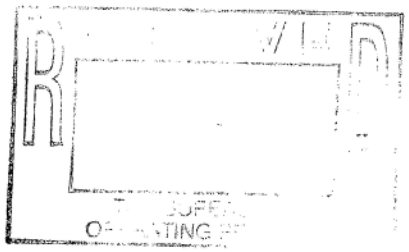
ConocoPhillips



Bayway Refinery
1400 Park Ave
Linden, NJ 07036

CERTIFIED MAIL – RRR
 # 7005 1160 0001 4008 1701

March 20, 2007

Corrected List of BART Affected Sources for Bayway Refinery; PI # 41805

Margaret Gardner
New Jersey Department of Environmental Protection
Bureau of Operating Permits
P.O. Box 027
Trenton, NJ 08625-0027

Dear Ms. Gardner:

We have reviewed the list of BART affected sources dated November 1, 2006. We thoroughly reviewed and researched the 70 sources the Department proposed as being BART affected. Many of these sources underwent major modifications after August 7, 1977 and therefore were the subject of PSD/NSR permits. Eighteen of the sources were permitted and constructed after the year 2000, and thus were in no way "in existence" on August 7, 1977. Several sources emitted no visibility impairing pollutants. In addition, some sources were permitted under SIC codes other than 2911 and are therefore not refinery units. They belong to source groupings that are not affected by the BART rule.

Ultimately we were able to use the Department's guidance to pare your list of 70 pieces of BART affected equipment to 13 units. Twelve of these units are furnaces that began operation after August 7, 1962, were in existence on August 7, 1977 and have not undergone a major modification since August 7, 1977. The remaining unit is the sulfur plant containing our Claus Reactors. We are attaching a spreadsheet that outlines the applicability of each of the sources listed in your letter of November 1.

We understand that the Department suggests that a facility specific, top down RACT analysis be done to determine if additional controls are warranted. We suggest that the Department consider exempting certain equipment from this analysis if they are subject to a MACT standard (as is allowed by the rule) and also sources subject to certain NSPS limits and recent Consent Decrees entered into by refiners and utilities. Consideration should also be given to sources that comply with the Department's Start of the Art declarations. Most of the controls required by these rules are the same that would be evaluated under a top down RACT process. We are aware that other states are considering taking similar actions.

In addition, the existing Claus units at Bayway will be replaced shortly by two Spent Acid Regeneration plants owned and operated by DuPont. We believe that, although the unit is BART affected, it is being replaced. Conducting a top down RACT analysis would merely be an exercise not resulting in any additional controls. We believe the Department has the authority to grant waivers from the requirements in cases such as these.

If you have any questions or need any additional information please feel free to call me at (908) 523-6390.

