



Environment
Canada

Environnement
Canada



Sulphur in Liquid Fuels

2006

Canada 



Environment
Canada

Environnement
Canada

Sulphur in Liquid Fuels

2006

Prepared by: **Jeffrey Guthrie**
 Fuels Section
 Oil, Gas and Alternative Energy Division
 Energy and Transportation Directorate
 Environment Canada

and **Safinaz El-Solh**
 Co-op Student
 University of Ottawa

and **Olivia McGuire**
 Co-op Student
 University of Waterloo

and **Crystel Hajjar**
 Co-op Student
 University of Ottawa

January 2008

Canada 

Environment Canada

Sulphur in Liquid Fuels

2006

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 plausibility but are subject to potential errors made at the source.

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

Fuels Section
Oil, Gas, and Alternative Energy Division
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 <i>FUELS INFORMATION REGULATIONS, NO. 1</i>	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	9
2.5 COMPANY-SPECIFIC SULPHUR LEVELS	12
3.0 VOLUMES OF LIQUID FUELS PRODUCED/IMPORTED	13
4.0 VOLUMES OF LIQUID FUELS PRODUCED/IMPORTED AND FUEL SULPHUR CONTENT	14
4.1 NATIONAL AND REGIONAL SUMMARIES	14
 APPENDICES	
Appendix 1	
Web Site References for <i>Fuels Information Regulations, No. 1</i> and Other Fuels Regulations	31
Appendix 2	
Sample Forms for Reporting Sulphur Content under the <i>Fuels Information Regulations, No. 1</i> , <i>Sulphur in Gasoline Regulations</i> , and <i>Sulphur in Diesel Fuel Regulations</i>	33
Appendix 3	
Volume-Weighted Annual Sulphur Levels by Refiner/Importer, 1995–2006	39
Appendix 4	
Canadian General Standards Board Standards for Sulphur Content in Fuels	57
Appendix 5	
Maximum Sulphur Content in Fuels According to Federal and Provincial Regulations and Municipal By-Laws	59
Appendix 6	
Average Sulphur Content in Fuel: Comparison of Levels Reported in 2006 and Limits Set by the Canadian General Standards Board and Provincial Regulations.....	63

List of Graphs

1.1	Sulphur Levels in Gasoline by Region and Nationally, 1995–2006	2
1.2	National and Regional Trends of Sulphur Content in Gasoline, 1999–2006	3
1.3	Sulphur Mass in Liquid Fuels by Region and Nationally, 1996–2006.....	4
4.1	National Liquid Fuel Production/Imports in 2006	15
4.2	Tonnage of Sulphur in Liquid Fuels in 2006.....	16
4.3	Mass of Sulphur in Liquid Fuels Produced/Imported in 2006	20
4.4	Sulphur Mass in Liquid Fuels by Region and Nationally, 1996–2006.....	21
4.5	Average Sulphur Levels in Motor/Aviation Gasoline by Region and Nationally, 1995–2006	22
4.6	Average Sulphur Levels in Motor Gasoline by Refiner/Importer in 2006.....	23
4.7	Average Sulphur Levels in Ultra-Low-Sulphur Diesel Fuel by Refiner/Importer in 2006 ...	24
4.8	Average Sulphur Levels in Low-Sulphur Diesel Fuel by Refiner/Importer in 2006.....	25
4.9	Average Sulphur Levels in High-Sulphur Diesel Fuel by Refiner/Importer in 2006.....	26
4.10	National Trend of Sulphur Content in Aviation Turbo Fuel, 1995–2006	27
4.11	National Trend of Sulphur Content in Motor/Aviation Gasoline, 1995–2006.....	27
4.12	National Trend of Sulphur Content in Kerosene/Stove Oil, 1995–2006.....	28
4.13	National Trend of Sulphur Content in Diesel Fuel (Total Pool), 1995–2006	28
4.14	National Trend of Sulphur Content in Light Fuel Oil, 1995–2006	29
4.15	National Trend of Sulphur Content in Heavy Fuel Oil, 1995–2006.....	29

List of Tables

1.1	Fuel Production/Imports and Sulphur Content: National Summary for 2006.....	5
2.1	Limits on Sulphur in Diesel Fuel and Effective Dates	7
2.2	Refineries, Blenders and Upgraders Reporting under the Respective Regulations.....	10
2.3	Importers Reporting under the Respective Regulations	11
3.1	Volumes of Liquid Fuels Produced/Imported for Sale in Canada	13
4.1	Fuel Production/Imports and Sulphur Content: National Summary for 2006.....	14
4.2A	Summary of Fuel Production/Imports and Sulphur Content for 2006: Atlantic Region	17
4.2B	Summary of Fuel Production/Imports and Sulphur Content for 2006: Quebec Region	17
4.2C	Summary of Fuel Production/Imports and Sulphur Content for 2006: Ontario Region.....	18
4.2D	Summary of Fuel Production/Imports and Sulphur Content for 2006: West Region.....	18
4.2E	Regional and National Volume-Weighted Averages of the Density of Fuels Produced and Imported in 2006.....	19
A3.1.a	Volume-Weighted Annual Sulphur Levels in Motor Gasoline, 1995–2006	40
A3.1.b	Volume-Weighted Quarterly Sulphur Levels in Motor Gasoline in 2006.....	41
A3.2.a	Volume-Weighted Annual Sulphur Levels in Ultra-Low-Sulphur Diesel Fuel, 1995–2006.....	42
A3.2.b	Volume-Weighted Quarterly Sulphur Levels in Ultra-Low-Sulphur Diesel Fuel in 2006.....	43
A3.3.a	Volume-Weighted Annual Sulphur Levels in Low-Sulphur Diesel Fuel, 1995–2006.....	44
A3.3.b	Volume-Weighted Quarterly Sulphur Levels in Low-Sulphur Diesel Fuel in 2006.....	46
A3.4.a	Volume-Weighted Annual Sulphur Levels in High-Sulphur Diesel Fuel, 1995–2006	47
A3.4.b	Volume-Weighted Quarterly Sulphur Levels in High-Sulphur Diesel Fuel in 2006	48
A3.5.a	Volume-Weighted Annual Sulphur Levels in Light Fuel Oil, 1995–2006.....	49
A3.5.b	Volume-Weighted Quarterly Sulphur Levels in Light Fuel Oil in 2006.....	50
A3.6.a	Volume-Weighted Annual Sulphur Levels in Heavy Fuel Oil in 1995-2006	51

A3.6.b Volume-Weighted Quarterly Sulphur Levels in Heavy Fuel Oil in 2006.....	53
A3.7.a Volume-Weighted Annual Sulphur Levels in Aviation Gasoline, 2000–2006	54
A3.7.b Volume-Weighted Quarterly Sulphur Levels in Aviation Gasoline in 2006	54
A3.8.a Volume-Weighted Annual Sulphur Levels in Aviation Turbo (Jet) Fuel, 1995-2006	55
A3.8.b Volume-Weighted Quarterly Sulphur Levels in Aviation Turbo (Jet) Fuel in 2006.....	56

1.0 Executive Summary

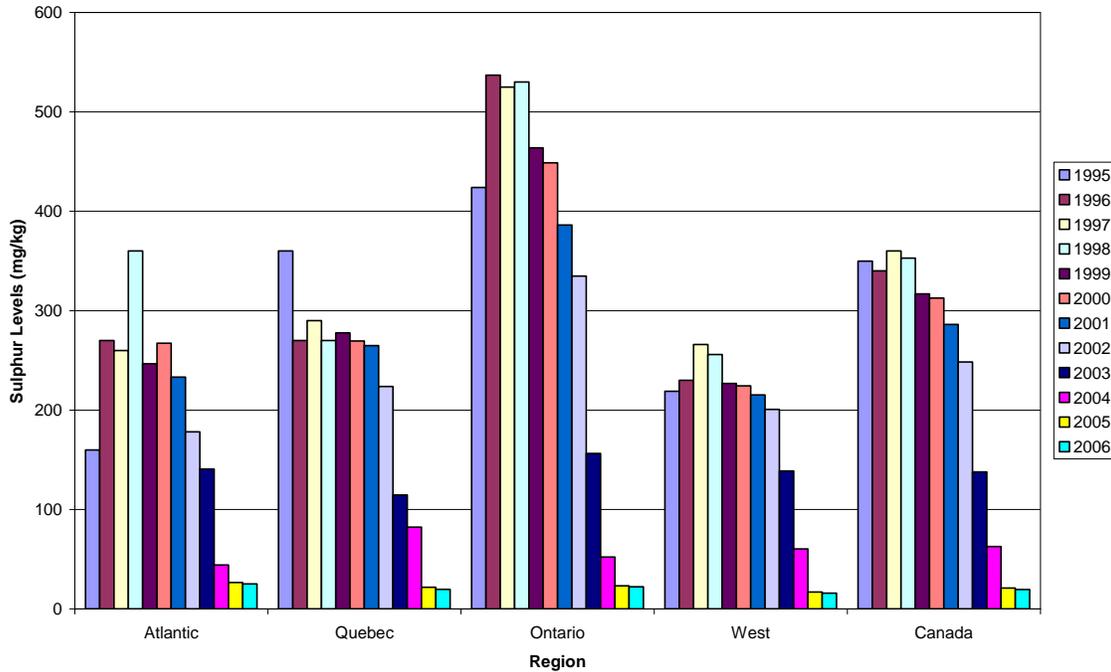
This report summarizes the 2006 data on the sulphur content in liquid fuels originating from crude oils, coal or bituminous sand. The information was provided to Environment Canada by producers and importers of liquid fuels pursuant to the federal *Fuels Information Regulations, No. 1* of the *Canadian Environmental Protection Act, 1999*.

During 2006, there were various developments with respect to federal regulations on sulphur in fuels and other non-regulatory issues:

- The new 15 mg/kg limit for on-road diesel fuel came into effect under the *Sulphur in Diesel Fuel Regulations*. The limits and timing were:
 - 15 mg/kg for production or imports as of June 2006;
 - 22 mg/kg for sales as of September 1, 2006; and
 - 15 mg/kg for sales as of October 15, 2006.

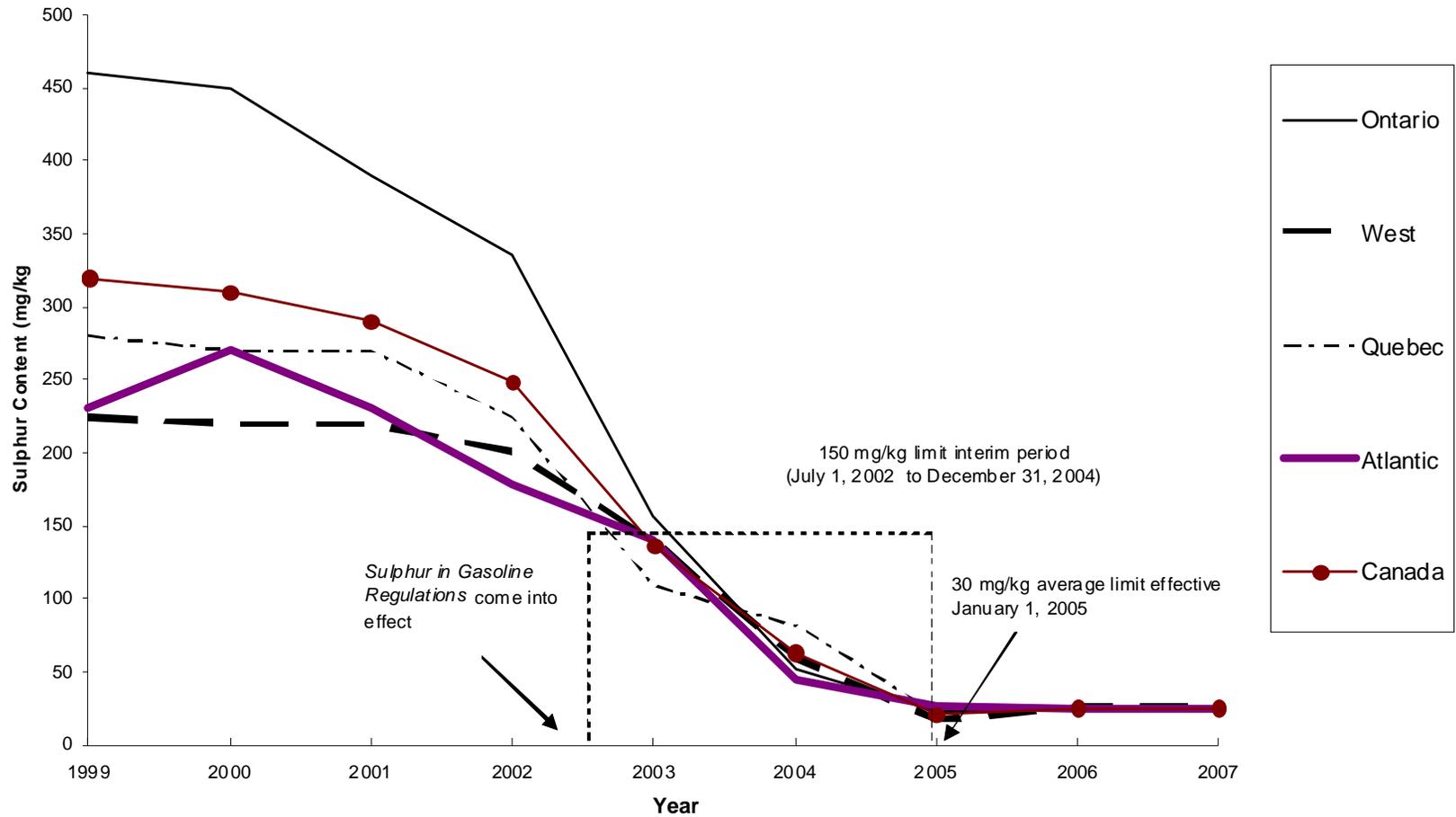
In 2006, the national average sulphur content in gasoline was determined to be 20 mg/kg, slightly less than 2005 levels (21 mg/kg). Graph 1.1 shows the trend for sulphur content in gasoline nationally and by region for the period 1995 to 2006. Note that the term “West Region” used throughout this report is an unofficial designation for Manitoba, Saskatchewan, Alberta, British Columbia, Yukon, Northwest Territories and Nunavut.

Graph 1.1: Sulphur Levels in Gasoline by Region and Nationally, 1995-2006



The lower sulphur levels beginning 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 trends in the levels of sulphur in gasoline from 1999 to 2006.

**Graph 1.2: National and Regional Trends of Sulphur Content in Gasoline
1999–2006**



The reported mass of sulphur content in all liquid fuels nationally decreased by 35% in 2006 from 2005 values, as shown in Graph 1.3. In the Atlantic Region, the reported mass of sulphur in all liquid fuels decreased by 57% for 2006, mainly due to a decrease in the importation of bituminous emulsion product in that region. In Ontario and Quebec and the West Region, the decreases were 8%, 11% and 11% respectively.

Graph 1.3: Sulphur Mass in Liquid Fuels by Region and Nationally, 1996-2006

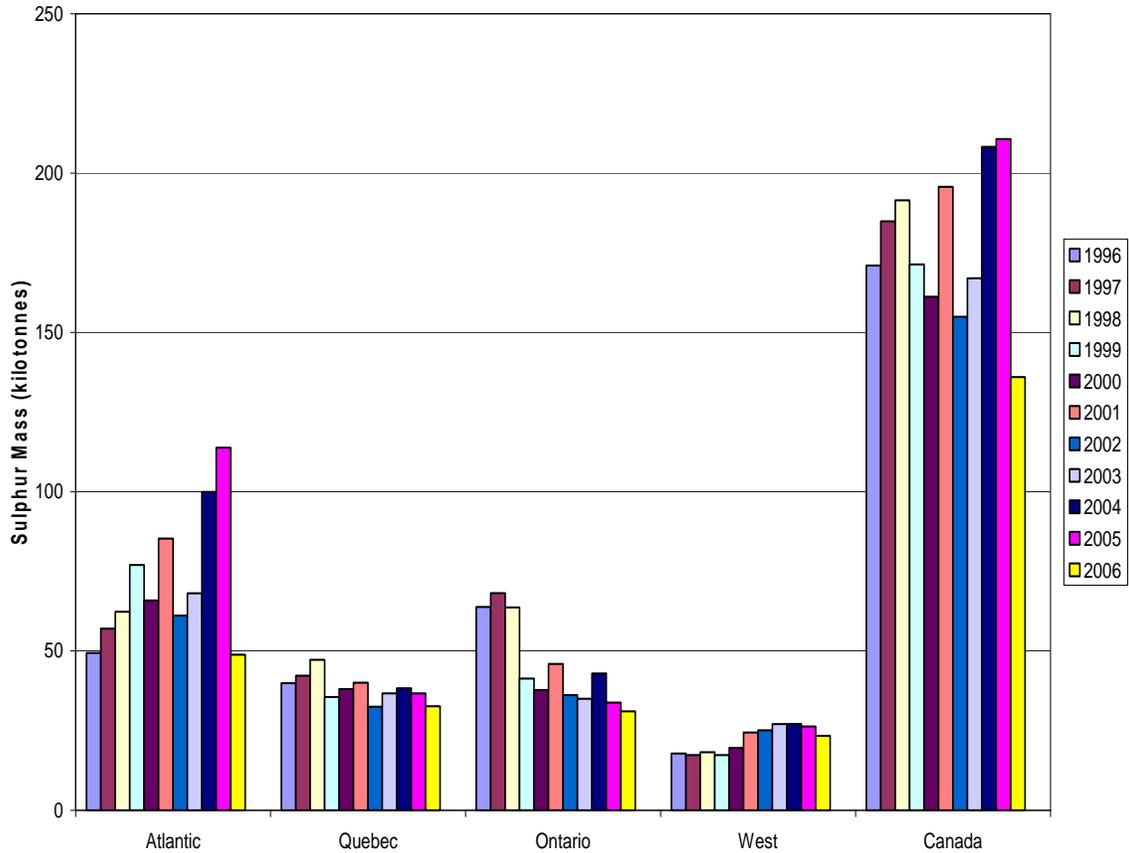


Table 1.1 shows the national summary of data compiled from Form 1, “Report on Sulphur Content,” which petroleum refineries and importing companies are required to submit to Environment Canada under the *Fuels Information Regulations, No. 1*.

