TransAlta Utilities Inc./EPCOR Generation Inc. Wabamun-Genesee Area Air Monitoring Programs

2007 First Quarter Report

Ambient Air Quality Monitoring Program
Acid Deposition Assessment Program
Mercury Assessment Program

Final

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EXECUTIVE SUMMARY

TransAlta Utilities Inc. and EPCOR Generation Inc. operate four coal-fired thermal generating plants – Sundance, Keephills, Wabamun, and Genesee – located in the Wabamun-Genesee area of west-central Alberta. The generating plants operate under Alberta Environmental Protection and Enhancement Act approvals. Under their approvals, the generating plants are committed to conducting special environmental monitoring programs. Three environmental monitoring programs conducted on an on-going manner include:

- Regional ambient air monitoring program.
- Acid deposition assessment program.
- Mercury assessment program.

This quarterly report summarizes key results of data collected for these programs in the first quarter (January, February, and March) of 2007. Completeness of monitoring data, quarterly summary statistics for selected air quality parameters, and contraventions of approval terms and applicable air quality monitoring objectives are summarized and discussed.

Regional Ambient Air Program

There were eight instances of invalid or missing data for intermittent PM_{10} and $PM_{2.5}$ samples out of 60 samples sought during the first quarter in the regional ambient air program. Five instances of sampler malfunctioning occurred. There were three instances where laboratory results were not produced: two were due to the wrong filter type being used in the field and one was due to the sample not being received at the lab. There were no instances of invalid or missing passive sampler results for the first quarter.

Data capture rates for continuous monitoring parameters at all air monitoring stations were well above the 90% criterion on a monthly basis as stipulated in the Air Monitoring Directive (1989). High uptimes indicate that equipment in the continuous air monitoring network was generally well-maintained. All measured concentrations were well below applicable Alberta Ambient Air Quality Guideline values or Canada Wide Standard values.

There were no contraventions of approval terms and applicable air quality monitoring objectives for the January to March 2007 period.

Acid Deposition Assessment Program

There were 30 of 32 valid intermittent TSP samples collected and 12 of 12 valid acid gas samples collected during the first quarter of 2007 for the acid deposition assessment program. In addition, all data capture rates were well above 90% for continuous monitoring parameters in the first quarter for the program.

Mercury Assessment Program

There were three valid precipitation samples collected and nine dry samples (i.e., no precipitation) in the wet deposition sampling program during the first quarter of 2007. A dry deposition sampling program started in March with no results received yet.

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ABBREVIATIONS

AAAQO ..... Alberta ambient air quality objective
AMS ..... air monitoring station
Ca^{2+} ..... calcium ion
CWS ..... Canada Wide Standard
EPEA ..... Environmental Protection and Enhancement Act
Hg ..... mercury
HNO_2 ..... nitrous acid
HNO_3 ..... nitric acid
K^+ ..... potassium ion
Mg^{2+} ..... magnesium ion
MW ..... megawatts
Na^+ ..... sodium ion
NAPS ..... Nation Air Pollutant Surveillance
NH_4^+ ..... ammonium ion
NO_2 ..... nitrogen dioxide
NO_3^- ..... nitrate ion
MDN ..... Mercury Deposition Network
O_3 ..... ozone
$PM_{2.5}$ ..... particulate matter ≤2.5 µm diameter
PM_{10} ..... particulate matter ≤10 µm diameter
Q1 ..... first quarter
RH ..... relative humidity
RGM ..... reactive gaseous mercury
SO_2 ..... sulphur dioxide
SO_4^{2-} ..... sulphate ion
SW ..... surface wetness
T_2 ..... ambient temperature at 2 m above ground
T_{10} ..... ambient temperature at 10 m above ground
TSP ..... total suspended solids
WDR ..... wind direction
WSP ..... wind speed

1 Introduction

TransAlta Utilities (TransAlta) [www.transalta.com] and EPCOR Generation Inc. (EPCOR) [www.epcor.ca] operate four coal-fired thermal generating plants (generating stations) – Wabamun, Sundance, Keephills, and Genesee - located in the Wabamun-Genesee area of west-central Alberta. The location of these generating plants is shown in Figure 1. Collectively, the four generating plants have a net generating capacity of 4,277 megawatts (MW).

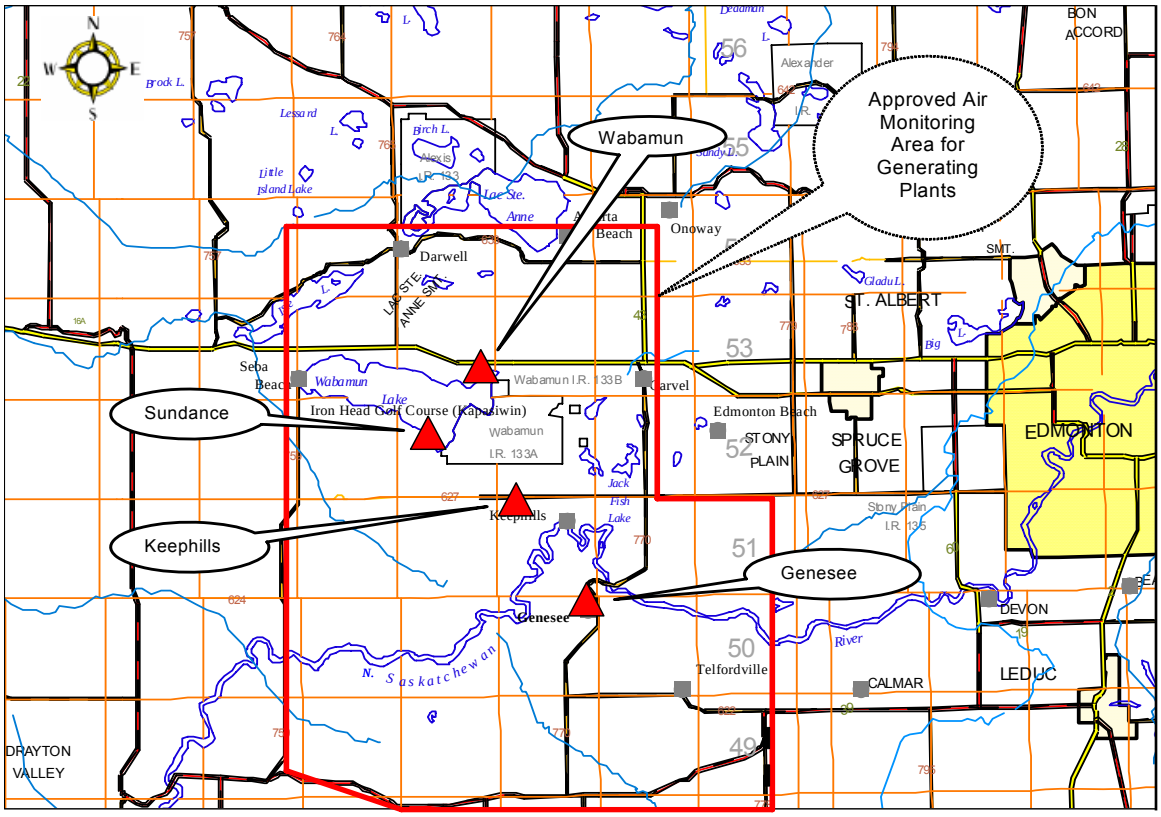


Figure 1 Coal fired generating plant locations in the Wabamun-Genesee area.

Wabamun generating plant is the oldest of TransAlta's three generating plants in the Lake Wabamun area. It is near the Village of Wabamun and has a net generating capacity of 279 MW. Only one generating unit was in operation at the Wabamun generating plant in 2006. The remaining three units were retired in 2002 (Unit 3) and 2004 (Units 1 and 2).

The TransAlta Sundance generating plant consists of six generating units, and is the largest, coal-fired generating plant in western Canada. Sundance is situated on the south shore of Lake Wabamun approximately 70 kilometres (km) west of Edmonton, Alberta (Figure 1). The plant has been in operation since 1970, with steady expansion from a single original generating unit to six generating units throughout the 1970s. Sundance currently has a net generating capacity of 2,020 MW. The Keephills generating plant is located 5 km southeast of Wabamun Lake (Figure 1). It has a net generating capacity of 766 MW, and consists of two generating units. Keephills has been in operation since 1983.

