INSTRUCTIONS: FILL IN ONLY THE YELLOW HIGHLIGHTED CELLS IN THE *General* and *Allowable* TABS AS NEEDED

Source	57-0246-01		APC 111, Box 2
Permit No.	982097		
Batch Rate by volume	120.00	yd^3 concrete/hr	APC 111, Box 9
Batch Rate by weight	241.44	tons concrete/hr, based on the composition of one cubic yard of concrete described below	
Maximum yearly production (assuming 8,760 hours)	1,051,200.00	yd^3 concrete/yr	
	2,115,014.40	tons concrete/yr, based on the composition of one cubic yard of concrete described below	

Voluntary Annual Limit(s)			
truck mix production	45,000.00	yd^3 concrete/yr, truck mix	APC 111, Box 6
central mix production	0.00	yd^3 concrete/yr, central mix	APC 111, Box 6
dry mix production [a]	0.00	yd^3 concrete/yr, dry mix	APC 111, Box 6
Total production [b]	45,000.00	yd^3 concrete/yr, total	

[a] Dry mix loading calculations in this workbook use the same emission factors as truck mix loading since AP42 does not have a separate factor for dry mix loading. Be aware that emissions from dry mix may possibly be higher due to factors such as a longer fall of dry materials, etc. , and using the control efficiency values simlar to those for truck mix may not be adequate. If necessary, the permit writer should request additional information from the applicant to evaluate the emissions from dry mix loading.

[b] Total production cannot add up to more than the value for maximum yearly production (assuming 8,760 hours) shown above

Total facility emissions based upon the following AP42 default composition of **one cubic yard of concrete**.		
Coarse Aggregate	1,865	pounds
Sand	1,428	pounds
Cement	491	pounds
Cement Supplement	73	pounds
Water [8.35 (lbs/gal)] x [20 (gal)]	167	pounds
Total for 1 yd^3	**4,024**	**pounds/yd^3**

Concrete material content factors for converting lb/ton emission factors to lb/yd^3 emission factors	
0.9325	(tons aggregate)/yd^3 concrete
0.7140	(tons sand)/yd^3 concrete
0.2455	(tons cement)/yd^3 concrete
0.0365	(tons supplement)/yd^3 concrete
1.6465	(tons aggregate + sand)/yd^3 concrete
0.2820	(tons cement + supplement)/yd^3 concrete

Control efficiencies, reference values, and point/fugitive source classification

% controlled	Point or Fugitive [a]	Source	Reference values for use as %controlled: AP42 [b]	Boot	Chute	Tube	Shroud	Enclosure	Wet suppression
	Fugitive	Aggregate delivery to ground storage (3-05-011-21)							
	Fugitive	Sand delivery to ground storage (3-05-011-22)							
	Fugitive	Aggregate transfer to conveyor (3-05-011-23)							
	Fugitive	Sand transfer to conveyor (3-05-011-24)							
	Fugitive	Aggregate transfer to elevated storage (3-05-011-04)							
	Fugitive	Sand transfer to elevated storage (3-05-011-05)							
99.9000%	Point	Cement delivery to Silo (3-05-011-07)	99.8631%						
99.9000%	Point	Cement supplement delivery to Silo (3-05-011-17)	99.7153%						
99.9000%	Point	Weigh hopper loading (3-05-011-08)							
99.9000%	Point	Truck mix loading (3-05-011-10)	91.2343%	10.0000%	10.0000%	10.0000%	20.0000%	40.0000%	75.0000%

[a] - The Point or Fugitive classification can only be changed for Weigh hopper loading, Truck mix loading, Central Mix loading, and Dry mix loading sources. The Point classification should be used only if these sources are fitted with capture and contol systems.

[b] - Values are based on AP42 Table 11.12-2 (6/06 on footer) Uncontrolled and Controlled Emission Factors.

[c] - Dry mix loading calculations in this workbook use the same emission factors as truck mix loading since AP42 does not have a separate factor for dry mix loading. Be aware that emissions from dry mix may possibly be higher due to factors such as a longer fall of dry materials, etc. , and using the control efficiency values simlar to those for truck mix may not be adequate. If necessary, the permit writer should request additional information from the applicant to evaluate the emissions from dry mix loading.

