
DEPARTMENT OF ENVIRONMENT AND CONSERVATION

# 2011 AMBIENT AIR MONITORING REPORT

April 2012

## 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 for the pollutants being measured. On occasion, communities in close proximity to an industrial operation may experience episodic decreases in the quality of the air; 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 can occur due to long-range transport from mainland Canada and the United States, but are also episodic in nature and rarely produce levels that exceed the ambient air quality standards. On a local level, emissions from sources such as vehicular traffic and woodstoves also impact the air quality in the province.

This report presents all the monitoring results from both the federal / provincial operated National Air Pollution Surveillance (NAPS) network as well as 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 2011, 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 a change in the operating condition as in the case of industrial monitoring.

# Table of Contents

# List of Tables

# List of Figures

# 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. In 2011, the Department operated stations at seven location as part of the National Air Pollution Surveillance (NAPS) network, while industrial facilities were required to monitor their own emissions. The Department audits the operation of the industrial monitoring networks 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 2011 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. Local emissions, such as those from vehicular traffic and woodstoves, also impact air quality on a routine basis.

This report provides summary information and trends from all air quality monitors in Newfoundland and Labrador in 2011. All data has gone through a data reduction and quality assurance process to account for any anomalous readings or system malfunctions.

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; Section 4 provides results from the monitoring of industrial emissions; while Section 5 provides the results for the mobile monitoring station operated by the Department of Environment and Conservation.

## 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 Pollution Surveillance |
| $NO_2$ | Nitrogen Dioxide |
| $NO_x$ | Oxides of Nitrogen |
| $O_3$ | Ozone |
| $PM_{2.5}$ | Particulate Matter less than or equal to 2.5 microns |
| $PM_{10}$ | Particulate Matter less than or equal to 10 microns |
| $SO_2$ | Sulphur Dioxide |
| TSP | Total Suspended Particulate |
| $\mu g/m^3$ | Micrograms per cubic metre |
| Vale | Vale Newfoundland and Labrador |

# 2.0 MONITORING NETWORK

Five pollutants are measured in the monitoring networks in the province. These criteria pollutants are sulphur dioxide ($SO_2$), oxides of nitrogen ($NO_x$), carbon monoxide (CO), particulate matter (PM) and ozone ($O_3$). Volatile organic compounds, (VOCs) are also measured periodically at the NAPS stations, but are not included in this report.

## 2.1 Pollutants

### 2.1.1 Oxides of Nitrogen ($NO_x$)

In a combustion process, $NO_x$ is produced through 3 mechanisms, namely thermal $NO_x$, fuel $NO_x$ and prompt $NO_x$. Thermal $NO_x$ is the primary source of $NO_x$ and is formed as a high temperature dissociation and subsequent reaction of nitrogen ($N_2$) and oxygen ($O_2$). It is produced in the hottest part of the flame and its formation increases exponentially with the flame temperature. The control of thermal $NO_x$ is generally achieved through reducing the flame temperature, reducing the residence time, or by operating under fuel rich conditions. Fuel $NO_x$ 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 $NO_x$ can account for up to 50% of the total $NO_x$ emissions. Prompt $NO_x$ 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.

$NO_2$ is the primary component of concern in $NO_x$ emissions. Generally between 5% and 10% of the $NO_x$ emitted from the combustion of fuel is emitted as $NO_2$. The remainder is emitted as NO, which is subsequently converted to $NO_2$ in reactions with various oxidants and oxygen as the plume is transported downwind from the source. The rate of $NO_2$ formation varies with time of day, season, temperature, wind speed, solar radiation and the availability of oxidants to help drive the chemical reactions.

$NO_2$ 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 ($PM_{10}$) 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 ($PM_{2.5}$) is believed to pose the greatest health risks as it can lodge deeply into the lungs; a $PM_{2.5}$ particle is approximately $1/30^{th}$ 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 and 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 for complete combustion is:

$$HC + O_2 \rightarrow CO_2 + H_2O$$

However if sufficient oxygen ($O_2$) is not present to complete the combustion of the hydrocarbon fuel (HC), then the oxidation to carbon dioxide ($CO_2$) and water ($H_2O$) is not completed and hence CO is emitted.

### 2.1.4 Sulphur Dioxide ($SO_2$)

Levels of sulphur dioxide ($SO_2$) 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 $SO_2$, with the remaining 2% producing sulphur trioxide ($SO_3$). The emitted $SO_2$ can also further oxidize to $SO_3$ and react with water to produce acid rain in the form of sulphuric acid ($H_2SO_4$).

Short-term exposures to $SO_2$ have shown adverse respiratory effects including bronchoconstriction and increased asthma symptoms.

### 2.1.5 Ozone ($O_3$)

Ground-level ozone is not directly emitted into the air, but rather is formed by chemical reactions between $NO_x$ 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 2.2.1.

**TABLE 2.2.1 - AMBIENT AIR STANDARDS IN NEWFOUNDLAND AND LABRADOR**

| POLLUTANT | AVERAGING PERIOD | CONCENTRATION ($MG/M^3$) |
|---|---|---|
| CARBON MONOXIDE (CO) | 1-HOUR | 35000 |
| | 8-HOUR | 15000 |
| NITROGEN DIOXIDE ($NO_2$) | 1-HOUR | 400 |
| | 24-HOUR | 200 |
| | 1-YEAR | 100 |
| OZONE | 1-HOUR | 160 |
| | 8-HOUR | 87 |
| PARTICULATE MATTER < 2.5 MICRONS ($PM_{2.5}$) | 24-HOUR | 25 |
| PARTICULATE MATTER < 10 MICRONS ($PM_{10}$) | 24-HOUR | 50 |
| TOTAL PARTICULATE MATTER (TPM) | 24-HOUR | 120 |
| | 1-YEAR | 60 |
| SULPHUR DIOXIDE ($SO_2$) | 1-HOUR | 900 |
| | 3-HOUR | 600 |
| | 24-HOUR | 300 |
| | 1-YEAR | 60 |

## 2.3 Monitoring in Newfoundland and Labrador

Table 2.3.1 provides the listing of monitoring stations in the province that measured pollutants during 2011. Figure 2.0.1 provides a picture of a typical ambient air monitoring station.

**TABLE 2.3.1 - POLLUTANT MONITORING IN NEWFOUNDLAND AND LABRADOR**

| | | POLLUTANT | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **OPERATOR** | **STATION LOCATION** | **$SO_2$** | **$NO_X$ / $NO_2$** | **$O_3$** | **TSP** | **$PM_{10}$** | **$PM_{2.5}$** | **CO** |
| ENVIRONMENT AND CONSERVATION + ENVIRONMENT CANADA (NAPS) | WATER STREET, ST. JOHN'S | ✓ | ✓ | ✓ | | | ✓ | ✓ |
| | OLD PLACENTIA ROAD, MOUNT PEARL | ✓ | ✓ | ✓ | | | ✓ | ✓ |
| | MACPHERSON AVENUE, CORNER BROOK | ✓ | ✓ | ✓ | | | ✓ | ✓ |
| | SCOTT AVENUE, GRAND FALLS WINDSOR | ✓ | ✓ | ✓ | | | ✓ | ✓ |
| | PORT AUX CHOIX | | | ✓ | | | | |
| ENVIRONMENT AND CONSERVATION | BUCHANS | ✓ | ✓ | ✓ | ✓ | | ✓ | |
| | BURIN | ✓ | ✓ | ✓ | ✓ | | ✓ | |
| NALCOR ENERGY | BUTTERPOT ROAD | ✓ | ✓ | | | | ✓ | |
| | GREEN ACRES ROAD | ✓ | ✓ | | ✓ | | ✓ | |
| | INDIAN POND DRIVE | ✓ | ✓ | | ✓ | | ✓ | |
| | INDIAN POND ROAD | ✓ | ✓ | | ✓ | | ✓ | |
| | LAWRENCE POND ROAD | ✓ | ✓ | | ✓ | | ✓ | |
| | PROPERTY BOUNDARY | | | | ✓ | | ✓ | |
| | LITTLE BAY ISLANDS | | ✓ | | | | | |

| | | POLLUTANT | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **OPERATOR** | **STATION LOCATION** | **$SO_2$** | **$NO_X$ / $NO_2$** | **$O_3$** | **TSP** | **$PM_{10}$** | **$PM_{2.5}$** | **CO** |
| NORTH ATLANTIC REFINING LIMITED | COME BY CHANCE | ✓ | | | | | ✓ | |
| | FIRST STREET, ARNOLD'S COVE | ✓ | | | | | ✓ | |
| | SUNNYSIDE | ✓ | | | | ✓ | ✓ | |
| | PROPERTY BOUNDARY | ✓ | | | | | ✓ | |
| CORNER BROOK PULP AND PAPER | MAIN STREET | ✓ | | | ✓ | | ✓ | |
| | WEST STREET | | | | ✓ | | | |
| IRON ORE COMPANY OF CANADA | TAMARACK DRIVE (1) | | | | ✓ | | | |
| | VANIER AVENUE | | | | ✓ | | | |
| | HUDSON DRIVE | | | | ✓ | | | |
| | BARTLETT DRIVE | | | | ✓ | | | |
| | INDIAN POINT | ✓ | ✓ | | | | ✓ | |
| | SMOKEY MOUNTAIN | ✓ | ✓ | | | | ✓ | |
| | TAMARACK DRIVE (2) | ✓ | ✓ | | | | ✓ | |
| VALE NEWFOUNDLAND AND LABRADOR LIMITED | VOISEY'S BAY CAMP | | ✓ | | | | ✓ | |
| | VOISEY'S BAY PROCESS AREA | | ✓ | | | | | |
| | VOISEY'S BAY PORT | | | | ✓ | | | |
| | LONG HARBOUR COMMUNITY CENTRE | | ✓ | | | | ✓ | |
| | LONG HARBOUR MAIN ROAD | | ✓ | | | | ✓ | |
| | LONG HARBOUR PROPERTY BOUNDARY | | ✓ | | | | ✓ | |

| | | POLLUTANT | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **OPERATOR** | **STATION LOCATION** | **$SO_2$** | **$NO_X$ / $NO_2$** | **$O_3$** | **TSP** | **$PM_{10}$** | **$PM_{2.5}$** | **CO** |
| WABUSH MINES | BOND AVENUE | ✓ | | | | | ✓ | |
| | SHEA STREET | | | | ✓ | | | |
| | HYDRO SUBSTATION | | | | ✓ | ✓ | ✓ | |

**FIGURE 2.0.1 - TYPICAL AMBIENT AIR MONITORING STATION**

## 2.4 Air Quality Health Index (AQHI)

The Air Quality Health Index (AQHI) is a scale designed to help an individual understand what the air quality 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 2.4.1.

The AQHI is calculated on an hourly basis based on the relative risks of $O_3$, $PM_{2.5}$ and $NO_2$. Data for the calculation of AQHI is currently being collected 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.

**TABLE 2.4.1 - 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

In 2010, the department developed its Guidance Document on Ambient Air Monitoring (GD-PPD-065) which further prescribes monitoring requirements. The document is available at http://www.env.gov.nl.ca/env/env_protection/science/gd_ppd_065.pdf

# 3.0 National Air Pollution 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 2011 there were four permanent sites operational with a complete suite monitoring ($SO_2$, $PM_{2.5}$ $NO_x$ / $NO_2$, CO and $O_3$), and one which monitored $O_3$ only. The NAPS stations with a complete suite of monitoring provide the data necessary to calculate the AQHI.

The four permanent sites with the complete suite of monitoring were located in St. John's on Water Street, in Mt. Pearl on Old Placentia Road, in Grand Falls Windsor on Scott Avenue and in Corner Brook on Macpherson Avenue.

In 2010, the Grand Falls Windsor station, which had been previously an $O_3$ only station, was upgraded with a complete suite of monitoring.

The location which monitored $O_3$ only was Port aux Choix. The Port aux Choix station had previously been located in Ferolle Point, however due to logistical issues; the station was closed in November 2009 and moved to the new location.

A map identifying the location of the NAPS stations in Eastern Newfoundland is presented in Figures 3.0.1, while the location of the Grand Falls Windsor station is presented in Figure and 3.0.2. The location of the Corner Brook station is presented in Figure 3.0.3 while Figure 3.0.4 presents the location of the Port aux Choix Station.

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

**FIGURE 3.0.2 - NAPS MONITORING STATION IN GRAND FALLS WINDSOR**

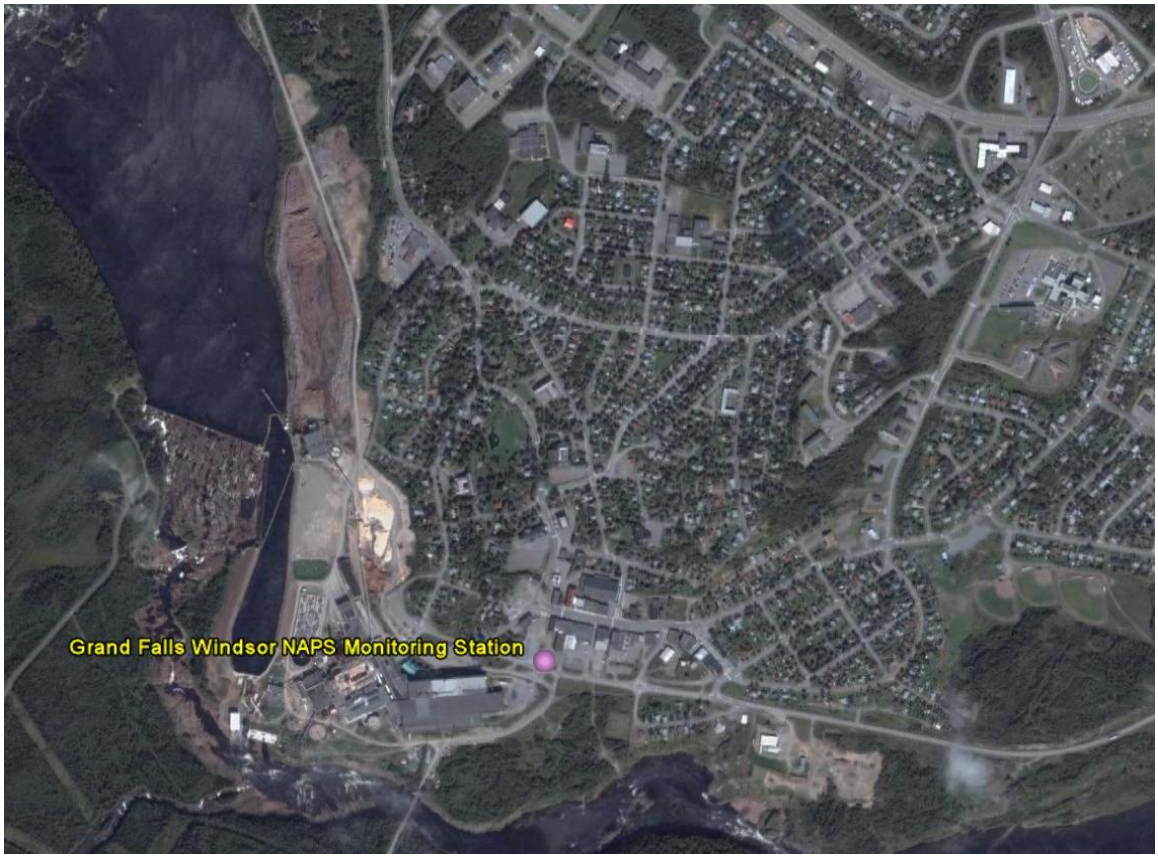


**FIGURE 3.0.3 - NAPS MONITORING STATION IN CORNER BROOK**

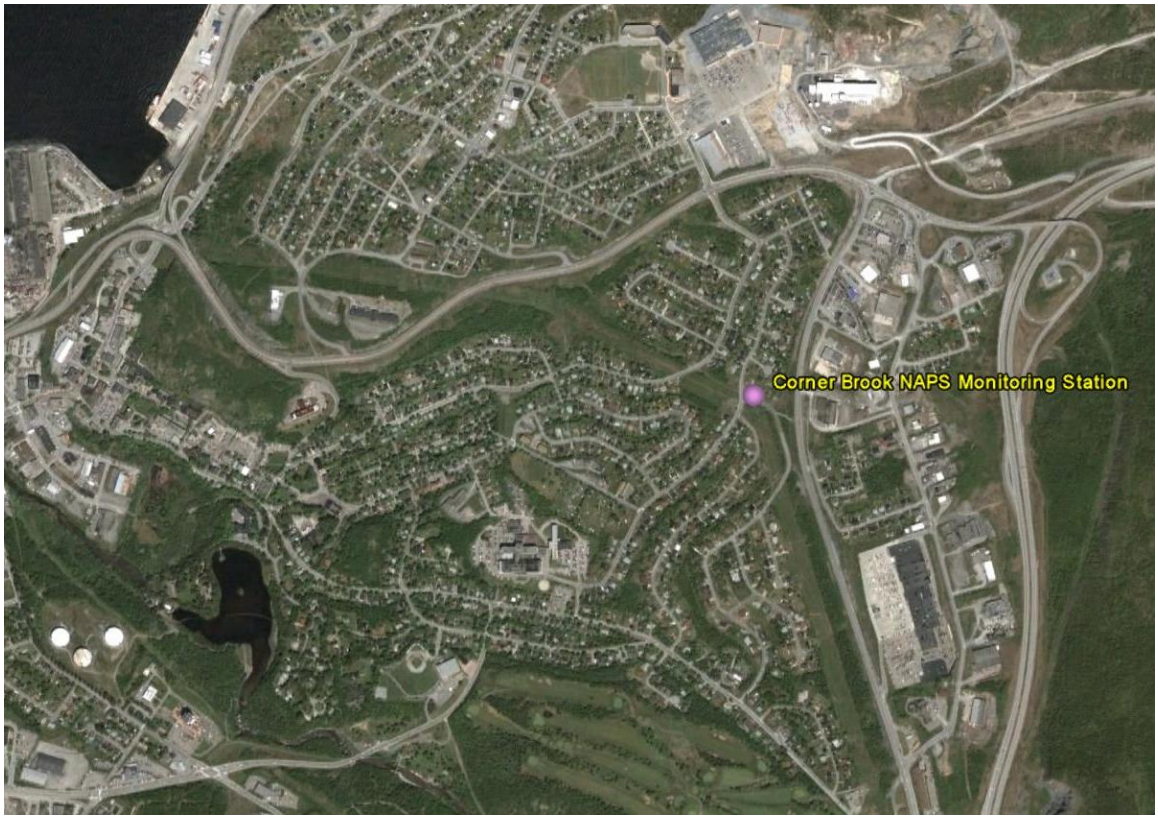
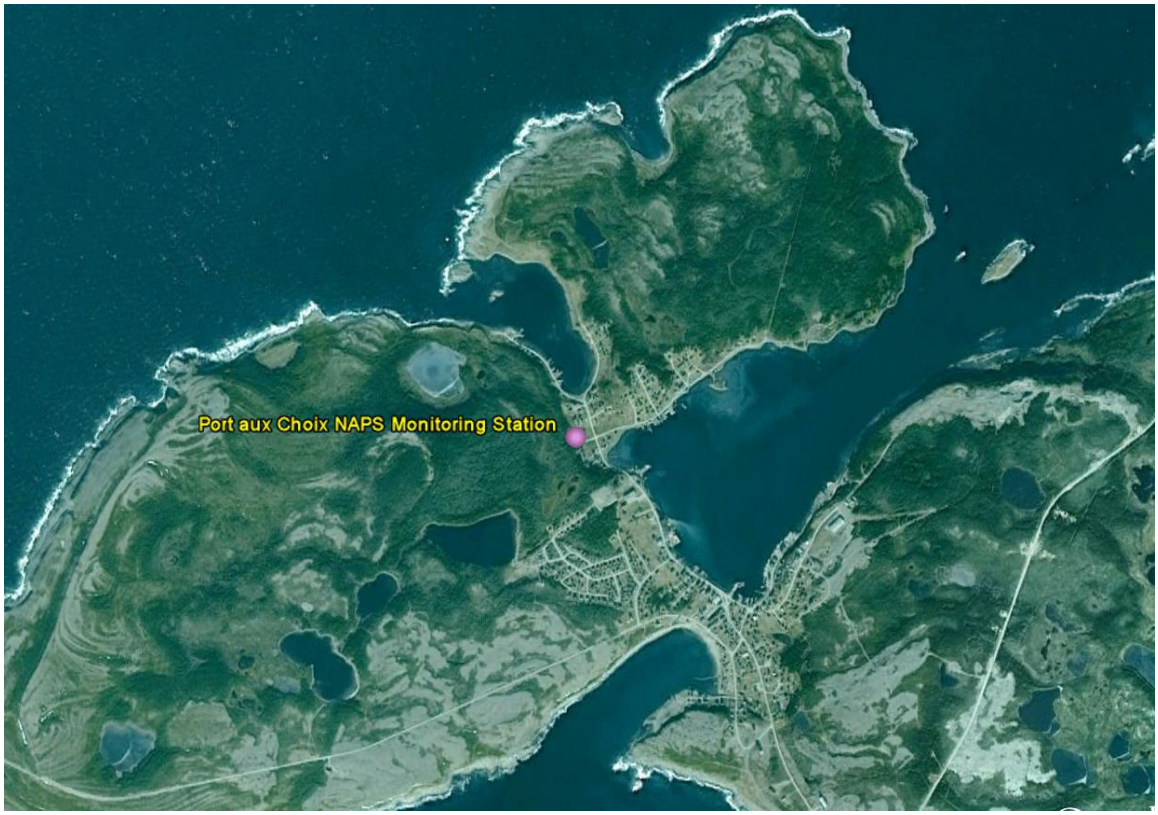


**FIGURE 3.0.4 - NAPS MONITORING STATION IN PORT AUX CHOIX**




## 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 $SO_2$, $NO_x$ / $NO_2$, CO, $O_3$ and $PM_{2.5}$ on a continuous basis. For all pollutants with the exception of $O_3$, the ambient air criteria were not exceeded on any occasion in 2011. For $O_3$, the 8-hour standard was exceeded eighteen times between March and July.

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 2010 and 2011 while Figure 3.1.6 provides a graphical representation of the percentage of time the AQHI values were below a given level in 2011.

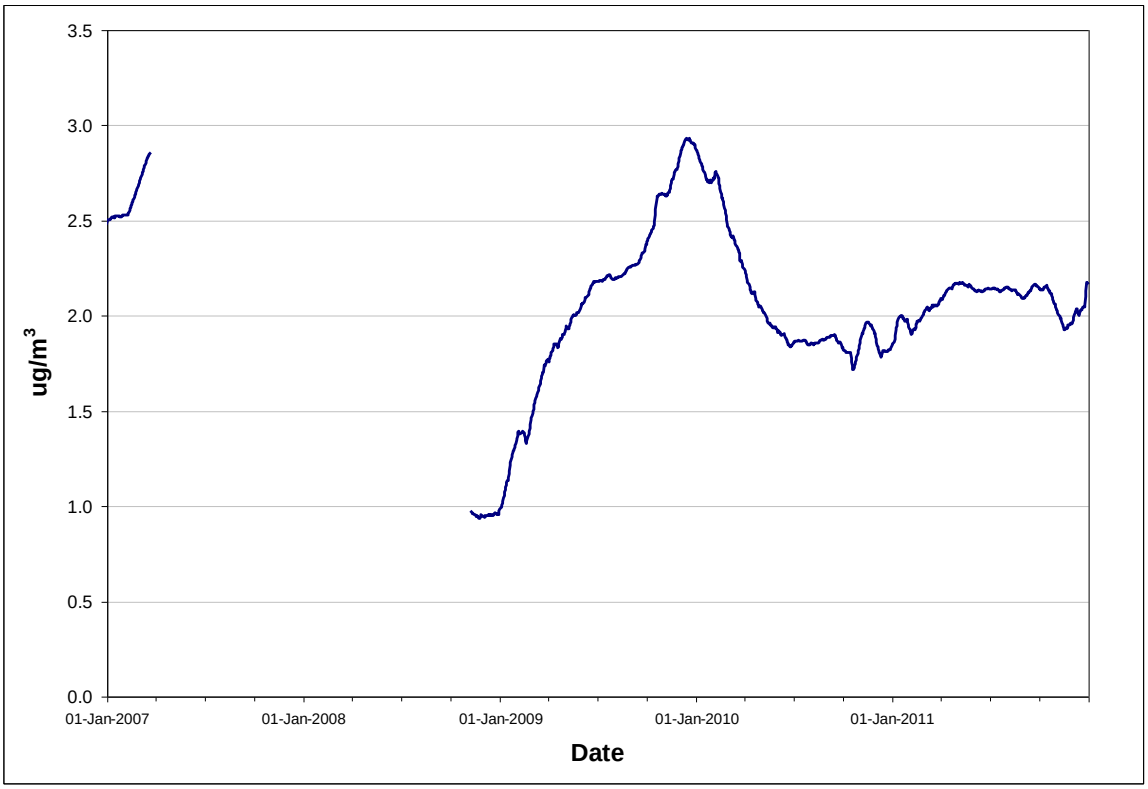
Of particular note, in 2008, the method of measuring $PM_{2.5}$ changed from Tapered Element Oscillating Microbalance (TEOM) technology to FEM Beta Attenuation Monitor (BAM) technology. This resulted in a sharp increase in the $PM_{2.5}$ concentrations.

**TABLE 3.1.1 - ST. JOHN'S NAPS $SO_2$ SUMMARY 2010 & 2011**

| Year | Month | # Valid Hours | % Valid Hours | Average | Maximum 1-Hour | Maximum 3-Hour | Maximum 24-Hour | Regulatory Exceedances 1-Hour (>900) | Regulatory Exceedances 3-Hour (>600) | Regulatory Exceedances 24-Hour (>300) |
|---|---|---|---|---|---|---|---|---|---|---|
| 2010 | January | 670 | 90.1% | 3.5 | 26.5 | 22.8 | 10.4 | 0 | 0 | 0 |
| | February | 573 | 85.3% | 2.6 | 24.9 | 20.7 | 11.5 | 0 | 0 | 0 |
| | March | 740 | 99.5% | 1.9 | 15.4 | 10.1 | 4.3 | 0 | 0 | 0 |
| | April | 693 | 96.3% | 1.1 | 15.2 | 8.1 | 2.5 | 0 | 0 | 0 |
| | May | 741 | 99.6% | 1.2 | 10.8 | 7.6 | 3.8 | 0 | 0 | 0 |
| | June | 716 | 99.4% | 1.2 | 21.3 | 14.2 | 4.2 | 0 | 0 | 0 |
| | July | 741 | 99.6% | 0.9 | 11.2 | 7.8 | 3.5 | 0 | 0 | 0 |
| | August | 740 | 99.5% | 1.3 | 7.4 | 4.4 | 3.0 | 0 | 0 | 0 |
| | September | 719 | 99.9% | 0.9 | 5.9 | 3.6 | 2.1 | 0 | 0 | 0 |
| | October | 741 | 99.6% | 3.0 | 9.9 | 7.5 | 5.5 | 0 | 0 | 0 |
| | November | 719 | 99.9% | 3.5 | 12.6 | 10.4 | 7.4 | 0 | 0 | 0 |
| | December | 744 | 100.0% | 1.3 | 25.3 | 18.5 | 8.0 | 0 | 0 | 0 |
| Annual | | 8537 | 97.5% | 1.8 | 26.5 | 22.8 | 11.5 | 0 | 0 | 0 |
| 2011 | January | 742 | 99.7% | 4.5 | 30.7 | 27.8 | 15.1 | 0 | 0 | 0 |
| | February | 671 | 99.9% | 3.4 | 26.3 | 20.9 | 7.7 | 0 | 0 | 0 |
| | March | 742 | 99.7% | 2.6 | 21.7 | 20.8 | 7.0 | 0 | 0 | 0 |
| | April | 719 | 99.9% | 2.3 | 14.5 | 12.2 | 5.8 | 0 | 0 | 0 |
| | May | 741 | 99.6% | 0.8 | 45.9 | 22.0 | 6.7 | 0 | 0 | 0 |
| | June | 719 | 99.9% | 1.2 | 32.9 | 14.5 | 2.7 | 0 | 0 | 0 |
| | July | 740 | 99.5% | 1.0 | 6.8 | 5.1 | 2.4 | 0 | 0 | 0 |
| | August | 742 | 99.7% | 0.6 | 27.5 | 12.9 | 3.4 | 0 | 0 | 0 |
| | September | 219 | 30.4% | 0.4 | 5.0 | 2.3 | 0.7 | 0 | 0 | 0 |
| | October | 743 | 99.9% | 1.9 | 35.2 | 12.2 | 4.4 | 0 | 0 | 0 |
| | November | 718 | 99.7% | 2.4 | 16.9 | 13.1 | 5.8 | 0 | 0 | 0 |
| | December | 743 | 99.9% | 3.8 | 84.3 | 55.7 | 16.1 | 0 | 0 | 0 |
| Annual | | 8239 | 94.1% | 2.2 | 84.3 | 55.7 | 16.1 | 0 | 0 | 0 |

Observations in $ug/m^3$

**FIGURE 3.1.1 - ST. JOHN'S NAPS ANNUAL $SO_2$ CONCENTRATIONS**



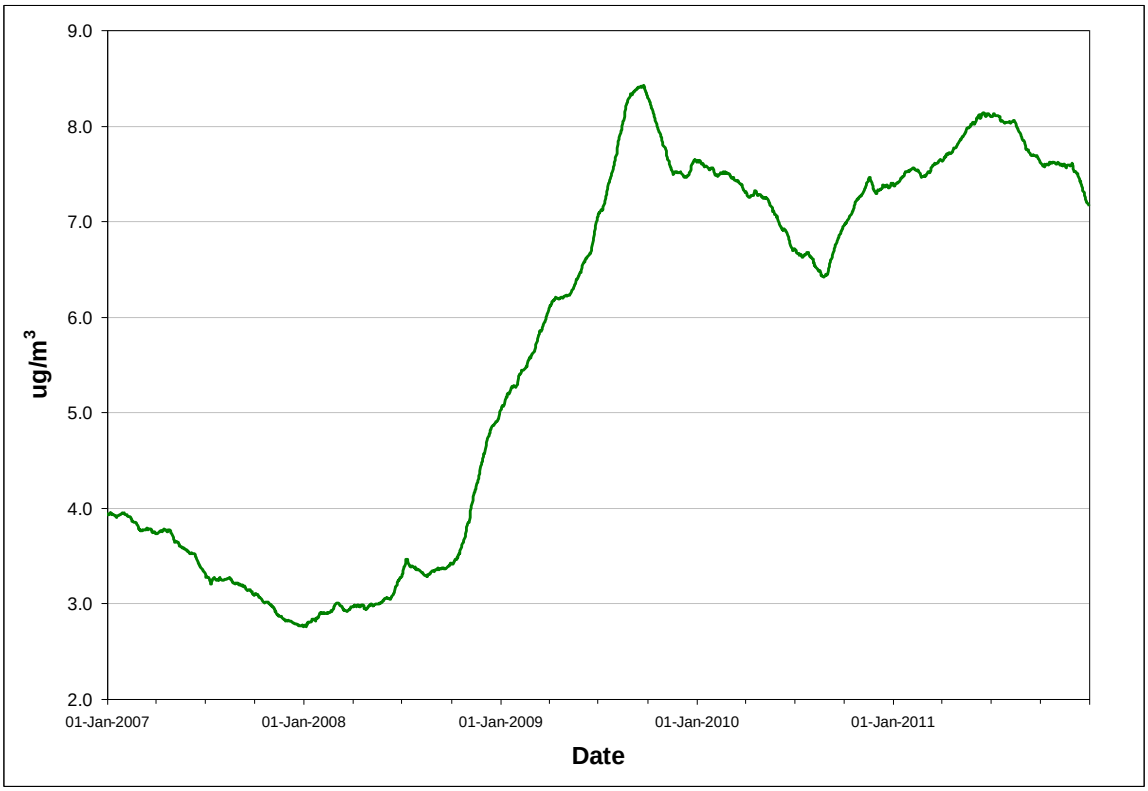

Rolling annual average of hourly concentrations

**TABLE 3.1.2 - ST. JOHN'S NAPS $PM_{2.5}$ SUMMARY 2010 & 2011**

| Year | Month | # Valid Days | % Valid Days | Average | Maximum 24-Hour | Regulatory Exceedances (>25 µg/m$^3$) |
|---|---|---|---|---|---|---|
| 2010 | January | 27 | 87.1% | 6.7 | 14.5 | 0 |
| | February | 22 | 78.6% | 7.2 | 13.6 | 0 |
| | March | 29 | 93.5% | 6.0 | 9.8 | 0 |
| | April | 30 | 100.0% | 6.1 | 13.6 | 0 |
| | May | 30 | 96.8% | 6.0 | 9.4 | 0 |
| | June | 30 | 100.0% | 7.9 | 15.4 | 0 |
| | July | 31 | 100.0% | 9.7 | 19.7 | 0 |
| | August | 31 | 100.0% | 9.0 | 14.5 | 0 |
| | September | 30 | 100.0% | 9.6 | 17.9 | 0 |
| | October | 30 | 96.8% | 5.3 | 8.4 | 0 |
| | November | 30 | 100.0% | 5.2 | 9.7 | 0 |
| | December | 26 | 83.9% | 10.1 | 14.4 | 0 |
| Annual | | 346 | 94.8% | 7.4 | 19.7 | 0 |
| 2011 | January | 31 | 100.0% | 8.2 | 12.5 | 0 |
| | February | 28 | 100.0% | 6.6 | 10.4 | 0 |
| | March | 31 | 100.0% | 8.0 | 11.7 | 0 |
| | April | 30 | 100.0% | 8.0 | 10.8 | 0 |
| | May | 31 | 100.0% | 8.8 | 15.1 | 0 |
| | June | 30 | 100.0% | 8.8 | 17.4 | 0 |
| | July | 31 | 100.0% | 8.8 | 13.7 | 0 |
| | August | 23 | 74.2% | 6.5 | 9.8 | 0 |
| | September | 5 | 16.7% | 4.1 | 6.2 | 0 |
| | October | 31 | 100.0% | 5.0 | 11.4 | 0 |
| | November | 30 | 100.0% | 5.3 | 10.0 | 0 |
| | December | 29 | 93.5% | 4.8 | 10.5 | 0 |
| Annual | | 330 | 90.4% | 7.2 | 17.4 | 0 |

Observations in ug/m$^3$

**FIGURE 3.1.2 - ST. JOHN'S NAPS ANNUAL $PM_{2.5}$ CONCENTRATIONS**



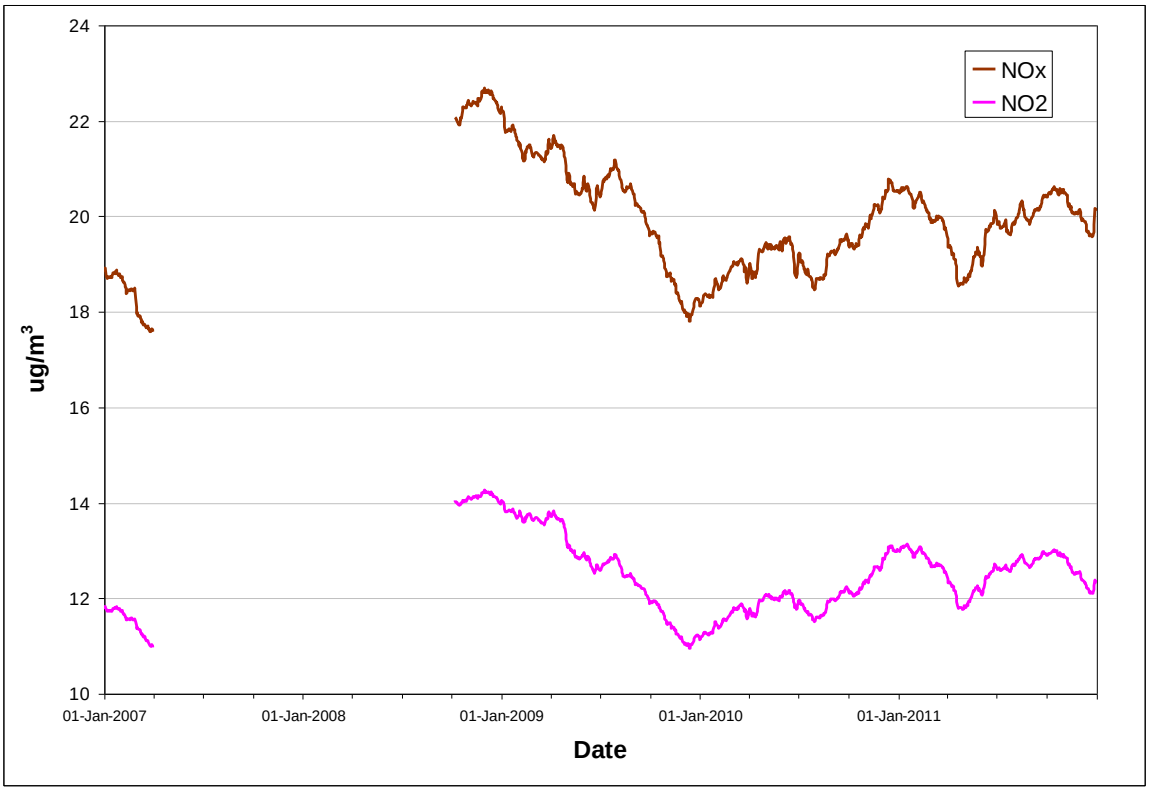

Rolling annual average of hourly concentrations

**TABLE 3.1.3 - ST. JOHN'S NAPS $NO_X$ / $NO_2$ SUMMARY 2010 & 2011**

| Year | Month | # Valid Hours | % Valid Hours | Average | | Maximums 1-Hour | | Maximums 24-Hour | | Exceedances 1-Hour | Exceedances 24-Hour |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | $NO_x$ | $NO_2$ | $NO_x$ | $NO_2$ | $NO_x$ | $NO_2$ | (>400) | (>200) |
| 2010 | January | 670 | 90.1% | 23.1 | 15.5 | 186.6 | 81.9 | 58.3 | 37.7 | 0 | 0 |
| | February | 668 | 99.4% | 24.4 | 16.6 | 133.8 | 68.0 | 44.0 | 30.9 | 0 | 0 |
| | March | 740 | 99.5% | 20.2 | 14.3 | 179.0 | 80.7 | 56.5 | 37.1 | 0 | 0 |
| | April | 717 | 99.6% | 26.0 | 17.1 | 821.0 | 204.3 | 100.9 | 49.5 | 0 | 0 |
| | May | 741 | 99.6% | 18.2 | 10.8 | 179.0 | 71.3 | 56.6 | 28.9 | 0 | 0 |
| | June | 718 | 99.7% | 21.0 | 11.3 | 374.8 | 77.4 | 76.3 | 33.5 | 0 | 0 |
| | July | 741 | 99.6% | 16.2 | 7.9 | 273.2 | 76.1 | 97.2 | 32.8 | 0 | 0 |
| | August | 740 | 99.5% | 22.9 | 13.0 | 126.0 | 57.2 | 75.5 | 38.6 | 0 | 0 |
| | September | 719 | 99.9% | 13.7 | 8.8 | 113.6 | 48.1 | 31.5 | 17.1 | 0 | 0 |
| | October | 741 | 99.6% | 16.8 | 10.4 | 193.7 | 57.8 | 53.8 | 31.2 | 0 | 0 |
| | November | 719 | 99.9% | 21.5 | 14.6 | 186.5 | 77.2 | 58.0 | 36.0 | 0 | 0 |
| | December | 744 | 100.0% | 22.9 | 16.6 | 186.8 | 74.2 | 82.6 | 38.3 | 0 | 0 |
| Annual | | 8658 | 98.8% | 20.5 | 13.0 | 821.0 | 204.3 | 100.9 | 49.5 | 0 | 0 |
| 2011 | January | 743 | 99.9% | 19.7 | 14.0 | 288.7 | 107.1 | 55.5 | 30.7 | 0 | 0 |
| | February | 671 | 99.9% | 20.6 | 14.5 | 191.4 | 84.2 | 43.1 | 26.9 | 0 | 0 |
| | March | 742 | 99.7% | 15.8 | 10.9 | 147.6 | 71.7 | 47.2 | 29.4 | 0 | 0 |
| | April | 718 | 99.7% | 14.0 | 8.7 | 143.5 | 58.3 | 43.1 | 22.1 | 0 | 0 |
| | May | 741 | 99.6% | 24.6 | 15.1 | 213.9 | 65.7 | 69.2 | 31.5 | 0 | 0 |
| | June | 719 | 99.9% | 30.9 | 17.4 | 321.2 | 73.1 | 90.3 | 44.8 | 0 | 0 |
| | July | 739 | 99.3% | 15.2 | 8.6 | 156.6 | 67.5 | 32.9 | 18.1 | 0 | 0 |
| | August | 742 | 99.7% | 23.2 | 12.5 | 245.9 | 83.0 | 52.7 | 27.4 | 0 | 0 |
| | September | 218 | 30.3% | 18.7 | 8.7 | 107.3 | 60.4 | 28.4 | 13.7 | 0 | 0 |
| | October | 743 | 99.9% | 18.6 | 10.6 | 213.9 | 56.9 | 49.7 | 25.5 | 0 | 0 |
| | November | 720 | 100.0% | 16.6 | 10.5 | 192.9 | 60.0 | 35.8 | 19.9 | 0 | 0 |
| | December | 744 | 100.0% | 22.9 | 14.2 | 646.9 | 133.4 | 129.2 | 51.5 | 0 | 0 |
| Annual | | 8240 | 94.1% | 20.1 | 12.3 | 646.9 | 133.4 | 129.2 | 51.5 | 0 | 0 |

Observations in $ug/m^3$

**FIGURE 3.1.3 - ST. JOHN'S NAPS ANNUAL $NO_X$ / $NO_2$ CONCENTRATIONS**



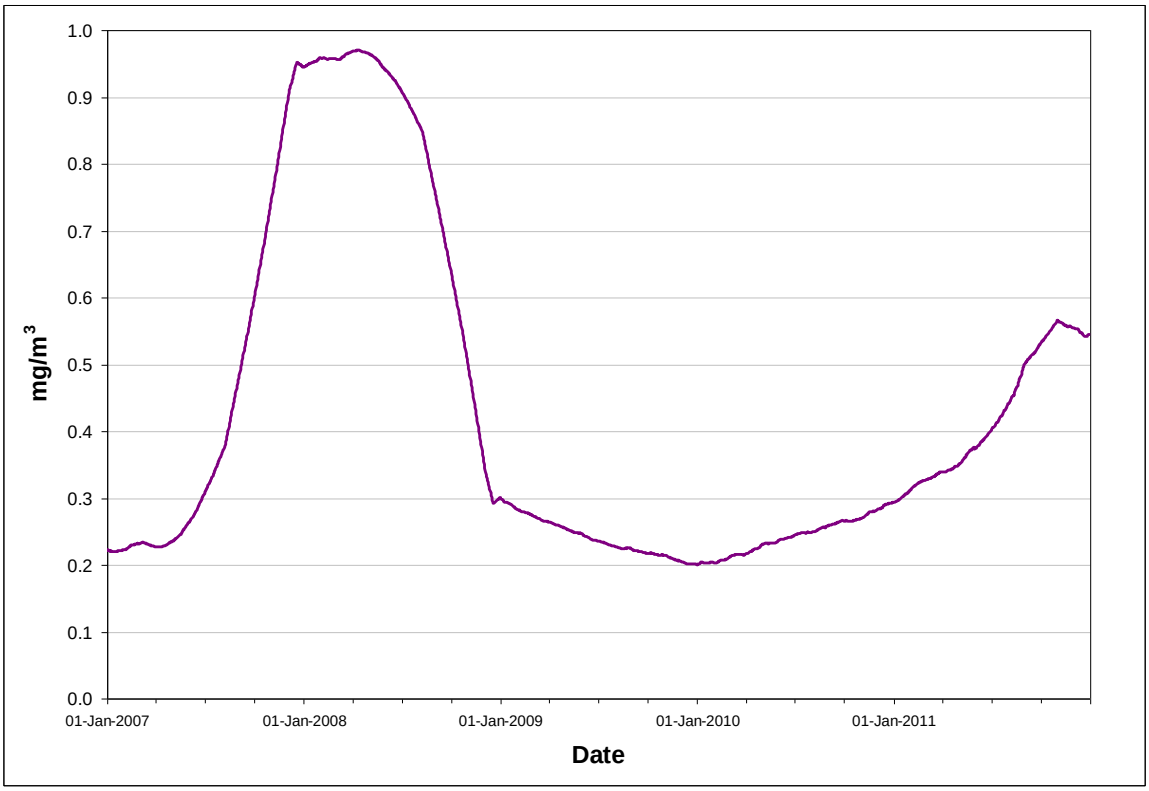

Rolling annual average of hourly concentrations

**TABLE 3.1.4 - ST. JOHN'S NAPS CO SUMMARY 2010 & 2011**

| Year | Month | # Valid Hours | % Valid Hours | Average | Maximum 1-Hour | Maximum 8-Hour | Regulatory Exceedances 1-Hour (>35) | Regulatory Exceedances 8-Hour (>15) |
|---|---|---|---|---|---|---|---|---|
| 2010 | January | 670 | 90.1% | 0.3 | 1.7 | 0.9 | 0 | 0 |
| | February | 667 | 99.3% | 0.3 | 1.0 | 0.7 | 0 | 0 |
| | March | 740 | 99.5% | 0.3 | 0.8 | 0.5 | 0 | 0 |
| | April | 713 | 99.0% | 0.4 | 1.3 | 0.8 | 0 | 0 |
| | May | 741 | 99.6% | 0.3 | 4.2 | 1.7 | 0 | 0 |
| | June | 718 | 99.7% | 0.3 | 0.8 | 0.5 | 0 | 0 |
| | July | 740 | 99.5% | 0.2 | 0.9 | 0.6 | 0 | 0 |
| | August | 740 | 99.5% | 0.3 | 1.0 | 0.9 | 0 | 0 |
| | September | 719 | 99.9% | 0.2 | 0.8 | 0.5 | 0 | 0 |
| | October | 739 | 99.3% | 0.3 | 1.1 | 0.9 | 0 | 0 |
| | November | 719 | 99.9% | 0.3 | 1.1 | 0.8 | 0 | 0 |
| | December | 744 | 100.0% | 0.4 | 1.3 | 0.9 | 0 | 0 |
| Annual | | 8650 | 98.7% | 0.3 | 4.2 | 1.7 | 0 | 0 |
| 2011 | January | 741 | 99.6% | 0.5 | 1.4 | 0.8 | 0 | 0 |
| | February | 671 | 99.9% | 0.5 | 2.0 | 0.9 | 0 | 0 |
| | March | 743 | 99.9% | 0.5 | 0.9 | 0.7 | 0 | 0 |
| | April | 718 | 99.7% | 0.5 | 1.1 | 1.0 | 0 | 0 |
| | May | 741 | 99.6% | 0.6 | 1.1 | 1.0 | 0 | 0 |
| | June | 719 | 99.9% | 0.6 | 1.7 | 1.1 | 0 | 0 |
| | July | 739 | 99.3% | 0.7 | 1.6 | 1.4 | 0 | 0 |
| | August | 741 | 99.6% | 1.0 | 2.3 | 2.0 | 0 | 0 |
| | September | 219 | 30.4% | 0.7 | 1.6 | 1.4 | 0 | 0 |
| | October | 742 | 99.7% | 0.7 | 1.5 | 1.3 | 0 | 0 |
| | November | 714 | 99.2% | 0.2 | 1.2 | 0.7 | 0 | 0 |
| | December | 743 | 99.9% | 0.2 | 1.7 | 1.0 | 0 | 0 |
| Annual | | 8231 | 94.0% | 0.5 | 2.3 | 2.0 | 0 | 0 |

Observations in $mg/m^3$

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



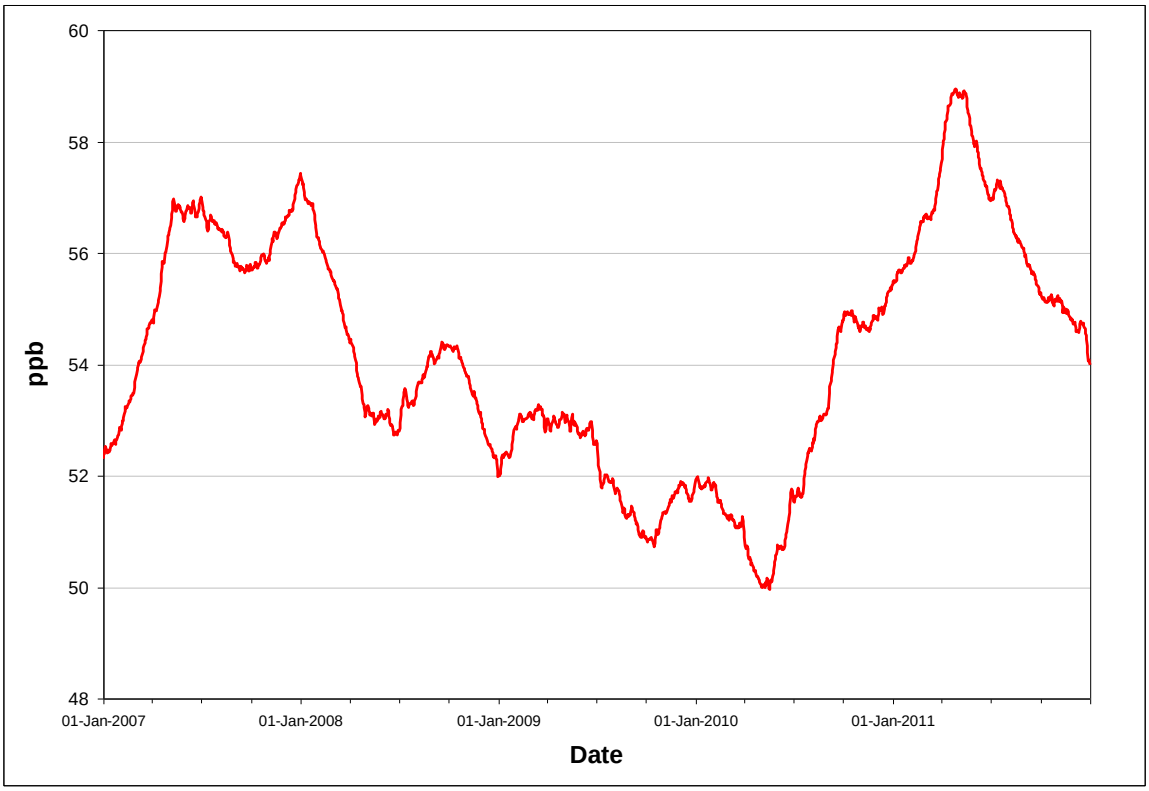

Rolling annual average of hourly concentrations

**TABLE 3.1.5 - ST. JOHN'S NAPS $O_3$ SUMMARY 2010 & 2011**

| Year | Month | # Valid Hours | % Valid Hours | Average | Maximum 1-Hour | Maximum 8-Hour | Regulatory Exceedances 1-Hour (>160) | Regulatory Exceedances 8-Hour (>87) |
|---|---|---|---|---|---|---|---|---|
| 2010 | January | 670 | 90.1% | 57.1 | 80.9 | 78.5 | 0 | 0 |
| | February | 667 | 99.3% | 57.3 | 79.4 | 75.9 | 0 | 0 |
| | March | 740 | 99.5% | 60.0 | 84.2 | 78.1 | 0 | 0 |
| | April | 716 | 99.4% | 55.2 | 86.8 | 78.6 | 0 | 0 |
| | May | 739 | 99.3% | 64.3 | 108.3 | 99.6 | 0 | 3 |
| | June | 718 | 99.7% | 55.2 | 106.7 | 96.3 | 0 | 2 |
| | July | 741 | 99.6% | 49.6 | 121.6 | 102.6 | 0 | 2 |
| | August | 740 | 99.5% | 46.6 | 102.5 | 83.3 | 0 | 0 |
| | September | 719 | 99.9% | 58.3 | 118.1 | 110.9 | 0 | 5 |
| | October | 741 | 99.6% | 46.4 | 94.0 | 84.9 | 0 | 0 |
| | November | 718 | 99.7% | 55.3 | 86.6 | 83.4 | 0 | 0 |
| | December | 744 | 100.0% | 60.5 | 87.6 | 84.7 | 0 | 0 |
| Annual | | 8653 | 98.8% | 55.4 | 121.6 | 110.9 | 0 | 12 |
| 2011 | January | 741 | 99.6% | 61.6 | 87.9 | 84.3 | 0 | 0 |
| | February | 671 | 99.9% | 67.6 | 90.2 | 84.8 | 0 | 0 |
| | March | 741 | 99.6% | 71.5 | 93.0 | 88.0 | 0 | 5 |
| | April | 719 | 99.9% | 69.9 | 112.8 | 103.3 | 0 | 12 |
| | May | 741 | 99.6% | 53.9 | 95.1 | 81.8 | 0 | 0 |
| | June | 719 | 99.9% | 43.1 | 76.9 | 73.6 | 0 | 0 |
| | July | 739 | 99.3% | 48.6 | 114.6 | 92.1 | 0 | 1 |
| | August | 742 | 99.7% | 37.0 | 78.0 | 55.9 | 0 | 0 |
| | September | 219 | 30.4% | 34.9 | 56.9 | 47.8 | 0 | 0 |
| | October | 743 | 99.9% | 45.6 | 79.9 | 75.7 | 0 | 0 |
| | November | 720 | 100.0% | 49.7 | 81.0 | 77.2 | 0 | 0 |
| | December | 744 | 100.0% | 52.5 | 78.7 | 74.8 | 0 | 0 |
| Annual | | 8239 | 94.1% | 54.0 | 114.6 | 103.3 | 0 | 18 |

Observations in $ug/m^3$

**FIGURE 3.1.5 - ST. JOHN'S NAPS ANNUAL $O_3$ CONCENTRATIONS**

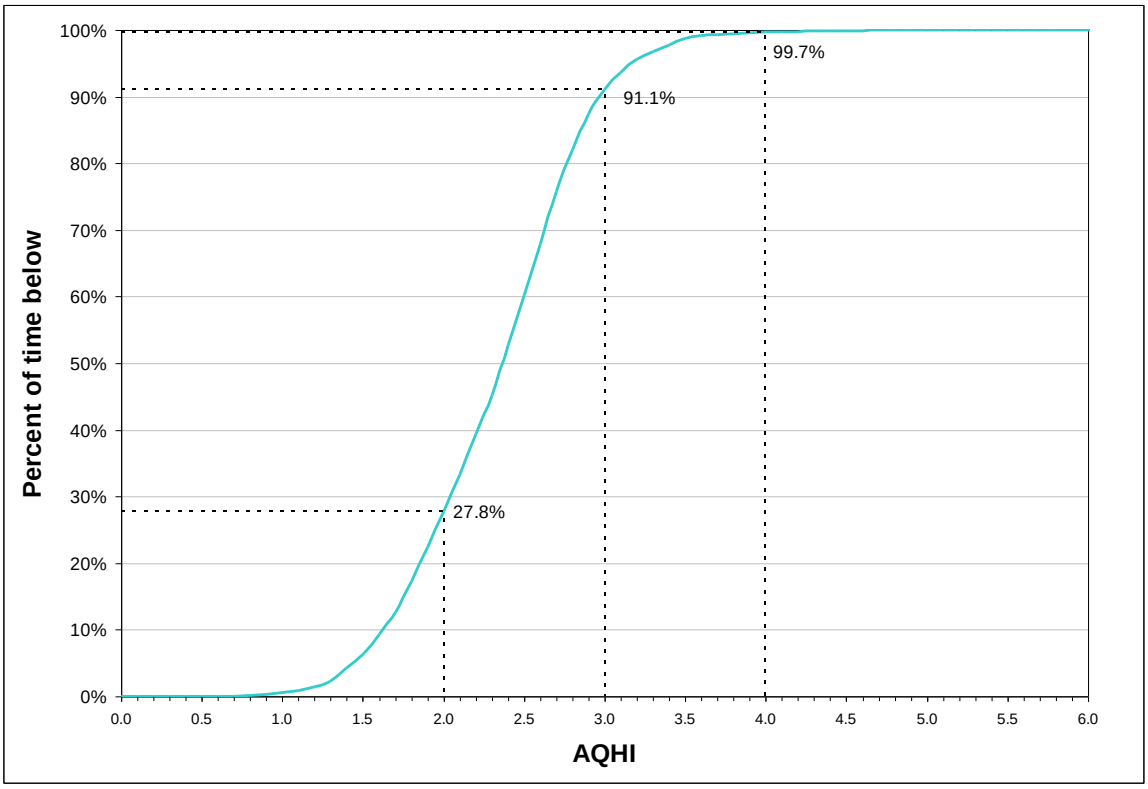



Rolling annual average of hourly concentrations

**TABLE 3.1.6 - ST. JOHN'S NAPS AQHI SUMMARY 2010 & 2011**

| Year | Month | # Valid Hours | % Valid Hours | Average | Maximum 3-Hour |
|---|---|---|---|---|---|
| 2010 | January | 669 | 89.9% | 2.5 | 4.2 |
| | February | 545 | 81.1% | 2.7 | 4.0 |
| | March | 713 | 95.8% | 2.5 | 4.1 |
| | April | 720 | 100.0% | 2.5 | 7.7 |
| | May | 729 | 98.0% | 2.5 | 3.9 |
| | June | 720 | 100.0% | 2.3 | 4.4 |
| | July | 742 | 99.7% | 2.1 | 4.6 |
| | August | 744 | 100.0% | 2.2 | 3.6 |
| | September | 715 | 99.3% | 2.4 | 4.1 |
| | October | 723 | 97.2% | 1.9 | 3.3 |
| | November | 720 | 100.0% | 2.4 | 4.1 |
| | December | 634 | 85.2% | 2.8 | 4.1 |
| Annual | | 8374 | 95.6% | 2.4 | 7.7 |
| 2011 | January | 742 | 99.7% | 2.7 | 4.5 |
| | February | 670 | 99.7% | 2.8 | 4.8 |
| | March | 740 | 99.5% | 2.8 | 4.0 |
| | April | 718 | 99.7% | 2.6 | 3.6 |
| | May | 742 | 99.7% | 2.5 | 3.9 |
| | June | 720 | 100.0% | 2.3 | 3.6 |
| | July | 737 | 99.1% | 2.1 | 4.0 |
| | August | 577 | 77.6% | 1.8 | 3.7 |
| | September | 149 | 20.7% | 1.5 | 2.2 |
| | October | 742 | 99.7% | 1.9 | 3.5 |
| | November | 720 | 100.0% | 2.0 | 3.1 |
| | December | 712 | 95.7% | 2.2 | 6.6 |
| Annual | | 7969 | 91.0% | 2.3 | 6.6 |

**FIGURE 3.1.6 - ST. JOHN'S NAPS AQHI FREQUENCY DISTRIBUTION 2011**




e.g. 91.1% 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 $SO_2$, $NO_x$ / $NO_2$, CO, $O_3$ and $PM_{2.5}$ on a continuous basis. For all pollutants, with the exception of $O_3$, the ambient air criteria were not exceeded on any occasion in 2011. For $O_3$, the 8-hour ambient standard was exceeded on fifty eight occasions in 2011.

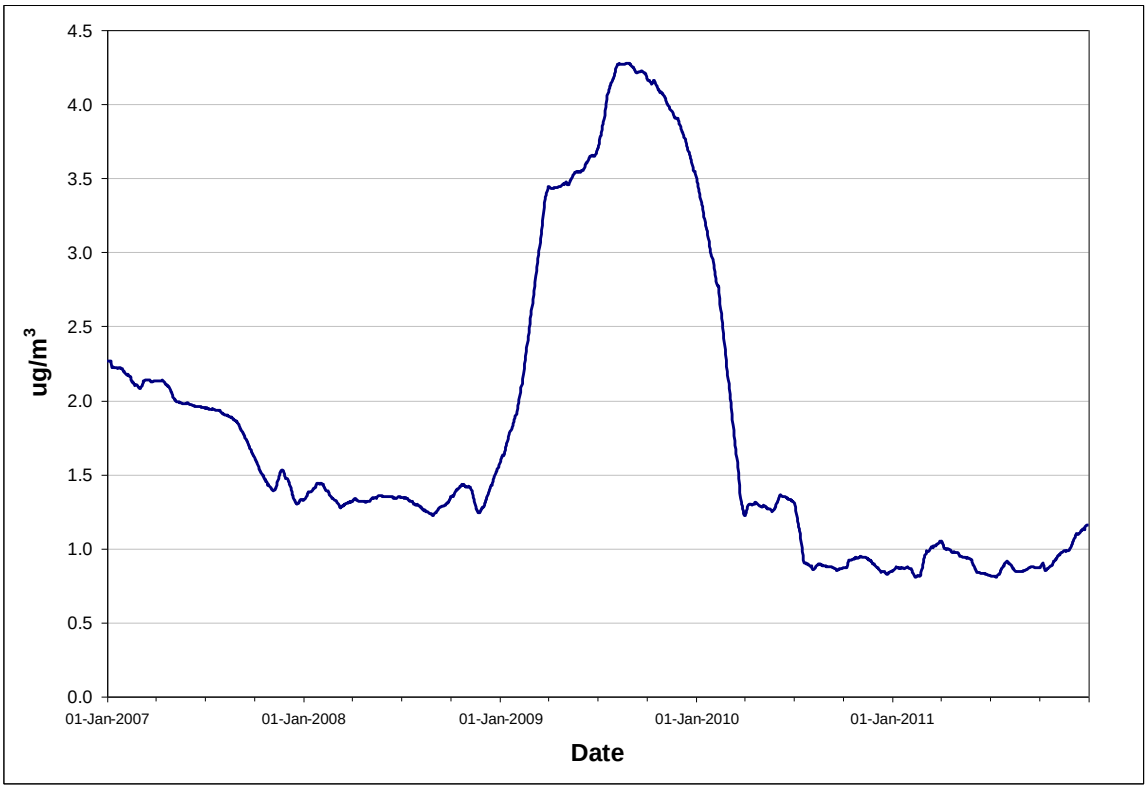
Tables 3.2.1 through 3.2.5 present the summary information on the level of air contaminants measured at the Mt. Pearl NAPS station, while Figures 3.2.1 through 3.2.5 provide a graphical representation of the annual trend of each pollutant. Table 3.2.6 provides a summary of the AQHI in 2010 and 2011 while Figure 3.2.6 provides a graphical representation of the percentage of time the AQHI values were below a given level in 2011.

