

2007
Air Quality
Data Summary
Appendix

October 2008

Air Quality Index 1980 – 2007

King County															
Year	Days in Each Air Quality Category					Pollutant Determining the AQI							Highest Value		
	Good	Moderate	Unhealthy for Sensitive		Very Unhealthy	All Days				Unhealthy Days			AQI	Date	Pollutant
			Groups	Unhealthy		PM	CO	SO ₂	O ₃	PM	CO	O ₃			
1980	73	275		18	0	95	270	1		1	17		194	Jan 23	PM
1981	69	267		28	1	109	254	2		5	24		213	Jan 15	CO
1982	86	268		10	1	96	264	5		1	10		214	Feb 6	PM
1983	98	258		9	0	101	261	3		0	9		183	Jan 28	CO
1984	146	218		2	0	111	242	13		2	0		103	Dec 6	PM
1985	150	202		10	3	156	206	3		6	7		204	Dec 12	PM
1986	130	226		8	1	113	246	6		1	8		206	Jan 7	PM
1987	120	238		7	0	119	246	0		3	4		184	Feb 6	PM
1988	215	146		5	0	67	298	1		2	3		150	Dec 3	CO
1989	231	134		0	0	129	233	3		0	0		100	Jan 19 #	CO
1990	216	145		4	0	139	201	6	19	0	0	4	131	Aug 11	O ₃
1991	229	136		0	0	140	190	8	27	0	0	0	100	Dec 15 #	CO
1992	206	159		1	0	103	230	1	32	0	1	0	167	Feb 3	CO
1993	240	125		0	0	118	235	1	11	0	0	0	88	Jan 11	PM
1994	293	70		2	0	72	270	1	22	0	0	2	134	Jul 21	O ₃
1995	299	66		0	0	95	249	5	16	0	0	0	89	Jan 3	CO
1996	297	69		0	0	85	252	2	27	0	0	0	100	Oct 9	CO
1997	302	63		0	0	117	230	0	18	0	0	0	94	Jan 16	PM
1998	317	46		2	0	111	228	0	26	0	0	2	114	Jul 27 #	O ₃
1999	267	92	6	0	0	251	60	0	54	5	0	1	134	Jan 4	PM
2000	241	118	7	0	0	288	25		53	5	0	2	114	Nov 21	PM
2001	273	86	6	0	0	295	10		60	6	0	0	118	Nov 10	PM
2002	262	99	4	0	0	275	11		79	4	0	0	113	Nov 27	PM
2003	268	95	2	0	0	250	5		110	0	0	2	132	Jun 6	O ₃
2004	256	105	5	0	0	280	2		84	4	0	1	132	Dec 18	PM
2005	254	106	5	0	0	302	3		60	5	0	0	117	Dec 11	PM
2006	268	87	6	4	0	273	2		90	6	0	4	169	Jul 22	O ₃
2007	<u>285</u>	<u>77</u>	<u>3</u>	<u>0</u>	<u>0</u>	<u>278</u>	<u>0</u>		<u>87</u>	<u>2</u>	<u>0</u>	<u>1</u>	115	Jan 29	PM
Totals	6091	3976	44	110	6	4568	4723	61	875	58	83	19			
	PM = Particulate Matter			CO = Carbon Monoxide		SO ₂ = Sulfur Dioxide			O ₃ = Ozone			# = 1st Occurrence			

Note: In 1987 the particulate matter (PM) standard, total suspended particulates (TSP), was replaced by only that fraction of particulate matter with particle diameters equal to or less than 10 micrometers (PM₁₀).

In 1999 the Pollutant Standard Index (PSI) was replaced by the Air Quality Index (AQI) and included new and more stringent fine particle (PM_{2.5}) and 8-hour ozone (O₃) standards.

Air Quality Index 1990 – 2007

Kitsap County															
Year	Days in Each Air Quality Category					Pollutant Determining the AQI							Highest Value		
	Good	Moderate	Unhealthy for Sensitive		Very Unhealthy	PM	All Days			Unhealthy Days			AQI	Date	Pollutant
			Groups	Unhealthy			CO	SO ₂	O ₃	PM	CO	O ₃			
1990															
1991															
1992	353	8		0	0	361				0			68	Nov 25	PM
1993	343	12		0	0	355				0			62	Jan 11	PM
1994	364	1		0	0	248	117			0	0		54	Dec 23	CO
1995	361	4		0	0	86	279			0	0		57	Jan 5	CO
1996	361	1		0	0	206	156			0	0		51	Mar 2	PM
1997	361	1		0	0	362				0			55	Jan 15	PM
1998	347	9		0	0	356				0			87	Nov 8	PM
1999	333	32	0	0	0	365				0			81	Jan 5 #	PM
2000	290	75	0	1	0	366				1			159	Jul 4	PM
2001	320	42	0	0	0	362				0			91	Dec 25	PM
2002	324	41	0	0	0	365				0			78	Nov 2	PM
2003	318	47	0	0	0	365				0			78	Nov 3	PM
2004	340	26	0	0	0	366				0			80	Jul 4	PM
2005	328	35	2	0	0	365				2			136	Jul 4	PM
2006	339	25	1	0	0	365				1			105	Dec 17	PM
2007	<u>322</u>	<u>42</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>364</u>				<u>0</u>			92	Nov 24	PM
Totals	5404	401	3	1	0	5257	552	0	0	4	0	0			
PM = Particulate Matter CO = Carbon Monoxide SO ₂ = Sulfur Dioxide O ₃ = Ozone # = 1st Occurrence															

Note: In 1999 the Pollutant Standard Index (PSI) was replaced by the Air Quality Index (AQI) and included new and more stringent fine particle (PM_{2.5}) and 8-hour ozone (O₃) standards.

