Max Lee

From: Max Lee [mlee@kooglerassociates.com]
Sent: Tuesday, June 30, 2009 12:48 PM
To: 'Knight, Nancy'
Cc: 'Joseph Shuler'
Subject: RE: CW Roberts Fugitive Emission Calculations
Attachments: App. A - WILDWOOD-Crusher and Plant_2009_06FINALrevised.pdf

Nancy,

Attached are the revised calculations of the C.W.Roberts, Wildwood facility that include road emissions and truck loadout.

The yellow highlights are provided on the sheet for the changes from the original sheets. The paved and unpaved road emissions sheets and site maps are new sheets.

Please let me know if you have questions.

Regards,
Max

P.S. I have a question regarding fugitive emissions calculations. While this asphalt plant does not approach any pollutant of 100 ton/yr, if the fugitives for a similar asphalt plant did have PM fugitives that caused an excess of 100 ton/yr for the facility, would that faciity be considered a Title V source?

From: Knight, Nancy [mailto:Nancy.Knight@dep.state.fl.us]
Sent: Wednesday, June 24, 2009 9:37 AM
To: mlee@kooglerassociates.com
Subject: RE: CW Roberts Fugitive Emission Calculations

Thank you.

From: Max Lee [mailto:mlee@kooglerassociates.com]
Sent: Wednesday, June 24, 2009 9:22 AM
To: Knight, Nancy
Subject: RE: CW Roberts Fugitive Emission Calculations

Hi Nancy,

just an update - I am working on the calculations and should have them to you on Monday.

Max

From: Knight, Nancy [mailto:Nancy.Knight@dep.state.fl.us]
Sent: Friday, June 19, 2009 1:39 PM
To: mlee@kooglerassociates.com
Subject: CW Roberts Fugitive Emission Calculations

- Max

The Department received the response to the second RAI for CW Roberts (7775176) on 6/18/09. I see where fugitive emissions for raw material storage piles have been calculated, but I don't see fugitive emissions from other sources such as vehicular traffic and truck load-out. Please provide calculations of fugitive emissions from all potential sources.
Nancy E. Knight
SWD Air Program

The Department of Environmental Protection values your feedback as a customer. DEP Secretary Michael W. Sole is committed to continuously assessing and improving the level and quality of services provided to you. Please take a few minutes to comment on the quality of service you received. Simply click on this link to the DEP Customer Survey. Thank you in advance for completing the survey.

_____ NOD32 3985 (20090403) Information _____

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_____ NOD32 3985 (20090403) Information _____

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C. W. Roberts Contracting, Inc.
Wildwood, Sumter County, Florida

Attachment A: June 2009 (revised June 29, 2009)

Potential Emissions Calculations
Counterflow Drum Mix Asphalt Plant

Facility-wide limits: 1.2 mmgal/yr of fuel burned
500,000 tn/yr of the sum of asphalt produced and RAP crushed
RAP crushed portion limited to 200,000 tn/yr

application year	PM		SO2		NOx		CO		VOC	
	Asphalt Plant	Asphalt Plant +Crushing	Asphalt Plant	Asphalt Plant +Crushing	Asphalt Plant	Asphalt Plant +Crushing	Asphalt Plant	Asphalt Plant +Crushing	Asphalt Plant	Asphalt Plant +Crushing
	ton/yr		ton/yr		ton/yr		ton/yr		ton/yr	
2002	8.2	6.1	60.0	60.0	13.8	29.1	32.5	35.8	8.0	9.3
2009	16.5	15.7	60.0	37.0	13.8	23.6	33.1	23.4	8.0	6.1
column numbers	1	2	3	4	5	6	7	8	9	10

column notes
1- PM- 2009 emissions higher for asphalt plant due to inclusion of more fugitive emissions
2- PM- 2009 emissions higher for asphalt plant + crushing due to inclusion of more fugitive emissions
3- SO2 -same emissions
4- SO2- 2002 emissions calculation assumed all SO2 emissions based on fuel burned for asphalt production
5- NOx- same emissions
7- CO- 2002 emissions did not account for fugitve CO from silos
9- VOC- same emissions

6, 8, and 10- NOx,CO,VOC- Total facility asphalt and crushing limited to 500,000 tn/yr. 2002 emissions did not account for reduction of asphalt production (total 300,000 tn/yr) when crusher operated at capacity (200,000 tn/yr). 2009 emissions does account.