INSTRUCTIONS: FILL IN ONLY THE YELLOW HIGHLIGHTED CELLS IN THE *General* and *Allowable* TABS AS NEEDED

Source	57-0246-01	
Permit No.	982097	
Batch Rate by volume	120.00	yd^3 concrete/hr
Batch Rate by weight	241.44	tons concrete/hr

Voluntary Annual Limit(s)		
truck mix production	45,000.00	yd3 concrete/yr, truck mix
Total production	45,000.00	yd^3 concrete/yr, total

Selected concrete composition values calculated from inputs in General tab.		
Coarse Aggregate	0.9325	(tons aggregate)/yd^3 concrete
Sand	0.7140	(tons sand)/yd^3 concrete
Cement	0.2455	(tons cement)/yd^3 concrete
Cement Supplement	0.0365	(tons supplement)/yd^3 concrete
Coarse Aggregate + Sand	1.6465	(tons aggregate + sand)/yd^3 concrete
Cement + Cement Supplement	0.2820	(tons cement + supplement)/yd^3 concrete

Allowable Emissions

Allowable(s) for Fugitive Emissions - BASED ON TAPCR 1200-03-08-.01, 1200-03-08-.03, 1200-03-09-.03(8), and AP42 EMISSION FACTORS (See "Actual" tab)

Source	Fugitive PM lb/hr	Fugitive PM tpy 45,000 yd3/yr
Aggregate and sand operations	2.84	0.53
	2.84	**0.53**

Equations used in calculations:
Fugitive PM (lb/hr) - See "Actual" tab - Controlled emissions (lb/hr)
Fugitive PM (tpy - for 45,000 yd3 concrete/yr)- See "Actual" tab - Controlled emissions (ton/yr)

Allowable(s) for Stack (Point Source) Emissions based on PWR (New Process - beginning operation on or after April 3, 1972 (TABLE 2)) and dscf/min

For P <= 30, E = 3.59 (P)^0.62
For P > 30, E = 17.31 (P)^0.16
However:
(1) E shall not be required to be less than **0.02 gr/dscf of stack gases corrected to 70°F and 1 atmosphere**
(2) E shall not be allowed to be more than **0.25 gr/dscf of stack gases corrected to 70°F and 1 atmosphere**

PWR P (ton/hr)	# of Units	Stack/Process ID	APC 111 Boxes 12 - 15 dscf/min	lb/hr 0.02 gr/dscfm	lb/hr E from table 2	lb/hr 0.25 gr/dscfm	Stack PM lb/hr	Stack PM tpy 45,000 yd3/yr
29.460 (each)	1	(default) cement delivery to silo	2,340 (each)	0.40 lb/hr (total)	29.24 lb/hr (total)	5.01 lb/hr (total)	5.01 lb/hr	0.94 tpy
4.380 (each)	1	(default) cement supplement delivery to silo	2,340 (each)	0.40 lb/hr (total)	8.97 lb/hr (total)	5.01 lb/hr (total)	5.01 lb/hr	0.94 tpy
33.84	1	(default) Weigh hopper loading	40	0.01 lb/hr	30.41 lb/hr (total)	0.09 lb/hr	0.09 lb/hr	0.02 tpy
241.44	1	(default) Truck mix loading 45,000 yd3/yr	5000	0.86 lb/hr	41.64 lb/hr (total)	10.71 lb/hr	10.71 lb/hr	2.01 tpy
	1			0.00 lb/hr	0.00 lb/hr (total)	0.00 lb/hr	0.00 lb/hr	0.00 tpy
	1			0.00 lb/hr	0.00 lb/hr (total)	0.00 lb/hr	0.00 lb/hr	0.00 tpy
				0.00 lb/hr	0.00 lb/hr (total)	0.00 lb/hr	0.00 lb/hr	0.00 tpy
				0.00 lb/hr	0.00 lb/hr (total)	0.00 lb/hr	0.00 lb/hr	0.00 tpy
				0.00 lb/hr	0.00 lb/hr (total)	0.00 lb/hr	0.00 lb/hr	0.00 tpy
				0.00 lb/hr	0.00 lb/hr (total)	0.00 lb/hr	0.00 lb/hr	0.00 tpy
				0.00 lb/hr	0.00 lb/hr (total)	0.00 lb/hr	0.00 lb/hr	0.00 tpy
				0.00 lb/hr	0.00 lb/hr (total)	0.00 lb/hr	0.00 lb/hr	0.00 tpy
				0.00 lb/hr	0.00 lb/hr (total)	0.00 lb/hr	0.00 lb/hr	0.00 tpy
				0.00 lb/hr	0.00 lb/hr (total)	0.00 lb/hr	0.00 lb/hr	0.00 tpy
				0.00 lb/hr	0.00 lb/hr (total)	0.00 lb/hr	0.00 lb/hr	0.00 tpy
				0.00 lb/hr	0.00 lb/hr (total)	0.00 lb/hr	0.00 lb/hr	0.00 tpy
							20.82 lb/hr	**3.91 tpy**

