

Form CA-01 CALCULATIONS

Duplicate this form for
Each Emission Unit

1) Company/Facility name MidAmerican Energy Co., Riverside		2) EIQ No. 92-2692
3) Emissions Point No.	4) Emissions Unit No.	5) Emission Unit Description or (SCC) No.

6) Calculations are provided in support of information reported on Form 4.0 page

7) Emissions Calculations

	CEMS Values			
	SO ₂ Tons	NO _x lb/mmBtu	NO _x Tons	mmBtu
EP1/EU1	2280.1	0.391	1478.94	7,564,889

Note: NO_x Tons = (NO_x lb/mmBtu x mmBtu)/2000

Form CA-01 CALCULATIONS

Duplicate this form for
Each Emission Unit

1) Company/Facility name MidAmerican Energy Co., Riverside		2) EIQ No. 92-2692
3) Emissions Point No.	4) Emissions Unit No.	5) Emission Unit Description or (SCC) No.

6) Calculations are provided in support of information reported on Form 4.0 page

7) Emissions Calculations

Calculation of Emission Factors for boiler particulate emissions

Boiler 9 - Dry bottom, tangentially fired boiler			Form 4.0 Page 1		
Boiler 7 & 8 - Dry bottom, wall fired boiler			Form 4.0 Page 16, 25		
Emission Point	Emission Unit	TSP Test Results lbs/MMBtu	TSP Emission Factor	PM10 Particle Distribution	PM10 Emission Factor
EP001	EU001,002,003	0.0460	0.0460	0.67	0.0308

Formula: TSP Emission Factor = TSP Test Results
PM10 Emission Factor = TSP Test Results x PM10 Particle Distribution

TSP Test Results from most recent particulate test.
PM10 Particle Distribution from AP-42.
Test results used were for boilers 8 & 9, the higher of the common stack combinations tested.

Boiler 6 - Dry bottom, wall fired boiler			Form 4.0 Page 35		
Emission Point	Emission Unit	TSP Test Results lbs/MMBtu	TSP Emission Factor	PM10 Particle Distribution	PM10 Emission Factor
EP002	EU004	0.0357	0.0357	0.67	0.0239

Formula: TSP Emission Factor = TSP Test Results
PM10 Emission Factor = TSP Test Results x PM10 Particle Distribution

TSP Test Results from most recent particulate test.
PM10 Particle Distribution from AP-42.

$$\text{Emissions Tons} = (((\text{Actual Throughput} \times 2000 \times \text{Btu/lb}) / 1,000,000) \times \text{Emission Factor}) / 2000$$

Form CA-01 CALCULATIONS

Duplicate this form for
Each Emission Unit

1) Company/Facility name MidAmerican Energy Co., Riverside		2) EIQ No. 92-2692
---	--	-----------------------

3) Emissions Point No. EP1,EP2	4) Emissions Unit No. EU2, EU3, EU4	5) Emission Unit Description or (SCC) No. Coal Fired Utility boiler
-----------------------------------	--	--

6) Calculations are provided in support of information reported on Form 4.0 page

7) Emissions Calculations

HCl Coal Emission Factor Conversion
lb/dry ton to lb/ton - Assume 90% chlorine present in coal is converted to HCl

Emission Factor lb/lb dry coal 0.00005453 (from laboratory analysis)
Coal Average Percent Moisture 30.54 (from laboratory analysis)
Correction for molecular weights 1.0282 (H 1.00 + Cl 35.45)/ Cl 34.45
Emission Factor lb/ton = ((EF x (1.0 - (Ave Moisture)/100)) x 2000 x 0.9) x CF molecular weight
Emission Factor lb/ton = 7.0100E-02

HF Coal Emission Factor Conversion
lb/dry ton to lb/ton - Assume 90% fluorine present in coal is converted to HF

Emission Factor lb/lb dry coal 0.00006168 (from laboratory analysis)
Coal Average Percent Moisture 30.54 (from laboratory analysis)
Correction for molecular weights 1.0527 (H 1.00 + F 18.99)/ F 18.99
Emission Factor lb/ton = ((EF x (1.0 - (Ave Moisture)/100)) x 2000 x 0.9) x CF molecular weight
Emission Factor lb/ton = 8.1181E-02

Hg
lb/dry ton to lb/ton - Assume 90% mercury present in coal is emitted as Hg compounds

Emission Factor lb/lb dry coal 0.000000086 (from laboratory analysis)
Coal Average Percent Moisture 30.54 (from laboratory analysis)
Emission Factor lb/ton = (EF x (1.0 - (Ave Moisture)/100)) x 2000 x 0.9
Emission Factor lb/ton = 1.0752E-04

Duplicate this form as needed

TYPE ALL INFORMATION

(DNR Form 542-4010, December 22, 1999)

