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OHIO ENVIRONMENTAL
PROTECTION AGENCY
SOUTHEAST DISTRICT

CLOW

CLOW WATER SYSTEMS COMPANY

JEFF OTTERSTEDT
Vice President and General Manager

2266 South Sixth Street
P.O. Box 6001
Coshocton, Ohio 43812
(740) 622-6651
FAX (740) 622-8551

October 30, 2006

Ms. Kimbra Reinbold
Ohio EPA, SEDO
2195 Front Street
Logan, OH 43138

RE: Clow Water Systems
Fac. ID 0616010006
Request for Administrative Modification

Dear Ms. Reinbold:

To avoid the requirements associated with the National Emission Standards for Hazardous Air Pollutants for Iron and Steel Foundries (40 CFR 63 Part EEEEE), the "Foundry MACT", and the National Emission Standards for Hazardous Air Pollutants for Miscellaneous Metal Parts and Products (40 CFR 63, Part MMMM), the "Coating MACT", Clow Water Systems (Clow) requests Ohio EPA Administratively Modify Permit #06-07603 to include federally enforceable requirements to limit emissions of any individual hazardous air pollutant (HAP) to less than 10 tons per year (tpy) and the total HAPs to less than 25 tpy.

It is important to recognize that Clow would be compliant with all emission limits included in the Foundry MACT and we believe all coatings would be in compliance with the Coating MACT. With this avoidance permitting strategy Clow is not attempting to avoid any emissions requirement, but we are trying to avoid onerous and time-consuming paperwork that constrain our internal resources. I count on these resources to continue to improve the plant's performance in the areas of operations, environment and safety. Examples of our environmental improvements include the reduction in volatile organic compounds (VOCs) and HAPs from our Pipe Coating operations and the installation of our ring jet scrubber.

HAP Emitting Units

The following emissions units have the potential to emit HAPs from the Clow facility:

Emission Unit ID	Emission Unit Description
B001	Gas-fired air makeup unit (7mmBTU/hr) BMM Area
B002	Gas-fired air makeup unit (9.625mmBTU/hr) Jolt Area
B006	Gas-fired air makeup unit (9.625mmBTU/hr) Pipe Shop

Emission Unit ID	Emission Unit Description
B007	Gas-fired air makeup unit (7.125mmBTU/hr) Flange Fab
F004	Desulphurization and Inoculation
F005	Large PUNB Mold and Core Sand Mixer and Making
F007	Jolt Shakeout
F009	Jolt Pouring and Cooling
F010	BMM Pouring and Cooling
F014	Laempe Core Machine
F015	Foundry Shotblast
F016	BMM Shakeout
F018	Pipe Casting Machines #1-#6
F022	Small PUNB Mold and Core Sand Mixer and Making
K002	Fittings Painting
P020	Annealing Oven
P033	Cupola Hot blast
P901	Cupola
Z129	Main Floor Pouring and Cooling
Z024	Main Floor Shakeout
Z004	Paint Stenciling – Small line
Z075	Paint Stenciling – Large Line
Z131	Paint Striping – Small Line
Z132	Paint Striping – Large Line

Non HAP Emitting Units

These emission units do not emit HAPS but have the potential to. For these units the reason there are no emissions of HAPS is because the raw materials used do not contain HAPs.

Emission Unit ID	Emission Unit Description
K001	Core Wash – Pipe Shell Cores
K006	Pipe Paint Operations
K007	Small PUNB Mold and Core Wash

K008	Large PUNB Mold and Core Wash
K009	Leampe Core Wash
Z008	Clean-up solvent
Z074	Core Glue (for small and large PUNB)
Z076	Paint Pad – Small Line
Z077	Paint Pad – Large Line
Z081	Pipe Painting – Large Line
Z082	Jolt line mold wash

Requested Operational Limitations

Below presents requested operational limitations to enable the facility to be an area source.

1. Facility-Wide Emission Limitations:
   - The facility-wide individual HAP and the facility-wide total combined HAP emissions not exceed 9.9 and 24.9 tons per year, respectively, based upon a rolling, 12-month summation of the emission rates.
   - Compliance with the facility-wide individual HAP and the facility-wide total combined HAP emission limitations shall be based upon a rolling, 12-month summation of the monthly usage/emissions figures.
   - The permittee has sufficient records to begin calculating and tracking these rolling emissions limitations upon issuance of this permit.

2. Operational Restrictions:

   In order to maintain compliance with the facility-wide emission limitations on HAPs, the permittee is limited to the following annual operational restrictions:
   - 275,000 tons of total metal melted;
   - 15,000 tons of metal poured at Jolt Pouring and Cooling (F009);
   - 20,000 tons of metal poured at BMM Pouring and Cooling (F010); and
   - 36,000 tons of metal processed at Foundry Shotblast (F015).

   Compliance with the annual operational restrictions shall be based upon a rolling, 12-month summation of the monthly usage figures.

   The permittee has sufficient records to begin calculating and tracking these rolling emissions limitations upon issuance of this permit.

3. Facility-Wide Monitoring and/or Record Keeping Requirements:

   The permittee shall collect and record the following information each month:
   - the quantity of metal melted, in tons;
   - the quantity of metal poured at Jolt Pouring and Cooling (F009), in tons;

- the quantity of metal poured at BMM Pouring and Cooling (F010), in tons;
- the quantity of metal processed at Foundry Shotblast (F015), in tons;
- the facility-wide individual HAP and facility-wide total combined HAP emissions, in tons;
- the rolling, 12-month summation of the quantity of metal melted, in tons;
- the rolling, 12-month summation of the quantity of metal poured at Jolt Pouring and Cooling (F009), in tons;
- the rolling, 12-month summation of the quantity of metal poured at BMM Pouring and Cooling (F010), in tons;
- the rolling, 12-month summation of the quantity of metal processed at Foundry Shotblast (F015), in tons; and
- the rolling, 12-month summation of the facility-wide individual HAP and facility-wide total combined HAP emissions, in tons.

4. Reporting Requirements:

   The permittee shall submit quarterly deviation (excursion) reports that identify all exceedances of the rolling, 12-month summations of facility-wide individual HAP and facility-wide total combined HAP emissions, or the operations restrictions in section 2 above.

In addition, Clow requests that references to Subpart A and EEEEE be removed from the permit #06-07603 since they will not be applicable following receipt of the administrative modification.

Clow has evaluated all the emission units at the facility that may emit HAPs. The calculations for all emission units that emit HAPs have been identified in the attachment. In addition, all other units that have the potential to emit HAPs, but do not, have been identified in the second table above.

We appreciate your time and effort involved in issuing this permit prior to the initial compliance date. If you have any questions at all please contact Patrick Huth of my staff at (740) 291-1061.

