Table 5 Summary of pollutants concentrations measured at different sites surrounding road paving with asphalt (μg/m^3)

			Averages (Maximum) Level detected Sampling locations							
Pollutant	**Limit value**	**Limit value Source**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**Background**
Acetone	30,000	EMEG	NS	NS	8.5 (22)	ND	NS	ND	2.0 (5.6)	2.4 (8.0)
Benzene	20	EMEG	NS	NS	1.5 (3.4)	0.12 (0.13)	0.79 (1.7)	2.9 (14)	0.6 (1.1)	1.1 (5.4)
Carbon Tetrachloride	200	EMEG	NS	NS	0.24 (0.41)	0.18 (0.22)	0.63 (0.79)	ND	ND	0.8 (1.0)
Ethylbenzene	4000	EMEG	NS	NS	0.59 (2.7)	ND	0.41 (1.9)	12 (18)	ND	1.1 (2.7)
Methylene Chloride	1000	EMEG	NS	NS	0.77 (2.4)	0.26 (0.32)	2.2 (3.8)	ND	ND	0.5 (2.7)
Tetrachloroethene	300	EMEG	NS	NS	0.054 (0.09)	ND	ND	1.7 (3.3)	ND	0.5 (2.4)
Toluene	300	EMEG	NS	NS	2.1 (3.9)	ND	1.9 (4.3)	32 (38)	1.0 (1.4)	2.6 (8.6)
1,1,1Trichloroethane	4000	EMEG	NS	NS	0.13 (2.7)	0.15 (0.18)	0.28 (0.38)	ND	ND	ND
m,p-Xylene	3000	EMEG	NS	NS	1.0 (2.3)	ND	0.60 (2.3)	33 (48)	ND	2.2 (7.1)
o-Xylene	3000	EMEG	NS	NS	0.39 (0.98)	ND	0.49 (1.0)	6.5 (8.7)	ND	1.2 (3.6)
Carbon Disulfide	900	EMEG	NS	NS	1.0 (3.6)	ND	NS	ND	1.2 (12.4)	ND
Hydrogen Sulfide	30	MRL	NS	NS	NS	NS	9 (65.5)	NS	0.1 (2)	ND
Carbon Monoxide (ppb)	10,000	NAAQS (8 hr)	NS	NS	NS	1580 (2980)	NS	NS	NS	NS
Acenaphthene	210	RBC	NS	NS	1.3 (2.9)	1.3	ND	ND	26 (70)	ND
Benzo(a)anthracene	200	OSHA PEL	NS	NS	0.14 (0.44)	ND	ND	ND	0.02 (0.031)	ND
Benzo(b)fluoranthene	200	OSHA PEL	NS	NS	0.14 (0.44)	ND	ND	ND	ND	ND
Benzo(k)fluoranthene	200	OSHA PEL	NS	NS	0.07 (0.13)	ND	ND	ND	ND	ND
Fluoranthene	150	RBC	NS	NS	0.30 (1.0)	0. 08	ND	ND	ND	ND
Fluorene	150	RBC	NS	NS	0.11 (0.24)	0. 2 1	ND	ND	0.09 (0.1)	ND
Pyrene	110	RBC	NS	NS	0.09 (0.15)	ND	ND	ND	ND	ND
Total Dust	150	EPA PM10 (24 hr)	52 (75)	18 (33)	50 (60)	14 (14)	140 (150)	NS	22 (38)	16 (21)

Respirable Dust	35	EPA PM2.5 (24 hr)	28 (49)	8.1 (19)	23 (30)	13 (21)	30 (40)	NS	19 (30)	13 (30)	

Table 7 Annual estimates of emissions of criteria pollutants and HAPs for typical batch mix and drum mix HMA plants

