Appendix C

Dispersion Modeling Info

IOWA DEPARTMENT OF NATURAL RESOURCES

Environmental Services Division
Air Quality Bureau
Modeling Group

M E M O R A N D U M

DATE: 03-21-07

TO: CHRIS ROLING

FROM: LORI HANSON LH

RE: MIDAMERICAN COUNCIL BLUFFS ENERGY CENTER (78-01-026), PSD PN 06-541

CC: CATHARINE FITZSIMMONS, DAVE PHELPS, BRIAN HUTCHINS

ANALYSIS RESULTS

☒ Passed / Acceptable

☐ Changes required that affect the permits (see below for details)

☐ Does not pass / Not acceptable

ANALYSIS SUMMARY

Review of the PSD dispersion modeling analysis for the MidAmerican Council Bluffs Energy Center (CBEC) facility located in Council Bluffs as conducted by CH2MHill, indicates that the modeling analysis is acceptable, with the DNR revisions listed below. This modeling analysis has been submitted in support of the PSD permit modifications to Boiler #4. The modeling analysis for this project was received October 2006, with additional modeling analyses submitted in February 2007.

The proposed modifications for Boiler #4 trigger a PSD modeling review for emissions of CO, NO_X, lead, SO_2, and PM_{10}. Preliminary modeling of CO and NO_X emissions resulted in predicted concentrations below the applicable PSD significant impact levels for those pollutants; therefore no additional modeling is required for CO and NO_X. The preliminary modeling analysis for NO_X can be used to evaluate the maximum NO_X increment consumption for this project. Modeling results indicate that NO_X emissions from this project will consume no more than 2.2% of the NO_X increment. The highest predicted NO_X concentrations from this project, along with the PSD increment level are listed in Table 1.

Since there is no PSD significant impact level or PSD increment for lead, the predicted lead concentrations were compared to the lead NAAQS. Predicted lead concentrations from CBEC, and nearby facilities (including Griffin Pipe and several facilities previously identified by the City of Omaha) were below the lead NAAQS. The highest predicted monthly concentration of lead (more conservative than the standard) was 0.62 $\mu g/m^3$; the lead NAAQS is 1.5 $\mu g/m^3$ per calendar quarter.

The preliminary modeling analyses for SO_2 resulted in predicted concentrations above the applicable PSD significant impact levels for the 3-hour and 24-hour averaging periods for SO_2. Modeling results from the preliminary SO_2 analysis indicate that SO_2 emissions from this project will consume no more than 3.5% of the increment for the 3-hour averaging period, 5.9% of the increment for the 24-hour averaging period, and 3.5% of the increment for the annual averaging period. The predicted SO_2 concentrations from this project, along with the applicable PSD increment values, are listed in Table 1.

Since the preliminary modeling analysis for SO_2 resulted in predicted concentrations above the applicable PSD significant impact levels, a full impact modeling analysis was conducted. The full impact analyses indicated that predicted SO_2 concentrations were below the applicable SO_2 NAAQS and PSD increment levels. The predicted impacts from the cumulative SO_2 NAAQS and PSD increment analyses are listed in Tables 2 and 3, respectively.

The preliminary modeling analyses for PM_{10} resulted in predicted concentrations above the applicable PSD significant impact levels for both the 24-hour and annual averaging periods. The PM_{10} significant impact analysis can conservatively be used to evaluate the maximum increment consumption. Modeling results from the preliminary PM_{10} analysis indicate that PM_{10} emissions from this project will consume no more than 36.7% of the increment for the 24-hour averaging period, and 36.5% of the increment for the annual averaging period. The predicted PM_{10} concentrations from this project, along with the applicable PSD increment values are listed in Table 1.

Since the preliminary modeling analysis for PM_{10} resulted in predicted concentrations above the applicable PSD significant impact levels, a full impact modeling analysis was conducted. The PM_{10} full impact modeling analyses indicated that predicted concentrations of PM_{10} exceed the applicable NAAQS and PSD increment levels for PM_{10}. Results form the PM_{10} NAAQS analyses showed that the predicted exceedances were all at one receptor location on the property of the nearby Bunge North America facility. When Bunge emission sources were removed from the analysis at this receptor location, there were no predicted exceedances of the PM_{10} NAAQS. The predicted exceedances of the PM_{10} increment were located near other facilities. Additional modeling analyses determined that emissions from the CBEC facility do not have a significant contribution at the receptors with predicted PM_{10} increment exceedances.

It should be noted that emissions from the CBEC paved haul road have been omitted from the PM_{10} PSD increment analysis for the 24-hour averaging period. The decision to omit the haul road emissions from this analysis is based on the facility having a paved haul road and using Best Management Practices to control emissions. CBEC is restricted to having covered trucks, is limited to 80 truck trips per day, and is required to water and vacuum the road daily. The predicted impacts from the cumulative PM_{10} NAAQS and PSD increment analyses are listed in Tables 2 and 3, respectively.

The predicted impacts from the ancillary equipment associated with this project are summarized in Table 4. The emission units associated with this project are listed in Table 5; the stack parameters and potential emission rates used to evaluate this project are summarized in Table 6.

The discrepancies identified and revised by the DNR during the review of this project are as follows:

1. The building height of the boiler building (52b) was increased from 110 feet to 157 feet in the preliminary modeling analyses for CO and NO_X, and in the full modeling analyses for SO_2 and PM_{10}, and the modeling conducted for ancillary sources. The Building Profile Input Program for

PRIME (BPIPPRM) was run to determine direction-specific downwash parameters with the revised building height.

2. The PM_{10} emission rate for the cooling tower (EP145) was increased from 1.22 to 1.28 lb/hr in the full PM_{10} modeling analyses (NAAQS and PSD increment).

3. The PM_{10} emission rate for the lime day bin (EP161) was increased from 0.024 to 0.03 lb/hr in the full PM_{10} modeling analyses.

4. The PM_{10} emission rate for the lime storage silo (EP163) was increased from 0.024 to 0.03 lb/hr and the stack tip diameter was changed from 3.2 to 4 inches the full PM_{10} modeling analyses.

5. The PM_{10} emission rates for the activated carbon silos (EP165A and EP165B) were increased from 0.024 to 0.03 lb/hr in the full PM_{10} modeling analyses.

6. The emission sources at the nearby Bunge facility were update in the full impact analyses of SO_2 and PM_{10} based on the most recent PSD modeling analyses (PN 06-167) conducted for Bunge in September and November of 2006.

7. The stack gas exit temperatures in the SO_2 NAAQS analysis were corrected for all sources other than the emission units associated with this project.

8. The full impact modeling analyses for SO_2 were revised to include the emission rate and stack parameter updates associated with the recent modifications to CBEC Boiler #3 (PSD project 06-250).

9. No modeling analysis was submitted to address the proposed changes to the emergency generator (EP143) and fire pump (EP144); therefore a modeling analysis was conducted to evaluate the ancillary equipment. It is appropriate to evaluate impacts from ancillary emission units separately since these units will only be operated when the rest of the facility is not in operation (except for test and maintenance purposes).

10. Future submittals should include a site plan with corrected locations for the lime filter separator vacuums (EP162A and EP162B) and correct building heights for building 23 (auxelec).

It also should be noted that MidAmerican had previously requested several changes to existing construction permits that have not been made. According to the email from MidAmerican received on February 21, 2007, MidAmerican requested the following changes should be made to existing construction permits on June 8, 2006:

- Transfer House #1 (EP9) - Permit 78-A-169-S3 should have a PM_{10} emission rate of 2.33 lb/hr, stack height of 74 feet, and a stack diameter of 2.92 feet.

- Boiler #3 East Silos (EP14) – Permit 78-A-174-S1 should have a stack height of 280 feet and a flow rate of 22,000 acfm.

- Boiler #3 West Silos (EP15) – Permit 78-A-175-S1 should have a stack height of 280 feet and a flow rate of 18,800 acfm.

The pre-construction monitoring, additional impact analyses (including a Growth Analysis, Soils and Vegetation Analysis, and Visibility Analysis), and Class I impacts were all addressed under the original PSD project for Boiler #4.

Table 1. Modeling Results for Increment Consumption from this Project

Pollutant	Averaging Period	Year in which event occurred	PSD Increment for Class II Areas ($\mu g/m^3$)	Maximum Modeled Increment Consumption* ($\mu g/m^3$)	Percent of Available Increment Used
NO_X	Annual	2002	25	0.55	2.2
SO_2	3-hour	2004	512	18.1	3.5
	24-hour	2000	91	5.4	5.9
	Annual	2002	20	0.7	3.5
PM_{10}	24-hour	2000	30	11.0	36.7
	Annual	2003	17	6.2	36.5

* The 3-hour and 24-hour concentrations are the highest, second-high values; annual concentrations are the highest, first-high predicted values. Haul road emissions are not included in the 24-hour PM_{10} analysis.

Table 2. Worse Case Cumulative Modeling Results for the NAAQS

Pollutant	Averaging Period	Year in which event occurred	Predicted Concentration* ($\mu g/m^3$)	Background Concentration ($\mu g/m^3$)	Total Concentration ($\mu g/m^3$)	NAAQS ($\mu g/m^3$)
SO_2	3-hour	2001	623.4	20	643.4	1300
	24-hour	2000	142.1	20	162.1	365
	Annual	2001	21.1	20	41.1	80
PM_{10}	24-hour	2000	250.4	45	295.4	150

* The modeled 3-hour and 24-hour SO_2 concentrations are the highest, second high values; the annual SO_2 concentration is the highest predicted value. The modeled 24-hour PM_{10} concentration is the highest, sixth-high predicted value. It should be noted that the predicted exceedances occur at only one receptor located on the property of the nearby Bunge facility. Without emissions from Bunge sources, there are no predicted exceedances of the NAAQS. The next highest, sixth-high predicted PM_{10} concentration was 96.2 $\mu g/m^3$.

Table 3. Worst Case Cumulative Modeling Results for PSD Increment Consumption

Pollutant	Averaging Period	Year in which event occurred	Predicted Concentration* (μg/m³)	PSD Increment for Class II Areas (μg/m³)
SO_2	3-hour	2004	226.5	512
	24-hour	2004	49.0	91
	Annual	2001	6.6	20
PM_{10}	24-hour	2001	107.5	30
	Annual	2003	21.8	17

* The 3-hour and 24-hour concentrations are the highest, second-high values; the annual concentrations are the highest, first-high predicted values. Additional modeling analyses indicate that the CBEC facility does not have a significant contribution at any predicted exceedance receptor location.

Table 4. Worse Case Modeling Results from Project's Ancillary Equipment

Pollutant	Averaging Period	Year in which event occurred	Predicted Concentration* (μg/m³)	Background Concentration (μg/m³)	Total Concentration (μg/m³)	NAAQS (μg/m³)
PM_{10}	24-hour	2004	14.2	45	59.2	150
SO_2	3-hour	2003	12.8	20	32.8	1,300
	24-hour	2004	2.7	20	22.7	365

* The short-term concentrations are the highest, second-high predicted values.

Table 5. Emission Units Associated with the CBEC Boiler #4 Project

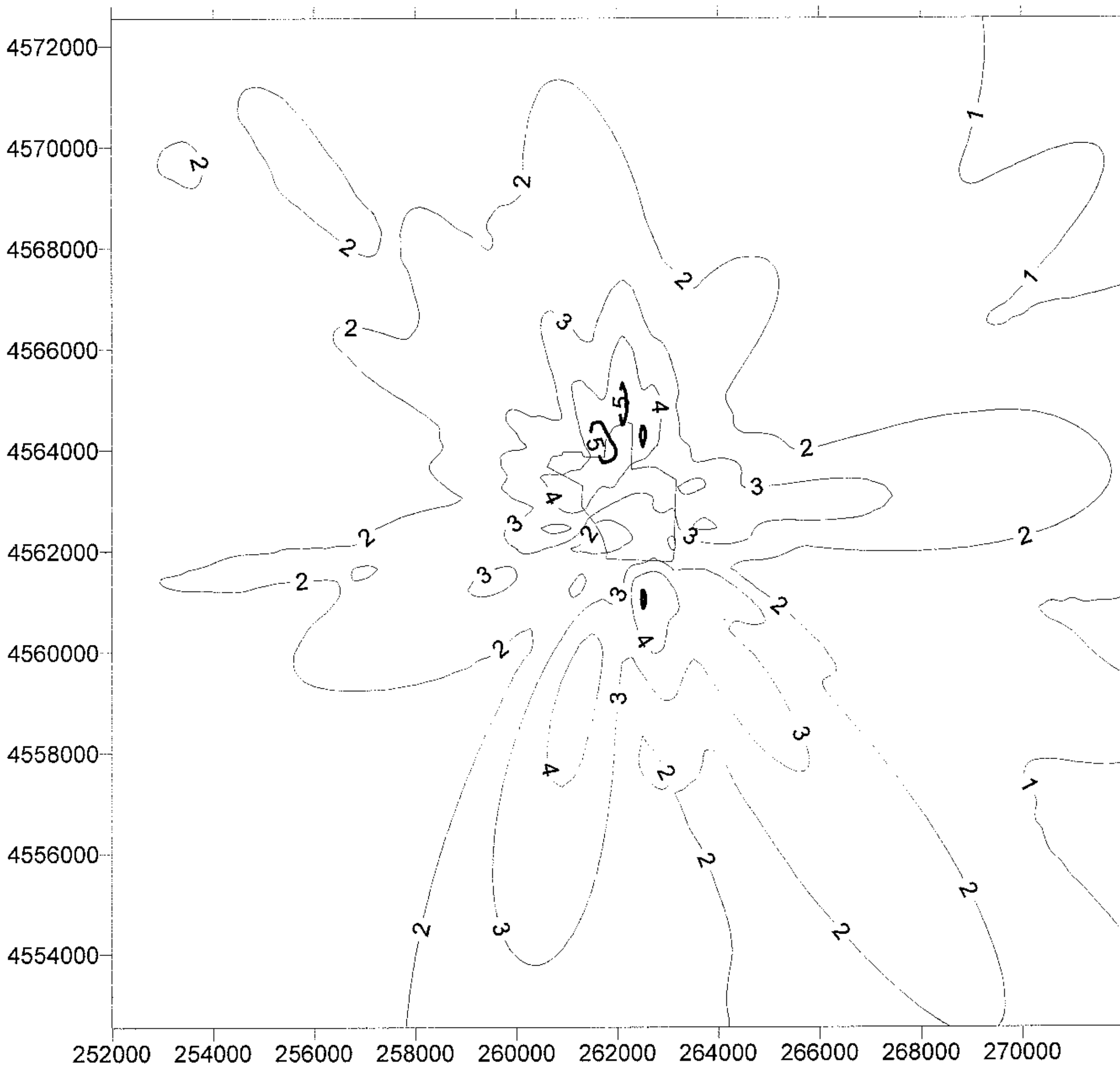
Emission Unit	Type of Source Modeled	Emission Point Description
EP6	point	dumper building
EP13	point	transfer house #4
EP141	point	boiler #4
EP142	point	auxiliary boiler
EP143	point	emergency generator
EP144	point	emergency fire pump
EP145	point	cooling tower (CT1-22)
EP160	point	unit #4 silos
EP161	point	unit #4 lime day bin vent
EP162A	point	unit #4 lime filter separator vacuum #1
EP162B	point	unit #4 lime filter separator vacuum #2
EP163	point	unit #4 lime storage silo vent
EP164	point	unit #4 urea tank
EP165A	point	unit #4 activated carbon silo #1
EP165B	point	unit #4 activated carbon silo #2
EP167	Point	unit #4 flyash/FGD waste silo
EP168	point	unit #4 flyash/FGD waste silo vacuum #1
EP169	point	unit #4 flyash/FGD waste silo vacuum #2
EP170	point	unit #4 flyash/FGD waste silo vacuum #3
EP171	point	unit #4 flyash recycle silo vacuum #1
EP172	point	unit #4 flyash recycle silo vacuum #2
EP173	point	unit #4 flyash recycle silo vacuum #3
EP174	point	unit #4 flyash recycle silo
EP180	point	water treatment lime storage silo A
EP181	point	water treatment lime storage silo B
EP182	point	unit #4 water treatment soda storage
EP10	volume	transfer house #2
F31A	volume	stacker conveyor
F31B	volume	transfer to active pile
F151A	volume	rail unloading
F118	volume	reclaim pit dumping
P1-P131	volume	haul road
F4A	area	active coal pile
F5A	area	inactive coal pile
F151B	area	rail unloading coal stockout pile

Table 6. Modeled Emission Rates and Stack Parameters for the CBEC Boiler #4 Project