Sincerely,

Clow Water Systems

Jeff Otterstedt
Vice President/General Manager

F004, F007, F009, F007
F006, F016, F012, F010

HAP Summary Table
Clow Water Systems Company
Coshocton, Ohio

Hazardous Air Pollutant	Emissions Units																							
	Baghouse 250 F3	Baghouse 250 F4	F001	F006	F015	F020 / F023 (Synthetic)	F005	F008	F010	Z109	Z024	F015	F015	F014	F005	F008	F007	F006	F015	F013	F014	F001, F002, F006, F007	HAP Total
	(tons/year)	(tons/year)	(tons/year)	(tons/year)	(tons/year)	(tons/year)	(tons/year)	(tons/year)	(tons/year)	(tons/year)	(tons/year)	(tons/year)	(tons/year)	(tons/year)	(tons/year)	(tons/year)	(tons/year)	(tons/year)	(tons/year)	(tons/year)	(tons/year)	(tons/year)	(tons/year)
Antimony (Sb)							4.66E-04	3.39E-06	3.69E-05	3.11E-05	2.80E-06	4.52E-06										2.87E-05	5.45E-04
Arsenic (As)	7.19E-04	1.25E-04	2.30E-04			2.29E-02	8.55E-05	0.00E+00	1.14E-04	5.70E-06	0.00E+00	0.00E+00										1.72E-00	2.42E-02
Beryllium (Be)						7.03E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00										1.56E-04	2.42E-06
Cadmium (Cd)			5.09E-03		5.72E-03	2.10E-02	3.94E-04	1.43E-05	1.14E-04	2.83E-05	1.61E-05	1.91E-05										2.01E-04	3.45E-02
Chromium (Cr)	1.03E-03	1.61E-04	2.37E-03		6.20E-02	4.68E-03	2.84E-02	2.25E-05	5.72E-04	1.90E-04	1.50E-04	1.00E-05	2.51E-03									1.20E-05	7.69E-02
Cobalt (Co)						2.29E-02	3.98E-02	1.11E-04	5.14E-02	2.05E-03	1.29E-04	1.48E-04										7.17E-05	1.17E-01
Lead (Pb)	1.88E-02	3.95E-04	1.56E-01	1.72E-03	6.52E-02	2.93E-06	5.40E-09	8.45E-06	2.41E-03	3.60E-04	5.30E-05	1.26E-05										5.45E-05	2.51E-01
Manganese (Mn)	1.82E-07		2.10E-00	1.03E-02	2.34E-01	2.30E-02	2.37E-02	3.33E-04	2.11E-02	1.58E-03	3.74E-04	4.44E-04	3.07E-03									3.33E-05	2.42E+00
Mercury (Hg)						2.30E-02				0.00E+00												3.01E-04	2.20E-02
Nickel (Ni)						2.31E-02	6.06E-03	2.97E-04	4.02E-03	4.04E-04	3.33E-04	3.98E-04	4.18E-03									3.44E-05	3.91E-02
Selenium (Se)					5.84E-04	1.41E-06	1.65E-04	0.00E+00	1.46E-05	1.23E-05	0.00E+00	0.00E+00											7.80E-04
2,3,7,8 -TCDF																							0.00E+00
1,2,3,7,8 -PeCDF																							0.00E+00
2,3,4,7,8 -PeCDF																							0.00E+00
1,2,3,4,7,8 -HxCDF																							0.00E+00
1,2,3,6,7,8 -HxCDF																							0.00E+00
2,3,4,6,7,8 -HxCDF																							0.00E+00
1,2,3,7,8,9 -HxCDF																							0.00E+00
1,2,3,4,6,7,8 -HpCDF																							0.00E+00
1,2,3,4,7,8,9 -HpCDF																							0.00E+00
1,2,3,4,6,7,8,9 -OCDF																							0.00E+00
2,3,7,8 -TCDD																							0.00E+00
1,2,3,7,8 -PeCDD																							0.00E+00
1,2,3,4,7,8 -HxCDD																							0.00E+00
1,2,3,6,7,8 -HxCDD																							0.00E+00
1,2,3,7,8,9 -HxCDD																							0.00E+00
1,2,3,4,6,7,8 -HpCDD																							0.00E+00
Total TEQ D/F																							1.20E-02
Hydrogen Fluoride (HF)																							2.76E-02
Hydrochloric Acid (HCl)							6.14E-03		5.86E-03													3.44E-06	4.92E-02
Chlorine (Cl2)							1.18E-02		1.98E-02													2.58E-07	3.64E-07
1,3-Dimethylnaphthalene									2.81E-02														1.50E-03
1-Methylnaphthalene					0.00E+00	1.41E-06	2.11E-02															2.29E-06	2.39E-06
2-Methylnaphthalene						1.05E-07				1.50E-03												2.58E-07	3.64E-07
3-Methylchloranthrene																						2.58E-07	3.64E-07
Dimethylnaphthalenes						9.37E-06																3.44E-07	4.85E-07
7,12-Dimethylbenz(a)anthracene						1.05E-07																2.58E-07	3.64E-07
Acenaphthene						1.06E-07																3.01E-04	5.21E+00
Acenaphthylene						1.41E-07																1.72E-07	2.42E-07
Anthracene						1.05E-07			1.71E+00	1.45E-02												2.58E-07	3.64E-07
Benz(a)anthracene					1.84E+00	4.68E-01	1.17E+00															1.72E-07	2.42E-07
Benzene						7.03E-08																2.58E-07	3.64E-07
Benzo(a)pyrene						1.05E-07																2.58E-07	3.64E-07
Benzo(b)fluoranthene						7.03E-08																1.72E-07	2.42E-07
Benzo(g,h,i)perylene						1.05E-07																1.72E-04	2.42E-04
Benzo(k)fluoranthene						1.05E-07																	3.22E-01
Chrysene						7.03E-08												2.20E-01	1.02E-01			4.30E-07	6.06E-07
Dibenzo(a,h)anthracene						7.03E-05																4.02E-07	5.66E-07
Dichlorobenzene																							0.00E+00
Ethylene Glycol						1.75E-07																1.06E-02	4.58E-02
Fluoranthene						1.54E-07																2.58E-01	4.84E-01
Fluorene									1.06E-02	1.20E-02												2.58E-07	3.64E-07
Fluoride						4.39E-03	7.57E-03		4.63E-02													6.73E-05	1.51E+00
Formaldehyde					4.13E-02	1.05E-01	3.39E-02															2.44E-06	3.43E-06
Hexane						1.05E-07			4.56E-02	1.40E-01				2.23E-01	4.38E-01	6.27E-01						7.17E-07	1.01E-06
Indeno(1,2,3-cd)pyrene					0.00E+00	3.87E-06	3.50E-02															4.86E-04	2.17E+00
Naphthalene						9.96E-07														2.66E-03	2.88E-03		5.42E-01
Phenanthrene						2.93E-07																	0.00E+00
Pyrene					7.94E-01	2.14E-01	4.58E-01		5.88E-01	2.40E-02					4.50E-02	6.43E-02	3.02E-01						4.13E-01
Toluene							4.93E-02		7.67E-02														0.00E+00
Ethylbenzene																							2.17E-01
1,1,1-Trichloroethane							7.56E-03		4.05E-01														0.00E+00
o-Xylene																							6.25E-01
Acrolein					4.13E-02		7.17E-02		1.04E-01														1.39E-02
Acetaldehyde																				6.94E-03	6.94E-03		0.00E+00
Acetophenone							2.68E-01		3.57E-01														0.00E+00
Aniline					0.00E+00																		0.00E+00
Cumene																							0.00E+00
Dibenzofurans														0.00E+00	0.00E+00	0.00E+00							0.00E+00
Methanol																	4.16E-01						4.16E-01
Methylene bis (phenylisocyanate) [MDI]					0.00E+00																		
Methylnaphthalenes																							
Methyl isobutyl ketone																							

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HAP Summary Table
Clow Water Systems Company
Coshocton, Ohio

Hazardous Air Pollutant	Baghouse 250 F-1	Baghouse 250 F-2	F001	F004	F014	Boiler (Fuel Oil Burner)	F009	F007	F010	F029	F024	F018	F015	F019	F027	F022	F026	F034	F075	F021	F023	B001, B002, B003, B007	HAP Total
m-Xylenes							3.24E-02		4.32E-02														7.56E-02
Nitrobenzene																							0.00E+00
o-Cresol					0.00E+00		1.36E-01		1.81E-01	1.30E-02													3.30E-01
m,p-Cresol					5.76E-01		4.32E-02		5.76E-02														6.78E-01
p-Xylenes							7.66E-03																7.66E-03
Phenanthrene																							0.00E+00
Phenol					5.46E-01		5.25E-01		7.01E-01	3.09E-01				2.74E-01	0.00E+00	0.00E+00							2.45E+00
POMs (Not individualized)					0.00E+00																		0.00E+00
Propanol																							0.00E+00
Propionaldehyde							2.08E-03		2.75E-03														4.81E-03
Styrene							5.25E-03		6.99E-03														1.22E-02
Triethyl amine (TEA)																							0.00E+00
Xylenes					3.58E-01		2.62E-01		4.05E-01	1.65E-02					4.50E-01	5.43E-01	1.50E+00						3.64E+00
Epichlorohydrin																							0.00E+00
1,2,4 Trimethylbenzene																							0.00E+00
Biphenyl																							0.00E+00
N,N-Dimethylaniline					4.13E-02		6.22E-02		8.30E-02														1.86E-01
Other HAPs - not specified					6.88E-02																		6.88E-02
Total HAPs	2.06E-02	5.92E-04	2.36E+00	1.28E-02	4.77E+00	9.35E-01	3.30E+00	7.91E-04	5.00E+00	5.36E-01	1.08E-03	1.05E-03	9.76E-03	4.98E-01	9.34E-01	1.13E+00	2.01E+00	2.20E-01	1.02E-01	9.80E-03	9.00E-03	2.71E-01	22.28

Highest Individual HAP (TPY) 5.23

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HAP Summary

HAP Emission Calculations
Clow Water Systems Company
Coshocton, Ohio

P020 & P033 Annual Emissions

Control Device: N/A

Fuel Combustion
PSD Regulated and HAP Emissions Estimates

Inputs

717,585 = Combined potential annual total gas usage (MMBTU)
600,405 = Limited annual total Syngas used (MMBTU)
117,180 = Potential annual total natural gas used (MMBTU) (remainder left after Syngas combustion)

POLLUTANT	CAS #	Natural Gas Emission Factor (lb/MMBTU)	Emission Factor With Syngas *** (lb/MMBTU)	Potential Emissions (tpy)
PM/PM10	n/a	0.0076	0.0203	6.54
NOx	n/a	0.1000	0.1420	48.49
CO	n/a	0.0840	0.1110	38.24
Lead	n/a	0.0000005	3.92E-5	2.93E-05 → 0.011
SO2	n/a	0.0006	0.0493	14.84
VOC	n/a	0.0055	0.0080	2.72
OC	n/a	0.0110	0.0080	3.05
Arsenic	7440-38-2	2.00E-08	7.64E-05	2.29E-02
Beryllium	7440-41-7	1.20E-08	None	7.03E-07
Cadmium	7440-43-9	1.10E-06	7.64E-05	2.30E-02
Chromium	7440-47-3	1.40E-06	1.53E-05	4.68E-03
Cobalt	7440-48-4	8.40E-08	7.64E-05	2.29E-02
Manganese	7439-96-5	3.80E-07	7.64E-05	2.30E-02
Mercury	7439-97-6	2.60E-07	7.64E-05	2.30E-02
Nickel	7440-02-0	2.10E-06	7.64E-05	2.31E-02
Selenium	7782-49-2	2.40E-08		1.41E-06
POM/2-Methylnaphthalene	91-57-6	2.40E-08		1.41E-06
POM/3-Methylchloranthrene	56-49-5	1.80E-09		1.05E-07
POM/7,12-Dimethylbenz(a)anthracene	n/a	1.60E-09		9.37E-08
POM/Acenaphthene	83-32-9	1.80E-09		1.05E-07
POM/Acenaphthylene	203-96-8	1.80E-09		1.05E-07
POM/Anthracene	120-12-7	2.40E-09		1.41E-07
POM/Benz(a)anthracene	56-55-3	1.80E-09		1.05E-07
Benzene	71-42-2	2.10E-06	1.56E-03	4.68E-01
POM/Benzo(a)pyrene	205-99-2	1.20E-09		7.03E-08
POM/Benzo(b)fluoranthene	205-99-2	1.80E-09		1.05E-07
POM/Benzo(g,h,i)perylene	191-24-2	1.20E-09		7.03E-08
POM/Benzo(k)fluoranthene	205-82-3	1.80E-09		1.05E-07
POM/Chrysene	218-01-9	1.80E-09		1.05E-07
POM/Dibenzo(a,h)anthracene	53-70-3	1.20E-09		7.03E-08
Dichlorobenzene	25321-22-6	1.20E-06		7.03E-05
POM/Fluoranthene	206-44-0	3.00E-09		1.76E-07
POM/Fluorene	86-73-7	2.80E-09		1.64E-07
Formaldehyde	50-00-0	7.50E-05		4.39E-03
Hexane	110-54-3	1.80E-03		1.05E-01
POM/Indeno(1,2,3-cd)pyrene	193-39-5	1.80E-09		1.05E-07
Naphthalene	91-20-3	6.10E-07		3.57E-05
POM/Phenanathrene	85-01-8	1.70E-08		9.96E-07
POM/Pyrene	129-00-0	5.00E-09		2.93E-07
Toluene	108-88-3	3.40E-06	7.13E-04	2.14E-01
Total POM				4.32E-06
Total HAPs				9.35E-01

* FROM AP-42 Fifth Edition, Supplement D, TABLE 1.4-3&4. EMISSION FACTORS FOR METALS FROM NATURAL GAS COMBUSTION; 7/98 External Combustion Sources 1.4-9. Many emission factors were < than a specific value.
The number of the specific value was used to error on the conservative side.