The largest reported volume of liquid fuel produced in or imported into Canada was gasoline, which constituted about 46% of all products and accounted for about 0.4% of the sulphur mass in liquid fuels. Heavy fuel oil constituted about 8% by volume of the total liquid fuels and contained about 72% of the total sulphur mass in Canada.

Table 1.1
Fuel Production/Imports and Sulphur Content
National Summary for 2006

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	6 342 543	7.18	2 813	549	2.07
Motor Gasoline	37 999 035	46.31	586	20	0.43
Aviation Gasoline	90 807	0.10	2	32	0.00
Kerosene/Stove Oil	825 720	0.97	169	241	0.12
Ultra-Low-Sulphur Diesel Fuel	15 638 947	17.70	53	4	0.04
Low-Sulphur Diesel Fuel	10 526 829	11.92	1 881	213	1.38
High-Sulphur Diesel Fuel	2 176 917	2.46	4 012	2 156	2.95
Light Fuel Oil	3 272 573	3.72	3 983	1 417	2.93
Heavy Fuel Oil	6 711 126	7.60	98 539	14 651	72.48
Plant Consumption/Other	1 659 197	2.04	23 924	12 893	17.60
TOTAL	88 343 170	100.00	135 962	1 559	100.00

- In the Type of Fuel category, “Plant Consumption” and “Other” were combined for 2006. Fuels reported under these categories included pitch, gasoline-like blendstock, light fuel oil, heavy fuel oil, Orimulsion, intermediate fuel oils (IFO 420, IFO 30-460), diesel and bunker.
- Totals may not add up due to rounding and volumes not included.

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 on liquid fuel composition, particularly regarding sulphur dioxide (SO₂) emissions from combustion. The 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 metres (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 that are to be reported are shown 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 the fuel.

The full 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 *Sulphur in Diesel Fuel Regulations* set maximum limits for sulphur in on-road, off-road, rail (locomotive) and marine (vessel) diesel fuels. The production, import and sales limits and effective dates of the regulations are summarized in Table 2.1. The timing and limits are aligned with those of the U.S.

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

Table 2.1
Limits on Sulphur in Diesel Fuel and Effective Dates

	Sulphur Limit (mg/kg)	On-Road Diesel Fuel	Off-Road Diesel Fuel	Rail and Marine Diesel Fuel
500	Production or Import	Since 1998	June 1, 2007	June 1, 2007
	Sales	Since 1998	October 1, 2007 ²	October 1, 2007 ²
22	Sales	September 1, 2006	N/A	N/A
15	Production or Import	June 1, 2006	June 1, 2010	June 1, 2012
	Sales	October 15, 2006 ¹	October 1, 2010 ³	N/A

N/A: Not applicable.

¹ September 1, 2007, in the Northern Supply Area, which is defined as the area corresponding to the following geographical areas: a) that part of the Yukon that is north of latitude 67° N; b) the Northwest Territories, except those areas within 1 km of the centre line of highways 2 to 7, and that portion of Hwy 1 south of Fort Simpson, and those areas within the municipalities of Yellowknife, Detah, Hay River, Fort Simpson, Rae, Edzo, Entreprise, Fort Resolution, Fort Smith and Fort Liard; c) Nunavut; d) those parts of Manitoba, Ontario and Quebec within 50 km from the coast of Hudson Bay or James Bay; e) that part of Quebec north of latitude 51° N if west of longitude 63.5° W, and north of latitude 50° N if east of longitude 63.5° W; and f) Newfoundland and Labrador, except the island of Newfoundland.

² December 1, 2008, in the Northern Supply Area.

³ December 1, 2011, in the Northern Supply Area.

Note that there is no volume threshold for reporting under the *Sulphur in Diesel Fuel Regulations*. The full text of the *Sulphur in Diesel Fuel Regulations* including amendments, along with the associated regulatory impact analysis statement and reporting forms, are available through Environment Canada's Diesel Fuel Web site:

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, limited the average sulphur content of gasoline to 150 mg/kg over a two-and-a-half year period.

The full text of the *Sulphur in Gasoline Regulations* along with the associated regulatory impact analysis statements and reporting forms are available through Environment Canada's Gasoline Web site:

http://www.ec.gc.ca/cleanair-airpur/Gasoline-WSBD413FE9-1_En.htm

Canadian General Standards Board

The Canadian General Standards Board (CGSB) sets commercial standards for fuels, including some that have been adopted by provincial regulations. The standards for sulphur in fuels vary considerably among 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* in 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 a view to matching the requirements set by the European Union (i.e. 1% by weight for heavy fuel oil and 0.1% by weight 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 multi-stakeholder workshop in May 2003. Complementary measures such as economic instruments have also been examined. Work undertaken by the National Round Table on the Economy and the Environment (NRTEE) in 2003 involved studying the environmental and economic implications of using fiscal instruments to reduce sulphur levels in light and heavy fuel oil.

http://www.nrtee-trnee.ca/eng/programs/Past-Programs/efr-energy/Case_Studies/HFO-Executive-Summary-E.pdf

More information is available at:

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

Low Sulphur Procurement Guide

In June 2003, Environment Canada and Friends of the Earth jointly produced a *Low Sulphur Fuels Procurement Guide* aimed at encouraging governments and other organizations to take a leadership role in procuring low sulphur fuels, where possible. It provides a checklist of suggested low sulphur fuel procurement practices, contracting recommendations, suggestions for estimating emissions reductions, case studies, and links to key sources of information.

The 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, 2006. 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. The *Sulphur in Diesel Fuel Regulations* also require quarterly reports on the level of sulphur in diesel fuel with sulphur concentrations exceeding 500 mg/kg, between 500 mg/kg and 15 mg/kg and equal

or less than 15 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 2.2 lists the petroleum refineries, blenders, and upgrading plants that reported, under the three regulations, information pertaining to *production* volume and fuel sulphur content for 2006.

**Table 2.2
Refineries, Blenders and Upgraders Reporting under the Respective Regulations**

Company	Location	Prov.	FIR¹	Gasoline²	Diesel³
Biox	Hamilton	Ont.			X
Chevron Canada Limited	Burnaby	B.C.	X	X	X
Consumers' Co-operative Refineries Limited	Regina	Sask.	X	X	X
Husky Oil Operations Ltd.	Prince George	B.C.	X	X	X
Imperial Oil	Dartmouth	N.S.	X	X	X
Imperial Oil	Edmonton	Alta.	X	X	X
Imperial Oil	Nanticoke	Ont.	X	X	X
Imperial Oil	Sarnia	Ont.	X	X	X
Irving Oil Limited	Saint John	N.B.	X	X	X
Milligan Biotech	Foam Lake	Sask.			X
Newalta	North Vancouver	B.C.	X		X
North Atlantic Refining Limited	Come-by-Chance	N.S.	X	X	X
NOVA Chemicals Canada Limited	Corunna	Ont.	X		X
Ocean Nutrition	Mulgrave	N.S.			X
Petro-Canada	Edmonton	Alta.	X	X	X
Petro-Canada	Montréal	Que.	X	X	X
Petro-Canada	Oakville	Ont.	NP		NP
Petro-Canada	Ottawa	Ont.			NP
Petro-Canada	Thunder Bay	Ont.			NP
Petro-Canada	Port Moody	B.C.	X		X
Petro-Canada Lubricants	Mississauga	Ont.	X	NP	X
Rothsay	Sainte-Catherine	Que.			X
Shell Canada Products	Edmonton	Alta.		NP	
Shell Canada Products	Corunna	Ont.	X	X	X
Shell Canada Products	Fort Saskatchewan	Alta.	X	X	X
Shell Canada Products	Montréal-Est	Que.	X	X	X
Suncor Energy Products Incorporated	Fort McMurray	Alta.	X		X
Suncor Energy Products Incorporated	Sarnia	Ont.	X	X	X
Syncrude Canada Ltd.	Fort McMurray	Alta.	X		X
Ultramar Limitée	Lévis/Saint-Romuald	Que.	X	X	X
Ultramar Limitée	Montréal-Est	Que.	X	X	

X = report received; NP = reported no production.

¹ *Fuels Information Regulations, No. 1.*

² *Sulphur in Gasoline Regulations.*

³ *Sulphur in Diesel Fuel Regulations.*

The following petroleum importers reported, under the three regulations, information pertaining to *import* volume and fuel sulphur content for 2006.

Table 2.3
Importers Reporting under the Respective Regulations

Company	Location	Prov./ Terr.	FIR¹	Gasoline²	Diesel³
Air Canada	Westridge	B.C.	X		
Air Canada (Vopak)	Hamilton	Ont.	X		
Air Canada	Beauport	Que.	X		
BP Cherry Point	Vancouver	B.C.	X		
Canada Clean Fuels	Toronto	Ont.			X
Canadian National Railway	Surrey	B.C.			X
Canadian Pacific Railway	Calgary	Alta.	NI		
Cervini Farms	Leamington	Ont.	X		
Chevron Canada Limited	Burnaby	B.C.	X	X	X
Compagnie Minière Québec Cartier	Port Cartier	Que.	X		
Consumers' Co-operative Refineries Limited	Regina	Sask.			X
Daigle Oil	Edmundston	N.B.	X		
Ford Motor Company of Canada	Windsor	Ont.			X
General Motors Canada	Ontario	Ont.		X	X
Great Lakes Greenhouses Inc	Leamington	Ont.	X		
Honda of Canada Mfg.	Queenston	Ont.		X	
Imperial Oil	B.C. Imports	B.C.			X
Imperial Oil	Burnaby	B.C.	X	X	
Imperial Oil	Calgary	B.C.			X
Imperial Oil	Dartmouth	N.S.	X		
Imperial Oil	Halifax	N.S.	X		
Imperial Oil	Nanticoke Refinery	Ont.		X	
Imperial Oil	N.S. Imports	N.S.			X
Imperial Oil	Point Tupper	N.S.	X	X	
Imperial Oil	Québec	Que.	X		X
Imperial Oil	Sarnia	Ont.		X	
Imperial Oil	Sept Isles	Que.	X		
Irving Oil Limited	Saint John	N.B.	X	X	
Kildair Services Ltée	Tracy	Que.	X		
Mackenzie Petroleum Limited	Dawson City	Y.T.	X		X
Marine Petrobulk Limited	North Vancouver	B.C.	X		X
New Brunswick Power Corporation	Fredericton	N.B.	X		
Newfoundland & Labrador Hydro	St. John's	N.L.	X		
Nexfor Fraser Papers Incorporated	Edmundston	N.B.	X		
Catalyst Paper Corporation (Norske Canada)	Campbell River	B.C.	X		
Catalyst Paper Corporation (Norske Canada)	Crofton	B.C.	X		
North Atlantic Refining Limited	Come-by-Chance	N.S.	X		
Northern Transportation Company Limited	Hay River	N.W.T.	X		X
Northland Biodiesel Marketing Inc.	Thunder Bay	Ont.			X
Nova Scotia Power	Halifax	N.S.	X		
Olco Petroleum Group	Beauport	Que.	X	X	
Ontario Limited	Leamington	Ont.	X		
Parkland Refineries Limited	Y.T. Imports	Y.T.	X		X

Petro-Canada	Montréal	Que.	X	X	
Petro-Canada	Port Moody	B.C.	X	X	X
Pétroles Norcan	Montréal-Est	Que.	X	X	X
Pope and Talbot Limited	Nanaimo	B.C.	X		
Port Colborne Quarries Limited	Port Colborne	Ont.	X		
Shell Canada Products	Montréal-Est	Que.	X	X	
Shell Canada Products	Burnaby	B.C.	X		X
Suncor Energy Products Incorporated	Sarnia	Ont.	X	X	X
Sylvite Sales Inc.	Burlington	Ont.			X
Ultramar Limitée	Halifax	N.S.			NI
Ultramar Limitée	Holyrood	N.L.		NI	NI
Ultramar Limitée	Lévis/Saint-Romuald	Que.	X	X	X
Ultramar Limitée	Montréal-Est	Que.	X	X	X
Western Gas and Liquids Company	Ontario Imports	Ont.			X

X = report received; NI = reported no imports.

¹ *Fuels Information Regulations, No. 1.*

² *Sulphur in Gasoline Regulations.*

³ *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 1995 to 2006 for each Canadian refinery and importer.

3.0 Volumes of Liquid Fuels Produced/Imported

In order to verify their accuracy, the reported volumes of produced fuels were compared to Statistics Canada figures for 2006 (see Table 3.1).

With the exception of “Kerosene/Stove Oil,” and “Plant Consumption/Other,” there appears to be reasonable agreement between the two sets of data. This may result from the different approaches used, as noted below.

Table 3.1
Volumes of Liquid Fuels Produced/Imported for Sale in Canada
As Reported to Statistics Canada¹ and Environment Canada for 2006

Type of Fuel	Statistics Canada	Environment Canada
	(m ³)	(m ³)
Aviation Turbo Fuel	6 828 200	6 342 543
Motor/Aviation Gasoline	40 336 700	38 089 842
Kerosene/Stove Oil	263 300	825 720
Ultra-Low-Sulphur Diesel Fuel	0	15 638 947
Low-Sulphur Diesel Fuel	0	10 526 829
Diesel Fuel	26 916 900	2 176 917
Light Fuel Oil	3 972 800	3 272 573
Heavy Fuel Oil	6 906 200	6 711 126
Plant Consumption/Other	5 199 600	1 659 197
TOTAL	90 423 700	88 343 170

Source: Statistics Canada, Catalogue No. 45-004-XIE monthly, January 2007.

¹ Statistics Canada data were compiled for the year 2006.

- According to Statistics Canada, approximately 75–80% of refinery-produced kerosene and stove oil are later transferred to diesel and light fuel oils.
- Statistics Canada does not distinguish between ultra-low-sulphur, low-sulphur and regular sulphur diesel grades in regards to production.
- Volumes reported to Environment Canada mostly reflect production at the various refineries while Statistics Canada considers opening and closing inventories and inter-product transfers.
- 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 pitch, gasoline-like blendstock, light fuel oil, heavy fuel oil, Orimulsion, intermediate fuel oils (IFO 420, IFO 30-460), and diesel. 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.
- Statistics Canada’s “Other Petroleum Products” is defined as all other petroleum products such as wax and candles, unfinished products, etc. The “Other” category under the *Fuels Information Regulations, No. 1* includes bunker.
- Totals may not add up due to rounding and volumes not included.

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 2006:

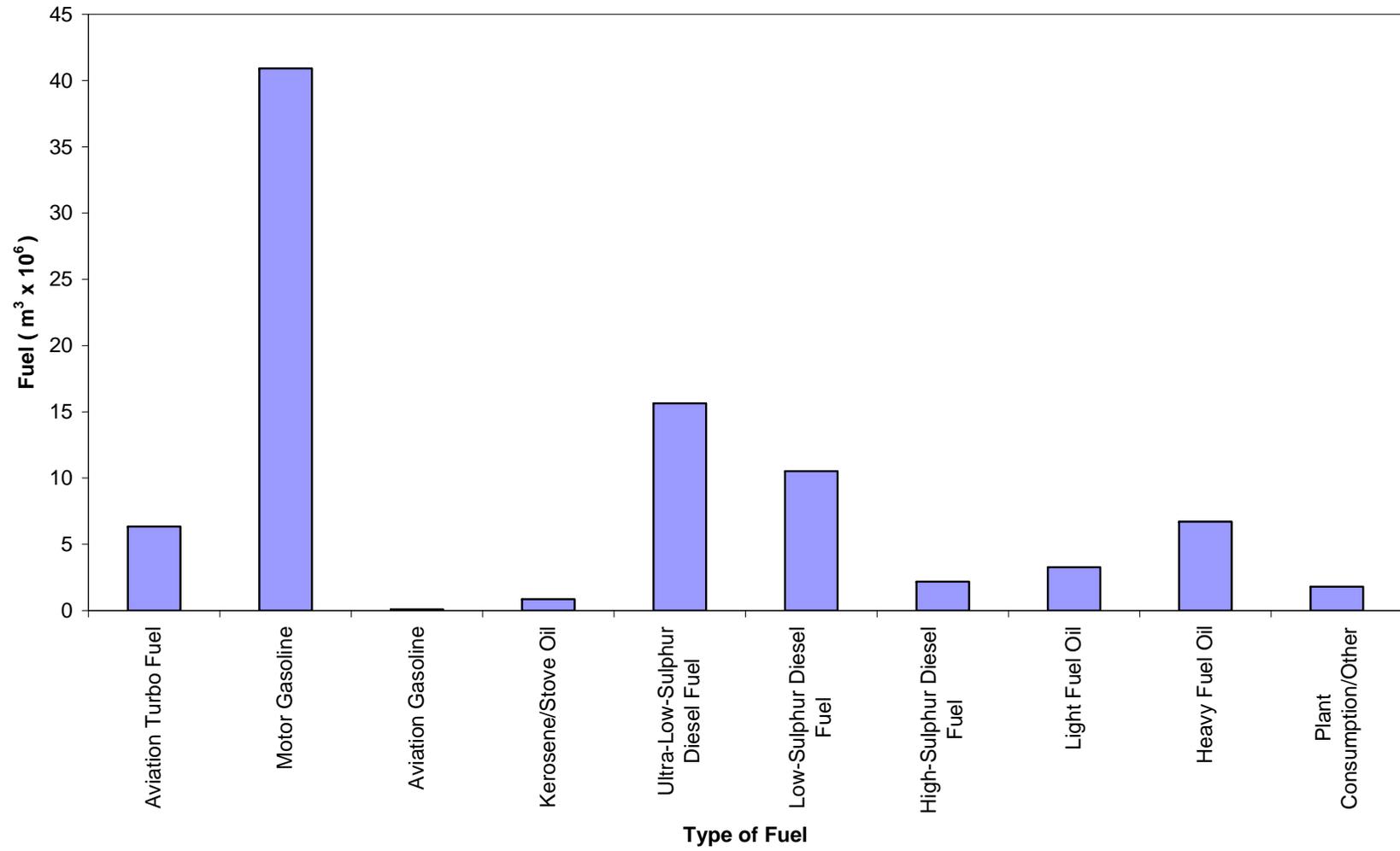
- National Data for Liquid Fuels: Table 4.1, graphs 4.1 and 4.2
- Regional Data for Liquid Fuels: Tables 4.2A to E, graphs 4.3 and 4.4
- Regional Data for Motor/Aviation Gasoline: Graph 4.5
- Refinery Data for Motor Gasoline: Graph 4.6
- Refinery Data for Diesel Fuel: Graphs 4.7, 4.8 and 4.9
- Historical Trends (National): Graphs 4.10 to 4.15

Table 4.1
Fuel Production/Imports and Sulphur Content
National Summary for 2006

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	6 342 543	7.18	2 813	549	2.07
Motor Gasoline	37 999 035	46.31	586	20	0.43
Aviation Gasoline	90 807	0.10	2	32	0.00
Kerosene/Stove Oil	825 720	0.97	169	241	0.12
Ultra-Low-Sulphur Diesel Fuel	15 638 947	17.70	53	4	0.04
Low-Sulphur Diesel Fuel	10 526 829	11.92	1 881	213	1.38
High-Sulphur Diesel Fuel	2 176 917	2.46	4 012	2 156	2.95
Light Fuel Oil	3 272 573	3.72	3 983	1 417	2.93
Heavy Fuel Oil	6 711 126	7.60	98 539	14 651	72.48
Plant Consumption/Other	1 659 197	2.04	23 924	12 893	17.60
TOTAL	88 343 170	100.00	135 962	1 559	100.00

- In the Type of Fuel category, “Plant Consumption” and “Other” were combined for 2006. Fuels reported under these categories included pitch, gasoline-like blendstock, light fuel oil, heavy fuel oil, Orimulsion, intermediate fuel oils (IFO 420, IFO 30-460), diesel and bunker.
- Totals may not add up due to rounding and volumes not included.