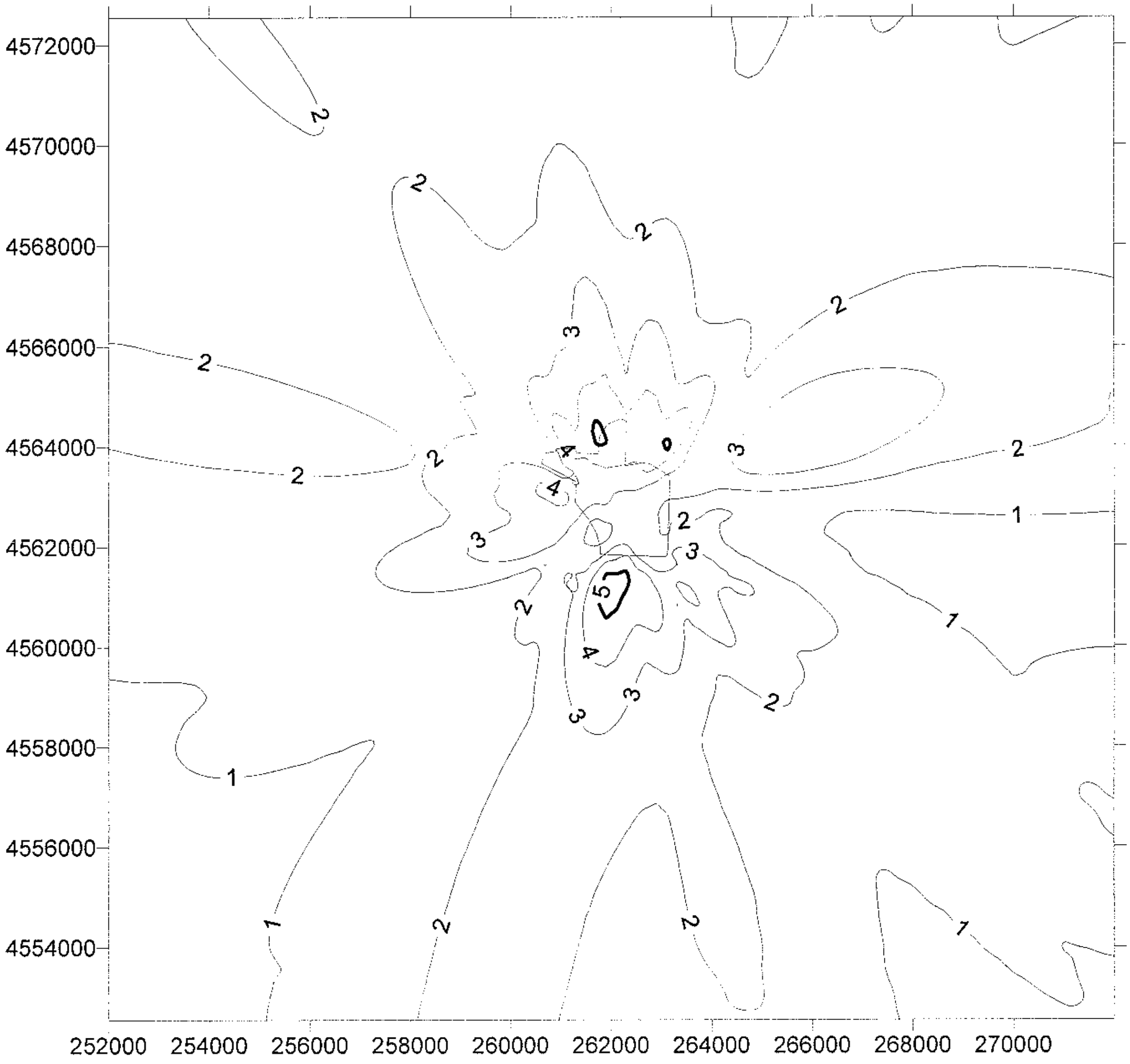
Emission Unit	CO (lb/hr)	NO_X (lb/hr)	Pb (lb/hr)	PM_{10} (lb/hr)	SO_2 (lb/hr)	Stack Height (ft)	Stack Gas Exit Temp. (°F)	Stack Tip Diameter (in)	Stack Gas Flow Rate (acfm)
EP6	-	-	-	6.44	-	90	70	82	150,000
EP13	-	-	-	1.14	-	50	70	39	26,880
EP141	1182	537.3	0.20	191.9	767.5	551	165	296	2,350,000
EP142	28.84	48.06	0.0004	2.61	0.21	290	310	69	104,981
EP143	13.89	-	-	2.29	0.85	22	855	18	14,500
EP144	2.15	-	-	0.70	0.12	13.5	850	6	2000
EP145*	-	-	-	0.058	-	63	98.1	394	1,303,000
EP160	-	-	-	2.14	-	246	70	54	49,700
EP161	-	-	-	0.03	-	85	70	3	300
EP162A	-	-	-	0.03	-	13	150	4	400
EP162B	-	-	-	0.03	-	13	150	4	400
EP163	-	-	-	0.03	-	104	70	4	300**
EP164	-	-	-	0.04	-	29	70	12	500**
EP165A	-	-	-	0.03	-	62	70	17	300**
EP165B	-	-	-	0.03	-	62	70	17	300**
EP167	-	-	-	0.13	-	126	160	9.4	3,000**
EP168	-	-	-	0.15	-	13	160	15	3,600**
EP169	-	-	-	0.15		13	160	15	3,600**
EP170	-	-	-	0.15	-	13	160	15	3,600**
EP171	-	-	-	0.2	-	13	160	15	4,700**
EP172	-	-	-	0.2	-	13	160	15	4,700**
EP173	-	-	-	0.2	-	13	160	15	4,700**
EP174	-	-	-	0.03	-	104	160	5	650**
EP180	-	-	-	0.1	-	81	70	54	1,200**
EP181	-	-	-	0.1	-	81	70	54	1,200**
EP182	-	-	-	0.1	-	81	70	54	1,200**
EP10	-	-	-	0.15	-	-	-	-	-
F31A	-	-	-	0.165	-	-	-	-	-
F31B	-	-	-	0.165	-	-	-	-	-
F151A	-	-	-	0.165	-	-	-	-	-
F118	-	-	-	0.08	-	-	-	-	-
P1-P150	-	-	-	1.89	-	-	-	-	-
F4A	-	-	-	1.0E-6	-	-	-	-	-
F5A	-	-	-	7.8E-8	-	-	-	-	-
F151B	-	-	-	7.8E-7	-	-	-	-	-

* The emission rate and stack parameters are for each individual cooling tower cell.
** These emission units were modeled with a 0 fps exit velocity due an obstructed, horizontal, or downward exhaust type.

MidAmerican CBEC Boiler #4 Modification
24-hour SO2 SIA
2000 Met Data



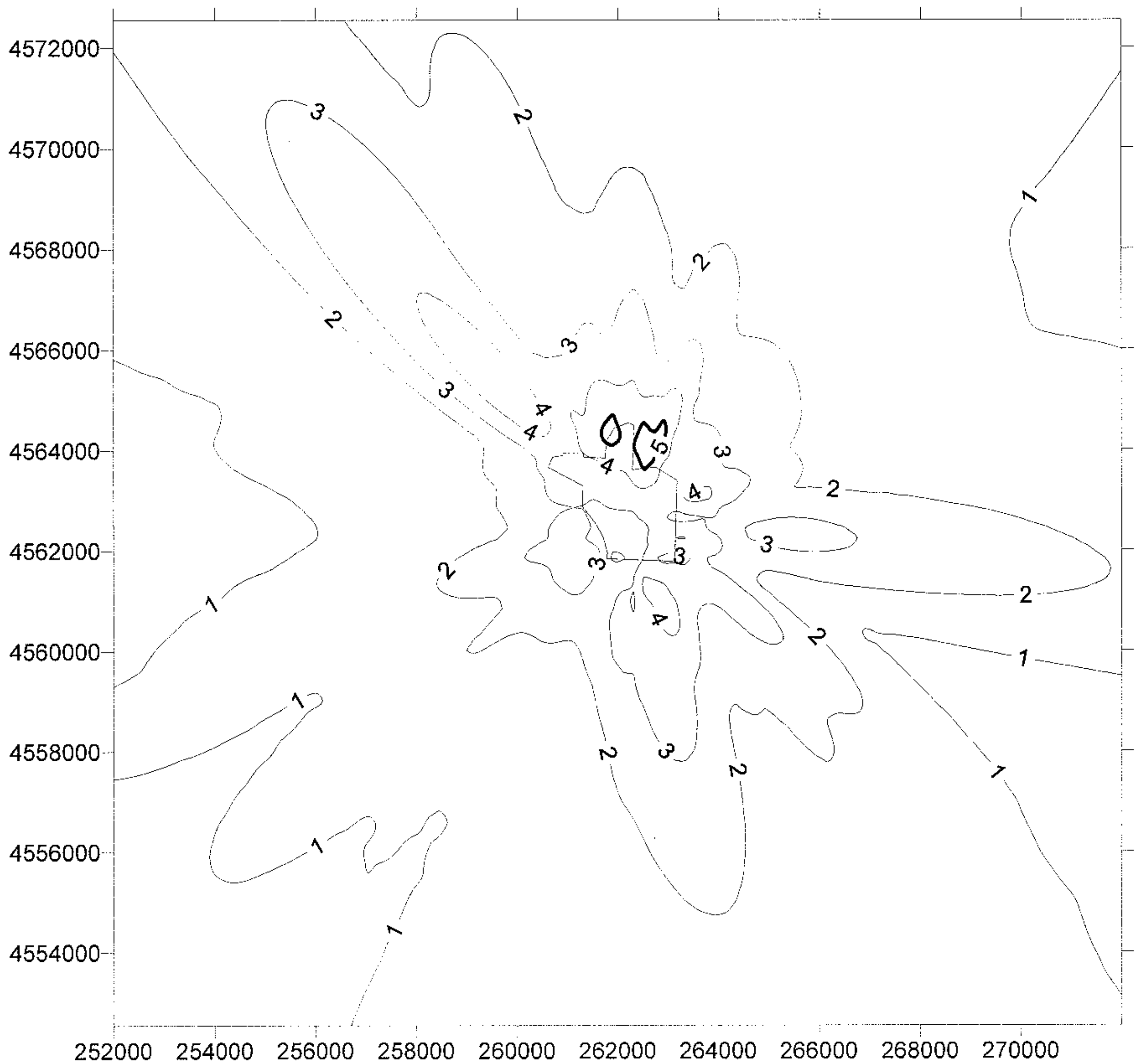
MidAmerican CBEC Boiler #4 Modification
24-hour SO2 SIA
2001 Met Data



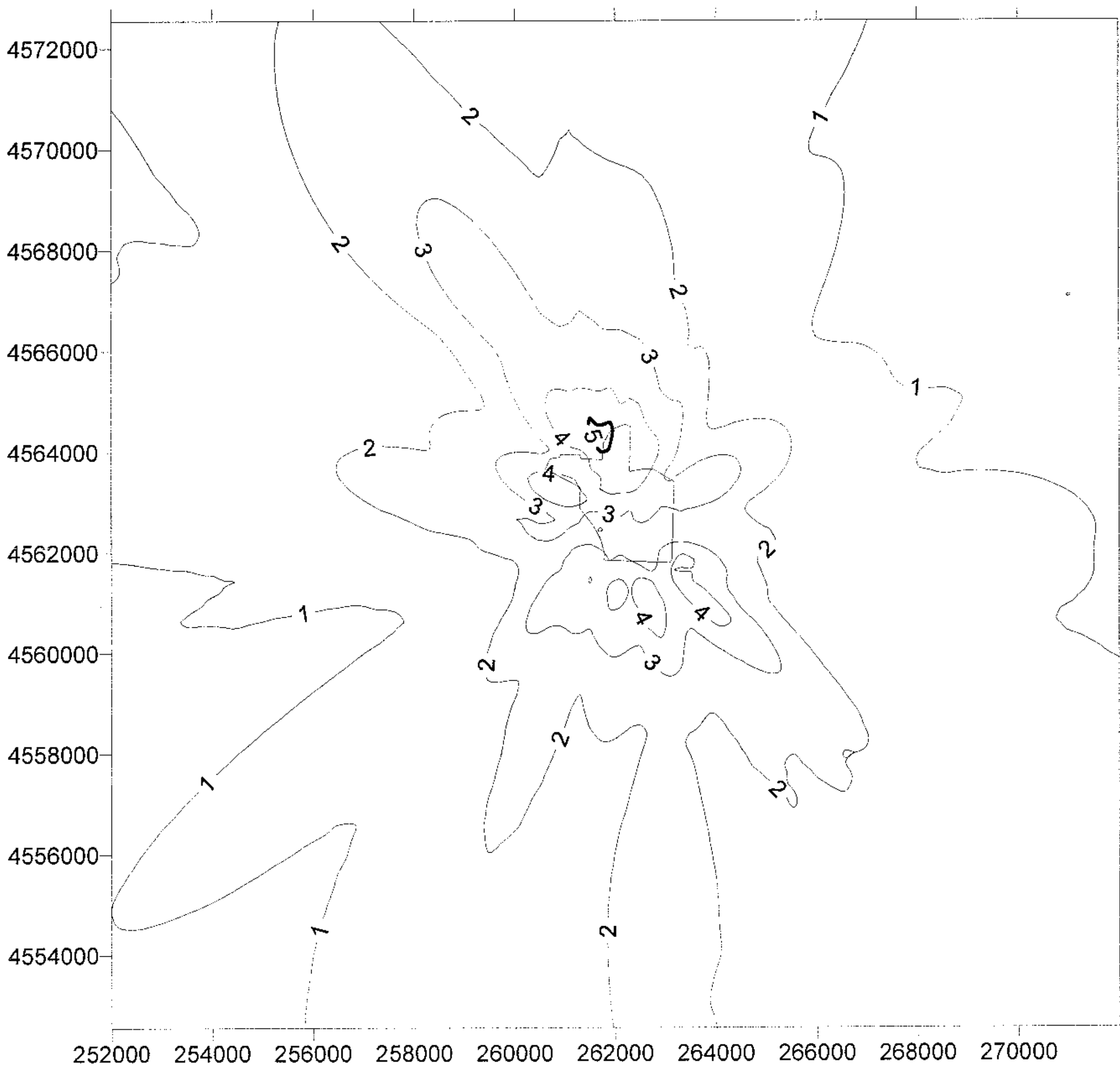
50 scale 15 = 10K

2 = 1.3 Km SO_2 SIA

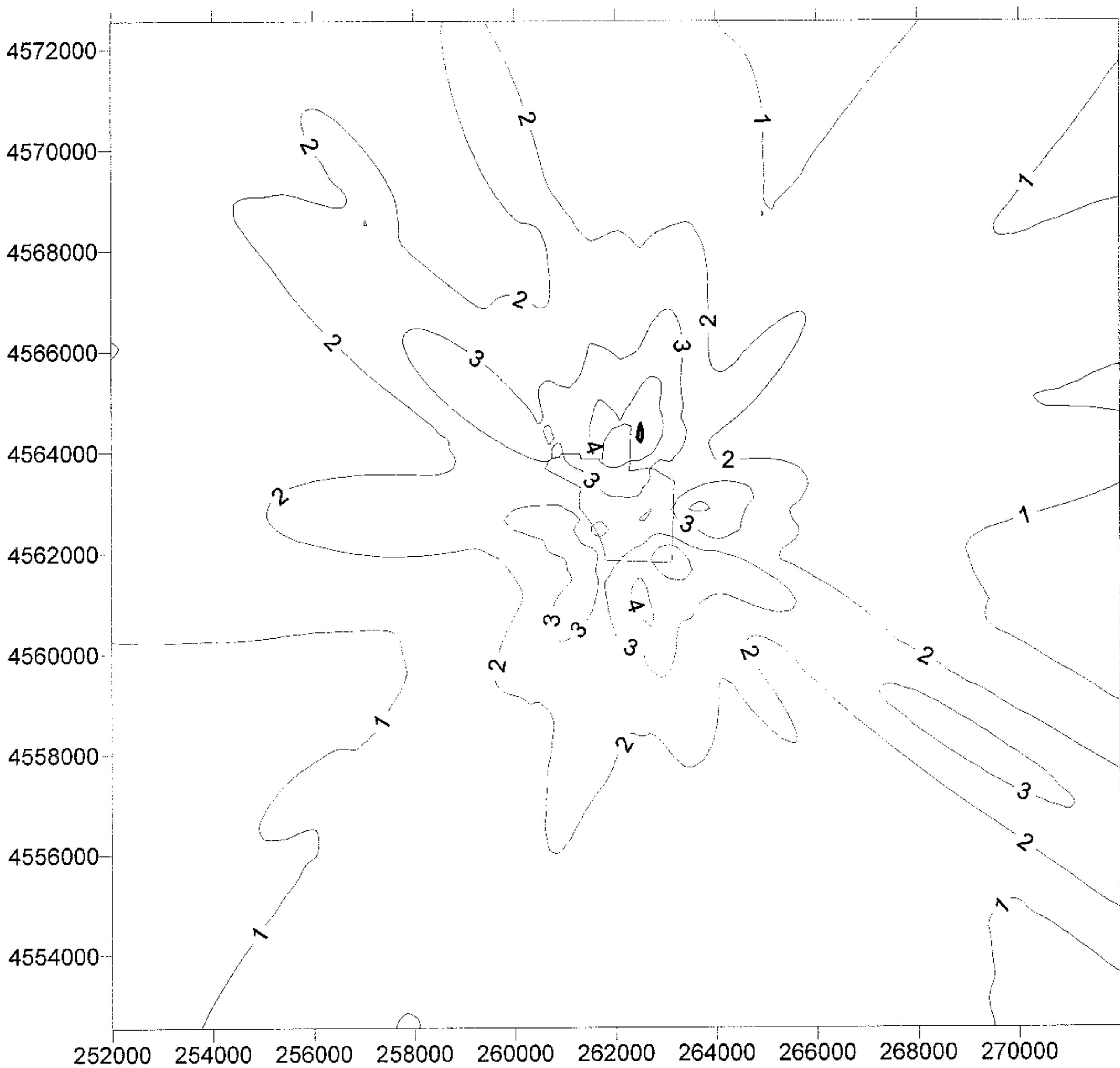
MidAmerican CBEC Boiler #4 Modification
24-hour SO2 SIA
2002 Met Data



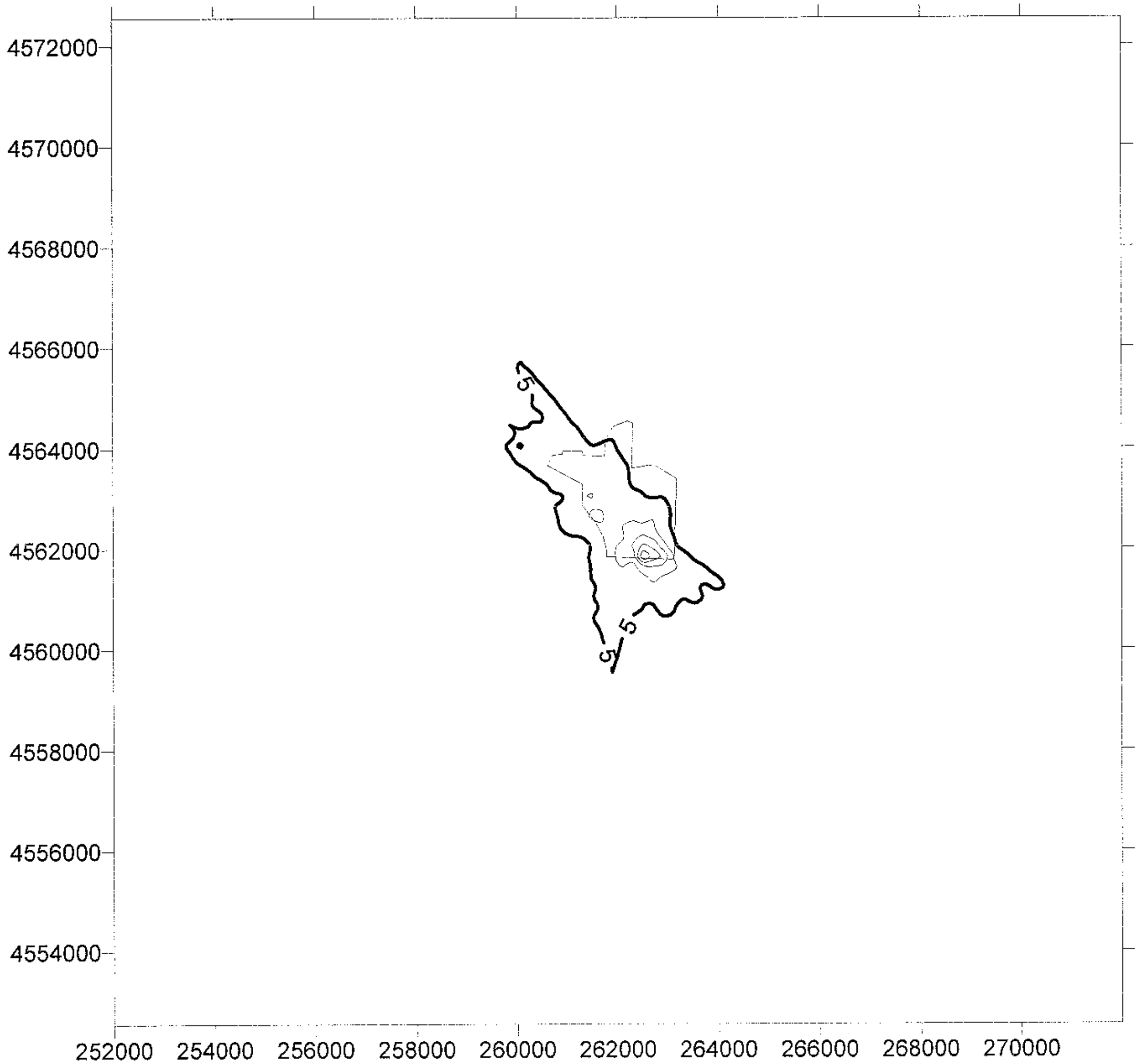
MidAmerican CBEC Boiler #4 Modification
24-hour SO2 SIA
2003 Met Data