*** FROM INTERINERGY PROJECT FACTOR FOR METALS FROM SYNGAS COMBUSTION

HAP Emission Calculations
Clow Water Systems Company
Coshocton, Ohio

Flow Diagram Designation

Baghouse 250.F3

This baghouse controls: Desulfurization & Innoculation (F004)
Jolt Sand Plant (P007)
Jolt Pouring & Cooling (F009)
Jolt Shakeout (F007)

Process Description:

Baghouse 250.F3

Control Device:	Baghouse	
Control Device outlet grain loading (PM/PM-10):	0.0075 gr/dscf	
Air Flow:	95,000 acfm	100 °F
Settling Factor (inside) PM/PM-10	0 %	

Facility Process Name:		Criteria Pollutants						
	Baghouse 250.F3							
Emission Factor Basis:		PM	SOx	NOx	VOC	CO	PM10	Lead
Emission Factors:		N/A					N/A	
(source)								
Potential Stack Emission Rate:								
	Hourly (lb/hr)	5.78					5.78	
	Annual (TPY)	25.32					25.32	
Average Stack Emission Rate (Prev. 2 Yrs.):								
	Hourly (lb/hr)							
	Annual (TPY)							
Net Emissions Increase								
	Hourly (lb/hr)	5.78					5.78	
	Annual (TPY)	25.32					25.32	

SAMPLE CALCULATIONS:

Potential Stack Emission Rate (lb/hr) = (Baghouse CFM) x (grain loading (gr/dscf)) x (460+70)/(460+gas temp)) x (60 min/hr) / (7,000 gr/lb)

Potential Stack Emission Rate (TPY) = (Baghouse CFM) x (grain loading (gr/dscf)) x (460+70)/(460+gas temp))x (60 min/hr) / (7,000 gr/lb) x (Potential Hrs of Operation (Hr/Yr) / (2000 lb/ton)

Average Actual Stack Emission Rate (lb/hr) = (Baghouse CFM) x (grain loading (gr/dscf)) x (460+70)/(460+gas temp))x (60 min/hr) / (7,000 gr/lb)

Average Actual Stack Emission Rate (TPY) = (Baghouse CFM) x (grain loading (gr/dscf)) x (460+70)/(460+gas temp))x (60 min/hr) / (7,000 gr/lb) x (Average Actual Hrs of Operation (Hr/Yr) / (2000 lb/ton)

Net Emissions Increase (TPY) = (Potential Stack Emission Rate (TPY)) - (Average Actual Emission Rate (TPY))

Potential Operating Schedule

20 hours/day
8760 hours/year

	CAS #	BH1 Dust	Stack		
		Analysis Data	Emissions		
Chemical		mg/kg	lb/hr	tons/yr	
Antimony (Sb)	7440-36-0				
Arsenic (As)	7440-38-2	28.4	1.64E-04	7.19E-04	See Note 1, 2
Beryllium (Be)	7440-41-7				
Cadmium (Cd)	7440-43-9				
Chromium (Cr)	7440-47-3	40.8	2.36E-04	1.03E-03	See Note 1, 2
Cobalt (Co)	7440-48-4				
Lead (Pb)		744	4.30E-03	1.88E-02	See Note 1, 2
Manganese (Mn)	7439-96-5	0.006	3.47E-08	1.52E-07	See Note 3
Mercury (Hg)	7439-97-6				
Nickel (Ni)	7440-02-0				
Selenium (Se)	7782-49-2				
Total HAPs			4.70E-03	2.06E-02	

Notes:

[1] Other pouring and cooling HAP emissions are quantified with emissions unit.

[2] HAP content from Belmont Labs dated June 6, 2006

[3] National Emission Standards for Hazardous Air Pollutants (NESHAP) for Iron and Steel Foundries-
Background Information for Proposed Standards (EPA-453/R-02-013, December 2002)
(for inoculation only; s/o mn is with unit spreadsheet)

HAP Emission Calculations
Clow Water Systems Company
Coshocton, Ohio

Flow Diagram Designation
Baghouse 250.F4

This baghouse controls: BMM Sand Plant (F006)
BMM Shakeout (F016)
Sand Cooling Drum (F002)
BMM Pouring/Cooling (F010)

Process Description:

Baghouse 250.F4		
Control Device:	Baghouse	
Control Device outlet grain loading (PM/PM-10):	0.0075 gr/dscf	
Air Flow:	90,000 acfm	70 °F
Settling Factor (inside) PM/PM-10	0 %	

		Criteria Pollutants						
Facility Process Name:	Baghouse 250.F4	PM	SOx	NOx	VOC	CO	PM10	Lead
Emission Factor Basis:							N/A	
Emission Factors:		N/A						
(source)								
Potential Stack Emission Rate:	Hourly (lb/hr)	5.79					5.79	
	Annual (TPY)	25.34					25.34	
Average Stack Emission Rate (Prev. 2 Yrs.):	Hourly (lb/hr)							
	Annual (TPY)							
Net Emissions Increase	Hourly (lb/hr)	5.79					5.79	
	Annual (TPY)	25.34					25.34	

SAMPLE CALCULATIONS:
Potential Stack Emission Rate (lb/hr) = (Baghouse CFM) x (grain loading (gr/dscf)) x (460+70)/(460+gas temp)) x (60 min/hr) / (7,000 gr/lb)
Potential Stack Emission Rate (TPY) = (Baghouse CFM) x (grain loading (gr/dscf)) x (460+70)/(460+gas temp))x (60 min/hr) / (7,000 gr/lb) x (Potential Hrs of Operation (Hr/Yr) / (2000 lb/ton)
Average Actual Stack Emission Rate (lb/hr) = (Baghouse CFM) x (grain loading (gr/dscf)) x (460+70)/(460+gas temp))x (60 min/hr) / (7,000 gr/lb)
Average Actual Stack Emission Rate (TPY) = (Baghouse CFM) x (grain loading (gr/dscf)) x (460+70)/(460+gas temp))x (60 min/hr) / (7,000 gr/lb) x (Average Actual Hrs of Operation (Hr/Yr) / (2000 lb/ton)
Net Emissions Increase (TPY) = (Potential Stack Emission Rate (TPY)) - (Average Actual Emission Rate (TPY))

Potential Operating Schedule
20 hours/day
8760 hours/year

Chemical	CAS #	BH1 Dust Analysis Data mg/kg	Stack Emissions lb/hr	Stack Emissions tons/yr	
Antimony (Sb)	7440-36-0				
Arsenic (As)	7440-38-2	4.94	2.86E-05	1.25E-04	See Note 1, 2
Beryllium (Be)	7440-41-7				
Cadmium (Cd)	7440-43-9				
Chromium (Cr)	7440-47-3	6.36	3.68E-05	1.61E-04	See Note 1, 2
Cobalt (Co)	7440-48-4				
Lead (Pb)		15.6	9.03E-05	3.95E-04	See Note 1, 2
Manganese (Mn)	7439-96-5				
Mercury (Hg)	7439-97-6				
Nickel (Ni)	7440-02-0				
Selenium (Se)	7782-49-2				
Total HAPs			1.56E-04	6.82E-04	

Notes:
[1] Other pouring and cooling HAP emissions are quantified with emissions unit.
[2] HAP content from Belmont Labs dated June 8, 2006

HAP Emission Calculations
Clow Water Systems Company
Coshocton, Ohio

Flow Diagram Designation
Cupola (P901)

Potential Capacity
85.00 Tons/hour
275,000 TPY

Process Description:

Cupola (P901)
Control Device: Afterburner & Scrubber

Control Device outlet grain loading (PM/PM-10): 0.01 gr/dscf
Air Flow: 48,759 dscf
Settling Factor (inside) PM/PM-10 %

Facility Process Name:		Criteria Pollutants						
	Cupola (P901)							
Emission Factor Basis:	lb/ton metal charged	PM	SOx	NOx	VOC	CO	PM10	Lead
Emission Factors:		0.209	0.06	0.46	0.27	0.51	0.162	0.0004
(source)		Note 1	Note 2	Note 3	Note 4	Note 5	Note 6	Note 7
Capture Efficiencies:		99.90	99.90	99.90	99.90	99.90	99.90	99.90
Potential Stack Emission Rate:								
	Hourly (lb/hr)	17.75	5.09	39.06	22.93	43.31	13.79	0.03
	Annual (TPY)	28.71	8.24	63.19	37.09	70.05	22.31	0.05
Average Stack Emission Rate (Previous 2 yrs):								
	Hourly (lb/hr)							
	Annual (TPY)							
Potential Fugitive Emission Rate:								
	Hourly (lb/hr)	0.02	0.01	0.04	0.02	0.04	0.01	0.00
	Annual (TPY)	0.03	0.01	0.06	0.04	0.07	0.02	0.00
Average Fugitive Emission Rate (Previous 2 yrs):								
	Hourly (lb/hr)							
	Annual (TPY)							
Net Emissions Increase								
	Hourly (lb/hr)	17.77	5.10	39.10	22.95	43.35	13.80	0.03
	Annual (TPY)	28.74	8.25	63.25	37.13	70.13	22.33	0.06

Maximum Operating Schedule
7300 Hr/Yr
20 Hr/Day

Note 1: Clow 1998 Cupola Stack Test plus 100% safety factor
Note 2: Emissions Factor represents Atlantic States baghouse for safety factor purposes.
Note 3: Atlantic States Stack Test (February 1990), Run 1, at 45 tph melt rate.
Note 4: Stack Testing Performed by United States Pipe & Foundry Company (Burlington, NJ Site) (August 1991), Method 25A as propane
Note 5: Atlantic States Stack Test (December 1999), Average Emission Factor + 70% safety factor.
Note 6: AP-42 Table 12.10-9 (77.7% of particulate is less than 10 microns).
Note 7: Stack Testing Performed by United States Pipe & Foundry Company (Burlington, NJ Site) (August 1991) + 50% safety factor.