Pollutant	**(Emissions, lb/yr)**										
	Batch mix plant					**Drum mix**					
	Dryer, hot screens and mixer		**Load-out operations**	**Asphalt storage tank**	**Yard emissions**	**Dryer**		**Load-out operations**	**Silo filling**	**Asphalt storage tank**	**Yard emissions**
	Oil fired dryer	**Natural gas fired dryer**				**Oil fired dryer**	**Natural gas fired dryer**				
Criteria Pollutants											
PM10	2,700	2,700	52	ND	ND	4,600	4,600	104	120	ND	ND
VOC	820	820	391	32	110	6,400	6,400	780	2,400	64	220
CO	40,000	40,000	135	3	36	26,000	26,000	270	240	6	72
SO2	8,800	460	-	-	-	2,200	680	-	-	-	-
NOx	12,000	2,500	-	-	-	11,000	5,200	-	-	-	-
PAHs (semi-volatile HAPs)											
Acenaphthene	0.09	0.09	0.089	0.0027	ND	0.28	0.28	0.177	0.24	0.0027	ND
Acenaphthylene	0.058	0.058	0.0095	0.001	ND	4.4	1.7	0.0191	0.0071	0.001	ND
Anthracene	0.021	0.021	0.0239	0.00092	ND	0.62	0.044	0.0477	0.066	0.00092	ND
Benzo(a)anthracene	0.00046	0.00046	0.0065	-	ND	0.042	0.042	0.013	0.028	-	ND
Benzo(a)pyrene	0.000031	0.000031	0.00078	-	ND	0.002	0.002	0.00157	-	-	ND
Benzo(e)pyren	-	-	0.0027	-	ND	0.022	0.02	0.0053	0.0048	-	ND

e							2				
Benzo(b)fluoranthene	0.00094	0.00094	0.0026	0.00051	ND	0.02	0.02	0.0052	-	0.00051	ND
Benzo(k)fluoranthene			0.00075	-	ND			0.0015		-	ND
Benzo(g,h,i)perylene	0.00005	0.00005	0.00065	-	ND	0.008	0.008	0.0013		-	ND
Benzo(k)fluoranthene	0.0013	0.0013	-	-	ND	0.0082	0.0082	-		-	ND
Chrysene	0.00038	0.00038	0.035	-	ND	0.036	0.036	0.07	0.11	-	ND
Dibenz(a,h)anthracene	0.0000095	0.0000095	0.00013	-	ND	-	-	0.00025	-	-	ND
Fluoranthene	0.016	0.016	0.017	0.00022	ND	0.12	0.12	0.034	0.076	0.00022	ND
Fluorene	0.16	0.16	0.26	0.00016	ND	2.2	0.76	0.53	0.51	0.00016	ND
Indendo(1,2,3-cd)pyrene	0.00003	0.00003	0.00016	-	ND	0.0014	0.0014	0.00032	-	-	ND
Naphthalene	3.6	3.6	0.43	0.087	ND	130	18	0.85	0.92	0.087	ND
2-Methylnaphthalene	7.1	7.1	0.81	-	ND	34	15	1.62	2.7	-	ND
Phenanthrene	0.26	0.26	0.28	0.025	ND	4.6	1.5	0.55	0.91	0.025	ND
Pyrene	0.0062	0.0062	0.051	0.00016	ND	0.6	0.11	0.1	0.22	0.00016	ND
Perylene	-	-	0.0075	-	ND	0.0018	0.0018	0.015	0.015	-	ND
Total PAHs	11	11	2.02	0.12	ND	180	37	4.05	5.8	0.12	ND
Other semi-volatile HAPs											
Phenol	-	-	0.4	0	-	-	-	0.8	0	0	-
Volatile HAPs											
Acetaldehyde	32	32	-	-	-	-	-	-	-	-	-
Benzene	28	28	0.22	0.01	0.057	78	78	0.43	0.78	0.02	0.11
Bromomethane	-	-	0.04	0.0016	0.011	-	-	0.08	0.12	0.0031	0.021
2-Butanone	-	-	0.2	0.012	0.054	-	-	0.41	0.95	0.025	0.11
Carbon disulfide	-	-	0.054	0.0051	0.014	-	-	0.11	0.39	0.01	0.029
Chloroethane	-	-	0.00087	0.0012	0.00023	-	-	0.0017	0.095	0.0025	0.0046