Very truly yours,

Doug LaFayette
Senior Environmental Engineer

Attachment

c: Y Doshi
P Madan

S:\ENVIRON\DJL\031507 Response to BART Determinations.doc

NJID	File No.	Equipment Description	Facility Designation	Installation Date	NOx	SO2	PM-10	BART Status	Comments
E186		Stretford Reactor Tank	Tk301TGCU	1974	No PTE	No PTE	No PTE	(3)	No PTE for BART pollutants
E187		Stretford Reactor Tank	Tk302TGCU	1974	No PTE	No PTE	No PTE	(3)	No PTE for BART pollutants
E188		Stretford Reactor Tank	Tk303TGCU	1974	No PTE	No PTE	No PTE	(3)	No PTE for BART pollutants
E189		Stretford Reactor Tank	Tk304TGCU	1974	No PTE	No PTE	No PTE	(3)	No PTE for BART pollutants
E241		PFBW Hydrofiner Heater	F-101 PFBW	1969	30.7	170.4	6.57	(1)	
E242		DSU-1 Gas Oil Heater	F-101 DSU-1	1969	22.3	121.3	4.8	(1)	
E243		PFBW Reheat Heater	F-102 PFBW	1971	186		24.6	(1)	F-102, F-103, F-104, F-105 Combined
E244		DSU-1 Treat Gas heater	F-102 DSU-1	1969	N/A	N/A	N/A	(2)	Reconstruction, 1996
E245		PFBW Reheat Heater	F-103 PFBW	1971	186		24.6	(1)	F-102, F-103, F-104, F-105 Combined
E246		PFBW Reheat Heater	F-104 PFBW	1971	186		24.6	(1)	F-102, F-103, F-104, F-105 Combined
E247		PFBW Reheat Heater	F-105 PFBW	1971	186		24.6	(1)	F-102, F-103, F-104, F-105 Combined
E248		PFBW Regen Heater	F-106 PFBW	1971	27.6	157.2	6.1	(1)	
E249		PFBW Dryer Heater	F-107 PFBW	1971	8.8	23.7	0.2	(4)	Emissions less than BART threshold
E250		PFBW Reboiler Heater	F-108 PFBW	1971	47.3	271.6	10.5	(1)	Associated emissions increase included in 2004 Clean fuels PSD Permit
E251		FCCU Feed Preheat Heater	F-251 FCCU	1949	N/A	N/A	N/A	(2)	1949, WGS 1978, ACO 1993, Major Modification 2004
E253		DSU-2 Reactor Heater	F-401 DSU-2	1972	60.9	330.7	4.4	(1)	
E254		DDU Heater	F-401 DDU	Oct-77	N/A	N/A	N/A	(2)	PSD 1977
E255		Cat Naphtha Hydrotreater Heater	F-601 CNH	Oct-77	N/A	N/A	N/A	(2)	PSD 1977, PSD 2004
E256		ISOM Purge Gas Heater	F-602 ISOM	Oct-77	N/A	N/A	N/A	(2)	PSD 1977
E257		Atmospheric Heater	F-701 APS	1970	1169	1493	58.7	(1)	Combined F-701, F-702, F-751
E258		Outboard Flash Heater	F-702 OBFT	1970				(1)	
E259		Vacuum Tower Heater	F-751 VPS	1970				(1)	
E260		ISOM Reactor Charge Heater	F-501 ISOM	Oct-77	N/A	N/A	N/A	(2)	PSD 1977
E261		ISOM Reactivation Gas Heater	F-502 ISOM	Oct-77	N/A	N/A	N/A	(2)	PSD 1977
E262		SDA Hot Oil Heater	F-601 SDA		N/A	N/A	N/A	(2)	
E263		FCCU Regenerator	FCCU Regen	1949	N/A	N/A	N/A	(2)	1949, WGS 1978, ACO 1993, Major Modification 2004
E264		FCCU Spent Catalyst Hopper	Cat Spnt Hop	1949	N/A	N/A	N/A	(2)	1949, WGS 1978, ACO 1993, Major Modification 2004
E265		FCCU Fresh Catalyst Hopper	Cat Frsh Hop	1949	N/A	N/A	N/A	(2)	1949, WGS 1978, ACO 1993, Major Modification 2004
E266		Sulfur Recovery Claus Plant	SRU's	1967/1974	307.7	362	6.7	(1)	Associated emissions increase included in 2004 Clean fuels PSD Permit
E267		TGCU Cooling Tower	TGCU CT301		No PTE	No PTE	No PTE	(3)	No PTE for BART pollutants
E268		D-118 Vent	PFBW D-118	1971	0	0	0	(3)	Permitted for VOC only; 10.95 tpy
E269		PFBW T-104 Scrubber	PFBW T-104	1971	0	0	0	(3)	Permitted for HCl only; 3.6 tpy
E270		PFBW MOV Bonnet Vents	PFBW Bonnet	1971	0	0	0	(3)	Permitted for VOC and HCl only; 2.3 tpy and 0.03 tpy
E271		Marine Loading VCU	Ref Mar Load	1990	10.5	9	2.9	(3,4)	Subject to Marine Loading MACT
E272		TPT Marine VCU	TPT Mar Load	1990	N/A	N/A	N/A	(3,5)	Not a refinery unit
E273		LMT VRU/VCU Control	LMT Tr Rack		N/A	N/A	N/A	(5)	Not a refinery unit
E274		TPT Rack VRU	TPT TR Rack		N/A	N/A	N/A	(5)	Not a refinery unit

