United States
Environmental Protection Agency

Air and Radiation
(6204J)

EPA # 430-F-11-066
December 2011

Documentation Supplement for EPA Base Case v.4.10_MATS – Updates for Final Mercury and Air Toxics Standards (MATS) Rule

This report is the third of three supplements to the August 2010 documentation for EPA Base Case v.4.10[1]. The previous two supplements presented the enhancements and updates that were made to the Base Case for the Proposed Toxics Rule (March 2011)[2] and the Cross-State Air Pollution Rule or CSAPR (June 2011)[3]. The current supplement presents the enhancements and updates that were made for the final Toxics Rule, now designated the Mercury and Air Toxics Standards (MATS).

The 3 documentation supplements are cumulative in nature. Previous documented features not addressed here were retained in the MATS Base Case as described in the most recent previous documentation. Figure 1 attempts to provide a graphical representation of the cumulative structure. The March 2011 documentation supplement for the Proposed Toxics Rule is highlighted in Figure 1 because the Base Case for MATS represents an extension of the Base Case for the Proposed Toxics Rule.

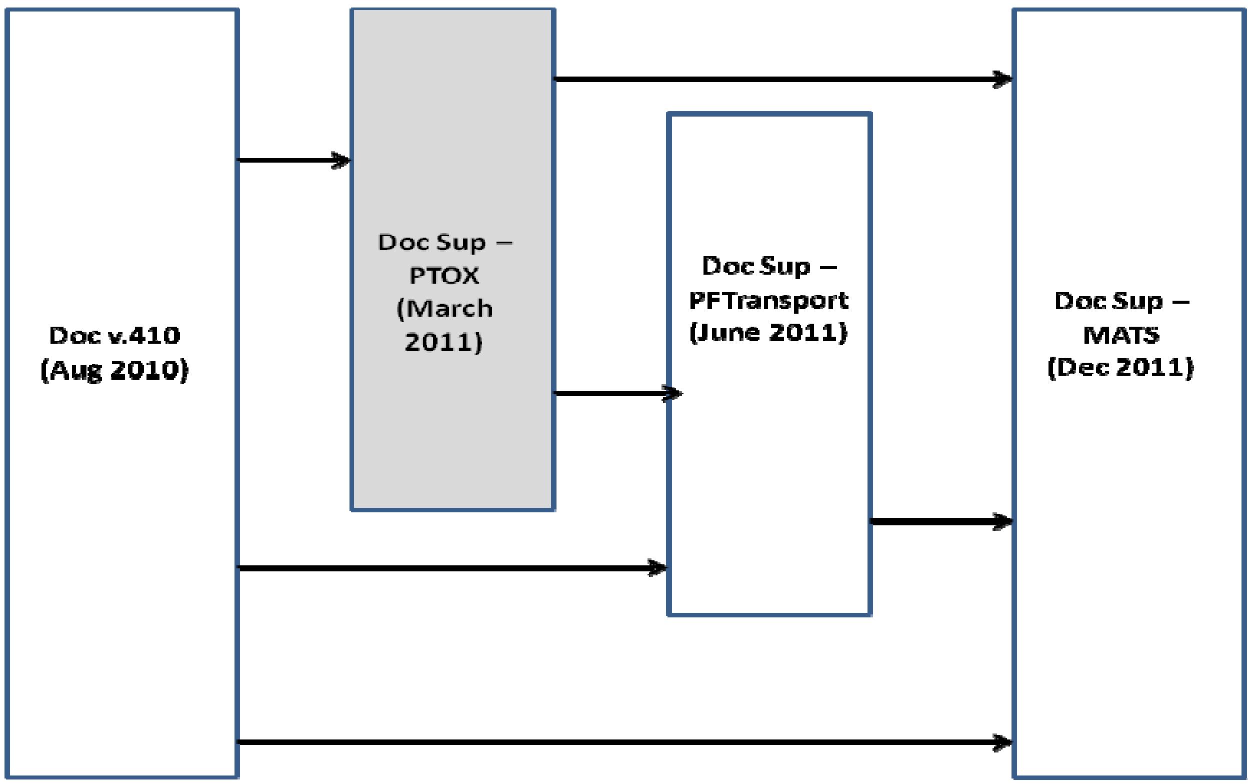

Figure 1. Relationship of Current Report to Previous Documentation for EPA Base Case v.4.10 Variants

The current report consists of two parts: Part A briefly summarizes the changes found in the EPA Base

[1] The formal title of the August 2010 documentation report is *Documentation for EPA Base Case v.4.10 Using the Integrated Planning Model* (EPA #430-R-10-010), August 2010. It is available for viewing and downloading at www.epa.gov/airmarkets/progsregs/epa-ipm/transport.html.

2 The formal title of the March 2011 documentation supplement is *Documentation Supplement for EPA Base Case v4.10_PTox – Updates for Proposed Toxics Rule* (EPA #430-R-11-006), March 2011. It is available for viewing and downloading at www.epa.gov/airmarkets/progsregs/epa-ipm/docs/suppdoc.pdf

[3] The formal title of the June 2011 documentation supplement is *Documentation Supplement for EPA Base Case v.4.10_FTransport – Updates for Final Transport Rule* (EPA #430-K-11-004). June 2011. It is available for viewing and downloading at www.epa.gov/airmarkets/progsregs/epa-ipm/CSAPR/docs/DocSuppv410_FTransport.pdf.

Case v.4.10 for the MATS. To facilitate cross-references to the previous documentation reports, the topics in Part A are covered in the same categories and in the same order as covered in the previous documentation reports. At the end of Part A there a listing of corrections to errors in previous documentation and enhancements to previous documentation items. The items in this section of Part A do not represent changes in the base case itself but in the documentation describing features included in the base case.

Part B of this report gives detailed information on these changes and takes the form of a supplement to the previous documentation, using redline and strike-out highlights to show provisions that changed and building upon the section numbering in the previous documentation to show where new enhancements fit into the modeling structure.

Part A

Summary of Key Changes in the EPA Base Case v.4.10 for the MATS

Power System Operations Assumptions

(Chapter 3 in previous documentation)

Cross-State Air Pollution Rule (CSAPR): Since issuing the *Documentation Supplement for the Proposed Toxics Rule* in March of 2011, the EPA Administrator on July 6, 2011 signed a Notice of Final Rulemaking for the Cross-State Air Pollution Rule (CSAPR). As a result of this regulatory action, the SO2 and NOx provisions of CSAPR were incorporated in the EPA Base Case v.4.10_MATS. Part B Cross-Reference: For an indication of previous provisions removed and details of the representation of CASAPR provisions in the final MATS base case (including tables of key CSAPR provisions, state budgets, and a map of affected states), see the new redlined text in Section 3.9 in Part B.

Colorado RPS: Part B Cross-Reference: For a summary of the Colorado RPS included see the redlined additions to Section 3.9.3 in Part B.)

Colorado Clean Air – Clean Jobs Act: Due to timing, previous versions of EPA Base Case v.4.10 did not include this state regulation, which was enacted in April 2011. Part B Cross-Reference: For a summary of the modeled provisions of the Colorado Clean Air – Clean Jobs Act, see the new redlined additions to Section 3.9.4 in Part B.)

Handling of State Mercury Regulations in MATS Base and Policy Cases: State mercury regulations (as shown in Appendix 3-2 in the Documentation Supplement for Proposed Toxics Rule) were not modeled in the MATS base or policy cases. Part B Cross-Reference: For an explanation of reasons why state mercury regulations were not included in the MATS base or policy cases, see the new text that appears at the end of Section 3.9.4 ("State Specific Environmental Regulations") in Part B.

NIPSCO and TVA NSR Settlements: Between the last previously released EPA Base Case v.4.10 (for CSAPR) and the base case for MATS, provisions of the NSR settlements with Northern Indiana Public Service Company (NIPSCO) and Tennessee Valley Authority (TVA) were announced. See www.epa.gov/compliance/resources/cases/civil/caa/nipsco.html and www.epa.gov/compliance/resources/cases/civil/caa/tvacoalfired. The NIPSCO settlement and the system-wide TVA SO2 limit, which were not previously included, are now represented in the Base Case v.4.10_MATS. Part B Cross-Reference: For a summary of the modeled provisions of the NIPSCO and TVA NSR settlements see the appropriate entries in the updated version of Appendix 3-3 ("New Source Review (NSR) Settlements in EPA Base Case v.4.10_MATS.

Handling of Existing ACI Controls in MATS Base and Policy Cases: Certain existing ACI controls (shown in the NEEDS database) were not included in EPA Base Case v.4.10_MATS but were included in the MATS policy case. Part B Cross-Reference: For an explanation of reasons and a listing of existing ACI controls that were not included in the MATS Base Case but were included in the MATS policy case see new sub-section 3.9.7 ("Unit-Level Control Assumptions") and 3.9.7.1 ("Existing ACI Controls in MATS Base and Policy Cases") in Part B.

Unit-Specific Assumptions on Emissions, Emission Controls, and Fuels:

Unit specific assumptions were adopted for

- Big Sandy Units 1 and 2,
- Monroe Units 1 and 2
- Dunkirk Units 3 and 4,
- C R Huntley Units 7 and 8
- Coal Units in Washington State, including the retirements at
    - Centralia
    - Boardman
- D B Wilson plant
- Revised coal assignments at various plants to improve consistency with EIA Form 923

Part B Cross-Reference: For details of these changes, see new documentation sub-section 3.9.7 ("Unit-Level Control, Emission and Fuel Assumptions") in Part B.

Generation Resources

(Chapter 4 in previous documentation)

Revised Capital Cost Structure for New Nuclear Units: The capital cost for new nuclear capacity was updated to $5,000/kW from $4,621 (in 2007$). The life extension costs for existing nuclear units were revised to be consistent with the new nuclear plant capital costs.

Part B Cross-Reference: The changes noted here are shown in Table 4-13 in Part B.

Emission Control Technologies

(Chapter 5 in previous documentation)

Filterable Particulate Matter (PM) Compliance Technologies for Existing Units: In the MATS policy case all coal units with a capacity greater than 25 MW must meet the filterable PM compliance requirement. Units that have an existing fabric filter are assumed to meet the requirement. Depending on the incremental filterable PM reduction needed to bring a unit into compliance, uncontrolled units and units with electrostatic precipitators (ESPs) for PM control that do not currently meet their compliance requirement are assigned either a fabric filter or one of three tiered ESP upgrades to bring them into compliance. The determination of the appropriate option is an off-line calculation and the assignment of that option is performed in setting up a run, not in the course of the run. Part B Cross-Reference: See new section 5.6 for details of the procedure used to determine the appropriate compliance technology.

Updated FGD Removal Rate Assumptions for Petroleum Coke: Based on the performance capabilities indicated in the 2010 ICR, a 93% mercury removal rate is assumed when FGD is present on units that burn petroleum coke. Part B Cross-Reference: The previous sentence should be appended as a note under Table 5-13 ("Mercury Emission Modification Factors Used in EPA Base Case v.4.10_MATS") in section 5.4.3 ("Mercury Control Capabilities") of the August 2010 documentation for EPA Base Case v.4.10. (This is not reproduced in Part B.)

Revised ACI VOM Cost for Units with Certain Particulate Control Configurations: For certain particulate control configurations the variable operating and maintenance (VOM) cost of activated carbon injection (ACI) retrofits is assumed to be 81 percent lower due the presence of pre-existing particulate controls. Part B Cross-Reference: See the redlined addition to section 5.4.3 ("Mercury Control Capabilities") for the specific configurations affected by this VOM cost revision.

Revised HCl Emissions from Lignite and Subbituminous Coals Reflecting Impact of Ash Chemistry: To account for the effect of ash chemistry on HCl emissions, the HCl content of lignite and subbituminous coals is reduced by 75%. Part B Cross-Reference: For a fuller explanation of these changes see additional redlined text at end of Section 5.5.1 ("Chlorine Content of Fuels") in Part B

FGD Upgrade Assumptions in MATS Policy Case: In setting up the MATS policy runs, it is assumed that the most cost effective approach for units with pre-existing FGD that do not meet the 94% HCl removal requirement is to upgrade their FGD to bring the unit into compliance. Part B Cross-Reference: For the specifics of the FGD upgrade see the new redlined text in Section 5.5.3.1 ("Wet and Dry FGD") in Part B.

Dry Scrubber Removal Assumptions for Waste Coal and Petroleum Coke Units in MATS Policy Case: In setting up the Base Case v.4.10_MATS, waste coal and petroleum coke fired FBC units without an existing FGD were mistakenly not provided with a scrubber retrofit option. To make up for this oversight, in run year 2015 a dry scrubber and its associated capital cost (applied through and FOM adder) are assigned to these units when setting up the MATS policy case. Part B Cross-Reference: For further details on these revisions see new redlined text in Section 5.5.3.1 ("Wet and Dry FGD").

Revisions to DSI cost and performance assumptions in the Base Case for MATS: A number of additional assumptions were made regarding DSI in the Base Case v.4.10_MATS. Part B Cross-Reference: : See the redlined addition to section 5.5.3.2 ("Dry Sorbent Injection") in Part 2 for a discussion of the specific assumptions.

Assumed Air-to-Cloth Ratio in the Cost Equations for the DSI + Fabric Filter Retrofit Option: Based on public comments and engineering assessments, an air-to-cloth ratio of 4.0, rather than 6.0, was used in MATS to provide a conservative projection of the requirements and cost of sorbent removal. Part B Cross-Reference: New redlined text was added to the "Capital Cost" write-up in Section 5.5.4 ("Fabric Filter (Baghouse) Cost Development") to reflect this assumption. This addition is shown in Part B.

Other Fuels and Fuel Emission Factor Assumptions

(Chapter 11 in previous documentation)

Correction of Error in Mercury Emission Factor (EMF) for Petroleum Coke: A previous computational error in the mercury emission factor for petroleum coke as presented in Table 6-3 of the EPA report titled *Control of Mercury Emissions from Coal-fired Electric Utility Boilers: Interim Report Including Errata,* 3-21-02 was corrected (from 23.18 lbs/TBtu to 2.66 lb/TBtu) based on re-examination of the 1999 ICR data for petroleum coke and implementation of a procedure for flagging and excluding outlier values above the 95 percentile value. Part B Cross-Reference: This correction is reflected in the update of Table 11-4 that appears in Part B.

Mercury Removal Assumption for Waste Coal Units: Based on 2010 ICR data waste coal units in the Base Case for MATS were assumed to achieve 99% mercury removal. Part B Cross-Reference: This revision is reflected in new footnote under Table 11-4 that appears in Part B.

Errata and Enhancements of Previous Documentation

Below is a listing of corrections to errors in previous documentation and enhancements to previous documentation items. The items below do not represent changes in the base case itself but in the documentation describing features included in the base case.

SCR Cost Equations: The following editorial corrections should be made to the Sargent & Lundy paper, SCR Cost Development Methodology (at www.epa.gov/airmarkets/progsregs/epa-ipm/docs/v410/Appendix52A.pdf :

a) on pages 5 and 6, change the formula text for "NOx Removal Factor" (L) to: K/80

b) on page 6, add the following formula text for "Variable O&M costs for catalyst replacement & disposal" (VOMW):

VOMW ($/MWh) = 0.3*(G)^2.9*(L)^0.71/8760/J*100*S

Fabric Filter (FF) Costs Include Ash Handling: The following clarifying text should be added to the Sargent & Lundy paper, Particulate Control Cost Development Methodology (at www.epa.gov/airmarkets/progsregs/epa-ipm/docs/append5_5.pdf):

a) on page 4, to the list of capital cost items included, add: "interconnecting piping, etc, to existing fly ash handling system"

SNCR Removal Rates in Table 5-7: The removal rates in the last column of Table 5-7 did not correctly reflect the implementation in EPA Base Case v.4.10_MATS. Table 5-7 ("Summary of Retrofit NOx Emission Control Performance Assumptions") is located in section 5.2 ("Nitrogen Oxides Control Technology") of the previous documentation. Part B Cross-Reference: Using redline and strike-out highlights, the corrections to Table 5-7 are shown in Part B.

ACI Cost Equations: The following editorial corrections should be made to the Sargent & Lundy paper, Mercury Control Cost Development Methodology (at www.epa.gov/airmarkets/progsregs/epa-ipm/docs/append5_3.pdf) :

a) on pages 12 – 16 change the formula text for capital cost component "BMB" to:

if(J = Not Added then 0, J = 6.0 Air-to-Cloth then 422, J = 4.0 Air-to-Cloth then 476)*B*L^0.81

Part B

Detailed Information on Changes in EPA Base Case v.4.10_MATS (Using Mark-Up of Previous Documentation Reports)

3.9 Existing Environmental Regulations

This section describes the existing federal, regional, and state SO_2, NO_x, mercury, and CO_2 emissions regulations that are represented in the EPA Base Case v.4.10_MATS. The first three subsections discuss national and regional regulations. The next two subsections describe state level environmental regulations and a variety of legal settlements. The last subsection presents emission assumptions for potential units.

~~**Note on Clean Air Interstate Rule (CAIR):** In December 2008 the U.S. Court of Appeals for the District of Columbia Circuit remanded CAIR to EPA to correct legal flaws in the proposed regulations as cited in the Court's July 2008 ruling. Until EPA's work was completed, CAIR, which includes a cap-and-trade system for SO_2 and NO_x emissions, was temporarily reinstated. However, although CAIR's provisions were still in effect when EPA Base Case v.4.10 was released, it is not included in the base case to allow EPA Base Case v.4.10 to be used to analyze the regulations proposed to replace CAIR.~~

Note on Cross-State Air Pollution Rule (CSAPR): Since issuing the *Documentation Supplement for the Proposed Toxics Rule* in March of 2011, the EPA Administrator on July 6, 2011 signed a Notice of Final Rulemaking for the Cross-State Air Pollution Rule (CSAPR). As a result of this regulatory action, the SO2 and NOx provisions of CSAPR were incorporated in the EPA Base Case v.4.10_MATS. Below are a map of affected states and state budget tables listing the key CSAPR provisions.

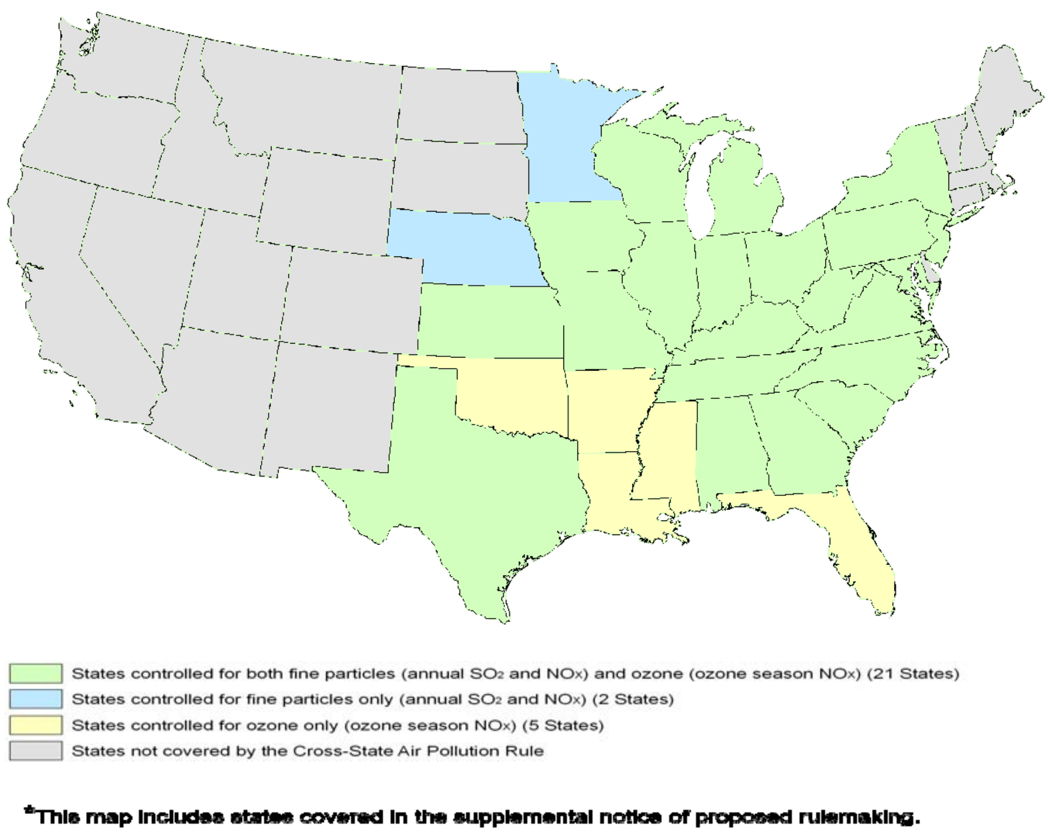

Figure 3.1. CSAPR States

Table 3. 1. a) SO2

Emissions	Budget		Variability Limit	
In 1000 tons	2012	2014	2012	2014
Alabama	216.033	213.258	38.886	38.386
Georgia	158.527	95.231	28.535	17.142
Illinois	234.889	124.123	42.28	22.342
Indiana	285.424	161.111	51.376	29
Iowa	107.085	75.184	19.275	13.533
Kansas	41.528	41.528	7.475	7.475
Kentucky	232.662	106.284	41.879	19.131
Maryland	30.12	28.203	5.422	5.077
Michigan	229.303	143.995	41.275	25.919
Minnesota	41.981	41.981	7.557	7.557
Missouri	207.466	165.941	37.344	29.869
Nebraska	65.052	65.052	11.709	11.709
New Jersey	5.574	5.574	1.003	1.003
New York	27.325	18.585	4.919	3.345
North Carolina	136.881	57.62	24.639	10.372
Ohio	310.23	137.077	55.841	24.674
Pennsylvania	278.651	112.021	50.157	20.164
South Carolina	88.62	88.62	15.952	15.952
Tennessee	148.15	58.833	26.667	10.59
Texas	243.954	243.954	43.912	43.912
Virginia	70.82	35.057	12.748	6.31
West Virginia	146.174	75.668	26.311	13.62
Wisconsin	79.48	40.126	14.306	7.223

Table 3.1. b) Ozone Season NOx

Emissions	Budget		Variability Limit	
In 1000 tons	2012	2014	2012	2014
Alabama	31.746	31.499	6.667	6.615
Arkansas	15.037	15.037	3.158	3.158
Florida	27.825	27.825	5.843	5.843
Georgia	27.944	18.279	5.868	3.839
Illinois	21.208	21.208	4.454	4.454
Indiana	46.876	46.175	9.844	9.697
Iowa	16.532	16.207	3.472	3.403
Kansas	13.536	10.998	2.843	2.31
Kentucky	36.167	32.674	7.595	6.862
Louisiana	13.432	13.432	2.821	2.821
Maryland	7.179	7.179	1.508	1.508

Michigan	25.752	24.727	5.408	5.193
Mississippi	10.16	10.16	2.134	2.134
Missouri	22.762	21.073	4.78	4.425
New Jersey	3.382	3.382	0.71	0.71
New York	8.331	8.331	1.75	1.75
North Carolina	22.168	18.455	4.655	3.876
Ohio	40.063	37.792	8.413	7.936
Oklahoma	21.835	21.835	4.585	4.585
Pennsylvania	52.201	51.912	10.962	10.902
South Carolina	13.909	13.909	2.921	2.921
Tennessee	14.908	8.016	3.131	1.683
Texas	63.043	63.043	13.239	13.239
Virginia	14.452	14.452	3.035	3.035
West Virginia	25.283	23.291	5.309	4.891
Wisconsin	13.704	13.216	2.878	2.775

Table 3.1. c) Annual NOx

Emissions	Budget		Variability Limit	
In 1000 tons	2012	2014	2012	2014
Alabama	72.691	71.962	13.084	12.953
Georgia	62.01	40.54	11.162	7.297
Illinois	47.872	47.872	8.617	8.617
Indiana	109.726	108.424	19.751	19.516
Iowa	38.335	37.498	6.9	6.75
Kansas	30.714	25.56	5.529	4.601
Kentucky	85.086	77.238	15.315	13.903
Maryland	16.633	16.574	2.994	2.983
Michigan	60.193	57.812	10.835	10.406
Minnesota	29.572	29.572	5.323	5.323
Missouri	52.374	48.717	9.427	8.769
Nebraska	26.44	26.44	4.759	4.759
New Jersey	7.266	7.266	1.308	1.308
New York	17.543	17.543	3.158	3.158
North Carolina	50.587	41.553	9.106	7.48
Ohio	92.703	87.493	16.687	15.749
Pennsylvania	119.986	119.194	21.597	21.455
South Carolina	32.498	32.498	5.85	5.85
Tennessee	35.703	19.337	6.427	3.481
Texas	133.595	133.595	24.047	24.047
Virginia	33.242	33.242	5.984	5.984
West Virginia	59.472	54.582	10.705	9.825

Wisconsin	31.628	30.398	5.693	5.472

"Dispatchable" Controls Operate in CSAPR Covered States: After the Clean Air Interstate Rule (CAIR) was remanded to EPA by the Court for revision, existing emission controls for SO2 and NOx that had been installed in anticipation of CAIR were modeled as "dispatchable." (see *Documentation Supplement for EPA Base Case v.4.10_FTransport – Updates for Final Transport Rule* (EPA #430-K-11-004). June 2011, page 54, available at www.epa.gov/airmarkets/progsregs/epa-ipm/CSAPR/docs/DocSuppv410_FTransport.pdf.)
Since Base Case v.4.10_MATS includes CASPR, which EPA recently promulgated to replace CAIR, "dispatchable" controls in states covered by CASPR are operated in this scenario.