Green shading shows the applicable basis (PWR or 0.02 gr/dscf or 0.25 gr/dscf) for each point source, BOTH a PWR and a dscf/min value must be input for each source.
Shaded cells indicate the estimated actual emission values to be used in the template permit and the emission summary.

Equations used in calculations:

For P <= 30, E (based on PWR & Table 2) = 3.59 (P)^0.62

For P > 30, E (based on PWR & Table 2) = 17.31 (P)^0.16

Emissions in gr/dscf corresponding to E (based on PWR and Table 2) = E (based on PWR and Table 2) * (7,000 gr/lb) / (dscf/min * 60 min/hr)

Emissions in lb/hr at a concentration of 0.02 gr/dscf = (dscf/min * 60 min/hr) * (0.02 gr/dscf) / (7,000 gr/lb)

Emissions in lb/hr at a concentration of 0.25 gr/dscf = (dscf/min * 60 min/hr) * (0.25 gr/dscf) / (7,000 gr/lb)

Example: When P = 29.460 ton/hr (per silo) and dscf/min = 2340.0 (per silo):

P (per silo) <= 30, therefore E (based on PWR and Table 2) = 3.59 (29.460)^0.62 = 29.24 lb/hr (per silo)

The corresponding gr/dscf value is (29.24 lb/hr) * (7,000 gr/lb) / (2340.0 dscf/min * 60 min/hr) = 1.46 gr/dscf

Since 1.46 gr/dscf is greater than 0.25 gr/dscf, then the allowable, based on 0.25 gr/dscf, is 5.01 lb/hr (per silo)

(1) * (5.01 lb/hr) * (45,000 yd3 concrete/yr) / (120 yd3 concrete/hr) / (2,000 lb/ton) = 0.94 tons/yr (tons/yr for 45,000 yd3 concrete/yr)

(1) * (5.01 lb/hr) * (8,760 hr/yr) / (2,000 lb/ton) = 21.94 tons/yr (tons/yr for 8,760 hr/yr)

INSTRUCTIONS: FILL IN ONLY THE YELLOW HIGHLIGHTED CELLS IN THE *General* and *Allowable* TABS AS NEEDED. DO NOT FILL OR MODIFY THIS TAB.

Source 57-0246-01

Permit No. 982097

Batch Rate by volume 120.00 yd^3 concrete/hr

Batch Rate by weight 241.44 tons concrete/hr

Voluntary Annual Limit(s)		
truck mix production	45,000.00	yd3 concrete/yr, truck mix
Total production	45,000.00	yd^3 concrete/yr, total

Concrete material content factors for converting lb/ton emission factors to lb/yd^3 emission factors	
0.9325	(tons aggregate)/yd^3 concrete
0.7140	(tons sand)/yd^3 concrete
0.2455	(tons cement)/yd^3 concrete
0.0365	(tons supplement)/yd^3 concrete
1.6465	(tons aggregate + sand)/yd^3 concrete
0.2820	(tons cement + supplement)/yd^3 concrete

CALCULATIONS BASED ON AP-42 TABLES 11.12-2, 11.12-5 and 11.12-6 (ENGLISH UNITS)
EMISSION FACTORS FOR CONCRETE BATCHING / PLANT WIDE EMISSION FACTORS PER YARD OF CONCRETE

