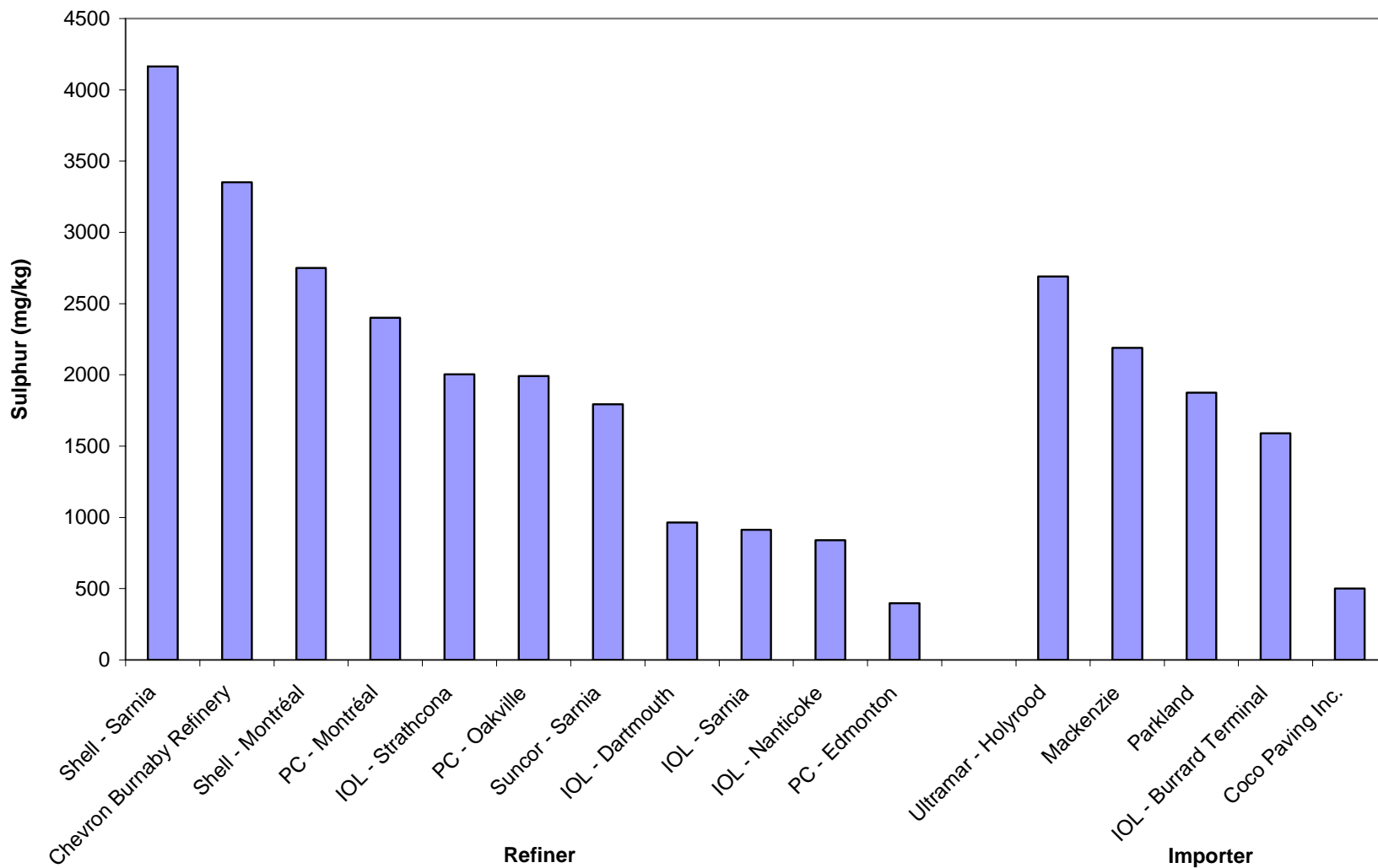
Graph 4.6: Sulphur Levels in Motor Gasoline by Refinery / Importer in 2005



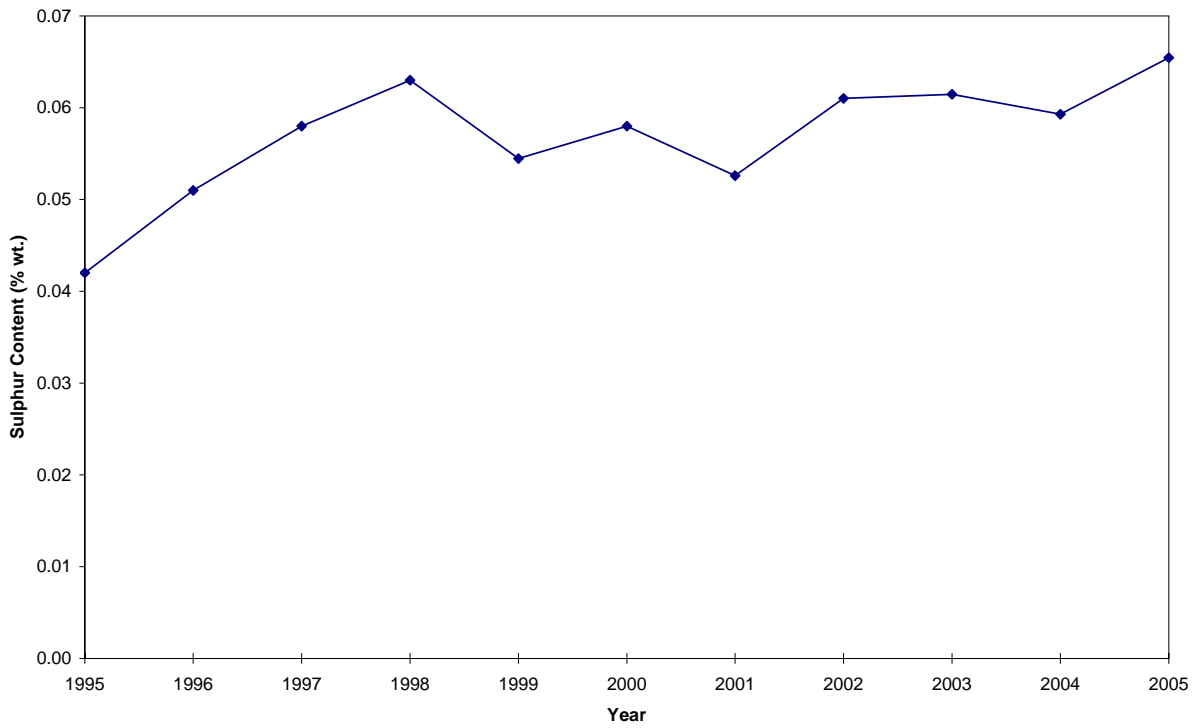
Graph 4.7: Sulphur Levels in Low Sulphur Diesel Fuel by Refinery / Importer in 2005



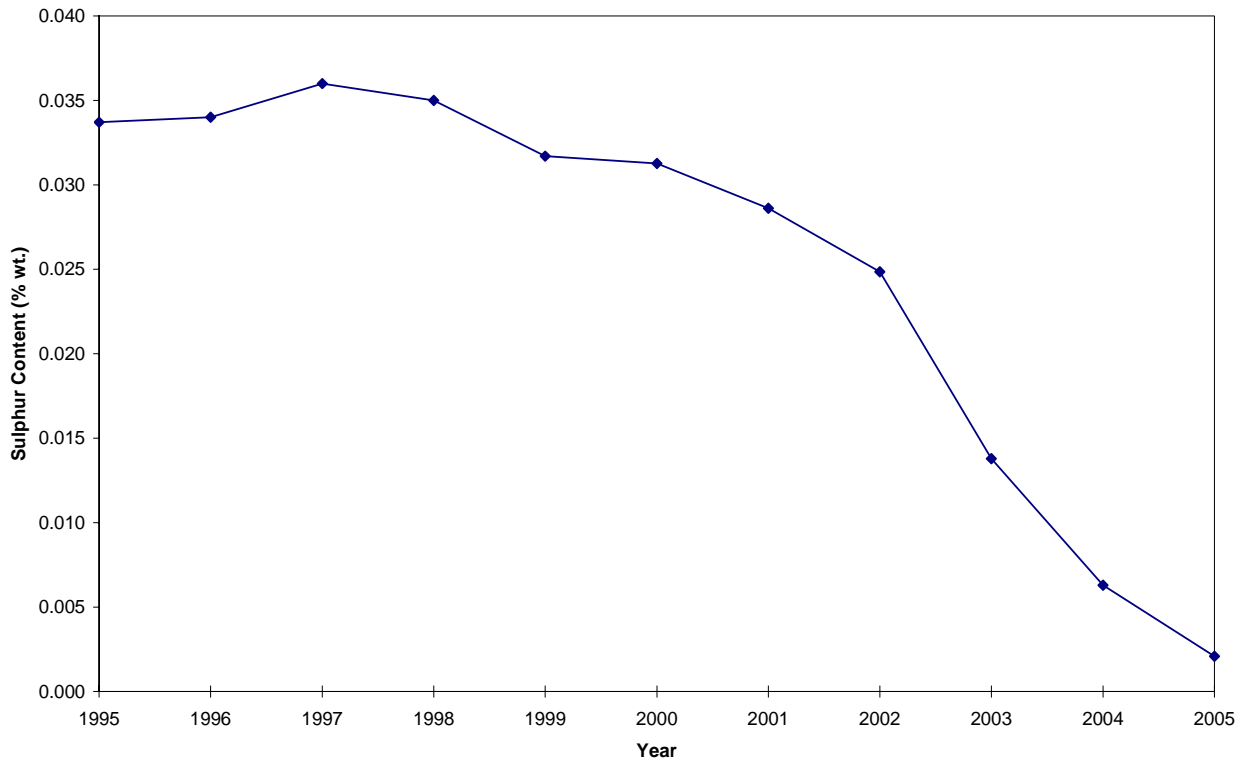
Graph 4.8: Sulphur Levels in Regular Diesel Fuel by Refinery / Importer in 2005



