

# FLIN FLON AREA QUARTERLY AIR QUALITY REPORT: JANUARY, FEBRUARY AND MARCH 2010

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To inform interested parties about air quality in the Flin Flon area, Manitoba Conservation issues on a quarterly basis an overview summary of monitoring results in the community, measured both by the Department and Hudson Bay Mining and Smelting Co., Limited. Manitoba Conservation strives to make these quarterly reports available within two months from the end of each quarter.

## Report Contents:

- Overall [summary](#) of air quality monitoring results in the Flin Flon area.
- Chart depicting [air quality warnings](#) (summarized monthly) issued since the commencement of this program.
- Chart depicting values in [excess of the 1-hour MAL](#) (Maximum Acceptable Level) for SO<sub>2</sub> (summarized monthly) at each site.
- Chart depicting values in excess of the 1-hour and 24-hour MAL for SO<sub>2</sub> during [each month](#) in this quarter.
- [Table depicting statistics](#) on selected heavy metals and particulate matter over the last year, as well as the entire sampling period.
- Chart depicting daily levels of total [suspended particulate matter](#) at each site since 1996.
- Chart depicting average daily levels of fine particulate matter ([PM<sub>10</sub>](#) and [PM<sub>2.5</sub>](#)) in the Flin Flon area.

# SUMMARY OF AIR QUALITY WITHIN THE FLIN FLON AREA

## JANUARY, FEBRUARY AND MARCH 2010

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### Monitoring Activity

The results from the continuous outdoor sulphur dioxide (SO<sub>2</sub>) monitoring and particulate matter (PM) sampling (including analysis for selected heavy metals) conducted by Manitoba Conservation and Hudson Bay Mining and Smelting Co., Limited (HBM&S) in the Flin Flon area form the basis of this report.

During the first quarter of 2010, ambient SO<sub>2</sub> concentrations showed significant improvement. A number of days with elevated levels of particulate matter were also recorded during this period at all sites – strong winds especially in the latter part of March greatly contributed to wind-swept dust and high particulate matter levels.

### Sulphur Dioxide

Selected statistics are shown in the attached graphs. An overview of air quality warnings issued to the Flin Flon area is also included.

During this quarter, exceedances of the 1-hour Maximum Acceptable Level for sulphur dioxide (Manitoba Ambient Air Quality Criteria is 0.34 parts per million) were only observed at the Provincial Bldg monitoring site for one hour each in January (on the 27<sup>th</sup>) and in March (on the 19<sup>th</sup>). These exceedances appear to have resulted from fugitive gas releases associated with the tapping of matte from the reverberatory furnace (as reported by HBM&S). These are gases that are released into the air closer to ground level (and not exhausted through the tall stack) and, therefore, are not subject to as much air dispersion and dilution. No elevated levels were recorded in February at any of the 5 monitoring sites.

The World Health Organization (WHO) daily maximum exposure guideline of 0.05 parts per million (ppm) was exceeded one day in January at the Provincial Bldg site (on the 27<sup>th</sup>) and at the Staff House site (on the 26<sup>th</sup>).

### Particulate Matter (PM)/ Heavy Metals (HM)

Selected particulate matter and heavy metal data statistics/graphs are attached for the first quarter of 2010 and for the past sampling period.

Daily TSP levels (including the larger-sized or coarse dust particles) measured in the first quarter of 2010 were below the Manitoba Ambient Air Quality Criteria of 120 µg/m<sup>3</sup> (24-hour average) at all sites except for 1 day each at the Provincial Bldg. site and Ruth Betts School (March 24<sup>th</sup>) and one day at Creighton (March 25<sup>th</sup>). These elevated levels were likely due to very strong winds encountered during these days that caused wind-swept ground dust or the blowing of street materials.

Fine particulate (PM<sub>10</sub>) levels were continuously measured at the Provincial Building and Creighton monitoring sites. Elevated levels of PM<sub>10</sub> above the Manitoba criteria of 50 µg/m<sup>3</sup> (daily average) were recorded for 4 days (January 24<sup>th</sup> and March 24<sup>th</sup>, 25<sup>th</sup> and 30<sup>th</sup>) at the Provincial Bldg. site, one day at Ruth Betts (March 24<sup>th</sup>), and 6 days at the Creighton monitoring site (mostly in March). Most of these high levels arose from local conditions, again influenced by strong winds blowing local ground dust (but not industrially related).

