



DEPARTMENT OF ENVIRONMENT AND CONSERVATION

2009 AMBIENT AIR MONITORING REPORT

June 2010

## **Executive Summary**

The air quality in communities across the province is generally considered to be good as the ambient air quality standards are rarely exceeded. On occasion, communities in close proximity to an industrial operation may experience episodic decreases in air quality; however, these episodes tend to be brief in nature and are rarely at levels that exceed the air quality standards. Elevated levels of air pollutants often occur due to long-range transport from mainland Canada and the United States, but again are episodic in nature and rarely produce levels that exceed the ambient air quality standards.

This report presents all the monitoring results from both the federal / provincial operated National Air Pollution Surveillance (NAPS) network as well and the stations operated by industrial facilities in the province. Both datasets undergo rigorous quality assurance procedure to ensure that the highest level of data confidence is achieved.

In 2009, most monitors indicated no exceedances of the ambient air quality standards. Those stations which indicated exceedances tended to be at an industrial property boundary and away from the community, though there were instances when a community based monitor indicated an exceedance of the air quality standard.

The report does not provide commentary into any trend identified in the data except in situations where there has been a technological change in the data collection system or there has been is change in operating condition in the case of industrial monitoring.

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## 1.0 Introduction

The air quality in Newfoundland and Labrador is monitored through a joint effort between the Department of Environment and Conservation, Environment Canada and the major industrial operations in the province. The Department operates several stations as part of the National Air Pollutant Surveillance (NAPS) network, while industrial facilities are required to monitor their own emissions, with the Department auditing their operation on a regular basis.

In general the air quality in the province is good as indicated by the levels recorded at the various monitors; however in 2009 there were instances where an individual industry had emissions which approached or exceeded the associated ambient standard. There were also instances when elevated air pollutant levels were seen as a result of long range transport.

This report provides summary information and trends for all air quality measured in Newfoundland and Labrador in 2009. All data has gone through a data reduction / quality assurance process to ensure that any anomalous readings or system malfunctions are accounted for.

In this report, Section 2 provides an overview of the monitoring network in the province, a description of the pollutants being measured and their associated standard. Section 3 provides results from the monitors in the NAPS network, while Section 4 provides results from the monitoring of industrial emissions.

## 1.1 Definitions

The following definitions are used throughout this report:

AQHI	Air Quality Health Index
CO	Carbon Monoxide
IOCC	Iron Ore Company of Canada
NARL	North Atlantic Refining Limited
NAPS	National Air Pollutant Surveillance
NO <sub>2</sub>	Nitrogen Dioxide
NO <sub>x</sub>	Oxides of Nitrogen
O <sub>3</sub>	Ozone
PM <sub>2.5</sub>	Particulate Matter less than or equal to 2.5 microns
PM <sub>10</sub>	Particulate Matter less than or equal to 10 microns
SO <sub>2</sub>	Sulphur Dioxide
TSP	Total Suspended Particulate
µg/m <sup>3</sup>	Micrograms per cubic metre

## **2.0 MONITORING NETWORK**

Five pollutants are measured in the monitoring networks in the province. These are sulphur dioxide (SO<sub>2</sub>), oxides of nitrogen (NO<sub>x</sub>), carbon monoxide (CO), particulate matter (PM) and ozone (O<sub>3</sub>). Volatile organic compounds, (VOCs) are also measured periodically at the NAPS stations, but are not included in the report.

### **2.1 Pollutants**

#### **2.1.1 Oxides of Nitrogen (NO<sub>x</sub>)**

In a combustion process, NO<sub>x</sub> is produced through 3 mechanisms, namely thermal NO<sub>x</sub>, fuel NO<sub>x</sub> and prompt NO<sub>x</sub>. Thermal NO<sub>x</sub> is the primary source of NO<sub>x</sub> and is formed as a high temperature dissociation and subsequent reaction of nitrogen (N<sub>2</sub>) and oxygen (O<sub>2</sub>). It is produced in the hottest part of the flame and its formation increases exponentially with the flame temperature. The control of thermal NO<sub>x</sub> is generally achieved through reducing the flame temperature, reducing the residence time, or by operating under fuel rich conditions. Fuel NO<sub>x</sub> is formed by the reaction of nitrogen compounds chemically bound in liquid or solid fuels with oxygen in the combustion air. In the combustion of such fuels, fuel NO<sub>x</sub> can account for up to 50% of the total NO<sub>x</sub> emissions. Prompt NO<sub>x</sub> is formed from the rapid reaction of atmospheric nitrogen with hydrocarbon radicals, and typically under partially fuel-rich conditions. It can be reduced through combustion staging or by operating under highly oxidizing combustion conditions.

NO<sub>2</sub> is the primary component of concern in NO<sub>x</sub> emissions. Only about 5% of the NO<sub>x</sub> emitted from diesel fuel combustion is emitted as NO<sub>2</sub>. The remainder is emitted as NO, which is subsequently converted to NO<sub>2</sub> in reactions with various oxidants and oxygen as the plume is transported downwind from the source. The rate of NO<sub>2</sub> formation varies with time of day, season, temperature, wind speed, solar radiation and the availability of oxidants to help drive the chemical reactions.

NO<sub>2</sub> is a reddish brown gas with a pungent odour, which upon reaction with other atmospheric compounds, becomes a major contributor to smog, acid rain, inhalable particulates and reduced visibility. At significant levels and exposure, inhalation may result in irritation and burning to the skin and eyes, nose and throat. Prolonged exposure may result in permanent lung damage.

#### **2.1.2 Particulate Matter (PM)**

Particulate matter is the term for particles found in the air, including dust, dirt, soot, smoke, and liquid droplets, and can be large and dark enough to be seen with the naked eye or so small that they can only be detected with an electron microscope. Many

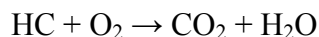
manmade and natural sources emit particulate matter directly while others emit gaseous pollutants that react in the atmosphere to form particulate matter.

The size of the particulate has important health considerations. Particulate matter less than 10 microns in diameter (PM<sub>10</sub>) poses a health concern because it can be inhaled into and accumulate in the respiratory system. Particulate matter less than 2.5 microns in diameter (PM<sub>2.5</sub>) is believed to pose the greatest health risks as it can lodge deeply into the lungs; a PM<sub>2.5</sub> particle is approximately 1/30<sup>th</sup> the average width of a human hair. Typically these smaller particles are suspended in the air for long periods of time. Total Suspended Particulate (TSP) is the term applied to any particle suspended in the atmosphere, but depending on the monitoring method, is typically limited to particulate matter less than 44 microns. Particulate larger than 10 microns is typically associated with a nuisance issue rather than a health issue.

### **2.1.3 Carbon Monoxide (CO)**

Carbon monoxide is a colourless / odourless gas which reduces the delivery of oxygen to the body's organs. For those with heart disease, exposure to low doses can result in chest pain. For healthier people, exposure to higher levels affects the central nervous system.

Incomplete oxidation of fuel results in the formation of CO. In simplified terms, the generic stoichiometric combustion equation is:



However if sufficient oxygen (O<sub>2</sub>) is not present to complete the combustion of the hydrocarbon fuel (HC), then the oxidation to carbon dioxide (CO<sub>2</sub>) and water (H<sub>2</sub>O) is not completed and hence CO is emitted.

### **2.1.4 Sulphur Dioxide (SO<sub>2</sub>)**

Levels of sulphur dioxide (SO<sub>2</sub>) in ambient air are directly related to the concentration of sulphur in fuel and the quantity of fuel being combusted. Upon combustion, approximately 98% of the sulphur in the fuel will oxidize to form SO<sub>2</sub>, with the remaining 2% producing sulphur trioxide (SO<sub>3</sub>). The emitted SO<sub>2</sub> can also further oxidize to SO<sub>3</sub> and react with water to produce acid rain in the form of sulphuric acid (H<sub>2</sub>SO<sub>4</sub>).

Short-term exposures to SO<sub>2</sub>, have shown adverse respiratory effects including bronchoconstriction and increased asthma symptoms.

## 2.1.5 Ozone (O<sub>3</sub>)

Ground-level ozone is not directly emitted into the air, but rather is formed by chemical reactions between NO<sub>x</sub> and volatile organic compounds (VOCs) in the presence of ultraviolet (uv) radiation. Ozone is a primary component of smog.

Breathing ozone, can trigger a variety of health problems including chest pain, coughing, throat irritation, and congestion. It can also worsen bronchitis, emphysema, and asthma as well as reduce lung function and inflame the linings of the lungs, permanently scarring lung tissue under repeated exposure.

## 2.2 Ambient Air Standards

The maximum concentrations of air pollutants considered to be protective of the environment are defined in the *Air Pollution Control Regulations, 2004*. For the pollutants discussed in the report, the ambient air standards are detailed in Table 2.1.

**TABLE 2.1 - AMBIENT AIR STANDARDS IN NEWFOUNDLAND AND LABRADOR**

Pollutant	Averaging Period	Concentration (µg/m <sup>3</sup> )
Carbon Monoxide (CO)	1-hour	35000
	8-hour	15000
Nitrogen Dioxide (NO <sub>2</sub> )	1-hour	400
	24-hour	200
	1-year	100
Ozone	1-hour	160
	8-hour	87
Particulate Matter < 2.5 microns (PM <sub>2.5</sub> )	24-hour	25
Particulate Matter < 10 microns (PM <sub>10</sub> )	24-hour	50
Particulate Matter Total (TPM)	24-hour	120
	1-year	60
Sulphur Dioxide (SO <sub>2</sub> )	1-hour	900
	3-hour	600
	24-hour	300
	1-year	60

## 2.3 Monitoring in Newfoundland and Labrador

Table 1 provides the listing of monitoring stations in the province at the end of 2009 and the pollutants which are measured.

**TABLE 2.2 - POLLUTANT MONITORING IN NEWFOUNDLAND AND LABRADOR**

Operator	Station Location	Pollutant						
		SO <sub>2</sub>	NO <sub>x</sub>	O <sub>3</sub>	TSP	PM <sub>10</sub>	PM <sub>2.5</sub>	CO
Environment and Conservation + Environment Canada	Water Street, St. John's	✓	✓	✓			✓	✓
	Old Placentia Road, Mount Pearl	✓	✓	✓			✓	✓
	Macpherson Avenue, Corner Brook	✓	✓	✓			✓	✓
	Scott Avenue, Grand Falls Windsor			✓				
	Ferolle Point			✓				
NALCOR Energy	Butterpot Road	✓	✓				✓	
	Green Acres Road	✓	✓		✓		✓	
	Indian Pond Drive	✓	✓		✓		✓	
	Indian Pond Road	✓	✓		✓		✓	
	Lawrence Pond Road	✓	✓		✓		✓	
	Property Boundary				✓		✓	
North Atlantic Refining Limited	Come by Chance	✓					✓	
	First Street, Arnold's Cove	✓					✓	
	Sunnyside	✓				✓	✓	
	Property Boundary	✓					✓	
Corner Brook Pulp and Paper	Main Street	✓			✓		✓	
	West Street				✓			
Wabush	Bond Avenue	✓					✓	

Operator	Station Location	Pollutant						
		SO <sub>2</sub>	NO <sub>x</sub>	O <sub>3</sub>	TSP	PM <sub>10</sub>	PM <sub>2.5</sub>	CO
Mines	Shea Street				✓			
	Hydro Substation					✓	✓	
Iron Ore Company of Canada	Tamarack Drive				✓			
	Vanier Avenue				✓			
	Bartlett Drive	✓			✓		✓	
	Property Boundary				✓			
Vale Inco	Voisey's Bay Camp		✓				✓	
	Voisey's Bay Process Area		✓					
	Voisey's Bay Port						✓	

## 2.4 Air Quality Health Index (AQHI)

The Air Quality Health Index is an index created to associate the air quality around you to what it means to your health. It is a numbered scaled from 1 to 10+ where the higher the number the greater the health risk associated with air quality. Specifically the AQHI health messages are defined in Table 2.3.

The AQHI is calculated on an hourly basis based on the relative risks of O<sub>3</sub>, PM<sub>2.5</sub> and NO<sub>2</sub>. Data for the calculation of AQHI is currently being monitored at the NAPS stations and the hourly AQHI is published to the Environment Canada weather office website [http://www.weatheroffice.gc.ca/forecast/canada/index\\_e.html?id=nl](http://www.weatheroffice.gc.ca/forecast/canada/index_e.html?id=nl).

**TABLE 2.3 - AQHI HEALTH MESSAGES**

AQHI reading	Health Risk Level	Health Messages	
		General Population	At Risk Population
1-3	Low	Ideal air quality for outdoor activities.	Enjoy your usual outdoor activities.
4-6	Moderate	No need to modify your usual outdoor activities unless you experience symptoms such as coughing and throat irritation.	Consider reducing or rescheduling strenuous activities outdoors if you are experiencing symptoms.
7-10	High	Consider reducing or rescheduling strenuous activities outdoors if you experience symptoms such as coughing and throat irritation.	Reduce or reschedule strenuous activities outdoors. Children and the elderly should also take it easy.
10+	Very High	Reduce or reschedule strenuous activities outdoors, especially if you experience symptoms such as coughing and throat irritation.	Avoid strenuous activities outdoors. Children and the elderly should also avoid outdoor physical exertion.

## 2.5 Data Validity and Acceptability

All data monitored in both the NAPS network and the industrial monitoring network undergoes a data reduction and quality assurance procedure before being published. This procedure ensures that any anomalous readings or questionable data is not incorporated into the published dataset. Elements of this procedure account for:

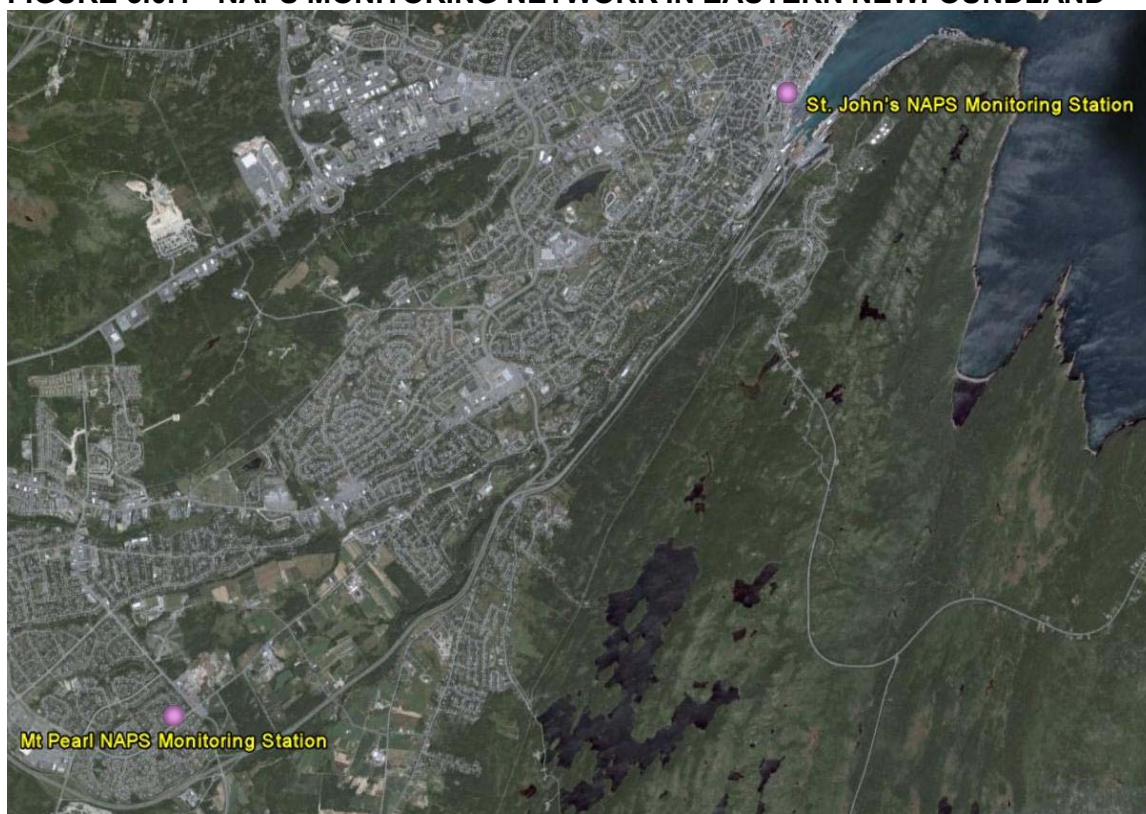
- Routine calibration and auditing of the analyzers
- Zero correction of the baseline drift and noise
- Analyzer “Status Flag” activation
- Shelter temperature analysis
- Statistical rendering of outliers

### 3.0 National Air Pollutant Surveillance Network (NAPS)

The NAPS network in the province is established to monitor the air quality in primarily urbanized settings and in neighbourhoods away from the influences of industrial operations. In 2009 there were 3 sites operational with a complete suite monitoring ( $\text{SO}_2$ ,  $\text{PM}_{2.5}$ ,  $\text{NO}_x / \text{NO}_2$ ,  $\text{CO}$  and  $\text{O}_3$ ) and 2 which monitored  $\text{O}_3$  only. The 3 sites with the complete monitoring were located in St. John's on Water Street, in Mt. Pearl on Old Placentia Road and in Corner Brook on Macpherson Avenue. These NAPS stations also provide the data necessary to calculate the AQHI. The 2 sites which monitored  $\text{O}_3$  only were located on Scott Avenue in Grand Falls Windsor and in Ferolle Point.

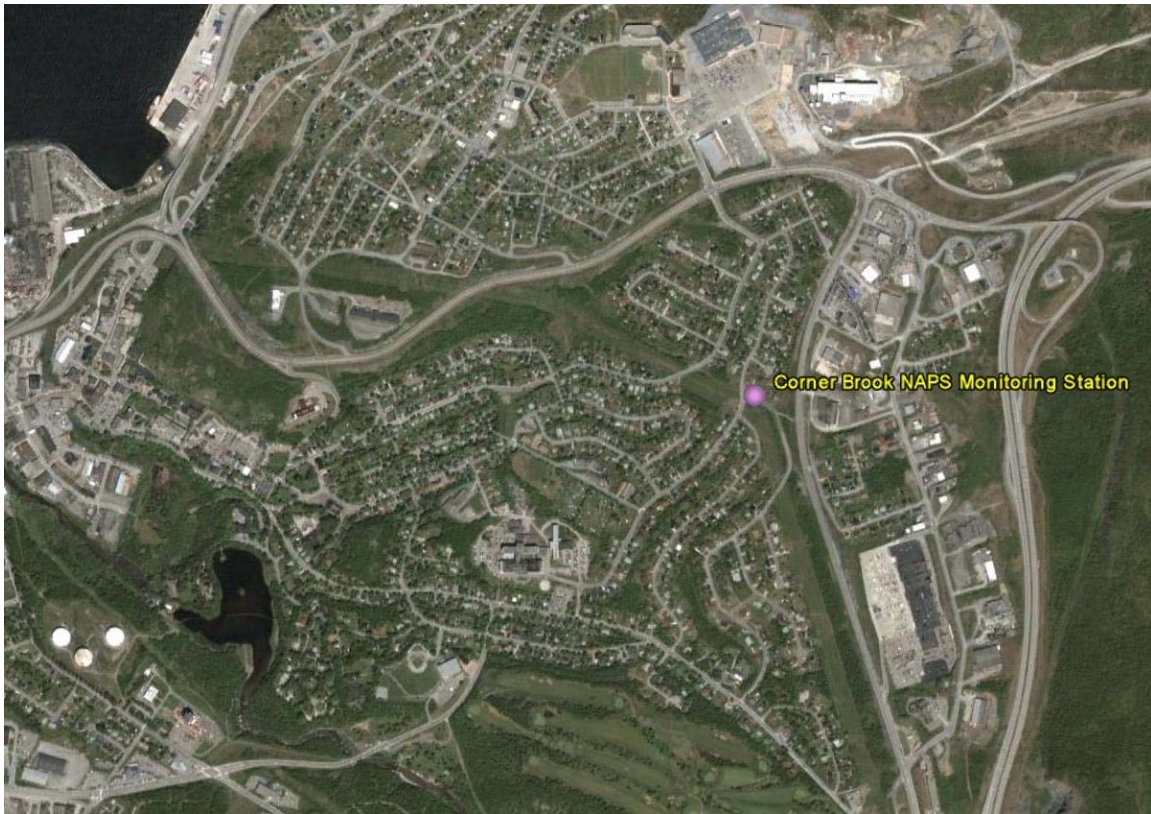
The location of the NAPS stations in eastern Newfoundland is presented in Figures 3.0.1, while the Corner Brook location is presented in Figure 3.0.2. The location of the Grand Falls Windsor station is presented in Figure 3.0.3 while Figure 3.0.4 presents the location of the Ferolle Point Station.

**FIGURE 3.0.1 - NAPS MONITORING NETWORK IN EASTERN NEWFOUNDLAND**

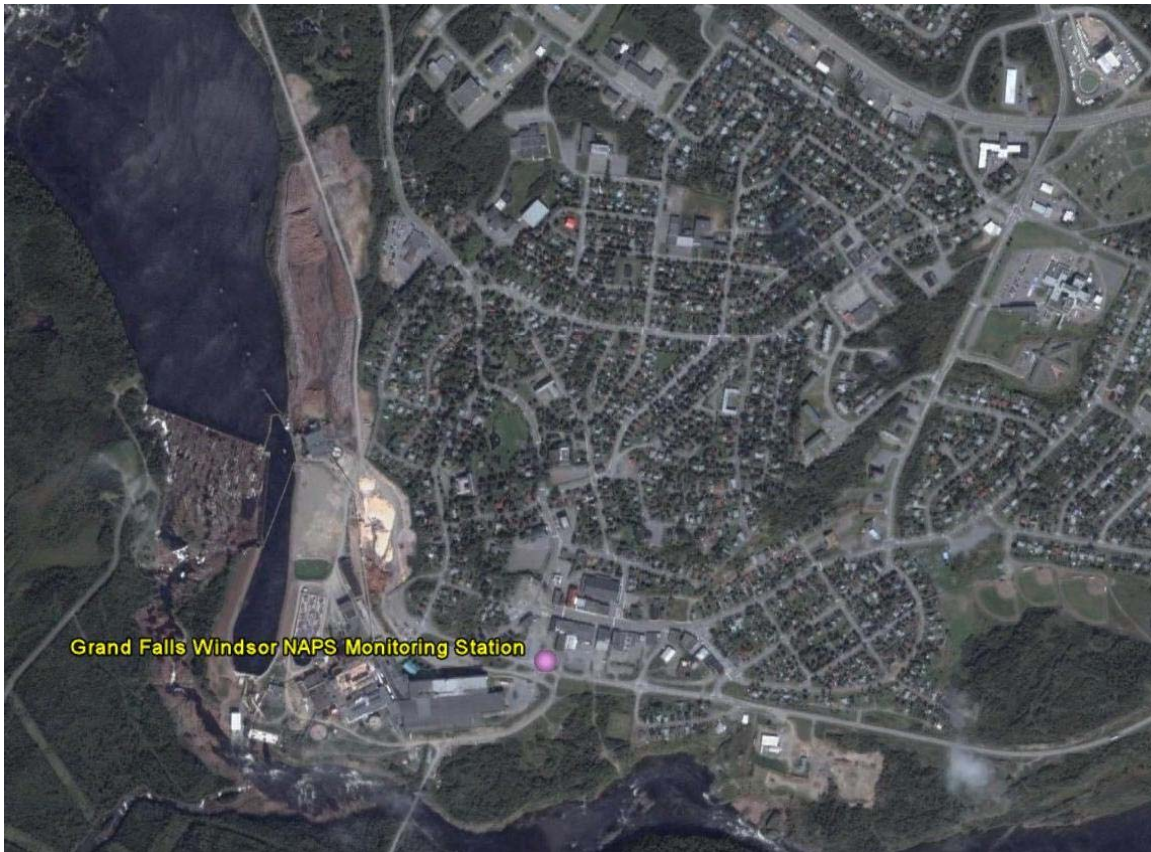




**FIGURE 3.0.2 - NAPS MONITORING NETWORK IN CORNER BROOK**



**FIGURE 3.0.3 - NAPS MONITORING NETWORK IN GRAND FALLS WINDSOR**



**FIGURE 3.0.4 - NAPS MONITORING NETWORK IN FEROLLE POINT**



### **3.1 St. John's**

The St. John's NAPS monitoring station is located on Water Street near the convention centre and monitors the ambient levels of SO<sub>2</sub>, NO<sub>x</sub> / NO<sub>2</sub>, CO, O<sub>3</sub> and PM<sub>2.5</sub> on a continuous basis. For all pollutants, the ambient air criteria were not exceeded on any occasion in 2009. Tables 3.1.1 through 3.1.5 present the summary information on the level of air contaminants measured at the St. John's NAPS station, while Figures 3.1.1 through 3.1.5 provide a graphical representation of the annual trend of each pollutant. Table 3.1.6 provides a summary of the AQHI in 2008 and 2009 while Figure 3.1.6 provides a graphical representation of the percentage of time the AQHI values were below a given level in 2009.

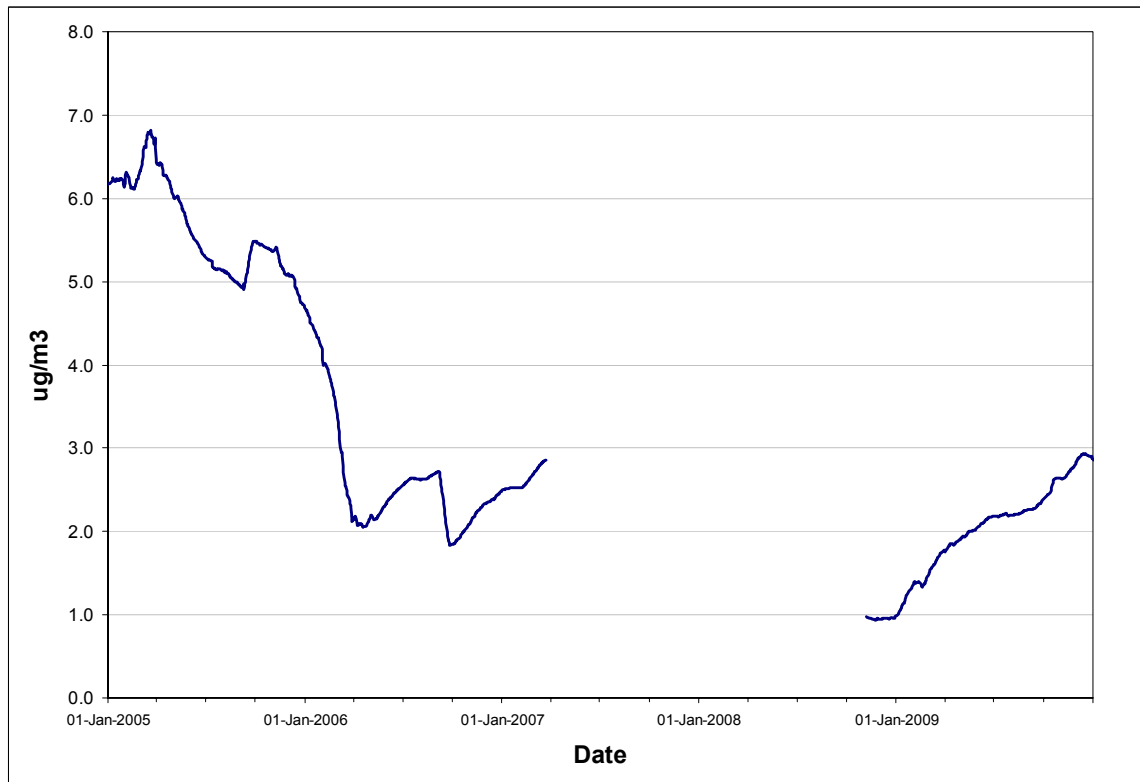
Of particular note, in 2008, the method of measuring PM<sub>2.5</sub> changed from Tapered Element Oscillating Microbalance (TEOM) technology to Beta Attenuation Monitor (BAM) technology. This resulted in a sharp increase in the PM<sub>2.5</sub> concentrations.

**TABLE 3.1.1 - ST. JOHN'S NAPS SO<sub>2</sub> SUMMARY 2008 & 2009**

Year	Month	# Valid Hours	% Valid Hours	Average	Maximum			Regulatory Exceedances		
					1-Hour	3-Hour	24-Hour	1-Hour (>900)	3-Hour (>600)	24-Hour (>300)
2008	January	0	0.0%							
	February	581	83.5%	4.4	28.3	23.4	12.0	0	0	0
	March	740	99.5%	0.7	18.6	13.7	2.9	0	0	0
	April	709	98.5%	1.7	26.7	22.6	8.7	0	0	0
	May	738	99.2%	0.9	15.3	12.5	5.5	0	0	0
	June	717	99.6%	0.4	5.5	2.9	1.2	0	0	0
	July	737	99.1%	0.8	22.3	15.4	4.3	0	0	0
	August	739	99.3%	0.1	38.6	21.7	4.1	0	0	0
	September	713	99.0%	0.1	5.4	3.3	0.9	0	0	0
	October	733	98.5%	0.2	9.1	5.5	1.3	0	0	0
	November	712	98.9%	0.7	13.4	9.5	4.4	0	0	0
	December	740	99.5%	1.4	19.4	14.3	7.4	0	0	0
Annual		7859	89.5%	1.0	38.6	23.4	12.0	0	0	0
2009	January	737	99.1%	5.2	35.7	23.1	10.1	0	0	0
	February	660	98.2%	5.6	39.1	33.0	13.5	0	0	0
	March	739	99.3%	4.3	42.8	36.1	14.9	0	0	0
	April	707	98.2%	3.4	70.6	32.9	8.2	0	0	0
	May	738	99.2%	2.6	25.4	17.3	6.2	0	0	0
	June	659	91.5%	1.9	40.3	27.2	6.4	0	0	0
	July	733	98.5%	1.0	7.3	4.7	2.8	0	0	0
	August	730	98.1%	0.9	16.2	6.5	2.8	0	0	0
	September	717	99.6%	1.5	9.7	8.8	6.4	0	0	0
	October	377	50.7%	3.9	20.1	16.1	11.5	0	0	0
	November	709	98.5%	2.9	13.1	9.6	6.0	0	0	0
	December	738	99.2%	1.9	9.1	7.7	5.9	0	0	0
Annual		8244	94.1%	2.9	70.6	36.1	14.9	0	0	0

Observations in ug/m<sup>3</sup>

**FIGURE 3.1.1 - ST. JOHN'S NAPS ANNUAL SO<sub>2</sub> CONCENTRATIONS**



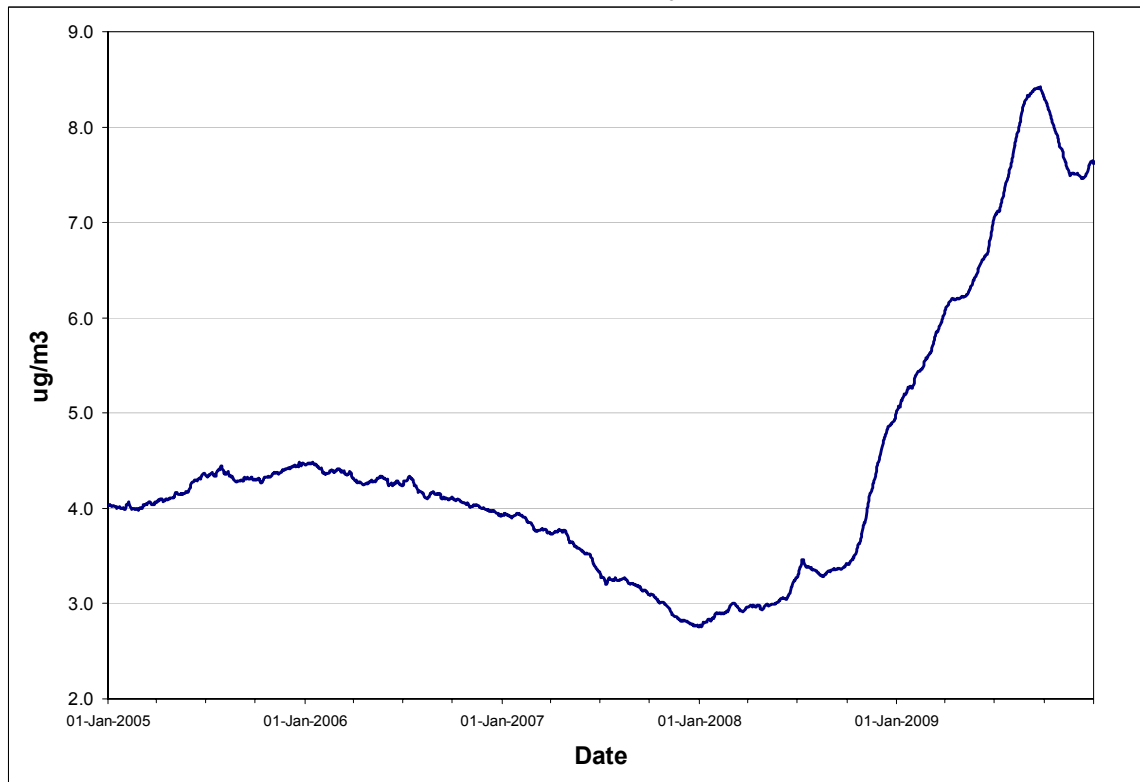
Rolling annual average of hourly concentrations

**TABLE 3.1.2 - ST. JOHN'S NAPS PM<sub>2.5</sub> SUMMARY 2008 & 2009**

Year	Month	# Valid Days	% Valid Days	Average	Maximum 24-Hour	Regulatory Exceedances (>25)
2008	January	31	100.0%	5.2	10.9	0
	February	22	75.9%	4.5	8.7	0
	March	28	90.3%	3.6	6.1	0
	April	19	63.3%	4.7	7.9	0
	May	3	9.7%	4.4	5.7	0
	June	12	40.0%	4.2	12.5	0
	July	31	100.0%	4.4	14.5	0
	August	30	96.8%	2.9	5.6	0
	September	24	80.0%	2.6	5.0	0
	October	14	45.2%	7.6	10.9	0
	November	30	100.0%	8.3	20.3	0
	December	31	100.0%	7.1	13.8	0
Annual		275	75.1%	5.0	20.3	0
2009	January	31	100.0%	7.6	16.6	0
	February	27	96.4%	8.0	15.3	0
	March	29	93.5%	8.2	12.8	0
	April	30	100.0%	6.6	10.0	0
	May	31	100.0%	8.8	20.3	0
	June	30	100.0%	11.8	18.9	0
	July	30	96.8%	10.6	16.6	0
	August	31	100.0%	11.1	21.5	0
	September	30	100.0%	3.7	10.4	0
	October	31	100.0%	1.8	5.6	0
	November	30	100.0%	5.0	13.1	0
	December	31	100.0%	8.4	19.5	0
Annual		361	98.9%	7.6	21.5	0

Observations in ug/m<sup>3</sup>

**FIGURE 3.1.2 - ST. JOHN'S NAPS ANNUAL PM<sub>2.5</sub> CONCENTRATIONS**



Rolling annual average of hourly concentrations

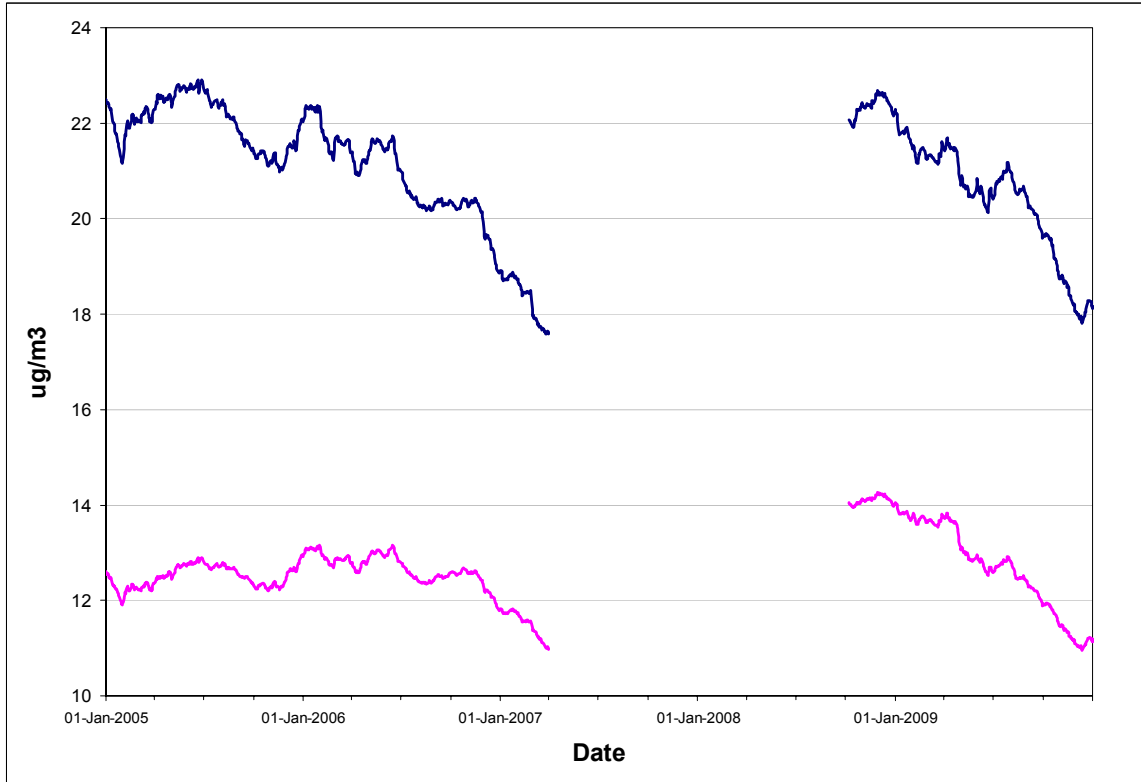
**TABLE 3.1.3 - ST. JOHN'S NAPS NO<sub>x</sub> / NO<sub>2</sub> SUMMARY 2008 & 2009**

Year	Month	# Valid Hours	% Valid Hours	Average NO <sub>x</sub> NO <sub>2</sub>		Maximums				Exceedances	
						1-Hour NO <sub>x</sub> NO <sub>2</sub>		24-Hour NO <sub>x</sub> NO <sub>2</sub>		1-Hour (>400)	24-Hour (>200)
2008	January	655	88.0%	24.7	15.1	280.6	65.4	79.9	34.4	0	0
	February	681	97.8%	24.6	14.4	228.5	74.3	53.2	32.0	0	0
	March	739	99.3%	19.2	13.3	209.1	105.7	47.7	30.6	0	0
	April	710	98.6%	26.7	19.6	178.6	79.1	67.1	49.7	0	0
	May	738	99.2%	19.9	13.7	150.6	77.6	52.9	31.1	0	0
	June	717	99.6%	29.1	17.6	246.7	72.4	86.0	36.7	0	0
	July	738	99.2%	15.3	8.8	374.4	59.8	47.3	19.4	0	0
	August	739	99.3%	20.4	12.9	128.4	50.5	43.2	25.5	0	0
	September	714	99.2%	21.3	12.5	150.1	55.2	53.8	29.5	0	0
	October	734	98.7%	23.9	13.8	281.9	65.6	67.7	29.0	0	0
	November	715	99.3%	24.8	15.4	218.9	93.6	69.8	37.3	0	0
	December	740	99.5%	17.8	11.6	131.6	57.4	44.9	23.4	0	0
Annual		8620	98.1%	22.2	14.0	374.4	105.7	86.0	49.7	0	0
2009	January	725	97.4%	16.9	11.4	356.4	79.4	44.1	23.8	0	0
	February	660	98.2%	19.9	13.2	174.3	78.5	82.7	42.6	0	0
	March	739	99.3%	22.2	14.8	262.3	103.1	76.1	41.3	0	0
	April	707	98.2%	18.7	12.4	248.4	88.8	61.3	32.0	0	0
	May	738	99.2%	18.4	10.9	314.4	78.5	92.4	36.9	0	0
	June	669	92.9%	25.7	13.3	300.0	66.3	78.4	36.1	0	0
	July	722	97.0%	22.8	12.2	241.5	87.5	74.5	28.4	0	0
	August	730	98.1%	13.7	7.6	223.3	48.2	32.7	13.4	0	0
	September	716	99.4%	10.7	6.3	136.0	45.3	34.3	15.4	0	0
	October	740	99.5%	14.0	8.9	147.0	48.8	44.5	22.1	0	0
	November	713	99.0%	16.6	10.8	208.7	69.9	58.0	29.7	0	0
	December	738	99.2%	18.3	12.2	139.7	63.4	48.4	30.2	0	0
Annual		8597	98.1%	18.1	11.1	356.4	103.1	92.4	42.6	0	0

Observations in ug/m<sup>3</sup>



**FIGURE 3.1.3 - ST. JOHN'S NAPS ANNUAL NO<sub>x</sub> / NO<sub>2</sub> CONCENTRATIONS**



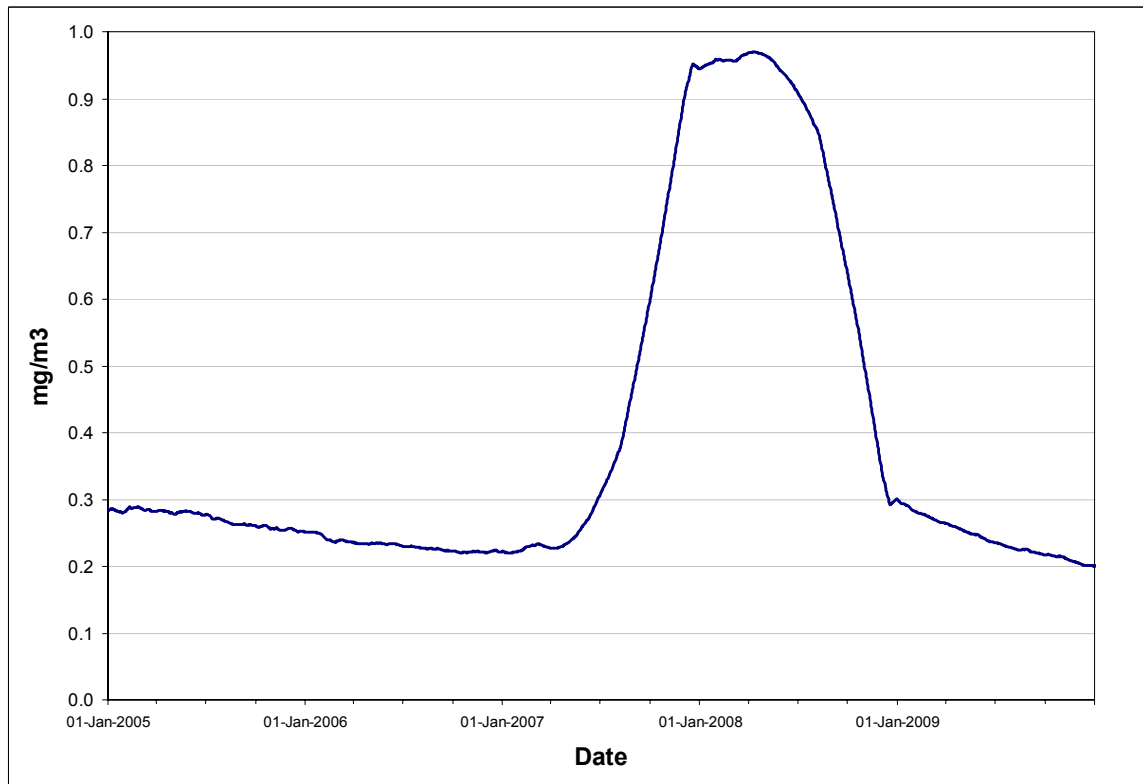
Rolling annual average of hourly concentrations

**TABLE 3.1.4 - ST. JOHN'S NAPS CO SUMMARY 2008 & 2009**

Year	Month	# Valid Hours	% Valid Hours	Average	Maximum		Regulatory Exceedances	
					1-Hour	8-Hour	1-Hour (>35)	8-Hour (>15)
2008	January	739	99.3%	0.4	2.3	1.3	0	0
	February	688	98.9%	0.4	1.1	0.6	0	0
	March	739	99.3%	0.4	1.0	0.6	0	0
	April	711	98.8%	0.3	1.0	0.6	0	0
	May	738	99.2%	0.3	0.8	0.5	0	0
	June	717	99.6%	0.3	0.9	0.6	0	0
	July	739	99.3%	0.2	0.6	0.5	0	0
	August	739	99.3%	0.2	0.8	0.4	0	0
	September	714	99.2%	0.2	0.7	0.5	0	0
	October	734	98.7%	0.2	1.5	0.5	0	0
	November	715	99.3%	0.3	1.2	1.0	0	0
	December	740	99.5%	0.3	1.2	0.9	0	0
Annual		8713	99.2%	0.3	2.3	1.3	0	0
2009	January	737	99.1%	0.2	1.0	0.5	0	0
	February	659	98.1%	0.3	1.7	0.6	0	0
	March	739	99.3%	0.3	1.1	0.5	0	0
	April	707	98.2%	0.2	0.7	0.4	0	0
	May	732	98.4%	0.2	0.8	0.4	0	0
	June	669	92.9%	0.2	0.7	0.3	0	0
	July	732	98.4%	0.1	0.6	0.5	0	0
	August	730	98.1%	0.2	1.3	0.5	0	0
	September	604	83.9%	0.1	0.5	0.3	0	0
	October	0	0.0%					
	November	602	83.6%	0.2	0.8	0.6	0	0
	December	722	97.0%	0.2	1.1	0.8	0	0
Annual		7633	87.1%	0.2	1.7	0.8	0	0

Observations in mg/m<sup>3</sup>

**FIGURE 3.1.4 - ST. JOHN'S NAPS ANNUAL CO CONCENTRATIONS**



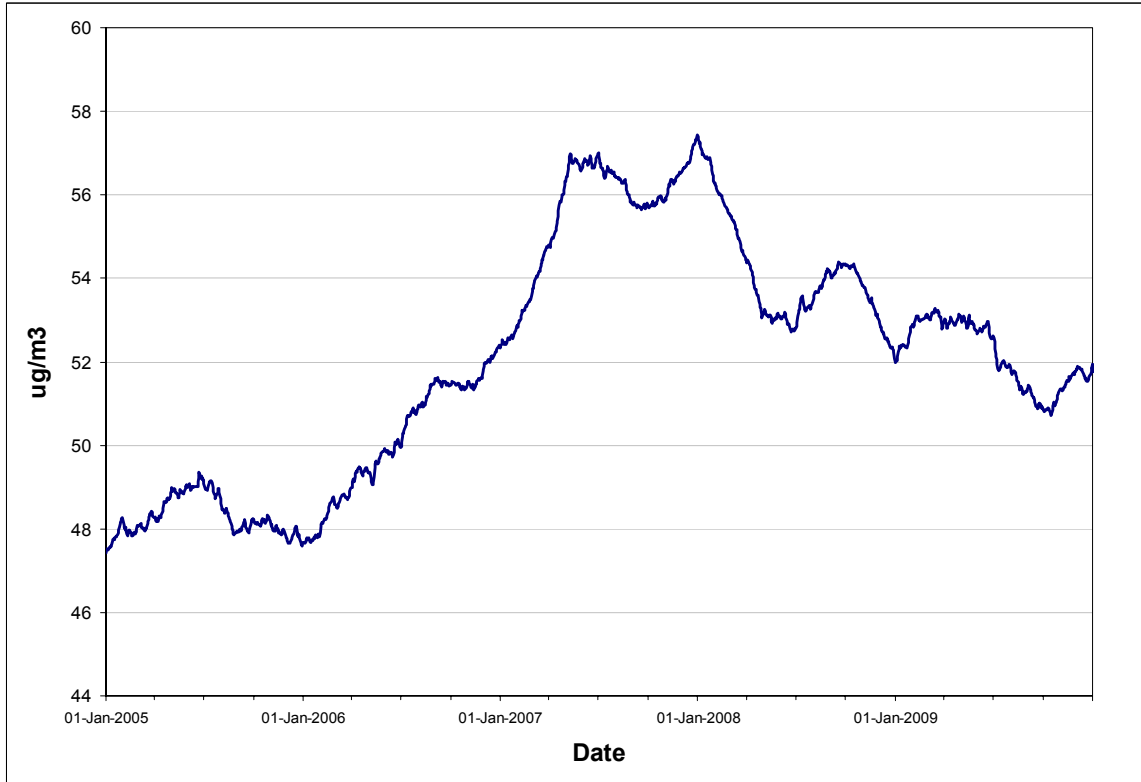
Rolling annual average of hourly concentrations

**TABLE 3.1.5 - ST. JOHN'S NAPS O<sub>3</sub> SUMMARY 2008 & 2009**

Year	Month	# Valid Hours	% Valid Hours	Average	Maximum		Regulatory Exceedances	
					1-Hour	8-Hour	1-Hour (>160)	8-Hour (>87)
2008	January	736	98.9%	48.4	80.5	79.3	0	0
	February	689	99.0%	60.4	86.5	84.2	0	0
	March	739	99.3%	64.8	86.2	83.5	0	0
	April	711	98.8%	64.2	97.4	89.9	0	4
	May	738	99.2%	62.3	101.2	94.5	0	2
	June	714	99.2%	45.8	85.1	76.7	0	0
	July	737	99.1%	47.1	116.3	106.0	0	3
	August	739	99.3%	46.9	101.6	82.8	0	0
	September	712	98.9%	43.8	83.7	74.0	0	0
	October	735	98.8%	43.2	81.8	71.7	0	0
	November	711	98.8%	45.8	76.3	72.6	0	0
	December	740	99.5%	51.9	78.4	75.3	0	0
Annual		8701	99.1%	52.0	116.3	106.0	0	9
2009	January	738	99.2%	58.1	85.3	75.2	0	0
	February	660	98.2%	64.6	92.9	86.6	0	0
	March	733	98.5%	62.6	91.8	88.7	0	1
	April	707	98.2%	66.1	101.1	91.4	0	4
	May	732	98.4%	57.6	127.0	103.7	0	4
	June	659	91.5%	43.7	89.0	75.3	0	0
	July	732	98.4%	39.5	71.1	66.0	0	0
	August	730	98.1%	39.1	112.8	89.8	0	1
	September	715	99.3%	39.4	79.3	74.8	0	0
	October	717	96.4%	47.7	76.5	74.4	0	0
	November	436	60.6%	51.2	76.0	73.6	0	0
	December	738	99.2%	53.7	82.3	81.2	0	0
Annual		8297	94.7%	51.9	127.0	103.7	0	10

Observations in ug/m<sup>3</sup>

**FIGURE 3.1.5 - ST. JOHN'S NAPS ANNUAL O<sub>3</sub> CONCENTRATIONS**

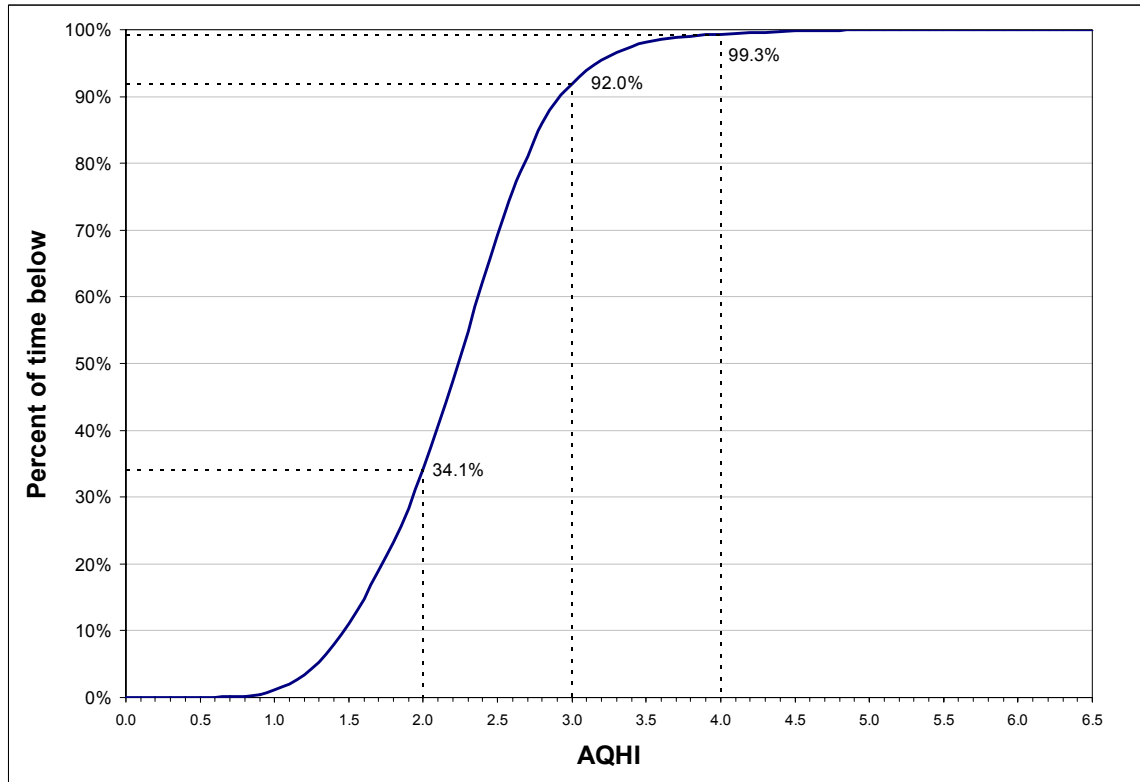


Rolling annual average of hourly concentrations

**TABLE 3.1.6 - ST. JOHN'S NAPS AQHI SUMMARY 2008 & 2009**

Year	Month	# Valid Hours	% Valid Hours	Average	<u>Maximum</u> 1-Hour
2008	January	643	86.4%	2.2	3.6
	February	530	76.1%	2.4	4.3
	March	674	90.6%	2.5	5.7
	April	556	77.2%	2.8	5.5
	May	102	13.7%	2.2	3.9
	June	515	71.5%	2.3	4.9
	July	716	96.2%	1.9	4.5
	August	688	92.5%	1.9	3.4
	September	563	78.2%	1.8	3.0
	October	339	45.6%	2.2	4.9
	November	704	97.8%	2.3	7.2
	December	738	99.2%	2.2	3.9
Annual		6768	77.0%	2.2	7.2
2009	January	720	96.8%	2.4	6.4
	February	652	97.0%	2.7	3.8
	March	701	94.2%	2.7	5.6
	April	707	98.2%	2.6	4.4
	May	731	98.3%	2.4	5.1
	June	657	91.3%	2.3	5.3
	July	717	96.4%	2.1	4.8
	August	721	96.9%	1.9	4.7
	September	708	98.3%	1.5	2.5
	October	696	93.5%	1.7	2.8
	November	431	59.9%	2.2	4.0
	December	738	99.2%	2.4	4.6
Annual		8179	93.4%	2.2	6.4

**FIGURE 3.1.6 - ST. JOHN'S NAPS AQHI FREQUENCY DISTRIBUTION 2009**



eg. 92.0% of the time the AQHI recorded was below 3.0

### **3.2 Mt. Pearl**

The Mt. Pearl NAPS monitoring station is located on Old Placentia Road near Admiralty House and monitors the ambient levels of SO<sub>2</sub>, NO<sub>x</sub> / NO<sub>2</sub>, CO, O<sub>3</sub> and PM<sub>2.5</sub> on a continuous basis. For all pollutants, the ambient air criteria were not exceeded on any occasion in 2009. Tables 3.2.1 through 3.2.5 present the summary information on the level of air contaminants measured at the Mt. Pearl NAPS station, while Figures 3.2.1 through 3.2.5 provide a graphical representation of the annual trend of each pollutant. Table 3.2.6 provides a summary of the AQHI in 2008 and 2009 while Figure 3.2.6 provides a graphical representation of the percentage of time the AQHI values were below a given level in 2009.