Graph 4.1: National Liquid Fuel Production/Imports in 2006



Graph 4.2: Tonnage of Sulphur in Liquid Fuels in 2006

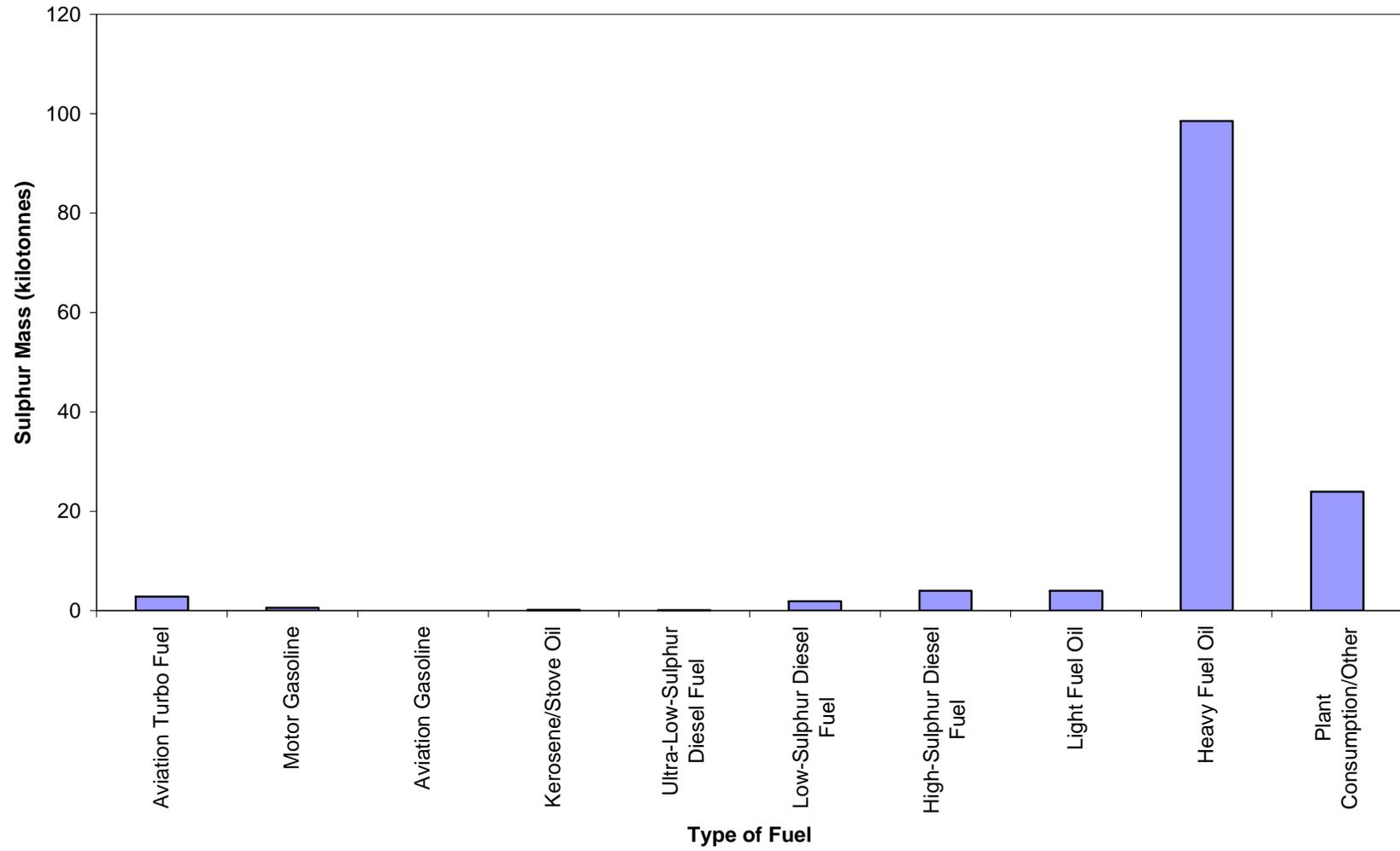


Table 4.2A
Summary of Fuel Production/Imports and Sulphur Content for 2006

Atlantic Region				
Type of Fuel	Fuel Production/Imports (m³)	Sulphur Mass (tonnes)	Average Sulphur Content (mg/kg)	Distribution of Sulphur in Products (%)
Aviation Turbo Fuel	439 018	440	1 249	0.90
Motor Gasoline	NI	54	25	0.11
Aviation Gasoline	0	0	0	0.00
Kerosene/Stove Oil	13 362	9	813	0.02
Ultra-Low-Sulphur Diesel Fuel	950 518	4	5	0.01
Low-Sulphur Diesel Fuel	757 065	162	256	0.33
High-Sulphur Diesel Fuel	NI	291	1 357	0.60
Light Fuel Oil	1 198 926	1 391	1 361	2.85
Heavy Fuel Oil	1 848 944	30 531	16 131	62.53
Plant Consumption/Other	780 264	15 949	19 749	32.66
TOTAL	5 988 095	48 831	5 249	100.00

- Volume not included to protect confidential data. NI = not included
- Total volume excludes the volume not included, as per the previous note.
- “Plant Consumption” in the Atlantic Region consists mostly of pitch, gasoline-like blendstock, intermediate fuel oil, and light/heavy fuel oil. “Other” consists of bunker and bituminous emulsion product (i.e. Orimulsion).
- Totals may not add up due to rounding.

Table 4.2B
Summary of Fuel Production/Imports and Sulphur Content for 2006

Quebec Region				
Type of Fuel	Fuel Production/Imports (m³)	Sulphur Mass (tonnes)	Average Sulphur Content (mg/kg)	Distribution of Sulphur in Products (%)
Aviation Turbo Fuel	1 693 011	736	540	2.25
Motor Gasoline	14 368 377	211	20	0.64
Aviation Gasoline	NI	0	1	0.00
Kerosene/Stove Oil	801 185	125	192	0.38
Ultra-Low-Sulphur Diesel Fuel	4 587 306	14	4	0.04
Low-Sulphur Diesel Fuel	2 670 822	549	248	1.68
High-Sulphur Diesel Fuel	NI	42	1 962	0.13
Light Fuel Oil	1 140 887	1 377	1 418	4.21
Heavy Fuel Oil	2 491 291	27 314	11 149	83.54
Plant Consumption/Other	NI	2 341	15 921	7.16
TOTAL	27 752 879	32 709	1 208	100.00

- Volume not included to protect confidential data. NI = not included
- Total volume excludes the volume not included, as per the previous note.
- “Plant Consumption” in Quebec consists mostly of heavy fuel oil and unspecified fuel.
- Totals may not add up due to rounding.

Table 4.2C
Summary of Fuel Production/Imports and Sulphur Content for 2006

Ontario Region				
Type of Fuel	Fuel Production/Imports (m³)	Sulphur Mass (tonnes)	Average Sulphur Content (mg/kg)	Distribution of Sulphur in Products (%)
Aviation Turbo Fuel	1 253 767	657	647	2.12
Motor Gasoline	10 055 638	165	22	0.53
Aviation Gasoline	0	0	0	0.00
Kerosene/Stove Oil	11 173	35	3 641	0.11
Ultra-Low-Sulphur Diesel Fuel	2 916 405	10	4	0.03
Low-Sulphur Diesel Fuel	1 515 617	431	337	1.39
High-Sulphur Diesel Fuel	415 395	824	2 320	2.65
Light Fuel Oil	932 760	1 180	1 465	3.80
Heavy Fuel Oil	1 285 220	22 136	17 230	71.33
Plant Consumption/Other	327 185	5 607	16 847	18.07
TOTAL	18 713 161	31 045	1 688	100.00

- Plant consumption in Ontario consists mostly of liquefied refinery fuel (LRF) and heavy fuel oil and unspecified fuels.
- Totals may not add up due to rounding.

Table 4.2D
Summary of Fuel Production/Imports and Sulphur Content for 2006

West Region				
Type of Fuel	Fuel Production/Imports (m³)	Sulphur Mass (tonnes)	Average Sulphur Content (mg/kg)	Distribution of Sulphur in Products (%)
Aviation Turbo Fuel	2 956 748	980	408	4.20
Motor Gasoline	13 575 020	156	16	0.67
Aviation Gasoline	NI	2	55	0.01
Kerosene/Stove Oil	NI	0	10	0.00
Ultra-Low-Sulphur Diesel Fuel	7 184 718	24	4	0.10
Low-Sulphur Diesel Fuel	5 583 325	739	156	3.16
High-Sulphur Diesel Fuel	1 484 543	2 855	2 248	12.21
Light Fuel Oil	NI	34	2 926	0.15
Heavy Fuel Oil	1 085 670	18 558	17 116	79.47
Plant Consumption/Other	551 748	27	58	0.11
TOTAL	32 421 771	23 377	748	100.00

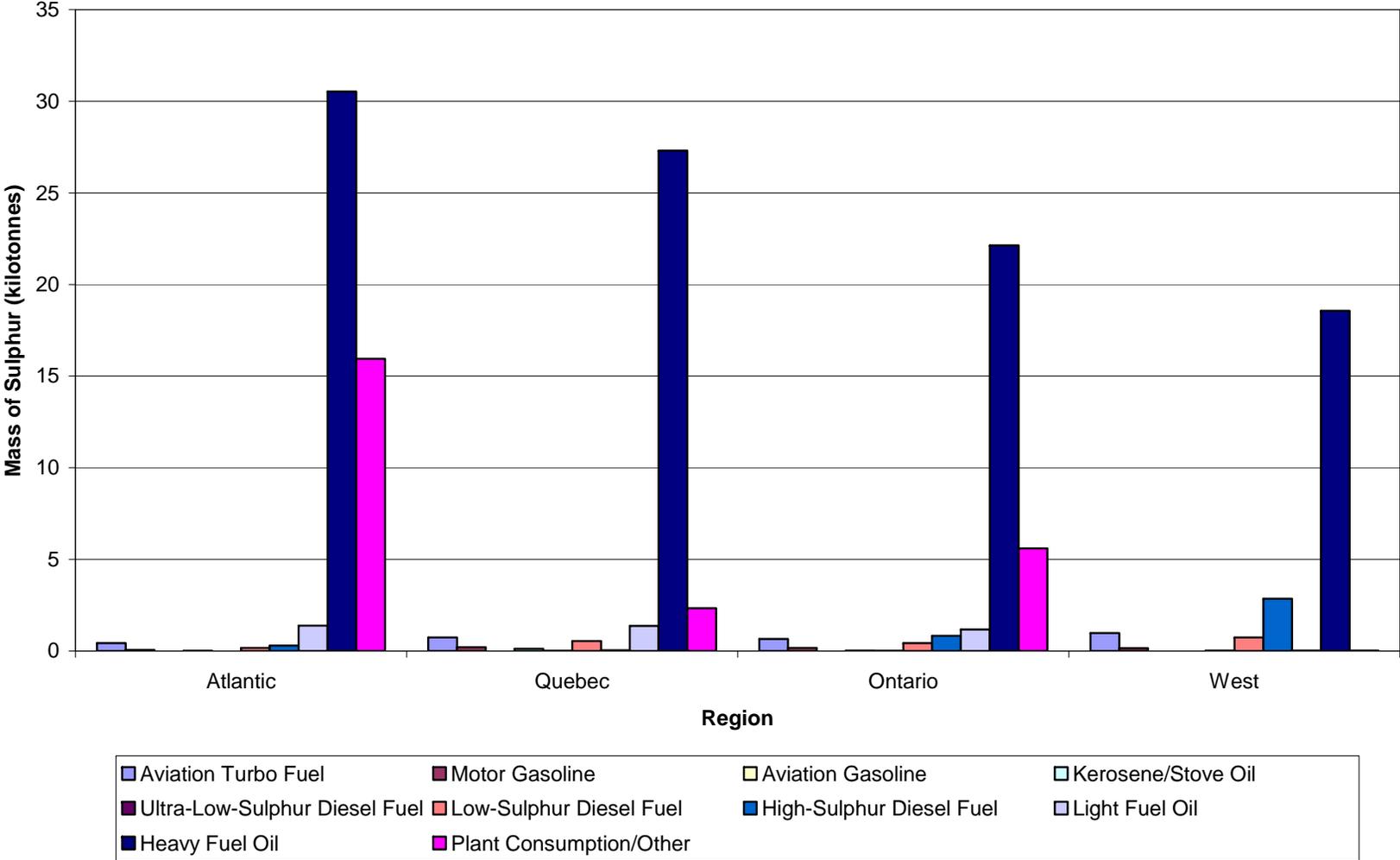
- Volume not included to protect confidential data. NI = not included
- Total volume excludes the volume not included, as per previous note.
- Plant consumption in the West Region—i.e. Man., Sask., Alta., B.C., Y.T., N.W.T., and Nunavut—consists mostly of diesel fuels and unspecified fuels.
- Totals may not add up due to rounding.

Table 4.2E
Regional and National Volume-Weighted Averages of the Density of Fuels
Produced and Imported in 2006

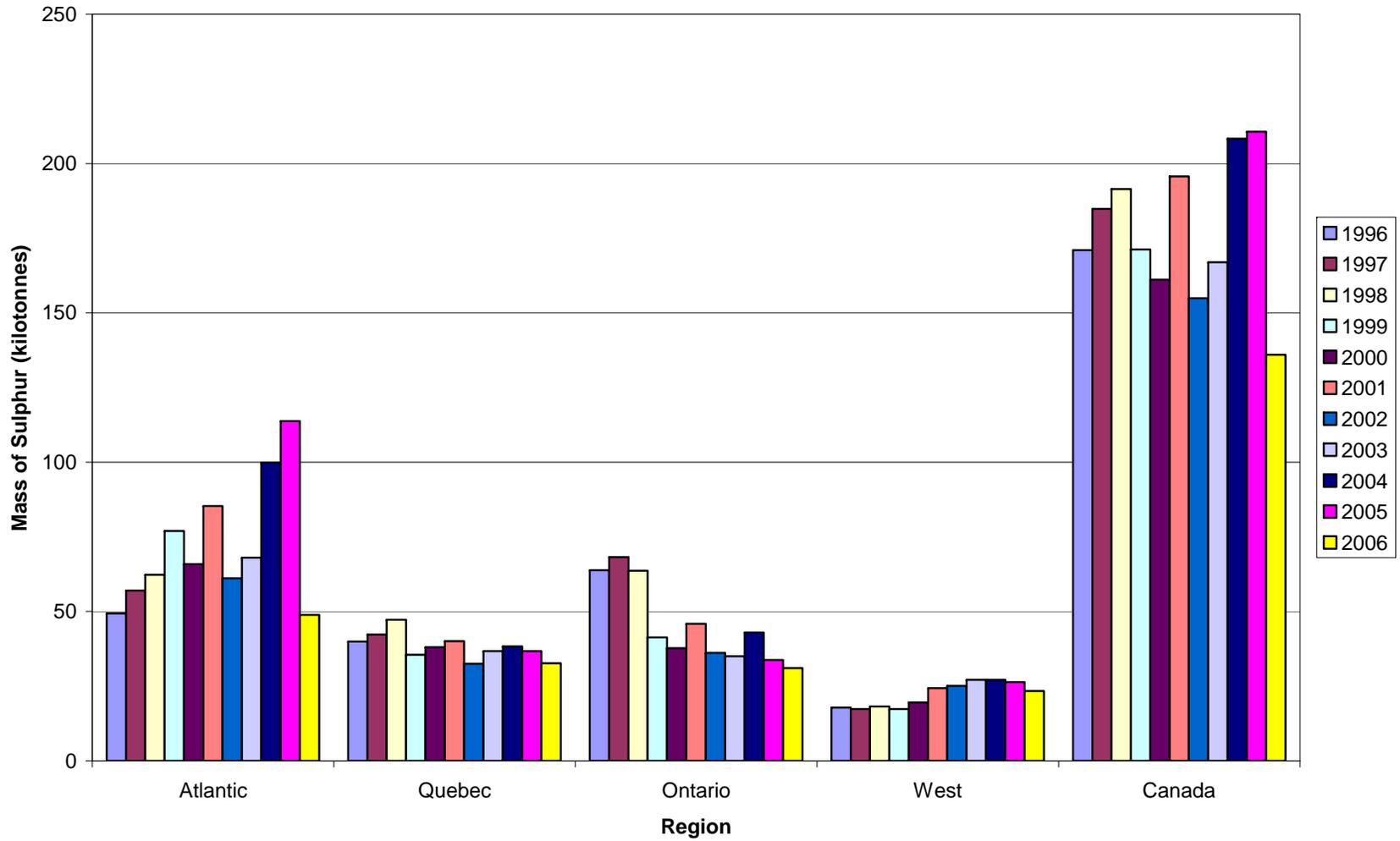
Type of Fuel	Atlantic	Quebec	Ontario	West	Canada
(kg/m³)					
Aviation Turbo Fuel	804.2	804.6	809.5	812.2	809.1
Motor Gasoline	736.3	735.6	736.6	729.7	733.9
Aviation Gasoline	NA	705.7	NA	700.8	702.9
Kerosene/Stove Oil	803.6	818.3	854.5	801.8	818.0
Ultra-Low-Sulphur Diesel Fuel	842.2	826.5	833.3	844.9	837.2
Low-Sulphur Diesel Fuel	839.9	826.8	844.6	849.3	842.3
High-Sulphur Diesel Fuel	850.3	848.9	856.2	853.8	853.8
Light Fuel Oil	854.0	844.6	852.4	915.2	850.5
Heavy Fuel Oil	1 015.5	970.2	998.4	999.5	992.8
Plant Consumption/Other	1 016.3	1 004.2	1 020.1	788.5	946.4

- NA = not applicable
- Plant consumption in the West Region—i.e. Man., Sask., Alta., B.C., Y.T., N.W.T., and Nunavut—consists mostly of diesel fuels and unspecified fuels.