Continuous (24/7) monitoring of very fine particulate matter (PM<sub>2.5</sub>) was also conducted at the Provincial Building and Creighton monitoring sites. PM<sub>2.5</sub> is the fraction of the total dust in the outdoor air most closely associated with human health impacts. During this quarter, one daily average (January 27<sup>th</sup>) of PM<sub>2.5</sub> at the Provincial Bldg site was above the 24-hour Canada-Wide Standard of 30 µg/m<sup>3</sup>. Also, four days were elevated at Creighton (February 17<sup>th</sup>, 25<sup>th</sup> and 26<sup>th</sup>; March 2<sup>nd</sup>). The elevated levels at Creighton are believed to arise from wood smoke (and not industrial emissions) due to the very strong smell of smoke on the sampling filters. The level at the Provincial Bldg is likely due to smelter-associated releases.

The concentrations of selected heavy metals were within the Manitoba Ambient Air Quality Criteria at all monitoring sites during this quarter.

### Additional Information

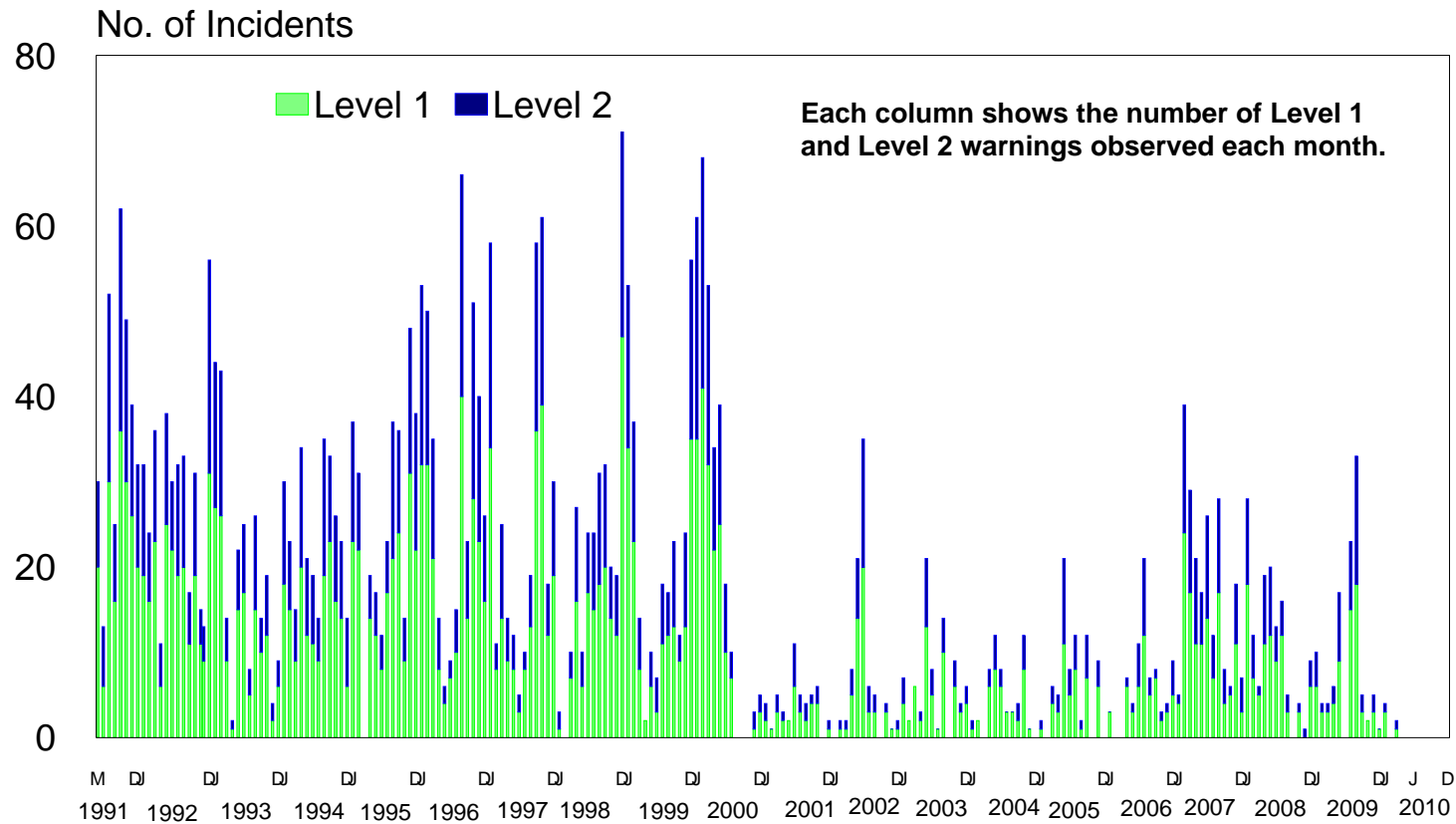
HBM&S permanently shutdown its copper smelter in mid-June 2010 resulting in significantly reduced emissions and the virtual elimination of sulphur dioxide releases.