The Genesee generating plant consists of three generating units located 50 km southwest of Edmonton (Figure 1). EPCOR fully owns and operates Units 1 and 2, which have a combined net generating capacity of 762 MW. These units have been in operation since 1994 and 1989, respectively. Genesee 3 (Unit 3), commissioned in 2005, is a 50/50 joint venture between TransAlta and EPCOR. Genesee 3 has a net generating capacity of 450 MW.

1.1 Environmental Monitoring Programs for Generating Plants

The generating plants operate under Alberta Environmental Protection and Enhancement Act (EPEA) approvals listed in Table 1. Under their EPEA approvals, the generating plants are committed to conducting special environmental monitoring programs. These programs are designed to:

- Identify and quantify ambient levels and deposition patterns of chemical species of potential concern that are associated with generating plant emissions.
- Generate an inventory of representative baseline data for the chemicals of potential concern.
- Provide data for assessing long-term impacts and for evaluating and implementing air quality management plans.

Table 1 Alberta Environmental Protection and Enhancement Act (EPEA) operating approvals for four generating plants in the Wabamun-Genesee area.

Facility	Capacity (MW, net)	Location	Approval No. (as amended)	Applicable Approval Terms
Wabamun	279	2,3,10,11-53-04 W5M	10323-02-00	6.1.18 to 6.1.24; 6.1.32 to 6.1.34
Sundance	2,020	3,4,8,9,10,16,17,20, and 31-52-04 W5M	9830-01-00	13.1.18 to 13.1.24; 13.1.32 to 13.1.34
Keephills	766	36-51-04 W5M	10324-01-00	6.1.18 to 6.1.24; 6.1.32 to 6.1.37
Genesee	1,212	25-50-03 W5M	773-02-00	7.1.1 to 7.1.9

1.1.1 Ambient Air Quality Monitoring Program

A component of the special environmental monitoring programs is an ambient air quality monitoring program. The ambient air quality monitoring program consists of the following elements:

- A continuous monitoring program consisting of four air monitoring stations (AMSs) (Figure 2) – Powers, Meadows, Wagner, and Genesee. Sulphur dioxide (SO_2), nitrogen dioxide (NO_2), and a number of meteorological parameters are measured at all four stations, particulate matter with aerodynamic diameter less than or equal to 2.5 microns ($PM_{2.5}$) is measured at the Powers and Genesee AMS, and ozone (O_3) is measured at the Genesee AMS.

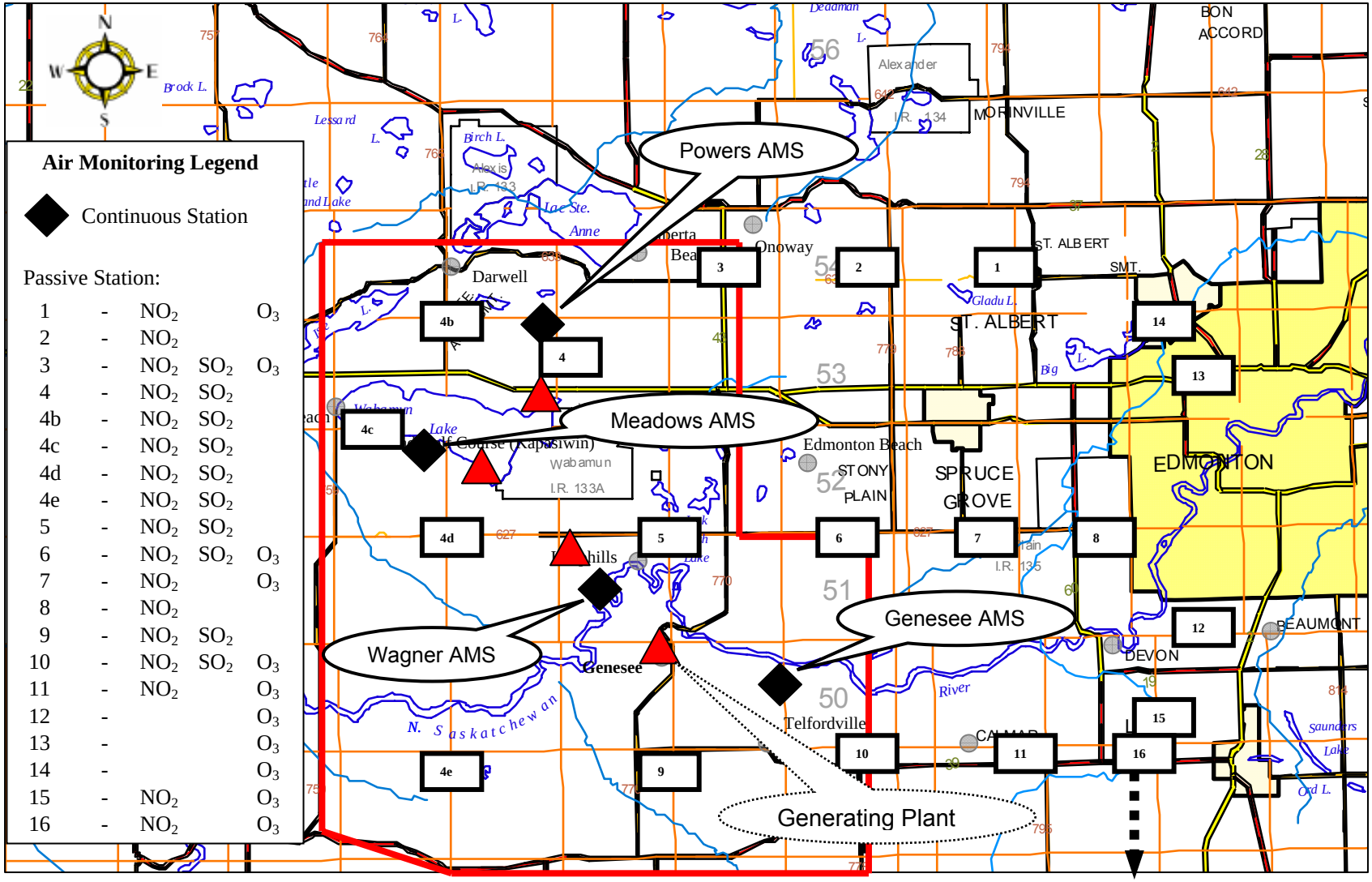


Figure 2 Continuous and passive monitoring locations in Wabamun-Genesee area.

- An integrated monitoring program (integrated monitoring for 24 hours every 6 days) for particulate matter with aerodynamic diameter less than or equal to 10 microns (PM_{10}), and $PM_{2.5}$, and metals speciation of $PM_{2.5}$ at two locations – Powers AMS and Genesee AMS.
- A passive monitoring program with monthly passive monitoring at 21 stations in the Wabamun-Genesee area measuring NO_2, SO_2, and O_3 at selected stations. Nineteen stations are shown in Figure 2. Two additional stations (15 and 16) were added in February 2006. These stations are located outside of the area shown in Figure 2 in the lower right hand corner and monitor NO_2 and O_3.

Table 2 Schedule for components of the ambient air quality monitoring program in the Wabamun-Genesee area.

Parameter	Continuous	Sampled intermittently – every 6th day according to NAPS schedule	Sampled monthly (passives)
SO_2	•		•
NO_2	•		•
O_3	•		•
PM_{10}		•	
$PM_{2.5}$	•	•	
Wind speed and direction, temperature, relative humidity)	•		

1.1.2 Acid Deposition Assessment Program

Another component of the special environmental monitoring programs is an acid deposition assessment program. The acid deposition assessment program includes wet and dry deposition monitoring of sulphur and nitrogen species that are important contributors to acid deposition in the Wabamun-Genesee area.

Two dedicated acid deposition monitoring sites are operated in the Wabamun-Genesee area. These sites are the Genesee air monitoring station (Figure 2) and the Violet Grove air monitoring station. The four coal-fired generating plants are located at distances of 8 to 33 km away from the Genesee AMS. The Violet Grove station is not shown in Figure 2 as it is located outside of the area shown in this figure in the lower left-hand corner. The four generating plants are located at distances of 55 to 60 km away from the Violet Grove station.