Air Quality Index 1980 – 2007

Pierce County															
Year	Days in Each Air Quality Category					Pollutant Determining the AQI							Highest Value		
	Good	Moderate	Unhealthy for Sensitive		Very Unhealthy	All Days				Unhealthy Days			AQI	Date	Pollutant
			Groups	Unhealthy		PM	CO	SO ₂	O ₃	PM	CO	O ₃			
1980	83	271		12	0	256	107	3		4	8		160	Apr 12	PM
1981	74	278		10	3	222	137	6		1	12		227	Jan 12	CO
1982	119	242		4	0	255	101	9		0	4		167	Dec 30	CO
1983	140	222		3	0	228	128	9		1	2		137	Dec 23	PM
1984	162	198		6	0	207	149	10		0	6		117	Jan 19 #	CO
1985	140	213		12	0	252	109	4		1	11		165	Dec 13	PM
1986	161	197		7	0	247	114	4		2	5		167	Oct 23	CO
1987	173	177		13	2	227	136	2		5	10		220	Feb 5	CO
1988	226	132		8	0	184	175	7		3	5		183	Jan 27	CO
1989	260	103		2	0	217	121	27		0	2		117	Nov 30 #	CO
1990	271	91		3	0	219	87	41	18	1	0	2	118	May 5	PM
1991	261	103		1	0	247	85	12	21	0	1	0	117	Jan 31	CO
1992	260	106		0	0	231	83	27	25	0	0	0	100	Feb 3 #	CO
1993	289	76		0	0	247	82	23	13	0	0	0	89	Feb 1	CO
1994	313	51		1	0	235	75	31	24	0	0	1	105	Jul 21	O ₃
1995	307	58		0	0	239	97	13	16	0	0	0	83	Jan 3	PM
1996	322	44		0	0	206	119	23	18	0	0	0	78	Oct 9	CO
1997	316	49		0	0	262	75	16	12	0	0	0	84	Jan 16	PM
1998	338	25		2	0	213	112	25	15	0	0	2	120	Jul 27	O ₃
1999	265	97	3	0	0	318	1	1	45	3	0	0	139	Jan 4	PM
2000	242	110	13	1	0	318	2		46	14	0	0	153	Dec 6	PM
2001	271	83	11	0	0	306	2		57	11	0	0	139	Nov 10	PM
2002	267	88	9	1	0	291	1		73	10	0	0	158	Nov 27	PM
2003	265	92	8	0	0	264	1		100	8	0	0	122	Jan 7	PM
2004	251	110	5	0	0	272			94	5	0	0	133	Nov 5	PM
2005	275	82	8	0	0	276	2		87	8	0	0	120	Dec 10	PM
2006	283	71	7	4	0	270			95	8	0	3	170	Dec 17	PM
2007	<u>298</u>	<u>57</u>	<u>10</u>	<u>0</u>	<u>0</u>	<u>261</u>			<u>104</u>	<u>9</u>	<u>0</u>	<u>1</u>	137	Jan 29	PM
Totals	6632	3426	74	90	5	6970	2101	293	863	94	66	9			
PM = Particulate Matter CO = Carbon Monoxide SO ₂ = Sulfur Dioxide O ₃ = Ozone # = 1st Occurrence															

Note: In 1987 the particulate matter (PM) standard, total suspended particulates (TSP), was replaced by only that fraction of particulate matter with particle diameters equal to or less than 10 micrometers (PM₁₀).

In 1999 the Pollutant Standard Index (PSI) was replaced by the Air Quality Index (AQI) and included new and more stringent fine particle (PM_{2.5}) and 8-hour ozone (O₃) standards.

Air Quality Index 1980 – 2007

Snohomish County																
Days in Each Air Quality Category						Pollutant Determining the AQI						Highest Value				
Year	Good	Moderate	Unhealthy		Very Unhealthy	All Days				Unhealthy Days			AQI	Date	Pollutant	
			for Sensitive Groups	Unhealthy		PM	CO	SO ₂	O ₃	PM	CO	SO ₂				
1980	340	19		0	0	356		3			0	0	60	Jan 23	PM	
1981	350	11		0	0	340		21			0	0	62	Jan 16	PM	
1982	334	30		1	0	277	70	18			0	1	0	117	Dec 30	CO
1983	308	56		1	0	191	150	24			0	1	0	117	Nov 30	CO
1984	309	57		0	0	105	217	44			0	0	0	92	Sep 28	PM
1985	300	64		1	0	152	166	47			0	1	0	117	Dec 11	CO
1986	324	41		0	0	169	148	48			0	0	0	89	Jan 25	CO
1987	203	158		3	0	96	250	18			0	3	0	117	Jun 26 #	CO
1988	174	184		8	0	15	345	6			0	8	0	133	Sep 13 #	CO
1989	150	213		2	0	26	338	1			0	2	0	133	Feb 10	CO
1990	166	197		2	0	29	335	1			0	2	0	117	Mar 2 #	CO
1991	188	176		1	0	32	333	0			0	1	0	117	Dec 16	CO
1992	180	186		0	0	34	332	0			0	0	0	100	Feb 4 #	CO
1993	237	128		0	0	56	306	0	3		0	0	0	79	Jan 11	PM
1994	294	71		0	0	28	334	1	2		0	0	0	78	Dec 30	CO
1995	316	49		0	0	59	294	1	11		0	0	0	78	Jul 7	CO
1996	340	26		0	0	54	299	0	13		0	0	0	67	Jul 26	O ₃
1997	348	17		0	0	210	151	0	4		0	0	0	67	Jan 14	PM
1998	353	11		1	0	143	219	3			1	0	0	153	Dec 22	PM
1999	300	62	3	0	0	260	105	0			3	0	0	129	Jan 3	PM
2000	253	79	5	0	0	301	36				5	0		113	Jul 4	PM
2001	290	73	2	0	0	356	9				2	0		111	Nov 10	PM
2002	288	69	8	0	0	343	22				8	0		116	Nov 4	PM
2003	282	80	3	0	0	364	1				3	0		108	Nov 4	PM
2004	290	74	2	0	0	364	2				2	0		107	Nov 5	PM
2005	288	72	5	0	0	360	5				5	0		139	Dec 11	PM
2006	301	57	7	0	0	364	1				7	0		143	Dec 17	PM
2007	<u>288</u>	<u>70</u>	<u>6</u>	<u>1</u>	<u>0</u>	<u>365</u>	<u>0</u>				<u>7</u>	<u>0</u>		155	Jan 15	PM
Totals	7794	2330	41	21	0	5449	4468	236	33		43	19	0			

PM = Particulate Matter CO = Carbon Monoxide SO₂ = Sulfur Dioxide O₃ = Ozone # = 1st Occurrence

Note: In 1987 the particulate matter (PM) standard, total suspended particulates (TSP), was replaced by only that fraction of particulate matter with particle diameters equal to or less than 10 micrometers (PM₁₀).