Details on the hourly air concentrations of sulphur dioxide and air quality warnings issued to the Flin Flon area, along with abatement actions taken by HBM&S, have been filed with the Manitoba Environment Act Public Registry at the Flin Flon Public Library; File 1095.30. Hourly averages of SO<sub>2</sub> from all 5 sites over the last 24-hours can be viewed at [www.flinflonairquality.com](http://www.flinflonairquality.com).

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# Flin Flon Air Quality

## Record of Warnings (1991 to 2010) - All Sites

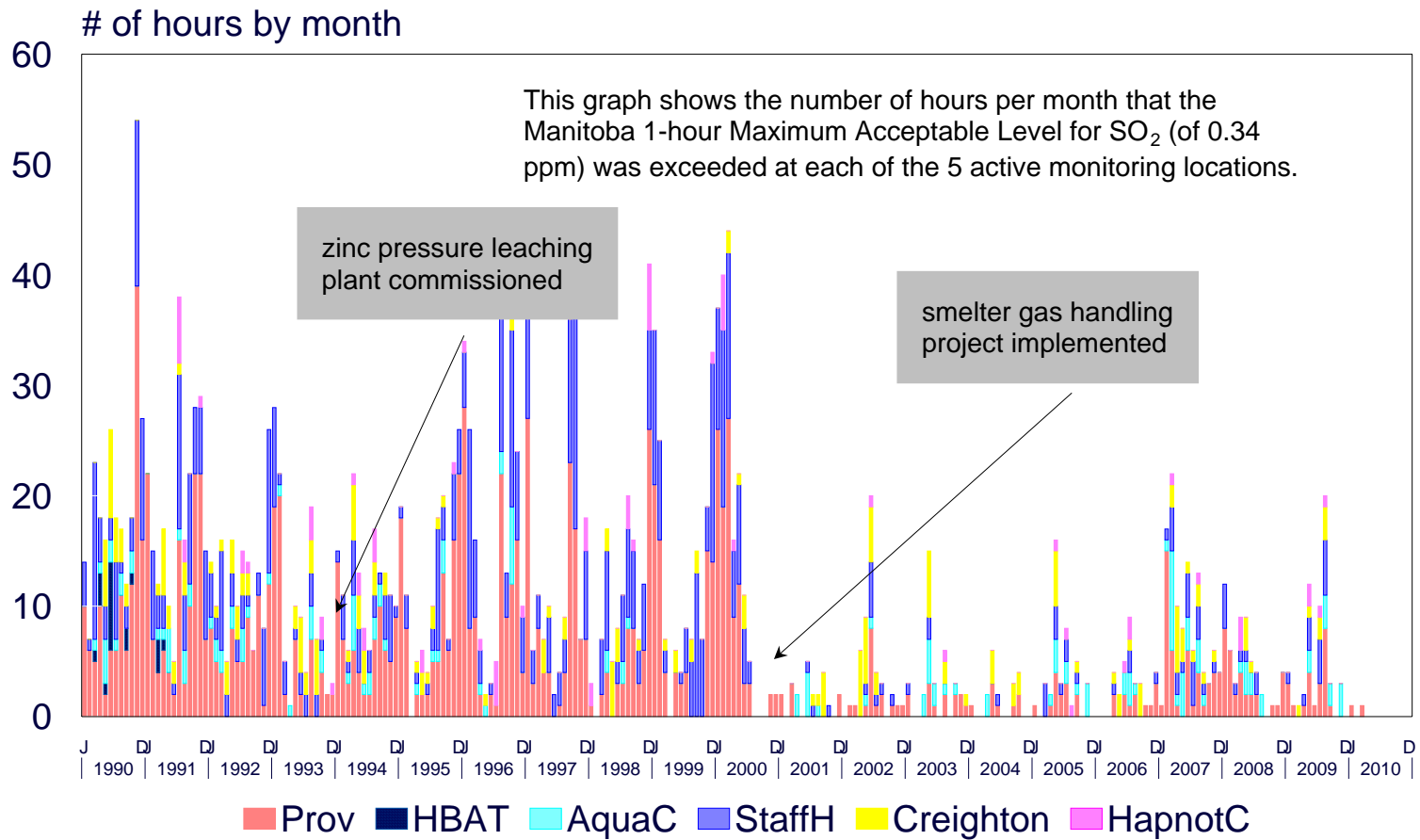


May 2010

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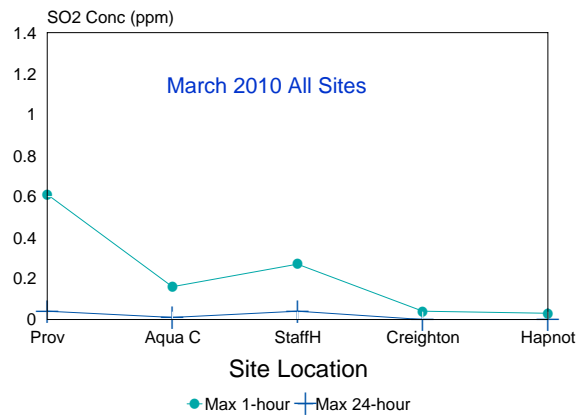
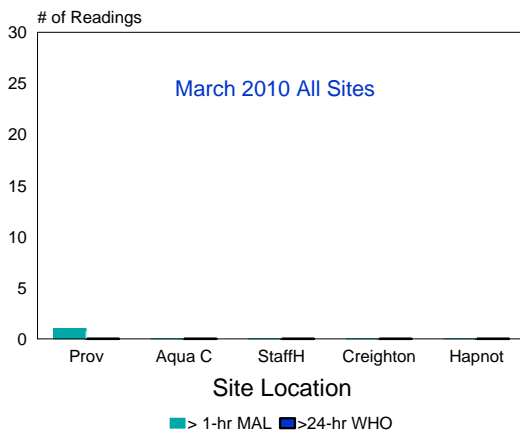
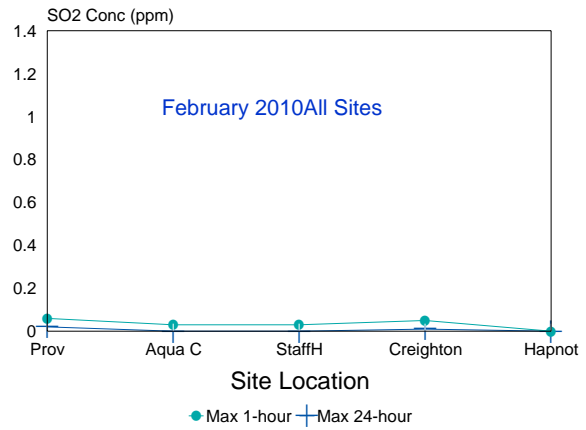
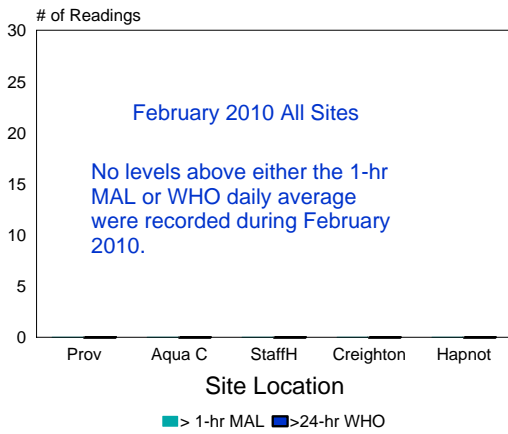
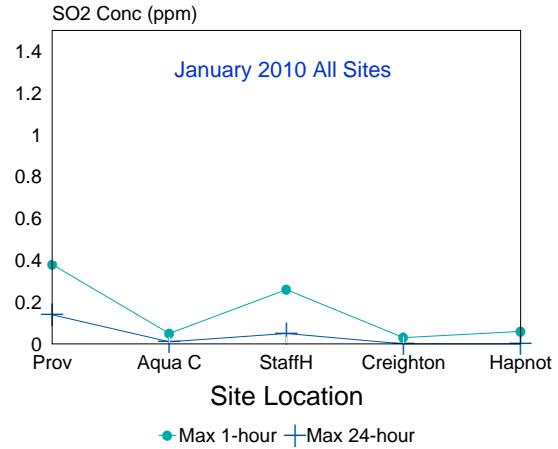
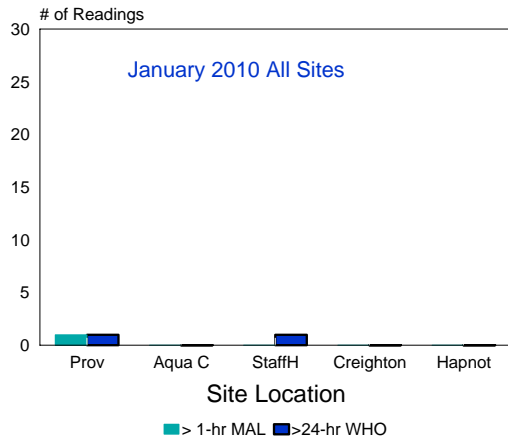
# Flin Flon Area Air Quality