Source (SCC)	Point or Fugitive	(ton material/ yd^3 concrete)	Uncontrolled emission factor PM		% controlled	Controlled emission factor PM		Uncontrolled emissions PM		Controlled emissions PM	
			(lb/ton)	(lb/yd^3)	PM	(lb/ton)	(lb/yd^3)	(lb/hr)	(ton/yr)	(lb/hr)	(ton/yr)
Aggregate delivery to ground storage (3-05-011-21)	Fugitive	0.9325	0.0069	0.0064		0.0069	0.0064	0.7680	0.1440	0.7680	0.1440
Sand delivery to ground storage (3-05-011-22)	Fugitive	0.7140	0.0021	0.0015		0.0021	0.0015	0.1800	0.0338	0.1800	0.0338
Aggregate transfer to conveyor (3-05-011-23)	Fugitive	0.9325	0.0069	0.0064		0.0069	0.0064	0.7680	0.1440	0.7680	0.1440
Sand transfer to conveyor (3-05-011-24)	Fugitive	0.7140	0.0021	0.0015		0.0021	0.0015	0.1800	0.0338	0.1800	0.0338
Aggregate transfer to elevated storage (3-05-011-04)	Fugitive	0.9325	0.0069	0.0064		0.0069	0.0064	0.7680	0.1440	0.7680	0.1440
Sand transfer to elevated storage (3-05-011-05)	Fugitive	0.7140	0.0021	0.0015		0.0021	0.0015	0.1800	0.0338	0.1800	0.0338
Cement delivery to Silo (3-05-011-07)	Point	0.2455	0.73	0.1792	99.9000%	0.0007300	0.0001792	21.5040	4.0320	0.0215	0.0040
Cement supplement delivery to Silo (3-05-011-17)	Point	0.0365	3.14	0.1146	99.9000%	0.0031400	0.0001146	13.7520	2.5785	0.0138	0.0026
Weigh hopper loading (3-05-011-08)	Point	1.6465	0.0048	0.0079	99.9000%	0.0000048	0.0000079	0.9480	0.1778	0.0009	0.0002
Truck mix loading (3-05-011-10) for 45,000.00 yd3/yr	Point	0.2820	1.118	0.3153	99.9000%	0.00112	0.000315	37.8360	7.0943	0.0378	0.0071
Point source emissions						**SUBTOTALS**		**74.04**	**13.88**	**0.07**	**0.01**
Fugitive source emissions											
Fugitive source emissions (aggregate and sand) (S1-4.B(a)								**2.84**	**0.53**	**2.84**	**0.53**
Fugitive source emissions (All)						**SUBTOTALS**		**2.84**	**0.53**	**2.84**	**0.53**
						TOTALS		**76.88**	**14.41**	**2.91**	**0.54**

Where material, based on AP42 11.12, is:

Aggregate for the aggregate delivery and transfer operations,
Sand for the sand delivery and transfer operations,
Cement for the cement delivery and discharge operations,
Cement supplement for the cement supplement delivery and discharge operations,
Aggregate + sand for the weigh hopper loading operation; and
Cement + cement supplement for the Truck mix loading and Central mix loading operations.

Cement + cement supplement is also used for the Dry mix loading operations.

Shaded cells indicate the estimated actual emission values to be used in the template permit and the emission summary.

Equations used in calculations for **PM** emissions:

[Uncontrolled PM Emissions factor (lb/ton material)] is taken from AP42 Table 11.12-2 or the background document

[Uncontrolled PM Emissions factor (lb/yd3)] = [Uncontrolled PM Emissions factor (lb/ton material)] x [concrete material content (ton material/yd3 concrete)] **Note:** This will match the value(s) in Tables 11.12-5 and 11.12-6

[Controlled PM Emissions factor (lb/ton material)] = [Uncontrolled PM Emissions factor (lb/ton material)] x [1 - (%controlled PM/100)]

[Controlled PM Emissions factor (lb/yd3 concrete)] = [Uncontrolled PM Emissions factor (lb/yd3 concrete)] x [1 - (%controlled PM/100)]

[Uncontrolled PM Emissions (lb/hr) = [Uncontrolled PM emissions factor (lb/yd3 concrete)] x [Batch Rate (yd3 concrete/hr)]

[Uncontrolled PM Emissions (ton/yr) = [Uncontrolled PM Emissions (lb/hr)] x [**Total** production (yd3 concrete/yr)] / [Batch Rate (yd3 concrete/hr)] / [2,000 (lb/ton)] **not for Truck mix loading or Central Mix loading**