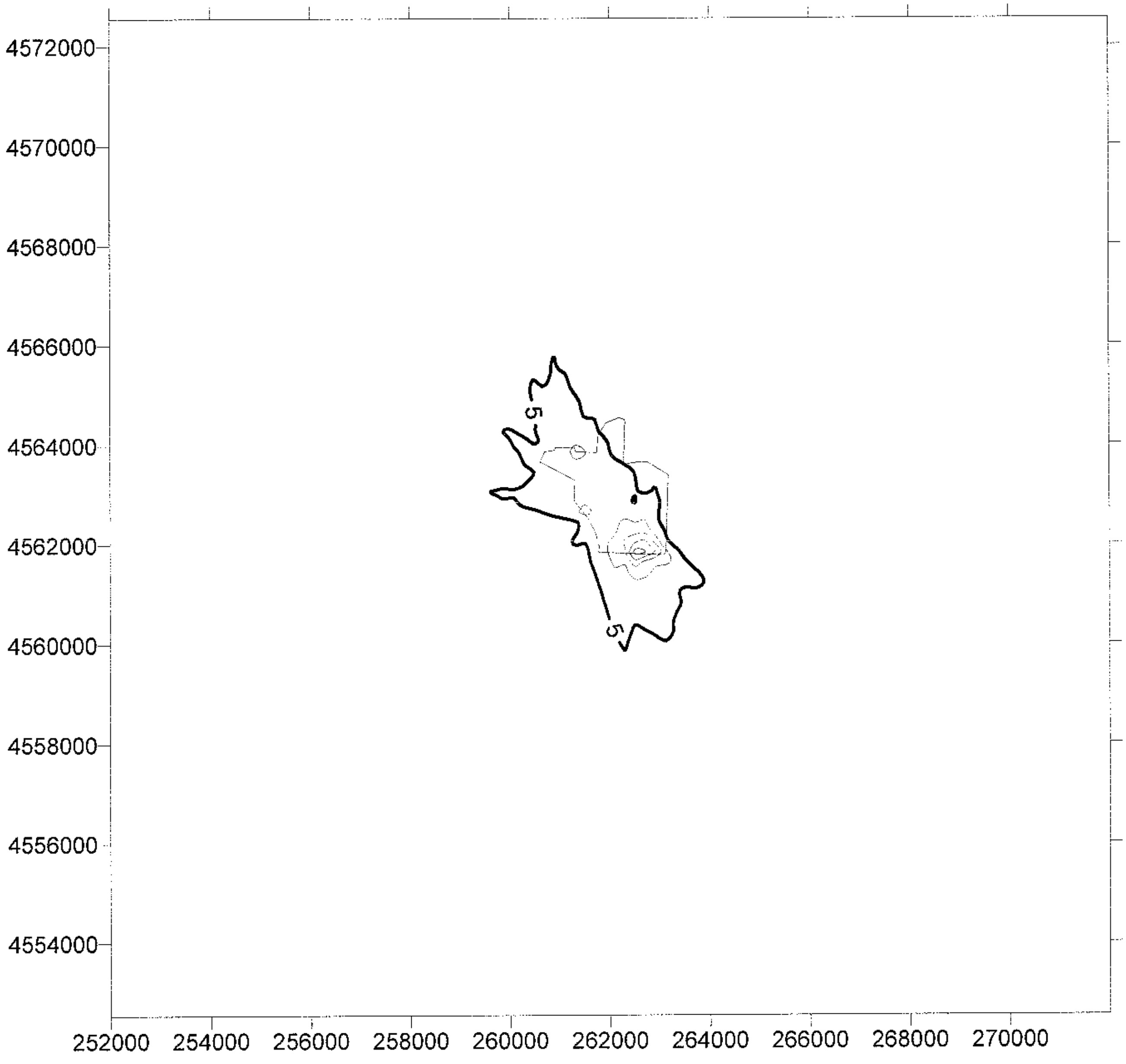
MidAmerican CBEC Boiler #4 Modification
24-hour SO2 SIA
2004 Met Data



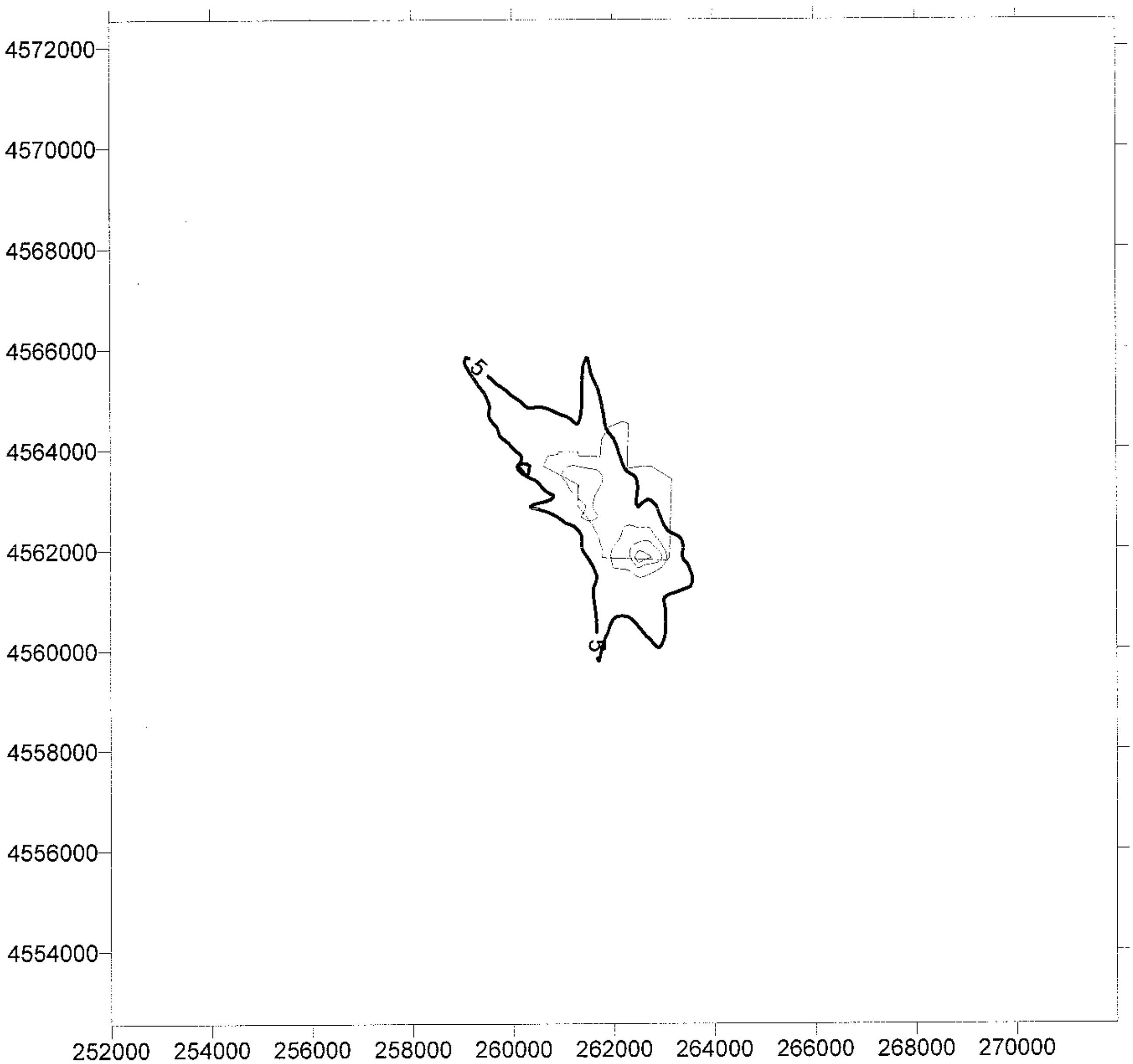
MidAmerican CBEC Boiler #4 Modification
24-hour PM-10 SIA
2000 Met Data



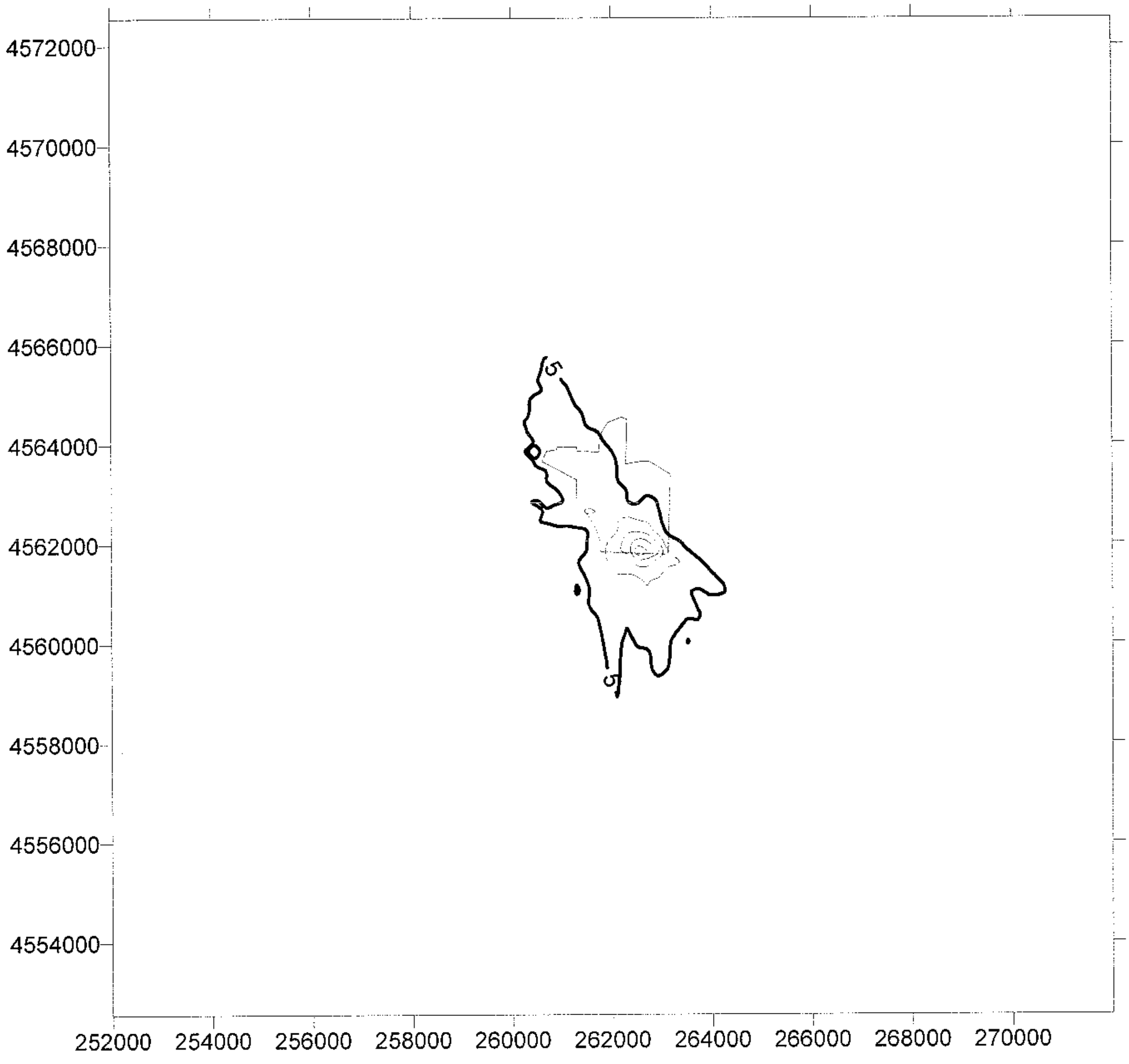
MidAmerican CBEC Boiler #4 Modification
24-hour PM-10 SIA
2001 Met Data



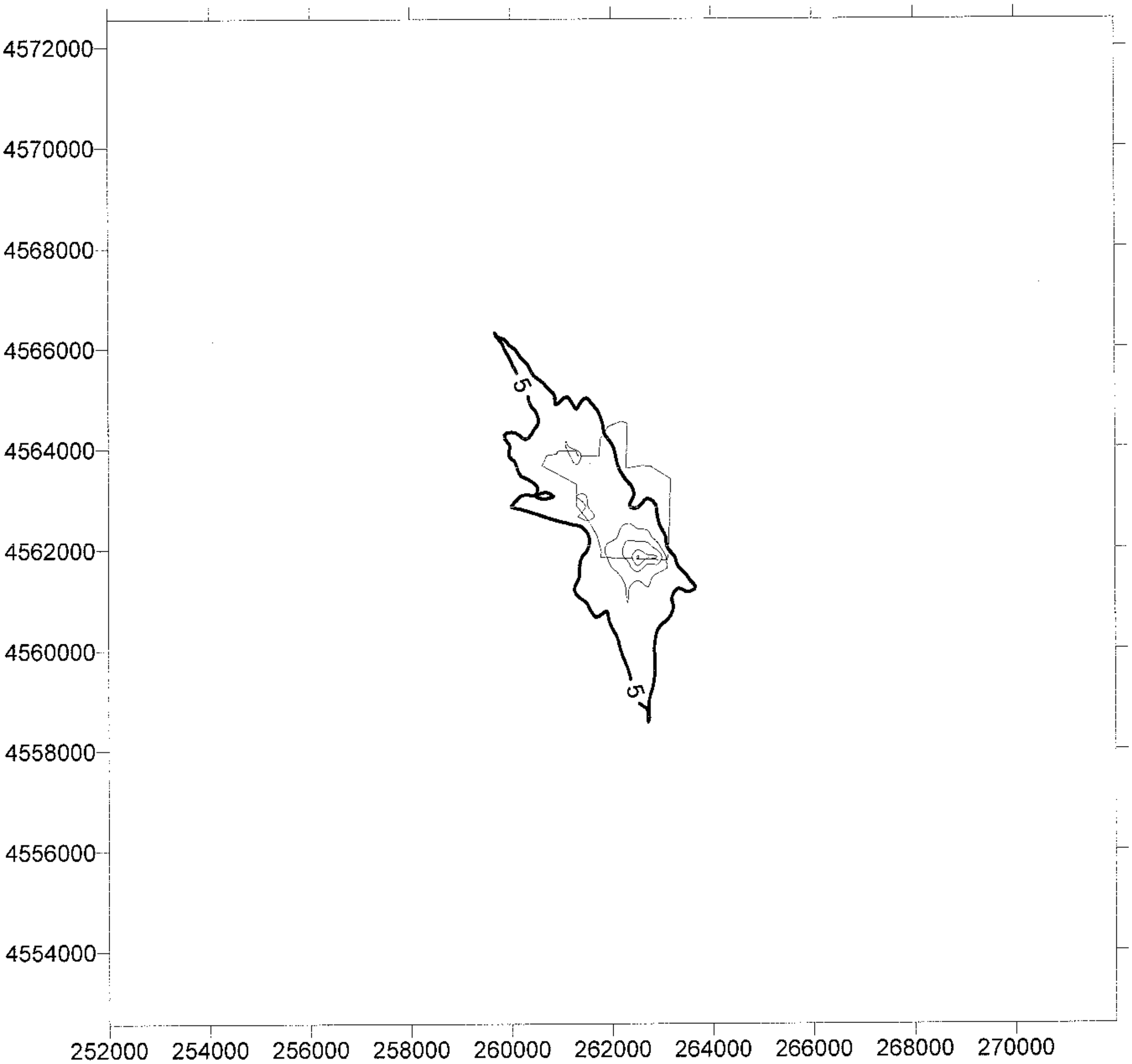
MidAmerican CBEC Boiler #4 Modification
24-hour PM-10 SIA
2002 Met Data



MidAmerican CBEC Boiler #4 Modification
24-hour PM-10 SIA
2003 Met Data



MidAmerican CBEC Boiler #4 Modification
24-hour PM-10 SIA
2004 Met Data



50 scale   10 Km = 151

49 = 3.245 Km
SIA from fenceline

Emission Point 141

Unit 4 Boiler

	450	ton/hr max design rate		
Potential Throughput	4,204,800.00	Tons	% Ash	5.37
	7,675.00	mmBtu/hr		
	8341	Ave Btu/lb		

Pollutant	Emission Factor	Units	Control Eff	Lbs/hr Uncontrolled	lbs/hr controlled	Controlled Tons/Yr
PM10	2.5000E-02	lb/mmBtu	0.00	191.88	191.88	840.41
PM	2.7000E-02	lb/mmBtu	0.00	207.23	207.23	907.65
SOx	1.0000E-01	lb/mmBtu		767.50		3,361.65
NOx	7.0000E-02	lb/mmBtu		537.25		2,353.16
VOC	3.6000E-03	lb/mmBtu		27.63		121.02
CO	1.5400E-01	lb/mmBtu		1,181.95		5,176.94
Flourides	9.0000E-04	lb/mmBtu		6.91		30.25
Lead	2.6000E-05	lb/mmBtu		0.20		0.87
Total Reduced Sulfur	1.0000E-03	lb/mmBtu		7.68		33.62
H2SO4	4.2100E-03	lb/mmBtu		32.31		141.53

	141	Total
	Pollutant	Tons/Yr
	PM10	840.41
	PM	907.65
	SOx	3,361.65
	NOx	2,353.16
	VOC	121.02
	CO	5,176.94
7664393	Hydrogen fluoride	30.25
	Lead compounds	0.87
	Total Reduced Sulfur	33.62
	H2SO4	141.53

Emission Point 142

Unit 4 Aux Boiler — Natural Gas

Potential Throughput	343.3	mmBtu/hr
	0.34	mmCF/hr

Pollutant	Emission Factor	Units	Control Eff	Uncontrolled lb/hr	Controlled lb/hr	Tons/Yr
PM10	7.60E-03	lb/mmBtu		2.61	2.61	1.14
PM	7.60E-03	lb/mmBtu		2.61	2.61	1.14
SOx	6.00E-04	lb/mmBtu		0.21	0.21	0.09
NOx	1.40E-01	lb/mmBtu		48.06	48.06	21.05
VOC	5.50E-03	lb/mmBtu		1.89	1.89	0.83
CO	8.40E-02	lb/mmBtu		28.84	28.84	12.63
Lead	5.00E-07	lb/mmBtu		0.00	0.00	0.00

142	Total
Pollutant	Tons/Yr
PM10	1.14
PM	1.14
SOx	0.09
NOx	21.05
VOC	0.83
CO	12.63

Emission Point 143

Units 4 Emergency Generator

Potential Throughput	0.1193	1000 gal/hr (max design rate, 500 hr limit)		
	16.34	mmBtu	% sulfur	0.05

Pollutant	Emission Factor	Units	Control Eff	Uncontrolled lb/hr	Controlled lbs/hr	Controlled Tons/Yr
PM10	1.40E-01	lb/mmBtu		2.29	2.29	0.57
PM	1.40E-01	lb/mmBtu		2.29	2.29	0.57
SOx	5.20E-02	lb/mmBtu		0.85	0.85	0.21
NOx	1.71E+00	lb/mmBtu		27.95	27.95	6.99
VOC	9.00E-02	lb/mmBtu		1.47	1.47	0.37
CO	8.50E-01	lb/mmBtu		13.89	13.89	3.47

143	
Pollutant	Tons/Yr
PM10	0.57
PM	0.57
SOx	0.21
NOx	6.99
VOC	0.37
CO	3.47

Emission Point 144

Units 4 Fire Pump

Potential Throughput	0.0165	1000 gal/hr (max design rate, 500 hr limit)		
	2.26	mmBtu	% sulfur	0.05