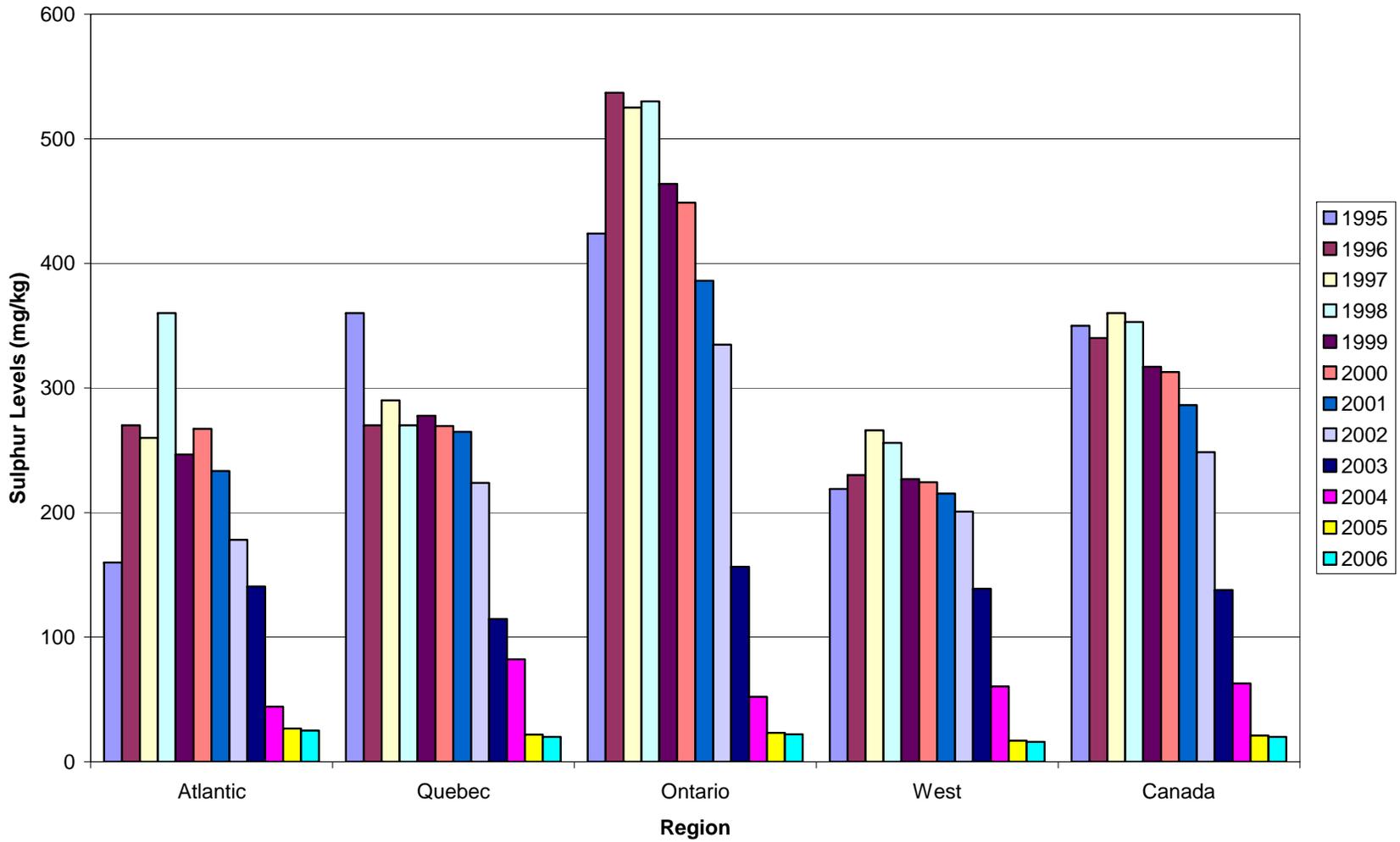
Graph 4.3: Mass of Sulphur in Liquid Fuels Produced/Imported in 2006



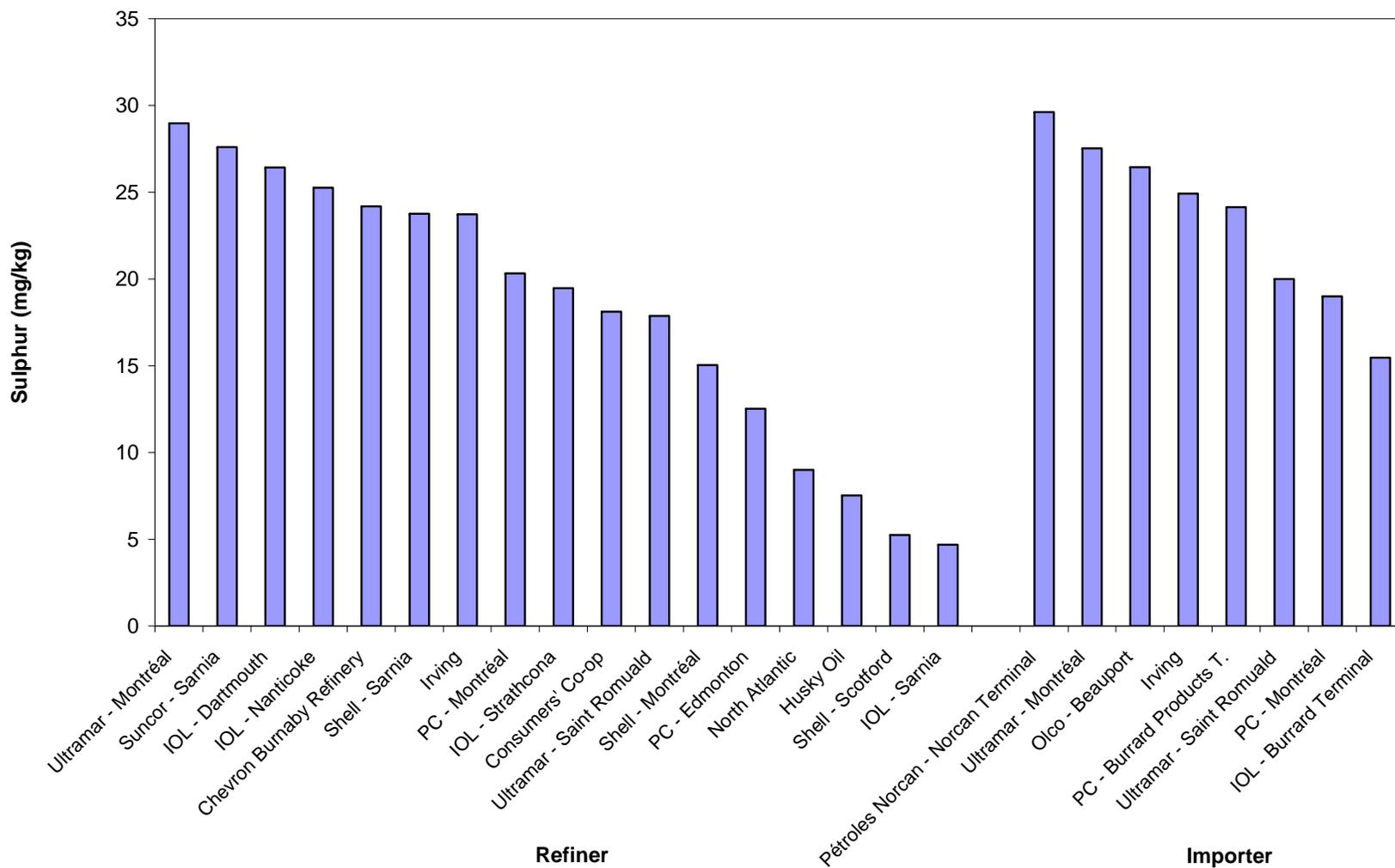
Graph 4.4: Sulphur Mass in Liquid Fuels by Region and Nationally, 1996–2006



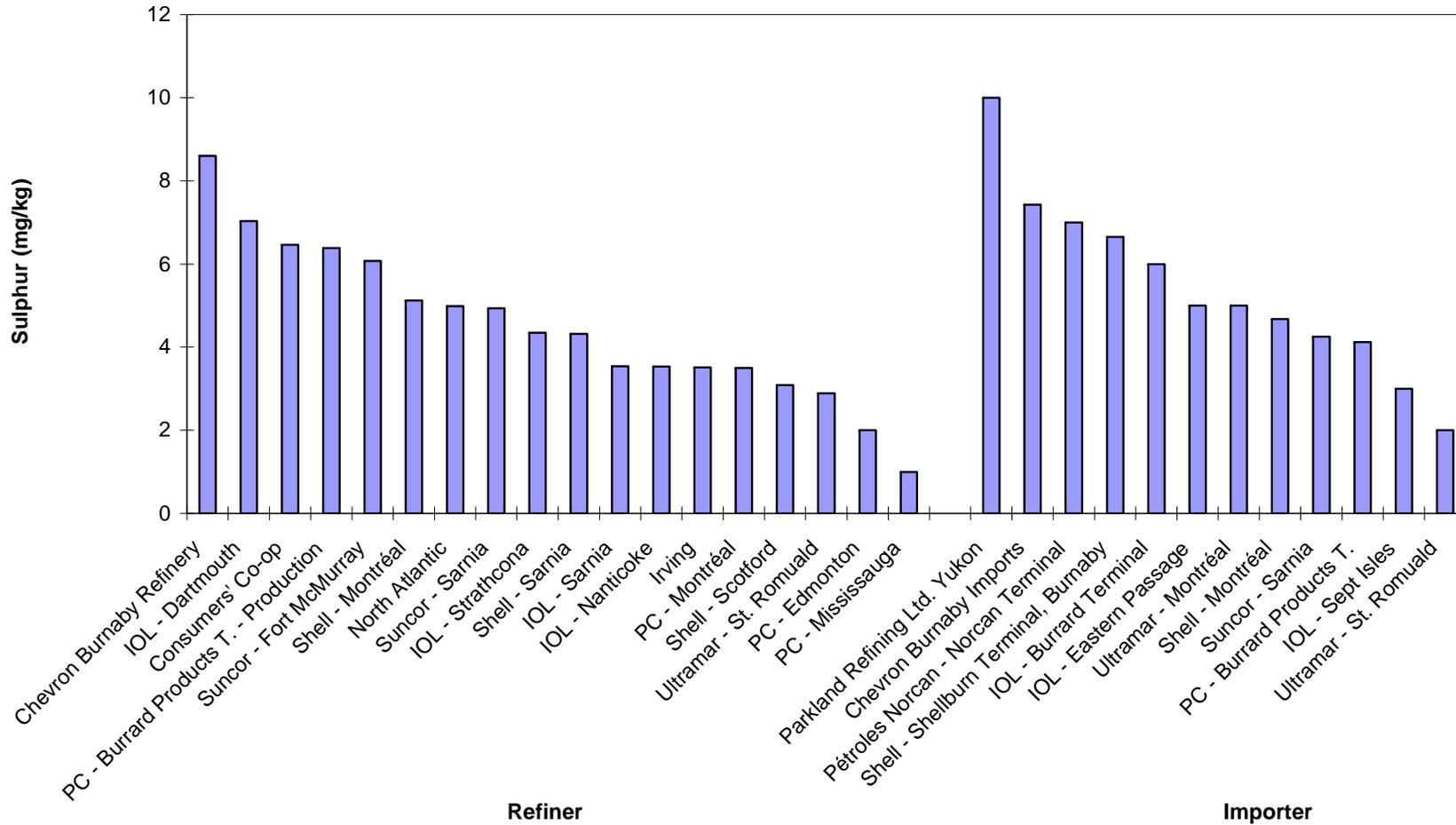
Graph 4.5: Average Sulphur Levels in Motor/Aviation Gasoline by Region and Nationally, 1995–2006



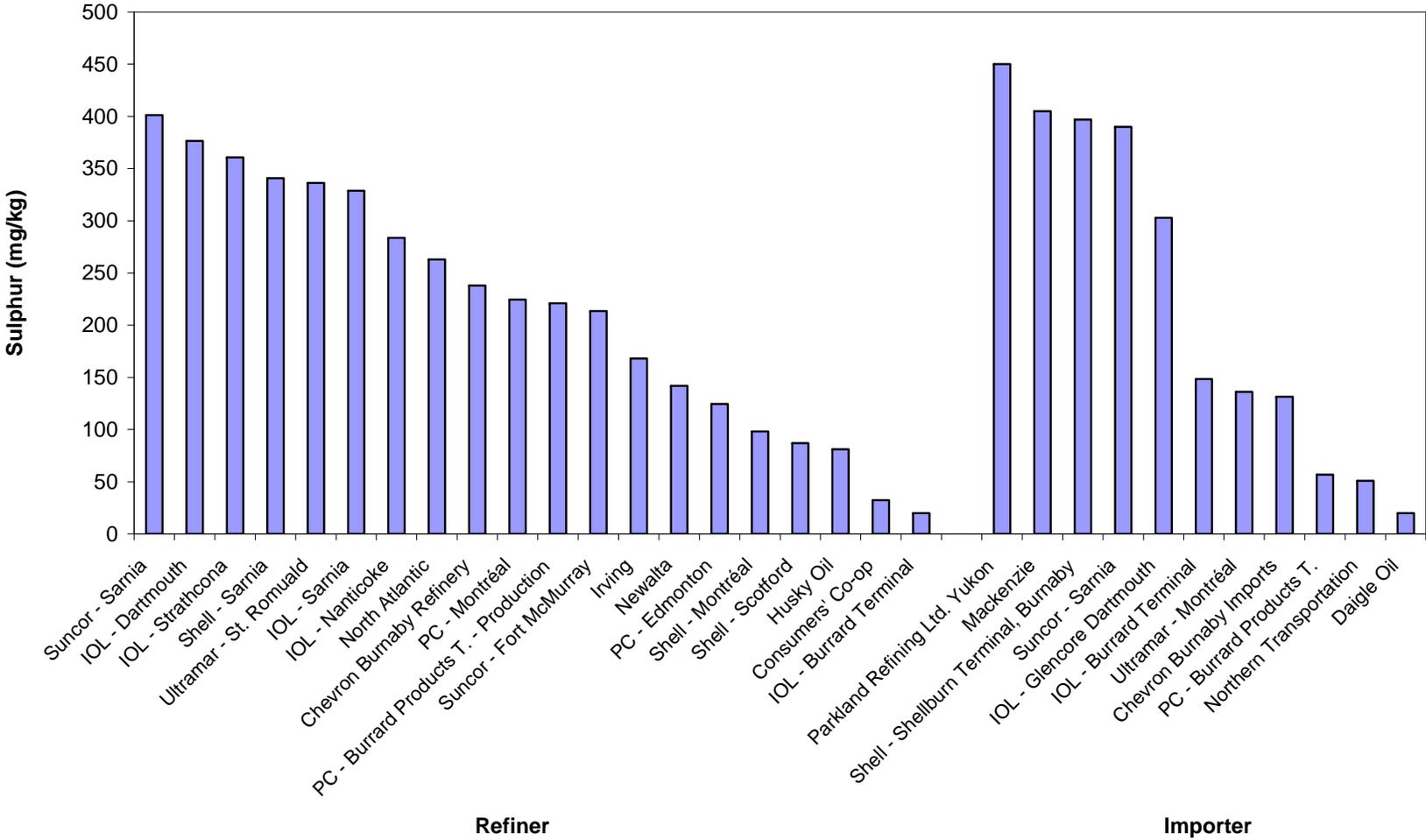
Graph 4.6: Average Sulphur Levels in Motor Gasoline by Refinery/Importer in 2006