The following parameters are currently measured at these two stations:

Wet Deposition
Wet deposition monitoring involves collecting rain and snow samples using a precipitation sampler at the Genesee AMS. Precipitation samples are retrieved from the field monthly or as necessary (e.g., after intense precipitation events) and sent to Alberta Research Council (Vegreville, AB) for chemistry analysis.

Dry Deposition
Dry deposition monitoring involves measuring and recording concentrations of the following atmospheric pollutants and meteorological parameters at Genesee AMS and Violet Grove AMS:

Atmospheric Pollutants
Atmospheric pollutants measured for dry deposition include eleven species:

- Continuous measurements for SO_2 and NO_2.
- Monthly integrated annular denuder samples for HNO_3 and HNO_2.
- One 24-hour integrated particulate matter (TSP) sample collected every 6th day for Na^+, K^+, Mg^{2+}, Ca^{2+}, NH_4^+, SO_4^{2-}, and NO_3^-.

Meteorological Parameters
Hourly average measured values were obtained for the following meteorological parameters:

- Wind speed (WSP).
- Wind direction standard deviation (WDR).
- Relative humidity (RH).
- Surface wetness (SW).
- Air temperature at surface (2 m), T_2.
- Air temperature at standard height (10 m), T_{10}; or difference in air temperature at standard height and surface.

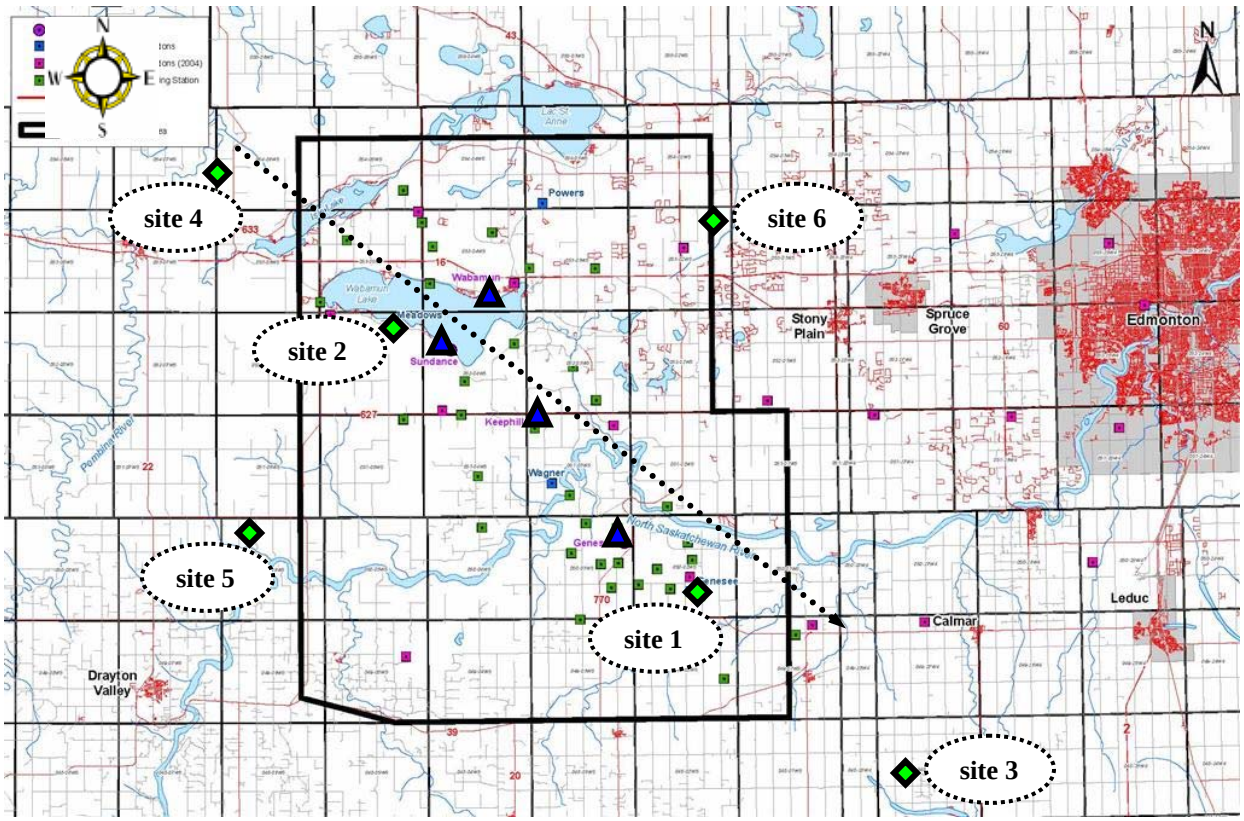
1.1.3 Mercury Assessment Program

The mercury assessment program consists of wet and dry deposition monitoring. The objective of this program component is to quantify wet and dry deposition rates of mercury in the Wabamun-Genesee region to better understand potential effects of generating plant emissions on receptors in the area.

Wet Deposition
Wet deposition monitoring is conducted at the Genesee air monitoring station (Figure 2). Wet deposition samples are collected on a weekly basis from this station – with sample change outs occurring every Tuesday. This monitoring program is part of the U.S. National Acid Deposition Program – Mercury Deposition Network (MDN) (http://nadp.sws.uiuc.edu/mdn/). The objective of the MDN is to develop a database of weekly concentrations of total mercury in precipitation and the seasonal and annual flux of total mercury in wet deposition across North America. The data are being used to develop information on spatial and seasonal trends in mercury deposited to surface waters, forested watersheds, and other sensitive receptors. There are over 85 wet deposition sampling sites in North America currently in operation. The network uses standardized methods for collection and analyses. Weekly precipitation samples are collected.

Dry Deposition
A full dry deposition monitoring component was designed with the approval of Alberta Environment. The field program commenced during the second week of March 2007. Seven-day I.C.E. 450 cation-exchange (ion exchange) membrane samples are being collected at six sites throughout the Wabamun-Genesee area (Figure 3) using the same schedule as the

MDN (sample change outs occur on Tuesday of each week). Membrane samples are sent weekly to Frontier GeoSciences Inc. (Seattle, WA) for analysis of Hg^{2+} (reactive gaseous mercury or RGM) and results are received within 90 days.



Legend:

Coal-fired generating plant

Hg dry deposition monitoring location

Figure 3 Locations of six sampling sites in Hg dry deposition monitoring program.

1.2 Purpose of Report

This quarterly report summarizes key results of data collected in the first quarter (January, February, and March) of the calendar year 2007. Specifically, completeness of monitoring data, quarterly summary statistics for selected air quality parameters, and contraventions of approval terms and applicable air quality monitoring objectives are summarized and discussed.

2 Results and Discussion

2.1 Regional Ambient Air Quality Monitoring Program

2.1.1 Data Completeness

Data capture rates for PM_{10} and $PM_{2.5}$ intermittent samples are listed in Table 3. There were eight instances of invalid or missing data for intermittent PM_{10} and $PM_{2.5}$ samples out of 60 samples sought during the first quarter (Table 4). Five instances of sampler malfunctioning occurred. There were three instances where laboratory results were not produced. Two were due to the wrong filter type being used in the field and one was due to the sample not being received at the lab.

Table 3 Data capture rates for intermittent PM_{10} and $PM_{2.5}$ monitoring during first quarter 2007.

	Powers AMS				Genesee AMS			
Month:	1	2	3	Q1	1	2	3	Q1
PM_{10}:	5/5	4/4	6/6	15/15	2/5	3/4	4/6	9/15
$PM_{2.5}$:	5/5	4/4	6/6	15/15	4/5	4/4	5/6	13/15

Note: 1 = January, 2 = February, 3 = March.

Table 4 Incidences of invalid or missing intermittent PM_{10} and $PM_{2.5}$ data during first quarter 2007.