Table 3.2.a) List of Units Operating "Dispatchable" FGD Retrofits in Base Case v4.10 for MATS

Plant Name	UniqueID	Unit ID	State Name	Capacity (MW)
Cayuga	1001_B_2	2	Indiana	473
E W Brown	1355_B_1	1	Kentucky	94.0
E W Brown	1355_B_2	2	Kentucky	160
Ghent	1356_B_1	1	Kentucky	475
Ghent	1356_B_2	2	Kentucky	469
Ghent	1356_B_3	3	Kentucky	478
Ghent	1356_B_4	4	Kentucky	478
Elmer Smith	1374_B_1	1	Kentucky	132
Elmer Smith	1374_B_2	2	Kentucky	261
Paradise	1378_B_3	3	Kentucky	977
Kenneth C Coleman	1381_B_C1	C1	Kentucky	150
Kenneth C Coleman	1381_B_C2	C2	Kentucky	150
Kenneth C Coleman	1381_B_C3	C3	Kentucky	155
HMP&L Station Two Henderson	1382_B_H1	H1	Kentucky	153
HMP&L Station Two Henderson	1382_B_H2	H2	Kentucky	159
Dickerson	1572_B_1	1	Maryland	182
Dickerson	1572_B_2	2	Maryland	182
Dickerson	1572_B_3	3	Maryland	182
Monroe	1733_B_1	1	Michigan	770
Monroe	1733_B_2	2	Michigan	785
Monroe	1733_B_3	3	Michigan	795
Monroe	1733_B_4	4	Michigan	775
Sioux	2107_B_1	1	Missouri	497
Sioux	2107_B_2	2	Missouri	497
B L England	2378_B_1	1	New Jersey	129
B L England	2378_B_2	2	New Jersey	155
AES Cayuga	2535_B_1	1	New York	152
AES Cayuga	2535_B_2	2	New York	153
C R Huntley Generating Station	2549_B_67	67	New York	190

C R Huntley Generating Station	2549_B_68	68	New York	190
Dunkirk Generating Station	2554_B_3	3	New York	185
Dunkirk Generating Station	2554_B_4	4	New York	185
E C Gaston	26_B_5	5	Alabama	861
Miami Fort	2832_B_7	7	Ohio	500
Miami Fort	2832_B_8	8	Ohio	500
Niles	2861_B_1	1	Ohio	109
Hamilton	2917_B_9	9	Ohio	51.0
Barry	3_B_5	5	Alabama	750
Homer City Station	3122_B_3	3	Pennsylvania	650
Keystone	3136_B_1	1	Pennsylvania	850
Keystone	3136_B_2	2	Pennsylvania	850
PPL Brunner Island	3140_B_1	1	Pennsylvania	335
PPL Brunner Island	3140_B_2	2	Pennsylvania	387
PPL Brunner Island	3140_B_3	3	Pennsylvania	754
PPL Montour	3149_B_1	1	Pennsylvania	761
PPL Montour	3149_B_2	2	Pennsylvania	757
Hatfields Ferry Power Station	3179_B_1	1	Pennsylvania	530
Hatfields Ferry Power Station	3179_B_2	2	Pennsylvania	530
Hatfields Ferry Power Station	3179_B_3	3	Pennsylvania	530
W S Lee	3264_B_3	3	South Carolina	170
Wateree	3297_B_WAT1	WAT1	South Carolina	350
Wateree	3297_B_WAT2	WAT2	South Carolina	350
Williams	3298_B_WIL1	WIL1	South Carolina	615
W A Parish	3470_B_WAP6	WAP6	Texas	650
Yorktown	3809_B_1	1	Virginia	159
Fort Martin Power Station	3943_B_1	1	West Virginia	552
Fort Martin Power Station	3943_B_2	2	West Virginia	555
Harrison Power Station	3944_B_1	1	West Virginia	652
Harrison Power Station	3944_B_2	2	West Virginia	642
Harrison Power Station	3944_B_3	3	West Virginia	651
Genoa	4143_B_1	1	Wisconsin	356
Charles R Lowman	56_B_1	1	Alabama	86.0
James H Miller Jr	6002_B_1	1	Alabama	684
Brandon Shores	602_B_1	1	Maryland	643
Killen Station	6031_B_2	2	Ohio	615
Gibson	6113_B_1	1	Indiana	630
Gibson	6113_B_2	2	Indiana	628

Gibson	6113_B_3	3	Indiana	628
Fayette Power Project	6179_B_1	1	Texas	598
Fayette Power Project	6179_B_2	2	Texas	598
Gorgas	8_B_10	10	Alabama	690
Gorgas	8_B_8	8	Alabama	165
Gorgas	8_B_9	9	Alabama	175
Cheswick	8226_B_1	1	Pennsylvania	580
Coffeen	861_B_01	01	Illinois	340
Coffeen	861_B_02	02	Illinois	560
Havana	891_B_9	9	Illinois	487
Harding Street	990_B_70	70	Indiana	435
Petersburg	994_B_3	3	Indiana	540

Table 3.2.b) List of Units Operating "Dispatchable" SCR Retrofits in Base Case v4.10 for MATS

Plant Name	UniqueID	Unit ID	State Name	Capacity (MW)
Lansing	1047_B_4	4	Iowa	261
AES Deepwater	10670_B_AAB001	AAB001	Texas	140
Seminole	136_B_1	1	Florida	658
Seminole	136_B_2	2	Florida	658
St Johns River Power Park	207_B_1	1	Florida	626
St Johns River Power Park	207_B_2	2	Florida	626
W A Parish	3470_B_WAP5	WAP5	Texas	645
W A Parish	3470_B_WAP6	WAP6	Texas	650
W A Parish	3470_B_WAP7	WAP7	Texas	565
W A Parish	3470_B_WAP8	WAP8	Texas	600
Edgewater	4050_B_5	5	Wisconsin	414
John P Madgett	4271_B_B1	B1	Wisconsin	398
Crystal River	628_B_4	4	Florida	722
Crystal River	628_B_5	5	Florida	721
Deerhaven Generating Station	663_B_B2	B2	Florida	228
Sandow	6648_B_4	4	Texas	545
C D McIntosh Jr	676_B_3	3	Florida	342

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3.9.3 CO_2 Regulations and Renewable Portfolio Standards

The Regional Greenhouse Gas Initiative (RGGI) is a year-round CO_2 cap and trade program affecting fossil fired electric power plants 25 MW or larger in Connecticut, Delaware, Maine, New Hampshire, New Jersey, New York, Vermont, Rhode Island, Massachusetts, and Maryland.

EPA Base Case v.4.10_MATS incorporated the following updated targets to reflect Colorado RPS:
- 12% of its retail electricity sales in Colorado for the years 2011-2014;
- 20% of its retail electricity sales in Colorado for the years 2015-2019; and

- 30% of its retail electricity sales in Colorado for the years 2020 and later.

Renewable Portfolio Standards (RPS) generally refer to various state-level policies that require the addition of renewable generation to meet a specified share of state-wide generation In EPA Base Case v.4.10 the state RPS requirements are represented at a regional level utilizing the aggregate regional representation of RPS requirements that is implemented in AEO 2010[4] as shown in Appendix 3-6. This appendix shows the RPS requirements that apply to the NEMS (National Energy Modeling System) regions used in AEO. The RPS requirement for a particular NEMS region applies to all IPM regions that are predominantly contained in that NEMS region.

3.9.4 State Specific Environmental Regulations

EPA Base Case v.4.10 represents laws and regulations in 25 states affecting emissions from the electricity sector. The laws and regulations had to either be on the books or expected to come into force. Appendix 3-2 summarizes the provisions of state laws and regulations that are represented in EPA Base Case 4.10.

EPA Base Case v.4.10_MATS incorporated the following provisions of the Colorado Clean Air-Clean Jobs Act (HB 1365, passed in April 2010):

Table 3-9-4. Changes Incorporated in EPA Base Case v.4.10_MATS in Response to Provisions of the Colorado Clean Air-Clean Jobs Act (HB 1365, passed in April 2010)

Plant Name	UniqueID	ORIS Plant Code	Unit ID	Modeled In v.4.10_FMATS
Arapahoe	465_B_3	465	3	Unit retired, effective in 2015 run year
Arapahoe	465_B_4	465	4	Unit forced to convert to natural gas, effective in 2015 run year
Cameo	468_B_1	468	1	Retired in NEEDS
Cameo	468_B_2	468	2	Retired in NEEDS
Cherokee	469_B_1	469	1	Unit retired, effective in 2012 run year
Cherokee	469_B_2	469	2	Unit retired, effective in 2012 run year
Cherokee	469_B_3	469	3	Unit retired, effective in 2020 run year
Cherokee	469_B_4	469	4	Unit forced to convert to natural gas, effective in 2020 run year
Valmont	477_B_5	477	5	Unit retired, effective in 2020 run year
W N Clark	462_B_55	462	55	Unit retired, effective in 2015 run year
W N Clark	462_B_59	462	59	Unit retired, effective in 2015 run year

State Mercury Regulations in MATS Base and Policy Cases: Consistent with the mercury risk deposition modeling for MATS, EPA did not model non-federally enforceable mercury-specific emissions reduction rules (as shown in Appendix 3-2 in the Documentation Supplement for Proposed Toxics Rule) in the base case or MATS policy case (see preamble section III.A)

3.9.5 New Source Review (NSR) Settlements

The New Source Review, (NSR) settlements refer to legal agreements with companies resulting from the

[4]Energy Information Administration, U.S. Department of Energy, *Assumptions to Annual Energy Outlook 2010: Renewable Fuels Module* (DOE/EIA-0554(2010)), April 9, 2010, Table 13.4 "Aggregate Regional RPS Requirements, www.eia.doe.gov/oiaf/aeo/assumption/renewable.html and www.eia.doe.gov/oiaf/aeo/assumption/pdf/renewable_tbls.pdf

permitting process under the CAAA which requires industry to undergo an EPA pre-construction review of proposed environmental controls either on new facilities or as modifications to existing facilities where there would result a "significant increase" in a regulated pollutant. EPA Base Case v.4.10_MATS includes more than 20 NSR settlements with electric power companies. EPA Base Case v.4.10_MATS includes provisions of the recently announced NSR settlements with Northern Indiana Public Service Company (NIPSCO) and Tennessee Valley Authority (TVA). See www.epa.gov/compliance/resources/cases/civil/caa/nipsco.html and www.epa.gov/compliance/resources/cases/civil/caa/tvacoalfired. An updated summary of ~~the units affected and how the settlements were~~ all the NSR settlements that are modeled in Base Case v.4.10_MATS can be found in Appendix 3-3.

Seven state settlements and five citizen settlements are also represented in EPA Base Case v.4.10. These are summarized in Appendices 3-4 and 3-5 respectively.

3.9.7 Unit-Level Control, Emission and Fuel Assumptions (new)

The following unit specific assumptions were adopted in EPA Base Case v.4.10 for MATS:

3.9.7.1 Existing ACI Controls in MATS Base and Policy Cases: As **indicated above in section 3.9.4,** EPA did not model non-federally enforceable mercury-specific emissions reduction rules. Units which were online before 2008 with existing ACI controls installed were therefore assumed not to operate those controls in EPA Base Case v.4.10_MATS, but were assumed to operate the existing ACI in the MATS policy case. Units that commenced operation after 2007 were assumed to operate existing ACI because these units are required under section 112(g) to meet HAP limitations (including Hg) for new units.

3.9.7.2 Monroe Units 1 and 2 and Big Sandy Units 1 and 2: The flue gas desulfurization (FGD) for SO2 control at Monroe units 1 and 2 are assumed not to run in 2012. This restriction was not imposed after 2012. Big Sandy Units 1 and 2 had dispatchable controls in the Proposed MATS. This flexibility was not offered in Final MATS, the controls were implemented as non-dispatchable.

3.9.7.3 Dunkirk Units 3 and 4, C R Huntley Units 7 and 8: The SO2 removal rates were adjusted to reflect DSI technology instead of FGD that was assumed in the previous versions.

	DSI	FGD
Dunkirk Units 3 and 4	70%	95.9%
CR Huntley Units 7 and 8	70%	92.3%

3.9.7.4 Coal Units in Washington State (including retirement of Centralia Units 1 and 2 and the Boardman Units: Due to the approval of the Washington State Senate bill (formally known as Senate Bill 5769), new base load coal generation in Washington is subjected to 1,100 lbs/MWh CO2 rate limit and Centralia Units 1 and 2 and the Boardman units are retired in 2021, 2026 and 2021 years respectively.

3.9.7.5 D B Wilson plant: Based on a comment received bituminous coal in addition to petroleum coke was provided as a fuel option for D B Wilson (unique ID 6823_B_W1). In previous base cases its fuel choice had been exclusively petroleum coke. To make the additional fuel choice possible, this plant was assigned to coal demand region IBB3 instead of PCOK

3.9.7.6 Revised Coal Assignments to Improve Consistency with EIA Form 923: The following table shows revisions in coal assignments that were made to improve the consistency between the coal assignments in EPA Base Case v.4.10_MATS and the coal consumption reported in EIA Form 923 for 2008.

Table 3-9-7-5. Changes in Coal Assignments in EPA Base Case v.4.10_MATS to Improve Consistency with Information Reported in EIA Form 923 (2008)

Plant Name	UniqueID	ORIS Plant Code	Unit ID	Modeled Fuels In v.4.10_FTransport	Modeled Fuels In v.4.10_MATS	Notes
C P Crane	1552_B_1	1552	1	Subbituminous	Subbituminous, Bituminous	
C P Crane	1552_B_2	1552	2	Subbituminous	Subbituminous, Bituminous	
Herbert A Wagner	1554_B_2	1554	2	Subbituminous	Subbituminous, Bituminous	
Herbert A Wagner	1554_B_3	1554	3	Subbituminous	Subbituminous, Bituminous	
PSEG Hudson Generating Station	2403_B_2	2403	2	Bituminous	Subbituminous, Bituminous	Coal demand region changed from NE2 to PE1 to provide both coal ranks.
R E Burger	2864_B_5	2864	5	Bituminous	Subbituminous, Bituminous	
R E Burger	2864_B_6	2864	6	Bituminous	Subbituminous, Bituminous	
Willow Island	3946_B_1	3946	1	Bituminous	Subbituminous	
Willow Island	3946_B_2	3946	2	Bituminous	Subbituminous	

Appendix 3-3 New Source Review (NSR) Settlements in EPA Base Case v.4.10_MATS

Company and Plant	State	Unit	Settlement Actions														Reference
			Retire/Repower		SO_2 control			NO_x Control			PM or Mercury Control			Allowance Retirement	Allowance Restriction		
			Action	Effective Date	Equipment	Percent Removal or Rate	Effective Date	Equipment	Rate	Effective Date	Equipment	Rate	Effective Date	Retirement	Restriction	Effective Date	
Alabama Power																	
James H. Miller	Alabama	Units 3 & 4			Install and operate FGD continuously	95%	12/31/11	Operate existing SCR continuously	0.1	05/01/08		0.03	12/31/06	With 45 days of settlement entry, APC must retire 7,538 SO_2 emission allowances.	APC shall not sell, trade, or otherwise exchange any Plant Miller excess SO_2 emission allowances outside of the APC system	1/1/21	http://www.epa.gov/compliance/resources/cases/civil/caa/alabamapower.html
Minnkota Power Cooperative																	
Beginning 1/01/2006, Minnkota shall not emit more than 31,000 tons of SO_2/year, no more than 26,000 tons beginning 2011, no more than 11,500 tons beginning 1/01/2012. If Unit 3 is not operational by 12/31/2015, then beginning 1/01/2014, the plant wide emission shall not exceed 8,500.																	
Milton R. Young	Minnesota	Unit 1			Install and continuously operate FGD	95% if wet FGD, 90% if dry	12/31/11	Install and continuously operate Over-fire AIR, or equivalent technology with emission rate < .36	0.36	12/31/09		0.03 if wet FGD, .015 if dry FGD		Plant will surrender 4,346 allowances for each year 2012 – 2015, 8,693 allowances for years 2016 – 2018, 12,170 allowances for year 2019, and 14,886 allowances/ year thereafter if Units 1 – 3 are operational by 12/31/2015. If only Units 1 and 2 are operational by12/31/2015, the plant shall retire 17,886 units in 2020 and thereafter.	Minnkota shall not sell or trade NO_x allowances allocated to Units 1, 2, or 3 that would otherwise be available for sale or trade as a result of the actions taken by the settling defendants to comply with the requirements		http://www.epa.gov/compliance/resources/cases/civil/caa/minnkota.html
		Unit 2			Design, upgrade, and continuously operate FGD	90%	12/31/10	Install and continuously operate over-fire AIR, or equivalent technology with emission rate < .36	0.36	12/31/07		0.03	Before 2008				

SIGECO																
FB Culley	Indiana	Unit 1	Repower to natural gas (or retire)	12/31/06										The provision did not specify an amount of SO_2 allowances to be surrendered. It only provided that excess allowances resulting from compliance with NSR settlement provisions must be retired.		http://www.epa.gov/compliance/resources/cases/civil/caa/sigecofb.html
		Unit 2			Improve and continuously operate existing FGD (shared by Units 2 and 3)	95%	06/30/04									
		Unit 3			Improve and continuously operate existing FGD (shared by Units 2 and 3)	95%	06/30/04	Operate Existing SCR Continuously	0.1	09/01/03	Install and continuously operate a Baghouse	0.015	06/30/07			
PSEG FOSSIL																
Bergen	New Jersey	Unit 2	Repower to combined cycle	12/31/02										The provision did not specify an amount of SO_2 allowances to be surrendered. It only provided that excess allowances resulting from compliance with NSR settlement provisions must be retired.		http://www.epa.gov/compliance/resources/cases/civil/caa/pseglic.html
Hudson	New Jersey	Unit 2			Install Dry FGD (or approved alt. technology) and continually operate	0.15	12/31/06	Install SCR (or approved tech) and continually operate	0.1	05/01/07	Install Baghouse (or approved technology)	0.015	12/31/06			

Mercer	New Jersey	Units 1 & 2			Install Dry FGD (or approved alt. technology) and continually operate	0.15	12/31/10	Install SCR (or approved tech) and continually operate	0.13	05/01/06							
TECO																	
Big Bend	Florida	Units 1 & 2			Existing Scrubber (shared by Units 1 & 2)	95% (95% or .25)	09/1/00 (01/01/13)	Install SCR	0.1	05/01/09				The provision did not specify an amount of SO_2 allowances to be surrendered. It only provided that excess allowances resulting from compliance with NSR settlement provisions must be retired.		http://www.epa.gov/compliance/resources/cases/civil/caa/teco.html	
		Unit 3			Existing Scrubber (shared by Units 3 & 4)	93% if Units 3 & 4 are operating	2000 (01/01/10)	Install SCR	0.1	05/01/09							
		Unit 4			Existing Scrubber (shared by Units 3 & 4)	93% if Units 3 & 4 are operating	06/22/05	Install SCR	0.1	07/01/07							
Gannon	Florida	Six units	Retire all six coal units and repower at least 550 MW of coal capacity to natural gas	12/31/04													
WEPCO																	
WEPCO shall comply with the following system wide average NO_x emission rates and total NO_x tonnage permissible: by 1/1/2005 an emission rate of 0.27 and 31,500 tons, by 1/1/2007 an emission rate of 0.19 and 23,400 tons, and by 1/1/2013 an emission rate of 0.17 and 17, 400 tons. For SO_2 emissions, WEPCO will comply with: by 1/1/2005 an emission rate of 0.76 and 86,900 tons, by 1/1/2007 an emission rate of 0.61 and 74,400 tons, by 1/1/2008 an emission rate of 0.45 and 55,400 tons, and by 1/1/2013 an emission rate of 0.32 and 33,300 tons.														http://www.epa.gov/compliance/resources/cases/civil/caa/wepco.html			
Presque Isle	Wisconsin	Units 1 – 4	Retire or install SO_2 and NO_x controls	12/31/12	Install and continuously operate FGD (or approved equiv. tech)	95% or 0.1	12/31/12	Install SCR (or approved tech) and continually operate	0.1	12/31/12				The provision did not specify an amount of SO_2 allowances to be surrendered. It only provided that excess allowances resulting from compliance with NSR settlement provisions must be retired.			
		Units 5 & 6						Install and operate low NO_x burners		12/31/03							
		Units 7 & 8						Operate existing low NO_x burners		12/31/05	Install Baghouse						
		Unit 9						Operate existing low NO_x burners		12/31/06	Install Baghouse						
Pleasant Prairie	Wisconsin	1			Install and continuously operate FGD (or	95% or 0.1	12/31/06	Install and continuously operate SCR (or	0.1	12/31/06							

					approved control tech)			approved tech)									
		2			Install and continuously operate FGD (or approved control tech)	95% or 0.1	12/31/07	Install and continuously operate SCR (or approved tech)	0.1	12/31/03							
Oak Creek	Wisconsin	Units 5 & 6			Install and continuously operate FGD (or approved control tech)	95% or 0.1	12/31/12	Install and continuously operate SCR (or approved tech)	0.1	12/31/12							
		Unit 7			Install and continuously operate FGD (or approved control tech)	95% or 0.1	12/31/12	Install and continuously operate SCR (or approved tech)	0.1	12/31/12							
		Unit 8			Install and continuously operate FGD (or approved control tech)	95% or 0.1	12/31/12	Install and continuously operate SCR (or approved tech)	0.1	12/31/12							
Port Washington	Wisconsin	Units 1 – 4	Retire	12/31/04 for Units 1 – 3. Unit 4 by entry of consent decree													
Valley	Wisconsin	Boiler s 1 – 4						Operate existing low NO_x burner		30 days after entry of consent decree							
VEPCO																	
The Total Permissible NOx Emissions (in tons) from VEPCO system are: 104,000 in 2003, 95,000 in 2004, 90,000 in 2005, 83,000 in 2006, 81,000 in 2007, 63,000 in 2008 – 2010, 54,000 in 2011, 50,000 in 2012, and 30,250 each year there after. Beginning 1/1/2013 they will have a system wide emission rate no greater then 0.15 lb/MMBtu.														http://www.epa.gov/compliance/resources/cases/civil/caa/vepco.html			
Mount Storm	West Virginia	Units 1 – 3			Construct or improve FGD	95% or 0.15	01/01/05	Install and continuously operate SCR	0.11	01/01/08				On or before March 31 of every year beginning in 2013 and continuing thereafter, VEPCO shall surrender 45,000 SO_2 allowances.			
Chesterfield	Virginia	Unit 4						Install and continuously operate SCR	0.1	01/01/13							
		Unit 5			Construct or improve FGD	95% or 0.13	10/12/12	Install and continuously operate SCR	0.1	01/01/12							
		Unit 6			Construct or improve FGD	95% or 0.13	01/01/10	Install and continuously operate SCR	0.1	01/01/11							

Chesapeake Energy	Virginia	Units 3 & 4						Install and continuously operate SCR	0.1	01/01/13							
Clover	Virginia	Units 1 & 2			Improve FGD	95% or 0.13	09/01/03										
Possum Point	Virginia	Units 3 & 4	Retire and repower to natural gas	05/02/03													
Santee Cooper	Santee Cooper shall comply with the following system wide averages for NO_x emission rates and combined tons for emission of: by 1/01/2005 facility shall comply with an emission rate of 0.3 and 30,000 tons, by 1/1/2007 an emission rate of 0.18 and 25,000 tons, by 1/1/2010 and emission rate of 0.15 and 20,000 tons. For SO_2 emission the company shall comply with system wide averages of: by 1/1/2005 an emission rate of 0.92 and 95,000 tons, by 1/1/2007 and emission rate of 0.75 and 85,000 tons, by 1/1/2009 an emission rate of 0.53 and 70 tons, and by 1/1/2011 and emission rate of 0.5 and 65 tons.																http://www.epa.gov/compliance/resources/cases/civil/caa/santeecooper.html
Cross	South Carolina	Unit 1			Upgrade and continuously operate FGD	95%	06/30/06	Install and continuously operate SCR	0.1	05/31/04				The provision did not specify an amount of SO_2 allowances to be surrendered. It only provided that excess allowances resulting from compliance with NSR settlement provisions must be retired.			
		Unit 2			Upgrade and continuously operate FGD	87%	06/30/06	Install and Continuously operate SCR	0.11/0.1	05/31/04 and 05/31/07							
Winyah	South Carolina	Unit 1			Install and continuously operate FGD	95%	12/31/08	Install and continuously operate SCR	0.11/0.1	11/30/04 and 11/30/04							
		Unit 2			Install and continuously operate FGD	95%	12/31/08	Install and continuously operate SCR	0.12	11/30/04							
		Unit 3			Upgrade and continuously operate existing FGD	90%	12/31/08	Install and continuously operate SCR	0.14/0.12	11/30/2005 and 11/30/08							
		Unit 4			Upgrade and continuously operate existing FGD	90%	12/31/07	Install and continuously operate SCR	0.13/0.12	11/30/05 and 11/30/08							
Grainger	South Carolina	Unit 1						Operate low NO_x burner or more stringent technology		06/25/04							
		Unit 2						Operate low NO_x burner or more stringent technology		05/01/04							
Jeffries	South Carolina	Units 3, 4						Operate low NO_x burner or more stringent technology		06/25/04							
Ohio Edison																	

Ohio Edison shall achieve reductions of 2,483 tons NO_x between 7/1/2005 and 12/31/2010 using any combination of: 1) low sulfur coal at Burger Units 4 and 5, 2) operating SCRs currently installed at Mansfield Units 1 – 3 during the months of October through April, and/or 3) emitting fewer tons than the Plant-Wide Annual Cap for NO_x required for the Sammis Plant. Ohio Edison must reduce 24,600 tons system-wide of SO_2 by 12/31/2010.

http://www.epa.gov/compliance/resources/cases/civil/caa/ohioedison.html

No later than 8/11/2005, Ohio Edison shall install and operate low NO_x burners on Sammis Units 1 - 7 and overfired air on Sammis Units 1,2,3,6, and 7. No later than 12/1/2005, Ohio Edison shall install advanced combustion control optimization with software to minimize NO_x emissions from Sammis Units 1 – 5.