E275	Alkylation MainAcid Emergency Flare	ABW Flare	ca 1945	N/A	N/A	N/A	(2)	
E276	Cat Light Ends Unit Emergency Flare	CLEU Flare	ca 1941	N/A	N/A	N/A	(2)	
E277	Eastside Emergency Flare	Estsde Flare	ca 1949	N/A	N/A	N/A	(2)	
E279	Poly MainAcid Emergency Flare	Poly Flare	ca 1941	N/A	N/A	N/A	(2)	
E280	API Main Bay Channel 3	API Mainbay	ca 1916	N/A	N/A	N/A	(2)	
E281	API Preseparator Channels 4-7	API PreSep	ca 1945	N/A	N/A	N/A	(2)	
E282	API Preseparator Channel 3	API PreSep 3	ca 1916	N/A	N/A	N/A	(2)	
E292	Fixed Roof Tank	Tk102 ABW		0	0	0	(3)	Caustic Tank
E294	API Main Bay Channel 4-7	API Mnby 4-7	ca 1945	N/A	N/A	N/A	(2)	
E295	Rahway River Separator East	RR Sep East	Oct-77	0	0	0	(2)	PSD 1977, Permitted for VOC only; 0.4 tpy
E296	Rahway River Separator West	RR Sep West		0	0	0	(3)	PSD 1977, Permitted for VOC only; 15.3 tpy
E299	Fixed Roof Tank	T619	1997	0	0	0	(2)	
E301	WWTP Sludge Handling Equipment			0	0	0	(3)	
E302	FCBW Temp Catalyst Additive	FCBW	1997	N/A	N/A	N/A	(2)	
E502	Hydrogen Plant Heater	H2Heater	2006	N/A	N/A	N/A	(2)	
E503	Hydrogen Steam Vent	H2 Steam	2006	N/A	N/A	N/A	(2)	
E504	Merifiner Thermal Oxidizer	Merifiner	2006	N/A	N/A	N/A	(5)	Not a refinery unit
E1003	Bag Dump Station/Master Mix Feeder Line No. 1	Maxtermix#1	2003	N/A	N/A	N/A	(5)	Not a refinery unit
E1004	Bag Dump Station/Master Mix Feeder Line No. 2	Maxtermix#2	2003	N/A	N/A	N/A	(5)	Not a refinery unit
E1005	Mixer Feed Line Hopper Vent - Line No. 1	Mix Fd #1	2003	N/A	N/A	N/A	(5)	Not a refinery unit
E1006	Mixer Feed Line Hopper Vent - Line No. 2	Mix Fd #2	2003	N/A	N/A	N/A	(5)	Not a refinery unit
E1007	Pellet Loadout dust Collector #1	Pellet	2003	N/A	N/A	N/A	(5)	Not a refinery unit
E1008	Seed Bed Silo	Seed Bed	2003	N/A	N/A	N/A	(5)	Not a refinery unit
E1009	Rail Car Vent Line #1	Rail Vent #1	2003	N/A	N/A	N/A	(5)	Not a refinery unit
E1010	Rail Car Vent Line #2	Rail Vent #2	2003	N/A	N/A	N/A	(5)	Not a refinery unit
E1013	Truck Loading Facilities	Truck	2003	N/A	N/A	N/A	(5)	Not a refinery unit
E1014	Polypropylene Unit	PP Unit	2003	N/A	N/A	N/A	(5)	Not a refinery unit
E1015	Polypropylene Unit Cooling Tower	PP Ct	2003	N/A	N/A	N/A	(5)	Not a refinery unit
E1116	Pellet Loadout Dust Collector #2	Pellet	2003	N/A	N/A	N/A	(5)	Not a refinery unit
E1302	Portable Diesel Engine #1	Port #1	2001	N/A	N/A	N/A	(2)	
E1303	Portable Diesel Engine #2	Port #2	2001	N/A	N/A	N/A	(2)	
E1304	Portable Diesel Engine #3	Port #3	2001	N/A	N/A	N/A	(2)	

(1) Bart Eligible

(2) Not BART Eligible, Construction date outside BART window

(3) Not BART eligible, emits no BART pollutants/No PTE for BART pollutants

(4) Not Bart eligible, emissions of BART pollutants less than thresholds

(5) Not part of one of the BART categories

Sunoco, Inc. (R&M)
Eagle Point Facility
PO Box 1000
Route 130 & I-295 South
Westville NJ 08093-1000

Certified-Return
Receipt Requested
#7004 2890 0002 0367 4910

Env-E07136

May 7, 2007

New Jersey Department of Environmental Protection
Bureau of Operating Permits
401 East State Street
2nd Floor, PO Box 27
Trenton, New Jersey 8625-0027
Attention: Margaret Gardner

Re: Regional Haze Rule- BART Requirements
Reference letter William O'Sullivan to James A. Keeler dated November 1, 2006

