

# FLIN FLON AREA QUARTERLY AIR QUALITY REPORT: APRIL, MAY AND JUNE 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

## APRIL, MAY AND JUNE 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 second quarter of 2010, ambient SO<sub>2</sub> concentrations generally were lower, consistent with reduced emissions as the copper smelter scaled back operations in preparation for shutdown. A number of days with significantly elevated levels of particulate matter were also recorded during this period as a result of smoke in air from nearby forest fires.

### 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 not recorded in April at any of the 5 monitoring sites. In May, only one hour at the Creighton monitoring site was elevated (on the 27<sup>th</sup>). In June, elevated hours were recorded again at the Creighton site (one hour on the 2<sup>nd</sup>), at Hapnot (1 hour on June 7<sup>th</sup>) and Aqua Centre (2 hours also on the 7<sup>th</sup>). The June 2<sup>nd</sup> incident arose from the plume looping onto the Creighton area. The June 7<sup>th</sup> readings arose (as reported by HBM&S) from fugitive gas releases associated with the tapping of matte from the reverberatory furnace. 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.

The World Health Organization (WHO) daily maximum exposure guideline of 0.05 parts per million (ppm) was exceeded one day in May at the Staff House site (on the 26<sup>th</sup>) and at three sites (Provincial Bldg, Aqua Centre and Hapnot) on June 7<sup>th</sup>.

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

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

Daily TSP levels (including the larger-sized or coarse dust particles) measured in the second 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 2 days at the Provincial Bldg. site (April 3<sup>rd</sup> and 5<sup>th</sup>) and 3 days at the Creighton site (April 6<sup>th</sup>, June 21<sup>st</sup> and 25<sup>th</sup>). These elevated levels were likely due to vehicular-entrained street dust (early spring) or wind-swept ground dust/soil 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 (April 5 to 7, June 24) at the Provincial Bldg. site and 6 days at the Creighton monitoring site (April 6, June 18, 22, 23-25). Most of these high levels arose from local conditions, again influenced by 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 particulate matter in the outdoor air most closely associated with human health impacts. During this quarter, three daily averages of PM<sub>2.5</sub> at both the Provincial Bldg and Creighton sites were above the 24-hour Canada-Wide Standard of 30 µg/m<sup>3</sup> (over the period of June 23 to 26). All levels were associated with smoke in air from nearby forest fires. PM<sub>2.5</sub> levels on June 24<sup>th</sup> and 25<sup>th</sup> were very much elevated and coincided with locally-observed visibility reductions due to smoke in air.

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 on June 11, 2010 resulting in significantly reduced emissions and the virtual elimination of sulphur dioxide releases.