W.H. Sammis Plant	Ohio	Unit 1			Install Induct Scrubber (or approved equiv. control tech)	50% removal or 1.1 lb/MMBtu	12/31/08	Install SNCR (or approved alt. tech) & operate continuously	0.25	10/31/07				Beginning on 1/1/2006, Ohio Edison may use, sell or transfer any restricted SO_2 only to satisfy the Operational Needs at the Sammis, Burger and Mansfield Plant, or new units within the FirstEnergy System that comply with a 96% removal for SO_2. For calendar year 2006 through 2017, Ohio Edison may accumulate SO_2 allowances for use at the Sammis, Burger, and Mansfield plants, or FirstEnergy units equipped with SO_2 Emission Control Standards. Beginning in 2018, Ohio Edison shall surrender unused restricted SO_2 allowances.			
		Unit 2			Install Induct Scrubber (or approved equiv. control tech)	50% removal or 1.1 lb/MMBtu	12/31/08	Operate existing SNCR continuously	0.25	02/15/06							
		Unit 3			Install Induct Scrubber (or approved equiv. control tech)	50% removal or 1.1 lb/MMBtu	12/31/08	Operate low NO_x burners and overfire air by 12/1/05; install SNCR (or approved alt. tech) & operate continuously by 12/31/07	0.25	12/01/05 and 10/31/07							
		Unit 4			Install Induct Scrubber (or approved equiv. control tech)	50% removal or 1.1 lb/MMBtu	06/30/09	Install SNCR (or approved alt. tech) & operate continuously	0.25	10/31/07							
		Unit 5			Install Flash Dryer Absorber or ECO[2] (or approved equiv. control tech) & operate continuously	50% removal or 1.1 lb/MMBtu	06/29/09	Install SNCR (or approved alt. tech) & Operate Continuously	0.29	03/31/08							
		Unit 6			Install FGD[3] (or approved equiv. control tech) & operate continuously	95% removal or 0.13 lb/MMBtu	06/30/11	Install SNCR (or approved alt. tech) & operate continuously	"Minimum Extent Practicable"	06/30/05	Operate Existing ESP Continuously	0.03	01/01/10				
		Unit 7			Install FGD (or approved equiv. control tech) & operate continuously	95% removal or 0.13 lb/MMBtu	06/30/11	Operate existing SNCR Continuously	"Minimum Extent Practicable"	08/11/05	Operate Existing ESP Continuously	0.03	01/01/10				
Mansfield Plant	Pennsylvania	Unit 1			Upgrade existing FGD	95%	12/31/05										

		Unit 2			Upgrade existing FGD	95%	12/31/06										
		Unit 3			Upgrade existing FGD	95%	10/31/07										
Eastlake	Ohio	Unit 5						Install low NO_x burners, over-fired air and SNCR & operate continuously	"Minimize Emissions to the Extent Practicable"	12/31/06							
Burger	Ohio	Unit 4	Repower with at least 80% biomass fuel, up to 20% low sulfur coal.	12/31/11													
		Unit 5		12/31/11													
Mirantl[1,6]																	
System-wide NO_x Emission Annual Caps: 36,500 tons 2004; 33,840 tons 2005; 33,090 tons 2006; 28,920 tons 2007; 22,000 tons 2008; 19,650 tons 2009; 16,000 tons 2010 onward. System-wide NO_x Emission Ozone Season Caps: 14,700 tons 2004; 13,340 tons 2005; 12,590 tons 2006; 10,190 tons 2007; 6,150 tons 2008 – 2009; 5,200 tons 2010 thereafter. Beginning on 5/1/2008, and continuing for each and every Ozone Season thereafter, the Mirant System shall not exceed a System-wide Ozone Season Emission Rate of 0.150 lb/MMBtu NO_x.														http://www.epa.gov/compliance/resources/cases/civil/caa/mirant.html			
Potomac River Plant	Virginia	Unit 1															
		Unit 2															
		Unit 3						Install low NO_x burners (or more effective tech) & operate continuously		05/01/04							
		Unit 4						Install low NO_x burners (or more effective tech) & operate continuously		05/01/04							
		Unit 5						Install low NO_x burners (or more effective tech) & operate continuously		05/01/04							
Morgantown Plant	Maryland	Unit 1						Install SCR (or approved alt. tech) & operate continuously	0.1	05/01/07							

		Unit 2						Install SCR (or approved alt. tech) & operate continuously	0.1	05/01/08							
Chalk Point	Maryland	Unit 1			Install and continuously operate FGD (or equiv. technology)	95%	06/01/10							For each year after Mirant commences FGD operation at Chalk Point, Mirant shall surrender the number of SO_2 Allowances equal to the amount by which the SO_2 Allowances allocated to the Units at the Chalk Point Plant are greater than the total amount of SO_2 emissions allowed under this Section XVIII.			
		Unit 2			Install and continuously operate FGD (or equiv. technology)	95%	06/01/10										
Illinois Power																	
System-wide NOx Emission Annual Caps: 15,000 tons 2005; 14,000 tons 2006; 13,800 tons 2007 onward. System-wide SO2 Emission Annual Caps: 66,300 tons 2005 – 2006; 65,000 tons 2007; 62,000 tons 2008 – 2010; 57,000 tons 2011; 49,500 tons 2012; 29,000 tons 2013 onward.														http://www.epa.gov/compliance/resources/cases/civil/caa/illinoispower.html			
Baldwin	Illinois	Units 1 & 2			Install wet or dry FGD (or approved equiv. alt. tech) & operate continuously	0.1	12/31/11	Operate OFA & existing SCR continuously	0.1	08/11/05	Install & continuously operate Baghouse	0.015	12/31/10	By year end 2008, Dynergy will surrender 12,000 SO_2 emission allowances, by year end 2009 it will surrender 18,000, by year end 2010 it will surrender 24,000, any by year end 2011 and each year thereafter it will surrender 30,000 allowances. If the surrendered allowances result in insufficient remaining allowances allocated to the units comprising the DMG system, DMG can request to surrender fewer SO_2 allowances.			
		Unit 3			Install wet or dry FGD (or approved equiv. alt. tech) & operate continuously	0.1	12/31/11	Operate OFA and/or low NO_x burners	0.12 until 12/30/12; 0.1 from 12/31/12	08/11/05 and 12/31/12	Install & continuously operate Baghouse	0.015	12/31/10				
Havana	Illinois	Unit 6			Install wet or dry FGD (or approved equiv. alt. tech) & operate continuously	1.2 lb/MMBtu until 12/30/2012; 0.1 lb/MMBtu from 12/31/2012 onward	08/11/05 and 12/31/12	Operate OFA and/or low NO_x burners & operate existing SCR continuously	0.1	08/11/05	Install & continuously operate Baghouse, then install ESP or alt. PM equip	For Bag-house: 0.015 lb/MMBtu; For ESP: 0.03 lb/MMBtu	For Baghouse: 12/31/12; For ESP: 12/31/05				
Hennepin	Illinois	Unit 1				1.2	07/27/05	Operate OFA and/or low NO_x burners	"Minimum Extent Practicable"	08/11/05	Install ESP (or equiv. alt. tech) & continuously	0.03	12/31/06				

											operate ESPs						
		Unit 2				1.2	07/27/05	Operate OFA and/or low NO_x burners	"Minimum Extent Practicable"	08/11/05	Install ESP (or equiv. alt. tech) & continuously operate ESPs	0.03	12/31/06				
Vermilion	Illinois	Units 1 & 2				1.2	01/31/07	Operate OFA and/or low NO_x burners	"Minimum Extent Practicable"	08/11/05	Install ESP (or equiv. alt. tech) & continuously operate ESPs	0.03	12/31/10				
Wood River	Illinois	Units 4 & 5				1.2	07/27/05	Operate OFA and/or low NO_x burners	"Minimum Extent Practicable"	08/11/05	Install ESP (or equiv. alt. tech) & continuously operate ESPs	0.03	12/31/05				
Kentucky Utilities Company																	
EW Brown Generating Station	Kentucky	Unit 3			Install FGD	97% or 0.100	12/31/10	Install and continuously operate SCR by 12/31/2012, continuously operate low NO_x boiler and OFA.	0.07	12/31/12	Continuously operate ESP	0.03	12/31/10	KU must surrender 53,000 SO_2 allowances of 2008 or earlier vintage by March 1, 2009. All surplus NO_x allowances must be surrendered through 2020.	SO_2 and NO_x allowances may not be used for compliance, and emissions decreases for purposes of complying with the Consent Decree do not earn credits.		http://www.epa.gov/compliance/resources/cases/civil/caa/kucompany.html
Salt River Project Agricultural Improvement and Power District (SRP)																	
Coronado Generating Station	Arizona	Unit 1 or Unit 2			Immediately begin continuous operation of existing FGDs on both units, install new FGD.	95% or 0.08	New FGD installed by 1/1/2012	Install and continuously operate low NO_x burner and SCR	0.32 prior to SCR installation, 0.080 after	LNB by 06/01/2009, SCR by 06/01/2014	Optimization and continuous operation of existing ESPs.	0.03	Optimization begins immediately, rate limit begins 01/01/12 (date of new FGD installation)	Beginning in 2012, all surplus SO_2 allowances for both Coronado and Springerville Unit 4 must be surrendered through 2020. The allowances limited by this condition may, however, be used for compliance at a prospective future plant using BACT and otherwise specified in par. 54 of the	SO_2 and NO_x allowances may not be used for compliance, and emissions decreases for purposes of complying with the Consent Decree do not earn credits.		http://www.epa.gov/compliance/resources/cases/civil/caa/srp.html
		Unit 1 or Unit 2			Install new FGD	95% or 0.08	01/01/13	Install and continuously operate low NO_x burner	0.32	06/01/11			Optimization begins immediately, rate limit begins 01/01/13 (date of				

													new FGD installation)	consent decree.			
American Electric Power																	
Eastern System-Wide						Annual Cap (tons)	Year		Annual Cap (tons)	Year				NO_x and SO_2 allowances that would have been made available by emission reductions pursuant to the Consent Decree must be surrendered.	NO_x and SO_2 allowances may not be used to comply with any of the limits imposed by the Consent Decree. The Consent Decree includes a formula for calculating excess NO_x allowances relative to the CAIR Allocations, and restricts the use of some. See par. 74-79 for details. Reducing emissions below the Eastern System-Wide Annual Tonnage Limitations for NO_x and SO_2 earns super compliance allowances.		http://www.epa.gov/compliance/resources/cases/civil/caa/americanelectricpower1007.html
						450,000	2010		96,000	2009							
						450,000	2011		92,500	2010							
						420,000	2012		92,500	2011							
						350,000	2013		85,000	2012							
						340,000	2014		85,000	2013							
						275,000	2015		85,000	2014							
						260,000	2016		75,000	2015							
						235,000	2017		72,000	2016 and thereafter							
						184,000	2018										
						174,000	2019 and thereafter										
At least 600MW from various units	West Virginia	Sporn 1 – 4	Retire, retrofit, or re-power	12/31/18													
	Virginia	Clinch River 1 – 3															
	Indiana	Tanners Creek 1 – 3															
	West Virginia	Kammer 1 – 3															
Amos	West Virginia	Unit 1			Install and continuously operate FGD		12/31/09	Install and continuously operate SCR		01/01/08							-

		Unit 2			Install and continuously operate FGD		12/31/10	Install and continuously operate SCR		01/01/09							-
		Unit 3			Install and continuously operate FGD		12/31/09	Install and continuously operate SCR		01/01/08							-
Big Sandy	Kentucky	Unit 1			Burn only coal with no more than 1.75 lb/MMBtu annual average		Date of entry	Continuousl y operate low NO_x burners		Date of entry							-
		Unit 2			Install and continuously operate FGD		12/31/15	Install and continuously operate SCR		01/01/09							-
Cardinal	Ohio	Unit 1			Install and continuously operate FGD		12/31/08	Install and continuously operate SCR		01/01/09	Continuously operate ESP	0.03	12/31/09				-
		Unit 2			Install and continuously operate FGD		12/31/08	Install and continuously operate SCR		01/01/09	Continuously operate ESP	0.03	12/31/09				-
		Unit 3			Install and continuously operate FGD		12/31/12	Install and continuously operate SCR		01/01/09							-
Clinch River	Virginia	Units 1 – 3				Plant-wide annual cap: 21,700 tons from 2010 to 2014, then 16,300 after 1/1/2015	2010 – 2014, 2015 and thereafte r	Continuousl y operate low NO_x burners		Date of entry							-
Conesville	Ohio	Unit 1	Retire, retrofit, or re-power	Date of entry													-
		Unit 2	Retire, retrofit, or re-power	Date of entry													-

		Unit 3	Retire, retrofit, or re-power	12/31/12													-
		Unit 4			Install and continuously operate FGD		12/31/10	Install and continuously operate SCR		12/31/10							-
		Unit 5			Upgrade existing FGD	95%	12/31/09	Continuously operate low NO_x burners		Date of entry							-
		Unit 6			Upgrade existing FGD	95%	12/31/09	Continuously operate low NO_x burners		Date of entry							-
Gavin	Ohio	Unit 1			Install and continuously operate FGD		Date of entry	Install and continuously operate SCR		01/01/09							-
		Unit 2			Install and continuously operate FGD		Date of entry	Install and continuously operate SCR		01/01/09							-
Glen Lyn	Virginia	Units 1 – 3															-
		Units 5, 6			Burn only coal with no more than 1.75 lb/MMBtu annual average		Date of entry	Continuously operate low NO_x burners		Date of entry							-
Kammer	West Virginia	Units 1 – 3				Plant-wide annual cap: 35,000	01/01/10	Continuously operate over-fire air		Date of entry							-
Kanawha River	West Virginia	Units 1, 2			Burn only coal with no more than 1.75 lb/MMBtu annual average		Date of entry	Continuously operate low NO_x burners		Date of entry							-
Mitchell	West Virginia	Unit 1			Install and continuously operate FGD		12/31/07	Install and continuously operate SCR		01/01/09							-
		Unit 2			Install and continuously operate FGD		12/31/07	Install and continuously operate SCR		01/01/09							-
Mountaineer	West Virginia	Unit 1			Install and continuously operate FGD		12/31/07	Install and continuously operate SCR		01/01/08							-
Muskingum River	Ohio	Units 1 – 4	Retire, retrofit, or re-power	12/31/15													-

		Unit 5			Install and continuously operate FGD		12/31/15	Install and continuously operate SCR		01/01/08	Continuously operate ESP	0.03	12/31/02				-
Picway	Ohio	Unit 9						Continuously operate low NO_x burners		Date of entry							-
Rockport	Indiana	Unit 1			Install and continuously operate FGD		12/31/17	Install and continuously operate SCR		12/31/17							-
		Unit 2			Install and continuously operate FGD		12/31/19	Install and continuously operate SCR		12/31/19							-
Sporn	West Virginia	Unit 5	Retire, retrofit, or re-power	12/31/13													-
Tanners Creek	Indiana	Units 1 – 3			Burn only coal with no more than 1.2 lb/MMBtu annual average		Date of entry	Continuously operate low NO_x burners		Date of entry							-
		Unit 4			Burn only coal with no more than 1.2% sulfur content annual average		Date of entry	Continuously operate over-fire air		Date of entry							-
East Kentucky Power Cooperative Inc.																	
By 12/31/2009, EKPC shall choose whether to: 1) install and continuously operate NO_x controls at Cooper 2 by 12/31/2012 and SO_2 controls by 6/30/2012 or 2) retire Dale 3 and Dale 4 by 12/31/2012.																	
System-wide					System-wide 12-month rolling tonnage limits apply	12-month rolling limit (tons) 57,000 40,000	Start of 12-month cycle 10/01/08 07/01/11	All units must operate low NO_x boilers	12-month rolling limit (tons) 11,500 8,500	Start of 12-month cycle 01/01/08 01/01/13	PM control devices must be operated continuously system-wide, ESPs must be optimized within 270 days of entry date, or	0.03	1 year from entry date	All surplus SO_2 allowances must be surrendered each year, beginning in 2008.	SO_2 and NO_x allowances may not be used to comply with the Consent Decree. NO_x allowances that would become available as a result of		http://www.epa.gov/compliance/resources/cases/civil/caa/nevadapower.html

						28,000	01/01/13		8,000	01/01/15	EKPC may choose to submit a PM Pollution Control Upgrade Analysis.				compliance with the Consent Decree may not be sold or traded. SO_2 and NO_x allowances allocated to EKPC must be used within the EKPC system. Allowances made available due to super compliance may be sold or traded.		
Spurlock	Kentucky	Unit 1			Install and continuously operate FGD	95% or 0.1	6/30/2011	Continuously operate SCR	0.12 for Unit 1 until 01/01/2013, at which point the unit limit drops to 0.1. Prior to 01/01/2013, the combined average when both units are operating must be no more than 0.1	60 days after entry							

		Unit 2			Install and continuously operate FGD by 10/1/2008	95% or 0.1	1/1/2009	Continuously operate SCR and OFA	0.1 for Unit 2, 0.1 combined average when both units are operating	60 days after entry							
Dale Plant	Kentucky	Unit 1						Install and continuously operate low NO_x burners by 10/31/2007	0.46	01/01/08				EKPC must surrender 1,000 NO_x allowances immediately under the ARP, and 3,107 under the NO_x SIP Call. EKPC must also surrender 15,311 SO_2 allowances.		Date of entry	http://www.epa.gov/compliance/resources/cases/civil/caa/eastkentuckypower-dale0907.html
		Unit 2						Install and continuously operate low NO_x burners by 10/31/2007	0.46	01/01/08							
		Unit 3	EKPC may choose to retire Dale 3 and 4 in lieu of installing controls in Cooper 2	12/31/2012													
		Unit 4															
Cooper	Kentucky	Unit 1															
		Unit 2			If EKPC opts to install controls rather than retiring Dale, it must install and continuously operate FGD or equiv. technology	95% or 0.10		If EKPC elects to install controls, it must continuously operate SCR or install equiv. technology	0.08 (or 90% if non-SCR technology is used)	12/31/12							
Nevada Power Company																	
Beginning 1/1/2010, combined NO_x emissions from Units 5,6,7, and 8 must be no more than 360 tons per year.																	
Clark Generating Station	Nevada	Unit 5	Units may only fire natural					Increase water injection immediately,	5ppm 1-hour average	12/31/08 (ULNB installation),					Allowances may not be used to comply with the		http://www.epa.gov/compliance/resources

			gas					then install and operate ultra-low NO_x burners (ULNBs) or equivalent technology. In 2009, Units 5 and 8 may not emit more than 180 tons combined		01/30/09 (1-hour average)					Consent Decree, and no allowances made available due to compliance with the Consent Decree may be traded or sold.		/cases/civil/caa/nevadapower.html
		Unit 6							5ppm 1-hour average	12/31/09 (ULNB installation), 01/30/10 (1-hour average)							
		Unit 7							5ppm 1-hour average	12/31/09 (ULNB installation), 01/30/10 (1-hour average)							
		Unit 8							5ppm 1-hour average	12/31/08 (ULNB installation), 01/30/09 (1-hour average)							
Dayton Power & Light																	
Non-EPA Settlement of 10/23/2008																	
Stuart Generating Station	Ohio	Station-wide			Complete installation of FGDs on each unit.	96% or 0.10	07/31/09	Owners may not purchase any new catalyst with SO_2 to SO_3 conversion rate greater than 0.5%	0.17 station-wide	30 days after entry		0.030 lb per unit	07/31/09		NO_x and SO_2 allowances may not be used to comply with the monthly rates specified in the Consent Decree.		Courtlink document provided by EPA in email
									0.17 station-wide	60 days after entry date							
						82% including data from periods of malfunctions	7/31/09 through 7/30/11	Install control technology on one unit	0.10 on any single unit	12/31/12		Install rigid-type electrodes in each unit's ESP	12/31/15				
						82% including data from periods of malfunctions	after 7/31/11		0.15 station-wide	07/01/12							
									0.10 station-wide	12/31/14							
PSEG FOSSIL, Amended Consent Decree of November 2006																	
Kearny	New Jersey	Unit 7	Retire unit	01/01/07										Allowances allocated to Kearny, Hudson, and Mercer may only be used for the operational			http://www.epa.gov/compliance/resources/decrees/amended/psegfossil-

														needs of those units, and all surplus allowances must be surrendered. Within 90 days of amended Consent Decree, PSEG must surrender 1,230 NO_x Allowances and 8,568 SO_2 Allowances not already allocated to or generated by the units listed here. Kearny allowances must be surrendered with the shutdown of those units.			amended-cd.pdf
		Unit 8	Retire unit	01/01/07													
Hudson	New Jersey	Unit 2			Install Dry FGD (or approved alt. technology) and continually operate	0.15	12/31/10	Install SCR (or approved tech) and continually operate	0.1	12/31/10	Install Baghouse (or approved technology)	0.015	12/31/10				
						Annual Cap (tons)	Year		Annual Cap (tons)	Year							
						5,547	2007		3,486	2007							
						5,270	2008		3,486	2008							
						5,270	2009		3,486	2009							
						5,270	2010		3,486	2010							
Mercer	New Jersey	Units 1 &2			Install Dry FGD (or approved alt. technology) and continually operate	0.15	12/31/10	Install SCR (or approved tech) and continually operate	0.1	01/01/07	Install Baghouse (or approved technology)	0.015	12/31/10				
Westar Energy																	
Jeffrey Energy Center	Kansas	All units			Units 1, 2, and 3 have a total annual limit of 6,600 tons of SO2 and an annual rate limit of 0.07 lbs/MMBtu starting 2012 Units 1, 2, and 3 must all install FGDs by 2011 and operate them continuously. FGDs must maintain a 30-Day Rolling Average Unit Removal Efficiency for SO2 of at least 97% or a 30-Day Rolling Average Unit Emission Rate for SO2 of no greater than 0.070 lb/MMBtu.			Units 1-3 must continuously operate Low NOx Combustion Systems by 2012 and achieve and maintain a 30-Day Rolling Average Unit Emission Rate for NOx of no greater than 0.180 lb/MMBtu. One of the three units must install an SCR by 2015 and operate it continuously to maintain a 30-Day Rolling Average Unit Emission Rate for NOx of no greater than 0.080 lb/MMBtu. By 2013 Westar shall elect to either (a) install a second SCR on one of the other JEC Units by 2017 or (b) meet a 0.100 lb/MMBtu Plant-Wide 12-Month Rolling Average Emission Rate and 9.6 MTons annual cap for NOx by 2015			Units 1, 2, and 3 must operate each ESP and FGD system continuously by 2011 and maintain a 0.030 lb/MMBtu PM Emissions Rate. Units 1 and 2's ESPs must be rebuilt by 2014 in order to meet a 0.030 lb/MMBtu PM Emissions Rate						
Duke Energy																	
Gallagher	Indiana	Units 1 & 3	Retire or repower as natural gas	1/1/2012													

		Units 2 & 4			Install Dry sorbent injection technology	80%	1/1/2012										
American Municipal Power																	
Gorsuch Station	Ohio	Units 2 & 3 Units 1 & 4	Elected to Retire Dec 15, 2010 (must retire by Dec 31, 2012)														http://ampartners.org/newsroom/amp-to-retire-gorsuch-generating-station/
Hoosier Energy Rural Electric Cooperative																	
Ratts	Indiana	Units 1 & 2						Install & continually operate SNCRS	0.25	12/31/2011	Continuously operate ESP			Annually surrender any NOx and SO2 allowances that Hoosier does not need in order to meet its regulatory obligations			http://www.epa.gov/compliance/resources/cases/civil/caa/hoosier.html
Merom	Indiana	Unit 1			Continually run current FGD for 90% removal and update FGD for 98% removal by 2012	98%	2012	Continuously operate existing SCRs	0.12		Continuously operate ESP and achieve PM rate no greater than 0.007 by 6/1/12						
		Unit 2			Continually run current FGD for 90% removal and update FGD for 98% removal by 2014	98%	2014				Continuously operate ESP and achieve PM rate no greater than 0.007 by 6/1/13						
Northern Indiana Public Service Co.																	
System-wide NO_x Emission Caps in Tons: 15,537 in 2012, if NIPSCO chooses NOx Option 1: 15,247 in 2013, 14,959 in 2014, 14,365 in 2015, 11,704 in 2016 - 2018, if NIPSCO chooses NOx option A: 11,704 in 2019 & onwards, if NIPSCO chooses NOx option B: 10,300 in 2019 & onwards; if NIPSCO chooses NOx Option 2: 13,752 in 2013, 13,464 in 2014, 12,870 in 2015 - 2018, if NIPSCO chooses NOx option A: 12,870 in 2019 & onwards, if NIPSCO chooses NOx option B: 11,470 in 2019 & onwards. System-wide SO2 Emission Caps in Tons: 50,200 in 2012 - 2013,10,200 35,900 in 2014 & 2015, 25,300 in 2016-2018, if NIPSCO chooses SO2 option 1: 10,200 in 2019 & onwards, if NIPSCO chooses SO2 option 2: 11,600 in 2019 & onwards.																	
Bailly	Indiana	Units 7 & 8			Upgrade existing FGD	95% by 01/01/11 97% by 01/01/14 (95% if low sulfur coal only is burned)		OFA & SCR	0.15 lb/MMBtu by 12/31/10 0.13 lb/MMBtu by 12/31/13 0.12 lb/MMBtu by 12/31/15			0.3 lb/MMBtu (0.015 if a baghouse is installed)	12/31/2010				
Michigan City	Indiana	Unit 12			FGD	0.1 lb/MMBtu	12/31/2018	OFA & SCR	0.14 lb/MMBtu by 12/31/10 0.12 lb/MMBtu by 12/31/11 0.10 lb/MMBtu by 12/31/13			0.3 lb/MMBtu (0.015 if a baghouse is installed)	12/31/2018				

Schahfer	Indiana	Unit 14			FGD	0.08 lb/MMBtu	12/31/2013	OFA & SCR	0.14 lb/MMBtu by 12/31/10 0.12 lb/MMBtu by 12/31/12 0.10 lb/MMBtu by 12/31/14			0.3 lb/MMBtu (0.015 if a baghouse is installed)	12/31/2013				
	Indiana	Unit 15			FGD	0.08 lb/MMBtu	12/31/2015	LNB/OFA	0.16	3/31/2011		0.3 lb/MMBtu (0.015 if a baghouse is installed)	12/31/2015				
								SCR	0.08	12/31/2015							
	Indiana	Units 17 & 18			Upgrade existing FGD	97%	1/31/2011	LNB/OFA	0.2	3/31/2011		0.3 lb/MMBtu (0.015 if a baghouse is installed)	12/31/2010				
Dean H Mitchell	Indiana	Units 4, 5, 6, & 11	Retire	12/31/2010													
Tennessee Valley Authority																	
System-wide NOx Emission Caps in Tons: 100,600 in 2012, 90,791 in 2013, 86,842 in 2014, 83,042 in 2015, 70,667 in 2016, 64,951 in 2017, 52,000 in 2018 & onwards. System-wide SO2 Emission Caps in Tons: 285,000 in 2012, 235,518 in 2013, 228,107 in 2014, 220,631 in 2015, 175,626 in 2016, 164,257 in 2017, 121,699 in 2018, 100,000 in 2019 & onwards.																	
Colbert	Alabama	Units 1- 4			FGD		6/30/2016	SCR		6/30/2016				Shall surrender all calendar year NOx and SO2 Allowances allocated to TVA that are not needed for compliance with its own CAA reqts. Allocated allowances may be used for TVA's own compliance with CAA reqts.	Shall not use NOx or SO2 Allowances to comply with any requirement of the Consent Decree, Nothing prevents TVA from purchasing or otherwise obtaining NOx and SO2 allowances from other sources for its compliance with CAA reqts. TVA may sell, bank, use, trade, or transfer any NOx and SO2 "Super-Compliance" Allowances resulting from	2011	http://www.epa.gov/compliance/resources/cases/civil/caa/tvacoal-fired.html
		Unit 5			FGD		12/31/15	SCR		Effective Date							
Widows Creek	Alabama	Units 1 - 6	Retire 2 units 7/31/13 Retire 2 units 7/31/14 Retire 2 units 7/31/15														
		Unit 7						SCR		Effective Date							
		Unit 8						SCR		Effective Date							
Paradise	Kentucky	Units 1 & 2			Upgrade FGD	93%	12/31/12	SCR		Effective Date							
		Unit 3			Wet FGD		Effective Date	SCR		Effective Date							
Shawnee	Kentucky	Units 1 & 4			FGD	1.2	12/31/17	SCR		12/31/17							
		Units 5 - 10				1.2	Effective Date										
Allen	Tennessee	Units 1 - 3			FGD		12/31/18					0.3	12/31/18				
Bull Run	Tennessee	Unit 1			Wet FGD		Effective Date					0.3	Effective Date				

Cumberland	Tennessee	Units 1 & 2			Wet FGD		Effective Date								meeting System-wide limits. Except that reductions used to support new CC/CT will not be Super Allowances in that year and thereafter.		
Gallatin	Tennessee	Units 1 - 4			FGD		12/31/17	SCR		12/31/17		0.3	12/31/17				
John Sevier	Tennessee	Units 1 & 2	Retire 2 Units 12/31/12 and 12/31/15														
		Units 3 & 4			FGD		12/31/15	SCR		12/31/15							
Johnsonville	Tennessee	Units 1 - 10	Retire 6 Units 12/31/15 Retire 4 Units 12/31/17														
Kingston	Tennessee	Units 1 - 9			FGD		Effective Date	SCR		Effective Date		0.3	Effective Date				

Notes:

1) Updates to the EPA Base Case 4.10 Final from EPA Base Case 4.10 include the additions of the American Municipal Power settlement, the Hoosier Energy Rural Electric Cooperative settlement, a modification to the control requirements on the Mercer plant under the PSEG Fossil settlement, and an update to the SO_2 emission modeling on Jeffrey Energy Center as part of the Westar settlement.

