Electric Power Annual 2010

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Table A1. Sulfur Dioxide Uncontrolled Emission Factors

(Units and Factors)

Fuel, Code, Source and Emission units

Combustion System Type/Firing Configuration

	Emissions
	Units
	(Lbs =
	pounds,
	MMCF =
	million cubic
and	feet.

Fuel And EIA Fuel Code	Source and Tables (As appropriate)	MG =	Cyclone Boiler	Fluidized Bed Boiler	Opposed Firing Boiler	Spreader Stoker Boiler	Tangential Boiler	All Other Boiler Types	Combustion Turbine	Internal Combustion Engine
Agricultural Byproducts (AB)	Source: 1	Lbs per ton	0.08	0.01	0.08	0.08	0.08	0.08	NA	NA
Blast Furnace Gas (BFG)	Sources: 1 (including footnote 7 within source); 2, Table 1.4-2 (including footnote d within source)	Lbs per MMCF	0.6	0.06	0.6	0.6	0.6	0.6	0.6	0.6
Bituminous Coal (BIT)*	Source: 2, Table 1.1-3	Lbs per ton	38	3.8	38	38	38	38	NA	NA
Black Liquor (BLQ)	Source: 1	Lbs per ton	7	0.7	7	7	7	7	NA	NA
Distillate Fuel Oil (DFO)*	Source: 2, Table 3.1-2a, 3.4-1 & 1.3-1	Lbs per MG	157	15.7	157	157	157	157	140	140
Jet Fuel (JF)*	Assumed to have emissions similar to DFO.	Lbs per MG	157	15.7	157	157	157	157	140	140
Kerosene (KER)*	Assumed to have emissions similar to DFO.	Lbs per MG	157	15.7	157	157	157	157	140	140
Landfill Gas (LFG)	Sources: 1 (including footnote 7 within source); 2, Table 1.4-2 (including footnote d within source)	Lbs per MMCF	0.6	0.06	0.6	0.6	0.6	0.6	0.6	0.6
Lignite Coal (LIG)*	Source: 2, Table 1.7-1	Lbs per ton	30	3	30	30	30	30	NA	NA
Municipal Solid Waste (MSW)	Source: 1	Lbs per ton	1.7	0.17	1.7	1.7	1.7	1.7	NA	NA
Natural Gas (NG)	Sources: 1 (including footnote 7 within source); 2, Table 1.4-2 (including footnote d within source)	Lbs per MMCF	0.6	0.06	0.6	0.6	0.6	0.6	0.6	0.6

Table A1. Sulfur Dioxide Uncontrolled Emission Factors (cont)

(Units and Factors)

Fuel, Code, Source and Emission units

Combustion System Type/Firing Configuration

Emissions
Units
(Lbs = pounds,
MMCF = million cubic

million cubic Source and feet, MG = Tables Spreader Internal thousand Cyclone Fluidized Opposed Stoker **Tangential** All Other Combustion Combustion (As gallons) Boiler Boiler Fuel And EIA Fuel Code Bed Boiler Firing Boiler Boiler Boiler Types Turbine appropriate) Engine Sources: 1 (including Other Biomass Gas (OBG) Lbs per MMCF 0.6 0.6 0.06 0.6 0.6 0.6 0.6 0.6 footnote 7 within source); 2, Table 1.4-2 (including footnote d within source) Other Biomass Liquids 15.7 157 157 140 Source: 1 Lbs per MG 157 157 157 140 (OBL)* (including footnotes 3 and 16 within source) Other Biomass Solids 0.23 0.02 0.23 NA Source: 1 Lbs per ton 0.23 0.23 0.23 NA (including (OBS) footnote 11 within source) Other Gases (OG) 0.6 0.06 0.6 0.6 Source: 1 Lbs per 0.6 0.6 0.6 0.6 (including MMCF footnote 7 within source) Other (OTH) Assumed to Lbs per 0.6 0.06 0.6 0.6 0.6 0.6 0.6 0.6 have MMCF emissions similar to NG. Petroleum Coke (PC)* NA NA Source: 1 Lbs per ton 39 3.9 39 39 39 39 Propane Gas (PG) Sources: 1 Lbs per 0.6 0.06 0.6 0.6 0.6 0.6 0.6 0.6 (including MMCF footnote 7 within source); 2, Table 1.4-2 (including footnote d within source) Residual Fuel Oil (RFO)* Source: 2, 157 15.7 157 157 157 157 NA NA Lbs per MG Table 1.3-1 Synthetic Coal (SC)* 38 3.8 38 38 38 38 NA NA Assumed to Lbs per ton have the emissions similar to Bituminous Coal Sludge Waste (SLW) Source: 1 Lbs per ton ** 2.8 0.28 2.8 2.8 2.8 2.8 NA NA (including footnote 11 within source) Subbituminous Coal (SUB)* Source: 2, Lbs per ton 35 3.5 35 38 35 35 NA NA Table 1.1-3 Tire-Derived Fuel (TDF)* Source: 1 Lbs per ton 38 3.8 38 38 38 38 NA NA (including footnote 13 within source)

Table A1. Sulfur Dioxide Uncontrolled Emission Factors (cont)

Source: 2,

Table 1.11-2

(Units and Factors)

Fuel, Code, Source and Emission units Combustion System Type/Firing Configuration **Emissions** Units (Lbs = pounds, MMCF = million cubic Source and feet, MG = Tables Spreader Internal thousand Cyclone Fluidized Opposed Stoker **Tangential** All Other Combustion Combustion (As Fuel And EIA Fuel Code gallons) Boiler Boiler Bed Boiler Firing Boiler Boiler Boiler Types Turbine Engine appropriate) Waste Coal (WC)* Source: 1 Lbs per ton 30 3 30 30 30 30 NΑ NΑ (including footnote 20 within source) Wood Waste Liquids 15.7 157 157 157 157 140 Source: 1 Lbs per MG 157 140 (including (WDL)* footnotes 3 and 16 within source) Wood Waste Solids (WDS) Source: 1 Lbs per ton 0.29 0.08 0.29 0.08 0.29 0.29 NA NA

Note: * For these fuels, emissions are estimated by multiplying the emissions factor by the physical volume of fuel and the sulfur percentage of the fuel (other fuels do not require the sulfur percentage in the calculation). Note that EIA data do not provide the sulfur content of TDF. The value used (1.56 percent) is from U.S. EPA, Control of Mercury Emissions from Coal-Fired Electric Utility Boilers, April 2002, EPA-600/R-01-109, Table A-11 (available at:http://www.epa.gov/appcdwww/aptb/EPA-600-R-01-109A.pdf).

147

147

147

147

NA

NA

14.7

147

Lbs per MG

Waste Oil (WO)*

^{**} Although Sludge Waste and Black Liquor consist substantially of liquids, these fuels are measured and reported to EIA in tons.

^{1.} Eastern Research Group, Inc. and E.H. Pechan & Associates, Inc., Documentation for the 2002 Electric Generating Unit National Emissions Inventory, Table 6, September 2004. Prepared for the U.S. Environmental Protection Agency, Emission Factor and Inventory Group (D205-01), Emissions, Monitoring and Analysis Division, Research Triangle Park; and

^{2.} U.S. Environmental Protection Agency, AP 42. Fifth Edition (Compilation of Air Pollutant Emission Factors, Volume 1: Stationary Point and Area Sources); available at: http://www.epa.gov/ttn/chie