Pollutant	Emission Factor	Units	Control Eff	Uncontrolled lb/hr	Controlled lbs/hr	Controlled Tons/Yr
PM10	3.10E-01	lb/mmBtu		0.70	0.70	0.18
PM	3.10E-01	lb/mmBtu		0.70	0.70	0.18
SOx	5.20E-02	lb/mmBtu		0.12	0.12	0.03
NOx	4.41E+00	lb/mmBtu		9.97	9.97	2.49
VOC	3.50E-01	lb/mmBtu		0.79	0.79	0.20
CO	9.50E-01	lb/mmBtu		2.15	2.15	0.54

144	
Pollutant	Tons/Yr
PM10	0.18
PM	0.18
SOx	0.03
NOx	2.49
VOC	0.20
CO	0.54

Emission Point 145

Units 4 Cooling Tower

Pollutant	Emission Factor	Units	Control Eff	Uncontrolled lb/hr	Controlled lbs/hr	Controlled Tons/Yr
PM10	1.28E+00	lb/hr		1.28	1.28	5.61
PM	6.40E+00	lb/hr		6.40	6.40	28.03

145	
Pollutant	Tons/Yr
PM10	5.61
PM	28.03

Emission Point 151A

Stockout Conveyor 7

Potential Throughput	3500	ton/hr (max design rate)

Pollutant	Emission Factor	Units	Control Eff	Uncontrolled lb/hr	Controlled lbs/hr	Controlled Tons/Yr
PM10	9.4000E-04	lb/ton	95.00	3.29	0.16	0.72
PM	2.0000E-03	lb/ton	95.00	7.00	0.35	1.53

151A	
Pollutant	Tons/Yr
PM10	0.72
PM	1.53

Emission Point 151B

Stockout wind erosion

Potential Throughput	0.65	Acres

Pollutant	Emission Factor	Units	Control Eff	Uncontrolled lb/hr		Tons/Yr
PM10	1.7060E+04	lb/acre	95	1.27	0.06	0.28
PM	3.4120E+04	lb/acre	95	2.53	0.13	0.55

151B	
Pollutant	Tons/Yr
PM10	0.28
PM	0.55

Emission Point 160

Unit 4 Coal Silos

Potential Throughput	900	tons/hr max design rate
	49,900.00	scfm

Pollutant	Emission Factor	Units	Control Eff	Uncontrolled lb/hr	Controlled lbs/hr	Controlled Tons/Yr
PM10	5.00E-03	gr/scf	0.00	2.14	2.14	9.37
PM	5.00E-03	gr/scf	0.00	2.14	2.14	9.37

160	
Pollutant	Tons/Yr
PM10	9.37
PM	9.37

Emission Point 161
Unit 4 Lime Day Bin Vent

Potential Throughput: 300.00 scfm

Pollutant	Emission Factor	Units	Control Eff	Uncontrolled lb/hr	Controlled lbs/hr	Controlled Tons/Yr
PM10	5.00E-03	gr/scf	0.00	0.01	0.01	0.06
PM	5.00E-03	gr/scf	0.00	0.01	0.01	0.06

161

Pollutant	Tons/Yr
PM10	0.06
PM	0.06

Emission Point 162A
CB4 Lime Filter Separator

Potential Throughput: 100 tons/hr max design rate
400.00 scfm

Pollutant	Emission Factor	Units	Control Eff	Uncontrolled lb/hr	Controlled lbs/hr	Controlled Tons/Yr
PM10	1.00E-02	gr/scf	0.00	0.03	0.03	0.15
PM	1.00E-02	gr/scf	0.00	0.03	0.03	0.15

162A

Pollutant	Tons/Yr
PM10	0.15
PM	0.15

Emission Point 162B
CB4 Lime Filter Separator

Potential Throughput: 100 tons/hr max design rate
400.00 scfm

Pollutant	Emission Factor	Units	Control Eff	Uncontrolled lb/hr	Controlled lbs/hr	Controlled Tons/Yr
PM10	5.00E-03	gr/scf	0.00	0.02	0.02	0.08
PM	5.00E-03	gr/scf	0.00	0.02	0.02	0.08

162B

Pollutant	Tons/Yr
PM10	0.08
PM	0.08

Emission Point 163
CB4 Lime Silo

Potential Throughput: 2000 tons/hr max design rate
300.00 scfm

Pollutant	Emission Factor	Units	Control Eff	Uncontrolled lb/hr	Controlled lbs/hr	Controlled Tons/Yr
PM10	1.00E-02	gr/scf	0.00	0.03	0.03	0.11
PM	1.00E-02	gr/scf	0.00	0.03	0.03	0.11

163

Pollutant	Tons/Yr
PM10	0.11
PM	0.11

Emission Point 164
CB4 Urea Silo #1

Potential Throughput: 60 tons/hr max design rate
500.00 scfm

Pollutant	Emission Factor	Units	Control Eff	Uncontrolled lb/hr	Controlled lbs/hr	Controlled Tons/Yr
PM10	1.00E-02	gr/scf	0.00	0.04	0.04	0.19
PM	1.00E-02	gr/scf	0.00	0.04	0.04	0.19

164

Pollutant	Tons/Yr
PM10	0.19
PM	0.19

Emission Point 165A
CB4 Carbon Silo #1

Potential Throughput: 60 tons/hr max design rate
300.00 scfm

Pollutant	Emission Factor	Units	Control Eff	Uncontrolled lb/hr	Controlled lbs/hr	Controlled Tons/Yr
PM10	5.00E-03	gr/scf	0.00	0.01	0.01	0.06
PM	5.00E-03	gr/scf	0.00	0.01	0.01	0.06

165A

Pollutant	Tons/Yr
PM10	0.06
PM	0.06

Emission Point 165B
CB4 Carbon Silo #2

Potential Throughput: 60 tons/hr max design rate
300.00 scfm

Pollutant	Emission Factor	Units	Control Eff	Uncontrolled lb/hr	Controlled lbs/hr	Controlled Tons/Yr
PM10	5.00E-03	gr/scf	0.00	0.01	0.01	0.06
PM	5.00E-03	gr/scf	0.00	0.01	0.01	0.06

165B

Pollutant	Tons/Yr
PM10	0.06
PM	0.06

Emission Point 167
CB4 Flyash/ FGD Waste Silo

Potential Throughput: 2000 tons/hr max design rate
3,000.00 scfm

Pollutant	Emission Factor	Units	Control Eff	Uncontrolled lb/hr	Controlled lbs/hr	Controlled Tons/Yr
PM10	5.00E-03	gr/scf	0.00	0.13	0.13	0.56
PM	5.00E-03	gr/scf	0.00	0.13	0.13	0.56

167

Pollutant	Tons/Yr
PM10	0.56
PM	0.56

Emission Point 168
CB4 Flyash/ FGD Waste Vacuum System Exhauster # 1

Potential Throughput: 40.44 tons/hr max design rate
2,500.00 scfm

Pollutant	Emission Factor	Units	Control Eff	Uncontrolled lb/hr	Controlled lbs/hr	Controlled Tons/Yr
PM10	5.00E-03	gr/scf	0.00	0.11	0.11	0.47
PM	5.00E-03	gr/scf	0.00	0.11	0.11	0.47

168

Pollutant	Tons/Yr
PM10	0.47
PM	0.47

Emission Point 169

CB4 Flyash/ FGD Waste Vacuum System Exhauster # 2

Potential Throughput: 10.44 tons/hr max design rate; 2,500.00 scfm

Pollutant	Emission Factor	Units	Control Eff	Uncontrolled lb/hr	Controlled lbs/hr	Controlled Tons/Yr
PM10	5.00E-03	gr/scf	0.00	0.11	0.11	0.47
PM	5.00E-03	gr/scf	0.00	0.11	0.11	0.47

169

Pollutant	Tons/Yr
PM10	0.47
PM	0.47

Emission Point 170

CB4 Flyash/ FGD Waste Vacuum System Exhauster # 3

Potential Throughput: 10.44 tons/hr max design rate; 2,500.00 scfm

Pollutant	Emission Factor	Units	Control Eff	Uncontrolled lb/hr	Controlled lbs/hr	Controlled Tons/Yr
PM10	5.00E-03	gr/scf	0.00	0.11	0.11	0.47
PM	5.00E-03	gr/scf	0.00	0.11	0.11	0.47

170

Pollutant	Tons/Yr
PM10	0.47
PM	0.47

Emission Point 171

CB4 Flyash/ FGD Recycle Vacuum Exhauster #1

Potential Throughput: 65 tons/hr max design rate; 4,700.00 scfm

Pollutant	Emission Factor	Units	Control Eff	Uncontrolled lb/hr	Controlled lbs/hr	Controlled Tons/Yr
PM10	5.00E-03	gr/scf	0.00	0.20	0.20	0.88
PM	5.00E-03	gr/scf	0.00	0.20	0.20	0.88

171

Pollutant	Tons/Yr
PM10	0.88
PM	0.88

Emission Point 172

CB4 Flyash/ FGD Recycle Vacuum Exhauster #2

Potential Throughput: 65 tons/hr max design rate; 4,700.00 scfm

Pollutant	Emission Factor	Units	Control Eff	Uncontrolled lb/hr	Controlled lbs/hr	Controlled Tons/Yr
PM10	5.00E-03	gr/scf	0.00	0.20	0.20	0.88
PM	5.00E-03	gr/scf	0.00	0.20	0.20	0.88

172

Pollutant	Tons/Yr
PM10	0.88
PM	0.88

Emission Point 173

CB4 Flyash/ FGD Recycle Vacuum Exhauster #3

Potential Throughput: 65 tons/hr max design rate; 4,700.00 scfm

Pollutant	Emission Factor	Units	Control Eff	Uncontrolled lb/hr	Controlled lbs/hr	Controlled Tons/Yr
PM10	5.00E-03	gr/scf	0.00	0.20	0.20	0.88
PM	5.00E-03	gr/scf	0.00	0.20	0.20	0.88

173

Pollutant	Tons/Yr
PM10	0.88
PM	0.88

Emission Point 174

CB4 Flyash/ FGD Recycle Silo Bin Vent

Potential Throughput: 650.00 scfm

Pollutant	Emission Factor	Units	Control Eff	Uncontrolled lb/hr	Controlled lbs/hr	Controlled Tons/Yr
PM10	5.00E-03	gr/scf	0.00	0.03	0.03	0.12
PM	5.00E-03	gr/scf	0.00	0.03	0.03	0.12

174

Pollutant	Tons/Yr
PM10	0.12
PM	0.12

Emission Point 180

Water Treatment Lime Silo 1 Bin Vent

Potential Throughput: 1,200.00 scfm

Pollutant	Emission Factor	Units	Control Eff	Uncontrolled lb/hr	Controlled lbs/hr	Controlled Tons/Yr
PM10	5.00E-03	gr/scf	0.00	0.05	0.05	0.23
PM	5.00E-03	gr/scf	0.00	0.05	0.05	0.23

180

Pollutant	Tons/Yr
PM10	0.23
PM	0.23

Emission Point 181

Water Treatment Lime Silo 2 Bin Vent

Potential Throughput: 1,200.00 scfm

Pollutant	Emission Factor	Units	Control Eff	Uncontrolled lb/hr	Controlled lbs/hr	Controlled Tons/Yr
PM10	5.00E-03	gr/scf	0.00	0.05	0.05	0.23
PM	5.00E-03	gr/scf	0.00	0.05	0.05	0.23

181

Pollutant	Tons/Yr
PM10	0.23
PM	0.23

Emission Point 182

Water Treatment Soda Ash Silo Bin Vent

Potential Throughput: 1,200.00 scfm

Pollutant	Emission Factor	Units	Control Eff	Uncontrolled lb/hr	Controlled lbs/hr	Controlled Tons/Yr
PM10	5.00E-03	gr/scf	0.00	0.05	0.05	0.23
PM	5.00E-03	gr/scf	0.00	0.05	0.05	0.23

182

Pollutant	Tons/Yr
PM10	0.23
PM	0.23

Council Bluffs Energy Center
Potential Emissions

EU ID	PM10	PM	SO2	NOx	VOC	CO	Flourides	Lead	TRS	H2SO4	EU ID
141	840.41	907.65	3,361.65	2,353.16	121.02	5,176.94	30.25	0.87	33.62	141.53	141
142	1.14	1.14	0.09	21.05	0.83	12.63					142
143	0.57	0.57	0.21	6.99	0.37	3.47					143
144	0.18	0.18	0.03	2.49	0.20	0.54					144
145	5.61	28.03									145
151A (F)	0.72	1.53									151A (F)
151B (F)	0.28	0.55									151B (F)
160	9.37	9.37									160
161	0.06	0.06									161
162A	0.15	0.15									162A
162B	0.08	0.08									162B
163	0.11	0.11									163
164	0.19	0.19									164A
165A	0.06	0.06									164B
165B	0.06	0.06									
167	0.56	0.56									167
168	0.47	0.47									168
169	0.47	0.47									169
170	0.47	0.47									170
171	0.88	0.88									171
172	0.88	0.88									172
173	0.88	0.88									173
174	0.12	0.12									174
180	0.23	0.23									180
181	0.23	0.23									181
182	0.23	0.23									182
	PM10	PM	SO2	NOx	VOC	CO	Hydrogen f	Lead comp	TRS	H2SO4	
Facility Total	864.41	955.15	3,361.98	2,383.69	122.42	5,193.58	30.25	0.87	33.62	141.53	

Chris Roling - RE: draft permits (Round 2)

From: "Mohning, Donald E" <DEMohning@midamerican.com>
To: "Chris Roling" <Chris.Roling@dnr.state.ia.us>
Date: 3/22/2007 7:05:15 PM
Subject: RE: draft permits (Round 2)

Chris,

I will review the drafts tonight. Thanks for getting them to me.

I have imbedded answers to your questions below:

I'll give you a call tomorrow morning to discuss the BACT limits.

I'm in meetings in Des Moines again today and tomorrow, so if you want to call me, use my cell number again (712-251-6218).

Thanks,

Don

-----Original Message-----
From: Chris Roling [mailto:Chris.Roling@dnr.state.ia.us]
Sent: Thursday, March 22, 2007 12:26 PM
To: Mohning, Donald E
Cc: Dave Phelps
Subject: draft permits (Round 2)

Don,

Attached are the amended draft permits based on MidAmerican's comments. Also, there are draft permits for the 3 permits that should have been modified in a previous project that did not get changed. In addition, is a copy of the draft fact sheet. There is some additional information I need based on the comments:

- For Transfer House #1 (78-A-169-S4) I need the EU#, CE #, and the maximum rated capacity (MRC).

EU009, EP009, CE010, 3500 Tons/Hour - I have attached the EU and CS forms that were submitted previously (EU9 EU14 EU15 forms.pdf)

- For both the #3 East Silos (78-A-174-S2) and the #3 West Silos (78-A-175-S2) I need the EU#, # of silos, MRC of each silo, CE#, and the stack orientation (i.e. horizontal, obstructed vertical, etc.).

EU014, EP014, CE015, 3200 Tons, vertical unobstructed - I have attached the EU and CS forms that were submitted previously (EU9 EU14 EU15 forms.pdf)

EU015, EP015, CE016, 800 Tons, vertical unobstructed - I have attached the EU and CS forms that were submitted previously (EU9 EU14 EU15 forms.pdf)
- Permit Condition 15.P.(2) on CBEC 4 permit (03-A-425-P2) had a comment that said "FGD Trucks Only. Per Operating Condition Changes." Could you explain this comment as I do understand what it is talking about.

15.P.2 should read "The date and number of ash or FGD waste trucks associated with Units 1, 2, 3 and 4. "

The purpose of the comment was to specify the counting of trucks hauling ash or FGD waste, so to eliminate the questions concerning the need to count trucks making deliveries or removing equipment to be repaired.

- The BACT limit for EP 162B (permit 07-A-386-P) has been amended to 0.005 gr/dscf to correspond to other BACT limits currently being set. In addition, the Department is not changing any of the BACT limits in the proposed permits to 0.01 gr/dscf as requested. Currently, particulate only sources are receiving BACT limits ranging from 0.003 gr/dscf to 0.005 gr/dscf. The 0.01 gr/dscf may have been BACT for some EPs in 2003, but that no longer represents BACT now.

We are having trouble getting vendors to guarrantee 0.005 gr/dscf on lime and carbon. They have accepted 0.005 gr/dscf on ash and coal, but not lime and carbon. Attached is a printout from the RACT/BACT clearing house. It shows a recent 0.01 for carbon and a 0.02 for ash, lime and carbon.

- Finally, the particulate testing was removed as requested for several units (i.e. silos) and the opacity limit was replaced with a "no visible emissions" standard. The "No VE" standard replaced both the SIP opacity limit and the opacity BACT limit. There is a footnote that states the "No VE" standard is in place in lieu of particulate testing. This is the Department's standard approach to these types of situations.

Please review and send me your comments by the end of the day on Monday March 26, 2007.

Chris

Christopher A. Roling, PE
Environmental Engineer Senior
Air Quality Bureau, IDNR
ph: (515) 242-6002
fax: (515) 242-5094

From: Chris Roling
To: demohning@midamerican.com
Date: 3/22/2007 12:46:03 PM
Subject: one additional item

Don,

I forgot to mention that you should also take a close look at Table 8 and verify the numbers as I tried to make changes comparing the original project with the changes in the completed project.

Chris

Christopher A. Roling, PE
Environmental Engineer Senior
Air Quality Bureau, IDNR
ph: (515) 242-6002
fax: (515) 242-5094

From: Chris Roling
To: demohning@midamerican.com
Date: 3/22/2007 12:25:44 PM
Subject: draft permits (Round 2)

Don,

Attached are the amended draft permits based on MidAmerican's comments. Also, there are draft permits for the 3 permits that should have been modified in a previous project that did not get changed. In addition, is a copy of the draft fact sheet. There is some additional information I need based on the comments:

- For Transfer House #1 (78-A-169-S4) I need the EU#, CE #, and the maximum rated capacity (MRC).

- For both the #3 East Silos (78-A-174-S2) and the #3 West Silos (78-A-175-S2) I need the EU#, # of silos, MRC of each silo, CE#, and the stack orientation (i.e. horizontal, obstructed vertical, etc.).

- Permit Condition 15.P.(2) on CBEC 4 permit (03-A-425-P2) had a comment that said "FGD Trucks Only. Per Operating Condition Changes." Could you explain this comment as I do understand what it is talking about.

- The BACT limit for EP 162B (permit 07-A-386-P) has been amended to 0.005 gr/dscf to correspond to other BACT limits currently being set. In addition, the Department is not changing any of the BACT limits in the proposed permits to 0.01 gr/dscf as requested. Currently, particulate only sources are receiving BACT limits ranging from 0.003 gr/dscf to 0.005 gr/dscf. The 0.01 gr/dscf may have been BACT for some EPs in 2003, but that no longer represents BACT now.

- Finally, the particulate testing was removed as requested for several units (i.e. silos) and the opacity limit was replaced with a "no visible emissions" standard. The "No VE" standard replaced both the SIP opacity limit and the opacity BACT limit. There is a footnote that states the "No VE" standard is in place in lieu of particulate testing. This is the Department's standard approach to these types of situations.

Please review and send me your comments by the end of the day on Monday March 26, 2007.

Chris

Christopher A. Roling, PE
Environmental Engineer Senior
Air Quality Bureau, IDNR
ph: (515) 242-6002
fax: (515) 242-5094

CC: Dave Phelps

From:	"Mohning, Donald E" <DEMohning@midamerican.com>
To:	"Lori Hanson" <Lori.Hanson@dnr.state.ia.us>
Date:	3/13/2007 5:19:03 PM
Subject:	RE: CBEC Boiler #4 Modification update

Lori,

EP003 should be modeled at 3080 lb/hr, 180 degrees F, and a flow rate of 2,800,000 acfm.

