State of New Jersey

CHRIS CHRISTIE
Governor

KIM GUADAGNO
Lt. Governor

DEPARTMENT of ENVIRONMENTAL PROTECTION
Division of Air Quality
Bureau of Air Permits
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BOB MARTIN
Acting Commissioner

March 2, 2011

The Honorable Judith A. Enck
Regional Administrator
United States Environmental Protection Agency – Region 2
290 Broadway – 26th Floor
New York, New York 10007-1866

Dear Regional Administrator Enck:

Enclosed for your consideration is the New Jersey Department of Environmental Protection's (NJDEP) final determination of Best Available Retrofit Technology (BART) for five facilities, one power plant and four petroleum refineries, which were previously identified for evaluation in the State Implementation Plan (SIP) for Regional Haze that was submitted to your office on July 28, 2009. These facilities are: 1) PSEG Hudson Generating Station, 2) Chevron Products, 3) Amerada Hess Port Reading Refinery, 4) ConocoPhillips Bayway Refinery, and 5) Sunoco Eagle Point. NJDEP determined that three of these five New Jersey facilities are eligible sources that are subject to BART under the Regional Haze Rule.

Specifically, this supplement to the Regional Haze SIP identifies the level of control representing BART, establishes a BART emission limit, and ensures compliance with that BART requirement for qualified equipment located at 1) PSEG Hudson Generating Station, 2) Chevron Products, and 3) ConocoPhillips Bayway Refinery.

On December 20, 2010, the NJDEP forwarded an electronic copy of the BART proposal to your office for review. At that time NJDEP posted the proposed SIP supplement and fact sheet on the Air Quality Permitting Program's website and also published a public notice in the Starledger newspaper. The public comment period ended on January 21, 2011. Concurrent comments were received from the U.S. Fish and Wildlife Service and the U.S. Forest Service. This supplement includes NJDEP's technical support for each BART determination and a summary of the comments received on the proposed BART determinations, as well as NJDEP's response to the comments.

If you have any questions regarding this SIP supplement, please contact me at (609) 984-1484.

Sincerely yours,

William O'Sullivan, P.E.
Director, Division of Air Quality

Enclosure: Final BART Technical Support Document

c: Barbara Finazzo, Director, Division of Environmental Planning and Protection, USEPA Region II
Raymond W. Werner, Chief, Air Programs Branch, USEPA Region II
Richard Ruvo, Chief, State Implementation Plan Section, USEPA Region II
Irene Kropp, Deputy Commissioner

TSD-vFinal

Final BART Determinations for Affected BART-eligible Sources in the State of New Jersey

Technical Support Document

State of New Jersey Department of Environmental Protection

Division of Air Quality

Bureau of Air Permits

401 E. State Street, 2nd floor, P.O. Box 27
Trenton, NJ 08625-0027

March 2, 2011

1.0 BEST AVAILABLE RETROFIT TECHNOLOGY (BART) DETERMINATIONS

1.1 Introduction

To protect scenic areas across the United States against regional haze as required by the federal Clean Air Act (CAA), the United States Environmental Protection Agency (USEPA) published regulations that require certain types of existing sources of visibility impairing air pollutants install Best Available Retrofit Technology (BART) to reduce such emissions.[1] On August 4, 2009, the New Jersey Department of Environmental Protection (NJDEP) submitted its State Implementation Plan (SIP) Revision for Regional Haze to protect and enhance visibility levels in the Brigantine Wilderness Area of the Edwin B. Forsythe National Wildlife Refuge, a federally designated Class I Area, to the USEPA. NJDEP identified five facilities in the SIP revision as potentially BART-eligible sources including one fossil fuel-fire steam electric power plant and four petroleum refineries, and committed to complete its review of facilities subject to BART in 2010.[2] These facilities are: 1) PSEG Hudson Generating Station, 2) Chevron Products, 3) Amerada Hess Port Reading Refinery, 4) ConocoPhillips Bayway Refinery, and 5) Sunoco Eagle Point.

The listed facilities submitted their own BART analysis to NJDEP.[3] NJDEP's review process to evaluate BART consisted of identifying 1) the facilities that are BART-eligible; 2) the BART-eligible facilities that are subject to BART review; and 3) the facilities that must comply with BART including controls, emission limits, and compliance dates.

1.2 BART-Eligibility

To be BART-eligible a facility must belong to one of 26 specific source categories with existing stationary emission units (or pieces of equipment) which meet specific criteria for start-up dates and potential emissions of visibility impairing pollutants including NO_x, SO_2, and PM_{10}.[4] The Mid-Atlantic/Northeast Visibility Union (MANE-VU) formed a BART workgroup consisting of member states and tribes to assist the region with the BART requirements of the Regional Haze rule including the identification of potentially BART-eligible sources and the emission units that comprise them. See Appendix A in NESCAUM'S 2007 report, Five-Factor Analysis of BART-Eligible Sources, for the final list of BART-eligible sources in the MANE-VU region including New Jersey.[5] Upon reviewing the current potential emissions from the applicable equipment still in existence at each named facility, NJDEP determined that three of the five New Jersey facilities identified in Appendix A are BART-eligible sources. See Table 1 below.

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[1] http://www.epa.gov/fedrgstr/EPA-AIR/2005/July/Day-06/a12526.pdf
[2] http://www.state.nj.us/dep/baqp/2008%20Regional%20Haze/Regional%20Haze%20SIP%20Final2009.pdf
[3] http://www.state.nj.us/dep/baqp/2008%20Regional%20Haze/Appendix%20G-8%20%28Final%20Only%29.pdf
[4] 64 Fed. Reg. 35737; July 1, 1999
[5] NESCAUM. Five-Factor Analysis of BART-eligible Sources Survey of Options for Conducting BART Determinations. Boston, MA; June 2007.

Table 1 List of BART-eligible Sources in New Jersey

Source category/ Facility	Cumulative visibility impairing pollutants from BART applicable equipment[1] Potential to Emit (PTE) in tons per year (tpy)			BART-eligible source (PTE > 250 tpy)
	NO_x	SO_2	PM_{10}	
Power plants:				
PSEG Hudson	11,846.0	11,659.0	4483.8	Yes
Petroleum refineries:				
Chevron	262.2	40.5	32.7	Yes
Amerada Hess	0.74	1.05	D[2]	No
ConocoPhillips	541.5	1829.5	66.0	Yes
Sunoco Eagle Point	232.5	130.0	45.2	No

Notes:
[1]equipment put in place August 7, 1962 through August 7, 1977.
[2]De minimis (D) – potential to emit below de minimis reporting threshold (0.05 pounds per hour)

1.2.1 Identification of BART-eligible Sources

NJDEP followed the step-by-step process for determining BART-eligibility provided in Appendix Y to Part 51, Section II.[6] The steps in identifying BART-eligible sources are:

Step 1: list existing equipment at facilities that fit any BART source category;
Step 2: verify the start-up dates of the equipment and check if within the 1962-1977 time window; and
Step 3: compare the cumulative potential emissions (PTE) from qualified equipment identified in Steps 1 and 2 to the 250 tons per year (tpy) cutoff for any single visibility impairing pollutant.

One of the MANE-VU BART workgroup's recommendations was to handle emission units with unknown (UKN) start up dates as if they were installed within the BART window. See recommendation 7. at Appendix C of the Five Factor Analysis report.[7] As a result, a large number of pieces of equipment were preliminarily identified in this manner at the New Jersey sources.

Tables 2 – 6 display the information gathered from the steps above for 1) Hess Corporation, Port Reading Refinery, 2) Sunoco, Eagle Point, 3) Chevron Products, 4) ConocoPhillips Bayway Refinery, and 5) PSEG Fossil LLC Hudson Generating Station, respectively.

[6] http://edocket.access.gpo.gov/cfr_2008/julqtr/pdf/40cfr51AppY.pdf
[7] NESCAUM. Five-Factor Analysis of BART-eligible Sources Survey of Options for Conducting BART Determinations. Boston, MA; June 2007.

1.2.2 Hess Corporation, Port Reading Refinery (PI#17996) – Woodbridge, Middlesex County

The Hess Port Reading petroleum refinery currently has one boiler (E66) that falls within the August 7, 1962 through August 7, 1977 BART time frame. The permitted potential to emit (PTE) totals for this qualified unit are below the 250 tpy applicability threshold for NO_x, SO_2, and PM_{10} (0.74, 1.05, and de minimis,[8] respectively), and therefore this source is not BART-eligible. See Table 2 below.

Note that of all the equipment initially identified as being potentially subject to BART at this source, a large number of pieces comprised the wastewater treatment plant. Since volatile organic compounds (VOCs) were the only pollutants emitted from this emission unit, these pieces of equipment were not included in the cumulative determination of the facility-wide PTE from qualified emission units. The fluidized catalytic cracking unit (FCCU), also identified on the original list, falls outside the applicable time frame with installation occurring in 1960 and is not affected by BART.

Table 2 List of Equipment, Start-up Date, Potential Emissions, and Eligibility Determination – Hess Corporation, Port Reading Refinery

Hess Corporation, Port Reading Refinery (PI#17996)							
Identify emission units		Verify dates		If yes, compare PTE to 250 tpy cutoff			
Equip. NJID	Equipment Description	Start-up Date	8/7/62 – 8/7/77	Potential to Emit (PTE) in tons per year (tpy)			BART eligible
				NO_x	SO_2	PM_{10}	
E1	FCCU	1960	No	—	—	—	N/A
E2	SRU			—	—	—	
E3	FGR			—	—	—	
E5	Boiler #3	1984	No	—	—	—	N/A
E6	Boiler #4			—	—	—	
E7 – 16	Waste Water Treatment Plant	1973	Yes	N/A	N/A	N/A	No[2]
E64	Flare	1984	No	—	—	—	N/A
E66	Space Heating Boiler	1975	Yes	0.74	1.05	D[3]	Yes[1]
E69	Air Compressor	1997	No	—	—	—	N/A
E70	Truck Loading Rack	P-1960	No	—	—	—	N/A
E94	Marine Loading	P-1959	No	—	—	—	N/A
E95	Boiler #1	1986	No	—	—	—	N/A
E96	Boiler #2			—	—	—	
E97	Boiler #3			—	—	—	
E67	Em. Generator	1984	No	—	—	—	N/A

[8] http://www.state.nj.us/dep/aqm/Sub8.pdf

Hess Corporation, Port Reading Refinery (PI#17996)							
Identify emission units		Verify dates		If yes, compare PTE to 250 tpy cutoff			
Equip. NJID	Equipment Description	Start-up Date	8/7/62 – 8/7/77	Potential to Emit (PTE) in tons per year (tpy)			BART eligible
				NO_x	SO_2	PM_{10}	
E2001	HDS Unit Process Heater	2006	No	—	—	—	N/A
E2002	Hydrogen Unit Process Heater	2006	No	—	—	—	N/A
E2003	E&I Shop Boiler	2002	No	—	—	—	N/A
Visibility Impairing Pollutants				**NO_x**	**SO_2**	**PM_{10}**	**PTE**
Totals (tpy):				**0.74**	**1.05**	**D[3]**	**< 250**

Notes:
[1]equipment with applicable emissions to be considered cumulatively in determining the facility's BART eligibility
[2] not applicable (N/A) – potential emissions from VOCs only
[3]De minimis (D) – potential to emit below de minimis level (less than 0.05 pounds per hour)

1.2.3 Sunoco, Eagle Point (PI#55781) – formerly Coastal Eagle Point, Westville, Gloucester County

The Eagle Point petroleum refinery currently has 11 process heaters and two diesel pumps that fall within the BART time frame. However, the permitted PTE totals from the qualified units are below the 250 tpy applicability threshold for NO_x, SO_2, and PM_{10} (232, 130, and 45, respectively), and therefore this source is not BART-eligible. See Table 3 below.

Note that some of the process heaters initially identified as being potentially subject to BART were taken out of service and subsequently removed from the Title V operating permit. All the remaining units have low NO_x burners (LNB) and, in any case, are subject to the requirements of an enforceable consent decree (CD) effective as of December 31, 2006.[9]

Table 3 List of Equipment, Start-up Date, Potential Emissions, and Eligibility Determination – Sunoco, Eagle Point

Sunoco, Eagle Point (PI#55781)							
Identify emission units		Verify dates		If yes, compare PTE to 250 tpy cutoff			
Equip. NJID	Equipment Description	Start-up Date	8/7/62 – 8/7/77	Potential to Emit (PTE) in tons per year (tpy)			BART eligible
				NO_x	SO_2	PM_{10}	
E5 – 7	VPS heaters HA-1, 3A & 3B	1949	No	—	—	—	N/A
E8	VPS heater HA-4	1956	No	—	—	—	N/A

[9] http://www.state.nj.us/dep/baqp/2008%20Regional%20Haze/Appendix%20G%20-%20BART%20Documentation/Appendix%20G-7_Coastal%20Consent%20Decree.pdf

Sunoco, Eagle Point (PI#55781)							
Identify emission units		Verify dates		If yes, compare PTE to 250 tpy cutoff			
Equip. NJID	Equipment Description	Start-up Date	8/7/62 – 8/7/77	Potential to Emit (PTE) in tons per year (tpy)			BART eligible
				NO_x	SO_2	PM_{10}	
E12	FCCU heater 5A	1971	Yes	4.47	4.90	1.80	Yes[1]
E412	FCCU heater 5B	1971	Yes	4.47	4.90	1.80	Yes[1]
E13	FCCU regenerator	1949	No	—	—	—	N/A
E22 – 27	FCCUcompressor engines J15A – F	1949	No	—	—	—	N/A
E28 - 30	FCCU heaters B-2, B-3 & B-4	1949	No	—	—	—	N/A
E32	Poly heaterB301	1949	No	—	—	—	N/A
E37	HTU #1 heater	1956	No	—	—	—	N/A
E39	ISOM PH-1	1953	No	—	—	—	N/A
E43	Slop oil sump	1972	Yes	N/A	N/A	N/A	No[2]
E44	ULSD process heater 2H-201	1972	Yes	5.26	1.54	2.72	Yes[1]
E45	ULSD process heater 2H-202	1972	Yes	23.0	10.5	4.25	Yes[1]
E47 – 48	Cumene loading spots #1 & #2	1960	No	—	—	—	N/A
E55	CRU PH-6	1979	No	—	—	—	N/A
E56	CRU heater PH-1	1967	Yes	18.6	16.6	4.40	Yes[1]
E57	CRU heater PH-2	1967	Yes	16.0	14.2	3.77	Yes[1]
E58	CRU heater PH-3	1967	Yes	30.3	17.4	6.4	Yes[1]
E59	CRU heater PH-4A	1967	Yes	43.2	24.9	9.1	Yes[1]
E60	CRU heater PH-4B	1967	Yes	15.9	9.1	3.4	Yes[1]
E62	CRU heater PH-5B	1967	Yes	53.9	13.2	2.76	Yes[1]
E65	CRU heater HC-301	1967	Yes	13.0	12.5	0.96	Yes[1]
E67	SRU1 complex	1995	No	—	—	—	N/A
E6702	SRU2 process	2005	No	—	—	—	N/A
E77	Sour water stripper	1994	No	—	—	—	N/A
E78	Oil skimmer vessel			—	—	—	
E415	East side flare	1967	Yes	N/A	N/A	N/A	No[3]
E416	West side flare	1949	No	N/A	N/A	N/A	
E417	Ground ZTOF	1995	No	N/A	N/A	N/A	

