Exhibit 3-6
24-hour Average PM_{10} Concentrations at Holnam Ada
(Half-pile and Paved Road Scenario)

*	ISCST3	(95250)	Holnam	Ada	Facility	(no	bulldozing)	pile/2,	OK	-1991													
*	MODELIN	OPTIONS	USED											SOURCE									
*	CONC	RURAL	FLAT	DFAULT										ABOVE 150 ug/m3 - INSIDE FACILITY									
*	PLOT	FILE	OF	HIGH	1ST	HIGH	24-HR	VALUES	FOR	SOURCE	GROUP	ALL		ABOVE 150 ug/m3 - OUTSIDE FACILITY									
*	FOR	A	TOTAL	OF	780	RECEPTORS																	
*	FORMAT	(3(1X,F13 5),1X,F8 2,3X,A5,2X,A8,2X,A4,6X,A8)																					
*	X	Y	AVERAG	CONC	ZELEV	AVE	GRP	HIVAL	NET	ID													
*	704450	704550	704650	704750	704850	704950	705050	705150	705250	705350	705450	705550	705650	705750	705850	705950	706050	706250	706350	706450	706553	706600	706700
3841185	20.89	23.99	26.57	29	32.02	43.36	56	67.25	63.75	74.93	78.35	76.98	78.24	70.72	65.14	53.99	43.96	32.55	25.85	23.78	23.11	22.53	21.35
3841085	20.53	22.73	26.34	29.41	32.51	39.17	52.36	68.5	77.51	80.29	89.68	90.98	87.61	80.81	74.78	62.63	47.79	32.06	28.77	27.42	24.95	23.99	21.99
3840985	20.76	22.87	24.8	29.04	32.78	36.87	47.97	64.91	85.28	86.63	104.23	108.66	100.3	93.61	87.5	74.34	50.69	34.56	33.5	29.28			
3840885	18.99	22.02	24.83	27.36	32.31	36.9	42.51	59.73	84.46	109.11	125.46	132.19	122.79	113.65	107.8	90.94	60.07	40.75			27.79	25.14	21.62
3840785	17.69	19.73	23.38	27.11	30.73	36.79	42.54	53.69	77.71	117.73	157.91	170.27	164.94	149.7	144.75	118.76	72.5			29.16	26.11	24.62	19.8
3840685	16.82	18.85	20.81	24.85	29.92	34.98	42.85	50.88	71.31	110.87	266.65	380.11	379.35	365.27	334.35	285		43.83	33.55	28.73	24.37	21.49	18.47
3840585	15.13	17.79	20.51	23.22	26.64	33.42	40.08	52.76	68.16	102.91	264.67	373.39	369.44	361.83			85.9	39.97	31.64	28.09	21.5	20.4	18.35
3840485	14.62	15.58	18.71	22.32	26.11	29.97	37.77	47.63	66.71	93.12	253	366.84	362.59				82.94	41.22	33.04	24.06	21.73	20.05	19.72
3840385	15.58	16.79	18.38	20.4	23.91	29.32	35.26	43.5	61.66	92.86	253.79						79.15	41.2	28.54	24.86	23.42	22.82	19.31
3840285	17.64	18.98	20.51	22.6	25.5	29.27	35.02	44.07	61.74	93.92							78.02	37.52	29.57	28.92	23.68	20.97	15.04
3840185	18.53	20.3	22.62	25.42	28.39	31.98	37.68	44.94	62.13	90.57							87.86	41.52	36.76	25.66	18.35	19.48	19.99
3840085	21.28	23.08	24.87	26.77	29.72	33.98	39.26	46.5	63.2	86.91											19.4	16.76	13.42
3839985	20.12	22.37	25	28.14	31.98	36.78	42.94	51.16	62.52	87.94											17.71	16.48	14.32
3839885	18.99	20.96	23.14	25.73	29.04	33.41	39.48	48.06	60.46	82.31											19.09	17.8	15.5
3839785	18.75	20.42	22.42	24.99	28.43	33.09	39.3	47.35	57.88	77.87											20.64	19.22	16.7
3839685	20.26	21.68	23.17	24.84	26.89	29.61	33.31	38.53	46.83	69.64											22.21	21.06	18.66
3839585	18.72	19.7	20.77	21.88	22.93	25.33	29.63	35.28	48.82	56.12	71.11	98.8	108.92	117.68	133.36	140.84	76.13	44.83	30.42	27.5	27.22	24.63	19.32
3839485	14.98	16.33	17.89	19.99	22.8	25.88	33.07	36.75	40.65	44.39	55.16	74.93	81.75	93.05	100.14	100.39	72.61	42.11	33.11	27.95	21.77	21.08	21.02
3839385	15.42	16.77	18.39	20.75	25.42	28.42	28.39	31.8	32.74	40.09	47.76	62.18	67.55	74.11	80.42	82.52	78.06	34.08	33.23	26.62	25.31	22.4	18.01
3839285	15.89	17.76	20.96	23.29	21.8	24.38	25.88	25.71	30.6	35.81	40.44	53.97	57.51	61.47	66.46	68.48	68.62	33.85	27.94	26.95	22.65	22.46	20.99
3839185	17.87	19.73	18.08	19.67	21.17	21.64	20.98	24.34	29.02	32.26	35.97	47.98	51.49	51.8	55.99	57.96	55.42	34.16	22.93	23.31	22.37	21.35	19.61
3839085	16.21	16.57	17.79	18.51	18.42	17.6	19.79	24.19	27.09	29.65	33.14	43.29	47.32	43.58	47.91	49.87	48.68	35.37	25.74	18.52	19.61	19.44	18.71
3838985	15.4	16.09	16.28	15.86	15.05	16.2	20.35	23.41	25.45	27.39	30.9	39.51	42.6	37.17	41.76	43.38	44.31	37.07	26.17	18.58	15.51	16.14	16.76
3838885	14.56	14.39	13.8	13.05	13.25	17.1	20.3	22.47	23.99	25.4	29	36.58	38.1	33.73	36.55	38.38	40.27	38.63	27.49	19.9	15.2	13.46	13.97
3838785	12.79	12.11	11.42	10.96	14.28	17.51	19.98	21.55	22.6	23.55	27.29	34.23	34.35	30.93	32.01	34.27	36.59	38.65	28.92	20.6	15.56	14.21	11.58
3838685	10.72	10.09	9.74	11.87	14.95	17.61	19.55	20.55	21.3	21.65	25.78	31.92	31.14	28.51	28.07	30.65	33.36	36.27	30.2	21.84	15.6	14.43	11.86

Exhibit 3-7
Annual Average PM_{10} Concentrations at Holnam Ada
(Half-pile and Paved Road Scenario)

*	ISCST3	(95250)	Holnam	Ada	Facility	(no	bulldozing)	pile/2,	OK	-1991													
*	MODELIN	OPTIONS	USED																				
*	CONC	RURAL	FLAT	DFAULT										SOURCE									
*	PLOT	FILE	OF	ANNUAL	VALUES	FOR	SOURCE	GROUP	ALL					ABOVE 50 ug/m3 - INSIDE FACILITY									
*	FOR	A	TOTAL	OF	780	RECEPTORS								ABOVE 50 ug/m3 - OUTSIDE FACILITY									
*	FORMAT	(3(1X,F13 5),1X,F8 2,2X,A6,2X,A8,2X,18 2X,A8)																					
*	X	Y	AVERAG	CONC	ZELEV	AVE	GRP	NUM	HRS	NET	ID												
*	704450	704550	704650	704750	704850	704950	705050	705150	705250	705350	705450	705550	705650	705750	705850	705950	706050	706250	706350	706450	706553	706600	706700
3841185	2.21	2.64	3.18	3.87	4.76	5.93	7.44	9.4	12.03	14.99	17.22	18.27	17.68	15.59	12.47	9.34	6.86	4.02	3.31	2.85	2.51	2.4	2.18
3841085	2.13	2.52	3.05	3.74	4.66	5.89	7.56	9.79	12.89	16.86	20.26	21.99	21.58	19.12	15.13	10.87	7.64	4.36	3.6	3.13	2.88	2.86	3.06
3840985	2.05	2.42	2.92	3.59	4.5	5.77	7.55	10.07	13.74	18.95	24.37	27.16	27.08	24.25	19.11	12.97	8.6	4.78	4.01	3.67			
3840885	1.94	2.3	2.78	3.43	4.32	5.56	7.42	10.16	14.4	21.21	30.28	35.02	35.41	32.34	25.72	16.13	9.78	5.4			4.4	3.18	2.18
3840785	1.85	2.19	2.65	3.26	4.11	5.32	7.16	10.02	14.73	23.31	40.15	49.23	50.39	47.28	39.05	21.79	11.34			3.68	2.7	2.41	1.88
3840685	1.75	2.07	2.49	3.08	3.91	5.09	6.86	9.74	14.68	24.58	72.93	131.03	132.87	129.95	120.64	72.04		5.96	4.04	3.07	2.4	2.16	1.72
3840585	1.6	1.91	2.31	2.84	3.6	4.75	6.47	9.3	14.39	25.25	85.88	167.62	170.18	167.67			13.93	5.05	3.68	2.84	2.21	1.98	1.61
3840485	1.48	1.76	2.14	2.66	3.4	4.47	6.2	9.03	14.17	25.43	88.33	171.84	175.7				13.36	4.87	3.56	2.67	2.07	1.86	1.49
3840385	1.43	1.68	2.04	2.52	3.21	4.26	5.9	8.63	13.7	24.8	94.81						13.62	4.9	3.43	2.57	1.96	1.77	1.42
3840285	1.4	1.65	1.97	2.43	3.07	4.02	5.53	8.11	12.82	23.72							13.75	4.81	3.37	2.48	1.88	1.67	1.34
3840185	1.38	1.61	1.92	2.34	2.95	3.84	5.17	7.42	11.71	21.98							13.55	4.7	3.29	2.39	1.79	1.59	1.27
3840085	1.39	1.62	1.91	2.3	2.82	3.59	4.77	6.72	10.47	19.65											1.74	1.55	1.24
3839985	1.39	1.61	1.89	2.26	2.74	3.41	4.4	6.01	9.07	17.04											1.7	1.53	1.23
3839885	1.39	1.6	1.86	2.18	2.61	3.2	4.02	5.32	7.78	14.09											1.67	1.5	1.22
3839785	1.37	1.56	1.8	2.11	2.5	3.01	3.73	4.84	6.8	11.32											1.63	1.48	1.22
3839685	1.37	1.56	1.78	2.05	2.39	2.85	3.48	4.44	6.03	9.28											1.66	1.52	1.27
3839585	1.39	1.56	1.78	2.03	2.34	2.73	3.29	4.11	5.4	7.51	11.91	16.61	18.19	18.92	18.16	13.3	7.56	3.6	2.66	2.08	1.68	1.53	1.26
3839485	1.39	1.54	1.72	1.93	2.19	2.52	2.98	3.58	4.49	5.96	8.38	10.94	12.2	12.79	12.12	9.63	6.52	3.36	2.62	2.08	1.68	1.55	1.32
3839385	1.33	1.47	1.62	1.8	2.01	2.27	2.6	3.08	3.78	4.93	6.51	8.15	9.24	9.59	9.01	7.57	5.61	3.09	2.47	2.01	1.67	1.54	1.3
3839285	1.27	1.38	1.51	1.65	1.8	2	2.28	2.67	3.28	4.22	5.29	6.52	7.35	7.57	7.11	6.16	4.77	2.86	2.3	1.91	1.61	1.5	1.3
3839185	1.2	1.29	1.38	1.48	1.61	1.78	2.01	2.37	2.93	3.67	4.5	5.44	6.02	6.16	5.83	5.16	4.14	2.62	2.15	1.79	1.52	1.42	1.26
3839085	1.11	1.17	1.25	1.33	1.44	1.59	1.81	2.16	2.66	3.25	3.91	4.64	5.07	5.14	4.91	4.43	3.68	2.45	2.02	1.69	1.44	1.35	1.19
3838985	1.02	1.07	1.13	1.2	1.3	1.45	1.67	2	2.43	2.94	3.47	4.02	4.33	4.37	4.21	3.87	3.31	2.34	1.89	1.6	1.35	1.27	1.13
3838885	0.93	0.98	1.03	1.09	1.19	1.34	1.57	1.87	2.26	2.68	3.1	3.52	3.76	3.78	3.67	3.42	2.99	2.19	1.8	1.52	1.29	1.2	1.06
3838785	0.85	0.89	0.94	1	1.11	1.26	1.48	1.76	2.11	2.46	2.8	3.12	3.3	3.32	3.23	3.05	2.71	2.04	1.76	1.45	1.24	1.16	1.01
3838685	0.78	0.82	0.86	0.93	1.05	1.2	1.41	1.68	1.98	2.27	2.53	2.79	2.93	2.96	2.88	2.74	2.47	1.9	1.68	1.41	1.2	1.12	0.97