Table: PTE Calculations for Paved Road Emissions
C.W. Roberts Contracting, Inc. - Wildwood, Florida
Wildwood, Sumter County, Florida
Facility ID 7775176

Segment No.	Segment Length (mi)	Operation	Constant *k* (lb/VMT)	Silt Loading *sL* (g/m^2)	Avg. Vehicle Weight *W* (tons)	Constant *C* (lb/VMT)	Wet Days *P* (days)	Averaging Period *N* (days)	PM EF (lb/VMT)	Material Throughput (ton/yr)	Material Trips (#/yr)	Trip Mileage (VMT/yr)	Paved Water Control %	PM Annual Emissions (ton/yr)
1	0.10	Empty Asphalt Truck	0 082	10.0	12 5	4.70E-04	118	365	1.82	500000	22222	2222	90	0.20
2	0 10	Filled Asphalt Truck	0.082	10 0	35.0	4.70E-04	118	365	8.55		22222	2222	90	0.95
														1.15

NOTE.

(1) Paved roads emission data were derived from:
AP-42, Fifth Edition, Compilation of Air Pollutant Emission Factor, Volume 1: Stationary Point and Area Sources.
Chapter 13.2 1, "Paved Roads", November 2006, Equation (2).

$$E = \left[k \left(\frac{sL}{2} \right)^{0.65} \left(\frac{W}{3} \right)^{1.5} - C \right] \left(1 - \frac{P}{4N} \right)$$

Where:
E = Particulate emission factor (lb/VMT)
sL = Road Surface Silt Loading (g/m^2)
W = Mean Vehicle Weight (tons)
k = Particle Size Mulitplier
C = Emission Factor for 1980's Vehicle Fleet Exhaust, Brake Wear, and Tire Wear
P = Number of "wet" days with at least 0.01 in of precipitation during the averaging period
N = Number of Days in Averaging Period

Constant	PM
k (lb/VMT)	0 082

Number of rain days (P) = 118 days
Silt content based engineering judgement.
Control efficiency is based on engineering judgement.

* Segment length based on distance for asphalt truck travel from site entrance to asphalt load location (unloaded truck) and from asphalt load location (loaded) to exit. See attached site plan.

C. W. Roberts, Wildwood Facility
Site Map
Distance of paved road

Table: PTE Calculations for Unpaved Road Emissions (1) Attachment A: June 2009 (revised June 29, 2009)

C.W. Roberts Contracting, Inc. - Wildwood, Florida

Wildwood, Sumter County, Florida

Facility ID 7775176

Segment No.	Segment Length* (mi)	Operation	Constant *k* (lb/VMT)	Silt Content *s* (%)	Constant *a*	Avg Vehicle Weight *W* (tons)	Constant *b*	Wet Days *P* (days)	PM EF (lb/VMT)	Material Throughput (ton/yr)	Material Trips (#/yr)	Trip Mileage (VMT/yr)	Unpaved Water Control %	PM Annual Emissions (ton/yr)
2	0.18	Empty Truck	4.9	10.0	0.7	12.5	0.45	118	5.55	500,000	22222	3889	90	1.08
2	0.18	Filler Truck	4.9	10.0	0.7	35.0	0.45	118	8.82		22222	3889	90	1.71
														2.79

NOTE:

(1) Unpaved roads emission data were derived from:
AP-42, Fifth Edition, Compilation of Air Pollutant Emission Factor, Volume 1: Stationary Point and Area Sources.
Chapter 13.2.2, "Unpaved Roads", November 2006, Equations (1a) and (2).

$$E = \left[k \left(\frac{s}{12} \right)^{a} \left(\frac{W}{3} \right)^{b} \right] \left(\frac{365 - P}{365} \right)$$

Where:
E = Particulate emission factor (lb/VMT)
s = Surface material silt content (%)
W = Mean vehicle weight (tons)
k,a, and b = Particle size empirical constants
P = Number of "wet" days with at least 0.01 in of precipitation during the averaging period

Constant	PM
k (lb/VMT)	4.9
a	0.7
b	0.45

Number of rain days (P) = 118 days
Silt content based engineering judgement.
Control efficiency is based on engineering judgement.