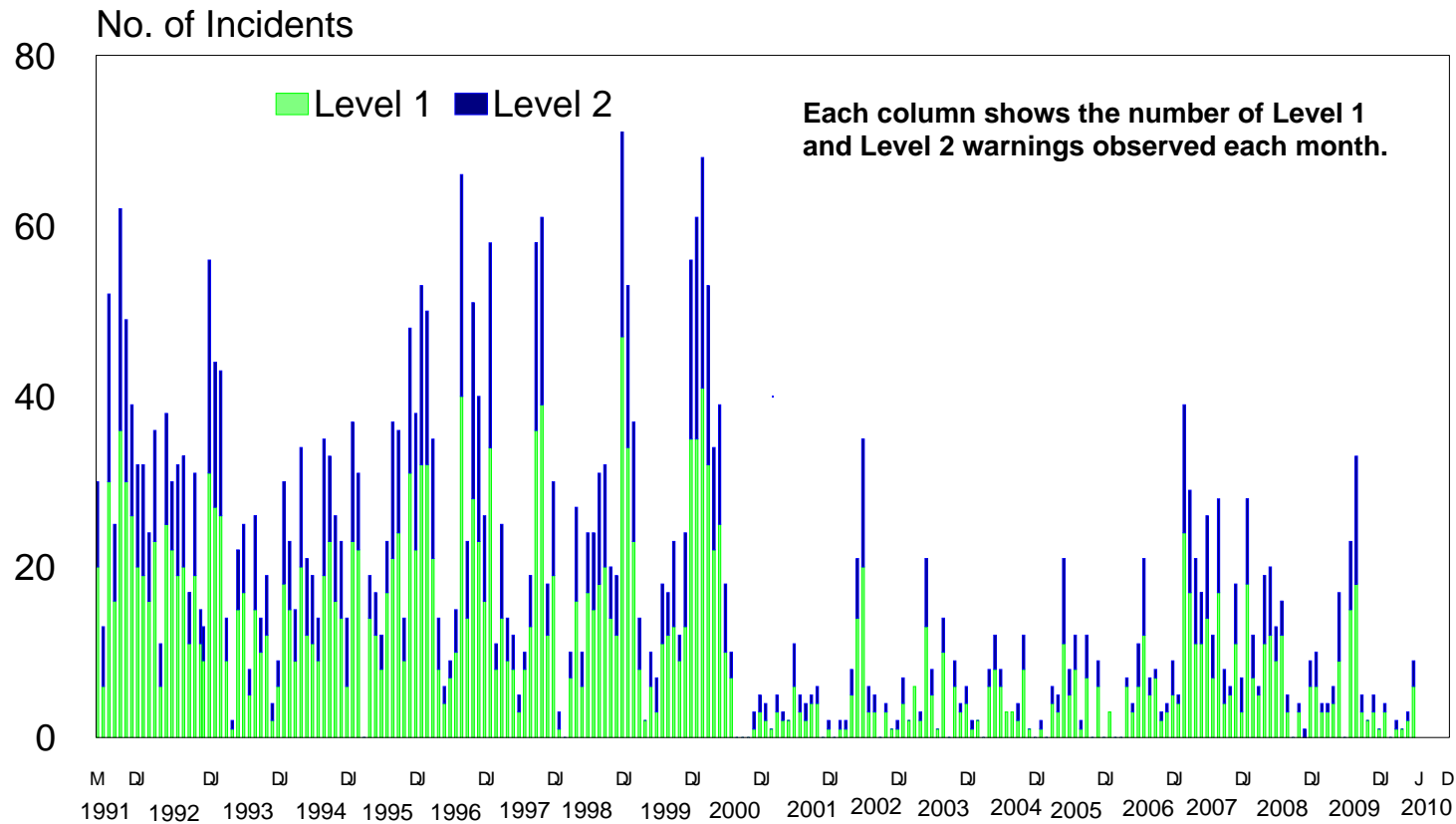
Details on the hourly air concentrations of sulphur dioxide and air quality warnings issued to the Flin Flon area, along with abatement actions taken by HBM&S, have been filed with the Manitoba Environment Act Public Registry at the Flin Flon Public Library; File 1095.30. Hourly averages of SO<sub>2</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