Date	Station	Parameter	Cause	Corrective Action
Jan 12	Genesee AMS	PM_{10}	Filter lost in transport.	Discussed courier procedures with lab.
Jan 24	Genesee AMS	PM_{10}	Sampler loaded with incorrect filter.	
Jan 24	Genesee AMS	$PM_{2.5}$	Sampler loaded with incorrect filter.	
Jan 30	Genesee AMS	PM_{10}	Sampler malfunction – did not run.	Sampler timer reprogrammed.
Feb 11	Genesee AMS	PM_{10}	Sampler malfunction – did not run.	Sampler timer reprogrammed.
Mar 1	Genesee AMS	PM_{10}	Sampler malfunction – did not run.	Sampler timer reprogrammed.
Mar 19	Genesee AMS	PM_{10}	Sampler malfunction – did not run (possible power interruption).	Sampler timer reprogrammed.
Mar 19	Genesee AMS	$PM_{2.5}$	Sampler malfunction – did not run (possible power interruption).	Sampler timer reprogrammed.

Data capture rates for the passive samples are presented in Table 5. There were no instances of invalid or missing passive results for the first quarter of 2007.

Table 5 Data capture rates for passive monitoring parameters during first quarter 2007.

Parameter	Capture Rate
NO_2	54/54
SO_2	33/33
O_3	36/36

Note: Data capture rates expressed as number of valid samples /total number of samples.

First quarter (Q1) 2007 uptimes for continuous monitoring equipment and air monitoring stations are summarized in Table 6. Data capture rates for continuous monitoring parameters at all air monitoring stations were well above the 90% criterion on a monthly basis as stipulated in the Air Monitoring Directive (1989), except as noted. High uptimes indicate that equipment in the continuous air monitoring network was generally well-maintained. The following comments are noted:

Powers AMS:

- The $PM_{2.5}$ analyzer experienced unstable operation in January and March returning uptimes $\leq$99.9 percent during these months.

Meadows AMS:

- All analyzers and meteorological equipment experienced uptimes of 98.5 percent in January due to data acquisition failure that continued from the end of December 2006.
- The station experienced a power failure during calibration on March 27. The calibration was completed the next day, and all uptimes were 99.9 percent for the month of March.

Wagner AMS:

- All equipment experienced 99.9 percent uptimes in the month of January due to a brief power failure.

Genesee AMS:

- The $PM_{2.5}$ analyzer experienced unstable operation in January and February returning uptimes $\leq$99.6 percent during these months.

Table 6 Data capture rates (%) for continuous monitoring parameters during Q1 2007.

	Powers AMS				Meadows AMS				Wagner AMS				Genesee AMS			
Month:	1	2	3	Q1	1	2	3	Q1	1	2	3	Q1	1	2	3	Q1
NO_2	100	100	100	100	98.5	99.6	99.9	99.3	99.9	100	100	99.9	100	100	100	100
SO_2	100	100	100	100	98.5	100	99.9	99.5	99.9	100	100	99.9	100	100	100	100
O_3	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	100	100	100	100
$PM_{2.5}$	99.7	100	98.7	99.5	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	99.6	99.3	100	99.6
WSP	100	100	100	100	98.5	100	99.9	99.5	99.9	100	100	99.9	100	100	100	100
WDR	100	100	100	100	98.5	100	99.9	99.5	99.9	100	100	99.9	100	100	100	100
T_2	100	100	100	100	98.5	100	99.9	99.5	99.9	100	100	99.9	100	100	100	100
T_{10}	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	100	100	100	100
RH	100	100	100	100	98.5	100	99.9	99.5	99.9	100	100	99.9	100	100	100	100

Note: 1 = January, 2 = February, 3 = March.
WSP = wind speed.
WDR = wind direction.
T_2 = temperature at 2 metre height above ground.
T_{10} = temperature at 10 metres height above ground.
RH = relative humidity.
n/a = not applicable.
Bolded values indicate <90% uptime.

2.1.2 Summary Statistics

One method of displaying a set of air quality data is with box-and-whisker plots. Box-and-whisker plots are helpful in interpreting the distribution of data. These plots only illustrate certain statistics rather than all the data. Box-and-whisker plots presented here specifically show five values for individual pollutants collected at each station during Q1 2007:

- 25^{th} percentile (bottom of box)
- 50^{th} percentile (horizontal line within box)
- 75^{th} percentile (top of box)
- 98^{th} percentile (diamond)
- maximum (top T)

The bottom whisker is not shown in plots presented here because the values represented by bottom whiskers are unessential for data interpretation. Box-and-whisker plots are presented for Q1 2007 for the following:

- 1-hour average NO_2 concentrations from continuous monitoring (Figure 4)
- 24-hour average NO_2 concentrations from continuous monitoring (Figure 5)
- 1-hour average SO_2 concentrations from continuous monitoring (Figure 6)
- 24-hour average SO_2 concentrations from continuous monitoring (Figure 7)
- 1-hour average O_3 concentrations from continuous monitoring (Figure 8)
- 8-hour average O_3 concentrations from continuous monitoring (Figure 9)
- 24-hour average $PM_{2.5}$ concentrations from continuous monitoring (Figure 10)
- 24-hour average PM_{10} concentrations from intermittent monitoring (Figure 11)
- 24-hour average $PM_{2.5}$ concentrations from intermittent monitoring (Figure 12)

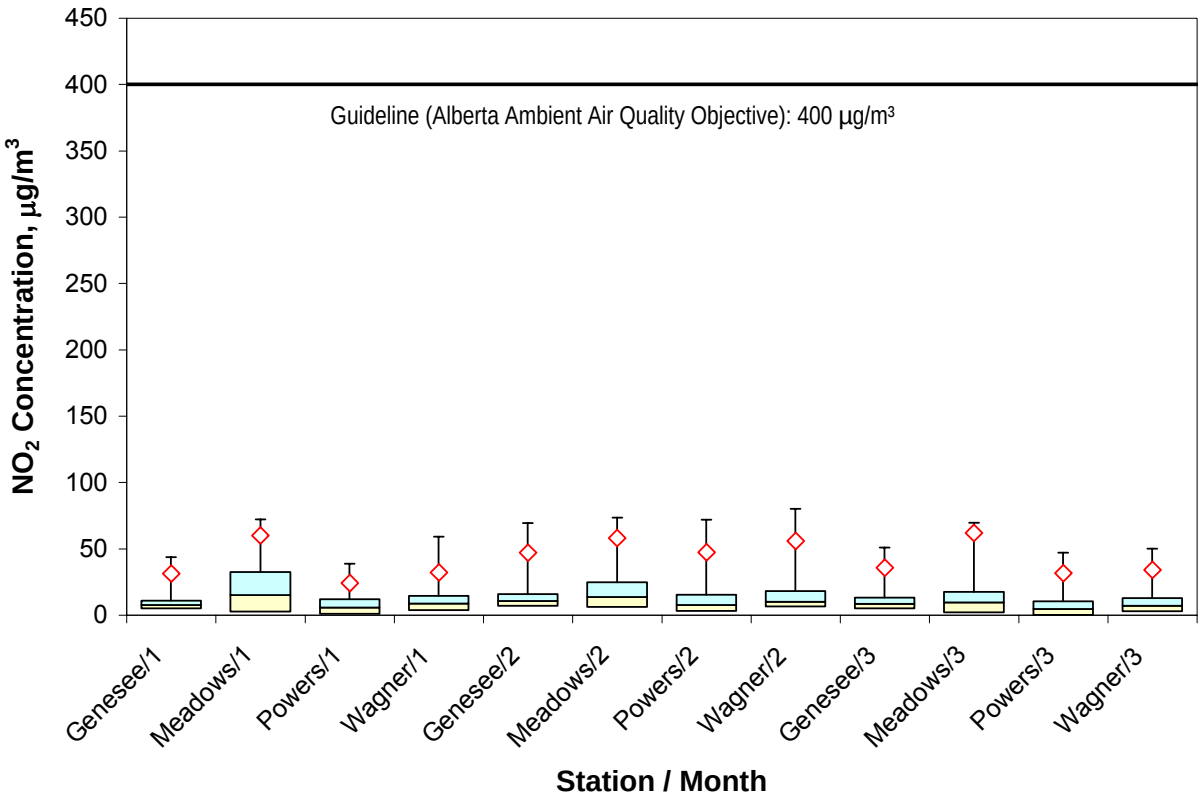


Figure 4 **Box-and-Whisker plot of 1-hour average NO_2 concentrations from continuous monitoring at selected air monitoring stations (Q1 2007).**