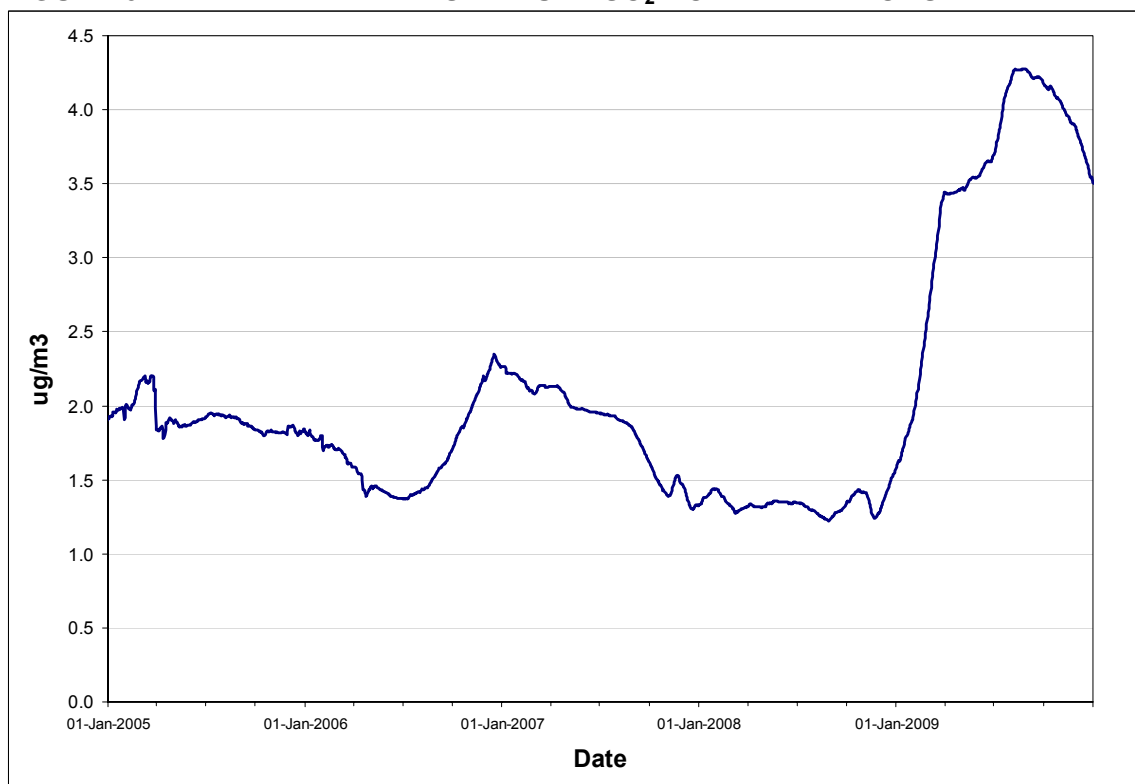
**TABLE 3.2.1 - MT. PEARL NAPS SO<sub>2</sub> SUMMARY 2008 & 2009**

Year	Month	# Valid Hours	% Valid Hours	Average	Maximum			Regulatory Exceedances		
					1-Hour	3-Hour	24-Hour	1-Hour (>900)	3-Hour (>600)	24-Hour (>300)
2008	January	739	99.3%							
	February	690	99.1%	1.1	23.9	14.7	3.3	0	0	0
	March	740	99.5%	1.1	8.9	5.3	2.3	0	0	0
	April	709	98.5%	0.5	8.2	6.3	2.1	0	0	0
	May	738	99.2%	0.7	16.1	12.3	4.9	0	0	0
	June	717	99.6%	0.5	8.3	3.5	2.3	0	0	0
	July	741	99.6%	0.8	33.5	12.3	2.7	0	0	0
	August	736	98.9%	0.6	2.8	2.3	2.0	0	0	0
	September	715	99.3%	1.4	4.2	3.9	3.3	0	0	0
	October	739	99.3%	2.1	10.2	8.8	4.3	0	0	0
	November	714	99.2%	3.0	17.9	10.5	5.9	0	0	0
	December	736	98.9%	4.5	15.3	10.6	6.0	0	0	0
Annual		8714	99.2%	1.4	33.5	14.7	6.0	0	0	0
2009	January	699	94.0%	6.8	29.6	16.8	9.8	0	0	0
	February	666	99.1%	10.1	32.4	25.4	13.7	0	0	0
	March	739	99.3%	10.9	38.5	30.4	16.7	0	0	0
	April	713	99.0%	0.8	7.9	5.5	2.8	0	0	0
	May	619	83.2%	1.4	10.6	6.9	2.9	0	0	0
	June	361	50.1%	0.7	5.1	3.1	1.7	0	0	0
	July	390	52.4%	8.0	14.0	12.4	10.3	0	0	0
	August	601	80.8%	0.9	12.6	9.5	5.4	0	0	0
	September	718	99.7%	0.5	3.9	3.1	1.8	0	0	0
	October	642	86.3%	0.4	3.7	2.1	1.5	0	0	0
	November	710	98.6%	0.9	14.6	10.3	3.7	0	0	0
	December	739	99.3%	0.9	4.6	3.5	2.2	0	0	0
Annual		7597	86.7%	3.5	38.5	30.4	16.7	0	0	0

Observations in ug/m<sup>3</sup>



**FIGURE 3.2.1 - MT. PEARL NAPS ANNUAL SO<sub>2</sub> CONCENTRATIONS**



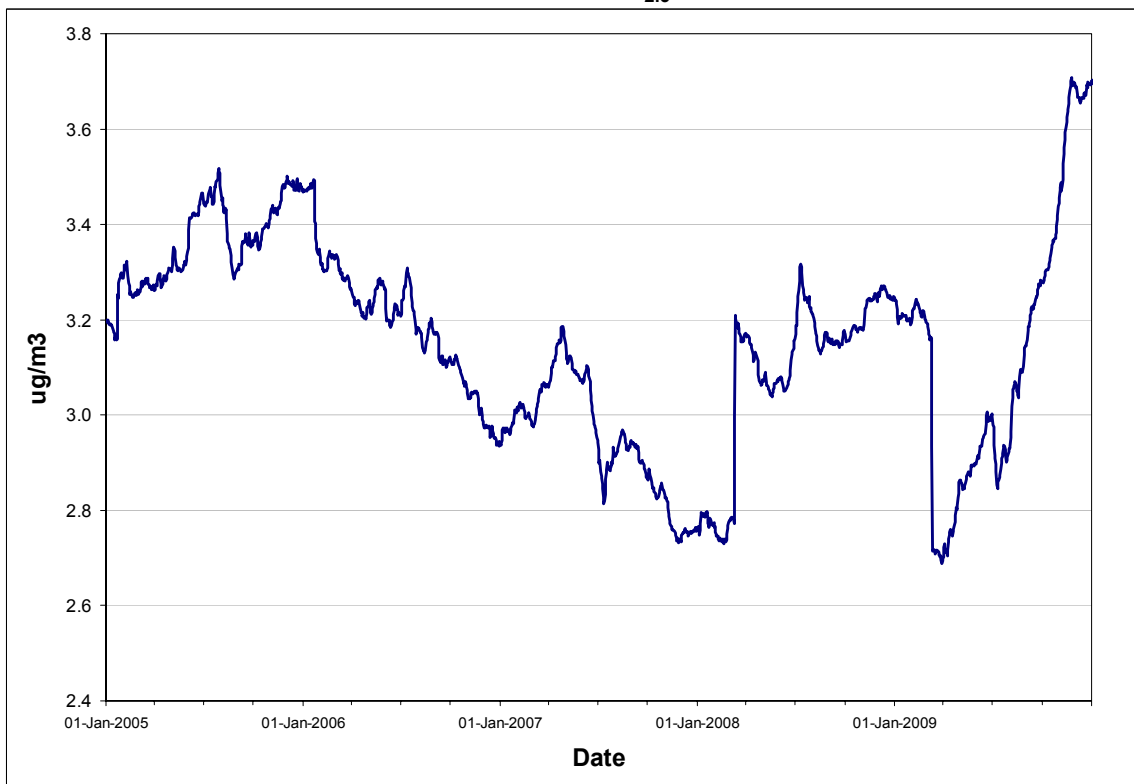
Rolling annual average of hourly concentrations

**TABLE 3.2.2 - MT. PEARL NAPS PM<sub>2.5</sub> SUMMARY 2008 & 2009**

Year	Month	# Valid Days	% Valid Days	Average	Maximum 24-Hour	Regulatory Exceedances (>25)
2008	January	31	100.0%	3.7	9.0	0
	February	29	100.0%	3.1	6.6	0
	March	31	100.0%	8.4	84.6	2
	April	29	96.7%	2.8	6.9	0
	May	31	100.0%	2.4	5.5	0
	June	30	100.0%	2.3	8.7	0
	July	31	100.0%	4.4	14.0	0
	August	30	96.8%	2.3	5.5	0
	September	30	100.0%	2.3	5.7	0
	October	31	100.0%	1.8	3.7	0
	November	30	100.0%	2.5	12.2	0
	December	31	100.0%	3.0	6.8	0
Annual		364	99.5%	3.2	84.6	2
2009	January	28	90.3%	3.0	8.7	0
	February	28	100.0%	3.1	7.7	0
	March	31	100.0%	2.6	6.1	0
	April	30	100.0%	4.7	11.5	0
	May	25	80.6%	2.8	12.1	0
	June	30	100.0%	3.5	7.8	0
	July	30	96.8%	3.5	8.4	0
	August	27	87.1%	5.1	20.3	0
	September	30	100.0%	3.8	8.3	0
	October	26	83.9%	3.7	7.0	0
	November	30	100.0%	5.5	12.1	0
	December	31	100.0%	2.9	9.3	0
Annual		346	94.8%	3.7	20.3	0

Observations in ug/m<sup>3</sup>

**FIGURE 3.2.2 - MT. PEARL NAPS ANNUAL PM<sub>2.5</sub> CONCENTRATIONS**



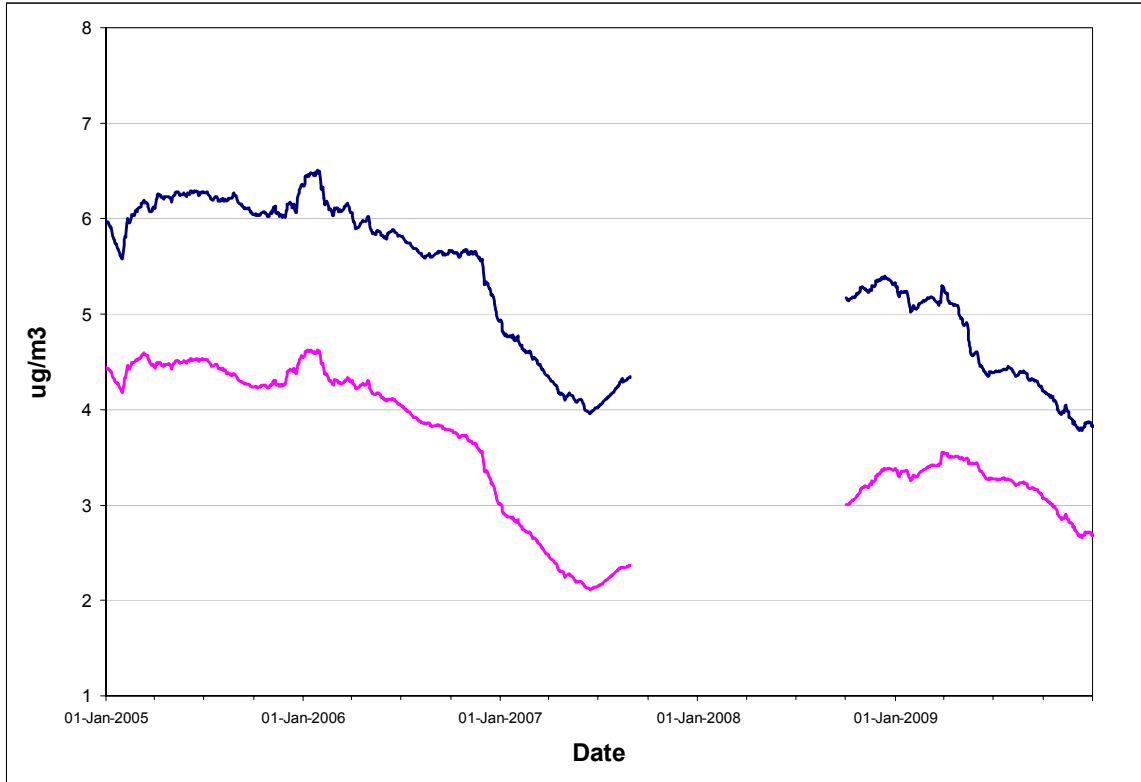
Rolling annual average of hourly concentrations

**TABLE 3.2.3 - MT. PEARL NAPS NO<sub>x</sub> / NO<sub>2</sub> SUMMARY 2008 & 2009**

Year	Month	# Valid Hours	% Valid Hours	Average		Maximums				Exceedances	
				NO <sub>x</sub>	NO <sub>2</sub>	1-Hour		24-Hour		1-Hour (>400)	24-Hour (>200)
2008	January	738	99.2%	7.6	4.3	140.1	45.2	19.2	11.3	0	0
	February	689	99.0%	3.4	2.0	72.7	32.8	13.4	8.3	0	0
	March	740	99.5%	3.7	1.8	50.6	24.2	9.3	5.1	0	0
	April	709	98.5%	5.7	2.6	116.8	29.1	21.6	11.4	0	0
	May	736	98.9%	8.0	3.1	81.9	37.9	37.6	18.3	0	0
	June	717	99.6%	6.5	4.7	320.0	127.9	26.5	12.1	0	0
	July	741	99.6%	2.8	2.3	48.3	19.7	9.9	6.9	0	0
	August	738	99.2%	3.8	2.6	24.0	17.6	8.9	6.6	0	0
	September	715	99.3%	5.0	3.7	44.3	30.1	14.8	11.0	0	0
	October	739	99.3%	6.3	4.8	98.4	31.3	16.7	12.2	0	0
	November	715	99.3%	6.1	4.7	135.2	46.7	23.2	15.1	0	0
	December	736	98.9%	5.1	4.0	54.8	37.0	14.6	10.8	0	0
Annual		8713	99.2%	5.3	3.4	320.0	127.9	37.6	18.3	0	0
2009	January	683	91.8%	3.9	2.9	97.0	47.3	19.1	13.3	0	0
	February	667	99.3%	5.0	3.6	108.3	42.4	12.7	10.3	0	0
	March	739	99.3%	5.1	3.7	118.0	58.8	42.7	29.2	0	0
	April	713	99.0%	2.2	1.8	43.8	29.3	5.3	4.7	0	0
	May	619	83.2%	3.3	2.3	31.0	17.6	7.0	6.1	0	0
	June	707	98.2%	3.9	2.7	46.8	26.1	18.7	10.8	0	0
	July	716	96.2%	3.4	2.2	22.2	11.8	6.5	4.2	0	0
	August	718	96.5%	3.0	2.1	31.9	19.4	7.2	4.9	0	0
	September	718	99.7%	2.9	1.9	91.8	26.3	13.5	6.9	0	0
	October	642	86.3%	3.7	2.4	96.6	28.6	12.1	5.9	0	0
	November	711	98.8%	4.5	3.1	82.0	44.7	20.7	12.7	0	0
	December	739	99.3%	4.8	3.4	84.2	56.3	20.2	15.8	0	0
Annual		8372	95.6%	3.8	2.7	118.0	58.8	42.7	29.2	0	0

Observations in ug/m<sup>3</sup>

**FIGURE 3.2.3 - MT. PEARL NAPS ANNUAL NO<sub>x</sub> / NO<sub>2</sub> CONCENTRATIONS**



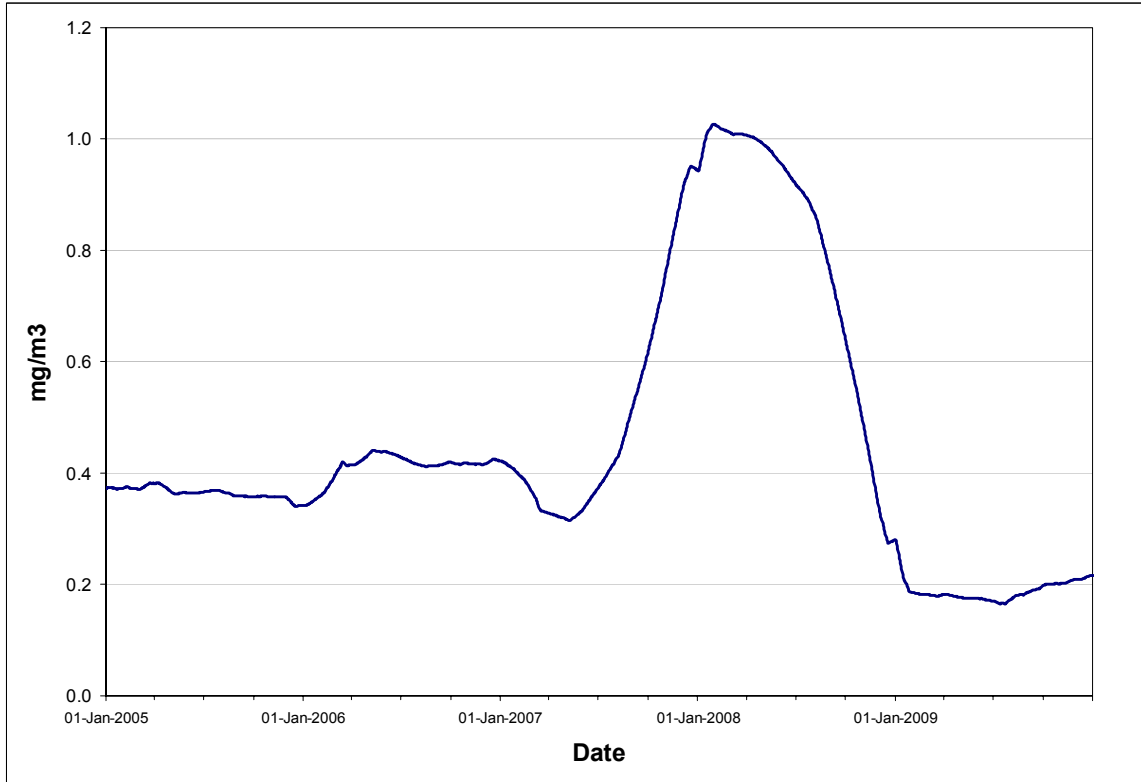
Rolling annual average of hourly concentrations

**TABLE 3.2.4 - MT. PEARL NAPS CO SUMMARY 2008 & 2009**

Year	Month	# Valid Hours	% Valid Hours	Average	Maximum		Regulatory Exceedances	
					1-Hour	8-Hour	1-Hour (>35)	8-Hour (>15)
2008	January	737	99.1%	1.2	2.7	2.3	0	0
	February	690	99.1%	0.2	1.4	0.3	0	0
	March	740	99.5%	0.2	0.9	0.3	0	0
	April	713	99.0%	0.2	0.7	0.3	0	0
	May	738	99.2%	0.2	0.5	0.3	0	0
	June	717	99.6%	0.2	0.6	0.6	0	0
	July	741	99.6%	0.3	2.0	0.6	0	0
	August	737	99.1%	0.2	1.0	0.4	0	0
	September	715	99.3%	0.1	0.5	0.3	0	0
	October	739	99.3%	0.2	1.9	0.4	0	0
	November	713	99.0%	0.2	1.3	0.6	0	0
	December	738	99.2%	0.2	0.7	0.5	0	0
Annual		8718	99.2%	0.3	2.7	2.3	0	0
2009	January	688	92.5%	0.1	0.7	0.4	0	0
	February	619	92.1%	0.2	0.7	0.3	0	0
	March	739	99.3%	0.2	0.9	0.4	0	0
	April	713	99.0%	0.1	0.7	0.3	0	0
	May	619	83.2%	0.2	0.4	0.3	0	0
	June	707	98.2%	0.2	0.5	0.4	0	0
	July	718	96.5%	0.3	0.5	0.4	0	0
	August	718	96.5%	0.3	0.6	0.5	0	0
	September	718	99.7%	0.3	0.7	0.4	0	0
	October	642	86.3%	0.3	0.7	0.4	0	0
	November	710	98.6%	0.3	0.7	0.5	0	0
	December	739	99.3%	0.3	1.2	0.6	0	0
Annual		8330	95.1%	0.2	1.2	0.6	0	0

Observations in mg/m<sup>3</sup>

**FIGURE 3.2.4 - MT. PEARL NAPS ANNUAL CO CONCENTRATIONS**



Rolling annual average of hourly concentrations

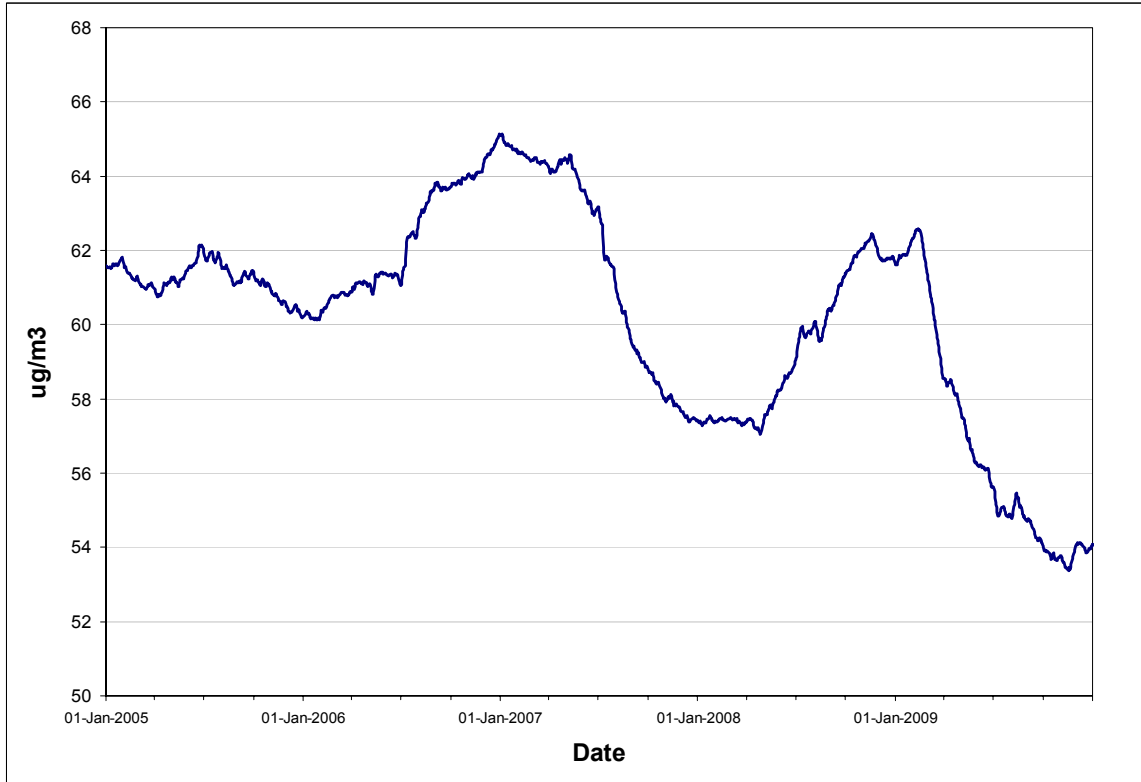
**TABLE 3.2.5 - MT. PEARL NAPS O<sub>3</sub> SUMMARY 2008 & 2009**

Year	Month	# Valid Hours	% Valid Hours	Average	Maximum		Regulatory Exceedances	
					1-Hour	8-Hour	1-Hour (>160)	8-Hour (>87)
2008	January	739	99.3%	61.0	83.3	82.0	0	0
	February	690	99.1%	71.6	92.4	90.1	0	2
	March	740	99.5%	76.4	93.2	90.3	0	9
	April	714	99.2%	79.0	113.3	108.2	0	26
	May	739	99.3%	73.8	106.5	103.6	0	18
	June	714	99.2%	59.5	96.8	84.4	0	0
	July	740	99.5%	49.9	122.4	111.0	0	5
	August	707	95.0%	43.3	105.8	90.8	0	1
	September	714	99.2%	53.5	97.0	82.2	0	0
	October	739	99.3%	56.7	87.1	79.5	0	0
	November	697	96.8%	53.5	96.8	92.2	0	2
	December	713	95.8%	61.3	83.5	80.0	0	0
Annual		8646	98.4%	61.7	122.4	111.0	0	63
2009	January	704	94.6%	68.6	93.9	85.8	0	0
	February	653	97.2%	60.8	95.8	93.9	0	8
	March	709	95.3%	42.4	65.4	64.2	0	0
	April	716	99.4%	69.9	103.2	94.5	0	10
	May	619	83.2%	56.0	115.1	94.0	0	1
	June	707	98.2%	51.9	83.5	77.4	0	0
	July	736	98.9%	41.7	77.4	71.1	0	0
	August	731	98.3%	41.8	113.2	92.6	0	1
	September	716	99.4%	45.9	85.6	81.3	0	0
	October	642	86.3%	52.6	80.0	78.4	0	0
	November	710	98.6%	57.0	84.0	76.3	0	0
	December	739	99.3%	61.7	83.4	82.4	0	0
Annual		8382	95.7%	54.1	115.1	94.5	0	20

Observations in ug/m<sup>3</sup>



**FIGURE 3.2.5 - MT. PEARL NAPS ANNUAL O<sub>3</sub> CONCENTRATIONS**

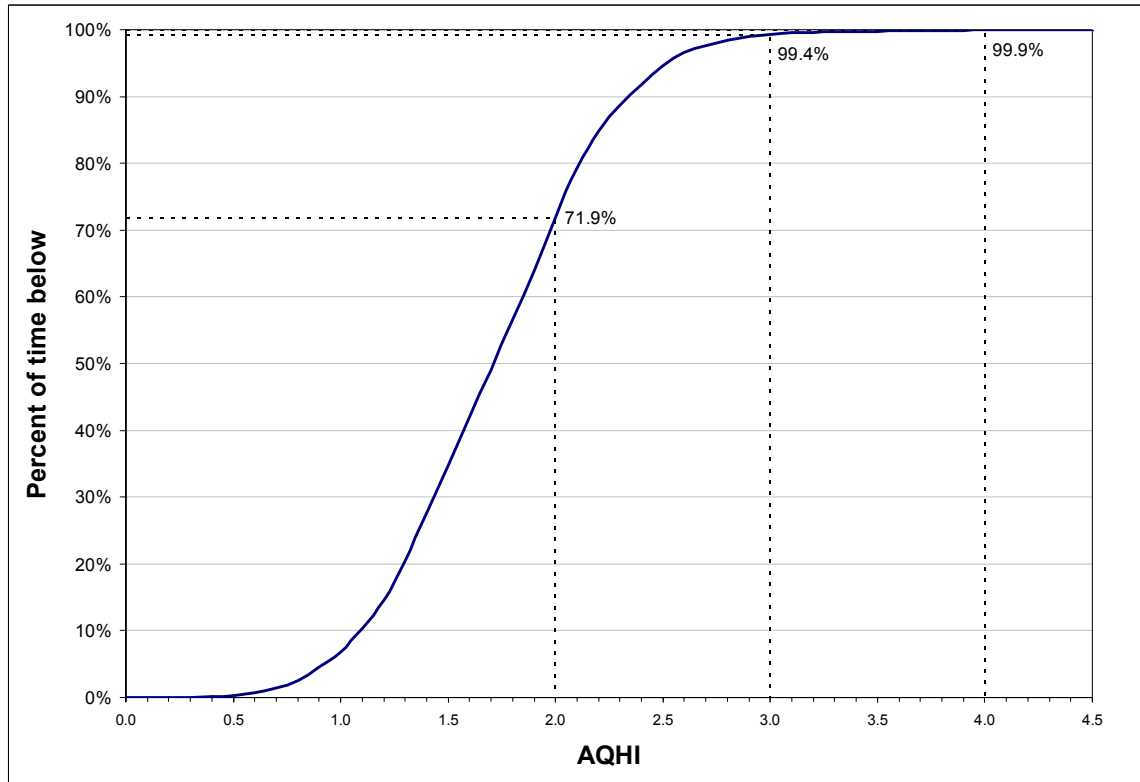


Rolling annual average of hourly concentrations

**TABLE 3.2.6 - MT. PEARL NAPS AQHI SUMMARY 2008 & 2009**

Year	Month	# Valid Hours	% Valid Hours	Average	<u>Maximum</u> 1-Hour
2008	January	729	98.0%	2.0	3.0
	February	687	98.7%	2.1	2.7
	March	732	98.4%	2.5	20.1
	April	696	96.7%	2.3	3.3
	May	736	98.9%	2.2	3.3
	June	710	98.6%	1.9	7.7
	July	691	92.9%	1.6	4.2
	August	678	91.1%	1.4	3.4
	September	708	98.3%	1.7	2.8
	October	735	98.8%	1.8	2.8
	November	685	95.1%	1.7	3.2
	December	692	93.0%	1.9	2.6
Annual		8479	96.5%	1.9	20.1
2009	January	672	90.3%	2.1	2.9
	February	644	95.8%	1.9	3.0
	March	695	93.4%	1.3	2.1
	April	707	98.2%	2.1	3.6
	May	612	82.3%	1.7	4.0
	June	702	97.5%	1.7	3.6
	July	671	90.2%	1.3	2.6
	August	630	84.7%	1.4	4.3
	September	714	99.2%	1.5	2.7
	October	638	85.8%	1.7	4.1
	November	707	98.2%	1.9	3.6
	December	739	99.3%	1.9	3.4
Annual		8131	92.8%	1.7	4.3

**FIGURE 3.2.6 - MT. PEARL NAPS AQHI FREQUENCY DISTRIBUTION 2009**



eg. 99.4% of the time the AQHI recorded was below 3.0

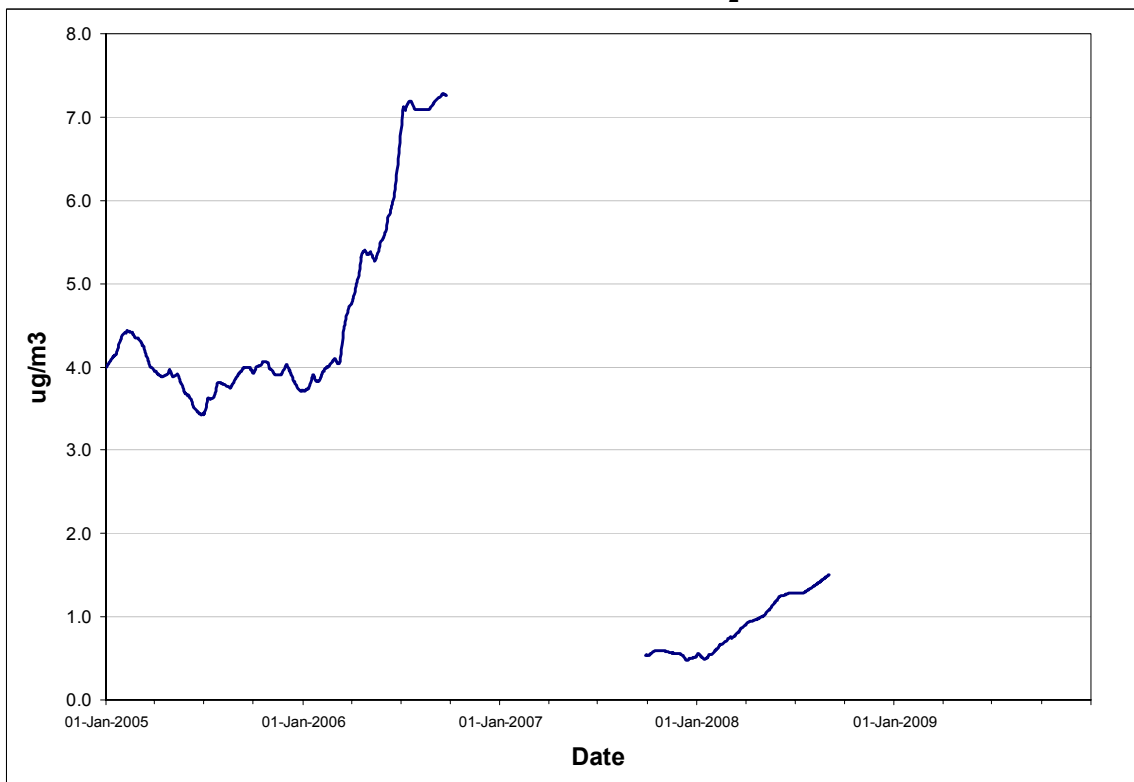
### 3.3 Corner Brook

The Corner Brook NAPS monitoring station is located on Macpherson Avenue near Confederation Drive and monitors the ambient levels of SO<sub>2</sub>, NO<sub>x</sub>/NO<sub>2</sub>, CO, O<sub>3</sub> and PM<sub>2.5</sub> on a continuous basis. The station was moved to its current location in 2009 after being located on Brook Street since 2001. For all pollutants, the ambient air criteria were not exceeded on any occasion in 2009. Tables 3.3.1 through 3.3.5 present the summary information on the level of air contaminants measured at the Corner Brook NAPS station, while Figures 3.3.1 through 3.3.5 provide a graphical representation of the annual trend of each pollutant. Table 3.3.6 provides a summary of the AQHI in 2008 and 2009 while Figure 3.3 provides a graphical representation of the percentage of time the AQHI values were below a given level in 2009.

**TABLE 3.3.1 - CORNER BROOK NAPS SO<sub>2</sub> SUMMARY 2008 & 2009**

Year	Month	# Valid Hours	% Valid Hours	Average	Maximum			Regulatory Exceedances		
					1-Hour	3-Hour	24-Hour	1-Hour (>900)	3-Hour (>600)	24-Hour (>300)
2008	January	741	99.6%							
	February	691	99.3%	2.5	6.8	5.6	4.9	0	0	0
	March	743	99.9%	2.2	7.6	5.7	3.5	0	0	0
	April	250	34.7%	1.4	7.0	6.2	3.0	0	0	0
	May	611	82.1%	2.9	8.5	5.7	3.8	0	0	0
	June	719	99.9%	0.8	6.9	3.6	2.8	0	0	0
	July	398	53.5%	0.0	2.0	0.8	0.2	0	0	0
	August	0	0.0%							
	September	0	0.0%							
	October	0	0.0%							
	November	0	0.0%							
	December	0	0.0%							
Annual		4153	47.3%	1.5	8.5	6.2	4.9	0	0	0
2009	January	0	0.0%							
	February	0	0.0%							
	March	0	0.0%							
	April	0	0.0%							
	May	0	0.0%							
	June	0	0.0%							
	July	58	7.8%	0.0	0.3	0.1	0.0	0	0	0
	August	744	100.0%	0.1	3.9	3.4	0.9	0	0	0
	September	713	99.0%	0.1	4.2	2.2	0.7	0	0	0
	October	690	92.7%	0.4	9.2	5.3	1.2	0	0	0
	November	718	99.7%	0.6	23.3	11.9	2.2	0	0	0
	December	741	99.6%	2.0	16.5	12.5	4.8	0	0	0
Annual		3664	41.8%	0.7	23.3	12.5	4.8	0	0	0

**FIGURE 3.3.1 - CORNER BROOK NAPS ANNUAL SO<sub>2</sub> CONCENTRATIONS**

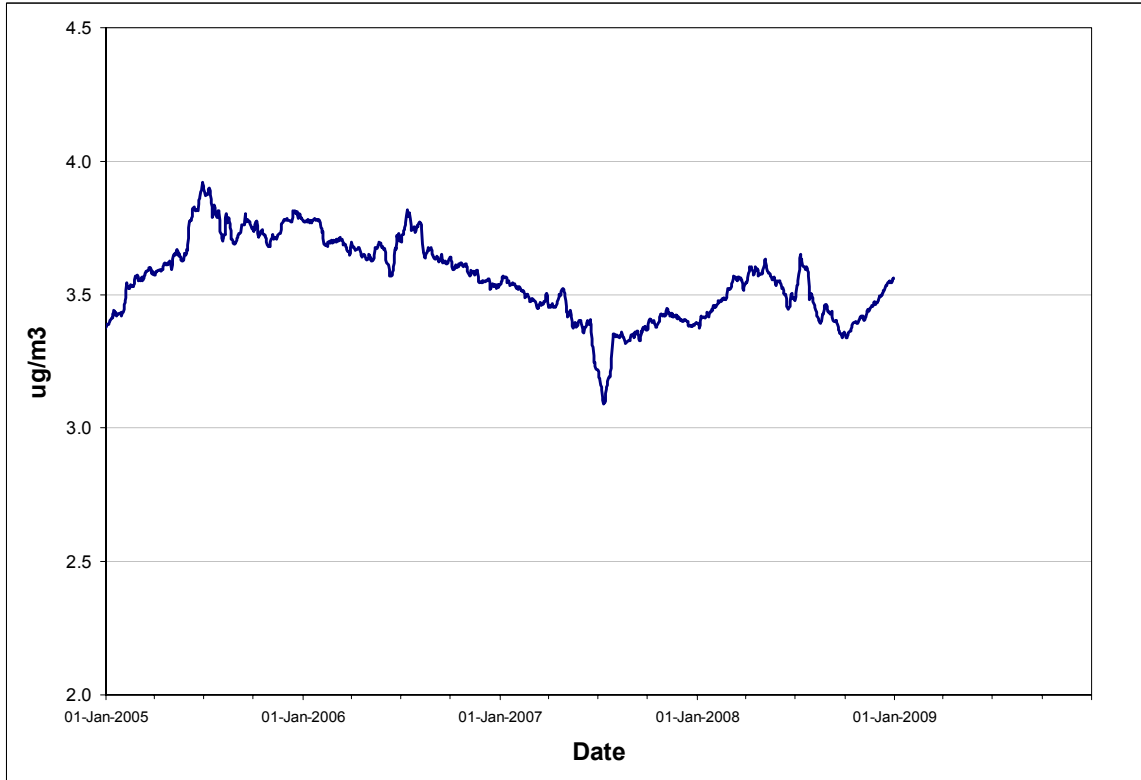


Rolling annual average of hourly concentrations

**TABLE 3.3.2 - CORNER BROOK NAPS PM<sub>2.5</sub> SUMMARY 2008 & 2009**

Year	Month	# Valid Days	% Valid Days	Average	Maximum 24-Hour	Regulatory Exceedances (>25)
2008	January	31	100.0%	3.7	9.3	0
	February	29	100.0%	3.7	9.5	0
	March	31	100.0%	3.5	7.6	0
	April	30	100.0%	4.2	11.0	0
	May	31	100.0%	2.8	8.0	0
	June	30	100.0%	2.6	12.9	0
	July	31	100.0%	6.7	18.9	0
	August	31	100.0%	2.2	10.7	0
	September	29	96.7%	2.5	6.8	0
	October	0	0.0%			
	November	0	0.0%			
	December	0	0.0%			
Annual		273	74.6%	3.6	18.9	0
2009	January	0	0.0%			
	February	0	0.0%			
	March	0	0.0%			
	April	0	0.0%			
	May	0	0.0%			
	June	0	0.0%			
	July	15	48.4%	4.5	7.9	0
	August	31	100.0%	5.2	12.0	0
	September	30	100.0%	4.4	11.3	0
	October	31	100.0%	5.3	11.6	0
	November	27	90.0%	5.9	13.0	0
	December	26	83.9%	3.1	7.8	0
Annual		160	43.8%	4.8	13.0	0

**FIGURE 3.3.2 - CORNER BROOK NAPS ANNUAL PM<sub>2.5</sub> CONCENTRATIONS**



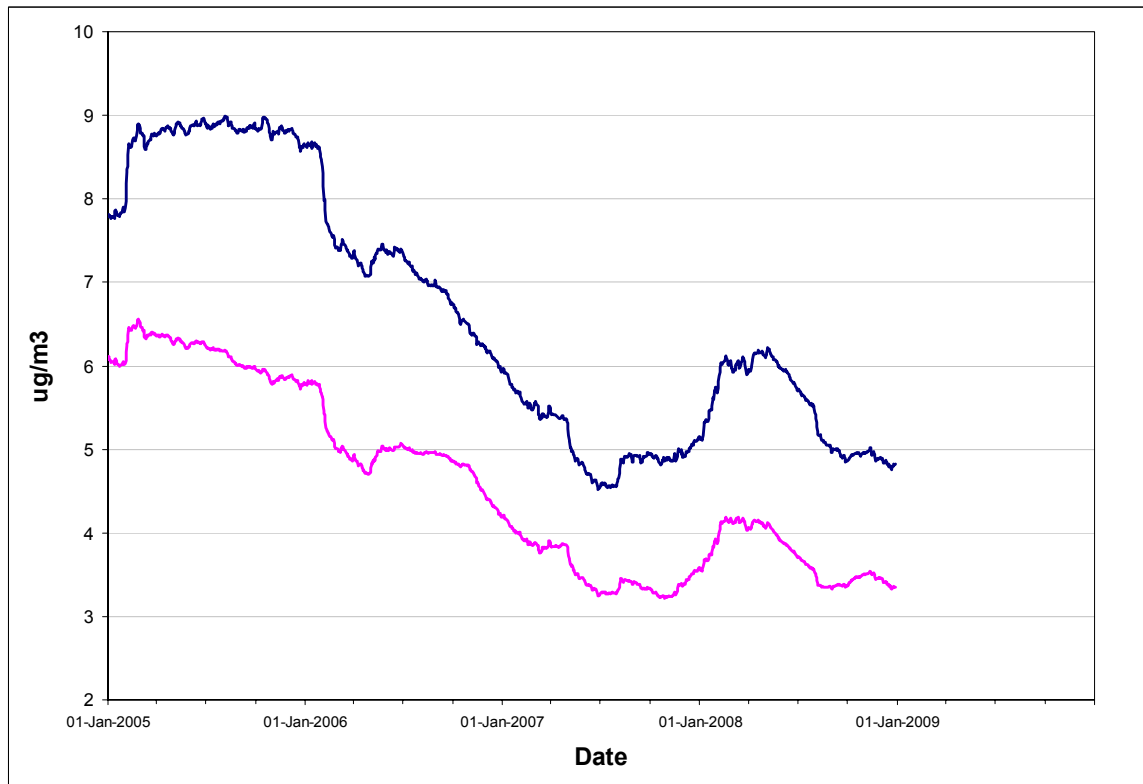
Rolling annual average of hourly concentrations

**TABLE 3.3.3 - CORNER BROOK NAPS NO<sub>x</sub> / NO<sub>2</sub> SUMMARY 2008 & 2009**

Year	Month	# Valid Hours	% Valid Hours	Average		Maximums				Exceedances	
				NO <sub>x</sub>	NO <sub>2</sub>	1-Hour		24-Hour		1-Hour (>400)	24-Hour (>200)
2008	January	740	99.5%	10.4	7.1	159.3	60.2	40.0	21.2	0	0
	February	689	99.0%	8.7	6.5	148.4	52.8	25.2	19.0	0	0
	March	744	100.0%	6.2	4.7	110.8	50.5	19.9	15.0	0	0
	April	718	99.7%	5.1	3.7	132.8	63.0	24.5	15.1	0	0
	May	743	99.9%	2.7	1.8	76.6	40.6	15.6	9.7	0	0
	June	719	99.9%	2.6	1.6	65.7	25.9	9.2	5.1	0	0
	July	742	99.7%	3.1	1.7	57.3	32.0	10.3	6.6	0	0
	August	742	99.7%	1.6	1.1	31.2	13.9	5.0	2.8	0	0
	September	700	97.2%	3.0	2.0	75.4	23.6	8.0	4.6	0	0
	October	0	0.0%								
	November	0	0.0%								
	December	0	0.0%								
Annual		6537	74.4%	4.8	3.3	159.3	63.0	40.0	21.2	0	0
2009	January	0	0.0%								
	February	0	0.0%								
	March	0	0.0%								
	April	0	0.0%								
	May	0	0.0%								
	June	0	0.0%								
	July	387	52.0%	6.3	3.9	49.5	26.5	16.0	8.5	0	0
	August	744	100.0%	6.8	4.6	61.1	31.0	15.0	9.4	0	0
	September	713	99.0%	4.9	3.4	45.5	23.7	11.3	7.5	0	0
	October	737	99.1%	5.7	3.9	75.6	38.5	17.9	10.2	0	0
	November	718	99.7%	8.0	6.0	98.7	44.2	37.6	23.9	0	0
	December	741	99.6%	7.2	5.6	76.0	42.7	20.1	15.4	0	0
Annual		4040	46.1%	6.5	4.6	98.7	44.2	37.6	23.9	0	0



**FIGURE 3.3.3 - CORNER BROOK NAPS ANNUAL NO<sub>x</sub> / NO<sub>2</sub> CONCENTRATIONS**

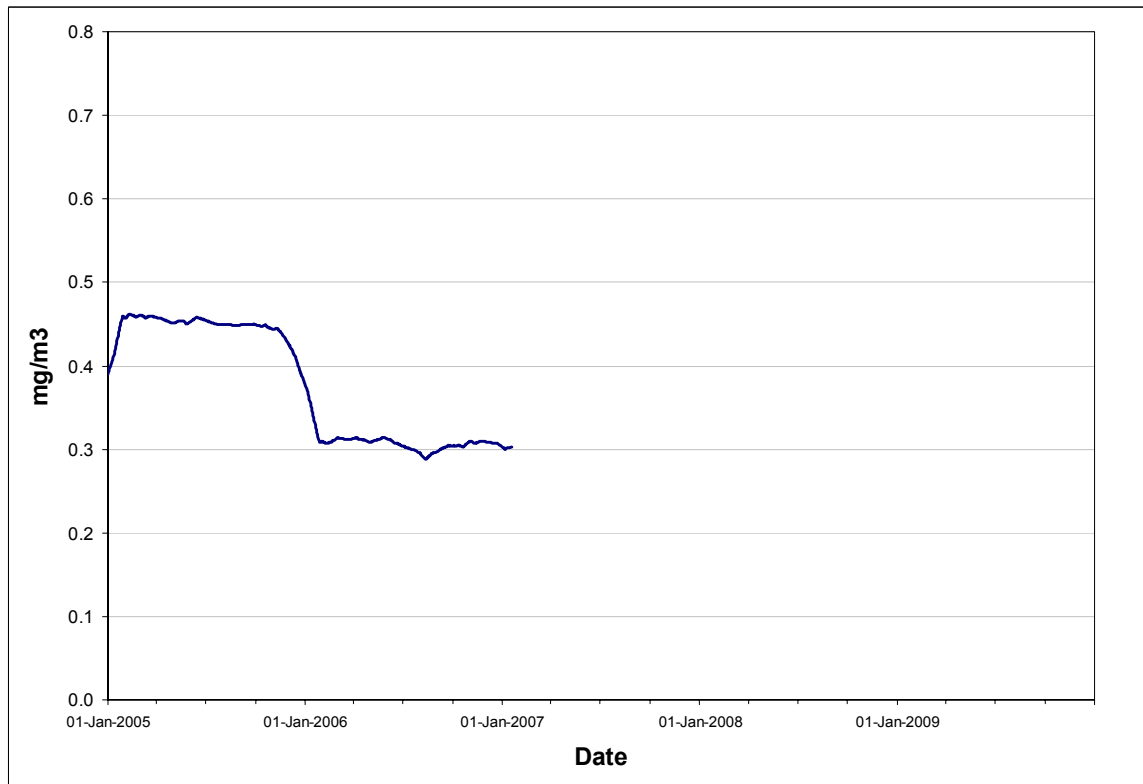


Rolling annual average of hourly concentrations

**TABLE 3.3.4 - CORNER BROOK NAPS CO SUMMARY 2008 & 2009**

Year	Month	# Valid Hours	% Valid Hours	Average	Maximum		Regulatory Exceedances	
					1-Hour	8-Hour	1-Hour (>35)	8-Hour (>15)
2008	January	742	99.7%	0.4	8.5	1.3	0	0
	February	696	100.0%	0.4	8.4	1.4	0	0
	March	744	100.0%	0.6	1.3	1.1	0	0
	April	720	100.0%	0.8	8.2	2.3	0	0
	May	744	100.0%	1.1	9.2	2.0	0	0
	June	719	99.9%	0.5	1.3	1.2	0	0
	July	742	99.7%	0.2	0.7	0.5	0	0
	August	514	69.1%	0.1	0.3	0.2	0	0
	September	0	0.0%					
	October	0	0.0%					
	November	0	0.0%					
	December	0	0.0%					
Annual		5621	64.0%	0.5	9.2	2.3	0	0
2009	January	0	0.0%					
	February	0	0.0%					
	March	0	0.0%					
	April	0	0.0%					
	May	0	0.0%					
	June	0	0.0%					
	July	393	52.8%	0.6	0.9	0.9	0	0
	August	744	100.0%	1.0	1.3	1.2	0	0
	September	714	99.2%	1.0	1.5	1.5	0	0
	October	737	99.1%	0.3	0.7	0.6	0	0
	November	718	99.7%	0.3	1.0	0.7	0	0
	December	741	99.6%	0.2	0.7	0.6	0	0
Annual		4047	46.2%	0.6	1.5	1.5	0	0