In 1999 the Pollutant Standard Index (PSI) was replaced by the Air Quality Index (AQI) and included new and more stringent fine particle (PM_{2.5}) and 8-hour ozone (O₃) standards.

**Burn Bans
1988 – 2007**

1988	Jan 25(0830) - Jan 28 (0830) Feb 5 (1630) - Feb 6 (0930) Dec 1 (1430) - Dec 2 (0800) Dec 4 (1430) - Dec 5 (1400) Dec 16 (1430) - Dec 18 (1430)	1995	Jan 4 - Jan 7
1989	Jan 19 (1430) - Jan 20 (1430) Jan 24 (1430) - Jan 26 (0930) Feb 6 (1430) - Feb 8 (0930) Feb 10 (1430) - Feb 16 (0930) Nov 29 (1430) - Dec 2 (0930) Dec 22 (1430) - Dec 23 (1430)	1996	Feb 14 (1430) - Feb 16 (1630)
1990	Jan 19 (1430) - Jan 21 (1430) Dec 7 (1430) - Dec 8 (0930) Dec 25 (1430) - Dec 27 (0815)* <i>*(Dec 26 1430 - Dec 27 0815) 2nd Stage</i>	1997	Nov 13 (1500) - Nov 15 (1500) Dec 4 (1500) - Dec 7 (1800)
1991	Jan 5 (1430) - Jan 6 (0930) Jan 21 (1430) - Jan 24 (1500)* <i>*(Jan 22 0930 - Jan 24 1500) 2nd Stage</i> Jan 29 (1430) - Jan 31 (0830) Dec 15 (1430) - Dec 17 (1430)* <i>*(Dec 16 1430 - Dec 17 0930) 2nd Stage</i>	1998	None
1992	Jan 8 (1430) - Jan 9 (0930) Jan 19 (1430) - Jan 20 (1430) Feb 5 (1000) - Feb 6 (1430) Nov 25 (1430) - Nov 26 (1430)	1999	Jan 5 (1400) - Jan 6 (1000) Dec 29 (1400) - Dec 31 (0600)
1993	Jan 11 (1430) - Jan 13 (0830) Jan 15 (1430) - Jan 16 (0700) Jan 17 (1430) - Jan 19 (0600) Jan 31 (1430) - Feb 3 (0830) Dec 20 (1430) - Dec 21 (1430) Dec 26 (1430) - Dec 29 (0830)	2000	Feb 18 (1400) - Feb 20 (1000) Nov 15 (1700) - Nov 23 (0600)
1994	None	2001	Nov 8 (1400) - Nov 12 (1800)
		2002	Nov 1 (1500) - Nov 6 (0900) Nov 27 (1000) - Dec 4 (1000)
		2003	Jan 7 (1500) - Jan 9 (1300)
		2004	None
		2005	Feb 21 (1600) - Feb 28 (0800) Dec 9 (1700) - Dec 18 (1200)
		2006	None
		2007	Jan 13 (1400) - Jan 16 (1500) Jan 28 (1400) - Jan 31 (1400) Dec 9 (1400) - Dec 11 (0930)

PARTICULATE MATTER (PM₁₀) – Continuous TEOM Sampling Method

Micrograms per Cubic Meter

Equivalent Sampling Methods: B - BetaAtten ANDERSEN FH62I-N Glass Fiber strip
 T - Mass Transducer R&P TEOM 1400a Teflon Coated Glass Fiber

2007

Location	Method	Number of Values	Quarterly Arithmetic Averages				Year Arith Mean	99th Percentile	Max Value
			1st	2nd	3rd	4th			
Duwamish, 4752 E Marginal Way S, Seattle	T	351	22.7	19.2	18.6	21.7	20.6	52	60
James St & Central Ave, Kent	T	354	17.7	13.0	13.9	15.6	15.1	42	62
Port of Tacoma, 2301 Alexander Ave, Tacoma	T	324	20.5	16.0	16.7		17.7	50	65

Notes

- (1) Sampling occurs continuously for 24 hours each day.
 Quarterly averages are shown only if 75 percent or more of the data is available.
- (2) Annual averages are shown only if there are at least three quarterly averages.

Summary of Maximum Observed Concentrations and Values >60

Location	Method	Jan	Feb
		29	2
		Mon	Fri
Duwamish, 4752 E Marginal Way S, Seattle	T		60
James St & Central Ave, Kent	T		62
Port of Tacoma, 2301 Alexander Ave, Tacoma	T	65	

-- Indicates no sample on specified day

Air Quality Index Summary

Location	Method	Unhealthy for Sensitive Groups		
		Good	Moderate	
Duwamish, 4752 E Marginal Way S, Seattle	T	350	1	0
James St & Central Ave, Kent	T	352	2	0
Port of Tacoma, 2301 Alexander Ave, Tacoma	T	322	2	0

PARTICULATE MATTER (PM_{2.5}) –Reference Sampling Method

Micrograms per Cubic Meter

Reference Sampling Method: R&P Partisol 2025 Sampler Teflon Filter

2007

Location	Number of Values	Quarterly Arithmetic Averages				Year Arith Mean	98th Percentile	Max Value
		1st	2nd	3rd	4th			
Darrington HS, 1085 Fir St, Darrington	195	9.9	4.2	5.1	9.1	7.1	36	72
Marysville JHS, 1605 7th St, Marysville	359	11.1	6.1	6.5	12.0	8.9	36	48
17171 Bothell Way NE, Lake Forest Park	119	10.2	5.3	5.9	12.0	8.4	30	35
Duwamish, 4752 E Marginal Way S, Seattle	119	10.8	7.4	8.2	12.0	9.6	26	37
7802 South L St, Tacoma	117	13.8	5.9	5.2	13.8	9.7	45	59

Notes

- (1) Sampling occurs for a 24 hour period from midnight to midnight.
Quarterly averages are shown only if 75 percent or more of the data is available.
- (2) Annual averages are shown only if there are at least three quarterly averages.