**TABLE 3.2.1 - MT. PEARL NAPS $SO_2$ SUMMARY 2010 & 2011**

| Year | Month | # Valid Hours | % Valid Hours | Average | Maximum 1-Hour | Maximum 3-Hour | Maximum 24-Hour | Regulatory Exceedances 1-Hour (>900) | Regulatory Exceedances 3-Hour (>600) | Regulatory Exceedances 24-Hour (>300) |
|---|---|---|---|---|---|---|---|---|---|---|
| 2010 | January | 740 | 99.5% | 0.8 | 6.4 | 3.9 | 2.2 | 0 | 0 | 0 |
| | February | 668 | 99.4% | 1.1 | 9.9 | 7.1 | 4.1 | 0 | 0 | 0 |
| | March | 686 | 92.2% | 1.1 | 12.9 | 7.4 | 3.5 | 0 | 0 | 0 |
| | April | 606 | 84.2% | 1.4 | 10.4 | 7.5 | 4.9 | 0 | 0 | 0 |
| | May | 216 | 29.0% | 2.5 | 6.3 | 5.9 | 4.6 | 0 | 0 | 0 |
| | June | 628 | 87.2% | 1.0 | 5.5 | 5.2 | 3.9 | 0 | 0 | 0 |
| | July | 625 | 84.0% | 0.3 | 1.4 | 1.2 | 0.8 | 0 | 0 | 0 |
| | August | 742 | 99.7% | 0.8 | 3.9 | 2.4 | 2.0 | 0 | 0 | 0 |
| | September | 715 | 99.3% | 0.4 | 8.4 | 2.7 | 1.9 | 0 | 0 | 0 |
| | October | 737 | 99.1% | 1.2 | 7.2 | 7.0 | 6.2 | 0 | 0 | 0 |
| | November | 717 | 99.6% | 0.3 | 5.8 | 2.9 | 0.8 | 0 | 0 | 0 |
| | December | 744 | 100.0% | 0.5 | 8.7 | 6.2 | 1.9 | 0 | 0 | 0 |
| Annual | | 7824 | 89.3% | 0.8 | 12.9 | 7.5 | 6.2 | 0 | 0 | 0 |
| 2011 | January | 159 | 21.4% | 1.4 | 5.5 | 4.1 | 1.6 | 0 | 0 | 0 |
| | February | 245 | 36.5% | 3.2 | 13.6 | 11.3 | 6.5 | 0 | 0 | 0 |
| | March | 743 | 99.9% | 2.2 | 38.3 | 17.6 | 6.1 | 0 | 0 | 0 |
| | April | 718 | 99.7% | 0.7 | 11.2 | 8.0 | 2.7 | 0 | 0 | 0 |
| | May | 741 | 99.6% | 0.6 | 4.3 | 2.6 | 1.3 | 0 | 0 | 0 |
| | June | 717 | 99.6% | 0.2 | 2.1 | 1.6 | 1.2 | 0 | 0 | 0 |
| | July | 736 | 98.9% | 1.3 | 7.4 | 5.2 | 3.4 | 0 | 0 | 0 |
| | August | 741 | 99.6% | 0.2 | 3.0 | 1.8 | 1.1 | 0 | 0 | 0 |
| | September | 691 | 96.0% | 0.7 | 8.2 | 2.1 | 1.4 | 0 | 0 | 0 |
| | October | 744 | 100.0% | 1.7 | 5.1 | 4.7 | 3.7 | 0 | 0 | 0 |
| | November | 541 | 75.1% | 1.4 | 8.4 | 4.8 | 2.9 | 0 | 0 | 0 |
| | December | 732 | 98.4% | 1.9 | 89.1 | 45.7 | 6.0 | 0 | 0 | 0 |
| Annual | | 7508 | 85.7% | 1.2 | 89.1 | 45.7 | 6.5 | 0 | 0 | 0 |

Observations in $ug/m^3$

**FIGURE 3.2.1 - MT. PEARL NAPS ANNUAL $SO_2$ CONCENTRATIONS**



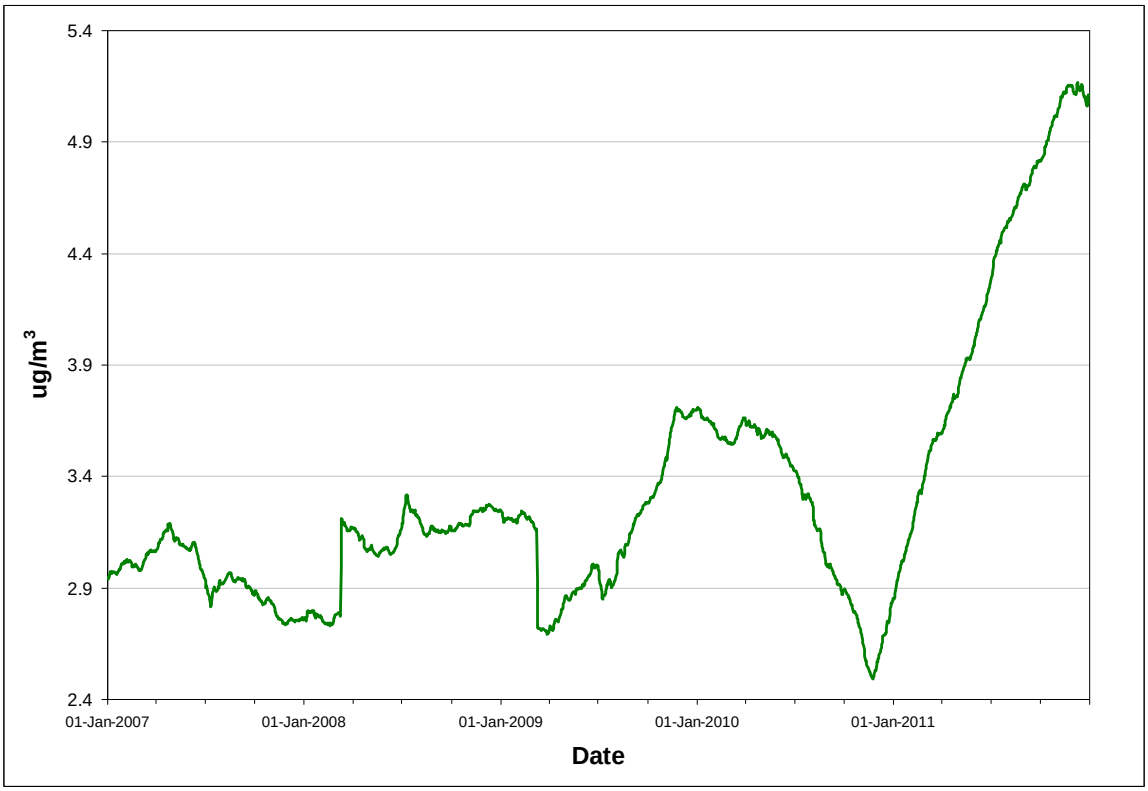

Rolling annual average of hourly concentrations

**TABLE 3.2.2 - MT. PEARL NAPS $PM_{2.5}$ SUMMARY 2010 & 2011**

| Year | Month | # Valid Days | % Valid Days | Average | Maximum 24-Hour | Regulatory Exceedances (>25 µg/m$^3$) |
|---|---|---|---|---|---|---|
| 2010 | January | 31 | 100.0% | 2.4 | 5.8 | 0 |
| | February | 28 | 100.0% | 2.0 | 7.6 | 0 |
| | March | 27 | 87.1% | 3.9 | 8.6 | 0 |
| | April | 25 | 83.3% | 3.8 | 9.0 | 0 |
| | May | 31 | 100.0% | 2.7 | 6.4 | 0 |
| | June | 25 | 83.3% | 1.7 | 7.3 | 0 |
| | July | 27 | 87.1% | 1.9 | 12.5 | 0 |
| | August | 30 | 96.8% | 1.5 | 7.3 | 0 |
| | September | 29 | 96.7% | 2.5 | 12.0 | 0 |
| | October | 31 | 100.0% | 1.7 | 4.5 | 0 |
| | November | 30 | 100.0% | 3.3 | 6.3 | 0 |
| | December | 31 | 100.0% | 6.5 | 13.5 | 0 |
| Annual | | 345 | 94.5% | 2.8 | 13.5 | 0 |
| 2011 | January | 31 | 100.0% | 5.5 | 10.8 | 0 |
| | February | 28 | 100.0% | 5.5 | 9.5 | 0 |
| | March | 29 | 93.5% | 6.1 | 11.2 | 0 |
| | April | 30 | 100.0% | 5.8 | 10.3 | 0 |
| | May | 31 | 100.0% | 5.3 | 11.2 | 0 |
| | June | 30 | 100.0% | 5.3 | 11.0 | 0 |
| | July | 31 | 100.0% | 5.3 | 10.9 | 0 |
| | August | 31 | 100.0% | 3.8 | 7.0 | 0 |
| | September | 28 | 93.3% | 3.8 | 8.2 | 0 |
| | October | 23 | 74.2% | 3.8 | 11.0 | 0 |
| | November | 30 | 100.0% | 5.0 | 10.1 | 0 |
| | December | 31 | 100.0% | 5.9 | 14.8 | 0 |
| Annual | | 353 | 96.7% | 5.1 | 14.8 | 0 |

Observations in ug/m$^3$

**FIGURE 3.2.2 - MT. PEARL NAPS ANNUAL $PM_{2.5}$ CONCENTRATIONS**



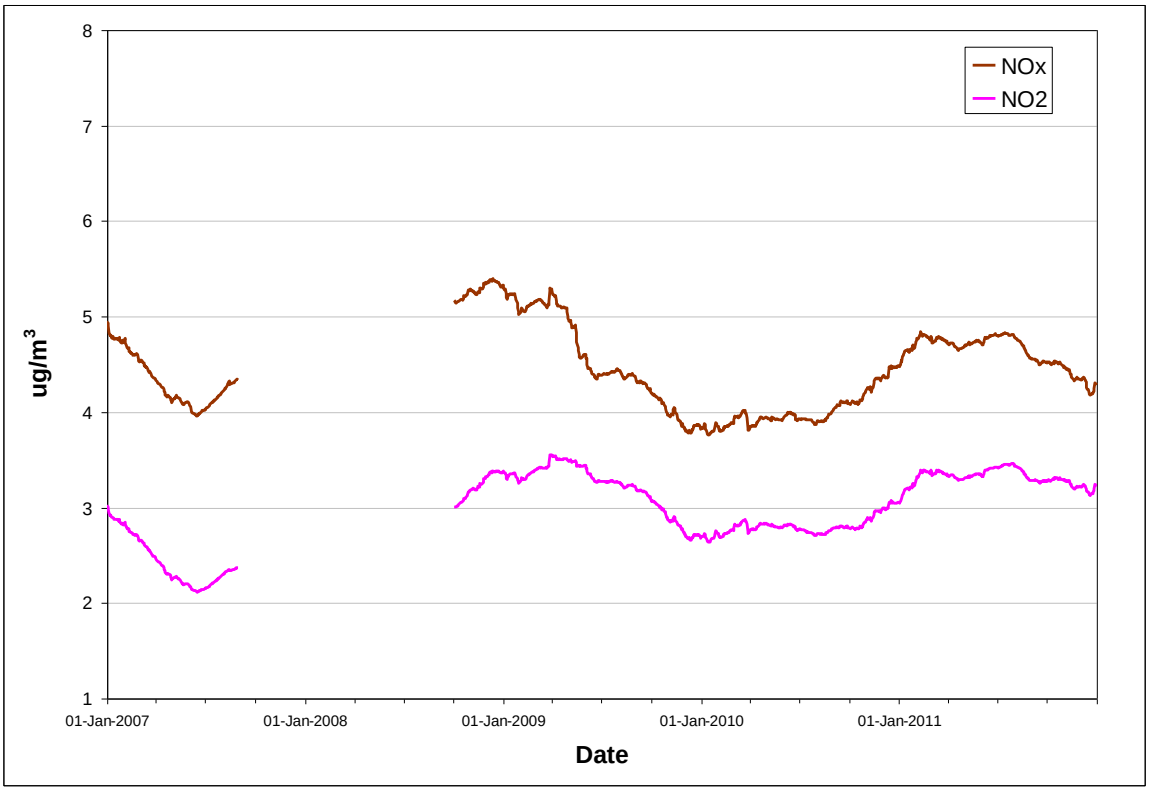

Rolling annual average of hourly concentrations

**TABLE 3.2.3 - MT. PEARL NAPS $NO_X$ / $NO_2$ SUMMARY 2010 & 2011**

| Year | Month | # Valid Hours | % Valid Hours | Average $NO_x$ | Average $NO_2$ | Maximums 1-Hour $NO_x$ | Maximums 1-Hour $NO_2$ | Maximums 24-Hour $NO_x$ | Maximums 24-Hour $NO_2$ | Exceedances 1-Hour (>400) | Exceedances 24-Hour (>200) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 2010 | January | 740 | 99.5% | 4.3 | 3.4 | 113.2 | 63.5 | 19.6 | 13.7 | 0 | 0 |
| | February | 669 | 99.6% | 5.4 | 4.0 | 74.5 | 43.7 | 12.6 | 9.9 | 0 | 0 |
| | March | 686 | 92.2% | 4.5 | 3.6 | 109.8 | 75.4 | 16.7 | 13.9 | 0 | 0 |
| | April | 606 | 84.2% | 3.5 | 2.7 | 34.3 | 32.1 | 11.3 | 9.3 | 0 | 0 |
| | May | 741 | 99.6% | 3.1 | 2.0 | 60.7 | 26.9 | 14.0 | 8.2 | 0 | 0 |
| | June | 628 | 87.2% | 3.9 | 2.3 | 46.8 | 28.1 | 13.6 | 7.9 | 0 | 0 |
| | July | 740 | 99.5% | 2.8 | 1.5 | 35.9 | 15.9 | 5.6 | 3.2 | 0 | 0 |
| | August | 742 | 99.7% | 4.7 | 3.0 | 58.5 | 23.9 | 12.4 | 8.5 | 0 | 0 |
| | September | 674 | 93.6% | 3.7 | 2.0 | 54.0 | 27.2 | 12.0 | 6.2 | 0 | 0 |
| | October | 714 | 96.0% | 5.1 | 3.2 | 96.8 | 28.4 | 15.4 | 11.6 | 0 | 0 |
| | November | 717 | 99.6% | 6.2 | 4.5 | 81.3 | 54.0 | 20.6 | 15.0 | 0 | 0 |
| | December | 744 | 100.0% | 6.3 | 4.3 | 174.4 | 54.1 | 32.3 | 16.7 | 0 | 0 |
| Annual | | 8401 | 95.9% | 4.5 | 3.1 | 174.4 | 75.4 | 32.3 | 16.7 | 0 | 0 |
| 2011 | January | 741 | 99.6% | 7.0 | 5.9 | 121.3 | 67.1 | 26.8 | 19.9 | 0 | 0 |
| | February | 670 | 99.7% | 6.2 | 5.4 | 87.2 | 65.8 | 16.1 | 15.1 | 0 | 0 |
| | March | 743 | 99.9% | 3.9 | 3.0 | 75.2 | 46.0 | 11.6 | 10.3 | 0 | 0 |
| | April | 716 | 99.4% | 3.1 | 2.4 | 35.2 | 33.0 | 5.2 | 4.4 | 0 | 0 |
| | May | 742 | 99.7% | 3.7 | 2.5 | 19.5 | 15.3 | 6.5 | 4.8 | 0 | 0 |
| | June | 718 | 99.7% | 4.9 | 3.3 | 45.6 | 37.1 | 16.0 | 12.3 | 0 | 0 |
| | July | 687 | 92.3% | 2.7 | 1.8 | 22.1 | 19.0 | 5.0 | 3.6 | 0 | 0 |
| | August | 741 | 99.6% | 1.9 | 1.0 | 42.0 | 10.8 | 7.2 | 3.5 | 0 | 0 |
| | September | 713 | 99.0% | 3.2 | 2.0 | 53.8 | 18.1 | 7.4 | 5.3 | 0 | 0 |
| | October | 744 | 100.0% | 4.7 | 3.4 | 77.3 | 37.5 | 14.5 | 9.2 | 0 | 0 |
| | November | 543 | 75.4% | 4.7 | 3.7 | 37.3 | 24.1 | 8.4 | 6.4 | 0 | 0 |
| | December | 744 | 100.0% | 5.7 | 4.4 | 49.3 | 35.8 | 23.6 | 18.2 | 0 | 0 |
| Annual | | 8502 | 97.1% | 4.3 | 3.2 | 121.3 | 67.1 | 26.8 | 19.9 | 0 | 0 |

Observations in $ug/m^3$

**FIGURE 3.2.3 - MT. PEARL NAPS ANNUAL $NO_X$ / $NO_2$ CONCENTRATIONS**



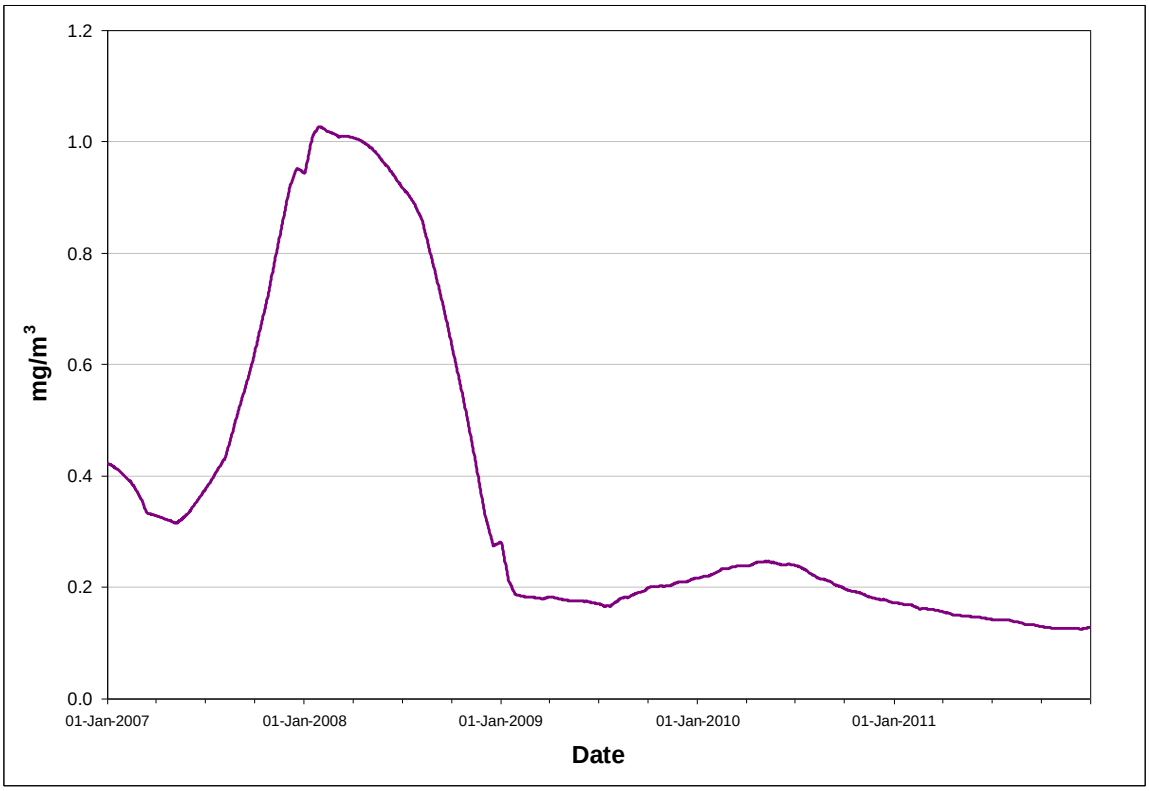

Rolling annual average of hourly concentrations

**TABLE 3.2.4 - MT. PEARL NAPS CO SUMMARY 2010 & 2011**

| Year | Month | # Valid Hours | % Valid Hours | Average | Maximum 1-Hour | Maximum 8-Hour | Regulatory Exceedances 1-Hour (>35) | Regulatory Exceedances 8-Hour (>15) |
|---|---|---|---|---|---|---|---|---|
| 2010 | January | 740 | 99.5% | 0.2 | 0.9 | 0.6 | 0 | 0 |
| | February | 669 | 99.6% | 0.3 | 1.2 | 0.6 | 0 | 0 |
| | March | 686 | 92.2% | 0.2 | 0.4 | 0.3 | 0 | 0 |
| | April | 606 | 84.2% | 0.2 | 0.5 | 0.3 | 0 | 0 |
| | May | 725 | 97.4% | 0.1 | 0.4 | 0.3 | 0 | 0 |
| | June | 628 | 87.2% | 0.1 | 0.3 | 0.2 | 0 | 0 |
| | July | 741 | 99.6% | 0.1 | 0.3 | 0.3 | 0 | 0 |
| | August | 742 | 99.7% | 0.2 | 0.5 | 0.4 | 0 | 0 |
| | September | 717 | 99.6% | 0.1 | 0.3 | 0.3 | 0 | 0 |
| | October | 720 | 96.8% | 0.1 | 0.4 | 0.3 | 0 | 0 |
| | November | 716 | 99.4% | 0.1 | 0.6 | 0.3 | 0 | 0 |
| | December | 722 | 97.0% | 0.2 | 2.4 | 0.7 | 0 | 0 |
| Annual | | 8412 | 96.0% | 0.2 | 2.4 | 0.7 | 0 | 0 |
| 2011 | January | 741 | 99.6% | 0.2 | 2.2 | 0.5 | 0 | 0 |
| | February | 670 | 99.7% | 0.2 | 2.4 | 0.5 | 0 | 0 |
| | March | 743 | 99.9% | 0.2 | 0.5 | 0.3 | 0 | 0 |
| | April | 717 | 99.6% | 0.1 | 0.5 | 0.3 | 0 | 0 |
| | May | 740 | 99.5% | 0.1 | 1.4 | 0.4 | 0 | 0 |
| | June | 717 | 99.6% | 0.1 | 0.3 | 0.2 | 0 | 0 |
| | July | 585 | 78.6% | 0.1 | 0.4 | 0.2 | 0 | 0 |
| | August | 741 | 99.6% | 0.1 | 0.3 | 0.2 | 0 | 0 |
| | September | 716 | 99.4% | 0.1 | 0.3 | 0.2 | 0 | 0 |
| | October | 744 | 100.0% | 0.1 | 0.5 | 0.2 | 0 | 0 |
| | November | 541 | 75.1% | 0.1 | 0.4 | 0.3 | 0 | 0 |
| | December | 733 | 98.5% | 0.2 | 0.8 | 0.4 | 0 | 0 |
| Annual | | 8388 | 95.8% | 0.1 | 2.4 | 0.5 | 0 | 0 |

Observations in $mg/m^3$

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



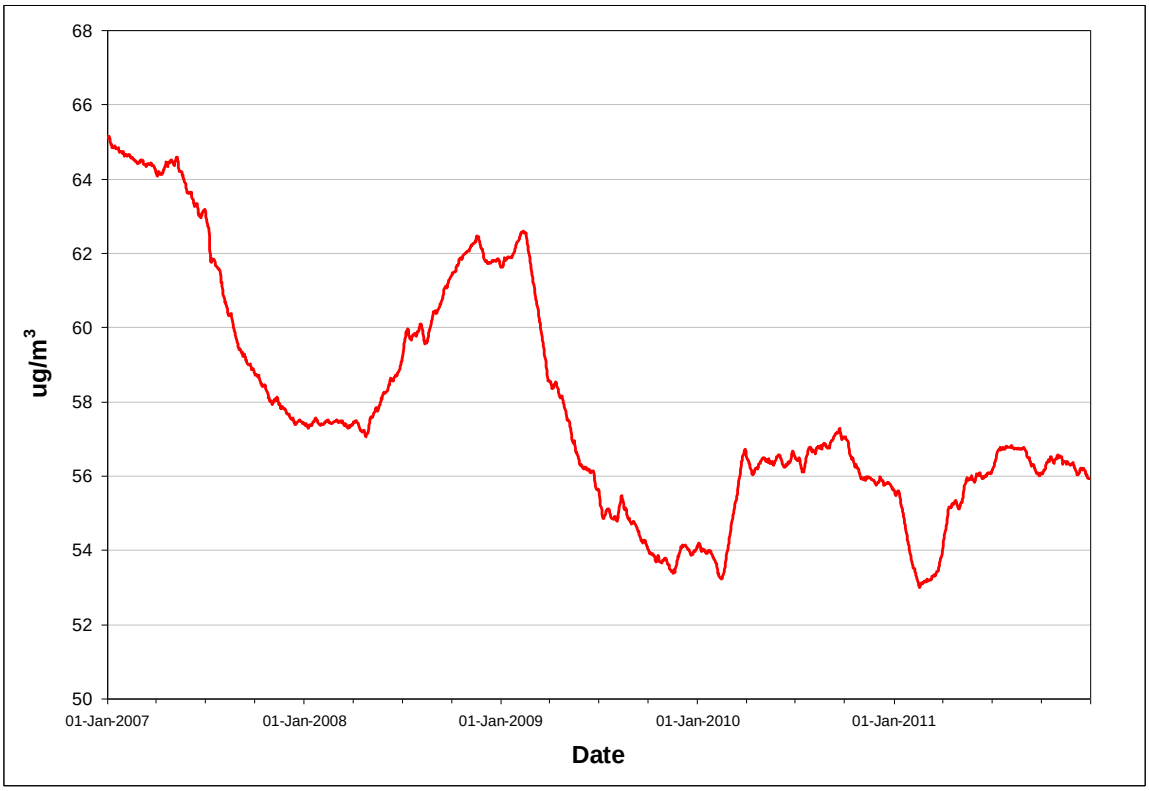

Rolling annual average of hourly concentrations

**TABLE 3.2.5 - MT. PEARL NAPS $O_3$ SUMMARY 2010 & 2011**

| Year | Month | # Valid Hours | % Valid Hours | Average | Maximum 1-Hour | Maximum 8-Hour | Regulatory Exceedances 1-Hour (>160) | Regulatory Exceedances 8-Hour (>87) |
|---|---|---|---|---|---|---|---|---|
| 2010 | January | 740 | 99.5% | 64.4 | 84.9 | 81.1 | 0 | 0 |
| | February | 670 | 99.7% | 65.7 | 84.6 | 81.0 | 0 | 0 |
| | March | 685 | 92.1% | 72.6 | 94.4 | 93.5 | 0 | 2 |
| | April | 596 | 82.8% | 68.9 | 156.5 | 89.7 | 0 | 2 |
| | May | 716 | 96.2% | 57.5 | 109.8 | 91.6 | 0 | 1 |
| | June | 628 | 87.2% | 51.3 | 93.7 | 80.2 | 0 | 0 |
| | July | 741 | 99.6% | 43.8 | 101.4 | 84.7 | 0 | 0 |
| | August | 741 | 99.6% | 42.3 | 81.8 | 71.4 | 0 | 0 |
| | September | 717 | 99.6% | 49.0 | 92.9 | 87.2 | 0 | 1 |
| | October | 737 | 99.1% | 41.0 | 79.7 | 74.7 | 0 | 0 |
| | November | 717 | 99.6% | 55.0 | 75.2 | 73.8 | 0 | 0 |
| | December | 603 | 81.0% | 60.9 | 77.2 | 75.8 | 0 | 0 |
| Annual | | 8291 | 94.6% | 55.6 | 156.5 | 93.5 | 0 | 6 |
| 2011 | January | 463 | 62.2% | 40.0 | 52.9 | 51.5 | 0 | 0 |
| | February | 670 | 99.7% | 56.4 | 88.8 | 85.6 | 0 | 0 |
| | March | 743 | 99.9% | 79.4 | 96.2 | 93.5 | 0 | 17 |
| | April | 718 | 99.7% | 80.0 | 120.5 | 112.6 | 0 | 32 |
| | May | 742 | 99.7% | 65.7 | 99.8 | 92.3 | 0 | 7 |
| | June | 718 | 99.7% | 54.2 | 83.4 | 79.3 | 0 | 0 |
| | July | 691 | 92.9% | 51.7 | 114.5 | 89.6 | 0 | 1 |
| | August | 741 | 99.6% | 41.8 | 72.9 | 67.6 | 0 | 0 |
| | September | 715 | 99.3% | 40.8 | 90.9 | 87.5 | 0 | 1 |
| | October | 743 | 99.9% | 46.8 | 76.5 | 72.2 | 0 | 0 |
| | November | 543 | 75.4% | 50.8 | 74.8 | 70.2 | 0 | 0 |
| | December | 744 | 100.0% | 56.0 | 74.3 | 71.3 | 0 | 0 |
| Annual | | 8231 | 94.0% | 55.9 | 120.5 | 112.6 | 0 | 58 |

Observations in $ug/m^3$

**FIGURE 3.2.5 - MT. PEARL NAPS ANNUAL $O_3$ CONCENTRATIONS**

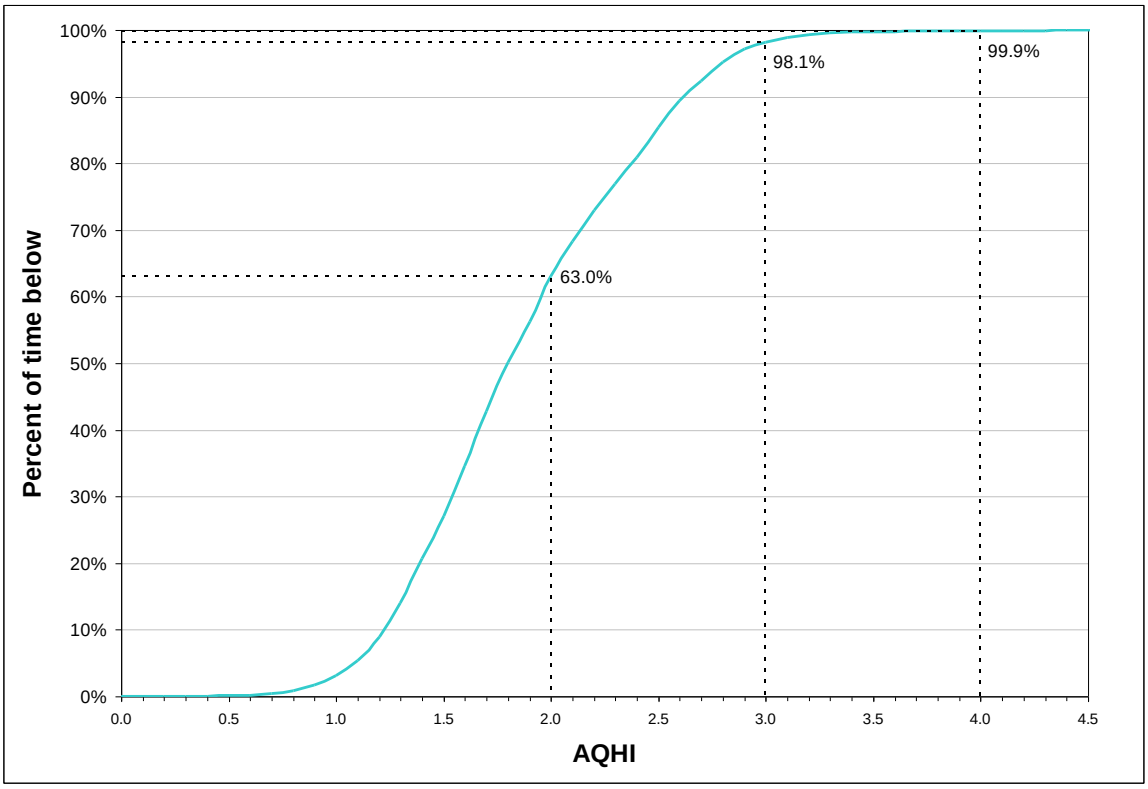



Rolling annual average of hourly concentrations

**TABLE 3.2.6 - MT. PEARL NAPS AQHI SUMMARY 2010 & 2011**

| Year | Month | # Valid Hours | % Valid Hours | Average | Maximum 3-Hour |
|---|---|---|---|---|---|
| 2010 | January | 739 | 99.3% | 2.0 | 3.4 |
| | February | 670 | 99.7% | 2.0 | 2.9 |
| | March | 681 | 91.5% | 2.3 | 3.3 |
| | April | 599 | 83.2% | 2.1 | 3.6 |
| | May | 708 | 95.2% | 1.7 | 3.0 |
| | June | 581 | 80.7% | 1.6 | 2.8 |
| | July | 689 | 92.6% | 1.3 | 3.1 |
| | August | 711 | 95.6% | 1.3 | 2.5 |
| | September | 654 | 90.8% | 1.5 | 3.4 |
| | October | 697 | 93.7% | 1.3 | 2.6 |
| | November | 720 | 100.0% | 1.8 | 3.0 |
| | December | 604 | 81.2% | 2.1 | 3.0 |
| Annual | | 8053 | 91.9% | 1.8 | 3.6 |
| 2011 | January | 462 | 62.1% | 1.6 | 3.4 |
| | February | 668 | 99.4% | 2.0 | 3.9 |
| | March | 704 | 94.6% | 2.5 | 3.3 |
| | April | 717 | 99.6% | 2.5 | 4.4 |
| | May | 740 | 99.5% | 2.1 | 4.9 |
| | June | 720 | 100.0% | 1.8 | 2.8 |
| | July | 685 | 92.1% | 1.7 | 3.4 |
| | August | 739 | 99.3% | 1.3 | 2.3 |
| | September | 669 | 92.9% | 1.4 | 2.9 |
| | October | 594 | 79.8% | 1.6 | 2.7 |
| | November | 541 | 75.1% | 1.7 | 3.3 |
| | December | 742 | 99.7% | 2.0 | 4.1 |
| Annual | | 7981 | 91.1% | 1.9 | 4.9 |

**FIGURE 3.2.6 - MT. PEARL NAPS AQHI FREQUENCY DISTRIBUTION 2011**




e.g. 98.1% of the time the AQHI recorded was below 3.0

## 3.3 Grand Falls Windsor

The Grand Falls Windsor NAPS monitoring station is located on Scott Avenue and monitors the ambient levels of $SO_2$, $NO_x$ / $NO_2$, CO, $O_3$ and $PM_{2.5}$ on a continuous basis. For all pollutants, with the exception of $O_3$, the ambient air criteria were not exceeded on any occasion in 2011. For $O_3$, the 8-hour ambient standard was exceeded on twenty two occasions in 2011.

Tables 3.3.1 through 3.3.5 present the summary information on the level of air contaminants measured at the Grand Falls Windsor NAPS station, while Figure 3.3.1 provides a graphical representation of the annual trend for $O_3$. A graphical presentation of the annual trend for the other pollutants is not presented owing to insufficient data for trending purposes. Table 3.3.6 provides a summary of the AQHI in 2010 and 2011 while Figure 3.3.2 provides a graphical representation of the percentage of time the AQHI values were below a given level in 2011.

**TABLE 3.3.1 - GRAND FALLS WINDSOR NAPS $SO_2$ SUMMARY 2011**

| Year | Month | # Valid Hours | % Valid Hours | Average | Maximum 1-Hour | Maximum 3-Hour | Maximum 24-Hour | Regulatory Exceedances 1-Hour (>900) | Regulatory Exceedances 3-Hour (>600) | Regulatory Exceedances 24-Hour (>300) |
|---|---|---|---|---|---|---|---|---|---|---|
| 2010 | January | 0 | 0.0% | | | | | | | |
| | February | 0 | 0.0% | | | | | | | |
| | March | 469 | 63.0% | 0.1 | 1.3 | 1.0 | 0.6 | 0 | 0 | 0 |
| | April | 698 | 96.9% | 0.7 | 3.4 | 3.1 | 2.3 | 0 | 0 | 0 |
| | May | 740 | 99.5% | 0.7 | 2.1 | 2.0 | 1.9 | 0 | 0 | 0 |
| | June | 718 | 99.7% | 0.1 | 1.3 | 1.0 | 0.6 | 0 | 0 | 0 |
| | July | 740 | 99.5% | 0.4 | 2.6 | 2.1 | 1.6 | 0 | 0 | 0 |
| | August | 737 | 99.1% | 1.1 | 8.6 | 3.0 | 1.6 | 0 | 0 | 0 |
| | September | 719 | 99.9% | 1.8 | 3.7 | 3.5 | 3.1 | 0 | 0 | 0 |
| | October | 743 | 99.9% | 1.3 | 3.4 | 3.1 | 3.0 | 0 | 0 | 0 |
| | November | 718 | 99.7% | 1.3 | 2.4 | 2.2 | 1.9 | 0 | 0 | 0 |
| | December | 742 | 99.7% | 0.9 | 6.8 | 6.7 | 1.9 | 0 | 0 | 0 |
| Annual | | 7024 | 80.2% | 0.9 | 8.6 | 6.7 | 3.1 | 0 | 0 | 0 |
| 2011 | January | 669 | 89.9% | 1.5 | 6.0 | 4.9 | 2.4 | 0 | 0 | 0 |
| | February | 670 | 99.7% | 1.8 | 6.8 | 5.5 | 2.9 | 0 | 0 | 0 |
| | March | 741 | 99.6% | 1.5 | 4.3 | 3.3 | 2.3 | 0 | 0 | 0 |
| | April | 704 | 97.8% | 1.1 | 3.2 | 2.8 | 1.7 | 0 | 0 | 0 |
| | May | 663 | 89.1% | 0.1 | 1.2 | 0.7 | 0.4 | 0 | 0 | 0 |
| | June | 718 | 99.7% | 0.3 | 1.0 | 1.0 | 0.8 | 0 | 0 | 0 |
| | July | 717 | 96.4% | 0.6 | 3.9 | 3.4 | 2.1 | 0 | 0 | 0 |
| | August | 724 | 97.3% | 0.2 | 2.6 | 2.3 | 1.8 | 0 | 0 | 0 |
| | September | 654 | 90.8% | 0.1 | 1.0 | 0.8 | 0.4 | 0 | 0 | 0 |
| | October | 647 | 87.0% | 0.5 | 3.1 | 2.5 | 2.2 | 0 | 0 | 0 |
| | November | 695 | 96.5% | 1.4 | 8.4 | 3.4 | 2.4 | 0 | 0 | 0 |
| | December | 141 | 19.0% | 0.2 | 4.4 | 1.5 | 0.4 | 0 | 0 | 0 |
| Annual | | 7743 | 88.4% | 0.8 | 8.4 | 5.5 | 2.9 | 0 | 0 | 0 |

Observations in $ug/m^3$

**TABLE 3.3.2 - GRAND FALLS WINDSOR NAPS $PM_{2.5}$ SUMMARY 2011**

| Year | Month | # Valid Days | % Valid Days | Average | Maximum 24-Hour | Regulatory Exceedances (>25 µg/m$^3$) |
|---|---|---|---|---|---|---|
| 2010 | January | 0 | 0.0% | | | |
| | February | 0 | 0.0% | | | |
| | March | 0 | 0.0% | | | |
| | April | 0 | 0.0% | | | |
| | May | 5 | 16.1% | 6.1 | 9.6 | 0 |
| | June | 30 | 100.0% | 4.3 | 10.0 | 0 |
| | July | 29 | 93.5% | 2.8 | 6.3 | 0 |
| | August | 20 | 64.5% | 4.7 | 10.3 | 0 |
| | September | 28 | 93.3% | 3.7 | 7.8 | 0 |
| | October | 16 | 51.6% | 3.6 | 9.4 | 0 |
| | November | 26 | 86.7% | 3.8 | 8.5 | 0 |
| | December | 0 | 0.0% | | | |
| Annual | | 154 | 42.2% | 3.8 | 10.3 | 0 |
| 2011 | January | 9 | 29.0% | 5.5 | 8.1 | 0 |
| | February | 12 | 42.9% | 4.4 | 6.3 | 0 |
| | March | 30 | 96.8% | 4.9 | 10.4 | 0 |
| | April | 24 | 80.0% | 3.6 | 6.4 | 0 |
| | May | 27 | 87.1% | 3.0 | 8.7 | 0 |
| | June | 29 | 96.7% | 1.9 | 6.0 | 0 |
| | July | 12 | 38.7% | 3.8 | 11.8 | 0 |
| | August | 29 | 93.5% | 4.2 | 13.8 | 0 |
| | September | 27 | 90.0% | 5.0 | 16.9 | 0 |
| | October | 31 | 100.0% | 5.5 | 19.7 | 0 |
| | November | 8 | 26.7% | 5.0 | 5.6 | 0 |
| | December | 22 | 71.0% | 4.8 | 10.2 | 0 |
| Annual | | 260 | 71.2% | 4.2 | 19.7 | 0 |

Observations in ug/m$^3$

**TABLE 3.3.3 - GRAND FALLS WINDSOR NAPS $NO_X$ / $NO_2$ SUMMARY 2011**

| Year | Month | # Valid Hours | % Valid Hours | Average $NO_X$ | Average $NO_2$ | Maximums 1-Hour $NO_X$ | Maximums 1-Hour $NO_2$ | Maximums 24-Hour $NO_X$ | Maximums 24-Hour $NO_2$ | Exceedances 1-Hour (>400) | Exceedances 24-Hour (>200) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 2010 | January | 0 | 0.0% | | | | | | | | |
| | February | 0 | 0.0% | | | | | | | | |
| | March | 33 | 4.4% | 4.1 | 3.4 | 18.1 | 12.0 | 5.4 | 4.4 | 0 | 0 |
| | April | 718 | 99.7% | 2.5 | 1.7 | 149.7 | 55.3 | 14.8 | 6.4 | 0 | 0 |
| | May | 741 | 99.6% | 8.0 | 2.4 | 120.3 | 53.8 | 39.2 | 15.0 | 0 | 0 |
| | June | 719 | 99.9% | 2.4 | 1.4 | 75.4 | 36.5 | 13.7 | 6.3 | 0 | 0 |
| | July | 346 | 46.5% | 2.4 | 1.3 | 37.2 | 17.3 | 5.8 | 3.4 | 0 | 0 |
| | August | 0 | 0.0% | | | | | | | | |
| | September | 203 | 28.2% | 1.8 | 0.9 | 19.6 | 13.5 | 3.8 | 2.2 | 0 | 0 |
| | October | 743 | 99.9% | 2.7 | 1.5 | 97.2 | 31.0 | 9.9 | 5.9 | 0 | 0 |
| | November | 719 | 99.9% | 2.9 | 1.9 | 107.9 | 40.4 | 14.2 | 8.8 | 0 | 0 |
| | December | 743 | 99.9% | 1.7 | 1.3 | 33.5 | 22.9 | 4.3 | 3.6 | 0 | 0 |
| Annual | | 4965 | 56.7% | 3.3 | 1.6 | 149.7 | 55.3 | 39.2 | 15.0 | 0 | 0 |
| 2011 | January | 669 | 89.9% | 3.2 | 2.5 | 69.6 | 45.0 | 9.9 | 7.3 | 0 | 0 |
| | February | 670 | 99.7% | 4.9 | 3.5 | 103.7 | 59.8 | 25.7 | 18.0 | 0 | 0 |
| | March | 741 | 99.6% | 2.9 | 1.9 | 19.0 | 16.9 | 5.2 | 3.8 | 0 | 0 |
| | April | 702 | 97.5% | 2.6 | 1.5 | 128.2 | 45.7 | 8.6 | 3.9 | 0 | 0 |
| | May | 663 | 89.1% | 3.1 | 1.8 | 17.0 | 10.9 | 4.8 | 3.3 | 0 | 0 |
| | June | 718 | 99.7% | 3.5 | 1.9 | 20.7 | 10.3 | 6.4 | 3.7 | 0 | 0 |
| | July | 697 | 93.7% | 2.9 | 1.5 | 40.3 | 25.0 | 7.2 | 3.8 | 0 | 0 |
| | August | 723 | 97.2% | 1.6 | 1.2 | 13.6 | 15.9 | 3.6 | 2.7 | 0 | 0 |
| | September | 654 | 90.8% | 2.5 | 1.2 | 22.5 | 12.8 | 6.1 | 2.9 | 0 | 0 |
| | October | 741 | 99.6% | 3.0 | 2.0 | 40.5 | 23.0 | 8.3 | 3.9 | 0 | 0 |
| | November | 598 | 83.1% | 3.6 | 2.5 | 46.2 | 30.7 | 9.8 | 6.2 | 0 | 0 |
| | December | 549 | 73.8% | 3.6 | 2.3 | 125.9 | 48.4 | 14.5 | 7.1 | 0 | 0 |
| Annual | | 8125 | 92.8% | 3.1 | 2.0 | 128.2 | 59.8 | 25.7 | 18.0 | 0 | 0 |

Observations in $ug/m^3$

**TABLE 3.3.4 - GRAND FALLS WINDSOR NAPS CO SUMMARY 2011**

| Year | Month | # Valid Hours | % Valid Hours | Average | Maximum 1-Hour | Maximum 8-Hour | Regulatory Exceedances 1-Hour (>35) | Regulatory Exceedances 8-Hour (>15) |
|---|---|---|---|---|---|---|---|---|
| 2010 | January | 0 | 0.0% | | | | | |
| | February | 0 | 0.0% | | | | | |
| | March | 134 | 18.0% | 0.5 | 0.7 | 0.7 | 0 | 0 |
| | April | 718 | 99.7% | 0.5 | 0.9 | 0.7 | 0 | 0 |
| | May | 741 | 99.6% | 0.3 | 0.8 | 0.7 | 0 | 0 |
| | June | 718 | 99.7% | 0.2 | 0.2 | 0.2 | 0 | 0 |
| | July | 739 | 99.3% | 0.2 | 0.6 | 0.5 | 0 | 0 |
| | August | 683 | 91.8% | 0.1 | 0.5 | 0.3 | 0 | 0 |
| | September | 719 | 99.9% | 0.1 | 0.6 | 0.4 | 0 | 0 |
| | October | 743 | 99.9% | 0.2 | 0.6 | 0.4 | 0 | 0 |
| | November | 719 | 99.9% | 0.5 | 0.9 | 0.7 | 0 | 0 |
| | December | 743 | 99.9% | 0.4 | 1.0 | 0.5 | 0 | 0 |
| Annual | | 6657 | 76.0% | 0.3 | 1.0 | 0.7 | 0 | 0 |
| 2011 | January | 669 | 89.9% | 0.6 | 1.2 | 1.0 | 0 | 0 |
| | February | 670 | 99.7% | 0.5 | 1.7 | 0.9 | 0 | 0 |
| | March | 741 | 99.6% | 0.3 | 0.8 | 0.6 | 0 | 0 |
| | April | 704 | 97.8% | 0.3 | 0.5 | 0.4 | 0 | 0 |
| | May | 663 | 89.1% | 0.3 | 0.4 | 0.3 | 0 | 0 |
| | June | 718 | 99.7% | 0.2 | 0.4 | 0.3 | 0 | 0 |
| | July | 715 | 96.1% | 0.1 | 0.7 | 0.4 | 0 | 0 |
| | August | 724 | 97.3% | 0.4 | 0.7 | 0.6 | 0 | 0 |
| | September | 618 | 85.8% | 0.3 | 0.5 | 0.5 | 0 | 0 |
| | October | 300 | 40.3% | 0.1 | 0.3 | 0.2 | 0 | 0 |
| | November | 694 | 96.4% | 0.1 | 0.4 | 0.2 | 0 | 0 |
| | December | 505 | 67.9% | 0.2 | 1.4 | 0.6 | 0 | 0 |
| Annual | | 7721 | 88.1% | 0.3 | 1.7 | 1.0 | 0 | 0 |

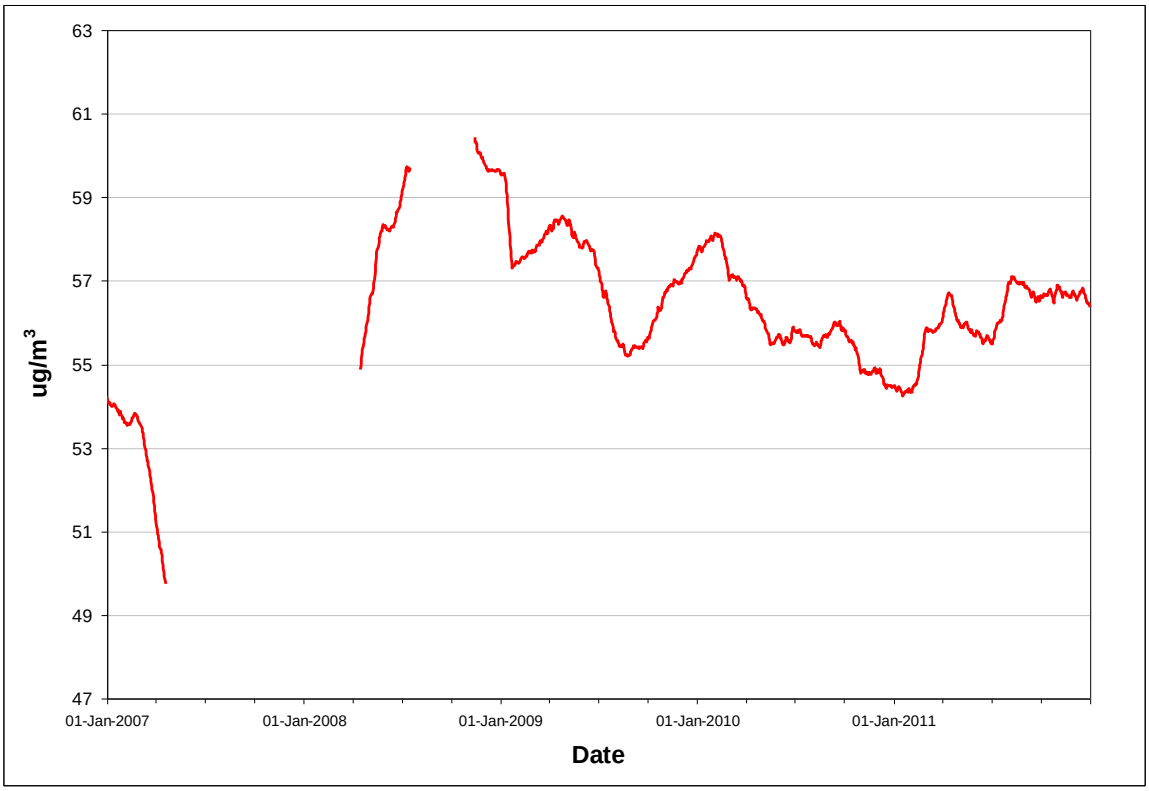
Observations in $mg/m^3$

**TABLE 3.3.5 - GRAND FALLS WINDSOR NAPS $O_3$ SUMMARY 2010 & 2011**

| Year | Month | # Valid Hours | % Valid Hours | Average | Maximum 1-Hour | Maximum 8-Hour | Regulatory Exceedances 1-Hour (>160) | Regulatory Exceedances 8-Hour (>87) |
|---|---|---|---|---|---|---|---|---|
| 2010 | January | 744 | 100.0% | 66.0 | 86.3 | 84.7 | 0 | 0 |
| | February | 672 | 100.0% | 56.2 | 78.3 | 72.8 | 0 | 0 |
| | March | 738 | 99.2% | 74.0 | 93.4 | 87.4 | 0 | 2 |
| | April | 718 | 99.7% | 70.9 | 95.4 | 91.5 | 0 | 6 |
| | May | 741 | 99.6% | 60.9 | 93.2 | 82.2 | 0 | 0 |
| | June | 718 | 99.7% | 53.1 | 92.8 | 79.1 | 0 | 0 |
| | July | 740 | 99.5% | 37.0 | 69.5 | 63.0 | 0 | 0 |
| | August | 738 | 99.2% | 38.8 | 76.1 | 61.4 | 0 | 0 |
| | September | 719 | 99.9% | 44.3 | 90.6 | 72.8 | 0 | 0 |
| | October | 743 | 99.9% | 38.9 | 76.1 | 68.4 | 0 | 0 |
| | November | 718 | 99.7% | 52.1 | 77.7 | 76.1 | 0 | 0 |
| | December | 743 | 99.9% | 61.7 | 81.2 | 79.8 | 0 | 0 |
| Annual | | 8732 | 99.7% | 54.5 | 95.4 | 91.5 | 0 | 8 |
| 2011 | January | 669 | 89.9% | 65.4 | 85.6 | 82.1 | 0 | 0 |
| | February | 670 | 99.7% | 74.9 | 92.8 | 88.9 | 0 | 1 |
| | March | 741 | 99.6% | 76.9 | 94.5 | 90.6 | 0 | 5 |
| | April | 444 | 61.7% | 80.4 | 103.7 | 98.6 | 0 | 12 |
| | May | 375 | 50.4% | 58.2 | 102.2 | 91.8 | 0 | 3 |
| | June | 718 | 99.7% | 51.1 | 83.5 | 75.7 | 0 | 0 |
| | July | 491 | 66.0% | 47.6 | 101.0 | 89.1 | 0 | 1 |
| | August | 710 | 95.4% | 39.5 | 91.4 | 71.8 | 0 | 0 |
| | September | 655 | 91.0% | 39.5 | 102.9 | 81.1 | 0 | 0 |
| | October | 741 | 99.6% | 41.7 | 78.7 | 73.5 | 0 | 0 |
| | November | 714 | 99.2% | 50.1 | 72.8 | 69.4 | 0 | 0 |
| | December | 608 | 81.7% | 58.6 | 75.8 | 73.1 | 0 | 0 |
| Annual | | 7536 | 86.0% | 56.4 | 103.7 | 98.6 | 0 | 22 |

Observations in $ug/m^3$

**FIGURE 3.3.1 - GRAND FALLS WINDSOR NAPS ANNUAL $O_3$ CONCENTRATIONS**

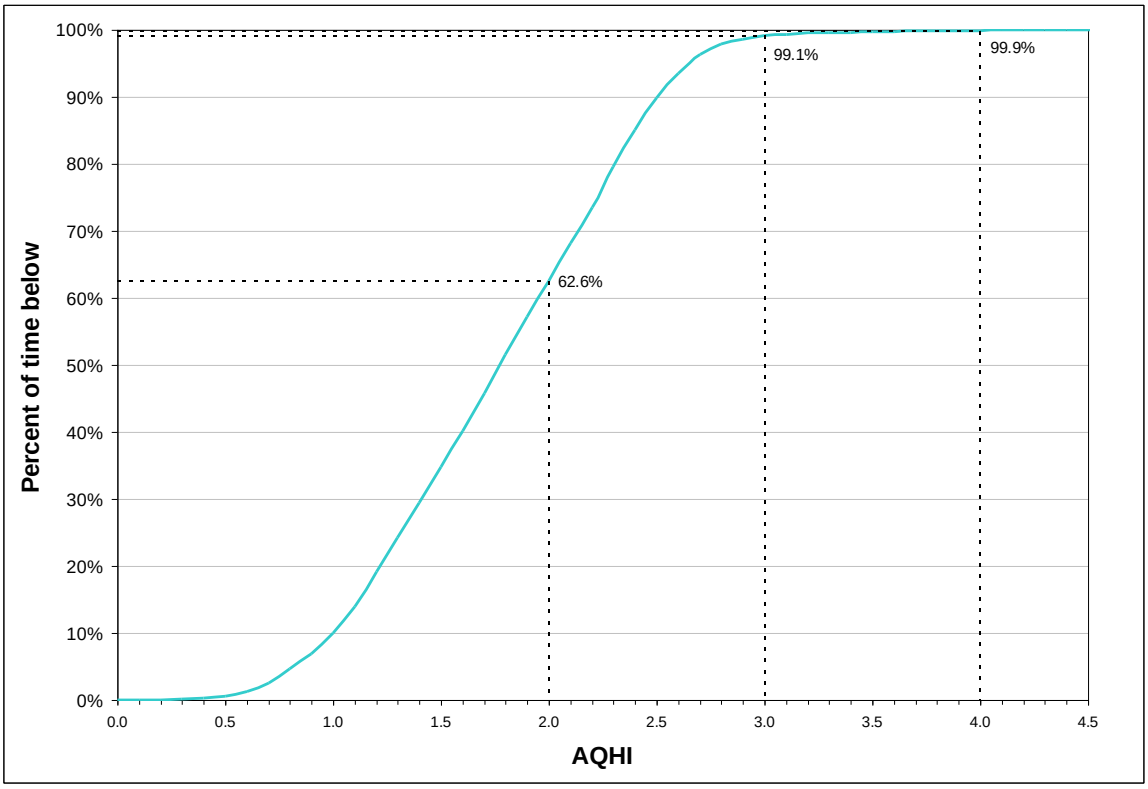



Rolling annual average of hourly concentrations

**TABLE 3.3.6 - GRAND FALLS WINDSOR NAPS AQHI SUMMARY 2011**

| Year | Month | # Valid Hours | % Valid Hours | Average | Maximum 3-Hour |
|---|---|---|---|---|---|
| 2010 | January | 0 | 0.0% | | |
| | February | 0 | 0.0% | | |
| | March | 0 | 0.0% | | |
| | April | 0 | 0.0% | | |
| | May | 132 | 17.7% | 2.1 | 2.9 |
| | June | 715 | 99.3% | 1.7 | 2.8 |
| | July | 341 | 45.8% | 1.2 | 2.0 |
| | August | 0 | 0.0% | | |
| | September | 166 | 23.1% | 1.3 | 1.7 |
| | October | 396 | 53.2% | 1.2 | 2.1 |
| | November | 634 | 88.1% | 1.7 | 2.7 |
| | December | 0 | 0.0% | | |
| Annual | | 2384 | 27.2% | 1.5 | 2.9 |
| 2011 | January | 246 | 33.1% | 2.3 | 3.8 |
| | February | 368 | 54.8% | 2.4 | 3.1 |
| | March | 723 | 97.2% | 2.4 | 4.1 |
| | April | 445 | 61.8% | 2.4 | 3.0 |
| | May | 362 | 48.7% | 1.7 | 2.9 |
| | June | 698 | 96.9% | 1.5 | 3.3 |
| | July | 199 | 26.7% | 1.4 | 2.7 |
| | August | 708 | 95.2% | 1.3 | 2.9 |
| | September | 654 | 90.8% | 1.3 | 4.5 |
| | October | 744 | 100.0% | 1.5 | 3.9 |
| | November | 208 | 28.9% | 1.7 | 2.3 |
| | December | 547 | 73.5% | 1.9 | 4.6 |
| Annual | | 5902 | 67.4% | 1.8 | 4.6 |

**FIGURE 3.3.2 - GRAND FALLS WINDSOR NAPS AQHI FREQUENCY DISTRIBUTION**
2011




e.g. 99.1% of the time the AQHI recorded was below 3.0

## 3.4 Corner Brook

The Corner Brook NAPS monitoring station is located on Macpherson Avenue near Confederation Drive and monitors the ambient levels of $SO_2$, $NO_x$ / $NO_2$, CO, $O_3$ and $PM_{2.5}$ 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, with the exception of $O_3$, the ambient air criteria were not exceeded on any occasion in 2011. The 8-hour $O_3$ standard was exceeded on twenty nine occasions in 2011.

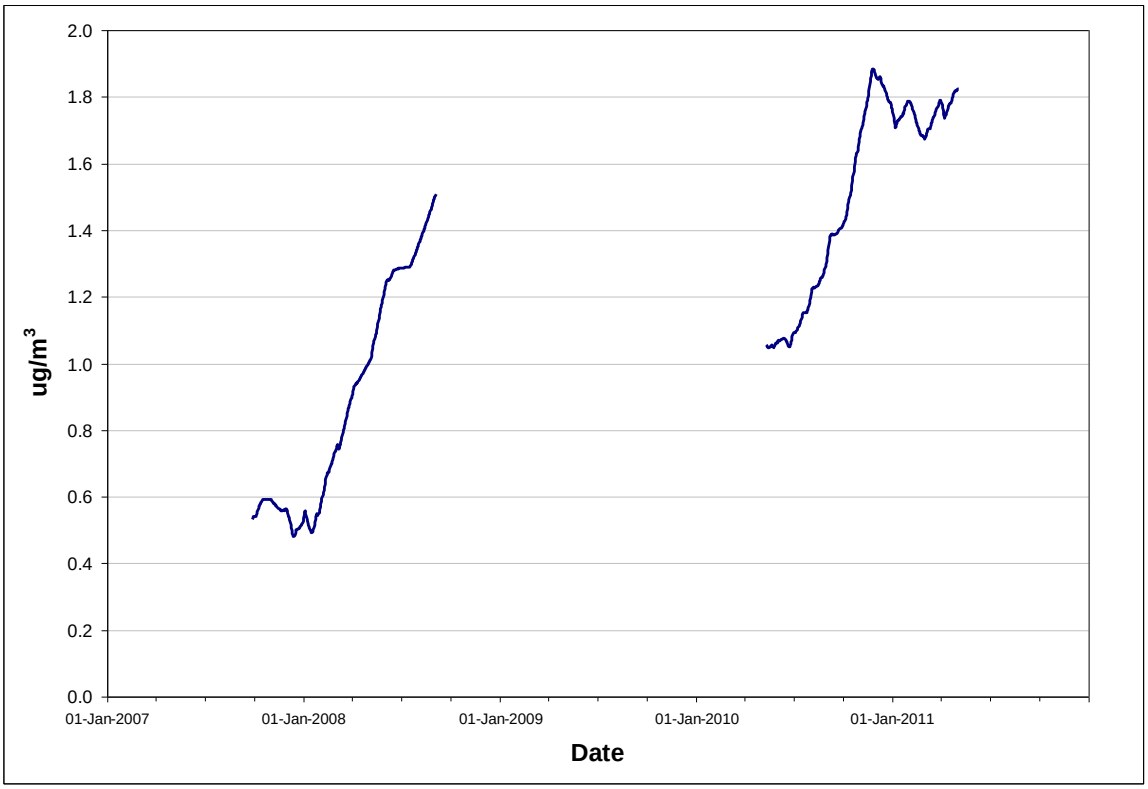
Tables 3.4.1 through 3.4.5 present the summary information on the level of air contaminants measured at the Corner Brook NAPS station, while Figures 3.4.1 through 3.3.5 provide a graphical representation of the annual trend of each pollutant. The disconnection in the Figures corresponds to the timeframe in which the station was relocated. Table 3.4.6 provides a summary of the AQHI in 2010 and 2011 while Figure 3.3 provides a graphical representation of the percentage of time the AQHI values were below a given level in 2011.