Sunoco, Eagle Point (PI#55781)							
Identify emission units		Verify dates		If yes, compare PTE to 250 tpy cutoff			
Equip. NJID	Equipment Description	Start-up Date	8/7/62 – 8/7/77	Potential to Emit (PTE) in tons per year (tpy)			BART eligible
				NO_x	SO_2	PM_{10}	
	flare						
E81	Sulfolane/clay treater unit, FL1	1967	Yes	N/A	N/A	N/A	
E82	CRU-2 /HTU-4, FL2			N/A	N/A	N/A	
E83	Hydrotreater 1, FL3	1956	No	N/A	N/A	N/A	
E84	ULSD unit, FL4	2006	No	N/A	N/A	N/A	
E85	ISOM /HTU-2, FL5	1953	No	N/A	N/A	N/A	
E86	Vacuum pipestill, FL6	1949	No	N/A	N/A	N/A	
E87	FCCU, FL7			N/A	N/A	N/A	
E88	Catalytic poly unit, FL8			N/A	N/A	N/A	
E89	Cumene unit, FL9	1960	No	N/A	N/A	N/A	
E90	Sulfur recovery unit, FL10	1995	No	N/A	N/A	N/A	
E91	Alkylation unit, FL11	1953	No	N/A	N/A	N/A	
E92	Powerhouse, FL12	2002	No	N/A	N/A	N/A	
E93	WWTP, FL13	1972	Yes	N/A	N/A	N/A	
E94	API separator	1949	No	N/A	N/A	N/A	No[2]
E95	API thickener	1972	Yes	N/A	N/A	N/A	
E97	Aeration basin			N/A	N/A	N/A	
E96	Dock sump	4/10/77	Yes	N/A	N/A	N/A	
E98	WWTU – em. diesel pump	1972	Yes	1.50	0.10	3.42	Yes[1]
E99	Handex	1992	No	N/A	N/A	N/A	N/A
E142	River pump diesel fire pump driver	UNK	Yes	2.9	0.2	0.4	Yes[1]
E310	Brinemaker #1	1984	No	—	—	—	N/A
E311	Brinemaker #2			—	—	—	
E318	Duct burner – gas turbine #1	1990	No	—	—	—	N/A
E319	Gas turbine #1			—	—	—	
E320	Duct burner – gas			—	—	—	

Sunoco, Eagle Point (PI#55781)							
Identify emission units		Verify dates		If yes, compare PTE to 250 tpy cutoff			
Equip. NJID	Equipment Description	Start-up Date	8/7/62 – 8/7/77	Potential to Emit (PTE) in tons per year (tpy)			BART eligible
				NO_x	SO_2	PM_{10}	
	turbine #2						
E321	Gas turbine #2			—	—	—	
E325	Diesel fire pump	1990	No	—	—	—	N/A
E334	J15G FCCU compressor engine	1997	No	—	—	—	N/A
E341	Boiler 5	2001	No	—	—	—	N/A
E342	Boiler 6			—	—	—	
E343	Boiler 7			—	—	—	
E344	Boiler 8			—	—	—	
E5600	Distillate fired engine	Tempo-rary mobile equip-ment as needed	No	—	—	—	N/A
E5601	Distillate fired boiler 1			—	—	—	
E5602	Distillate fired boiler 2			—	—	—	
E55015	LSG preheat reactor furnace	2005	No	—	—	—	N/A
E55016	LSG stripper reboiler			—	—	—	
Visibility Impairing Pollutants				**NO_x**	**SO_2**	**PM_{10}**	**PTE**
Totals (tpy):				**232.5**	**130.0**	**45.2**	**< 250**

Notes:
[1]equipment with applicable emissions to be considered cumulatively in determining the facility's BART eligibility
[2] not applicable (N/A) – potential emissions are VOCs only
[3] not applicable (N/A) – flare control system was assigned NJID E415 – 417 and E81 – 93 as a permit workaround to ensure that enforceable operational requirements for these flares are part of the compliance plan

1.2.4 Chevron Products (PI#18058) – Perth Amboy, Middlesex County

Chevron currently has two refinery fuel gas-fired furnaces (E1501 and E1502) that fall within the applicable BART time frame. The NO_x emissions from E1501 and E1502 cumulatively exceed the PTE threshold and make this facility a BART-eligible source. See Table 4 below. However, Chevron proposed an enforceable permit limit to cap out this facility's NO_x emissions to less than the 250 tpy PTE cutoff from the two qualified furnaces. See Section 1.5.1 for details.

Note that of all the equipment initially identified as being potentially subject to BART at this source, a large number of pieces comprised the wastewater treatment plant. Since VOCs are the

only pollutants emitted from this emission unit, these pieces of equipment were not included in the cumulative determination of the facility-wide PTE from qualified emission units. Also a process heater, E1601, initially identified as being potentially subject to BART, was taken out of service and subsequently removed from the Title V operating permit.

Table 4 List of Equipment, Start-up Dates, Potential Emissions, and Eligibility Determination – Chevron Products

Chevron Products (PI#18058)							
Identify equipment		Verify dates		If yes, compare PTE to 250 tpy cutoff			
Equip. NJID	Equipment Description	Start-up Date	8/7/62 – 8/7/77	Potential to Emit (PTE) in tons per year (tpy)			BART eligible
				NO_x	SO_2	PM_{10}	
E1002	Barge Berth	1975	Yes	N/A	N/A	N/A	No[5]
E1501	Atmospheric crude furnace	1976	Yes	181.3	28.0	18.9	Yes[1]
E1502	Vacuum crude furnace	1976	Yes	80.9	12.5	13.9	Yes[1]
E1601	Hot oil heater	1976	Yes	—	—	—	No[6]
E1801	North Flare	1976	Yes	N/A	N/A	N/A	No[3]
E2001	#3 API separator diversion box	1977	Yes	N/A	N/A	N/A	No[2]
E2002	#3 API separator forebay			N/A	N/A	N/A	
E2003	#3 API separator			N/A	N/A	N/A	
E2004 - 2005	IAF units			N/A	N/A	N/A	
E2006	Equalization tank			N/A	N/A	N/A	
E2007	Oily water bin			N/A	N/A	N/A	
E2008	Oil bin			N/A	N/A	N/A	
E2009	Stormwater diversion box			N/A	N/A	N/A	
E2010	Float separation box			N/A	N/A	N/A	
E2011	Sludge mixing tank			N/A	N/A	N/A	
E2012	Sludge settling tank			N/A	N/A	N/A	
E2301	Desalting water drum	1975	Yes	N/A	N/A	D[4]	No
E2401	Light products loading rack – AER incinerator	1975	Yes	N/A	N/A	N/A	No[3]

Chevron Products (PI#18058)							
Identify equipment		Verify dates		If yes, compare PTE to 250 tpy cutoff			
Equip. NJID	Equipment Description	Start-up Date	8/7/62 – 8/7/77	Potential to Emit (PTE) in tons per year (tpy)			BART eligible
				NO_x	SO_2	PM_{10}	
Visibility Impairing Pollutants				**NO_x**	**SO_2**	**PM_{10}**	**PTE**
Totals (tpy):				**262.5**	**40.5**	**32.7**	**> 250**

Notes:
[1]equipment with applicable emissions to be considered cumulatively in determining the facility's BART eligibility
[2]not applicable (N/A) – potential emissions from VOCs only
[3]not applicable (N/A) – control device, CD2401, was assigned an Equipment NJID as a permit workaround to ensure enforceable operational requirements of this flare are part of the compliance plan to control VOC while loading gasoline
[4]De minimis (D) – potential to emit below de minimis level (less than 0.05 pounds per hour)
[5]not applicable (N/A) – potential emissions are combustion byproducts of the marine vapor control, CD1001, used to control VOC from product loading arm
[6]equipment is demolished and removed from the Title V permit

1.2.5 ConocoPhillips Bayway Refinery (PI#41805) – Linden, Union County

Bayway petroleum refinery currently has 11 process heaters that fall within the applicable BART time frame. The cumulative permitted PTE from these qualified units exceed the BART threshold for NO_x and SO_2 emissions (541.5 and 1829.5, respectively), and therefore this facility is a BART-eligible source. See Section 1.5.2 for details regarding existing controls and proposed BART.

Note that of all the equipment initially identified as being potentially subject to BART at this source, a large number of pieces comprised the wastewater treatment plant. Since VOCs were the only pollutants to be emitted from this emission unit, these pieces of equipment were not included in the cumulative determination of the facility-wide PTE from qualified emission units. The FCCU emission unit, also identified on the original list, falls outside the applicable time frame with installation occurring in 1949 and is not affected by BART.

SO_2 and PM_{10} emissions from two process heaters, E242 and E250, were considered in netting for modifications incorporated into the facility's PSD permit in 2004 in order to meet the USEPA's low sulfur gasoline requirements, and may not be subject to BART for these two visibility impairing pollutants. In any case these heaters are subject to federal Subpart J – Standards of Performance for Petroleum Refineries (NSPS subpart J) that regulates the H_2S content in refinery fuel gas. See section 1.5.2.

One heater, E244, with a start up date of 1969, suffered extensive damage from a fire in the late 1990's that required reconstruction. According to ConocoPhillips, the reconstruction exceeded 50 percent (%) of the replacement cost of the heater.[10] Consequently this heater is subject to

[10] http://edocket.access.gpo.gov/cfr_2006/julqtr/pdf/40cfr51.301.pdf

NSPS subpart J standards for particulate matter, carbon monoxide and sulfur oxides that are included in the facility's Title V operating permit. Sources reconstructed after 1977, which reconstruction had gone through NSR/PSD permitting, are not BART-eligible.[11] To summarize, process heater E244 is therefore not affected by BART because this unit meets USEPA's BART exemption guidance in Appendix Y for a "reconstructed" unit for the following reasons:
(1) the reconstruction date was after August 7, 1977;
(2) the reconstructed unit went through NSR/PSD permitting; and
(3) the fixed capital cost of the new component exceeds 50 percent of the fixed capital cost of a comparable entirely new source.
See Appendix A to this Technical Support Document (TSD) for ConocoPhillips' email confirming this information.

The Sulfur Recovery Unit (SRU), E266, that was included in the initial list of potentially BART qualified equipment, has been dismantled and, after confirmation by NJDEP's Regional Enforcement Office, was subsequently removed from the equipment list. See Table 5 below.

Table 5 List of Equipment, Start-up Date, Potential Emissions, and Eligibility Determination – ConocoPhillips Bayway Refinery

ConocoPhillips Bayway Refinery (PI#41805)							
Identify equipment		Verify dates		If yes, compare PTE to 250 tpy cutoff			
Equip. NJID	Equipment Description	Start-up Date	8/7/62 – 8/7/77	Potential to Emit (PTE) in tons per year (tpy)			BART eligible
				NO_x	SO_2	PM_{10}	
E241	F-101 PFBW hydrofiner heater	1969	Yes	30.7	170.4	6.57	Yes[1]
E242	F-101 DSU-1 gas oil heater	1969	Yes	22.3	N/A[6]	N/A[6]	Yes[1]
E244	F-102 DSU-1 Treat Gas heater	1969	Yes	—	—	—	No[5]
E243	F-102 PFBW Reheat heater	1971	Yes	186	1066.5	24.6	Yes[1]
E245	F-103 PFBW Reheat heater						
E246	F-104 PFBW Reheat heater						
E247	F-105 PFBW Reheat heater						
E248	F-106 PFBW Regen Gas heater	1971	Yes	27.6	157.2	6.1	Yes[1]
E249	F-107 PFBW Dryer heater	1971	Yes	9.0	23.7	0.88	Yes[1]
E250	F-108 PFBW	1971	Yes	47.3	N/A[6]	N/A[6]	Yes[1]

[11] http://edocket.access.gpo.gov/cfr_2008/julqtr/pdf/40cfr51AppY.pdf

ConocoPhillips Bayway Refinery (PI#41805)							
Identify equipment		Verify dates		If yes, compare PTE to 250 tpy cutoff			
Equip. NJID	Equipment Description	Start-up Date	8/7/62 – 8/7/77	Potential to Emit (PTE) in tons per year (tpy)			BART eligible
				NO_x	SO_2	PM_{10}	
	Reboiler heater						
E251	F-251 FCCU feed preheat heater	1949	No	—	—	—	N/A
E253	F-401 DSU-2 Reactor heater	1972	Yes	60.9	330.7	4.4	Yes[1]
E254	F-401 DDU heater	Oct 77	No	—	—	—	N/A
E255	F-601 CNH heater	Oct 77	No	—	—	—	N/A
E256	F-601 ISOM Purge Gas heater	Oct 77	No	—	—	—	N/A
E257	F-701 Pipestill Atmospheric heater	1970	Yes	N/A	N/A	N/A	No[7]
E258	F-702 OBFT Outboard Flash heater	1970	Yes	157.7	81.0	23.4	Yes[1]
E259	F-752 Vacuum Tower heater	2009	No	—	—	—	N/A
E260	ISOM Reactor Charge heater	Oct 77	No	—	—	—	N/A
E261	ISOM Reactivation Gas heater	Oct 77	No	—	—	—	N/A
E262	SDA Hot Oil heater	Oct 77	No	—	—	—	N/A
E263 –E265	FCCU regenerator and catalyst hoppers	1949	No	—	—	—	N/A
E266	Sulfur recovery Claus plant	1967/74	Yes	—	—	—	No[3]
E186 –E189	Stretford tanks	1974	Yes	N/A	N/A	N/A	No[4]
E267	Cooling Tower	UNK	N/A	N/A	N/A	N/A	No[4]
E268 –E270	PFBW vents	1971	Yes	N/A	N/A	N/A	No[2]
E271 –E272	Marine loading operations	1990	No	—	—	—	N/A
E273 –E274	Truck loading operations	UNK	N/A	N/A	N/A	N/A	No[2]

ConocoPhillips Bayway Refinery (PI#41805)							
Identify equipment		Verify dates		If yes, compare PTE to 250 tpy cutoff			
Equip. NJID	Equipment Description	Start-up Date	8/7/62 – 8/7/77	Potential to Emit (PTE) in tons per year (tpy)			BART eligible
				NO_x	SO_2	PM_{10}	
E275 –E277 E279	Emergency flares (pilot flame only)	1941 – 1949	No	—	—	—	N/A
E280 –E282 E294	Wastewater treatment	1916 – 1945	No	—	—	—	N/A
E295 –E296		Oct 77	No	—	—	—	N/A
E301		UNK	N/A	N/A	N/A	N/A	No[2]
E292	Fixed roof tank	UNK	N/A	N/A	N/A	N/A	No[4]
E299	Fixed roof tank	1997	No	—	—	—	N/A
E302	Temp. catalyst additive hopper	1997	No	—	—	—	N/A
E502	Hydrogen plant heater	2006	No	—	—	—	N/A
E503	Hydrogen	2006	No	—	—	—	N/A
E504	Merifiner thermal oxidizer	2006	No	—	—	—	N/A
E1003 -1010, E1013 -1015, E1116	Polypropylene unit	2003	No	—	—	—	N/A
E1302 –1304	Diesel engines - concrete crusher	2001	No	—	—	—	N/A
Visibility Impairing Pollutants				**NO_x**	**SO_2**	**PM_{10}**	**PTE**
Totals (tpy):				**541.5**	**1829.5**	**66.0**	**> 250**

Notes:
[1]equipment with applicable emissions to be considered cumulatively in determining the facility's BART eligibility
[2]not applicable (N/A) – potential emissions from VOCs only
[3]equipment is demolished and removed from the Title V permit
[4]not applicable (N/A) – potential emissions from pollutants other than NO_x, SO_2, or PM_{10}
[5]reconstruction commenced after August 7, 1977
[6]not applicable (N/A) – SO_2 and PM_{10} emissions considered in PSD netting (2004) for the Clean Fuels project
[7]SOTA (ULNB + SCR) 2004, 2007 – NO_x, 0.03 lb/MMBtu; H_2S, 0.10 gr/dscf (or 162 ppmvd)

1.2.6 PSEG Fossil LLC Hudson Generating Station (PI#12202) – Jersey City, Hudson County

Hudson Generating Station currently has four pieces of equipment that fall within the BART time frame with permitted PTE totals above the 250 tpy applicability threshold for NO_x, SO_2, and PM_{10} (11,846, 11,659, and 4483.8, respectively), and therefore this facility is a BART-eligible source. See Section 1.6.1 for details regarding existing controls and BART determinations.