Note: 1 = January; 2 = February; 3 = March;
25th %ile (bottom of box);
50th %ile (horizontal line within box);
75th %ile (top of box);
98th percentile (diamond);
maximum (top T)

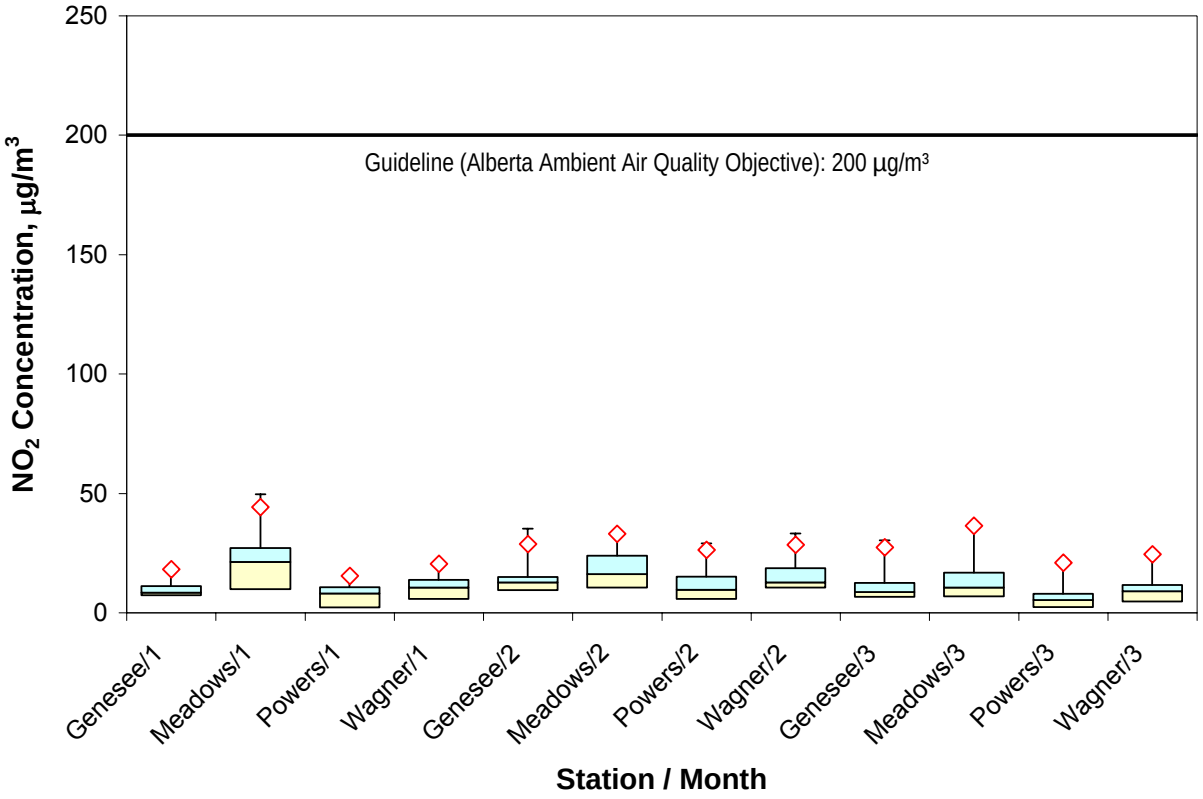


Figure 5 **Box-and-Whisker plot of 24-hour average NO_2 concentrations from continuous monitoring at selected air monitoring stations (Q1 2007).**

Note: 1 = January; 2 = February; 3 = March;
25th %ile (bottom of box);
50th %ile (horizontal line within box);
75th %ile (top of box);
98th percentile (diamond);
maximum (top T)

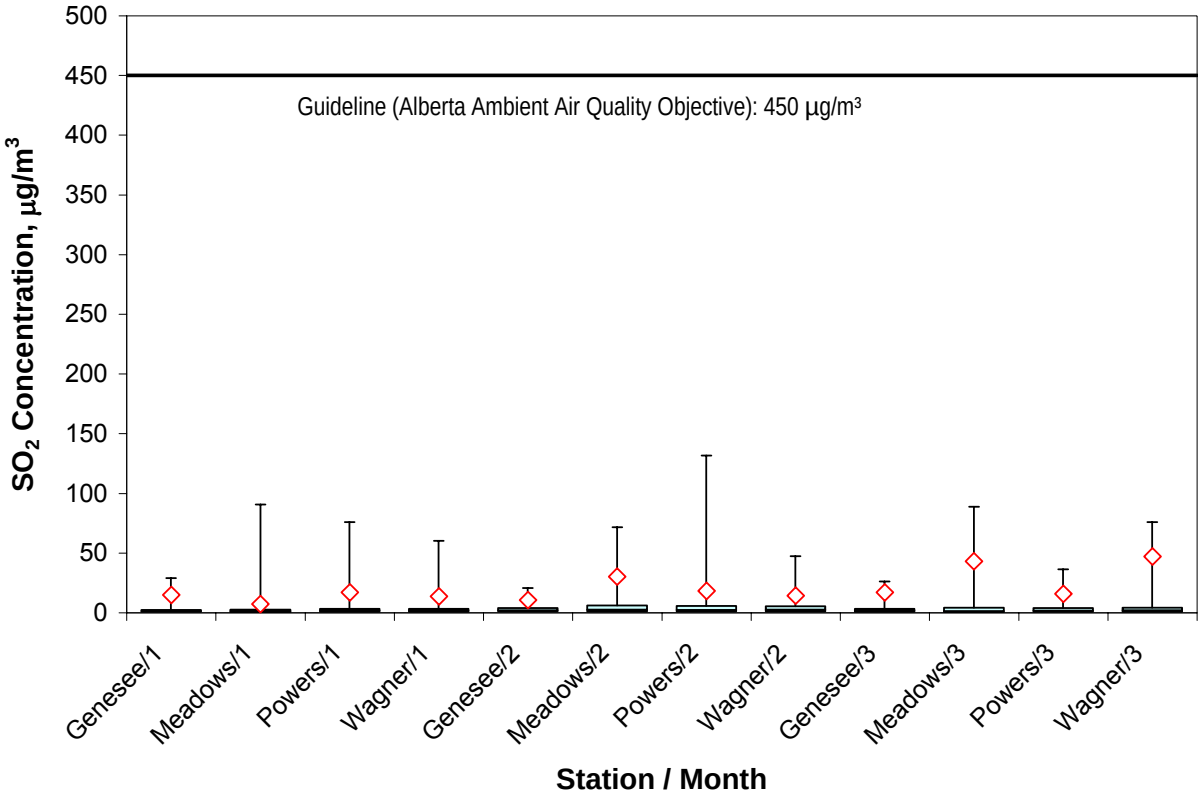


Figure 6 **Box-and-Whisker plot of 1-hour average SO_2 concentrations from continuous monitoring at selected air monitoring stations (Q1 2007).**

Note: 1 = January; 2 = February; 3 = March;
25th %ile (bottom of box);
50th %ile (horizontal line within box);
75th %ile (top of box);
98th percentile (diamond);
maximum (top T)