**TABLE 3.4.1 - CORNER BROOK NAPS $SO_2$ SUMMARY 2010 & 2011**

| Year | Month | # Valid Hours | % Valid Hours | Average | Maximum 1-Hour | Maximum 3-Hour | Maximum 24-Hour | Regulatory Exceedances 1-Hour (>900) | Regulatory Exceedances 3-Hour (>600) | Regulatory Exceedances 24-Hour (>300) |
|---|---|---|---|---|---|---|---|---|---|---|
| 2010 | January | 663 | 89.1% | 1.3 | 6.3 | 6.1 | 5.7 | 0 | 0 | 0 |
| | February | 627 | 93.3% | 3.2 | 6.5 | 5.1 | 4.2 | 0 | 0 | 0 |
| | March | 738 | 99.2% | 0.4 | 3.9 | 3.5 | 2.9 | 0 | 0 | 0 |
| | April | 660 | 91.7% | 1.5 | 15.2 | 8.0 | 5.2 | 0 | 0 | 0 |
| | May | 742 | 99.7% | 1.3 | 9.2 | 7.0 | 2.5 | 0 | 0 | 0 |
| | June | 714 | 99.2% | 1.4 | 12.8 | 10.0 | 5.1 | 0 | 0 | 0 |
| | July | 552 | 74.2% | 2.5 | 11.3 | 6.7 | 4.1 | 0 | 0 | 0 |
| | August | 736 | 98.9% | 1.4 | 16.0 | 12.9 | 5.1 | 0 | 0 | 0 |
| | September | 715 | 99.3% | 1.4 | 11.8 | 10.5 | 5.0 | 0 | 0 | 0 |
| | October | 741 | 99.6% | 3.4 | 11.8 | 10.2 | 5.5 | 0 | 0 | 0 |
| | November | 710 | 98.6% | 2.9 | 8.1 | 6.5 | 5.4 | 0 | 0 | 0 |
| | December | 740 | 99.5% | 0.8 | 3.7 | 3.4 | 3.2 | 0 | 0 | 0 |
| Annual | | 8338 | 95.2% | 1.8 | 16.0 | 12.9 | 5.7 | 0 | 0 | 0 |
| 2011 | January | 741 | 99.6% | 1.6 | 4.7 | 4.5 | 3.4 | 0 | 0 | 0 |
| | February | 85 | 12.6% | 2.0 | 4.3 | 4.1 | 2.5 | 0 | 0 | 0 |
| | March | 188 | 25.3% | 1.1 | 3.0 | 2.9 | 2.5 | 0 | 0 | 0 |
| | April | 0 | 0.0% | | | | | | | |
| | May | 107 | 14.4% | 0.5 | 4.9 | 1.5 | 1.1 | 0 | 0 | 0 |
| | June | 714 | 99.2% | 1.7 | 27.5 | 19.9 | 6.2 | 0 | 0 | 0 |
| | July | 741 | 99.6% | 2.5 | 13.2 | 9.3 | 3.8 | 0 | 0 | 0 |
| | August | 737 | 99.1% | 1.5 | 16.3 | 12.9 | 4.2 | 0 | 0 | 0 |
| | September | 719 | 99.9% | 1.4 | 11.5 | 7.0 | 2.9 | 0 | 0 | 0 |
| | October | 717 | 96.4% | 0.4 | 15.3 | 5.8 | 1.6 | 0 | 0 | 0 |
| | November | 715 | 99.3% | 0.7 | 9.2 | 3.1 | 1.9 | 0 | 0 | 0 |
| | December | 739 | 99.3% | 1.0 | 16.9 | 3.9 | 3.6 | 0 | 0 | 0 |
| Annual | | 6203 | 70.8% | 1.3 | 27.5 | 19.9 | 6.2 | 0 | 0 | 0 |

Observations in $ug/m^3$

**FIGURE 3.4.1 - CORNER BROOK NAPS ANNUAL $SO_2$ CONCENTRATIONS**



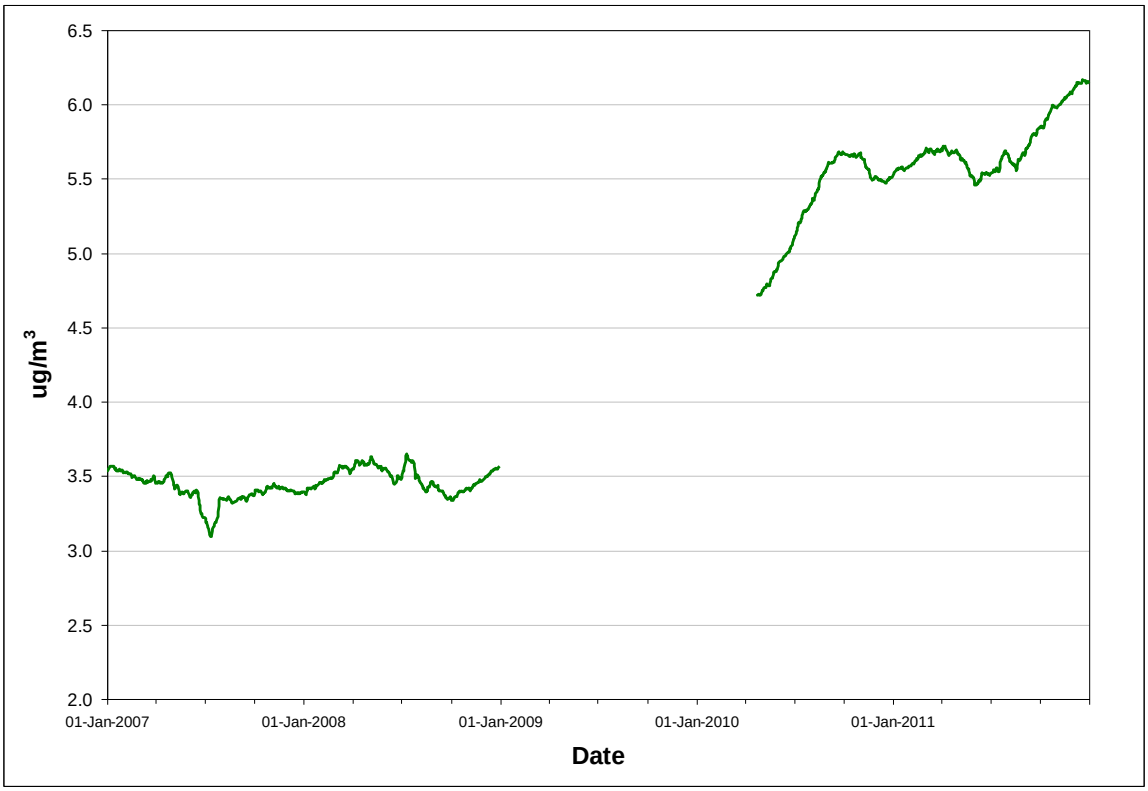

Rolling annual average of hourly concentrations

**TABLE 3.4.2 - CORNER BROOK NAPS $PM_{2.5}$ SUMMARY 2010 & 2011**

| Year | Month | # Valid Days | % Valid Days | Average | Maximum 24-Hour | Regulatory Exceedances (>25 µg/m$^3$) |
|---|---|---|---|---|---|---|
| 2010 | January | 31 | 100.0% | 3.9 | 10.0 | 0 |
| | February | 28 | 100.0% | 3.8 | 7.5 | 0 |
| | March | 31 | 100.0% | 5.5 | 10.5 | 0 |
| | April | 30 | 100.0% | 5.4 | 9.3 | 0 |
| | May | 31 | 100.0% | 6.5 | 10.6 | 0 |
| | June | 30 | 100.0% | 7.1 | 12.0 | 0 |
| | July | 22 | 71.0% | 8.3 | 11.6 | 0 |
| | August | 31 | 100.0% | 8.0 | 13.3 | 0 |
| | September | 30 | 100.0% | 5.6 | 12.1 | 0 |
| | October | 31 | 100.0% | 5.1 | 8.4 | 0 |
| | November | 30 | 100.0% | 4.1 | 6.3 | 0 |
| | December | 31 | 100.0% | 3.6 | 5.9 | 0 |
| Annual | | 356 | 97.5% | 5.5 | 13.3 | 0 |
| 2011 | January | 22 | 71.0% | 4.3 | 7.0 | 0 |
| | February | 28 | 100.0% | 4.8 | 7.3 | 0 |
| | March | 29 | 93.5% | 5.7 | 10.8 | 0 |
| | April | 30 | 100.0% | 5.2 | 11.3 | 0 |
| | May | 31 | 100.0% | 4.5 | 9.7 | 0 |
| | June | 28 | 93.3% | 7.5 | 15.3 | 0 |
| | July | 31 | 100.0% | 9.1 | 17.1 | 0 |
| | August | 31 | 100.0% | 8.1 | 15.8 | 0 |
| | September | 30 | 100.0% | 7.6 | 15.1 | 0 |
| | October | 31 | 100.0% | 6.7 | 11.6 | 0 |
| | November | 14 | 46.7% | 4.4 | 6.5 | 0 |
| | December | 30 | 96.8% | 4.1 | 11.9 | 0 |
| Annual | | 335 | 91.8% | 6.1 | 17.1 | 0 |

Observations in ug/m$^3$

**FIGURE 3.4.2 - CORNER BROOK NAPS ANNUAL $PM_{2.5}$ CONCENTRATIONS**



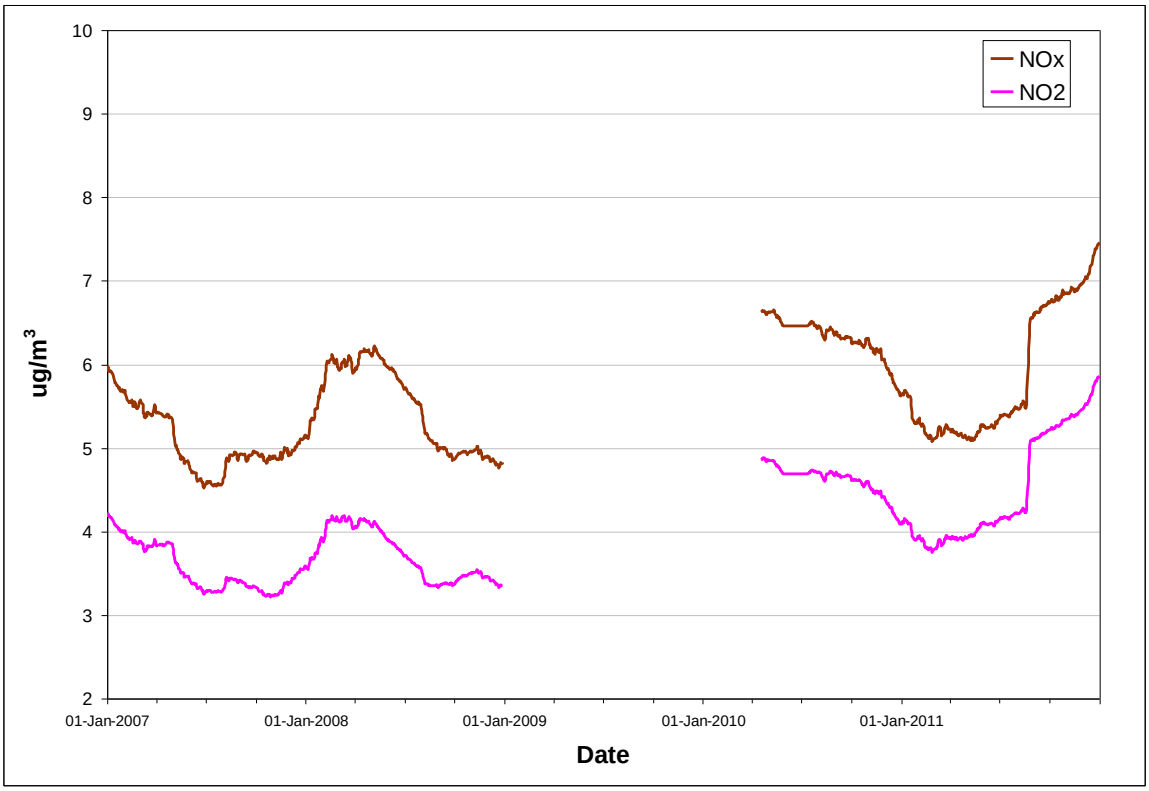

Rolling annual average of hourly concentrations

**TABLE 3.4.3 - CORNER BROOK NAPS $NO_X$ / $NO_2$ SUMMARY 2010 & 2011**

| Year | Month | # Valid Hours | % Valid Hours | Average | | Maximums 1-Hour | | Maximums 24-Hour | | Exceedances 1-Hour | Exceedances 24-Hour |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | $NO_x$ | $NO_2$ | $NO_x$ | $NO_2$ | $NO_x$ | $NO_2$ | (>400) | (>200) |
| 2010 | January | 743 | 99.9% | 8.6 | 6.6 | 123.0 | 55.8 | 37.9 | 27.6 | 0 | 0 |
| | February | 672 | 100.0% | 8.8 | 7.0 | 116.6 | 59.4 | 20.8 | 15.6 | 0 | 0 |
| | March | 686 | 92.2% | 4.3 | 3.2 | 103.6 | 51.9 | 21.5 | 14.4 | 0 | 0 |
| | April | 691 | 96.0% | 5.3 | 3.8 | 64.7 | 42.3 | 12.0 | 9.9 | 0 | 0 |
| | May | 513 | 69.0% | 4.4 | 2.5 | 66.0 | 39.3 | 15.0 | 8.6 | 0 | 0 |
| | June | 0 | 0.0% | | | | | | | | |
| | July | 188 | 25.3% | 5.5 | 3.9 | 42.3 | 20.3 | 9.3 | 6.3 | 0 | 0 |
| | August | 606 | 81.5% | 5.7 | 4.0 | 73.5 | 58.3 | 24.5 | 16.4 | 0 | 0 |
| | September | 713 | 99.0% | 4.5 | 3.2 | 52.7 | 34.4 | 12.4 | 9.7 | 0 | 0 |
| | October | 741 | 99.6% | 5.7 | 3.4 | 108.5 | 30.5 | 18.9 | 8.3 | 0 | 0 |
| | November | 696 | 96.7% | 5.6 | 4.3 | 92.1 | 43.8 | 22.7 | 14.8 | 0 | 0 |
| | December | 740 | 99.5% | 3.2 | 2.5 | 60.5 | 32.7 | 13.9 | 9.6 | 0 | 0 |
| Annual | | 6989 | 79.8% | 5.6 | 4.1 | 123.0 | 59.4 | 37.9 | 27.6 | 0 | 0 |
| 2011 | January | 741 | 99.6% | 5.9 | 5.3 | 71.6 | 55.2 | 17.8 | 14.7 | 0 | 0 |
| | February | 662 | 98.5% | 6.3 | 5.3 | 127.6 | 62.6 | 17.6 | 13.0 | 0 | 0 |
| | March | 691 | 92.9% | 5.6 | 4.8 | 73.0 | 50.4 | 25.3 | 19.5 | 0 | 0 |
| | April | 716 | 99.4% | 4.3 | 3.7 | 52.4 | 35.5 | 9.6 | 8.0 | 0 | 0 |
| | May | 744 | 100.0% | 6.1 | 4.8 | 77.6 | 52.4 | 17.6 | 12.3 | 0 | 0 |
| | June | 619 | 86.0% | 6.2 | 4.5 | 44.9 | 33.3 | 22.1 | 17.9 | 0 | 0 |
| | July | 741 | 99.6% | 6.8 | 5.0 | 53.5 | 35.3 | 16.4 | 11.2 | 0 | 0 |
| | August | 737 | 99.1% | 18.5 | 14.3 | 99.7 | 68.0 | 68.4 | 60.6 | 0 | 0 |
| | September | 719 | 99.9% | 6.4 | 4.5 | 40.1 | 28.4 | 15.5 | 10.7 | 0 | 0 |
| | October | 740 | 99.5% | 7.0 | 5.0 | 152.1 | 30.0 | 21.6 | 11.2 | 0 | 0 |
| | November | 714 | 99.2% | 7.0 | 5.7 | 71.7 | 36.5 | 17.6 | 12.8 | 0 | 0 |
| | December | 739 | 99.3% | 8.9 | 7.1 | 171.7 | 63.4 | 38.1 | 28.5 | 0 | 0 |
| Annual | | 8563 | 97.8% | 7.5 | 5.9 | 171.7 | 68.0 | 68.4 | 60.6 | 0 | 0 |

Observations in $ug/m^3$

**FIGURE 3.4.3 - CORNER BROOK NAPS ANNUAL $NO_X$ / $NO_2$ CONCENTRATIONS**



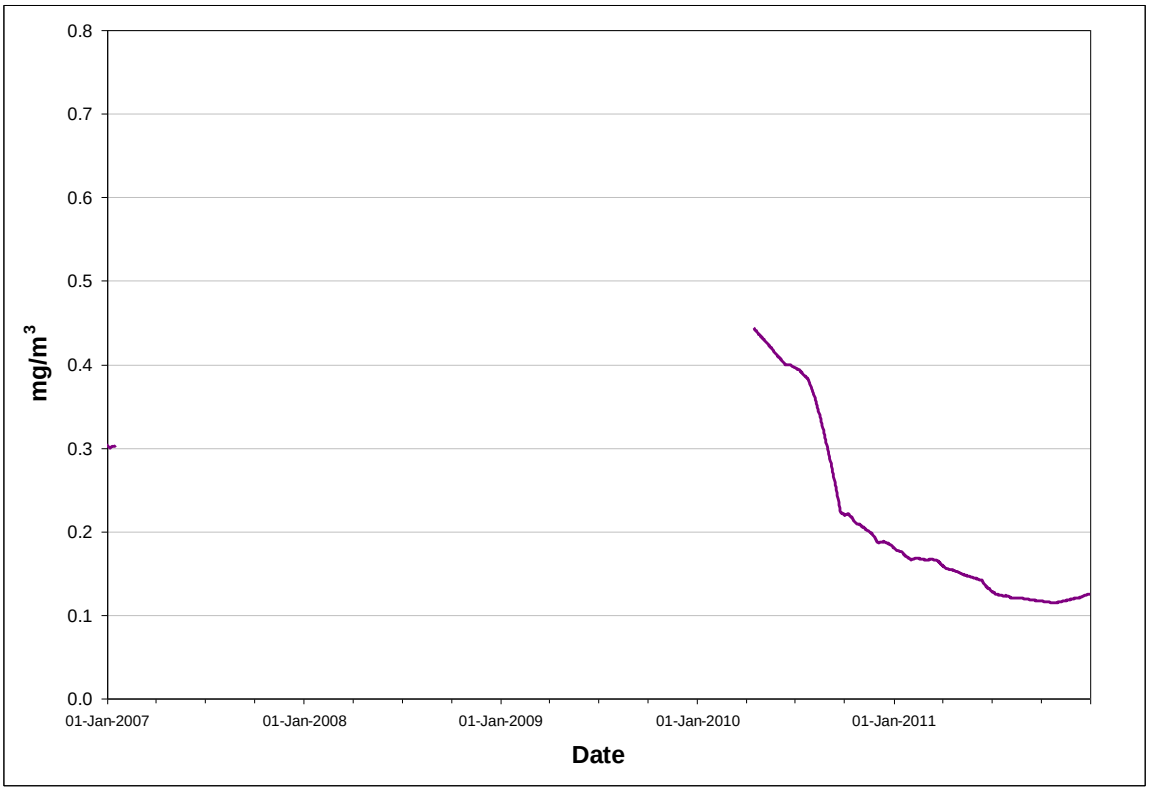

Rolling annual average of hourly concentrations

**TABLE 3.4.4 - CORNER BROOK NAPS CO SUMMARY 2010 & 2011**

| Year | Month | # Valid Hours | % Valid Hours | Average | Maximum 1-Hour | Maximum 8-Hour | Regulatory Exceedances 1-Hour (>35) | Regulatory Exceedances 8-Hour (>15) |
|---|---|---|---|---|---|---|---|---|
| 2010 | January | 743 | 99.9% | 0.3 | 1.1 | 0.6 | 0 | 0 |
| | February | 672 | 100.0% | 0.2 | 0.6 | 0.5 | 0 | 0 |
| | March | 739 | 99.3% | 0.2 | 0.8 | 0.4 | 0 | 0 |
| | April | 712 | 98.9% | 0.2 | 0.5 | 0.4 | 0 | 0 |
| | May | 740 | 99.5% | 0.2 | 0.3 | 0.3 | 0 | 0 |
| | June | 713 | 99.0% | 0.3 | 2.5 | 1.2 | 0 | 0 |
| | July | 552 | 74.2% | 0.2 | 0.7 | 0.6 | 0 | 0 |
| | August | 734 | 98.7% | 0.1 | 1.7 | 0.3 | 0 | 0 |
| | September | 713 | 99.0% | 0.1 | 0.2 | 0.2 | 0 | 0 |
| | October | 741 | 99.6% | 0.1 | 0.5 | 0.2 | 0 | 0 |
| | November | 715 | 99.3% | 0.1 | 0.6 | 0.2 | 0 | 0 |
| | December | 739 | 99.3% | 0.1 | 0.7 | 0.4 | 0 | 0 |
| Annual | | 8513 | 97.2% | 0.2 | 2.5 | 1.2 | 0 | 0 |
| 2011 | January | 741 | 99.6% | 0.1 | 0.5 | 0.3 | 0 | 0 |
| | February | 669 | 99.6% | 0.2 | 0.6 | 0.3 | 0 | 0 |
| | March | 741 | 99.6% | 0.2 | 0.7 | 0.3 | 0 | 0 |
| | April | 713 | 99.0% | 0.1 | 0.4 | 0.2 | 0 | 0 |
| | May | 744 | 100.0% | 0.1 | 0.4 | 0.2 | 0 | 0 |
| | June | 719 | 99.9% | 0.1 | 0.5 | 0.2 | 0 | 0 |
| | July | 742 | 99.7% | 0.1 | 0.3 | 0.2 | 0 | 0 |
| | August | 738 | 99.2% | 0.1 | 0.2 | 0.2 | 0 | 0 |
| | September | 719 | 99.9% | 0.1 | 0.3 | 0.2 | 0 | 0 |
| | October | 738 | 99.2% | 0.1 | 0.5 | 0.2 | 0 | 0 |
| | November | 710 | 98.6% | 0.2 | 0.5 | 0.3 | 0 | 0 |
| | December | 738 | 99.2% | 0.2 | 0.9 | 0.6 | 0 | 0 |
| Annual | | 8712 | 99.5% | 0.1 | 0.9 | 0.6 | 0 | 0 |

Observations in $mg/m^3$

**FIGURE 3.4.4 - CORNER BROOK NAPS ANNUAL CO CONCENTRATIONS**



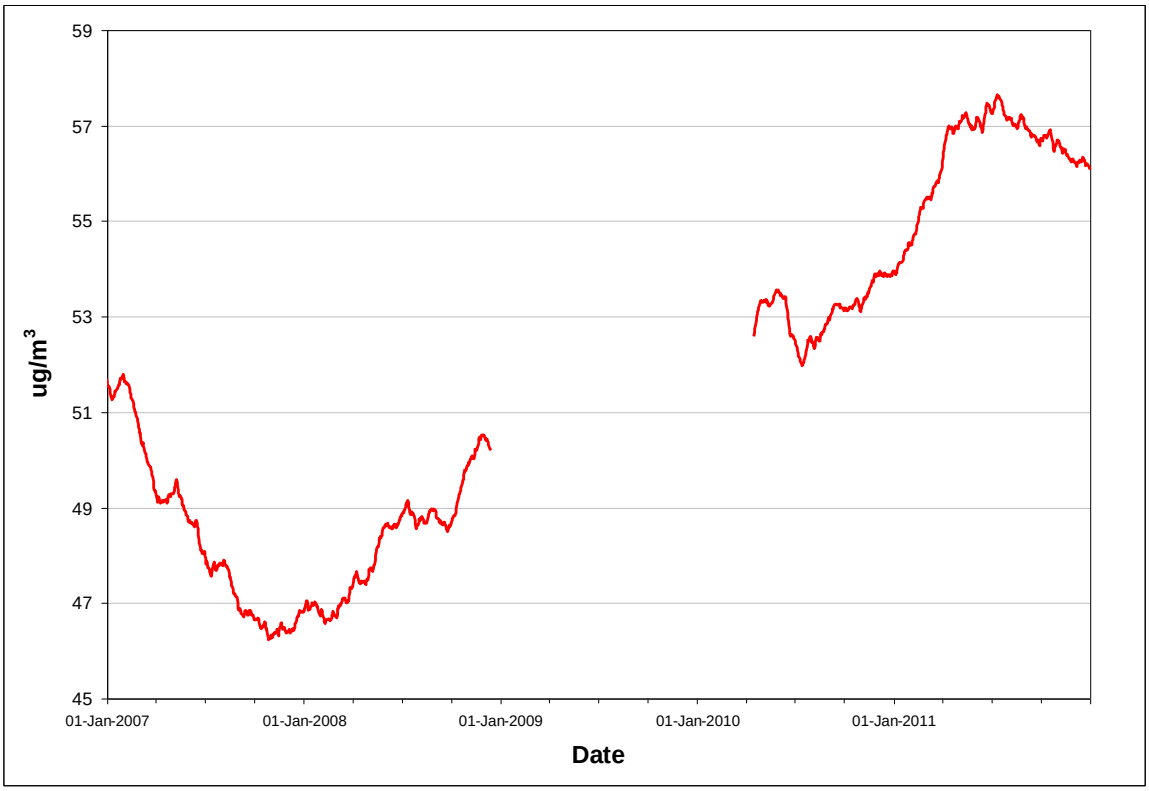

Rolling annual average of hourly concentrations

**TABLE 3.4.5 - CORNER BROOK NAPS $O_3$ SUMMARY 2010 & 2011**

| Year | Month | # Valid Hours | % Valid Hours | Average | Maximum 1-Hour | Maximum 8-Hour | Regulatory Exceedances 1-Hour (>160) | Regulatory Exceedances 8-Hour (>87) |
|---|---|---|---|---|---|---|---|---|
| 2010 | January | 743 | 99.9% | 60.7 | 85.3 | 83.5 | 0 | 0 |
| | February | 671 | 99.9% | 65.2 | 89.1 | 82.4 | 0 | 0 |
| | March | 743 | 99.9% | 68.8 | 88.5 | 87.3 | 0 | 1 |
| | April | 713 | 99.0% | 65.3 | 92.4 | 87.0 | 0 | 1 |
| | May | 738 | 99.2% | 55.7 | 93.4 | 81.6 | 0 | 0 |
| | June | 703 | 97.6% | 41.2 | 89.1 | 79.8 | 0 | 0 |
| | July | 552 | 74.2% | 40.5 | 96.5 | 75.1 | 0 | 0 |
| | August | 740 | 99.5% | 40.9 | 82.4 | 71.2 | 0 | 0 |
| | September | 715 | 99.3% | 41.9 | 87.7 | 67.0 | 0 | 0 |
| | October | 741 | 99.6% | 43.7 | 80.8 | 76.1 | 0 | 0 |
| | November | 715 | 99.3% | 59.0 | 85.3 | 83.5 | 0 | 0 |
| | December | 740 | 99.5% | 61.5 | 81.8 | 80.4 | 0 | 0 |
| Annual | | 8514 | 97.2% | 54.0 | 96.5 | 87.3 | 0 | 2 |
| 2011 | January | 741 | 99.6% | 66.9 | 84.5 | 82.1 | 0 | 0 |
| | February | 669 | 99.6% | 77.3 | 100.4 | 97.7 | 0 | 2 |
| | March | 738 | 99.2% | 76.7 | 98.7 | 95.4 | 0 | 7 |
| | April | 718 | 99.7% | 74.9 | 110.2 | 104.5 | 0 | 15 |
| | May | 744 | 100.0% | 55.8 | 105.0 | 89.6 | 0 | 2 |
| | June | 719 | 99.9% | 45.8 | 100.7 | 88.1 | 0 | 1 |
| | July | 742 | 99.7% | 43.0 | 105.4 | 88.7 | 0 | 1 |
| | August | 574 | 77.2% | 35.3 | 66.3 | 53.0 | 0 | 0 |
| | September | 719 | 99.9% | 37.1 | 98.2 | 87.4 | 0 | 1 |
| | October | 739 | 99.3% | 44.2 | 86.8 | 82.8 | 0 | 0 |
| | November | 716 | 99.4% | 53.6 | 79.9 | 76.3 | 0 | 0 |
| | December | 739 | 99.3% | 59.5 | 79.0 | 76.8 | 0 | 0 |
| Annual | | 8558 | 97.7% | 56.1 | 110.2 | 104.5 | 0 | 29 |

Observations in $ug/m^3$

**FIGURE 3.4.5 - CORNER BROOK NAPS ANNUAL $O_3$ CONCENTRATIONS**

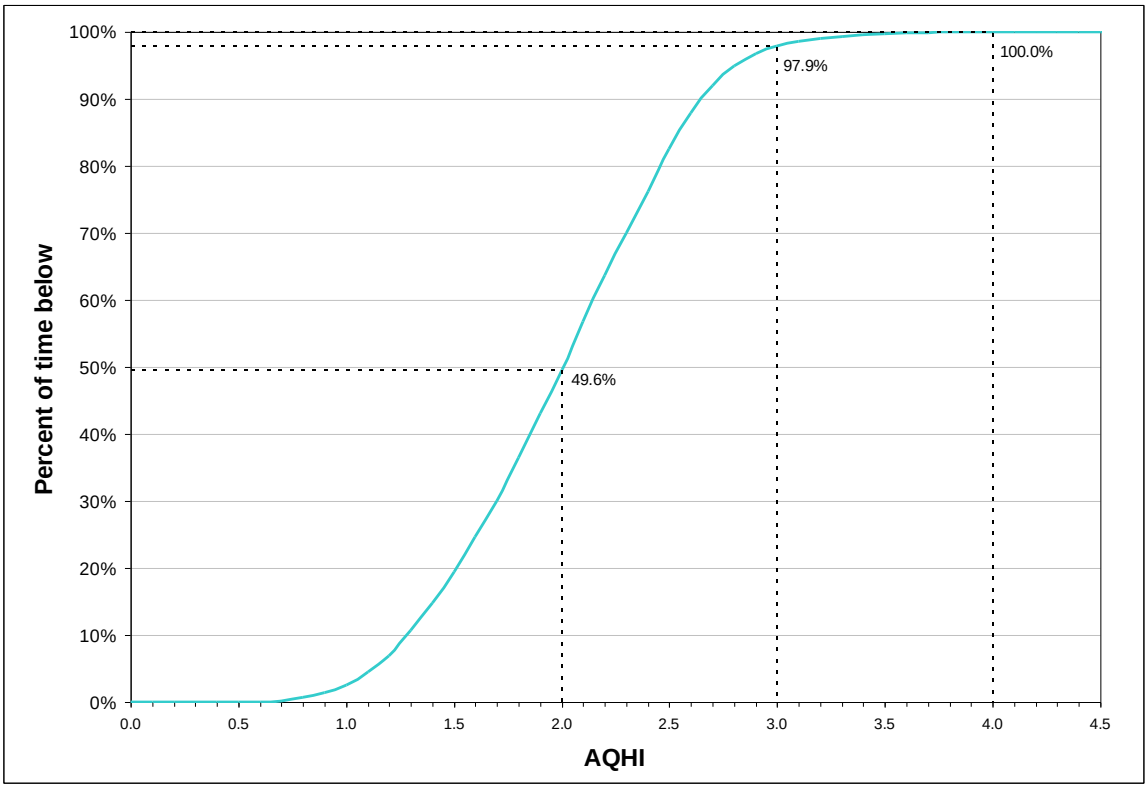



Rolling annual average of hourly concentrations

**TABLE 3.4.6 - CORNER BROOK NAPS AQHI SUMMARY 2010 & 2011**

| Year | Month | # Valid Hours | % Valid Hours | Average | Maximum 1-Hour |
|---|---|---|---|---|---|
| 2010 | January | 739 | 99.3% | 2.1 | 3.9 |
| | February | 670 | 99.7% | 2.2 | 3.1 |
| | March | 687 | 92.3% | 2.2 | 3.7 |
| | April | 690 | 95.8% | 2.2 | 3.6 |
| | May | 515 | 69.2% | 1.9 | 3.2 |
| | June | 0 | 0.0% | | |
| | July | 187 | 25.1% | 1.7 | 3.2 |
| | August | 607 | 81.6% | 1.6 | 4.1 |
| | September | 713 | 99.0% | 1.5 | 2.9 |
| | October | 742 | 99.7% | 1.6 | 2.5 |
| | November | 694 | 96.4% | 2.0 | 2.7 |
| | December | 742 | 99.7% | 1.9 | 3.0 |
| Annual | | 6986 | 79.7% | 1.9 | 4.1 |
| 2011 | January | 537 | 72.2% | 2.2 | 2.9 |
| | February | 662 | 98.5% | 2.5 | 3.6 |
| | March | 663 | 89.1% | 2.5 | 3.5 |
| | April | 717 | 99.6% | 2.4 | 4.0 |
| | May | 742 | 99.7% | 1.9 | 4.0 |
| | June | 587 | 81.5% | 1.8 | 3.1 |
| | July | 744 | 100.0% | 1.8 | 3.6 |
| | August | 573 | 77.0% | 1.5 | 3.1 |
| | September | 720 | 100.0% | 1.5 | 3.5 |
| | October | 736 | 98.9% | 1.7 | 2.9 |
| | November | 367 | 51.0% | 1.9 | 2.9 |
| | December | 730 | 98.1% | 2.1 | 3.8 |
| Annual | | 7778 | 88.8% | 2.0 | 4.0 |

**FIGURE 3.4.6 - CORNER BROOK NAPS AQHI FREQUENCY DISTRIBUTION** 2011




e.g. 97.9% of the time the AQHI recorded was below 3.0

## 3.5 Port aux Choix

The Port aux Choix NAPS monitoring station was relocated from the Ferolle Point location in 2010 due to logistical issues. The station monitors the ambient levels of $O_3$ on a continuous basis.

The 8-hour ambient air standard for $O_3$ was exceeded eight times in 2011. Table 3.5.1 presents the summary information on the level of $O_3$ measured at the Port aux Choix NAPS station. A graphical representation of the annual trend of $O_3$ is not presented owing to the limited data.

**TABLE 3.5.1 - PORT AUX CHOIX NAPS $O_3$ SUMMARY 2011**

| Year | Month | # Valid Hours | % Valid Hours | Average | Maximum 1-Hour | Maximum 8-Hour | Regulatory Exceedances 1-Hour (>160) | Regulatory Exceedances 8-Hour (>87) |
|---|---|---|---|---|---|---|---|---|
| | January | 0 | 0.0% | | | | | |
| | February | 0 | 0.0% | | | | | |
| | March | 0 | 0.0% | | | | | |
| | April | 0 | 0.0% | | | | | |
| | May | 0 | 0.0% | | | | | |
| 2010 | June | 366 | 50.8% | 52.0 | 80.4 | 78.0 | 0 | 0 |
| | July | 741 | 99.6% | 44.7 | 96.1 | 81.7 | 0 | 0 |
| | August | 725 | 97.4% | 45.8 | 102.0 | 86.3 | 0 | 0 |
| | September | 221 | 30.7% | 43.8 | 58.9 | 56.2 | 0 | 0 |
| | October | 743 | 99.9% | 47.5 | 78.5 | 75.8 | 0 | 0 |
| | November | 720 | 100.0% | 57.2 | 74.6 | 73.3 | 0 | 0 |
| | December | 744 | 100.0% | 63.2 | 80.4 | 75.3 | 0 | 0 |
| Annual | | 4260 | 48.6% | 51.3 | 102.0 | 86.3 | 0 | 0 |
| | January | 597 | 80.2% | 67.7 | 78.5 | 76.0 | 0 | 0 |
| | February | 365 | 54.3% | 72.2 | 82.4 | 81.2 | 0 | 0 |
| | March | 0 | 0.0% | | | | | |
| | April | 84 | 11.7% | 69.4 | 92.2 | 86.8 | 0 | 0 |
| | May | 744 | 100.0% | 68.7 | 104.0 | 97.4 | 0 | 7 |
| 2011 | June | 682 | 94.7% | 55.5 | 92.2 | 78.5 | 0 | 0 |
| | July | 403 | 54.2% | 55.9 | 96.1 | 86.3 | 0 | 0 |
| | August | 489 | 65.7% | 47.5 | 85.0 | 80.8 | 0 | 0 |
| | September | 584 | 81.1% | 44.3 | 92.6 | 83.3 | 0 | 0 |
| | October | 722 | 97.0% | 47.2 | 89.0 | 87.5 | 0 | 1 |
| | November | 718 | 99.7% | 56.6 | 77.0 | 74.0 | 0 | 0 |
| | December | 721 | 96.9% | 65.3 | 82.0 | 78.8 | 0 | 0 |
| Annual | | 6109 | 69.7% | 58.1 | 104.0 | 97.4 | 0 | 8 |

# 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 five monitoring networks operated by industry in 2011 and another three 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 within a given network.

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

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

## 4.1 NALCOR - Holyrood

In 2011, NALCOR operated monitoring stations at 6 locations in the Holyrood area. 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

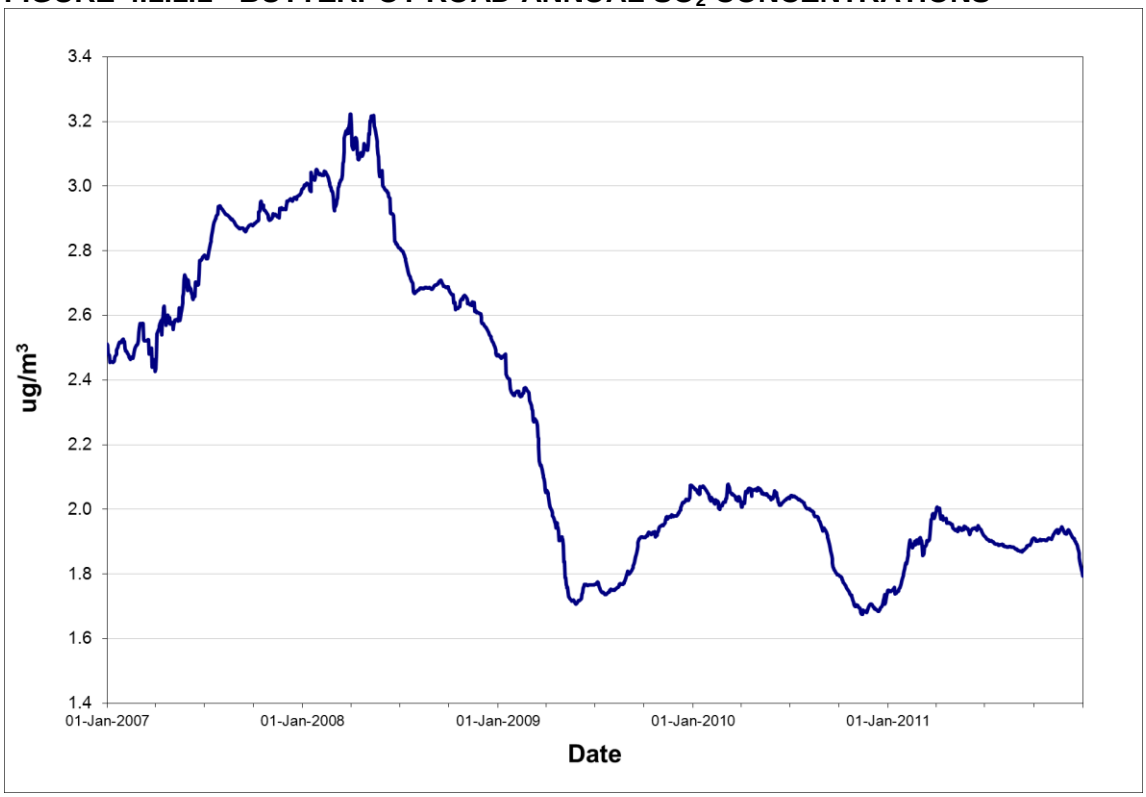
The Butterpot Road station monitors the ambient levels of $SO_2$, $NO_x$ / $NO_2$ and $PM_{2.5}$ on a continuous basis. For all pollutants, the ambient air criteria were not exceeded on any occasion in 2011. Tables 4.1.1.1 through 4.1.1.4 provide summary information on the level of air contaminants measured 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 $SO_2$ SUMMARY 2010 & 2011**

| Year | Month | # Valid Hours | % Valid Hours | Average | Maximum 1-Hour | Maximum 3-Hour | Maximum 24-Hour | Regulatory Exceedances 1-Hour (>900) | Regulatory Exceedances 3-Hour (>600) | Regulatory Exceedances 24-Hour (>300) |
|---|---|---|---|---|---|---|---|---|---|---|
| 2010 | January | 713 | 95.8% | 1.7 | 44.0 | 26.6 | 9.8 | 0 | 0 | 0 |
| | February | 614 | 91.4% | 1.7 | 44.3 | 18.7 | 6.0 | 0 | 0 | 0 |
| | March | 713 | 95.8% | 2.1 | 46.3 | 32.6 | 10.8 | 0 | 0 | 0 |
| | April | 689 | 95.7% | 2.7 | 71.0 | 34.7 | 10.0 | 0 | 0 | 0 |
| | May | 666 | 89.5% | 1.6 | 31.3 | 16.6 | 5.1 | 0 | 0 | 0 |
| | June | 665 | 92.4% | 1.8 | 73.4 | 30.6 | 5.1 | 0 | 0 | 0 |
| | July | 711 | 95.6% | 1.4 | 3.9 | 2.9 | 1.9 | 0 | 0 | 0 |
| | August | 707 | 95.0% | 1.1 | 4.7 | 3.4 | 1.6 | 0 | 0 | 0 |
| | September | 684 | 95.0% | 1.0 | 4.8 | 3.2 | 2.0 | 0 | 0 | 0 |
| | October | 707 | 95.0% | 1.3 | 24.2 | 13.3 | 3.1 | 0 | 0 | 0 |
| | November | 683 | 94.9% | 1.6 | 37.7 | 25.5 | 6.4 | 0 | 0 | 0 |
| | December | 710 | 95.4% | 2.9 | 18.6 | 13.6 | 5.6 | 0 | 0 | 0 |
| Annual | | 8262 | 94.3% | 1.7 | 73.4 | 34.7 | 10.8 | 0 | 0 | 0 |
| 2011 | January | 712 | 95.7% | 2.4 | 19.7 | 9.9 | 4.1 | 0 | 0 | 0 |
| | February | 638 | 94.9% | 3.0 | 29.5 | 20.1 | 6.0 | 0 | 0 | 0 |
| | March | 710 | 95.4% | 3.1 | 33.8 | 18.7 | 9.5 | 0 | 0 | 0 |
| | April | 667 | 92.6% | 2.2 | 16.5 | 10.5 | 4.6 | 0 | 0 | 0 |
| | May | 713 | 95.8% | 1.4 | 34.3 | 17.0 | 4.8 | 0 | 0 | 0 |
| | June | 570 | 79.2% | 1.5 | 35.9 | 20.2 | 5.6 | 0 | 0 | 0 |
| | July | 711 | 95.6% | 1.1 | 2.9 | 1.8 | 1.5 | 0 | 0 | 0 |
| | August | 706 | 94.9% | 0.9 | 2.5 | 1.7 | 1.3 | 0 | 0 | 0 |
| | September | 688 | 95.6% | 1.5 | 5.9 | 4.6 | 2.4 | 0 | 0 | 0 |
| | October | 710 | 95.4% | 1.3 | 14.1 | 7.9 | 2.5 | 0 | 0 | 0 |
| | November | 686 | 95.3% | 1.8 | 13.1 | 7.1 | 3.0 | 0 | 0 | 0 |
| | December | 709 | 95.3% | 1.4 | 22.2 | 9.1 | 3.4 | 0 | 0 | 0 |
| Annual | | 8220 | 93.8% | 1.8 | 35.9 | 20.2 | 9.5 | 0 | 0 | 0 |

Observations in $ug/m^3$

**FIGURE 4.1.1.1 - BUTTERPOT ROAD ANNUAL $SO_2$ CONCENTRATIONS**



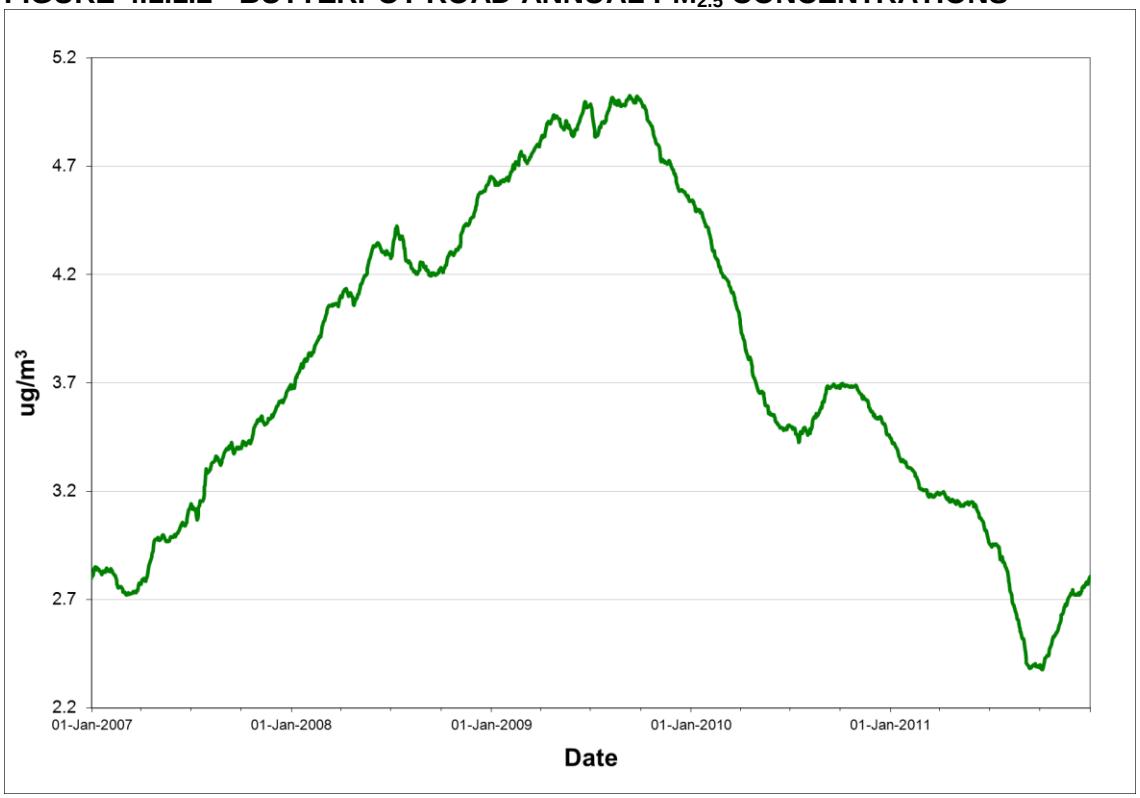

Rolling annual average of hourly concentrations

**TABLE 4.1.1.2 - BUTTERPOT ROAD $PM_{2.5}$ SUMMARY 2010 & 2011**

| Year | Month | # Valid Days | % Valid Days | Average | Maximum 24-Hour | Regulatory Exceedances (>25 µg/m$^3$) |
|---|---|---|---|---|---|---|
| 2010 | January | 31 | 100.0% | 3.2 | 6.5 | 0 |
| | February | 28 | 100.0% | 2.8 | 7.2 | 0 |
| | March | 31 | 100.0% | 3.2 | 5.8 | 0 |
| | April | 30 | 100.0% | 3.2 | 7.5 | 0 |
| | May | 31 | 100.0% | 3.3 | 6.1 | 0 |
| | June | 28 | 93.3% | 4.3 | 8.4 | 0 |
| | July | 27 | 87.1% | 4.8 | 15.2 | 0 |
| | August | 31 | 100.0% | 5.7 | 13.3 | 0 |
| | September | 26 | 86.7% | 4.3 | 14.8 | 0 |
| | October | 30 | 96.8% | 2.3 | 6.9 | 0 |
| | November | 29 | 96.7% | 1.6 | 4.8 | 0 |
| | December | 28 | 90.3% | 2.8 | 8.1 | 0 |
| Annual | | 350 | 95.9% | 3.4 | 15.2 | 0 |
| 2011 | January | 29 | 93.5% | 1.6 | 4.3 | 0 |
| | February | 28 | 100.0% | 1.6 | 3.4 | 0 |
| | March | 25 | 80.6% | 2.8 | 6.4 | 0 |
| | April | 28 | 93.3% | 2.6 | 4.7 | 0 |
| | May | 31 | 100.0% | 3.4 | 5.5 | 0 |
| | June | 28 | 93.3% | 2.0 | 5.4 | 0 |
| | July | 30 | 96.8% | 3.3 | 8.5 | 0 |
| | August | 28 | 90.3% | 2.0 | 5.1 | 0 |
| | September | 26 | 86.7% | 2.7 | 5.1 | 0 |
| | October | 31 | 100.0% | 4.0 | 9.8 | 0 |
| | November | 30 | 100.0% | 3.8 | 8.1 | 0 |
| | December | 31 | 100.0% | 3.4 | 6.7 | 0 |
| Annual | | 345 | 94.5% | 2.8 | 9.8 | 0 |

Observations in ug/m$^3$

**FIGURE 4.1.1.2 - BUTTERPOT ROAD ANNUAL $PM_{2.5}$ CONCENTRATIONS**



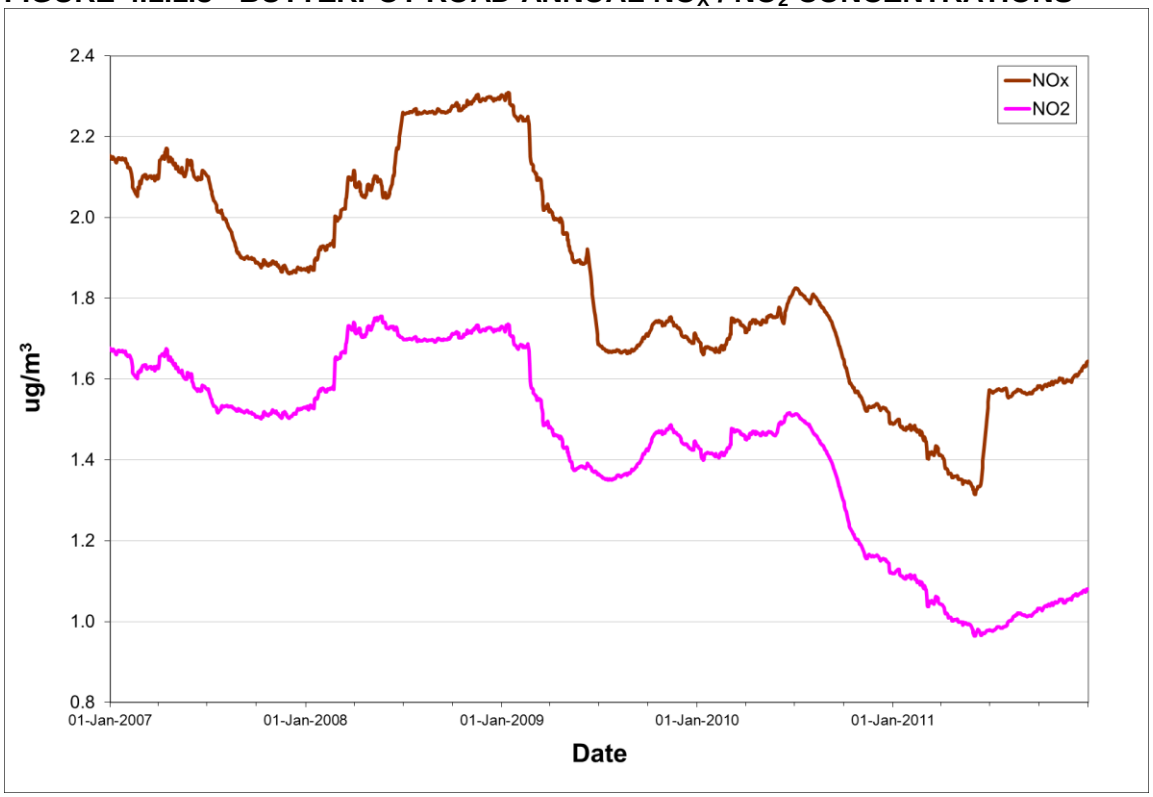

Rolling annual average of hourly concentrations

**TABLE 4.1.1.3 - BUTTERPOT ROAD $NO_X$ / $NO_2$ SUMMARY 2010 & 2011**

| Year | Month | # Valid Hours | % Valid Hours | Average $NO_x$ | Average $NO_2$ | Maximums 1-Hour $NO_x$ | Maximums 1-Hour $NO_2$ | Maximums 24-Hour $NO_x$ | Maximums 24-Hour $NO_2$ | Exceedances 1-Hour (>400) | Exceedances 24-Hour (>200) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 2010 | January | 682 | 91.7% | 1.4 | 1.2 | 39.3 | 35.4 | 6.8 | 6.0 | 0 | 0 |
| | February | 610 | 90.8% | 1.8 | 1.4 | 34.8 | 32.6 | 5.4 | 4.7 | 0 | 0 |
| | March | 682 | 91.7% | 2.1 | 1.8 | 32.2 | 28.9 | 10.1 | 9.4 | 0 | 0 |
| | April | 660 | 91.7% | 1.6 | 1.2 | 33.9 | 22.2 | 6.0 | 4.3 | 0 | 0 |
| | May | 680 | 91.4% | 1.6 | 1.3 | 23.4 | 12.9 | 5.3 | 3.5 | 0 | 0 |
| | June | 682 | 94.7% | 2.6 | 1.4 | 29.6 | 19.2 | 4.8 | 3.1 | 0 | 0 |
| | July | 713 | 95.8% | 0.9 | 0.8 | 5.0 | 4.6 | 1.9 | 1.6 | 0 | 0 |
| | August | 705 | 94.8% | 1.2 | 0.6 | 12.1 | 6.4 | 4.0 | 1.2 | 0 | 0 |
| | September | 690 | 95.8% | 0.9 | 0.7 | 7.9 | 4.3 | 1.5 | 1.2 | 0 | 0 |
| | October | 711 | 95.6% | 1.3 | 1.0 | 10.6 | 9.2 | 3.2 | 2.8 | 0 | 0 |
| | November | 655 | 91.0% | 1.5 | 1.1 | 19.5 | 12.6 | 3.8 | 3.2 | 0 | 0 |
| | December | 679 | 91.3% | 1.1 | 0.9 | 20.7 | 19.9 | 3.0 | 2.4 | 0 | 0 |
| Annual | | 8149 | 93.0% | 1.5 | 1.1 | 39.3 | 35.4 | 10.1 | 9.4 | 0 | 0 |
| 2011 | January | 682 | 91.7% | 1.3 | 1.1 | 17.4 | 15.0 | 3.8 | 3.4 | 0 | 0 |
| | February | 610 | 90.8% | 1.4 | 1.1 | 33.3 | 20.7 | 3.7 | 2.8 | 0 | 0 |
| | March | 679 | 91.3% | 1.6 | 1.3 | 18.5 | 16.0 | 6.2 | 5.2 | 0 | 0 |
| | April | 634 | 88.1% | 0.9 | 0.8 | 7.5 | 6.2 | 1.8 | 1.4 | 0 | 0 |
| | May | 681 | 91.5% | 1.2 | 0.9 | 23.2 | 12.2 | 4.2 | 3.1 | 0 | 0 |
| | June | 686 | 95.3% | 5.6 | 1.5 | 24.1 | 16.0 | 9.6 | 3.9 | 0 | 0 |
| | July | 713 | 95.8% | 1.0 | 0.9 | 12.6 | 6.1 | 2.2 | 1.8 | 0 | 0 |
| | August | 709 | 95.3% | 1.0 | 0.9 | 9.7 | 4.4 | 1.8 | 1.7 | 0 | 0 |
| | September | 687 | 95.4% | 1.0 | 0.9 | 6.3 | 5.7 | 1.5 | 1.3 | 0 | 0 |
| | October | 710 | 95.4% | 1.5 | 1.2 | 19.8 | 14.9 | 2.8 | 2.3 | 0 | 0 |
| | November | 660 | 91.7% | 1.5 | 1.2 | 6.4 | 6.2 | 2.4 | 2.1 | 0 | 0 |
| | December | 680 | 91.4% | 1.7 | 1.2 | 13.9 | 12.8 | 4.0 | 3.0 | 0 | 0 |
| Annual | | 8131 | 92.8% | 1.6 | 1.1 | 33.3 | 20.7 | 9.6 | 5.2 | 0 | 0 |

Observations in $ug/m^3$

**FIGURE 4.1.1.3 - BUTTERPOT ROAD ANNUAL $NO_X$ / $NO_2$ CONCENTRATIONS**




Rolling annual average of hourly concentrations

## 4.1.2 Green Acres Road

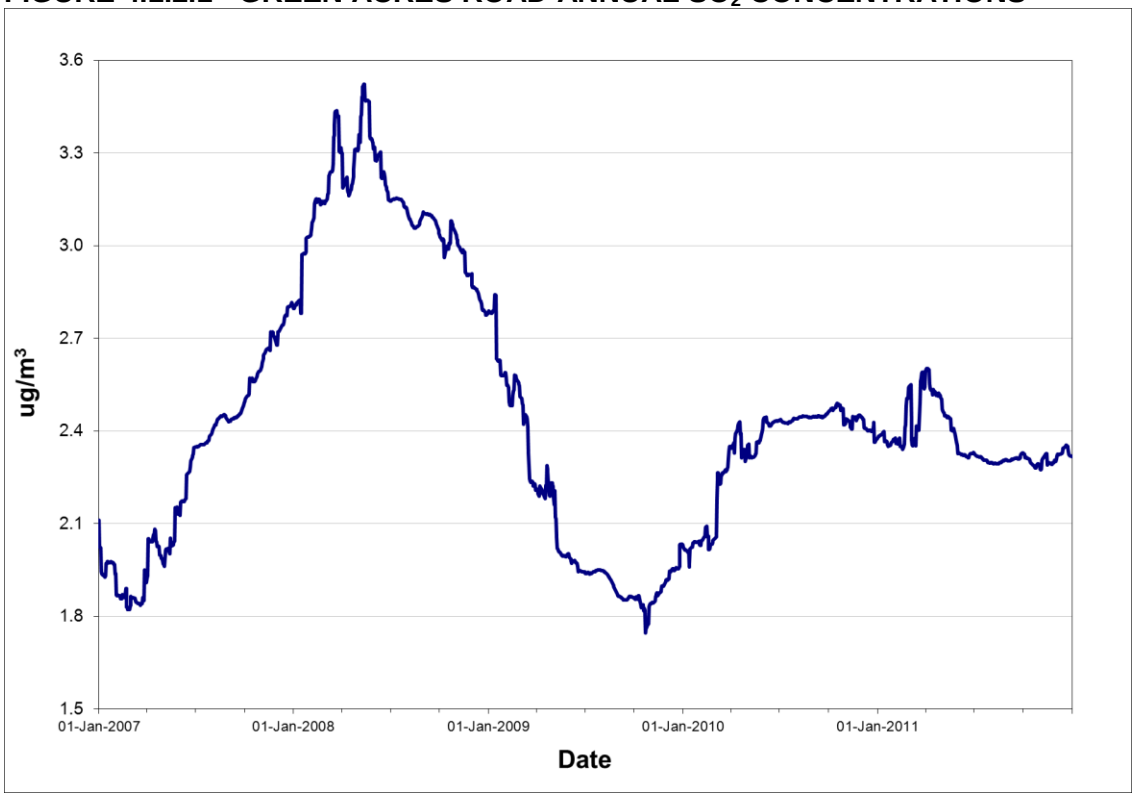
The Green Acres Road station monitors the ambient levels of $SO_2$, $NO_x$ / $NO_2$, $PM_{2.5}$ on a continuous basis and TSP on a 1 day in 6 day cycle consistent with the NAPS defined schedule. For all pollutants, the ambient air criteria were not exceeded on any occasion in 2011. Tables 4.1.2.1 through 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 $SO_2$ SUMMARY 2010 & 2011**

| Year | Month | # Valid Hours | % Valid Hours | Average | Maximum 1-Hour | Maximum 3-Hour | Maximum 24-Hour | Regulatory Exceedances 1-Hour (>900) | Regulatory Exceedances 3-Hour (>600) | Regulatory Exceedances 24-Hour (>300) |
|---|---|---|---|---|---|---|---|---|---|---|
| 2010 | January | 712 | 95.7% | 2.4 | 76.9 | 48.5 | 19.1 | 0 | 0 | 0 |
| | February | 624 | 92.9% | 2.9 | 75.8 | 43.9 | 11.3 | 0 | 0 | 0 |
| | March | 705 | 94.8% | 5.4 | 146.7 | 132.9 | 45.6 | 0 | 0 | 0 |
| | April | 690 | 95.8% | 3.1 | 236.4 | 106.0 | 18.2 | 0 | 0 | 0 |
| | May | 713 | 95.8% | 3.4 | 138.5 | 90.9 | 14.8 | 0 | 0 | 0 |
| | June | 683 | 94.9% | 1.3 | 18.6 | 14.8 | 3.2 | 0 | 0 | 0 |
| | July | 708 | 95.2% | 1.5 | 4.2 | 3.8 | 2.3 | 0 | 0 | 0 |
| | August | 713 | 95.8% | 1.0 | 3.8 | 3.0 | 1.8 | 0 | 0 | 0 |
| | September | 684 | 95.0% | 1.2 | 3.9 | 3.8 | 2.9 | 0 | 0 | 0 |
| | October | 713 | 95.8% | 2.0 | 39.8 | 24.8 | 4.8 | 0 | 0 | 0 |
| | November | 690 | 95.8% | 2.4 | 171.1 | 84.0 | 15.9 | 0 | 0 | 0 |
| | December | 703 | 94.5% | 1.9 | 40.9 | 24.6 | 6.3 | 0 | 0 | 0 |
| Annual | | 8338 | 95.2% | 2.4 | 236.4 | 132.9 | 45.6 | 0 | 0 | 0 |
| 2011 | January | 713 | 95.8% | 2.3 | 95.5 | 34.3 | 6.9 | 0 | 0 | 0 |
| | February | 644 | 95.8% | 5.0 | 150.4 | 103.3 | 24.7 | 0 | 0 | 0 |
| | March | 705 | 94.8% | 6.1 | 180.1 | 96.7 | 27.3 | 0 | 0 | 0 |
| | April | 667 | 92.6% | 2.0 | 51.6 | 26.4 | 8.8 | 0 | 0 | 0 |
| | May | 712 | 95.7% | 1.3 | 25.0 | 17.5 | 4.5 | 0 | 0 | 0 |
| | June | 682 | 94.7% | 1.3 | 36.6 | 23.9 | 4.6 | 0 | 0 | 0 |
| | July | 713 | 95.8% | 1.1 | 6.1 | 4.6 | 2.0 | 0 | 0 | 0 |
| | August | 712 | 95.7% | 1.2 | 4.1 | 2.2 | 1.7 | 0 | 0 | 0 |
| | September | 683 | 94.9% | 1.5 | 7.2 | 4.8 | 3.4 | 0 | 0 | 0 |
| | October | 713 | 95.8% | 1.6 | 14.7 | 9.7 | 4.0 | 0 | 0 | 0 |
| | November | 690 | 95.8% | 2.6 | 33.0 | 23.2 | 10.9 | 0 | 0 | 0 |
| | December | 707 | 95.0% | 2.1 | 34.7 | 18.8 | 5.4 | 0 | 0 | 0 |
| Annual | | 8341 | 95.2% | 2.3 | 180.1 | 103.3 | 27.3 | 0 | 0 | 0 |

Observations in $ug/m^3$

**FIGURE 4.1.2.1 - GREEN ACRES ROAD ANNUAL $SO_2$ CONCENTRATIONS**



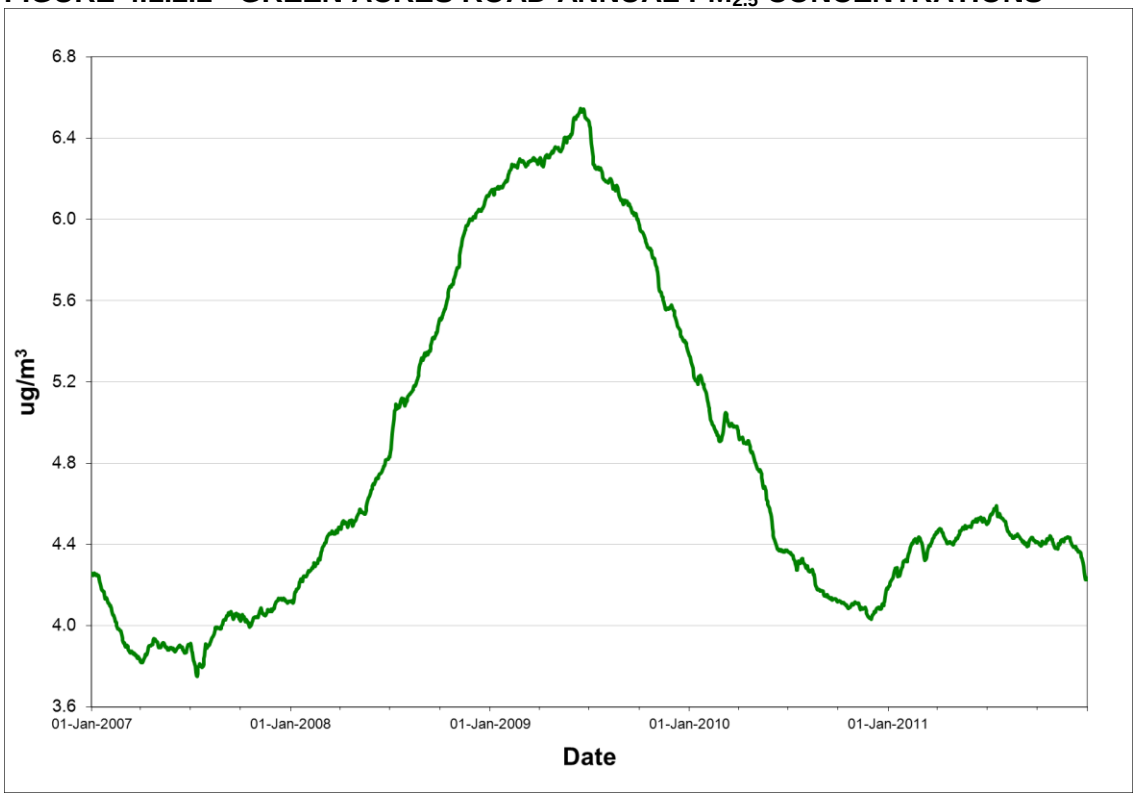

Rolling annual average of hourly concentrations

**TABLE 4.1.2.2 - GREEN ACRES ROAD $PM_{2.5}$ SUMMARY 2010 & 2011**

| Year | Month | # Valid Days | % Valid Days | Average | Maximum 24-Hour | Regulatory Exceedances (>25 µg/m$^3$) |
|---|---|---|---|---|---|---|
| 2010 | January | 31 | 100.0% | 4.0 | 18.3 | 0 |
| | February | 28 | 100.0% | 3.6 | 9.3 | 0 |
| | March | 31 | 100.0% | 6.4 | 16.1 | 0 |
| | April | 30 | 100.0% | 4.9 | 9.6 | 0 |
| | May | 31 | 100.0% | 3.4 | 6.2 | 0 |
| | June | 30 | 100.0% | 3.8 | 9.3 | 0 |
| | July | 31 | 100.0% | 3.9 | 15.2 | 0 |
| | August | 31 | 100.0% | 4.1 | 9.1 | 0 |
| | September | 23 | 76.7% | 3.8 | 8.0 | 0 |
| | October | 31 | 100.0% | 3.5 | 5.2 | 0 |
| | November | 30 | 100.0% | 3.2 | 6.4 | 0 |
| | December | 25 | 80.6% | 5.6 | 12.1 | 0 |
| Annual | | 352 | 96.4% | 4.2 | 18.3 | 0 |
| 2011 | January | 28 | 90.3% | 5.7 | 10.0 | 0 |
| | February | 28 | 100.0% | 5.0 | 7.4 | 0 |
| | March | 31 | 100.0% | 6.7 | 10.7 | 0 |
| | April | 28 | 93.3% | 4.3 | 7.8 | 0 |
| | May | 31 | 100.0% | 4.4 | 7.2 | 0 |
| | June | 30 | 100.0% | 4.0 | 11.0 | 0 |
| | July | 31 | 100.0% | 4.2 | 9.7 | 0 |
| | August | 31 | 100.0% | 3.0 | 6.4 | 0 |
| | September | 26 | 86.7% | 3.7 | 9.0 | 0 |
| | October | 31 | 100.0% | 3.3 | 9.9 | 0 |
| | November | 30 | 100.0% | 3.6 | 7.9 | 0 |
| | December | 31 | 100.0% | 2.9 | 6.7 | 0 |
| Annual | | 356 | 97.5% | 4.2 | 11.0 | 0 |