Exhibit 3-8
24-hour Average PM_{10} Concentrations at Holnam Ada
(Half-pile and Unpaved Road Scenario)

*	ISCST3	(95250)	Holnam	Ada	Facility	(no	bulldozing)	pile/2,	roadx7,	OK	-1991												
*	MODELIN	OPTIONS	USED											SOURCE									
*	CONC	RURAL	FLAT	DFAULT										ABOVE 150 ug/m3 - INSIDE FACILITY									
*	PLOT	FILE	OF	HIGH	1ST	HIGH	24-HR	VALUES	FOR	SOURCE	GROUP	ALL		ABOVE 150 ug/m3 - OUTSIDE FACILITY									
*	FOR	A	TOTAL	OF	780	RECEPTORS																	
*	FORMAT	(3(1X,F13 5),1X,F8.2,3X,A5,2X,A8,2X,A4,6X,A8)																					
*	X	Y	AVERAG	CONC	ZELEV	AVE	GRP	HIVAL	NET	ID													
*	704450	704550	704650	704750	704850	704950	705050	705150	705250	705350	705450	705550	705650	705750	705850	705950	706050	706250	706350	706450	706553	706600	706700
3841185	21.22	24.35	26.98	29.46	32.02	43.36	56	67.25	63.76	76.37	80.56	79.27	80.6	73.22	65.8	55.18	46.71	36.65	29.38	28.34	25.45	25.08	25.64
3841085	20.53	23.08	26.74	29.86	33.04	39.17	52.36	68.5	77.51	81.84	92.21	93.51	90.29	83.63	75.69	64.1	51.05	37.11	33.93	30.29	29.8	30.83	39.59
3840985	20.76	22.88	25.19	29.5	33.3	37.52	47.97	64.91	85.29	87.03	106.62	111.45	102.35	96.88	89.24	76.35	55.34	40.45	37.45	36.9			
3840885	19.3	22.02	24.83	27.77	32.84	37.53	44.43	59.73	84.46	109.14	127.55	135.29	126.49	116.76	112.48	93.91	63.15	46.56			122.4	71.45	38.53
3840785	18.7	20.69	23.38	27.12	31.26	37.44	43.35	55.67	77.71	117.76	160.42	173.77	167.48	153.85	150.81	123.68	79.21			60.52	38.18	31.12	23.83
3840685	17.44	19.72	22.12	24.85	29.92	35.62	43.7	53.16	72.33	110.89	268.02	382.74	382.86	369.74	340.26	294.94		76.25	45.24	34.98	27.26	24.85	21.34
3840585	15.55	18.33	21.26	24.37	27.89	33.42	40.85	52.76	69.55	102.91	267.02	376.99	374.83	369.59			109.05	45.44	35.74	30.63	24.43	23.28	20.18
3840485	14.87	15.89	19.14	22.91	27.07	31.77	37.77	49.69	67.73	102.07	258	373.15	383.8				84.72	44.55	35.29	26.35	23.53	22.52	20.96
3840385	16.12	17.46	19.2	21.4	24.34	29.94	36.45	46.45	64.92	102.45	526.77						83.31	43.42	30.44	26.52	25.54	24.71	20.21
3840285	18.58	20.09	21.84	24.21	27.5	32.12	40.51	52.79	73.9	118.55							81.84	39.13	31.73	30.89	25.4	22.46	15.74
3840185	19.96	22.02	24.73	28.08	31.83	36.19	42.73	55.62	75.57	106.35							90.79	43.5	38.58	27.34	19.36	20.47	20.91
3840085	23.27	25.41	27.65	30.2	33.73	39.29	46.83	53.8	68.03	91.85											20.31	17.64	14.48
3839985	22.33	25.03	28.39	32.56	37.31	41.87	46.23	53.14	66.22	87.97											19.19	17.93	15.69
3839885	21.64	24.29	27.05	29.62	31.96	34.91	40.56	50.33	63.27	83.87											20.39	19.08	16.73
3839785	19.55	20.94	22.68	25.08	28.44	33.09	39.31	47.35	57.88	79.64											21.77	20.33	17.79
3839685	20.51	21.79	23.21	24.89	26.89	29.61	33.31	38.53	48.92	74.79											23.16	22.01	19.61
3839585	18.77	21.53	22.8	22.7	22.93	26.04	30.46	36.42	49.29	56.21	75.91	100.64	110.61	119.62	134.78	142.73	77.94	45.69	31.33	28.23	27.99	25.41	20.12
3839485	20.45	21.14	20.87	20.71	22.88	25.91	33.27	37.08	40.74	50.41	59.86	76.45	83.26	94.79	101.77	101.98	74.3	42.78	33.86	28.75	22.38	21.71	21.69
3839385	19.79	19.45	19.3	20.78	25.47	28.55	28.66	31.89	36.29	45.84	49.78	63.47	68.91	75.35	81.92	83.98	79.65	34.63	33.84	27.29	26.03	23.14	18.78
3839285	18.35	18.24	20.98	23.33	22.37	24.63	25.98	28.78	35.14	41.33	43.37	55.09	58.72	62.62	67.83	69.82	70.13	35.26	28.45	27.5	23.26	23.09	21.65
3839185	17.87	19.74	18.82	20.2	21.41	21.73	23.58	28.61	33.46	37.61	39.12	48.97	52.59	52.87	57.23	59.2	56.85	35.51	25.15	23.79	22.88	21.88	20.18
3839085	16.85	17.51	18.29	18.74	18.51	19.04	24.07	28.24	31.5	34.88	35.62	44.18	48.31	44.57	49	51.01	49.83	36.65	26.96	20.12	20.05	19.9	19.2
3838985	16.26	16.56	16.51	15.96	15.12	20.16	24.39	27.34	29.87	32.53	32.6	40.32	43.5	38.75	42.71	44.44	45.38	38.3	27.33	20.5	16.27	16.55	17.19
3838885	15	14.61	13.89	13.08	16.54	21.02	24.17	26.36	28.43	30.47	29.69	37.32	38.92	35.31	37.39	39.34	41.26	39.8	28.59	20.9	17.03	15.33	14.35
3838785	13	12.21	11.46	13.41	17.76	21.33	23.75	25.43	27.06	28.53	27.94	34.92	35.1	32.44	32.74	35.14	37.52	39.77	29.98	21.56	17.23	15.93	12.84
3838685	10.81	10.12	10.93	14.7	18.51	21.35	23.26	24.46	25.77	26.55	26.38	32.56	31.84	29.97	28.73	31.43	34.22	37.34	31.2	22.76	16.95	15.99	13.52

Exhibit 3-9
Annual Average PM_{10} Concentrations at Holnam Ada
(Half-pile and Unpaved Road Scenario)

*	ISCST3	(95250)	Holnam	Ada	Facility	(no	bulldozing)	pile/2,	roadx7,	OK	-1991												
*	MODELIN	OPTIONS	USED																				
*	CONC	RURAL	FLAT	DFAULT										SOURCE									
*	PLOT	FILE	OF	ANNUAL	VALUES	FOR	SOURCE	GROUP	ALL					ABOVE 50 ug/m3 - INSIDE FACILITY									
*	FOR	A	TOTAL	OF	780	RECEPTORS								ABOVE 50 ug/m3 - OUTSIDE FACILITY									
*	FORMAT	(3(1X,F13 5),1X,F8 2,2X,A6,2X,A8,2X,I8,2X,A8)																					
*	X	Y	AVERAG	CONC	ZELEV	AVE	GRP	NUM	HRS	NET	ID												
*	704450	704550	704650	704750	704850	704950	705050	705150	705250	705350	705450	705550	705650	705750	705850	705950	706050	706250	706350	706450	706553	706600	706700
3841185	2.29	2.73	3.3	4.01	4.93	6.14	7.69	9.72	12.43	15.51	17.89	19.07	18.63	16.69	13.72	10.76	8.45	6.04	5.6	5.47	5.58	5.69	5.64
3841085	2.21	2.61	3.16	3.88	4.83	6.11	7.82	10.13	13.33	17.44	21.02	22.92	22.69	20.42	16.63	12.58	9.59	6.96	6.69	6.92	7.84	8.64	11.67
3840985	2.12	2.51	3.02	3.72	4.66	5.98	7.82	10.42	14.22	19.6	25.25	28.26	28.42	25.82	20.95	15.11	11.09	8.41	8.7	10.28	[redacted]	[redacted]	[redacted]
3840885	2.01	2.39	2.88	3.55	4.47	5.77	7.7	10.53	14.92	21.96	31.34	36.35	37.06	34.32	28.07	18.94	13.22	11.42	[redacted]	[redacted]	18.06	10.55	5.5
3840785	1.92	2.27	2.75	3.38	4.27	5.52	7.44	10.42	15.3	24.18	41.46	50.9	52.5	49.87	42.25	25.87	16.84	[redacted]	[redacted]	9.97	6.1	5.16	3.58
3840685	1.82	2.15	2.59	3.2	4.06	5.28	7.13	10.16	15.31	25.61	74.66	133.26	135.74	133.67	125.64	79.42	[redacted]	14.03	8.11	5.75	4.32	3.81	2.84
3840585	1.67	1.99	2.41	2.96	3.75	4.94	6.73	9.7	15.09	26.51	88.45	170.85	174.58	174.16	[redacted]	[redacted]	24.89	8.07	5.87	4.52	3.52	3.13	2.45
3840485	1.55	1.85	2.24	2.78	3.54	4.66	6.45	9.41	14.88	27.08	93.45	176.99	184.85	[redacted]	[redacted]	[redacted]	16.75	6.71	5.04	3.89	3.06	2.74	2.16
3840385	1.5	1.77	2.13	2.64	3.36	4.45	6.15	9	14.36	26.65	139.78	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	15.6	6.23	4.55	3.52	2.74	2.48	1.98
3840285	1.47	1.73	2.08	2.55	3.23	4.22	5.8	8.52	13.57	25.8	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	15.14	5.84	4.27	3.25	2.52	2.27	1.81
3840185	1.46	1.7	2.03	2.48	3.13	4.08	5.52	7.97	12.65	23.84	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	14.62	5.54	4.04	3.04	2.33	2.09	1.69
3840085	1.48	1.73	2.05	2.47	3.05	3.89	5.19	7.31	11.26	20.72	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	2.21	1.99	1.61
3839985	1.5	1.74	2.06	2.46	3	3.74	4.81	6.47	9.56	17.81	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	2.12	1.92	1.56
3839885	1.52	1.75	2.04	2.4	2.87	3.5	4.34	5.64	8.17	14.68	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	2.04	1.85	1.52
3839785	1.51	1.72	1.99	2.32	2.73	3.25	3.96	5.09	7.14	11.79	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	1.97	1.8	1.49
3839685	1.51	1.72	1.96	2.24	2.58	3.03	3.67	4.66	6.33	9.68	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	1.97	1.81	1.52
3839585	1.53	1.72	1.93	2.18	2.48	2.88	3.45	4.31	5.66	7.84	12.3	17.06	18.65	19.39	18.62	13.74	7.97	3.96	3	2.39	1.96	1.79	1.5
3839485	1.52	1.67	1.85	2.06	2.32	2.65	3.12	3.77	4.73	6.25	8.72	11.32	12.6	13.2	12.52	10.02	6.89	3.69	2.92	2.36	1.94	1.79	1.54
3839385	1.44	1.58	1.73	1.9	2.12	2.38	2.74	3.25	4	5.19	6.81	8.48	9.59	9.95	9.37	7.92	5.95	3.39	2.75	2.27	1.91	1.77	1.51
3839285	1.36	1.47	1.6	1.74	1.9	2.11	2.41	2.83	3.48	4.46	5.56	6.82	7.66	7.89	7.44	6.48	5.08	3.14	2.56	2.15	1.83	1.71	1.49
3839185	1.28	1.37	1.46	1.56	1.7	1.88	2.14	2.52	3.11	3.88	4.74	5.7	6.31	6.46	6.13	5.46	4.42	2.88	2.39	2.01	1.72	1.61	1.44
3839085	1.18	1.24	1.32	1.41	1.53	1.7	1.94	2.31	2.83	3.45	4.13	4.88	5.33	5.41	5.18	4.7	3.93	2.69	2.24	1.89	1.63	1.53	1.36
3838985	1.08	1.13	1.2	1.28	1.39	1.55	1.79	2.14	2.59	3.12	3.67	4.24	4.57	4.61	4.46	4.11	3.55	2.56	2.1	1.8	1.53	1.44	1.29
3838885	0.99	1.04	1.09	1.16	1.28	1.44	1.68	2	2.41	2.85	3.29	3.72	3.98	4	3.89	3.64	3.21	2.4	2	1.71	1.46	1.37	1.21
3838785	0.91	0.95	1	1.08	1.19	1.36	1.59	1.89	2.25	2.62	2.97	3.31	3.5	3.53	3.44	3.26	2.92	2.23	1.94	1.63	1.4	1.31	1.15
3838685	0.83	0.87	0.92	1	1.13	1.29	1.51	1.8	2.11	2.42	2.7	2.97	3.12	3.15	3.08	2.93	2.66	2.08	1.86	1.57	1.35	1.27	1.11

