EMISSIONS FROM UNLOADING OPERATIONS

Source:	ID 1, Unloading of waste dust from ESP to haul trucks.

Emission Factor: $E = k(0.0032)(U/5)^{1.3}/(M/2)^{1.4}$ Source: AP-42 13.2.4

where:
E = Emission factor, uncontrolled, lbs/ton
k = Particle size multiplier
= 0.74 for material <30um
= 0.35 for material <10um
= 0.11 for material <2.5um
U = Mean wind speed, mph
M = Material moisture content, %

Input:
U = 9.8 mph
M = 4.8 % (4.8% is the maximum recommended by AP-42, actual moisture is 12.6%)
Tonnage = 80,556 tons/yr

Emission Calculations:

	<30um	<10um	<2.5um
Emission Factors (lbs/ton):	0.00167	0.00079	0.00025
Emissions (lbs/yr):	134.31	63.53	19.97
Emissions (tons/yr):	0.067	0.032	0.010

EMISSIONS FROM UNPAVED ROADS

Source:	ID 2, Haul truck travel on road segments from ESP loadout to waste pile.

Emission Factor: $E = [k(s/12)(S/30)(W/3)^{0.7}(w/4)^{0.5}((365-p)/365)]F$ Source: AP-42 13.2.2

where:
- E = Emission factor, uncontrolled, lbs/VMT
- k = Particle size multiplier
  - = 4.7 for material <30um
  - = 2.1 for material <10um
  - = 0.56 for material <2.5um
- s = Silt content of road surface material, percent
- S = Mean vehicle speed, mph
- W = Mean vehicle weight, tons
- w = Mean number of wheels
- p = Number of days with >=0.01 inches of precipitation
- VMT = Vehicle miles travelled per year
- F = Factor to account for the fraction of surface material that is waste dust

Input:

s =	1.8 %	
S =	10 mph	
W =	33.5 tons	Truck + Load = 17.5 + 16.0 = 33.5
w =	6 wheels	
p =	150 days	
VMT =	4,280 miles =	
F =	0.1	

Emission Calculations:

	<30um	<10um	<2.5um
Emission Factors (lbs/VMT):	0.092	0.041	0.011
Emissions (lbs/yr):	392.8	175.5	46.8
Emissions (tons/yr):	0.196	0.088	0.023

VMT = DT/C

where:
- D = Distance, miles 0.85
  (0.7 to 1.0 miles depending upon route, select 0.85 and assume completely unpaved)
- T = CKD Wasted, ton/yr 80,556
- C = Truck Capacity, tons 16

EMISSIONS FROM UNPAVED ROADS

Source:	ID 4, Haul truck travel on waste pile - loaded.

Emission Factor: $E = [k(s/12)(S/30)(W/3)^{0.7}(w/4)^{0.5}((365-p)/365)]F$ Source: AP-42 13.2.2

where:
- E = Emission factor, uncontrolled, lbs/VMT
- k = Particle size multiplier
  - = 4.7 for material <30um
  - = 2.1 for material <10um
  - = 0.56 for material <2.5um
- s = Silt content of road surface material, percent
- S = Mean vehicle speed, mph
- W = Mean vehicle weight, tons
- w = Mean number of wheels
- p = Number of days with >=0.01 inches of precipitation
- VMT = Vehicle miles travelled per year
- F = Factor to account for the fraction of surface material that is waste dust.

Input:

s =	1.8 %	
S =	5 mph	
W =	33.5 tons	Truck + Load = 17.5 + 16.0 = 33.5
w =	6 wheels	
p =	150 days	
VMT =	1007 miles	
F =	1	

Emission Calculations:

	<30um	<10um	<2.5um
Emission Factors (lbs/VMT):	0.459	0.205	0.055
Emissions (lbs/yr):	462.2	206.5	55.1
Emissions (tons/yr):	0.231	0.103	0.028

VMT = DT/C

where:

D =	Distance, miles	0.2
T =	CKD Wasted, ton/yr	80,556
C =	Truck Capacity, tons	16

EMISSIONS FROM UNLOADING OPERATIONS

Source: ID 5, Unloading of waste dust from haul trucks to waste pile.