Observations in ug/m$^3$

**FIGURE 4.1.2.2 - GREEN ACRES ROAD ANNUAL $PM_{2.5}$ CONCENTRATIONS**



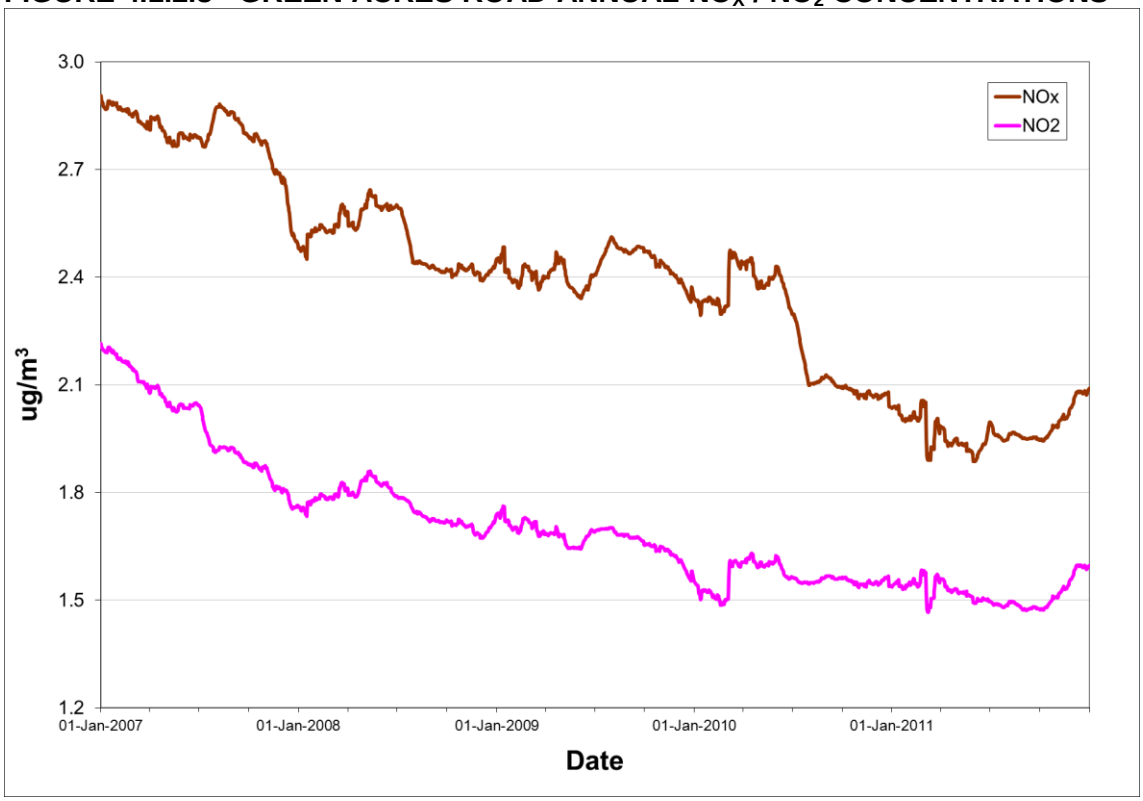

Rolling annual average of hourly concentrations

**TABLE 4.1.2.3 - GREEN ACRES ROAD $NO_X$ / $NO_2$ SUMMARY 2010 & 2011**

| Year | Month | # Valid Hours | % Valid Hours | Average $NO_x$ | Average $NO_2$ | Maximums 1-Hour $NO_x$ | Maximums 1-Hour $NO_2$ | Maximums 24-Hour $NO_x$ | Maximums 24-Hour $NO_2$ | Exceedances 1-Hour (>400) | Exceedances 24-Hour (>200) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 2010 | January | 682 | 91.7% | 2.4 | 1.5 | 56.3 | 34.3 | 13.2 | 9.0 | 0 | 0 |
| | February | 599 | 89.1% | 2.2 | 1.6 | 52.2 | 37.1 | 7.6 | 5.8 | 0 | 0 |
| | March | 674 | 90.6% | 4.0 | 2.8 | 117.3 | 65.1 | 38.3 | 23.8 | 0 | 0 |
| | April | 660 | 91.7% | 2.1 | 1.6 | 109.8 | 41.4 | 9.6 | 5.2 | 0 | 0 |
| | May | 682 | 91.7% | 2.4 | 1.7 | 77.7 | 39.1 | 9.8 | 7.0 | 0 | 0 |
| | June | 650 | 90.3% | 1.3 | 1.3 | 22.6 | 16.1 | 3.3 | 3.1 | 0 | 0 |
| | July | 709 | 95.3% | 2.0 | 1.1 | 39.6 | 19.2 | 4.0 | 1.6 | 0 | 0 |
| | August | 713 | 95.8% | 1.7 | 1.3 | 12.7 | 7.5 | 2.3 | 1.9 | 0 | 0 |
| | September | 661 | 91.8% | 1.3 | 1.0 | 8.4 | 4.5 | 2.3 | 1.7 | 0 | 0 |
| | October | 681 | 91.5% | 1.6 | 1.3 | 13.2 | 12.3 | 4.0 | 3.7 | 0 | 0 |
| | November | 660 | 91.7% | 1.8 | 1.6 | 61.3 | 38.8 | 7.4 | 5.2 | 0 | 0 |
| | December | 653 | 87.8% | 1.8 | 1.6 | 34.1 | 24.6 | 3.5 | 2.8 | 0 | 0 |
| Annual | | 8024 | 91.6% | 2.0 | 1.5 | 117.3 | 65.1 | 38.3 | 23.8 | 0 | 0 |
| 2011 | January | 682 | 91.7% | 2.0 | 1.5 | 62.9 | 36.6 | 5.9 | 5.1 | 0 | 0 |
| | February | 616 | 91.7% | 2.9 | 2.1 | 77.7 | 46.7 | 15.0 | 11.0 | 0 | 0 |
| | March | 659 | 88.6% | 3.1 | 2.6 | 84.4 | 49.5 | 14.6 | 10.7 | 0 | 0 |
| | April | 635 | 88.2% | 1.7 | 1.2 | 21.6 | 10.9 | 4.2 | 2.6 | 0 | 0 |
| | May | 687 | 92.3% | 1.7 | 1.3 | 11.1 | 7.9 | 2.8 | 2.4 | 0 | 0 |
| | June | 668 | 92.8% | 2.7 | 1.4 | 18.9 | 12.5 | 5.2 | 3.2 | 0 | 0 |
| | July | 713 | 95.8% | 1.4 | 0.9 | 8.7 | 4.6 | 2.3 | 1.8 | 0 | 0 |
| | August | 713 | 95.8% | 1.7 | 1.2 | 11.4 | 7.1 | 3.4 | 2.6 | 0 | 0 |
| | September | 673 | 93.5% | 1.2 | 1.1 | 5.6 | 5.0 | 1.7 | 1.4 | 0 | 0 |
| | October | 682 | 91.7% | 2.1 | 1.8 | 9.6 | 7.7 | 4.1 | 3.4 | 0 | 0 |
| | November | 660 | 91.7% | 2.5 | 2.3 | 22.4 | 14.8 | 6.1 | 4.6 | 0 | 0 |
| | December | 659 | 88.6% | 2.3 | 2.0 | 14.1 | 10.3 | 4.4 | 3.9 | 0 | 0 |
| Annual | | 8047 | 91.9% | 2.1 | 1.6 | 84.4 | 49.5 | 15.0 | 11.0 | 0 | 0 |

Observations in $ug/m^3$

**FIGURE 4.1.2.3 - GREEN ACRES ROAD ANNUAL $NO_X$ / $NO_2$ CONCENTRATIONS**



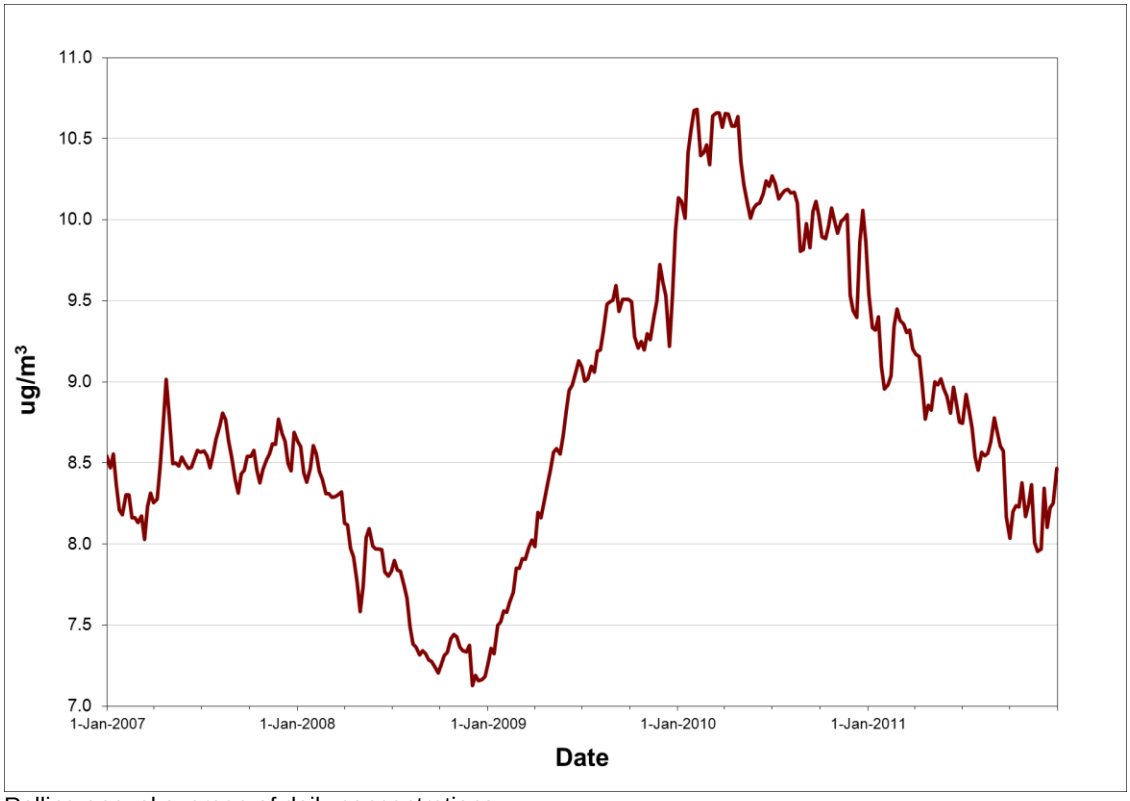

Rolling annual average of hourly concentrations

**TABLE 4.1.2.4 - GREEN ACRES ROAD TSP SUMMARY 2010 & 2011**

| Year | Month | # Valid Days | % Valid Days | Average | Maximum 24-Hour | Regulatory Exceedances (>120 ug/m$^3$) |
|---|---|---|---|---|---|---|
| 2010 | January | 5 | 100.0% | 18.6 | 66.2 | 0 |
| | February | 4 | 80.0% | 7.2 | 12.8 | 0 |
| | March | 5 | 100.0% | 13.0 | 21.4 | 0 |
| | April | 5 | 100.0% | 10.8 | 12.7 | 0 |
| | May | 5 | 100.0% | 7.3 | 14.2 | 0 |
| | June | 5 | 100.0% | 17.5 | 39.8 | 0 |
| | July | 6 | 100.0% | 9.8 | 19.7 | 0 |
| | August | 5 | 100.0% | 6.4 | 14.1 | 0 |
| | September | 4 | 80.0% | 11.4 | 27.5 | 0 |
| | October | 5 | 100.0% | 7.9 | 13.6 | 0 |
| | November | 5 | 100.0% | 5.5 | 18.7 | 0 |
| | December | 5 | 100.0% | 8.1 | 13.1 | 0 |
| Annual | | 59 | 96.7% | 9.6 | 66.2 | 0 |
| 2011 | January | 4 | 80.0% | 8.3 | 12.4 | 0 |
| | February | 5 | 100.0% | 12.7 | 22.5 | 0 |
| | March | 5 | 100.0% | 9.8 | 15.9 | 0 |
| | April | 4 | 80.0% | 6.3 | 15.5 | 0 |
| | May | 5 | 100.0% | 8.0 | 13.5 | 0 |
| | June | 5 | 100.0% | 14.0 | 32.4 | 0 |
| | July | 5 | 100.0% | 7.9 | 35.1 | 0 |
| | August | 6 | 100.0% | 8.1 | 13.3 | 0 |
| | September | 5 | 100.0% | 4.6 | 15.2 | 0 |
| | October | 5 | 100.0% | 9.0 | 17.2 | 0 |
| | November | 5 | 100.0% | 6.5 | 13.6 | 0 |
| | December | 5 | 100.0% | 9.3 | 18.0 | 0 |
| Annual | | 59 | 96.7% | 8.4 | 35.1 | 0 |

Observations in ug/m$^3$

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




Rolling annual average of daily concentrations

## 4.1.3 Indian Pond Drive

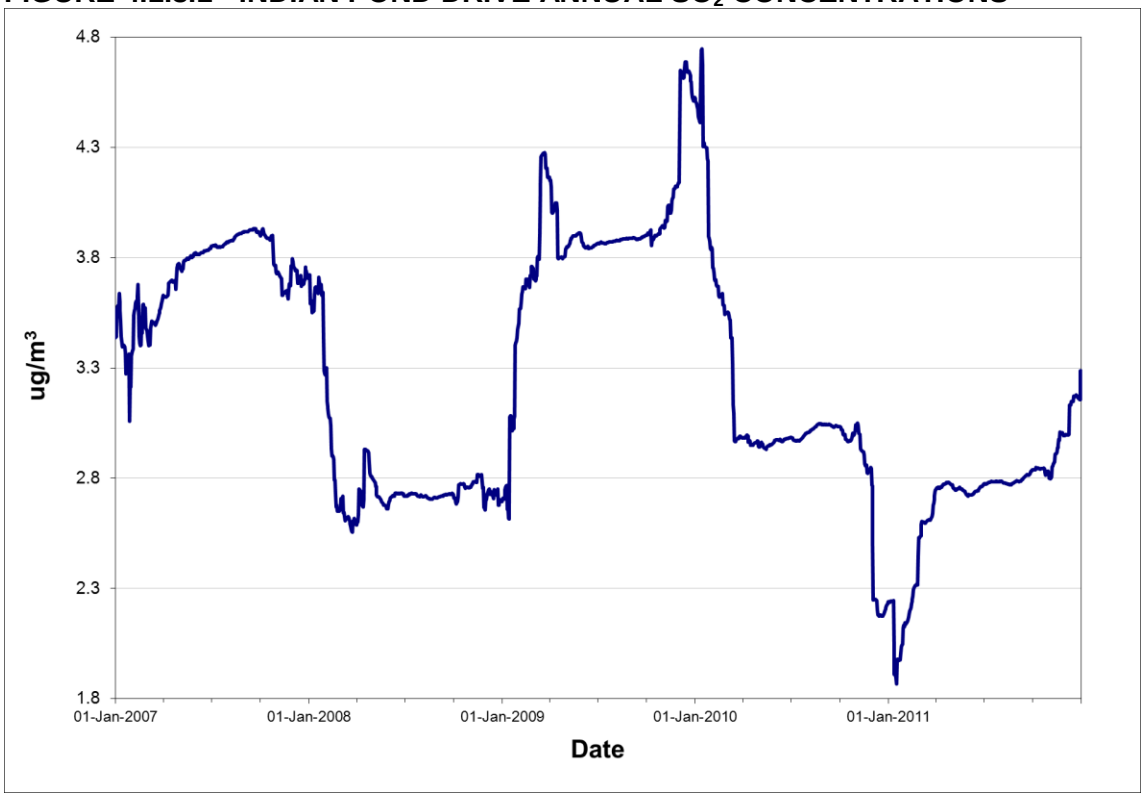
The Indian Pond Drive station monitors the ambient levels of $SO_2$, $NO_x$ / $NO_2$, $PM_{2.5}$ on a continuous basis and TSP on a 1 day in 6 day cycle consistent with the NAPS defined schedule. For all pollutants, the ambient air criteria were not exceeded on any occasion in 2011. Tables 4.1.3.1 through 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 $SO_2$ SUMMARY 2010 & 2011**

| Year | Month | # Valid Hours | % Valid Hours | Average | Maximum 1-Hour | Maximum 3-Hour | Maximum 24-Hour | Regulatory Exceedances 1-Hour (>900) | Regulatory Exceedances 3-Hour (>600) | Regulatory Exceedances 24-Hour (>300) |
|---|---|---|---|---|---|---|---|---|---|---|
| 2010 | January | 706 | 94.9% | 6.3 | 151.1 | 118.8 | 78.8 | 0 | 0 | 0 |
| | February | 636 | 94.6% | 2.3 | 26.9 | 15.0 | 5.6 | 0 | 0 | 0 |
| | March | 713 | 95.8% | 1.6 | 16.1 | 6.3 | 3.9 | 0 | 0 | 0 |
| | April | 688 | 95.6% | 1.9 | 43.4 | 19.1 | 4.2 | 0 | 0 | 0 |
| | May | 708 | 95.2% | 1.8 | 38.8 | 28.4 | 5.1 | 0 | 0 | 0 |
| | June | 687 | 95.4% | 1.6 | 14.0 | 7.3 | 2.5 | 0 | 0 | 0 |
| | July | 707 | 95.0% | 1.5 | 5.1 | 4.1 | 2.8 | 0 | 0 | 0 |
| | August | 684 | 91.9% | 1.5 | 5.8 | 4.0 | 2.0 | 0 | 0 | 0 |
| | September | 675 | 93.8% | 1.1 | 4.0 | 3.8 | 2.9 | 0 | 0 | 0 |
| | October | 713 | 95.8% | 2.8 | 47.9 | 31.8 | 12.4 | 0 | 0 | 0 |
| | November | 681 | 94.6% | 2.0 | 23.6 | 10.5 | 4.6 | 0 | 0 | 0 |
| | December | 710 | 95.4% | 2.5 | 46.5 | 27.5 | 10.1 | 0 | 0 | 0 |
| Annual | | 8308 | 94.8% | 2.2 | 151.1 | 118.8 | 78.8 | 0 | 0 | 0 |
| 2011 | January | 713 | 95.8% | 4.9 | 129.8 | 87.1 | 42.9 | 0 | 0 | 0 |
| | February | 639 | 95.1% | 7.5 | 168.1 | 146.3 | 49.6 | 0 | 0 | 0 |
| | March | 709 | 95.3% | 4.2 | 110.5 | 57.5 | 19.7 | 0 | 0 | 0 |
| | April | 690 | 95.8% | 2.1 | 38.1 | 31.3 | 6.1 | 0 | 0 | 0 |
| | May | 706 | 94.9% | 1.2 | 3.0 | 2.6 | 2.1 | 0 | 0 | 0 |
| | June | 688 | 95.6% | 2.3 | 41.2 | 15.1 | 3.4 | 0 | 0 | 0 |
| | July | 710 | 95.4% | 1.6 | 9.5 | 6.1 | 2.6 | 0 | 0 | 0 |
| | August | 706 | 94.9% | 1.6 | 6.7 | 5.7 | 2.9 | 0 | 0 | 0 |
| | September | 687 | 95.4% | 1.7 | 6.0 | 4.2 | 3.4 | 0 | 0 | 0 |
| | October | 713 | 95.8% | 2.3 | 24.9 | 14.3 | 7.5 | 0 | 0 | 0 |
| | November | 687 | 95.4% | 4.3 | 148.0 | 84.5 | 17.6 | 0 | 0 | 0 |
| | December | 710 | 95.4% | 6.0 | 199.6 | 176.6 | 57.8 | 0 | 0 | 0 |
| Annual | | 8358 | 95.4% | 3.3 | 199.6 | 176.6 | 57.8 | 0 | 0 | 0 |

Observations in $ug/m^3$

**FIGURE 4.1.3.1 - INDIAN POND DRIVE ANNUAL $SO_2$ CONCENTRATIONS**



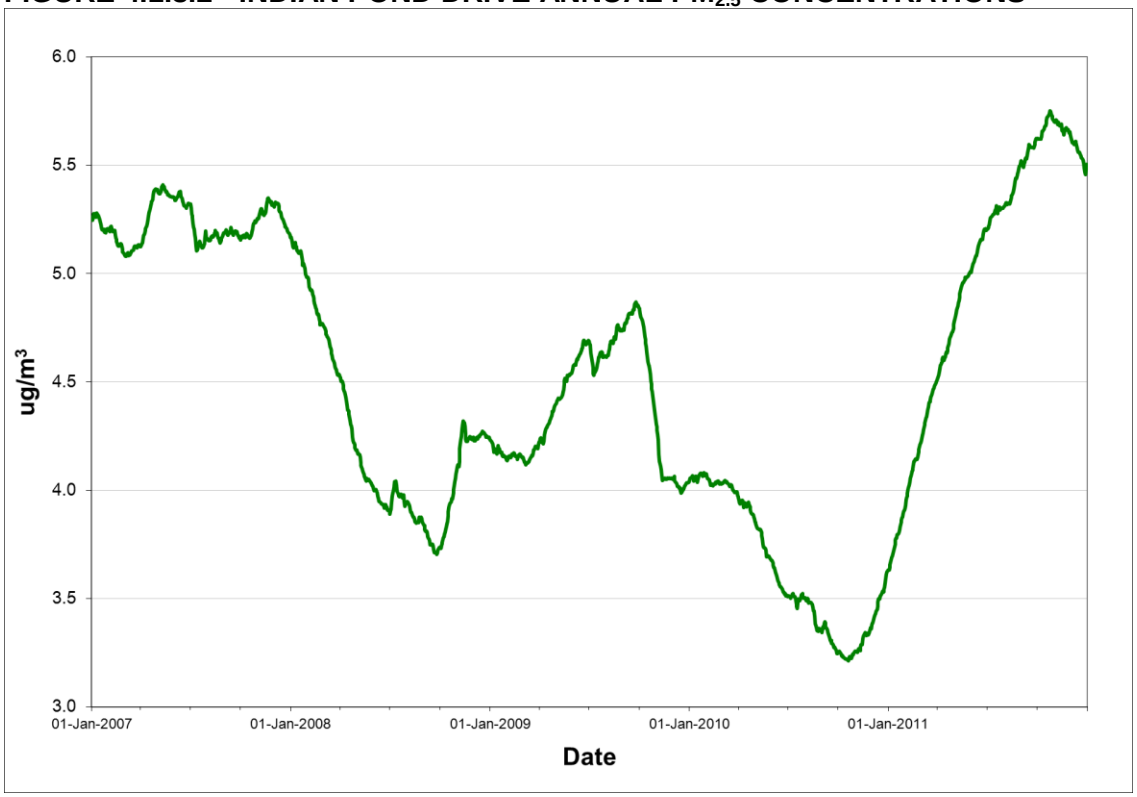

Rolling annual average of hourly concentrations

**TABLE 4.1.3.2 - INDIAN POND DRIVE $PM_{2.5}$ SUMMARY 2010 & 2011**

| Year | Month | # Valid Days | % Valid Days | Average | Maximum 24-Hour | Regulatory Exceedances (>25 µg/m$^3$) |
|---|---|---|---|---|---|---|
| 2010 | January | 31 | 100.0% | 2.8 | 5.8 | 0 |
| | February | 28 | 100.0% | 2.2 | 5.3 | 0 |
| | March | 31 | 100.0% | 3.1 | 6.4 | 0 |
| | April | 30 | 100.0% | 3.8 | 8.8 | 0 |
| | May | 31 | 100.0% | 2.3 | 5.7 | 0 |
| | June | 30 | 100.0% | 2.6 | 6.6 | 0 |
| | July | 29 | 93.5% | 4.5 | 14.2 | 0 |
| | August | 31 | 100.0% | 4.0 | 10.4 | 0 |
| | September | 24 | 80.0% | 4.1 | 16.2 | 0 |
| | October | 31 | 100.0% | 3.1 | 6.6 | 0 |
| | November | 30 | 100.0% | 5.2 | 14.1 | 0 |
| | December | 28 | 90.3% | 6.3 | 11.7 | 0 |
| Annual | | 354 | 97.0% | 3.6 | 16.2 | 0 |
| 2011 | January | 31 | 100.0% | 6.0 | 10.3 | 0 |
| | February | 28 | 100.0% | 5.9 | 10.8 | 0 |
| | March | 31 | 100.0% | 6.4 | 8.7 | 0 |
| | April | 30 | 100.0% | 6.6 | 9.3 | 0 |
| | May | 29 | 93.5% | 5.3 | 8.5 | 0 |
| | June | 30 | 100.0% | 4.8 | 9.9 | 0 |
| | July | 27 | 87.1% | 5.8 | 12.5 | 0 |
| | August | 30 | 96.8% | 6.2 | 11.1 | 0 |
| | September | 25 | 83.3% | 5.8 | 9.6 | 0 |
| | October | 31 | 100.0% | 4.1 | 11.0 | 0 |
| | November | 30 | 100.0% | 4.6 | 7.9 | 0 |
| | December | 31 | 100.0% | 4.5 | 13.9 | 0 |
| Annual | | 353 | 96.7% | 5.5 | 13.9 | 0 |

Observations in ug/m$^3$

**FIGURE 4.1.3.2 - INDIAN POND DRIVE ANNUAL $PM_{2.5}$ CONCENTRATIONS**




Rolling annual average of hourly concentrations

**TABLE 4.1.3.3 - INDIAN POND DRIVE $NO_X$ / $NO_2$ SUMMARY 2010 & 2011**

| Year | Month | # Valid Hours | % Valid Hours | Average $NO_x$ | Average $NO_2$ | Maximums 1-Hour $NO_x$ | Maximums 1-Hour $NO_2$ | Maximums 24-Hour $NO_x$ | Maximums 24-Hour $NO_2$ | Exceedances 1-Hour (>400) | Exceedances 24-Hour (>200) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 2010 | January | 678 | 91.1% | 4.2 | 2.3 | 75.9 | 32.4 | 44.0 | 18.7 | 0 | 0 |
| | February | 609 | 90.6% | 1.6 | 1.2 | 15.1 | 9.5 | 2.9 | 2.3 | 0 | 0 |
| | March | 681 | 91.5% | 1.6 | 1.3 | 11.1 | 8.0 | 3.6 | 3.3 | 0 | 0 |
| | April | 660 | 91.7% | 1.6 | 1.4 | 28.9 | 18.6 | 4.7 | 4.0 | 0 | 0 |
| | May | 677 | 91.0% | 1.5 | 1.2 | 19.7 | 17.6 | 4.7 | 3.7 | 0 | 0 |
| | June | 664 | 92.2% | 1.6 | 1.3 | 15.6 | 14.8 | 3.5 | 3.0 | 0 | 0 |
| | July | 710 | 95.4% | 1.2 | 1.0 | 11.8 | 7.6 | 3.3 | 2.5 | 0 | 0 |
| | August | 706 | 94.9% | 1.7 | 1.1 | 14.5 | 5.2 | 4.1 | 1.5 | 0 | 0 |
| | September | 668 | 92.8% | 3.7 | 1.1 | 9.6 | 4.9 | 6.1 | 2.0 | 0 | 0 |
| | October | 709 | 95.3% | 2.0 | 1.5 | 20.0 | 14.1 | 5.1 | 4.5 | 0 | 0 |
| | November | 658 | 91.4% | 1.9 | 1.4 | 13.6 | 11.0 | 4.3 | 3.4 | 0 | 0 |
| | December | 680 | 91.4% | 1.7 | 1.5 | 19.6 | 10.0 | 3.7 | 3.0 | 0 | 0 |
| Annual | | 8100 | 92.5% | 2.0 | 1.3 | 75.9 | 32.4 | 44.0 | 18.7 | 0 | 0 |
| 2011 | January | 682 | 91.7% | 3.3 | 2.1 | 52.4 | 19.3 | 17.9 | 8.5 | 0 | 0 |
| | February | 588 | 87.5% | 3.2 | 1.9 | 65.2 | 24.7 | 18.9 | 7.5 | 0 | 0 |
| | March | 658 | 88.4% | 1.6 | 1.2 | 36.5 | 17.0 | 5.8 | 3.6 | 0 | 0 |
| | April | 660 | 91.7% | 1.4 | 0.9 | 14.7 | 8.3 | 2.9 | 1.7 | 0 | 0 |
| | May | 675 | 90.7% | 1.3 | 1.1 | 13.2 | 11.5 | 3.8 | 3.1 | 0 | 0 |
| | June | 657 | 91.3% | 1.6 | 1.5 | 14.9 | 70.1 | 3.4 | 5.7 | 0 | 0 |
| | July | 713 | 95.8% | 1.7 | 1.4 | 14.4 | 7.9 | 3.5 | 3.2 | 0 | 0 |
| | August | 705 | 94.8% | 1.8 | 1.4 | 17.4 | 9.7 | 4.4 | 3.4 | 0 | 0 |
| | September | 688 | 95.6% | 1.7 | 1.1 | 14.8 | 7.4 | 2.9 | 2.2 | 0 | 0 |
| | October | 711 | 95.6% | 1.9 | 1.5 | 13.1 | 10.3 | 4.3 | 3.6 | 0 | 0 |
| | November | 654 | 90.8% | 3.8 | 1.7 | 59.7 | 23.1 | 9.3 | 3.3 | 0 | 0 |
| | December | 680 | 91.4% | 2.9 | 2.0 | 84.0 | 28.1 | 23.9 | 8.8 | 0 | 0 |
| Annual | | 8071 | 92.1% | 2.2 | 1.5 | 84.0 | 70.1 | 23.9 | 8.8 | 0 | 0 |

Observations in $ug/m^3$

**FIGURE 4.1.3.3 - INDIAN POND DRIVE ANNUAL $NO_X$ / $NO_2$ CONCENTRATIONS**

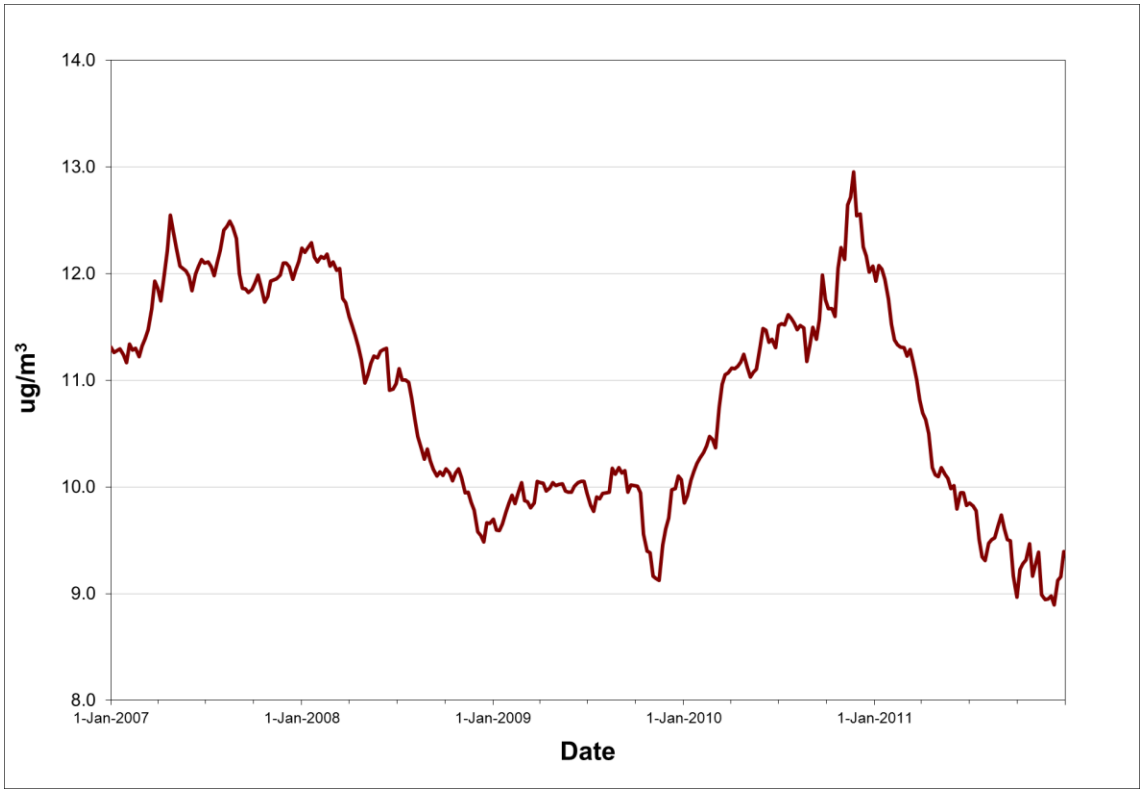

Rolling annual average of hourly concentrations

**TABLE 4.1.3.4 - INDIAN POND DRIVE TSP SUMMARY 2010 & 2011**

| Year | Month | # Valid Days | % Valid Days | Average | Maximum 24-Hour | Regulatory Exceedances (>120 ug/m$^3$) |
|---|---|---|---|---|---|---|
| 2010 | January | 5 | 100.0% | 13.9 | 23.1 | 0 |
| | February | 5 | 100.0% | 17.7 | 30.8 | 0 |
| | March | 5 | 100.0% | 23.6 | 51.5 | 0 |
| | April | 5 | 100.0% | 14.6 | 18.1 | 0 |
| | May | 5 | 100.0% | 11.5 | 21.7 | 0 |
| | June | 5 | 100.0% | 14.5 | 29.5 | 0 |
| | July | 6 | 100.0% | 11.1 | 21.5 | 0 |
| | August | 5 | 100.0% | 6.2 | 11.5 | 0 |
| | September | 5 | 100.0% | 12.0 | 32.0 | 0 |
| | October | 5 | 100.0% | 9.3 | 13.0 | 0 |
| | November | 5 | 100.0% | 11.4 | 23.2 | 0 |
| | December | 5 | 100.0% | 7.8 | 15.8 | 0 |
| Annual | | 61 | 100.0% | 12.1 | 51.5 | 0 |
| 2011 | January | 5 | 100.0% | 9.1 | 15.5 | 0 |
| | February | 3 | 60.0% | 11.2 | 16.8 | 0 |
| | March | 5 | 100.0% | 13.0 | 21.0 | 0 |
| | April | 5 | 100.0% | 7.3 | 11.9 | 0 |
| | May | 5 | 100.0% | 9.0 | 12.9 | 0 |
| | June | 5 | 100.0% | 14.6 | 26.7 | 0 |
| | July | 5 | 100.0% | 6.2 | 10.2 | 0 |
| | August | 6 | 100.0% | 9.5 | 18.8 | 0 |
| | September | 5 | 100.0% | 5.7 | 17.1 | 0 |
| | October | 5 | 100.0% | 9.8 | 18.0 | 0 |
| | November | 5 | 100.0% | 8.4 | 18.4 | 0 |
| | December | 5 | 100.0% | 12.7 | 20.6 | 0 |
| Annual | | 59 | 96.7% | 9.3 | 26.7 | 0 |

Observations in ug/m$^3$

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




Rolling annual average of daily concentrations

## 4.1.4 Indian Pond Road

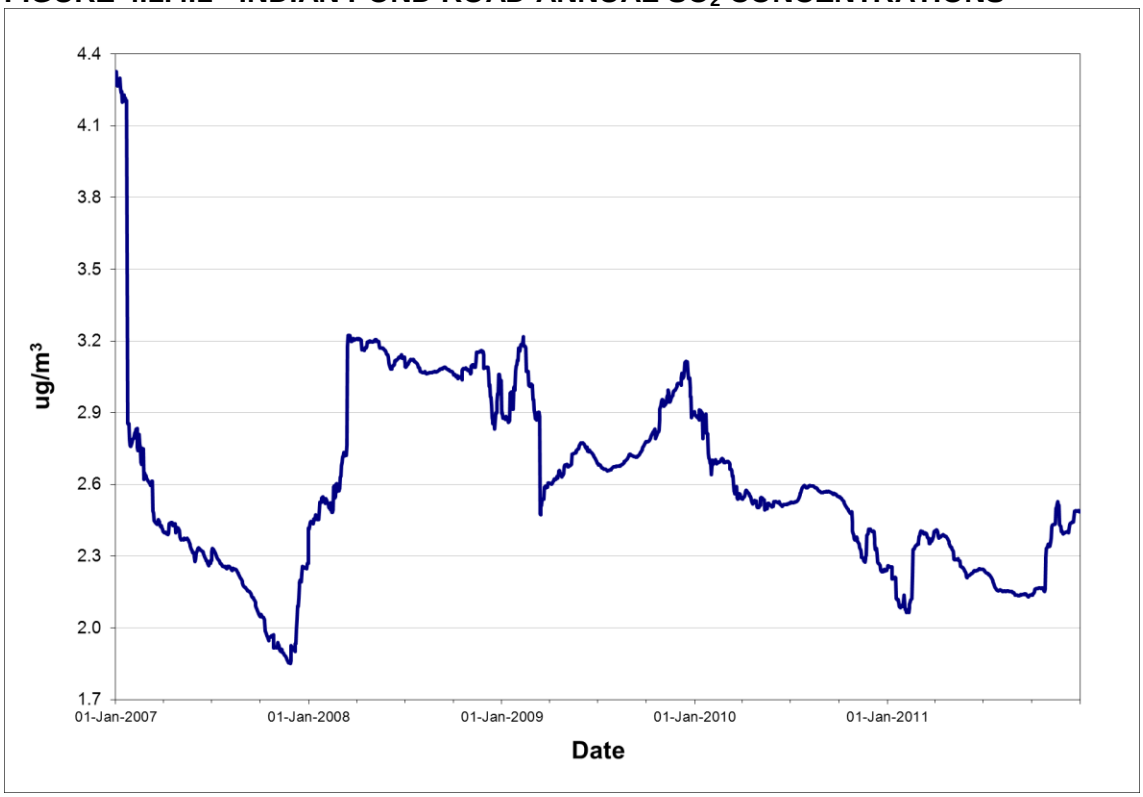
The Indian Pond Road station monitors the ambient levels of $SO_2$, $NO_x$ / $NO_2$, $PM_{2.5}$ on a continuous basis and TSP on a 1 day in 6 day cycle consistent with the NAPS defined schedule. For all pollutants, the ambient air criteria were not exceeded on any occasion in 2011. Tables 4.1.4.1 through 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 $SO_2$ SUMMARY 2010 & 2011**

| Year | Month | # Valid Hours | % Valid Hours | Average | Maximum 1-Hour | Maximum 3-Hour | Maximum 24-Hour | Regulatory Exceedances 1-Hour (>900) | Regulatory Exceedances 3-Hour (>600) | Regulatory Exceedances 24-Hour (>300) |
|---|---|---|---|---|---|---|---|---|---|---|
| 2010 | January | 706 | 94.9% | 3.7 | 130.0 | 95.5 | 35.6 | 0 | 0 | 0 |
| | February | 638 | 94.9% | 3.0 | 54.8 | 39.4 | 15.6 | 0 | 0 | 0 |
| | March | 713 | 95.8% | 2.2 | 73.3 | 41.3 | 9.0 | 0 | 0 | 0 |
| | April | 684 | 95.0% | 2.5 | 54.9 | 34.5 | 10.1 | 0 | 0 | 0 |
| | May | 713 | 95.8% | 2.4 | 116.4 | 49.6 | 11.5 | 0 | 0 | 0 |
| | June | 686 | 95.3% | 1.5 | 13.1 | 4.8 | 2.5 | 0 | 0 | 0 |
| | July | 692 | 93.0% | 1.9 | 6.6 | 6.0 | 3.8 | 0 | 0 | 0 |
| | August | 713 | 95.8% | 1.3 | 6.1 | 4.3 | 2.3 | 0 | 0 | 0 |
| | September | 686 | 95.3% | 1.4 | 4.6 | 4.0 | 3.1 | 0 | 0 | 0 |
| | October | 707 | 95.0% | 1.7 | 21.4 | 14.9 | 5.5 | 0 | 0 | 0 |
| | November | 689 | 95.7% | 3.4 | 116.5 | 75.6 | 32.7 | 0 | 0 | 0 |
| | December | 710 | 95.4% | 1.9 | 19.2 | 12.8 | 6.8 | 0 | 0 | 0 |
| Annual | | 8337 | 95.2% | 2.2 | 130.0 | 95.5 | 35.6 | 0 | 0 | 0 |
| 2011 | January | 708 | 95.2% | 2.1 | 114.7 | 58.8 | 9.7 | 0 | 0 | 0 |
| | February | 644 | 95.8% | 6.1 | 161.9 | 115.8 | 43.0 | 0 | 0 | 0 |
| | March | 711 | 95.6% | 2.9 | 47.5 | 25.6 | 10.3 | 0 | 0 | 0 |
| | April | 686 | 95.3% | 1.7 | 39.5 | 17.8 | 4.2 | 0 | 0 | 0 |
| | May | 710 | 95.4% | 0.8 | 4.6 | 2.1 | 1.5 | 0 | 0 | 0 |
| | June | 688 | 95.6% | 1.9 | 23.0 | 14.2 | 3.1 | 0 | 0 | 0 |
| | July | 700 | 94.1% | 0.9 | 5.3 | 3.5 | 1.5 | 0 | 0 | 0 |
| | August | 711 | 95.6% | 1.1 | 6.3 | 3.1 | 1.6 | 0 | 0 | 0 |
| | September | 687 | 95.4% | 1.4 | 5.5 | 4.1 | 2.8 | 0 | 0 | 0 |
| | October | 710 | 95.4% | 4.1 | 93.9 | 84.4 | 47.0 | 0 | 0 | 0 |
| | November | 689 | 95.7% | 4.1 | 145.4 | 118.6 | 24.7 | 0 | 0 | 0 |
| | December | 710 | 95.4% | 3.0 | 98.8 | 31.6 | 10.4 | 0 | 0 | 0 |
| Annual | | 8354 | 95.4% | 2.5 | 161.9 | 118.6 | 47.0 | 0 | 0 | 0 |

Observations in $ug/m^3$

**FIGURE 4.1.4.1 - INDIAN POND ROAD ANNUAL $SO_2$ CONCENTRATIONS**



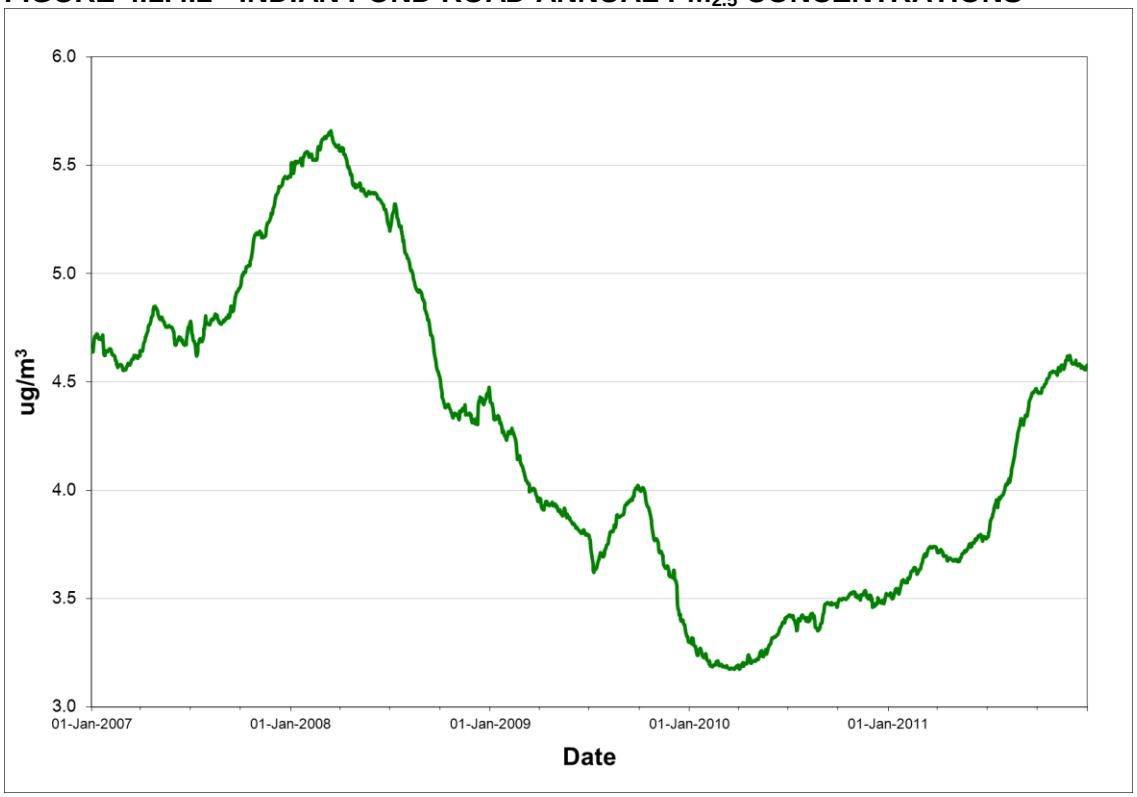

Rolling annual average of hourly concentrations

**TABLE 4.1.4.2 - INDIAN POND ROAD $PM_{2.5}$ SUMMARY 2010 & 2011**

| Year | Month | # Valid Days | % Valid Days | Average | Maximum 24-Hour | Regulatory Exceedances (>25 µg/m$^3$) |
|---|---|---|---|---|---|---|
| 2010 | January | 29 | 93.5% | 3.3 | 11.9 | 0 |
| | February | 28 | 100.0% | 2.9 | 7.7 | 0 |
| | March | 26 | 83.9% | 2.9 | 5.8 | 0 |
| | April | 30 | 100.0% | 4.1 | 11.4 | 0 |
| | May | 31 | 100.0% | 3.5 | 7.1 | 0 |
| | June | 30 | 100.0% | 3.7 | 8.0 | 0 |
| | July | 31 | 100.0% | 3.9 | 15.4 | 0 |
| | August | 31 | 100.0% | 3.9 | 10.7 | 0 |
| | September | 26 | 86.7% | 4.9 | 16.8 | 0 |
| | October | 31 | 100.0% | 2.5 | 4.4 | 0 |
| | November | 30 | 100.0% | 2.9 | 10.0 | 0 |
| | December | 31 | 100.0% | 3.7 | 8.4 | 0 |
| Annual | | 354 | 97.0% | 3.5 | 16.8 | 0 |
| 2011 | January | 27 | 87.1% | 4.0 | 8.1 | 0 |
| | February | 28 | 100.0% | 3.7 | 6.7 | 0 |
| | March | 31 | 100.0% | 4.1 | 8.2 | 0 |
| | April | 30 | 100.0% | 3.5 | 7.2 | 0 |
| | May | 31 | 100.0% | 4.4 | 6.3 | 0 |
| | June | 30 | 100.0% | 4.1 | 9.0 | 0 |
| | July | 31 | 100.0% | 6.3 | 12.4 | 0 |
| | August | 31 | 100.0% | 7.7 | 12.1 | 0 |
| | September | 26 | 86.7% | 6.8 | 11.6 | 0 |
| | October | 29 | 93.5% | 3.4 | 9.4 | 0 |
| | November | 30 | 100.0% | 3.8 | 9.4 | 0 |
| | December | 31 | 100.0% | 3.2 | 9.4 | 0 |
| Annual | | 355 | 97.3% | 4.6 | 12.4 | 0 |

Observations in ug/m$^3$

**FIGURE 4.1.4.2 - INDIAN POND ROAD ANNUAL $PM_{2.5}$ CONCENTRATIONS**




Rolling annual average of hourly concentrations

**TABLE 4.1.4.3 - INDIAN POND ROAD $NO_X$ / $NO_2$ SUMMARY 2010 & 2011**

| Year | Month | # Valid Hours | % Valid Hours | Average $NO_x$ | Average $NO_2$ | Maximums 1-Hour $NO_x$ | Maximums 1-Hour $NO_2$ | Maximums 24-Hour $NO_x$ | Maximums 24-Hour $NO_2$ | Exceedances 1-Hour (>400) | Exceedances 24-Hour (>200) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 2010 | January | 676 | 90.9% | 3.2 | 2.2 | 73.4 | 37.0 | 21.4 | 10.5 | 0 | 0 |
| | February | 614 | 91.4% | 2.6 | 1.9 | 32.2 | 18.2 | 9.1 | 5.3 | 0 | 0 |
| | March | 682 | 91.7% | 2.0 | 1.5 | 44.5 | 22.3 | 4.4 | 3.0 | 0 | 0 |
| | April | 655 | 91.0% | 1.9 | 1.5 | 26.9 | 17.0 | 5.8 | 4.0 | 0 | 0 |
| | May | 682 | 91.7% | 2.0 | 1.5 | 61.9 | 32.6 | 6.4 | 4.0 | 0 | 0 |
| | June | 682 | 94.7% | 1.8 | 1.5 | 16.2 | 14.1 | 3.7 | 3.1 | 0 | 0 |
| | July | 676 | 90.9% | 1.9 | 0.9 | 6.5 | 4.7 | 5.3 | 1.8 | 0 | 0 |
| | August | 713 | 95.8% | 2.1 | 1.2 | 9.2 | 5.9 | 3.3 | 1.8 | 0 | 0 |
| | September | 686 | 95.3% | 1.5 | 1.1 | 6.5 | 5.1 | 2.4 | 1.8 | 0 | 0 |
| | October | 708 | 95.2% | 2.0 | 1.6 | 21.5 | 20.6 | 5.5 | 4.6 | 0 | 0 |
| | November | 689 | 95.7% | 2.9 | 2.5 | 52.0 | 26.7 | 15.2 | 9.7 | 0 | 0 |
| | December | 672 | 90.3% | 2.6 | 2.1 | 22.9 | 18.1 | 8.3 | 6.7 | 0 | 0 |
| Annual | | 8135 | 92.9% | 2.2 | 1.6 | 73.4 | 37.0 | 21.4 | 10.5 | 0 | 0 |
| 2011 | January | 657 | 88.3% | 3.2 | 2.5 | 86.8 | 36.8 | 11.0 | 8.2 | 0 | 0 |
| | February | 364 | 54.2% | 4.1 | 2.6 | 98.2 | 48.5 | 19.5 | 11.8 | 0 | 0 |
| | March | 680 | 91.4% | 1.8 | 1.4 | 23.1 | 16.7 | 5.1 | 4.3 | 0 | 0 |
| | April | 655 | 91.0% | 1.4 | 1.1 | 15.9 | 9.0 | 2.6 | 2.1 | 0 | 0 |
| | May | 682 | 91.7% | 1.7 | 1.5 | 11.0 | 7.7 | 3.5 | 2.9 | 0 | 0 |
| | June | 657 | 91.3% | 2.2 | 1.9 | 17.0 | 16.6 | 4.2 | 3.9 | 0 | 0 |
| | July | 652 | 87.6% | 2.1 | 1.9 | 8.5 | 6.5 | 4.3 | 3.5 | 0 | 0 |
| | August | 701 | 94.2% | 3.2 | 1.9 | 10.8 | 8.2 | 4.6 | 3.4 | 0 | 0 |
| | September | 684 | 95.0% | 2.0 | 1.8 | 11.8 | 8.5 | 3.1 | 2.8 | 0 | 0 |
| | October | 679 | 91.3% | 3.3 | 2.5 | 38.9 | 21.4 | 18.6 | 10.6 | 0 | 0 |
| | November | 660 | 91.7% | 3.1 | 2.4 | 58.0 | 24.5 | 11.3 | 7.1 | 0 | 0 |
| | December | 679 | 91.3% | 3.0 | 2.4 | 44.0 | 19.1 | 7.7 | 5.0 | 0 | 0 |
| Annual | | 7750 | 88.5% | 2.5 | 2.0 | 98.2 | 48.5 | 19.5 | 11.8 | 0 | 0 |

Observations in $ug/m^3$

**FIGURE 4.1.4.3 - INDIAN POND ROAD ANNUAL $NO_X$ / $NO_2$ CONCENTRATIONS**

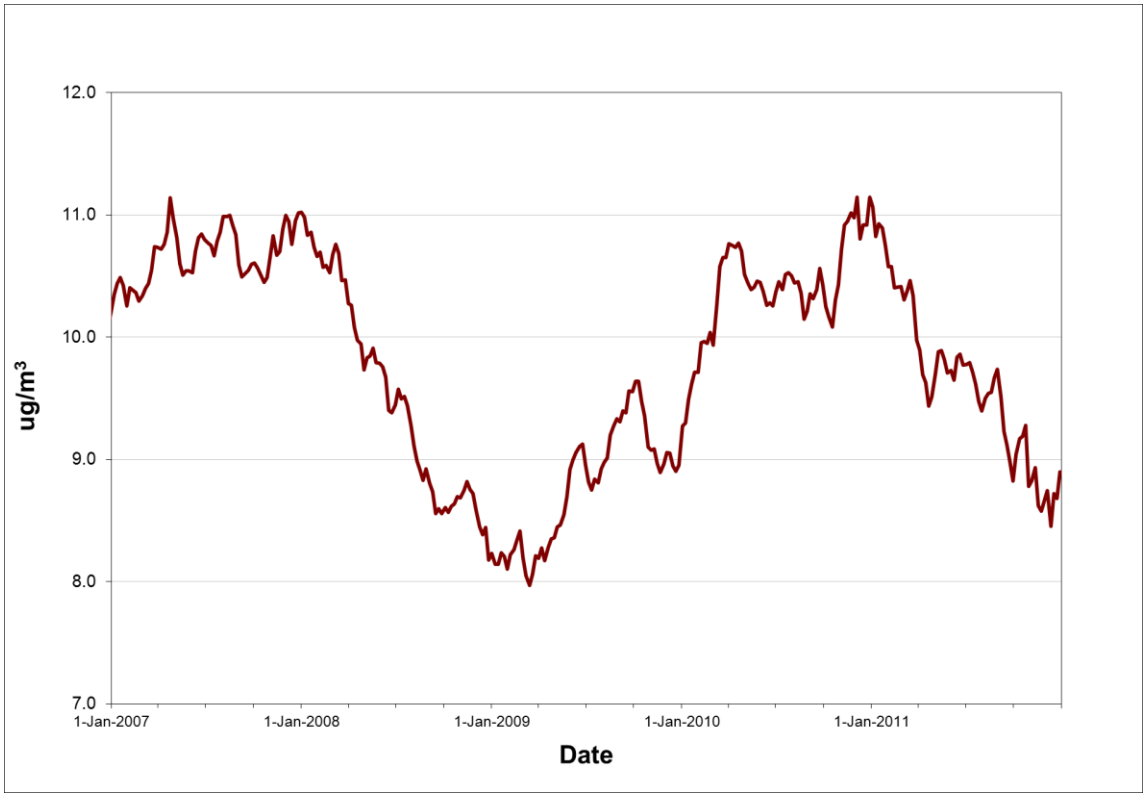

Rolling annual average of hourly concentrations

**TABLE 4.1.4.4 - INDIAN POND ROAD TSP SUMMARY 2010 & 2011**

| Year | Month | # Valid Days | % Valid Days | Average | Maximum 24-Hour | Regulatory Exceedances (>120 ug/m$^3$) |
|---|---|---|---|---|---|---|
| 2010 | January | 5 | 100.0% | 20.0 | 27.8 | 0 |
| | February | 3 | 60.0% | 14.3 | 19.3 | 0 |
| | March | 5 | 100.0% | 17.2 | 55.1 | 0 |
| | April | 5 | 100.0% | 11.7 | 14.9 | 0 |
| | May | 5 | 100.0% | 9.1 | 14.8 | 0 |
| | June | 5 | 100.0% | 13.7 | 19.1 | 0 |
| | July | 6 | 100.0% | 9.7 | 20.3 | 0 |
| | August | 5 | 100.0% | 6.8 | 16.4 | 0 |
| | September | 5 | 100.0% | 12.6 | 26.9 | 0 |
| | October | 5 | 100.0% | 8.7 | 12.8 | 0 |
| | November | 5 | 100.0% | 10.7 | 19.2 | 0 |
| | December | 5 | 100.0% | 7.7 | 18.6 | 0 |
| Annual | | 59 | 96.7% | 11.2 | 55.1 | 0 |
| 2011 | January | 4 | 80.0% | 10.6 | 23.4 | 0 |
| | February | 3 | 60.0% | 8.7 | 14.0 | 0 |
| | March | 5 | 100.0% | 10.6 | 27.3 | 0 |
| | April | 5 | 100.0% | 8.0 | 17.6 | 0 |
| | May | 5 | 100.0% | 10.4 | 20.9 | 0 |
| | June | 5 | 100.0% | 15.9 | 43.7 | 0 |
| | July | 5 | 100.0% | 6.8 | 10.3 | 0 |
| | August | 6 | 100.0% | 8.3 | 12.6 | 0 |
| | September | 5 | 100.0% | 5.1 | 6.7 | 0 |
| | October | 5 | 100.0% | 7.2 | 18.5 | 0 |
| | November | 5 | 100.0% | 9.4 | 17.6 | 0 |
| | December | 5 | 100.0% | 9.2 | 19.1 | 0 |
| Annual | | 58 | 95.1% | 8.8 | 43.7 | 0 |

Observations in ug/m$^3$

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




Rolling annual average of daily concentrations

## 4.1.5 Lawrence Pond Road

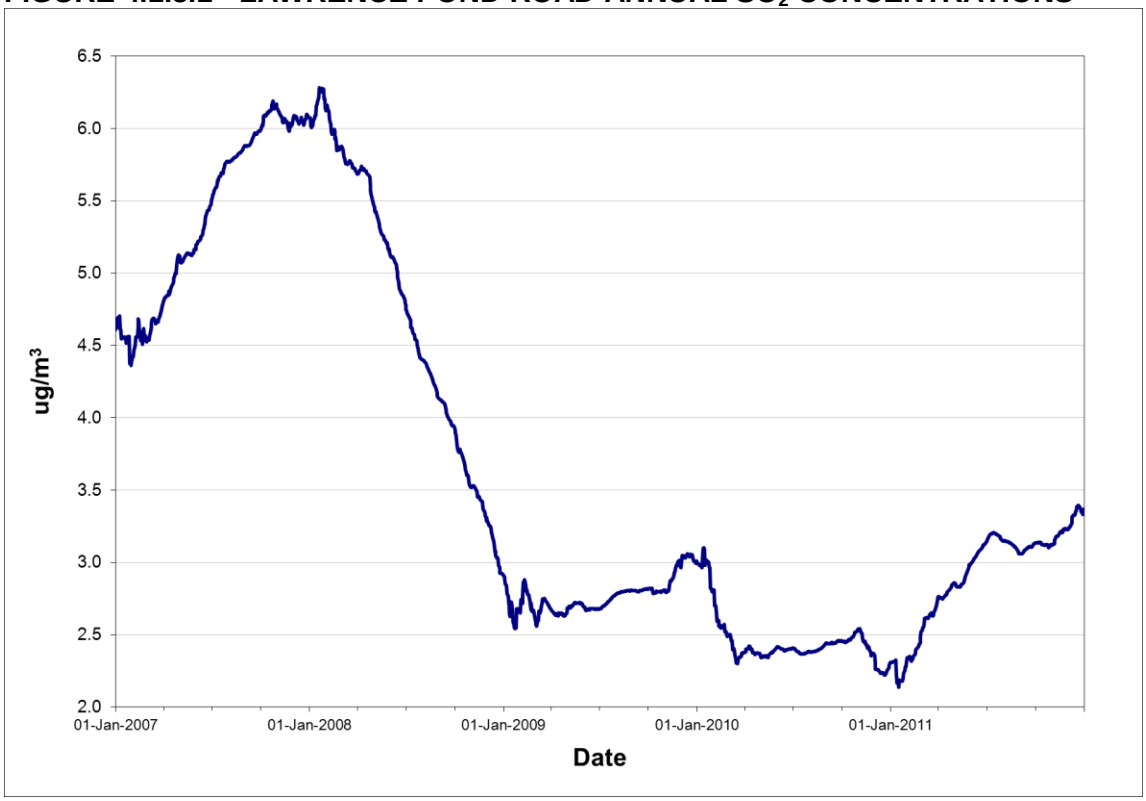
The Lawrence Pond Road station monitors the ambient levels of $SO_2$, $NO_x$ / $NO_2$, $PM_{2.5}$ on a continuous basis and TSP on a 1 day in 6 day cycle consistent with the NAPS defined schedule. For all pollutants, the ambient air criteria were not exceeded on any occasion in 2011. Tables 4.1.5.1 through 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 $SO_2$ SUMMARY 2010 & 2011**

| Year | Month | # Valid Hours | % Valid Hours | Average | Maximum 1-Hour | Maximum 3-Hour | Maximum 24-Hour | Regulatory Exceedances 1-Hour (>900) | Regulatory Exceedances 3-Hour (>600) | Regulatory Exceedances 24-Hour (>300) |
|---|---|---|---|---|---|---|---|---|---|---|
| 2010 | January | 712 | 95.7% | 4.1 | 94.1 | 74.3 | 38.3 | 0 | 0 | 0 |
| | February | 642 | 95.5% | 3.0 | 49.5 | 37.0 | 9.8 | 0 | 0 | 0 |
| | March | 708 | 95.2% | 2.3 | 45.6 | 18.8 | 10.2 | 0 | 0 | 0 |
| | April | 690 | 95.8% | 2.0 | 45.6 | 20.7 | 7.2 | 0 | 0 | 0 |
| | May | 713 | 95.8% | 2.5 | 27.2 | 20.2 | 5.8 | 0 | 0 | 0 |
| | June | 685 | 95.1% | 1.2 | 8.5 | 5.9 | 2.0 | 0 | 0 | 0 |
| | July | 709 | 95.3% | 1.6 | 4.2 | 3.8 | 3.4 | 0 | 0 | 0 |
| | August | 711 | 95.6% | 2.1 | 7.4 | 5.8 | 3.7 | 0 | 0 | 0 |
| | September | 669 | 92.9% | 1.2 | 5.0 | 4.7 | 3.8 | 0 | 0 | 0 |
| | October | 713 | 95.8% | 2.6 | 27.4 | 19.8 | 7.0 | 0 | 0 | 0 |
| | November | 689 | 95.7% | 2.3 | 25.9 | 19.0 | 5.8 | 0 | 0 | 0 |
| | December | 702 | 94.4% | 2.7 | 50.8 | 42.0 | 13.6 | 0 | 0 | 0 |
| Annual | | 8343 | 95.2% | 2.3 | 94.1 | 74.3 | 38.3 | 0 | 0 | 0 |
| 2011 | January | 713 | 95.8% | 4.1 | 73.4 | 44.1 | 21.0 | 0 | 0 | 0 |
| | February | 644 | 95.8% | 5.7 | 62.9 | 46.9 | 16.3 | 0 | 0 | 0 |
| | March | 706 | 94.9% | 5.1 | 125.0 | 76.5 | 17.0 | 0 | 0 | 0 |
| | April | 686 | 95.3% | 3.2 | 33.7 | 25.2 | 5.8 | 0 | 0 | 0 |
| | May | 666 | 89.5% | 4.0 | 24.5 | 20.3 | 8.0 | 0 | 0 | 0 |
| | June | 0 | 0.0% | | | | | | | |
| | July | 604 | 81.2% | 1.4 | 14.2 | 5.4 | 2.9 | 0 | 0 | 0 |
| | August | 708 | 95.2% | 1.2 | 5.5 | 3.1 | 1.7 | 0 | 0 | 0 |
| | September | 683 | 94.9% | 2.1 | 4.8 | 4.0 | 3.4 | 0 | 0 | 0 |
| | October | 711 | 95.6% | 2.4 | 25.7 | 12.2 | 5.1 | 0 | 0 | 0 |
| | November | 689 | 95.7% | 3.5 | 39.4 | 25.8 | 8.5 | 0 | 0 | 0 |
| | December | 685 | 92.1% | 4.3 | 79.1 | 69.1 | 24.1 | 0 | 0 | 0 |
| Annual | | 7495 | 85.6% | 3.4 | 125.0 | 76.5 | 24.1 | 0 | 0 | 0 |