Exhibit 3-10
24-hour Average PM_{10} Concentrations at Signal Mountain Chattanooga

	648500	649000	649500	650000	650100	650200	650300	650400	650500	650600	650700	650800	650900	651000	651100	651200	651300	651400	651500	651600	651700	651800	651900	652000	652100	652200	652300	652400	652500	653000	653500	654000
3887200	1.07	1.65	1.6	2.14	2.13	1.97	2.07	2.42	2.96	3.6	4.29	4.99	5.62	6.48	8.02	9.57	10.94	11.9	12.34	12.17	11.54	10.6	9.61	8.73	8.05	7.58	7.27	6.99	6.66	3.35	2.41	2.71
3887300	1.12	1.45	1.66	2.39	2.72	2.77	2.52	2.75	3.38	4.24	5.17	6.11	6.93	8.87	10.97	12.83	14.07	14.45	14.01	12.95	11.69	10.52	9.6	8.96	8.43	7.84	7.1	6.19	5.19	3.01	3.49	4.33
3886800	0.98	1.72	2.39	3.09	3.06	3.68	3.79	3.4	4.03	5.15	6.51	7.81	9.78	12.83	15.59	17.33	17.58	16.56	14.81	13.15	11.81	10.72	9.62	8.35	6.89	5.39	4.01	3.92	3.99	4.72	5.17	4.01
3886300	1.14	1.45	2.52	3.36	4.44	4.29	5.37	5.63	5.35	6.7	8.77	10.77	15.34	20.01	22.78	22.6	20.25	17.4	14.93	12.6	10.11	7.56	5.8	5.88	5.41	5.16	5.78	6.33	6.72	6.13	4.59	4.46
3886200	1.33	1.64	2.82	3.59	4.57	4.91	5.65	6.22	5.85	7.13	9.43	11.65	17.05	22.11	24.57	23.55	20.51	17.39	14.58	11.71	8.76	6.42	6.49	5.89	5.65	6.34	6.9	7.26	7.4	5.94	4.86	4.4
3886100	1.5	1.66	2.81	3.79	4.5	5.5	5.87	6.87	6.61	7.74	10.21	12.82	19.08	24.5	26.44	24.41	20.68	17.15	13.75	10.27	7.18	7.24	6.44	6.26	6.99	7.55	7.87	7.94	7.79	5.75	4.99	4.22
3886000	1.68	1.5	2.43	3.98	4.45	5.97	6.15	7.58	7.51	8.63	11.12	14.32	21.5	27.24	28.36	25.08	20.62	16.42	12.22	8.36	8.18	7.09	6.97	7.75	8.29	8.56	8.54	8.3	7.87	5.62	4.96	4.11
3885900	1.88	1.66	2.42	4.32	4.82	6.19	6.68	8.31	8.57	9.7	12.2	16.13	24.45	30.4	30.29	25.51	20.07	14.83	10	9.39	7.86	7.84	8.65	9.16	9.35	9.22	8.85	8.34	7.77	5.69	4.85	4.39
3885800	2.02	1.87	2.49	4.96	5.15	6	7.79	9.18	9.78	11.03	13.5	18.39	28.08	34.07	32.11	25.43	18.49	12.2	11.02	8.76	8.93	9.73	10.17	10.24	9.99	9.5	8.87	8.22	7.6	5.75	5.06	4.63
3885700	1.99	2.23	2.79	5.02	5.74	6.42	8.72	10.26	11.17	12.68	15.08	21.25	32.68	38.34	33.61	24.13	15.33	13.31	9.79	10.3	11.02	11.38	11.32	10.92	10.27	9.51	8.75	8.07	7.5	5.91	5.21	4.67
3885600	1.69	2.54	2.52	5.78	6.56	7.05	9.11	11.34	13.02	14.79	18.37	25.01	38.79	43.57	33.99	20.28	16.81	10.98	12.02	12.62	12.88	12.7	12.08	11.2	10.26	9.38	8.61	7.99	7.48	6.05	5.27	4.6
3885500	1.52	2.68	3.02	6.67	6.43	8.12	9.1	12.36	16.07	17.54	22.89	30.19	47.61	50.64	30.16	22.82	13.68	14.27	14.76	14.93	14.48	13.5	12.26	11.05	9.99	9.11	8.41	7.86	7.42	6.06	5.17	4.41
3885400	1.39	2.59	3.91	6.09	8.46	9.08	10.47	14.65	20.06	21.22	28.49	37.99	62.9	61.23	35.69	18.13	17.9	17.97	17.63	16.52	14.88	13.15	11.62	10.37	9.41	8.66	8.07	7.6	7.22	5.9	4.92	4.1
3885300	1.28	2.27	4.62	6.8	8.3	10.71	12.64	15.47	24.77	27.32	38.86	56.84	127.69	[redacted]	35.39	22.19	20.64	19.51	17.66	15.39	13.27	11.56	10.73	10.13	9.48	8.82	8.19	7.6	7.07	5.55	4.51	3.68
3885200	1.27	2.05	4.7	6.81	9.28	11.56	13.73	17.75	30.01	36.62	52.88	165.97	[redacted]	30.59	21.02	20.82	19.92	17.58	14.89	14.3	13.54	12.64	11.69	10.76	9.9	9.14	8.45	7.83	7.27	5.09	3.98	3.18
3885100	1.81	1.87	3.93	9.54	8.94	12.64	17.17	22.87	33.62	48.15	81.86	[redacted]	43.06	26.2	24.55	21.48	17.75	17.18	16.64	15.64	14.45	13.26	12.14	11.12	10.21	9.38	8.63	7.95	7.33	5.01	3.64	2.81
3885000	2	2.67	3.44	12.06	14.5	15	18.3	28.41	39.34	76.48	[redacted]	103.08	38.28	30.45	25.38	21.37	19.92	18.7	17.28	15.84	14.46	13.18	12.01	10.93	9.97	9.1	8.32	7.63	7.03	4.9	3.71	2.99
3884900	1.66	2.82	4.59	9.21	14.68	21.98	28.39	30.82	53.96	140.54	[redacted]	88.48	45.86	36.28	33.49	27.74	22.82	19.46	16.98	14.98	13.33	11.94	10.76	9.76	8.91	8.18	7.55	7.01	6.53	4.88	3.89	3.25
3884800	1.31	2.17	4.31	10.91	13.37	17.97	26.86	53.95	93.17	306.24	[redacted]	112.61	67.52	53.34	40.24	29.63	22	17.21	14.24	12.25	10.84	9.78	8.95	8.28	7.75	7.28	6.86	6.52	6.2	4.98	4.15	3.55
3884700	1.24	1.85	3.25	8.92	12.28	17.54	26.25	43.83	96.13	[redacted]	[redacted]	[redacted]	78.75	49.4	34.22	24.71	18.29	14.2	11.8	10.35	9.37	8.66	8.1	7.65	7.28	6.95	6.65	6.39	6.15	5.16	4.41	3.83
3884600	1.4	2.16	4.31	12.35	16.15	22.33	36.5	60.78	137.06	[redacted]	512.78	140.58	71.89	50.82	38.16	28.65	21.71	16.75	13.2	11.13	9.95	9.1	8.45	7.94	7.5	7.14	6.83	6.55	6.32	5.36	4.64	4.07
3884500	1.82	3.12	5.74	17.51	22.21	26.71	48.66	70.99	143.08	[redacted]	[redacted]	109.82	60.67	36.21	25.98	23.57	21.09	17.83	14.63	12.57	10.91	9.67	8.96	8.39	7.9	7.48	7.13	6.82	6.54	5.53	4.82	4.26
3884400	2.31	3.44	6.84	16.11	25.76	34.08	35.94	57.68	95.41	99.55	114.89	51.49	49.6	39.25	25.94	19.08	15.12	13.38	11.75	11.32	10.55	9.51	8.55	8.14	7.77	7.44	7.13	6.85	6.6	5.61	4.93	4.39
3884300	2.36	3.54	7.52	20.54	21.17	23.9	30.82	57.32	59.69	62.98	72.6	42.33	26.61	28.67	28.28	18.04	14.41	12.14	9.65	8.53	7.99	7.61	7.35	7.15	6.97	6.8	6.63	6.46	6.29	5.54	4.93	4.45
3884200	2.38	4.48	8.95	16.44	17.52	19.2	36.28	36.59	35.37	43.52	47.6	30.94	22.36	17.36	18.99	20.85	14.28	11.55	9.8	8.57	7.27	6.59	5.95	5.92	5.89	5.85	5.81	5.75	5.67	5.25	4.81	4.41
3884100	2.88	4.71	10.77	13.66	13.17	24.19	28.42	28.97	24.6	31.94	33.02	26.67	20.83	18.56	14.25	13.68	15.86	12.5	9.17	7.95	7.26	6.48	5.74	5.44	4.88	4.82	4.88	4.91	4.93	4.8	4.55	4.27
3884000	3.01	6.13	11.76	10.21	16.98	22.29	20.12	21.56	20.94	26.83	25.82	23.69	18.47	18.62	15.5	11.94	10.43	12.42	10.79	7.38	6.79	5.8	5.69	5.13	4.69	4.58	4.25	4.02	4.13	4.3	4.21	4.05
3883900	3.45	7.47	11.77	12.48	17.35	16.75	17.37	15.57	17.45	23.63	21.85	20.4	15.99	17.78	16.15	13.08	10.06	8.27	10	9.28	6.99	5.76	5.18	4.64	4.62	4.21	3.95	3.93	3.75	3.75	3.83	3.77
3883800	4.46	8.53	10.9	13.57	14.61	13.02	14.43	12.83	14.52	21.16	19.75	17.4	13.73	16.43	16.14	13.91	11.09	8.48	6.76	8.23	8.02	6.5	4.87	4.59	4.07	3.9	3.85	3.54	3.39	3.18	3.43	3.47
3883300	7.8	7.48	4.88	6.59	7.03	6.23	6.92	8.65	11.98	14.15	13.36	10.38	8.3	9.39	11.63	12.8	12.74	11.7	10.06	8.2	6.41	4.84	3.54	3.23	3.92	4.25	4.15	3.7	3.04	1.9	1.94	1.97
3882800	5.61	2.86	4.37	4.12	4.02	4.75	6.23	8.22	9.96	10.74	10.13	8.44	6.58	5.33	7.19	8.87	10.09	10.71	10.66	10.02	8.95	7.66	6.29	5	3.84	2.88	2.1	2.02	2.08	2.49	1.51	1.32
3882300	2.36	3.53	3.54	2.98	3.56	4.86	6.24	7.52	8.45	8.72	8.12	7.05	5.7	4.63	4.48	5.8	7.13	8.22	8.98	9.32	9.24	8.78	8.03	7.08	6.03	4.98	4.01	3.13	2.39	1.85	1.94	1.17