Emission Factor: E = k(0.0032)(U/5)^1.3/(M/2)^1.4 Source: AP-42 13.2.4

where:
E = Emission factor, uncontrolled, lbs/ton
k = Particle size multiplier
= 0.74 for material <30um
= 0.35 for material <10um
= 0.11 for material <2.5um
U = Mean wind speed, mph
M = Material moisture content, %

Input:
U = 9.8 mph
M = 4.8 % (4.8% is the maximum recommended by AP-42, actual moisture is 12.6%)
Tonnage = 80,556 tons/yr

Emission Calculations:

	<30um	<10um	<2.5um
Emission Factors (lbs/ton):	0.00167	0.00079	0.00025
Emissions (lbs/yr):	134.31	63.53	19.97
Emissions (tons/yr):	0.067	0.032	0.010

EMISSIONS FROM UNPAVED ROADS

Source: ID 6, Haul truck travel on waste pile - empty.

Emission Factor: $E = [k(s/12)(S/30)(W/3)^{0.7}(w/4)^{0.5}((365-p)/365)]F$ Source: AP-42 13.2.2

where:
- E = Emission factor, uncontrolled, lbs/VMT
- k = Particle size multiplier
  - = 4.7 for material <30um
  - = 2.1 for material <10um
  - = 0.56 for material <2.5um
- s = Silt content of road surface material, percent
- S = Mean vehicle speed, mph
- W = Mean vehicle weight, tons
- w = Mean number of wheels
- p = Number of days with >=0.01 inches of precipitation
- VMT = Vehicle miles travelled per year
- F = Factor to account for the fraction of surface material that is waste dust.

Input:

s =	1.8	%
S =	10	mph
W =	17.5	tons
w =	6	wheels
p =	150	days
VMT =	1,007	miles
F =	1	

Truck + Load = 17.5 + 0.0 = 17.5

Emission Calculations:

	<30um	<10um	<2.5um
Emission Factors (lbs/VMT):	0.583	0.260	0.069
Emissions (lbs/yr):	586.7	262.1	69.9
Emissions (tons/yr):	0.293	0.131	0.035

VMT = DT/C

where:

D = Distance, miles	0.2
T = CKD Wasted, ton/yr	80,556
C = Truck Capacity, tons	16

EMISSIONS FROM UNPAVED ROADS

Source: ID 7, Haul truck travel on road segments to ESP loadout from waste pile.

Emission Factor: $E = [k(s/12)(S/30)(W/3)^{0.7}(w/4)^{0.5}((365-p)/365)]F$ Source: AP-42 13.2.2

where:
- E = Emission factor, uncontrolled, lbs/VMT
- k = Particle size multiplier
  - = 4.7 for material <30um
  - = 2.1 for material <10um
  - = 0.56 for material <2.5um
- s = Silt content of road surface material, percent
- S = Mean vehicle speed, mph
- W = Mean vehicle weight, tons
- w = Mean number of wheels
- p = Number of days with >=0.01 inches of precipitation
- VMT = Vehicle miles travelled per year
- F = Factor to account for the fraction of surface material that is waste dust.

Input:

s =	1.8	%
S =	20	mph
W =	17.5	tons
w =	6	wheels
p =	150	days
VMT =	4,280	miles
F =	0.1	

Truck + Load = 17.5 + 0.0 = 17.5

Emission Calculations:

	<30um	<10um	<2.5um
Emission Factors (lbs/VMT):	0.117	0.052	0.014
Emissions (lbs/yr):	498.7	222.8	59.4
Emissions (tons/yr):	0.249	0.111	0.030

VMT = DT/C

where:
- D = Distance, miles 0.85
  (0.7 to 1.0 miles depending upon route, select 0.85 and assume completely unpaved)
- T = CKD Wasted, ton/yr 80,556
- C = Truck Capacity, tons 16

EMISSIONS FROM UNPAVED ROADS

Source:	ID 8, Frontend loader travel on road segments to and from waste pile.

Emission Factor: $E = [k(s/12)(S/30)(W/3)^{0.7}(w/4)^{0.5}((365-p)/365)]F$ Source: AP-42 13.2.2

where:
- E = Emission factor, uncontrolled, lbs/VMT
- k = Particle size multiplier
  - = 4.7 for material <30um
  - = 2.1 for material <10um
  - = 0.56 for material <2.5um
- s = Silt content of road surface material, percent
- S = Mean vehicle speed, mph
- W = Mean vehicle weight, tons
- w = Mean number of wheels
- p = Number of days with >=0.01 inches of precipitation
- VMT = Vehicle miles travelled per year
- F = Factor to account for the fraction of surface material that is waste dust.