## Exceedances of the 1-hr MAL for SO<sub>2</sub>



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# FLIN FLON SULPHUR DIOXIDE MONITORING



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# Flin Flon Heavy Metals and Particulate Summaries

## Total Suspended Particulates (TSP) Particulate Matter 100 µm and smaller in diameter

	Site/Time Period	Sample Range		Geometric Mean		# of Samples > MAL	
		Dec. '88 – Mar. '10	Jan. '09- Mar. '10	Dec. '88 – Mar. '10	Jan. '09- Mar. '10	Dec. '88 – Mar. '10	Apr. '09- Mar. '10
PM	Prov.	0-468	5-180	34	29	189*	8 *
	R.B.	0-423	1-129	19	15	9 *	1 *
	C./S.P.	0-235	--	16	--	5 *	--
	Cr. Sch.	1-3601	4-244	22	22	28 *	4 *
Pb	Prov.	0.00-13.11	0.01-4.18	0.10	0.07	23 (9) *	4 (4) *
	R.B.	0.00-3.09	0.01-0.75	0.04	0.02	0 *	0 *
	C./S.P.	0.00-1.75	--	0.05	--	0 *	--
	Cr. Sch.	0.01-3.39	0.01-0.28	0.02	0.02	0 *	0 *
As	Prov.	0.000-1.380	0.001-1.041	0.019	0.021	124 **	8 **
	R.B.	0.000-0.524	0.000-0.375	0.005	0.004	5 **	1 **
	C./S.P.	0.000-0.282	--	0.003	--	0 **	--
	Cr. Sch.	0.000-4.548	0.000-0.091	0.003	0.003	6 **	0 **

Concentration results are shown in units of micrograms of mass per cubic metre (µg/m<sup>3</sup>) of air per 24-hour averaging period.

Prov. = Provincial Building monitoring site (MB Conservation) [to March 31, 2010]

R.B. = Ruth Betts monitoring site (HBM&S)

C./S.P. = Centoba / Sewage Plant monitoring site (HBM&S)

Cr. Sch. = Creighton School monitoring site (HBM&S) [all HBM&S sites to March 31, 2010 for TSP and heavy metals except as follows - Sewage Plant to November 10, 2002 then Hi-Vol moved to Creighton School where sampling was daily from November 13 through December 12, 2002 and every second day from December 18, 2002]

Annual range April 1, 2009 to March 31, 2010 inclusive for all sites (thus no data for Sewage Plant site - see note above.).

## PM<sub>10</sub> (Inhalable Particulates) Particulate Matter 10 µm and smaller in diameter.

	Site/Time Period	Sample Range		Geometric Mean		# of Samples > MAL	
		Dec. '96 – Mar. '10	Jan. '09- Mar. '10	Dec. '96 – Mar. '10	Jan. '09- Mar. '10	Dec. '96 – Mar. '10	Apr. '09- Mar. '10
PM <sub>2.5</sub>	Prov.	0.00-56.93	0.29-34.68	3.82	3.40	16 ****	1 ****
PM <sub>10</sub>	Prov.	0.30-248.5	2.83-77.6	14.21	13.34	269 ***	13 ***
	R.B.	1-66	1-52	10	9	5 ***	1 ***
	S.P.	2-50	--	9	--	0 ***	--
	Cr. Sch.	3-93	--	15	--	1 ***	-- ***
D-PM <sub>10</sub>	Cr. Sch.	0-167.5	1.2-167.5	16.96	23.73	81 ***	31 ***
D-PM <sub>2.5</sub>	Cr. Sch.	0-80.1	0.5-51.4	8.97	10.89	101 ****	11 ****

Concentrations are shown in units of micrograms of mass per cubic metre (µg/m<sup>3</sup>) of air per 24-hour averaging period.