[Uncontrolled PM Emissions (ton/yr) = [Uncontrolled PM Emissions (lb/hr)] x [**truck mix** production (yd3 concrete/yr)] / [Batch Rate (yd3 concrete/hr)] / [2,000 (lb/ton)] **for Truck mix loading only**

[Uncontrolled PM Emissions (ton/yr) = [Uncontrolled PM Emissions (lb/hr)] x [**central mix** production (yd3 concrete/yr)] / [Batch Rate (yd3 concrete/hr)] / [2,000 (lb/ton)] **for Central mix loading only**

[Uncontrolled PM Emissions (ton/yr) = [Uncontrolled PM Emissions (lb/hr)] x [**dry mix** production (yd3 concrete/yr)] / [Batch Rate (yd3 concrete/hr)] / [2,000 (lb/ton)] **for Dry mix loading only**

[Controlled PM Emissions (lb/hr) = [Controlled PM emissions factor (lb/ton material)] x [Batch Rate (yd3 concrete/hr)] x [concrete material content (ton material/yd3 concrete)]

[Controlled PM Emissions (ton/yr) = [Controlled PM Emissions (lb/hr)] x [Total production (yd3 concrete/yr)] / [Batch Rate (yd3 concrete/hr)] / [2,000 (lb/ton)] **not for Truck mix loading or Central Mix loading**

[Controlled PM Emissions (ton/yr) = [Controlled PM Emissions (lb/hr)] x [truck mix production (yd3 concrete/yr)] / [Batch Rate (yd3 concrete/hr)] / [2,000 (lb/ton)] **for Truck mix loading only**

[Controlled PM Emissions (ton/yr) = [Controlled PM Emissions (lb/hr)] x [central mix production (yd3 concrete/yr)] / [Batch Rate (yd3 concrete/hr)] / [2,000 (lb/ton)] **for Central mix loading only**

[Controlled PM Emissions (ton/yr) = [Controlled PM Emissions (lb/hr)] x [dry mix production (yd3 concrete/yr)] / [Batch Rate (yd3 concrete/hr)] / [2,000 (lb/ton)] **for Dry mix loading only**

Example: Aggregate delivery to ground storage

Uncontrolled PM Emissions factor, taken from AP42 Table 11.12-2 or the background document, = [6.90E-03 (lb/ton aggregate)]

Uncontrolled PM Emissions factor = [6.90E-03 (lb/ton aggregate)] x [0.9325 (ton aggregate/yd3 concrete)] = [6.40E-03 (lb/yd3 concrete)]

Controlled PM Emissions factor = [6.90E-03 (lb/ton aggregate)] x [1 - (0.0000 % /100)] = [6.90E-03 (lb/ton aggregate)]

Controlled PM Emissions factor = [6.40E-03 (lb/yd3 concrete)] x [1 - (0.0000 % /100)] = [6.40E-03 (lb/yd3 concrete)]

Uncontrolled PM Emissions = [6.40E-03 (lb/yd3 concrete)] x [120.00 (yd3 concrete/hr)] = [0.7680 (lb/hr)]

Uncontrolled PM Emissions = [0.7680 (lb/hr)] x [45,000 (yd3 concrete/yr)] / [120 (hr/yr)] / [2,000 (lb/ton)] = [0.1440 (ton/yr)]

Controlled PM Emissions = [6.40E-03 (lb/yd3 concrete)] x [120.00 (yd3 concrete/hr)] = [0.7680 (lb/hr)]

Controlled PM Emissions = [0.7680 (lb/hr)] x [45,000.00 (yd3 concrete/yr) / 120 (yd3 concrete/hr)] / [2,000 (lb/ton)] = [0.1440 (ton/yr)]

Example: Truck mix loading

Uncontrolled PM Emissions factor, taken from AP42 Table 11.12-2 or the background document, = [1.118E+00 (lb/ton (cement + supplement)]

Uncontrolled PM Emissions factor = [1.118E+00 (lb/ton (cement + supplement)] x [0.2820 (ton (cement + supplement)/yd3 concrete)] = [3.15E-01 (lb/yd3 concrete)]

Controlled PM Emissions factor = [1.118E+00 (lb/ton (cement + supplement)] x [1 - (99.9000 % /100)] = [1.12E-03 (lb/ton (cement + supplement)]