Observations in $ug/m^3$

**FIGURE 4.1.5.1 - LAWRENCE POND ROAD ANNUAL $SO_2$ CONCENTRATIONS**



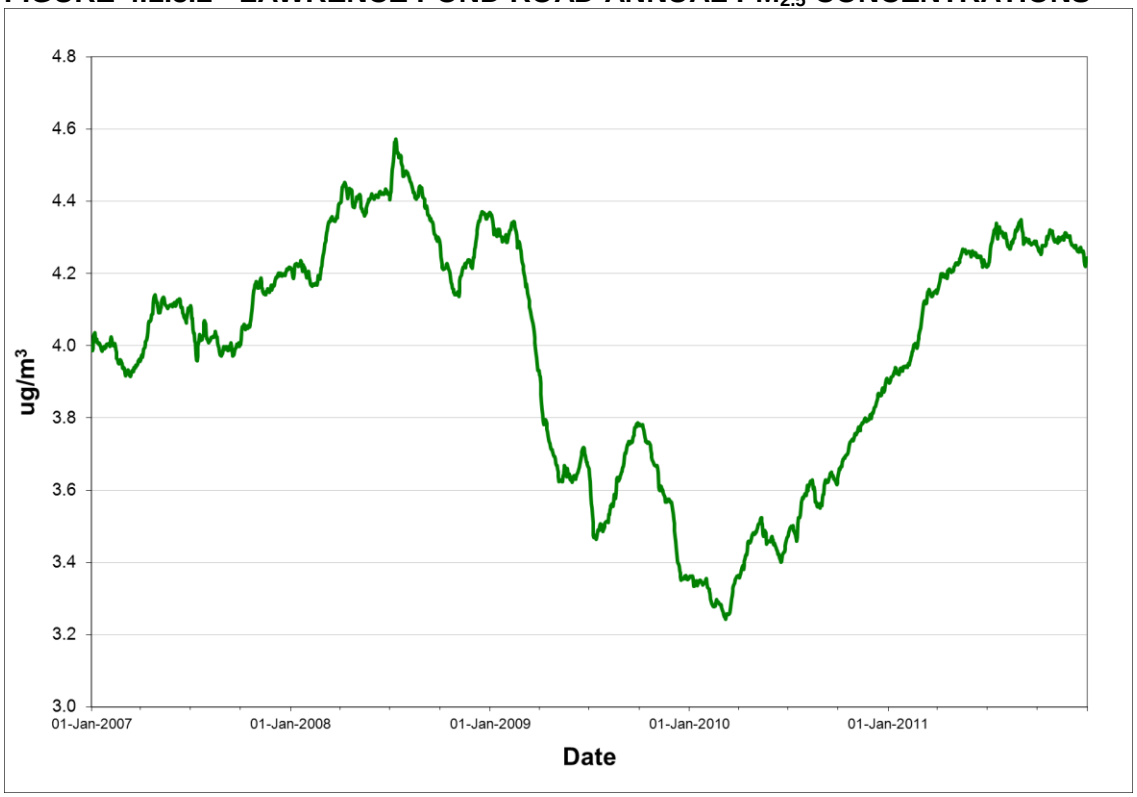

Rolling annual average of hourly concentrations

**TABLE 4.1.5.2 - LAWRENCE POND ROAD $PM_{2.5}$ SUMMARY 2010 & 2011**

| Year | Month | # Valid Days | % Valid Days | Average | Maximum 24-Hour | Regulatory Exceedances (>25 µg/m$^3$) |
|---|---|---|---|---|---|---|
| 2010 | January | 31 | 100.0% | 2.8 | 6.5 | 0 |
| | February | 28 | 100.0% | 2.8 | 6.5 | 0 |
| | March | 31 | 100.0% | 3.6 | 6.8 | 0 |
| | April | 30 | 100.0% | 3.9 | 9.5 | 0 |
| | May | 31 | 100.0% | 3.3 | 5.5 | 0 |
| | June | 28 | 93.3% | 4.3 | 8.5 | 0 |
| | July | 31 | 100.0% | 4.9 | 15.8 | 0 |
| | August | 31 | 100.0% | 4.6 | 9.7 | 0 |
| | September | 23 | 76.7% | 5.9 | 16.0 | 0 |
| | October | 31 | 100.0% | 3.5 | 6.1 | 0 |
| | November | 30 | 100.0% | 3.5 | 6.5 | 0 |
| | December | 31 | 100.0% | 4.1 | 8.5 | 0 |
| Annual | | 356 | 97.5% | 3.9 | 16.0 | 0 |
| 2011 | January | 31 | 100.0% | 3.3 | 6.3 | 0 |
| | February | 28 | 100.0% | 4.1 | 6.3 | 0 |
| | March | 31 | 100.0% | 4.8 | 8.9 | 0 |
| | April | 30 | 100.0% | 4.7 | 7.9 | 0 |
| | May | 31 | 100.0% | 3.8 | 6.3 | 0 |
| | June | 30 | 100.0% | 3.9 | 8.4 | 0 |
| | July | 31 | 100.0% | 5.8 | 12.3 | 0 |
| | August | 30 | 96.8% | 5.2 | 10.6 | 0 |
| | September | 26 | 86.7% | 4.8 | 7.7 | 0 |
| | October | 31 | 100.0% | 3.8 | 10.5 | 0 |
| | November | 30 | 100.0% | 3.6 | 7.7 | 0 |
| | December | 31 | 100.0% | 3.4 | 7.2 | 0 |
| Annual | | 360 | 98.6% | 4.2 | 12.3 | 0 |

Observations in ug/m$^3$

**FIGURE 4.1.5.2 - LAWRENCE POND ROAD ANNUAL $PM_{2.5}$ CONCENTRATIONS**



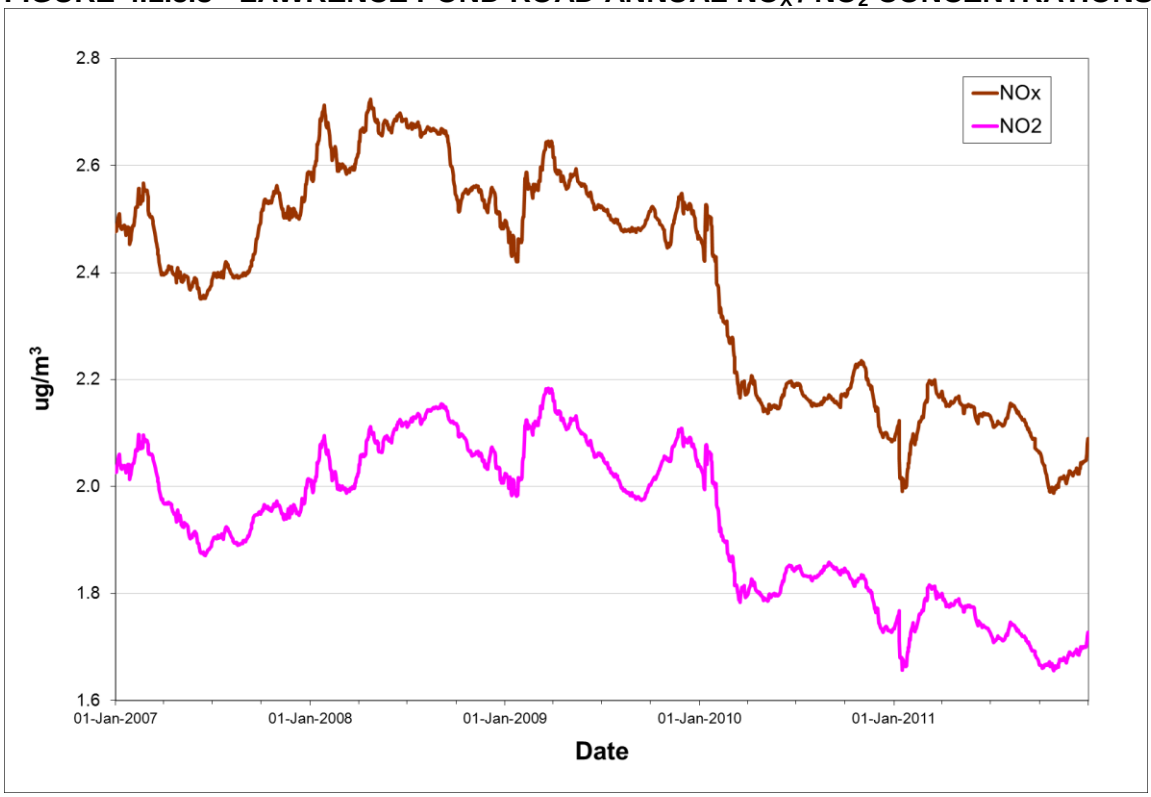

Rolling annual average of hourly concentrations

**TABLE 4.1.5.3 - LAWRENCE POND ROAD $NO_X$ / $NO_2$ SUMMARY 2010 & 2011**

| Year | Month | # Valid Hours | % Valid Hours | Average $NO_x$ | Average $NO_2$ | Maximums 1-Hour $NO_x$ | Maximums 1-Hour $NO_2$ | Maximums 24-Hour $NO_x$ | Maximums 24-Hour $NO_2$ | Exceedances 1-Hour (>400) | Exceedances 24-Hour (>200) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 2010 | January | 682 | 91.7% | 3.2 | 2.7 | 65.9 | 50.5 | 28.1 | 22.4 | 0 | 0 |
| | February | 614 | 91.4% | 2.1 | 1.7 | 32.9 | 30.2 | 6.0 | 4.6 | 0 | 0 |
| | March | 677 | 91.0% | 2.0 | 1.7 | 28.8 | 22.0 | 6.0 | 5.7 | 0 | 0 |
| | April | 660 | 91.7% | 1.7 | 1.5 | 24.7 | 22.0 | 5.0 | 4.2 | 0 | 0 |
| | May | 682 | 91.7% | 1.9 | 1.5 | 30.3 | 17.2 | 6.5 | 4.6 | 0 | 0 |
| | June | 665 | 92.4% | 2.3 | 2.1 | 15.6 | 14.6 | 5.3 | 4.8 | 0 | 0 |
| | July | 710 | 95.4% | 1.4 | 1.2 | 7.0 | 6.7 | 2.5 | 2.2 | 0 | 0 |
| | August | 713 | 95.8% | 1.9 | 1.7 | 7.2 | 6.2 | 3.4 | 3.0 | 0 | 0 |
| | September | 652 | 90.6% | 2.4 | 1.8 | 52.9 | 19.6 | 9.3 | 4.5 | 0 | 0 |
| | October | 655 | 88.0% | 2.8 | 1.5 | 14.5 | 13.9 | 4.4 | 4.0 | 0 | 0 |
| | November | 660 | 91.7% | 1.9 | 1.7 | 57.8 | 17.8 | 4.6 | 3.3 | 0 | 0 |
| | December | 673 | 90.5% | 1.7 | 1.6 | 26.3 | 20.7 | 5.6 | 5.2 | 0 | 0 |
| Annual | | 8043 | 91.8% | 2.1 | 1.7 | 65.9 | 50.5 | 28.1 | 22.4 | 0 | 0 |
| 2011 | January | 682 | 91.7% | 2.8 | 2.5 | 41.2 | 36.4 | 10.5 | 8.8 | 0 | 0 |
| | February | 616 | 91.7% | 3.4 | 2.7 | 42.1 | 30.1 | 10.6 | 8.3 | 0 | 0 |
| | March | 674 | 90.6% | 2.2 | 1.8 | 67.1 | 83.5 | 9.5 | 6.5 | 0 | 0 |
| | April | 656 | 91.1% | 1.6 | 1.4 | 18.1 | 14.7 | 3.3 | 2.8 | 0 | 0 |
| | May | 690 | 92.7% | 1.6 | 1.3 | 14.7 | 11.4 | 4.6 | 3.8 | 0 | 0 |
| | June | 683 | 94.9% | 2.1 | 1.6 | 24.8 | 16.8 | 7.3 | 5.8 | 0 | 0 |
| | July | 712 | 95.7% | 1.3 | 1.2 | 13.4 | 7.3 | 3.1 | 2.5 | 0 | 0 |
| | August | 708 | 95.2% | 1.8 | 1.6 | 8.5 | 7.3 | 3.8 | 3.2 | 0 | 0 |
| | September | 679 | 94.3% | 1.6 | 1.2 | 8.3 | 7.4 | 2.9 | 2.1 | 0 | 0 |
| | October | 711 | 95.6% | 2.0 | 1.5 | 16.1 | 15.4 | 3.3 | 2.9 | 0 | 0 |
| | November | 659 | 91.5% | 2.3 | 2.0 | 19.7 | 17.7 | 4.1 | 3.7 | 0 | 0 |
| | December | 655 | 88.0% | 2.5 | 2.1 | 49.7 | 35.6 | 14.6 | 10.3 | 0 | 0 |
| Annual | | 8125 | 92.8% | 2.1 | 1.7 | 67.1 | 83.5 | 14.6 | 10.3 | 0 | 0 |

Observations in $ug/m^3$

**FIGURE 4.1.5.3 - LAWRENCE POND ROAD ANNUAL $NO_X$ / $NO_2$ CONCENTRATIONS**



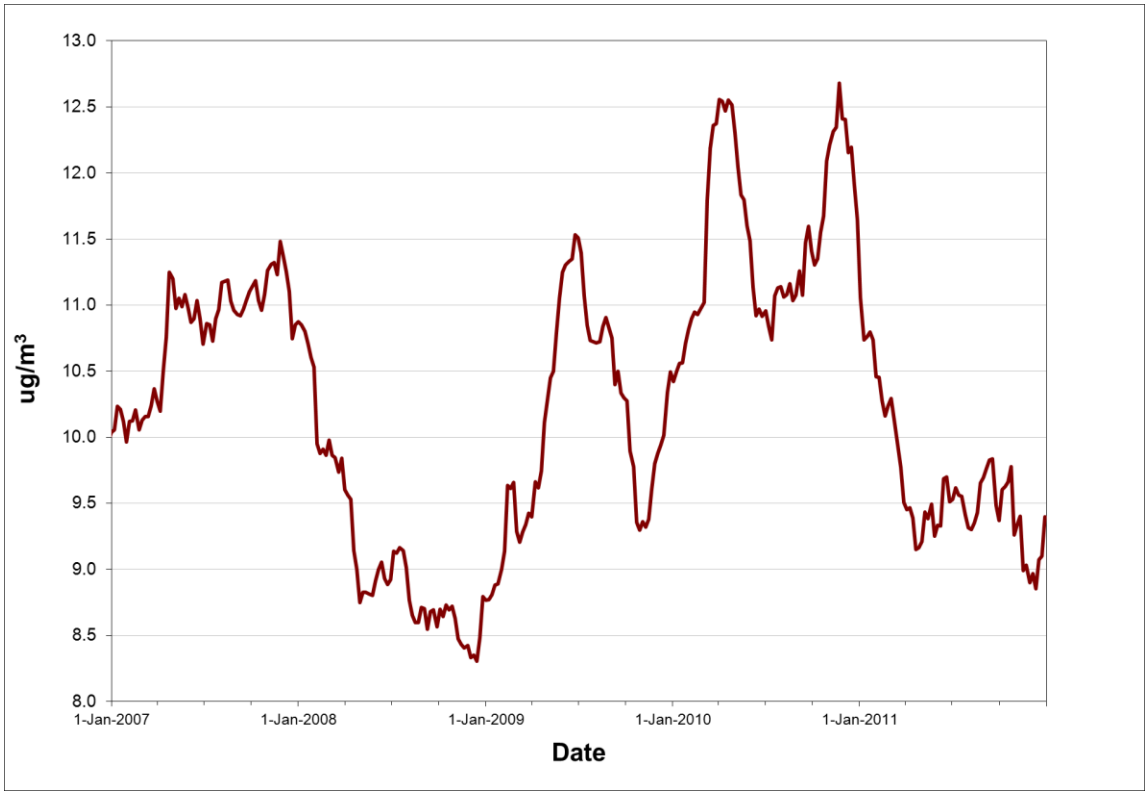

Rolling annual average of hourly concentrations

**TABLE 4.1.5.4 - LAWRENCE POND ROAD TSP SUMMARY 2010 & 2011**

| Year | Month | # Valid Days | % Valid Days | Average | Maximum 24-Hour | Regulatory Exceedances (>120 ug/m$^3$) |
|---|---|---|---|---|---|---|
| 2010 | January | 5 | 100.0% | 15.7 | 22.4 | 0 |
| | February | 4 | 80.0% | 12.2 | 14.9 | 0 |
| | March | 5 | 100.0% | 31.0 | 55.4 | 0 |
| | April | 5 | 100.0% | 12.2 | 17.5 | 0 |
| | May | 5 | 100.0% | 7.5 | 17.0 | 0 |
| | June | 5 | 100.0% | 11.5 | 25.4 | 0 |
| | July | 6 | 100.0% | 12.9 | 33.9 | 0 |
| | August | 5 | 100.0% | 8.1 | 13.2 | 0 |
| | September | 5 | 100.0% | 11.9 | 35.4 | 0 |
| | October | 5 | 100.0% | 7.9 | 11.4 | 0 |
| | November | 5 | 100.0% | 10.8 | 31.1 | 0 |
| | December | 4 | 80.0% | 6.2 | 11.1 | 0 |
| Annual | | 59 | 96.7% | 11.4 | 55.4 | 0 |
| 2011 | January | 5 | 100.0% | 6.8 | 16.7 | 0 |
| | February | 5 | 100.0% | 7.9 | 19.1 | 0 |
| | March | 5 | 100.0% | 11.1 | 19.8 | 0 |
| | April | 5 | 100.0% | 8.8 | 18.8 | 0 |
| | May | 5 | 100.0% | 9.1 | 22.6 | 0 |
| | June | 5 | 100.0% | 14.6 | 31.5 | 0 |
| | July | 5 | 100.0% | 11.1 | 22.9 | 0 |
| | August | 5 | 83.3% | 12.1 | 32.3 | 0 |
| | September | 5 | 100.0% | 10.1 | 52.7 | 0 |
| | October | 5 | 100.0% | 6.1 | 16.6 | 0 |
| | November | 5 | 100.0% | 6.7 | 12.9 | 0 |
| | December | 5 | 100.0% | 11.8 | 22.5 | 0 |
| Annual | | 60 | 98.4% | 9.4 | 52.7 | 0 |

Observations in ug/m$^3$

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




Rolling annual average of daily concentrations

## 4.1.6 NALCOR Property Boundary

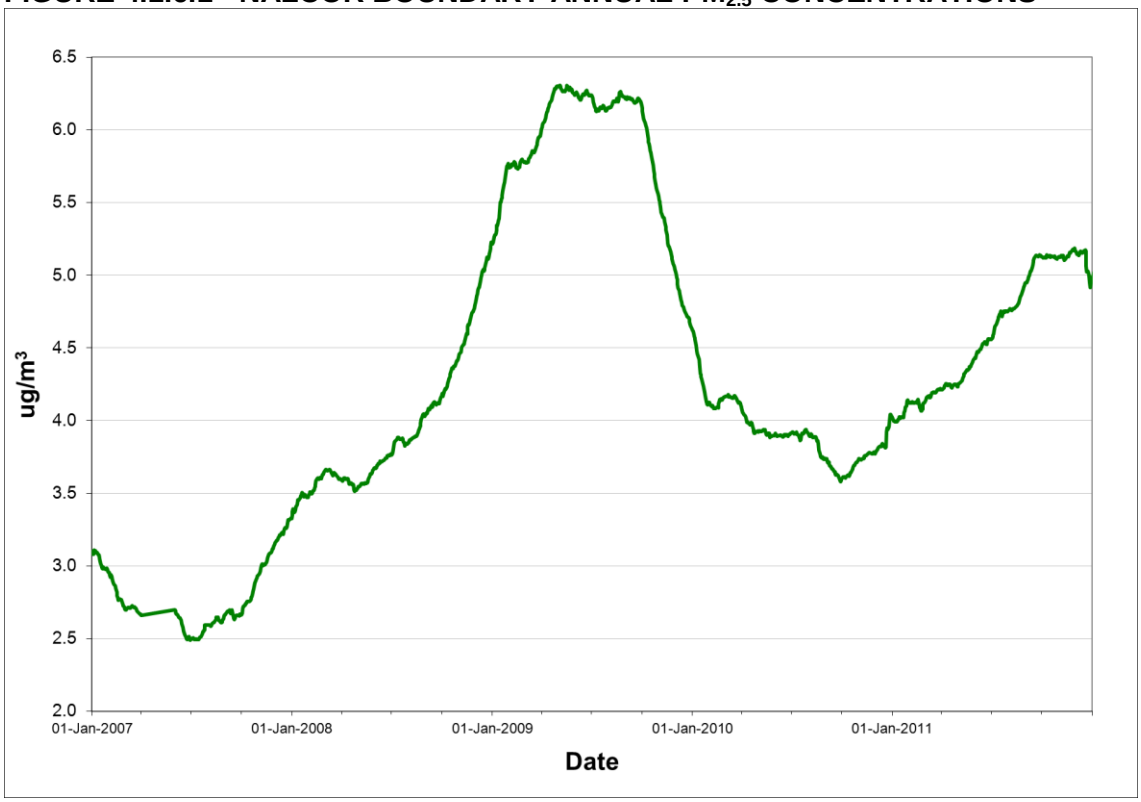
The NALCOR Property Boundary station monitors the ambient levels of $PM_{2.5}$ on a continuous basis and TSP on a 1 day in 6 day cycle consistent with the NAPS defined schedule. For TSP and $PM_{2.5}$, the ambient air criteria were not exceeded on any occasion in 2011. Tables 4.1.6.1 through 4.1.6.2 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 $PM_{2.5}$ SUMMARY 2010 & 2011**

| Year | Month | # Valid Days | % Valid Days | Average | Maximum 24-Hour | Regulatory Exceedances (>25 µg/m$^3$) |
|---|---|---|---|---|---|---|
| 2010 | January | 31 | 100.0% | 3.7 | 7.1 | 0 |
| | February | 28 | 100.0% | 4.7 | 12.4 | 0 |
| | March | 31 | 100.0% | 4.4 | 7.2 | 0 |
| | April | 30 | 100.0% | 5.0 | 10.6 | 0 |
| | May | 31 | 100.0% | 2.9 | 5.8 | 0 |
| | June | 30 | 100.0% | 3.6 | 8.1 | 0 |
| | July | 31 | 100.0% | 4.5 | 15.5 | 0 |
| | August | 28 | 90.3% | 4.0 | 11.0 | 0 |
| | September | 24 | 80.0% | 2.7 | 6.5 | 0 |
| | October | 31 | 100.0% | 2.9 | 6.5 | 0 |
| | November | 30 | 100.0% | 2.9 | 6.9 | 0 |
| | December | 31 | 100.0% | 6.8 | 40.8 | 1 |
| Annual | | 356 | 97.5% | 4.0 | 40.8 | 1 |
| 2011 | January | 31 | 100.0% | 4.8 | 15.8 | 0 |
| | February | 28 | 100.0% | 4.7 | 17.4 | 0 |
| | March | 30 | 96.8% | 5.5 | 9.4 | 0 |
| | April | 27 | 90.0% | 5.4 | 9.3 | 0 |
| | May | 29 | 93.5% | 5.2 | 8.5 | 0 |
| | June | 30 | 100.0% | 5.1 | 9.6 | 0 |
| | July | 31 | 100.0% | 6.7 | 13.0 | 0 |
| | August | 31 | 100.0% | 6.2 | 10.4 | 0 |
| | September | 26 | 86.7% | 5.4 | 10.1 | 0 |
| | October | 27 | 87.1% | 2.6 | 8.2 | 0 |
| | November | 29 | 96.7% | 3.6 | 7.6 | 0 |
| | December | 31 | 100.0% | 4.5 | 13.9 | 0 |
| Annual | | 350 | 95.9% | 5.0 | 17.4 | 0 |

Observations in ug/m$^3$

**FIGURE 4.1.6.1 - NALCOR BOUNDARY ANNUAL $PM_{2.5}$ CONCENTRATIONS**



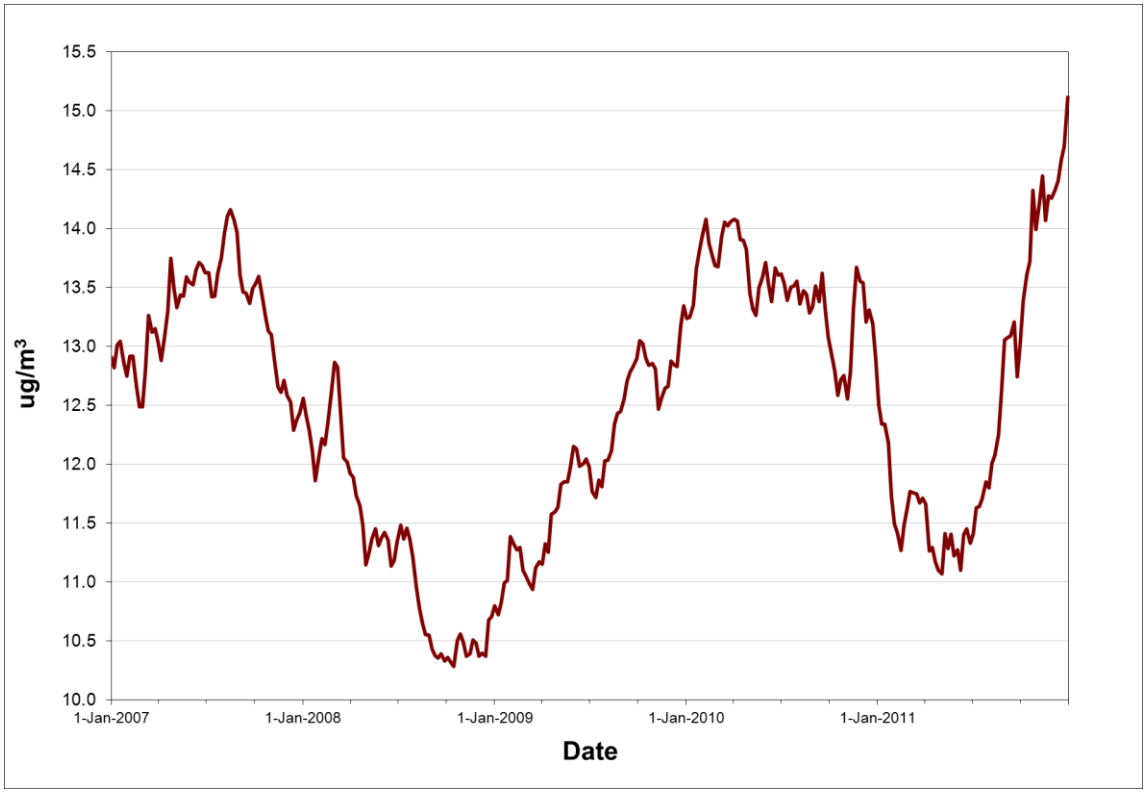

Rolling annual average of hourly concentrations

**TABLE 4.1.6.2 - NALCOR BOUNDARY TSP SUMMARY 2010 & 2011**

| Year | Month | # Valid Days | % Valid Days | Average | Maximum 24-Hour | Regulatory Exceedances (>120 ug/m$^3$) |
|---|---|---|---|---|---|---|
| 2010 | January | 5 | 100.0% | 24.7 | 62.6 | 0 |
| | February | 4 | 80.0% | 13.6 | 28.5 | 0 |
| | March | 5 | 100.0% | 20.0 | 38.9 | 0 |
| | April | 4 | 80.0% | 13.6 | 18.8 | 0 |
| | May | 5 | 100.0% | 11.6 | 40.8 | 0 |
| | June | 5 | 100.0% | 14.7 | 33.7 | 0 |
| | July | 6 | 100.0% | 9.3 | 21.8 | 0 |
| | August | 5 | 100.0% | 9.4 | 18.0 | 0 |
| | September | 5 | 100.0% | 10.5 | 34.8 | 0 |
| | October | 5 | 100.0% | 9.1 | 14.0 | 0 |
| | November | 5 | 100.0% | 16.7 | 30.6 | 0 |
| | December | 5 | 100.0% | 8.2 | 12.9 | 0 |
| Annual | | 59 | 96.7% | 12.6 | 62.6 | 0 |
| 2011 | January | 5 | 100.0% | 9.0 | 16.0 | 0 |
| | February | 5 | 100.0% | 14.0 | 23.8 | 0 |
| | March | 5 | 100.0% | 18.9 | 26.8 | 0 |
| | April | 5 | 100.0% | 6.9 | 17.0 | 0 |
| | May | 5 | 100.0% | 13.4 | 21.4 | 0 |
| | June | 5 | 100.0% | 18.7 | 31.9 | 0 |
| | July | 5 | 100.0% | 16.0 | 45.4 | 0 |
| | August | 6 | 100.0% | 23.4 | 52.2 | 0 |
| | September | 5 | 100.0% | 13.7 | 32.0 | 0 |
| | October | 5 | 100.0% | 19.2 | 59.1 | 0 |
| | November | 5 | 100.0% | 20.2 | 40.6 | 0 |
| | December | 2 | 40.0% | 18.3 | 23.8 | 0 |
| Annual | | 58 | 95.1% | 15.2 | 59.1 | 0 |

Observations in ug/m$^3$

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

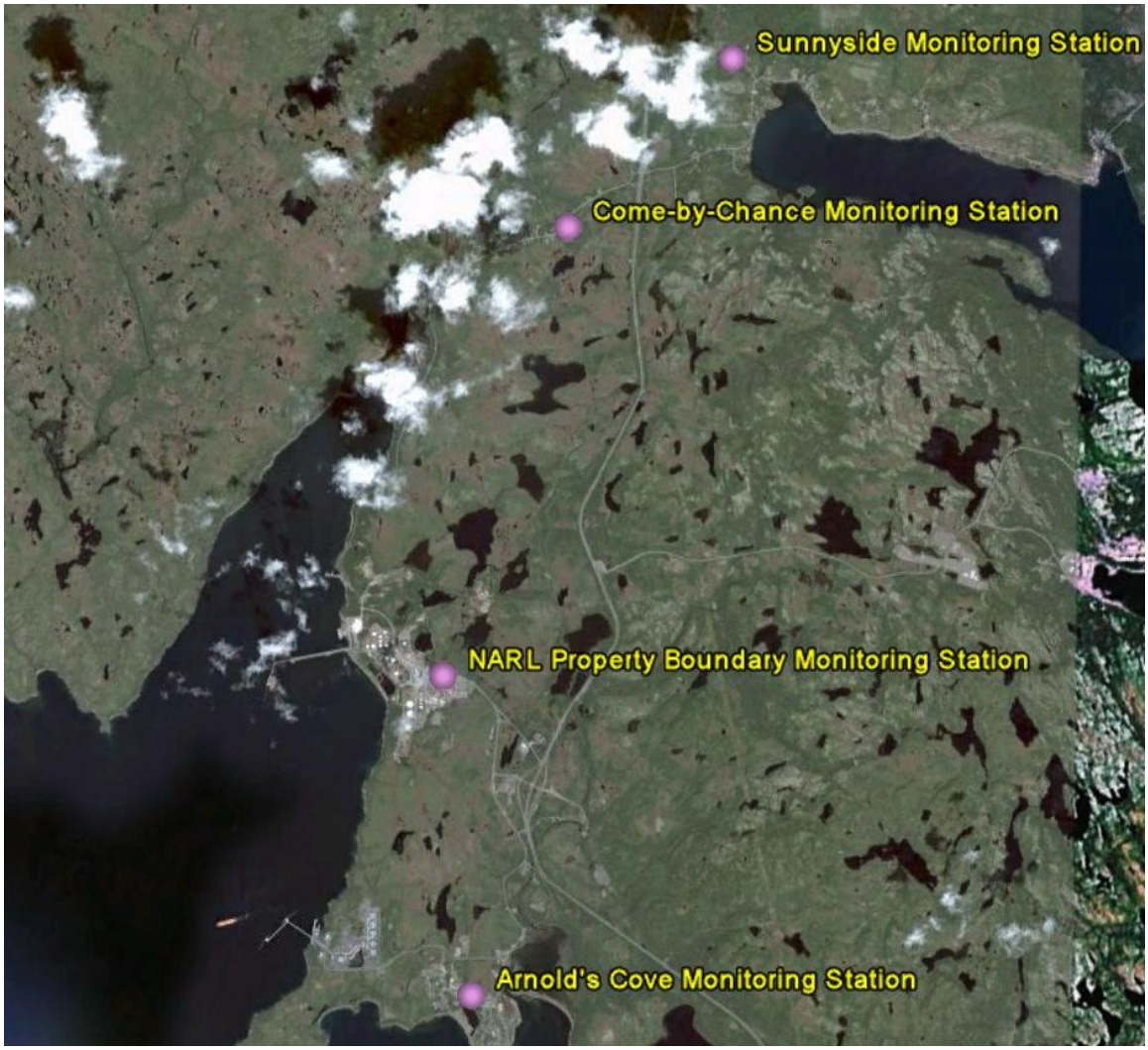



Rolling annual average of daily concentrations

## 4.2 North Atlantic Refining Limited

In 2011, North Atlantic Refining Limited (NARL) operated monitoring stations at four 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

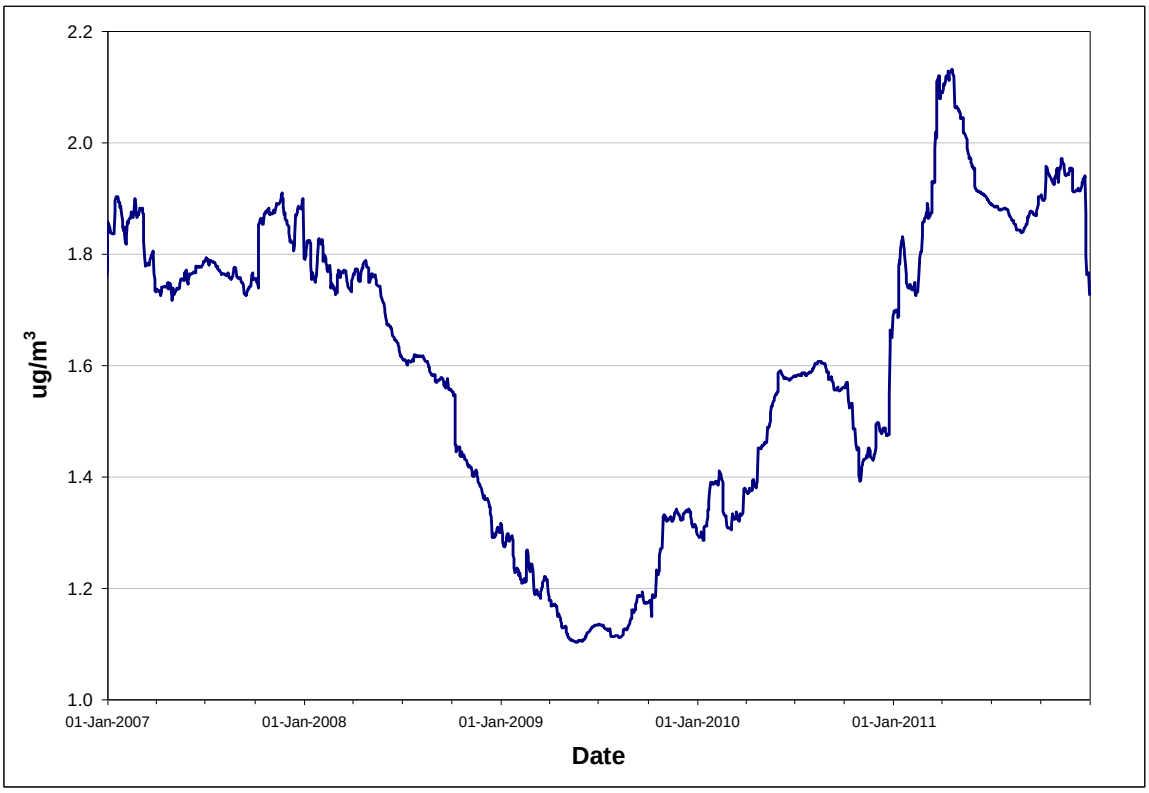
The Arnold's Cove station monitors the ambient levels of $SO_2$ and $PM_{2.5}$ on a continuous basis and is located near Tricentia Academy School. For both pollutants, the ambient air criteria were not exceeded on any occasion in 2011. Tables 4.2.1.1 through 4.2.1.2 provide summary information on the 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 $SO_2$ SUMMARY 2010 & 2011**

| Year | Month | # Valid Hours | % Valid Hours | Average | Maximum 1-Hour | Maximum 3-Hour | Maximum 24-Hour | Regulatory Exceedances 1-Hour (>900) | Regulatory Exceedances 3-Hour (>600) | Regulatory Exceedances 24-Hour (>300) |
|---|---|---|---|---|---|---|---|---|---|---|
| 2010 | January | 710 | 95.4% | 2.7 | 74.0 | 44.5 | 9.3 | 0 | 0 | 0 |
| | February | 638 | 94.9% | 1.2 | 28.4 | 18.6 | 7.2 | 0 | 0 | 0 |
| | March | 707 | 95.0% | 2.1 | 79.7 | 43.6 | 15.8 | 0 | 0 | 0 |
| | April | 685 | 95.1% | 1.8 | 55.4 | 45.9 | 19.4 | 0 | 0 | 0 |
| | May | 709 | 95.3% | 1.7 | 57.2 | 51.4 | 10.0 | 0 | 0 | 0 |
| | June | 666 | 92.5% | 1.1 | 58.9 | 38.8 | 12.8 | 0 | 0 | 0 |
| | July | 694 | 93.3% | 0.5 | 11.0 | 8.4 | 2.1 | 0 | 0 | 0 |
| | August | 709 | 95.3% | 0.9 | 24.7 | 16.5 | 3.4 | 0 | 0 | 0 |
| | September | 684 | 95.0% | 0.9 | 18.8 | 9.1 | 2.2 | 0 | 0 | 0 |
| | October | 691 | 92.9% | 1.1 | 32.0 | 10.6 | 3.5 | 0 | 0 | 0 |
| | November | 685 | 95.1% | 2.3 | 94.0 | 39.9 | 16.1 | 0 | 0 | 0 |
| | December | 696 | 93.5% | 3.8 | 131.5 | 95.7 | 31.7 | 0 | 0 | 0 |
| Annual | | 8274 | 94.5% | 1.7 | 131.5 | 95.7 | 31.7 | 0 | 0 | 0 |
| 2011 | January | 694 | 93.3% | 3.3 | 185.6 | 131.4 | 35.5 | 0 | 0 | 0 |
| | February | 640 | 95.2% | 2.7 | 66.3 | 40.7 | 11.8 | 0 | 0 | 0 |
| | March | 708 | 95.2% | 4.7 | 219.8 | 164.5 | 38.1 | 0 | 0 | 0 |
| | April | 685 | 95.1% | 1.5 | 37.1 | 28.2 | 5.3 | 0 | 0 | 0 |
| | May | 710 | 95.4% | 0.5 | 2.3 | 1.8 | 0.9 | 0 | 0 | 0 |
| | June | 683 | 94.9% | 0.4 | 3.7 | 2.0 | 0.8 | 0 | 0 | 0 |
| | July | 706 | 94.9% | 0.4 | 12.9 | 7.9 | 1.4 | 0 | 0 | 0 |
| | August | 709 | 95.3% | 0.5 | 7.1 | 4.5 | 1.9 | 0 | 0 | 0 |
| | September | 687 | 95.4% | 1.6 | 53.9 | 24.5 | 6.0 | 0 | 0 | 0 |
| | October | 704 | 94.6% | 1.7 | 83.7 | 69.2 | 14.2 | 0 | 0 | 0 |
| | November | 687 | 95.4% | 1.9 | 31.4 | 20.1 | 11.0 | 0 | 0 | 0 |
| | December | 703 | 94.5% | 1.6 | 25.1 | 11.2 | 3.8 | 0 | 0 | 0 |
| Annual | | 8316 | 94.9% | 1.7 | 219.8 | 164.5 | 38.1 | 0 | 0 | 0 |

Observations in $ug/m^3$

**FIGURE 4.2.1.1 - ARNOLD'S COVE ANNUAL $SO_2$ CONCENTRATIONS**



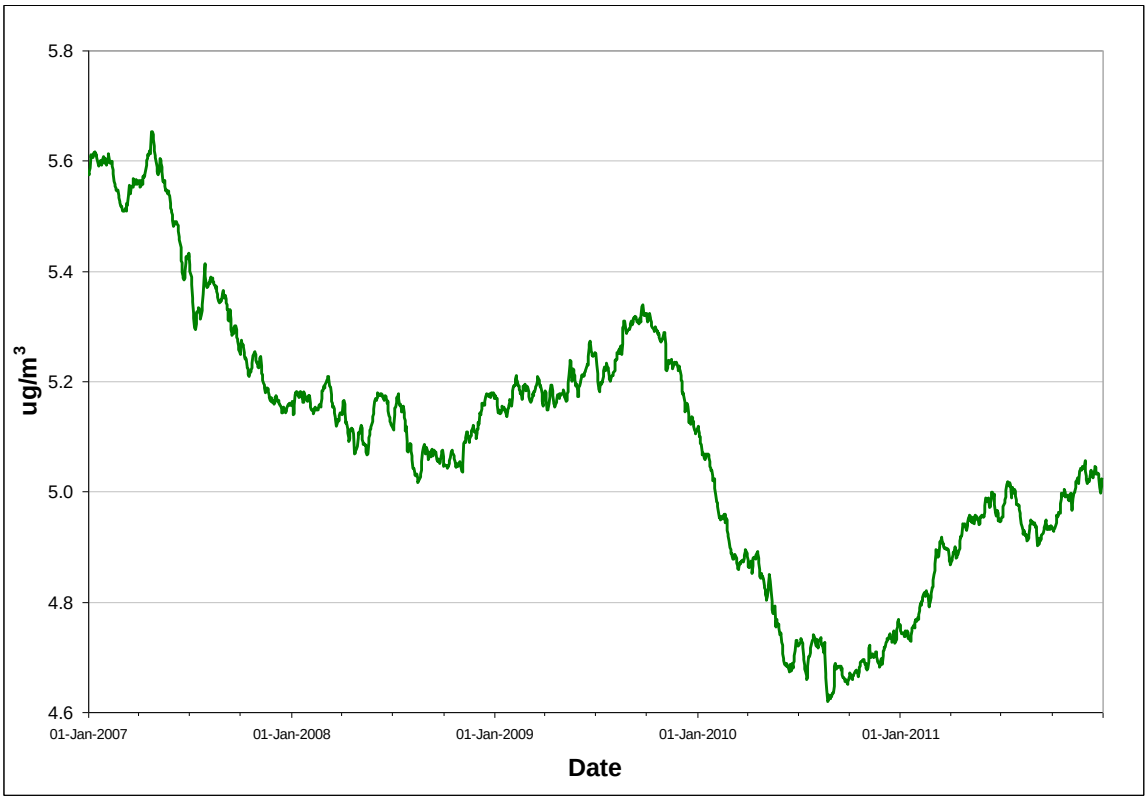

Rolling annual average of hourly concentrations

**TABLE 4.2.1.2 - ARNOLD'S COVE $PM_{2.5}$ SUMMARY 2010 & 2011**

| Year | Month | # Valid Days | % Valid Days | Average | Maximum 24-Hour | Regulatory Exceedances (>25 µg/m$^3$) |
|---|---|---|---|---|---|---|
| 2010 | January | 31 | 100.0% | 4.4 | 7.6 | 0 |
| | February | 28 | 100.0% | 4.1 | 9.5 | 0 |
| | March | 31 | 100.0% | 4.9 | 8.5 | 0 |
| | April | 30 | 100.0% | 5.0 | 11.4 | 0 |
| | May | 31 | 100.0% | 4.2 | 8.3 | 0 |
| | June | 30 | 100.0% | 4.7 | 11.8 | 0 |
| | July | 30 | 96.8% | 5.3 | 11.7 | 0 |
| | August | 31 | 100.0% | 5.1 | 8.7 | 0 |
| | September | 25 | 83.3% | 5.3 | 17.2 | 0 |
| | October | 31 | 100.0% | 4.3 | 6.3 | 0 |
| | November | 30 | 100.0% | 4.7 | 11.4 | 0 |
| | December | 31 | 100.0% | 5.3 | 10.9 | 0 |
| Annual | | 359 | 98.4% | 4.8 | 17.2 | 0 |
| 2011 | January | 31 | 100.0% | 4.5 | 8.3 | 0 |
| | February | 28 | 100.0% | 4.9 | 6.4 | 0 |
| | March | 30 | 96.8% | 5.5 | 10.1 | 0 |
| | April | 30 | 100.0% | 5.6 | 8.8 | 0 |
| | May | 31 | 100.0% | 4.5 | 7.1 | 0 |
| | June | 29 | 96.7% | 4.5 | 8.7 | 0 |
| | July | 31 | 100.0% | 5.6 | 10.1 | 0 |
| | August | 29 | 93.5% | 4.7 | 7.5 | 0 |
| | September | 28 | 93.3% | 5.2 | 8.7 | 0 |
| | October | 31 | 100.0% | 4.9 | 9.6 | 0 |
| | November | 30 | 100.0% | 5.5 | 10.2 | 0 |
| | December | 31 | 100.0% | 4.9 | 8.9 | 0 |
| Annual | | 359 | 98.4% | 5.0 | 10.2 | 0 |

Observations in ug/m$^3$

**FIGURE 4.2.1.2 - ARNOLD'S COVE ANNUAL $PM_{2.5}$ CONCENTRATIONS**




Rolling annual average of hourly concentrations

## 4.2.2 Come by Chance

The Come by Chance station, located near the medical clinic, monitors the ambient levels of $SO_2$ and $PM_{2.5}$ on a continuous basis. For all pollutants, the ambient air criteria were not exceeded on any occasion in 2011. 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.

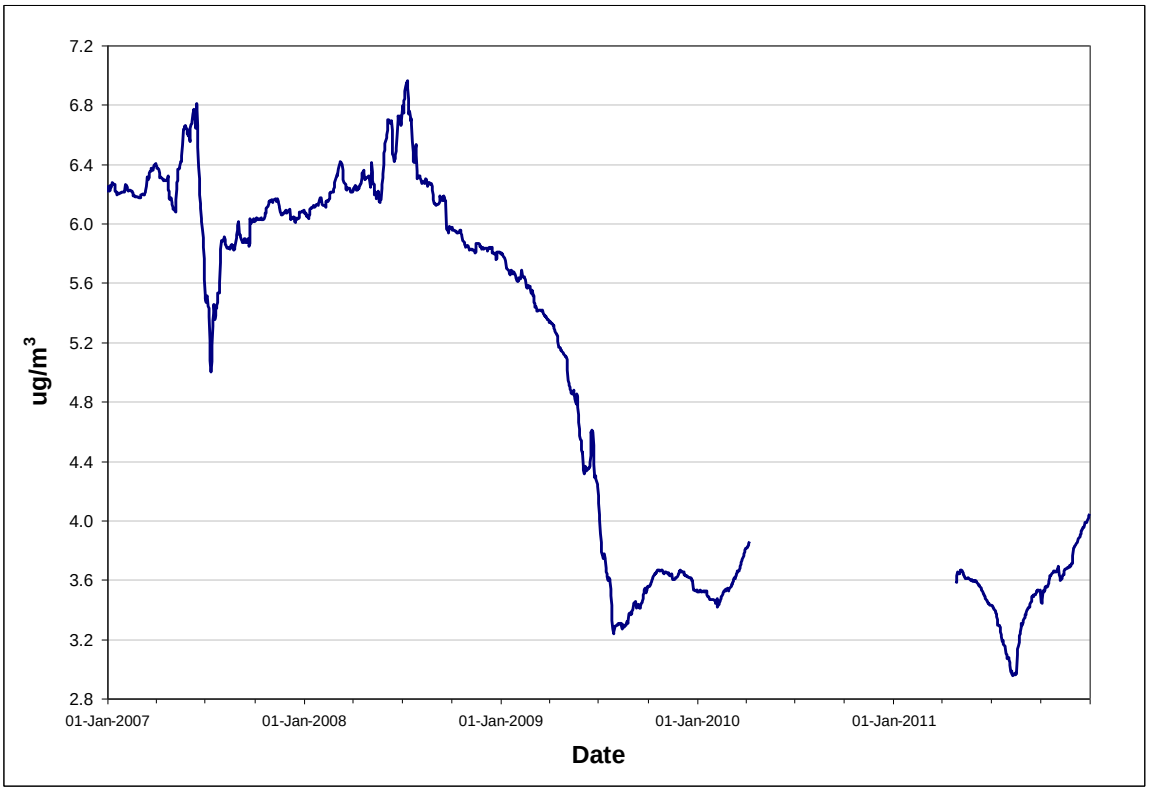
Due to successive audit failures of the $SO_2$ analyzer, 3788 hours of data were invalidated from this monitoring location in 2010.

**TABLE 4.2.2.1 - COME BY CHANCE $SO_2$ SUMMARY 2010 & 2011**

| Year | Month | # Valid Hours | % Valid Hours | Average | Maximum 1-Hour | Maximum 3-Hour | Maximum 24-Hour | Regulatory Exceedances 1-Hour (>900) | Regulatory Exceedances 3-Hour (>600) | Regulatory Exceedances 24-Hour (>300) |
|---|---|---|---|---|---|---|---|---|---|---|
| 2010 | January | 709 | 95.3% | 0.6 | 11.1 | 5.3 | 3.4 | 0 | 0 | 0 |
| | February | 78 | 11.6% | 0.0 | 0.0 | 0.0 | 0.0 | 0 | 0 | 0 |
| | March | 0 | 0.0% | | | | | | | |
| | April | 0 | 0.0% | | | | | | | |
| | May | 0 | 0.0% | | | | | | | |
| | June | 0 | 0.0% | | | | | | | |
| | July | 442 | 59.4% | 8.4 | 99.3 | 73.2 | 19.3 | 0 | 0 | 0 |
| | August | 707 | 95.0% | 4.8 | 181.1 | 115.2 | 29.3 | 0 | 0 | 0 |
| | September | 680 | 94.4% | 2.9 | 55.2 | 23.5 | 8.8 | 0 | 0 | 0 |
| | October | 698 | 93.8% | 4.3 | 78.1 | 64.2 | 31.7 | 0 | 0 | 0 |
| | November | 685 | 95.1% | 2.6 | 147.1 | 77.7 | 23.5 | 0 | 0 | 0 |
| | December | 706 | 94.9% | 1.3 | 19.4 | 7.9 | 2.8 | 0 | 0 | 0 |
| Annual | | 4705 | 53.7% | 3.2 | 181.1 | 115.2 | 31.7 | 0 | 0 | 0 |
| 2011 | January | 707 | 95.0% | 1.4 | 18.9 | 9.2 | 4.1 | 0 | 0 | 0 |
| | February | 641 | 95.4% | 1.4 | 40.5 | 18.6 | 4.3 | 0 | 0 | 0 |
| | March | 707 | 95.0% | 3.8 | 64.1 | 41.6 | 11.9 | 0 | 0 | 0 |
| | April | 681 | 94.6% | 7.3 | 124.5 | 72.6 | 26.8 | 0 | 0 | 0 |
| | May | 708 | 95.2% | 3.0 | 58.1 | 31.1 | 10.5 | 0 | 0 | 0 |
| | June | 683 | 94.9% | 1.7 | 11.3 | 8.9 | 5.1 | 0 | 0 | 0 |
| | July | 702 | 94.4% | 2.3 | 13.1 | 8.4 | 4.3 | 0 | 0 | 0 |
| | August | 708 | 95.2% | 7.9 | 186.8 | 175.6 | 43.6 | 0 | 0 | 0 |
| | September | 682 | 94.7% | 5.2 | 91.1 | 55.3 | 15.5 | 0 | 0 | 0 |
| | October | 693 | 93.1% | 5.9 | 109.5 | 72.7 | 23.8 | 0 | 0 | 0 |
| | November | 676 | 93.9% | 3.8 | 68.7 | 44.5 | 19.2 | 0 | 0 | 0 |
| | December | 700 | 94.1% | 4.6 | 83.8 | 53.9 | 17.5 | 0 | 0 | 0 |
| Annual | | 8288 | 94.6% | 4.0 | 186.8 | 175.6 | 43.6 | 0 | 0 | 0 |

Observations in $ug/m^3$

**FIGURE 4.2.2.1 - COME BY CHANCE ANNUAL $SO_2$ CONCENTRATIONS**



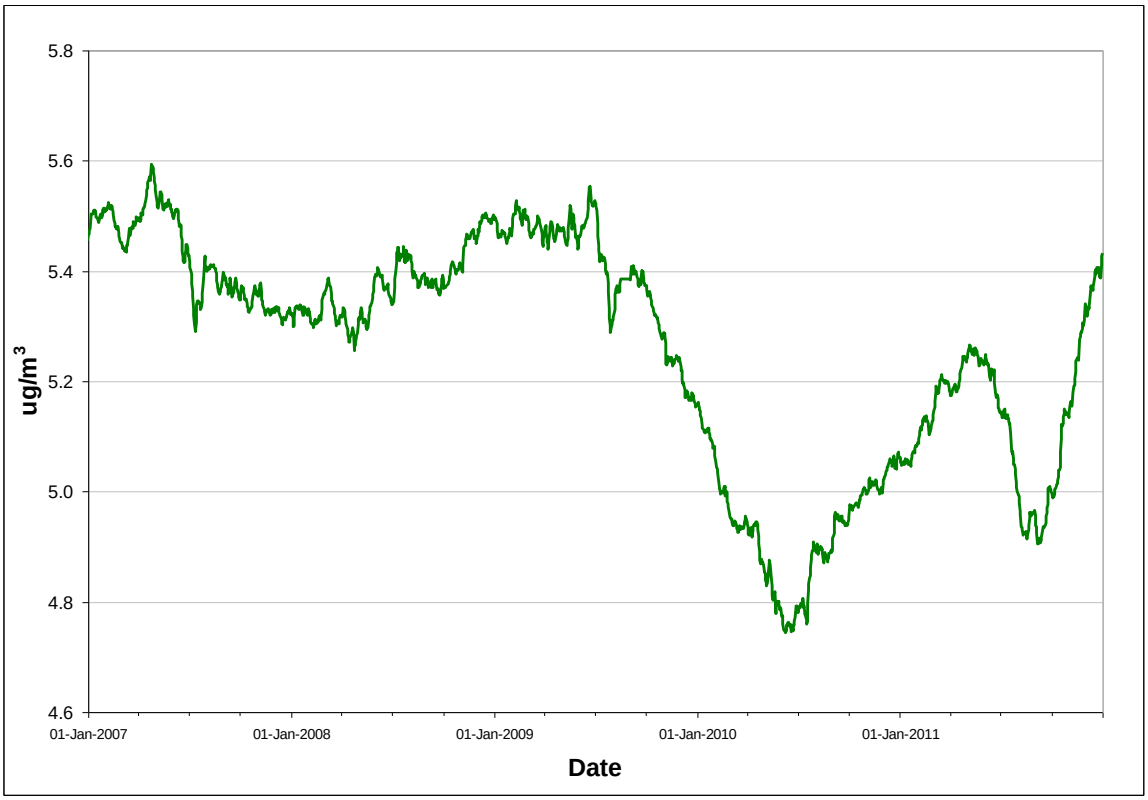

Rolling annual average of hourly concentrations

**TABLE 4.2.2.2 - COME BY CHANCE $PM_{2.5}$ SUMMARY 2010 & 2011**

| Year | Month | # Valid Days | % Valid Days | Average | Maximum 24-Hour | Regulatory Exceedances (>25 µg/m$^3$) |
|---|---|---|---|---|---|---|
| 2010 | January | 31 | 100.0% | 4.2 | 7.2 | 0 |
| | February | 28 | 100.0% | 4.1 | 9.2 | 0 |
| | March | 31 | 100.0% | 4.9 | 8.8 | 0 |
| | April | 30 | 100.0% | 5.1 | 9.9 | 0 |
| | May | 31 | 100.0% | 4.6 | 10.5 | 0 |
| | June | 30 | 100.0% | 5.6 | 14.2 | 0 |
| | July | 31 | 100.0% | 7.0 | 15.1 | 0 |
| | August | 31 | 100.0% | 5.6 | 11.5 | 0 |
| | September | 28 | 93.3% | 5.8 | 15.5 | 0 |
| | October | 29 | 93.5% | 4.3 | 8.1 | 0 |
| | November | 30 | 100.0% | 4.5 | 8.0 | 0 |
| | December | 31 | 100.0% | 5.1 | 11.0 | 0 |
| Annual | | 361 | 98.9% | 5.1 | 15.5 | 0 |
| 2011 | January | 31 | 100.0% | 4.4 | 6.7 | 0 |
| | February | 28 | 100.0% | 4.7 | 6.5 | 0 |
| | March | 31 | 100.0% | 5.6 | 9.5 | 0 |
| | April | 30 | 100.0% | 5.7 | 8.7 | 0 |
| | May | 31 | 100.0% | 4.6 | 6.8 | 0 |
| | June | 29 | 96.7% | 4.5 | 8.6 | 0 |
| | July | 31 | 100.0% | 5.3 | 9.7 | 0 |
| | August | 31 | 100.0% | 5.2 | 9.0 | 0 |
| | September | 22 | 73.3% | 6.6 | 14.6 | 0 |
| | October | 20 | 64.5% | 6.4 | 14.2 | 0 |
| | November | 30 | 100.0% | 6.8 | 14.4 | 0 |
| | December | 31 | 100.0% | 6.1 | 12.2 | 0 |
| Annual | | 345 | 94.5% | 5.4 | 14.6 | 0 |

Observations in ug/m$^3$

**FIGURE 4.2.2.2 - COME BY CHANCE ANNUAL $PM_{2.5}$ CONCENTRATIONS**




Rolling annual average of hourly concentrations

## 4.2.3 Sunnyside

The Sunnyside station monitors the ambient levels of $SO_2$, $PM_{2.5}$ and $PM_{10}$ on a continuous basis. For all pollutants, the ambient air criteria were not exceeded on any occasion in 2011. 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.

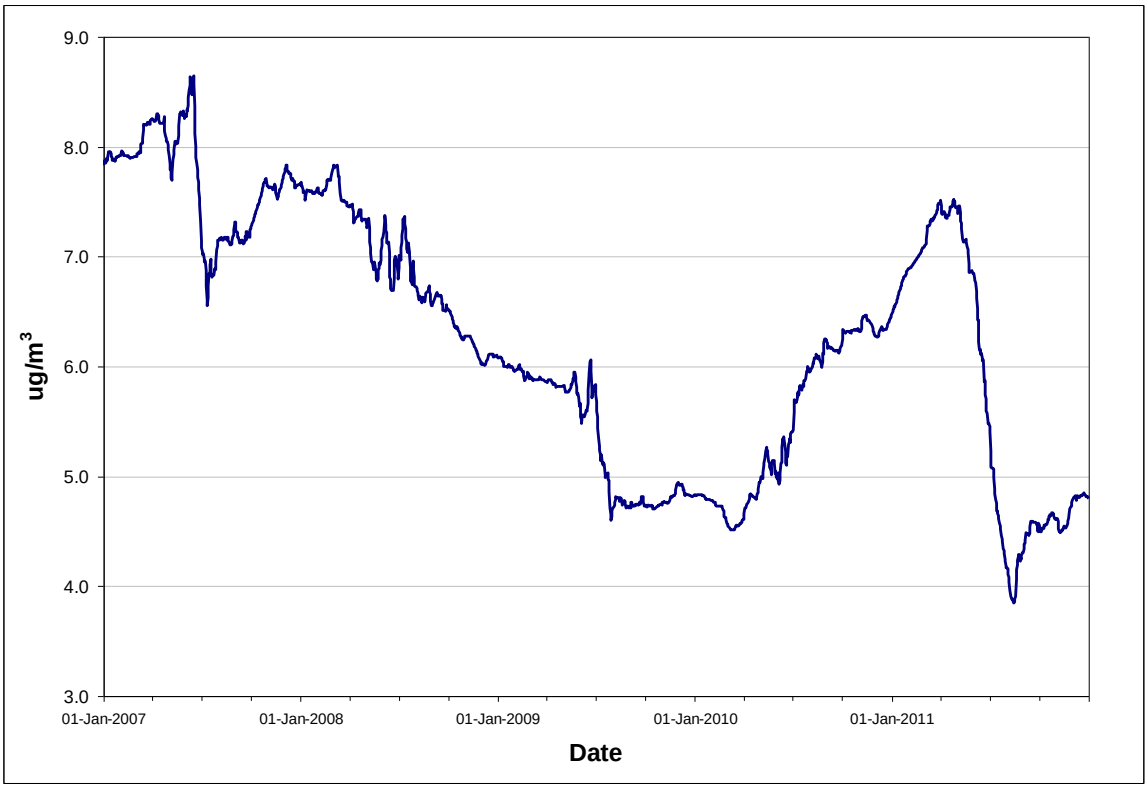
Due to successive audit failures in 2010 and 2011, the first 180 days of data for 2011 from the $PM_{10}$ analyzer were invalidated.