**FIGURE 3.3.4 - CORNER BROOK NAPS ANNUAL CO CONCENTRATIONS**

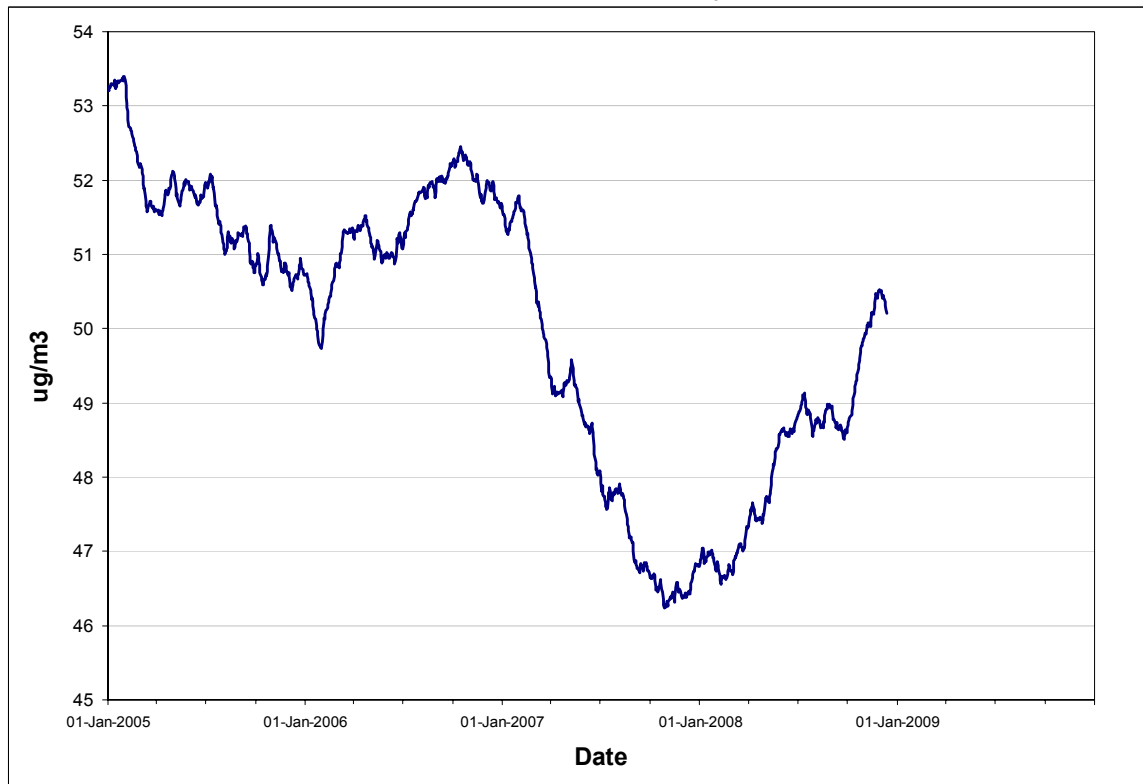


Rolling annual average of hourly concentrations

**TABLE 3.3.5 - CORNER BROOK NAPS O<sub>3</sub> SUMMARY 2008 & 2009**

Year	Month	# Valid Hours	% Valid Hours	Average	Maximum		Regulatory Exceedances	
					1-Hour	8-Hour	1-Hour (>160)	8-Hour (>87)
2008	January	553	74.3%	52.8	79.5	75.3	0	0
	February	579	83.2%	58.5	83.1	78.3	0	0
	March	682	91.7%	67.8	94.9	91.1	0	2
	April	718	99.7%	72.8	110.1	100.9	0	21
	May	743	99.9%	61.4	112.2	100.2	0	5
	June	719	99.9%	40.3	78.9	62.0	0	0
	July	742	99.7%	36.6	99.4	75.8	0	0
	August	742	99.7%	30.6	83.2	72.5	0	0
	September	700	97.2%	28.7	55.4	51.9	0	0
	October	0	0.0%					
	November	0	0.0%					
	December	0	0.0%					
Annual		6178	70.3%	49.5	112.2	100.9	0	28
2009	January	0	0.0%					
	February	0	0.0%					
	March	0	0.0%					
	April	0	0.0%					
	May	0	0.0%					
	June	0	0.0%					
	July	392	52.7%	35.6	76.9	57.8	0	0
	August	743	99.9%	36.6	117.1	110.8	0	1
	September	713	99.0%	39.3	98.9	85.1	0	0
	October	741	99.6%	44.0	71.4	67.5	0	0
	November	717	99.6%	50.0	77.7	72.1	0	0
	December	741	99.6%	60.3	79.7	79.1	0	0
Annual		4047	46.2%	45.0	117.1	110.8	0	1

**FIGURE 3.3.5 - CORNER BROOK NAPS ANNUAL O<sub>3</sub> CONCENTRATIONS**

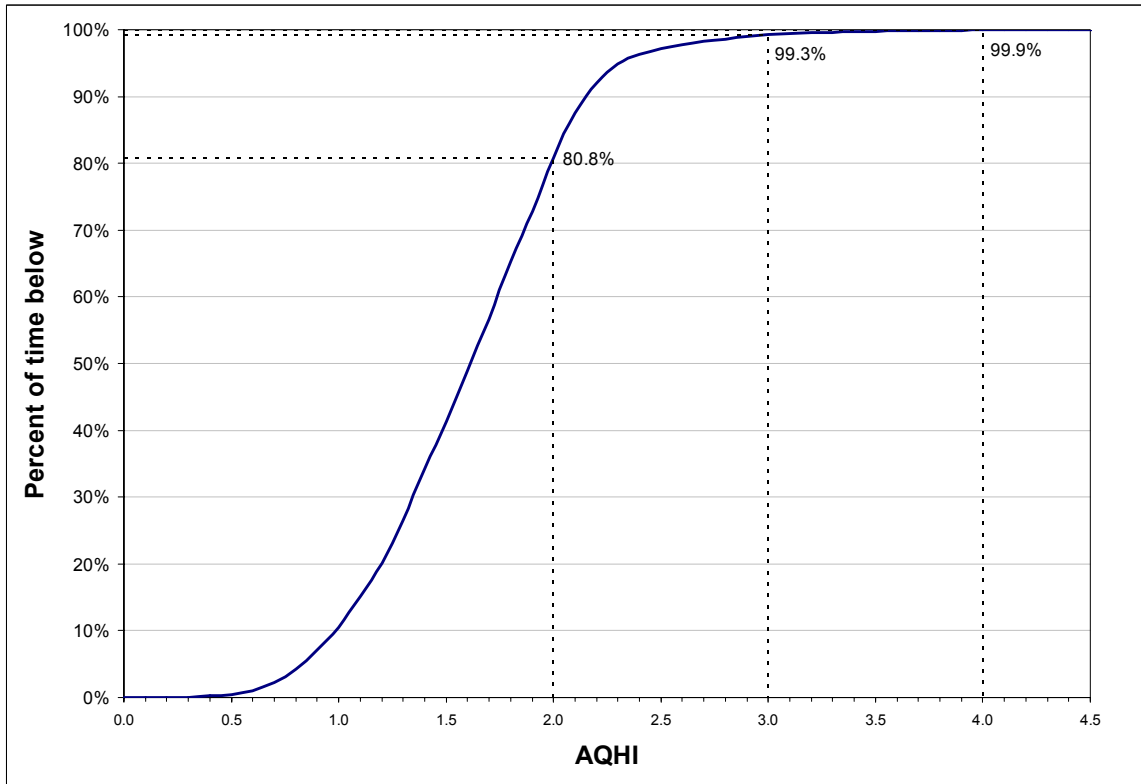


Rolling annual average of hourly concentrations

**TABLE 3.3.6 - CORNER BROOK NAPS AQHI SUMMARY 2008 & 2009**

Year	Month	# Valid Hours	% Valid Hours	Average	<u>Maximum</u> 1-Hour
2008	January	544	73.1%	1.8	3.9
	February	566	81.3%	2.0	3.4
	March	674	90.6%	2.2	3.7
	April	716	99.4%	2.3	5.6
	May	730	98.1%	1.8	4.1
	June	711	98.8%	1.3	2.9
	July	707	95.0%	1.4	3.5
	August	731	98.3%	1.0	3.2
	September	687	95.4%	1.0	2.0
	October	0	0.0%		
	November	0	0.0%		
	December	0	0.0%		
Annual		6066	69.1%	1.6	5.6
2009	January	0	0.0%		
	February	0	0.0%		
	March	0	0.0%		
	April	0	0.0%		
	May	0	0.0%		
	June	0	0.0%		
	July	374	50.3%	1.3	3.1
	August	727	97.7%	1.4	4.2
	September	705	97.9%	1.4	3.2
	October	737	99.1%	1.6	3.4
	November	672	93.3%	1.9	3.6
	December	633	85.1%	2.0	3.4
Annual		3848	43.9%	1.6	4.2

**FIGURE 3.3.6 - CORNER BROOK NAPS AQHI FREQUENCY DISTRIBUTION 2009**



eg. 99.3% of the time the AQHI recorded was below 3.0

### **3.4 Grand Falls Windsor**

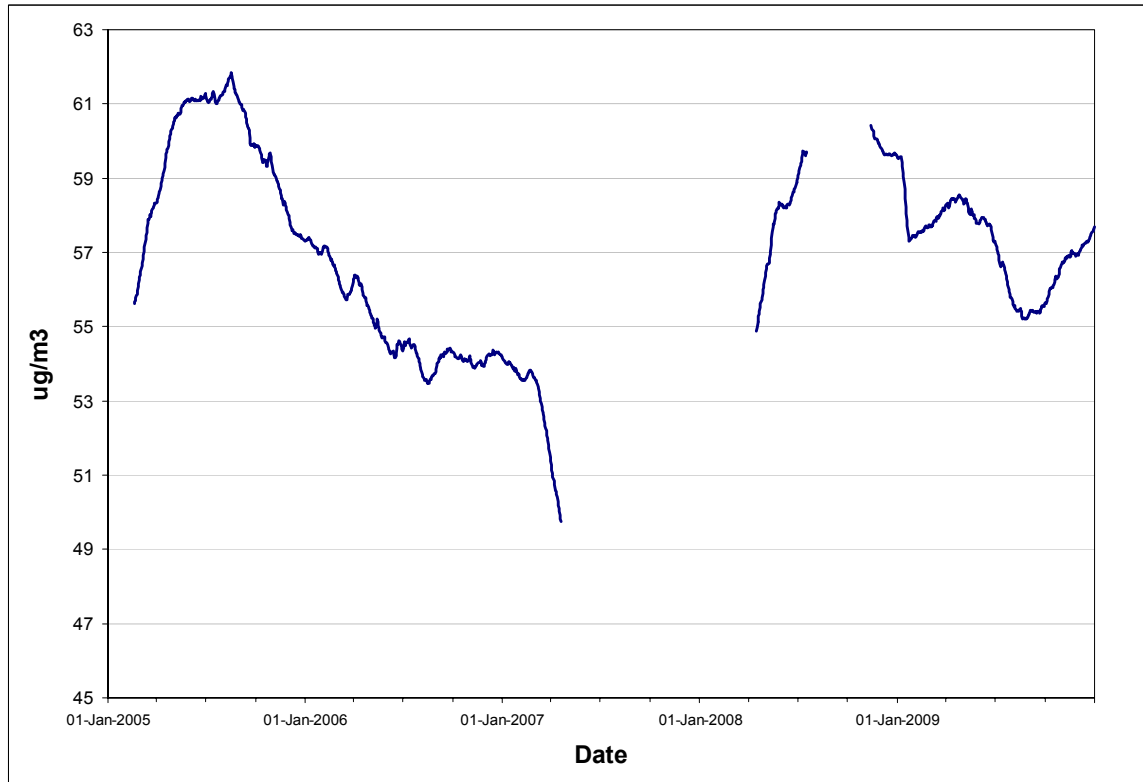
The Grand Falls Windsor NAPS monitoring station is co-located with the ambient monitoring station formerly operated by Abitibi Consolidated on Scott Avenue and monitors the ambient levels of O<sub>3</sub> on a continuous basis. The ambient air 1-hour standard was not exceeded in 2009, however, the 8-hour standard was on 59 occasions. Table 3.4.1 presents the summary information on the level of O<sub>3</sub> measured at the Grand Falls Windsor NAPS station, while Figure 3.4.1 provides a graphical representation of the annual trend of O<sub>3</sub>.



**TABLE 3.4.1 - GRAND FALLS WINDSOR NAPS O<sub>3</sub> SUMMARY 2008 & 2009**

Year	Month	# Valid Hours	% Valid Hours	Average	Maximum		Regulatory Exceedances	
					1-Hour	8-Hour	1-Hour (>160)	8-Hour (>87)
2008	January	541	72.7%	93.5	155.4	147.2	0	41
	February	696	100.0%	65.8	90.1	84.5	0	0
	March	742	99.7%	71.7	95.1	91.9	0	1
	April	716	99.4%	76.6	120.5	107.7	0	24
	May	737	99.1%	73.3	115.8	103.3	0	18
	June	271	37.6%	56.2	80.5	78.2	0	0
	July	367	49.3%	57.1	141.3	87.4	0	1
	August	741	99.6%	43.4	105.2	88.8	0	1
	September	716	99.4%	39.5	78.7	71.6	0	0
	October	744	100.0%	19.3	67.9	64.0	0	0
	November	714	99.2%	24.7	81.6	71.7	0	0
	December	744	100.0%	29.1	76.8	73.7	0	0
Annual		7729	88.0%	52.9	155.4	147.2	0	86
2009	January	742	99.7%	31.3	78.9	73.6	0	0
	February	666	99.1%	35.5	93.0	88.3	0	2
	March	744	100.0%	39.4	100.9	99.2	0	19
	April	713	99.0%	40.1	139.1	115.9	0	27
	May	742	99.7%	33.6	115.2	98.5	0	11
	June	718	99.7%	26.4	89.7	80.6	0	0
	July	735	98.8%	39.1	82.6	69.3	0	0
	August	742	99.7%	38.0	74.1	69.4	0	0
	September	720	100.0%	42.8	84.0	75.5	0	0
	October	744	100.0%	50.7	80.8	78.2	0	0
	November	716	99.4%	52.3	78.5	75.2	0	0
	December	743	99.9%	65.4	85.6	83.7	0	0
Annual		8725	99.6%	41.3	139.1	115.9	0	59

**FIGURE 3.4.1 - GRAND FALLS WINDSOR NAPS ANNUAL O<sub>3</sub> CONCENTRATIONS**



Rolling annual average of hourly concentrations

### 3.5 Ferolle Point

The Ferolle Point NAPS monitoring station is located in the lighthouse at Ferolle Point and monitors the ambient levels of O<sub>3</sub> on a continuous basis. From the start-up of the monitoring station, there have been communication issues with the station resulting in significant periods of missing data. The station has since been relocated.

The ambient air 1-hour standard was not exceeded in 2009, however, the 8-hour standard was on 21 occasions and that number is likely low owing to the periods of missing data. Table 3.5.1 presents the summary information on the level of O<sub>3</sub> measured at the Ferolle Point NAPS station. A graphical representation of the annual trend of O<sub>3</sub> is not presented owing to the missing data.

**TABLE 3.5.1 - FEROLLE POINT NAPS O<sub>3</sub> SUMMARY 2008 & 2009**

Year	Month	# Valid Hours	% Valid Hours	Average	Maximum		Regulatory Exceedances	
					1-Hour	8-Hour	1-Hour (>160)	8-Hour (>87)
2008	January	744	100.0%	73.7	94.2	93.7	0	7
	February	264	37.9%	77.9	94.2	88.8	0	3
	March	0	0.0%					
	April	0	0.0%					
	May	572	76.9%	79.3	121.6	110.6	0	22
	June	515	71.5%	64.9	107.9	96.1	0	3
	July	744	100.0%	68.5	137.3	115.8	0	15
	August	744	100.0%	64.1	107.9	95.4	0	10
	September	716	99.4%	67.5	119.7	100.8	0	9
	October	744	100.0%	32.8	104.0	96.1	0	3
	November	720	100.0%	34.9	104.0	93.2	0	4
	December	729	98.0%	32.6	94.2	80.9	0	0
Annual		6492	73.9%	57.7	137.3	115.8	0	76
2009	January	607	81.6%	34.9	91.4	82.0	0	0
	February	0	0.0%					
	March	0	0.0%					
	April	131	18.2%	43.5	114.1	98.4	0	8
	May	206	27.7%	37.4	106.3	99.5	0	3
	June	0	0.0%					
	July	375	50.4%	48.0	101.8	78.2	0	0
	August	738	99.2%	55.0	119.9	99.5	0	3
	September	720	100.0%	62.7	107.3	95.0	0	6
	October	728	97.8%	60.9	94.6	87.2	0	1
	November	0	0.0%					
	December	0	0.0%					
Annual		3505	40.0%	52.1	119.9	99.5	0	21

## 4.0 Industrial Monitoring Network

Industrial operations in the province are responsible for the monitoring of their emissions. The Department audits the operation of the industrial monitoring stations on a regular basis to ensure that the monitors are functioning according to instrument specifications and to the standard operating procedures. If the audits indicate a monitor is not operating with the specifications, corrective actions are required by the industry and data may be invalidated.

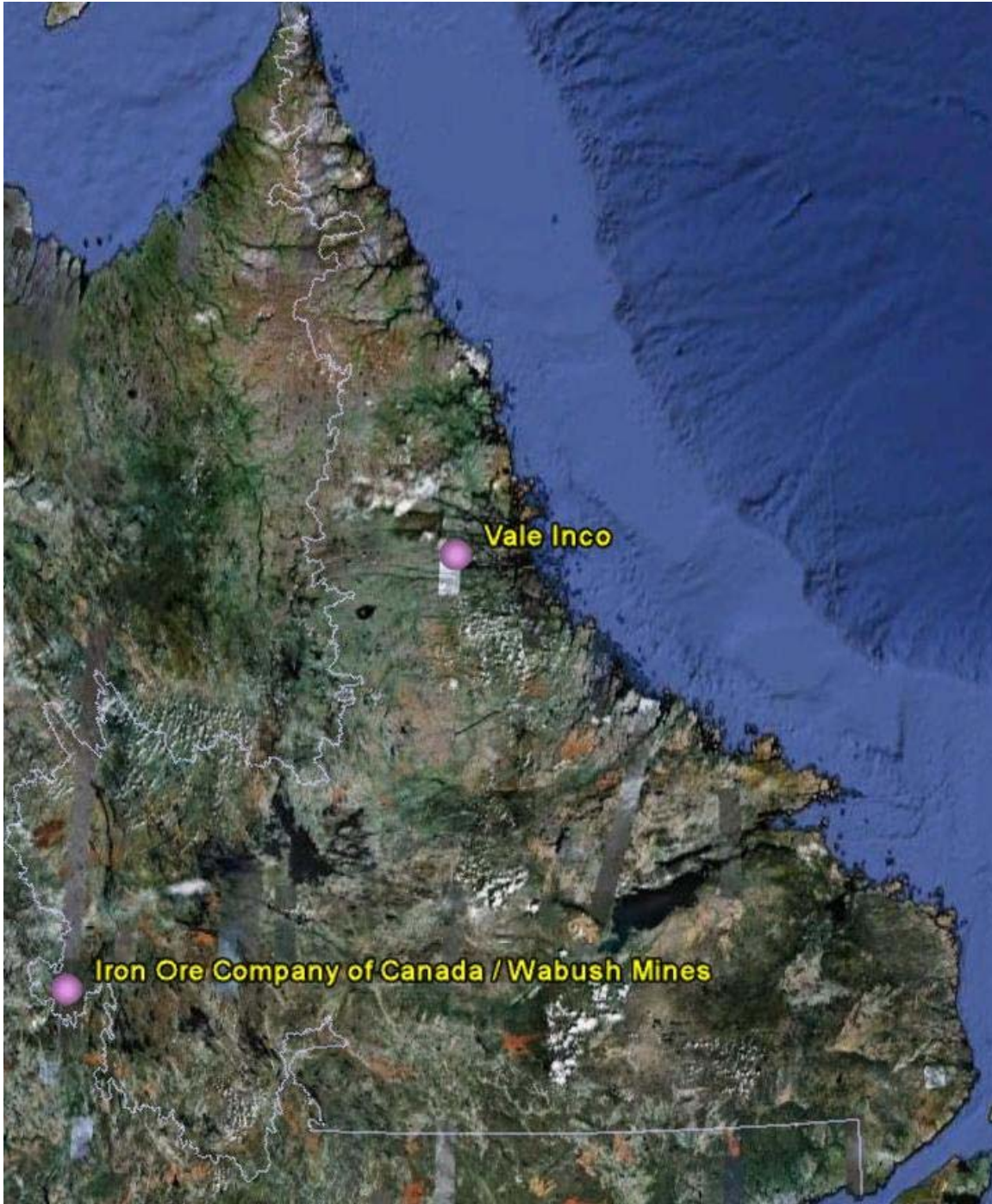
On the island of Newfoundland, there were 5 monitoring networks operated by industry in 2009 and another 3 in Labrador. Figures 4.0.1 and 4.0.2 present the locations of these monitoring networks.

The subsequent sections of this report detail the summary statistics and the longer term trend of pollutants measured at each station with a given network.

**FIGURE 4.0.1 - INDUSTRIAL MONITORING NETWORK IN NEWFOUNDLAND**



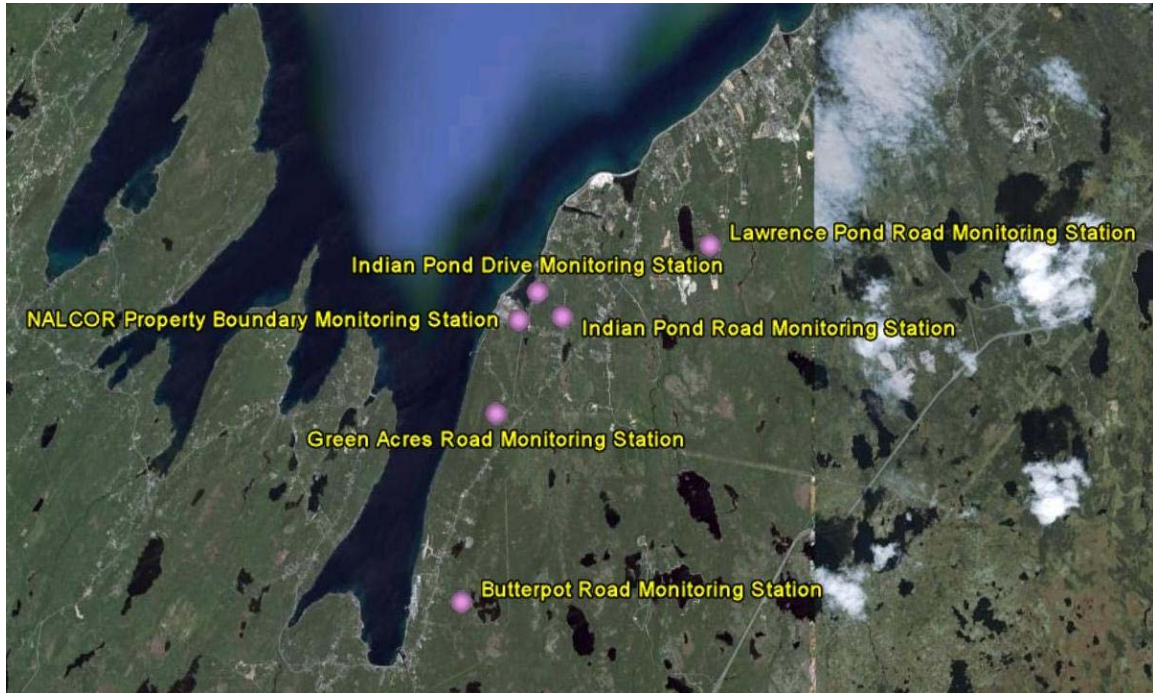
**FIGURE 4.0.2 - INDUSTRIAL MONITORING NETWORK IN LABRADOR**



## 4.1 NALCOR

In 2009, NALCOR operated monitoring stations at 6 locations. These stations are installed to monitor the emissions from the Holyrood Thermal Generating Station and are located at Butterpot Road, Green Acres Road, Indian Pond Drive, Indian Pond Road, Lawrence Pond, and the NALCOR property boundary. Figure 4.1.1 indicates the location of these stations.

**FIGURE 4.1.1 - NALCOR AMBIENT MONITORING STATIONS**



### 4.1.1 Butterpot Road

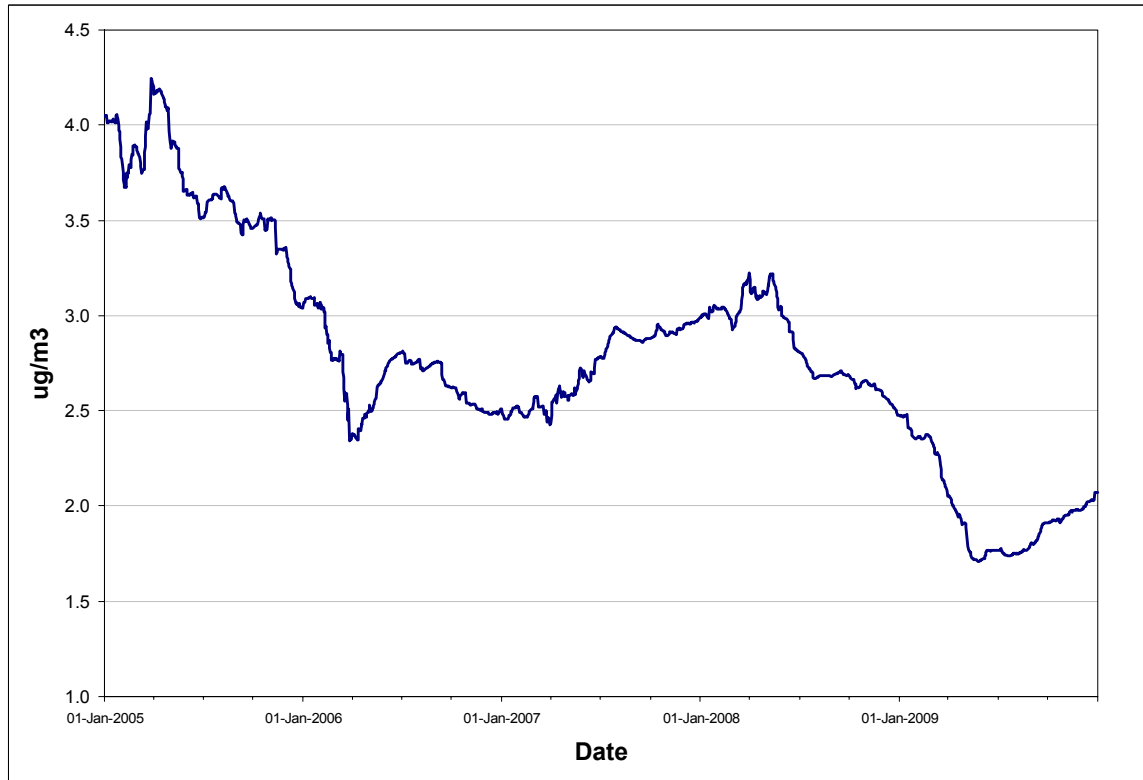
The Butterpot Road station monitors the ambient levels of  $\text{SO}_2$ ,  $\text{NO}_x/\text{NO}_2$  and  $\text{PM}_{2.5}$  on a continuous basis. For all pollutants, the ambient air criteria were not exceeded on any occasion in 2009. Tables 4.1.1.1 through 4.1.1.4 provide summary information on the level of air contaminants measured at Butterpot Road, while Figures 4.1.1.1 through 4.1.1.4 provide a graphical representation of the annual trend of each pollutant.

**TABLE 4.1.1.1 - BUTTERPOT ROAD SO<sub>2</sub> SUMMARY 2008 & 2009**

Year	Month	# Valid Hours	% Valid Hours	Average	Maximum			Regulatory Exceedances		
					1-Hour	3-Hour	24-Hour	1-Hour (>900)	3-Hour (>600)	24-Hour (>300)
2008	January	713	95.8%	3.4	91.6	84.6	24.6	0	0	0
	February	660	94.8%	1.9	72.5	37.1	7.4	0	0	0
	March	704	94.6%	5.7	110.8	57.0	15.8	0	0	0
	April	680	94.4%	3.9	63.4	48.7	13.0	0	0	0
	May	703	94.5%	4.2	99.8	90.0	20.6	0	0	0
	June	690	95.8%	1.2	2.9	2.3	2.0	0	0	0
	July	704	94.6%	1.9	7.4	5.6	4.3	0	0	0
	August	708	95.2%	1.3	4.0	2.6	1.8	0	0	0
	September	690	95.8%	1.4	4.8	4.0	2.0	0	0	0
	October	710	95.4%	2.0	31.9	20.1	7.8	0	0	0
	November	682	94.7%	1.1	25.1	20.6	4.2	0	0	0
	December	702	94.4%	1.4	31.8	11.4	3.0	0	0	0
Annual		8346	95.0%	2.5	110.8	90.0	24.6	0	0	0
2009	January	699	94.0%	2.0	26.1	11.4	3.8	0	0	0
	February	638	94.9%	2.0	64.7	25.7	7.5	0	0	0
	March	713	95.8%	2.1	71.4	26.5	5.7	0	0	0
	April	686	95.3%	2.2	39.1	34.5	10.8	0	0	0
	May	681	91.5%	1.9	41.7	16.1	3.6	0	0	0
	June	690	95.8%	1.8	30.6	20.2	6.3	0	0	0
	July	711	95.6%	1.7	5.9	4.5	2.6	0	0	0
	August	706	94.9%	1.9	5.2	3.9	3.7	0	0	0
	September	657	91.3%	2.7	7.3	5.8	5.1	0	0	0
	October	713	95.8%	2.4	15.6	12.1	4.6	0	0	0
	November	666	92.5%	1.5	37.1	21.9	5.3	0	0	0
	December	688	92.5%	2.5	47.8	27.0	15.6	0	0	0
Annual		8248	94.2%	2.1	71.4	34.5	15.6	0	0	0

Observations in ug/m<sup>3</sup>

**FIGURE 4.1.1.1 - BUTTERPOT ROAD ANNUAL SO<sub>2</sub> CONCENTRATIONS**



Rolling annual average of hourly concentrations

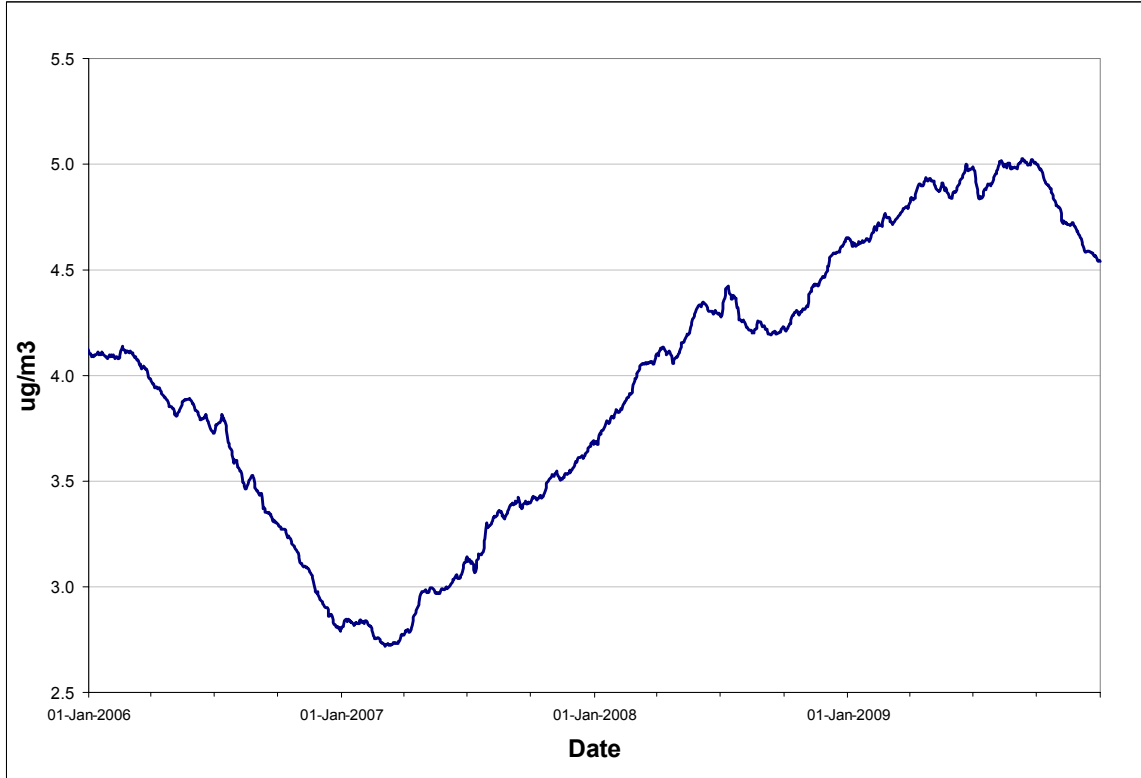


**TABLE 4.1.1.2 - BUTTERPOT ROAD PM<sub>2.5</sub> SUMMARY 2008 & 2009**

Year	Month	# Valid Days	% Valid Days	Average	Maximum 24-Hour	Regulatory Exceedances (>25)
2008	January	31	100.0%	4.7	11.3	0
	February	29	100.0%	4.4	9.3	0
	March	30	96.8%	4.7	7.5	0
	April	29	96.7%	5.3	9.0	0
	May	31	100.0%	6.0	9.4	0
	June	30	100.0%	3.5	10.2	0
	July	31	100.0%	5.4	16.3	0
	August	31	100.0%	3.5	10.0	0
	September	30	100.0%	3.2	6.0	0
	October	31	100.0%	4.7	8.9	0
	November	30	100.0%	4.7	15.1	0
	December	28	90.3%	5.6	11.7	0
Annual		361	98.6%	4.6	16.3	0
2009	January	30	96.8%	4.6	11.1	0
	February	28	100.0%	5.8	12.1	0
	March	31	100.0%	5.5	10.9	0
	April	30	100.0%	6.7	11.2	0
	May	31	100.0%	4.9	14.3	0
	June	24	80.0%	5.2	8.7	0
	July	31	100.0%	4.9	9.2	0
	August	31	100.0%	4.0	11.1	0
	September	30	100.0%	3.5	8.3	0
	October	31	100.0%	2.4	4.5	0
	November	30	100.0%	3.2	6.3	0
	December	31	100.0%	4.0	7.3	0
Annual		358	98.1%	4.5	14.3	0

Observations in ug/m<sup>3</sup>

**FIGURE 4.1.1.2 - BUTTERPOT ROAD ANNUAL PM<sub>2.5</sub> CONCENTRATIONS**



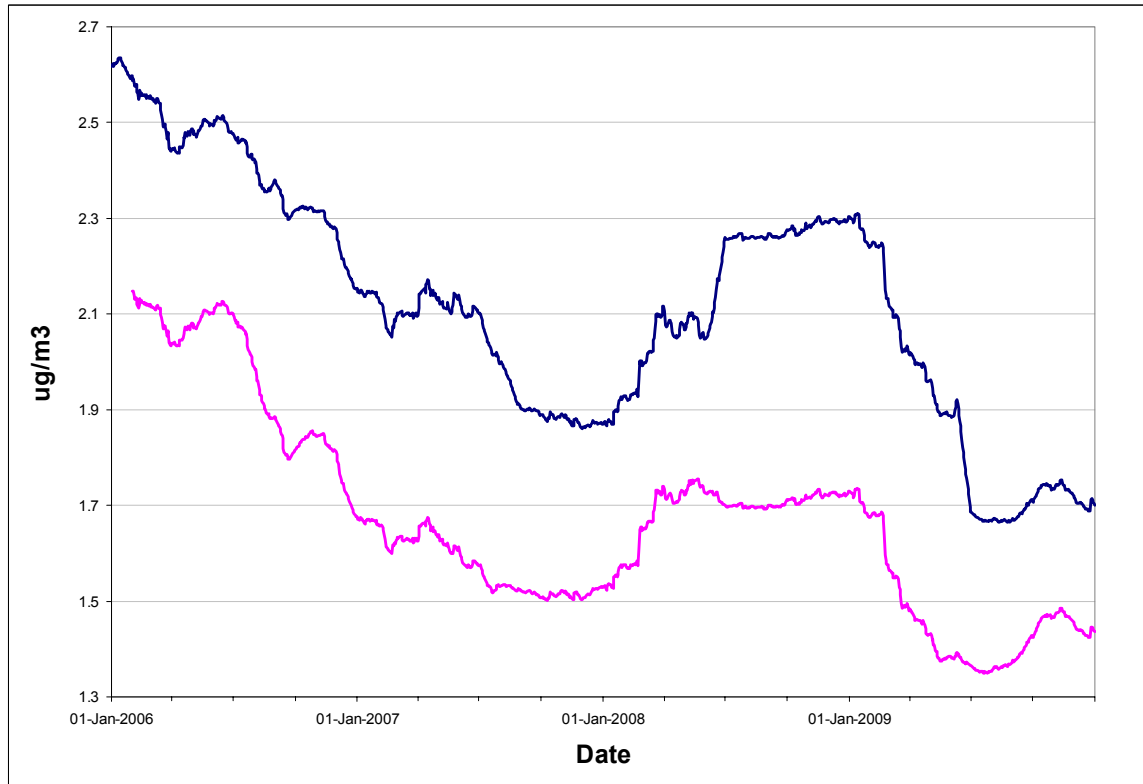
Rolling annual average of hourly concentrations

**TABLE 4.1.1.3 - BUTTERPOT ROAD NO<sub>x</sub> / NO<sub>2</sub> SUMMARY 2008 & 2009**

Year	Month	# Valid Hours	% Valid Hours	Average NO <sub>x</sub> NO <sub>2</sub>		Maximums				Exceedances	
						1-Hour NO <sub>x</sub> NO <sub>2</sub>		24-Hour NO <sub>x</sub> NO <sub>2</sub>		1-Hour (>400)	24-Hour (>200)
2008	January	682	91.7%	2.4	2.0	42.3	37.6	10.5	9.3	0	0
	February	634	91.1%	2.8	2.5	45.1	27.0	16.5	15.4	0	0
	March	673	90.5%	3.2	2.6	57.6	52.6	9.5	8.3	0	0
	April	645	89.6%	2.1	1.8	59.2	24.6	6.7	4.7	0	0
	May	674	90.6%	2.2	1.7	28.7	21.8	6.9	5.1	0	0
	June	659	91.5%	4.4	1.2	18.0	11.0	7.4	2.8	0	0
	July	679	91.3%	1.5	1.2	13.3	4.4	2.3	1.8	0	0
	August	676	90.9%	1.4	1.1	7.9	7.0	2.8	2.3	0	0
	September	660	91.7%	1.7	1.5	11.5	8.7	3.1	2.8	0	0
	October	680	91.4%	2.1	1.8	18.5	14.2	5.5	4.5	0	0
	November	654	90.8%	1.9	1.6	17.8	13.3	4.3	3.5	0	0
	December	678	91.1%	1.9	1.7	20.5	17.2	3.3	2.9	0	0
Annual		7994	91.0%	2.3	1.7	59.2	52.6	16.5	15.4	0	0
2009	January	669	89.9%	1.7	1.4	16.2	15.8	6.4	5.9	0	0
	February	610	90.8%	1.4	1.2	31.5	25.7	3.7	3.0	0	0
	March	682	91.7%	1.8	1.4	32.5	22.2	4.0	3.2	0	0
	April	658	91.4%	1.5	1.2	27.3	18.4	5.2	3.9	0	0
	May	658	88.4%	1.3	1.1	13.8	9.5	2.0	1.9	0	0
	June	687	95.4%	2.0	1.0	20.6	13.4	6.9	3.0	0	0
	July	712	95.7%	1.3	1.1	7.2	5.6	2.6	2.1	0	0
	August	706	94.9%	1.5	1.4	20.5	20.3	2.7	2.6	0	0
	September	687	95.4%	2.2	2.1	19.6	19.2	3.0	2.8	0	0
	October	689	92.6%	2.4	2.3	12.0	11.8	3.6	3.5	0	0
	November	650	90.3%	1.7	1.5	14.8	13.7	4.2	3.6	0	0
	December	679	91.3%	1.7	1.4	30.3	25.0	10.0	8.9	0	0
Annual		8087	92.3%	1.7	1.4	32.5	25.7	10.0	8.9	0	0

Observations in ug/m<sup>3</sup>

**FIGURE 4.1.1.3 - BUTTERPOT ROAD ANNUAL NO<sub>x</sub> / NO<sub>2</sub> CONCENTRATIONS**



Rolling annual average of hourly concentrations

#### **4.1.2 Green Acres Road**

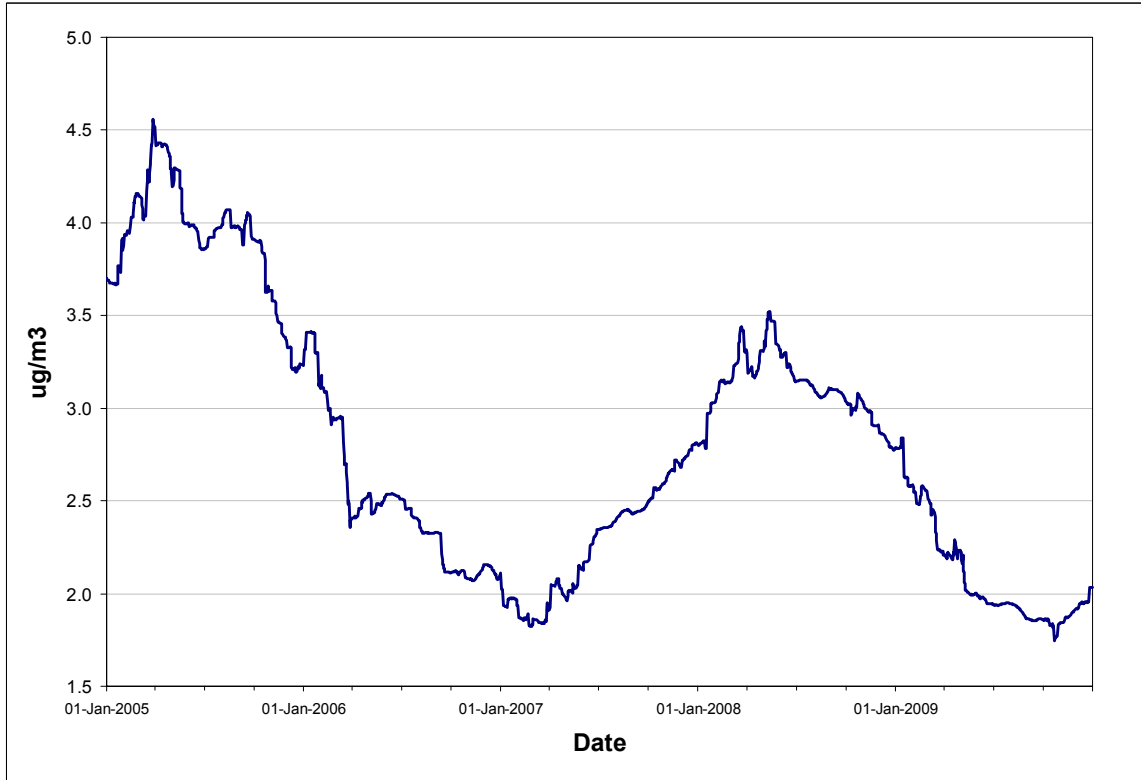
The Green Acres Road station monitors the ambient levels of SO<sub>2</sub>, NO<sub>x</sub> / NO<sub>2</sub>, PM<sub>2.5</sub> on a continuous basis and TSP on a 1 day in 6 day cycle consistent with the NAPS defined schedule. For all pollutants, the ambient air criteria were not exceeded on any occasion in 2009. Tables 4.1.2.1 through 4.1.2.4 provide summary information on the level of air contaminants measured at Green Acres Road, while Figures 4.1.2.1 through 4.1.2.4 provide a graphical representation of the annual trend of each pollutant.