Form CA-01 CALCULATIONS

Duplicate this form for
Each Emission Unit

1) Company/Facility name MidAmerican Energy Co., Riverside		2) EIQ No. 92-2692
3) Emissions Point No. EP1	4) Emissions Unit No. EU1	5) Emission Unit Description or (SCC) No. Coal Fired Utility boiler
6) Calculations are provided in support of information reported on Form 4.0 page		
7) Emissions Calculations		
<p>HCl Coal Emission Factor Conversion lb/dry ton to lb/ton - Assume 90% chlorine present in coal is converted to HCl</p> <p>Emission Factor lb/lb dry coal 0.00005453 (from laboratory analysis) Coal Average Percent Moisture 30.54 (from laboratory analysis) Correction for molecular weights 1.0282 (H 1.00 + Cl 35.45)/ Cl 34.45 Emission Factor lb/ton = ((EF x (1.0 - (Ave Moisture)/100)) x 2000 x 0.9) x CF molecular weight Emission Factor lb/ton = 7.0100E-02</p> <p>HF Coal Emission Factor Conversion lb/dry ton to lb/ton - Assume 90% fluorine present in coal is converted to HF</p> <p>Emission Factor lb/lb dry coal 0.00006168 (from laboratory analysis) Coal Average Percent Moisture 30.54 (from laboratory analysis) Correction for molecular weights 1.0527 (H 1.00 + F 18.99)/ F 18.99 Emission Factor lb/ton = ((EF x (1.0 - (Ave Moisture)/100)) x 2000 x 0.9) x CF molecular weight Emission Factor lb/ton = 8.1181E-02</p> <p>Hg lb/dry ton to lb/ton - Assume 90% mercury present in coal is emitted as Hg compounds</p> <p>Emission Factor lb/lb dry coal 0.000000086 (from laboratory analysis) Coal Average Percent Moisture 30.54 (from laboratory analysis) Emission Factor lb/ton = (EF x (1.0 - (Ave Moisture)/100)) x 2000 x 0.9 Emission Factor lb/ton = 1.0752E-04</p>		

Duplicate this form as needed

TYPE ALL INFORMATION

(DNR Form 542-4010. December 22, 1999)

Form CA-01 CALCULATIONS

Duplicate this form for
Each Emission Unit

1) Company/Facility name MidAmerican Energy Co., Riverside		2) EIQ No. 92-2692
---	--	-----------------------

3) Emissions Point No. EP4	4) Emissions Unit No. EU5	5) Emission Unit Description or (SCC) No.
-------------------------------	------------------------------	---

6) Calculations are provided in support of information reported on Form 4.0 page

7) Emissions Calculations

Coal Bulldozing Emission Factor -Fire 6.23/AP-42 11.9-1 Western Surface Coal Mining

Emission Factor PM10

$$E = 0.75 * ((18.6 * (s^{1.5})) / (M^{1.4}))$$

$$E = 0.75 * ((18.6 * (8.6^{1.5})) / (10.4^{1.4}))$$

$$E = 13.25791 \text{ lbs/hr}$$

s = material silt content Table 11.9-3 mean for as received coal 8.6

M = material moisture content Table 11.9-3 mean for as received coal 10.4

Form CA-01 CALCULATIONS

Duplicate this form for
Each Emission Unit

1) Company/Facility name MidAmerican Energy Co., Riverside		2) EIQ No. 92-2692
3) Emissions Point No. EP5, EP6, EP8A	4) Emissions Unit No. EU6, EU7, EU9	5) Emission Unit Description or (SCC) No. 30501011
6) Calculations are provided in support of information reported on Form 4.0 page		
7) Emissions Calculations		
<p>Coal Handling Emission Factor - AP42 13.2.4 Aggregate Handling And Storage Piles Applicable to coal continuous drop process such as stocking out and conveyor belt feeds.</p> <p>Emission Factor PM10 $E = k(0.0032)((U/5)^{1.3}/(M/2)^{1.4})$ $E = (0.35 * 0.0032) * (((9.7/5)^{1.3}) / (4.5/2)^{1.4})$ $E = 0.00085 \text{ lbs/ton}$</p> <p>Emission Factor PM $E = k(0.0032)((U/5)^{1.3}/(M/2)^{1.4})$ $E = (0.74 * 0.0032) * (((9.7/5)^{1.3}) / (4.5/2)^{1.4})$ $E = 0.00180 \text{ lbs/ton}$</p> <p>E = emission factor k = particle size multiplier PM10 = 0.35 PM = 0.74 U = mean wind speed - mph Moline average = 9.7 mph M = material moisture content Table 13.2.4-1 mean for as received coal 4.5</p>		

Duplicate this form as needed

TYPE ALL INFORMATION

(DNR Form 542-4010, December 22, 1999)