**TABLE 4.2.3.1 - SUNNYSIDE $SO_2$ SUMMARY 2010 & 2011**

| Year | Month | # Valid Hours | % Valid Hours | Average | Maximum 1-Hour | Maximum 3-Hour | Maximum 24-Hour | Regulatory Exceedances 1-Hour (>900) | Regulatory Exceedances 3-Hour (>600) | Regulatory Exceedances 24-Hour (>300) |
|---|---|---|---|---|---|---|---|---|---|---|
| 2010 | January | 710 | 95.4% | 1.2 | 21.6 | 10.9 | 4.8 | 0 | 0 | 0 |
| | February | 638 | 94.9% | 0.8 | 6.5 | 4.5 | 1.4 | 0 | 0 | 0 |
| | March | 711 | 95.6% | 2.2 | 81.6 | 43.4 | 11.3 | 0 | 0 | 0 |
| | April | 685 | 95.1% | 6.6 | 110.6 | 80.2 | 24.6 | 0 | 0 | 0 |
| | May | 707 | 95.0% | 9.2 | 188.9 | 130.6 | 36.6 | 0 | 0 | 0 |
| | June | 685 | 95.1% | 17.7 | 180.8 | 143.6 | 64.4 | 0 | 0 | 0 |
| | July | 709 | 95.3% | 14.6 | 154.7 | 137.5 | 57.7 | 0 | 0 | 0 |
| | August | 707 | 95.0% | 8.3 | 251.8 | 147.5 | 39.5 | 0 | 0 | 0 |
| | September | 546 | 75.8% | 3.9 | 111.1 | 54.2 | 13.9 | 0 | 0 | 0 |
| | October | 704 | 94.6% | 4.7 | 93.5 | 71.3 | 33.5 | 0 | 0 | 0 |
| | November | 683 | 94.9% | 3.6 | 152.1 | 71.4 | 25.0 | 0 | 0 | 0 |
| | December | 480 | 64.5% | 2.6 | 60.8 | 22.8 | 10.0 | 0 | 0 | 0 |
| Annual | | 7965 | 90.9% | 6.5 | 251.8 | 147.5 | 64.4 | 0 | 0 | 0 |
| 2011 | January | 305 | 41.0% | 4.8 | 58.8 | 47.4 | 9.8 | 0 | 0 | 0 |
| | February | 639 | 95.1% | 3.0 | 33.1 | 24.2 | 6.0 | 0 | 0 | 0 |
| | March | 683 | 91.8% | 6.4 | 134.7 | 100.1 | 27.4 | 0 | 0 | 0 |
| | April | 683 | 94.9% | 6.3 | 81.5 | 65.2 | 19.3 | 0 | 0 | 0 |
| | May | 708 | 95.2% | 2.7 | 71.6 | 59.2 | 19.4 | 0 | 0 | 0 |
| | June | 670 | 93.1% | 2.6 | 8.4 | 7.9 | 6.9 | 0 | 0 | 0 |
| | July | 695 | 93.4% | 0.8 | 6.5 | 4.5 | 2.2 | 0 | 0 | 0 |
| | August | 708 | 95.2% | 9.6 | 182.1 | 144.2 | 52.2 | 0 | 0 | 0 |
| | September | 682 | 94.7% | 6.9 | 96.8 | 76.3 | 28.3 | 0 | 0 | 0 |
| | October | 699 | 94.0% | 5.2 | 86.2 | 79.8 | 17.8 | 0 | 0 | 0 |
| | November | 685 | 95.1% | 5.3 | 109.1 | 64.6 | 23.5 | 0 | 0 | 0 |
| | December | 707 | 95.0% | 3.6 | 57.2 | 38.0 | 18.9 | 0 | 0 | 0 |
| Annual | | 7864 | 89.8% | 4.8 | 182.1 | 144.2 | 52.2 | 0 | 0 | 0 |

Observations in $ug/m^3$

**FIGURE 4.2.3.1 - SUNNYSIDE ANNUAL $SO_2$ CONCENTRATIONS**



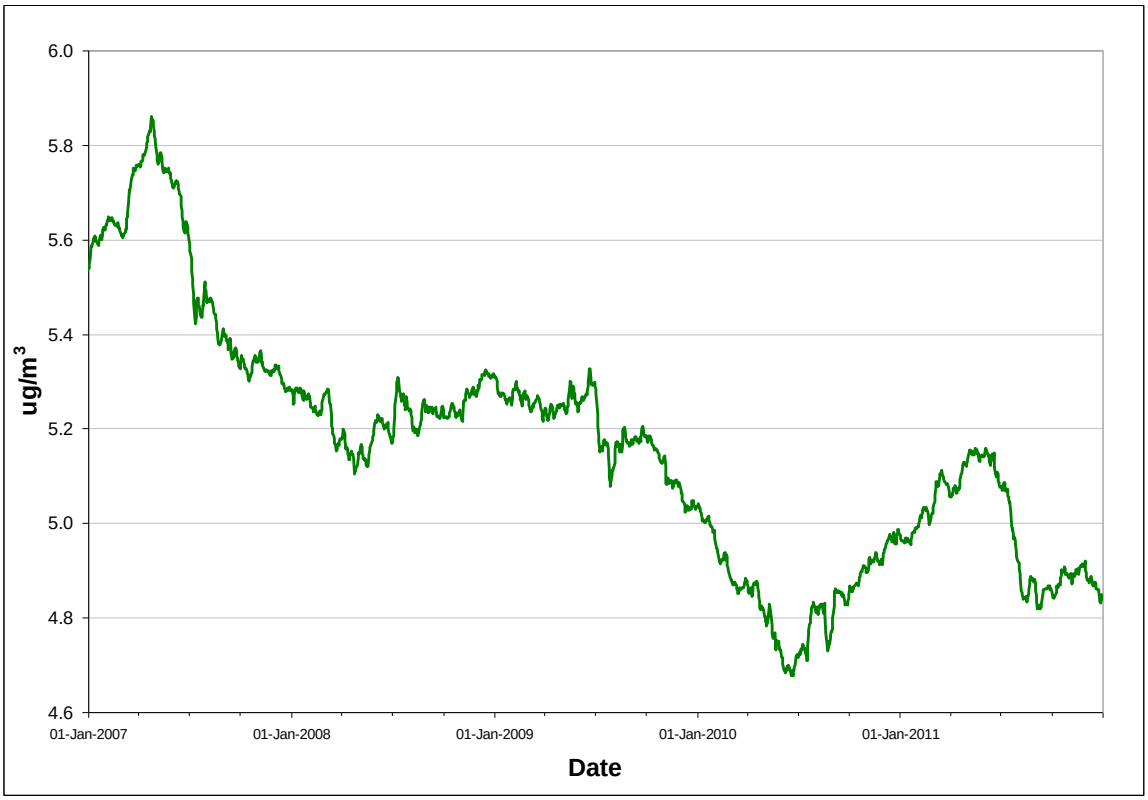

Rolling annual average of hourly concentrations

**TABLE 4.2.3.2 - SUNNYSIDE $PM_{2.5}$ SUMMARY 2010 & 2011**

| Year | Month | # Valid Days | % Valid Days | Average | Maximum 24-Hour | Regulatory Exceedances (>25 µg/m$^3$) |
|---|---|---|---|---|---|---|
| 2010 | January | 31 | 100.0% | 4.1 | 7.4 | 0 |
| | February | 28 | 100.0% | 4.0 | 9.5 | 0 |
| | March | 31 | 100.0% | 4.7 | 8.9 | 0 |
| | April | 30 | 100.0% | 4.9 | 10.2 | 0 |
| | May | 31 | 100.0% | 4.3 | 9.9 | 0 |
| | June | 30 | 100.0% | 5.1 | 13.4 | 0 |
| | July | 30 | 96.8% | 7.1 | 15.4 | 0 |
| | August | 31 | 100.0% | 5.7 | 13.9 | 0 |
| | September | 26 | 86.7% | 5.9 | 15.2 | 0 |
| | October | 31 | 100.0% | 4.4 | 7.1 | 0 |
| | November | 30 | 100.0% | 4.4 | 8.6 | 0 |
| | December | 31 | 100.0% | 5.2 | 10.9 | 0 |
| Annual | | 360 | 98.6% | 5.0 | 15.4 | 0 |
| 2011 | January | 31 | 100.0% | 4.2 | 6.8 | 0 |
| | February | 28 | 100.0% | 4.4 | 6.0 | 0 |
| | March | 31 | 100.0% | 5.1 | 9.3 | 0 |
| | April | 30 | 100.0% | 5.7 | 8.9 | 0 |
| | May | 31 | 100.0% | 4.6 | 7.2 | 0 |
| | June | 30 | 100.0% | 4.3 | 7.4 | 0 |
| | July | 31 | 100.0% | 5.2 | 9.1 | 0 |
| | August | 31 | 100.0% | 5.3 | 9.4 | 0 |
| | September | 21 | 70.0% | 5.7 | 10.3 | 0 |
| | October | 31 | 100.0% | 4.7 | 9.5 | 0 |
| | November | 30 | 100.0% | 4.8 | 8.0 | 0 |
| | December | 31 | 100.0% | 4.4 | 7.7 | 0 |
| Annual | | 356 | 97.5% | 4.8 | 10.3 | 0 |

Observations in ug/m$^3$

**FIGURE 4.2.3.2 - SUNNYSIDE ANNUAL $PM_{2.5}$ CONCENTRATIONS**



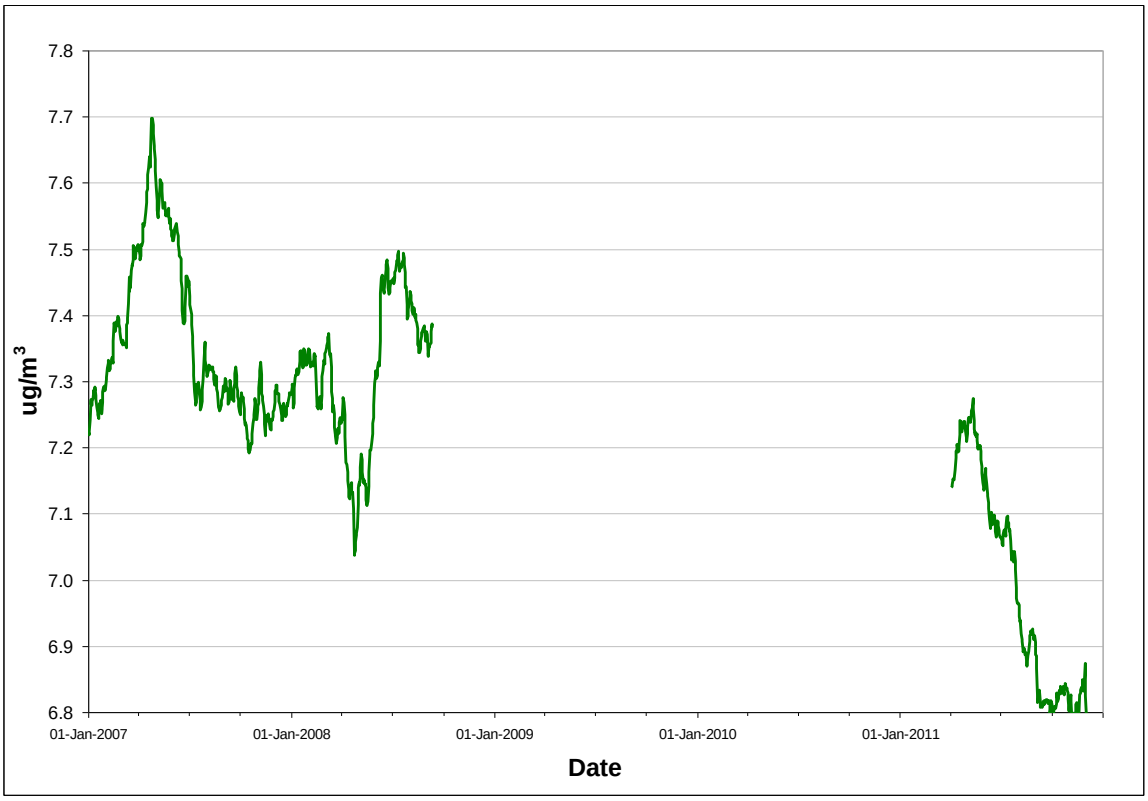

Rolling annual average of hourly concentrations

**TABLE 4.2.3.3 - SUNNYSIDE $PM_{10}$ SUMMARY 2010 & 2011**

| Year | Month | # Valid Days | % Valid Days | Average | Maximum 24-Hour | Regulatory Exceedances (>50 µg/m$^3$) |
|---|---|---|---|---|---|---|
| 2010 | January | 0 | 0.0% | | | |
| | February | 0 | 0.0% | | | |
| | March | 0 | 0.0% | | | |
| | April | 0 | 0.0% | | | |
| | May | 0 | 0.0% | | | |
| | June | 1 | 3.3% | 6.7 | 6.7 | 0 |
| | July | 31 | 100.0% | 7.9 | 15.3 | 0 |
| | August | 31 | 100.0% | 7.1 | 12.8 | 0 |
| | September | 26 | 86.7% | 8.7 | 26.8 | 0 |
| | October | 31 | 100.0% | 6.2 | 9.0 | 0 |
| | November | 30 | 100.0% | 6.5 | 16.2 | 0 |
| | December | 31 | 100.0% | 8.7 | 23.8 | 0 |
| Annual | | 181 | 49.6% | 7.5 | 26.8 | 0 |
| 2011 | January | 31 | 100.0% | 5.9 | 11.6 | 0 |
| | February | 28 | 100.0% | 5.7 | 10.4 | 0 |
| | March | 31 | 100.0% | 7.9 | 19.4 | 0 |
| | April | 30 | 100.0% | 7.8 | 13.7 | 0 |
| | May | 31 | 100.0% | 6.4 | 12.0 | 0 |
| | June | 30 | 100.0% | 6.2 | 11.9 | 0 |
| | July | 31 | 100.0% | 6.7 | 13.0 | 0 |
| | August | 31 | 100.0% | 6.6 | 12.7 | 0 |
| | September | 29 | 96.7% | 7.3 | 12.2 | 0 |
| | October | 17 | 54.8% | 5.6 | 12.4 | 0 |
| | November | 30 | 100.0% | 7.1 | 16.3 | 0 |
| | December | 31 | 100.0% | 6.1 | 12.8 | 0 |
| Annual | | 350 | 95.9% | 6.6 | 19.4 | 0 |

Observations in ug/m$^3$

**FIGURE 4.2.3.3 - SUNNYSIDE ANNUAL $PM_{10}$ CONCENTRATIONS**




Rolling annual average of hourly concentrations

## 4.2.4 NARL Property Boundary

The NARL Property Boundary station monitors the ambient levels of $SO_2$ and $PM_{2.5}$. Given its proximity to the process area of NARL, this station routinely records ambient levels of $SO_2$ and $PM_{2.5}$ in excess of the standards. In 2011, the 1-hour $SO_2$ standard was exceeded one hundred and thirty seven times the 3-hour standard one hundred and twenty times and the 24-hour standard fifty times. The $PM_{2.5}$ monitor only operated for the month of January as problems with the instrument necessitated it being taken out of service. The replacement monitor is due to go into service in 2012. In January 2011 there were five recorded $PM_{2.5}$ exceedances of the ambient standard.

Due to the nature of the $PM_{2.5}$ monitoring equipment at this location, numerous days of data are invalidated each year due to the volatilization of hydrocarbons from the collected particulate. Consequently the $PM_{2.5}$ data from this station routinely does not achieve established annual data acceptability criteria.

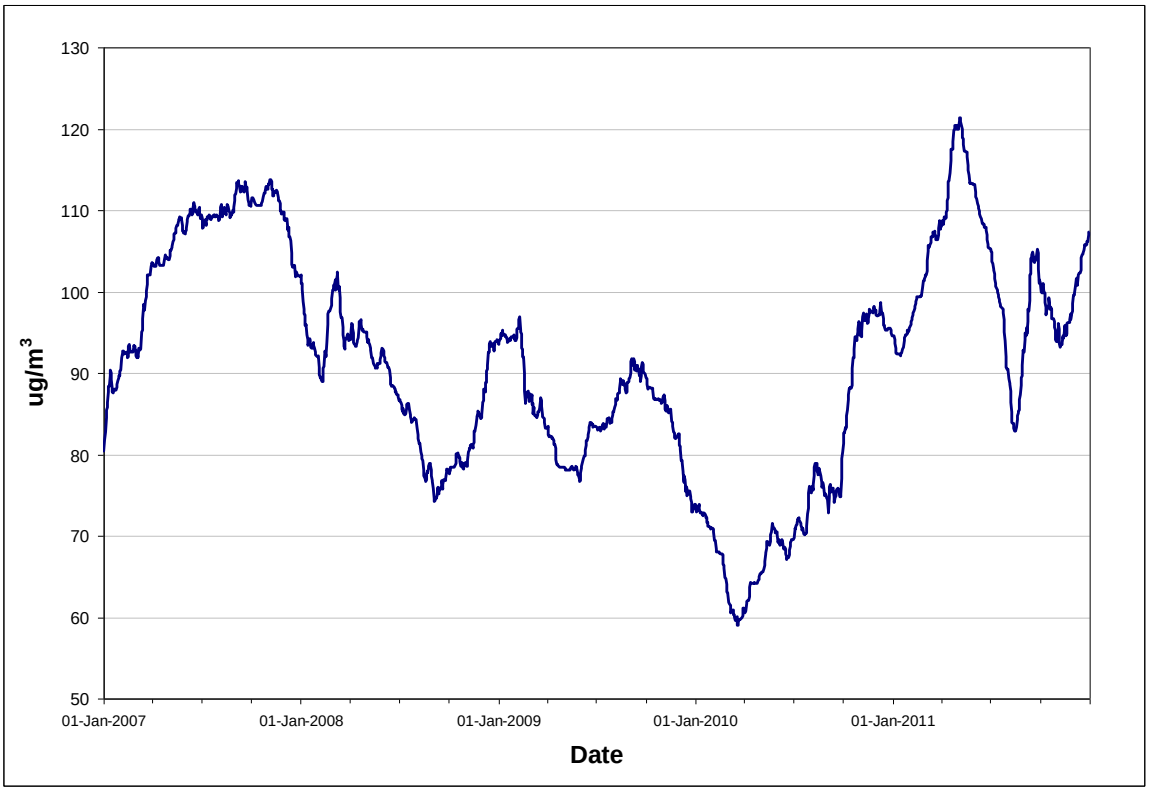
Tables 4.2.4.1 through 4.2.4.2 provide summary information on the level of air contaminants measured at NARL Property Boundary, while Figures 4.2.4.1 through 4.2.4.2 provide a graphical representation of the annual trend of each pollutant.

**TABLE 4.2.4.1 - NARL BOUNDARY $SO_2$ SUMMARY 2010 & 2011**

| Year | Month | # Valid Hours | % Valid Hours | Average | Maximum 1-Hour | Maximum 3-Hour | Maximum 24-Hour | Regulatory Exceedances 1-Hour (>900) | Regulatory Exceedances 3-Hour (>600) | Regulatory Exceedances 24-Hour (>300) |
|---|---|---|---|---|---|---|---|---|---|---|
| 2010 | January | 710 | 95.4% | 35.5 | 679.5 | 652.6 | 288.4 | 0 | 2 | 0 |
| | February | 639 | 95.1% | 0.5 | 15.0 | 6.7 | 2.1 | 0 | 0 | 0 |
| | March | 710 | 95.4% | 44.9 | 721.4 | 422.7 | 329.9 | 0 | 0 | 1 |
| | April | 686 | 95.3% | 67.6 | 878.6 | 526.3 | 416.3 | 0 | 0 | 2 |
| | May | 710 | 95.4% | 94.6 | 1203.6 | 785.7 | 369.5 | 2 | 4 | 4 |
| | June | 684 | 95.0% | 91.4 | 779.3 | 731.4 | 325.7 | 0 | 4 | 1 |
| | July | 524 | 70.4% | 190.4 | 1246.7 | 1049.2 | 661.0 | 7 | 15 | 5 |
| | August | 688 | 92.5% | 120.7 | 1147.1 | 1039.1 | 482.8 | 19 | 13 | 2 |
| | September | 685 | 95.1% | 194.2 | 1157.8 | 985.3 | 833.9 | 18 | 30 | 8 |
| | October | 704 | 94.6% | 204.5 | 1164.8 | 929.2 | 792.3 | 19 | 30 | 10 |
| | November | 686 | 95.3% | 86.5 | 1424.6 | 845.9 | 611.8 | 1 | 8 | 1 |
| | December | 690 | 92.7% | 21.3 | 689.1 | 625.2 | 376.1 | 0 | 1 | 1 |
| Annual | | 8116 | 92.6% | 94.5 | 1424.6 | 1049.2 | 833.9 | 66 | 107 | 35 |
| 2011 | January | 695 | 93.4% | 42.1 | 563.7 | 519.1 | 273.5 | 0 | 0 | 0 |
| | February | 303 | 45.1% | 52.7 | 684.5 | 619.5 | 304.9 | 0 | 1 | 1 |
| | March | 708 | 95.2% | 116.7 | 674.5 | 576.5 | 424.4 | 0 | 0 | 4 |
| | April | 687 | 95.4% | 204.2 | 1144.3 | 1011.6 | 658.7 | 10 | 25 | 9 |
| | May | 710 | 95.4% | 20.2 | 817.5 | 566.4 | 285.8 | 0 | 0 | 0 |
| | June | 677 | 94.0% | 1.1 | 44.5 | 18.2 | 4.7 | 0 | 0 | 0 |
| | July | 703 | 94.5% | 0.7 | 14.3 | 8.3 | 2.8 | 0 | 0 | 0 |
| | August | 708 | 95.2% | 145.5 | 1236.6 | 1022.9 | 704.4 | 23 | 19 | 8 |
| | September | 687 | 95.4% | 295.0 | 1508.1 | 1340.6 | 1139.8 | 99 | 43 | 11 |
| | October | 693 | 93.1% | 118.7 | 797.1 | 722.8 | 413.3 | 0 | 11 | 5 |
| | November | 688 | 95.6% | 141.3 | 1097.7 | 880.9 | 457.0 | 3 | 13 | 6 |
| | December | 694 | 93.3% | 121.8 | 1105.0 | 911.9 | 549.4 | 2 | 8 | 6 |
| Annual | | 7953 | 90.8% | 107.3 | 1508.1 | 1340.6 | 1139.8 | 137 | 120 | 50 |

Observations in $ug/m^3$

**FIGURE 4.2.4.1 - NARL BOUNDARY ANNUAL $SO_2$ CONCENTRATIONS**



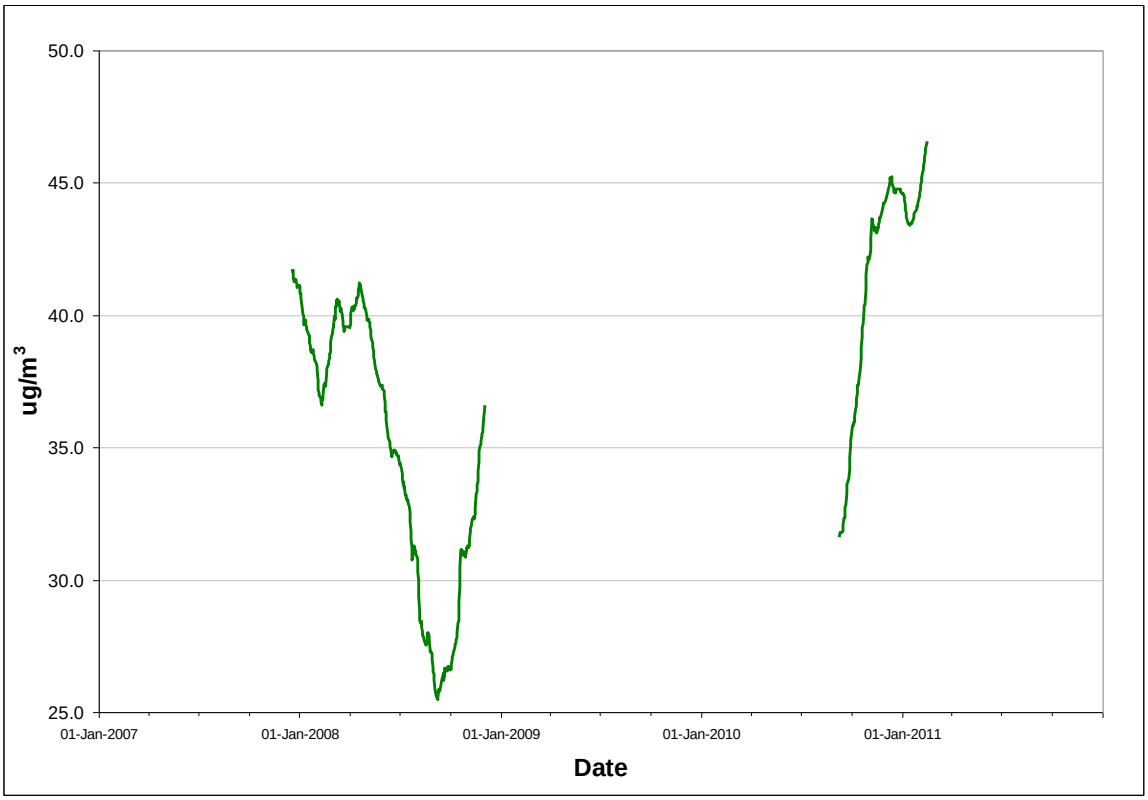

Rolling annual average of hourly concentrations

**TABLE 4.2.4.2 - NARL BOUNDARY $PM_{2.5}$ SUMMARY 2010 & 2011**

| Year | Month | # Valid Days | % Valid Days | Average | Maximum 24-Hour | Regulatory Exceedances (>25 µg/m$^3$) |
|---|---|---|---|---|---|---|
| 2010 | January | 27 | 87.1% | 13.3 | 65.1 | 4 |
| | February | 28 | 100.0% | 4.2 | 8.3 | 0 |
| | March | 31 | 100.0% | 11.5 | 47.5 | 3 |
| | April | 26 | 86.7% | 16.4 | 66.6 | 6 |
| | May | 22 | 71.0% | 25.7 | 60.3 | 10 |
| | June | 22 | 73.3% | 36.3 | 72.1 | 15 |
| | July | 25 | 80.6% | 92.0 | 161.9 | 22 |
| | August | 20 | 64.5% | 114.2 | 183.9 | 19 |
| | September | 21 | 70.0% | 98.0 | 181.2 | 20 |
| | October | 21 | 67.7% | 113.9 | 171.7 | 21 |
| | November | 21 | 70.0% | 45.2 | 198.5 | 10 |
| | December | 24 | 77.4% | 10.1 | 74.8 | 2 |
| Annual | | 288 | 78.9% | 44.6 | 198.5 | 132 |
| 2011 | January | 28 | 90.3% | 12.0 | 43.2 | 5 |
| | 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 | 0 | 0.0% | | | |
| Annual | | 28 | 7.7% | 12.0 | 43.2 | 5 |

Observations in ug/m$^3$

**FIGURE 4.2.4.2 - NARL BOUNDARY ANNUAL $PM_{2.5}$ CONCENTRATIONS**




Rolling annual average of hourly concentrations

## 4.3 Iron Ore Company of Canada

In 2011, the Iron Ore Company of Canada (IOCC).began a major revamp of their monitoring network to include the monitoring of more pollutants on a continuous basis. The revamp also included the introduction of several new station locations, the decommissioning of some stations as well as the moving of others. At the end of 2011, there were five stations in operation located near Smokey Mountain, the Town Depot / Tamarack Drive, Indian Point, Bartlett Drive, and Hudson Drive. The locations of these monitoring stations are identified in Figure 4.3.1. A sixth station will be installed in 2012.

Due to start-up related issues, all stations in the new network recorded data loss at some time during 2011. However by the end of the year, most issues had been resolved.

This report also presents the last datasets from the old monitoring network.

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

### 4.3.1 Indian Point

The Indian Point station monitors the ambient levels of $SO_2$, $NO_x$ / $NO_2$, $PM_{2.5}$ and TSP on a continuous basis. For all pollutants, the ambient air criteria were not exceeded on any occasion in 2011. Tables 4.3.1.1 through 4.3.1.4 provide summary information on the level of air contaminants measured at Indian Point. Owing to insufficient data, graphical representations indicating the annual trend of each pollutant are not presented.

**TABLE 4.3.1.1 - INDIAN POINT $SO_2$ SUMMARY 2011**

| Year | Month | # Valid Hours | % Valid Hours | Average | Maximum 1-Hour | Maximum 3-Hour | Maximum 24-Hour | Regulatory Exceedances 1-Hour (>900) | Regulatory Exceedances 3-Hour (>600) | Regulatory Exceedances 24-Hour (>300) |
|---|---|---|---|---|---|---|---|---|---|---|
| 2011 | January | 0 | 0.0% | | | | | | | |
| | February | 0 | 0.0% | | | | | | | |
| | March | 0 | 0.0% | | | | | | | |
| | April | 0 | 0.0% | | | | | | | |
| | May | 274 | 36.8% | 2.9 | 15.8 | 11.3 | 5.1 | 0 | 0 | 0 |
| | June | 486 | 67.5% | 3.8 | 33.1 | 20.8 | 9.2 | 0 | 0 | 0 |
| | July | 0 | 0.0% | | | | | | | |
| | August | 433 | 58.2% | 1.0 | 29.9 | 12.8 | 2.6 | 0 | 0 | 0 |
| | September | 676 | 93.9% | 1.1 | 20.1 | 13.0 | 4.5 | 0 | 0 | 0 |
| | October | 695 | 93.4% | 1.6 | 18.2 | 13.4 | 4.4 | 0 | 0 | 0 |
| | November | 690 | 95.8% | 0.8 | 26.3 | 11.5 | 4.0 | 0 | 0 | 0 |
| | December | 709 | 95.3% | 2.0 | 74.7 | 53.2 | 24.0 | 0 | 0 | 0 |
| Annual | | 3963 | 45.2% | 1.8 | 74.7 | 53.2 | 24.0 | 0 | 0 | 0 |

Observations in $ug/m^3$

**TABLE 4.3.1.2 - INDIAN POINT $PM_{2.5}$ SUMMARY 2011**

| Year | Month | # Valid Days | % Valid Days | Average | Maximum 24-Hour | Regulatory Exceedances (>25 µg/m$^3$) |
|---|---|---|---|---|---|---|
| 2011 | January | 24 | 77.4% | 3.3 | 8.3 | 0 |
| | February | 26 | 92.9% | 3.9 | 7.3 | 0 |
| | March | 31 | 100.0% | 3.6 | 7.3 | 0 |
| | April | 23 | 76.7% | 3.6 | 6.4 | 0 |
| | May | 25 | 80.6% | 4.9 | 8.8 | 0 |
| | June | 20 | 66.7% | 4.9 | 11.1 | 0 |
| | July | 21 | 67.7% | 7.6 | 18.6 | 0 |
| | August | 21 | 67.7% | 4.9 | 9.3 | 0 |
| | September | 24 | 80.0% | 3.0 | 6.7 | 0 |
| | October | 20 | 64.5% | 2.6 | 8.6 | 0 |
| | November | 2 | 6.7% | 5.6 | 6.2 | 0 |
| | December | 0 | 0.0% | | | |
| Annual | | 237 | 64.9% | 4.2 | 18.6 | 0 |

Observations in ug/m$^3$

**TABLE 4.3.1.3 - INDIAN POINT $NO_X$ / $NO_2$ SUMMARY 2011**

| | | | | Average | | Maximums 1-Hour | | Maximums 24-Hour | | Exceedances 1-Hour | Exceedances 24-Hour |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Year | Month | # Valid Hours | % Valid Hours | $NO_x$ | $NO_2$ | $NO_x$ | $NO_2$ | $NO_x$ | $NO_2$ | (>400) | (>200) |
| 2011 | January | 740 | 99.5% | 16.1 | 11.7 | 170.5 | 71.4 | 67.9 | 39.5 | 0 | 0 |
| | February | 669 | 99.6% | 13.3 | 8.2 | 96.1 | 71.8 | 33.0 | 20.6 | 0 | 0 |
| | March | 744 | 100.0% | 11.8 | 8.4 | 200.8 | 83.1 | 24.0 | 13.6 | 0 | 0 |
| | April | 674 | 93.6% | 7.3 | 5.7 | 88.2 | 43.4 | 23.4 | 17.1 | 0 | 0 |
| | May | 741 | 99.6% | 9.3 | 7.3 | 58.3 | 47.5 | 14.7 | 12.2 | 0 | 0 |
| | June | 717 | 99.6% | 8.4 | 6.1 | 102.8 | 34.2 | 16.5 | 10.6 | 0 | 0 |
| | July | 740 | 99.5% | 7.0 | 5.0 | 83.1 | 32.0 | 13.1 | 8.1 | 0 | 0 |
| | August | 742 | 99.7% | 8.7 | 5.8 | 518.5 | 44.7 | 45.8 | 16.3 | 0 | 0 |
| | September | 705 | 97.9% | 7.0 | 5.2 | 51.7 | 28.7 | 12.4 | 9.6 | 0 | 0 |
| | October | 723 | 97.2% | 7.9 | 6.1 | 51.0 | 33.4 | 15.9 | 13.0 | 0 | 0 |
| | November | 720 | 100.0% | 7.7 | 6.1 | 67.8 | 42.2 | 21.5 | 14.9 | 0 | 0 |
| | December | 742 | 99.7% | 11.0 | 8.6 | 106.1 | 55.3 | 32.7 | 27.2 | 0 | 0 |
| Annual | | 8657 | 98.8% | 9.6 | 7.0 | 518.5 | 83.1 | 67.9 | 39.5 | 0 | 0 |

Observations in ug/m$^3$

**TABLE 4.3.1.4 - INDIAN POINT TSP SUMMARY 2011**

| Year | Month | # Valid Days | % Valid Days | Average | Maximum 24-Hour | Regulatory Exceedances (>120 µg/m$^3$) |
|---|---|---|---|---|---|---|
| 2011 | January | | | | | |
| | February | | | | | |
| | March | | | | | |
| | April | | | | | |
| | May | | | | | |
| | June | 27 | 90.0% | 46.5 | 95.4 | 0 |
| | July | 28 | 90.3% | 39.5 | 75.9 | 0 |
| | August | 29 | 93.5% | 24.2 | 79.4 | 0 |
| | September | 30 | 100.0% | 21.7 | 61.4 | 0 |
| | October | 26 | 83.9% | 20.8 | 72.0 | 0 |
| | November | 19 | 63.3% | 12.1 | 37.8 | 0 |
| | December | 23 | 74.2% | 11.9 | 87.8 | 0 |
| Annual | | 182 | 85.0% | 26.2 | 95.4 | 0 |

Observations in ug/m$^3$

## 4.3.2 Town Depot / Tamarack Drive

The Town Depot / Tamarack Drive Point station monitors the ambient levels of $SO_2$, $NO_x$ / $NO_2$, $PM_{2.5}$ and TSP on a continuous basis. For all pollutants, the ambient air criteria were not exceeded on any occasion in 2011. Tables 4.3.2.1 through 4.3.2.4 provide summary information on the level of air contaminants measured at Town Depot / Tamarack Drive. Owing to insufficient data, graphical representations indicating the annual trend of each pollutant are not presented.

**TABLE 4.3.2.1 - TOWN DEPOT / TAMARACK DRIVE $SO_2$ SUMMARY 2011**

| Year | Month | # Valid Hours | % Valid Hours | Average | Maximum 1-Hour | Maximum 3-Hour | Maximum 24-Hour | Regulatory Exceedances 1-Hour (>900) | Regulatory Exceedances 3-Hour (>600) | Regulatory Exceedances 24-Hour (>300) |
|---|---|---|---|---|---|---|---|---|---|---|
| 2011 | January | 709 | 95.3% | 4.4 | 97.7 | 69.0 | 33.3 | 0 | 0 | 0 |
| | February | 641 | 95.4% | 1.7 | 65.2 | 39.1 | 10.5 | 0 | 0 | 0 |
| | March | 713 | 95.8% | 4.0 | 133.2 | 109.8 | 26.9 | 0 | 0 | 0 |
| | April | 690 | 95.8% | 2.2 | 74.0 | 43.9 | 15.7 | 0 | 0 | 0 |
| | May | 710 | 95.4% | 2.3 | 62.0 | 54.0 | 10.9 | 0 | 0 | 0 |
| | June | 510 | 70.8% | 2.0 | 370.5 | 129.5 | 17.4 | 0 | 0 | 0 |
| | July | 0 | 0.0% | | | | | | | |
| | August | 312 | 41.9% | 2.0 | 122.8 | 107.9 | 21.0 | 0 | 0 | 0 |
| | September | 683 | 94.9% | 0.7 | 25.4 | 12.8 | 3.6 | 0 | 0 | 0 |
| | October | 704 | 94.6% | 0.8 | 18.9 | 13.7 | 4.6 | 0 | 0 | 0 |
| | November | 695 | 96.5% | 1.3 | 51.5 | 40.8 | 7.5 | 0 | 0 | 0 |
| | December | 711 | 95.6% | 2.9 | 129.8 | 82.9 | 42.4 | 0 | 0 | 0 |
| Annual | | 7078 | 80.8% | 2.2 | 370.5 | 129.5 | 42.4 | 0 | 0 | 0 |

Observations in ug/$m^3$

**TABLE 4.3.2.2 - TOWN DEPOT / TAMARACK DRIVE $PM_{2.5}$ SUMMARY 2011**

| Year | Month | # Valid Days | % Valid Days | Average | Maximum 24-Hour | Regulatory Exceedances (>25 µg/$m^3$) |
|---|---|---|---|---|---|---|
| 2011 | January | 22 | 71.0% | 5.5 | 12.2 | 0 |
| | February | 25 | 89.3% | 5.2 | 10.0 | 0 |
| | March | 30 | 96.8% | 5.3 | 10.0 | 0 |
| | April | 12 | 40.0% | 6.2 | 10.6 | 0 |
| | May | 12 | 38.7% | 3.9 | 6.1 | 0 |
| | June | 20 | 66.7% | 4.8 | 16.3 | 0 |
| | July | 21 | 67.7% | 3.9 | 13.1 | 0 |
| | August | 30 | 96.8% | 2.9 | 7.3 | 0 |
| | September | 29 | 96.7% | 2.4 | 7.7 | 0 |
| | October | 30 | 96.8% | 2.4 | 8.8 | 0 |
| | November | 30 | 100.0% | 2.9 | 7.3 | 0 |
| | December | 30 | 96.8% | 3.6 | 19.9 | 0 |
| Annual | | 291 | 79.7% | 3.9 | 19.9 | 0 |

Observations in ug/$m^3$

**TABLE 4.3.2.3 - TOWN DEPOT / TAMARACK DRIVE $NO_X$ / $NO_2$ SUMMARY 2011**

| Year | Month | # Valid Hours | % Valid Hours | Average $NO_x$ | Average $NO_2$ | Maximums 1-Hour $NO_x$ | Maximums 1-Hour $NO_2$ | Maximums 24-Hour $NO_x$ | Maximums 24-Hour $NO_2$ | Exceedances 1-Hour (>400) | Exceedances 24-Hour (>200) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 2011 | January | 733 | 98.5% | 19.9 | 15.0 | 233.9 | 78.8 | 84.2 | 43.8 | 0 | 0 |
| | February | 669 | 99.6% | 15.8 | 11.8 | 159.3 | 77.8 | 42.5 | 30.2 | 0 | 0 |
| | March | 744 | 100.0% | 16.8 | 13.3 | 177.4 | 85.1 | 36.5 | 27.3 | 0 | 0 |
| | April | 720 | 100.0% | 9.7 | 8.3 | 85.1 | 67.5 | 27.7 | 22.7 | 0 | 0 |
| | May | 740 | 99.5% | 10.6 | 8.9 | 160.6 | 79.4 | 33.5 | 24.9 | 0 | 0 |
| | June | 716 | 99.4% | 8.8 | 6.7 | 80.9 | 34.2 | 16.2 | 13.8 | 0 | 0 |
| | July | 738 | 99.2% | 6.6 | 5.0 | 72.8 | 28.3 | 13.6 | 9.3 | 0 | 0 |
| | August | 740 | 99.5% | 7.1 | 5.0 | 139.0 | 26.7 | 29.7 | 10.3 | 0 | 0 |
| | September | 713 | 99.0% | 7.3 | 5.5 | 121.1 | 31.3 | 15.4 | 11.0 | 0 | 0 |
| | October | 733 | 98.5% | 7.8 | 5.9 | 101.3 | 38.5 | 20.0 | 13.0 | 0 | 0 |
| | November | 720 | 100.0% | 8.5 | 7.3 | 94.0 | 54.7 | 36.0 | 30.9 | 0 | 0 |
| | December | 742 | 99.7% | 13.2 | 10.9 | 105.8 | 54.8 | 40.6 | 31.8 | 0 | 0 |
| Annual | | 8708 | 99.4% | 11.0 | 8.6 | 233.9 | 85.1 | 84.2 | 43.8 | 0 | 0 |

Observations in ug/$m^3$

**TABLE 4.3.2.4 - TOWN DEPOT / TAMARACK DRIVE TSP SUMMARY 2011**

| Year | Month | # Valid Days | % Valid Days | Average | Maximum 24-Hour | Regulatory Exceedances (>120 µg/$m^3$) |
|---|---|---|---|---|---|---|
| 2011 | January | | | | | |
| | February | | | | | |
| | March | | | | | |
| | April | | | | | |
| | May | | | | | |
| | June | 27 | 90.0% | 32.6 | 74.8 | 0 |
| | July | 31 | 100.0% | 28.5 | 59.3 | 0 |
| | August | 30 | 96.8% | 17.6 | 44.5 | 0 |
| | September | 30 | 100.0% | 24.9 | 91.9 | 0 |
| | October | 29 | 93.5% | 20.7 | 100.5 | 0 |
| | November | 29 | 96.7% | 15.9 | 105.8 | 0 |
| | December | 28 | 90.3% | 16.0 | 145.6 | 1 |
| Annual | | 204 | 95.3% | 22.3 | 145.6 | 1 |

Observations in ug/$m^3$

### 4.3.3 Smokey Mountain

The Smokey Mountain station monitors the ambient levels of $SO_2$, $NO_x$ / $NO_2$, $PM_{2.5}$ and TSP on a continuous basis. For all pollutants, the ambient air criteria were not exceeded on any occasion in 2011. Tables 4.3.3.1 through 4.3.3.4 provide summary information on the level of air contaminants measured at Smokey Mountain. Owing to insufficient data, graphical representations indicating the annual trend of each pollutant are not presented.

**TABLE 4.3.3.1 - SMOKEY MOUNTAIN $SO_2$ SUMMARY 2011**

| Year | Month | # Valid Hours | % Valid Hours | Average | Maximum 1-Hour | Maximum 3-Hour | Maximum 24-Hour | Regulatory Exceedances 1-Hour (>900) | Regulatory Exceedances 3-Hour (>600) | Regulatory Exceedances 24-Hour (>300) |
|---|---|---|---|---|---|---|---|---|---|---|
| 2011 | January | 58 | 7.8% | 1.6 | 3.5 | 3.1 | 2.3 | 0 | 0 | 0 |
| | February | 667 | 99.3% | 2.7 | 44.9 | 36.3 | 10.6 | 0 | 0 | 0 |
| | March | 720 | 96.8% | 1.4 | 25.6 | 9.5 | 2.3 | 0 | 0 | 0 |
| | April | 703 | 97.6% | 2.1 | 28.0 | 17.2 | 4.7 | 0 | 0 | 0 |
| | May | 741 | 99.6% | 1.5 | 44.7 | 31.3 | 9.0 | 0 | 0 | 0 |
| | June | 703 | 97.6% | 1.0 | 7.5 | 3.9 | 2.1 | 0 | 0 | 0 |
| | July | 707 | 95.0% | 0.8 | 8.3 | 4.1 | 1.6 | 0 | 0 | 0 |
| | August | 706 | 94.9% | 1.0 | 2.0 | 2.0 | 1.5 | 0 | 0 | 0 |
| | September | 684 | 95.0% | 1.2 | 5.8 | 3.1 | 1.8 | 0 | 0 | 0 |
| | October | 704 | 94.6% | 0.9 | 12.4 | 4.7 | 2.5 | 0 | 0 | 0 |
| | November | 690 | 95.8% | 1.0 | 16.4 | 10.3 | 3.3 | 0 | 0 | 0 |
| | December | 710 | 95.4% | 0.6 | 5.7 | 3.4 | 1.2 | 0 | 0 | 0 |
| Annual | | 7793 | 89.0% | 1.3 | 44.9 | 36.3 | 10.6 | 0 | 0 | 0 |

Observations in ug/$m^3$

**TABLE 4.3.3.2 - SMOKEY MOUNTAIN $PM_{2.5}$ SUMMARY 2011**

| Year | Month | # Valid Days | % Valid Days | Average | Maximum 24-Hour | Regulatory Exceedances (>25 µg/m$^3$) |
|---|---|---|---|---|---|---|
| 2011 | January | 25 | 80.6% | 3.7 | 8.6 | 0 |
| | February | 25 | 89.3% | 5.2 | 7.6 | 0 |
| | March | 29 | 93.5% | 3.8 | 6.0 | 0 |
| | April | 23 | 76.7% | 3.7 | 7.0 | 0 |
| | May | 25 | 80.6% | 1.9 | 4.6 | 0 |
| | June | 27 | 90.0% | 2.3 | 6.2 | 0 |
| | July | 23 | 74.2% | 2.8 | 10.0 | 0 |
| | August | 22 | 71.0% | 2.2 | 5.9 | 0 |
| | September | 22 | 73.3% | 1.7 | 3.4 | 0 |
| | October | 18 | 58.1% | 1.6 | 3.7 | 0 |
| | November | 29 | 96.7% | 1.8 | 4.7 | 0 |
| | December | 31 | 100.0% | 2.4 | 5.0 | 0 |
| Annual | | 299 | 81.9% | 2.8 | 10.0 | 0 |

Observations in ug/m$^3$

**TABLE 4.3.3.3 - SMOKEY MOUNTAIN $NO_X$ / $NO_2$ SUMMARY 2011**

| | | | | Average | | Maximums 1-Hour | | Maximums 24-Hour | | Exceedances 1-Hour | Exceedances 24-Hour |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Year | Month | # Valid Hours | % Valid Hours | $NO_x$ | $NO_2$ | $NO_x$ | $NO_2$ | $NO_x$ | $NO_2$ | (>400) | (>200) |
| 2011 | January | 580 | 78.0% | 34.1 | 30.9 | 169.2 | 89.0 | 105.7 | 69.7 | 0 | 0 |
| | February | 628 | 93.5% | 17.8 | 16.1 | 97.8 | 67.7 | 35.2 | 30.2 | 0 | 0 |
| | March | 686 | 92.2% | 15.0 | 14.2 | 122.4 | 68.9 | 28.2 | 27.3 | 0 | 0 |
| | April | 13 | 1.8% | 30.0 | 23.4 | 97.7 | 65.6 | 0.0 | 0.0 | 0 | 0 |
| | May | 0 | 0.0% | | | | | | | | |
| | June | 178 | 24.7% | 26.4 | 25.0 | 64.5 | 54.1 | 33.9 | 33.2 | 0 | 0 |
| | July | 663 | 89.1% | 25.3 | 24.2 | 83.1 | 79.1 | 47.4 | 45.0 | 0 | 0 |
| | August | 378 | 50.8% | 28.1 | 26.4 | 70.3 | 66.2 | 36.8 | 34.1 | 0 | 0 |
| | September | 0 | 0.0% | | | | | | | | |
| | October | 0 | 0.0% | | | | | | | | |
| | November | 31 | 4.3% | 10.5 | 9.9 | 27.5 | 26.4 | 11.7 | 11.0 | 0 | 0 |
| | December | 740 | 99.5% | 10.8 | 9.0 | 88.8 | 52.7 | 35.2 | 26.6 | 0 | 0 |
| Annual | | 3897 | 44.5% | 21.0 | 19.4 | 169.2 | 89.0 | 105.7 | 69.7 | 0 | 0 |

Observations in ug/m$^3$

**TABLE 4.3.3.4 - SMOKEY MOUNTAIN TSP SUMMARY 2011**

| Year | Month | # Valid Days | % Valid Days | Average | Maximum 24-Hour | Regulatory Exceedances (>120 µg/m$^3$) |
|---|---|---|---|---|---|---|
| 2011 | January | | | | | |
| | February | | | | | |
| | March | | | | | |
| | April | | | | | |
| | May | | | | | |
| | June | 20 | 66.7% | 16.6 | 42.6 | 0 |
| | July | 27 | 87.1% | 16.5 | 64.4 | 0 |
| | August | 31 | 100.0% | 15.2 | 44.0 | 0 |
| | September | 30 | 100.0% | 20.2 | 93.5 | 0 |
| | October | 29 | 93.5% | 12.4 | 30.8 | 0 |
| | November | 30 | 100.0% | 10.7 | 59.2 | 0 |
| | December | 27 | 87.1% | 5.3 | 31.5 | 0 |
| Annual | | 194 | 90.7% | 13.8 | 93.5 | 0 |

Observations in ug/m$^3$

## 4.3.4 Bartlett Drive

The Bartlett Drive monitoring station is located at A. P. Low School and measured TSP on a one day in six day cycle in 2011. The station had an equipment upgrade in 2011, resulting in period of monitoring downtime.

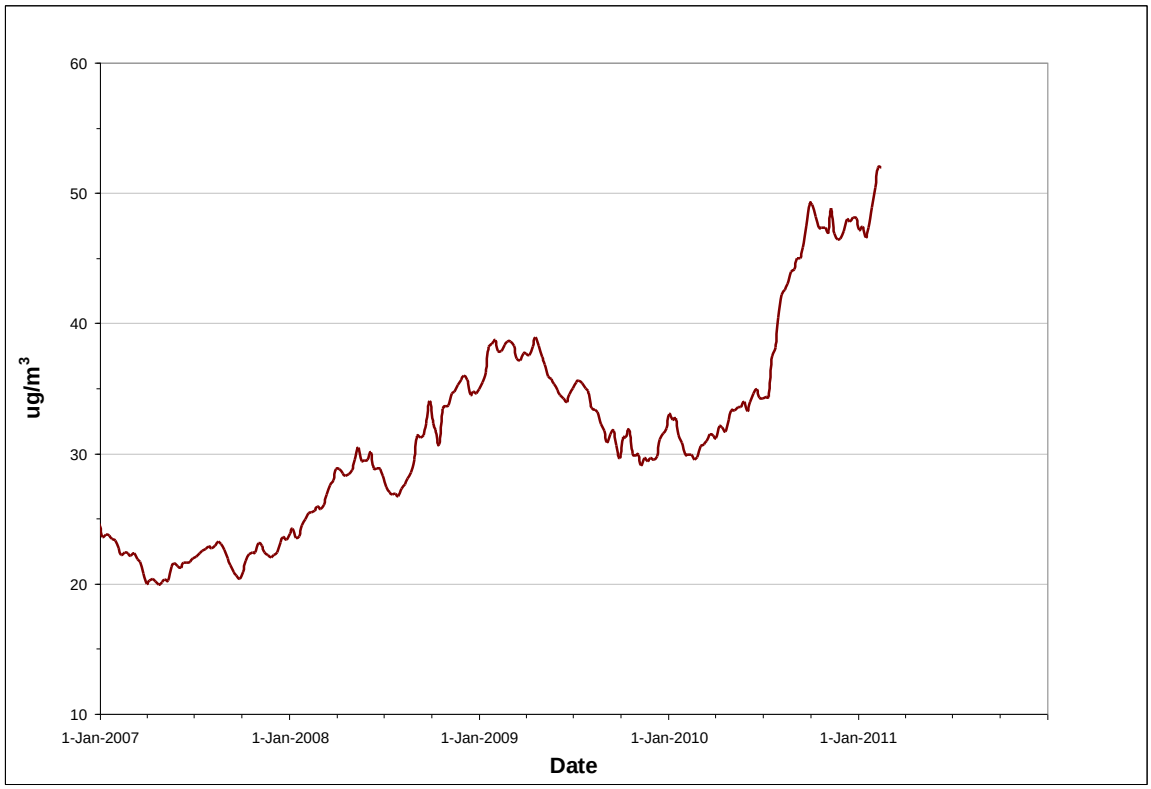
Table 4.3.4.1 provides summary information of air contaminants measured at Bartlett Drive, while Figure 4.3.4.1 provides a graphical representation of the annual trend of the measured pollutants.

**TABLE 4.3.4.1 - BARTLETT DRIVE TSP SUMMARY 2010 & 2011**

| Year | Month | # Valid Days | % Valid Days | Average | Maximum 24-Hour | Regulatory Exceedances (>120 ug/m$^3$) |
|---|---|---|---|---|---|---|
| 2010 | January | 5 | 100.0% | 27.6 | 137.9 | 1 |
| | February | 4 | 80.0% | 25.6 | 89.1 | 0 |
| | March | 4 | 80.0% | 47.4 | 138.9 | 1 |
| | April | 5 | 100.0% | 75.2 | 126.0 | 1 |
| | May | 5 | 100.0% | 82.7 | 144.5 | 1 |
| | June | 5 | 100.0% | 53.4 | 221.9 | 1 |
| | July | 6 | 100.0% | 139.5 | 1996.0 | 3 |
| | August | 2 | 40.0% | 70.2 | 113.4 | 0 |
| | September | 2 | 40.0% | 28.1 | 64.6 | 0 |
| | October | 3 | 60.0% | 17.6 | 33.3 | 0 |
| | November | 4 | 80.0% | 24.7 | 101.8 | 0 |
| | December | 4 | 80.0% | 42.0 | 99.8 | 0 |
| Annual | | 49 | 80.3% | 48.1 | 1996.0 | 8 |
| 2011 | January | 4 | 80.0% | 29.7 | 52.0 | 0 |
| | February | 0 | 0.0% | | | |
| | March | 4 | 80.0% | 13.2 | 22.3 | 0 |
| | April | 5 | 100.0% | 36.5 | 54.6 | 0 |
| | May | 4 | 80.0% | 56.6 | 95.6 | 0 |
| | June | 5 | 100.0% | 40.8 | 98.3 | 0 |
| | July | 5 | 100.0% | 22.3 | 32.7 | 0 |
| | August | 0 | 0.0% | | | |
| | September | 2 | 100.0% | 16.3 | 17.9 | 0 |
| | October | 5 | 100.0% | 32.3 | 72.1 | 0 |
| | November | 5 | 100.0% | 17.1 | 46.6 | 0 |
| | December | 5 | 100.0% | 4.7 | 8.5 | 0 |
| Annual | | 44 | 72.1% | 22.5 | 98.3 | 0 |

Observations in ug/m$^3$

**FIGURE 4.3.4.1 - BARTLETT DRIVE ANNUAL TSP CONCENTRATIONS**




Rolling annual average of daily concentrations

## 4.3.5 Hudson Drive

The Hudson Drive monitoring station is located at the fire hall and measured TSP on a one day in six day cycle in 2011. The station is new in 2011.

Table 4.3.5.1 provides summary information of air contaminants measured at Hudson Drive.

**TABLE 4.3.5.1 - HUDSON DRIVE TSP SUMMARY 2011**

| Year | Month | # Valid Days | % Valid Days | Average | Maximum 24-Hour | Regulatory Exceedances (>120 ug/m$^3$) |
|---|---|---|---|---|---|---|
| 2011 | January | | | | | |
| | February | | | | | |
| | March | | | | | |
| | April | | | | | |
| | May | | | | | |
| | June | | | | | |
| | July | | | | | |
| | August | | | | | |
| | September | 2 | 100.0% | 18.3 | 26.6 | 0 |
| | October | 5 | 100.0% | 42.6 | 68.9 | 0 |
| | November | 5 | 100.0% | 25.6 | 83.3 | 0 |
| | December | 5 | 100.0% | 5.5 | 16.2 | 0 |
| Annual | | 17 | 100.0% | 18.2 | 83.3 | 0 |

Observations in ug/m$^3$

## 4.3.6 Tamarack Drive

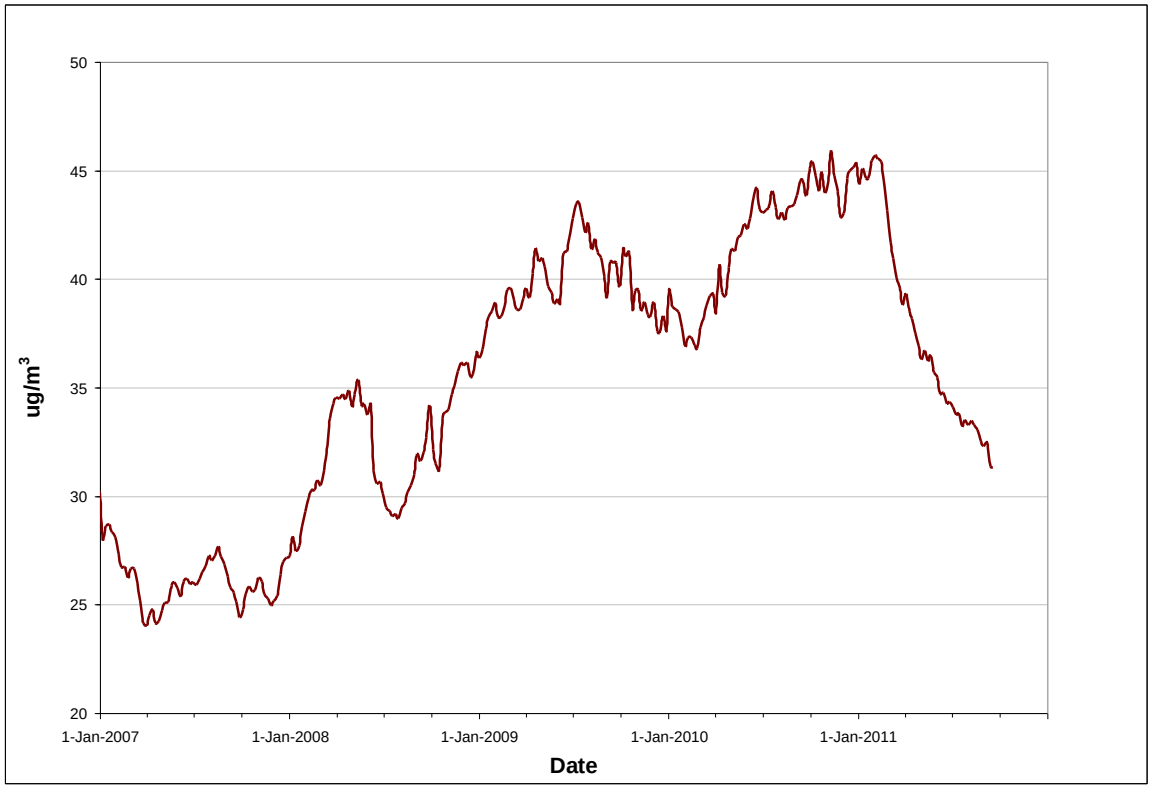
The Tamarack Drive monitoring station measured TSP on a one day in six day cycle and was decommissioned in September 2011. In 2011 there was one exceedance of the TSP standard. Table 4.3.6.1 provides summary information of air contaminants measured at Tamarack Drive, while Figure 4.3.6.1 provides a graphical representation of the annual trend of TSP.

**TABLE 4.3.6.1 - TAMARACK DRIVE TSP SUMMARY 2010 & 2011**

| Year | Month | # Valid Days | % Valid Days | Average | Maximum 24-Hour | Regulatory Exceedances (>120 ug/m$^3$) |
|---|---|---|---|---|---|---|
| 2010 | January | 5 | 100.0% | 30.7 | 120.9 | 1 |
| | February | 4 | 80.0% | 30.3 | 51.9 | 0 |
| | March | 5 | 100.0% | 57.1 | 139.4 | 1 |
| | April | 5 | 100.0% | 84.6 | 171.4 | 2 |
| | May | 5 | 100.0% | 115.4 | 160.3 | 3 |
| | June | 5 | 100.0% | 64.2 | 131.8 | 1 |
| | July | 6 | 100.0% | 44.2 | 78.3 | 0 |
| | August | 5 | 100.0% | 39.4 | 47.7 | 0 |
| | September | 5 | 100.0% | 43.2 | 103.4 | 0 |
| | October | 5 | 100.0% | 29.2 | 119.7 | 0 |
| | November | 5 | 100.0% | 25.9 | 94.6 | 0 |
| | December | 5 | 100.0% | 36.4 | 82.4 | 0 |
| Annual | | 60 | 98.4% | 45.3 | 171.4 | 8 |
| 2011 | January | 5 | 100.0% | 31.9 | 44.7 | 0 |
| | February | 5 | 100.0% | 17.6 | 39.9 | 0 |
| | March | 5 | 100.0% | 15.5 | 35.6 | 0 |
| | April | 3 | 60.0% | 53.8 | 61.3 | 0 |
| | May | 4 | 80.0% | 94.7 | 206.6 | 1 |
| | June | 3 | 60.0% | 45.8 | 79.2 | 0 |
| | July | 5 | 100.0% | 34.3 | 47.6 | 0 |
| | August | 6 | 100.0% | 28.0 | 37.7 | 0 |
| | September | 2 | 66.7% | 24.3 | 37.9 | 0 |
| | October | | | | | |
| | November | | | | | |
| | December | | | | | |
| Annual | | 38 | 86.4% | 31.4 | 206.6 | 1 |

Observations in ug/m$^3$

**FIGURE 4.3.6.1 - TAMARACK DRIVE ANNUAL TSP CONCENTRATIONS**




Rolling annual average of daily concentrations

## 4.3.7 Vanier Avenue

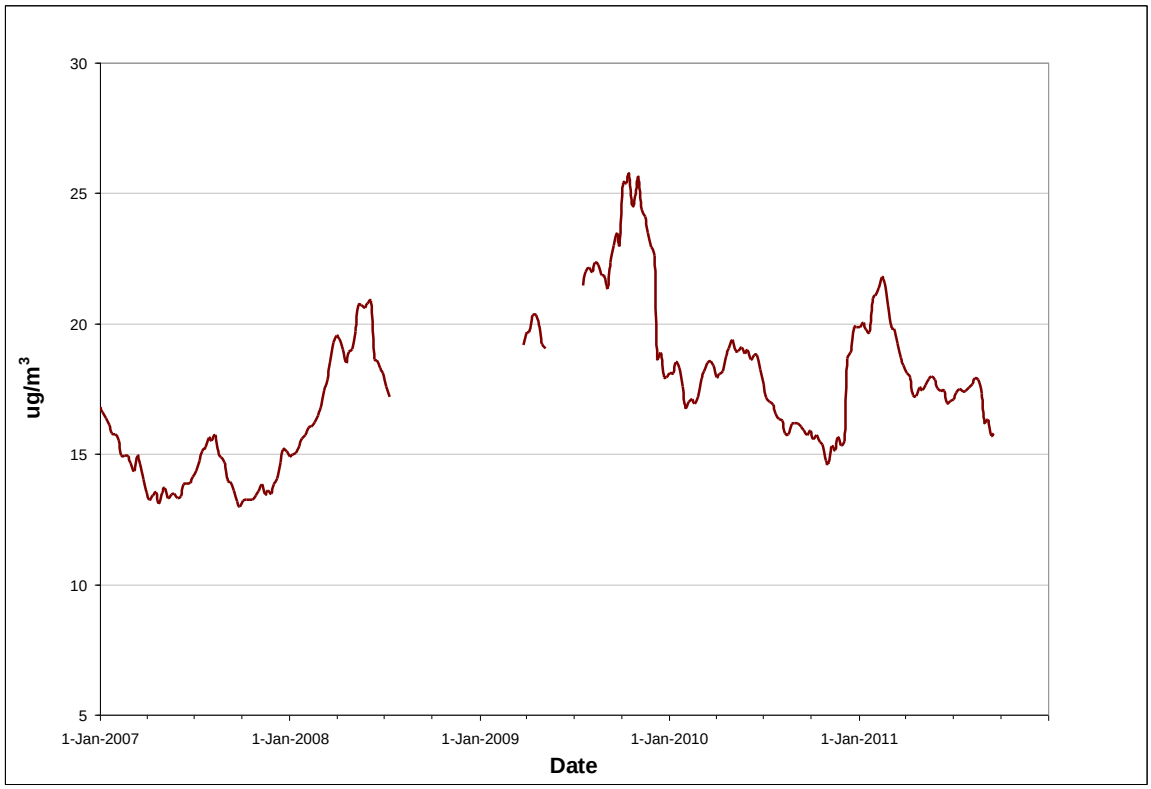
The Vanier Avenue monitoring station was located at the Labrador Mall and measures TSP on a one day in six day cycle. The station was decommissioned in 2011. Table 4.3.7.1 provides summary information of air contaminants measured at Vanier Avenue, while Figure 4.3.7.1 provides a graphical representation of the annual trend of TSP.

**TABLE 4.3.7.1 - VANIER AVENUE TSP SUMMARY 2010 & 2011**

| Year | Month | # Valid Days | % Valid Days | Average | Maximum 24-Hour | Regulatory Exceedances (>120 ug/m$^3$) |
|---|---|---|---|---|---|---|
| 2010 | January | 4 | 80.0% | 7.6 | 21.6 | 0 |
| | February | 4 | 80.0% | 12.9 | 39.2 | 0 |
| | March | 5 | 100.0% | 27.5 | 113.5 | 0 |
| | April | 5 | 100.0% | 47.3 | 121.1 | 1 |
| | May | 4 | 80.0% | 30.8 | 50.8 | 0 |
| | June | 5 | 100.0% | 32.8 | 62.4 | 0 |
| | July | 5 | 83.3% | 15.9 | 19.5 | 0 |
| | August | 5 | 100.0% | 26.0 | 65.0 | 0 |
| | September | 5 | 100.0% | 15.5 | 28.9 | 0 |
| | October | 3 | 60.0% | 10.0 | 16.8 | 0 |
| | November | 5 | 100.0% | 14.6 | 45.7 | 0 |
| | December | 0 | 0.0% | | | |
| Annual | | 50 | 82.0% | 19.9 | 121.1 | 1 |
| 2011 | January | 4 | 80.0% | 14.7 | 76.6 | 0 |
| | February | 5 | 100.0% | 12.3 | 24.7 | 0 |
| | March | 5 | 100.0% | 8.3 | 13.6 | 0 |
| | April | 3 | 60.0% | 41.3 | 111.3 | 0 |
| | May | 4 | 80.0% | 38.0 | 46.4 | 0 |
| | June | 5 | 100.0% | 20.6 | 29.7 | 0 |
| | July | 5 | 100.0% | 20.0 | 26.9 | 0 |
| | August | 6 | 100.0% | 13.4 | 25.8 | 0 |
| | September | 2 | 66.7% | 8.2 | 15.0 | 0 |
| | October | | | | | |
| | November | | | | | |
| | December | | | | | |
| Annual | | 39 | 88.6% | 16.6 | 111.3 | 0 |

Observations in ug/m$^3$

**FIGURE 4.3.7.1 - VANIER AVENUE ANNUAL TSP CONCENTRATIONS**




Rolling annual average of daily concentrations

## 4.4 Wabush Mines

In 2011, Wabush Mines operated monitoring stations at three 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 $SO_2$ and $PM_{2.5}$ on a continuous basis. For all pollutants, the ambient air criteria were not exceeded on any occasion in 2011.

The $SO_2$ analyzer has been sporadically malfunctioning for a number of years resulting in baseline drifting. Various repairs over this timeframe resulted in periods of validated data; however large periods of data have also been invalidated. The last repair occurred

in September 2010 and the analyzer was operating within acceptable parameters until the end of 2011.

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 $PM_{2.5}$. An $SO_2$ graph is not provided due to the quantity of invalidated data.