Chloromethane	-	-	0.062	0.0074	0.017	-	-	0.12	0.56	0.015	0.033
Cumene	-	-	0.46	-	0.12	-	-	0.91	-	-	0.24
Ethylbenzene	220	220	1.16	0.012	0.31	48	48	2.3	0.93	0.024	0.62
Formaldehyde	74	74	0.37	140	0.1	620	620	0.73	17	140	0.19
n-Hexane	-	-	0.62	0.032	0.17	184	180	1.25	2.4	0.064	0.33
Isooctane	-	-	0.0075	0.000099	0.002	8	8	0.015	0.0076	0.0002	0.004
Methylene chloride	-	-	0	0.000086	0	-	-	0	0.0066	0.00017	0
Methyl tert-butyl ether	-	-	-	-	-			0	-	-	-
Methyl chloroform	-	-	-	-	-	9.6	9.6	-	-	-	-
Quinone	-	-				-	-				
Styrene	-	-	0.03	0.0017	0.008	-	-	0.06	0.13	0.0035	0.016
Toluene	100	100	0.87	0.02	0.23	580	30	1.74	1.5	0.04	0.46
Tetrachloroethene	-	-	0.032		0.0085	-	-	0.064	-	-	0.017
1,1,1-Trichloroethane	-	-	0			-	-	0	-	-	-
Trichloroethene	-	-	0			-	-	0	-	-	-
Trichlorofluoromethane	-	-	0.0054		0.0014	-	-	0.011	-	-	0.0029
m-/p-Xylene	-	-	1.7	0.061	0.45	-	-	3.4	4.6	0.12	0.9
o-Xylene	270	270	0.33	0.018	0.088	40	40	0.66	1.4	0.036	0.18
Total Volatile HAPs	751	751	6.18	140	1.6	1,568	1,020	12.35	31	140	3.3
Metal HAPs											
Antimony			-	-	-	0.036	0.036	-	-	-	-
Arsenic	0.046	0.046	-	-	-	0.11	0.11	-	-	-	-
Beryllium	0.015	0.015	-	-	-	0	0	-	-	-	-
Cadmium	0.061	0.061	-	-	-	0.082	0.082	-	-	-	-
Chromium	0.057	0.057	-	-	-	1.1	1.1	-	-	-	-

Lead	0.089	0.089	-	-	-	3	0.12	-	-	-	-								
Manganese	0.69	0.69	-	-	-	1.5	1.5	-	-	-	-								
Mercury	0.041	0.041	-	-	-	0.52	0.048	-	-	-	-								
Nickel	0.3	0.3	-	-	-	12.6	12.6	-	-	-	-								
Selenium	0.049	0.049	-	-	-	0.07	0.07	-	-	-	-								
Total metal HAPs	1.35	1.35	-	-	-	19	16	-	-	-	-								

Table 8 Annual emissions (pounds per year) for HMA facility

Pollutants	**Batch Mix HMA a**									**Drum Mix HMA b**									
	Mobile sources (diesel exhaust)	**Material handling and road dust**	**Fuel oil fired dryer, hot screens, and mixer**	**Natural gas fired dryer, hot screens, and mixer**	**Load out**	**Asphalt Storage**	**Yard**	**Total (oil fired)**	**Total (gas fired)**	**Mobile sources (diesel exhaust)**	**Material handling and road dust**	**Fuel oil fired dryer**	**Natural gas fired dryer**	**Load out**	**Silo filling**	**Asphalt Storage**	**Yard**	**Total (oil fired)**	**Total (gas fired)**
Criteria air pollutants	46	7,900	2,700	2,700	52	-	-	10,700	10,700	220	26,000	4,600	4,600	104	117				
PM10	100	-	820	820	391	32	110	1,500	1,500	190	-	6,400	6,400	782	2,440	-	-	31,000	31,000
VOCs	700	-	40,000	40,000	135	3	35	41,000	41,000	1,200	-	26,000	26,000	270	236	64	220	10,000	10,000
CO	22	-	8,800	460	-	-	-	8,800	480	26	-	2,200	680	-	-	6	72	28,000	28,000
SO2	380	-	12,000	2,500	-	-	-	12,400	2,900	560	-	11,000	5,200	-	-	-	-	2,200	710
NOx																-	-	12,000	5,800
Hazardous air polluta	0.035	-	11	11	2	0.12	-	13	13	0.13	-	176	37	4	5.8				

nts (HAPs)																			
PAHs	-	-	-	-	0.4	-	-	0.4	0.4	-	-	-	-	0.8	-	0.12	-	190	50
Phenol	1.9	-	751	751	6.2	140	1.6	760	760	6.6	-	1,560	1,020	12.4	31	-	-	0.8	0.8
Volatile HAPs	-	-	1.4	1.4	-	-	-	1.4	1.4	-	-	19	16	-	-	140	3.3	1,800	1,200
Metal HAPs	1.9	-	760	760	8.6	140	1.6	770	770	6.7	-	1,800	1,100	17	37	-	-	19	16
Total HAPs																140	3.3	2,000	1,300