**TABLE 4.1.2.1 - GREEN ACRES ROAD SO<sub>2</sub> SUMMARY 2008 & 2009**

Year	Month	# Valid Hours	% Valid Hours	Average	Maximum			Regulatory Exceedances		
					1-Hour	3-Hour	24-Hour	1-Hour (>900)	3-Hour (>600)	24-Hour (>300)
2008	January	713	95.8%	4.4	267.6	225.7	71.4	0	0	0
	February	667	95.8%	3.1	81.5	52.2	18.0	0	0	0
	March	701	94.2%	5.6	164.3	116.0	32.6	0	0	0
	April	283	39.3%	4.5	85.1	66.6	13.0	0	0	0
	May	713	95.8%	4.7	246.2	92.6	31.7	0	0	0
	June	661	91.8%	2.0	71.8	41.6	7.2	0	0	0
	July	711	95.6%	1.4	5.3	4.0	2.2	0	0	0
	August	713	95.8%	1.9	4.5	3.8	3.4	0	0	0
	September	685	95.1%	1.1	6.1	4.5	1.8	0	0	0
	October	713	95.8%	2.7	95.0	71.0	27.3	0	0	0
	November	688	95.6%	1.2	18.7	14.4	4.9	0	0	0
	December	647	87.0%	1.4	31.4	13.1	2.4	0	0	0
Annual		7895	89.9%	2.8	267.6	225.7	71.4	0	0	0
2009	January	709	95.3%	2.2	154.3	100.7	18.7	0	0	0
	February	644	95.8%	2.7	198.6	97.2	17.7	0	0	0
	March	710	95.4%	1.9	45.1	22.4	9.8	0	0	0
	April	688	95.6%	3.4	222.5	104.3	31.5	0	0	0
	May	713	95.8%	2.1	167.4	89.8	18.3	0	0	0
	June	685	95.1%	1.3	44.5	30.2	7.2	0	0	0
	July	713	95.8%	1.4	9.2	5.8	2.3	0	0	0
	August	711	95.6%	1.0	11.5	5.1	2.1	0	0	0
	September	679	94.3%	1.0	3.8	2.9	1.8	0	0	0
	October	709	95.3%	2.5	96.9	75.9	21.1	0	0	0
	November	690	95.8%	2.1	68.9	27.9	6.6	0	0	0
	December	710	95.4%	2.8	184.8	63.5	27.7	0	0	0
Annual		8361	95.4%	2.0	222.5	104.3	31.5	0	0	0

Observations in ug/m<sup>3</sup>

**FIGURE 4.1.2.1 - GREEN ACRES ROAD ANNUAL SO<sub>2</sub> CONCENTRATIONS**



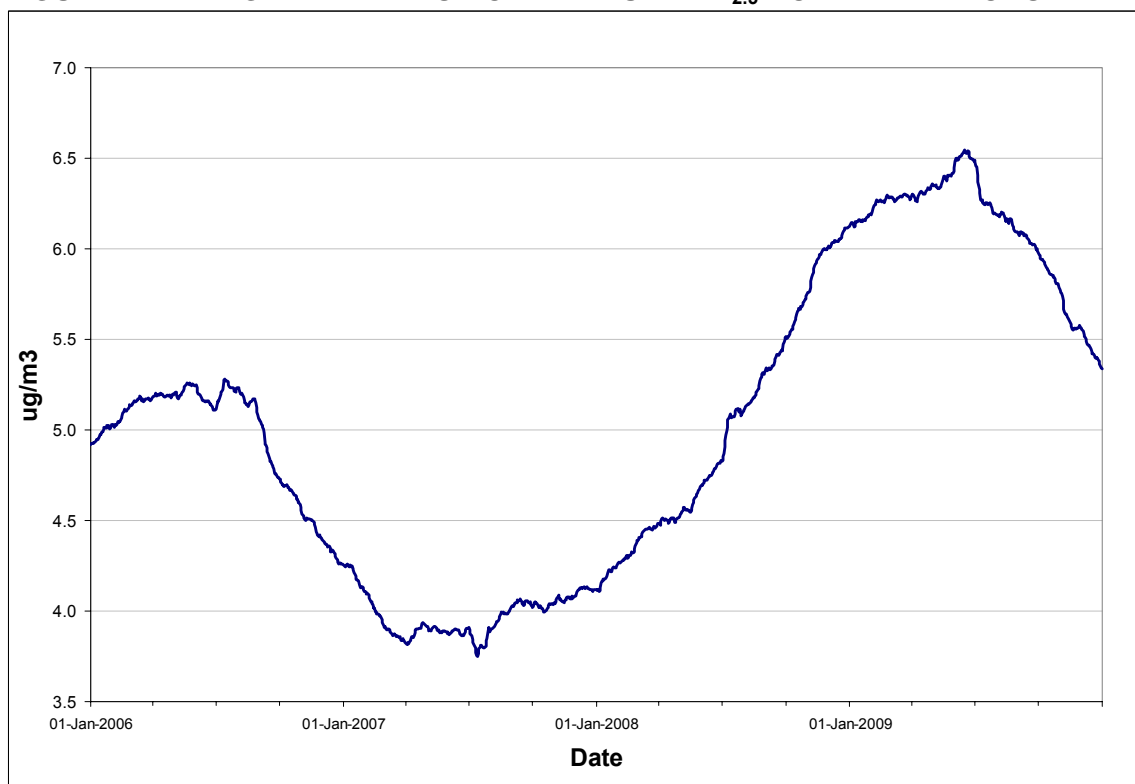
Rolling annual average of hourly concentrations

**TABLE 4.1.2.2 - GREEN ACRES ROAD PM<sub>2.5</sub> SUMMARY 2008 & 2009**

Year	Month	# Valid Days	% Valid Days	Average	Maximum 24-Hour	Regulatory Exceedances (>25)
2008	January	31	100.0%	5.6	11.1	0
	February	29	100.0%	5.3	10.0	0
	March	31	100.0%	5.8	9.8	0
	April	28	93.3%	5.8	10.7	0
	May	31	100.0%	5.8	9.9	0
	June	30	100.0%	5.5	11.3	0
	July	31	100.0%	8.0	18.1	0
	August	31	100.0%	6.6	12.1	0
	September	30	100.0%	5.8	9.5	0
	October	31	100.0%	6.1	9.9	0
	November	30	100.0%	6.9	18.5	0
	December	29	93.5%	6.0	10.5	0
Annual		362	98.9%	6.1	18.5	0
2009	January	19	61.3%	6.6	16.2	0
	February	28	100.0%	6.6	10.7	0
	March	31	100.0%	5.8	10.3	0
	April	30	100.0%	6.6	10.1	0
	May	30	96.8%	6.6	17.5	0
	June	25	83.3%	6.1	15.5	0
	July	31	100.0%	4.7	7.7	0
	August	31	100.0%	5.6	14.1	0
	September	30	100.0%	4.5	9.8	0
	October	25	80.6%	3.4	5.7	0
	November	23	76.7%	4.3	8.4	0
	December	31	100.0%	3.5	7.1	0
Annual		334	91.5%	5.3	17.5	0

Observations in ug/m<sup>3</sup>

**FIGURE 4.1.2.2 - GREEN ACRES ROAD ANNUAL PM<sub>2.5</sub> CONCENTRATIONS**



Rolling annual average of hourly concentrations

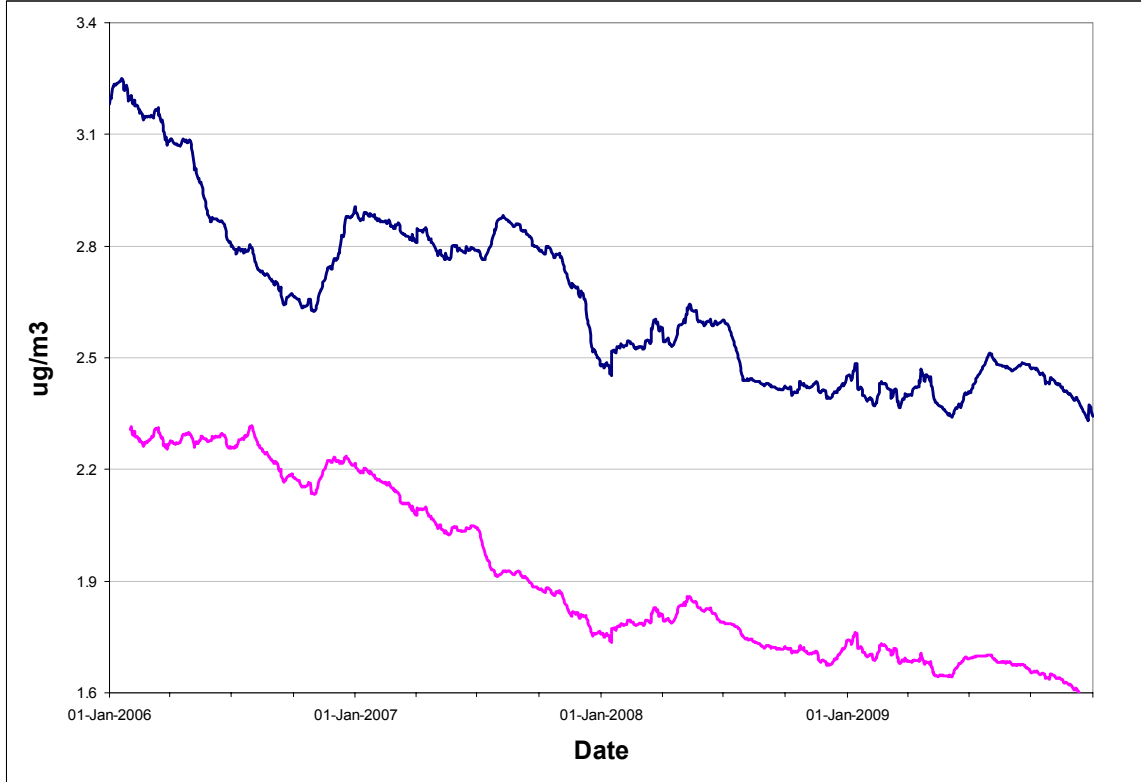


**TABLE 4.1.2.3 - GREEN ACRES ROAD NO<sub>x</sub> / NO<sub>2</sub> SUMMARY 2008 & 2009**

Year	Month	# Valid Hours	% Valid Hours	Average NO <sub>x</sub> NO <sub>2</sub>		Maximums				Exceedances	
						1-Hour NO <sub>x</sub> NO <sub>2</sub>		24-Hour NO <sub>x</sub> NO <sub>2</sub>		1-Hour (>400)	24-Hour (>200)
2008	January	682	91.7%	3.1	2.3	105.1	55.8	25.8	14.8	0	0
	February	638	91.7%	1.9	1.5	36.6	24.0	7.7	6.6	0	0
	March	678	91.1%	2.9	2.0	67.2	39.8	14.3	9.7	0	0
	April	649	90.1%	2.4	1.8	39.6	25.9	6.9	4.5	0	0
	May	681	91.5%	2.9	1.8	86.6	45.1	10.1	6.3	0	0
	June	653	90.7%	2.2	1.5	22.7	9.2	5.3	2.7	0	0
	July	680	91.4%	3.1	1.1	9.4	5.7	3.9	1.6	0	0
	August	682	91.7%	1.8	1.3	9.0	7.9	3.2	2.5	0	0
	September	654	90.8%	1.6	1.4	7.6	6.2	3.1	2.7	0	0
	October	681	91.5%	2.3	1.8	34.7	21.4	9.6	6.4	0	0
	November	658	91.4%	2.3	1.8	16.7	14.6	4.7	4.0	0	0
	December	620	83.3%	2.8	2.5	34.3	24.2	4.6	4.4	0	0
Annual		7956	90.6%	2.4	1.7	105.1	55.8	25.8	14.8	0	0
2009	January	678	91.1%	2.4	1.8	60.8	33.0	8.3	7.3	0	0
	February	603	89.7%	2.5	1.9	102.4	54.8	10.0	5.8	0	0
	March	682	91.7%	2.5	1.5	27.8	16.9	5.6	4.8	0	0
	April	658	91.4%	3.0	1.8	90.8	47.8	15.1	9.0	0	0
	May	682	91.7%	1.7	1.4	61.6	34.7	7.6	4.3	0	0
	June	647	89.9%	3.0	2.0	34.7	14.0	5.5	4.7	0	0
	July	713	95.8%	4.2	1.3	28.5	8.1	5.7	1.9	0	0
	August	709	95.3%	1.3	1.1	8.4	6.7	3.3	2.3	0	0
	September	655	91.0%	1.7	1.1	10.2	6.6	2.4	1.6	0	0
	October	677	91.0%	2.0	1.7	35.6	23.7	7.7	5.5	0	0
	November	660	91.7%	1.7	1.4	18.1	12.4	4.1	3.3	0	0
	December	676	90.9%	2.1	1.7	67.7	31.8	17.3	12.3	0	0
Annual		8040	91.8%	2.3	1.6	102.4	54.8	17.3	12.3	0	0

Observations in ug/m<sup>3</sup>

**FIGURE 4.1.2.3 - GREEN ACRES ROAD ANNUAL NO<sub>x</sub> / NO<sub>2</sub> CONCENTRATIONS**



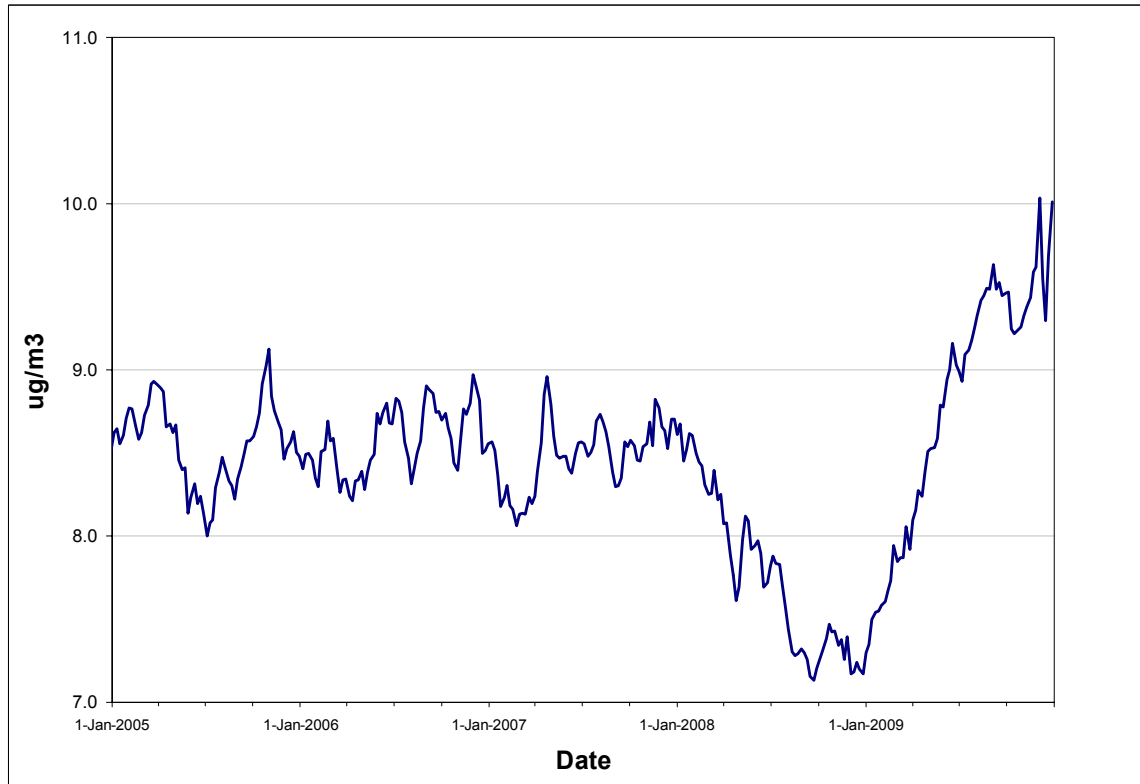
Rolling annual average of hourly concentrations

**TABLE 4.1.2.4 - GREEN ACRES ROAD TSP SUMMARY 2008 & 2009**

Year	Month	# Valid Days	% Valid Days	Average	Maximum 24-Hour	Regulatory Exceedances (>120)
2008	January	6	100.0%	5.2	8.0	0
	February	4	100.0%	5.4	6.1	0
	March	6	100.0%	8.0	17.8	0
	April	5	100.0%	7.2	11.1	0
	May	5	100.0%	8.4	12.7	0
	June	5	100.0%	10.2	18.1	0
	July	5	100.0%	7.0	14.8	0
	August	5	100.0%	7.5	12.0	0
	September	5	100.0%	9.6	14.5	0
	October	5	100.0%	9.3	11.4	0
	November	5	100.0%	7.6	19.3	0
	December	5	100.0%	3.8	8.5	0
Annual		61	100.0%	7.2	19.3	0
2009	January	6	100.0%	9.1	15.7	0
	February	4	100.0%	11.0	20.0	0
	March	5	100.0%	9.1	18.9	0
	April	5	100.0%	12.8	21.2	0
	May	6	100.0%	12.7	15.2	0
	June	5	100.0%	13.6	29.0	0
	July	5	100.0%	9.9	16.6	0
	August	5	100.0%	10.1	14.2	0
	September	5	100.0%	9.3	19.3	0
	October	5	100.0%	7.1	11.7	0
	November	5	100.0%	12.1	22.7	0
	December	4	80.0%	5.5	44.8	0
Annual		60	98.4%	10.0	44.8	0

Observations in ug/m<sup>3</sup>

**FIGURE 4.1.2.4 - GREEN ACRES ROAD ANNUAL TSP CONCENTRATIONS**



Rolling annual average of daily concentrations

### 4.1.3 Indian Pond Drive

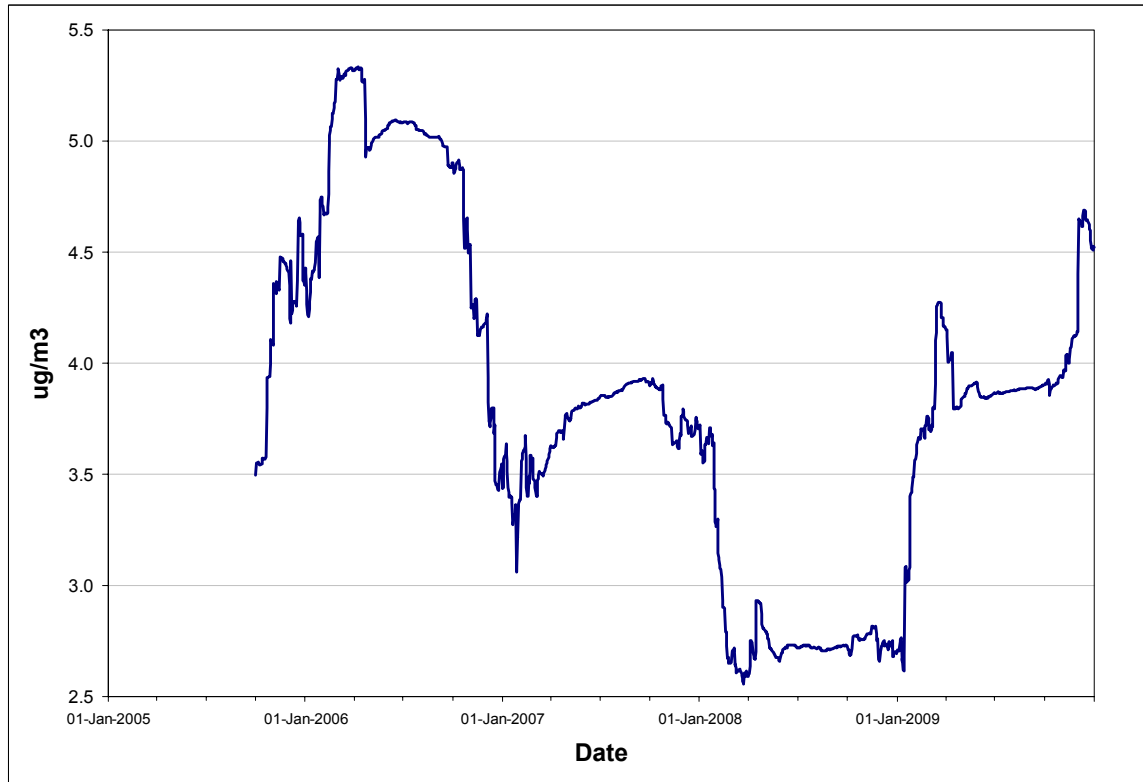
The Indian Pond Drive station monitors the ambient levels of SO<sub>2</sub>, NO<sub>x</sub> / NO<sub>2</sub>, PM<sub>2.5</sub> on a continuous basis and TSP on a 1 day in 6 day cycle consistent with the NAPS defined schedule. For all pollutants, the ambient air criteria were not exceeded on any occasion in 2009. Tables 4.1.3.1 through 4.1.3.4 provide summary information on the level of air contaminants measured at Indian Pond Drive, while Figures 4.1.3.1 through 4.1.3.4 provide a graphical representation of the annual trend of each pollutant.

**TABLE 4.1.3.1 - INDIAN POND DRIVE SO<sub>2</sub> SUMMARY 2008 & 2009**

Year	Month	# Valid Hours	% Valid Hours	Average	Maximum			Regulatory		
					1-Hour	3-Hour	24-Hour	1-Hour (>900)	3-Hour (>600)	24-Hour (>300)
2008	January	657	88.3%	5.2	181.2	154.1	41.0	0	0	0
	February	542	77.9%	2.7	112.6	29.8	13.5	0	0	0
	March	692	93.0%	3.6	120.2	71.5	22.0	0	0	0
	April	677	94.0%	6.2	198.0	145.6	83.2	0	0	0
	May	707	95.0%	1.1	55.0	42.3	8.8	0	0	0
	June	690	95.8%	1.6	25.7	17.2	6.5	0	0	0
	July	705	94.8%	1.1	4.9	3.3	2.1	0	0	0
	August	706	94.9%	0.9	11.5	4.8	1.9	0	0	0
	September	690	95.8%	1.1	6.7	5.2	1.8	0	0	0
	October	711	95.6%	2.2	112.5	75.1	19.6	0	0	0
	November	682	94.7%	3.0	99.9	53.0	26.7	0	0	0
	December	605	81.3%	4.3	193.5	105.3	17.5	0	0	0
Annual		8064	91.8%	2.7	198.0	154.1	83.2	0	0	0
2009	January	575	77.3%	16.4	272.7	227.2	138.4	0	0	0
	February	562	83.6%	6.5	145.6	109.1	35.7	0	0	0
	March	710	95.4%	8.3	294.9	232.5	68.6	0	0	0
	April	688	95.6%	2.4	44.4	32.3	12.0	0	0	0
	May	710	95.4%	1.5	33.9	15.6	5.7	0	0	0
	June	689	95.7%	1.5	29.7	20.4	4.7	0	0	0
	July	709	95.3%	1.3	17.8	8.1	2.5	0	0	0
	August	706	94.9%	1.1	14.9	5.6	1.5	0	0	0
	September	686	95.3%	1.2	6.7	3.6	1.9	0	0	0
	October	708	95.2%	2.7	96.4	35.8	9.2	0	0	0
	November	686	95.3%	5.3	139.0	116.1	29.4	0	0	0
	December	711	95.6%	8.7	224.7	202.1	99.3	0	0	0
Annual		8140	92.9%	4.5	294.9	232.5	138.4	0	0	0

Observations in ug/m<sup>3</sup>

**FIGURE 4.1.3.1 - INDIAN POND DRIVE ANNUAL SO<sub>2</sub> CONCENTRATIONS**



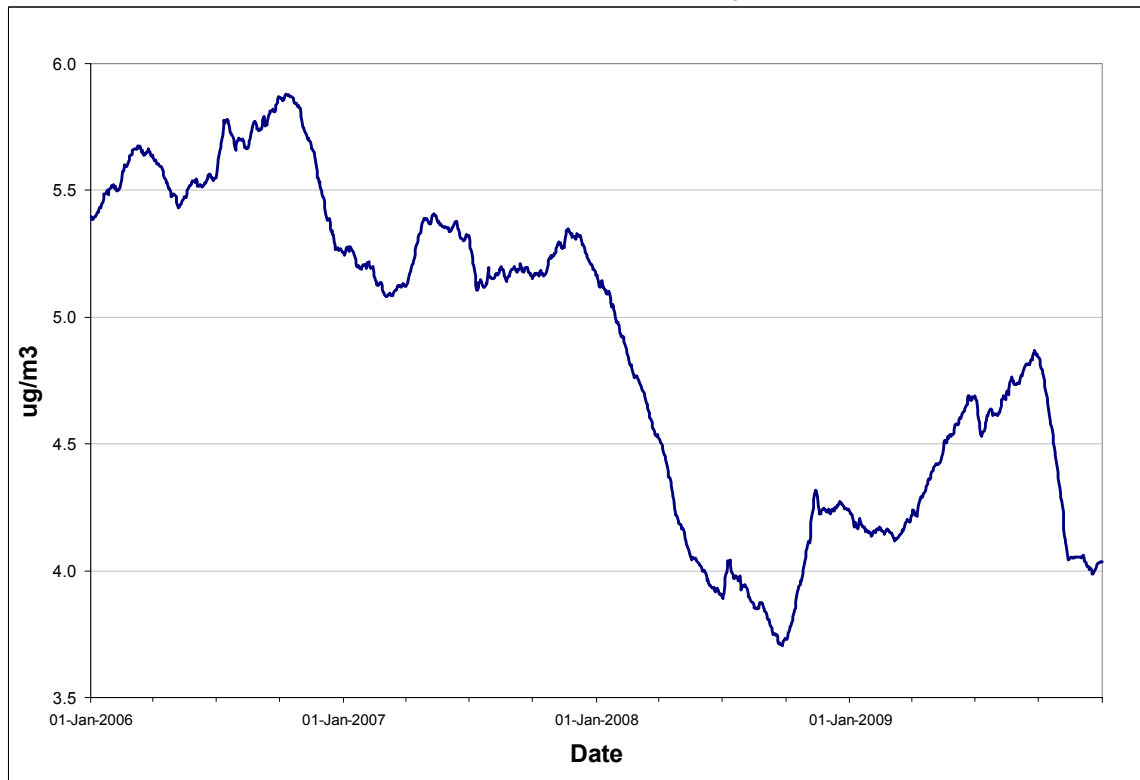
Rolling annual average of hourly concentrations

**TABLE 4.1.3.2 - INDIAN POND DRIVE PM<sub>2.5</sub> SUMMARY 2008 & 2009**

Year	Month	# Valid Days	% Valid Days	Average	Maximum 24-Hour	Regulatory Exceedances (>25)
2008	January	30	96.8%	3.5	9.5	0
	February	29	100.0%	2.7	6.1	0
	March	27	87.1%	2.8	5.8	0
	April	30	100.0%	3.0	8.4	0
	May	31	100.0%	2.8	7.4	0
	June	30	100.0%	3.0	8.5	0
	July	31	100.0%	5.3	17.1	0
	August	31	100.0%	4.4	9.6	0
	September	30	100.0%	4.0	8.4	0
	October	31	100.0%	8.8	13.0	0
	November	26	86.7%	7.6	27.4	1
	December	30	96.8%	3.1	7.1	0
Annual		356	97.3%	4.2	27.4	1
2009	January	30	96.8%	2.3	9.1	0
	February	26	92.9%	2.6	5.6	0
	March	26	83.9%	3.7	9.4	0
	April	30	100.0%	5.0	12.0	0
	May	31	100.0%	4.5	13.4	0
	June	26	86.7%	4.7	8.1	0
	July	31	775.0%	4.5	8.4	0
	August	30	96.8%	5.8	15.2	0
	September	30	100.0%	5.2	12.0	0
	October	31	100.0%	3.1	5.2	0
	November	30	100.0%	4.0	8.5	0
	December	31	100.0%	2.9	8.1	0
Annual		352	96.4%	4.0	15.2	0

Observations in ug/m<sup>3</sup>

**FIGURE 4.1.3.2 - INDIAN POND DRIVE ANNUAL PM<sub>2.5</sub> CONCENTRATIONS**



Rolling annual average of hourly concentrations

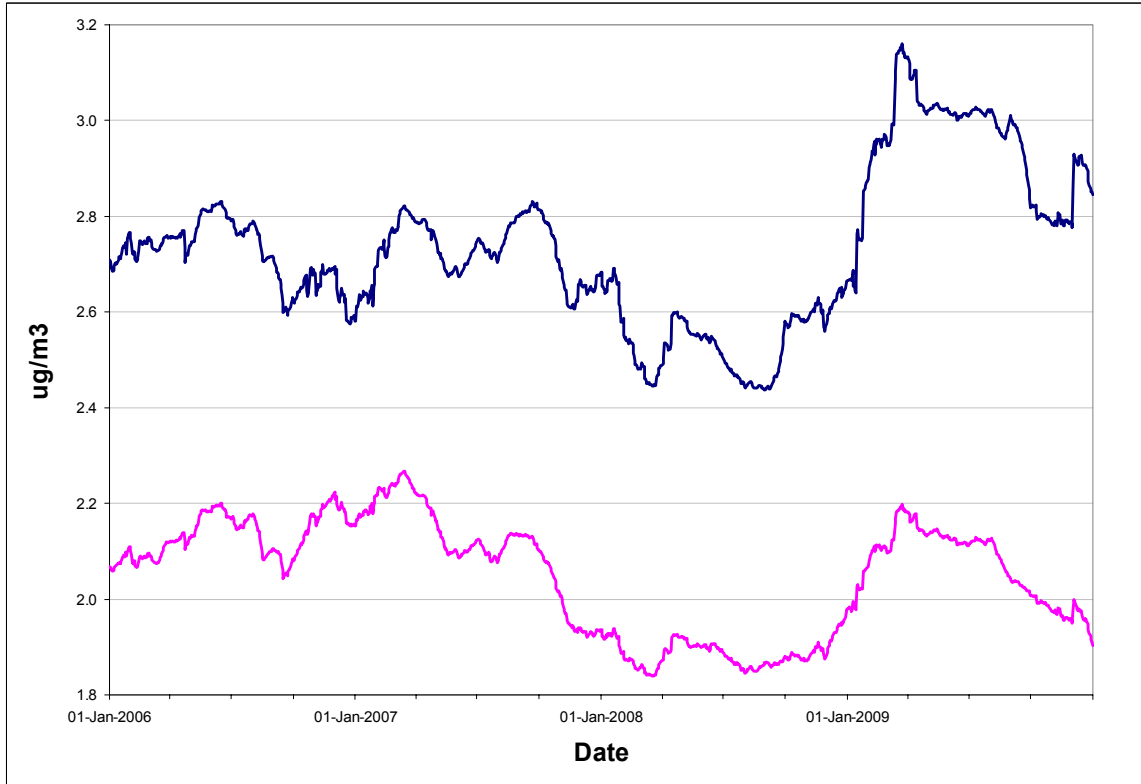


**TABLE 4.1.3.3 - INDIAN POND DRIVE NO<sub>x</sub> / NO<sub>2</sub> SUMMARY 2008 & 2009**

Year	Month	# Valid Hours	% Valid Hours	Average		Maximums				Exceedances	
						1-Hour		24-Hour		1-Hour (>400)	24-Hour (>200)
				NO <sub>x</sub>	NO <sub>2</sub>	NO <sub>x</sub>	NO <sub>2</sub>	NO <sub>x</sub>	NO <sub>2</sub>		
2008	January	630	84.7%	3.0	2.2	57.5	20.5	13.2	5.7	0	0
	February	638	91.7%	2.2	1.8	34.2	16.7	12.1	6.1	0	0
	March	661	88.8%	2.1	1.6	45.1	21.9	7.3	4.5	0	0
	April	646	89.7%	3.1	2.0	52.0	23.8	22.6	10.9	0	0
	May	682	91.7%	1.5	1.3	12.6	10.2	3.0	2.6	0	0
	June	656	91.1%	2.0	1.7	30.8	27.0	5.4	4.6	0	0
	July	680	91.4%	1.9	1.6	10.7	7.3	3.5	3.0	0	0
	August	676	90.9%	2.7	2.3	14.4	12.0	5.2	4.4	0	0
	September	631	87.6%	4.5	1.9	13.3	8.2	9.0	3.6	0	0
	October	682	91.7%	2.4	2.0	36.5	14.8	8.0	4.4	0	0
	November	653	90.7%	3.0	2.3	35.0	21.3	10.1	6.1	0	0
	December	579	77.8%	3.9	3.2	62.9	22.0	8.3	4.8	0	0
Annual		7814	89.0%	2.7	2.0	62.9	27.0	22.6	10.9	0	0
2009	January	551	74.1%	6.0	3.5	73.2	29.0	38.6	15.7	0	0
	February	538	80.1%	3.5	2.3	44.3	20.1	13.1	7.2	0	0
	March	682	91.7%	4.0	2.5	92.2	31.0	21.4	8.8	0	0
	April	658	91.4%	1.8	1.4	17.0	9.2	5.0	3.0	0	0
	May	678	91.1%	1.5	1.2	11.9	6.5	2.6	1.8	0	0
	June	667	92.6%	1.9	1.6	18.2	12.9	3.7	2.9	0	0
	July	711	95.6%	2.0	1.7	15.3	10.9	3.4	3.0	0	0
	August	683	91.8%	2.6	1.4	15.2	9.7	5.5	3.1	0	0
	September	686	95.3%	2.2	1.5	10.1	7.1	3.6	2.4	0	0
	October	691	92.9%	2.1	1.6	32.1	8.9	3.8	2.7	0	0
	November	652	90.6%	3.0	2.1	40.4	17.6	9.1	4.7	0	0
	December	682	91.7%	4.4	2.4	74.8	26.5	33.8	12.7	0	0
Annual		7879	89.9%	2.8	1.9	92.2	31.0	38.6	15.7	0	0

Observations in ug/m<sup>3</sup>

**FIGURE 4.1.3.3 - INDIAN POND DRIVE ANNUAL NO<sub>x</sub> / NO<sub>2</sub> CONCENTRATIONS**



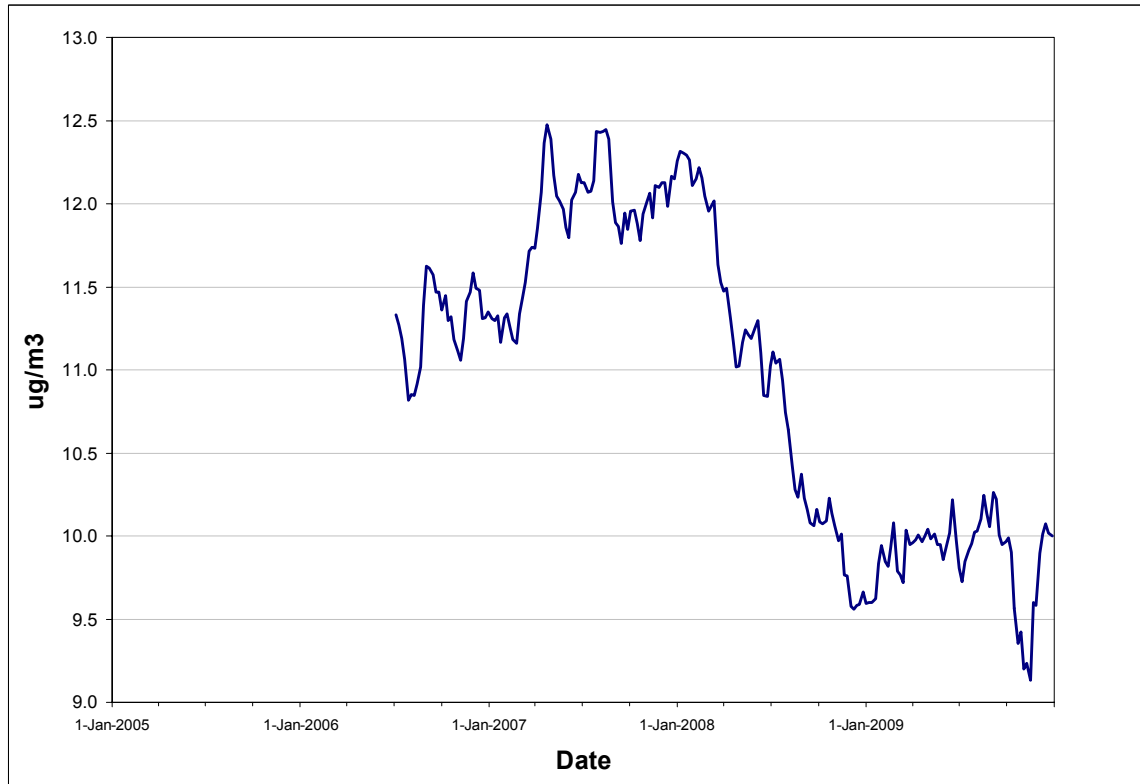
Rolling annual average of hourly concentrations

**TABLE 4.1.3.4 - INDIAN POND DRIVE TSP SUMMARY 2008 & 2009**

Year	Month	# Valid Days	% Valid Days	Average	Maximum 24-Hour	Regulatory Exceedances (>120)
2008	January	6	100.0%	9.3	18.7	0
	February	4	100.0%	11.1	15.8	0
	March	6	100.0%	13.0	18.8	0
	April	5	100.0%	10.5	13.8	0
	May	4	80.0%	12.7	17.2	0
	June	5	100.0%	11.6	22.2	0
	July	5	100.0%	8.4	17.5	0
	August	5	100.0%	8.0	20.4	0
	September	5	100.0%	8.6	14.8	0
	October	5	100.0%	10.2	12.8	0
	November	5	100.0%	6.7	11.0	0
	December	5	100.0%	8.1	16.2	0
Annual		60	98.4%	9.7	22.2	0
2009	January	6	100.0%	12.4	23.2	0
	February	3	75.0%	15.1	20.7	0
	March	5	100.0%	10.6	21.7	0
	April	5	100.0%	12.8	17.3	0
	May	4	66.7%	9.9	13.2	0
	June	5	100.0%	11.0	24.3	0
	July	5	100.0%	10.9	13.8	0
	August	5	100.0%	8.3	15.4	0
	September	5	100.0%	7.8	15.5	0
	October	5	100.0%	5.3	12.4	0
	November	5	100.0%	8.2	71.8	0
	December	5	100.0%	13.3	20.4	0
Annual		58	95.1%	10.0	71.8	0

Observations in ug/m<sup>3</sup>

**FIGURE 4.1.3.4 - INDIAN POND DRIVE ANNUAL TSP CONCENTRATIONS**



Rolling annual average of daily concentrations

#### **4.1.4 Indian Pond Road**

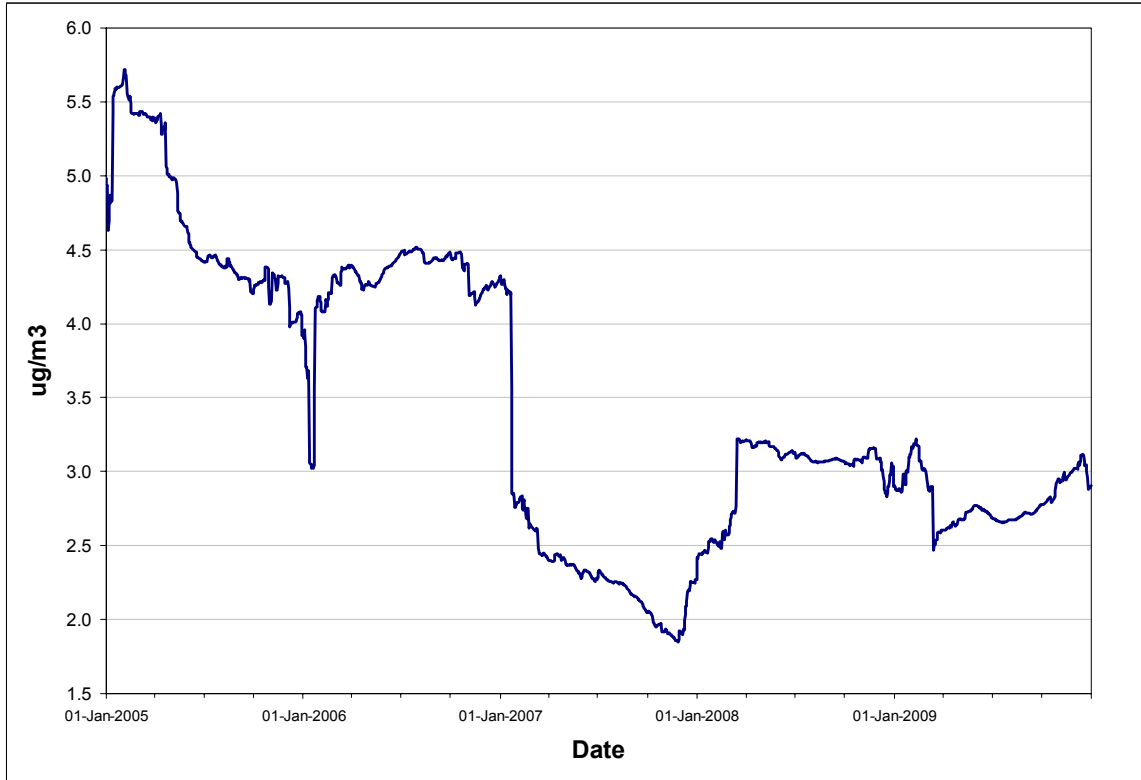
The Indian Pond Road station monitors the ambient levels of SO<sub>2</sub>, NO<sub>x</sub>/NO<sub>2</sub>, PM<sub>2.5</sub> on a continuous basis and TSP on a 1 day in 6 day cycle consistent with the NAPS defined schedule. For all pollutants, the ambient air criteria were not exceeded on any occasion in 2009. Tables 4.1.4.1 through 4.1.4.4 provide summary information on the level of air contaminants measured at Indian Pond Road, while Figures 4.1.4.1 through 4.1.4.4 provide a graphical representation of the annual trend of each pollutant.

**TABLE 4.1.4.1 - INDIAN POND ROAD SO<sub>2</sub> SUMMARY 2008 & 2009**

Year	Month	# Valid Hours	% Valid Hours	Average	Maximum			Regulatory Exceedances		
					1-Hour	3-Hour	24-Hour	1-Hour (>900)	3-Hour (>600)	24-Hour (>300)
2008	January	709	95.3%	5.3	222.2	174.7	52.3	0	0	0
	February	667	95.8%	4.3	113.0	89.4	36.6	0	0	0
	March	713	95.8%	8.7	277.3	272.6	151.1	0	0	0
	April	677	94.0%	2.0	42.8	25.3	9.9	0	0	0
	May	714	96.0%	1.0	32.7	16.6	3.1	0	0	0
	June	690	95.8%	2.6	28.3	18.4	7.0	0	0	0
	July	698	93.8%	1.4	6.1	4.3	2.9	0	0	0
	August	707	95.0%	0.9	6.2	3.8	1.7	0	0	0
	September	690	95.8%	1.0	7.1	5.4	2.0	0	0	0
	October	708	95.2%	1.7	61.7	44.0	16.4	0	0	0
	November	684	95.0%	2.1	112.0	65.4	15.9	0	0	0
	December	710	95.4%	5.2	106.9	73.6	32.4	0	0	0
Annual		8367	95.3%	3.0	277.3	272.6	151.1	0	0	0
2009	January	698	93.8%	6.3	206.5	148.9	40.5	0	0	0
	February	643	95.7%	2.9	171.8	149.4	24.0	0	0	0
	March	713	95.8%	4.0	118.2	96.6	19.3	0	0	0
	April	683	94.9%	3.0	89.0	71.8	12.0	0	0	0
	May	712	95.7%	2.1	145.4	63.2	15.7	0	0	0
	June	690	95.8%	1.6	32.7	19.8	4.8	0	0	0
	July	705	94.8%	1.2	10.0	7.3	2.1	0	0	0
	August	713	95.8%	1.6	5.0	3.5	2.5	0	0	0
	September	687	95.4%	1.6	4.6	3.3	2.6	0	0	0
	October	704	94.6%	3.8	85.0	56.8	17.2	0	0	0
	November	690	95.8%	2.9	86.6	37.2	9.8	0	0	0
	December	712	95.7%	3.8	78.8	40.6	14.2	0	0	0
Annual		8350	95.3%	2.9	206.5	149.4	40.5	0	0	0

Observations in ug/m<sup>3</sup>

**FIGURE 4.1.4.1 - INDIAN POND ROAD ANNUAL SO<sub>2</sub> CONCENTRATIONS**



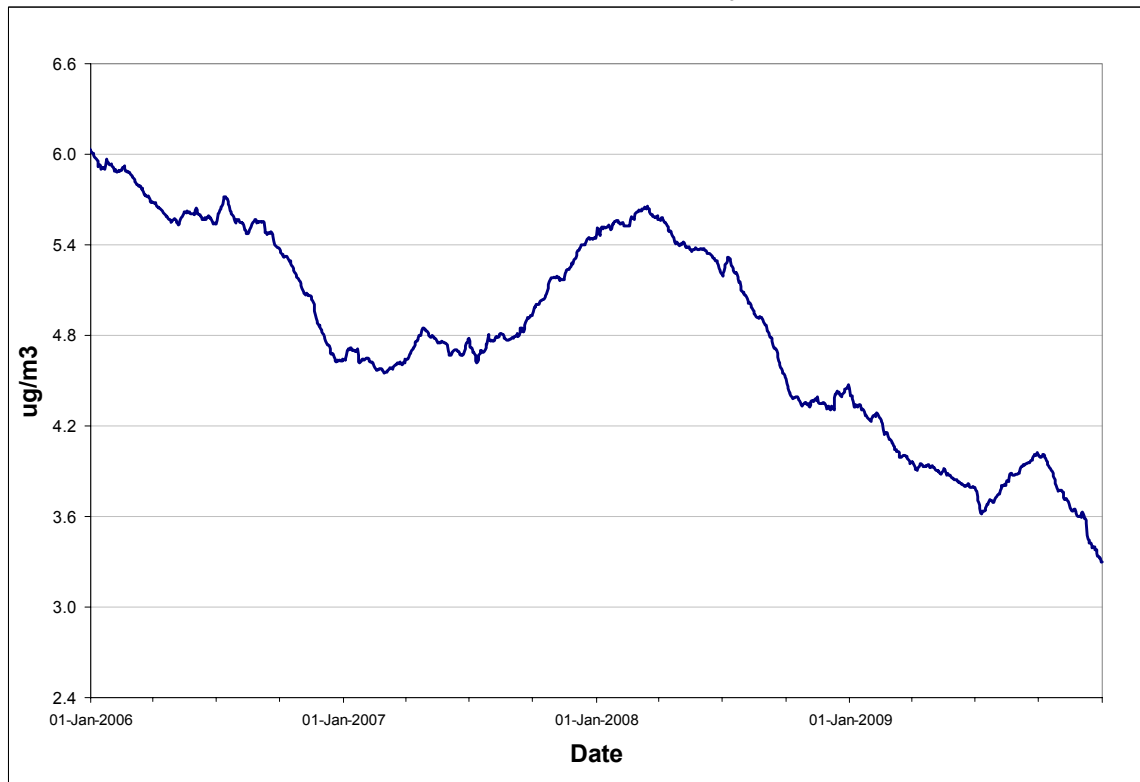
Rolling annual average of hourly concentrations

**TABLE 4.1.4.2 - INDIAN POND ROAD PM<sub>2.5</sub> SUMMARY 2008 & 2009**

Year	Month	# Valid Days	% Valid Days	Average	Maximum 24-Hour	Regulatory Exceedances (>25)
2008	January	31	100.0%	6.6	17.4	0
	February	29	100.0%	5.1	18.4	0
	March	31	100.0%	4.8	13.1	0
	April	30	100.0%	4.1	8.7	0
	May	31	100.0%	3.4	7.5	0
	June	30	100.0%	3.1	8.9	0
	July	29	93.5%	4.8	15.4	0
	August	30	96.8%	2.3	6.0	0
	September	29	96.7%	2.1	5.1	0
	October	28	90.3%	4.6	10.1	0
	November	28	93.3%	5.5	15.9	0
	December	27	87.1%	7.3	33.9	1
Annual		353	96.4%	4.5	33.9	1
2009	January	31	100.0%	3.9	11.8	0
	February	27	96.4%	3.6	7.5	0
	March	31	100.0%	3.1	6.8	0
	April	30	100.0%	3.8	7.7	0
	May	30	96.8%	2.4	10.9	0
	June	24	80.0%	2.2	4.5	0
	July	31	100.0%	4.0	7.2	0
	August	31	100.0%	4.1	14.2	0
	September	30	100.0%	3.7	8.1	0
	October	30	96.8%	1.8	5.4	0
	November	30	100.0%	3.4	9.1	0
	December	26	83.9%	3.3	15.0	0
Annual		351	96.2%	3.3	15.0	0

Observations in ug/m<sup>3</sup>

**FIGURE 4.1.4.2 - INDIAN POND ROAD ANNUAL PM<sub>2.5</sub> CONCENTRATIONS**



Rolling annual average of hourly concentrations

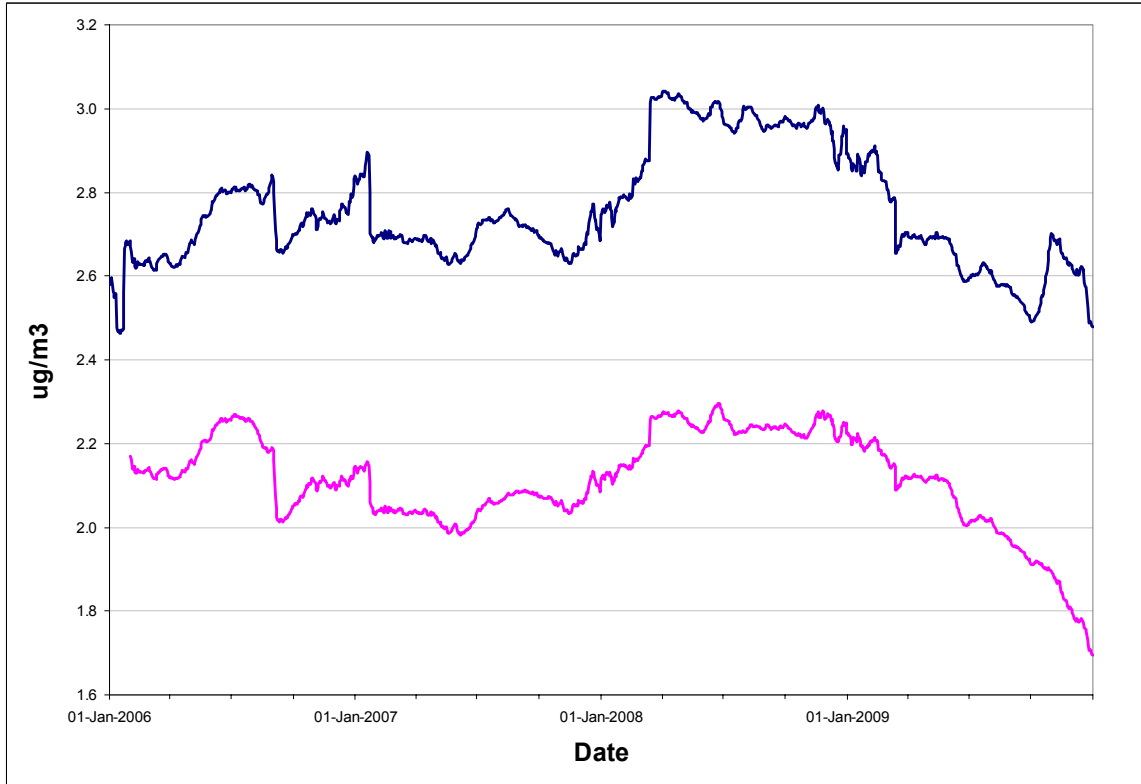


**TABLE 4.1.4.3 - INDIAN POND ROAD NO<sub>x</sub> / NO<sub>2</sub> SUMMARY 2008 & 2009**

Year	Month	# Valid Hours	% Valid Hours	Average		Maximums				Exceedances	
						1-Hour		24-Hour		1-Hour (>400)	24-Hour (>200)
				NO <sub>x</sub>	NO <sub>2</sub>	NO <sub>x</sub>	NO <sub>2</sub>	NO <sub>x</sub>	NO <sub>2</sub>		
2008	January	677	91.0%	4.4	3.1	88.9	40.8	23.7	11.6	0	0
	February	638	91.7%	3.1	2.2	49.4	25.1	15.7	8.4	0	0
	March	682	91.7%	4.1	2.5	85.7	35.9	46.5	21.6	0	0
	April	644	89.4%	2.2	1.8	24.8	14.9	5.1	3.8	0	0
	May	682	91.7%	2.1	1.7	9.7	8.6	4.6	4.0	0	0
	June	660	91.7%	3.4	3.1	28.2	23.6	9.7	7.6	0	0
	July	673	90.5%	2.8	1.6	7.9	6.2	5.8	3.1	0	0
	August	678	91.1%	1.9	1.7	9.6	8.5	3.8	3.4	0	0
	September	660	91.7%	2.3	1.8	11.1	8.3	4.6	3.8	0	0
	October	676	90.9%	2.0	1.6	20.4	9.1	6.1	3.2	0	0
	November	658	91.4%	3.0	2.7	38.2	24.9	10.2	8.0	0	0
	December	679	91.3%	4.1	3.0	60.2	26.4	15.9	8.4	0	0
Annual		8007	91.2%	2.9	2.3	88.9	40.8	46.5	21.6	0	0
2009	January	675	90.7%	3.5	2.4	74.8	26.5	16.4	8.2	0	0
	February	616	91.7%	2.5	1.9	61.2	28.8	9.8	5.0	0	0
	March	682	91.7%	2.7	2.0	50.1	27.0	9.2	5.5	0	0
	April	654	90.8%	2.1	1.7	36.5	20.5	5.6	3.2	0	0
	May	682	91.7%	2.1	1.6	56.9	29.1	8.1	4.8	0	0
	June	658	91.4%	2.2	1.9	14.4	10.6	3.8	3.0	0	0
	July	639	85.9%	3.0	1.7	13.0	8.7	5.3	2.9	0	0
	August	677	91.0%	1.5	1.2	13.0	9.4	2.4	2.2	0	0
	September	687	95.4%	1.4	1.1	7.8	5.6	2.6	2.2	0	0
	October	682	91.7%	4.5	1.4	35.6	13.6	10.3	3.1	0	0
	November	660	91.7%	2.0	1.6	25.0	16.7	4.5	3.7	0	0
	December	680	91.4%	2.4	1.7	26.1	16.2	5.4	3.4	0	0
Annual		7992	91.2%	2.5	1.7	74.8	29.1	16.4	8.2	0	0

Observations in ug/m<sup>3</sup>

**FIGURE 4.1.4.3 - INDIAN POND ROAD ANNUAL NO<sub>x</sub> / NO<sub>2</sub> CONCENTRATIONS**



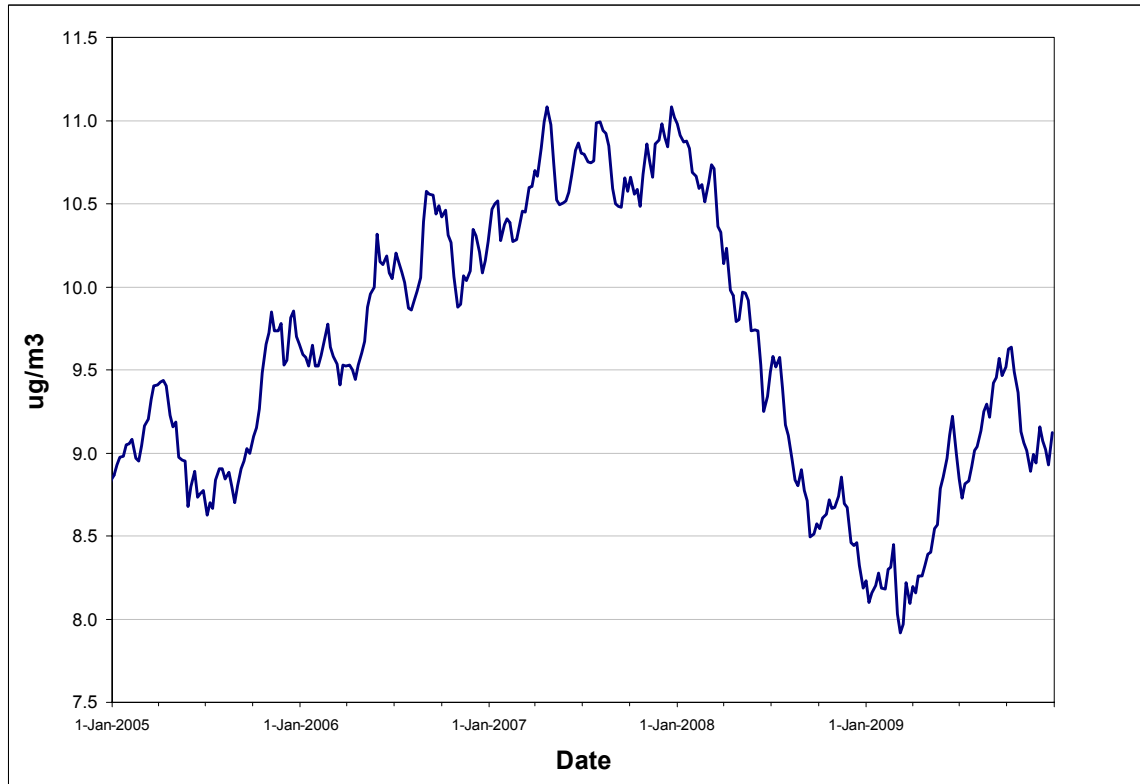
Rolling annual average of hourly concentrations

**TABLE 4.1.4.4 - INDIAN POND ROAD TSP SUMMARY 2008 & 2009**

Year	Month	# Valid Days	% Valid Days	Average	Maximum 24-Hour	Regulatory Exceedances (>120)
2008	January	5	83.3%	7.0	11.1	0
	February	4	100.0%	8.2	11.0	0
	March	6	100.0%	11.1	27.2	0
	April	5	100.0%	8.8	20.3	0
	May	5	100.0%	7.6	13.5	0
	June	5	100.0%	10.5	21.9	0
	July	5	100.0%	7.0	16.0	0
	August	5	100.0%	7.7	19.9	0
	September	5	100.0%	7.1	17.3	0
	October	5	100.0%	9.1	10.6	0
	November	5	100.0%	10.1	14.8	0
	December	5	100.0%	5.4	7.9	0
Annual		60	98.4%	8.2	27.2	0
2009	January	5	83.3%	7.0	14.5	0
	February	4	100.0%	13.2	17.4	0
	March	5	100.0%	7.2	16.9	0
	April	5	100.0%	12.7	16.3	0
	May	6	100.0%	13.8	21.5	0
	June	5	100.0%	10.3	23.5	0
	July	5	100.0%	8.9	10.6	0
	August	5	100.0%	10.0	13.9	0
	September	5	100.0%	10.5	17.3	0
	October	5	100.0%	5.5	20.5	0
	November	5	100.0%	7.8	10.8	0
	December	5	100.0%	6.9	19.8	0
Annual		60	98.4%	9.1	23.5	0

Observations in ug/m<sup>3</sup>

**FIGURE 4.1.4.4 - INDIAN POND ROAD ANNUAL TSP CONCENTRATIONS**



Rolling annual average of daily concentrations

#### **4.1.5 Lawrence Pond Road**

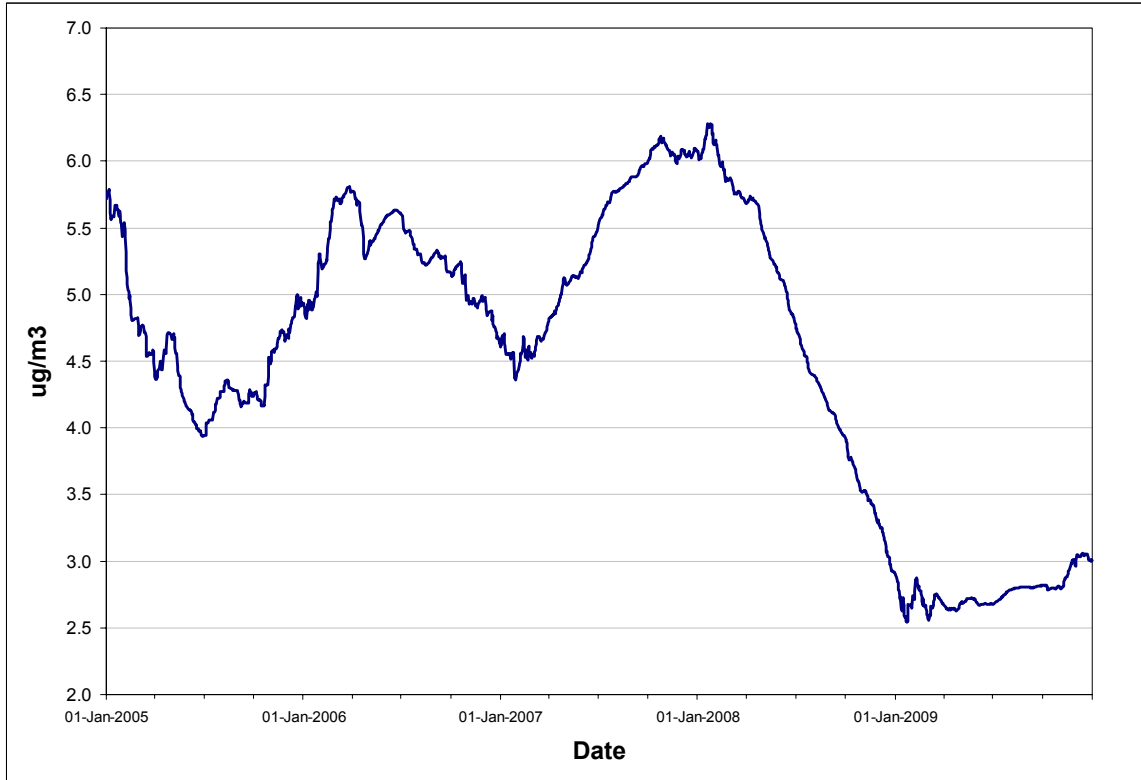
The Lawrence Pond Road station monitors the ambient levels of SO<sub>2</sub>, NO<sub>x</sub> / NO<sub>2</sub>, PM<sub>2.5</sub> on a continuous basis and TSP on a 1 day in 6 day cycle consistent with the NAPS defined schedule. For all pollutants, the ambient air criteria were not exceeded on any occasion in 2009. Tables 4.1.5.1 through 4.1.5.4 provide summary information on the level of air contaminants measured at Lawrence Pond Road, while Figures 4.1.5.1 through 4.1.5.4 provide a graphical representation of the annual trend of each pollutant.