* Segment length based conservative assumption of distance for truck to travel from site entrance to unload location (loaded truck) and from unload location (unloaded) to exit. See attached site

C.W. Roberts, Wildwood Facility
Site Map
Distance of unpaved roads

TABLE PM Attachment A: June 2009 (revised June 29, 2009)
C. W. Roberts Contracting, Inc.
Wildwood, Sumter County, Florida

Potential Emissions Calculations
Counterflow Drum Mix Asphalt Plant

ASPHALT PLANT ONLY
Particulate Matter (PM)

Assumed Fugitive Emission Points		Emission Factor		Process Rate			PM Potential Emissions			
	TOTAL PM:						**15.90**	**lb/hr**	**16.46**	**TPY**
	TOTAL PM10: (12)						**11.13**		**11.53**	
	RAP Feed System (EU001) (assume RAP not crushed on-site)									
1-01	Front End Loader to Portable Recycle System Hopper	0.00014	lb/ton (1)	160	TPH	200,000 TPY	0.02	lb/hr	0.014	TPY
1-02	Portable Recycle System Hopper to Underhopper Conveyor Belt	0.00014	lb/ton (1)	160	TPH	200,000 TPY	0.02	lb/hr	0.014	TPY
1-03	Underhopper Conveyor Belt to 4x8 Screen	0.00014	lb/ton (1)	160	TPH	200,000 TPY	0.02	lb/hr	0.014	TPY
1-04	4x8 Screen	0.00360	lb/ton (1)	160	TPH	200,000 TPY	0.58	lb/hr	0.360	TPY
1-05	4x8 Screen to Drum Mix Plant Feeder Conveyor Belt	0.00014	lb/ton (1)	160	TPH	200,000 TPY	0.02	lb/hr	0.014	TPY
1-06	Drum Mix Plant Feeder Conveyor Belt to Drum Mix Plant	0.00014	lb/ton (1)	160	TPH	200,000 TPY	0.02	lb/hr	0.0	TPY
	TOTAL PM:						0.69	lb/hr	0.43	TPY
	* assume 10% of 200 tph and 200,000 tpy is screened to a pile									
	Drum Mix Asphalt Plant (EU001)									
4-01 to 4-06	Front End Loader to Cold Feed Storage Bin 1-6	0.00014	lb/ton (1)	400	TPH	500,000 TPY	0.06	lb/hr	0.0	TPY
4-07 to 4-12	Cold Feed Storage Bin 1- 6 to Conveyor	0.00014	lb/ton (1)	400	TPH	500,000 TPY	0.06	lb/hr	0.0	TPY
4-13	Conveyor to 5x12 Single Deck Screen	0.00014	lb/ton (1)	400	TPH	500,000 TPY	0.06	lb/hr	0.0	TPY
4-14	5x12 Single Deck Screen	0.00360	lb/ton (1)	400	TPH	500,000 TPY	1.44	lb/hr	0.9	TPY
4-15	5x12 Single Deck Screen to SC-3050 Conveyor Belt	0.00014	lb/ton (1)	400	TPH	500,000 TPY	0.06	lb/hr	0.0	TPY
4-16	SC-3050 Conveyor Belt to Drum Mix Plant	0.00014	lb/ton (1)	400	TPH	500,000 TPY	0.06	lb/hr	0.0	TPY
	Drum Mix Plant Loadout	0.00052	lb/ton (3)	400	TPH	500,000 TPY	0.21	lb/hr	0.1	TPY
	Silo Filling	0.0006	lb/ton (3)	400	TPH	500,000 TPY	0.23	lb/hr	0.1	TPY
4-17	Drum Mix Plant (vented to Baghouse)	0.04	gr/dscf	38070	dscfm	500,000 TPY	13.05	lb/hr	8.16	TPY
	Unpaved Road Emissions (Empty Trucks)	5.55	lb/VMT	N/A		3,889 VMT/yr	N/A		1.08	TPY (4)
	Unpaved Road Emissions (Filled Trucks)	8.82	lb/VMT	N/A		3,889 VMT/yr	N/A		1.71	TPY (5)
	Paved Road Emissions (Empty Trucks)	1.8244	lb/VMT	N/A		2,222 VMT/yr	N/A		0.20	TPY (7)
	Paved Road Emissions (Filled Trucks)	8.55	lb/VMT	N/A		2,222 VMT/yr	N/A		0.95	TPY (6)
4-21	Raw Material Storage Piles	5.8882	lb/day/acre (8)	NA		730 acres-day/yr (9)	N/A		2.1	TPY (10)
	TOTAL PM:						15.22	lb/hr	15.6	TPY
	TOTAL PM (EU001)						**15.90**	**lb/hr**	**16.03**	**TPY**
	Portable RAP Crushing System (EU002)									
2-01	Front End Loader to Hopper	0.00014	lb/ton (1)	0	TPH	0 TPY	0.00	lb/hr	0.0	TPY
2-02	hopper to screening	0.00014	lb/ton (1)	0	TPH	0 TPY	0.00	lb/hr	0.0	TPY
2-03	Screening	0.00360	lb/ton (1)	0	TPH	0 TPY	0.00	lb/hr	0.0	TPY
2-04	Screening to Oversize Belt	0.00014	lb/ton (1)	0	TPH	0 TPY	0.00	lb/hr	0.0	TPY
2-05	Oversize Belt to Crusher	0.00014	lb/ton (1)	0	TPH	0 TPY	0.00	lb/hr	0.0	TPY
2-06	Crusher	0.0012	lb/ton (11)	0	TPH	0 TPY	0.00	lb/hr	0.0	TPY
2-07	Crusher to Crusher Return Belt	0.00014	lb/ton (1)	0	TPH	0 TPY	0.00	lb/hr	0.0	TPY
2-08	Crusher Return Belt to Underscreen Belt	0.00014	lb/ton (1)	0	TPH	0 TPY	0.00	lb/hr	0.0	TPY
2-09	Screening to Underscreen Belt	0.00014	lb/ton (1)	0	TPH	0 TPY	0.00	lb/hr	0.0	TPY
2-10	Underscreen Belt to Short Belt	0.00014	lb/ton (1)	0	TPH	0 TPY	0.00	lb/hr	0.0	TPY
2-11	Short Belt to Stacker Belt	0.00014	lb/ton (1)	0	TPH	0 TPY	0.00	lb/hr	0.0	TPY
2-12	Stacker Belt to Storage Pile	0.00014	lb/ton (1)	0	TPH	0 TPY	0.00	lb/hr	0.0	TPY
						Sum =	0.00	lb/hr	0.00	TPY
						2 x Sum (14) =	0.00	lb/hr	0.00	TPY
	Portable RAP Crushing Engine (EU002)									
3-01	Engine Exhaust (13)	0.31	lb/mmbtu	0	mmbtu/hr	0 mmbtu/yr	0.00	lb/hr	0.00	TPY
	TOTAL PM:							**0.0 lb/hr**		**0.0 TPY**