Unit 2 (E2) is a coal-fired boiler and subject to state-of-the-art controls and federally enforceable emission limits by December 31, 2010, due to an enforceable consent decree (CD).[12] Required controls include year-round operation of selective catalytic reduction (SCR); flue gas desulfurization (FGD) and full-size baghouse. The Unit 1 boiler (E1) is uncontrolled and primarily combusts natural gas, but is permitted to burn No. 6 fuel oil.

The coal receiving system (E22) and the coal reclaim system (E23) are support systems to E2 with the potential to emit particulate emissions only. The conveying systems are covered and the coal piles are controlled with aqueous spray dust suppression systems. See Table 6 below.

Table 6 List of Equipment, Start-up Date, Potential Emissions, and Eligibility Determination – PSEG Fossil LLC Hudson Generating Station

PSEG Fossil LLC Hudson Generating Station (PI#12202)							
Identify emission units		Verify dates		If yes, compare PTE to 250 tpy cutoff			
Equip. NJID	Equipment Description	Start-up Date	8/7/62 – 8/7/77	Potential to Emit (PTE) in tons per year (tpy)			BART eligible
				NO_x	SO_2	PM_{10}	
E1	Unit No.1 boiler	1964	Yes	8,360	6,389	1,996[3]	Yes[1]
E2	Unit No.2 boiler	1968	Yes	3,486	5,270	2,480[3]	Yes[1]
E14	Em. Fire pump	1963	Yes	N/A	N/A	N/A	No[4]
E22	Coal receiving system	1968	Yes	N/A	N/A	5.4[2]	Yes[1]
E23	Coal reclaim system	1968	Yes	N/A	N/A	2.4[2]	Yes[1]
Visibility Impairing Pollutants				**NO_x**	**SO_2**	**PM_{10}**	**PTE**
Totals (tpy):				**11,846**	**11,659**	**4483.8**	**> 250**

Notes:
[1]equipment with applicable emissions to be considered cumulatively in determining the facility's BART eligibility
[2]includes quantifiable fugitive emissions counted for comparison purposes to the 250 tpy cutoff
[3]TSP potential to emit – PM_{10} to be established (refer to BOP100001)
[4]replaced in 1985-1986 timeframe

1.3 Subject to BART

[12]http://www.epa.gov/compliance/resources/cases/civil/caa/psegfs.pdf

Based on the cumulative assessment of all BART-eligible sources in the MANE-VU region, all member states with BART-eligible facilities contribute to visibility impairment at Class I areas.[13] Therefore, as a member state of MANE-VU, the State of New Jersey adhered to the MANE-VU Board decision that any source that meets the BART eligibility requirements is subject to BART review.[14] Of the five potentially BART-eligible sources, or facilities, in New Jersey, three are subject to BART review. These facilities are: 1) Chevron Products, 2) ConocoPhillips Bayway Refinery, and 3) PSEG Hudson Generating Station.

1.4 Evaluation of BART Analyses

For each qualified emission unit at an eligible facility, BART must be established for pollutants reasonably anticipated to impair visibility. The three New Jersey facilities which are subject to BART submitted emissions control analyses that included analytical information about affected equipment; existing controls in use; available retrofit controls; technical feasibility; costs of compliance; remaining useful life; energy and other environmental impacts as applicable; and other supporting data. NJDEP developed tables summarizing each facility's current compliance requirements, including enforceable consent decree requirements and recent rule development, and proposed BART alternatives, to help determine the best control options, establish emission limits, and set compliance deadlines for the qualified emission units.[15]

1.5 Petroleum Refineries

Petroleum refineries are one of 26 specific categories identified as being applicable to the BART requirement. The qualifying emission units at Chevron and ConocoPhillips that are subject to BART review are process heaters that combust refinery fuel gas, and natural gas in a few cases. Table 7 lists a number of available retrofit control measures to reduce NO_x, SO_2 and PM_{10} emissions from process heaters at petroleum refineries.

According to USEPA there are a number of available control alternatives to reduce NO_x emissions from process heaters. [16,17,18,19, 20] Control techniques include combustion modifications to help prevent the formation of NO_x such as low NO_x burners (LNB), ultra low NO_x Burners (ULNB), and flue gas recirculation (FGR). In addition, there are add-on NO_x controls including selective catalytic reduction (SCR) or selective non-catalytic reduction (SNCR). These post-combustion controls can be used either alone or in conjunction with combustion control techniques as illustrated below in Table 7. The effectiveness levels of the controls, ranked from most to least, indicate best control for new heaters. Existing process

[13] NESCAUM. Five-Factor Analysis of BART-eligible Sources Survey of Options for Conducting BART Determinations. Boston, MA; June 2007.
[14] Ibid.
[15] http://edocket.access.gpo.gov/cfr_2008/julqtr/pdf/40cfr51AppY.pdf
[16] http://www.epa.gov/ttn/catc/dir1/procheat.pdf , p.24
[17] http://www.epa.gov/visibility/pdfs/bart_ria_2005_6_15.pdf , p.8-19
[18] http://www.epa.gov/ttn/catc/dir1/fnoxdoc.pdf , p.36
[19] http://www.epa.gov/ttnnaaqs/ozone/ctg_act/199309_nox_epa453_r-93-034_process_heaters(rev).pdf , p.2-8
[20] http://www.epa.gov/visibility/pdfs/bart_ria_2005_6_15.pdf , p. 3-7

heaters throughout the petroleum refinery source category are commonly retrofit with LNBs and ULNBs. SCR retrofits are less widely in use due to space constraints and other factors such as size, utilization rate, and temperature range.[21] According to USEPA SNCR is generally not used.[22]

Refinery fuel gas contains varying concentrations of hydrogen sulfide (H_2S). Petroleum refineries commonly employ amine scrubbing to process, or condition, the refinery fuel gas to reduce the levels of H_2S before combustion in the process heaters to reduce SO_2 emissions. Add-on SO_2 and PM_{10} controls for individual refinery fuel gas-fired process heaters are not used in practice due to the low sulfur level after in-process gas conditioning. As the sulfur content in fuel decreases, the cost per ton of control for individual units to remove additional sulfur increases.[23]

Table 7 List of Potential Retrofit Emission Control Techniques for Process Heaters at Petroleum Refineries

Potential Retrofit Control Techniques for Process Heaters at Petroleum Refineries				
Pollutant	Available control options	Percent (%) reduction	Potentially applicable	Technically feasible
NO_x	1. ULNB + SCR	85 – 99	Yes	Case-by-case[1]
	2. ULNB + SNCR	75 – 95	Yes	No[2]
	3. SCR	80 – 90	Yes	Case-by-case[1]
	4. ULNB	75 – 85	Yes	Yes
	5. SNCR	30 – 75	Yes	No[2]
	6. LNB + FGR	50 – 72	Yes	Yes
	7. LNB	50	Yes	Yes
SO_2	1. Fuel switching	> 95	Yes	Yes
	2. Fuel processing	90	Yes	No[3]
	3. Scrubbers	90 – 99.9	No	No[4]
PM_{10}	1. Wet scrubbers		No	No[4]
	2. ESP	90		
	3. Good combustion practices		Yes	Yes

Notes:
[1]Case-by-case – not widely in use on process heaters within the industry
[2]Not reasonably applicable – temperature dependent and limited operating range
[3]Not practically applicable to individual process heaters – typically in-process gas treatment
[4]Not practically applicable to refinery fuel gas if already low sulfur concentrations

New Jersey regulates NO_x emissions from process heaters under N.J.A.C. 7:27-19.7(h). Any process heater located at a petroleum refinery that is rated 50 million BTU per hour (MMBtu/hr), or greater, and that combusts refinery fuel gas, shall emit NO_x at a rate no greater than the applicable maximum allowable NO_x emission rate of 0.20 pound per million BTU (lb/MMBtu).[24] The State of the Art (SOTA) performance emission level for NO_x from NJDEP's SOTA Manual

[21] http://www.4cleanair.org/PM25Menu-Final.pdf , p.162
[22] http://www.epa.gov/ttn/nsr/gen/refbact.pdf , p.3-9
[23] http://www.epa.gov/visibility/pdfs/bart_ria_2005_6_15.pdf , p.8-25
[24] http://www.state.nj.us/dep/aqm/Sub19.pdf , p.42

for Petroleum Refineries is 0.07 lb/MMBtu for burner replacement.[25] Certain petroleum refineries, like ConocoPhillips, are also subject to enforceable consent decrees (CD) that require process heaters greater than 40 MMBtu/hr to reduce emission rates to 0.04 lb/MMBtu, or less. NJDEP used these emission levels as a baseline in determining BART. See Table 8 below.

Table 8 Comparison of NO_x Performance Limits for Process Heaters Located at Petroleum Refineries

NO_x limits	RACT N.J.A.C. 7:27-19.7	SOTA Manual	Consent Decree (typical from USEPA refinery initiative)
lb/MMBtu	0.20	0.07*	0.04
*performance limit for burner replacement			

The process heaters under consideration in this document are subject to federal Subpart J – Standards of Performance for Petroleum Refineries (NSPS Subpart J)[26] that requires H_2S content in refinery fuel gas be less than 162 ppmvd (or 0.1 gr/dscf).

In addition N.J.A.C. 7:27-19.7(g) requires annual combustion adjustments for process heaters with a maximum gross heat input rate of at least five million BTU per hour, or greater.

1.5.1 Chevron (PI#18058) BART Analysis

The two refinery fuel gas-fired furnaces, E1501 and E1502, referred to by Chevron as the Crude Unit Heaters, comprise the BART-eligible source. However, the Crude Unit Heaters have been idling for several years as illustrated in Table 9 below, and did not operate in 2009 as reported to NJDEP in its electronic emission statement.

Table 9 Summary of 2002 – 2009 Annual Emissions of Visibility Impairing Pollutants – Chevron (PI#18058)

Equip. NJID	E1501-Atmospheric Crude Furnace F501				E1502-Vacuum Crude Furnace F510			
Pollutant	NO_x	NO_x	SO_2	PM_{10}	NO_x	NO_x	SO_2	PM_{10}
	lb/MMBtu*	tons per year (tpy)			lb/MMBtu*	tons per year (tpy)		
Year								
2002	0.15	109.41	9.25	2.43	0.10	11.68	1.47	1.17
2003	0.16	105.77	8.37	9.80	0.10	9.88	1.20	2.06
2004	0.16	115.20	9.31	10.67	0.10	11.39	1.41	2.38
2005	0.16	99.96	7.06	9.26	0.10	13.65	1.48	2.85
2006	0.16	87.12	4.74	8.07	0.10	16.05	1.34	3.35
2007	0.16	46.82	3.09	4.34	0.10	6.12	0.62	1.28
2008	0.14	19.09	1.16	1.60	0.08	2.01	0.23	0.11
2009**	—	—	—	—	—	—	—	—

[25] http://www.state.nj.us/dep/aqpp/downloads/sota/sota3.pdf , p.3.3-6

[26] http://ecfr.gpoaccess.gov/cgi/t/text/text-idx?c=ecfr&sid=185bdc165a6c68b9a1df1bc3fa8e658c&rgn=div6&view=text&node=40:6.0.1.1.1.21&idno=40

* based on stack testing ** source did not operate

Chevron reported that no decision has been made to restart the Crude Unit to date. Consequently, given the operational history of these two furnaces, Chevron proposed to cap out the annual potential to emit NO_x from these BART qualified heaters to less than 250 tons per year. This is consistent with the MANE-VU Air Directors' recommendation that by accepting a permit limit, a facility may "cap-out" of BART-eligibility. See recommendation 1. at Appendix C of the Five Factor Analysis report.[27]

Chevron proposed that the annual fuel input for each furnace be limited to approximately 95 percent of the current allowable limits in its Title V operating permit. The annual BTU consumption is continuously monitored using a flow rate meter and heat content analyzer.[28] Accordingly, the cumulative annual allowable NO_x PTE from E1501 and E1502 will be reduced by five percent to 249 tpy from 262.5 tpy which is below the 250 tpy BART eligibility cutoff. The facility is required to annually report process information such as the amount of fuel burned and actual emission rates for each process heater to NJDEP through the Emission Statements program according to N.J.A.C. 7:27-21.[29] See Table 10 below.

Chevron submitted a permit modification (BOP100001) to NJDEP on December 8, 2010 requesting the proposed BART requirements be incorporated as part of its operating permit conditions for the Crude Unit Heaters. See Appendix B at the end of this TSD. If the decision is made to restart the Crude Unit, and Chevron requests an increase in PTE that results in cumulative NO_x emissions greater than 250 tpy from these two qualified furnaces, then E1501 and E1502 shall be subject to BART and the facility's operating permit must be revised to include new applicable requirements.