Prov. = Provincial Building real-time continuous PM<sub>10</sub> & PM<sub>2.5</sub> monitoring site (Man. Conservation)[to March 31, 2010]

R.B. = Ruth Betts monitoring site (HBM&S) [from June 8, 1996 to March 31, 2010 for PM<sub>10</sub>]

S.P. = Sewage Plant monitoring site (HBM&S) [from June 8, 1996 to December 7, 2002 for PM<sub>10</sub>]

Cr. Sch. = Creighton School monitoring site (HBM&S) [from December 15, 2002 to May 22, 2003 every second day for PM<sub>10</sub> and metals] On May 23, 2003 a R&P Dichotomous Partisol Sampler was installed at this site. It has provided daily 24-hr samples except for when there were instrument problems. The Partisol Sampler draws ambient air through a PM<sub>10</sub> size selective head and the sample is split internally to give a PM<sub>2.5</sub> (fine) [D-PM<sub>2.5</sub>] and PM<sub>2.5-10</sub> (coarse) [D-PM<sub>2.5-10</sub>] sample. D-PM<sub>10</sub> is the sum of D-PM<sub>2.5</sub> and D-PM<sub>2.5-10</sub>. Sample results to March 31, 2010. Annual range April 1, 2009 to March 31, 2010 inclusive for all sites.

\* In comparison to the Manitoba Ambient Air Quality Objective (or Guideline) of 120 µg/m<sup>3</sup> for TSP and 5 µg/m<sup>3</sup> for Pb and as of July 1, 2005 2 µg/m<sup>3</sup> for Pb (number in bracket indicates the number above the new standard)

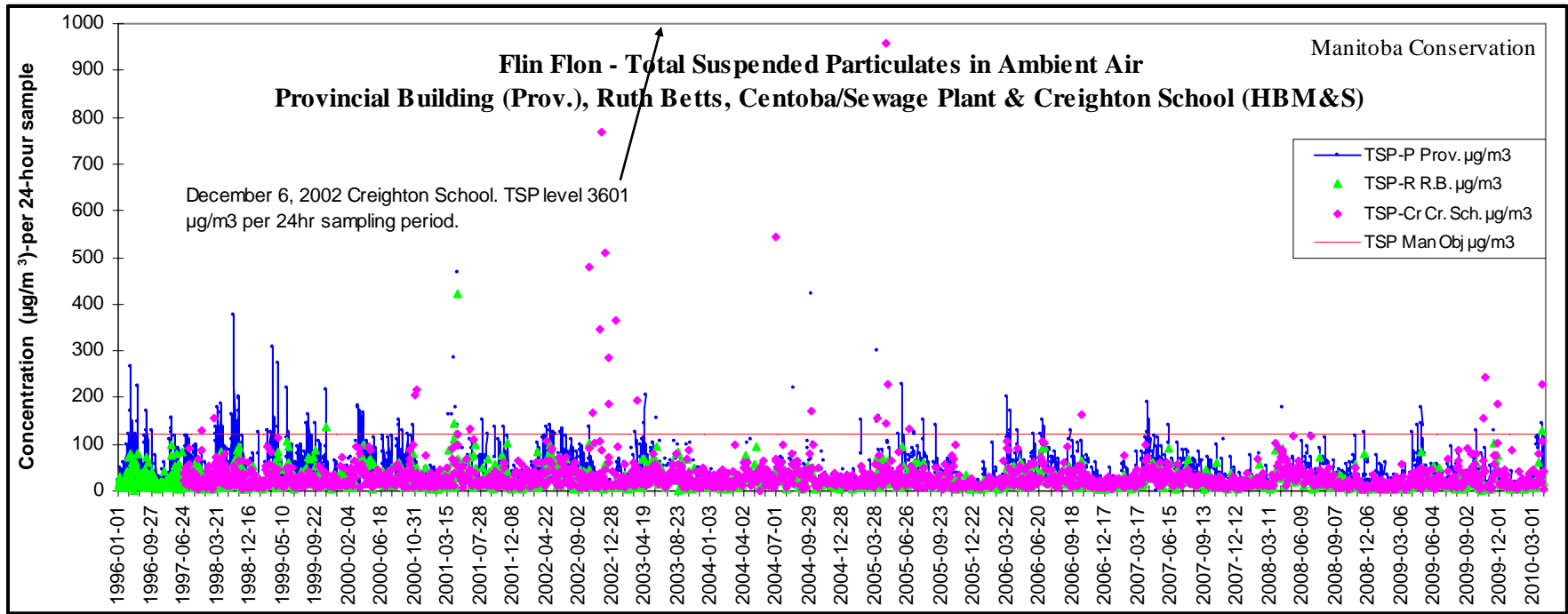
\*\* In comparison to Guidelines (24 hours) [0.3 µg/m<sup>3</sup> for As]