2) This summary table describes New Source Review settlement actions as they are represented in EPA Base Case. The settlement actions are simplified for representation in the model. This table is not intended to be a comprehensive description of all elements of the actual settlement agreements.

3) Settlement actions for which the required emission limits will be effective by the time of the first mapped run year (before 1/1/2012) are built into the database of units used in EPA Base Case ("hardwired"). However, future actions are generally modeled as individual constraints on emission rates in EPA Base Case, allowing the modeled economic situation to dictate whether and when a unit would opt to install controls versus retire.

4) Some control installations that are required by these NSR settlements have already been taken by the affected companies, even if deadlines specified in their settlement haven't occurred yet. Any controls that are already in place are built into EPA Base Case

5) If a settlement agreement requires installation of PM controls, then the controls are shown in this table and reflected in EPA Base Case. If settlement requires optimization or upgrade of existing PM controls, those actions are not included in EPA Base Case.

6) For units for which an FGD is modeled as an emissions constraint in EPA Base Case, EPA used the assumptions on removal efficiencies that are shown in the latest emission control technologies documentation

7) For units for which an FGD is hardwired in EPA Base Case, unless the type of FGD is specified in the settlement, EPA modeling assumes the most cost effective FGD (wet or dry) and a corresponding 95% removal efficiency for wet and 90% for dry.

8) For units for which an SCR is modeled as an emissions constraint or is hardwired in EPA Base Case, EPA assumed an emissions rate equal to 10% of the unit's uncontrolled rate, with a floor of .06 lb/MMBtu or used the emission limit if provided.

9) The applicable low NOx burner reduction efficiencies are shown in Table A 3-1:3 in the Base Case documentation materials.

10) EPA included in EPA Base Case the requirements of the settlements as they existed on January 1, 2011.

11) Some of the NSR settlements require the retirement of SO2 allowances. For Base Case, EPA estimates the amount of allowances to be retired from these settlements and adjusted the total Title IV allowances accordingly.

Table 4-13. Performance and Unit Cost Assumptions for Potential (New) Capacity from Conventional Technologies in EPA Base Case v4.10_MATS

	Advanced Combined Cycle	Advanced Combustion Turbine	Nuclear	Integrated Gasification Combined Cycle – Bituminous	Integrated Gasification Combined Cycle – Subbituminous	Advanced Coal with Carbon Capture-Bituminous[1]	Advanced Coal with Carbon Capture – Subbituminous[1]	Supercritical Pulverized Coal - Wet Bituminous	Supercritical Pulverized Coal - Dry Sub-Bituminous
Size (MW)	560	170	1350	600	600	500	500	600	600
First Year Available	2015	2012	2017	2013	2013	2015	2015	2013	2013
Lead Time (Years)	3	2	6	4	4	4	4	4	4
Vintage #1 (years covered)	2012 - 2054	2012 - 2054	2012 - 2054	2012 - 2054	2012 - 2054	2012 - 2054	2015 - 2054	2012 - 2054	2012 - 2054
Availability	87%	92%	90%	85%	85%	85%	85%	85%	85%
					Vintage #1				
Heat Rate (Btu/kWh)	6,810	10,720	10,400	8,424	8,062	10,149	9,713	8,874	8,937
Capital[2] (2007$/kW)	976	698	~~4,621~~ 5,000	3,265	3,310	4,720	4,785	2,918	3,008
Fixed O&M (2007$/kW/yr)	14.4	12.3	92.4	47.9	48.2	60.5	61.0	28.9	28.6
Variable O&M (2007$/MWh)	2.57	3.59	0.77	1.32	1.15	1.67	1.46	3.43	2.27

Notes:
[1]For The term “Advanced Coal with Carbon Capture” is used here and in the output files for EPA Base Case v.4.10_MATS to represent a variety of technologies that are expected to provide carbon capture capabilities. These include both supercritical steam generators with carbon capture and integrated gasification combined cycle (IGCC) with carbon capture. Although IGCC with carbon capture was used to define the cost and performance parameters that are implemented in EPA Base Case v.4.10_MATS, projections of “Advanced Coal with Carbon Capture” in EPA Base Case v.4.10_MATS are not limited to this technology.
[2]Capital cost represents overnight capital cost.

Chapter 5: Emission Control Technologies

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5.2 Nitrogen Oxides Control Technology

Table 5-7. Summary of Retrofit NOx Emission Control Performance Assumptions

Control Performance Assumptions	**Selective Catalytic Reduction (SCR)**		**Selective Non-Catalytic Reduction (SNCR)**
Unit Type	Coal	Oil/Gas	Coal
Percent Removal	90% down to 0.06 lb/MMBtu	80%	Pulverized Coal: ~~35%~~ 25% with a NOx rate floor of 0.1 lbs/MMBtu Fluidized Bed: 50% with a NOx rate floor of 0.08lbs/MMBtu
Size Applicability	Units ≥ 25 MW	Units ≥ 25 MW	Units ≥ 25 MW
Costs (2007$)	See Table 5-8*	Table 5-9*	Table 5-8*

* Tables in *EPA Base Case v.4.10* (EPA #430-R-10-010), August 2010 at www.epa.gov/airmarkets/progsregs/epa-ipm/transport.html.

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5.4.3 Mercury Control Capabilities

[Insert the following text at the end of section 5.4.3 as it appears in the *Documentation Supplement for the Proposed Toxics Rule* (March 2011)]

<u>Revisions to ACI VOM Cost in Base Case v.4.10_MATS</u>: For coal units that have a FF embedded in LSD or DSI+FF retrofits, the variable operating and maintenance (VOM) cost of activated carbon injection (ACI) retrofits is assumed to be 81 percent lower due to the presence of pre-existing particulate controls.

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5.5.1 Chlorine Content of Fuels

HCl emissions from the power sector result from the chlorine content of the coal that is combusted by electric generating units. Data on chlorine content of coals had been collected as part EPA's 1999 "Information Collection Request for Electric Utility Steam Generating Unit Mercury Emissions Information Collection Effort" (ICR 1999) described above in section 5.4.1 To provide the capability for EPA Base Case v4.10_MATS to account for HCl emissions, this data had to be incorporated into the model. The procedures used for this are presented in the updated text in section 9.1.3 below.

To account for the effect of ash chemistry on HCl emissions, the HCl content of lignite and subbituminous coals is reduced by 75%.

In the IPM modeling runs done in support of the proposed MATS, 100 % of the coal chlorine was assumed to convert to HCl and be present in the flue gas at the point of injection of the dry sorbent. This was the assumption for all coal ranks and types. After MATS proposal a team of EPA and DOE engineers and control technology specialists met regularly to further evaluate the application of DSI. One of the outcomes of that collaboration was recognition that western sub-bituminous coal (such as that mined in the Powder River Basin) and lignites contain natural alkalinity in the form of non-glassy calcium oxide (CaO) and other alkaline and alkaline earth oxides. This fly ash (classified as ‘Class C’ fly ash) has a natural pH of 9 and higher and the natural alkalinity can effectively neutralize much of the HCl in the flue gas stream prior to the primary control device.

Eastern bituminous coals, by contrast, tend to produce fly ash with lower natural alkalinity. Though bituminous fly ash (classified as ‘Class F’ fly ash) may contain calcium, it tends to be present in a glassy matrix and unavailable for acid-base neutralization reactions.

In order to assess the extent of expected natural neutralization, the 2010 ICR data was examined. It was observed that some of the subbituminous coals contained chlorine levels in such low quantities that users should expect to meet the HCl emission limit with no additional controls. It was also noted that some other units burning subbituminous or lignite coals with higher levels of Cl were achieving 50-85 % HCl control with only cold-side ESP (i.e., with no flue gas desulfurization or other acid gas control technology). We examined the Cl content of the sub-bituminous coals that are modeled in IPM and compared those to the ICR results. From that analysis we believe that those coals can expect to achieve approximately 75 % natural HCl neutralization from the alkaline fly ash.

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5.5.3 HCl Retrofit Emission Control Options

Table 5-20 Summary of HCl Emission Control Technology Assumptions in EPA Base Case v4.10_PTox (Proposed Toxics Rule)

HCl Control Technology Options	Applicability
Limestone Forced Oxidation (LSFO) Scrubber	Base case and policy case
Lime Spray Dryer (LSD)	Base case and policy case
Dry Sorbent Injection (DSI)	Base case and policy case
Scrubber upgrade adjustment	To existing coal steam units with FGD in policy cases analyzed for MATS Rulemaking

All the retrofit options for HCl emission control are summarized in Table 5-20. The scrubber upgrade adjustment was discussed above in 5.5.2. The other options are discussed in detail in the following sections.

5.5.3.1 Wet and Dry FGD

In addition to providing SO_2 reductions, wet scrubbers (Limestone Forced Oxidation, LSFO) and dry scrubbers (Lime Spray Dryer, LSD) reduce HCl as well. For both LSFO and LSD the HCl removal rate is assumed to be 99% with a floor of 0.0001 lbs/MMBtu. This is summarized in columns 2-5 of Table 5-21.

FGD Upgrade Assumptions in MATS Policy Case: In setting up the MATS policy case, all scrubbed unit that do not currently achieve an SO2 removal rate of 94% are assigned a capital cost of $100/kW (2009$) for an FGD upgrade that will improve their HCl removal rates to 99% and bring any unit whose SO2 removal rate was below 90% up to 90%.

Dry Scrubber Removal Assumptions for Waste Coal and Petroleum Coke Units in MATS Policy Case: In setting up the Base Case v.4.10_MATS, waste coal and petroleum coke units without an existing FGD were mistakenly not provided with a scrubber retrofit option. To make up for this oversight, in run year 2015 a dry scrubber and an associated capital cost of $748/kW (applied through and FOM adder) are assigned to these units when setting up the MATS policy case. (The $748/kW capital cost was calculated using the procedures described in section 5.1.1 and, illustrated in Appendix 5-1 for a 100 MW unit with an average heat rate of the waste coal units.) The removal rates obtained by the dry FGD (92% for SO2 and 99% for HCl) are incremental to existing FBC removals. In addition, petroleum coke units with dry FGD are assigned a mercury emission modification factor (EMF) of 0.07.]

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5.5.3.2 Dry Sorbent Injection

[Insert the following text at the end of section 5.5.3.2 as it appears in the *Documentation Supplement for the Proposed Toxics Rule* (March 2011)]

Revisions to DSI Cost and Performance Assumptions in Base Case v.4.10_MATS: The following additional assumptions were made with respect to DSI in the Base Case v.4.10_MATS

(a) Since fabric filters are a pre-requisite for a DSI retrofit, the DSI retrofit VOM cost incurred by units with no pre-existing fabric filter is reduced by 35% to reflect the non-contamination of fly ash and the resulting savings in fly ash disposal costs from the forced installation of a fabric filter.

(b) The cost of the pre-requisite fabric filter is implemented as adders to the FOM and capital cost of the DSI installation.

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5.5.4 Fabric Filter (Baghouse) Cost Development

Fabric filters are not endogenously modeled as a separate retrofit option in EPA Base Case v4.10_PTox, but are accounted for as a cost adder where they are required for particulate matter (PM), mercury, or HCl emission control. In EPA Base Case v4.10_PTox, an existing or new fabric filter particulate control device is a pre-condition for installing a DSI retrofit. In the v4.10_PTox policy case any unit that was retrofit by the model with DSI and did not have an existing fabric filter incurred the cost of installing a fabric filter. This cost was added to the DSI costs discussed in section 5.5.3.2. This section describes the methodology used by Sargent & Lundy to derive the cost of a fabric filter.

The engineering cost analysis is based on a pulse-jet fabric filter which collects particulate matter on a fabric bag and uses air pulses to dislodge the particulate from the bag surface and collect it in hoppers for removal via an ash handling system to a silo. This is a mature technology that has been operating commercially for more than 25 years. “Baghouse” and “fabric filters” are used interchangeably to refer to such installations.

Capital Cost: Two governing variables are used to derive the bare module capital cost of a fabric filter. The first of these is the “air-to-cloth” (A/C) ratio. The major driver of fabric filter capital cost, the A/C ratio is defined as the volumetric flow, (typically expressed in Actual Cubic Feet per Minute, ACFM) of flue gas entering the baghouse divided by the areas (typically in square feet) of fabric filter cloth in the baghouse. The lower the A/C ratio, e.g., A/C = 4.0 compared to A/C = 6.0, the greater the area of the cloth required and the higher the cost for a given volumetric flow.

Note: Based on public comments and engineering assessments, an air-to-cloth ratio or 4.0, rather than 6.0, was used in modeling for MATS to provide a conservative projection of the requirements and cost of sorbent removal.

The other determinant of capital cost is the flue gas volumetric flow rate (in ACFM) which is a function of the type of coal burned and the unit's size and heat rate.

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5.6 Filterable Particulate Matter (PM) Compliance

When the MATS policy case is modeled off the v.4.10_MATS Base Case, it is assumed that all coal burning generating units with a capacity of 25 MW or greater will comply with the filterable PM requirements through the operation of either electrostatic precipitator (ESP) or fabric filter (FF) particulate controls. The decision of whether an upgrade of existing controls will be needed to meet the requirement is not modeled endogenously but supplied as an input when setting up the run.

Units with existing fabric filters are assumed to be able to meet the filterable PM compliance requirement. For units with existing ESPs the following procedure is used to determine if they already meet the filterable PM requirement, can meet it by one of three possible ESP upgrades, or can only meet it by installing a FF.

First, PM emission rate data derived either from 2005 EIA Form 767 or (where available) from EPA's 2010 Information Collection Request5 are compared to the applicable filterable PM compliance requirement. If the unit's emission rate is equal to or less than the compliance requirement, adequate controls are assumed already to be in place and no additional upgrade costs are imposed. For units that do not meet the filterable PM compliance requirement, the incremental reduction needed (in lbs/mmBtu) is calculated by subtracting the filterable PM compliance standard from the reported emission rate. Depending on the magnitude of the incremental reduction needed, the unit is assigned one of three ESP upgrade costs (designated ESP1, ESP2, and ESP3) or the cost of a FF installation (designated ESP4), if the required incremental reduction cannot be achieved by an ESP upgrade. Table 5-25 shows the four levels of ESP upgrades (column 1), the key technologies included in each upgrade (column 2), trigger points for the upgrades (column 3), the capital cost of each upgrade (column 4), and the percent increase in collection efficiency provided by the upgrade, differentiated according to the rank (subbituminous, bituminous, or lignite) of coal burned.

When setting up a model run, the capital costs for the ESP upgrades that are shown in Table 5-25 are converted into annual fixed operating and maintenance (FOM) charges which are added to the other FOM costs incurred by a particular generating unit. To obtain the FOM adder for the ESP upgrades, the values shown in Table 5-25 are multiplied by 11.3%, the capital charge rate for environmental retrofits. (For a discussion of all the capital charge rates in the model runs built upon the EPA base case v.4.10_MATS, see Chapter 8 ("Financial Assumptions") in *Documentation for EPA Base Case v.4.10_MATS Using the Integrated Planning Model*, August 2010, EPA #430-R-10-010.) To prevent double counting of PM control costs, the FOM adder described here is removed if a represented generating unit had previously had an ESP4 fabric filter upgrade, or if, in the course of a model run, was retrofit with dry flue gas desulfurization (FGD), DSI, or ACI plus TOXECON --- each of which includes particulate controls in its capital cost.

The percentage improvements in collection efficiency shown in column 5 in Table 5-25 are additive in the sense that the values shown in this column are added to the pre-upgrade collection efficiency to obtain the after-upgrade collection efficiency.

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5 2005 EIA Form 767 is the last year where the data was reported in the format of lb/MMBtu, which is compatible with this analysis. Since any changes to facilities since 2005 would likely have improved (reduced) emissions, the use of this data is conservative. More recent 2010 ICR test data is used where available.

Table 5-25. Electrostatic Precipitator (ESP) Upgrades as Implemented in EPA Base Case for MATS --- Characteristics, Trigger Points, Associated Costs, and Performance Improvements

Upgrade Level	Key Technologies Employed in Upgrade	Trigger Points for ESP Upgrade (Expressed in terms of incremental reduction needed (lbs/mmBtu) to meet the filterable PM Compliance Standard)	Capital Cost	Additive Percent Improvement[5] in Collection Efficiency as a Result of the Upgrade (differentiated by the rank of coal combusted)
1	High Frequency transformer-rectifier (TR) sets	> 0.0 to ≤ 0.005	$55/kW[1]	0.12 for subbituminous 0.05 for bituminous 0.01 for lignite
2	High frequency transformer-rectifier (TR) sets + New internals (rigid electrodes, increased plate spacing, increased plate height)	> 0.005 to ≤ 0.01	$80/kW[2]	0.25 for subbituminous 0.10 for bituminous 0.02 for lignite
3	High frequency transformer-rectifier (TR) sets + New internals (rigid electrodes, increased plate spacing, increased plate height) + Additional field	> 0.01 to ≤ 0.02	$100/kW[3]	0.50 for subbituminous 0.20 for bituminous 0.05 for lignite
4	Replacement with fabric filter (baghouse)	> 0.02	Use capital cost equations for a fabric filter[4]	(Not Applicable)

[1]Assumes upgrading the specific collection area (SCA) to 250 square-feet/1000 afm (actual feet per minute).

[2]Assumes upgrading the specific collection area (SCA) to 300 square-feet/1000 afm (actual feet per minute).

[3]Assumes upgrading the existing specific collection area (SCA) by 100 square-feet/1000 afm (actual feet per minute), a 20% height increase, and additional field.

[4]The cost equations for fabric filters are described in Section 5.5.4 ("Fabric Filter (Baghouse) Cost Development") with calculations illustrated in Tables 1 and 2 in Appendix 5-5 ("Example Cost Calculation Worksheets for Fabric Filters") in *Documentation Supplement for EPA Base Case v4.10_PTox − Updates for Proposed Toxics Rule* (EPA # 430-R-11-006). This documentation supplement is available on the web at ww.epa.gov/airmarkets/progsregs/epa-ipm/docs/suppdoc.pdf.

[5]The percentage improvement due to the ESP upgrade as shown in this column is added to the pre-upgrade collection efficiency to obtain the after-upgrade collection removal efficiency.

Appendix 5-6 contains a complete listing of coal generating units with either cold- or hot-side ESPs but no fabric filters. For each generating unit the table in Appendix 5-6 shows the incremental reductions needed to meet the PM filterable compliance requirement and the corresponding ESP upgrade (if any) assigned to the unit to enable it to meet that requirement. A filterable PM limit of 0.279 lb/mmBtu was used in this analysis. This value is roughly 10% below the limit in the final MATS rule, therefore resulting in a conservative estimate of the need to upgrade existing ESPs

Appendix 5-6. ESP Upgrade Provided to Existing Units without Fabric Filters so that They Meet Their Filterable PM Compliance Requirement

Plant Name	Unit ID	State Name	UniqueID	Capacity (MW)	OnLineYear	Firing	Bottom	Dry Scrubber Installed	Current Filterable PM Emission (lbs/MMBtu)	Filterable PM Limit (lbs/MMBtu)	Compliance with the Filterable PM Limit?	Final Filterable Emission (lb/MMBtu)	Incremental Filterable Reduction Needed (lb/MMBtu)	Level of ESP Upgrade Required to Meet Filterable PM Requirement
A B Brown	2	Indiana	6137_B_2	245	1986	wall	dry	0	0.0100	0.0279	Yes	0.0100	0.0000	---
AES Beaver Valley Partners Beaver Valley	2	Pennsylvania	10676_B_2	43	1943	wall	dry	0	0.0500	0.0279	No	0.0279	0.0221	ESP-4
AES Beaver Valley Partners Beaver Valley	3	Pennsylvania	10676_B_3	43	1943	wall	dry	0	0.0700	0.0279	No	0.0279	0.0421	ESP-4
AES Beaver Valley Partners Beaver Valley	4	Pennsylvania	10676_B_4	43	1943	wall	dry	0	0.0300	0.0279	No	0.0279	0.0021	ESP-1
AES Cayuga	1	New York	2535_B_1	150	1955	tangential	dry	0	0.0200	0.0279	Yes	0.0200	0.0000	---
AES Cayuga	2	New York	2535_B_2	151	1958	tangential	dry	0	0.0200	0.0279	Yes	0.0200	0.0000	---
AES Deepwater	AAB001	Texas	10670_B_AAB001	139	1986	vertical	dry	0	0.0100	0.0279	Yes	0.0100	0.0000	---
AES Somerset LLC	1	New York	6082_B_1	681	1984	wall	dry	0	0.0200	0.0279	Yes	0.0200	0.0000	---
Albright	1	West Virginia	3942_B_1	73	1952	wall	dry	0	0.0696	0.0279	No	0.0279	0.0417	ESP-4
Albright	2	West Virginia	3942_B_2	73	1952	wall	dry	0	0.0100	0.0279	Yes	0.0100	0.0000	---
Albright	3	West Virginia	3942_B_3	137	1954	tangential	dry	0	0.0500	0.0279	No	0.0279	0.0221	ESP-4
Allen Steam Plant	1	Tennessee	3393_B_1	245	1959	cyclone	wet	0	0.0100	0.0279	Yes	0.0100	0.0000	---
Allen Steam Plant	2	Tennessee	3393_B_2	245	1959	cyclone	wet	0	0.0200	0.0279	Yes	0.0200	0.0000	---
Allen Steam Plant	3	Tennessee	3393_B_3	245	1959	cyclone	wet	0	0.0100	0.0279	Yes	0.0100	0.0000	---
Alloy Steam Station	BLR4	West Virginia	50012_B_BLR4	38	1950	wall	dry	0	0.0400	0.0279	No	0.0279	0.0121	ESP-3
Alma	B4	Wisconsin	4140_B_B4	51	1957	wall	dry	0	0.0200	0.0279	Yes	0.0200	0.0000	---
Alma	B5	Wisconsin	4140_B_B5	77	1960	wall	dry	0	0.0900	0.0279	No	0.0279	0.0621	ESP-4
Ames Electric Services Power Plant	7	Iowa	1122_B_7	33	1968	tangential	dry	0	0.0200	0.0279	Yes	0.0200	0.0000	---
Ames Electric Services Power Plant	8	Iowa	1122_B_8	70	1982	wall	dry	0	0.0200	0.0279	Yes	0.0200	0.0000	---
Apache Station	2	Arizona	160_B_2	175	1979	wall	dry	0	0.0100	0.0279	Yes	0.0100	0.0000	---
Apache Station	3	Arizona	160_B_3	175	1979	wall	dry	0	0.0100	0.0279	Yes	0.0100	0.0000	---

Armstrong Power Station	1	Pennsylvania	3178_B_1	172	1958	wall	dry	0	0.0400	0.0279	No	0.0279	0.0121	ESP-3
Armstrong Power Station	2	Pennsylvania	3178_B_2	171	1959	wall	dry	0	0.0100	0.0279	Yes	0.0100	0.0000	---
Asbury	1	Missouri	2076_B_1	213	1970	cyclone	wet	0	0.1300	0.0279	No	0.0279	0.1021	ESP-4
Asheville	1	North Carolina	2706_B_1	191	1964	wall	dry	0	0.0030	0.0279	Yes	0.0030	0.0000	---
Asheville	2	North Carolina	2706_B_2	185	1971	wall	dry	0	0.0036	0.0279	Yes	0.0036	0.0000	---
Ashtabula	7	Ohio	2835_B_7	244	1958	tangential	dry	0	0.0100	0.0279	Yes	0.0100	0.0000	---
Austin Northeast	NEPP	Minnesota	1961_B_NEPP	29	1971	wall	dry	0	0.0300	0.0279	No	0.0279	0.0021	ESP-1
Avon Lake	10	Ohio	2836_B_10	93	1949	tangential	dry	0	0.0100	0.0279	Yes	0.0100	0.0000	---
Avon Lake	12	Ohio	2836_B_12	616	1970	wall	dry	0	0.0200	0.0279	Yes	0.0200	0.0000	---
B C Cobb	4	Michigan	1695_B_4	156	1956	tangential	dry	0	0.1000	0.0279	No	0.0279	0.0721	ESP-4
B C Cobb	5	Michigan	1695_B_5	156	1957	tangential	dry	0	0.0620	0.0279	No	0.0279	0.0341	ESP-4
B L England	1	New Jersey	2378_B_1	126	1962	cyclone	wet	0	0.0300	0.0279	No	0.0279	0.0021	ESP-1
B L England	2	New Jersey	2378_B_2	152	1964	cyclone	wet	0	0.0300	0.0279	No	0.0279	0.0021	ESP-1
Bailly	7	Indiana	995_B_7	160	1962	cyclone	wet	0	0.0300	0.0279	No	0.0279	0.0021	ESP-1
Bailly	8	Indiana	995_B_8	320	1968	cyclone	wet	0	0.0300	0.0279	No	0.0279	0.0021	ESP-1
Barry	1	Alabama	3_B_1	138	1954	tangential	dry	0	0.0300	0.0279	No	0.0279	0.0021	ESP-1
Barry	2	Alabama	3_B_2	137	1954	tangential	dry	0	0.0400	0.0279	No	0.0279	0.0121	ESP-3
Barry	3	Alabama	3_B_3	249	1959	tangential	dry	0	0.0200	0.0279	Yes	0.0200	0.0000	---
Barry	4	Alabama	3_B_4	362	1969	tangential	dry	0	0.0200	0.0279	Yes	0.0200	0.0000	---
Barry	5	Alabama	3_B_5	740	1971	tangential	dry	0	0.0200	0.0279	Yes	0.0200	0.0000	---
Bay Shore	2	Ohio	2878_B_2	138	1959	vertical	wet	0	0.3200	0.0279	No	0.0279	0.2921	ESP-4
Bay Shore	3	Ohio	2878_B_3	142	1963	wall	dry	0	0.3200	0.0279	No	0.0279	0.2921	ESP-4
Bay Shore	4	Ohio	2878_B_4	215	1968	wall	dry	0	0.3200	0.0279	No	0.0279	0.2921	ESP-4
Belews Creek	1	North Carolina	8042_B_1	1115	1974	cell	dry	0	0.0500	0.0279	No	0.0279	0.0221	ESP-4
Belews Creek	2	North Carolina	8042_B_2	1115	1975	cell	dry	0	0.0200	0.0279	Yes	0.0200	0.0000	---
Belle River	1	Michigan	6034_B_1	698	1984	wall	dry	0	0.0300	0.0279	No	0.0279	0.0021	ESP-1