**TABLE 4.4.1.1 - BOND STREET $SO_2$ SUMMARY 2010 & 2011**

| Year | Month | # Valid Hours | % Valid Hours | Average | Maximum 1-Hour | Maximum 3-Hour | Maximum 24-Hour | Regulatory Exceedances 1-Hour (>900) | Regulatory Exceedances 3-Hour (>600) | Regulatory Exceedances 24-Hour (>300) |
|---|---|---|---|---|---|---|---|---|---|---|
| 2010 | 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 | 0 | 0.0% | | | | | | | |
| | August | 0 | 0.0% | | | | | | | |
| | September | 166 | 23.1% | 2.7 | 20.6 | 8.8 | 4.8 | 0 | 0 | 0 |
| | October | 712 | 95.7% | 1.4 | 11.0 | 7.4 | 2.7 | 0 | 0 | 0 |
| | November | 688 | 95.6% | 2.1 | 23.3 | 15.4 | 5.0 | 0 | 0 | 0 |
| | December | 707 | 95.0% | 1.4 | 14.8 | 3.8 | 2.9 | 0 | 0 | 0 |
| Annual | | 2273 | 25.9% | 1.7 | 23.3 | 15.4 | 5.0 | 0 | 0 | 0 |
| 2011 | January | 702 | 94.4% | 2.4 | 24.6 | 13.2 | 7.3 | 0 | 0 | 0 |
| | February | 614 | 91.4% | 2.8 | 30.4 | 21.3 | 8.1 | 0 | 0 | 0 |
| | March | 698 | 93.8% | 3.4 | 44.2 | 24.5 | 11.9 | 0 | 0 | 0 |
| | April | 688 | 95.6% | 1.4 | 29.8 | 17.0 | 3.3 | 0 | 0 | 0 |
| | May | 714 | 96.0% | 2.5 | 18.5 | 10.1 | 4.7 | 0 | 0 | 0 |
| | June | 674 | 93.6% | 2.6 | 23.6 | 11.5 | 4.9 | 0 | 0 | 0 |
| | July | 714 | 96.0% | 3.7 | 21.8 | 15.1 | 6.4 | 0 | 0 | 0 |
| | August | 712 | 95.7% | 4.3 | 16.6 | 12.4 | 7.9 | 0 | 0 | 0 |
| | September | 672 | 93.3% | 3.1 | 16.5 | 9.8 | 5.3 | 0 | 0 | 0 |
| | October | 549 | 73.8% | 1.5 | 11.1 | 6.4 | 3.4 | 0 | 0 | 0 |
| | November | 496 | 68.9% | 3.0 | 16.2 | 11.3 | 5.1 | 0 | 0 | 0 |
| | December | 705 | 94.8% | 3.1 | 49.2 | 30.6 | 9.4 | 0 | 0 | 0 |
| Annual | | 7938 | 90.6% | 2.8 | 49.2 | 30.6 | 11.9 | 0 | 0 | 0 |

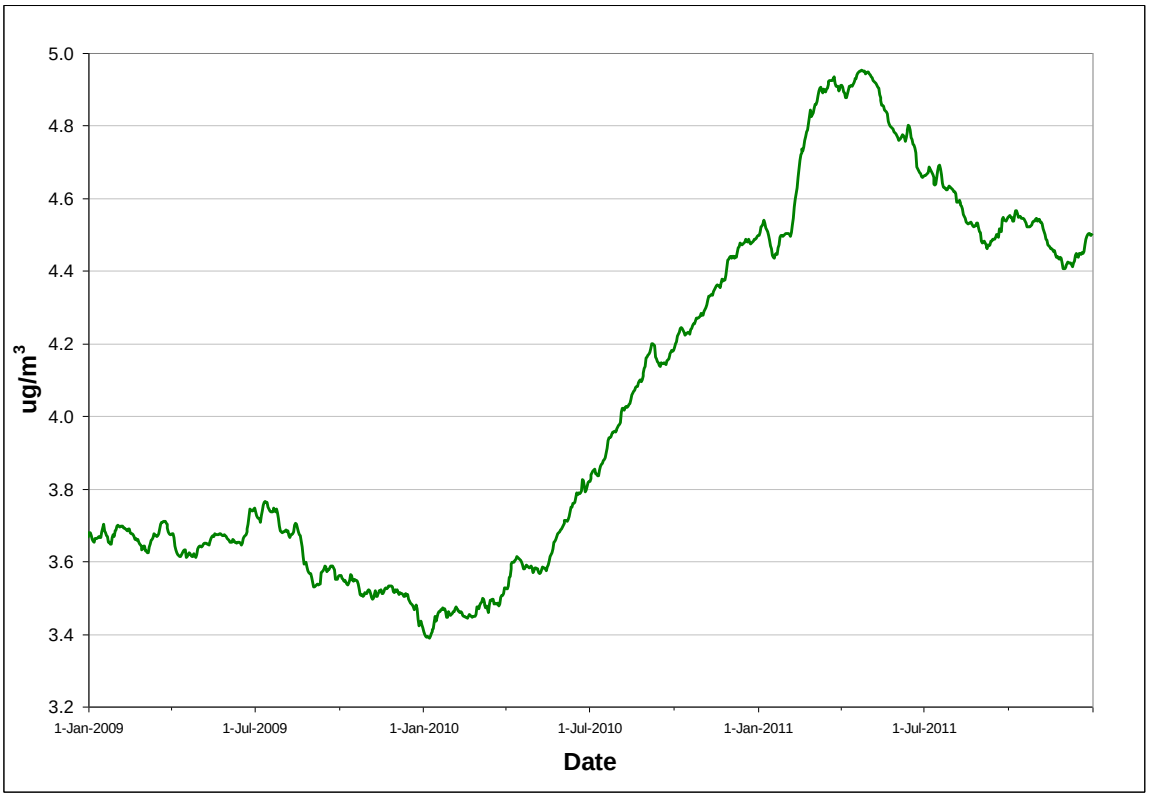
Observations in $ug/m^3$

**TABLE 4.4.1.1 - BOND STREET $PM_{2.5}$ SUMMARY 2010 & 2011**

| Year | Month | # Valid Days | % Valid Days | Average | Maximum 24-Hour | Regulatory Exceedances (>25 µg/m$^3$) |
|---|---|---|---|---|---|---|
| 2010 | January | 31 | 100.0% | 4.8 | 9.1 | 0 |
| | February | 28 | 100.0% | 3.5 | 12.4 | 0 |
| | March | 31 | 100.0% | 4.6 | 11.5 | 0 |
| | April | 30 | 100.0% | 4.1 | 11.0 | 0 |
| | May | 31 | 100.0% | 4.9 | 9.3 | 0 |
| | June | 30 | 100.0% | 5.2 | 17.5 | 0 |
| | July | 31 | 100.0% | 5.3 | 11.8 | 0 |
| | August | 31 | 100.0% | 5.2 | 12.4 | 0 |
| | September | 30 | 100.0% | 3.9 | 11.0 | 0 |
| | October | 31 | 100.0% | 3.8 | 6.2 | 0 |
| | November | 30 | 100.0% | 4.8 | 10.0 | 0 |
| | December | 31 | 100.0% | 3.7 | 7.5 | 0 |
| Annual | | 365 | 100.0% | 4.5 | 17.5 | 0 |
| 2011 | January | 31 | 100.0% | 4.9 | 10.7 | 0 |
| | February | 28 | 100.0% | 7.7 | 14.0 | 0 |
| | March | 31 | 100.0% | 5.6 | 10.1 | 0 |
| | April | 30 | 100.0% | 4.6 | 7.7 | 0 |
| | May | 31 | 100.0% | 2.9 | 4.6 | 0 |
| | June | 26 | 86.7% | 3.6 | 9.4 | 0 |
| | July | 31 | 100.0% | 4.9 | 10.1 | 0 |
| | August | 31 | 100.0% | 3.8 | 7.0 | 0 |
| | September | 29 | 96.7% | 4.4 | 15.2 | 0 |
| | October | 19 | 61.3% | 3.3 | 10.9 | 0 |
| | November | 19 | 63.3% | 2.5 | 5.8 | 0 |
| | December | 26 | 83.9% | 4.8 | 9.8 | 0 |
| Annual | | 332 | 91.0% | 4.5 | 15.2 | 0 |

Observations in ug/m$^3$

**FIGURE 4.4.1.1 - BOND STREET ANNUAL $PM_{2.5}$ CONCENTRATIONS**




Rolling annual average of hourly concentrations

## 4.4.2 Shea Street

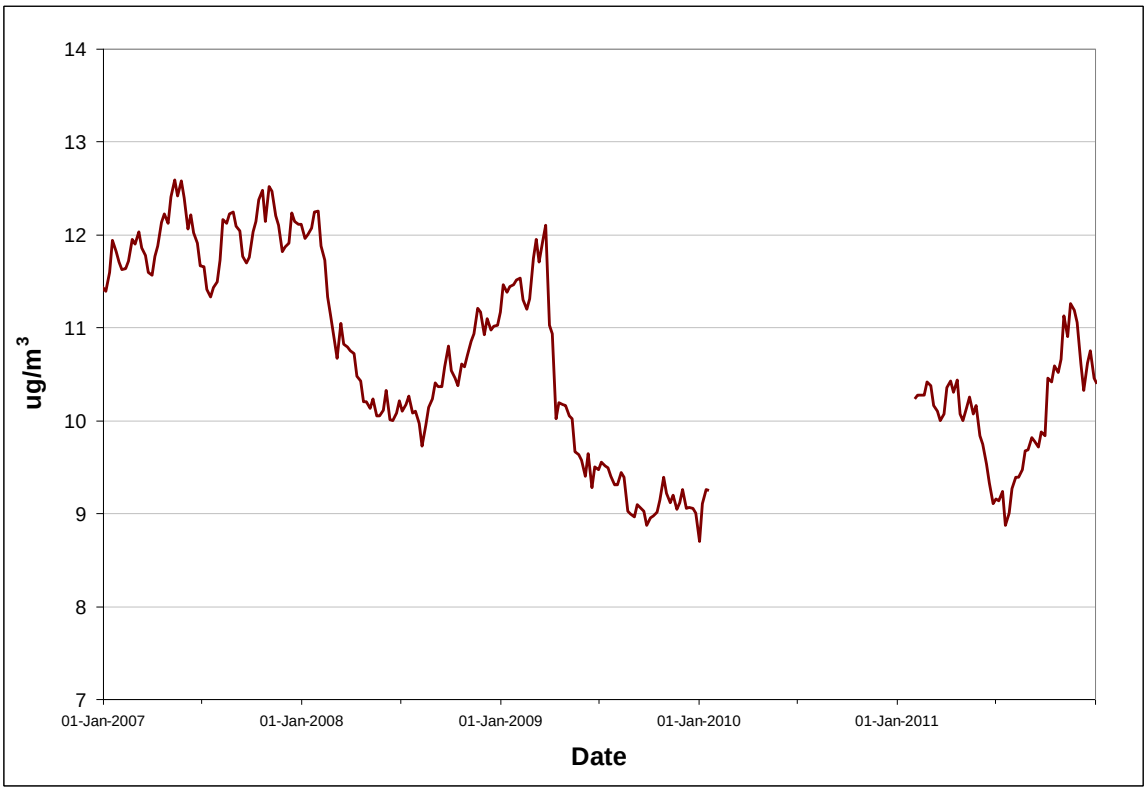
The Shea Street station monitors the ambient levels of TSP on a 1 day in 6 day cycle. There were no exceedances of the ambient air criteria in 2011. Table 4.4.2.1 provides summary information on the level of air contaminants measured at Shea Street, while Figure 4.4.2.1 provides a graphical representation of the annual trend in TSP.

**TABLE 4.4.2.1 - SHEA STREET TSP SUMMARY 2010 & 2011**

| Year | Month | # Valid Days | % Valid Days | Average | Maximum 24-Hour | Regulatory Exceedances (>120 ug/m$^3$) |
|---|---|---|---|---|---|---|
| 2010 | January | 2 | 40.0% | 23.0 | 80.6 | 0 |
| | February | 0 | 0.0% | | | |
| | March | 0 | 0.0% | | | |
| | April | 2 | 40.0% | 32.5 | 97.5 | 0 |
| | May | 5 | 100.0% | 17.2 | 21.3 | 0 |
| | June | 5 | 100.0% | 37.1 | 72.9 | 0 |
| | July | 6 | 100.0% | 10.2 | 27.7 | 0 |
| | August | 3 | 60.0% | 5.8 | 17.8 | 0 |
| | September | 4 | 80.0% | 13.2 | 21.3 | 0 |
| | October | 5 | 100.0% | 7.4 | 14.7 | 0 |
| | November | 5 | 100.0% | 7.2 | 33.4 | 0 |
| | December | 5 | 100.0% | 3.6 | 7.9 | 0 |
| Annual | | 42 | 68.9% | 11.2 | 97.5 | 0 |
| 2011 | January | 5 | 100.0% | 7.2 | 15.0 | 0 |
| | February | 3 | 60.0% | 12.2 | 19.6 | 0 |
| | March | 5 | 100.0% | 7.3 | 14.1 | 0 |
| | April | 5 | 100.0% | 16.1 | 46.1 | 0 |
| | May | 5 | 100.0% | 18.9 | 28.9 | 0 |
| | June | 5 | 100.0% | 10.8 | 21.1 | 0 |
| | July | 5 | 100.0% | 11.6 | 28.6 | 0 |
| | August | 6 | 100.0% | 12.2 | 30.8 | 0 |
| | September | 5 | 100.0% | 14.8 | 47.8 | 0 |
| | October | 5 | 100.0% | 19.0 | 40.9 | 0 |
| | November | 5 | 100.0% | 11.2 | 100.3 | 0 |
| | December | 4 | 80.0% | 1.2 | 3.5 | 0 |
| Annual | | 58 | 95.1% | 10.5 | 100.3 | 0 |

Observations in ug/m$^3$

**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, $PM_{10}$ and $PM_{2.5}$ on a 1 day in 6 day cycle. There were four exceedances of the ambient air criteria for TSP and two exceedances of the $PM_{10}$ standard; however were no exceedances of the $PM_{2.5}$ standard in 2011.

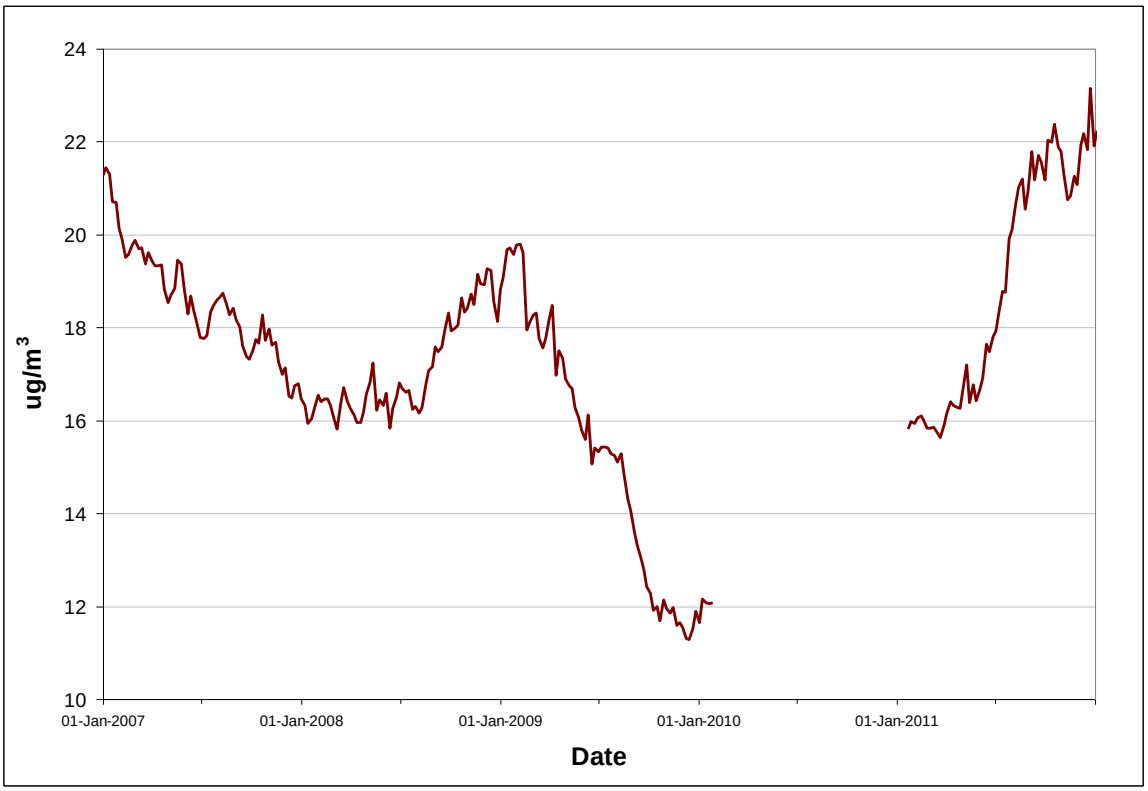
Tables 4.4.3.1 through 4.4.3.3 provide summary information on the level of air contaminants measured at the Substation, while Figures 4.4.3.1 through 4.4.3.3 provide a graphical representation of the annual trend of each air contaminant. Due to calibration errors in early 2010, a number of TSP samples were invalidated from January through April.

**TABLE 4.4.3.1 - SUBSTATION TSP SUMMARY 2010 & 2011**

| Year | Month | # Valid Days | % Valid Days | Average | Maximum 24-Hour | Regulatory Exceedances (>120 ug/m$^3$) |
|---|---|---|---|---|---|---|
| 2010 | January | 2 | 40.0% | 38.9 | 95.0 | 0 |
| | February | 0 | 0.0% | | | |
| | March | 0 | 0.0% | | | |
| | April | 1 | 20.0% | 34.2 | 34.2 | 0 |
| | May | 5 | 100.0% | 36.5 | 103.2 | 0 |
| | June | 5 | 100.0% | 13.9 | 32.7 | 0 |
| | July | 6 | 100.0% | 17.1 | 28.8 | 0 |
| | August | 5 | 100.0% | 23.3 | 38.6 | 0 |
| | September | 5 | 100.0% | 16.4 | 49.6 | 0 |
| | October | 5 | 100.0% | 21.3 | 36.8 | 0 |
| | November | 5 | 100.0% | 15.5 | 45.2 | 0 |
| | December | 5 | 100.0% | 3.7 | 65.0 | 0 |
| Annual | | 44 | 72.1% | 16.9 | 103.2 | 0 |
| 2011 | January | 5 | 100.0% | 14.2 | 25.7 | 0 |
| | February | 5 | 100.0% | 14.5 | 23.0 | 0 |
| | March | 5 | 100.0% | 16.4 | 40.0 | 0 |
| | April | 5 | 100.0% | 24.8 | 44.0 | 0 |
| | May | 4 | 80.0% | 51.2 | 146.8 | 1 |
| | June | 5 | 100.0% | 36.9 | 258.0 | 1 |
| | July | 5 | 100.0% | 63.9 | 247.7 | 1 |
| | August | 6 | 100.0% | 37.1 | 106.9 | 0 |
| | September | 5 | 100.0% | 18.7 | 82.1 | 0 |
| | October | 5 | 100.0% | 30.2 | 125.1 | 1 |
| | November | 5 | 100.0% | 10.4 | 42.7 | 0 |
| | December | 5 | 100.0% | 5.9 | 38.3 | 0 |
| Annual | | 60 | 98.4% | 21.9 | 258.0 | 4 |

Observations in ug/m$^3$

**FIGURE 4.4.3.1 - SUBSTATION ANNUAL TSP CONCENTRATIONS**



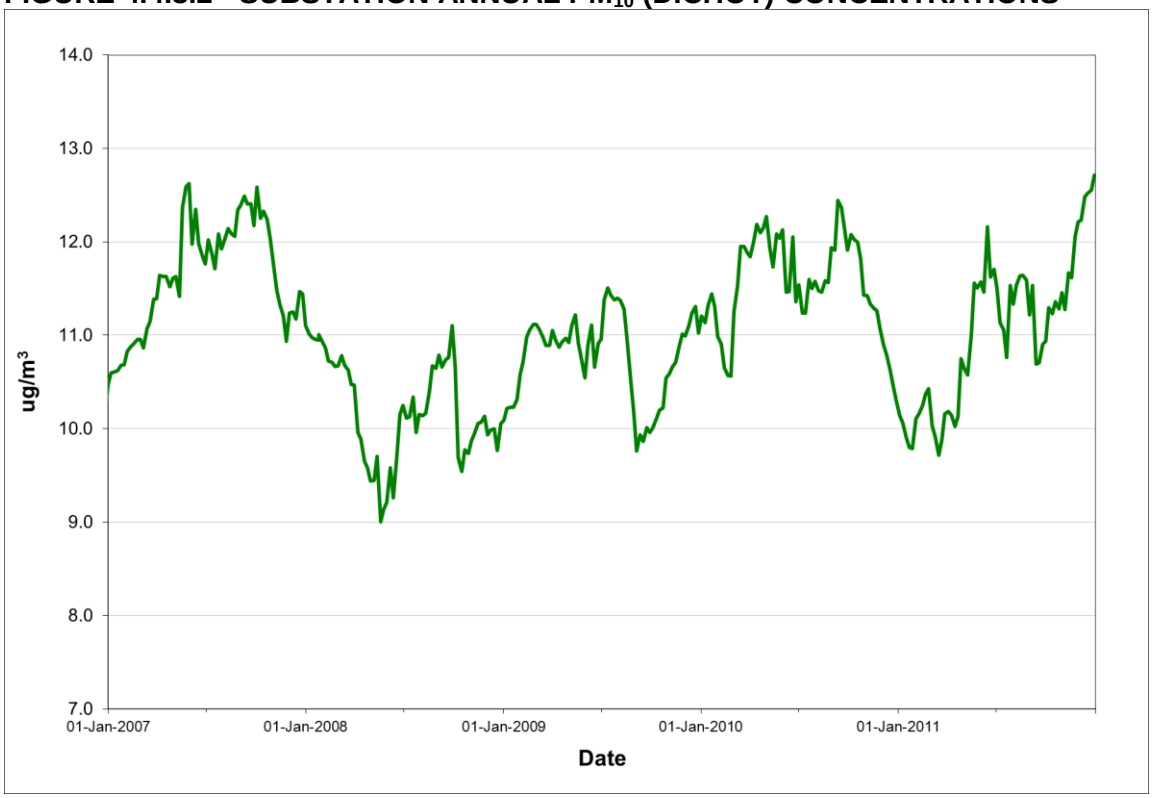

Rolling annual average of daily concentrations

**TABLE 4.4.3.2 - SUBSTATION $PM_{10}$ (DICHOT) SUMMARY 2010 & 2011**

| Year | Month | # Valid Days | % Valid Days | Average | Maximum 24-Hour | Regulatory Exceedances (>50 ug/m$^3$) |
|---|---|---|---|---|---|---|
| 2010 | January | 5 | 100.0% | 7.7 | 11.2 | 0 |
| | February | 5 | 100.0% | 4.3 | 5.1 | 0 |
| | March | 5 | 100.0% | 15.3 | 33.6 | 0 |
| | April | 5 | 100.0% | 8.6 | 12.6 | 0 |
| | May | 5 | 100.0% | 14.5 | 22.2 | 0 |
| | June | 5 | 100.0% | 16.2 | 32.7 | 0 |
| | July | 6 | 100.0% | 18.7 | 28.8 | 0 |
| | August | 5 | 100.0% | 9.7 | 21.4 | 0 |
| | September | 5 | 100.0% | 11.6 | 45.7 | 0 |
| | October | 5 | 100.0% | 6.3 | 11.9 | 0 |
| | November | 5 | 100.0% | 7.4 | 11.0 | 0 |
| | December | 5 | 100.0% | 1.7 | 5.2 | 0 |
| Annual | | 61 | 100.0% | 10.3 | 45.7 | 0 |
| 2011 | January | 5 | 100.0% | 1.4 | 2.9 | 0 |
| | February | 3 | 60.0% | 13.2 | 24.0 | 0 |
| | March | 2 | 40.0% | 14.9 | 18.5 | 0 |
| | April | 5 | 100.0% | 15.3 | 47.3 | 0 |
| | May | 4 | 80.0% | 25.9 | 53.9 | 1 |
| | June | 4 | 80.0% | 20.0 | 57.7 | 1 |
| | July | 4 | 80.0% | 18.2 | 47.6 | 0 |
| | August | 4 | 66.7% | 6.9 | 12.3 | 0 |
| | September | 3 | 60.0% | 7.1 | 17.0 | 0 |
| | October | 4 | 80.0% | 11.4 | 29.7 | 0 |
| | November | 5 | 100.0% | 14.7 | 31.2 | 0 |
| | December | 5 | 100.0% | 6.5 | 17.1 | 0 |
| Annual | | 48 | 78.7% | 12.7 | 57.7 | 2 |

Observations in ug/m$^3$

**FIGURE 4.4.3.2 - SUBSTATION ANNUAL $PM_{10}$ (DICHOT) CONCENTRATIONS**



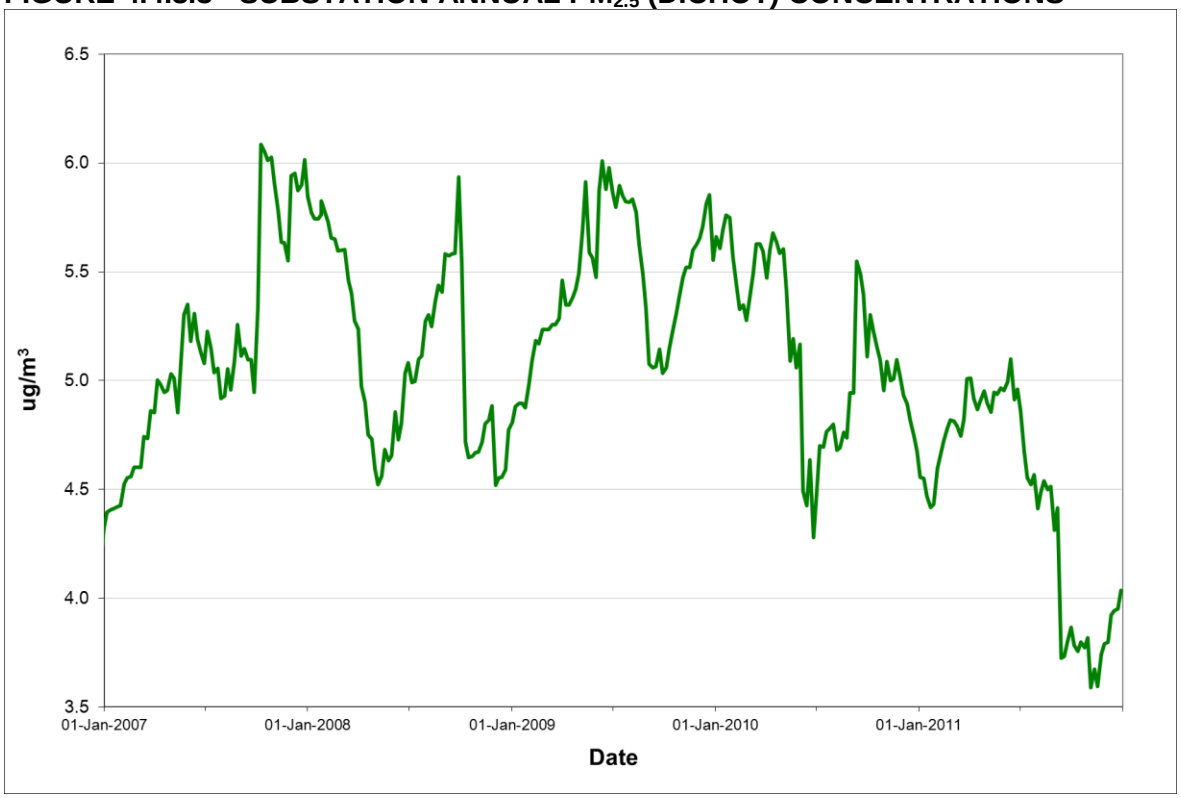

Rolling annual average of daily concentrations

**TABLE 4.4.3.3 - SUBSTATION $PM_{2.5}$ (DICHOT) SUMMARY 2010 & 2011**

| Year | Month | # Valid Days | % Valid Days | Average | Maximum 24-Hour | Regulatory Exceedances (>25 ug/m$^3$) |
|---|---|---|---|---|---|---|
| 2010 | January | 5 | 100.0% | 4.0 | 7.7 | 0 |
| | February | 5 | 100.0% | 1.1 | 2.2 | 0 |
| | March | 5 | 100.0% | 4.1 | 8.3 | 0 |
| | April | 5 | 100.0% | 3.9 | 6.5 | 0 |
| | May | 5 | 100.0% | 4.8 | 9.1 | 0 |
| | June | 5 | 100.0% | 5.7 | 11.0 | 0 |
| | July | 6 | 100.0% | 9.0 | 11.0 | 0 |
| | August | 5 | 100.0% | 4.7 | 11.2 | 0 |
| | September | 5 | 100.0% | 7.6 | 36.1 | 1 |
| | October | 5 | 100.0% | 3.7 | 11.5 | 0 |
| | November | 5 | 100.0% | 5.6 | 11.8 | 0 |
| | December | 5 | 100.0% | 0.9 | 2.6 | 0 |
| Annual | | 61 | 100.0% | 4.7 | 36.1 | 1 |
| 2011 | January | 5 | 100.0% | 1.1 | 2.9 | 0 |
| | February | 3 | 60.0% | 6.5 | 12.2 | 0 |
| | March | 2 | 40.0% | 8.2 | 10.8 | 0 |
| | April | 5 | 100.0% | 3.3 | 5.6 | 0 |
| | May | 4 | 80.0% | 5.0 | 8.4 | 0 |
| | June | 4 | 80.0% | 5.8 | 11.2 | 0 |
| | July | 4 | 80.0% | 4.5 | 8.0 | 0 |
| | August | 4 | 66.7% | 3.0 | 4.6 | 0 |
| | September | 3 | 60.0% | 2.5 | 5.7 | 0 |
| | October | 4 | 80.0% | 3.1 | 7.5 | 0 |
| | November | 5 | 100.0% | 5.3 | 16.9 | 0 |
| | December | 5 | 100.0% | 3.2 | 8.6 | 0 |
| Annual | | 48 | 78.7% | 4.0 | 16.9 | 0 |

Observations in ug/m$^3$

**FIGURE 4.4.3.3 - SUBSTATION ANNUAL $PM_{2.5}$ (DICHOT) CONCENTRATIONS**

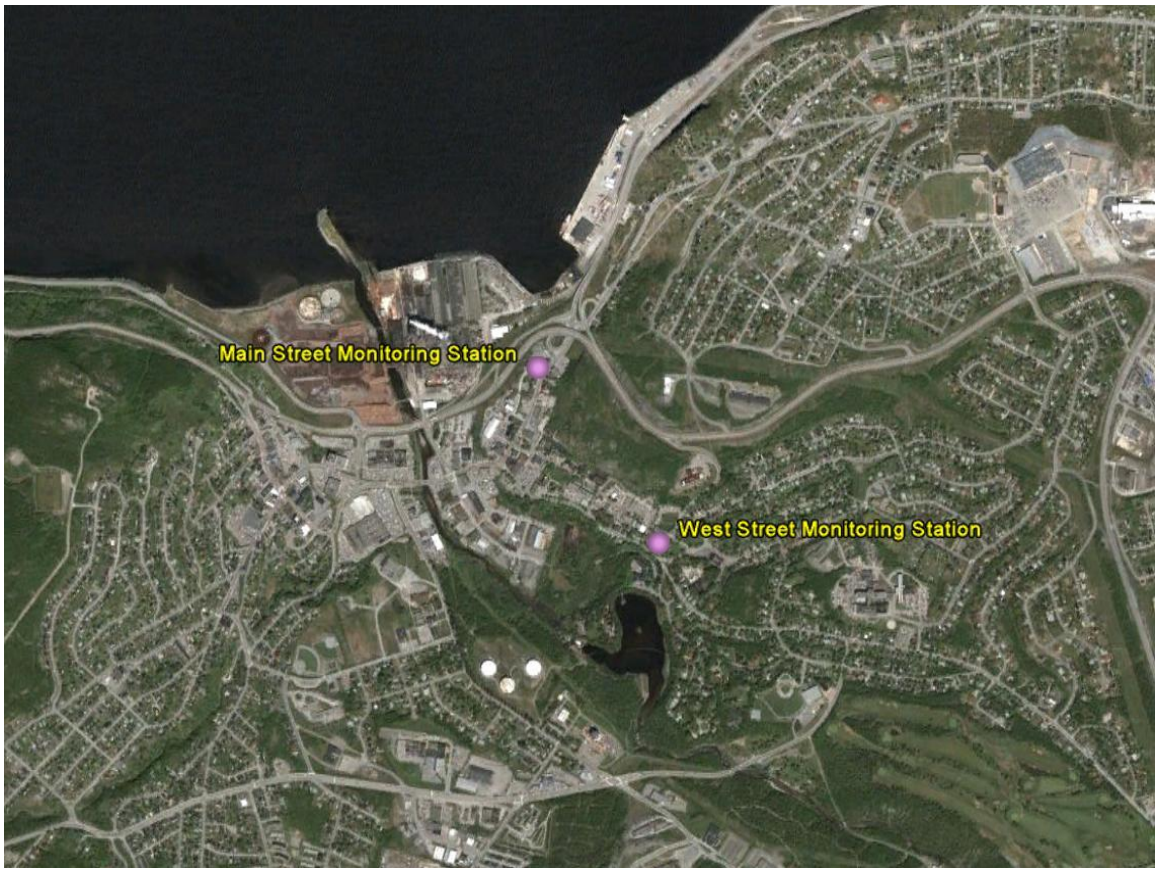



Rolling annual average of daily concentrations

## 4.5 Corner Brook Pulp and Paper

In 2011, Corner Brook Pulp and Paper operated monitoring stations at two 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 $SO_2$ and $PM_{2.5}$ 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 2011.

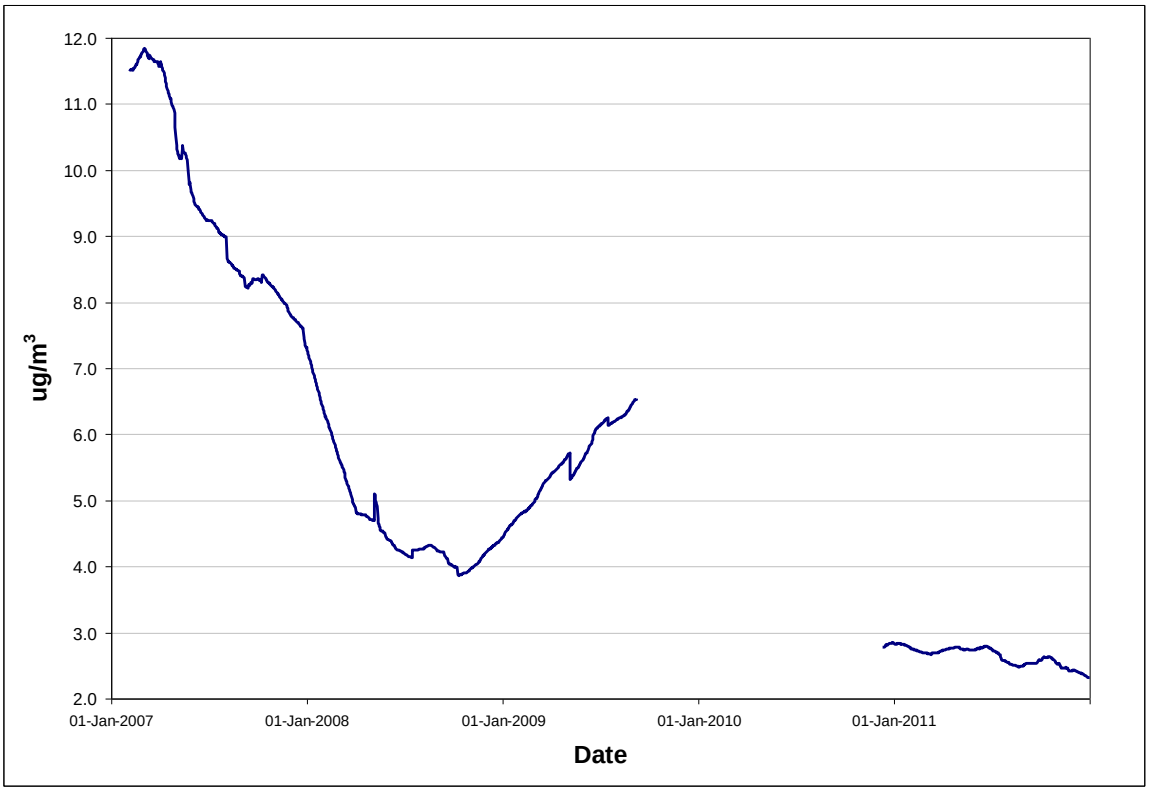
Tables 4.5.1.1 through 4.5.1.3 provide summary information on the level of air contaminants measured at the Main Street Station, while Figures 4.5.1.1 through 4.5.1.3 provide a graphical representation of the annual trend of each pollutant.

**TABLE 4.5.1.1 - MAIN STREET $SO_2$ SUMMARY 2010 & 2011**

| Year | Month | # Valid Hours | % Valid Hours | Average | Maximum 1-Hour | Maximum 3-Hour | Maximum 24-Hour | Regulatory Exceedances 1-Hour (>900) | Regulatory Exceedances 3-Hour (>600) | Regulatory Exceedances 24-Hour (>300) |
|---|---|---|---|---|---|---|---|---|---|---|
| 2010 | January | 0 | 0.0% | | | | | | | |
| | February | 131 | 19.5% | 1.3 | 2.6 | 2.3 | 1.8 | 0 | 0 | 0 |
| | March | 713 | 95.8% | 2.1 | 4.3 | 4.2 | 3.0 | 0 | 0 | 0 |
| | April | 691 | 96.0% | 1.8 | 4.0 | 3.9 | 3.5 | 0 | 0 | 0 |
| | May | 708 | 95.2% | 2.3 | 26.7 | 12.7 | 4.3 | 0 | 0 | 0 |
| | June | 653 | 90.7% | 2.8 | 18.0 | 15.2 | 6.4 | 0 | 0 | 0 |
| | July | 708 | 95.2% | 4.3 | 45.3 | 23.6 | 10.8 | 0 | 0 | 0 |
| | August | 684 | 91.9% | 2.4 | 45.9 | 32.3 | 9.9 | 0 | 0 | 0 |
| | September | 647 | 89.9% | 1.9 | 16.0 | 4.5 | 3.5 | 0 | 0 | 0 |
| | October | 714 | 96.0% | 4.1 | 10.1 | 9.7 | 8.7 | 0 | 0 | 0 |
| | November | 695 | 96.5% | 3.6 | 42.4 | 34.8 | 12.0 | 0 | 0 | 0 |
| | December | 714 | 96.0% | 3.3 | 15.7 | 12.7 | 6.9 | 0 | 0 | 0 |
| Annual | | 7058 | 80.6% | 2.8 | 45.9 | 34.8 | 12.0 | 0 | 0 | 0 |
| 2011 | January | 708 | 95.2% | 2.0 | 5.7 | 5.4 | 4.3 | 0 | 0 | 0 |
| | February | 642 | 95.5% | 1.5 | 3.7 | 3.5 | 2.7 | 0 | 0 | 0 |
| | March | 714 | 96.0% | 2.5 | 8.2 | 4.9 | 4.4 | 0 | 0 | 0 |
| | April | 697 | 96.8% | 2.4 | 4.5 | 4.5 | 3.9 | 0 | 0 | 0 |
| | May | 713 | 95.8% | 1.8 | 7.1 | 4.7 | 3.5 | 0 | 0 | 0 |
| | June | 689 | 95.7% | 3.0 | 10.2 | 9.1 | 5.2 | 0 | 0 | 0 |
| | July | 729 | 98.0% | 1.9 | 25.8 | 14.2 | 5.4 | 0 | 0 | 0 |
| | August | 741 | 99.6% | 1.9 | 13.4 | 10.5 | 3.6 | 0 | 0 | 0 |
| | September | 720 | 100.0% | 2.9 | 65.3 | 40.6 | 10.3 | 0 | 0 | 0 |
| | October | 740 | 99.5% | 3.4 | 25.1 | 23.4 | 7.7 | 0 | 0 | 0 |
| | November | 718 | 99.7% | 2.4 | 6.4 | 5.9 | 4.7 | 0 | 0 | 0 |
| | December | 733 | 98.5% | 2.1 | 5.0 | 4.1 | 3.5 | 0 | 0 | 0 |
| Annual | | 8544 | 97.5% | 2.3 | 65.3 | 40.6 | 10.3 | 0 | 0 | 0 |

Observations in $ug/m^3$

**FIGURE 4.5.1.1 - MAIN STREET ANNUAL $SO_2$ CONCENTRATIONS**



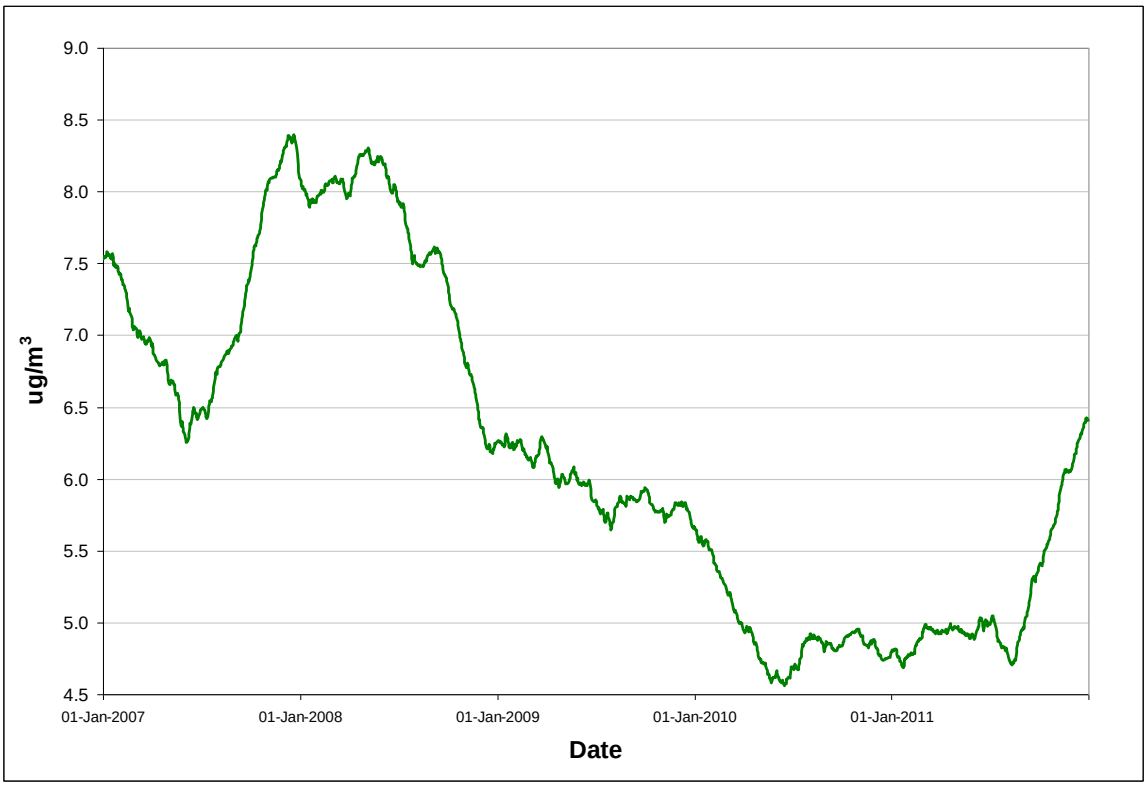

Rolling annual average of hourly concentrations

**TABLE 4.5.1.2 - MAIN STREET $PM_{2.5}$ SUMMARY 2010 & 2011**

| Year | Month | # Valid Days | % Valid Days | Average | Maximum 24-Hour | Regulatory Exceedances (>25 µg/m$^3$) |
|---|---|---|---|---|---|---|
| 2010 | January | 31 | 100.0% | 4.6 | 16.1 | 0 |
| | February | 25 | 89.3% | 2.6 | 7.2 | 0 |
| | March | 31 | 100.0% | 4.2 | 9.3 | 0 |
| | April | 30 | 100.0% | 4.0 | 11.3 | 0 |
| | May | 31 | 100.0% | 4.7 | 13.0 | 0 |
| | June | 28 | 93.3% | 5.7 | 19.4 | 0 |
| | July | 31 | 100.0% | 9.6 | 19.3 | 0 |
| | August | 29 | 93.5% | 7.1 | 16.3 | 0 |
| | September | 30 | 100.0% | 5.2 | 16.2 | 0 |
| | October | 31 | 100.0% | 3.5 | 6.8 | 0 |
| | November | 30 | 100.0% | 3.6 | 13.7 | 0 |
| | December | 31 | 100.0% | 2.6 | 13.2 | 0 |
| Annual | | 358 | 98.1% | 4.8 | 19.4 | 0 |
| 2011 | January | 31 | 100.0% | 4.3 | 21.5 | 0 |
| | February | 27 | 96.4% | 5.0 | 16.8 | 0 |
| | March | 26 | 83.9% | 4.0 | 9.4 | 0 |
| | April | 30 | 100.0% | 4.5 | 9.8 | 0 |
| | May | 29 | 93.5% | 4.1 | 11.1 | 0 |
| | June | 30 | 100.0% | 6.5 | 23.3 | 0 |
| | July | 25 | 80.6% | 8.2 | 19.3 | 0 |
| | August | 31 | 100.0% | 8.6 | 16.4 | 0 |
| | September | 30 | 100.0% | 10.3 | 23.8 | 0 |
| | October | 31 | 100.0% | 7.1 | 15.4 | 0 |
| | November | 30 | 100.0% | 7.9 | 18.4 | 0 |
| | December | 31 | 100.0% | 6.3 | 13.1 | 0 |
| Annual | | 351 | 96.2% | 6.4 | 23.8 | 0 |

Observations in ug/m$^3$

**FIGURE 4.5.1.2 - MAIN STREET ANNUAL $PM_{2.5}$ CONCENTRATIONS**



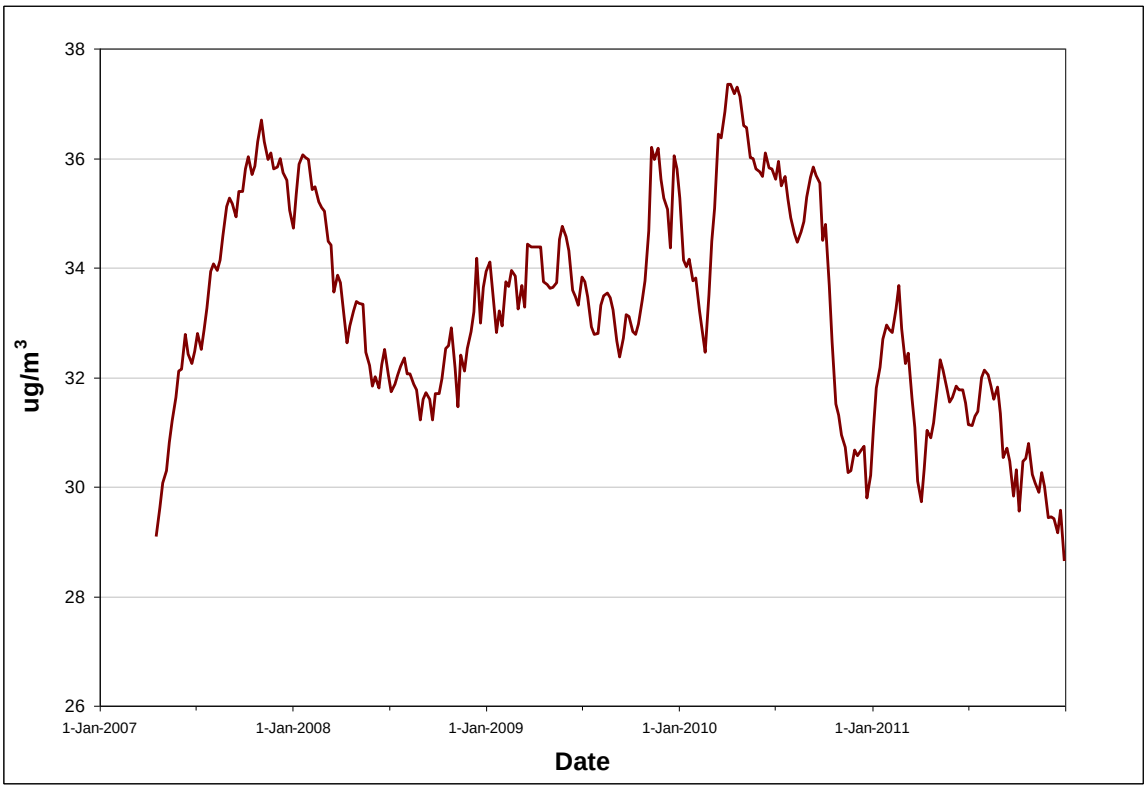

Rolling annual average of hourly concentrations

**TABLE 4.5.1.3 - MAIN STREET TSP SUMMARY 2010 & 2011**

| Year | Month | # Valid Days | % Valid Days | Average | Maximum 24-Hour | Regulatory Exceedances (>120 ug/m$^3$) |
|---|---|---|---|---|---|---|
| 2010 | January | 5 | 100.0% | 8.9 | 14.0 | 0 |
| | February | 5 | 100.0% | 20.8 | 111.4 | 0 |
| | March | 5 | 100.0% | 80.0 | 118.0 | 0 |
| | April | 3 | 60.0% | 76.9 | 83.7 | 0 |
| | May | 5 | 100.0% | 37.6 | 44.2 | 0 |
| | June | 4 | 80.0% | 36.0 | 46.7 | 0 |
| | July | 6 | 100.0% | 33.5 | 50.8 | 0 |
| | August | 5 | 100.0% | 39.6 | 48.2 | 0 |
| | September | 2 | 40.0% | 21.4 | 45.2 | 0 |
| | October | 5 | 100.0% | 15.9 | 41.7 | 0 |
| | November | 4 | 80.0% | 39.5 | 51.0 | 0 |
| | December | 5 | 100.0% | 26.5 | 66.4 | 0 |
| Annual | | 54 | 88.5% | 30.2 | 118.0 | 0 |
| 2011 | January | 3 | 60.0% | 18.0 | 20.3 | 0 |
| | February | 4 | 80.0% | 18.0 | 20.9 | 0 |
| | March | 3 | 60.0% | 34.0 | 102.0 | 0 |
| | April | 5 | 100.0% | 75.6 | 117.9 | 0 |
| | May | 5 | 100.0% | 42.4 | 90.6 | 0 |
| | June | 2 | 40.0% | 40.4 | 54.2 | 0 |
| | July | 5 | 100.0% | 39.1 | 67.4 | 0 |
| | August | 6 | 100.0% | 32.4 | 56.7 | 0 |
| | September | 5 | 100.0% | 19.0 | 40.8 | 0 |
| | October | 5 | 100.0% | 15.4 | 33.7 | 0 |
| | November | 5 | 100.0% | 28.2 | 55.7 | 0 |
| | December | 5 | 100.0% | 19.9 | 27.7 | 0 |
| Annual | | 53 | 86.9% | 28.6 | 117.9 | 0 |

Observations in ug/m$^3$

**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 exceeded on one occasion in 2011.

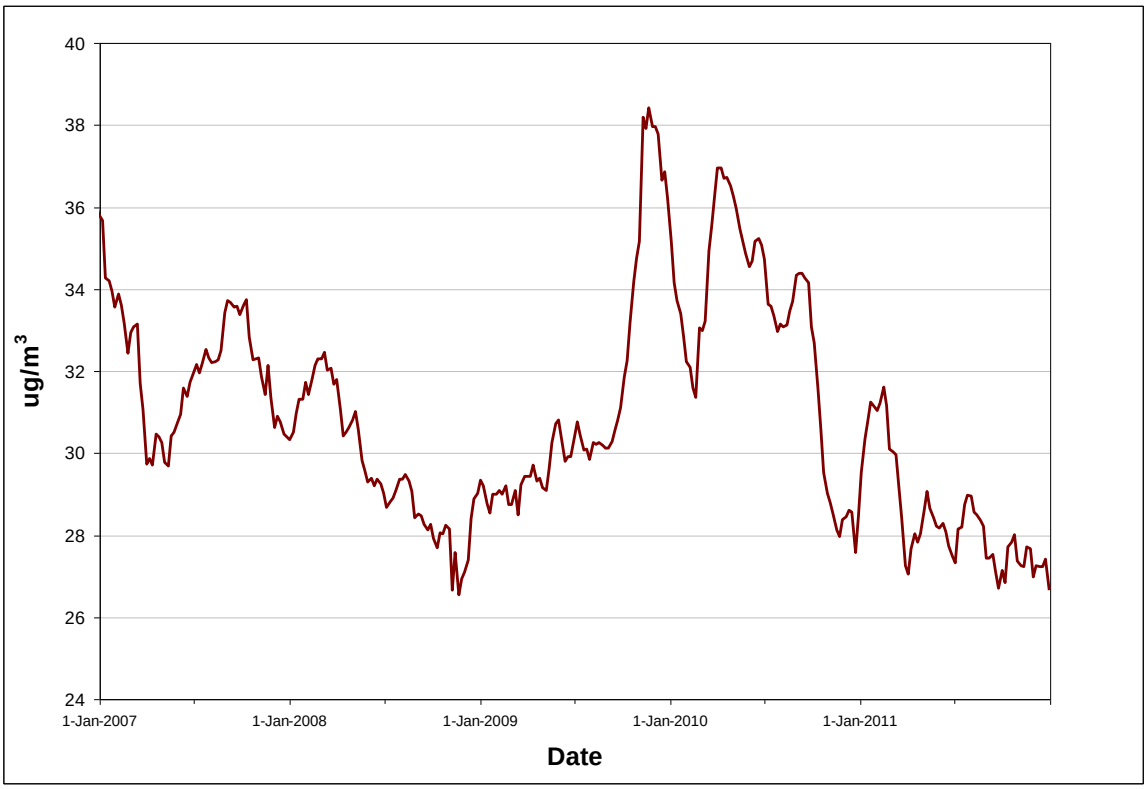
Tables 4.5.2.1 provides summary information on the level of air contaminants measured at the West Street Station, while Figure 4.5.2.1 provides a graphical representation of the annual trend.

**TABLE 4.5.2.1 - WEST STREET TSP SUMMARY 2010 & 2011**

| Year | Month | # Valid Days | % Valid Days | Average | Maximum 24-Hour | Regulatory Exceedances (>120 ug/m$^3$) |
|---|---|---|---|---|---|---|
| 2010 | January | 5 | 100.0% | 6.4 | 12.7 | 0 |
| | February | 5 | 100.0% | 17.6 | 115.4 | 0 |
| | March | 5 | 100.0% | 81.6 | 114.2 | 0 |
| | April | 3 | 60.0% | 88.2 | 113.0 | 0 |
| | May | 5 | 100.0% | 41.6 | 45.0 | 0 |
| | June | 5 | 100.0% | 40.5 | 53.2 | 0 |
| | July | 5 | 83.3% | 22.5 | 43.7 | 0 |
| | August | 5 | 100.0% | 50.6 | 78.0 | 0 |
| | September | 2 | 40.0% | 18.4 | 37.9 | 0 |
| | October | 5 | 100.0% | 14.8 | 33.9 | 0 |
| | November | 4 | 80.0% | 36.2 | 48.3 | 0 |
| | December | 5 | 100.0% | 23.2 | 52.5 | 0 |
| Annual | | 54 | 88.5% | 28.4 | 115.4 | 0 |
| 2011 | January | 4 | 80.0% | 14.7 | 21.6 | 0 |
| | February | 5 | 100.0% | 12.2 | 18.1 | 0 |
| | March | 3 | 60.0% | 29.5 | 75.1 | 0 |
| | April | 5 | 100.0% | 74.7 | 119.1 | 0 |
| | May | 5 | 100.0% | 44.6 | 128.3 | 1 |
| | June | 1 | 20.0% | 46.5 | 46.5 | 0 |
| | July | 5 | 100.0% | 34.8 | 45.5 | 0 |
| | August | 6 | 100.0% | 31.3 | 41.8 | 0 |
| | September | 4 | 80.0% | 19.5 | 31.6 | 0 |
| | October | 5 | 100.0% | 16.1 | 31.7 | 0 |
| | November | 5 | 100.0% | 29.5 | 70.1 | 0 |
| | December | 4 | 80.0% | 19.0 | 53.5 | 0 |
| Annual | | 52 | 85.2% | 26.7 | 128.3 | 1 |

Observations in ug/m$^3$

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




Rolling annual average of daily concentrations

## 4.6 Vale Newfoundland and Labrador Limited - Voisey's Bay

In 2011, Vale Newfoundland and Labrador Limited (Vale) operated monitoring stations at three locations at its Voisey's Bay mine site. These stations are installed to monitor the emissions from Vale'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 4.6.1.

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

### 4.6.1 Accommodation Unit

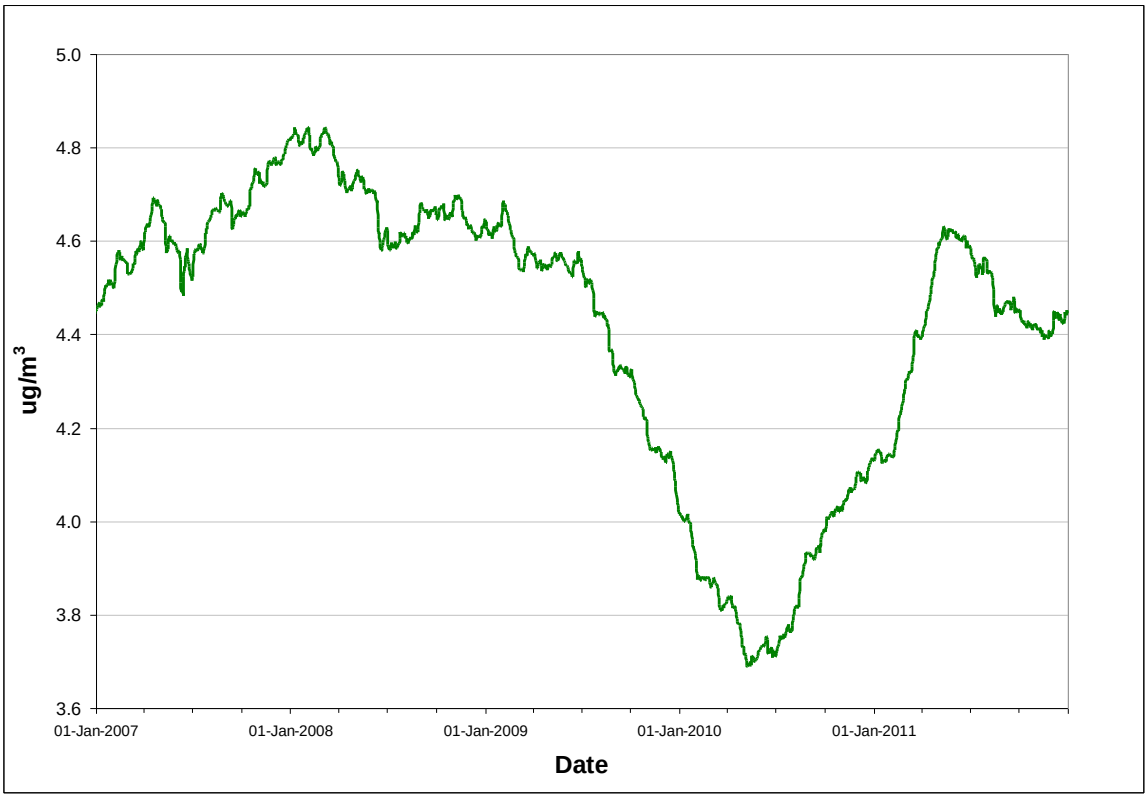
The Accommodation Unit station monitors the ambient levels of $PM_{2.5}$ and $NO_x$ / $NO_2$ on a continuous basis. For all pollutants, the ambient air criteria were not exceeded on any occasion in 2011. Tables 4.6.1.1 through 4.6.1.2 provide summary information on the level of air contaminants measured 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 $PM_{2.5}$ SUMMARY 2010 & 2011**

| Year | Month | # Valid Days | % Valid Days | Average | Maximum 24-Hour | Regulatory Exceedances (>25 ug/m$^3$) |
|---|---|---|---|---|---|---|
| 2010 | January | 31 | 100.0% | 4.1 | 7.6 | 0 |
| | February | 28 | 100.0% | 3.6 | 5.8 | 0 |
| | March | 31 | 100.0% | 4.4 | 6.4 | 0 |
| | April | 30 | 100.0% | 3.6 | 6.4 | 0 |
| | May | 31 | 100.0% | 4.0 | 10.6 | 0 |
| | June | 30 | 100.0% | 3.7 | 8.7 | 0 |
| | July | 31 | 100.0% | 4.3 | 7.7 | 0 |
| | August | 31 | 100.0% | 5.2 | 10.3 | 0 |
| | September | 30 | 100.0% | 4.3 | 10.1 | 0 |
| | October | 31 | 100.0% | 3.9 | 8.5 | 0 |
| | November | 30 | 100.0% | 4.3 | 7.3 | 0 |
| | December | 18 | 58.1% | 4.2 | 8.2 | 0 |
| Annual | | 352 | 96.4% | 4.1 | 10.6 | 0 |
| 2011 | January | 2 | 6.5% | 5.3 | 5.4 | 0 |
| | February | 28 | 100.0% | 5.2 | 7.2 | 0 |
| | March | 31 | 100.0% | 5.6 | 15.5 | 0 |
| | April | 30 | 100.0% | 5.6 | 8.1 | 0 |
| | May | 31 | 100.0% | 4.4 | 11.0 | 0 |
| | June | 29 | 96.7% | 3.4 | 7.2 | 0 |
| | July | 31 | 100.0% | 4.0 | 9.4 | 0 |
| | August | 31 | 100.0% | 4.0 | 10.6 | 0 |
| | September | 30 | 100.0% | 4.3 | 7.0 | 0 |
| | October | 31 | 100.0% | 3.5 | 5.3 | 0 |
| | November | 30 | 100.0% | 4.1 | 6.2 | 0 |
| | December | 31 | 100.0% | 4.8 | 13.4 | 0 |
| Annual | | 335 | 91.8% | 4.4 | 15.5 | 0 |

Observations in ug/m$^3$

**FIGURE 4.6.1.1 - ACCOMMODATION UNIT ANNUAL $PM_{2.5}$ CONCENTRATIONS**



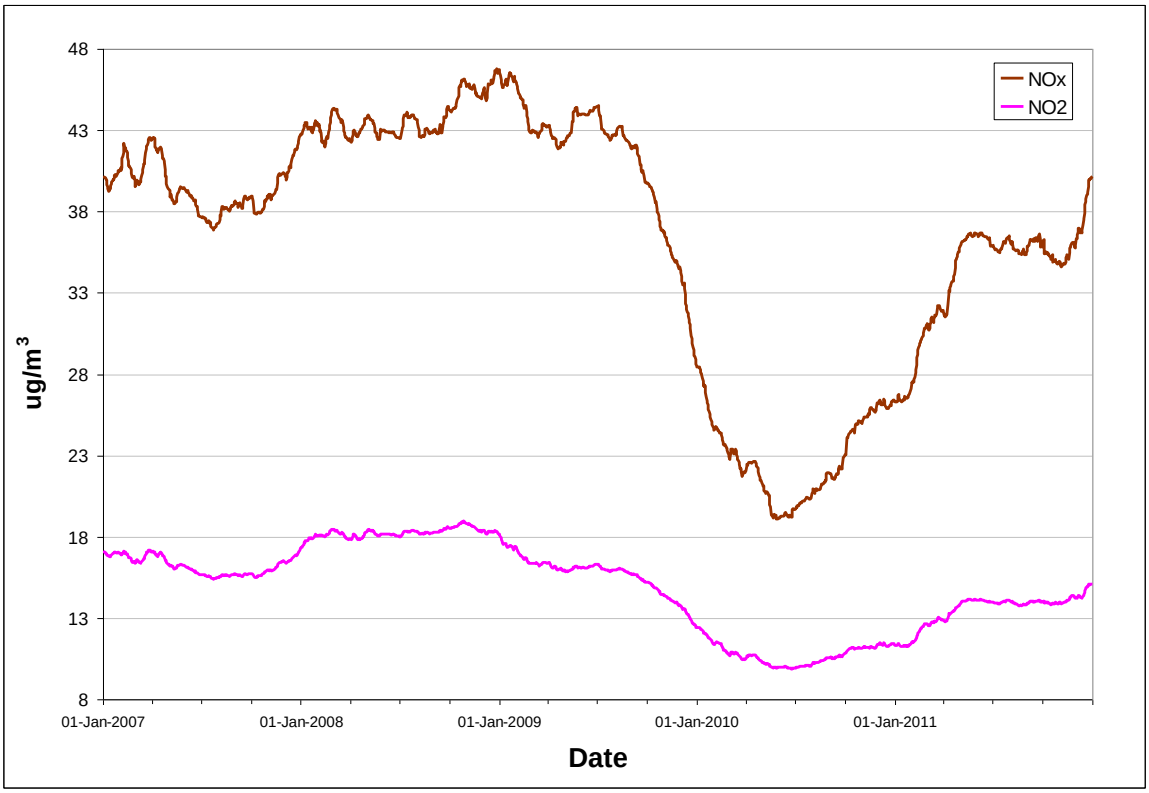

Rolling annual average of hourly concentrations

**TABLE 4.6.1.2 - ACCOMMODATION UNIT $NO_X$ / $NO_2$ SUMMARY 2010 & 2011**

| Year | Month | # Valid Hours | % Valid Hours | Average $NO_x$ | Average $NO_2$ | Maximums 1-Hour $NO_x$ | Maximums 1-Hour $NO_2$ | Maximums 24-Hour $NO_x$ | Maximums 24-Hour $NO_2$ | Exceedances 1-Hour (>400) | Exceedances 24-Hour (>200) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 2010 | January | 684 | 91.9% | 30.5 | 16.6 | 288.8 | 72.7 | 62.2 | 31.3 | 0 | 0 |
| | February | 618 | 92.0% | 15.9 | 9.4 | 187.0 | 75.2 | 62.0 | 30.6 | 0 | 0 |
| | March | 677 | 91.0% | 36.0 | 16.2 | 441.0 | 80.9 | 146.4 | 44.0 | 0 | 0 |
| | April | 662 | 91.9% | 17.0 | 9.7 | 449.8 | 88.1 | 123.1 | 46.6 | 0 | 0 |
| | May | 673 | 90.5% | 10.7 | 6.2 | 345.1 | 61.9 | 61.9 | 19.2 | 0 | 0 |
| | June | 659 | 91.5% | 17.7 | 6.1 | 646.4 | 50.4 | 189.5 | 26.3 | 0 | 0 |
| | July | 682 | 91.7% | 16.7 | 7.5 | 199.2 | 96.8 | 42.6 | 19.6 | 0 | 0 |
| | August | 685 | 92.1% | 33.2 | 11.9 | 644.0 | 59.5 | 142.8 | 27.4 | 0 | 0 |
| | September | 660 | 91.7% | 35.2 | 12.1 | 514.3 | 64.6 | 188.4 | 37.8 | 0 | 0 |
| | October | 684 | 91.9% | 37.0 | 11.4 | 581.5 | 62.5 | 326.6 | 48.3 | 0 | 0 |
| | November | 617 | 85.7% | 35.8 | 14.1 | 492.5 | 68.4 | 135.8 | 45.4 | 0 | 0 |
| | December | 681 | 91.5% | 29.7 | 15.2 | 376.3 | 76.9 | 95.2 | 35.6 | 0 | 0 |
| Annual | | 7982 | 91.1% | 26.3 | 11.4 | 646.4 | 96.8 | 326.6 | 48.3 | 0 | 0 |
| 2011 | January | 682 | 91.7% | 39.5 | 17.3 | 424.8 | 70.6 | 140.2 | 41.3 | 0 | 0 |
| | February | 604 | 89.9% | 67.2 | 25.5 | 571.0 | 76.0 | 155.9 | 41.7 | 0 | 0 |
| | March | 676 | 90.9% | 46.5 | 19.0 | 457.8 | 93.4 | 147.0 | 50.9 | 0 | 0 |
| | April | 662 | 91.9% | 63.3 | 20.9 | 779.2 | 117.4 | 227.0 | 67.5 | 0 | 0 |
| | May | 683 | 91.8% | 21.0 | 9.6 | 301.5 | 92.0 | 82.6 | 24.6 | 0 | 0 |
| | June | 643 | 89.3% | 8.4 | 4.3 | 173.8 | 52.1 | 50.5 | 15.4 | 0 | 0 |
| | July | 684 | 91.9% | 23.6 | 9.2 | 401.1 | 74.8 | 120.6 | 30.1 | 0 | 0 |
| | August | 682 | 91.7% | 19.9 | 8.1 | 335.7 | 62.3 | 58.1 | 20.1 | 0 | 0 |
| | September | 629 | 87.4% | 41.9 | 14.5 | 445.3 | 124.4 | 131.8 | 36.8 | 0 | 0 |
| | October | 689 | 92.6% | 25.9 | 10.9 | 414.5 | 271.7 | 149.2 | 32.8 | 0 | 0 |
| | November | 664 | 92.2% | 46.2 | 17.5 | 698.4 | 74.7 | 180.1 | 43.8 | 0 | 0 |
| | December | 581 | 78.1% | 88.1 | 26.9 | 558.0 | 77.8 | 193.9 | 49.6 | 0 | 0 |
| Annual | | 7879 | 89.9% | 40.2 | 15.1 | 779.2 | 271.7 | 227.0 | 67.5 | 0 | 0 |

Observations in $ug/m^3$

**FIGURE 4.6.1.2 - ACCOMMODATION UNIT ANNUAL $NO_X$ / $NO_2$ CONCENTRATIONS**




Rolling annual average of hourly concentrations

## 4.6.2 Crusher Site

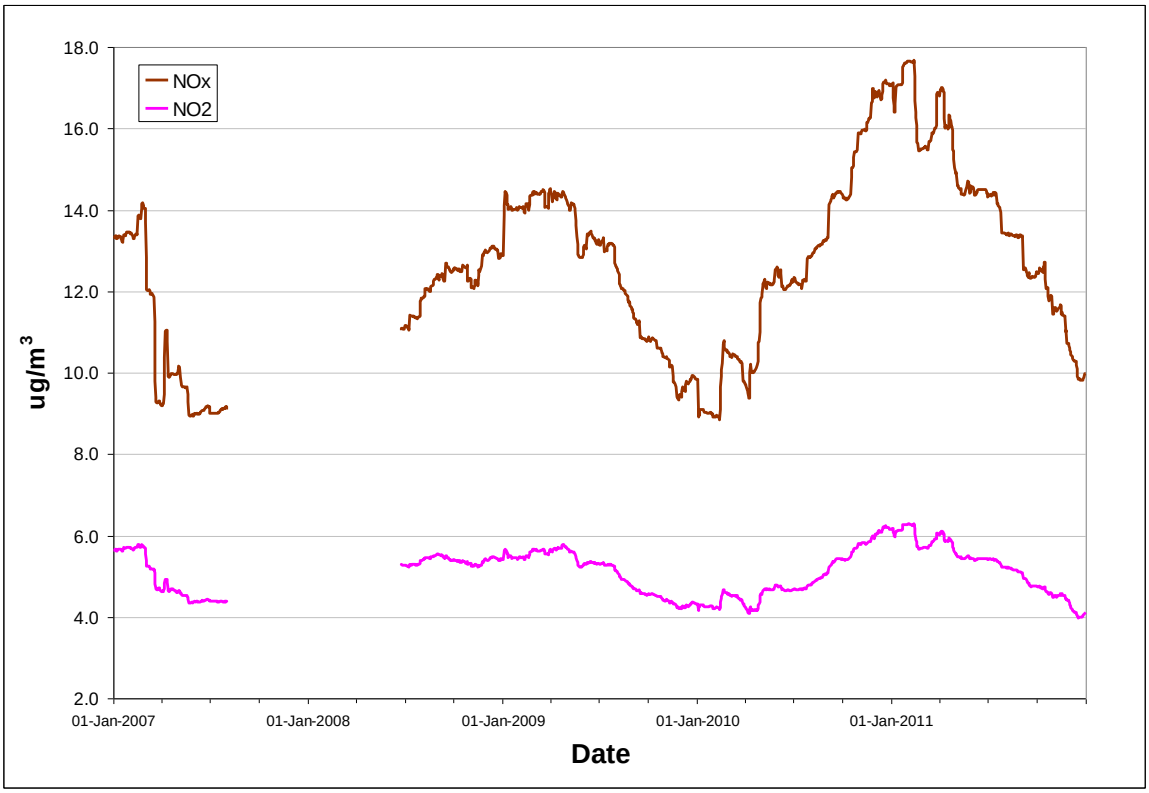
The Crusher Site station monitors the ambient levels of $NO_x$ / $NO_2$ on a continuous basis. The ambient air criteria were not exceeded on any occasion in 2011. Table 4.6.2.1 provides summary information on the level of air contaminants measured at the Crusher Site, while Figure 4.6.2.1 provides a graphical representation of the annual trend.