How long do you think the SO2 model run will take?

Don

From: Lori Hanson [mailto:Lori.Hanson@dnr.state.ia.us]
Sent: Tuesday, March 13, 2007 4:40 PM
To: Mohning, Donald E
Cc: Chris Roling
Subject: CBEC Boiler #4 Modification update

Hi Don,

I will be re-running the SO2 NAAQs and increment analyses. There are several discrepancies:

1) Boiler #3 updates were not included - it was evaluated at 418 degrees F and 2,380,000 acfm, rather than the 180 degrees and 2,80,000 acfm used in the boiler #3 project and the current permit for this unit. I am also a little confused about the emission rate. The current permit list 3080 lb/hr. I assume that this is the correct emission rate to be used for both the NAAQS and increment. The submitted modeling used 4465 and 8760 for the NAAQS and increment, respectively. Could you verify that EP003 should be modeled at 3080 lb/hr, 180 degrees F, and a flow rate of 2,800,000 acfm?

2) Stack parameters for Bunge sources need to be updated per recent PSD project.

3) The stack exhaust temperatures are incorrect for all sources except EP141 and EP142. It looks like the setting for degrees F and K may have been incorrect. For example the correct temp for EP112 is 300 F (422 K), it is in the SO2 modeling at 422 F.

4) I am also a little confused by 5 Bunge sources that were in the increment analysis, but not in the NAAQS. This left over from the original project, but does not make sense. The unit don't seem like they would have any SO2 emissions, so I will be checking into that in case they can be removed form the analysis.

5) Account for change in building height for 52b.

Thanks, Lori

Lori Hanson
Iowa DNR - Air Quality Bureau
(515)281-8911
lori.hanson@dnr.state.ia.us

CC: "Chris Roling" <Chris.Roling@dnr.state.ia.us>

Modeling Notes for CBEC #4 Boiler Modifications PN 06-541
2/21/07

1. Has the new property been fenced? The new property has not been fenced yet, but will be this summer.

2. EP145 (CT1-22) - EC form lists 1.28 lb/hr total emission rate; the CT was modeled at 1.22 lb/hr (0.0555 per cell). What is the correct emission rate? The correct rate is 1.28 lb/hr.

3. EP163 – EC form lists 0.03 lb/hr and form CS lists a 4" diameter, was modeled at 0.024 lb/hr and 3.2" diameter. What is the correct emission rate and diameter? The correct emission rate is 0.03 lb/hr and the correct diameter is 4".

4. EP165A and EP165B - EC forms list 0.03 lb/hr, were modeled at 0.024 lb/hr. What are the correct emission rates? The correct emission rate is 0.03 lb/hr.

5. EP168, EP169, and EP170 - EC forms list 0.11 lb/hr, were modeled at 0.15 lb/hr. What are the correct emission rates? The correct emission rate is 0.15 lb/hr. The EC form was incorrect.

Modeling Questions for Don Mohning
CBEC #4 Boiler Modifications PN 06-541
2/20/07

So far I have only partially reviewed the PM-10 NAAQS modeling. I have not reviewed the preliminary modeling for PM-10 and have not determined if the grid used in the NAAQS modeling is acceptable. I may identify additional concerns regarding the NAAQS modeling as I continue my review.

<u>Site Plan</u>

Building 23 (transfer house #1) site plan = 55’, modeling = 64’
The model is correct.

Building 52b (boiler building) site plan = 157’, modeling 110’
Building 52b is 157 feet high. The modeled height is incorrect.

Auxelec building site plan = 16’, modeling = 20’
The model is partially correct. The Auxelec building has two levels. One level is 20 feet high and the second level approximately 40 feet

Location of EP162A and EP162B do not match modeled location.
The model is correct.

<u>NAAQS</u>

EP159 removed, no forms submitted – has the permit been rescinded?
A request was made to rescind the permits for EP159 and EP161 in the October 11, 2006 submittal.

EP164A and EP164B are now EP164, has one of these permits been rescinded.
A request was made to rescind the permit for EP164B in the October 11, 2006 submittal.

EP14 current permit (78-A-174-S1) lists stack height of 193 feet and obstructed stack (zero fps), modeled at 280 feet and 52.3 fps.
A request was made and forms submitted to change the stack for this source in an addendum to the CB3 LNB/FGD project on June 8, 2006. A revised permit has not yet been issued.

EP15 current permit (78-A-175-S1) lists stack height of 193 feet and obstructed stack (zero fps), modeled at 280 feet and 44.8 fps.
A request was made and forms submitted to change the stack for this source in an addendum to the CB3 LNB/FGD project on June 8, 2006. A revised permit has not yet been issued.

Questions for Chris/Don:

1) Boiler 3 was permitted at 207.9 lb/hr PM-10, but project report and model for 06-250 lists 195.1. Current model is at 195.1 – what is the correct potential emission rate?
   207.9 lb/hr PM-10 is the correct emission rate for boiler 3 as permitted in the Unit 3 LNB/FGD project.

2) EP9 modeled at 2.33 lb/hr, also difference in stack parameters. Form EI lists permit 78-A-169-**S4**. Only 78-A-169-**S3** is posted on web. What values are listed in current permit?
   A request was made and forms submitted to change the stack for this source in an addendum to the CB3 LNB/FGD project on June 8, 2006. A revised permit has not yet been issued. 78-A-169-S3 is the current permit number.

3) Previous modeling included Pb from EP141 and EP142. Why are there no Pb emissions from these sources?
   Question removed per telephone conversation.

MidAmerican
ENERGY
OBSESSIVELY, RELENTLESSLY ***AT YOUR SERVICE.***

MidAmerican Energy Company
401 Douglas Street
P.O. Box 778
Sioux City, Iowa 51102
712 277-7500 Telephone

October 12, 2006

Mr. Brian Hutchins
Air Quality Bureau
Iowa Department of Natural Resources
7900 Hickman Road, Suite 1
Urbandale, IA 50322

RE: Council Bluffs Energy Center Unit 4, Facility No. 78-01-026; Request to remove 112g permit requirements in construction permit 03-A-425-P1

Dear Mr. Hutchins:

Per the discussions in a recent meeting between staffs of the Iowa Department of Natural Resources and MidAmerican Energy Company concerning Council Bluffs Energy Center Unit 4, Air Quality Bureau construction permit 03-A-425-P1, MidAmerican requests the removal of the permit requirements associated with Section 112 of the Clean Air Act. These requirements are no longer applicable to this unit based on regulatory actions taken by the United States Environmental Protection Agency (EPA).

On March 29, 2005 the EPA revised the regulatory finding that it issued in December 2000. The revision concluded that it was neither appropriate nor necessary to regulate EGUs under section 112, and EGUs were removed from the 112(c) source category list.

On May 18, 2005 the EPA promulgated the new source performance standard for Hg. In the Background section of the preamble, EPA states *"We took this action because we now believe that the December 2000 finding lacked foundation and because recent information demonstrates that it is not appropriate or necessary to regulate coal- and oil-fired Utility Units under section 112. Based solely on the revised finding, we are removing coal- and oil-fired Utility Units from the section 112(c) list and instead establishing standards of performance for Hg for new and existing coal-fired Utility Units, as defined in CAA section 111."*

MidAmerican believes that EPA's actions, as described above, clearly demonstrate that the agency has taken the approach of regulating Hg emissions through the New Source Performance Standard and that it does not intend to regulate hazardous air pollutants through Section 112 of the Clean Air Act for EGUs. It is on this basis that MidAmerican is requesting that the permit requirements associated with Section 112 be removed from the referenced permit.

RECEIVED

OCT 16 2006

MidAmerican
ENERGY

If you have any questions concerning this matter, please feel free to contact me at 712-277-7461 or by e-mail at demohning@midamerican.com. Your prompt response will be appreciated.

Sincerely,

Donald E. Mohning
Manager Air Programs

cc: S. J. Brewer
B. J. Mundt
C. S. Woollums
S. C. Guyer
M. X. Wei

Council Bluffs Energy Center
Unit 4 Emission Calculations
EC-4A

Emission Point 141
Unit 4 Boiler

Potential Throughput
480 ton/hr max design rate
4,204,800.00 Tons — % Ash 5.37
7,675.00 mmBtu/hr
8341 Ave Btu/lb

Pollutant	Emission Factor	Units	Control Eff	Lbs/hr Uncontrolled	lbs/hr controlled	Controlled Tons/Yr
PM10	2.5000E-02	lb/mmBtu	0.00	191.88	191.88	840.41
PM	2.7000E-02	lb/mmBtu	0.00	207.23	207.23	907.65
SOx	1.0000E-01	lb/mmBtu		767.50		3,361.65
NOx	7.0000E-02	lb/mmBtu		537.25		2,353.16
VOC	3.6000E-03	lb/mmBtu		27.63		121.02
CO	1.5400E-01	lb/mmBtu		1,181.95		5,176.94
Lead	NA					
Antimony	1.8000E-05	lb/ton		0.01		0.04
Arsenic compounds	4.1000E-04	lb/ton		0.20		0.86
Beryllium compounds	2.1000E-05	lb/ton		0.01		0.04
Cadmium compounds	5.1000E-05	lb/ton		0.02		0.11
Chromium compounds	3.3900E-04	lb/ton		0.16		0.71
Cobalt	1.0000E-04	lb/ton		0.05		0.21
Cyanide	2.5000E-03	lb/ton		1.20		5.26
Hydrochloric acid	2.9000E-03	lb/mmBtu		22.26		97.49
Hydrogen fluoride	9.0000E-04	lb/mmBtu		6.91		30.25
Lead compounds	2.6000E-05	lb/mmBtu		0.20		0.87
Manganese compounds	4.9000E-04	lb/ton		0.24		1.03
Mercury compounds	1.0663E-04	lb/ton		0.05		0.22
Nickel compounds	2.8000E-04	lb/ton		0.13		0.59
POM	2.0800E-06	lb/mmBtu		0.02		0.07
Radionuclides	9.5000E-02	lb/ton PM		0.01		0.04
Selenium compounds	1.3000E-03	lb/ton		0.62		2.73
Acetaldehyde	5.7000E-04	lb/ton		0.27		1.20
Acetophenone	1.5000E-05	lb/ton		0.01		0.03
Acrolein	2.9000E-04	lb/ton		0.14		0.61
Benzene	1.3000E-03	lb/ton		0.62		2.73
Benzyl Chloride	7.0000E-04	lb/ton		0.34		1.47
Bis(2-ethylhexyl)phthalate	7.3000E-05	lb/ton		0.04		0.15
Bromoform	3.9000E-05	lb/ton		0.02		0.08
Carbon Disulfide	1.3000E-04	lb/ton		0.06		0.27
2-Chloroacetophenone	7.0000E-06	lb/ton		0.00		0.01
Chlorobenzene	2.2000E-05	lb/ton		0.01		0.05
Chloroform	5.9000E-05	lb/ton		0.03		0.12
Cumene	5.3000E-06	lb/ton		0.00		0.01
Dimethyl Sulfate	4.8000E-05	lb/ton		0.02		0.10
Ethylbenzene	9.4000E-05	lb/ton		0.05		0.20
Ethylchloride	4.2000E-05	lb/ton		0.02		0.09
Ethylene Dichloride	4.0000E-05	lb/ton		0.02		0.08
Formaldehyde	2.4000E-04	lb/ton		0.12		0.50
Hexane	6.7000E-05	lb/ton		0.03		0.14
Isophorone	5.8000E-04	lb/ton		0.28		1.22
Methyl Tert Butyl Ether	3.5000E-05	lb/ton		0.02		0.07
Methyl Bromide	1.6000E-04	lb/ton		0.08		0.34
Methyl Chloride	5.3000E-04	lb/ton		0.25		1.11
Methyl Ethyl Ketone	3.9000E-04	lb/ton		0.19		0.82
methyl Hydrazine	1.7000E-04	lb/ton		0.08		0.36
Methyl Methacrylate	2.0000E-05	lb/ton		0.01		0.04
Methylene Chloride	2.9000E-04	lb/ton		0.14		0.61
Phenol	1.6000E-05	lb/ton		0.01		0.03
Propionaldehyde	3.8000E-04	lb/ton		0.18		0.80
Styrene	2.5000E-05	lb/ton		0.01		0.05
Tetrachloroethaylene	4.3000E-05	lb/ton		0.02		0.09
Toluene	2.4000E-04	lb/ton		0.12		0.50
1,1,1 Trichloroethane	2.0000E-05	lb/ton		0.01		0.04
Vinyl Acetate	7.6000E-06	lb/ton		0.00		0.02
Xylene	3.7000E-05	lb/ton		0.02		0.08
Total Reduced Sulfur	1.0000E-03	lb/mmBtu		7.68		33.62
H2SO4	4.2100E-03	lb/mmBtu		32.31		141.53

Oil
2.08 1000 gal/hr max design rate
18,220.80 1000 gal — % sulfur 0.6
284.96 mmBtu/hr — 137,000 Btu/gal

Pollutant	Emission Factor	Units	Control Eff	lb/hr Uncontrolled	lb/hr (controlled)	Tons/Yr
PM10	1.0000E-01	lb/mmBtu	0.00	28.50	28.50	124.81
PM	1.0000E-01	lb/mmBtu	0.00	28.50	28.50	124.81
SOx	1.4365E+02	lb/1000 gal		298.79		785.23
NOx	2.4000E+01	lb/1000 gal		49.92		218.65
VOC	2.0000E-01	lb/1000 gal		0.42		1.82
CO	5.0000E+00	lb/1000 gal		10.40		45.55
Lead compounds	1.2400E-03	lb/1000 gal		0.00		0.01

141	Pollutant	Total Tons/Yr
	PM10	840.41
	PM	907.65
	SOx	3,361.65
	NOx	2,353.16
	VOC	121.02
	CO	5,176.94
	Lead	0.00
7440360	Antimony	0.04
7440382	Arsenic compounds	0.86
7440417	Beryllium compounds	0.04
7440439	Cadmium compounds	0.11
7440473	Chromium compounds	0.71
7440484	Cobalt	0.21
	Cyanide	5.26
7647010	Hydrochloric acid	97.49
7664393	Hydrogen fluoride	30.25
	Lead compounds	0.87
7439965	Manganese compounds	1.03
7439976	Mercury compounds	0.22
7440020	Nickel compounds	0.59
	POM	0.07
	Radionuclides	0.04
7782492	Selenium compounds	2.73
75070	Acetaldehyde	1.20
98862	Acetophenone	0.03
107028	Acrolein	0.61
71432	Benzene	2.73
100447	Benzyl Chloride	1.47
117817	Bis(2-ethylhexyl)phthalat	0.15
75252	Bromoform	0.08
75150	Carbon Disulfide	0.27
532574	2-Chloroacetophenone	0.01
108907	Chlorobenzene	0.05
67663	Chloroform	0.12
98828	Cumene	0.01
77781	Dimethyl Sulfate	0.10
100414	Ethylbenzene	0.20
75003	Ethylchloride	0.09
107062	Ethylene Dichloride	0.08
50000	Formaldehyde	0.50
110543	Hexane	0.14
78591	Isophorone	1.22
1634044	Methyl Tert Butyl Ether	0.07
74839	Methyl Bromide	0.34
74873	Methyl Chloride	1.11
78933	Methyl Ethyl Ketone	0.82
60344	methyl Hydrazine	0.36
80626	Methyl Methacrylate	0.04
75092	Methylene Chloride	0.61
108952	Phenol	0.03
123386	Propionaldehyde	0.80
100425	Styrene	0.05
127184	Tetrachloroethaylene	0.09
108883	Toluene	0.50
71556	1,1,1 Trichloroethane	0.04
108054	Vinyl Acetate	0.02
1330207	Xylene	0.08
	Total Reduced Sulfur	33.62
	H2SO4	141.53

Emission Point 142
Unit 4 Aux Boiler — Natural Gas

Potential Throughput 343.3 mmBtu/hr
0.34 mmCF/hr

Pollutant	Emission Factor	Units	Control Eff	Uncontrolled lb/hr	Controlled lb/hr	Tons/Yr
PM10	7.60E-03	lb/mmBtu		2.61	2.61	1.14
PM	7.60E-03	lb/mmBtu		2.61	2.61	1.14
SOx	6.00E-04	lb/mmBtu		0.21	0.21	0.09
NOx	1.40E-01	lb/mmBtu		48.06	48.06	21.05
VOC	5.50E-03	lb/mmBtu		1.89	1.89	0.83
CO	8.40E-02	lb/mmBtu		28.84	28.84	12.63
Lead	5.00E-07	lb/mmBtu		0.00	0.00	0.00

Emission Point 143
Units 4 Emergency Generator

Potential Throughput 0.1193 1000 gal/hr (max design rate, 500 hr limit)
16.34 mmBtu — % sulfur 0.05

Pollutant	Emission Factor	Units	Control Eff	Uncontrolled lb/hr	Controlled lbs/hr	Controlled Tons/Yr
PM10	1.40E-01	lb/mmBtu		2.29	2.29	0.57
PM	1.40E-01	lb/mmBtu		2.29	2.29	0.57
SOx	5.20E-02	lb/mmBtu		0.85	0.85	0.21
NOx	1.71E+00	lb/mmBtu		27.95	27.95	6.99
VOC	9.00E-02	lb/mmBtu		1.47	1.47	0.37
CO	8.50E-01	lb/mmBtu		13.89	13.89	3.47

Emission Point 144
Units 4 Fire Pump

Potential Throughput 0.0165 1000 gal/hr (max design rate, 500 hr limit)
2.26 mmBtu — % sulfur 0.05

Pollutant	Emission Factor	Units	Control Eff	Uncontrolled lb/hr	Controlled lbs/hr	Controlled Tons/Yr
PM10	3.10E-01	lb/mmBtu		0.70	0.70	0.18
PM	3.10E-01	lb/mmBtu		0.70	0.70	0.18
SOx	5.20E-02	lb/mmBtu		0.12	0.12	0.03
NOx	4.41E+00	lb/mmBtu		9.97	9.97	2.49
VOC	3.50E-01	lb/mmBtu		0.79	0.79	0.20
CO	9.50E-01	lb/mmBtu		2.15	2.15	0.54

Emission Point 145
Units 4 Cooling Tower

Pollutant	Emission Factor	Units	Control Eff	Uncontrolled lb/hr	Controlled lbs/hr	Controlled Tons/Yr
PM10	1.28E+00	lb/hr		1.28	1.28	0.32
PM	1.28E+00	lb/hr		1.28	1.28	0.32

Total

142 Pollutant	Tons/Yr
PM10	1.14
PM	1.14
SOx	0.09
NOx	21.05
VOC	0.83
CO	12.63

143 Pollutant	Tons/Yr
PM10	0.57
PM	0.57
SOx	0.21
NOx	6.99
VOC	0.37
CO	3.47

144 Pollutant	Tons/Yr
PM10	0.18
PM	0.18
SOx	0.03
NOx	2.49
VOC	0.20
CO	0.54

145 Pollutant	Tons/Yr
PM10	0.32
PM	0.32

Emission Point 160
Unit 4 Coal Silos
Potential Throughput 900 tons/hr max design rate
49,900.00 scfm

Pollutant	Emission Factor	Units	Control Eff	Uncontrolled lb/hr	Controlled lbs/hr	Controlled Tons/Yr
PM10	5.00E-03	gr/scf	0.00	2.14	2.14	9.37
PM	5.00E-03	gr/scf	0.00	2.14	2.14	9.37

