Appendix 5.2.3 Estimation of Particle Size Distribution

(A) For Heavy Construction Activities (including Crushing Plant) and Wind Erosion

Aerodynamic Particle size (µm)	< 30	<10	<2.5
TSP			
Average Aerodynamic Particle size (µm)	20	6.25	1.25
Proportion of average aerodynamic particle size*	70%	27%	3%
RSP			
Average Aerodynamic Particle size (µm)	--	6.25	1.25
Normalized proportion for RSP	--	90%	10%
FSP			
Average Aerodynamic Particle size (µm)	--	--	1.25
Normalized proportion for FSP	--	--	100%

*References:

(1) RSP proportion based on USEPA document Estimating Particulate Matter Emissions from Construction Operations, 1999

(2) FSP proportion based on Thompson G. Pace, USEPA. Examination of the Multiplier Used to Estimate PM2.5 Fugitive Dust Emissions from PM10, April 2005

(B) For Loading & Unloading of Dusty Materials for Stockpiles, Barging Points and Concrete/Asphalt Batching Plants

Aerodynamic Particle size (µm)	< 30	< 15	< 10	< 5	< 2.5
TSP					
Particle Size Multiplier (k)*	0.74	0.48	0.35	0.2	0.053
Emission factor (E)*	0.002196	0.001425	0.001039	0.000594	0.000157
Proportion of below aerodynamic particle size	100%	65%	47%	27%	7%
Average Aerodynamic Particle size (µm)	22.5	12.5	7.5	3.75	1.25
Proportion of average aerodynamic particle size (%)	35%	18%	20%	20%	7%
RSP					
Average Aerodynamic Particle size (µm)	--	--	7.5	3.75	1.25
Normalized proportion for RSP	--	--	42.6%	42.6%	14.9%
FSP					
Average Aerodynamic Particle size (µm)	--	--	--	--	1.25
Normalized proportion for FSP	--	--	--	--	100%

*References:

Based on USEPA AP-42 Section 13.2.4.3, Emission factor, $E = k \times 0.0016 \times [(U/2.2)^{1.3}/(M/2)^{1.4}$ kg/Mg where
k is particle size multiplier as given in USEPA AP-42 Section 13.2.4.3;
U is average wind speed of 4.9 m/s and based on wind data from HKOAMO 2012 and
M is moisture content of 5% and is based on engineering estimates

(C) For Cement/ Asphalt Batching Plant

Aerodynamic Particle size (µm)	< 30	<10	<2.5
TSP			
Average Aerodynamic Particle size (µm)	20	6.25	1.25
Proportion of average aerodynamic particle size*	63%	23%	14%
RSP			
Average Aerodynamic Particle size (µm)	--	6.25	1.25
Normalized proportion for RSP	--	62%	38%
FSP			
Average Aerodynamic Particle size (µm)	--	--	1.25
Normalized proportion for FSP	--	--	100%

*References:

RSP and FSP proportions based on R.K. Gupta, et al., Particulate Matter and Elemental Emission from a Cement Kiln, Fuel Processing Technology, 2012

(D) For Paved Haul Roads

Aerodynamic Particle size (µm)	< 30	< 15	< 10	< 2.5
TSP				
Particle Size Multiplier (k)*	3.23	0.77	0.62	0.15
Emission factor (E)*	937.7	223.5	180.0	43.5
Proportion of below aerodynamic particle size	100%	24%	19%	5%
Average Aerodynamic Particle size (µm)	22.5	12.5	6.25	1.25
Proportion of average aerodynamic particle size	76%	5%	15%	5%
RSP				
Average Aerodynamic Particle size (µm)	--	--	6.25	1.25
Normalized proportion for RSP	--	--	75%	25%
FSP				
Average Aerodynamic Particle size (µm)	--	--	--	1.25
Normalized proportion for FSP	--	--	--	100%

*References:

Based on USEPA AP-42 Section 13.2.1, Eission factor, $E = k \times (sL)^{0.91} \times W^{1.02}$ g/VKT where
k is particle size multiplier as given in USEPA AP-42 Section 13.2.1 (Table 13.2.1-1);
sL is road surface silt loading of 12 g/m³ given in USEPA AP-42, Section 13.2.1, Table 13.2.1-3, 01/11 ed. and
W is average truck weight based on engineering estimates (the W does not effect the particle proportion)