Table 10 Summary of Final Permit Limits to Cap NO_x Emissions below 250 tpy from Qualified Equipment at Chevron (PI#18058)

Equip. NJID	Equipment Description	Proposed permit restriction	Annual Heat Input*		Proposed Potential to Emit (PTE)	Proposed compliance date
			Existing	Proposed		
			(Btu/yr)	(Btu/yr)	(tpy)	
E1501	F-501 Atmospheric crude furnace	Reduce annual heat input	2,189.3 billion (any consecutive 365-day period) BOP090002	2,079.8 billion (any consecutive 365-day period)	172	March 15, 2011
E1502	F-510 Vacuum	Reduce annual heat	941.7 billion (any	894.6 billion (any	77	March 15, 2011

[27] NESCAUM. Five-Factor Analysis of BART-eligible Sources Survey of Options for Conducting BART Determinations. Boston, MA; June 2007.

[28] http://datamine2.state.nj.us/DEP_OPRA/OpraMain/REPORT_FACADE?id=a8acb14d9d3f4b1ed49bfb952e12a641fde1122acf05d1217e9938b3612795d0deec0b282a8f7fcd5267954f6e3d16a3450764cfda6b46a0f4c0161c228a622cb68baec4c3656669a71adb7b1bd8c7d987945fa168fd23ba

[29] http://www.state.nj.us/dep/aqm/Sub21.pdf

	crude furnace	input	consecutive 365-day period) BOP090002	consecutive 365-day period)		
					Total (tpy):	249 (<250)
*natural gas or refinery gas						

1.5.2 ConocoPhillips Bayway Refinery (PI#41805) BART Analysis

The USEPA undertook an enforcement initiative focused on Clean Air Act compliance violations within the petroleum refinery sector with respect to New Source Review (NSR)/Prevention of Significant Deterioration (PSD) and New Source Performance Standards (NSPS). On January 27, 2005, the United States Department of Justice (USDOJ), USEPA, and NJDEP entered into an enforceable consent decree (CD)[30] with ConocoPhillips including its New Jersey refinery. The types of equipment that are affected by the terms of the CD include: fluidized catalytic cracking units (FCCUs); heaters and boilers; flares; and sulfur recovery units (SRUs). The resulting CD primarily requires reductions of nitrogen oxide and sulfur dioxide, precursors to fine particulate matter.[31] Bayway petroleum refinery currently has 11 refinery fuel gas-fired process heaters that are subject to BART and the requirements of the CD. See Table 11 below.

Table 11 Summary of Consent Decree Requirements for Combustion Units – ConocoPhillips

Equipment NJID	Pollutant	Control strategy	Emission limit	Compliance date
Combustion units – 30% total allowable heat input capacity incl: E241 E247 E242 E248 E243 E250 E245 E253 E246 E258	NO_x	One, or any combination: SCR or SNCR; ULNB; or other qualifying technologies	0.040 lb/MMBtu, or lower	12/31/2008
E257 E259		SCR		12/31/2010*
E241 E248 E242 E249 E243 E250 E245 E253 E246 E258 E247	SO_2	Upgrade gas system**	40 CFR 60 Subpart J - H_2S, 0.10 gr/dscf (or 162 ppmvd)	06/30/2011
		Eliminate fuel oil	N/A	01/27/2005

[30] http://www.epa.gov/compliance/resources/cases/civil/caa/conocophillips.html
[31] http://www.epa.gov/particles/basic.html

Equipment NJID	Pollutant	Control strategy	Emission limit	Compliance date
		burning***		
* BOP070011 modification				
** Upgrade refinery fuel gas system no later than 12/31/2010, Paragraph 114(b)				
***Affects any existing combustion devices from the Date of Lodging, Paragraph 117				

According to paragraph 99 of the CD, "By no later than December 31, 2012, Combustion Units with Qualifying Controls will represent at least 30% of the total maximum heat input capacity or, if less, the allowable heat input capacity, as shown in Appendix B, of all of the Combustion Units located at a particular Covered Refinery." … "Any Qualifying Controls can be used to satisfy this requirement, regardless of when the Qualifying Controls were installed." Qualifying controls are defined in the CD as one, or any combination of SCR or SNCR; current generation or next generation ULNB; or other qualifying technologies that can reduce NO_x emissions to 0.040 lbs/MMBtu. All the BART qualified heaters are currently equipped with ULNBs with internal FGR to control NO_x with overall average NO_x emissions of approximately 0.04 lbs/MMBtu.

In addition, as of the date of lodging, January 27, 2005, ConocoPhillips eliminated fuel oil burning in these heaters (BOP050011). Moreover the facility is obliged to upgrade the gas system by December 31, 2010, and to comply with the H_2S requirements of NSPS subpart J by June 30, 2011. Subpart J also stipulates continuous monitoring of the H_2S concentration based on a 3-hour rolling average. ConocoPhillips is already required to monitor the H_2S concentration of the refinery fuel gas as a condition of their operating permit. See Table 12 below.

Table12 Summary of Current Title V Permit Conditions for BART Qualified Equipment (BOP100005) – ConocoPhillips (PI#41805)

Equip. NJID	Equipment Description	Heat Input (MMBtu/hr)		Fuel type	NO_x		SO_2		PM_{10}		Notes
					Existing Control(s)	Allowable emission limit (lb/hr)	Existing Control*	Allowable emission limit (lb/hr)	Existing Control	Allowable emission limit (lb/hr)	
1. E241	F-101 PFBW hydrofiner heater	74		RFG only	Callidus ULNB**	7	Fuel switching	38.9	GCP	1.5	
2. E242	F-101 DSU-1 gas oil heater	51			Callidus ULNB**	5.1		N/A		N/A	SO_2 and PM_{10} netting for PSD, 2004
3. E243	F-102 PFBW Reheat heater	167	448		Callidus ULNB**	42.6		244		5.6	Individual radiant sections; shared convection section
4. E245	F-103 PFBW Reheat heater	90			Callidus ULNB**						
5. E246	F-104 PFBW Reheat heater	108			Callidus ULNB**						
6. E247	F-105 PFBW Reheat heater	83			Callidus ULNB**						
7. E248	F-106 PFBW Regen Gas heater	66			Callidus ULNB**	6.3		35.9		1.4	
8. E249	F-107 PFBW Dryer heater	10			ULNB**	2		5.4		0.2	
9. E250	F-108 PFBW Reboiler heater	114			Callidus ULNB**	10.8		N/A		N/A	SO_2 and PM_{10} netting for PSD, 2004
10.E253	F-401 DSU-2 Reactor heater	139			Callidus ULNB**	13.9		75.5		1.0	
11.E258	F-702 OBFT Outboard Flash heater	500		RFG and NG	JohnZink ULNB** + air preheater	36		18.5		5.35	H_2S, 162 ppmvd (or 0.10 gr/dscf)*** average of three 1-hour block averages

*firing of fuel oil is not allowed in these furnaces (Paragraph 117 of Consent Decree, H-05-0258)

**Ultra Low NO_x Burner (ULNB) employs internal Flue Gas Recirculation

***existing gas system averages about 80 ppm H_2S; reducing SO_2 emissions also reduces condensable particulate emissions

Due to misinterpretation of the de minimis levels allowed in the Regional Haze rule, E249, a 10 MMBtu/hr process heater, was initially excluded from ConocoPhillips BART analysis. Based on informal guidance from USEPA regarding determination of de minimis exemption levels that are based on cumulative plant-wide emissions,[32] NJDEP considers E249 subject to BART review. Refer to Table 5. However, given the existing ULNB, add-on NO_x control to a unit of this relatively small size is unlikely to be cost effective due to its low impact over baseline levels.[33]

There are three process heaters that serve the facility's crude unit, E257, E258, and E259. All have ULNBs. Note that an operating permit modification (BOP070010) to install SCR on the Pipestill heaters, E257 and E259, per the CD, was approved by NJDEP on January 1, 2009 and compliance is expected by December 31, 2010. In conjunction with the SCR installation, E259 was replaced in 2009 with a new heater and is no longer considered a qualified unit. Likewise E257 is not identified in Table 5 as a qualified unit. Based on USEPA's ranking of available control options, ULNB and SCR is the best control combination and therefore NJDEP has determined that these NO_x controls are BART for this unit, E257. USEPA estimates a reduction of 500 tons per year in total NO_x emissions (actual) from E257 and E259.[34]

ConocoPhillips budgeted $45,000,000 to install SCR for E257 and E259 which are rated at 500 MMBtu/hr and 275 MMBtu/hr, respectively. E258 is rated at 500 MMBtu/hr and is equipped with first generation ULNB combustion control. Using the actual capital cost for E257 and E259, ConocoPhillips estimated the cost of modifying E258 to be two-thirds, or $30,000,000, based on its size. See Table 13 below.

However the feasibility and costs of retrofit controls depend on the refinery configuration. E258 is a heat recovery unit that sits atop an air preheater which is not a qualified unit. There is no acceptable location to install SCR since the flue gas temperature is too high before E258 and too low aft to operate properly. Also due to space constraints, both E258 and the air preheater would need to be replaced to accommodate SCR. Due to space and temperature constraints, SCR is not technically feasible, and therefore is not a viable option. NJDEP has determined that the existing NO_x controls are BART for E258.

The remaining process heaters have Callidus ULNBs and range in size from 51 to 167 MMBtu/hr. The installed capital cost for retrofit controls would be similar to E258, rated at 500 MMBtu/hr, regardless of the size of the unit. Annual emissions reductions will be lower for these smaller units resulting in greater cost effectiveness numbers.

[32] USEPA. Additional Regional Haze Questions; August, 2006.
[33] http://www.epa.gov/ttn/nsr/gen/refbact.pdf , p. 3-17
[34] http://www.epa.gov/compliance/resources/decrees/amended/noticeoflodging-firstamendmentconocophillips-cd.pdf

Table 13 Comparison of Technically Feasible NO_x Control Technologies – Bayway (PI#41805)

Feasible Control Alternative(s)	Actual Emission Rate	Annual Emissions	Annual Emissions Reduction	Installed Capital Cost	Annual Operating Cost Estimate	Total Annualized Costs*	Cost Effectiveness	Incremental Cost	Toxic Impact	Adverse Environ. Impact	Energy Impact
	lb/MMBtu	(tpy)	(tpy)	($ 1998)	($/yr)	($/yr)	($/ton)	($/ton)			
E258 (F-702)											
Baseline (1st gen ULNB)	0.057**	79***	N/A	N/A	N/A	N/A	N/A	N/A	—	—	—
a. ULNB newer generation (21% eff.)	0.045	62	17	$ 1,750,000	Minimal	$ 249,000	$ 15,659	$104,933	No	No	No
b. SCR (79% eff.)	0.012	17	45	$30,000,000	$450,000	$ 3,775,000	$ 76,161		Yes	No	No

*based on 7% interest rate and 10 yrs remaining useful life of equipment, the capital recovery factor (CRF) is 0.14238.
**based on CEMS.
***based on 2009 reported emissions

According to the CD, at least 30% of the total maximum heat input capacity or, if less, the allowable heat input capacity of the process heaters located at Bayway Refinery, as shown in Appendix B of the first amendment to the CD, must use qualifying technologies that can reduce NO_x emissions to 0.040 lbs/MMBtu.[35] Of the remaining process heaters considered in this section, all are equipped with Callidus ULNBs, and over 55 percent (%) of the units emit less than the 0.040 lbs/MMBtu design value. As shown in Table 14 below, the actual NO_x emissions average 0.048 lb/MMBtu. Based on the performance of the existing ULNBs, compared to the NO_x performance levels cited in Table 8, and the expected higher cost effectiveness numbers, NJDEP has determined that existing NO_x controls are BART.

Table 14 Summary of Actual 2000-2001 Average NO_x Emissions of Remaining Process Heaters

Equip. NJID	Equipment Description	Allowable Heat Input	Actual NO_x Emission Rate (lb/MMBtu)		
		MMBtu/hr	2000	2001	Avg.
1. E241	F-101 PFBW hydrofiner heater	74	0.050	0.074	0.062
2. E242	F-101 DSU-1 gas oil heater	51	0.038	0.035	0.0365
3. E243	F-102 PFBW Reheat heater	167	0.039	0.043	0.041
4. E245	F-103 PFBW Reheat heater	90	0.039	0.048	0.0435
5. E246	F-104 PFBW Reheat heater	108	0.035	0.043	0.039
6. E247	F-105 PFBW Reheat heater	83	0.028	0.046	0.037
7. E248	F-106 PFBW Regen Gas heater	66	0.100	0.150	0.125
8. E250	F-108 PFBW Reboiler heater	114	0.026	0.029	0.0275
9.E253	F-401 DSU-2 Reactor heater	139	0.021	0.025	0.023
		Overall average NO_x emission rate			**0.048**

There are 18 heaters total, including 10 of the 11 affected process heaters listed in Table 15 below, that will become NSPS compliant in June, 2011 under the CD requirements after the upgrade to the gas system that serves the furnaces named in the CD. Heater, E258, is already compliant with NSPS subpart J as noted in Tables 12 and 15. The affected gas system receives fuel gas from a variety of units that currently have amine treaters but was prone to spikes above 162 ppm. The upgrades to the gas system, primarily re-routing certain gas streams, will ensure

[35] http://www.epa.gov/compliance/resources/decrees/amended/noticeoflodging-firstamendmentconocophillips-cd.pdf

that compliance with subpart J can be maintained under all potential refinery scenarios including start-up, shutdown, and maintenance.

Monitoring of this gas system for compliance with the existing standard, 0.5% sulfur according to the operating permit, typically indicates a concentration about 60 ppmv of H_2S. The NSPS subpart J standard is 162 ppmv (0.1 gr/dscf) H_2S based on a three-hour rolling average (average of three 1-hour block averages per NJDEP Bureau of Technical Services). According to NSPS subpart J, affected facilities can sample refinery gas continuously to monitor H_2S in lieu of having a SO_2 CEM.

Compliance with 162 ppmv H_2S limit under NSPS subpart J is estimated to reduce annual PTE SO_2 from affected heaters, including E242 and E250, by approximately 94 percent (%). See Table 15 below. NJDEP has determined that compliance with the H_2S requirements of NSPS subpart J as BART.