Emission Point 161
Unit 4 Lime Day Bin Vent
Potential Throughput
300.00 scfm

Pollutant	Emission Factor	Units	Control Eff	Uncontrolled lb/hr	Controlled lbs/hr	Controlled Tons/Yr
PM10	1.00E-02	gr/scf	0.00	0.03	0.03	0.11
PM	1.00E-02	gr/scf	0.00	0.03	0.03	0.11

Emission Point 162A
CB4 Lime Filter Separator
Potential Throughput 100 tons/hr max design rate
400.00 scfm

Pollutant	Emission Factor	Units	Control Eff	Uncontrolled lb/hr	Controlled lbs/hr	Controlled Tons/Yr
PM10	1.00E-02	gr/scf	0.00	0.03	0.03	0.15
PM	1.00E-02	gr/scf	0.00	0.03	0.03	0.15

Emission Point 162B
CB4 Lime Filter Separator
Potential Throughput 100 tons/hr max design rate
400.00 scfm

Pollutant	Emission Factor	Units	Control Eff	Uncontrolled lb/hr	Controlled lbs/hr	Controlled Tons/Yr
PM10	1.00E-02	gr/scf	0.00	0.03	0.03	0.15
PM	1.00E-02	gr/scf	0.00	0.03	0.03	0.15

Emission Point 163
CB4 Lime Silo
Potential Throughput 2000 tons/hr max design rate
300.00 scfm

Pollutant	Emission Factor	Units	Control Eff	Uncontrolled lb/hr	Controlled lbs/hr	Controlled Tons/Yr
PM10	1.00E-02	gr/scf	0.00	0.03	0.03	0.11
PM	1.00E-02	gr/scf	0.00	0.03	0.03	0.11

160

Pollutant	Tons/Yr
PM10	9.37
PM	9.37

161

Pollutant	Tons/Yr
PM10	0.11
PM	0.11

162A

Pollutant	Tons/Yr
PM10	0.15
PM	0.15

162B

Pollutant	Tons/Yr
PM10	0.15
PM	0.15

163

Pollutant	Tons/Yr
PM10	0.11
PM	0.11

Emission Point 164
CB4 Urea Silo #1
Potential Throughput 60 tons/hr max design rate
500.00 scfm

Pollutant	Emission Factor	Units	Control Eff	Uncontrolled lb/hr	Controlled lbs/hr	Controlled Tons/Yr
PM10	1.00E-02	gr/scf	0.00	0.04	0.04	0.19
PM	1.00E-02	gr/scf	0.00	0.04	0.04	0.19

Emission Point 165A
CB4 Carbon Silo #1
Potential Throughput 60 tons/hr max design rate
300.00 scfm

Pollutant	Emission Factor	Units	Control Eff	Uncontrolled lb/hr	Controlled lbs/hr	Controlled Tons/Yr
PM10	1.00E-02	gr/scf	0.00	0.03	0.03	0.11
PM	1.00E-02	gr/scf	0.00	0.03	0.03	0.11

Emission Point 165B
CB4 Carbon Silo #2
Potential Throughput 60 tons/hr max design rate
300.00 scfm

Pollutant	Emission Factor	Units	Control Eff	Uncontrolled lb/hr	Controlled lbs/hr	Controlled Tons/Yr
PM10	1.00E-02	gr/scf	0.00	0.03	0.03	0.11
PM	1.00E-02	gr/scf	0.00	0.03	0.03	0.11

Emission Point 167
CB4 Flyash/ FGD Waste Silo
Potential Throughput 2000 tons/hr max design rate
3,000.00 scfm

Pollutant	Emission Factor	Units	Control Eff	Uncontrolled lb/hr	Controlled lbs/hr	Controlled Tons/Yr
PM10	5.00E-03	gr/scf	0.00	0.13	0.13	0.56
PM	5.00E-03	gr/scf	0.00	0.13	0.13	0.56

Emission Point 168
CB4 Flyash/ FGD Waste Vacuum System Exhauster # 1
Potential Throughput 40.44 tons/hr max design rate
2,500.00 scfm

Pollutant	Emission Factor	Units	Control Eff	Uncontrolled lb/hr	Controlled lbs/hr	Controlled Tons/Yr
PM10	5.00E-03	gr/scf	0.00	0.11	0.11	0.47
PM	5.00E-03	gr/scf	0.00	0.11	0.11	0.47

Emission Point 169
CB4 Flyash/ FGD Waste Vacuum System Exhauster # 2
Potential Throughput 40.44 tons/hr max design rate
2,500.00 scfm

Pollutant	Emission Factor	Units	Control Eff	Uncontrolled lb/hr	Controlled lbs/hr	Controlled Tons/Yr
PM10	5.00E-03	gr/scf	0.00	0.11	0.11	0.47
PM	5.00E-03	gr/scf	0.00	0.11	0.11	0.47

Emission Point 170
CB4 Flyash/ FGD Waste Vacuum System Exhauster # 3
Potential Throughput 40.44 tons/hr max design rate
2,500.00 scfm

Pollutant	Emission Factor	Units	Control Eff	Uncontrolled lb/hr	Controlled lbs/hr	Controlled Tons/Yr
PM10	5.00E-03	gr/scf	0.00	0.11	0.11	0.47
PM	5.00E-03	gr/scf	0.00	0.11	0.11	0.47

164

Pollutant	Tons/Yr
PM10	0.19
PM	0.19

165A

Pollutant	Tons/Yr
PM10	0.11
PM	0.11

165B

Pollutant	Tons/Yr
PM10	0.11
PM	0.11

167

Pollutant	Tons/Yr
PM10	0.56
PM	0.56

168

Pollutant	Tons/Yr
PM10	0.47
PM	0.47

169

Pollutant	Tons/Yr
PM10	0.47
PM	0.47

170

Pollutant	Tons/Yr
PM10	0.47
PM	0.47

Emission Point 171
CB4 Flyash/ FGD Recycle Vacuum Exhauster #1

Potential Throughput 65 tons/hr max design rate
4,700.00 scfm

Pollutant	Emission Factor	Units	Control Eff	Uncontrolled lb/hr	Controlled lbs/hr	Controlled Tons/Yr
PM10	5.00E-03	gr/scf	0.00	0.20	0.20	0.88
PM	5.00E-03	gr/scf	0.00	0.20	0.20	0.88

Emission Point 172
CB4 Flyash/ FGD Recycle Vacuum Exhauster #2

Potential Throughput 65 tons/hr max design rate
4,700.00 scfm

Pollutant	Emission Factor	Units	Control Eff	Uncontrolled lb/hr	Controlled lbs/hr	Controlled Tons/Yr
PM10	5.00E-03	gr/scf	0.00	0.20	0.20	0.88
PM	5.00E-03	gr/scf	0.00	0.20	0.20	0.88

Emission Point 173
CB4 Flyash/ FGD Recycle Vacuum Exhauster #3

Potential Throughput 65 tons/hr max design rate
4,700.00 scfm

Pollutant	Emission Factor	Units	Control Eff	Uncontrolled lb/hr	Controlled lbs/hr	Controlled Tons/Yr
PM10	5.00E-03	gr/scf	0.00	0.20	0.20	0.88
PM	5.00E-03	gr/scf	0.00	0.20	0.20	0.88

Emission Point 174
CB4 Flyash/ FGD Recycle Silo Bin Vent

Potential Throughput
650.00 scfm

Pollutant	Emission Factor	Units	Control Eff	Uncontrolled lb/hr	Controlled lbs/hr	Controlled Tons/Yr
PM10	5.00E-03	gr/scf	0.00	0.03	0.03	0.12
PM	5.00E-03	gr/scf	0.00	0.03	0.03	0.12

Emission Point 180
Water Treatment Lime Silo 1 Bin Vent

Potential Throughput
1,200.00 scfm

Pollutant	Emission Factor	Units	Control Eff	Uncontrolled lb/hr	Controlled lbs/hr	Controlled Tons/Yr
PM10	1.00E-02	gr/scf	0.00	0.10	0.10	0.45
PM	1.00E-02	gr/scf	0.00	0.10	0.10	0.45

Emission Point 181
Water Treatment Lime Silo 2 Bin Vent

Potential Throughput
1,200.00 scfm

Pollutant	Emission Factor	Units	Control Eff	Uncontrolled lb/hr	Controlled lbs/hr	Controlled Tons/Yr
PM10	1.00E-02	gr/scf	0.00	0.10	0.10	0.45
PM	1.00E-02	gr/scf	0.00	0.10	0.10	0.45

Emission Point 182
Water Treatment Soda Ash Silo Bin Vent

Potential Throughput
1,200.00 scfm

Pollutant	Emission Factor	Units	Control Eff	Uncontrolled lb/hr	Controlled lbs/hr	Controlled Tons/Yr
PM10	1.00E-02	gr/scf	0.00	0.10	0.10	0.45
PM	1.00E-02	gr/scf	0.00	0.10	0.10	0.45

171

Pollutant	Tons/Yr
PM10	0.88
PM	0.88

172

Pollutant	Tons/Yr
PM10	0.88
PM	0.88

173

Pollutant	Tons/Yr
PM10	0.88
PM	0.88

174

Pollutant	Tons/Yr
PM10	0.12
PM	0.12

180

Pollutant	Tons/Yr
PM10	0.45
PM	0.45

181

Pollutant	Tons/Yr
PM10	0.45
PM	0.45

182

Pollutant	Tons/Yr
PM10	0.45
PM	0.45

Council Bluffs Energy Center
Title V Emissions Inventory
Potential to Emit

Emission Point 001

Coal
40 ton/hr ma design rate

Potential Throughput 350,400.00 Tons   % Ash 5.38
656.00 mmBtu/hr
8200 Ave Btu/lb

Pollutant	Emission Factor	Units	Control Eff	Lbs/hr Uncontrolled	lbs/hr controlled	Controlled Tons/Yr
PM10	4.9000E-01	lb/mmBtu	0.00	321.44	321.44	1,407.91
PM	4.9000E-01	lb/mmBtu	0.00	321.44	321.44	1,407.91
SOx	1.2000E+00	lb/mmBtu		787.20		3,447.94
NOx	4.0000E-01	lb/mmBtu		262.40		1,149.31
VOC	6.0000E-02	lb/ton		2.40		10.51
CO	4.2000E-01	lb/mmBtu		275.52		1,206.78
Lead	NA			0.00		
Antimony	1.8000E-05	lb/ton		0.00		0.00
Arsenic compounds	4.1000E-04	lb/ton		0.02		0.07
Beryllium compounds	2.1000E-05	lb/ton		0.00		0.00
Cadmium compounds	5.1000E-05	lb/ton		0.00		0.01
Chromium compounds	3.3900E-04	lb/ton		0.01		0.06
Cobalt	1.0000E-04	lb/ton		0.00		0.02
Cyanide	2.5000E-03	lb/ton		0.10		0.44
Hydrochloric acid	1.2997E-01	lb/ton		5.20		22.77
Hydrogen fluoride	6.9112E-02	lb/ton		2.76		12.11
Lead compounds	4.2000E-04	lb/ton		0.02		0.07
Manganese compounds	4.9000E-04	lb/ton		0.02		0.09
Mercury compounds	1.0664E-04	lb/ton		0.00		0.019
Nickel compounds	2.8000E-04	lb/ton		0.01		0.05
POM	2.0800E-06	lb/mmBTU		0.00		0.01
Radionuclides	9.5000E-02	lb/ton PM		0.02		0.07
Selenium compounds	1.3000E-03	lb/ton		0.05		0.23
Acetaldehyde	5.7000E-04	lb/ton		0.02		0.10
Acetophenone	1.5000E-05	lb/ton		0.00		0.00
Acrolein	2.9000E-04	lb/ton		0.01		0.05
Benzene	1.3000E-03	lb/ton		0.05		0.23
Benzyl Chloride	7.0000E-04	lb/ton		0.03		0.12
Bis(2-ethylhexyl)phthalate	7.3000E-05	lb/ton		0.00		0.01
Bromoform	3.9000E-05	lb/ton		0.00		0.01
Carbon Disulfide	1.3000E-04	lb/ton		0.01		0.02
2-Chloroacetophenone	7.0000E-06	lb/ton		0.00		0.00
Chlorobenzene	2.2000E-05	lb/ton		0.00		0.00
Chloroform	5.9000E-05	lb/ton		0.00		0.01
Cumene	5.3000E-06	lb/ton		0.00		0.00
Dimethyl Sulfate	4.8000E-05	lb/ton		0.00		0.01
Ethylbenzene	9.4000E-05	lb/ton		0.00		0.02
Ethylchloride	4.2000E-05	lb/ton		0.00		0.01
Ethylene Dichloride	4.0000E-05	lb/ton		0.00		0.01
Formaldehyde	2.4000E-04	lb/ton		0.01		0.04
Hexane	6.7000E-05	lb/ton		0.00		0.01
Isophorone	5.8000E-04	lb/ton		0.02		0.10
Methyl Tert Butyl Ether	3.5000E-05	lb/ton		0.00		0.01
Methyl Bromide	1.6000E-04	lb/ton		0.01		0.03
Methyl Chloride	5.3000E-04	lb/ton		0.02		0.09
Methyl Ethyl Ketone	3.9000E-04	lb/ton		0.02		0.07
methyl Hydrazine	1.7000E-04	lb/ton		0.01		0.03
Methyl Methacrylate	2.0000E-05	lb/ton		0.00		0.00
Methylene Chloride	2.9000E-04	lb/ton		0.01		0.05
Phenol	1.6000E-05	lb/ton		0.00		0.00
Propionaldehyde	3.8000E-04	lb/ton		0.02		0.07
Styrene	2.5000E-05	lb/ton		0.00		0.00
Tetrachloroethaylene	4.3000E-05	lb/ton		0.00		0.01
Toluene	2.4000E-04	lb/ton		0.01		0.04
1,1,1 Trichloroethane	2.0000E-05	lb/ton		0.00		0.00
Vinyl Acetate	7.6000E-06	lb/ton		0.00		0.00
Xylene	3.7000E-05	lb/ton		0.00		0.01

Natural Gas
0.66 mmcf/hr max design rate
5781.6 MMcf
656 mmBtu

Pollutant	Emission Factor	Units	Control Eff	Lbs/hr Uncontrolled	lbs/hr controlled	Tons/Yr
PM10	4.9000E-01	lb/mmBtu	0.00	321.44	321.44	1,407.91
PM	4.9000E-01	lb/mmBtu	0.00	321.44	321.44	1,407.91
SOx	6.0000E-01	lb/MMcf		0.40		1.73
NOx	4.0000E-01	lb/mmBtu		262.40		1,149.31
VOC	5.50E+00	lb/MMcf		3.63		15.90
CO	8.40E+01	lb/MMcf		55.44		242.83
Formaldehyde	7.5000E-02	lb/MMcf		0.02		0.22
Hexane	1.8000E+00	lb/MMcf		0.41		5.20

001 Total

	Pollutant	Tons/Yr
	PM10	1,407.91
	PM	1,407.91
	SOx	3,447.94
	NOx	1,149.31
	VOC	15.90
	CO	1,206.78
	Lead	0.00
7440360	Antimony	0.00
7440382	Arsenic compounds	0.07
7440417	Beryllium compounds	0.00
7440439	Cadmium compounds	0.01
7440473	Chromium compounds	0.06
7440484	Cobalt	0.02
	Cyanide	0.44
7647010	Hydrochloric acid	22.77
7664393	Hydrogen fluoride	12.11
	Lead compounds	0.07
7439965	Manganese compounds	0.09
7439976	Mercury compounds	0.02
7440020	Nickel compounds	0.05
	POM	0.01
	Radionuclides	0.07
7782492	Selenium compounds	0.23
75070	Acetaldehyde	0.10
98862	Acetophenone	0.00
107028	Acrolein	0.05
71432	Benzene	0.23
100447	Benzyl Chloride	0.12
117817	Bis(2-ethylhexyl)phthalat	0.01
75252	Bromoform	0.01
75150	Carbon Disulfide	0.02
532574	2-Chloroacetophenone	0.00
108907	Chlorobenzene	0.00
67663	Chloroform	0.01
98828	Cumene	0.00
77781	Dimethyl Sulfate	0.01
100414	Ethylbenzene	0.02
75003	Ethylchloride	0.01
107062	Ethylene Dichloride	0.01
50000	Formaldehyde	0.22
110543	Hexane	5.20
78591	Isophorone	0.10
1634044	Methyl Tert Butyl Ether	0.01
74839	Methyl Bromide	0.03
74873	Methyl Chloride	0.09
78933	Methyl Ethyl Ketone	0.07
60344	methyl Hydrazine	0.03
80626	Methyl Methacrylate	0.00
75092	Methylene Chloride	0.05
108952	Phenol	0.00
123386	Propionaldehyde	0.07
100425	Styrene	0.00
127184	Tetrachloroethaylene	0.01
108883	Toluene	0.04
71556	1,1,1 Trichloroethane	0.00
108054	Vinyl Acetate	0.00
1330207	Xylene	0.01

CBEC POTENTIAL EMISSIONS

Emission Point 002

Coal
57 ton/hr max design rate
Potential Throughput 499,320.00 Tons % Ash 5.4
935.00 mmBtu/hr
8200 Ave Btu/lb