Belle River	2	Michigan	6034_B_2	698	1985	wall	dry	0	0.0100	0.0279	Yes	0.0100	0.0000	---
Big Bend	BB01	Florida	645_B_BB01	391	1970	wall	wet	0	0.0300	0.0279	No	0.0279	0.0021	ESP-1
Big Bend	BB02	Florida	645_B_BB02	391	1973	wall	wet	0	0.0200	0.0279	Yes	0.0200	0.0000	---
Big Bend	BB03	Florida	645_B_BB03	364	1976	wall	wet	0	0.0200	0.0279	Yes	0.0200	0.0000	---
Big Bend	BB04	Florida	645_B_BB04	447	1985	tangential	dry	0	0.0100	0.0279	Yes	0.0100	0.0000	---
Big Cajun 2	2B1	Louisiana	6055_B_2B1	580	1981	wall	dry	0	0.0200	0.0279	Yes	0.0200	0.0000	---
Big Cajun 2	2B2	Louisiana	6055_B_2B2	575	1982	wall	dry	0	0.0200	0.0279	Yes	0.0200	0.0000	---
Big Cajun 2	2B3	Louisiana	6055_B_2B3	588	1983	wall	dry	0	0.0200	0.0279	Yes	0.0200	0.0000	---
Big Sandy	BSU1	Kentucky	1353_B_BSU1	259	1963	wall	dry	0	0.0300	0.0279	No	0.0279	0.0021	ESP-1
Big Sandy	BSU2	Kentucky	1353_B_BSU2	789	1969	wall	dry	0	0.0300	0.0279	No	0.0279	0.0021	ESP-1
Black Dog	3	Minnesota	1904_B_3	94	1955	wall	dry	0	0.0400	0.0279	No	0.0279	0.0121	ESP-3
Black Dog	4	Minnesota	1904_B_4	165	1960	wall	dry	0	0.0400	0.0279	No	0.0279	0.0121	ESP-3
Blount Street	8	Wisconsin	3992_B_8	49	1957	wall	dry	0	0.1200	0.0279	No	0.0279	0.0921	ESP-4
Blount Street	9	Wisconsin	3992_B_9	48	1961	wall	dry	0	0.0900	0.0279	No	0.0279	0.0621	ESP-4
Blue Valley	3	Missouri	2132_B_3	51	1965	tangential	dry	0	0.0300	0.0279	No	0.0279	0.0021	ESP-1
Boardman	1SG	Oregon	6106_B_1SG	585	1980	wall	dry	0	0.0100	0.0279	Yes	0.0100	0.0000	---
Bowen	1BLR	Georgia	703_B_1BLR	713	1971	tangential	dry	0	0.0800	0.0279	No	0.0279	0.0521	ESP-4
Bowen	2BLR	Georgia	703_B_2BLR	718	1972	tangential	dry	0	0.0800	0.0279	No	0.0279	0.0521	ESP-4
Bowen	3BLR	Georgia	703_B_3BLR	902	1974	tangential	dry	0	0.0500	0.0279	No	0.0279	0.0221	ESP-4
Bowen	4BLR	Georgia	703_B_4BLR	929	1975	tangential	dry	0	0.0500	0.0279	No	0.0279	0.0221	ESP-4
Brayton Point	3	Massachusetts	1619_B_3	607	1969	wall	dry	0	0.0100	0.0279	Yes	0.0100	0.0000	---
Bremo Bluff	3	Virginia	3796_B_3	71	1950	wall	dry	0	0.0200	0.0279	Yes	0.0200	0.0000	---
Bremo Bluff	4	Virginia	3796_B_4	156	1958	wall	dry	0	0.0200	0.0279	Yes	0.0200	0.0000	---
Bruce Mansfield	3	Pennsylvania	6094_B_3	830	1979	wall	dry	0	0.0800	0.0279	No	0.0279	0.0521	ESP-4
Buck	5	North Carolina	2720_B_5	38	1941	tangential	dry	0	0.0400	0.0279	No	0.0279	0.0121	ESP-3
Buck	6	North Carolina	2720_B_6	38	1941	tangential	dry	0	0.0200	0.0279	Yes	0.0200	0.0000	---

Buck	7	North Carolina	2720_B_7	38	1942	tangential	dry	0	0.0300	0.0279	No	0.0279	0.0021	ESP-1
Buck	8	North Carolina	2720_B_8	128	1953	tangential	dry	0	0.0200	0.0279	Yes	0.0200	0.0000	---
Buck	9	North Carolina	2720_B_9	128	1953	tangential	dry	0	0.0300	0.0279	No	0.0279	0.0021	ESP-1
Bull Run	1	Tennessee	3396_B_1	881	1967	tangential	dry	0	0.0100	0.0279	Yes	0.0100	0.0000	---
Burlington	1	Iowa	1104_B_1	209	1968	tangential	dry	0	0.1000	0.0279	No	0.0279	0.0721	ESP-4
C D McIntosh Jr	3	Florida	676_B_3	340	1982	wall	dry	0	0.0736	0.0279	No	0.0279	0.0457	ESP-4
Canadys Steam	CAN1	South Carolina	3280_B_CAN1	105	1962	tangential	dry	0	0.2600	0.0279	No	0.0279	0.2321	ESP-4
Canadys Steam	CAN2	South Carolina	3280_B_CAN2	116	1964	tangential	dry	0	0.0140	0.0279	Yes	0.0140	0.0000	---
Cane Run	4	Kentucky	1363_B_4	155	1962	wall	dry	0	0.0257	0.0279	Yes	0.0257	0.0000	---
Cane Run	5	Kentucky	1363_B_5	168	1966	wall	dry	0	0.0113	0.0279	Yes	0.0113	0.0000	---
Cane Run	6	Kentucky	1363_B_6	240	1969	tangential	dry	0	0.0700	0.0279	No	0.0279	0.0421	ESP-4
Cape Fear	5	North Carolina	2708_B_5	144	1956	tangential	dry	1	0.0700	0.0279	No	0.0279	0.0421	---
Cape Fear	6	North Carolina	2708_B_6	172	1958	tangential	dry	0	0.0600	0.0279	No	0.0279	0.0321	ESP-4
Carbon	1	Utah	3644_B_1	67	1954	tangential	dry	0	0.0200	0.0279	Yes	0.0200	0.0000	---
Carbon	2	Utah	3644_B_2	105	1957	tangential	dry	0	0.0600	0.0279	No	0.0279	0.0321	ESP-4
Cardinal	1	Ohio	2828_B_1	600	1967	cell	dry	0	0.0114	0.0279	Yes	0.0114	0.0000	---
Cardinal	2	Ohio	2828_B_2	600	1967	cell	dry	0	0.0114	0.0279	Yes	0.0114	0.0000	---
Cardinal	3	Ohio	2828_B_3	621	1977	wall	dry	0	0.0114	0.0279	Yes	0.0114	0.0000	---
Cayuga	1	Indiana	1001_B_1	479	1970	tangential	dry	0	0.0700	0.0279	No	0.0279	0.0421	ESP-4
Cayuga	2	Indiana	1001_B_2	466	1972	tangential	dry	0	0.0700	0.0279	No	0.0279	0.0421	ESP-4
Chalk Point LLC	1	Maryland	1571_B_1	341	1964	wall	dry	0	0.0200	0.0279	Yes	0.0200	0.0000	---
Chalk Point LLC	2	Maryland	1571_B_2	342	1965	wall	dry	0	0.0200	0.0279	Yes	0.0200	0.0000	---
Chamois	2	Missouri	2169_B_2	49	1960	cyclone	wet	0	0.0900	0.0279	No	0.0279	0.0621	ESP-4
Charles R Lowman	1	Alabama	56_B_1	85	1969	wall	dry	0	0.0100	0.0279	Yes	0.0100	0.0000	---
Charles R Lowman	2	Alabama	56_B_2	238	1979	wall	dry	0	0.0300	0.0279	No	0.0279	0.0021	ESP-1
Charles R Lowman	3	Alabama	56_B_3	238	1980	wall	dry	0	0.0300	0.0279	No	0.0279	0.0021	ESP-1

Chesapeake	1	Virginia	3803_B_1	111	1953	tangential	dry	0	0.0100	0.0279	Yes	0.0100	0.0000	---
Chesapeake	2	Virginia	3803_B_2	111	1954	tangential	dry	0	0.0100	0.0279	Yes	0.0100	0.0000	---
Chesapeake	3	Virginia	3803_B_3	155	1959	wall	dry	0	0.0300	0.0279	No	0.0279	0.0021	ESP-1
Chesapeake	4	Virginia	3803_B_4	216	1962	tangential	dry	0	0.0100	0.0279	Yes	0.0100	0.0000	---
Chesterfield	3	Virginia	3797_B_3	98	1952	tangential	dry	0	0.0300	0.0279	No	0.0279	0.0021	ESP-1
Chesterfield	4	Virginia	3797_B_4	164	1960	tangential	dry	0	0.0200	0.0279	Yes	0.0200	0.0000	---
Chesterfield	5	Virginia	3797_B_5	310	1964	tangential	dry	0	0.0300	0.0279	No	0.0279	0.0021	ESP-1
Cliffside	5	North Carolina	2721_B_5	550	1972	tangential	dry	0	0.0200	0.0279	Yes	0.0200	0.0000	---
Cliffside	6	North Carolina	2721_B_6	800	2011	tangential	dry	0	0.0300	0.0279	No	0.0279	0.0021	ESP-1
Clifty Creek	1	Indiana	983_B_1	214	1955	wall	wet	0	0.0100	0.0279	Yes	0.0100	0.0000	---
Clifty Creek	2	Indiana	983_B_2	214	1955	wall	wet	0	0.0100	0.0279	Yes	0.0100	0.0000	---
Clifty Creek	3	Indiana	983_B_3	214	1955	wall	wet	0	0.0100	0.0279	Yes	0.0100	0.0000	---
Clifty Creek	4	Indiana	983_B_4	214	1955	wall	wet	0	0.0500	0.0279	No	0.0279	0.0221	ESP-4
Clifty Creek	5	Indiana	983_B_5	214	1955	wall	wet	0	0.0500	0.0279	No	0.0279	0.0221	ESP-4
Clifty Creek	6	Indiana	983_B_6	214	1956	wall	wet	0	0.0500	0.0279	No	0.0279	0.0221	ESP-4
Clinch River	1	Virginia	3775_B_1	234	1958	vertical	dry	0	0.0531	0.0279	No	0.0279	0.0252	ESP-4
Clinch River	2	Virginia	3775_B_2	234	1958	vertical	dry	0	0.0300	0.0279	No	0.0279	0.0021	ESP-1
Clinch River	3	Virginia	3775_B_3	234	1961	vertical	dry	0	0.0300	0.0279	No	0.0279	0.0021	ESP-1
Coal Creek	1	North Dakota	6030_B_1	554	1979	tangential	dry	0	0.0047	0.0279	Yes	0.0047	0.0000	---
Coal Creek	2	North Dakota	6030_B_2	560	1981	tangential	dry	0	0.0035	0.0279	Yes	0.0035	0.0000	---
Coffeen	01	Illinois	861_B_01	335	1965	cyclone	wet	0	0.0600	0.0279	No	0.0279	0.0321	ESP-4
Coffeen	02	Illinois	861_B_02	551	1972	cyclone	wet	0	0.0600	0.0279	No	0.0279	0.0321	ESP-4
Colbert	1	Alabama	47_B_1	177	1955	wall	dry	0	0.0100	0.0279	Yes	0.0100	0.0000	---
Colbert	2	Alabama	47_B_2	177	1955	wall	dry	0	0.0500	0.0279	No	0.0279	0.0221	ESP-4
Colbert	3	Alabama	47_B_3	177	1955	wall	dry	0	0.0114	0.0279	Yes	0.0114	0.0000	---
Colbert	4	Alabama	47_B_4	173	1955	wall	dry	0	0.0240	0.0279	Yes	0.0240	0.0000	---

Colbert	5	Alabama	47_B_5	459	1965	wall	dry	0	0.0200	0.0279	Yes	0.0200	0.0000	---
Columbia	1	Wisconsin	8023_B_1	546	1975	tangential	dry	0	0.0400	0.0279	No	0.0279	0.0121	ESP-3
Columbia	2	Wisconsin	8023_B_2	551	1978	tangential	dry	0	0.0300	0.0279	No	0.0279	0.0021	ESP-1
Conemaugh	1	Pennsylvani a	3118_B_1	850	1970	tangential	dry	0	0.0100	0.0279	Yes	0.0100	0.0000	---
Conemaugh	2	Pennsylvani a	3118_B_2	850	1971	tangential	dry	0	0.0200	0.0279	Yes	0.0200	0.0000	---
Conesville	3	Ohio	2840_B_3	165	1962	wall	dry	0	0.0491	0.0279	No	0.0279	0.0212	ESP-4
Conesville	4	Ohio	2840_B_4	780	1973	tangential	dry	0	0.0300	0.0279	No	0.0279	0.0021	ESP-1
Conesville	5	Ohio	2840_B_5	375	1976	tangential	dry	0	0.0300	0.0279	No	0.0279	0.0021	ESP-1
Conesville	6	Ohio	2840_B_6	375	1978	tangential	dry	0	0.0300	0.0279	No	0.0279	0.0021	ESP-1
Cooper	1	Kentucky	1384_B_1	116	1965	wall	dry	0	0.1700	0.0279	No	0.0279	0.1421	ESP-4
Cooper	2	Kentucky	1384_B_2	221	1969	wall	dry	0	0.1700	0.0279	No	0.0279	0.1421	ESP-4
Coronado	U1B	Arizona	6177_B_U1B	395	1979	wall	dry	0	0.0100	0.0279	Yes	0.0100	0.0000	---
Coronado	U2B	Arizona	6177_B_U2B	388	1980	wall	dry	0	0.0100	0.0279	Yes	0.0100	0.0000	---
Crawford	7	Illinois	867_B_7	212	1958	tangential	dry	0	0.0570	0.0279	No	0.0279	0.0291	ESP-4
Crawford	8	Illinois	867_B_8	318	1961	tangential	dry	0	0.0560	0.0279	No	0.0279	0.0281	ESP-4
Crist	4	Florida	641_B_4	78	1959	tangential	dry	0	0.0100	0.0279	Yes	0.0100	0.0000	---
Crist	5	Florida	641_B_5	78	1961	tangential	dry	0	0.0100	0.0279	Yes	0.0100	0.0000	---
Crist	6	Florida	641_B_6	300	1970	wall	dry	0	0.0100	0.0279	Yes	0.0100	0.0000	---
Crist	7	Florida	641_B_7	472	1973	wall	dry	0	0.0100	0.0279	Yes	0.0100	0.0000	---
Cross	1	South Carolina	130_B_1	620	1995	wall	dry	0	0.0140	0.0279	Yes	0.0140	0.0000	---
Cross	2	South Carolina	130_B_2	540	1984	tangential	dry	0	0.0160	0.0279	Yes	0.0160	0.0000	---
Cross	3	South Carolina	130_B_3	580	2007	wall	dry	0	0.0300	0.0279	No	0.0279	0.0021	ESP-1
Cross	4	South Carolina	130_B_4	600	2009	wall	dry	0	0.0300	0.0279	No	0.0279	0.0021	ESP-1
Crystal River	1	Florida	628_B_1	379	1966	tangential	dry	0	0.1470	0.0279	No	0.0279	0.1191	ESP-4
Crystal River	2	Florida	628_B_2	491	1969	tangential	dry	0	0.0100	0.0279	Yes	0.0100	0.0000	---
Crystal River	4	Florida	628_B_4	718	1982	wall	dry	0	0.1000	0.0279	No	0.0279	0.0721	ESP-4

Crystal River	5	Florida	628_B_5	717	1984	wall	dry	0	0.0200	0.0279	Yes	0.0200	0.0000	---
Cumberland	1	Tennessee	3399_B_1	1232	1973	cell	dry	0	0.0100	0.0279	Yes	0.0100	0.0000	---
Cumberland	2	Tennessee	3399_B_2	1233	1973	cell	dry	0	0.0100	0.0279	Yes	0.0100	0.0000	---
D B Wilson	W1	Kentucky	6823_B_W1	420	1986	wall	dry	0	0.0100	0.0279	Yes	0.0100	0.0000	---
Dale	1	Kentucky	1385_B_1	27	1954	wall	dry	0	0.0700	0.0279	No	0.0279	0.0421	ESP-4
Dale	2	Kentucky	1385_B_2	27	1954	wall	dry	0	0.0700	0.0279	No	0.0279	0.0421	ESP-4
Dale	3	Kentucky	1385_B_3	75	1957	wall	dry	0	0.1300	0.0279	No	0.0279	0.1021	ESP-4
Dale	4	Kentucky	1385_B_4	75	1960	wall	dry	0	0.1300	0.0279	No	0.0279	0.1021	ESP-4
Dallman	31	Illinois	963_B_31	86	1968	cyclone	wet	0	0.0200	0.0279	Yes	0.0200	0.0000	---
Dallman	32	Illinois	963_B_32	87	1972	cyclone	wet	0	0.0200	0.0279	Yes	0.0200	0.0000	---
Dallman	33	Illinois	963_B_33	199	1978	tangential	wet	0	0.1000	0.0279	No	0.0279	0.0721	ESP-4
Dan E Karn	1	Michigan	1702_B_1	255	1959	tangential	dry	0	0.0100	0.0279	Yes	0.0100	0.0000	---
Dan E Karn	2	Michigan	1702_B_2	260	1961	wall	dry	0	0.0400	0.0279	No	0.0279	0.0121	ESP-3
Danskammer Generating Station	3	New York	2480_B_3	133	1987	tangential	dry	0	0.0200	0.0279	Yes	0.0200	0.0000	---
Danskammer Generating Station	4	New York	2480_B_4	236	1987	tangential	dry	0	0.0200	0.0279	Yes	0.0200	0.0000	---
Dave Johnston	BW41	Wyoming	4158_B_BW41	106	1959	wall	dry	0	0.0500	0.0279	No	0.0279	0.0221	ESP-4
Dave Johnston	BW42	Wyoming	4158_B_BW42	106	1961	wall	dry	0	0.0100	0.0279	Yes	0.0100	0.0000	---
Dolet Hills	1	Louisiana	51_B_1	650	1986	wall	dry	0	0.0300	0.0279	No	0.0279	0.0021	ESP-1
Dolphus M Grainger	1	South Carolina	3317_B_1	85	1966	wall	dry	0	0.3600	0.0279	No	0.0279	0.3321	ESP-4
Dolphus M Grainger	2	South Carolina	3317_B_2	85	1966	wall	dry	0	0.1300	0.0279	No	0.0279	0.1021	ESP-4
Dubuque	1	Iowa	1046_B_1	35	1959	wall	dry	0	0.0500	0.0279	No	0.0279	0.0221	ESP-4
Dubuque	5	Iowa	1046_B_5	30	1952	wall	dry	0	0.0500	0.0279	No	0.0279	0.0221	ESP-4
Duck Creek	1	Illinois	6016_B_1	335	1976	wall	dry	0	0.0033	0.0279	Yes	0.0033	0.0000	---
E C Gaston	1	Alabama	26_B_1	254	1960	wall	dry	0	0.0100	0.0279	Yes	0.0100	0.0000	---
E C Gaston	4	Alabama	26_B_4	256	1962	wall	dry	0	0.0200	0.0279	Yes	0.0200	0.0000	---
E C Gaston	5	Alabama	26_B_5	849	1974	tangential	dry	0	0.0300	0.0279	No	0.0279	0.0021	ESP-1

E D Edwards	1	Illinois	856_B_1	112	1960	wall	dry	0	0.1300	0.0279	No	0.0279	0.1021	ESP-4
E D Edwards	2	Illinois	856_B_2	273	1968	wall	dry	0	0.0700	0.0279	No	0.0279	0.0421	ESP-4
E D Edwards	3	Illinois	856_B_3	364	1972	wall	dry	0	0.0400	0.0279	No	0.0279	0.0121	ESP-3
E W Brown	1	Kentucky	1355_B_1	92	1957	wall	dry	0	0.1400	0.0279	No	0.0279	0.1121	ESP-4
E W Brown	2	Kentucky	1355_B_2	158	1963	tangential	dry	0	0.0200	0.0279	Yes	0.0200	0.0000	---
E W Brown	3	Kentucky	1355_B_3	420	1971	tangential	dry	0	0.0200	0.0279	Yes	0.0200	0.0000	---
Eagle Valley	3	Indiana	991_B_3	43	1951	tangential	wet	0	0.0500	0.0279	No	0.0279	0.0221	ESP-4
Eagle Valley	4	Indiana	991_B_4	56	1953	tangential	dry	0	0.0500	0.0279	No	0.0279	0.0221	ESP-4
Eagle Valley	5	Indiana	991_B_5	62	1953	tangential	dry	0	0.0800	0.0279	No	0.0279	0.0521	ESP-4
Eagle Valley	6	Indiana	991_B_6	99	1956	tangential	dry	0	0.0800	0.0279	No	0.0279	0.0521	ESP-4
Earl F Wisdom	1	Iowa	1217_B_1	38	1960	wall	dry	0	0.0200	0.0279	Yes	0.0200	0.0000	---
East Bend	2	Kentucky	6018_B_2	600	1981	wall	dry	0	0.0087	0.0279	Yes	0.0087	0.0000	---
Eastlake	1	Ohio	2837_B_1	132	1953	tangential	dry	0	0.0057	0.0279	Yes	0.0057	0.0000	---
Eastlake	2	Ohio	2837_B_2	132	1953	tangential	dry	0	0.0100	0.0279	Yes	0.0100	0.0000	---
Eastlake	3	Ohio	2837_B_3	132	1954	tangential	dry	0	0.0056	0.0279	Yes	0.0056	0.0000	---
Eastlake	4	Ohio	2837_B_4	240	1956	tangential	dry	0	0.0200	0.0279	Yes	0.0200	0.0000	---
Eastlake	5	Ohio	2837_B_5	597	1972	wall	dry	0	0.0200	0.0279	Yes	0.0200	0.0000	---
Eckert Station	1	Michigan	1831_B_1	40	1954	wall	dry	0	0.1000	0.0279	No	0.0279	0.0721	ESP-4
Eckert Station	2	Michigan	1831_B_2	42	1958	tangential	dry	0	0.0300	0.0279	No	0.0279	0.0021	ESP-1
Eckert Station	3	Michigan	1831_B_3	41	1961	tangential	dry	0	0.1400	0.0279	No	0.0279	0.1121	ESP-4
Eckert Station	4	Michigan	1831_B_4	69	1964	wall	dry	0	0.0400	0.0279	No	0.0279	0.0121	ESP-3
Eckert Station	5	Michigan	1831_B_5	69	1968	wall	dry	0	0.0400	0.0279	No	0.0279	0.0121	ESP-3
Eckert Station	6	Michigan	1831_B_6	67	1970	wall	dry	0	0.0400	0.0279	No	0.0279	0.0121	ESP-3
Edge Moor	3	Delaware	593_B_3	86	1957	tangential	dry	1	0.0500	0.0279	No	0.0279	0.0221	---
Edge Moor	4	Delaware	593_B_4	174	1966	tangential	dry	1	0.0500	0.0279	No	0.0279	0.0221	---
Edgewater	3	Wisconsin	4050_B_3	76	1951	cyclone	wet	0	0.0500	0.0279	No	0.0279	0.0221	ESP-4
Edgewater	4	Wisconsin	4050_B_4	321	1969	cyclone	wet	0	0.0400	0.0279	No	0.0279	0.0121	ESP-3

Edgewater	5	Wisconsin	4050_B_5	412	1985	wall	dry	0	0.0300	0.0279	No	0.0279	0.0021	ESP-1
Elmer Smith	1	Kentucky	1374_B_1	130	1964	cyclone	wet	0	0.0147	0.0279	Yes	0.0147	0.0000	---
Elmer Smith	2	Kentucky	1374_B_2	257	1974	tangential	dry	0	0.0147	0.0279	Yes	0.0147	0.0000	---
Elrama	1	Pennsylvania	3098_B_1	93	1952	vertical	dry	0	0.0184	0.0279	Yes	0.0184	0.0000	---
Elrama	2	Pennsylvania	3098_B_2	93	1953	vertical	dry	0	0.0184	0.0279	Yes	0.0184	0.0000	---
Elrama	3	Pennsylvania	3098_B_3	103	1952	vertical	dry	0	0.0184	0.0279	Yes	0.0184	0.0000	---
Elrama	4	Pennsylvania	3098_B_4	171	1952	wall	dry	0	0.0184	0.0279	Yes	0.0184	0.0000	---
Endicott Station	1	Michigan	4259_B_1	55	1982	wall	dry	0	1.7300	0.0279	No	0.0279	1.7021	ESP-4
Erickson Station	1	Michigan	1832_B_1	152	1973	wall	dry	0	0.0100	0.0279	Yes	0.0100	0.0000	---
Fair Station	2	Iowa	1218_B_2	41	1967	wall	dry	0	0.0300	0.0279	No	0.0279	0.0021	ESP-1
Fayette Power Project	1	Texas	6179_B_1	590	1979	tangential	dry	0	0.0300	0.0279	No	0.0279	0.0021	ESP-1
Fayette Power Project	2	Texas	6179_B_2	590	1980	tangential	dry	0	0.0300	0.0279	No	0.0279	0.0021	ESP-1
Fayette Power Project	3	Texas	6179_B_3	445	1988	tangential	dry	0	0.0300	0.0279	No	0.0279	0.0021	ESP-1
Fisk Street	19	Illinois	886_B_19	325	1959	tangential	dry	0	0.0780	0.0279	No	0.0279	0.0501	ESP-4
Flint Creek	1	Arkansas	6138_B_1	528	1978	wall	dry	0	0.0300	0.0279	No	0.0279	0.0021	ESP-1
Fort Martin Power Station	1	West Virginia	3943_B_1	545	1967	tangential	dry	0	0.0500	0.0279	No	0.0279	0.0221	ESP-4
Fort Martin Power Station	2	West Virginia	3943_B_2	547	1968	wall	dry	0	0.0500	0.0279	No	0.0279	0.0221	ESP-4
Frank E Ratts	1SG1	Indiana	1043_B_1SG1	122	1970	wall	dry	0	0.3400	0.0279	No	0.0279	0.3121	ESP-4
Frank E Ratts	2SG1	Indiana	1043_B_2SG1	121	1970	wall	dry	0	0.3000	0.0279	No	0.0279	0.2721	ESP-4
G F Weaton Power Station	BLR1	Pennsylvania	50130_B_BLR1	56	1957	tangential	dry	0	0.0200	0.0279	Yes	0.0200	0.0000	---
G F Weaton Power Station	BLR2	Pennsylvania	50130_B_BLR2	56	1957	tangential	dry	0	0.0100	0.0279	Yes	0.0100	0.0000	---
G G Allen	1	North Carolina	2718_B_1	162	1957	tangential	dry	0	0.0400	0.0279	No	0.0279	0.0121	ESP-3
G G Allen	2	North Carolina	2718_B_2	162	1957	tangential	dry	0	0.1400	0.0279	No	0.0279	0.1121	ESP-4
G G Allen	3	North Carolina	2718_B_3	260	1959	tangential	dry	0	0.0041	0.0279	Yes	0.0041	0.0000	---
G G Allen	4	North Carolina	2718_B_4	275	1960	tangential	dry	0	0.0041	0.0279	Yes	0.0041	0.0000	---