Summary of Maximum Observed Concentrations and Values >40

Location	Jan 12	Jan 14	Jan 15	Feb 2	Nov 23	Dec 9
	Fri	Sun	Mon	Fri	Fri	Sun
Darrington HS, 1085 Fir St, Darrington	48	52	72			
Marysville JHS, 1605 7th St Marysville		47		41		48
17171 Bothell Way NE, Lake Forest Park	35	--				--
Duwamish, 4752 E Marginal Way, Seattle		--	37			--
7802 South L St, Tacoma	45	--	59	47	45	--

-- Indicates no sample on specified day

Air Quality Index Summary

Location	Unhealthy for Sensitive Groups			
	Good	Moderate	Unhealthy	Unhealthy
Darrington HS, 1085 Fir St, Darrington	176	16	2	1
Marysville JHS, 1605 7 th St, Marysville	314	42	3	
17171 Bothell Way NE, Lake Forest Park	104	15		
Duwamish, 4752 E Marginal Way S, Seattle	104	15		
7802 South L St, Tacoma	98	15	4	

PARTICULATE MATTER (PM_{2.5}) – Continuous TEOM Sampling Method
Micrograms per Cubic Meter

Equivalent Sampling Methods: T - Mass Transducer R&P TEOM 1400a Tef-coat Glass Fiber

2007

Location	Method	Number of Values	Quarterly Arithmetic Averages				Year Arith	98 th	Max
			1st	2nd	3rd	4th	Mean	Percentile	Value
Marysville JHS, 1605 7th St, Marysville	T	327	11.3	7.4	8.1	12.1	9.7	31	37
6120 212th St SW, Lynnwood	T	195				10.1	10.1		32
17171 Bothell Way NE, Lake Forest Park	T	359	9.7	5.9	8.0	11.2	8.9	25	36
James St & Central Ave, Kent	T	342	13.2	7.8	8.3	10.9	10.1	28	42
7802 South L St, Tacoma	T	339	11.6	6.9	7.0	12.3	9.5	33	44

Notes

- (1) Sampling occurs continuously for 24 hours each day.
Quarterly averages are shown only if 75 percent or more of the data is available.
- (2) Annual averages are shown only if there are at least three quarterly averages.

Summary of Maximum Observed Concentrations and Values >40

Location	Method	Jan 14	Jan 28	Jan 29	Nov 23	Dec 9
		Sun	Sun	Mon	Fri	Sun
Marysville JHS, 1605 7th St, Marysville	T					37
6120 212th St SW, Lynnwood	T	--	--	--		32
17171 Bothell Way NE, Lake Forest Park	T					36
James St & Central Ave, Kent	T					42
7802 South L St, Tacoma	T			44	42	

-- Indicates no sample on specified day

Air Quality Index Summary

Location	Method	Good	Moderate	Unhealthy	
				for Sensitive Groups	Unhealthy
Marysville JHS, 1605 7th St, Marysville	T	289	38		
6120 212th St SW, Lynnwood	T	171	24		
17171 Bothell Way NE, Lake Forest Park	T	324	35		
James St & Central Ave, Kent	T	303	38		1
7802 South L St, Tacoma	T	299	38		2

PARTICULATE MATTER (PM2.5) – Continuous Nephelometer Sampling Method
Micrograms per Cubic Meter

Sampling Method: Equivalent - Radiance Research M903 Nephelometer

2007

Location	Number of Values	Quarterly Arithmetic Averages				Year Arith Mean	98 th Percentile	Daily Max Value
		1st	2nd	3rd	4th			
Darrington HS, 1085 Fir St, Darrington	344	11.8	3.5	4.2	9.2	7.2	34.8	63
Marysville JHS, 1605 7th St, Marysville	361	10.3	5.9	6.7	11.7	8.7	34.5	46
6120 212th St SW, Lynnwood	356	10.1	5.0	6.2	11.2	8.1	29.3	43
17171 Bothell Way NE, Lake Forest Park	360	10.2	5.1	5.9	11.6	8.2	29.0	47
Queen Anne Hill, 400 W Garfield St, Seattle	349	7.2	4.7	6.4	7.8	6.5	21.4	30
Olive & Boren, Seattle	351	7.7	5.1	6.4	8.3	6.9	20.4	26
Duwamish, 4752 E Marginal Way S, Seattle	342	9.1	5.2	6.5	12.4	8.3	30.5	40
South Park, 8025 10 th Ave S, Seattle	354	10.1	6.6	6.4	10.4	8.4	28.5	40
305 Bellevue Way NE, Bellevue	359	7.9	5.2	4.5	6.4	6.0	15.8	32
42404 SE North Bend Way, North Bend	352	4.1	3.4	6.0	6.8	5.1	14.0	19
James St & Central Ave, Kent	349	12.0	7.3	6.3	10.3	9.0	30.8	48
Port of Tacoma, 2301 Alexander Ave, Tacoma	365	12.7	6.1	6.8	11.0	9.2	33.9	47
7802 South L St, Tacoma	345	12.4	4.4	4.7	11.0	8.1	38.7	58
South Hill, 9616 128 th St E, Puyallup	360	11.3	5.0	5.8	11.2	8.3	32.0	43
Meadowdale, 7252 Blackbird Dr NE, Kitsap Co	361	9.5	5.2	5.8	11.6	8.0	26.9	36
10955 Silverdale Way NW, Silverdale	358	7.9	5.1	5.3	8.1	6.6	19.7	28

Notes

- (1) Sampling occurs continuously for 24 hours each day.
Quarterly averages are shown only if 75 percent or more of the data is available.
- (2) Annual averages are shown only if there are at least three quarterly averages.
- (3) All data values are correlated using site-specific relationships with Federal Reference Method samplers.