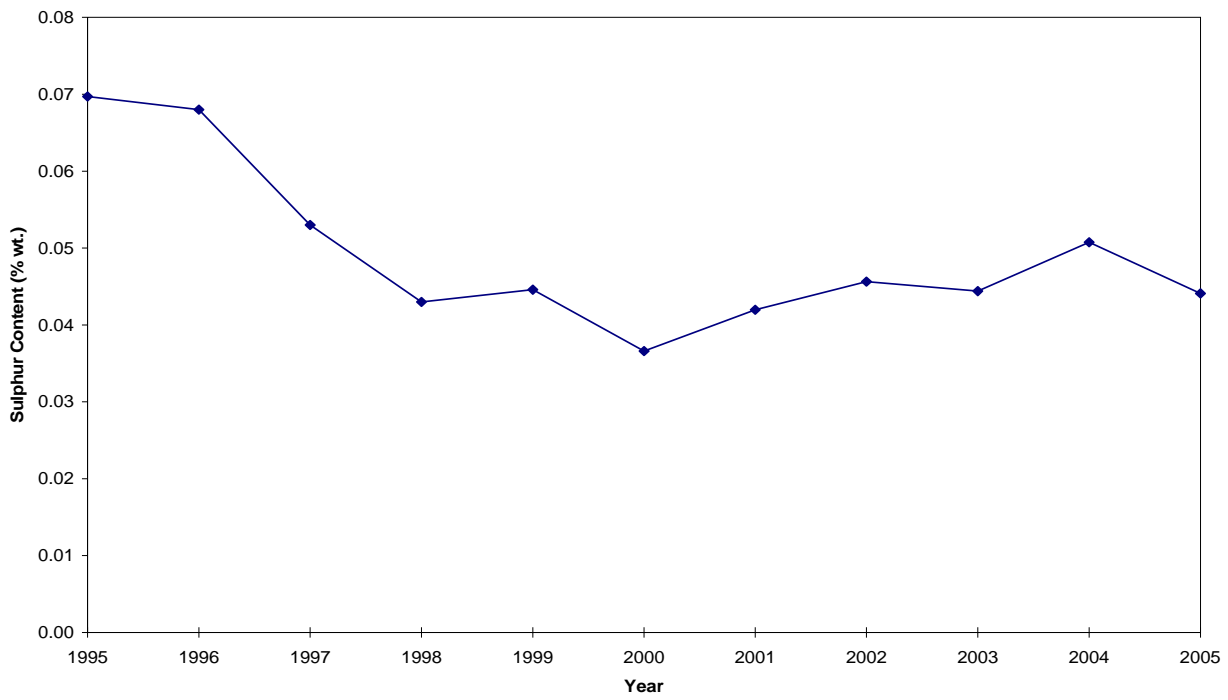
Graph 4.9: National Trend of Sulphur Content in Aviation Turbo Fuel, 1995-2005



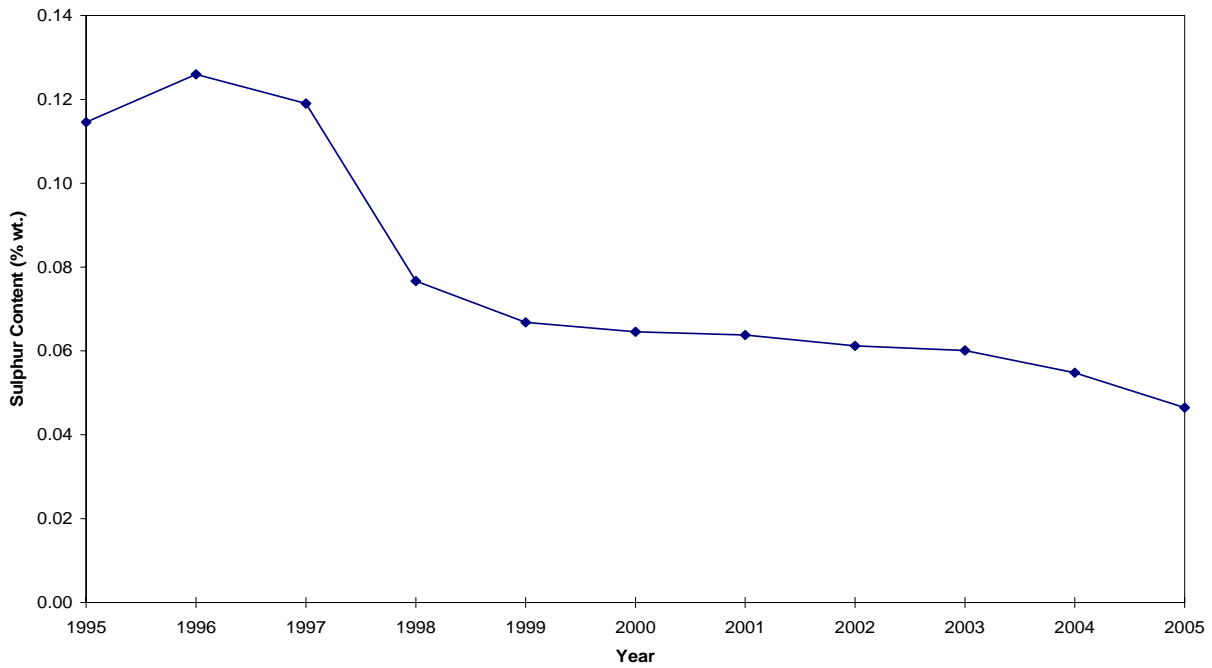
Graph 4.10: National Trend of Sulphur Content in Motor/Aviation Gasoline, 1995-2005



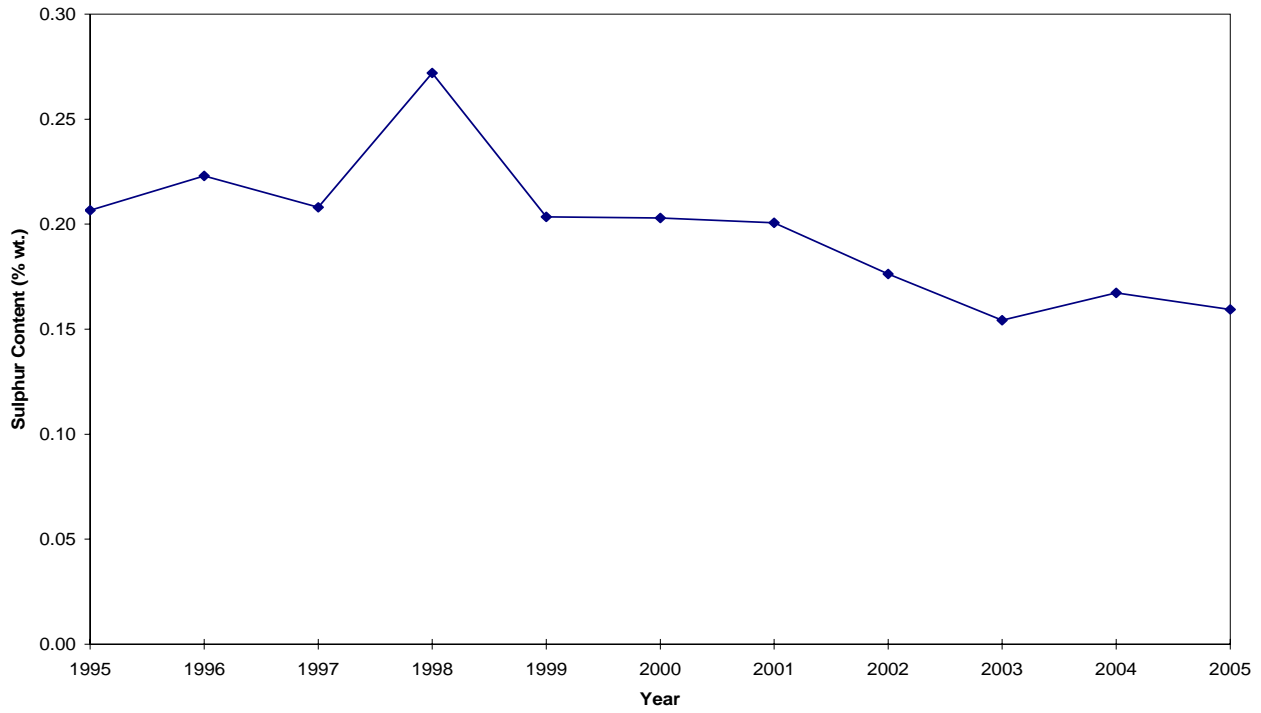
Graph 4.11: National Trend of Sulphur Content in Kerosene/Stove Oil, 1995-2005