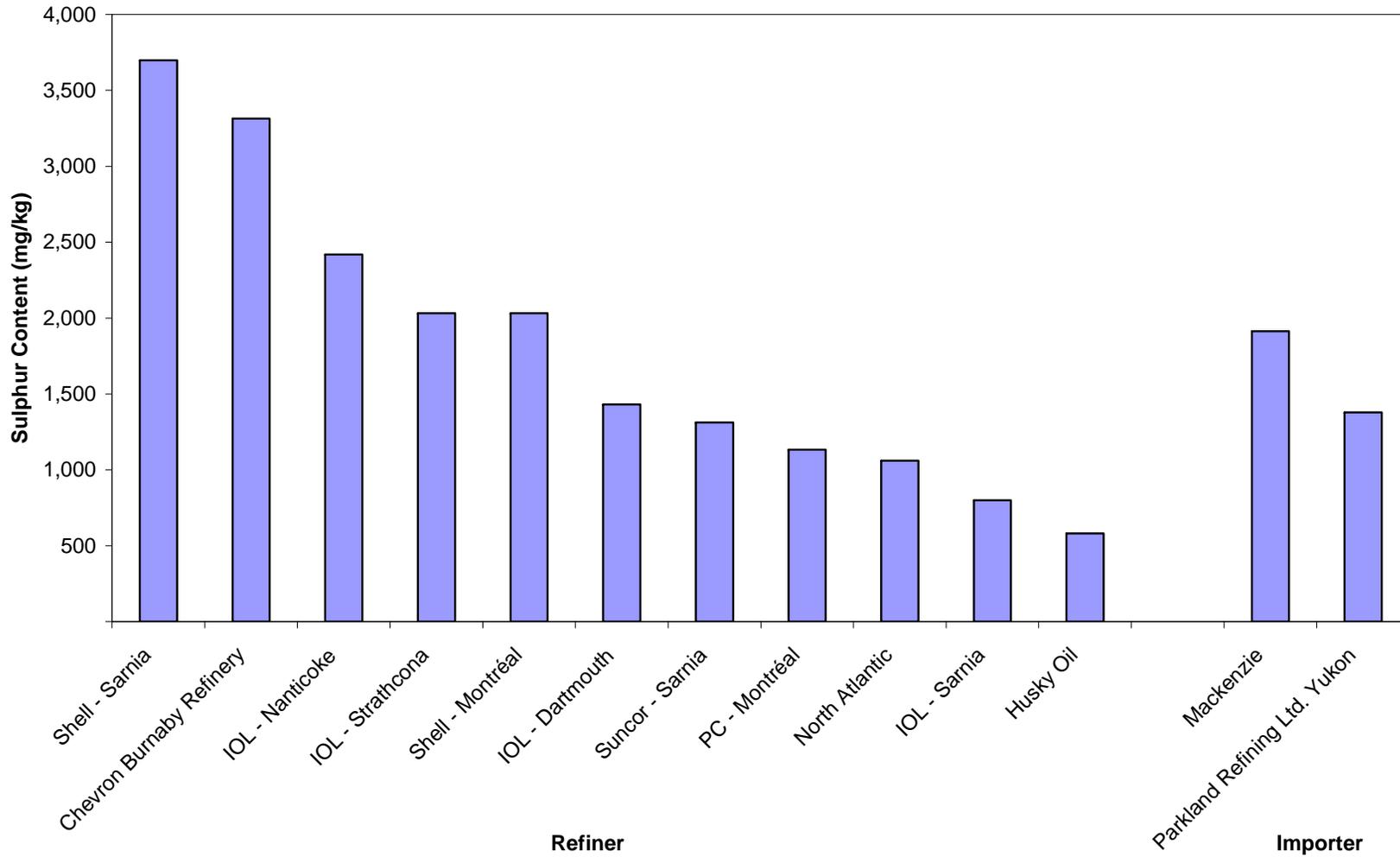
Graph 4.7: Average Sulphur Levels in Ultra-Low-Sulphur Diesel Fuel by Refinery/Importer in 2006



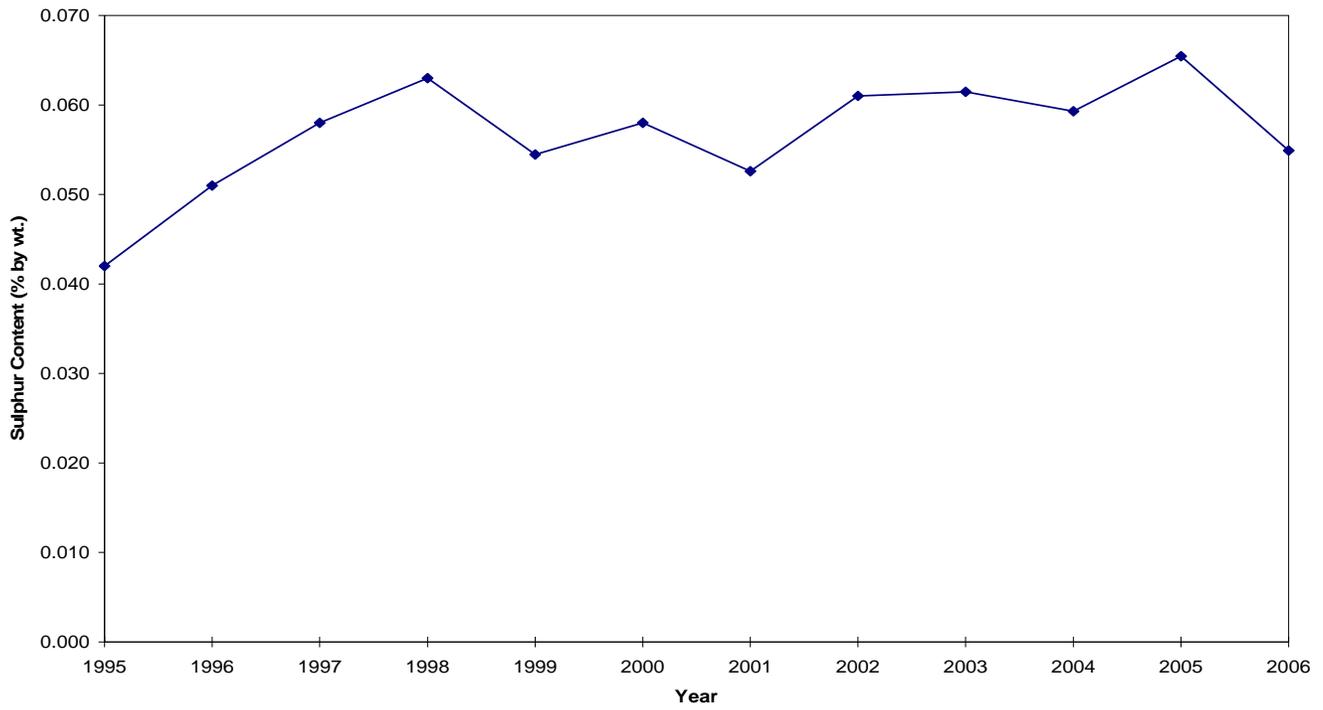
Graph 4.8: Average Sulphur Levels in Low-Sulphur Diesel Fuel by Refinery/Importer in 2006



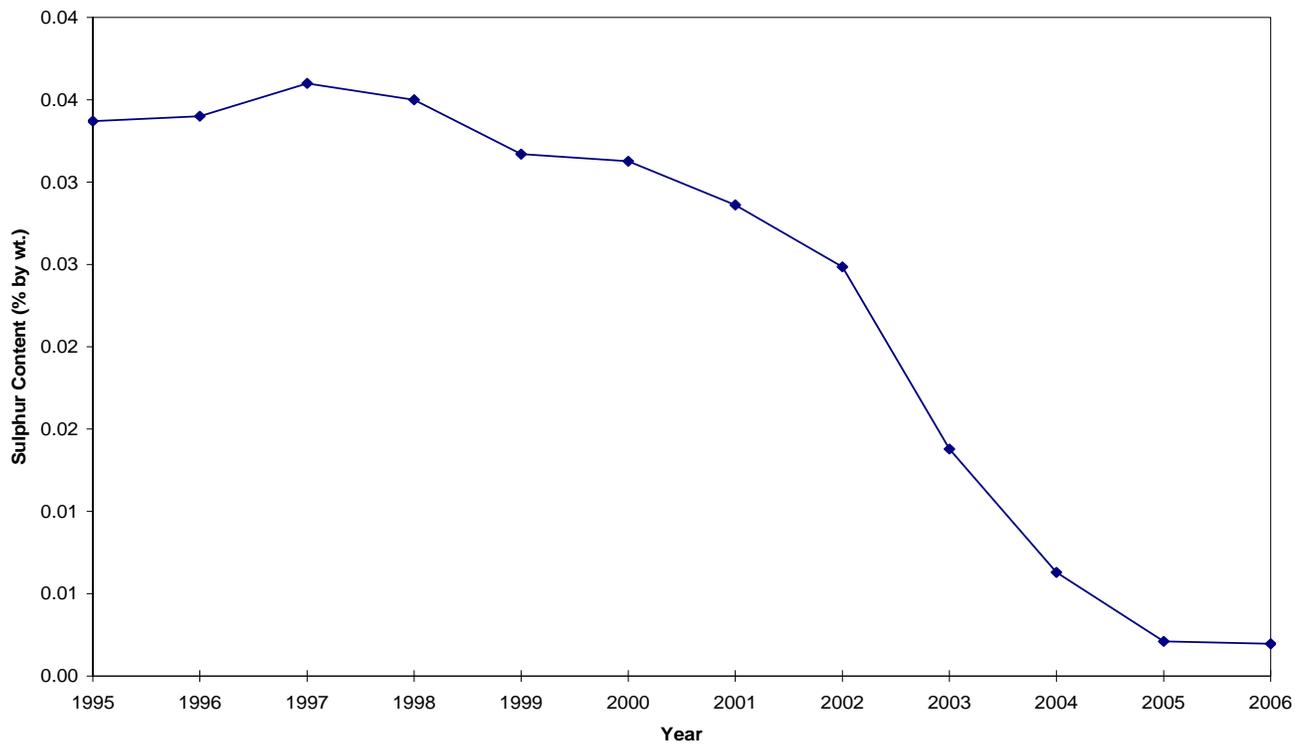
Graph 4.9: Average Sulphur in High-Sulphur Diesel Fuel by Refinery/Importer in 2006



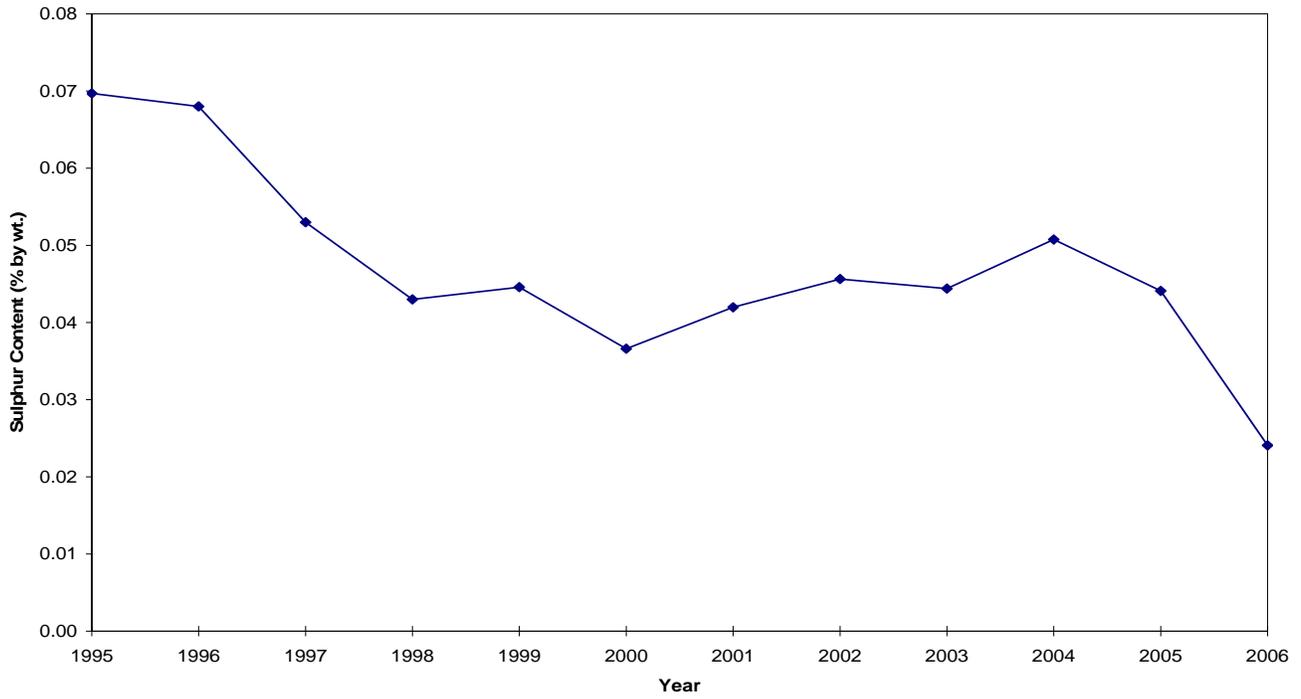
Graph 4.10: National Trend of Sulphur Content in Aviation Turbo Fuel, 1995-2006



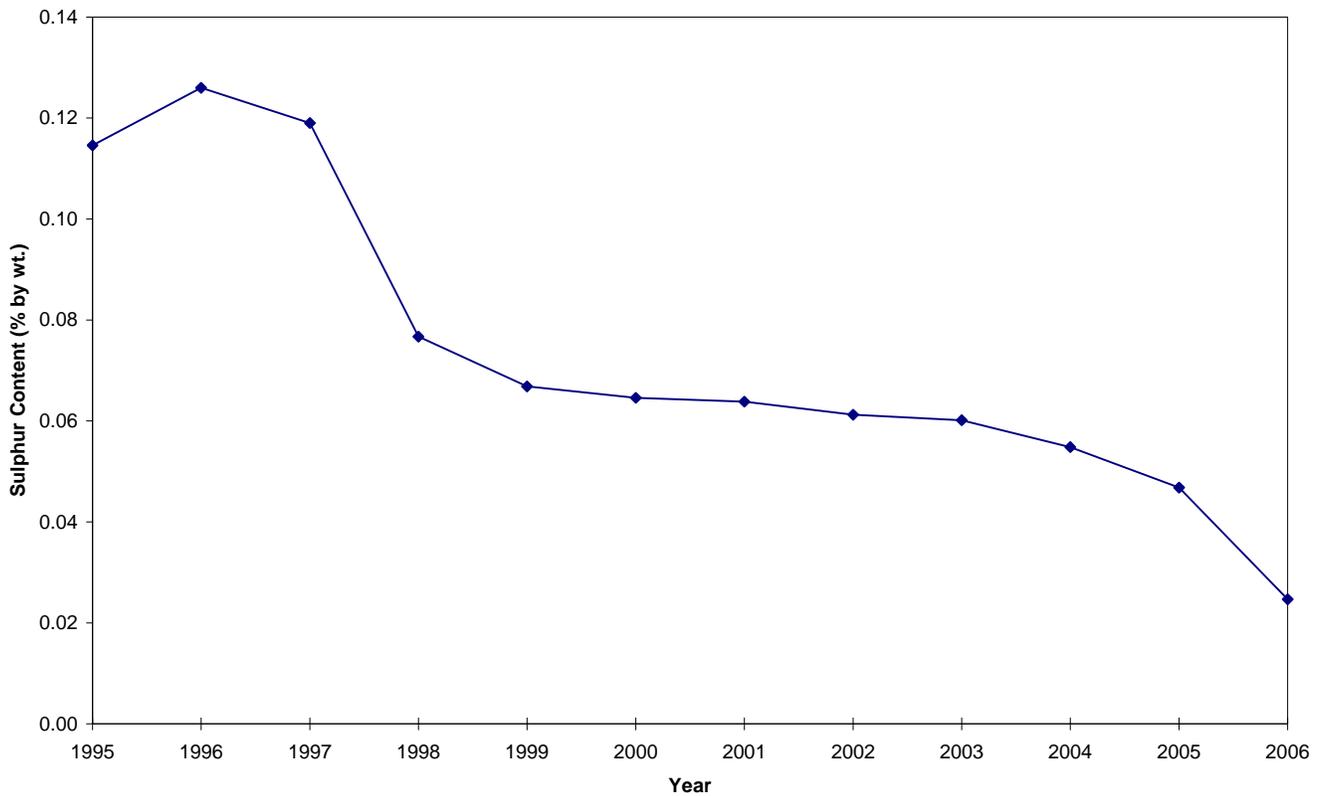
Graph 4.11: National Trend of Sulphur Content in Motor/Aviation Gasoline, 1995-2006



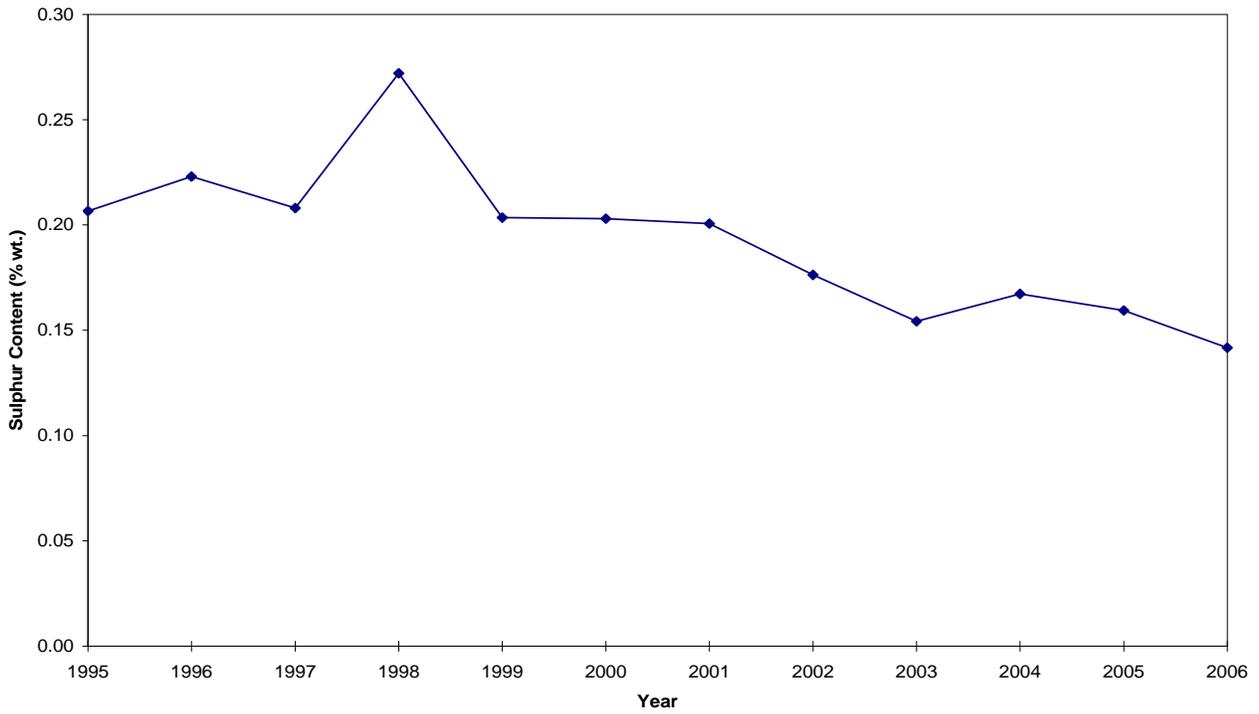
Graph 4.12: National Trend of Sulphur Content in Kerosene/Stove Oil, 1995-2006