Input:

s =	1.8	%
S =	10	mph
W =	45	tons
w =	4	wheels
p =	150	days
VMT =	52	miles
F =	0.1	

Emission Calculations:

	<30um	<10um	<2.5um
Emission Factors (lbs/VMT):	0.092	0.041	0.011
Emissions (lbs/yr):	4.8	2.1	0.6
Emissions (tons/yr):	0.002	0.001	0.000

$VMT = D_R T_R$

where:

D_R = Round Trip Dist., miles 2.0

(1.4 to 2.0 miles depending upon route, select 2.0 assume completely unpaved)

T_R = Round Trips, per year 26

EMISSIONS FROM UNPAVED ROADS

Source: ID 9, Frontend loader travel on waste pile.

Emission Factor: $E = [k(s/12)(S/30)(W/3)^{0.7}(w/4)^{0.5}((365-p)/365)]F$ Source: AP-42 13.2.2

where:
- E = Emission factor, uncontrolled, lbs/VMT
- k = Particle size multiplier
  - = 4.7 for material <30um
  - = 2.1 for material <10um
  - = 0.56 for material <2.5um
- s = Silt content of road surface material, percent
- S = Mean vehicle speed, mph
- W = Mean vehicle weight, tons
- w = Mean number of wheels
- p = Number of days with >=0.01 inches of precipitation
- VMT = Vehicle miles travelled per year
- F = Factor to account for the fraction of surface material that is waste dust.

Input:

s =	1.8	%
S =	2.5	mph
W =	45	tons
w =	4	wheels
p =	150	days
VMT =	260	miles
F =	1	

Emission Calculations:

	<30um	<10um	<2.5um
Emission Factors (lbs/VMT):	0.230	0.103	0.027
Emissions (lbs/yr):	59.9	26.8	7.1
Emissions (tons/yr):	0.030	0.013	0.004

$VMT = ST_PE$

where:
- S = Event Speed, mph 2.5
- T_P = Event Time, hr 4
- E = Events, per yr 26

EMISSIONS FROM PUSHING OPERATIONS

Source:	ID 10, Pushing of waste dust over edge of pile with frontend loader.

Emission Factor: E = 2.2[k(s)^a/(M)^b]C (for material <30um) Source: AP-42 11.9-4
E = 2.2(0.75) (for material <10um)
E = 2.2(0.105) (for material <2.5um)

where:
E = Emission factor, uncontrolled, lbs/hr
k = Particle size multiplier
= 35.6 for material <30um
s = Material silt content, %
M = Material moisture content, %
a = 1.2 for <30um
b = 1.3 for <30um
C = Factor to account for change in chemical make-up of dust as dust ages.

Input:

s =	1.8 %	
M =	7.96 %	(average of as generated, 7day, and 14 day moisture)
Activity =	104 hrs/yr	
C =	0.5	

Emission Calculations:

	<30um	<10um	<2.5um
Emission Factors (lbs/hr):	5.345	1.650	0.231
Emissions (lbs/yr):	555.92	171.60	24.02
Emissions (tons/yr):	0.278	0.086	0.012

Actvity = $T_P E$

where:
T_P = Event Time, hr 4
E = Events, per yr 26

EMISSIONS FROM WIND EROSION Source: AP-42 13.2.5

Source: ID 11, Wind erosion of exposed face and top of waste dust pile.