Source

Above NAAQS, Outside Facility

Exhibit 3-11
Annual Average PM_{10} Concentrations at Signal Mountain Chattanooga

	648500	649000	649500	650000	650100	650200	650300	650400	650500	650600	650700	650800	650900	651000	651100	651200	651300	651400	651500	651600	651700	651800	651900	652000	652100	652200	652300	652400	652500	653000	653500	654000
3887800	0.09	0.12	0.19	0.31	0.34	0.37	0.4	0.43	0.45	0.47	0.47	0.47	0.45	0.43	0.41	0.39	0.37	0.35	0.33	0.31	0.3	0.29	0.28	0.27	0.26	0.24	0.23	0.21	0.19	0.13	0.09	0.0
3887300	0.1	0.13	0.21	0.37	0.41	0.45	0.5	0.55	0.59	0.61	0.62	0.61	0.59	0.56	0.52	0.49	0.46	0.43	0.41	0.39	0.37	0.35	0.33	0.31	0.28	0.26	0.23	0.21	0.19	0.13	0.1	0.0
3886800	0.09	0.14	0.22	0.44	0.5	0.58	0.66	0.73	0.81	0.86	0.88	0.86	0.82	0.77	0.71	0.66	0.61	0.57	0.54	0.5	0.46	0.41	0.37	0.33	0.29	0.26	0.23	0.21	0.19	0.14	0.1	0.0
3886300	0.09	0.14	0.25	0.53	0.63	0.76	0.91	1.07	1.22	1.34	1.39	1.38	1.31	1.2	1.08	0.98	0.89	0.8	0.71	0.61	0.52	0.44	0.38	0.33	0.29	0.27	0.25	0.23	0.21	0.14	0.1	0.0
3886200	0.09	0.14	0.26	0.54	0.66	0.8	0.98	1.16	1.35	1.49	1.56	1.55	1.47	1.34	1.2	1.08	0.97	0.86	0.74	0.62	0.53	0.44	0.38	0.33	0.3	0.28	0.25	0.23	0.21	0.14	0.11	0.0
3886100	0.09	0.14	0.26	0.56	0.69	0.85	1.05	1.27	1.49	1.68	1.76	1.75	1.66	1.51	1.35	1.2	1.06	0.91	0.76	0.63	0.53	0.45	0.39	0.34	0.31	0.28	0.26	0.24	0.21	0.14	0.11	0.0
3886000	0.08	0.14	0.27	0.57	0.72	0.9	1.13	1.4	1.67	1.9	2.02	2.02	1.92	1.74	1.53	1.34	1.15	0.96	0.78	0.64	0.53	0.45	0.4	0.36	0.32	0.29	0.26	0.24	0.21	0.14	0.11	0.0
3885900	0.08	0.14	0.27	0.58	0.75	0.95	1.22	1.54	1.89	2.18	2.34	2.35	2.25	2.03	1.76	1.5	1.24	1	0.8	0.65	0.54	0.47	0.41	0.37	0.33	0.29	0.26	0.24	0.21	0.15	0.12	0
3885800	0.08	0.13	0.27	0.6	0.77	1.01	1.31	1.71	2.15	2.53	2.75	2.8	2.7	2.42	2.05	1.67	1.32	1.03	0.81	0.66	0.56	0.49	0.43	0.38	0.33	0.3	0.26	0.24	0.22	0.16	0.12	0
3885700	0.09	0.13	0.26	0.63	0.79	1.06	1.42	1.9	2.46	2.97	3.29	3.42	3.37	3	2.42	1.85	1.39	1.06	0.83	0.68	0.58	0.51	0.44	0.39	0.34	0.3	0.27	0.24	0.22	0.16	0.12	0
3885600	0.09	0.13	0.26	0.66	0.82	1.1	1.53	2.12	2.85	3.55	4.03	4.34	4.42	3.93	2.89	2.03	1.46	1.09	0.87	0.72	0.62	0.53	0.45	0.39	0.34	0.31	0.28	0.25	0.23	0.17	0.13	0
3885500	0.09	0.13	0.25	0.7	0.87	1.15	1.64	2.37	3.34	4.33	5.07	5.78	6.35	5.66	3.47	2.19	1.53	1.15	0.93	0.77	0.64	0.54	0.46	0.4	0.35	0.32	0.29	0.27	0.25	0.17	0.13	0
3885400	0.09	0.14	0.25	0.73	0.93	1.21	1.73	2.63	3.94	5.38	6.58	8.34	10.96	10.62	4.14	2.41	1.66	1.25	0.99	0.8	0.66	0.55	0.47	0.42	0.37	0.33	0.3	0.28	0.25	0.17	0.13	0
3885300	0.08	0.14	0.25	0.73	0.98	1.3	1.84	2.92	4.71	6.87	8.91	14.09	31.04	[redacted]	5.24	2.7	1.82	1.34	1.03	0.82	0.68	0.57	0.5	0.44	0.39	0.35	0.32	0.29	0.26	0.18	0.13	0
3885200	0.08	0.14	0.26	0.72	1	1.41	2	3.23	5.72	9.18	13.05	44.62	[redacted]	10.57	4.86	2.86	1.94	1.4	1.07	0.86	0.72	0.61	0.53	0.47	0.41	0.37	0.33	0.3	0.27	0.18	0.13	0
3885100	0.08	0.13	0.27	0.71	0.99	1.45	2.22	3.59	7.02	13.02	21.81	[redacted]	15	7.28	4.23	2.76	1.93	1.44	1.13	0.92	0.77	0.65	0.56	0.49	0.43	0.38	0.34	0.31	0.28	0.18	0.13	0
3885000	0.09	0.13	0.26	0.74	0.99	1.45	2.37	4.12	8.55	19.73	[redacted]	32.69	11.66	6.24	3.87	2.63	1.93	1.49	1.18	0.97	0.8	0.68	0.58	0.51	0.44	0.39	0.35	0.31	0.28	0.18	0.13	0
3884900	0.09	0.14	0.26	0.78	1.06	1.51	2.4	4.54	10.5	33.92	[redacted]	25.47	10.33	5.77	3.72	2.64	1.97	1.53	1.21	0.99	0.82	0.69	0.59	0.51	0.45	0.4	0.35	0.32	0.29	0.19	0.13	0
3884800	0.09	0.15	0.28	0.79	1.08	1.58	2.51	4.69	12.39	80.68	[redacted]	25.92	10.28	5.8	3.78	2.67	1.98	1.53	1.22	0.99	0.83	0.7	0.6	0.52	0.46	0.4	0.36	0.32	0.29	0.19	0.14	0
3884700	0.1	0.16	0.3	0.88	1.2	1.75	2.82	5.39	15.18	[redacted]	[redacted]	30.22	11.51	6.25	3.97	2.77	2.05	1.58	1.26	1.03	0.86	0.72	0.62	0.54	0.47	0.42	0.37	0.34	0.3	0.2	0.14	0.1
3884600	0.11	0.17	0.35	1.1	1.53	2.28	3.78	7.33	18.96	[redacted]	137.58	27.82	12	6.92	4.5	3.15	2.33	1.79	1.41	1.15	0.95	0.8	0.68	0.59	0.51	0.45	0.4	0.36	0.32	0.24	0.15	0.1
3884500	0.12	0.2	0.41	1.29	1.8	2.65	4.13	6.88	14.22	32.79	26.65	15.1	8.82	5.64	4.01	3.03	2.36	1.88	1.52	1.26	1.05	0.89	0.76	0.65	0.57	0.5	0.44	0.4	0.36	0.23	0.16	0.1
3884400	0.13	0.22	0.46	1.39	1.87	2.54	3.49	5.4	9.71	13.95	12.08	8.28	6.19	4.48	3.2	2.43	1.97	1.65	1.41	1.21	1.04	0.9	0.79	0.69	0.61	0.54	0.48	0.43	0.39	0.25	0.17	0.1
3884300	0.14	0.24	0.49	1.36	1.7	2.14	2.91	4.6	6.32	7.99	7.16	5.28	4.19	3.46	2.78	2.14	1.67	1.38	1.19	1.04	0.93	0.83	0.74	0.66	0.6	0.54	0.49	0.44	0.4	0.26	0.19	0.1
3884200	0.15	0.25	0.51	1.22	1.46	1.86	2.66	3.65	4.36	5.27	4.83	3.73	3.06	2.58	2.24	1.91	1.56	1.26	1.04	0.9	0.8	0.72	0.66	0.6	0.55	0.51	0.47	0.43	0.39	0.27	0.2	0.1
3884100	0.16	0.27	0.52	1.07	1.3	1.74	2.35	2.81	3.23	3.77	3.52	2.81	2.34	2.03	1.77	1.58	1.4	1.19	0.99	0.83	0.72	0.64	0.58	0.53	0.49	0.46	0.43	0.4	0.37	0.27	0.2	0.1
3884000	0.17	0.28	0.51	0.98	1.23	1.63	1.98	2.21	2.51	2.86	2.7	2.21	1.88	1.64	1.45	1.3	1.19	1.08	0.95	0.81	0.69	0.6	0.53	0.48	0.44	0.41	0.39	0.36	0.34	0.26	0.2	0.1
3883900	0.17	0.29	0.49	0.93	1.19	1.46	1.64	1.8	2.02	2.26	2.15	1.8	1.55	1.36	1.22	1.1	1	0.93	0.86	0.77	0.68	0.59	0.51	0.45	0.41	0.38	0.35	0.33	0.31	0.24	0.19	0.1
3883800	0.18	0.29	0.45	0.9	1.11	1.27	1.37	1.5	1.67	1.83	1.76	1.5	1.3	1.15	1.04	0.95	0.86	0.8	0.75	0.7	0.64	0.58	0.51	0.45	0.4	0.36	0.33	0.3	0.29	0.22	0.18	0.1
3883300	0.19	0.24	0.36	0.61	0.63	0.67	0.71	0.76	0.82	0.86	0.84	0.76	0.68	0.62	0.57	0.53	0.49	0.46	0.44	0.41	0.39	0.37	0.36	0.35	0.33	0.32	0.3	0.29	0.26	0.17	0.14	0.1
3882800	0.16	0.2	0.33	0.4	0.41	0.43	0.45	0.48	0.51	0.52	0.51	0.48	0.44	0.4	0.37	0.35	0.33	0.31	0.3	0.28	0.27	0.26	0.25	0.24	0.23	0.22	0.22	0.21	0.21	0.18	0.13	0
3882300	0.14	0.2	0.25	0.29	0.3	0.31	0.33	0.34	0.36	0.36	0.36	0.34	0.32	0.29	0.27	0.25	0.24	0.23	0.22	0.21	0.2	0.2	0.19	0.19	0.18	0.17	0.17	0.16	0.16	0.14	0.13	0.1