Table 15 Estimated SO_2 Emission Rates based on NSPS subpart J for Affected Process Heaters– ConocoPhillips (PI#41805)

Equip. NJID	Equipment Description	Heat Input		SO_2				Notes
		MMBtu/hr Allowable		tons per year		lb/hr**	lb/ MMBtu	
				Allow.	Est.*			
1. E241	F-101 PFBW hydrofiner heater	74		170.4	10.6	2.42	0.033	Upgrade gas system by December 31, 2010; and comply with NSPS subpart J H_2S limits, 162 ppmvd (or 0.10 gr/dscf), average of three 1-hour block averages, by June30, 2011.
2. E242	F-101 DSU-1 gas oil heater	51		121.3	7.40	1.68	0.033	
3. E243	F-102 PFBW Reheat heater	167	448	1066.5	64.4	14.7	0.033	
4. E245	F-103 PFBW Reheat heater	90						
5. E246	F-104 PFBW Reheat heater	108						
6. E247	F-105 PFBW Reheat heater	83						
7. E248	F-106 PFBW Regen Gas heater	66		157.2	9.6	2.19	0.033	
8. E249	F-107 PFBW Dryer heater	10		23.7	1.45	0.33	0.033	
9. E250	F-108 PFBW Reboiler heater	114		271.6	16.5	3.76	0.033	
10.E253	F-401 DSU-2 Reactor heater	139		330.7	19.4	4.43	0.032	
		Totals (tpy):		**2141.4**	**129.35**	**94% reduction allowable SO_2**		
11.E258	F-702 OBFT	500		81	N/A	18.5	0.03	NSPS subpart J

Equip. NJID	Equipment Description	Heat Input	SO_2				Notes
		MMBtu/hr Allowable	tons per year		lb/hr**	lb/ MMBtu	
			Allow.	Est.*			
	Outboard Flash heater						compliant (BOP090004)

*Annual SO_2 numbers represent estimated new permit limits following CD requirement to comply with NSPS subpart J.
**Compliance with 162 ppmv H_2S limit will result in SO_2 emission rates approximately the same as these hourly emissions based on 3-hr rolling average.

Annual combustion adjustments of the process heaters are to be carried out according to the manufacturer's recommended procedures and maintenance schedule pursuant to N.J.A.C. 7:27-19.7 and 19.16 to ensure complete combustion through good combustion practices (GCP). When operating properly, SO_2, NO_x, CO, PM_{10}, and VOCs from refinery fuel gas-fired process heaters are relatively low.[36]

NJDEP has determined that the NO_x, SO_2 and PM controls, emission limits, averaging times, and compliance dates from the CD for ConocoPhillips' Bayway refinery are BART. ConocoPhillips submitted an application to modify its Title V operating permit to incorporate the H_2S requirements of NSPS subpart J in December, 2010 (BOP110001) . Full implementation is expected by June 30, 2011.

Table 16 Summary of Final BART for NO_x, SO_2, and PM_{10} at ConocoPhillips Bayway Refinery (PI#41805)

Equip. NJID	Equipment Description	BART Controls		BART Emission Limit	Compliance Date
1. E241	F-101 PFBW hydrofiner heater 74 MMBtu/hr	NO_x	Existing ULNB	7 lb/hr (any 60-min. period)	Effective BOP090004
		SO_2	Upgrade gas system	10.6 tpy	06/30/2011* Pending approval BOP110001
				H_2S*** 162 ppmvd (three-hour rolling average)	
		PM_{10}	Continue GCP	1.5 lb/hr	Effective BOP090004
			Upgrade gas system**		06/30/2011
2. E242	F-101 DSU-1 gas oil heater 51 MMBtu/hr	NO_x	Existing ULNB	5.1 lb/hr (any 60-min. period)	Effective BOP090004
		SO_2	Upgrade gas system	7.4 tpy	06/30/2011* Pending approval
				H_2S*** 162 ppmvd	

[36] http://www.epa.gov/compliance/resources/publications/assistance/sectors/notebooks/petrefsn.pdf , p.39

Equip. NJID	Equipment Description	BART Controls		BART Emission Limit	Compliance Date
				(three-hour rolling average)	BOP110001
		PM_{10}	Continue GCP	1.1 lb/hr	Effective BOP090004
			Upgrade gas system**		06/30/2011
3. E243 4. E245 5. E246 6. E247	F-102 PFBW Reheat heater (167 MMBtu/hr) F-103 PFBW Reheat heater (90 MMBtu/hr) F-104 PFBW Reheat heater (108 MMBtu/hr) F-105 PFBW Reheat heater (83 MMBtu/hr)	NO_x	Existing ULNB	42.6 lb/hr Total (any 60-min. period) Stack testing	Effective BOP090004
		SO_2	Upgrade gas system**	64.4 tpy	06/30/2011* Pending approval BOP110001
				H_2S*** 162 ppmvd (three-hour rolling average)	
		PM_{10}	Continue GCP	5.6 lb/hr	Effective BOP090004
			Upgrade gas system**		06/30/2011
7. E248	F-106 PFBW Regen Gas heater 66 MMBtu/hr	NO_x	Existing ULNB	6.3 lb/hr (any 60-min. period)	Effective BOP090004
		SO_2	Upgrade gas system	9.6 tpy	06/30/2011* Pending approval BOP110001
				H_2S*** 162 ppmvd (three-hour rolling average)	
		PM_{10}	Continue GCP	1.4 lb/hr	Effective BOP090004
			Upgrade gas system**		06/30/2011
8. E249	F-107 PFBW Dryer heater 10 MMBtu/hr	NO_x	Existing ULNB	2 lb/hr (any 60-min. period)	Effective BOP090004
		SO_2	Upgrade gas system	1.45 tpy	06/30/2011* Pending approval BOP110001
				H_2S*** 162 ppmvd (three-hour	

Equip. NJID	Equipment Description	BART Controls		BART Emission Limit	Compliance Date
				rolling average)	
		PM_{10}	Continue GCP	0.2 lb/hr	In 2010 N.J.A.C. 7:27-19.7(g)
			Upgrade gas system**		06/30/2011
9. E250	F-108 PFBW Reboiler heater 114 MMBtu/hr	NO_x	Existing ULNB	10.8 lb/hr (any 60-min. period)	Effective BOP090004
		SO_2	Upgrade gas system	16.5 tpy	06/30/2011* Pending approval BOP110001
				H_2S*** 162 ppmvd (three-hour rolling average)	
		PM_{10}	Continue GCP	2.4 lb/hr	Effective BOP090004
			Upgrade gas system**		06/30/2011
10. E253	F-401 DSU-2 Reactor heater 139 MMBtu/hr	NO_x	Existing ULNB	13.9 lb/hr (any 60-min. period)	Effective BOP090004
		SO_2	Upgrade gas system	19.4 tpy	06/30/2011* Pending approval BOP110001
				H_2S*** 162 ppmvd (three-hour rolling average)	
		PM_{10}	Continue GCP	1 lb/hr	Effective BOP090004
			Upgrade gas system**		06/30/2011
11. E258	F-702 OBFT Outboard Flash heater 500 MMBtu/hr	NO_x	Existing ULNB	36 lb/hr (rolling one-day basis) CEMS	Effective BOP090004
		SO_2	Continue/ maintain gas conditioning	81 tpy	
				H_2S*** 162 ppmvd (three-hour rolling average)	

Equip. NJID	Equipment Description	BART Controls		BART Emission Limit	Compliance Date
		PM_{10}	Continue GCP	5.35 lb/hr (avg. three one-hour stack tests)	Effective BOP090004
			Continue/ maintain gas conditioning		
*Compliance date required by Consent Decree (gas system must be updated by December 31, 2010) ** Sulfur removal has cobenefit of reducing condensable PM *** in lieu of SO_2 CEM (NSPS is considered a surrogate for short term SO_2 limits on each heater) **** Based on estimated allowable PTE after incorporation of Consent Decree in Title V permit					

1.6 Fossil fuel-fire steam Electric Power Plants of more than 250 Million British Thermal Units (BTU) per Hour Heat Input

The BART requirement applies to qualified emission units located at Fossil fuel-fire steam Electric Power Plants of more than 250 Million British thermal units (BTU) per hour heat input that generate electricity for sale. Appendix Y Guidelines for BART require coal-fired electric generating units (EGUs) greater than 200 MW meet 0.15 lb/MMBtu emission limit for SO_2; and for any size oil-fired units, the sulfur fuel content must be limited to 1 percent or less by weight. The BART guidelines also set year-round use of SCR or SNCR as the presumptive BART for NO_x for EGUs currently using these controls. For oil and gas-fired EGUs current combustion controls should be part of the BART determination.

1.6.1 PSEG Fossil LLC Hudson Generating Station (PI#12202)

Hudson Generating Station currently has two boilers serving electric generating units (E1 and E2) and two coal handling systems (E22 and E23) that are subject to BART review. One boiler is coal-fired (E2) and subject to controls and federally enforceable emission limits effective December 31, 2010, due to an enforceable consent decree (CD). The other boiler (E1) primarily combusts natural gas but is permitted to burn No. 6 fuel oil.

New Jersey adopted a rule at N.J.A.C. 7:27-27 to control mercury emissions from specific sources. Compliance with the mercury standard for coal-fired boilers was contingent upon the installation and operation of air pollution control systems to meet the NO_x, SO_2, and PM standards shown in Table 17 below by December 15, 2012.

Table 17 N.J.A.C. 7:27-27.7(b) – Maximum Allowable NO_x, SO_2 and PM Emission Rates for Coal-fired boilers (Operative on and after December 15, 2012)

Pollutant	Emission Limit (lb/MMBtu)	Boiler Type

Pollutant	Emission Limit (lb/MMBtu)	Boiler Type
NO_x	0.100	Dry bottom*
	0.130	Wet bottom
SO_2	0.150	
PM	0.030	
* Unit 2 is a dry bottom boiler		

More recently, New Jersey's NO_x rules for boilers serving EGUs were revised on March 20, 2009. Unless subject to more stringent permit limits or otherwise specified in an enforceable agreement, the rules require more stringent NO_x limits for boilers serving EGUs based on output and measured in pounds per megawatt-hour (lbs/MW-hr) beginning May 1, 2015. See Table 18 below.

Table 18 N.J.A.C. 7:27-19.4 Table 3 – Maximum Allowable NO_x Emission Rates for Boilers Serving Electric Generating Units (Operative on and after May 1, 2015)

Fuel Type	lbs/MWhr
Coal	1.50
Heavier than No. 2 fuel oil	2.00
No. 2 and lighter fuel oil	1.00
Gas only	1.00

Also on March 20, 2009, New Jersey adopted an amendment to its Sulfur in Solid Fuels rule at N.J.A.C. 7:27-10.2(h) which specifies that on and after December 15, 2012, the owner or operator of any source that combusts solid fuel shall cause it to emit SO_2 at a 24-hour emission rate no greater than 0.250 lbs/MMBTU gross heat input for every calendar day, and at a 30-calendar-day rolling average emission rate no greater than 0.150 lbs/MMBTU gross heat input.

The coal receiving system (E22) and the coal reclaim system (E23) are support systems to the coal-fired E2 with the potential to emit particulate emissions only. The conveying systems are covered, and the coal piles are controlled with spray dust suppression systems. The quantifiable fugitive emissions from the conveying systems were counted for comparison purposes in determining BART eligibility. Fugitive emissions are those that are not vented through a stack and that cannot be reasonably controlled.[37] These emission units, E22 and E23, are not discussed further. See Table 19.

[37] http://www.state.nj.us/dep/aqm/Sub22.doc

Table 19 Summary of Current Title V Permit Conditions for BART Qualified Equipment (BOP080003) – PSEG Fossil LLC Hudson Generating Station (PI#12202)

Equip. NJID	Equipment Description	Heat Input (MMBtu/hr)	Fuel type	NO_x Existing Control	NO_x Allowable emission limit (lb/hr)	SO_2 Existing Control	SO_2 Allowable emission limit (lb/hr)	PM_{10} Existing Control	PM_{10} Allowable emission limit (lb/hr)	Notes
1. E1	Unit No.1 boiler (420 MW)	4,558	NG	None	1,960	None	7.8	GCP	100.3*	
			#6FO		1,960	0.3% S by wt	1,459		227.2*	
2. E2	Unit No.2 boiler (640 MW)	6,600	Coal	LNB** & SNCR (year-round)	0.259 lb/MMBtu	0.25% S by wt	0.216 lb/MMBtu	ESP	607	Interim limits expire on 12/31/10; Subject to Consent Decree (see Table 23)
			NG		3,643	None	3.5	GCP	29.5	
			#6FO		3,643	0.3% S by wt	1,907	ESP	191	
3. E22	Coal receiving system	N/A	N/A	N/A		N/A		Covered; Spray dust suppressor	1.27	
4. E23	Coal reclaim system							Covered; Spray dust suppressor	0.2	

* BOP1000001 Modification to establish PM_{10} maximum allowable emission limits is pending approval.
** New LNBs installed in 2008

Unit No. 1 Boiler (E1):

Unit No. 1 is a 4,558 MMBtu/hr Babcock and Wilcox cyclone-fired steam generating boiler that began commercial operation in 1964. This unit is permitted to combust natural gas or No. 6 fuel oil. See Table 20 below.

Table 20 Current Title V Operating Permit (BOP080003) for Unit 1 – PSEG Fossil LLC Hudson Generating Station (PI#12202)

Effective Permit Requirements (BOP080003)						
Heat Input (MMBtu/hr)	Pollutant	Maximum Allowable Emission Limits				
		Natural Gas		#6 Fuel Oil		PTE
		lb/hr	lb/MMBtu	lb/hr	lb/MMBtu	tpy
4,558	NO_x	1,960	0.39*	1,960	0.4*	8,360
	SO_2	7.8	0.0017	1,459	0.32**	6,389
	PM_{10}	100.3	0.022	227.2***	0.050***	995
*NO_x emissions avg. plan **N.J.A.C.7:27-9.2(c) ***PM_{10} based on AP42 emission factors for residual oil (BOP100001)						

PSEG intended to retire E1 in 2005. However the Pennsylvania-New Jersey-Maryland (PJM) Interconnection designated E1 as a Reliability Must Run (RMR) unit that must remain in service through 2012 to maintain PJM electrical system reliability. Consequently, this boiler operates infrequently and well below its annual operating capacity. In recent years the unit has burned only natural gas, which has inherently lower NO_x, SO_2, and PM_{10} emissions, and currently operates without combustion technology or add-on emission controls. Operational problems have prevented the unit from burning No. 6 fuel oil since 2005 as shown in Table 21 below.

Table 21 Reported Operating Time of Unit No. 1 Firing No. 6 Fuel Oil

U1, OS2 – Utility boiler firing No. 6 fuel oil			
Emission Year	Operating time (days)	Emission Year	Operating time (days)
1999	52	2005*	-0-
2000	28	2006*	-0-
2001	32	2007*	-0-
2002	15	2008*	-0-
2003	50	2009*	-0-
2004	20	2010**	not available
* source did not operate on # 6 FO **reporting year 2010 info due April 15, 2011			

PSEG searched USEPA's RACT/BACT/LAER Clearinghouse (RBLC) to identify retrofit technology currently in use with similar equipment to control NO_x, SO_2, and PM_{10} emissions. [38]

[38] http://cfpub.epa.gov/RBLC/index.cfm?action=Home.Home&lang=en

The facility also consulted a vendor to assess technical feasibility of various NO_x controls and potential NO_x reductions.[39] The results are summarized in Table 22 below.