Summary of Maximum Observed Concentrations and Values >40

Location	Jan 12	Jan 13	Jan 14	Jan 15	Jan 21	Jan 28	Jan 29	Feb 2	Nov 7	Nov 8	Nov 24	Dec 9
	Fri	Sat	Sun	Mon	Sun	Mon	Fri	Wed	Thu	Sat	Sun	
Darrington HS, 1085 Fir St, Darrington	52	63	56	41	43							
Marysville JHS, 1605 7th St, Marysville			45									46
6120 212th St SW, Lynnwood			43									
17171 Bothell Way NE, Lake Forest Park			47									
Queen Anne Hill, 400 W Garfield St, Seattle									30			
Olive & Boren, Seattle									30			
Duwamish, 4752 E Marginal Way S, Seattle									40			
South Park, 8025 10 th Ave S, Seattle							39					
305 Bellevue Way NE, Bellevue							32					
42404 SE North Bend Way, North Bend												19
James St & Central Ave, Kent							48					
Port of Tacoma, 2301 Alexander Ave, Tacoma				44		44	47			45		
7802 South L St, Tacoma			46	55		55	58	43				
South Hill, 9616 128 th St E, Puyallup			43									
Meadowdale, 7252 Blackbird Dr NE, Kitsap Co												36
10955 Silverdale Way NW, Silverdale							28					

-- Indicates no sample on specified day

Air Quality Index Summary

Location	Unhealthy for Sensitive			
	Good	Moderate	Groups	Unhealthy
Darrington HS, 1085 Fir St, Darrington	310	29	5	
Marysville JHS, 1605 7th St, Marysville	314	45	2	
6120 212th St SW, Lynnwood	312	43	1	
17171 Bothell Way NE, Lake Forest Park	313	46	1	
Queen Anne Hill, 400 W Garfield St, Seattle	326	23		
Olive & Boren, Seattle	335	16		
Duwamish, 4752 E Marginal Way S, Seattle	295	47		
South Park, 8025 10 th Ave S, Seattle	311	43		
305 Bellevue Way NE, Bellevue	350	9		
42404 SE North Bend Way, North Bend	348	4		
James St & Central Ave, Kent	311	37	1	
Port of Tacoma, 2301 Alexander Ave, Tacoma	319	42	4	
7802 South L St, Tacoma	301	39	5	
Meadowdale, 7252 Blackbird Dr NE, Kitsap Co	322	39		
10955 Silverdale Way NW, Silverdale	343	15		

PM_{2.5} Speciation Analytes Monitored in 2007
Average Annual Concentrations in Micrograms per Cubic Meter^a

Analyte	Beacon Hill (101 samples) Average (ug/m3)	Duwamish (55 samples) Average (ug/m3)	Tacoma South L (53 samples) Average (ug/m3)	Average Minimum Detection Level (ug/m3)
Ammonium	4.23E-01	4.57E-01	4.14E-01	
Nitrate	0.81	0.89	0.83	
Potassium	NA	NA	NA	
Sodium	1.50E-01	2.24E-01	1.69E-01	
Sulfate	1.00	1.42	0.98	
Elemental Carbon	0.74	1.30	1.03	
Organic Carbon Blank Adjusted	2.45	3.84	5.39	
Total Carbonaceous Mass	3.19	5.14	6.42	
Soil ^b	0.33	0.84	0.34	
Reconstructed Fine Mass - Urban PM _{2.5} ^c	5.76	8.68	8.99	
Total PM2.5 Mass	8.2	9.8	11.9	
XRF - Aluminum	NA	2.77E-02	NA	1.20E-02
XRF - Antimony	NA	NA	NA	2.89E-02
XRF - Arsenic	NA	9.76E-04	NA	1.27E-03
XRF - Barium	NA	NA	NA	1.48E-02
XRF - Bromine	1.43E-03	2.59E-03	2.20E-03	1.31E-03
XRF - Cadmium	NA	NA	NA	1.31E-02
XRF - Calcium	2.62E-02	1.50E-01	2.26E-02	5.06E-03
XRF - Cerium	NA	NA	NA	1.74E-02
XRF - Cesium	NA	NA	NA	1.94E-02
XRF - Chlorine	5.48E-02	1.14E-01	1.07E-01	6.26E-03
XRF - Chromium	NA	2.21E-03	NA	1.89E-03
XRF - Cobalt	NA	NA	NA	1.11E-03
XRF - Copper	7.74E-03	5.16E-03	3.44E-03	1.40E-03
XRF - Europium	NA	NA	NA	4.51E-03
XRF - Gallium	NA	NA	NA	1.92E-03
XRF - Gold	NA	NA	NA	3.46E-03
XRF - Hafnium	NA	NA	NA	7.38E-03
XRF - Indium	NA	NA	NA	1.42E-02
XRF - Iridium	NA	NA	NA	4.12E-03
XRF - Iron	6.29E-02	1.35E-01	5.81E-02	1.55E-03
XRF - Lanthanum	NA	NA	NA	1.48E-02
XRF - Lead	NA	5.25E-03	NA	3.25E-03
XRF - Magnesium	NA	NA	NA	1.26E-02
XRF - Manganese	6.78E-03	1.38E-02	NA	1.61E-03
XRF - Mercury	NA	NA	NA	4.84E-03
XRF - Molybdenum	NA	NA	NA	5.17E-03
XRF - Nickel	2.50E-03	2.54E-03	1.28E-03	1.11E-03
XRF - Niobium	NA	NA	NA	3.23E-03
XRF - Phosphorus	NA	NA	NA	9.72E-03
XRF - Potassium	4.59E-02	7.91E-02	1.08E-01	5.23E-03