[redacted] Source

[redacted] Above NAAQS, Outside Facility

Exhibit 3-12
24-hour Average $PM_{2.5}$ Concentrations at Signal Mountain Chattanooga

	648500	649000	649500	650000	650100	650200	650300	650400	650500	650600	650700	650800	650900	651000	651100	651200	651300	651400	651500	651600	651700	651800	651900	652000	652100	652200	652300	652400	652500	653000	653500	654
3887800	0.38	0.51	0.6	0.78	0.8	0.74	0.76	0.89	1.07	1.28	1.49	1.69	1.87	2.2	2.7	3.19	3.61	3.9	4	3.92	3.7	3.39	3.07	2.79	2.58	2.44	2.34	2.25	2.15	1.09	0.75	
3887300	0.45	0.5	0.61	0.88	1.01	1.02	0.92	1.01	1.26	1.51	1.8	2.07	2.34	2.99	3.66	4.23	4.59	4.67	4.49	4.14	3.73	3.36	3.07	2.87	2.71	2.52	2.29	2	1.68	0.93	1.17	
3886800	0.36	0.68	0.76	1.16	1.16	1.37	1.38	1.28	1.61	1.85	2.26	2.63	3.33	4.29	5.13	5.62	5.65	5.28	4.72	4.19	3.77	3.43	3.09	2.69	2.23	1.76	1.31	1.21	1.23	1.56	1.69	
3886300	0.4	0.54	1	1.28	1.69	1.65	2.06	2.03	2.14	2.55	3.06	3.63	5.17	6.58	7.34	7.19	6.42	5.52	4.76	4.04	3.27	2.47	1.79	1.82	1.69	1.68	1.89	2.07	2.2	1.99	1.42	
3886200	0.44	0.62	1.12	1.36	1.74	1.84	2.2	2.28	2.29	2.8	3.29	4	5.73	7.23	7.87	7.46	6.49	5.52	4.66	3.77	2.86	2.01	2	1.84	1.83	2.06	2.25	2.38	2.43	1.91	1.53	
3886100	0.52	0.63	1.12	1.49	1.72	2.08	2.34	2.57	2.51	3.1	3.56	4.43	6.38	7.96	8.42	7.71	6.54	5.45	4.41	3.34	2.34	2.23	2.01	2.02	2.26	2.46	2.58	2.6	2.55	1.83	1.59	
3886000	0.59	0.55	0.97	1.59	1.69	2.27	2.46	2.9	2.76	3.45	3.88	4.94	7.16	8.79	8.98	7.9	6.52	5.24	3.96	2.75	2.52	2.22	2.24	2.5	2.7	2.8	2.8	2.71	2.57	1.77	1.6	
3885900	0.66	0.61	0.95	1.72	1.88	2.37	2.56	3.26	3.14	3.88	4.25	5.56	8.09	9.73	9.53	8.03	6.37	4.78	3.29	2.89	2.47	2.51	2.79	2.98	3.05	3.02	2.89	2.71	2.5	1.8	1.55	
3885800	0.7	0.75	0.93	1.98	2.06	2.3	2.95	3.66	3.59	4.41	4.71	6.33	9.22	10.8	10.05	8.01	5.91	3.99	3.38	2.76	2.84	3.13	3.3	3.35	3.27	3.09	2.87	2.63	2.41	1.85	1.55	
3885700	0.7	0.89	1.06	2.01	2.29	2.46	3.33	4.08	4.13	5.07	5.31	7.3	10.63	12.03	10.48	7.64	4.99	4.08	3.09	3.25	3.53	3.69	3.7	3.56	3.33	3.06	2.79	2.54	2.34	1.83	1.6	
3885600	0.67	1.02	0.96	2.29	2.62	2.81	3.51	4.49	5.09	5.92	6.4	8.55	12.45	13.51	10.6	6.54	5.12	3.49	3.78	4.04	4.18	4.14	3.93	3.61	3.27	2.96	2.69	2.48	2.31	1.86	1.63	
3885500	0.61	1.07	1.21	2.65	2.54	3.24	3.5	4.81	6.34	7.02	7.95	10.25	15.01	15.48	9.55	6.91	4.18	4.46	4.71	4.83	4.7	4.36	3.92	3.5	3.13	2.83	2.6	2.42	2.29	1.87	1.62	
3885400	0.5	1.04	1.56	2.31	3.36	3.63	4.18	5.65	7.89	8.49	9.91	12.72	19.32	18.46	10.79	5.47	5.54	5.71	5.69	5.34	4.78	4.18	3.66	3.23	2.91	2.75	2.61	2.46	2.31	1.84	1.55	
3885300	0.51	0.91	1.85	2.53	3.09	4.25	5.04	6.02	9.72	10.51	13.37	16.97	35.68		10.48	6.83	6.58	6.34	5.74	4.96	4.22	3.64	3.44	3.28	3.09	2.89	2.69	2.5	2.34	1.76	1.44	
3885200	0.5	0.76	1.88	2.36	3.41	4.44	5.26	7.09	11.72	13.38	17.83	46.76		9.17	6.65	6.84	6.64	5.82	4.85	4.5	4.32	4.08	3.8	3.51	3.24	3	2.78	2.59	2.4	1.68	1.29	
3885100	0.72	0.72	1.57	3.82	3.57	4.66	6.84	9.13	13.03	18.09	25.85		14.77	8.3	8.24	7.31	5.96	5.44	5.35	5.07	4.71	4.34	3.98	3.66	3.36	3.09	2.84	2.62	2.41	1.62	1.15	0
3885000	0.8	1.06	1.32	4.82	5.8	6	6.81	11.31	15.73	29.73		38.77	13.65	10.42	8.71	6.89	6.58	6.23	5.77	5.28	4.82	4.39	3.99	3.61	3.28	2.98	2.71	2.48	2.27	1.54	1.15	0
3884900	0.66	1.13	1.83	3.68	5.87	8.79	11.35	11.67	21.25	55.3		32.21	16.52	11.6	11.1	9.45	7.87	6.72	5.83	5.1	4.5	3.99	3.56	3.2	2.89	2.64	2.41	2.22	2.06	1.51	1.19	0
3884800	0.52	0.87	1.72	4.35	5.33	6.96	10.74	21.57	37.18	121.59		40.98	23.36	18.49	13.92	10.29	7.67	5.97	4.89	4.15	3.62	3.22	2.92	2.67	2.48	2.31	2.17	2.05	1.94	1.53	1.27	
3884700	0.5	0.72	1.2	3.43	4.69	6.67	10	16.86	36.25				28.25	17.29	11.77	8.45	6.41	5.13	4.26	3.61	3.14	2.87	2.66	2.49	2.35	2.23	2.12	2.03	1.94	1.61	1.36	
3884600	0.55	0.82	1.6	4.75	6.24	8.4	13.9	23.37			200.83		28.15	20.18	15.17	11.39	8.64	6.66	5.25	4.22	3.48	3.15	2.9	2.69	2.52	2.38	2.26	2.15	2.06	1.7	1.46	
3884500	0.67	1.17	2.19	6.65	8.44	10.14	18.97	27.77				43.47	23.33	13.85	9.81	9.28	8.31	7.02	5.76	5.01	4.35	3.76	3.25	2.97	2.77	2.6	2.45	2.33	2.21	1.81	1.54	
3884400	0.86	1.3	2.61	6.14	9.96	13.24	13.64	22.16	36.4	39.07	45.48	19.95	19.65	15.55	9.96	7.42	5.51	4.86	4.54	4.46	4.16	3.75	3.31	2.97	2.81	2.67	2.54	2.42	2.31	1.89	1.62	
3884300	0.89	1.37	2.85	7.93	8.16	9	11.68	21.87	22.93	24.76	28.76	16.47	10.27	11.37	11.22	6.92	5.58	4.75	3.56	3.28	2.99	2.87	2.8	2.74	2.6	2.5	2.42	2.34	2.26	1.92	1.66	
3884200	0.89	1.73	2.9	5.8	6.43	7.21	13.84	13.99	13.49	16.93	18.85	12.08	8.76	6.32	7.53	8.28	5.66	4.42	3.83	3.37	2.67	2.39	2.26	2.25	2.22	2.2	2.16	2.13	2.08	1.86	1.65	
3884100	1.12	1.54	3.58	4.96	4.91	9.2	10.73	11.07	9.63	12.41	13.02	10.55	7.62	5.73	4.63	5.43	6.3	4.96	3.51	3.04	2.85	2.55	2.1	1.96	1.81	1.84	1.85	1.85	1.84	1.74	1.6	
3884000	1.16	1.97	3.98	3.67	6.42	8.46	7.65	8.22	7.87	9.58	9.42	9.38	6.53	5.89	4.66	3.53	4.14	4.94	4.29	2.92	2.6	2.22	2.24	2.03	1.71	1.65	1.51	1.54	1.57	1.58	1.51	
3883900	1.1	2.44	4.03	4.7	6.59	6.27	6.61	5.92	6.55	8.33	7.4	8.09	5.36	5.72	4.98	3.87	2.89	3.29	3.98	3.69	2.77	2.2	1.98	1.83	1.82	1.66	1.43	1.41	1.33	1.41	1.39	
3883800	1.43	2.83	3.77	5.14	5.52	4.93	5.49	5.09	5.46	7.39	6.67	6.9	4.67	5.35	5.06	4.2	3.25	2.43	2.69	3.27	3.19	2.58	1.86	1.76	1.55	1.54	1.52	1.4	1.23	1.21	1.27	
3883300	2.61	2.57	1.82	2.49	2.67	2.36	2.43	2.99	4.08	4.78	4.44	3.35	3.29	3.12	3.79	4.09	3.99	3.59	3.02	2.42	1.86	1.39	1.12	1.29	1.56	1.69	1.65	1.47	1.21	0.75	0.69	
3882800	1.92	1.01	1.65	1.56	1.6	1.55	2.12	2.76	3.32	3.57	3.34	2.73	2.1	2.01	2.36	2.88	3.24	3.39	3.33	3.08	2.72	2.3	1.86	1.46	1.11	0.83	0.78	0.67	0.78	0.99	0.58	0
3882300	0.83	1.25	1.16	1.14	1.22	1.64	2.07	2.48	2.78	2.87	2.66	2.28	1.82	1.49	1.48	1.9	2.31	2.64	2.85	2.94	2.88	2.71	2.45	2.14	1.8	1.48	1.18	0.91	0.69	0.58	0.77	0