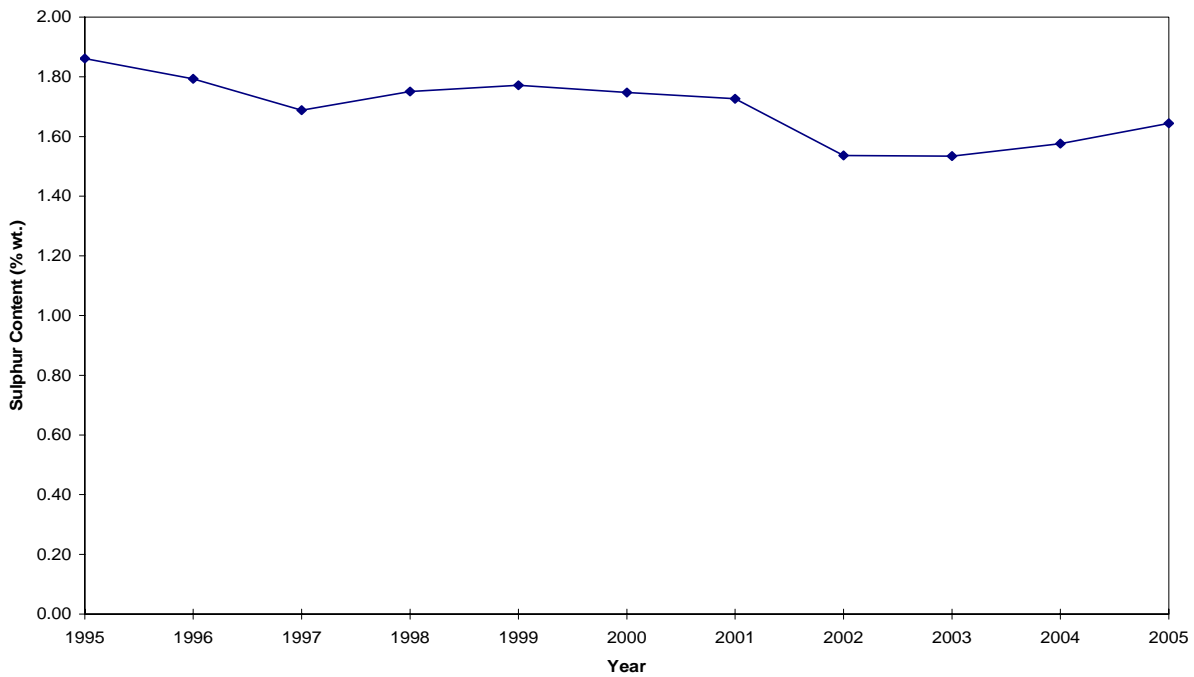
Graph 4.12: National Trend of Sulphur Content in Diesel Fuel (Total Pool), 1995-2005



Graph 4.13: National Trend of Sulphur Content in Light Fuel Oil, 1995-2005



Graph 4.14: National Trend of Sulphur Content in Heavy Fuel Oil, 1995-2005



Appendix 1

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

Environment Canada's Fossil Fuels –Home page

http://www.ec.gc.ca/cleanair-airpur/Fuels-WS0E66B313-1_En.htm

Fuels Information Regulations, No. 1

http://www.ec.gc.ca/cleanair-airpur/Fuel_Information_Regulations,_No._1-WS0FDA3887-1_En.htm

Sulphur in Gasoline Regulations

http://www.ec.gc.ca/cleanair-airpur/Sulphur_in_Gasoline_Regulations-WSD7F604F8-1_En.htm

Benzene in Gasoline Regulations

http://www.ec.gc.ca/cleanair-airpur/Benzene_in_Gasoline_Regulations-WS4664F2AB-1_En.htm

Contaminated Fuels Regulations

http://www.ec.gc.ca/cleanair-airpur/Contaminated_Fuels_Regulations-WS70BC5C6B-1_En.htm

Gasoline Regulations

http://www.ec.gc.ca/cleanair-airpur/Gasoline_Regulations-WS55EC66D9-1_En.htm

Gasoline and Gasoline Blend Dispensing Flow Rate Regulations

http://www.ec.gc.ca/cleanair-airpur/Gasoline_and_Gasoline_Blend_Dispensing_Flow_Rate_Regulations-WS6DCE43CD-1_En.htm

Sulphur in Diesel Fuels Regulations

http://www.ec.gc.ca/cleanair-airpur/Sulphur_in_Diesel_Fuel_Regulations-WS5B4D506F-1_En.htm

Appendix 2

Sample Forms for Reporting Sulphur Content under the Regulations:

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

(2005 Compliance promotion package)

FUELS INFORMATION REGULATIONS, NO 1

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.
- b) by every person who during the calendar year has produced or imported over 400 cubic meters of petroleum fuels for use in Canada.
- c) for the purpose of informing the Minister of Environment
to:

REGIONAL ADDRESS

This form is provided for your convenience. Please refer to the *Canadian Environmental Protection Act* and *Fuels Information Regulation No. 1*, 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:						
	NAME OF LIQUID FUEL	VOLUME (m ³)		Density (kg/m ³) or API	SULPHUR CONTENT (WEIGHT %)	
		PRODUCED	IMPORTED		Highest	Lowest
1	AVIATION TURBO FUEL 1.1 Jet A 1.2 Jet B					
2	GASOLINE 2.1 Lead Free 2.2 Regular 2.3 Premium					
3	KEROSENE AND STOVE OIL					
4	DIESEL OIL (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	Synthetic Crude (sold as fuel)					
8	A Fuel other than the fuels named in items 1 to 5					
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: (____) _____

SULPHUR IN GASOLINE REGULATIONS (SOR/99-236)

Note: This form is provided for your convenience in reporting. For reporting details, refer to the Regulations.
Section 4 of the federal *Sulphur in Gasoline Regulations* requires that certain information be submitted:

- a) by each primary supplier that produces or imports gasoline identified as low-sulphur gasoline, California gasoline or gasoline-like blend stock as identified under section 5 of the Regulations,
- b) for each refinery and blending facility at which the primary supplier produced the gasoline, for each province into which it imported the gasoline and for each combination which it elected under section 9 of the Regulations,
- c) annually, on or before February 15 of the year following the year for which the report is prepared.

The information should be submitted to the appropriate regional office of Environment Canada.

Registration Number under the <i>Benzene in Gasoline Regulations</i>	Year
Company name	
Company address	

Type of primary supplier (check one or more): Producer at a refinery Producer at a blending facility Importer

Which method has been elected to meet the Sulphur limit? Pool Average Flat
 If pool average, what is the averaging period during the interim period that was elected? annual basis OR 30 month period
If pool average, elected as annual basis, the averaging period is January 1, 2004 to December 31, 2004
If pool average, elected as 30 month period, the averaging period is July 1, 2002 to December 31, 2004
Please note that, once pool average election has been made, it can not be changed part way through an averaging period.

Name and location of the refinery, blending facility or points of importation in the province, covered by this report:

Type of Gasoline	Annual Volume (m ³) (January 1, 2004 to December 31, 2004)		Flat Limit	Pool Average	
	PRODUCED	IMPORTED	Maximum S Concentration in Gasoline (mg/kg)	Maximum S Concentration in Gasoline (mg/kg)	Volume Weighted average (mg/kg)
1. Low Sulphur Gasoline					
2. California Gasoline				NOT REQ'D	NOT REQ'D
3. Gasoline-Like Blendstock			NOT REQ'D	NOT REQ'D	NOT REQ'D

Authorized Official	Telephone No. () -
Title	Fax No. () -
Signature	Date
Contact Name	Contact Telephone No. () -

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

Head of Inspections
Environmental Protection – Pacific & Yukon Region
Environment Canada
Suite 201 – 401 Burrard Street
Vancouver, British Columbia V6C 3S5

Appendix 3

Volume Weighted Annual Sulphur Levels by Refiner for 1995 to 2005

Appendix 3.1a: Volume Weighted Annual Sulphur Levels in Motor Gasoline 1995 - 2005