Table 22 List of Potential Retrofit Emission Control Techniques for Large Utility Boilers > 250 MMBtu/hr that Combust Natural Gas

Potential Retrofit Control Techniques for Unit 1 (E1)				
Pollutant	Available control options	Percent (%) reduction	Potentially applicable	Technically feasible
NO_x[1]	1. SCR	90	Yes	Yes
	2. LNB/ULNB, OFA + SNCR	55	Yes	Yes
	3. LNB/ULNB, OFA + FGR	55	Yes	Yes
	4. LNB/ULNB + OFA	40	Yes	Yes
	5. FGR	40	Yes	Yes
	6. SNCR	35	Yes	Yes
	7. OFA	25	Yes	Yes
	8. LNB/ULNB	20	Yes	Yes
SO_2[2]	1. None			
PM_{10}	1. Good combustion practices (GCP)			

Notes:
[1]Reduction based on the current baseline NO_x emission for equivalent boilers.
[2]None indicated in recent BACT/LAER determinations for boilers > 250 MMBtu/hr that combust natural gas.

Table 23 shows the NO_x control alternatives that were evaluated for Unit 1. Based on efficiency and cost effectiveness, the dominant controls appear to be a. c. and e. However since Unit 1 must meet 1.00 lbs/MWhr (approx. 0.10 lb/MMBtu) when combusting natural gas by May 1, 2015, option a. may be the most viable control alternative. This date is consistent with the federal requirement to install BART controls as soon as practicable but no later than 5 years after USEPA's approval.

In December, 2010 PSEG submitted an application (BOP110001) to modify the Hudson operating permit to include more stringent NO_x emission limits, 1.0 lb/MW-hr when burning natural gas and 2.0 lb/MW-hr when burning No. 6 fuel oil, with a compliance date of May 1, 2015, to coincide with the requirements of the revised NO_x rule at N.J.A.C.7:27-19.4 Table 3 for E1; and to only burn No. 6 fuel oil, already restricted to 0.3% sulfur by wt, in this boiler when natural gas is curtailed, effective upon approval of the permit modification but no later than December 31, 2011.

[39] http://www.state.nj.us/dep/baqp/2008%20Regional%20Haze/Appendix%20G-8%20%28Final%20Only%29.pdf

Table 23 Comparison of Technically Feasible NO_x Control Technologies for Unit #1 Firing Natural Gas – PSEG Fossil LLC Hudson Generating Station (PI#12202)

Feasible Control Alternative(s)	Actual Emission Rate	Annual Emissions	Annual Emissions Reduction	Installed Capital Cost	Annual Operating Cost Estimate	Total Annualized Costs*	Cost Effectiveness	Incremental Cost	Toxic Impact	Adverse Environ. Impact	Energy Impact
	lb/MMBtu	(tpy)	(tpy)	($ 2009)	($/yr)	($/yr)	($/ton)	($/ton)			
1.E1 (Unit #1 – boiler)											
Baseline (no controls)	0.337	162.1**	N/A	N/A	N/A	N/A	N/A	N/A	—	—	—
a. SCR (90% eff.)	0.034	23.51	138.59	$28,205,173	$1,410,706	$5,614,509	$40,508	$87,979			
b. ULNB, OFA + SNCR (55% eff.)	0.152	72.95	89.15	$10,546,981	$ 167,000	$1,738,811	$19,504	N/A			
c. ULNB, OFA + FGR (55% eff.)	0.152	72.95	89.15	$ 8,136,242	$ 52,300	$1,264,840	$14,187	$35,100			
d. ULNB + OFA (40% eff.)	0.202	97.26	64.84	$ 5,725,504	$0	$ 853,269	$13,160	N/A			
e. FGR (40% eff.)	0.202	97.26	64.84	$ 2,410,739	$ 52,300	$ 411,571	$ 6,348	See c.			
f. SNCR (35% eff.)	0.219	105.37	56.73	$ 4,821,477	$ 167,000	$ 885,542	$15,609	N/A			
g. OFA (25% eff.)	0.253	121.58	40.52	$ 2,561,410	$0	$ 381,726	$ 9,420	N/A			
h. ULNB (20% eff.)	0.270	129.68	32.42	$ 3,164,094	$0	$ 471,543	$14,545	N/A			

*based on 8% interest rate and 10 yrs remaining useful life of equipment, the capital recovery factor (CRF) is 0.14903.
**based on last three-year period, 2006 - 2008

Unit No. 2 Boiler (E2):

On July 26, 2002, a federal enforcement settlement required PSEG to install state-of-the-art (SOTA) controls for NO_x, SO_2, and PM on all its coal-fired boilers in the State of New Jersey. These controls included SCR, FGD, and a polishing baghouse for Hudson Unit No. 2.

An amendment to the initial consent decree was negotiated to extend the compliance deadlines. As a consequence PSEG Hudson Generating Station specifically took interim steps to reduce emissions of NO_x, SO_2 and PM until December 31, 2010, when the required pollution control equipment was installed on Unit 2. These interim measures included year-round operation of the existing NO_x control equipment utilizing selective non-catalytic reduction (SNCR) to reduce NO_x, use of 100% ultra-low sulfur coal, compliance with annual emission caps for NO_x and SO_2, and operation of an electrostatic precipitator (ESP) and a fly ash conditioning system to control PM. PSEG was also required to install a more effective baghouse than previously required, and to use a carbon injection system to reduce mercury emissions from this facility after the pollution control equipment was installed. Refer to Table 24 below for the interim and final controls for Unit 2 and compliance deadlines.

Table 24 Summary of Amendment to 2002 Consent Decree Requirements for Unit 2 – PSEG Fossil LLC Hudson Generating Station (PI#12202)

Equip. NJID	Pollutant	Control strategy*	Emission limit	Compliance date
E2	NO_x	Interim:		
		Use ultra low sulfur coal and operate SNCR year round	Annual tonnage cap (3,486 tpy); 0.300 lbs/MMBtu 30-day avg. emission rate	01/01/2007
		Final:		
		Install SCR (to replace SNCR)	0.100 lbs/MMBtu 30-day avg. 0.150 lbs/MMBtu 24-hr avg.	12/31/2010
	SO_2	Interim:		
		Use ultra low sulfur coal (<= 0.25% sulfur content)	Annual tonnage cap (5,270 tpy); 0.216 lbs/MMBtu 30-day avg. emission rate	05/01/2007
		Final:		
		Install dry FGD with spray dryer absorber (SDA)	0.150 lbs/MMBtu 30-day avg.	12/31/2010

Equip. NJID	Pollutant	Control strategy*	Emission limit	Compliance date
		Use low sulfur coal (<= 2.00% sulfur content)	0.250 lbs/MMBtu 24-hr avg.	
	PM	Interim:		
		Optimize ESP and fly ash conditioner		01/07/2006
		Final:		
		Install full size baghouse **	0.0150 lbs/MMBtu	12/31/2010
	Hg	Carbon injection		12/31/2010
	Other	PM Continuous Emission Monitoring Systems (CEMS)		12/31/2010

* State-of-the-art (SOTA) for sulfur dioxide, nitrogen oxide and particulate matter. Refer to http://www.epa.gov/compliance/resources/cases/civil/caa/psegllc-fcsht-061130.html
**The ESP will remain in place and will be operated on an as needed basis at the discretion of PSEG.

Unit 2 is a dry-bottom wall-fired unit and, since bringing the SCR, FGD, baghouse, and activated carbon on-line, fires low sulfur bituminous coal. The existing LNBs, installed on Unit 2 in 2008, continue to be used in addition to the new SCR. The new FGD is a dry type that utilizes Spray Dryer Absorbers (SDAs) in concert with the fabric filter (baghouse). The SCR, FGD, baghouse, and carbon injection are newly constructed and commenced operation on November 24, 2010. PSEG Fossil is still optimizing the operation of these new controls. Since commencing operation, however, the average calendar day emission rates of NO_x and SO_2 have been approximately 0.09 lb/MMBtu and 0.132 lb/MMBtu, respectively, based on CEMS data through February 1, 2011. The domestic, bituminous coal ranged from 1.12% to 1.28% sulfur content during the same period.

NJDEP has determined the new selective catalytic reduction (SCR) and the existing low NO_x burners (LNBs), dry flue gas desulfurization (FGD) with spray dryer absorber (SDA) and use of 2 percent (%) by weight low sulfur coal, and baghouse air pollution control systems for oxides of nitrogen (NO_x), sulfur dioxide (SO_2), and particulate matter (PM), respectively, for E2, and the existing PM controls for the two coal handling systems, are BART.

Under the Clean Air Act, BART requirements must be included as Title V operating permit conditions. This required PSEG to submit a modification application to implement the NO_x control, emission limits, fuel oil restriction, and compliance deadlines. PSEG submitted a permit modification to NJDEP in December, 2010 to incorporate the proposed BART requirements as part of its operating permit conditions for E1 only (BOP110001). The CD requirements for E2, determined by NJDEP to be BART, are already included in the current approved Title V operating permit, BOP080003.

Table 25 Summary of Final BART for NO_x, SO_2, and PM_{10} at PSEG Fossil LLC Hudson Generating Station (PI#12202)

Equip. NJID	Equipment Description	BART control		BART emission limit		Compliance date
				lb/MMBtu	lb/hr	
E1	Unit No.1 boiler 4,558 MMBtu/hr	Natural Gas				
		NO_x	SCR (or equivalent)	—	1.00 lb/MWh 24-hour avg.	05/01/2015 Pending approval BOP110001
		SO_2	None	—	7.8 any 60 minute period	Effective BOP080003
		PM_{10}	Continue GCP	—	100.3 three one-hour stack tests	Pending approval BOP1000001
		No. 6 fuel Oil - Restricted use during gas curtailments only				
		NO_x	SCR (or equivalent)	—	2.00 lb/MWh 24-hour avg.	05/01/2015 Pending approval BOP110001
		SO_2	0.3% S by wt (exist.)	—	1,459 any 60 minute period	Effective BOP080003
			Restricted use – gas curtailments only			12/31/2011 Pending approval BOP110001
		PM_{10}	Continue GCP	—	227.2 three one-hour stack tests	Pending approval BOP1000001
E2	Unit No.2 boiler 6,600 MMBtu/hr	Coal				
		NO_x	Existing LNBs	0.100 30-day avg. 0.150 24-hr avg.	—	Effective BOP080003
			SCR			12/31/2010 BOP080003
		SO_2	Dry FGD w/SDA	0.150 30-day avg. 0.250 24-hr avg.	—	12/31/2010 BOP080003
			<= 2.00% sulfur content			
		PM_{10}	Baghouse (and ESP as needed)	0.0150 three one-	—	12/31/2010 BOP080003

Equip. NJID	Equipment Description	BART control		BART emission limit		Compliance date
				lb/MMBtu	lb/hr	
				hour stack tests		
		Natural Gas				
		NO_x	Existing LNBs	0.100 30-day avg. 0.150 24-hr avg	—	Effective BOP080003
			SCR			12/31/2010 BOP080003
		SO_2	No need to operate FGD	0.150 30-day avg. 0.250 24-hr avg.	—	12/31/2010 BOP080003
		PM_{10}	No need to operate baghouse	0.0150 three one-hour stack tests	—	12/31/2010 BOP080003
		No.6 Fuel Oil				
		NO_x	Existing LNBs	0.100 30-day avg. 0.150 24-hr avg	—	Effective BOP080003
			SCR			12/31/2010 BOP080003
		SO_2	Dry FGD w/SDA	0.150 30-day avg. 0.250 24-hr avg	—	12/31/2010 BOP080003
		PM_{10}	Baghouse (and ESP as needed)	0.0150 three one-hour stack tests	—	12/31/2010 BOP080003
E22	Coal receiving system	PM_{10}	Existing enclosure and dust suppression system	N/A	1.27	Effective BOP080003
E23	Coal reclaiming system	PM_{10}	Existing enclosure and dust suppression system	N/A	0.2	Effective BOP080003

1.7 Final BART Requirements

Under the Regional Haze rule, States must identify the best system of continuous emission control technology for each eligible source that is subject to BART. After a State has identified the level of control representing BART, it must establish an emission limit representing BART and must ensure compliance with that requirement no later than five years after the USEPA approves the State Implementation Plan.

NJDEP has determined that Chevron Products, ConocoPhillips Bayway Refinery, and PSEG Hudson Generating Station, are subject to BART review. The Hess Port Reading and Sunoco Eagle Point petroleum refineries are below the emissions threshold for BART.

Chevron Products:

Chevron currently has two refinery fuel gas-fired furnaces (E1501 and E1502) that are subject to BART review. Chevron proposed to reduce to its annual combustion limit to bring this facility's potential to emit NO_x to less than 250 tons per year (tpy) by March 15, 2011.

ConocoPhillips Bayway Refinery:

Bayway petroleum refinery currently has 11 refinery fuel gas-fired process heaters that are subject to BART review. On January 27, 2005, the USEPA entered into a CD with ConocoPhillips including its New Jersey refinery. NJDEP has determined that the NO_x, SO_2, and PM controls, emission limits, averaging times, and compliance dates from the CD for the process are BART. Also, the CD requires all the BART-qualified process heaters at the Bayway facility to eliminate oil burning, and to only burn refinery fuel gas with an hydrogen sulfide (H_2S) content less than 162 ppmvd based on NSPS subpart J. Full implementation is expected by June 30, 2011.

PSEG Hudson Generating Station:

Hudson Generating Station currently has two boilers serving electric generating units (E1 and E2) and two coal handling systems (E22 and E23) that are subject to BART review. One boiler is coal-fired (E2) and subject to controls and federally enforceable emission limits effective December 31, 2010, due to an enforceable consent decree (CD). The other boiler (E1) primarily combusts natural gas but is permitted to burn No. 6 fuel oil.

The coal receiving system (E22) and the coal reclaim system (E23) are support systems to E2 with the potential to emit particulate emissions only. The conveying systems are covered and the coal piles are controlled with water dust suppression system.

NJDEP has determined that the new selective catalytic reduction (SCR) and existing low NO_x burners (LNBs), new flue gas desulfurization (FGD), and new baghouse air pollution control systems for oxides of nitrogen (NO_x), sulfur dioxide (SO_2) and particulate matter (PM), respectively, for E2, and the existing PM controls for the two coal handling systems, are BART.

In addition PSEG has submitted an application to modify the Hudson operating permit to include more stringent NO_x emission limits, 1.0 lb/MW-hr when burning natural gas and 2.0 lb/MW-hr when burning No. 6 fuel oil, with a compliance date of May 1, 2015, to coincide with the requirements of the revised NO_x rule at N.J.A.C.7:27-19.4 Table 3 for E1; and to only burn No. 6 fuel oil, already restricted to 0.3% sulfur by wt, in this boiler when natural gas is curtailed, effective upon approval of the permit modification but no later than December 31, 2011.