**TABLE 4.1.5.1 - LAWRENCE POND ROAD SO<sub>2</sub> SUMMARY 2008 & 2009**

Year	Month	# Valid Hours	% Valid Hours	Average	Maximum			Regulatory Exceedances		
					1-Hour	3-Hour	24-Hour	1-Hour (>900)	3-Hour (>600)	24-Hour (>300)
2008	January	713	95.8%	8.9	99.1	64.1	29.5	0	0	0
	February	666	95.7%	7.4	85.7	62.3	24.0	0	0	0
	March	123	16.5%	5.4	36.4	20.9	7.9	0	0	0
	April	97	13.5%	0.8	4.3	1.1	0.9	0	0	0
	May	713	95.8%	1.5	57.9	32.4	6.5	0	0	0
	June	662	91.9%	1.5	25.5	16.9	6.3	0	0	0
	July	710	95.4%	0.7	6.4	4.1	1.5	0	0	0
	August	713	95.8%	1.1	3.2	2.9	1.8	0	0	0
	September	668	92.8%	0.9	2.9	1.8	1.3	0	0	0
	October	713	95.8%	1.7	33.9	28.0	8.2	0	0	0
	November	688	95.6%	2.6	74.0	51.1	23.7	0	0	0
	December	685	92.1%	2.8	91.0	50.6	8.3	0	0	0
Annual		7151	81.4%	2.9	99.1	64.1	29.5	0	0	0
2009	January	665	89.4%	6.6	157.0	79.1	47.1	0	0	0
	February	644	95.8%	7.1	126.3	95.6	42.2	0	0	0
	March	707	95.0%	3.6	94.7	65.8	23.8	0	0	0
	April	686	95.3%	2.3	35.9	27.7	9.8	0	0	0
	May	711	95.6%	1.8	93.3	38.6	8.6	0	0	0
	June	683	94.9%	1.3	29.6	11.7	3.2	0	0	0
	July	710	95.4%	1.9	11.3	5.6	2.9	0	0	0
	August	713	95.8%	1.4	8.2	4.7	1.9	0	0	0
	September	688	95.6%	1.0	36.1	3.0	3.3	0	0	0
	October	703	94.5%	1.6	40.5	17.2	5.2	0	0	0
	November	687	95.4%	4.5	73.7	52.6	14.1	0	0	0
	December	710	95.4%	3.3	61.2	38.5	20.0	0	0	0
Annual		8307	94.8%	3.0	157.0	95.6	47.1	0	0	0

Observations in ug/m<sup>3</sup>

**FIGURE 4.1.5.1 - LAWRENCE POND ROAD ANNUAL SO<sub>2</sub> CONCENTRATIONS**



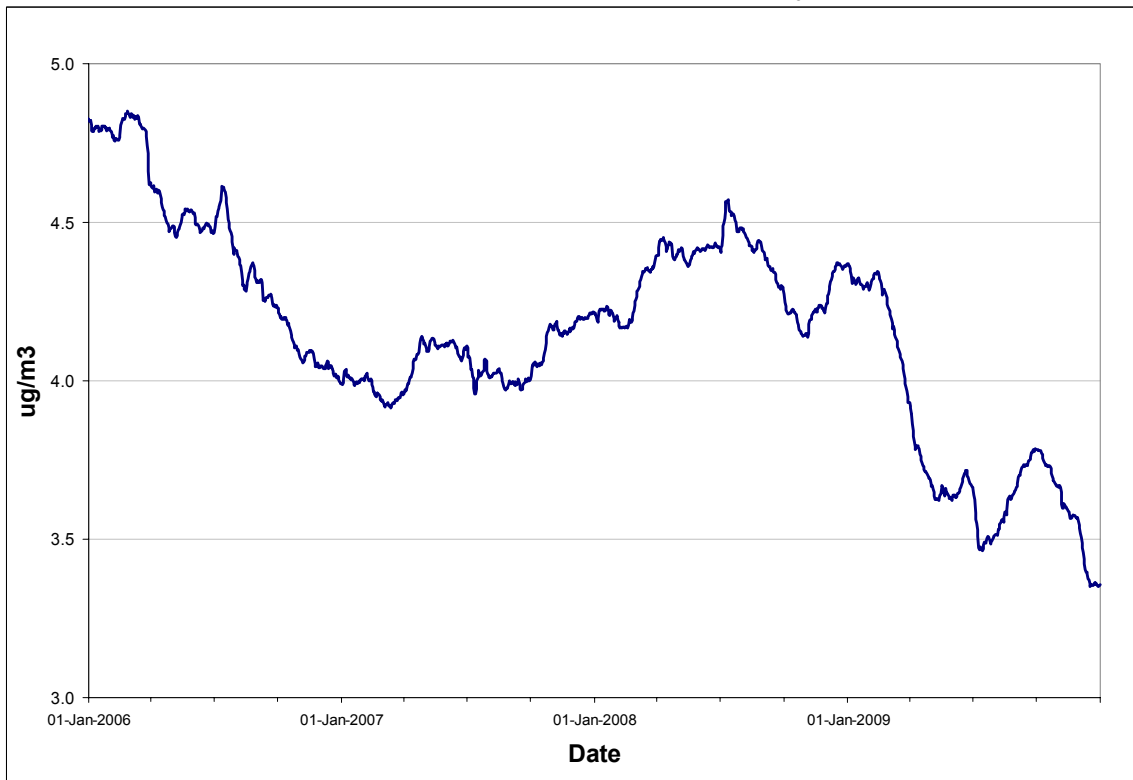
Rolling annual average of hourly concentrations

**TABLE 4.1.5.2 - LAWRENCE POND ROAD PM<sub>2.5</sub> SUMMARY 2008 & 2009**

Year	Month	# Valid Days	% Valid Days	Average	Maximum 24-Hour	Regulatory Exceedances (>25)
2008	January	31	100.0%	3.8	11.2	0
	February	29	100.0%	4.6	9.5	0
	March	31	100.0%	6.0	9.5	0
	April	25	83.3%	5.6	13.3	0
	May	31	100.0%	4.1	8.3	0
	June	30	100.0%	3.8	9.3	0
	July	28	90.3%	5.4	15.6	0
	August	31	100.0%	3.3	7.4	0
	September	29	96.7%	3.0	6.0	0
	October	30	96.8%	3.4	7.7	0
	November	28	93.3%	4.4	14.5	0
	December	31	100.0%	5.2	12.6	0
Annual		354	96.7%	4.4	15.6	0
2009	January	30	96.8%	2.9	9.4	0
	February	21	75.0%	3.8	8.2	0
	March	29	93.5%	2.6	8.4	0
	April	30	100.0%	2.5	6.8	0
	May	28	90.3%	3.4	13.3	0
	June	25	83.3%	4.4	6.5	0
	July	31	100.0%	3.5	7.5	0
	August	31	100.0%	4.9	14.5	0
	September	30	100.0%	4.5	9.4	0
	October	31	100.0%	2.1	4.3	0
	November	30	100.0%	3.0	6.8	0
	December	31	100.0%	2.9	6.8	0
Annual		347	95.1%	3.4	14.5	0

Observations in ug/m<sup>3</sup>

**FIGURE 4.1.5.2 - LAWRENCE POND ROAD ANNUAL PM<sub>2.5</sub> CONCENTRATIONS**



Rolling annual average of hourly concentrations

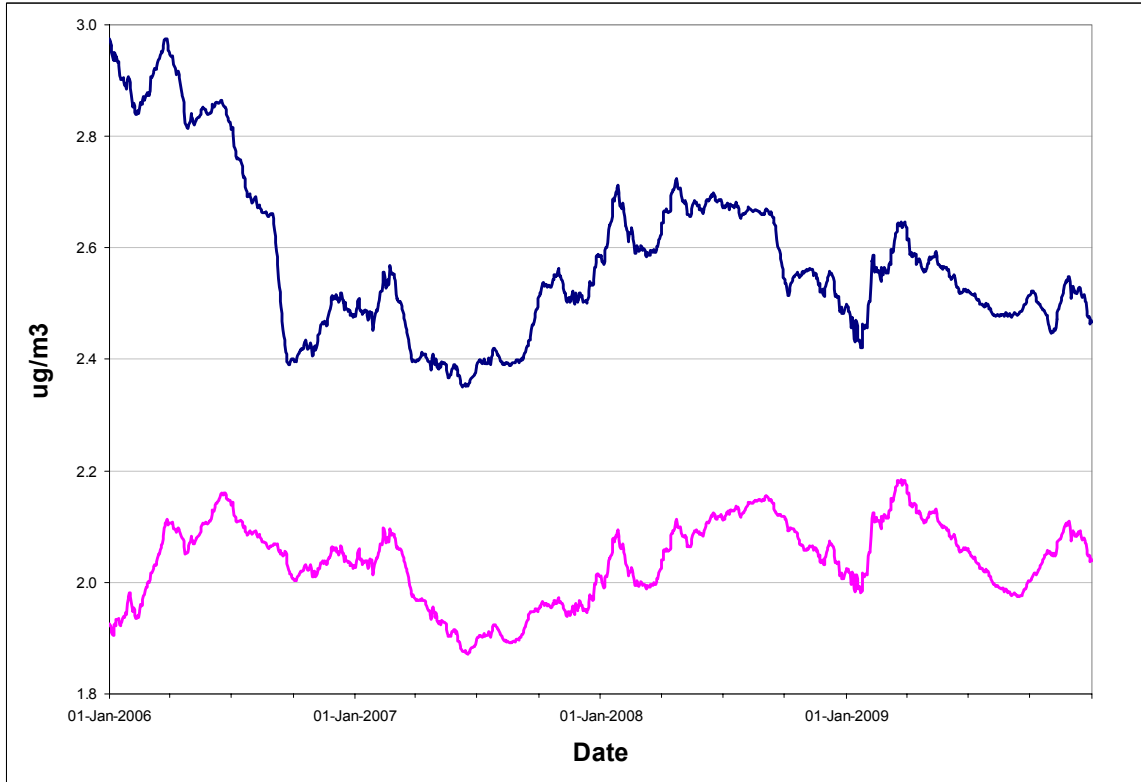


**TABLE 4.1.5.3 - LAWRENCE POND ROAD NO<sub>x</sub> / NO<sub>2</sub> SUMMARY 2008 & 2009**

Year	Month	# Valid Hours	% Valid Hours	Average		Maximums				Exceedances	
						1-Hour		24-Hour		1-Hour (>400)	24-Hour (>200)
				NO <sub>x</sub>	NO <sub>2</sub>	NO <sub>x</sub>	NO <sub>2</sub>	NO <sub>x</sub>	NO <sub>2</sub>		
2008	January	682	91.7%	4.0	3.2	39.3	34.6	13.5	11.6	0	0
	February	638	91.7%	2.7	2.1	45.0	38.4	11.5	8.8	0	0
	March	674	90.6%	2.1	1.8	24.8	23.2	6.1	5.3	0	0
	April	614	85.3%	2.9	2.4	36.6	31.5	11.3	9.5	0	0
	May	682	91.7%	1.9	1.6	18.0	13.3	4.3	3.9	0	0
	June	657	91.3%	2.2	2.0	14.6	13.1	4.3	4.0	0	0
	July	677	91.0%	2.1	1.9	9.9	6.4	4.3	3.9	0	0
	August	681	91.5%	1.8	1.7	5.8	5.6	2.9	2.7	0	0
	September	644	89.4%	1.9	1.7	21.3	15.8	4.3	3.9	0	0
	October	673	90.5%	3.0	1.3	12.1	8.3	4.9	2.8	0	0
	November	650	90.3%	2.3	2.2	31.2	21.1	11.7	9.6	0	0
	December	661	88.8%	2.9	2.4	57.0	33.6	6.8	4.7	0	0
Annual		7933	90.3%	2.5	2.0	57.0	38.4	13.5	11.6	0	0
2009	January	636	85.5%	3.6	3.2	66.6	49.0	19.6	14.7	0	0
	February	615	91.5%	4.0	3.5	52.1	44.1	18.5	15.3	0	0
	March	679	91.3%	3.0	2.5	39.8	31.0	11.4	9.3	0	0
	April	657	91.3%	2.0	1.6	55.8	25.6	5.4	4.8	0	0
	May	682	91.7%	1.8	1.4	37.3	22.0	4.1	2.8	0	0
	June	663	92.1%	1.8	1.6	30.9	19.7	3.6	3.4	0	0
	July	710	95.4%	1.8	1.4	12.3	10.7	2.7	2.3	0	0
	August	713	95.8%	1.7	1.3	7.4	6.8	2.6	2.1	0	0
	September	680	94.4%	2.3	1.9	28.7	13.9	3.3	2.7	0	0
	October	127	17.1%	1.6	1.4	11.3	10.3	2.0	1.6	0	0
	November	657	91.3%	3.0	2.5	26.6	24.3	6.5	5.5	0	0
	December	677	91.0%	2.4	2.0	23.7	23.1	8.3	6.9	0	0
Annual		7496	85.6%	2.5	2.0	66.6	49.0	19.6	15.3	0	0

Observations in ug/m<sup>3</sup>

**FIGURE 4.1.5.3 - LAWRENCE POND ROAD ANNUAL NO<sub>x</sub> / NO<sub>2</sub> CONCENTRATIONS**



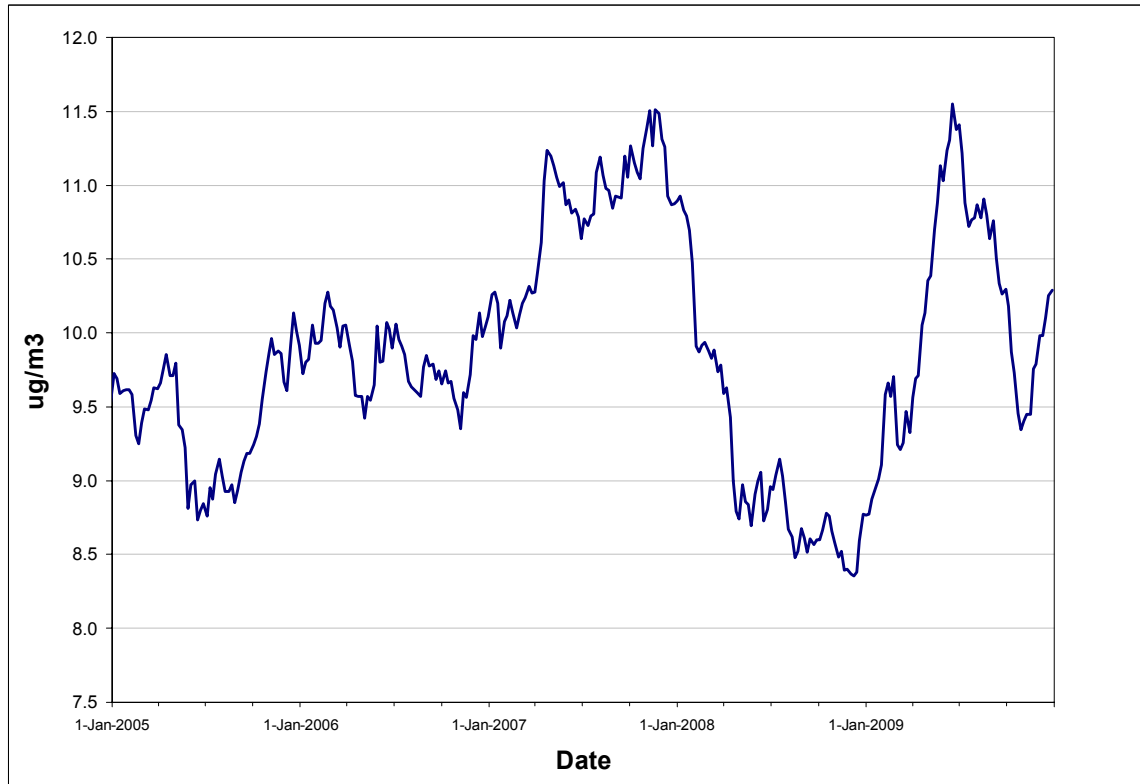
Rolling annual average of hourly concentrations

**TABLE 4.1.5.4 - LAWRENCE POND ROAD TSP SUMMARY 2008 & 2009**

Year	Month	# Valid Days	% Valid Days	Average	Maximum 24-Hour	Regulatory Exceedances (>120)
2008	January	5	83.3%	5.5	8.8	0
	February	4	100.0%	4.4	12.4	0
	March	6	100.0%	8.2	18.2	0
	April	5	100.0%	5.2	9.0	0
	May	5	100.0%	9.9	36.8	0
	June	5	100.0%	13.3	25.9	0
	July	5	100.0%	17.1	31.5	0
	August	5	100.0%	11.1	32.5	0
	September	4	80.0%	12.5	27.0	0
	October	5	100.0%	9.8	17.5	0
	November	5	100.0%	5.8	10.5	0
	December	5	100.0%	10.7	34.9	0
Annual		59	96.7%	8.8	36.8	0
2009	January	6	100.0%	8.6	11.1	0
	February	4	100.0%	11.5	16.7	0
	March	5	100.0%	6.1	16.1	0
	April	5	100.0%	12.3	17.8	0
	May	6	100.0%	21.5	28.3	0
	June	5	100.0%	20.0	49.0	0
	July	5	100.0%	8.7	11.4	0
	August	5	100.0%	9.5	15.1	0
	September	5	100.0%	8.2	20.5	0
	October	5	100.0%	3.0	8.9	0
	November	5	100.0%	10.2	26.3	0
	December	5	100.0%	19.8	44.6	0
Annual		61	100.0%	10.3	49.0	0

Observations in ug/m<sup>3</sup>

**FIGURE 4.1.5.4 - LAWRENCE POND ROAD ANNUAL TSP CONCENTRATIONS**



Rolling annual average of daily concentrations

#### **4.1.6 NALCOR Property Boundary**

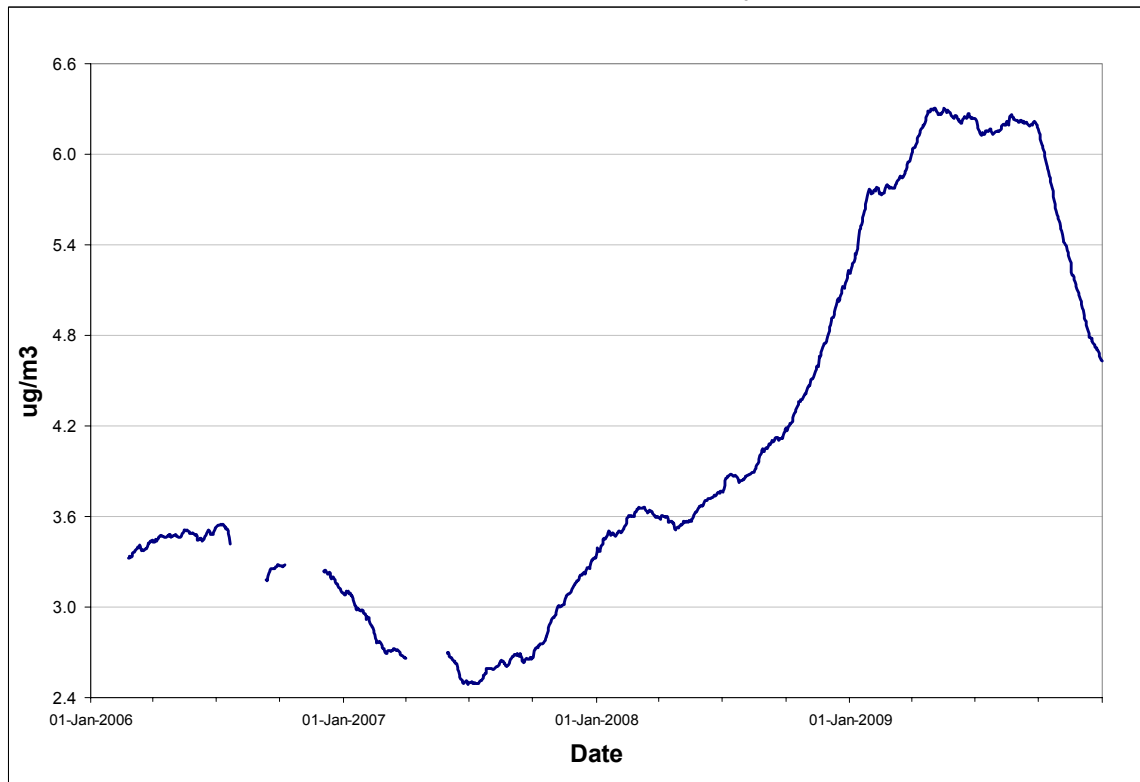
The NALCOR Property Boundary station monitors the ambient levels of PM<sub>2.5</sub> on a continuous basis and TPM on a 1 day in 6 day cycle consistent with the NAPS defined schedule. For all pollutants, the ambient air criteria were not exceeded on any occasion in 2009. Tables 4.1.6.1 through 4.1.6.2 provide summary information on the level of air contaminants measured at NALCOR Property Boundary, while Figures 4.1.6.1 through 4.1.6.2 provide a graphical representation of the annual trend of each pollutant.

**TABLE 4.1.6.1 - NALCOR BOUNDARY PM<sub>2.5</sub> SUMMARY 2008 & 2009**

Year	Month	# Valid Days	% Valid Days	Average	Maximum 24-Hour	Regulatory Exceedances (>25)
2008	January	30	96.8%	4.1	11.0	0
	February	25	86.2%	3.7	11.8	0
	March	31	100.0%	2.8	6.0	0
	April	28	93.3%	3.5	7.3	0
	May	30	96.8%	3.8	6.7	0
	June	28	93.3%	3.6	9.7	0
	July	22	71.0%	5.1	13.3	0
	August	31	100.0%	5.2	10.6	0
	September	28	93.3%	5.1	8.4	0
	October	28	90.3%	8.6	13.2	0
	November	25	83.3%	9.0	23.0	0
	December	26	83.9%	9.2	14.9	0
Annual		332	90.7%	5.2	23.0	0
2009	January	29	93.5%	9.9	22.6	0
	February	27	96.4%	4.2	8.9	0
	March	31	100.0%	5.2	10.9	0
	April	30	100.0%	6.9	12.0	0
	May	31	100.0%	3.2	11.7	0
	June	26	86.7%	3.4	6.6	0
	July	31	100.0%	4.5	8.8	0
	August	31	100.0%	6.0	19.0	0
	September	30	100.0%	4.6	10.5	0
	October	31	100.0%	1.4	4.6	0
	November	30	100.0%	2.5	5.4	0
	December	31	100.0%	3.9	8.9	0
Annual		358	98.1%	4.6	22.6	0

Observations in ug/m<sup>3</sup>

**FIGURE 4.1.6.1 - NALCOR BOUNDARY ANNUAL PM<sub>2.5</sub> CONCENTRATIONS**



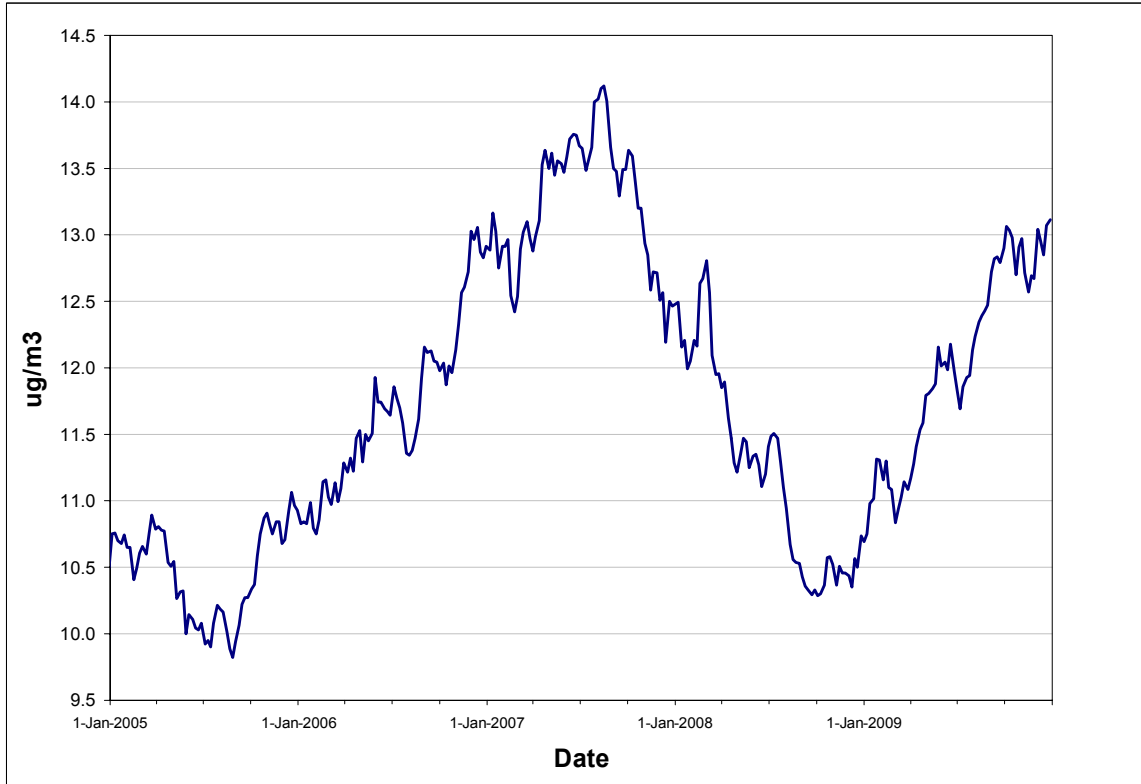
Rolling annual average of hourly concentrations

**TABLE 4.1.6.2 - NALCOR BOUNDARY TSP SUMMARY 2008 & 2009**

Year	Month	# Valid Days	% Valid Days	Average	Maximum 24-Hour	Regulatory Exceedances (>120)
2008	January	6	100.0%	8.3	19.7	0
	February	4	100.0%	17.7	31.2	0
	March	6	100.0%	13.2	31.7	0
	April	5	100.0%	9.3	14.6	0
	May	5	100.0%	11.6	22.6	0
	June	5	100.0%	13.7	24.4	0
	July	5	100.0%	8.4	17.1	0
	August	4	80.0%	7.0	11.3	0
	September	5	100.0%	9.9	15.0	0
	October	5	100.0%	12.9	23.8	0
	November	5	100.0%	8.4	12.4	0
	December	5	100.0%	13.3	34.4	0
Annual		60	98.4%	10.7	34.4	0
2009	January	5	83.3%	14.5	17.0	0
	February	2	50.0%	16.0	20.7	0
	March	4	80.0%	14.7	23.7	0
	April	5	100.0%	17.3	25.6	0
	May	5	83.3%	15.0	19.9	0
	June	5	100.0%	11.4	20.2	0
	July	5	100.0%	11.2	17.9	0
	August	4	80.0%	10.2	14.4	0
	September	5	100.0%	14.3	19.8	0
	October	5	100.0%	13.0	25.2	0
	November	5	100.0%	6.8	17.8	0
	December	5	100.0%	19.6	51.5	0
Annual		55	90.2%	13.1	51.5	0

Observations in ug/m<sup>3</sup>

**FIGURE 4.1.6.2 - NALCOR BOUNDARY ANNUAL TSP CONCENTRATIONS**



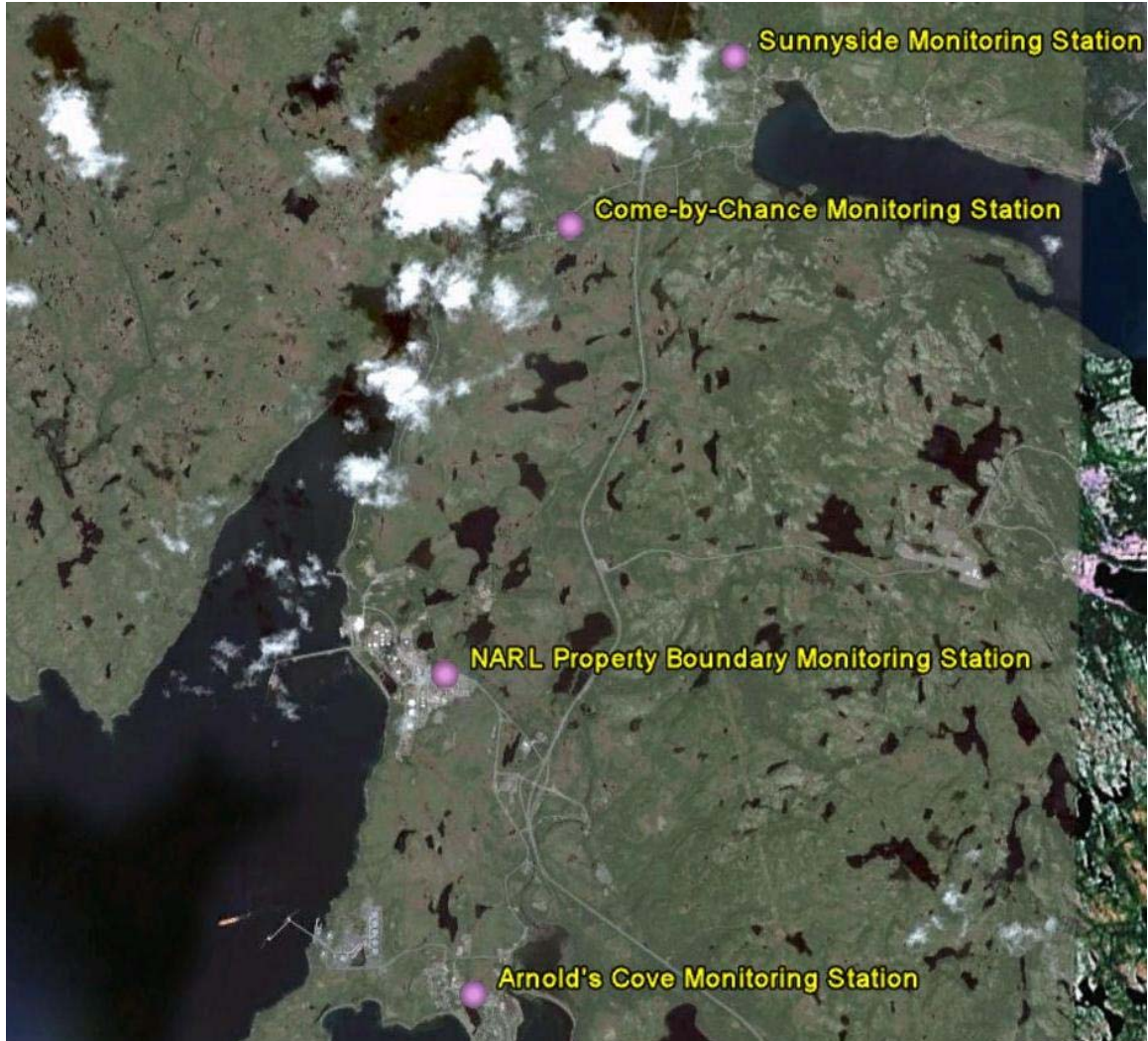
Rolling annual average of daily concentrations



## 4.2 North Atlantic Refining Limited

In 2009, NARL operated monitoring stations at 4 locations. These stations are installed to monitor the emissions from North Atlantic's refinery in Come-by-Chance and are located at Arnold's Cove, Come-by-Chance, Sunnyside and the NARL property boundary. The locations of these monitoring stations are identified in Figure 4.2.1.

**FIGURE 4.2.1 - NARL AMBIENT MONITORING STATIONS**



#### **4.2.1 Arnold's Cove**

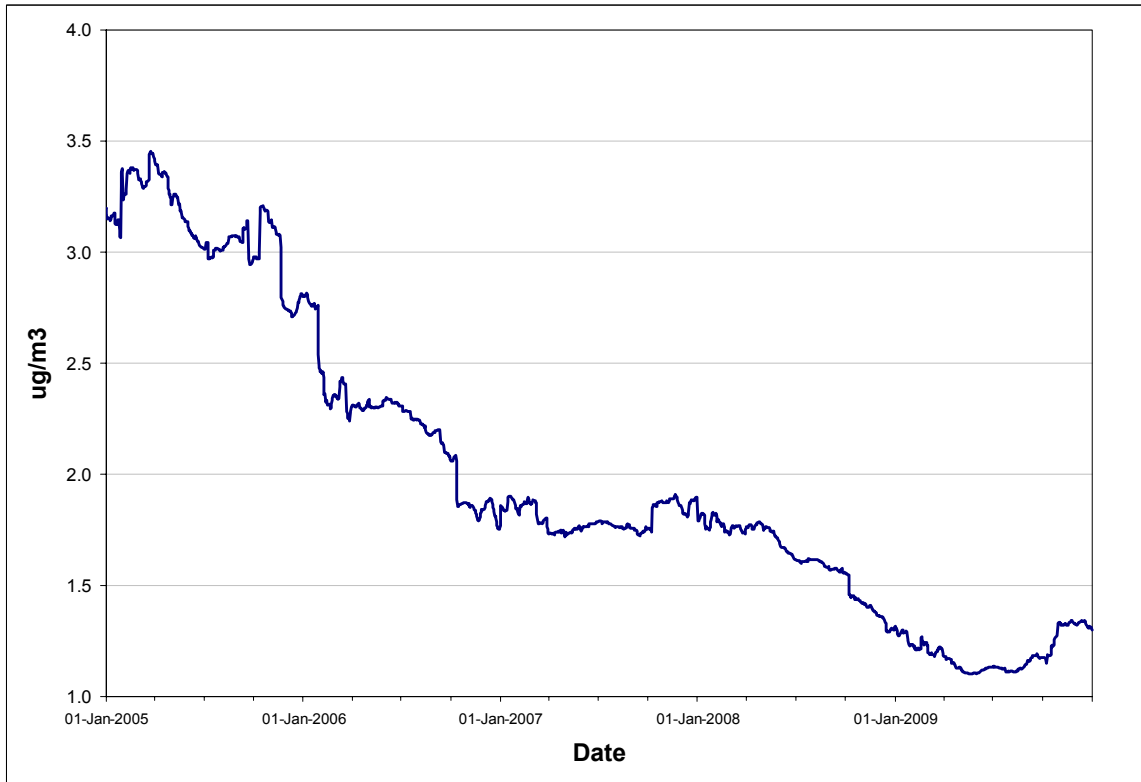
The Arnold's Cove station monitors the ambient levels of SO<sub>2</sub> and PM<sub>2.5</sub> on a continuous basis and is located near Tricentia Academy. For all pollutants, the ambient air criteria were not exceeded on any occasion in 2009. Tables 4.2.1.1 through 4.2.1.2 provide summary information on the level of air contaminants measured at Arnold's Cove, while Figures 4.2.1.1 through 4.2.1.2 provide a graphical representation of the annual trend of each pollutant.

**TABLE 4.2.1.1 - ARNOLD'S COVE SO<sub>2</sub> SUMMARY 2008 & 2009**

Year	Month	# Valid Hours	% Valid Hours	Average	Regulatory Exceedances					
					Maximum			1-Hour (>900)	3-Hour (>600)	24-Hour (>300)
					1-Hour	3-Hour	24-Hour			
2008	January	708	95.2%	2.5	76.5	56.5	11.4	0	0	0
	February	664	95.4%	2.1	28.5	21.1	5.7	0	0	0
	March	707	95.0%	1.9	49.3	40.2	12.7	0	0	0
	April	685	95.1%	1.6	59.7	41.4	6.8	0	0	0
	May	710	95.4%	0.8	35.3	19.4	3.7	0	0	0
	June	684	95.0%	0.4	7.0	3.6	0.9	0	0	0
	July	707	95.0%	0.7	31.9	18.2	5.5	0	0	0
	August	709	95.3%	0.5	10.6	4.7	1.6	0	0	0
	September	681	94.6%	0.8	18.1	12.4	4.7	0	0	0
	October	707	95.0%	1.3	39.0	28.0	8.9	0	0	0
	November	685	95.1%	1.1	15.1	10.0	3.7	0	0	0
	December	702	94.4%	1.8	35.0	14.8	4.3	0	0	0
Annual		8349	95.0%	1.3	76.5	56.5	12.7	0	0	0
2009	January	709	95.3%	1.7	34.9	20.8	4.9	0	0	0
	February	639	95.1%	2.2	137.5	116.4	19.9	0	0	0
	March	706	94.9%	1.3	16.1	12.1	5.5	0	0	0
	April	685	95.1%	0.9	25.5	10.0	2.6	0	0	0
	May	706	94.9%	0.5	13.8	5.6	1.6	0	0	0
	June	685	95.1%	0.8	11.8	5.7	1.9	0	0	0
	July	709	95.3%	0.5	13.4	6.3	1.4	0	0	0
	August	706	94.9%	0.9	19.2	12.6	3.6	0	0	0
	September	683	94.9%	1.2	91.0	37.1	5.5	0	0	0
	October	709	95.3%	3.1	66.9	51.7	17.3	0	0	0
	November	684	95.0%	1.1	20.8	11.0	4.2	0	0	0
	December	709	95.3%	1.5	79.2	27.2	5.0	0	0	0
Annual		8330	95.1%	1.3	137.5	116.4	19.9	0	0	0

Observations in ug/m<sup>3</sup>

**FIGURE 4.2.1.1 - ARNOLD'S COVE ANNUAL SO<sub>2</sub> CONCENTRATIONS**



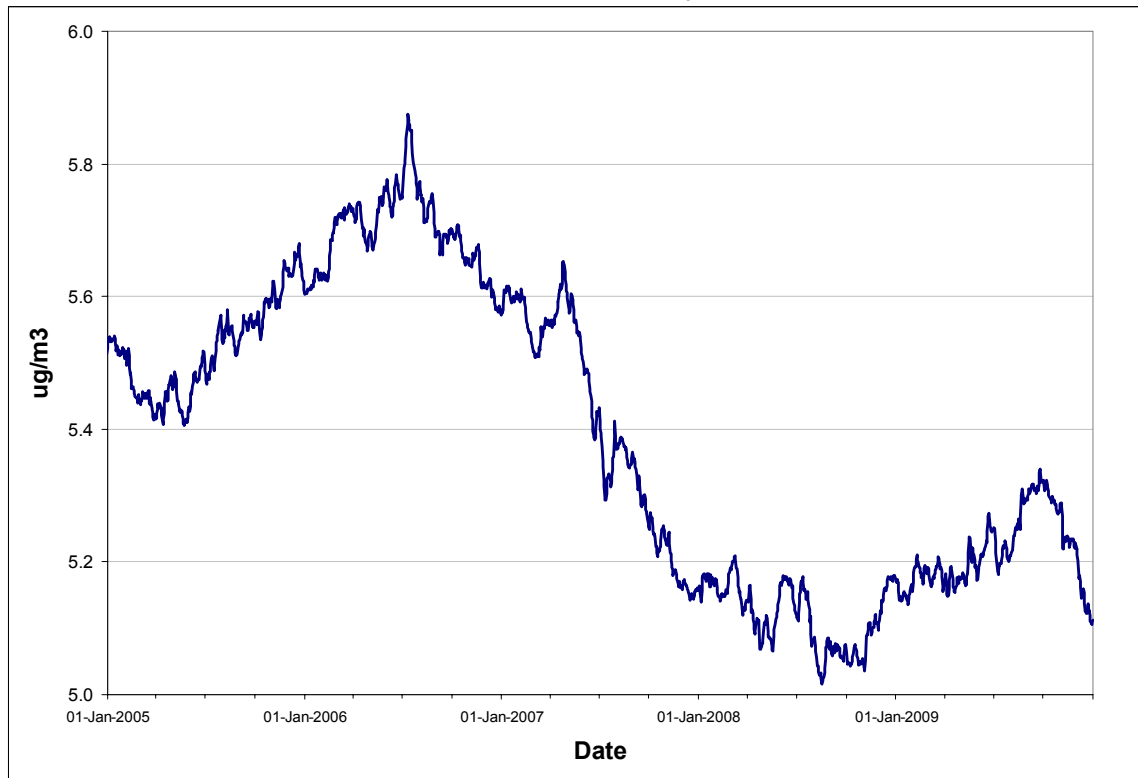
Rolling annual average of hourly concentrations

**TABLE 4.2.1.2 - ARNOLD'S COVE PM<sub>2.5</sub> SUMMARY 2008 & 2009**

Year	Month	# Valid Days	% Valid Days	Average	Maximum 24-Hour	Regulatory Exceedances (>25)
2008	January	31	100.0%	5.6	12.8	0
	February	29	100.0%	5.2	8.8	0
	March	31	100.0%	5.3	8.0	0
	April	30	100.0%	5.5	9.5	0
	May	31	100.0%	5.3	9.6	0
	June	29	96.7%	3.9	8.8	0
	July	30	96.8%	5.6	10.3	0
	August	31	100.0%	5.3	9.9	0
	September	30	100.0%	4.9	8.5	0
	October	31	100.0%	4.5	6.8	0
	November	30	100.0%	5.3	18.4	0
	December	31	100.0%	5.7	10.6	0
Annual		364	99.5%	5.2	18.4	0
2009	January	31	100.0%	5.4	7.7	0
	February	26	92.9%	5.7	10.4	0
	March	31	100.0%	5.0	8.8	0
	April	28	93.3%	5.6	9.9	0
	May	31	100.0%	5.3	15.5	0
	June	30	100.0%	4.8	9.3	0
	July	31	100.0%	5.2	9.0	0
	August	29	93.5%	6.4	15.3	0
	September	13	43.3%	5.1	8.7	0
	October	31	100.0%	4.0	6.0	0
	November	30	100.0%	4.7	8.3	0
	December	31	100.0%	4.4	10.8	0
Annual		342	93.7%	5.1	15.5	0

Observations in ug/m<sup>3</sup>

**FIGURE 4.2.1.2 - ARNOLD'S COVE ANNUAL PM<sub>2.5</sub> CONCENTRATIONS**



Rolling annual average of hourly concentrations

#### **4.2.2 Come by Chance**

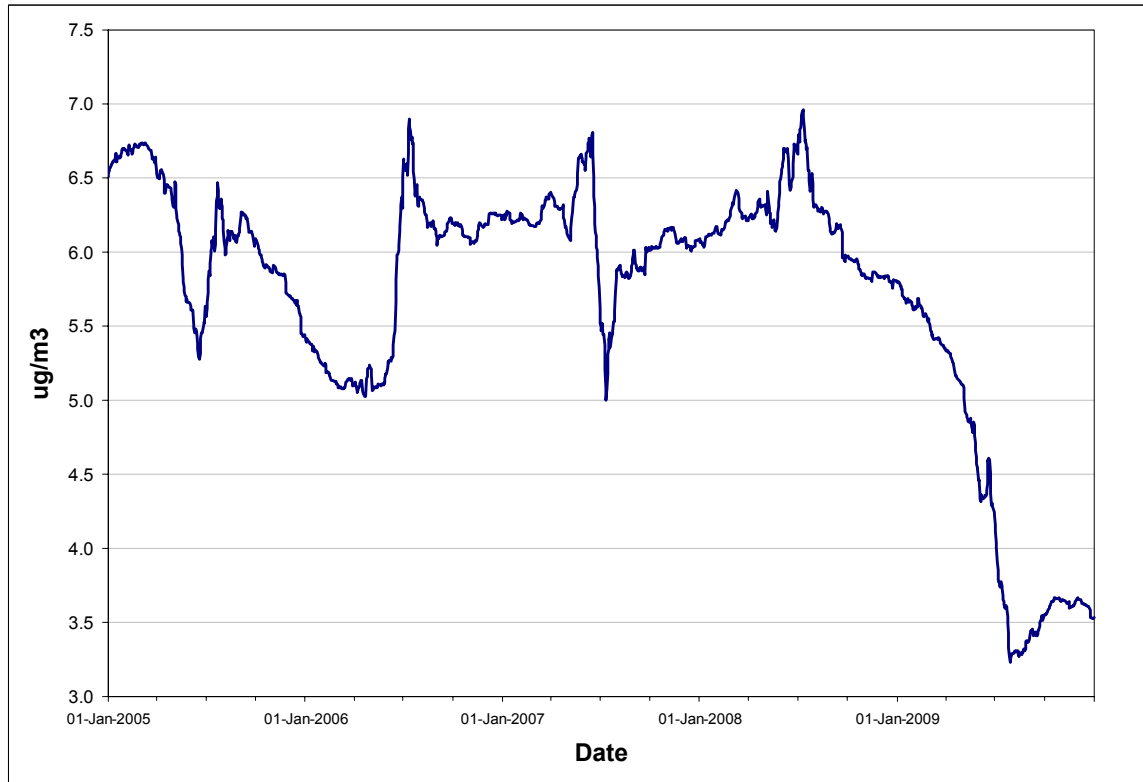
The Come by Chance station monitors the ambient levels of SO<sub>2</sub> and PM<sub>2.5</sub> on a continuous basis. For all pollutants, the ambient air criteria were not exceeded on any occasion in 2009. Tables 4.2.2.1 through 4.2.2.2 provide summary information on the level of air contaminants measured at Come by Chance, while Figures 4.2.2.1 through 4.2.2.2 provide a graphical representation of the annual trend of each pollutant.

**TABLE 4.2.2.1 - COME BY CHANCE SO<sub>2</sub> SUMMARY 2008 & 2009**

Year	Month	# Valid Hours	% Valid Hours	Average	Maximum			Regulatory Exceedances		
					1-Hour	3-Hour	24-Hour	1-Hour (>900)	3-Hour (>600)	24-Hour (>300)
2008	January	708	95.2%	3.5	68.5	28.5	16.3	0	0	0
	February	664	95.4%	3.1	99.3	83.0	14.7	0	0	0
	March	705	94.8%	3.3	103.4	62.7	18.2	0	0	0
	April	681	94.6%	3.9	54.9	22.4	14.0	0	0	0
	May	709	95.3%	12.3	138.4	88.5	29.5	0	0	0
	June	680	94.4%	13.7	151.5	120.6	52.0	0	0	0
	July	702	94.4%	17.8	127.2	82.1	41.1	0	0	0
	August	707	95.0%	3.8	65.6	34.9	9.3	0	0	0
	September	680	94.4%	2.9	105.9	70.6	17.4	0	0	0
	October	708	95.2%	1.2	39.6	19.0	4.2	0	0	0
	November	684	95.0%	1.7	166.5	71.9	25.3	0	0	0
	December	698	93.8%	2.3	133.7	83.6	18.4	0	0	0
Annual		8326	94.8%	5.8	166.5	120.6	52.0	0	0	0
2009	January	710	95.4%	1.3	102.1	42.0	9.2	0	0	0
	February	640	95.2%	2.3	89.2	59.5	22.1	0	0	0
	March	708	95.2%	0.9	58.6	21.4	5.3	0	0	0
	April	685	95.1%	1.0	22.8	14.2	4.5	0	0	0
	May	706	94.9%	4.8	199.9	155.0	32.7	0	0	0
	June	680	94.4%	10.7	203.8	182.4	64.6	0	0	0
	July	707	95.0%	6.4	121.9	81.0	28.0	0	0	0
	August	703	94.5%	4.8	153.5	115.0	20.0	0	0	0
	September	683	94.9%	5.2	66.4	40.3	15.8	0	0	0
	October	430	57.8%	1.3	13.5	9.5	4.8	0	0	0
	November	680	94.4%	1.9	50.3	20.9	11.8	0	0	0
	December	709	95.3%	0.8	35.7	20.0	5.9	0	0	0
Annual		8041	91.8%	3.5	203.8	182.4	64.6	0	0	0

Observations in ug/m<sup>3</sup>

**FIGURE 4.2.2.1 - COME BY CHANCE ANNUAL SO<sub>2</sub> CONCENTRATIONS**



Rolling annual average of hourly concentrations

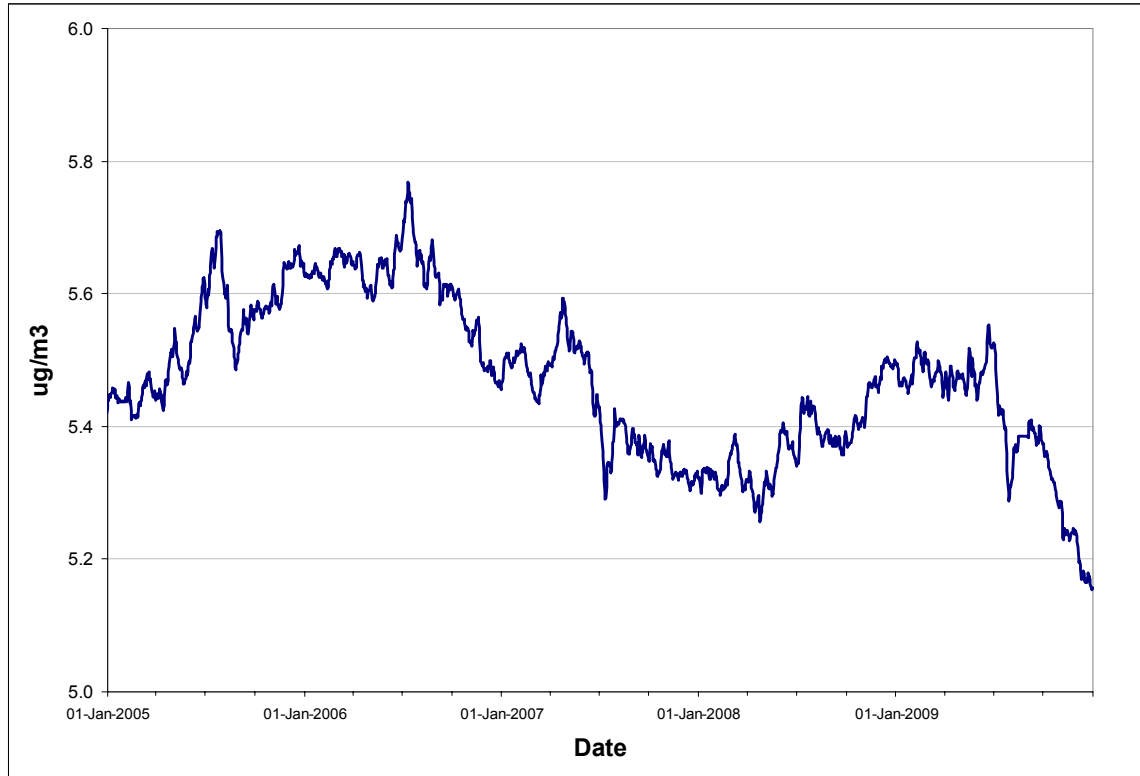


**TABLE 4.2.2.2 - COME BY CHANCE PM<sub>2.5</sub> SUMMARY 2008 & 2009**

Year	Month	# Valid Days	% Valid Days	Average	Maximum 24-Hour	Regulatory Exceedances (>25)
2008	January	31	100.0%	5.3	11.1	0
	February	29	100.0%	5.3	9.6	0
	March	31	100.0%	5.4	8.1	0
	April	29	96.7%	5.9	9.6	0
	May	31	100.0%	5.9	10.1	0
	June	29	96.7%	4.6	11.6	0
	July	30	96.8%	8.2	14.3	0
	August	10	32.3%	4.4	6.8	0
	September	26	86.7%	5.2	8.0	0
	October	31	100.0%	4.8	6.9	0
	November	29	96.7%	5.0	15.3	0
	December	31	100.0%	5.2	10.4	0
Annual		337	92.1%	5.5	15.3	0
2009	January	31	100.0%	5.0	7.5	0
	February	28	100.0%	5.7	10.7	0
	March	31	100.0%	5.0	9.3	0
	April	30	100.0%	6.0	10.1	0
	May	30	96.8%	5.5	16.6	0
	June	30	100.0%	5.6	10.4	0
	July	31	100.0%	5.7	11.3	0
	August	16	51.6%	6.5	13.1	0
	September	29	96.7%	5.0	9.3	0
	October	31	100.0%	3.8	6.4	0
	November	30	100.0%	4.5	7.8	0
	December	31	100.0%	4.3	10.5	0
Annual		348	95.3%	5.2	16.6	0

Observations in ug/m<sup>3</sup>

**FIGURE 4.2.2.2 - COME BY CHANCE ANNUAL PM<sub>2.5</sub> CONCENTRATIONS**



Rolling annual average of hourly concentrations

### **4.2.3 Sunnyside**

The Sunnyside station monitors the ambient levels of SO<sub>2</sub>, PM<sub>2.5</sub> and PM<sub>10</sub> on a continuous basis. For all pollutants, the ambient air criteria were not exceeded on any occasion in 2009. Tables 4.2.3.1 through 4.2.3.3 provide summary information on the level of air contaminants measured at Sunnyside, while Figures 4.2.3.1 through 4.2.3.3 provide a graphical representation of the annual trend of each pollutant.