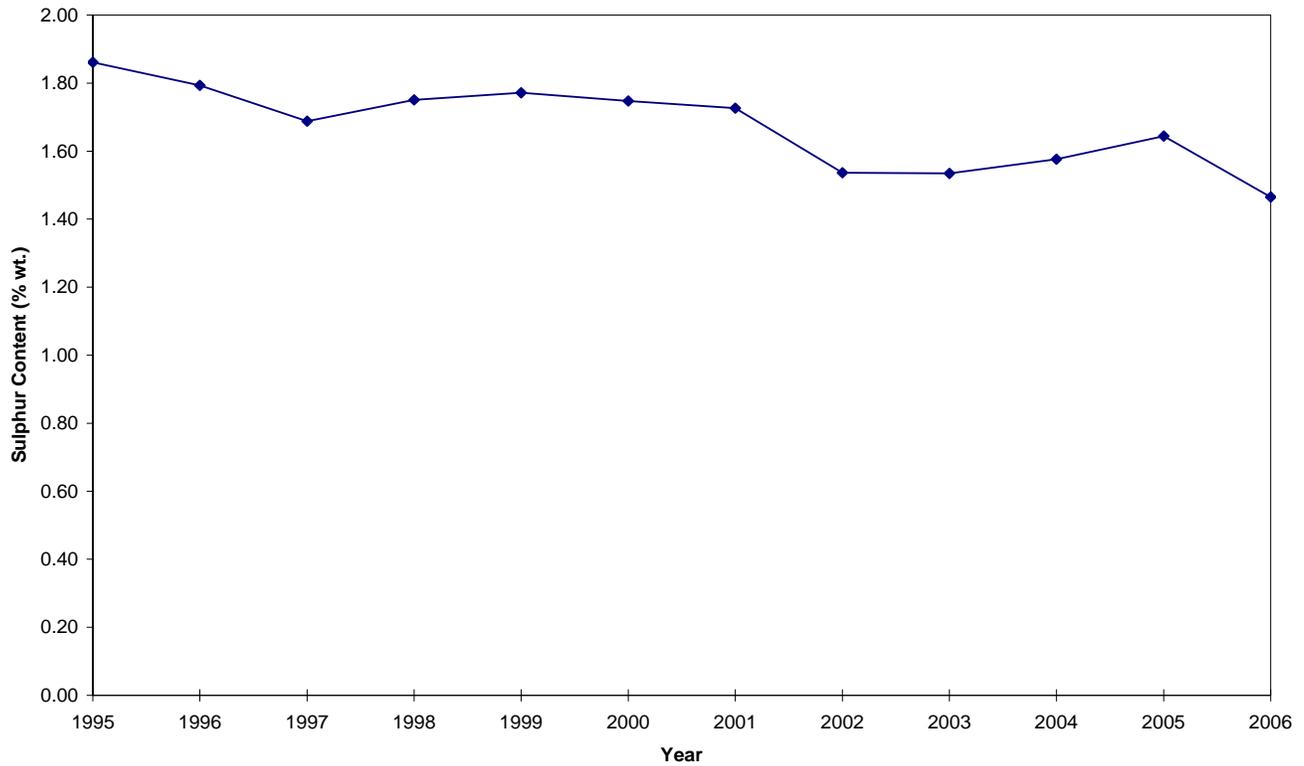
Graph 4.13: National Trend of Sulphur Content in Diesel Fuel (Total Pool), 1995-2006



Graph 4.14: National Trend of Sulphur Content in Light Fuel Oil, 1995–2006



Graph 4.15: National Trend of Sulphur Content in Heavy Fuel Oil, 1995–2006



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 Fuel 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
Fuels Information Regulations, No. 1,
Sulphur in Gasoline Regulations, and
*Sulphur in Diesel Fuel Regulations***

(2006 Compliance Promotion Package)

FUEL INFORMATION REGULATIONS, NO. 1

REPORT ON SULPHUR CONTENT OF LIQUID FUELS (Form 1)

QUARTER: _____ YEAR: _____

This report should be submitted:

- a) for each quarter of the calendar year on or before January 31 of each year following the end of the calendar year during which the fuel was produced or imported.
- b) by every person who, during the calendar year, has produced or imported more than 400 cubic metres of liquid fuels for use in Canada.
- c) for the purpose of informing the Minister of Environment.

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

This form is provided for your convenience. Please refer to the *Canadian Environmental Protection Act, 1999* and *Fuels Information Regulations, No. 1* for information on compliance with the requirements for reporting on the 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	Weighted Average
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, and sulphur concentration, in mg/kg _____

Diesel Fuel Excluding Biodiesel Fuel and Blends of Biodiesel Fuel and Diesel Fuel	Biodiesel Fuel	Blends of Biodiesel Fuel and Diesel Fuel
---	----------------	--

- (a) Diesel fuel with a concentration of sulphur that was less than or equal to 15mg/kg
- (i) Volume of diesel fuel
 - (ii) Highest sulphur concentration
 - (iii) Lowest sulphur concentration
 - (iv) Volume-weighted average sulphur concentration
 - (v) Method used (for reporting purposes) to measure sulphur concentration
- (b) Diesel fuel with a concentration of sulphur that exceeded 15mg/kg and was less than or equal to 500 mg/kg
- (i) Volume of diesel fuel
 - (ii) Highest sulphur concentration
 - (iii) Lowest sulphur concentration
 - (iv) Volume-weighted average sulphur concentration

Diesel Fuel Excluding Biodiesel
Fuel and Blends of Biodiesel Fuel
and Diesel Fuel

Biodiesel Fuel

Blends of Biodiesel Fuel and
Diesel Fuel

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

(c) Diesel fuel with a concentration of sulphur exceeding 500 mg/kg

(i) Volume of diesel fuel

(ii) Highest sulphur concentration

(iii) Lowest sulphur concentration

(iv) Volume-weighted average sulphur
concentration

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

7. Authorized official

Name _____

Title _____

Signature and date _____

Telephone number: (____) _____

Fax number: (____) _____

SULPHUR IN GASOLINE REGULATIONS (SOR/99-236)

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 blendstock 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 selected 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.

Note that this form is provided for your convenience. Please refer to the *Sulphur in Gasoline Regulations* for information on compliance with the requirements for reporting on the sulphur content of liquid fuels.

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

Method selected to meet the sulphur limit: Pool average Flat

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)		Flat Limit	Pool Average	
	PRODUCED	IMPORTED	Maximum Sulphur Concentration in Gasoline (mg/kg)	Maximum Sulphur Concentration in Gasoline (mg/kg)	Volume-Weighted Average (mg/kg)
1. Low Sulphur Gasoline					
2. California Gasoline				NOT REQUIRED	NOT REQUIRED
3. Gasoline-like Blendstock			NOT REQUIRED	NOT REQUIRED	NOT REQUIRED

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

ADDRESSES OF ENVIRONMENT CANADA'S REGIONAL OFFICES

Newfoundland and Labrador, 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 McGill Street, 4th Floor
Montréal, Quebec H2Y 2E7

Ontario

Manager, Emergencies and Enforcement Division
Environment Canada – Ontario Region
Environmental Protection Branch
4905 Dufferin Street, 2nd floor
Downsview, Ontario M3H 5T4

Manitoba, Saskatchewan, Alberta, Northwest Territories, and Nunavut

Director
Environmental Protection – Prairie & 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/Importer, 1995–2006

Table A3.1.a: Volume-Weighted Annual Sulphur Levels in Motor Gasoline, 1995–2006

	Name	City	Sulphur Levels (mg/kg)											
			1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
Refiner	Chevron Canada Limited	Burnaby	215	273	294	246	199	174	171	213	118	132	18	24
	Consumers' Co-operative Refineries Limited	Regina	97	179	103	148	187	242	197	178	163	68	20	18
	Husky Oil Operations Ltd.	Prince George	183	261	225	282	170	248	239	242	143	108	33	8
	Imperial Oil	Dartmouth	365	419	374	491	329	382	356	265	188	28	25	26
	Imperial Oil	Edmonton	239	243	346	297	272	252	302	268	165	30	22	19
	Imperial Oil	Nanticoke	340	506	530	529	450	456	376	366	208	21	29	25
	Imperial Oil	Sarnia	728	787	712	792	694	693	596	432	191	15	4	5
	Irving Oil Limited	Saint John	71	35	43	129	96	85	48	50	66	65	29	24
	North Atlantic Refining Limited	Come-by-Chance	38	75	118	76	55	47	49	58	29	25	30	9
	Parkland Refining Limited	Bowden	-	1	1	4	4	8	4	-	-	-	-	-
	Petro-Canada	Edmonton	360	380	394	377	311	311	250	202	168	81	11	13
	Petro-Canada	Montréal	472	356	387	316	367	292	320	275	218	25	21	20
	Petro-Canada	Oakville	528	489	519	514	523	479	396	305	133	138	24	-
	Shell Canada Products	Corunna	553	579	582	567	453	466	462	399	53	58	28	24
	Shell Canada Products	Fort Saskatchewan	50	50	50	50	50	50	49	50	7	10	12	5
	Shell Canada Products	Montréal-Est	392	319	333	312	269	318	280	231	38	33	19	15
	Suncor Energy Products Incorporated	Sarnia	368	276	298	301	209	192	180	196	157	47	21	28
	Ultramar Limitée	Lévis/Saint-Romuald	219	174	186	171	173	218	212	188	105	152	18	18
	Ultramar Limitée	Montréal-Est	-	-	-	-	-	-	-	155	95	75	27	29
Blender	Robbins Feed and Fuel	Allanburg	-	-	-	137	271	239	307	222	120	104	33	-
Importer	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 Terminal	-	-	-	-	-	-	-	-	-	74	11	15
	Imperial Oil	Montréal	-	-	-	-	340	-	-	-	-	-	-	-
	Imperial Oil	Point Tupper	-	-	-	-	-	-	-	-	-	-	74	-
	Irving Oil Limited	Saint John	-	-	-	-	-	-	-	-	-	-	-	25
	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	-	-	-	-	-	-	-	-	-	-	421	26
	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	Bowden	-	-	-	110	18	18	82	265	-	-	-	-
	Petro-Canada	Montréal	-	-	-	340	360	-	420	315	230	18	20	19
	Petro-Canada	Oakville	-	-	-	610	520	490	368	-	-	75	-	-
	Petro-Canada	Port Moody	-	-	-	210	321	-	-	-	49	114	2	24

Pétroles Norcan	Montréal-Est	-	-	-	470	560	273	243	196	100	145	29	30
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	Halifax	-	-	-	-	-	-	-	-	-	-	-	-
Ultramar Limitée	Holyrood	-	-	-	-	-	-	-	-	180	96	22	-
Ultramar Limitée	Lévis/Saint-Romuald	-	-	-	120	300	270	262	140	77	183	19	20
Ultramar Limitée	Montréal-Est	-	-	-	-	-	-	-	170	88	77	28	28
National Average		345	340	360	350	320	310	290	246	138	63	21	20

Table A3.1.b: Volume-Weighted Quarterly Sulphur Levels in Motor Gasoline in 2006

	Name	City	Sulphur Levels (mg/kg)				
			Q1	Q2	Q3	Q4	Annual
Refiner	Chevron Canada Limited	Burnaby	18	30	23	26	24
	Consumers' Co-operative Refineries Limited	Regina	20	16	17	19	18
	Husky Oil Operations Ltd.	Prince George	10	10	10	0	8
	Imperial Oil	Dartmouth	34	26	29	17	26
	Imperial Oil	Edmonton	19	15	19	22	19
	Imperial Oil	Nanticoke	19	26	29	26	25
	Imperial Oil	Sarnia	4	2	7	6	5
	Irving Oil Limited	Saint John	22	23	23	27	24
	North Atlantic Refining Limited	Come-by-Chance	-	-	-	9	9
	Petro-Canada	Edmonton	18	16	8	11	13
	Petro-Canada	Montréal	23	21	23	13	20
	Shell Canada Products	Corunna	4	3	8	6	5
	Shell Canada Products	Montréal-Est	17	14	14	14	15
	Shell Canada Products	Shell Fort Saskatchewan	20	20	26	31	24
	Suncor Energy Products Incorporated	Sarnia	16	25	31	38	28
Ultramar Limitée	Lévis/Saint-Romuald	20	20	11	21	18	
Ultramar Limitée	Montréal-Est	28	27	31	17	29	
Importer	Imperial Oil	Burnaby	3	19	14	-	15
	Irving Oil Limited	Saint John	22	23	23	27	25
	Olco Petroleum Group	Beauport	33	32	40	5	26
	Petro-Canada	Montréal	23	21	23	13	19
	Petro-Canada	Port Moody	21	16	53	-	24
	Pétroles Norcan	Montréal-Est	52	22	35	7	30
	Ultramar Limitée	Lévis/Saint-Romuald	20	20	11	21	20
	Ultramar Limitée	Montréal-Est	28	27	31	17	28
National Average			19	19	20	19	20

Table A3.2.a: Volume-Weighted Annual Sulphur Levels in Ultra-Low-Sulphur Diesel Fuel, 1995–2006

			Sulphur Levels (mg/kg)											
	Name	City	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
Refiner	Chevron Canada Limited	Burnaby	-	-	-	-	-	-	-	-	-	-	-	9
	Consumers' Co-operative Refineries Limited	Regina	-	-	-	-	-	-	-	-	-	-	-	6
	Imperial Oil	Dartmouth	-	-	-	-	-	-	-	-	-	-	-	7
	Imperial Oil	Edmonton	-	-	-	-	-	-	-	-	-	-	-	4
	Imperial Oil	Nanticoke	-	-	-	-	-	-	-	-	-	-	-	4
	Imperial Oil	Sarnia	-	-	-	-	-	-	-	-	-	-	-	4
	Irving Oil Limited	Saint John	-	-	-	-	-	-	-	-	-	-	-	4
	North Atlantic Refining Limited	Come-by-Chance	-	-	-	-	-	-	-	-	-	-	-	5
	Petro-Canada	Edmonton	-	-	-	-	-	-	-	-	-	-	-	2
	Petro-Canada	Montréal	-	-	-	-	-	-	-	-	-	-	-	4
	Petro-Canada	Port Moody	-	-	-	-	-	-	-	-	-	-	-	6
	Petro-Canada Lubricants	Mississauga	-	-	-	-	-	-	-	-	-	-	-	1
	Shell Canada Products	Corunna	-	-	-	-	-	-	-	-	-	-	-	4
	Shell Canada Products	Fort McMurray	-	-	-	-	-	-	-	-	-	-	-	6
	Shell Canada Products	Fort Saskatchewan	-	-	-	-	-	-	-	-	-	-	-	3
	Shell Canada Products	Montréal-Est	-	-	-	-	-	-	-	-	-	-	-	5
	Suncor Energy Products Incorporated	Fort McMurray	-	-	-	-	-	-	-	-	-	-	-	6
	Suncor Energy Products Incorporated	Sarnia	-	-	-	-	-	-	-	-	-	-	-	5
	Suncor Energy Products Incorporated	Fort McMurray	-	-	-	-	-	-	-	-	-	-	-	6
	Ultramar Limitée	Lévis/Saint-Romuald	-	-	-	-	-	-	-	-	-	-	-	3
Importer	Chevron Canada Limited	Burnaby	-	-	-	-	-	-	-	-	-	-	-	7
	Imperial Oil	Burnaby	-	-	-	-	-	-	-	-	-	-	-	6
	Imperial Oil	Eastern Passage	-	-	-	-	-	-	-	-	-	-	-	5
	Imperial Oil	Sept Isles	-	-	-	-	-	-	-	-	-	-	-	3
	Parkland Refining Limited	Bowden	-	-	-	-	-	-	-	-	-	-	-	10
	Petro-Canada	Port Moody	-	-	-	-	-	-	-	-	-	-	-	4
	Pétroles Norcan	Montréal	-	-	-	-	-	-	-	-	-	-	-	7
	Shell Canada Products	Burnaby	-	-	-	-	-	-	-	-	-	-	-	7
	Shell Canada Products	Montréal-Est	-	-	-	-	-	-	-	-	-	-	-	5
	Suncor Energy Products Incorporated	Sarnia	-	-	-	-	-	-	-	-	-	-	-	4
	Ultramar Limitée	Lévis/Saint-Romuald	-	-	-	-	-	-	-	-	-	-	-	2
Ultramar Limitée	Montréal	-	-	-	-	-	-	-	-	-	-	-	5	
National Average			-	-	-	-	-	-	-	-	-	-	-	4

Table A3.2.b: Volume-Weighted Quarterly Sulphur Levels in Ultra-Low-Sulphur Diesel Fuel in 2006

	Name	City	Sulphur Levels (mg/kg)				
			Q1	Q2	Q3	Q4	Annual
Refiner	Chevron Canada Limited	Burnaby	-	12	8	8	9
	Consumers' Co-operative Refineries Limited	Regina	-	-	5	8	6
	Imperial Oil	Dartmouth	-	7	7	7	7
	Imperial Oil	Edmonton	-	3	5	4	4
	Imperial Oil	Nanticoke	-	4	4	3	4
	Imperial Oil	Sarnia	-	4	4	3	4
	Irving Oil Limited	Saint John	-	-	4	3	4
	North Atlantic Refining Limited	Come-by-Chance	-	-	7	2	5
	Petro-Canada	Edmonton	-	-	3	1	2
	Petro-Canada Lubricants	Mississauga	1	1	1	1	1
	Petro-Canada	Montréal	-	-	4	3	4
	Petro-Canada	Port Moody	-	-	8	6	6
	Shell Canada Products	Corunna	-	7	4	4	4
	Shell Canada Products	Fort McMurray	-	5	8	5	6
	Shell Canada Products	Fort Saskatchewan	4	3	3	3	3
	Shell Canada Products	Montréal-Est	8	9	3	3	5
	Suncor Energy Products Incorporated	Fort McMurray	-	5	8	5	6
	Suncor Energy Products Incorporated	Sarnia	-	2	5	5	5
	Ultramar Limitée	Lévis/Saint-Romuald	-	2	3	3	3
	Importer	Chevron Canada Limited	Burnaby	-	8	8	6
Imperial Oil		Burnaby	-	6	6	-	6
Imperial Oil		Eastern Passage	-	-	-	5	5
Imperial Oil		Sept Isles	-	-	-	3	3
Parkland Refining Limited		Bowden	-	10	-	-	10
Petro-Canada		Port Moody	-	2	5	4	4
Pétroles Norcan		Montréal	-	-	7	-	7
Shell Canada Products		Burnaby	-	10	6	-	7
Shell Canada Products		Montréal-Est	8	9	3	3	5
Suncor Energy Products Incorporated		Sarnia	-	2	5	5	4
Ultramar Limitée		Lévis/Saint-Romuald	-	2	3	3	2
Ultramar Limitée		Montréal	-	-	-	5	5
National Average			6	5	4	4	4