(1) Emission Factor based on AP-42, Table 11.19.2-2, tertiary crushing controlled by water spray
(2) FYI- totally enclosed drop point with baghouse fan suction.
(3) Emission Factor based on AP-42, Table 11.1-14. Assume V = ~0.5 and T = 325F.
(4) PM Emissions based on an empty truck traveling an unpaved road and 90% Control Efficiency. See Table "PTE Calculations for Unpaved Roads" for calculation details.
(5) PM Emissions based on a truck carrying asphalt traveling an unpaved road and 90% Control Efficiency. See Table "PTE Calculations for Unpaved Roads" for calculation details.
(6) PM Emissions based on a truck carrying material traveling on a paved road and 90% Control Efficiency. See Table "PTE Calculations for Paved Roads" for calculation details.
(7) PM Emissions based on an empty truck traveling on a paved road and 90% Control Efficiency. See Table "PTE Calculations for Paved Roads" for calculation details.
(8) Emission Factor based on EPA's Technical Report Data, Control of Open Fugitive Dust Sources, EPA-450/3-88-008, p. 4-17. Assumes s = 19%; p = 110 days; f = 13.3%
(9) Based on the assumption that the total pile area of 2 acres and the pile(s) are continuously active for 365 days per year.
(10) Emissions based on the product of the emission factor, total pile area, and days the pile(s) are continuously active.
(11) Emiss. Factor: 0.00059 (PM10) x 2.1 = 0.0012 lb/ton, AP-42, Table 11.19.2-2
(12) Conservatively assume PM10 = 0.7 PM. Baghouse controlled drum mix (AP-42, 11.1-3) PM10/PM = 0.023/0.033. Whereas, uncontrolled or less controlled sources will have less wt. fraction of PM10/PM.
(13) AP-42, Table 3.3-1
(14) Conservatively assume that twice the expected number of pieces of equipment of a RAP crusher are on site.