**TABLE 4.6.2.1 - CRUSHER SITE $NO_X$ / $NO_2$ SUMMARY 2010 & 2011**

| Year | Month | # Valid Hours | % Valid Hours | Average $NO_x$ | Average $NO_2$ | Maximums 1-Hour $NO_x$ | Maximums 1-Hour $NO_2$ | Maximums 24-Hour $NO_x$ | Maximums 24-Hour $NO_2$ | Exceedances 1-Hour (>400) | Exceedances 24-Hour (>200) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 2010 | January | 685 | 92.1% | 10.9 | 4.5 | 264.0 | 70.3 | 143.9 | 42.1 | 0 | 0 |
| | February | 618 | 92.0% | 29.6 | 9.8 | 371.1 | 75.0 | 197.3 | 50.3 | 0 | 0 |
| | March | 677 | 91.0% | 3.2 | 2.5 | 180.4 | 41.4 | 22.7 | 10.3 | 0 | 0 |
| | April | 564 | 78.3% | 41.8 | 12.1 | 534.3 | 78.8 | 251.3 | 54.6 | 0 | 0 |
| | May | 540 | 72.6% | 16.9 | 6.2 | 306.0 | 63.6 | 92.4 | 23.6 | 0 | 0 |
| | June | 263 | 36.5% | 15.1 | 5.2 | 299.3 | 45.7 | 65.2 | 16.2 | 0 | 0 |
| | July | 684 | 91.9% | 18.7 | 5.8 | 400.8 | 45.1 | 173.7 | 24.6 | 0 | 0 |
| | August | 682 | 91.7% | 8.5 | 4.8 | 73.7 | 29.8 | 20.4 | 10.4 | 0 | 0 |
| | September | 663 | 92.1% | 16.5 | 6.0 | 582.2 | 70.0 | 246.6 | 40.3 | 0 | 0 |
| | October | 685 | 92.1% | 20.0 | 6.1 | 497.5 | 92.3 | 144.3 | 30.7 | 0 | 0 |
| | November | 639 | 88.8% | 15.3 | 4.8 | 905.7 | 109.2 | 115.6 | 26.6 | 0 | 0 |
| | December | 681 | 91.5% | 12.2 | 6.6 | 364.9 | 77.7 | 74.6 | 19.9 | 0 | 0 |
| Annual | | 7381 | 84.3% | 17.1 | 6.2 | 905.7 | 109.2 | 251.3 | 54.6 | 0 | 0 |
| 2011 | January | 623 | 83.7% | 17.1 | 5.8 | 494.6 | 85.3 | 137.9 | 34.6 | 0 | 0 |
| | February | 610 | 90.8% | 4.1 | 2.8 | 181.6 | 56.1 | 25.5 | 14.7 | 0 | 0 |
| | March | 684 | 91.9% | 17.3 | 6.1 | 675.2 | 98.6 | 251.4 | 42.2 | 0 | 0 |
| | April | 662 | 91.9% | 17.2 | 6.1 | 542.7 | 76.0 | 182.4 | 37.3 | 0 | 0 |
| | May | 590 | 79.3% | 11.8 | 4.5 | 254.0 | 40.9 | 70.2 | 15.2 | 0 | 0 |
| | June | 192 | 26.7% | 9.8 | 4.6 | 200.7 | 33.7 | 23.7 | 7.4 | 0 | 0 |
| | July | 558 | 75.0% | 6.8 | 3.3 | 159.5 | 34.5 | 35.1 | 8.5 | 0 | 0 |
| | August | 586 | 78.8% | 7.1 | 3.4 | 119.4 | 23.0 | 26.5 | 7.4 | 0 | 0 |
| | September | 589 | 81.8% | 6.0 | 1.9 | 408.8 | 63.6 | 45.0 | 8.1 | 0 | 0 |
| | October | 714 | 96.0% | 9.4 | 3.3 | 269.3 | 46.5 | 47.9 | 12.8 | 0 | 0 |
| | November | 691 | 96.0% | 7.1 | 3.9 | 131.3 | 68.9 | 31.2 | 19.7 | 0 | 0 |
| | December | 697 | 93.7% | 5.0 | 3.6 | 190.7 | 59.1 | 24.9 | 11.8 | 0 | 0 |
| Annual | | 7196 | 82.1% | 10.0 | 4.1 | 675.2 | 98.6 | 251.4 | 42.2 | 0 | 0 |

Observations in $ug/m^3$

**FIGURE 4.6.2.1 - CRUSHER SITE ANNUAL $NO_X$ / $NO_2$ CONCENTRATIONS**




Rolling annual average of hourly concentrations

## 4.6.3 Port Site

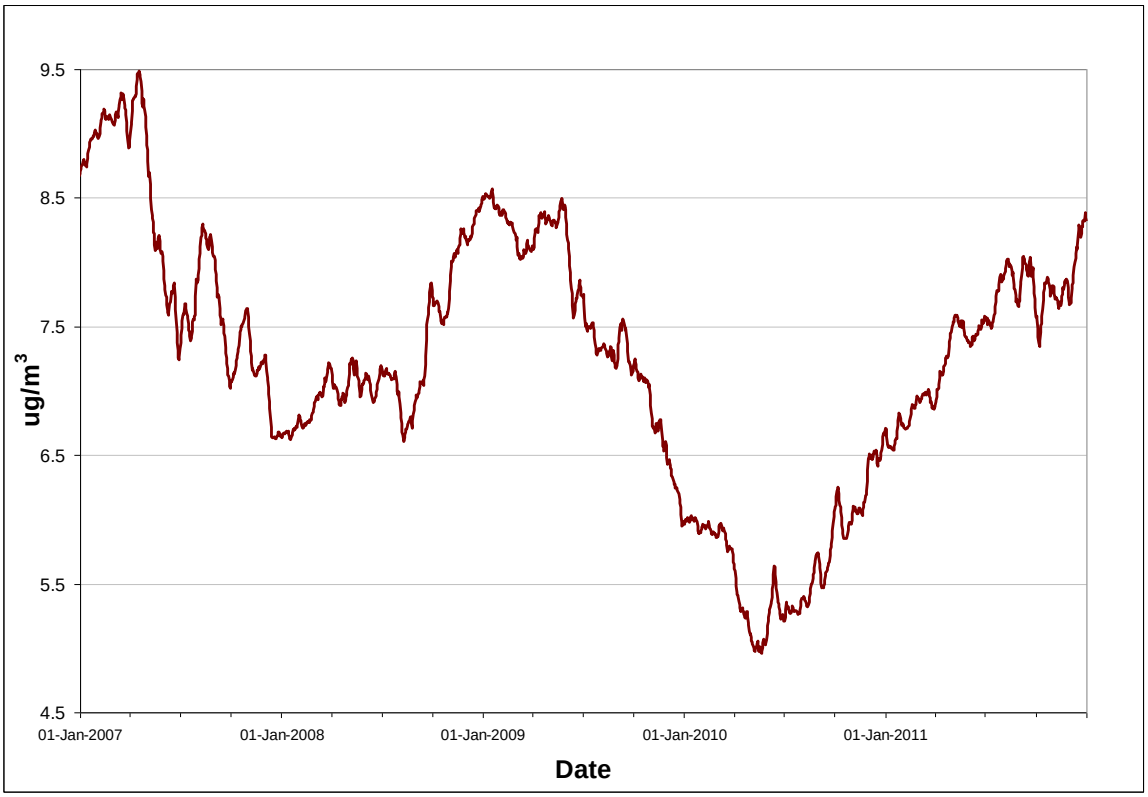
The Port Site station monitors the ambient levels of TSP on a continuous basis. The ambient air criterion was exceeded on six occasions in 2011. Table 4.6.3.1 provides summary information on the level of air contaminants measured at the Port Site, while Figure 4.6.3.1 provides a graphical representation of the annual trend.

**TABLE 4.6.3.1 - PORT SITE TSP SUMMARY 2010 & 2011**

| Year | Month | # Valid Days | % Valid Days | Average | Maximum 24-Hour | Regulatory Exceedances (>120ug/m$^3$) |
|---|---|---|---|---|---|---|
| 2010 | January | 31 | 100.0% | 4.3 | 13.9 | 0 |
| | February | 28 | 100.0% | 4.0 | 10.3 | 0 |
| | March | 31 | 100.0% | 8.6 | 32.8 | 0 |
| | April | 30 | 100.0% | 4.3 | 43.0 | 0 |
| | May | 31 | 100.0% | 5.8 | 51.9 | 0 |
| | June | 28 | 93.3% | 4.1 | 18.1 | 0 |
| | July | 31 | 100.0% | 6.7 | 39.7 | 0 |
| | August | 31 | 100.0% | 11.9 | 67.8 | 0 |
| | September | 30 | 100.0% | 17.5 | 141.4 | 2 |
| | October | 31 | 100.0% | 5.1 | 226.7 | 1 |
| | November | 18 | 60.0% | 21.0 | 207.6 | 1 |
| | December | 30 | 96.8% | 5.3 | 94.5 | 0 |
| Annual | | 350 | 95.9% | 7.8 | 226.7 | 4 |
| 2011 | January | 31 | 100.0% | 9.7 | 74.5 | 0 |
| | February | 27 | 96.4% | 7.2 | 22.5 | 0 |
| | March | 31 | 100.0% | 9.6 | 32.3 | 0 |
| | April | 30 | 100.0% | 15.8 | 69.7 | 0 |
| | May | 28 | 90.3% | 7.2 | 39.2 | 0 |
| | June | 29 | 96.7% | 8.5 | 32.9 | 0 |
| | July | 24 | 77.4% | 20.1 | 132.8 | 1 |
| | August | 31 | 100.0% | 15.3 | 82.8 | 0 |
| | September | 25 | 83.3% | 59.0 | 479.2 | 5 |
| | October | 27 | 87.1% | 8.2 | 29.3 | 0 |
| | November | 24 | 80.0% | 20.3 | 71.2 | 0 |
| | December | 31 | 100.0% | 22.1 | 95.4 | 0 |
| Annual | | 338 | 92.6% | 16.4 | 479.2 | 6 |

Observations in ug/m$^3$

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




Rolling annual average of hourly concentrations

## 4.7 Vale Newfoundland and Labrador - Long Harbour

In 2010, Vale Newfoundland and Labrador (Vale) began the installation of a monitoring network in the Long Harbour / Mt. Arlington Heights area to monitor the emissions from the Hydromet Nickel Processing facility currently being constructed by Vale. The network monitors levels of $NO_x$ / $NO_2$ as well as $PM_{2.5}$. By the end of 2011, all three stations were operational. The location of these stations is shown in Figure 4.7.1.

**FIGURE 4.7.1 - VALE / LONG HARBOUR AMBIENT MONITORING STATIONS**


### 4.7.1 Community Centre (AM1)

The Community Centre (AM1) station was the first station installed in the area and monitors the ambient levels of $PM_{2.5}$ and $NO_x$ / $NO_2$ on a continuous basis. The ambient air criteria were not exceeded on any occasion in 2011. Tables 4.7.1.1 and 4.7.1.2 provide summary information on the level of air contaminants measured at the Community Centre (AM1) site. Due to the limited data, no graphical representation of the annual trend is provided.

The $NO_x$ / $NO_2$ monitor experienced prolonged episodes of baseline shifting in 2010 and 2011, resulting in most of the data being invalidated for both years. The issue has since been resolved.

**TABLE 4.7.1.1 - COMMUNITY CENTRE (AM1) $PM_{2.5}$ SUMMARY 2010 & 2011**

| Year | Month | # Valid Days | % Valid Days | Average | Maximum 24-Hour | Regulatory Exceedances (>25 µg/m$^3$) |
|---|---|---|---|---|---|---|
| 2010 | January | 31 | 100.0% | 3.9 | 7.3 | 0 |
| | February | 28 | 100.0% | 3.3 | 8.4 | 0 |
| | March | 31 | 100.0% | 3.7 | 8.2 | 0 |
| | April | 30 | 100.0% | 3.8 | 10.5 | 0 |
| | May | 31 | 100.0% | 3.5 | 10.4 | 0 |
| | June | 29 | 96.7% | 3.5 | 9.8 | 0 |
| | July | 31 | 100.0% | 4.9 | 15.3 | 0 |
| | August | 31 | 100.0% | 4.2 | 8.6 | 0 |
| | September | 28 | 93.3% | 5.1 | 20.5 | 0 |
| | October | 31 | 100.0% | 2.4 | 5.9 | 0 |
| | November | 30 | 100.0% | 2.8 | 5.2 | 0 |
| | December | 31 | 100.0% | 3.4 | 9.1 | 0 |
| Annual | | 362 | 99.2% | 3.7 | 20.5 | 0 |
| 2011 | January | 25 | 80.6% | 4.0 | 7.6 | 0 |
| | February | 28 | 100.0% | 3.9 | 6.7 | 0 |
| | March | 31 | 100.0% | 5.3 | 10.7 | 0 |
| | April | 30 | 100.0% | 5.3 | 12.7 | 0 |
| | May | 31 | 100.0% | 3.4 | 6.4 | 0 |
| | June | 30 | 100.0% | 3.0 | 6.6 | 0 |
| | July | 31 | 100.0% | 4.4 | 10.8 | 0 |
| | August | 31 | 100.0% | 2.9 | 6.1 | 0 |
| | September | 30 | 100.0% | 3.4 | 9.6 | 0 |
| | October | 31 | 100.0% | 3.1 | 10.8 | 0 |
| | November | 30 | 100.0% | 4.0 | 10.7 | 0 |
| | December | 17 | 54.8% | 3.4 | 11.8 | 0 |
| Annual | | 345 | 94.5% | 3.9 | 12.7 | 0 |

Observations in ug/m$^3$

**TABLE 4.7.1.2 - COMMUNITY CENTRE (AM1) $NO_X$ / $NO_2$ SUMMARY 2010 & 2011**

| Year | Month | # Valid Hours | % Valid Hours | Average $NO_x$ | Average $NO_2$ | Maximums 1-Hour $NO_x$ | Maximums 1-Hour $NO_2$ | Maximums 24-Hour $NO_x$ | Maximums 24-Hour $NO_2$ | Exceedances 1-Hour (>400) | Exceedances 24-Hour (>200) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 2010 | 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 | 0 | 0.0% | | | | | | | | |
| | August | 0 | 0.0% | | | | | | | | |
| | September | 0 | 0.0% | | | | | | | | |
| | October | 0 | 0.0% | | | | | | | | |
| | November | 0 | 0.0% | | | | | | | | |
| | December | 0 | 0.0% | | | | | | | | |
| Annual | | 0 | 0.0% | | | | | | | | |
| 2011 | 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 | 0 | 0.0% | | | | | | | | |
| | August | 0 | 0.0% | | | | | | | | |
| | September | 167 | 23.2% | 5.1 | 4.2 | 47.9 | 18.5 | 8.8 | 7.8 | 0 | 0 |
| | October | 714 | 96.0% | 6.6 | 6.0 | 35.7 | 26.9 | 11.8 | 11.0 | 0 | 0 |
| | November | 687 | 95.4% | 6.4 | 6.2 | 28.9 | 22.9 | 9.9 | 8.8 | 0 | 0 |
| | December | 705 | 94.8% | 5.5 | 5.2 | 46.8 | 34.3 | 11.3 | 9.9 | 0 | 0 |
| Annual | | 2273 | 25.9% | 6.1 | 5.7 | 47.9 | 34.3 | 11.8 | 11.0 | 0 | 0 |

Observations in $ug/m^3$

### 4.8.2 Main Road (AM2)

The Main Road (AM2) station was installed in April 2010 and monitors the ambient levels of $PM_{2.5}$ and $NO_x$ / $NO_2$ on a continuous basis. The ambient air criteria were not exceeded on any occasion in 2011. Tables 4.7.2.1 and 4.7.2.2 provide summary information on the level of air contaminants measured at the Main Road (AM2) site. Due to the limited data, no graphical representation of the annual trend is provided.

**TABLE 4.7.2.1 - MAIN ROAD (AM2) $PM_{2.5}$ SUMMARY 2010 & 2011**

| Year | Month | # Valid Days | % Valid Days | Average | Maximum 24-Hour | Regulatory Exceedances (>25 µg/m$^3$) |
|---|---|---|---|---|---|---|
| 2010 | January | | | | | |
| | February | | | | | |
| | March | | | | | |
| | April | 8 | 88.9% | 2.0 | 3.6 | 0 |
| | May | 31 | 100.0% | 2.4 | 6.9 | 0 |
| | June | 30 | 100.0% | 4.2 | 11.9 | 0 |
| | July | 31 | 100.0% | 3.6 | 15.5 | 0 |
| | August | 31 | 100.0% | 3.4 | 8.3 | 0 |
| | September | 28 | 93.3% | 4.1 | 21.6 | 0 |
| | October | 31 | 100.0% | 2.3 | 4.4 | 0 |
| | November | 30 | 100.0% | 2.5 | 6.3 | 0 |
| | December | 31 | 100.0% | 4.8 | 9.2 | 0 |
| Annual | | 251 | 98.8% | 3.4 | 21.6 | 0 |
| 2011 | January | 31 | 100.0% | 5.0 | 7.7 | 0 |
| | February | 22 | 78.6% | 5.3 | 8.5 | 0 |
| | March | 31 | 100.0% | 6.4 | 11.5 | 0 |
| | April | 30 | 100.0% | 6.2 | 12.8 | 0 |
| | May | 31 | 100.0% | 4.9 | 8.0 | 0 |
| | June | 30 | 100.0% | 4.7 | 9.2 | 0 |
| | July | 31 | 100.0% | 6.6 | 12.7 | 0 |
| | August | 31 | 100.0% | 5.0 | 10.6 | 0 |
| | September | 30 | 100.0% | 6.0 | 9.9 | 0 |
| | October | 31 | 100.0% | 5.0 | 12.7 | 0 |
| | November | 30 | 100.0% | 7.2 | 14.4 | 0 |
| | December | 20 | 64.5% | 6.5 | 18.1 | 0 |
| Annual | | 328 | 95.3% | 5.7 | 18.1 | 0 |

Observations in ug/m$^3$

**TABLE 4.7.2.2 - MAIN ROAD (AM2) $NO_X$ / $NO_2$ SUMMARY 2010 & 2011**

| Year | Month | # Valid Hours | % Valid Hours | Average $NO_x$ | Average $NO_2$ | Maximums 1-Hour $NO_x$ | Maximums 1-Hour $NO_2$ | Maximums 24-Hour $NO_x$ | Maximums 24-Hour $NO_2$ | Exceedances 1-Hour (>400) | Exceedances 24-Hour (>200) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 2010 | January | | | | | | | | | | |
| | February | | | | | | | | | | |
| | March | | | | | | | | | | |
| | April | 198 | 91.7% | 9.6 | 4.0 | 52.9 | 13.0 | 16.9 | 5.7 | 0 | 0 |
| | May | 711 | 95.6% | 10.5 | 3.6 | 69.1 | 16.6 | 29.5 | 9.0 | 0 | 0 |
| | June | 683 | 94.9% | 9.2 | 3.2 | 47.3 | 9.8 | 16.6 | 5.0 | 0 | 0 |
| | July | 714 | 96.0% | 11.3 | 3.2 | 27.7 | 7.8 | 17.1 | 6.3 | 0 | 0 |
| | August | 712 | 95.7% | 10.6 | 3.2 | 46.6 | 12.1 | 19.0 | 7.2 | 0 | 0 |
| | September | 663 | 92.1% | 14.9 | 5.0 | 100.9 | 30.4 | 67.1 | 16.9 | 0 | 0 |
| | October | 714 | 96.0% | 11.4 | 6.6 | 70.5 | 32.4 | 22.9 | 13.0 | 0 | 0 |
| | November | 687 | 95.4% | 12.7 | 9.0 | 74.2 | 39.0 | 27.2 | 20.2 | 0 | 0 |
| | December | 712 | 95.7% | 8.8 | 6.5 | 63.5 | 42.5 | 28.8 | 20.9 | 0 | 0 |
| Annual | | 5794 | 95.0% | 11.1 | 5.0 | 100.9 | 42.5 | 67.1 | 20.9 | 0 | 0 |
| 2011 | January | 714 | 96.0% | 10.3 | 8.5 | 46.1 | 33.7 | 29.9 | 22.4 | 0 | 0 |
| | February | 645 | 96.0% | 9.8 | 8.8 | 40.6 | 32.5 | 24.8 | 20.5 | 0 | 0 |
| | March | 709 | 95.3% | 10.4 | 9.4 | 36.0 | 30.1 | 21.8 | 19.0 | 0 | 0 |
| | April | 690 | 95.8% | 15.7 | 11.5 | 53.6 | 41.5 | 25.9 | 19.5 | 0 | 0 |
| | May | 714 | 96.0% | 11.6 | 9.6 | 52.1 | 42.4 | 33.2 | 26.8 | 0 | 0 |
| | June | 671 | 93.2% | 10.7 | 8.0 | 58.0 | 37.2 | 36.5 | 25.4 | 0 | 0 |
| | July | 707 | 95.0% | 18.8 | 14.1 | 76.5 | 56.3 | 32.9 | 25.3 | 0 | 0 |
| | August | 650 | 87.4% | 14.6 | 10.2 | 52.3 | 33.8 | 29.3 | 20.7 | 0 | 0 |
| | September | 680 | 94.4% | 6.3 | 5.0 | 41.2 | 23.9 | 18.0 | 12.3 | 0 | 0 |
| | October | 682 | 91.7% | 3.9 | 3.4 | 16.6 | 15.3 | 9.4 | 7.4 | 0 | 0 |
| | November | 692 | 96.1% | 5.5 | 4.9 | 24.0 | 18.8 | 9.4 | 7.6 | 0 | 0 |
| | December | 706 | 94.9% | 5.9 | 5.3 | 40.2 | 32.6 | 12.2 | 10.7 | 0 | 0 |
| Annual | | 8260 | 94.3% | 10.3 | 8.2 | 76.5 | 56.3 | 36.5 | 26.8 | 0 | 0 |

Observations in $ug/m^3$

### 4.7.3 Access Road (AM3)

The Access Road (AM3) station was installed in June 2011 near the Vale Inco security gate and monitors the ambient levels of $PM_{2.5}$ and $NO_x$ / $NO_2$ on a continuous basis. The ambient air criteria were not exceeded on any occasion in 2011. Tables 4.7.3.1 and 4.7.3.2 provide summary information on the level of air contaminants measured at the Access Road (AM3) site. Due to the limited data, no graphical representation of the annual trend is provided.

**TABLE 4.7.3.1 - ACCESS ROAD (AM3) $PM_{2.5}$ SUMMARY 2011**

| Year | Month | # Valid Days | % Valid Days | Average | Maximum 24-Hour | Regulatory Exceedances (>25 µg/m$^3$) |
|---|---|---|---|---|---|---|
| 2011 | January | | | | | |
| | February | | | | | |
| | March | | | | | |
| | April | | | | | |
| | May | | | | | |
| | June | 15 | 93.8% | 3.1 | 7.0 | 0 |
| | July | 31 | 100.0% | 4.9 | 11.3 | 0 |
| | August | 31 | 100.0% | 4.8 | 7.6 | 0 |
| | September | 30 | 100.0% | 5.0 | 8.4 | 0 |
| | October | 31 | 100.0% | 4.9 | 12.1 | 0 |
| | November | 30 | 100.0% | 5.0 | 9.8 | 0 |
| | December | 31 | 100.0% | 4.9 | 10.0 | 0 |
| Annual | | 199 | 99.5% | 4.8 | 12.1 | 0 |

Observations in ug/m$^3$

**TABLE 4.7.3.2 - ACCESS ROAD (AM3) $NO_X$ / $NO_2$ SUMMARY 2011**

| Year | Month | # Valid Hours | % Valid Hours | Average $NO_x$ | Average $NO_2$ | Maximums 1-Hour $NO_x$ | Maximums 1-Hour $NO_2$ | Maximums 24-Hour $NO_x$ | Maximums 24-Hour $NO_2$ | Exceedances 1-Hour (>400) | Exceedances 24-Hour (>200) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 2011 | January | | | | | | | | | | |
| | February | | | | | | | | | | |
| | March | | | | | | | | | | |
| | April | | | | | | | | | | |
| | May | | | | | | | | | | |
| | June | 353 | 91.9% | 3.0 | 2.1 | 22.5 | 15.8 | 7.2 | 4.8 | 0 | 0 |
| | July | 712 | 95.7% | 2.3 | 1.8 | 38.4 | 26.1 | 6.4 | 4.4 | 0 | 0 |
| | August | 683 | 91.8% | 2.5 | 1.7 | 17.4 | 13.3 | 5.7 | 3.6 | 0 | 0 |
| | September | 685 | 95.1% | 1.6 | 1.2 | 19.2 | 9.5 | 4.0 | 2.2 | 0 | 0 |
| | October | 714 | 96.0% | 1.7 | 1.4 | 16.8 | 15.0 | 4.7 | 3.8 | 0 | 0 |
| | November | 691 | 96.0% | 2.4 | 1.8 | 31.8 | 18.7 | 8.2 | 5.1 | 0 | 0 |
| | December | 706 | 94.9% | 2.0 | 1.5 | 62.4 | 25.7 | 9.4 | 6.2 | 0 | 0 |
| Annual | | 4544 | 94.7% | 2.2 | 1.6 | 62.4 | 26.1 | 9.4 | 6.2 | 0 | 0 |

Observations in $ug/m^3$

## 4.8 NALCOR - Little Bay Islands

In 2011, NALCOR began monitoring the levels of $NO_x$ / $NO_2$ in the community of Little Bay Islands. The monitor is situated in an area to measure emissions from the NALCOR diesel generating plant in the community. The location of the station is shown in Figure 4.8.1.

**FIGURE 4.8.1 - NALCOR LITTLE BAY ISLANDS AMBIENT MONITORING STATION**


### 4.8.1 Little Bay Islands

The Little Bay Islands station monitors the ambient levels of $NO_x$ / $NO_2$ on a continuous basis. The ambient air criteria were not exceeded on any occasion in 2011. Table 4.8.1.1 provides summary information on the level of air contaminants measured at the Little Bay Islands site. Due to the limited data, no graphical representation of the annual trend is provided.

**TABLE 4.8.1.1 - LITTLE BAY ISLANDS $NO_X$ / $NO_2$ SUMMARY 2010 & 2011**

| Year | Month | # Valid Hours | % Valid Hours | Average $NO_x$ | Average $NO_2$ | Maximums 1-Hour $NO_x$ | Maximums 1-Hour $NO_2$ | Maximums 24-Hour $NO_x$ | Maximums 24-Hour $NO_2$ | Exceedances 1-Hour (>400) | Exceedances 24-Hour (>200) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 2010 | January | | | | | | | | | | |
| | February | 71 | 10.6% | 2.3 | 2.4 | 6.6 | 5.8 | 2.7 | 2.8 | 0 | 0 |
| | March | 657 | 88.3% | 17.0 | 9.2 | 229.0 | 61.1 | 81.3 | 29.0 | 0 | 0 |
| | April | 690 | 95.8% | 44.4 | 17.1 | 338.5 | 81.0 | 109.4 | 39.7 | 0 | 0 |
| | May | 713 | 95.8% | 36.9 | 11.6 | 682.7 | 87.5 | 151.2 | 33.6 | 0 | 0 |
| | June | 690 | 95.8% | 39.3 | 13.6 | 561.8 | 112.2 | 112.0 | 29.8 | 0 | 0 |
| | July | 675 | 90.7% | 40.1 | 11.9 | 468.8 | 56.5 | 112.5 | 23.5 | 0 | 0 |
| | August | 588 | 79.0% | 37.7 | 12.4 | 377.6 | 65.7 | 99.6 | 24.7 | 0 | 0 |
| | September | 679 | 94.3% | 24.8 | 8.9 | 361.6 | 57.5 | 57.0 | 21.5 | 0 | 0 |
| | October | 711 | 95.6% | 21.4 | 8.7 | 247.6 | 39.8 | 67.3 | 19.0 | 0 | 0 |
| | November | 690 | 95.8% | 17.5 | 8.7 | 207.2 | 53.1 | 67.3 | 24.5 | 0 | 0 |
| | December | 712 | 95.7% | 21.0 | 8.7 | 171.8 | 47.9 | 90.5 | 32.0 | 0 | 0 |
| Annual | | 6876 | 85.8% | 29.6 | 11.0 | 682.7 | 112.2 | 151.2 | 39.7 | 0 | 0 |
| 2011 | January | 703 | 94.5% | 19.3 | 9.1 | 147.1 | 49.6 | 67.9 | 25.9 | 0 | 0 |
| | February | 633 | 94.2% | 12.6 | 7.2 | 104.6 | 45.5 | 37.9 | 19.4 | 0 | 0 |
| | March | 706 | 94.9% | 20.5 | 10.2 | 241.0 | 71.8 | 67.7 | 28.6 | 0 | 0 |
| | April | 690 | 95.8% | 26.5 | 13.1 | 434.3 | 67.1 | 98.5 | 28.6 | 0 | 0 |
| | May | 707 | 95.0% | 52.9 | 17.5 | 377.3 | 69.1 | 107.9 | 29.4 | 0 | 0 |
| | June | 680 | 94.4% | 51.4 | 14.6 | 515.0 | 69.0 | 131.5 | 30.0 | 0 | 0 |
| | July | 704 | 94.6% | 38.4 | 12.7 | 358.3 | 62.0 | 92.9 | 26.3 | 0 | 0 |
| | August | 713 | 95.8% | 39.7 | 12.7 | 348.4 | 57.9 | 98.5 | 26.4 | 0 | 0 |
| | September | 688 | 95.6% | 19.1 | 9.0 | 147.3 | 47.9 | 56.2 | 19.0 | 0 | 0 |
| | October | 713 | 95.8% | 17.9 | 7.6 | 178.8 | 49.3 | 56.7 | 16.9 | 0 | 0 |
| | November | 668 | 92.8% | 28.6 | 13.1 | 354.7 | 71.4 | 114.2 | 36.7 | 0 | 0 |
| | December | 713 | 95.8% | 17.1 | 9.4 | 218.4 | 57.1 | 49.6 | 18.2 | 0 | 0 |
| Annual | | 8318 | 95.0% | 28.8 | 11.4 | 515.0 | 71.8 | 131.5 | 36.7 | 0 | 0 |

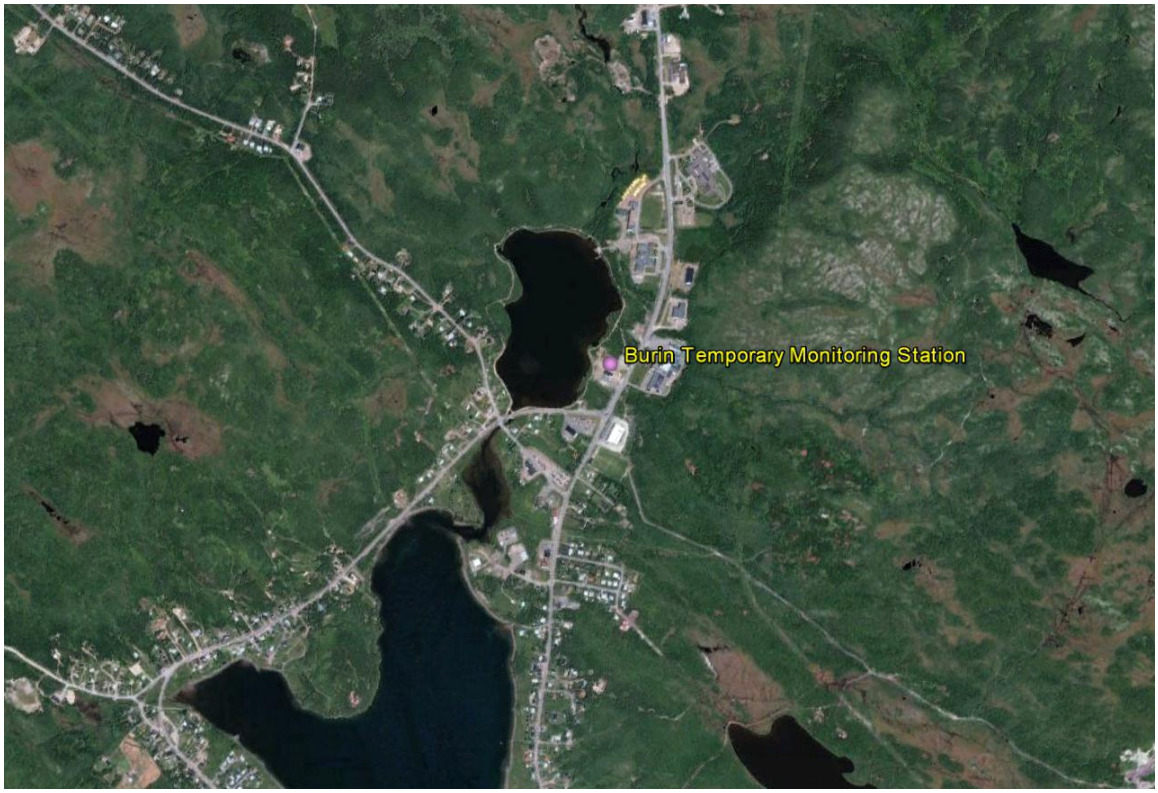
Observations in $ug/m^3$

# 5.0 Department of Environment and Conservation

In mid-year 2010, the Department of Environment and Conservation positioned its mobile air monitoring station at Buchans to begin monitoring the levels of $SO_2$, $PM_{2.5}$ $NO_x$ / $NO_2$, $O_3$ and TSP in the community of Buchans. The station was situated in an area to measure emissions from the remediation work that was ongoing at the former Buchans mining operation. In the summer of 2011 after completion of the remediation work, the station was relocated to the Burin Peninsula. The location of the mobile station in Buchans is shown in Figure 5.0.1. The location of the mobile station in Burin is shown in Figure 5.0.2

**FIGURE 5.0.1 - DOEC TEMPORARY BUCHANS AMBIENT MONITORING STATION**

**FIGURE 5.0.2 - DOEC TEMPORARY BURIN AMBIENT MONITORING STATION**




## 5.1 Buchans

The Buchans station monitored the ambient levels of $SO_2$, $PM_{2.5}$ $NO_x$ / $NO_2$, $O_3$ and TSP on a continuous basis. The ambient air criteria were not exceeded on any occasion in 2011. Tables 5.1.1 through 5.1.5 provide summary information on the level of each air contaminant measured at the Buchans site. Due to the limited data, no graphical representation of the annual trend is provided.

Table 5.1.6 provides a summary of the AQHI, while Figure 5.1.1 provides a graphical representation of the AQHI frequency based on all data collected in Buchans.

**TABLE 5.1.1 - BUCHANS $SO_2$ SUMMARY 2010 & 2011**

| Year | Month | # Valid Hours | % Valid Hours | Average | Maximum 1-Hour | Maximum 3-Hour | Maximum 24-Hour | Regulatory Exceedances 1-Hour (>900) | Regulatory Exceedances 3-Hour (>600) | Regulatory Exceedances 24-Hour (>300) |
|---|---|---|---|---|---|---|---|---|---|---|
| 2010 | January | | | | | | | | | |
| | February | | | | | | | | | |
| | March | | | | | | | | | |
| | April | | | | | | | | | |
| | May | | | | | | | | | |
| | June | | | | | | | | | |
| | July | 544 | 73.1% | 13.5 | 26.6 | 22.4 | 20.4 | 0 | 0 | 0 |
| | August | 688 | 92.5% | 7.9 | 19.0 | 12.8 | 10.8 | 0 | 0 | 0 |
| | September | 687 | 95.4% | 6.0 | 16.7 | 13.3 | 10.9 | 0 | 0 | 0 |
| | October | 606 | 81.5% | 7.7 | 14.6 | 13.6 | 12.2 | 0 | 0 | 0 |
| | November | 528 | 73.3% | 8.9 | 17.0 | 16.8 | 15.3 | 0 | 0 | 0 |
| | December | 361 | 48.5% | 12.0 | 23.5 | 22.2 | 21.0 | 0 | 0 | 0 |
| Annual | | 3414 | 77.3% | 9.0 | 26.6 | 22.4 | 21.0 | 0 | 0 | 0 |
| 2011 | January | 441 | 59.3% | 11.6 | 14.9 | 14.8 | 14.1 | 0 | 0 | 0 |
| | February | 294 | 43.8% | 9.0 | 11.7 | 11.7 | 10.6 | 0 | 0 | 0 |
| | March | 742 | 99.7% | 11.4 | 17.1 | 16.7 | 16.1 | 0 | 0 | 0 |
| | April | 720 | 100.0% | 13.6 | 18.2 | 18.1 | 16.9 | 0 | 0 | 0 |
| | May | 695 | 93.4% | 10.3 | 35.0 | 22.1 | 13.4 | 0 | 0 | 0 |
| | June | 518 | 71.9% | 2.3 | 11.2 | 9.5 | 5.4 | 0 | 0 | 0 |
| | July | 174 | 38.2% | 2.4 | 3.0 | 2.8 | 2.6 | 0 | 0 | 0 |
| | August | | | | | | | | | |
| | September | | | | | | | | | |
| | October | | | | | | | | | |
| | November | | | | | | | | | |
| | December | | | | | | | | | |
| Annual | | 3584 | 74.7% | 9.7 | 35.0 | 22.1 | 16.9 | 0 | 0 | 0 |

Observations in $ug/m^3$

**TABLE 5.1.2 - BUCHANS $PM_{2.5}$ SUMMARY 2010 & 2011**

| Year | Month | # Valid Days | % Valid Days | Average | Maximum 24-Hour | Regulatory Exceedances (>25 µg/m$^3$) |
|---|---|---|---|---|---|---|
| 2010 | January | | | | | |
| | February | | | | | |
| | March | | | | | |
| | April | | | | | |
| | May | | | | | |
| | June | 17 | 85.0% | 3.2 | 9.2 | 0 |
| | July | 6 | 19.4% | 3.9 | 7.6 | 0 |
| | August | 17 | 54.8% | 2.7 | 6.7 | 0 |
| | September | 30 | 100.0% | 2.7 | 11.7 | 0 |
| | October | 27 | 87.1% | 2.7 | 12.9 | 0 |
| | November | 26 | 86.7% | 2.4 | 5.9 | 0 |
| | December | 14 | 45.2% | 3.2 | 6.4 | 0 |
| Annual | | 137 | 67.2% | 2.8 | 12.9 | 0 |
| 2011 | January | 18 | 58.1% | 4.0 | 15.3 | 0 |
| | February | 12 | 42.9% | 4.8 | 11.4 | 0 |
| | March | 31 | 100.0% | 5.0 | 9.5 | 0 |
| | April | 30 | 100.0% | 4.3 | 8.0 | 0 |
| | May | 23 | 74.2% | 4.2 | 6.8 | 0 |
| | June | 26 | 86.7% | 1.4 | 3.3 | 0 |
| | July | 18 | 94.7% | 3.1 | 9.4 | 0 |
| | August | | | | | |
| | September | | | | | |
| | October | | | | | |
| | November | | | | | |
| | December | | | | | |
| Annual | | 158 | 79.0% | 3.8 | 15.3 | 0 |

Observations in ug/m$^3$

**TABLE 5.1.3 - BUCHANS $NO_X$ / $NO_2$ SUMMARY 2010 & 2011**

| Year | Month | # Valid Hours | % Valid Hours | Average $NO_X$ | Average $NO_2$ | Maximums 1-Hour $NO_X$ | Maximums 1-Hour $NO_2$ | Maximums 24-Hour $NO_X$ | Maximums 24-Hour $NO_2$ | Exceedances 1-Hour (>400) | Exceedances 24-Hour (>200) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 2010 | January | | | | | | | | | | |
| | February | | | | | | | | | | |
| | March | | | | | | | | | | |
| | April | | | | | | | | | | |
| | May | | | | | | | | | | |
| | June | | | | | | | | | | |
| | July | | | | | | | | | | |
| | August | | | | | | | | | | |
| | September | 537 | 74.6% | 5.6 | 3.4 | 148.5 | 107.0 | 15.3 | 10.2 | 0 | 0 |
| | October | 660 | 88.7% | 4.8 | 2.9 | 136.4 | 84.3 | 20.2 | 11.1 | 0 | 0 |
| | November | 637 | 88.5% | 3.0 | 1.8 | 92.6 | 57.4 | 9.1 | 5.2 | 0 | 0 |
| | December | 361 | 48.5% | 1.5 | 1.0 | 9.5 | 5.7 | 3.2 | 1.6 | 0 | 0 |
| Annual | | 2195 | 75.0% | 3.9 | 2.4 | 148.5 | 107.0 | 20.2 | 11.1 | 0 | 0 |
| 2011 | January | 441 | 59.3% | 1.9 | 1.5 | 10.2 | 4.1 | 4.4 | 1.8 | 0 | 0 |
| | February | 171 | 25.4% | 2.0 | 1.6 | 8.9 | 5.3 | 2.5 | 2.0 | 0 | 0 |
| | March | 0 | 0.0% | | | | | | | | |
| | April | 0 | 0.0% | | | | | | | | |
| | May | 0 | 0.0% | | | | | | | | |
| | June | 420 | 58.3% | 0.1 | 0.3 | 3.9 | 2.4 | 0.3 | 1.2 | 0 | 0 |
| | July | | | | | | | | | | |
| | August | | | | | | | | | | |
| | September | | | | | | | | | | |
| | October | | | | | | | | | | |
| | November | | | | | | | | | | |
| | December | | | | | | | | | | |
| Annual | | 1032 | 21.5% | 1.2 | 1.0 | 10.2 | 5.3 | 4.4 | 2.0 | 0 | 0 |

Observations in $ug/m^3$

**TABLE 5.1.4 - BUCHANS $O_3$ SUMMARY 2010 & 2011**

| Year | Month | # Valid Hours | % Valid Hours | Average | Maximum 1-Hour | Maximum 8-Hour | Regulatory Exceedances 1-Hour (>160) | Regulatory Exceedances 8-Hour (>87) |
|---|---|---|---|---|---|---|---|---|
| 2010 | January | | | | | | | |
| | February | | | | | | | |
| | March | | | | | | | |
| | April | | | | | | | |
| | May | | | | | | | |
| | June | | | | | | | |
| | July | | | | | | | |
| | August | | | | | | | |
| | September | 535 | 74.3% | 40.1 | 74.1 | 63.5 | 0 | 0 |
| | October | 658 | 88.4% | 38.9 | 68.9 | 66.2 | 0 | 0 |
| | November | 635 | 88.2% | 54.8 | 72.7 | 70.3 | 0 | 0 |
| | December | 361 | 48.5% | 63.2 | 76.2 | 73.9 | 0 | 0 |
| Annual | | 2189 | 74.8% | 47.8 | 76.2 | 73.9 | 0 | 0 |
| 2011 | January | 441 | 59.3% | 63.0 | 78.3 | 75.6 | 0 | 0 |
| | February | 294 | 43.8% | 72.2 | 86.8 | 85.0 | 0 | 0 |
| | March | 743 | 99.9% | 74.3 | 88.0 | 86.5 | 0 | 0 |
| | April | 720 | 100.0% | 73.3 | 99.9 | 97.3 | 0 | 9 |
| | May | 695 | 93.4% | 38.2 | 64.9 | 58.7 | 0 | 0 |
| | June | 456 | 63.3% | 55.5 | 85.0 | 76.4 | 0 | 0 |
| | July | 42 | 9.2% | 34.5 | 52.3 | 42.5 | 0 | 0 |
| | August | | | | | | | |
| | September | | | | | | | |
| | October | | | | | | | |
| | November | | | | | | | |
| | December | | | | | | | |
| Annual | | 3391 | 70.6% | 62.0 | 99.9 | 97.3 | 0 | 9 |

Observations in $ug/m^3$

**TABLE 5.1.5 - BUCHANS TSP SUMMARY 2010 & 2011**

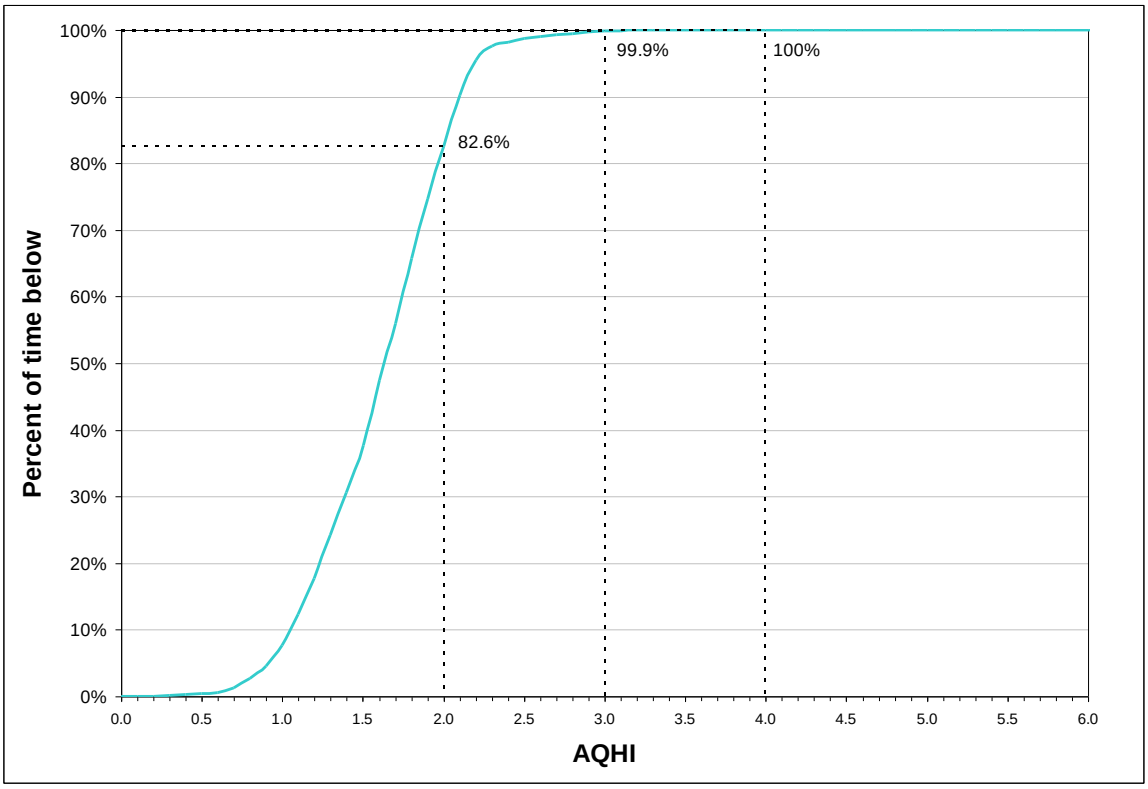
| Year | Month | # Valid Days | % Valid Days | Average | Maximum 24-Hour | Regulatory Exceedances (>120 µg/m$^3$) |
|---|---|---|---|---|---|---|
| 2010 | January | 0 | | | | |
| | February | 0 | | | | |
| | March | 0 | | | | |
| | April | 0 | | | | |
| | May | 0 | | | | |
| | June | 14 | 70.0% | 5.5 | 14.8 | 0 |
| | July | 31 | 100.0% | 6.3 | 14.5 | 0 |
| | August | 20 | 64.5% | 14.7 | 40.3 | 0 |
| | September | 30 | 100.0% | 14.5 | 53.5 | 0 |
| | October | 27 | 87.1% | 7.8 | 34.2 | 0 |
| | November | 25 | 83.3% | 10.4 | 26.8 | 0 |
| | December | 14 | 45.2% | 6.5 | 16.3 | 0 |
| Annual | | 161 | 78.9% | 9.7 | 53.5 | 0 |
| 2011 | January | 18 | 58.1% | 7.4 | 16.9 | 0 |
| | February | 12 | 40.0% | 4.8 | 9.8 | 0 |
| | March | 31 | 100.0% | 7.7 | 25.8 | 0 |
| | April | 9 | 30.0% | 6.6 | 10.4 | 0 |
| | May | 0 | 0.0% | | | |
| | June | 26 | 86.7% | 3.0 | 19.0 | 0 |
| | July | 18 | 94.7% | 6.1 | 15.0 | 0 |
| | August | | | | | |
| | September | | | | | |
| | October | | | | | |
| | November | | | | | |
| | December | | | | | |
| Annual | | 114 | 57.0% | 5.9 | 25.8 | 0 |

Observations in ug/m$^3$

**TABLE 5.1.6 - BUCHANS AQHI SUMMARY 2010 & 2011**

| Year | Month | # Valid Hours | % Valid Hours | Average | Maximum 1-Hour |
|---|---|---|---|---|---|
| 2010 | January | | | | |
| | February | | | | |
| | March | | | | |
| | April | | | | |
| | May | | | | |
| | June | | | | |
| | July | | | | |
| | August | | | | |
| | September | 536 | 74.4% | 1.3 | 3.2 |
| | October | 660 | 88.7% | 1.3 | 2.9 |
| | November | 636 | 88.3% | 1.6 | 2.7 |
| | December | 361 | 48.5% | 1.9 | 2.5 |
| Annual | | 2193 | 74.9% | 1.5 | 3.2 |
| 2011 | January | 442 | 59.4% | 1.9 | 3.1 |
| | February | 171 | 25.4% | 2.2 | 3.0 |
| | March | 0 | 0.0% | | |
| | April | 0 | 0.0% | | |
| | May | 0 | 0.0% | | |
| | June | 215 | 29.9% | 1.7 | 2.3 |
| | July | | | | |
| | August | | | | |
| | September | | | | |
| | October | | | | |
| | November | | | | |
| | December | | | | |
| Annual | | 828 | 17.3% | 1.9 | 3.1 |

**FIGURE 5.1.1 - BUCHANS AQHI FREQUENCY DISTRIBUTION** 2010 / 2011




## 5.2 Burin

The Burin station was commissioned in October 2011 and monitored the ambient levels of $SO_2$, $PM_{2.5}$ $NO_x$ / $NO_2$, $O_3$ and TSP on a continuous basis. The ambient air criteria were not exceeded on any occasion in 2011. Tables 5.2.1 through 5.2.5 provide summary information on the level of each air contaminant measured at the Burin site. Due to the limited data, no graphical representation of the annual trend is provided.

Table 5.2.6 provides a summary of the AQHI, while Figure 5.2.1 provides a graphical representation of the AQHI frequency based on all data collected in Burin.

**TABLE 5.2.1 - BURIN $SO_2$ SUMMARY 2011**

| Year | Month | # Valid Hours | % Valid Hours | Average | Maximum 1-Hour | Maximum 3-Hour | Maximum 24-Hour | Regulatory Exceedances 1-Hour (>900) | Regulatory Exceedances 3-Hour (>600) | Regulatory Exceedances 24-Hour (>300) |
|---|---|---|---|---|---|---|---|---|---|---|
| 2011 | January | | | | | | | | | |
| | February | | | | | | | | | |
| | March | | | | | | | | | |
| | April | | | | | | | | | |
| | May | | | | | | | | | |
| | June | | | | | | | | | |
| | July | | | | | | | | | |
| | August | | | | | | | | | |
| | September | | | | | | | | | |
| | October | 165 | 76.4% | 0.1 | 0.4 | 0.3 | 0.2 | 0 | 0 | 0 |
| | November | 425 | 59.0% | 0.4 | 1.2 | 0.8 | 0.6 | 0 | 0 | 0 |
| | December | 322 | 43.3% | 0.9 | 2.7 | 1.8 | 1.4 | 0 | 0 | 0 |
| Annual | | 912 | 54.3% | 0.5 | 2.7 | 1.8 | 1.4 | 0 | 0 | 0 |

Observations in ug/$m^3$

**TABLE 5.2.2 - BURIN $PM_{2.5}$ SUMMARY 2011**

| Year | Month | # Valid Days | % Valid Days | Average | Maximum 24-Hour | Regulatory Exceedances (>25 µg/$m^3$) |
|---|---|---|---|---|---|---|
| 2011 | January | | | | | |
| | February | | | | | |
| | March | | | | | |
| | April | | | | | |
| | May | | | | | |
| | June | | | | | |
| | July | | | | | |
| | August | | | | | |
| | September | | | | | |
| | October | 8 | 88.9% | 2.9 | 4.6 | 0 |
| | November | 30 | 100.0% | 4.7 | 10.0 | 0 |
| | December | 31 | 100.0% | 4.1 | 15.7 | 0 |
| Annual | | 69 | 98.6% | 4.2 | 15.7 | 0 |

Observations in ug/$m^3$

**TABLE 5.2.3 - BURIN $NO_X$ / $NO_2$ SUMMARY 2011**

| Year | Month | # Valid Hours | % Valid Hours | Average $NO_x$ | Average $NO_2$ | Maximums 1-Hour $NO_x$ | Maximums 1-Hour $NO_2$ | Maximums 24-Hour $NO_x$ | Maximums 24-Hour $NO_2$ | Exceedances 1-Hour (>400) | Exceedances 24-Hour (>200) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 2011 | January | | | | | | | | | | |
| | February | | | | | | | | | | |
| | March | | | | | | | | | | |
| | April | | | | | | | | | | |
| | May | | | | | | | | | | |
| | June | | | | | | | | | | |
| | July | | | | | | | | | | |
| | August | | | | | | | | | | |
| | September | | | | | | | | | | |
| | October | 196 | 90.7% | 1.7 | 0.4 | 36.3 | 34.7 | 3.5 | 0.2 | 0 | 0 |
| | November | 713 | 99.0% | 2.3 | 0.5 | 44.7 | 22.2 | 8.6 | 2.7 | 0 | 0 |
| | December | 742 | 99.7% | 1.8 | 0.9 | 54.7 | 20.2 | 5.2 | 2.7 | 0 | 0 |
| Annual | | 1651 | 98.3% | 2.0 | 0.7 | 54.7 | 34.7 | 8.6 | 2.7 | 0 | 0 |

Observations in $ug/m^3$

**TABLE 5.2.4 - BURIN $O_3$ SUMMARY 2011**

| Year | Month | # Valid Hours | % Valid Hours | Average | Maximum 1-Hour | Maximum 8-Hour | Regulatory Exceedances 1-Hour (>160) | Regulatory Exceedances 8-Hour (>87) |
|---|---|---|---|---|---|---|---|---|
| 2011 | January | | | | | | | |
| | February | | | | | | | |
| | March | | | | | | | |
| | April | | | | | | | |
| | May | | | | | | | |
| | June | | | | | | | |
| | July | | | | | | | |
| | August | | | | | | | |
| | September | | | | | | | |
| | October | 200 | 92.6% | 52.1 | 75.2 | 72.8 | 0 | 0 |
| | November | 718 | 99.7% | 54.5 | 85.2 | 81.6 | 0 | 0 |
| | December | 742 | 99.7% | 58.7 | 81.9 | 78.0 | 0 | 0 |
| Annual | | 1660 | 98.8% | 56.1 | 85.2 | 81.6 | 0 | 0 |

Observations in $ug/m^3$

**TABLE 5.2.5 - BURIN $PM_{10}$ SUMMARY 2011**

| Year | Month | # Valid Days | % Valid Days | Average | Maximum 24-Hour | Regulatory Exceedances (>50 µg/m$^3$) |
|---|---|---|---|---|---|---|
| 2011 | January | | | | | |
| | February | | | | | |
| | March | | | | | |
| | April | | | | | |
| | May | | | | | |
| | June | | | | | |
| | July | | | | | |
| | August | | | | | |
| | September | | | | | |
| | October | 8 | 88.9% | 8.4 | 15.0 | 0 |
| | November | 30 | 100.0% | 11.8 | 24.0 | 0 |
| | December | 31 | 100.0% | 10.6 | 22.6 | 0 |
| Annual | | 69 | 98.6% | 10.8 | 24.0 | 0 |

Observations in ug/m$^3$

**TABLE 5.2.6 - BURIN AQHI SUMMARY 2011**

| Year | Month | # Valid Hours | % Valid Hours | Average | Maximum 3-Hour |
|---|---|---|---|---|---|
| 2011 | January | | | | |
| | February | | | | |
| | March | | | | |
| | April | | | | |
| | May | | | | |
| | June | | | | |
| | July | | | | |
| | August | | | | |
| | September | | | | |
| | October | 196 | 90.7% | 1.5 | 2.2 |
| | November | 714 | 99.2% | 1.7 | 2.6 |
| | December | 742 | 99.7% | 1.8 | 6.6 |
| Annual | | 1652 | 98.3% | 1.7 | 6.6 |

**FIGURE 5.2.1 - BURIN AQHI FREQUENCY DISTRIBUTION** 2011