SAMPLE CALCULATIONS:

Potential Stack Emission Rate (TPY) = (Potential Capacity (TPY)) x (Emission Factor (lb/ton)) x (Capture Efficiency/100) / (2000 lb/ton)
Potential Fugitive Emission Rate (TPY) = (Potential Capacity (TPY) x (Emission Factor (lb/ton)) x (1-(Capture Efficiency/100)) / (2000 lb/ton)
Average Actual Stack Emission Rate (TPY) = (Average Actual Capacity (TPY)) x (Emission Factor (lb/ton)) x (Capture Efficiency/100) / (2000 lb/ton)
Average Actual Fugitive Emission Rate (TPY) = (Average Actual Capacity (TPY) x (Emission Factor (lb/ton)) x (1-(Capture Efficiency/100)) / (2000 lb/ton)
Total Potential Emission Rate (TPY) = (Potential Stack Emission Rate (TPY)) + (Potential Fugitive Emission Rate (TPY))
Total Average Actual Emission Rate (TPY) = (Average Actual Stack Emission Rate (TPY)) + (Average Actual Fugitive Emission Rate (TPY))
Net Emissions Increase (TPY) = (Total Potential Emission Rate (TPY)) - (Total Average Actual Emission Rate (TPY))

Chemical	CAS #	BH1 Dust Analysis Data mg/kg	Stack Emissions lb/hr	Stack Emissions tons/yr	Fugitive Emissions lb/hr	Fugitive Emissions tons/yr	Total Emissions lb/hr	Total Emissions tons/yr	
Antimony (Sb)	7440-36-0								
Arsenic (As)	7440-38-2	8	1.42E-04	2.30E-04	1.42E-07	2.30E-07	1.42E-04	2.30E-04	Note 1
Barrylium (Be)	7440-41-7								
Cadmium (Cd)	7440-43-9	177	3.14E-03	5.09E-03	3.14E-06	5.09E-06	3.14E-03	5.09E-03	Note 1
Chromium (Cr)	7440-47-3	82.6	1.47E-03	2.37E-03	1.47E-06	2.37E-06	1.47E-03	2.37E-03	Note 1
Cobalt (Co)	7440-48-4								
Lead (Pb)		5440	9.65E-02	1.56E-01	9.65E-05	1.56E-04	9.65E-02	1.56E-01	Note 1
Manganese (Mn)	7439-96-5	75000	1.30E+00	2.10E+00	1.30E-03	2.10E-03	1.30E+00	2.10E+00	Note 2
Mercury (Hg)	7439-97-6								
Nickel (Ni)	7440-02-0								
Selenium (Se)	7782-49-2								
Total HAPs			1.40E+00	2.26E+00	1.40E-03	2.26E-03	1.40E+00	2.26E+00	

Notes:
[1]HAP content from Belmont Labs dated June 8, 2006
[2]HAP Metal content of iron based on EPA source test at GM (EPA, 1995b) for cupola melting furnace with wet scrubber.

HAP Emission Calculations
Clow Water Systems Company
Coshocton, Ohio

Flow Diagram Designation
Desulfurization and Inoculation (F004)

Potential Capacity
85.00 Tons/hour
275,000 TPY

Process Description:

Desulfurization and Inoculation (F004)	Baghouse	
Control Device:		
Control Device outlet grain loading (PM/PM-10):	See 250.F3	gr/dscf
Air Flow:	See 250.F3	acfm
Settling Factor (Inside) PM/PM-10		%

Facility Process Name: Desulfurization and Inoculation (F004	Hazardous Air Pollutants				
HAPs	Emission Factor (% of PM)	HAP Capture Efficiency	Fugitive Emissions (lbs/hr)	Fugitive Emissions (tons/yr)	
Antimony (Sb)					
Arsenic (As)					
Beryllium (Be)					
Cadmium (Cd)					
Chromium (Cr)					
Cobalt (Co)	0.1%	99%	1.06E-03	1.72E-03	Note 1,2
Lead (Pb)	0.6%	99%	6.38E-03	1.03E-02	Note 1,2
Manganese (Mn)					
Mercury (Hg)					
Nickel (Ni)					
Selenium (Se)			7.44E-03	1.20E-02	
Total HAPs					

Note 1: National Emission Standards for Hazardous Air Pollutants (NESHAP) for Iron and Steel Foundries-
Background Information for Proposed Standards (EPA-453/R-02-013, December 2002)
Note 2: Stack emissions are quantified with baghouse.

SAMPLE CALCULATIONS:
Potential Stack Emission Rate (TPY) = (Potential Capacity (TPY)) x (Emission Factor (lb/ton)) x (Capture Efficiency/100) / (2000 lbton)
Potential Fugitive Emission Rate (TPY) = (Potential Capacity (TPY) x (Emission Factor (lb/ton)) x (1-(Capture Efficiency/100)) / (2000 lb/ton)
Average Actual Stack Emission Rate (TPY) = (Average Actual Capacity (TPY)) x (Emission Factor (lb/ton)) x (Capture Efficiency/100) / (2000 lbton)
Average Actual Fugitive Emission Rate (TPY) = (Average Actual Capacity (TPY) x (Emission Factor (lb/ton)) x (1-(Capture Efficiency/100)) / (2000 lb/ton)
Total Potential Emission Rate (TPY) = (Potential Stack Emission Rate (TPY)) + (Potential Fugitive Emission Rate (TPY))
Total Average Actual Emission Rate (TPY) = (Average Actual Stack Emission Rate (TPY)) + (Average Actual Fugitive Emission Rate (TPY))
Net Emissions Increase (TPY) = (Total Potential Emission Rate (TPY)) - (Total Average Actual Emission Rate (TPY))

HAP Emission Calculations
Clow Water Systems Company
Coshocton, Ohio

Clow Water Systems

HAP Emission Estimates from Pipe Casting Machines

Pipe Casting Machines #1-#6 (F018)

275,000 = Maximum Annual Production (Tons/yr)

Metal HAP's	CAS #	HAP Emission Factor lb/ton	Emissions Factor Basis	Maximum Emissions tons/yr
Cadmium (Cd)	7440-43-9	4.16E-05	Note 1	5.72E-03
Chromium (Cr)	7440-47-3	4.51E-04	Note 1	6.20E-02
Lead (Pb)	7439-92-1	4.74E-04	Note 1	6.52E-02
Manganese (Mn)	7439-96-5	1.70E-03	Note 1	2.34E-01
Selenium (Se)	7782-49-2	4.10E-06	Note 1	5.64E-04
Phenol	108-95-2	4.70E-03	Note 2	6.46E-01
Benzene	71-42-2	1.34E-02	Note 2	1.84E+00
Aniline	62-53-3	0.00E+00	Note 2	0.00E+00
2-Methylnaphthalene	91-57-6	0.00E+00	Note 2	0.00E+00
o-Cresol	95-48-7	0.00E+00	Note 2	0.00E+00
Naphthalene	91-20-3	0.00E+00	Note 2	0.00E+00
N,N-Dimethylaniline	N/A	3.00E-04	Note 2	4.13E-02
1-Methylnaphthalene	N/A	0.00E+00	Note 2	0.00E+00
Toluene	108-88-3	5.70E-03	Note 2	7.84E-01
1,3-Dimethylnaphthalene	N/A	0.00E+00	Note 2	0.00E+00
m,p-Cresol	N/A	4.20E-03	Note 2	5.78E-01
o,m,p-Xylene	1330-20-7	2.60E-03	Note 2	3.58E-01
Acetaldehyde	75-07-0	3.00E-04	Note 2	4.13E-02
Hexane	110-54-3	3.00E-04	Note 2	4.13E-02
Other HAPs	N/A	5.00E-04	Note 2	6.88E-02
Total HAPS				4.77E+00

Notes:
[1]From Foundry Process Emission Factors: Baseline Emissions from Automotive Foundries in Mexico
[2]From CERP Emission Test 1410-177 FU, Shell Cores, 9/1/04.