\*\*\* Based on the Manitoba Guideline of 50 µg/m<sup>3</sup> \*\*\*\* Based on Canada-Wide Standard of 30 µg/m<sup>3</sup>

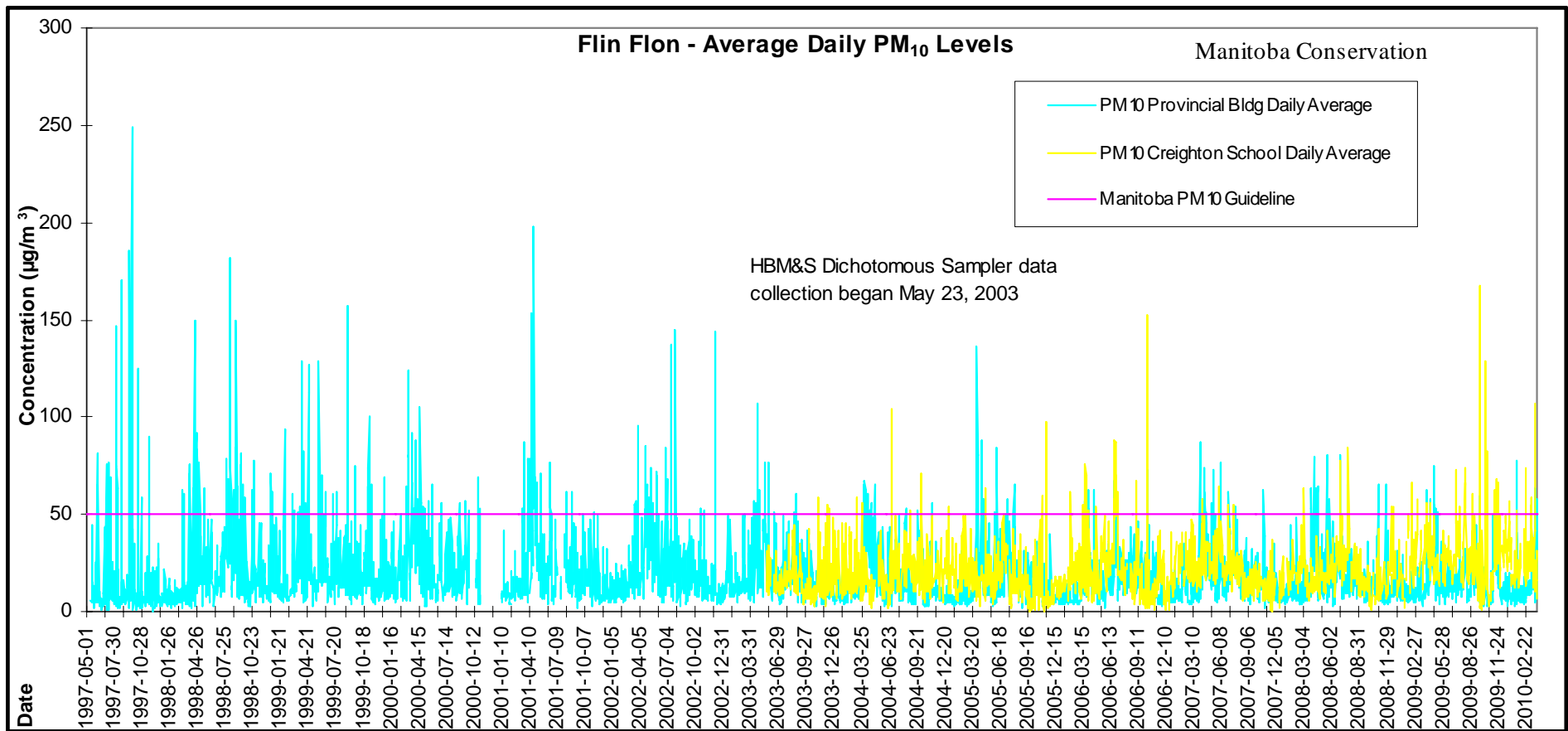
MAL - Maximum Acceptable Level