	Name	City	Sulphur Levels (mg/kg)										
			1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Refiner	Chevron Canada Limited	Burnaby	215	273	294	246	199	174	171	213	118	132	18
	Consumers' Co-operative Limited	Regina	97	179	103	148	187	242	197	178	163	68	20
	Husky Oil Operations Ltd.	Prince George	183	261	225	282	170	248	239	242	143	108	27
	Imperial Oil	Dartmouth	365	419	374	491	329	382	356	265	188	28	25
	Imperial Oil	Edmonton	239	243	346	297	272	252	302	268	165	30	22
	Imperial Oil	Nanticoke	340	506	530	529	450	456	376	366	208	21	29
	Imperial Oil	Sarnia	728	787	712	792	694	693	596	432	191	15	4
	Irving Oil Limited	Saint-John	71	35	43	129	96	85	48	50	66	65	29
	North Atlantic Refining Limited	Come-by-Chance	38	75	118	76	55	47	49	58	29	25	30
	Parkland Refining Limited	Bowden	-	1	1	4	4	8	4	-	-	-	-
	Petro-Canada	Edmonton	360	380	394	377	311	311	250	202	168	81	11
	Petro-Canada	Montréal	472	356	387	316	367	292	320	275	218	25	21
	Petro-Canada	Oakville	528	489	519	514	523	479	396	305	133	138	24
	Shell Canada Products	Sarnia	553	579	582	567	453	466	462	399	53	58	28
	Shell Canada Products	Fort Saskatchewan	50	50	50	50	50	50	49	50	7	10	12
	Shell Canada Products	Montréal-Est	392	319	333	312	269	318	280	231	38	33	19
	Suncor Energy Products Incorporated	Sarnia	368	276	298	301	209	192	180	196	157	47	21
	Ultramar Limitée	Lévis / St-Romuald	219	174	186	171	173	218	212	188	105	152	18
Ultramar Limitée	Montréal-Est	-	-	-	-	-	-	-	155	95	75	27	
Blender	Robbins Feed and Fuel	Allanburg	-	-	-	137	271	239	307	222	120	104	33
	BP West Coast Products, LLC	Blaine	-	-	-	70	103	105	110	100	-	-	-
	Delta Western Fuel (Totem Oil)	Whitehorse	-	-	-	610	73	236	-	-	-	-	-
	Ford Motor Company of Canada, Limited	Windsor	-	-	-	-	-	28	22	28	15	-	-
	Husky Oil Operations Ltd.	Prince George	-	-	-	80	-	-	-	-	-	-	-
	Imperial Oil	Burnaby	-	-	-	210	-	-	63	63	-	-	-
	Imperial Oil	Burrard	-	-	-	-	-	-	-	-	-	74	11
	Imperial Oil	Montréal	-	-	-	-	340	-	-	-	-	-	-
	Imperial Oil	Point Tupper	-	-	-	-	-	-	-	-	-	-	74
	Mackenzie Petroleum Limited	Dawson City	-	-	-	170	301	280	234	234	-	-	-
	Murphy Oil USA	Superior	-	-	-	540	430	-	-	-	-	-	-
	Neste Petroleum	Beauport	-	-	-	-	-	-	386	400	-	103	-
	Neste Petroleum	Montréal-Est	-	-	-	-	-	-	361	222	-	103	-
	Northern Transportation	Iqaluit	-	-	-	100	310	107	743	43	-	-	-
	Olco Petroleum Group	Beauport	-	-	-	-	-	-	-	-	-	-	43
	Olco Petroleum Group	Hamilton	-	-	-	410	540	394	317	307	-	-	-
	Olco Petroleum Group	Montréal	-	-	-	-	-	-	-	-	-	20	-
	Olco Petroleum Group	Québec	-	-	-	457	511	299	-	-	-	-	-
	PaceSetter Enterprises	Whitehorse	-	-	-	-	246	220	-	-	-	-	-
	Parkland Refining Limited	Yukon Imports	-	-	-	110	18	18	82	265	-	-	-
	Petro-Canada	Montréal	-	-	-	340	360	-	420	315	230	18	20
	Petro-Canada	Oakville	-	-	-	610	520	490	368	-	-	75	-
	Petro-Canada	Port Moody	-	-	-	210	321	-	-	-	49	114	2
	Pétroles Norcan	Montréal	-	-	-	470	560	273	243	196	100	145	29
	Robbins Feed and Fuel	Allanburg	-	-	-	140	270	-	-	-	-	-	-
	Shell Canada Products	Montréal-Est	392	313	333	312	269	318	280	231	63	55	26
	TransCanada Energy	Calgary	-	-	-	100	500	-	-	-	-	-	-
	Ultramar Limitée	Holyrood	-	-	-	-	-	-	-	-	180	96	22
	Ultramar Limitée	Lévis // St-Romuald	-	-	-	120	300	270	262	140	77	183	19
	Ultramar Limitée	Montréal-Est	-	-	-	-	-	-	-	170	88	77	28
National Average			345	340	360	350	320	310	290	246	138	63	21

**Table A3.1b: Volume-Weighted Annual Sulphur Level in Motor Gasoline for 2005
(Reported by quarters)**

	Name	City	Sulphur Levels (mg/kg)				
			Q1	Q2	Q3	Q4	Annual
Refiner	Chevron Canada Limited	Burnaby	20	18	16	19	18
	Consumers' Co-operative Limited	Regina	19	20	19	22	20
	Husky Oil Operations Ltd.	Prince George	40	30	30	10	27
	Imperial Oil	Dartmouth	19	28	22	32	25
	Imperial Oil	Nanticoke	21	28	33	31	29
	Imperial Oil	Sarnia	6	2	4	4	4
	Imperial Oil	Edmonton	17	23	27	20	22
	Irving Oil Limited	Saint-John	25	38	27	24	29
	North Atlantic Refining Limited	Come-by-Chance	31	9	0	0	30
	Petro-Canada	Edmonton	7	9	11	18	11
	Petro-Canada	Montréal	21	24	17	21	21
	Petro-Canada	Oakville	24	24	15	0	24
	Shell Canada Products	Montréal-Est	16	19	22	18	19
	Shell Canada Products	Sarnia	21	27	37	28	28
	Shell Canada Products	Fort Saskatchewan	14	15	15	3	12
	Suncor Energy Products Incorporated	Sarnia	19	19	29	19	21
	Ultramar Limitée	Montréal-Est	23	27	30	30	27
	Ultramar Limitée	Lévis // St-Romuald	20	11	20	20	18
Blender	Robbins Feed and Fuel	Allanburg	32	34	36	32	33
Importer	Imperial Oil	Burnaby	0	13	10	1	11
	Imperial Oil	Point Tupper	0	0	74	0	74
	Olco Petroleum Group	Beauport	33	33	41	66	43
	Petro-Canada	Port Moody	0	0	2	0	2
	Petro-Canada	Montréal	21	24	17	21	20
	Pétroles Norcan	Montréal	29	35	25	30	29
	Shell Canada Products	Montréal-Est	16	19	22	18	26
	Ultramar Limitée	Holyrood	31	32	3	0	22
	Ultramar Limitée	Montréal-Est	23	27	30	30	28
	Ultramar Limitée	Lévis // St-Romuald	20	11	20	20	19
National Average			19	20	23	22	21

* Only the annual average was reported.

Appendix 3.2a: Volume Weighted Annual Sulphur Levels in Low-Sulphur Diesel 1995 - 2005

			Sulphur Levels (mg/kg)										
	Name	C city	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Refiner	Chevron Canada Limited	Burnaby	350	390	380	400	400	400	389	490	397	355	308
	Consumers' Co-operative Limited	Regina	200	270	250	230	220	190	211	211	189	153	113
	Husky Oil Operations Ltd.	Prince George	140	200	200	210	190	190	188	165	161	183	149
	Imperial Oil	Calgary	-	-	-	-	-	-	-	-	-	320	-
	Imperial Oil	Dartmouth	340	360	390	400	330	370	402	397	400	363	341
	Imperial Oil	Edmonton	290	400	410	380	430	400	420	409	400	405	383
	Imperial Oil	Nanticoke	-	-	160	290	280	310	356	322	286	283	310
	Imperial Oil	Sarnia	-	-	420	290	410	350	349	371	342	292	328
	Irving Oil Limited	Saint-John	400	400	440	450	440	430	433	432	420	391	382
	Newalta	North Vancouver	-	-	-	-	-	-	-	-	-	209	120
	North Atlantic Refining Limited	Come-by-Chance	-	-	490	130	330	260	148	163	188	180	184
	Petro-Canada	Edmonton	190	220	210	230	240	280	283	256	283	240	170
	Petro-Canada	Mississauga	-	-	-	-	-	-	-	-	85	1	-
	Petro-Canada	Montréal	340	420	330	400	400	430	451	422	400	338	327
	Petro-Canada	Oakville	-	-	170	320	300	300	278	222	245	294	350
	Petro-Canada	Port Moody	-	-	-	-	-	-	-	-	-	13	71
	Petro-Canada Lubricants	Mississauga	10	20	20	20	20	20	20	20	-	-	1
	Shell Canada Products	Sarnia	330	340	360	360	370	390	392	400	391	389	377
	Shell Canada Products	Fort Saskatchewan	50	80	100	210	140	150	196	129	129	111	124
	Shell Canada Products	Montréal-Est	390	370	210	280	360	350	378	344	365	327	255
Suncor Energy Incorporated	Fort McMurray	70	90	140	160	200	250	225	225	225	204	225	
Suncor Energy Products Incorporated	Sarnia	340	300	370	460	450	440	437	425	419	399	410	
Ultramar Limitée	Lévis // St-Romuald	450	380	400	410	430	420	420	424	412	418	379	
Blender	Robbins Feed and Fuel	Allanburg	-	-	-	-	-	410	-	-	-	-	-
Importer	BP West Coast Products, LLC	Blaine	-	-	-	380	380	360	339	400	-	-	-
	Canadian Pacific Railway	Calgary	-	-	-	-	-	-	-	-	-	-	470
	Coco Paving Inc.	Windsor	-	-	-	-	-	-	-	-	-	-	-
	Consumers' Co-operative Limited	Regina	-	-	-	-	-	-	-	-	-	163	112
	Daigle Oil Limited	Edmundston	-	-	-	-	-	500	500	-	160	-	-
	Delta Western Fuel (Totem Oil)	Whitehorse	-	-	-	160	400	430	-	-	-	-	-
	Husky Oil Operations Ltd.	Prince George	-	-	-	380	-	-	-	-	-	-	-
	Imperial Oil	Burnaby	-	-	-	-	-	-	-	-	424	345	341
	Imperial Oil	Burnaby	-	-	-	230	-	360	345	-	-	-	-
	Mackenzie Petroleum Limited	Dawson City	-	-	-	300	400	450	400	398	385	207	310
	Marine Petrobulk Limited.	North Vancouver	-	-	-	-	-	-	-	200	272	300	-
	Murphy Oil USA	Superior	-	-	-	270	270	-	-	-	-	-	-
	Northern Transportation	Iqaluit	-	-	-	20	210	270	271	255	-	-	-
	Olco Petroleum Group	Beauport	-	-	-	400	310	-	-	-	-	-	-
	Olco Petroleum Group	Montréal	-	-	-	-	310	-	-	-	-	-	-
	Parkland Refining Limited	Yukon Imports	-	-	-	400	500	480	500	448	290	378	450
	Petro-Canada	Montréal	-	-	-	390	400	400	473	500	-	333	-
	Petro-Canada	Oakville	-	-	-	310	-	-	-	-	-	-	-
	Petro-Canada	Port Moody	-	-	-	-	-	360	251	-	375	348	267
	Pétroles Norcan	Montréal	-	-	-	450	450	-	-	-	-	462	-
	Robbins Feed and Fuel	Allanburg	-	-	-	-	-	-	289	-	-	-	-
	Shell Canada Products	Burnaby	-	-	-	-	-	-	-	-	-	379	388
	Shell Canada Products	Montréal-Est	-	-	-	-	-	-	-	-	-	365	-
	Suncor Energy Products Incorporated	Sarnia	-	-	-	-	-	-	-	-	-	410	430
	Sunoco	Sarnia	-	-	-	-	-	-	430	-	-	-	-
	Ultramar Limitée	Holyrood	-	-	-	-	-	-	-	-	400	258	237
Ultramar Limitée	Lévis // St-Romuald	-	-	-	410	430	410	412	-	-	-	365	
Ultramar Limitée	Montréal-Est	-	-	-	-	-	-	-	440	-	254	242	
United Refining Company	Warren	-	-	-	-	-	-	282	286	296	-	-	
National Average			210	260	270	310	320	330	340	324	317	295	268