TABLE PM
C. W. Roberts Contracting, Inc.
Wildwood, Sumter County, Florida

Potential Emissions Calculations
Counterflow Drum Mix Asphalt Plant

Attachment A: June 2009 (revised June 29, 2009)

ASPHALT PLANT AND RAP CRUSHER
Particulate Matter (PM)

Assumed Fugitive Emission Points		Emission Factor		Process Rate				PM Potential Emissions			
	TOTAL PM:							**21.92**	**lb/hr**	**15.66**	**TPY**
	TOTAL PM10: (12)							**15.35**		**10.96**	
	RAP Feed System (EU001)										
1-01	Front End Loader to Portable Recycle System Hopper	0.00014	lb/ton (1)	160	TPH	200,000	TPY	0.02	lb/hr	0.0	TPY
1-02	Portable Recycle System Hopper to Underhopper Conveyor Belt	0.00014	lb/ton (1)	160	TPH	200,000	TPY	0.02	lb/hr	0.0	TPY
1-03	Underhopper Conveyor Belt to 4x8 Screen	0.00014	lb/ton (1)	160	TPH	200,000	TPY	0.02	lb/hr	0.0	TPY
1-04	4x8 Screen	0.00360	lb/ton (1)	160	TPH	200,000	TPY	0.58	lb/hr	0.4	TPY
1-05	4x8 Screen to Drum Mix Plant Feeder Conveyor Belt	0.00014	lb/ton (1)	160	TPH	200,000	TPY	0.02	lb/hr	0.0	TPY
1-06	Drum Mix Plant Feeder Conveyor Belt to Drum Mix Plant	0.00014	lb/ton (1)	160	TPH	200,000	TPY	0.02	lb/hr	0.0	TPY
	TOTAL PM:							0.69	lb/hr	0.43	TPY
	* assume 10% of 200 tph and 200,000 tpy is screened to a pile										
	Drum Mix Asphalt Plant (EU001)										
4-01 to 4-06	Front End Loader to Cold Feed Storage Bin 1-6	0.00014	lb/ton (1)	400	TPH	300,000	TPY	0.06	lb/hr	0.0	TPY
4-07 to 4-12	Cold Feed Storage Bin 1- 6 to Conveyor	0.00014	lb/ton (1)	400	TPH	300,000	TPY	0.06	lb/hr	0.0	TPY
4-13	Conveyor to 5x12 Single Deck Screen	0.00014	lb/ton (1)	400	TPH	300,000	TPY	0.06	lb/hr	0.0	TPY
4-14	5x12 Single Deck Screen	0.00360	lb/ton (1)	400	TPH	300,000	TPY	1.44	lb/hr	0.5	TPY
4-15	5x12 Single Deck Screen to SC-3050 Conveyor Belt	0.00014	lb/ton (1)	400	TPH	300,000	TPY	0.06	lb/hr	0.0	TPY
4-16	SC-3050 Conveyor Belt to Drum Mix Plant	0.00014	lb/ton (1)	400	TPH	300,000	TPY	0.06	lb/hr	0.0	TPY
	Drum Mix Plant Loadout	0.00052	lb/ton (3)	400	TPH	300,000	TPY	0.21	lb/hr	0.1	TPY
	Silo Filling	0.0006	lb/ton (3)	400	TPH	300,000	TPY	0.23	lb/hr	0.1	TPY
4-17	Drum Mix Plant (vented to Baghouse)	0.04	gr/dscf	38070	dscfm	300,000	TPY	13.05	lb/hr	4.89	TPY
	Unpaved Road Emissions (Empty Trucks)	5.55	lb/VMT	N/A		3,889	VMT/yr	N/A		1.08	TPY (4)
	Unpaved Road Emissions (Filled Trucks)	8.82	lb/VMT	N/A		3,889	VMT/yr	N/A		1.71	TPY (5)
	Paved Road Emissions (Filled Trucks)	8.55	lb/VMT	N/A		2,222	VMT/yr	N/A		0.95	TPY (6)
	Paved Road Emissions (Empty Trucks)	1.82	lb/VMT	N/A		2,222	VMT/yr	N/A		0.20	TPY (7)
4-21	Raw Material Storage Piles	5.8882	lb/day/acre (8)	NA		730	acres-day/yr (9)	N/A		2.1	TPY (10)
	TOTAL PM:							15.22	lb/hr	11.8	TPY
	TOTAL PM (EU001)							**15.90**	**lb/hr**	**12.23**	**TPY**
	Portable RAP Crushing System (EU002)										
2-01	Front End Loader to Hopper	0.00014	lb/ton (1)	200	TPH	200,000	TPY	0.03	lb/hr	0.0	TPY
2-02	hopper to screening	0.00014	lb/ton (1)	200	TPH	200,000	TPY	0.03	lb/hr	0.0	TPY
2-03	Screening	0.00360	lb/ton (1)	200	TPH	200,000	TPY	0.72	lb/hr	0.4	TPY
2-04	Screening to Oversize Belt	0.00014	lb/ton (1)	180	TPH	180,000	TPY	0.03	lb/hr	0.0	TPY
2-05	Oversize Belt to Crusher	0.00014	lb/ton (1)	180	TPH	180,000	TPY	0.03	lb/hr	0.0	TPY
2-06	Crusher	0.0012	lb/ton (11)	180	TPH	180,000	TPY	0.22	lb/hr	0.1	TPY
2-07	Crusher to Crusher Return Belt	0.00014	lb/ton (1)	180	TPH	180,000	TPY	0.03	lb/hr	0.0	TPY
2-08	Crusher Return Belt to Underscreen Belt	0.00014	lb/ton (1)	200	TPH	200,000	TPY	0.03	lb/hr	0.0	TPY
2-09	Screening to Underscreen Belt	0.00014	lb/ton (1)	20	TPH	20,000	TPY	0.00	lb/hr	0.0	TPY
2-10	Underscreen Belt to Short Belt	0.00014	lb/ton (1)	200	TPH	200,000	TPY	0.03	lb/hr	0.0	TPY
2-11	Short Belt to Stacker Belt	0.00014	lb/ton (1)	200	TPH	200,000	TPY	0.03	lb/hr	0.0	TPY
2-12	Stacker Belt to Storage Pile	0.00014	lb/ton (1)	200	TPH	200,000	TPY	0.03	lb/hr	0.0	TPY
							Sum =	1.18	lb/hr	0.59	TPY
						2 x Sum (14) =		2.36	lb/hr	1.18	TPY
	Portable RAP Crushing Engine (EU002)										
3-01	Engine Exhaust (13)	0.31	lb/mmbtu	4.25	mmbtu/hr	6955.49	mmbtu/yr	1.32	lb/hr	1.08	TPY
	TOTAL PM:							**6.0**	**lb/hr**	**3.4**	**TPY**
	TOTAL PM10 (12):							**4.2**	**lb/hr**	**2.4**	**TPY**