Clow Water Systems

Metal HAP Emission Estimates from Pouring/Cooling Operations

Jolt Pouring and Cooling (F009)

15,000 = Maximum Annual Production (Tons/yr)
0% = Capture Efficiency
0% = Control Efficiency

Metal HAP's	CAS #	Pouring Emission Factor lb/ton	Cooling Emission Factor lb/ton	Emissions Factor Basis	Controls	Maximum Emissions tons/yr
Antimony (Sb)	7440-36-0	0.00E+00	6.21E-05	Note 1	Dust Collectors	4.66E-04
Arsenic (As)	7440-38-2	1.14E-05	0.00E+00	Note 1	Dust Collectors	8.55E-05
Beryllium (Be)	7440-41-7	0.00E+00	0.00E+00	Note 1	Dust Collectors	0.00E+00
Cadmium (Cd)	7440-43-9	8.81E-06	4.37E-05	Note 1	Dust Collectors	3.94E-04
Chromium (Cr)	7440-47-3	6.72E-05	3.12E-04	Note 1	Dust Collectors	2.84E-03
Cobalt (Co)	7440-48-4	5.13E-03	1.72E-04	Note 1	Dust Collectors	3.98E-02
Lead (Pb)	7439-92-1	2.41E-04	4.79E-04	Note 1	Dust Collectors	5.40E-03
Manganese (Mn)	7439-96-5	2.04E-03	1.12E-03	Note 1	Dust Collectors	2.37E-02
Nickel (Ni)	7440-02-0	3.76E-04	4.32E-04	Note 1	Dust Collectors	6.06E-03
Selenium (Se)	7782-49-2	0.00E+00	2.46E-05	Note 1	Dust Collectors	1.85E-04
Total HAPS						7.89E-02

Notes:
[1]From Foundry Process Emission Factors: Baseline Emissions from Automotive Foundries in Mexico, Table 5.12

HAP Emission Calculations
Clow Water Systems Company
Coshocton, Ohio

Flow Diagram Designation	Potential Capacity
Jolt Pouring Cooling and Shakeout	6.00 tph
	15,000 TPY

Process Description:

Jolt Pouring Cooling and Shakeout
Control Device:
SCC Code:
Control Device Outlet: gr/dscf
Airflow: acfm
Stack Gas Temperature: °F

Emission Factor Process Variables - Tested v. Actual Process Variables			
	Tested	Actual	
1. P/C/S Emissions from Green Sand Molds			See Note 1
Loss on Ignition	4.97%	4.3%	
2. P/C/S Emissions from Core			See Note 2, 3
Binder Level	1.75%	1.20%	
Core Type	Isocure	Isocure, Pepset	

	Tested Emission Factors					Facility Specific Emission Factors			Emissions	
Analyte	Greensand Mold Emission Factor (lbs/ton)	Emission Factor Reference	Core Emission Factor (lbs/ton)	Emission Factor Reference	Combined Green Sand and Core Emission Factor (lbs/ton)	Greensand Mold Emission Factor (lbs/ton)	Core Emission Factor (lbs/ton)	Combined Green Sand and Core Emission Factor (lbs/ton)	(lbs/hr)	(TPY)
1,3-Dimethylnaphthalene			0.0010	Note 2	0.0010		0.0007	0.0007	0.00	5.14E-03
1,6-Demethylnaphthalene										
1-Methylnaphthalene			0.0023	Note 2	0.0023		0.0016	0.0016	0.01	1.18E-02
2,6-Demethylnaphthalene										
2,7-Demethylnaphthalene										
2-Methylnaphthalene			0.0041	Note 2	0.0041		0.0028	0.0028	0.02	2.11E-02
Acetaldehyde	0.0059	Note 1	0.0065	Note 2	0.0124	0.0051	0.0045	0.0096	0.06	7.17E-02
Analine			0.0521	Note 2	0.0521		0.0357	0.0357	0.21	2.68E-01
Benzene	0.1051	Note 1	0.0955	Note 2	0.2006	0.0909	0.0655	0.1564	0.94	1.17E+00
Ethylbenzene	0.0068	Note 1	0.0011	Note 2	0.0079	0.0059	0.0007	0.0066	0.04	4.96E-02
Formaldehyde			0.0016	Note 2	0.0016		0.0011	0.0011	0.01	7.97E-03
Hexane			0.0066	Note 2	0.0066		0.0045	0.0045	0.03	3.39E-02
m,p-Cresol			0.0084	Note 2	0.0084		0.0058	0.0058	0.03	4.32E-02
m,p-Xylene			0.0063	Note 2	0.0063		0.0043	0.0043	0.03	3.24E-02
N,N-Dimethylaniline			0.0121	Note 2	0.0121		0.0083	0.0083	0.05	6.22E-02
Naphthalene			0.0068	Note 2	0.0068		0.0047	0.0047	0.03	3.50E-02
o-Cresol			0.0264	Note 2	0.0264		0.0181	0.0181	0.11	1.36E-01
o-xylene			0.0015	Note 2	0.0015		0.0010	0.0010	0.01	7.66E-03
Xylene	0.0403	Note 1			0.0403	0.0349		0.0349	0.21	2.62E-01
Phenol			0.1022	Note 2	0.1022		0.0701	0.0701	0.42	5.26E-01
Propionaldehyde			0.0004		0.0004		0.0003	0.0003	0.00	2.06E-03
Styrene			0.0010		0.0010		0.0007	0.0007	0.00	5.25E-03
Toluene	0.0547	Note 1	0.0201	Note 2	0.0748	0.0473	0.0138	0.0611	0.37	4.58E-01
Total HAPs	0.1581		0.3559		0.5140	0.1841	0.2441	0.4282	2.57	3.21E+00

Note 1: Process variables and emission rates obtained from Casting Emission Reduction Program (CERP) Emissions Report 1256-1311DQ
Note 2: Process variables and emission rates obtained from Casting Emission Reduction Program (CERP) Emissions Report 1256-11GSA.3 CM
Note 3: All cores are assumed to be PUCB.

Clow Water Systems

Metal HAP Emission Estimates from Shakeout Operations

Jolt Shakeout (F007)

15,000 = Maximum Annual Production (Tons/yr)
99% = Capture Efficiency
95% = Control Efficiency

Metal HAP's	CAS #	Emission Factor lb/ton	Emissions Factor Basis	Controls	Maximum Emissions tons/yr	
Antimony (Sb)	7440-36-0	7.59E-06	Note 1	Fabric Filter	3.39E-06	Stack + fugitive
Arsenic (As)	7440-38-2	0.00E+00	Note 1,2	Fabric Filter	0.00E+00	fugitve
Beryllium (Be)	7440-41-7	0.00E+00	Note 1	Fabric Filter	0.00E+00	Stack + fugitive
Cadmium (Cd)	7440-43-9	3.21E-05	Note 1	Fabric Filter	1.43E-05	Stack + fugitive
Chromium (Cr)	7440-47-3	3.00E-04	Note 1,2	Fabric Filter	2.25E-05	fugitve
Cobalt (Co)	7440-48-4	2.49E-04	Note 1	Fabric Filter	1.11E-04	Stack + fugitive
Lead (Pb)	7439-92-1	1.26E-04	Note 1,2	Fabric Filter	9.45E-06	fugitve
Manganese (Mn)	7439-96-5	7.47E-04	Note 1	Fabric Filter	3.33E-04	Stack + fugitive
Nickel (Ni)	7440-02-0	6.66E-04	Note 1	Fabric Filter	2.97E-04	Stack + fugitive
Selenium (Se)	7782-49-2	0.00E+00	Note 1	Fabric Filter	0.00E+00	Stack + fugitive
Total HAPS					7.91E-04	

Notes:
[1]From Foundry Process Emission Factors: Baseline Emissions from Automotive Foundries in Mexico, Table 5.12
[2]Stack emissions quantified with 250.F3

Clow Water Systems

Metal HAP Emission Estimates from Pouring/Cooling Operations

BMM Pouring and Cooling (F010)

20,000 = Maximum Annual Production (Tons/yr)
0% =Pouring Capture Efficiency
0% =Pouring Control Efficiency

99% = Cooling Capture Efficiency
95% = Cooling Control Efficiency

Metal HAP's	CAS #	Pouring Emission Factor lb/ton	Cooling Emission Factor lb/ton	Emissions Factor Basis	Controls	Maximum Emissions tons/yr	
Antimony (Sb)	7440-36-0	0.000000	0.000062	Note 1	Baghouse	3.69E-05	stack + fugitive
Arsenic (As)	7440-38-2	0.000011		Note 1,2	Baghouse	1.14E-04	fugitive
Beryllium (Be)	7440-41-7	0.000000	0.000000	Note 1	Baghouse	0.00E+00	stack + fugitive
Cadmium (Cd)	7440-43-9	0.000009	0.000044	Note 1	Baghouse	1.14E-04	stack + fugitive
Chromium (Cr)	7440-47-3	0.000067		Note 1,2	Baghouse	6.72E-04	fugitive
Cobalt (Co)	7440-48-4	0.005130	0.000172	Note 1	Baghouse	5.14E-02	stack + fugitive
Lead (Pb)	7439-92-1	0.000241		Note 1,2	Baghouse	2.41E-03	fugitive
Manganese (Mn)	7439-96-5	0.002040	0.001120	Note 1	Baghouse	2.11E-02	stack + fugitive
Nickel (Ni)	7440-02-0	0.000376	0.000432	Note 1	Baghouse	4.02E-03	stack + fugitive
Selenium (Se)	7782-49-2	0.000000	0.000025	Note 1	Baghouse	1.46E-05	stack + fugitive
Total HAPS						7.98E-02	

Notes:
[1]From Foundry Process Emission Factors: Baseline Emissions from Automotive Foundries in Mexico, Table 5.12
[2]See 250F.4 Spreadesheet for pollutant cooling emissions.