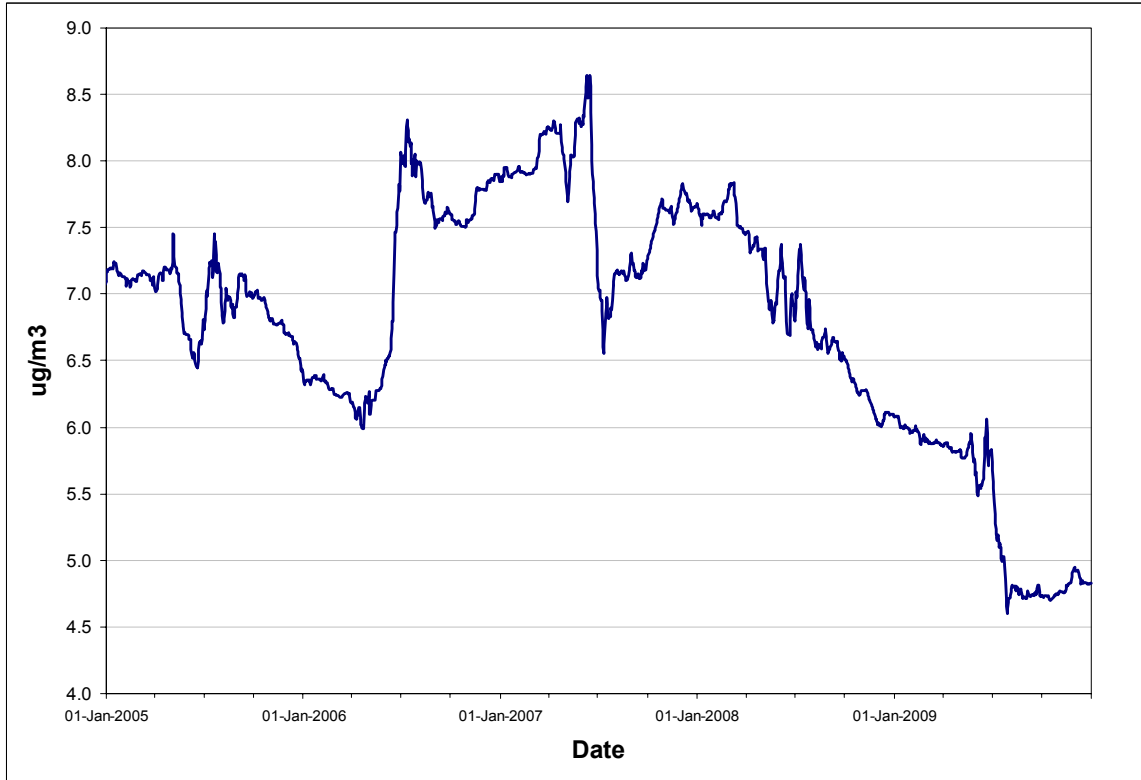
The PM<sub>10</sub> analyzer malfunctioned in 2008 and given the vintage of the analyzer, it took an extended period of time to get the analyzer functional again, which resulted in numerous months of no data being collected.

**TABLE 4.2.3.1 - SUNNYSIDE SO<sub>2</sub> SUMMARY 2008 & 2009**

Year	Month	# Valid Hours	% Valid Hours	Average	Maximum			Regulatory Exceedances		
					1-Hour	3-Hour	24-Hour	1-Hour (>900)	3-Hour (>600)	24-Hour (>300)
2008	January	706	94.9%	3.4	100.5	57.3	18.9	0	0	0
	February	664	95.4%	3.9	110.6	76.8	16.7	0	0	0
	March	705	94.8%	2.4	52.1	42.3	9.8	0	0	0
	April	684	95.0%	3.0	47.7	31.6	14.0	0	0	0
	May	706	94.9%	10.2	100.8	77.7	35.3	0	0	0
	June	681	94.6%	11.0	220.2	132.4	61.8	0	0	0
	July	708	95.2%	21.3	200.0	146.8	56.1	0	0	0
	August	667	89.7%	4.7	83.8	64.5	21.5	0	0	0
	September	640	88.9%	4.7	96.9	82.4	19.6	0	0	0
	October	705	94.8%	3.0	63.2	42.0	13.5	0	0	0
	November	684	95.0%	1.8	49.6	17.4	5.6	0	0	0
	December	703	94.5%	3.0	98.1	72.3	14.9	0	0	0
Annual		8253	94.0%	6.1	220.2	146.8	61.8	0	0	0
2009	January	709	95.3%	1.8	78.7	33.6	7.1	0	0	0
	February	639	95.1%	3.5	52.7	41.1	18.4	0	0	0
	March	708	95.2%	1.8	51.2	38.5	8.2	0	0	0
	April	684	95.0%	2.5	22.7	14.2	6.8	0	0	0
	May	708	95.2%	8.1	166.0	146.0	35.4	0	0	0
	June	684	95.0%	13.3	192.6	147.6	49.9	0	0	0
	July	691	92.9%	8.0	147.9	67.3	29.1	0	0	0
	August	706	94.9%	5.1	92.3	62.3	18.6	0	0	0
	September	682	94.7%	4.8	81.6	63.2	24.2	0	0	0
	October	702	94.4%	3.1	50.0	13.7	6.4	0	0	0
	November	683	94.9%	4.3	82.2	45.9	14.8	0	0	0
	December	709	95.3%	1.7	44.1	35.5	7.9	0	0	0
Annual		8305	94.8%	4.8	192.6	147.6	49.9	0	0	0

Observations in ug/m<sup>3</sup>

**FIGURE 4.2.3.1 - SUNNYSIDE ANNUAL SO<sub>2</sub> CONCENTRATIONS**



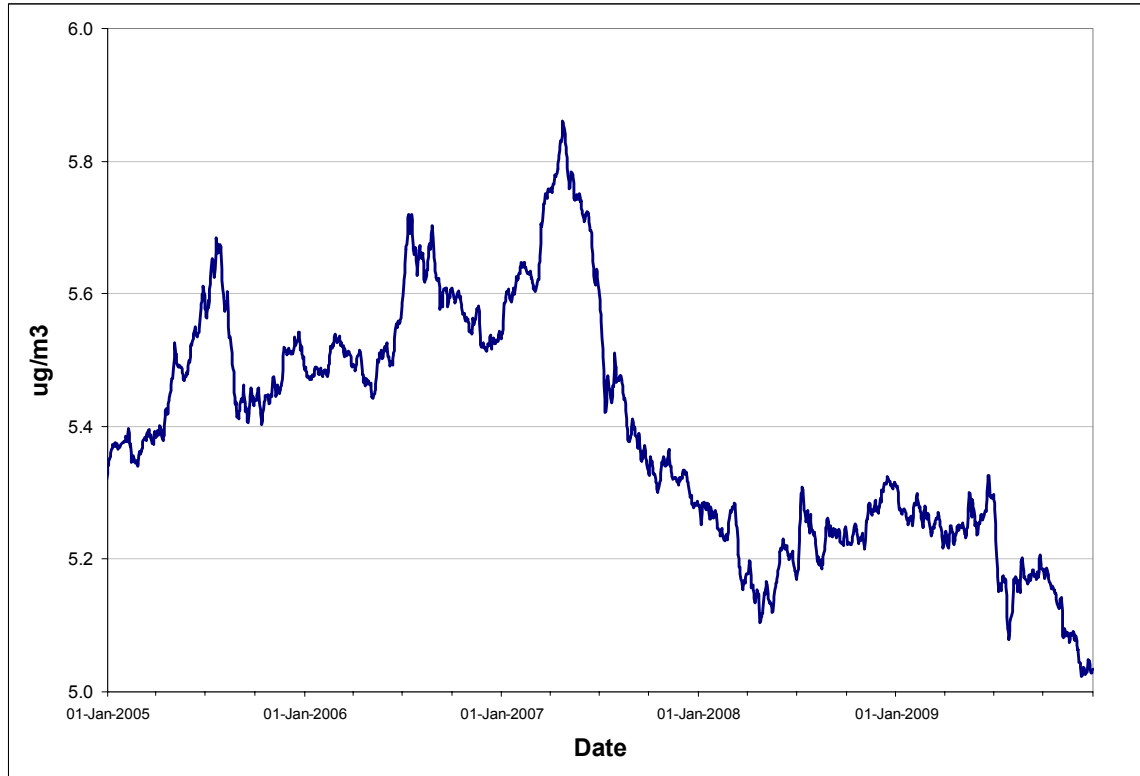
Rolling annual average of hourly concentrations

**TABLE 4.2.3.2 - SUNNYSIDE PM<sub>2.5</sub> SUMMARY 2008 & 2009**

Year	Month	# Valid Days	% Valid Days	Average	Maximum 24-Hour	Regulatory Exceedances (>25)
2008	January	31	100.0%	5.4	10.8	0
	February	29	100.0%	5.0	8.8	0
	March	27	87.1%	5.2	7.6	0
	April	30	100.0%	5.4	9.3	0
	May	31	100.0%	5.4	9.9	0
	June	29	96.7%	4.5	11.5	0
	July	31	100.0%	8.1	16.0	0
	August	31	100.0%	5.6	9.7	0
	September	30	100.0%	4.9	8.5	0
	October	31	100.0%	4.3	6.3	0
	November	30	100.0%	4.9	15.6	0
	December	31	100.0%	5.0	9.9	0
Annual		361	98.6%	5.3	16.0	0
2009	January	31	100.0%	4.7	6.8	0
	February	28	100.0%	5.2	10.5	0
	March	31	100.0%	4.8	8.8	0
	April	30	100.0%	5.6	9.5	0
	May	31	100.0%	5.3	15.9	0
	June	30	100.0%	5.2	9.7	0
	July	31	100.0%	5.8	10.4	0
	August	31	100.0%	6.4	17.5	0
	September	17	56.7%	4.9	9.0	0
	October	31	100.0%	3.7	5.8	0
	November	30	100.0%	4.4	8.3	0
	December	31	100.0%	4.4	10.8	0
Annual		352	96.4%	5.0	17.5	0

Observations in ug/m<sup>3</sup>

**FIGURE 4.2.3.2 - SUNNYSIDE ANNUAL PM<sub>2.5</sub> CONCENTRATIONS**



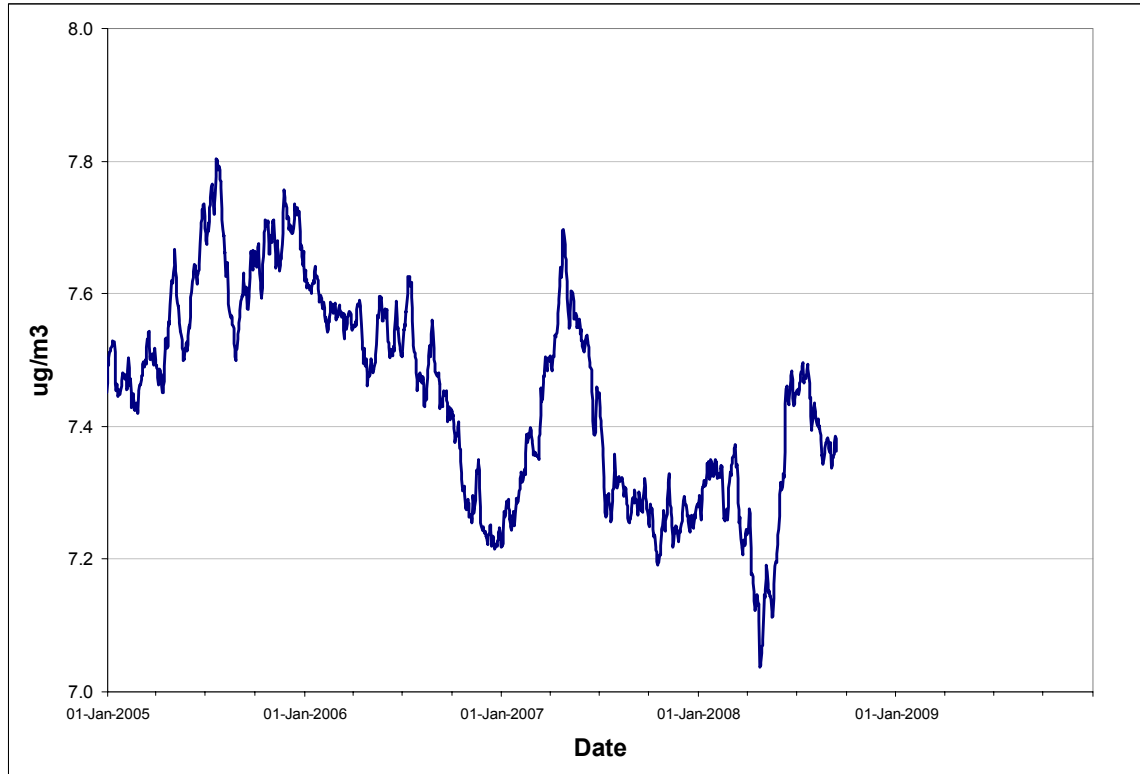
Rolling annual average of hourly concentrations

**TABLE 4.2.3.3 - SUNNYSIDE PM<sub>10</sub> SUMMARY 2008 & 2009**

Year	Month	# Valid Days	% Valid Days	Average	Maximum 24-Hour	Regulatory Exceedances (>50)
2008	January	31	100.0%	7.7	13.4	0
	February	29	100.0%	7.4	14.0	0
	March	29	93.5%	7.7	11.6	0
	April	30	100.0%	7.5	15.8	0
	May	31	100.0%	8.4	15.5	0
	June	16	53.3%	8.5	29.8	0
	July	0	0.0%			
	August	0	0.0%			
	September	0	0.0%			
	October	0	0.0%			
	November	0	0.0%			
	December	0	0.0%			
Annual		166	45.4%	7.8	29.8	0
2009	January	0	0.0%			
	February	0	0.0%			
	March	0	0.0%			
	April	0	0.0%			
	May	6	19.4%	5.1	9.4	0
	June	30	100.0%	7.7	22.3	0
	July	31	100.0%	6.8	16.4	0
	August	31	100.0%	7.3	16.7	0
	September	28	93.3%	6.8	13.9	0
	October	31	100.0%	4.8	10.8	0
	November	30	100.0%	6.1	14.1	0
	December	31	100.0%	6.6	20.0	0
Annual		218	59.7%	6.5	22.3	0

Observations in ug/m<sup>3</sup>

**FIGURE 4.2.3.3 - SUNNYSIDE ANNUAL PM<sub>10</sub> CONCENTRATIONS**



Rolling annual average of hourly concentrations

#### **4.2.4 NARL Property Boundary**

The NARL Property Boundary station monitors the ambient levels of SO<sub>2</sub> and PM<sub>2.5</sub>. Given its proximity to the process area of NARL, this station routinely records ambient levels of SO<sub>2</sub> and PM<sub>2.5</sub> in excess of the standards. In 2009, the 1-hour SO<sub>2</sub> standard was exceeded 8 times the 3-hour standard 21 times and the 24-hour standard 18 times. For PM<sub>2.5</sub>, the standard was exceeded 39 times; however the monitor was malfunctioning for an extended period in 2009.

Tables 4.2.4.1 through 4.2.4.2 provide summary information on the level of air contaminants measured at NARL Property Boundary, while Figures 4.2.4.1 through 4.2.4.2 provide a graphical representation of the annual trend of each pollutant.

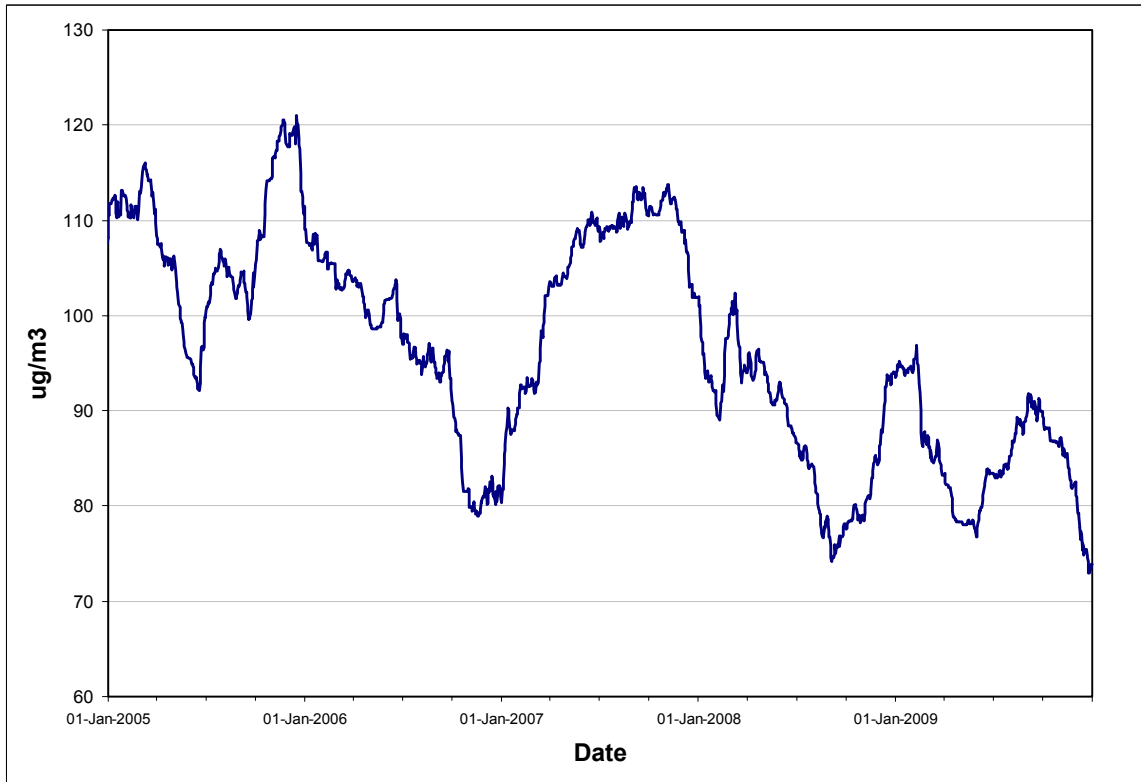


**TABLE 4.2.4.1 - NARL BOUNDARY SO<sub>2</sub> SUMMARY 2008 & 2009**

Year	Month	# Valid Hours	% Valid Hours	Average	Maximum			Regulatory Exceedances		
					1-Hour	3-Hour	24-Hour	1-Hour (>900)	3-Hour (>600)	24-Hour (>300)
2008	January	710	95.4%	67.8	620.8	485.4	268.7	0	0	0
	February	663	95.3%	185.7	1895.4	1528.9	831.9	40	27	8
	March	705	94.8%	116.6	1376.7	926.2	487.7	9	17	3
	April	684	95.0%	74.6	844.8	598.3	505.8	0	0	2
	May	709	95.3%	54.7	525.4	336.4	228.5	0	0	0
	June	684	95.0%	20.2	538.4	472.2	163.4	0	0	0
	July	703	94.5%	71.0	737.8	490.3	320.3	0	0	1
	August	711	95.6%	78.3	750.4	580.2	308.8	0	0	1
	September	678	94.2%	121.7	679.2	644.5	370.1	0	2	4
	October	710	95.4%	66.3	756.7	703.8	397.1	0	1	1
	November	684	95.0%	113.4	909.1	740.7	531.0	1	4	3
	December	704	94.6%	160.0	972.4	907.6	562.1	6	19	8
Annual		8345	95.0%	93.8	1895.4	1528.9	831.9	56	70	31
2009	January	710	95.4%	69.9	882.2	579.6	231.2	0	0	0
	February	640	95.2%	102.1	987.9	636.6	431.8	1	1	5
	March	708	95.2%	68.8	681.5	649.7	374.2	0	2	3
	April	686	95.3%	15.9	411.0	366.3	221.5	0	0	0
	May	708	95.2%	35.2	592.6	447.9	202.4	0	0	0
	June	682	94.7%	102.1	802.8	739.7	339.6	0	2	1
	July	710	95.4%	88.1	703.3	562.8	337.3	0	0	1
	August	709	95.3%	129.5	802.1	759.1	436.4	0	8	2
	September	685	95.1%	129.4	872.3	647.0	580.1	0	4	4
	October	711	95.6%	24.4	452.7	409.0	265.0	0	0	0
	November	673	93.5%	64.7	597.4	525.7	439.5	0	0	1
	December	710	95.4%	59.6	1204.6	924.6	400.2	7	4	1
Annual		8332	95.1%	73.9	1204.6	924.6	580.1	8	21	18

Observations in ug/m<sup>3</sup>

**FIGURE 4.2.4.1 - NARL BOUNDARY ANNUAL SO<sub>2</sub> CONCENTRATIONS**



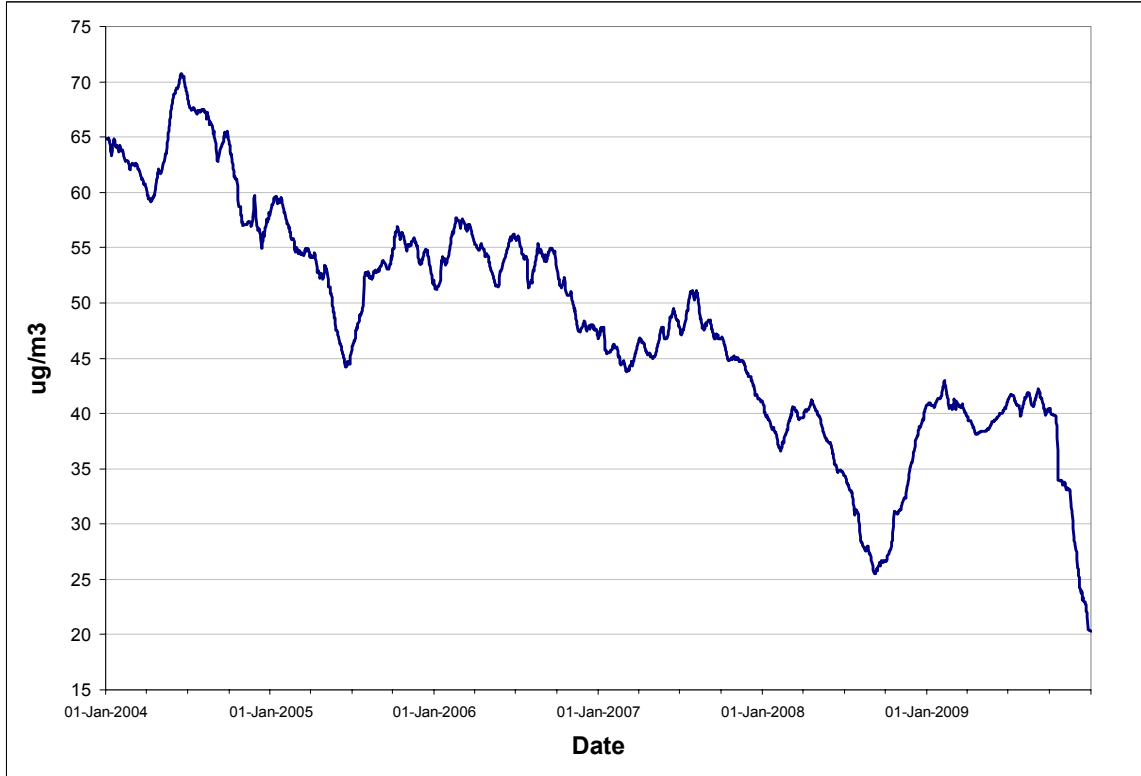
Rolling annual average of hourly concentrations

**TABLE 4.2.4.2 - NARL BOUNDARY PM<sub>2.5</sub> SUMMARY 2008 & 2009**

Year	Month	# Valid Days	% Valid Days	Average	Maximum 24-Hour	Regulatory Exceedances (>25)
2008	January	24	77.4%	20.4	52.2	10
	February	19	65.5%	43.9	139.9	9
	March	18	58.1%	51.3	167.4	11
	April	21	70.0%	27.7	116.5	9
	May	31	100.0%	13.5	46.1	5
	June	18	60.0%	15.4	47.9	2
	July	23	74.2%	50.8	112.9	16
	August	26	83.9%	31.1	107.1	11
	September	24	80.0%	48.4	123.2	15
	October	22	71.0%	67.1	229.8	15
	November	19	63.3%	64.7	148.0	14
	December	14	45.2%	82.6	159.4	12
Annual		259	70.8%	40.6	229.8	129
2009	January	20	64.5%	24.7	67.6	9
	February	20	71.4%	37.0	135.3	8
	March	22	71.0%	36.9	213.1	9
	April	24	80.0%	14.4	49.2	2
	May	18	58.1%	9.4	22.8	0
	June	0	0.0%			
	July	0	0.0%			
	August	0	0.0%			
	September	0	0.0%			
	October	15	48.4%	9.5	47.0	2
	November	22	73.3%	17.4	73.8	5
	December	29	93.5%	12.5	74.9	4
Annual		170	46.6%	20.3	213.1	39

Observations in ug/m<sup>3</sup>

**FIGURE 4.2.4.2 - NARL BOUNDARY ANNUAL PM<sub>2.5</sub> CONCENTRATIONS**

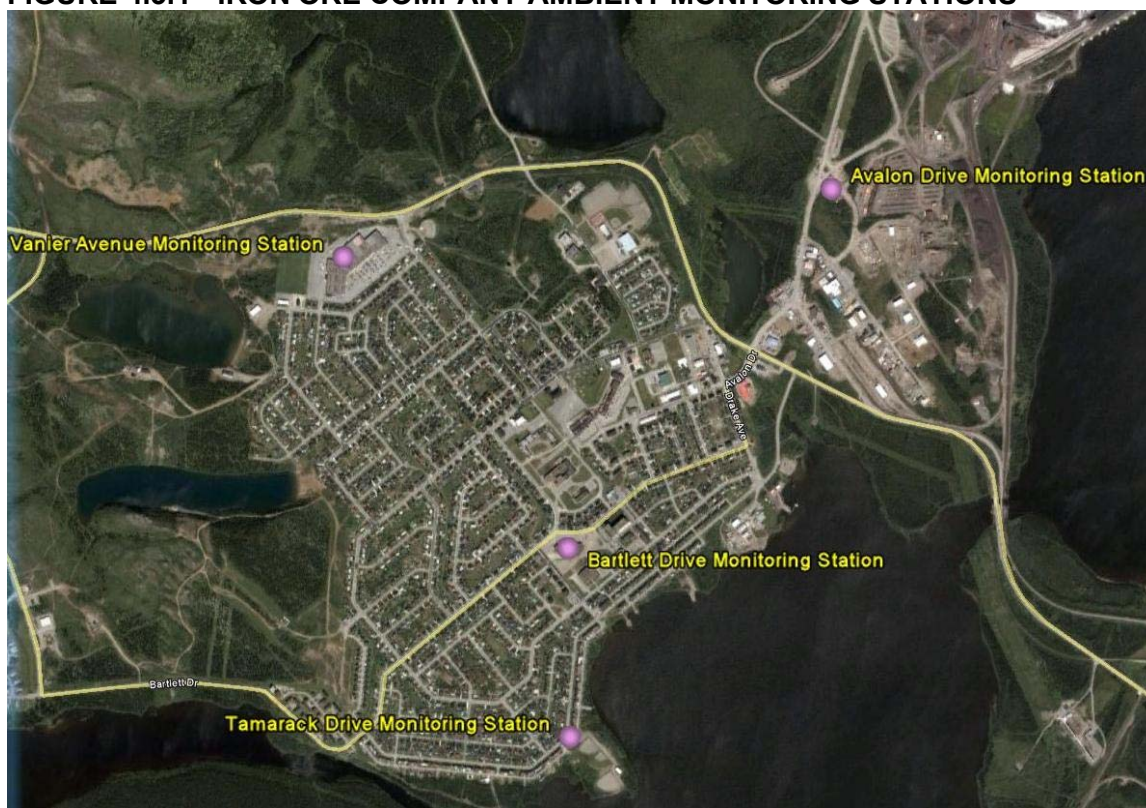


Rolling annual average of hourly concentrations

### 4.3 Iron Ore Company of Canada

In 2009, the Iron Ore Company of Canada (IOCC) operated monitoring stations at 4 locations. These stations are installed to monitor the emissions from IOCC's concentrating and pelletizing operation in Labrador City and are located at Bartlett Drive, Tamarack Drive, Vanier Avenue and the IOCC property boundary. The locations of these monitoring stations are identified in Figure 4.3.1.

**FIGURE 4.3.1 - IRON ORE COMPANY AMBIENT MONITORING STATIONS**



#### 4.3.1 Bartlett Drive

The Bartlett Drive monitoring station is located at A. P. Low School and measures SO<sub>2</sub> and PM<sub>2.5</sub> on a continuous basis and TSP, PM<sub>10</sub> and PM<sub>2.5</sub> on a 1 day in 6 day cycle.

The SO<sub>2</sub> analyzer is located in an area where the room temperature is not readily controlled and as such, the room temperature regularly exceeds or drops below the acceptable operating range of the analyzer. To that end, large portions of data have been invalidated and are consequently not presented in this report.

The continuous PM<sub>2.5</sub> recorded one exceedances of the ambient standard in 2009. The other monitors recorded exceedances of their associated standard; twice for TSP, six times for PM<sub>10</sub> and 3 times for PM<sub>2.5</sub>.

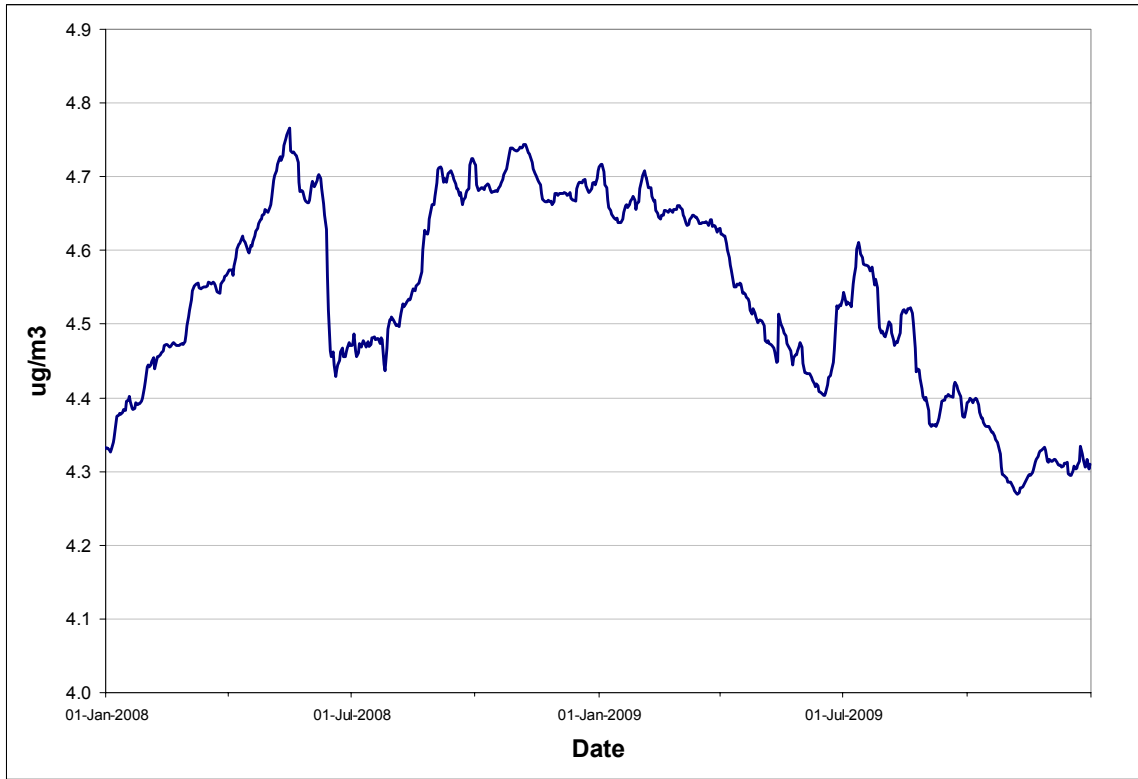
Tables 4.3.1.1 through 4.3.1.4 provide summary information of air contaminants measured at Bartlett Drive, while Figures 4.3.1.1 through 4.3.1.4 provide a graphical representation of the annual trend of the measured pollutants. An SO<sub>2</sub> table and graph are not provided due to the quantity of invalidated data.

**TABLE 4.3.1.1 - BARTLETT DRIVE PM<sub>2.5</sub> SUMMARY 2008 & 2009**

Year	Month	# Valid Days	% Valid Days	Average	Maximum 24-Hour	Regulatory Exceedances (>25)
2008	January	28	90.3%	4.9	10.2	0
	February	29	100.0%	4.4	7.4	0
	March	30	96.8%	4.5	7.2	0
	April	30	100.0%	5.7	10.2	0
	May	31	100.0%	5.0	11.3	0
	June	25	83.3%	4.6	9.7	0
	July	31	100.0%	5.6	13.6	0
	August	30	96.8%	4.9	14.5	0
	September	24	80.0%	4.2	13.9	0
	October	21	67.7%	3.7	9.9	0
	November	22	73.3%	3.4	8.7	0
	December	31	100.0%	4.9	9.7	0
Annual		332	90.7%	4.7	14.5	0
2009	January	31	100.0%	4.6	10.5	0
	February	28	100.0%	4.1	8.0	0
	March	31	100.0%	4.1	6.3	0
	April	30	100.0%	4.3	7.1	0
	May	31	100.0%	4.6	27.0	1
	June	30	100.0%	5.3	15.8	0
	July	29	93.5%	5.2	12.8	0
	August	31	100.0%	4.0	12.2	0
	September	29	96.7%	3.9	8.7	0
	October	31	100.0%	2.8	5.1	0
	November	26	86.7%	3.8	5.8	0
	December	23	74.2%	5.1	11.7	0
Annual		350	95.9%	4.3	27.0	1

Observations in ug/m<sup>3</sup>

**FIGURE 4.3.1.1 - BARTLETT DRIVE ANNUAL PM<sub>2.5</sub> CONCENTRATIONS**



Rolling annual average of hourly concentrations

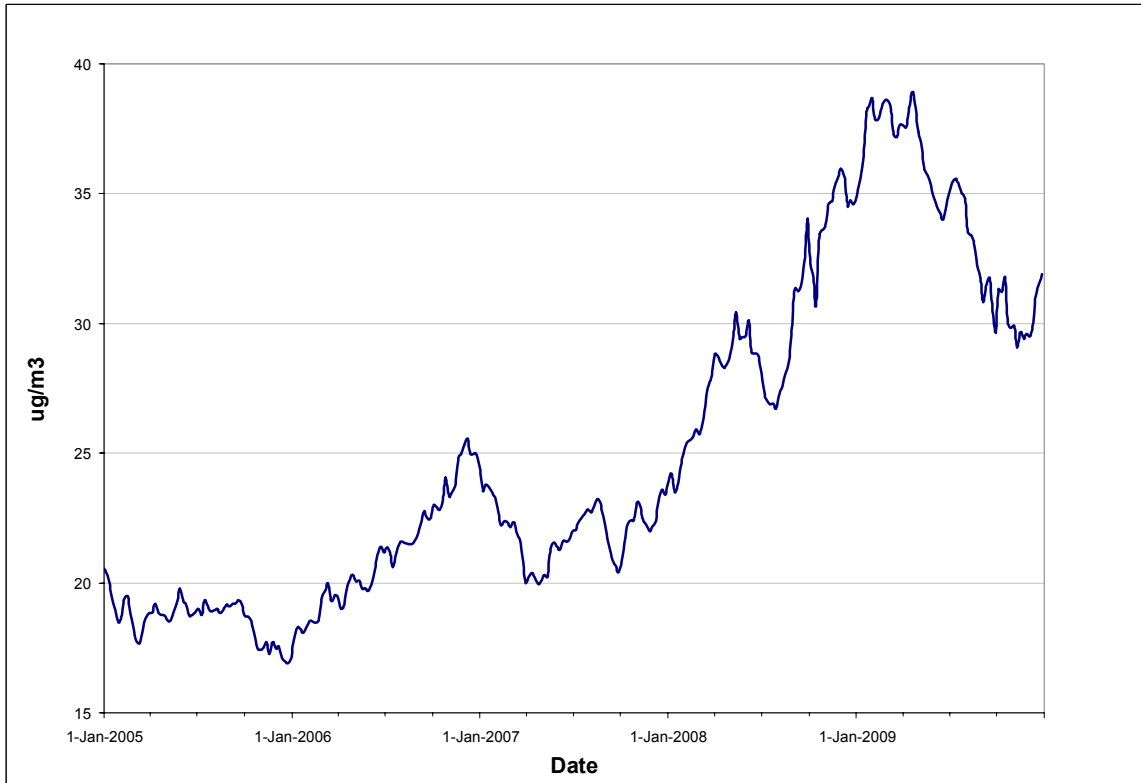
**TABLE 4.3.1.2 - BARTLETT DRIVE TSP SUMMARY 2008 & 2009**

Year	Month	# Valid Days	% Valid Days	Average	Maximum 24-Hour	Regulatory Exceedances (>120)
2008	January	5	83.3%	14.4	23.3	0
	February	0	0.0%	0.0	0.0	0
	March	4	66.7%	33.6	74.9	0
	April	5	100.0%	48.6	79.0	0
	May	5	100.0%	120.0	234.5	3
	June	5	100.0%	46.4	128.9	1
	July	5	100.0%	29.0	95.4	0
	August	5	100.0%	50.9	80.0	0
	September	5	100.0%	21.9	73.8	0
	October	5	100.0%	37.3	946.0	1
	November	4	80.0%	38.4	65.0	0
	December	4	80.0%	11.4	28.4	0
Annual		52	85.2%	34.6	946.0	5
2009	January	5	83.3%	46.3	162.3	1
	February	3	75.0%	36.4	69.5	0
	March	3	60.0%	20.7	24.1	0
	April	4	80.0%	53.4	213.5	1
	May	6	100.0%	48.8	80.4	0
	June	5	100.0%	47.9	99.8	0
	July	4	80.0%	25.8	52.7	0
	August	5	100.0%	19.1	33.4	0
	September	4	80.0%	8.2	16.7	0
	October	5	100.0%	40.0	59.8	0
	November	5	100.0%	33.7	48.4	0
	December	5	100.0%	30.9	70.0	0
Annual		54	88.5%	31.9	213.5	2

Observations in ug/m<sup>3</sup>



**FIGURE 4.3.1.2 - BARTLETT DRIVE ANNUAL TSP CONCENTRATIONS**



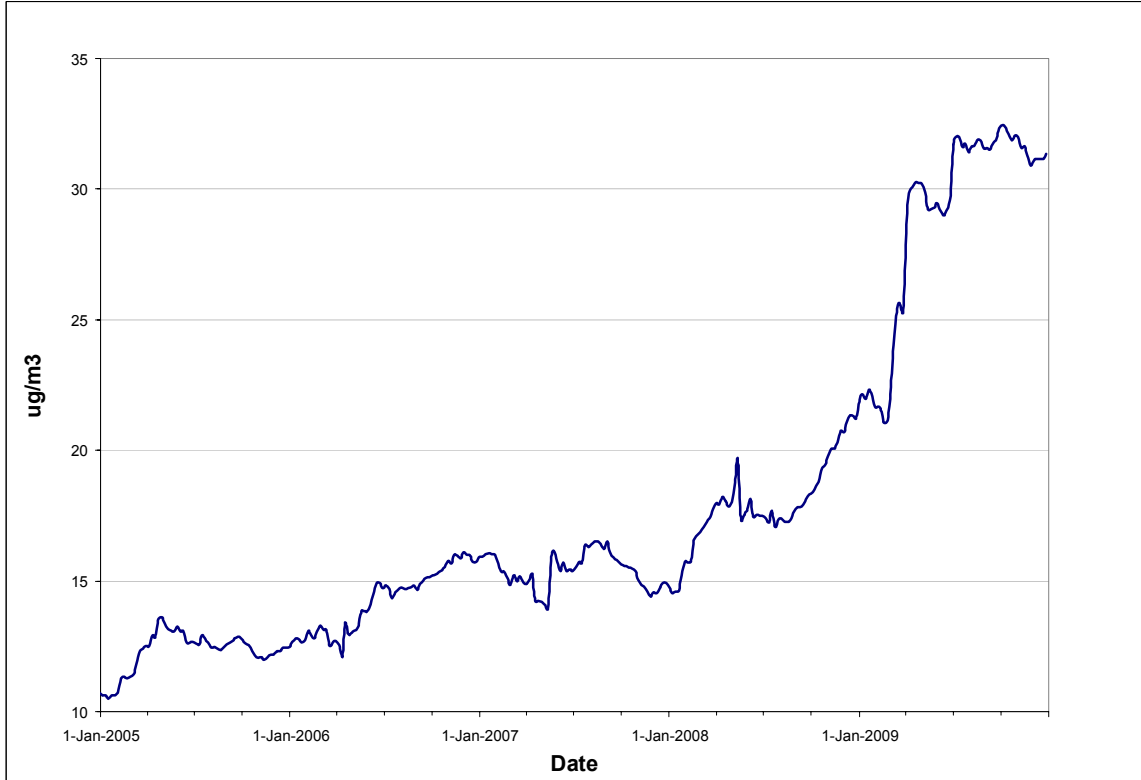
Rolling annual average of daily concentrations

**TABLE 4.3.1.3 - BARTLETT DRIVE PM<sub>10</sub> (DICHOT) SUMMARY 2008 & 2009**

Year	Month	# Valid Days	% Valid Days	Average	Maximum 24-Hour	Regulatory Exceedances (>120)
2008	January	6	100.0%	12.6	34.0	0
	February	4	100.0%	19.4	55.5	1
	March	4	66.7%	28.0	39.2	0
	April	5	100.0%	18.0	34.4	0
	May	4	80.0%	30.2	70.6	2
	June	5	100.0%	12.1	34.7	0
	July	5	100.0%	17.1	29.3	0
	August	5	100.0%	8.5	26.3	0
	September	3	60.0%	14.8	30.0	0
	October	5	100.0%	16.3	33.3	0
	November	3	60.0%	21.9	31.7	0
	December	4	80.0%	18.7	30.4	0
Annual		53	86.9%	21.2	70.6	3
2009	January	3	50.0%	14.5	49.4	0
	February	3	75.0%	14.6	23.7	0
	March	3	60.0%	59.7	156.5	3
	April	5	100.0%	51.1	234.2	2
	May	6	100.0%	25.2	44.7	0
	June	4	80.0%	26.3	130.8	1
	July	5	100.0%	10.6	33.5	0
	August	4	80.0%	9.7	14.9	0
	September	3	60.0%	2.8	2.8	0
	October	4	80.0%	14.5	25.7	0
	November	3	60.0%	8.4	20.9	0
	December	5	100.0%	14.2	25.4	0
Annual		48	78.7%	31.3	234.2	6

Observations in ug/m<sup>3</sup>

**FIGURE 4.3.1.3 - BARTLETT DRIVE ANNUAL PM<sub>10</sub> (DICHOT) CONCENTRATIONS**



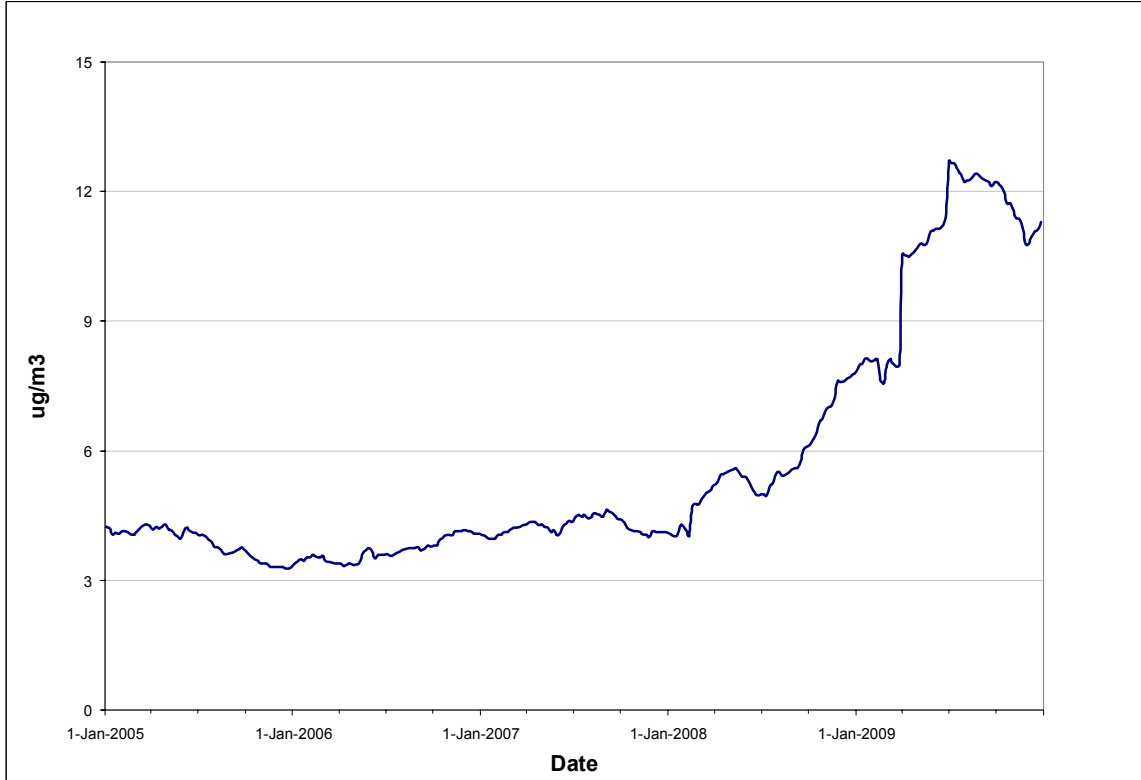
Rolling annual average of daily concentrations

**TABLE 4.3.1.4 - BARTLETT DRIVE PM<sub>2.5</sub> (DICHOT) SUMMARY 2008 & 2009**

Year	Month	# Valid Days	% Valid Days	Average	Maximum 24-Hour	Regulatory Exceedances (>120)
2008	January	6	100.0%	3.4	14.2	0
	February	4	100.0%	6.8	43.9	1
	March	6	100.0%	9.4	10.8	0
	April	5	100.0%	5.2	11.0	0
	May	5	100.0%	2.5	10.4	0
	June	5	100.0%	2.3	2.7	0
	July	5	100.0%	9.3	13.6	0
	August	5	100.0%	4.0	9.1	0
	September	5	100.0%	9.9	17.6	0
	October	5	100.0%	8.0	16.6	0
	November	4	80.0%	12.6	23.1	0
	December	5	100.0%	5.5	10.7	0
Annual		60	98.4%	7.8	43.9	1
2009	January	6	100.0%	6.6	11.8	0
	February	4	100.0%	5.9	13.2	0
	March	5	100.0%	10.4	32.9	1
	April	5	100.0%	13.9	164.7	1
	May	6	100.0%	7.3	18.7	0
	June	5	100.0%	9.3	81.4	1
	July	5	100.0%	3.7	5.6	0
	August	4	80.0%	5.0	7.8	0
	September	1	20.0%	1.0	1.0	0
	October	5	100.0%	3.0	8.2	0
	November	5	100.0%	2.4	5.1	0
	December	2	40.0%	12.1	19.3	0
Annual		53	86.9%	11.3	164.7	3

Observations in ug/m<sup>3</sup>

**FIGURE 4.3.1.4 - BARTLETT DRIVE ANNUAL PM<sub>2.5</sub> (DICHOT) CONCENTRATIONS**



Rolling annual average of daily concentrations

### 4.3.2 Tamarack Drive

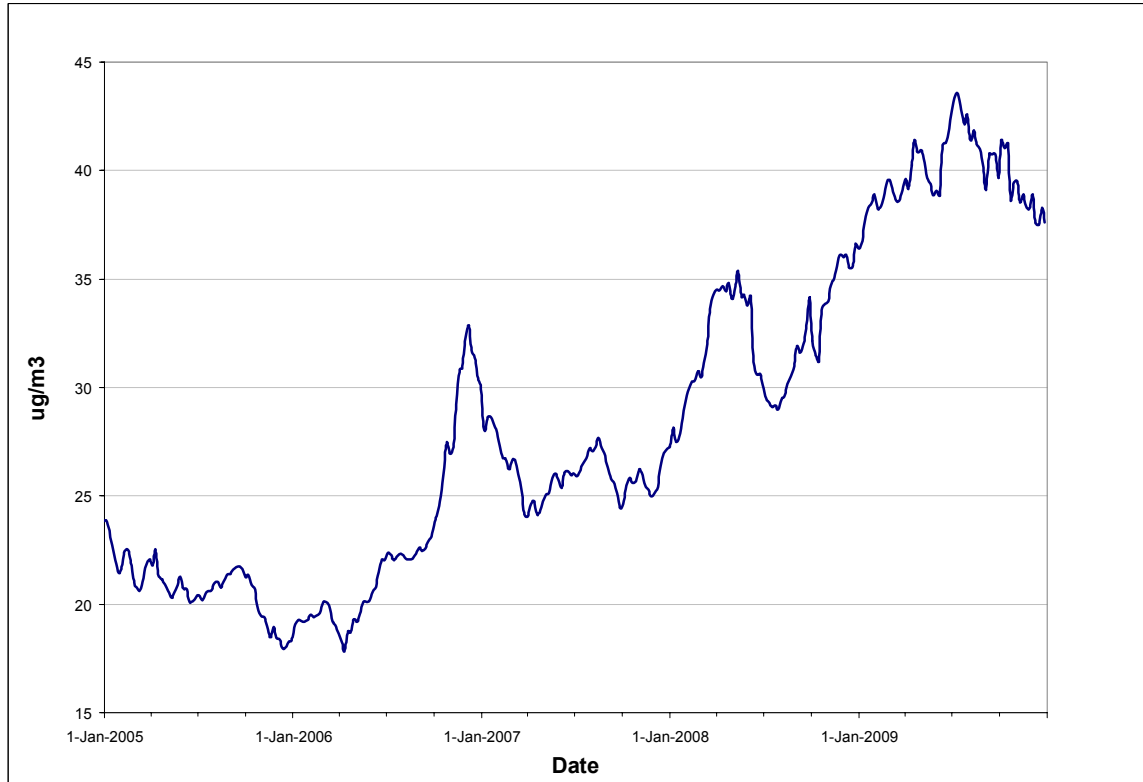
The Tamarack Drive monitoring station measures TSP on a 1 day in 6 day cycle. In 2009 there were five exceedances of the TSP standard. Table 4.3.2.1 provides summary information of air contaminants measured at Tamarack Drive, while Figure 4.3.2.1 provides a graphical representation of the annual trend of TSP.