Dear Ms. Gardner:

Sunoco, Inc. Eagle Point Refinery (Sunoco) has reviewed the "Draft List" of "BART-affected equipment" at the facility provided by the NJDEP in the referenced letter. Based on this review Sunoco prepared the attached table defining BART applicability for each emission unit. The table was prepared by utilizing the Draft List prepared by NJDEP and adding the following columns:

- Emission Unit (U)- from Eagle Point Title V Permit
- Potential To Emit (PTE) NOx- Tons/yr
- Potential To Emit (PTE) SO2- Tons/yr
- Potential To Emit (PTE) PM10- Tons/yr
- Meets BART date eligibility- Y/N
- Exceeds BART emissions deminimis levels- N or Y/Pollutant
- BART affected equipment- Y/N

Equipment with an indication of "N" in the column "BART affected equipment" does not meet one or both of the BART eligibility requirements. This equipment was installed and went into operation prior to August 17, 1962 or after August 17, 1977 or its potential-to-emit NOx, SO2 or PM10 is below the deminimis level for each pollutant (i.e. below 40 Tons/yr for NOx or SO2 and below 15 Tons/yr for PM10). Equipment with an indication of "Y" in the column "BART affected equipment" meets both eligibility requirements.

As you will note, no additional sources were added to the list. Five sources (E42, E46, E51, E61, E66) are currently out of service and are indicated as "OOS" in the Installation Date column. Two sources (E413, E414) were never constructed and should be removed from the list. Finally, four sources (E58, E59, E62 and E415) are "BART-affected equipment" at this facility.

The Table below summarizes the potential-to-emit from these four sources:

Equipment	NOx-TPY	SO2-TPY	PM10-TPY
E58-CRU Heater PH-3	30.66	30.53	22.61
E59-CRU Heater PH-4A	43.40	43.58	32.26
E62-CRU Heater PH-5B	63.95	13.20	9.77
E415-East Flare	23.74	3.37	64.84
Total TPY emitted	161.75	90.68	129.48

The cumulative emissions from all "BART-affected equipment" are less than 250 Tons per year for each pollutant. Therefore, this facility will not have to make a BART determination for any of the pollutants.

Should you have any questions or need additional information, please contact me at 856-384-3984.

Sincerely,

Paul Johnston
Environmental Lead Engineer

Attachment

cc: Helen Gregory
File: E 20.3575.001
Chron File

ATTACHMENT
BART DETERMINATION CHART

Emission Unit(U)	Equipment Inventory, NJID	Equipment Description	Installation Date	Facility Designation	Control Device	PTE-NOx Tons/Yr.	PTE-SO2 Tons/Yr.	PTE-PM10 Tons/Yr.	Meets BART date eligibility Y/N	Exceeds BART emissions deminimus levels- N or Y/Pollutant	BART affected equipment Y/N
U5	E5	VPS Heater HA-1	1949	1026	Lo-NOx Burners				N		N
U5	E6	VPS Heater HA-3A	1949	1028	Lo-NOx Burners				N		N
U5	E7	VPS Heater HA-3B	1949	1027					N		N
U6	E8	VPS Heater HA-4	1956	1025	Ultra Lo-NOx Burners				N		N
U8	E12	FCCU Heater 5A	1971	1004A		4.47	4.47	6.38	Y	N	N
U9	E13	FCCU -Regenerator	1949	FCCU-Regen	Ten 3-stage cyclones Quench section of 2 stage scrubber system Venturi Scrubber				N		N
U14	E22	J15A FCCU Compressor engine	1949	J15A					N		N
U14	E23	J15B FCCU Compressor engine	1949	J15B					N		N
U14	E24	J15C FCCU Compressor engine	1949	J15C					N		N
U14	E25	J15D FCCU Compressor engine	1949	J15D					N		N
U14	E26	J15E FCCU Compressor engine	1949	J15E					N		N
U14	E27	J15F FCCU Compressor engine	1949	J15F					N		N
U20	E28	FCCU Heater B-2	1949	1001					N		N
U20	E29	FCCU Heater B-4	1949	1003	Lo-NOx Burners				N		N
U21	E30	FCCU Heater B-3	1949	1002					N		N
U23	E32	Poly Heater B-301	1949	RK1					N		N
U28	E37	HTU #1 Heater HH 1	1956	1005	Lo-NOx Burners				N		N
U30	E39	ISOM PH-1	1953	1012					N		N
U30	E42	ISOM PH-4	OOS	1013					-		-
U31	E43	Slop Oil Sump 2F-224	1972	Sump		0	0	0	Y	N	N
U32	E44	ULSD Process Heater 2H-201	1972	1006		5.26	1.54	9.57	Y	N	N
U33	E45	ULSD Process Heater 2H-202	1972	1007		23	10.52	14.95	Y	N	N
U33	E46	ULSD Process Heater 2H-203	OOS	1008					-		-
U34	E47	Cumene Loading Spot #1	1960	R5-1					N		N
U34	E48	Cumene Loading Spot #2	1960	R5-2					N		N
U37	E51	AH-1T Asphalt Heater	OOS	1029					-		-
U40	E55	CRU PH-6	1979	1023	Lo-NOx Burners				N		N
U41	E56	CRU Heater PH-1	1967	1016	Lo-NOx Burners	18.6	16.6	14	Y	N	N
U42	E57	CRU Heater PH-2	1967	1017	Lo-NOx Burners	16	14.2	13.3	Y	N	N
U43	E58	CRU Heater PH-3	1967	1018		30.66	30.53	22.61	Y	Y/PM10	Y
U43	E59	CRU Heater PH-4A	1967	1019		43.4	43.58	32.26	Y	Y/NOx,SO2,PM10	Y