(1) Emission Factor based on AP-42, Table 11.19.2-2, tertiary crushing controlled by water spray.
(2) FYI- totally enclosed drop point with baghouse fan suction.
(3) Emission Factor based on AP-42, Table 11.1-14. Assume V = -0.5 and T = 325F.
(4) PM Emissions based on an empty truck traveling an unpaved road and 90% Control Efficiency. See Table "PTE Calculations for Unpaved Roads" for calculation details.
(5) PM Emissions based on a truck carrying asphalt traveling an unpaved road and 90% Control Efficiency. See Table "PTE Calculations for Unpaved Roads" for calculation details.
(6) PM Emissions based on a truck carrying material traveling on a paved road and 90% Control Efficiency. See Table "PTE Calculations for Paved Roads" for calculation details.
(7) PM Emissions based on an empty truck traveling on a paved road and 90% Control Efficiency. See Table "PTE Calculations for Paved Roads" for calculation details.
(8) Emission Factor based on EPA's Technical Report Data, Control of Open Fugitive Dust Sources, EPA-450/3-88-008, p. 4-17. Assumes s = 19%, p = 110 days, f = 13.3%
(9) Based on the assumption that the total pile area of 2 acres and the pile(s) are continuously active for 365 days per year.
(10) Emissions based on the product of the emission factor, total pile area, and days the pile(s) are continuously active.
(11) Emiss. Factor: 0.00059 (PM10) x 2.1 = 0.0012 lb/ton, AP-42, Table 11.19.2-2
(12) Conservatively assume PM10 = 0.7 PM. Baghouse controlled drum mix (AP-42, 11.1-3) PM10/PM = 0.023/0.033. Whereas, uncontrolled or less controlled sources will have less wt. fraction of PM10/PM.
(13) AP-42, Table 3.3-1. 6955.49 mmbtu/yr based on 50.77 gal/yr @ 137 mmbtu/1000gal
(14) Conservatively assume that twice the expected number of pieces of equipment of a RAP crusher are on site.