Period Between Disturbances	Fastest 1 Minute 10m Wind Speed (a) u+ (mph)	u+ (m/sec)	Equivalent Friction Velocity By Pile Subarea: Lower Face u*a (m/sec)	Mid Face u*b (m/sec)	Upper Face u*c (m/sec)	Top Area u*d (m/sec)	Threshold Friction Velocity(b) ut* (m/sec)	Equivalent Wind Erosion Potential By Pile Subarea: Lower Face Pa (g/m2)	Mid Face Pb (g/m2)	Upper Face Pc (g/m2)	Top Area Pd (g/m2)	
1	29	12.963	0.259	0.778	1.167	0.778	0.760	0.000	0.463	19.759	0.463	
2	29	12.963	0.259	0.778	1.167	0.778	0.760	0.000	0.463	19.759	0.463	
3	25	11.175	0.224	0.671	1.006	0.671	0.760	0.000	0.000	9.647	0.000	
4	28	12.516	0.250	0.751	1.126	0.751	0.760	0.000	0.000	16.949	0.000	
5	30	13.410	0.268	0.805	1.207	0.805	0.760	0.000	1.230	22.756	1.230	
6	25	11.175	0.224	0.671	1.006	0.671	0.760	0.000	0.000	9.647	0.000	
7	22	9.834	0.197	0.590	0.885	0.590	0.760	0.000	0.000	4.034	0.000	
8	28	12.516	0.250	0.751	1.126	0.751	0.760	0.000	0.000	16.949	0.000	
9	28	12.516	0.250	0.751	1.126	0.751	0.760	0.000	0.000	16.949	0.000	
10	24	10.728	0.215	0.644	0.966	0.644	0.760	0.000	0.000	7.588	0.000	
11	21	9.387	0.188	0.563	0.845	0.563	0.760	0.000	0.000	2.538	0.000	
12	37	16.539	0.331	0.992	1.489	0.992	0.760	0.000	8.939	48.995	8.939	
13	31	13.857	0.277	0.831	1.247	0.831	0.760	0.000	2.081	25.941	2.081	
14	22	9.834	0.197	0.590	0.885	0.590	0.760	0.000	0.000	4.034	0.000	
15	16	7.152	0.143	0.429	0.644	0.429	0.760	0.000	0.000	0.000	0.000	
16	28	12.516	0.250	0.751	1.126	0.751	0.760	0.000	0.000	16.949	0.000	
17	26	11.622	0.232	0.697	1.046	0.697	0.760	0.000	0.000	11.893	0.000	
18	26	11.622	0.232	0.697	1.046	0.697	0.760	0.000	0.000	11.893	0.000	
19	26	11.622	0.232	0.697	1.046	0.697	0.760	0.000	0.000	11.893	0.000	
20	23	10.281	0.206	0.617	0.925	0.617	0.760	0.000	0.000	5.717	0.000	
21	33	14.751	0.295	0.885	1.328	0.885	0.760	0.000	4.034	32.875	4.034	
22	30	13.410	0.268	0.805	1.207	0.805	0.760	0.000	1.230	22.756	1.230	
23	25	11.175	0.224	0.671	1.006	0.671	0.760	0.000	0.000	9.647	0.000	
24	32	14.304	0.286	0.858	1.287	0.858	0.760	0.000	3.016	29.314	3.016	
25	25	11.175	0.224	0.671	1.006	0.671	0.760	0.000	0.000	9.647	0.000	
26	29	12.963	0.259	0.778	1.167	0.778	0.760	0.000	0.463	19.759	0.463	
					Sum of Erosion Potential (g/m2-yr):			0.000	21.919	407.886	21.919	
					Pile Area (m2):			768	3912	2305	2143	
					Pile Area Disturbence Frequency Adjustment factor:			1.00	1.00	1.00	14.04	(365/26 = 14.04)
					Emissions (lbs/yr):			0.00	189.0	2072.7	1453.8	

	<30um	<10um	<2.5um
TOTAL EMISSIONS (lbs/yr):	3,716	1,858	743
TOTAL EMISSIONS (tons/yr):	1.86	0.93	0.37

(a) From NOAA Local Climatological Data Monthly Summaries, Indianapolis, IN, 1/92 - 1/93.
(b) From Essroc sieve analysis of CKD and AP-42 13.2.5

EMISSIONS FROM UNLOADING OPERATIONS

Source: ID 13, Loading of waste dust from ESP area to accumulation bin.

Emission Factor: $E = k(0.0032)(U/5)^{1.3}/(M/2)^{1.4}$ Source: AP-42 13.2.4

where:
E = Emission factor, uncontrolled, lbs/ton
k = Particle size multiplier
= 0.74 for material <30um
= 0.35 for material <10um
= 0.11 for material <2.5um
U = Mean wind speed, mph
M = Material moisture content, %

Input:
U = 9.8 mph
M = 4.8 % (4.8% is the maximum recommended by AP-42, actual moisture is > 8.9%)
Tonnage = 1,664 tons/yr

Emission Calculations:

	<30um	<10um	<2.5um
Emission Factors (lbs/ton):	0.00167	0.00079	0.00025
Emissions (lbs/yr):	2.77	1.31	0.41
Emissions (tons/yr):	0.001	0.001	0.000

Tonnage = TE

where:
T = Bin Capacity, tons 32
E = Events, per yr 52

EMISSIONS FROM UNLOADING OPERATIONS

Source: ID 14, Unloading of waste dust from accumulation bin.