ATTACHMENT
BART DETERMINATION CHART

Emission Unit(U)	Equipment Inventory, NJID	Equipment Description	Installation Date	Facility Designation	Control Device	PTE-NOx Tons/Yr.	PTE-SO2 Tons/Yr.	PTE-PM10 Tons/Yr.	Meets BART date eligibility Y/N	Exceeds BART emissions deminimus levels- N or Y/Pollutant	BART affected equipment Y/N
U43	E60	CRU Heater PH-4B	1967	1020		16	16	11.84	Y	N	N
U44	E61	CRU Heater PH-5A	OOS	1055					-		-
U44	E62	CRU Heater PH-5B	1967	1021		63.95	13.2	9.77	Y	Y/NOx	Y
U47	E65	CRU Heater HC-301	1967	1009							
U47	E66	CRU Heater HC-302	OOS	1010					-		-
U48	E67	SRU 1 Complex	1995	SRU 1	SRU Thermal Oxidizer				N		N
U49	E77	Sour Water Stripper	1994	SRU 2	SWS Offgas Flare				N		N
U49	E78	Oil Skimmer Vessel	1994	SR 3	SWS Offgas Flare				N		N
	E81	Sulfolane/Clay Treater Unit	1967	FL 1	East Side Flare West Side Flare Ground ZTOF Flare				Y	N-See Note 6	N
	E82	CRU-2/HTU-4	1967	FL 2	East Side Flare West Side Flare Ground ZTOF Flare				Y	N-See Note 6	N
	E83	Hydrotreater Unit	1956	FL 3	East Side Flare West Side Flare Ground ZTOF Flare				N		N
	E84	ULSD Unit	2006	FL 4	East Side Flare West Side Flare Ground ZTOF Flare				N		N
	E85	ISOM/HTU-2	1953	FL 5	East Side Flare West Side Flare Ground ZTOF Flare				N		N
	E86	Vacuum Pipe Still	1949	FL 6	East Side Flare West Side Flare Ground ZTOF Flare				N		N
	E87	FCCU	1949	FL 7	East Side Flare West Side Flare Ground ZTOF Flare				N		N
	E88	Catalytic Poly Unit	1949	FL 8	East Side Flare West Side Flare Ground ZTOF Flare				N		N