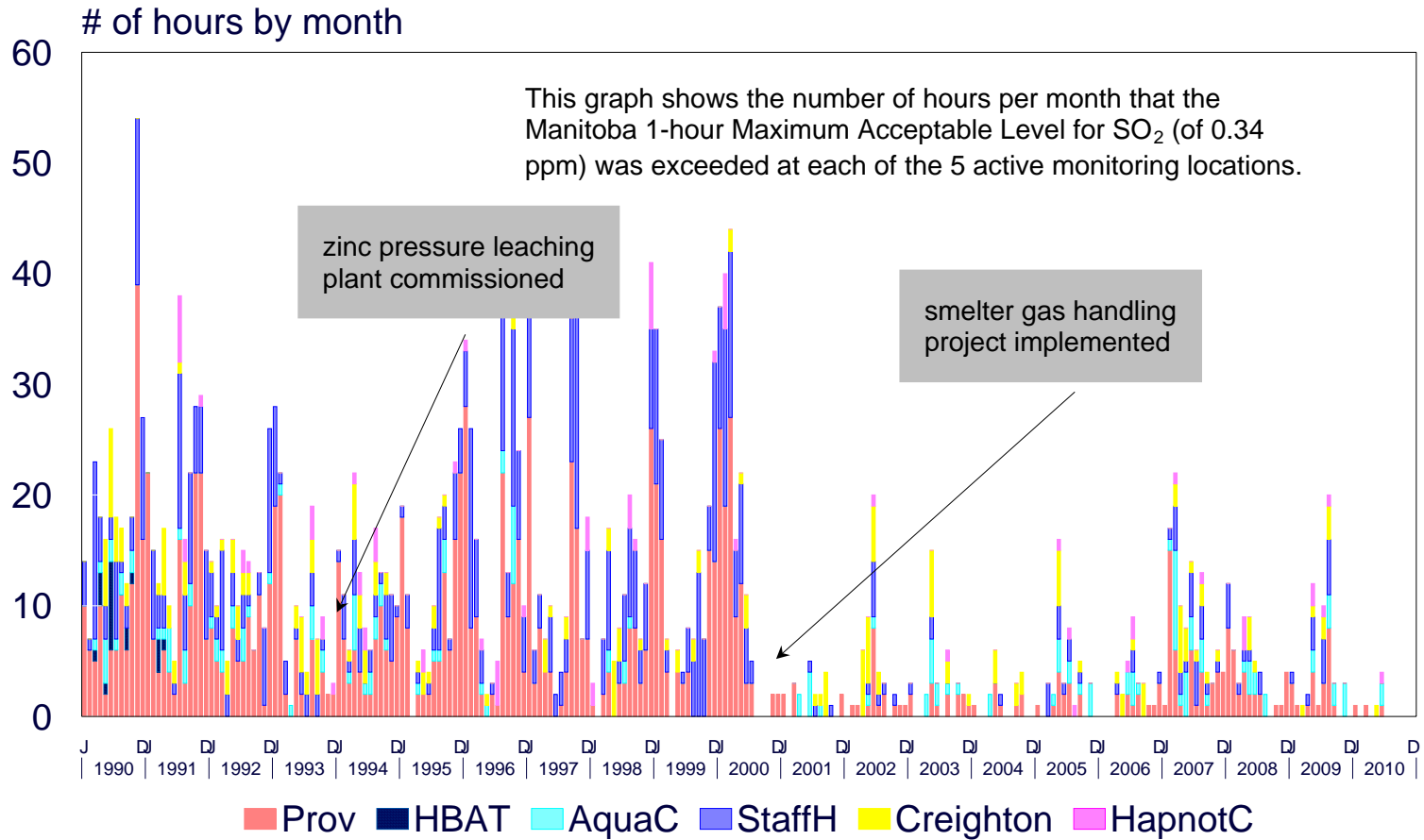


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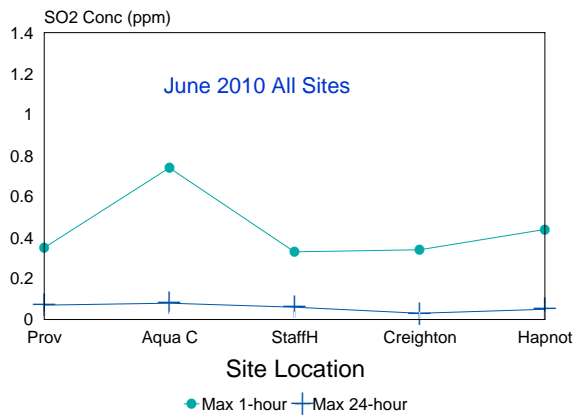
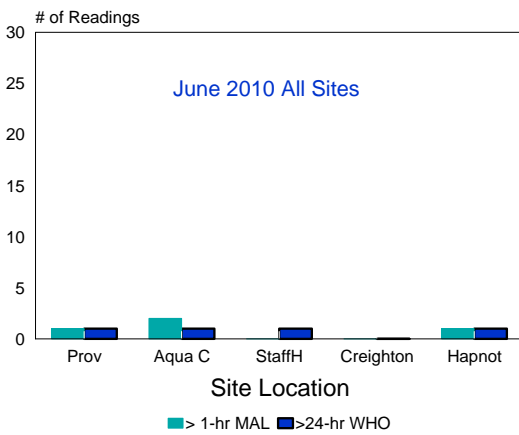
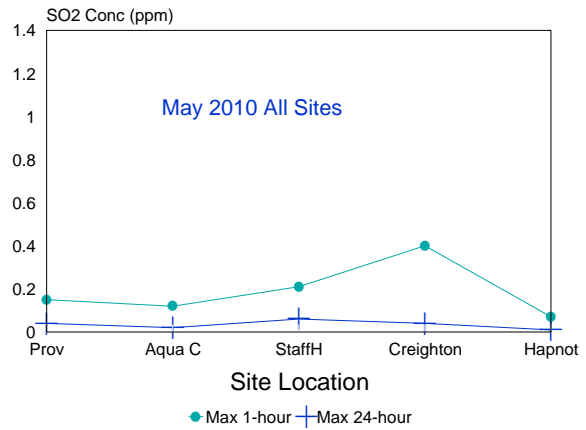
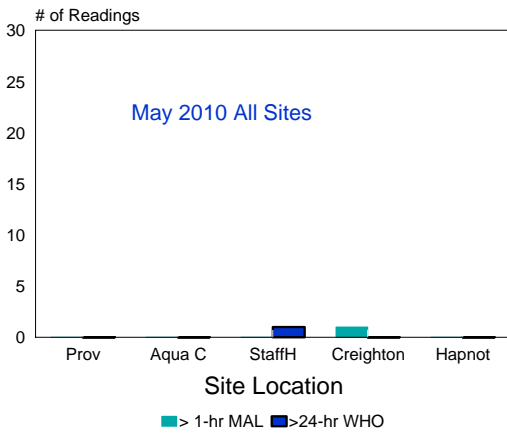
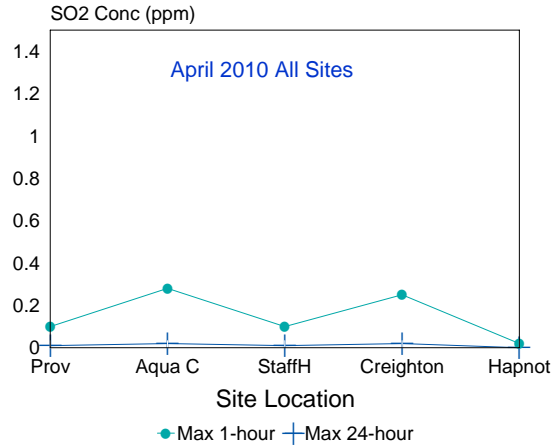
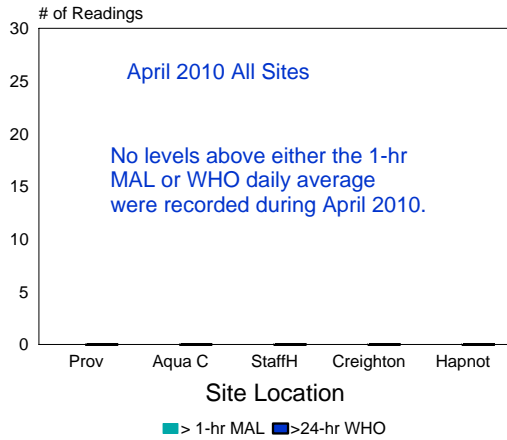
# Flin Flon Area Air Quality

## 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 – Jun. '10	Jul. '09- Jun. '10	Dec. '88 – Jun. '10	Jul. '09- Jun. '10	Dec. '88 – Jun. '10	Jul. '09- Jun. '10
PM	Prov.	0-468	5-154	34	27	191*	5 *
	R.B.	0-423	1-129	19	17	9 *	1 *
	C./S.P.	0-235	--	16	--	5 *	--
	Cr. Sch.	1-3601	4-598	23	27	31 *	7 *
Pb	Prov.	0.00-13.11	0.01-4.09	0.10	0.06	23 (9) *	2 (2) *
	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	0.018	124 **	6 **
	R.B.	0.000-0.524	0.000-0.375	0.005	0.003	5 **	1 **
	C./S.P.	0.000-0.282	--	0.003	--	0 **	--
	Cr. Sch.	0.000-4.548	0.000-0.153	0.003	0.003	6 **	0 **

Concentration results are shown in units of micrograms of mass per cubic metre ( $\mu\text{g}/\text{m}^3$ ) of air per 24-hour averaging period.