HAP Emission Calculations
Clow Water Systems Company
Coshocton, Ohio

Flow Diagram Designation		Potential Capacity
	BMM Pouring Cooling and Shakeout	7.50 tph
		20,000 TPY

Process Description:

BMM Pouring Cooling and Shakeout
Control Device:
SCC Code:
Control Device Outlet: gr/dscf
Airflow: acfm
Stack Gas Temperature: °F

Emission Factor Process Variables - Tested v. Actual Process Variables		Tested	Actual	
1. P/C/S Emissions from Green Sand Molds				See Note 1
	Pouring Temperature			
	Loss on Ignition	4.97%	5.0%	
2. P/C/S Emissions from Core				See Note 2, 3
	Binder Level	1.75%	1.20%	
	Core Type	Isocure	Isocure, Pepset	

	Tested Emission Factors					Facility Specific Emission Factors			Emissions	
Analyte	Greensand Mold Emissions (lbs/ton)	Emission Factor Reference	Core Emissions (lbs/ton)	Emission Factor Reference	Combined Emissions (lbs/ton)	Greensand Mold Emissions (lbs/ton)	Core Emissions (lbs/ton)	Combined Emissions (lbs/ton)	(lbs/hr)	(TPY)
1,3-Dimethylnaphthalene			0.0010	Note 2	0.0010		0.0007	0.0007	0.01	6.86E-03
1,6-Demethylnaphthalene					0.0000					
1-Methylnaphthalene			0.0023	Note 2	0.0023		0.0016	0.0016	0.01	1.58E-02
2,6-Demethylnaphthalene					0.0000					
2,7-Demethylnaphthalene					0.0000					
2-Methylnaphthalene			0.0041	Note 2	0.0041	0.0059	0.0028	0.0028	0.02	2.81E-02
Acetaldehyde	0.0059	Note 1	0.0065	Note 2	0.0124		0.0045	0.0104	0.08	1.04E-01
Analine			0.0521	Note 2	0.0521	0.1057	0.0357	0.0357	0.27	3.57E-01
Benzene	0.1051	Note 1	0.0955	Note 2	0.2006	0.0068	0.0655	0.1712	1.28	1.71E+00
Ethylbenzene	0.0068	Note 1	0.0011	Note 2	0.0079		0.0007	0.0076	0.06	7.57E-02
Formaldehyde			0.0016	Note 2	0.0016		0.0011	0.0011	0.01	1.06E-02
Hexane			0.0066	Note 2	0.0066		0.0045	0.0045	0.03	4.53E-02
m,p-Cresol			0.0084	Note 2	0.0084		0.0058	0.0058	0.04	5.76E-02
m,p-Xylene			0.0063	Note 2	0.0063		0.0043	0.0043	0.03	4.32E-02
N,N-Dimethylaniline			0.0121	Note 2	0.0121		0.0083	0.0083	0.06	8.30E-02
Naphthalene			0.0068	Note 2	0.0068		0.0047	0.0047	0.03	4.66E-02
o-Cresol			0.0264	Note 2	0.0264		0.0181	0.0181	0.14	1.81E-01
o-xylene			0.0015	Note 2	0.0015	0.0405	0.0010	0.0010	0.01	1.02E-02
Xylene	0.0403	Note 1			0.0403			0.0405	0.30	4.05E-01
Phenol			0.1022	Note 2	0.1022		0.0701	0.0701	0.53	7.01E-01
Propionaldehyde			0.0004		0.0004		0.0003	0.0003	0.00	2.75E-03
Styrene			0.0010		0.0010	0.0550	0.0007	0.0007	0.01	6.99E-03
Toluene	0.0547	Note 1	0.0201	Note 2	0.0748		0.0138	0.0688	0.52	6.88E-01
Total HAPs	0.1581		0.3559		0.5140	0.2141	0.2441	0.4582	2.91	4.58E+00

Note 1: Process variables and emission rates obtained from Casting Emission Reduction Program (CERP) Emissions Report 1256-1311DQ
Note 2: Process variables and emission rates obtained from Casting Emission Reduction Program (CERP) Emissions Report 1256-11GSA.3 CM
Note 3: All cores are assumed to be PUCB.

Clow Water Systems

Metal HAP Emission Estimates from Pouring/Cooling Operations

BMM Shakeout (F016)

20,000 = Maximum Annual Production (Tons/yr)
99% = Capture Efficiency
95% = Control Efficiency

Metal HAP's	CAS #	Emission Factor lb/ton	Emissions Factor Basis	Controls	Maximum Emissions tons/yr	
Antimony (Sb)	7440-36-0	7.59E-06	Note 2	Dust Collectors	4.52E-06	stack+fugitive
Arsenic (As)	7440-38-2	0.00E+00	Note 2	Dust Collectors	0.00E+00	fugitive
Beryllium (Be)	7440-41-7	0.00E+00	Note 2	Dust Collectors	0.00E+00	stack+fugitive
Cadmium (Cd)	7440-43-9	3.21E-05	Note 2	Dust Collectors	1.91E-05	stack+fugitive
Chromium (Cr)	7440-47-3	3.00E-04	Note 2	Dust Collectors	3.00E-05	fugitive
Cobalt (Co)	7440-48-4	2.49E-04	Note 2	Dust Collectors	1.48E-04	stack+fugitive
Lead (Pb)	7439-92-1	1.26E-04	Note 2	Dust Collectors	1.26E-05	fugitive
Manganese (Mn)	7439-96-5	7.47E-04	Note 2	Dust Collectors	4.44E-04	stack+fugitive
Nickel (Ni)	7440-02-0	6.66E-04	Note 2	Dust Collectors	3.96E-04	stack+fugitive
Selenium (Se)	7782-49-2	0.00E+00	Note 2	Dust Collectors	0.00E+00	stack+fugitive
Total HAPS					1.06E-03	

Notes:
[1]From Foundry Process Emission Factors: Baseline Emissions from Automotive Foundries in Mexico, Table 5.12

HAP Emission Calculations
Clow Water Systems Company
Coshocton, Ohio

Clow Water Systems

Metal HAP Emission Estimates from Pouring/Cooling Operations

Main Floor Pouring and Cooling (Z129)

1,000 = Maximum Annual Production (Tons/yr)
0% = Capture Efficiency
0% = Control Efficiency

Metal HAP's	CAS #	Pouring Emission Factor lb/ton	Cooling Emission Factor lb/ton	Emissions Factor Basis	Controls	Maximum Emissions tons/yr
Antimony (Sb)	7440-36-0	0.00E+00	6.21E-05	Note 2	Dust Collectors	3.11E-05
Arsenic (As)	7440-38-2	1.14E-05	0.00E+00	Note 2	Dust Collectors	5.70E-06
Beryllium (Be)	7440-41-7	0.00E+00	0.00E+00	Note 2	Dust Collectors	0.00E+00
Cadmium (Cd)	7440-43-9	8.81E-06	4.37E-05	Note 2	Dust Collectors	2.63E-05
Chromium (Cr)	7440-47-3	6.72E-05	3.12E-04	Note 2	Dust Collectors	1.90E-04
Cobalt (Co)	7440-48-4	5.13E-03	1.72E-04	Note 2	Dust Collectors	2.65E-03
Lead (Pb)	7439-92-1	2.41E-04	4.79E-04	Note 2	Dust Collectors	3.60E-04
Manganese (Mn)	7439-96-5	2.04E-03	1.12E-03	Note 2	Dust Collectors	1.58E-03
Mercury (Hg)	7439-97-6	0.00E+00	0.00E+00	Note 1	Dust Collectors	0.00E+00
Nickel (Ni)	7440-02-0	3.76E-04	4.32E-04	Note 2	Dust Collectors	4.04E-04
Selenium (Se)	7782-49-2	0.00E+00	2.46E-05	Note 2	Dust Collectors	1.23E-05
Total HAPS						5.26E-03

Notes:
[1] Emission factors from stack test data
[2] Emission Factors from Table 5.12

HAP Emission Calculations
Clow Water Systems Company
Coshocton, Ohio

Clow Water Systems

Organic HAP Emission Estimates from Pouring and Cooling Operations

Main Floor Pouring and Cooling (Z129)

7 = Maximum Daily Production (Tons/day)
1,000 =Maximum Annual Production (Tons/year)

Organic HAP's			
	Emission Factor lb/ton	**Emissions Factor Basis**	**Maximum Emissions** tons/yr
Phenol	0.618	Note 1	3.09E-01
o,m,p Cresol	0.026	Note 1	1.30E-02
Benzene	0.029	Note 1	1.45E-02
Dimethylnaphtalenes	0.003	Note 1	1.50E-03
Toluene	0.048	Note 1	2.40E-02
o,m,p, Xylene	0.033	Note 1	1.65E-02
Formaldehyde	0.024	Note 1	1.20E-02
Naphthalene	0.28	Note 1	1.40E-01
Total HAPS			5.31E-01

Notes:
[1] Emission factors from stack test data, includes s/o.

Clow Water Systems

Metal HAP Emission Estimates from Pouring/Cooling Operations

Main Floor Shakeout (Z024)

1,000 = Maximum Annual Production (Tons/yr)
0% = Capture Efficiency
0% = Control Efficiency

Metal HAP's	CAS #	Emission Factor lb/ton	Emissions Factor Basis	Controls	Maximum Emissions tons/yr
Antimony (Sb)	7440-36-0	7.59E-06	Note 2	Dust Collectors	3.80E-06
Arsenic (As)	7440-38-2	0.00E+00	Note 2	Dust Collectors	0.00E+00
Beryllium (Be)	7440-41-7	0.00E+00	Note 2	Dust Collectors	0.00E+00
Cadmium (Cd)	7440-43-9	3.21E-05	Note 2	Dust Collectors	1.61E-05
Chromium (Cr)	7440-47-3	3.00E-04	Note 2	Dust Collectors	1.50E-04
Cobalt (Co)	7440-48-4	2.49E-04	Note 2	Dust Collectors	1.25E-04
Lead (Pb)	7439-92-1	1.26E-04	Note 2	Dust Collectors	6.30E-05
Manganese (Mn)	7439-96-5	7.47E-04	Note 2	Dust Collectors	3.74E-04
Nickel (Ni)	7440-02-0	6.66E-04	Note 2	Dust Collectors	3.33E-04
Selenium (Se)	7782-49-2	0.00E+00	Note 2	Dust Collectors	0.00E+00
Total HAPS					1.06E-03

Notes:
[1]From Foundry Process Emission Factors: Baseline Emissions from Automotive Foundries in Mexico, Table 5.12

Clow Water Systems

Fugitive Metal HAP Emission Estimates from Shotblaster

Foundry Shotblast (F015)

99.9% = Capture Efficiency

15.50 = PM Emission Factor (lb/ton iron) - Bernard S. Gutow Article, Modern Castings, January 1972

36,000 = Maximum Annual Production (Tons/yr)

EIF's Maximum Emission Rate of Particulates		0.28	TPY
HAP pollutant	**CAS #**	**% of Metal Content ***	**Maximum Fugitive Emissions**** tons/yr
Chromium	7440-47-3	0.9	2.51E-03
Manganese	7439-96-5	1.1	3.07E-03
Nickel	7440-02-0	1.5	4.18E-03
		Total HAPs	9.76E-03

* HAP Metal content of iron based on MSDS (maximum of range selected).
** Captured emissions are ducted to and included with the baghouse.