**Table A3.2b: Volume-Weighted Annual Sulphur Level in Low-Sulphur Diesel for 2005
(Reported by quarters)**

	Name	City	Sulphur Levels (mg/kg)				
			Q1	Q2	Q3	Q4	Annual
Refiner	Chevron Canada Limited	Burnaby	340	370	300	200	308
	Consumers' Co-operative Limited	Regina	124	112	98	119	113
	Husky Oil Operations Ltd.	Prince George	60	330	190	50	149
	Imperial Oil	Dartmouth	300	330	360	360	341
	Imperial Oil	Nanticoke	280	330	320	310	310
	Imperial Oil	Sarnia	280	350	336	346	328
	Imperial Oil	Edmonton	422	394	320	393	383
	Irving Oil Limited	Saint-John	399	420	0	329	382
	Newalta	North Vancouver	70	120	180	110	120
	North Atlantic Refining Limited	Come-by-Chance	50	30	380	150	184
	Petro-Canada	Port Moody	86	267	10	65	71
	Petro-Canada	Edmonton	0	242	249	168	170
	Petro-Canada	Montréal	254	351	375	322	327
	Petro-Canada	Oakville	344	391	0	0	350
	Petro-Canada Lubricants	Mississauga	1	1	1	1	1
	Shell Canada Products	Montréal-Est	300	346	241	155	255
	Shell Canada Products	Sarnia	395	366	406	336	377
	Shell Canada Products	Fort Saskatchewan	94	148	179	84	124
	Suncor Energy Incorporated	Fort McMurray	214	260	244	214	225
	Suncor Energy Products Incorporated	Sarnia	390	390	430	420	410
Ultramar Limitée	Lévis // St-Romuald	380	380	390	365	379	
Importer	Canadian Pacific Railway	Calgary	470	470	0	0	470
	Consumers' Co-operative Limited	Regina	124	112	98	119	112
	Imperial Oil	Burnaby	214	360	351	0	341
	Mackenzie Petroleum Limited	Dawson City	150	440	405	400	310
	Parkland Refining Limited	Yukon Imports	0	0	450	450	450
	Petro-Canada	Port Moody	86	267	10	65	267
	Shell Canada Products	Burnaby	388	0	0	0	388
	Suncor Energy Products Incorporated	Sarnia	390	390	430	420	430
	Ultramar Limitée	Holyrood	0	0	0	237	237
	Ultramar Limitée	Montréal-Est	210	0	0	304	242
Ultramar Limitée	Lévis // St-Romuald	380	380	390	365	365	
National Average			235	300	292	255	268

* Only the annual average was reported.

Table A3.3a: Volume-Weighted Annual Sulphur Level in Regular Diesel 1995-2005

			Sulphur Levels (mg/kg)										
	Name	City	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Refinery / Terminal	Chevron Canada Limited	Burnaby	1,680	2,670	4,140	3,750	4,050	3,110	3,290	3,648	3,518	1,885	3,351
	Husky Oil Operations Ltd.	Prince George	570	580	-	-	-	-	-	-	-	-	-
	Imperial Oil	Dartmouth	2,010	1,460	1,840	890	510	740	989	656	944	887	965
	Imperial Oil	Edmonton	1,820	2,100	1,980	2,100	2,140	2,170	2,495	2,253	2,219	2,154	2,005
	Imperial Oil	Nanticoke	3,480	3,880	4,300	-	-	-	-	-	-	-	840
	Imperial Oil	Regina	-	-	-	-	-	-	-	-	-	610	-
	Imperial Oil	Sarnia	660	690	-	-	-	1,430	1,297	1,154	-	1,067	913
	Imperial Oil	Winnipeg	-	-	-	-	-	-	-	-	-	2,020	-
	Irving Oil Limited	Saint-John	1,820	1,840	1,750	2,150	1,700	1,690	-	-	-	-	-
	North Atlantic Refining Limited	Come-by-Chance	2,320	1,270	1,100	4,220	-	1,100	485	-	1,273	-	-
	Parkland Refining Limited	Bowden	5,650	5,680	4,620	4,730	3,880	4,820	3,781	-	-	-	-
	Petro-Canada	Edmonton	-	-	-	-	-	-	-	-	513	477	399
	Petro-Canada	Montréal	2,910	3,720	3,540	2,430	5,330	3,510	3,071	2,044	1,600	2,000	2,400
	Petro-Canada	Oakville	3,570	3,500	3,810	3,720	3,160	2,990	2,839	3,216	3,026	3,107	1,991
	Shell Canada Products	Sarnia	4,050	4,040	4,200	4,090	3,720	3,780	3,676	3,658	4,390	4,313	4,165
	Shell Canada Products	Fort Saskatchewan	-	-	270	-	480	470	-	-	441	310	-
	Shell Canada Products	Montréal-Est	2,060	2,230	1,900	3,020	2,470	2,110	2,431	2,050	2,153	2,847	2,751
Suncor Energy Products Incorporated	Sarnia	1,290	1,620	2,370	2,650	2,010	2,300	2,291	1,958	1,678	1,404	1,794	
Ultramar Limitée	Lévis // St-Romuald	800	760	860	-	-	-	-	-	-	-	-	
Importer	Coco Paving Inc.	Windsor	-	-	-	-	-	-	-	-	-	500	500
	Daigle Oil Limited	Edmundston	-	-	-	-	-	1,750	-	-	-	-	-
	Imperial Oil	Burnaby	-	-	-	-	-	-	-	-	-	-	1,590
	Mackenzie Petroleum Limited	Dawson City	-	-	-	4,730	3,730	4,130	3,592	4,100	2,967	1,905	2,190
	Marine Petrobulk Limited.	North Vancouver	-	-	-	-	-	-	500	-	-	-	-
	Murphy Oil USA	Superior	-	-	-	2,900	820	-	-	-	-	-	-
	North 60 Petroleum Limited	Whitehorse	-	-	-	-	-	2,710	-	-	-	-	-
	Northern Transportation	Iqaluit	-	-	-	800	-	1,840	-	-	-	-	-
	Parkland Refining Limited	Yukon Imports	-	-	-	4,730	3,500	4,780	3,621	4,074	2,827	2,294	1,875
	Petro-Canada	Oakville	-	-	-	3,700	2,510	3,030	2,812	-	-	-	-
	Petro-Canada	Port Moody	-	-	-	-	490	-	-	-	-	-	-
	Ultramar Limitée	Holyrood	-	-	-	-	-	-	-	-	-	-	2,690
National Average			2,150	2,360	2,580	2,990	2,300	2,170	2,480	2,467	2,469	2,180	2,177