Emission Factor: E = k(0.0032)(U/5)^1.3/(M/2)^1.4 Source: AP-42 13.2.4

where:
E = Emission factor, uncontrolled, lbs/ton
k = Particle size multiplier
= 0.74 for material <30um
= 0.35 for material <10um
= 0.11 for material <2.5um
U = Mean wind speed, mph
M = Material moisture content, %

Input:
U = 9.8 mph
M = 4.8 % (4.8% is the maximum recommended by AP-42, actual moisture is > 8.9%)
Tonnage = 1,664 tons/yr

Emission Calculations:

	<30um	<10um	<2.5um
Emission Factors (lbs/ton):	0.00167	0.00079	0.00025
Emissions (lbs/yr):	2.77	1.31	0.41
Emissions (tons/yr):	0.001	0.001	0.000

Tonnage = TE

where:
T = Bin Capacity, tons 32
E = Events, per yr 52

Cement Kiln Dust

	Sieve Weight	As-Generated Pan + CKD	As-Generated CKD		One-Week Pan + CKD	One-Week CKD		Two-Weeks Pan + CKD	Two-Weeks CKD	
	(grams)	(grams)	(grams)		(grams)	(grams)		(grams)	(grams)	
Retained Sieve 4mm	680.4	1447.0	766.6	52.2%	1460.6	780.2	52.6%	1496.9	816.5	53.2%
Retained Sieve 2mm	499.0	993.4	494.4	33.7%	1011.4	512.4	34.5%	1088.7	589.7	38.4%
Retained Sieve 1mm	589.7	721.1	131.4	9.0%	689.5	99.8	6.7%	671.4	81.7	5.3%
Retained Sieve 0.5mm	567.0	632.1	65.1	4.4%	612.4	45.4	3.1%	589.7	22.7	1.5%
Retained Sieve 0.25mm	499.0	508.1	9.1	0.6%	544.3	45.4	3.1%	521.7	22.7	1.5%
Retained Pan	317.5	318.4	0.9	0.1%	318.4	0.9	0.1%	318.4	0.9	0.1%
Total			1467.5	100.0%		1484.1	100.0%		1534.1	100.0%
Conversion	0.00220									

Dried Cement Kiln Dust

	Sieve Weight	As-Generated Pan + CKD	As-Generated CKD		One-Week Pan + CKD	One-Week CKD		Two-Weeks Pan + CKD	Two-Weeks CKD	
	(grams)	(grams)	(grams)		(grams)	(grams)		(grams)	(grams)	
Sieve 3/8	1077.1	1710.7	633.6	21.3%	2219.4	1142.3	35.2%	1543.1	466.0	15.2%
Retained Sieve 4mesh	1033.5	1564.6	531.1	17.9%	1541.9	508.4	15.6%	1511.1	477.6	15.6%
Retained Sieve 10mesh	1160.6	1525.8	365.2	12.3%	1469.7	309.1	9.5%	1655.2	494.6	16.1%
Retained Sieve 20mesh	972.5	1175.5	203.0	6.8%	1143.9	171.4	5.3%	1324.1	351.6	11.5%
Retained Sieve 40mesh	768.3	939.4	171.1	5.8%	919.8	151.5	4.7%	1175.1	406.8	13.3%
Retained Sieve 100mesh	701.5	1075.0	373.5	12.6%	1061.3	359.8	11.1%	1068.6	367.1	12.0%
Retained Sieve 200mesh	334.4	982.8	648.4	21.8%	880.3	545.9	16.8%	779.2	444.8	14.5%
Retained Pan	405.9	454.2	48.3	1.6%	466.9	61.0	1.9%	461.4	55.5	1.8%
Total Cummulative Weight			2974.2	100.0%		3249.4	100.0%		3064.0	100.0%
Original CKD Weight			2974.7			3250.4			3064.1	
Dust Loss			0.5	0.02%		1.0	0.03%		0.1	0.00%

Moisture: 12/13/93 In oven @ 1100 hours
Moisture: 1/13/93 Out oven @ 1100 hours

Tare	10,744.4	(23.7)lbs.		12,292.3	(27.1)lbs.		12,255.4	(27.0)lbs.	
Final	9,393.2	(20.7)lbs.		11,197.1	(24.7)lbs.		11962.3	(26.4)lbs.	
Net	1351.2			1095.2			293.1		
Moisture Loss	12.58%			8.91%			2.39%		

APPENDIX C

DERMAL PERMEABILITY CONSTANTS

The Dermal Exposure Assessment: Principles and Applications guidance (U.S. EPA, 1992) was used to derive the coefficients of permeability through the skin for the chemicals of potential concern.

For inorganics, the default value of 0.001 cm/hour was used for the dermal permeability constant as recommended.