HAP Emission Calculations
Clow Water Systems Company
Coshocton, Ohio

Laempe Coremaking (F014) VOC & HAPs

3.00 = Potential Capacity (Tons core/hr)
26,280 =Potential Capacity (Tons cores/yr)

1%	% resin usage (of sand)	OCMA/AFS study
4%	% catalyst uage (of resin)	Delta
48.0%	% by weight Part I	
48.0%	% by weight Part II	

VOCS AND HAPS	CAS #	% by Weight	Basis	Control Efficiency %	Emission Factor lb/ton	Emissions Factor Basis	Potential Emissions lb/hr	Potential Emissions tons/yr	Average Emissions lb/hr	Average Emissions tons/yr	Net Emissions Increase lb/hr	Net Emissions Increase tons/yr
Total VOCs					0.68	OCMA/AFS Study (1997)	2.040	8.94	-	-	2.040	8.94E+00
Part 1												
Phenol	108-95-2	6.40%	24-811 Technikure Resin Part I MSDS		0.02	VOC E.F. x (Part content/100) x (HAP by weight/100)	0.06	0.27	-	-	0.063	2.74E-01
Naphthalene*	91-20-3	3.00%	24-811 Technikure Resin Part I MSDS		0.0098	VOC E.F. x (Part content/100) x (HAP by weight/100)	0.03	0.13	-	-	0.029	1.29E-01
Part 2												
Methylene bis (phenylisocyanate) [MDI]*	101-68-8	42.00%	23-221 Technikure Coreactant Part II MSDS		-	Form R- Reporting of Binder Chemical Used in Foundries **	-	-	-	-	-	0.00E+00
Naphthalene*	91-20-3	2.20%	23-221 Technikure Coreactant Part II MSDS		0.0072	VOC E.F. x (Part content/100) x (HAP by weight/100)	0.02	0.09	-	-	0.022	9.44E-02

Note 1: Clow has replaced catalyst (TEA) that was a HAP with a non-HAP.

* - Indicates compound is a Polycylic Organic Matter (POM)
** - Form R Reporting of Binder Chemicals Used in Foundries indicates that for PUCB Chemical #2, that MDI present 99.99% is reacted and 0.01% remains in the core. None is emitted. It is assumed that what remains in the core will be released and counted in the Pouring & Cooling emissions.

SAMPLE CALCULATIONS:
Potential Emission Rate (lb/hr) =(Potential Hourly Production T/Hr) x (Emission factor (lb/ton))
Potential Emission Rate (TPY) =(Potential Annual Production T/Yr) x (Emission factor (lb/ton)) / (2000 lb/ton)
Average Actual Emission Rate (lb/hr) =(Average Actual Hourly Production T/Hr) x (Emission factor (lb/ton))
Average Actual Emission Rate (TPY) =(Average Actual Annual Production T/Yr) x (Emission factor (lb/ton)) / (2000 lb/ton)
Net Emissions Increase (TPY) = (Potential Emission Rate (TPY)) - (Average Actual Emission Rate (TPY))

HAP Emission Calculations
Clow Water Systems Company
Coshocton, Ohio

Large PUNB Mold/Core Making (F005) (VOCs/HAPs)

22.5 =Potential Capacity (Tons core/hr)
12,500.0 = Potential Capacity (Tons cores/yr)

1.2% % resin usage (of sand)
6% % catalyst usage (of resin)
57.0% % by weight Part I
43.0% % by weight Part II

VOCS AND HAPS	Control Efficiency (Resin Application)											
	CAS #	% by Weight	Basis	Control Efficiency %	Emission Factor lb/ton	Emissions Factor Basis	Potential Emissions lb/hr	Potential Emissions tons/yr	Average Emissions lb/hr	Average Emissions tons/yr	Net Emissions Increase lb/hr	Net Emissions Increase tons/yr
Total VOCs					1.44	Note 1	32.338	8.98	-	-	32.338	8.98E+00
Part 1												
Phenol	108-95-2	10.00%	MSDS		-	Note 2					-	0.00E+00
Natphthalene	91-20-3	5.00%	MSDS		0.04001	Note 2	0.9003	0.2501			0.9003	2.50E-01
Part 2												
MDI	9016-87-9	55.00%	MSDS		-	Note 2	-	-			-	0.00E+00
Methylene Dipheyldiisocyanate	101-68-8	25.00%	MSDS		-	Note 2	-	-			-	0.00E+00
Natphthalene	91-20-3	5.00%	MSDS		0.03019	Note 2	0.6792	0.1887			0.6792	1.89E-01
Catalyst												
Xylene	1330-20-7	5.00%	MSDS		0.07200	N/A	1.6200	0.4500			1.6200	4.50E-01
Ethylbenzene	100-41-4	0.50%	MSDS		0.00720	N/A	0.1620	0.0450			0.1620	4.50E-02

Note 1: Ashland Data based on OCMA weight loss method (Pepset XI1000/XI2000 with catalyst 3550)
Note 2: Form R: Reporting of Binder Chemicals Used in Foundries

SAMPLE CALCULATIONS:
Potential Emission Rate (lb/hr) =(Potential Hourly Production T/Hr) x (weight percent) x (2000 lb/ton)
Potential Emission Rate (TPY) =(Potential Annual Production TPY) x (weight percent)
Average Actual Emission Rate (lb/hr) =(Average Actual Hourly Production T/Hr) x (weight percent) x (2000 lb/ton)
Average Actual Emission Rate (TPY) =(Average Actual Annual Production TPY) x (weight percent)
Net Emissions Increase (TPY) = (Potential Emission Rate (TPY)) - (Average Actual Emission Rate (TPY))

HAP Emission Calculations
Clow Water Systems Company
Coshocton, Ohio

Small PUNB Core/Mold Making F022 (VOCs/HAPs)

10.20 =Potential Capacity (Tons core/hr)
17,870.0 = Potential Capacity (Tons cores/yr)

1.2% % resin usage (of sand)
6.0% % catalyst usage (of resin)
57.0% % by weight Part I
43.0% % by weight Part II

VOCS AND HAPS	CAS #	% by Weight	Basis	Control Efficiency %	Emission Factor lb/ton	Emissions Factor Basis	Potential Emissions lb/hr	Potential Emissions tons/yr	Average Emissions lb/hr	Average Emissions tons/yr	Net Emissions Increase lb/hr	Net Emissions Increase tons/yr
				Control Efficiency (Resin Application)								
Total VOCs					1.44	Note 1	14.660	12.84	-	-	14.660	1.28E+01
Part 1											-	0.00E+00
Phenol	108-95-2	10.00%	MSDS		-	Note 2					0.4081	3.58E-01
Natphthalene	91-20-3	5.00%	MSDS		0.04001	Note 2	0.4081	0.3575				
Part 2											-	0.00E+00
MDI	9016-87-9	55.00%	MSDS		-	Note 2	-	-			-	0.00E+00
Methylene Dipheyldiisocyanate	101-68-8	25.00%	MSDS		-	Note 2	-	-			0.3079	2.70E-01
Natphthalene	91-20-3	5.00%	MSDS		0.03019	Note 2	0.3079	0.2697				
Catalyst											0.7344	6.43E-01
Xylene	1330-20-7	5.00%	MSDS		0.07200	N/A	0.7344	0.6433			0.0734	6.43E-02
Ethylbenzene	100-41-4	0.50%	MSDS		0.00720	N/A	0.0734	0.0643				

Note 1: Ashland Data based on OCMA weight loss method (Pepset XI1000/XI2000 with catalyst 3550)
Note 2: Form R: Reporting of Binder Chemicals Used in Foundries

SAMPLE CALCULATIONS:
Potential Emission Rate (lb/hr) =(Potential Hourly Production T/Hr) x (weight percent) x (2000 lb/ton)
Potential Emission Rate (TPY) =(Potential Annual Production TPY) x (weight percent)
Average Actual Emission Rate (lb/hr) =(Average Actual Hourly Production T/Hr) x (weight percent) x (2000 lb/ton)
Average Actual Emission Rate (TPY) =(Average Actual Annual Production TPY) x (weight percent)
Net Emissions Increase (TPY) = (Potential Emission Rate (TPY)) - (Average Actual Emission Rate (TPY))

HAP Emission Calculations
Clow Water Systems Company
Coshocton, Ohio

Flow Diagram Designation

Fittings Painting (K002)

		Potential Capacity	
Coating #1	1,400	Gal/yr
	1	Gal/hr
Solvent	187	Gal/yr
	1	Gal/hr

Process Description:

Fittings Painting (K002)

Control Device:	N/A	
Control Device outlet grain loading (PM/PM-10):	N/A	gr/dscf
Air Flow:	N/A	acfm
Settling Factor (inside) PM/PM-10	N/A	%