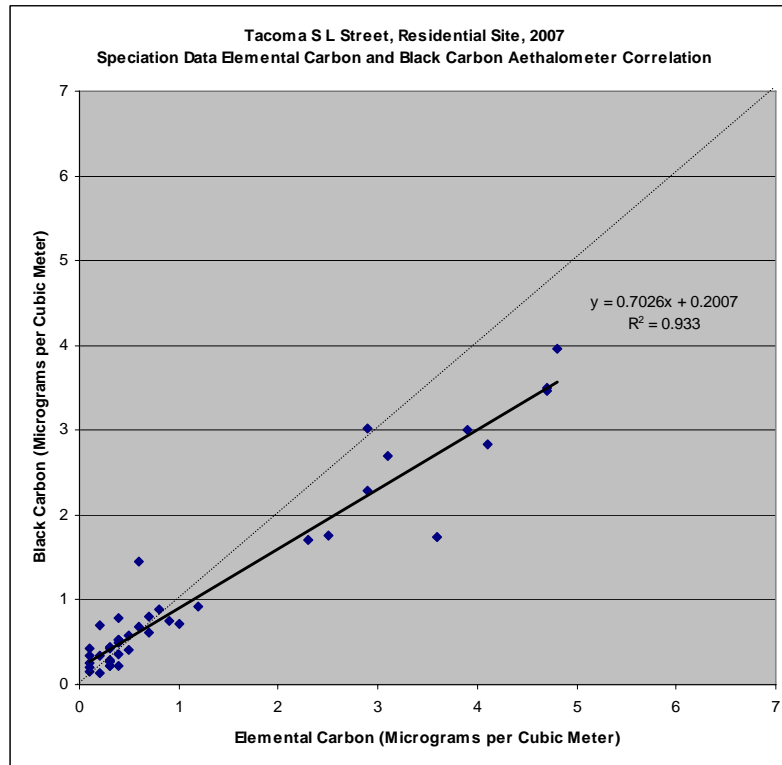
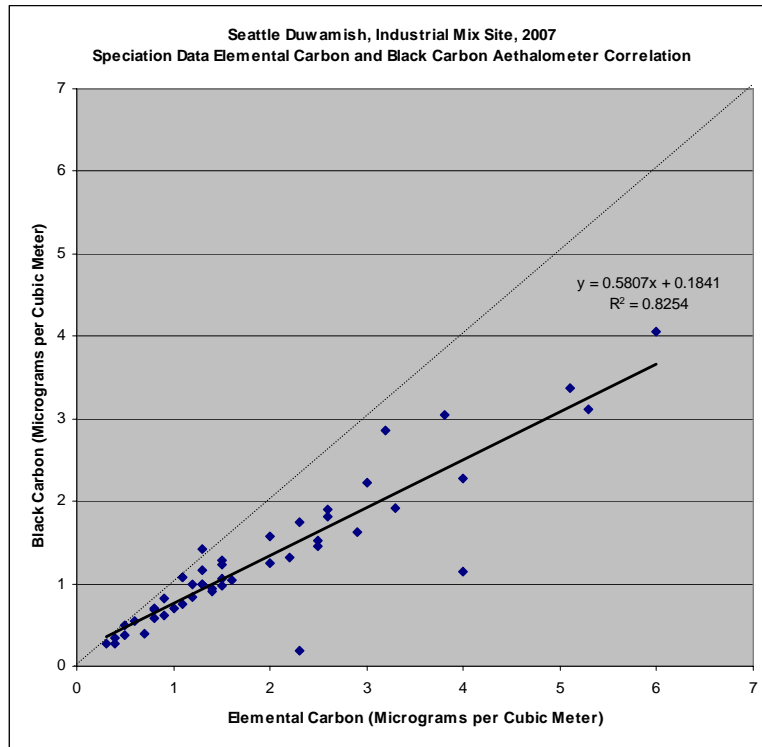
Analyte	Beacon Hill (101 samples) Average (ug/m3)	Duwamish (55 samples) Average (ug/m3)	Tacoma South L (53 samples) Average (ug/m3)	Average Minimum Detection Level (ug/m3)
XRF - Rubidium	NA	NA	NA	1.58E-03
XRF - Samarium	NA	NA	NA	4.45E-03
XRF - Scandium	NA	NA	NA	1.55E-02
XRF - Selenium	NA	NA	NA	1.57E-03
XRF - Silicon	3.97E-02	8.48E-02	5.27E-02	9.32E-03
XRF - Silver	NA	NA	NA	1.05E-02
XRF - Sodium	9.36E-02	1.93E-01	9.67E-02	3.76E-02
XRF - Strontium	NA	NA	NA	1.93E-03
XRF - Sulfur	3.22E-01	4.75E-01	3.25E-01	6.64E-03
XRF - Tantalum	NA	NA	NA	6.09E-03
XRF - Terbium	NA	NA	NA	4.04E-03
XRF - Tin	NA	NA	NA	1.91E-02
XRF - Titanium	NA	4.10E-03	NA	3.85E-03
XRF - Tungsten	NA	NA	NA	4.60E-03
XRF - Vanadium	3.36E-03	8.06E-03	NA	2.61E-03
XRF - Yttrium	NA	NA	NA	2.16E-03
XRF - Zinc	7.93E-03	2.18E-02	1.22E-02	2.04E-03
XRF - Zirconium	NA	NA	NA	3.13E-03

^aNA = Levels below detection or <75% data completeness.

^bSoil calculation = 2.2 * Aluminum + 2.49 * Silicon + 1.63 * Calcium + 2.42 * Iron + 1.94 * Titanium.

^cReconstructed Fine Mass = Ammonium Sulfate Mass + Ammonium Nitrate Mass + Organics Mass + Light Absorbing Carbon Mass (units = $\mu\text{g}/\text{m}^3$).

Aethalometer and Speciation Data Correlations



Note: aethalometer and speciation data are collected at Beacon Hill also; however, there was less than 75% for 2007 so the correlation is not shown in this report.

PM_{2.5} BLACK CARBON
Micrograms per Cubic Meter

Sampling Method: Light Absorption by Aethalometer

2007

Location	Number of Values	Quarterly Arithmetic Averages				Annual Mean	Max Value
		1 st	2 nd	3 rd	4 th		
Darrington HS, 1085 Fir St, Darrington	355	0.8	0.4	0.6	0.8	0.6	3.1
Marysville JHS, 1605 7th St, Marysville	309	1.2	0.8	0.8		1.0	4.4
17171 Bothell Way NE, Lake Forest Park	349	1.3	0.5	0.7	1.6	1.0	4.5
Olive & Boren, Seattle	274	1.9	1.3			1.6	4.4
Duwamish, 4752 E Marginal Way S, Seattle	317		1.2	1.6	2.6	1.9	8.2
7802 South L St, Tacoma	285	1.3	0.4		2.0	1.1	6.6

Notes

- (1) Sampling occurs continuously for 24 hours each day.
Quarterly averages are shown only if 75% or more of the data is available.
- (2) Annual averages are shown only if there are at least three quarterly averages.