The dermal permeability constants (PC) for organics were either: (1) the recommended values presented in U.S. EPA (1992) or (2) derived using Equation 5-11 of that reference. Equation 5-11 is reproduced below.

$$\text{LogPC} = -2.72 + 0.71 \log K_{OW} - 0.0061\, MW$$

where:

PC	=	Skin permeability coefficient (cm/hr)
K_{OW}	=	Octanol-water partition coefficient (dimensionless)
MW	=	Molecular weight (grams/mole)

Table 1 of this Appendix summarizes the permeability constants (PC) used to estimate intakes via dermal contact with chemicals while swimming, the values of the parameters needed to calculate PC, and the source of the value.

References:

Howard, Philip H., 1989. Handbook of Environmental Fate and Exposure Data for Organic Chemicals. Lewis Publishers.

U.S. Environmental Protection Agency. 1992. Dermal Exposure Assessment: Principles and Applications. Office of Health and Environmental Assessment, Washington, D.C. 20460. EPA/600/8-91/011B.

Table C-1
Dermal Permeability Coefficients
ESSROC
Logansport, Indiana

Chemical	Kow	PC
2,3,7,8 TCDD	4370000	1.4
2,3,7,8-PeCDD	4370000	0.59
2,3,7,8-HxCDD	17000000	1.1
2,3,7,8-HpCDD	150000000	1
OCDD	38900000	1
2,3,7,8-TCDF	3390000	1.1
1,2,3,7,8-PeCDF	6170000	1
2,3,4,7,8-PeCDF	8320000	1
2,3,7,8-HxCDF	17800000	1.8
2,3,7,8-HpCDF	83000000	2.5
OCDF	603000000	1
Antimony		0.001
Arsenic		0.001
Barium		0.001
Beryllium		0.001
Cadmium		0.001
Chromium (VI)		0.001
Chromium, total		0.001
Lead		0.001
Divalent Mercury	0.61	0.001
Methyl Mercury		0.001
Nickel		0.001
Selenium		0.001
Silver		0.001
Thallium		0.001
Acenaphthene	9220	0.17
Benzo(a)pyrene	1350000	1.2
Benzo(a)anthracene	477000	0.81
Benzo(b)fluoranthene	1590000	1.2
Bis(2-ethyl hexyl)phthalate	20000000	1.2
2-Chlorophenol	145	0.011
Dibenz(a,h)anthracene	3530000	1.2
1,4-dichlorobenzene	2580	0.062
2,4-Dimethylphenol	229	0.015
2,4-Dinitrophenol	33	0.0018
2,4-Dinitrotoluene	99	0.0038
2,6-Dinitrotoluene	77	0.0025
Fluoranthene	121000	0.36
Hexachlorobenzene	318000	0.21
Hexachlorobutadiene	60255	0.121
Hexachlorocyclopentadiene	80700	0.109
Hexachloroethane	9660	0.046
Naphthalene	2360	0.069

Table C-1
Dermal Permeability Coefficients
ESSROC
Logansport, Indiana

Chemical	Kow	PC
2-Nitroaniline	70.8	0.0194
Nitrobenzene	68	0.0213
n-Nitroso-di-n-propylamine	24	0.323
Pentachlorophenol	120000	0.65
Phenol	30	0.0055
Pyrene	100000	0.39
1,2,4-Trichlorobenzene	9730	0.1
2,4,5-Trichlorophenol	7410	0.05
3,3'-Tetra CB	1610000	1.3
2,3,4,4','5-Penta CB	1610000	1.3
2,3',4,4',5-Penta CB	1610000	1.3
2',3,3',4,4'-Penta CB	1610000	1.3
2,3,3',4,4'-Penta CB	1610000	1.3
3,3',4,4',5-Penta CB	1610000	1.3
2,3',4,4',5,5'-Hexa CB	1610000	0.71
2,3,3'4,4',5-Hexa CB	1610000	0.71
2,3,3',4,4',5'_Hexa CB	1610000	0.71
3.3',4,4',5,5'-Hexa CB	1610000	0.71
2,2',3,4,4',5,5'-Hepta CB	1610000	0.71
2,2'3,3'4,4',5-Hepta CB	1610000	0.71
2,3,3',4,4',5,5'-Hepta CB	1610000	0.71
Total Mono CB	1610000	1.3
Total Di CB	1610000	1.3
Total Tri CB	1610000	1.3
Total Tetra CB	1610000	1.3
Total Penta CB	1610000	1.3
Total Hex CB	1610000	0.71
Total Hepta CB	1610000	0.71
Total Octa CB	1610000	0.71
Total Nona CB	1610000	0.71
Total Deca CB	1610000	0.71