**Table A3.3b: Volume-Weighted Annual Sulphur Level in Regular Diesel for 2005
(Reported by quarters)**

	Name	City	Sulphur Levels (mg/kg)				
			Q1	Q2	Q3	Q4	Annual
Refiner	Chevron Canada Limited	Burnaby	3,300	3,240	3,800	3,090	3,351
	Imperial Oil	Dartmouth	720	970	840	1,400	965
	Imperial Oil	Nanticoke	0	0	0	840	840
	Imperial Oil	Sarnia	770	960	890	880	913
	Imperial Oil	Edmonton	1,438	3,011	2,056	1,533	2,005
	Petro-Canada	Edmonton	340	462	0	413	399
	Petro-Canada	Montréal	0	0	2,400	0	2,400
	Petro-Canada	Oakville	0	1,991	0	0	1,991
	Shell Canada Products	Montréal-Est	1,733	3,526	2,409	2,396	2,751
	Shell Canada Products	Sarnia	3,587	4,771	4,249	3,954	4,165
	Suncor Energy Products Incorporated	Sarnia	1,500	1,330	1,880	2,230	1,794
	Importer	Coco Paving Inc.	Windsor	500	500	500	500
Imperial Oil		Burnaby	0	0	1,590	0	1,590
Mackenzie Petroleum Limited		Dawson City	1,008	2,930	2,909	897	2,190
Parkland Refining Limited		Yukon Imports	0	2,170	2,170	1,390	1,875
Ultramar Limitée		Holyrood	2,690	0	0	0	2,690
National Average			1,661	2,803	2,389	1,874	2,177

* Only the annual average was reported.

Table A3.4a: Volume-Weighted Annual Sulphur Level in Light Fuel Oil 1995-2005

			Sulphur Levels (mg/kg)										
Name	City	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	
Refiner	Husky Oil Operations Ltd.	Prince George	-	-	514	599	590	600	599	703	403	274	150
	Imperial Oil	Dartmouth	2,125	2,004	1,928	1,360	940	1,230	1,168	1,037	1,030	1,094	1,105
	Imperial Oil	Nanticoke	2,950	3,189	3,327	1,791	2,000	1,950	1,269	-	2,770	-	-
	Imperial Oil	Sarnia	1,668	1,803	1,417	2,260	1,830	1,690	2,277	2,047	1,414	2,279	1,991
	Irving Oil Limited	Saint-John	-	-	1,731	2,080	1,770	1,660	1,630	1,553	1,304	1,740	1,489
	North Atlantic Refining Limited	Come-by-Chance	-	-	-	-	-	-	-	1,282	860	1,176	1,216
	NOVA Chemicals Canada Limited	Corunna	1,520	1,450	1,550	1,850	1,770	1,450	1,449	1,252	1,117	1,063	887
	Petro-Canada	Montréal	2,577	3,591	2,753	3,336	3,360	3,470	3,129	2,509	2,400	2,298	1,883
	Petro-Canada	Oakville	3,642	4,069	3,663	4,253	4,120	3,650	3,368	3,819	3,710	3,433	2,380
	Shell Canada Products	Sarnia	3,000	-	-	-	-	-	-	-	-	-	-
	Shell Canada Products	Montréal-Est	2,357	2,256	2,784	2,837	2,720	2,770	2,895	2,291	2,468	2,814	2,693
	Suncor Energy Products Incorporated	Sarnia	1,591	1,758	2,144	2,578	2,190	2,960	1,810	2,376	1,654	1,500	1,827
	Ultramar Limitée	Lévis // St-Romuald	1,120	1,281	1,355	2,231	1,810	1,630	1,539	1,215	1,074	1,086	-
Importer	Daigle Oil Limited	Edmundston	-	-	-	-	-	3,000	3,000	3,000	500	-	-
	North 60 Petroleum Limited	Whitehorse	-	-	-	1,000	1,000	1,000	2,700	-	-	-	-
	Olco Petroleum Group	Beauport	-	-	-	-	2,300	-	-	-	-	-	-
	Olco Petroleum Group	Montréal	-	-	-	-	2,300	-	-	-	-	-	-
	Petro-Canada	Oakville	-	-	-	3,880	3,880	-	3,440	3,600	-	-	-
	Pétroles Norcan	Montréal-Est	-	-	-	-	-	-	-	-	2,740	-	-
	Port Colborne Quarries Limited	Port Colborne	-	-	-	-	-	-	-	-	2,231	1,274	1,254
	Statia Terminals Canada	Point Tupper	-	-	-	-	-	-	1,020	-	-	-	-
	Ultramar Limitée	Lévis // St-Romuald	-	-	-	-	-	-	1,643	-	-	-	-
National Average		1,980	2,150	2,000	2,270	2,030	2,030	1,890	1,763	1,543	1,673	1,594	

Table A3.4b: Volume-Weighted Annual Sulphur Level in Light Fuel Oil for 2005

(Reported by quarters)

	Name	City	Sulphur Levels (mg/kg)				
			Q1	Q2	Q3	Q4	Annual
Refiner	Husky Oil Operations Ltd.	Prince George	60	280	210	60	150
	Imperial Oil	Dartmouth	880	1,260	860	1,480	1,105
	Imperial Oil	Sarnia	1,980	1,830	1,410	2,680	1,991
	Irving Oil Limited	Saint-John	2,147	2,299	401	1,919	1,489
	North Atlantic Refining Limited	Come-by-Chance	1,660	1,020	664	1,380	1,216
	NOVA Chemicals Canada Limited	Corunna	847	910	930	849	887
	Petro-Canada	Montréal	1,700	1,700	1,800	2,200	1,883
	Petro-Canada	Oakville	2,428	1,991	0	0	2,380
	Shell Canada Products	Montréal-Est	2,700	3,300	2,600	2,400	2,693
	Suncor Energy Products Incorporated	Sarnia	1,380	1,370	2,000	2,270	1,827
Importer	Port Colborne Quarries Limited	Port Colborne	1,220	1,080	1,330	1,440	1,254
National Average			1,699	1,635	990	1,864	1,594

* Only the annual average was reported.

Table A3.5a: Volume-Weighted Annual Sulphur Level in Heavy Fuel Oil 1995-2005

			Sulphur Levels (mg/kg)										
	Name	City	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Refiner	Chevron Canada Ltd.	Burnaby	14,663	17,832	15,153	15,107	17,880	-	-	-	-	-	-
	Consumers' Co-operative Limited	Regina	8,313	12,315	11,207	8,986	8,870	10,640	7,032	9,122	8,742	5,531	6,244
	Husky Oil Operations Ltd.	Prince George	26,300	16,636	13,800	19,549	20,340	17,200	14,818	16,976	21,185	23,878	23,577
	Imperial Oil	Dartmouth	14,698	13,590	12,664	15,820	13,540	14,130	14,959	12,553	13,778	14,836	13,124
	Imperial Oil	Edmonton	15,302	15,080	15,493	13,697	12,660	12,930	13,864	13,598	14,378	14,014	15,025
	Imperial Oil	Nanticoke	23,022	23,325	25,815	27,319	22,780	17,030	14,610	12,613	11,294	17,208	16,033
	Imperial Oil	Sarnia	21,970	20,153	21,840	22,530	19,900	17,980	19,465	14,922	17,846	19,000	17,860
	Irving Oil Limited	Saint-John	20,850	18,612	18,396	18,409	17,800	16,270	17,454	15,917	16,781	13,471	17,965
	Newalta	North Vancouver	-	-	-	-	-	-	-	-	-	6,444	6,038
	North Atlantic Refining Limited	Come-by-Chance	17,876	22,302	28,323	26,460	28,070	28,410	26,267	-	24,368	21,500	-
	NOVA Chemicals Canada Limited	Corunna	11,840	11,990	13,520	14,690	13,870	11,750	11,751	12,411	11,584	11,990	10,872
	Petro-Canada	Edmonton	23,009	26,568	25,890	23,736	22,160	24,500	22,128	21,219	21,839	15,821	-
	Petro-Canada	Montréal	20,644	22,130	21,072	19,730	15,450	18,810	17,034	16,348	15,100	12,458	11,558
	Petro-Canada	Oakville	14,702	15,029	15,848	16,099	14,270	14,240	13,425	14,540	12,070	13,045	10,761
	Shell Canada Products	Sarnia	25,835	27,398	28,326	26,485	25,130	25,540	25,736	24,339	24,335	22,829	23,130
	Shell Canada Products	Montréal-Est	17,723	19,447	18,230	17,679	15,960	14,210	15,828	12,890	12,782	14,712	15,409
	Suncor Energy Products Incorporated	Sarnia	17,317	18,351	20,169	20,539	17,220	20,240	18,239	19,480	18,561	17,741	20,161
	Ultramar Limitée	Lévis // St-Romuald	8,324	10,070	11,361	11,440	11,100	10,990	10,165	9,790	9,626	8,666	9,155
	Importer	Cervini Farms	Leamington	-	-	-	-	-	-	-	-	-	15,000
Companie Miniere de Quebec Cartier		Port-Cartier	-	-	-	-	-	-	-	-	-	15,944	-
Compaq Papiers		Stadacona	-	-	-	-	-	-	-	-	19,259	-	-
Emera Fuels Incorporated		Dartmouth	-	-	-	-	-	-	-	-	27,200	-	-
Great Lakes Greenhouses Inc		Leamington	-	-	-	-	-	-	-	-	-	15,060	15,932
Kildair Services Ltée		Tracy	-	-	-	4,150	8,290	18,080	8,006	15,000	8,355	9,230	4,751
Marine Petrobulk Limited.		North Vancouver	-	-	-	-	-	17,920	24,000	16,390	18,406	18,796	18,500
Murphy Oil USA		Superior	-	-	-	45,710	18,230	-	-	-	-	-	-
New Brunswick Power Corporation		Fredericton	-	-	-	27,360	27,820	27,800	27,269	25,194	25,541	24,550	27,206
Newalta		North Vancouver	-	-	-	-	-	-	-	-	-	-	4,305
Newfoundland & Labrador Hydro		St. John's	-	-	-	19,960	19,940	20,970	20,600	20,186	20,604	20,941	19,424
Nexfor Fraser Papers Incorporated		Edmundston	-	-	-	-	4,280	3,980	4,214	4,379	4,634	4,656	4,613
Norske Canada		Campbell River	-	-	-	-	-	-	10,237	9,400	-	9,161	7,393
Norske Canada		Crofton	-	-	-	-	-	-	9,871	-	-	9,835	6,599
North 60 Petroleum Limited		Whitehorse	-	-	-	6,530	3,440	2,430	4,313	4,288	4,250	3,830	-
North Atlantic Refining Limited		Come-by-Chance	-	-	-	-	-	-	-	25,491	20,230	19,394	18,911
Nova Scotia Power		Halifax	-	-	-	27,030	25,990	26,810	28,102	19,728	17,868	20,120	19,513
Ontario Limited		Leamington	-	-	-	-	-	-	-	-	-	-	14,855
Pope and Talbot Limited		Nanaimo	-	-	-	-	-	10,600	10,216	10,749	9,646	10,036	9,445
Stadacona Inc.		Québec	-	-	-	-	-	-	-	-	-	19,300	-
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	13,822	12,873	-
Western Pulp		Squamish	-	-	-	-	-	-	11,000	-	-	-	-
National Average			16,761	17,300	17,250	17,220	17,710	17,400	17,280	15,366	15,347	14,612	16,444