G G Allen	5	North Carolina	2718_B_5	265	1961	tangential	dry	0	0.0400	0.0279	No	0.0279	0.0121	ESP-3
Gadsden	1	Alabama	7_B_1	64	1949	tangential	dry	0	0.0300	0.0279	No	0.0279	0.0021	ESP-1
Gadsden	2	Alabama	7_B_2	66	1949	tangential	dry	0	0.0400	0.0279	No	0.0279	0.0121	ESP-3
Gallatin	1	Tennessee	3403_B_1	222	1956	tangential	dry	0	0.0100	0.0279	Yes	0.0100	0.0000	---
Gallatin	2	Tennessee	3403_B_2	222	1957	tangential	dry	0	0.0393	0.0279	No	0.0279	0.0114	ESP-3
Gallatin	3	Tennessee	3403_B_3	260	1959	tangential	dry	0	0.0100	0.0279	Yes	0.0100	0.0000	---
Gallatin	4	Tennessee	3403_B_4	260	1959	tangential	dry	0	0.0100	0.0279	Yes	0.0100	0.0000	---
General James M Gavin	1	Ohio	8102_B_1	1310	1974	cell	dry	0	0.0300	0.0279	No	0.0279	0.0021	ESP-1
General James M Gavin	2	Ohio	8102_B_2	1300	1975	cell	dry	0	0.0300	0.0279	No	0.0279	0.0021	ESP-1
George Neal North	1	Iowa	1091_B_1	135	1964	cyclone	wet	0	0.1700	0.0279	No	0.0279	0.1421	ESP-4
George Neal North	2	Iowa	1091_B_2	300	1972	wall	dry	0	0.2300	0.0279	No	0.0279	0.2021	ESP-4
George Neal North	3	Iowa	1091_B_3	515	1975	wall	dry	0	0.0300	0.0279	No	0.0279	0.0021	ESP-1
George Neal South	4	Iowa	7343_B_4	632	1979	wall	dry	0	0.0300	0.0279	No	0.0279	0.0021	ESP-1
Ghent	1	Kentucky	1356_B_1	468	1973	tangential	dry	0	0.0600	0.0279	No	0.0279	0.0321	ESP-4
Ghent	2	Kentucky	1356_B_2	463	1977	tangential	dry	0	0.0700	0.0279	No	0.0279	0.0421	ESP-4
Ghent	3	Kentucky	1356_B_3	472	1981	wall	dry	0	0.0300	0.0279	No	0.0279	0.0021	ESP-1
Ghent	4	Kentucky	1356_B_4	472	1984	wall	dry	0	0.0200	0.0279	Yes	0.0200	0.0000	---
Gibbons Creek	1	Texas	6136_B_1	462	1983	tangential	dry	0	0.3000	0.0279	No	0.0279	0.2721	ESP-4
Gibson	1	Indiana	6113_B_1	621	1975	wall	dry	0	0.0067	0.0279	Yes	0.0067	0.0000	---
Gibson	2	Indiana	6113_B_2	619	1975	wall	dry	0	0.0038	0.0279	Yes	0.0038	0.0000	---
Gibson	3	Indiana	6113_B_3	619	1978	wall	dry	0	0.0400	0.0279	No	0.0279	0.0121	ESP-3
Gibson	4	Indiana	6113_B_4	622	1979	wall	dry	0	0.0500	0.0279	No	0.0279	0.0221	ESP-4
Gibson	5	Indiana	6113_B_5	620	1982	wall	dry	0	0.0900	0.0279	No	0.0279	0.0621	ESP-4
Glen Lyn	51	Virginia	3776_B_51	45	1944	tangential	dry	0	0.0300	0.0279	No	0.0279	0.0021	ESP-1
Glen Lyn	52	Virginia	3776_B_52	45	1944	tangential	dry	0	0.0300	0.0279	No	0.0279	0.0021	ESP-1
Glen Lyn	6	Virginia	3776_B_6	235	1957	wall	dry	0	0.0300	0.0279	No	0.0279	0.0021	ESP-1
Gorgas	10	Alabama	8_B_10	681	1972	tangential	dry	0	0.0200	0.0279	Yes	0.0200	0.0000	---

Gorgas	6	Alabama	8_B_6	108	1951	wall	dry	0	0.0600	0.0279	No	0.0279	0.0321	ESP-4
Gorgas	7	Alabama	8_B_7	109	1952	wall	dry	0	0.0300	0.0279	No	0.0279	0.0021	ESP-1
Gorgas	8	Alabama	8_B_8	163	1956	tangential	dry	0	0.0100	0.0279	Yes	0.0100	0.0000	---
Gorgas	9	Alabama	8_B_9	173	1958	tangential	dry	0	0.0200	0.0279	Yes	0.0200	0.0000	---
GRDA	1	Oklahoma	165_B_1	490	1982	wall	dry	0	0.0400	0.0279	No	0.0279	0.0121	ESP-3
GRDA	2	Oklahoma	165_B_2	520	1986	wall	dry	1	0.0200	0.0279	Yes	0.0200	0.0000	---
Green River	4	Kentucky	1357_B_4	68	1954	wall	dry	0	0.0900	0.0279	No	0.0279	0.0621	ESP-4
Green River	5	Kentucky	1357_B_5	95	1959	wall	dry	0	0.0600	0.0279	No	0.0279	0.0321	ESP-4
Greene County	1	Alabama	10_B_1	254	1965	wall	dry	0	0.0140	0.0279	Yes	0.0140	0.0000	---
Greene County	2	Alabama	10_B_2	243	1966	wall	dry	0	0.0160	0.0279	Yes	0.0160	0.0000	---
H B Robinson	1	South Carolina	3251_B_1	176	1960	tangential	dry	0	0.0800	0.0279	No	0.0279	0.0521	ESP-4
H L Spurlock	1	Kentucky	6041_B_1	315	1977	wall	dry	0	0.0065	0.0279	Yes	0.0065	0.0000	---
H L Spurlock	2	Kentucky	6041_B_2	509	1981	tangential	dry	0	0.0065	0.0279	Yes	0.0065	0.0000	---
Hamilton	8	Ohio	2917_B_8	33	1964	wall	dry	0	0.0400	0.0279	No	0.0279	0.0121	ESP-3
Hammond	1	Georgia	708_B_1	112	1954	wall	dry	0	0.0430	0.0279	No	0.0279	0.0151	ESP-3
Hammond	2	Georgia	708_B_2	112	1954	wall	dry	0	0.0430	0.0279	No	0.0279	0.0151	ESP-3
Hammond	3	Georgia	708_B_3	112	1955	wall	dry	0	0.0430	0.0279	No	0.0279	0.0151	ESP-3
Hammond	4	Georgia	708_B_4	510	1970	wall	dry	0	0.0190	0.0279	Yes	0.0190	0.0000	---
Harbor Beach	1	Michigan	1731_B_1	103	1968	wall	dry	0	0.0900	0.0279	No	0.0279	0.0621	ESP-4
Harding Street	50	Indiana	990_B_50	109	1958	tangential	dry	0	0.0049	0.0279	Yes	0.0049	0.0000	---
Harding Street	60	Indiana	990_B_60	109	1961	tangential	dry	0	0.0021	0.0279	Yes	0.0021	0.0000	---
Harding Street	70	Indiana	990_B_70	429	1973	tangential	dry	0	0.0168	0.0279	Yes	0.0168	0.0000	---
Harllee Branch	1	Georgia	709_B_1	261	1965	cell	dry	0	0.0100	0.0279	Yes	0.0100	0.0000	---
Harllee Branch	2	Georgia	709_B_2	319	1967	wall	dry	0	0.0100	0.0279	Yes	0.0100	0.0000	---
Harllee Branch	3	Georgia	709_B_3	499	1968	cell	dry	0	0.0500	0.0279	No	0.0279	0.0221	ESP-4
Harllee Branch	4	Georgia	709_B_4	497	1969	cell	dry	0	0.0500	0.0279	No	0.0279	0.0221	ESP-4
Harrington	061B	Texas	6193_B_061B	347	1976	tangential	dry	0	0.0400	0.0279	No	0.0279	0.0121	ESP-3

Harrison Power Station	1	West Virginia	3944_B_1	643	1972	wall	dry	0	0.0200	0.0279	Yes	0.0200	0.0000	---
Harrison Power Station	2	West Virginia	3944_B_2	633	1973	wall	dry	0	0.0200	0.0279	Yes	0.0200	0.0000	---
Harrison Power Station	3	West Virginia	3944_B_3	642	1974	wall	dry	0	0.0100	0.0279	Yes	0.0100	0.0000	---
Hatfields Ferry Power Station	1	Pennsylvania	3179_B_1	523	1969	cell	dry	0	0.0323	0.0279	No	0.0279	0.0044	ESP-1
Hatfields Ferry Power Station	2	Pennsylvania	3179_B_2	523	1970	cell	dry	0	0.0200	0.0279	Yes	0.0200	0.0000	---
Hatfields Ferry Power Station	3	Pennsylvania	3179_B_3	523	1971	cell	dry	0	0.0200	0.0279	Yes	0.0200	0.0000	---
Herbert A Wagner	2	Maryland	1554_B_2	135	1959	wall	dry	0	0.0017	0.0279	Yes	0.0017	0.0000	---
Herbert A Wagner	3	Maryland	1554_B_3	324	1966	wall	dry	0	0.0100	0.0279	Yes	0.0100	0.0000	---
HMP&L Station Two Henderson	H1	Kentucky	1382_B_H1	151	1973	wall	dry	0	0.0700	0.0279	No	0.0279	0.0421	ESP-4
HMP&L Station Two Henderson	H2	Kentucky	1382_B_H2	157	1974	wall	dry	0	0.0700	0.0279	No	0.0279	0.0421	ESP-4
Homer City Station	1	Pennsylvania	3122_B_1	612	1969	wall	dry	0	0.0300	0.0279	No	0.0279	0.0021	ESP-1
Homer City Station	2	Pennsylvania	3122_B_2	606	1970	wall	dry	0	0.0300	0.0279	No	0.0279	0.0021	ESP-1
Homer City Station	3	Pennsylvania	3122_B_3	641	1977	wall	dry	0	0.0600	0.0279	No	0.0279	0.0321	ESP-4
Hoot Lake	2	Minnesota	1943_B_2	60	1959	tangential	dry	0	0.0812	0.0279	No	0.0279	0.0533	ESP-4
Hoot Lake	3	Minnesota	1943_B_3	84	1964	wall	dry	0	0.0812	0.0279	No	0.0279	0.0533	ESP-4
Hugo	1	Oklahoma	6772_B_1	440	1982	wall	dry	0	0.0100	0.0279	Yes	0.0100	0.0000	---
Hunter	1	Utah	6165_B_1	430	1978	tangential	dry	0	0.0100	0.0279	Yes	0.0100	0.0000	---
Hunter	2	Utah	6165_B_2	430	1980	tangential	dry	0	0.0300	0.0279	No	0.0279	0.0021	ESP-1
Hutsonville	05	Illinois	863_B_05	76	1953	tangential	dry	0	0.0300	0.0279	No	0.0279	0.0021	ESP-1
Hutsonville	06	Illinois	863_B_06	77	1954	tangential	dry	0	0.0300	0.0279	No	0.0279	0.0021	ESP-1
Independence	1	Arkansas	6641_B_1	836	1983	tangential	wet	0	0.0400	0.0279	No	0.0279	0.0121	ESP-3
Independence	2	Arkansas	6641_B_2	842	1985	tangential	wet	0	0.0400	0.0279	No	0.0279	0.0121	ESP-3
J B Sims	3	Michigan	1825_B_3	73	1983	wall	dry	0	0.0300	0.0279	No	0.0279	0.0021	ESP-1
J C Weadock	7	Michigan	1720_B_7	151	1955	tangential	dry	0	0.0500	0.0279	No	0.0279	0.0221	ESP-4
J C Weadock	8	Michigan	1720_B_8	151	1958	tangential	dry	0	0.0400	0.0279	No	0.0279	0.0121	ESP-3

J E Corette Plant	2	Montana	2187_B_2	158	1968	tangential	dry	0	0.2700	0.0279	No	0.0279	0.2421	ESP-4
J H Campbell	1	Michigan	1710_B_1	260	1962	tangential	dry	0	0.0111	0.0279	Yes	0.0111	0.0000	---
J H Campbell	2	Michigan	1710_B_2	353	1967	wall	dry	0	0.0111	0.0279	Yes	0.0111	0.0000	---
J H Campbell	3	Michigan	1710_B_3	822	1980	wall	dry	0	0.0100	0.0279	Yes	0.0100	0.0000	---
J M Stuart	1	Ohio	2850_B_1	597	1971	cell	dry	0	0.0500	0.0279	No	0.0279	0.0221	ESP-4
J M Stuart	2	Ohio	2850_B_2	597	1970	cell	dry	0	0.0500	0.0279	No	0.0279	0.0221	ESP-4
J M Stuart	3	Ohio	2850_B_3	597	1972	cell	dry	0	0.0700	0.0279	No	0.0279	0.0421	ESP-4
J M Stuart	4	Ohio	2850_B_4	597	1974	cell	dry	0	0.0200	0.0279	Yes	0.0200	0.0000	---
J R Whiting	1	Michigan	1723_B_1	102	1952	wall	dry	0	0.1600	0.0279	No	0.0279	0.1321	ESP-4
J R Whiting	2	Michigan	1723_B_2	102	1952	wall	dry	0	0.1400	0.0279	No	0.0279	0.1121	ESP-4
J R Whiting	3	Michigan	1723_B_3	124	1953	wall	dry	0	0.1300	0.0279	No	0.0279	0.1021	ESP-4
Jack Watson	4	Mississippi	2049_B_4	230	1968	wall	dry	0	0.0400	0.0279	No	0.0279	0.0121	ESP-3
Jack Watson	5	Mississippi	2049_B_5	476	1973	wall	dry	0	0.0400	0.0279	No	0.0279	0.0121	ESP-3
James De Young	5	Michigan	1830_B_5	27	1969	wall	dry	0	0.0300	0.0279	No	0.0279	0.0021	ESP-1
James H Miller Jr	1	Alabama	6002_B_1	674	1978	wall	dry	0	0.0100	0.0279	Yes	0.0100	0.0000	---
James H Miller Jr	2	Alabama	6002_B_2	687	1985	wall	dry	0	0.0200	0.0279	Yes	0.0200	0.0000	---
James H Miller Jr	3	Alabama	6002_B_3	687	1989	wall	dry	0	0.0100	0.0279	Yes	0.0100	0.0000	---
James H Miller Jr	4	Alabama	6002_B_4	688	1991	wall	dry	0	0.0040	0.0279	Yes	0.0040	0.0000	---
James River Power Station	3	Missouri	2161_B_3	41	1960	wall	dry	0	0.1100	0.0279	No	0.0279	0.0821	ESP-4
James River Power Station	4	Missouri	2161_B_4	56	1964	wall	dry	0	0.1000	0.0279	No	0.0279	0.0721	ESP-4
James River Power Station	5	Missouri	2161_B_5	97	1970	wall	dry	0	0.0113	0.0279	Yes	0.0113	0.0000	---
Jefferies	3	South Carolina	3319_B_3	153	1970	wall	dry	0	0.0000	0.0279	Yes	0.0000	0.0000	---
Jefferies	4	South Carolina	3319_B_4	153	1970	wall	dry	0	0.0000	0.0279	Yes	0.0000	0.0000	---
Jeffrey Energy Center	1	Kansas	6068_B_1	726	1978	tangential	dry	0	0.0600	0.0279	No	0.0279	0.0321	ESP-4
Jeffrey Energy Center	2	Kansas	6068_B_2	727	1980	tangential	dry	0	0.0300	0.0279	No	0.0279	0.0021	ESP-1
Jeffrey Energy Center	3	Kansas	6068_B_3	727	1983	tangential	dry	0	0.0200	0.0279	Yes	0.0200	0.0000	---

Jim Bridger	BW71	Wyoming	8066_B_BW71	530	1974	tangential	dry	0	0.0100	0.0279	Yes	0.0100	0.0000	---
Jim Bridger	BW72	Wyoming	8066_B_BW72	530	1975	tangential	dry	0	0.0100	0.0279	Yes	0.0100	0.0000	---
Jim Bridger	BW73	Wyoming	8066_B_BW73	530	1976	tangential	dry	0	0.0200	0.0279	Yes	0.0200	0.0000	---
Jim Bridger	BW74	Wyoming	8066_B_BW74	530	1979	tangential	dry	0	0.0100	0.0279	Yes	0.0100	0.0000	---
John E Amos	1	West Virginia	3935_B_1	800	1971	wall	dry	0	0.0300	0.0279	No	0.0279	0.0021	ESP-1
John E Amos	2	West Virginia	3935_B_2	789	1972	wall	dry	0	0.0300	0.0279	No	0.0279	0.0021	ESP-1
John E Amos	3	West Virginia	3935_B_3	1282	1973	cell	dry	0	0.0300	0.0279	No	0.0279	0.0021	ESP-1
John Sevier	2	Tennessee	3405_B_2	176	1955	tangential	dry	0	0.0100	0.0279	Yes	0.0100	0.0000	---
John Sevier	3	Tennessee	3405_B_3	176	1956	tangential	dry	0	0.0100	0.0279	Yes	0.0100	0.0000	---
John Sevier	4	Tennessee	3405_B_4	176	1957	tangential	dry	0	0.0100	0.0279	Yes	0.0100	0.0000	---
Johnsonville	1	Tennessee	3406_B_1	106	1951	tangential	dry	0	0.0200	0.0279	Yes	0.0200	0.0000	---
Johnsonville	10	Tennessee	3406_B_10	141	1959	wall	dry	0	0.0200	0.0279	Yes	0.0200	0.0000	---
Johnsonville	2	Tennessee	3406_B_2	106	1951	tangential	dry	0	0.0200	0.0279	Yes	0.0200	0.0000	---
Johnsonville	3	Tennessee	3406_B_3	106	1952	tangential	dry	0	0.0200	0.0279	Yes	0.0200	0.0000	---
Johnsonville	4	Tennessee	3406_B_4	106	1952	tangential	dry	0	0.0200	0.0279	Yes	0.0200	0.0000	---
Johnsonville	5	Tennessee	3406_B_5	106	1952	tangential	dry	0	0.0200	0.0279	Yes	0.0200	0.0000	---
Johnsonville	6	Tennessee	3406_B_6	106	1953	tangential	dry	0	0.0200	0.0279	Yes	0.0200	0.0000	---
Johnsonville	7	Tennessee	3406_B_7	141	1958	wall	dry	0	0.0200	0.0279	Yes	0.0200	0.0000	---
Johnsonville	8	Tennessee	3406_B_8	141	1959	wall	dry	0	0.0200	0.0279	Yes	0.0200	0.0000	---
Johnsonville	9	Tennessee	3406_B_9	141	1959	wall	dry	0	0.0200	0.0279	Yes	0.0200	0.0000	---
Joliet 29	71	Illinois	384_B_71	258	1965	tangential	dry	0	0.0650	0.0279	No	0.0279	0.0371	ESP-4
Joliet 29	72	Illinois	384_B_72	258	1965	tangential	dry	0	0.0650	0.0279	No	0.0279	0.0371	ESP-4
Joliet 29	81	Illinois	384_B_81	258	1965	tangential	dry	0	0.0490	0.0279	No	0.0279	0.0211	ESP-4
Joliet 29	82	Illinois	384_B_82	258	1965	tangential	dry	0	0.0490	0.0279	No	0.0279	0.0211	ESP-4
Joliet 9	5	Illinois	874_B_5	311	1959	cyclone	wet	0	0.0588	0.0279	No	0.0279	0.0309	ESP-4
Joppa Steam	1	Illinois	887_B_1	167	1953	tangential	dry	0	0.0200	0.0279	Yes	0.0200	0.0000	---
Joppa Steam	2	Illinois	887_B_2	167	1953	tangential	dry	0	0.0200	0.0279	Yes	0.0200	0.0000	---

Joppa Steam	3	Illinois	887_B_3	167	1954	tangential	dry	0	0.0400	0.0279	No	0.0279	0.0121	ESP-3
Joppa Steam	4	Illinois	887_B_4	167	1954	tangential	dry	0	0.0400	0.0279	No	0.0279	0.0121	ESP-3
Joppa Steam	5	Illinois	887_B_5	167	1955	tangential	dry	0	0.0400	0.0279	No	0.0279	0.0121	ESP-3
Joppa Steam	6	Illinois	887_B_6	167	1955	tangential	dry	0	0.0400	0.0279	No	0.0279	0.0121	ESP-3
Kammer	1	West Virginia	3947_B_1	206	1958	cyclone	wet	0	0.0300	0.0279	No	0.0279	0.0021	ESP-1
Kammer	2	West Virginia	3947_B_2	206	1958	cyclone	wet	0	0.0300	0.0279	No	0.0279	0.0021	ESP-1
Kammer	3	West Virginia	3947_B_3	206	1959	cyclone	wet	0	0.0300	0.0279	No	0.0279	0.0021	ESP-1
Kanawha River	1	West Virginia	3936_B_1	204	1953	vertical	dry	0	0.0300	0.0279	No	0.0279	0.0021	ESP-1
Kanawha River	2	West Virginia	3936_B_2	204	1953	vertical	dry	0	0.0300	0.0279	No	0.0279	0.0021	ESP-1
Kenneth C Coleman	C1	Kentucky	1381_B_C1	148	1969	wall	dry	0	0.1400	0.0279	No	0.0279	0.1121	ESP-4
Kenneth C Coleman	C2	Kentucky	1381_B_C2	148	1970	wall	dry	0	0.1900	0.0279	No	0.0279	0.1621	ESP-4
Kenneth C Coleman	C3	Kentucky	1381_B_C3	153	1971	wall	dry	0	0.1200	0.0279	No	0.0279	0.0921	ESP-4
Keystone	1	Pennsylvania	3136_B_1	839	1967	tangential	dry	0	0.0800	0.0279	No	0.0279	0.0521	ESP-4
Keystone	2	Pennsylvania	3136_B_2	839	1968	tangential	dry	0	0.0600	0.0279	No	0.0279	0.0321	ESP-4
Killen Station	2	Ohio	6031_B_2	608	1982	wall	dry	0	0.0300	0.0279	No	0.0279	0.0021	ESP-1
Kincaid Generation LLC	1	Illinois	876_B_1	584	1967	cyclone	wet	0	0.0100	0.0279	Yes	0.0100	0.0000	---
Kincaid Generation LLC	2	Illinois	876_B_2	584	1968	cyclone	wet	0	0.0100	0.0279	Yes	0.0100	0.0000	---
Kingston	1	Tennessee	3407_B_1	134	1954	tangential	dry	0	0.0100	0.0279	Yes	0.0100	0.0000	---
Kingston	2	Tennessee	3407_B_2	134	1954	tangential	dry	0	0.0100	0.0279	Yes	0.0100	0.0000	---
Kingston	3	Tennessee	3407_B_3	134	1954	tangential	dry	0	0.0100	0.0279	Yes	0.0100	0.0000	---
Kingston	4	Tennessee	3407_B_4	134	1954	tangential	dry	0	0.0100	0.0279	Yes	0.0100	0.0000	---
Kingston	5	Tennessee	3407_B_5	175	1955	tangential	dry	0	0.0100	0.0279	Yes	0.0100	0.0000	---
Kingston	6	Tennessee	3407_B_6	175	1955	tangential	dry	0	0.0200	0.0279	Yes	0.0200	0.0000	---
Kingston	7	Tennessee	3407_B_7	175	1955	tangential	dry	0	0.0200	0.0279	Yes	0.0200	0.0000	---
Kingston	8	Tennessee	3407_B_8	175	1955	tangential	dry	0	0.0200	0.0279	Yes	0.0200	0.0000	---
Kingston	9	Tennessee	3407_B_9	175	1955	tangential	dry	0	0.0200	0.0279	Yes	0.0200	0.0000	---

Kraft	1	Georgia	733_B_1	48	1958	tangential	dry	0	0.0200	0.0279	Yes	0.0200	0.0000	---
Kraft	2	Georgia	733_B_2	52	1961	tangential	dry	0	0.0170	0.0279	Yes	0.0170	0.0000	---
Kraft	3	Georgia	733_B_3	102	1965	tangential	dry	0	0.0430	0.0279	No	0.0279	0.0151	ESP-3
KUCC	1	Utah	56163_B_1	30	1944	wall	wet	0	0.0300	0.0279	No	0.0279	0.0021	ESP-1
KUCC	2	Utah	56163_B_2	30	1945	wall	wet	0	0.0300	0.0279	No	0.0279	0.0021	ESP-1
KUCC	3	Utah	56163_B_3	30	1945	wall	wet	0	0.0300	0.0279	No	0.0279	0.0021	ESP-1
KUCC	4	Utah	56163_B_4	65	1959	tangential	dry	0	0.0300	0.0279	No	0.0279	0.0021	ESP-1
Kyger Creek	1	Ohio	2876_B_1	214	1955	wall	wet	0	0.0500	0.0279	No	0.0279	0.0221	ESP-4
Kyger Creek	2	Ohio	2876_B_2	214	1955	wall	wet	0	0.0300	0.0279	No	0.0279	0.0021	ESP-1
Kyger Creek	3	Ohio	2876_B_3	214	1955	wall	wet	0	0.0400	0.0279	No	0.0279	0.0121	ESP-3
Kyger Creek	4	Ohio	2876_B_4	214	1955	wall	wet	0	0.0100	0.0279	Yes	0.0100	0.0000	---
Kyger Creek	5	Ohio	2876_B_5	214	1955	wall	wet	0	0.0500	0.0279	No	0.0279	0.0221	ESP-4
La Cygne	2	Kansas	1241_B_2	682	1977	wall	dry	0	0.0200	0.0279	Yes	0.0200	0.0000	---
Labadie	1	Missouri	2103_B_1	597	1970	tangential	dry	0	0.0400	0.0279	No	0.0279	0.0121	ESP-3
Labadie	2	Missouri	2103_B_2	594	1971	tangential	dry	0	0.0300	0.0279	No	0.0279	0.0021	ESP-1
Labadie	3	Missouri	2103_B_3	612	1972	tangential	dry	0	0.0300	0.0279	No	0.0279	0.0021	ESP-1
Labadie	4	Missouri	2103_B_4	612	1973	tangential	dry	0	0.0200	0.0279	Yes	0.0200	0.0000	---
Lake Road	6	Missouri	2098_B_6	97	1967	cyclone	wet	0	0.0200	0.0279	Yes	0.0200	0.0000	---
Lake Shore	18	Ohio	2838_B_18	245	1962	tangential	dry	0	0.0500	0.0279	No	0.0279	0.0221	ESP-4
Lansing	4	Iowa	1047_B_4	260	1977	wall	dry	0	0.0900	0.0279	No	0.0279	0.0621	ESP-4
Lansing Smith	1	Florida	643_B_1	162	1965	tangential	dry	0	0.0200	0.0279	Yes	0.0200	0.0000	---
Lansing Smith	2	Florida	643_B_2	195	1967	tangential	dry	0	0.0100	0.0279	Yes	0.0100	0.0000	---
Laramie River Station	1	Wyoming	6204_B_1	565	1980	wall	dry	0	0.0100	0.0279	Yes	0.0100	0.0000	---
Laramie River Station	2	Wyoming	6204_B_2	570	1981	wall	dry	0	0.0100	0.0279	Yes	0.0100	0.0000	---
Laramie River Station	3	Wyoming	6204_B_3	570	1982	wall	dry	1	0.0100	0.0279	Yes	0.0100	0.0000	---
Lawrence Energy Center	3	Kansas	1250_B_3	48	1955	tangential	dry	0	0.0300	0.0279	No	0.0279	0.0021	ESP-1
Leland Olds	1	North Dakota	2817_B_1	221	1966	wall	dry	0	0.0100	0.0279	Yes	0.0100	0.0000	---