Natural Gas
0.95 MMcf/hr max design rate
8322 MMcf
950 mmBtu/hr

Pollutant	Emission Factor	Units	Control Eff	Lbs/hr Uncontrolled	lbs/hr controlled	Controlled Tons/Yr	Emission Factor	Units	Control Eff	Lbs/hr Uncontrolled	lbs/hr controlled	Tons/Yr	002	Pollutant	Total Tons/Yr
PM10	4.9000E-01	lb/mmBtu	0.00	458.15	458.15	2,006.70	4.9000E-01	lb/mmBtu	0.00	465.50	465.50	2,038.89		PM10	2,038.89
PM	4.9000E-01	lb/mmBtu	0.00	458.15	458.15	2,006.70	4.9000E-01	lb/mmBtu	0.00	465.50	465.50	2,038.89		PM	2,038.89
SOx	1.2000E+00	lb/mmBtu		1,122.00		4,914.36	6.0000E-01	lb/MMcf		0.57		2.50		SOx	4,914.36
NOx	4.5000E-01	lb/mmBtu		420.75		1,842.89	4.5000E-01	lb/mmBtu		427.50		1,872.45		NOx	1,872.45
VOC	6.0000E-02	lb/ton		3.42		14.98	5.50E+00	lb/MMcf		5.23		22.89		VOC	22.89
CO	5.0000E-01	lb/ton		28.50		124.83	2.40E+01	lb/MMcf		22.80		99.86		CO	124.83
Lead	NA													Lead	0.00
Antimony	1.8000E-05	lb/ton		0.00		0.00							7440360	Antimony	0.00
Arsenic compounds	4.1000E-04	lb/ton		0.02		0.10							7440382	Arsenic compounds	0.10
Beryllium compounds	2.1000E-05	lb/ton		0.00		0.01							7440417	Beryllium compounds	0.01
Cadmium compounds	5.1000E-05	lb/ton		0.00		0.01							7440439	Cadmium compounds	0.01
Chromium compounds	3.3900E-04	lb/ton		0.02		0.08							7440473	Chromium compounds	0.08
Cobalt	1.0000E-04	lb/ton		0.01		0.02							7440484	Cobalt	0.02
Cyanide	2.5000E-03	lb/ton		0.14		0.62								Cyanide	0.62
Hydrochloric acid	1.2997E-01	lb/ton		7.41		32.45							7647010	Hydrochloric acid	32.45
Hydrogen fluoride	6.9112E-02	lb/ton		3.94		17.25							7664393	Hydrogen fluoride	17.25
Lead compounds	4.2000E-04	lb/ton		0.02		0.10								Lead compounds	0.10
Manganese compounds	4.9000E-04	lb/ton		0.03		0.12							7439965	Manganese compounds	0.12
Mercury compounds	1.0684E-04	lb/ton		0.01		0.027							7439976	Mercury compounds	0.03
Nickel compounds	2.8000E-04	lb/ton		0.02		0.07							7440020	Nickel compounds	0.07
POM	2.4000E-06	lb/mmBTU		0.00		0.01								POM	0.01
Radionuclides	9.5000E-02	lb/ton PM		0.02		0.10								Radionuclides	0.10
Selenium compounds	1.3000E-03	lb/ton		0.07		0.32							7782492	Selenium compounds	0.32
Acetaldehyde	5.7000E-04	lb/ton		0.03		0.14							75070	Acetaldehyde	0.14
Acetophenone	1.5000E-05	lb/ton		0.00		0.00							98862	Acetophenone	0.00
Acrolein	2.9000E-04	lb/ton		0.02		0.07							107028	Acrolein	0.07
Benzene	1.3000E-03	lb/ton		0.07		0.32							71432	Benzene	0.32
Benzyl Chloride	7.0000E-04	lb/ton		0.04		0.17							100447	Benzyl Chloride	0.17
Bis(2-ethylhexyl)phthalate	7.3000E-05	lb/ton		0.00		0.02							117817	Bis(2-ethylhexyl)phthalat	0.02
Bromoform	3.9000E-05	lb/ton		0.00		0.01							75252	Bromoform	0.01
Carbon Disulfide	1.3000E-04	lb/ton		0.01		0.03							75150	Carbon Disulfide	0.03
2-Chloroacetophenone	7.0000E-06	lb/ton		0.00		0.00							532574	2-Chloroacetophenone	0.00
Chlorobenzene	2.2000E-05	lb/ton		0.00		0.01							108907	Chlorobenzene	0.01
Chloroform	5.9000E-05	lb/ton		0.00		0.01							67663	Chloroform	0.01
Cumene	5.3000E-06	lb/ton		0.00		0.00							98828	Cumene	0.00
Dimethyl Sulfate	4.8000E-05	lb/ton		0.00		0.01							77781	Dimethyl Sulfate	0.01
Ethylbenzene	9.4000E-05	lb/ton		0.00		0.02							100414	Ethylbenzene	0.02
Ethylchloride	4.2000E-05	lb/ton		0.00		0.01							75003	Ethylchloride	0.01
Ethylene Dichloride	4.0000E-05	lb/ton		0.00		0.01							107062	Ethylene Dichloride	0.01
Formaldehyde	2.4000E-04	lb/ton		0.01		0.06	7.5000E-02	lb/MMcf		0.0713		0.312	50000	Formaldehyde	0.31
Hexane	6.7000E-05	lb/ton		0.00		0.02	1.8000E+00	lb/MMcf		1.710		7.490	110543	Hexane	7.49
Isophorone	5.8000E-04	lb/ton		0.03		0.14							78591	Isophorone	0.14
Methyl Tert Butyl Ether	3.5000E-05	lb/ton		0.00		0.01							1634044	Methyl Tert Butyl Ether	0.01
Methyl Bromide	1.6000E-04	lb/ton		0.01		0.04							74839	Methyl Bromide	0.04
Methyl Chloride	5.3000E-04	lb/ton		0.03		0.13							74873	Methyl Chloride	0.13
Methyl Ethyl Ketone	3.9000E-04	lb/ton		0.02		0.10							78933	Methyl Ethyl Ketone	0.10
methyl Hydrazine	1.7000E-04	lb/ton		0.01		0.04							60344	methyl Hydrazine	0.04
Methyl Methacrylate	2.0000E-05	lb/ton		0.00		0.00							80626	Methyl Methacrylate	0.00
Methylene Chloride	2.9000E-04	lb/ton		0.02		0.07							75092	Methylene Chloride	0.07
Phenol	1.6000E-05	lb/ton		0.00		0.00							108952	Phenol	0.00
Propionaldehyde	3.8000E-04	lb/ton		0.02		0.09							123386	Propionaldehyde	0.09
Styrene	2.5000E-05	lb/ton		0.00		0.01							100425	Styrene	0.01
Tetrachloroethaylene	4.3000E-05	lb/ton		0.00		0.01							127184	Tetrachloroethaylene	0.01
Toluene	2.4000E-04	lb/ton		0.01		0.06							108883	Toluene	0.06
1,1,1 Trichloroethane	2.0000E-05	lb/ton		0.00		0.00							71556	1,1,1 Trichloroethane	0.00
Vinyl Acetate	7.6000E-06	lb/ton		0.00		0.00							108054	Vinyl Acetate	0.00
Xylene	3.7000E-05	lb/ton		0.00		0.01							1330207	Xylene	0.01

Emission Point 003

*Bituminous coal usage and FIRE factors (10100202) are used to calculate HCl and HF emissions as a worst case.

	Subbituminous Coal	Bituminous Coal	Oil
Potential Throughput	450 ton/hr max design rate	361 ton/hr max design rate	2.08 1000 gal/hr max design rate
	3,942,000.00 Tons	3,074,760 Tons	18,220.80 1000 gal; % sulfur 0.6
	7,700.00 mmBtu/hr	7,700 mmBtu/hr	284.96 mmBtu/hr; 137,000 Btu/gal
	8341 Ave Btu/lb	10,957 Ave Btu/lb	

Pollutant	Emission Factor	Units	Control Eff	Lbs/hr Uncontrolled	lbs/hr controlled	Controlled Tons/Yr	Oil Emission Factor	Units	Control Eff	lb/hr Uncontrolled	lb/hr (controlled)	Tons/Yr
PM10	2.7000E-02	lb/mmBtu	0.00	207.90	207.90	910.60	1.0000E-01	lb/mmBtu	0.00	28.50	28.50	124.81
PM	2.7000E-02	lb/mmBtu	0.00	207.90	207.90	910.60	1.0000E-01	lb/mmBtu	0.00	28.50	28.50	124.81
SOx	4.0000E-01	lb/mmBtu		3,080.00		13,490.40	1.4365E+02	lb/1000 gal		298.79		785.23
NOx	2.5000E-01	lb/mmBtu		1,925.00		8,431.50	2.4000E+01	lb/1000 gal		49.92		218.65
VOC	3.6000E-03	lb/mmBtu		27.72		121.41	2.0000E-01	lb/1000 gal		0.42		1.82
CO	4.2000E-01	lb/mmBtu		3,234.00		14,164.92	5.0000E+00	lb/1000 gal		10.40		45.55
Lead		NA										
Antimony	1.8000E-05	lb/ton		0.01		0.04						
Arsenic compounds	4.1000E-04	lb/ton		0.18		0.81						
Beryllium compounds	2.1000E-05	lb/ton		0.01		0.04						
Cadmium compounds	5.1000E-05	lb/ton		0.02		0.10						
Chromium compounds	3.3900E-04	lb/ton		0.15		0.67						
Cobalt	1.0000E-04	lb/ton		0.05		0.20						
Cyanide	2.5000E-03	lb/ton		1.13		4.93						
Hydrochloric acid*	1.2000E+00	lb/ton	90.00	421.20	42.12	184.49						
Hydrogen fluoride*	1.5000E-01	lb/ton	90.00	52.65	5.27	23.06						
Lead compounds	4.2000E-04	lb/ton		0.19		0.83	1.2400E-03	lb/1000 gal		0.00		0.01
Manganese compounds	4.9000E-04	lb/ton		0.22		0.97						
Mercury compounds	8.4238E-05	lb/ton		0.04		0.166						
Nickel compounds	2.8000E-04	lb/ton		0.13		0.55						
POM	2.0800E-06	lb/mmBtu		0.02		0.07						
Radionuclides	9.5000E-02	lb/ton PM		0.01		0.04						
Selenium compounds	1.3000E-03	lb/ton		0.59		2.56						
Acetaldehyde	5.7000E-04	lb/ton		0.26		1.12						
Acetophenone	1.5000E-05	lb/ton		0.01		0.03						
Acrolein	2.9000E-04	lb/ton		0.13		0.57						
Benzene	1.3000E-03	lb/ton		0.58		2.56						
Benzyl Chloride	7.0000E-04	lb/ton		0.32		1.38						
Bis(2-ethylhexyl)phthalate	7.3000E-05	lb/ton		0.03		0.14						
Bromoform	3.9000E-05	lb/ton		0.02		0.08						
Carbon Disulfide	1.3000E-04	lb/ton		0.06		0.26						
2-Chloroacetophenone	7.0000E-06	lb/ton		0.00		0.01						
Chlorobenzene	2.2000E-05	lb/ton		0.01		0.04						
Chloroform	5.9000E-05	lb/ton		0.03		0.12						
Cumene	5.3000E-06	lb/ton		0.00		0.01						
Dimethyl Sulfate	4.8000E-05	lb/ton		0.02		0.09						
Ethylbenzene	9.4000E-05	lb/ton		0.04		0.19						
Ethylchloride	4.2000E-05	lb/ton		0.02		0.08						
Ethylene Dichloride	4.0000E-05	lb/ton		0.02		0.08						
Formaldehyde	2.4000E-04	lb/ton		0.11		0.47						
Hexane	6.7000E-05	lb/ton		0.03		0.13						
Isophorone	5.8000E-04	lb/ton		0.26		1.14						
Methyl Tert Butyl Ether	3.5000E-05	lb/ton		0.02		0.07						
Methyl Bromide	1.6000E-04	lb/ton		0.07		0.32						
Methyl Chloride	5.3000E-04	lb/ton		0.24		1.04						
Methyl Ethyl Ketone	3.9000E-04	lb/ton		0.18		0.77						
methyl Hydrazine	1.7000E-04	lb/ton		0.08		0.34						
Methyl Methacrylate	2.0000E-05	lb/ton		0.01		0.04						
Methylene Chloride	2.9000E-04	lb/ton		0.13		0.57						
Phenol	1.6000E-05	lb/ton		0.01		0.03						
Propionaldehyde	3.8000E-04	lb/ton		0.17		0.75						
Styrene	2.5000E-05	lb/ton		0.01		0.05						
Tetrachloroethaylene	4.3000E-05	lb/ton		0.02		0.08						
Toluene	2.4000E-04	lb/ton		0.11		0.47						
1,1,1 Trichloroethane	2.0000E-05	lb/ton		0.01		0.04						
Vinyl Acetate	7.6000E-06	lb/ton		0.00		0.01						
Xylene	3.7000E-05	lb/ton		0.02		0.07						

003 Total

CAS	Pollutant	Tons/Yr
	PM10	910.60
	PM	910.60
	SOx	13,490.40
	NOx	8,431.50
	VOC	121.41
	CO	14,164.92
	Lead	0.00
7440360	Antimony	0.04
7440382	Arsenic compounds	0.81
7440417	Beryllium compounds	0.04
7440439	Cadmium compounds	0.10
7440473	Chromium compounds	0.67
7440484	Cobalt	0.20
	Cyanide	4.93
7647010	Hydrochloric acid	184.49
7664393	Hydrogen fluoride	23.06
	Lead compounds	0.83
7439965	Manganese compounds	0.97
7439976	Mercury compounds	0.17
7440020	Nickel compounds	0.55
	POM	0.07
	Radionuclides	0.04
7782492	Selenium compounds	2.56
75070	Acetaldehyde	1.12
98862	Acetophenone	0.03
107028	Acrolein	0.57
71432	Benzene	2.56
100447	Benzyl Chloride	1.38
117817	Bis(2-ethylhexyl)phthalat	0.14
75252	Bromoform	0.08
75150	Carbon Disulfide	0.26
532574	2-Chloroacetophenone	0.01
108907	Chlorobenzene	0.04
67663	Chloroform	0.12
98828	Cumene	0.01
77781	Dimethyl Sulfate	0.09
100414	Ethylbenzene	0.19
75003	Ethylchloride	0.08
107062	Ethylene Dichloride	0.08
50000	Formaldehyde	0.47
110543	Hexane	0.13
78591	Isophorone	1.14
1634044	Methyl Tert Butyl Ether	0.07
74839	Methyl Bromide	0.32
74873	Methyl Chloride	1.04
78933	Methyl Ethyl Ketone	0.77
60344	methyl Hydrazine	0.34
80626	Methyl Methacrylate	0.04
75092	Methylene Chloride	0.57
108952	Phenol	0.03
123386	Propionaldehyde	0.75
100425	Styrene	0.05
127184	Tetrachloroethaylene	0.08
108883	Toluene	0.47
71556	1,1,1 Trichloroethane	0.04
108054	Vinyl Acetate	0.01
1330207	Xylene	0.07

Council Bluffs Energy Center
Potential Emissions

EU ID	PM10	PM	SO2	NOx	VOC	CO
001	1,407.91	1,407.91	3,447.94	1,149.31	15.90	1,206.78
002	2,038.89	2,038.89	4,914.36	1,872.45	22.89	124.83
003	910.60	910.60	13,490.40	8,431.50	121.41	14,184.92
004	0.79	0.79	4.17	0.71	0.01	0.15
005 F	4.30	20.10				
006	28.16	28.16				
009	10.21	108.87				
010	0.66	1.40				
011	10.29	79.22				
013	4.97	4.97				
014	29.83	99.49				
015	25.75	85.79				
016	5.83	44.68				
017	12.88	99.11				
018 (F)	8.31	42.58				
019 (F)	39.41	73.44				
020 (F)	2.36	2.84				
021 (F)	0.45	0.54				
025					8.03	
026 (F)					2.10	
027	3.41	3.41	3.18	48.41	3.95	10.42
031 (F)	1.44	3.06				
112	0.33	0.33	0.03	6.13	0.24	3.68
113	0.06	0.06	0.05	0.82	0.06	0.18
114	0.06	0.06	0.47	0.64	0.02	0.04
117b (F)	0.74	1.58				
118 (F)	0.33	0.70				
119A	3.58	3.58				
119B	0.02	0.02				
141	840.41	907.65	3,361.65	2,353.16	121.02	5,176.94
142	1.14	1.14	0.09	21.05	0.83	12.63
143	0.57	0.57	0.21	6.99	0.37	3.47
144	0.18	0.18	0.03	2.49	0.20	0.54
145	0.32	0.32				
151A (F)	0.72	1.53				
151B (F)	0.28	0.55				
160	9.37	9.37				
161	0.11	0.11				
162A	0.15	0.15				
162B	0.15	0.15				
163	0.11	0.11				
164	0.19	0.19				
165A	0.11	0.11				
165B	0.11	0.11				
167	0.56	0.56				
168	0.47	0.47				
169	0.47	0.47				
170	0.47	0.47				
171	0.88	0.88				
172	0.88	0.88				
173	0.88	0.88				
174	0.12	0.12				
180	0.45	0.45				
181	0.45	0.45				
182	0.45	0.45				
200	0.56	0.56				
201	0.47	0.47				
202	0.47	0.47				
204	0.56	0.56				
205	0.56	0.56				
206	0.56	0.56				
207	1.13	1.13				
208	0.38	0.38				
209	0.19	0.19				
210	0.19	0.19				
211	0.19	0.19				
	PM10	PM	SO2	NOx	VOC	CO
Facility Total	5,416.83	5,995.76	25,222.58	13,893.66	297.03	20,704.58
Point Source Total	5,358.49	5,848.84	25,222.58	13,893.66	294.93	20,704.58
Fugitive Source Total	58.34	146.92	0.00	0.00	2.10	0.00

EU ID	Pb	Antimony	Arsenic co	Beryllium c	Cadmium c	Chromium	Cobalt	Cyanide	Hydrochlori	Hydrogen f	Lead comp	Manganese	Mercury co	Nickel com	POM (Poly	Radionuclic	Selenium c
001	0.00	0.00	0.07	0.00	0.01	0.06	0.02	0.44	22.77	12.11	0.07	0.09	0.02	0.05	0.01	0.07	0.23
002	0.00	0.00	0.10	0.01	0.01	0.08	0.02	0.62	32.45	17.25	0.10	0.12	0.03	0.07	0.01	0.10	0.32
003	0.00	0.04	0.81	0.04	0.10	0.67	0.20	4.93	184.49	23.06	0.83	0.97	0.17	0.55	0.07	0.04	2.56
141		0.04	0.86	0.04	0.11	0.71	0.21	5.26	97.49	30.25	0.87	1.03	0.22	0.59	0.07	0.04	2.73
	Pb	Antimony	Arsenic co	Beryllium c	Cadmium c	Chromium	Cobalt	Cyanide	Hydrochlori	Hydrogen f	Lead comp	Manganese	Mercury co	Nickel com	POM (Poly	Radionuclic	Selenium c
Facility Total	0.00	0.08	1.84	0.09	0.23	1.52	0.45	11.25	337.20	82.67	1.87	2.21	0.44	1.26	0.16	0.25	5.84
Point Source Total	0.00	0.08	1.84	0.09	0.23	1.52	0.45	11.25	337.20	82.67	1.87	2.21	0.44	1.26	0.16	0.25	5.84
Fugitive Source Total	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

EU ID	Acetaldehy	Acetophen	Acrolein	Benzene	Benzyl Chl	Bis(2-ethyl	Bromoform	Carbon Dis	2-Chloroac	Chlorobenz	Chloroform	Cumene
001	0.10	0.00	0.05	0.23	0.12	0.01	0.01	0.02	0.00	0.00	0.01	0.00
002	0.14	0.00	0.07	0.32	0.17	0.02	0.01	0.03	0.00	0.01	0.01	0.00
003	1.12	0.03	0.57	2.56	1.38	0.14	0.08	0.26	0.01	0.04	0.12	0.01
141	1.20	0.03	0.61	2.73	1.47	0.15	0.08	0.27	0.01	0.05	0.12	0.01
	Acetaldehy	Acetophen	Acrolein	Benzene	Benzyl Chl	Bis(2-ethyl	Bromoform	Carbon Dis	2-Chloroac	Chlorobenz	Chloroform	Cumene
Facility Total	2.56	0.06	1.30	5.84	3.14	0.32	0.18	0.58	0.02	0.10	0.26	0.02
Point Source Total	2.56	0.06	1.30	5.84	3.14	0.32	0.18	0.58	0.02	0.10	0.26	0.02
Fugitive Source Total	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

(F) = Fugitive Source
Sources 141 - 170 are associated with the CBEC Unit 4 project.
Values are the greater of the pollutants for dual fuel sources.