Potential HAP Emissions	HAP	% wt.	Weight by Volume (lb/gal)	Paint Ratio		Lb/yr (Gal/yr)	Ton/yr
Tnemec N140-1211A	Xylene	10.57%	13.94	50.00%		1,031.17	5.16E-01
Tnemec N140-0140B	Xylene	12.27%	11.62	50.00%		998.20	4.99E-01
	Ethyl Benzene	1.37%	11.62	50.00%		111.45	5.57E-02
	Methyl Isobutyl Ketone	4.07%	11.62	50.00%		331.11	1.66E-01
						TOTAL	1.24E+00
Tnemec N140-1255A	Xylene	10.25%	14.02	50.00%		1,005.91	5.03E-01
	Ethyl Benzene	2.48%	14.02	50.00%		243.38	1.22E-01
Tnemec N140-0140B	Xylene	12.27%	11.62	50.00%		998.20	4.99E-01
	Ethyl Benzene	1.37%	11.62	50.00%		111.45	5.57E-02
	Methyl Isobutyl Ketone	4.07%	11.62	50.00%		331.11	1.66E-01
						TOTAL	1.35E+00
Tnemec F046H0413A	Xylene	12.00%	11.25	50.00%		945.29	4.73E-01
	Ethyl Benzene	2.72%	11.25	50.00%		214.26	1.07E-01
Tnemec F046H0413B	Xylene	13.20%	12.17	50.00%		1,124.18	5.62E-01
	Ethyl Benzene	3.30%	12.17	50.00%		281.04	1.41E-01
						TOTAL	1.28E+00
Tnemec N69-11WHA	Xylene	10.17%	15.27	50.00%		1,086.97	5.43E-01
	Ethyl Benzene	2.47%	15.27	50.00%		263.99	1.32E-01
Tnemec N69-0069B	Xylene	11.83%	12.06	50.00%		998.54	4.99E-01
	Ethyl Benzene	1.32%	12.06	50.00%		111.42	5.57E-02
	Methyl Isobutyl Ketone	3.92%	12.06	50.00%		330.88	1.65E-01
						TOTAL	1.40E+00
Sherwin Williams Epoxy Tan B67H5	Ethyl Benzene	2.00%	14.15	100.00%		396.20	1.98E-01
	Xylene	13.00%	14.15	100.00%		2,575.30	1.29E+00
						TOTAL	1.49E+00
Sherwin Williams Copoxy Gold B62Y110	Ethyl Benzene	0.30%	14.47	100.00%		60.77	3.04E-02
	Xylene	1.00%	14.47	100.00%		202.58	1.01E-01
						TOTAL	1.32E-01
		THINNERS					
Tnemec F041-0004 Thinner	Xylene	33.40%	6.90	100.00%		431.62	2.16E-01
	Methyl Isobutyl Ketone	38.67%	6.90	100.00%		499.73	2.50E-01
	Ethyl Benzene	8.34%	6.90	100.00%		107.78	5.39E-02
						TOTAL	5.20E-01

Notes:
All coatings that Clow will not be used at the MACT designated facility are not included in this spreadsheet.
Clow can use any of the coatins and the thinner (maximum emissions are based on the highest individual and total HAP from a coating plus the individual and total HAP from the thinner.

HAP Emission Calculations
Clow Water Systems Company
Coshocton, Ohio

Flow Diagram Designation
Pipe Stencil - Small Line (Z004)

Process Description:

Pipe Stencil - Small Line (Z004)	N/A	
Control Device:	N/A	gr/dscf
Control Device outlet grain loading	N/A	acfm
Air Flow:	N/A	%
Settling Factor (inside) PM/PM-10	10.5	lbs/gal
Coating Density	4.00%	% by Wt.
HAP Content		

Potential Capacity

Pipe	275,000	tons of pipe per year
Coating #1	1,049	Gal/yr

2004 Actual Production/Usage Rate

177,195	tons of pipe per year
676	Gal/yr

	Analyte	CAS #	Lbs/year	TPY
Various	Ethylene Glycol	107-21-1	4.41E+02	2.20E-01
			Total HAPs	2.20E-01

HAP Emission Calculations
Clow Water Systems Company
Coshocton, Ohio

Flow Diagram Designation		Potential Capacity		2004 Actual Production/Usage Rate
Paint Stencil - Large Line (Z075)	Pipe	275,000	tons of pipe per year	177,195 tons of pipe per year
Process Description:	Coating #1	484	Gal/yr	312 Gal/yr

Paint Stencil - Large Line (Z075)		
Control Device:	N/A	
Control Device outlet grain loading (PM/PM-	N/A	gr/dscf
Air Flow:	N/A	acfm
Settling Factor (inside) PM/PM-10	N/A	%
Coating Density	10.5	lbs/gal
HAP Content	4.00%	% by Wt.

	Analyte	CAS #	Lbs/year	TPY
Various	Ethylene Glycol	107-21-1	2.03E+02	1.02E-01
			Total HAPs	**1.02E-01**

HAP Emission Calculations
Clow Water Systems Company
Coshocton, Ohio

Flow Diagram Designation	Potential Capacity	2004 Actual Production/Usage Rate
Pipe Paint Striping - Small Line (Z1:	Pipe 275,000 tons of pipe per year	177,195 tons of pipe per year
	Coating #1 365 Gal/yr	233 Gal/yr

Process Description:

Pipe Paint Striping - Small Line (Z131)		
Control Device:	N/A	
Control Device outlet grain loading	N/A	gr/dscf
Air Flow:	N/A	acfm
Settling Factor (inside) PM/PM-10	N/A	%
Coating Density	8.092302	lbs/gal
HAP Content (Cumene)	0.47%	% by Wt.
HAP Content (Ethyl Benzene)	0.18%	% by Wt.

	Analyte	CAS #	Lbs/year	TPY
Various	Cumene	98-80-8	1.39E+01	6.94E-03
	Ethyl Benzene	100-41-4	5.32E+00	2.66E-03
			Total HAPs	9.60E-03

HAP Emission Calculations
Clow Water Systems Company
Coshocton, Ohio

Flow Diagram Designation

Pipe Paint Striping - Large Line (Z132)

Process Description:

	Potential Capacity		2004 Actual Production/Usage Rate
Pipe	275,000	tons of pipe per year	177,195 tons of pipe per year
Coating #1	365	Gal/yr	233 Gal/yr
	2.4	gal/day	

Pipe Paint Striping - Large Line (Z132)		
Control Device:	N/A	
Control Device outlet grain loading (PM/PM-	N/A	gr/dscf
Air Flow:	N/A	acfm
Settling Factor (inside) PM/PM-10	N/A	%
Coating Density	8.092302	lbs/gal
HAP Content (Cumene)	0.47%	% by Wt.
HAP Content (Ethyl Benzene)	0.18%	% by Wt.

	Analyte	CAS #	LBs/year	tpy
Various	Cumene	98-80-8	1.39E+01	6.94E-03
	Ethyl Benzene	100-41-4	5.32E+00	2.66E-03
			Total HAPs	9.60E-03

Flow Diagram Designation

Gas-fired air makeup units (B001, B002, B006, B007)

Process Description:

Gas-fired air makeup units (B001, B002, B006, B007)

Control Device:

Natural Gas Combustion

Inputs	
33.4	Max hourly heat input Rate (mmBtu/hr) **
1,020	Fuel heat content (Btu/ft^3)
0.033	Max hourly fuel usage rate (million standard cubic feet hour)
287	Max annual fuel usage rate (million standard cubic feet year)

POLLUTANT	CAS #	Emission Factor (lb/10^6 scf) *	Potential Emissions (lb/hr)	Potential Emissions (TPY)
Arsenic	7440-38-2	2.0E-04	6.55E-06	2.87E-05
Beryllium	7440-41-7	1.2E-05	3.93E-07	1.72E-06
Cadmium	7440-43-9	1.1E-03	3.60E-05	1.58E-04
Chromium	7440-47-3	1.4E-03	4.58E-05	2.01E-04
Cobalt	7440-48-4	8.4E-05	2.75E-06	1.20E-05
Lead		5.0E-04	1.64E-05	7.17E-05
Manganese	7439-96-5	3.8E-04	1.24E-05	5.45E-05
Mercury	7439-97-6	2.6E-04	8.51E-06	3.73E-05
Nickel	7440-02-0	2.1E-03	6.88E-05	3.01E-04
Selenium	7782-49-2	2.4E-05	7.86E-07	3.44E-06
POM/2-Methylnaphthalene	91-57-6	2.4E-05	7.86E-07	3.44E-06
POM/3-Methylchloranthrene	56-49-5	1.8E-06	5.89E-08	2.58E-07
POM/7,12-Dimethylbenz(a)anthracene		1.6E-05	5.24E-07	2.29E-06
POM/Acenaphthene	83-32-9	1.8E-06	5.89E-08	2.58E-07
POM/Acenaphthylene	203-96-8	1.8E-06	5.89E-08	2.58E-07
POM/Anthracene	120-12-7	2.4E-06	7.86E-08	3.44E-07
POM/Benz(a)anthracene	56-55-3	1.8E-06	5.89E-08	2.58E-07
Benzene	71-43-2	2.1E-03	6.88E-05	3.01E-04
POM/Benzo(a)pyrene	50-32-8	1.2E-06	3.93E-08	1.72E-07
POM/Benzo(b)fluoranthene	205-99-2	1.8E-06	5.89E-08	2.58E-07
POM/Benzo(g,h,i)perylene	191-24-2	1.2E-06	3.93E-08	1.72E-07
POM/Benzo(k)fluoranthene	205-82-3	1.8E-06	5.89E-08	2.58E-07
POM/Chrysene	218-01-9	1.8E-06	5.89E-08	2.58E-07
POM/Dibenzo(a,h)anthracene	53-70-3	1.2E-06	3.93E-08	1.72E-07
Dichlorobenzene	25321-22-6	1.2E-03	3.93E-05	1.72E-04
POM/Fluoranthene	206-44-0	3.0E-06	9.82E-08	4.30E-07
POM/Fluorene	86-73-7	2.8E-06	9.17E-08	4.02E-07
Formaldehyde	50-00-0	7.5E-02	2.46E-03	1.08E-02
Hexane	110-54-3	1.8E+00	5.89E-02	2.58E-01
POM/Indeno(1,2,3-cd)pyrene	193-39-5	1.8E-06	5.89E-08	2.58E-07
Naphthalene	91-20-3	6.1E-04	2.00E-05	8.75E-05
POM/Phenanathrene	85-01-8	1.7E-05	5.57E-07	2.44E-06
POM/Pyrene	129-00-0	5.0E-06	1.64E-07	7.17E-07
Toluene	108-88-3	3.4E-03	1.11E-04	4.88E-04
Total POM		8.8E-05	2.89E-06	1.26E-05
Total HAPs		1.9E+00	6.18E-02	2.71E-01

* Emission Factors from USEPA's AP-42 Fifth Edition, July 1998,
Chapter 1.4 (Natural Gas Combustion, External Combustion Sources), Tables 1.4-1+2+3+4.

** The fuel values represent the maximum fuel used by all 4 air make up units

Many emission factors were < than a specific value.
The number of the specific value was used to error on the conservative side.