TABLE SO2
C W Roberts Contracting, Inc
Wildwood, Sumter County, Florida

Potential Emissions Calculations
Counterflow Drum Mix Asphalt Plant

ASPHALT PLANT ONLY

Sulfur Dioxide (SO_2)													
Emission Point	**Emission Factor**	**Process Rate**								**Potential Emissions**			
Drum Mix Plant (EU001)	0 2398 lb SO2/ton			400 ton/hr	500000 tonasph/yr					95 92	lb/hr	59 95	TPY
TOTAL SO_2										**95 92**	lb/hr	**59.95**	TPY

(1) From 2002 application 1 2 10^6 gal/yr / 500,000 ton/yr = 2 4 gal/ton asphalt
SO2 per ton asphalt 2 4 gal/ton x 7 08 lb/gal(AP42AppA) x 0 01 S x 2 SO2/S = 0 3398 lb SO2/ton asphalt
AP-42, Table 11 1-7 allows reduction factor of SO2 by 0 1 lb/ton = 0 3398 - 0 1 = 0 2398 lb SO2/ton asphalt

RAP CRUSHER AND ASPHALT PLANT

Sulfur Dioxide (SO_2)													
Emission Point	**Emission Factor**	**Process Rate**								**Potential Emissions**			
Drum Mix Plant (EU001)	0 2398 lb SO2/ton			400 ton/hr	300000 tonasph/yr					95 92	lb/hr	35 97	TPY
		asphalt plant production = 500 000 ton/yr minus 200,000 RAP crusher											
	Emission Factor (1) (2)	**Capacity**								**Potential Emissions**			
Engine Exhaust (EU 002)	0 29 lb/mmbtu	4 25 mmbtu/hr(3)	0 0310 1000gal/hr	200 tonRAP/hr	0 000155 1000gal/ton	200000 tonRAP/yr	31 02 1000gal/yr	**50 77 1000gal/yr**	6955 49 mmbtu/yr				
								* use higher annual fuel usage from 2002 application of 50 777 TGB					
	0 29 lb/mmbtu	4 25 mmbtu/hr(3)							6955 49 mmbtu/yr	1 23	lb/hr	1 01	TPY
TOTAL SO_2										**97 15**	lb/hr	**36.98**	TPY

(1) Emission Factor based on AP-42, Table 1 3-1
(2) 157 x S , S = assume Fuel Sulfur Content is 0 5%
(3) see application, conservatively assume twice the largest HP (835 HP) expected for potential emissions

TABLE NOx
C W Roberts Contracting, Inc
Widwood, Sumter County, Florida

Attachment A. June 2009

Potential Emissions Calculations
Counterflow Drum Mix Asphalt Plant

ASPHALT PLANT ONLY

Nitrogen Oxides (NOx)													
Emission Point	**Emission Factor**	**Process Rate**							**Potential Emissions**			
Drum Mix Plant (EU001)	0 055 lb/ton			400 ton/hr	500000 tonasph/yr				22 00	lb/hr	13 8	TPY
TOTAL NOx									**22 0**	lb/hr	**13 8**	TPY

(1) Emission Factor based on AP-42, Table 11 1-7

RAP CRUSHER AND ASPHALT PLANT

Nitrogen Oxides (NOx)													
Emission Point	**Emission Factor**	**Process Rate**							**Potential Emissions**			
Drum Mix Plant (EU001)	0 055 lb/ton			400 ton/hr	300000 tonasph/yr				22 00	lb/hr	8 3	TPY
		asphalt plant production = 500,000 ton/yr minus 200,000 RAP crusher										
	Emission Factor (1) (2)	**Capacity**							**Potential Emissions**			
Engine Exhaust (EU 002)	4 41 lb/mmbtu	4 25 mmbtu/hr(3)	0 0310 1000gal/hr	200 tonRAP/hr	0 000155 1000gal/ton	200000 tonRAP/yr	31 02 1000gal/yr	**50 77 1000gal/yr** *	6955 49 mmbtu/yr			
								* use higher annual fuel usage from 2002 application of 50 777 TGB				
	4 41 lb/mmbtu	4 25 mmbtu/hr(3)							6955 49 mmbtu/yr	18 74	lb/hr	15 34	TPY
TOTAL NOx.										**40 74**	lb/hr	**23 59**	TPY

(1) Emission Factor based on AP-42, Table 3 3-1, Diesel Fuel Oil (137 mmbtu/1000gal)

(3) see application, conservatively assume twice the largest HP (835 HP) expected for potential emissions NOTE 2007 or newer engines, per NSPS subpart IIII, Table 1 NOx at 6 9 gr/HP-hr= 2 17 lb/mmbtu

TABLE CO
C. W. Roberts Contracting, Inc.
Wildwood, Sumter County, Florida

Attachment A: June 2009 (revised June 29, 2009)

Potential Emissions Calculations
Counterflow Drum Mix Asphalt Plant

ASPHALT PLANT ONLY

Carbon Monoxide (CO)