Leland Olds	2	North Dakota	2817_B_2	448	1975	cyclone	wet	0	0.0100	0.0279	Yes	0.0100	0.0000	---
Limestone	LIM1	Texas	298_B_LIM1	830	1985	tangential	dry	0	0.0100	0.0279	Yes	0.0100	0.0000	---
Limestone	LIM2	Texas	298_B_LIM2	857	1986	tangential	dry	0	0.0100	0.0279	Yes	0.0100	0.0000	---
Lon Wright	8	Nebraska	2240_B_8	85	1976	wall	dry	0	0.1200	0.0279	No	0.0279	0.0921	ESP-4
Marion	4	Illinois	976_B_4	170	1978	cyclone	wet	0	0.0400	0.0279	No	0.0279	0.0121	ESP-3
Marshall	1	North Carolina	2727_B_1	378	1965	tangential	dry	0	0.0200	0.0279	Yes	0.0200	0.0000	---
Marshall	2	North Carolina	2727_B_2	378	1966	tangential	dry	0	0.0200	0.0279	Yes	0.0200	0.0000	---
Marshall	3	North Carolina	2727_B_3	657	1969	tangential	dry	0	0.0600	0.0279	No	0.0279	0.0321	ESP-4
Marshall	4	North Carolina	2727_B_4	657	1970	tangential	dry	0	0.0200	0.0279	Yes	0.0200	0.0000	---
Martin Lake	1	Texas	6146_B_1	750	1977	tangential	wet	0	0.0100	0.0279	Yes	0.0100	0.0000	---
Martin Lake	2	Texas	6146_B_2	750	1978	tangential	wet	0	0.0100	0.0279	Yes	0.0100	0.0000	---
Martin Lake	3	Texas	6146_B_3	750	1979	tangential	wet	0	0.0100	0.0279	Yes	0.0100	0.0000	---
Mayo	1A	North Carolina	6250_B_1A	371	1983	wall	dry	0	0.0600	0.0279	No	0.0279	0.0321	ESP-4
Mayo	1B	North Carolina	6250_B_1B	371	1983	wall	dry	0	0.0600	0.0279	No	0.0279	0.0321	ESP-4
McIntosh	1	Georgia	6124_B_1	157	1979	wall	dry	0	0.0200	0.0279	Yes	0.0200	0.0000	---
Meramec	1	Missouri	2104_B_1	122	1953	tangential	dry	0	0.0300	0.0279	No	0.0279	0.0021	ESP-1
Meramec	2	Missouri	2104_B_2	120	1954	tangential	dry	0	0.0100	0.0279	Yes	0.0100	0.0000	---
Meramec	3	Missouri	2104_B_3	269	1959	wall	dry	0	0.0200	0.0279	Yes	0.0200	0.0000	---
Meramec	4	Missouri	2104_B_4	347	1961	wall	dry	0	0.0100	0.0279	Yes	0.0100	0.0000	---
Meredosia	05	Illinois	864_B_05	203	1960	tangential	dry	0	0.0319	0.0279	No	0.0279	0.0040	ESP-1
Merom	1SG1	Indiana	6213_B_1SG1	507	1983	wall	dry	0	0.0200	0.0279	Yes	0.0200	0.0000	---
Merom	2SG1	Indiana	6213_B_2SG1	493	1982	wall	dry	0	0.0200	0.0279	Yes	0.0200	0.0000	---
Merrimack	1	New Hampshire	2364_B_1	111	1960	wall	wet	0	0.0332	0.0279	No	0.0279	0.0053	ESP-2
Merrimack	2	New Hampshire	2364_B_2	315	1968	cyclone	wet	0	0.0332	0.0279	No	0.0279	0.0053	ESP-2
Miami Fort	6	Ohio	2832_B_6	162	1960	tangential	dry	0	0.0400	0.0279	No	0.0279	0.0121	ESP-3

Miami Fort	7	Ohio	2832_B_7	493	1975	wall	dry	0	0.0100	0.0279	Yes	0.0100	0.0000	---
Miami Fort	8	Ohio	2832_B_8	493	1978	wall	dry	0	0.0900	0.0279	No	0.0279	0.0621	ESP-4
Michigan City	12	Indiana	997_B_12	469	1974	cyclone	wet	0	0.0800	0.0279	No	0.0279	0.0521	ESP-4
Mill Creek	1	Kentucky	1364_B_1	303	1972	tangential	dry	0	0.0500	0.0279	No	0.0279	0.0221	ESP-4
Mill Creek	2	Kentucky	1364_B_2	301	1974	tangential	dry	0	0.0900	0.0279	No	0.0279	0.0621	ESP-4
Mill Creek	3	Kentucky	1364_B_3	391	1978	wall	dry	0	0.0900	0.0279	No	0.0279	0.0621	ESP-4
Mill Creek	4	Kentucky	1364_B_4	477	1982	wall	dry	0	0.0100	0.0279	Yes	0.0100	0.0000	---
Milton L Kapp	2	Iowa	1048_B_2	211	1967	tangential	dry	0	0.1420	0.0279	No	0.0279	0.1141	ESP-4
Milton R Young	B1	North Dakota	2823_B_B1	250	1970	cyclone	wet	0	0.0100	0.0279	Yes	0.0100	0.0000	---
Milton R Young	B2	North Dakota	2823_B_B2	455	1977	cyclone	wet	0	0.0100	0.0279	Yes	0.0100	0.0000	---
Mitchell	1	West Virginia	3948_B_1	800	1971	wall	dry	0	0.0300	0.0279	No	0.0279	0.0021	ESP-1
Mitchell	2	West Virginia	3948_B_2	800	1971	wall	dry	0	0.0300	0.0279	No	0.0279	0.0021	ESP-1
Mitchell Power Station	33	Pennsylvania	3181_B_33	277	1963	tangential	dry	0	0.1800	0.0279	No	0.0279	0.1521	ESP-4
Monroe	1	Michigan	1733_B_1	760	1972	cell	dry	0	0.0300	0.0279	No	0.0279	0.0021	ESP-1
Monroe	2	Michigan	1733_B_2	775	1973	cell	dry	0	0.0300	0.0279	No	0.0279	0.0021	ESP-1
Monroe	3	Michigan	1733_B_3	785	1973	cell	dry	0	0.0200	0.0279	Yes	0.0200	0.0000	---
Monroe	4	Michigan	1733_B_4	765	1974	cell	dry	0	0.0200	0.0279	Yes	0.0200	0.0000	---
Monticello	3	Texas	6147_B_3	750	1978	wall	wet	0	0.0453	0.0279	No	0.0279	0.0174	ESP-3
Montrose	1	Missouri	2080_B_1	170	1958	tangential	dry	0	0.1300	0.0279	No	0.0279	0.1021	ESP-4
Montrose	2	Missouri	2080_B_2	164	1960	tangential	dry	0	0.1300	0.0279	No	0.0279	0.1021	ESP-4
Montrose	3	Missouri	2080_B_3	176	1964	tangential	dry	0	0.1300	0.0279	No	0.0279	0.1021	ESP-4
Morgantown Generating Plant	1	Maryland	1573_B_1	624	1970	tangential	dry	0	0.0700	0.0279	No	0.0279	0.0421	ESP-4
Morgantown Generating Plant	2	Maryland	1573_B_2	620	1971	tangential	dry	0	0.0700	0.0279	No	0.0279	0.0421	ESP-4
Mountaineer	1	West Virginia	6264_B_1	1300	1980	wall	dry	0	0.0300	0.0279	No	0.0279	0.0021	ESP-1
Mt Storm	1	West Virginia	3954_B_1	524	1965	tangential	dry	0	0.0100	0.0279	Yes	0.0100	0.0000	---

Mt Storm	2	West Virginia	3954_B_2	524	1966	tangential	dry	0	0.0100	0.0279	Yes	0.0100	0.0000	---
Mt Storm	3	West Virginia	3954_B_3	521	1973	tangential	dry	0	0.0100	0.0279	Yes	0.0100	0.0000	---
Muscatine Plant #1	8	Iowa	1167_B_8	35	1969	cyclone	wet	0	0.0200	0.0279	Yes	0.0200	0.0000	---
Muscatine Plant #1	9	Iowa	1167_B_9	147	1983	tangential	dry	0	0.0200	0.0279	Yes	0.0200	0.0000	---
Muskingum River	1	Ohio	2872_B_1	190	1953	wall	wet	0	0.0300	0.0279	No	0.0279	0.0021	ESP-1
Muskingum River	2	Ohio	2872_B_2	190	1954	wall	wet	0	0.0300	0.0279	No	0.0279	0.0021	ESP-1
Muskingum River	3	Ohio	2872_B_3	205	1957	cyclone	wet	0	0.0300	0.0279	No	0.0279	0.0021	ESP-1
Muskingum River	4	Ohio	2872_B_4	205	1958	cyclone	wet	0	0.0300	0.0279	No	0.0279	0.0021	ESP-1
Muskingum River	5	Ohio	2872_B_5	578	1968	cell	dry	0	0.0300	0.0279	No	0.0279	0.0021	ESP-1
Muskogee	4	Oklahoma	2952_B_4	511	1977	tangential	dry	0	0.0300	0.0279	No	0.0279	0.0021	ESP-1
Muskogee	5	Oklahoma	2952_B_5	522	1978	tangential	dry	0	0.0300	0.0279	No	0.0279	0.0021	ESP-1
Muskogee	6	Oklahoma	2952_B_6	515	1984	tangential	dry	0	0.0300	0.0279	No	0.0279	0.0021	ESP-1
Naughton	1	Wyoming	4162_B_1	158	1963	tangential	dry	0	0.0100	0.0279	Yes	0.0100	0.0000	---
Naughton	2	Wyoming	4162_B_2	207	1968	tangential	dry	0	0.0200	0.0279	Yes	0.0200	0.0000	---
Naughton	3	Wyoming	4162_B_3	330	1971	tangential	dry	0	0.0200	0.0279	Yes	0.0200	0.0000	---
Navajo	1	Arizona	4941_B_1	750	1974	tangential	dry	0	0.0200	0.0279	Yes	0.0200	0.0000	---
Navajo	2	Arizona	4941_B_2	750	1975	tangential	dry	0	0.0200	0.0279	Yes	0.0200	0.0000	---
Navajo	3	Arizona	4941_B_3	750	1976	tangential	dry	0	0.0200	0.0279	Yes	0.0200	0.0000	---
Nearman Creek	N1	Kansas	6064_B_N1	229	1981	wall	dry	0	0.0200	0.0279	Yes	0.0200	0.0000	---
Nebraska City	1	Nebraska	6096_B_1	646	1979	wall	dry	0	0.0300	0.0279	No	0.0279	0.0021	ESP-1
Neil Simpson II	2	Wyoming	7504_B_2	80	1995	wall	dry	1	0.0300	0.0279	No	0.0279	0.0021	---
Nelson Dewey	1	Wisconsin	4054_B_1	107	1959	cyclone	wet	0	0.1000	0.0279	No	0.0279	0.0721	ESP-4
Nelson Dewey	2	Wisconsin	4054_B_2	111	1962	cyclone	wet	0	0.0700	0.0279	No	0.0279	0.0421	ESP-4
New Castle	3	Pennsylvania	3138_B_3	95	1952	wall	dry	0	0.0100	0.0279	Yes	0.0100	0.0000	---
New Castle	4	Pennsylvania	3138_B_4	96	1958	wall	dry	0	0.0100	0.0279	Yes	0.0100	0.0000	---
New Castle	5	Pennsylvania	3138_B_5	138	1964	wall	dry	0	0.0500	0.0279	No	0.0279	0.0221	ESP-4

New Madrid	1	Missouri	2167_B_1	580	1972	cyclone	wet	0	0.0600	0.0279	No	0.0279	0.0321	ESP-4
New Madrid	2	Missouri	2167_B_2	580	1977	cyclone	wet	0	0.0500	0.0279	No	0.0279	0.0221	ESP-4
Newton	1	Illinois	6017_B_1	555	1977	tangential	dry	0	0.0091	0.0279	Yes	0.0091	0.0000	---
Newton	2	Illinois	6017_B_2	567	1982	tangential	dry	0	0.0091	0.0279	Yes	0.0091	0.0000	---
Niles	1	Ohio	2861_B_1	107	1954	cyclone	wet	0	0.0100	0.0279	Yes	0.0100	0.0000	---
Niles	2	Ohio	2861_B_2	111	1954	cyclone	wet	0	0.0100	0.0279	Yes	0.0100	0.0000	---
North Omaha	1	Nebraska	2291_B_1	79	1954	tangential	dry	0	0.0300	0.0279	No	0.0279	0.0021	ESP-1
North Omaha	2	Nebraska	2291_B_2	111	1957	tangential	dry	0	0.0300	0.0279	No	0.0279	0.0021	ESP-1
North Omaha	3	Nebraska	2291_B_3	111	1959	tangential	dry	0	0.0300	0.0279	No	0.0279	0.0021	ESP-1
North Omaha	4	Nebraska	2291_B_4	138	1963	tangential	dry	0	0.0300	0.0279	No	0.0279	0.0021	ESP-1
North Omaha	5	Nebraska	2291_B_5	224	1968	wall	dry	0	0.0300	0.0279	No	0.0279	0.0021	ESP-1
Northeastern	3313	Oklahoma	2963_B_3313	450	1979	tangential	dry	0	0.0200	0.0279	Yes	0.0200	0.0000	---
Northeastern	3314	Oklahoma	2963_B_3314	450	1980	tangential	dry	0	0.0200	0.0279	Yes	0.0200	0.0000	---
O H Hutchings	H-1	Ohio	2848_B_H-1	58	1948	tangential	dry	0	0.0300	0.0279	No	0.0279	0.0021	ESP-1
O H Hutchings	H-2	Ohio	2848_B_H-2	55	1949	tangential	dry	0	0.0600	0.0279	No	0.0279	0.0321	ESP-4
O H Hutchings	H-3	Ohio	2848_B_H-3	63	1950	tangential	dry	0	0.0300	0.0279	No	0.0279	0.0021	ESP-1
O H Hutchings	H-4	Ohio	2848_B_H-4	63	1951	tangential	dry	0	0.0300	0.0279	No	0.0279	0.0021	ESP-1
O H Hutchings	H-5	Ohio	2848_B_H-5	63	1952	tangential	dry	0	0.0200	0.0279	Yes	0.0200	0.0000	---
O H Hutchings	H-6	Ohio	2848_B_H-6	63	1953	tangential	dry	0	0.0200	0.0279	Yes	0.0200	0.0000	---
Oklaunion	1	Texas	127_B_1	690	1986	wall	dry	0	0.0200	0.0279	Yes	0.0200	0.0000	---
Ottumwa	1	Iowa	6254_B_1	673	1981	tangential	dry	0	0.0300	0.0279	No	0.0279	0.0021	ESP-1
P H Glatfelter	5PB036	Pennsylvania	50397_B_5PB036	36	1989	FBC	dry	0	0.0300	0.0279	No	0.0279	0.0021	ESP-1
Paradise	3	Kentucky	1378_B_3	963	1970	cyclone	wet	0	0.0400	0.0279	No	0.0279	0.0121	ESP-3
Petersburg	1	Indiana	994_B_1	232	1967	tangential	dry	0	0.0520	0.0279	No	0.0279	0.0241	ESP-4
Petersburg	2	Indiana	994_B_2	435	1969	tangential	dry	0	66.0000	0.0279	No	0.0279	65.9721	ESP-4
Petersburg	3	Indiana	994_B_3	532	1977	tangential	dry	0	0.0270	0.0279	Yes	0.0270	0.0000	---
Petersburg	4	Indiana	994_B_4	545	1986	tangential	dry	0	0.0250	0.0279	Yes	0.0250	0.0000	---

Philip Sporn	11	West Virginia	3938_B_11	150	1950	vertical	dry	0	0.0300	0.0279	No	0.0279	0.0021	ESP-1
Philip Sporn	21	West Virginia	3938_B_21	150	1950	vertical	dry	0	0.0300	0.0279	No	0.0279	0.0021	ESP-1
Philip Sporn	31	West Virginia	3938_B_31	150	1951	vertical	dry	0	0.0300	0.0279	No	0.0279	0.0021	ESP-1
Philip Sporn	41	West Virginia	3938_B_41	150	1952	vertical	dry	0	0.0300	0.0279	No	0.0279	0.0021	ESP-1
Picway	9	Ohio	2843_B_9	95	1955	wall	dry	0	0.0300	0.0279	No	0.0279	0.0021	ESP-1
Pirkey	1	Texas	7902_B_1	674	1985	wall	dry	0	0.2500	0.0279	No	0.0279	0.2221	ESP-4
Platte	1	Nebraska	59_B_1	100	1982	tangential	dry	0	0.0280	0.0279	No	0.0279	0.0001	ESP-1
Pleasant Prairie	1	Wisconsin	6170_B_1	617	1980	wall	dry	0	0.0100	0.0279	Yes	0.0100	0.0000	---
Pleasant Prairie	2	Wisconsin	6170_B_2	617	1985	wall	dry	0	0.0100	0.0279	Yes	0.0100	0.0000	---
Pleasants Power Station	1	West Virginia	6004_B_1	639	1979	wall	dry	0	0.0200	0.0279	Yes	0.0200	0.0000	---
Pleasants Power Station	2	West Virginia	6004_B_2	639	1980	wall	dry	0	0.0200	0.0279	Yes	0.0200	0.0000	---
Portland	1	Pennsylvani a	3113_B_1	157	1958	tangential	dry	0	0.0800	0.0279	No	0.0279	0.0521	ESP-4
Portland	2	Pennsylvani a	3113_B_2	242	1962	tangential	dry	0	0.0200	0.0279	Yes	0.0200	0.0000	---
Potomac River	1	Virginia	3788_B_1	88	1949	tangential	dry	1	0.0200	0.0279	Yes	0.0200	0.0000	---
Potomac River	2	Virginia	3788_B_2	88	1950	tangential	dry	1	0.0300	0.0279	No	0.0279	0.0021	---
Potomac River	3	Virginia	3788_B_3	102	1954	tangential	dry	1	0.0500	0.0279	No	0.0279	0.0221	---
Potomac River	4	Virginia	3788_B_4	102	1956	tangential	dry	1	0.0100	0.0279	Yes	0.0100	0.0000	---
Potomac River	5	Virginia	3788_B_5	102	1957	tangential	dry	1	0.0200	0.0279	Yes	0.0200	0.0000	---
Powerton	51	Illinois	879_B_51	382	1972	cyclone	wet	0	0.0300	0.0279	No	0.0279	0.0021	ESP-1
Powerton	52	Illinois	879_B_52	383	1972	cyclone	wet	0	0.0300	0.0279	No	0.0279	0.0021	ESP-1
Powerton	61	Illinois	879_B_61	382	1975	cyclone	wet	0	0.0100	0.0279	Yes	0.0100	0.0000	---
Powerton	62	Illinois	879_B_62	383	1975	cyclone	wet	0	0.0100	0.0279	Yes	0.0100	0.0000	---
PPL Brunner Island	2	Pennsylvani a	3140_B_2	382	1965	tangential	dry	0	0.0256	0.0279	Yes	0.0256	0.0000	---
PPL Brunner Island	3	Pennsylvani a	3140_B_3	744	1981	tangential	dry	0	0.0256	0.0279	Yes	0.0256	0.0000	---
PPL Montour	1	Pennsylvani a	3149_B_1	751	1971	tangential	dry	0	0.0107	0.0279	Yes	0.0107	0.0000	---

PPL Montour	2	Pennsylvania	3149_B_2	747	1973	tangential	dry	0	0.0166	0.0279	Yes	0.0166	0.0000	---
Prairie Creek	3	Iowa	1073_B_3	42	1958	wall	dry	0	0.0800	0.0279	No	0.0279	0.0521	ESP-4
Prairie Creek	4	Iowa	1073_B_4	125	1967	wall	dry	0	0.0600	0.0279	No	0.0279	0.0321	ESP-4
Pulliam	5	Wisconsin	4072_B_5	49	1949	wall	dry	0	0.0700	0.0279	No	0.0279	0.0421	ESP-4
Pulliam	6	Wisconsin	4072_B_6	72	1951	wall	dry	0	0.0700	0.0279	No	0.0279	0.0421	ESP-4
Pulliam	7	Wisconsin	4072_B_7	88	1958	wall	dry	0	0.0200	0.0279	Yes	0.0200	0.0000	---
Pulliam	8	Wisconsin	4072_B_8	133	1964	wall	dry	0	0.0700	0.0279	No	0.0279	0.0421	ESP-4
Quindaro	1	Kansas	1295_B_1	72	1965	cyclone	wet	0	0.0284	0.0279	No	0.0279	0.0005	ESP-1
Quindaro	2	Kansas	1295_B_2	111	1971	wall	dry	0	0.0284	0.0279	No	0.0279	0.0005	ESP-1
R D Green	G1	Kentucky	6639_B_G1	231	1979	wall	dry	0	0.0469	0.0279	No	0.0279	0.0190	ESP-3
R D Green	G2	Kentucky	6639_B_G2	233	1981	wall	dry	0	0.0469	0.0279	No	0.0279	0.0190	ESP-3
R D Morrow	1	Mississippi	6061_B_1	180	1978	wall	dry	0	0.0300	0.0279	No	0.0279	0.0021	ESP-1
R D Morrow	2	Mississippi	6061_B_2	180	1978	wall	dry	0	0.0200	0.0279	Yes	0.0200	0.0000	---
R E Burger	5	Ohio	2864_B_5	47	1955	wall	dry	0	0.0600	0.0279	No	0.0279	0.0321	ESP-4
R E Burger	6	Ohio	2864_B_6	47	1955	wall	dry	0	0.0400	0.0279	No	0.0279	0.0121	ESP-3
R M Heskett	B1	North Dakota	2790_B_B1	29	1954	stoker/SPR	dry	0	0.0400	0.0279	No	0.0279	0.0121	ESP-3
R M Heskett	B2	North Dakota	2790_B_B2	76	1963	FBC	dry	0	0.0100	0.0279	Yes	0.0100	0.0000	---
R M Schahfer	14	Indiana	6085_B_14	424	1976	cyclone	wet	0	0.0152	0.0279	Yes	0.0152	0.0000	---
R M Schahfer	15	Indiana	6085_B_15	472	1979	wall	dry	0	0.0152	0.0279	Yes	0.0152	0.0000	---
R M Schahfer	17	Indiana	6085_B_17	361	1983	tangential	dry	0	0.0152	0.0279	Yes	0.0152	0.0000	---
R M Schahfer	18	Indiana	6085_B_18	361	1986	tangential	dry	0	0.0152	0.0279	Yes	0.0152	0.0000	---
R Paul Smith Power Station	9	Maryland	1570_B_9	28	1947	wall	dry	0	0.1700	0.0279	No	0.0279	0.1421	ESP-4
R S Nelson	6	Louisiana	1393_B_6	550	1982	tangential	wet	0	0.0113	0.0279	Yes	0.0113	0.0000	---
River Rouge	2	Michigan	1740_B_2	241	1957	tangential	dry	0	0.0100	0.0279	Yes	0.0100	0.0000	---
River Rouge	3	Michigan	1740_B_3	272	1958	wall	dry	0	0.0100	0.0279	Yes	0.0100	0.0000	---
Riverbend	10	North Carolina	2732_B_10	133	1954	tangential	dry	0	0.0284	0.0279	No	0.0279	0.0005	ESP-1