Prov. = Provincial Building monitoring site (MB Conservation) [to June 30, 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 June 30, 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 July 1, 2009 to June 30, 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 – Jun. '10	Jul. '09- Jun. '10	Dec. '96 – Jun. '10	Jul. '09- Jun. '10	Dec. '96 – Jun. '10	Jul. '09- Jun. '10
PM <sub>2.5</sub>	Prov.	0.00-203.6	0.29-203.6	3.84	3.61	19 ****	4 ****
PM <sub>10</sub>	Prov.	0.30-248.5	2.32-213.75	14.26	13.17	273 ***	10 ***
	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.	0-334.2	1.2-334.2	17.05	21.92	87 ***	35 ***
D-PM <sub>2.5</sub>	Cr. Sch.	0-285.7	0.5-285.6	8.89	9.13	104 ****	14 ****

Concentrations are shown in units of micrograms of mass per cubic metre ( $\mu\text{g}/\text{m}^3$ ) 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 June 30, 2010]

R.B. = Ruth Betts monitoring site (HBM&S) [from June 8, 1996 to June 30, 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 PM10 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 June 30, 2010. Annual range July 1, 2009 to June, 2010 inclusive for all sites.

\* In comparison to the Manitoba Ambient Air Quality Objective (or Guideline) of 120  $\mu\text{g}/\text{m}^3$  for TSP and 5  $\mu\text{g}/\text{m}^3$  for Pb and as of July 1, 2005 2  $\mu\text{g}/\text{m}^3$  for Pb (number in bracket indicates the number above the new standard)

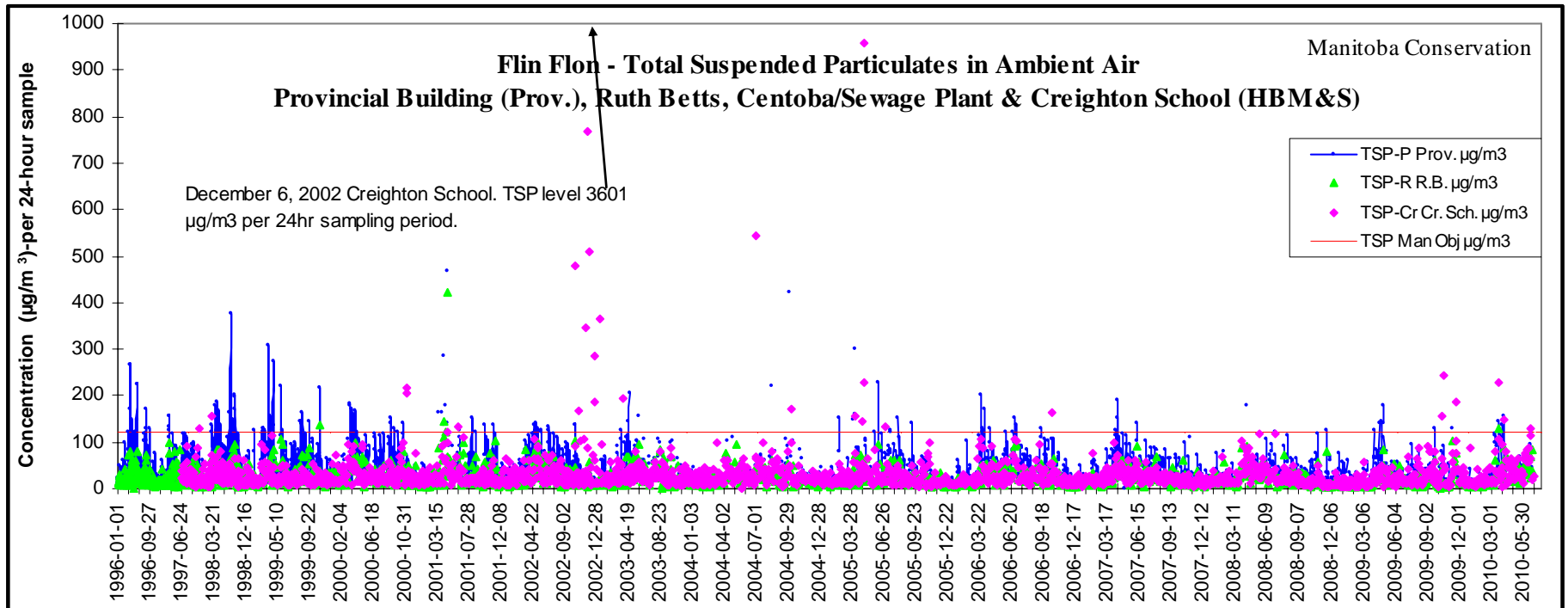
\*\* In comparison to Guidelines (24 hours) [0.3  $\mu\text{g}/\text{m}^3$  for As]