Dimethyl S	Ethylbenze	Ethylchloric	Ethylene D	Ethylene gl	Formaldeh	Hexane	Isophorone	Methyl Ter	Methyl Bro	Methyl Chl	Methyl Eth	Methyl Hyd	Methyl Met	Methylene	Phenol	Propionald	Styrene	Tetrachlore	Toluene	1,1,1 Trichl	Vinyl Aceta	Xylenes (m	TRS	H2SO4	HAP Total	EU ID
0.01	0.02	0.01	0.01		0.22	5.20	0.10	0.01	0.03	0.09	0.07	0.03	0.00	0.05	0.00	0.07	0.00	0.01	0.04	0.00	0.00	0.01			42.55	001
0.01	0.02	0.01	0.01		0.31	7.49	0.14	0.01	0.04	0.13	0.10	0.04	0.00	0.07	0.00	0.09	0.01	0.01	0.06	0.00	0.00	0.01			60.63	002
0.09	0.19	0.08	0.08		0.47	0.13	1.14	0.07	0.32	1.04	0.77	0.34	0.04	0.57	0.03	0.75	0.05	0.08	0.47	0.04	0.01	0.07			232.68	003
																									0.00	004
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																									0.00	021
				8.03																					8.03	025
	0.00																	0.00	0.00	0.00		0.02			0.02	026
																									0.00	027
																									0.00	030
																									0.00	031
																									0.00	112
																									0.00	113
																									0.00	114
																									0.00	117
																									0.00	118
																									0.00	119A
																									0.00	119B
0.10	0.20	0.09	0.08		0.50	0.14	1.22	0.07	0.34	1.11	0.82	0.36	0.04	0.61	0.03	0.80	0.05	0.09	0.50	0.04	0.02	0.08	33.62	141.53	329.69	141
																									0.00	142
																									0.00	143
																									0.00	144
																									0.00	145
																									0.00	151A (F)
																									0.00	151B (F)
																									0.00	160
																									0.00	161
																									0.00	162A
																									0.00	162B
																									0.00	163
																									0.00	164A
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Dimethyl S	Ethylbenze	Ethylchloric	Ethylene D	Ethylene gl	Formaldeh	Hexane	Isophorone	Methyl Ter	Methyl Bro	Methyl Chl	Methyl Eth	Methyl Hyd	Methyl Met	Methylene	Phenol	Propionald	Styrene	Tetrachlore	Toluene	1,1,1 Trichl	Vinyl Aceta	Xylenes (m	TRS	H2SO4	HAP Total
0.21	0.43	0.19	0.18	8.03	1.50	12.96	2.60	0.16	0.73	2.37	1.76	0.77	0.08	1.30	0.06	1.71	0.11	0.19	1.07	0.08	0.03	0.19	33.62	141.53	673.60
0.21	0.43	0.19	0.18	8.03	1.50	12.96	2.60	0.16	0.73	2.37	1.76	0.77	0.08	1.30	0.06	1.71	0.11	0.19	1.07	0.08	0.03	0.17	33.62	141.53	673.58
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.00	0.02

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October 10, 2006

Mr. Don Mohning
MidAmerican Energy Company
401 Douglas Street
Sioux City, Iowa 51101

Subject: **Dispersion Modeling Analysis for the CBEC4 As-Built Configuration**

Don:

CH2M HILL has completed a dispersion modeling analysis for the as-built configuration of the Unit 4 project at the Council Bluffs Energy Center (CBEC). This analysis considered the changes to the CBEC4 project since the last dispersion modeling analysis that was submitted to the IDNR. In addition, the facility-wide modeling runs included the sources/structures associated with the Unit 3 SO_2 scrubber and low-NO_x burners/separated over-fire air system (LNB/SOFA) project. A plot plan that shows the as-built configuration for the facility is included with the submittal package.

Background Levels

Preliminary impacts for the CBEC4 project for PM_{10} and SO_2 were above the modeling significance levels (MSL), and therefore background levels were needed for full-impact modeling. IDNR has requested that the existing statewide default background values be used for dispersion modeling for the CBEC4 project. The existing default background levels for PM_{10} and SO_2 are presented in the document *Air Dispersion Modeling Guidelines for PSD Projects* on the IDNR as listed below:

SO_2 (all averaging periods): 20 $\mu g/m^3$
24-hour PM_{10}: 52 $\mu g/m^3$
Annual PM_{10}: 26 $\mu g/m^3$

Table 1 presents the MSL that are applicable for this analysis.

TABLE 1
Modeling Significance Levels

Pollutant	Averaging Period	MSL ($\mu g/m^3$)
PM_{10}	Annual	1
	24-hour	5
NO_x	Annual	1
SO_2	Annual	1
	24-hour	5
	3-hour	25
CO	8-hour	500
	1-hour	2,000

Modeling Methodology

Dispersion Model

Air quality impacts from the project were determined with the EPA AERMOD model. Appendix A of Appendix W of 40 CFR Part 51 (Guideline on Air Quality Models) lists AERMOD as the preferred air quality model for near-field analyses.

Dispersion Coefficient

The land surrounding the CBEC in all directions is predominantly open country with no significant development. Therefore, the urban dispersion option was not used within the AERMOD model.

Source Characterization

The emission inventory for the CBEC4 project includes the coal fired boiler and material-handling sources, including systems for handling fly ash, FGD waste, and lime. The material handling systems will include dust collectors for control of particulate emissions. For these sources, CH2M HILL used the expected limits on grain loading and the expected air flow through the dust collector to arrive at estimates of particulate emissions. Detailed emissions calculations and documentation for the project emission sources are provided with the submittal package.

The CBEC4 boiler was modeled as a point source within AERMOD. Other sources that emit from a vent, such as dust collectors that control particulate emissions from material handling, were also modeled as point sources. Sources with ambient release temperatures were modeled with exhaust temperatures of 70°F.

Full-impact modeling for PM_{10} included fugitive dust sources at the CBEC such as storage piles, material drops, and haul roads. Fugitive emissions from material handling sources were modeled as volume sources with source dimensions that reflect actual operations. The actual source dimensions were converted to volume source inputs in accordance with EPA guidance for the ISC model.

Fugitive emissions from traffic over haul roads were modeled as a series of volume sources. Volume source parameters for the haul roads were taken in part from the EPA document Modeling Fugitive Dust Impacts from Surface Coal Mining Operations – Phase II Model Evaluation Protocol (EPA, 1994). The source height of the haul road volume sources was 2 m, as based on the statement from the EPA document that the maximum mass flux from haul road dust plumes occurs at that height. Initial vertical dispersion terms (3 m) for the haul road volumes were also be taken from the EPA document. The separation distance of the volume sources was set at 44 feet (two road widths), in accordance with recommendations in the User's Guide For The Industrial Source Complex (ISC3) Dispersion Models, Volume I – User Instructions (EPA, 1995). Initial horizontal dimensions for the volume sources were determined from the separation distance and Table 3-1 in the ISC3 User's Guide using the factor for a "line source represented by separated volume sources":

- Center to center distance (13.41 meters) divided by 2.15 = 6.24 meters

Three sources that were modeled as point sources with previous submittals to the IDNR were modeled as volume sources. Attachment 1 presents the volume source dimensions for these three sources: EP10, EP20, and EP21. For EP10, the emissions from Transfer Tower #2 are no longer routed through a vent. For EP20 and EP21, the future loading of trucks with ash from Units 1 and 2 will take place within partially enclosed areas within the silos that store the ash.

Building Downwash

Point sources were modeled with stack heights that did not exceed good engineering practice (GEP) stack height. Building downwash effects for point sources were determined with the U.S. Environmental Protection Agency (EPA) Building Profile Input Program (BPIP) for the AERMOD model (BPIP-PRIME).

Receptor Grids

The base receptor grid for AERMOD modeling consisted of Cartesian-grid receptors that were placed at and beyond the ambient boundary at spacing that increased with distance from the origin. The base grid originated at the approximate location of the CBEC4 boiler stack. Ambient boundary receptors are placed at 50-meter (m) intervals along a line that represents the physical barrier (fence) that will restrict public access to the facility. Beyond the ambient boundary, receptor spacing was as follows:

- 100-m spacing from the boundary to 1 km beyond the ambient boundary in all directions
- 250-m spacing from beyond the 100-m receptors to 5 km from the origin
- 500-m spacing from beyond 5 km to 10 km from the origin

Previous modeling for the project included receptors with 1000-m spacing that were placed from 10 km to 30 km from the origin, but preliminary modeling for the project indicated that the significant impacts from the project were contained within 10 km of the plant. Therefore, the receptor grid was reduced to include only those receptors within 10 km to reduce model run time.

Universal Transverse Mercator (UTM) coordinates for the modeled sources, downwash structures, and receptors were all be based on the North American Datum of 1927 (NAD 27), and UTM Zone 15.

Terrain Elevations

Terrain in the vicinity of CBEC was accounted for by assigning elevations to each modeling receptor. CH2M HILL used 1:24,000-scale (7.5-minute) Digital Elevation Model (DEM) files data from the U.S. Geological Survey (USGS) to determine receptor elevations.

Hill heights for each receptor were determined with the AERMAP pre-processor and DEM files obtained from the IDNR website. Several DEM files for eastern Nebraska that were not available from the IDNR website were obtained from the WebMet website (http://www.webgis.com/).

Meteorological Data

Meteorological input for the AERMOD model was obtained from the IDNR website. The website includes pre-processed .SFC and .PFL files for the five-year period from 2000-2004 for several stations. One of these stations is Omaha, Nebraska, and these data are the most suitable for the nearby CBEC station.

Modeling Analysis

Preliminary CO Analysis

For CO, the Unit 4 boiler and the Unit 4 auxiliary boiler were included in the preliminary analysis. The highest 1-hour CO impact was 77.7 µg/m³. This predicted impact occurred approximately 1.5 km southwest of the Unit 3 boiler stack in an area of 250-m receptor spacing with 2003 meteorology. Because this predicted impact is less than 4 percent of the Class II modeling significance level of 2,000 µg/m³, no further modeling was conducted for 1-hour CO.

For 8-hour CO, the highest impact of 22.7 µg/m³ was predicted to occur with 2000 meteorology. This impact was also predicted to occur approximately 3 km southwest of the Unit 3 boiler stack in an area with 250-m receptor spacing, and is well below (less than 5 percent) of the Class II modeling significance level of 500 µg/m³.

Because the preliminary analysis demonstrated that the project will not produce a significant impact of CO, no further analysis of the project's CO impacts was conducted.

Preliminary NO_x Analysis

For the preliminary analysis of the impacts of NOx emissions for the Unit 4 Project, the Unit 4 boiler and the Unit 4 auxiliary boiler were modeled together, with NOx emission rates that reflect the potential annual operating conditions for each source.

The highest predicted annual impact of NOx was 0.55 µg/m³. This predicted impact occurred at the northern facility fenceline in an area with 50-meter receptor spacing. The predicted impact is well below the Class II modeling significance level of 1.0 µg/m³ for annual NOx. The preliminary analysis demonstrated that the Unit 4 Project will not produce a significant impact of annual NOx.

Preliminary SO_2 Analysis

For a preliminary analysis of the SO_2 impacts for the Unit 4 Project, the Unit 4 boiler and the Unit 4 auxiliary boiler were both modeled. Short-term impacts were modeled with the maximum hourly SO_2 emission rate expected from each source. Annual impacts were conservatively modeled with those same short-term emission rates. The highest predicted 3-hour SO_2 impact was 24.99 µg/m³. This predicted impact is slightly below the Class II modeling significance level of 25.0 µg/m³ for 3-hour SO_2. Predicted 24-hour impacts exceeded the Class II modeling significance level of 5.0 µg/m³, with a maximum modeled impact of 5.6 µg/m³. Annual impacts were below the modeling significance level of 1.0 µg/m³, with a maximum modeled impact of 0.71 µg/m³.

With predicted 24-hour impacts for the project exceeding the Class II modeling significance levels, we next determined the impact area for SO_2. The impact area for a particular pollutant, as described in the draft EPA *New Source Review Workshop Manual* (EPA 1990), is "a circular area extending from the source to the most distant point where approved dispersion modeling predicts a significant impact will occur". The impact area will define the area over which the analyses for NAAQS compliance and PSD increment consumption will be performed. For a given pollutant, the impact area is determined for each averaging period, and the area used for a given pollutant is the largest of the impact areas. For the project, the largest impact area has a radius of 2.7 kilometers.

Preliminary PM_{10} Analysis

For the preliminary analysis for PM_{10}, the increase in emissions from the CBEC4 project, including material handling sources associated with the handling of FGD waste and lime and fugitive sources associated with transfer of coal, were evaluated.

The maximum predicted annual impact was 6.2 $\mu g/m^3$ with 2004 meteorology. This value exceeds the Class II MSL of 1.0 $\mu g/m^3$. For 24-hour impacts, the maximum predicted impact was 32.2 $\mu g/m^3$, which exceeds the MSL of 5.0 $\mu g/m^3$. For PM_{10} the largest impact area has a radius of 5.3 kilometers.

Table 2 presents the results of the preliminary modeling.

TABLE 2
Results of Preliminary Modeling

Pollutant	Averaging Period	Maximum Modeled Impact from CBEC4 Project ($\mu g/m^3$)	MSL ($\mu g/m^3$)
PM_{10}	Annual	6.2	1
	24-hour	32.2	5
NO_x	Annual	0.55	1
SO_2	Annual	0.71	1
	24-hour	5.6	5
	3-hour	24.99	25
CO	8-hour	22.7	500
	1-hour	77.7	2,000

Analysis for Lead

Estimated lead emissions from the CBEC Unit 4 Project exceed the PSD significant emission rate of 0.6 tons per year. Because no modeling significance level has been established for lead impacts, CH2M HILL conservatively modeled total lead impacts by including emissions from Units 1 through 4, the auxiliary boilers at the CBEC, and two outside sources. The modeled lead impacts were compared to the NAAQS for lead of 1.5 $\mu g/m^3$. Because the NAAQS for lead is set for an averaging period of a calendar quarter, the AERMOD model was conservatively run for monthly periods for each year of meteorology. The background levels of lead in the vicinity of the CBEC are assumed to be negligible.

The highest modeled lead impact for any month within the 5-year meteorological period was 0.62 μg/m³. This predicted impact occurred approximately 10 kilometers to the northwest of the CBEC, at a receptor within 1 kilometer of the source (PIPE_EP2) representing the Griffin Pipe facility. The contribution from the CBEC sources was, at most, 0.002 μg/m³ for any month and any receptor during the five-year meteorological period. The highest estimated total impact is less than 50 percent of the NAAQS for lead, and the maximum contribution from the CBEC is two orders of magnitude lower than the NAAQS. This modeling analysis demonstrates that the NAAQS for lead will not be threatened by the proposed Unit 4 Project or the existing facility together with the Unit 4 Project.

Source Inventories

For the full impact analyses for SO_2 and PM_{10}, CH2M HILL used the same list of outside sources that was used for the full-impact modeling for the CBEC4 project modeling, with the exception of the nearby Bunge facility. For the nearby Bunge facility, CH2M HILL used the PM_{10} NAAQS and increment model inputs that were recently submitted to the IDNR and obtained by CH2M HILL from the IDNR via e-mail. Building profile parameters for the Bunge facility were also provided by the DNR, and these parameters were included in the full-impact model runs.

PM-10 Increment Analysis

To determine compliance with the allowable PSD increments for PM_{10}, CH2M HILL modeled increment-consuming sources and compared the predicted highest 2nd-high 24-hour impacts to the allowable Class II 24-hour increment of 30 μg/m³, and the highest annual impact to the allowable Class II annual increment of 17 μg/m³. Sources associated with Units 1 and 2 at CBEC were not included because Units 1 and 2 are not increment consuming sources. It should be noted that several material handling sources convey material for each of the main units at CBEC, but rather than attempt to subtract emissions associated with Units 1 and 2 only, these sources were conservatively modeled as if all material was associated with Units 3 and 4. Actual emission rates were used for several sources, including existing dust collectors for which stack test results were available. The haul road source group was not modeled for the 24-hour increment model runs.

For each of the five years of meteorological input, there were several receptors for which the highest 2nd-high 24-hour impacts exceeded the allowable increment level of 30 μg/m³. Also for each of the five years of meteorological input, there was a single receptor that yielded an annual impact that exceeded the allowable annual increment level of 17 μg/m³. These high receptors were clustered near sources outside of the CBEC facility.

The next step in the analysis was to determine if CBEC4 project sources contributed significantly to these modeled violations of the PSD increment. CH2M HILL created a receptor grid that consisted only of the receptors that yielded violations of the PSD increments and used that receptor grid to re-model the CBEC4 preliminary analysis for PM_{10}. Results of this analysis showed that the contribution from CBEC4 sources was below the Class II modeling significance levels for each year of meteorological input, as shown in Table 3. Therefore, the CBEC4 Project does not significantly contribute to any modeled exceedances of the PSD increment for PM_{10}.

TABLE 3
CBEC4 Project Contribution to Modeled Exceedances of PSD Increment for PM10

Averaging Period	Maximum Predicted Impact ($\mu g/m^3$)	Class II Modeling Significance Level ($\mu g/m^3$)
24-Hour PM_{10}	3.65	5
Annual PM_{10}	0.27	1

Notes:

PM_{10} = Particulate matter less than 10 microns
$\mu g/m^3$ = micrograms per cubic meter

NAAQS Analysis for PM_{10}

The full-impact NAAQS analysis for PM_{10} made use of the Pre-1997 Method for determining compliance with the NAAQS. The Pre-1997 Method consists of calculating the highest 6th-high 24-hour average concentration for a five-year period and calculating the highest five-year average for the "annual" value ("highest" means the receptor with the highest value, e.g. highest 6th-high or highest 5-year average). The 24-hour and annual impacts determined in this way were compared to the 24-hour NAAQS for PM_{10} (150 $\mu g/m^3$) and the annual NAAQS for PM_{10} (50 $\mu g/m^3$).

With the exception of auxiliary equipment (fire pumps and emergency generators), all PM_{10} sources at CBEC were included in the NAAQS analysis, with emission rates at potential-to-emit (PTE). Outside sources from IDNR, the City of Omaha, and the Nebraska DEQ were also included.

The highest 6th-high 24-hour average concentration for the five-year period was 96.1 $\mu g/m^3$. With the addition of the 24-hour PM_{10} background provided by DNR (52 $\mu g/m^3$), the total modeled impact is 148.1 $\mu g/m^3$, which is below the NAAQS of 150 $\mu g/m^3$. This impact was predicted to occur at the CBEC fenceline at the southeast part of the facility.

The highest annual impact over the five-year period was predicted to occur within the sources that represent the Bunge facility. The magnitude of the highest annual impact was 21.1 $\mu g/m^3$. With the addition of the annual PM_{10} background provided by DNR (26 $\mu g/m^3$), the total modeled impact is 47.1 $\mu g/m^3$, which is below the NAAQS of 50 $\mu g/m^3$.

NAAQS and Increment Analysis for SO_2

To determine compliance with the allowable PSD increments for SO_2, CH2M HILL modeled increment-consuming sources and compared the highest predicted 2nd-high 3-hour and 24-

hour impacts to the allowable Class II 3-hour increment of 512 μg/m³, and the 24-hour increment of 91 μg/m³.

To determine compliance with the allowable NAAQS for SO_2, CH2M HILL modeled all CBEC and all outside sources of SO_2 and added the appropriate background as provided by the DNR. The highest predicted 2nd-high 3-hour and 24-hour total impacts were compared to the 3-hour NAAQS of 1,300 μg/m³ and the 24-hour NAAQS of 365 μg/m³.

Table 4 summarizes the results of the PSD increment and NAAQS modeling. All predicted impacts were below the allowable PSD increment and NAAQS (with the addition of background). All maximum predicted impacts occurred in areas with 100-m receptor spacing.

TABLE 4
Summary of Full-Impact SO_2 Modeling

Averaging Period/ Pollutant	Modeled Increment Impact (μg/m³)	Class II PSD Increment (μg/m³)	Modeled NAAQS Impact (μg/m³)	Background Concentration (μg/m³)	Total NAAQS Impact (μg/m³)	National Ambient Air Quality Standard (μg/m³)
3-hour SO_2	225.9	512	623.4	20	643.4	1300
24-hour SO_2	45.4	91	141.8	20	161.8	365

Modeling Files on CD

Attachment 2 presents a list of modeling input/output files that are provided to IDNR with this submittal.

Please contact me at (720) 286-5362 if you have any questions.

Sincerely,

CH2M HILL

James Nall

James (Josh) Nall
Air Quality Meteorologist

cc: Thomas Tucker/CH2M HILL