Source

Above NAAQS, Outside Facility

Exhibit 3-13
24-hour Average PM_{10} Concentrations at Lafarge Alpena

	307500	308000	308500	309000	309100	309200	309300	309400	309500	309600	309700	309800	310000	310500	311000	311500	311900	312000	312100	312200	312300	312400	312500	313000	313500	314000
4996800	4.08	4.23	4.96	5.71	5.58	5.36	5.04	4.66	4.26	4.65	5	5.28	5.4	7.65	13.44	24.86	28.9	29.53	29.68	28.67	26.48	26.48	29.13	41.84	35.67	12.97
4996300	5.46	4.67	4.73	5.79	6.18	6.54	6.81	6.93	6.83	6.57	6.16	5.63	6.15	8.87	16.28	27.44	31.57	31.99	31.85	33.98	36.71	39.5	42.23	45.35	18.82	8.16
4995800	7.12	6.97	6.21	5.47	5.56	5.73	6.02	6.43	6.95	7.52	8.04	8.41	8.34	11.71	22.34	31.02	43.94	45.02	46.77	48.94	50.93	53.02	53.83	28.76	9.2	5.66
4995300	15.56	10.59	8.14	8.55	8.57	8.53	8.47	8.32	8.06	7.69	7.22	7.75	8.75	14.05	30.78	49.26	61.07	61.95	63.01	63.36	61.9	56.36	46.92	10.94	11.68	17.08
4994800	36.14	34.56	31.09	25.24	23.76	22.19	20.65	18.94	17.4	15.83	14.24	12.59	12.24	13.47	34.27	76.27	85.32	78.98	67.36	48.74	28.83	22.09	19.4	24.83	25.57	26.71
4994300	34.04	38.03	42.12	45.72	46.29	46.83	47.36	47.88	48.43	49.18	50.26	51.78	56.01	72.66	57.76	157	113	79.43	60.55	57.25	59.33	59.86	58.31	43.16	32.41	25.9
4994200	30.85	35.08	39.48	44.35	45.26	46.09	46.82	47.4	47.95	48.42	49.03	49.91	53.38	81.11	102.7	248.22	144.13	96.49	94.92	89.56	82.1	74.67	67.98	46.7	35.72	29.12
4994100	27.36	31.42	35.85	41.23	42.4	43.58	44.77	45.77	46.69	47.47	47.93	48.32	49.16	70.84	117.06	465.44	239.2		138.9	115.44	99.1	87.32	78.31	52.72	40.48	32.9
4994000	23.55	27.6	31.6	36.5	37.7	39.04	40.52	42.07	43.63	45.29	46.73	48.04	49.66	59.54	73.41		177.93	149.53	128.73	112.7	100.08	90.02	82	57.02	44.09	36.33
4993900	19.86	23.57	27.38	31.12	31.99	33.01	34.16	35.6	37.24	39.16	41.41	43.92	50.31	71.93		631.85	101.61	77.87	77.07	76.04	74.38	71.9	69.19	55.05	44.67	37.71
4993800	16.15	19.73	23.47	26.33	26.87	27.32	27.82	28.45	29.19	30.23	31.56	33.27	38.54	127.64		181.71	85.93	76.76	59.95	53.37	48.66	49.54	50.04	47.39	41.85	36.81
4993700	12.61	15.94	19.74	22.97	23.34	23.46	23.55	23.59	23.39	23.31	23.28	23.38	23.92		77.4	105.46	63.58	67.79	62.82	50.71	46.01	42.53	37.96	37.45	36.53	34.16
4993600	9.46	12.26	15.97	20.2	20.87	21.46	21.93	22.04	21.9	21.37	20.73	19.96	18.99		36.42	70.52	41.33	52.11	56.31	53.41	45.6	39.24	38.17	28.83	30.3	30.05
4993500	6.77	8.86	12.08	16.74	17.87	18.99	20.16	21.06	21.95	22.31	22.48	21.66	18.91		34.59	51.15	23.83	35.89	44.81	48.61	46.76	41.42	35.47	26.8	24.4	25.61
4993400	4.65	6.06	8.34	12.14	13.18	14.44	15.85	17.4	19.15	21.05	22.9	24.6	24.51		32.78	39.5	17.84	23.18	32.24	39.45	42.77	41.74	37.85	27.89	19.58	21.12
4993300	3.08	3.84	5.09	7.28	8.02	8.67	9.71	10.7	11.96	13.61	15.75	18.67	26.99		35.34	31.82	15.66	16.74	22.34	29.44	35.32	38.15	37.61	26.75	21.23	17.25
4993200	3.17	3.97	4.68	4.96	4.92	5.86	7.2	8.83	10.67	12.58	14.27	15.66	17.92		35.54	26.35	13.92	14.47	16.88	21.54	27.3	32.04	34.47	24.41	22.23	16.41
4993100	3.51	4.12	4.45	5.29	6.37	7.62	8.99	10.32	11.48	12.32	12.76	12.86	13.55	176.29	35.75	22.14	14.37	13.64	14.5	16.82	20.81	25.46	29.35	25.29	22.13	17.81
4993000	3.68	4.03	3.92	6.73	7.77	8.76	9.59	10.15	10.37	10.46	11.02	11.36	11.82	59.27	33.93	18.87	15.02	13.06	13.47	14.5	16.79	20.21	24.06	26.36	21.19	18.64
4992900	3.68	3.71	3.84	7.64	8.28	8.73	8.88	8.94	9.39	9.65	9.71	9.56	9.83	32.51	27.27	16.2	15.29	12.44	12.75	13.3	14.52	16.63	19.67	26.62	19.89	18.81
4992800	3.5	3.22	4.83	7.7	7.84	7.81	8.11	8.32	8.34	8.16	7.73	7.02	9.3	21.78	22.44	14.04	15.27	11.69	12.06	12.48	13.17	14.48	16.49	25.86	19.22	18.48
4992700	3.16	3.01	5.66	7.05	7.1	7.26	7.28	7.12	6.78	6.21	6.08	6.96	8.64	19.85	19.62	12.23	15.02	11.71	11.35	11.72	12.21	13.02	14.34	24.24	20.33	17.76
4992600	2.72	3.76	6.06	6.42	6.45	6.33	6.06	5.62	5.01	5.37	6	6.4	9.12	20	17.2	10.74	14.62	12.11	10.72	11.05	11.45	12	12.87	21.9	21.11	16.81
4992500	2.48	4.45	5.94	5.67	5.47	5.13	4.67	4.48	4.93	5.33	5.71	6.69	11.16	19.94	14.85	9.49	14.11	12.31	10.34	10.54	10.85	11.24	11.83	19.4	21.42	15.8
4992400	3.06	4.92	5.38	4.72	4.36	3.89	4.25	4.66	5.03	5.3	6.08	6.89	12.87	19.58	12.82	8.68	13.55	12.35	10.01	10.17	10.39	10.65	11.08	17.04	21.19	16.64
4992300	3.63	5.03	4.72	3.7	3.69	4.05	4.41	4.75	5.02	5.6	6.34	8.37	14.18	19.01	11.12	8.46	12.96	12.26	9.92	9.84	10.04	10.25	10.54	15.03	20.49	17.46
4991800	3.45	2.83	2.8	3.95	4.1	4.47	5.14	6.39	7.9	9.62	11.47	13.32	16.13	14.26	6.56	7.86	10.06	10.75	10.33	8.86	6.78	7.2	7.76	9.95	13.7	17.22
4991300	1.81	2.39	3.28	5.28	6.21	7.26	8.44	9.71	10.97	12.22	13.29	14.1	14.37	9.77	5.6	7.44	7.76	8.81	9.29	9	7.99	6.5	4.85	6.38	9.12	12.54
4990800	2.09	2.81	3.97	7.5	8.41	9.35	10.29	11.17	11.9	12.41	12.61	12.5	11.32	6.92	5.2	6.74	6.07	7.11	7.9	8.24	8.03	7.29	6.17	3.61	5.42	8.24

