



Ministry of
Environment and
Climate Change Strategy

AQHI and PM_{2.5} Summary

Summary of PM_{2.5} concentrations and AQHI values since 1998 in
Kamloops

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This summary is based on air quality measurements which are available at the Ministry air quality site www.bcairquality.ca. The data used in preparing this summary were downloaded on November 23rd, 2017. The data for 2017 are not yet considered final as QA/QC is not yet complete. It is possible that some of the values will change over the next months. The analysis of these data was completed using R. The scripts used to generate the analysis and this report are available on request. Files of all hourly AQHI calculations can be supplied in csv format.

The complete record of PM_{2.5} measurements available for Kamloops were used in preparation of this summary. This means that both the older TEOM instruments, and the newer FRM (in this case both a BAM 1020 and a Sharp 5030) were used in the calculations. The older TEOM instruments are known to underestimate PM_{2.5}, especially under cold winter conditions. The TEOM data used to generate this summary have not been adjusted. The reason for this is that under summer conditions the relationship between collocated TEOM and FRM instruments is not good and the Ministry has made the decision not to adjust TEOM data upwards. This must be kept in mind when interpreting these data. In addition, the location of the ozone and nitrogen dioxide sensors changed during the period of record.

The AQHI₊ calculations include the jump and hold algorithm for all years. The AQHI₊ was implemented in December 2016. The jump and hold increases the AQHI₊ to a value of 7 (high health risk) when the hourly average PM_{2.5} concentration is $\geq 60 \mu\text{g}\text{m}^{-3}$. If the following hour is greater than $25 \mu\text{g}\text{m}^{-3}$, the AQHI₊ is held at a value of 7 for an additional 5 hours.

year	maximum 24 hour	maximum hourly	hours 24 hour > 25 μgm^{-3}	hours > 60 μgm^{-3}
1998	50	192	33	6
1999	19	95	0	1
2000	19	70	0	1
2001	18	73	0	3
2002	28	87	64	3
2003	155	369	377	116
2004	32	86	52	2
2005	17	42	0	0
2006	33	83	20	1
2007	19	91	0	4
2008	23	89	0	1
2009	79	143	154	26
2010	139	283	244	53
2011	31	145	20	2
2012	36	57	52	0
2013	26	93	12	1
2014	76	125	241	29
2015	116	188	110	33
2016	38	75	46	4
2017	286	862	841	470

Table 1: PM_{2.5} statistics for Kamloops from 1998 until present. Note that data for the 2017 year only use data to 23rd November. The values for 2011 and following years are based on the FRM instruments. The hours that PM_{2.5} is $\geq 60 \mu\text{gm}^{-3}$ is included as that is the value when the AQHI+ jumps to a value of 7 (high health risk).

year	Low	Moderate	High	Very High	Valid Hours
1998	7484	86	4	3	7577
1999	7774	30	1	0	7805
2000	8529	72	1	0	8602
2001	8299	77	8	0	8384
2002	8549	66	7	0	8622
2003	7198	77	167	19	7461
2004	8528	64	7	0	8599
2005	8497	14	0	0	8511
2006	7076	80	2	0	7158
2007	8346	20	9	0	8375
2008	8584	26	1	0	8611
2009	8315	110	57	0	8482
2010	8242	53	72	8	8375
2011	7700	11	7	0	7718
2012	8292	116	0	0	8408
2013	8251	15	1	0	8267
2014	8194	77	49	0	8320
2015	8228	59	57	6	8350
2016	8431	19	9	0	8459
2017	6788	180	466	128	7562

Table 2: AQHI+ statistics for Kamloops from 1998 until November 23rd, 2017. The columns show the number of hours in each year that the AQHI+ was in the Low ($AQHI+ < 4$), Moderate ($4 \leq AQHI+ < 7$), High ($7 \leq AQHI+ < 10$), and Very High ($AQHI+ \geq 10$) health risk categories in that year. The valid hours are the number of hours that the AQHI+ was available in that year, the maximum possible is 8760 hours.