The BART requirements must be included as operating permit conditions according to the procedures established in 40 CFR part 70, and the state regulations promulgated at N.J.A.C. 7:27-22. Chevron, PSEG Hudson, and ConocoPhillips have submitted timely permit modifications to incorporate the BART requirements. NJDEP commits to post the final operating permit modifications once they are approved.

Appendix A

From: "LaFayette, Doug:" <Doug.LaFayette@conocophillips.com>
To: "'Margaret Gardner'" <Margaret.Gardner@dep.state.nj.us>
Date: Mon, Jul 19, 2010 5:30 PM
Subject: RE: Follow up on BART Analysis

Peg,

First let me wish you a great vacation...get away and recharge those batteries!!!

I will look at the tables and respond separately if I have issues with any of them. Regarding your particular questions:

1. E244 (F102 DSU-1) - please verify that "reconstruction" meets the definition in 51.301 of the BART rule (a question from EPA);
F-102 DSU 1 suffered a fire in the late 1990's and was reconstructed and is thus subject to NSPS Subpart J. The rebuild easily exceeded 50% of the replacement cost of the heater. The Title V Permit conditions are reflective of its NSPS status.

2. Do these heaters have both ULNB plus FGR? External FGR? (the equipment inventory details from NJEMS list both);
The ULNB installed on the heaters at Bayway employ internal Flue Gas Recirculation. The person that permitted them (predates my tenure) apparently listed FGR as well as ULNB in RADIUS. None of the heaters employ external FGR.

3. From paragraph 114(b) of consent decree - when does ConocoPhillips anticipate submitting a modification to Title V to add NSPS Subpart J sulfur in gas limits for these process heaters? Does CP plan to coordinate with modification application to upgrade the refinery fuel gas system?
First, no permit is required for the "upgrade" to the fuel gas system. A permit will be necessary to incorporate NSPS Subpart J conditions into the existing heaters that are not currently subject to the NSPS in order to comply with CD requirements. The existing "sour" gas system averages about 80 ppm H2S but was prone to spikes above 162 ppm from time to time for various known reasons. Bayway has undertaken several minor projects which will alleviate those spikes. Some of these projects have already been completed and others will be completed during a turnaround later this year. All projects "required" to achieve compliance with the NSPS will be completed by 12/31/2010. Most of these projects involved re-routing certain streams out of the sour gas system. Some projects were necessary to assure compliance with the NSPS even during turnarounds when certain fuel gas treaters were not available. Note that the CD allows until 6/30/2011 to demonstrate compliance with the NSPS and we will comply by that date. The plan is to submit a permit modification to incorporate NSPS Subpart J conditions on the heaters not currently subject to NSPS Subpart J by this fall. We anticipate permit approval before 6/30/2011 but even absent an approved permit we will comply with the NSPS limit as we have for every other CD requirement where permit approval lagged behind the CD compliance date.

4. E249 (PFBW dryer heater) - the EPA determined that deminimis thresholds do not apply on an individual emission unit basis, so this unit meets the applicability criteria for BART. It is listed in the tables below.
I have no comment here. This is a 10 MMBtu/hr heater which isn't going to have much impact on visibility. I actually thought there was a deminimis but I will defer to you. Every time BART raises it's ugly head I end up re-reading the rule. I don't have time for that right now.
5. Appendix B of the consent decree doesn't list the affected combustion units at the Bayway facility. From paragraphs 94 and 95: are any of the facility's combustion units affected by the CD?

The original CD was actually published without the BW heater tables. It was a pain for us as well. The subsequent versions of the CD (following the first and second amendments) which you may not have do include the Bayway heaters in Appendix B. I am attaching a copy of the Bayway table from Appendix B for your convenience. The print is very small and you may need a magnifying glass (a big one) but welcome to my world. Note that all the heaters burn RFG. We are not allowed (by permit) nor are we capable of burning oil any more at the refinery. As a side note, no one I have spoken with at NJDEP has a copy of the current version of the CD. A current copy should be available from USEPA and/or DOJ.

6. Also I'm assuming that all the process heaters are subject to good combustion practices since they are all subject to annual combustion tune-ups under N.J.A.C.7:27-19.7(g).
You assume correctly but keep in mind I think the annual combustion tuning requirement kicks in for the smallest heaters this year. Recent rulemakings made all heaters subject to the rule where only those >50 MMBtu/hr were subject for many years.
Let me know if there is anything here that you do not understand and I will try to further explain it to you

Doug

-----Original Message-----
From: Margaret Gardner [mailto:Margaret.Gardner@dep.state.nj.us]
Sent: Monday, July 19, 2010 4:17 PM
To: LaFayette, Doug:
Cc: Francis Steitz
Subject: Follow up on BART Analysis

Hi, Doug.

I'm following up on all the BART analyses submitted by NJ's BART-eligible facilities, and I'm working closely with EPA Region 2 and the Federal Land Manager as I work through each review.

Attached are draft tables summarizing ConocoPhillips' analysis of affected process heaters that I forwarded to EPA and the FLM for their feedback. If you have questions or changes to these preliminary tables, please let me know.

The following are questions I have which arose during the evaluation of this facility's analysis:
1. E244 (F102 DSU-1) - please verify that "reconstruction" meets the definition in 51.301 of the BART rule (a question from EPA);
2. Do these heaters have both ULNB plus FGR? External FGR? (the equipment inventory details from NJEMS list both);
3. From paragraph 114(b) of consent decree - when does ConocoPhillips anticipate submitting a modification to Title V to add NSPS Subpart J sulfur in gas limits for these process heaters? Does CP plan to coordinate with modification application to upgrade the refinery fuel gas system?
4. E249 (PFBW dryer heater) - the EPA determined that deminimis thresholds do not apply on an individual emission unit basis, so this unit meets the applicability criteria for BART. It is listed in the tables below.
5. Appendix B of the consent decree doesn't list the affected combustion units at the Bayway facility. From paragraphs 94 and 95: are any of the facility's combustion units affected by the CD?
6. Also I'm assuming that all the process heaters are subject to good combustion practices since they are all subject to annual combustion tune-ups under N.J.A.C.7:27-19.7(g).

I'm trying to wrap this up before leaving on vacation this Saturday. If possible, please get back to me by COB this Thursday (7/22).

Thanks for your help, and please feel free to phone me if you'd like to discuss anything.

Peg G.

Margaret Gardner
Division of Air Quality

State of New Jersey
Department of Environmental Protection
Bureau of Air Permits
401 E. State St.
PO Box 27
Trenton, NJ 08625-0027

(609) 292-7095

CC: Francis Steitz <Francis.Steitz@dep.state.nj.us>

Appendix B

Kevin McMahon
Operations Manager

Asphalt Division
Chevron Products Company
1200 State Street
Perth Amboy, NJ 08861
Tel (732) 738-2048
Fax (732) 738-2028
mcmh@chevron.com

December 6, 2010

VIA EMAIL & CERTIFIED MAIL
RETURN RECEIPT REQUESTED

Mr. F. Steitz
New Jersey Department of Environmental Protection
Air Quality Permitting Program - Bureau of Air Permits
401 E. State Street
P.O. Box 027
Trenton, NJ 08625-0027

SUBJECT: Chevron Products Company, PI# 18058
Title V Minor Modification Request for Enforceable Permit Limit on F-501//F510 to Cap Out of BART Eligibility

Dear Mr. Steitz,

Chevron is submitting this Title V minor modification request to limit the annual fuel firing allowable on the crude unit furnaces, F-501 Atmospheric Crude Furnace and F-510 Vacuum Crude Furnace. This modification is being proposed to obtain an enforceable permit limit that will reduce the NOx emissions of the two sources below the BART eligibility trigger of 250 tpy. Reducing the annual fuel firing limit will also reduce the ton per year emission limits of other pollutants.

The following emission unit is impacted by this change:

U15 – F-501 Atmospheric Crude Furnace (E1501) and F-510 Vacuum Crude Furnace (E1502)

Please see Table 1 attached for the permit changes required to facilitate these changes.

Should you have any questions, please contact myself or Ms. Fran Lindsley-Matthews at (732) 738-2065.

Sincerely,

Kevin McMahon

cc: Peg Gardner, NJDEP

Table 1 Permit Modifications Required

Permit Reference #	Parameter	Current Value	New Modified Value
U15 OS0 Ref#12 AR	Annual Btu consumption	F-501 - 2,189.3 billion Btu/365 day period F-510 – 941.7 billion Btu/364 day period	F-501 - 2,079.8 billion Btu/365 day period F-510 – 894.6 billion Btu/365 day period
U15 OS0 Ref#15 AR	Total tpy of TSP	25.1 tons	23.8 tons
U15 OS0 Ref#16 AR	Total tpy of PM-10	32.7 tons	31.1 tons
U15 OS0 Ref#17 AR	Total tpy of VOC	12.5 tons	11.9 tons
U15 OS0 Ref#23 AR	Total tpy of CO	66.1 tons	63.3 tons
U15 OS0 Ref#24 AR	Total tpy of NOx	262.2 tons	249.1 tons
U15 OS0 Ref#25 AR	Total tpy of SO2	40.5 tons	38.5 tons
U15 OS0 Ref#18 AR	Total tpy of HAPs	1.94 tons	1.84 tons
U15 OS0 Ref#19 AR	Total tpy of Arsenic	0.001 tons	0.001 tons
U15 OS0 Ref#20 AR	Total tpy of Cadmium	0.001 tons	0.001 tons
U15 OS0 Ref#21 AR	Total tpy of n-Hexane	1.93 tons	1.83 tons
U15 OS0 Ref#22 AR	Total tpy of Lead	0.008 tons	0.007 tons

Note: All reference numbers are from current BOP Permit # 090002

Responsible Official Signature Statement

Pursuant to N.J.A.C. 7:27-1.39(a)2: "I certify, under penalty of law, that I have personally examined and am familiar with the information submitted in this document and all attached documents and, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the submitted information is true , accurate and complete. I am aware that there are significant civil criminal penalties, including the possibility of fine or imprisonment or both, for submitting false, inaccurate or incomplete information."

Signature: K-McMahon Date: 12/8/10

Print: Kevin McMahon

Title of Responsible Official: Operations Manager

Telephone: 732-738-2048

Direct Knowledge Official Signature Statement

Pursuant to N.J.A.C. 7:27-1.39(a)1: "I certify, under penalty of law, that I believe the information provided in this document is true, accurate and complete. I am aware that there are significant civil and criminal penalties, including the possibility of fine or imprisonment or both, for submitting false, inaccurate or incomplete information."

Signature: F-D Date: 12/6/10

Print: Frances Lindsley-Matthews

Title of Direct Knowledge Official: ESH Specialist

Telephone: 732 738-2065

Appendix C: Public Participation

Response to Comment Document regarding BART Determinations

A notice of opportunity for public comment on New Jersey Department of Environmental Protection's (NJDEP) proposed Best Available Retrofit Technology (BART) determinations was published on December 20, 2010. The public notice, Technical Support Document (TSD), and fact sheet were also posted on the NJDEP Air Quality Permitting Program's website under Public Notices. NJDEP also sent written notification of the proposed BART to each environmental commission of the cities of Linden and Jersey City where ConocoPhillips and PSEG Hudson are located, respectively.

During the public comment period, several comments were received from the United States Fish and Wildlife Service (in concurrence with the United States Forest Service) regarding NJDEP's proposed BART determinations. The following is a summary of those comments, and NJDEP's responses to those comments.

General

1) **Comment:** Post all applicable operating permits or other enforceable commitments as an appendix to the BART section of the Regional Haze State Implementation Plan (SIP), including the permit modification from Chevron Products that requested capped emission limits of oxides of nitrogen (NO_x) below the 250 tons per year (tpy) threshold in order to be excluded from BART.

   Response: Chevron, PSEG Hudson, and ConocoPhillips have submitted timely permit modifications to incorporate the BART requirements proposed in the TSD. NJDEP commits to post the final operating permits once the modifications are approved. The consent decrees for PSEG and ConocoPhillips can be found under Appendix G of the Regional Haze SIP that is posted online at http://www.state.nj.us/dep/baqp/2008%20Regional%20Haze/Regional%20Haze.html.

ConocoPhillips Bayway Refinery

2) **Comment:** For the Bayway process heaters, the $_{NOx}$ control efficiency of 0.04 lb/MMBtu through the use of existing Ultra Low NO_x Burners and SCR, and the SO_2 control efficiency of 0.033 lb/MMBtu through a refinery gas upgrade, would seem to be BART for those units.

   Response: NJDEP acknowledges the feedback that we have received from the United States Fish and Wildlife Service and the United States Forest Service concurring with NJDEP's BART determination for the qualified process heaters located at ConocoPhillips Bayway Refinery.

PSEG Fossil Hudson Generating Station

Unit No.1 gas-fired boiler, E1

3) **Comment:** Implementation of Selective Catalytic Reduction (SCR) for NO_x control on gas boiler E1 by May 1, 2015, would seem to satisfy BART.

   Response: E1 must meet 1.00 lbs/MWhr (approx. 0.10 lb/MMBtu) when combusting natural gas by May 1, 2015, under N.J.A.C. 7:27-19.4. Table 23 of the TSD shows the NO_x control alternatives that were evaluated for E1. SCR, or the equivalent, would be required to meet this emission limit.

Unit No.2 coal-fired boiler, E2

4) **Comment:**
   From the USEPA Appendix Y Guidelines for BART, control evaluation must take into account 1) the most stringent level of efficiency that a control technique is capable of achieving,[40] and 2) upgrades to existing control devices,[41] even if the proposed control option meets the presumptive BART emission limit for NO_x or SO_2.

   Response: The SCR, FGD, baghouse, and carbon injection commenced operation on November 24, 2010. These are Best Available Control Technology (BACT) and Maximum Achievable Control Technology (MACT) controls that are also BART.

5) **Comment:** For NO_x control on boiler E2, SCR has been proposed as BART with an emission limit of 0.10 lb/MMBtu. Since low NO_x burners (LNB) were installed in 2008, as shown in Table 19, it is assumed that BART will be the combination of LNB and SCR. This control technology has delivered control efficiencies of 0.05 to 0.08 lb/MMBtu in many boilers using various types of coals and reagents. The only information presented about the type of coal being used is that it is less than or equal to 2% in sulfur content. The type and amount of reagent proposed are not presented. Either more information and analysis should be provided to justify an emission limit of 0.10 lb/MMBtu for BART, or a lower emission limit should be proposed.

   Response: E2 is a dry-bottom wall-fired unit and fires low sulfur bituminous coal. The existing LNBs continue to be used in addition to the new SCR. Since commencing operation, the average calendar day emission rate of NO_x has been approximately 0.09 lb/MMBtu based on CEMS data through February 1, 2011. The "presumptive" level of NO_x control provided for in the EPA BART Guidelines for dry-bottom wall-fired units

[40] See 40 CFR Part 51, Appendix Y, Section IV.D.STEP 3.1.
[41] Ibid., See Section IV.D.STEP 3.4

that combust bituminous coal is 0.39 lb/MMBtu. This SCR/LNB controlled unit is less than 25 percent of the presumptive BART limit.