ATTACHMENT
BART DETERMINATION CHART

Emission Unit(U)	Equipment Inventory, NJID	Equipment Description	Installation Date	Facility Designation	Control Device	PTE-NOx Tons/Yr.	PTE-SO2 Tons/Yr.	PTE-PM10 Tons/Yr.	Meets BART date eligibility Y/N	Exceeds BART emissions deminimus levels- N or Y/Pollutant	BART affected equipment Y/N
	E89	Cumene Unit	1960	FL 9	East Side Flare West Side Flare Ground ZTOF Flare				N		N
	E90	Sulfur Recovery Unit	1995	FL 10	East Side Flare West Side Flare Ground ZTOF Flare				N		N
	E91	Alkylation Unit	1953	FL 11	East Side Flare West Side Flare Ground ZTOF Flare				N		N
U110	E92	Powerhouse	2002	FL 12	East Side Flare West Side Flare Ground ZTOF Flare				N		N
	E93	Wastewater Treatment Plant	1972	FL 13	East Side Flare West Side Flare Ground ZTOF Flare	0	0	0	Y	N	N
U53	E94	API Separator	1949	APIS	Cover w/nitrogen blanket				N		N
U53	E95	API Thickner	1972	APIT		0	0	0	Y	N	N
U54	E96	Dock Sump	4/10/1977	Sump		0	0	0	Y	N	N
U53	E97	Aeration Basin	1972	AER		0	0	0	Y	N	N
U56	E98	WWTU-Emerg. Diesel Pump	1972	DSL 1		1.5	0.1	3.42	Y	N	N
U57	E99	Handex	1992						N		N
U66	E142	River Pump Diesel Fire Pump Driver	unknown	DSL 2		2.9	0.2	0.4	unknown	N	N
U96	E310	Brinemaker #1	1984	BR 1	Particulate filter(dust bag)				N		N
U96	E311	Brinemaker #2	1984	BR 2	Particulate filter(dust bag)				N		N
U99	E318	Gas fired duct burner for gas turbine #1	1990	DB 1	Catalytic Oxidizer				N		N
U99	E319	Gas turbine generator #1	1990	GT 1	Catalytic Oxidizer				N		N
U99	E320	Gas fired duct burner for gas turbine #2	1990	DB 2	Catalytic Oxidizer				N		N
U99	E321	Gas turbine generator #2	1990	GT 2	Catalytic Oxidizer				N		N
U103	E325	Cogen Diesel Fire Pump	1990	DL 3					N		N
U14	E334	J15G FCCU Compressor engine	1997	J15G					N		N
U8	E412	FCCU Heater 5B	1971	1004B		4.47	4.47	6.38	Y	N	N
-	E413	Spray Dryer Air Heater	never built	Dryer 1					-		-
-	E414	Metal Hydroxide Spray Dryer	never built	Dryer 2					-		-
U52	E415	East Side Flare	1967	East Flare	Flare gas recov. system	23.74	7.23	64.84	Y	Y/PM10	Y

ATTACHMENT
BART DETERMINATION CHART

Emission Unit(U)	Equipment Inventory, NJID	Equipment Description	Installation Date	Facility Designation	Control Device	PTE-NOx Tons/Yr.	PTE-SO2 Tons/Yr.	PTE-PM10 Tons/Yr.	Meets BART date eligibility Y/N	Exceeds BART emissions deminimus levels- N or Y/Pollutant	BART affected equipment Y/N
U52	E416	West Side Flare	1949	West Flare	Flare gas recov. system				N		N
U52	E417	Ground ZTOF Flare	1995	Ground Flare	Flare gas recov. system				N		N
U560	E5600	Distillate fired engine	Temporary mobile equipment as needed	Engine					N		N
U560	E5601	Distillate fired Boiler #1	Temporary mobile equipment as needed	Hot Vap					N		N
U560	E5602	Distillate fired Boiler #2	Temporary mobile equipment as needed	Cold Vap					N		N
U48	E6702	Sulfur Recovery Unit Process (new)	2005	SRU Process 2	SRU Thermal Oxidizer				N		N
U45	E55015	LSG Reactor Preheat Furnace	2005	H-1	Lo-NOx Burners				N		N
U45	E55016	LSG Stripper Reboiler	2005	H-2	Lo-NOx Burners				N		N

NOTES:

1- PTE-NOx and PTE-SO2 are based on enforceable limits in the Title V Permit.

2- PTE-PM10 for Heaters is based on recent stack tests.

3- PTE-PM10 for the East Flare is based on the highest annual emission reported for the applicable pollutant in the previous five years.

4- PTE-PM10 for other miscellaneous equipment is based on enforceable limits in the Title V Permit.

5- NOx, SO2 and PM10 for non-combustion equipment are zero.

6- Except for emissions from the Unit's combustion equipment which is identified separately on this chart, emissions of NOx, SO2 and PM10 occur only when non-routine releases of gases from the Unit are flared. Emissions from these incidents are included in the PTE-NOx, PTE-SO2 and PTE-PM10 for the flares (Equipment E415, E416 and E417).