Emission Point	Emission Factor		Process Rate				Potential Emissions			
Drum Mix Plant	0.13 lb/ton (1)		400 ton/hr		500000 ton/yr		52.0		32.50	
Silo Filling	0.00117998 lb/ton (2)		400 ton/hr		500000 ton/yr		0.5		0.29	
Silo Load Out	0.00134924 lb/ton (2)		400 ton/hr		500000 ton/yr		0.5	lb/hr	0.34	TPY

(1) Emission Factor based on AP-42, Table 11.1-7.
(2) Emission Factor based on AP-42, Table 11.1-14. Assume V = -0.5 and T = 325F.

TOTAL CO:							53.0	lb/hr	33.1	TPY

RAP CRUSHER AND ASPHALT PLANT

Carbon Monoxide (CO)

Emission Point	Emission Factor		Process Rate				Potential Emissions			
Drum Mix Plant	0.13 lb/ton (1)		400 ton/hr		300000 ton/yr		52.0		19.50	
Silo Filling	0.00117998 lb/ton (2)		400 ton/hr		500000 ton/yr		0.5		0.29	
Silo Load Out	0.00134924 lb/ton (2)		400 ton/hr		500000 ton/yr		0.5	lb/hr	0.34	TPY

(1) Emission Factor based on AP-42, Table 11.1-7.
(2) Emission Factor based on AP-42, Table 11.1-14. Assume V = -0.5 and T = 325F.

TOTAL CO:							53.0	lb/hr	20.1	TPY

asphalt plant tonnageuel = 500,000 minus RAP crusher

	Emission Factor (1)		Capacity							Potential Emissions			
Engine Exhaust (EU 002)	0.95 lb/mmbtu	4.25 mmbtu/hr(3)	0.0310 1000gal/hr	200 tonRAP/hr	0.000155 1000gal/ton	200000 tonRAP/yr	31.02 1000gal/yr	**50.77 1000gal/yr**	6955.49 mmbtu/yr				
								* use higher annual fuel usage from 2002 application of 50,777 TGB					
	0.95 lb/mmbtu	4.25 mmbtu/hr(3)							6955.49 mmbtu/yr	4.04	lb/hr	3.30	TPY

(1) Emission Factor based on AP-42, Table 3.3-1, Diesel Fuel Oil (137 mmbtu/1000gal).

(3) see application, conservatively assume twice the largest HP (835 HP) expected for potential emissions

TOTAL CO:							57.05	lb/hr	23.44	TPY

TABLE VOC
C W Roberts Contracting, Inc
Wildwood, Sumter County, Florida

Attachment A June 2009

Potential Emissions Calculations
Counterflow Drum Mix Asphalt Plant

ASPHALT PLANT ONLY

Volatile Organic Compounds (VOC)											
Emission Point	Emission Factor		Process Rate						Potential Emissions		
Drum Mix Plant (EU001)	0 032	lb/ton (1)		400 ton/hr		500000 ton/yr			12 80	lb/hr	8 0 TPY
TOTAL NOx:									12 8	lb/hr	8 0 TPY

RAP CRUSHER AND ASPHALT PLANT

Volatile Organic Compounds (VOC)													
Emission Point	Emission Factor		Process Rate								Potential Emissions		
Drum Mix Plant (EU001)	0 032	lb/ton (1)		400 ton/hr		300000 ton/yr					12 80	lb/hr	4 8 TPY
						asphalt plant = 500000 tons minus RAP crusher							
	Emission Factor (2)		Capacity								Potential Emissions		
Engine Exhaust (EU 002)	0 36	lb/mmbtu	4 25 mmbtu/hr(3)	0 0310 1000gal/hr	200 tonRAP/hr	0 000155 1000gal/ton	200000 tonRAP/yr	31 02 1000gal/yr	50 77 1000gal/yr	6955 49 mmbtu/yr			
									* use higher annual fuel usage from 2002 application of 50 77 TGB				
	0 36	lb/mmbtu	4 25 mmbtu/hr(3)							6955 49 mmbtu/yr	1 53	lb/hr	1 25 TPY
TOTAL NOx											14 33	lb/hr	6 05 TPY

(1) Emission Factor based on AP-42, Table 11 1-8
(2) Emission Factor based on AP-42, Table 3 3-1, Diesel Fuel Oil (137 mmbtu/1000gal)
(3) see application, conservatively assume twice the largest HP (835 HP) expected for potential emissions