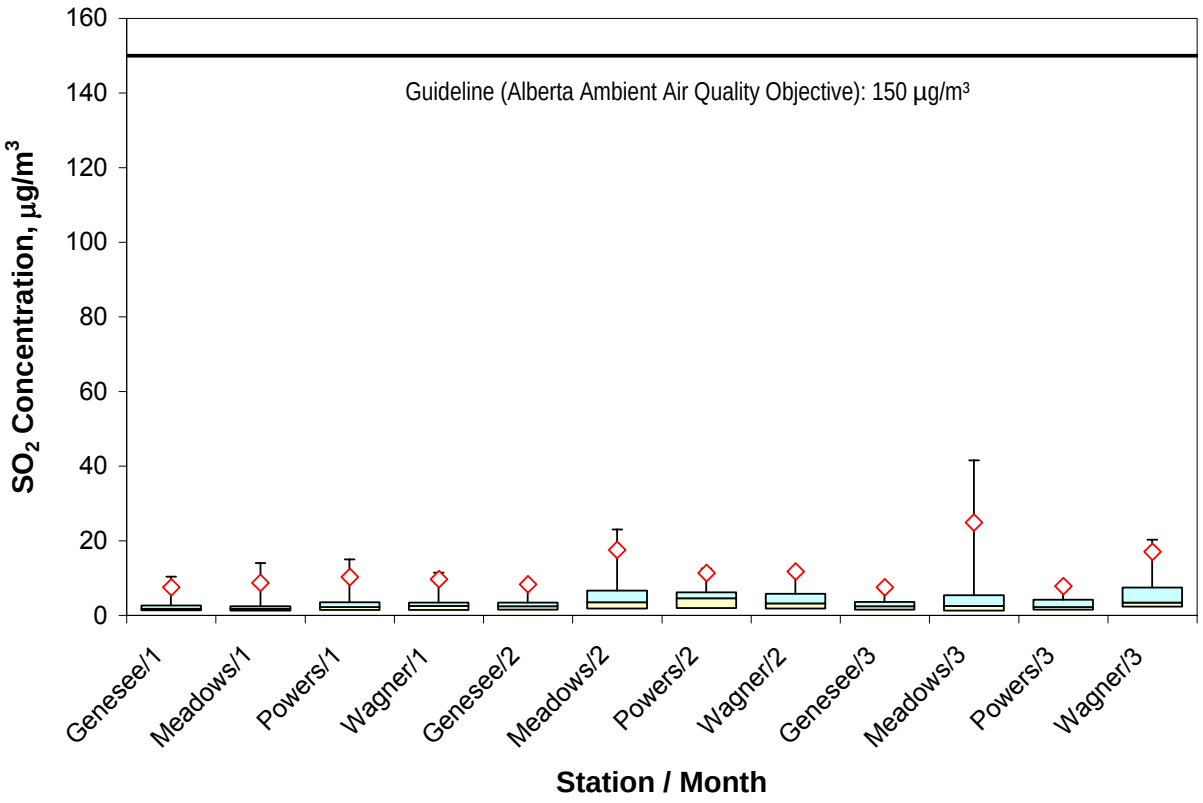


Figure 7 **Box-and-Whisker plot of 24-hour average SO_2 concentrations from continuous monitoring at selected air monitoring stations (Q1 2007).**

Note: 1 = January; 2 = February; 3 = March;
25th %ile (bottom of box);
50th %ile (horizontal line within box);
75th %ile (top of box);
98th percentile (diamond);
maximum (top T)

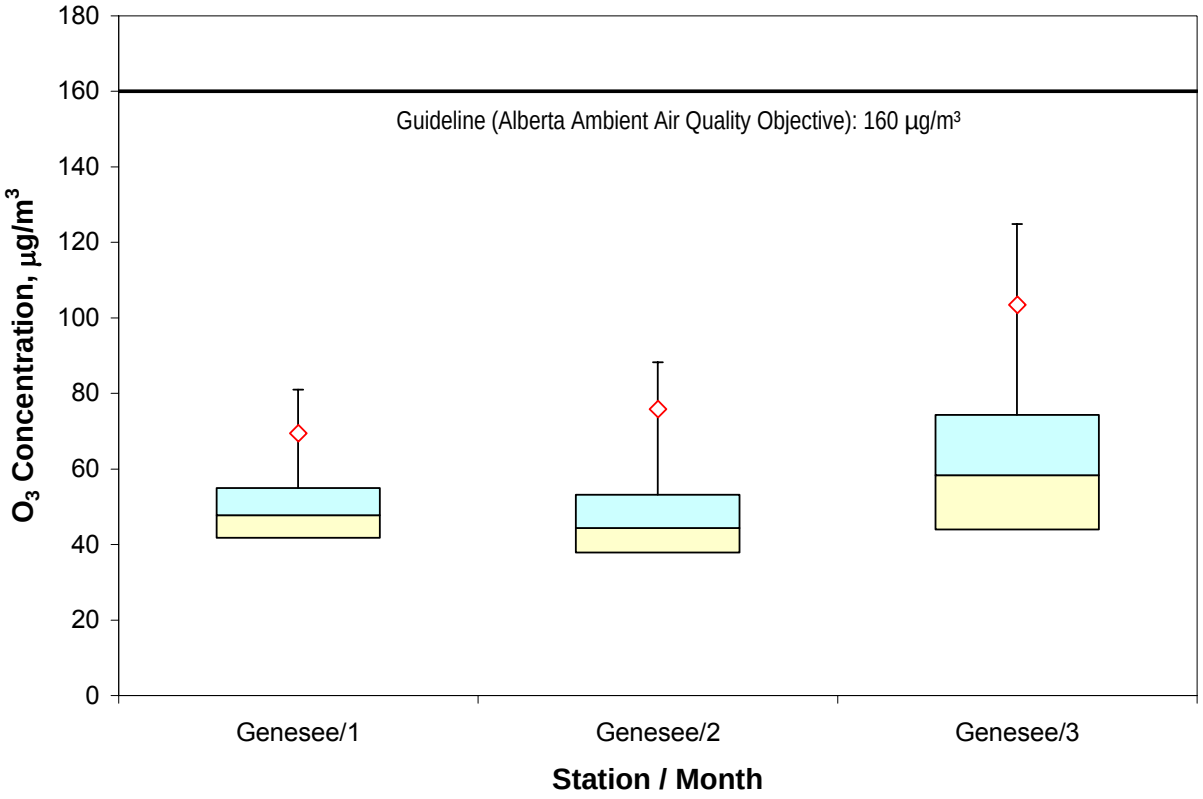


Figure 8 **Box-and-Whisker plot of 1-hour average O_3 concentrations from continuous monitoring at Genesee AMS (Q1 2007).**

Note: 1 = January; 2 = February; 3 = March; 25th %ile (bottom of box); 50th %ile (horizontal line within box); 75th %ile (top of box); 98th percentile (diamond); maximum (top T)

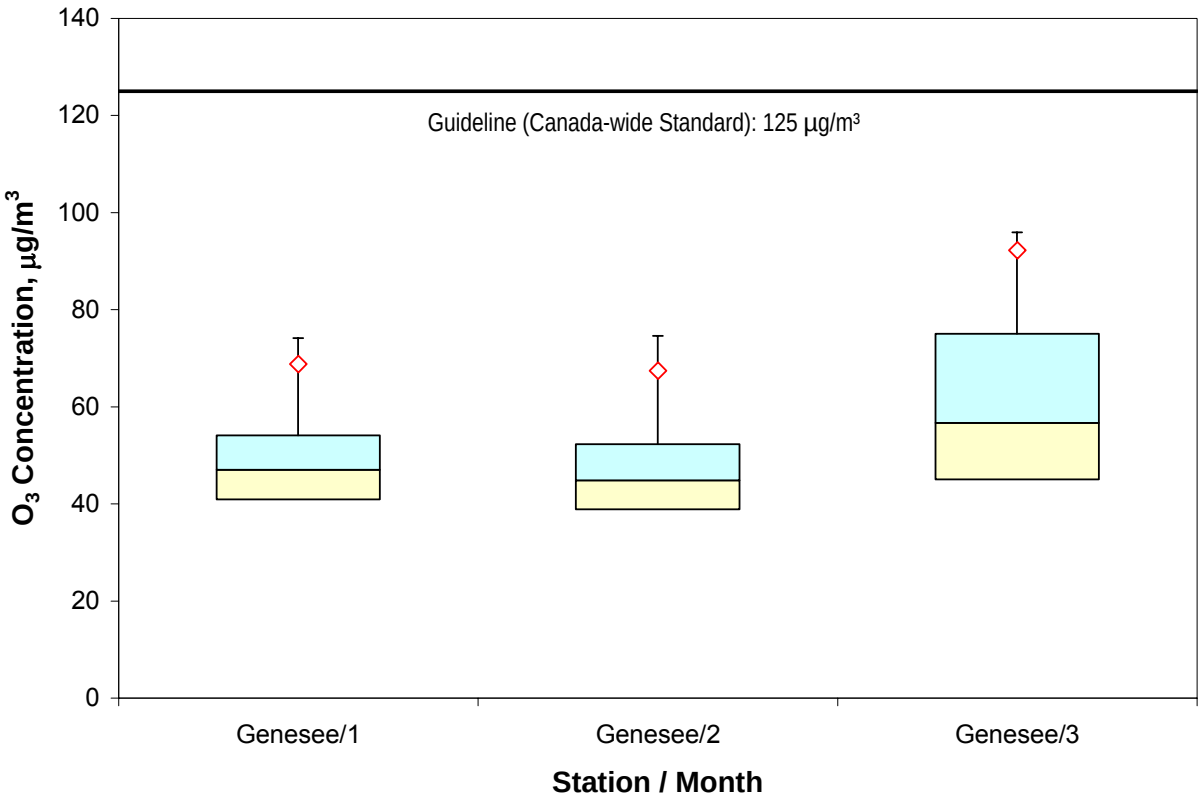


Figure 9 **Box-and-Whisker plot of 8-hour average O_3 concentrations from continuous monitoring at Genesee AMS (Q1 2007).**