Riverbend	7	North Carolina	2732_B_7	94	1952	tangential	dry	0	0.0284	0.0279	No	0.0279	0.0005	ESP-1
Riverbend	8	North Carolina	2732_B_8	94	1952	tangential	dry	0	0.1050	0.0279	No	0.0279	0.0771	ESP-4
Riverbend	9	North Carolina	2732_B_9	133	1954	tangential	dry	0	0.1050	0.0279	No	0.0279	0.0771	ESP-4
Riverside	9	Iowa	1081_B_9	130	1961	tangential	dry	0	0.0500	0.0279	No	0.0279	0.0221	ESP-4
Riverton	39	Kansas	1239_B_39	38	1950	wall	dry	0	0.0300	0.0279	No	0.0279	0.0021	ESP-1
Riverton	40	Kansas	1239_B_40	54	1954	tangential	dry	0	0.0300	0.0279	No	0.0279	0.0021	ESP-1
Rivesville	7	West Virginia	3945_B_7	46	1943	vertical	wet	0	0.0100	0.0279	Yes	0.0100	0.0000	---
Rivesville	8	West Virginia	3945_B_8	91	1951	vertical	wet	0	0.0200	0.0279	Yes	0.0200	0.0000	---
Rockport	MB1	Indiana	6166_B_MB1	1280	1984	wall	dry	0	0.0300	0.0279	No	0.0279	0.0021	ESP-1
Rockport	MB2	Indiana	6166_B_MB2	1280	1989	wall	dry	0	0.0300	0.0279	No	0.0279	0.0021	ESP-1
Rodemacher	2	Louisiana	6190_B_2	523	1982	wall	dry	0	0.0100	0.0279	Yes	0.0100	0.0000	---
Roxboro	1	North Carolina	2712_B_1	369	1966	wall	dry	0	0.0600	0.0279	No	0.0279	0.0321	ESP-4
Roxboro	2	North Carolina	2712_B_2	671	1968	tangential	dry	0	0.0700	0.0279	No	0.0279	0.0421	ESP-4
Roxboro	3A	North Carolina	2712_B_3A	353	1973	wall	dry	0	0.0600	0.0279	No	0.0279	0.0321	ESP-4
Roxboro	3B	North Carolina	2712_B_3B	353	1973	wall	dry	0	0.0600	0.0279	No	0.0279	0.0321	ESP-4
Roxboro	4A	North Carolina	2712_B_4A	349	1980	wall	dry	0	0.0700	0.0279	No	0.0279	0.0421	ESP-4
Roxboro	4B	North Carolina	2712_B_4B	349	1980	wall	dry	0	0.0700	0.0279	No	0.0279	0.0421	ESP-4
Rumford Cogeneration	6	Maine	10495_B_6	43	1990	FBC	dry	0	0.0100	0.0279	Yes	0.0100	0.0000	---
Rumford Cogeneration	7	Maine	10495_B_7	43	1990	FBC	dry	0	0.0100	0.0279	Yes	0.0100	0.0000	---
Rush Island	1	Missouri	6155_B_1	604	1976	tangential	dry	0	0.0100	0.0279	Yes	0.0100	0.0000	---
Rush Island	2	Missouri	6155_B_2	604	1977	tangential	dry	0	0.0300	0.0279	No	0.0279	0.0021	ESP-1
Salem Harbor	1	Massachusetts	1626_B_1	82	1951	wall	dry	0	0.0100	0.0279	Yes	0.0100	0.0000	---
Salem Harbor	2	Massachusetts	1626_B_2	80	1952	wall	dry	0	0.0005	0.0279	Yes	0.0005	0.0000	---
Salem Harbor	3	Massachusetts	1626_B_3	149	1958	wall	dry	0	0.0300	0.0279	No	0.0279	0.0021	ESP-1

San Miguel	SM-1	Texas	6183_B_SM-1	391	1982	wall	dry	0	0.1000	0.0279	No	0.0279	0.0721	ESP-4
Sandow	4	Texas	6648_B_4	542	1981	tangential	wet	0	0.0400	0.0279	No	0.0279	0.0121	ESP-3
Schiller	4	New Hampshire	2367_B_4	48	1952	wall	dry	0	0.0400	0.0279	No	0.0279	0.0121	ESP-3
Scholz	1	Florida	642_B_1	49	1953	wall	dry	0	0.0200	0.0279	Yes	0.0200	0.0000	---
Scholz	2	Florida	642_B_2	49	1953	wall	dry	0	0.0200	0.0279	Yes	0.0200	0.0000	---
Seminole	1	Florida	136_B_1	654	1984	wall	dry	0	0.0210	0.0279	Yes	0.0210	0.0000	---
Seminole	2	Florida	136_B_2	654	1984	wall	dry	0	0.0160	0.0279	Yes	0.0160	0.0000	---
Shawville	1	Pennsylvania	3131_B_1	122	1954	wall	dry	0	0.0800	0.0279	No	0.0279	0.0521	ESP-4
Shawville	2	Pennsylvania	3131_B_2	125	1954	wall	dry	0	0.0400	0.0279	No	0.0279	0.0121	ESP-3
Shawville	3	Pennsylvania	3131_B_3	175	1959	tangential	dry	0	0.0133	0.0279	Yes	0.0133	0.0000	---
Shawville	4	Pennsylvania	3131_B_4	175	1960	tangential	dry	0	0.0133	0.0279	Yes	0.0133	0.0000	---
Sherburne County	1	Minnesota	6090_B_1	762	1976	tangential	dry	0	0.0200	0.0279	Yes	0.0200	0.0000	---
Sherburne County	2	Minnesota	6090_B_2	752	1977	tangential	dry	0	0.0200	0.0279	Yes	0.0200	0.0000	---
Sibley	1	Missouri	2094_B_1	54	1960	cyclone	wet	0	0.0300	0.0279	No	0.0279	0.0021	ESP-1
Sibley	2	Missouri	2094_B_2	54	1962	cyclone	wet	0	0.0400	0.0279	No	0.0279	0.0121	ESP-3
Sibley	3	Missouri	2094_B_3	401	1969	cyclone	wet	0	0.0092	0.0279	Yes	0.0092	0.0000	---
Sikeston Power Station	1	Missouri	6768_B_1	233	1981	wall	dry	0	0.0200	0.0279	Yes	0.0200	0.0000	---
Sioux	1	Missouri	2107_B_1	490	1967	cyclone	wet	0	0.0034	0.0279	Yes	0.0034	0.0000	---
Sioux	2	Missouri	2107_B_2	490	1968	cyclone	wet	0	0.0034	0.0279	Yes	0.0034	0.0000	---
Sooner	1	Oklahoma	6095_B_1	535	1979	tangential	dry	0	0.0320	0.0279	No	0.0279	0.0041	ESP-1
Sooner	2	Oklahoma	6095_B_2	540	1980	tangential	dry	0	0.0500	0.0279	No	0.0279	0.0221	ESP-4
South Oak Creek	5	Wisconsin	4041_B_5	257	1959	wall	dry	0	0.0200	0.0279	Yes	0.0200	0.0000	---
South Oak Creek	6	Wisconsin	4041_B_6	260	1961	wall	dry	0	0.0100	0.0279	Yes	0.0100	0.0000	---
South Oak Creek	7	Wisconsin	4041_B_7	292	1965	tangential	dry	0	0.0015	0.0279	Yes	0.0015	0.0000	---
South Oak Creek	8	Wisconsin	4041_B_8	306	1967	tangential	dry	0	0.0117	0.0279	Yes	0.0117	0.0000	---
Southwest Power Station	1	Missouri	6195_B_1	178	1976	wall	dry	0	0.0400	0.0279	No	0.0279	0.0121	ESP-3

St Clair	1	Michigan	1743_B_1	151	1953	wall	dry	0	0.1000	0.0279	No	0.0279	0.0721	ESP-4
St Clair	2	Michigan	1743_B_2	154	1953	wall	dry	0	0.0100	0.0279	Yes	0.0100	0.0000	---
St Clair	3	Michigan	1743_B_3	160	1954	wall	dry	0	0.0100	0.0279	Yes	0.0100	0.0000	---
St Clair	4	Michigan	1743_B_4	151	1954	wall	dry	0	0.0300	0.0279	No	0.0279	0.0021	ESP-1
St Clair	6	Michigan	1743_B_6	312	1961	tangential	dry	0	0.0100	0.0279	Yes	0.0100	0.0000	---
St Clair	7	Michigan	1743_B_7	440	1969	tangential	dry	0	0.0200	0.0279	Yes	0.0200	0.0000	---
St Johns River Power Park	1	Florida	207_B_1	623	1987	wall	dry	0	0.0100	0.0279	Yes	0.0100	0.0000	---
St Johns River Power Park	2	Florida	207_B_2	622	1988	wall	dry	0	0.0100	0.0279	Yes	0.0100	0.0000	---
Stanton	1	North Dakota	2824_B_1	130	1967	wall	dry	0	0.0100	0.0279	Yes	0.0100	0.0000	---
Stanton Energy Center	1	Florida	564_B_1	440	1987	wall	dry	0	0.0100	0.0279	Yes	0.0100	0.0000	---
Stanton Energy Center	2	Florida	564_B_2	446	1996	wall	dry	0	0.0100	0.0279	Yes	0.0100	0.0000	---
Stone Container Florence Mill	PB4	South Carolina	50806_B_PB4	75	1987	wall	dry	0	0.0100	0.0279	Yes	0.0100	0.0000	---
Streeter Station	7	Iowa	1131_B_7	36	1973	wall	dry	0	0.0300	0.0279	No	0.0279	0.0021	ESP-1
Sunbury Generation LP	3	Pennsylvania	3152_B_3	94	1951	wall	dry	0	0.0400	0.0279	No	0.0279	0.0121	ESP-3
Sunbury Generation LP	4	Pennsylvania	3152_B_4	128	1953	wall	dry	0	0.0600	0.0279	No	0.0279	0.0321	ESP-4
Sutherland	3	Iowa	1077_B_3	82	1961	cyclone	wet	0	0.0300	0.0279	No	0.0279	0.0021	ESP-1
Taconite Harbor Energy Center	1	Minnesota	10075_B_1	65	1957	tangential	dry	1	0.0055	0.0279	Yes	0.0055	0.0000	---
Taconite Harbor Energy Center	2	Minnesota	10075_B_2	67	1957	tangential	dry	1	0.0201	0.0279	Yes	0.0201	0.0000	---
Taconite Harbor Energy Center	3	Minnesota	10075_B_3	68	1967	tangential	dry	1	0.0201	0.0279	Yes	0.0201	0.0000	---
Tanners Creek	U1	Indiana	988_B_U1	145	1951	vertical	dry	0	0.0300	0.0279	No	0.0279	0.0021	ESP-1
Tanners Creek	U2	Indiana	988_B_U2	145	1952	vertical	dry	0	0.0053	0.0279	Yes	0.0053	0.0000	---
Tanners Creek	U3	Indiana	988_B_U3	200	1954	vertical	dry	0	0.0053	0.0279	Yes	0.0053	0.0000	---
Tanners Creek	U4	Indiana	988_B_U4	500	1964	cyclone	wet	0	0.0053	0.0279	Yes	0.0053	0.0000	---
Tecumseh Energy Center	10	Kansas	1252_B_10	129	1962	tangential	dry	0	0.0500	0.0279	No	0.0279	0.0221	ESP-4
Tecumseh Energy Center	9	Kansas	1252_B_9	74	1957	tangential	dry	0	0.0900	0.0279	No	0.0279	0.0621	ESP-4

Thomas Hill	MB1	Missouri	2168_B_MB1	175	1966	cyclone	wet	0	0.0300	0.0279	No	0.0279	0.0021	ESP-1
Thomas Hill	MB2	Missouri	2168_B_MB2	275	1969	cyclone	wet	0	0.0300	0.0279	No	0.0279	0.0021	ESP-1
Thomas Hill	MB3	Missouri	2168_B_MB3	670	1982	wall	dry	0	0.0300	0.0279	No	0.0279	0.0021	ESP-1
Titus	1	Pennsylvania	3115_B_1	81	1951	tangential	dry	0	0.0400	0.0279	No	0.0279	0.0121	ESP-3
Titus	2	Pennsylvania	3115_B_2	81	1951	tangential	dry	0	0.0400	0.0279	No	0.0279	0.0121	ESP-3
Titus	3	Pennsylvania	3115_B_3	81	1953	tangential	dry	0	0.0300	0.0279	No	0.0279	0.0021	ESP-1
Transalta Centralia Generation	BW21	Washington	3845_B_BW21	703	1972	tangential	dry	0	0.0100	0.0279	Yes	0.0100	0.0000	---
Transalta Centralia Generation	BW22	Washington	3845_B_BW22	703	1973	tangential	dry	0	0.0100	0.0279	Yes	0.0100	0.0000	---
Trenton Channel	16	Michigan	1745_B_16	53	1949	tangential	dry	0	0.0300	0.0279	No	0.0279	0.0021	ESP-1
Trenton Channel	17	Michigan	1745_B_17	53	1949	tangential	dry	0	0.0300	0.0279	No	0.0279	0.0021	ESP-1
Trenton Channel	18	Michigan	1745_B_18	53	1949	tangential	dry	0	0.0300	0.0279	No	0.0279	0.0021	ESP-1
Trenton Channel	19	Michigan	1745_B_19	53	1950	tangential	dry	0	0.0300	0.0279	No	0.0279	0.0021	ESP-1
Trenton Channel	9A	Michigan	1745_B_9A	536	1968	tangential	dry	0	0.0400	0.0279	No	0.0279	0.0121	ESP-3
Trimble County	1	Kentucky	6071_B_1	383	1990	tangential	dry	0	0.0300	0.0279	No	0.0279	0.0021	ESP-1
Tyrone	5	Kentucky	1361_B_5	71	1953	wall	dry	0	0.0300	0.0279	No	0.0279	0.0021	ESP-1
Urquhart	URQ3	South Carolina	3295_B_URQ3	94	1955	tangential	dry	0	0.0800	0.0279	No	0.0279	0.0521	ESP-4
Victor J Daniel Jr	1	Mississippi	6073_B_1	507	1977	tangential	dry	0	0.0200	0.0279	Yes	0.0200	0.0000	---
Victor J Daniel Jr	2	Mississippi	6073_B_2	507	1981	tangential	dry	0	0.0300	0.0279	No	0.0279	0.0021	ESP-1
W H Sammis	5	Ohio	2866_B_5	300	1967	wall	dry	0	0.0200	0.0279	Yes	0.0200	0.0000	---
W H Sammis	6	Ohio	2866_B_6	597	1969	wall	dry	0	0.0100	0.0279	Yes	0.0100	0.0000	---
W H Sammis	7	Ohio	2866_B_7	600	1971	wall	dry	0	0.0100	0.0279	Yes	0.0100	0.0000	---
W H Weatherspoon	1	North Carolina	2716_B_1	48	1949	wall	dry	0	0.0600	0.0279	No	0.0279	0.0321	ESP-4
W H Weatherspoon	2	North Carolina	2716_B_2	49	1950	wall	dry	0	0.0600	0.0279	No	0.0279	0.0321	ESP-4
W H Weatherspoon	3	North Carolina	2716_B_3	76	1952	tangential	dry	0	0.0900	0.0279	No	0.0279	0.0621	ESP-4
W H Zimmer	1	Ohio	6019_B_1	1300	1991	wall	dry	0	0.0100	0.0279	Yes	0.0100	0.0000	---

W S Lee	1	South Carolina	3264_B_1	98	1951	tangential	dry	0	0.1300	0.0279	No	0.0279	0.1021	ESP-4
W S Lee	2	South Carolina	3264_B_2	98	1951	tangential	dry	0	0.0700	0.0279	No	0.0279	0.0421	ESP-4
W S Lee	3	South Carolina	3264_B_3	168	1958	tangential	dry	0	0.0400	0.0279	No	0.0279	0.0121	ESP-3
Wabash River	2	Indiana	1010_B_2	43	1953	wall	dry	0	0.0500	0.0279	No	0.0279	0.0221	ESP-4
Wabash River	4	Indiana	1010_B_4	43	1955	wall	dry	0	0.1100	0.0279	No	0.0279	0.0821	ESP-4
Wabash River	6	Indiana	1010_B_6	318	1968	tangential	dry	0	0.1100	0.0279	No	0.0279	0.0821	ESP-4
Walter C Beckjord	1	Ohio	2830_B_1	94	1952	tangential	dry	0	0.0700	0.0279	No	0.0279	0.0421	ESP-4
Walter C Beckjord	2	Ohio	2830_B_2	94	1953	tangential	dry	0	0.0500	0.0279	No	0.0279	0.0221	ESP-4
Walter C Beckjord	3	Ohio	2830_B_3	128	1954	wall	dry	0	0.0600	0.0279	No	0.0279	0.0321	ESP-4
Walter C Beckjord	4	Ohio	2830_B_4	150	1958	tangential	dry	0	0.0500	0.0279	No	0.0279	0.0221	ESP-4
Walter C Beckjord	5	Ohio	2830_B_5	238	1962	tangential	dry	0	0.0400	0.0279	No	0.0279	0.0121	ESP-3
Walter C Beckjord	6	Ohio	2830_B_6	409	1969	tangential	dry	0	0.0400	0.0279	No	0.0279	0.0121	ESP-3
Walter Scott Jr. Energy Center	1	Iowa	1082_B_1	45	1954	wall	dry	0	0.0700	0.0279	No	0.0279	0.0421	ESP-4
Walter Scott Jr. Energy Center	2	Iowa	1082_B_2	88	1958	tangential	dry	0	0.0500	0.0279	No	0.0279	0.0221	ESP-4
Wansley	1	Georgia	6052_B_1	891	1976	tangential	dry	0	0.0620	0.0279	No	0.0279	0.0341	ESP-4
Wansley	2	Georgia	6052_B_2	892	1978	tangential	dry	0	0.0600	0.0279	No	0.0279	0.0321	ESP-4
Warrick	1	Indiana	6705_B_1	136	1960	wall	dry	0	0.1000	0.0279	No	0.0279	0.0721	ESP-4
Warrick	2	Indiana	6705_B_2	136	1964	wall	dry	0	0.0900	0.0279	No	0.0279	0.0621	ESP-4
Warrick	3	Indiana	6705_B_3	136	1965	wall	dry	0	0.1500	0.0279	No	0.0279	0.1221	ESP-4
Warrick	4	Indiana	6705_B_4	300	1970	cell	dry	0	0.1400	0.0279	No	0.0279	0.1121	ESP-4
Waukegan	17	Illinois	883_B_17	100	1952	cyclone	wet	0	0.0200	0.0279	Yes	0.0200	0.0000	---
Waukegan	7	Illinois	883_B_7	327	1958	tangential	dry	0	0.0517	0.0279	No	0.0279	0.0238	ESP-4
Waukegan	8	Illinois	883_B_8	359	1962	tangential	dry	0	0.0517	0.0279	No	0.0279	0.0238	ESP-4
Welsh	1	Texas	6139_B_1	527	1977	wall	dry	0	0.0075	0.0279	Yes	0.0075	0.0000	---
Welsh	2	Texas	6139_B_2	524	1980	wall	dry	0	0.0075	0.0279	Yes	0.0075	0.0000	---
Welsh	3	Texas	6139_B_3	524	1982	wall	dry	0	0.0075	0.0279	Yes	0.0075	0.0000	---

Weston	1	Wisconsin	4078_B_1	62	1954	wall	dry	0	0.0021	0.0279	Yes	0.0021	0.0000	---
Weston	2	Wisconsin	4078_B_2	86	1960	wall	dry	0	0.0021	0.0279	Yes	0.0021	0.0000	---
Whelan Energy Center	1	Nebraska	60_B_1	76	1981	tangential	dry	0	0.0042	0.0279	Yes	0.0042	0.0000	---
White Bluff	1	Arkansas	6009_B_1	815	1980	tangential	dry	0	0.0100	0.0279	Yes	0.0100	0.0000	---
White Bluff	2	Arkansas	6009_B_2	825	1981	tangential	dry	0	0.0070	0.0279	Yes	0.0070	0.0000	---
Widows Creek	7	Alabama	50_B_7	473	1961	tangential	dry	0	0.0100	0.0279	Yes	0.0100	0.0000	---
Will County	3	Illinois	884_B_3	250	1957	tangential	dry	0	0.0288	0.0279	No	0.0279	0.0009	ESP-1
Will County	4	Illinois	884_B_4	503	1963	tangential	dry	0	0.0288	0.0279	No	0.0279	0.0009	ESP-1
Williams	WIL1	South Carolina	3298_B_WIL1	606	1973	tangential	dry	0	0.0200	0.0279	Yes	0.0200	0.0000	---
Willow Island	1	West Virginia	3946_B_1	54	1949	vertical	dry	0	0.0200	0.0279	Yes	0.0200	0.0000	---
Willow Island	2	West Virginia	3946_B_2	181	1960	cyclone	wet	0	0.0200	0.0279	Yes	0.0200	0.0000	---
Winyah	1	South Carolina	6249_B_1	295	1975	wall	dry	0	0.0800	0.0279	No	0.0279	0.0521	ESP-4
Winyah	2	South Carolina	6249_B_2	295	1977	wall	dry	0	0.0100	0.0279	Yes	0.0100	0.0000	---
Winyah	3	South Carolina	6249_B_3	295	1980	wall	dry	0	0.0400	0.0279	No	0.0279	0.0121	ESP-3
Winyah	4	South Carolina	6249_B_4	270	1981	wall	dry	0	0.0300	0.0279	No	0.0279	0.0021	ESP-1
Wood River	4	Illinois	898_B_4	105	1954	tangential	dry	0	0.0400	0.0279	No	0.0279	0.0121	ESP-3
Wood River	5	Illinois	898_B_5	383	1964	tangential	dry	0	0.0100	0.0279	Yes	0.0100	0.0000	---
Wyandotte	7	Michigan	1866_B_7	35	1948	wall	dry	0	0.0300	0.0279	No	0.0279	0.0021	ESP-1
Yates	Y1BR	Georgia	728_B_Y1BR	99	1950	tangential	dry	0	0.2000	0.0279	No	0.0279	0.1721	ESP-4
Yates	Y2BR	Georgia	728_B_Y2BR	105	1950	tangential	dry	0	0.2000	0.0279	No	0.0279	0.1721	ESP-4
Yates	Y3BR	Georgia	728_B_Y3BR	112	1952	tangential	dry	0	0.2000	0.0279	No	0.0279	0.1721	ESP-4
Yates	Y4BR	Georgia	728_B_Y4BR	135	1957	tangential	dry	0	0.0700	0.0279	No	0.0279	0.0421	ESP-4
Yates	Y5BR	Georgia	728_B_Y5BR	137	1958	tangential	dry	0	0.0700	0.0279	No	0.0279	0.0421	ESP-4
Yates	Y6BR	Georgia	728_B_Y6BR	346	1974	tangential	dry	0	0.0300	0.0279	No	0.0279	0.0021	ESP-1
Yates	Y7BR	Georgia	728_B_Y7BR	349	1974	tangential	dry	0	0.0200	0.0279	Yes	0.0200	0.0000	---
Yorktown	1	Virginia	3809_B_1	157	1957	tangential	dry	0	0.0518	0.0279	No	0.0279	0.0239	ESP-4

Yorktown	2	Virginia	3809_B_2	164	1959	tangential	dry	0	0.0518	0.0279	No	0.0279	0.0239	ESP-4

Gibsons Creek Power Plant: This unit is listed as only having access to subbituminious coal in NEEDS. However, since it the unit was originally designed to burn lignite, as evidenced by historic consumption, in MATS policy runs it is subjected to the Hg limit for low Btu virgin coal in the policy case.

Treatment of DSI in Emissions Calculations: DSI is considered when calculating condensable PM for air quality modeling but not when assigning mercury EMFs in the power sector modeling.

Accounting for Presence of Fabric Filters in Deriving Mercury Emission Modification Factors (EMFs) and Calculating Filterable Particulate Matter (PM): When fabric filters are added to generating units, the mercury EMFs are recalculated to account for their presence. This is applied in both the base and policy case v.4.10_MATS runs and in the v.4.10_MATS runs used in air quality modeling. In addition, since the calculation of filterable PM for air quality modeling is a function of filter efficiency, the post-processing procedure, used to prepare model output of air quality modeling, was also updated to account for the presence of FFs

Chapter 7: Set-Up Parameters and Rules

7.5 MATS Specific Set-Up Rules” (new)

The following set-up features apply in the v.4.10 base and policy cases for MATS:

7.5.1 <u>New Builds and Retrofits in 2012</u>: Given the short lead time, EPA’s policy analysis has disabled incremental new capacity and retrofit construction in the 2012 model year. The results presented for the 2012 model year reflect the model’s enactment of investment decisions already underway (as opposed to any investment decisions driven by new policies).

7.5.2 <u>SCR Retrofits in the MATS Policy Scenario</u>: SCR is an advanced post-combustion technology for NO_X control. While SCR can yield mercury control cobenefits, IPM results demonstrate that MATS alone is insufficient to drive new SCR retrofitting by 2015; the results show that other control technologies, such as ACI, are generally more cost-effective compliance options in the near term for MATS implementation. It is possible that certain units may elect to ‘accelerate’ the installation of SCR that they may otherwise have considered installing in the 2020-2050 timeframe, depending on future NO_X control requirements. In light of the inherent long-run uncertainty in this type of decision, and the focus of this analysis on quantifying the incremental impacts of MATS in 2015, EPA conservatively constrained IPM to prevent the model from “re-locating” (i.e., accelerating) long-term base case SCR installations from 2020-2050 to the 2015 model year for MATS.

11.5 Fuel Emission Factors

Table 11-4 brings together all the fuel emission factor assumptions as implemented in EPA Base Case v.4.10_MATS. For sulfur dioxide and mercury in coal, where emission factors vary widely based on the rank, grade, and supply seam source of the coal, cross references are given to tables that provide more detailed treatment of the topic. Nitrogen oxides (NO_X) are not included in Table 11-4 because NO_X levels are not primarily fuel based but are a factor of the combustion process.

Table 11-4 Fuel Emission Factor Assumptions in EPA Base Case v.4.10_MATS

Fuel Type	Heat Content (Btu/lb)[1]	Carbon Dioxide (lbs/MMBtu)[2]	Sulfur Dioxide (lbs/MMBtu)[3]	Mercury (lbs/TBtu)[3]
Coal				
Bituminous	>10,260 - 13,000	205.2 - 206.6	0.67 - 6.43	1.82 - 34.71
Subbituminous	> 7,500 - 10,260	212.7 - 213.1	0.58 - 1.41	4.24 - 6.44
Lignite	< 7,500	213.5 - 217.0	1.46 - 3.91	7.51 - 14.88
Natural Gas	--	117.08	0	0.00014
Fuel Oil				
Distillate	--	161.4	0	0.48
Residual	--	161.4 - 173.9	0.3 - 2.65	0.48
Biomass	--	0	0.08	0.57
Waste Fuels				
Waste Coal[4]	6,175	205.7	5.36	63.9
Petroleum Coke	14,150	225.1	7.27	~~23.18~~2.66
Fossil Waste	--	321.1	0.08	0
Non-Fossil Waste	--	0	0	0
Tires	--	189.5	1.65	3.58
Municipal Solid Waste	--	91.9	0.35	71.85

Notes:

[1]Distillate and Residual Oils, Biomass, Fossil Waste, Non-Fossil Waste, Tires, and Municipal Solid Waste (MSW) are priced at a $/MMBtu basis and hence heat content is not required for modeling.

[2]Also see Table 9-9 in *EPA Base Case v.4.10* (EPA #430-R-10-010), August 2010 at www.epa.gov/airmarkets/progsregs/epa-ipm/transport.html.

[3]Also see Table 9-6 and Table 9-7 in *EPA Base Case v.4.10* (EPA #430-R-10-010), August 2010 at www.epa.gov/airmarkets/progsregs/epa-ipm/transport.html.

Biomass fuel is considered to have a net zero impact on atmospheric carbon dioxide levels since the emissions released are equivalent in carbon content to the carbon absorbed during fuel crop growth. (See, for example, Hughes, E., Role of Renewables in Greenhouse Gas Reduction, Electric Power Research Institute (EPRI): November, 1998. Report TR-111883, p. 28.)

"Biomass Co-firing," Chapter 2 in *Renewable Energy Technology Characterizations*, U.S. Department of Energy and Electric Power Research Institute (EPRI), 1997.

Analysis of Emissions Reduction Option for the Electric Power Industry, Office of Air and Radiation, U.S. Environmental Protection Agency, March 1999.

[4]In EPA Base Case v.4.10_MATS waste coal units are assumed to achieve 99% mercury removal.