**TABLE 4.3.2.1 - TAMARACK DRIVE TSP SUMMARY 2008 & 2009**

Year	Month	# Valid Days	% Valid Days	Average	Maximum 24-Hour	Regulatory Exceedances (>120)
2008	January	6	100.0%	19.0	31.8	0
	February	4	100.0%	32.9	40.3	0
	March	4	66.7%	30.4	38.1	0
	April	5	100.0%	40.5	92.2	0
	May	4	80.0%	146.6	210.6	3
	June	5	100.0%	22.2	90.7	0
	July	5	100.0%	49.1	156.7	1
	August	5	100.0%	58.2	92.3	0
	September	3	60.0%	26.0	62.8	0
	October	5	100.0%	39.9	797.6	1
	November	3	60.0%	50.9	73.3	0
	December	4	80.0%	18.9	23.4	0
Annual		53	86.9%	36.6	797.6	5
2009	January	3	50.0%	27.6	53.0	0
	February	3	75.0%	39.5	63.0	0
	March	3	60.0%	23.8	40.0	0
	April	5	100.0%	61.4	368.2	2
	May	6	100.0%	66.0	120.7	1
	June	4	80.0%	58.6	134.0	1
	July	5	100.0%	47.3	80.4	0
	August	4	80.0%	30.6	62.3	0
	September	3	60.0%	21.5	39.1	0
	October	4	80.0%	37.8	138.3	1
	November	3	60.0%	30.9	61.4	0
	December	5	100.0%	18.6	63.9	0
Annual		48	78.7%	37.6	368.2	5

Observations in ug/m<sup>3</sup>

**FIGURE 4.3.2.1 - TAMARACK DRIVE ANNUAL TSP CONCENTRATIONS**



Rolling annual average of daily concentrations

### 4.3.3 Vanier Avenue

The Vanier Avenue monitoring station is located at the Labrador Mall and measures TSP on a 1 day in 6 day cycle. In 2009 there were no exceedances of the TSP standard. Table 4.3.3.1 provides summary information of air contaminants measured at Vanier Avenue, while Figure 4.3.3.1 provides a graphical representation of the annual trend of TSP.

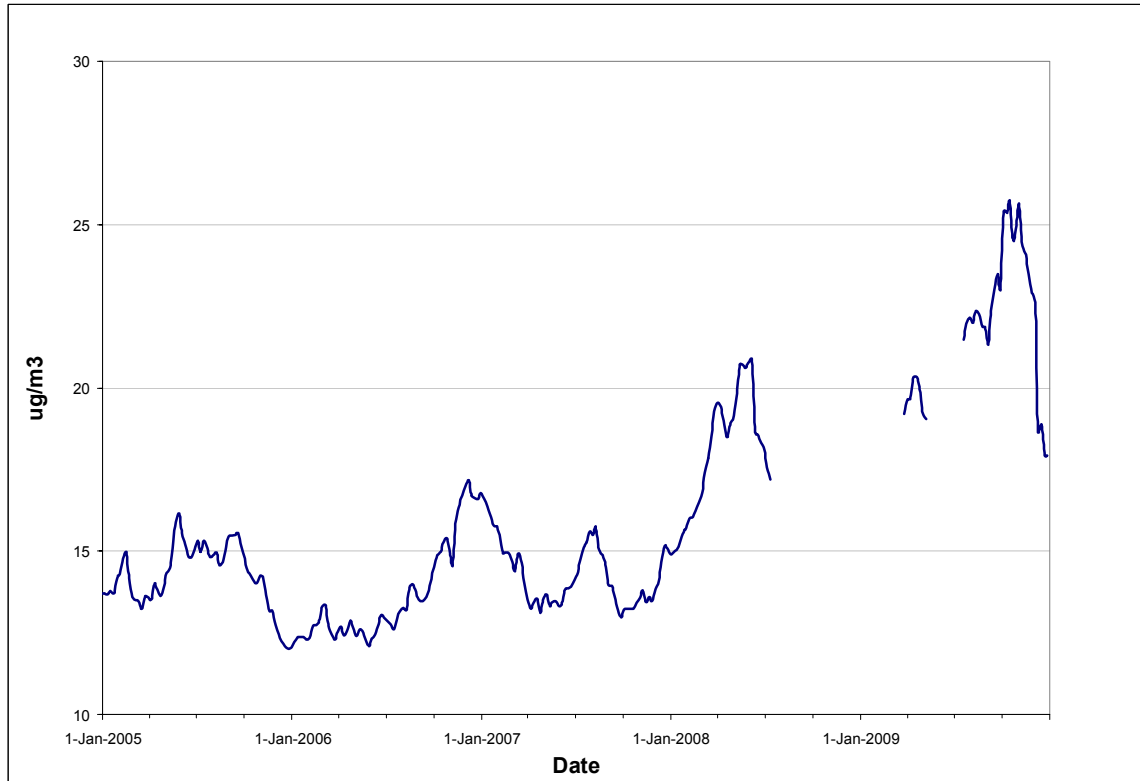
**TABLE 4.3.3.1 - VANIER AVENUE TSP SUMMARY 2008 & 2009**

Year	Month	# Valid Days	% Valid Days	Average	Maximum 24-Hour	Regulatory Exceedances (>120)
2008	January	6	100.0%	11.6	18.2	0
	February	1	25.0%	22.0	22.0	0
	March	2	33.3%	17.8	27.3	0
	April	3	60.0%	48.2	144.4	1
	May	5	100.0%	70.7	219.9	3
	June	4	80.0%	13.8	53.9	0
	July	0	0.0%			
	August	4	80.0%	39.0	52.5	0
	September	5	100.0%	11.7	41.8	0
	October	5	100.0%	11.8	220.4	1
	November	5	100.0%	22.4	45.5	0
	December	3	60.0%	9.9	17.4	0
Annual		43	70.5%		220.4	5
2009	January	5	83.3%	14.2	64.9	0
	February	4	100.0%	12.0	28.1	0
	March	3	60.0%	12.4	35.4	0
	April	3	60.0%	48.5	93.3	0
	May	2	33.3%	65.0	89.6	0
	June	4	80.0%	88.9	117.0	0
	July	5	100.0%	38.5	64.2	0
	August	4	80.0%	33.4	58.4	0
	September	5	100.0%	19.3	47.5	0
	October	5	100.0%	26.4	80.1	0
	November	5	100.0%	9.5	38.4	0
	December	4	80.0%	0.6	10.3	0
Annual		49	80.3%	17.9	117.0	0

Observations in ug/m<sup>3</sup>



**FIGURE 4.3.3.1 - VANIER AVENUE ANNUAL TSP CONCENTRATIONS**



Rolling annual average of daily concentrations

#### **4.3.4 IOCC Property Boundary**

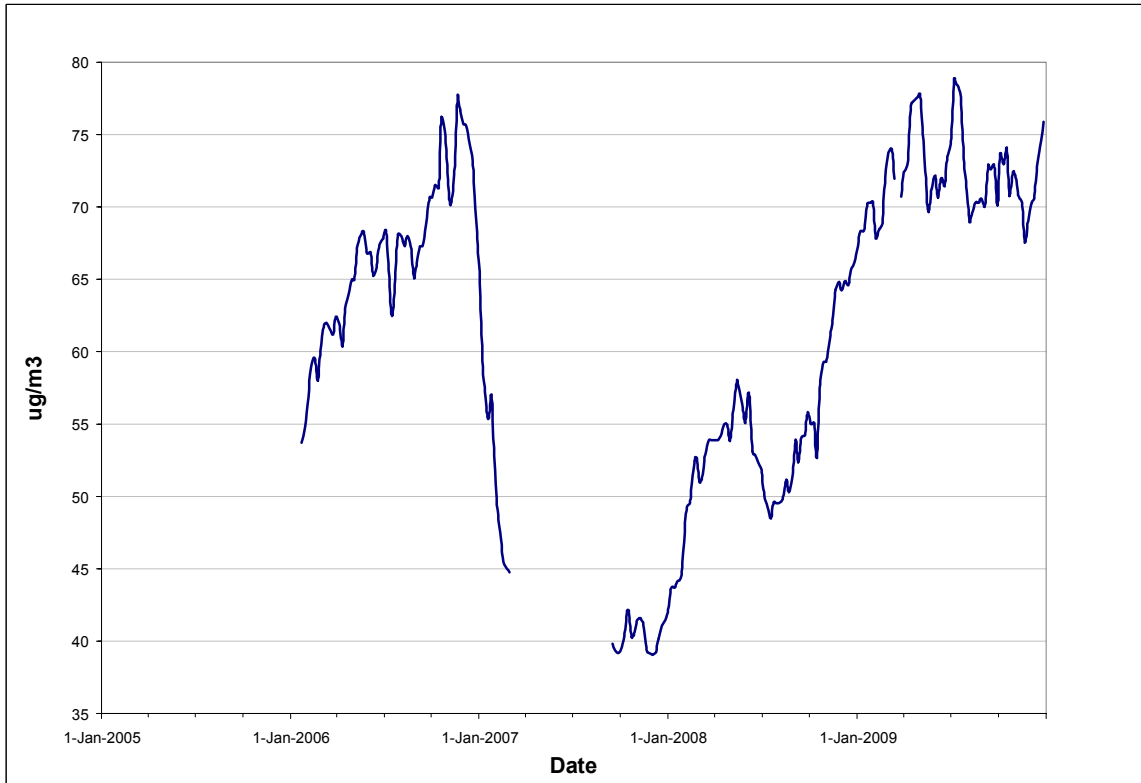
The IOCC Property Boundary monitoring station is located in close proximity to the guardhouse at the entrance to IOCC, and measures TSP on a 1 day in 6 day cycle. In 2009 there were sixteen exceedances of the TSP standard. Table 4.3.4.1 provides summary information of air contaminants measured at the IOCC Property Boundary, while Figure 4.3.4.1 provides a graphical representation of the annual trend of TSP.

**TABLE 4.3.4.1 - IOCC BOUNDARY TSP SUMMARY 2008 & 2009**

Year	Month	# Valid Days	% Valid Days	Average	Maximum 24-Hour	Regulatory Exceedances (>120)
2008	January	4	66.7%	30.7	68.3	0
	February	4	100.0%	78.5	136.2	2
	March	4	66.7%	107.1	275.7	2
	April	5	100.0%	60.8	126.1	1
	May	4	80.0%	215.8	479.2	3
	June	5	100.0%	60.6	364.3	1
	July	5	100.0%	50.3	530.2	1
	August	2	40.0%	68.6	69.5	0
	September	5	100.0%	44.4	146.4	1
	October	5	100.0%	128.4	2021.7	2
	November	3	60.0%	73.4	127.1	1
	December	4	80.0%	26.0	31.5	0
Annual		50	82.0%	66.2	2021.7	14
2009	January	2	33.3%	62.1	74.8	0
	February	4	100.0%	103.8	250.0	2
	March	2	40.0%	105.5	172.7	1
	April	4	80.0%	205.0	938.1	3
	May	6	100.0%	75.6	209.0	1
	June	5	100.0%	80.4	164.2	2
	July	5	100.0%	35.9	225.2	1
	August	4	80.0%	57.5	119.4	0
	September	5	100.0%	41.3	127.7	1
	October	3	60.0%	321.4	392.5	3
	November	5	100.0%	45.3	156.9	1
	December	3	60.0%	86.1	195.7	1
Annual		48	78.7%	75.9	938.1	16

Observations in ug/m<sup>3</sup>

**FIGURE 4.3.4.1 - IOCC BOUNDARY ANNUAL TSP CONCENTRATIONS**



Rolling annual average of daily concentrations

## 4.4 Wabush Mines

In 2009, Wabush Mines operated monitoring stations at 3 locations in and around Wabush. These stations are installed to monitor the emissions from Wabush Mines' iron ore mine and concentrator facility and are located on Bond Street, Shea Street and near the NALCOR substation to the north of the town. The locations of these monitoring stations are identified in Figure 4.4.1.

**FIGURE 4.4.1 - WABUSH MINES AMBIENT MONITORING STATIONS**



### 4.4.1 Bond Street

The Bond Street monitoring station is located near the Provincial Building and measures SO<sub>2</sub> and PM<sub>2.5</sub> on a continuous basis. For all pollutants, the ambient air criteria were not exceeded on any occasion in 2009.

The SO<sub>2</sub> analyzer has been sporadically malfunctioning for a number of years. In late 2008 and early 2009 the problem appeared to be rectified, however towards the end of 2009 the malfunction reoccurred, resulting in the data being invalidated.

Tables 4.4.1.1 and 4.4.1.2 provide summary information of air contaminants measured at Bond Street, while Figure 4.4.1.1 provides a graphical representation of the annual trend of PM<sub>2.5</sub>. An SO<sub>2</sub> graph is not provided due to the quantity of invalidated data.

**TABLE 4.4.1.1 - BOND STREET SO<sub>2</sub> SUMMARY 2008 & 2009**

Year	Month	# Valid Hours	% Valid Hours	Average	Maximum			Regulatory Exceedances		
					1-Hour	3-Hour	24-Hour	1-Hour (>900)	3-Hour (>600)	24-Hour (>300)
2008	January	509	68.4%	5.7	73.0	18.7	12.5	0	0	0
	February	0	0.0%							
	March	0	0.0%							
	April	0	0.0%							
	May	0	0.0%							
	June	0	0.0%							
	July	0	0.0%							
	August	0	0.0%							
	September	0	0.0%							
	October	0	0.0%							
	November	0	0.0%							
	December	677	91.0%							
Annual		1186	13.5%	4.9	73.0	38.4	13.7	0	0	0
2009	January	708	95.2%	2.9	59.2	32.1	13.8	0	0	0
	February	631	93.9%							
	March	706	94.9%							
	April	684	95.0%							
	May	565	75.9%							
	June	0	0.0%							
	July	0	0.0%							
	August	311	41.8%							
	September	558	77.5%							
	October	0	0.0%							
	November	0	0.0%							
	December	0	0.0%							
Annual		4163	47.5%	2.9	59.2	32.1	13.8	0	0	0

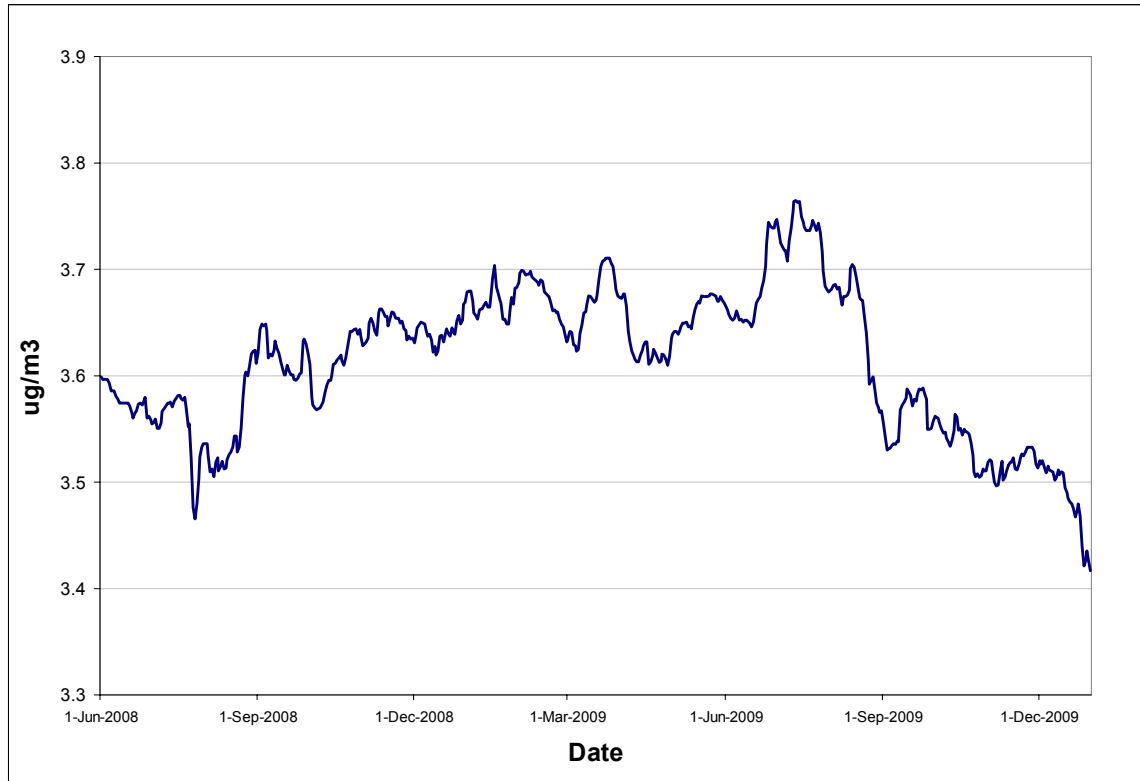
Observations in ug/m<sup>3</sup>

**TABLE 4.4.1.1 - BOND STREET PM<sub>2.5</sub> SUMMARY 2008 & 2009**

Year	Month	# Valid Days	% Valid Days	Average	Maximum 24-Hour	Regulatory Exceedances (>25)
2008	January	31	100.0%	4.2	10.3	0
	February	29	100.0%	3.9	7.4	0
	March	31	100.0%	3.6	7.2	0
	April	30	100.0%	4.0	11.4	0
	May	27	87.1%	3.0	5.6	0
	June	19	63.3%	2.2	3.9	0
	July	30	96.8%	4.4	10.3	0
	August	31	100.0%	4.5	12.3	0
	September	30	100.0%	3.5	12.8	0
	October	31	100.0%	3.1	9.5	0
	November	30	100.0%	2.9	9.1	0
	December	24	77.4%	4.3	11.1	0
Annual		343	93.7%	3.7	12.8	0
2009	January	31	100.0%	4.4	10.6	0
	February	23	82.1%	3.2	5.5	0
	March	31	100.0%	4.0	8.0	0
	April	30	100.0%	3.6	7.2	0
	May	31	100.0%	3.5	9.1	0
	June	30	100.0%	3.6	9.4	0
	July	27	87.1%	3.6	10.1	0
	August	31	100.0%	3.2	9.0	0
	September	28	93.3%	3.3	14.4	0
	October	31	100.0%	2.6	7.4	0
	November	30	100.0%	3.0	5.9	0
	December	31	100.0%	3.0	7.4	0
Annual		354	97.0%	3.4	14.4	0

Observations in ug/m<sup>3</sup>

**FIGURE 4.4.1.1 - BOND STREET ANNUAL PM<sub>2.5</sub> CONCENTRATIONS**



Rolling annual average of hourly concentrations

#### **4.4.2 Shea Street**

The Shea Street station monitors the ambient levels of TSP on a 1 day in 6 day cycle. There were no exceedances of the ambient air criteria in 2009. Table 4.4.2.1 provides summary information on the level of air contaminants measured at Shea Street, while Figure 4.4.2.1 provides a graphical representation of the annual trend in TSP. Due to personnel issue at Wabush Mines in late 2009, a number of samples were not collected.

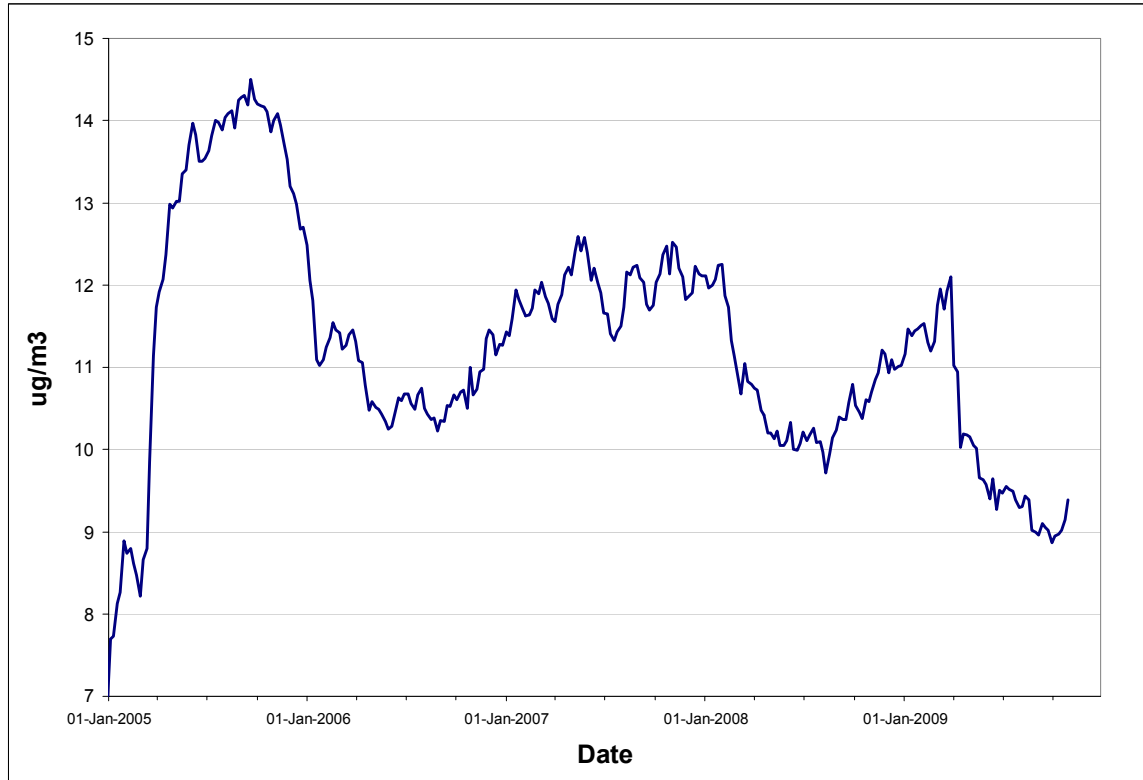
**TABLE 4.4.2.1 - SHEA STREET TSP SUMMARY 2008 & 2009**

Year	Month	# Valid Days	% Valid Days	Average	Maximum 24-Hour	Regulatory Exceedances (>120)
2008	January	6	100.0%	7.9	15.4	0
	February	4	100.0%	4.8	12.4	0
	March	6	100.0%	7.6	55.6	0
	April	5	100.0%	13.9	23.6	0
	May	5	100.0%	20.2	49.2	0
	June	5	100.0%	14.6	33.9	0
	July	5	100.0%	12.8	19.0	0
	August	5	100.0%	17.9	48.6	0
	September	5	100.0%	12.2	18.5	0
	October	4	80.0%	6.5	10.1	0
	November	5	100.0%	12.7	27.2	0
	December	5	100.0%	10.3	29.0	0
Annual		60	98.4%	11.0	55.6	0
2009	January	5	83.3%	12.4	33.5	0
	February	3	75.0%	2.5	3.7	0
	March	5	100.0%	15.2	22.6	0
	April	5	100.0%	1.9	60.5	0
	May	6	100.0%	10.3	40.1	0
	June	5	100.0%	12.9	46.1	0
	July	3	60.0%	11.1	12.5	0
	August	5	100.0%	12.2	22.2	0
	September	5	100.0%	10.4	19.8	0
	October	5	100.0%	13.2	24.3	0
	November	0	0.0%			
	December	0	0.0%			
Annual		47	77.0%	9.0	60.5	0

Observations in ug/m<sup>3</sup>



**FIGURE 4.4.2.1 - SHEA STREET ANNUAL TSP CONCENTRATIONS**



Rolling annual average of daily concentrations

### 4.4.3 Substation

The Substation monitoring station is located near the NALCOR substation to the north of the town of Wabush. The station monitors the ambient levels of TSP, PM<sub>10</sub> and PM<sub>2.5</sub> on a 1 day in 6 day cycle. There were no exceedances of the ambient air criteria for TSP and PM<sub>10</sub> in 2009, however there was one exceedances of the PM<sub>2.5</sub> standard.

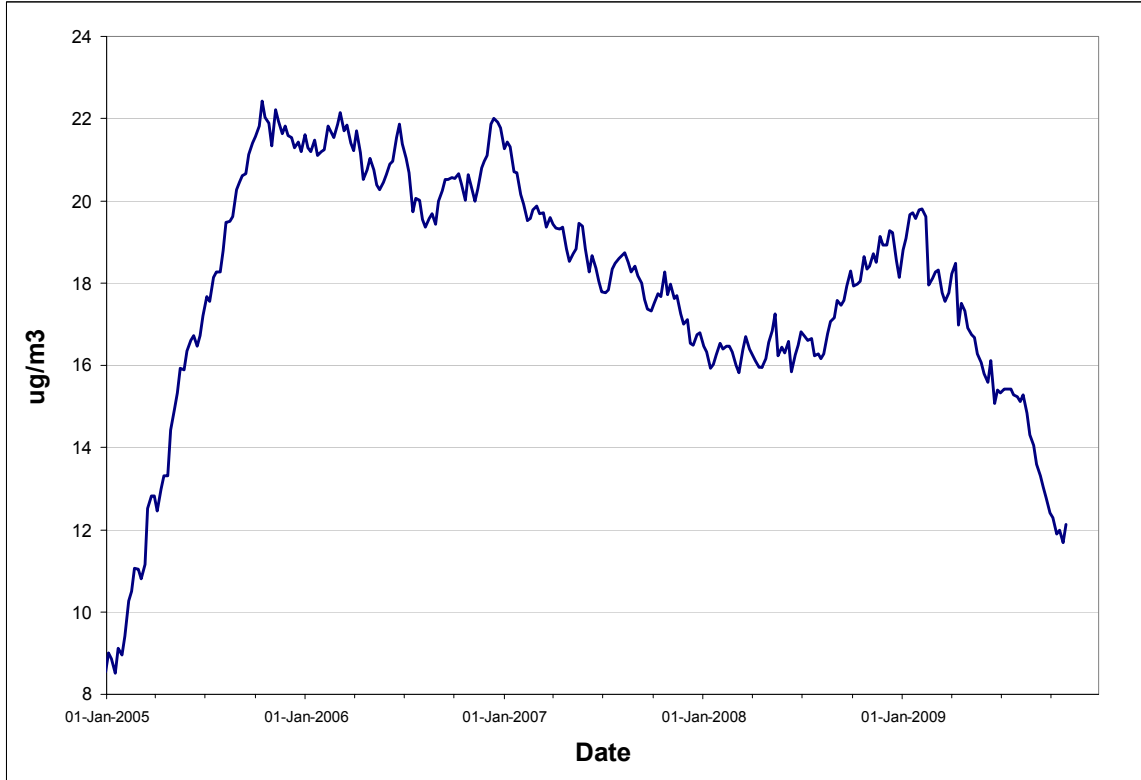
Tables 4.4.3.1 through 4.4.3.3 provide summary information on the level of air contaminants measured at the Substation, while Figures 4.4.3.1 through 4.4.3.3 provide a graphical representation of the annual trend of each air contaminant. Due to personnel issue at Wabush Mines in late 2009, a number of samples were not collected.

**TABLE 4.4.3.1 - SUBSTATION TSP SUMMARY 2008 & 2009**

Year	Month	# Valid Days	% Valid Days	Average	Maximum 24-Hour	Regulatory Exceedances (>120)
2008	January	6	100.0%	8.3	16.7	0
	February	4	100.0%	12.7	21.9	0
	March	6	100.0%	14.8	86.9	0
	April	5	100.0%	18.4	49.0	0
	May	5	100.0%	30.8	76.3	0
	June	5	100.0%	28.7	166.8	1
	July	5	100.0%	17.5	25.1	0
	August	5	100.0%	35.5	62.6	0
	September	5	100.0%	27.3	59.5	0
	October	4	80.0%	19.2	150.9	1
	November	5	100.0%	18.6	68.2	0
	December	5	100.0%	9.5	34.7	0
Annual		60	98.4%	18.1	166.8	2
2009	January	5	83.3%	19.6	43.3	0
	February	4	100.0%	3.5	20.0	0
	March	5	100.0%	13.3	17.7	0
	April	5	100.0%	9.6	96.7	0
	May	6	100.0%	13.4	60.5	0
	June	5	100.0%	20.3	105.4	0
	July	3	60.0%	17.0	23.0	0
	August	5	100.0%	14.1	48.2	0
	September	5	100.0%	6.6	9.0	0
	October	5	100.0%	13.4	48.0	0
	November	0	0.0%			
	December	0	0.0%			
Annual		48	78.7%	11.9	105.4	0

Observations in ug/m<sup>3</sup>

**FIGURE 4.4.3.1 - SUBSTATION ANNUAL TSP CONCENTRATIONS**



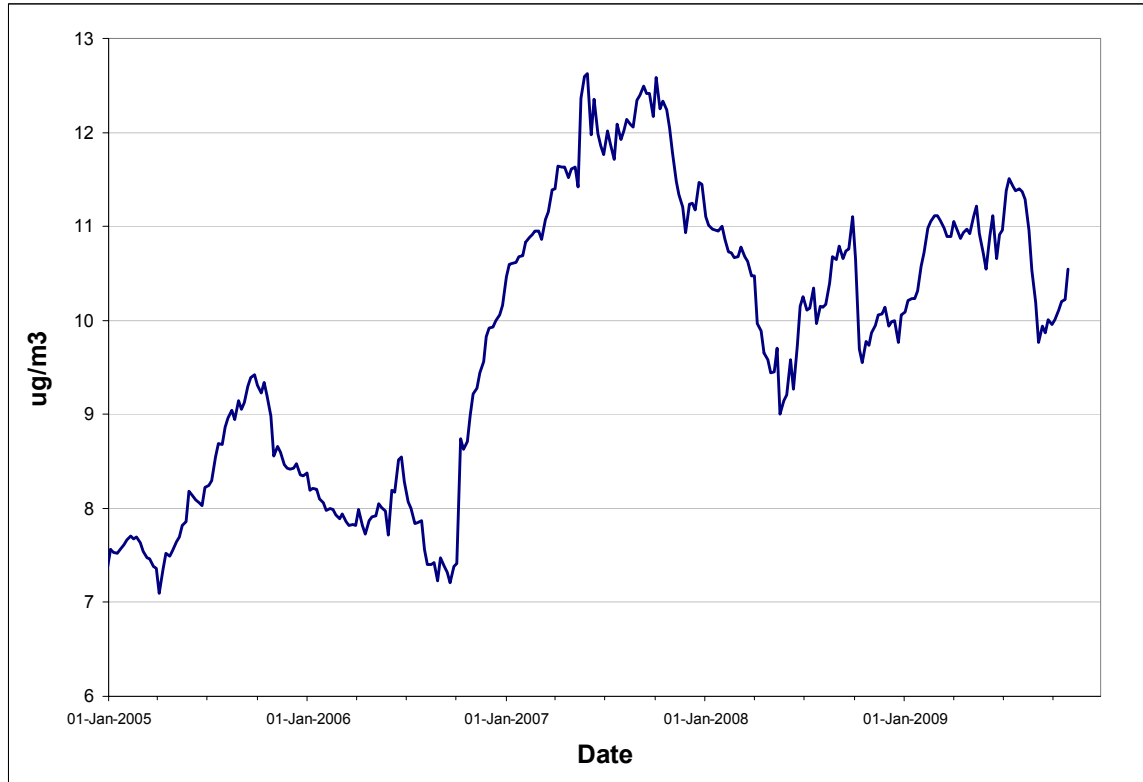
Rolling annual average of daily concentrations

**TABLE 4.4.3.2 - SUBSTATION PM<sub>10</sub> (DICHOT) SUMMARY 2008 & 2009**

Year	Month	# Valid Days	% Valid Days	Average	Maximum 24-Hour	Regulatory Exceedances (>120)
2008	January	6	100.0%	1.6	4.2	0
	February	4	100.0%	1.1	2.7	0
	March	6	100.0%	4.2	7.2	0
	April	5	100.0%	5.2	7.9	0
	May	5	100.0%	18.7	28.5	0
	June	5	100.0%	17.1	31.9	0
	July	5	100.0%	11.5	16.0	0
	August	5	100.0%	17.8	33.5	0
	September	5	100.0%	9.7	26.7	0
	October	5	100.0%	2.5	14.2	0
	November	5	100.0%	4.9	8.4	0
	December	5	100.0%	9.0	24.7	0
Annual		61	100.0%	10.1	33.5	0
2009	January	5	83.3%	3.8	19.7	0
	February	4	100.0%	8.3	16.6	0
	March	5	100.0%	1.9	5.7	0
	April	5	100.0%	3.5	13.6	0
	May	6	100.0%	10.1	29.3	0
	June	5	100.0%	19.0	44.0	0
	July	3	60.0%	19.4	35.1	0
	August	5	100.0%	5.7	8.8	0
	September	4	80.0%	7.9	21.0	0
	October	5	100.0%	9.1	22.7	0
	November	0	0.0%			
	December	0	0.0%			
Annual		47	77.0%	11.0	44.0	0

Observations in ug/m<sup>3</sup>

**FIGURE 4.4.3.2 - SUBSTATION ANNUAL PM<sub>10</sub> (DICHOT) CONCENTRATIONS**



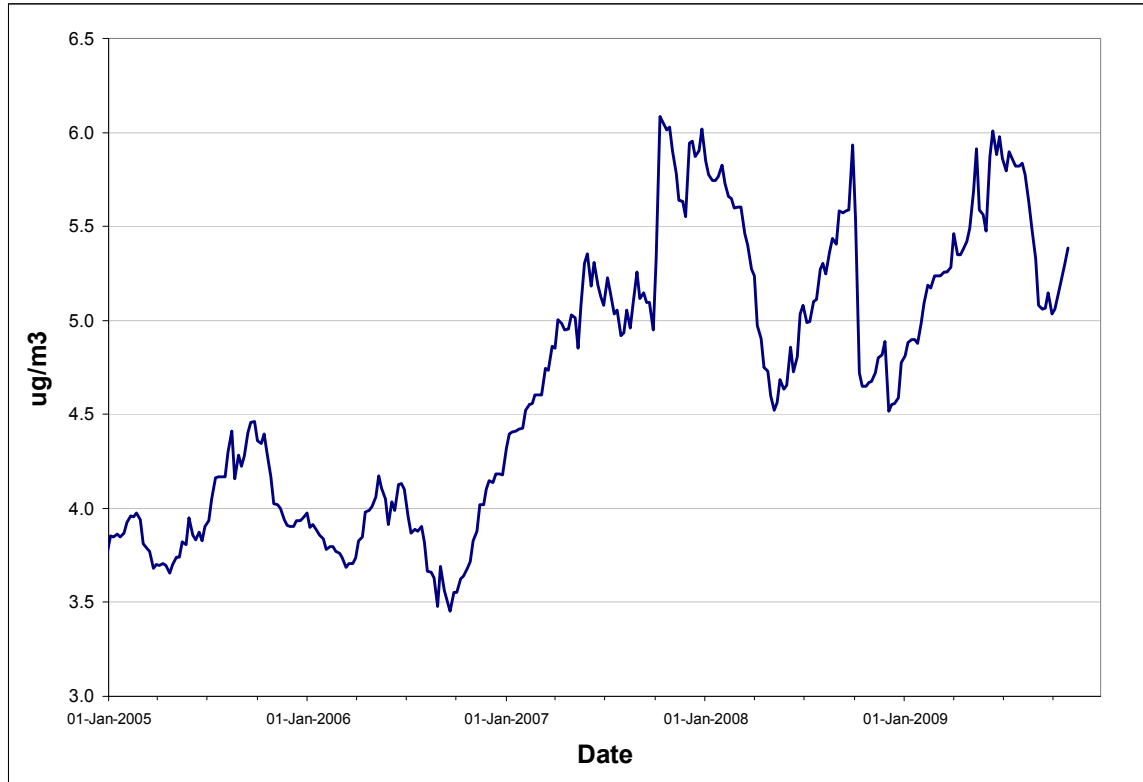
Rolling annual average of daily concentrations

**TABLE 4.4.3.3 - SUBSTATION PM<sub>2.5</sub> (DICHOT) SUMMARY 2008 & 2009**

Year	Month	# Valid Days	% Valid Days	Average	Maximum 24-Hour	Regulatory Exceedances (>120)
2008	January	6	100.0%	0.8	4.2	0
	February	4	100.0%	0.6	1.3	0
	March	6	100.0%	0.4	0.4	0
	April	5	100.0%	1.3	7.3	0
	May	5	100.0%	5.0	23.8	0
	June	5	100.0%	5.5	14.0	0
	July	5	100.0%	6.1	9.9	0
	August	5	100.0%	8.2	12.8	0
	September	5	100.0%	5.0	21.3	0
	October	5	100.0%	0.8	4.3	0
	November	5	100.0%	2.1	5.5	0
	December	5	100.0%	3.3	20.0	0
Annual		61	100.0%	4.8	23.8	0
2009	January	5	83.3%	1.7	10.8	0
	February	4	100.0%	3.0	6.9	0
	March	5	100.0%	0.8	2.1	0
	April	5	100.0%	2.0	11.0	0
	May	6	100.0%	5.2	17.9	0
	June	5	100.0%	4.9	36.1	1
	July	3	60.0%	3.4	9.7	0
	August	5	100.0%	2.4	6.4	0
	September	4	80.0%	3.4	15.1	0
	October	5	100.0%	4.7	8.8	0
	November	0	0.0%			
	December	0	0.0%			
Annual		47	77.0%	5.6	36.1	1

Observations in ug/m<sup>3</sup>

**FIGURE 4.4.3.3 - SUBSTATION ANNUAL PM<sub>2.5</sub> (DICHOT) CONCENTRATIONS**

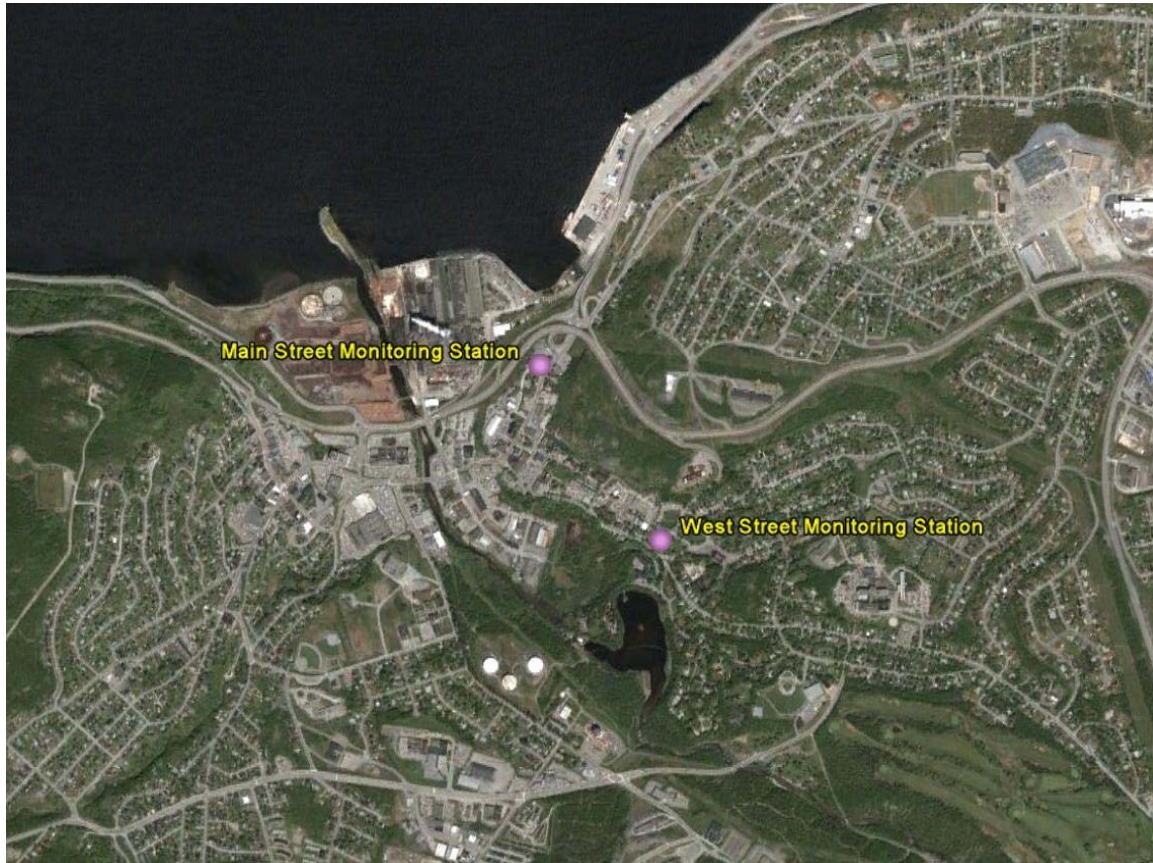


Rolling annual average of daily concentrations

## 4.5 Corner Brook Pulp and Paper

In 2009, Corner Brook Pulp and Paper operated monitoring stations at 2 locations in Corner Brook. These stations are installed to monitor the emissions from Corner Brook Pulp and Paper's paper mill operation and are located on Main Street and West Street. The locations of these monitoring stations are identified in Figure 4.5.1.

**FIGURE 4.5.1 - CORNER BROOK PULP & PAPER AMBIENT MONITORING STATIONS**



### 4.5.1 Main Street

The Main Street monitoring station is located at Hotel Corner Brook. The station monitors ambient levels of SO<sub>2</sub> and PM<sub>2.5</sub> on a continuous basis and TSP on a 1 day in 6 day cycle. For all pollutants, the ambient air criteria were not exceeded on any occasion in 2009.

Due to data interferences with an analog data recording system, much of the SO<sub>2</sub> data in 2009 was invalidated. In late 2009, Corner Brook Pulp and Paper began switching from



an analog recording system to a digital system. It is anticipated that this switch will resolve the data integrity issues.

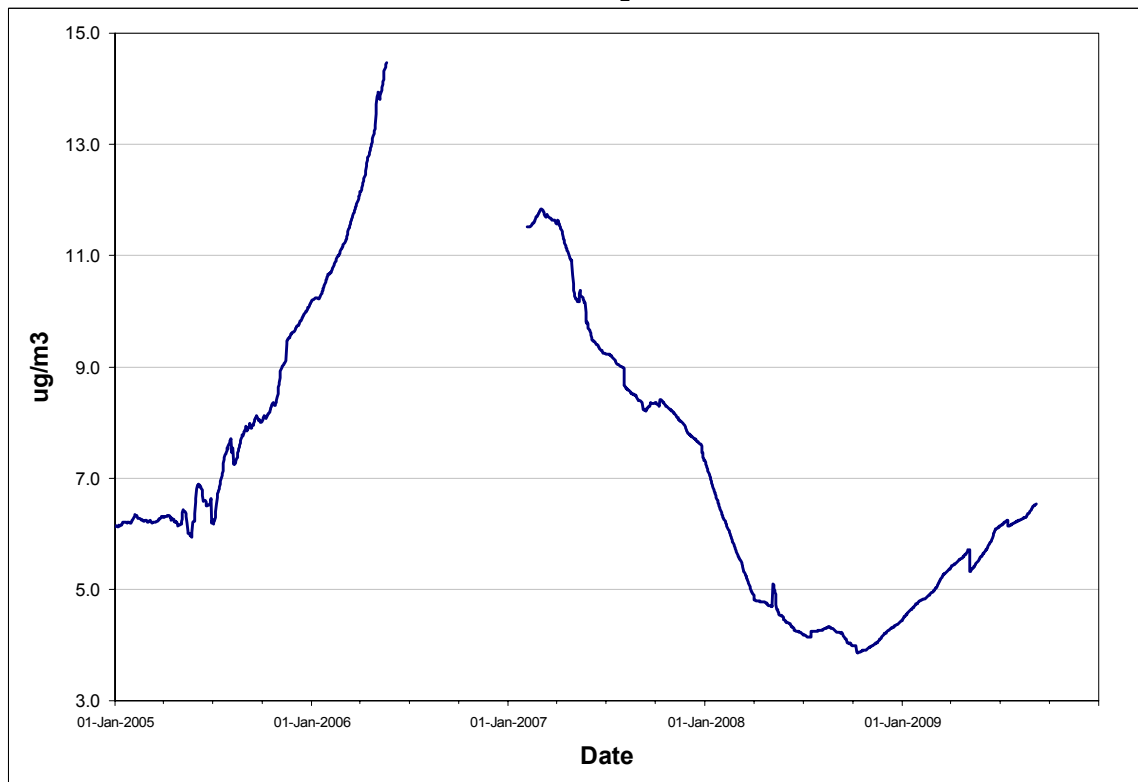
Tables 4.5.1.1 through 4.5.1.3 provide summary information on the level of air contaminants measured at the Main Street Station, while Figures 4.5.1.1 through 4.5.1.3 provide a graphical representation of the annual trend of each pollutant.