Controlled PM Emissions factor = [3.15E-01 (lb/yd3 concrete)] x [1 - (99.9000 % /100)] = [3.15E-04 (lb/yd3 (concrete)]

Uncontrolled PM Emissions = [3.15E-01 (lb/yd3)] x [120.00 (yd3 concrete/hr)] = 37.8360 lb/hr

Uncontrolled PM Emissions = [37.8360 (lb/hr)] x [45,000.00 (yd3 concrete/yr)] / [120.00 (yd3 concrete/hr)] / [2,000 (lb/ton)] = [7.0943 (ton/yr)]

Controlled PM Emissions = [3.15E-04 (lb/yd3)] x [120.00 (yd3 concrete/hr)] = [0.0378 (lb/hr)]

Controlled PM Emissions = [0.0378 (lb/hr)] x [45,000.00 (yd3 concrete/yr)] / [120.00 (yd3 concrete/hr)] / [2,000 (lb/ton)] = [0.0071 (ton/yr)]

Example: Central mix loading

Uncontrolled PM Emissions factor, taken from AP42 Table 11.12-2 or the background document, = [0.00E+00 (lb/ton (cement + supplement)]

Uncontrolled PM Emissions factor = [0.00E+00 (lb/ton (cement + supplement)] x [0.0000 (ton (cement + supplement)/yd3 concrete)] = [0.00E+00 (lb/yd3 concrete)]

Controlled PM Emissions factor = [0.00E+00 (lb/ton (cement + supplement)] x [1 - (0.0000 % /100)] = [0.00E+00 (lb/ton (cement + supplement)]

Controlled PM Emissions factor = [0.00E+00 (lb/yd3 concrete)] x [1 - (0.0000 % /100)] = [0.00E+00 (lb/yd3 (concrete)]

Uncontrolled PM Emissions = [0.00E+00 (lb/yd3)] x [0.00 (yd3 concrete/hr)] = [0.0000 (lb/hr)]

Uncontrolled PM Emissions = [0.0000 (lb/hr)] x [0.00 (yd3 concrete/yr)] / [120.00 (yd3 concrete/hr)] / [2,000 (lb/ton)] = [0.0000 (ton/yr)]

Controlled PM Emissions = [0.00E+00 (lb/yd3)] x [0.00 (yd3 concrete/hr)] = [0.0000 (lb/hr)]

Controlled PM Emissions = [0.0000 (lb/hr)] x [0.00 (yd3 concrete/yr)] / [120.00 (yd3 concrete/hr)] / [2,000 (lb/ton)] = [0.0000 (ton/yr)]

Example: Dry mix loading

Uncontrolled PM Emissions factor for truck mix loading used as estimate, taken from AP42 Table 11.12-2 or the background document, = [0.000E+00 (lb/ton (cement + supplement)]

Uncontrolled PM Emissions factor = [0.000E+00 (lb/ton (cement + supplement)] x [0.0000 (ton (cement + supplement)/yd3 concrete)] = [0.00E+00 (lb/yd3 concrete)]

Controlled PM Emissions factor = [0.000E+00 (lb/ton (cement + supplement)] x [1 - (0.0000 % /100)] = [0.00E+00 (lb/ton (cement + supplement)]

Controlled PM Emissions factor = [0.00E+00 (lb/yd3 concrete)] x [1 - (0.0000 % /100)] = [0.00E+00 (lb/yd3 (concrete)]

Uncontrolled PM Emissions = [0.00E+00 (lb/yd3)] x [0.00 (yd3 concrete/hr)] = [0.0000 (lb/hr)]

Uncontrolled PM Emissions = [0.0000 (lb/hr)] x [0.00 (yd3 concrete/yr)] / [120.00 (yd3 concrete/hr)] / [2,000 (lb/ton)] = [0.0000 (ton/yr)]

Controlled PM Emissions = [0.00E+00 (lb/yd3)] x [0.00 (yd3 concrete/hr)] = [0.0000 (lb/hr)]

Controlled PM Emissions = [0.0000 (lb/hr)] x [0.00 (yd3 concrete/yr)] / [120.00 (yd3 concrete/hr)] / [2,000 (lb/ton)] = [0.0000 (ton/yr)]