6) **Comment:** For SO2 control on boiler E2, Flue Gas Desulfurization (FGD) has been proposed as BART with an emission limit of 0.15 lb/MMBtu. It is not clear exactly which type of FGD is proposed (e.g., wet, dry sorbent injection, lime spray dryer). Wet FGD would be considered to be the most stringent control available. If any other type of FGD is being proposed, a BART determination that considers the other SO2 control alternatives should be performed. Assuming that wet FGD is the control alternative being implemented as BART, this technology has been shown to be capable of achieving a much lower emission rate than 0.15 lb./MMBtu at other Electric Generation Units. The type and amount of reagent proposed are not presented. Either more information and analysis should be provided to justify an emission limit of 0.15 lb/MMBtu for BART, or a lower emission limit should be proposed. The above references remain applicable even if the proposed control alternative meets the "presumptive" level of control provided for in the EPA BART Guidelines (e.g., 0.15 lb/MMBtu for SO2 control).

   Response: The new FGD is a wet/dry type that utilizes Spray Dryer Absorbers (SDAs) in concert with the fabric filter (baghouse). According to the U.S. Department of Energy, dry FGD is typically used with low sulfur coal having less than 2 percent by weight sulfur content along with a downstream fabric filter (baghouse) to capture any by-product.[42] The domestic, bituminous coal ranged from 1.12% to 1.28% sulfur content during the operational period from November 24, 2010 through February 1, 2011. Since commencing operation, the average calendar day emission rate of SO_2 has been approximately 0.132 lb/MMBtu based on CEMS data through February 1, 2011 which is lower than 0.15 lb/MMBtu, the EPA "presumptive" level.
   .

Department-initiated Changes

In addition to non-substantive minor and/or stylistic edits (i.e., correcting typos, ensuring consistency, etc.), the NJDEP made the following department-initiated changes when finalizing the Technical Support Document and its appendices for submittal to the USEPA.

1) added information regarding pending permit modification (BOP110001) for ConocoPhillips' Title V operating permit to incorporate the consent decree requirement to implement the H_2S requirements of NSPS subpart J;
2) added information regarding pending permit modification (BOP110001) for PSEG Hudson Generating Station's Title V operating permit to include more stringent NO_x emission limits for E1;
3) added the following paragraph regarding E2:

"Unit 2 is a dry-bottom wall-fired unit and, since bringing the SCR, FGD, baghouse, and activated carbon on-line, fires low sulfur bituminous coal. The existing LNBs, installed on

[42] http://www.netl.doe.gov/technologies/coalpower/ewr/coal_utilization_byproducts/pdf/mercury_%20FGD%20white%20paper%20Final.pdf

Unit 2 in 2008, continue to be used in addition to the new SCR. The new FGD is a dry type that utilizes Spray Dryer Absorbers (SDAs) in concert with the fabric filter (baghouse). The SCR, FGD, baghouse, and carbon injection are newly constructed and commenced operation on November 24, 2010. PSEG Fossil is still optimizing the operation of these new controls. Since commencing operation, however, the average calendar day emission rates of NO_x and SO_2 have been approximately 0.09 lb/MMBtu and 0.132 lb/MMBtu, respectively, based on CEMS data through February 1, 2011. The domestic, bituminous coal ranged from 1.12% to 1.28% sulfur content during the same period;" and

4) added NJDEP's commitment to post the final operating permit modifications once they are approved.

County: Essex
Printed In: The Star-Ledger, Newark
Printed On: 2010/12/20

NOTICE OF OPPORTUNITY FOR PUBLIC COMMENT
ON PROPOSED BEST
AVAILABLE RETROFIT
TECHNOLOGY DETERMINATIONS TO PROTECT AND ENHANCE VISIBILITY LEVELS IN NEW JERSEY'S FEDERALLY
DESIGNATED CLASS I AREA

The New Jersey Department of Environmental Protection (NJDEP) is proposing to approve Best Available Retrofit Technology (BART) for qualified equipment to reduce air pollution that causes regional haze. The federal Clean Air Act requires that regional haze be reduced in national parks and wilderness areas, including the Brigantine Wilderness Area in New Jersey. The BART provisions of the federal Regional Haze Rule require that states identify BART for controlling emissions of haze-causing air pollutants from specific existing sources, and that the appropriate BART emission limitations are included in the State's Implementation Plan to reduce regional haze. This notice seeks public comment on NJDEP's determination of BART for the eligible facilities in New Jersey.

The five facilities included in the proposed BART determinations include four refineries and one coal fired power plant, 1) Chevron Products (asphalt refinery), 2) Amerada Hess Port Reading Refinery (gasoline and heating oil), 3) ConocoPhillips Bayway Refinery (gasoline and heating oil), 4) Sunoco Eagle Point (gasoline and heating oil), and 5) PSEG Hudson Generating Station (coal and gas-fired electric generation). All the refinery fluid catalytic cracking unit regenerators, the major sulfur dioxide emitting unit at a gasoline refinery, have scrubbers to effectively control sulfur dioxide and particulate emissions. The coal fired power plant is being retrofit with scrubbers for sulfur dioxide control, baghouses for particulate control, and selective catalytic reduction for nitrogen oxide control. These three pollutants all contribute to regional haze, with sulfur dioxide being the greatest contributor.

NJDEP has determined that only three facilities in New Jersey currently meet the federal criteria for BART eligibility. Two of these facilities, ConocoPhillips Bayway Refinery and PSEG Hudson Generating Station, are subject to New Jersey rules, permits, and enforcement agreements that require air pollution control that is BART. Another facility, Chevron Products, has proposed to take limits on the operation of affected emission units so the potential to emit air pollution is lower than the threshold levels for which BART is required. Two remaining facilities, which had previously been identified in NJDEP's haze plan as possibly requiring BART, have been determined to have the potential to emit less air pollution than would be subject to BART.

In addition to satisfying the BART requirements, New Jersey has also adopted rules to reduce the sulfur in oil used for heating and electric generation as part of a regional agreement with other states to reduce regional haze and particulate air pollution in the Mid-Atlantic and Northeast. The State Implementation Plan for Regional Haze, which provides more information on these rules and BART, is available at http://www.state.nj.us/dep/baqp/2008%20Regional%20Haze/Regional%20Haze.html.

This public notice, a fact sheet, and the Technical Support Document for the BART determinations have been posted at the Air Quality Permitting website: http://www.state.nj.us/dep/aqpp/publicnotices.htm. Copies of these documents and additional information on this proposed BART determination can be obtained by calling Margaret Gardner (609-292-7095).

All persons, including the affected facilities, who believe that any condition of the proposed BART determination is inappropriate, must raise all reasonable issues of concern and submit all arguments and factual grounds or materials supporting their position during the public comment period. Any comments on this proposed BART determination and/or a request for public hearing

must be received within thirty days of the date of this notice and addressed to Margaret Gardner, Bureau of Air Permits, New Jersey Department of Environmental Protection, 401 E State Street, 2nd Floor, PO Box 27, Trenton, New Jersey 08625-0027.
12/20/10 $200.68

Public Notice ID: 15238522

United States Department of the Interior

FISH AND WILDLIFE SERVICE
National Wildlife Refuge System
Branch of Air Quality
7333 W. Jefferson Ave., Suite 375
Lakewood, CO 80235-2017

IN REPLY REFER TO:
FWS/ANRS-NR-AQ

January 14, 2011

William O'Sullivan, Director
Division of Air Quality
New Jersey Department of Environmental Protection
401 E State Street
7th Floor, East Wing
P.O. Box 402
Trenton, New Jersey 08625-0402

Dear Mr. O'Sullivan:

On December 15, 2010, the State of New Jersey provided information on Best Available Retrofit Technology (BART) to supplement your draft implementation plan to improve air quality regional haze impacts at mandatory Class I areas across your region. We appreciate the opportunity to work closely with the State through the initial evaluation, development, and, now, subsequent review of your States BART evaluations.

This letter acknowledges that the U.S. Department of the Interior, U.S. Fish and Wildlife Service (FWS), in cooperation with the National Park Service (NPS), has received and conducted a substantive review of the BART supplement of your proposed Regional Haze Rule implementation plan in fulfillment of your requirements under the federal regulations 40 CFR 51.308(i)(2). Please note, however, that only the U.S. Environmental Protection Agency (EPA) can make a final determination regarding the document's completeness and, therefore, ability to receive federal approval from EPA.

Please consider these comments in addition to those provided by the U.S. Department of the Interior regarding the New Jersey draft Regional Haze State Implementation Plan with a letter dated October 29, 2008. Furthermore, this letter is copied to Ms. Margaret Gardner of the NJDEP Bureau of Air Permitting, in official response to the public notice regarding the State's BART determinations. The public notice was posted on December 20, 2010, and announced a comment period extending until January 21, 2011.

Again, we appreciate the opportunity to work closely with the State of New Jersey and compliment you on your hard work and dedication. For further information, please contact Tim Allen (FWS) at (303) 914-3802.

Sincerely,

Sandra V. Silva

Sandra V. Silva
Chief, Branch of Air Quality
U.S. Fish and Wildlife Service

Enclosure

cc:

Ms. Margaret Gardner
Bureau of Air Permitting
New Jersey Department of
Environmental Protection
401 E State Street
2nd Floor, East Wing
P.O. Box 27
Trenton, NJ 08625-0027

Wake Haven, Acting Executive Director
MANE-VU
444 N. Capitol St, NW, Suite 638
Washington, DC 20001

Ray Werner, Chief
Branch of Air Programs
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290 Broadway
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Robert Kelly
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Tony Leger, Regional Chief
National Wildlife Refuge System
USFWS Region 5
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Hadley, MA 01035

Virginia Rettig, Refuge Manager
Edwin B. Forsythe National Wildlife
Refuge
Box 72, Great Creek Road
Oceanville, NJ 08231

Comments/Issues Pertaining to the Proposed Best Available Retrofit Technology (BART) Determinations for Affected Bart-eligible Sources in the State of New Jersey – Technical Support Document

U.S. Fish and Wildlife Service
January 14, 2011

The U. S. Fish and Wildlife Service (FWS) appreciates the opportunity to review and comment on the New Jersey Department of Environmental Protection (NJDEP) Proposed BART Determinations. The NJDEP followed a consistent and organized approach to gather, analyze and present information for the three BART-eligible sources in New Jersey. Some significant emission controls have been implemented as part of previously negotiated consent decrees as reflected in the BART process. The FWS would like to comment on a few aspects of the BART determinations that were provided for our review. The general comments below are followed by facility-specific comments.

The Technical Support Document does not append BART determination analyses performed by the companies whose facilities are subject to BART, which is usually required documentation to provide detail to the proposed BART decisions. However, the proposed BART determinations made by NJDEP generally entail BART controls considered to be the most stringent controls available. As a result, the detailed documentation usually provided by company BART determinations (i.e., cost efficiency and cost of visibility improvement) are not required. The EPA BART Guidelines state, "If you find that a BART source has controls already in place which are the most stringent controls available (note that this means that all possible improvements to any control devices have been made), then it is not necessary to comprehensively complete each following step of the BART analysis in this section. As long as these most stringent controls available are made federally enforceable for the purpose of implementing BART for that source, you may skip the remaining analyses in this section, including the visibility analysis in step 5."[1] Nevertheless, as discussed later, there is some question as to whether the control efficiency of some proposed controls allowed in a facility's permits are as stringent as possible.

It is clear that NJDEP is fully cognizant that BART emission limits must be reflected in the sources' operating permits. Please assure that all of the permits or other enforceable commitments are posted as an appendix to the BART section of the Regional Haze SIP. Of course, this would include those facilities that accepted capped emission limits to be excluded from BART (i.e., Chevron Products' permit modification).

ConocoPhillips Bayway Refinery

For the ConocoPhillips Bayway Refinery heaters, the NO_x control efficiency of 0.04 lb./MMBtu through the use of existing Ultra Low NO_x Burners and SCR, and the SO_2 control efficiency of 0.033 lb./MMBtu through a gas upgrade, would seem to be BART for those units.

[1] See 40 CFR Part 51, Appendix Y, Section IV.D.STEP 1.9.

PSEG Fossil LLC Hudson Generating Station

Implementation of Selective Catalytic Reduction (SCR) for NO_x control on gas boiler E1 by May 1, 2015, would seem to satisfy BART.

For NO_x control on boiler E2, SCR has been proposed as BART with an emission limit of 0.10 lb./MMBtu. Since low NO_x burners (LNB) were installed in 2008, as shown in Table 19, it is assumed that BART will be the combination of LNB and SCR. This control technology has delivered control efficiencies of 0.05 to 0.08 lb./MMBtu in many boilers using various types of coals and reagents. The only information presented about the type of coal being used is that it is less than or equal to 2% in sulfur content. The type and amount of reagent proposed are not presented. Either more information and analysis should be provided to justify an emission limit of 0.10 lb./MMBtu for BART, or a lower emission limit should be proposed. The EPA BART Guidelines state, "It is important, however, that in analyzing the technology you take into account the most stringent emission control level that the technology is capable of achieving."[2] Further, the EPA BART Guidelines state, ". . . you should consider ways to improve the performance of existing control devices, particularly when a control device is not achieving the level of control that other similar sources are achieving in practice with the same device."[3]

For SO_2 control on boiler E2, Flue Gas Desulfurization (FGD) has been proposed as BART with an emission limit of 0.15 lb./MMBtu. It is not clear exactly which type of FGD is proposed (e.g., wet, dry sorbent injection, lime spray dryer). Wet FGD would be considered to be the most stringent control available. If any other type of FGD is being proposed, a BART determination that considers the other SO_2 control alternatives should be performed. Assuming that wet FGD is the control alternative being implemented as BART, this technology has been shown to be capable of achieving a much lower emission rate than 0.15 lb./MMBtu at other Electric Generation Units. The type and amount of reagent proposed are not presented. Either more information and analysis should be provided to justify an emission limit of 0.15 lb./MMBtu for BART, or a lower emission limit should be proposed. The EPA BART Guidelines state, "It is important, however, that in analyzing the technology you take into account the most stringent emission control level that the technology is capable of achieving."[4] Further, the EPA BART Guidelines state, ". . . you should consider ways to improve the performance of existing control devices, particularly when a control device is not achieving the level of control that other similar sources are achieving in practice with the same device."[5] The above references remain applicable even if the proposed control alternative meets the "presumptive" level of control provided for in the EPA BART Guidelines (e.g., 0.15 lb./MMBtu for SO_2 control).

[2] Ibid. See Section IV.D.STEP 3.1.
[3] Ibid., See Section IV.D.STEP 3.4.
[4] Ibid., See Section IV.D.STEP 3.1.
[5] Ibid., See Section IV.D.STEP 3.4.