Note: 1 = January; 2 = February; 3 = March; 25th %ile (bottom of box); 50th %ile (horizontal line within box); 75th %ile (top of box); 98th percentile (diamond); maximum (top T)

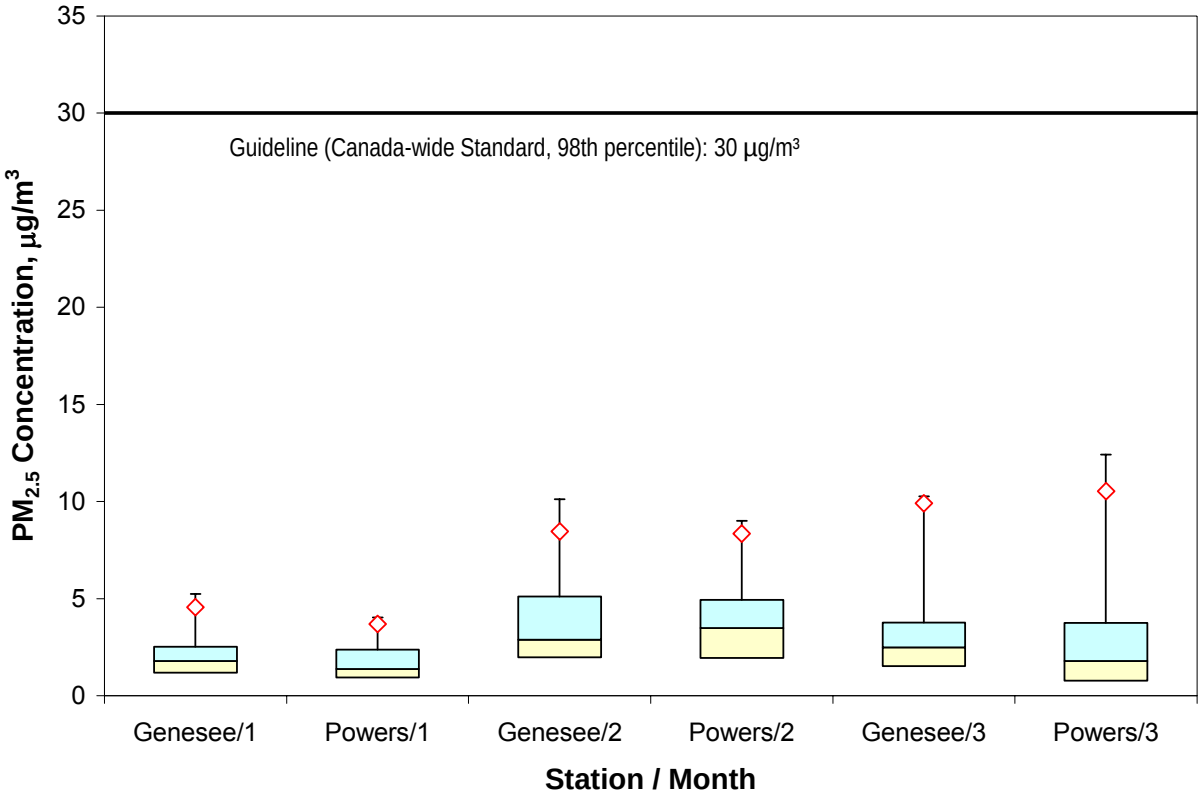


Figure 10 **Box-and-Whisker plot of 24-hour average $PM_{2.5}$ concentrations from continuous monitoring at Genesee and Powers air monitoring stations (Q1 2007).**

Note: 1 = January; 2 = February; 3 = March;
50th %ile (horizontal line within box);
98th percentile (diamond);
25th %ile (bottom of box);
75th %ile (top of box);
maximum (top T)

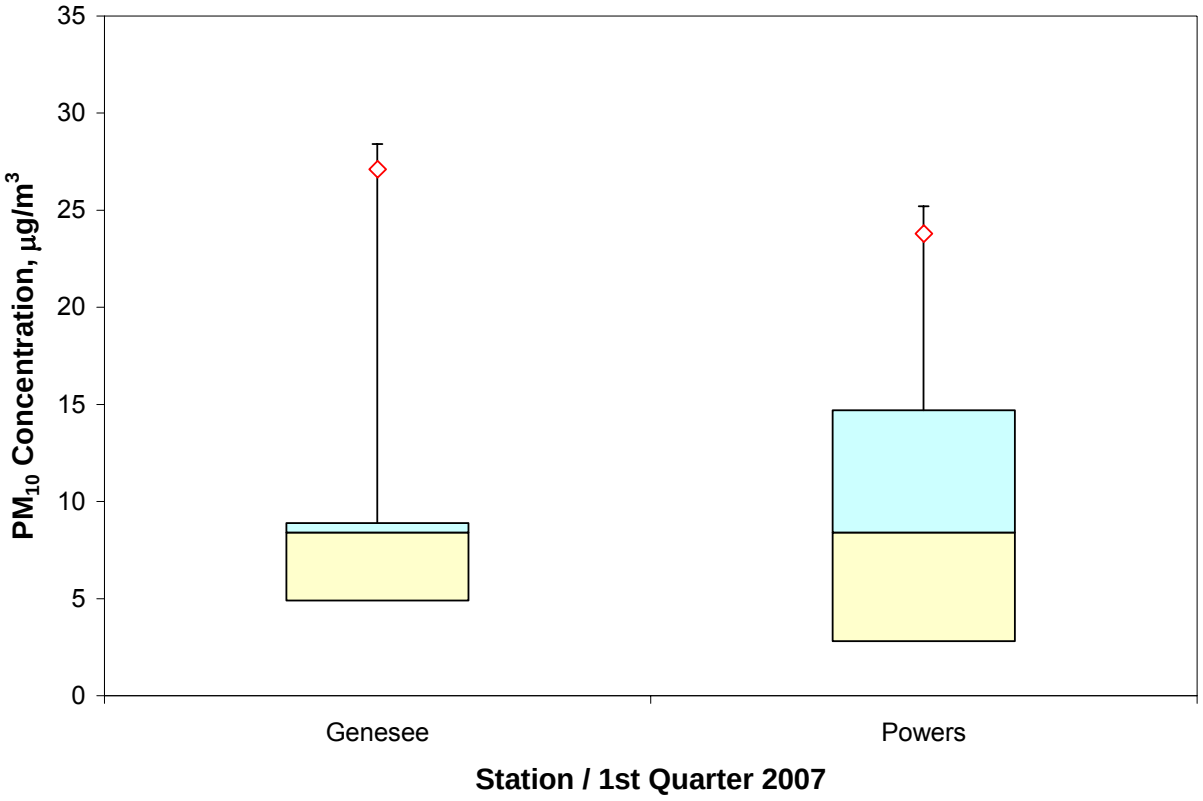


Figure 11 **Box-and-Whisker plot of 24-hour average PM_{10} concentrations from intermittent monitoring at Genesee and Powers air monitoring stations (Q1 2007).**

Note: 25th %ile (bottom of box);
50th %ile (horizontal line within box); 75th %ile (top of box);
98th percentile (diamond); maximum (top T)