*revised May 20, 2010*

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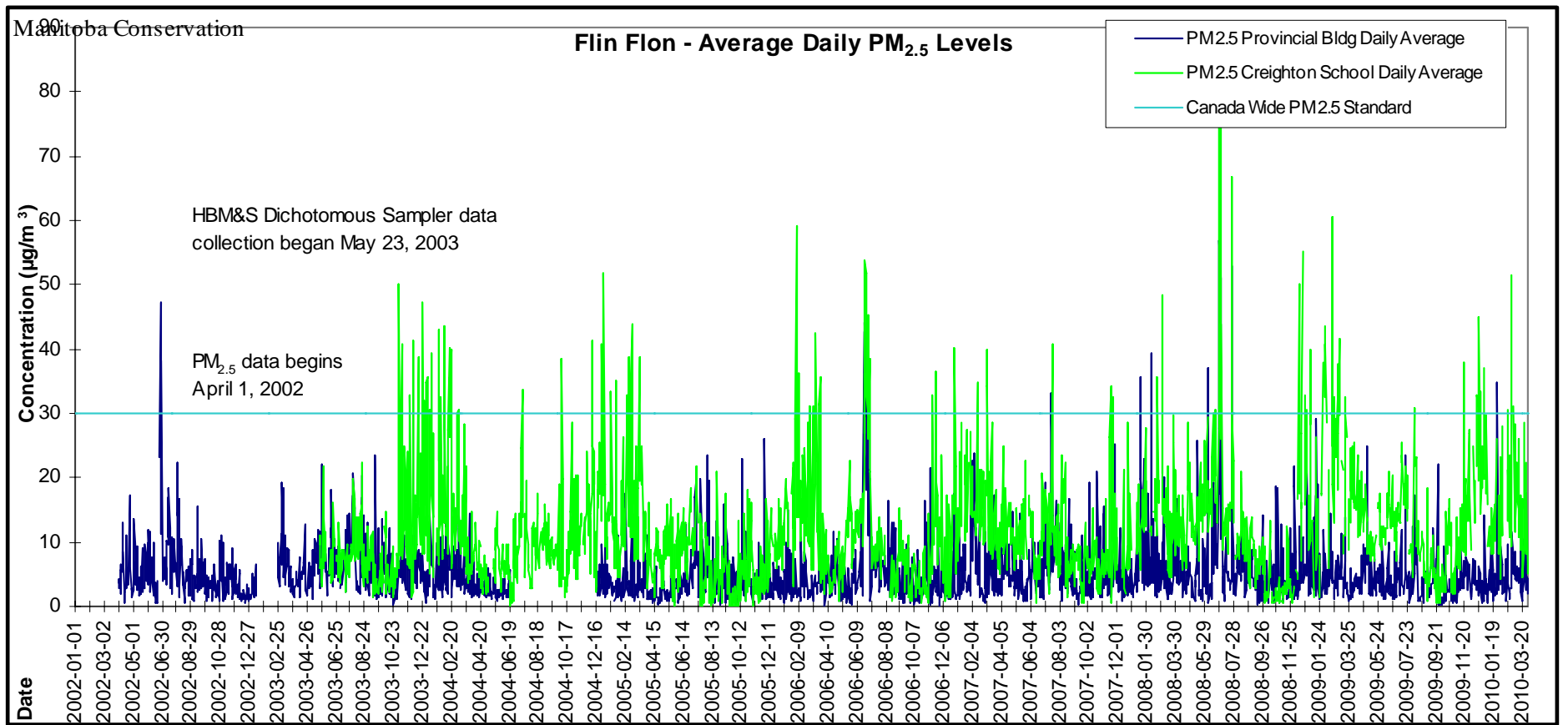


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