Source

Above NAAQS, Outside Facility

Exhibit 3-14
Annual Average PM_{10} Concentrations at Lafarge Alpena

	307500	308000	308500	309000	309100	309200	309300	309400	309500	309600	309700	309800	310000	310500	311000	311500	311900	312000	312100	312200	312300	312400	312500	313000	313500	314000
4996800	0.17	0.19	0.21	0.25	0.26	0.27	0.28	0.3	0.32	0.34	0.37	0.4	0.46	0.53	0.61	0.65	0.66	0.67	0.67	0.67	0.66	0.64	0.63	0.63	0.55	0.42
4996300	0.18	0.2	0.23	0.28	0.29	0.3	0.32	0.33	0.35	0.37	0.39	0.41	0.48	0.69	0.79	0.87	0.89	0.9	0.9	0.88	0.86	0.84	0.82	0.76	0.57	0.48
4995800	0.19	0.23	0.27	0.31	0.33	0.34	0.36	0.38	0.4	0.42	0.45	0.48	0.54	0.85	1.1	1.28	1.33	1.31	1.27	1.22	1.18	1.15	1.13	0.85	0.68	0.59
4995300	0.19	0.23	0.29	0.37	0.38	0.4	0.42	0.45	0.47	0.5	0.53	0.57	0.67	1	1.73	2.19	2.17	2.06	1.94	1.86	1.77	1.66	1.53	1.12	0.9	0.72
4994800	0.19	0.23	0.29	0.38	0.41	0.43	0.46	0.49	0.53	0.58	0.63	0.69	0.85	1.45	2.66	4.9	4.37	3.96	3.56	3.15	2.83	2.62	2.43	1.6	1.15	0.88
4994300	0.17	0.22	0.28	0.39	0.42	0.45	0.49	0.53	0.58	0.63	0.69	0.76	0.96	2.17	5.22	25.13	16.68	12.47	9.29	7.16	5.75	4.74	3.98	2.03	1.29	0.92
4994200	0.17	0.21	0.28	0.39	0.42	0.45	0.49	0.54	0.59	0.65	0.71	0.79	1	2.41	5.92	48.16	25.39	15.8	10.93	8.11	6.29	5.06	4.18	2.09	1.33	0.95
4994100	0.17	0.21	0.28	0.39	0.42	0.46	0.5	0.55	0.6	0.67	0.74	0.83	1.06	2.8	6.58	155.3	33.4	18.41	12.07	8.69	6.64	5.29	4.35	2.15	1.36	0.97
4994000	0.17	0.21	0.28	0.39	0.43	0.46	0.51	0.56	0.62	0.69	0.78	0.88	1.15	3.58	7.62		30.44	17.78	11.81	8.57	6.58	5.26	4.34	2.16	1.37	0.98
4993900	0.16	0.21	0.28	0.39	0.43	0.46	0.51	0.56	0.63	0.7	0.8	0.91	1.24	5.36		67.85	19.63	14.37	10.54	7.95	6.21	5.02	4.17	2.13	1.37	0.99
4993800	0.16	0.2	0.27	0.38	0.42	0.46	0.5	0.55	0.62	0.69	0.79	0.91	1.29	12.08		18.02	11.67	10.09	8.45	6.96	5.71	4.73	3.98	2.08	1.35	0.99
4993700	0.16	0.2	0.26	0.37	0.4	0.44	0.48	0.53	0.59	0.67	0.76	0.89	1.27		13.29	9.96	6.98	6.69	6.23	5.6	4.94	4.29	3.72	2.03	1.33	0.98
4993600	0.15	0.19	0.24	0.34	0.37	0.41	0.45	0.5	0.56	0.64	0.73	0.85	1.24		6.21	6.5	4.52	4.45	4.41	4.26	4	3.68	3.34	1.97	1.31	0.97
4993500	0.14	0.17	0.23	0.32	0.35	0.38	0.42	0.47	0.53	0.6	0.7	0.82	1.23		4.45	4.65	3.22	3.16	3.16	3.18	3.12	3.01	2.85	1.89	1.29	0.96
4993400	0.13	0.16	0.21	0.3	0.32	0.36	0.39	0.44	0.5	0.57	0.67	0.8	1.22		3.59	3.54	2.49	2.4	2.39	2.41	2.43	2.41	2.36	1.79	1.26	0.94
4993300	0.13	0.16	0.2	0.28	0.31	0.34	0.37	0.42	0.47	0.54	0.63	0.75	1.15		3.04	2.81	2.03	1.93	1.89	1.9	1.93	1.95	1.94	1.65	1.22	0.93
4993200	0.12	0.15	0.19	0.27	0.29	0.32	0.35	0.39	0.44	0.5	0.58	0.67	0.99		2.66	2.31	1.71	1.62	1.56	1.55	1.57	1.6	1.61	1.49	1.17	0.91
4993100	0.12	0.14	0.18	0.26	0.28	0.31	0.34	0.37	0.41	0.46	0.51	0.58	0.81	8.32	2.29	1.94	1.47	1.4	1.33	1.3	1.31	1.33	1.35	1.33	1.11	0.89
4993000	0.11	0.14	0.18	0.25	0.27	0.29	0.32	0.35	0.38	0.41	0.46	0.51	0.69	3.03	1.93	1.64	1.27	1.22	1.16	1.12	1.11	1.12	1.15	1.17	1.05	0.86
4992900	0.11	0.13	0.17	0.24	0.26	0.28	0.3	0.32	0.35	0.38	0.42	0.47	0.62	1.82	1.6	1.4	1.1	1.07	1.03	0.98	0.96	0.96	0.98	1.03	0.97	0.82
4992800	0.11	0.13	0.17	0.23	0.25	0.26	0.28	0.3	0.32	0.35	0.38	0.43	0.56	1.31	1.31	1.21	0.96	0.94	0.91	0.88	0.85	0.84	0.85	0.91	0.89	0.79
4992700	0.1	0.13	0.17	0.22	0.23	0.24	0.26	0.28	0.3	0.33	0.36	0.4	0.52	1.04	1.08	1.05	0.85	0.83	0.81	0.79	0.76	0.74	0.74	0.81	0.81	0.75
4992600	0.1	0.13	0.17	0.21	0.22	0.23	0.24	0.26	0.28	0.31	0.34	0.38	0.48	0.88	0.91	0.92	0.75	0.74	0.73	0.71	0.69	0.67	0.66	0.72	0.74	0.71
4992500	0.11	0.13	0.16	0.2	0.21	0.22	0.23	0.25	0.27	0.3	0.33	0.36	0.45	0.76	0.78	0.8	0.67	0.66	0.66	0.64	0.63	0.61	0.6	0.65	0.67	0.66
4992400	0.11	0.13	0.15	0.19	0.2	0.21	0.22	0.24	0.26	0.29	0.31	0.35	0.42	0.68	0.68	0.71	0.6	0.6	0.59	0.59	0.57	0.56	0.54	0.58	0.61	0.61
4992300	0.11	0.13	0.15	0.18	0.19	0.2	0.22	0.24	0.26	0.28	0.3	0.33	0.39	0.62	0.6	0.62	0.54	0.54	0.54	0.53	0.53	0.51	0.5	0.52	0.56	0.57
4991800	0.09	0.1	0.13	0.16	0.17	0.18	0.2	0.21	0.22	0.24	0.25	0.27	0.31	0.4	0.39	0.38	0.33	0.33	0.33	0.34	0.34	0.34	0.34	0.33	0.37	0.4
4991300	0.08	0.1	0.12	0.15	0.16	0.17	0.18	0.19	0.2	0.21	0.22	0.24	0.26	0.27	0.28	0.26	0.23	0.23	0.22	0.23	0.23	0.24	0.24	0.24	0.25	0.28
4990800	0.08	0.09	0.11	0.14	0.15	0.16	0.17	0.17	0.18	0.19	0.2	0.21	0.21	0.2	0.22	0.2	0.18	0.17	0.17	0.17	0.17	0.17	0.17	0.18	0.18	0.2

Source

Above NAAQS, Outside Facility

Exhibit 3-15
24-hour Average $PM_{2.5}$ Concentrations at Lafarge Alpena

	307500	308000	308500	309000	309100	309200	309300	309400	309500	309600	309700	309800	310000	310500	311000	311500	311900	312000	312100	312200	312300	312400	312500	313000	313500	314000
4996800	1.23	1.3	1.62	1.99	1.96	1.9	1.79	1.67	1.53	1.63	1.75	1.81	1.98	2.33	3.88	7.26	8.91	9.33	9.63	9.54	9.01	8.06	8.78	12.84	11.78	4
4996300	1.81	1.5	1.45	1.9	2.06	2.22	2.34	2.42	2.41	2.35	2.22	2.05	2.21	2.78	4.7	8.05	10.06	10.51	10.42	10.38	11.1	11.89	12.73	14.73	6.55	2.6
4995800	2.29	2.3	2.09	1.76	1.72	1.79	1.9	2.07	2.28	2.52	2.75	2.94	3.02	3.73	6.45	9.6	13.76	13.88	14.28	14.88	15.55	16.38	16.97	10.05	2.99	1.7
4995300	5.37	3.72	2.64	2.86	2.88	2.88	2.86	2.82	2.73	2.61	2.46	2.57	2.79	4.5	8.96	14.98	19.05	19.23	19.69	20.21	20.37	19.15	16.38	3.59	3.59	5.3
4994800	11.75	11.5	10.61	8.81	8.33	7.8	7.28	6.68	6.13	5.56	4.98	4.38	4.4	4.77	9.83	23.49	27.95	26.89	24.04	17.98	10.81	8.11	7.05	7.86	8.17	8.6
4994300	10.18	11.48	12.92	14.41	14.7	14.99	15.28	15.59	15.92	16.32	16.83	17.47	19.09	24.62	19.13	52.96	44.57	30.94	24.03	19.31	19.96	20.23	19.71	14.37	10.69	8.5
4994200	9.11	10.41	11.82	13.53	13.88	14.22	14.54	14.84	15.15	15.45	15.81	16.27	17.74	27.2	34.6	91.77	57.65	38.59	33.05	31.13	28.39	25.66	23.22	15.64	11.88	9.6
4994100	8.02	9.2	10.53	12.21	12.59	12.98	13.38	13.74	14.1	14.42	14.68	14.94	15.55	23.06	39.69	180.43	88.17		49.53	40.66	34.57	30.22	26.93	17.79	13.54	10.9
4994000	6.88	8.03	9.16	10.57	10.92	11.31	11.75	12.22	12.69	13.2	13.65	14.08	14.71	18.14	23.67		63.95		45.35	39.38	34.72	31.03	28.11	19.21	14.71	12.0
4993900	5.81	6.85	7.89	8.89	9.13	9.41	9.73	10.13	10.59	11.12	11.76	12.46	14.25	20.36		251.51	40.34	29.57	25.4	25.19	24.72	23.94	23.04	18.25	14.74	12.3
4993800	4.75	5.76	6.78	7.51	7.64	7.75	7.87	8.03	8.22	8.5	8.86	9.33	10.78	35		71.65	32.23	29.06	22.19	19.8	17	15.34	15.67	15.24	13.54	11.9
4993700	3.74	4.69	5.76	6.61	6.7	6.7	6.7	6.69	6.6	6.56	6.53	6.56	6.71		25.26	41.53	23.04	25.06	23.47	18.98	16.69	15.5	13.84	11.54	11.5	10.8
4993600	2.84	3.65	4.72	5.91	6.09	6.24	6.35	6.35	6.28	6.09	5.87	5.62	5.31		12.21	27.75	14.34	18.66	20.55	19.7	16.88	14.01	13.63	8.47	9.24	9.3
4993500	2.06	2.68	3.63	4.98	5.31	5.63	5.96	6.2	6.44	6.5	6.51	6.21	5.28		12.85	20.1	8.31	12.32	15.88	17.55	17.05	15.17	13.02	9.52	7.2	7.7
4993400	1.44	1.87	2.55	3.68	3.99	4.36	4.78	5.23	5.74	6.29	6.81	7.28	7.09		11.12	15.51	7.13	7.42	10.97	13.87	15.3	15.07	13.73	9.78	6.69	6.24
4993300	1.07	1.4	1.79	2.26	2.48	2.67	2.99	3.28	3.66	4.15	4.79	5.67	8.16		12.19	12.49	6.26	5.4	7.15	9.96	12.33	13.55	13.48	9.19	7.41	5.0
4993200	1.24	1.55	1.83	1.93	1.9	1.86	2.2	2.69	3.24	3.81	4.33	4.77	5.48		12.35	10.33	5.49	4.77	5.03	6.89	9.19	11.12	12.16	8.57	7.7	5.67
4993100	1.38	1.62	1.74	1.64	1.96	2.34	2.75	3.15	3.51	3.78	4.05	4.39	4.74	53.03	12.39	8.67	5.75	4.56	4.11	5.05	6.65	8.53	10.12	9.06	7.56	6.1
4993000	1.45	1.58	1.54	2.07	2.39	2.69	2.95	3.13	3.43	3.7	3.89	4	4.09	17.57	11.78	7.38	6.01	4.23	3.72	4.15	5.07	6.45	8.01	9.36	7.11	6.4
4992900	1.45	1.46	1.26	2.36	2.56	2.7	2.96	3.18	3.33	3.41	3.42	3.35	2.91	9.61	9.61	6.33	6.12	4.08	3.49	3.7	4.19	5.04	6.27	9.36	6.54	6.4
4992800	1.38	1.27	1.5	2.39	2.59	2.76	2.89	2.95	2.96	2.88	2.73	2.47	2.82	6.72	7.96	5.48	6.11	4.43	3.34	3.43	3.69	4.2	5.01	8.98	6.83	6.2
4992700	1.24	1.04	1.76	2.43	2.54	2.59	2.59	2.53	2.41	2.21	1.92	2.09	2.92	6.87	6.94	4.77	6.01	4.69	3.1	3.21	3.37	3.67	4.19	8.28	7.16	5.87
4992600	1.07	1.18	1.88	2.3	2.3	2.26	2.16	2	1.79	1.6	1.81	2.14	3.06	6.97	6.06	4.18	5.85	4.85	3.29	3.02	3.14	3.33	3.65	7.32	7.37	5.46
4992500	0.88	1.39	1.85	2.03	1.96	1.83	1.67	1.46	1.48	1.63	1.94	2.29	3.75	6.97	5.23	3.69	5.65	4.92	3.58	2.88	2.97	3.09	3.3	6.31	7.41	5.54
4992400	0.97	1.54	1.82	1.69	1.56	1.4	1.28	1.4	1.51	1.78	2.07	2.4	4.33	6.86	4.51	3.27	5.42	4.94	3.8	2.79	2.84	2.92	3.06	5.38	7.25	5.8
4992300	1.14	1.57	1.7	1.33	1.17	1.22	1.33	1.43	1.64	1.89	2.18	2.91	4.78	6.66	4.23	2.91	5.18	4.9	3.97	2.75	2.76	2.81	2.9	4.6	6.93	6.07
4991800	1.15	1.02	0.85	1.2	1.33	1.54	1.9	2.32	2.82	3.37	3.97	4.56	5.5	4.95	2.62	2.55	4.02	4.3	4.13	3.54	2.71	2.03	2.18	2.79	4.19	5.7
4991300	0.61	0.73	1	1.97	2.28	2.62	3	3.4	3.81	4.21	4.56	4.82	4.92	3.33	1.76	2.39	3.11	3.53	3.71	3.6	3.2	2.6	1.94	1.79	2.6	3.84
4990800	0.64	0.86	1.52	2.68	2.98	3.28	3.58	3.86	4.09	4.25	4.31	4.26	3.85	2.33	1.6	2.16	2.43	2.84	3.16	3.3	3.21	2.92	2.47	1.17	1.53	2.38