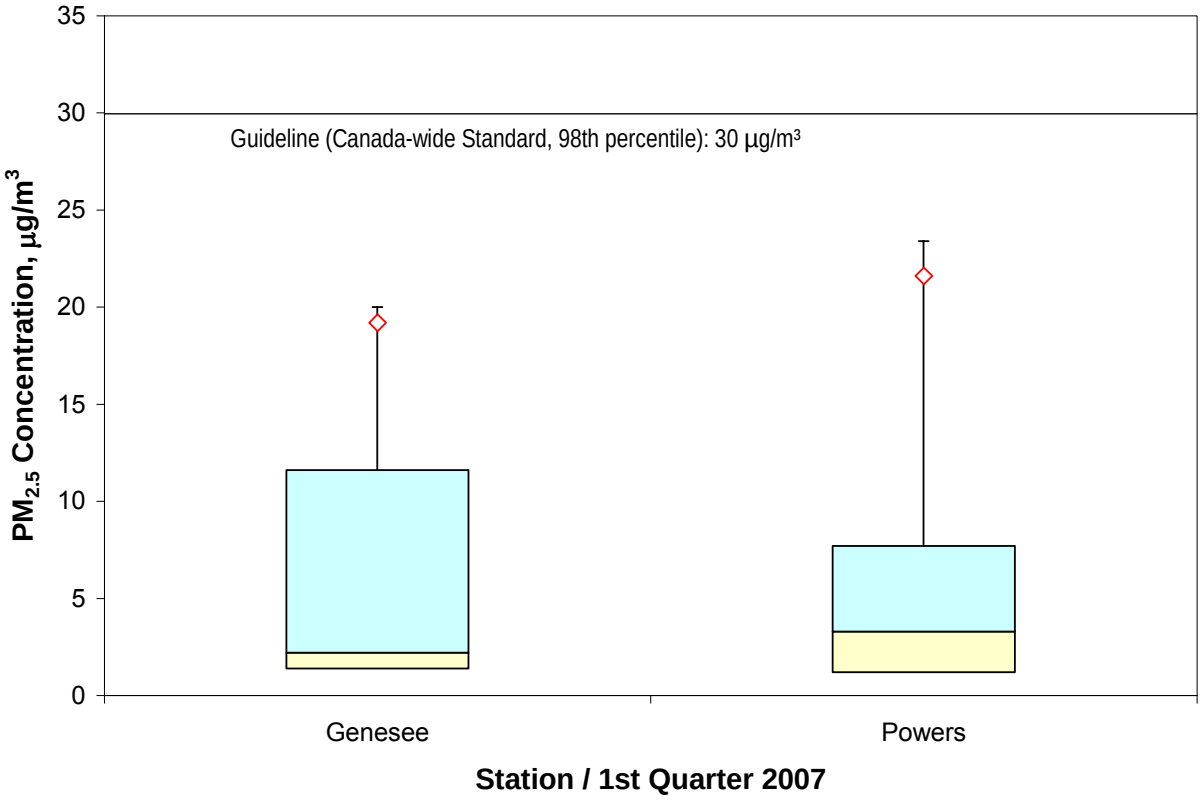


Figure 12 **Box-and-Whisker plot of 24-hour average $PM_{2.5}$ concentrations from intermittent monitoring at Genesee and Powers stations in central Alberta (Q1 2007).**

Note: 25th %ile (bottom of box);
50th %ile (horizontal line within box); 75th %ile (top of box);
98th percentile (diamond); maximum (top T)

All measured concentrations were well below applicable AAAQOs or Canada Wide Standard (CWS) values shown in these figures.

2.2 Acid Deposition Assessment Program

2.2.1 Data Completeness

Data capture rates for the acid deposition program integrated samples are presented in Table 7 for the first quarter of 2007. There were two incidents of invalid or missing data out of 42 samples sought. These incidents are summarized in Table 8.

Table 7 Capture rates for integrated data for the acid deposition assessment program (Q1 2007).

Station	Violet Grove AMS				Genesee MAS			
Month	1	2	3	Q1	1	2	3	Q1
TSP	5/5	4/4	6/6	15/15	4/5	4/4	5/6	13/15
HNO_3	1/1	1/1	1/1	3/3	1/1	1/1	1/1	3/3
HNO_2	1/1	1/1	1/1	3/3	1/1	1/1	1/1	3/3

Note: 1 = January; 2 = February; 3 = March.
Data capture rates expressed as: valid samples/total samples scheduled.

Table 8 Incidences of invalid or missing data for the acid deposition assessment program (Q1 2007).

Date	Station	Parameter	Cause	Corrective Action
Jan 24	Genesee	TSP	Sampler loaded with incorrect filter.	
Mar 19	Genesee	TSP	Sampler malfunction – did not run (possible power interruption).	Sampler timer reprogrammed.

Table 9 shows data capture rates for continuous data collected at the Violet Grove and Genesee air monitoring stations for the acid deposition assessment program. In February all analyzers and meteorological sensors at Violet Grove had uptime efficiencies of 100 percent with the exception of the SO_2 analyzer. The SO_2 analyzer failed and was replaced, resulting in 91.7 percent uptime. With the exception of this analyzer, all data capture rates were well above 90% for the continuous monitoring program in the first quarter of 2007.

Table 9 Capture rates (%) for continuous data for the acid deposition assessment program (Q1 2007).

Station	Violet Grove AMS				Genesee AMS			
Month	1	2	3	Q1	1	2	3	Q1
NO_2	100	100	99.9	99.9	100	100	100	100
SO_2	100	91.7	100	97.2	100	100	100	100
WSP	100	100	100	100	100	100	100	100
WDR	100	100	100	100	100	100	100	100
T_2	100	100	100	100	100	100	100	100
T_{10}	100	100	100	100	100	100	100	100
RH	100	100	100	100	100	100	100	100

Note: 1 = January; 2 = February; 3 = March.
WSP = wind speed.
WDR = wind direction.
T_2 = temperature at 2 metre height above ground.
T_{10} = temperature at 10 metres height above ground.
RH = relative humidity.
n/a = not applicable.
Bolded values indicate <90% uptime.

2.3 Mercury Assessment Program

2.3.1 Data Completeness

There were 13 wet deposition sample collection periods (weeks) in the first quarter of 2007. However, one wet deposition sample was deployed for a two-week period – from February 6 to February 20 – meaning that only 12 collection periods were used in the first quarter. From these 12 collection periods, three precipitation samples and nine dry samples (i.e., no precipitation occurred these collection periods) were submitted. Frontier Geosciences Inc. rated all three precipitation samples as valid. Data capture rates for integrated sample data relevant to the mercury assessment (wet deposition) program are presented in Table 10. No dry deposition sample results have been received as of yet.

Table 10 Capture rates for precipitation samples in the mercury assessment (wet deposition) sampling program (Q1 2007).

Station	Genesee AMS			
Month	1	2	3	Q1
Hg wet deposition sample	5/5	3/3	4/4	12/12

Note: 1 = January; 2 = February; 3 = March.

2.4 Contraventions of Special Environmental Monitoring Programs

There were no contraventions of approval terms and applicable air quality monitoring objectives for the January to March 2007 period.

3 Summary

3.1 Regional Ambient Air Program

There were eight instances of invalid or missing data for intermittent PM_{10} and $PM_{2.5}$ samples out of 60 samples sought during the first quarter in the regional ambient air program. Five instances of sampler malfunctioning occurred. There were three instances where laboratory results were not produced: two were due to the wrong filter type being used in the field and one was due to the sample not being received at the lab. There were no instances of invalid or missing passive sampler results for the first quarter.

Data capture rates for continuous monitoring parameters at all air monitoring stations were well above the 90% criterion on a monthly basis as stipulated in the Air Monitoring Directive (1989). High uptimes indicate that equipment in the continuous air monitoring network was generally well-maintained. All measured concentrations were well below applicable Alberta Ambient Air Quality Guideline values or Canada Wide Standard values.

There were no contraventions of approval terms and applicable air quality monitoring objectives for the January to December 2007 period.

3.2 Acid Deposition Assessment Program

There were 30 of 32 valid intermittent TSP samples collected and 12 of 12 valid acid gas samples collected during the first quarter of 2007 for the acid deposition assessment program. In addition, all data capture rates were well above 90% for continuous monitoring parameters in the first quarter for the program.

3.3 Mercury Assessment Program

There were three valid precipitation samples collected and nine dry samples (i.e., no precipitation) in the wet deposition sampling program during the first quarter of 2007. The dry deposition sampling program started in March with no results received yet.