Table A3.3.a: Volume-Weighted Annual Sulphur Levels in Low-Sulphur Diesel Fuel, 1995–2006

	Name	City	Sulphur Levels (mg/kg)											
			1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
Refiner	Chevron Canada Limited	Burnaby	350	390	380	400	400	400	389	490	397	355	308	238
	Consumers' Co-operative Refineries Limited	Regina	200	270	250	230	220	190	211	211	189	153	113	32
	Husky Oil Operations Ltd.	Prince George	140	200	200	210	190	190	188	165	161	183	149	81
	Imperial Oil	Calgary	-	-	-	-	-	-	-	-	-	320	-	-
	Imperial Oil	Dartmouth	340	360	390	400	330	370	402	397	400	363	341	376
	Imperial Oil	Edmonton	290	400	410	380	430	400	420	409	400	405	383	361
	Imperial Oil	Nanticoke	-	-	160	290	280	310	356	322	286	283	310	284
	Imperial Oil	Sarnia	-	-	420	290	410	350	349	371	342	292	328	329
	Irving Oil Limited	Saint John	400	400	440	450	440	430	433	432	420	391	382	168
	Newalta	North Vancouver	-	-	-	-	-	-	-	-	-	209	120	142
	North Atlantic Refining Limited	Come-by-Chance	-	-	490	130	330	260	148	163	188	180	184	263
	Petro-Canada	Edmonton	190	220	210	230	240	280	283	256	283	240	170	124
	Petro-Canada	Mississauga	-	-	-	-	-	-	-	-	85	1	-	-
	Petro-Canada	Montréal	340	420	330	400	400	430	451	422	400	338	327	225
	Petro-Canada	Oakville	-	-	170	320	300	300	278	222	245	294	350	-
	Petro-Canada	Port Moody	-	-	-	-	-	-	-	-	-	13	71	221
	Petro-Canada Lubricants	Mississauga	10	20	20	20	20	20	20	20	-	-	1	-
	Pétroles Norcan	Montréal-Est	-	-	-	-	-	-	-	-	-	-	-	-
	Shell Canada Products	Corunna	330	340	360	360	370	390	392	400	391	389	377	341
	Shell Canada Products	Fort Saskatchewan	50	80	100	210	140	150	196	129	129	111	124	87
Shell Canada Products	Montréal-Est	390	370	210	280	360	350	378	344	365	327	255	98	
Suncor Energy Incorporated	Fort McMurray	70	90	140	160	200	250	225	225	225	204	225	214	
Suncor Energy Products Incorporated	Sarnia	340	300	370	460	450	440	437	425	419	399	410	401	
Ultramar Limitée	Lévis/Saint-Romuald	450	380	400	410	430	420	420	424	412	418	379	336	
Blender	Robbins Feed and Fuel	Allanburg	-	-	-	-	-	410	-	-	-	-	-	
Importer	BP West Coast Products, LLC	Blaine	-	-	-	380	380	360	339	400	-	-	-	
	Canadian Pacific Railway	Calgary	-	-	-	-	-	-	-	-	-	470	-	
	Chevron Canada Limited	Burnaby	-	-	-	-	-	-	-	-	-	-	131	
	Coco Paving Inc.	Windsor	-	-	-	-	-	-	-	-	-	-	-	
	Consumers' Co-operative Refineries Limited	Regina	-	-	-	-	-	-	-	-	-	163	112	
Daigle Oil	Edmundston	-	-	-	-	-	500	500	-	160	-	-	20	

Limited														
Delta Western Fuel (Totem Oil)	Whitehorse	-	-	-	160	400	430	-	-	-	-	-	-	-
Husky Oil Operations Ltd.	Prince George	-	-	-	380	-	-	-	-	-	-	-	-	-
Imperial Oil	Burnaby	-	-	-	230	-	360	345	-	424	345	341	148	
Imperial Oil	Glencore Dartmouth	-	-	-	-	-	-	-	-	-	-	-	303	
Imperial Oil	Montréal	-	-	-	-	-	-	-	-	-	-	-	-	
Mackenzie Petroleum Limited	Dawson City	-	-	-	300	400	450	400	398	385	207	310	405	
Marine Petrobulk Limited	North Vancouver	-	-	-	-	-	-	-	200	272	300	-	-	
Murphy Oil USA	Superior	-	-	-	270	270	-	-	-	-	-	-	-	
Northern Transportation Olco	Iqaluit	-	-	-	20	210	270	271	255	-	-	-	51	
Petroleum Group Olco	Beauport	-	-	-	400	310	-	-	-	-	-	-	-	
Petroleum Group	Montréal	-	-	-	-	310	-	-	-	-	-	-	-	
Parkland Refining Limited	Bowden	-	-	-	400	500	480	500	448	290	378	450	450	
Petro-Canada	Montréal	-	-	-	390	400	400	473	500	-	333	-	-	
Petro-Canada	Oakville	-	-	-	310	-	-	-	-	-	-	-	-	
Petro-Canada	Port Moody	-	-	-	-	-	360	251	-	375	348	267	57	
Pétroles Norcan	Montréal	-	-	-	450	450	-	-	-	-	-	-	-	
Pétroles Norcan	Montréal-Est	-	-	-	-	-	-	-	-	-	462	-	-	
Robbins Feed and Fuel	Allanburg	-	-	-	-	-	-	289	-	-	-	-	-	
Shell Canada Products	Burnaby	-	-	-	-	-	-	-	-	-	379	388	397	
Shell Canada Products	Montréal-Est	-	-	-	-	-	-	-	-	-	365	-	-	
Suncor Energy Products Incorporated	Sarnia	-	-	-	-	-	-	-	-	-	410	430	390	
Sunoco	Sarnia	-	-	-	-	-	-	430	-	-	-	-	-	
Ultramar Limitée	Halifax	-	-	-	-	-	-	-	-	-	-	-	-	
Ultramar Limitée	Holyrood	-	-	-	-	-	-	-	-	400	258	237	-	
Ultramar Limitée	Lévis/Saint-Romuald	-	-	-	410	430	410	412	-	-	-	365	-	
Ultramar Limitée	Montréal-Est	-	-	-	-	-	-	-	440	-	254	242	136	
United Refining Company	Warren	-	-	-	-	-	-	282	286	296	-	-	-	
National Average		210	260	270	310	320	330	340	324	317	295	270	213	

Table A3.3.b: Volume-Weighted Quarterly Sulphur Levels in Low-Sulphur Diesel Fuel in 2006

	Name	City	Sulphur Levels (mg/kg)				
			Q1	Q2	Q3	Q4	Annual
Refiner	Chevron Canada Limited	Burnaby	290	140	-	-	238
	Consumers' Co-operative Refineries Limited	Regina	49	18	-	-	32
	Husky Oil Operations Ltd.	Prince George	90	240	30	-	81
	Imperial Oil	Dartmouth	340	449	-	423	376
	Imperial Oil	Edmonton	425	273	365	263	361
	Imperial Oil	Nanticoke	282	263	-	490	284
	Imperial Oil	Sarnia	340	261	-	-	329
	Irving Oil Limited	Saint John	305	34	-	-	168
	Newalta	North Vancouver	100	200	-	-	142
	North Atlantic Refining Limited	Come-by-Chance	55	58	394	280	263
	Petro-Canada	Edmonton	161	81	-	-	124
	Petro-Canada	Montréal	306	148	-	-	225
	Petro-Canada	Port Moody	219	224	-	-	221
	Shell Canada Products	Corunna	337	348	-	287	341
	Shell Canada Products	Fort Saskatchewan	87	-	-	-	87
	Shell Canada Products	Montréal-Est	101	48	155	94	98
	Suncor Energy Products Incorporated	Fort McMurray	246	232	141	172	214
	Suncor Energy Products Incorporated	Sarnia	410	390	220	-	401
	Ultramar Limitée	Lévis/Saint-Romuald	320	360	-	-	336
	Importer	Chevron Canada Limited	Burnaby	270	91	-	-
Daigle Oil Limited		Edmundston	-	20	-	-	20
Imperial Oil		Burnaby	276	20	-	-	148
Imperial Oil		Glencore	303	-	-	-	303
Mackenzie Petroleum Limited		Dartmouth					
		Dawson City	405	-	-	-	405
Northern Transportation		Iqaluit	-	-	51	-	51
Parkland Refining Limited		Bowden	450	-	-	-	450
Petro-Canada		Port Moody	25	119	-	-	57
Shell Canada Products		Burnaby	397	-	-	-	397
Suncor Energy Products Incorporated		Sarnia	410	390	220	-	390
Ultramar Limitée	Montréal-Est	180	114	-	-	136	
National Average			241	177	132	172	213

Table A3.4.a: Volume-Weighted Annual Sulphur Levels in High-Sulphur Diesel Fuel, 1995–2006

	Name	City	Sulphur Levels (mg/kg)											
			1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
Refiner	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	3 315
	Husky Oil Operations Ltd.	Prince George	570	580	-	-	-	-	-	-	-	-	-	580
	Imperial Oil	Dartmouth	2 010	1 460	1 840	890	510	740	989	656	944	887	965	1 431
	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	2 031
	Imperial Oil	Nanticoke	3 480	3 880	4 300	-	-	-	-	-	-	-	840	2 419
	Imperial Oil	Regina	-	-	-	-	-	-	-	-	-	610	-	-
	Imperial Oil	Sarnia	660	690	-	-	-	1 430	1 297	1 154	-	1 067	913	799
	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	-	-	1 059
	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	1 132
	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	Corunna	4 050	4 040	4 200	4 090	3 720	3 780	3 676	3 658	4 390	4 313	4 165	3 699
	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	2 030
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	1 312	
Ultramar Limitée	Lévis/Saint-Romuald	800	760	860	-	-	-	-	-	-	-	-	-	
Importer	Coco Paving Inc.	Windsor	-	-	-	-	-	-	-	-	-	500	500	-
	Daigle Oil Limited	Edmonton	-	-	-	-	-	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	1 912
	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	Bowden	-	-	-	4 730	3 500	4 780	3 621	4 074	2 827	2 294	1 875	1 379
	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	2 156

Table A3.4.b: Volume-Weighted Quarterly Annual Sulphur Levels in High-Sulphur Diesel Fuel in 2006

	Name	City	Sulphur Levels (mg/kg)				
			Q1	Q2	Q3	Q4	Annual
Refiner	Chevron Canada Limited	Burnaby	3 960	3 330	3 170	2 890	3 315
	Husky Oil Operations Ltd.	Prince George	-	580	-	-	580
	Imperial Oil	Dartmouth	1 020	1 410	1 840	1 180	1 431
	Imperial Oil	Edmonton	1 578	2 241	2 642	1 748	2 031
	Imperial Oil	Nanticoke	-	2 722	2 401	1 018	2 419
	Imperial Oil	Sarnia	980	980	740	730	799
	North Atlantic Refining Limited	Come-by-Chance	424	1 740	-	-	1 059
	Petro-Canada	Montréal	-	1 132	-	-	1 132
	Shell Canada Products	Corunna	3 783	3 804	3 694	1 184	3 699
	Shell Canada Products	Montréal-Est	1 853	2 189	-	-	2 030
	Suncor Energy Products Incorporated	Sarnia	1 680	1 090	1 150	-	1 312
Importer	Mackenzie Petroleum Limited	Dawson City	854	2 605	-	-	1 912
	Parkland Refining Limited	Bowden	1 028	2 370	-	-	1 379
National Average			1 736	2 249	2 482	1 822	2 156

Table A3.5.a: Volume-Weighted Annual Sulphur Levels in Light Fuel Oil, 1995–2006

		Sulphur Levels (mg/kg)												
Name	City	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	
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	1 184
	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	2 133
	Irving Oil Limited	Saint John	-	-	1 731	2 080	1 770	1 660	1 630	1 553	1 304	1 740	1 489	1 555
	Newalta	North Vancouver	-	-	-	-	-	-	-	-	-	-	-	143
	North Atlantic Refining Limited	Come-by-Chance	-	-	-	-	-	-	-	1 282	860	1 176	1 216	1 604
	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	820
	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	1 033
	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	Corunna	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	2 875
Suncor Energy Products Incorporated	Fort McMurray	-	-	-	-	-	-	-	-	-	-	-	2 991	
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	1 249	
Ultramar Limitée	Lévis/Saint-Romuald	1 120	1 281	1 355	2 231	1 810	1 630	1 539	1 215	1 074	1 086	-	467	
Importer	Daigle Oil Limited	Edmundston	-	-	-	-	-	3 000	3 000	3 000	500	-	-	14
	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	1 262
	Statia Terminals Canada	Point Tupper	-	-	-	-	-	-	1 020	-	-	-	-	-
Ultramar Limitée	Lévis/Saint-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	1 417

Table A3.5.b: Volume-Weighted Quarterly Sulphur Levels in Light Fuel Oil in 2006

	Name	City	Sulphur Levels (mg/kg)				
			Q1	Q2	Q3	Q4	Annual
Refiner	Imperial Oil	Dartmouth	1 040	1 530	1 470	1 090	1 184
	Imperial Oil	Sarnia	1 880	2 520	2 450	2 130	2 133
	Irving Oil Limited	Saint John	1 730	1 446	2 303	1 158	1 555
	Newalta	North Vancouver	-	100	200	100	143
	North Atlantic Refining Limited	Come-by-Chance	600	2 240	1 500	1 900	1 604
	NOVA Chemicals Canada Limited	Corunna	967	928	689	761	820
	Petro-Canada	Montréal	1 680	900	600	310	1 033
	Shell Canada Products	Montréal-Est	2 800	3 000	3 100	2 700	2 875
	Suncor Energy Products Incorporated	Fort McMurray	3 052	3 148	2 651	2 718	2 991
	Suncor Energy Products Incorporated	Sarnia	1 640	1 390	590	-	1 249
Ultramar Limitée	Lévis/Saint-Romuald	1 110	-	40	50	467	
Importer	Daigle Oil Limited	Edmundston	-	14	-	-	14
	Port Colborne Quarries Limited	Port Colborne	1 440	1 550	1 020	1 130	1 262
National Average			1 542	1 507	1 506	1 180	1 417

Table A3.6.a: Volume-Weighted Annual Sulphur Levels in Heavy Fuel Oil, 1995–2006

			Sulphur Levels (mg/kg)											
	Name	City	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
Refiner	Chevron Canada Limited	Burnaby	14 663	17 832	15 153	15 107	17 880	-	-	-	-	-	-	-
	Consumers' Co-operative Refineries Limited	Regina	8 313	12 315	11 207	8 986	8 870	10 640	7 032	9 122	8 742	5 531	6 244	6 669
	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	21 937
	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	11 747
	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	17 601
	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	16 962
	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	20 448
	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	15 215
	Newalta	North Vancouver	-	-	-	-	-	-	-	-	-	6 444	6 038	6 880
	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	10 051
	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	12 295
	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	Corunna	25 835	27 398	28 326	26 485	25 130	25 540	25 736	24 339	24 335	22 829	23 130	23 735
	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	17 003
	Suncor Energy Incorporated	Sarnia	17 317	18 351	20 169	20 539	17 220	20 240	18 239	19 480	18 561	17 741	20 161	20 328
Ultramar Limitée	Lévis/Saint-Romuald	8 324	10 070	11 361	11 440	11 100	10 990	10 165	9 790	9 626	8 666	9 155	6 722	
Importer	Catalyst Paper Corporation	Campbell River	-	-	-	-	-	-	-	-	-	-	-	7 153
	Catalyst Paper Corporation	Crofton	-	-	-	-	-	-	-	-	-	-	-	8 148
	Cervini Farms	Leamington	-	-	-	-	-	-	-	-	-	15 000	13 500	13 500
	Compagnie Minière de Québec Cartier	Port-Cartier	-	-	-	-	-	-	-	-	-	15 944	-	17 563
	Compaq Papiers	Québec	-	-	-	-	-	-	-	-	19 259	-	-	-
	Compaq Papiers	Stradacona	-	-	-	-	-	-	-	-	-	-	-	-
	Emera Fuels Incorporated	Dartmouth	-	-	-	-	-	-	-	-	27 200	-	-	-
	Great Lakes Greenhouses Inc	Leamington	-	-	-	-	-	-	-	-	-	15 060	15 932	10 396
	Kildair Services Ltée	Tracy	-	-	-	4 150	8 290	18 080	8 006	15 000	8 355	9 230	4 751	5 300
	Marine Petrobulk Limited	North Vancouver	-	-	-	-	-	17 920	24 000	16 390	18 406	18 796	18 500	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	27 419	27 206	27 026
	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	9 214

Nexfor Fraser Papers Incorporated	Edmundston	-	-	-	-	4 280	3 980	4 214	4 379	4 634	4 656	4 613	4 721
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	15 919
Nova Scotia Power	Halifax	-	-	-	27 030	25 990	26 810	28 102	19 728	17 868	20 120	19 513	19 700
Ontario Limited	Leamington	-	-	-	-	-	-	-	-	-	-	14 855	7 437
Pope and Talbot Limited	Nanaimo	-	-	-	-	-	10 600	10 216	10 749	9 646	10 036	9 445	9 731
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	15 763	16 444	14 651

Table A3.6.b: Volume-Weighted Quarterly Annual Sulphur Levels in Heavy Fuel Oil in 2006