Summary of Maximum Observed Concentrations

Location	Jan	Feb	Oct	Nov	Nov
	14 Sun	2 Fri	23 Tue	7 Wed	18 Sun
Darrington HS, 1085 Fir St, Darrington	3.1				
Marysville JHS, 1605 7th St, Marysville		4.4		--	
17171 Bothell Way NE, Lake Forest Park	4.5			--	
Olive & Boren, Seattle				--	4.4
Duwamish, 4752 E Marginal Way S, Seattle			8.2		
7802 South L St, Tacoma				6.6	

-- Indicates no sample on specified day

OZONE 8-HOUR CONCENTRATIONS

(Parts per Million)

2007

Location / Continuous Sampling Period(s)	2007 Six Highest Daily 8-Hour Concentrations		4 th Highest Daily 8-Hour Concentration			3-Year Average of 4 th Highest 8-Hour Concentration
	Value	Date	2005	2006	2007	2005 - 2007
Beacon Hill, 15th S & Charlestown Seattle, Wa 1 Mar-31 Dec	.051 .049 .048 .047 .045 .045	30 May 2 Jun 11 May 15 May 5 May 12 May	.043	.029	.047	.040
20050 SE 56 th Lake Sammamish State Park, Wa 1 May-30 Sep	.064 .061 .060 .059 .058 .053	30 May 11 Jul 2 Jun 3 Jun 4 Jul 10 Jul	.054	.070	.059	.061
42404 SE North Bend Way, North Bend, Wa 1 May-6 Sep	.069 .059 .058 .057 .057 .057	15 Aug 11 Jul 4 Jul 31 May 14 Jul 30 Aug	.061	.067	.057	.062
30525 SE Mud Mountain Road, Enumclaw, Wa 1 May-30 Sep	.090 .078 .070 .068 .067 .064	11 Jul 3 Jun 2 Jun 30 May 4 Jul 10 Jul	.063	.088	.068	.073
Charles L Pack Forest La Grande, Wa 17 May-30 Sep	.085 .068 .067 .064 .062 .061	11 Jul 30 May 31 May 4 Jul 10 Jul 2 Jun	.061	.080	.064	.068
931 Northern Pacific Rd SE, Yelm, Wa 1 May-30 Sep	.069 .060 .059 .055 .054 .053	30 May 31 May 2 Jun 11 Jul 11 Sep 15 Aug	.059	.068	.055	.061

Notes

- (1) All ozone stations are operated by the Washington State Department of Ecology.
- (2) Ending times are reported in Pacific Standard Time.
- (3) For equal concentration values the date and time refer to the earliest occurrences.
- (4) Continuous sampling periods are those with fewer than 10 consecutive days of missing data.
- (5) At all stations ozone was measured using the continuous ultraviolet photometric detection method.

REACTIVE NITROGEN
(Parts per Million)
2007

Monthly and Annual Arithmetic Averages

Location	Monthly Arithmetic Averages							No of 1 Hour Samples	Year Arith Mean
	Jan	Feb Aug	Mar Sep	Apr Oct	May Nov	Jun Dec	Jul		
Beacon Hill, 15th S & Charlestown, Seattle		.014	.016 .016	.015 .017	.013 .020	.012 .017	.013	7472	.015

Maximum and Second Highest Concentrations

Location / Continuous Sampling Period(s)	1 Hour Average		
	Value	Date	End Time
Beacon Hill, 15th S & Charlestown, Seattle 13 Feb - 31 Dec	.080	29 Mar	2000
	.076	29 Mar	1900

Notes

- (1) Ending times are reported in Pacific Standard Time.
- (2) For equal concentration values the date and time refer to the earliest occurrences.
- (3) Continuous sampling periods are those with fewer than 10 consecutive days of missing data.
- (4) At all stations nitrogen dioxide was measured using the continuous chemiluminescence method.

CARBON MONOXIDE

(Parts per Million)

2007

Location / Continuous Sampling Period(s)	Six Highest Concentrations						Number of 8 Hour Averages Exceedin g 9 ppm	Number of Days 8 Hour Average Exceeded 9 ppm
	1 Hour Average			8 Hour Average				
	Value	Date	End	Value	Date	Date		
Time								
2421 148th Ave NE Bellevue 1 Jan-31 Dec	3.9	2 Feb	2000	2.7	29 Jan		0	0
	3.5	29 Jan	1800	2.6	2 Feb			
	3.4	15 Jan	1800	2.3	1 Feb			
	3.4	29 Jan	1900	2.3	8 Dec			
	3.3	31 Jan	0800	2.1	15 Jan			
	3.2	1 Feb	1900	2.0	31 Jan			
Beacon Hill, 15th S and Charlestown Seattle 2 Feb-31 Dec	1.4	6 Apr	0700	1.0	7 Nov		0	0
	1.4	11 Sep	0800	1.0	11 Sep			
	1.3	7 Nov	1800	0.9	7 Feb			
	1.3	11 Sep	0600	0.9	23 Oct			
	1.3	7 Feb	1900	0.9	6 Nov			
	1.2	23 Oct	0900	0.8	11 Dec			

Notes

- (1) All carbon monoxide stations are operated by the Washington State Department of Ecology.
- (2) Ending times are reported in Pacific Standard Time.
- (3) For equal concentration values the date and time refer to the earliest occurrences.
- (4) Continuous sampling periods are those with fewer than 10 consecutive days of missing data.
- (5) At all stations carbon monoxide was measured using the continuous nondispersive infrared method.