**TABLE 4.5.1.1 - MAIN STREET SO<sub>2</sub> SUMMARY 2008 & 2009**

Year	Month	# Valid Hours	% Valid Hours	Average	Maximum			Regulatory Exceedances		
					1-Hour	3-Hour	24-Hour	1-Hour (>900)	3-Hour (>600)	24-Hour (>300)
2008	January	714	96.0%	3.1	8.7	6.4	4.4	0	0	0
	February	667	95.8%	3.5	68.1	26.8	6.9	0	0	0
	March	690	92.7%	2.8	12.2	11.1	4.3	0	0	0
	April	691	96.0%	3.7	27.9	14.0	5.2	0	0	0
	May	708	95.2%	7.7	1433.7	875.5	152.6	1	1	0
	June	691	96.0%	3.5	24.5	15.1	6.2	0	0	0
	July	709	95.3%	5.3	375.1	228.5	42.5	0	0	0
	August	710	95.4%	3.7	20.9	12.8	5.7	0	0	0
	September	691	96.0%	4.6	47.1	21.5	7.2	0	0	0
	October	685	92.1%	4.2	47.2	25.0	8.3	0	0	0
	November	686	95.3%	5.3	12.2	10.5	7.8	0	0	0
	December	715	96.1%	5.7	10.5	8.7	6.9	0	0	0
Annual		8357	95.2%	4.4	1433.7	875.5	152.6	1	1	0
2009	January	711	95.6%	7.2	17.5	11.7	8.9	0	0	0
	February	642	95.5%	6.0	14.0	10.5	7.5	0	0	0
	March	709	95.3%	7.7	69.9	38.5	12.8	0	0	0
	April	689	95.7%	7.1	38.4	21.0	9.6	0	0	0
	May	707	95.0%	7.5	38.4	17.5	9.6	0	0	0
	June	518	71.9%	10.6	219.8	79.1	25.6	0	0	0
	July	0	0.0%		0.0	0.0	0.0	0	0	0
	August	0	0.0%		0.0	0.0	0.0	0	0	0
	September	0	0.0%		0.0	0.0	0.0	0	0	0
	October	0	0.0%		0.0	0.0	0.0	0	0	0
	November	0	0.0%		0.0	0.0	0.0	0	0	0
	December	0	0.0%		0.0	0.0	0.0	0	0	0
Annual		3976	45.4%	7.5	219.8	79.1	25.6	0	0	0

Observations in ug/m<sup>3</sup>

**FIGURE 4.5.1.1 - MAIN STREET ANNUAL SO<sub>2</sub> CONCENTRATIONS**



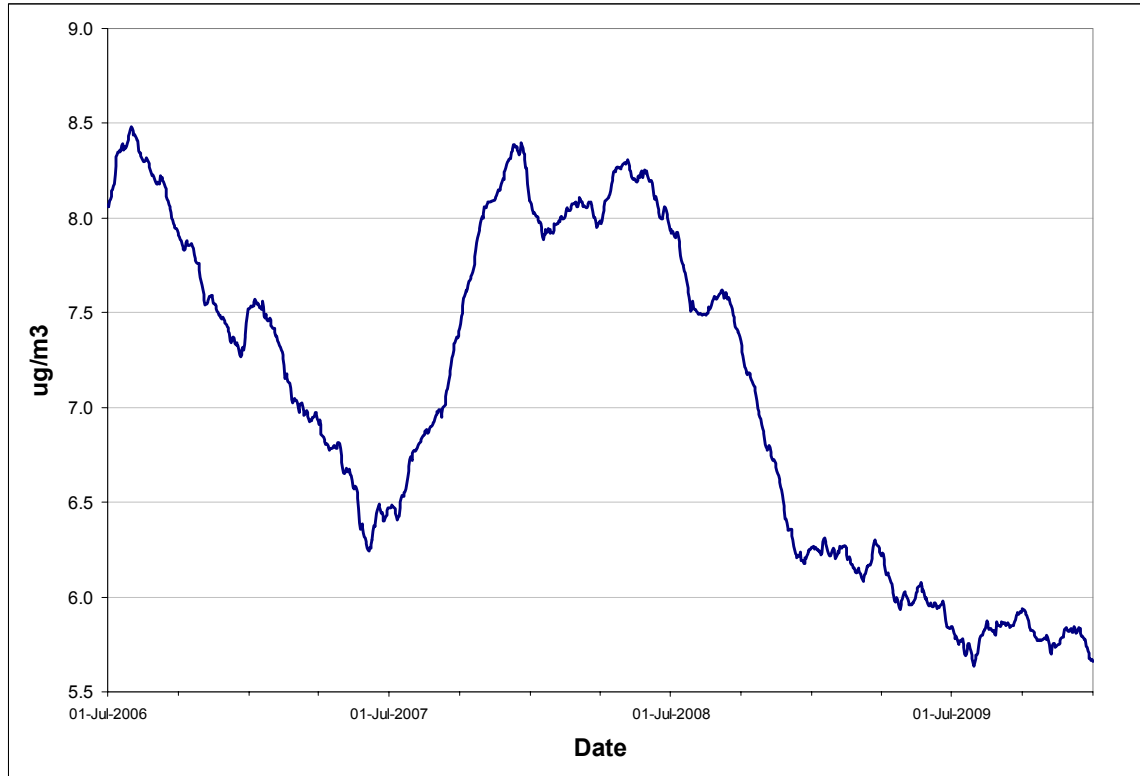
Rolling annual average of hourly concentrations

**TABLE 4.5.1.2 - MAIN STREET PM<sub>2.5</sub> SUMMARY 2008 & 2009**

Year	Month	# Valid Days	% Valid Days	Average	Maximum 24-Hour	Regulatory Exceedances (>25)
2008	January	31	100.0%	6.5	17.0	0
	February	29	100.0%	7.5	18.7	0
	March	31	100.0%	6.5	14.8	0
	April	28	93.3%	8.9	17.2	0
	May	31	100.0%	6.9	16.6	0
	June	30	100.0%	6.4	18.0	0
	July	31	100.0%	9.3	20.4	0
	August	29	93.5%	5.5	13.4	0
	September	14	46.7%	2.6	7.0	0
	October	31	100.0%	3.7	12.9	0
	November	30	100.0%	4.1	16.6	0
	December	31	100.0%	5.3	13.0	0
Annual		346	94.5%	6.3	20.4	0
2009	January	31	100.0%	6.3	20.9	0
	February	26	92.9%	6.3	18.7	0
	March	25	80.6%	7.9	15.8	0
	April	30	100.0%	6.5	14.6	0
	May	31	100.0%	6.2	12.4	0
	June	23	76.7%	4.8	11.0	0
	July	31	100.0%	7.4	15.9	0
	August	31	100.0%	7.7	24.4	0
	September	30	100.0%	5.1	11.2	0
	October	31	100.0%	2.1	5.9	0
	November	30	100.0%	4.5	14.4	0
	December	31	100.0%	3.5	10.8	0
Annual		319	87.4%	5.6	24.4	0

Observations in ug/m<sup>3</sup>

**FIGURE 4.5.1.2 - MAIN STREET ANNUAL PM<sub>2.5</sub> CONCENTRATIONS**



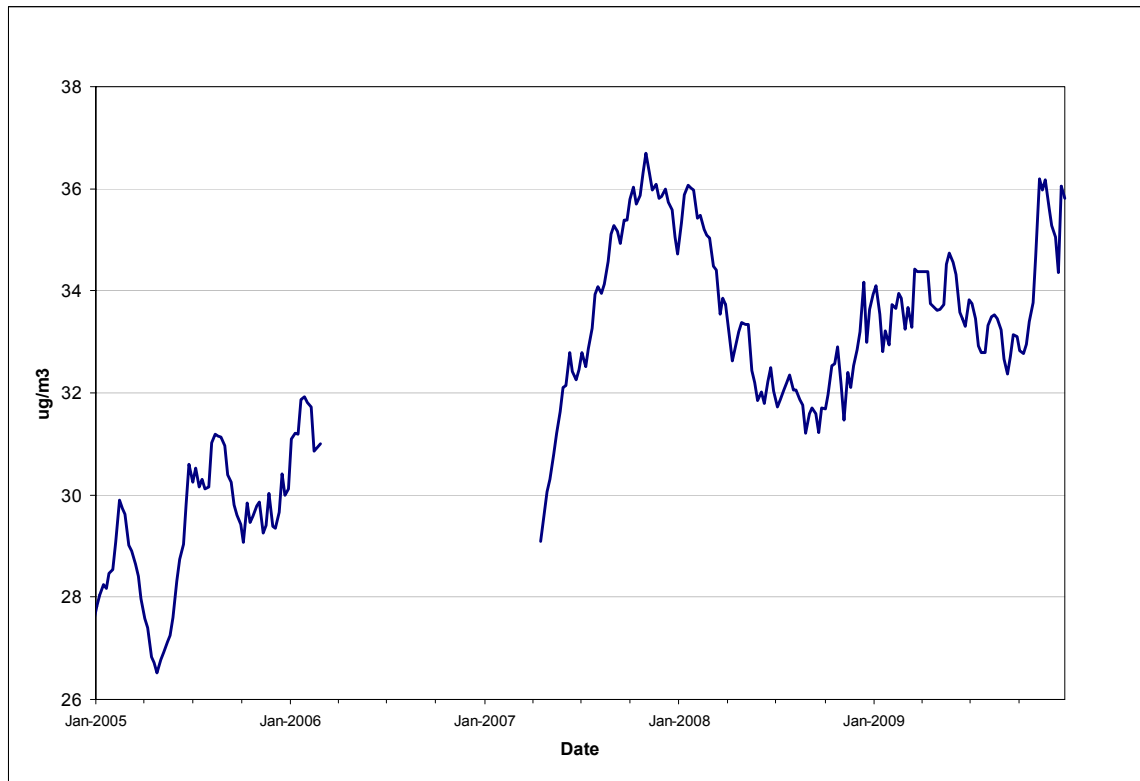
Rolling annual average of hourly concentrations

**TABLE 4.5.1.3 - MAIN STREET TSP SUMMARY 2008 & 2009**

Year	Month	# Valid Days	% Valid Days	Average	Maximum 24-Hour	Regulatory Exceedances (>120)
2008	January	6	100.0%	21.1	37.2	0
	February	4	100.0%	17.0	23.7	0
	March	5	83.3%	22.2	37.7	0
	April	4	80.0%	91.1	159.9	1
	May	5	100.0%	35.6	68.2	0
	June	5	100.0%	53.1	68.2	0
	July	4	80.0%	62.4	67.0	0
	August	3	60.0%	28.8	32.7	0
	September	5	100.0%	38.6	56.3	0
	October	3	60.0%	39.6	46.9	0
	November	5	100.0%	25.2	99.4	0
	December	5	100.0%	29.4	70.5	0
Annual		54	88.5%	33.6	159.9	1
2009	January	6	100.0%	17.5	38.5	0
	February	4	100.0%	24.6	49.7	0
	March	4	80.0%	24.5	82.5	0
	April	3	60.0%	66.3	98.1	0
	May	6	100.0%	51.2	78.3	0
	June	5	100.0%	42.2	62.5	0
	July	5	100.0%	39.5	55.0	0
	August	5	100.0%	35.1	61.5	0
	September	5	100.0%	37.1	56.0	0
	October	5	100.0%	46.3	76.2	0
	November	5	100.0%	46.9	76.6	0
	December	5	100.0%	31.3	55.1	0
Annual		58	95.1%	35.8	98.1	0

Observations in ug/m<sup>3</sup>

**FIGURE 4.5.1.3 - MAIN STREET ANNUAL TSP CONCENTRATIONS**



Rolling annual average of daily concentrations

## 4.5.2 West Street

The West Street monitoring station is located at the Western Star building. The station monitors ambient levels TSP on a 1 day in 6 day cycle. The ambient air criterion was not exceeded on any occasion in 2009.

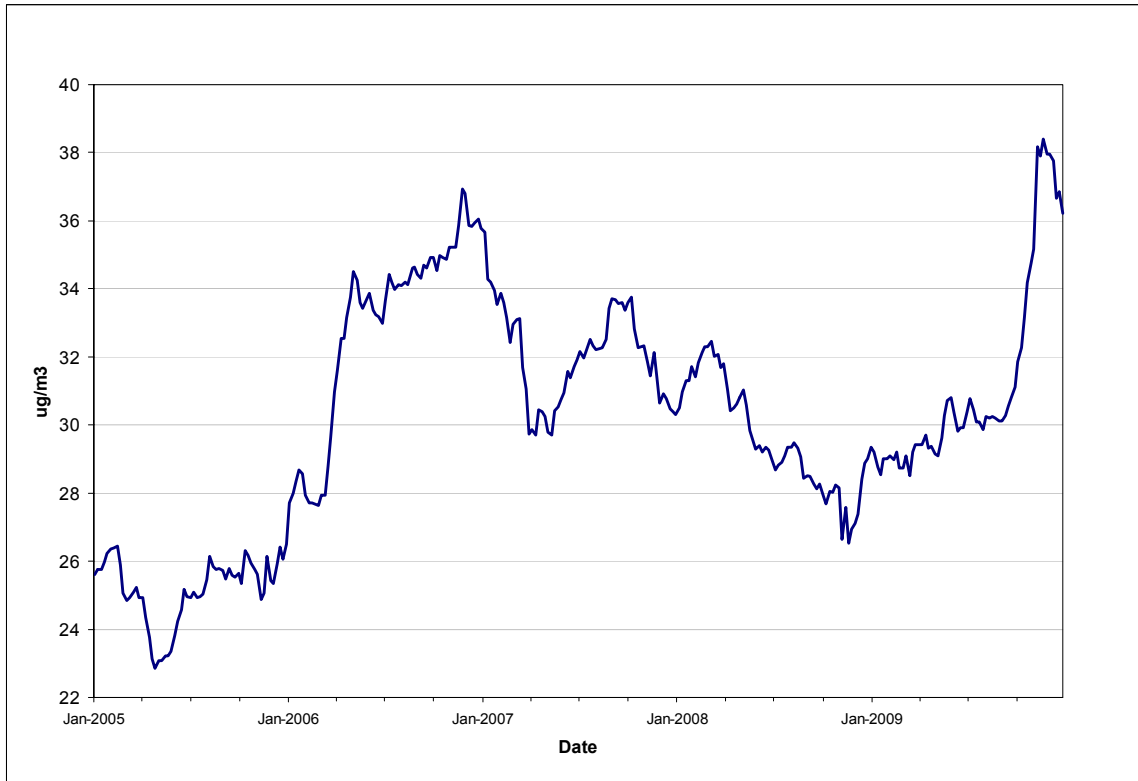
Tables 4.5.2.1 provides summary information on the level of air contaminants measured at the West Street Station, while Figure 4.5.2.1 provides a graphical representation of the annual trend.

**TABLE 4.5.2.1 - WEST STREET TSP SUMMARY 2008 & 2009**

Year	Month	# Valid Days	% Valid Days	Average	Maximum 24-Hour	Regulatory Exceedances (>120)
2008	January	5	83.3%	19.0	27.3	0
	February	4	100.0%	15.3	22.3	0
	March	4	66.7%	19.3	32.4	0
	April	4	80.0%	83.8	142.8	1
	May	5	100.0%	39.5	73.2	0
	June	5	100.0%	43.9	60.0	0
	July	4	80.0%	51.4	62.2	0
	August	3	60.0%	31.1	43.0	0
	September	4	80.0%	28.3	33.1	0
	October	4	80.0%	16.1	20.5	0
	November	5	100.0%	16.9	86.4	0
	December	3	60.0%	42.3	103.2	0
Annual		50	82.0%	29.0	142.8	1
2009	January	5	83.3%	18.8	32.2	0
	February	4	100.0%	13.7	20.6	0
	March	3	60.0%	25.0	59.0	0
	April	3	60.0%	76.9	109.6	0
	May	6	100.0%	67.7	98.5	0
	June	5	100.0%	38.4	57.8	0
	July	5	100.0%	38.8	56.9	0
	August	5	100.0%	33.7	53.1	0
	September	5	100.0%	40.2	50.1	0
	October	5	100.0%	60.8	84.9	0
	November	5	100.0%	43.9	72.5	0
	December	4	80.0%	21.5	49.0	0
Annual		55	90.2%	36.2	109.6	0

Observations in ug/m<sup>3</sup>

**FIGURE 4.5.2.1 - WEST STREET ANNUAL TSP CONCENTRATIONS**



Rolling annual average of daily concentrations



#### 4.6 Vale Inco - Voisey's Bay

In 2009, Vale Inco operated monitoring stations at 3 locations at its Voisey's Bay mine site. These stations are installed to monitor the emissions from Vale Inco's mining operation and port activities and are located at the Accommodation unit, the Crusher and the concentrate storage facility near the Port. The locations of these monitoring stations are identified in Figure 4.6.

**FIGURE 4.6.1 - VALE INCO / VOISEY'S BAY AMBIENT MONITORING STATIONS**



#### 4.6.1 Accommodation Unit

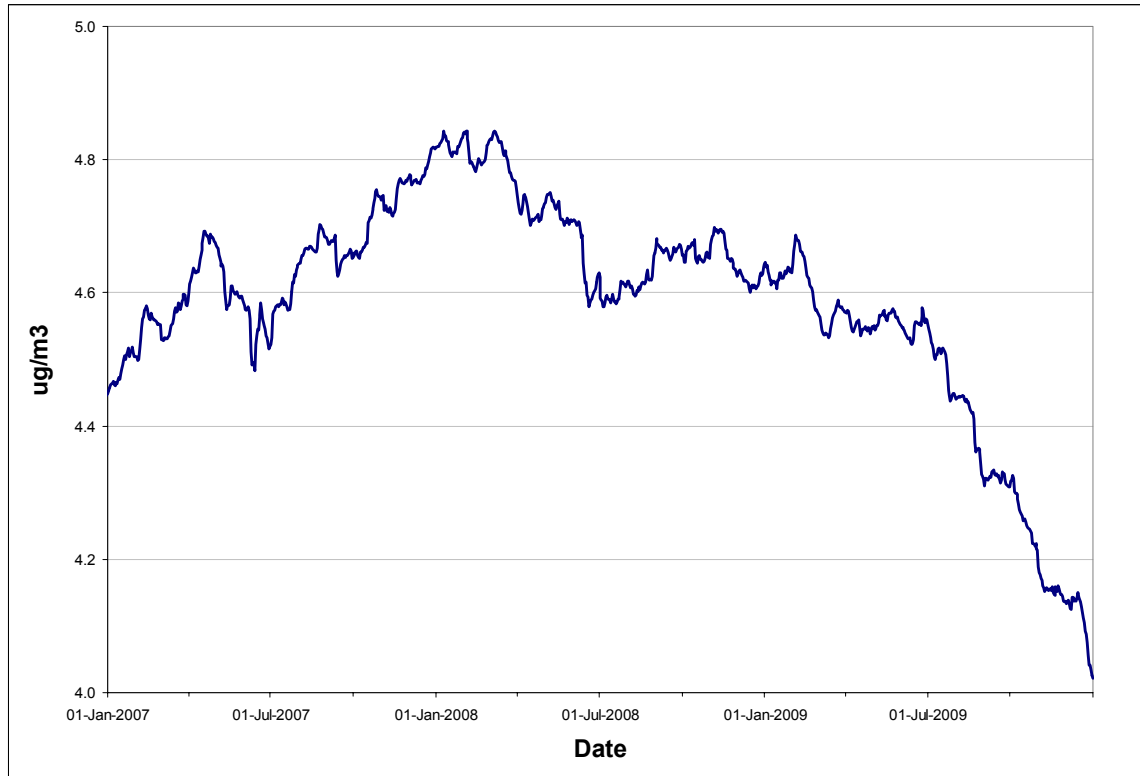
The Accommodation Unit station monitors the ambient levels of PM<sub>2.5</sub> and NO<sub>x</sub> / NO<sub>2</sub> on a continuous basis. For all pollutants, the ambient air criteria were not exceeded on any occasion in 2009. Tables 4.6.1.1 through 4.6.1.2 provide summary information on the level of air contaminants measured at the Accommodation Unit, while Figures 4.6.1.1 through 4.6.1.2 provide a graphical representation of the annual trend of each pollutant.

**TABLE 4.6.1.1 - ACCOMMODATION UNIT PM<sub>2.5</sub> SUMMARY 2008 & 2009**

Year	Month	# Valid Days	% Valid Days	Average	Maximum 24-Hour	Regulatory Exceedances (>25)
2008	January	31	100.0%	5.3	7.7	0
	February	29	100.0%	5.2	7.6	0
	March	31	100.0%	4.8	6.8	0
	April	29	96.7%	5.1	9.5	0
	May	31	100.0%	4.0	8.3	0
	June	29	96.7%	3.8	5.9	0
	July	24	77.4%	5.0	12.3	0
	August	31	100.0%	4.7	14.7	0
	September	28	93.3%	3.9	7.6	0
	October	31	100.0%	4.4	9.4	0
	November	30	100.0%	4.5	14.2	0
	December	30	96.8%	5.1	9.0	0
Annual		354	96.7%	4.6	14.7	0
2009	January	30	96.8%	5.2	8.2	0
	February	28	100.0%	4.4	11.3	0
	March	30	96.8%	4.8	8.2	0
	April	30	100.0%	4.8	6.8	0
	May	31	100.0%	4.0	6.4	0
	June	30	100.0%	3.9	11.8	0
	July	31	100.0%	3.6	7.1	0
	August	31	100.0%	3.3	5.1	0
	September	30	100.0%	3.7	7.9	0
	October	31	100.0%	3.3	5.3	0
	November	30	100.0%	3.6	6.0	0
	December	31	100.0%	3.7	9.4	0
Annual		363	99.5%	4.0	11.8	0

Observations in ug/m<sup>3</sup>

**FIGURE 4.6.1.1 - ACCOMMODATION UNIT ANNUAL PM<sub>2.5</sub> CONCENTRATIONS**



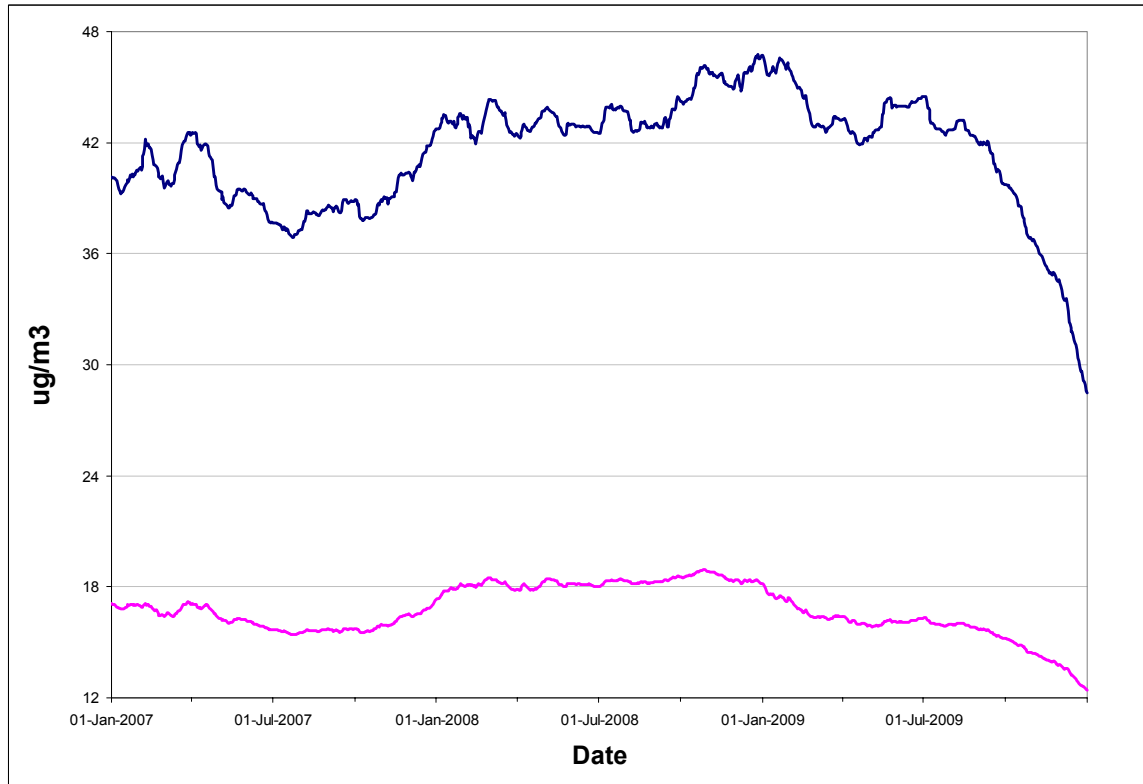
Rolling annual average of hourly concentrations

**TABLE 4.6.1.2 - ACCOMMODATION UNIT NOX / NO2 SUMMARY 2008 & 2009**

Year	Month	# Valid Hours	% Valid Hours	Average		Maximums				Exceedances	
				NO <sub>x</sub>	NO <sub>2</sub>	1-Hour		24-Hour		1-Hour (>400)	24-Hour (>200)
2008	January	712	95.7%	81.4	36.9	453.0	118.7	164.8	57.5	0	0
	February	665	95.5%	75.4	30.1	426.6	76.5	157.9	42.4	0	0
	March	536	72.0%	44.6	20.1	265.2	80.7	121.0	36.8	0	0
	April	654	90.8%	35.9	17.0	500.5	103.4	108.6	43.6	0	0
	May	715	96.1%	17.7	8.7	383.3	89.7	198.5	44.9	0	0
	June	669	92.9%	7.8	4.8	113.1	32.6	20.3	10.6	0	0
	July	614	82.5%	29.9	9.5	330.1	252.3	185.3	32.0	0	0
	August	640	86.0%	21.3	8.5	977.3	163.1	142.7	20.3	0	0
	September	646	89.7%	50.3	15.5	449.4	60.3	191.1	35.1	0	0
	October	679	91.3%	47.2	16.1	457.8	72.5	187.7	34.2	0	0
	November	645	89.6%	46.4	19.0	484.0	67.1	89.5	37.8	0	0
	December	664	89.2%	100.5	31.2	661.6	80.9	236.5	52.9	0	0
Annual		7839	89.2%	46.7	18.2	977.3	252.3	236.5	57.5	0	0
2009	January	654	87.9%	77.1	29.2	510.0	99.0	170.4	54.5	0	0
	February	620	92.3%	36.3	17.3	338.9	67.4	68.5	33.0	0	0
	March	677	91.0%	48.8	19.9	427.0	83.4	131.2	38.0	0	0
	April	662	91.9%	24.7	11.5	589.2	90.5	100.3	28.0	0	0
	May	684	91.9%	35.4	10.0	484.0	79.6	224.5	33.2	0	0
	June	609	84.6%	11.3	6.7	255.8	52.7	49.5	19.5	0	0
	July	601	80.8%	6.4	4.9	127.4	35.9	22.1	10.0	0	0
	August	684	91.9%	15.2	6.1	194.2	31.1	85.6	19.4	0	0
	September	662	91.9%	22.9	9.4	220.9	56.0	79.4	31.9	0	0
	October	684	91.9%	12.3	7.0	140.6	42.5	59.6	25.2	0	0
	November	664	92.2%	21.1	11.6	277.9	60.8	56.9	23.0	0	0
	December	676	90.9%	28.3	14.8	299.4	63.2	104.0	34.4	0	0
Annual		7877	89.9%	28.5	12.4	589.2	99.0	224.5	54.5	0	0

Observations in ug/m<sup>3</sup>

**FIGURE 4.6.1.2 - ACCOMMODATION UNIT ANNUAL NO<sub>x</sub> / NO<sub>2</sub> CONCENTRATIONS**



Rolling annual average of hourly concentrations

#### 4.6.2 Crusher Site

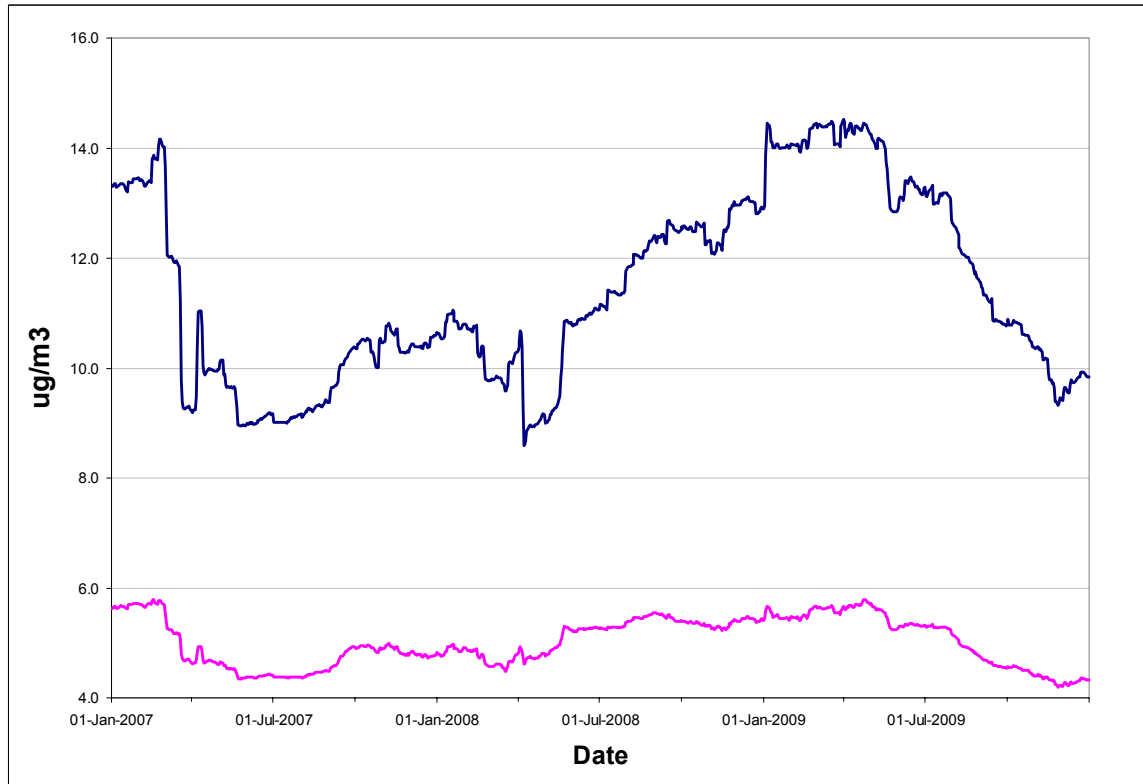
The Crusher Site station monitors the ambient levels of NO<sub>x</sub> / NO<sub>2</sub> on a continuous basis. The ambient air criteria were not exceeded on any occasion in 2009. Table 4.6.2.1 provides summary information on the level of air contaminants measured at the Crusher Site, while Figure 4.6.2.1 provides a graphical representation of the annual trend.

**TABLE 4.6.2.1 - CRUSHER SITE NO<sub>x</sub> / NO<sub>2</sub> SUMMARY 2008 & 2009**

Year	Month	# Valid Hours	% Valid Hours	Average NO <sub>x</sub> NO <sub>2</sub>		Maximums				Exceedances	
						1-Hour NO <sub>x</sub> NO <sub>2</sub>		24-Hour NO <sub>x</sub> NO <sub>2</sub>		1-Hour (>400)	24-Hour (>200)
2008	January	686	92.2%	8.6	5.2	604.3	71.2	81.9	27.4	0	0
	February	640	92.0%	5.4	2.9	188.1	41.4	47.4	14.9	0	0
	March	676	90.9%	11.1	6.1	368.3	74.3	129.5	33.0	0	0
	April	504	70.0%	17.0	7.5	475.1	91.1	78.3	19.2	0	0
	May	572	76.9%	24.9	9.1	244.0	75.5	97.2	25.8	0	0
	June	652	90.6%	12.7	5.5	129.4	35.0	29.1	10.9	0	0
	July	626	84.1%	19.7	6.7	420.0	52.8	131.2	27.7	0	0
	August	591	79.4%	16.4	6.5	245.4	41.5	76.5	16.4	0	0
	September	612	85.0%	12.4	4.0	346.7	46.3	138.1	22.8	0	0
	October	625	84.0%	8.2	3.6	293.2	38.5	56.8	15.2	0	0
	November	653	90.7%	15.9	5.3	367.2	60.1	99.2	25.9	0	0
	December	645	86.7%	4.9	3.2	146.6	54.3	27.4	15.4	0	0
Annual		7482	85.2%	12.9	5.4	604.3	91.1	138.1	33.0	0	0
2009	January	631	84.8%	22.1	5.8	600.2	88.4	321.6	57.0	0	0
	February	618	92.0%	10.0	5.4	430.8	68.7	73.3	23.1	0	0
	March	656	88.2%	12.0	6.1	431.0	70.5	146.7	34.6	0	0
	April	637	88.5%	13.0	7.5	236.4	67.2	66.8	21.0	0	0
	May	618	83.1%	7.1	3.3	175.5	62.3	75.5	14.1	0	0
	June	631	87.6%	17.8	6.3	287.1	39.4	105.3	20.8	0	0
	July	440	59.1%	11.7	4.3	148.4	33.8	43.2	11.0	0	0
	August	685	92.1%	4.2	2.0	106.3	28.7	20.9	6.1	0	0
	September	625	86.8%	3.3	1.6	127.5	37.3	46.6	13.7	0	0
	October	698	93.8%	3.8	2.1	131.8	34.8	25.1	8.0	0	0
	November	676	93.9%	5.5	3.4	206.4	60.8	64.1	21.9	0	0
	December	679	91.3%	9.4	4.3	287.8	70.2	52.6	19.6	0	0
Annual		7594	86.7%	9.8	4.3	600.2	88.4	321.6	57.0	0	0

Observations in ug/m<sup>3</sup>

**FIGURE 4.6.2.1 - CRUSHER SITE ANNUAL NO<sub>x</sub> / NO<sub>2</sub> CONCENTRATIONS**



Rolling annual average of hourly concentrations

### 4.6.3 Port Site

The Port Site station monitors the ambient levels of TSP on a continuous basis. The ambient air criterion was exceeded on one occasion in 2009. In September, the analyzer went off-line due to a malfunction, and replaced with a back-up unit in November, resulting in data loss for that timeframe. Table 4.6.3.1 provides summary information on the level of air contaminants measured at the Port Site, while Figure 4.6.3.1 provides a graphical representation of the annual trend.

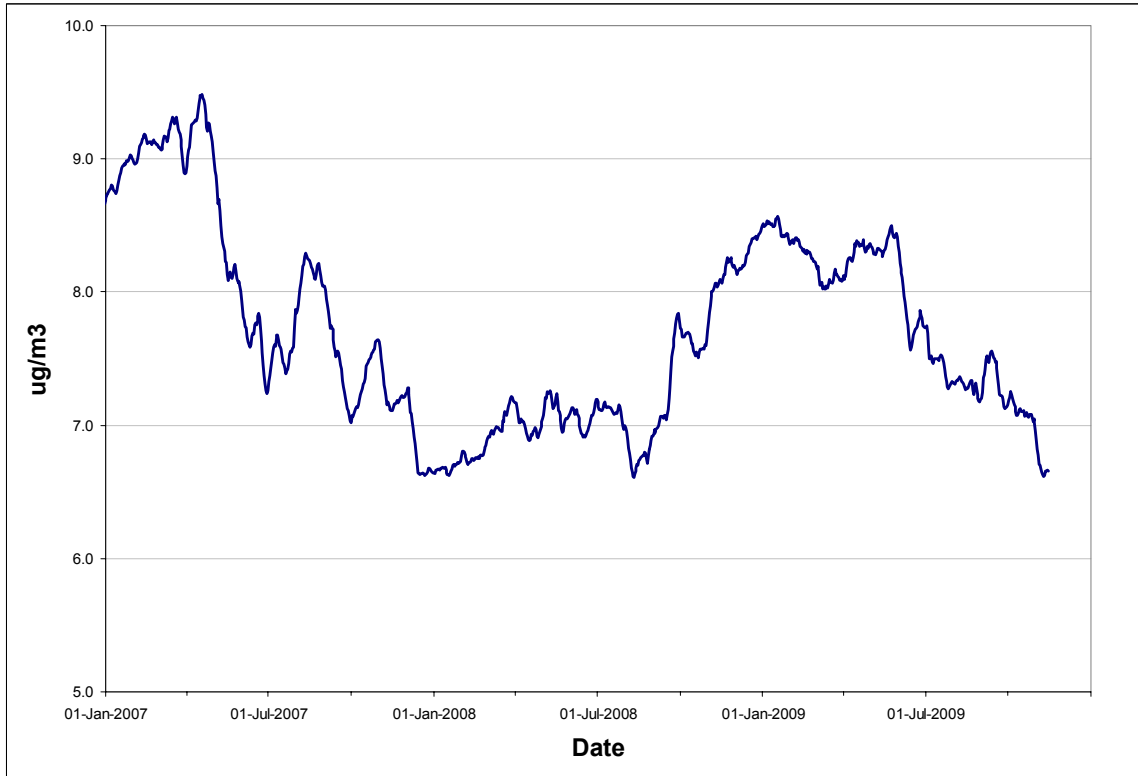
**TABLE 4.6.3.1 - PORT SITE TSP SUMMARY 2008 & 2009**

Year	Month	# Valid Days	% Valid Days	Average	Maximum 24-Hour	Regulatory Exceedances (>120)
2008	January	31	100.0%	6.6	22.8	0
	February	28	96.6%	6.8	18.4	0
	March	31	100.0%	18.3	57.8	0
	April	28	93.3%	10.7	65.6	0
	May	31	100.0%	10.8	48.3	0
	June	30	100.0%	10.0	24.3	0
	July	31	100.0%	22.9	140.7	1
	August	31	100.0%	17.8	181.0	1
	September	30	100.0%	25.8	196.4	2
	October	31	100.0%	14.7	73.4	0
	November	29	96.7%	28.7	161.8	2
	December	30	96.8%	7.8	23.4	0
Annual		361	98.6%	15.1	196.4	6
2009	January	31	100.0%	5.9	28.1	0
	February	28	100.0%	5.0	12.9	0
	March	31	100.0%	17.1	83.6	0
	April	29	96.7%	19.8	74.8	0
	May	31	100.0%	10.9	79.4	0
	June	30	100.0%	16.2	103.3	0
	July	24	77.4%	9.4	30.7	0
	August	5	16.1%	9.7	16.8	0
	September	19	63.3%	29.6	185.0	1
	October	0	0.0%			0
	November	26	86.7%	5.7	44.1	0
	December	31	100.0%	3.2	38.7	0
Annual		285	78.1%	6.7	185.0	1

Observations in ug/m<sup>3</sup>



**FIGURE 4.6.3.1 - PORT SITE ANNUAL TSP CONCENTRATIONS**

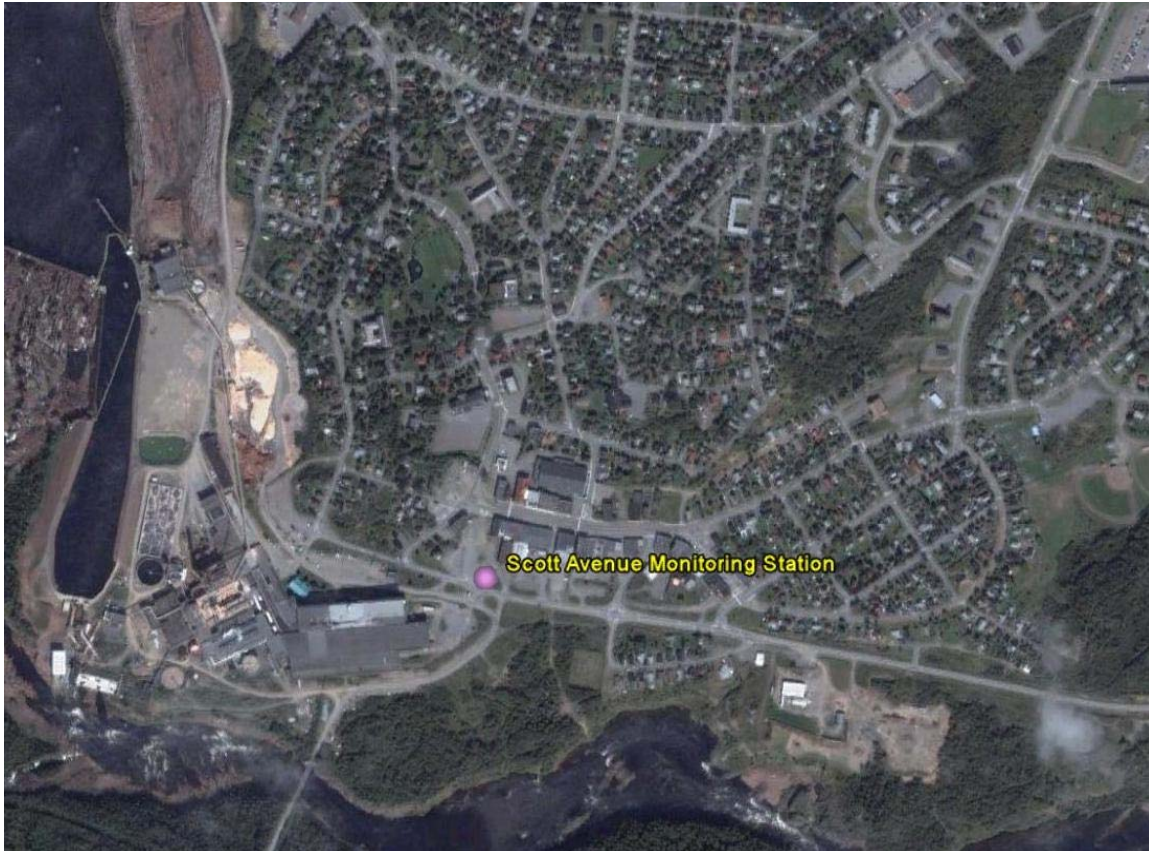


Rolling annual average of hourly concentrations

## 4.7 Abitibi - Consolidated Grand Falls Windsor

In 2009, Abitibi - Consolidated operated one monitoring stations on Scott Avenue. This station was installed to monitor the emissions from Abitibi – Consolidated pulp and paper mill in Grand Falls Windsor. In February 2009 Abitibi Consolidated closed the mill, however, the monitoring station remained operational for an extended period of time. The location of the monitoring station is identified in Figure 4.7.1.

**FIGURE 4.7.1 - ABITIBI - CONSOLIDATED AMBIENT MONITORING STATION**



### 4.7.1 Scott Avenue

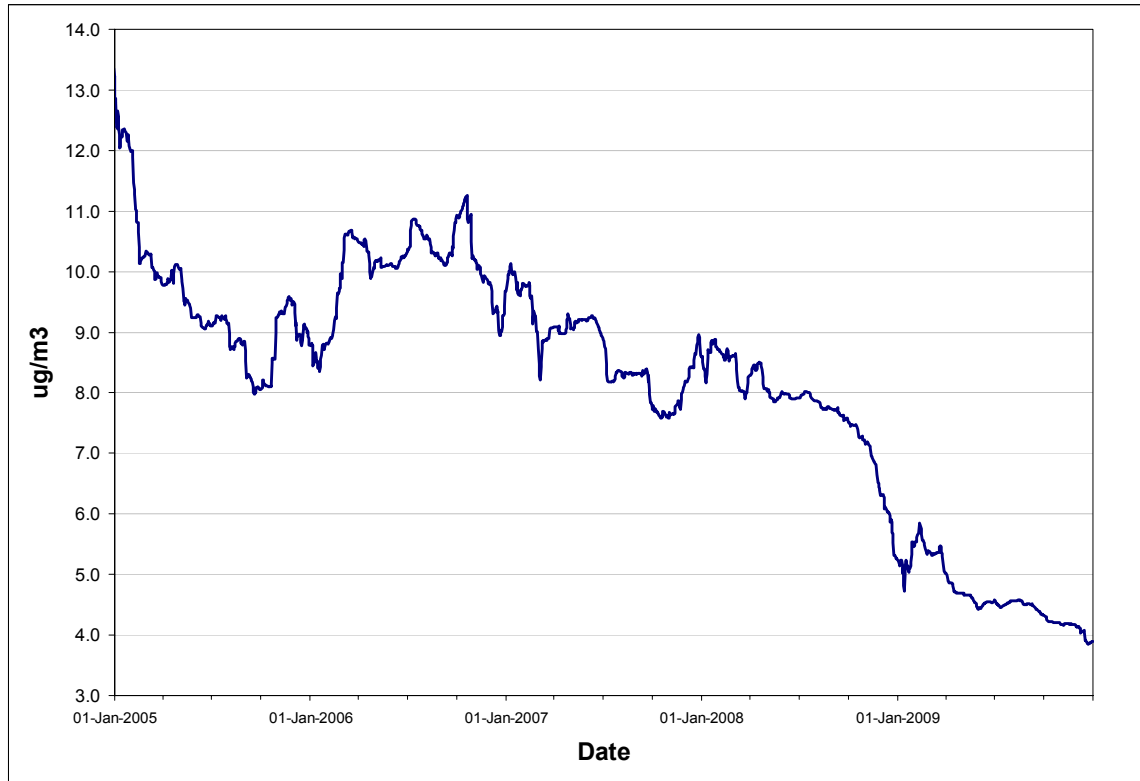
The Scott Avenue station monitors the ambient levels of SO<sub>2</sub>, PM<sub>2.5</sub> and TSP on a continuous basis. The ambient air criteria were not exceeded on any occasion in 2009. Tables 4.7.1.1 through 4.7.1.3 provide summary information on the level of air contaminants measured at the Scott Avenue site, while Figures 4.7.1.1 through 4.7.1.3 provide a graphical representation of the annual trend.

**TABLE 4.7.1.1 - SCOTT AVENUE SO<sub>2</sub> SUMMARY 2008 & 2009**

Year	Month	# Valid Hours	% Valid Hours	Average	Maximum			Regulatory Exceedances		
					1-Hour	3-Hour	24-Hour	1-Hour (>900)	3-Hour (>600)	24-Hour (>300)
2008	January	706	94.9%	15.8	210.2	200.4	106.8	0	0	0
	February	664	95.4%	9.5	132.4	105.8	33.1	0	0	0
	March	709	95.3%	8.2	192.2	115.2	48.1	0	0	0
	April	615	85.4%	4.3	135.7	78.2	33.2	0	0	0
	May	713	95.8%	3.8	123.6	61.2	19.5	0	0	0
	June	686	95.3%	1.5	27.6	21.7	8.3	0	0	0
	July	688	92.5%	2.9	108.0	61.3	15.7	0	0	0
	August	712	95.7%	2.1	65.1	36.3	13.8	0	0	0
	September	452	62.8%	2.9	36.7	21.0	7.5	0	0	0
	October	712	95.7%	3.0	93.1	63.6	20.3	0	0	0
	November	683	94.9%	2.2	45.9	25.5	10.7	0	0	0
	December	711	95.6%	6.2	198.7	122.8	47.6	0	0	0
Annual		8051	91.7%	5.3	210.2	200.4	106.8	0	0	0
2009	January	676	90.9%	19.1	279.0	143.1	78.2	0	0	0
	February	637	94.8%	8.1	123.9	114.6	56.2	0	0	0
	March	713	95.8%	4.2	118.7	71.1	36.9	0	0	0
	April	690	95.8%	0.4	2.9	2.3	0.8	0	0	0
	May	705	94.8%	0.8	3.5	2.1	1.5	0	0	0
	June	272	37.8%	0.9	5.5	4.2	1.5	0	0	0
	July	677	91.0%	2.8	4.2	4.2	4.0	0	0	0
	August	714	96.0%	1.6	4.1	3.3	2.7	0	0	0
	September	691	96.0%	1.4	2.8	2.8	2.4	0	0	0
	October	714	96.0%	1.5	2.7	2.6	2.1	0	0	0
	November	483	67.1%	0.6	4.4	2.7	1.3	0	0	0
	December	122	16.4%	1.2	3.6	3.5	3.4	0	0	0
Annual		7094	81.0%	3.9	279.0	143.1	78.2	0	0	0

Observations in ug/m<sup>3</sup>

**FIGURE 4.7.1.1 - SCOTT AVENUE ANNUAL SO<sub>2</sub> CONCENTRATIONS**



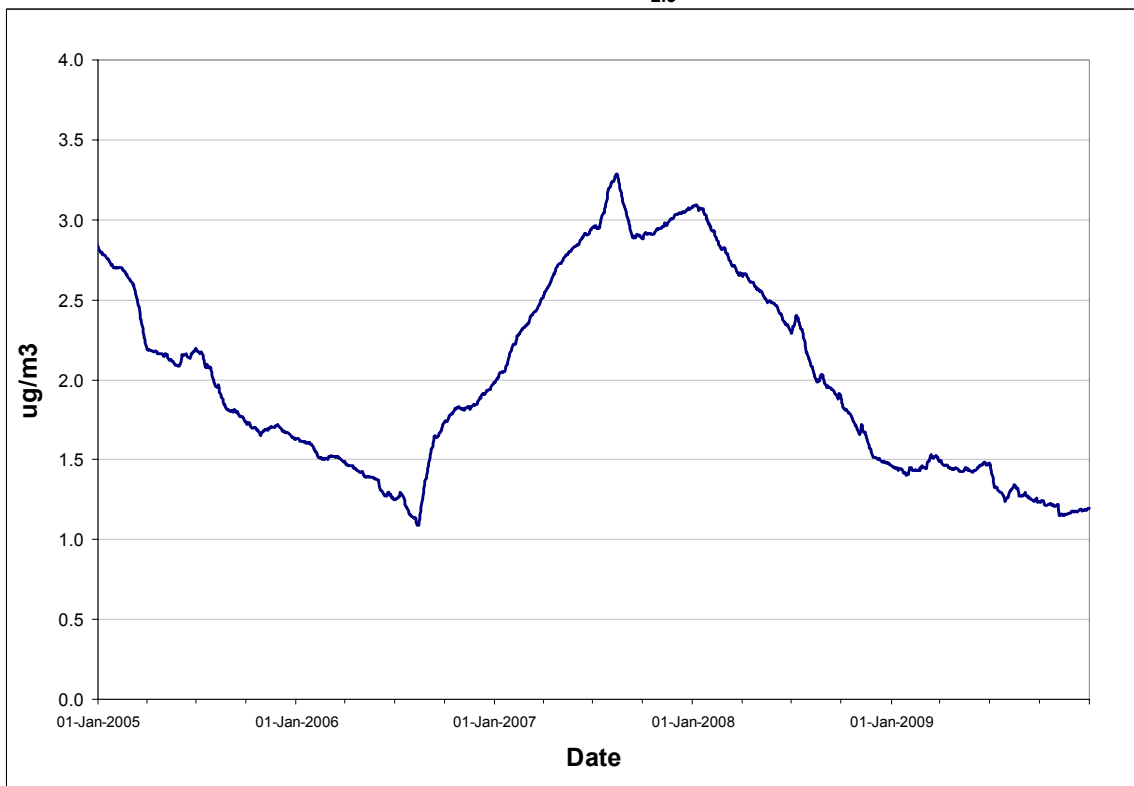
Rolling annual average of hourly concentrations

**TABLE 4.7.1.2 - SCOTT AVENUE PM<sub>2.5</sub> SUMMARY 2008 & 2009**

Year	Month	# Valid Days	% Valid Days	Average	Maximum 24-Hour	Regulatory Exceedances (>25)
2008	January	23	74.2%	1.9	4.2	0
	February	29	100.0%	1.4	4.3	0
	March	29	93.5%	1.4	4.4	0
	April	20	66.7%	1.4	7.0	0
	May	31	100.0%	1.0	4.2	0
	June	30	100.0%	0.7	4.9	0
	July	30	96.8%	3.5	10.4	0
	August	31	100.0%	1.4	6.9	0
	September	20	66.7%	1.6	9.1	0
	October	31	100.0%	1.0	5.5	0
	November	29	96.7%	1.6	16.2	0
	December	29	93.5%	1.0	3.7	0
Annual		332	90.7%	1.5	16.2	0
2009	January	31	100.0%	1.2	4.0	0
	February	28	100.0%	1.8	10.1	0
	March	31	100.0%	1.8	14.0	0
	April	30	100.0%	0.9	2.8	0
	May	30	96.8%	0.7	3.3	0
	June	12	40.0%	1.3	3.1	0
	July	29	93.5%	0.9	4.6	0
	August	18	58.1%	1.9	6.7	0
	September	30	100.0%	1.0	5.0	0
	October	31	100.0%	0.7	4.5	0
	November	0	0.0%	0.0	0.0	0
	December	1	3.2%	1.2	1.2	0
Annual		271	74.2%	1.2	14.0	0

Observations in ug/m<sup>3</sup>

**FIGURE 4.7.1.2 - SCOTT AVENUE ANNUAL PM<sub>2.5</sub> CONCENTRATIONS**



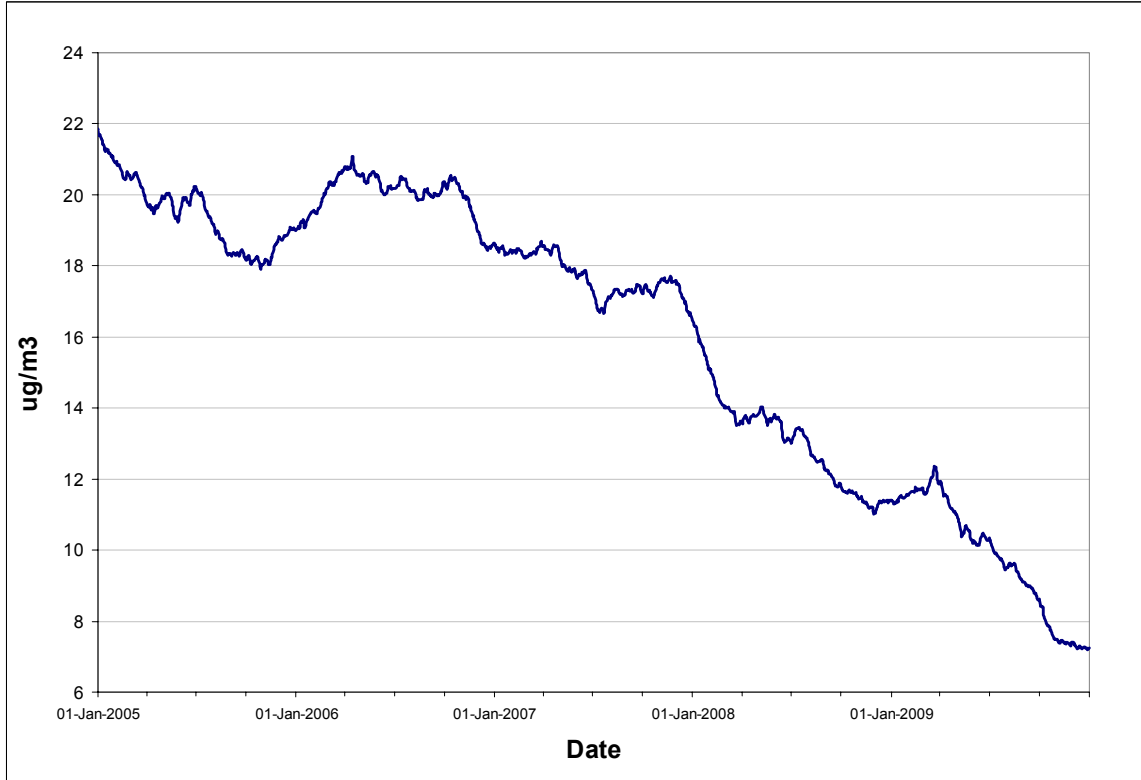
Rolling annual average of hourly concentrations

**TABLE 4.7.1.3 - SCOTT AVENUE TSP SUMMARY 2008 & 2009**

Year	Month	# Valid Days	% Valid Days	Average	Maximum 24-Hour	Regulatory Exceedances (>120)
2008	January	31	100.0%	5.8	22.2	0
	February	29	100.0%	6.4	21.5	0
	March	31	100.0%	12.2	51.5	0
	April	30	100.0%	21.7	81.4	0
	May	31	100.0%	14.7	73.4	0
	June	30	100.0%	8.7	35.9	0
	July	30	96.8%	23.3	50.5	0
	August	31	100.0%	11.7	35.8	0
	September	20	66.7%	14.7	49.8	0
	October	31	100.0%	12.8	42.9	0
	November	29	96.7%	8.4	46.7	0
	December	28	90.3%	9.2	43.2	0
Annual		351	95.9%	12.4	81.4	0
2009	January	29	93.5%	6.6	26.3	0
	February	24	85.7%	6.5	27.9	0
	March	29	93.5%	15.2	114.1	0
	April	30	100.0%	8.9	45.6	0
	May	29	93.5%	6.0	48.1	0
	June	0	0.0%	0.0	0.0	0
	July	25	80.6%	9.6	26.5	0
	August	31	100.0%	7.8	20.1	0
	September	30	100.0%	7.1	16.1	0
	October	31	100.0%	3.1	14.4	0
	November	0	0.0%	0.0	0.0	0
	December	1	3.2%	18.9	18.9	0
Annual		259	71.0%	7.9	114.1	0

Observations in ug/m<sup>3</sup>

**FIGURE 4.7.1.3 - SCOTT AVENUE ANNUAL TSP CONCENTRATIONS**



Rolling annual average of hourly concentrations



#### **4.8 Vale Inco - Long Harbour**

In 2009, Vale Inco began the installation of a monitoring network in the Long Harbour / Mt. Arlington Heights area. This network is being installed to monitor the emissions from the Hydromet Nickel Processing facility currently being constructed by Vale Inco. The network will monitor levels of  $\text{NO}_x$  /  $\text{NO}_2$  as well as  $\text{PM}_{2.5}$ . Data from this network will be reported in subsequent annual reports.