**Table A3.5b: Volume-Weighted Annual Sulphur Level in Heavy Fuel Oil for 2005
(Reported by quarters)**

	Name	City	Sulphur Levels (mg/kg)				
			Q1	Q2	Q3	Q4	Annual
Refiner	Consumers' Co-operative Limited	Regina	4,081	8,315	7,719	5,630	6,244
	Husky Oil Operations Ltd.	Prince George	23,004	24,184	23,449	23,632	23,577
	Imperial Oil	Dartmouth	12,493	14,115	11,104	14,079	13,124
	Imperial Oil	Nanticoke	16,600	16,110	14,990	16,300	16,033
	Imperial Oil	Sarnia	0	16,280	18,430	20,710	17,860
	Imperial Oil	Edmonton	14,057	15,252	14,482	16,311	15,025
	Irving Oil Limited	Saint-John	18,600	18,000	18,200	17,100	17,965
	Newalta	North Vancouver	5,168	7,735	4,199	6,982	6,038
	NOVA Chemicals Canada Limited	Corunna	11,995	10,839	9,095	9,830	10,872
	Petro-Canada	Montréal	11,400	10,700	12,800	11,300	11,558
	Petro-Canada	Oakville	10,700	11,200	0	0	10,761
	Shell Canada Products	Montréal-Est	14,875	16,091	14,949	15,816	15,409
	Shell Canada Products	Sarnia	22,912	23,841	22,974	22,880	23,130
	Suncor Energy Products Incorporated	Sarnia	19,130	21,200	19,250	21,270	20,161
	Ultramar Limitée	Lévis // St-Romuald	10,050	9,610	8,980	8,100	9,155
Importer	Ontario Limited	Leamington	15,700	16,600	16,900	8,800	14,855
	Cervini Farms	Leamington	13,500	13,500	13,500	13,500	13,500
	Nexfor Fraser Papers Incorporated	Edmundston	4,750	4,710	4,510	4,420	4,613
	Great Lakes Greenhouses Inc	Leamington	17,600	18,600	15,500	12,000	15,932
	Kildair Services Ltée	Tracy	0	0	3,000	5,300	4,751
	Marine Petrobulk Limited.	North Vancouver	18,500	18,500	18,500	18,500	18,500
	New Brunswick Power Corporation	Fredericton	24,200	28,500	28,200	28,000	27,206
	Newalta	North Vancouver	5,168	7,735	4,199	6,982	4,305
	Newfoundland & Labrador Hydro	St. John's	19,500	0	0	19,300	19,424
	Norske Canada	Campbell River	8,800	10,100	4,100	3,400	7,393
	Norske Canada	Crofton	8,100	8,100	0	5,200	6,599
	North Atlantic Refining Limited	Come-by-Chance	19,000	20,600	17,000	18,600	18,911
	Nova Scotia Power	Halifax	19,900	20,000	17,400	19,600	19,513
	Pope and Talbot Limited	Nanaimo	9,700	0	9,800	9,000	9,445
	National Average			16,743	16,814	16,042	16,125

* Only the annual average was reported.

Table A3.6a: Volume-Weighted Annual Sulphur Level in Aviation Gasoline 2000 - 2005

	Name	City	Sulphur Levels (mg/kg)					
			2000	2001	2002	2003	2004	2005
Refiner	Imperial Oil	Edmonton	-	-	10	10	10	11
	Petro-Canada	Edmonton	-	352	229	206	400	334
	Shell Canada Products	Montréal-Est	-	14	50	10	1	1
Importer	Imperial Oil	Burnaby	-	30	-	-	-	-
	Imperial Oil	Edmonton	-	10	-	-	-	-
National Average			-	51	59	35	59	43

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 2005
(Reported by quarters)

	Name	City	Sulphur Levels (mg/kg)				
			Q1	Q2	Q3	Q4	Annual
Refiner	Imperial Oil	Edmonton	10	12	10	10	11
	Petro-Canada	Edmonton	300	340	352	300	334
	Shell Canada Products	Montréal-Est	1	1	1	1	1
National Average			45	36	47	49	43

Table A3.7a: Volume-Weighted Annual Sulphur Level in Aviation Turbo Fuel 2000 – 2005

			Sulphur Levels (mg/kg)										
Name	City	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	
Refiner	BP West Coast Products, LLC	Blaine	-	-	-	-	-	-	-	-	766	-	
	Chevron Canada Limited	Burnaby	410	447	-	605	1,006	1,129	745	781	741	637	720
	Imperial Oil	Dartmouth	542	447	-	776	522	657	750	1,003	727	881	736
	Imperial Oil	Edmonton	-	436	-	491	483	484	527	536	485	536	531
	Imperial Oil	Nanticoke	-	1,714	-	2,015	1,340	989	823	810	466	939	840
	Imperial Oil	Sarnia	449	86	-	99	76	83	94	100	100	100	64
	Irving Oil Limited	Saint-John	1,657	1,708	-	1,853	1,738	1,719	1,777	2,263	2,263	2,316	2,256
	North Atlantic Refining Limited	Come-by-Chance	-	-	-	2,119	1,787	1,808	2,264	2,097	1,383	1,222	1,769
	Petro-Canada	Edmonton	-	2	-	13	7	-	12	-	6	4	7
	Petro-Canada	Montréal	-	157	-	84	110	1,297	947	914	1,120	938	-
	Petro-Canada	Oakville	-	627	-	731	478	360	326	319	249	267	-
	Shell Canada Products	Sarnia	-	100	-	633	532	377	429	1,217	1,250	1,568	1,205
	Shell Canada Products	Fort Saskatchewan	-	50	-	50	100	100	90	100	100	100	100
	Shell Canada Products	Montréal-Est	449	445	-	291	262	334	285	256	319	574	481
	Suncor Energy Products Incorporated	Sarnia	-	700	-	1,259	1,034	993	1,082	1,570	1,311	1,079	1,231
Ultramar Limitée	Lévis // St-Romuald	-	-	-	267	399	496	371	345	267	259	44	
Importer	Air Canada	Burnaby	-	-	-	-	-	-	-	-	631	322	584
	Air Canada	Hamilton	-	-	-	-	-	-	-	-	438	683	-
	Air Canada	Québec	-	-	-	-	-	-	-	-	1,312	347	1,277
	BP West Coast Products, LLC	Blaine	-	-	-	-	-	534	606	461	599	789	643
	Imperial Oil	Burnaby	-	-	-	193	234	370	110	-	330	240	25
	Mackenzie Petroleum Limited	Dawson City	-	-	-	-	1,000	1,000	900	800	830	658	743
	NOCO Energy Canada Inc.	Toronto	-	-	-	-	-	182	169	240	-	273	-
	North 60 Petroleum Limited	Whitehorse	-	-	-	-	1,000	1,000	-	-	-	724	738
	Petro-Canada	Port Moody	-	-	-	174	234	316	5	10	133	143	393
	Pétroles Norcan	Montréal-Est	-	447	-	-	203	-	-	-	99	-	-
	Shell Canada Products	Burnaby	-	-	-	-	-	-	-	-	-	100	337
	Shell Canada Products	Montréal-Est	-	-	-	-	-	-	-	-	-	458	316
	Ultramar Limitée	Holyrood	-	-	-	-	-	-	-	-	360	279	-
	Ultramar Limitée	Lévis // St-Romuald	-	-	-	-	-	-	-	-	-	240	-
National Average			-	-	-	-	-	-	-	775	-	426	654