\*\*\* Based on the Manitoba Guideline of 50  $\mu\text{g}/\text{m}^3$  \*\*\*\* Based on Canada-Wide Standard of 30  $\mu\text{g}/\text{m}^3$

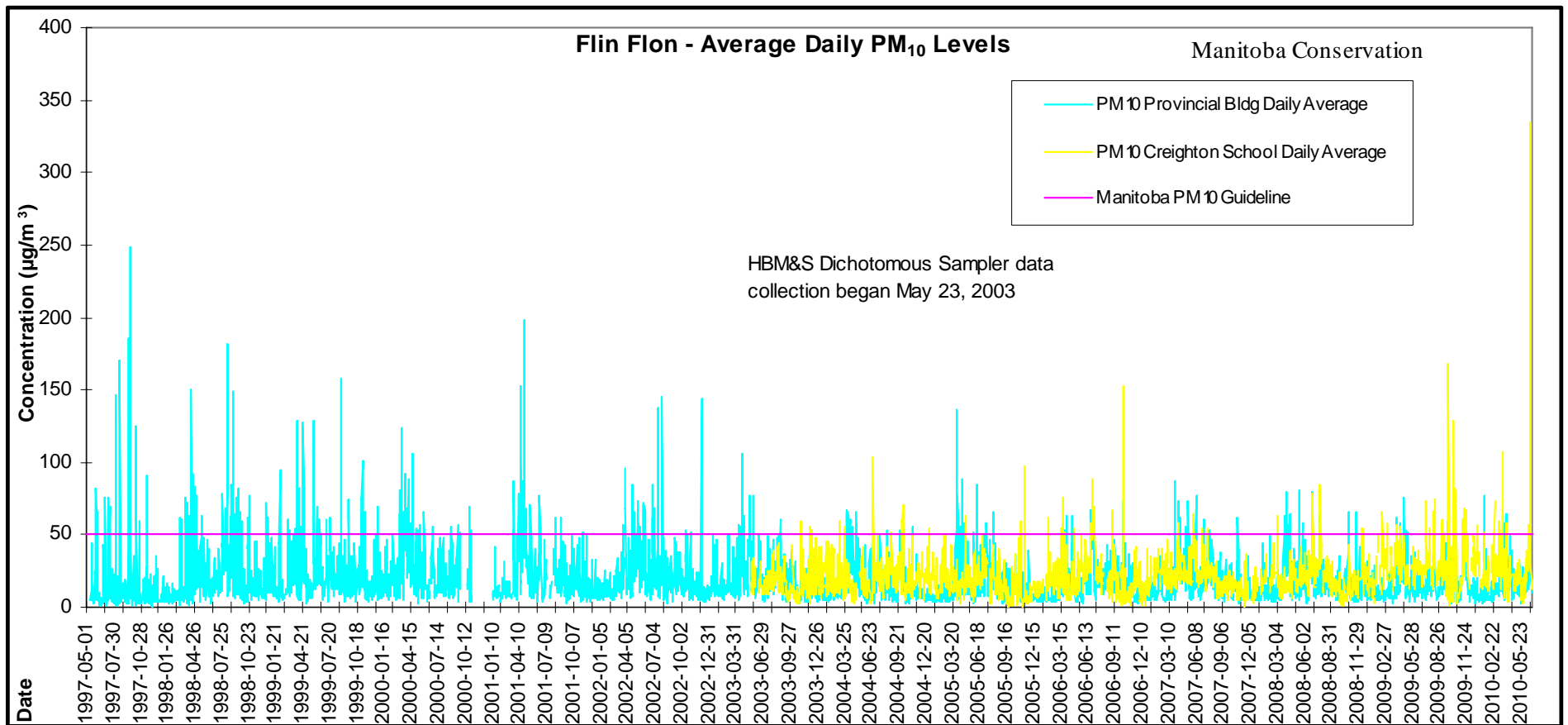