Source

Above NAAQS, Outside Facility

Exhibit 3-16
Estimated Population Exposed Above the NAAQS at 52 Facilities Examined

ASH GROVE CEMENT CO	CHANUTE	KS	0
ASH GROVE CEMENT CO	FOREMAN	AR	0
ASH GROVE CEMENT CO	INKOM	ID	364
ASH GROVE CEMENT CO	LOUISVILLE	NE	0
ASH GROVE CEMENT CO	MONTANA CITY	MT	0
BLUE CIRCLE INT.	RAVENA	NY	0[a]
CALIF PORTLAND CEMENT	MOJAVE	CA	0
CAPITOL AGGREGATES INC	SAN ANTONIO	TX	0
CONTINENTAL CEMENT CO INC	HANNIBAL	MO	2
DACOTAH CEMENT	RAPID CITY	SD	5
ESSROC MATERIALS	LOGANSPORT	IN	0
ESSROC MATERIALS	SPEED	IN	0
GIANT CEMENT COMPANY	HARLEYVILLE	SC	0
HEARTLAND CEMENT COMPANY	INDEPENDENCE	KS	0
HOLNAM INC	ADA	OK	0[b]
HOLNAM INC	ARTESIA	MS	0
HOLNAM INC	CLARKSVILLE	MO	0
HOLNAM INC	MORGAN	UT	0
HOLNAM INC	DUNDEE	MI	0
HOLNAM INC	LAPORTE	CO	0
HOLNAM INC	HOLLY HILL	SC	0
HOLNAM INC	FLORENCE	CO	0
HOLNAM INC	TIJERAS	NM	0[a]
INDEPENDENT CEMENT CORP	CATSKILL	NY	0
INDEPENDENT CEMENT CORP	HAGERSTOWN	MD	0
LAFARGE CORPORATION	APENA	MI	0[b]
LAFARGE CORPORATION	NEW BRAUNFELS	TX	1
LAFARGE CORPORATION	BUFFALO	IA	5
LAFARGE CORPORATION	FREDONIA	KS	0[a]
LAFARGE CORPORATION	GRAND CHAIN	IL	0
LAFARGE CORPORATION	PAULDING	OH	0
LAFARGE CORPORATION	SUGAR CREEK	MO	1
LEHIGH PORTLAND CEMENT CO	CEMENTON	NY	0
LEHIGH PORTLAND CEMENT CO	MASON CITY	IA	0
LEHIGH PORTLAND CEMENT CO	MITCHELL	IN	0
LEHIGH PORTLAND CEMENT CO	UNION BRIDGE	MD	7
LONE STAR INDUSTRIES	CAPE GIRARDEAU	MO	0
LONE STAR INDUSTRIES	GREENCASTLE	IN	0
LONE STAR INDUSTRIES	NAZARETH	PA	7
LONE STAR INDUSTRIES	OGLESBY	IL	0
MEDUSSA CEMENT COMPANY	CHARLEVOIX	MI	0
MEDUSSA CEMENT COMPANY	DEMOPOLIS	AL	0
NATIONAL CEMENT CO OF CALIFORNIA	LEBEC	CA	0
RINKER PORTLAND CEMENT CORP	MIAMI	FL	0
RIVER CEMENT COMPANY	FESTUS	MO	0
ROANOKE CEMENT COMPANY	CLOVERDALE	VA	0
SIGNAL MOUNTAIN CEMENT COMPANY	CHATTANOOGA	TN	0[b]
SOUTHDOWN	KNOXVILLE	TN	236
SOUTHDOWN	LYONS	CO	6
SOUTHDOWN	ODESSA	TX	0
TARMAC FLORIDA	MEDLEY	FL	0
TEXAS INDUSTRIES	MIDLOTHIAN	TX	0
TOTAL			**634**

[a] Although these facilities have people living within 500 meters, the population exposed above the NAAQS is assumed to be zero because the CKD is wetted or watered.

[b] Although the NAAQS is predicted to be exceeded out to a certain distance from the property line at these three facilities, no people live in the affected area.

3.4 MAJOR LIMITATIONS AND UNCERTAINTIES

This study has significantly enhanced EPA's understanding of the extent to which populations living near cement plants are potentially at risk due to exposures to airborne particulate matter from CKD waste management activities. The Agency recognizes, however, several limitations and uncertainties inherent in the analysis. Limitations and uncertainties associated with the PM exposures analysis include those related to the emissions and dispersion modeling, and those related to assessing population exposures across the facilities.

- All emission and dispersion/air quality modeling applications are limited by the accuracy of the input data and the inherent limitations of the specific models used. While site-specific data were used to the extent possible to develop emission and air quality modeling inputs, data were not available for several inputs and, thus, assumptions were developed as needed. Many of the AP-42 equations used in this analysis were developed originally based on empirical data, collected from industries using soil, gravel or other material (coal) all of which have properties different from CKD. Since no on-site emission testing was available for CKD facilities, use of these AP-42 equations was necessary for this analysis. Using equations to model CKD emissions that are not developed using empirical CKD data (or are at the equation limit) can introduce error into the present analysis. For example, the value for moisture content of the CKD during handling and at the pile used in the present analysis is the lower limit allowed by the equation rather than a value based on empirical analysis of actual CKD. For more realistic emissions modeling, equations and parameters that are based on studies of the actual behavior of CKD are required.

- Emissions controls for CKD (e.g., pelletized prior to transport) can greatly reduce emissions. After consulting the information on hand (i.e., site visit trip reports, PCA surveys, the NODA), EPA determined that there was no facility-specific information provided on how the CKD emissions are controlled between collection at the facility and disposal at the pile for the seven high-risk facilities modeled. Thus, EPA developed a general handling train scenario (and associated emissions controls) that was used at all seven facilities. Where this generic scenario does not match the actual CKD handling (and emissions controls) of the actual facility, the present analysis will not reflect the actual conditions.

- EPA used the "fastest mile" data from "Extreme Wind Speed at 129 Stations in the Contiguous United States" to calculate emissions for this analysis. This wind speed represents the mean annual fastest mile. Analysis of historical meteorological data to determine mean daily fastest mile values for each facility and the subsequent use of these values to estimate emissions were beyond the scope of this effort. Consequently, the emission estimates prepared for this analysis were calculated by assuming that the mean annual fastest mile occurs between every disturbance (i.e., as frequently as once per day) instead of once per year, and thus may overstate actual emission rates.

- The key assumptions underlying the estimation of the number of people exposed to PM concentrations are (i) individuals are always located at their residence; (ii) outdoor concentrations at the block centroid can adequately represent outdoor concentrations

throughout the block; and (iii) outdoor concentrations can adequately represent concentrations in all microenvironments. The first assumption may lead to over- or underestimates of population exposure, depending on whether the number of individuals typically located in each block is greater or less than the residential population. For example, an industrial or commercial area is likely to have more people present on average than is indicated by the residential population. The second assumption similarly may lead to either over- or underestimates of population exposure depending on the spatial distribution of the population throughout the block, and the steepness of concentration gradients. The smaller the spatial extent of the block, the less potential bias is introduced by this assumption. Because census subdivisions are designed to have approximately equal populations, blocks in urban areas tend to be significantly smaller than those in rural areas. Because concentration gradients tend to be steepest at locations closest to the emission source, the uncertainty introduced by this assumption is highest near the facility boundary. The third assumption is likely to lead to overestimates of the exposure concentration increment, since indoor concentrations of outdoor generated particulate matter are generally lower than concurrent outdoor concentrations, and individuals typically spend more than 80 percent of their time indoors. The amount of protection afforded by being indoors depends on a number of factors, including the air exchange rate, and the presence or absence of air filtration equipment.

- Extrapolation of the air quality modeling results completed for the Holnam Ada, Signal Mountain Chattanooga, and Lafarge Alpena facilities to other facilities involves some uncertainty because the physical characteristics that exist at these three facilities will not be replicated exactly at other cement facilities. Although these physical characteristics (meteorology, terrain, physical layout of sources) were examined at a basic level to determine which were the most significant in driving predicted concentrations, extensive sensitivity analysis was not conducted to fully explore the effect of such variations at other facilities.

- Extrapolation of the air quality modeling results to receptors located in a complete circle surrounding the facility is a conservative assumption since the maximum modeled concentrations at the Holnam Ada, Signal Mountain Chattanooga, and Lafarge Alpena facilities occurred only at receptors located downwind of the CKD sources. Concentrations predicted at receptors located upwind of the sources were considerably lower. If meteorological conditions at a given facility were to vary enough to produce concentrations at equal levels at all directions surrounding the facility, the final predicted concentrations at any given receptor point would be lower compared to that predicted at the three facilities.

- While EPA has established that coarse and fine airborne PM can increase respiratory symptoms and impair breathing, leading to adverse health effects, there are no widely accepted dose-response or toxicity measures for PM exposures. Thus, for this PM analysis, EPA could not describe the population risk in conventional terms of number of excess disease cases, and had to, instead, rely on comparing predicted airborne concentrations to air quality standards. Because the characteristics of the dose-

response relationship are not well understood as yet, it is possible that some or all of the people predicted to be exposed to PM levels exceeding the NAAQS will not exhibit any adverse effects.

- Assuming that emissions are completely eliminated (100 percent effectiveness) at facilities that report watering or wetting their waste piles involves significant uncertainty because there may be portions of the pile or the handling train that still can be sources of PM releases. Use of this assumption will tend to underestimate the population effects.

- There is significant uncertainty associated with predicting the number of people who live within 100 or 200 meters of the facility or waste pile boundary. This is because the finest resolution of Census data available from electronic databases is at the block level, and the method used for predicting the populations is the "buffer method." This method calculates the population within a circle (defined by a given radius) around the facility by tabulating the total populations of Census blocks whose centroids fall within that circle. As the circle gets smaller, it is less probable that the centroid of a given block will fall within the circle, although part of the block would still be in the circle.