Table A3.7b: Volume-Weighted Annual Sulphur Level in Aviation Turbo Fuel for 2005

(Reported by quarters)

	Name	City	Sulphur Levels (mg/kg)				
			Q1	Q2	Q3	Q4	Annual
Refiner	Chevron Canada Limited	Burnaby	720	710	740	710	720
	Imperial Oil	Dartmouth	1,020	580	580	820	736
	Imperial Oil	Nanticoke	930	850	770	790	840
	Imperial Oil	Sarnia	100	100	20	30	64
	Imperial Oil	Edmonton	559	518	489	573	531
	Irving Oil Limited	Saint-John	2,303	2,362	2,164	2,220	2,256
	North Atlantic Refining Limited	Come-by-Chance	1,830	1,980	990	2,000	1,769
	Petro-Canada	Edmonton	13	6	4	9	7
	Shell Canada Products	Montréal-Est	400	400	600	200	481
	Shell Canada Products	Sarnia	1,500	1,400	900	1,100	1,205
	Shell Canada Products	Fort Saskatchewan	100	100	100	100	100
	Suncor Energy Products Incorporated	Sarnia	1,020	1,330	1,320	1,260	1,231
	Ultramar Limitée	Lévis // St-Romuald	0	20	60	120	44
Importer	Air Canada	Québec	1,047	1,377	1,538	1,102	1,277
	Air Canada	Burnaby	524	568	778	634	584
	BP West Coast Products, LLC	Blaine	540	690	770	560	643
	Imperial Oil	Burnaby	81	0	0	2	25
	Mackenzie Petroleum Limited	Dawson City	738	759	691	782	743
	North 60 Petroleum Limited	Whitehorse	738	0	0	0	738
	Petro-Canada	Port Moody	811	0	127	315	393
	Shell Canada Products	Montréal-Est	400	400	600	200	316
	Shell Canada Products	Burnaby	200	1,100	0	0	337
National Average			601	642	692	689	654

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 (% 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)	Diesel 0.05 (on-road)
	Sulphur in Diesel Fuel Regs (start 2003)	2002	Diesel 0.05 (on-road) 0.05 (2007 - off-road, rail, marine) 0.0015 (2006 – on-road) 0.0015 (2010 – off-road) 0.0015 (2012 – rail, marine)
	Sulphur in Gasoline Regulation	1999	Gasoline 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)	Fuel Oil 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	Fuel Oil 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)	Gasoline: Grades 1, 2, 3, 4= 0.15% Diesel (Regular): <ul style="list-style-type: none"> - Type AA= 0.2% - Types A, B, C, D, E= 0.5% Diesel (Low-sulphur content): <ul style="list-style-type: none"> - Type AA, A, B, C, D, E= 0.05% Fuel Oil: <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	Fuel Oil Light Oil (LFO)= 0.5% Intermediate Oil= 1.0% Heavy Oil (HFO)= 2.0%
	By-Law 90, Montreal Urban Community	1987	Fuel Oil 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)	<u>Fuel Oil</u> 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)	<u>Fuel Oil</u> 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.	<u>Gasoline</u> 0.015 ² 0.020 ²
Nova Scotia	<i>Environment Act</i> Air Quality Regulations.	March 2005	<u>Fuel Oil</u> HFO= 2.2% by mass and 2.0% by mass on annual average basis

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 2005 Liquid Fuels Report with the Limits Set Forth by the Canadian General Standards Board and the Provincial Regulations

Appendix 6

Comparison of 2005 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	0.000	0.065	0.236	0.30 - Jet A 0.40 - Jet B
Motor Gasoline	0.000	0.002	0.007	0.008 - Unleaded
Aviation Fuel	0.000	0.004	0.035	0.05
Kerosene/Stove Oil	0.000	0.044	0.470	0.04 - Type No. 1 -K 0.30 - Type No. 2 -K
Low Sulphur Diesel Fuel	0.000	0.027	0.047	0.05 - Automotive
Diesel Fuel	0.034	0.218	0.477	0.30 - Type A 0.50 - Type B
Light Fuel Oil	0.006	0.159	0.330	0.30 - Type No. 0 0.50 - Type No. 1 0.50 - Type No. 2
Heavy Fuel Oil	0.300	1.644	2.850	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	1.965	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	1.074	Quebec	2.0 - All types 1.25 to 1.4 - HFO Type No.6 (Montreal)
Ontario	1.757	Ontario	1.0 - Boilers 1.5 - All Types (Toronto)
West	1.558	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 <i>Sulphur and Gasoline Regulations</i>													
Company	Locations	Type	Registration No.	No Election	1 Year	2½ Year	Averaging Type Used	Estimate of Volume weighted average concentration of Sulphur (cumulative)			Estimate of Volume weighted average concentration of Sulphur (straight)		
				(flat limits)	Avg.	Avg.		[Note 1]	End of 2002	End of 2003	End of 2004	End of 2002	End of 2003
Chevron	British Columbia	Refinery	CHV-R1-BC-98			Y	Straight	216	120	110	216	170	100
Husky	Prince George, BC	Refinery	HUS-R1-BC-98			Y	Cumulative	194	150	140	194	175	75
Petro-Can	Edmonton, AB	Refinery	PCL-R4-AB-98			Y	Cumulative	220	170	150	220	175	90
Imperial	Strathcona, AB	Refinery	IOL-R4-ON-98			Y	Cumulative	270	260	145	270	210	30
Shell	Scotford, AB	Refinery	SHL-R3-AB-98			Y	Straight	50	50	50	50	50	50
Co-op	Regina, SK	Refinery	CCR-R1-SK-98			Y	Cumulative	200	160	100	200	87.5	63
Imperial	Sarnia, ON	Refinery	IOL-R2-ON-98			Y	Cumulative	230	150	150	230	182	78
Shell	Sarnia, ON	Refinery	SHL-R2-ON-98			Y	Straight	530	60	50	530	80	30
Sunoco	Sarnia, ON	Refinery	SUN-R1-ON-98			Y	Cumulative	250	160	140	250	194.5	31
Imperial	Nanticoke, ON	Refinery	IOL-R3-ON-98			Y	Cumulative	295	200	150	295	221.5	6
Petro-Can	Oakville, ON	Refinery	PCL-R2-ON-98			Y	Cumulative	220	100	150	220	130	135
Petro-Can	Montreal, QC	Refinery	PCL-R1-QU-98			Y	Cumulative	230	150	140	230	230	30
Shell	Montreal, QC	Refinery	SHL-R1-QU-98			Y	Straight	350	200	150	350	170	30
Ultramar	Quebec, QC	Refinery	ULM-R1-QC-98			Y	Cumulative	200	150	145	200	170	93
Irving	St.John, NB	Refinery	IRV-R1-NB-98		Y		Assumed [2]	200	227	150	200	227	150
Imperial	Dartmouth, NS	Refinery	IOL-R1-NS-98			Y	Cumulative	270	127	150	270	127	30
North Atlantic	Come-by-Chance, NF	Refinery	NAR-R1-NF-98	Y			Assumed [2]	49	49	49	49	49	49
Sunoco	Montreal, QC	Blending	SUN-B6-QU-02			Y	Cumulative	300	222	145	300	183	30
Ultramar	Montreal, QC	Blending	ULM-B1-QU-98			Y	Cumulative	200	160	140	200	140	110
Ultramar	Dartmouth, NF	Blending	ULM-B2-NF-98			Y	Cumulative	200	127	140	200	127	110
Petro-Can	British Columbia	Imports	PCL-I3-BC-98			Y	Cumulative	150	150	150	150	150	150
Petro-Can	Ontario	Imports	PCL-I2-ON-98			Y	Cumulative	Note 3	Note 3	150	Note 3	Note 3	150
Neste	Ontario	Imports	NES-I2-ON-98			Y	Straight	300	200	140	300	150	50
Olco	Ontario	Imports	OLC-I1-QU-98			Y	Straight	300	200	140	300	150	50
Olco	Ontario	Imports	OLC-I2-ON-98			Y	Straight	300	0	0	300	0	0
Sunoco	Ontario	Imports	SUN-I1-ON-98			Y	Cumulative	300	222	145	300	183	30
Petro-Can	Quebec	Imports	PCL-I1-QU-98			Y	Cumulative	Note 3	Note 3	150	Note 3	Note 1	150
Neste	Quebec	Imports	NES-I1-QU-98			Y	Straight	300	0	0	300	0	0
Sunoco	Quebec	Imports	SUN-I2-QU-00			Y	Cumulative	300	222	145	300	183	30

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 the Fuels Division 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 a 30 month volume-weighted election has been made, it is their intention to combine all import batches with their refinery volumes, in that province of import. Therefore, no reported imports in those provinces are expected.

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

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	60	82	44	63
2005	23	17	21	27	21