SULFUR DIOXIDE
(Parts per Million)
2007

Monthly and Annual Arithmetic Averages

Location	Monthly Arithmetic Averages							No of 1 Hour Samples	Year Arith Mean
	Jan	Feb Aug	Mar Sep	Apr Oct	May Nov	Jun Dec	Jul		
Beacon Hill, 15th S & Charlestown, Seattle		.001	.002	.001 .001	.001 .002	.001 .001	.002	5983	.001

Maximum and Second Highest Concentrations for Various Averaging Periods

Location / Continuous Sampling Periods(s)	1 Hour Average			24 Hour Average	
	Value	Date	End Time	Value	Date
Beacon Hill, 15th S & Charlestown, Seattle 10 Apr-31 Dec	.039	14 Sept	0800	.007	11 Sept
	.031	11 Sept	1000	.006	17 July

Notes

- (1) Ending times are reported in Pacific Standard Time.
- (2) For equal concentration values the date and time refer to the earliest occurrences.
- (3) Continuous sampling periods are those with fewer than 10 consecutive days of missing data.
- (4) Sulfur dioxide was measured using the continuous ultraviolet fluorescence method.

2007 Beacon Hill Air Toxics Statistical Summary for Air Toxics Gases (units in parts per billion)

	benzene	1,3-butadiene	carbon tetrachloride	chloroform	dichloromethane	tetrachloroethylene	trichloroethylene	acrolein
2007 count	60	60	60	60	60	60	60	60
NDs (reported as 0)	0	0	0	2	0	3	37	2
Median (ppb)	0.193	0.030	0.104	0.024	0.096	0.017	0.000	0.137
Mean (ppb)	0.249	0.040	0.110	0.026	0.113	0.023	0.008	0.161
95%tile (ppb)	0.572	0.110	0.150	0.042	0.242	0.051	0.036	0.351
Max (ppb)	0.847	0.149	0.155	0.054	0.370	0.084	0.059	0.390
MDL (ppb)	0.024	0.018	0.015	0.017	0.015	0.011	0.018	0.025
# below MDL	0	10	0	3	0	13	49	2
% below MDL	0%	17%	0%	5%	0%	22%	82%	3%

NDs – nondetects – reported as “0” in dataset.

MDL – minimum detection limit provided by laboratory. Concentrations provided below this value are estimates.

Trichloroethylene is shaded because greater than 75% of its samples were below limits of detection. Statistics are shown, but a graph in the main text is not presented because of the level of uncertainty in quantification.

100% of samples were below detection for vinyl chloride and 1-2 dichloropropane. The health screening values (cancer and non-cancer) for vinyl chloride are well above the detection limit, so it is unlikely that vinyl chloride concentrations pose any health risk. No health screening values are available for 1-2 dichloropropane. Cancer screening values are concentrations set at a potential risk of 1 in a million.

2007 Beacon Hill Air Toxics Statistical Summary for PM₁₀ Metals (units in nanograms per cubic meter)

	Arsenic	Cadmium	Chromium	Cr+6 TSP	Lead	Manganese	Nickel
2007 count	57	57	57	59	57	57	57
NDs (reported as 0)	0	0	0	0	0	0	0
Median (ng/m3)	0.591	0.087	3.770	0.029	3.195	7.195	1.380
Mean (ng/m3)	0.768	0.126	3.948	0.046	4.224	13.353	2.167
95%tile (ng/m3)	1.738	0.292	6.722	0.124	9.628	41.960	6.448
Max (ng/m3)	2.770	0.480	8.010	0.206	13.100	91.700	7.160
MDL (ng/m3)	0.009	0.008	0.142	0.0074	0.018	0.016	0.088
# below MDL	0	0	0	8	0	0	0
% below MDL	0%	0%	0%	14%	0%	0%	0%

100% of samples were below detection limit for beryllium. The health screening values (cancer and non-cancer) for beryllium are well above the detection limit, so it is unlikely that beryllium concentrations pose any health risk. Cancer screening values are concentrations set at a potential risk of 1 in a million.

2007 Beacon Hill Potential Cancer Risk Estimates per 1,000,000 – 95th Percentile
 Percentage of samples greater than cancer screen value

AIR TOXIC	RISK BASED ON 95 TH PERCENTILE CONCENTRATIONS	RISK BASED ON 95 TH PERCENTILE CONCENTRATIONS	RANGE	% OF SAMPLES> IRIS SCREEN	% OF SAMPLES> OEHHA SCREEN
	IRIS	OEHHA			
Benzene	14	53	14-53	100%	100%
1,3-Butadiene	7	42	7-42	20%	98%
Carbon Tetrachloride	15	41	15-41	100%	100%
Formaldehyde	26	12	12-26	100%	98%
Chromium 6 (M)	2	19	2-19	19%	88%
Arsenic (M)	8	6	6-8	100%	96%
Chloroform	5	1	1-5	43%	8%
Acetaldehyde	4	5	4-5	100%	85%
Nickel (M)	3	2	2-3	33%	14%
Tetrachloroethylene	na	2	2	NA	28%
Trichloroethylene	na	<1	<1	NA	0%
Cadmium (M)	<1	1	<1-1	0%	11%
Lead (M)	na	<1	<1	NA	0%
Beryllium (M)	<1	<1	<1	0%	0%
Dichloromethane	<1	1	<1-1	0%	3%
Vinyl chloride	<1	<1	<1	0%	0%

Shaded air toxics have >75% of samples with estimated concentrations (values below the reported laboratory detection limit).

Screening value used is concentration equivalent to an estimated 1 in a million potential cancer risk.

Non-cancer Reference Concentrations (RfC) and Hazard Indices

Air Toxic	Non-Cancer Chronic RfC OEHHA (ug/m3)	Mean Hazard Index
Benzene	60	0.013
1,3-butadiene	20	0.004
Carbon tetrachloride	40	0.018
Chloroform	300	0.000
Dichloromethane	400	0.001
Tetrachloroethylene	35	0.004
Trichloroethylene	600	0.000
Acrolein	0.06	14.436
Acetaldehyde	9	0.102
Formaldehyde	3	0.305
Arsenic PM10 (M)	0.03	0.026
Beryllium PM10 (M)	0.007	0.000
Cadmium PM10(M)	0.02	0.006
Cr+6 TSP (M)	0.2	0.000
Lead PM10 (M)	na	na
Manganese PM10 (M)	0.2	0.067
Nickel PM10(M)	0.05	0.043