MAL - Maximum Acceptable Level

*revised August 18, 2010*

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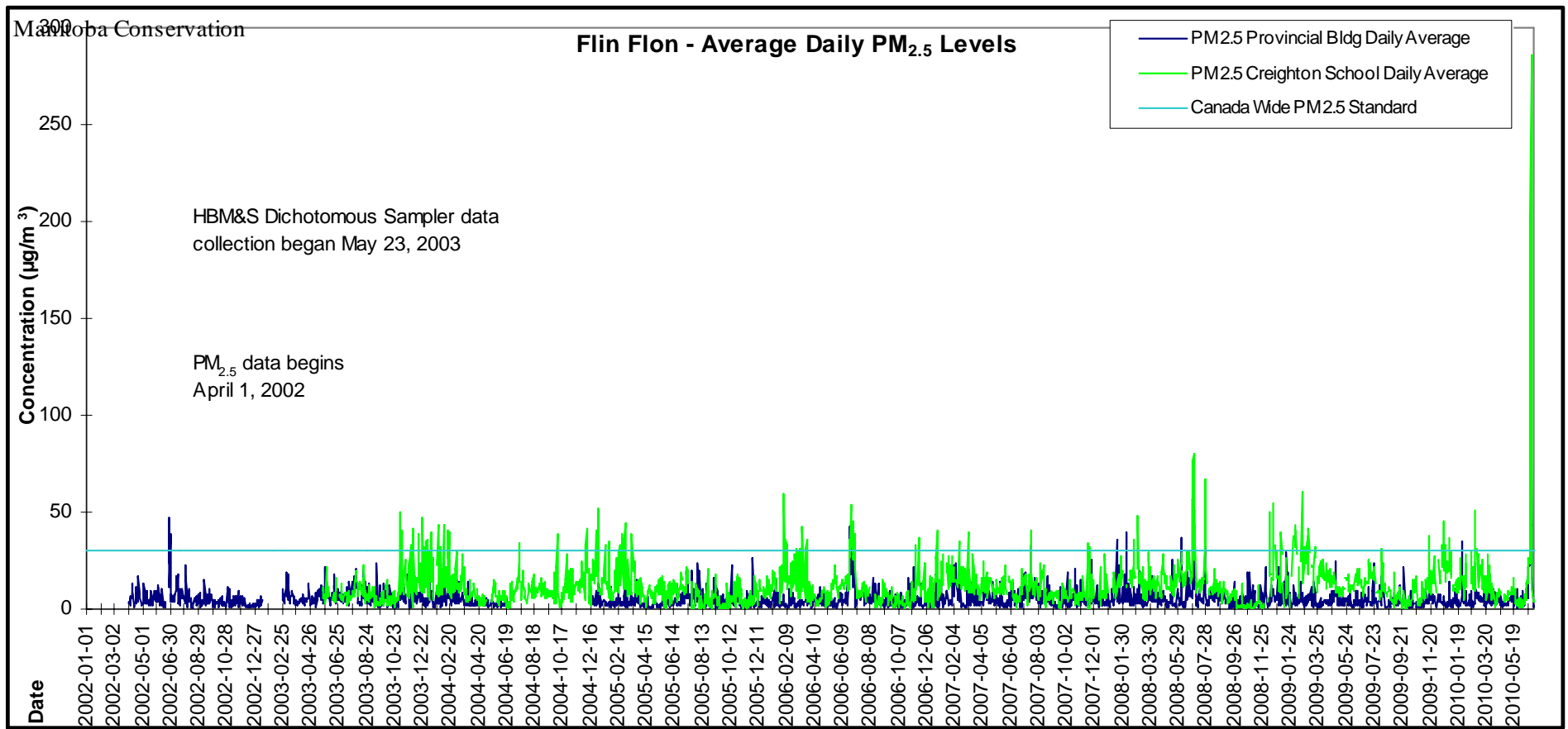


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