	Name	City	Sulphur Levels (mg/kg)				
			Q1	Q2	Q3	Q4	Annual
Refiner	Consumers' Co-operative Refineries Limited	Regina	5 563	9 512	5 975	5 478	6 669
	Husky Oil Operations Ltd.	Prince George	24 000	22 978	20 400	21 842	21 937
	Imperial Oil	Dartmouth	12 577	11 723	12 445	9 872	11 747
	Imperial Oil	Edmonton	17 243	17 328	17 514	18 334	17 601
	Imperial Oil	Nanticoke	17 600	18 500	16 600	16 100	16 962
	Imperial Oil	Sarnia	22 700	23 000	17 400	17 800	20 448
	Irving Oil Limited	Saint John	14 800	15 500	16 300	15 200	15 215
	Newalta	North Vancouver	7 073	7 131	6 295	6 978	6 880
	NOVA Chemicals Canada Limited	Corunna	11 397	10 159	9 406	9 785	10 051
	Petro-Canada	Montréal	11 700	12 000	13 700	12 200	12 295
	Shell Canada Products	Corunna	26 686	24 626	-	22 090	23 735
	Shell Canada Products	Montréal-Est	16 335	16 434	15 827	18 913	17 003
	Suncor Energy Products Incorporated	Sarnia	19 460	20 480	20 900	20 450	20 328
	Ultramar Limitée	Lévis/Saint-Romuald	8 740	8 860	5 600	4 070	6 722
	Importer	Catalyst Paper Corporation	Campbell River	7 300	-	8 500	6 300
Catalyst Paper Corporation		Crofton	7 200	-	7 100	10 600	8 148
Cervini Farms		Leamington	13 500	13 500	13 500	13 500	13 500
Compagnie Minière de Québec Cartier		Port-Cartier	16 100	15 700	-	18 900	17 563
Great Lakes Greenhouses Inc		Leamington	20 600	3 400	4 500	4 600	10 396
Kildair Services Ltée		Tracy	-	-	-	5 300	5 300
Marine Petrobulk Limited		North Vancouver	18 500	18 500	18 500	18 500	18 500
New Brunswick Power Corporation		Fredericton	-	27 200	26 700	27 400	27 026
Newfoundland & Labrador Hydro		St. John's	9 050	-	9 390	-	9 214
Nexfor Fraser Papers Incorporated		Edmundston	4 590	4 770	4 900	4 710	4 721
North Atlantic Refining Limited		Come-by-Chance	17 700	17 400	11 100	14 100	15 919
Nova Scotia Power		Halifax	19 700	-	-	-	19 700
Ontario Limited		Leamington	16 600	3 600	3 800	4 900	7 437
Pope and Talbot Limited		Nanaimo	9 700	9 800	-	9 700	9 731
National Average			14 231	15 158	14 609	14 590	14 651

Table A3.7.a: Volume-Weighted Annual Sulphur Levels in Aviation Gasoline, 2000–2006

	Name	City	Sulphur Levels (mg/kg)						
			2000	2001	2002	2003	2004	2005	2006
Refiner	Imperial Oil	Edmonton	-	-	10	10	10	11	10
	Petro-Canada	Edmonton	-	352	229	206	400	334	248
	Shell Canada Products	Montréal-Est	-	14	50	10	1	1	1
Importer	Imperial Oil	Burnaby	-	30	-	-	-	-	-
	Imperial Oil	Edmonton	-	10	-	-	-	-	-
National Average			-	51	59	35	59	43	32

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

Table A3.7.b: Volume-Weighted Quarterly Sulphur Levels in Aviation Gasoline in 2006

	Name	City	Sulphur Levels (mg/kg)				
			Q1	Q2	Q3	Q4	Annual
Refiner	Imperial Oil	Edmonton	10	10	10	10	10
	Petro-Canada	Edmonton	163	163	332	332	248
	Shell Canada Products	Montréal-Est	1	1	1	1	1
National Average			18	29	34	85	32

Table A3.8.a: Volume-Weighted Annual Sulphur Levels in Aviation Turbo (Jet) Fuel, 1995–2006

	Name	City	Sulphur Levels (mg/kg)												
			1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	
Refiner	BP West Coast Products, LLC	Blaine	-	-	-	-	-	-	-	-	-	-	766	-	-
	Chevron Canada Limited	Burnaby	410	447	-	605	1 006	1 129	745	781	741	637	720	891	
	Imperial Oil	Dartmouth	542	447	-	776	522	657	750	1 003	727	881	736	541	
	Imperial Oil	Nanticoke	-	1 714	-	2 015	1 340	989	823	810	466	939	840	781	
	Imperial Oil	Sarnia	449	86	-	99	76	83	94	100	100	100	64	12	
	Imperial Oil	Edmonton	-	436	-	491	483	484	527	536	485	536	531	222	
	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	2 290	
	North Atlantic Refining Limited	Come-by-Chance	-	-	-	2 119	1 787	1 808	2 264	2 097	1 383	1 222	1 769	2 123	
	Petro-Canada	Edmonton	-	2	-	13	7	-	12	-	6	4	7	5	
	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	Montréal	449	445	-	291	262	334	285	256	319	574	481	565	
	Shell Canada Products	Corunna	-	100	-	633	532	377	429	1 217	1 250	1 568	1 205	956	
	Shell Canada Products	Fort Saskatchewan	-	50	-	50	100	100	90	100	100	100	100	100	
	Suncor	Sarnia	-	700	-	1 259	1 034	993	1 082	1 570	1 311	1 079	1 231	876	
	Ultramar Limitée	Lévis/Saint-Romuald	-	-	-	267	399	496	371	345	267	259	44	83	
	Importer	Air Canada	Hamilton	-	-	-	-	-	-	-	-	438	683	-	589
Air Canada		Québec	-	-	-	-	-	-	-	-	1 312	347	1 277	626	
Air Canada		Westridge	-	-	-	-	-	-	-	-	631	322	584	759	
BP West Coast Products, LLC		Blaine	-	-	-	-	-	534	606	461	599	789	643	655	
Imperial Oil		Burnaby	-	-	-	193	234	370	110	-	330	240	25	3	
Imperial Oil		Québec	-	-	-	-	-	-	-	-	-	-	-	336	
Mackenzie Petroleum Limited		Dawson City	-	-	-	-	1 000	1 000	900	800	830	658	743	643	
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	6	
Pétroles Norcan		Montréal-Est	-	447	-	-	203	-	-	-	99	-	-	3	
Shell Canada Products		Burnaby	-	-	-	-	-	-	-	-	-	100	337	311	
Shell Canada Products		Montréal	-	-	-	-	-	-	-	-	-	458	316	621	
Ultramar Limitée		Holyrood	-	-	-	-	-	-	-	-	360	279	-	-	
Ultramar Limitée		Lévis/Saint-Romuald	-	-	-	-	-	-	-	-	-	240	-	170	

	Ultramar Limitée	Montréal	-	-	-	-	-	-	-	775	-	426	-	454
National Average			-	-	-	-	-	-	-	775	-	426	654	549

Table A3.8.b: Volume-Weighted Quarterly Sulphur Levels in Aviation Turbo (Jet) Fuel in 2006

	Name	City	Sulphur Levels (mg/kg)				
			Q1	Q2	Q3	Q4	Annual
Refiner	Chevron Canada Limited	Burnaby	1 000	790	990	770	891
	Imperial Oil	Dartmouth	870	350	580	420	541
	Imperial Oil	Nanticoke	640	700	970	760	781
	Imperial Oil	Sarnia	26	14	3	5	12
	Imperial Oil	Strathcona	622	203	2	1	222
	Irving Oil Limited	Saint John	2 393	2 310	2 095	2 297	2 290
	North Atlantic Refining Limited	Come-by-Chance	1 030	2 470	2 630	2 340	2 123
	Petro-Canada	Edmonton	4	2	7	6	5
	Shell Canada Products	Montréal	500	900	500	400	565
	Shell Canada Products	Sarnia	1 100	1 200	800	700	956
	Shell Canada Products	Scotford	100	100	100	100	100
	Suncor	Sarnia	860	950	1 010	610	876
	Ultramar Limitée	Lévis/Saint- Romuald	170	190	30	50	83
Importer	Air Canada	Hamilton	-	412	861	437	589
	Air Canada	Québec	728	259	882	737	626
	Air Canada	Westridge	554	717	863	824	759
	BP West Coast Products, LLC	Blaine	530	720	880	480	655
	Imperial Oil	Burnaby	1	1	6	-	3
	Imperial Oil	Québec	-	-	192	482	336
	Mackenzie Petroleum Limited	Dawson City	782	571	-	-	643
	Petro-Canada	Port Moody	25	2	5	6	6
	Pétroles Norcan	Montréal-Est	-	-	3	-	3
	Shell Canada Products	Burnaby	800	-	100	-	311
	Shell Canada Products	Montréal	500	900	500	400	621
	Ultramar Limitée	Lévis/Saint- Romuald	170	-	-	-	170
	Ultramar Limitée	Montréal	960	550	620	260	454
National Average			590	498	570	537	549

Appendix 4

Canadian General Standards Board Standards for Sulphur Content in Fuels

Canadian General Standards Board
Standards for Sulphur Content in Fuels

Specification Number	Fuel Category	Maximum Sulphur Content (mg/kg)
CAN/CGSB-3.5-2004 (amend. no. 2 Apr. 2007) CAN/CGSB-3.511-2005 (amend. no. 2 Apr. 2007) CAN/CGSB-3.25-2004 (amend. no. 1 Dec. 2005)	Gasoline Unleaded, Automotive Oxygenated Unleaded Automotive (containing Ethanol) Aviation	80 ¹ 80 ² 500
CAN/CGSB-3.23-2005 (amend. no. 1 July 2006) CAN/CGSB-3.22-2002 (amend. no. 4 July 2004) CAN/CGSB-3.24-2005 (amend. no. 1 July 2005)	Aviation Turbine Fuel Kerosene Type (Jet A, Jet A-1) Wide Cut Type (Jet B, F-40) Military Grades (F-34, F-44)	3 000 4 000 3 000
CAN/CGSB-3.3-2007	Kerosene Type No. 1-K Type No. 2-K	400 3 000
CAN/CGSB 3.6-2000 (amend. no. 2 Sept. 2004) CAN/CGSB-3.517-2007 CAN/CGSB-3.520-2005 (amend. no. 1 Mar. 2006, amend. no. 2 Apr. 2007)	Diesel Fuel Regular Sulphur - Type A Regular Sulphur - Type B Automotive (On-road) – Type A & B - LS Automotive (On-road) – Type A & B - ULS Automotive Low-Sulphur Diesel Fuel Containing Low Levels of Biodiesel Esters (B1-B5): - Type A & B – LS - Type A & B - ULS	3 000 5 000 500 15 500 15
CAN/CGSB-3.16-99	Mining Diesel Fuel Special Special - Low Sulphur	2 500 500
CAN/CGSB-3.2-2007	Heating Fuel Oil Type 0 Type 1 Type 2 Type 4 Type 5 Type 6	3 000 3 000 5 000 No limit No limit No limit
3-GP-11d (November 2002) (Amend. No. 1 Sept. 2004)	Naval Distillate Fuel Type 11 Type 15	5 000 5 000
CAN/CGSB-3.27-2005 CAN/CGSB-3.18-2000 (Amend. No. 2 Sept. 2004)	Naphtha Fuel Diesel Fuel for Locomotive Type Medium-Speed Diesel Engines	5 5 000

¹ Changed to 80 mg/kg from 300 mg/kg - CAN/CGSB-3.5-2004 Amendment No. 2, April 2007.

² Changed to 80 mg/kg from 300 mg/kg - CAN/CGSB-3.511-2005 Amendment No. 2, April 2007.

Appendix 5

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

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

Jurisdiction	Act/Regulation/By-Law	Regulation Adopted	Maximum Sulphur Content (% mass)
Canada	<i>Canadian Environmental Protection Act 1999</i>		
	Sulphur in Diesel Fuel Regulations (start 2003)	2002 2005 amendments	Diesel 0.05 (on-road – until mid-2006) 0.0015 (after mid-2006 – on-road) 0.05 (2007 – off-road, rail, marine) 0.0015 (2010 – off-road) 0.0015 (2012 – rail, marine)
	Sulphur in Gasoline Regulations	1999	Gasoline 0.015 ave./0.03 cap (2002–2004) ¹ 0.003 ave./0.008 cap (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"> - 3.0%, and - 2.0% on an annual basis. • Where BAT is not employed: <ul style="list-style-type: none"> - 2.2%, and - 2.0% on an annual basis.
Nova Scotia	<i>Environment Act</i> Air Quality Regulations	March 2005	Fuel Oil - 2.2% by mass, and - 2.0% on an annual basis.
Prince Edward Island	<i>Petroleum Products Act</i> Petroleum Products Act Regulations	March 2001	Minimum specifications for the type or grade of petroleum product as issued by the CGSB or Public Utilities Commission.

¹ Have various options. See regulation for details.

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

(Cont'd)

Jurisdiction	Act /Regulation/By-Law	Regulation Adoption	Maximum Sulphur Content (% by wt. - m/m)
Quebec	<i>Petroleum Products and Equipment Act</i> Petroleum Products Regulation	1991 (amended 1996, 1998, 1999 and 2007 ²)	<p>Gasoline: Grades 1, 2, 3, 4 = 0.0080 Gasoline containing fuel ethanol: = 0.0080 Diesel</p> <ul style="list-style-type: none"> - Type 1 (Regular Sulphur) : - Type A = 0.3 - Type B = 0.5 - Types 2 (Low-Sulphur) = 0.05 - Type 3 (Ultra-Low-Sulphur) = 0.0015 <p>Diesel fuel containing biodiesel fuel</p> <ul style="list-style-type: none"> - Type A and B – LS = 0.05 <p>Heating Fuel Oil:</p> <ul style="list-style-type: none"> - Types Nos. 0, 1 = 0.3 - Type No. 2 = 0.5 - Types Nos. 4, 5, 6 = no limit - <p>Aviation Fuel:</p> <ul style="list-style-type: none"> - Type 1 Aviation Gasoline = 0.05 - Type 2 Aviation Turbine Fuel: - Jet A, Jet A-1 and F-34 = 0.30 - Jet B and F-40 = 0.4 - F-44 = 0.3
	<i>Environment Quality Act</i> Regulation Respecting the Quality of the Atmosphere ³	1981	<p>Fuel Oil</p> <p>Light Oil (LFO) = 0.5% Intermediate Oil = 1.0% Heavy Oil (HFO) = 2.0%</p>
	By-Law 90, Montreal Urban Community	1987	<p>Fuel Oil</p> <p>LFO Type No. 2 = 0.4% HFO Type No. 6 = 1.25 to 1.4%</p>
Ontario	<i>Environmental Protection Act</i> Regulation 361, Sulphur Content of Fuels (effective in Metro Toronto only)	1970 (amended 1980, 1990 and 1999)	<p>Fuel Oil</p> <p>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</p>

² O.C. 226-2007, 12 March 2007, *Petroleum Products Regulations* – Maximum sulphur content determined by reference to CGSB specifications.

³ <http://www.mddep.gouv.qc.ca/Infuseur/communiqu.e.asp?no=1202> – On October 1, 2007, Quebec announced its plan to lower sulphur content in industrial fuel oil from 2% to 1.5% and, in natural gas, to 1%.

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

(Cont'd)

	<i>Environmental Protection Act</i> Regulation 338, Boilers Regulation		
British Columbia	<i>Environmental Management Act</i> ⁴ Sulphur Content of Fuel Regulation (B.C. Regulation 67/89 as amended, B.C. Reg. 321/2004)	1989	1.1
	<i>Environmental Management Act</i> Cleaner Gasoline Regulation (B.C. Reg. 498/95) as amended by Order in Council No. 010 in January 2007.		<u>Gasoline</u> 0.0080 ⁵
Yukon	<i>Environment Act</i> Air Emissions Regulations	1998	<u>Fuel for heating, generating steam or electricity or combustion in industrial processes</u> = 1.1, except as authorized by a permit issued under these Regulations.

⁴ *Environmental Management Act* 2003 replaced the *Waste Management Act* in 2004.

⁵ Maximum sulphur content determined by reference to CGSB specifications

Appendix 6

Average Sulphur Content in Fuel: Comparison of Levels Reported in 2006 and Limits Set by the Canadian General Standards Board and Provincial Regulations

Average Sulphur Content in Fuel: Comparison of Levels Reported in 2006 and Limits Set by the Canadian General Standards Board and Provincial Regulations

1) Average reported sulphur content (%) versus CGSB standards

Type of Fuel	Average Reported Sulphur Content (%)			CGSB (% mass)
	Low Value	National Average	High Value	
Aviation Turbo Fuel	0.0001	0.0549	0.2630	0.30 - Jet A 0.40 - Jet B
Motor Gasoline	0.0001	0.0020	0.0053	0.0080 - Unleaded
Aviation Fuel	0.0001	0.0032	0.0332	0.0500
Kerosene/Stove Oil	0.0002	0.0241	0.3900	0.04 - Type No. 1 - K 0.30 - Type No. 2 - K
Ultra-Low-Sulphur Diesel Fuel	0.0001	0.0004	0.0012	0.0015 - Automotive
Low-Sulphur Diesel Fuel	0.0018	0.0213	0.0490	0.05 - Automotive
High-Sulphur Diesel Fuel	0.0424	0.2156	0.3960	0.30 - Type A 0.50 - Type B
Light Fuel Oil	0.0014	0.1417	0.3148	0.30 - Type No. 0 0.30 - Type No. 1 0.50 - Type No. 2
Heavy Fuel Oil	0.3400	1.4651	2.7400	No limits

2) Average reported sulphur content (%) for heavy fuel oil versus limits under provincial regulations

Region	Sulphur Content (%) in Heavy Fuel Oil (2006)	Provincial Regulations	
		Province	Sulphur Content Limit (%)
Atlantic	1.613	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 Types No. 4, 5 or 6: <ul style="list-style-type: none"> • Where Best Available Technology (BAT) is employed: <ul style="list-style-type: none"> - 3.0%, and - 2.0% on an annual basis. • Where BAT is not employed: <ul style="list-style-type: none"> - 2.2%, and - 2.0% on an annual basis
		Nova Scotia	- 2.2 % by mass, and - 2.0% on an annual basis
		P.E.I.	No limit since references CGSB

Quebec	1.115	Quebec	2.0 - All types 1.25 to 1.4 – HFO Type No. 6 (Montréal)
Ontario	1.723	Ontario	1.0 - Boilers 1.5 - All types (Toronto)
West	1.712	B.C. Alberta Saskatchewan Manitoba Yukon N.W.T. Nunavut	1.1 - All types Not regulated provincially Not regulated provincially Not regulated provincially 1.1 ¹ Not regulated provincially Not regulated provincially

¹ Fuel for heating, generating steam or electricity or combustion in industrial processes except as authorized by a permit issued under the *Air Emissions Regulations*.